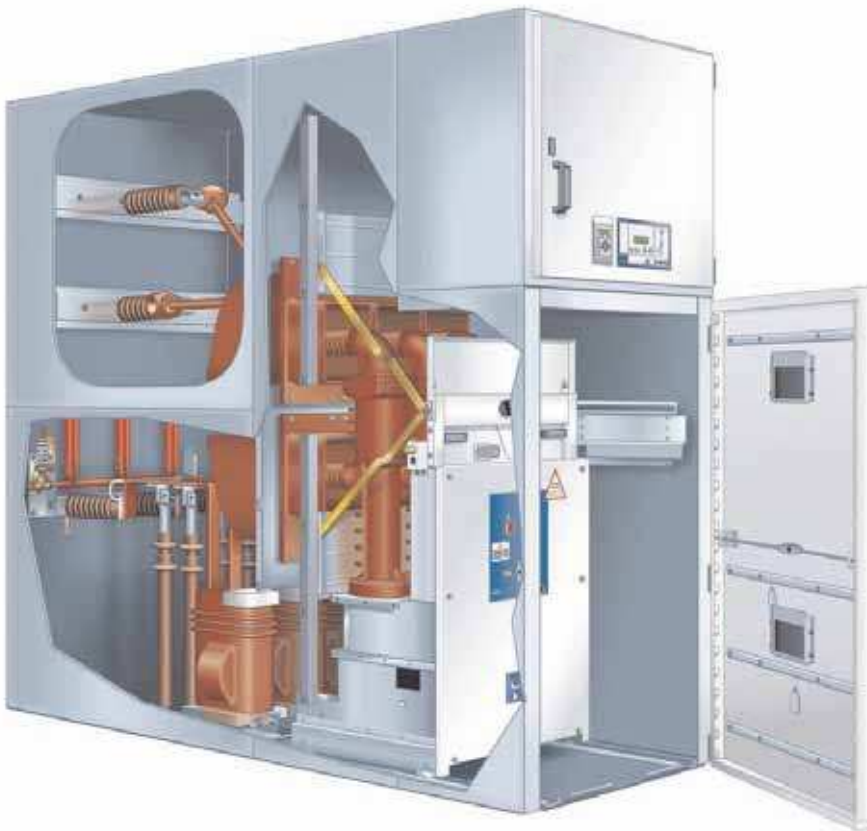


Air Insulated Vacuum Switchgear - PIX-36

Complete solution for applications up to 36 kV, 2500A, 31.5kA



Air Insulated Switchgear PIX-36

Whether you generate, distribute or use electric power-in today's economic climate, you need a cost effective solution which is reliable, safe and easy to use.

This version has been optimized for the primary distribution range up to 36 kV/31.5 kA/2500A.

PIX -36 is equipped with Vacuum Circuit Breaker. The fully metal clad design makes this product robust for all applications. It offers space saving and complies strictly with the latest IEC standards. Safety is the number one priority.

Customer benefits

- > Internal Arc tested upto 31.5 kA for AFLR - PM with loss of service continuity-LSC (2B)
- > All operations with doors closed, including racking in/out of breaker.
- > Use of earthed automatic shutters ensuring operator safety.
- > Designed for Classes S1, E2, M2, C2
- > Fully type test as per IEC standards.
- > Interrupters completely insensitive to adverse environmental conditions, achieved by the latest concept of solid encapsulation.
- > With a compact width of 1000 mm, it offers savings on space & civil costs.
- > All necessary positive interlocks installed, as per IEC guidelines.



Industry



Utility



Oil & Gas



Power Plants



Mining and Metals



Infrastructure

LSC2B, Best Service Continuity Class

Using four distinct compartments (circuit breaker, current transformers, busbar and low voltage equipment) and the use of earthed automatic shutter, PIX-36 is compliant with loss of service continuity class LSC 2B. This provides complete safety for the operator in all operating conditions.

Ergonomic

PIX - 36 is characterized by a reduced width which offers savings on space and civil costs. Even with its reduced size of 1,000 mm, it offers spacious compartments enhanced by its withdrawable design and allows easy access for insulation and maintenance work.

This new truck-mounted breaker design eliminates the need for a separate handling truck, which enhances manoeuvrability at this voltage rating.



Highest Internal Arc Classification

A unique design for operator safety, the front hinged door is locked on four flanges, this contributes to the highest level of IAC certification - IAC AFLR 31.5/0.1 sec. according to the latest IEC 62271 - 200.

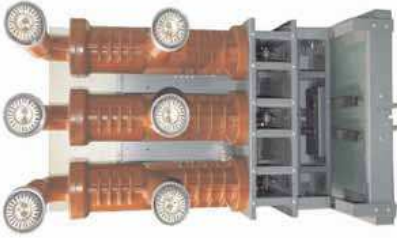


Safety First

- > **All operations with doors closed**
All operations on the equipment are performed with the compartment doors closed. It even includes movement of the breaker from test / isolated to the service position.
- > **Front access**
PIX-36 is designed to allow complete operation from the front of the unit, ensuring that correct operation is always achieved
- > **Clear, visible switching devices**
The front mechanism cover shows a clear visual display of circuit breaker position, ON/OFF condition, spring charged / discharged and earthing switch status
- > **Complete set of interlocks**
All necessary positive interlock are installed according to IEC standards, Nevertheless, exceeding standard is possible with PIX- 36. As an example: an interlock is provided in option on the rear cable cover, preventing opening unless the circuit has first been earthed.

Reliability

- > **Highly reliable circuit breakers**
Incorporating Schneider Electric's State-of-the-art technological developments in vacuum switching technology and operating mechanism
- > **Encapsulated Vacuum Interrupter**
A new concept of encapsulation using solid insulation makes vacuum interrupters not only replaceable but also insensitive to any adverse environmental conditions.
Dielectric tightness in the poles is achieved through engineered silicon rubber rings. Creepage distance is in excess of 20 kV per mm and the partial discharge is less than 5pc in accordance with the latest IEC standards.
- > **Interrupters - a long-life cycle circuit breaker**
The specially designed Schneider Electric VG series of interrupters --- housed in special epoxy cast poles-work on the principle of a radial and axial magnetic field. Based on the level of fault current, these interrupter poles are suitable for 30,000 mechanical operations, 20,000 electrical operations and 100 full short circuit operations.



- > **Reliable Spring Mechanism**
A single-shaft, spiral spring mechanism design, with a minimum number of moving parts, is housed in an enclosure and is more reliable for closing and tripping operation and perfectly suited for the fast O-CO operations. Usage of specially designed CAM profile minimizes operating energy while providing necessary speed for operation under fault conditions. Mechanism stress is therefore very low and ensures 30,000 mechanical operations.
- > **Distortion and corrosion free**
Cubicles are manufactured from 2mm thick galvanized sheet for corrosion prevention. The frame is riveted for higher mechanical strength so as to better withstand Internal Arc Pressure.

Easy Access To All Compartments

PIX-36 has been designed for both front and rear access for ease of operation and maintenance. The functional design of front panels affords easy access to the separate compartments within the cubicles. In addition, internal partitions can be quickly and easily removed to facilitate access for installation, cabling and commissioning, as well as for inspection and maintenance.

Applied Standards

PIX-36 switchgear units meet following standards and regulations :

Switchgear	IEC 62271-200 & IEC 62271-1
Internal arc classification (IAC), LSC ZB	IEC 62271-200
Circuit-breaker	IEC 62271-100
Earthing switch	IEC 62271-102
Isolating truck	IEC 62271-102
Current transformers	IEC 60441-1
Voltage transformers	IEC 60442-2
Voltage Detecting Systems	IEC 61243-5, IEC 61958
Protection against accidental contact, foreign bodies and water	IEC 60529

PIX-36 is defined as follows

- > **Partition Metallic (PM)**: It is provided with metallic shutters and partitions between adjacent compartments.
- > **Loss of Service Continuity (LSC) - 2B**: Service of the main busbar and the cable compartment are ensured when normal maintenance operations are carried out in one of the compartments of the main circuit (example circuit breaker compartment).
- > **Internal Arc Classification (IAC) - AFLR**: It is Accessible from Front, Lateral and Rear with one second duration in all compartments.

Ambient conditions in accordance with IEC 62271-1	
Temperature Class	*Minus 5 indoors**
Min / max ambient temperature	-5 / 40 deg C*
Average value over 24 hours	35 deg C
Average relative humidity: 24 hour / 1 month	≤ 95 / ≤ 90
Installation altitude above sea-level	< 1000m

* other values available on request

Technical Overview

Ratings	
Type	PIX-36
Rated Voltage	upto 36kV
Rated Continuous Current	upto 2500 A
Rated Frequency	50 Hz
Rated Interrupting Current	upto 31.5 kA
Rated Making Current	upto 78,75 kAp
Rated Short Time Current	upto 31.5 kA for 3 sec.
Operating Duty	O-0.3 sec-CO-3min-CO
Applicable Standards	IEC 62271-100 / 200 & IEC 62271-1
Power Frequency Withstand Voltage	70 kV
Impulse Withstand Voltage	170 kVp
Degree Of Protection	IP4X as per IEC 60529
Type Of Mechanism	Motor charged, Stored energy, Spring operated
Rated Single Capacitor Bank	400A Class C2 category
Rated Cable Charging Current	50A Class C2 category
Rated Line Charging Current	10A Class C2 category

Dimensions and weights

Height of the cubicle = 2350 mm, Height of LV Chamber = 805 mm

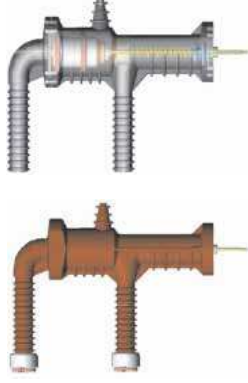
Panel Type	Panel width (mm)	Panel depth (mm)	Weight approx. (kg)
Feeder panel with circuit-breaker	1000	2655 (Std)/ 3075 (Ext)	1700
Bus section coupler circuit-breaker	1000	3075	1700
Bus Riser Panel	1000	3075	1000
Busbar Metering Panel	1000	2655 (Std)/ 3075 (Ext)	1000
Cable In / Cable Out (CICO)	1000	3075	1700

HVX Breaker

New, most compact , latest technology breaker using time tested & proven concepts up to 36 kV/31.5 kA, 2500 A. Uses solid encapsulation technology, making the performance consistent & reliable, irrespective of the working environment. Proven mechanical drive used successfully both in domestic and international locations.

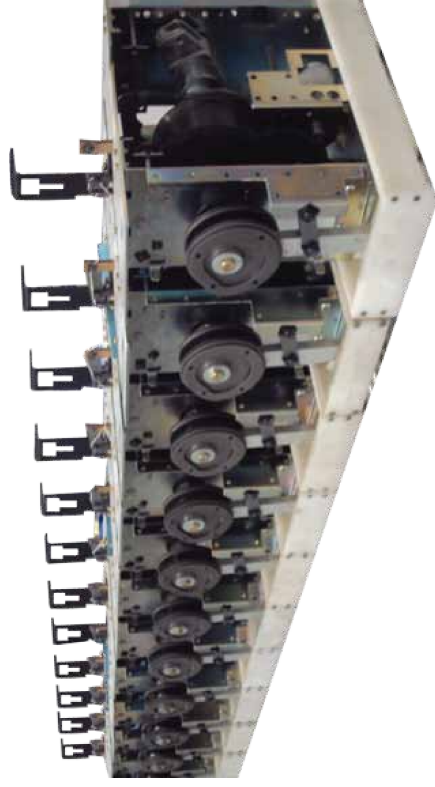
Breaker Poles

- > No live part exposed.
- > All parts are of round shape which is experimentally determined to be the best shape for HV Impulse & partial discharge performance.
- > Springs covered with a special corona shielding, which ensures best Partial Discharge performance.
- > Very high creepage distance for indoor application.
- > Dielectric tightness achieved in the pole through patented silicon rubber rings.
- > Performance is completely insensitive to the environment. Even the base is sealed through sealing ring.
- > Environmental friendly, the pole could be disassembled at the end of life.

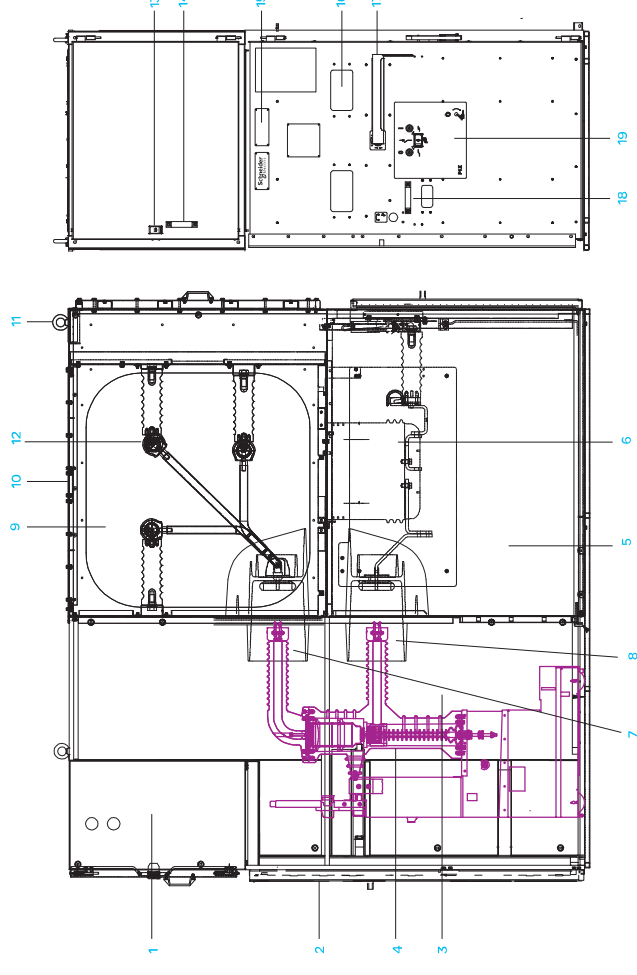


Mechanism

- > Highly specialized spiral spring housed in enclosure.
- > Fast acceleration for opening of the contacts by Single shaft design with spiral spring for closing & tripping - lesser components, higher reliability.
- > Highly precise transmission by means of cam with short contact trouble.



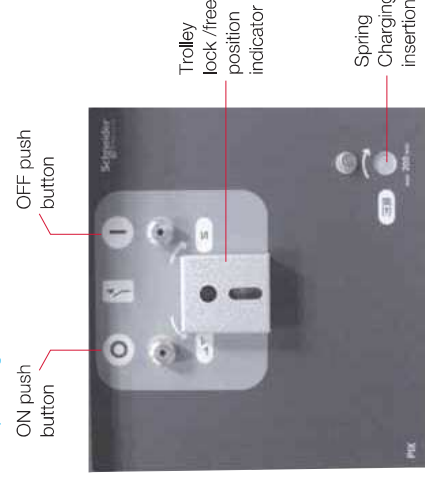
Panel Overview



HWX with roll on floor circuit-breaker truck

- 1 Low-voltage chamber
- 2 Front door
- 3 Breaker chamber
- 4 Circuit breaker
- 5 CT & cable chamber
- 6 Current transformers
- 7 Busbar spouts
- 8 Circuit spouts
- 9 Busbar chamber
- 10 Blow off covers
- 11 Lifting lugs
- 12 Busbars
- 13 Door pad locking
- 14 Door handle
- 15 Feeder description
- 16 Viewing arrangement
- 17 Rack in / out handle
- 18 Panel front facia

Panel Operating Facia



Panel safety interlocks

Operating mechanical interlocking

The PIX-36 functional units are equipped with mechanical function interlocks, intended to avoid any kind of operational error.

These interlocks must be known before any operation is performed.

Interlock	Function of interlock	Method of operation of interlock
Between the racking-in of the moving part and the installation of the low voltage plug.	The racking-in of the moving part is impossible if the low voltage is not connected.	The racking handle can not be inserted to desired position.
Between the racking-in of the moving part and the earthing switch "closed".	racking-in of the moving part is impossible if the earthing switch is closed.	Earthing interlock lever prohibits VCB movement.
Between the closure of the earthing switch and the earthing position of the moving part.	Closure of the earthing switch is impossible as soon as the moving part is in the course of being racked in or is "racked-in".	Earthing interlock lever prohibits "ON" movement.
Between the racking-in and the closed state of the moving part.	Racking-in of the moving part is impossible if the latter is closed.	Interlock lever prohibits insertion of the crack handle.
Between the closing of the moving part and racking-in	Closing of the moving part is impossible outside of the "Racked-n" or "Test" positions.	Electrical and manual command controls of the moving part are impossible.
The rear cover opening & earthing switch closure.	Opening of rear cover is impossible if the earthing switch is in "OFF" condition.	The interlock lever prohibits of rear cover movement.
Cubicle front door opening & moving part in racked-in condition.	Opening of the front door is impossible if the moving part is racked-in.	The interlock lever prohibits the front cover movement.
Between Low voltage plug & position of moving part in racked-in condition.	Opening of the LV plug is impossible if the moving part is racked-in.	The interlock lever prohibits the LV plug opening.

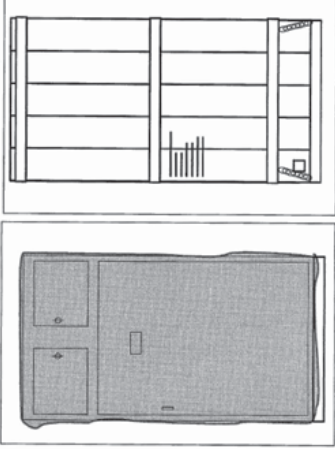
Packing, Handling and Storage

Packaging

- > For road & rail transport: cubicles on wooden pallets and wrapped under plastic film.
- > For air & sea transport: cubicle wrapped under heat sealing film with desiccant bags and placed in wooden crates.

Handling

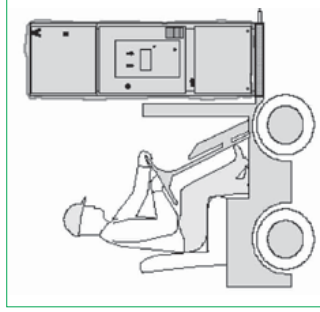
- > Truck & train transport (max. 900 kg): by means of forklift truck.
- > It is imperative to ensure that the forks of the truck are fully engaged throughout the entire width of the functional unit.
- > To lift the cubicles, pass two slings supporting 1500 kg each and a lifting device.
- > Place a protection stringer between each sling, on the roof of the cubicle.



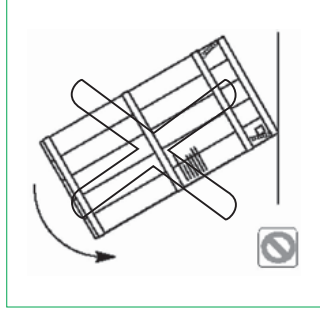
Packaging for road and rail transport

Transport

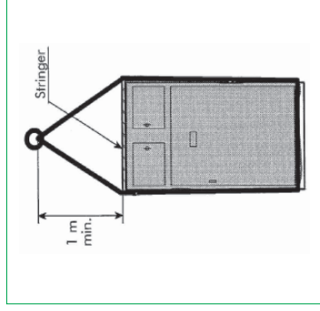
The panel may only be transported on a pallet. The entire length of the forks must be placed



Transport using a forklift truck



Never tip the crates over

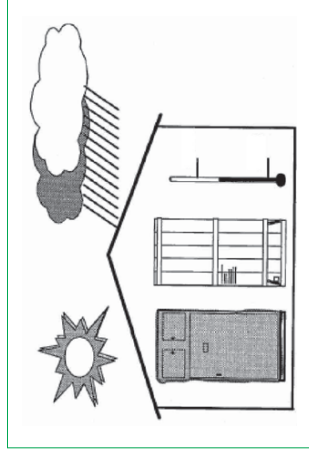


Handling of cubicle with stringer

Storage

The storage area must shelter the equipment from agents likely to cause deterioration such as :

- > Water
- > Water vapour
- > Salt laden air
- > Pollution of any type
- > Microorganisms



Protection Relay

Operating mechanical interlocking

Protection devices are integral part of switchgear panels. Schneider Electric is a leader in switchgear protection relay technology with a range of applications.

The protection unit is chosen based on

- > Requirement of protection functions
- > Communication protocol (IEC 103 / IEC 61850 / MODBUS / Others)
- > Choice of ports (Redundant ports)
- > Number & types of analog inputs & digital inputs / outputs



MICOM

The MICOM range of relays offers varying levels of functionality and hardware options to best suit the protection requirements, and allows the customer to choose the most cost effective solution for their application.

The 20, 30 and 40 series hardware platforms are the building blocks of the MICOM protection relay range providing the capability for a wide variety of protection, control, measurement, monitoring and communication functions.

The versatile hardware allows for application in many installations and a common relay management software (MICOM S1) makes for easy configuration and application.

A standard and simple user interface across the range makes this ideal in any environment, from the more complex bay level control and mimic to the more simple LCD display and interrogation facility.

SEPM

Breaking new ground back in 1982, Merlin Gerin launched Sepam, the first multi-functional, digital protection relay. Today, with the extended Sepam range (series 10, 20, 40 and 80), customers benefit from over 30 years of experience on the part of the Schneider Electric R&D teams.

More than 250 000 Sepam relays have been installed in over 130 countries and in every sector of activity:

- > energy production and distribution
- > infrastructure: airports, tunnels, public transportation, water treatment
- > industry: automobile, mines, semiconductors, metallurgy, petrochemicals
- > commercial sector: shopping centres, hospitals.

VAMP

Schneider Electric Vamp type relay specialises in arc flash protection for power systems.

VAMP relays are already used in nearly 80 countries to protect applications, from overhead line feeders and substations to power plants and industrial power systems.

The unique arc fault protection functionality enhances the safety of both people and property and has made Vamp a leading brand in arc protection worldwide. All Vamp products meet the latest international standards and regulations.



Manufacturing facility in India



PLX-36 switchgear with roll on floor circuit breaker is manufactured at the state of the art green field facility in Vadodara, India. The factory is situated 12 kms. from National highway joining the Ahmedabad and Mumbai, which gives excellent connectivity to an extensive road and railway network and access to major ports. With a built up area of 19,820 sq. meter, the facility has the capability to cater to both the domestic as well as the export markets. The facility houses sheet metal fabrication and bus-bar machining processes, in addition to switchgear assembly capabilities.

The facility is designed to work according to world class manufacturing practices. A departure from the traditional batch production concept to single piece flow concept enhances the productivity.

Factory has complete high voltage testing facilities and a dedicated FAT area for costumers to inspect the functionality of complete switch boards.

A full-fledged R&D team and a well equipped laboratory constantly endeavors to develop new features in our product range. Panel modifications to meet specific customer requirement can also be carried out.

High emphasis is given on the quality of the incoming material, and strict control of the production processes ensures good quality product is delivered to the customer. The facility is ISO 9001, ISO 14001 and OHSAS Certified.

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