



MV METAL-CLAD SWITCHGEARS NEX 10(6) KV

CITY ELECTRIC TRANSPORT ■
METRO ■ RAILWAYS ■
INDUSTRY ■ ENERGY

NEX METAL-CLAD SWITCHGEARS

Medium voltage metal-clad switchgear is one of the most important units in the power supply distribution system. On the basis of its long-term experience of equipment supply Pluton offers as MV switchgears NEX cubicles manufactured under license of Schneider Electric Company.

NEX is indoor, metal-enclosed switchgear designed for step-down and distribution substations, and also for distribution centers. NEX integrates a host of innovative solutions designed around proven techniques and includes: high performance switchgear, digital protection, monitoring and control systems, enclosure capable of withstanding internal arcing.

NEX Cubicle corresponds to the requirements of IEC 60298.

Cubicle is made up of four compartments separated internally using metallic partitions:

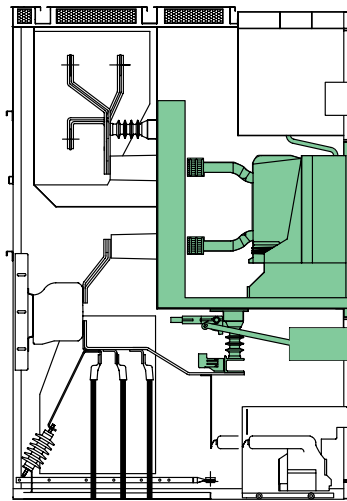
- **Relay protection and automatics compartment** with Sepam or MiCom (upon Customer's requirement), energy monitoring and accounting units, terminal blocks and other auxiliary circuits equipment;
- **Switching device compartment.** Compartment includes withdrawable part (circuit-breaker, disconnecter truck or earthing truck), moving metal shutters that close automatically upon circuit-breaker/disconnector /earthing switch transfer from operation to control position;
- **Cable compartment.** Compartment includes cable inputs, earthing switch, power-on indicator unit, current transformers, voltage transformers;
- **Busbars compartment.** Compartment includes copper busbars, bushing insulators.
- **Each compartment** (except for relay protection compartment) has its own gas disposal channel.

MAIN FUNCTIONS

Withdrawable unit and earthing

Composed of:

- withdrawable circuit-breaker,
- complete cradle equipped with metallic safety shutters and dedicated bushings,
- earthing switch with making capacity,
- LV connector between LV control cabinet and CB auxiliaries.

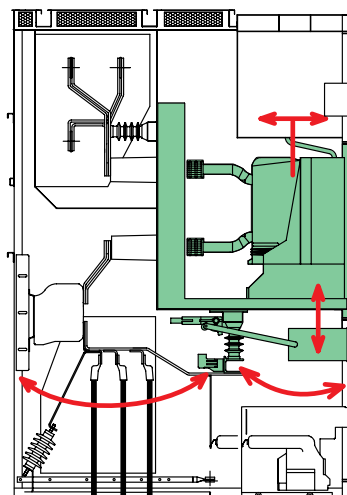


Interlocking

The cubicle integrates the different interlocking to prevent incorrect operation by the operator.

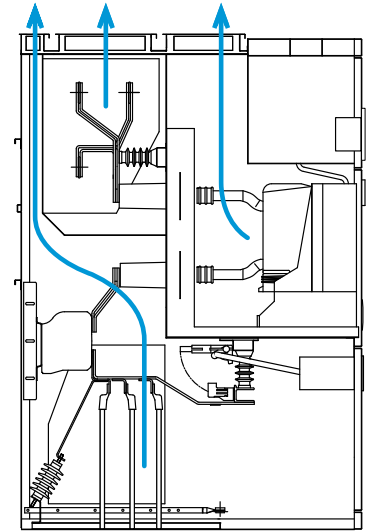
NEX secures operation to:

- access the cable compartment,
- rack in and out,
- operate the earthing switch,
- open the CB door.



Safety

- General structure that allows gas evacuation through pressure relief flaps.
- Each compartment is designed with a specific chimney for upward gas evacuation.



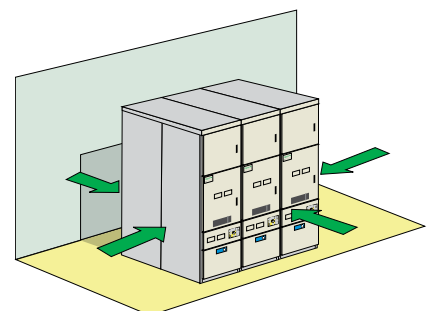
Internal arc protection

NEX is designed to withstand and protect operators in the case of failure due to an internal arc.

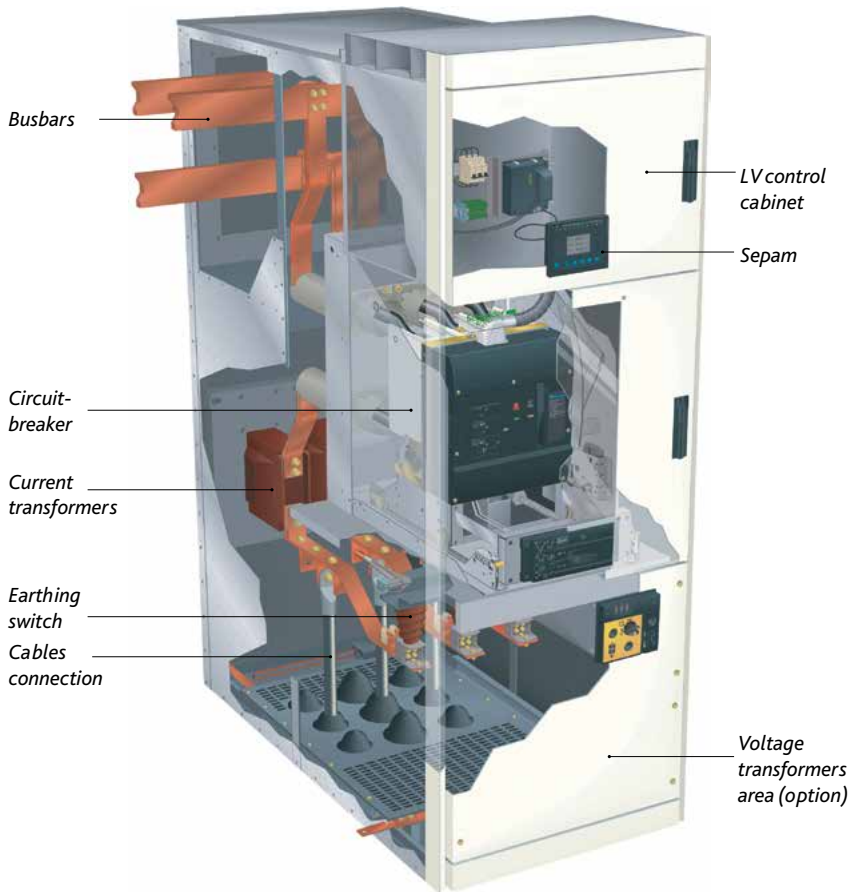
In the case of a NEX switchboard installed in the middle of a room, internal arc protection on 4 sides is necessary in order to protect an operator who goes behind the cubicle.

NEX can have 2 systems that can detect internal arcing:

- electromechanical detector
- optic detector (VAMP system).



MAIN COMPONENTS OF SWITCHGEAR NEX



Evolis Vacuum Circuit-Breaker

Evolis circuit-breaker is used to protect and control MV public or industrial distribution network.

Technical parameters of Evolis circuit-breaker:

- Rated operating voltage up to 17.5 kV
- Short circuit breaking capacity up to 31.5 kA.
- Rated current from 630 A to 2500 A.
- Axial magnetic field (AMF) breaking technology.
- Withdrawable version.



Special configuration of working contacts in circuit-breaker vacuum chambers and arc movement during its "blowout" provide maximum possible in this type of circuit-breakers "softness" of arc blowout even at high current values.

The advantages of this technique are:

- a very compact working contacts and vacuum chambers;
- "softness" of arc blowout.

Evolis is in conformity with the highest electrical endurance class (IEC 62271-100: class E2).

The magnetic field is generated by a patented outside coil which surrounds the contact area. This technical solution simplifies and therefore increases reliability of vacuum chamber, heavy duty contacts do not distort under repeated switching operations.

Evolis is in conformity with the most demanding mechanical endurance class (IEC 62271-100: class M2).

Relay Protection and Control Unit Sepam

Sepam is at the centre of the protection, monitoring and control system for NEX functional units: all the necessary protection, metering, control, monitoring and signalling functions are carried out by Sepam.

Digital relay protection units Sepam series 20, 40, 80 are designed with regards to the world experience in the field of electric circuits protection.

Like the NEX range, the Sepam range is a range of units defined to provide an optimal solution for each application, and includes (eg):

- Sepam S, substation incomer and feeder,
- Sepam B, bussectioning,
- Sepam T, transformer feeder,
- Sepam G, generator feeder.

Sepam corresponds to IEC 61850.

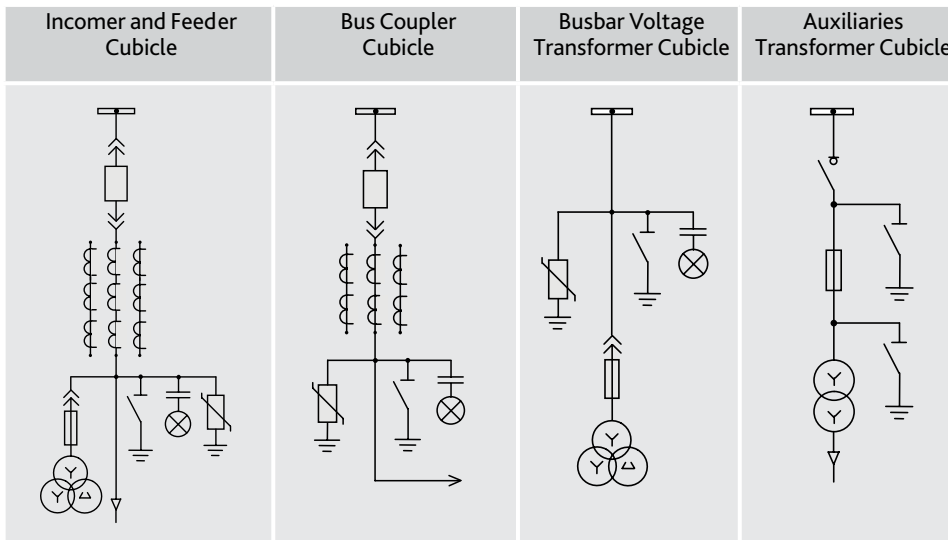
Advantages of SEPAM System:

- Over 20 years of experience in multi-function digital protection relays;
- Over 150,000 Sepam units in service in more than 90 countries;
- Quality design based on dependability studies and strict definition of environmental constraints: temperature, pollution, etc.;
- Ergonomic and intuitive user machine interface (UMI);
- User friendly and powerful PC setting software;
- Effective protection of personnel and equipment;
- Accurate measurements and detailed diagnosis;
- Integral equipment control;
- Local or remote indication and operation.



Upon Customer request can be applied other type of relay protection and control unit (e.g. MiCOM, VAMP).

FUNCTIONAL UNITS



TECHNICAL CHARACTERISTICS

Name of Parameter	Unit	Value	
Rated voltage	kV	6	10
Maximum operating voltage	kV	7.2	12
Insulation electrical strength			
Power frequency withstand voltage 50 Hz during 1 min	kV	32	42
Impulse value 1,2/50 mks	kV	60	75
Thermal resistance current	kA/3 s	25	31.5
Electrodynamical resistance current	kA	62.5	81
Busbars rated current	A	1250,	2500
Main circuits rated current	A	630	1250
		1250	2500
Internal arc resistance (option)			
IAC-AFLR	kA/0.5 s	25	

The NEX range meets the following international standards:

IEC 62271-1: clauses common to high voltage switchgear

IEC 62271-100: high voltage alternating current circuit-breakers

IEC 62271-102: alternating current disconnectors and earthing switches

IEC 62271-103: switches for rated voltages above 1 and less than 52 kV

IEC 62271-200: metal-enclosed switchgear for alternating current at rated voltages of between 1 and 52 kV

IEC 60282-2: high voltage fuses

IEC 60255: measurement relay and protection unit

IEC 60044-1: current transformers

IEC 60044-2: voltage transformers

IEC 60529: defining the protection indices provided by the enclosures

IEC 61958: Voltage Presence Indicating Systems (High Voltage prefabricated switchgear and controlgear assemblies).

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