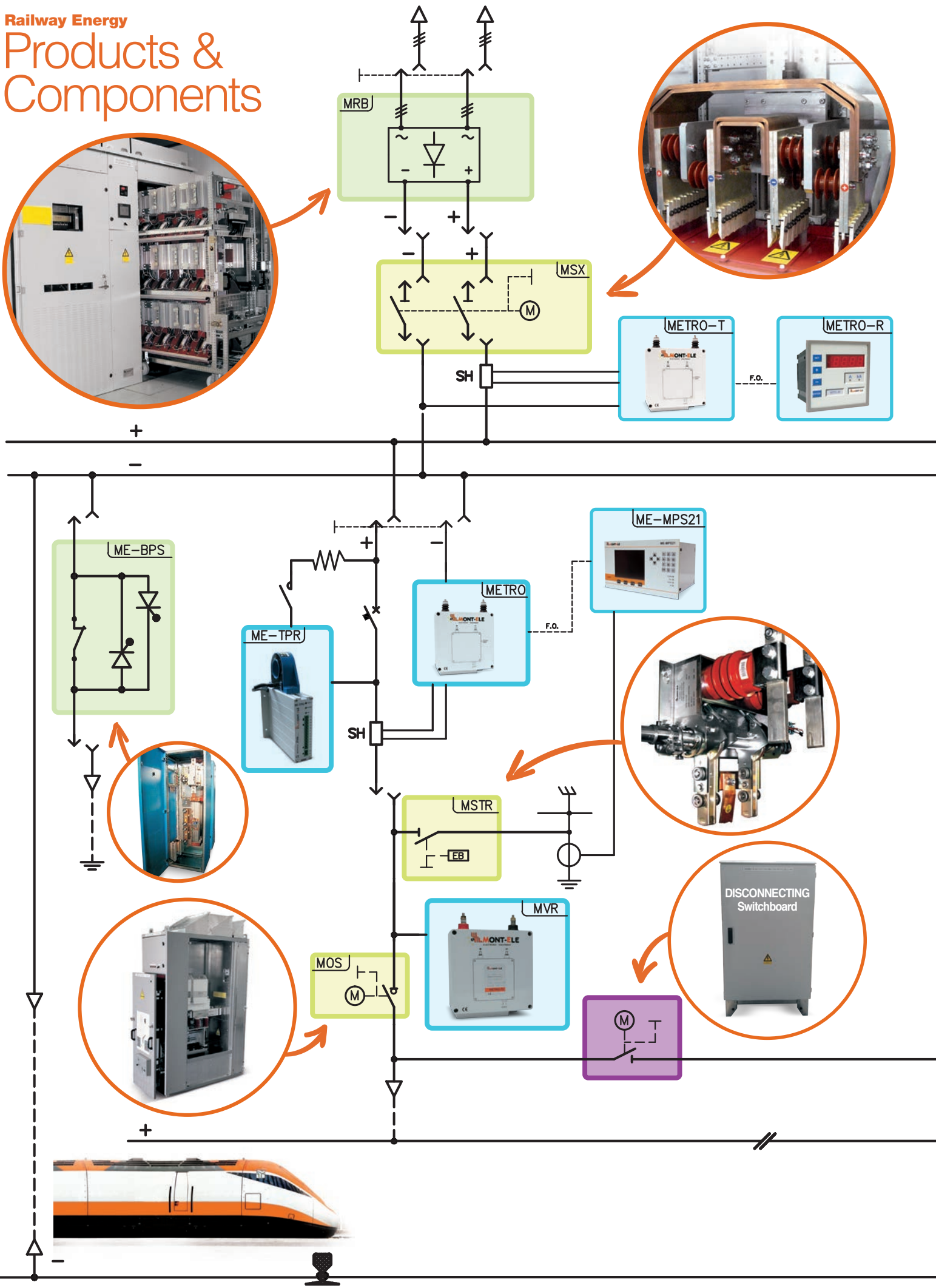
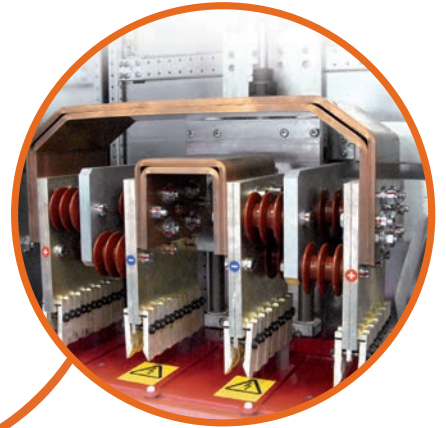


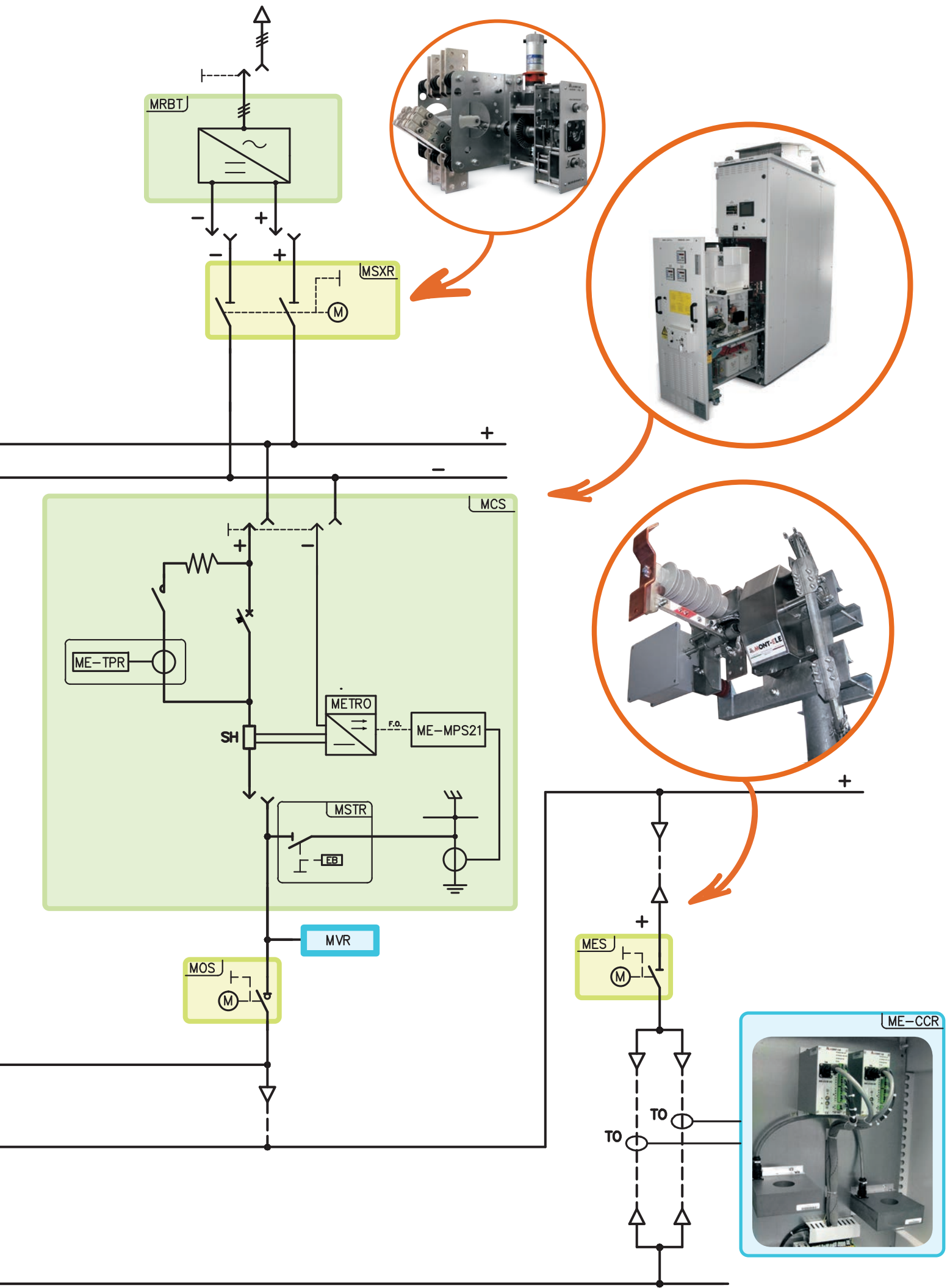
Railway Energy

Products & Components



Products & Components





Mont-Ele Railway Energy Products & Components

Thanks to the experience gained over more than forty years of activity, both in engineering and commissioning of systems, making use of a competent technical department and having a flexible manufacturing unit, Mont-Ele has developed its own range of products and components of the Railway Energy series. Reliability, maintainability and Safety are the criteria that have guided our engineers in the choice of construction solutions, making our products the landmarks of the railway and metro market.

MRB - Rectifier Unit

The DC rectifier unit MRB, is AC/DC bridge converter for traction application assembled with press pack Diodes, even if standardized, allows various configuration and can be adapted to suit the needs of projects of any type.

Main Version

- Execution Fixed / withdrawable truck
- Configuration single / double
- Bridge connection series / parallel
- Diode connection series / parallel
- Rated DC voltage from 750 up to 3600Vdc
- Rated power up to 6000 kW
- Cooling type AN / AF
- Reaction 6/12/24 Pulsed
- Duty class according to IEC 60146-1-1



The MRB in function of the system and the version is available with accessories like:

Fibre optic Diode fault control panel, High temperature probe, Fuse protection, RC group, PLC and touch screen control panel.

MRBT - Active rectifier

Mont-Ele is able to provide technical studies and solutions for energy recovery systems for DC traction systems for wide field of applications (trams, trolleybuses, metro systems, trains).

These professional studies and solutions are intended for traction systems typically of nominal voltages 600, 750, 1500 or 3000 VDC.

MRBT- active rectifier is a complete line of bidirectional converters based on thyristor or IGBT technology, to design system like:

- BRAKING ENERGY RECOVERY SYSTEM
- BRAKING ENERGY RECOVERY SYSTEM AND STORAGE
- ACTIVE RECTIFIER FOR DC VOLTAGE NETWORK REGULATION
- BOOSTER SYSTEM



ME-BPS - Voltage limit device

ME-BPS is based on a hybrid switch consisting of anti-parallel thyristors and an earthing switch connected in parallel, it can be used, depending on execution, as short-circuit unit for rail joints as short-circuit to earthing device in order to limit the voltage between the return circuit and the earth, preventing dangerous touch voltages.

ME-BPS is typically installed into Mont-Ele DC metal-clad switchgear - Negative panel, for installation in SS or in outdoor switchgear for wayside installation.

The Voltage Limiting Device ME-BPS fulfills all the criteria of EN50122-1 standards.



MCS - DC METAL-CLAD SWITCHBOARD

MCS D.C. metal-clad switchboards, RAILWAY ENERGY series, are standard modular units in withdrawable solution which allow various configurations for the feeding of traction systems (tramway - underground railway - trolleybus - train) at rated voltage of 575 - 750 - 1500 - 3000 Vdc.

The wide range of rated current (I_{Ne} omnibus bus bar up to 10kA) and the high value of short-time withstand current (I_{Nss} up to 80kA) makes the DC METAL-CLAD SWITCHBOARD suitable to the most severe duty. The standard modular units allow various configurations can be adapted to suit the needs of any type of project; mainly, they allow the utilization of components made by different manufactures and to satisfy costumers' preferences as to standards, spare parts, applications, etc.



MCS - DC METAL-CLAD SWITCHBOARDS are available with Arching due to internal fault characteristic (Classification IAC = AFLRI) MCS withdrawable type, are designed, manufactured and tested according to IEC 62271- 200 standards with $I_{ss} = 80kA$ for 250ms at rated voltage of 900 - 1800 Vdc and $I_{ss} = 53kA$ for 250ms at rated voltage of 3600 Vdc.

DISCONNECTING Switchboard

Metal-clad switchboard equipped with MSX Off load disconnectors or MOS DC switch disconnector, disconnecting Switchboard guarantees a wide range of products and versions for system with rated voltage from 600 to 3600 Vdc.

- Uses by-pass or line disconnectors, Automatic earthing of the line
- Commands: manual or motorized
- Execution: Fixed / withdrawable truck
- Installation: indoor (up to IP 31) / outdoor (up to IP 65)
- Type: Steel / Polyester
- Arc due to internal fault is available



DISCONNECTING Switchboards

allow to isolate portion of the track system or, in case of cross-over track application, to get very fast reconfiguration the continuity of the power supply and in order to guarantee the service.

MOS - DC SWITCH DISCONNECTOR

The MOS-DC switch-disconnectors, are designed and produced with electrical and mechanical characteristics, equipped with special arc chute, suitable to be installed in metal-clad switchboards.

The disconnectors are tested in accordance with EN 50123-3 and IEC 61992-3 standards. The MOS-DC switch-disconnectors thank to its high technical characteristics (rated current 4kA, making capacity 42kA, braking capacity 5.4kA, rated short circuit current 70kA) offer a wide range of possible applications in the railway traction system (trolley bus, tramway, underground) for a rated voltage up to 3600Vdc.

In particular, they can be used for the following applications:

- First line switch disconnectors
- Second line switch disconnectors
- DC feeding line disconnectors
- Earthing switches
- Switch disconnectors for tunnel
- Current switch disconnectors
- Voltage switch disconnectors



ME-CCR Continuity control system of cable connection

The ME-CCR system makes the continuity control of cable connections among:

- The earth disconnector and the rail
- The negative switchboard and the negative/rail pit
- The earth connections with significant priority

APPLICATIONS

- Systems for safety earthing of tunnels
- Systems for safety earthing of railway section for works
- Security earthing
- Control of SS negative cables connection

MODELS

- ME-CCR01 Standard version
- ME-CCR02 Safety integrity level SIL 4
- ME-CCR03 Safety integrity level SIL 3

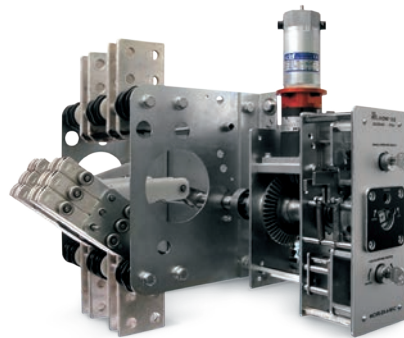


MSX - DC DISCONNECTOR

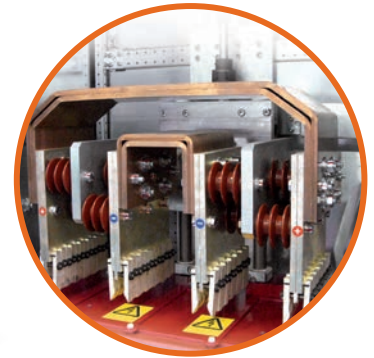
MSX-DC disconnectors are a wide range of Indoor d.c. disconnectors and earthing switches for the DC traction system with rated voltages 600, 750, 1500 or 3000 VDC for wide field of applications (trams, trolleybuses, metro systems, trains).

The wide range of rated current (up to 8000A) and the high value of short-time withstand current (50kA-70kA- 100kA) makes the MSX-DC disconnectors suitable to the most severe duty.

All the MSX-DC disconnectors are suitable with electrical, mechanical and key interlock and safety signaling of the position of the power contact according to Standard.



MSXR



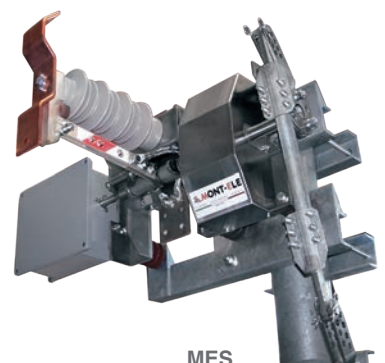
MSX



MAIN VERSIONS

- One pole / two pole disconnector
MSX - MSXR
- Change over switch
- Earthing switch **MSTR**
- Earthing switch with making capacity
MES

The design of these disconnectors is suitable for installation in MCS, DC metal-clad switchboard – Railway Energy series, with the segregation of live parts and double breaking, to allow the maintenance with open isolator and live feeder and bus-bar.



MES

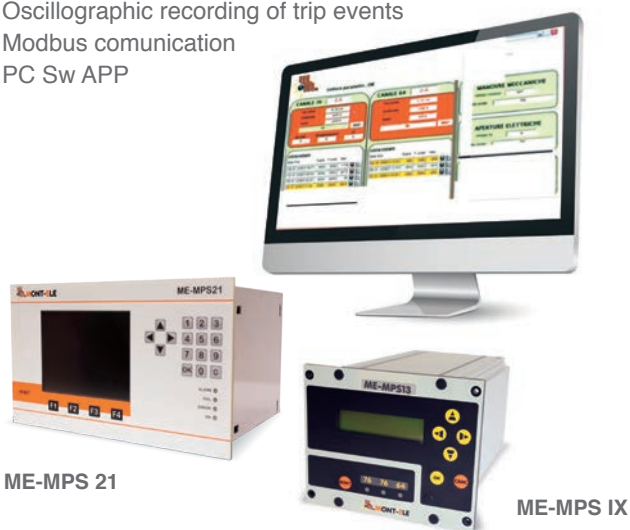
This type of design to guarantee the highest safety level, has allowed the use of MSX earthing switch (MES type) in the EMERGENCY TUNNEL EARTHING SYSTEM OF OVERHEAD LINE, TÜV certificated SAFETY integrity level SIL 4.

ME-MPS 1X series

The multifunction protection relays ME-MPS1X series connected with suitable measure probes, guarantee an high degree of protection, control and diagnostic of the line and of the plants where the relay are installed and they offer a wide range of possible applications in DC system for railway, tramway and metro applications.

Main Functions

- DC over current relay 76
- Reverse power relay 32
- AC and DC earth fault protection 64
- DC under voltage relay 27
- High speed circuit breaker diagnostic relay
- Overhead line diagnostic relay
- Oscillographic recording of trip events
- Modbus communication
- PC Sw APP



ME-MPS 21

ME-MPS21 is a high-tech equipment that satisfies the most demanding safety requirements applicable to DC electrical power transmission networks. ME-MPS21, based on the last generation of microprocessor and interfaced with suitable measure probes, it is able to recognize the fault type, analysing and recording the input variables, optimizing the interventions and improving the reliability and availability of traction plants.

Main FEATURES

Wide Protection functions adapted for each project and functionally like:

- Overvoltage/undervoltage levels
- Overcurrent forward/reverse levels
- Thermal image protection levels
- Impedence monitoring levels
- Di/dt levels
- HSCB diagnostic level

Programming PLC control functions adapted for each project and functionally like:

- Intertripping
- Automatic reclosing
- Anti-pumping
- Line test
- Feeder switchgear command

Wide memory for event recording

GPS time synchronization

Wide communication possible

- IEC 60870-5-103
- MODBUS –RTU
- IEC 61850

Graphic colour LCD display
Oscillographic recording

The Mont-Ele DC measuring converter, METRO series, are transducers for High DC voltage and High DC current in all DC traction systems with rated voltages 600, 750, 1500 or 3000 VDC for wide field of applications (trams, trolleybuses, metro systems, trains).

Thanks to FO connection between the transmitter and the receiver, and to high voltage isolation, the METRO measuring equipment can be connected directly to the high voltage systems giving accurate outputs for measuring and protective purposes, ensures safety for the equipment and for the personnel.

MODELS

- **METRO – MTI/ TI:** Current optical measure transducer $I_n =$ up to 8kA
- **METRO – MTV/ TV:** Voltage optical measure transducer $U_n =$ up to 6kV
- **METRO – MTIV:** Combo design, Voltage and current optical measure transducer $U_n =$ up to 6kV / $I_n =$ up to 8kA
- **MVR:** Voltage presence relay designed with high galvanic isolation and equipped with dip switch for the setting voltage level and SPDT relays for diagnostics and voltage presence signalization for system with rated voltage up to 3600Vdc.



ME-TPR THERMAL IMAGE DEVICE FOR LINE TEST RESISTOR PROTECTION

ME-TPR device for checking the temperature of the line-test resistor is based on the principle of the thermal image by current measurement. The device can be installed in the feeder DC switchgear.

As known, the direct temperature measurement of the line test resistance with a standard temperature probe is not reliable and not safe. Thanks to the thermal image algorithm, the device gives safe information of the temperature reached by the line test resistor, avoiding failures and out of order of the system services due to overheating of the resistance.



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The information in this document contains general description of the technical options which do not always have to be present in individual cases. Therefore, the required performance characteristics must be defined in individual cases during conclusion of the contract.

In view of the constant evolution in standards and design, and due to the continuous development, the characteristics of the elements contained in this catalogue are subject to changes without prior notification.

These characteristics, as well as the availability of components, are subject to confirmation by Mont-Ele's Technical Sales Department.

Not valid as a contractual item.

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