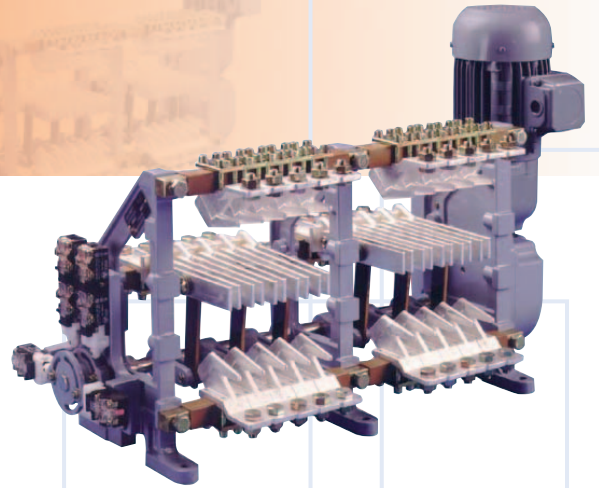
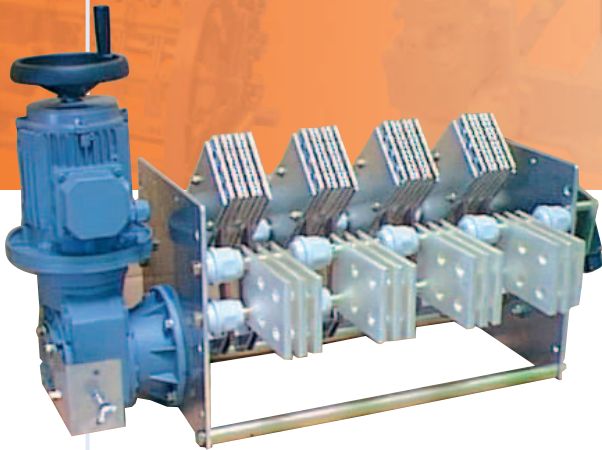


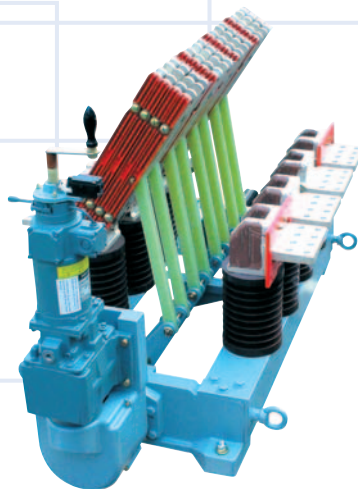
FERRAZ SHAWMUT IS NOW

merseN

High Power Switchgear



We can create a solution that's
both effective and cost-effective



Switch Application Questionnaire

Customer:
Address:
State/Zip:
Contact:
Project Name:

Date:
Phone:
Fax:
e-mail:

Electrical Data

- Switch to operate: ON OFF LOAD
- Operating Voltage: AC: _____ Volt _____ O _____ Hz _____ Number Poles _____
DC: _____ Volt _____ L/R _____ (DC), Number Poles _____
- Full Load Current _____ Amp. (If variable, attach duty cycle)
- Overload Current _____ Amp
- Peak Withstand Current _____ kA
- Dielectric Withstand (1 min) _____ kV
- Rated Impulse Voltage BIL _____ kV
- Rated short-time withstand current _____ kA

Note: Please indicate if items C-E are expected to be interrupted

Mechanical Data

- Disconnect
Isolator (1-0) Open switch
Isolator (1-M) M: Ground
- Changeover
2 Positions Changeover (1-2)
3 Positions Changeover (1-0-2) Note that Mid-Point is OFF
3 Positions Changeover (1-M-2) Note that Mid-Point is ground
- Pole Reverser For reversing current inside Cells, such as Mg. Cells
Number of Poles: _____

Connections by

- Cables , Number of cables per phase , Lugs , bolted
- Busbar , Number of bars per Bus _____
- Welding
- Size: (H) _____ (S) _____
- Bus Type: Copper Aluminium Others _____

Accessories

- Operation: Motorized Manual Pneumatic
- Motor _____ VAC. - Hz _____ VDC _____
- Provision for Lockable handle
- Number of Auxiliary Contact (NO+NC) per position _____
- Interlock System

Quantities

- Date required by _____
- Annual Usage _____

Environment

- Outdoor Indoor

Application _____

Comments or special insructions

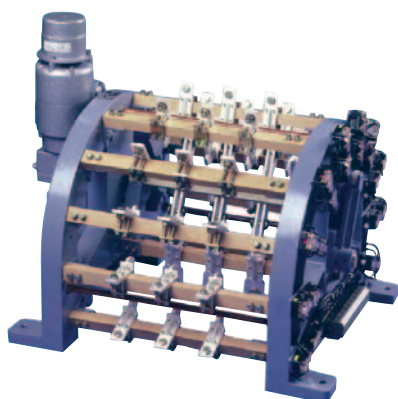
Your contact:

Please attach a sketch and sequence of operation.

HIGH POWER SWITCHES APPLICATION

When industry-leading companies worldwide have a special challenge, they call Ferraz Shawmut. Why? Because we've pioneered more technological advances in high-power switches than all of our competitors combined with three Ferraz Shawmut brands:

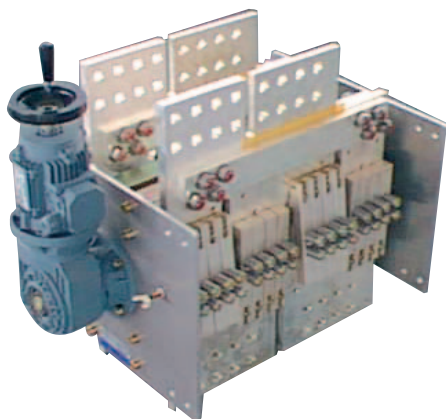
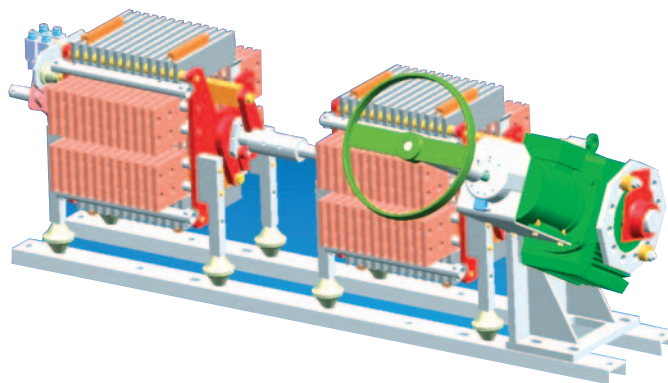
- Fouilleret
- Berg
- Soulé



- A deformable disconnect switch that can move on three axes to allow for bus bar expansion, eliminating the need for expensive flexible connections.
- A proven air-cooled switch for aluminium smelting - the first of its kind.
- The first input loadbreak disconnect switch for "choppers" - DC-to-DC converters used in chlor-alkali applications.
- The first loadbreak switch and rotating current transfer unit for copper foil process.
- The first dual-shell switching system for DC arc furnaces.

DC and AC switch designs to handle high current/low voltage and high voltage/low current applications, include

- Rectifier output disconnect switches.
- Change-over disconnect switches.
- Change-over grounding disconnect switches.
- Polarity-reversing disconnect switches.
- Distribution panel disconnect switches.
- Low-voltage disconnect switches.
- Medium-voltage disconnect switches.
- Grounding switches.
- Mobile and stationary shorting switches.



- Pure silver-to-silver contacts for the best connection.
- A visible disconnect that eliminates guesswork and increases safety.
- Self-cleaning contacts for minimal maintenance.
- Aluminium or copper, bolted or welded connection.
- Various methods of operation - manual, electric or pneumatic.
- Mechanical or electrical open-switch locks.
- Multiple contacts, with spring-loaded arc-quenching chambers independent from the main contacts on load break switches.
- Outdoor enclosures resistant to corrosive environments

CHEMICAL, METAL PROCESS

A range of switches, from transformer to cell

High-power chemical processes, like electroplating and the electrolysis of chlorine, fluorine and magnesium, require disconnect switches that can handle 300 kA plus.

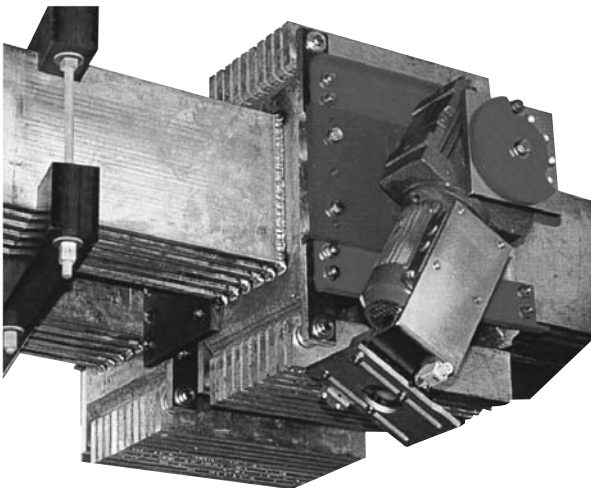
Ferraz Shawmut offers these as well as a range of other types of switches, to cover the entire line from transformer to cell. In fact, we were the first to create multiple products for specific applications.

Switches are available for flexible or fixed connections - copper or aluminium, bolted or welded.

They include:

- Medium-voltage transformer disconnect switches.
- Rectifier output disconnect switches.
- Mobile and stationary shorting switches.
- Polarity-reversing disconnect switches for electroplating.

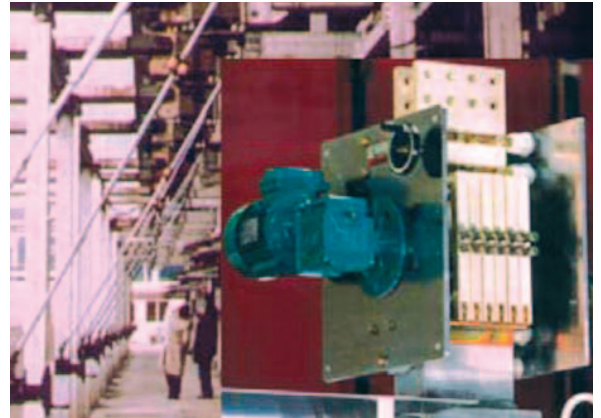
Very High Power Disconnectors
PBD (Plain Bars Disconnectors) Type
2000 V DC - 20 kA to 160 kA
Single pole / Double pole / Change-over
Aluminum Terminals



Few applications are as extreme as metals processing.

Whether it involves arc furnaces or induction ovens that reach over 300 kA, rolling mills or the electrically charged drums used to create foils, metals processing poses formidable challenges to circuit protection.

High-Current Disconnectors
NORD Type
1500 V DC - 14 kA to 140 kA
Single pole / Double pole / Change-over
Aluminum or Copper Terminals



High-Current Disconnectors
MBD (Multi-Blade Disconnectors) Type
2000 V DC - 5kA to 60 kA
Single pole / Double pole / Change-over
Aluminum or Copper Terminals



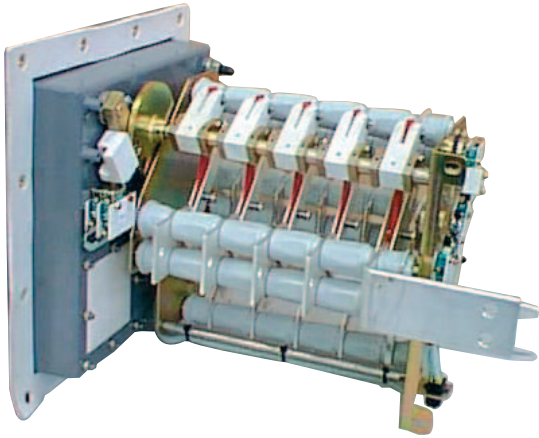
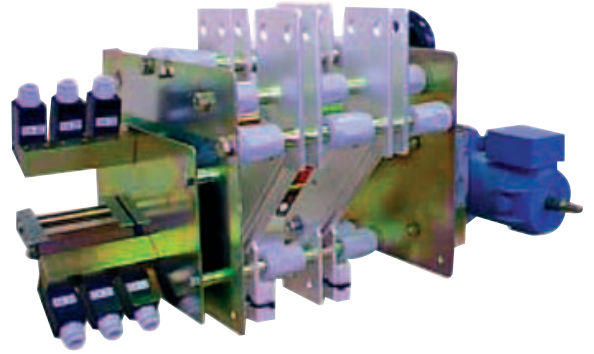
TRACTION APPLICATION

If you've traveled by train anywhere in the world, chances are Ferraz Shawmut's high-power switches were part of trip.

Built to take the vibration and constant punishment of traction applications, our AC and DC switches are found everywhere - from light rail and subway trains to locomotives, from substations and rolling stock to third rails.

Customers rely on us for:

High Current Disconnectors
Change-over disconnectors
FA Type
3000 V ~ / = 500-8000 A 0-175 HZ

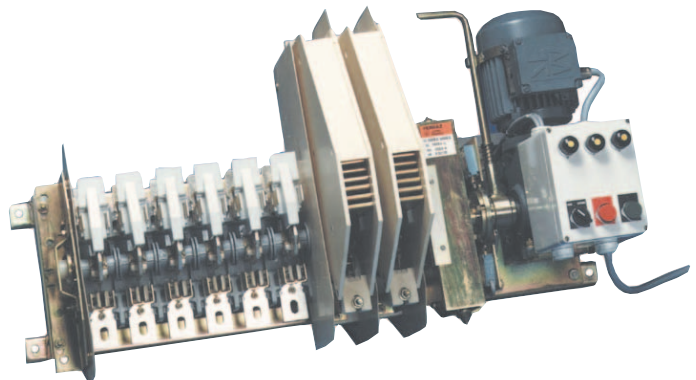


Change-over disconnectors on board
FA Type

The switches can be operated manually, or they can be motorized and operated locally or remotely, increasing safety and reliability. Another safety feature is a built-in interlock that ensures the position of the switch.

- Substation switches:
 - DC change-over switches.
 - DC grounding switches.
 - AC medium-voltage disconnect switches.
- Rolling stock switches:
 - AC and DC disconnect switches.
 - AC and DC change-over switches with several poles and several positions, to handle main, shop, auxiliary and other sources of power.
- Track and main yard switches:
 - Catenary and third-rail switches.
 - Loadbreak disconnect switches to sectionalize track.

DC Loadbreak Switches
IF Type
1000 V DC - 800 to 6300 A



MEDIUM VOLTAGE

So whether your needs are simple or complex, you can rely on Ferraz Shawmut to deliver the best solution. To learn more, call us. We'll show you all the ways we're your circuit protection resource.

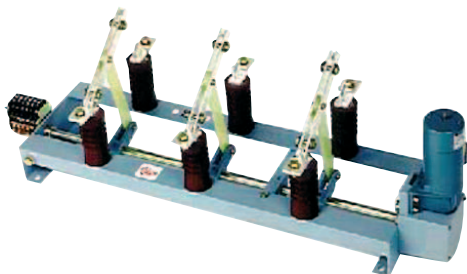
- Distribution panel disconnect switches.
- Low-voltage disconnect switches.
- Medium-voltage disconnect switches.
- Grounding switches.
- Mobile and stationary shorting switches.

HAS Type

12 kV, 24 kV, 36 kV

400 A to 1 000 A - up to 175 Hz

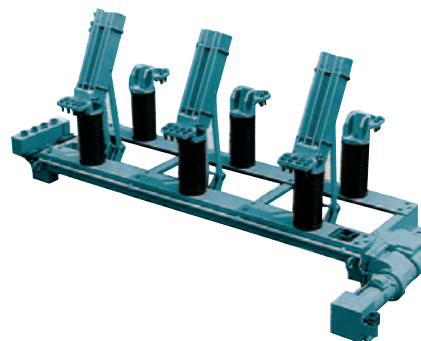
Number of poles : 1, 2, 3, ...



HAS Type

1.6 kA to 6.3 kA - up to 175 Hz

Number of poles: 1, 2, 3, ...

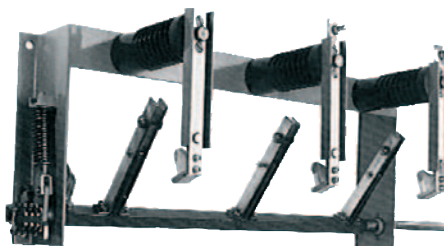


Equally important, we possess the ability to listen. An ability that enables us to truly understand your operation and your needs, so we can create a high-power switch solution that's both effective and cost-effective.

ETM Type

3.6 kV, 12 kV, 24 kV, 36 kV

Number of poles : 1, 2, 3, ...

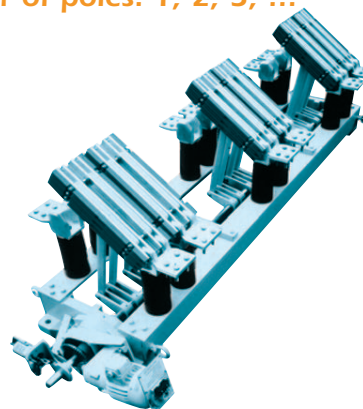


HAS Type

12 kV, 24 kV, 36 kV

1.6 kA to 6.3 kA - up to 175 Hz

Number of poles: 1, 2, 3, ...



- Large isolation air and creepage path
- Self-cleaning blade contacts
- True opening and visible break
- Rugged anti-torsion construction
- Large customisation with :
 - Manual, motor, pneumatic drives
 - Auxiliary switches, solenoid interlocks
- According to IEC 62 271
- Dimensions Adaptable

DESIGN AND DEVELOPMENT

Innovating to meet customers' needs



Ferraz Shawmut, a division of the Carbone Lorraine group, is the world's reference in circuit protection.

On the strength of that position, and long experience with electrical contacts, the company offers a range of equipment for railway traction applications.

Its strong presence around the world brings it close to its customers wherever they are, and helps it to tailor products to their needs.

To maintain its leadership on the traction market, Ferraz Shawmut makes the most of the synergies offered by its Test Center, dedicated to innovation and quality. Products run the full gamut of tests there - electrical, climatic, mechanical - static, dynamic, endurance, wear - under the harshest conditions possible, before final assembly.

From the very outset of a project, Ferraz Shawmut works with the builders and operators of the traction system to study the best solutions to meet their requirements.



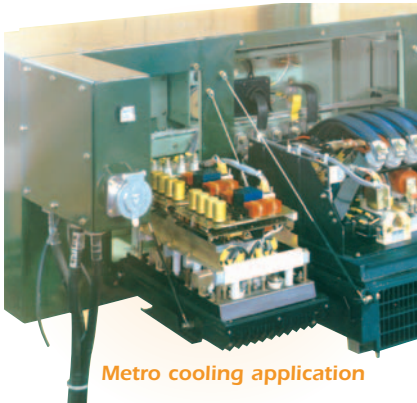
In close collaboration with customers' design and engineering departments, Ferraz Shawmut has developed specific know-how, working methods and organizational structure, with the goal of constantly proposing new solutions.

Ferraz Shawmut offers you:

- a team of experts working with design software to better optimize your equipment
- exceptional product performances
- great flexibility to adapt to the specific characteristics of your applications.

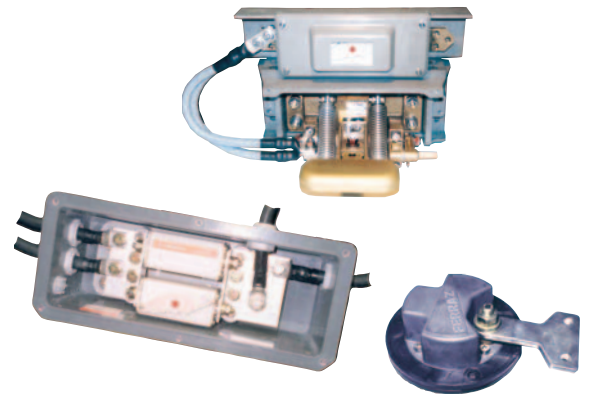
OTHER FERRAZ SHAWMUT ACTIVITIES

THERMAL MANAGEMENT



Metro cooling application

BOGIE PROTECTION



CIRCUIT PROTECTION



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