

Busbar system with ERIP-insulation for medium voltage

Typ/Type:	ISOBUS MR
Application:	>3,6 kV- 52 kV, -7000A
Insulation:	ERIP
Degree of protection:	IP30-IP54 Indoor IP54-IP68 Outdoor
Remark:	Capacitive grading device

The ISOBUS MR system provides a value added solution for primary and secondary distribution up to 52kV and 7000A, for indoor and outdoor applications.

ERIP Insulation Properties

PBP Preissinger uses Epoxy Resin Impregnated Paper as the main component in our composite insulation medium. Design, manufacture and installation processes ensure an installed product with a very long lifespan, which is basically "fit and forget."

Medium Voltage Application

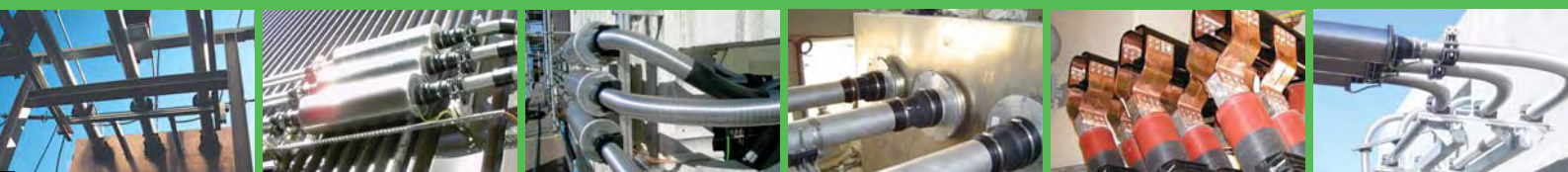
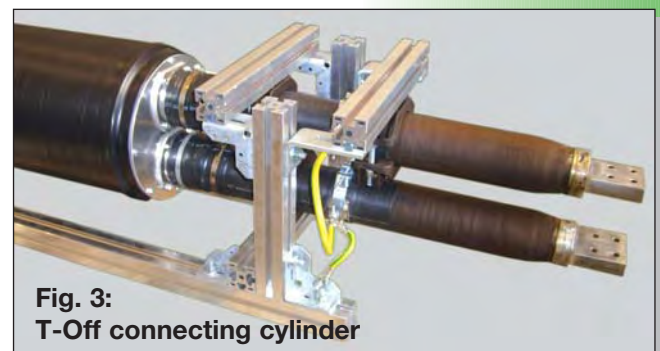
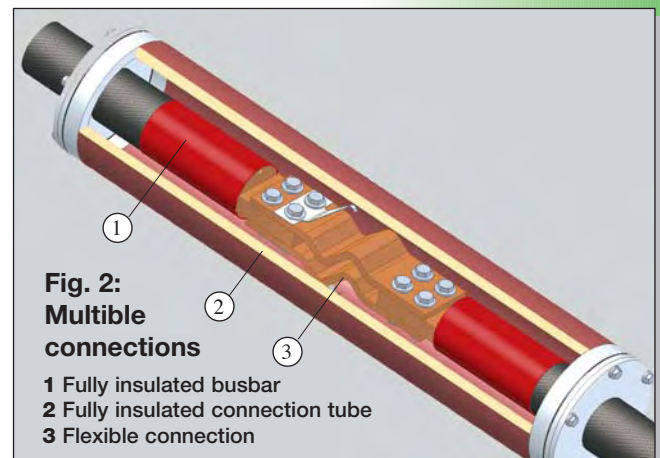
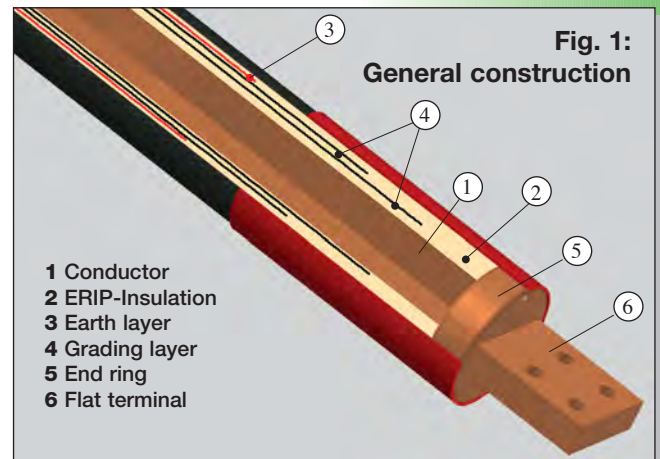
Generator lead out
Transformer – switchgear connections
Switchgear – switchgear connections
Switchgear - cable connections

Basic Design (Fig. 1)

Design starts with data capture from our clients because we dimension ISOBUS MR systems according to specific project requirements. This data comprises voltage, current, short circuit current, frequency and ambient temperature. At the design stage, we engineer the ISOBUS MR solution to provide the shortest and safest routes between electrical equipment. E.g. we have right angled plug-in connectors between switchgear and cable, therefore eliminating the need for cable basements.

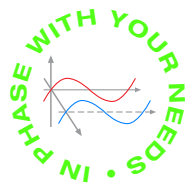
Safety and Reliability

- Touch safe under operational conditions.
- Partial discharge free acc. to IEC 60 137 due to void free manufacture & high voltage routine testing of each section
- No phase to phase short circuit due to complete encapsulation and insulation of each phase
- No flashover. Due to embedded capacitive field control through the insulation
- Insulation withstand is E-120
- Easily withstands ambient temperatures from below -50°C to +55°C
- Degree of protection up to IP68. Suitable for harsh environmental conditions
- Natural cooling
- No halogens. If a fire occurs no toxic gases develop and the insulation is self-extinguishing
- Very high dynamic and thermal short circuit capability.





Preissinger GmbH & Co. KG



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ISOBUS MR

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Space and Time Saving Installation (Fig. 5)

- Value added solution supplied. Both ISOBUS MR and its fixing system are designed, manufactured, tested and delivered as a distribution kit, complete with all necessary components and installation documents
- Modular system components allow made to measure distribution solutions, within medium voltage applications. Any three dimensional shape is possible
- Compact outer dimensions, extremely small bending radii and close phase to phase distance allow maximum power in minimum space
- 1 Busbar per phase up to 7000A
- Light weight system
- Minimum impact in the surrounding building
- Surrounding space in new buildings can be dimensioned smaller
- No special tools required
- Fast installation of type tested components

Physical Components (Fig. 1)

The conductor can be E-Cu or E-AlMgSi and is either tubular or cylindrical

The insulation consists of :

- Crepe paper wound round the conductor
- Embedded capacitive grading which ensures even voltage distribution at the busbar ends
- A concentric earth layer on the outside plus a copper stocking ensures touch safety during operational conditions

This construction is then impregnated with epoxy resin under vacuum and heat conditions. The dimensions of our autoclave are 8 meters X 2 meters X 2 meters. The outer sheath is always metal for outdoor applications, with degree of protection IP 54-IP 68, (Fig. 6)

On outdoor applications, the grading devices are equipped with sheds which lengthen the creepage distance. The outer sheath is heat shrink for indoor applications, with degree of protection IP 30-IP 54

Routine Testing

Following manufacture, we conduct routine high voltage testing in our own laboratory. Every manufactured component is subject to the following tests prior to delivery:

- Power frequency test
- Partial discharge test
- Capacitance measurement
- Tan delta measurement
- Quality assurance according to ISO 9001

Busbar - Busbar Connection

ISOBUS MR is a modular system and the maximum busbar length is determined by the autoclave dimensions. Therefore connections between busbars are made as shown. (Fig 2.)



Fig. 4:
Plug-in system
Flat terminals

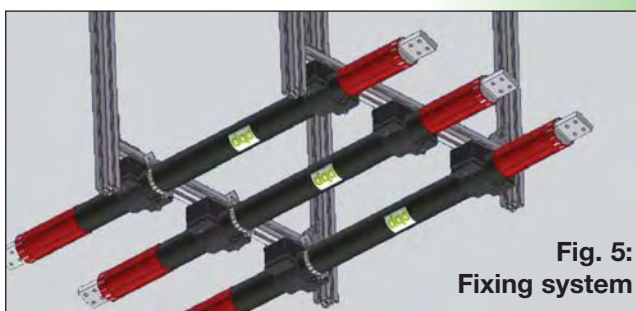


Fig. 5:
Fixing system

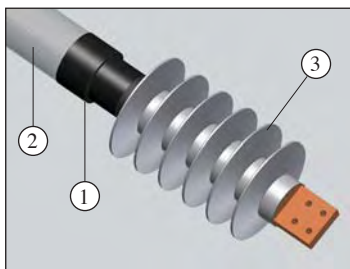


Fig. 6: Busbar system for outdoor application

- 1 Fully insulated busbar
- 2 Metal tube
- 3 Sheds

Electro-Technical Equipment-ISOBUS MR Connection

It is very easy to connect the ISOBUS MR system with all makes and types of electro-technical equipment available in today's market. Whether generator lead out, transformer connections, switchgear connections or cable connections.

The following list shows the connection options at a glance:

- Connections to flat terminals according to DIN 42206 or customer specifications (Fig. 3)
- Connections to round bolts
- Connections to SF6 switchgear
- Touch safe connections into transformers and air insulated switchgear using junction box
- Plug-in connections (Fig. 4)

Fixing System (Fig. 5)

For each project, PBP Preissinger designs and supplies an easy to assemble, modular fixing system, that allows for compensation of tolerances during installation. We use special computer programmes in house, to calculate the technical requirements. E.g. short circuit, temperature rise, natural frequency, and from this information the fixing system is produced, together with the installation documentation.

