

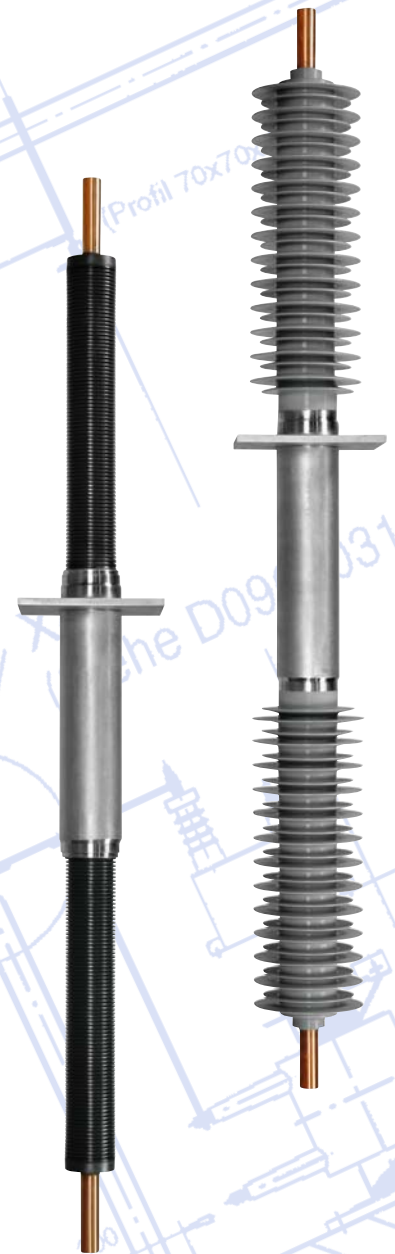
Your Independent Bushing Supplier  
*Ihr unabhängiger Durchführungslieferant*

## **DURESCA<sup>®</sup>-Wall Bushings**

Capacitance fine graded with  
**RIP** (Resin Impregnated Paper) dry type  
insulation material.

**Manual for Installation**

***Maintenance and Storage***

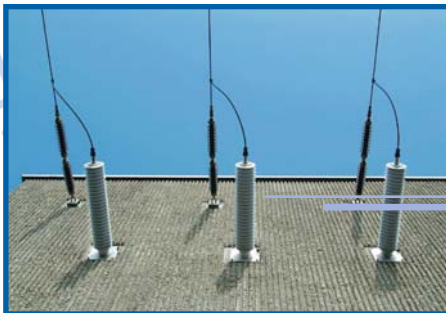




DE 17,5 kV – 2500 A

## Duresca®

**Busbar systems**  
*Schienensystem*



DEMI 145 kV – 800 A

## Duresca®

**Wall bushings**  
*Wanddurchführungen*



TE 24 kV – 1250 A

## Tiresca®

**Busbar systems**  
*Schienensystem*



DTOI 123 kV – 1250 A

## Travesca®

**Transformer bushings**  
*Transformator-Durchführungen*



## Gaslink®

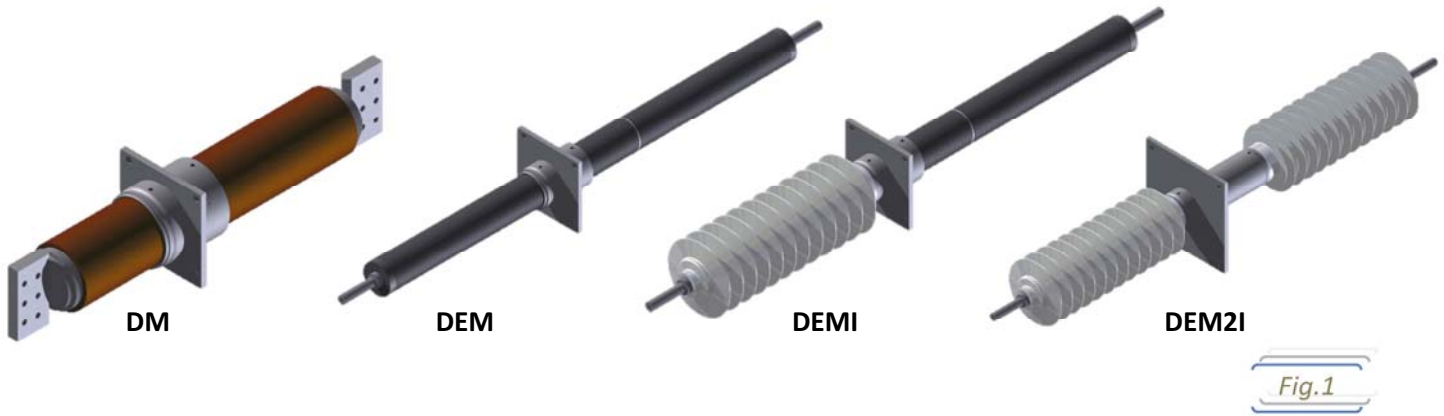
**SF<sub>6</sub> insulated busbar systems**  
*SF<sub>6</sub> isoliertes Schienensystem*

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# 1. Description

## 1.1. Design



Protection of the RIP body				
Application incoming			Application outgoing	
<b>DM</b>	<i>Indoor</i>	High quality coating	<i>Indoor</i>	High quality coating
<b>DMI</b>	<i>Indoor</i>	High quality coating	<i>Outdoor</i>	Silicone insulator*
<b>DM2I</b>	<i>Outdoor</i>	Silicone insulator*	<i>Outdoor</i>	Silicone insulator*
<b>DEM</b>	<i>Indoor</i>	Polyamide tube	<i>Indoor</i>	Polyamide tube
<b>DEMI</b>	<i>Indoor</i>	Polyamide tube	<i>Outdoor</i>	Polyamide tube and silicone insulator*
<b>DEM2I</b>	<i>Outdoor</i>	Polyamide tube and silicone insulator*	<i>Outdoor</i>	Polyamide tube and silicone insulator*

\*Porcelain is also available on request.

## 1.2. Application

DURESCA® wall bushings are designed to conduct the electrical energy through a wall or a roof.

The electrical current is conducted by a round conductor in copper or aluminium. It is characterised by a compact design and a partial discharge-free operation.

DURESCA® wall bushings can be described as being maintenance-free.

## 1.3. Description

DURESCA® wall bushings have a dry insulation RIP (Resin Impregnated Paper).

The insulation lies directly on the conductor and consists of wrapped paper, which is impregnated with special epoxy resin under vacuum. Conductive grading layers are embedded during the wrapping of the paper insulation for the optimal distribution of the electrical field. This structure ensures the longest possible operational reliability and the highest possible human safety.

## 1.4. Version with high-quality coating DM/ DMI/DM2I

To protect the RIP body of the bushing on indoor side, a high quality coating is applied on a thickness 30 – 40 µm.

Resistant to water, dilute acids and chemicals. Excellent resistance against abrasion.

## 1.5. Version with polyamide tube DEM/DEM/DEMI/DEM2I

The polyamide tube provides:

- the best possible barrier against humidity and moisture ingress
- an excellent mechanical protection
- Additional creepage distance of about 16mm/kV in indoor application

## 1.6. Version with silicone insulator DMI/DM2I/DEMI/DEM2I

The silicone rubber insulator with alternating sheds has a uniform creepage distance of min. 31 mm/kV SCD or 53.7mm/kV USCD. This corresponds to a class 4 according to IEC 60815-1986 very high pollution level.

## 1.7. Standard operating conditions:

### *GENERAL*

Standard	IEC 60137-2008
Application	Wall or roof

### *DESIGN*


Type	Fine Graded Condenser Type
Insulation	RIP Resin Impregnated Paper
Material Flange	Made of corrosion free aluminium alloy

### *OPERATING CONDITIONS*

Altitude	< 1000 m
Ambient temperature	-40 up to +40°C
Mounting	0 to 90°
Insulator outdoor	Silicone or porcelain
Pollution class level	Min 31mm/kV according to the IEC 60815-1986

For deviation, consult the specific datasheet from the corresponding bushing.

# 2.Transport, storage and handling



**Warning**

The function of the wall bushing is only guaranteed with the planned arrangement of components to each other. Severe malfunctions could otherwise occur. The installation instructions on the following pages must therefore always be followed absolutely. Local installation regulations are intended to ensure the safety of electrical installations. They are not taken into account in this operation manual, but must be observed in all cases.

## 2.1. Packaging

A special attention is taken for the packaging.  
 The bushings are packed in wooden crates for transportation.

All of our boxes are made of wood according to the ISPM 15 Standard.  
 (ISPM: *International Standards for Phytosanitary Measures*)



Fig.2



Fig.3

All packaging has to be examined against damage during transport.

A copy from the Routine test is attached in the box.



Fig.4

DMI version



Fig.5

DEM version



Fig.6

DEMI with current transformer

## 2.2. Removal from the case.

Small bushings can be taken by hand, larger require rope and lifting gear.

The bushings are secured as much as possible against transport damage.

The protective plastic bag must only be removed shortly before the assembly and installation.



Use of cutting tools is not recommended as it could damage the silicone sheds.

Please check the bushings for any transport damage immediately after the receipt of the goods.

In case of visual damage, proceed as following:

1. Inform the insurance from the carrier.
2. Declare the carrier as responsible on the Acknowledgement of receipt
3. Declare the carrier as responsible by registered letter. (In order to avoid prescribe the right of appeal against the carrier).

In case of transport under Moser-Glaser AG responsibility, the additional following points need to be followed:

4. MGC needs to be informed as quick as possible:  
Tel. ++41 (0) 61 467 61 11 Fax. ++41 (0) 61 467 61 10 [info@mgc.ch](mailto:info@mgc.ch)
5. A copy of the registered letter has to be sent to MGC

**MGC Moser-Glaser AG**  
**Lerchenweg 21**  
**CH-4303 Kaiseraugst (Switzerland)**

If no damage has been observed, you can continue with the removal of the bushing.

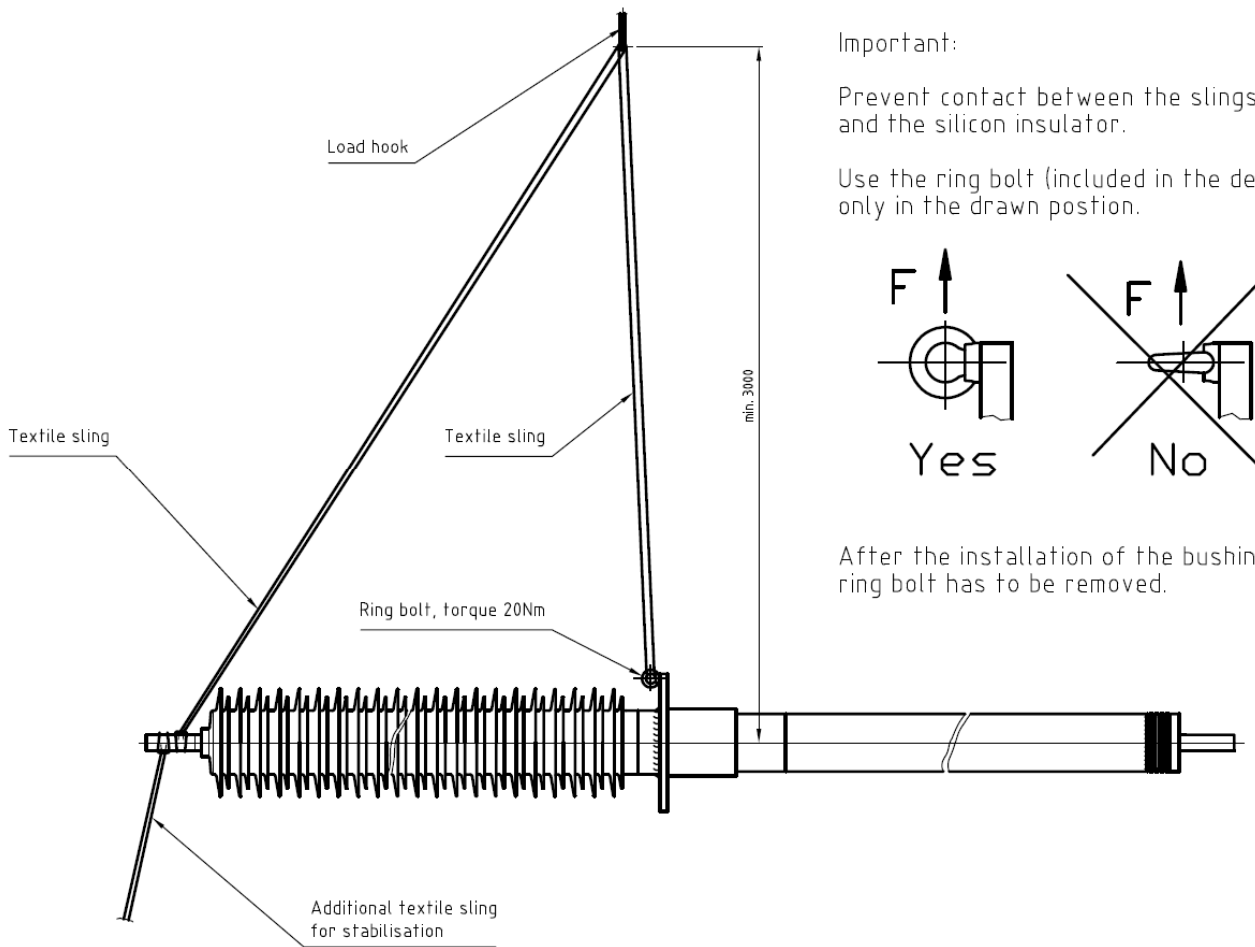


### 2.3. Mounting and grounding

Bushings are fixed in the wall by 4 screws through the wall.

Sufficient clearances between live parts, wall, floor or grounded parts must be respected.

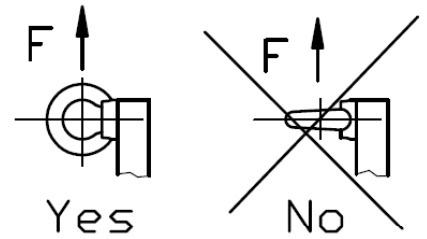
#### Lifting out by hand or using a crane



Important:

Prevent contact between the slings and the silicon insulator.

Use the ring bolt (included in the delivery) only in the drawn position.



After the installation of the bushing, the ring bolt has to be removed.

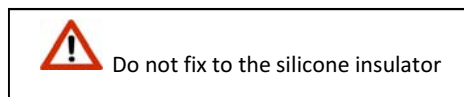


Fig.7

## 2.4. Recommended checks before connecting the voltage

MGC Moser-Glaser AG recommends that the following checks be carried out after the installation of the bushing in order to ensure safe operation:

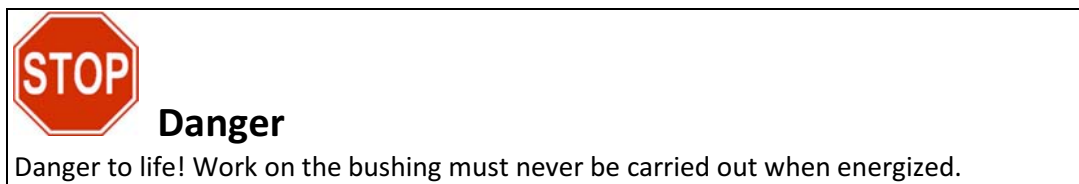
- ✓ Check that the bushing is grounded
- ✓ When the bushing is equipped with a test tap, measure the  $\tan \delta$  and capacity cf. page 11.

## 2.5. Maintenance during service work

The MGC Moser-Glaser AG bushing is **maintenance-free**.

We recommend a control every 5 to 10 years

The following check may be made during inspection:



### *Silicone insulator cleaning.*

Hydrophobic properties of silicone rubber cause far lower leakage currents, which results in excellent behaviour in polluted environments. Thus, there is no need for washing or greasing, even in humid or polluted areas, which saves on maintenance and cleaning costs. Silicone disables the formation of conductive paths, which lead to flashovers, line outages, and erosion of the insulator.

In case of exceptional severe site conditions, the insulators can be cleaned manually with soapy water and soft cloth.

No oils or detergents should be used.

Silicone rubber retains its hydrophobicity after washing.



## Note

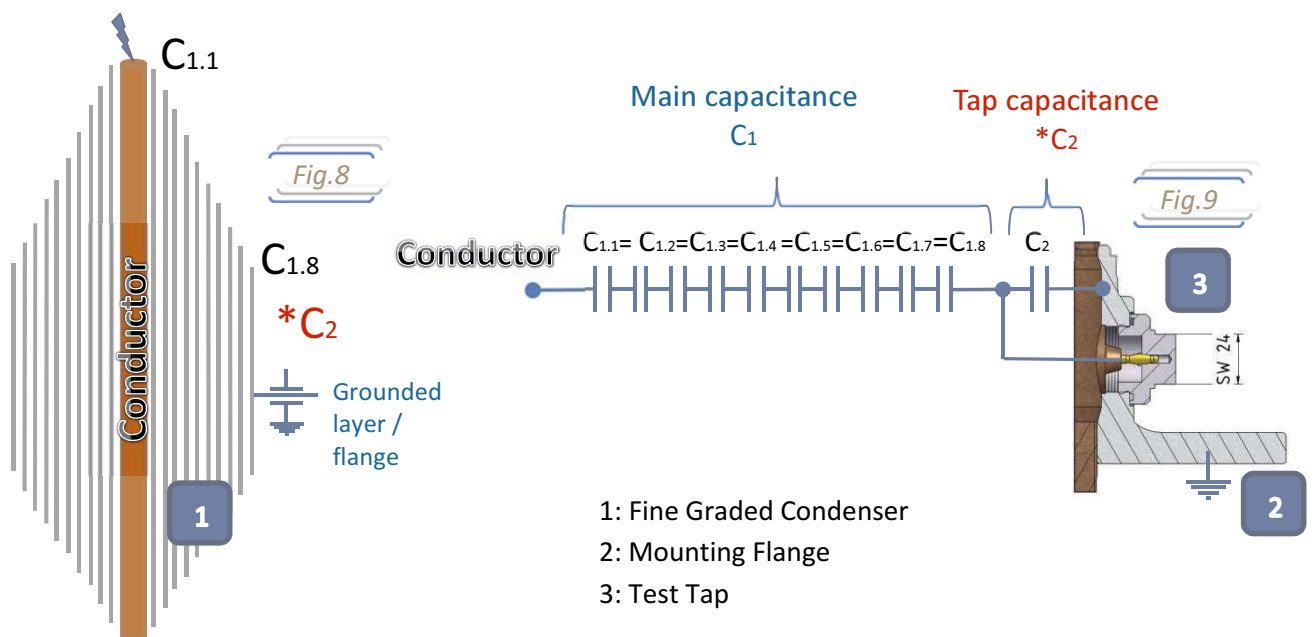
Clause 4.10 from IEC 60137-2008 mention that test tap is mandatory for transformer bushings with  $U_m \geq 72.5 \text{ kV}$

MGC can provide on request for its wall bushings a test tap

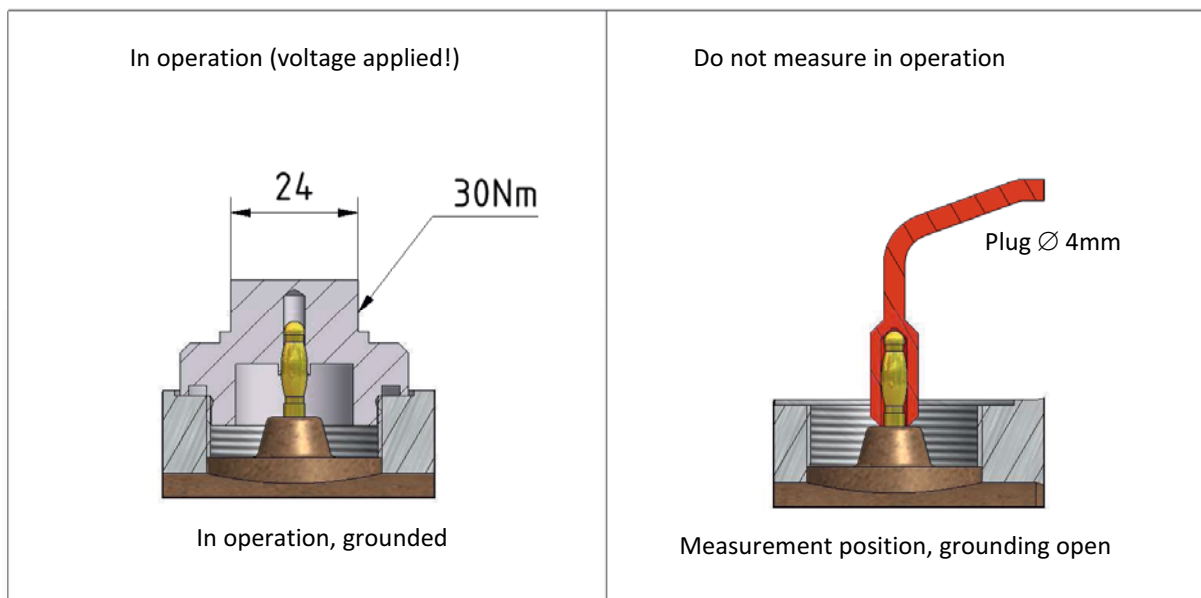
*Capacitance and tangent delta measurement.*

*\*Only valid if the bushing is equipped with a Test tap*

Principle of functioning:



The test tap is designed for testing under an industrial frequency of 2kV.



Measurement of the Capacitance and Tangent delta are made during the routine test and reported in the test report provided with the bushing.

Capacitance measured during routine test is engraved at the nameplate for bushings with  $U_m > 100\text{kV}$ . These values represent the references for the following measurement made on site.

- We recommend making a second reference measurement before the electrification on-site.

<b>Capacitance C1</b>	Under the same test conditions should not increase by more than 5-7%
<b>Tangent delta</b>	For new bushings, is in the range of 0.4 to 0.7% and should not increase by more than 0.10% at $1.05U_m/\sqrt{3}$ or $U_m$  Tangent Delta is temperature linked, when possible, measurement needs to be done at an ambient temperature of 20°C for a direct comparison with factory measurement, otherwise contact MGC for other conditions.

These values can be influenced by the methods, equipment, position of the bushing (vertical or horizontal) and conditions on-site, humidity, pollution, weather...

In standard the Test tap is not self-grounded.  
The cap has to be screwed tightly after measurement (30Nm).



Fig.11

In option MGC can provide Self-earthed test tap.



Fig.12



**Danger**



**Warning**



**Note**

The measurement connection may only be used when the voltage supply is switched off. After making the measurements, the measurement connection cover must always be screwed in again.

# 3. Special attention for wall bushing with current transformer



## 3.1 Secondary connection

Before making the secondary connections, it is essential to ensure that the installation is switched off and grounded. Be careful also of electromagnetic fields coming from nearby power plants.

The secondary connection must be carried out according to the scheme presented in the cable box.

To ensure the accuracy of the measuring transformer, the secondary line section must be sufficiently dimensioned.



### Warning

- Do not put into service with a secondary circuit open! High voltage will be produced on secondary terminals !
- Each secondary circuit must be grounded at one point.
- Unused CT windings must be short circuited over the highest tap.



Fig.13



Fig.14

Example of cable box and nameplate for CT with two cores

## 4.Storage

For any duration, chose an indoor location which will be protected again rain and humidity.

Bushings should remain in original transport box, unpacked.

Contact MGC when long term storage is required.

If you have any doubt about after storage not appropriated, proceed to a capacitance and tan delta measurement if the bushing is equipped with a test tap.

If measured data deviate too much compared to the routine test provided, please contact MGC.



This operation manual is also available in German, French and Russian.

Please contact your local representative.

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