Metal Clad Indoor Instrument Transformer for Plug-In Systems
RITZ Instrument Transformers GmbH – Core competency

Under the trading name „RITZ Instrument Transformers GmbH“ RITZ has been pooling its activities to gather new strengths since 01/08/2007.

The tradition and knowledge of the parent company “RITZ Messwandler Hamburg” and the subsidiary “RITZ Messwandler Dresden (TuR)” has been united with the companies “Wandler- und Transformatoren-Werk Wirges (WTW)” and “Messwandlerbau Bamberg (MWB)” under this name. This merger unites a total of more than two hundred years of know-how in instrument transformers production.

In addition, RITZ has decided to concentrate on the core business of medium voltage and low voltage transformers in which the high voltage division is sold. The resources gained through this shall now be applied for additional innovations and quality standards in the medium and low voltage products. RITZ is therefore securing its position on the global market.

The overseas corporations of RITZ Instrument Transformers GmbH in Austria (Marchtrenk), Hungary (Kecskemét), China (Shanghai) and USA (Hartwell) strengthen the company’s position on the international market.
Contents

General Description GBEAN, GBEIN and Secondary Connections 4
Specific Advantages of Metal Clad Voltage Instrument Transformers and Plug Systems 5
Overview Cable Connections 6
Applications “Plug-in” Voltage Instrument Transformers – Direct Connected to Switchgear 7
“Plug-in” Voltage Instrument Transformers with Fuse – Direct Connected to Switchgear 8
Cable Connected Instrument Transformers with Fuse 8
Assembly and Fuse Information 9
Metal Clad Current Transformer with inside cone 9
Metal Clad Combined Voltage and Current Transformer 9
General Information: Test, Handling after Receipt, Maintenance, Safty Advice 10
Inquiry/Ordering Information 11
RITZ Examples of Metal Clad Instrument Transformers 11
RITZ Product Overview 12
Indoor Voltage Transformer
Type GBEAN & GBEIN 12 . . . 52

General Description:

Voltage Transformers, type GBEAN and GBEIN, are single pole insulated and casted with epoxy resin for indoor application. The resin body is covered with a grounded aluminium box. The PTs are suitable for installation in or outside of switchgears up to a highest voltage for equipment of 52 kV corresponding to all relevant international standards.

The primary coil and the iron core together with the secondary winding(s) are completely resin embedded and casted in a single process step. The secondary terminals are integrated in the resin body and protected by an aluminium box.

Standard design drawing:

The cover of the aluminium box is removable and can be sealed. Each secondary terminal (M6) can be grounded separately inside of the box. The secondary terminal box is equipped with several removable cable plugs (Pg 16) according to customer request.

Alternative secondary terminal connections on request

Cable connecting according to DIN 57281 H07V-K1X4. The secondary leads are covered with fibre ribbons. The end splices are equipped with additional sleeves.

HARTING Connector. PIN assignment according to connecting diagram will be given during offer stage.

AMP Connector. PIN assignment will be given during tendering phase.

The high voltage end of the primary winding (terminal “A”) can be provided with an outer or inner silicon cone and is applicable for specific plug-in or cable connection according to EN 50181. The other end of the primary winding (terminal “N”) is grounded inside of the secondary terminal box [Standard design]. For other secondary design the terminal “N” will be grounded by the manufacturer.
For plug in connection the terminal “A” of the PT is equipped with a spring for easy and secure mounting. In case of connecting the PT to a cable elbow plug the fixing device is included in delivery.

Specific Advantages of Metal Clad Voltage Instrument Transformers

- Compact design, less space requirement
- Mounting outside of panel [Ring Main Unit, SF6 insulated switchgears]
- Safe to touch, due to grounded housing
- No maintenance
- Simple assembly
- Inner/outer cone according to all international standards
- Cable plug-in connection
- No cable necessary due to direct plug-in design

Terminal marking according to IEC 60044-2 (Example):

Primary:

Secondary:

measuring winding  a – n
open delta winding  da – dn

Available “plug-in” systems

Cable and pluggable connection according to EN 50181

Outside cone

<table>
<thead>
<tr>
<th>Type</th>
<th>Max. rated voltage [kV]</th>
<th>Rated current [A]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12..24</td>
<td>250</td>
</tr>
<tr>
<td>B</td>
<td>12..36</td>
<td>400</td>
</tr>
<tr>
<td>C</td>
<td>12..36</td>
<td>630</td>
</tr>
</tbody>
</table>

Inside cone

<table>
<thead>
<tr>
<th>Size</th>
<th>Max. rated voltage [kV]</th>
<th>Rated current [A]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>12..36</td>
<td>250</td>
</tr>
<tr>
<td>1</td>
<td>12..36</td>
<td>630</td>
</tr>
<tr>
<td>2</td>
<td>12..40,5</td>
<td>800</td>
</tr>
<tr>
<td>3</td>
<td>12..52</td>
<td>1250</td>
</tr>
</tbody>
</table>
Overview Cable Connections

Outside cone

Type A [250 A]

Type B [400 A]

Type C [630 A]

Inside cone

<table>
<thead>
<tr>
<th>size 0</th>
<th>size 1</th>
<th>size 2</th>
<th>size 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 A</td>
<td>630 A</td>
<td>800 A</td>
<td>1250 A</td>
</tr>
</tbody>
</table>
Application
“Plug-in” Voltage Instrument Transformers - Direct Connected to Switchgear

Um 12..24 kV Plug type A [250 A]  Um 12..36 kV Plug size 0 [250 A]

Silicon adapter (included in delivery)

Um 12..36 kV Plug type B [400 A]  Um 12..40,5 kV Plug size 2 [800 A]

Example of T-connection option

Um 12..52 kV Plug size 3 [1250 A]

SF₆-insulated switchgear

SF₆-insulated switchgear

SF₆-insulated switchgear
“Plug-in” Voltage Instrument Transformers with Fuse - Direct Connected to Switchgear

Um 12..36 kV size 1 [630 A],
Um 12..40,5 kV size 2 [800 A]

Fuse $I_N = 2$ A [non accessible]

Fuse $I_N = 2$ A [accessible]
Dummy cable connector

Um 12..36 kV Plug type A [250 A],
type B [400 A], type C [630 A]

Fuse $I_N = 2$ A [accessible]
Dummy cable connector

Cable Connected Instrument Transformers with Fuse

Um 12..36 kV size 1 [630 A],
Um 12..40,5 kV size 2 [800 A]

Fuse $I_N = 2$ A [accessible]
Dummy cable connector

Um 12..36 kV Plug type A [250 A],
type B [400 A], type C [630 A]

Fuse $I_N = 2$ A [accessible]
Dummy cable connector

Silicon adapter included

Fuse $I_N = 2$ A [non accessible]
Assembly

The PTs can be mounted either in vertical or horizontal position. Before mounting the cone has to be cleaned with cleaning benzene and coated with silicone grease. For further details please refer to the Ritz assembly manual. The dimensions of the PTs are mentioned in the outline drawing.

Note:
During assembly it must be strictly adhered that the PT is mounted into the connecting part in a straight and horizontal position. The plug must not be canted or twisted in any direction.

Fuse

The PTs can be equipped with an accessible or non accessible fuse which is designed for a tripping current of 2 A.

Attention:
In case of tripping of the fuse a complete replacement of the PT is compulsory. The fuse does not protect the PT itself. In case of a fault it has to be assumed that the PT is partially damaged.

Attention:
- Do not remove dummy plug, before switching off voltage.
- Danger! High Voltage!

Metal Clad CT
Inside Cone

Technical data and design parameters on request

Metal Clad combined PT & CT
Outside Cone

Technical data and design parameters on request

Metal Clad combined PT & CT
Inside Cone

Technical data and design parameters on request
General Information

Tests:
A routine test according to the valid international standards for Instrument Transformers will be performed on all PTs. The results will be recorded in the test report.

Handling after receipt
The PTs are suitably packed for transportation. Immediately after receipt, the package should be inspected for possible transport damages. In case of any external damage or any sign of rough handling, notify Ritz Instrument Transformers GmbH immediately.

Safety advice
Hazardous voltage is present in this electrical equipment during operation. Non-observance of the instructions can result in property damage, severe personal injury or even death. Only qualified personal should work on or around this equipment after becoming thoroughly familiar with warnings and safety notices. The successful and safe operation of this equipment depends on proper handling, installation, operation and maintenance.

Maintenance
No special maintenance is required. However, it is recommended to clean the surface from time to time with a dry, soft cloth.

Attention:
• For cleaning never spray with water.
• Do not short circuit secondary windings.
• The neutral terminal “N” has to be grounded at any time.
Inquiry/Ordering Information

Technical parameters

• Ratio
• Number of secondary windings
• Burden
• Accuracy class
• Rated voltage factor
• Frequency
• Standard

Design Parameters

• Outer/Inner cone
• Plug-in or cable connection
• Size of plug
• Fuse [accessible or non-accessible]

If you need some further assistance please contact our agent or one of the Ritz companies

Examples of Metal Clad Instrument Transformers

Voltage Transformer
GBEIN12-0
Inner cone

Voltage Transformer
GBEAN24-0
Outer cone

Voltage Transformer
GBE136
Inner cone

Voltage Transformer
TGBZI24
Inner cone

Voltage Transformer
GBE136SES
Inner cone

Voltage Transformer
TGBZI36
Inner cone

Current Transformer
GBW
Inner cone

Current and Voltage Transformer
KGBEA
Outer cone
**Medium Voltage Instrument Transformers**

- up to 72.5 kV
- Indoor and Outdoor
- Metal Clad Design
- Metalized Design
- Burst Proofed Metering Voltage Transformers for Railway Vehicle
- Sensor Types

**Low Voltage Instrument Transformers**

- up to 1.2 kV

**Current Transformers for Measuring and Protection Purposes**
- Wound primary CT
- Summation CT
- CT for switch fuses
- Window type CT for high currents
- Split-core types for earth fault protection

**Special Instrument Transformers for Measuring Purposes**
- 3-phase CT
- Laboratory Current and Voltage Transformers
- Voltage Transformers

**SIS Cast Resin Bus Bar Systems**

- up to 72.5 kV & 7000 A – The Alternative to Parallel-Connected Cables

**System Specific Benefits**
- Compact design
- Reduced requirements for the installation space
- Small bending radii
- 3-dimensional geometric shape is possible
- Natural cooling due to effectual conductor design
- High opererational reliability due to factory routine test of each bus bar
- No maintenance

**Safety Benefits**
- Touch Safe
- Fully insulated and capacitive graded system
- High thermal and dynamic short circuit current withstand capabilities
- Excluded phase to phase short-circuits
- No toxic fumes in case of fire - self extinguishing

**Cast Resin Power Transformers**

- up to 40.5 kV and 25 MVA

**Applications**
- Power Distribution
- Oil Platforms / Vessels
- Injection Systems
- Grounding Systems
- Traction Power Systems (Streetcar, Tram, Metro, Railway)
- Rectifier Drives
- Generator Excitation
- Transmitter Systems
- Laboratory Systems

**Electronic Instrument Transformers and Sensor**

**Voltage-Sensoric**
- Voltage up to 90 kV
- Accuracy of 0.2 %
- Frequency from 0 to 10 kHz

**Current-Sensoric**
- Current up to 24000 A
- Accuracy of 0.01 %
- Frequency from 0 to 10 kHz

**Applications**
- Power Engineering
- Grid Analyse
- Traction Power Distribution Systems
- Protection Technology
- Electro-chemistry
- Switchgear Systems
- Environment Engineering
- Automobile Industry
- Research

**Customised Cast Resin Parts**

- Development and formulation of cast resin moulding materials for electrical applications in low and medium voltage ranges and for electronics
- Design and production of cast resin mouldings e.g. special bushings, fuse housings etc.

**RITZ Instrument Transformers GmbH**

Mühlberg 1 | 97514 Oberaurach-Kirchaich | GERMANY
Tel.: +49 95 49 89-0 | Fax: +49 95 49 89-11
E-Mail: info@ritz-international.com