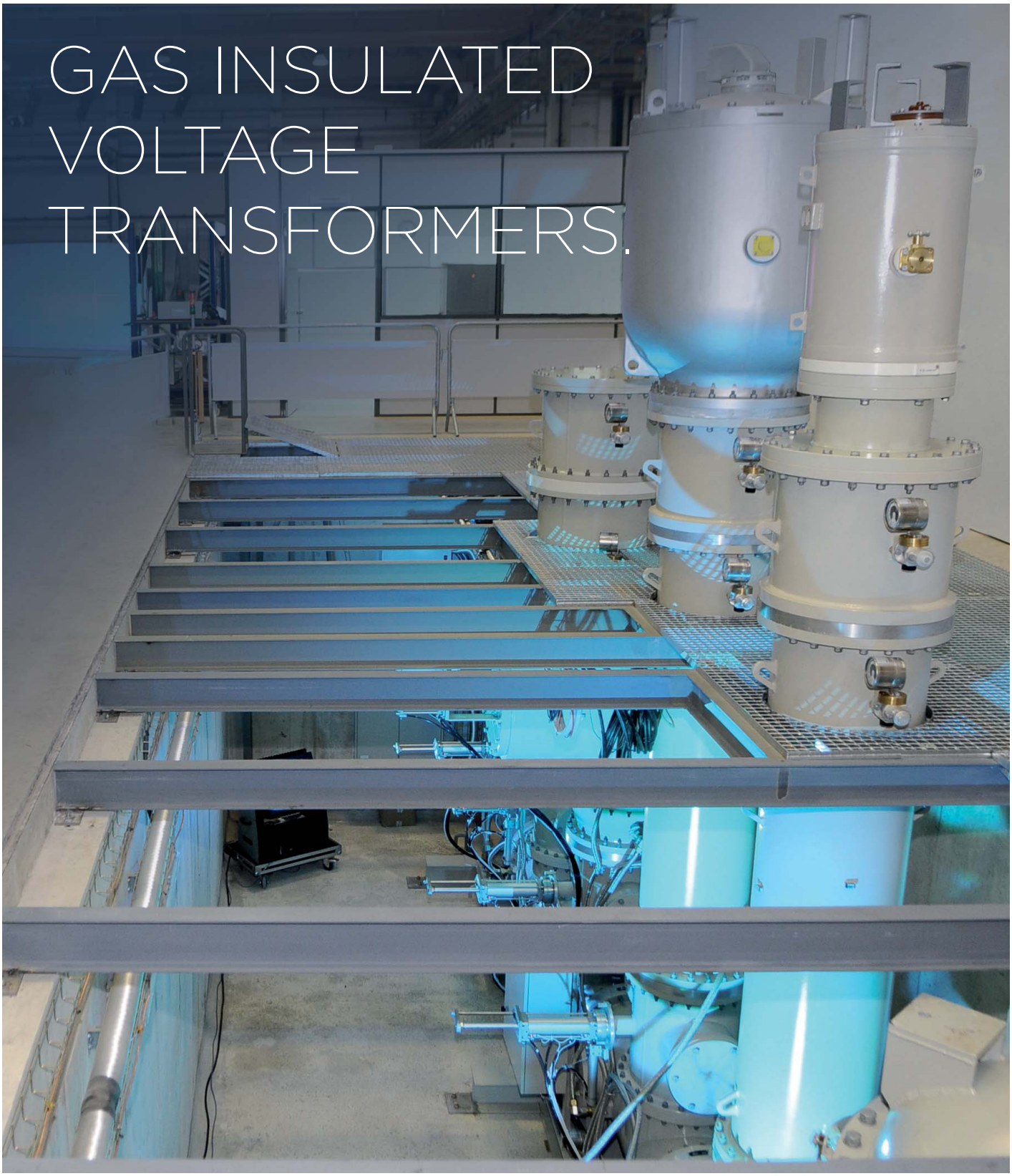
arteche
NISSIN ELECTRIC

GAS INSULATED VOLTAGE TRANSFORMERS.



This document may be subject to changes. Contact ARTECHE NISSIN to confirm the characteristics and availability of the products described here.

CONTENTS

› 800 kV Single phase voltage transformers (Korea).

› 170 kV Single phase voltage transformers.

We have installed transformers in over 150 countries.

1. PRESENTATION

ARTECHE NISSIN borns with the aim to become the reference as independent manufacturer in SF_6 gas insulated voltage transformers' market, for Gas Insulated Switchgears.

The production plant is located in Vitoria-Gasteiz, in northern Spain with good logistics communications to provide close support and ensuring short delivery times, improving the competitiveness of our customers.

ARTECHE NISSIN is a joint-venture between the ARTECHE GROUP and NISSIN ELECTRIC CO., LTD., both companies have extensive worldwide experience in the instrument transformers field and have joined their efforts through ARTECHE NISSIN to become a trustworthy partner for all European GIS substation manufacturers.

In ARTECHE NISSIN we share a vision of future for our projects. Innovation is our key to find more efficient solutions through most advanced technologies and resources, which will strengthen further our position in the market, being able to successfully face the challenges set by a transforming sector.

› 220 kV single phase voltage transformer with isolating device.

› 420 kV single phase voltage transformer.

› 145 kV voltage transformer for AIS.

› Production plant and technical office at Vitoria-Gasteiz (Spain).

2. MANUFACTURING

Gas insulated VTs are divided into two types. One is single-phase type, the other is three phase type.

A three-phase Gas-VT consists of three units of single-phase VT which are enclosed in a tank. Both type Gas-VTs are connected to GIS through an insulator.

WINDING

Heat-resisting electric wires with synthetic resin coating and plastic film with high dielectric strength, superior heat-resisting, strong mechanical strength and no need to be troubled by moisture are used.

Insulation medium among winding layers is SF_6 gas and plastic film.

Iron cores are oriented silicon steel plates.

FILLING VALVE FOR SF_6 GAS

A filling valve for SF_6 gas is provided on a side of the tank.

Gas runs between Gas-VT and GIS through this valve in operation. Therefore, monitoring devices for gas leakage and gas pressure are not provided generally on a Gas-VT itself.

TERMINAL BOX

A terminal box is provided on a side of the tank.

A low voltage terminal of primary windings and secondary terminals of secondary windings are brought out in this terminal box through SF_6 gas seal tightness bushings.

Through its production plant based in Spain, ARTECHE NISSIN offers in Europe the leading technology in the asian market.

› Drying and vacuum ovens.

› Core assembly.

High and steady accuracy, combined with safe design and maximum reliability.

3. FEATURES

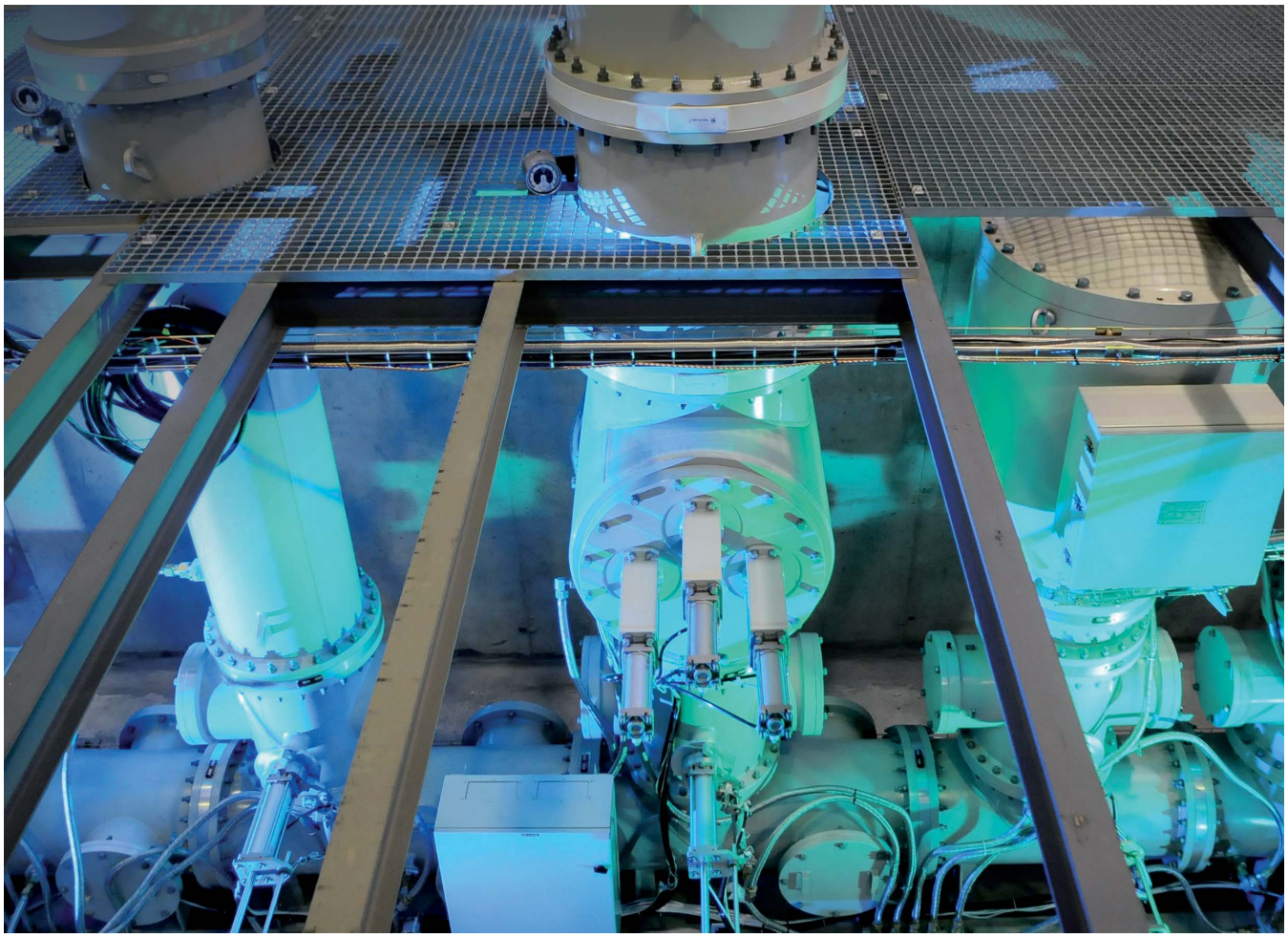
- Convenient and easy for GIS designing. Gas insulated voltage transformers (Gas-VTs) are designed to be light and compact and furthermore can be connected to GIS in horizontal, vertical or inverted position.
- Safety. No oil is used as an insulation medium. Therefore, our Gas-VTs are appropriate for indoor use in safety conditions.
- High-reliability of insulation. A superior distribution of electric field in primary windings ensures high-reliability against incoming surge voltage.
- Line trapped charge discharging. Line charge, which is trapped after opening the line circuit breaker of a long transmission line or power cable, is discharged through VTs, if either is connected to the power line or cable.
- Easy for maintenance. SF_6 gas is used as insulation medium like GIS. Thus, its maintenance is easy. Main components are enclosed in SF_6 gas and hermetically sealed. Thus no maintenance is required for them.

4. ACCESSORIES

Voltage transformers include usually the following accessories:

- Terminal box (1 piece)
- Secondary (Tertiary) terminal block (1 set)
- Earth terminal (1 piece)
- Nameplate (1 piece)
- Inlet valve for gas (1 piece)
- Lifting lugs (1 set)

› Gas Test Unit (GTU).



5. RANGE AND DIAGRAMS

ARTECHE NISSIN can manufacture to comply with any national or international standard. All kinds of burdens and accuracy classes can be met.

VOLTAGE TRANSFORMERS FOR GIS

Single phase

Model	Highest system voltage (kV)	Rated primary voltage (kV)	Power frequency withstand voltage (kV)	Lightning impulse withstand voltage (kV)	Switching impulse withstand voltage (kV)
SVR-6	72,5	66/√3	140	325	
SVR-10	123	110/√3	230	550	
SVR-12	145	132/√3	275	650	
SVR-14	170	154/√3	325	750	
SVR-20	245	220/√3	460	1.050	
SVR-25	300	275/√3	460	1.050	850
SVR-34	362	345/√3	510	1.175	950
SVR-38	420	380/√3	630	1.425	1.050
SVR-50	550	500/√3	680	1.550	1.175
SVR-80	800	735/√3	975	2.100	1.550

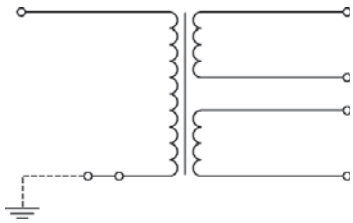
Data subject to change without notice.

Three phase

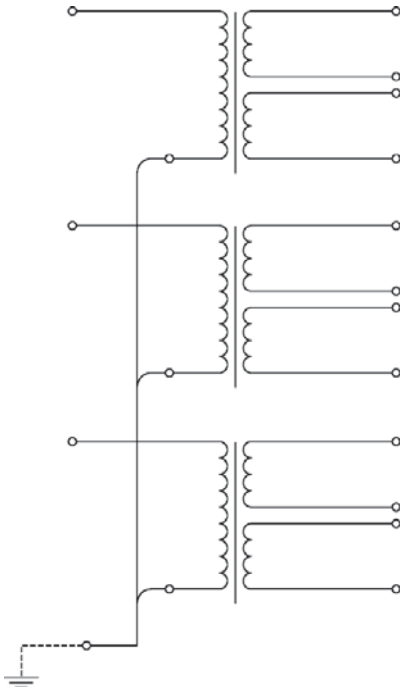
Model	Highest system voltage (kV)	Rated primary voltage (kV)	Power frequency withstand voltage (kV)	Lightning impulse withstand voltage (kV)
SVTR-6	72,5	66/√3	140	325
SVTR-10	123	110/√3	230	550
SVTR-12	145	132/√3	275	650
SVTR-14	170	154/√3	325	750

Data subject to change without notice.

› SINGLE PHASE
Connexion typical diagram



› THREE PHASE
Connexion typical diagram



VOLTAGE TRANSFORMERS FOR AIS

Gas insulation > Model UG

Model	Highest voltage (kV)	Rated insulation level			Thermal burden (VA)	Standard creepage distance (mm)
		Power frequency (kV)	Lightning impulse (BIL) (kVp)	Switching impulse (kVp)		
UG-123	123	230	550	-	1.000	3.813
UG-145	145	275	650	-	1.000	4.495
UG-170	170	325	750	-	1.000	5.270
UG-245	245	460	1.050	-	1.000	7.595
UG-300	300	460	1.050	850	1.000	9.300
UG-362	362	510	1.175	950	1.000	11.222
UG-420	420	630	1.425	1.050	1.000	13.020
UG-550	550	680	1.550	1.175	1.000	17.050

Approximate dimensions and weights. For special requirements, please consult.

POWER VOLTAGE TRANSFORMERS

This type of voltage transformer can supply several kVA low voltage power directly from a high voltage transmission line. It offers all the benefits of a potential transformer with the applications of a distribution transformer.

APPLICATIONS:

1. **Substations auxiliary services power supply:** Power supply in conventional substations where low voltage power is needed as a primary or back-up supply; or in remote areas where building distribution lines is unsafe and with unreliable supply that requires frequent maintenance and high costs. It can also be used as a primary power source in switching substations without power transformers to supply the substation and SCADA control systems.
2. **Power supply for telecommunication and monitoring systems:** High quality electrical supply for booster antennas in remote locations using a voltage transformer connected to a nearby transmission line.
3. **Rural electrification of isolated populations:** As a power source for supplying reliable power to rural populations in isolated areas where there are no distribution lines nearby, but there are transmission lines. This particular application supplies low voltage power directly from HV line in an economical and practical way.
4. **Temporary power supply** when building substations, wind farms, etc., and emergency supply during natural disasters.

ADVANTAGES:

The conventional solution used for the previously mentioned applications is a dedicated medium voltage line. ARTECHE's voltage transformer for auxiliary services has the following advantages:

- Social benefits. Electrification of isolated rural areas, emergency power after natural disasters...
- Independent power supply, more flexible as the user does not have to depend on third parties.
- Cost effective.
- Quick and flexible solution compared to building new lines, since there is no need to apply for license, conduct environmental studies, use eminent domain, etc.).
- Highly reliable power source within the substation.
- Safety for the most critical equipment in the substation (power transformer). Low voltage and auxiliary services are the most unreliable uses. With this solution there is no need for a tertiary winding that could put the power transformer in risk.
- Dual function, it can be used as a power source and as an instrument transformer in a single unit, since it can also be used for metering and/or protection.
- PT100 temperature sensor available.

Power voltage transformers are designed following both Instrument transformers and power transformers standards:

- Instrument transformers as per IEC 61869-3, IEEE C57.13.
- Power transformers as per IEC 60076, IEEE C57.12.00.

Model UG > PVT

Model	Highest voltage (kV)	Rated insulation level			Burden (kVA)	Standard creepage distance (mm)
		Power frequency (kV)	Lightning impulse (BIL) (kVp)	Switching Impulse (kVp)		
UG-72	72.5	140	325	-	50	2,248
UG-145	123	230	550	-	100	3,813
	145	275	650	-	100	4,495
UG-245	170	325	750	-	100	5,270
	245	460	1,050	-	100	7,595
	300	460	1,050	850	100	9,300
UG-420	362	510	1,175	950	100	11,222
	420	630	1,425	1,050	100	13,020
UG-550	550	680	1,550	1,175	100	17,050

Approximate dimensions and weights. For special requirements, please consult.

› Model UG

6. QUALITY & ENVIRONMENT

Everyone in ARTECHE NISSIN works under the criteria set out in our environmental and quality policy.

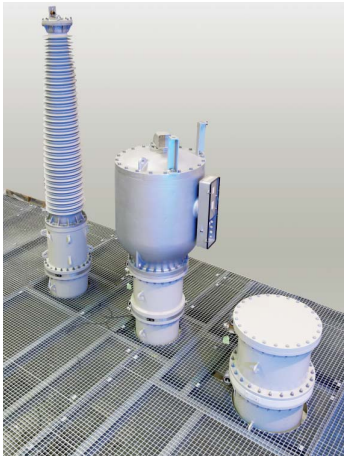
A sum of regulated procedures based on communication, teamwork, prevention analysis and continuous improvement, common to the whole organization.

- Advanced sustainability criteria in production and in the creation and development of new products.
- Compact designs, manufactured with minimal energy consumption and enviromental-friendly materials.
- Internal and external skill motivation programs.
- Advanced development of knowledge management.
- Quality agreements with utilities.
- Electrical laboratories for testing of products and components according to international standards.
- Type test reports issued by independent laboratories.
- Final testing according to specific customer requirements.
- ISO 9001:2008.
- ISO 14001:2004.
- OHSAS 18001:2007.

7. SERVICE

- Our service is based on a close relationship with the customers, reflected in the integrated post-sale assistance plan and structured client opinion system.
- In addition to ensuring rapid response, ARTECHE NISSIN developed a continuous service improvement plan, which sustains an extensive training program with courses, publications, conferences, etc.
- As a part of the ARTECHE Group and NISSIN ELECTRIC, we are an active participant in the electrical organizations such as: IEC, IEEE, CIGRE, CIRED, ASINEL, etc.
- From its leadership in the asian market, ARTECHE NISSIN has technical offices throughout Europe. To provide effective responses to the requirements of any customer and situation, based on the global knowledge acquired.

Exceeding environmental regulations, ARTECHE NISSIN has been able to minimize the use off hazardous materials, energy consumption and waste generation.



- Routine test at ARTECHE NISSIN's laboratory.
- Independent laboratory tests.
- The solutions ARTECHE NISSIN has developed and expanded have made us an active participant in the most important electrical events and organizations.

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