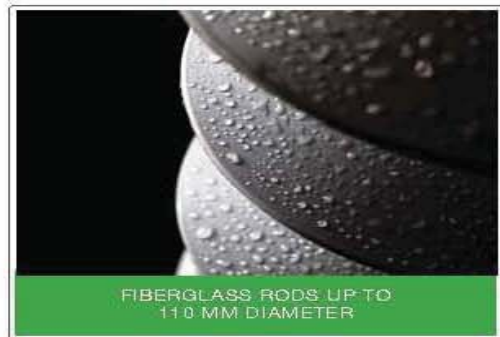




LINE AND STATION POST INSULATORS

FOR HIGH AND MEDIUM VOLTAGE



sales@bonomieugenio.com



(0039) 030 9650304



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CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

EB Rebosio S.r.l.
Via Carso, 49
24040 Madone (Bergamo) – Italia

has been approved by Lloyd's Register Quality Assurance Italy Srl
to the following Quality Management System Standards:

UNI EN ISO 9001:2008

The Quality Management System is applicable to:

**Design and manufacture of composite insulator for
traction/ transmission/ distribution power lines.**

This certificate forms part of the approval identified by certificate number LRC 0160127/QMS.

Approval	Original Approval: 14 th March 1996
Certificate No.: LRC 0160127/QMS/002	Current Certificate: 14 th March 2011
EA Sector 19	Certificate Expiry: 13 th March 2014



Issued by: Lloyd's Register Quality Assurance Italy Srl



SGQ N° 039A SGA N° 026D
SSI N° 004G SGE N° 002M

Membro degli Accordi di Mutuo Riconoscimento
EA, IAF e ILAC

Signatory of EA, IAF and ILAC
Mutual Recognition Agreement

This document is subject to the provision on the reverse.

Registered Office: Piazza della Vittoria 6-1 – 16121 Genova – Trib.Genova 189273/1996 – CCIAA Genova 356347

The approval is subject to the company maintaining its system to the required standards, which will be monitored by LRQA

Macro Rev. 13

REFERENCES ON COMPOSIT INSULATORS

isoelectric

- ENEL S.p.A. (Italian Electric Company)
- FERROVIE DELLO STATO S.p.A. (Italian Railways Company)
- O.N.E. (National Office of the Electricity of Morocco)
- TRANSELEC (Chilean Electric Company)
- ENDESA (Spanish Electric Company)
- TRINIDAD and TOBAGO ELECTRICITY CO.
- FIJI ELECTRIC COMPANY CO.
- U.T.E. (Uruguayan Electric Company)
- SAESA (Chilean Electric Company)
- RENFE (Spanish Railways)
- S.N.C.B. (Belgian Railways)
- TEIAS (Turkish Electric Company)
- R.A.T.P. (Underground of Paris)
- CEMIG (Brazilian Electric Company)
- LUZ y FUERZA (Mexican Electric Company)
- EDELNOR (Peruvian Electric Company)
- P.P.C. (Grecian Electric Company)
- COELBA (Brazilian Electric Company)
- CONECTIV (Delaware - USA Electric Company)
- UNION FENOSA (Spanish Electric Company)
- TANESCO (Tanzanian Electric Company)
- MANUFACTURERS of ELECTRIC EQUIPMENT'S

Note: All the above references can be proved by documents. The above list includes the firsts insulators installed in 1985 and it is revised to JANUARY 2011, **more than 26 years !!.**

“ SILISOL “

COMPOSITE INSULATORS IN SILICONE RUBBER

“**SILISOL**“, the composite **SILICONE** insulator, was born through a twenty years experience of the **isoelectric**, which is the market leader in epoxy resin insulators, for indoor use and in cycloaliphatic resin insulators, for outdoor use.

isoelectric work with **ISO 9001-2008 certification**.

In the last **35** years the trend of using technologies making use of composite materials has been developed. These technologies, from a first application to indoor equipment, extended successively to outdoor equipment, especially interesting the field of line insulators of medium and high voltage.

The **isoelectric**, keeping into account the problems of using organic materials, developed a high **quality** product with interesting mechanical and electrical features as well as a good pollution resistance.

WHY THIS CHOICE ?

- High mechanical strength in relation to weight.
- High breaking points with limited overall dimensions.
- High impact resistance (even against gunshots).
- Reduced weight (from 10 to 300 times in relation to the traditional insulators).
- High mechanical strength in relation to weight.
- Lower transport costs.
- Lower packing and storage costs.
- Lower installation costs.
- Lighter support mechanical structures.
- Wider leakage distance with the same spark gap.
- Higher discharge voltage in highly polluted environments.
- Higher resistance to the power arc.
- Higher ultra-violet (UV) radiation resistance.

The properties of **hydrophobicity** and corrosion-proof of the **SILICONE** keep the outer casing of the insulators clean. These properties help the cleaning action of the rain on the insulators and help to avoid damages of the salinity, of dusts and corrosion of the industrial smokes improving the outer casing resistivity.

CONSTRUCTIVE COMPOSITION OF THE INSULATOR

The composite silicone insulators reinforced with ECR fibreglass rod have been introduced because of the high mechanical stresses that post, suspension, tension and mooring insulators are subjected to, allowing greater performances.

The “**SILISOL**“ composite silicone insulators are constituted by 3 main elements:

1. A central rod in **ECR** fibreglass (corrosion resistant) impregnated with epoxy resin or polyester resin.
2. A coating in **silicone rubber** that protects the central rod from external factors (humidity, chemical contamination, and so on).
3. External metal end fittings that are used to transmit the mechanical stresses of the electric line to the central rod.

A special care has to be taken in connecting the ECR fibreglass rod to the metal end fittings. **isoelectric** has developed a system that allows having high bending, traction, torsion and compression loads. Moreover this system allows eliminating water penetration which happens in the usual execution of compression end fittings.

The “**SILISOL**” insulators are made of a central rod in ECR fibreglass impregnated with epoxy resin or polyester resin and they must have 4 essential requisites:

- The capacity to withstand mechanical stresses that come from a specific use.
- Sufficient insulating properties to withstand, with an adequate safety-margin, the electrical stresses of usage and those resulting from over voltages of internal and external origin.
- Power arc resistance.
- Positive results at the tests according to the standard **IEC 61109, IEC 61952, IEC 62217, IEC 62231, AS 4435.4 & ANSI C29-11.**

Even though the glass or porcelain insulators fully satisfy two of the above mentioned requirements, they are not resistant to the power arcs caused by the power-cuts on the lines.

The phenomenon of tracking is the main drawback of insulators made only with the ECR fibreglass rod without any special additives and subjected to a certain determined electrical gradient on the surface. This happens as a result of the simultaneous presence of an electrical gradient between the metal endings of the insulator and the polluted substances full of humidity on the external surface.

Taking this phenomenon into account **isoelectric** has applied an external housing of suitable shape, made of a material with excellent dielectric features, a material that is totally resistant to chemical attack and atmospheric agents.

THE SILICONE “ SILIC 1.75 “

The adherence of the SILICONE housing to the ECR fibreglass rod is achieved by particular methods that allow very high shearing values. By these methods, at an interface level with the housing in SILICONE, a **one piece injection moulding (monolithic)** construction has been obtained from one end fitting to the other end fitting.

The SILICONE mixture is made of a *pure 100% silicon polymer* and filler. This mixture is characterised by a great resistance to the superficial electrical discharges, “tracking”, by a surface with permanent properties of hydrophobicity as well as by a great insulating property under high pollution.

METALLIC END FITTINGS

The metallic end fittings placed at the end of the ECR fibreglass rod must have sufficient mechanical features to take the stresses that insulators are subjected to. These terminals can be manufactured in different shapes and materials, according to the **IEC 60120**, **IEC 60471**, and **IEC 61466-1** standard and according to the characteristics requested by the customer or their use. The terminals can be manufactured as follows:

- forged steel C 30 or C 40, worked and then hot dip galvanised
- casting steel C 30 or C 40, worked and then hot dip galvanised
- forged aluminium and then worked
- forged aluminium - bronze and then worked
- casting aluminium, aluminium bronze or other alloys and then worked.

Shapes, dimensions and materials can agree every time, according to the customer's need too.

isoelectric

COMPOSITE INSULATORS ARE PRODUCED ACCORDING TO SAME OF THE FOLLOWING STANDARDS

STANDARD	DESCRIPTION
IEC 61109 Emend. 1	Composite insulators for overhead lines with a nominal voltage greater than 1000 V.
IEC 61952	Composite line post insulators for overhead lines with a nominal voltage greater than 1000 V.
IEC 61466-1	Composite string insulator unit for overhead lines, part 1: standard strength classes and end fittings.
IEC 61466-2 Ed. 1.1 / 2002	Composite string insulator unit for overhead lines, part 2: dimensional and electrical characteristics
IEC 60707	Test for flammability
ANSI C29.11	Composite suspension insulators for overhead transmission lines with voltages greater than 1000 V.
AS 4435.4	Composite line post insulators for overhead power lines.
I.E. TE 127	Composite insulators I621 for contact railways lines with 3 kV dc
ASTM E 662	Test to determine the optical density of the smokes
ASTM G 26	Ageing test by ultra-violet rays (UV)
CEI 20-37	Test to determine the toxicity and corrosion of the smokes
DIN 57441	Accelerated ageing test in saline fog
IEEE Std 1024	Recommended practice for specifying distribution composite insulators (suspension type)
IEC 60060-1	Methods of tests in high voltage
IEC 60071-1	Insulation co-ordination
IEC 60120	Dimensions of ball & socket couplings of string insulators units
IEC 60273	Dimensions of post insulators for lines with voltages >1000 V
IEC 60383	Tests on porcelain and glass insulators for lines >1000 V
IEC 60471	Dimensions of the clevis and tongue couplings of string insulators units
IEC 60507	Artificial pollution test on H.V. insulators to be used in a.c. system
IEC 60815	Guide for the selection of insulators in respect of polluted conditions

The above said standards are taken as reference for design, production and testing. Other standards can be taken into consideration according to the customer's needs.

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TESTS PERFORMED ACCORDING THE STANDARD IEC 61109

Some tests were performed on some composite insulators “SILISOL“ of the **isoelectric** according to the **IEC 61109** standard, as follows:

PARAG.	DESCRIPTION	REPORT
5	Design tests	TESTS REPORT OF RECOGNIZED LABORATORY ARE AVAILABLE IN OUR FIRM
5.1	Tests on interfaces and connections of metal fittings	
5.1.1	Test specimens and preliminary tests	
5.1.2	Dry power frequency voltage test	
5.1.3	Pre-stressing	
5.1.3.1	Sudden load release test	
5.1.3.2	Thermal-mechanical test	
5.1.3.3	Water immersion test	
5.1.4	Verification test	
5.1.4.1	Visual examination	
5.1.4.2	Steep-front impulse voltage test	
5.1.4.3	Dry power frequency voltage test	
5.2	Assembled core load-time test	
5.2.1	Test specimens	
5.2.2	Mechanical load test	
5.2.2.1	Determ. ave. failing load of the core of the assem. ins.	
5.2.2.2	Control strength-time curve slope of the insulator	
5.3	Test of housing : tracking and erosion test	
5.3.1	Test specimens “duration of 1.000 & 5.000 hours ”	
5.3.2	Test procedure	
5.3.3	Test conditions	
5.3.4	Evaluation of the test	
5.4	Test for the core material	
5.4.1	Dye penetration test	
5.4.1.1	Test specimens	
5.4.1.2	Performance of the test	
5.4.1.3	Acceptance criterion	
5.4.2	Water diffusion test	
5.4.2.1	Test specimens	
5.4.2.2	Pre-stressing	
5.4.2.3	Voltage test	
5.5	Flammability test	
5.5.1	Test procedure	
5.5.2	Evaluation of the test	
6	Type tests	Internal tests at isoelectric
6.1	Dry lightning impulse withstand voltage test	
6.2	Wet power - frequency test	
6.4	Mechanical load-time test and test of the tightness of	

TESTS COMPARABLE TO THE STANDARD ANSI C29.11

The **isoelectric** composite insulators “**SILISOL**“ performed some tests were comparable to the standard ANSI C29.11 as follows :

PARAG.	DESCRIPTION	REPORT
7	Prototype tests	TESTS REPORT OF RECOGNIZED LABORATORY ARE AVAILABLE IN OUR FIRM
7.1	Test on interfaces and connection of end fittings	
7.1.1	Test specimens and preliminary test	
7.1.2	Dry power frequency voltage test	
7.1.3	Sudden load release test	
7.1.4	Thermal-mechanical test	
7.1.5	Water penetration test	
7.1.6	Verification test	
7.1.6.1	Visual examination	
7.1.6.2	Steep front impulse voltage test	
7.1.6.3	Dry power frequency voltage test	
7.2	Core time-load test	
7.2.1	Test specimens	
7.2.2	Test to determine the aver. failing load of the core	
7.2.3	Control of the load-time slope of the insulators	
7.3	Housing tracking and erosion test	
7.3.1	Test specimens “ duration of 5000 hours “	
7.3.2	Test chamber	
7.3.3	Test conditions	
7.3.4	Evaluation of the test	
7.4	Core material test	
7.4.1	Dye penetration test	
7.4.1.1	Test specimens	
7.4.1.2	Performance of the test	
7.4.1.3	Evaluation of the test	
7.4.2	Water diffusion test	
7.4.2.1	Test specimens	
7.4.2.2	Pre-stressing	
7.4.2.3	Voltage test	
7.4.2.4	Acceptance criterion	
8	Design test	Internal tests at isoelectric
8.1	Lighting critical - impulse flashover test	
8.2	Wet power frequency test	
9.*	All acceptance tests	

TESTS PERFORMED ACCORDING THE STANDARD IEC 61952

Some tests were performed on some composite insulators “SILISOL“ of the **isoelectric** according to the **IEC 61952** standard, as follows:

PARAG.	DESCRIPTION	REPORT
6	Desion tests	TESTS REPORT OF RECOGNIZED LABORATORY ARE AVAILABLE IN OUR FIRM
6.1	General	
6.2	Tests on interfaces and connections of end fittings	
6.2.1	Test specimens	
6.2.2	Pre-stressing	
6.2.2.1	Thermal-mechanical pre-stressing	
6.2.2.2	Water immersion test	
6.2.3	Verification tests	
6.2.3.1	Visual examination	
6.2.3.2	Steep-front impulse voltage test	
6.2.3.3	Dry power frequency voltage test	
6.3	Assembled core load-time tests	
6.3.1	Test for verif. the Maximum Design Cantilever Load MDCL	
6.3.2	Tensile load test	
6.4	Test of sheds and housing material	
6.4.1	Hardness test	
6.4.2	Accelerated weathering test	
6.4.3	Tracking and erosion test	
6.4.3.1 a	Test specimens “ duration of 1000 hours ”	
6.4.3.1 b	Test specimens “ duration of 5000 hours annex C ”	
6.4.4	Flammability test acc. to IEC 60707	
6.5	Test for the core material	
6.5.1	Dye penetration test	
6.5.1.1	Test procedure	
6.5.1.2	Acceptance criteria	
6.5.2	Water diffusion test	
6.5.2.1	Test specimens	
6.5.2.2	Pre-stressing	
6.5.2.3	Voltage test	
7	Tvne tests	
7.1	Verification of dimensions	
7.2	Electrical tests	
7.2.1	Mounting arrangements	
7.2.2	Dry lighting impulse withstand voltage test	
7.2.3	Wet power - frequency test	
7.2.4	Wet switching impulse withstand voltage test only >300 kV	
7.3	Mechanical test	
7.3.1	Cantilever failing load test	
8	Sample test	

TESTS PERFORMED ACCORDING TO OTHER STANDARDS

On some composite insulators “**SILISOL**“ of the **isoelectric** some tests were performed according to other standards as follows:

- ◆ Standard **ASTM C 542** Test for flammability
- ◆ Standard **ASTM E 662** Test to determine the optical density of the smokes
- ◆ Standard **ASTM G 26** Ageing tests using ultraviolet rays UV
- ◆ Standard **CEI 20-37** Smoke toxicity and corrosion test
- ◆ Standard **DIN 57441** Accelerated ageing test in saline fog
- ◆ Standard **IEEE Std 1024** Accelerated ageing test in saline fog
- ◆ Standard **AS 4435.4**
Definition, test methods and acceptance criteria for post insulators units
- ◆ Standard **HN 66 S02** Power arc test
- ◆ Standard **IE.TE. 127** Test for railways post insulators (power arc test)
- ◆ Standard **IEC 507** Test for artificial pollution performance in H.V. insulators **80 kg/m³** of salt fog (**heavy pollution** as for IEC 815)
- ◆ Standard **IEC 507** Test for artificial pollution performance in H.V. insulators **224 kg/m³** of salt fog (**very heavy pollution** as for IEC 815)
- ◆ Standard **IEC K-2630/1** Test for power wash in H.V. composite insulators

In the enclosure **3 & 4** there are some extracts of the complete tests.

Tests performed according to standards or specifications in force in European and world-wide Countries are not listed above because they have only a specific interest.

isoelectric, however, has performed tests and got homologations all over the world.

LIST OF TESTS THAT CAN BE PERFORMED AT OUR LABORATORY

- Dry power frequency test up to 200 kV
- Wet power frequency test up to 200 kV
- Air or oil discharge test up to 200 kV
- Atmospheric lighting impulse test 1,2/50 μ s up to 400 kV
- Atmospheric lighting impulse discharge test 1,2/50 μ s in oil and air up to 400 kV
- Partial discharges test
- Measure of the insulation resistance up to 2000 M Ω , 1000 V
- Accelerated ageing test in saline fog
- Water penetration test
- Test to verify the galvanisation thickness
- Traction test up to 350 kN
- Flexion test up to 160 kN
- Compression test up to 160 kN
- Torsion test up to 60 kN
- Hibernation test up to - 55° C
- Heat test up to + 250° C
- Dimensional verifications test

SOME NOT STANDARDIZED TESTS

• SHOOTING RESISTANCE TEST

Opposite to the fragile porcelain or glass, the composite insulators “**SILISOL**” of **isoelectric** have a high resistance to mechanical shocks.

This property gives a substantially better performance in case of a severe mechanical impact, such as a gunshot.

To study this behaviour the shooting resistance test was performed on MV and HV insulators using the following firearms:

- Revolver cal. 9 mm , distance 10/100 m
- Rifle cal. 7,5 mm , distance 10/100 m
- Rifle cal. 12/70 with a small bullet (3,5 g) , distance 10 m

Tests performed with a small bullet demonstrated that the bullets that struck in the outer casing did not damage the fibreglass rod. Also the revolver shots at a distance of 10 m did not damaged the fibreglass rod, while the bullets that struck the insulators at an angle of 90° damaged the rod without impairing the good working of the insulators.

Porcelain or glass insulators - taken by comparison - exploded completely as soon as they are struck.

• HIBERNATION TEST IN NATURAL ENVIRONMENT AT -25° C

As you can note on the enclosures different kind of composed insulators were mounted on the same support.

The white colour insulator at - 25°C suffered the following drawback: the lower and the upper end fittings were short-circuited as a result of the ice. This drawback is caused by the roughness and scarce hydrophobicity of the insulating surface; consequently it keeps the water that at a low temperature forms stalactites of ice.

This phenomenon doesn't happen with composite insulators “**SILISOL**” of **isoelectric**, because the surface has scarce hydrophobicity (like drops of mercury on the table forming small balls) and having sloping sheds the water slips away very easily. As you can see in the picture the ends of the sheds are covered only with light frost.

Then the white insulators were submitted to the power frequency test and partial discharge test giving a negative result.

Composite insulators “**SILISOL**” in **SILICONE** of the **isoelectric**, because of the hydrophobicity and elasticity of the coating give positive result without suffering drawbacks.

CONCLUSIONS

Composite insulators “**SILISOL**” in **SILICONE “SILIC 1.75”** of the **isoelectric** have been installing for a long time, namely since **June 1985**, in many Countries both on MV and HV lines.

The insulators installed are divided as follows:

- Horizontal and vertical line post insulators MV and HV
- Rod insulators for switch gear MV
- Suspension, tension, long rod, dead end insulators MV and HV
- Suspension insulators with horns gap MV
- Pin insulators MV
- Phase spacer insulators
- Insulators for traction railways lines
- Insulators for underground

Special applications (deflectors, insulated connections, additional sheds to lengthen the leakage line of porcelain or glass insulators, etc.) and not least the realisation of composite insulators for transformers in Sf6 gas up to 400 kV.

By the latest laboratory tests and by working the excellent features of the **SILICONE “SILIC 1.75”** of **isoelectric** have been demonstrated as a casing material for composite insulators that can be used on distribution line MV and HV and on traction lines especially in high pollution conditions.

All this constitutes an important stage towards the reduction in the use of traditional insulators in favour of an ever growing use of composite insulators in **SILICONE “SILIC 1.75”** of the **ISOELECTRIC**.

Particular attention should be given when “**COMPACT LINES**” are planning where the compactness of the composite insulator and its lightness constitute a great advantage both for dimensional terms of the whole structure and during the installation phase.

Some drawings will be shown on isoelectric composite insulators that are parts of the standard production.

However we are able to offer our customer all the solutions he asks us with any features from 1 kV to 500 kV.

We shall be pleased if you contact us for any requests you need at our web site or e-mail address :

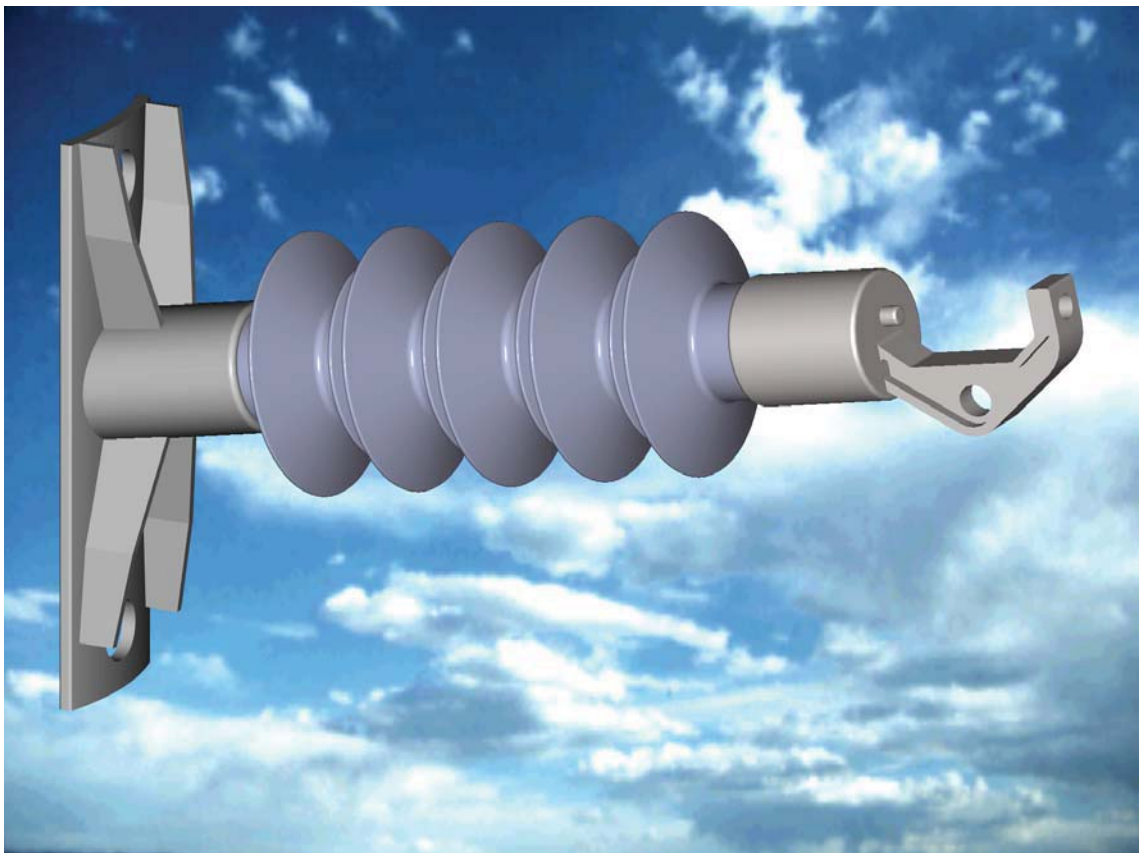
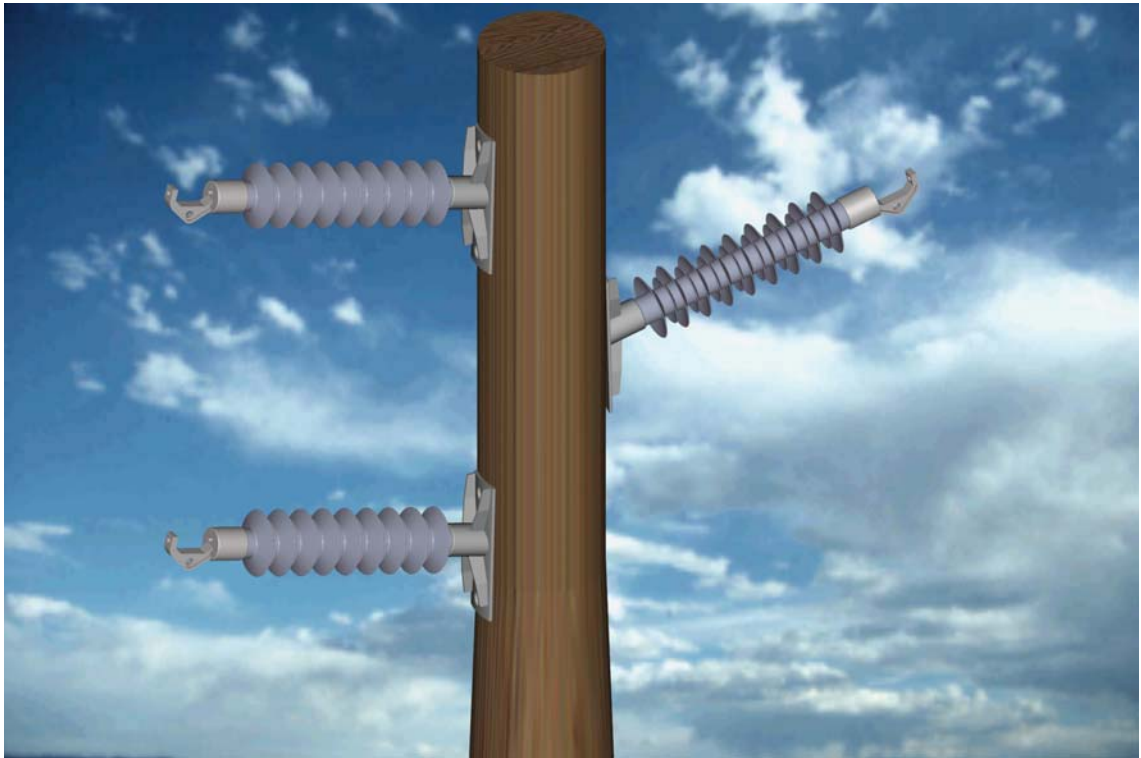
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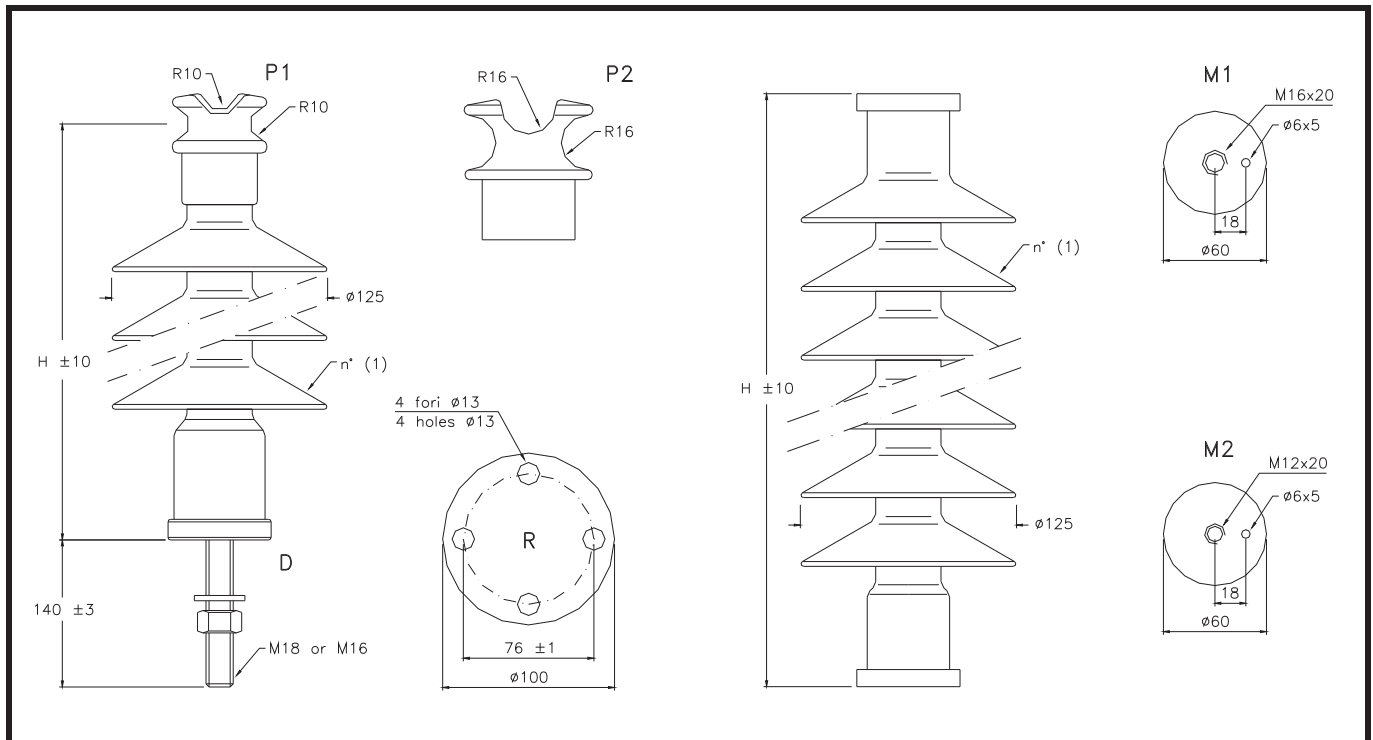
SAME PICTURES OF THE OUR HORIZONTAL POST COMPOSITE INSULATORS

Type ISI-BIG



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COMPOSITE PIN or VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-SAS-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 10 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	Σ							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-SAS-*	16,7	2	200	310	135	60	50	90	160	1,0
						ISI-SAS-*	12,9	3	240	445	175	70	60	120	200	1,5
						ISI-SAS-*	10,8	4	280	580	215	80	70	145	240	2,0
						ISI-SAS-*	9,0	5	320	715	255	90	80	160	270	2,5
						ISI-SAS-*	7,7	6	360	850	295	110	100	165	280	3,0
						ISI-SAS-*	6,6	7	400	985	335	120	110	180	310	3,5
						ISI-SAS-*	5,9	8	440	1120	375	135	120	200	340	4,0
						ISI-SAS-*	5,3	9	480	1255	415	150	130	220	370	4,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table:

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting P1	Fitting D	P1D	0
Fitting P1	Fitting R	P1R	-10
Fitting M2	Fitting M1	M2M1	-15
Fitting P1	Fitting M1	P1M1	-5
Fitting M1	Fitting R	M1R	-5
Fitting P2	Fitting D	P2D	+10
Fitting P2	Fitting R	P2R	0
Fitting P2	Fitting M1	P2M1	+5
Fitting R	Fitting R	RR	-10

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 10 daN*m

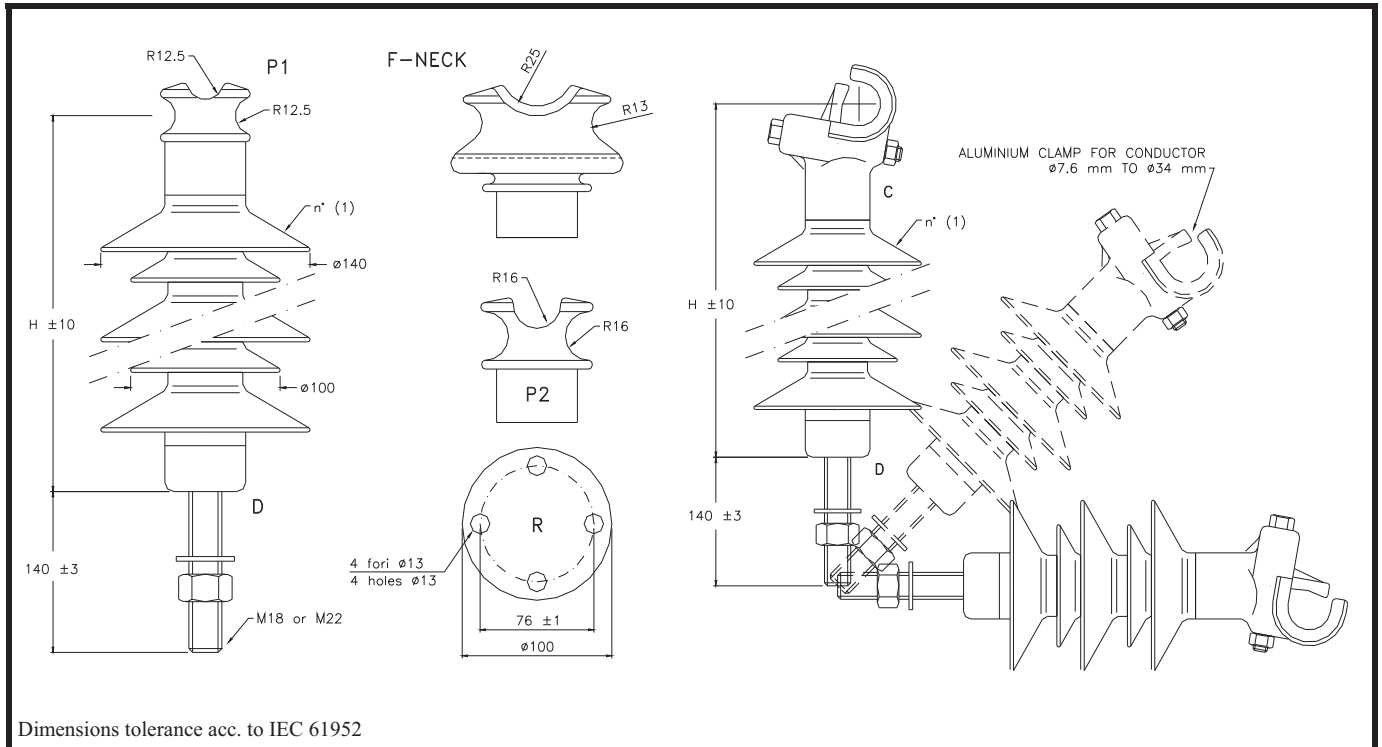
The metal fittings can be in aluminium or galvanized steel.

(◆) Key to the catalogue numbers
 Key : ISI-SAS-A(1) - (2)
 Example: ISI-SAS-A3-P1D (specify the screw size)

These insulators are produced and tested according to IEC 61952. It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE PIN INSULATOR in SILICONE RUBBER type ISI-RG-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)				Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 10 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	24	36	45							Dry kV	Wet kV	posit. kV	negat. kV	
				ISI-RG-*	16,2	2+1	185	335	110	70	65	115	160	2,0
				ISI-RG-*	12,5	3+2	245	540	170	110	100	150	190	2,5
				ISI-RG-*	9,8	4+3	305	750	230	120	110	180	215	3,0
				ISI-RG-*	8,2	5+4	365	960	290	150	140	235	270	3,5
				ISI-RG-*	7,4	6+5	425	1170	330	160	150	260	300	3,9
				ISI-RG-*	6,6	7+6	485	1380	390	180	165	285	325	4,4
				ISI-RG-*	6,0	8+7	545	1590	450	200	185	305	355	5,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting P1	Fitting D	P1D	0
Fitting P2	Fitting D	P2D	+5
Fitting P1	Fitting R	P1R	0
Fitting P2	Fitting R	P2R	+20
Fitting F-neck	Fitting D	F-neckD	+25
Fitting F-neck	Fitting R	F-neckR	+45
Fitting C	Fitting D	CD	+45
Fitting C	Fitting R	CR	+100

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.

The metal fittings can be in aluminium or galvanized steel.

(◆) Key to the catalogue numbers

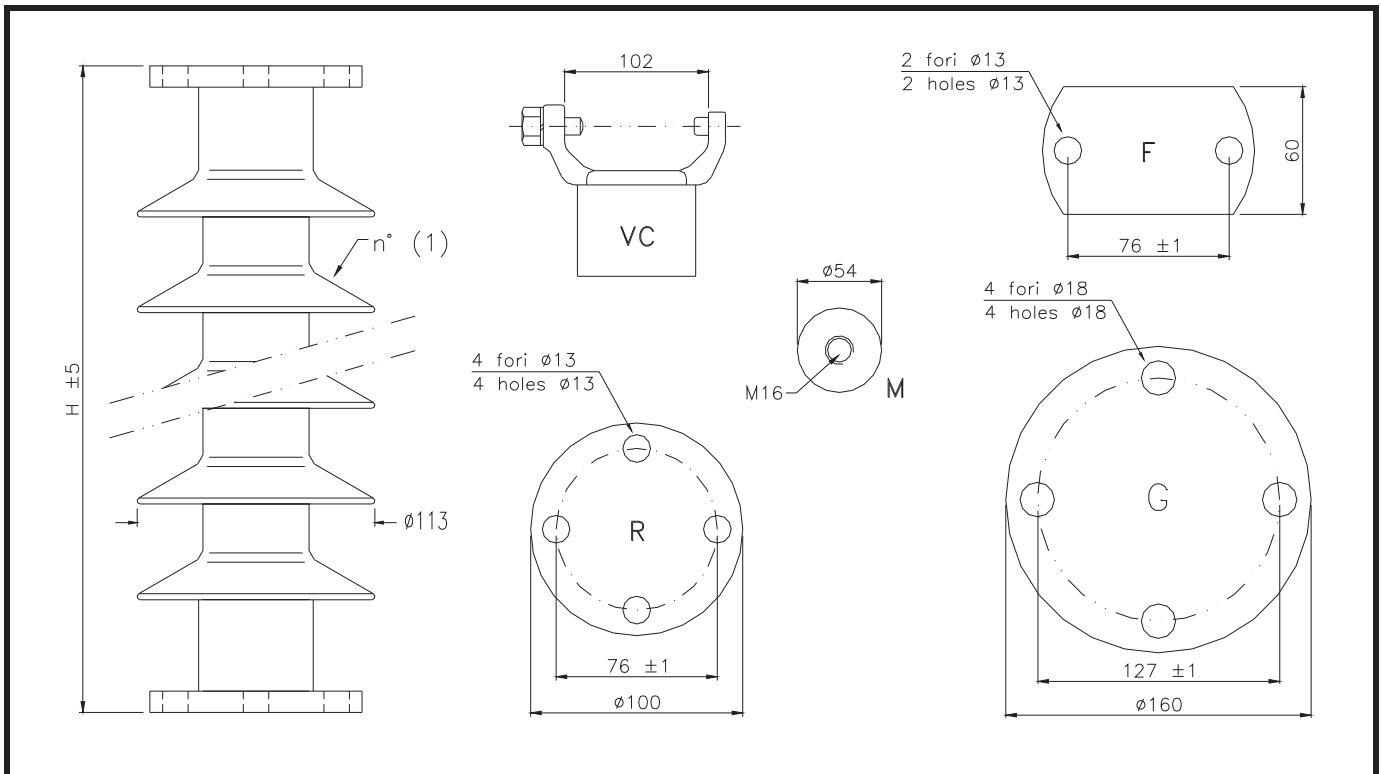
Key : ISI-RG-A(1) - (2)

Example: ISI-RG-A4+3-P1D (specify the screw size)

These insulators are produced, tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-Fn-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	Σ							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-Fn-*	17,6	2	170	265	150	65	60	100	180	2,0
						ISI-Fn-*	14,0	3	215	370	195	75	65	130	220	2,5
						ISI-Fn-*	11,5	4	260	475	240	85	75	150	250	3,0
						ISI-Fn-*	9,8	5	305	580	295	110	100	165	280	3,5
						ISI-Fn-*	8,5	6	350	685	330	120	110	180	310	4,0
						ISI-Fn-*	7,5	7	395	790	375	135	120	200	340	4,5
						ISI-Fn-*	6,8	8	440	895	420	150	130	220	370	5,0
						ISI-Fn-*	6,1	9	485	1000	465	160	140	245	395	5,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting R	Fitting R	RR	0
Fitting F	Fitting R	FR	0
Fitting G	Fitting G	GG	+160
Fitting M	Fitting R	MR	0
Fitting M	Fitting G	MG	+80
Fitting M	Fitting M	MM	0
Fitting VC	Fitting R	VCR	+95
Fitting VC	Fitting G	VCG	+175
Fitting VC	Fitting M	VCM	+95

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.

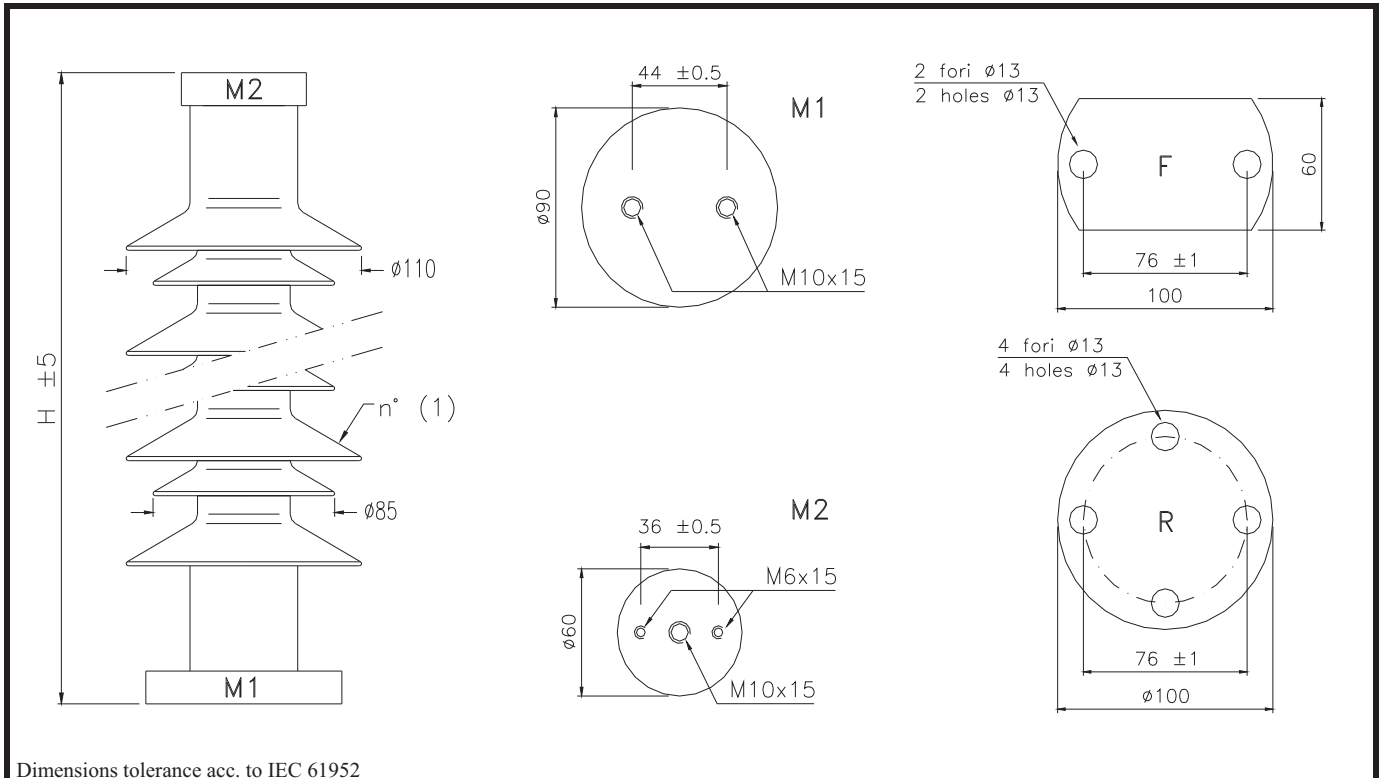
The metal fittings can be in aluminium or galvanized steel.

(◆) Key to the catalogue numbers
 Key : ISI-Fn-A(1) - (2)
 Example: ISI-Fn-A4-RR

These insulators are produced and tested according to IEC 61952. It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-SCA-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	52							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-SCA-*	16,2	2+1	190	315	160	65	60	100	150	2,0
						ISI-SCA-*	12,2	3+2	240	465	210	95	85	130	170	2,5
						ISI-SCA-*	10,0	4+3	285	610	255	110	95	155	190	3,0
						ISI-SCA-*	9,0	5+4	335	760	305	120	110	180	215	3,5
						ISI-SCA-*	7,8	6+5	385	910	355	150	140	235	270	4,0
						ISI-SCA-*	7,1	7+6	430	1055	400	170	155	270	300	4,5
						ISI-SCA-*	6,2	8+7	480	1205	450	180	165	285	325	5,0
						ISI-SCA-*	5,7	9+8	525	1350	495	190	175	300	345	5,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting M2	Fitting M1	M2M1	0
Fitting F	Fitting R	FR	+15
Fitting R	Fitting R	RR	+15
Fitting M2	Fitting R	M2R	+8
Fitting M2	Fitting F	M2F	+8

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.

The metal fittings can be in aluminium or galvanized steel.

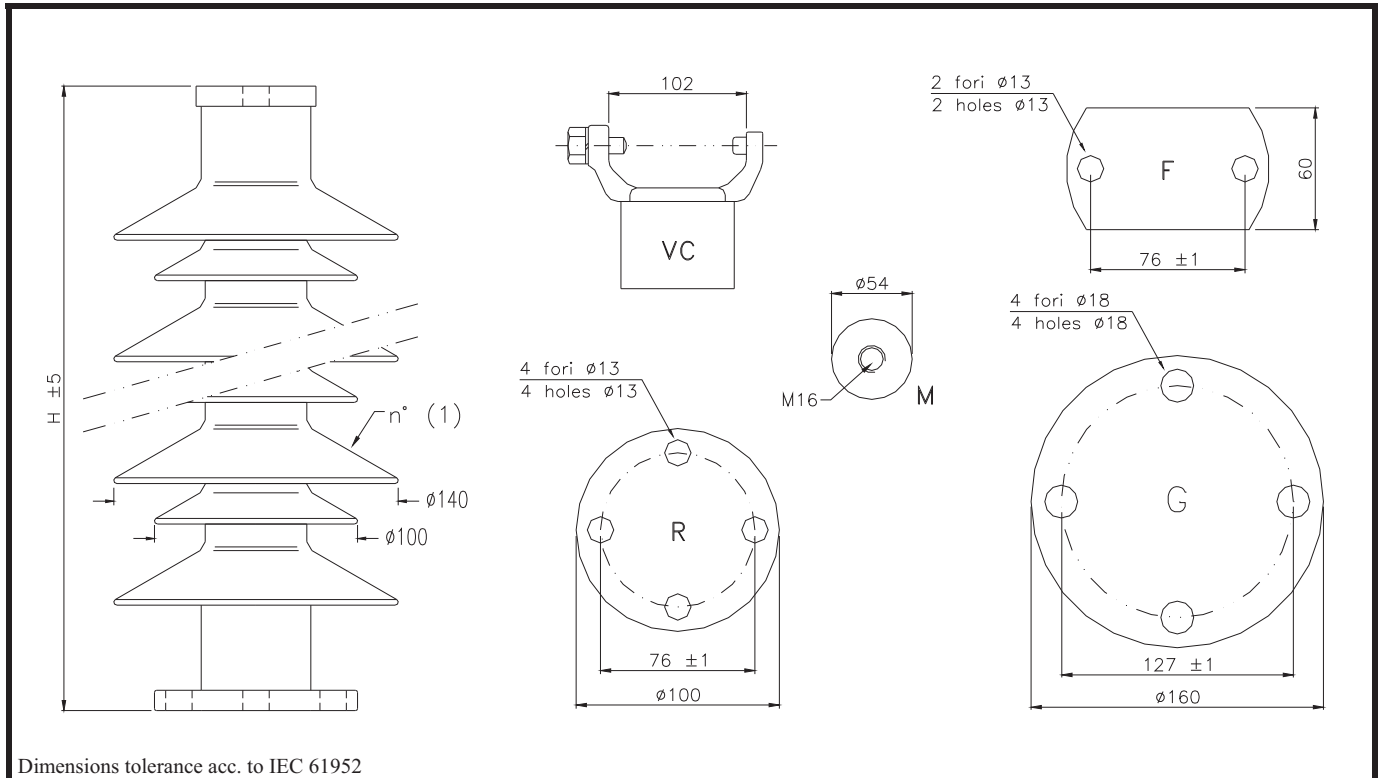
(◆) Key to the catalogue numbers
 Key : ISI-SCA-A(1) - (2)
 Example: ISI-SCA-A4+3-M2M1

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-FC-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	52							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-FC-*	16,2	2+1	185	390	165	70	65	115	160	2,0
						ISI-FC-*	12,2	3+2	245	585	225	110	100	150	190	2,5
						ISI-FC-*	9,8	4+3	305	780	285	120	110	180	215	3,0
						ISI-FC-*	8,2	5+4	365	975	345	150	140	235	270	3,5
						ISI-FC-*	7,1	6+5	425	1170	405	170	155	270	300	4,0
						ISI-FC-*	6,2	7+6	485	1365	465	180	165	285	325	4,5
						ISI-FC-*	5,5	8+7	545	1560	525	200	185	305	355	5,0
						ISI-FC-*	5,0	9+8	605	1755	585	225	210	345	405	5,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting R	Fitting R	RR	0
Fitting F	Fitting R	FR	0
Fitting G	Fitting G	GG	+160
Fitting M	Fitting R	MR	0
Fitting M	Fitting G	MG	+80
Fitting M	Fitting M	MM	0
Fitting VC	Fitting R	VCR	+95
Fitting VC	Fitting G	VCG	+175
Fitting VC	Fitting M	VCM	+95

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.
 The metal fittings can be in aluminium or galvanized steel.

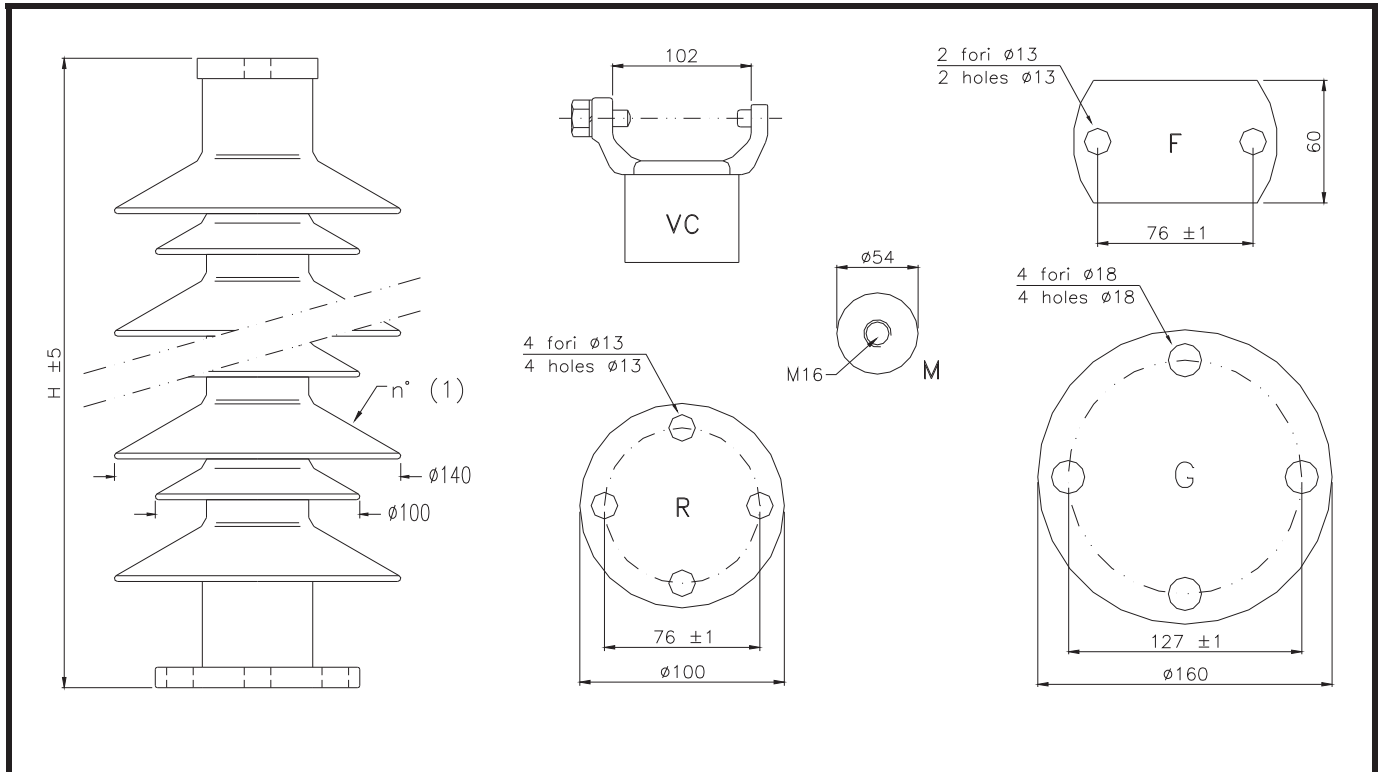
(◆) Key to the catalogue numbers
 Key : ISI-FC-A(1) - (2)
 Example : ISI-FC-A4+3-FR

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-FC-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)			Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
72	115	150							Dry kV	Wet kV	posit. kV	negat. kV	
			ISI-FC-*	4,5	10+9	665	1950	645	270	225	450	490	6,0
			ISI-FC-*	3,8	12+11	785	2340	765	310	245	515	550	7,0
			ISI-FC-*	3,3	14+13	905	2730	885	355	285	570	615	8,0
			ISI-FC-*	2,9	16+15	1025	3120	1005	400	320	625	670	9,0
			ISI-FC-*	2,6	18+17	1145	3510	1125	435	355	680	735	10,0
			ISI-FC-*	2,4	20+19	1265	3900	1245	475	390	750	805	11,0
			ISI-FC-*	2,2	22+21	1385	4290	1365	520	430	820	890	12,0
			ISI-FC-*	2,0	24+23	1505	4680	1485	560	475	870	940	13,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting R	Fitting R	RR	0
Fitting F	Fitting R	FR	0
Fitting G	Fitting G	GG	+160
Fitting M	Fitting R	MR	0
Fitting M	Fitting G	MG	+80
Fitting M	Fitting M	MM	0
Fitting VC	Fitting R	VCR	+95
Fitting VC	Fitting G	VCG	+175
Fitting VC	Fitting M	VCM	+95

Specified Cantilever Load **SCL - IEC 61952**
Max. Design Cantilever Load **MDCL = 65% of SCL**

Specified Tensile Load (STL) 15 kN
Max design compression 15 kN
Max design torsion 15 daN*m

The SCL can be increased, please contact us.

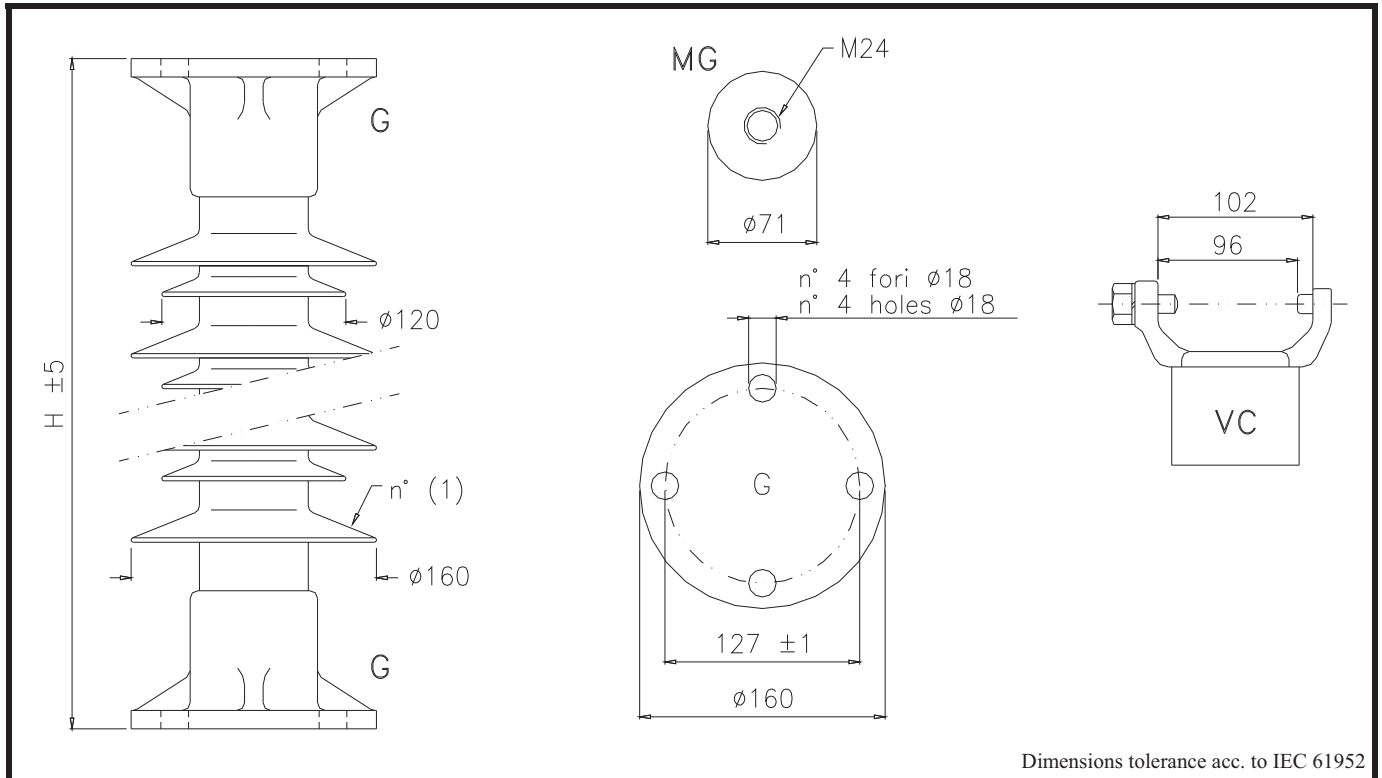
(◆) Key to the catalogue numbers
Key : ISI-FC-A(1) - (2)
Example : ISI-FC-A16+15-FR

These insulators are produced and tested according to IEC 61952. It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-BIG-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	52							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-BIG-*	40,0	2+1	315	340	135	65	60	100	145	6,5
						ISI-BIG-*	33,0	3+2	375	530	195	80	75	135	180	7,0
						ISI-BIG-*	28,0	4+3	435	710	255	100	90	160	210	7,5
						ISI-BIG-*	24,2	5+4	495	900	315	125	110	190	240	8,0
						ISI-BIG-*	21,5	6+5	555	1100	375	145	130	220	275	8,5
						ISI-BIG-*	19,2	7+6	615	1280	435	170	155	255	310	9,0
						ISI-BIG-*	17,3	8+7	675	1470	495	190	175	290	340	9,5
						ISI-BIG-*	15,8	9+8	735	1660	555	215	200	320	380	10,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting G	Fitting G	GG	0
Fitting MG	Fitting G	MGG	+20
Fitting VC	Fitting G	VCG	+10
Fitting G	Fitting MG	GMG	+20
Fitting VC	Fitting MG	VCMG	+75

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 40 kN
 Max design compression 40 kN
 Max design torsion 20 daN*m

(◆) Key to the catalogue numbers

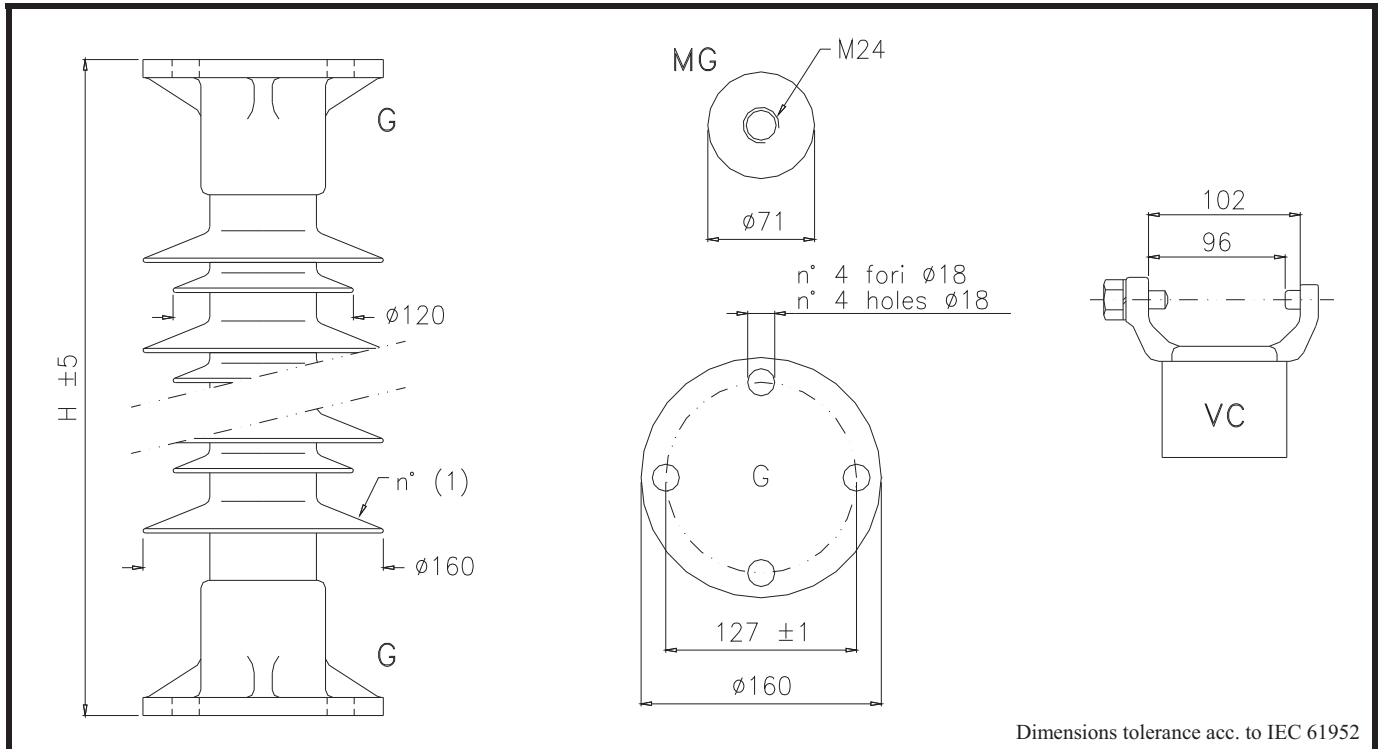
Key : ISI-BIG-A(1) - (2)

Example : ISI-BIG-A7+6-GG

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-BIG-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)				Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
72	115	150	230							Dry kV	Wet kV	posit. kV	negat. kV	
				ISI-BIG-*	14,6	10+9	795	1800	615	275	195	420	480	11
				ISI-BIG-*	12,6	12+11	915	2200	735	310	230	460	540	12
				ISI-BIG-*	11,1	14+13	1035	2600	855	340	265	500	595	13
				ISI-BIG-*	9,9	16+15	1155	2900	975	380	300	560	650	14
				ISI-BIG-*	8,9	18+17	1275	3300	1095	415	335	615	705	15
				ISI-BIG-*	8,2	20+19	1395	3700	1215	450	370	670	760	16
				ISI-BIG-*	7,5	22+21	1515	4100	1335	485	405	725	815	17
				ISI-BIG-*	6,9	24+23	1635	4450	1455	520	435	830	880	18
				ISI-BIG-*	6,0	28+27	1875	5200	1695	615	515	940	1040	22
				ISI-BIG-*	5,3	32+31	2115	5950	1935	675	575	1100	1200	24
				ISI-BIG-*	4,7	36+35	2360	6700	2175	760	640	1230	1340	26

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting G	Fitting G	GG	0
Fitting MG	Fitting G	MGG	+20
Fitting VC	Fitting G	VCG	+10
Fitting G	Fitting MG	GMG	+20
Fitting VC	Fitting MG	VCMG	+75

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 40 kN
 Max design compression 40 kN
 Max design torsion 20 daN*m

(◆) Key to the catalogue numbers

Key : ISI-BIG-A(1) - (2)

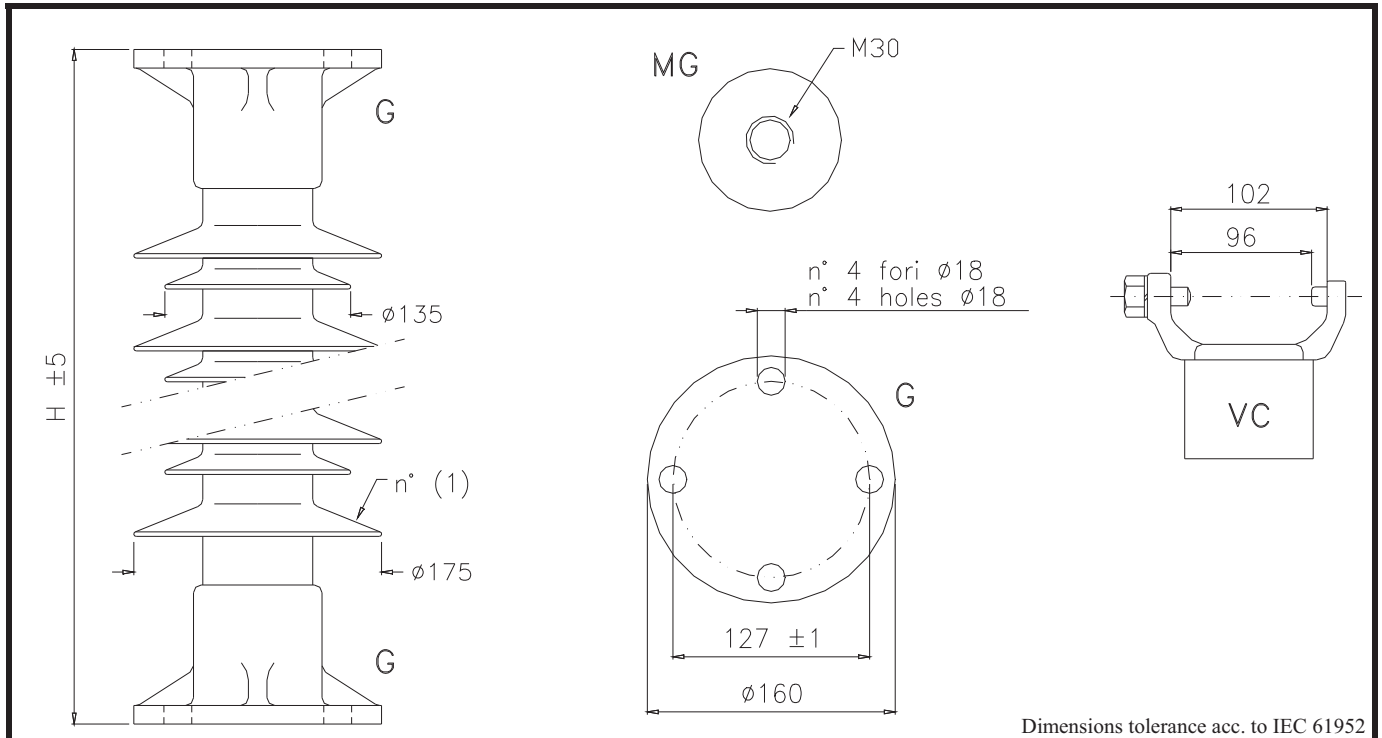
Example : ISI-BIG-A14+13-GG

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-MAX-*



Selection Guide (Line Voltage, kV)				Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
115	150	220	345							Dry kV	Wet kV	posit. kV	negat. kV	
				ISI-MAX-*	15,0	14+13	1035	2600	855	340	265	500	595	15,5
				ISI-MAX-*	13,5	16+15	1155	2900	975	380	300	560	650	17,5
				ISI-MAX-*	11,2	18+17	1275	3300	1095	415	335	615	705	18,5
				ISI-MAX-*	11,1	20+19	1395	3700	1215	450	370	670	760	20,0
				ISI-MAX-*	10,2	22+21	1515	4100	1335	485	405	725	815	21,0
				ISI-MAX-*	9,4	24+23	1635	4450	1455	520	435	830	880	22,5
				ISI-MAX-*	8,1	28+27	1875	5200	1695	615	515	940	1040	26,5
				ISI-MAX-*	7,7	32+31	2115	5950	1935	675	575	1100	1200	29,5
				ISI-MAX-*	7,2	38+37	2475	7100	2295	810	675	1330	1430	34,5
				ISI-MAX-*	6,4	43+42	2775	8090	2595	855	750	1460	1565	40,0
				ISI-MAX-*	5,7	46+45	2955	8600	2775	905	780	1585	1715	45,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Height change (H)
Fitting G	Fitting G	GG	0
Fitting MG	Fitting G	MGG	+65
Fitting MG	Fitting MG	MGMG	+130
Fitting VC	Fitting G	VCG	+65
Fitting VC	Fitting MG	VCMG	+80

Specified Cantilever Load SCL - IEC 61952
 Max. Design Cantilever Load MDCL = 65% of SCL
 Specified Tensile Load (STL) 50 kN
 Max design compression 50 kN
 Max design torsion 25 daN*m

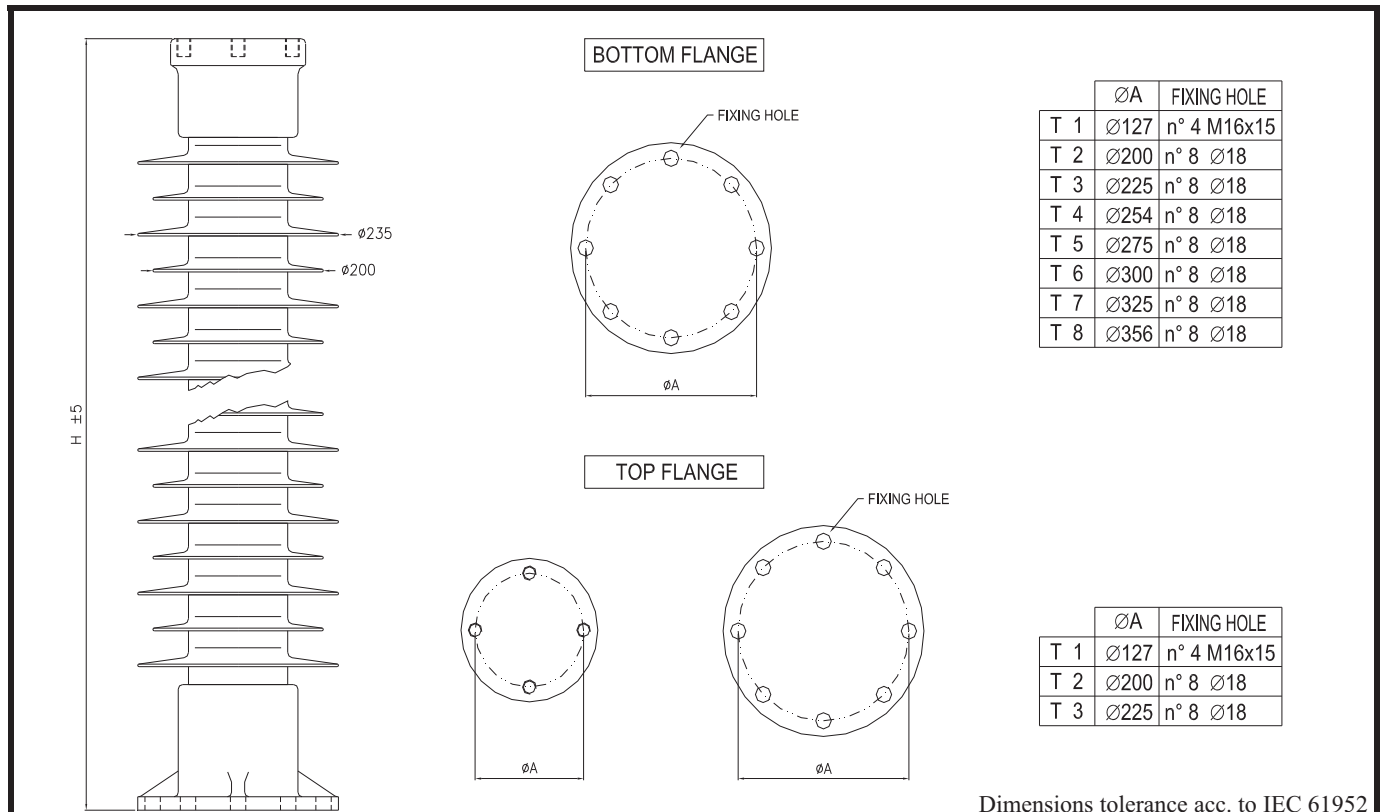
(◆) Key to the catalogue numbers
 Key : ISI-MAX-A(1) - (2)
 Example : ISI-MAX-A14+13-GG

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE VERTICAL LINE POST INSULATOR in SILICONE RUBBER type ISI-BUL-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)				Catalogue Code (♦)	Specified Cantilever Load (SCL) kN	n° of Sheds A n° (1)	Height H ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50 Hz		Lightning impulse withstand 1,2/50 kV	Similar to * IEC 60660	Weight ~ kg
										Dry kV	Wet kV			
1101	2002	3003	420	ISI-BUL-*	27,7	13+12	1260	3200	1010	380	300	570	≤ C20-550	48
70	50	62	765	ISI-BUL-*	23,3	16+15	1500	3950	1250	450	370	670	≤ C20-650	58
				ISI-BUL-*	21,2	18+17	1660	4500	1410	485	405	760	≤ C16-750	65
				ISI-BUL-*	19,4	20+19	1820	5000	1570	520	435	860	≤ C16-850	72
				ISI-BUL-*	16,3	24+23	2140	6000	1890	615	515	950	≤ C12-850	87
				ISI-BUL-*	15,2	26+25	2300	6500	2050	675	575	1120	≤ C12-1050	94
				ISI-BUL-*	13,3	30+29	2620	7550	2370	810	675	1280	≤ C10-1175	108
				ISI-BUL-*	12,2	33+32	2860	8300	2610	855	750	1410	≤ C10-1300	120
				ISI-BUL-*	11,2	36+35	3100	9050	2850	905	780	1500	≤ C10-1425	130
				ISI-BUL-*	10,5	39+38	3340	9800	3090	900	750	1610	≤ C8-1550	141
				ISI-BUL-*	9,0	47+46	3980	11840	3730	1140	1020	1930	≤ C8-1800	170
				ISI-BUL-*	7,5	56+55	4700	14100	4450	1280	1100	2210	≤ C6-2100	203

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total height of the insulator (H), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting (Top)	Ground fitting (Bottom)	Code (2)	Height change (H)
Fitting T1	Fitting T2	T1T2	0
Fitting T1	Fitting T1	T1T1	-30
Fitting T1	Fitting T3	T1T3	+30
Fitting T1	Fitting T4	T1T4	+60
Fitting T3	Fitting T3	T3T3	+90
Fitting T3	Fitting T4	T3T4	+120
Fitting T3	Fitting T5	T3T5	+120
Fitting T3	Fitting T6	T3T6	+170

Specified Cantilever Load
Max. Design Cantilever Load
Specified Tensile Load (STL)
Max design compression
Max design torsion

SCL - IEC 61952
MDCL = 65% of SCL
80 kN
100 kN
400 daN*m

(♦) Key to the catalog numbers

Key : ISI-BUL-A(1) - (2)

Example : ISI-BUL-A16-T1T2

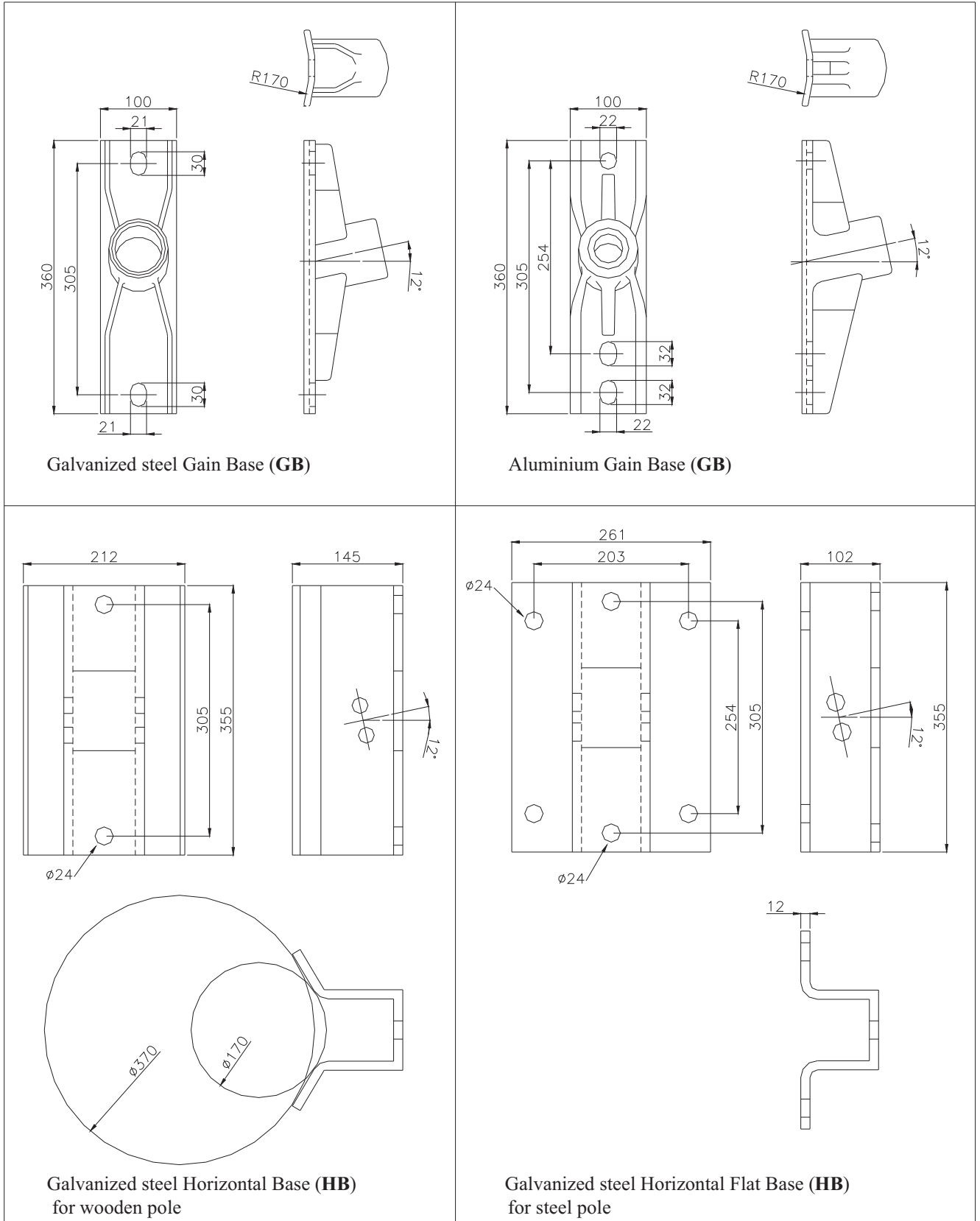
These insulators are produced and tested acc. to IEC 61952.

It's possible to have all the other combinations.

* Please consider the "flexibility" of the composite insulators

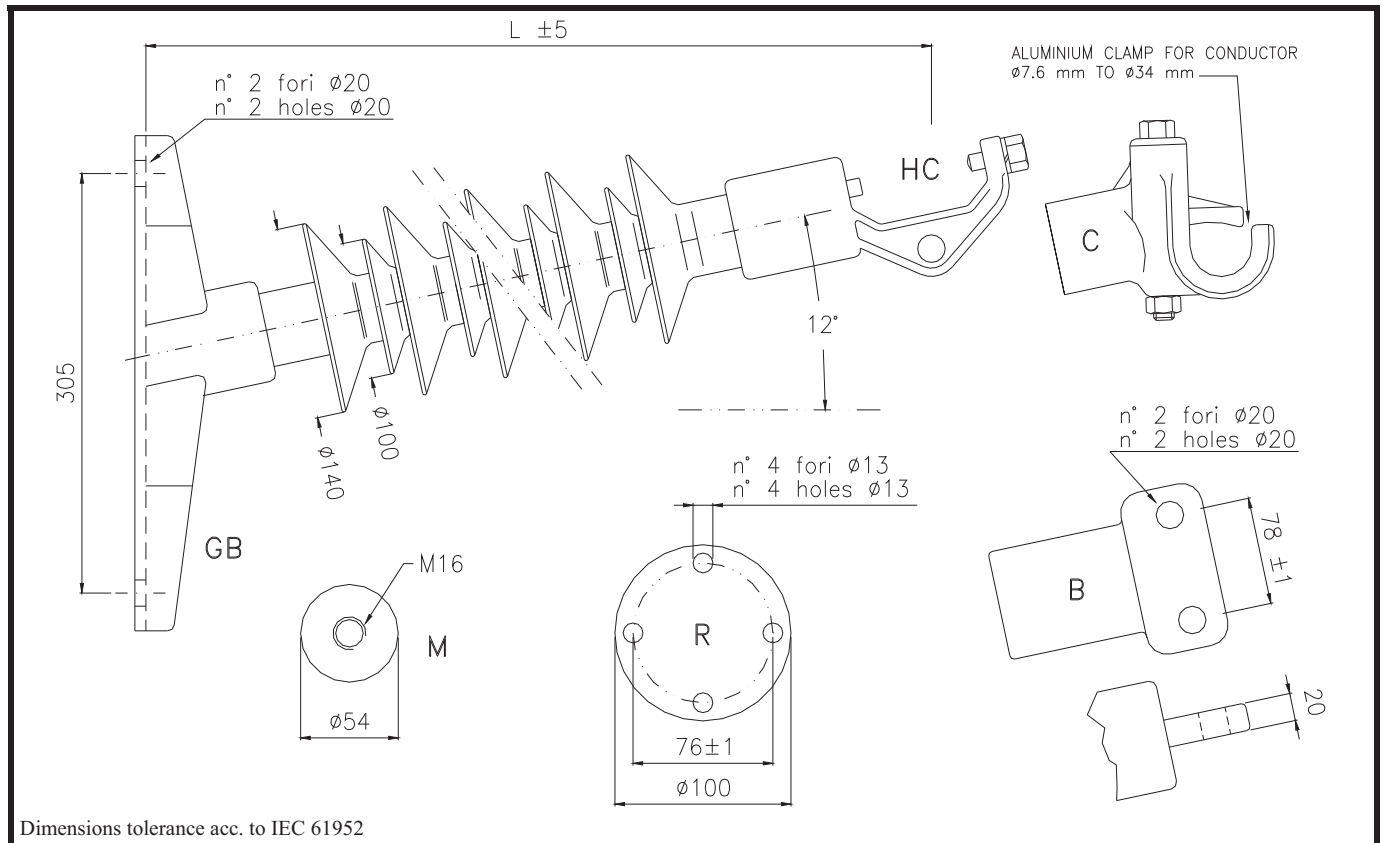
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POST INSULATORS FIXING BASE



Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE HORIZONTAL LINE POST INSULATOR in SILICONE RUBBER type ISI-FC-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Length L ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	52							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-FC-*	10,0	2+1	395	390	165	70	65	115	160	6,5
						ISI-FC-*	8,4	3+2	450	585	225	110	100	150	190	7,0
						ISI-FC-*	7,2	4+3	510	780	285	120	110	180	215	7,5
						ISI-FC-*	6,3	5+4	570	975	340	150	140	235	270	8,0
						ISI-FC-*	5,5	6+5	630	1170	400	170	155	270	300	8,5
						ISI-FC-*	5,0	7+6	690	1365	460	180	165	285	325	9,0
						ISI-FC-*	4,5	8+7	745	1560	520	200	185	305	355	9,5
						ISI-FC-*	4,2	9+8	805	1755	575	225	210	345	405	10,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total length of the insulator (L), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Length change (L)
Fitting HC	Fitting GB	HCGB	0
Fitting HC	Fitting M	HCM	-88
Fitting HC	Fitting R	HCR	-88
Fitting B	Fitting GB	BGB	+7
Fitting B	Fitting M	BM	-80
Fitting B	Fitting R	BR	-80
Fitting C	Fitting GB	CGB	-40
Fitting C	Fitting M	CM	-125
Fitting C	Fitting R	CR	-125

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.

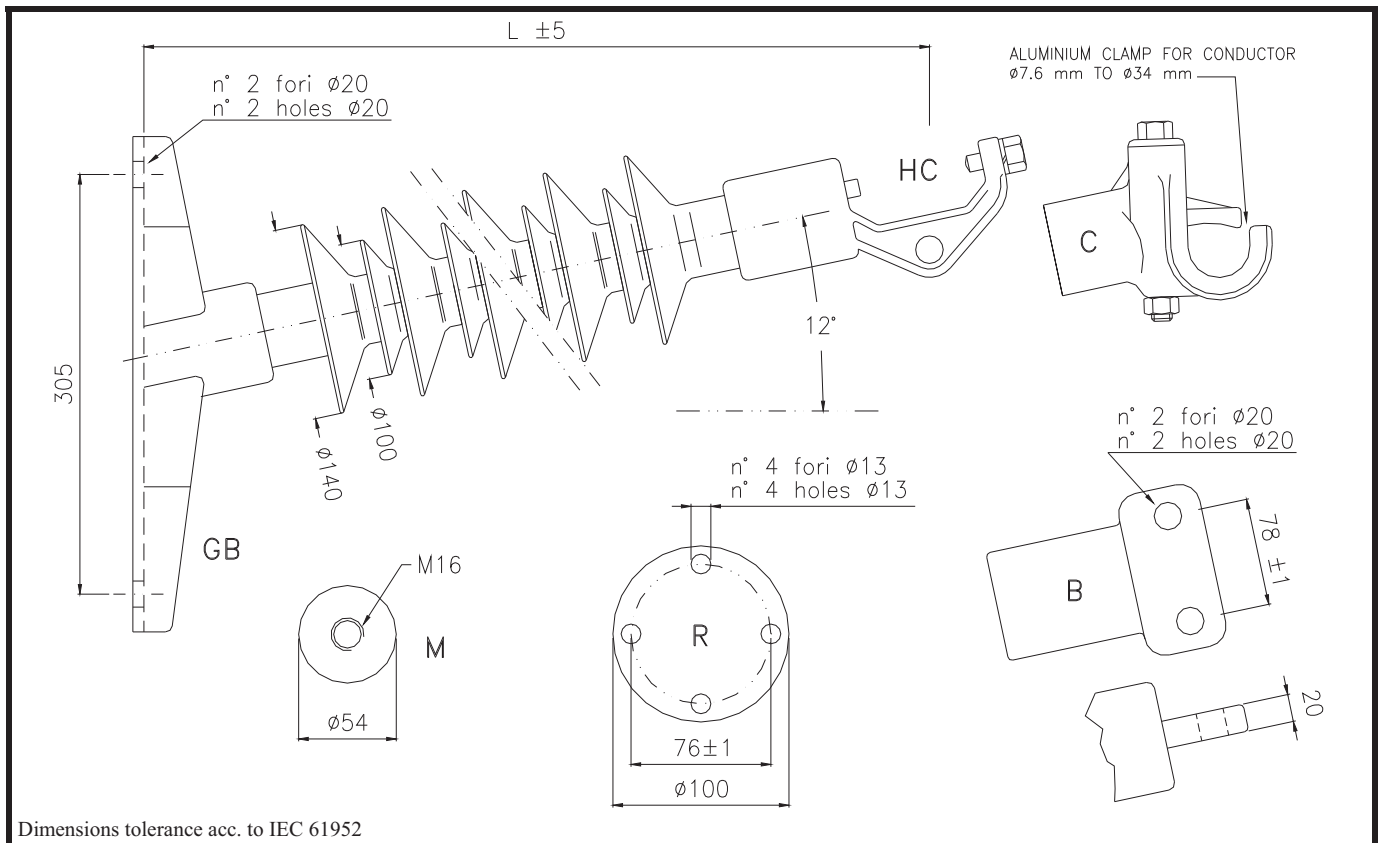
The metal fittings can be in aluminium or galvanized steel.

(◆) Key to the catalogue numbers
 Key : ISI-FC-A(1) - (2)
 Example : ISI-FC-A4+3-HCGB

These insulators are produced and tested according to IEC 61952. It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE HORIZONTAL LINE POST INSULATOR in SILICONE RUBBER type ISI-FC-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)			Catalogue Code (♦)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Length L +/- 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight +/- kg
72	115	150							Dry kV	Wet kV	posit. kV	negat. kV	
			ISI-FC-*	3,9	10+9	865	1950	635	270	225	450	490	10,5
			ISI-FC-*	3,3	12+11	985	2340	750	310	245	515	550	11,5
			ISI-FC-*	3,0	14+13	1100	2730	870	355	285	570	615	12,5
			ISI-FC-*	2,7	16+15	1220	3120	985	400	320	625	670	13,5
			ISI-FC-*	2,4	18+17	1335	3510	1105	435	355	680	735	14,5
			ISI-FC-*	2,2	20+19	1455	3900	1220	475	390	750	805	15,5
			ISI-FC-*	2,0	22+21	1575	4290	1335	520	430	820	890	16,5
			ISI-FC-*	1,8	24+23	1690	4680	1455	560	475	870	940	17,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total length of the insulator (L), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Length change (L)
Fitting HC	Fitting GB	HCGB	0
Fitting HC	Fitting M	HCM	-88
Fitting HC	Fitting R	HCR	-88
Fitting B	Fitting GB	BGB	+7
Fitting B	Fitting M	BM	-80
Fitting B	Fitting R	BR	-80
Fitting C	Fitting GB	CGB	-40
Fitting C	Fitting M	CM	-125
Fitting C	Fitting R	CR	-125

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 15 kN
 Max design compression 15 kN
 Max design torsion 15 daN*m
The SCL can be increased, please contact us.

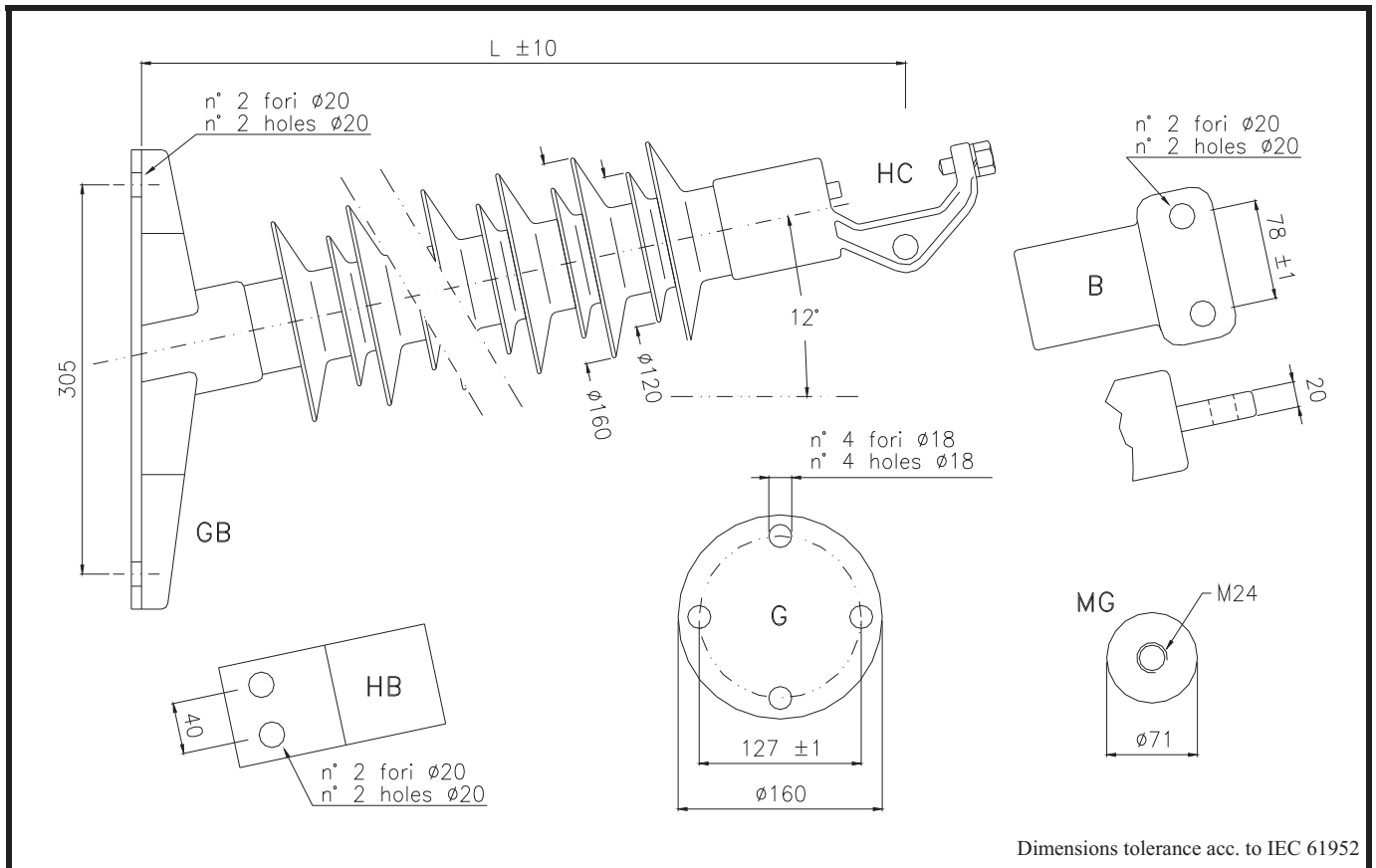
The metal fittings can be in aluminium or galvanized steel.

(♦) Key to the catalogue numbers
 Key : ISI-FC-A(1) - (2)
 Example : ISI-FC-A16+15-HCGB

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

COMPOSITE HORIZONTAL LINE POST INSULATOR in SILICONE RUBBER type ISI-BIG-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)						Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Length L ± 10 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
12	17	24	36	45	52							Dry kV	Wet kV	posit. kV	negat. kV	
						ISI-BIG-*	34,5	2+1	360	340	135	65	60	100	145	7,0
						ISI-BIG-*	29,8	3+2	410	530	195	80	75	135	180	7,5
						ISI-BIG-*	25,6	4+3	470	710	255	100	90	160	210	8,0
						ISI-BIG-*	22,5	5+4	530	900	315	125	110	190	240	8,5
						ISI-BIG-*	20,2	6+5	585	1100	375	145	130	220	275	9,0
						ISI-BIG-*	17,6	7+6	645	1280	435	170	155	255	310	10,0
						ISI-BIG-*	16,6	8+7	705	1470	495	190	175	290	340	10,5
						ISI-BIG-*	15,3	9+8	760	1660	555	215	200	320	380	11,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total length of the insulator (L), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Length change (L)
Fitting HC	Fitting GB	HCGB	0
Fitting HC	Fitting HB	HCHB	+36
Fitting HC	Fitting G	HCG	+20
Fitting B	Fitting GB	BGB	+9
Fitting B	Fitting HB	BHB	+44
Fitting B	Fitting G	BG	+29
Fitting MG	Fitting GB	MGGB	-24

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 40 kN
 Max design compression 40 kN
 Max design torsion 20 daN*m

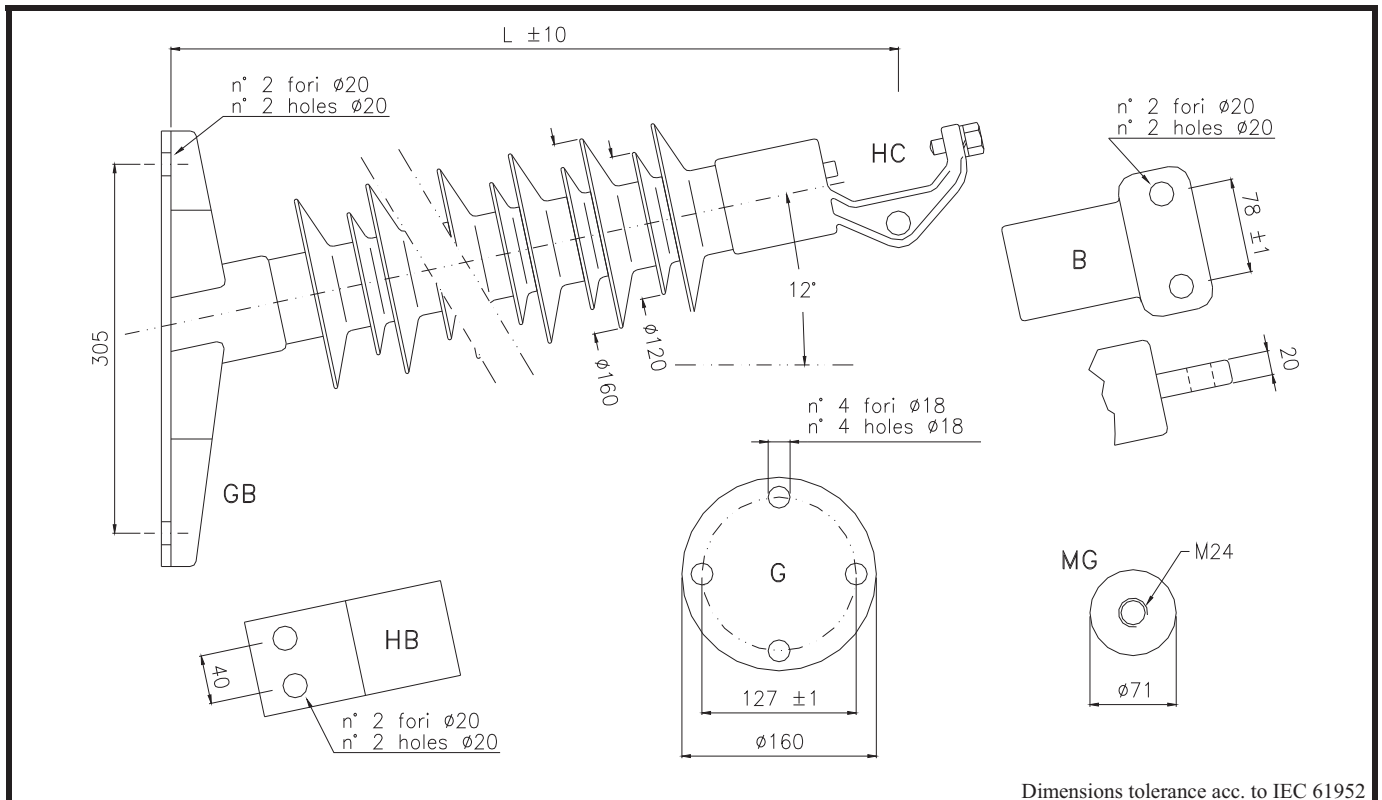
(◆) Key to the catalogue numbers
 Key : ISI-BIG-A(1) - (2)
 Example : ISI-BIG-A8+7-HCGB

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

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COMPOSITE HORIZONTAL LINE POST INSULATOR in SILICONE RUBBER type ISI-BIG-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)				Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Length L ± 10 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
72	115	150	230							Dry kV	Wet kV	posit. kV	negat. kV	
				ISI-BIG-*	14,0	10+9	820	1800	615	275	195	420	480	11,5
				ISI-BIG-*	12,0	12+11	940	2200	735	310	230	460	540	12,5
				ISI-BIG-*	10,8	14+13	1060	2600	855	340	265	500	595	13,5
				ISI-BIG-*	9,6	16+15	1175	2900	975	380	300	560	650	14,5
				ISI-BIG-*	8,8	18+17	1290	3300	1095	415	335	615	705	15,5
				ISI-BIG-*	8,0	20+19	1410	3700	1215	450	370	670	760	16,5
				ISI-BIG-*	7,4	22+21	1525	4100	1335	485	405	725	815	17,5
				ISI-BIG-*	6,8	24+23	1645	4450	1455	520	435	830	880	18,5
				ISI-BIG-*	6,0	28+27	1880	5200	1695	615	515	940	1040	22,5
				ISI-BIG-*	5,3	32+31	2115	5950	1935	675	575	1100	1200	24,5
				ISI-BIG-*	4,7	36+35	2350	6700	2175	760	640	1230	1340	26,5

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total length of the insulator (L), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Length change (L)
Fitting HC	Fitting GB	HCGB	0
Fitting HC	Fitting HB	HCHB	+36
Fitting HC	Fitting G	HCG	+20
Fitting B	Fitting GB	BGB	+9
Fitting B	Fitting HB	BHB	+44
Fitting B	Fitting G	BG	+29
Fitting MG	Fitting GB	MGBB	-24

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 40 kN
 Max design compression 40 kN
 Max design torsion 20 daN*m

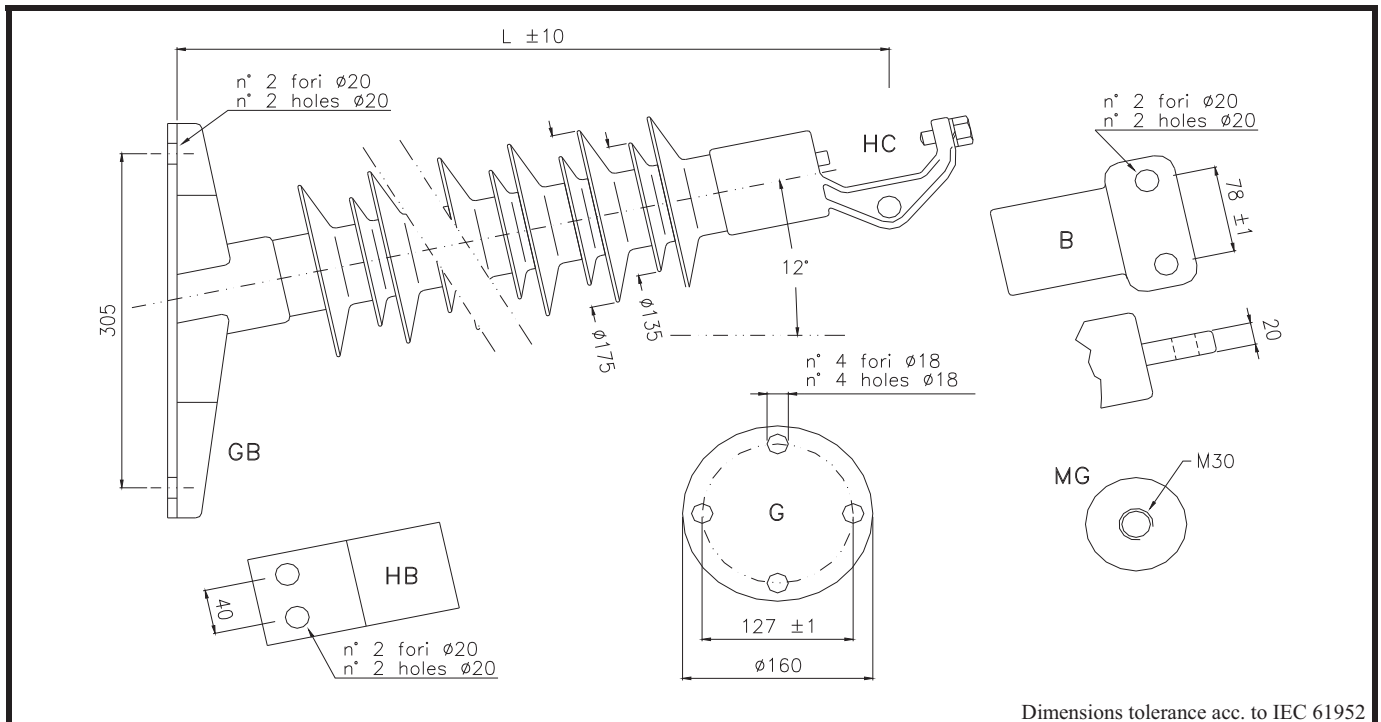
(◆) Key to the catalogue numbers
 Key : ISI-BIG-A(1) - (2)
 Example : ISI-BIG-A14+13-HCGB

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi

COMPOSITE HORIZONTAL LINE POST INSULATOR in SILICONE RUBBER type ISI-MAX-*



Dimensions tolerance acc. to IEC 61952

Selection Guide (Line Voltage, kV)				Catalogue Code (◆)	Specified Cantilever Load kN	n° of Sheds A n° (1)	Length L ± 5 mm	Leakage distance mm	Dry arc distance mm	Power frequency withstand 50-60 Hz		Lightning impul. withstand 1,2/50		Weight ~ kg
115	150	220	345							Dry kV	Wet kV	posit. kV	negat. kV	
				ISI-MAX-*	14,5	14+13	1060	2600	855	340	265	500	595	15,5
				ISI-MAX-*	13,0	16+15	1175	2900	975	380	300	560	650	17,5
				ISI-MAX-*	11,6	18+17	1290	3300	1095	415	335	615	705	18,5
				ISI-MAX-*	10,7	20+19	1410	3700	1215	450	370	670	760	20,0
				ISI-MAX-*	9,8	22+21	1525	4100	1335	485	405	725	815	21,0
				ISI-MAX-*	9,0	24+23	1645	4450	1455	520	435	830	880	22,5
				ISI-MAX-*	7,8	28+27	1880	5200	1695	615	515	940	1040	26,5
				ISI-MAX-*	7,3	32+31	2115	5950	1935	675	575	1100	1200	29,5
				ISI-MAX-*	6,9	38+37	2475	7100	2295	810	675	1330	1430	34,5
				ISI-MAX-*	6,2	43+42	2895	8090	2595	855	750	1460	1565	40,0
				ISI-MAX-*	5,5	46+45	2950	8600	2775	905	780	1585	1715	45,0

NOTE : Once chosen the insulator that is the most suitable to the characteristics of the line on which you have to install it, in order to obtain the total length of the insulator (L), please, select the kind of fitting end you have to use and make the opportune correction with reference to the following table :

Line fitting	Ground fitting	Code (2)	Length change (L)
Fitting HC	Fitting GB	HCGB	0
Fitting HC	Fitting HB	HCHB	+36
Fitting HC	Fitting G	HCG	+20
Fitting B	Fitting GB	BGB	+9
Fitting B	Fitting HB	BHB	+44
Fitting B	Fitting G	BG	+29
Fitting MG	Fitting GB	MGGB	-24
Fitting MG	Fitting HB	MGHB	+12
Fitting MG	Fitting G	MGG	-4

Specified Cantilever Load **SCL - IEC 61952**
 Max. Design Cantilever Load **MDCL = 65% of SCL**
 Specified Tensile Load (STL) 50 kN
 Max design compression 50 kN
 Max design torsion 25 daN*m

(◆) Key to the catalogue numbers

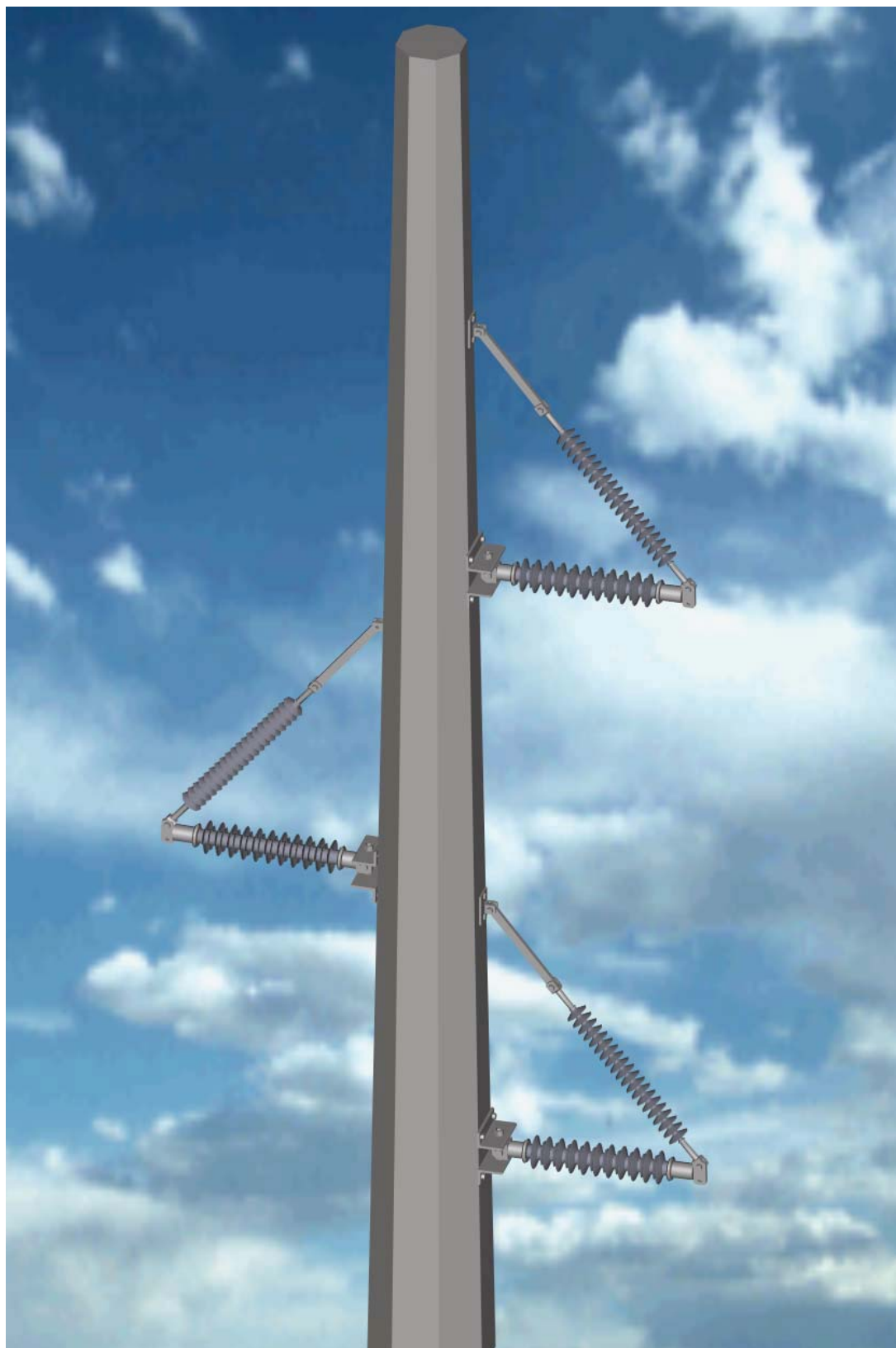
Key : ISI-MAX-A(1) - (2)
 Example : ISI-MAX-A20+19-HCGB

These insulators are produced and tested according to IEC 61952.
 It's possible to have all the other combinations.

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

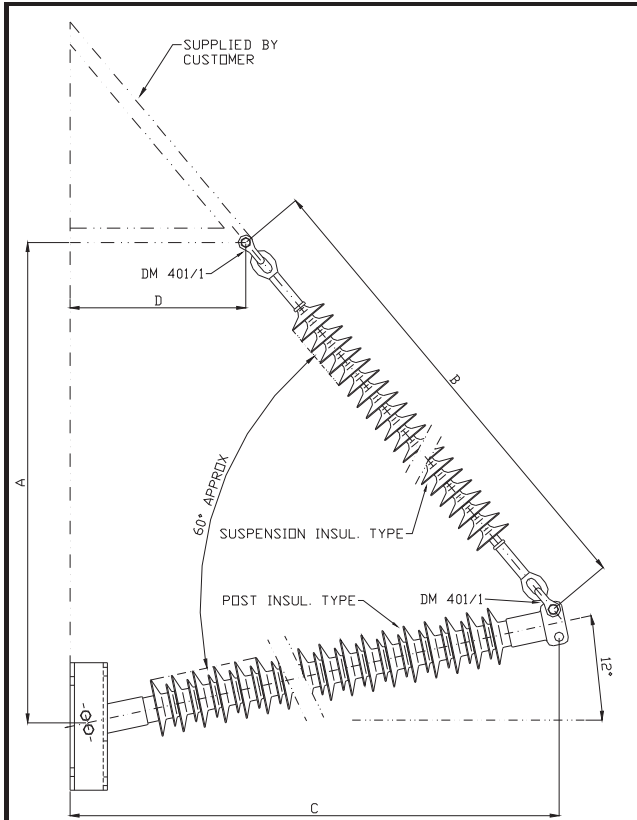
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SAME PICTURES OF THE OUR COMPOSITE INSULATING BRACKET

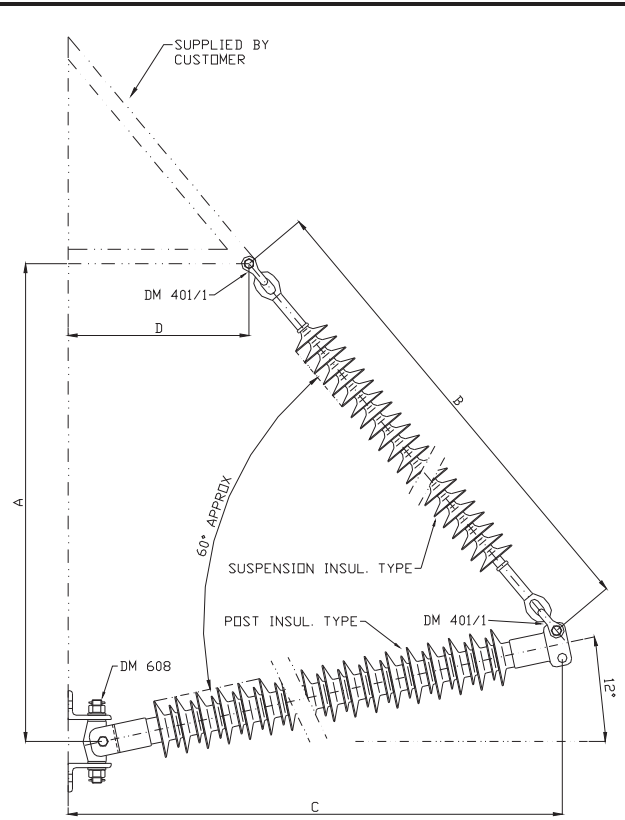


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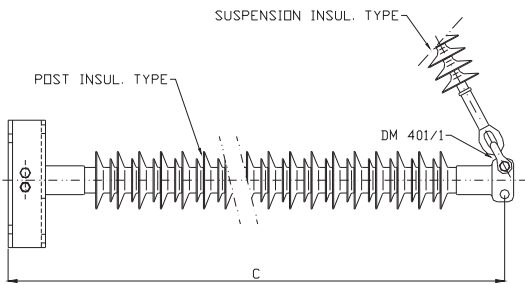
INSULATING BRACKET ASSEMBLY DRAWINGS



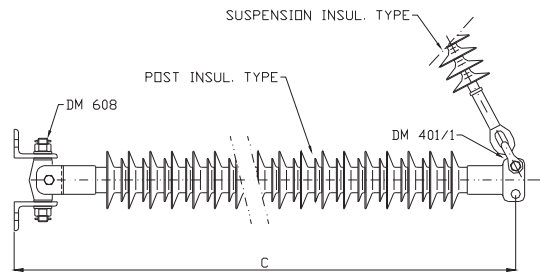
Fixed assembly with 12° inclination



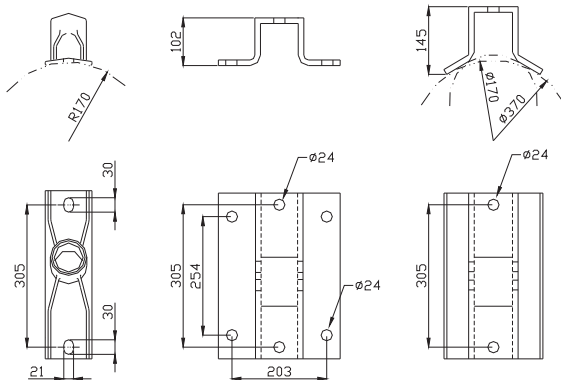
Horizontal & Vertical Pivoting assembly with 12° inclination



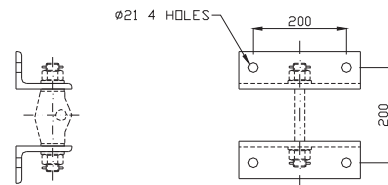
Fixed assembly with 0° inclination



Horizontal & Vertical Pivoting assembly with 0° inclination



Base for Fixed assembly with 0° or 12° inclination



Base for Pivoting assembly with 0° or 12° inclination

Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

INSULATING BRACKET ASSEMBLY – Dimensions and Strength Ratings

FIXED ASSEMBLY with 12° inclination

Typical Voltage	Component insulators		Dimensions (mm)				Maximum Load* (kN)				Pollution mm/kV
	Suspension type	Post type	A	B	C	D	1*	2*	3*	4*	
138	ISI-CAN-A27-120EE	ISI-BIG-A18+17-BHB	1560	1600	1420	370	55	35	55	5,72	> 23
138	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BHB	1685	1675	1775	680	55	35	55	4,42	> 31
145	ISI-ROK-A18+17-120EE	ISI-MAX-A24+23-BHB	1740	1745	1775	635	70	45	70	5,85	> 31
161	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BHB	1685	1675	1775	680	55	35	50	4,42	> 27
161	ISI-ROK-A20+19-120EE	ISI-BIG-A27+26-BHB	1910	1885	1950	695	55	35	50	4,22	> 31
170	ISI-ROK-A21+20-120EE	ISI-MAX-A29+28-BHB	1990	1960	2065	770	70	45	60	4,87	> 31
230	ISI-CAN-A48-120EE	ISI-BIG-A31+30-BHB	2335	2410	2185	615	55	35	45	3,57	> 25
230	ISI-ROK-A28+27-120EE	ISI-BIG-A38+37-BHB	2450	2445	2595	1005	55	35	45	2,90	> 31
245	ISI-ROK-A30+29-120EE	ISI-MAX-A41+40-BHB	2595	2585	2770	1095	70	45	50	4,22	> 31

FIXED ASSEMBLY with 0° inclination (Horizontal V)

Typical Voltage	Component insulators		Dimensions (mm)				Maximum Load* (kN)				Pollution mm/kV
	Suspension type	Post type	A	B	C	D	1*	2*	3*	4*	
138	ISI-CAN-A27-120EE	ISI-BIG-A18+17-BHB	1400	1600	1445	655	50	35	55	5,50	> 23
138	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BHB	1490	1675	1800	965	50	35	55	4,20	> 31
145	ISI-ROK-A18+17-120EE	ISI-MAX-A24+23-BHB	1550	1745	1800	930	65	45	70	5,60	> 31
161	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BHB	1490	1675	1800	965	50	35	55	4,20	> 27
161	ISI-ROK-A20+19-120EE	ISI-BIG-A27+26-BHB	1675	1885	1985	1040	50	35	55	4,00	> 31
170	ISI-ROK-A21+20-120EE	ISI-MAX-A29+28-BHB	1735	1960	2105	1125	65	45	70	4,60	> 31
230	ISI-CAN-A48-120EE	ISI-BIG-A31+30-BHB	2125	2410	2225	1015	50	35	55	3,30	> 25
230	ISI-ROK-A28+27-120EE	ISI-BIG-A38+37-BHB	2155	2445	2645	1420	50	35	55	2,70	> 31
245	ISI-ROK-A30+29-120EE	ISI-MAX-A41+40-BHB	2280	2585	2825	1530	65	45	70	4,00	> 31

HORIZONTAL & VERTICAL PIVOTING ASSEMBLY with 12° inclination

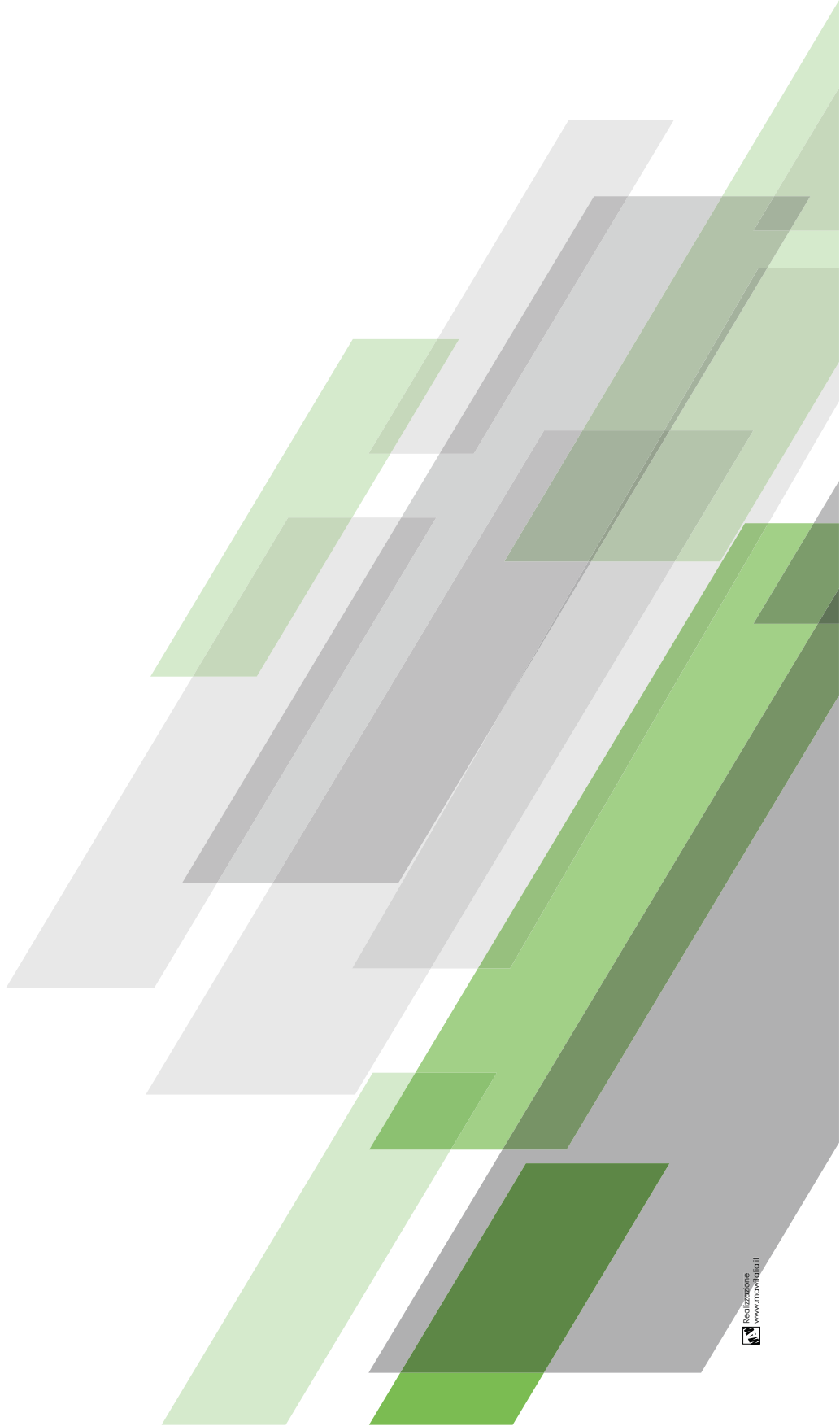
Typical Voltage	Component insulators		Dimensions (mm)				Maximum Load* (kN)				Pollution mm/kV
	Suspension type	Post type	A	B	C	D	1*	2*	3*	4*	
138	ISI-CAN-A27-120EE	ISI-BIG-A18+17-BC	1555	1600	1435	385	55	35	55	--	> 23
138	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BC	1680	1675	1788	695	55	35	55	--	> 31
145	ISI-ROK-A18+17-120EE	ISI-MAX-A24+23-BC	1735	1745	1790	650	70	45	70	--	> 31
161	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BC	1680	1675	1790	695	55	35	50	--	> 27
161	ISI-ROK-A20+19-120EE	ISI-BIG-A27+26-BC	1905	1920	1965	710	55	35	50	--	> 31
170	ISI-ROK-A21+20-120EE	ISI-MAX-A29+28-BC	1985	1990	2080	785	70	45	60	--	> 31
230	ISI-CAN-A48-120EE	ISI-BIG-A31+30-BC	2330	2410	2200	630	55	35	45	--	> 25
230	ISI-ROK-A28+27-120EE	ISI-BIG-A38+37-BC	2445	2445	2610	1020	55	35	45	--	> 31
245	ISI-ROK-A30+29-120EE	ISI-MAX-A41+40-BC	2590	2585	2795	1110	70	45	50	--	> 31

HORIZONTAL & VERTICAL PIVOTING ASSEMBLY with 0° inclination

Typical Voltage	Component insulators		Dimensions (mm)				Maximum Load* (kN)				Pollution mm/kV
	Suspension type	Post type	A	B	C	D	1*	2*	3*	4*	
138	ISI-CAN-A27-120EE	ISI-BIG-A18+17-BC	1555	1600	1450	400	50	35	55	--	> 23
138	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BC	1680	1675	1805	710	50	35	55	--	> 31
145	ISI-ROK-A18+17-120EE	ISI-MAX-A24+23-BC	1735	1745	1805	665	65	45	70	--	> 31
161	ISI-ROK-A17+16-120EE	ISI-BIG-A24+23-BC	1680	1675	1805	710	50	35	55	--	> 27
161	ISI-ROK-A20+19-120EE	ISI-BIG-A27+26-BC	1905	1920	1980	725	50	35	55	--	> 31
170	ISI-ROK-A21+20-120EE	ISI-MAX-A29+28-BC	1985	1990	2095	800	65	45	70	--	> 31
230	ISI-CAN-A48-120EE	ISI-BIG-A31+30-BC	2330	2410	2215	645	50	35	55	--	> 25
230	ISI-ROK-A28+27-120EE	ISI-BIG-A38+37-BC	2445	2445	2625	1035	50	35	55	--	> 31
245	ISI-ROK-A30+29-120EE	ISI-MAX-A41+40-BC	2590	2585	2810	1125	65	45	70	--	> 31

* Maximum load are for single loads in the specified direction: 1=Vertical, 2=Tension, 3=Compression, 4=Longitudinal
Please, don't hesitate to contact us directly for obtaining possible explanations or different solutions.

EB Rebosio - Isoelectric - Gruppo Bonomi



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