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	12/20(24) kV AND 18/30(36) kV COLD SHRINK TERMINATIONS FOR MV CABLES	GSCC005 Rev. 3 Addendum Ed. 1 12/2020


12/20(24) kV AND 18/30(36) kV COLD SHRINK TERMINATIONS FOR MV CABLES ADDENDUM Ed 1.

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Revision	Data	List of modifications
00	25/11/2015	First emission.
01	23/02/2018	Material codes updated. Chapter on barcode updated, Painted or coated semiconducting layer not allowed; New tests: expiration test, UV test for outdoor accessories; Modification of requirements for resistance to fire; pin lugs eliminated, Modification of requirements of screen connecting plate; modification of requirements of tracking and erosion test. Class 24 kV for Italy and Rumania. Rated short time withstand current in the screen; Increase of the minimum section of the earthing lug for Italy, Rumania, Spain and Peru from 16 to 25 mm ² .
02	25/05/2018	Revised tables 4, 5, 6, 7, 8, 9, 10 and 11. Expiration tests description. Paragraph on robustness test eliminated.
03	09/07/2018	Note on table 11. Revised material codes for Brazil.
Addendum Ed 0.	12/2019	Material codes updated for Chile.
Addendum Ed 1.	12/2020	Enel Distribuição São Paulo is included; table 2, Rated short time withstand current in the screen (kA) is updated for Colombia; table 7 updated for Argentina; Material codes updated; The range of sections available for 18/30(36) kV joints is updated; special consideration for São Paulo in type tests; special indoor termination for Peru in local section.

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1 SCOPE

This addendum of the Global Standard GSCC005 rev. 3 specifies the requirements applicable to Enel Distribution Group. They are specified in this document with reference to the same paragraph number of GSCC005 rev.3 (09/07/2018)

These Global Standard applies to the Distribution Companies of Enel Group listed below:

<i>Enel Distribución Colombia</i>	<i>Colombia</i>
<i>Enel Distribución Perú</i>	<i>Perú</i>
<i>e-distributie Banat</i>	<i>Romania</i>
<i>e-distributie Dobrogea</i>	<i>Romania</i>
<i>e-distributie Muntenia</i>	<i>Romania</i>
<i>e-distribuzione</i>	<i>Italy</i>
<i>Enel Distribuição Ceará</i>	<i>Brazil</i>
<i>Enel Distribuição Rio</i>	<i>Brazil</i>
<i>Enel Distribuição Goiás</i>	<i>Brazil</i>
<i>Enel Distribuição São Paulo</i>	<i>Brazil</i>

1.2 Global Standards

- GSC001¹
- GSCC015
- GSCC008


7 ELECTRICAL CHARACTERISTICS

The following requirements apply:

Rated voltage $U_0/U (U_m)$ (kV)	12/20(24)	18/30(36)
Rated power frequency withstand voltage (kV)	50	70
Rated impulse withstand voltage (kV)	125	170
Rated short time withstand current in the conductor (kA)	According to HD629-1 (EN 61442)	
Rated short time (0,5 s ^a) withstand current in the screen (kA)	5 ^b ; 10 ^c	
NOTE (see Table 7): a: for E-distribuzione, E-distributie, Endesa Distribución Eléctrica, the rated short time is 1 s b: for 16 mm ² and 25 mm ² joint screen c: 50 mm ² joint screen		

Table 2 – Electrical characteristics


¹ The characteristics of the cables are included in the Enel Group Global Standard. Besides installation on new cables, which comply to GSC001, the termination may be installed on the existing network, which is made of cables compliant to older local standards. Nevertheless, this Global Standard also takes into account the main characteristics of existing cables for each Country (rated voltage, section and min/max diameter over insulation).

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The rated voltage levels of the cables for which is foreseen the installation of the terminations is the following:

Rated voltage of the termination $U_0/U (U_m)$ (kV)	12/20(24)	18/30(36)
Distribution Company (Country)	Rated voltage of the cables $U_0/U (U_m)$ (kV)	
Enel Distribuição São Paulo (Brazil)	8.7/15(17.5)	15/25(31) 20/35(42)
Enel Distribuição Ceará (Brazil) Enel Distribución Colombia (Colombia)	8.7/15(17.5)	-
Enel Distribución Chile (Chile)	8.7/15(17.5)	15/25(31)
Enel Distribución Perú (Perù)	8.7/15(17.5); 12/20(24)	-
Edesur (Argentina) Enel Distribuição Rio (Brazil) Enel Distribuição Goiás (Brazil)	8.7/15(17.5)	18/30(36)
Endesa Distribución Eléctrica (Spain)	12/20(24)	18/30(36) 12/20(24)*
E-distributie Banat (Romania); E-distributie Dobrogea (Romania); E-distributie Muntenia (Romania); E-Distribuzione (Italy)	12/20(24)	-
* Only for 200022		

Table 3 – Rated voltage of the cables

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10.2.1.1 Lugs for indoor terminations

10.2.1.1.1 Palm lugs

With reference to Figure , Table reports the main characteristics and dimensions of the palm lugs for indoor installation:

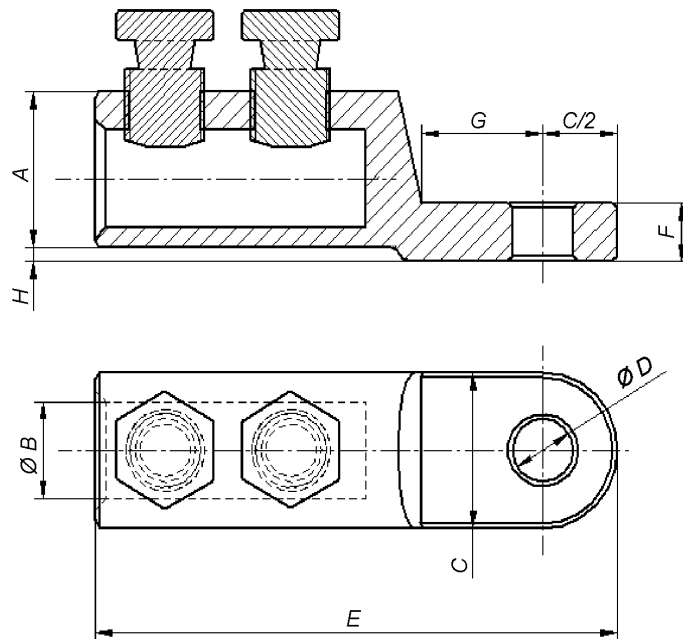



Figure 3 – Indoor lug

Cable section (mm ²)	A max	$\varnothing B$ min	C max	$\varnothing D \pm 0,2$	E max	F min	G min	H	n ^o of screws min
35 ÷ 95	28	13	27	13	105	8,5	12,5	(*)	1
95 ÷ 240	38	19,5	37	13	130	9	14,5		2
150 ÷ 240									2; 3 ^a
400	45	26	42	13 ; 17 ^a	170	12	18,5		3
400 ÷ 630	53	33	52	13; 17 ^b	175	20	22		3
500 ÷ 630									

a. apply to Enel Distribuição Rio (Brazil), Enel Distribuição Ceará (Brazil), Enel Distribuição Goiás (Brazil), Enel Distribuição São Paulo (Brazil), Enel Distribución Perú (Peru);
b. apply to Enel Distribuição São Paulo (Brazil)
(*) The palm and the barrel shall be on a different quote (to be verified by visual inspection).

Table 5 – Indoor lugs dimensions (mm)

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10.2.1.2 Lugs for outdoor terminations

10.2.1.2.1 Palm lugs

With reference to Figure , Table reports the main characteristics and dimensions of the palm lugs for outdoor installation:

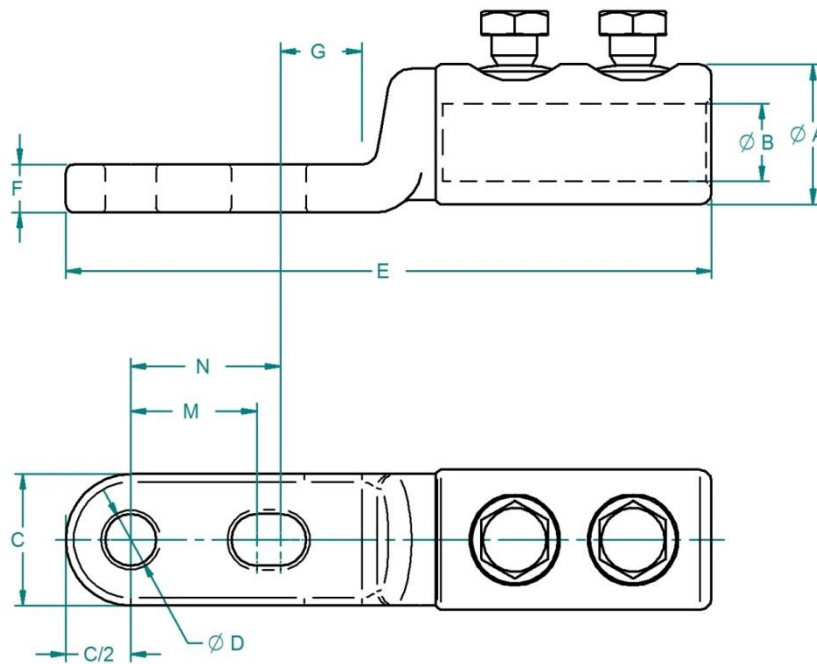



Figure 4 - Outdoor lug

Cable section (mm ²)	A max	Ø B min	C min	Ø D ± 0,2	E max	F min	G min	M -0,5/+0	N -0/+1	nº of screws min
35 ÷ 95	28	13	20	13	143	8,5	12,5	32	45	2
95 ÷ 240	38	19,5	33	13	168	13	14,5	32	45	2
150 ÷ 240										
400	45	26	40	13; 17 ^a	208	15	18,5	32	45	2; 3 ^a
500 ÷ 630	53	33	52	13; 17 ^b	220	20	22	32	45	3

a. apply to to Enel Distribuição Rio (Brazil), Enel Distribuição Ceará (Brazil), Enel Distribuição Goiás (Brazil), Enel Distribuição São Paulo (Brazil), Enel Distribución Perú (Peru);
 b. apply to Enel Distribuição São Paulo (Brazil)

Table 6 - Outdoor palm lugs dimensions (mm)

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Distribution Company (Country)	Cable section (mm ²)	Copper stocking section (mm ²)
Enel Distribuição Rio (Brazil) Enel Distribuição Ceará (Brazil) Enel Distribuição Goiás (Brazil) Enel Distribución Chile (Chile) Enel Distribución Colombia (Colombia)	≤ 240 ^a	25
	400 ^a and 630 ^a	50
Edesur (Argentina)	50 (13.2 kV) 185 (33 kV)	25
	all other sections (13.2 kV)	50
Enel Distribuição São Paulo (Brazil) Enel Distribución Perú (Perù) Endesa Distribución Eléctrica (Spain) E-distributie Banat (Romania) E-distributie Dobrogea (Romania) E-distributie Muntenia (Romania) E-Distribuzione (Italy)	all sections ^a	25
NOTE: a: The copper stocking of the joint shall be compatible with both aluminum tape screen and copper wires screen of cables, except for: Edesur(Argentina).		

Table 7 – Earthing lug section

11 CONTENT OF THE KIT

All the necessary elements and accessory to install the termination on-field shall be included, namely:

- 1 (one) shear bolt lug (see 10.2.1)
- 1 (one) component to control the electric field (see 10.2.2)
- 1 (one) main insulating housing (see 10.2.3)
- 1 (one) earthing lug (see 10.2.4.1)
- 1 (one) plate for aluminum tape screen cables (see 10.2.4.2) (except for Argentina, see Table 7).
- 1 (one) connector for copper wire screen (see 10.2.4.3.1)
- Greases and sealing compounds (see 10.2.5)
- Accessories for cleaning;
- Plastic bag for collecting residual materials of installation;
- List of materials;
- Installing instructions and templates (see 14.3);
- Identification label (see 14.2.2);
- Other materials, tools and accessories (according to supplier's design).

12 LIST OF COMPONENTS

The list of components included in this Global Standard is reported in the following tables for 12/20(24) kV and 18/30(36) kV rated voltages:



12/20(24) kV AND 18/30(36) kV COLD SHRINK TERMINATIONS
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Distribution Company (Country)	Type: GSCC005/1					
Enel Distribuição Rio (Brazil) Enel Distribuição Ceará (Brazil) Enel Distribuição Goiás (Brazil)	-	-	-	-	-	-
Enel Distribuição São Paulo (Brazil)	-	T270500	T270501	T270499		T270498
Enel Distribución Chile (Chile)	-	-	-	-	-	-
Enel Distribución Colombia (Colombia)	-	-	-	-	-	-
Enel Distribución Perú (Perù)	-	-	-	-	-	274052 (*)
E-distributie Banat (Romania); E-distributie Dobrogea (Romania); E-distributie Muntenia (Romania); E-Distribuzione (Italy)	273043	-	-	-	273049	-
Characteristics of the cable						
Cable section (mm ²)	25	35 ÷ 95	95 ÷ 240	400	400 ÷ 630	500 ÷ 630
Rated voltage $U_0/U (U_m)$ (kV)	See Table					
Min/max diameter over insulation (mm)	17/22	14.9/ 25.0	20.6/32.2	31/37.5	35/46	37.9/43.5
(*) Indoor termination without sheds and different palm lug, see local section for more details						

Table 8 – Material codes for cold shrink 12/20(24) kV indoor termination



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Distribution Company (Country)	Type: GSCC005/2			
Enel Distribuição Rio (Brazil) Enel Distribuição Ceará (Brazil) Enel Distribuição Goiás (Brazil)	-	-	-	-
Enel Distribuição São Paulo (Brazil)	T270505	T270504	T270503	T270502
Enel Distribución Chile (Chile)	-	-	-	-
Enel Distribución Colombia (Colombia)	-	-	-	-
Enel Distribución Perú (Perù)	-	-	-	274051
E-distributie Banat (Romania); E-distributie Dobrogea (Romania); E-distributie Muntenia (Romania); E-Distribuzione (Italy)	-	-	-	-
Characteristics of the cable				
Cable section (mm ²)	35 ÷ 95	95 ÷ 240	400	500 ÷ 630
Rated voltage U_0/U (U_m) (kV)	See Table			
Min/max diameter over insulation (mm)	14.9/ 25.0	20.6/32.2	31/37.5	36.2/43.5

Table 9 – Material codes for cold shrink 12/20(24) kV outdoor termination



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Distribution Company (Country)	Type: GSCC005/3					
Enel Distribuição Rio (Brazil) Enel Distribuição Goiás (Brazil)	-	-	-	-	-	-
Enel Distribuição São Paulo (Brazil)		T270496	-	-	T270495	-
Enel Distribución Chile (Chile)	-	-	-	-	-	-
Enel Distribución Colombia (Colombia)	-	-	-	274515	-	-
Enel Distribuição Ceará (Brazil)	-	-	-	-	-	-
Enel Distribución Perú (Perù)	-	-	-	-	-	-
E-distributie Banat (Romania); E-distributie Dobrogea (Romania); E-distributie Muntenia (Romania); E-Distribuzione (Italy)	-	-	-	-	-	-
Characteristics of the cable						
Cable section (mm ²)	35 ÷ 95	95 ÷ 240	70 ÷ 150	150 ÷ 240	400	630
Rated voltage $U_0/U (U_m)$ (kV)	See Table					
Min/max diameter over insulation (mm)	20.4/30.0	24.8/37.2	19.0/32.2	27.3/37.2	34.9/42.5	41.3/46.7

Table 10 – Material codes for cold shrink 18/30(36) kV indoor termination




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Distribution Company (Country)	Type: GSCC005/4					
Enel Distribuição Rio (Brazil) Enel Distribuição Goiás (Brazil)	-	-	-	-	-	-
Enel Distribuição São Paulo (Brazil)	T270494	T270493	-	-	T270506	-
Enel Distribución Chile (Chile)	-	-	-	-	-	-
Enel Distribución Colombia (Colombia)	-	-	-	274516	-	-
Enel Distribuição Ceará (Brazil)	-	-	-	-	-	-
Enel Distribución Peru (Perù)	-	-	-	-	-	-
E-distributie Banat (Romania); E-distributie Dobrogea (Romania); E-distributie Muntenia (Romania); E-Distribuzione (Italy)	-	-	-	-	-	-
Characteristics of the cable						
Cable section (mm ²)	35 ÷ 95	95 ÷ 240	70 ÷ 150	150 ÷ 240	400	630
Rated voltage U_0/U (U_m) (kV)	See Table					
Min/max diameter over insulation (mm)	20.4/30.0	24.8/37.2	19.0/32.2	27.3/37.2	34.9/42.5	41.3/46.7

Table 11 – Material codes for cold shrink 18/30(36) kV outdoor termination

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13.2 TYPE TEST

For each material code, type tests shall be carried out on a sample installed on cables with the maximum section indicated in Table 8, Table 9, Table 10 and Table 11, respectively for U₀/U (U_m) 12/20(24) kV indoor and outdoor and 18/30(36) kV indoor and outdoor (e.g. 270096 shall be tested on a 240 mm² – 18/30(36) kV cable and 270094 on a 240 mm² 12/20(24) kV cable).

For E-Distribuzione, E-Distributie Banat, E-Distributie Dobrogea and E-Distributie Muntenia, type tests shall be carried out on both HPTE and XLPE insulated cables.

For Endesa Distribución code 200022 type tests shall be carried out using a 185 mm² – 18/30(36) kV cable.

Type tests shall be carried out at the maximum rated voltage level prescribed for the termination (i.e. 12/20(24) kV or 18/30(36) kV) except for type codes GSCC006/3 and GSCC006/4 (Enel Distribuição São Paulo).

For type codes GSCC006/3 and GSCC006/4 (Enel Distribuição São Paulo). Type tests shall be carried with the following special considerations:

Description	Test	Notes
Heating cycle voltage in air	Item N° 5 Table 3 or Item N° 6 Table 4 HD 629-1	Test requirements for U ₀ /U (U _m) 20,8/36(42) kV
AC voltage dry	Item N° 2 Table 3 or Table 4 HD 629-1	

The lugs shall be tested both for their maximum and minimum section, according to IEC 61238-1, class A.


Insulating materials shall be tested for resistance to tracking and erosion according to IEC 60587, with 3.5 kV test voltage.

The Supplier shall declare the resistance to fire of the main insulating housing according to IEC 60695-11-10 or another equivalent standard.

13.2.3 ADDITIONAL TYPE TESTS

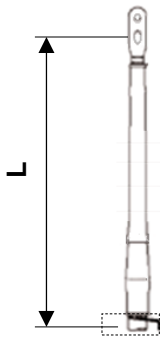
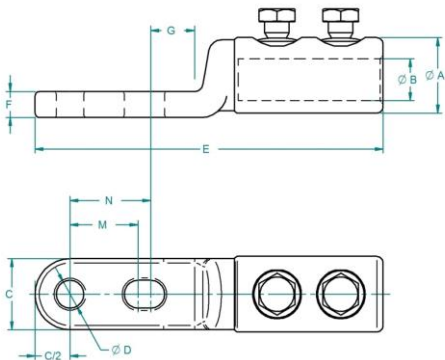
For each material code, the extension of compliance from maximum section to minimum section in the reference range shall be verified on a cable having the minimum diameter over insulation (or lower) specified in Table 8, Table 9, Table 10 and Table 11, by carrying out all the additional tests prescribed by HD 629-1, table 10, taking into account that test No. 5 must be performed, additionally to prescribed conditions, also by subjecting the samples to 63 cycles in water (to be performed according to HD 629-1, table 4, test No. 7) for external terminations. Additional type tests shall be carried out at the maximum rated voltage level prescribed for the termination (i.e. 12/20(24) kV or 18/30(36) kV).

For E-Distribuzione, E-Distributie Banat, E-Distributie Dobrogea and E-Distributie Muntenia additional type tests shall be carried out on both HPTE and XLPE insulated cables.

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LOCAL SECTION A – ENEL DISTRIBUCIÓN PERÚ

The country code 274052, from Peru, is for all purposes defined according to the type code GSCC005/1, with the following exceptions:

ITEM	TITLE	DESCRIPTION																						
8	OVERALL DIMENSIONS	<p>Overall dimension of termination are defined in Table A.1</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Country Code</th> <th>274052</th> </tr> </thead> <tbody> <tr> <td>Minimum creepage distance (mm)</td> <td style="text-align: center;">420</td> </tr> <tr> <td>Maximum height L (from first hole center of the lug to the support axis) (mm)</td> <td style="text-align: center;">500</td> </tr> <tr> <td>Maximum diameter of sheds D</td> <td style="text-align: center;">NO SHEDS</td> </tr> </tbody> </table> <p style="text-align: center;">Table A.1 Overall dimensions for 274052 code.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Figure A.1 Indoor termination without sheds</p>	Country Code	274052	Minimum creepage distance (mm)	420	Maximum height L (from first hole center of the lug to the support axis) (mm)	500	Maximum diameter of sheds D	NO SHEDS														
Country Code	274052																							
Minimum creepage distance (mm)	420																							
Maximum height L (from first hole center of the lug to the support axis) (mm)	500																							
Maximum diameter of sheds D	NO SHEDS																							
10.2.1.1	Lugs for indoor terminations	<p>The main characteristics and dimensions of the palm lugs for special indoor installation:</p> <div style="text-align: center;">  </div> <p style="text-align: center;"><i>Figure A.2</i> Special Indoor Lug for country code 274052</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Cable section (mm²)</th> <th>A max</th> <th>Ø B min</th> <th>C min</th> <th>Ø D ± 0,2</th> <th>E max</th> <th>F min</th> <th>G min</th> <th>M -0,5/+0</th> <th>N -0/+1</th> <th>nº of screws min</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">500 ÷ 630</td> <td style="text-align: center;">53</td> <td style="text-align: center;">33</td> <td style="text-align: center;">52</td> <td style="text-align: center;">17</td> <td style="text-align: center;">220</td> <td style="text-align: center;">20</td> <td style="text-align: center;">22</td> <td style="text-align: center;">32</td> <td style="text-align: center;">45</td> <td style="text-align: center;">3</td> </tr> </tbody> </table> <p style="text-align: center;">Table A.2 Special Indoor palm lug dimensions (mm) for country code 274052</p>	Cable section (mm ²)	A max	Ø B min	C min	Ø D ± 0,2	E max	F min	G min	M -0,5/+0	N -0/+1	nº of screws min	500 ÷ 630	53	33	52	17	220	20	22	32	45	3
Cable section (mm ²)	A max	Ø B min	C min	Ø D ± 0,2	E max	F min	G min	M -0,5/+0	N -0/+1	nº of screws min														
500 ÷ 630	53	33	52	17	220	20	22	32	45	3														