



**Technical Specification code: GRI-GRI-MAT-E&C-0022**

Version no. 0 dated 12/2022

**Subject:** Global Infrastructure and Networks - GSC028 LV insulated control cables

**Application Areas**

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

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**THE GLOBAL HEAD OF NETWORK COMPONENTS**

**Fabrizio Gasbarri**

**Application Areas**

 Perimeter: *Global*

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## 1. DOCUMENT AIMS AND APPLICATION AREA

The aim of this document is to provide technical requirements for the supply of LV insulated non-fire propagating cables, single and multi-core, used for energy or signal in control systems of the distributions networks.

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

Country	Distribution Company
Brazil	Enel Distribuição Rio (RJ) Enel Distribuição Ceará (CE) Enel Distribuição Goiás (GO) Enel Distribuição São Paulo (SP)
Chile	Enel Distribución Chile
Colombia	Codensa
Iberia	E-distribución
Italy	E-distribuzione
Perú	Enel Distribución Perú
Romania	E-distributie Banat E-distributie Dobrogea E-distributie Muntenia

**Table 1 Distribution Companies**

*This document shall be implemented and applied to the extent possible within the Enel Grids Business Line and in compliance with any applicable laws, regulations and governance rules, including any stock exchange and unbundling-relevant provisions, which in any case prevail over the provisions contained in this document.*

### 1.1 RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL

This document does not require implementation of further documents..

## 2. DOCUMENT VERSION MANAGEMENT

Version	Date	Main changes description
00	29/12/2022	First emission.

**Table 2 Version management**

**Application Areas**Perimeter: *Global*

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### 3. UNITS IN CHARGE OF THE DOCUMENT

Responsible for drawing up the document:

- Enel Grids: Engineering and Construction / Components and Devices Design unit / Network Components unit

Responsible for authorizing the document:

- Enel Grids: Head of Network Components unit
- Enel Grids: Head of Quality unit.

### 4. REFERENCES

- Code of Ethics of Enel Group;
- Enel Human Right Policy;
- The Enel Group Zero Tolerance of Corruption (ZTC) Plan;
- Organization and management model as per Legislative Decree No. 231/2001;
- Enel Global Compliance Program (EGCP);
- Stop Work Policy;
- Integrated Policy for Quality, Health and Safety, Environment, anti-Bribery and Information security;
- ISO 9001:2015 - Quality Management System – Requirements;
- ISO 14001:2015 - Environmental Management System - Requirements with guidance for use;
- ISO 45001:2018 - Occupational Health and Safety Management System - Requirements with guidance for use;
- ISO 37001:2016 - Anti-bribery Management System - Requirements with guidance for use;
- ISO 27001:2017 - Information Security Management System – Requirements;
- MAT-O&M-NCS-2021-0033-EGIN version 3 “GSCG002 Technical Conformity Assessment”;
- Construction Specification GRI-GRI-CNS-O&M-0002 “Barcode specification - ex CNS-O&M-S&L-2021-0032-EGIN.

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**GLOBAL STANDARDS***Not applicable***LAWS***Brazil*

- *NR-10 - Segurança em Instalações e Serviços em Eletricidade*

*Chile*

- *NSEG 5 En.71 Reglamento de Instalaciones Eléctricas de Corrientes Fuertes.*

*Colombia*

- *RETIE, Reglamento Técnico de Instalaciones Eléctricas.*
- *Código Eléctrico Colombiano, NTC 2050*

*Peru*

- *Código Nacional de Electricidad – Suministro 2011.*
- *Norma Técnica de Calidad de los servicios eléctricos (NTCSE)*

*Romania*

- *NTE007/08/00 Normativ pentru proiectare și executarea rețelelor de cabluri electrice*

*Spain*

- *R.D. 614/2001, de 8 de junio, sobre disposiciones mínimas para la protección de la salud y seguridad de los trabajadores frente al riesgo eléctrico.*
- *REAL DECRETO 842/2002, de 2 de agosto, por el que se aprueba el Reglamento Electrotécnico para Baja Tensión e Instrucciones Técnicas Complementarias (R.E.B.T.)*
- *R.D. 337/2014, de 9 de mayo, por el que se aprueban el Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión y sus Instrucciones Técnicas Complementarias ITC-RAT 01 a 23.*
- *Reglamento (UE) nº 305/2011 del Parlamento Europeo y del Consejo, de 9 de marzo de 2011, por el que se establecen condiciones armonizadas para la comercialización de productos de construcción y se deroga la Directiva 89/106/CEE del Consejo.*
- *UNE 21123-4 “Electric cables for industrial use with rated voltage 0.6/1 kV. Part 4: Cross-linked polyethylene insulated and polyolefin sheathed cables”.*

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- UNE 211627 “Cables with an assigned voltage of 0.6/1 kV, insulated with cross-linked polyethylene and polyolefin sheathing, for use as fixed installation in control circuits”.

**EUROPEAN & INTERNATIONAL STANDARDS**

- *EN13501-6 “Fire classification of construction products and building elements - Part 6: Classification using data from reaction to fire tests on electric cables”.*
- *EN 50575 “Power, control and communication cables - Cables for general applications in construction works subject to reaction to fire requirements”*
- *HD 603 “Distribution cables of rated voltage 0,6/1 kV”*
- *HD 605 “Electric cables - Additional test methods”*
- *IEC 60228: “Conductors of insulated cables”*
- *IEC 60410: Sampling plans and procedures for inspection by attributes.*
- *IEC 60502-1:” Power cables with extruded insulation and their accessories for rated voltages from 1 kV up to 30 kV – Part 1: cables for rated voltages of 1 kV and 3 kV”*
- *IEC 60332-Series: “Tests on electric and optical fibre cables under fire conditions”*
- *EN 50362 Series: “Insulating, sheathing and covering materials for low voltage energy cables”*
- *EN 50395 “Electrical test methods for low-voltage energy cables”*
- *IEC 60754-1 “Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content”*
- *IEC 60754-2 “Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity”*
- *IEC 60811 Series: “Electric and optical fibre cables – Test methods for non- metallic materials”*
- *IEC 61034-2 “Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements”*
- *IEC 62230 “Electric cables - Spark-test method”*
- *ISO 2859-0 “Sampling procedures for inspection by attributes -- Part 0: Introduction to the ISO 2859 attribute sampling system”*
- *ISO 2859-1 “Sampling procedures for inspection by attributes -- Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection”*
- *Reglamentación AEA 95101 Versión 2015 Líneas Subterráneas Exteriores de Energía y Telecomunicaciones*
- *ASTM B 3 “Standard Specification for Soft or Annealed Copper Wire”*

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**LOCAL STANDARDS**

*See local section*

**REPLACED LOCAL STANDARDS**

- Italy

DV201

DV202

DV203

DV204 ED. 6

DV205

DV206

DV207

DV208

DV209

- Chile

ESP-S-0206 REV. 1

- Colombia

ET119

- Brazil

ET-206/2007 R-02

MAT-OMBR-MAT-18-0114-EDCE - Cabo de Controle Blindado

NTC-44

NTE-030-1

NTE-100-0

PM-R 2136 R-01

- Peru

MAT-OYM-NDS-18-607-ESP (Rev2)



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- Romania

FT-153\_MAT

FT-091\_MAT

FT-094\_MAT

FT-126\_MAT

FT-027\_TLT Ed. 01

FT-087\_MAT Ed. 03

FT-088\_MAT Ed. 02

FT-160\_MAT Ed. 01

- Spain

NNC007 CABLES DE CONTROL MULTIPOLARES

## **5. ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY**

Value Chain/Process Area: Engineering and Construction.

Macro Process: Materials management Devices and Components Development

Process: Standard Catalog Management.

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## 6. DEFINITIONS AND ACRONYMS

Acronym and Key words	Description
<b>Acceptable Quality Level (AQL)</b>	The maximum percentage of malfunctions that can be detected during a sample inspection and can still be considered satisfactory
<b>Low Voltage (LV)</b>	Any set of nominal voltage levels in the range 0,5 to 1 kV AC or 120 to 1500 V DC
<b>Technical Conformity Assessment (TCA)</b>	A "conformity assessment" with respect to "specified requirements" <sup>1</sup> consists in functional, dimensional, constructional and test characteristics required for a product (or a series of products) and quoted in technical specifications and quality requirements issued by Enel Group distribution companies. This also includes the verification of conformity with respect to local applicable regulation and laws and possession of relevant requested certifications

**Table 3**



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**7. DESCRIPTION**
**7.1 LIST OF COMPONENTS**
**7.1.1.STANDARD CABLE**

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/1	IT	349022	I	450/750 V	COPPER	5	1 x 1,5	0,26	1,8	0,8	PVC	-		Unipolar	light blue	Colour
GSCC028/2	IT	349023	I	450/750 V	COPPER	5	1 x 2,5	0,26	2,4	0,8	PVC	-		Unipolar	light blue	Colour
GSCC028/2	RO	633165	I	450/750 V	COPPER	5	1 x 2,5	0,26	2,4	0,8	PVC	-		Unipolar		
GSCC028/3	IT	349024	I	450/750 V	COPPER	5	1 x 4	0,31	3	1	PVC	-		Unipolar	light blue	Colour
GSCC028/3	RO	633166	I	450/750 V	COPPER	5	1 x 4	0,31	3	1	PVC	-		Unipolar		
GSCC028/4	IT	349025	I	450/750 V	COPPER	5	1 x 6	0,31	3,9	1	PVC	-		Unipolar	light blue	Colour
GSCC028/4	RO	633164	I	450/750 V	COPPER	5	1 x 6	0,31	3,9	1	PVC	-		Unipolar		
GSCC028/5	IT	349026	I	450/750 V	COPPER	5	1 x 10	0,41	5,1	1	PVC	-		Unipolar	light blue	Colour
GSCC028/5	RO	633163	I	450/750 V	COPPER	5	1 x 10	0,41	5,1	1	PVC	-		Unipolar		
GSCC028/6	IT	349027	I	450/750 V	COPPER	5	1 x 16	0,41	6,3	1	PVC	-		Unipolar	light blue	Colour
GSCC028/6	RO	633199	I	450/750 V	COPPER	5	1 x 16	0,41	6,3	1	PVC	-		Unipolar		
GSCC028/7	IT	349028	I	450/750 V	COPPER	5	1 x 25	0,41	7,8	1,2	PVC	-		Unipolar	light blue	Colour
GSCC028/8	IT	349030	I	450/750 V	COPPER	5	1 x 50	0,41	11	1,4	PVC	-		Unipolar	light blue	Colour

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GSCC028/9	IT	349032	I	450/750 V	COPPER	5	1 x 95	0,51	15,1	1,6	PVC	-		Unipolar	light blue	Colour
GSCC028/10	IT	349033	I	450/750 V	COPPER	5	1 x 120	0,51	17	1,6	PVC	-		Unipolar	light blue	Colour
GSCC028/11	IT	349034	I	450/750 V	COPPER	5	1 x 150	0,51	19	1,8	PVC	-		Unipolar	light blue	Colour
GSCC028/12	IT	349036	I	450/750 V	COPPER	5	1 x 185	0,51	21	2	PVC	-		Unipolar	light blue	Colour
GSCC028/13	IT	349038	I	450/750 V	COPPER	5	1 x 240	0,51	24	2,2	PVC	-		Unipolar	light blue	Colour
GSCC028/14	CL	340011	I	0,6\1kV	COPPER	2	1 x 35	0,41	9,2	1,2	XLPE	0,1	helically arranged copper strip	Unipolar	black	numbers
GSCC028/15	CL	340004	I	0,6\1kV	COPPER	5	1 x 1	0,21	1,5	\	XLPE	-		Unipolar		
GSCC028/16	CL	340003	I	0,6\1kV	COPPER	5	1 x 1,5	0,26	1,8	0,8	XLPE	-		Unipolar		
GSCC028/17	CL	340002	I	0,6\1kV	COPPER	5	1 x 2,5	0,26	2,4	0,8	XLPE	-		Unipolar		
GSCC028/18	CL	340001	I	0,6\1kV	COPPER	5	1 x 4	0,31	3	0,8	XLPE	-		Unipolar		
GSCC028/19	RO	633105	I	450/750 V	COPPER	5	1 x 70	0,51	13,1	1,4	PVC	-		Unipolar		
GSCC028/20	RO	631101	I	0,6\1kV	COPPER	5	1 x 1,5	0,26	1,8	0,8	PVC	-		Unipolar		Colour
GSCC028/21	RO	631102	I	0,6\1kV	COPPER	5	1 x 2,5	0,26	2,4	0,8	PVC	-		Unipolar		Colour
GSCC028/22	RO	631103	I	0,6\1kV	COPPER	5	1 x 4	0,31	3	1	PVC	-		Unipolar		Colour
GSCC028/23	RO	631104	I	0,6\1kV	COPPER	5	1 x 6	0,31	3,9	1	PVC	-		Unipolar		Colour
GSCC028/24	RO	631105	I	0,6\1kV	COPPER	5	1 x 10	0,41	5,1	1	PVC	-		Unipolar		Colour
GSCC028/25	RO	631106	I	0,6\1kV	COPPER	5	1 x 16	0,41	6,3	1	PVC	-		Unipolar		Colour
GSCC028/26	RO	631107	I	0,6\1kV	COPPER	5	1 x 25	0,41	7.8	1,2	PVC	-		Unipolar		Colour
GSCC028/27	RO	633140	II	450\750V	ALUMINUM	2	1 x 2,5	0,26		0,8	PVC	-		Unipolar		
GSCC028/28	RO	633141	II	450\750V	ALUMINUM	2	1 x 4	0,31		1	PVC	-		Unipolar		
GSCC028/29	RO	633143	II	450\750V	ALUMINUM	2	1 x 6	0,31		1	PVC	-		Unipolar		
GSCC028/30	RO	631203	II	450\750V	ALUMINUM	2	1 x 10	0,41		1	PVC	-		Unipolar		
GSCC028/31	RO	631204	II	450\750V	ALUMINUM	2	1 x 16	0,41		1	PVC	-		Unipolar		
GSCC028/32	RO	631206	II	450\750V	ALUMINUM	2	1 x 25	0,41		1,2	PVC	-		Unipolar		
GSCC028/33	RO	631207	II	450\750V	ALUMINUM	2	1 x 35	0,41		1,2	PVC	-		Unipolar		
GSCC028/34	RO	631208	II	450\750V	ALUMINUM	2	1 x 50	0,41		1,4	PVC	-		Unipolar		
GSCC028/35	RO	631209	II	450\750V	ALUMINUM	2	1 x 70	0,51		1,4	PVC	-		Unipolar		

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GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/36	RO	631210	II	450\750V	ALUMINUM	2	1 x 95	0,51		1,6	PVC	-		Unipolar		
GSCC028/37	RO	631211	II	450\750V	ALUMINUM	2	1 x 120	0,51		1,6	PVC	-		Unipolar		
GSCC028/38	RO	631212	II	450\750V	ALUMINUM	2	1 x 150	0,51		1,8	PVC	-		Unipolar		
GSCC028/39	RO	631213	II	450\750V	ALUMINUM	2	1 x 185	0,51		2	PVC	-		Unipolar		
GSCC028/40	RO	631214	II	450\750V	ALUMINUM	2	1 x 240	0,51		2,2	PVC	-		Unipolar		
GSCC028/41	IT	349151	IV	0,6/1 kV	COPPER	5	2 x 1,5	0.26	1,8	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/42	IT	349152	IV	0,6/1 kV	COPPER	5	2 x 2,5	0.26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/43	RO	633214	III	0,6/1 kV	COPPER	5	2 x 2,5	0.26	2,4	0,8	PVC/HEPR	-		Bipolar		
GSCC028/44	IT	349153	IV	0,6/1 kV	COPPER	5	2 x 4	0.31	3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/45	RO	633213	III	0,6/1 kV	COPPER	5	2 x 4	0.31	3	1	PVC/HEPR	-		Bipolar		
GSCC028/46	IT	349154	IV	0,6/1 kV	COPPER	5	2 x 6	0.31	3,9	1	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/47	IT	349155	IV	0,6/1 kV	COPPER	5	2 x 10	0.41	5,1	1	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/48	IT	349156	IV	0,6/1 kV	COPPER	5	2 x 16	0.41	6,3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/49	IT	349157	IV	0,6/1 kV	COPPER	5	2 x 25	0.41	7,8	1,2	PVC/HEPR	0,1	Two helically wound copper tapes	Bipolar	light blue	Colour
GSCC028/50	PE	330560	V	0.6/1kV	COPPER	5	2 x 2,5	0.26	2,4	0,8	XLPE	-		Bipolar	black	numbers
GSCC028/51	CL	340022	VI	0.6/1kV	COPPER	5	2 x 4	0.31	3	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/52	CL	340021	VI	0.6/1kV	COPPER	5	2 x 6	0.31	3,9	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/53	CL	340013	VI	0.6/1kV	COPPER	5	2 x 10	0,41	5,1	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/54	CL	340010	VI	0.6/1kV	COPPER	2	2 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/55	CL	340009	VI	0.6/1kV	COPPER	2	2 x 4	0,31	3	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/56	CL	340008	VI	0.6/1kV	COPPER	2	2 x 6	0,31	3,9	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/57	CL	340007	VI	0.6/1kV	COPPER	2	2 x 10	0,41	5,1	1	XLPE	0,1	helically arranged copper strip	Bipolar	black	numbers
GSCC028/58	BR	310587	IV	0,6/1 kV	COPPER	5	2 x 2,5	0,41	2,4	0,8	PVC	0,1	Copper wires	Bipolar		
GSCC028/59	BR	340274	IV	0,6/1 kV	COPPER	5	2 x 6	0,31	3,9	1	PVC	0,1	Copper wires	Bipolar		
GSCC028/60	CO (*)	330608	III	0,6/1 kV	COPPER	B	2x12AWG	\	3,31	1,14	PVC	-		Bipolar	black	numbers

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GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/61	IT	349166	IV	0,6/1 kV	COPPER	5	3 x 1,5	0,26	1,8	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/62	IT	349167	IV	0,6/1 kV	COPPER	5	3 x 2,5	0,26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/63	RO	633174	III	0,6/1 kV	COPPER	5	3 x 2,5	0,26	2,4	0,8	PVC/HEPR	-		Multipolar		
GSCC028/64	IT	349168	IV	0,6/1 kV	COPPER	5	3 x 4	0,31	3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/65	RO	633124	III	0,6/1 kV	COPPER	5	3 x 4	0,31	3	1	PVC/HEPR	-		Multipolar		
GSCC028/66	IT	349169	IV	0,6/1 kV	COPPER	5	3 x 6	0,31	3,9	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/67	IT	349171	IV	0,6/1 kV	COPPER	5	3 x 16	0,41	6,3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/68	IT	349181	IV	0,6/1 kV	COPPER	5	4 x 1,5	0,26	1,8	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/69	IT	349182	IV	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/70	RO	633127	III	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,8	PVC/HEPR	-		Multipolar		
GSCC028/71	IT	349183	IV	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/72	RO	633128	III	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	PVC/HEPR	-		Multipolar		
GSCC028/73	IT	349184	IV	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/74	RO	633129	III	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	1	PVC/HEPR	-		Multipolar		
GSCC028/75	IT	349185	IV	0,6/1 kV	COPPER	5	4 x 10	0,41	5,1	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/76	IT	349186	IV	0,6/1 kV	COPPER	5	4 x 16	0,41	6,3	1	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/77	IT	349187	IV	0,6/1 kV	COPPER	5	4 x 25	0,41	7,8	1,2	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/78	IT	351052	IV	0,6/1 kV	COPPER	5	7 x 1,5	0,26	1,8	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/79	IT	351053	IV	0,6/1 kV	COPPER	5	7 x 2,5	0,26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/80	IT	351057	IV	0,6/1 kV	COPPER	5	12 x 2,5	0,26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/81	IT	351073	IV	0,6/1 kV	COPPER	5	16 x 2,5	0,26	2,4	0,8	PVC/HEPR	0,1	Two helically wound copper tapes	Multipolar	light blue	Colour
GSCC028/82	IT	351000	III	0,6/1 kV	COPPER	5	5 x 1,5	0,26	1,8	0,8	PVC/HEPR	-		Multipolar	light blue	Colour
GSCC028/83	IT	351002	III	0,6/1 kV	COPPER	5	7 x 1,5	0,26	1,8	0,8	PVC/HEPR	-		Multipolar	light blue	Colour
GSCC028/84	IT	351003	III	0,6/1 kV	COPPER	5	7 x 2,5	0,26	2,4	0,8	PVC/HEPR	-		Multipolar	light blue	Colour
GSCC028/85	IT	351007	III	0,6/1 kV	COPPER	5	12 x 2,5	0,26	2,4	0,8	PVC/HEPR	-		Multipolar	light blue	Colour
GSCC028/86	IT	351023	III	0,6/1 kV	COPPER	5	16 x 2,5	0,26	2,4	0,8	PVC/HEPR	-		Multipolar	light blue	Colour
GSCC028/87	PE	330561	V	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,8	XLPE	-		Multipolar	black	numbers
GSCC028/88	PE	330562	V	0,6/1 kV	COPPER	5	8 x 2,5	0,26	2,4	0,8	XLPE	-		Multipolar	black	numbers
GSCC028/89	PE	330563	V	0,6/1 kV	COPPER	5	12 x 2,5	0,26	2,4	0,8	XLPE	-		Multipolar	black	numbers
GSCC028/90	PE	330564	V	0,6/1 kV	COPPER	5	16 x 2,5	2,26	2,4	0,8	XLPE	-		Multipolar	black	numbers
GSCC028/91	PE	330565	V	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	XLPE	-		Multipolar	black	numbers
GSCC028/92	PE	330566	VII	0,6/1 kV	COPPER	5	1 x (2 x 0,6 + 0,6) mm2	\	\	\	XLPE	0,1	Aluminium tape	Multipolar	black	numbers
GSCC028/93	PE	330567	VII	0,6/1 kV	COPPER	5	6 x (2 x 0,6 + 0,6) mm2	\	\	\	XLPE	0,1	Aluminium tape	Multipolar	black	numbers
GSCC028/94	PE	330568	VII	0,6/1 kV	COPPER	5	20 x (2 x 0,6 + 0,6) mm2	\	\	\	XLPE	0,1	Aluminium tape	Multipolar	black	numbers
GSCC028/95	CL	340016	VI	0,6/1 kV	COPPER	5	9 x 1	0,21	1,5	\	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/96	CL	340014	VI	0,6/1 kV	COPPER	5	19 x 1	0,21	1,5	\	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/97	CL	340024	VI	0,6/1 kV	COPPER	5	27 x 1	0,21	1,5	\	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/98	CL	340020	VI	0,6/1 kV	COPPER	5	3 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/99	CL	340017	VI	0,6/1 kV	COPPER	5	5 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/100	CL	340015	VI	0,6/1 kV	COPPER	5	9 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/101	CL	340025	VI	0,6/1 kV	COPPER	5	19 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/102	CL	340023	VI	0,6/1 kV	COPPER	5	27 x 2,5	0,26	2,4	0,8	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/103	CL	340019	VI	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/104	CL	340018	VI	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	1	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/105	CL	340012	VI	0,6/1 kV	COPPER	5	4 x 16	0,41	6,3	1	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/106	CL	340006	VI	0,6/1 kV	COPPER	2	4 x 4	0,31	3	1	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers



**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/107	CL	340005	VI	0,6/1 kV	COPPER	2	4 x 6	0,31	3,9	1	XLPE	0,1	helically arranged copper strip	Multipolar	black	numbers
GSCC028/108	BR	310585	IV	0,6/1 kV	COPPER	5	3 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/109	BR	350493	IV	0,6/1 kV	COPPER	5	4 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/110	BR	310586	IV	0,6/1 kV	COPPER	5	3 x 2,5	0,26	2,4	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/111	BR	310597	IV	0,6/1 kV	COPPER	5	6 x 2,5	0,26	2,4	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/112	BR	310598	IV	0,6/1 kV	COPPER	5	12 x 2,5	0,26	2,4	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/113	BR	350500	IV	0,6/1 kV	COPPER	5	12 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires			
GSCC028/114	BR	310582	IV	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/115	BR_SP	323299	III	0,6/1 kV	COPPER	5	6 x 4	0,31	3	1	PVC	-		Multipolar		
GSCC028/116	BR	310599	IV	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/117	BR	340320	IV	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/118	BR	166444	IV	0,6/1 kV	COPPER	5	4 x 10	0,41	5,1	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/119	BR	340307	IV	500 V	COPPER	5	4 x 1				PVC	0,1	Copper wires	Multipolar		
GSCC028/120	BR	340312	IV	500V	COPPER	5	7 x 1				PVC	0,1	Copper wires	Multipolar		
GSCC028/121	BR	340369	III	0,6/1 kV	COPPER	5	2 x 4	0,31	3	1	PVC	-		Bipolar		
GSCC028/122	BR	350722	IV	0,6/1 kV	COPPER	5	2 x 1,5	0,26	1,8	0,7	PVC	0,1	Copper wires	Bipolar		
GSCC028/123	BR	330827	IV	0,6/1 kV	COPPER	5	7 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/124	BR	330826	IV	0,6/1 kV	COPPER	5	7 x 2,5	0,26	2,4	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/125	BR_SP	323279	III	0,6/1 kV	COPPER	5	3 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		
GSCC028/126	BR_SP	323280	III	0,6/1 kV	COPPER	5	2 x 4	0,31	3	1	PVC	-		Bipolar		
GSCC028/127	BR_SP	323281	III	0,6/1 kV	COPPER	5	5 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		
GSCC028/128	BR_SP	323284	IV	0,6/1 kV	COPPER	5	3 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/129	BR_SP	323292	III	0,6/1 kV	COPPER	5	2 x 1,5	0,26	1,8	0,7	PVC	-		Bipolar		
GSCC028/130	BR_SP	323293	III	0,6/1 kV	COPPER	5	7 x 4	0,31	3	1	PVC	-		Multipolar		
GSCC028/131	BR_SP	323296	III	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	PVC	-		Multipolar		
GSCC028/132	BR_SP	323297	III	0,6/1 kV	COPPER	5	7 x 6	0,31	3,9	1	PVC	-		Multipolar		
GSCC028/133	BR_SP	323312	III	0,6/1 kV	COPPER	5	2 x 6	0,31	3,9	1	PVC	-		Bipolar		
GSCC028/134	BR_SP	323492	III	0,6/1 kV	COPPER	5	4/7 x 2,5/1	0,26	2,4	0,8	PVC	-		Multipolar		
GSCC028/135	BR_SP	323635	III	0,6/1 kV	COPPER	5	7 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		
GSCC028/136	BR_SP	323636	IV	0,6/1 kV	COPPER	5	4 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/137	BR_SP	323637	IV	0,6/1 kV	COPPER	5	2 x 1,5	0,26	1,8	0,7	PVC	0,1	Copper wires	Bipolar		

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/138	BR_SP	323638	IV	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/139	BR_SP	323639	IV	0,6/1 kV	COPPER	5	7 x 6	0,31	3,9	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/140	BR_SP	323640	IV	0,6/1 kV	COPPER	5	7 x 4	0,31	3	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/141	BR_SP	323642	IV	0,6/1 kV	COPPER	5	2 x 4	0,31	3	1	PVC	0,1	Copper wires	Bipolar		
GSCC028/142	BR_SP	323643	IV	0,6/1 kV	COPPER	5	4 x 4	0,31	3	1	PVC	0,1	Copper wires	Multipolar		
GSCC028/143	BR_SP	323647	IV	0,6/1 kV	COPPER	5	5 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/144	BR	340026	III	0,6/1 kV	COPPER	5	4/7 x 2,5/1	0,26	2,4	0,8	PVC	-		Multipolar		
GSCC028/145	BR_SP	323840	III	0,6/1 kV	COPPER	5	4 x 16	0,41	6,3	1	PVC	-		Multipolar		
GSCC028/146	BR_SP	323648	IV	0,6/1 kV	COPPER	5	7 x 1,5	0,26	1,8	0,8	PVC	0,1	Copper wires	Multipolar		
GSCC028/147	CO (*)	330613	III	0,6/1 kV	COPPER	B	4x9AWG	\	6,63	1,14	PVC	-		Multipolar	black	numbers
GSCC028/148	CO (*)	330611	III	0,6/1 kV	COPPER	B	4x12AWG	\	3,31	1	PVC	-		Multipolar	black	numbers
GSCC028/149	CO (*)	330614	III	0,6/1 kV	COPPER	B	7x12AWG	\	3,31	1	PVC	-		Multipolar	black	numbers
GSCC028/150	CO (*)	330612	III	0,6/1 kV	COPPER	B	12x12AWG	\	3,31	1	PVC	-		Multipolar	black	numbers
GSCC028/151	RO	633102	VI	450/750 V	COPPER	5	3 x 2,5	0,26	2,4	0,8	XLPE	-		Multipolar		Colour
GSCC028/152	RO	633131	VI	450/750 V	COPPER	5	3 x 25 + 16	0,41	7,8	1,2	XLPE	-		Multipolar		Colour
GSCC028/153	RO	633103	VI	450/750 V	COPPER	5	5 x 2,5	0,26	2,4	0,8	XLPE	-		Multipolar		Colour
GSCC028/154	RO	633122	VI	450/750 V	COPPER	5	4 x 1,5	0,26	1,8	0,8	XLPE	-		Multipolar		Colour
GSCC028/155	RO	633123	VI	450/750 V	COPPER	5	4 x 4	0,31	3	1	XLPE	-		Multipolar		Colour
GSCC028/156	RO	633104	VI	450/750 V	COPPER	5	4 x 10	0,41	5,1	1	XLPE	-		Multipolar		Colour
GSCC028/157	RO	631158	III	300/500 V	COPPER	5	2 x 1	0,21	1,5	\	PVC	-		Multipolar		Colour
GSCC028/158	RO	631159	III	300/500 V	COPPER	5	3 x 1	0,21	1,5	\	PVC	-		Multipolar		Colour
GSCC028/159	RO	631160	III	300/500 V	COPPER	5	4 x 1	0,21	1,5	\	PVC	-		Multipolar		Colour
GSCC028/160	RO	631161	III	300/500 V	COPPER	5	5 x 1	0,21	1,5	\	PVC	-		Multipolar		Colour

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/161	RO	631162	III	300/500 V	COPPER	5	2 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/162	RO	631163	III	300/500 V	COPPER	5	3 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/163	RO	631164	III	300/500 V	COPPER	5	4 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/164	RO	631165	III	300/500 V	COPPER	5	5 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/165	RO	631166	III	300/500 V	COPPER	5	2 x 2,5	0,26	2,4	0,8	PVC	-		Multipolar		Colour
GSCC028/166	RO	631167	III	300/500 V	COPPER	5	3 x 2,5	0,26	2,4	0,8	PVC	-		Multipolar		Colour
GSCC028/167	RO	631168	III	300/500 V	COPPER	5	4 x 2,5	0,26	2,4	0,8	PVC	-		Multipolar		Colour
GSCC028/168	RO	631169	III	300/500 V	COPPER	5	5 x 2,5	0,26	2,4	0,8	PVC	-		Multipolar		Colour
GSCC028/169	RO	631170	III	300/500 V	COPPER	5	2 x 4	0,31	3	1	PVC	-		Multipolar		Colour
GSCC028/170	RO	631171	III	300/500 V	COPPER	5	3 x 4	0,31	3	1	PVC	-		Multipolar		Colour
GSCC028/171	RO	631172	III	300/500 V	COPPER	5	4 x 4	0,31	3	1	PVC	-		Multipolar		Colour
GSCC028/172	RO	631173	III	300/500 V	COPPER	5	5 x 4	0,31	3	1	PVC	-		Multipolar		Colour
GSCC028/173	RO	633132	III	450/750 V	COPPER	5	3 x 25 + 16	0,41	7,8	1,2	PVC/HEPR	-		Multipolar		Colour
GSCC028/174	RO	633133	III	450/750 V	COPPER	5	3 x 35 + 16	0,41		1,2	PVC/HEPR	-		Multipolar		Colour
GSCC028/175	RO	633125	III	0,6/1 kV	COPPER	5	12 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/176	RO	633126	III	0,6/1 kV	COPPER	5	19 x 1,5	0,26	1,8	0,8	PVC	-		Multipolar		Colour
GSCC028/177	ES	160053	VIII	0,6/1 kV	COPPER	5	2 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/178	ES	160054	VIII	0,6/1 kV	COPPER	5	2 x 4	0,31	3	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour



**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/179	ES	160055	VIII	0,6/1 kV	COPPER	5	2 x 6	0,31	3,9	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/180	ES	160056	VIII	0,6/1 kV	COPPER	5	2 x 10	0,41	5,1	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/181	ES	160057	VIII	0,6/1 kV	COPPER	5	2 x 16	0,41	6,3	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/182	ES	160058	VIII	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/183	ES	160059	VIII	0,6/1 kV	COPPER	5	4 x 4	0,31	3	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/184	ES	160080	VIII	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/185	ES	160081	VIII	0,6/1 kV	COPPER	5	4 x 10	0,41	5,1	0,7	XLPE (DIX 3)	-		Multipolar	green	Colour
GSCC028/186	ES	160094	IX	0,6/1 kV	COPPER	5	2 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/187	ES	160095	IX	0,6/1 kV	COPPER	5	2 x 4	0,31	3	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/188	ES	160096	IX	0,6/1 kV	COPPER	5	2 x 6	0,31	3,9	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/189	ES	160097	IX	0,6/1 kV	COPPER	5	2 x 10	0,41	5,1	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/190	ES	160098	IX	0,6/1 kV	COPPER	5	2 x 16	0,41	6,3	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/191	ES	160099	IX	0,6/1 kV	COPPER	5	4 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/192	ES	160100	IX	0,6/1 kV	COPPER	5	4 x 4	0,31	3	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/193	ES	160101	IX	0,6/1 kV	COPPER	5	4 x 6	0,31	3,9	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/194	ES	160102	IX	0,6/1 kV	COPPER	5	4 x 10	0,41	5,1	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/195	ES	160103	IX	0,6/1 kV	COPPER	5	6 x 1	0,21	1,5	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/196	ES	160104	IX	0,6/1 kV	COPPER	5	6 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

GS Type Code	Distribution Company	Material code	Type	Voltage	Conductor material	Conductor class (Acc to IEC 60228)	Number of conductors per section [n° mm2]	Conductor wire diameter (MAX) [mm]	Maximum diameters of circular copper conductors [mm]	Average insulation thickness (MIN) [mm]	Insulation material	Screen thickness(MIN) [mm]	Screen type	Const Charact	Outer sheath colour	Cond ident
GSCC028/197	ES		IX	0,6/1 kV	COPPER	5	7 x 1	0,21	1,5	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/198	ES		IX	0,6/1 kV	COPPER	5	7 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/199	ES		IX	0,6/1 kV	COPPER	5	7 x 4	0,31	3	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/200	ES		IX	0,6/1 kV	COPPER	5	7 x 6	0,31	3,9	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/201	ES	160107	IX	0,6/1 kV	COPPER	5	10 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/202	ES	160108	IX	0,6/1 kV	COPPER	5	10 x 4	0,31	3	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/203	ES	160109	IX	0,6/1 kV	COPPER	5	14 x 1	0,21	1,5	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/204	ES	160110	IX	0,6/1 kV	COPPER	5	14 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/205	ES	160111	IX	0,6/1 kV	COPPER	5	24 x 1	0,21	1,5	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/206	ES	160112	IX	0,6/1 kV	COPPER	5	24 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/207	ES	160113	IX	0,6/1 kV	COPPER	5	37 x 1	0,21	1,5	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers
GSCC028/208	ES	160114	IX	0,6/1 kV	COPPER	5	37 x 2,5	0,26	2,4	0,7	XLPE (DIX 3)	0,1	Copper spiral tape	Multipolar	black	numbers

(\*)Conductor acc to ASTM B 3, minimum number of conductor wires is 7.

**Table 4 List of components, main characteristics**

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

## 7.2 SERVICE CONDITIONS

### 7.2.1. General service conditions

*No special service conditions apply.*

### 7.2.2. Specific service conditions

Colombia (Enel Distribución Colombia): the reference altitude is 2.700 m

## 7.3 TECHNICAL CHARACTERISTICS

### 7.3.1. Type of cables

The following table describes briefly the different types of cables specified in this document.

TYPE	DESCRIPTION
I	Single core cables, flexible copper conductor, PVC/HEPR insulated, fire retardant.
II	Single core cables, flexible aluminum conductor, PVC/HEPR insulated, fire retardant.
III	Multicore cables, flexible copper conductors, PVC/HEPR insulated, fire retardant.
IV	Multicore cables with copper conductor, shielded copper (wires or tapes), PVC/HEPR insulated, PVC outer sheath.
V	Multicore control cables with flexible copper conductor XLPE insulation, PE (ST8) outer sheath without halogens
VI	Multicore shielded control armored cables with flexible copper conductors under XLPE insulation, PVC outer sheath
VII	Multipolar cables with flexible copper conductors bundled on three (2 phases, 1 neutral), aluminum foil screen, XLPE insulation PE (ST8) outer sheath without halogens
VIII	Industrial cables of rated voltage 0,6/1kV. Part 4: XLPE insulated and polyolefin sheathed cables. (*)
IX	Multi-core XLPE-insulated and polyolefin-sheathed cables of rated voltage 0.6/1 kV, resistant to flame propagation, for fixed wiring in control circuits. (**)
(*) per la Spagna (type RZ1-K according to UNE 21123-4)	
(**) per la Spagna (type ROZ1-K according to UNE 211627)	

**Table 5**

The typical layout of cables is shown in Figure 1 to 7.

The different parts of the cables are depicted in section 7.4.

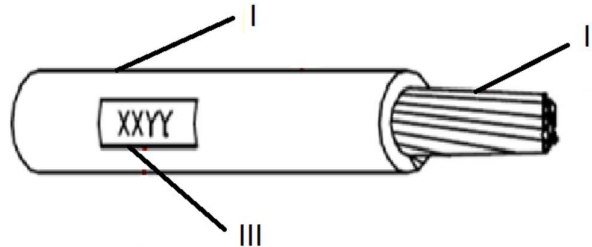
**Application Areas**

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

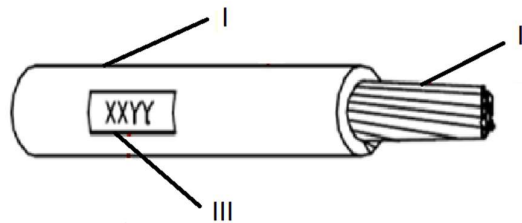


**Figure 1 Schematic drawing of Type I cables**

I – Cu Conductor

III – Marking

II – PVC or HEPR Insulation



**Figure 2 Schematic drawing of Type II cables**

I – Al Conductor

III – Marking

II – PVC or HEPR Insulation

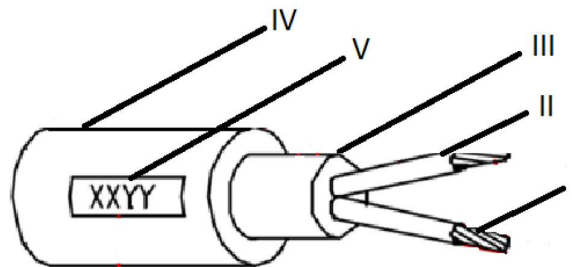
**Application Areas**

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -



**Figure 3 Schematic drawing of Type III cable**

I – Cu Conductor

II – PVC or HEPR Insulation

V – Marking

III – Filler

IV – Outer Sheath

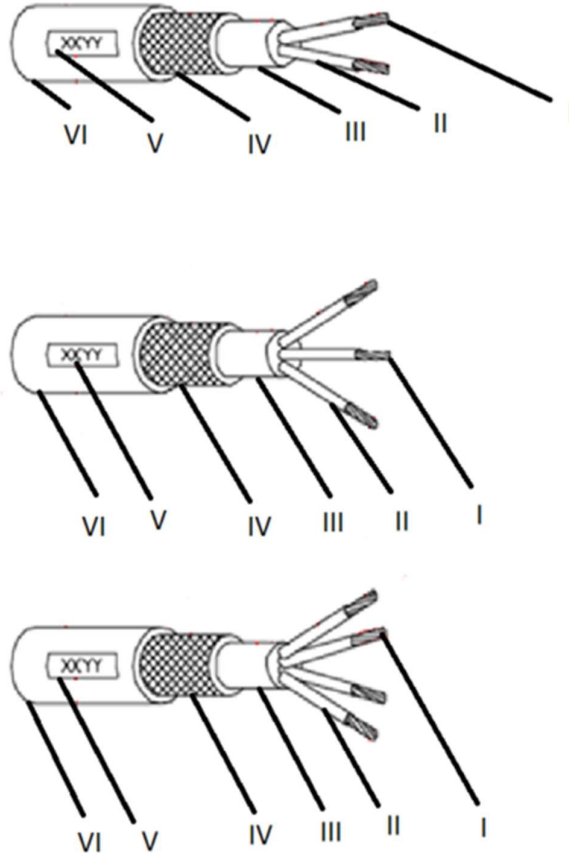
**Application Areas**

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -



**Figure 4 Schematic drawing of Type IV cable**

I – Cu Conductor

II – PVC or HEPR Insulation

III – Filler

IV – Al Screen

V – Marking

VI - Outer Sheath

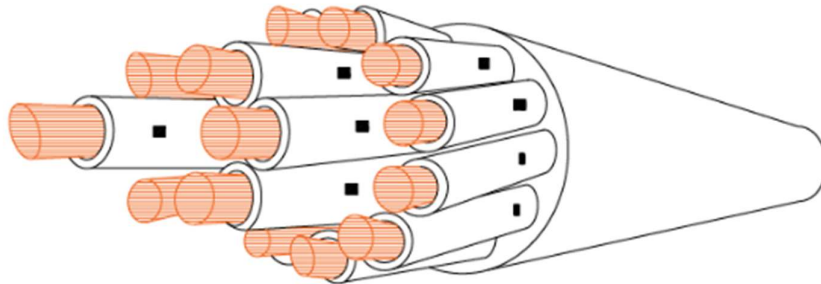
**Application Areas**

Perimeter: *Global*

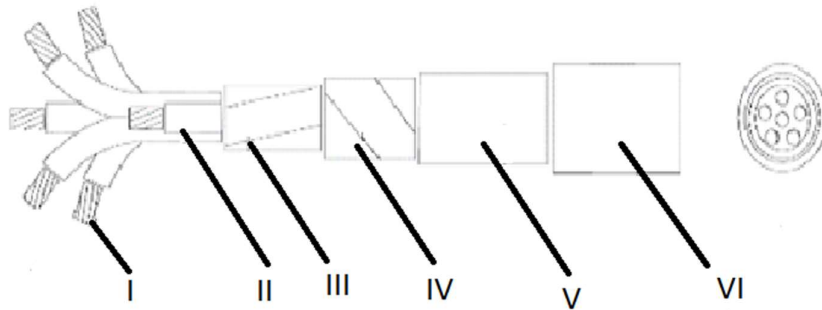
Staff Function: -

Service Function: -

Business Line: *Enel Grids* -



**Figure 5 Schematic drawing of Type V cable**



I – Cu Conductor

II – Insulation

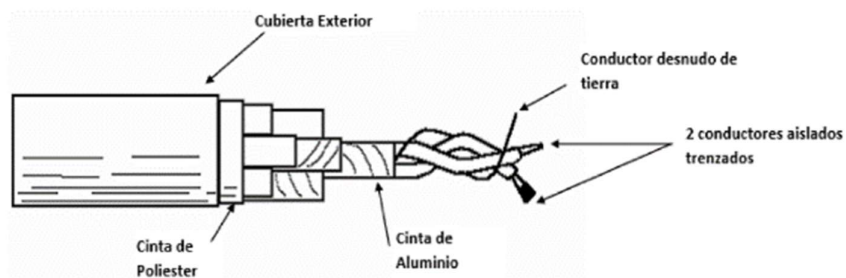
III – Filler

IV– Separator tape

V – Armouring

VI – Outer Sheath

**Figure 6 Schematic drawing of Type VI cable**



**Figure 7 Schematic drawing of Type VII cable**

**Application Areas**

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

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**Figure 8 Schematic drawing of type VIII cable.**



**Figure 9 Schematic drawing of type IX cable.**

**Note: Figures are for illustrative purposes only.**

Enel could request for each type of cables a sustainable solution based among others upon:

- Cable whose outer sheath is made of polyolefin of vegetable origin;
- Cables with a percentage of recycled material (in the conductor and/or sheathing)

## 7.4 CONSTRUCTION CHARACTERISTICS

### 7.4.1. CONDUCTOR

For all types, the conductor class is defined in table 4 according to IEC60228.

In Table 6 and 7, aluminum and copper conductors main features are depicted.



**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

Nominal cross-section [mm <sup>2</sup> ]	Minimum number of wires	Diameter of conductors [mm]		Maximum resistance of conductor at 20°C [Ω/km]
		Minimum	Maximum	
2,5	\	\	\	\
4	\	\	\	\
6	\	\	\	\
10	7	3,4	3,7	3,08
16	7	4,1	4,6	1,91
25	7	5,2	5,7	1,2
35	7	6,1	6,7	0,668
50	19	7,2	7,8	0,641
70	19	8,7	9,4	0,443
95	19	1,3	11,0	0,32
120	37	1,6	12,4	0,253
150	37	12,9	13,8	0,206
185	37	14,5	15,4	0,164
240	37	16,7	17,6	0,125
300	61	18,8	19,8	0,1

**Table 6** Aluminum conductors characteristics according to IEC 60228 (Class 2).

Nominal cross-section [mm <sup>2</sup> ]	Minimum number of wires	Diameter of conductors [mm]		Maximum resistance of conductor at 20°C [Ω/km]
		Minimum	Maximum	
0,75	7	\	1,3	26,7
1	7	\	1,5	20,0
1,5	7	\	1,8	13,7
2,5	7	\	2,4	8,21
4	7	\	3,0	5,09
6	7	\	3,9	3,39
10	7	\	5,1	1,95
16	7	\	6,3	1,24
25	7	\	7,8	0,795
35	7	\	9,2	0,565
50	19	\	11,0	0,393
95	19	\	15,1	0,210
120	37	\	17,0	0,164
150	37	\	19,0	0,132
185	37	\	21,0	0,108

**Tabella 7** Copper conductors characteristics according to IEC 60228 (Class 5).

**Application Areas**Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

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Copper purity shall not be less than 99,9 %.

For cable classified as “sustainable solution” the conductor material (Copper or Aluminum) shall contain more than 10% of recycled material.

This case, the conductor material shall be compliant with the characteristics required in this Global Standard.

**7.4.2.INSULATION**

The insulation shall be applied by a suitable extrusion process and shall form a compact and homogenous body. In addition, it shall be possible to remove without creating any damage to the conductor.

The insulating material shall be PVC, HEPR cross-linked polyethylene (XLPE) as defined as per table 4.

The PVC insulation must allow maximum conductor temperatures of 70 °C in normal operation and 160 °C under short circuit condition by at least 5 seconds.

The HEPR insulation must allow maximum conductor temperatures of 90 °C in normal operation and 250 °C under short circuit condition by at least 5 seconds.

The XLPE insulation must allow maximum conductor temperatures of 90 °C in normal operation and 250 °C under short circuit condition by at least 5 seconds.

The minimum thickness of insulation measured and accepted at any point of the cable shall not be less than 90% of the nominal value minus 0,1 mm. In addition, the average of all these measures should not be less than the nominal thickness.

$$t_{min} \geq 0,9 t_n - 0,1$$

Where:

$t_{min}$ : minimum insulation thickness in millimeters

$t_n$  : nominal thickness in millimeters

In Table 8 nominal and minimum thickness for XLPE insulated cables are shown:

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

Cross-section [mm <sup>2</sup> ]	PVC		XLPE - HEPR		EPR	
	Insulation nominal thickness [mm]	Insulation minimum thickness [mm]	Insulation nominal thickness [mm]	Insulation minimum thickness [mm]	Insulation nominal thickness [mm]	Insulation minimum thickness [mm]
0,75	\	\	\	\	\	\
1	\	\	\	\	\	\
1,5	0,8	0,62	0,7	0,53	1,0	0,8
2,5	0,8	0,62	0,7	0,53	1,0	0,8
4	1,0	0,8	0,7	0,53	1,0	0,8
6	1,0	0,8	0,7	0,53	1,0	0,8
10	1,0	0,8	0,7	0,53	1,0	0,8
16	1,0	0,8	0,7	0,53	1,0	0,8
25	1,2	0,98	0,9	0,71	1,2	0,98
35	1,2	0,98	0,9	0,71	1,2	0,98
50	1,4	1,16	1,0	0,8	1,4	1,16
70	1,4	1,16	1,1	0,89	1,4	1,16
95	1,6	1,34	1,1	0,89	1,6	1,34
120	1,6	1,34	1,2	0,98	1,6	1,34
150	1,8	1,52	1,4	1,16	1,8	1,52
185	2,0	1,7	1,6	1,34	2,0	1,7
240	2,2	1,88	1,7	1,43	2,2	1,88
300	2,4	2,06	1,8	1,52	2,4	2,06

**Table 8** Insulation thickness

**Application Areas**Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

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**7.4.3. FILLER****7.4.3.1. Central Fillers**

It shall consist of non-hygroscopic textile yarn or by a combination of an extruded compound based on non-vulcanized elastomeric material with textile yarn and that not contaminating insulation and easy to be removed from the cores. The central filler is mandatory for conductor cross-section greater than 25 mm<sup>2</sup>

**7.4.3.2. Overall Fillers**

It shall consist of an extruded compound based on non-vulcanized elastomeric material non-hygroscopic and that not contaminating insulation and easy to be removed from the cores. It shall be penetrate between the cores and must allow easy separation of the concentric conductor wires and cover the laid up cores without gaps. It could be replaced by the inner covering

**7.4.3.3. Inner covering**

Over the cores assembly shall be applied an inner covering consisting of a cylindrical layer of extruded compound. It shall be based on a non-vulcanized non-hygroscopic elastomeric material and may be extruded or lapped. Optionally, a synthetic tape may be applied helically over the laid up of cores

**7.4.4. OUTER SHEATH**

For those type of cables including an outer sheath, it shall be resistant to moisture and abrasion. In addition, it shall be free from heavy metals or volatile hydrocarbons.

The outer sheath material shall be PVC RZ/PE (ST8)/PO as described in each type (see table 5).

The outer sheath shall be adhered to the insulation.

The nominal outer sheath thickness is given by:

$$T_{nom} = 0,035xD + 1$$

Where:

t<sub>min</sub>: minimum thickness in millimeters

t<sub>n</sub> : nominal thickness in millimeters

The minimum thickness of the outer sheath measured and accepted at any point of the cable shall not be less than 85% of the nominal value minus 0,1 mm. In addition, the average of all these measures should not be less than the nominal thickness.

$$t_{min} \geq 0,85 t_n - 0,1$$

Where:

t<sub>min</sub>: minimum thickness in millimeters

t<sub>n</sub> : nominal thickness in millimeters

**Application Areas**Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids* -

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**7.4.5. COSTRUCTION CHARACTERISTICS FOR SPAIN**

The construction characteristics must be adapted to the above tables and in accordance with UNE 21123-4 and UNE 211627. Also the markings and designations.

**7.5 DESIGNATION OF THE CABLE AND FIRE REACTION CLASS****7.5.1.Cable designation**

For UE, conforming to RPC UE N. 305/2011.

For European cables, the fire reaction class must be, according to EN 50575, (Cca-s3;d1;a3), while for Spain it is (Cca-s1b, d1, a1).

**7.6 TESTING**

EN 50395 Electrical test methods for low-voltage energy cables

IEC 60332 Series "Tests on electric and optical fibre cables under fire conditions"

EN 60754-1 Testing of gases emitted during combustion of materials taken from cables

EN 50363-0 Insulating, sheathing and covering materials for low-voltage energy cables

IEC 60811 Electric and fibre optic cables - Test methods for non-metallic materials

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

## 8. LOCAL SECTION

If the insulation is black, all conductors must be clearly identified by sequential numbering indicated on the insulation, which differs from country to country.

LOCAL SECTION A – e-distributie (Romania)

Fisa Tehnica	Diametru Ø [mm <sup>2</sup> ]	Coloare
FT-027_TLT/1N	1,5	Negru
FT-027_TLT/2N	2,5	Negru
FT-027_TLT/3N	4	Negru
FT-027_TLT/4N	6	Negru
FT-027_TLT/5N	10	Negru
FT-027_TLT/6N	16	Negru
FT-027_TLT/7N	25	Negru
FT-027_TLT/1M	1,5	Maro
FT-027_TLT/2M	2,5	Maro
FT-027_TLT/3M	4	Maro
FT-027_TLT/4M	6	Maro
FT-027_TLT/5M	10	Maro
FT-027_TLT/6M	16	Maro
FT-027_TLT/7M	25	Maro
FT-027_TLT/1G	1,5	Gri
FT-027_TLT/2G	2,5	Gri
FT-027_TLT/3G	4	Gri

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

FT-027_TLT/4G	6	Gri
FT-027_TLT/5G	10	Gri
FT-027_TLT/6G	16	Gri
FT-027_TLT/7G	25	Gri
FT-027_TLT/1A	1,5	Albastru Deschis
FT-027_TLT/2A	2,5	Albastru Deschis
FT-027_TLT/3A	4	Albastru Deschis
FT-027_TLT/4A	6	Albastru Deschis
FT-027_TLT/5A	10	Albastru Deschis
FT-027_TLT/6A	16	Albastru Deschis
FT-027_TLT/7A	25	Albastru Deschis
FT-027_TLT/1GV	1,5	Galben-Verde
FT-027_TLT/2GV	2,5	Galben-Verde
FT-027_TLT/3GV	4	Galben-Verde
FT-027_TLT/4GV	6	Galben-Verde
FT-027_TLT/5GV	10	Galben-Verde
FT-027_TLT/6GV	16	Galben-Verde
FT-027_TLT/7GV	25	Galben-Verde

**LOCAL SECTION B – Enel distribución (Perú)**

Nº de Conductor	Color de Aislamiento
1	Blanco
2	Rojo
3	Negro
4	Violeta
5	Azul
6	Naranja
7	Marrón
8	Gris
9	Blanco - Azul
10	Blanco - Naranja
11	Blanco - Marrón
12	Blanco - Gris
13	Rojo - Azul
14	Negro - Naranja
15	Violeta - Naranja
16	Violeta - Gris

**LOCAL SECTION C – Enel Distribución Chile**

**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

- Class 2 conductor (type I and VI)

Conductor Nº	Inscripción
1	1 Azul
2	2 Negro
3	3 Rojo
4	4 Blanco

- Class 5 conductor (other types)

1	1 NEGRO	20	20 ROJO/VERDE
2	2 BLANCO	21	21 NARANJA/VERDE
3	3 ROJO	22	22 NEGRO/BLANCO/ROJO
4	4 VERDE	23	23 BLANCO/NEGRO/ROJO
5	5 NARANJA	24	24 ROJO/NEGRO/BLANCO
6	6 AZUL	25	25 VERDE/NEGRO/BLANCO
7	7 BLANCO/NEGRO	26	26 NARANJA/NEGRO/BLANCO
8	8 ROJO/NEGRO	27	27 AZUL/NEGRO/BLANCO
9	9 VERDE/NEGRO	28	28 NEGRO/ROJO/VERDE
10	10 NARANJA/NEGRO	29	29 BLANCO/ROJO/VERDE
11	11 AZUL/NEGRO	30	30 ROJO/NEGRO/VERDE
12	12 NEGRO/BLANCO	31	31 VERDE/NEGRO/NARANJA
13	13 ROJO/BLANCO	32	32 NARANJA/NEGRO/VERDE
14	14 VERDE/BLANCO	33	33 AZUL/BLANCO/NARANJA
15	15 AZUL/BLANCO	34	34 NEGRO/BLANCO/NARANJA
16	16 NEGRO/ROJO	35	35 BLANCO/ROJO/NARANJA
17	17 BLANCO/ROJO	36	36 NARANJA/BLANCO/AZUL
18	18 NARANJA/ROJO	37	37 BLANCO/ROJO/AZUL
19	19 AZUL/ROJO		



**Application Areas**

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids* -

**LOCAL SECTION D – Enel Codensa (Colombia)**

COND. No.	COLOR BASE-TRAZA							
	4x9	2x12	4x12	7x12	8x12	10x12	12x12	19x12
	AWG	AWG	AWG	AWG	AWG	AWG	AWG	AWG
1	Negro	Negro	Negro	Negro	Amarillo	Amarillo	Negro	Negro
2	Blanco	Blanco	Blanco	Blanco	Azul	Azul	Blanco	Blanco
3	Rojo		Rojo	Rojo	Rojo	Rojo	Rojo	Rojo
4	Verde		Verde	Verde	Amarillo- Negro	Amarillo-Negro	Verde	Verde
5				Naranja	Azul-Negro	Azul-Negro	Naranja	Naranja
6				Azul	Rojo-Negro	Rojo-Negro	Azul	Azul
7				Blanco- Negro	Blanco	Amarillo- Blanco	Blanco- Negro	Blanco- Negro
8					Gris	Azul-Blanco	Rojo- Negro	Rojo- Negro
9						Rojo-Blanco	Verde- Negro	Verde- Negro
10						Blanco	Naranja- Negro	Naranja- Negro
11							Azul- Negro	Azul- Negro
12							Negro-Blanco	Negro-Blanco
13								Rojo-Blanco
14								Verde-Blanco
15								Azul-Blanco
16								Negro-Rojo
17								Blanco-Rojo
18								Naranja-Rojo
19								Azul-Rojo