

**IMPIANTO DI RETE PER LA CONNESSIONE 15 kV**  
**DELL'IMPIANTO FOTOVOLTAICO DELLA POTENZA DI 4.950 kW**  
**IREN GREEN GENERATION TECH S.R.L.**  
**UBICATI IN COMUNE DI TORTONA (AL) – S.C. BOSCO**

PROCEDURA AUTORIZZATIVA: AUTORIZZAZIONE UNICA AI SENSI DELL'ART. 12 D. LGS. 387/2003 E S.M.I.

**PROGETTO DEFINITIVO**

**PARTICOLARI COSTRUTTIVI**

**IDENTIFICAZIONE ELABORATO**

Livello prog.	Codice di rintracciabilità	Tipo docum.	N. elaborato	N. foglio	Tot. fogli	Nome file	Data	Scala
PD	355368246						08/2025	varie

**REVISIONI**

REV.	DATA		ESEGUITO	VERIFICATO	APPROVATO
1	05/2024	EMISSIONE	Dott.Ing.Bizzarri G	Dott.Ing.Bizzarri G	Dott.Ing.Bizzarri G
2	08/2025	REVISIONE	Dott.Ing.Bizzarri G	Dott.Ing.Bizzarri G	Dott.Ing.Bizzarri G

**PROGETTAZIONE**

FUTURO SOLARE 1 S.r.l.  
P.IVA 03013660349

IL RESPONSABILE TECNICO

  
Giacomo Bizzarri

IL DIRETTORE TECNICO

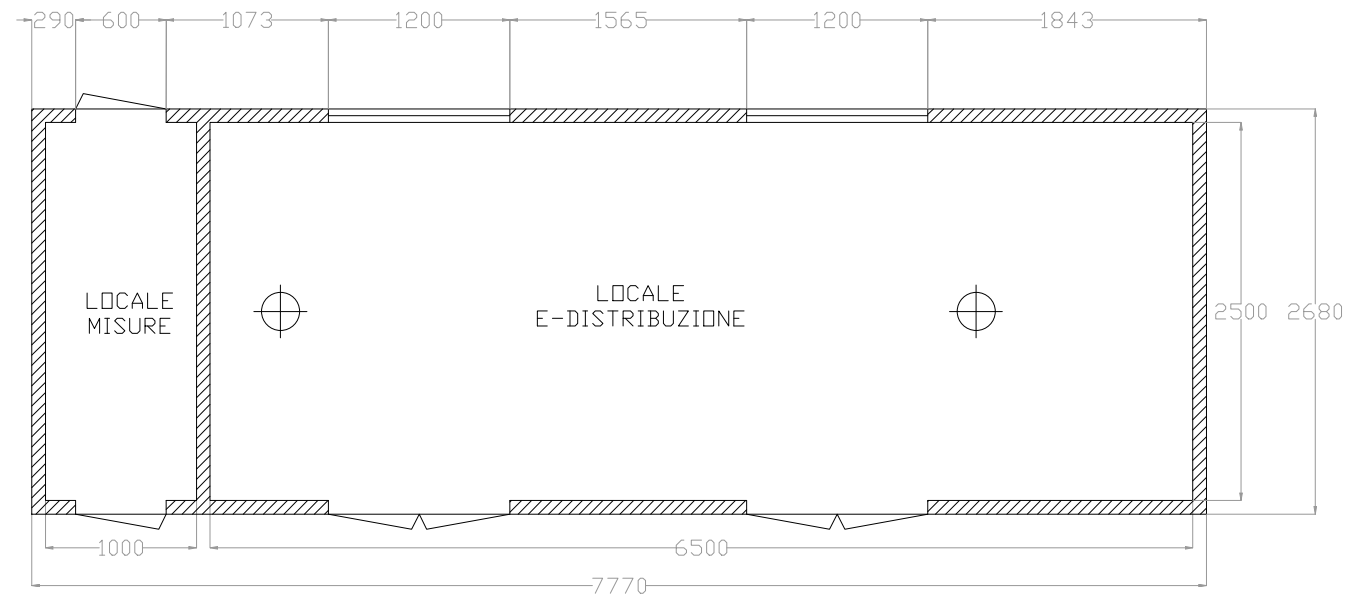
  
Giacomo Bizzarri

**GESTORE RETE ELETTRICA**

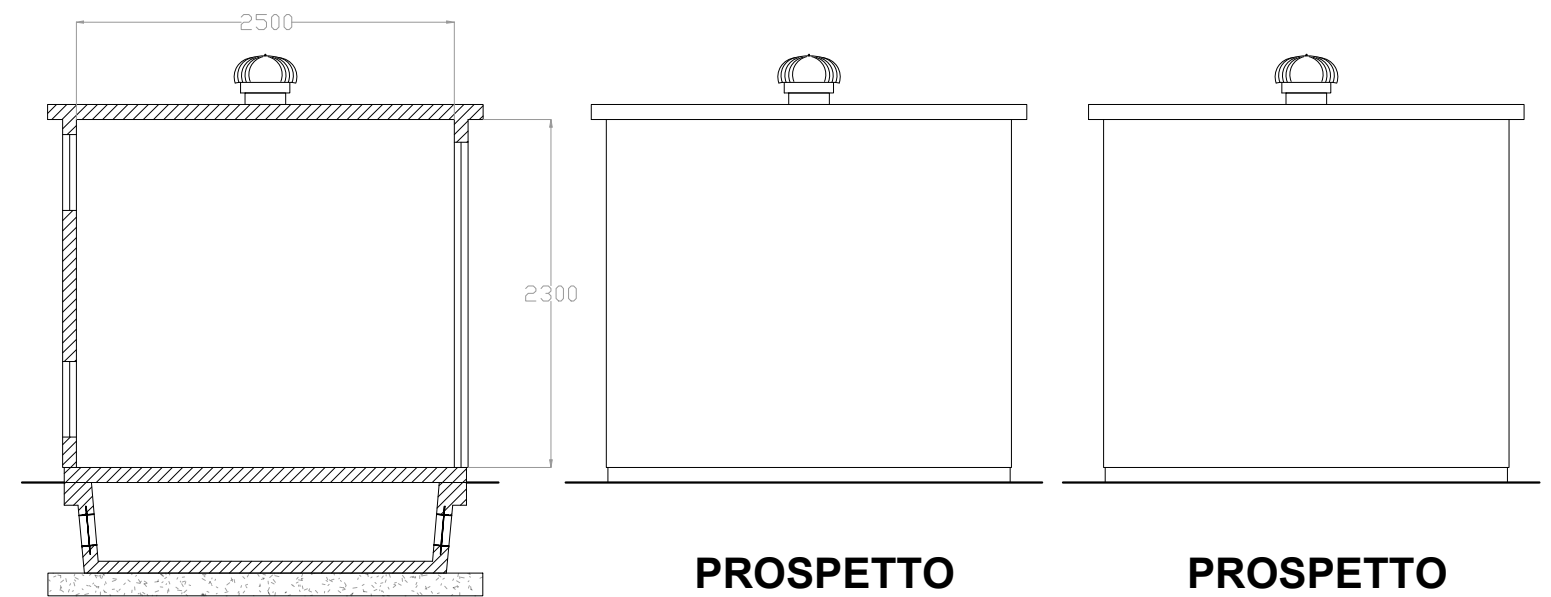
**PRODUTTORE**

**IREN GREEN GENERATION TECH S.R.L.**  
Corso Svizzera, 95  
10143 – Torino  
p.iva 10576731003  
REA TO-1306912

## CABINA DI CONSEGNA



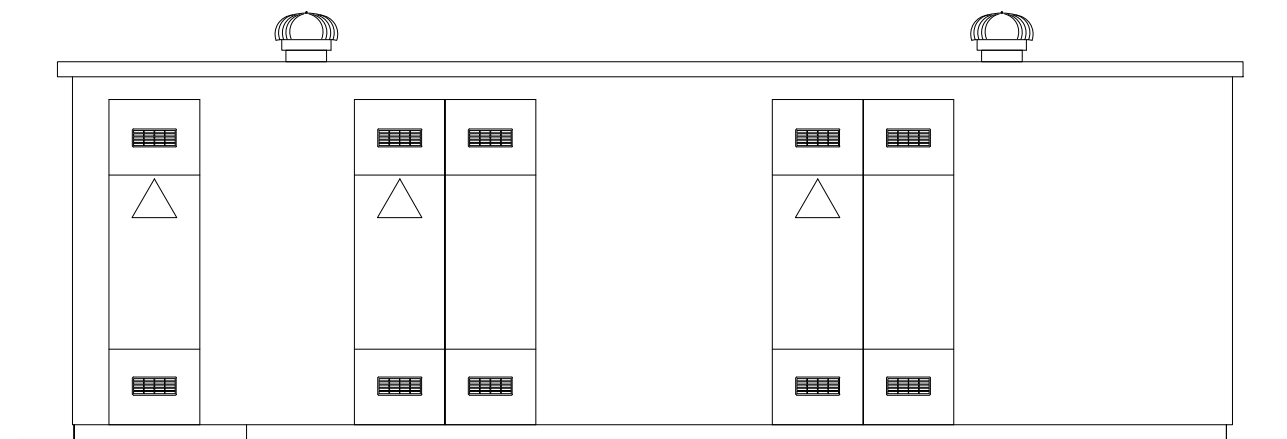
## PIANTA



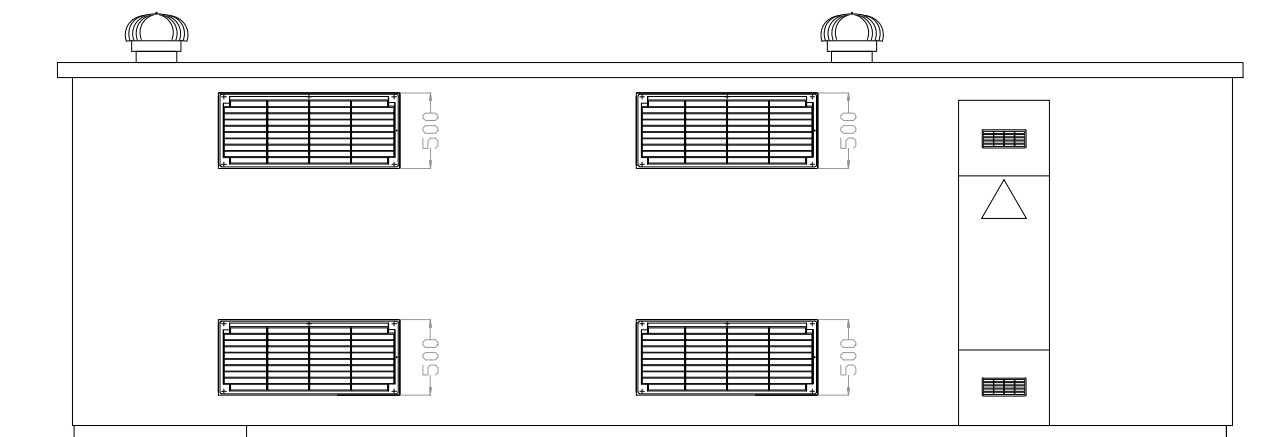
SEZIONE

**PROSPETTO  
LATERALE**

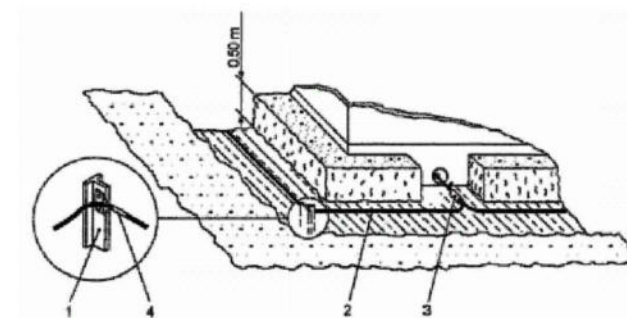
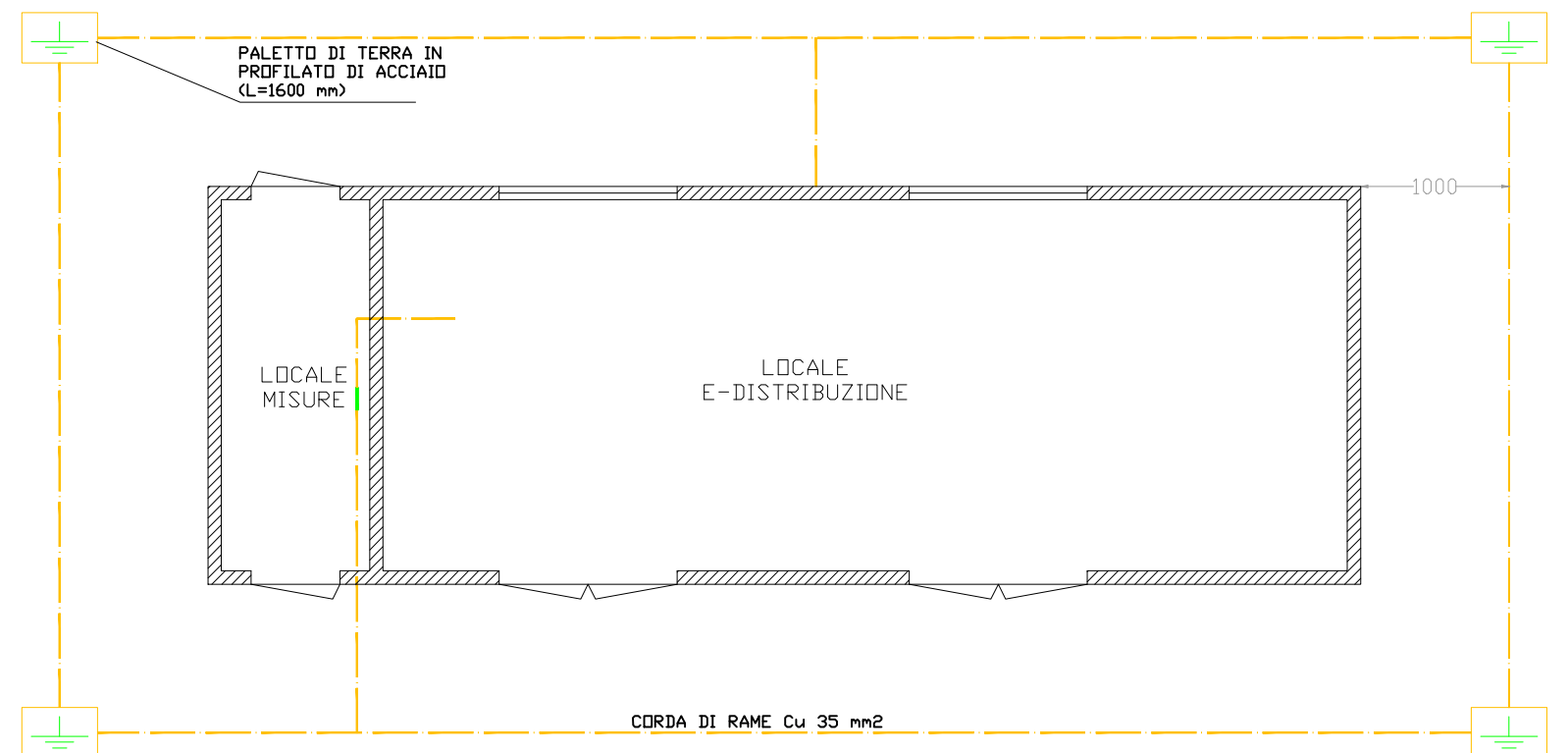
## PROSPETTO LATERALE



## PROSPETTO ESTERNO



## PROSPETTO INTERNO



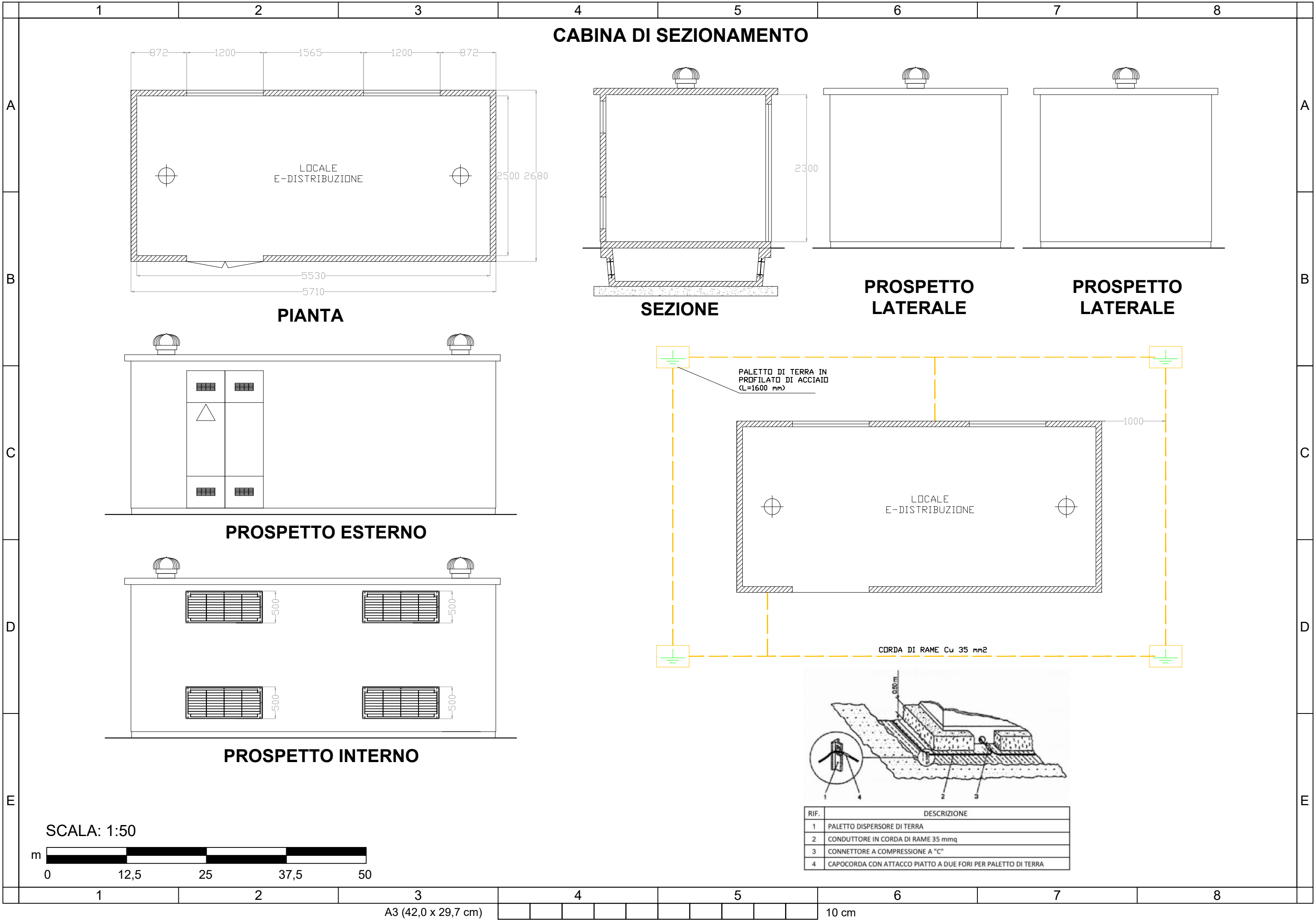
RIF.	DESCRIZIONE
1	PALEETTO DISPERSORE DI TERRA
2	CONDUTTORE IN CORDA DI RAME 35 mmq
3	CONNETTORE A COMPRESSIONE A "C"
4	CAPOCORDA CON ATTACCO PIATTO A DUE FORI PER PALEETTO DI TERRA

SCALA: 1:50



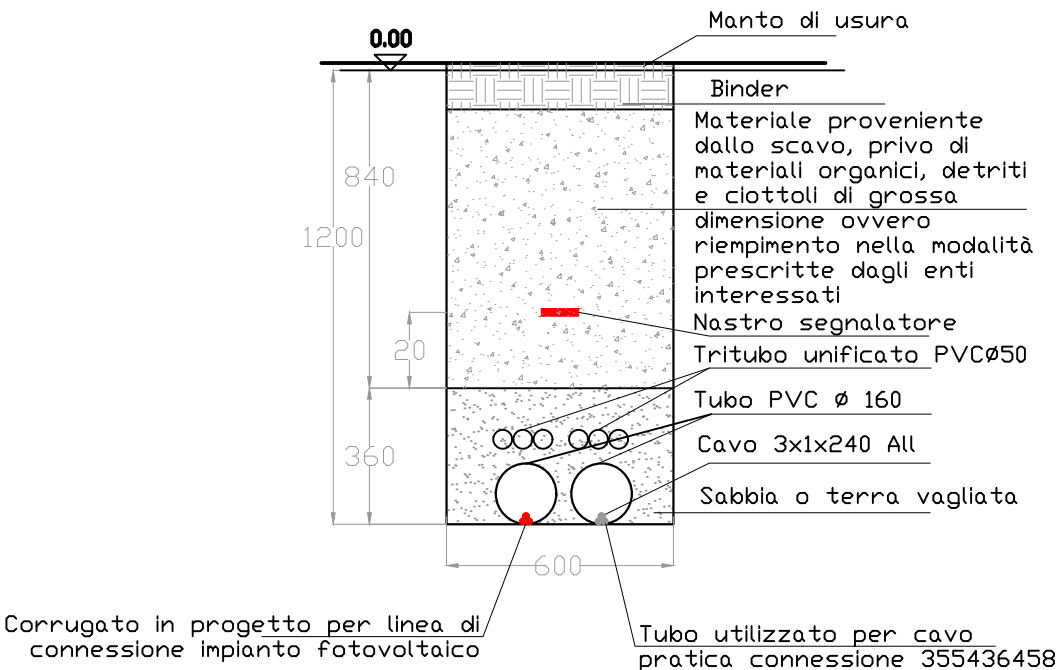
A3 (42,0 x 29,7 cm)

	10 cm
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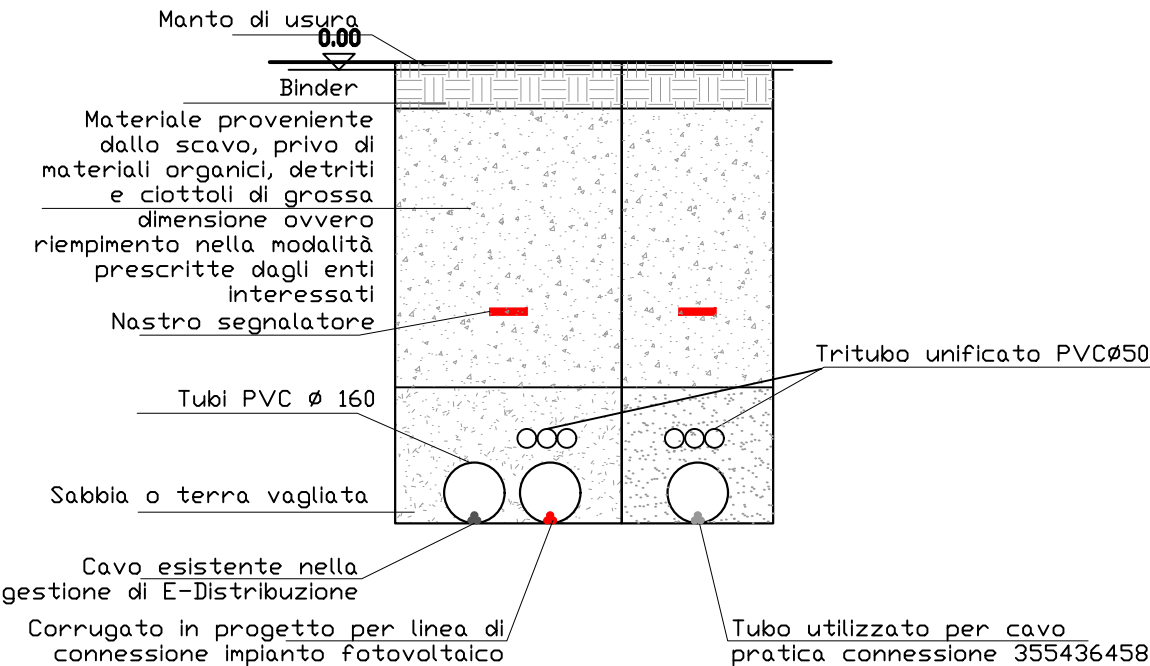


# TIPOLOGIE COSTRUTTIVE ELETTRODOTTO

## TRATTO DI POSA CAVIDOTTO PARALLELO AD ALTRA PRATICA CONNESSIONE



## TRATTO DI POSA PARALLELO A LINEA MT INTERRATA ESISTENTE




SCALA: 1:20 - SEZIONE CAVIDOTTO INTERRATO



### LEGENDA

PROGETTO	ESISTENTE	DA DEMOLIRE
  	  	  
		
		

PALI/CABINA SECONDARIA-CABINA SU PALO  
Linea 15 kV aerea in conduttori nudi  
Linea 15 kV in cavo sotterraneo  
Linea 15 kV in cavo aereo

	GLOBAL STANDARD	Page 7 of 38
	<b>TECHNICAL SPECIFICATION OF MEDIUM VOLTAGE CABLES WITH RATED VOLTAGE <math>U_0/U_c(U_m)</math> 8,7/15(17,5) kV, 12/20(24) kV, 15/25(31) kV, 18/30(36) kV AND 20/34,5(37,95) kV</b>	GSC001 Rev. 02 20/02/2015

- IEC 60410 ed1.0 1973-01-1 Sampling Plans and Procedures for Inspection by attributes
- HD 605 S2:2008 Electric cables - Additional test methods

### 3.3 LOCAL STANDARDS

See Local Section.

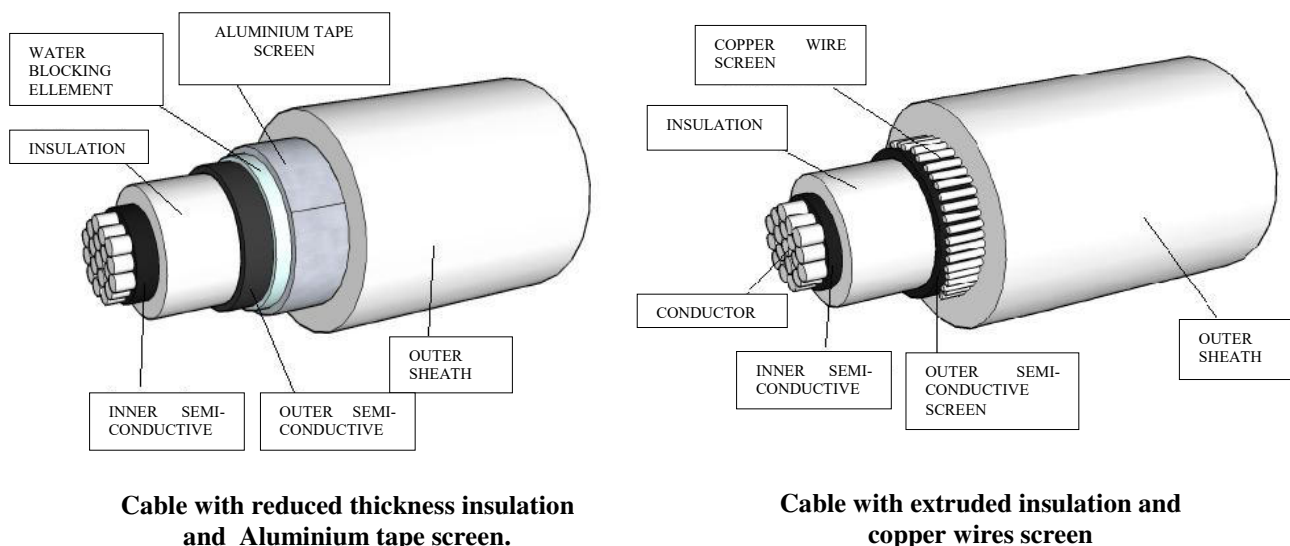
### 3.4 REPLACED LOCAL STANDARDS

See Local Section.

Under any doubt or discrepancy prevail indication of the Standard Reference. Likewise, any change in the Reference Standards updates this document.


## 4 TECHNICAL REQUIREMENTS

The types of cable considered in this Global Standard are shown in figure 1. The following sections provides technical information about the parts of the cable.



*Figure 1: Layout of single conductor of insulated cables*

Types of cables are defined in different sections and voltage level; the cables are single or three cores of aluminium or copper.

	GLOBAL STANDARD	Page 34 of 38
	<b>TECHNICAL SPECIFICATION OF MEDIUM VOLTAGE CABLES WITH RATED VOLTAGE <math>U_0/U_c(U_m)</math> 8,7/15(17,5) kV, 12/20(24) kV, 15/25(31) kV, 18/30(36) kV AND 20/34,5(37,95) kV</b>	GSC001 Rev. 02 20/02/2015

**C LOCAL SECTION– ENEL DISTRIBUZIONE (Italy), ENEL DISTRIBUTIE: Banat, Dobrogea, Muntenia (Romania)**

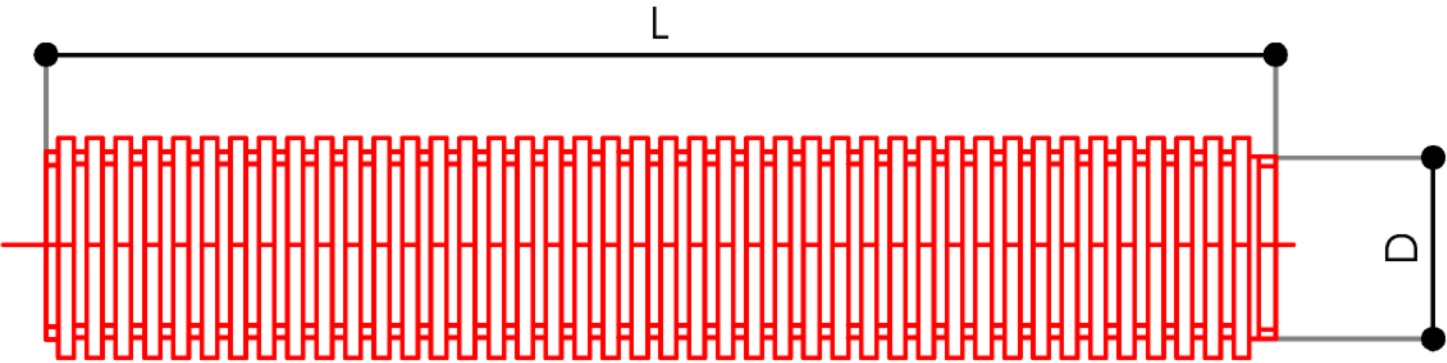
ITEM	TITLE	DESCRIPTION																																																					
3.2	INTERNATIONAL STANDARDS	<u>Distribuzione Enel (Italy)</u> <ul style="list-style-type: none"><li>• Directiva 2000/29/CE medidas de protección contra la introducción en la Comunidad de organismos nocivos para los vegetales o para los productos vegetales y contra su difusión en la Comunidad. – Unión Europea.</li><li>• ISO 2859: Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection.</li></ul>																																																					
3.3	LOCAL STANDARDS	<u>Distribuzione Enel (Italy)</u> <ul style="list-style-type: none"><li>• Standard UNI-CEI 2-1 and 2-2 (Type "A" - REUSABLE)</li><li>• Standard UNI-CEI 2-1 and 2-2 (Type "B" - NOT REUSABLE)</li><li>• CEI 20-86 Cavi Per Media Tensione Aventi Isolamento Estruso In Elastomero Termoplastico A Spessore Ridotto Con Schermo A Tubo Di Alluminio E Guaina Di Pe Cavi Con Tensione Nominale 12/20 kV.</li></ul> <u>Distribuzione Enel (Italy), Romania</u> <ul style="list-style-type: none"><li>• Standar PVR 006 Operational Note Vendor Rating Control: BARCODES Warranty and Traceability of Enel Distribution Materials</li></ul>																																																					
3.4	REPLACED	<u>Distribuzione Enel (Italy)</u> This Global Standard GSC001 replaced the following technical standard of ENEL: <ul style="list-style-type: none"><li>- NCDC4384: Norma Común, Cables para la distribución subterránea de energía eléctrica a tensión Uo/U = 12/20 kV con aislamiento reducido y pantalla de tubo de aluminio.</li></ul>																																																					
5.9	CURRENT - CARRYING CAPACITY OF CABLES	<u>Distribuzione Enel (Italy), Romania</u>  <b>Current-Carrying Capacity of Cables (ampacity)</b> <table><tr><th rowspan="2">Nominal cross-sectional area</th><th rowspan="2">Country Code</th><th rowspan="2">Type of Cables</th><th>Aluminium Cables</th></tr><tr><th>Current - Carrying Capacity (A)</th></tr><tr><td>35*</td><td>332262</td><td>I</td><td>140</td></tr><tr><td>50*</td><td>332263</td><td>I</td><td>170</td></tr><tr><td>95*</td><td>332264</td><td>I</td><td>255</td></tr><tr><td>150*</td><td>332265</td><td>I</td><td>340</td></tr><tr><td>95</td><td>332283</td><td>I</td><td>255</td></tr><tr><td>95</td><td>332283</td><td>IV</td><td>255</td></tr><tr><td>185</td><td>332284</td><td>I</td><td>360</td></tr><tr><td>185</td><td>332284</td><td>IV</td><td>360</td></tr><tr><td>185</td><td>332286</td><td>I</td><td>360</td></tr><tr><td>185</td><td>332286</td><td>IV</td><td>360</td></tr><tr><td>240</td><td>332285</td><td>I</td><td>490</td></tr><tr><td>240</td><td>332285</td><td>IV</td><td>490</td></tr></table> <p><i>* Overhead cable installed in air</i></p> <p>The values shown is for the following conditions:</p>	Nominal cross-sectional area	Country Code	Type of Cables	Aluminium Cables	Current - Carrying Capacity (A)	35*	332262	I	140	50*	332263	I	170	95*	332264	I	255	150*	332265	I	340	95	332283	I	255	95	332283	IV	255	185	332284	I	360	185	332284	IV	360	185	332286	I	360	185	332286	IV	360	240	332285	I	490	240	332285	IV	490
Nominal cross-sectional area	Country Code	Type of Cables				Aluminium Cables																																																	
			Current - Carrying Capacity (A)																																																				
35*	332262	I	140																																																				
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95*	332264	I	255																																																				
150*	332265	I	340																																																				
95	332283	I	255																																																				
95	332283	IV	255																																																				
185	332284	I	360																																																				
185	332284	IV	360																																																				
185	332286	I	360																																																				
185	332286	IV	360																																																				
240	332285	I	490																																																				
240	332285	IV	490																																																				

**NASTRO MONITORE PER INDICAZIONE DELLA PRESENZA DI CAVI ELETTRICI  
INTERRATI**

**CAVI ELETTRICI ENEL**

**CAVIDOTTI  
TUBO PROTETTIVO PIEGHEVOLE**

MATRICOLA	TIPO	D (mm)	L (m)
295510	DS 4247/1	25	50
295511	DS 4247/2	32	50
295512	DS 4247/3	50	50
295513	DS 4247/4	63	50
295514	DS 4247/5	125	50
<b>295515</b>	<b>DS 4247/6</b>	<b>160</b>	<b>25</b>
Norma di riferimento CEI EN 61386-22, CEI EN 50086-2-4/TIPO "N"			



**GIUNTI  
TAB ENEL GSCC004**



MATRICOLA	Sezione cavo mmq	Soluzione costruttiva	TABELLA	CONNETTORE
<b>271030</b>	<b>95 / 240</b>	<b>TAB ENEL GSCC004</b>		



# GLOBAL STANDARD

Page 13 of 17

12/20(24) kV AND 18/30(36) kV COLD SHRINK  
COMPACT JOINTS FOR  
MV UNDERGROUND CABLES

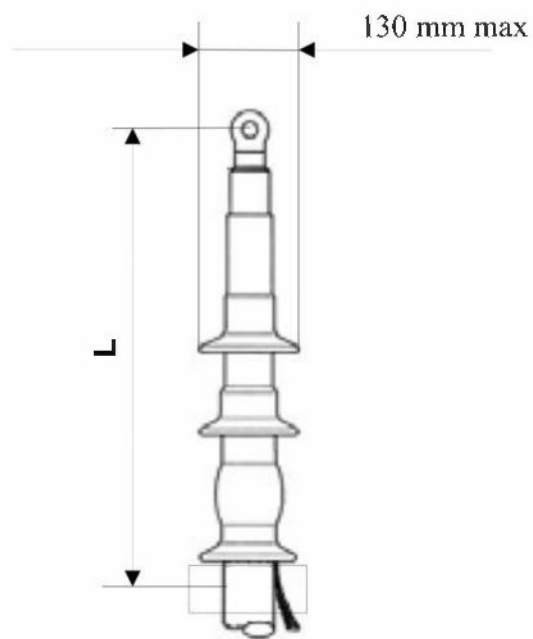
**GSCC004**

Rev. 0  
25/11/2015

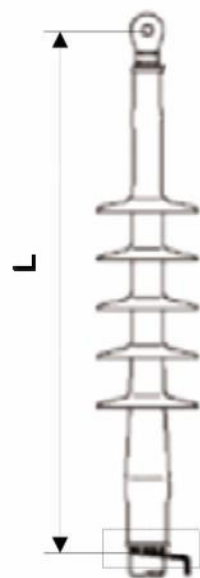
Distribution Company (Country)	Type: GSCC004/2					
Ampla (Brazil)	-	-	-	-	-	-
Chilectra (Chile)	-	-	6811535	6811536	6812035	6811537
Codensa (Colombia)	-	-	-	-	-	-
Coelce (Brazil)	-	-	-	-	-	-
Edelnor (Perù)	-	-	-	-	-	-
Edesur (Argentina)	-	-	-	-	-	-
Endesa Distribución Eléctrica (Spain)	-	-	-	6710249	6710250	-
Enel Distributie Banat (Romania); Enel Distributie Dobrogea (Romania); Enel Distributie Muntenia (Romania); Enel Distribuzione (Italy)	271026	271030	-	-	-	-
Characteristics of the cable						
Cable section (mm <sup>2</sup> )	35 ÷ 95	95 ÷ 240	70 ÷ 150	150 ÷ 240	240 ÷ 400	400 ÷ 630
Rated voltage $U_0/U$ ( $U_m$ ) (kV)	See Table 3					
Min/max diameter over insulation (mm)	16.4/22.7	20.7/32.2	19/32.2	27.3/37.2	29.8 /42.5	34.9/49.7

**Table 8 – Material codes cold shrink 18/30(36) kV compact joints**






**Fig. 1 Terminale per uso interno**



**Fig. 2 Terminale per uso esterno**

	<b>TERMINALI UNIPOLARI PER INTERNO E PER ESTERNO PER CAVI MT 12/20kV E CAVI MT 18/30 kV CON ISOLAMENTO ESTRUSO</b>	
DJ4457	NCDJ4457    Rev.: 01    Data: 20/05/2013	DND004

Tipo de terminación :		INTERIOR					
Referencia ENEL		273039		273041			
Referencia ENDESA		6710463	6710464		6710465	6710466	
Características del cable	Secciones del cable extruido con pantalla de tubo Al o hilos de Cu (mm <sup>2</sup> )	70 ÷ 240	400	70 ÷ 240	150 ÷ 240	400	
	Tensión nominal de aislamiento Uo/U (kV)	12/20			18/30		
	Diámetro min/max sobre el aislante (mm)	19 ÷ 32.2	32.1 ÷ 37.5	19 ÷ 32.2	27.3 ÷ 37.2	36.3 ÷ 42.5	
Tensiones de prueba	Tensión de ensayo a frecuencia industrial (kV)	50			70		
	Tensión de ensayo a impulso atmosférico (kV pico)	125			170		
Línea de fuga nominal mínima (mm)		420			420		
Altura max L (mm)		350			350		
Corrente nominale di corto circuito di breve durata		Según HD629-1 (EN 61442)					

	<b>TERMINALI UNIPOLARI PER INTERNO E PER ESTERNO PER CAVI MT 12/20kV E CAVI MT 18/30 kV CON ISOLAMENTO ESTRUSO</b>	
DJ4457	NCDJ4457    Rev.: 01    Data: 20/05/2013	DND004

Tipo de terminación :		EXTERIOR				
Características del cable	Referencia ENEL	273068	<div>273069</div>			
	Referencia ENDESA	6710251	6710252		6710461	6710462
	Secciones del cable extruido con pantalla de tubo Al o hilos de Cu (mm <sup>2</sup> )	70 ÷ 240	400		70 ÷ 240	150 ÷ 240
	Tensión nominal de aislamiento U <sub>0</sub> /U (kV)		12/20			18/30
	Diámetro min/max sobre el aislante (mm)	19 ÷ 32.2	32.1 ÷ 37.5	19 ÷ 32.2	27.3 ÷ 37.2	36.3 ÷ 42.5
Tensiones de prueba	Tensión de ensayo a frecuencia industrial (kV)	50			70	
	Tensión de ensayo a impulso atmosférico (kV pico)	125			170	
Línea de fuga nominal mínima (mm)		550			835	
Altura max L (mm)		450			450 ÷ 750	
Corrente nominale di corto circuito di breve durata		Según HD629-1 (EN 61442)				