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REVISIONE	DATA	DESCRIZIONE	PREPARATO	CONTROLLATO	VALIDATO

CODICE IDENTIFICATIVO ELABORATO

23_PD_23

SOCIETÀ PROPONENTE

TIMBRO E FIRMA

RIC ENERGY

CAPRARA SOLARE S.R.L.
Via Giuseppe Pozzone 5
20121 - Milano (Italia)
PEC: caprarasolare@legalmail.it
CF:12950530969

TITOLO INIZIATIVA

PROGETTO DEFINITIVO DI UN PROGETTO AGRIVOLTAICO DENOMINATO "RAMACCA IUDICA" CON POTENZA INSTALLATA PARI A 40.22592 MWp E POTENZA IN IMMISSIONE PARI A 40 MW CON 20 MW DI ACCUMULO SITO TRA LE CONTRADE ALBOSPINO,VAITA E VAITELLO, COMUNE DI RAMACCA (CT)

SOCIETÀ PROGETTAZIONE

TIMBRO E FIRMA TECNICO ABILITATO

E-PRIMA

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95030 Nicolosi (CT)
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Vicino Gianluca
Ordine degli Ingegneri della Provincia di Catania
Ingegnere
22.05.2024 17:58:51
GMT+01:00

FORMATO

A4

SCALA

FOGLIO

TITOLO DOCUMENTO

DATASHEET MAIN EQUIPMENT

LIVELLO DI PROGETTAZIONE

PROGETTO DEFINITIVO

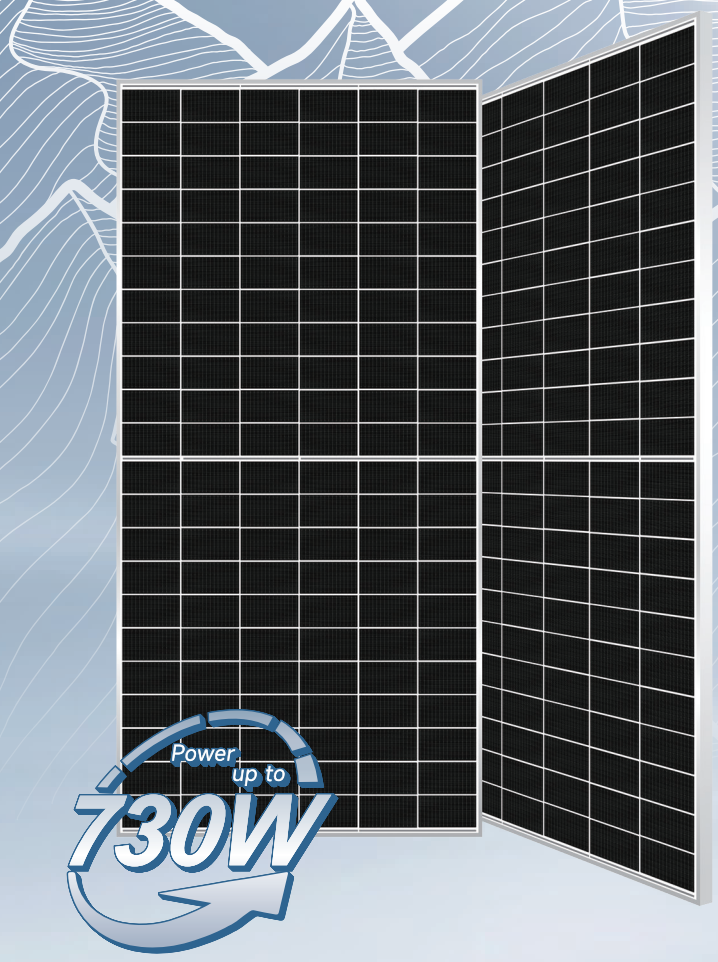
HUASUN

HETERO JUNCTION TECHNOLOGY

Himalaya G12 Series

710-730W

132-cell Bifacial HJT Half Cell Double-glass Solar Module



HJT Technology

Combining gettering process and μc-Si technology to ensure higher cell efficiency and higher module power.

-0.26%/℃ Pmax temperature coefficient

More stable power generation performance and even better in hot climate.

SMBB design with Half-Cut Technology

Shorter current transmission distance, less resistive loss and higher cell efficiency.

Up to 90% Bifaciality

Natrual symmetrical bifacial structure bringing more energy yield from the backside.

Sealing with PIB based sealant

Stronger water resistance, greater air impermeability to extent module lifespan.

Higher reliability

Industrial leading product and performance warranty, ensuring modules' consistent outstanding performance.

Suitable for Utility project

Lower BOS cost, lower LCOE.

WARRANTY

Product Warranty 15 years

Linear Power Warranty 30 years

TOP PERFORMER 2023 PVEL member of group kiwa PV MODULE RELIABILITY SCORECARD

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The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Anhui Huasun reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the latest version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.

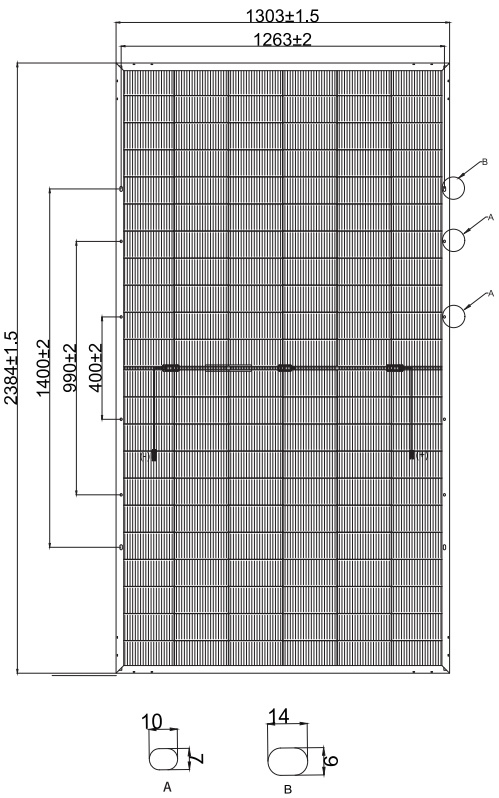
Himalaya G12 Series 710-730W

132-cell Bifacial HJT Solar Half Cell Module

- BloombergNEF Tier 1 PV module manufacturer
- Reinsurance underwritten by Ariel Re

Engineering Drawings

Unit: mm



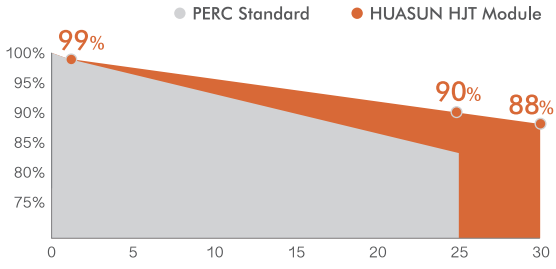
Temperature Characteristics

Nominal Operating Cell Temp. (NOCT)	44°C±2°C
Temperature Coefficient of Pmax	-0.26%/°C
Temperature Coefficient of Voc	-0.24%/°C
Temperature Coefficient of Isc	0.04%/°C

Safety & Warranty

Safety Class	Class II
Product Warranty	15 yrs Workmanship
Performance Warranty	30 yrs Linear Warranty*

* Less than 1% attenuation in the 1st year, the annual attenuation from the 2nd year is no more than 0.375%, and the power is no less than 88% until the 30th year.



* Refer to HUASUN standard warranty for details

Electrical Characteristics (STC*)

HS-210-B132	DS710	DS715	DS720	DS725	DS730
Maximum Power (Pmax)	710W	715W	720W	725W	730W
Module Efficiency (%)	22.86%	23.02%	23.18%	23.34%	23.50%
Optimum Operating Voltage (Vmp)	42.39V	42.54V	42.68V	42.83V	42.97V
Optimum Operating Current (Imp)	16.75A	16.81A	16.87A	16.93A	16.99A
Open Circuit Voltage (Voc)	50.44V	50.59V	50.74V	50.88V	51.03V
Short Circuit Current (Isc)	17.55Aa	17.61A	17.67A	17.73A	17.79A
Operating Module Temperature	-40 to +85°C				
Maximum System Voltage	DC1500V (IEC)				
Maximum Series Fuse	35A				
Power Tolerance	0~+5W				
Bifaciality	85%±5%				

*STC: Irradiance 1000 W/m², cell temperature 25°C, AM=1.5. Tolerance of Pmax is within +/- 3%.

BSTC**

Maximum Power (Pmax)	780W	785W	790W	795W	800W
Optimum Operating Voltage (Vmp)	42.39V	42.54V	42.68V	42.83V	42.97V
Optimum Operating Current (Imp)	18.41A	18.46A	18.51A	18.57A	18.62A
Open Circuit Voltage (Voc)	50.44V	50.59V	50.74V	50.88V	51.03V
Short Circuit Current (Isc)	19.28A	19.33A	19.39A	19.44A	19.50A

**BSTC: Front side irradiation 1000W/m², back side reflection irradiation 135W/m², AM=1.5, ambient temperature 25°C.

Mechanical Characteristics

Cell Type	HJT Mono 210×105mm
Cell Connection	132 (6×22)
Module Dimension	2384×1303×35 mm
Weight	38.7 kg
Junction Box	IP68
Output Cable	4mm², 300mm in length, length can be customized / UV resistant
Connectors Type	MC4 original / MC4 compatible
Frame	Anodised aluminum alloy
Front Load	5400 Pa
Rear Load	2400 Pa
Glass Thickness	Double glass, 2.0mm

Shipping Configurations

	HC
Container Size	40'
Pallets Per Container	18
Modules Per Pallet (pcs)	31
Modules Per Container (pcs)	558

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sales@huasunsolar.com customerservice@huasunsolar.com

SG350HX

Inverter di stringa multi-MPPT per sistemi a 1500 Vdc

NEW

RESA ELEVATA

- Fino a 16 MPPT con efficienza massima 99%
- 20 A per stringa, compatibilità con moduli da 500Wp+
- Scambio dati con sistema tracker, miglioramento della resa

BASSI COSTI

- Funzione Q at night, risparmio sull'investimento
- Power line communication (PLC)
- Diagnosi con Smart IV Curve*, O&M attivo

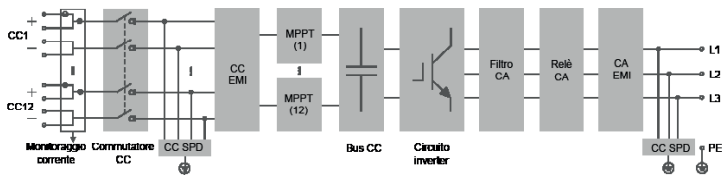
SUPPORTO ALLA RETE

- SCR≥1.16 funzionamento stabile in reti estremamente deboli
- Tempo di risposta della potenza reattiva <30ms
- Conforme al codice di rete globale

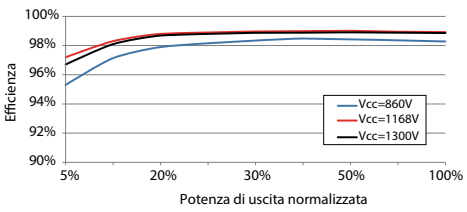
SICUREZZA

- 2 stringhe per MPPT, protezione del collegamento da inversione di polarità CC
- Interruttore CC integrato, spegnimento automatico in caso di guasti
- Monitoraggio dell'isolamento CA e CC in tempo reale 24 ore su 24

TOPOLOGIA



CURVA DI EFFICIENZA



ITALIA

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SUNGROW
Clean power for all

Designazione	SG350HX
Ingresso (CC)	
Tensione fotovoltaica in ingresso max.	1500 V
Tensione fotovoltaica in ingresso min. / Tensione di avvio	500 V / 550 V
Tensione nominale in ingresso	1080 V
Intervallo tensione MPP	500 V – 1500 V
Intervallo di tensione MPP per potenza nominale	860 V – 1300 V
N. di MPPT	12 (Opzionale: 14/16)
Numero max. stringhe fotovoltaiche per MPPT	2
Corrente max. in ingresso	12 * 40 A (Opzionale: 14 * 30 A / 16 * 30 A)
Corrente di cortocircuito max.	60 A
Uscita (CA)	
Potenza CA massima in uscita alla rete	352 kVA @ 30 °C / 320 kVA @ 40 °C / 295 kVA @ 50 °C
Potenza CA nominale in uscita	320 kW
Corrente CA max. in uscita	254 A
Tensione CA nominale	3 / PE, 800 V
Intervallo tensione CA	640 – 920 V
Frequenza di rete nominale / Intervallo f requenza di rete	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
Distorsione armonica totale (THD)	< 3 % (alla potenza nominale)
Iniezione di corrente CC	< 0.5 % In
Fattore di potenza alla potenza nominale / regolabile	> 0.99 / 0.8 in anticipo – 0.8 in ritardo
Fasi di immissione / fasi di connessione	3 / 3
Efficienza	
Efficienza max. / Efficienza europea / Efficienza CEC	99.01 % / 98.8 % / 98.5 %
Protezione	
Protezione da collegamento inverso CC	Si
Protezione corto circuito CA	Si
Protezione da dispersione di corrente	Si
Monitoraggio della rete	Si
Monitoraggio dispersione verso terra	Si
Sezionatore CC / Sezionatore CA	Si / No
Monitoraggio corrente stringa fotovoltaica	Si
Funzione erogazione reattiva notturna (Q at night)	Si
Protezione anti-PID e PID-recovery	Opzionale
Protezione sovratensione	CC Tipo II / CA Tipo II
Dati Generali	
Dimensioni (L x A x P)	1136*870*361 mm
Peso	≤ 116 kg
Metodo di isolamento	Senza trasformatore
Grado di protezione	IP66 (NEMA 4X)
Consumo energetico notturno	< 6 W
Intervallo di temperature ambiente di funzionamento	-30 to 60 °C
Intervallo umidità relativa consentita (senza condensa)	0 – 100 %
Metodo di raffreddamento	Raffreddamento ad aria forzata intelligente
Altitudine massima di funzionamento	4000 m (> 3000 m derating)
Display	LED, Bluetooth+APP
Comunicazione	RS485 / PLC
Tipo di collegamento CC	MC4-Evo2 (Max. 6 mm², opzionale 10 mm²)
Tipo di collegamento CA	Supporto terminali OT / DT (Max. 400 mm²)
Conformità	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4110:2018, VDE-AR-N 4120:2018, EN 50549-1/2, UNE 206007-1:2013, P.O.12.3, UTE C15-712-1:2013, UL1741, UL1741SA, IEEE1547, IEEE1547.1, CSA C22.2 107.1-01-2001, California Rule 21, UL1699B, CEI 0-16
Supporto rete	Funzione erogazione potenza reattiva notturna (Q at night), LVRT, HVRT, controllo potenza attiva e reattiva, velocità rampa di potenza, Q-U e P-f

*: Compatibile solo con logger Sungrow e iSolarCloud

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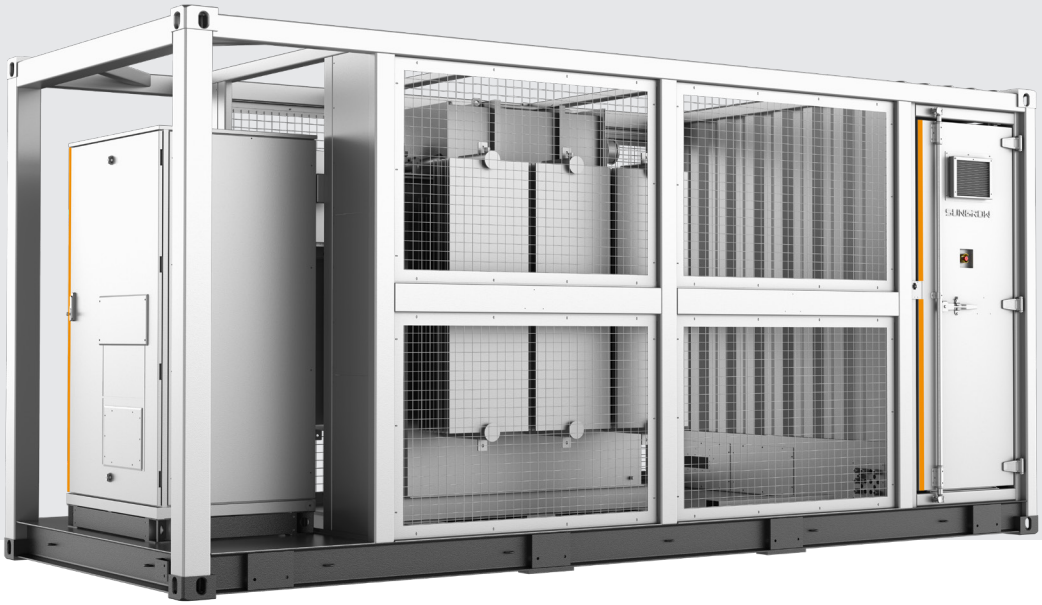
ITALIA

MVS3200/4480-LV

MV Turnkey Solution for 1500 Vdc String Inverter SG350HX



SAVED INVESTMENT

- Up to 4.48 MW block design
- Easy transportation due to standard container design
- All pre-assembled for easy set-up and commissioning

SAFETY

- MV and LV isolated, independent control room
- All key components front accessible, no need walk-in operation

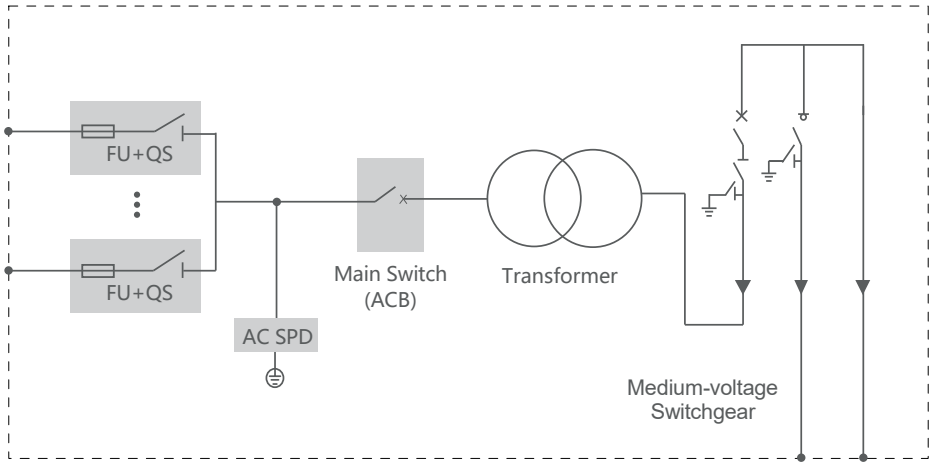
EASY O&M

- Online analysis for fast trouble shooting
- Modular design, main device easy replacement

RELIABLE

- All components type-tested
- Compliance with standards: IEC 60076, IEC 62271, IEC 61439

CIRCUIT DIAGRAM



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Type designation	MVS3200-LV	MVS4480-LV
Transformer		
Transformer type	Oil immersed	
Rated power	3200 kVA @ 40 ℃	4480 kVA @ 40 ℃
Max. power	3520 kVA @ 30 ℃	4928 kVA @ 30 ℃
Vector group	Dy11	
LV / MV voltage	0.8 kV / 10 – 35 kV	
Maximum input current at nominal voltage	2540 A	3557 A
Frequency	50 Hz / 60 Hz	
Tapping on HV	0 , ± 2 * 2.5 %	
Efficiency	≥99%	
Cooling type	ONAN (Oil Natural Air Natural)	
Impedance	7 % (± 10 %)	8 % (± 10 %)
Oil type	Mineral oil (PCB free)	
Winding material	Al / Al	
Insulation class	A	
MV switchgear		
Insulation type	SF6	
Rate voltage	24 kV – 36 kV	
Rate current	630 A	
Internal arcing fault	IAC AFL 20 kA / 1 s	
Qty. of feeder	3 feeders	
LV panel		
Main switch specification	4000 A / 800 Vac / 3P, 1 pcs	
Disconnector specification	260 A / 800 Vac / 3P, 10 pcs	260 A / 800 Vac / 3P, 14 pcs
Fuse specification	400A / 800 Vac / 1P, 30 pcs	400 A / 800 Vac / 1P, 42 pcs
Protection		
AC input protection	FUSE+Disconnector	
Transformer protection	Oil-temperature, oil-level, oil-pressure	
Relay protection	50/51,50N/51N	
LV overvoltage protection	AC Type II (optional: AC Type I + II)	
General Data		
Dimensions(W*H*D)	6058 mm * 2896 mm * 2438 mm	
Approximate weight	15 T	17 T
Operating ambient temperature range	-20 ℃ to 60 ℃ (optional: -30 ℃ to 60 ℃)	
Auxiliary transformer supply	5 kVA / 400 V (optional: max. 40 kVA)	
Degree of protection	IP54	
Allowable relative humidity range (non-condensing)	0 – 95 %	
Operating altitude	1000 m (standard) / > 1000 m (optional)	
Communication	Standard: RS485, Ethernet ; Optional: optical fiber	
Compliance	IEC 60076, IEC 62271-200, IEC 62271-202, IEC 61439-1, EN50588-1	

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SUNGROW
Clean power for all

MVS3460-LS

PowerTitan 2.0 MVS

Preliminary

Product name	MVS3460-LS
MV transformer	
Rated power	3460 kVA
MV / LV poltage	11 kV - 33 kV / 0.69 kV
Transformer vector	Dy11 (standard)
Insulation level	A
Rated frequency	50 Hz / 60 Hz
Impedance	7 % (tolerance -5 % - 10 %)
Material of winding (MV / LV)	Aluminum / Aluminum
Cooling method	ONAN
Degree of protection	Transformer body: IP68 , Other parts: IP55
RMU	
Rated voltage	24 kV / 36 kV
Rated current	630 A (50 Hz) / 600 A (60 Hz)
Units	DCV / CCV / CV / DV
Relay protection	ANSI 50 , 50N , 51 , 51N
Rated short-time withstand current	20 kA / 3 s or 25 kA / 1 s
Smart control cabinet	
Protection	AC Breaker
Surge protection	Type II
Meter for main circuit	Optional
AC insulation detection	Support
Temperature control method	Air cooling and HVAC
Degree of protection	IP55
UPS	15 min / 2 h / 3 h / 4 h
General data	
Dimensions (W * H * D)	6058 mm * 2896 mm * 2438 mm
Weight	14400 (± 500) kg
Cable entry	Bottom Entry
Degree of protection	IP55
Anti-corrosion degree	C4 (standard)
Operation ambient temperature range	-40˚C - 60˚C > 40 °C derating (standard) ; > 45 °C derating (optional)
Operation humidity range	0 % - 100 % (non-condensing)
Maximum operation altitude	4500 m
Standard	IEC 62271-202, IEC 61439
Communication	Ethernet, Optical fiber, RS485

* 15 min UPS only supplies power for the control and communication devices in the MVS.
** 2 / 3 / 4 h UPS supplies power for the control and communication devices in the MVS, and the ventilation system in the battery container.

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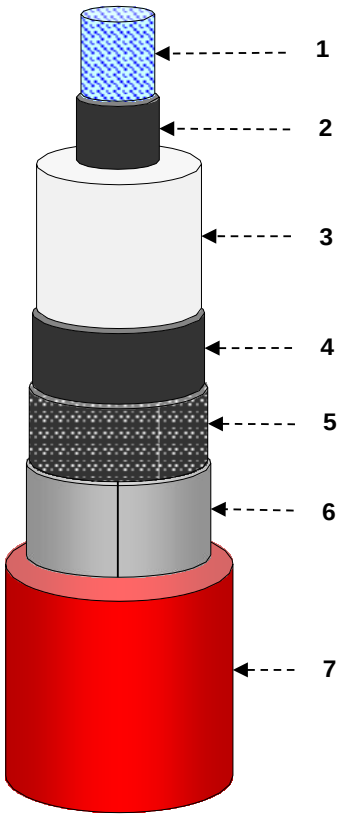
ARE4H5E
20,8/36kV
1x… SR/0,2

HIGH VOLTAGE POWER CABLES

SINGLE CORE CABLES WITH ALUMINIUM CONDUCTOR, REDUCED THICKNESS XLPE INSULATION, ALLUMINIUM TAPE SCREEN AND PE OUTER SHEATH, LONGITUDINAL AND RADIAL WATERTIGHTNESS

APPLICATIONS

In HV energy distribution networks for voltage systems up to **42kV**.
Suitable for fixed installation indoor or outdoor laying in air or directly or indirectly buried, also in wet location.



FUNCTIONAL CHARACTERISTICS

Rated voltage U_0/U:	**20,8/36**	kV
Maximum voltage U_m:	**42**	kV
Test voltage:	**2,5**	U_0
Max operating temperature of conductor:	**90**	°C
Max short-circuit temperature:	**250**	°C (max duration 5 s)
Max short-circuit temperature (screen):	**150**	°C

CONSTRUCTION

1. **Conductor**
   stranded, compacted, round ***aluminium*** *- class* ***2*** *acc. to IEC 60228*
2. **Conductor screen**
   extruded semiconducting compound
3. **Insulation**
   extruded ***XLPE*** *compound*
4. **Insulation screen**
   extruded semiconducting compound - ***fully bonded***
5. **Longitudinal watertightness**
   semiconducting ***water blocking tape***
6. **Metallic screen and radial water barrier**
   aluminium tape *longitudinally applied (nominal thickness = 0,20 mm)*
7. **Outer sheath**
   extruded ***PE*** *compound - colour:* ***red***

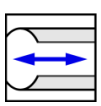
INSTALLATION DATA

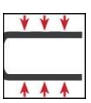
Max pulling force during laying
50 N/mm² (applied on the conductors)
Min bending radius during laying
14 D_{cable} (dynamic condition)
Min temperature during laying
- 25 °C (cable temperature)

STANDARDS

IEC 60840 where applicable *(testing)*
Nexans Design
HD 620 where applicable *(materials)*

MARKING by ink-jet of the following legend:
ARE4H5E 20,8/36kV 1x<S> <meter marking>"
<Year> = year of manufacturing
<S> = section of the conductor

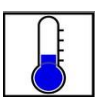

Longitudinal waterproof


Radial waterproof


Max operating temp. of conductor: **90 °C**


Max short-circuit temperature : **250 °C**


Max short-circuit temperature screen: **150 °C**


Minimum installation temperature: **-25 °C**

ARE4H5E 20,8/36kV 1x…														
Type	Conductor diameter nominal	Insulation		Sheath thickness nominal	Cable		Electrical resistance		X at 50 Hz	C	Current capacity		Short circuit current	
		thickness min	diameter nominal		diameter approx	weight indicative	at 20 °C - d.c. max	at 90 °C - a.c.			in ground at 20 °C	in free air at 30 °C	conductor Tmax 250°C	screen Tmax 150°C
n° x mm²	mm	mm	mm	mm	mm	kg/km	Ω/km	Ω/km	Ω/km	μF/km	A	A	kA x 1,0 s	kA x 0,5 s
1x120	13,1	7,9	30,7	2,2	**39,2**	**1.260**	0,253	0,325	0,125	0,185	**254**	**332**	11,3	2,2
1x150	14,3	7,6	31,3	2,2	**39,8**	**1.340**	0,206	0,265	0,121	0,201	**283**	**374**	14,2	2,2
1x185	16,0	7,4	32,6	2,2	**41,2**	**1.470**	0,1640	0,211	0,116	0,221	**321**	**430**	17,5	2,3
1x240	18,5	7,1	34,5	2,3	**43,4**	**1.690**	0,1250	0,161	0,110	0,252	**372**	**508**	22,7	2,3
1x300	20,7	6,8	36,1	2,3	**45,0**	**1.880**	0,1000	0,129	0,105	0,283	**419**	**583**	28,3	2,4
1x400	23,5	6,9	39,1	2,4	**48,3**	**2.220**	0,0778	0,101	0,101	0,308	**479**	**680**	37,8	2,6
1x500	26,5	7,0	42,6	2,5	**52,2**	**2.670**	0,0605	0,079	0,099	0,337	**547**	**792**	47,2	2,9
1x630	30,0	7,1	46,3	2,7	**56,4**	**3.220**	0,0469	0,063	0,096	0,367	**622**	**921**	59,5	3,0

Note

Laying condition: trefoil formation
depth (m): 0,8
soil thermal resistivity (°Cm/W): 1,5
metallic layers connection: solid bonding (earthed at both ends)

X = phase reactance
C = capacitance

FG7R - FG7OR 0,6/1 kV

NON PROPAGANTI LA FIAMMA, NON PROPAGANTI L'INCENDIO, BASSISSIMA EMISSIONE DI FUMI, GAS TOSSICI E CORROSIVI, ZERO ALOGENI
FLAME RETARDANT, FIRE RETARDANT, VERY LOW EMISSION OF SMOKE, TOXIC AND CORROSIVE GASES, HALOGEN FREE

RoHS 2002/95/EC CE

NON PROPAGANTE LA FIAMMA
FLAME RETARDANT

NON PROPAGANTE L'INCENDIO
FIRE RETARDANT
CEI EN 20-22 II

RIFERIMENTO NORMATIVO/*STANDARD REFERENCE*

Costruzione e requisiti/*Construction and specifications*	CEI 20-13 IEC 60502-1 CEI UNEL 35375 CEI UNEL 35377
Propagazione fiamma/*Flame propagation*	CEI EN 60332-1-2
Propagazione incendio/*Fire propagation*	CEI EN 20-22 II
Emissione gas corrosivi e alogenidrici/*Corrosive gases emission or halogens*	CEI EN 50267-2-1
Emissione di fumi (trasmittanza)/*Smoke density (trasmittance*	CEI EN 61034-2
Direttiva Bassa Tensione/*Low Voltage Directive*	2006/95/CE
Direttiva RoHS/*RoHS Directive*	2011/65/CE

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DESCRIZIONE:
Cavo per energia, isolato con gomma etilpropilenica ad alto modulo di qualità G7, sotto guaina di PVC, non propagante l'incendio e a ridotta emissione di gas corrosivi.

CARATTERISTICHE FUNZIONALI:
- Tensione nominale Uo/U: 0,6/1 kV
- Temperatura massima di esercizio: 90°C
- Temperatura minima di esercizio: -15°C (in assenza di sollecitazioni meccaniche)
- Temperatura minima di posa: 0°C
- Temperatura massima di corto circuito: 250°C
- Sforzo massimo di trazione (consigliato): 50 N/mm² di sezione del rame.
- Raggio minimo di curvatura: 4 volte il diametro del cavo.

CONDIZIONI DI IMPIEGO:
Adatto per l'alimentazione e trasporto di comandi e/o segnali nell'industria, nei cantieri, nell'edilizia residenziale.
Per installazione fissa all'interno e all'esterno. Installazione su murature e strutture metalliche, su passerelle, tubazioni, canalette e sistemi similari.
Ammessa la posa interrata, anche se non protetta. (CEI 20-67)

DESCRIPTION:
Power cable insulated with high quality ethyl-propylene rubber, G7 quality, with PVC sheath, not propagating fire with reduced corrosive gas emission.

FUNCTIONAL CHARACTERISTICS
- *Maximum voltage Um: 0,6/1 kV*
- *Maximum operating temperature: 90°C*
- *Minimum operating temperature: -15°C (without mechanical stress)*
- *Minimum installation temperature: 0°C*
- *Maximum short circuit temperature: 250° C*
- *Maximum tensile stress (recommended): 50 N/mm² of the cross-section of the copper.*
- *Minimum bending radius: 4 x cable diameter.*

USE AND INSTALLATION
Suitable for the supply and transport of commands and/or signals in industry, construction sites, in housing. For use outdoor and indoor. For installation in brickwork, metal structures, gangways, pipes, ducts or similar closed systems.
Allowed for underground laying also unprotected. (CEI 20-67)

COM CAVI

FG7R - FG7OR 0,6/1 kV

COSTRUZIONE DEL CAVO / *CABLE CONSTRUCTION*

CONDUTTORE
Materiale:
Rame rosso, formazione flessibile, classe 5

CONDUCTOR
Material: *Copper flexible wire, class 5*

ISOLAMENTO
Materiale: Gomma, qualità G7

INSULATION
Material: *Rubber compound, G7 quality*

CORDATURA TOTALE
Tipo: i conduttori isolati sono cordati insieme

TOTAL CABLING
Type: *The cores are stranded together in concentric lay*

RIEMPITIVO
Materiale: termoplastico, penetrante tra le anime (solo nei cavi multipolari)

FILLER
Material: *Thermoplastic, penetrating between the cores (only in multi-core cables)*

GUAINA
Materiale: PVC, qualità Rz
Colore: Grigio

SHEATH
Material: *PVC, Rz quality*
Colour: *Grey*

Unipolari/Single core

Formazione *Size*	Ø indicativo conduttore *Approx. conduct. Ø*	Spessore medio isolante *Average insulation thickness*	Spessore medio guaina *Average sheath thickness*	Ø esterno massimo *Max outer Ø*	Peso indicativo cavo *Indicative cable weight*	Resistenza elettrica max a *Max electrical resistance at 20° C*	Portata di corrente *Current rating* A					
							in aria a *in air at*	in tubo in aria a *in pipe in air at*	interrato a *Underground at* 20° C		in tubo interrato a *In underground pipe at* 20°C	
n° x mm²	mm	mm	mm	mm	kg/km	Ω/km	*30° C*	30°C	K=1	K=1,5	K=1	K=1,5
1 x 1,5	1,5	0,7	1,4	6,7	50,0	13,3	24,0	20,0	26,0	24,0	23,0	21,0
1 x 2,5	2,0	0,7	1,4	7,2	63,0	7,98	33,0	28,0	34,0	31,0	29,0	27,0
1 x 4	2,5	0,7	1,4	7,8	80,0	4,95	45,0	37,0	43,0	40,0	38,0	35,0
1 x 6	3,0	0,7	1,4	8,4	110,0	3,30	58,0	48,0	55,0	51,0	48,0	44,0
1 x 10	4,0	0,7	1,4	9,4	152,0	1,91	80,0	66,0	73,0	68,0	64,0	59,0
1 x 16	5,0	0,7	1,4	10,4	215,0	1,21	107,0	88,0	96,0	89,0	83,0	77,0
1 x 25	6,2	0,9	1,4	12,2	320,0	0,798	141,0	117,0	124,0	115,0	108,0	100,0
1 x 35	7,4	0,9	1,4	13,6	400,0	0,554	176,0	144,0	150,0	139,0	131,0	121,0
1 x 50	8,9	1,0	1,4	15,4	550,0	0,386	216,0	175,0	186,0	173,0	162,0	150,0
1 x 70	10,5	1,1	1,4	17,3	750,0	0,272	279,0	222,0	229,0	212,0	199,0	184,0
1 x 95	12,2	1,1	1,5	19,4	980,0	0,206	342,0	269,0	270,0	250,0	234,0	217,0
1 x 120	13,8	1,2	1,5	21,4	1235,0	0,161	400,0	312,0	312,0	289,0	271,0	251,0
1 x 150	15,4	1,4	1,6	23,8	1545,0	0,129	464,0	355,0	356,0	330,0	310,0	287,0
1 x 185	16,9	1,6	1,6	26,0	1865,0	0,106	533,0	417,0	401,0	371,0	349,0	323,0
1 x 240	19,5	1,7	1,7	29,2	2410,0	0,0801	634,0	490,0	471,0	436,0	409,0	379,0
1 x 300	23,0	1,8	1,8	32,0	3000,0	0,0641	736,0	-	533,0	493,0	463,0	429,0
1 x 400	26,5	2,0	1,9	36,5	4005,0	0,0486	686,0	-	621,0	575,0	540,0	500,0

N.B. I valori di portata di corrente sono riferiti a:
- n°3 conduttori attivi
- profondità di posa 0,8 m per i cavi interrati

Permissible current rating values are according to:
- three-phase circuit
- laying depth of 0,8 m for buried cables

N.B. K=1: resistività termica del terreno 1,0 K.m/W
K=1,5: resistività termica del terreno 1,5 K.m/W
N.B. K=1: thermal resistivity 1,0 K.m/W
K=1,5: thermal resistivity 1,5 K.m/W

FG7R - FG7OR 0,6/1 kV

Bipolari/2 cores

Formazione *Size*	Ø indicativo conduttore *Approx. conduct. Ø*	Spessore medio isolante *Average insulation thickness*	Spessore medio guaina *Average sheath thickness*	Ø esterno massimo *Max outer Ø*	Peso indicativo cavo *Indicative cable weight*	Resistenza elettrica max a *Max electrical resistance at 20° C*	Portata di corrente *Current rating* A					
							in aria a *in air at*	in tubo in aria a *in pipe in air at*	interrato a *Underground at* 20° C		in tubo interrato a *In underground pipe at* 20°C	
n° x mm²	mm	mm	mm	mm	kg/km	Ω/km	*30° C*	30°C	K=1	K=1,5	K=1	K=1,5
2 x 1,5	1,5	0,7	1,8	12,0	145,0	13,30	26,0	22,0	28,0	26,0	25,0	23,0
2 x 2,5	2,0	0,7	1,8	13,0	185,0	7,98	36,0	30,0	37,0	35,0	32,0	30,0
2 x 4	2,5	0,7	1,8	14,2	235,0	4,95	49,0	40,0	48,0	45,0	41,0	39,0
2 x 6	3,0	0,7	1,8	15,4	290,0	3,30	63,0	51,0	60,0	56,0	52,0	49,0
2 x 10	4,0	0,7	1,8	17,3	420,0	1,91	86,0	69,0	80,0	76,0	70,0	66,0
2 x 16	5,0	0,7	1,8	19,4	600,0	1,21	115,0	91,0	105,0	99,0	91,0	86,0
2 x 25	6,2	0,9	1,8	23,0	875,0	0,798	149,0	119,0	135,0	128,0	118,0	111,0
2 x 35	7,4	0,9	1,8	25,7	1135,0	0,554	185,0	140,0	166,0	156,0	144,0	136,0
2 x 50	8,9	1,0	1,8	29,3	1525,0	0,386	225,0	175,0	205,0	193,0	178,0	168,0

N.B. I valori di portata di corrente sono riferiti a:
- n°3 conduttori attivi
- profondità di posa 0,8 m per i cavi interrati

Permissible current rating values are according to:
- three-phase circuit
- laying depth of 0,8 m for buried cables

N.B. K=1: resistività termica del terreno 1,0 K.m/W
K=1,5: resistività termica del terreno 1,5 K.m/W
N.B. K=1: thermal resistivity 1,0 K.m/W
K=1,5: thermal resistivity 1,5 K.m/W

Tripolari/3 cores

3 x 1,5	1,5	0,7	1,8	12,5	163,0	13,30	23,0	19,0	23,0	22,0	20,0	19,0
3 x 2,5	2,0	0,7	1,8	13,6	215,0	7,98	32,0	26,0	30,0	29,0	27,0	25,0
3 x 4	2,5	0,7	1,8	14,9	275,0	4,95	42,0	35,0	39,0	37,0	34,0	32,0
3 x 6	3,0	0,7	1,8	16,2	350,0	3,30	54,0	44,0	50,0	47,0	43,0	41,0
3 x 10	4,0	0,7	1,8	18,2	530,0	1,91	75,0	60,0	67,0	63,0	58,0	55,0
3 x 16	5,0	0,7	1,8	20,6	730,0	1,21	100,0	80,0	88,0	83,0	76,0	72,0
3 x 25	6,2	0,9	1,8	24,5	1.085,0	0,798	127,0	105,0	113,0	107,0	99,0	93,0
3 x 35	7,4	0,9	1,8	27,3	1.425,0	0,554	158,0	128,0	139,0	131,0	121,0	114,0
3 x 50	8,9	1,0	1,8	31,2	1.935,0	0,386	192,0	154,0	172,0	162,0	149,0	141,0
3 x 70	10,5	1,1	1,9	35,6	2.700,0	0,272	246,0	194,0	212,0	200,0	184,0	174,0
3 x 95	12,2	1,1	2,0	40,0	3.450,0	0,206	298,0	233,0	251,0	237,0	218,0	206,0
3 x 120	13,8	1,2	2,1	44,4	4.375,0	0,161	346,0	268,0	290,0	274,0	252,0	238,0
3 x 150	15,4	1,4	2,3	49,5	5.505,0	0,129	399,0	300,0	332,0	313,0	288,0	372,0
3 x 185	16,9	1,6	2,4	55,2	6.630,0	0,106	456,0	340,0	373,0	352,0	324,0	306,0
3 x 240	19,5	1,7	2,6	61,9	8.625,0	0,0801	538,0	398,0	439,0	414,0	382,0	360,0
3 x 300	22,0	1,8	2,8	68,0	10.595,0	0,0641	621,0	-	-	-	-	-

N.B. I valori di portata di corrente sono riferiti a: n°3 conduttori attivi - Profondità di posa 0,8 m per i cavi interrati
N.B. Current rating values are refered to: n° 3 loaded conductors - Installation depth for underground cables 0,8 m

N.B. K=1: resistività termica del terreno 1,0 K.m/W
K=1,5: resistività termica del terreno 1,5 K.m/W
N.B. K=1: thermal resistivity 1,0 K.m/W
K=1,5: thermal resistivity 1,5 K.m/W

FG7R - FG7OR 0,6/1 kV

Quadripolari/4 cores

Formazione *Size*	Ø indicativo conduttore *Approx. conduct. Ø*	Spessore medio isolante *Average insulation thickness*	Spessore medio guaina *Average sheath thickness*	Ø esterno massimo *Max outer Ø*	Peso indicativo cavo *Indicative cable weight*	Resistenza elettrica max a *Max electrical resistance at 20° C*	Portata di corrente *Current rating* A					
							in aria a *in air at*	in tubo in aria a *in pipe in air at*	interrato a *Underground at* 20° C		in tubo interrato a *In underground pipe at* 20°C	
n° x mm²	mm	mm	mm	mm	kg/km	Ω/km	*30° C*	30°C	K=1	K=1,5	K=1	K=1,5
4 x 1,5	1,5	0,7	1,8	13,4	191,0	13,30	23,0	19,0	23,0	22,0	20,0	19,0
4 x 2,5	2,0	0,7	1,8	14,6	260,0	7,98	32,0	26,0	30,0	29,0	27,0	25,0
4 x 4	2,5	0,7	1,8	16,0	335,0	4,95	42,0	35,0	39,0	37,0	34,0	32,0
4 x 6	3,0	0,7	1,8	17,5	440,0	3,30	54,0	44,0	50,0	47,0	43,0	41,0
4 x 10	4,0	0,7	1,8	19,8	655,0	1,91	75,0	60,0	67,0	63,0	58,0	55,0
4 x 16	5,0	0,7	1,8	22,4	920,0	1,21	100,0	80,0	88,0	83,0	76,0	72,0
4 x 25	6,2	0,9	1,8	26,8	1.370,0	0,780	127,0	105,0	113,0	107,0	99,0	93,0
3 x 35 + 25	7,4/6,2	0,9/0,9	1,8	29,2	1.705,0	0,554/0,780	158,0	128,0	139,0	131,0	121,0	114,0
3 x 50 + 25	8,9/6,2	1,0/0,9	1,8	32,4	2.185,0	0,386/0,780	192,0	154,0	172,0	162,0	149,0	141,0
3 x 70 + 35	10,5/7,4	1,1/1,0	1,9	37,0	3.005,0	0,272/0,554	246,0	194,0	212,0	200,0	184,0	174,0
3 x 95 + 50	12,2/8,9	1,1/1,0	2,1	42,0	3.905,0	0,206/0,386	298,0	233,0	251,0	237,0	218,0	206,0
3 x 120 + 70	13,8/10,5	1,2/1,1	2,2	46,9	5.050,0	0,161/0,272	346,0	268,0	290,0	274,0	252,0	238,0
3 x 150 + 95	15,4/12,2	1,4/1,1	2,4	52,5	6.370,0	0,129/,0206	399,0	300,0	332,0	313,0	288,0	272,0
3 x 185 + 95	16,9/12,2	1,6/1,1	2,5	57,3	7.425,0	0,106/0,206	456,0	340,0	373,0	352,0	324,0	306,0
3 x 240 +150	19,5/15,4	1,7/1,4	2,7	65,5	9.995,0	0,0801/0,129	538,0	398,0	439,0	414,0	382,0	360,0
3 x 300 +150	22,0/15,4	1,8/1,4	2,9	70,8	12.025,0	0,0641/0,129	621,0	455,0	-	-	-	-

Pentapolari/5 cores

5G1,5	1,5	0,7	1,8	14,4	225,0	13,30	23,0	19,0	23,0	22,0	20,0	19,0
5G2,5	2,0	0,7	1,8	15,6	305,0	7,98	32,0	26,0	30,0	29,0	27,0	25,0
5G4	2,5	0,7	1,8	17,3	400,0	4,95	42,0	35,0	39,0	37,0	34,0	32,0
5G6	3,0	0,7	1,8	18,9	530,0	3,30	54,0	44,0	50,0	47,0	43,0	41,0
5G10	4,0	0,7	1,8	21,5	765,0	1,91	75,0	60,0	67,0	63,0	58,0	55,0
5G16	5,0	0,7	1,8	24,4	1.110,0	1,21	100,0	80,0	88,0	83,0	76,0	72,0
5G25	6,2	0,9	1,8	29,3	1.660,0	0,780	127,0	105,0	113,0	107,0	99,0	93,0
5G35	7,4	0,9	1,8	32,8	2.200,0	0,554	158,0	128,0	139,0	131,0	121,0	114,0
5G50	8,9	1,0	2,0	38,2	3.010,0	0,386	192,0	154,0	172,0	162,0	149,0	141,0

N.B. I valori di portata di corrente sono riferiti a: n°3 conduttori attivi - Profondità di posa 0,8 m per i cavi interrati

N.B. Current rating values are refered to: n° 3 loaded conductors - Installation depth for underground cables 0,8 m

N.B. K=1: resistività termica del terreno 1,0 K.m/W - K=1,5: resistività termica del terreno 1,5 K.m/W

N.B. K=1: thermal resistivity 1,0 K.m/W - K=1,5: thermal resistivity 1,5 K.m/W

Multipli, Segnalamento e comando/Multi-cores, Signal and control

5G1,5	1,5	0,7	1,8	14,4	225,0	13,30	16,0	14,0	-	-	26,0	23,0
7G1,5	1,5	0,7	1,8	15,4	305,0	13,30	13,0	11,5	-	-	18,5	16,0
10G1,5	1,5	0,7	1,8	18,7	395,0	13,40	13,0	11,5	-	-	18,5	16,0
12G1,5	1,5	0,7	1,8	19,3	440,0	13,40	11,0	9,5	-	-	14,5	12,5
16G1,5	1,5	0,7	1,8	21,1	545,0	13,40	11,0	9,5	-	-	14,5	12,5
19G1,5	1,5	0,7	1,8	22,1	620,0	13,40	9,0	8,0	-	-	13,0	11,5
24G1,5	1,5	0,7	1,8	25,4	765,0	13,50	9,0	8,0	-	-	13,0	11,5
7G2,5	2,0	0,7	1,8	16,8	420,0	7,98	17,5	15,5	-	-	24,0	21,0
10G2,5	2,0	0,7	1,8	20,6	525,0	8,06	17,5	15,5	-	-	24,0	21,0
12G2,5	2,0	0,7	1,8	21,3	595,0	8,06	13,5	12,0	-	-	20,0	17,5
16G2,5	2,0	0,7	1,8	23,3	750,0	8,06	13,5	12,0	-	-	20,0	17,5
19G2,5	2,0	0,7	1,8	24,5	845,0	8,06	12,0	10,5	-	-	16,0	14,0
24G2,5	2,0	0,7	1,8	28,3	1.040,0	8,10	12,0	10,5	-	-	16,0	14,0

*Disponibile anche senza conduttore giallo/verde - N.B. I valori di portata di corrente sono riferiti a: tutti i conduttori attivi (eccetto il conduttore giallo/verde) - Profondità di posa 0,8 m per i cavi interrati

**Available without yellow/green conductor - N.B. Current rating values are refered to: All loaded conductors - Installation depth for underground cables 0,8 m*

N.B. K=1: resistività termica del terreno 1,0 K.m/W - K=1,5: resistività termica del terreno 1,5 K.m/W

N.B. K=1: thermal resistivity 1,0 K.m/W - K=1,5: thermal resistivity 1,5 K.m/W

COM CAVI

ST5015kWh-2500kW-2h

PowerTitan 2.0 Liquid Cooling Energy Storage System

NEW

Optimal Cost

- Intelligent liquid-cooled temperature control system to optimize the auxiliary power consumption
- Pre-assembled, no battery module handling on site,transportation of complete system

Safety and Reliable

- AI monitoring for cell health, with early warning
- Electrical safety management, overcurrent fast breaking and arc extinguishing protection
- The electrical cabinet and battery cabinet are separated to prevent thermal runaway

Efficient and Flexible

- High-efficiency heat dissipation, increase battery life and system discharge capacity
- Front single-door-open design, supporting back to back & side by side layout drawing
- System commissioning in advance, reduce commissioning work on site, accelerate COD process

Convenient O&M

- One-click system upgrade
- Intelligent automatic rehydration reduces manual rehydration
- Online intelligent monitoring to reduce manual inspections frequency

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SUNGROW
Clean power for all

Technical Data	ST5015kWh-2500kW-2h
DC side	
Cell Type	LFP 3.2 V / 314 Ah
Battery Configuration	416S12P
Nominal Capacity	5015 kWh
Nominal Voltage Range	1123.2 V - 1497.6 V
AC side	
Nominal AC power	210 kVA * 12
AC Current Distortion Rate	< 3 % (Nominal Power)
DC Component	< 0.5 %
Nominal AC voltage	690 V
AC Voltage Range	621 V - 759 V
Power Factor	> 0.99 (Nominal Power)
Adjustable Range of Reactive Power	- 100 % - 100 %
Nominal Frequency	50 Hz / 60 Hz
Topology	Transformerless
Termination (LV)	352 A * 3 Phase * 6
System Parameter	
Container Size（W * H * D）	6058 mm * 2896 mm * 2438 mm
Container Weight	42500 kg
Degree of Protection	IP55
Operation Temperature Range	- 30 ℃ - 50 ℃ （ > 45 ℃ De-rating ）
Operation Humdity Range	0 % - 100 % (Non-condensing)
Highest Altitude	4000 m
Temperature Control Method	Intelligent Liquid Cooling
Fire Suppression System	FACP、FK5112、Flammable gas detector、Smoke detector、Heat detector 、Sounder beacon、Alarm bell、Warning sign、Extinguishant abort button、Ventilation system、Pressure relief port、Manual automatic switching and emergency starting device (Default) Sprinkler、Vent panel 、Aerosol (Optional)
Communication Interface	Ethernet
Communication protocol	Modbus TCP
Standard	IEC61000, IEC62619, IEC62933,AS3000,UKCA,G99,UN38.3/UN3536,CE,IEC62477

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