

FR/VA - 0,02 VA at 1 A
FR/VA - 0,15 VA at 110 V

FR/VA - 0,7mVA at 1A
FR/VA - 17mVA at 120 V

Is $\approx 0,01 \Omega$ per phase
sUP / 1,54 MQ per phase

BENDING FACTOR CABLES (minimum ray)

- MV cables 1 m
- LV cables 0,6 m
- Fiber optical cables 0,4 m
- Flex conduit 0,5 m

ALL THE SETTINGS OF THE PROTECTION RELAYS MUST BE DONE IN AGREEMENT WITH LOCAL DNO GRID STANDARD AND VALIDATED BY THE GRID OPERATOR - **Benevento**

ALL INSTRUMENTS SETTINGS AND VOLTAGE - CURRENT TRANSFORMER SIZING MUST BE CHOSEN WITH THE CONSTRUCTOR AND ACCEPTED BY THE LOCAL DNO GRID OPERATOR

ALL INSTRUMENTS AND PROTECTION RELAY MUST BE PROVIDED WITH TEST BLOCK

VOLTAGE TRANSFORMERS
THE VOLTAGE TRANSFORMERS SHALL COMPRISE THREE UNITS FOR A THREE-PHASE SET, EACH ONE OF WHICH COMPLIES WITH IEC 60044-2. THE ACCURACY SHALL BE CLASS 0.2. THE VOLTAGE TRANSFORMERS SHALL BE CONNECTED STAR-STAR WITH BOTH STAR POINTS CONNECTED SOLIDLY TO EARTH.

THE VOLTAGE DROP IN EACH PHASE OF THE VOLTAGE TRANSFORMER CONNECTIONS SHALL NOT EXCEED 0.2V. IT SHALL BE CONNECTED TO THE REVENUE METERS (BOTH MAIN AND BACKUP) WITH A BURDEN THAT SHALL NOT AFFECT THE ACCURACY OF MEASUREMENT

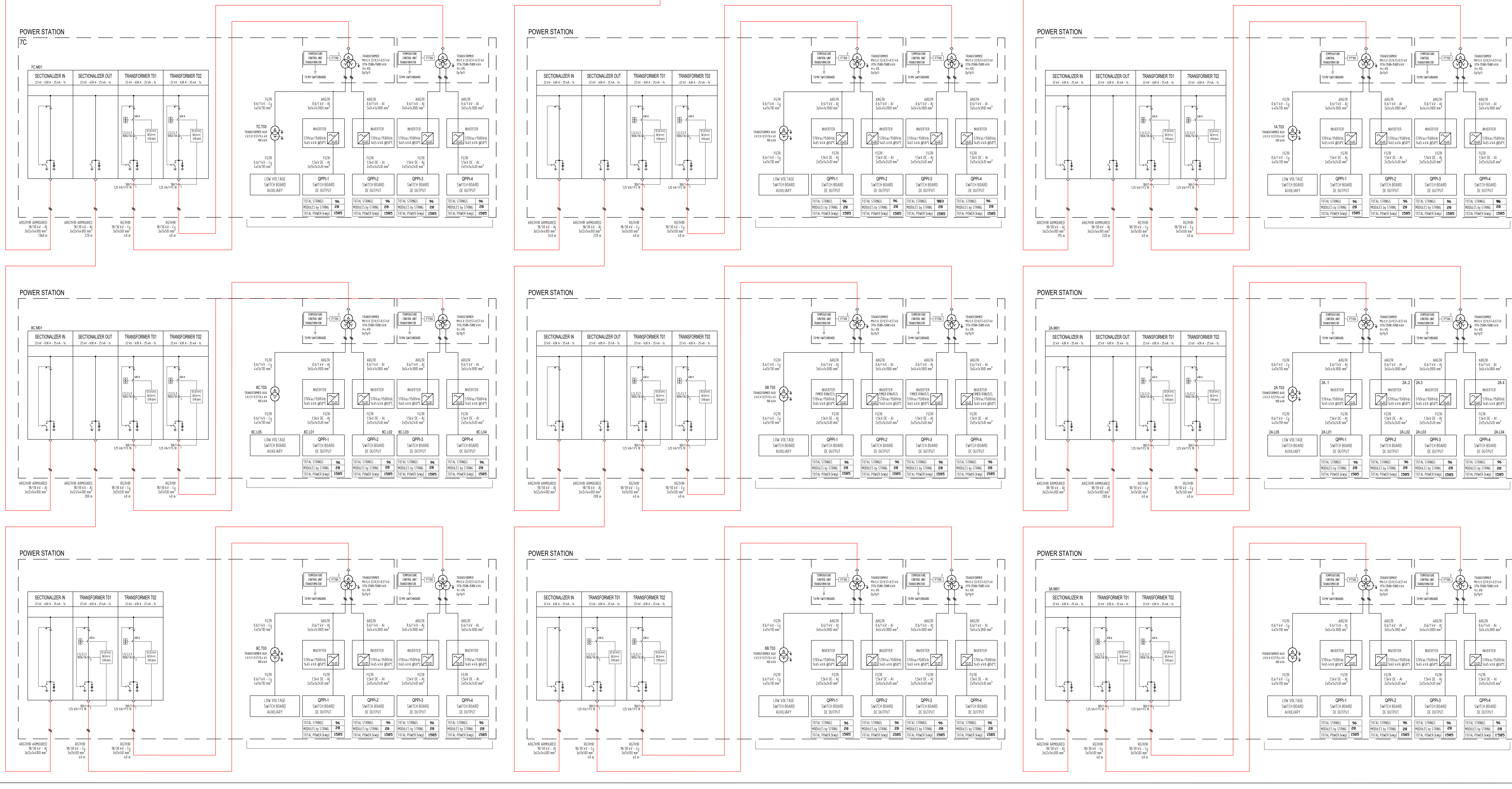
IN-OUTGOING A - (22-46 kV - 20 MW - 32,3 kA - 3s)
IN-OUTGOING B - (22-46 kV - 20 MW - 32,3 kA - 3s)
IN-OUTGOING C - (22-46 kV - 20 MW - 32,3 kA - 3s)

- TO Electric Sub Station
- Cannello 38% su Rtn
- Garigliano-Patria
- MV / HV / 380 kV

CURRENT TRANSFORMERS
THE CURRENT TRANSFORMERS SHALL COMPRISE THREE UNITS FOR A THREE-PHASE SET, EACH ONE OF WHICH COMPLIES WITH IEC 60044-1. THE ACCURACY SHALL BE CLASS 0.2.

UNLESS STATED OTHERWISE IN THE CONNECTION AGREEMENT, THE MAIN AND THE BACKUP METERS SHALL BE FED FROM DIFFERENT CURRENT TRANSFORMER CORES.

THE CURRENT TRANSFORMER PREFERRED RATED SECONDARY CURRENT OUTPUT SHALL BE 1 AMPERES. THE NEUTRAL CONDUCTOR SHALL BE EFFECTUALLY GROUNDING AT A SINGLE POINT AND SHALL BE CONNECTED ONLY TO METERS (MAIN AND BACKUP) SHALL BE OF THE THREE-PHASE TYPE RATED FOR THE REQUIRED SITE AND SHALL COMPLY WITH IEC 60053-22 WITH ACCURACY CLASS 0.2



LEGEND

	THREE-PHASE TRANSFORMER, STAR-DELTA CONNECTION		THREE-PHASE WINDING, STAR
	THREE-PHASE WINDING, DELTA		CURRENT TRANSFORMER (PHASE)
	DIRECT CURRENT		ALTERNATIVE CURRENT
	CIRCUIT BREAKER		DISCONNECTOR
	FUSE SWITCH 3 POLE		SWITCH-DISCONNECTOR
	FUSE		EARTH GROUND POINT
	SURGE PROTECTION DEVICES		EMERGENCY PUSH BUTTON
	INVERTER (DC/AC)		CONVERTER (AC/DC)
	UPS AC/DC		UPS AC/DC
	MAGNETO THERMAL CIRCUIT BREAKER WITH RELAY OR RELEASES		DIFFERENTIAL MAGNETO THERMAL CIRCUIT BREAKER
	PV MODULES		DIFFERENTIAL WITH FORCED MAGNETO THERMAL CIRCUIT BREAKER
	METERING ONE-WAY		METERING TWO-WAY
	27 UNDERVOLTAGE RELAY		50 INSTANTANEOUS OVERCURRENT RELAY
	27VI UNDERVOLTAGE RELAY DIRECT SEQUENCE		50N INSTANTANEOUS OVERCURRENT RELAY CONNECTED TO NEUTRAL
	51V DELAYED OVERCURRENT RELAY		59 OVERVOLTAGE RELAY
	51VN DELAYED OVERCURRENT RELAY CONNECTED TO NEUTRAL		59N OVERVOLTAGE RELAY CONNECTED TO NEUTRAL
	64 GROUND DETECTOR RELAY		59RV OVERVOLTAGE RELAY REVERSE SEQUENCE
	81 FREQUENCY RELAY		67N DIRECT EARTH FAULT RELAY

NOTE

THE ENVIRONMENTAL CONDITIONS ARE:
AMBIENT AIR MAX TEMPERATURE: 50°C - RELATIVE HUMIDITY OF THE AIR: 95%

THE SIZING CALCULATION WAS MADE ACCORDING TO THE LAYING CONDITIONS SHOWN IN THE TRENCH SECTIONS DETAILS

FOR MORE DETAILS AND INFORMATION SEE MANUALS AND TECHNICAL DOCUMENTATION PROVIDED BY THE MANUFACTURER OF THE EQUIPMENTS

THE FUSES OF THE STRINGBOXES AND THE FUSES INSTALLED IN THE DC SIDE PARALLEL LOW VOLTAGE SWITCH BOARD LOCATED IN THE POWER STATION MUST BE 1500 Vdc OPERATING VOLTAGE AND 4pV TYPE

THE FEEDERS (A and C) WILL NEVER WORK IN PARALLEL INCOMING AND OUTGOING

BEFORE CUTTING THE INDIVIDUAL MV AND LV CABLES AND THE BURIED CONDUITS, IT IS NECESSARY TO CHECK THE NEEDED LENGTHS IN THE PV FIELD, CONSIDERING THE TRENCHES WAY, THE ASCENTS TO THE EQUIPMENT AND MORE

THE SHIELDING OF MV CABLES MUST BE CONNECTED TO THE EARTH COLLECTOR AS PER MANUFACTURER'S SPECIFICATIONS

MV AND LV CABLES MUST BE TIED EVERY 1 METER IN BOTH FLAT AND TREFOIL LAYING

MV AND LV CABLES MUST BE IDENTIFIED AND LABELED IN DEPARTURES ON ARRIVAL AND EVERY 30 METERS OF THE EACH LINE

THE TIGHTENING TORQUE OF THE ELECTRICAL EQUIPMENT BOLTS AND TERMINALS MUST BE APPLIED IN ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS AND DATASHEETS

TO RESPECT ELECTRICAL SAFETY RULES MUST BE PROVIDED THE ELECTRICAL INTERLOCKS BETWEEN MV CELLS AND MV / LV TRANSFORMER ACCESS DOORS

DURING THE CONSTRUCTION THE CABLE JUNCTIONS MUST BE LISTED WITH GEO-REFERENCE AND TAG INFORMATIONS

ACCORDING TO THE DNO GRID CODE AND POSSIBLE ELECTRIC OPERATING SCENARIOS OF THE PLANT MUST BE SUPPLIED AND COMPLETED SPECIFICALLY OPERATING MANUAL WITH PROCEDURES, INTERLOCKS AND ALL NECESSARY INFORMATIONS

THE SUPPLIER OF THE DELIVERY CABIN EQUIPMENT MUST CALCULATE AND SECT THE PROTECTION LEVELS OF THE OVER CURRENT AND THE SHORT CIRCUIT CURRENT, IN ACCORDING WITH SHORT CIRCUIT CURRENT VALUE COMMUNICATED BY THE

TO REDUCE THE FERRORESONANCE MUST BE INSTALLED A SPECIFIC RESISTOR IN THE COUPLED VOLTAGE TRANSFORMER (VT)



REGIONE CAMPANIA
PROVINCIA DI CASERTA
COMUNI DI CASTEL VOLTURNO E CANCELLO ED ARNONE

PROGETTO PER LA REALIZZAZIONE DI UN IMPIANTO FOTOVOLTAICO DENOMINATO "BUFFALA" DELLA POTENZA DI 56,48 MWp

STARENERGIA

LV / MV SINGLE LINE DIAGRAM
SCHEMA ELETTRICO UNIFILARE

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Revisions e coordinamento:

Rev: 00	Data: 27/10/2021	Note: Prima emissione
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