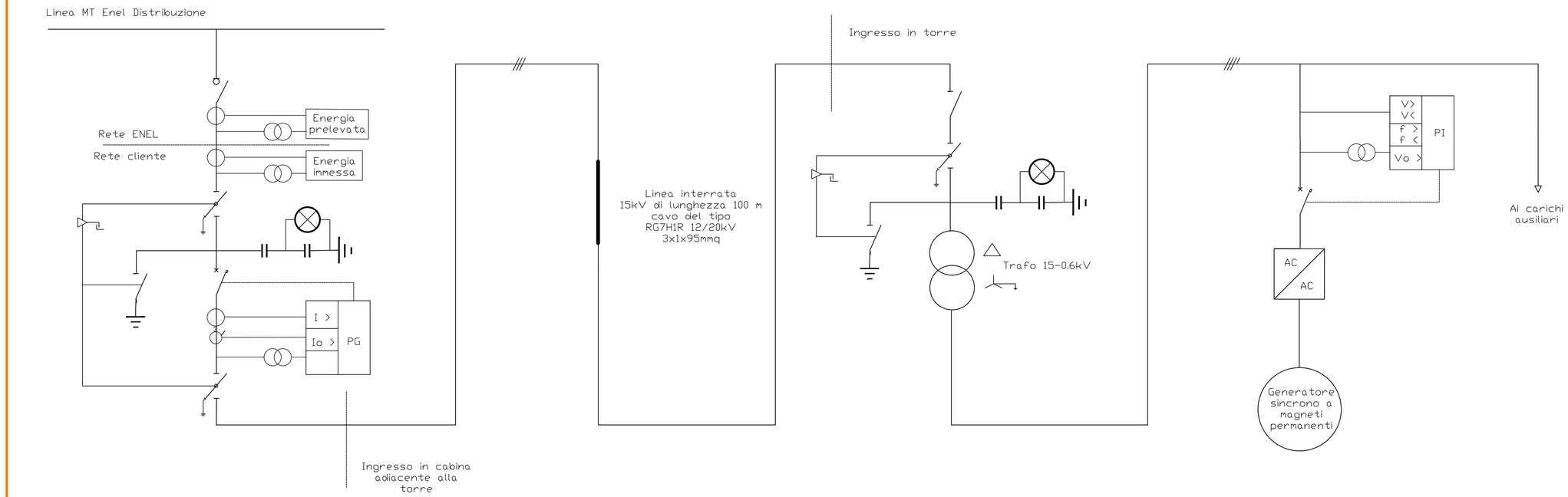


REGIONE LIGURIA
Provincia di Savona
COMUNE DI QUILIANO - COMUNE DI SAVONA



PROGETTISTI		PROPONENTE
STRUTTURE	**Ing. BONINO Ingrid** Via A.Diaz 1 - 17047 Vado ligure (SV) c.f. BNNNRD74C63I480S - p. IVA 01319220099 tel. 339.3373268 - email ingridbonino@libero.it	**LA FATTORIA DEL VENTO S.r.l.** Via Gramsci 38 r - 17100 Savona - c.f. 01456080090 - REA 147779 - tel. 019 821335 - PEC lafattoriadelvento@pec.it SIRITO Fabrizio amministratore delegato
TOPOG./ARCH.	**Geom. LUCON Stefano** Via Madonna della neve 6 - 17047 Quiliano (SV) c.f. LCNSFN70P29I480J - p. IVA 01099260091 tel. 393.9678644 - email lucon.stefano@gmail.com	
ELETTRICO	**Ing. MASSA Enrico** Via Nazario Sauro 4/5A - 17100 Savona (SV) - c.f. MSSNRC73E09D969Q - p. IVA 00283290049 tel. 328.4503069 - email enrico.massa@tecgeo.net	01-108-SE
ARCHITETTURA	**Arch. MORAS Alberto** Via Quarda Sup. 4/5 - 17100 Savona (SV) c.f. MRS LRT 72L07 I480V - p. IVA 01257250090 tel. 347.2324222 - email alb.moras@awn.it	
GEOLOGIA	**Dott . Geol. PEIRONE Paolo** Via Barrili 4/1 - 1700 Savona (SV) c.f. PRNPLA63M28I480M - p. IVA 1052320098 tel. 347.2764854 - email paolopeirone.studio@gmail.com	
AMBIENTE	**Dott. For. Andrea Sambado** Via Scatti 7/7 - 17100 Savona (SV) c.f. SMBNDR84A17I480Z - p. IVA 01666630098 tel. 349.0721869 - email a.sambado@gmail.com	

ELABORATO						Schema elettrico unifilare di connessione alla rete di distribuzione MT
revisione					data	emissione	scala
0	1	2	3	4	15 novembre 2021	PRIMA EMISSIONE	1:200

Technical specifications of ENERCON wind energy converter – E-138 EP3 E2

General	
Manufacturer	ENERCON GmbH Dreekamp 5 26605 Aurich Germany
Type designation	E-138 EP3 E2
Nominal power	4200 kW
Design service life	25 years
Rotor diameter	138.25 m
IEC wind class (ed. 3)[1]	IIIA (HH 160 m) SA (HH 81 m, HH 96 m, HH 111 m, NH 131 m and HH 149 m)
Extreme wind speed at hub height (10-minute mean) according to IEC (ed. 3)	37.50 m/s Corresponds to a load equivalent of approx. 52.50 m/s (3-second gust)
Annual average wind speed at hub height according to IEC (ed. 3)[1]	6.60 m/s (HH 81 m, HH 96 m, HH 111 m and HH 131 m) 7.50 m/s (HH 160 m) 7.63 m/s (HH 149 m)

[1] Hub height (HH) from tower designation

Generator rotor with pitch unit	
Type	Upwind rotor with active pitch unit
Rotational direction	Clockwise
Number of rotor blades	3
Rotor blade length	67.795 m
Swept area	15011.36 m²
Rotor blade material	GRP (glass fibre + epoxy resin)/balsa wood/foam
Maximum idle speed	2.5 rpm
Lower power-feed speed[1]	4.4 rpm (HH 81 m and HH 131 m) 5.0 rpm (HH 96 m, HH 111 m, HH 149 m and HH 160 m)
Nominal speed	10.8 rpm
Speed setpoint	11.1 rpm
Tip speed at nominal speed	80.5 m/s
Power reduction wind speed (with ENERCON storm control)	22 (12-second mean)–28 (10-minute mean) m/s
Conical angle	2.5°
Rotor axis angle	7°

Generator rotor with pitch unit	
Pitch unit	One independent electrical pitch unit per rotor blade with dedicated emergency power supply

[1] Hub height (HH) from tower designation

Drive train with generator	
Wind energy converter concept	Gearless, variable speed, full-scale converter
Hub	Rigid connection with generator rotor
Bearing	2 tapered roller bearings
Generator	Direct-driven, externally excited synchronous generator
Grid feed	ENERCON inverter with high clock speed and sinusoidal current
IP Code/insulation class	At least IP 23/F

Brake system	
Aerodynamic brake	Three independent pitch units with emergency power supply
Rotor holding brake	Hydraulic
Rotor lock	Latching in 10° steps

Yaw control	
Yaw system	Electromechanical yaw system

Wind energy converter control system	
Type	Microprocessor
Remote monitoring system	ENERCON SCADA system
Uninterruptible power supply (UPS)	Integrated

Tower types

Hub height	Total height	Design	IEC wind class[1]	IEC turbulence category[1]	DIBt wind zone[2]
80.26 m	149.38 m	Tubular steel tower	S	A	WZS GK II
95.53 m	164.65 m	Tubular steel tower	S	A	WZS GK II
110.13 m	179.25 m	Tubular steel tower	S	A	WZS GK II
130.29 m	199.41 m	Tubular steel tower	S	A	-
130.07 m	199.2 m	Hybrid steel tower	S	A	WZS GK II
149.00 m	218.13 m	Hybrid tower	S	A	WZS GK II
160.00 m	229.13 m	Hybrid tower	III	A	WZ2 GK II

[1]Issue of directive: Edition 3
[2]Issue of directive published: 2012

Generatore sincrono a magneti permanenti

Rated output Power 4.500kW
Power Factor 0.9 Leading
Nominal Voltage 660 V
Frequency 89.6Hz
Temperature Conditions From -20oC to +50oC
Stator Connection Star
Number of Poles 24
Direction of Rotation Clockwise seen from NDE
Cooling Type IC71W
Degree of Protection IP54 according to IEC 60034
Corrosion Protection C3H according to ISO12944
Insulation Class F according to IEC 60034
Speed Range From 50 rpm to 533 rpm
Nominal Speed 448 rpm
Overspeed 627 rpm
Weight 18.5 Tn
Inertia 1900 kgm2