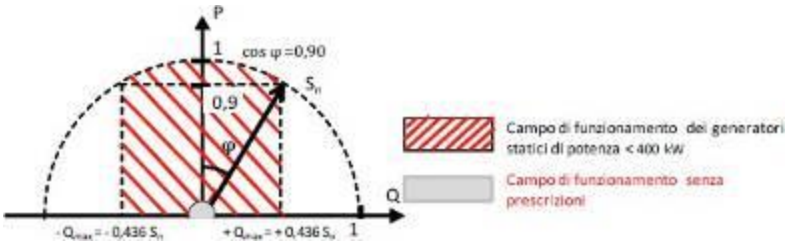
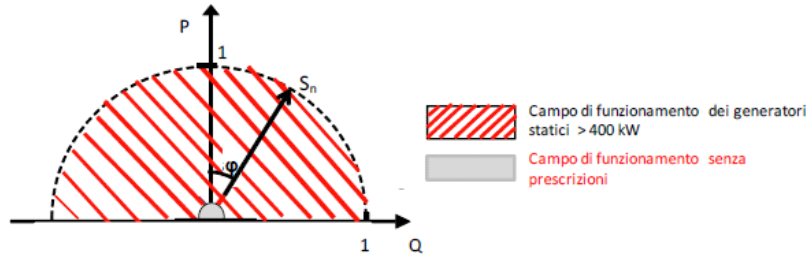
N.6.1 Verifica della capability di erogazione della potenza reattiva *reactive power production capability*	
Potenza massima dell'impianto di destinazione: *Maximum power of the destination plant:*	☒ PV $_{plant}$ < 400 KW *(see picture 1A)* ☒ PV $_{plant}$ ≥ 400 KW *(see picture 1B)* ☐ Wind generator *(see picture 1C)*
Tollerance:	ΔQ ≤ ±5% for each measured points For values of P≤10%*Sn → ΔQ ≤ ±10%Sn
Sampling:	For each of the 11 levels of active power, 1 values of inductive reactive power and 1 values of capacitive reactive power must be recorded, as **averaged values in 1 min**, based on the measurements at the **fundamental frequency in a window of 200ms**,
Ambient temperature (°C) .....:	25
Humidity (RH %) .....:	70
Input voltage .....:	600V (typical value specified by the manufacturer)
Deviation for wind generator (FC e DFIG) - N,6,1,2: Test performed according: **IEC 61400-21 Ed, 2, §, 6,7,1 and §, 7,7,1,**	

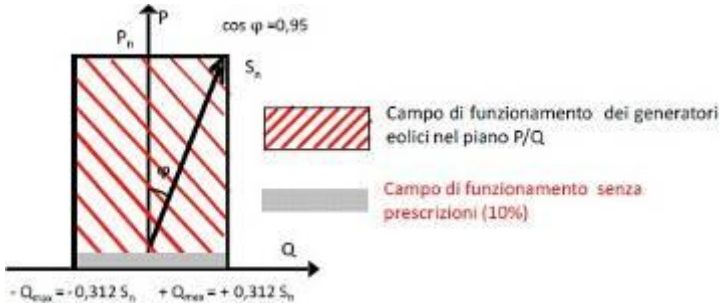
Picture 1A



Picture 1B



Picture 1C

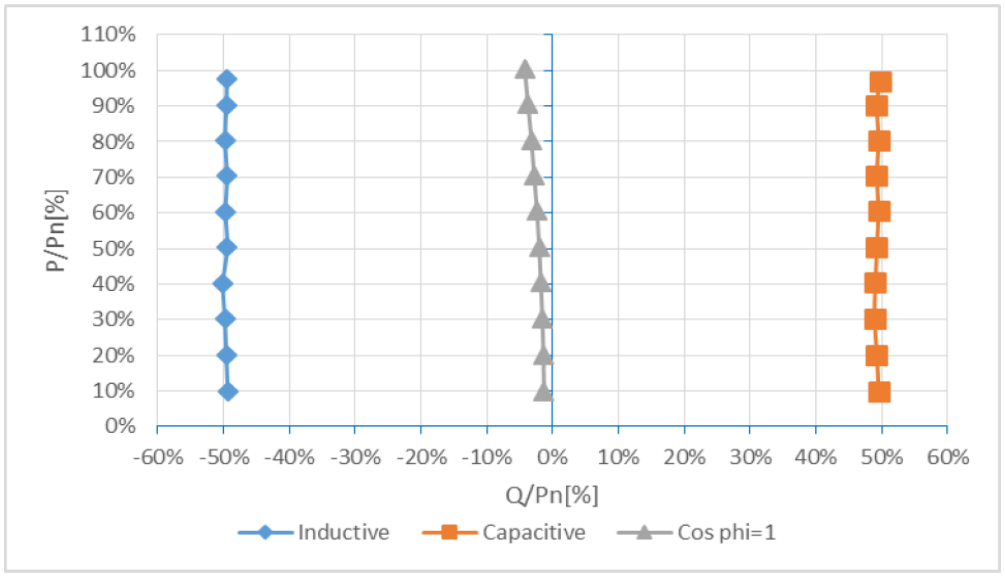


PV $_{plant}$ < 400 KW *(see picture 1A)*

Inductive cos φ absorbation				
Power-BIN	Active power [kW]	Reactive power [kVar]	Power factor (cos φ)	DC power [kW]
0% -10%	2,364	-11,848	0,1957	2,633
10% -20%	4,816	-11,903	0,3751	5,111
20% -30%	7,237	-11,954	0,5179	7,564
30% -40%	9,660	-12,025	0,6263	10,032
40% -50%	12,080	-11,868	0,7133	12,502
50% -60%	14,478	-11,932	0,7717	14,960
60% -70%	16,875	-11,879	0,8177	17,425
70% -80%	19,270	-11,947	0,8499	19,898
80% -90%	21,648	-11,904	0,8763	22,363
90% -100%	23,406	-11,874	0,8918	24,228

Capacitive cos φ supply				
Power-BIN	Active power [kW]	Reactive power [kVar]	Power factor (cos φ)	DC power [kW]
0% -10%	2,383	11,886	0,1966	2,629
10% -20%	4,841	11,819	0,3790	5,107
20% -30%	7,260	11,731	0,5262	7,555
30% -40%	9,692	11,767	0,6358	10,031
40% -50%	12,108	11,817	0,7156	12,503
50% -60%	14,516	11,873	0,7741	14,973
60% -70%	16,919	11,817	0,8198	17,441
70% -80%	19,281	11,877	0,8514	19,878
80% -90%	21,674	11,817	0,8780	22,358
90% -100%	23,235	11,924	0,8897	24,008

Reactive power supply with set point cos φ=1				
Power-BIN	Active power [kW]	Reactive power [kVar]	Power factor (cos φ)	DC power [kW]
0% -10%	1,101	-0,319	0,9598	1,157
10% -20%	2,394	-0,317	0,9913	2,465
20% -30%	4,839	-0,342	0,9975	4,941
30% -40%	7,268	-0,379	0,9986	7,416
40% -50%	9,694	-0,432	0,9990	9,888
50% -60%	12,111	-0,495	0,9992	12,359
60% -70%	14,523	-0,576	0,9992	14,831
70% -80%	16,928	-0,676	0,9992	17,299
80% -90%	19,322	-0,782	0,9992	19,765
90% -100%	21,707	-0,900	0,9991	22,227
100%-110%	24,082	-1,024	0,9991	24,687


110%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
P/Pn[%]
-60% -50% -40% -30% -20% -10% 0% 10% 20% 30% 40% 50% 60%
Q/Pn[%]
Inductive
Capacitive
Cos phi=1

Semicircular Curve (Capacitive)							
P Desired (%Sn)	**Power DC (KW)**	**P measured (%Sn)**	**S measured (%Sn)**	**Power factor (cos ϕ)**	**Q measured (%Sn)**	**Q desired (%Sn)**	**Q deviation (%Sn)**
0	0.858	1.508	99.960	0.015	99.947	100.00	-0.053
10	2.804	9.761	99.911	0.089	99.515	99.50	0.015
20	5.211	19.742	99.889	0.180	98.263	97.98	0.283
30	7.664	29.928	99.888	0.272	96.110	95.39	0.720
40	10.071	39.907	99.609	0.364	92.766	91.65	1.116
50	12.535	50.091	99.737	0.457	88.733	86.60	2.133
60	14.894	59.850	99.669	0.546	81.506	80.00	1.506
70	17.359	70.016	99.848	0.637	71.928	71.41	0.518
80	19.774	79.955	99.756	0.729	61.320	60.00	1.320
90	22.243	90.078	99.838	0.820	45.110	43.59	1.520
100	24.725	100.213	100.970	0.999	0.666	0.00	0.666

Semicircular Curve (Inductive)							
P Desired (%Sn)	**Power DC (KW)**	**P measured (%Sn)**	**S measured (%Sn)**	**Power factor (cos ϕ)**	**Q measured (%Sn)**	**Q desired (%Sn)**	**Q deviation (%Sn)**
0	1.416	1.100	99.897	0.010	-99.891	-100.00	0.109
10	3.462	9.632	99.918	0.088	-99.532	-99.50	-0.032
20	5.904	19.822	99.800	0.181	-98.157	-97.98	-0.177
30	8.293	29.808	99.809	0.271	-96.059	-95.39	-0.669
40	10.683	39.804	99.815	0.363	-92.023	-91.65	-0.373
50	13.018	49.590	99.710	0.452	-88.934	-86.60	-2.334
60	15.345	59.370	99.620	0.542	-81.731	-80.00	-1.731
70	17.768	69.557	99.703	0.634	-72.084	-71.41	-0.674
80	20.185	79.745	99.787	0.727	-61.567	-60.00	-1.567
90	22.590	89.925	99.915	0.818	-44.443	-43.59	-0.853
100	24.992	100.163	100.838	0.992	-0.451	0.00	-0.451

Capability for static generators in plants with power > 400 kW (limited semi-circular characteristic)

