Test 4: Semicircle Curve (S = 110 %Sn)

This test verifies the capability of the inverter to provide a fixed value of apparent power.

Allowed tolerance for reactive power measurements is to be considered inside ±5 %Sn.

Test results are offered in the tables below.

Semicircle Curve (S = 110 %Sn / Inductive)						
P Desired (%Sn)	**P measured (%Sn)**	**S measured (%Sn)**	**Power Factor (cos φ)**	**Q measured (%Sn)**	**Q desired (%Sn) ([2])**	**Q deviation (±5%Sn)**
0([1])	2.1	111.4	0.018	+111.4	**+110.0**	--
5([1])	4.9	111.4	0.044	+111.3	**+109.9**	--
10	9.9	111.4	0.089	+111.0	**+109.5**	+1.5
15	15.0	111.4	0.135	+110.4	**+109.0**	+1.4
20	20.1	111.4	0.180	+109.6	**+108.2**	+1.4
25	25.1	111.5	0.225	+108.6	**+107.1**	+1.5
30	30.0	111.5	0.269	+107.4	**+105.8**	+1.6
35	35.0	111.5	0.314	+105.9	**+104.3**	+1.6
40	40.0	111.5	0.358	+104.1	**+102.5**	+1.6
45	45.1	111.6	0.404	+102.1	**+100.4**	+1.7
50	50.1	111.6	0.449	+99.7	**+98.0**	+1.7
55	55.0	111.6	0.493	+97.1	**+95.3**	+1.8
60	60.1	111.6	0.538	+94.0	**+92.2**	+1.8
65	65.1	111.6	0.583	+90.7	**+88.7**	+2.0
70	70.1	111.7	0.628	+86.9	**+84.9**	+2.0
75	75.1	111.7	0.672	+82.7	**+80.5**	+2.2
80	80.0	111.8	0.716	+78.0	**+75.5**	+2.5
85	85.0	111.8	0.760	+72.7	**+69.8**	+2.9
90	90.1	111.9	0.805	+66.4	**+63.2**	+3.2
95	95.0	112.0	0.848	+59.3	**+55.5**	+3.8
100	100.0	112.0	0.893	+50.3	**+45.8**	+4.5
105	104.8	111.4	0.941	+37.7	**+32.8**	+4.9
110	110.1	110.1	1.000	+0.7	**+0.0**	+0.7

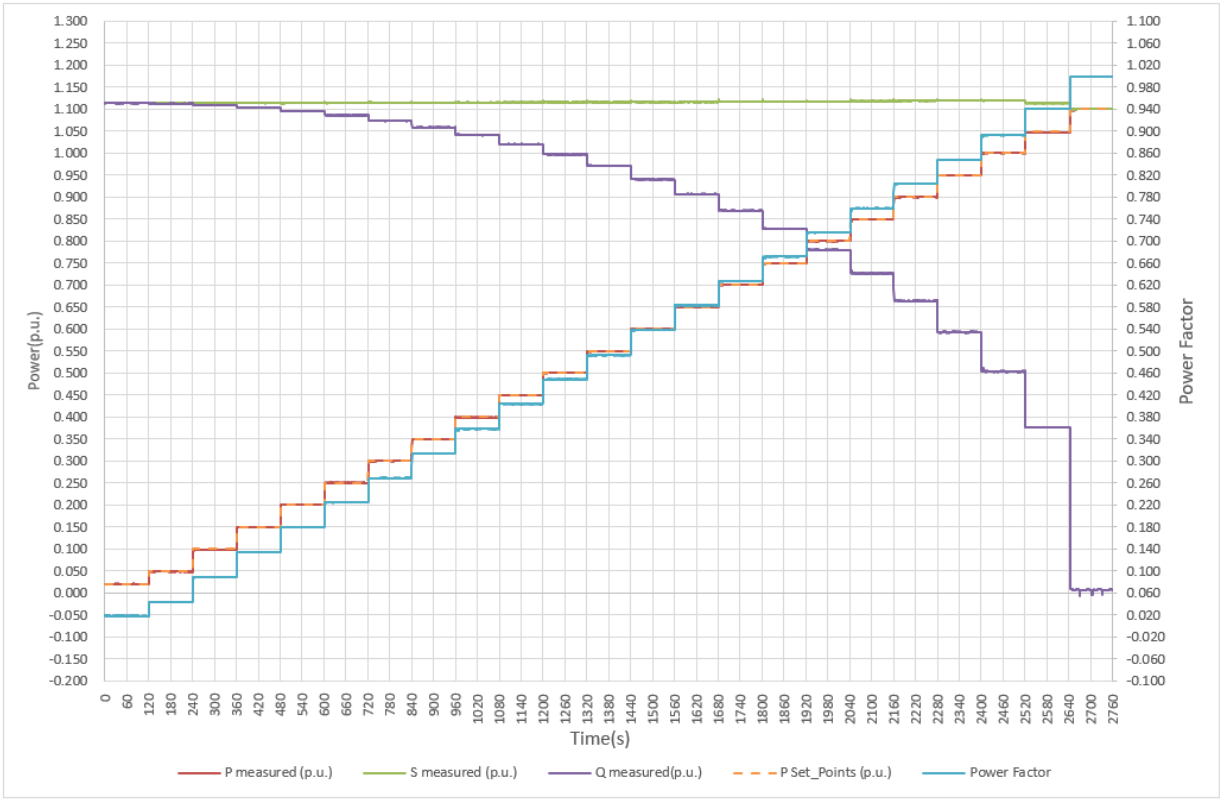
([1]) According to point N.6.1 for lower values of generated active power (P≤10 %Sn), deviations in the reactive power are allowed up to a 10 %Sn.
([2]) The desired Q is calculated from Q = -√ (S^2 - P^2).

Semicircle Curve (S = 110 %Sn / Capacitive)						
P Desired (%Sn)	**P measured (%Sn)**	**S measured (%Sn)**	**Power Factor (cos φ)**	**Q measured (%Sn)**	**Q desired (%Sn)** ([2])	**Q deviation (%Sn)**
0([1])	2.1	110.0	0.019	-109.9	**-110.0**	--
5([1])	5.0	109.9	0.046	-109.8	**-109.9**	--
10	10.0	110.0	0.091	-109.5	**-109.5**	0.0
15	15.1	110.0	0.137	-108.9	**-109.0**	+0.1
20	20.0	109.9	0.182	-108.0	**-108.2**	+0.2
25	25.1	109.8	0.229	-106.9	**-107.1**	+0.2
30	30.1	109.9	0.273	-105.7	**-105.8**	+0.1
35	35.0	110.0	0.318	-104.3	**-104.3**	0.0
40	40.1	110.0	0.364	-102.5	**-102.5**	0.0
45	45.0	110.0	0.409	-100.3	**-100.4**	+0.1
50	50.1	109.9	0.456	-97.8	**-98.0**	+0.2
55	55.0	110.0	0.500	-95.2	**-95.3**	+0.1
60	60.0	110.2	0.544	-92.5	**-92.2**	-0.3
65	65.1	110.5	0.589	-89.3	**-88.7**	-0.6
70	70.0	110.7	0.633	-85.7	**-84.9**	-0.8
75	75.0	110.7	0.677	-81.5	**-80.5**	-1.0
80	80.0	110.7	0.723	-76.4	**-75.5**	-0.9
85	85.0	110.7	0.768	-70.8	**-69.8**	-1.0
90	90.0	110.8	0.812	-64.6	**-63.2**	-1.4
95	95.0	111.0	0.856	-57.3	**-55.5**	-1.8
100	99.1	111.1	0.893	-50.1	**-45.8**	-4.3
105	104.1	110.1	0.945	-35.9	**-32.8**	-3.1
110	110.0	110.1	1.000	+0.7	**0.0**	+0.7

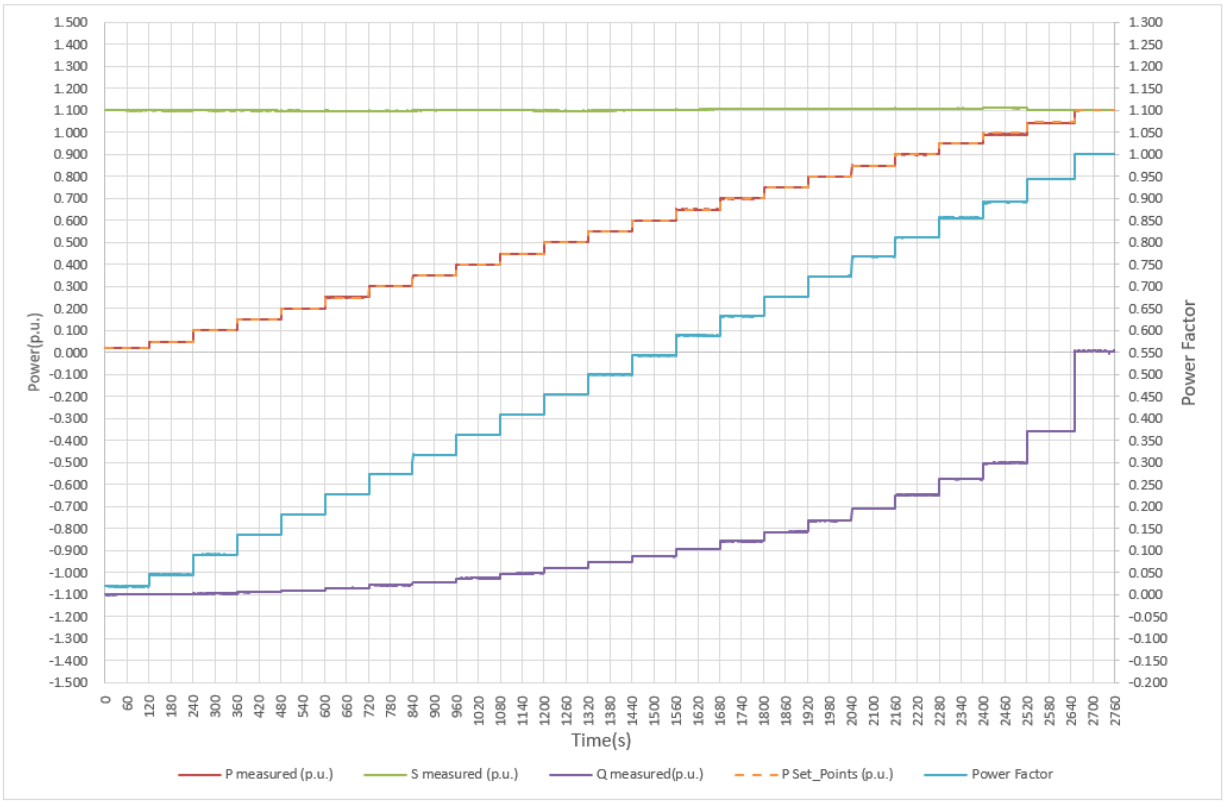
([1]) According to point N.6.1 for lower values of generated active power (P≤10 %Sn), deviations in the reactive power are allowed up to a 10 %Sn.
([2]) The desired Q is calculated from Q = -√ (S^2 - P^2).

Test results are represented in the diagrams below.

Semicircle Curve (Sn = 110 %Sn / Inductive)



Semicircle Curve (Sn = 110 %Sn / Capacitive)



Semicircle Curve; Capacitive vs Inductive