

**Allegato N of CEI 0-16: 2019-04**

**Test 4: Semicircular Curve (S=100%Sn)**

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

Test results are offered at the tables below.

Semicircular Curve (Inductive)							
P Desired (%Sn)	Power DC (kW)	P measured (%Sn)	S measured (%Sn)	Power Factor (cos φ)	Q desired (%Sn)	Q measured (%Sn)	Q deviation (%Sn)
0%	0.054	0.0	0.0	0.000	<10	0.0	--
3%	2.012	3.1	3.7	0.826	<10	2.1	--
8%	5.222	8.4	8.6	0.974	<10	2.0	--
10%	8.030	10.2	93.2	0.110	99.5	94.7	-4.8
15%	10.621	15.0	97.7	0.153	98.9	96.5	-2.4
18%	12.464	18.0	98.4	0.183	98.4	96.7	-1.7
20%	13.748	20.0	98.3	0.204	98.0	96.3	-1.7
25%	16.908	25.3	98.8	0.256	96.8	95.6	-1.2
28%	18.674	28.2	98.8	0.286	96.0	94.7	-1.3
30%	19.880	30.3	99.0	0.306	95.4	94.3	-1.1
33%	21.520	33.1	99.0	0.335	94.4	93.3	-1.1
37%	24.031	37.2	99.3	0.375	92.9	92.0	-0.9
40%	25.706	40.0	99.3	0.403	91.7	90.9	-0.8
43%	27.550	43.0	99.4	0.433	90.3	89.6	-0.7
47%	29.965	47.0	99.5	0.473	88.3	87.6	-0.7
50%	31.804	50.1	99.5	0.504	86.6	85.9	-0.7
53%	33.635	53.2	99.5	0.535	84.8	84.1	-0.7
57%	36.026	57.1	99.5	0.574	82.2	81.5	-0.7
60%	37.852	60.0	99.5	0.603	80.0	79.4	-0.6
63%	39.645	63.1	99.6	0.634	77.7	77.0	-0.7
67%	42.073	67.2	99.6	0.675	74.2	73.5	-0.7
70%	43.798	70.1	99.6	0.704	71.4	70.7	-0.7
75%	46.858	75.2	99.6	0.755	66.1	65.3	-0.8
78%	48.598	78.0	99.6	0.783	62.6	61.9	-0.7
80%	49.785	80.0	99.6	0.804	60.0	59.3	-0.7
83%	51.609	83.1	99.6	0.834	55.8	54.9	-0.9
87%	54.019	87.2	99.6	0.876	49.3	48.1	-1.2
90%	55.784	90.0	99.5	0.904	43.6	42.6	-1.0
92%	56.899	92.0	99.6	0.924	39.2	38.2	-1.0
94%	58.395	94.3	99.5	0.948	34.1	31.7	-2.4
96%	59.384	96.0	99.5	0.965	28.0	26.1	-1.9
100%	61.522	99.4	99.5	1.000	0.0	2.4	2.4

Note: according to point N.6.1 for lower values of generated active power ( $P \leq 10\%S_n$ ), deviations in the reactive power are allowed up to a  $10\%S_n$ .

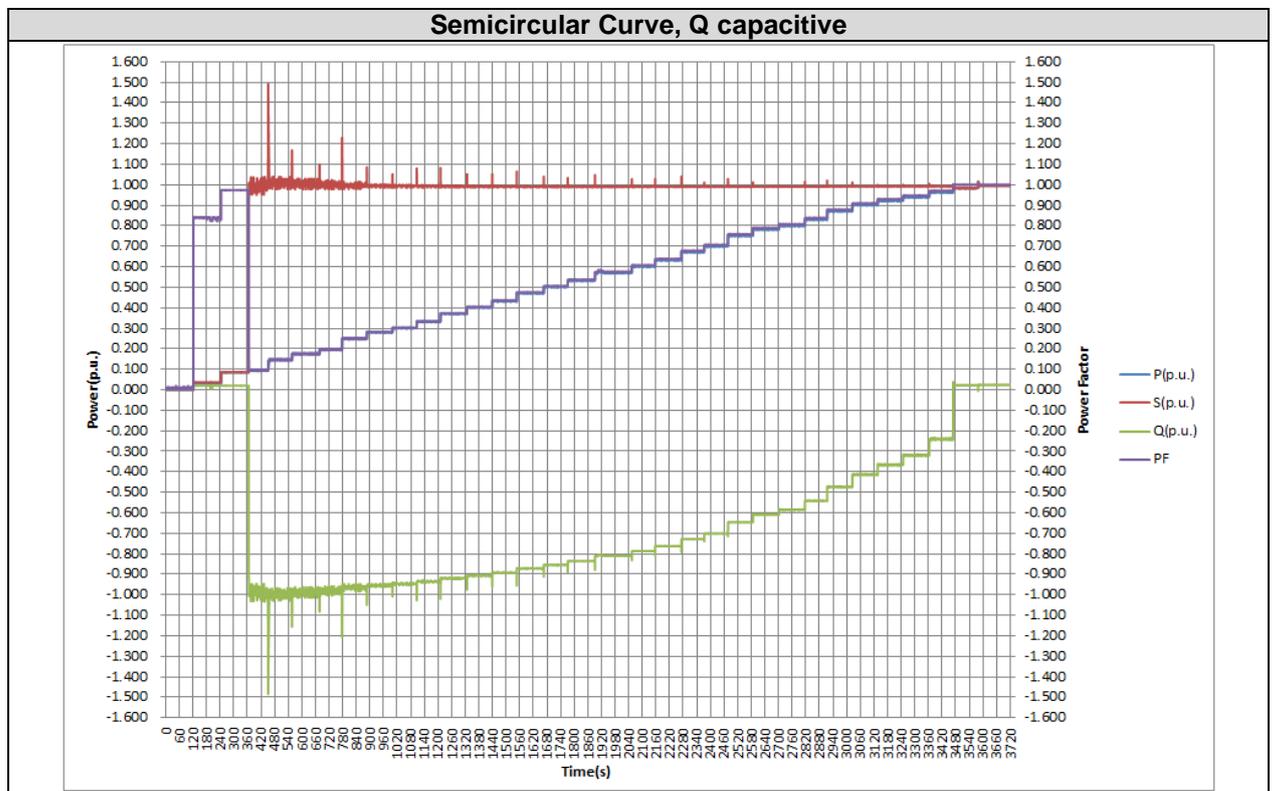
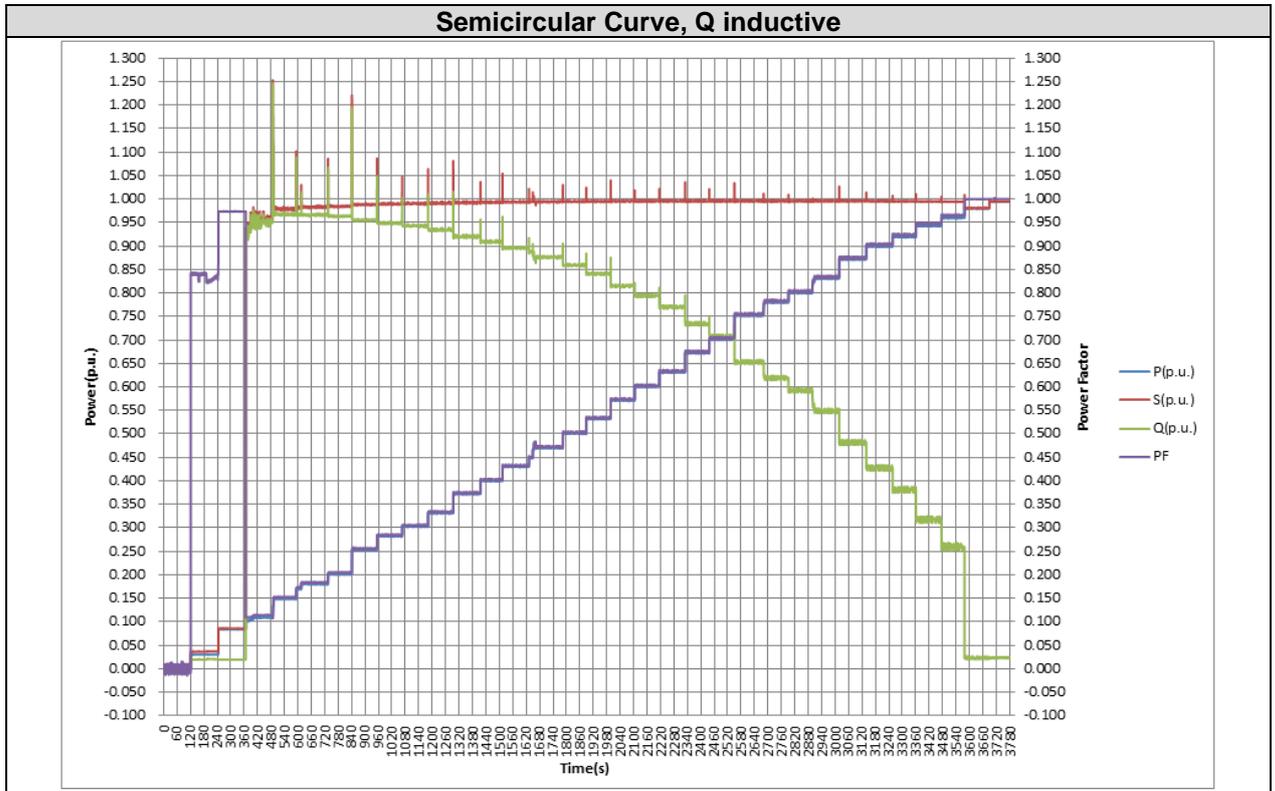
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Semicircular Curve (Capacitive)							
P Desired (%Sn)	Power DC (kW)	P measured (%Sn)	S measured (%Sn)	Power Factor (cos φ)	Q desired (%Sn)	Q measured (%Sn)	Q deviation (%Sn)
0%	0.054	0.0	0.0	0.000	>-10	0.0	--
3%	2.012	3.1	3.7	0.826	>-10	-2.1	--
8%	5.222	8.4	8.6	0.974	>-10	-2.0	--
10%	7.888	9.6	99.0	0.097	-99.5	-98.5	1.0
15%	11.073	14.8	100.8	0.146	-98.9	-99.7	-0.8
18%	12.782	17.7	100.2	0.176	-98.4	-98.6	-0.2
20%	14.050	19.8	99.9	0.198	-98.0	-97.9	0.1
25%	17.232	25.0	99.2	0.252	-96.8	-96.0	0.8
28%	19.002	28.0	99.3	0.282	-96.0	-95.3	0.7
30%	20.282	30.1	99.2	0.303	-95.4	-94.6	0.8
33%	22.065	33.2	99.2	0.334	-94.4	-93.5	0.9
37%	24.378	37.0	99.1	0.374	-92.9	-91.9	1.0
40%	26.238	40.1	99.1	0.404	-91.7	-90.6	1.1
43%	28.123	43.1	99.1	0.435	-90.3	-89.2	1.1
47%	30.498	47.1	99.0	0.475	-88.3	-87.1	1.2
50%	32.360	50.1	99.0	0.506	-86.6	-85.4	1.2
53%	34.160	53.2	99.0	0.537	-84.8	-83.5	1.3
57%	36.403	57.0	99.0	0.576	-82.2	-80.9	1.3
60%	38.225	60.1	99.0	0.607	-80.0	-78.7	1.3
63%	40.126	63.2	99.0	0.638	-77.7	-76.2	1.5
67%	42.424	67.1	99.0	0.678	-74.2	-72.8	1.4
70%	44.106	70.0	99.0	0.707	-71.4	-70.0	1.4
75%	47.200	75.1	99.1	0.758	-66.1	-64.7	1.4
78%	49.064	78.1	99.1	0.789	-62.6	-60.9	1.7
80%	50.173	79.9	99.1	0.807	-60.0	-58.5	1.5
83%	51.951	83.0	99.1	0.838	-55.8	-54.1	1.7
87%	54.356	87.1	99.1	0.879	-49.3	-47.3	2.0
90%	56.282	90.1	99.1	0.909	-43.6	-41.3	2.3
92%	57.550	92.2	99.2	0.929	-39.2	-36.6	2.6
94%	58.544	93.9	99.2	0.947	-34.1	-31.9	2.2
96%	59.914	96.3	99.2	0.970	-28.0	-24.0	4.0
100%	61.902	99.5	99.5	1.000	0.0	2.4	2.4

The Maximum deviation for Reactive Power is considered  $\pm 5$  %Sn above 10%Pn

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Test results are represented at the diagrams below.



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Semicircular Curve; Capacitive vs Inductive

