Calculation of reactive power

Automatic Power Factor Correction Systems

Necessary data

Active Power **(kW)**
Initial cos phi or Active + Reactive Energy
Desired cos phi

Calculation

Q = P * k

Q: Necessary reactive power
P: Active Power (kW)
K: cos phi coefficient from the table

Example

Plant with active power 650 kW and initial cos phi 0.75, to be brought to 0.95.

What is the necessary reactive power**?**
500*0.553 = **276 kVAr**

It is advisable to oversize the necessary reactive power by 15-20% in order to maintain an average cos phi of 0.95 even with load variations.
In this specific case, it would be advisable to propose an Automatic Board with power **325 kVAr**

Initial cos phi — Desired cos phi

Cosphi iniziale	Cosphi desiderato						
	0,90	0,92	0,94	0,95	0,96	0,98	1,00
0,30	2,695	2,754	2,817	2,851	2,888	2,977	3,180
0,35	2,192	2,250	2,313	2,348	2,385	2,473	2,676
0,40	1,807	1,865	1,928	1,963	2,000	2,088	2,291
0,45	1,500	1,559	1,622	1,656	1,693	1,781	1,985
0,50	1,248	1,306	1,369	1,403	1,440	1,529	1,732
0,55	1,034	1,092	1,156	1,190	1,227	1,315	1,518
0,60	0,849	0,907	0,970	1,005	1,042	1,130	1,333
0,65	0,685	0,743	0,806	0,840	0,877	0,966	1,169
0,70	0,536	0,594	0,657	0,692	0,729	0,817	1,020
0,75	0,398	0,456	0,519	0,553	0,590	0,679	0,882
0,80	0,226	0,324	0,387	0,421	0,458	0,547	0,750
0,85	0,135	0,194	0,257	0,291	0,328	0,417	0,620
0,90		0,058	0,121	0,156	0,193	0,281	0,484
0,95					0,037	0,126	0,329