



## Product overview

## Reactive power compensation



## Condensator Dornit

Our plants and solutions serve users and the environment. By prevention of reactive power, harmonics and other system perturbations we reduce the energy consumption and the load in the grid.

The benefits for our customers are:

- Lower costs for energy (Active and reactive power)
- Higher reliability of electrical installations
- Prevention of investments for a network reinforcement

Reduction of losses is a contribution to the protection of our environment by reduction of CO<sub>2</sub> emission.

We offer a suitable solution for each customer specific network quality problem. Due to the multitude of variable business segments, in which our customers and we are active, there is a huge variation of different possibilities, to solve arising problems.

In times of increasing complexity of network and user structure we again and again create new ideas, to offer our customers advantages in competition. In many cases we are able, to offer an already existing solution, in sophisticated cases we invent and produce a tailor-made solution, meeting the requirements in a cost efficient way.

### **More than 55 years still at the same location**

1950 DOMINIT-WERKE  
1973 Lepper-Dornit  
1981 ASEA Lepper  
1982 ASEA Kondensatoren  
1988 ABB Kondensatoren  
2002 ABB Schaltanlagentechnik  
2005 CONDENSATOR DOMINIT

### **More than 65 years of experience and innovation**

1953 developed in Brilon  
the first automatic PFC-bank  
1972 new HV application:  
the first tuned filter-bank  
1991 developed in Brilon: COMFIL®  
the filter-combination  
1993 market introduction of: DYNACOMP®  
the dynamic PFC-bank  
1997 developed in Brilon: ALFC  
the flicker compensation  
1998 market introduction of: PQF  
the active harmonic filter  
2001 market introduction of: SCOMP  
the arc-proof encapsulated HV-bank  
2002 developed in Brilon: UBF  
the wide-band filter  
2014 developed in Brilon: OSKαR  
Dynamic voltage stabilisation  
2015 developed in Brilon: SOΦIA  
Active regulated voltage controlled harmonic filter

## Why to use reactive power compensation equipment

The majority of electrical equipment has an inductive characteristic, such as motors and fluorescent lamps. They create a reactive load on the supply network, which generates additional losses in transformers and cables. Utilities take the reactive power percentage into account in their tariffs and the enduser has to pay for his reactive power consumption. The use of power capacitors for reactive power compensation not only saves costs, but also results in better utilisation of the local network. The power reserves which are obtained can avoid otherwise necessary network extension and thus save on considerable investment costs.

One way for the dimensioning of the necessary size of a capacitor bank is given in the upper table on the following page. Assuming that the actual uncompensated  $\cos \varphi$  or  $\tan \varphi$  is known the necessary size of the compensation can be calculated, by taking the factor  $k$  from the table according to the target value.

Example:

- Motor 250 kW
- actual  $\cos \varphi = 0,8$  (manufacturer data or measurement)
- Target  $\cos \varphi = 0,95$

From the table:  $k = 0,421 \Rightarrow Q_c = 250 \text{ kW} \times 0,421 \text{ kvar/kW} = 105 \text{ kvar}$

For dimensioning the size of a capacitor bank to avoid reactive power costs according to the energy bill an estimation can be made using the data of an actual energy bill by dividing the value of reactive power consumption (kvarh) by the value of the active power consumption (kwh). This value is an average  $\tan \varphi$  and together with the max power consumption (kW max) the necessary size can also be calculated by using the K-factor from the table on the following page.

Condensator Dornit capacitors offer proven solutions adapted to your conditions on site. The flowchart on page 5 is made to help users to find out, which product is suitable for their needs according to their type of application.

The table on page 4 below is a guideline for dimensioning the connection cables and the protection of the equipment, independent of the concrete type.

## K-Factor for calculating the necessary compensation power

Actual value		Target value										
		0,90	0,91	0,92	0,93	0,94	0,95	0,96	0,97	0,98	0,99	1
cos φ	tan φ	0,48	0,46	0,43	0,40	0,36	0,33	0,29	0,25	0,20	0,14	0
0,40	2,29	1,807	1,836	1,865	1,896	1,928	1,963	2,000	2,041	2,088	2,149	2,291
0,45	1,98	1,500	1,529	1,559	1,589	1,622	1,656	1,693	1,734	1,781	1,842	1,985
0,50	1,73	1,248	1,276	1,306	1,337	1,369	1,403	1,440	1,481	1,529	1,590	1,732
0,52	1,64	1,158	1,187	1,217	1,247	1,280	1,314	1,351	1,392	1,440	1,500	1,643
0,54	1,56	1,074	1,103	1,133	1,163	1,196	1,230	1,267	1,308	1,356	1,416	1,559
0,56	1,48	0,995	1,024	1,053	1,084	1,116	1,151	1,188	1,229	1,276	1,337	1,479
0,58	1,40	0,920	0,949	0,979	1,009	1,042	1,076	1,113	1,154	1,201	1,262	1,405
0,60	1,33	0,849	0,878	0,907	0,938	0,970	1,005	1,042	1,083	1,130	1,191	1,333
0,62	1,27	0,781	0,810	0,839	0,870	0,903	0,937	0,974	1,015	1,062	1,123	1,265
0,64	1,20	0,716	0,745	0,775	0,805	0,838	0,872	0,909	0,950	0,998	1,058	1,201
0,66	1,14	0,654	0,683	0,712	0,743	0,775	0,810	0,847	0,888	0,935	0,996	1,138
0,68	1,08	0,594	0,623	0,652	0,683	0,715	0,750	0,787	0,828	0,875	0,936	1,078
0,70	1,02	0,536	0,565	0,594	0,625	0,657	0,692	0,729	0,770	0,817	0,878	1,020
0,72	0,96	0,480	0,508	0,538	0,569	0,601	0,635	0,672	0,713	0,761	0,821	0,964
0,74	0,91	0,425	0,453	0,483	0,514	0,546	0,580	0,617	0,658	0,706	0,766	0,909
0,76	0,86	0,371	0,400	0,429	0,460	0,492	0,526	0,563	0,605	0,652	0,713	0,855
0,78	0,80	0,318	0,347	0,376	0,407	0,439	0,474	0,511	0,552	0,599	0,660	0,802
0,80	0,75	0,266	0,294	0,324	0,355	0,387	0,421	0,458	0,499	0,547	0,608	0,750
0,81	0,72	0,240	0,268	0,298	0,329	0,361	0,395	0,432	0,473	0,521	0,581	0,724
0,82	0,70	0,214	0,242	0,272	0,303	0,335	0,369	0,406	0,447	0,495	0,556	0,698
0,83	0,67	0,188	0,216	0,246	0,277	0,309	0,343	0,380	0,421	0,469	0,530	0,672
0,84	0,65	0,162	0,190	0,220	0,251	0,283	0,317	0,354	0,395	0,443	0,503	0,646
0,85	0,62	0,135	0,164	0,194	0,225	0,257	0,291	0,328	0,369	0,417	0,477	0,620
0,86	0,59	0,109	0,138	0,167	0,198	0,230	0,265	0,302	0,343	0,390	0,451	0,593
0,87	0,57	0,082	0,111	0,141	0,172	0,204	0,238	0,275	0,316	0,364	0,424	0,567
0,88	0,54	0,055	0,084	0,114	0,145	0,177	0,211	0,248	0,289	0,337	0,397	0,540
0,89	0,51	0,028	0,057	0,086	0,117	0,149	0,184	0,221	0,262	0,309	0,370	0,512
0,90	0,48	0	0,029	0,058	0,089	0,121	0,156	0,193	0,234	0,281	0,342	0,484
0,91	0,46	-	0	0,030	0,060	0,093	0,127	0,164	0,205	0,253	0,313	0,456
0,92	0,43	-	-	0	0,031	0,063	0,097	0,134	0,175	0,223	0,283	0,426
0,93	0,40	-	-	-	0	0,032	0,067	0,104	0,145	0,192	0,253	0,395

## Guideline for dimensioning connection cables and feeding breakers

HRC-fuses / A	Protection		Connection Cross-section / mm <sup>2</sup>
		SACE-CB Teramax <sup>1</sup>	
16		T2N160R016	4 x 2,5
25		T2N160R025	4 x 4
35		T2N160R040	4 x 6
50		T2N160R050	4 x 10
63		T2N160R063	4 x 16
80		T2N160R080	3 x 25 / 16
100		T2N160R100	3 x 35 / 16
125		T2N160R125	3 x 50 / 25
160		T2N160R160	3 x 70 / 35
200		T3N250R200	3 x 95 / 50
250		T3N250R250	3 x 120 / 70
315		T4N320R320	3 x 185 / 95
400		T5N400R400	2    3 x 95 / 70
500		T5N630R500	2    3 x 120 / 70
630		T5N630R630	2    3 x 185 / 95
800		T6N800R800	2    3 x 240 / 120

1 = Recommendation for Network with  $I_{cu} \leq 36$  kA, in cases of higher values a different type of breaker is required (for example „S“ for  $I_{cu} \leq 50$  kA)

# Selection guide for power factor improvement Equipment

## Decision

## Solution

Fixed capacitor?  
( $Q_{\text{Capacitor}} < 15\% Q_{\text{Transformer}}$ )

Low non-linear load?  
( $Q_N / Q_L \leq 1 / 3$ )

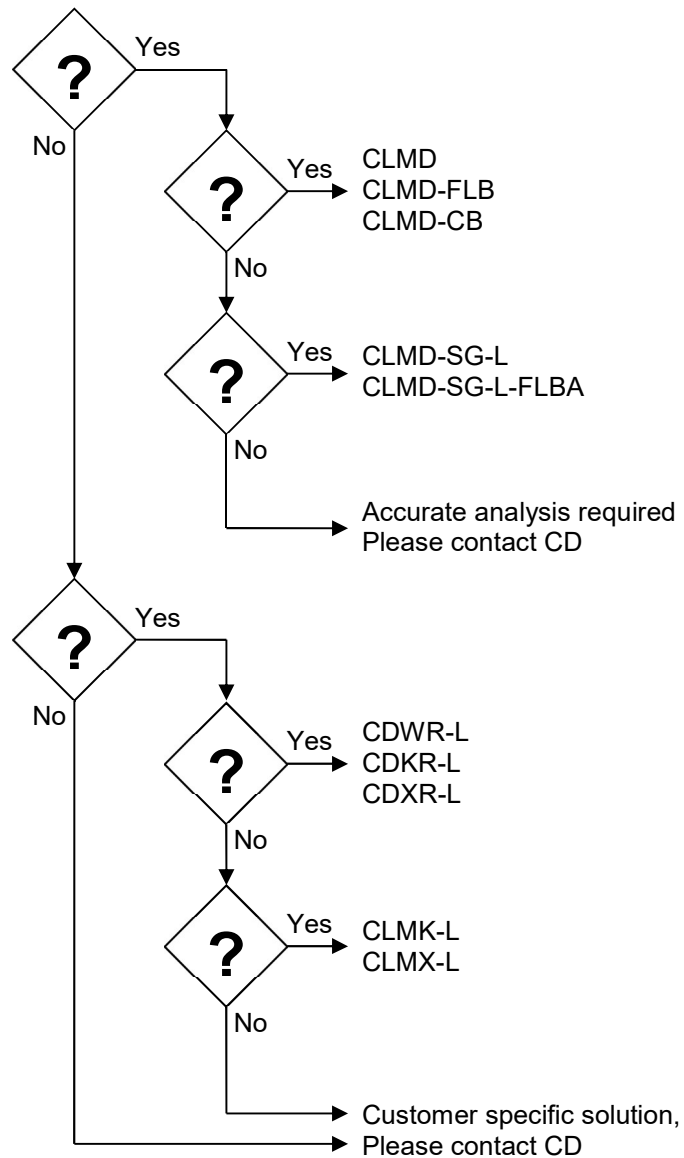
Medium non-linear load?  
( $Q_N / Q_L \leq 1$ )

Automatic bank?

Light environment

Heavy Duty Industry  
(Mining, Paper, ...)

Special requirements  
- extreme harmonic load  
- Environmental conditions  
- highly dynamic load (welders, cranes, ...)



$Q_N$  = non linear loads  
 $Q_L$  = linear loads

## Fixed capacitors CLMD



### Application

The CLMD fixed capacitor is particularly suitable for compensation on site i.e. directly on the electrical equipment which generates reactive power (such as electric motors, transformers). It can also be used where capacitors have to fulfil high mechanical requirements.

### Description

The CLMD power capacitor consists of a number of single-phase cylindrical windings made of metallized polypropylene foil. Each element contains an internal winding fuse according to the IPE principle. The individual self-healing capacitors are installed together with cooling plates in a common sheet metal housing with fireproof granulate filling.

### Advantages

- Wired ready for connection
- Mechanically robust and compact construction
- Robust unbreakable terminals
- Easy installation
- Mounting in any position
- Protection degree IP 42 or IP 54
- Terminals fitted with discharge resistors
- Leakproof and environmental friendly dry capacitor
- Self-healing capacitors with patented winding protection
- Light in weight, no hoisting equipment required

Rated voltage 400 V / 50 Hz /threephase)					
Capacitor design 440 V / 50 Hz					
Rated power kvar	description	Protection fuse* A	Dimensions W x D x H mm	Weight net kg	Article code
5	CLMD 13-400/50-5,0	16	182 x 80 x 262	2	K049-311
10	CLMD 13-400/50-10	25	182 x 80 x 262	2	K049-313
12,5	CLMD 13-400/50-12,5	35	182 x 80 x 262	2	K049-314
15	CLMD 13-400/50-15	35	182 x 80 x 262	2	K049-315
20	CLMD 43-400/50-20	50	176 x 152 x 275	7	C161-OAH
25	CLMD 43-400/50-25	63	176 x 152 x 275	8	C161-OAK
30	CLMD 53-400/50-30	63	346 x 152 x 310	9	C161-OAL
35	CLMD 53-400/50-35	80	346 x 152 x 310	10	C161-OAM
40	CLMD 53-400/50-40	100	346 x 152 x 310	11	C161-OAN
50	CLMD 63-400/50-50	125	346 x 152 x 485	15	C161-OAP
60	CLMD 63-400/50-60	125	346 x 152 x 485	17	C161-OAR
70	CLMD 63-400/50-70	160	346 x 152 x 485	18	C161-OAS
80	CLMD 63-400/50-80	200	346 x 152 x 485	25	C161-OAT
100	CLMD 83-400/50-100	200	346 x 152 x 670	25	C161-OAU
120	CLMD 83-400/50-120	250	346 x 152 x 670	27	C161-OAV

\*Cable dimensioning according page 4

Discharge to 75 V max. 3 minutes after disconnection  
Other voltages, frequencies, power-ratings, reactor-rates on request

## Fixed Capacitor CLMD-FLB with fuse disconnecter and CLMD-CB with circuit breaker



### Application

The fixed capacitors CLMD-FLB and CLMD-CB are fixed capacitors as described on page 3, they are used for individual compensation directly on the electrical equipment. The CLMD-FLB is equipped with an integrated HRC fuse disconnecter which may be operated under no-load conditions. The CLMD-CB is equipped with a circuit breaker, which may be operated even under load.

### Description

The CLMD-FLB power capacitor is a fixed capacitor in sheet steel enclosure with integrated HRC fuse disconnecter which can be operated in no-load condition.

### Advantages

- CLMD-FLB with fuse disconnecter with HRC fuses
- CLMD-CB with circuit breaker
- Wired ready for connection
- Mechanically robust and compact construction
- Easy installation
- Leakproof and environment friendly dry capacitor
- Self-healing capacitors with patented winding protection

Rated voltage 400 V / 50 Hz /threephase) Capacitor design 440 V / 50 Hz					
Rated power kvar	description	Protection fuse* A	Dimensions W x D x H mm	Weight net kg	Article code
10	CLMD 53-400/50-10-FLB	25	346 x 152 x 310	6	F162-OAA
12,5	CLMD 53-400/50-12,5-FLB	35	346 x 152 x 310	7	F162-OAB
15	CLMD 53-400/50-15-FLB	35	346 x 152 x 310	9	F162-OAC
20	CLMD 53-400/50-20-FLB	50	346 x 152 x 310	9	F162-OAD
25	CLMD 53-400/50-25-FLB	63	346 x 152 x 310	10	F162-OAE
30	CLMD 53-400/50-30-FLB	63	346 x 152 x 310	11	F162-OAF
35	CLMD 53-400/50-35-FLB	80	346 x 152 x 310	12	F162-OAG
40	CLMD 53-400/50-40-FLB	100	346 x 152 x 310	13	F162-OAH
50	CLMD 63-400/50-50-FLB	125	346 x 152 x 485	17	F162-OAK

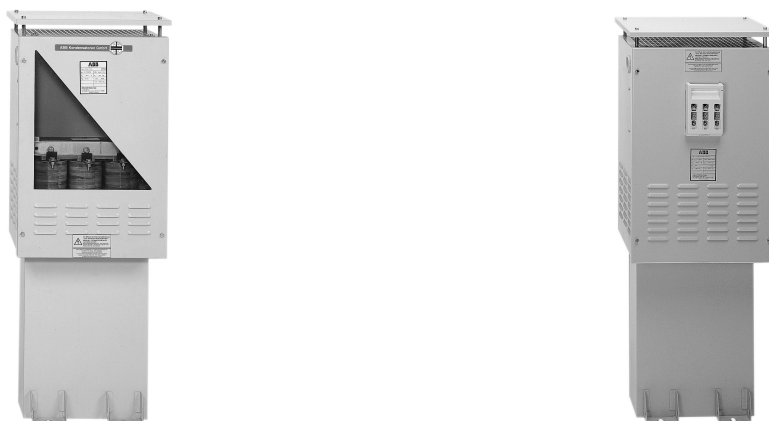
\*Cable dimensioning according page 4

Discharge to 75 V max. 3 minutes after disconnection  
Other voltages, frequencies, power-ratings, reactor-rates on request

### Article codes for CLMD-CB

The article code for CLMD-CB can be derived from the –FLB by changing the code F162-OAx to F162-OEx (e. G. CLMD 53-400/50-10 CB => F162-OEA).

## Fixed Capacitor with detuning reactor CLMD-SG-L/-FLBA



### Application

The CLMD-SG-L fixed capacitor with detuning reactor is used in networks with harmonic loads. More detailed information on harmonics and filters is given in the Annex "Technology". The CLMD-SG-L is particularly suitable for compensation on site, also with high mechanical requirements. The additional built-on fuse disconnecter provides the possibility of disconnecting from the network (in no-load condition).

### Description

The CLMD-SG-L consists of a fixed capacitor and a built-on detuning reactor in a sheet steel enclosure. It can be equipped with an externally operated fuse disconnecter, type CLMD-SG-L-FLBA. The capacitor and the detuning reactor are rated for continuous duty at full admissible harmonic load according to harmonic content, rating, and, if necessary, audio frequencies.

### Advantages

- Wired ready for connection
- Fixed capacitor with detuning reactor for continuous duty at full harmonic load (5% at 250 Hz and 5% for all higher harmonics)
- No RTF suppressors required in networks with audio frequency signals depending on remote frequency
- Easy connection, also for high rating
- Mechanically compact construction
- Leakproof and environment friendly dry capacitor
- Self-healing capacitors with patented winding protection

### Accessory:

- built-on fuse disconnecter with HRC fuses
- Capacitor design voltage with 7% reactor  $\geq 440$  V
- Capacitor design voltage with 12.5% reactor  $\geq 480$  V

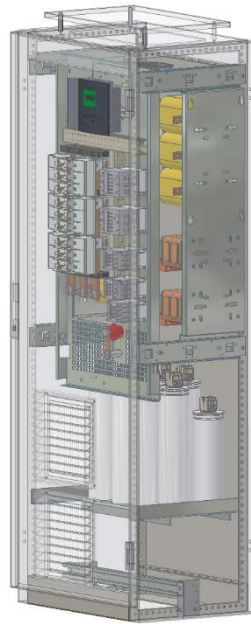


Rated voltage 400 V / 50 Hz (Threephase)					
Rated power kvar	description	Protection fuse* A	Dimensions W x D x H mm	Weight net kg	Code article
<b>Reactor-rate: 7% - IP22</b>					
10	CLMD-400/50-10-SG-L070	20	423 x 325 x 960	28	F162-ACA
15	CLMD-400/50-15-SG-L070	35	423 x 325 x 960	33	F162-ACB
20	CLMD-400/50-20-SG-L070	50	423 x 325 x 960	38	F162-ACC
25	CLMD-400/50-25-SG-L070	50	423 x 325 x 960	43	F162-ACD
30	CLMD-400/50-30-SG-L070	63	423 x 325 x 960	48	F162-ACE
35	CLMD-400/50-35-SG-L070	80	423 x 325 x 960	53	F162-ACF
40	CLMD-400/50-40-SG-L070	80	423 x 325 x 1125	62	F162-ACG
50	CLMD-400/50-50-SG-L070	100	423 x 325 x 1125	68	F162-ACH
60	CLMD-400/50-60-SG-L070	125	423 x 325 x 1125	74	F162-ACK
70	CLMD-400/50-70-SG-L070	160	423 x 325 x 1125	82	F162-ACL
80	CLMD-400/50-80-SG-L070	160	423 x 325 x 1125	88	F162-ACM
<b>Reactor-rate: 12,5% - IP22</b>					
10	CLMD-400/50-10-SG-L125	20	423 x 325 x 960	30	F162-ADA
15	CLMD-400/50-15-SG-L125	35	423 x 325 x 960	35	F162-ADB
20	CLMD-400/50-20-SG-L125	50	423 x 325 x 960	40	F162-ADC
25	CLMD-400/50-25-SG-L125	50	423 x 325 x 960	45	F162-ADD
30	CLMD-400/50-30-SG-L125	63	423 x 325 x 960	50	F162-ADE
35	CLMD-400/50-35-SG-L125	80	423 x 325 x 960	55	F162-ADF
40	CLMD-400/50-40-SG-L125	80	423 x 325 x 1125	62	F162-ADG
50	CLMD-400/50-50-SG-L125	100	423 x 325 x 1125	70	F162-ADH
60	CLMD-400/50-60-SG-L125	125	423 x 325 x 1125	76	F162-ADK
70	CLMD-400/50-70-SG-L125	160	423 x 325 x 1125	84	F162-ADL
80	CLMD-400/50-80-SG-L125	160	423 x 325 x 1125	90	F162-ADM
<b>Reactor-rate: 7% - IP20 - with fuse disconnecter</b>					
10	CLMD-400/50-10-SG-L070-FLBA	20	423 x 350 x 960	28	F162-ORA
15	CLMD-400/50-15-SG-L070-FLBA	35	423 x 350 x 960	33	F162-ORB
20	CLMD-400/50-20-SG-L070-FLBA	50	423 x 350 x 960	38	F162-ORC
25	CLMD-400/50-25-SG-L070-FLBA	50	423 x 350 x 960	43	F162-ORD
30	CLMD-400/50-30-SG-L070-FLBA	63	423 x 350 x 960	48	F162-ORE
35	CLMD-400/50-35-SG-L070-FLBA	80	423 x 350 x 960	53	F162-ORF
40	CLMD-400/50-40-SG-L070-FLBA	80	423 x 350 x 1125	62	F162-ORG
50	CLMD-400/50-50-SG-L070-FLBA	100	423 x 350 x 1125	68	F162-ORH
<b>Reactor-rate: 12,5% - IP20 - with fuse disconnecter</b>					
10	CLMD-400/50-10-SG-L125-FLBA	20	423 x 350 x 960	28	F162-AFA
15	CLMD-400/50-15-SG-L125-FLBA	35	423 x 350 x 960	33	F162-AFB
20	CLMD-400/50-20-SG-L125-FLBA	50	423 x 350 x 960	38	F162-AFC
25	CLMD-400/50-25-SG-L125-FLBA	50	423 x 350 x 960	43	F162-AFD
30	CLMD-400/50-30-SG-L125-FLBA	63	423 x 350 x 960	48	F162-AFE
35	CLMD-400/50-35-SG-L125-FLBA	80	423 x 350 x 960	53	F162-AFF
40	CLMD-400/50-40-SG-L125-FLBA	80	423 x 350 x 1125	62	F162-AFG
50	CLMD-400/50-50-SG-L125-FLBA	100	423 x 350 x 1125	68	F162-AFH

\*Cable dimensioning according page 4

Discharge to 75 V max. 3 minutes after disconnection  
Other voltages, frequencies, power-ratings, reactor-rates on request

## Medium size cubicles with reactor CLMK2-L / CDK2R-L



### Application

CLMK-L and CDKR-L with reactors are used as central compensation for medium reactive power requirements in networks with harmonics. CLMK-L is specially designed for rough environmental conditions and available for networks up to 690 V.

### Description

The bank is factory mounted and tested and ready for connection. The component arrangement guarantees optimized thermal conditions. The power controller BR7000-1 switches the compensation power in steps according the actual requirements. Capacitors and reactors are dimensioned according the step power, harmonics and remote control frequency.

### Advantages

Reactor for each step dimensioned for continuous operation with harmonics

No audio frequency block necessary in networks with remote control

Cable entry from the bottom

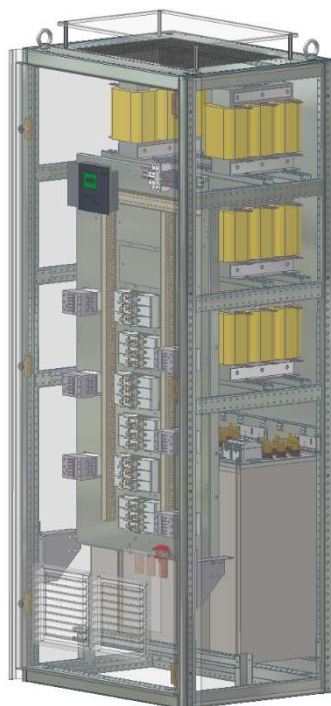
Rated voltage 400 V / 50 Hz (Threephase)						
Rated Power kvar	Switching steps kvar	Description	Protection fuse* A	Dimensions W x D x H mm	Weight net Kg	Article Code
<b>Reactor rate 7%</b>						
56,25	9x6,25	CDK2R-400/50-9x6,25-L070	125	605 x 543 x 1710	145	A151-DVA
68,75	11x6,25	CDK2R-400/50-11x6,25-L070	160	605 x 543 x 1710	153	A151-DVC
81,25	13x6,25	CDK2R-400/50-13x6,25-L070	160	605 x 543 x 1710	164	A151-DVE
93,75	15x6,25	CDK2R-400/50-15x6,25-L070	200	605 x 543 x 1710	177	A151-DVG
62,5	5x12,5	CDK2R-400/50-5x12,5-L070	125	605 x 543 x 1710	143	A151-DYA
75	6x12,5	CDK2R-400/50-6x12,5-L070	160	605 x 543 x 1710	154	A151-DYB
87,5	7x12,5	CDK2R-400/50-7x12,5-L070	160	605 x 543 x 1710	165	A151-DYC
100	8x12,5	CDK2R-400/50-8x12,5-L070	200	605 x 543 x 1710	175	A151-DYD
112,5	9x12,5	CDK2R-400/50-9x12,5-L070	200	605 x 543 x 1710	187	A151-DYE
125	10x12,5	CDK2R-400/50-10x12,5-L070	250	605 x 543 x 1710	200	A151-DYF
137,5	11x12,5	CDK2R-400/50-11x12,5-L070	250	605 x 543 x 1710	207	A151-DYG
150	12x12,5	CDK2R-400/50-12x12,5-L070	315	605 x 543 x 1710	220	A151-DYH
75	3x25	CDK2R-400/50-3x25-L070	160	605 x 543 x 1710	150	A151-DZA
100	4x25	CDK2R-400/50-4x25-L070	200	605 x 543 x 1710	171	A151-DZB
125	5x25	CDK2R-400/50-5x25-L070	250	605 x 543 x 1710	195	A151-DZC
150	6x25	CDK2R-400/50-6x25-L070	315	605 x 543 x 1710	216	A151-DZD

Rated voltage 400 V / 50 Hz (Threephase)						
Rated Power kvar	Switching steps kvar	Description	Protection fuse* A	Dimensions W x D x H mm	Weight net Kg	Article Code
<b>Reactor rate 12,5%</b>						
56,25	9x6,25	CDK2R-400/50-9x6,25-L125	125	605 x 543 x 1710	169	A151-ECA
68,75	11x6,25	CDK2R-400/50-11x6,25-L125	160	605 x 543 x 1710	179	A151-ECC
81,25	13x6,25	CDK2R-400/50-13x6,25-L125	160	605 x 543 x 1710	195	A151-ECE
93,75	15x6,25	CDK2R-400/50-15x6,25-L125	200	605 x 543 x 1710	210	A151-ECG
62,5	5x12,5	CDK2R-400/50-5x12,5-L125	125	605 x 543 x 1710	163	A151-EEA
75	6x12,5	CDK2R-400/50-6x12,5-L125	160	605 x 543 x 1710	178	A151-EEB
87,5	7x12,5	CDK2R-400/50-7x12,5-L125	160	605 x 543 x 1710	193	A151-EEC
100	8x12,5	CDK2R-400/50-8x12,5-L125	200	605 x 543 x 1710	208	A151-EED
112,5	9x12,5	CDK2R-400/50-9x12,5-L125	200	605 x 543 x 1710	223	A151-EEE
125	10x12,5	CDK2R-400/50-10x12,5-L125	250	605 x 543 x 1710	237	A151-EEF
137,5	11x12,5	CDK2R-400/50-11x12,5-L125	250	605 x 543 x 1710	252	A151-EEG
150	12x12,5	CDK2R-400/50-12x12,5-L125	315	605 x 543 x 1710	267	A151-EEH
75	3x25	CDK2R-400/50-3x25-L125	160	605 x 543 x 1710	178	A151-EFA
100	4x25	CDK2R-400/50-4x25-L125	200	605 x 543 x 1710	205	A151-EFB
125	5x25	CDK2R-400/50-5x25-L125	250	605 x 543 x 1710	232	A151-EFC
150	6x25	CDK2R-400/50-6x25-L125	315	605 x 543 x 1710	262	A151-EFD
<b>Reactor rate 7%</b>						
56,25	9x6,25	CLMK2-400/50-9x6,25-L070	125	605 x 543 x 1710	145	A351-DVA
68,75	11x6,25	CLMK2-400/50-11x6,25-L070	160	605 x 543 x 1710	153	A351-DVC
81,25	13x6,25	CLMK2-400/50-13x6,25-L070	160	605 x 543 x 1710	164	A351-DVE
93,75	15x6,25	CLMK2-400/50-15x6,25-L070	200	605 x 543 x 1710	177	A351-DVG
62,5	5x12,5	CLMK2-400/50-5x12,5-L070	125	605 x 543 x 1710	143	A351-DYA
75	6x12,5	CLMK2-400/50-6x12,5-L070	160	605 x 543 x 1710	154	A351-DYB
87,5	7x12,5	CLMK2-400/50-7x12,5-L070	160	605 x 543 x 1710	165	A351-DYC
100	8x12,5	CLMK2-400/50-8x12,5-L070	200	605 x 543 x 1710	175	A351-DYD
112,5	9x12,5	CLMK2-400/50-9x12,5-L070	200	605 x 543 x 1710	187	A351-DYE
125	10x12,5	CLMK2-400/50-10x12,5-L070	250	605 x 543 x 1710	200	A351-DYF
137,5	11x12,5	CLMK2-400/50-11x12,5-L070	250	605 x 543 x 1710	207	A351-DYG
150	12x12,5	CLMK2-400/50-12x12,5-L070	315	605 x 543 x 1710	220	A351-DYH
75	3x25	CLMK2-400/50-3x25-L070	160	605 x 543 x 1710	150	A351-DZA
100	4x25	CLMK2-400/50-4x25-L070	200	605 x 543 x 1710	171	A351-DZB
125	5x25	CLMK2-400/50-5x25-L070	250	605 x 543 x 1710	195	A351-DZC
150	6x25	CLMK2-400/50-6x25-L070	315	605 x 543 x 1710	216	A351-DZD
<b>Reactor rate 12,5%</b>						
56,25	9x6,25	CLMK2-400/50-9x6,25-L125	125	605 x 543 x 1710	169	A351-ECA
68,75	11x6,25	CLMK2-400/50-11x6,25-L125	160	605 x 543 x 1710	179	A351-ECC
81,25	13x6,25	CLMK2-400/50-13x6,25-L125	160	605 x 543 x 1710	195	A351-ECE
93,75	15x6,25	CLMK2-400/50-15x6,25-L125	200	605 x 543 x 1710	210	A351-ECG
62,5	5x12,5	CLMK2-400/50-5x12,5-L125	125	605 x 543 x 1710	163	A351-EEA
75	6x12,5	CLMK2-400/50-6x12,5-L125	160	605 x 543 x 1710	178	A351-EEB
87,5	7x12,5	CLMK2-400/50-7x12,5-L125	160	605 x 543 x 1710	193	A351-EEC
100	8x12,5	CLMK2-400/50-8x12,5-L125	200	605 x 543 x 1710	208	A351-EED
112,5	9x12,5	CLMK2-400/50-9x12,5-L125	200	605 x 543 x 1710	223	A351-EEE
125	10x12,5	CLMK2-400/50-10x12,5-L125	250	605 x 543 x 1710	237	A351-EEF
137,5	11x12,5	CLMK2-400/50-11x12,5-L125	250	605 x 543 x 1710	252	A351-EEG
150	12x12,5	CLMK2-400/50-12x12,5-L125	315	605 x 543 x 1710	267	A351-EEH
75	3x25	CLMK2-400/50-3x25-L125	160	605 x 543 x 1710	178	A351-EFA
100	4x25	CLMK2-400/50-4x25-L125	200	605 x 543 x 1710	205	A351-EFB
125	5x25	CLMK2-400/50-5x25-L125	250	605 x 543 x 1710	232	A351-EFC
150	6x25	CLMK2-400/50-6x25-L125	315	605 x 543 x 1710	262	A351-EFD

\*Cable dimensioning according page 4

Also available with ABB controller RVC, Article code changes to A171... resp. A371...  
Other voltages, frequencies, power-ratings, reactor-rates on request

## Cubicles with reactors CLMX-L, CDXR-L



### Application

The switchgear systems CLMX-L and CDXR-L are designed for centralized compensation with high reactive power requirements in networks with harmonics. CLMX-L is specially designed for rough environmental conditions and available for networks up to 690 V.

### Description

The bank is factory mounted and tested and ready for connection. The component arrangement guarantees optimized thermal conditions. The power controller BR7000-1 switches the compensation power in steps according the actual requirements. Capacitors and reactors are dimensioned according the step power, harmonics and remote control frequency.

### Advantages

Reactor for each step dimensioned for continuous operation with harmonics

No audio frequency block necessary in networks with remote control

Degree of Protection IP20

Standard execution with cable entry from the bottom, optional from top

Rated voltage 400 V / 50 Hz (Threephase)						
Rated Power kvar	Switching steps kvar	Description	Protection fuse* A	Dimensions W x D x H mm	Weight net Kg	Article Code
<b>Basic units with controller, Reactor rate 7%</b>						
137,5	11x12,5	CDXR-400/50-11x12,5-L070	315	640 x 651 x 2084	255	A156-CAK
187,5	15x12,5	CDXR-400/50-15x12,5-L070	400	640 x 651 x 2084	300	A156-CAP
237,5	19x12,5	CDXR-400/50-19x12,5-L070	500	640 x 651 x 2084	345	A156-CAU
287,5	23x12,5	CDXR-400/50-23x12,5-L070	630	840 x 651 x 2084	405	A156-CBZ
125	5x25	CDXR-400/50-5x25-L070	250	640 x 651 x 2084	235	A156-CCC
150	6x25	CDXR-400/50-6x25-L070	315	640 x 651 x 2084	260	A156-CCD
175	7x25	CDXR-400/50-7x25-L070	400	640 x 651 x 2084	280	A156-CCE
200	8x25	CDXR-400/50-8x25-L070	400	640 x 651 x 2084	305	A156-CCF
225	9x25	CDXR-400/50-9x25-L070	500	640 x 651 x 2084	325	A156-CCG
250	10x25	CDXR-400/50-10x25-L070	500	640 x 651 x 2084	350	A156-CCH
275	11x25	CDXR-400/50-11x25-L070	630	640 x 651 x 2084	370	A156-CCK
300	12x25	CDXR-400/50-12x25-L070	630	840 x 651 x 2084	410	A156-CDL
325	13x25	CDXR-400/50-13x25-L070	630	840 x 651 x 2084	425	A156-CDM
350	14x25	CDXR-400/50-14x25-L070	800	840 x 651 x 2084	450	A156-CDN
375	15x25	CDXR-400/50-15x25-L070	800	840 x 651 x 2084	470	A156-CDP

<b>Rated voltage 400 V / 50 Hz (Threephase)</b>						
<b>Rated Power kvar</b>	<b>Switching steps kvar</b>	<b>Description</b>	<b>Protection fuse* A</b>	<b>Dimensions W x D x H mm</b>	<b>Weight net Kg</b>	<b>Article Code</b>
150	3x50	CDXR-400/50-3x50-L070	315	640 x 651 x 2084	255	A156-CEA
200	4x50	CDXR-400/50-4x50-L070	400	640 x 651 x 2084	300	A156-CEB
250	5x50	CDXR-400/50-5x50-L070	500	640 x 651 x 2084	345	A156-CEC
300	6x50	CDXR-400/50-6x50-L070	630	640 x 651 x 2084	385	A156-CED
350	7x50	CDXR-400/50-7x50-L070	800	840 x 651 x 2084	445	A156-CFE
400	8x50	CDXR-400/50-8x50-L070	800	840 x 651 x 2084	490	A156-CFF
<b>Extension units without controller, without sidewalls, Reactor rate 7%</b>						
100	2x50	CDXR-400/50-2x50-L070/E	200	640 x 651 x 2084	180	F176-CKB
150	3x50	CDXR-400/50-3x50-L070/E	315	640 x 651 x 2084	225	F176-CKC
200	4x50	CDXR-400/50-4x50-L070/E	400	640 x 651 x 2084	265	F176-CKD
250	5x50	CDXR-400/50-5x50-L070/E	500	640 x 651 x 2084	315	F176-CKE
300	6x50	CDXR-400/50-6x50-L070/E	630	640 x 651 x 2084	355	F176-CKF
350	7x50	CDXR-400/50-7x50-L070/E	800	840 x 651 x 2084	415	F176-CKG
400	8x50	CDXR-400/50-8x50-L070/E	800	840 x 651 x 2084	460	F176-CKH
<b>Basic units with controller, Reactor rate 12,5%</b>						
137,5	11x12,5	CDXR-400/50-11x12,5-L125	315	640 x 651 x 2084	280	A156-EAK
187,5	15x12,5	CDXR-400/50-15x12,5-L125	400	640 x 651 x 2084	335	A156-EAP
237,5	19x12,5	CDXR-400/50-19x12,5-L125	500	640 x 651 x 2084	390	A156-EAU
287,5	23x12,5	CDXR-400/50-23x12,5-L125	630	840 x 651 x 2084	455	A156-EBZ
125	5x25	CDXR-400/50-5x25-L125	250	640 x 651 x 2084	260	A156-ECC
150	6x25	CDXR-400/50-6x25-L125	315	640 x 651 x 2084	290	A156-ECD
175	7x25	CDXR-400/50-7x25-L125	400	640 x 651 x 2084	315	A156-ECE
200	8x25	CDXR-400/50-8x25-L125	400	640 x 651 x 2084	345	A156-ECF
225	9x25	CDXR-400/50-9x25-L125	500	640 x 651 x 2084	370	A156-ECG
250	10x25	CDXR-400/50-10x25-L125	500	640 x 651 x 2084	400	A156-ECH
275	11x25	CDXR-400/50-11x25-L125	630	640 x 651 x 2084	420	A156-ECK
300	12x25	CDXR-400/50-12x25-L125	630	840 x 651 x 2084	465	A156-EDL
325	13x25	CDXR-400/50-13x25-L125	630	840 x 651 x 2084	490	A156-EDM
350	14x25	CDXR-400/50-14x25-L125	800	840 x 651 x 2084	520	A156-EDN
375	15x25	CDXR-400/50-15x25-L125	800	840 x 651 x 2084	540	A156-EDP
150	3x50	CDXR-400/50-3x50-L125	315	640 x 651 x 2084	280	A156-EEA
200	4x50	CDXR-400/50-4x50-L125	400	640 x 651 x 2084	335	A156-EEB
250	5x50	CDXR-400/50-5x50-L125	500	640 x 651 x 2084	390	A156-EEC
300	6x50	CDXR-400/50-6x50-L125	630	640 x 651 x 2084	440	A156-EED
350	7x50	CDXR-400/50-7x50-L125	800	840 x 651 x 2084	510	A156-EFE
400	8x50	CDXR-400/50-8x50-L125	800	840 x 651 x 2084	560	A156-EFF
<b>Extension units without controller, without sidewalls, Reactor rate 12,5%</b>						
100	2x50	CDXR-400/50-2x50-L125/E	200	640 x 651 x 2084	195	F176-EKB
150	3x50	CDXR-400/50-3x50-L125/E	315	640 x 651 x 2084	250	F176-EKC
200	4x50	CDXR-400/50-4x50-L125/E	400	640 x 651 x 2084	305	F176-EKD
250	5x50	CDXR-400/50-5x50-L125/E	500	640 x 651 x 2084	360	F176-EKE
300	6x50	CDXR-400/50-6x50-L125/E	630	640 x 651 x 2084	410	F176-EKF
350	7x50	CDXR-400/50-7x50-L125/E	800	840 x 651 x 2084	475	F176-EKG
400	8x50	CDXR-400/50-8x50-L125/E	800	840 x 651 x 2084	530	F176-EKH
<b>Basic units with controller, Reactor rate 7%</b>						
137,5	11x12,5	CLMX-400/50-11x12,5-L070	315	640 x 651 x 2084	370	A170-OHG
187,5	15x12,5	CLMX-400/50-15x12,5-L070	400	640 x 651 x 2084	390	A170-OHM
237,5	19x12,5	CLMX-400/50-19x12,5-L070	500	640 x 651 x 2084	420	A170-OHS
287,5	23x12,5	CLMX-400/50-23x12,5-L070	630	840 x 651 x 2084	510	A170-OHX
125	5x25	CLMX-400/50-5x25-L070	250	640 x 651 x 2084	390	A170-ORC
150	6x25	CLMX-400/50-6x25-L070	315	640 x 651 x 2084	405	A170-ORD
175	7x25	CLMX-400/50-7x25-L070	400	640 x 651 x 2084	430	A170-ORE
200	8x25	CLMX-400/50-8x25-L070	400	640 x 651 x 2084	445	A170-ORF
225	9x25	CLMX-400/50-9x25-L070	500	640 x 651 x 2084	460	A170-ORG
250	10x25	CLMX-400/50-10x25-L070	500	840 x 651 x 2084	520	A170-ORH
275	11x25	CLMX-400/50-11x25-L070	630	840 x 651 x 2084	570	A170-ORK
300	12x25	CLMX-400/50-12x25-L070	630	840 x 651 x 2084	620	A170-ORL

<b>Rated voltage 400 V / 50 Hz (Threephase)</b>						
<b>Rated Power kvar</b>	<b>Switching steps kvar</b>	<b>Description</b>	<b>Protection fuse* A</b>	<b>Dimensions W x D x H mm</b>	<b>Weight net Kg</b>	<b>Article Code</b>
150	3x50	CLMX-400/50-3x50-L070	315	640 x 651 x 2084	370	A170-OTA
200	4x50	CLMX-400/50-4x50-L070	400	640 x 651 x 2084	390	A170-OTB
250	5x50	CLMX-400/50-5x50-L070	500	840 x 651 x 2084	490	A170-OTC
300	6x50	CLMX-400/50-6x50-L070	630	840 x 651 x 2084	510	A170-OTD
<b>Extension units without controller, without sidewalls, Reactor rate 7%</b>						
150	3x50	CLMX-400/50-3x50-L070/E	315	640 x 651 x 2084	370	F190-OTA
200	4x50	CLMX-400/50-4x50-L070/E	400	640 x 651 x 2084	390	F190-OTB
250	5x50	CLMX-400/50-5x50-L070/E	500	840 x 651 x 2084	490	F190-OTC
300	6x50	CLMX-400/50-6x50-L070/E	630	840 x 651 x 2084	510	F190-OTD
<b>Basic units with controller, Reactor rate 12,5%</b>						
137,5	11x12,5	CLMX-400/50-11x12,5-L125	315	640 x 651 x 2084	370	A170-OKG
187,5	15x12,5	CLMX-400/50-15x12,5-L125	400	640 x 651 x 2084	390	A170-OKM
237,5	19x12,5	CLMX-400/50-19x12,5-L125	500	840 x 651 x 2084	420	A170-OKS
287,5	23x12,5	CLMX-400/50-23x12,5-L125	630	840 x 651 x 2084	510	A170-OKX
125	5x25	CLMX-400/50-5x25-L125	250	640 x 651 x 2084	390	A190-AKC
150	6x25	CLMX-400/50-6x25-L125	315	640 x 651 x 2084	405	A170-AKD
175	7x25	CLMX-400/50-7x25-L125	400	640 x 651 x 2084	430	A170-AKE
200	8x25	CLMX-400/50-8x25-L125	400	640 x 651 x 2084	445	A170-AKF
225	9x25	CLMX-400/50-9x25-L125	500	640 x 651 x 2084	460	A170-AKG
250	10x25	CLMX-400/50-10x25-L125	500	840 x 651 x 2084	520	A170-AKH
275	11x25	CLMX-400/50-11x25-L125	630	840 x 651 x 2084	570	A170-AKK
300	12x25	CLMX-400/50-12x25-L125	630	840 x 651 x 2084	620	A170-AKL
150	3x50	CLMX-400/50-3x50-L125	315	640 x 651 x 2084	370	A170-AMA
200	4x50	CLMX-400/50-4x50-L125	400	640 x 651 x 2084	390	A170-AMB
250	5x50	CLMX-400/50-5x50-L125	500	840 x 651 x 2084	490	A170-AMC
300	6x50	CLMX-400/50-6x50-L125	630	840 x 651 x 2084	510	A170-AMD
<b>Extension units without controller, without sidewalls, Reactor rate 12,5%</b>						
150	3x50	CLMX-400/50-3x50-L125/E	315	640 x 651 x 2084	370	F190-AMA
200	4x50	CLMX-400/50-4x50-L125/E	400	640 x 651 x 2084	390	F190-AMB
250	5x50	CLMX-400/50-5x50-L125/E	500	840 x 651 x 2084	490	F190-AMC
300	6x50	CLMX-400/50-6x50-L125/E	630	840 x 651 x 2084	510	F190-AMD

\*Cable dimensioning according page 4

Also available with ABB controller RVC, Article code changes to A156... resp. A190...  
Other voltages, frequencies, power-ratings, reactor-rates on request

# Products and Services of Condensator Dominit

## Qualified network analysis

Caused by wrong measurements network problems are often analysed inaccurate. Suitable measures can not be deducted. Our employees use top class equipment for qualified network analyses and give recommendations for the elimination of disturbances and the improvement of network quality.

## Reactive power

Electrical equipments, which aside active power also require reactive current, cause significant higher grid load and by this increased transmission losses. We offer banks for reactive power compensation help to lower costs and to reduce CO<sub>2</sub>-emission. Our customers by this save money and support the environment.

## Harmonics

Frequency converters, power supplies for electronic devices etc. are non-linear loads and by this generate harmonics which cause increased losses and disturbances. We offer active and passive filters fitting to the source of disturbance and customer's requirements. Our customers by this avoid harmonic problems and save costs.

## Voltage dips

Motors need a high starting current and by this may cause an unacceptable voltage drop during start-up time resulting in overload-tripping and mal-functions. We offer motor-start compensation, which does not limit the motor-current but only the grid load. Our customers by this achieve a save start without affecting other processes.

## Voltage fluctuation

Repeatedly heavy load changes can cause a disturbing voltage fluctuation which often results in critical mal-function of other electrical equipment. We offer systems for dynamic compensation to stabilize the supply voltage. Our customers by this reduce production failures and achieve more constant product quality.

## Flicker disturbance

Voltage fluctuation with high repetition rate is typical for equipments like grid-welders. Such productions can cause unacceptable flicker disturbance on the grid. We offer customer designed flicker compensation to fight excessive flicker. Our customers by this achieve a stable supply voltage and avoid disturbing flicker levels.

## Voltage unbalance

Single-phase and two-phase electrical equipments can cause unacceptable voltage unbalance resulting in increased losses and reduced grid capacity. We offer customer designed compensation equipments for load-balancing. Our customers by this reduce the voltage unbalance and resulting excessive losses.

## Commutation notches

Rectifiers and converters show commutations with high voltage steepness. Such notches cause mal-functions and may destroy electronic devices. We offer special commutation filters related to the generating load as well as to reduce the disturbing impact on separate sensitive network area.

## **Transients and pulses**

Load switching, pulse frequencies, atmospheric disturbances etc. can cause high voltage spikes on the grid, which disturb and destroy electrical devices. We offer over-voltage protection capacitors, but also special customer designed filters. Our customers by this can protect their grid and avoid costly production failure.

## **Neutral overload**

The increasing use of non-linear single-phase loads results in overload of the neutral conductor and faults of electronic devices. An upgrade of the network to neutral cross-section according phase cross-section is hardly to realize. Filtering measures to unload the neutral conductor can help to avoid disturbances and the risk of fire.

## **Ripple control**

Audio frequency control signals may not be inadmissibly affected, but should themselves not be the source of disturbances. With blocking circuits in front of generators or at the feeding point of your distribution systems we guarantee compatibility of your plant, with noise filters we prevent you from disturbances by ripple control signals in the grid.

## **Maintenance**

The proper operation of a compensation- or filter system saves costs and provides sufficient voltage quality. Regular inspection and well timed maintenance ensure a high operational availability. Additionally we offer a cost efficient short check of the network compatibility.

Condensator Dornit GmbH  
An der Bremecke 8  
59929 Brilon  
Germany

Phone: +49 / 29 61 / 7 82 – 0  
FAX: +49 / 29 61 / 7 82 – 36  
e-mail: [info@dornit.eu](mailto:info@dornit.eu)  
Internet: [www.dornit.eu](http://www.dornit.eu)