

HARMONIC FILTER REACTORS Type FKD / FDR

Features

- Low losses
- Complete with mounting brackets and connecting cables
- Including temperature switches
- Temperature range up to +60 °C

Application

Used in conjunction with LKT type Power Factor Correction Capacitors, harmonic filter reactors (blocking reactors) make it possible to install detuned versions of fixed capacitor banks and power factor correction systems. This enables users installing distribution boards to construct customized systems themselves.

Design

Low-loss, three-phase assembly complete with mounting brackets, connecting cables and thermal trip.

Series Resonance Frequency

Version	Series resonance frequency	Detuning factor	For networks with utility company AF remote control ¹⁾
P1	136 Hz	p=13.5 %	> 166 Hz
P7	189 Hz	p= 7 %	> 228 Hz

Utility company specifications inconsistent with the above must be taken into account.

Mounting

The reactor must be mounted in a suitable enclosure ensuring an ambient temperature within the specified range.

Connections

The coil line-side (U1, V1, W1) and load-side (U2, V2, W2) cables can be connected to the switch gear directly or via terminals. The temperature switch (contacts open at 140 °C) must be connected to a trip/alarm circuit in the control system.



Power Loss

3.5 – 6 W/kvar (depending on version and level of harmonics)

Temperature Range

-10 to +60 °C

Ingress Protection

IP00 to IEC 60529 for mounting within an enclosure

Important Note

Please use only the correct number of the appropriate power capacitors as stated in the table for each individual harmonic filter reactor. If this requirement is not adhered to, the resulting series resonance frequency can under certain circumstances move into a critical range. Apart from possibly overloading the installed components, the utility company's remote control systems could also be adversely affected.



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Load Capacity

Version	Power loss W/kvar	Permissible harmo 250 Hz	onic voltage 350 Hz
P1	4-6	6%	6%
P7	3.5-6	6%	6%

1)Utility company specifications inconsistent with the above must be taken into account.



FKD / FDR dimensions

Power Loss

3.5 - 6 W/kvar (depending on version and level of harmonics)

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TECHNICAL DATA

Specimen order 1

P.F. correction stage with 7 % det	tuning factor 25 kvar at
400 V / 50 Hz supply voltage	
2 power capacitors	
Type LKT 11.7 – 400 – DL	ArtNo. 31-10604
2 terminal blocks	
Type AKD 25/3	ArtNo. 31-08000
1 low-loss harmonic filter reactor v	vith temperature switch
Туре	
FKD 25 – 400 – P7	ArtNo. 88-01768
Specimen order 2	

Specimen order 2

P.F. correction stage with 13.5 % detuning factor 12.5 kvar at 400 V / 50 Hz supply voltage 1 nower canacitor

i power capacitor	
Type LKT 15.5 – 480 – DP	ArtNo. 31-10513
1 terminal block	
Type AKD 25/3	ArtNo. 31-08000
1 low-loss harmonic filter reactor v	vith temperature switch
Type FKD 12.5 – 400 – P1	ArtNo. 88-01168

Specimen order 3

P.F. correction stage with 13.5 % detuning factor 20 kvar at 400 V / 50 Hz supply voltage

1 power capacitor

Type LKT 7.6 – 440 – DL	ArtNo. 31-10608
1 power capacitor	
Type LKT 15.5 – 480 – DP	ArtNo. 31-10513
2 terminal blocks	
Type AKD 25/3	ArtNo. 31-08000
1 low-loss harmonic filter reactor v	vith temperature switch
Type FKD 15 – 400 – P1	ArtNo. 88-01038

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Capacitors and Harmonic Filter Reactors for 230 V / 50 Hz - mains network

Resonance f	requency		fres: 189 Hz, detu	ning factor p: 7%									
Rated power	Rated current		Туре		Dim	ensions	Weight	Harmonic Filter Reactors					
Reactor Reactor combination combin Q _{LC} [kvar] In [A]	Reactor combination In [A]	LKT 10.0-400-DP ArtNo. 31-10501	LKT 12,5-400-DP ArtNo. 31-10502	LKT 10.0-440-DP ArtNo. 31-10508	LKT 10,0-525-DP ArtNo. 31-10517	w	W1	н	D	D1	kg	ArtNo.	Туре
5.0	12.6			1	1	150	80	132	109	75.5	5	88-01980	FDR 5-230-P7
10.0	26.9	3				178	100	156	95	66	9	88-01575	FKD 10-230-P7
12.5	31.3	1	2			178	100	156	115.5	85.5	9	88-01974	FDR 12.5-230-P7
16.7	44.9		4			178	100	156	128	98	10	88-01583	FKD 16.7-230-P7
20.0	53.8	1	4			202	100	177	121	91	15	88-01576	FKD 20-230-P7
25.0	62.5	2	4			202	100	177	121	91	16	88-01943	FDR 25-230-P7
33.0	89.9		8			226	100	197	128	98	21	88-01568	FKD 33-230-P7

Capacitors and Harmonic Filter Reactors for 230 V / 60 Hz - mains network

Resonance fr	requency		fres: 227 Hz, detu	uning factor p: 7%									
Rated power of Capacitor Reactor combination Q _{LC} [kvar]	Rated current of Capacitor Reactor combination In [A]	LKT 10.0-400-DP ArtNo. 31-10501	Type and Quantity of the required capacitors 10.0-400-DP LKT 7,1-300-DP .>No. ArtNo. 10501 31-10523		w	Dime W1	ensions H	in mm D	D1	Weight	Harmor ArtNo.	nic Filter Reactors	
17.0 25.0	43.1 62.2	4 2	3			178 202	100 100	156 177	115 121	86 91	10 21	88-01809 88-01892	FKD 17-230-60Hz-P7 FDR 25-230-60Hz-P7

Capacitors and Harmonic Filter Reactors for 400 V / 50 Hz – mains network

Resonance frequency fres: 189 Hz, detuning factor p: 7%														
Rated power	Rated current		Тур	e and Quantity of the	e required capacitors			Dim	ensions	in mm		Weight	Harmonic Filter Reactors	
Reactor combination Q _{tc} [kvar]	Reactor combination In [A]	LKT 7,6-440-DL ArtNo. 31-10608	LKT 9,1-440-DL ArtNo. 31-10609	LKT 12,5-440-DP ArtNo. 31-10507	LKT 11,7-400-DL ArtNo. 31-10604	LKT 15.0-440-DP ArtNo. 31-10506	w	W1	н	D	D1	kg	ArtNo.	Туре
6.25	9.0	1					150	80	130	109	75.5	7	88-01410	FKD 6.25-400-P7
7.5	10.8		1				150	80	130	109	75.5	7	88-01482	FKD 7.5-400-P7
10.0	14.4			1			178	100	156	115.5	85.5	10	88-01479	FKD 10-400-P7
12.5	18.0				1		178	100	156	115.5	85.5	10	88-01767	FDR 12.5-400-P7
15.0	21.6		2				202	100	177	121	91	15	88-01362	FKD 15-400-P7
20.0	29.0			2			226	100	198	104	74	19	88-01363	FKD 20-400-P7
25.0	36.0				2		202	100	177	121	91	21	88-01768	FDR 25-400-P7
30.0	43.0			3			261	140	229	110	80	21	88-01484	FKD 30-400-P7
40.0	58.0					3	261	140	228	110	80	21	88-01782	FDR 40-400-P7
50.0	72.0				4		261	140	225	136	106	27	88 01769	EDP 50 400 P7

Resonance fi	requency		fres: 136 Hz, de	tuning factor p: 13.5	%											
Rated power	Rated current		Туј	Type and Quantity of the required capacitors				Dimensions in mm					Weight	Harmonic Filter Reactors		
Reactor combination Q _{tc} [kvar]	Reactor combination In [A]	LKT 7,8-480-DL ArtNo. 31-10616	LKT 7,7-525-DL ArtNo. 31-10621	LKT 7,6-440-DL ArtNo. 31-10608	LKT 15,5-480-DP ArtNo. 31-10513	LKT 12,1-440-DL ArtNo. 31-10610	LKT 9,1-440-DL ArtNo. 31-10609	w	W1	н	D	D1	kg	ArtNo.	Туре	
6.25	9.0	1						178	100	156	115	86	10	88-01505	FKD 6.25-400-P1	
10.0	14.4		2					178	100	156	115	86	10	88-01695	FKD 10-400-P1	
12.5	18.0				1			202	100	177	121	91	15	88-01168	FKD 12.5-400-P1	
20.0	28.8			1	1			226	100	197	128	98	21	88-01038	FKD 20-400-P1	
25.0	36.0				2			261	140	230	136	106	27	88-01171	FKD 25-400-P1	
40.0	57.6					2	2	295	225	265	155	135	33	88-01779	FDR 40-400-P1	
50.0	72.0							205	225	265	100	105	22	00.01700	500 50 100 D1	

Capacitors and Harmonic Filter Reactors for 415 V / 50 Hz – mains network

Resonance fr	requency		fres: 189 Hz, detuning factor p: 7 %								
Rated power of Capacitor Reactor combination Q _{LC} [kvar]	Rated current of Capacitor Reactor combination In [A]	LKT 15,5-480-DP ArtNo. 31-10513	w	Dime W1	ensions H	in mm D	D1	Weight kg	Harmon ArtNo.	ic Filter Reactors	
12.5	17.3	1		178	100	156	115	86	10	88-01937	FDR 12.5-415-P7
16.8	23.4		2	178	100	156	115	86	11	88-01977	FDR 16.8-415-P7
25.0	34.7	2		202	100	177	121	91	15	88-01938	FDR 25-415-P7
33.6	46.7		4	226	100	197	128	98	19	88-01978	FDR 33.6-415-P7
50.0	69.3	4		261	140	235	136	106	27	88-01930	FDR 50-415-P7

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Capacitors and Harmonic Filter Reactors for 440 V / 50 Hz - mains network

Resonance fr	requency	fres: 189 Hz, detuning factor p: 7%								
Rated power of Capacitor Reactor combination Qtc [kvar]	Rated current of Capacitor Reactor combination In [A]	Type and Quantity of the required capacitors LKT 12,1-440-DL ArtNo. 31-10610	w	Din W1	nensions H	in mm D	D1	Weight	Harmor ArtNo.	ic Filter Reactors Type
25.0 50.0	34.2 68.4	2 4	220 26	100 140	197 235	128 110	98 80	21 28	88-01008 88-01124	FKD 25-440-P7 FKD 50-440-P7

Capacitors and Harmonic Filter Reactors for 440 V / 60 Hz - mains network

Resonance fi	requency		fres: 227 Hz, detu	uning factor p: 7%											
Rated power of Capacitor	Rated current of Capacitor		Тур	e and Quantity of th	e required capacitor	rs			Dim	ensions	in mm		Weight	Harmonic Filter Reactors	
Reactor combination Q _{tc} [kvar]	Reactor combination In [A]	LKT 8,33-525-DL ArtNo. 31-10622	LKT 15,5-480-DP ArtNo. 31-10513	LKT 12,1-440-DL ArtNo. 31-10610	LKT 7,7-525-DL ArtNo. 31-10621	LKT 5,9-525-DL ArtNo. 31-10620	LKT 7,8-480-DL ArtNo. 31-10616	w	W1	н	D	D1	kg	ArtNo.	Туре
6.25	9.2				1			150	80	132	109	75.5	6	88-01914	FKD 6.25-440-60Hz-P7
7.5	9.9	1						150	80	132	109	75.5	6	88-01795	FKD 7.5-440-60Hz-P7
12.5	16.9	1				1		178	100	156	95	66	21	88-01883	FKD 12.5-440-60Hz-P7
15.0	19.8			1				178	100	156	115.5	85.5	10	88-01796	FKD 15-440-60Hz-P7
25.0	33.1		1				1	202	100	177	121	91	11	88-01884	FKD 25-440-60Hz-P7
50.0	66.2		3					261	140	235	110	80	29	88-01875	FDR 50-440-60Hz-P7

Capacitors and Harmonic Filter Reactors for 460 V / 60 Hz - mains network

Resonance frequency		fres: 189 Hz, detuning factor p: 7 %	fres: 189 Hz, detuning factor p: 7 %										
Rated power of Capacitor Reactor combination Q _{tc} [kvar]	Rated current of Capacitor Reactor combination In [A]	Type and Quantity of the required capacitors LKT 12,5-525-DP Art-No. 31-10516	w	Dim W1	ensions H	in mm D	D1	Weight kg	Harmon ArtNo.	nic Filter Reactors Type			
12.5	15.5	1	178	100	156	115.5	85.5	10	88-01854	FDR 12.5-460-60Hz-P7			
25.0	31.1	2	202	100	177	121	91	21	88-01855	FDR 25-460-60Hz-P7			
50.0	62.1	4	261	140	235	136	106	27	88-01856	FDR 50-460-60Hz-P7			

Capacitors and Harmonic Filter Reactors for 480 V / 60 Hz - mains network

Resonance frequency															
Rated power of Capacitor	Rated current of Capacitor		Type and Quantity of the required capacitors				Dimensions in mm						Harmonic Filter Reactors		
Reactor combination Q _{tc} [kvar]	Reactor n combination In [A]	LKT 12,5-525-DP ArtNo. 31-10516	LKT 7,7-525-DL ArtNo. 31-10621	LKT 4,17-525-DL ArtNo. 31-10619	LKT 8,33-525-DL ArtNo. 31-10622	w	W1	н	D	D1	kg	ArtNo.	Туре		
33.3	43.1	2			1	261	140	229	110	80	21	88-01736	FKD 33.3-480-60Hz-P7		
41.6	53.9	3		1		261	140	229	110	80	21	88-01737	FKD 41.6-480-60Hz-P7		
50.0	60.5		6			261	140	235	136	106	27	88-01858	FDR 50-480-60Hz-P7		

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Capacitors and Harmonic Filter Reactors for 525 V / 50 Hz - mains network

Resonance frequency		fres: 189 Hz, detuning factor p: 7 %											
Rated power of Capacitor Reactor combination Q _{tc} [kvar]	r Rated current r of Capacitor Reactor n combination In [A]	Type and Quantity of the required capacitors					Dim	ensions	in mm	Weight	Harmonic Filter Reactors		
		LKT 4,17-525-DL ArtNo. 31-10619	LKT 5,9-525-DL ArtNo. 31-10620	LKT 7,7-525-DL ArtNo. 31-10621	LKT 8,33-525-DL ArtNo. 31-10622	w	W1	н	D	D1	kg	ArtNo.	Туре
6.25	7.0		1			150	80	130	109	75.5	7	88-01801	FKD 6.25-525-P7
12.5	14.1		2			178	100	156	115.5	85.5	10	88-01802	FKD 12.5-525-P7
20.0	24.7	1			2	226	100	198	104	74	19	88-01080	FKD 20-525-P7
25.0	29.6			3		226	100	197	128	98	21	88-01838	FDR 25-525-P7
30.0	34.6	1			3	226	100	197	128	98	21	88-01533	FKD 30-525-P7
50.0	55.0			6		261	140	235	136	106	29	88-01872	FDR 50-525-P7
Resonance	irequency		fres: 136 Hz, det	uning factor p: 13.5	%								

Resonance nequency			ites. 150 fiz, detailing factor p. 15.5 %										
Rated power Rated current of Capacitor of Capacitor					Dim	ensions	in mm		Weight	Harmonic Filter Reactors			
	combination Q _{tc} [kvar]	combination In [A]	ArtNo. 31-10616	LN 53525-DL ArtNo. 31-10620	w	W1	н	D	D1	kg	ArtNo.	Туре	
	36.0	27.9	1	3	261	140	230	136	106	25	88-01960	FDR 25-525-P1	
	50.0	55.8	2	6	295	225	265	155	125	52	88-01900	FDR 50-525-P1	

Capacitors and Harmonic Filter Reactors for 690 V / 50 Hz - mains network

Resonance fr	requency		fres: 189 Hz, det	uning factor p: 7 %								
Rated power of Capacitor Reactor combination Q _{tc} [kvar]	Rated current of Capacitor Reactor combination In [A]	LKT 9,4-440-EP ArtNo. 31-10511	Тур	e and Quantity of the required capacitors	w	Dim W1	ensions H	in mm D	D1	Weight	Harmon ArtNo.	nic Filter Reactors Type
25.0	22.6	3			202	100	177	121	91	19	88-01932	FDR 25-690-P7
50.0	45.2	6			261	140	235	136	106	27	88-01933	FDR 50-690-P7
Resonance fr	requency		fres: 136 Hz, det	uning factor p: 13.5 %								
Rated power of Capacitor	Rated current of Capacitor		Тур	e and Quantity of the required capacitors		Dim	Dimensions in mm Weight Harmonic Filter		nic Filter Reactors			
Reactor	Reactor	LKT 4,8-480-EP ArtNo.	LKT 6,0-480-EP ArtNo.	LKT 8,33-525-EP ArtNo.								
Q _{tc} [kvar]	In [A]	31-10515	31-10514	31-10518	W	W1	н	D	D1	kg	ArtNo.	Туре
25.0	21.7	3	3		261	140	230	136	106	27	88-01842	FKD 25-690-P1
50.0	43.4			9	295	225	265	155	125	33	88-01843	FKD 50-690-P1

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