HARMONIC FILTER REACTORS

Detuned Harmonic Filter Reactors, are used in series with capacitor banks in power factor correction units. By using these types of detuned reactors it is possible to avoid following negative effects on system.

- Overcurrent during switching on the capacitor banks
- Overload of capacitor banks because of the harmonic resonance.
- Short lifetime on capacitors
- Overheating of the utility transmission cables.
- Overheating of the distribution transformer.
- Unintended triggering of the protective devices.
- Distortion of utility voltage waveform and problems on voltage sensitive devices
- Interferences on data transmission systems
- Unexplainable faults in electronic boards

Chosing the correct detuned filter reactor and capacitor value on detuned power factor correction systems is very important. To obtain optimum performance form a detuned power factor correction system following criteria must be controlled and met during the pairing of the reactors and capacitors.

CHOOSING CORRECT HARMONIC FILTER REACTOR

- The resonance frequency must be chosen according to harmonic analysis of the system
- The voltage across the terminals of the capacitor will increase because of the inductive reaction of the rector. The rated voltage of the capacitors must be chosen according to the resonance frequency.
- In detuned power factor correction systems, presence of higher voltage rated capacitors and reactors causes a difference between rated capacitor power and obtained reactive power. The obtained power must be calculated in order to avoid low compensation.
- The reactors will genereate extensive heat due to heavy harmonic load. The cabinets must be designed to disperse this heat.
- All Elektra harmonic filter reactors have CE sign, produced according to 61558-2-20 standards, and tested in accredited laboratory

Harmonics	U_3 = 0,5%U_R
	U_5 = 6,0%U_R
	U_7 = 5,0%U_R
	U_{11} = 3,5%U_R
	U_{13} = 3,0%U_R
Effecive Current	$I_{rms} = \sqrt{(I_1^2 + I_3^2 \ldots I_{13}^2)}$

HARMONIC FILTER REACTORS P=%7 189Hz 400V/50Hz/LINEARITY>1.73xIrms						
Model No	Power (kVAr)	Inductance (mH)	I_1 (A)	I_{rms} (A)	Losses (W)	Weight (kg)
ERH 7/400/2.5K	2,5	15,3	3,6	3,8	42,86	2,4
ERH 7/400/6.25K	6,25	6,13	9	9,51	70,12	4,7
ERH 7/400/10K	10	3,84	14,4	15,21	56,02	8
ERH 7/400/12.5K	12,5	3,07	18,1	19,11	80,02	9,3
ERH 7/400/20K	20	1,92	29	30,63	101,95	12,8
ERH 7/400/25K	25	1,53	36,1	38,12	125,21	13,4
ERH 7/400/40K	40	0,95	57,7	60,94	172,7	18,1
ERH 7/400/50K	50	0,76	72,2	76,26	221,8	21
ERH 7/400/75K	75	0,51	108	114,1	289,2	27,6
ERH 7/400/100K	100	0,38	145	153	353,8	42,4
HARMONIC FILTER REACTORS P=%5.67 210Hz 400V/50Hz/ LINEARITY>2.08xIrms						
ERH 5.67/400/2.5K	2,5	12,25	3,6	4,179	61,37	2,7
ERH 5.67/400/6.25K	6,25	4,9	9	10,48	88,24	7,2
ERH 5.67/400/10K	10	3,06	16,79	16,79	95,05	7,4
ERH 5.67/400/12.5K	12,5	2,33	19	22,09	114,18	8,1
ERH 5.67/400/20K	20	1,53	28,9	33,62	119,9	13,7
ERH 5.67/400/25K	25	1,22	36,1	42,01	146,5	15,6
ERH 5.67/400/40K	40	0,76	57,7	67,15	213,1	19,9
ERH 5.67/400/50K	50	0,58	75,9	88,34	238,2	31,5
ERH 5.67/400/75K	75	0,41	108	125,7	320,6	51,2
ERH 5.67/400/100K	100	0,31	144	167,6	431	52,2
HARMONIC FILTER REACTORS P=%14 134Hz 400V/50Hz/LINEARITY>1.37xIrms						
ERH 14/400/2.5K	2,5	33,2	3,6	3,63	55,96	3,9
ERH 14/400/6.25K	6,25	13,3	9	9,06	70,56	8,9
ERH 14/400/10K	10	8,3	14,4	14,49	94,75	10,2
ERH 14/400/12.5K	12,5	6,63	18	18,11	118,2	12,6
ERH 14/400/20K	20	4,15	28,9	29,08	168,74	16,1
ERH 14/400/25K	25	3,32	36,1	36,32	144,5	19,2
ERH 14/400/40K	40	2,07	57,7	58,06	192,1	33,8
ERH 14/400/50K	50	1,66	72,2	72,65	283	42,5
ERH 14/400/75K	75	1,11	109	109,6	334	55,5
ERH 14/400/100K	100	0,83	144	144,9	425,3	67,9

Products with customized dimensions, power ratings and connection types can be produced

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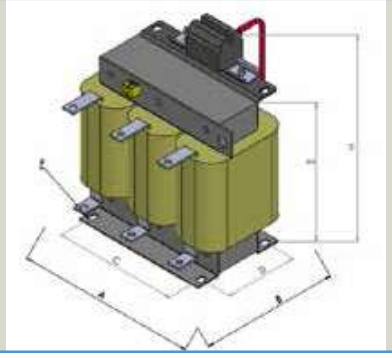
ERH P=%7 189Hz 400V/50Hz/LINEARITY1.73xIrms							R-1
Model No	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	H (mm)	F (mm)
ERH 7/400/2.5K	120	105	90	52		120	5X10
ERH 7/400/6.25K	150	105	110	55		160	5X10
ERH 7/400/10K	180	140	135	88	155		5X10
ERH 7/400/12.5K	180	150	135	97	155		5X10
ERH 7/400/20K	250	135	185	80	205		10X15
ERH 7/400/25K	250	135	185	80	205		10X15
ERH 7/400/40K	250	155	185	100	205		10X15
ERH 7/400/50K	270	170	200	106	250		10X15
ERH 7/400/75K	300	175	224	110	255		10X15
ERH 7/400/100K	350	195	265	126	305		10X15
ERH P=%5.67 210Hz 400V/50Hz/LINEARITY>2.08xIrms							
ERH 5.67/400/2.5K	120	115	90	62		120	5X10
ERH 5.67/400/6.25K	180	120	135	68		170	5X10
ERH 5.67/400/10K	180	130	135	78	155		5X10
ERH 5.67/400/12.5K	180	140	135	88	155		5X10
ERH 5.67/400/20K	250	135	185	80	205		10X15
ERH 5.67/400/25K	250	145	185	90	205		10X15
ERH 5.67/400/40K	250	135	185	81	205		10X15
ERH 5.67/400/50K	270	195	200	121	250		10X15
ERH 5.67/400/75K	350	195	265	126	305		10X15
ERH 5.67/400/100K	350	195	265	126	305		10X15
ERH P=%14 134Hz 400V/50Hz/LINEARITY>1.37xIrms							
ERH 14/400/2.5K	120	115	90	62		120	5X10
ERH 14/400/6.25K	180	130	135	78		170	5X10
ERH 14/400/10K	180	150	135	97	155		5X10
ERH 14/400/12.5K	250	134	185	80	205		10X15
ERH 14/400/20K	250	145	185	90	205		10X15
ERH 14/400/25K	250	135	185	81	205		10X15
ERH 14/400/40K	300	180	224	115	255		10X15
ERH 14/400/50K	300	185	224	120	255		10X15
ERH 14/400/75K	350	195	265	126	305		10X15
ERH 14/400/100K	350	225	265	156	305		10X15



Tolerance for dimension B: ± 5 mm
Tolerance for dimension D: ± 3 mm
Tolerance for dimensions H,E: ±5 mm