DETUNED FILTER REACTORS

Detuned 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.

- 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 reactor. 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 on them. The cabinets must be designed to disperse this heat.

ELEKTRA Detuned filter reactors are high quality reactors designed to be used in detuned power factor correction units. These reactors are compatible with european standards and are CE marked.

TECHNICAL SPECIFICATIONS:

- Single or three phase, high permeable iron core, air gapped design
- High quality copper or aluminium windings
- Availiable at any resonance frequency
- Linearty according to resonance frequency
- Harmonic loads according to EN 61000-2-2
  U1= %106 x UN
  U3= %0.5 x UN
  U5= %5 x UN
  U7= %5 x UN
- Thermal Switch for overload protection
- Terminal block, bar or cable connection depending on current value
- Vacuum impregnated varnish to ensure silent and moisture-immune operation
- CE sign and compatibility with EN 61558 2-20
- Manufactured under ISO 9000 quality management

VALUES TO BE SPECIFIED FOR CUSTOM DETUNED FILTER REACTORS

- Utility Voltage
- Resonance Frequency
- Information on the availiable capacitors.

Most common mistake made at detuned filter applications is chosing inappropriate reactor and capacitor pairs. Especially the reactors stated in manufacturer catalogues are used in conjunction with a specifict capacitor value. While chosing the necessary capacitor reactor pair, the selection tables in catalogs must be controlled to ensure that proper pair is chosen. If a different brand capacitor is going to be chosen, the capacity value must be the same as the original. In a mismatch case the resonance frequency will shift and cause severe problems for the system.

DETUNED FILTER REACTOR SELECTION TABLE

400V 50Hz Utility Voltage, 210Hz Resonance Frequency (p=%5,67)

Type	L (mH)	I_{rms} (A)	I_{th} (A)	I_{lin} (A)	C* (uF)	Size	Weight (kg)
ERH-5,67/400/6,25	4,97	10,80	11,88	20,41	38,50	2	6
ERH-5,67/400/7,5	4,05	13,27	14,60	25,08	47,31	3	7
ERH-5,67/400/12,5	2,33	23,06	25,37	43,58	82,21	4	9
ERH-5,67/400/15	2,08	25,84	28,42	48,83	92,10	5	12,5
ERH-5,67/400/25	1,25	43,05	47,35	81,35	153,46	7	17,5
ERH-5,67/400/30	1,04	51,67	56,84	97,65	184,21	7	19
ERH-5,67/400/50	0,62	86,09	94,70	162,7	306,91	12	32
ERH-5,67/400/75	0,41	131,6	144,7	248,7	469,2	13	48
ERH-5,67/400/100	0,31	172,18	189,40	325,41	613,82	14	50

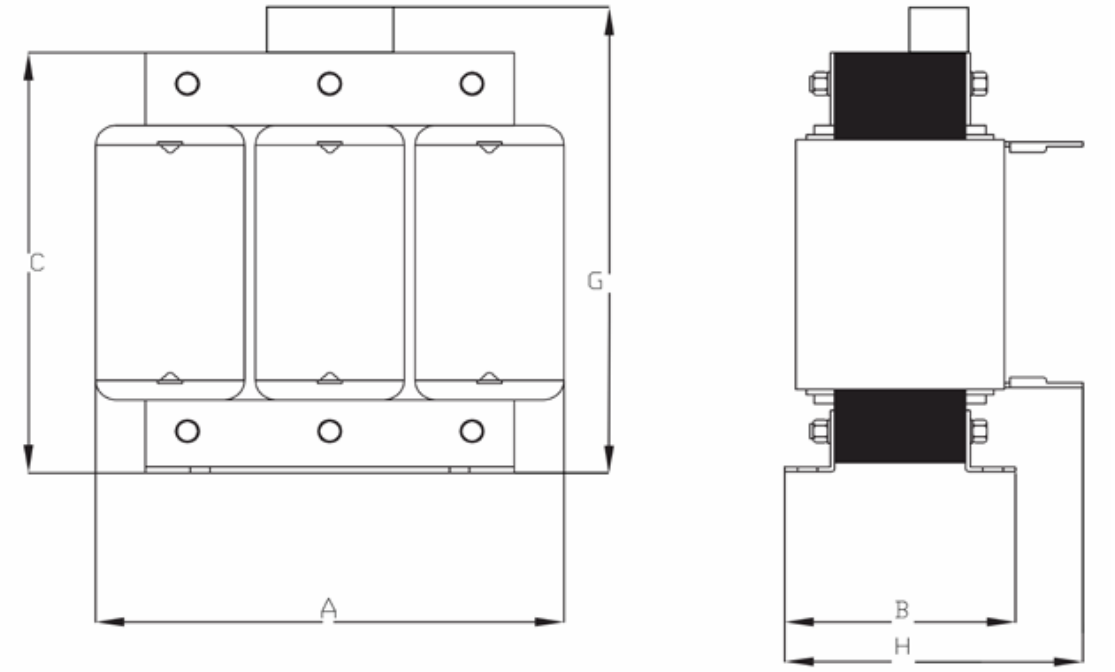
400V 50Hz Utility Voltage, 189Hz Resonance Frequency (p=%7)

Type	L (mH)	I_{rms} (A)	I_{th} (A)	I_{lin} (A)	C* (uF)	Size	Weight (kg)
ERH-7/400/6,25	6,14	10,03	11,03	17,45	38,50	3	6
ERH-7/400/7,5	5,00	12,33	13,56	21,45	47,31	3	7
ERH-7/400/12,5	2,88	21,42	23,56	37,27	82,21	4	9
ERH-7/400/15	2,57	23,99	26,39	41,76	92,10	4	10
ERH-7/400/25	1,54	39,98	43,98	69,57	153,46	7	17,5
ERH-7/400/30	1,28	47,99	52,79	83,51	184,21	7	19
ERH-7/400/50	0,77	79,96	87,95	139,15	306,91	10	21
ERH-7/400/75	0,51	120,5	132,55	209,7	462,54	12	38
ERH-7/400/100	0,39	159,91	175,90	278,29	613,82	13	43

400V 50Hz Utility Voltage, 134Hz Resonance Frequency(p=%14)

Type	L (mH)	I_{rms} (A)	I_{th} (A)	I_{lin} (A)	C* (uF)	Size	Weight (kg)
ERH-14/400/6,25	12,28	10,38	11,42	15,79	38,50	3	9
ERH-14/400/7,5	9,99	12,76	14,04	19,40	47,31	4	10
ERH-14/400/12,5	6,84	18,63	20,50	28,33	69,08	5	17,5
ERH-14/400/15	5,13	24,85	27,33	37,77	92,10	5	19
ERH-14/400/25	3,42	37,27	41,00	56,66	138,16	7	20
ERH-14/400/30	2,77	45,97	50,56	69,88	170,39	8	22
ERH-14/400/50	1,71	74,54	81,99	113,32	276,31	11	32
ERH-14/400/75	1,1	115,38	126,9	175,1	426,91	12	49
ERH-14/400/100	0,86	149,08	163,98	226,64	552,62	13	62

DETUNED FILTER REACTOR SIZES



Size	A	B	C	G	H
1	150	67	125	195	-
2	150	82	125	195	-
3	180	92	150	220	-
4	180	102	150	220	-
5	225	100	190	-	200
6	225	124	190	-	224
7	240	130	200	-	230
8	265	126	220	-	226
9	265	140	220	-	240
10	265	152	220	-	252
11	300	132	250	-	232
12	300	140	250	-	240
13	360	163	300	-	263
14	420	168	350	-	288

* Specified capacitor values are used during the reactor design. Severe problems may occur when using another capacitor in conjuntion with these reactors. Custom reactor designs are possible.
* Dimension values may change depending on design