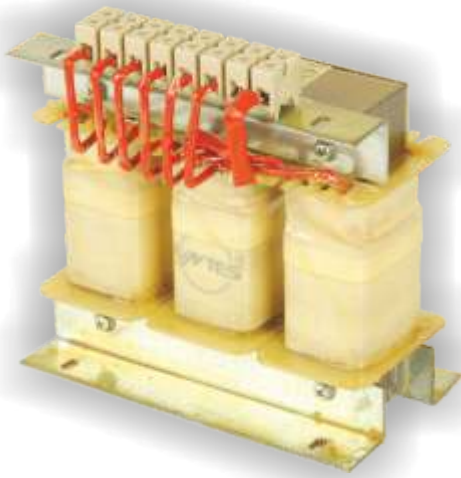


Detuned Filter Reactors

ENT.ERH Series



ENTES harmonic filter reactors protect the power factor correction systems by suppressing the harmonics.

With the use of harmonic filters, the currents flowing through the capacitors are reduced by creating impedance in addition to capacitor impedance at harmonic frequencies (such as 250 Hz for 5th harmonic and 350 Hz for 7th harmonic).

As a result;

- When the capacitor is switched-on, capacitor heat is reduced because currents flowing at the harmonic frequencies over the capacitor will decrease.
- High currents occurring during the switching of capacitor groups are prevented.
- Eliminates overloading risk due to resonance.
- Capacitor life improves because overheating and isolation failure risks are reduced.
- Since harmonics will decrease throughout the establishment, it helps sensitive devices such as computers, medical systems and PLC to be protected against deforming effects caused by harmonics.

CE

Features;

- Air gap design that minimizes the enclosure grounding resistance
- Iron core with high magnetic permeability
- Vacuum impregnated varnish method that improves efficiency by reducing heat losses, provides protection against humidity, and enables quiet operation
- Thermal protection switch in the middle coil against overloading and overheating
- CE mark and compatibility with EN 61000-2-2 and EN 61558 2-20



Detuned Filter Reactors

ENT.ERH Series

Harmonic Filter Reactor Selection

For harmonic filter reactor selection, firstly harmonic (THDV and THDI) measurement should be taken at different times and loading conditions while the power factor correction system is switched off.

P factor is selected based on THDV and THDI values, as shown in the following table.

** P factor depending on THDV and THDI values is selected as shown on the table below.*

fr=P factor	THDV	THDI
5,67%	<2%	>25%
7%	All other cases	
14%	>4%	<15%

Size	Size (mm)				
	A	B	C	G	H
0	120	45	100	120	-
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

** Dimensions may vary depending on design.*

Reactors' Serial Resonance Frequency Table:

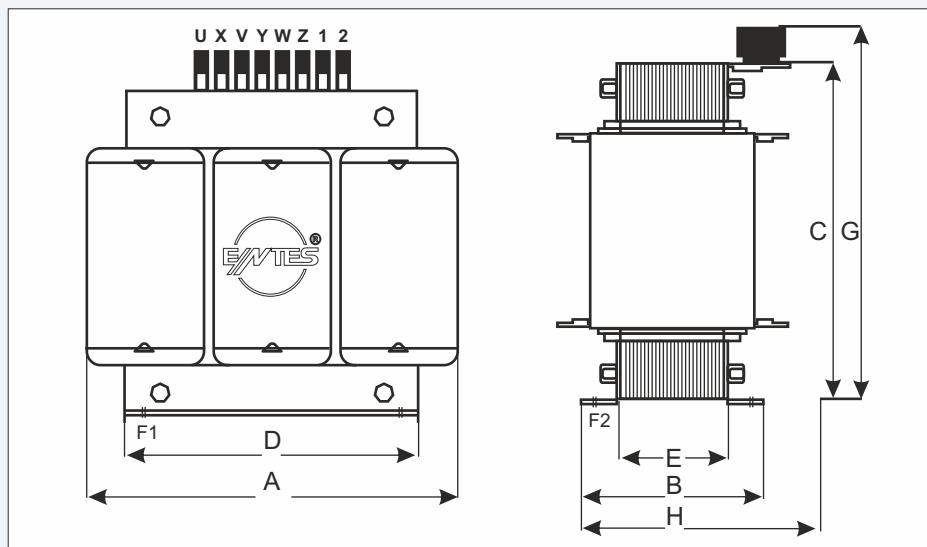
fr=P factor	Resonance Frequency for 50Hz	C Min. Voltage Value
5,67%	210Hz	424V
7%	189Hz	430V
14%	134Hz	465V

According to this; capacitors with a minimum 440V should be used for P factors of 5,67% and 7%, 500V capacitors should be used for a P factor of 14%.

**For more information on the next page Harmonic Filter Reactors refer to the Selection Table.*

Power Factor Correction

Detuned Filter Reactor Dimensions



Reactors with filtering factors other than 5,67%, 7%, 14%; reactors for 60 Hz grids and reinforced harmonic filter reactors for different capacitors and facilities where voltage harmonics values are high are manufactured on special order.

Detuned Filter Reactors

ENT.ERH Series

Detuned Filter Reactor Selection Table
400V 50Hz, 210Hz Resonance Frequency ($p=5,67\%$)

Type	kVAr	L (mH)	I _{rms} (A)	I _{th} (A)	I _{lin} (A)	C* (uF)	Size	Weight (kg)	Suitable Capacitor
ENT.ERH-5,67-400-4	4	7,65	7,02	7,72	15,92	25,02	0	4	ENT.CXD-450-5
ENT.ERH-5,67-400-5	5	6,12	8,77	9,65	19,90	31,28	0	4,5	ENT.CXD-450-5+ENT.CXD-450-1
ENT.ERH-5,67-400-6,25	6,25	4,90	10,97	12,06	24,87	39,1	0	5	ENT.CXD-450-7,5
ENT.ERH-5,67-400-7,5	7,5	4,08	13,16	14,48	29,85	46,92	1	7	ENT.CXD-450-7,5+ENT.C10-450-1,5
ENT.ERH-5,67-400-10	10	3,06	17,55	19,30	39,79	62,55	1	8	ENT.CXD-450-12,5
ENT.ERH-5,67-400-12,5	12,5	2,45	21,93	24,13	49,74	78,19	2	10	ENT.CXD-450-15
ENT.ERH-5,67-400-15	15	2,04	26,32	28,95	59,69	93,83	2	11	ENT.CXD-450-10+ENT.CXD-450-7,5
ENT.ERH-5,67-400-20	20	1,53	35,09	38,60	79,59	125,11	3	12	ENT.CXD-450-25
ENT.ERH-5,67-400-22,4	22,4	1,37	39,31	43,24	89,14	140,12	4	15,5	ENT.CXD-450-25
ENT.ERH-5,67-400-25	25	1,22	43,87	48,26	99,49	156,39	4	16	ENT.CXD-450-30
ENT.ERH-5,67-400-30	30	1,02	52,64	57,91	119,38	187,66	5	20	ENT.CXD-450-15+ENT.CXD-450-20
ENT.ERH-5,67-400-40	40	0,77	70,19	77,21	159,18	250,22	5	23	ENT.CXD-450-25 2 pcs.
ENT.ERH-5,67-400-44,4	44,4	0,69	77,91	85,70	176,69	277,74	5	28	ENT.C100-440-50
ENT.ERH-5,67-400-50	50	0,61	87,74	96,51	198,97	312,77	5	30	ENT.CXD-450-30 2 pcs.
ENT.ERH-5,67-400-60	60	0,51	105,28	115,81	238,77	375,33	5	30	ENT.CXD-450-25 3 pcs.
ENT.ERH-5,67-400-80	80	0,38	140,38	154,42	318,36	500,44	6	34	ENT.CXD-450-25 4 pcs.
ENT.ERH-5,67-400-100	100	0,31	175,47	193,02	397,95	625,55	6	36	ENT.CXD-450-30 4 pcs.

400V 50Hz, 189Hz Resonance Frequency ($p=7\%$)

Type	kVAr	L (mH)	I _{rms} (A)	I _{th} (A)	I _{lin} (A)	C* (uF)	Size	Weight (kg)	Suitable Capacitor
ENT.ERH-7-400-2,5	2,5	15,3	4	4,4	8,4	15	0	2,5	ENT.C10-450-1,5 2 adet
ENT.ERH-7-400-4	4	9,58	6,4	7	13,4	24,7	0	3	ENT.CXD-450-5
ENT.ERH-7-400-5	7,6	7,67	8	8,85	17	30,8	0	5	ENT.CXD-450-5+ENT.C10-450-1
ENT.ERH-7-400-6,25	6,25	6,13	10,04	11,05	20,97	39,30	3	6	ENT.CXD-450-7,5
ENT.ERH-7-400-7,5	7,5	5,11	12,05	13,26	25,16	47,16	1	7	ENT.CXD-450-7,5+ENT.C10-450-1,5
ENT.ERH-7-400-10	10	3,83	16,07	17,67	33,55	65,50	2	8	ENT.CXD-450-12,5
ENT.ERH-7-400-12,5	12,5	3,07	20,08	22,09	41,94	78,60	2	9	ENT.CXD-450-15
ENT.ERH-7-400-15	15	2,56	24,10	26,51	50,33	91,69	2	10	ENT.CXD-450-10+ENT.CXD-450-7,5
ENT.ERH-7-400-20	20	1,92	32,13	35,35	67,11	130,99	3	13	ENT.CXD-450-25
ENT.ERH-7-400-22,2	22,2	1,72	35,7	39,3	75	137	4	15	ENT.C100-440-25
ENT.ERH-7-400-25	25	1,53	40,17	44,18	83,88	157,19	4	17,5	ENT.CXD-450-30
ENT.ERH-7-400-30	30	1,28	48,20	53,02	100,66	183,39	4	19	ENT.CXD-450-15+ENT.CXD-450-20
ENT.ERH-7-400-40	40	0,96	64,27	70,69	134,21	261,98	5	21	ENT.CXD-450-25 2 pcs.
ENT.ERH-7-400-44,4	44,4	0,86	71,4	78,6	141	274	5	23	ENT.C100-440-50
ENT.ERH-7-400-50	50	0,77	80,33	88,37	167,76	314,38	5	25	ENT.CXD-450-30 2 pcs.
ENT.ERH-7-400-60	60	0,64	96,40	106,04	201,32	392,98	5	30	ENT.CXD-450-25 3 pcs.
ENT.ERH-7-400-80	80	0,48	128,53	141,39	268,42	523,97	6	43	ENT.CXD-450-25 4 pcs.
ENT.ERH-7-400-100	100	0,38	160,67	176,73	335,53	628,76	6	45	ENT.CXD-450-30 4 pcs.

400V 50Hz, 134Hz Resonance Frequency ($p=14\%$)

Type	kVAr	L (mH)	I _{rms} (A)	I _{th} (A)	I _{lin} (A)	C* (uF)	Size	Weight (kg)	Suitable Capacitor
ENT.ERH-14-400-5	5	16,58	7,69	8,46	14,03	28,52	1	6,5	ENT.CXD-525-7,5
ENT.ERH-14-400-6,25	6,25	13,27	9,62	10,58	17,54	35,64	2	7,5	ENT.CXD-525-10
ENT.ERH-14-400-7,5	7,5	11,05	11,54	12,69	21,05	42,77	2	9	ENT.CXD-550-7,5+ENT.CXD-550-5
ENT.ERH-14-400-10	10	8,29	15,38	16,92	28,07	57,03	2	10	ENT.CXD-525-15
ENT.ERH-14-400-12,5	12,5	6,63	19,23	21,15	35,08	71,29	3	12	ENT.CXD-525-20
ENT.ERH-14-400-15	15	5,53	23,08	25,38	42,10	85,55	4	13	ENT.CXD-525-10+ENT.CXD-525-12,5
ENT.ERH-14-400-20	20	4,15	30,77	33,85	56,13	114,06	5	21	ENT.CXD-525-30
ENT.ERH-14-400-22,2	22,2	3,70	34,46	37,91	62,87	127,75	5	22	ENT.CXD-525-20+ENT.CXD-525-12,5
ENT.ERH-14-400-25	25	3,32	38,46	42,31	70,17	142,58	5	25	ENT.CXD-525-25+ENT.CXD-525-12,5
ENT.ERH-14-400-30	30	2,76	46,15	50,77	84,20	171,09	5	27	ENT.CXD-525-30+ENT.CXD-525-15
ENT.ERH-14-400-40	40	2,07	61,54	67,69	112,27	228,12	5	32	ENT.CXD-525-30 2 pcs.
ENT.ERH-14-400-44,4	44,4	1,87	68,31	75,14	124,62	253,22	5	32	ENT.CXD-525-30 2 pcs.
ENT.ERH-14-400-50	50	1,66	76,92	84,62	140,33	285,15	5	40	ENT.CXD-525-25 3 pcs.
ENT.ERH-14-400-60	60	1,38	92,31	101,54	168,40	342,18	6	48	ENT.CXD-525-30 3 pcs.
ENT.ERH-14-400-80	80	1,04	123,08	135,38	224,54	456,24	6	55	ENT.CXD-525-30 4 pcs.
ENT.ERH-14-400-100	100	0,83	153,85	169,23	280,67	570,31	7	62	ENT.CXD-525-30 5 pcs.

Power Factor Correction

