AsiaElectricTechologies

EDR series
Anti-resonance Harmonic Filter Reactor for Detuned Systems

Catalogue no. AET-EDR-2004-01

Preview

General

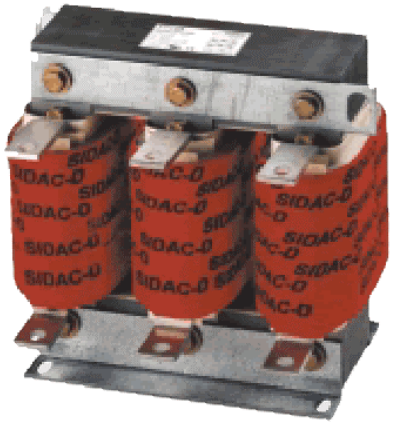
Electrical energy is a significant production factor for industry, and its efficient use should be a primary objective. Reducing the reactive current component by PFC correction helps to save energy.

The increasing use of modern power electronic apparatus (drives, uninterruptible power supplies, etc) that produce nonlinear current influences and loads the network with harmonics
(line pollution).

The power factor correction or capacitance of the power capacitor forms a resonant circuit in conjunction with the feeding transformer. Experience shows that the self-resonant frequency of this circuit lies typically between 250 and 500 Hz, i.e. in the region of the 5th and 7th harmonics. Resonance can lead to the following undesirable effects:

- overloading of capacitors,
- overloading of transformers
- overloading og transmission equipment,
- interference with metering and control systems, computers and electrical gear,
- resonance elevation, i.e. amplification of harmonics,
- voltage distortion.

These resonance phenomena can be avoided by connecting capacitors in series with filter reactors. Detuned systems are scaled so that the self-resonant frequency is below the lowest line harmonic. The detuned PFC system is purely inductive seen by harmonics above this frequency. For the 50 Hz line frequency, the detuned system acts purely capacitively, thus correcting the reactive power.



Features:

- High harmonic overloading capability
- Very low losses
- High linearity to avoid choke tilt
- Low noise
- Simple mounting
- Long useful life
- Temperature protection (NC contact)

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Filter Reactors Technical Data

Harmonics : According to DIN ENV VV61000-2-2
U3 = 0.5% U_R (ED = 100%)
U5 = 6.0% U_R (ED = 100%)
U7 = 5.0% U_R (ED = 100%)
U11 = 3.5% U_R (ED = 100%)
U13 = 3.0% U_R (ED = 100%)

Effective current : Irms = $\sqrt{(I_1^2+I_3^2 \ldots I_{13}^2)}$

Fundamental current : I_1 = 1.06 * I_R (50 Hz current of capacitor)

Temperature Protection : microswitch (NC)

Three-phase filter reactors to EN 61558/VDE 0532

Frequency : 50 / 60 Hz

Voltage : 400, 440, 480 V

Output : 5 ... 100 kvar

Detuning : 5.67%, 7%, 14%

Cooling : natural

Ambient temperature : 40 °C

Class of protection : I

Enclosure : IP00

Approval :

Rated voltage U = 400 V, f = 50 Hz, p = 5.67% (fr = 210 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 2.08 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	564	3.06	18.5	64	6.4	1c	B44066D5010S400
12.5	709	2.45	23.0	89	8.4	1d	B44066D5012S400
20	1125	1.53	36.9	100	13	1e	B44066D5020S400
25	1407	1.22	46.1	130	17	1f	B44066D5025S400
40	2250	0.765	73.7	220	23	3b	B44066D5040S400
50	2814	0.612	92.1	290	31	3c	B44066D5050S400
75	4222	0,408	138.2	280	35	3c	B44066D5075S400
100	5628	0.306	183.8	390	47	3d	B44066D5100S400

Rated voltage U = 400 V, f = 50 Hz, p = 7% (fr = 189 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.73 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	555	3.83	16.4	73	5.9	1c	B44066D7010S400
12.5	693	3.07	20.5	87	8.1	1d	B44066D7012S400
20	1110	1.92	32.7	100	12	1e	B44066D7020S400
25	1386	1.53	41.0	120	16	1f	B44066D7025S400
40	2220	0.958	65.6	210	23	3b	B44066D7040S400
50	2775	0.766	81.9	210	24	3b	B44066D7050S400
75	4161	0.511	122.9	267	32	3c	B44066D7075S400
100	5550	0.383	164.2	370	46	3d	B44066D7100S400

*Total max. losses, considering max. specified overvoltage and harmonic currents

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Rated voltage U = 440 V, f = 50 Hz, p = 7% (fr = 189 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.73 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	459	4.64	14.9	71	6.5	1c	B44066D7010S440
12.5	573	3.71	18.7	85	8.5	1d	B44066D7012S440
25	1147	1.86	37.2	105	17	3a	B44066D7025S440
50	2294	0.93	74.5	210	25	3b	B44066D7050S440
75	3440	0.618	112.2	250	35	3c	B44066D7075S440
100	4587	0.464	148.9	370	47	3d	B44066D7100S440

Rated voltage U = 400 V, f = 60 Hz, p = 5.67% (fr = 252 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 2.08 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	1173	1.02	46.1	130	16	3a	B44066D5025S401
50	2346	0.51	92.2	230	26	3b	B44066D5050S401
75	3519	0.34	138.2	280	34	3c	B44066D5075S401
100	4692	0.255	184.3	370	48	3d	B44066D5100S401

Rated voltage U = 400 V, f = 60 Hz, p = 7% (fr = 227 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.73 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	1156	1.29	41.0	103	16	3a	B44066D7025S401
50	2313	0.64	81.9	205	24	3b	B44066D7050S401
75	3469	0.426	122.9	245	33	3c	B44066D7075S401
100	4625	0.319	163.9	310	45	3d	B44066D7100S401

Rated voltage U = 400 V, f = 60 Hz, p = 14% (fr = 162 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.4 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	1069	2.76	38.5	130	25	2a	B44066D1425S401
50	2139	1.38	77.0	250	34	3c	B44066D1450S401
75	3208	0.92	115.4	340	49	3d	B44066D1475S401
100	4277	0.69	154.0	400	55	3d	B44066D1499S401

Rated voltage U = 400 V, f = 50 Hz, p = 14% (fr = 135 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.4 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	513	8.23	15.4	87	9.4	1d	B44066D1410S400
12.5	642	6.63	19.2	100	12	1e	B44066D1412S400
20	1026	4.14	30.8	120	18	1f	B44066D1420S400
25	1284	3.32	38.5	210	25	2a	B44066D1425S400
40	2052	2.07	61.6	220	32	3c	B44066D1440S400
50	2565	1.66	76.9	340	34	3c	B44066D1450S400
75	3850	1.1	115.4	330	52	3d	B44066D1475S400
100	5130	0.829	154	450	62	3e	B44066D1499S400

*Total max. losses, considering max. specified overvoltage and harmonic currents

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Rated voltage U = 440 V, f = 50 Hz, p = 5.67% (fr = 210 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 2.08 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	465	3.7	16.8	74	7	1c	B44066D5010S440
12.5	582	2.96	21.0	88	9	1d	B44066D5012S440
25	1163	1.48	42.0	130	16.5	3a	B44066D5025S440
50	2326	0.74	83.8	230	25	3b	B44066D5050S440
75	3490	0.49	125.6	260	36	3c	B44066D5075S440
100	4653	0.37	168.0	340	50	3d	B44066D5100S440

Rated voltage U = 440 V, f = 60 Hz, p = 7% (fr = 227 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.73 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	956	1.55	37.2	100	16	3a	B44066D7025S441
50	1910	0.773	74.5	190	24	3b	B44066D7050S441
75	2867	0.515	111.8	235	34	3c	B44066D7075S441
100	3823	0.387	148.9	350	46	3d	B44066D7100S441

Rated voltage U = 440 V, f = 60 Hz, p = 14% (fr = 162 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.4 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	884	3.34	35.0	100	24	2a	B44066D1425S441
50	1767	1.67	70.0	240	35	3c	B44066D1450S441
75	2651	1.11	105.0	360	48	3d	B44066D1475S441
100	3535	0.836	140.0	450	52	3d	B44066D1499S441

Rated voltage U = 480 V, f = 60 Hz, p = 5.67% (fr = 252 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 2.08 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	814	1.47	38.3	130	18	1f	B44066D5025S481
50	1629	0.74	76.8	300	31	3c	B44066D5050S481
75	2445	0.49	115.1	230	33	3c	B44066D5075S481
100	3258	0.367	153.6	400	47	3d	B44066D5100S481

Rated voltage U = 480 V, f = 60 Hz, p = 7% (fr = 227 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.73 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
12.5	402	3.68	17.0	71	6.5	1c	B44066D7012S481
25	804	1.84	34.2	103	13.2	1e	B44066D7025S481
50	1605	0.92	68.4	240	24.2	3b	B44066D7050S481
75	2409	0.61	102.4	270	32	3c	B44066D7075S481
100	3213	0.46	136.7	270	35	3c	B44066D7100S481

Rated voltage U = 480 V, f = 60 Hz, p = 14% (fr = 162 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.4 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	742	4.0	32.1	155	20	2a	B44066D1425S481
50	1485	2.0	64.1	280	34	3c	B44066D1450S481
75	2229	1.33	96.2	350	48	3d	B44066D1475S481
100	2970	1.0	128.2	430	53	3d	B44066D1499S481

*Total max. losses, considering max. specified overvoltage and harmonic currents

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Rated voltage U = 440 V, f = 60 Hz, p = 5.67% (fr = 252 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 2.08 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
25	969	1.235	42.0	125	18	3a	B44066D5025S441 18
50	1939	0.617	83.8	210	25	3b	B44066D5050S441 18
75	2908	0.412	126.0	300	33	3c	B44066D5075S441 12
100	3877	0.309	167.4	400	47	3d	B44066D5100S441 1

Rated voltage U = 440 V, f = 50 Hz, p = 14% (fr = 135 Hz)

Linearity: L ≥ 0.95 * L_N for current up to 1.4 * I_1

Power KVAR	Capacitance µF (Star)	Inductance mH	I_{rms} A (I_{eff})	Losses* W	Weight kg	Drawing number	Ordering Code
10	424	10	14.0	87	10	1d	B44066D1410S440 40
12.5	530	8.03	17.5	95	13	1e	B44066D1412S440 18
25	1060	4	35.0	130	26	2a	B44066D1425S440 18
50	2121	2.12	70.0	260	40	3c	B44066D1450S440 1
75	3181	1.34	105.0	350	52	3d	B44066D1475S440 1
100	4242	1	140.0	440	66	3d	B44066D1499S440 1

*Total max. losses, considering max. specified overvoltage and harmonic currents

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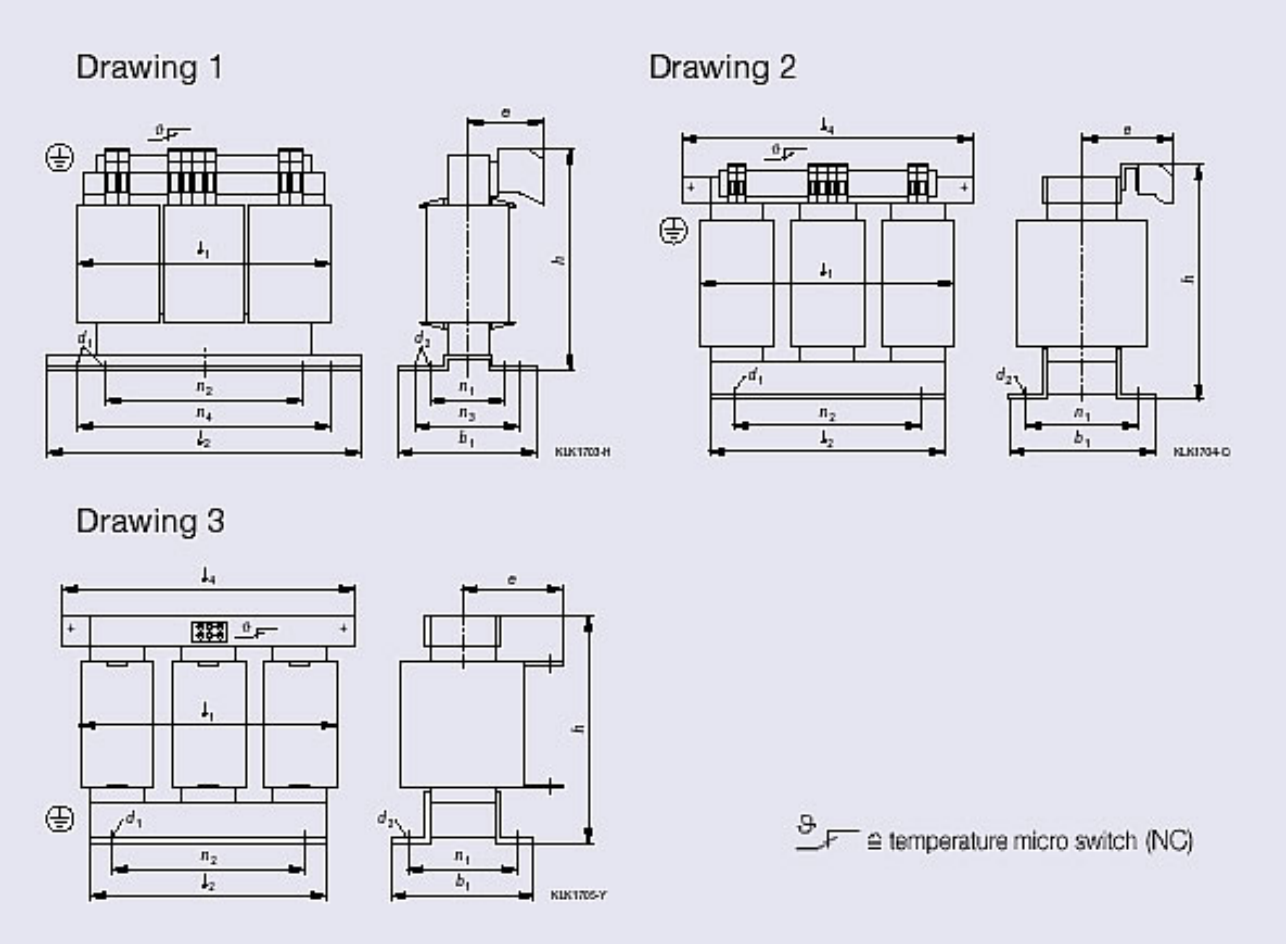
Dimensional Drawings



Drawing 1

	b1	d1	d2	d3	e	h	l1	l2	n1	n2	n3	n4
a	73	5.8	11	M5	60	159	150	178	49	113	53	166
b	88	5.8	11	M5	67	159	150	178	64	113	68	166
c	99	7	13	M6	62	181	182	219	56	136	69	201
d	119	7	13	M6	72	181	182	219	76	136	89	201
e	107	7	13	M6	66	221	228	267	70	176	77	249
f	131	7	13	M6	79	221	228	267	94	176	101	249

Insulation class B: 130 °C

Drawing 2

	b1	d1	d2	d3	e	h	l1	l2	l4	n1	n2
a	162	10	18	M8	108	291	264	220	270	101	200

Insulation class H: 180 °C

Drawing 3

	b1	d1	d2	d3	e	h	l1	l2	l4	n1	n2
a	115	7	12	M6	103	210	228	190	–	94	176
b	133	10	18	M8	121	248	264	220	270	101	200
c	148	10	18	M8	137	269	300	250	300	118	224
d	169	10	18	M8	142	321	360	300	350	138	264
e	174	12	18	M10	171	385	405	350	410	141	316

Insulation class H: 180 °C

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