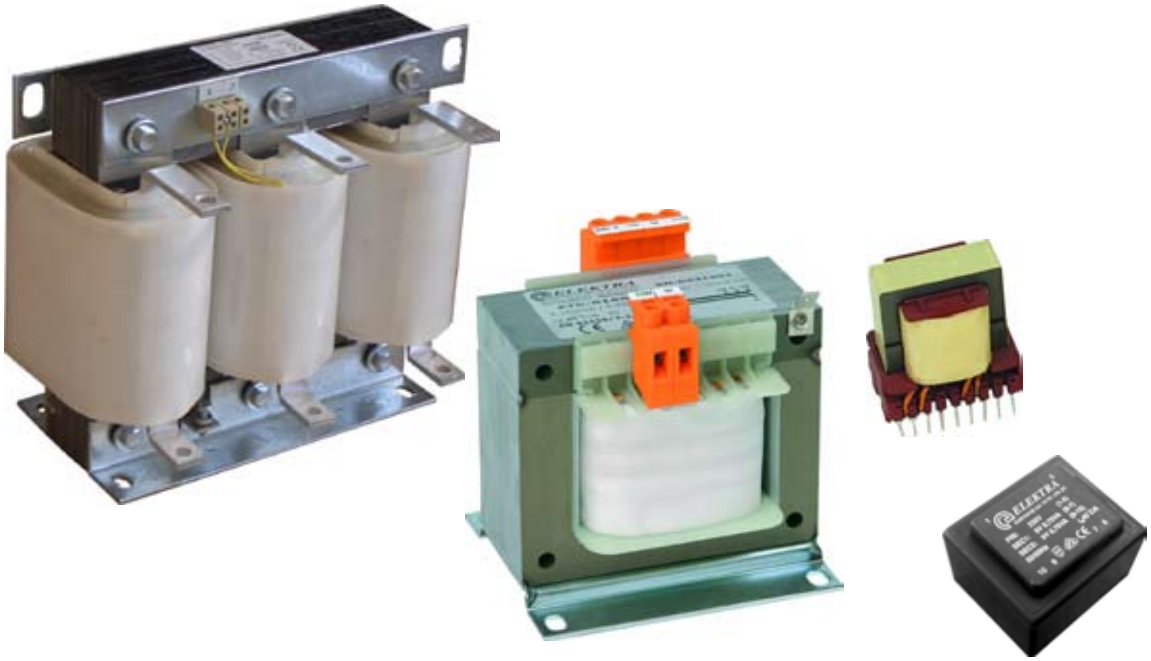
www.elektra.com.tr



TRANSFORMERS AND CHOKES

ELEKTRA

INDEX

About ELEKTRA

As one of the leading transformer manufacturers in Turkey, Elektra continues its production in Buyukcekmece/Istanbul factory with 150 workers at a 5000m2 working area. Elektra manufactures top quality products in a very wide range under ISO9000 quality management system certificate.

Main Product Types

- PCB type transformers
- Control transformers
- Safety-Isolation Transformers
- Motor Drive Input Reactors
- Motor Drive Output Reactors
- Detuned Filter Reactors
- Shunt Reactors
- High Frequency Ferrrite Core Transformers

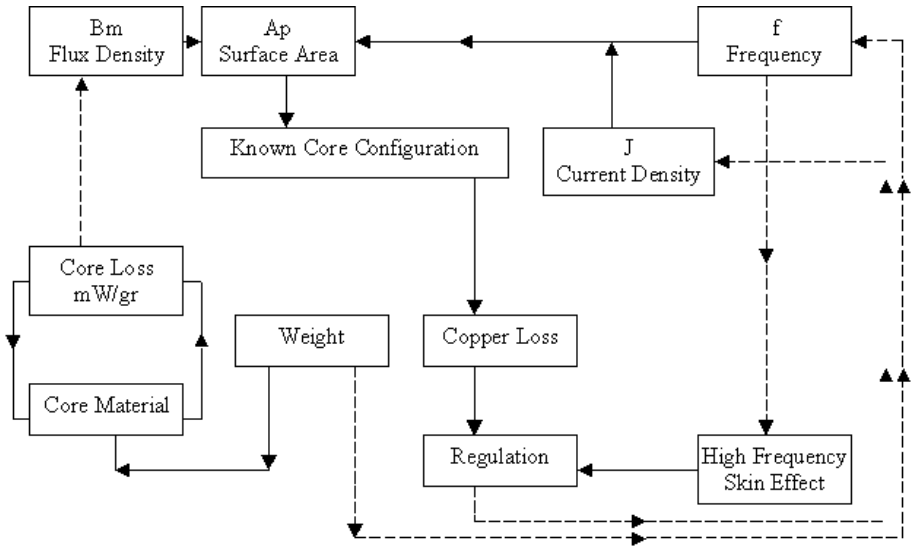
ELEKTRA products carry CE sign and are compatible with the international harmonized standards. We also have VDE sign for PCB type transformers. The production in the factory is carried out under ISO 9000 quality management system.

ELEKTRA products are in high demand in many countries including England, Spain, Holland, Belgium, Poland, Romania, Germany, Egypt, Dubai, Greece, Iran.

GENERAL INFORMATION ON TRANSFORMERS

GENERAL

All windings are made of copper or aluminium, the insulating materials are in accordance with the declared insulation classes. Generally all ELEKTRA-transformers are impregnated with resin and correspond at least to the insulation class B.



POWER AND HEATING

The nominal powers rated in the list refer to the continuous power output in the kVA at the secondary side of the transformer. When the transformers are not permanently loaded with the full rated power, they may be overloaded for a short time as following:

Ratio of Nominal Load to Rated Load (%)	Overload amount				
	150%	140%	130%	120%	110%
50	30 min	45 min	65 min	105 min	180 min
60	25 min	40 min	60 min	95 min	170 min
70	20 min	30 min	45 min	80 min	155 min
80	15 min	25 min	40 min	75 min	140 min
90	8 min	15 min	30 min	60 min	120 min

These values refer to an ambient temperature of 40 C and an installation height of 1000m above the sea level

CYCLIC DURATION FACTOR

In many cases the transformers are not operated steadily with nominal load. Thereby the construction size can be reduced, as described hereafter:

Cyclic duration time ED =100 x (Load time/Duty Cycle time)

Duty Cycle Time =Load time + interval time

Factor F = √ (ED/100)

In case that the stress ratio proportions are known, the type size of the transformer can be determined with the following table:

ED %	5	10	15	20	40	60	80
Factor F	0.22	0.32	0.39	0.45	0.63	0.77	0.89

Example:

A power of 1.0 kVA at 40% ED is required. The type power is calculated as follows:
Ptype = F x 1,0 kVA = 0.63 x 1,0 kVA = 0.63 kVA.

VOLTAGE

At three-phase current, the indicated nominal voltage is the voltage of the three conductors against one another (linked voltage). The transformers are made for voltage tolerance of ±10%.

FREQUECY

Our transformers are layed out for a frequency of 50/60 Hz ± 5%. On request we also manufacture transformers with other frequencies.

WINDING TYPE

a) Seperate Winding

These transformers have no conducting connection between primary-and secondary winding. There is no galvanical separation. The type power of the transformers with separate winding corresponds to the rated power

b) Auto Winding

The auto winding has a conducting connection between the primary and secondary winding. With this winding method a considerable material economy can be achieved to the transformation ratio.

The type power of the transformer is always smaller than the rated power (throughput power).

It is calculated as follows:

Type Power = nominal power x (1-(lowervoltage/uppervoltage))
Example:
Nominal Power = 1.0 kVA
Primary Voltage = 440 V
Secondary Voltage = 220 V
Type power = 1.0 kVA x (1-(220 V / 440 V)) = 0.5 kVA

This transformer can be used with a type power of 0.5 kVA.

ISOLATION CLASSES

Class	Max. Temperature (Peak)	Max. Temperature Rise (Average)	
		Rated Load	Short Circuit
E	120 C	75 C	135 C
B	130 C	80 C	145 C
F	155 C	100 C	170 C
H	180 C	135 C	200 C

Insulation class H on request

ENVIRONMENT

Ambient Temperature	-10 C to +40 C
Shelf Temperature	-20 C to +70 C
Max. elevation.	Up to 1000m

NON SHORT CIRCUIT PROOF TRANSFORMERS

Without attached fuses, protective switch or temperature controller: During the operation of the transformer an appropriate fuse protection has to be undertaken. When choosing the fuse,it should be paid attention that at the primary side of the transformers starting current peaks can occur which make a multiple (10-30 times) of the primary nominal current. Therefore it is suitable to use for the fuse protection at the primary side medium slow-acting or sluggish fuses. If the transformer is on-load at the secondary side, the secondary current has a damping effect on the starting current.

LIMITED SHORT CIRCUIT PROOF TRANSFORMERS

These transformers have appropriate fuses, overcurrent switches or other protective equipment attached from our work.

ABSOLUTE SHORT CIRCUIT PROOF TRANSFORMERS

These are so-called leak transformers, with them a great voltage drop can be reached a special construction manner.

PROTECTIVE SYSTEMS

The transformers were designed according to specified protection systems appropriated to DIN 40050. The respective protection system is defined by a short symbol with the code number IP and two letters. The transformers were mostly executed according to the protective systems IP 00, IP 23, IP 54. Other protective systems on request.

Code	First Code		Second Code
	Contact Protection	Foreign Body Protection	Liquid Protection
0	No Special Protection	No Special Protection	No Special Protection
1	Big bodies	Big foreign bodies(50mm)	Veritical dripping water
2	Fingers or comparable things	Medium sized foreign bodies(12mm)	Diagonally dripping water (15 degrees)
3	Wires, tools and other things with thickness >2.5 mm	Small-sized foreign bodies(2.5mm)	Diagonally sparkling water (60 degrees)
4	Wires, tools and other things with thickness >1 mm	Edged foreign bodies(1mm)	Splash water each direction
5	Dust Deposit	Complete Protection against contact	Hose-Water from a nozzle
6	Dust-entry dust-proof	Complete Protection against contact	Strong Hose-water, stormy sea
7	-	-	Plunge with constant defined pressure and time
8	-	-	Permanent plunge with constant defined pressure

INSTALLATION INSTRUCTIONS

Transformers have to be mounted in that manner, that the necessary cooling is guaranteed. The inlets and outlets of the transformer cooling chanels must be free of obstruction which hinder the air circulation.

Transformers with chanels have to be installed that way, that the channel direction is fundamentally vertically.

START-UP OPERATIONS

Before starting a transformer it must be checked if the input voltage and frequency agree with the values indicated at the rating plate. Also the screws of the connecting elements have to be tightened. If the transformers are no short-circuit-proof, a fuse has to be foreseen.

MAINTENANCE

Start-up operation and maintenance by trained personnel only. Please observe the operating instructions. ELEKTRA-dry-type transformers are maintenance-free. A check on contamination should be done every half year, if necessary, the transformers have to be cleaned, for this disconnect unit from supply voltage before cleaning

CONTROL TRANSFORMERS

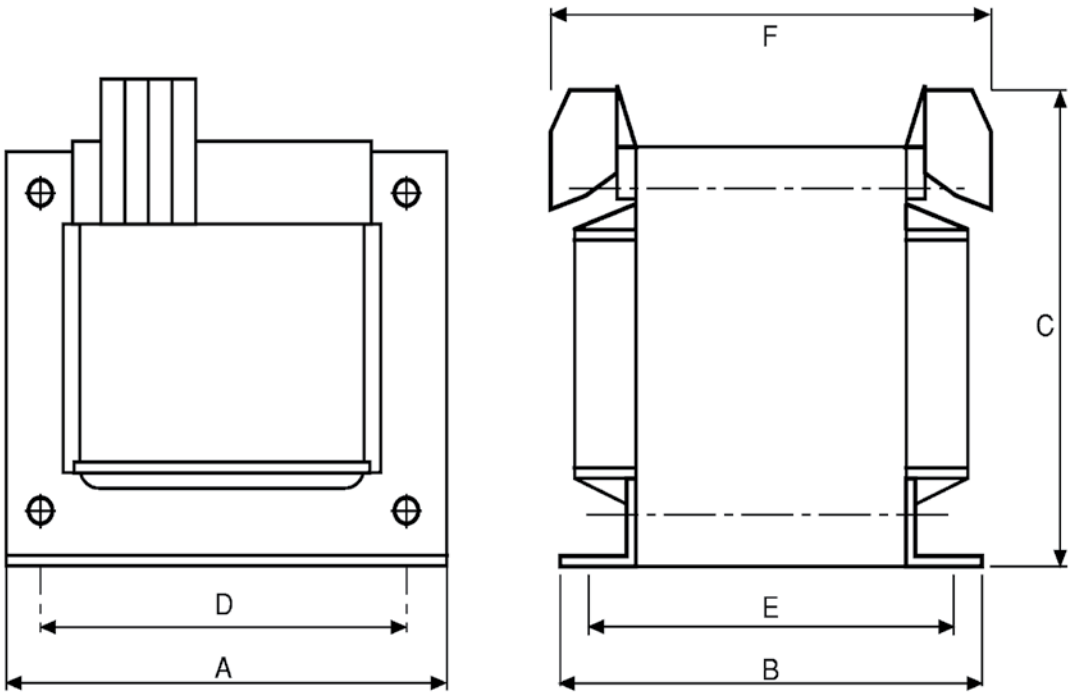
Control transformers are widely used in industrial applications such as electrical panels or PLC power supplies.

Input and output voltages may vary up to 1000V and they possibily include voltage taps or shielding wndings. Power ratings of these transformers go up to 10kVA. The electrical connection is done via terminal blocks and special mounting for DIN rails is availiable on request

ELEKTRA transformers are compatible with international standards and CE signed. Also the transformers are produced under ISO9000 quality management system.

ELEKTRA Control Transformers Specifications

- High permeable iron core
- High quality copper or aluminium windings
- Class I transformer
- Excellent voltage regulation
- High short time power
- Vacuum impregnated varnish to ensure silent and moisture-immune operation
- CE sign and compatibility with EN 61558 2-2
- Manufactured under ISO 9000 quality management



MODEL	Power (VA)	Instantaneous Power (VA)	Core	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Weight (kg)
ETC-0050	50	120	84/29.5	84	76	91	64	64	65	1.5
ETC-0075	75	160	84/29.5	84	76	91	64	64	65	1.7
ETC-0100	100	225	84/43.5	84	76	91	64	64	79	2
ETC-0160	160	400	96/45.7	96	89	99	84	74	75	2.5
ETC-0200	200	487	96/45.7	96	89	99	84	74	75	3
ETC-0250	250	620	96/59.7	96	102	99	84	87	89	3.5
ETC-0320	320	750	120/41.7	120	90	127	90	83	85	4.5
ETC-0400	400	1010	120/53.7	120	102	127	90	95	97	5.5
ETC-0500	500	1350	120/73.7	120	122	117	90	109	111	7
ETC-0630	630	1740	150/49.6	150	113	141	122	89	90	8
ETC-0800	800	2250	150/66.6	150	129	141	122	104	105	10
ETC-1000	1000	3150	150/92.6	150	153	141	122	128	130	14
ETC-1300	1300	3820	192/70	192	144	200	130	126	128	22
ETC-1600	1600	5050	192/82	192	166	200	130	148	150	24
ETC-2000	2000	6400	192/105	192	178	200	130	160	162	26
ETC-2500	2500	7980	192/120	192	193	200	130	175	176	29

* Dimension values may change depending on design

SAFETY ISOLATION TRANSFORMERS

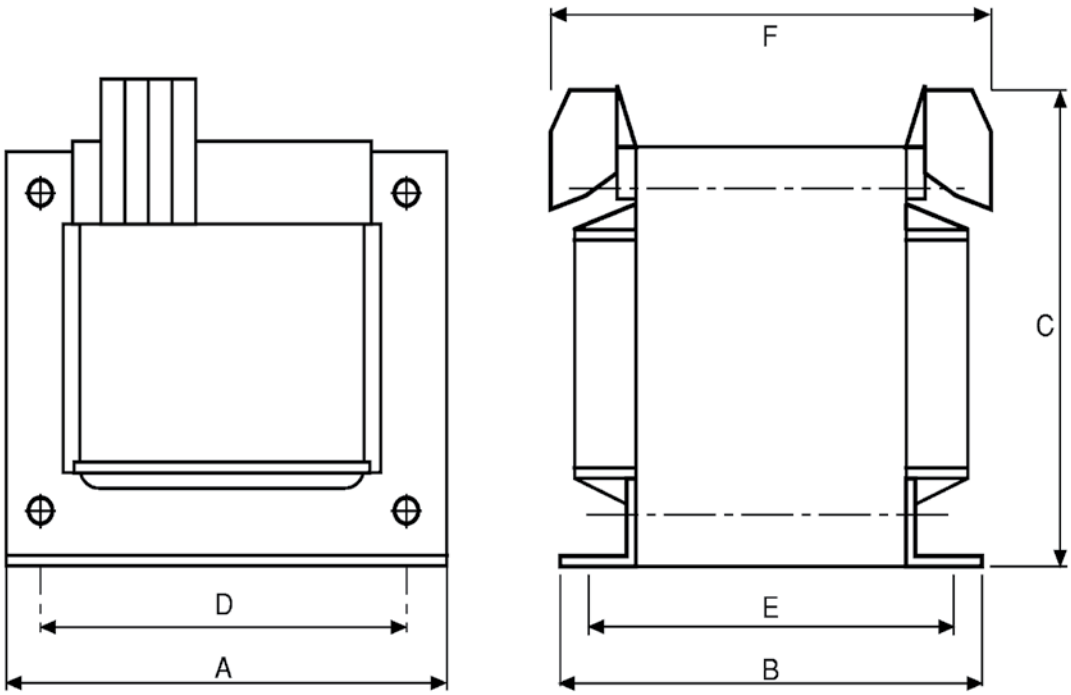
Safety Isolation transformers are mainly used where operational safety is of utmost concern.

Input voltage varies up to 1000V while output voltage varies up to 50V They possibily include voltage taps or shielding wndings. Power ratings of these transformers go up to 10kVA. The electrical connection is done via terminal blocks and special mounting for DIN rails is availiable on request

ELEKTRA transformers are compatible with international standards and CE signed. Also the transformers are produced under ISO9000 quality management system.

ELEKTRA Safety-Isolation Transformers Specifications

- High permeable iron core
- High quality copper or aluminium windings
- Class I transformer
- Very high insulation
- Low protective earth resistance
- Vacuum impregnated varnish to ensure silent and moisture-immune operation
- CE sign and compatibility with EN 61558 2-6
- Manufactured under ISO 9000 quality management



MODEL	Power (VA)	Instantaneous Power (VA)	Core	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Weight (kg)
ETS-0050	50	120	84/29.5	84	76	91	64	64	65	1.5
ETS-0075	75	160	84/29.5	84	76	91	64	64	65	1.7
ETS-0100	100	225	84/43.5	84	76	91	64	64	79	2
ETS-0160	160	400	96/45.7	96	89	99	84	74	75	2.5
ETS-0200	200	487	96/45.7	96	89	99	84	74	75	3
ETS-0250	250	620	96/59.7	96	102	99	84	87	89	3.5
ETS-0320	320	750	120/41.7	120	90	127	90	83	85	4.5
ETS-0400	400	1010	120/53.7	120	102	127	90	95	97	5.5
ETS-0500	500	1350	120/73.7	120	122	117	90	109	111	7
ETS-0630	630	1740	150/49.6	150	113	141	122	89	90	8
ETS-0800	800	2250	150/66.6	150	129	141	122	104	105	10
ETS-1000	1000	3150	150/92.6	150	153	141	122	128	130	14
ETS-1300	1300	3820	192/70	192	144	200	130	126	128	22
ETS-1600	1600	5050	192/82	192	166	200	130	148	150	24
ETS-2000	2000	6400	192/105	192	178	200	130	160	162	26
ETS-2500	2500	7980	192/120	192	193	200	130	175	176	29

* Dimension values may change depending on design

PCB TYPE TRANSFORMERS

PCB type transformers are potted type transformers which are designed to be used in low power printed circuit boards.

Input voltage varies up to 415V while output voltage varies up to 36V. Multiple output configirations are possible. Power rating can be selected up to 25VA according to demand. The terminals of the transformer are pins. Pin distances are set and any requested pin configuration may be used to manage connections

ELEKTRA transformers are compatible with international standards and CE signed. Also the transformers are produced under ISO9000 quality management system.

ELEKTRA PCB Type Transformer Specifications.

- High permeable iron core
- Grade 2 high quality copper windings
- Class II transformer
- Very high insulation
- Configurable output pins
- Vacuum impregnated varnish to ensure silent and moisture-immune operation
- CE sign and compatibility with EN 61558 2-6
- Manufactured under ISO 9000 quality management

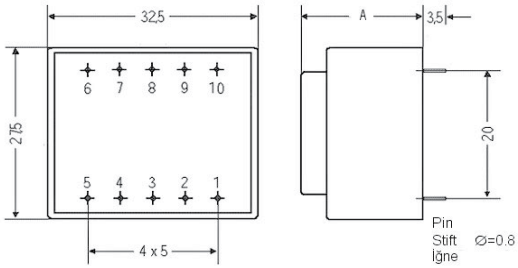


Figure A

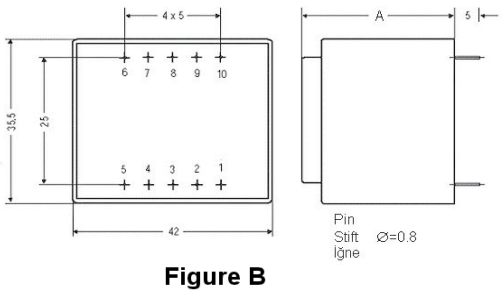


Figure B

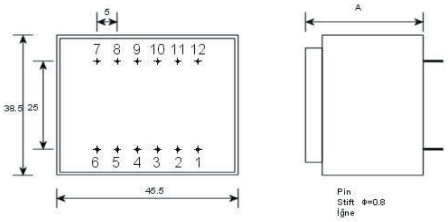


Figure C

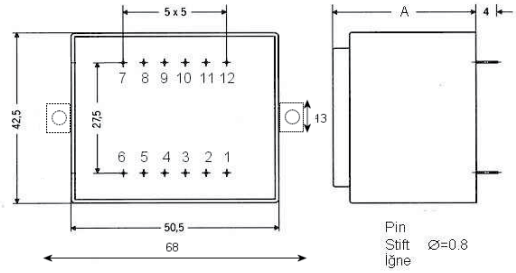


Figure D

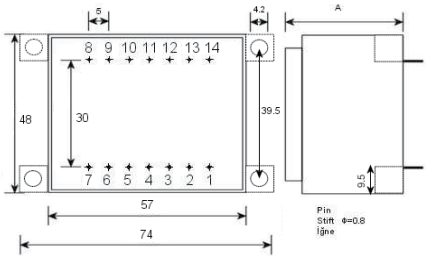


Figure E

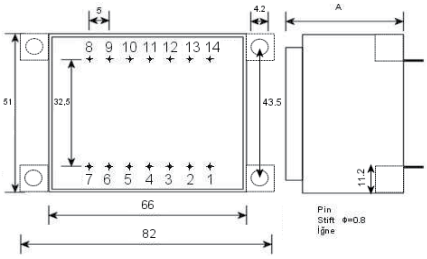


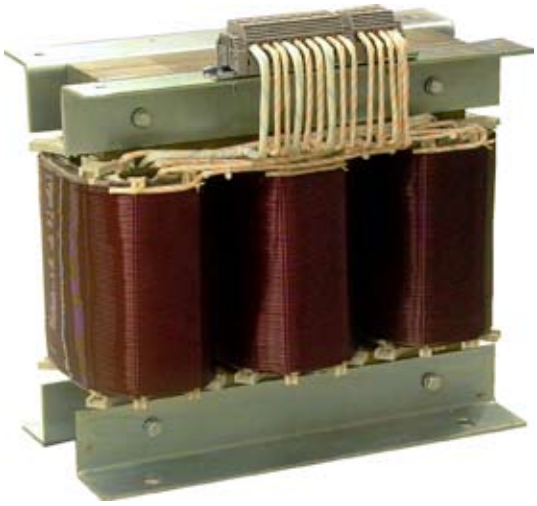
Figure F

MODEL	POWER (VA)	FIGURE	A (mm)	WEIGHT (g)
EPD-0005	0.5	A	15.5	50
EPD-0010	1.0	A	21	70
EPD-0015	1.5	A	23	80
EPD-0020	2.0	A	26	100
EPD-0023	2.3	A	29	112
EPD-0028	2.8	A	34	130
EPD-0035	3.5	B	27	155
EPD-0050	5	C	32	200
EPD-0100	10	D	35	295
EPD-0120	12	D	41	350
EPD-0160	16	E	41	510
EPD-0250	25	F	52	730

* Dimension values may change depending on design

THREE PHASE TRANSFORMERS

Three phase transformers are designed to be used on three phase systems where galvanic isolation or voltage level change is required.



Input and output voltages may vary up to 1000V and they possibily include voltage taps or shielding wndings. Power ratings of these transformers go up to 10kVA. The electrical connection is done via terminal blocks or bars. Any vectoral connection type is availiable on request

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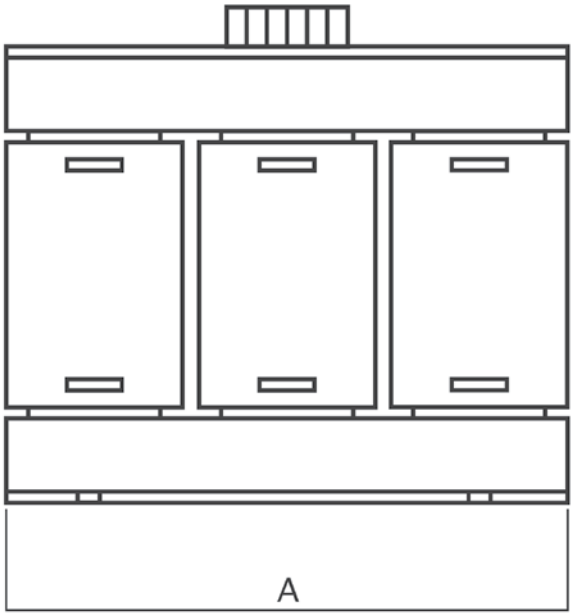
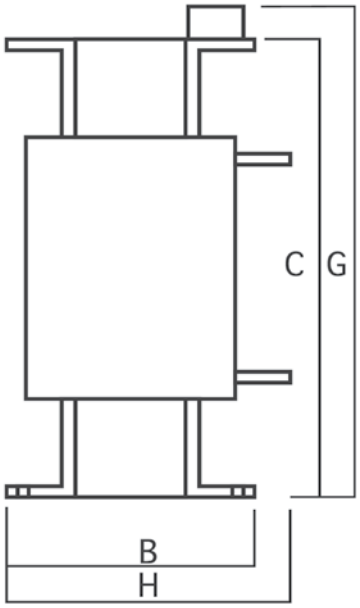
ELEKTRA transformers are compatible with international standards and CE signed. Also the transformers are produced under ISO9000 quality management system.

ELEKTRA Three Phase Transformer Specificaitons

- High permeable iron core
- High quality copper or aluminium windings
- Class I transformer
- Very high insulation
- Low losses, high efficiency
- Vacuum impregnated varnish to ensure silent and moisture-immune operation
- CE sign and compatibility with EN 61558 and suitable subclauses
- Manufactured under ISO 9000 quality management





MODEL	Power (kVA)	Core	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F1 (mm)	F2 (mm)	G (mm)	H (mm)	Weight (kg)
ET3U-3700	0.37	3UI- 25/025	150	67	132	113	50	6	11	182	85	4
ET3U-5300	0,53	3UI- 25/041	150	82	132	113	65	6	11	182	105	6
ET3U-7000	0,70	3UI- 30/031	180	76	155	136	57	7	13	205	95	7
ET3U-1101	1,10	3UI- 30/051	180	96	155	136	77	7	13	205	120	11
ET3U-1601	1,60	3UI- 40/041	240	90	210	185	65	7	13	260	120	18
ET3U-2701	2,70	3UI- 40/066	240	117	210	185	95	7	13	260	145	28
ET3U-4501	4,50	3UI- 50/051	300	122	256	224	94	10	18	305	155	45
ET3U-6401	6,40	3UI- 60/061	360	158	310	264	125	10	18	380	200	60
ET3U-8501	8,50	3UI- 60/091	360	188	330	264	155	10	18	400	235	76
ET3U-1252	12,50	3UI- 70/070	420	173	390	316	143	10	18	460	200	85
ET3U-1752	17,50	3UI- 70/100	420	209	390	316	173	10	18	460	260	110
ET3U-2202	22,00	3UI- 80/080	480	201	440	356	157	10	18	510	250	130
ET3U-3002	30,00	3UI- 80/105	480	228	440	356	184	10	18	510	285	110
ET3U-4002	40,00	3UI-100/070	600	173	568	480	128	10	18	690	270	215
ET3U-5002	50,00	3UI-100/090	600	210	568	480	148	10	18	690	290	220
ET3U-6302	63,00	3UI-120/095	720	210	653	600	143	14	22	780	300	315
ET3U-8002	80,00	3UI-120/105	720	220	653	600	153	14	22	780	310	350
ET3U-1003	100,00	3UI-120/125	720	240	653	600	173	14	22	780	330	420
ET3U-1253	125,00	3UI-160/100	960	250	786	780	149	18	26	915	340	530
ET3U-1603	160,00	3UI-160/120	960	270	786	780	169	18	26	915	360	640
ET3U-2003	200,00	3UI-160/150	960	300	786	780	199	18	26	915	390	770
ET3U-2503	250.00	3UI-160/170	960	329	786	780	219	18	26	915	410	880
ET3U-3153	315,00	3UI-160/210	960	360	786	780	259	18	26	915	450	1130

*Dimension values may change depending on design

GENERAL INFORMATION ON REACTORS

GENERAL

All windings are made of copper or aluminium, the insulating materials are in accordance with the declared insulation classes. Generally all ELEKTRA-transformers are impregnated with resin and correspond at least to the insulation class B.

VOLTAGE and CURRENT

Voltage and current values are set and designed according to specifications given by the customer.

FREQUENCY

Iron core reactos are mainly designed for 50Hz. Design for different frequencies is availiable on request.

ISOLATION CLASSES

Class	Max. Temperature (Peak)	Max. Temperature Rise (Average)	
		Rated Load	Short Circuit
E	120 C	75 C	135 C
B	130 C	80 C	145 C
F	155 C	100 C	170 C
H	180 C	135 C	200 C

Insulation class H on request

ENVIRONMENT

Ambient Temperature	-10 C to +40 C
Shelf Temperature	-20 C to +70 C
Max. elevation.	Up to 1000m

LINEARITY

Linearity of a reactor is especially important for tuning reactors. This value depends on flux density under nominal load value. Flux density for nominal load must be chosen at a lower value than saturation value in order to prevent saturation during overload events.

If a saturation occurs, inductance value drops and resonance point shifts towards a higher and more dangerous point, which may cause severe damage on reactor and surrounding equipment.

Because of this during design of reactors the flux density during nominal load must be chosen at a lower value than saturation point.

POWER AND HEATING

The current flowing through the reactors causes an extensive amount of heat on the windings. This is because of heavy high frequency harmonic content of the current that flows through. This harmonic content causes the wires and the core to overheat.

Because of this, during thermic design of the reactors heavy harmonic current must be taken into consideration in calculations

AIR GAPS

Another point that must be taken consideration is the distribution of air gap in a reactor. At high currents and high frequencies the electromagnetic interference around these airgaps causes additional losses in core and windings.

Because of this the current and frequency values must be taken into consideration when designing airgaps for an iron core reactor.

INSTALLATION INSTRUCTIONS

Reactors have to be mounted in a manner, that the necessary cooling is guaranteed. The inlets and outlets of the reactor cooling chanels must be free of obstruction which hinder the air circulation.

Reactors with chanells have to be installed that way, that the channel direction is fundamentally vertically.

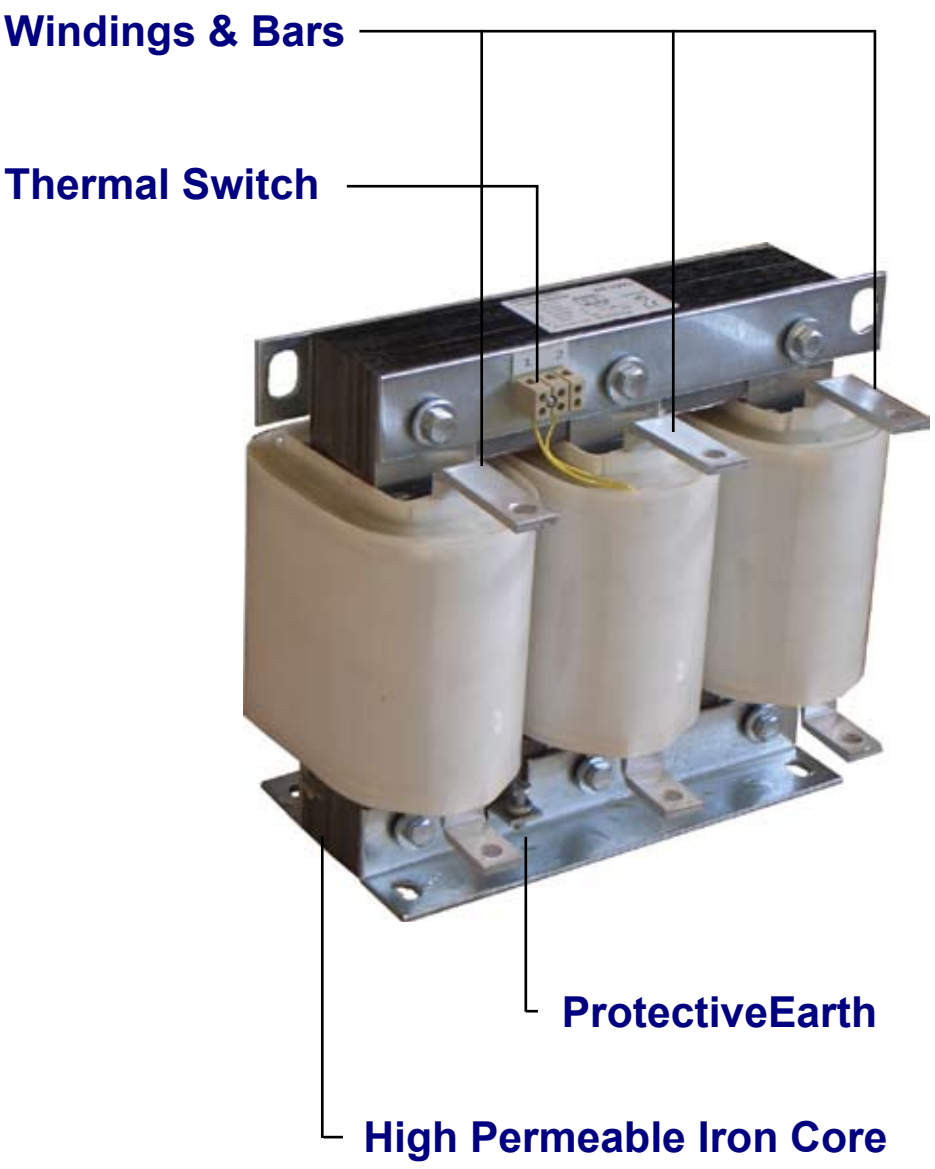
START-UP OPERATIONS

Before starting a reactor it must be checked if the input voltage and frequency agree with the values indicated at the rating plate. Also the screws of the connecting elements have to be tightened. If the reactors are no short-circuit-proof, a fuse has to be foreseen.

MAINTENANCE

Start-up operation and maintenance by trained personnel only. Please observe the operating instructions. ELEKTRA-dry-type reactors are maintenance-free. A check on contamination should be done every half year, if necessary, the reactors have to be cleaned, for this disconnect unit from supply voltage before cleaning

STRUCTURE OF A REACTOR



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-5,67/400/60	0,52	103,34	113,68	195,31	368,41	13	43
ERH-5,67/400/100	0,31	172,18	189,40	325,41	613,82	14	50

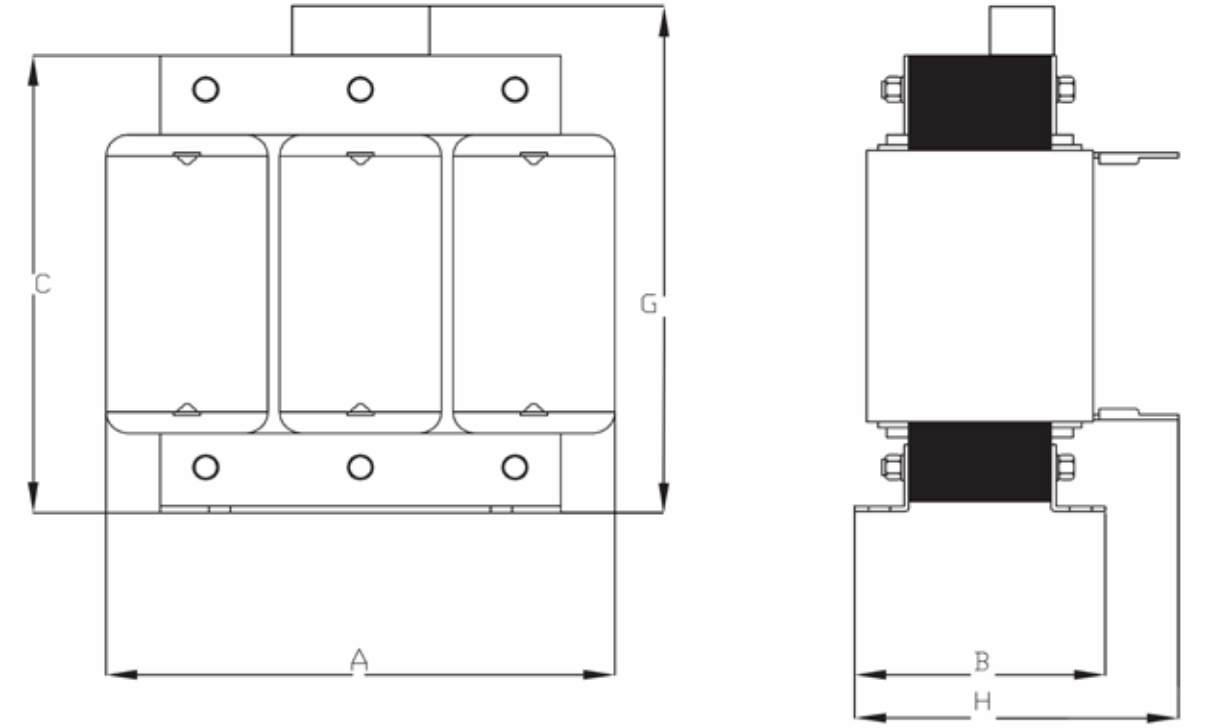
400V 50Hz Utility Voltage, 189Hz Resonance Frequency (p=%7)

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-7/400/60	0,64	95,98	105,58	167,03	368,41	12	32
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-14/400/60	1,37	93,17	102,49	141,65	345,39	12	43
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

SHUNT REACTORS

In some cases using inductive energy producing shunt reactors might be a necessity

These type of reactors are mainly used in places with long power transmission and distribution lines. Especially for supplying telecomunication stations in urban areas like radio, GSM and TV transmitters with electricity, long overland cables must be used. These cables have a capacitive characteristic at longer distances. This capacitive characteristic causes the system to become overcompensated. This results in penalties in electricity bills because of high capacitive demand. Furthermore this capacitive characteristic causes the line voltage to increase and may damage sensitive equipment connected to it.

This problem can also surface in large campuses, farmlands etc.

The solution for this problem is loading the system inductively with shunt reactors. these reactors can be used single or three phased. They will utilize necessary inductive load for the system to stop overcompensation.

APPLICATION AREAS:

- Telecomunication stations in urban areas like radio, GSM and TV transmitters.
- Places with large area like campuses and farmlands.
- Inductive load test systems.

ELEKTRA SHUNT REACTORS

ELEKTRA shunt reactors are high quality reactors designed to be used in inductive load systems. These reactors are compatible with european standards and are CE marked.

TEKNİK ÖZELLİKLERİ:

- Single or three phase, high permeable iron core, air gapped design
- High quality copper or aluminium windings
- Design according to customer specs
- Thermal Switch for overload protection at each leg
- 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 SHUNT REACTORS

- Line Voltage
- Amount of Phases
- Rated Current or Rated Power
- Voltage distortion amount.

MOTOR DRIVE INPUT REACTORS

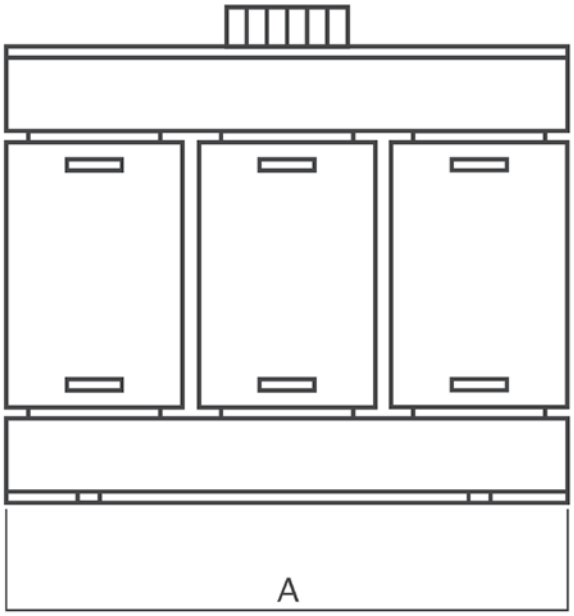
Motor drive input reactors are used between variable speed drives and utility. They are used to dampen the harmonic content of the current drawn by the motor drive.

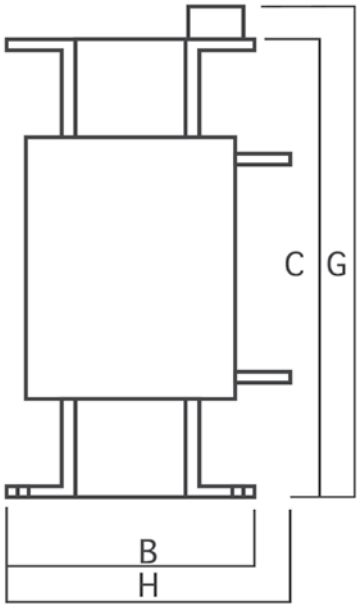
Operating voltage is up to 1000V. Maximum design current for these rectors are 1000A. The connections are terminal block, bar or cable connection depending on current value

ELEKTRA reactors are compatible with international standards and CE signed. Also the reactors are produced under ISO9000 quality management system.

ELEKTRA Motor Drive Input Reactor Specifications

- High permeable iron core
- High quality copper or aluminium windings
- High linearity
- Excellent thermal layout
- Voltage drop Uk=%4. Uk=%2 availiable on request.
- 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





MODEL	Power (kVA)	Core	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F1 (mm)	F2 (mm)	G (mm)	H (mm)	Weight (kg)
ERL3-16/1.83	10	3UI 75/25	150	67	125	110	47	5	10	195	167	4
ERL3-20/1.43	12.5	3UI 75/25	150	67	125	110	47	5	10	195	167	4.5
ERL3-25/1.13	15	3UI 75/25	150	67	125	110	47	5	10	195	167	5
ERL3-35/0.84	22.5	3UI 75/40	150	82	125	110	62	5	10	195	182	6
ERL3-40/0.73	25	3UI 90/30	180	92	150	132	72	5	10	220	192	10
ERL3-50/0.59	32.5	3UI 90/40	180	102	150	132	82	5	10	220	192	13
ERL3-63/0.47	40	3UI 90/50	180	112	150	132	92	5	10	220	212	16
ERL3-80/0.37	50	3UI 120/40	240	102	200	175	76	10	15	270	202	20
ERL3-100/0.29	65	3UI 120/40	240	102	200	175	76	10	15	270	202	22
ERL3-125/0.23	85	3UI 120/50	240	112	200	175	86	10	15	270	212	24
ERL3-150/0.18	100	3UI 120/65	240	126	200	175	100	10	15	270	226	28

* Dimension values may change depending on design

MOTOR DRIVE OUTPUT REACTORS

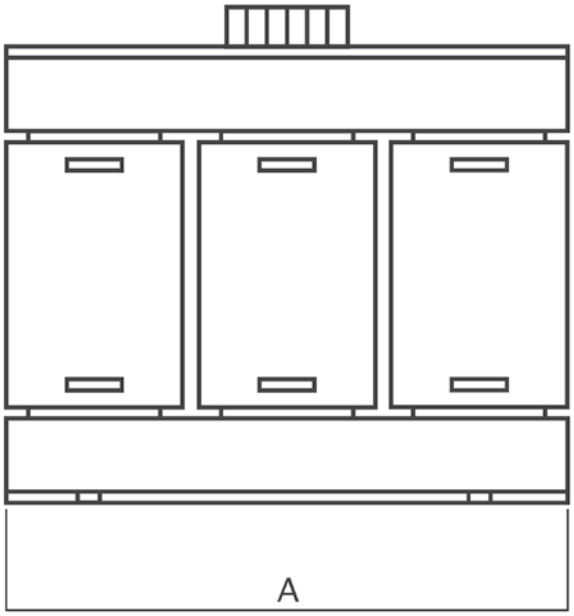
Motor drive output reactors are used between variable speed drives and the motor. They are used to dampen the harmonic content of the voltage generated by the motor drive.

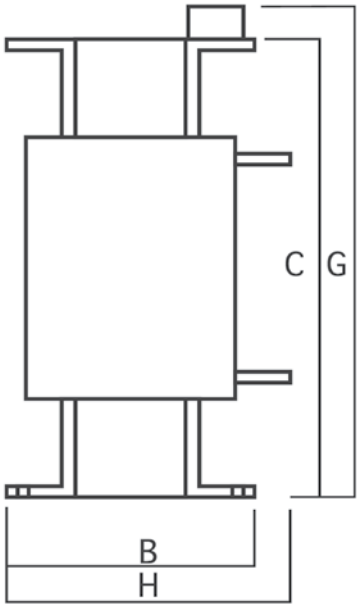
Operating voltage is up to 1000V. Maximum design current for these rectors are 500A. The connections are terminal block, bar or cable connection depending on current value

ELEKTRA reactors are compatible with international standards and CE signed. Also the reactors are produced under ISO9000 quality management system.

ELEKTRA Motor Drive Output Reactor Specifications

- High permeable iron core
- High quality copper or aluminium windings
- High linearity
- Excellent thermal layout
- Thermal overlaod protection
- 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





MODEL	Power (kVA)	Core	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F1 (mm)	F2 (mm)	G (mm)	H (mm)	Weight (kg)
ERM-400/6.3	2.2	3UI 75/25	150	67	125	110	47	5	10	195	167	4
ERM-400/9.4	4	3UI 75/25	150	67	125	110	47	5	10	195	167	4.5
ERM-400/13	5.5	3UI 75/25	150	67	125	110	47	5	10	195	167	5
ERM-400/16	7.5	3UI 75/40	150	82	125	110	62	5	10	195	182	6
ERM-400/24	11	3UI 90/30	180	92	150	132	72	5	10	220	192	10
ERM-400/30	15	3UI 90/40	180	102	150	132	82	5	10	220	192	13
ERM-400/39	18.5	3UI 90/40	180	102	150	132	82	5	10	220	202	14
ERM-400/46	22	3UI 90/50	180	112	150	132	92	5	10	220	212	16
ERM-400/61	30	3UI 90/50	180	112	150	132	92	5	10	220	212	17
ERM-400/72	37	3UI 90/50	180	112	150	132	92	5	10	220	212	18
ERM-400/91	45	3UI 90/50	180	112	150	132	92	5	10	220	212	18
ERM-400/110	55	3UI 90/50	180	112	150	132	92	5	10	220	212	19
ERM-400/150	75	3UI 120/40	240	102	200	175	76	10	15	270	202	20
ERM-400/176	90	3UI 120/50	240	112	200	175	86	10	15	270	212	24

* Dimension values may change depending on design

HIGH FREQUENCY FERRITE CORE TRANSFORMERS

High frequency ferrite core transformers are used for switch mode power supplies and telecommunication applications. Operation at a very high frequency ensures a very small size at large powers. Magnetic iron cores are usuallly not suitable for high frequency applications. Therefore ferrit core transformers are preferred for this area.

The outputs of the transformer can be pin or cable output type. Design and production can be carried out for any switch mode topology availiable. Furthermore, for smaller powers, common switch mode integrated circuits are supported as well.

ELEKTRA High Frequency Ferrite Core Transformers

- Special ferrite cores for high frequency applications
- Litz wire depending on application
- Compatibiltiy with common SMPS integrated circuits.
- Excellent thermal layout
- Wide frequency range
- 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

www.elektra.com.tr

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