1 PHASE TRANSFORMERS power model 6,3 - 630kVA

These transformers are made according to norms EN/IEC 61558-4 or IEC60076/IEC726 and
- have compact structure
- are cost-effective
- are of temperature class F (155ºC) / H (180ºC)

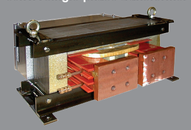
On request transformers can also be made according to norms such as DNV or LRS.

Transformers have been designed to be cost-effective. Design methods allow the smallest possible size and lightweight construction. All materials used are of the highest quality and from certified suppliers.

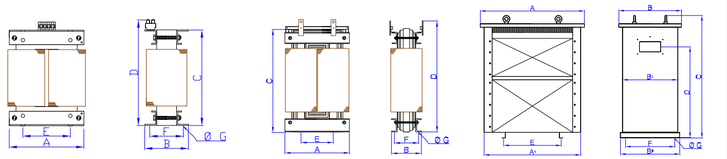
16kVA Isolation Transformer

7,5kVA Medical Transformer

Custom made water-cooled 50kVA single-phase transformer



Power kVA	P0/W	Pk/W	Uk/%	Io/%
6,3	95	245	3	15
8	105	285	3	15
10	110	315	3	10
12,5	140	335	3	10
16	150	390	2,5	10
20	185	455	2,5	10
25	200	760	4	10
31,5	270	780	4	10
40	300	980	4	8
50	330	1200	4	8
63	400	1330	4	6
80	520	1330	4	6
100	600	1700	4	6
125	760	1750	4	5
160	850	2250	4	4
200	850	2350	4	4
250	900	2900	4	3
315	1100	2950	4	3
400	1300	3700	4	3
500	1800	3500	4	2
630	2000	4400	4	2



Open construction <50kVA Open construction > 63kVA Enclosure IP23 - 34

Power kVA	Open construction A	B	C	D	E	F	G	Weight kg	Enclosure IP23 A	A¹	B	B¹	B²	C	D	E	F	G	Weight kg
6,3	250	210	335	335	224	152	8,5	42	340	335	340	300	335	540	380	144	305	11×20	47
8	250	240	335	335	224	172	8,5	49	340	335	340	300	335	540	380	144	305	11×20	57
10	310	215	395	395	285	140	11	59	340	335	340	300	335	540	380	144	305	11×20	65
12,5	310	235	395	395	285	160	11	71	380	375	340	300	335	590	440	176	305	11×20	78
16	320	275	435	460	295	190	11	90	380	375	340	300	335	590	440	176	305	11×20	90
20	320	300	435	460	295	210	11	103	430	425	400	370	400	800	630	196	370	11×20	120
25	320	204	410	470	196	194	11	120	430	425	400	370	400	800	630	196	370	11×20	130
31,5	320	224	410	470	196	214	11	133	430	425	400	370	400	800	630	196	370	11×20	145
40	320	224	480	540	196	214	11	166	430	425	400	370	400	800	630	196	370	11×20	210
50	320	224	500	590	196	214	11	195	430	425	400	370	400	800	630	196	370	11×20	210
63	520	280	690	770	260	190	13	350	670	640	560	510	560	1110	900	260	510	13	370
80	520	280	780	860	260	190	13	390	670	640	560	510	560	1110	900	260	510	13	410
100	560	265	730	810	280	210	13	410	930	900	560	510	560	1110	900	520	510	13	500
125	560	265	840	920	280	210	13	450	930	900	560	510	560	1110	900	520	510	13	650
160	610	290	1040	1120	305	225	17	720	1170	1140	700	650	700	1490	1300	600	650	13	800
200	610	290	1040	1120	305	225	17	720	1170	1140	700	650	700	1490	1300	600	650	13	800
250	750	360	1090	1170	340	265	17	1000	1170	1140	700	650	700	1490	1300	680	650	13	1000
315	750	360	1290	1370	340	265	17	1150	1170	1140	700	650	700	1490	1300	680	650	13	1500
400	820	500	1200	1300	420	330	17	1450	1360	1330	820	770	820	1750	1600	780	770	18	1800
500	820	500	1450	1550	420	330	17	1800	1360	1330	820	770	820	1750	1600	780	770	18	2300
630	940	450	1300	1400	470	350	17	1600	1630	1600	1000	950	1000	2000	1750	940	950	18	2600

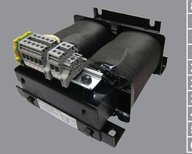
1 PHASE TRANSFORMERS eco model 6,3 - 630kVA

- IEC60076/IEC726 (on request also: DNV, LRS...)
- Raw materials of temperature class F (155ºC)
- Low loss construction

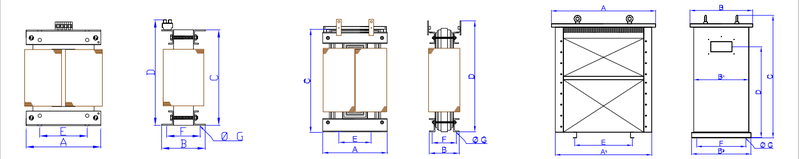
Transformers have been built to minimize load losses. The advantage with ECO-transformer is low load losses, low operating temperature and small magnetic stray field. Also the inrush current is lower than in POWER-model. All this has been achieved by decreasing the temperature rise and magnetic flux density in the transformer. All materials used are of the highest quality from certified suppliers. ECO-transformers have lower operating costs than POWER-transformers.

10kVA transformer in IP34 enclosure

Isolation transformer of XH series



Power kVA	P0/W	Pk/W	Uk/%	Io/%
6,3	90	240	4	12
8	90	310	4	12
10	100	350	4	10
12,5	140	360	4	10
16	160	400	4	10
20	180	540	4	8
25	230	570	4	8
31,5	270	620	4	8
40	280	840	4	7
50	340	940	4	7
63	480	980	4	5
80	640	990	4	5
100	700	1200	4	5
125	700	1340	4	4
160	760	1700	4	4
200	950	1720	4	3
250	1060	2100	4	3
315	1460	2000	4	2
400	1600	2500	4	2
500	1770	3000	4	2
630	2000	3800	4	2



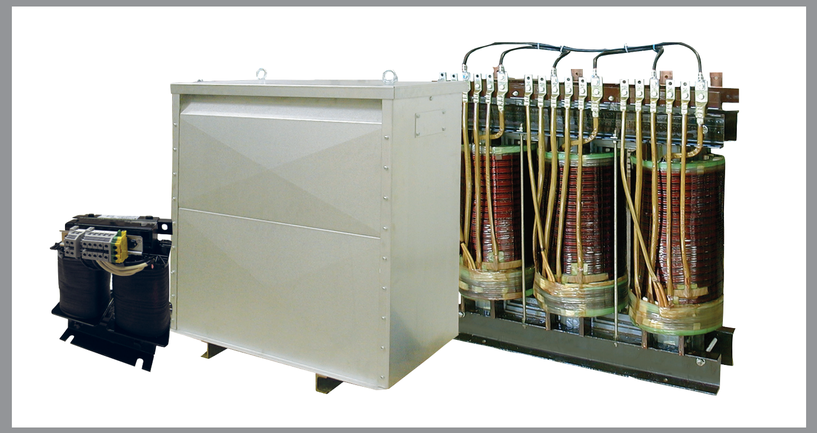
Open construction < 50kVA Open construction > 63kVA Enclosure IP23 - 34

Power kVA	Open construction A	B	C	D	E	F	G	Weight kg	Enclosure IP23 A	A¹	B	B¹	B²	C	D	E	F	G	Weight kg
6,3	240	190	310	370	144	131	11	45	340	310	305	265	335	480	330	124	305	11×20	45
8	240	190	310	370	144	131	11	50	340	335	340	300	335	540	380	144	305	11×20	52
10	240	210	310	370	144	146	11	55	340	335	340	300	335	540	380	144	305	11×20	57
12,5	280	200	360	420	176	163	11	75	380	375	340	300	335	590	440	176	305	11×20	80
16	320	210	410	470	196	174	11	100	380	375	340	300	335	590	440	176	305	11×20	90
20	320	220	410	470	196	184	11	110	430	425	400	370	400	800	630	196	370	11×20	100
25	320	250	410	470	196	194	11	125	430	425	400	370	400	800	630	196	370	11×20	115
31,5	320	250	500	560	196	194	11	160	430	425	400	370	400	800	630	196	370	11×20	145
40	380	260	510	570	216	174	11	180	430	425	400	370	400	800	630	196	370	11×20	155
50	380	280	510	570	216	194	13	200	480	475	400	370	400	800	630	216	370	11×20	200
63	520	280	620	700	260	190	13	250	480	475	400	370	400	800	630	216	370	11×20	250
80	600	300	660	740	300	210	13	340	670	640	560	510	560	1080	900	260	510	13	350
100	600	300	780	860	300	210	13	400	670	640	560	510	560	1080	900	260	510	13	390
125	680	330	790	870	340	225	13	480	830	800	650	600	650	1190	1000	300	600	13	480
160	680	330	900	980	340	225	13	550	830	800	700	650	700	1490	1300	300	650	13	540
200	780	380	980	1080	390	265	17	750	830	800	700	650	700	1490	1300	340	650	13	670
250	780	380	1090	1190	390	265	17	840	830	800	700	650	700	1490	1300	340	650	13	780
315	940	450	1000	1100	470	350	17	1200	970	940	820	770	820	1750	1600	390	770	18	980
400	940	450	1120	1220	470	350	17	1300	970	940	820	770	820	1750	1600	390	770	18	1180
500	940	450	1200	1300	470	350	17	1500	1160	1130	1000	950	1000	1600	1400	470	950	18	1480
630	940	450	1400	1500	470	350	17	1700	1160	1130	1000	950	1000	1900	1700	470	950	18	1680

VTO-11-00-616 rev4

TRAFOX POWER TRANSFORMERS

6,3kVA - 1000kVA



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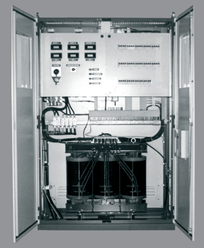
P.O. Box 10, FI-00621 Helsinki, tel. +358 207 933 700, fax. +358 207 933 746, www.trafox.fi, sales@trafox.fi

PRODUCTS

Single- and three-phase low voltage transformers:

Power: 6.3 kVA...1,000 kVA
Voltage: max. 1,000 V
Enclosure: IP00...IP34, others on request.
Cooling: Free air cooling(AN), forced air cooling (AF) also available.

All the raw materials used in our transformers can be recycled. Transformers can be custom manufactured. Please ask for a quotation.



Quality

Muuntosähkö Oy -Trafox has a certified Quality Assurance System ISO 9001:2000 that guarantees high quality.

ISO 9001
BUREAU VERITAS
Certification

Single- and three-phase distortion suspension transformers:

Power: 2 kVA...800 kVA

These transformers are used to separate sensitive electronic devices or demanding electrical networks from high frequency disturbances, high ground currents and transients that are present in electrical networks. They also have a high capacity for suppressing the symmetrical, longitudinal and common-mode interferences. An earth leakage monitoring unit (for example Superintend®) can be attached to monitor the secondary couplings and devices attached to it. In this case the secondary must be grounded.

Different usages

Ship transformers. Manufactured by using LRS, DNV or other standard.

Power plants and nuclear power stations.

Industry.

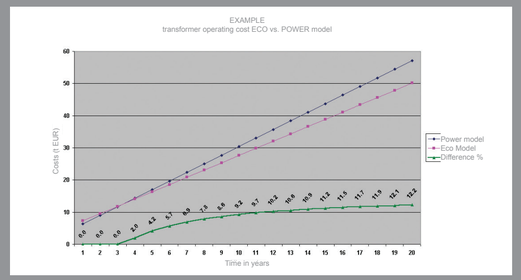
Operating costs

ECO-transformers have been designed to have lower operating losses. In light of today's high energy prices it is cost-effective to choose a transformer from ECO- series instead of POWER series.

The curves on the right show cost-benefit analysis over a long period of time. The operating cost calculations have been based on the following values:

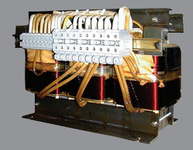
Power of the transformer: 315kVA
Load: 100%
Operation time: 24h/day
Price of energy incl. transfer costs: 0.06€/kwh

For example after 5 years usage the saving in operation costs is: appr. 4.2%
after 10 years: appr. 9.2%
after 15 years: appr. 11.2%
after 20 years: appr. 12.2%



3 PHASE TRANSFORMERS power model 10 - 1000kVA

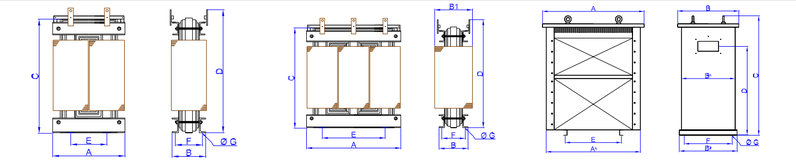
The transformers have been designed according to norms IEC60076/IEC726 and
- have compact structure
- are cost-effective
- are of temperature class F (155ºC)



Transformers have been designed to be cost-effective. This enables them to have the smallest possible size and lightweight construction. All materials used are of the highest quality from certified suppliers.

Transformers meet the technical standards of norms IEC60076/IEC726. They are also manufactured on request according to the following ship transformer standards: DNV, LRS, Germanische Lloyds, American Bureau of Shipping, Rina ja BV. If needed, we can also manufacture transformers using UL/UR approved materials.

Power kVA	P0/W	Pk/W	Uk/%	Io/%
10	160	480	4	18
12,5	170	540	4	18
16	200	620	4	15
20	240	710	4	15
25	250	890	4	15
31,5	280	1030	4	10
40	350	1150	4	10
50	440	1250	4	10
63	520	1550	4	8
80	530	1900	4	8
100	630	2200	4	6
125	850	2100	4	6
160	930	2700	4	6
200	1250	2900	4	5
250	1350	3600	4	4
315	1400	3700	4	4
400	1600	4800	4	3
500	2000	5000	4	3
630	2200	6000	4	3
800	3300	6500	4	2
1000	3500	7000	4	2



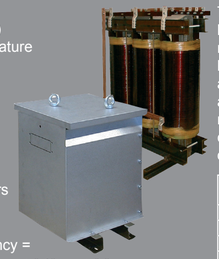
Open construction ≤ 80kVA — Open construction ≥ 100kVA — Enclosure IP23 - 34

Power kVA	Open construction A	B	C	D	E	F	G	Weight kg	Enclosure IP23 A	A¹	B	B¹	B²	C	D	E	F	G	Weight kg
10	300	180	260	320	224	145	10	53	400	395	305	265	335	480	330	224	305	11×20	65
12,5	360	180	310	370	264	131	11	65	460	455	340	300	335	540	380	264	305	11×20	80
16	360	200	310	370	264	146	11	75	460	455	340	300	335	540	380	264	305	11×20	90
20	420	190	360	420	316	153	11	100	520	515	340	300	335	590	440	316	305	11×20	120
25	480	190	410	470	356	154	11	120	600	595	400	370	400	800	630	356	370	11×20	140
31,5	480	200	410	470	356	164	11	140	600	595	400	370	400	800	630	356	370	11×20	160
40	480	220	410	470	356	184	11	160	600	595	400	370	400	800	630	356	370	11×20	180
50	480	250	410	470	356	194	11	190	600	595	400	370	400	800	630	356	370	11×20	210
63	480	250	500	560	356	194	11	230	600	595	400	370	400	800	630	356	370	11×20	250
80	570	260	510	570	380	174	13	280	700	695	400	370	400	800	630	380	370	11×20	320
100	690	240	740	820	460	160	13	330	930	900	560	510	560	1080	900	460	510	13	400
125	780	270	710	790	520	190	13	430	930	900	560	510	560	1080	900	520	510	13	500
160	780	270	780	860	520	190	13	480	930	900	560	510	560	1080	900	520	510	13	550
200	900	300	840	920	600	210	13	640	1170	1140	650	600	650	1190	1000	600	600	13	720
250	900	300	920	1000	600	210	13	720	1170	1140	700	650	700	1490	1300	600	650	13	800
315	1020	330	960	1040	680	225	17	910	1170	1140	700	650	700	1490	1300	680	650	13	1000
400	1020	330	1090	1170	680	225	17	1100	1170	1140	700	650	700	1490	1300	680	650	13	1200
500	1170	380	1090	1190	780	265	17	1400	1360	1330	820	770	820	1750	1600	780	770	18	1500
630	1170	380	1280	1380	780	265	17	1700	1360	1330	820	770	820	1750	1600	780	770	18	1800
800	1410	500	1200	1350	940	350	17	2200	1630	1600	1000	950	1000	1900	1700	940	950	18	2300
1000	1410	500	1300	1450	940	350	17	2500	1630	1600	1000	950	1000	1900	1700	940	950	18	2600

3 PHASE TRANSFORMERS eco model 10 - 500kVA

for solar-energy and machinery industry

- IEC60076/IEC726 (if needed, also DNV, LRS...)
- Raw materials are of temperature class F (155 °C)
- CE,UL/Ur
- Tamb 45 °C
- Voltage max 1000V
- Frequency 50-60Hz
- Relative humidity: 95%, no condensation
- Overload: 120% for two hours

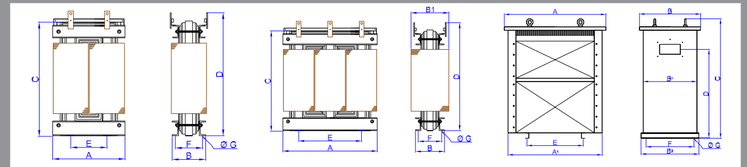


The advantage with ECO-transformer is low load losses, low operating temperature and small magnetic stray field. Also the inrush current is lower than in POWER-model. All this has been achieved by decreasing the temperature rise and magnetic flux density in the transformer. All materials used are of the highest quality from certified suppliers. ECO-transformers have lower operating costs than POWER-transformers.

Transformer European efficiency =
$0{,}03 \times \eta_5 + 0{,}06 \times \eta_{10} + 0{,}13 \times \eta_{20} + 0{,}1 \times \eta_{30} + 0{,}48 \times \eta_{50} + 0{,}2 \times \eta_{100}$

Where:
η_5 = efficiency working at 5% of rated power.
η_{10} = efficiency working at 10% of rated power.
η_{20} = efficiency working at 20% of rated power.
η_{30} = efficiency working at 30% of rated power.
η_{50} = efficiency working at 50% of rated power.
η_{100} = efficiency working at 100% of rated power.

Power kVA	P0/W	Pk/W	Uk/%	Io/%	Efficiency
10	62	422	4-7	12	95.81
15	81	426	4-7	10	96.78
20	95	543	4-7	10	97.04
25	107	768	4-7	10	97.02
30	132	754	4-7	8	97.27
40	203	713	4-7	8	97.41
50	206	752	4-7	8	97.87
80	273	1387	4-7	7	97.99
100	405	1897	4-7	5	97.69
200	623	3587	4-7	4	98.07
300	707	6011	4-7	3	98.20
400	1032	5652	4-7	3	98.42
500	1042	7984	4-7	2	98.50



Open construction ≤ 100kVA — Open construction ≥ 200kVA — Enclosure IP23 - 34

Power kVA	Open construction IP00 A	B	C	D	E	F	G	Weight kg	Enclosure IP23 A	A¹	B	B¹	B²	C	D	E	F	G	Weight kg
10	360	180	350	410	264	131	10x19	59	460	455	340	300	335	540	380	264	305	11×20	89
15	420	182	310	370	316	162	10x19	80	460	455	340	300	335	540	380	264	305	11×20	110
20	420	192	340	400	316	172	10x19	96	520	515	340	300	335	590	440	316	305	11×20	145
25	480	180	420	480	356	144	10x19	114	600	595	400	370	400	800	630	356	370	11×20	180
30	480	210	420	480	356	174	10x19	137	600	595	400	370	400	800	630	356	370	11×20	190
40	480	250	410	490	356	194	10x19	190	600	595	400	370	400	800	630	356	370	11×20	220
50	530	250	530	610	356	194	10x19	235	600	595	400	370	400	800	630	356	370	11×20	240
80	710	235	880	1000	460	160	13	345	700	695	400	370	400	800	630	380	370	11×20	380
100	685	253	930	1050	520	190	13	460	930	900	560	510	560	1080	900	520	510	13	560
200	1120	380	1000	1100	600	210	13	780	1170	1140	650	600	650	1190	1000	680	600	13	890
300	1160	390	1040	1140	680	210	18	930	1360	1330	820	770	820	1750	1600	780	770	18	1390
400	1400	530	1100	1200	780	265	18	1370	1360	1330	820	770	820	1750	1600	780	770	18	1500
500	1475	555	1100	1200	780	265	18	1450	1630	1600	1000	950	1000	1600	1400	940	950	18	1600

Solar-energy applications Uk/% -value can be factory adjusted to 4-7% level. Also is available adjustment reactors to reach needed inductance value in LCL filtering circuit. Maximum switching frequency 10kHz.