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### **Company Profile**

Skot Transformers is one of the UK's leading manufacturers of power transformers, line reactors, chokes and power supplies, which range from 3VA to 3MVA.

You can select from our extensive stock range, or have a product designed to meet your specific requirements by our highly experienced design and development team.

For orders, price quotation and technical advice contact our technical sales team by phone, fax or e-mail.

Skot Transformers has supplied the electrical and electronic industries for over thirty five years and has won the approval of some of the UK's most prestigious companies.

Skot Transformers Limited was established in 1963 and moved to its current location in the Malvern Hills in 1979. In 1985 Skot Transformers became a wholly owned subsidiary of Goodyear Transformers Limited of Birmingham. In 1991 Skot Transformers separated from Goodyear following a management buyout.

Over the years the company has continued to broaden its product range and a continued investment in the company has led to a doubling of the manufacturing area which now consists of two manufacturing sites.

The company employs approximately eighty five people and is supported by a comprehensive design and development team. We have continued to undertake considerable investment in people over the years to confirm our position as a leading transformer manufacturer and have experienced good rates of growth.



Main Manufacturing Site in Malvern

# **RESIN CAST TRANSFORMERS**

A new range of industrial power transformers ideal for installation close to the electrical load indoors, where adverse environmental conditions exist.

The windings are cast under vacuum ensuring moisture cannot penetrate enabling the transformer to be safely operated in humid conditions.

### Advantages of Resin Cast Transformers

- Large short time overload capability
- Improved resistance to short circuit conditions
- Excellent impulse strength
- Resistant to thermal shock
- Maintenance free
- Environmentally safe





# LIQUID FILLED TRANSFORMERS

Skot Transformers can now supply liquid cooled transformers for a wide variety of industrial applications. Typical applications are: Furnace Heating, Mining, Electroplating, Cathodic Protection, Thyristor Drives, Converters etc.

The transformers are designed and constructed to meet British, European and International Standards.

### **Advantages of Liquid Filled Transformers**

- Ideal for hostile outdoor environment
- Efficient cooling
- Good impulse strength
- Large short time overload capability



# SKOT COMPACT LINEAR DC POWER SUPPLY

A smoothed power supply designed to give 24V DC with less than 5% ripple. Designed for use with electromechanical devices such as contactors, solenoids and relays.

#### **SPECIFICATION**

Nominal voltage ±10% Input voltage: Input frequency: 50/60Hz Input fuse: See table Output voltage: 24V DC Output ripple: <5% (at full load) Transformer in accordance with BS EN 60742 Input voltage tolerance IEC38 Output voltage variation DIN 19240 (max. open circuit volts 30V, min. full load volts 19.2V)







**10A Power Supply** 



#### **SELECTION TABLE**

Part Number	Primary Voltage	Secondary Voltage (dc)	Rating	А	В	С	D	E	Input fuse Type T (external)	Output fuse (Internal)
29206	110	24	3A	102	95	145	82	70	2A	5A
29207	230	24	ЗA	102	95	145	82	70	1A	5A
29208	400	24	3A	102	95	145	82	70	0.5A	5A
29209	110/230	24	3A	102	105	145	82	80	2/1A	5A
29210	110	24	5A	102	105	145	82	80	3.15A	10A
29211	230	24	5A	102	105	145	82	80	1.25A	10A
29212	400	24	5A	102	105	145	82	80	0.8A	10A
29213	110/230	24	5A	102	120	145	82	80	3.15/1.25A	10A
29214	230	24	10A	117	123	160	90	94	3.15A	20A
29215	400	24	10A	117	123	160	90	94	1.6A	20A

#### **TYPICAL LOAD REGULATION GRAPHS**



# DIMMABLE ELECTRONIC TRANSFORMERS

The **LOVO-TRAN-70** and **LOVO-TRAN-105** dimmable electronic transformers are designed to power 12V tungsten halogen lamps and can be used with all types of domestic light dimmer.



### Key Features

- Dimmable
- Easy installation
- High efficiency
- Compact design
- Lightweight
- Quiet operation
- Short circuit protected
- Overload protected
- Over temperature protected

Model:	LOVO-TRAN-70	LOVO-TRAN-105
Input voltage:	230V	230V
Input frequency:	50Hz	50Hz
Output voltage:	12V	12V
Minimum load:	10W	20W
Maximum load:	70W	105W
Power factor:	>0.99	>0.99
Max. ambient temperature:	50°C	50°C
Max. case temperature:	70ºC	70ºC

### Dimensions for LOVO-TRAN-70 and LOVO-TRAN-105



### **CONTROL PANEL TRANSFORMERS**







#### Selection Guide

PRI V	0-400-4	115-440	0-230	)-240
SEC V	12-0-12	55-0-55	12-0-12	55-0-55
VA	Part No	Part No	Part No	Part No
50	19100	19101	19102	19103
100	19104	19105	19106	19107
150	19108	19109	19110	19111
250	19112	19113	19114	19115
350	19116	19117	19118	19119
500	19120	19121	19122	19123
750		19124		19125
1000		19126		19127
1500		19128		12129

#### Dimensions

VA	А	В	С	D	Е	F	G	SLOT	WT. kg	TYP	ENC
										REG %	REF
50	80	92	76	54	39	N/A	52	8 x 4	1.1	10.6	P0
100	98	108	82	64	46	80	60	8 x 5	2.1	7.0	P2
150	98	108	95	64	59	80	73	8 x 5	2.8	5.4	P2
250	118	125	112	64	60	95	76	10 x 5	4.0	4.8	P2
350	137	140	115	89	65	115	83	10 x 5	6.9	4.5	P2
500	137	140	130	89	84	115	102	10 x 5	7.4	3.3	P2
750	168	165	125	89	78	119	92	12 x 7	10.2	3.1	P4
1000	168	165	145	89	97	119	112	12 x 7	12.6	2.1	P4
1500	216	230	140	115	95	160	113	18 x 10	17.4	2.5	P5

PREMIER 742

An ex-stock isolating and safety isolating range meeting the full requirements of EN60742, BS3535 1990.

#### **BASIC REQUIREMENTS OF BS3535**

Terminal cover only removable by use of tool.

All transformers should be marked in a durable form with labelling specific to the type of transformer.

Minimum 25mm gap between input and output terminals.

Temperature must be controlled by either construction, internal protection or specifying of external protection, or any combination.

#### **FEATURES OF RANGE**

Universal fixing with fixing points clear of bobbin.

Terminals shielded to IP20.

Robust construction.

### **CONTROL PANEL TRANSFORMERS STANDARD PANEL** RANGE An ex-stock panel range built generally in accordance with EN60742, BS3535 1990, BS171, VDE0551 These units have been redesigned to satisfy the requirements of panel builders and are available either direct or through SEE NOTE our network of stockists. В **FEATURES OF RANGE** õ 0 Δ Universal mounting with fixing points clear of bobbin. Terminals shielded to IP20 up to 1.5kVA. Е G Anti-pinch connector blocks from F 50VA up to 1.5kVA. С Stud connection from 2kVA to 6kVA. D F Selection Guide Dimensions

PRI V		0-380-41	5-440			0-220-240	)
SEC V	0-220-240	55-0-55	24-0-24	12-0-12	55-0-55	24-0-24	12-0-12
VA	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.
50	11961	11962	11963	11964	11965	11966	11967
100	11968	11969	11970	11971	11972	11973	11974
200	11982	11983	11984	11985	11986	11987	11988
300	11989	11990	11991	11992	11993	11994	11995
500	12003	12004	12005	12006	12007	12008	12009
750		14319			14322		
1000	14325	14326			14329		
1500		12756			12757		
2000		13705			13704		
2500		13707			13706		
3000		13709			13708		
4000		13711			13710		
5000		13713			13712		
6000		13895			13894		

VA	А	В	С	D	Е	F	G	SLOT	WT.kg	TYP	ENC
										REG %	REF
50	80	95	80	54	39	N/A	52	8 x 4	1.1	10.2	P0
100	98	108	80	64	40	80	53	8 x 5	2.1	10.0	P2
200	118	125	110	64	55	95	70	10 x 5	3.7	3.8	P2
300	118	125	115	64	68	95	82	10 x 5	4.5	3.5	P2
500	137	145	125	89	74	115	95	10 x 5	7.4	2.8	P2
750	168	165	125	89	78	119	92	12 x 7	10.2	3.1	P4
1000	168	165	145	89	91	119	112	12 x 7	12.6	2.1	P4
1500	216	230	140	115	95	160	113	18 x 10	17.4	2.5	P5
2000	216	230	155	115	107	160	125	18 x 10	21.0	2.1	P5
2500	216	230	165	115	121	160	138	18 x 10	24.0	1.9	P5
3000	233	246	195	115	140	162	158	18 x 10	34.8	1.7	P5
4000	233	246	230	115	165	162	182	18 x 10	43.4	1.5	P5
5000	267	290	215	165	140	205	180	25 x 8	52.2	1.2	P6
6000	267	290	245	165	160	205	200	25 x 8	61.8	1.1	P6

All dimensions in mm

Note: Covered terminal blocks up to 1500VA. Studs terminals 2000VA to 6000VA. Page 9

### **CONTROL PANEL TRANSFORMERS**











A comprehensive range of transformer sizes that can be designed and built to meet specific applications or European standards including EN60742 (BS3535).

Our sales engineers are available to discuss your requirements or undertake site visits with the backup of our large technical department, to give you total confidence from enquiry through project design, to final delivery.

Modern methods of computer aided design are used, which enable quotations to be prepared speedily and technical information to be supplied to the customer at the quotation stage, if required.

Skot's commitment to holding large stocks of the constituent materials for this range of transformers means that speedy deliveries can be achieved for both prototype and production quantities.

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VA	А	В	С	D	Е	F	G	SLOT	WT.kg	ENC REF
25	69	83	50	45	36	n/a	48	8 x 4	0.8	P0
50	80	92	60	54	39	n/a	52	8 x 4	1.1	P0
75	80	92	76	54	54	n/a	65	8 x 4	1.6	P0
100	98	108	70	64	46	80	60	8 x 5	2.1	P2
150	98	108	80	64	59	80	73	8 x 5	2.8	P2
200	118	125	90	64	55	95	70	10 x 5	3.7	P2
250	118	125	95	64	60	95	76	10 x 5	4.0	P2
300	118	125	105	64	68	95	82	10 x 5	4.5	P2
400	137	140	110	89	65	115	83	10 x 5	6.9	P2
500	137	140	130	89	84	115	102	10 x 5	7.4	P2
750	168	165	125	89	78	119	92	12 x 7	10.2	P4
1000	168	165	145	89	97	119	112	12 x 7	12.6	P4
1500	216	230	140	115	95	160	113	18 x 10	17.4	P4
2000	216	230	155	115	107	160	125	18 x 10	21.0	P4
2500	216	230	165	115	121	160	138	18 x 10	24.0	P4
3000	233	246	195	115	140	162	158	18 x 10	34.8	P4
4000	233	246	230	115	165	162	182	18 x 10	43.4	P5
5000	267	290	215	165	140	205	180	25 x 8	52.2	P6
6000	267	290	245	165	160	205	200	25 x 8	61.8	P6

All dimensions in mm.

Note: Dimension B may vary depending upon form of termination.

### **SINGLE & THREE PHASE POWER TRANSFORMERS**

# SINGLE PHASE POWER TRANSFORMERS

These single phase transformers are custom built to meet the most stringent requirements in terms of operational safety and reliability, using high quality materials throughout.

The transformers can be designed to meet the requirements of British, European and other international standards.

Enclosures area readily available and a large selection of fittings can be provided.

#### Dimensions

kVA	А	В	С	D	Е	F	G	SLOT	WT.kg	ENC
										REF
7.5	260	200	445	161	230	200		10 x 25	60	EF1
10	260	220	445	178	230	220		10 x 25	69	EF1
12.5	260	250	445	190	230	230		10 x 25	77	EF1
15	260	255	445	203	230	245		10 x 25	87	EF1
20	260	260	515	203	230	245		10 x 25	103	EF2
25	360	240	700	300	270	200	350	M10	124	EF3
30	360	240	700	300	270	220	350	M10	147	EF3
40	360	260	700	300	270	240	350	M10	210	EF3
50	440	260	800	325	330	232	350	M12	250	EF3



All dimensions in mm.



# **SINGLE & THREE PHASE POWER TRANSFORMERS**

# THREE PHASE POWER TRANSFORMERS

These three phase transformers are custom built to meet the most stringent requirements in terms of operational safety and reliability, using high quality materials throughout.

The transformers can be designed to meet the requirements of British, European and other international standards.

Enclosures are readily available and a large selection of fittings can be provided.



kVA	А	В	С	D	Е	F	SLOT	WT.kg	ENC REF
0.5	180	116	200	76	130	96	8 x 20	10	P5
1.0	180	136	200	96	130	116	8 x 20	12	P5
1.5	240	130	250	90	200	110	10 x 20	16	P5
2.0	240	140	250	100	200	120	10 x 20	20	P6
2.5	240	150	250	110	200	130	10 x 20	25	P6
3.0	300	150	310	110	204	130	10 x 20	31	EF5
4.0	300	160	310	120	204	140	10 x 20	36	EF5
5.0	385	155	380	107	240	142	10 x 25	55	EF6
6.0	385	165	380	120	240	154	10 x 25	63	EF6
7.0	385	180	380	132	240	167	10 x 25	71	EF6
10.0	385	205	380	170	240	205	10 x 25	94	EF6

#### Dimensions

kVA	А	В	С	D	Е	F	G	SLOT	WT.kg	ENC
										REF
12.5	390	215	445	180	300	218		10 x 25	105	EF6
15	390	235	445	190	300	231		10 x 25	118	EF6
20	390	240	515	190	300	231		10 x 25	145	EF7
25	450	220	500	165	330	206		10 x 25	150	EF7
30	450	250	500	195	330	236		10 x 25	180	EF8
40	540	250	680	300	360	220	350	M 10	250	EF8
50	540	260	680	300	360	230	350	M 10	280	EF8
65	540	270	750	300	360	250	350	M 10	340	EF9
80	640	300	800	325	440	252	400	M 12	425	EF9
100	640	300	850	325	440	252	400	M 12	450	EF9













С

G

D

### SINGLE & THREE PHASE POWER TRANSFORMERS





#### P STYLE

A robust ventilated sheet steel enclosure suitable for wall and floor mounting. Standard finish is hammer grey epoxy powder. Ideal for control panel transformers.



#### Dimensions

REF	А	В	С	D	Е	F	G	Н	WT.kg
P0	135	132	118	200	75	65	160	8	1
P1	135	195	118	200	126	65	160	8	1.5
P2	160	225	155	220	152	115	182	8	2
P4	260	272	185	340	152	115	295	8	3
P5	290	355	250	350	230	150	320	8	5
P6	315	455	315	385	255	161	345	8	7

Cable entry via 2 x 20mm conduit entry holes up to EF8. Cable entry via undrilled gland plates on EF9 and EF10.

### EF STYLE

A robust ventilated sheet steel enclosure suitable for floor mounting. Standard finish is epoxy poly powder ripple graphite grey BS-00-A-13. Ideal for single & three phase power transformers.





#### Dimensions

REF	А	В	С	D	Е	F	G	Н	WT.kg
EF1	380	450	600	350	350	540	106		13
EF2	430	500	695	400	400	635	106		26
EF3	580	500	800	550	400	740	126		40
EF4	330	250	350	300	150	290	106		10
EF5	430	300	450	400	200	390	106		13
EF6	480	400	550	450	300	490	126		19
EF7	630	500	650	600	400	590	126		26
EF8	730	590	800	700	490	740	176		47
EF9	1030	600	1060	1000	500	1000	126		60
EF10	1250	850	1270	1190	760	1190	100		75

All dimensions in mm.



Skot Transformers has been involved with many leading drive and control manufacturers in the design and development of specific ranges of wound components for use with drives. In particular, for phase shifting, we have introduced a range of lower cost high efficiency auto phase shifting transformers. The range covers in particular the needs for 12 and 24 pulse applications.

Components from the range have been successfully type tested for:

- Short circuit withstand at full primary voltage
- Shock and vibration at 30g
- Life testing at 85% Humidity

### INDUCTORS, LINE REACTORS & CHOKES

Due to close contact between our product engineers and the drive manufacturers we have developed ranges of Iron and Air Cored reactors to suit particular drives. We offer a full range of input and output line reactors, interbridge reactors, DC link and swinging chokes.

Special winding techniques have been incorporated in the manufacture of reactors, for example, foil winding for heavy current applications. This method of winding has the advantage of offering competitively priced, compact units with reduced short circuit forces within the coils.

Aluminium conductors are also used for certain air cored applications.

Our experience in these products has enabled us to offer reactors for other applications including harmonic suppression, de-tuning and power factor correction.











We manufacture a full range of transformers for use with drives. Where isolation from input circuits or high reactance is required, double wound transformers, with either single or dual secondary outputs, can be supplied. Dual secondary units can be either loosely or closely coupled.

### POLYGONAL TRANSFORMERS

An interesting option, where isolation is not required, is the use of a polygonal auto transformer which, by design, can still introduce a respectable level of reactance in the region of 2 to 3% into the circuit.

This method has the advantage of being more cost effective, efficient and smaller than the double wound equivalent.

The polygonal transformer is particularly useful when a 12 pulse system is required at the system voltage. It provides a  $\pm 15^{\circ}$  phase shift at the output terminals.

# PAT Range

A range of Polygonal Autotransformers providing a low cost 380/440 Volt 50/60 Hz 12 pulse system.

Features: • Low relative cost

- High efficiency
- Low weight
- Ratings from 25 kVA to 1000 kVA
- Class H insulation system
- Designed for use at 55°C Ambient
- Reactance of 2 to 3%
- Low magnetizing inrush current
- Provision for input line fuses
- Winding protection fuses
- Over temperature thermal cutouts
- CE Compliant



# **PAT Range**

**Object** To provide a 12 pulse system from a nominal 415 Volt Three Phase 50/60 Hz Supply.

CE Marked. Complies with Low Voltage and EMC Directives.

Construction: Cooling: Standards: Phase Shift: Power Rating:	Open Type IP00 Naturally Air Cooled BS171; IEC76; BS7806; IEC726. ±15 ° Refer to table
Reactance at rated kVA:	2.0% Minimum
Supply Voltage: Output Voltage: (On Load):	415 Volt + 20% 3 Phase 50/60Hz 415 Volt + 15 °. Based on nominal 415 Volt Input.
Bridge Balance:	Transformer designed to accommodate 10% imbalance between bridges.
Maximum Ambient: Insulation Class:	55°C H
Temperature Rise:	Limited to class F
Winding Protection:	HRC fuses fitted in windings. In the event of Diode short circuit the winding fuses will prevent major transformer failure.
Over Temperature Protection:	Each coil is fitted with a NC thermal switch which will operate on over temperature. Rating 250 Volt 2.5 Amps (Resistive) 1.6 Amps (Inductive)
Input Line Fuses:	Provision will be made for fitting input line fuses. Fuses are not supplied with Transformer
Lifting Facilities:	Suitably rated Eye bolts included
Protection Cover:	Clear plastic cover over Termination's is available. This provides IP20 Protection for terminals only



# PAT Range

Style Number	Total kVA	Total Losses Watts at 115°C	Peak Inrush Current Amps
PAT0025	25.0	550W	300
PAT0031	31.5	630W	300
PAT0040	40.0	750W	350
PAT0050	50.0	850W	400
PAT0063	63.0	950W	500
PAT0080	80.0	1100W	700
PAT0100	100.0	1300W	750
PAT0125	125.0	1400W	1100
PAT0160	160.0	1850W	1200
PAT0200	200.0	2300W	1300
PAT0250	250.0	2400W	1600
PAT0315	315.0	2800W	1800
PAT0400	400.0	2900W	2000
PAT0500	500.0	3600W	2200
PAT0630	630.0	4150W	2800
PAT0800	800.0	5000W	3500
PAT1000	1000.0	6000W	4500



# PAT Range

Style Total kVA		Dime	nsions	Weight kg	
Number		L	W	Н	
PAT0025	25.0	560	240	430	55
PAT0031	31.5	560	240	430	60
PAT0040	40.0	580	270	460	70
PAT0050	50.0	580	270	460	80
PAT0063	63.0	690	330	460	95
PAT0080	80.0	690	340	460	110
PAT0100	100.0	750	360	460	130
PAT0125	125.0	750	380	520	140
PAT0160	160.0	750	380	520	170
PAT0200	200.0	800	400	520	200
PAT0250	250.0	800	400	520	260
PAT0315	315.0	880	420	620	320
PAT0400	400.0	880	460	650	380
PAT0500	500.0	900	460	650	420
PAT0630	630.0	900	500	800	520
PAT0800	800.0	990	500	800	600
PAT1000	1000.0	1050	550	850	700

# PAT Range

Mounting Details

Style Total kVA		Fixing Ce	entres mm	Hole Size
Number		L1	W1	mm
PAT0025	25.0	380	160	14
PAT0031	31.5	380	160	14
PAT0040	40.0	380	185	14
PAT0050	50.0	380	190	14
PAT0063	63.0	460	200	14
PAT0080	80.0	460	210	14
PAT0100	100.0	500	225	14
PAT0125	125.0	500	235	14
PAT0160	160.0	500	250	14
PAT0200	200.0	520	275	14
PAT0250	250.0	520	275	14
PAT0315	315.0	580	275	14
PAT0400	400.0	580	300	14
PAT0500	500.0	600	300	14
PAT0630	630.0	600	350	14
PAT0800	800.0	630	350	14
PAT1000	1000.0	700	400	14

# SLT Range

A range of Double Wound Separating Transformers with Loosely Coupled Secondary windings for an isolated 12 pulse system.

Features: •

- es: Electrically Isolated Secondary Windings
  - Electrostatic screen between Primary and Secondary Windings.
  - Closely Matched windings to reduce distortion
  - Secondary Windings rated to allow for 10% current imbalance in rectifiers.
  - Secondary Windings are rated to accommodate 40% Total Harmonic Distortion of rated current.
  - 3000 Volt Isolation Winding to Winding and Windings to Earth for nominal 415 Volt use.
  - Ratings from 25 kVA to 1000 kVA
  - Class H insulation system
  - Designed for use at 55°C Ambient
  - Nominal Reactance of 4.0 to 5.0%
  - Magnetizing inrush current less than 10 times rated full load current for 20 ms
  - High Quality Low Loss Core Steel
  - PTC Thermistors for over temperature detection
  - CE Compliant

# SLT Range

**Object** To provide an isolated 12 pulse system from a nominal 415 Volt Three Phase 50/60 Hz Supply.

CE Marked. Complies with Low Voltage and EMC Directives.

Construction:	Open Type IP00
Cooling:	Naturally Air Cooled
Standards:	BS171; IEC76; BS7806; IEC726.
Vector Group:	Ddoyn11
Phase Displacement:	0°, +30°
Power Rating:	Refer to table
Reactance at rated kVA:	Nominally 4.5 %
Supply Voltage:	415 Volt + 10% 3 Phase 50/60Hz
Output Voltage:	415 Volt / 415 Volt at rated input
(On Load):	
Balance:	Secondary Windings Reactance and Voltage
	closely matched
Bridge Balance:	Transformer designed to accommodate 10%
	imbalance between bridges.
Harmonic Capability:	Windings rated for 40% Total Harmonic
	Distortion
Maximum Ambient:	55°C
Insulation Class:	Н
Temperature Rise:	Limited to class F
Short Circuit Withstand:	Capable of withstanding effects of a short circuit
	at Secondary Terminals for 1 second.
Primary protection:	Suitably rated BS88 fuses or MCCB should be
	fitted in input circuit
Lifting Facilities:	Suitably rated Eye bolts included

# SLT Range

Style Number	Total kVA	Total Losses Watts at 115°C	Peak Inrush Current Amps
SLT0025	25.0	1050	350
SLT0031	31.5	1250	450
SLT0040	40.0	1500	550
SLT0050	50.0	1750	700
SLT0063	63.0	2100	850
SLT0080	80.0	2600	1100
SLT0100	100.0	3150	1400
SLT0125	125.0	3700	1750
SLT0160	160.0	4300	1900
SLT0200	200.0	5000	2400
SLT0250	250.0	5800	3000
SLT0315	315.0	6500	4000
SLT0400	400.0	8000	5000
SLT0500	500.0	9400	6000
SLT0630	630.0	11500	7500
SLT0800	800.0	13500	9000
SLT1000	1000.0	16000	11000



# SLT Range

Style	yle Total kVA		Dimensions mm			
Number		L	W	Н	0 0	
SLT0025	25.0	540	320	650	150	
SLT0031	31.5	540	350	650	200	
SLT0040	40.0	600	350	700	250	
SLT0050	50.0	600	350	700	290	
SLT0063	63.0	640	400	750	350	
SLT0080	80.0	640	420	750	440	
SLT0100	100.0	750	420	800	460	
SLT0125	125.0	900	450	850	550	
SLT0160	160.0	1000	450	900	690	
SLT0200	200.0	1000	500	950	800	
SLT0250	250.0	1000	500	1120	850	
SLT0315	315.0	1100	550	1200	1140	
SLT0400	400.0	1150	550	1250	1350	
SLT0500	500.0	1300	600	1300	1600	
SLT0630	630.0	1350	600	1300	1900	
SLT0800	800.0	1450	700	1400	2300	
SLT1000	1000.0	1550	750	1400	2700	

# SLT Range Mounting Details

Style Number Total kVA		Fixing Cer	ntres mm	Hole Size
		L1	W1	mm
SLT0025	25.0	360	280	11
SLT0031	31.5	360	310	11
SLT0040	40.0	400	310	13
SLT0050	50.0	400	310	13
SLT0063	63.0	420	360	13
SLT0080	80.0	420	380	13
SLT0100	100.0	500	380	13
SLT0125	125.0	630	410	13
SLT0160	160.0	660	410	13
SLT0200	200.0	660	450	13
SLT0250	250.0	660	450	13
SLT0315	315.0	740	500	17
SLT0400	400.0	760	500	17
SLT0500	500.0	880	550	17
SLT0630	630.0	920	550	17
SLT0800	800.0	970	650	17
SLT1000	1000.0	1020	700	17

# **IBR** Range

A range of Inter Bridge Reactors for use with Polygonal Auto Transformers on 12 or 24 pulse systems.

Features:

- es: Ratings from 50 Amps to 1600 Amps DC
  - Class H insulation system
  - Designed for use at 55°C Ambient
  - High Quality Low Loss Core Steel
  - CE Compliant



# **IBR Range**

Object	<b>Dbject</b> To provide a link between two 6 pulse, 3 Phase Diode Bridges having a 30 Phase Displacement.				
CEN	CE Marked. Complies with Low Voltage and EMC Directives.				
	Construction:	Open Type IP00 Suitable for floor Mounting within Ventilated Enclosure			
	Cooling:	Naturally Air Cooled			
	Standards:	BSEN60289; BS171; IEC76; BS7806; IEC726.			
S	ystem Voltage:	415 Volt 3 Phase 50Hz			
React	or Voltage End to End:	± 124 Volt Triangular 300Hz			
Ma Currei	aximum Rated nt at Mid Point:	Idc Refer to table			
Wo	orking Voltage:	560 Volt DC			
	Peak Voltage:	900 Volt DC			
Cu	urrent Balance:	Reactor designed to accommodate 10% unbalance between Line Currents.			
Maxi	mum Ambient:	55°C			
In	sulation Class:	Н			
Tem	perature Rise:	Limited to class F			
Pro	otection Cover:	Clear plastic cover over Terminations is available.			
		This provides IP20 Protection for terminals only.			





# **IBR Range**

Style Number	Idc Mid Point	Dime	ensions	mm	Weight kg
-		L	W	Н	
IBR0050	50.0	170	200	230	18
IBR0063	63.0	170	240	230	21
IBR0080	80.0	250	210	360	24
IBR0100	100.0	250	220	360	25
IBR0125	125.0	250	230	360	27
IBR0160	160.0	250	260	360	36
IBR0200	200.0	250	260	360	43
IBR0250	250.0	250	290	360	50
IBR0315	315.0	250	300	360	56
IBR0400	400.0	250	330	360	63
IBR0500	500.0	290	370	480	85
IBR0630	630.0	290	400	480	110
IBR0800	800.0	340	420	450	135
IBR1000	1000.0	380	460	650	185
IBR1250	1250.0	460	430	750	260
IBR1600	1600.0	460	460	750	320

# **IBR Range**

Mounting Details

Style	Idc Mid Point	Fixing (	Centres mm	Hole Size
Number		L1	W1	mm
IBR0050	50.0	89	120	7
IBR0063	63.0	89	145	7
IBR0080	80.0	165	70	13
IBR0100	100.0	165	80	13
IBR0125	125.0	165	90	13
IBR0160	160.0	165	120	13
IBR0200	200.0	165	130	13
IBR0250	250.0	165	150	13
IBR0315	315.0	165	155	13
IBR0400	400.0	165	165	13
IBR0500	500.0	184	240	14
IBR0630	630.0	184	255	14
IBR0800	800.0	184	275	14
IBR1000	1000.0	190	310	14
IBR1250	1250.0	230	275	14
IBR1600	1600.0	230	310	14

# SLR Range

A range of Input and Output Line Reactors.

- Benefits: Inexpensive solution to line spike problems.
  - Acts as a current limiting device and filters the waveform and attenuates the electrical noise and harmonics associated with the inverter.
  - Virtual elimination of nuisance tripping due to the electricity supplier's power factor correction switching.
  - Extended IGBT and diode life.
  - Extended motor life.
  - Waveform improvement.

Reactors can be used on the line side of the system to protect the drive from dirty supplies or on the load side to protect the system from motor short circuits.

We also have a range of Harmonic compensated reactors, that are designed to cope with the higher total rms current as well as higher frequencies present in the waveform, often found in higher level modern devices.

On the load side the ability of the reactor to filter the waveform produced by the drive, improves motor performance and therefore total system performance.





### NX 200 RANGE DRY TYPE SINGLE & THREE PHASE TRANSFORMERS

# NX 200 R A N G E

Skot produce a wide range of dry type transformers for large industrial purposes including drive, rectifier and furnace applications.

Transformers are manufactured generally in accordance with BS171 1978, IEC 76. We can also comply with other national and international standards.

This range is constructed using class C insulation materials in the parts of the transformers that see elevated temperatures. (The windings and adjacent materials). These materials are able to withstand temperatures in excess of 300°C for short periods of time providing substantial resistance to thermal shock.

The NX 200 range, however, is designed so as to limit winding temperature rise to class H, (125°C measured by resistance method above a maximum ambient of 40°C).







### SPECIAL APPLICATION TRANSFORMERS

Skot Transformers produce a wide range of dry type transformers for large industrial purposes including drive, rectifier and furnace applications. The transformers can be designed to comply with national and international standards.

This range is constructed using class C insulation materials in the parts of the transformer that see elevated temperatures. (The windings and adjacent materials). These materials are able to withstand temperatures in excess of 300°C for short periods of time providing substantial resistance to thermal shock.





High reactance three phase to one phase transformer.

### **MARINE TRANSFORMERS UP TO 3MVA**

Skot Transformers supply transformers for shipboard use, submersibles and Military applications. Transformers can be designed to meet the requirements of BS3399, Lloyds, DNV and other marine specifications.

We have supplied transformers up to 1MVA that have been short circuit tested and type tested to BS171 1978 in accordance with DNV rules. We also supply transformers up to 4kV for remote operation of submersibles also tested in accordance with DNV rules.



900kVA DNV transformer.

One of four identical units supplied for marine use, these units underwent short circuit testing and routine tests to BS171 including heat runs witnessed by DNV inspectors.



Range of marine transformers.

### **RECTIFIER & DC POWER SUPPLIES**



A wide range of both single and three phase rectifier units are manufactured to customer requirements. Both air and oil cooled units are available.

Transformers can be supplied to be incorporated into customers' rectifier assemblies including 2,3,6 and 12 pulse systems.



Our technical department is available to advise you on your applications and where interbridge or interphase reactors may be required.

### **KORNDORFFER AUTO STARTING TRANSFORMERS**

The Korndorffer Auto Starting method is used where large motors have to be started from rest. The inertia of the motor means that a far greater current is required for starting than running.

A transformer is used to reduce the voltage and therefore the current at starting. It is necessary to provide several percentages of the voltage at starting in order to find the optimum torque current characteristic. The normal percentage taps are 50, 65 and 80% of the nominal voltage. The transformer is an autowound type where there is only one winding per phase required to reduce the voltage. This greatly reduces the size of the transformer.

The size of the transformer is determined not only by the kW rating, but also by the starts per hour of the motor; the more starts from rest, the larger the transformer.

Units can be supplied with thermal sensors in the windings.

TYPE	POWER RATINGS					DIM	ENSIONS (	mm)	FIXING	WEIGHT	
REF	2s	ph	15:	sph	40	sph	W	D	Н	(mm)	(kg)
	HP	kW	HP	kW	HP	kW					
5	7.5	5.60	5	3.73	4	2.98	240	170	250	200 x 110	40
7.5	12.5	9.33	7.5	5.60	5	3.73	300	170	310	204 x 110	45
10	15	11.2	10	7.46	7.5	5.60	300	180	310	204 x 110	55
15	25	18.7	15	11.2	10	7.46	385	210	380	240 x 107	58
20	30	22.4	20	14.9	15	11.2	385	220	380	240 x 120	63
25	35	26.1	25	18.7	17	12.7	385	230	380	240 x 132	71
30	45	33.6	30	22.4	20	14.9	385	240	380	240 x 145	77
40	60	44.8	40	29.8	30	22.4	385	240	380	240 x 145	81
50	80	59.7	50	37.3	35	26.1	385	245	380	240 x 170	94
70	125	93.3	70	52.2	45	33.6	385	245	380	240 x 170	98
90	150	112	90	67.1	60	44.8	390	245	445	300 x 172	105
125	225	168	125	93.3	80	59.7	390	245	445	300 x 172	110
150	250	187	150	112	95	70.9	390	300	445	300 x 185	118
175	300	224	175	127	100	74.6	390	300	515	300 x 185	145
200	350	261	200	149	150	112	390	300	515	300 x 197	159

All dimensions in mm

### **PCB / CHASSIS TRANSFORMER RANGE**

A range of open type transformers wound on double section bobbins with either pin or solder tag termination. Primaries suitable for either 50 or 60Hz operation. U clamp and framed transformers are normally supplied with input tags at top.

**PCB MOUNTING** 

All	dimer	isions	in mr	n						
VA	А	В	С	D	Е	Hole	Р	Q	No. Pins	
6	50	42	42	N/A	N/A	N/A	5.08	25.4	2 x 6	
10	56	46	45	N/A	N/A	N/A	5.08	27.9	2 x 6	
15	59	50	48	47.6	38.1	3.97	7.62	30.5	2 x 5	
20	59	50	54	47.6	38.1	3.97	7.62	30.5	2 x 5	
25	69	58	54	55.6	44.5	3.96	7.62	35.6	2 x 5	
30	69	58	58	55.6	44.5	3.96	7.62	35.6	2 x 5	E
35	69	58	62	55.6	44.5	3.96	7.62	35.6	2 x 5	
50	79	66	61	63.5	50.8	5.56	7.62	40.6	2 x 6	
60	79	66	70	63.5	50.8	5.56	7.62	40.6	2 x 6	
75	79	66	75	63.5	50.8	5.56	7.62	40.6	2 x 6	

UNIVERSAL FRAME & SOLDER TAG



F

#### All dimensions in mm

Α

VA	А	В	С	D	Е	F	G	Slot
25	69	58	55	45	36	45	48	8 x 4
50	80	66	61	54	39	54	52	8 x 4
100	90	76	65	57	45	57	58	8 x 4
150	100	85	95	62	64	80	72	8 x 5
200	100	85	95	62	64	80	72	8 x 5

**CLAMPED** 



#### All dimensions in mm

VA	А	В	С	D	Е	SLOT F
6	50	42	42	75	61	4
10	56	46	45	80	68	5
15	59	50	48	89	74	5
20	59	50	54	89	74	5
25	69	58	54	97	83	5
30	69	58	58	97	83	5
35	69	58	62	97	83	5
50	79	66	61	105	93	5
60	79	66	70	105	93	5
75	79	66	75	105	93	5

## **PORTABLE TOOL & SITE TRANSFORMERS**

### PORTABLE TOOL TRANSFORMERS

Temperature sensitive cutout with manual reset. Insulation materials to BS2757. Double wound with positive inter-winding barrier. BS4343 sockets.

REF	CONT. RATING	INT. RATING	SOCKETS		
750/1	500	750	1 x 16A		
1000/2	750	1000	2 x 16A		
1500/2	1000	1500	2 x 16A		
2000/2	1500	2000	2 x 16A		
3000/2	1500	3000	2 x 16A		
3300/2 2500 3300 2 x 16A					
INPUT 240V					
OUTPUT 110V CENTRE TAPPED TO EARTH					

### SITE TRANSFORMERS

A range of robust transformers designed to be used on site. Each transformer is fitted with carrying handles and stands on a skid base.

These units incorporate BS4343 sockets protected by double pole MCB's. Non standard items are available.

REF	RATING	SOCKETS	MCB
			PROTECTION
5k/5	5kVA	4 x 16A	1 PRI
		1 x 32A	3 SEC
10k/6	10kVA	4 x 16A	1 PRI
		2 x 32A	4 SEC
10k/6/3	10kVA	4 x 16A	1 PRI
	(3 PHASE)	2 x 32A	4 SEC

### FIXED POWER POINT TRANSFORMERS

Custom designed to meet your requirements for indoor and outdoor applications.

Available with a range of primary and secondary voltages.

MCB or fuse protection available.







### TOROIDAL TRANSFORMERS

We offer a high quality range of toroidal transformers to complement our standard laminated ranges. The toroid, due to its construction, has many advantages over laminated transformers for certain applications.

- Low Acoustic Noise
- Low Stray Flux
- Good Regulation
- Low Height Profile
- High Efficiency

### **OTHER PRODUCT AREAS**

### LOW VOLTAGE LIGHTING TRANSFORMERS

A range of maintenance free transformers protected against short circuit, overload and over temperature by a temperature/current sensitive trip. The range consists of a 50 Watt can (independently tested to BS3535) suitable for bulbs between 35 and 50 Watts. We also supply a 20 Watt version. For track applications we cover a range between 100VA and 250VA.

### INSTRUMENT TRANSFORMERS

A range of single and three phase class one instrument transformers including high voltage encapsulated units.









### FACTORS AFFECTING TRANSFORMER SELECTION

#### OUTPUT VA

This is the product of the output volts and amps and is the major factor affecting transformer size. All of the following have a greater or lesser effect on selection of the correct size for given applications.

#### SUPPLY FREQUENCY

Transformers in the standard ranges in this catalogue are suitable for both 50Hz and 60Hz supplies. However, frequencies below 50Hz result in larger transformer size, while frequencies above 50Hz may enable transformer size to be reduced. Any frequency other than 50Hz should be notified at the order/enquiry stage.

#### AMBIENT TEMPERATURE

Ambient temperatures in excess of 40°C should be notified, as transformer size or rating may be affected. As a rule of thumb output VA should be de-rated by 10 - 15% per 10°C above 40°C ambient.

#### TEMPERATURE RISE

If it is required that temperature rise be limited to a certain value, this should be notified. Otherwise full load temperature rises are limited to values specified in the relevant British Standard for the Insulation System in question. The temperature ratings for the various classes of insulation are given below for BS171 at 40°C Ambient.

CLASS	CONT.	TEMP.
CLASS	TEMP. RATING	RISE
A	105ºC	60°C
E	120°C	75°C
В	130°C	80°C
F	155°C	100°C
н	180ºC	125ºC
С	220°C	150°C

#### REGULATION

This is the ratio between off load and on load volts given by the formula:

OFF LOAD - ON LOAD VOLTS OFF LOAD VOLTS Regulation percentage tends to be a function of transformer size and percentage copper loss.

Smaller transformers have higher regulation. This means that for a given size a more heavily loaded transformer will have higher regulation than a less heavily loaded one. Therefore specifying a low value of regulation may have the effect of increasing transformer size.

#### DC RECTIFICATION

When a transformer is intended to supply DC from a bridge rectifier the following multiplying factors should be employed to calculate transformer size (VA).

Single phase unsmoothed	VA = 1.3 x IDC x VDC	Ripple = 48%
Single phase with capacitor	$VA = 1.5 \times IDC \times VDC$	Ripple = 10%
Three phase unsmoothed	VA = 1.1 x IDC x VDC	Ripple = 4.2%

#### VOLTAGE TAP SPREAD

A large spread of voltage taps on a transformer primary will lead to an increase in transformer size, for example

0 - 110 - 240V	Increase by 25%
0 - 240 - 415V	Increase by 25%
0 - 110 - 240 - 415V	Increase by 40%

Taps on secondary windings may also increase transformer size.

#### DUTY CYCLE

If a winding is to be used for less than 100% of the time, allowance can be made for this leading to a reduction in size. The effective VA may be calculated from the following formula:

Effective VA = 
$$\sqrt{\frac{\text{TIME ON}}{\text{TOTAL TIME}}}$$
 (I<sup>2</sup>) x VOLTS

#### HARMONICS

It is important to state at the time of order/enquiry whether harmonics will be present on the supply, or will be generated by the load. Harmonics are created by non linear devices such as thyristors, silicon controlled rectifiers, UPS and DC Drives.

Various methods exist for making transformers suitable for harmonics. These include low operating flux density, five limb construction and tertiary delta windings.



### TRANSFORMERS FOR USE WITH CONTACTORS

Contactors present two different levels of demand to a transformer. Initially, as the contactor mechanism is pulled in, the demand is very high. Thereafter, once the contacts are pulled home, the load reduces to a small fraction of that during pull-in. The two demand levels are often referred to as inrush VA and hold VA, with inrush VA being the initial pull-in demand.

These VA figures are stated by the contactor manufacturer. The minimum possible size for a transformer is dictated by the hold VA which is a continuous rating. However, transformer size is normally somewhere between hold and inrush VA values.

The other factor affecting transformer size is contactor minimum pull-in volts. This is stated by the manufacturer as a percentage of nominal volts (normally between 85% and 95%). This figure is important because during the pull-in phase the transformer output volts drop below nominal. The transformer must be sized such that the output volts do not drop below the contactor minimum pull-in volts.

The above factors may be used in conjunction with the table below to calculate the required transformer size for a given contactor or group of contactors.

FRAME SIZE VA	MAX INRUSH VA FOR 90% NOMINAL VOLTS	MAX INRUSH VA FOR 95% NOMINAL VOLTS
50	100	75
100	240	170
150	410	280
200	700	450
250	875	560
300	1000	700
350	1300	820
500	2100	1300
750	3600	2200
1000	6000	3500

EXAMPLE:

To calculate the correct size for a transformer to power nine contactors with the following specification.

> Inrush VA = 85 Hold VA = 8 Minimum Pull-in Volts = 90% TOTAL HOLD VA =  $9 \times 8$ = 72VA TOTAL INRUSH VA =  $9 \times 85$ = 765VA

The frame size suggested by the hold VA would be 100VA. However, the table shows that the maximum inrush VA available before output volts drop below 90% is 240VA. In this case, as in most, the inrush VA is the governing factor.

The 250VA transformer is capable of supplying 875VA at 90% volts. It can obviously cater for the hold VA requirement and is therefore the smallest suitable transformer.

### **VOLTAGE DROP IN CABLE RUNS**

When current passes through cables of a given length and cross sectional area a certain volt drop will result. This volt drop may be calculated and allowed for when specifying a transformer. Approximate volt drops for various cable C.S.A.'s per amp flowing per meter are given below.

CSA mm <sup>2</sup>	VOLT DROP mV/A/m	TYPICAL NUMBER & DIAMETER OF WIRES no/mm <sup>2</sup>
0.5	83	16/0.20
0.75	56	24/0.20
1.0	50	32/0.20
1.5	32	30/0.25
2.5	18	50/0.25
4.0	11	56/0.30
6.0	7.2	84/0.30
10.0	4.3	80/0.40
16.0	2.7	126/0.40
25.0	1.7	196/0.40
35.0	1.2	276/0.40
50.0	1.0	396/0.40

#### EXAMPLE:

To calculate the volt drop in a run of 16mm<sup>2</sup> cable with 65 Amps flowing over a distance of 30m.

Volt Drop =  $\frac{2.7 \times 65 \times 30}{1000}$  = 5.3 Volts



VA	220/240V FUSE TYPE T (AMPS)	380/415/440V FUSE TYPE T (AMPS)
50	0.500	0.315
100	0.800	0.500
150	1.25	0.800
200	2.00	1.25
250	3.15	1.60
350	4.00	2.50
500	6.30	3.15
750	8.00	5.00
1000	10.0	6.30
2000	16.0	8.00
2500	20.0	10.0
3000	25.0	16.0
4000	32.0	20.0
5000	40.0	25.0
6000	50.0	32.0

	INPUT	APPROX	SUGGES	STED MCB RA	TING (A)
VA	VOLTS	FLC	TYPE 2	TYPE 3	TYPE 4
50	240	0.25	1		
50	440	0.14	1		
100	240	0.45	2	1	1
100	440	0.25	1		
150	240	0.67	4	2	1
150	440	0.36	2	1	1
200	240	0.90	4	2	2
200	440	0.49	2	2	1
300	240	1.30	6	4	2
300	440	0.73	4	2	2
400	240	1.75	10	4	4
400	440	0.95	4	4	2
500	240	2.19	10	6	4
500	440	1.20	6	4	2
750	240	3.25	16	10	6
750	440	1.77	10	4	4
1000	240	4.30	20	10	10
1000	440	2.36	10	6	4
1500	240	6.46	25	16	10
1500	440	3.5	16	10	6
2000	240	8.7	32	20	16
2000	440	4.8	20	16	10
2500	240	10.8	40	25	16
2300	440	5.9	25	16	10
3000	240	12.9	50	32	20
3000	440	7.1	32	16	16
Deer	- 45				



Autowound Duty Cycle Fuse Value	MCB Sizing	Motors
Autowound Transformer Calculation		
		SFORMERS
	Sales: Fax: E-mail: Web site:	01684 569104 01684 565766 sales@skot.co.uk
Please note that autowound transformers do not provide isolation and may therefore not be suitable for some applications.	web site.	www.skot.co.uk
2. Press Calculate If there are a large number of intermediate taps this can lead to a larger transformer being required.		
Where an equivalent rating is indicated that falls between standard ranges the larger frame size should be selected.	i our	Figures given are for guidance only!

Autowound Duty Cycle Fuse Value	MCB Sizing	Motors
Duty Cycle / Overload Calculation		
1. Enter Values		
		SFORMERS
	Sales: Fax: E-mail: Web site:	01684 569104 01684 565766 sales@skot.co.uk www.skot.co.uk
2. Press Calculate Any overload will result in a drop of the output voltage and this sh allowed for if voltage is critical. The higher the overload the large	nould be r the volt drop.	
3. View Result		
Where an equivalent rating is indicated that falls between standard ranges the larger frame size should be selected.	our	Figures given are for guidance only!

Autowound Duty Cycle Fuse Value	MCB Sizing Motors
Suggested Primary Fuse Value	
-1. Enter Values	
	T R A N S F O R M E R S
	Sales:         01684 569104           Fax:         01684 565766           E-mail:         sales@skot.co.uk           Web site:         www.skot.co.uk
2. Press Calculate Ensure fuse is correctly rated for voltage.	
	Figures given are for guidance only!

Autowound Duty Cycle Fuse Valu	e MCB Sizing Motors
Selecting MCB for Transformer Primary	
1. Enter Values	
	T R A N S F D R M E R S
	Sales:         01684 569104           Fax:         01684 565766           E-mail:         sales@skot.co.uk           Web site:         www.skot.co.uk
-2. Press Calculate	
3. View Result	
	Figures given are for guidance only!

Autowound Duty Cycle Fuse Value	MCB Sizing Motors
Sizing Transformers for use with Motors	
1. Enter Values	
	TRANSFORMERS
	Sales:       01684 569104         Fax:       01684 565766         E-mail:       sales@skot.co.ul         Web site:       www.skot.co.uk
2. Press Calculate Normally allow a minimum of 15 seconds for the start up.	
3. View Result	
Where an equivalent rating is indicated that falls between standard ranges the larger frame size should be selected.	ourFigures given arefor guidance only!