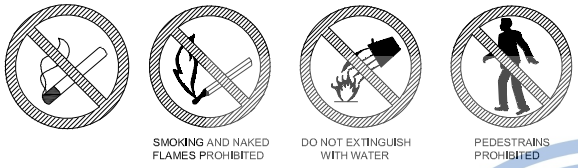
Reading of electrical sign and symbols

Reading of Electrical Signs

a) Prohibition signs



Shape	Circular.
Colour	Red border and crossbar. Black symbol on white background.
Meaning	Shows what must not be done.
Example	No smoking and naked flames

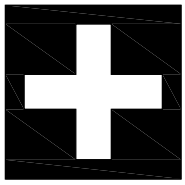
b) Mandatory signs

Shape	Circular.
Colour	White symbol on blue background.
Meaning	Shows what must not be done.
Example	Wear hand protection.

c) Warning signs

Shape	Triangular.
Colour	Yellow background with black border and symbols.
Meaning	Warns of hazard or danger.
Example	Caution, risk of electric shock.

d) Information signs



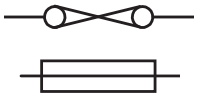
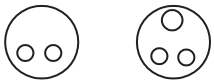
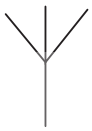
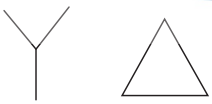
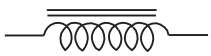
FIRST AID POINT

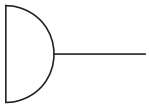
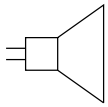
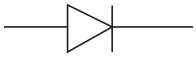
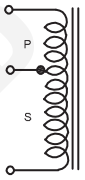
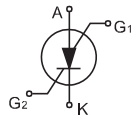
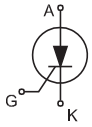
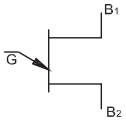
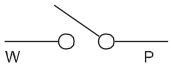
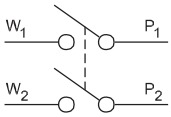
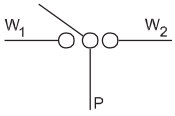
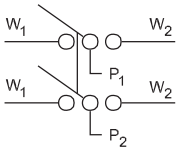
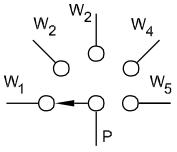
Shape	Square or oblong
Colour	White symbols on green background.
Meaning	Indicates or gives information of safety provision/First aid
Example	Caution, risk of electric shock.

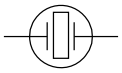
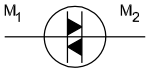
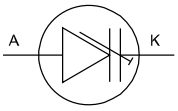
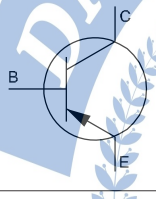
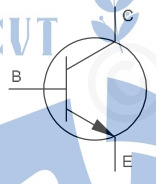
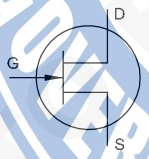
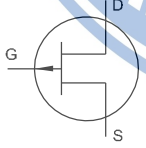
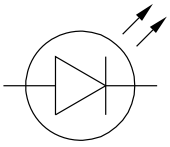
Reading of Electrical Symbols

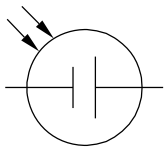
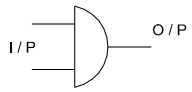
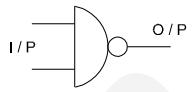
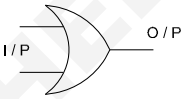
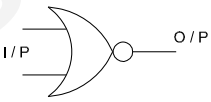
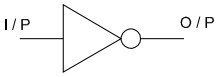
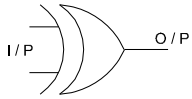
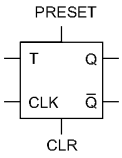
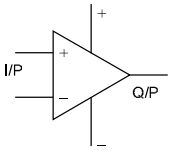
S.No.	Description	Symbol
1	D.C.	
2	A.C.	
3	Positive	
4	Negative	
5	Single Phase A.C. 50 Hz	50 Hz, 1Ø
6	Three Phase A.C., 50 Hz	50 Hz, 3Ø
7	A.C. / D.C.	
8	Earth	
9	Cell	+ -
10	Battery	+ -

S.No.	Description	Symbol
11	Single pole single throw switch	
12	Push-button switch	
13	Energy meter	Kwh
14	Alternator	A
15	Generator	+ G -
16	D.C. Motor	+ M -
17	A.C.Motor Single phase	M
18	Capacitor: Fixed, variable	
19	Electrolytic Capacitor	- +
20	Two-way switch	

S.No.	Description	Symbol
21	Fuse: ordinary catridge	
22	Socket 2 pin, 3 pin	
23	Aerial / Antenna	
24	Voltmeter	
25	Ammeter	
26	Ohm Meter	
27	Watt Meter	
28	Lamp	
29	Relay	
30	Buzzer	
31	Connections: star, Delta	
32	Choke	
33	Transformers	

S.No.	Description	Symbol
34	Carbon microphone	
35	Loudspeaker	
36	Diode	
37	Auto transformer	
38	Silicon Bilateral switch (SBS)	
39	SCR	
40	UJT	
41	SPS T switch	
42	DPS T switch	
43	SPD T switch	
44	DPD T switch	
45	Single Pole 5 way rotary switch	

S.No.	Description	Symbol
46	Piezoelectric crystal	
47	Diac	
48	Varactor diode	
49	Zener diode	
50	TRIAC	
51	PNP transistor	
52	NPN transistor	
53	FET N-channel	
54	FET P-channel	
55	LED diode	

S.No.	Description	Symbol
56	Photo voltaic cell	
57	AND Gate	
58	NAND Gate	
59	OR Gate	
60	NOR Gate	
61	NOT Gate	
62	EX-OR Gate	
63	T Flip-Flop	
64	Operational amplifier	
65	Analog multimeter	

Wiring symbols

Table 1

Graphical symbols used for electrical installation in a building: It is common practice to indicate the electrical fittings in architectural diagrams, building plans etc. by graphical symbols.

The B.I.S. symbols used in the wiring are given here.

ITEMS	SYMBOLS
I Wiring	
1 General wiring	
2 Wiring on the surface	
3 Wiring under the surface	
4 Wiring in conduit	
a Conduit on the surface	
b Conduit concealed	
The type of conduit may be indicated, if necessary.	
5 Wiring going upwards	
6 Wiring going downwards	
7 Wiring passing vertically through a room	
II Fuse-boards	
1 Lighting circuit fuse-boards	
a Main fuse-board without switches	
b Main fuse-board with switches	
c Distribution fuse-board without switches	
d Distribution fuse-board with switches	
2 Power circuit fuse-boards	
a Main fuse-board without switches	

ITEMS	SYMBOLS
b Main fuse-board with switches	
c Distribution fuse-board without switches	
d Distribution fuse-board with switches	
SYMBOLS	
III Switches and switch outlets	
a Single pole	
b Two-pole	
c Three-pole	
2 Single pole pull-switch	
3 Multi-position switch	
4 Two-way switch	
5 Intermediate switch	
6 Pendent switch	
7 Push-button or bell-push	
IV Socket outlets	
1 Socket outlet, 6A	
2 Socket outlet, 16A	
3 Combined switch and socket outlet, 6A	
4 Combined switch and socket outlet, 16A	
5 Interlocking switch and socket outlet, 6A	
6 Interlocking switch and socket outlet 16A	

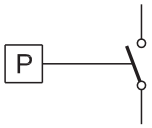
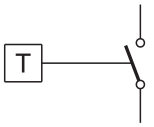
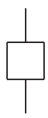
ITEMS	SYMBOLS
V Lamps	
1 Lamp or outlet for lamp	
Group of three 40 W lamps	3x40 W
2 Lamp mounted on a wall or light bracket	
3 Lamp mounted on ceiling	
4 Counterweight lamp fixture	
5 Chain lamp fixture	
6 Red lamp fixture	
SYMBOLS	
7 Lamp fixture with built-in switch	
8 Lamp fed from variable voltage supply	
9 Emergency lamp	
10 Panic lamp	
11 Bulk-head lamp	
12 Water tight light fitting	WT
13 Battern lamp-holder (Mounted on the wall)	BH
14 Projector	
15 Spot light	
16 Flood light	
17 Fluorescent lamp	
Group of three 40W fluorescent lamps	3x40 W

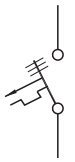
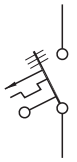
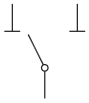
ITEMS	SYMBOLS
VI Electrical appliances	
1 General	
If necessary, use designation to specify	
2 Heater	
SYMBOLS	
VII Bells, buzzers and sirens	
1 Bell	
2 Buzzer	
3 Siren	
4 Horn or hooter	
5 Indicator 9 at `N' insert number of ways)	N
VIII Fans	
1 Ceiling fan	
2 Bracket fan	
3 Exhaust fan	
4 Fan regulator	
IX Telecommunication apparatus	
1 Aerial	
2 Loudspeaker	
3 Radio receiving set	
4 Television receiving set	
X Earthing	
1 Earth point	

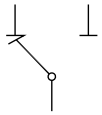
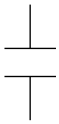
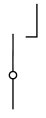
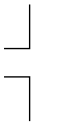
Symbols pertaining to contactor and machines

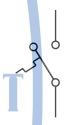
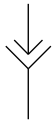
The table given below contains most of the important symbols used by an electrician. However, you are advised to refer the quoted B.I.S. standards for further additional information.

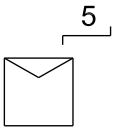
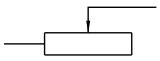
TABLE

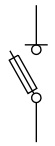
S.No.	BIS Code No.	Description	Symbol
	BIS 2032 (Part XXV)-1980		
	9	**Switch gear, accessories**	
1	9.1	Switch, general symbol	
2	9.1.1	Alternate symbol for switch.	
3	9.2	Three-pole switch, single line representation.	
4	9.2.1	Alternate symbol for three-pole switch, single line representation.	
5	9.3	Pressure switch	
6	9.4	Thermostat	
7	9.5	Circuit-breaker	
8	9.5.1	Alternate symbol of circuit-breaker. **The rectangle of symbol 9.5 should contain some indication to circuit-breaker is concerned.**	
9	9.5.2	Alternate symbol for circuit breaker.	

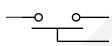
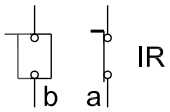
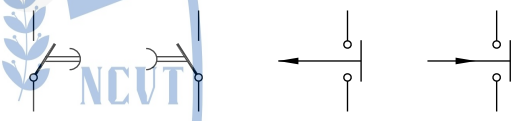
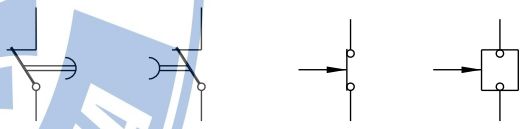
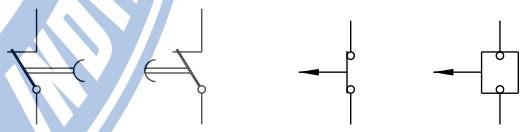
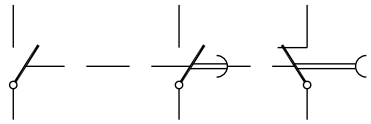
S.No.	BIS Code No.	Description	Symbol
10	9.5.3	Circuit-breaker with short circuit under voltage and thermal overload releases.	
11	9.5.4	Hand-operated circuit-breaker with short circuit, thermal overload protection and no-volt tripping.	
12	9.5.5	Motor - solenoid operated air circuit-breaker with short circuit and no-volt tripping (triple pole).	E/M 
13	9.6	Change over contact, break before make. **The fixed contacts may be placed at any angle except at 60°. In order to facilitate the work of the draughtsman, the contacts may be arranged differently.**	
14	9.7	Two-way contact with neutral position	
15	9.8	Make-before-break contact.	
16	9.9	Contactor, normally open.	
17	9.9.1	Contactor, normally closed.	
18	9.10	Push-button with normally open contact.	
19	9.10.1	Push-button with normally closed contact.	
20	9.11	Isolator.	
21	9.12	Two-way isolator with interruption of circuit.	

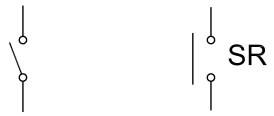
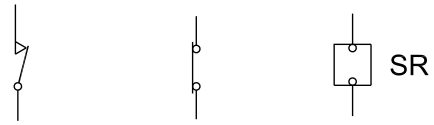
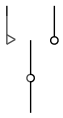
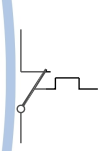
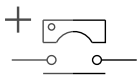
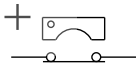
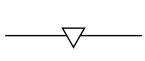
S.No.	BIS Code No.	Description	Symbol
22	9.13	Two-way isolator without interruption of circuit.	
23	9.14	Make contact, general symbol.	
24	9.14.1	Alternate symbol for make contact, general symbol.	
25	9.14.2	Alternate symbol for make-contact.	
26	9.14.3	Alternate symbol for make-contact.	
27	9.14.4	Alternate symbol for make-contact.	
28	9.14.5	Alternate symbol for make-contact.	
29	9.14.6	Alternate symbol for make-contact.	
30	9.14.7	Alternate symbol for make-contact.	
31	9.14.8	Alternate symbol for make-contact.	
32	9.15	Break-contact, general symbol.	

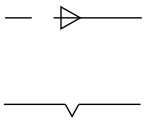
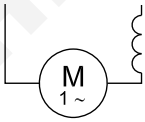
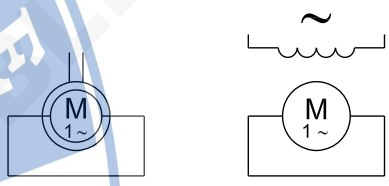
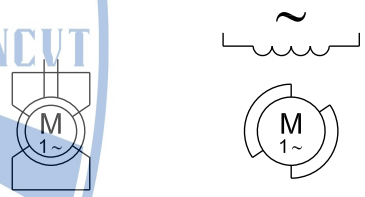
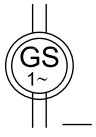
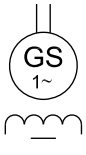
S.No.	BIS Code No.	Description	Symbol
33	9.15.1	Alternate symbol for break-contact.	
34	9.15.2	Alternate symbol for break-contact.	
35	9.15.3	Alternate symbol for break-contact.	
36	9.15.4	Alternate symbol for break-contact.	
37	9.15.5	Alternate symbol for break-contact.	
38	9.16	Thermal overload contact.	
39	9.17	Socket (female).	
40	9.17.1	Alternate symbol for socket (female).	
41	9.17.2	Socket with switch.	
42	9.18	Plug (male).	
43	9.18.1	Alternate symbol for plug (male).	
44	9.19	Plug and socket (male and female).	
45	9.19.1	Alternate symbol for plug and socket (male and female).	

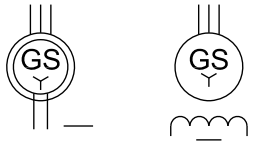
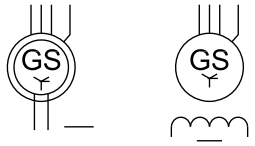
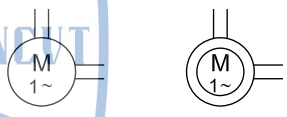
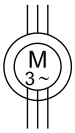
S.No.	BIS Code No.	Description	Symbol
46	9.20	Starter, general symbol.	
47	9.21	Starter by steps (Example: 5 steps).	
48	9.22	Star-delta starter.	
59	9.23	Auto-transformer starter.	
50	9.24	Pole-changing starter (Example, 8/4 poles).	
51	9.25	Rheostatic starter.	
52	9.26	Direct on-line starter.	
53	9.27	Sliding contact, general symbol.	
54	9.27.1	Resistor with moving contact, general symbol.	
55	9.28	Combined control panel for two motors (multiple speed and reversible).	
56	9.29	Fuse.	
57	9.29.1	Alternate symbol for fuse.	
58	9.29.2	Alternate symbol for fuse where supply side is indicated by a thick line.	

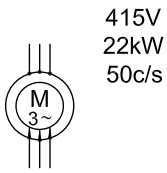
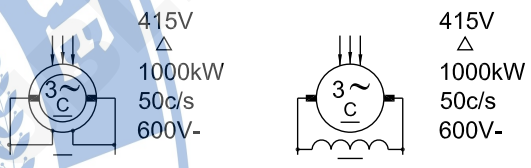
S.No.	BIS Code No.	Description	Symbol
59	9.29.3	Alternate symbol for fuse where supply side is indicated by a thick line.	
60	9.30	Isolating fuse-switch, switching on load.	
62	9.31	Isolating fuse-switch.	
	BIS 2032 Part(XXV11) 1932	**Contactors**	
	3.2	**Qualifying symbols**	
63	3.2.1	Contactor function.	
64	3.2.2	Circuit-breaker function.	
65	3.2.3	Disconnector (isolator) function.	
66	3.2.4	Switch-disconnector (isolator switch) function.	
67	3.2.5	Automatic release function.	
68	3.2.6	Delayed action. Convention - delayed action in direction of movement from the arc towards its centre. **This symbol must be linked by a doubleline to the symbol of the device, the action of which is delayed.**	
69	3.2.6.1	Delayed action convention - delayed action in the direction of movement of the arrow mark.	
70	3.2.7	Non-spring return (stay put) function. **The symbols shown above may be used to indicate spring-return and stay-put contacts. When this convention is invoked, its use should be appropriately referenced. These symbols should not be used together with the qualifying symbols Nos. 3.1 to 3.4.**	 

S.No.	BIS Code No.	Description	Symbol
71	3.2.8	Hand reset.	
72	3.3.7	Contact with two makes.	
73	3.3.8	Contact with two breaks.	
74	3.3.9	Three-point contact.	
75	3.3.10	Make contact-hand reset.	
76	3.3.11	Break contact-hand reset.	
77	3.3.19	Make-contact delayed when operating.	
78	3.3.20	Break-contact delayed when operating.	
79	3.3.21	Break-contact delayed when releasing.	
80	3.3.22	Make-contact delayed when operating and releasing.	
81	3.3.23	Contact assembly with one make-contact not delayed. One make contact delayed when operating and one break-contact delayed when releasing.	
82	3.3.24	Make-contact with spring return.	

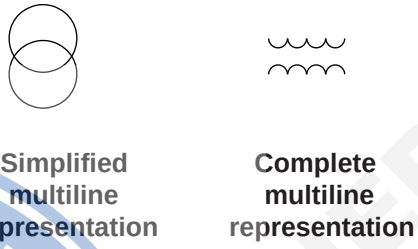
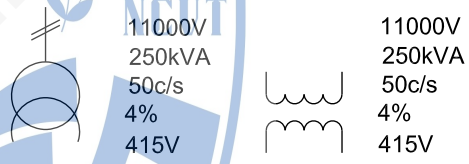
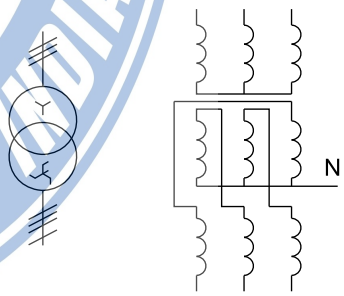
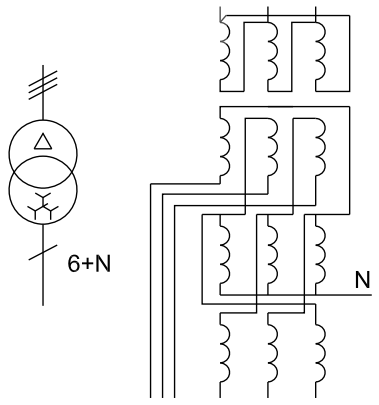
S.No.	BIS Code No.	Description	Symbol
83	3.3.25	Make-contact without spring return (stay-put)	
84	3.3.26	Break-contact with spring return.	
85	3.3.27	Two-way contact with centre off position with spring. Return from the left-hand position but not from the right hand one (stay-put).	
86	3.3.28	Temperature-sensitive make-contact. **May be replaced by the value of the operating temperature conditions.**	
87	3.3.29	Temperature sensitive break-contact. **May be replaced by the value of the operating temperature conditons.**	
88	3.3.30	Self-operating thermal-break contact. **It is important to distinguish between a contact as shown and a contact of a thermal relay, which in detached representation is shown in the example below.**	
		Example: Break contact of a thermal relay.	
89	3.3.32	Blow-out magnetic make-contact.	
90	3.3.33	Blow-out magnetic break-contact.	
	BIS:2032 (PART VII) 1974	**Mechanical controls**	
91	8.4	**Mechanical interlock**	

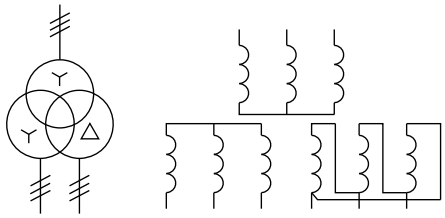
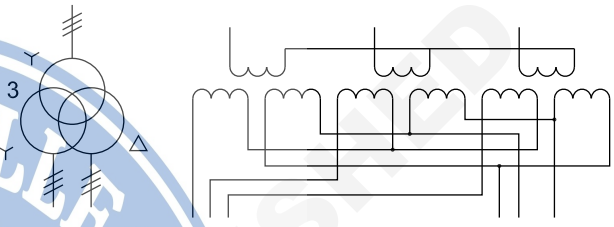
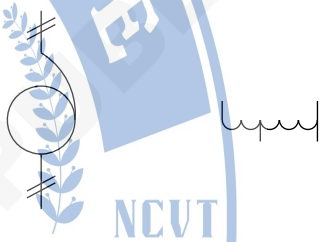
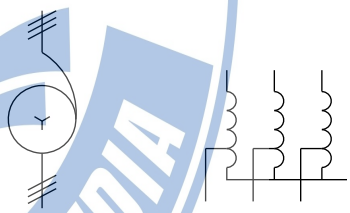
S.No.	BIS Code No.	Description	Symbol
92	8.5	Reset a Automatic reset b Non-automatic reset **These symbols should be used only if it is essential to indicate the type of reset.**	
93	BIS:2032 (Part IV) 1964 4.3.2	**Classification** AC motor, general symbol.	
	4.4	Alternating current Commutator machines.	Simplified multiline representation  Complete multiline representation 
94	4.4.1	AC series motor, single phase.	
95 96	4.4.2 4.4.3	Repulsion motor, single phase. AC series motor, single phase, Deri type.	
97	4.5 4.5.1	**Synchronous machines** Synchronous generator, general symbol.	
98	4.5.2	Synchronous motor - general symbol.	
99	4.5.3	Permanent magnet synchronous generator (GS) or synchronous motor (MS), three-phase.	
100	4.5.4	Synchronous generator (GS) or synchronous motor (MS) single-phase.	Simplified multiline representation  Complete multiline representation 

S.No.	BIS Code No.	Description	Symbol
101	4.5.5	Synchronous generator (GS) or synchronous motor (MS) three-phase, star-connected, neutral not brought out.	
102	4.5.6	Synchronous generator (GS) or synchronous motor (MS) three-phase star-connected with neutral brought out.	
	4.6	**Induction machines** **In symbols 4.6.1 to 4.6.9 groups of conductors may be placed in another manner than generally shown below. For example, symbol 4.6.6.**	
103	4.6.1	Induction motor, with short-circuited rotor, general symbol.	
104	4.6.2	Induction motor, with wound rotor, general symbol.	
105	4.6.3	Induction motor, single phase, squirrel-cage.	
106	4.6.4	Induction motor, single phase, squirrel cage, leads of split-phase brought out.	
107	4.6.5	Induction motor, three-phase, squirrel-cage.	**Simplified multiline representation** **Complete multiline representation** 
108	4.6.6	Induction motor, three-phase, squirrel cage, both leads of each phase brought out.	
109	4.6.7	Induction motor, three-phase, with wound rotor.	

S.No.	BIS Code No.	Description	Symbol
110	4.6.8	Induction motor, three-phase, star-connected, with automatic starter in the rotor.	
111	4.6.9	Symbol showing terminals, brushes and numerical data. Example : Induction motor, three-phase, with wound rotor 415V, 22 kW, 50 c/s.	
112	4.7 4.7.1	**Synchronous converters.** Synchronous converter, general symbol.	
113	4.7.2	Three-phase synchronous converter, shunt excited.	
114	4.7.3	Symbol showing terminals, brushes and numerical data. *Example* : Three-phase synchronous converter, shunt excited 600 V, 1000 kW, 50 c/s.	

Graphic symbols for transformer

S.No.	BIS Code No.	Description	Symbol
	5.1	**General symbols**	
115	5.1.1	Transformer with two separate windings.	
116	5.1.2	Transformer with three separate windings.	
117	5.1.3	Auto-transformers	
	5.2	**Transformers with two or three Windings.**	
118	5.2.1	Single-phase transformer with two separate windings.	
119	5.2.2	Three-phase transformer with two separate windings. Connection: star zig-zag.	
120	5.2.3	Three-phase transformer with two separate windings. Connection: delta 6-phase fork.	

S.No.	BIS Code No.	Description	Symbol
121	5.2.4	Three-phase transformer with three separate windings. Connection: star, star-delta.	 **Simplified multiline representation** **Complete multiline representation**
122	5.2.5	Three-phase bank of single-phase transformers with three separate windings. Connection: star, star-delta.	
	5.3	**Auto-transformers**	
123	5.3.1	Auto-transformer, single-phase.	
124	5.3.2	Auto-transformer, three-phase. Connection:star.	
125	5.3.3	Single-phase auto-transformer with continuous voltage regulation.