

**APPENDIX A**

**ELECTRICAL SYMBOLS**

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**PER ANSI Y32.16****22.4 CLASS DESIGNATION LETTERS:****ALPHABETICAL LIST:**

Parts not specifically included in this list shall be assigned a letter or from the list below for the part or class most similar in function.

Designations for general classes of parts are marked with an asterisk (\*) to facilitate designation of parts not specifically included in this standard.

(SEE ALSO U AND 22.2.4)

- A\*** ELECTRONIC DIVIDER  
ELECTRONIC FUNCTION GENERATOR  
(OTHER THEN ROTATING)  
ELECTRONIC MULTIPLIER  
FACSIMILE SET  
FIELD-POLARIZATION AMPLITUDE MODULATOR  
FIELD-POLARIZATION ROTATOR  
GENERAL CIRCUIT ELEMENT  
GYROSCOPE  
INTEGRATOR  
POSITIONAL SERVOMECHANISM  
SENSOR (TRANSDUCER TO ELECTRIC POWER)  
SEPARABLE ASSEMBLY  
SEPARABLE SUBASSEMBLY  
TELEPHONE SET  
TELEPHONE STATION  
TELEPRINTER  
TELETYPEWRITER  
**AR** AMPLIFIER (OTHER THAN ROTATING) REPEATER

**AT** BOLOMETER  
CAPACITIVE TERMINATION  
FIXED ATTENUATOR  
INDUCTIVE TERMINATION  
ISOLATOR (NONRECIPROCAL DEVICE)  
PAD  
RESISTIVE TERMINATION

**B** BLOWER  
MOTOR  
SYNCHRO

**BT** BARRIER PHOTOCELL  
BATTERY  
BATTERY CELL  
BLOCKING LAYER CELL  
PHOTOVOLTAIC TRANSDUCER  
SOLAR CELL

**C** CAPACITOR BUSHING  
CAPACITOR

**CB** CIRCUIT BREAKER  
NETWORK PROTECTOR

**CP** CONNECTOR ADAPTER  
COUPLING (APERTURE, LOOP, OR PROBE)  
JUNCTION (COAXIAL OR WAVEGUIDE)

**D** ASYMMETRICAL VARISTOR  
OR CRYSTAL DIODE

**CR** CURRENT REGULATOR (SEMICONDUCTOR DEVICE)  
DIODE (SEMICONDUCTOR TYPE)  
DIODE RECTIFIER (SEMICONDUCTOR TYPE)

DIODE-TYPE RING DEMODULATOR  
 DIODE-TYPE RING MODULATOR  
 METALLIC RECTIFIER  
 PHOTODIODE (PHOTOSENSITIVE TYPE)  
 STABISTOR  
 THYRISTOR (SEMICONDUCTOR DIODE TYPE)  
 VARACTOR

**D** BREAKDOWN DIODE (VOLTAGE REGULATOR)  
**OR** OVERVOLTAGE ABSORBER  
**VR**

**DC** DIRECTIONAL COUPLER

**DL** DELAY FUNCTION  
 DELAY LINE  
 SLOW-WAVE STRUCTURE

**DS** ALPHANUMERIC DISPLAY DEVICE  
 ANNUNCIATOR  
 ELECTRICALLY RESTORED DROP  
 GENERAL LIGHT SOURCE  
 INDICATOR (EXCLUDING METER OR THERMOMETER)  
 LAMP (EXCLUDING HEATER LAMP)  
 LIGHT-EMITTING SOLID-STATE DEVICE  
 MANUALLY RESTORED DROP  
 PHOTODIODE (PHOTOEMMISSIVE TYPE)  
 SIGNAL LIGHT  
 VISUAL ALARM  
 VISUAL INDICATOR  
 VISUAL SIGNALING DEVICE

**E\*** ALUMINUM CELL  
ANTENNA  
ARMATURE  
BINDING POST  
CABLE TERMINATION  
CARBON BLOCK  
CIRCUIT TERMINAL  
CONDUCTIVITY CELL  
ELECTRICAL CONTACT  
ELECTRICAL CONTACT BRUSH  
ELECTRICAL SHIELD  
ELECTROLYTIC CELL  
FERRITE BEAD RINGS  
FILM ELEMENT  
GAP (HORN, PROTECTIVE, OR SPHERE)  
HALL ELEMENT  
IGNITOR GAP  
INSULATOR  
LIGHTNING ARRESTER  
MAGNETIC CORE  
MISCELLANEOUS ELECTRICAL PART  
OPTICAL SHIELD  
PERMANENT MAGNET  
ROTARY JOINT (MICROWAVE)  
SHORT CIRCUIT (TERMINATION)  
SPARK GAP  
SPLICE  
TELEPHONE PROTECTOR  
TELEPHONE PROTECTOR BLOCK  
TERMINAL (INDIVIDUAL)  
VALVE ELEMENT  
VIBRATING REED

<b>EQ</b>	EQUALIZER EQUALIZING NETWORK
<b>F</b>	CURRENT LIMITER (FOR POWER CABLE) FUSE FUSE CUTOFF
<b>FL</b>	FILTER
<b>G</b>	ELECTRONIC CHOPPER GENERATOR IGNITION MAGNETO INTERRUPTER VIBRATOR OSCILLATOR ROTATING AMPLIFIER (REGULATING GENERATOR) TELEPHONE MAGNETO
<b>H*</b>	HARDWARE (COMMON FASTENER, ETC.)
<b>HP*</b>	HYDRAULIC PART
<b>HR</b>	HEATER HEATING LAMP HEATING RESISTOR INFRARED LAMP THERMOMECHANICAL TRANSDUCER
<b>HS</b>	HANDSET OPERATOR SET
<b>HT</b>	EARPHONE ELECTRICAL HEADSET RECEIVER (EXCLUDING RADIO RECEIVER) TELEPHONE RECEIVER

- HY** CIRCULATOR  
DIRECTIONALLY SELECTIVE TRANSMISSION DEVICE  
HYBRID CIRCUIT NETWORK  
HYBRID COIL (TELEPHONE USAGE)  
HYBRID JUNCTION (MAGIC T)
- J** DISCONNECTING DEVICE (RECEPTACLE CONNECTOR)  
ELECTRICAL RECEPTACLE CONNECTOR  
JACK  
RECEPTACLE (CONNECTOR, STATION PORTION)  
WAVEGUIDE FLANGE (CHOKE)
- K** CONTACTOR (MAGNETICALLY OPERATED)  
RELAY
- L** COIL (ALL NOT CLASSIFIED AS TRANSFORMER)  
ELECTRICAL SOLENOID  
FIELD WINDING  
GENERATOR FIELD  
INDUCTOR  
LAMP BALLAST  
MOTOR FIELD  
REACTOR  
WINDING
- LS** AUDIBLE ALARM  
AUDIBLE SIGNALING DEVICE  
BUZZER  
ELECTRIC BELL  
ELECTRIC HORN  
LOUDSPEAKER  
LOUDSPEAKER-MICROPHONE SIREN  
TELEPHONE RINGER  
TELEPHONE SOUNDER



UNDERWATER SOUND TRANSDUCER

- M**    CLOCK  
       COULCOMB ACCUMULATOR  
       ELAPSED TIME RECORDER  
       ELECTRIC TIMER  
       ELECTRICAL COUNTER  
       ELECTROCHEMICAL STEP-FUNCTION DEVICE  
       INSTRUMENT  
       MESSAGE REGISTER  
       METER  
       METER-TYPE LEVEL PRESSURE GAGE  
       OSCILLOGRAPH  
       OSCILLOSCOPE  
       POSITION INDICATOR  
       THERMOMETER
- MG**    CONVERTER (ROTATING MACHINE)  
       DYNAMOTOR  
       INVERTER (MOTOR-GENERATOR)  
       MOTOR-GENERATOR
- MK**    HYDROPHONE  
       MICROPHONE  
       TELEPHONE TRANSMITTER
- MP\***    BRAKE  
       CLUTCH  
       MECHANICAL INTERLOCK  
       MECHANICAL PART  
       MISCELLANEOUS MECHANICAL PART (BEARING, COUPLING, GEAR SHAFT)

**MT** ACCELEROMETER  
MEASURING TRANSDUCER  
MODE TRANSDUCER  
MOTIONAL PICKUP TRANSDUCER  
PRIMARY DETECTOR

**N** EQUIPMENT SUBDIVISION

**P** DISCONNECTING DEVICE (PLUG CONNECTOR)  
ELECTRICAL PLUG CONNECTOR  
PLUG (CONNECTOR, MOVABLE PORTION)  
WAVEGUIDE FLANGE (PLAIN)

**PS** POWER SUPPLY  
RECTIFIER (COMPLETE POWER SUPPLY ASSEMBLY)

**PU** HEAD (WITH VARIOUS MODIFIERS)  
SOUND REPRODUCER

**Q** SEMICONDUCTOR CONTROLLED RECTIFIER  
SEMICONDUCTOR CONTROLLED SWITCH  
PHOTOTRANSISTOR (3 TERMINAL)  
THYRATRON (SEMICONDUCTOR DEVICE)  
THYRATRON (SEMICONDUCTOR TRIODE TYPE)  
TRANSISTOR

**R** FUNCTIONAL POTENTIOMETER  
INSTRUMENT SHUNT  
MAGNETORESISTOR  
POTENTIOMETER  
RELAY SHUNT  
RESISTOR  
RHEOSTAT

**RE** RADIO RECEIVER

**RT** BALLAST LAMP  
 BALLAST TUBE  
 CURRENT-REGULATING RESISTOR  
 RESISTANCE LAMP  
 TEMPERATURE-SENSING ELEMENT  
 THERMAL RESISTOR  
 THERMISTOR

**RV** SYMMETRICAL VARISTOR  
 VOLTAGE-SENSITIVE RESISTOR

**S** CONTACTOR (MANUALLY, MECHANICALLY OR THERMALLY OPERATED)  
 DISCONNECTING DEVICE (SWITCH)  
 ELECTRICAL SAFETY INTERLOCK  
 FLASHER (CIRCUIT INTERRUPTER)  
 GOVERNOR (ELECTRICAL CONTACT TYPE)  
 SPEED REGULATOR (ELECTRICAL CONTACT TYPE)  
 SWITCH  
 TELEGRAPH KEY  
 TELEPHONE DIAL  
 THERMAL CUTOUT (CIRCUIT INTERRUPTER) (NOT VISUAL)  
 THERMOSTAT

**SQ** ELECTRIC SQUIB  
 EXPLOSIVE SQUIB  
 FUSIBLE LINK  
 IGNITER SQUIB  
 SENSING LINK

**SR** ELECTRICAL CONTACT RING

ROTATING CONTACT  
SLIP RING

**T** AUTOTRANSFORMER  
COAXIAL TAPER  
LINEAR COUPLER  
TELEPHONE INDUCTION COIL  
TELEPHONE REPEATING COIL  
TRANSFORMER  
WAVEGUIDE TAPER

**TB** CONNECTING STRIP  
TERMINAL BOARD  
TERMINAL STRIP  
TEST BLOCK

**TC** SEMICONDUCTOR THERMOCOUPLE  
THERMOCOUPLE  
THERMOPILE

**TP** TEST POINT

**TR** RADIO TRANSMITTER

(ALSO SEE A\* AND 22.2.4)

**U** INSEPARABLE ASSEMBLY  
INTEGRATED-CIRCUIT PACKAGE  
MICROCIRCUIT  
MICROMODULE  
PHOTON-COUPLED ISOLATOR

**V** ELECTRON TUBE  
GEIGER-MULLER COUNTER TUBE

IONIZATION CHAMBER

KLYSTRON

MAGNETRON

PHOTOTUBE

PROPORTIONAL COUNTER TUBE

RESONATOR TUBE (CAVITY TYPE)

SOLION

THYRATRON (ELECTRON TUBE)

TRAVELING-WAVE TUBE

VOLTAGE REGULATOR (ELECTRON TUBE)

(SEE ALSO D)

**VR** INDUCTION VOLTAGE REGULATOR

VOLTAGE REGULATOR (EXCLUDING ELECTRON TUBE)

**W** BUS BAR

CABLE

CABLE ASSEMBLY (WITH CONNECTORS)

COAXIAL CABLE

CONDUCTOR

DISTRIBUTION LINE

DISTRIBUTION PATH

GOUBAU LINE

STRIP-TYPE TRANSMISSION LINE

TRANSMISSION LINE

TRANSMISSION PATH

WAVEGUIDE

WIRE

**WT** WIRING TIEPOINT

**X** FUSEHOLDER

LAMPHOLDER

SOCKET

**Y** MAGNETOSTRICTION OSCILLATOR

PIEZOELECTRIC CRYSTAL UNIT

QUARTZ CRYSTAL UNIT

TUNING-FORK RESONATOR

**Z** ARTIFICIAL LINE (OTHER THAN DELAY LINE)

BALUN

CARRIER-LINE TRAP

COUPLED TURNABLE RESONATOR

DIRECTIONAL PHASE SHIFTER (NONRECIPROCAL)

DISCONTINUITY (USUALLY COAXIAL OR WAVEGUIDE TRANSMISSION USE)

E-H TUNER

GENERAL NETWORK (WHERE SPECIFIC CLASS LETTERS DO NOT FIT)

GYRATOR

MOE SUPPRESSOR

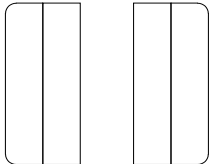
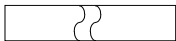
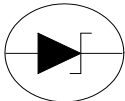
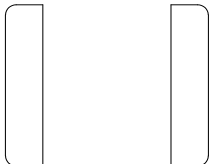
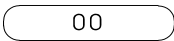
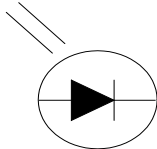





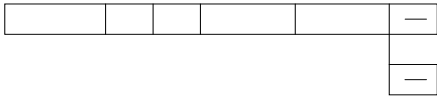
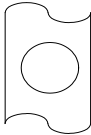
MULTISTUB TUNER

PHASE SHIFTER









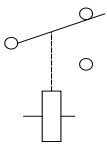






PHASE-CHANGING NETWORK

RESONATOR (TUNED CAVITY)

SLIDE-SCREW TUNER







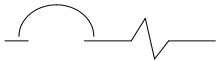
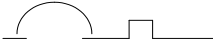







 <p>CONNECTOR 5.3.4</p>	 <p>ONE PIN CONNECTOR</p>	 <p>UNIDIRECTIONAL DIODE 8.5.6.1</p>
 <p>PLUG 5.3.3.2</p>	 <p>BUS BAR</p>	 <p>PHOTOSENSITIVE DIODE 8.5.4.1</p>
 <p>RECEPTACLE JACK 5.3.3.1</p>	 <p>SHIELD GND</p>	 <p>SEMICONDUCTOR DIODE 8.5.1</p>
 <p>DI AND DO</p>		 <p>CHASSIS OR FRAME CONNECTION 3.9.2</p>
 <p>A/D AND D/A</p>		 <p>TERMINAL STRIP POST</p>

SYM1.GEM
















 <p>SWITCH 4.3.3</p>	 <p>PUSH-BUTTON CIRCUIT CLOSING 4.7.1</p>	 <p>CONNECTION</p>
 <p>MOMENTARY SWITCH CENTER OFF POSITION 4.3.A.1.4</p>	 <p>PUSH-BUTTON CIRCUIT OPENING 4.7.2</p>	 <p>COMMON OR RETURN CONNECTION 3.9.3.2</p>
 <p>2-POSITION SWITCH, MOMENTARY ONE POSITION CENTER OFF 4.3A.5.4</p>	 <p>PUSH-BUTTON TWO CIRCUIT 4.7.2</p>	 <p>RELAY 4.3</p>
 <p>CLOSED CONTACT 4.3.1</p>	 <p>OPEN CONTACT 4.3.2</p>	 <p>NO-HELD CLOSED 4.14.5.2</p>
 <p>NORMALLY CLOSED 4.14.5.3</p>	 <p>NC-HELD OPEN 4.14.5.4</p>	 <p>NORMALLY OPEN 4.14.5.1</p>

SYM2.GEM

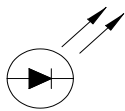





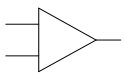

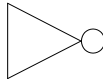








 <p>SHIELD DOUBLE CONDUCTOR</p>	 <p>SHIELD ONE CONDUCTOR ONE OUTER CONDUCTOR CONN. &amp; ONE SHIELD CONN.</p>	 <p>RESISTOR 2.1.1</p>
 <p>TRIPLE TWIST 3.1.7.1</p>	 <p>TWISTED PAIR 3.1.7.2</p>	 <p>CIRCUIT BREAKER 9.4.1</p>
 <p>BREAKER WITH THERMAL-OVERLOAD DEVICE 9.4.5</p>	 <p>BREAKER WITH MAGNETIC-OVERLOAD DEVICE 9.4.6</p>	 <p>ROTATING MACHINE-BASIC 13.1.1</p>
 <p>COMMUNICATION INDICATING LAMP 11.2.6</p>	 <p>JEWELLED SIGNAL LT. 11.2.8</p>	 <p>INDICATING LT. OR SIGNAL LT. 11.2.7</p>
 <p>OSCILLATOR 2.7</p>	 <p>ROTATING MACHINE- GENERATOR 13.1.2</p>	 <p>MOTOR GENERAL 11.1.3</p>




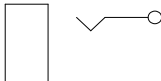
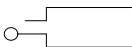




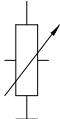





SYM3.GEM

 <p>1-PHASE VOLT REG 6.4.12</p>	 <p>ROTATING MACHINE-GENERATOR DIRECT CURRENT 13.1.2.1</p>	 <p>GENERATOR ALTERNATE CURRENT 13.1.2.2</p>
 <p>GENERATOR SYNCHRONOUS 13.1.2.3</p>	 <p>MOTOR DIRECT CURRENT 13.1.3.1</p>	 <p>MOTOR ALTERNATING CURRENT 13.1.3.2</p>
 <p>MOTOR SYNCHRONOUS 13.1.3.3</p>	 <p>NEON LAMP ALTERNATING CURRENT 11.3.1.1</p>	 <p>NEON LAMP DIRECT CURRENT 11.3.1.2</p>
 <p>INCANDESCENT LAMP 11.1.4</p>	 <p>SEMICONDUCTOR THERMOCOUPLE -CURRENT MEASURING 8.8.2</p>	 <p>FLOURESCENT LAMP 2-TERMINAL 11.1.2.1</p>
 <p>FLOURESCENT LAMP 4-TERMINAL 11.1.2.2</p>	 <p>VISUAL SIGNAL DEVICE ANNUNAIATOR 11.2.1</p>	 <p>SEMICONDUCTOR THERMOCOUPLE -TEMP MEASURING 8.8.1</p>



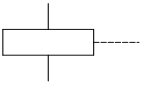








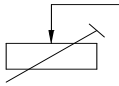


SYM4.GEM

 <p>PHOTOSENSITIVE DIODE 8.5.4.2</p>	 <p>PNP TRANSISTOR 8.4.1</p>	 <p>NPN TRANSISTOR 8.6.2</p>
 <p>DARLINGTON AMPLIFIER 8.6.17</p>	 <p>HORN, LOUDSPEAKER 10.1.3.1</p>	 <p>N-CHANNEL JUNCTION GATE 8.6.10.1</p>
 <p>OPERATIONAL AMPLIFIER</p>	 <p>THERMOMECH TRANSDUCER 2.14</p>	 <p>INVERTER</p>
 <p>LOGIC OR</p>	 <p>LOGIC AND</p>	 <p>TRANSFORMER 6.4.1</p>
 <p>TRANSFORMER WITH MAGNETIC CORE 6.4.1</p>	 <p>AMPLIFIER 16.2</p>	 <p>MODE FILTER 15.16.1</p>

SYM5.GEM

 <p>FREQUENCY FILTER 15.16.2</p>	 <p>FREQ. FILTER HIGH PASS</p>	 <p>FREQ. FILTER LOW PASS</p>
 <p>2-CONDUCTOR JACK 5.3.5.1</p>	 <p>2-CONDUCTOR PLUG 5.3.5.2</p>	 <p>MICROPHONE GENERAL 10.2</p>
 <p>HEADSET GENERAL 10.3</p>	 <p>MALE CONTACT 5.3.1</p>	 <p>FEMALE CONTACT 5.3.2</p>
 <p>VARIABLE ATTENUATOR -UNBALANCED 2.4.6</p>	 <p>EARPHONE GENERAL 10.4</p>	 <p>PIEZOELECTRIC CRYSTAL UNIT 2.10</p>
 <p>ELECTRIC SQUIB EXPLOSIVE 2.12.1</p>	 <p>ELECTRIC SQUIB IGNITOR 2.12.2</p>	 <p>THERMOCOUPLE TEMPERATURE MEASURING 2.13.1</p>

SYM6.GEM

 <p>THERMOCOUPLE CURRENT MEASURING WITH INTEGAL HEATER INTERNALLY CONNECTED 2.13.2.1</p>	 <p>THERMOCOUPLE CURRENT MEASURING WITH INTEGAL INSULATED HEATER 2.13.2.2</p>	 <p>ELECTRO MAGNETIC ACTUATOR 4.5.3</p>
 <p>TEST POINT RECOGNITION SYMBOL GENERAL 1.5.1</p>	 <p>TEST POINT RECOGNITION FOR TEST JACK 1.5.2</p>	 <p>TEST POINT RECOGNITION FOR CIRCUIT TERMINAL 1.5.4</p>
 <p>FIXED ATTENUATOR GENERAL 2.4.1</p>	 <p>BALANCED ATTENUATOR GENERAL 2.4.2</p>	 <p>UNBALANCED ATTENUATOR GENERAL 2.4.4</p>
 <p>VARIABLE ATTENUATOR GENERAL 2.4.4</p>	 <p>VARIABLE ATTENUATOR BALANCED 2.4.5</p>	 <p>PRESET ADJUSTABLE RESISTOR</p>
 <p>HEADER BOARD</p>	 <p>BRACKET</p>	

SYM7.GEM

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