

# Appendix A

## Abbreviations Commonly used in Electrical Documents

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### A

A	Amperes, amps.
A.C. or AC or a.c.	Alternating current or voltage.
ACB	Air circuit breaker.
ACSR	Aluminium conductor steel reinforced.
AGME	American Gear Manufacturer's Association
AH	Ampere-hour capacity of batteries.
ANSI	American National Standards Institute.
API	American Petroleum Institute.
ASTA	Association of Short-circuit Testing Authorities.
ASME	American Society for Testing and Materials.
AVR	Automatic voltage regulator.
AWA	Aluminium wire armour.

### B

B or b	Electrical susceptance.
Bar or bar	Pressure in atmospheres.
BASEEFA	British Approvals Service for Electrical Equipment in Flammable Atmospheres.
BIL	Breakdown insulation level.
BSI, BS or CP	British Standards Institution, or its publications.
Btu	British thermal unit.

### C

C	Electrical capacitance.
CACA	Totally enclosed air circuit, air cooled.
CACW	Totally enclosed air circuit, water cooled.
CAD	Computer aided design.
CB	Circuit breaker.

CBCU	Circuit breaker control unit.
CCR	Central control room.
cct.	Circuit.
CCU	Central control unit.
CEGB	Central Electricity Generating Board (UK).
CENELEC	European Committee for Electrotechnical Standardisation.
cont.	Continuous quantity.
COR CU	Corrugated copper.
$\text{Cos } \phi$	Power factor.
CPU	Central processing unit.
CSA or csa	Cross-sectional area.
CSI	Current source inverter.
CSP	Chloro-sulphonated polyethylene.
CSS	Computerised synchronising system.
C.T. or CT	Current transformer.
CU	Un-tinned copper.
CUWB	Copper wire braid.

**D**

d	Day.
db(A)	Measurement unit of sound, Decibels, absolute.
D.C. or DC or d.c.	Direct current or voltage.
DCS	Distributed control system.
DE	Drive end of a shaft.
deg C or °C	Thermal temperature in degrees Celsius or Centigrade.
deg F or °F	Thermal temperature in degrees Fahrenheit.
deg K or °K	Thermal temperature in degrees Kelvin.
DIN	Verein Deutscher Ingenieure.
DMS	Data management system.
DMT	Definite minimum time.
DnV	Det Norsk Veritas (Norway).
DOL or D.O.L.	Direct-on-line starting of induction motors.
DWR	Divided winding rotor synchronous generator.

**E**

E	Earth or ground.
ECHA	Equipment certified for hazardous areas.
EEC	European Economic Community.
EEMVA	The Engineering Equipment and Materials Users Association.
EHV	Extra high voltage.
EIEMA	The Electrical Installation Equipment Manufacturer's Association (UK).
ELCB	Earth Leakage Circuit Breaker.
ELV	Extra low voltage, less than 51 volts.
EMA	Ethylene methyl acrylate.
EMC	Electromagnetic compatibility.

EMI	Electromagnetic interference.
EMF or e.m.f.	Electromotive force.
EPDM	Ethylene propylene diene monomer.
EPR	Ethylene propylene rubber.
ERA	Electrical Research Association (UK).
ERM	Electronic restart module.
ESD	Emergency shut down.
ESP	Electric submersible pump.
Ex () or Ex ‘ ’	Certification symbol for hazardous area equipment.
EEx () or EEx ‘ ’	Certification symbol for hazardous area equipment, with European harmonisation of standards.
EWS	Engineering work station.

## F

F, f or Hz	Frequency.
FBA	Factory built assemblies.
FCU	Feeder control unit.
F and G	Fire and Gas.
FEED	Front-end engineering and design of a project.
Freq.	Frequency.
FAT	Factory acceptance testing.
Fig.	Figure.
Flex	Flexible, used for cables.

## G

G or g	Electrical conductance, or ground.
GCB	Gas circuit breaker.
GCP	Generator control panel.
GIS	Gas insulated switchgear.
GOR	Gas to oil ratio of oil well fluids.
GRP	Glass reinforced plastic.
GSWA	Galvanised steel wire armour.
GSWB	Galvanised steel wire braid.
GTG or GT	Gas-turbine generator.
GTO	Gate turn off thyristor.

## H

h or hr	Hour.
HCL	Hydrogen chloride, gas or acid.
HF	High frequency.
HOFR	Heat and oil resisting, flame retardant.
HRC	High rupturing capacity.
HV	High voltage, above 600 volts.
HVAC	Heating ventilation and air conditioning.
Hz	Frequency in cycles per second, or hertz.

**I**

I	Current in amperes.
IAC or Iac	Alternating current.
IALA	International Association of Lighthouse Authorities.
ICI	Imperial Chemical Industries plc (UK).
IDC or Idc	Direct current.
IDMT	Inverse definite minimum time.
IEC	International Electrotechnical Commission.
IEE	The Institution of Electrical Engineers of UK.
IEEE	The Institute of Electronic and Electrical Engineers of USA.
I/O	Input or output signals or quantity.
IMO	International Maritime Organisation.
IMCS	Integrated motor control system.
IMS	Information management system.
inst.	Instantaneous quantity.
int.	Intermittent quantity.
IP	Institute of Petroleum (UK) and its publications.
IP	Ingress protection code, see IEC60529.
IR	Insulation resistance.
IS	Intrinsically safe signal, circuit or equipment.
Is/In or IS/IN	Ratio of starting current to running current.
ISO	International Standards Organisation.

**J**

J	Energy in joules or newton-metres.
J	Current density, amps/mm <sup>2</sup> .

**K**

kA	Kilo-amperes.
KEMA	Short circuit testing authority in The Netherlands.
kg	Kilogram.
km	Length in kilometres.
kpm	Kilometres per hour.
kV or Ku	Kilo-volts.
kVA	Kilo-volt-amperes.
kVAr	Reactive kilo-volt-amperes.
kW	Kilowatts.

**L**

L	Electrical inductance in henries.
L	Line or local control operation.
LAN	Local area network.
lbs	Weight of a substance in pounds.
LDS	Low density foam.

LED	Light emitting diode.
LEL	Lower explosive limit.
LF	Low frequency.
LHS	Left-hand side.
Lloyds	Lloyds Register of Shipping (UK).
LMS	Load management system.
LNG	Liquefied natural gas.
loc or (L)	Local operation.
LPG	Liquefied petroleum gas.
LSDS or LSS	Load shedding system.
LSF	Low smoke and fumes, applied to cables and wires.
LSLH	Low smoke low halogen.
LSRS or LSR	Load sharing system.
LV	Low voltage, 51 to 599 volts.
L1, L2, L3, N	Notation for line and neutral voltages and currents.
LUX	Level of illumination.

**M**

m	Length or dimension in metres, or month.
mA	Current in milli-amperes.
man or (M)	Manual operation.
mbar	Milli-bar.
MB	High-pressure mercury, without phosphor coating.
MBF	High-pressure mercury, with phosphor coating.
MBFR	High-pressure mercury, with phosphor coating and internal reflector.
MBI	High-pressure discharge with metallic halides.
MBIF	High-pressure discharge with metallic halides, with phosphor coating.
MBR	Double-ended linear arc tube.
MBTF	Combination of MBF lamp and a filament lamp.
MCB	Miniature circuit breaker.
MCC	Motor control centre.
MCCB	Moulded case circuit breaker.
MCF	Switch-start lamp, also used for tubular fluorescent lamps in general.
MCFE	Starterless lamp, coated with silicone.
MCFA	Starterless lamp, with earth strip, mainly used in cold environments.
MCR	Maximum continuous rating.
MCU	Motor control unit.
MESG	Maximum experimental safe gap.
Mho	Unit of electrical admittance.
MIC	Minimum ignition current.
MICC	Mineral insulated calander cable.
MIMIC	Mimic display panel.
mm	Length or dimension in millimetres.
MMF or mmf	Magneto-motive force.
MMI	Man-machine interface.
MMSCF	Million standard cubic feet of a gas.

Mole %	Molecular weight in %.
MSW	Module steelwork.
MT	Mica glass tape.
MTBF	Mean time between failures.
MTTR	Mean time to repair.
MV	Medium voltage.
mV	Voltage in millivolts.
MVA	Mega-volt-amperes.
MVA <sub>r</sub>	Reactive mega-volt-amperes.
MW	Megawatts.

**N**

N or n	Number of items e.g. generators installed.
N or n	Number of turns in a winding.
N or n	Neutral terminal or line.
NACE	National Association of Corrosion Engineers (USA).
NBR	Nitrile butadiene rubber.
NC or N/C	Normally closed switching device.
NDE	Non-drive end of a shaft.
NEMA	The National Electrical Manufacturer's Association (USA).
NEC	National Electric Code (USA).
NER	Neutral earth resistor.
NFPA	National Fire Protection Association (USA).
Ni	Nickel metal.
NO or N/O	Normally open switching device.
NO <sub>x</sub>	Nitrogen based gas emissions.
NPT	National pipe threads (USA).
NS	Used to describe a type of variable speed AC motor
NTS	Not to scale.

**O**

O	Open, off or stop.
OC or O/C	Overcurrent or open circuit.
OCB	Oil circuit breaker.
OF or O/F	Overfrequency.
OFAF	Forced circulation of internal liquid, forced heat exchanging to external air.
OFAN	Forced circulation of internal liquid, natural heat exchanging to external air.
OHL or OHLine	Overhead line.
Ohms	Unit of electrical resistance or impedance.
OIM	Offshore installation manager.
OL or O/L	Overload.
ONAF	Naturally circulated internal liquid, forced heat exchanging to external air.
ONAN	Naturally circulated internal liquid, natural heat exchanging to external air.

OSHA	Occupational Health and Safety Administration (USA).
OV or O/V	Overvoltage.
<b>P</b>	
P or W	Active power, watts.
PA	Public address system.
p or s	Laplace operator in mathematics, for transfer functions.
PC	Programmable controller or personal computer.
PAM	Pulse or pole amplitude modulation.
PCC	Point of common connection.
PB or Pb	Lead metal.
PBWB	Phosphor bronze wire braid.
PBCU or TCU	Tinned copper.
PELV	An extra-low voltage system similar to SELV but connected to earth at some point.
P & ID	Piping and instrument diagram.
PF or pf	Power factor.
Ph or ph	Phases of an electrical circuit.
pk or peak	Peak value of an instantaneous quantity.
PLC	Programmable logic controller.
PMS	Power management system.
POL	Polyethylene.
PTB	Physikalisch Technische Bundesanstalt.
PTP	Polyethylene terephthalate.
PTFE	Polytetra fluoro ethylene.
pu or p.u.	Per unit.
PVC	Polyvinyl chloride.
PVDF	Polyvinylidene fluoride.
PWM	Pulse width modulation.
<b>Q</b>	
Q	Reactive power, volt-amperes-reactive.
QA	Quality assurance.
QC	Quality control.
<b>R</b>	
R or r	Electrical resistance.
Rad or rad	Angular displacement in radians.
RAM	Random access memory.
RCU	Remote control unit.
Ref. or REF.	Reference.
rem or (R)	Remote operation.
RHS	Right-hand side.
RMS, rms	Root mean square.

RMU	Ring main unit.
ROM	Read only memory.
RTD	Resistance temperature detector.
RTU	Remote transmitter unit.
Rx	Receiver.
<b>S</b>	
S	Apparent power in volt-amperes.
s or p	Laplace operator in mathematics, for transfer functions.
S	Slip of a rotating machine with respect to 1.0 pu.
SBM	Single buoy mooring.
SC or S/C	Short circuit.
SCADA	Supervisory control and data acquisition system.
SCF	Standard cubic feet of a gas.
SDR	Single discipline review.
SECT	Skin effect current trace heating.
SELV	Safety extra-low voltage.
SF6	Sulphur hexafluoride.
SI	Système Internationale d'Unités
SLI	Double-ended, linear arc tube.
SOLAS	Safety of life at sea, a document relating to marine practice.
SON	Diffused ellipsoidal outer bulb, single-ended lamp.
SON-T	Clear tubular outer bulb, single-ended lamp.
SON-TD or – L	Clear tubular outer bulb, double-ended lamp.
SON-R	SON lamp, with internal reflector.
SOL CU	Solid copper.
SOX	U-shaped arc tube, single-ended lamp.
Sox	Sulphur based gas emissions.
SP	Single phase.
sq	Square, e.g. sq mm is square millimetres.
sq2	Square root of 2.0 = 1.414214
sq3	Square root of 3.0 = 1.732051
SSR	Synchronisation check protection relay.
STG	Steam turbine generator.
STR CU	Stranded copper.
SWA	Steel wire armour.
SWBD	Switchboard.
SWGR	Switchgear.
SYNC or Sync	Synchronising.
<b>T</b>	
T or t	Time, usually in seconds.
Td	Time constant in seconds for the quantity 'd'.
TDRM	Time delayed restart relay.

TEFC	Totally enclosed fan cooled.
temp.	Temperature.
TESFC	Totally enclosed separate fan cooled, fan attached to an auxiliary motor shaft.
TG	Turbo-generator, gas or steam.
THF	Telephone harmonic factor.
TOP	Gas-turbine operating temperature (hot-end blade temperature).
TM	Technical measurement system of units.
TCP	Gas-turbine control panel.
TLX	Cold starting tubular fluorescent lamp, with single-pin caps.
TPN	Three-phase and neutral power supply.
TPPL	Total plant peak load.
TPRL	Total plant running load.
Tran. or Tx	Transformer.
Tx	Transmitter.
<b>U</b>	
U	Voltage, also used for energy.
UC or U/C	Undercurrent.
UCP	Unit control panel.
UEL	Upper explosive limit.
UF or U/F	Underfrequency.
UHF	Ultra high frequency.
UI or U/I	Undercurrent.
UL or U/L	Underload.
UL	Underwriters Laboratory (USA).
UNO	Unless noted otherwise.
UPS	Uninterruptible power supply unit.
UV or U/V	Undervoltage.
<b>V</b>	
V or U	Voltage or volts.
VA	Volt-amperes.
VAC or Vac	Alternating voltage.
VAr or Var	Reactive volt-amperes.
VDC or Vdc	Direct voltage.
VDE	Verband Deutscher Electrechniker (Germany).
VDI	Verein Deutscher Ingenieure (Germany).
VDU	Visual display unit.
VHF	Very high frequency.
VSI	Voltage source inverter.
VSD or VSDS	Variable speed drive systems.
V.T. or VT	Voltage transformer.
v/v	Comparison by volume, per-unit.

**W**

W or P	Active power, watts.
w or $\omega$	Frequency in radians per second.
wdg.	Winding of a machine or transformer.
WHRU	Waste heat recovery unit.

**X**

X or x	Electrical reactance.
XLPA	Cross-linked polyalkene.
XLPE	Cross-linked polyethylene.

**Y**

Y or y	Electrical admittance.
y	Year.

**Z**

Z or z	Electrical impedance.
ZH	Zero halogen, as used for cables.

**Numerical**

1P or SP	Single phase.
3P	Three-phase supply.
3P-N	Three-phase and neutral supply.
3P-N-E	Three-phase neutral and earth supply.
2W	Two-wire supply.
3W	Three-wire supply.
4W	Four-wire supply.

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