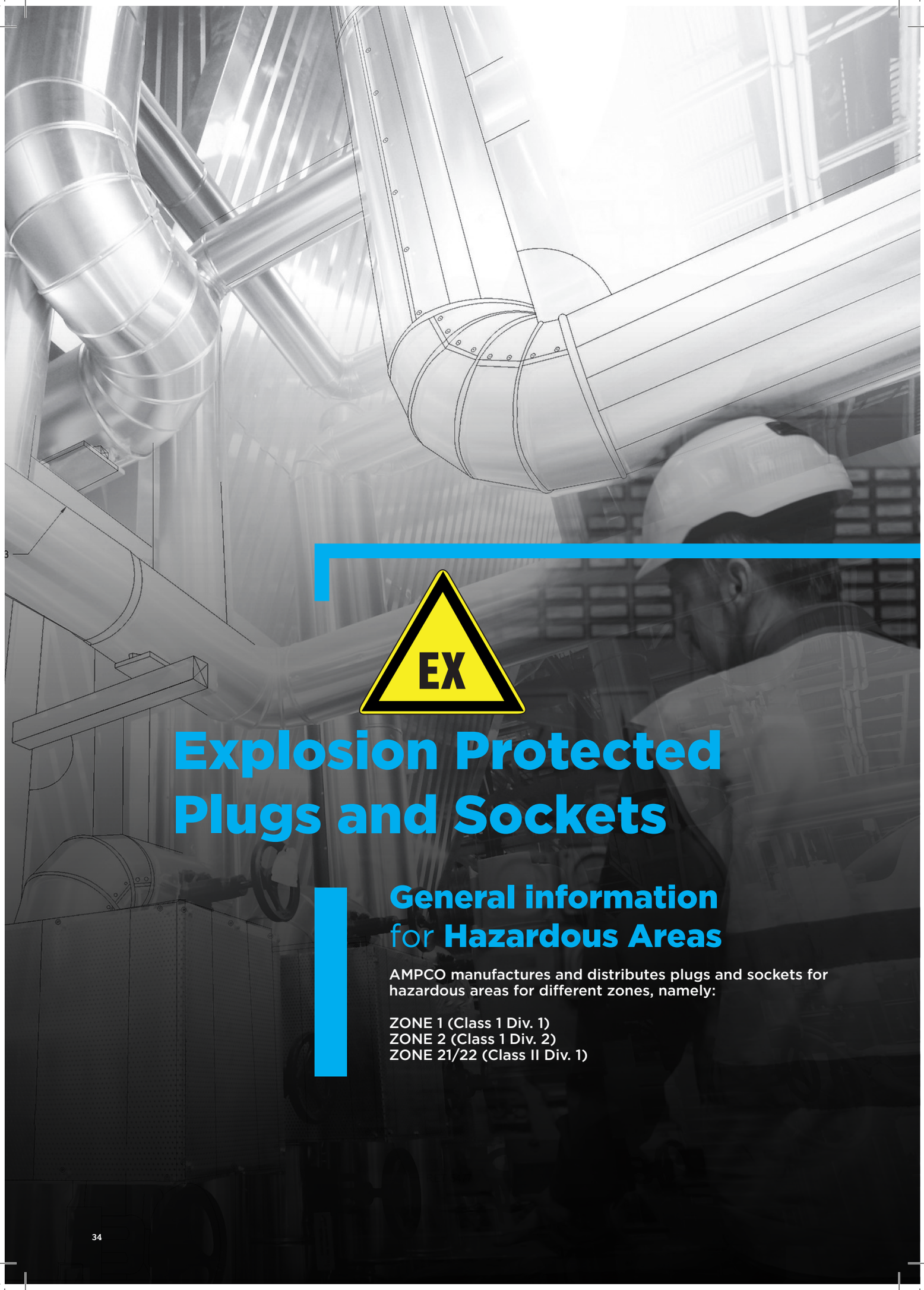

Explosion Protected Plugs and Sockets

General information for Hazardous Areas

AMPCO manufactures and distributes plugs and sockets for hazardous areas for different zones, namely:

ZONE 1 (Class 1 Div. 1)
ZONE 2 (Class 1 Div. 2)
ZONE 21/22 (Class II Div. 1)

34 Explosion Protected Plugs and Sockets

36 **EX ZONE 1** Metal IP67
Interlocked Switched Socket Outlet
380/500V, 63AMP

EX ZONE 1 Metal Plug IP67
380/500V, 63AMP

37 **EX ZONE 2** Metal IP67
Interlocked Switched Socket Outlet
380/500V, 63AMP

EX ZONE 2 Metal Plug IP67
380/500V, 63AMP

Introduction to the principles of explosion protected electrical equipment

In the manufacture, processing, transport and storage of flammable chemicals and petroleum products (for example, Benzene, Alcohol, Acetylene, Coal-gas) it is inevitable that there will be leakage of gases and vapours which, in conjunction with the oxygen of the atmosphere, may form mixtures of an explosive concentration.

Accidental ignition of such a mixture - for example by an electrical spark or excessively hot surface - may cause an explosion which will endanger life and property. To avoid these risks many countries have developed specific safety practices. In view of the growing international nature of the industries, international standardisation and agreement with respect to the safety practices was extremely desirable.

AMPCO

EX ZONE 1

Explosion Protected Plugs and Sockets

*PG Refer to technical section page.

IP67 WATERTIGHT, SWITCHED DUAL INTERLOCKED SOCKET - METAL 63A 380V - 500V, 50Hz ZONE 1							
Amp	Volt	IP	h	Description	n	Part No.	*PG
63A	380	67	6	3P+E 3P+N+E		A0145 A0146	64A
	500		7	3P+E 3P+N+E		A0147 A0148	64A

IP67 WATERTIGHT PLUG - METAL 63A 380V - 500V, 50Hz ZONE 1							
Amp	Volt	IP	h	Description	n	Part No.	*PG
63A	380	67	6	3P+E 3P+N+E		A0648 A0649	64B
	500		7	3P+E 3P+N+E		A0650 A0651	64B

AMPCO® EXPLOSION PROTECTED PLUGS AND SOCKETS
63 A 380 V - 500 V Switched Dual Interlocked

Zone 1 AMPCO® Switch Sockets are manufactured to include the following:

Salient Features

- Switch knob, lockable in “off” position
- One top and one bottom entry (32mm)
- Protection Class IP 67
- Mechanically interlocked
- All contacts are manufactured of brass and female contacts are Type Multilams with torsion spring louvers
- Inserts are made of plastic and are virtually unbreakable
- Competitive pricing due to South African manufacture
- Packing: 1 off socket per carton (plug not included)

The design is in accordance with SANS/IEC 60309 Part 1 + 2 + 3. SANS 60309-1 for general requirements, SANS 60309-2 for dimensional requirements, SANS 60309-3 for particular requirements for use in explosive gas atmospheres, SANS/IEC 79-0 increased Safety “e”, SANS 314 (IEC 79-1) flameproof enclosures, SABS 1031 type “e” apparatus for use in flammable gas atmospheres, SABS 969 enclosures for use in Class II Div. 1 + 2 locations (dust ignition proof), SABS 970 Non-sparking for use in Class 1 Div 1 locations, SABS 1222 (IEC 529) classification of degrees of protection provided by enclosures.

Certificate of conformity is existent and available on request. Plugs and Sockets correspond with National (SABS 1239) and International Standards (IEC 60309 Part 1 + 2). Therefore the explosion protected plugtop can be inserted into a normal CEE round type socket. A normal CEE plugtop, however, cannot mate an explosion protected socket!

Switch socket and plug body are manufactured from an aluminium alloy LM24 in a high pressure die cast process and is epoxy coated in hammer grey to give an attractive appearance and a lasting finish, even in coastal atmospheres.
All springs and screws are stainless steel.
Contact pins are manufactured of brass and bedded in Amplast insulation (unbreakable and heat resistant)
One bottom and top entry (32mm) is provided for easy cable termination
The socket is fitted with one EXe blanking plug.

LOCATIONS:	Zone 1 (Class 1 Div 1) gas surface
HAZARD FREQUENCY:	intermittent, occurring under normal operating conditions in hazardous areas
ENVIRONMENT:	Group IIA to IIC Propane to Hydrogen
LIMITING TEMPERATURE:	T4
CERTIFIED:	Explosion protected Ex ed II T4/DIP

Explosion Protected Plugs and Sockets

*PG Refer to technical section page.

EX ZONE 2

AMPCO

IP67 WATERTIGHT, SWITCHED DUAL INTERLOCKED SOCKET - METAL 63A 380V - 500V, 50Hz							
Amp	Volt	IP	h	Description	n	Part No.	*PG
63A	380	67	6	3P+E 3P+N+E		A0644 A0645	65A
	500		7	3P+E 3P+N+E		A0646 A0647	65A

IP67 WATERTIGHT PLUG - METAL 63A 380V - 500V, 50Hz							
Amp	Volt	IP	h	Description	n	Part No.	*PG
63A	380	67	6	3P+E 3P+N+E		A0648 A0649	65B
	500		7	3P+E 3P+N+E		A0650 A0651	65B

AMPCO® EXPLOSION PROTECTED PLUGS AND SOCKETS ZONE 2, CLASS I, DIVISION 2 LOCATIONS

These are locations in which operations concerned with flammable or explosive substances, gases, or vapours or volatile liquids are so well controlled that an explosive or ignitable concentration is only likely to occur under abnormal conditions.

NOTE 1: The following shall be regarded as the minimum requirements for a location to which this classification is applicable.

a) The area is so well ventilated that, if abnormal conditions arise, ignitable concentrations of the gas or vapour are rapidly dispersed and their possible contact with electrical equipment is of minimum duration.
b) Complete segregation from any Class I, Division 0 or 1 location is ensured, in the case of enclosed premises by the use of a gasproof structure and the absence of doorways, ventilating ducts, and trenches communicating with such locations, and in the case of open premises by the distance between the area and such locations being great enough to ensure safety in any atmospheric conditions.
c) Bursting discs and relief valves on the containers of the flammable liquids, gases, or vapours are situated (or so arranged as to vent) outside the area and in positions where, if they operate, no additional risk is introduced to the area.
d) There is no point at which, under normal operating conditions, a flammable liquid, gas, or vapour is in direct contact with the surrounding atmosphere.
e) All vessels, pumps, pipes, and fittings containing flammable liquids, gases, or vapours are so constructed and maintained as to prevent any significant leakage.

NOTE 2: The following are examples of Class I, Division 2 locations.

a) A distillation unit on open premises, with or without a roof, and in which a flammable liquid is distilled. Such a unit may extend over several floors that house pumps, pipework, vapourizers, distillation, storage, and pressure vessels, but relief valves must be connected to a closed system or so arranged as to discharge into the open air under emergency conditions only.
b) An area where equipment (such as pumps, vessels, and pipework) containing flammable liquids, gases, or vapours is installed in the open air or outside buildings that enclose a Class I, Division 1 location, any openings in the enclosing walls being far enough away from non-flameproof electrical apparatus to ensure that the apparatus will not be exposed is a flammable concentration of the dangerous substance.
c) An instrument control bay equipped with pipes, valves, and instruments and segregated from any Class I, Division 1 location with which it is associated. (Where supervision of such an area is involved, hermetically sealed windows of strengthened glass should be provided in the common wall.)
d) Areas surrounding the walls of a tank installed in the open air and having a floating roof, and in which a flammable liquid is stored. Where the tank is surrounded by a bund wall, the classification of the area inside the bund wall depends on the probability of a flammable concentration arising within the wall under any foreseeable conditions.

NOTE: The space within the tank and above the roof is classified as a Class I, Division 1 location.

e) The area surrounding a motor-driven compressor of flammable gases and in which the sealing and ventilation of the compressor are such as to prevent the exposure of the motor to a flammable concentration of the gas.
f) Open air loading and unloading areas for road or rail tankers (used for transporting e.g. flammable liquids), where the use of flexible pipes is confined to the connection to the vehicle, a closed system is used, rapid drainage for any escaping liquid is provided, valves are well maintained, and blank flanges are fitted over pipe ends whenever the pipes are not in use.

AMPCO plugs and sockets fulfill the following requirements:

- Switched, interlocked wall mounted sockets fitted with a fully encapsulated switch and its enclosure complies at least with IP 54. An internal overpressure of 4 mbar requires more than 30 seconds to drop to 2 mbar.
- Plugs and sockets are interlocked so that the plugs may be inserted and withdrawn only with the voltage switched off.
- Zone 2 is harmonized in many countries.
- In South Africa Zone 2 complies with SABS 970-1971.

This specification covers constructional requirements for "EX N" (non-sparking electrical equipment for use in potentially flammable atmospheres Class I, Division 2 Locations) as defined in SABS 0108 and IEC 79-10, 1986. Attention is drawn to the fact that such electrical installations are subject to regulations framed under the Machinery and Occupational Safety Act, 1983 (Act 6 of 1983) or the Mines and Works Act, 1956 (Act 27 of 1956) both Acts as latest amended and possibly also to other Regulations such as Municipal By-laws!

Note: "EX N" - equipment is not considered suitable for use in hazardous areas such as in a fiery mine. Electrical apparatus intended for use in hazardous areas such as in fiery mines is subject to approval by the Government Mining Engineer.