

# HAZARDOUS AREAS

SENSOR-ACTUATOR-INTERFACE

OVERVOLTAGE PROTECTION

Klippon® JUNCTION BOXES

TERMINALS

FIELD BUS COMPONENTS

## Electrical equipment for gases, vapours, mists (G)

SYMBOL	TYPE OF PROTECTION	CATEGORY	CENELEC	BASIC CONCEPT OF PROTECTION
e nA	Increased safety Non-sparking	M2 & 2 3	EN 50019 EN 50021	No arcs, sparks or hot surfaces
d nC q	Flameproof Enclosed break Quartz/sand filled	M2 & 2 3 2	EN 50018 EN 50021 EN 50017	Contain the explosion, prevent flame propagation
ia ib nL	Intrinsic safety Intrinsic safety Energy limitation	M1 & 1 M2 & 2 3	EN 50020/39 EN 50020/39 EN 50021	Limit the energy of the spark and the surface temperature
p nR m o	Pressurised Restricted breathing Simple pressurisation Encapsulation Oil immersion	2 3 3 2 2	EN 50016 EN 50021 EN 50021 EN 50028 EN 50015	Keep the flammable gas out

## Electrical equipment for combustible dusts (D)

TYPE OF PROTECTION	SYMBOL	CENELEC	BASIC CONCEPT OF PROTECTION
Protection by enclosure	tD	EN 50281-1-1 (IEC 61241-1*)	Keep the combustible dust out and avoid hot surfaces
Pressurisation Encapsulation	pD mD	IEC 61241-4 IEC 61241-18*	
Intrinsic safety	iD	IEC 61241-11	Limit the energy of the spark and the surface temperature

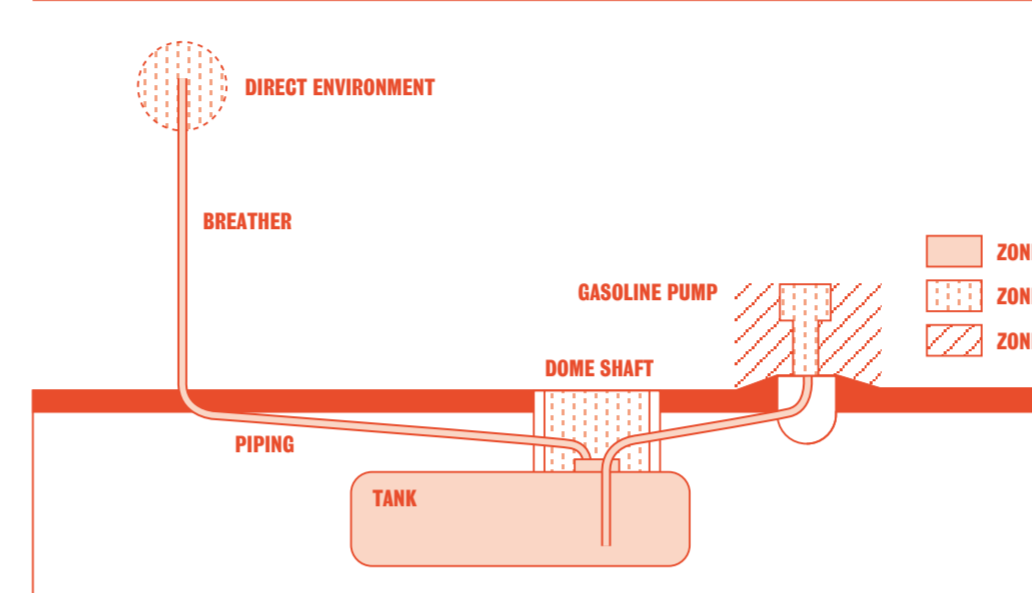
  

TYPE OF PROTECTION	SYMBOL	CENELEC	BASIC CONCEPT OF PROTECTION
Constructionally safety Inherent safety	c g	EN 13463-5* EN 13463-4*	Ignition sources cannot arise
Flow restriction Pressurisation Liquid immersion	fr p k	EN 13463-2* EN 13463-7* EN 13463-8*	Keep the explosive atmosphere out
Flameproof	d	EN 13463-3*	Contain the explosion, prevent flame propagation
Control of ignition sources	b	EN 13463-6*	Ignition source cannot become active

\*Standards in preparation

## Non-electrical equipment and machinery

## Zone classification example - petrol station



## Conversion of US 'TYPE' into 'IP' Code destinations

TYPE NUMBER	IP DESIGNATION
3	IP54
3R	IP14
3S	IP54
4 and 4X	IP56
6 and 6P	IP67

## Definition of protection classes according to NEMA

TYPE	NEMA
Type 1	Enclosure predominately for indoor use. Protection against penetration by solid foreign bodies.
Type 2	Enclosure predominately for indoor use. Protection against penetration by solid foreign bodies and water.
Type 3	Enclosure predominately for indoor use. Protection against penetration by rainfall and dust as well as damage due to ice-formation.
Type 3R	Enclosure predominately for indoor use. Protection against rain and snow as damage due to ice-formation.
Type 3S	Enclosure predominately for indoor use. Protection against rain, snow and foreign bodies. External mechanisms can be operated despite ice accumulation.
Type 4	Enclosure for indoor or outdoor use. Protection against rain, foreign bodies, splashing water and hose water as well as damage due to ice-formation on the outside of the enclosure.
Type 4X	Enclosure for indoor or outdoor use. Protection against corrosion, rain, foreign bodies, splashing water and hose water as well as damage due to ice-formation on the outside of the enclosure.
Type 6	Enclosure for indoor or outdoor use. Protection against hose water as well as against penetration by water during immersion; protection damage due to ice-formation on the outside of the enclosure.
Type 12	Enclosure predominately for indoor use. Protection against dust accumulation, foreign bodies and non-corrosive drops of liquids.
Type 13	Enclosure predominately for indoor use. Protection against splashing water, oil, and non-corrosive coolants.

## Documents issued by the manufacturer (ATEX)

DESCRIPTION	DOCUMENTATION
Attestation of Conformity (1)	Declaration by the manufacturer that the components conform with the provisions of Directive 94/9/EC and includes detail on how to be incorporated into equipment or protective systems
EC Declaration of Conformity (1)	Declaration by the manufacturer that the equipment complies with the EHSR's of Directive 94/9/EC and any other relevant directives that apply
Instructions (2)	<ul style="list-style-type: none"> <li>Detailed information for safe use, installation, commissioning, maintenance, etc...</li> <li>Drawn up in one of the community languages</li> <li>On putting into service, translation of the instructions in the language of the country in which the equipment or protective system is to be used</li> </ul>

(1) Declaration to accompany information given with each single product or each batch of identical products  
(2) Instructions to accompany each piece of equipment or protective system



## Work equipment and workplaces - directive 1999/92/EG

SCOPE	DETAILS	COMPLIANCE	* RA - Risk Assessment
WORK EQUIPMENT	Already in use or made available for the first time before 30 June 2003		May continue to be used provided the RA* indicates it is safe
WORK EQUIPMENT	Made available for the first time after 30 June 2003		ATEX 95 applies (selection on the basis of categories)
WORKPLACES	First time after 30 June 2003 OR modifications, extensions or restructuring after 30 June 2003		ATEX 137 applies
WORKPLACES	Already in use before 30 June 2003		Classify into zones, mark with a sign, provide protective clothing, duty of coordination by 30 June 2006

Note: The mineral extracting industries are exempt from ATEX 137 BUT ATEX 95 applies. However, Chemical Agents Directive 98/24/EC does apply to the extracting industries and both CAD and ATEX contain a lot of common requirements for employers such as risk assessment, prevention and protection measures, providing training, emergency arrangements. ATEX 137 and the safety requirements of CAD are implemented through the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

## Employer's obligations under directive 1999/92/EG

- Prevent the formation of explosive atmospheres OR avoid the ignition of the explosive atmosphere, and control the effects of explosions
- Assessment of explosion risks
  - Likelihood of explosive atmospheres occurring and their persistence
  - Likelihood that ignition sources are present
  - Scale of the anticipated effects
- Duty of coordination between employers
- Hazardous Area classification
- Mark explosive atmospheres with sign at point of entry (where necessary)
- Verification before first use
- Risk Assessment Record (extension of MHSW record - no separate EPD required)
  - Explosion risks have been determined and assessed
  - Safety measures taken to eliminate or reduce the risk
  - Hazardous areas classified into zones
  - Selection of equipment (link to ATEX 95)
  - Arrangements for incidents and emergencies
  - Measures taken to inform, instruct and train employees



Type Klippon®  
Serial No. 0123/01

II 2  
II 2(1)  
II 1

GD EEx e  
GD EEx ia

II T6  
II C T6

T100°

CE  
0344

Max. Dis. Power 100W Voltage 1100V  
Sira 04ATEX0000 T<sub>amb</sub> = -40 °C to +60 °C

Year of construction 2004 IP68

Weidmüller Interface, 32760 Detmold, Germany

**For dust atmospheres only**

The surface temperature T100 °C is based on max. ambient temperature of +60 °C.

**Notified body (examples) for assessment of the manufacturer's quality system**

NOTIFIED BODY	COUNTRY	NO.
PTB	D	0102
DMT (BVS)	D	0158
LCIE	F	0081
LQM	E	0163
KEMA	NL	0344
SIRA	UK	0518

## Ingress and impact protection for enclosures - EN 60529 (IP) and EN 50102 (K)

1 <sup>st</sup> NUMBER		2 <sup>nd</sup> NUMBER	
IP	PROTECTION AGAINST SOLID BODIES	IP	PROTECTION AGAINST LIQUIDS
0	No protection	0	
1	Protected against solid bodies larger than 50 mm (e.g.: accidental contact with the hand)	1	
2	Protected against solid bodies larger than 12 mm (e.g.: hand fingers)	2	
3	Protected against solid bodies larger than 2.5 mm (e.g.: tools, and small wires, etc.)	3	
4	Protected against solid bodies larger than 1 mm (e.g.: fine tools, wires, etc.)	4	
5	Protected against dust (no harmful deposit)	5	
6	Completely protected against dust	6	
		7	15cm min. 1m
		8	1m

## Equipment selection (ATEX)

CATEGORY OF EQUIPMENT	EQUIPMENT GROUP	ATMOSPHERE	LEVEL OF PROTECTION	PERFORMANCE OF PROTECTION	DEFINITIONS OF ZONES
M1	Equipment group I	Methane, dust	Very high	2 independent protection methods, or safe with 2 faults	-
M2	Equipment group I	Methane, dust	High	Suitable for normal operation and severe operating conditions	-
1	Equipment group II	G Gas, vapour, mist D Dust	Very high	2 independent protection methods or safe with 2 fault	<b>ZONE 0</b> A place in which an explosive atmosphere is present continuously, for long periods or frequently.
2	Equipment group II	G Gas, vapour, mist D Dust	High	Suitable for normal operation and frequently occurring disturbances, or safe with 1 fault	<b>ZONE 1</b> A place in which an explosive atmosphere is likely to occur in normal operation, occasionally. <b>ZONE 21</b>
3	Equipment group II	G Gas, vapour, mist D Dust	Normal	Suitable for normal operation	<b>ZONE 2</b> A place in which an explosive atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only. <b>ZONE 22</b>

## Equipment groups

**Equipment group I** applies to equipment intended for use in underground parts of mines, and to those parts of surface installations of such mines, liable to be endangered by firedamp and/or combustible dust.

**Equipment group II** applies to equipment intended for use in other places liable to be endangered by explosive atmospheres. Further subdivisions into IIA, IIB and IIC.

## Gases, vapours and mists for group II are grouped by...

TEMPERATURE CLASS	MAX. SURFACE TEMPERATURE	II A (180 mJ)	II B (60 mJ)	II C (20 mJ)
T1	450 °C	Acetone	Town gas	Hydrogen
T2	300 °C	Butane	Ethyls	Acetylene
T3	200 °C	Fuel oil	Hydrogen-sulphide	-
T4	135 °C	Acetaldehyd	Ethylether	-
T5	100 °C	-	-	-
T6	85 °C	-	-	Carbon-disulfide

Type Klippon®  
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II 2  
II 2(1)  
II 1

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T100°

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When good enough just isn't good enough

**Weidmüller**

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## POSTER

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- Turkey
- United Arab Emirates
- United Kingdom
- USA
- Venezuela
- Vietnam
- Yemen
- Yugoslavia

Weidmüller is the leading manufacturer of components for electrical connection technology. The Weidmüller product portfolio ranges from terminal blocks, PCB connectors and terminal blocks, components and relay sockets to power supply and overvoltage protection modules suitable for all applications. Electrical installation and marking material, basic I/O components and a variety of tools round off the range. As an OEM supplier, the company sets global standards in the field of electrical connection technology.