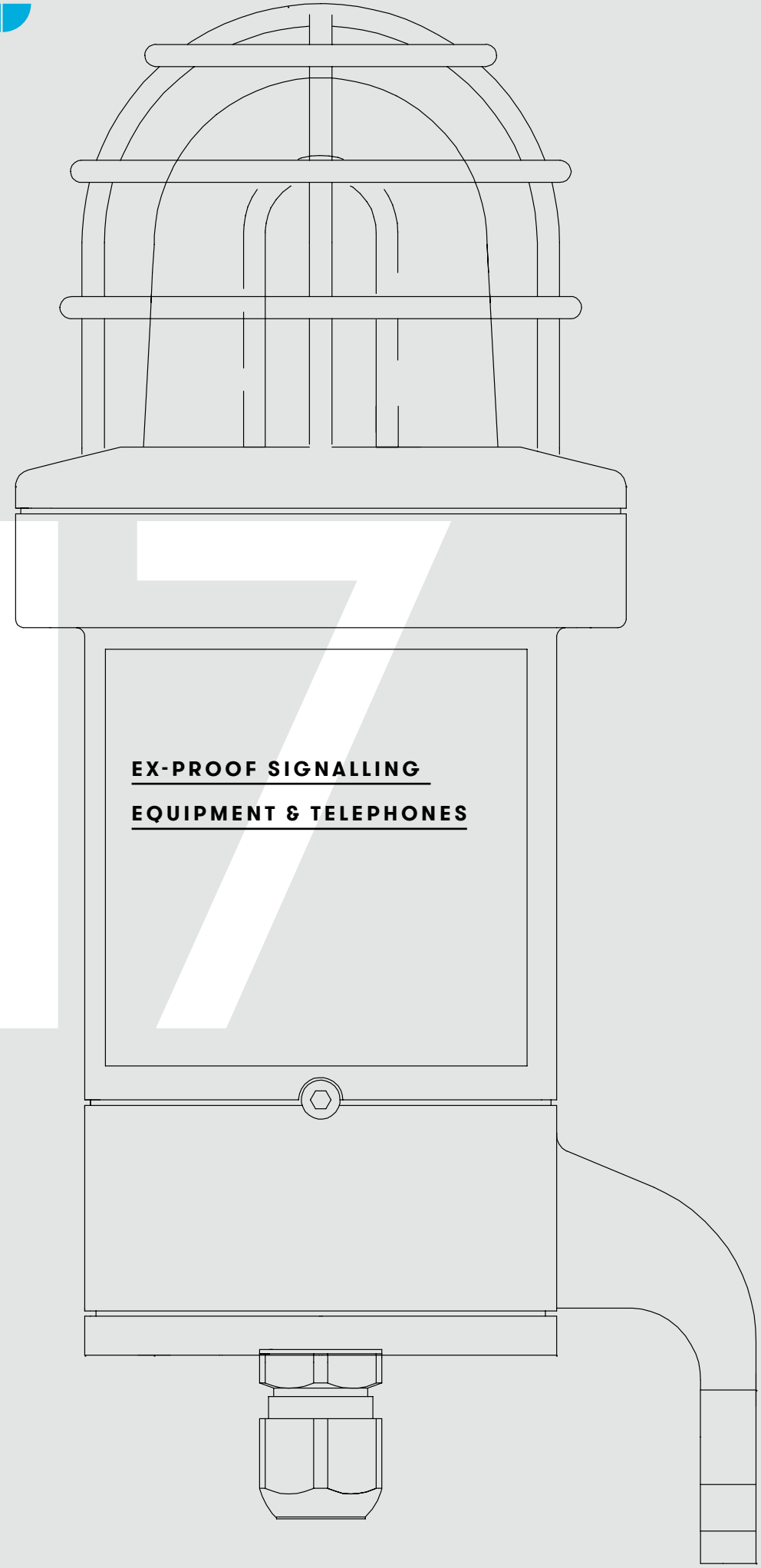

17

EX-PROOF SIGNALLING EQUIPMENT & TELEPHONES

Louder &
Brighter
since 1910.

Auer Signal

Potentially explosive atmospheres – dust

Labelling of electrical equipment as per
EC Directive 2014/34/EU – ATEX

CE 0102 Ex II 2D tD T80 °C

1 2 3 4 5

1 CE **COMPLIANCE WITH EU DIRECTIVE(S)**

5 T80 °C **MAXIMUM PERMITTED SURFACE TEMPERATURE**

2 0102 **OFFICIAL TESTING AUTHORITY**

testing authority	Country	Identification number
TÜV-A	Austria	0408
PTB	Germany	0102
EXAM	Germany	0158

CLASSES AND GROUPS ACCORDING TO NEC 500: TYPICAL DUSTS, LINT, FIBRES

Class II	Class III
Metal dust/Group E	Fibres/lint
Coal dust/Group F	
Grain dust/Group G	

3 II 2D **CONDITIONS IN POTENTIALLY EXPLOSIVE ATMOSPHERES**

Flammable substances	Temporary behaviour of the flammable substance in the potentially explosive atmosphere	Classification of potentially explosive atmospheres			Labelling required for applicable equipment according to CENELEC	
		CENELEC/IEC	US NEC 505	US NEC 500	Device group	Device category
Dusts	Present continuously, for long periods or frequently	Zone 20	---	Class II Division 1	II	1D
	Occur occasionally	Zone 21	---		II	2D (or 1D)
	Not likely to occur – if so, infrequently or for a short period only	Zone 22	---		II	3D (or 2D or 1D)
Dust	---	Mining Mining	--- ---	Mining ---	I I	M1 M2 (or M1)

4 tD **TYPES OF IGNITION PROTECTION**

Type of ignition protection	Symbol	Label-ling	Protection principle	Zone	CENELEC IEC FM/UL	Application
General requirements				All Class II, Div. 1/2	IEC 61241-0 UL 1604	All applications
Protection by enclosure		tD	Potentially explosive atmos-phere is kept away from the source of ignition; there is a limit on the temperature.	20, 21 oder 22 20, 21 oder 22 Class II, Div. 1	EN 50281-1-1 IEC 61241-1-1 UL 1203	Control, command and signalling equipment, beacons, engines, junction boxes, enclosure
Pressurised enclosure		pD	Potentially explosive atmos-phere is kept away from the source of ignition.	21 or 22 21 or 22 Class II, Div. 1/2	EN 50281-4 IEC 61241-2 NFPA 496	Switch and control cabinets, engines, measurement and analysis equipment, computers
Intrinsic safety		iD	Energy limitation of sparks and temperatures	20, 21 or 22 20, 21 or 22 Class II, Div. 1	EN 50281-5 IEC 61241-11 FM 3610/UL 913	Measurement and control technology, sensors, actuators, instrumentation
Special encapsulation		mD	Potentially explosive atmos-phere is kept away from the source of ignition.	20, 21 or 22 20, 21 or 22 ---	EN 50281-6 IEC 61241-18	Relay and engine coils, electronics, solenoid valves, connection systems
Non-incendive		[NI]	Prevention of sparks and temperatures	Class II, Div. 1	FM 3611/UL 1604	
Dust-proof			Transferral of explosion outside not possible	Class II, Div. 2	FM 3611/UL 1604	

Potentially explosive atmospheres – gas

Labelling of electrical equipment
as per EC Directive 94/9 – ATEX

CE 0102 Ex II2G EEx de IIC T6

1 2 3 4 5 6 7 8

1 CE **COMPLIANCE WITH EU DIRECTIVE(S)**

2 0102 **OFFICIAL TESTING AUTHORITY**

testing authority	Country	Identification number
TÜV-A	Austria	0408
PTB	Germany	0102
EXAM	Germany	0158

4 E **AS PER DIRECTIVE 94/9/EG (ATEX)**

5 Ex **EXPLOSION-PROOF EQUIPMENT**

3 II2G **CONDITIONS IN POTENTIALLY EXPLOSIVE ATMOSPHERES**

Flammable substances	Temporary behaviour of the flammable substance in the potentially explosive atmosphere	Classification of potentially explosive atmospheres			Labelling required for applicable equipment according to CENELEC	
		CENELEC / IEC	US NEC 505	US NEC 500	Device group	Device category
Gases, vapours	Present continuously, for long periods or frequently	Zone 0	Class I Zone 0	Class I Division 1	II	1G
	Occur occasionally	Zone 1	Class I Zone 0		II	2G (or 1G)
	Not likely to occur – if so, infrequently or for a short period only	Zone 2	Class I Zone 0	Class I Division 2	II	3G (or 2G or 1G)
Methane	---	Mining Mining	--- ---	Mining ---	I I	M1 M2 (or M1)

8 T6 **TEMPERATURE CLASSES AND MAXIMUM PERMITTED SURFACE TEMPERATURE OF EQUIPMENT ACCORDING TO CENELEC/IEC/NEC 505 UND NEC 500**

450° C	T1					
300° C	■	T2				
200° C	■	■	T3			
135° C	■	■	■	T4		
100° C	■	■	■	■	T5	
85° C 0° C	■	■	■	■	■	T6
CENELEC IEC NEC 505	T1	T2	T3	T4	T5	T6

CLASSES AND GROUPS ACCORDING TO NEC 500: TYPICAL GASES

Class I	Mining
Acetylene/Class A	Methane
Hydrogen/Class B	
Ethylene/Class C	
Propane/Class D	

6 de TYPES OF IGNITION PROTECTION

Type of ignition protection	Symbol	Label-ling	Protection principle	Zone	CENELEC IEC FM/UL	Application
General requirements				all	EN 60079-0 IEC 60079-0 FM 3600/UL 2279	all
Flame-proof enclosure		Eex d Ex d AEx d	Transferral of explosion outside not possible	1 or 2 1 or 2	EN 50018 IEC 60079-1 FM 3615/UL 2279	Control, command and signalling equipment, control systems, engines, power electronics
Increased safety		EEx e Ex e AEx e	Prevention of sparks and temperatures	1 or 2 1 or 2 Class 1, Zone 1	EN 50019 IEC 60079-7 FM 3600/UL 2279	Junction boxes, enclosure, engines, beacons, terminals
Intrinsic safety		EEx i Ex i [IS]	Energy limitation of sparks and temperatures	0, 1 oder 2 0, 1 oder 2 Class I, Div. 1	EN 50020, EN 50039 IEC 60079-11 FM 3610/UL 2279	Measurement and control technology, sensors, actuators, instrumentation
Pressurised enclosure		EEx p Ex p	Potentially explosive atmosphere is kept away from the source of ignition.	1 or 2 1 or 2 Class I, Div. 1/2	EN 50016 IEC 60079-2 FM 3620/NFPA 496	Switch and control cabinets, engines, measurement and analysis equipment, computers
Special encapsulation		EEx m Ex m AEx m	Potentially explosive atmosphere is kept away from the source of ignition.	1 or 2 1 or 2 Class I, Zone 1	EN 50028 IEC 60079-18 FM 3600/UL 2279	Relay and engine coils, electronics, solenoid valves, connection systems
Oil filled		EEx o Ex o AEx o	Potentially explosive atmosphere is kept away from the source of ignition.	1 or 2 1 or 2 Class I, Zone 1	EN 50015 IEC 60079-6 FM 3600/UL 2279	Transformers, relays start-up controllers, control systems
Sand filled		EEx q Ex q AEx q	Transferral of explosion outside not possible	1 or 2 1 or 2 Class, Zone 1	EN 50017 IEC 60079-5 FM 3600/UL 2279	Transformers, relays, capacitors
Type of ignition protection 'n'		EEx n Ex n AEx n	Different protection principles for Zone 2	2 2 Class I, Zone 2	EN 50021 IEC 60079-15 FM 3600	Only Zone 2 applications
Non-incendive		[NI]	Prevention of sparks and temperatures	-- -- Class I, Div. 1	-- -- FM 3611/UL 1604	
Explosion-proof		[XP]	Transferral of explosion outside not possible	-- -- Class I, Div. 1	-- -- Class I, Div. 1	
Optical radiation		Eex op Ex op	Limit, prevent, etc., transfer of energy from optical radiation	1 or 2 1 or 2	EN 60079-28 IEC 60079-28	Optoelectronic devices, e.g. with optical waveguide

7 IIC CLASSIFICATION PER CENELEC/IEC/NEC 505, EXPLOSION SUB-GROUP GASES AND VAPOURS

	T1	T2	T3	T4	T5	T6
I	Methane	--	--	--	--	--
IIA	Ammonia Methane Ethane Propane	Ethyl alcohol Cyclohexan n-Butane n-Hexane	Fuels in general Jet fuel Heating oils	Acetaldehyde	--	--
IIB	Town gas Acrylonitrile	Ethylene Ethylene oxide	Ethylene glycol Hydrogen sulphide	Ethyl ether	--	--
IIC	Hydrogen	Ethyne (acetylene)	--	--	--	Carbon disulphide