



12 Appendix

12.1 Check list and inquiry form for explosion-proof drives

The following check list will help you to determine the necessary information for specifying the unit properties and unit categories of drives that are used in potentially explosive atmospheres.

12.1.1 Check list for explosion-proof drives

Step	Criterion	Condition	Decision	Continue with step
1	Potentially explosive mixture of air and	Gas		2
		Dust		7
For gas				
2	Drive will be installed in	Zone 1		3
		Zone 2		5
3	In the case of zone 1, the protection type of the motor is prescribed by the customer as	Flameproof enclosure (d)		4
		Increased safety (e)		5
4	In the case of motors with flameproof enclosure, design of the terminal box (TB)	TB with flameproof enclosure (d)		5
		TB with increased safety (e)		
5	Group specification	IIA		6
		IIB		
		IIC		
6	Temperature class (for gas/air mixtures)	T3		9
		T4		
		T5 (only with flameproof enclosure)		
		T6 (only with flameproof enclosure)		
For dust				
7	Drive will be installed in	Zone 21		8
		Zone 22 (flammable lint)		
		Zone 22 (non-conducting dust)		
		Zone 22 (conducting dust)		
8	Maximum permitted surface temperature (for dust/air mixtures)	T120 °C		9
		T140 °C		
		T150 °C (only for synchronous servo gearmotors)		
Company address				
9	Ms. / Mr.			
	Company			
	Department			
		Place, date		

**Notes on the individual items:****Step 1**

Categorization of the potentially explosive atmosphere into gas or dust.

Step 2

Zone categorization according to the installation location of the drive. The owner is responsible for the zone categorization according to directive 99/92/EC. Assistance can be obtained from the TÜV (German Technical Control Board), German Institutions for Statutory Accident Insurance and Prevention or expert offices:

- Zone 1: Potentially explosive gas mixtures are to be expected in normal operation.
- Zone 2: Potentially explosive gas mixtures are not to be expected in normal operation and if they occur at all, then only briefly.

Step 3

Protection types of the motor for use in zone 1.

- Flameproof enclosure (d)

Potentially explosive mixtures can penetrate the equipment, the mixture inside the housing can be ignited → Design measures prevent ignition of the external atmosphere

- Increased safety (e)

Potentially explosive mixtures can penetrate the equipment, no sources of combustion in or on the equipment → No ignition of the gas mixture.

Step 4

Design of the terminal box in the case of motors with flameproof enclosure with protection type

- Flameproof enclosure (d)

When this terminal box version is selected, it is essential to take account of the permitted cable bushings (conduit system, cable glands, etc.). In addition, the thread type of the screw fitting (ISO or NPT) must be specified.

- Increased safety (e)

When this terminal box version is selected, the cable entry design can be simpler. It is merely necessary to use an Ex-certified screw fitting.

Step 5

Group II is divided into 3 subgroups according to substance.

- All protection types

Electrostatic requirements for plastic surfaces (including paint). As a consequence, the EX designation of protection types "e" and "nA" (previously II) is changed to IIA, IIB or IIC, depending on the plastic surfaces or paint used.

- Additionally for flameproof enclosure (d)

Here, the subgroup determines the parameters of the ignition gap.

Refer to the relevant published tables, e.g. Nabert/Schön, "Kennzahlen brennbarer Gase und Dämpfe" ("Classifications of flammable gases and vapors"), Deutscher Eichverlag GmbH, D-38102 Braunschweig, Germany.



Step 6

Each of the temperature classes represents the assured maximum surface temperatures of the drive. For information about the temperature classes of the hazardous materials, refer to step 5:

- T3: Max. permitted surface temperature: 200 °C
- T4: Max. permitted surface temperature: 135 °C
- T5: Max. permitted surface temperature: 100 °C
- T6: Max. permitted surface temperature: 85 °C

Step 7

Zone categorization according to location where the drive is used. According to Directive 99/92/EC, the owner is responsible for the zone categorization. Assistance can be obtained from the TÜV (German Technical Control Board), German Institutions for Statutory Accident Insurance and Prevention or expert offices:

- Zone 21: Potentially explosive dust/air mixtures are to be expected in normal operation.
- Zone 22: Potentially explosive dust/air mixtures are not to be expected in normal operation and if they occur at all, then only briefly.

Group III is divided into 3 subgroups according to substance.

Group	Suitable for atmospheres with	Minimum degree of protection IP
IIIA	Inflammable fluffing	5x
IIIB	Non-conducting dust	5x
IIIC	Conducting dust	6x

Step 8

The maximum surface temperature of a drive in dust/air mixtures. The value is specified in °C. The maximum surface temperature of synchronous servo gearmotors is 150 °C.

For information about this, refer for example to: BIA-Report "Brenn- und Explosionskenngrößen von Stäuben" (Report no. 3051 of BG Institute for Occupational Safety, "Combustion and explosion characteristics of dusts"), Hauptverband der gewerbl. Berufsgenossenschaften, D-53757 St. Augustin, Germany



Appendix

Check list and inquiry form for explosion-proof drives

12.1.2 Inquiry form for explosion-proof drives

Customer data											
Company:						Customer no.:					
Department											
Name						Tel.:					
Street / P.O. Box:						Fax:					
Zip code/city:						Email:					
Your contact person at SEW-EURODRIVE											
Name:						Tel.:					
Technical office:						Fax:					
Technical data											
Quantity:						Desired delivery date:					
Catalog designation:											
Gear unit type											
<input type="checkbox"/> Helical gear unit		<input type="checkbox"/> Parallel-shaft helical gear unit		<input type="checkbox"/> Helical-bevel gear unit		<input type="checkbox"/> Helical-worm gear unit		<input type="checkbox"/> SPIROPLAN®			
<input type="checkbox"/> Multi-stage gear unit											
Power: kW		Output speed: rpm		Output torque: Nm							
Cycles/hour: c/h											
<input type="checkbox"/> 1-shift operation		<input type="checkbox"/> 2-shift operation		<input type="checkbox"/> 3-shift operation							
<input type="checkbox"/> Regular		<input type="checkbox"/> Irregular		<input type="checkbox"/> Very irregular							
Mounting position						Housing type					
M1	M2	M3	M4	M5	M6	Pivoted	<input type="checkbox"/> Foot-mounted	<input type="checkbox"/> Flange (bore)	<input type="checkbox"/> Flange (thread)		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
						<input type="checkbox"/> Torque arm	Other:				
Shaft type											
<input type="checkbox"/> Solid shaft with key				<input type="checkbox"/> Shrink disk				Shaft/hollow shaft Ø mm			
<input type="checkbox"/> Hollow shaft with key				<input type="checkbox"/> TorqLoc®				Flange Ø mm			
Shaft position (for angular gear units)				Terminal box position				Cable entry			
<input type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> AB	<input type="checkbox"/> 0° (R)	<input type="checkbox"/> 90° (B)	<input type="checkbox"/> 180° (L)	<input type="checkbox"/> 270° (T)	<input type="checkbox"/> X	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
Degree of protection				Thermal class				Surface/corrosion protection			
<input type="checkbox"/> IP54	<input type="checkbox"/> IP55	<input type="checkbox"/> IP65	<input type="checkbox"/> 130 (B)	<input type="checkbox"/> 155 (F)	<input type="checkbox"/> KS	<input type="checkbox"/> OS1	<input type="checkbox"/> OS2	<input type="checkbox"/> OS3	<input type="checkbox"/> OS4		
Line voltage: V											
Line frequency:		<input type="checkbox"/> 50 Hz	<input type="checkbox"/> 60 Hz	Connection type:		<input type="checkbox"/> Δ	<input type="checkbox"/> Y				
<input type="checkbox"/> For inverter operation				Max. frequency: Hz				Control range:			
Typical application check											
Supply voltage:				Typical application				Deviations			
				400 V, ± 5 %							
Installation:				Without line filter, choke, without sine filter							
Frequency inverter:				MOVITRAC® B, MOVIDRIVE® B							
Motor cable / permitted voltage drop:				100 m, max. 10 V							
Rated motor voltage:				230 V / 400 V, 50 Hz							
Required options						Other options:					
<input type="checkbox"/> Brake		Voltage: V		Braking torque: Nm							
<input type="checkbox"/> Manual brake release		<input type="checkbox"/> HR		<input type="checkbox"/> HF							
<input type="checkbox"/> Forced cooling fan		Forced cooling fan voltage: V									
<input type="checkbox"/> Motor protection: TF											
<input type="checkbox"/> Encoder											
<input type="checkbox"/> Inverter											
<input type="checkbox"/> RAL 7031		<input type="checkbox"/> RAL									
Special ambient conditions											
Temperature fr. °C to °C				<input type="checkbox"/> Operation outdoors				<input type="checkbox"/> Installation altitude > 1000 m above msl			
Other ambient conditions:											
Other:											