

## Safety Aspects Integrated Drives

### Document history

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<b>Doc. Rev.</b>	<b>Date</b>	<b>Author(s)</b>	<b>Change(s)</b>	<b>Status</b>
1.0	2007-03-30	O. Lehmann	Initial document	released
1.1	2010-06-25	A. Renggli	Various additions	released
2.0	2014-10-29	M. Mildner	CID / minor changes	released

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## Overview Service Bulletins Integrated Drives

### SB-60 Overview of Integrated Drives

- General product description
- Drive unit product lines and related capacitor series
- Function levels and configurations
- Description of module components
- Technical specifications
- Overview of the product range
- Type designation

### SB-61 Drive Unit

- Drive unit product lines and related capacitor series
- Description of the drive unit components

### SB-62 Introduction to Stepping Motors

- Principal function of stepper motors
- Control system of the drive unit

### SB-63 Electrical Installation ID-400

- Stepping driver control signals and connections for EXPERT ID

### SB-64 Electrical Installation ID-1200

- Stepping driver control signals and connections for EXPERT ID

### SB-65 Electrical Installation ID-2800

- Stepping driver control signals and connections for EXPERT ID

### SB-66 Electrical Installation ID-5400

- Stepping driver control signals and connections for EXPERT ID

### SB-67 Step/Direction; Clockwise / Counter clockwise (CW/CCW) Interface

- Stepping driver signals
- Stepping driver timing diagram

### SB-68 Software Protocol Interface RS-232

- Specification of the interface
- Frame structure
- Communication protocol between the ID and the host system

### SB-72 Safety Aspects of Integrated Drives

- Capacitor
- Electrical Insulation between ID and Capacitor

**DATA SHEETS** are available for each Integrated Drive

## 1 Safety aspects

### 1.1 Capacitor

Be aware that the capacitor can store electrical power.

### 1.2 Electrical Insulation

The electrical insulation between the bulkhead mounting flange and the capacitor mounting flange is achieved by the IFLEX™ coupler and the mounting tube, using highly insulating PEEK material. The dimensions of the coupler and the mounting tube are chosen such that their insulation voltage is generally in the range of 50% to 70% of the respective capacitor's stand-off voltage (**working voltage**). For some capacitors, though, this insulation voltage will even cover the full stand-off voltage. The former is referred to as "reduced voltage", whereas the latter is referred to as "full voltage". The type designation of the selected product will also reflect the respective specification.

The calculation of the isolation distance is based on the norm EN 50178 (norm for high voltage systems).

The following terms and conditions are based:

- Degree of pollution: 1
- Over voltage class: 1
- Safety factor: 7.7

The isolation distance is calculated on the formula shown in Figure 1.

$d = \frac{U_z - 1.35}{30 * p}$	d     distance [cm] U <sub>z</sub> ignition voltage [kV] P     pressure in [atm]
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**Figure 1: Formula to calculate the isolation distance**