# SAFETY FUNCTIONS IN THE DRIVE

## BASIS FOR SAFETY

### COMPACT

In the Compact variant, the COMBIVERT F6 and S6 drive controllers are equipped with Safe-Torque-Off (STO).

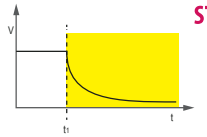
## SAFETY FUNCTIONS WITH SPEED AND POSITION MONITORING

### APPLICATION

The device variant Application is available in two versions. In addition to STO, Module 1 adds safe brake control (SBC) which provides a safe 24 V supply for the brakes.
Module 3 offers safe motion functionality according to IEC 61800-5-2 through speed and position detection using encoders.
The error reaction time is shortened and costs are reduced by reducing the number of separate protective devices. Module 3 also offers the option of controlling all available safety functions and limit values via Safety over EtherCAT (FSoE).

**COMPACT** | **APPLICATION**

**on board**

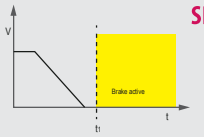


STO
Safe Torque OFF

**Module 1**

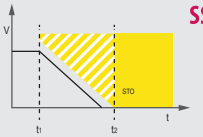
STO
Safe Torque OFF

+

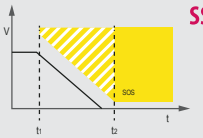


SBC
Safe Brake Control

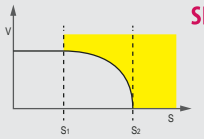
**Module 3**



SS1
Safe Stop 1

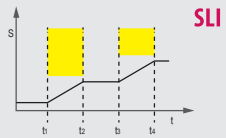


SS2
Safe Stop 2

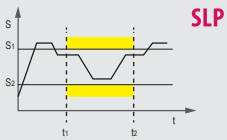


SEL
Safe Emergency Limit

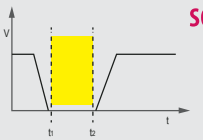
Safety over EtherCAT®



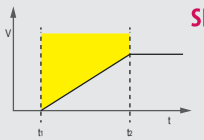
SLI
Safely-Limited Increment



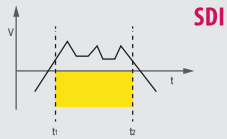
SLP
Safely-Limited Position



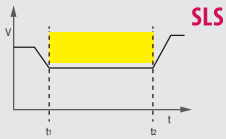
SOS
Safe Operating Stop



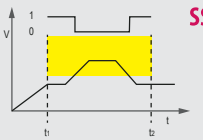
SLA
Safely-Limited Acceleration



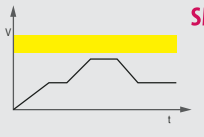
SDI
Safe Direction



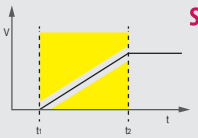
SLS
Safely-Limited Speed



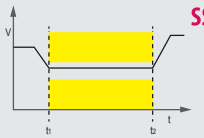
SSM
Safe Speed Monitor



SMS
Safe Maximum Speed



SAR
Safe Acceleration Range



SSR
Safe Speed Range

## ENCODERLESS SAFETY FUNCTIONS

### PRO

The Pro device variant of the COMBIVERT F6 and S6 drive controllers offers advanced safety functions without having to use a safety encoder. The device determines the safe velocity parameters from the pulse width modulation (PWM) of the motor supply.

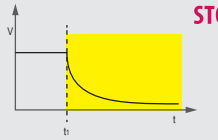
In addition to STO, Module 5 is equipped with a safe brake control (SBC), which provides a safe 24 V supply for braking operation as well as a monitoring of the switching status of the brake via microswitch evaluation.

Module 5 also offers the option of controlling all available safety functions via Safety over EtherCAT (FSoE).

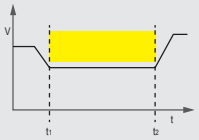
### PRO

**Module 5**

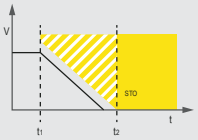
Safety over EtherCAT®



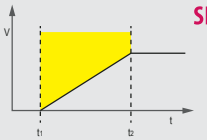

Safe Torque OFF



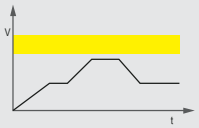

Safely-Limited Speed



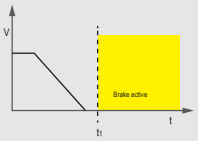

Safe Stop 1



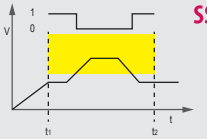

Safely-Limited Acceleration



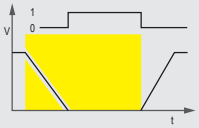

Safe Maximum Speed




Safe Brake Control




Safe Speed Monitor




Safe Door-Lock Control

### WHY USE DRIVE-BASED SAFETY (SAFE MOTION)?

- Less wiring – remove contactors and other traditional safety components
- Fast reaction – direct handling inside the drive
- Easy to operate – up to 8 different safety setups per function
- Cost savings compared to traditional safety solution