LOW VOLTAGE AC DRIVES

ABB industrial drives
Safety functions modules, FSO-12 and FSO-21

ACS880 industrial drives has high-performance integrated safety functionalities for the safe operation of machines and processes. The plug-in safety functions module guarantees a cost efficient and compact solution that enables increased productivity of the applications.

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Make it safe by doing things smarter

Maximized safety and conformity
The TÜV certified safety functions module with the highest safety performance available in machinery safety (SIL 3 / PL e), helps make your machines and processes safe.

Increased productivity by doing things smarter
Minimize downtime and waste by keeping the application in control in all situations. This is achieved with functions like safely limited speed (SLS), which enables keeping the process running instead of stopping it.

Compact and cost effective solutions
The integrated drive-based safety solution minimizes engineering and installation costs as well as the need for required installation space. This solution eliminates the need for most of the external components and a separate cabinet. Further cost saving and improved process reliability is gained with the safe speed estimation feature, which eliminates the need for external encoders.

Flexibility and ease of use
ABB drive-based safety solutions support both safety I/O and PROFIsafe communication to meet the needs of all applications. Verification and commissioning of complete safety solutions is made easy and simple with ABB graphical engineering tools. With these, it is possible to verify and document the safety system according to EN ISO 13849-1 and IEC 62061 as well as easily configure safety functions with a clear visualization of the safety functionality.
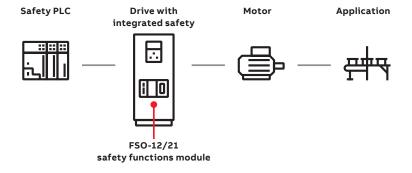
Technical data

Safety data	SIL 3 (IEC 61508, 62061, 61511, 61800-5-2) PL e & cat. 3 (ISO 13849-1)
Safety I/Os (FSO-12 and FSO-21)	Inputs: 4 redundant or 8 single Outputs: 3 redundant or 6 single
Supported safety protocols	PROFIsafe over PROFINET [2]
Supported safety encoders (FSE-31)	Differential incremental HTL encoder
Functionality of different safety options	
Safety functions	Safe torque off, STO Safe stop 1 (SS1-t, SS1-r) Safe stop emergency, SSE Safely limited speed, SLS [3] Variable safely limited speed, varSLS [3] Safe maximum speed, SMS [3] Safe brake control, SBC Preventation of unexpected start-up, POUS Safe speed monitoring, SSM (3) [4] Safe direction, SDI [1], [4] PROFIsafe safety communication [2]

NOTE! All the safety functions except of SDI can be realized with or without safety encoder
[1] Requires FSO-21 and FSE-31
[2] Requires FENA-21 or FPNO-21 communication adapter
[3] If safety encoder is used, FSO-21 and FSE-31 are required
[4] Available only with FSO-21

Safety PLC	Drive with integrated safety	Motor	Application

FSO-12/21
safety functions module

Typical safety functions

Master machine building with drive-based functional safety

Key features

Wide selection of ready made safety functions integrated into the drive.

Highest safety performance in machinery safety (PL e / SIL 3).

TÜV-certified components, tools and functional safety management system.

One solution for any power and voltage range
The same safety solution for a wide power (0.55 to 5600 kW) and voltage range (208 to 690 V).

Variable Safely-limited speed (SLS)
Possibility to adjust SLS speed limits based on process needs.

Suitable for various applications
Integrated safety I/O and support for PLC based safety systems (PROFIsafe over PROFINET).

Safe speed estimation
Enables safe speed monitoring without an encoder. Operation with a safety encoder is also supported. When using an encoder, the system can change to safe speed estimation without interruption in case of encoder failure.

Easy safety verification and documentation tool
Safety calculations and documentation are made easy with the ABB Functional safety design tool (FSDT-01).

Easy commissioning by graphical user interface with visualization of the safety functionality.