The 5SM6 AFD unit – order now!

5SM6011-2 AFD unit (16 A)			
Miniature circuit breaker 1+N, 6 kA, 1 MW (16 A)			
Type	**Current**	**Characteristic B**	**Characteristic C***
MCB 1+N ,1 MW	10 A	5SY6010-6	5SY6010-7
MCB 1+N, 1 MW	13 A	5SY6013-6	5SY6013-7
MCB 1+N, 1 MW	16 A	5SY6016-6	5SY6016-7
5SM6021-2 AFD unit (16 A)			
RCBO type A, 6 kA, 30 mA, 2 MW			
Type	**Current**	**Characteristic B**	**Characteristic C***
RCBO 1+N, 2 MW	10 A	5SU1356-6KK10	5SU1356-7KK10
RCBO 1+N, 2 MW	13 A	5SU1356-6KK13	5SU1356-7KK13
RCBO 1+N, 2 MW	16 A	5SU1356-6KK16	5SU1356-7KK16
RCBO type F, 10 kA, 30 mA, 2 MW			
RCBO 1+N, 2 MW	10 A	5SU1354-3KK10	5SU1354-4KK10
RCBO 1+N, 2 MW	13 A	5SU1354-3KK13	5SU1354-4KK13
RCBO 1+N, 2 MW	16 A	5SU1354-3KK16	5SU1354-4KK16

5SM6014-2 AFD unit (40 A)			
Miniature circuit breaker 1+N, 6 kA, 1 MW			
Type	**Current**	**Characteristic B**	**Characteristic C***
MCB 1+N, 1 MW	20 A	5SY6020-6	5SY6020-7
MCB 1+N, 1 MW	25 A	5SY6025-6	5SY6025-7
MCB 1+N, 1 MW	32 A	5SY6032-6	5SY6032-7
MCB 1+N, 1 MW	40 A	5SY6040-6	5SY6040-7
Compatible busbars (10 mm², cutable):			
Busbar, single-phase, gray (56 MW, 962 mm)			5ST37641
Busbar, single-phase, blue (56 MW, 962 mm)			5ST37651
Busbar, 3-phase, gray (58 MW, 1,032 mm)			5ST37401
Power supply terminals			
Power supply terminal 25 mm² short			5ST3768
Power supply terminal 25 mm² long			5ST3771-1
Matching end caps			
For busbar, single-phase, gray			5ST3766
For busbar, single-phase, blue			5ST3767
For busbar, 2/3-phase, gray			5ST3750

5SM6024-2 AFD unit (40 A)			
RCBO type A, 6 kA, 30 mA, 2 MW			
Type	**Current**	**Characteristic B**	**Characteristic C***
RCBO 1+N, 2 MW	20 A	5SU1356-6KK20	5SU1356-7KK20
RCBO 1+N, 2 MW	25 A	5SU1356-6KK25	5SU1356-7KK25
RCBO 1+N, 2 MW	32 A	5SU1356-6KK32	5SU1356-7KK32
RCBO 1+N, 2 MW	40 A	5SU1356-6KK40	5SU1356-7KK40
RCBO type F, 10 kA, 30 mA, 2 MW			
RCBO 1+N, 2 MW	20 A	5SU1354-3KK20	5SU1354-4KK20
RCBO 1+N, 2 MW	25 A	5SU1354-3KK25	5SU1354-4KK25
RCBO 1+N, 2 MW	32 A	5SU1354-3KK32	5SU1354-4KK32
RCBO 1+N, 2 MW	40 A	5SU1354-3KK40	5SU1354-4KK40
Compatible busbars (10 mm², cutable):			
Busbar, 2-phase, gray (56 MW, 996 mm)			5ST37351
Busbar, 4-phase, gray (52 MW, 926 mm)			5ST37461
Matching end caps			
For busbar, 2/3-phase, gray			5ST3750
For busbar, 4-phase, gray			5ST3718

* Characteristic C is needed for higher starting currents, e.g. for fluorescent lighting in industrial buildings.

Order now

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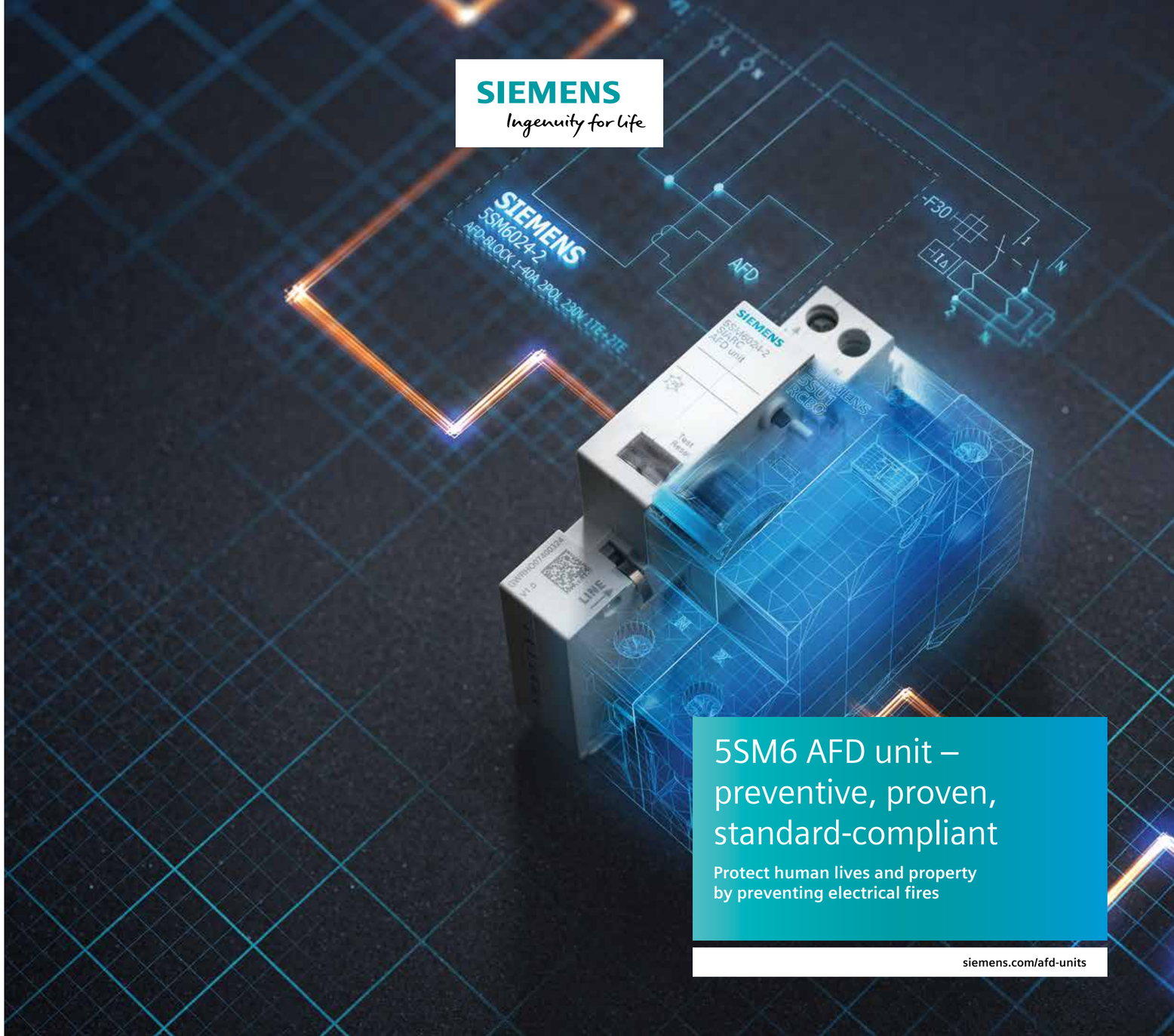

5SM6 AFD unit – preventive, proven, standard-compliant

Protect human lives and property by preventing electrical fires

siemens.com/afd-units

Maximum safety in buildings

Continuous protection

Electrical fires cost many human lives and major financial losses every year. That's why it is an urgent need to ensure appropriate protection for electrical installations in buildings. The ideal technical solution for all hazard sources has a name: SENTRON. This consistent portfolio contains all the products necessary to provide reliable protection for people and systems.

An essential component is the 5SM6 arc fault detection (AFD) unit, which has been available since 2012 and is the only proven technology to protect against fires caused by dangerous serial arcing faults. The new standard IEC 60364-4-42 strongly recommends the installation of AFD units in specific locations of use as the recognized state-of-the-art technology – and with Siemens, the AFD unit is already available for reliable use.

Contents

approx. 25,000
people die in Europe every year due to fires*

about 30% of all fires are caused by electricity*

more than **2 million** fires are reported in Europe per year*

* Consumer fire safety (2009): European statistics and potential fire safety measures

Electricity as a cause of fire

Even the slightest faults in electrical installations can have serious consequences. Faulty power cables pose a particular risk. Mechanical stresses or damaged insulations cause dangerous arcing faults, which can lead to fires. About one-third of all building fires are caused by electricity, and approximately 30 percent of these fires can be traced back to defects in the electrical installation itself. The 5SM6 AFD unit prevents electrical fires by identifying faults and safely disconnecting the circuit before the wires overheat.

Better to play it safe

End-to-end protection concept

The Siemens AFD unit offers preventive protection against electrical fires. The protection devices can be flexibly used and are available in two versions, for combined use with miniature circuit breakers (MCBs) or with residual current operated circuit breakers (RCBOs). With the extensive range of accessories, numerous additional functions can be realized quickly and easily.

The AFD unit is part of a consistent, mutually coordinated product portfolio offering comprehensive safety in electrical installations.

State-of-the-art protection

According to the international standard IEC 60364-4-42, AFD units are strongly recommended throughout Europe as the recognized state-of-the-art technology in specific locations of use.

Proven technology

The AFD unit is the first device in the European IEC market to provide protection against serial arcing faults, and has proven itself in many practical applications since it was first introduced.

Already available in the second generation, the 5SM6 AFD unit comes in two versions each for circuits up to 16 A and 40 A. In addition to the new design and optimized handling, the innovative protection device excels through the patented SIARC detection technology.

siemens.com/afd-units
siemens.com/protection-concept

Highlights

- **Preventive fire protection for humans, assets, and plants**
- **A smart protection concept for modern electrical installations**
- **Recommended installation of AFD units by IEC 60364-4-42**
- **Patented SIARC technology from Siemens**

Comprehensive all-round protection for electrical installations with the SENTRON protection devices.

Identifying hazards

Highlights

- **Reliable disconnection of the circuit if hazardous arcing faults occur**
- **Recognition of harmless working arcs that do not require disconnection**

If an arc occurs in an electrical system or cable as the result of a fault, this is known as an arcing fault. The great heat involved can trigger a fire and have serious impact for people, plants and buildings.

Closing the safety gap

Electrical installation circuits are usually safeguarded by miniature circuit breakers (MCBs) and residual current operated circuit breakers (RCCBs). These are not designed, however, to detect and safely disconnect serial arcing faults and do not offer adequate protection in such cases. This is where the 5SM6 AFD unit comes into play, closing the previous safety gap.

Clearly identifying hazardous arcing faults

Based on the SIARC detection methodology developed and patented by Siemens to record parallel and serial arcing faults, AFD units detect arcing faults by continuously measuring the high-frequency noise of voltage and current for their intensity, duration, and the gaps between them. The signals are analyzed by integrated filters with intelligent software. If anything unusual is detected, the protection device disconnects the circuit in fractions of a second. SIARC reliably distinguishes harmless causes of faults, such as those generated by drills or vacuum cleaners, from dangerous arcs. The result: intelligent fire prevention and thus optimal and standard-compliant comprehensive protection of people and plants.

Mandatory installation of an AFD unit according to DIN VDE 0100-420 in main locations such as barns, daycare centers and storage areas with flammable materials.






How series and parallel arcing faults occur

Serial arcing faults	Parallel arcing faults	
		
A conductor is interrupted.	Contact between phase and neutral conductor.	Contact between phase and protection conductor.

Commonest causes of arcing faults

Damaged wire insulation	Crushed cables	Broken cables
		
Damaged wire insulation, caused by nails or screws, for example, can lead to insulation faults.	If cables are run through open doors and windows, closing the doors or windows can crush the cable, damaging the insulation and leading to arcing faults.	Another source of risk are cables which break because they are bent with a too tight radius during installation. Too tightly fastened clips can damage the wire insulation as well.
UV radiation and rodent damage	**Loose contacts and connectors**	**Bent connectors and cables**
		
Outdoors, insulation faults are frequently the result of UV radiation from sunlight or damage caused by rodents.	Loose contacts in poorly mounted switches or sockets can cause dangerous arcing faults. Even beyond the socket, however, danger lurks in the form of damaged wires and loose contacts in multi-plugs or connected devices.	Arcing faults can also be caused if connectors and cables are kinked or crushed by moving furniture carelessly.

It’s time to act

Highlights

- **Arc protection is recommended for many locations, in accordance with the IEC standard 60364-4-42**
- **State-of-the-art AFD unit**
- **End-to-end protection strategy with the right combination of devices for each application**

Recommended installation of AFD units

Devices to provide protection against serial arcing faults have been a requirement for many years in North America. Siemens was the first manufacturer to introduce this technology to the IEC market in 2012 with its 5SM6 AFD unit.

According to the international standard IEC 60364-4-42, AFD units are strongly recommended all over Europe as the recognized state-of-the-art technology in specific application fields. With the publishing of the standard DIN VDE 0100-420, the installation of AFD units is now mandatory in Germany for many locations.

Advanced preventative protection against fire

RCCBs ensure protection against direct and indirect contact in cases of residual currents to ground, or the protection conductor or the occurrence of parallel arcing faults. MCBs provide protection against short-circuits and overloads.

Advanced preventative protection against fire goes a step further in providing protection against serial and parallel arcing faults. This is now achieved by the 5SM6 AFD unit in combination with 5SY MCB or 5SU1 RCBO.

The combination with the MCB is used together with an upstream RCCB, while the combination with the RCBO is used in all other applications. In the event of a fault, the protected circuit is completely disconnected from the mains supply.

The scope of protection offered by the 5SM6 AFD unit is rounded out by an integrated overvoltage release that disconnects when the voltage between phase conductor and neutral conductor exceeds 275 V. Thanks to the combination of the 5SM6 AFD units with MCBs or RCBOs, people and property are reliably protected against possible damage from fires caused by overloads, short-circuits, or arcing faults.

Type of faults	Protection options
Parallel (phase-neutral/phase-phase) 	MCB
Parallel (phase protection conductor) 	RCCB or RCBO
Series 	AFD unit

MCB	Miniature circuit breaker
RCCB / RCBO	Residual current protective device
AFD unit	Arc-fault detection unit

Recommended installation acc. to IEC 60364-4-42

- **Premises with sleeping accommodations**
- **Fire-propagating structures, i.e. high-rises, where a chimney effect can occur**
- **Branch circuits with a high connected load that supply electrical consumers such as washing machines, dryers, or dishwashers**

Note: already mandatory in Germany acc. to DIN VDE 0100-420

- **Woodworking industry, paper, and textile factories**
- **Storage areas with combustible materials**
- **Wooden buildings and barns**
- **Airports[2]**
- **Railway stations[2]**
- **National monuments, museums[2]**
- **Public buildings[2]**
- **Laboratories[2]**
- **Data centers[2]**

Mandatory installation in Germany acc. to DIN VDE 0100-420

- **Daycare centers[1]**
- **Retirement homes[1]**
- **Barrier-free apartments[1]**

1. Daycare centers[3]
2. Storage area with combustible materials
3. Laboratory[2]
4. Archive[2]
5. Gallery[2]
6. Joiners’ workshops
7. Data centers[2]

[1] to be provided in bedrooms and lounges
[2] With irreplaceable goods/materials
[3] Now mandatory in Germany according to DIN VDE 0100-420

Quick and easy to install

Highlights

- **Convenient self-test function**
- **Time-saving mounting – no tools required**
- **Comprehensive accessories provide expanded functionality**

Efficient selection and handling

Two versions of AFD units are available, which can be used with different MCBs (1+N in 1 MW or 2 MW) or RCBOs for rated currents of up to 16 A and up to 40 A. Both versions have an LED multifunction button. First, tripping is indicated by the LED button's lighting up. Second, it also functions as a test button. When in operation, the LED lights red.

Wide range of accessories

Whether auxiliary switches or fault signal contacts – the 5SM6 AFD units can be combined as required with many different auxiliary components from the familiar portfolio of 5SY MCBs and 5SU1 RCBOs. Thanks to the modular installation, up to 300 combinations are possible. This also enables connection to a higher-level management system.

Easy and time-saving mounting

The 5SM6 AFD units can be connected without difficulty. The MCBs or RCBOs can be mounted quickly and simply by just snapping them onto the mounting rail without the need for tools. For a fast and reliable power supply, the infeed can be implemented via a busbar assembly.

Maximum technical performance

The QR code printed on the AFD unit provides quick and comprehensive information. By means of easy code scanning, all device-specific data can be conveniently called up using any mobile device.

The newly developed product generation stands out thanks to easy handling and an essential improvement in detection.

The AFD unit in everyday use

Best possible protection of passengers

At Nuremberg's VAG*, passengers are the main focus. In order to guarantee maximum safety, the city of Nuremberg equips its subway stations with AFD units from Siemens.

*Verkehrs-Aktiengesellschaft = transport authority

Fire protection is cool

"The AFD unit and the additional protection associated with it are a further component in our protection concept, which previously was not technically possible."

Alexander Rolf, Technical Manager, cool it

Fire protection as easy as child's play

"I am glad that a safe AFD unit from Siemens has been installed!"

Alexandra Immeyer, Head of SieKids – Stromstrolche daycare center

Do you have any more questions? Our support is always at hand.

Information	Planning/order	Operation/service	Training

Technical Assistance: +49 911 895-5900
siemens.com/lowvoltage/support

It is time to act!

AFD units are strongly recommended in Europe according to the international standard IEC 60364-4-42 for reliable protection against fires in specific locations of use. In Germany the installation of AFD units has even become mandatory in many locations with the publishing of the standard DIN VDE 0100-420 in February 2016.

AFD units can be installed in single-phase AC systems with an operating current no higher than 16 A.

Recommended installation acc. to IEC 60364-4-42

- **Premises with sleeping accommodations**
- **Fire-propagating structures, i.e. high-rises, where a chimney effect can occur**
- **Branch circuits with a high connected load that supply electrical consumers such as washing machines, dryers, or dishwashers**

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