Doepke

Residual current protection for energy transition

Forward-thinking technologies demand future-proof strategies for residual current protection. For this reason, residual current protection expert Doepke offers residual current circuit-breakers specifically for the requirements of photovoltaic systems, heat pumps and electromobility.
For sustainable safety.

Use electricity safely.

DFS PV – safe energy

residual current protection for photovoltaics

sustainable safety

As energy prices have risen and the focus on sustainability has increased, the purchase of photovoltaic systems in the private and commercial sectors has become more and more attractive. When planning such a system, it is also important to think about circuit protection. Under certain conditions, it is mandatory to use residual current devices for electrical installations with a PV power supply system, for instance due to fire safety regulations in accordance with VDE 0100-705 in agricultural premises. Many manufacturers of PV systems or inverters also require the use of residual current devices in their installation instructions.

As photovoltaic systems use inverters that can cause smooth DC residual currents, residual current protection expert Doepke recommends AC/DC sensitive residual current protection devices for all PV systems.

The new DFS PV has been specially developed for use in photovoltaic systems and offers the highest possible protection level.

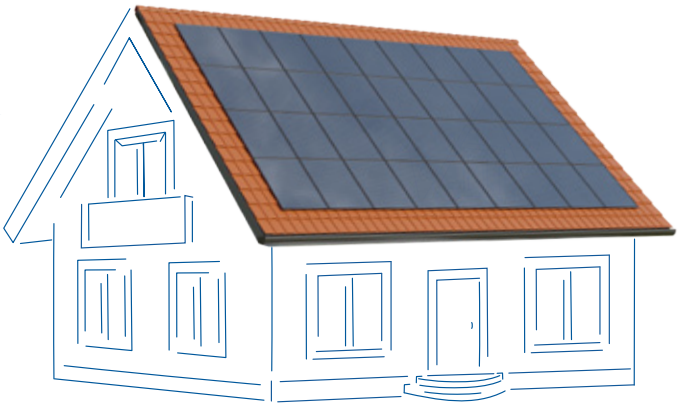
With a PV-optimised short-time delay, the AC/DC sensitive residual current circuit-breaker is resistant to surge currents. It thus provides higher system availability due to fewer false trippings.

The special design of the DFS PV ensures its reduced power loss. This makes it particularly energy-efficient.

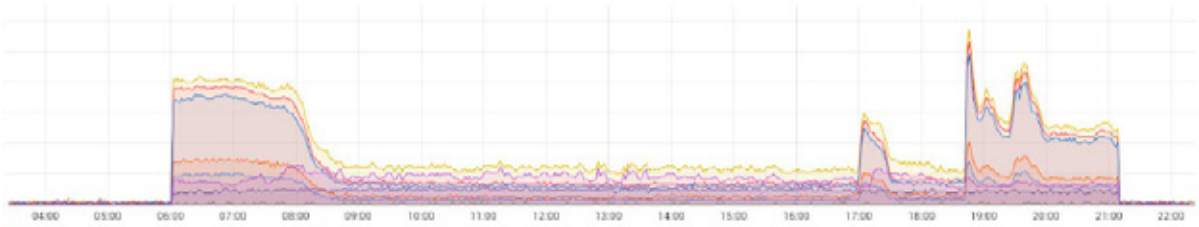
As recommended by many manufacturers of photovoltaic systems, the DFS PV is available with a rated current of 100 mA and 300 mA for increased fire protection.

The DFS PV is optionally offered in an HD (= Heavy Duty) version for use in harsh environments. In this version, it is especially resitant to dust, harmful gases, heat and cold.

- meets the normative requirements for fire-hazardous premises
- PV-optimised short-time delay
- easy to identify in the switch cabinet due to clear labeling
- energy-efficient due to low power loss
- also available in N right, HD- and 2-pole versions



product name	article no.
DFS 4 040-4/0,10-PV	09135804
DFS 4 040-4/0,30-PV	09136804
DFS 4 063-4/0,10-PV	09145804
DFS 4 063-4/0,30-PV	09146804



Operational leakage currents of a PV system over the course of the day
The measurement was carried out in eight frequency ranges from 0 Hz to >10 kHz. High-frequency leakage currents that deviate from 50 Hz also occur; therefore, an AC-DC sensitive residual current protection device is required.

DFS HP – safe heat

residual current protection for heat pumps

With increasing oil and gas prices as well as the expansion of renewable energies, the demand for heat pumps has grown worldwide. Heat pumps are not only used for environmentally friendly heat production; in the long term, heat pumps are an energy and cost-efficient alternative to traditional oil or gas heating, particularly in new buildings or well-insulated old buildings. However, new technologies also require new strategies for protection. The manufacturers' specifications do not allow for any compromises: as heat pumps use frequency inverters that can generate smooth DC residual currents, heat pump manufacturers mandate the use of AC/DC sensitive residual current devices.

HP-optimised protection

Doepke's new DFS HP (HP stands for "Heat Pump") offers the optimum protection parameters for this. The AC/DC sensitive residual current device has been specially developed for heat pump applications. The protection level not only fulfils all manufacturer requirements. The HP-optimised short-time delay also ensures increased system availability. This means that the heat pump continues to run reliably even in the event of brief impulse-shaped surge currents - without compromising personal protection, of course.

The DFS HP is also offered in a HD (= Heavy Duty) version for use in harsh environments. It is particularly resistant to dust, harmful gases, heat and cold in this version. The DFS HP is available in a HD (=Heavy Duty) version for use in harsh environments. It is particularly resistant to dust, harmful gases, heat and cold in this version. The DFS HP is available with a rated residual current of 100 mA and 30 mA or 300 mA for increased fire protection.

- meets the requirements of most heat pump manufacturers
- easy to identify in the switch cabinet due to clear labeling
- energy-eficient due to low power loss
- also available in N right, HD and 2-pole versions

product name	article no.
DFS 4 040-4/0,03-HP	09134805
DFS 4 040-4/0,10-HP	09135805
DFS 4 040-4/0,30-HP	09136805
DFS 4 063-4/0,03-HP	09144805
DFS 4 063-4/0,10-HP	09145805
DFS 4 063-4/0,30-HP	09146805

DRCBO 4 PV/HP – compact dual protection

RCD/MCB combination

The well-proven combination of residual current protection and miniature circuit breaker is the most space-saving choice for reliably protecting circuits for PV systems and heat pumps in the event of a short circuit, overload or residual currents.

Doepke offers AC/DC sensitive residual current operated circuit-breakers with integral overcurrent protection (RCBOs) in an even more compact form: the two-pole version of the DRCBO 4 B is no bigger than 2.5 module widths and the four-pole version just 4.5 module widths.

- significant space saving
- rated currents up to 32 A

New: compact design

product name	article no.
DRCBO 4 C16/0,30/3N-PV	09948434
DRCBO 4 C25/0,30/3N-PV	09948436
DRCBO 4 C32/0,30/3N-PV	09948437
DRCBO 4 C16/0,03/3N-HP	09948524
DRCBO 4 C25/0,03/3N-HP	09948526
DRCBO 4 C32/0,03/3N-HP	09948527
DRCBO 4 C16/0,30/3N-HP	09948534
DRCBO 4 C25/0,30/3N-HP	09948536
DRCBO 4 C32/0,30/3N-HP	09948537

DFS 4 EV – the safe way to fill up with electricity

residual current protection for electromobility

innovation for charging columns

With the increasing number of electric vehicles and plug-in hybrids, the charging infrastructure in public spaces continues to expand. The number of charging stations in home garages is also on the rise. Nevertheless, whether a private wallbox at home or a public charging column, charging facilities have to be designed to be completely safe in order to avoid hazardous situations or even when charging electric vehicles.

Smooth DC residual currents greater than 6 mA can occur when electric vehicles are charged. This goes beyond the design scope of conventional type A or type F residual current circuit-breakers. In the worst case, these circuit-breakers may not trip as a result of the pre-magnetisation of their summation current transformer - they "go blind". Protection against smooth DC residual currents has therefore to be guaranteed as well. For this reason, either the use of a type B residual current circuit-breaker or the use of a type A or F residual current circuit-breaker in combination with a DC residual current monitoring device in accordance to IEC 62955 is specified in the standard.

In the case of upstream type A or F residual current devices, or if the upstream protective device is unknown, protection by a type B is not adequate. The upstream residual current devices could go blind. Therefore, type B residual current devices may not be operated downstream of type A or type F RCDs.

Doepke has developed the EV (EV short for Electric Vehicles) version of its DFS residual current circuit-breaker especially for charging electric vehicles. The special feature of the EV series is the integrated DC residual current detection, which reliably identifies smooth DC residual currents and reliably disconnects them at a maximum of 6 mA. This means that DFS with the EV suffix comply with the IEC 62955 product standard in one compact device.

- tripping at max. 6 mA DC
- type A certified in accordance to IEC 62955
- maintaining the protective function of upstream residual current devices

product name	article no.
DFS4 025-2/0,03-A EV	09124018
DFS4 040-2/0,03-A EV	09134018
DFS4 040-4/0,03-A EV	09134818
DFS4 063-4/0,03-A EV	09144818
DFS4 080-4/0,03-A EV	09154818

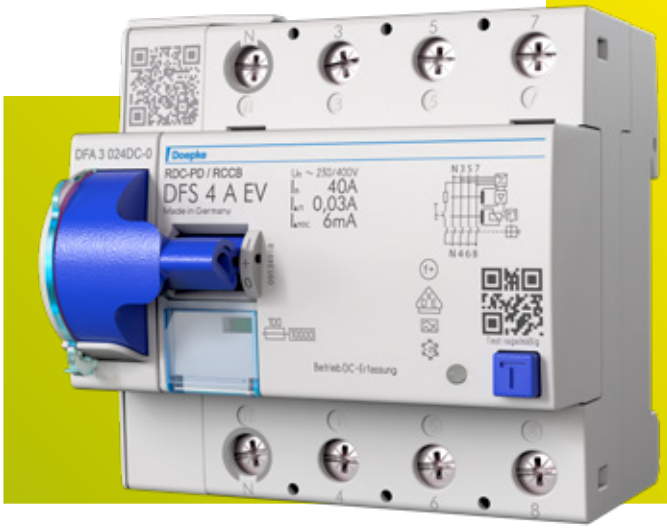
DFS A EV NA – in an emergency: OFF!

residual current protection with emergency switching-off function

The DFS A EV is also available with an emergency switching-off function. Residual current circuit-breakers of this design not only monitor the charging device, they also monitor the external emergency switching-off circuit. In the event of a hazard, one or more charging points can be switched off centrally by pressing a connected emergency stop switch or button. This provides additional safety, for example in public spaces. The DFS A EV NA has a wire break-proof emergency switching-off circuit and an integrated auxiliary switch for remote signalling of the switching status.

- optimised for wallboxes and charging columns
- DC current detection of 6 mA and emergency switching-off function in one device
- emergency switching-off circuit wire break-proof
- integrated auxiliary switch for remote signalling
- standard-compliant all-round protection, also according to IEC 62955

product name	article no.
DFS 4 025-4/0,03-A EV NA HD	09124850 HD
DFS 4 040-4/0,03-A EV NA HD	09134850 HD
DFS 4 063-4/0,03-A EV NA HD	09144850 HD



Remote switching and signalling

DFA

remote operator

After a residual current circuit-breaker has tripped, switching it back on is normally not a problem if it is easily accessible. The DFA remote operator allows you to prevent longer downtimes, even in remote installations. The residual current circuit-breaker can be monitored via the additional device and, depending on the series, can be switched on again remotely after tripping. For models with automatic reclosing equipment, power is restored automatically, 15 seconds after the RCCB is tripped – a maximum of three times.

- enables monitoring and, depending on the series, automatic switching on of the connected residual current circuit-breaker
- simple clip-on connection
- status signal via relay or semiconductor output
- DFA 2: four standard units
- DFA 3: one standard unit
- compatible with residual current circuit-breakers from the DFS 2 and DFS 4 series

product name	article no.
DFA 2-3	09100114
DFA 2-4	09100115
DFA 3 012DC-3	09100142
DFA 3 024DC-3	09100143

PREMIUM MARKEN Partner

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