Doepke

# The safe way to fill up with electricity

DFS 4 A EV — optimised for wall boxes and charging columns
— preserves the protective function of upstream residual current devices
— also reliably detects smooth DC residual currents exceeding 6 mA
— standard-compliant all-round protection in accordance with IEC 62955
DFS 4 A EV NA — safeguards charging device and external emergency stop circuit
— emergency stop circuit secure against wire breakage
DFS 6 A EV OCP HD — with integrated temperature-independent over-current release
— significant space savings

now VDE-certified to IEC 62955


www — doepke.de

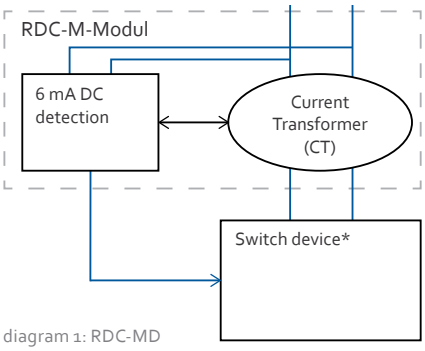
# Residual current protection for charging devices

*E-mobility is opening up a profitable future market for electrical specialists: the higher the number of electric cars on the roads, the greater the need for charging points. Residual current protection for charging columns, wall boxes and similar devices can pose a challenge, but Doepke's residual current circuit-breakers for electric vehicles (EV design) offer a problem-free solution and now comply with the new IEC 62955 product standard.*

## Reliable protection for e-mobility

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 scenario, these circuit-breakers may fail as a result of the pre-magnetisation of their summation current transformer, and this failure may go unnoticed.

The IEC 62955 standard includes a residual direct current protective device (RDC-PD) and a residual direct current monitoring device (RDC-MD) under the umbrella term RCD-DD. Residual direct current monitoring devices consist, for example, of a monitoring module for detecting smooth DC residual currents and a switching device (Graphic 1). When working with this particular combination, the installer must, however, always carefully follow the switch-off criteria required in the event of a fault.




*RCCB, RCBO, disconnector or remote-controlled switches e. g. contactor or relay

diagram 1: RDC-MD

Our DFS EV residual current circuit-breakers meet the requirements of this standard in just one device (Graphic 2). This means that they protect themselves and upstream residual current circuit-breakers reliably against failure, as well as offering users guaranteed protection against hazardous residual currents.

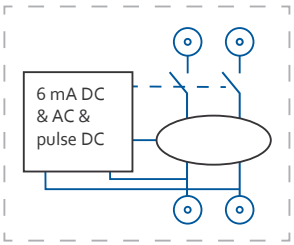


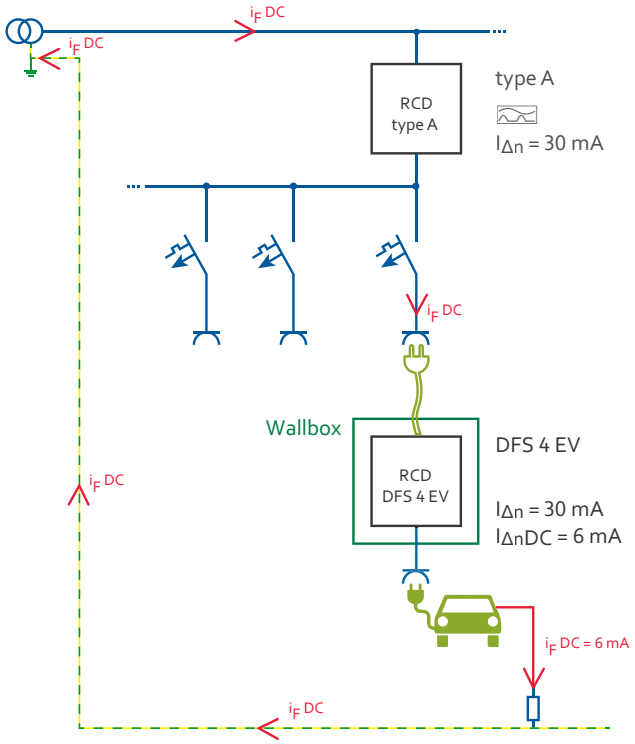

diagram 2: RDC-PD

**Choice**

Doepke's residual current circuit-breakers (EV design) are available in Type A and Type F versions. The DFS 4 A EV detects sinusoidal AC and pulsating DC residual currents, regardless of the mains voltage. Plus, the DFS 4 F EV also detects residual currents with mixed frequencies, which may occur when e-vehicles are charged. The DFS 4 F EV is also short-time delayed and has increased surge current strength. This significantly reduces the risk of nuisance tripping.

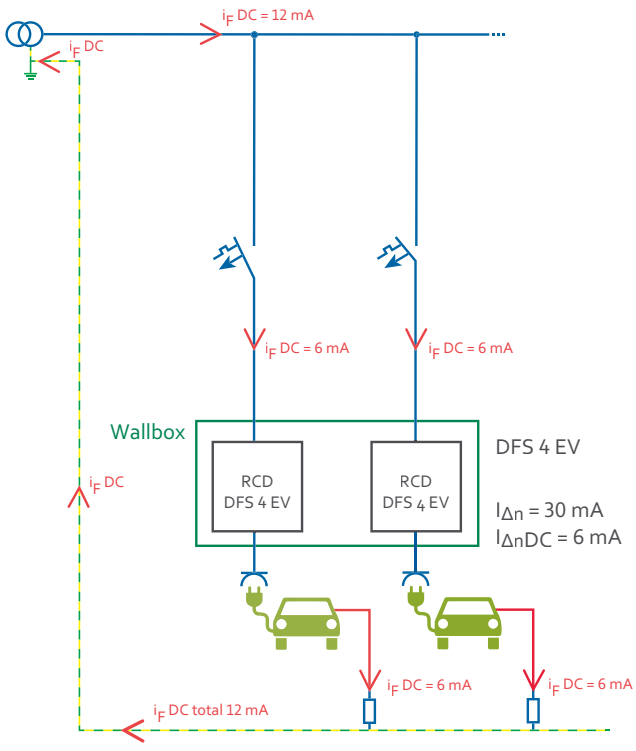
| | DFS 4 A EV | DFS 4 F EV |
|---|---|---|
| detection of pulsating and AC residual currents, not dependent on auxiliary voltage | ✓ | ✓ |
| active additional function for tripping in the event of smooth DC residual currents ≥ 6 mA | ✓ | ✓ |
| maintains the protective function of upstream type A residual current protective devices | ✓ | ✓ |
| two-pole design | ✓ | ✓ |
| four-pole design | ✓ | ✓ |
| rated current up to 80 A | ✓ | ✓ |
| no other components required per charging socket for residual current protection | ✓ | ✓ |
| sensitive to mixed frequencies | | ✓ |
| short-time delayed, increased surge current strength and lightning-resistant | | ✓ |
| certified according the new IEC 62955 standard | ✓ | |

# TN-system



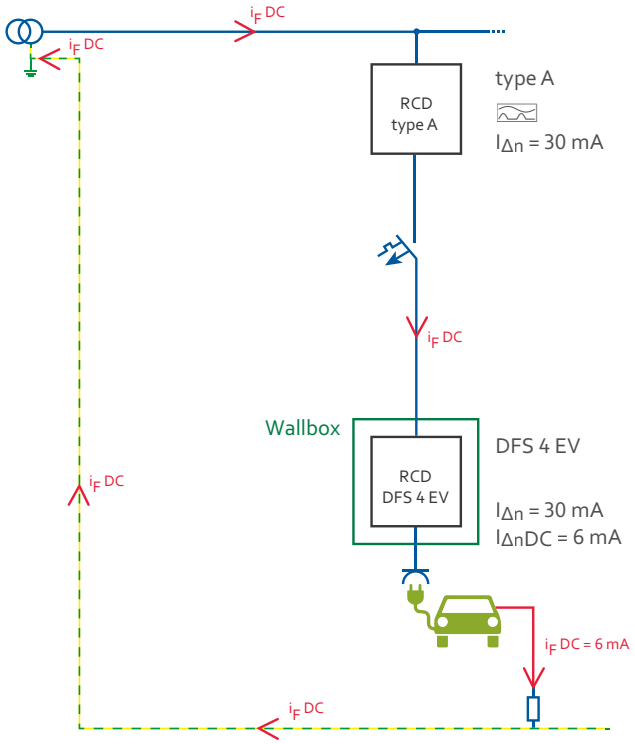

**Case 1:** The charging device is powered from an existing socket protected with a Type A residual current circuit-breaker. The standard requires protection against smooth DC residual currents above 6 mA. This protection is guaranteed by DFS 4 EV.

## TN-system

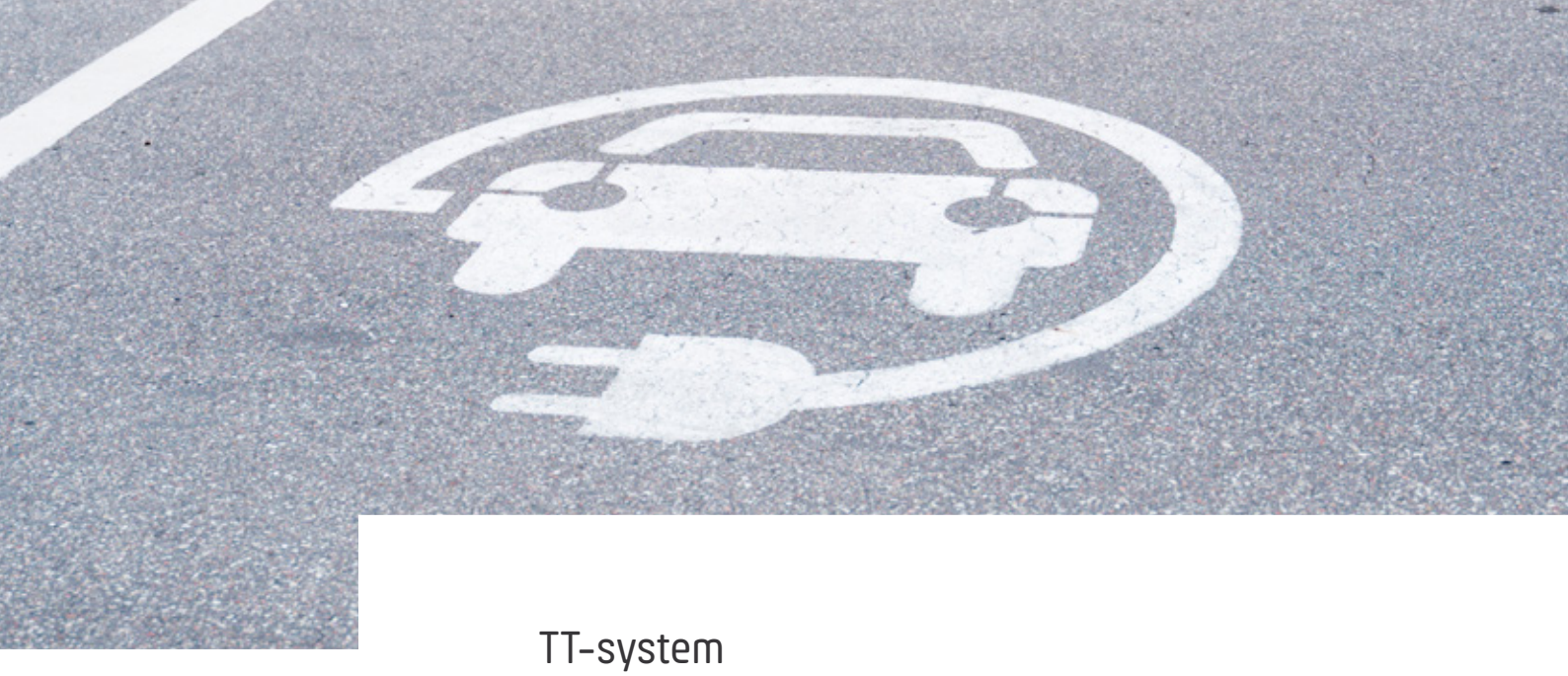



**Case 2:** The charging device has a fixed connection. In this case the installation of one DFS 4 EV per charging point is sufficient. It ensures complete protection against residual currents. There is no need for an upstreamresidual current circuit-breaker.

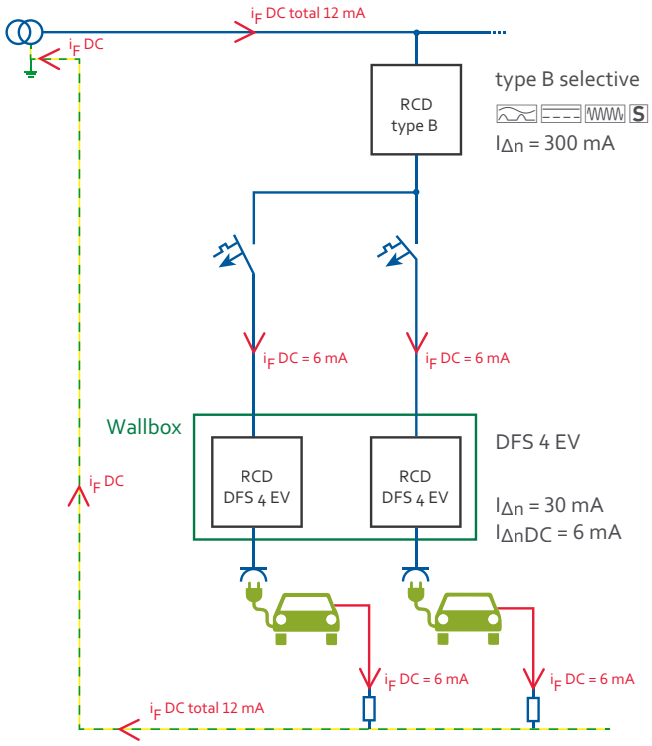
# TT-system




**Case 3:** Disconnection times are subject to stricter rules in this instance. Charging devices with a fixed connection therefore require an upstream residual current circuit-breaker. The downstream DFS 4 EV guarantees the protective function of upstream residual current circuit-breakers even in the event of smooth DC residual currents above 6 mA.



## TT-system




**Case 4:** If several charging devices are placed downstream of a residual current circuit-breaker, the latter must be AC-DC sensitive as the smooth DC residual currents can add up. The EV design provides each charge plug socket with its own residual current circuit-breaker.

**Complete solution for charging points –** Play it safe with Doepke's residual current circuit-breakers (EV-design): the DFS 4 EV devices provide a comprehensive guarantee of the required protection for charging points. Their active additional function means that they offer reliable protection for users and installations, even in the event of smooth DC residual currents above 6 mA. As an easy-to-install complete solution, they obviate the need for additional residual current operated protective devices.

# Keep a close eye on the charging station: DFA 3 remote actuator

For higher system availability in electromobility, look no further than our lightweight DFA 3 remote actuator. These devices, only 1 module width in size, are the ideal add-on for our EV-design residual current circuit-breakers, particularly when dealing with remote charging points.

The DFA 3 can be used to switch residual current circuit-breakers on and off remotely. With a semiconductor output, the current switching status of the connected RCCB (on/off) can also be transmitted. There, where allowed and permitted, the DFA 3s automatically turn the residual current circuit-breaker back on again up to three times after tripping – provided there is no error, enabling monitoring of the connected RCCB and, depending on the series, reclosing it automatically.

- simple click-on connection
- semiconductor output status message
- compact design: only one module width

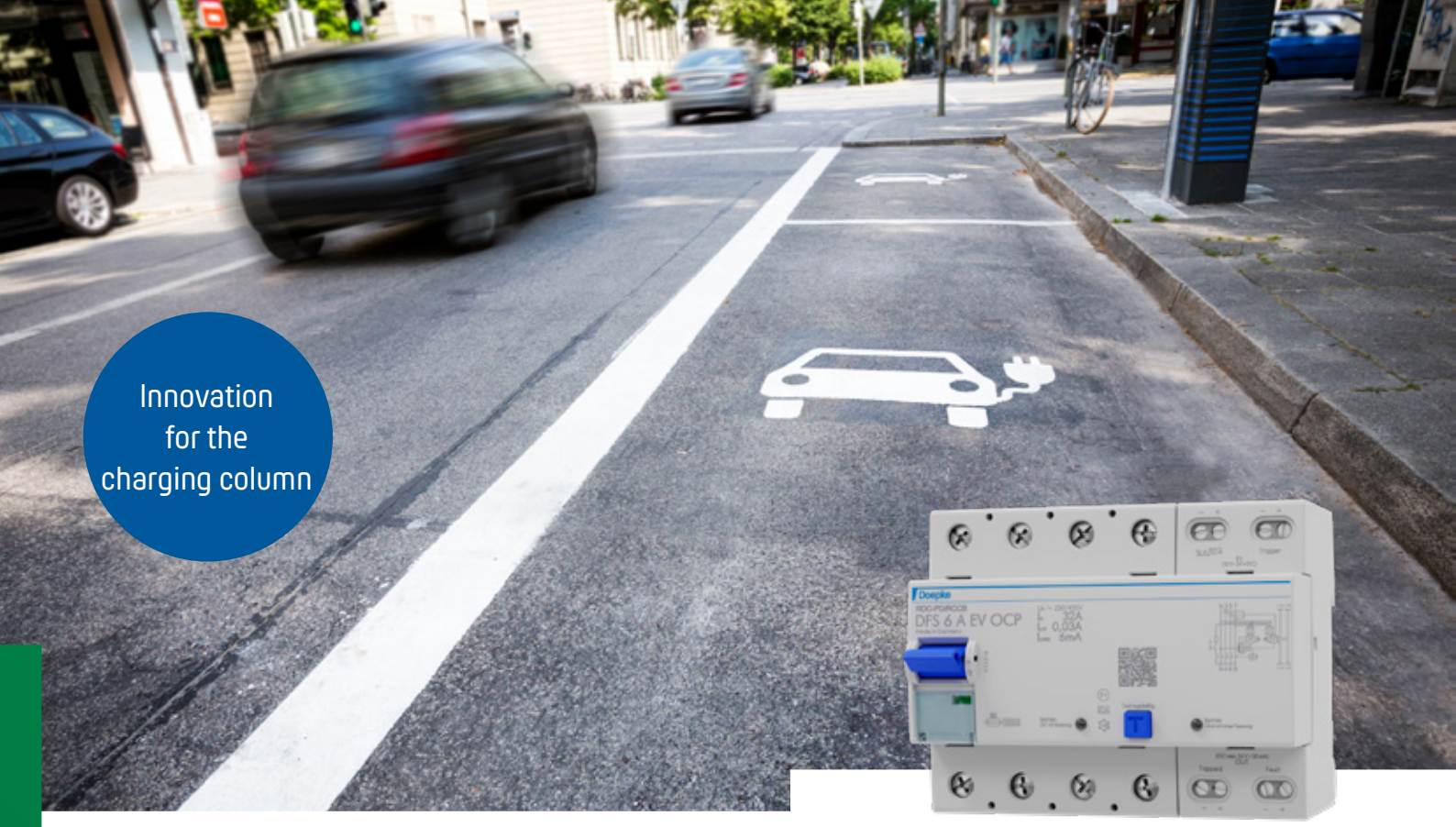

Make energy-efficient use of electricity.


Also available in N right upon request

# Residual current protection for the charging column with emergency shut-off function

The DFS 4 A EV NA provides reliable protection for electromobility charging devices. This RCCB not only monitors the charging device, but also the external emergency stop circuit. In the event of danger, one or even several charging points can be switched off centrally at the push of a button. This ensures additional safety in public areas, for example.

- optimised for wall boxes and charging columns
- DC detection from 6 mA and emergency stop function in one unit
- emergency stop circuit secure against wire breakage
- integrated auxiliary switch for remote signalling
- standard-compliant all-round protection, including to IEC 62955

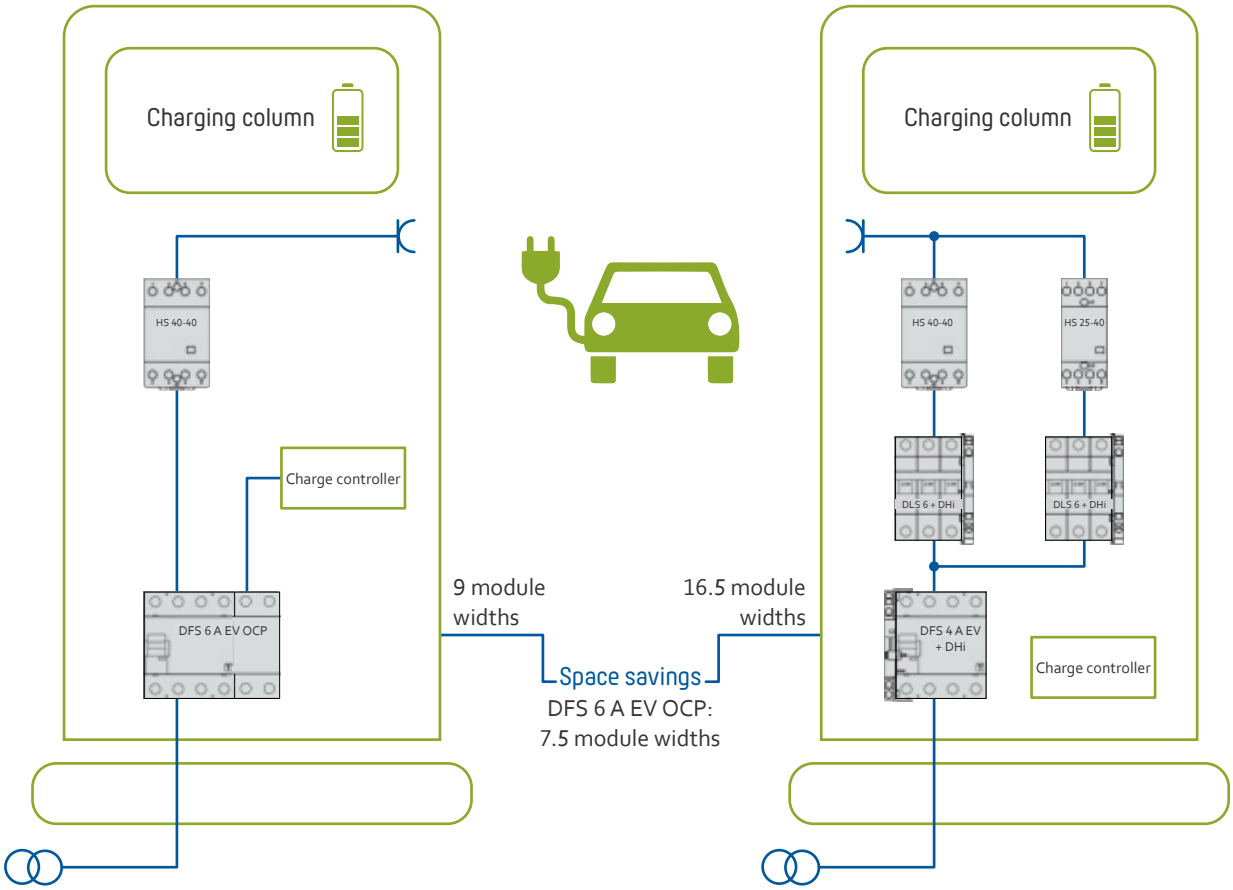



# Space-saving double protection for the charging column: DFS 6 A EV OCP HD

The DFS 6 A EV OCP HD offers residual current and over-current protection at the cost of just 6 module widths. The switch combines a pulsating and AC current-sensitive residual current circuit-breaker (EV design) with an integrated over-current release.
By reducing the number of circuit-breakers and contractors, space savings up to 7.5 module widths are possible. The over-current release is electronic and so functions independent of temperature. Heat generation due to solar radiation, for example, will therefore not result in accidentally tripping.

The residual current circuit-breaker's HD design means it is also particularly resistant to harsh environmental conditions such as heat, cold, moisture and dust. The DFS 6 A EV OCP HD may optionally be switched to a charging capacity of 16 A or 32 A.
As with all Doepke residual current circuit-breakers in the DFS EV series, the new combination switch is certified to product standard IEC 62955.

- RDC-PD with integrated temperature-independent over-current release
- 6-mA-DC detection
- IEC 62955 certified
- HD design: durable in tough environments
- switchable charging to 16 A or 32 A
- significant space savings of up to 7.5 module widths




Power supply with short-circuit back-up fuse

Power supply with short-circuit back-up fuse

We take the responsibility needed to make energy efficient and safe to use.

Melanie Brandes, Team Leader Product Management

PREMIUM MARKEN Partner

# Doepke

**Doepke** Schaltgeräte GmbH
Stellmacherstraße 11
26506 Norden

@ —— info@doepke.de
T —— +49 (0) 49 31 18 06-0
F —— +49 (0) 49 31 18 06-101

**www** —— doepke.de

article number 59 620 13 | state 08/2022