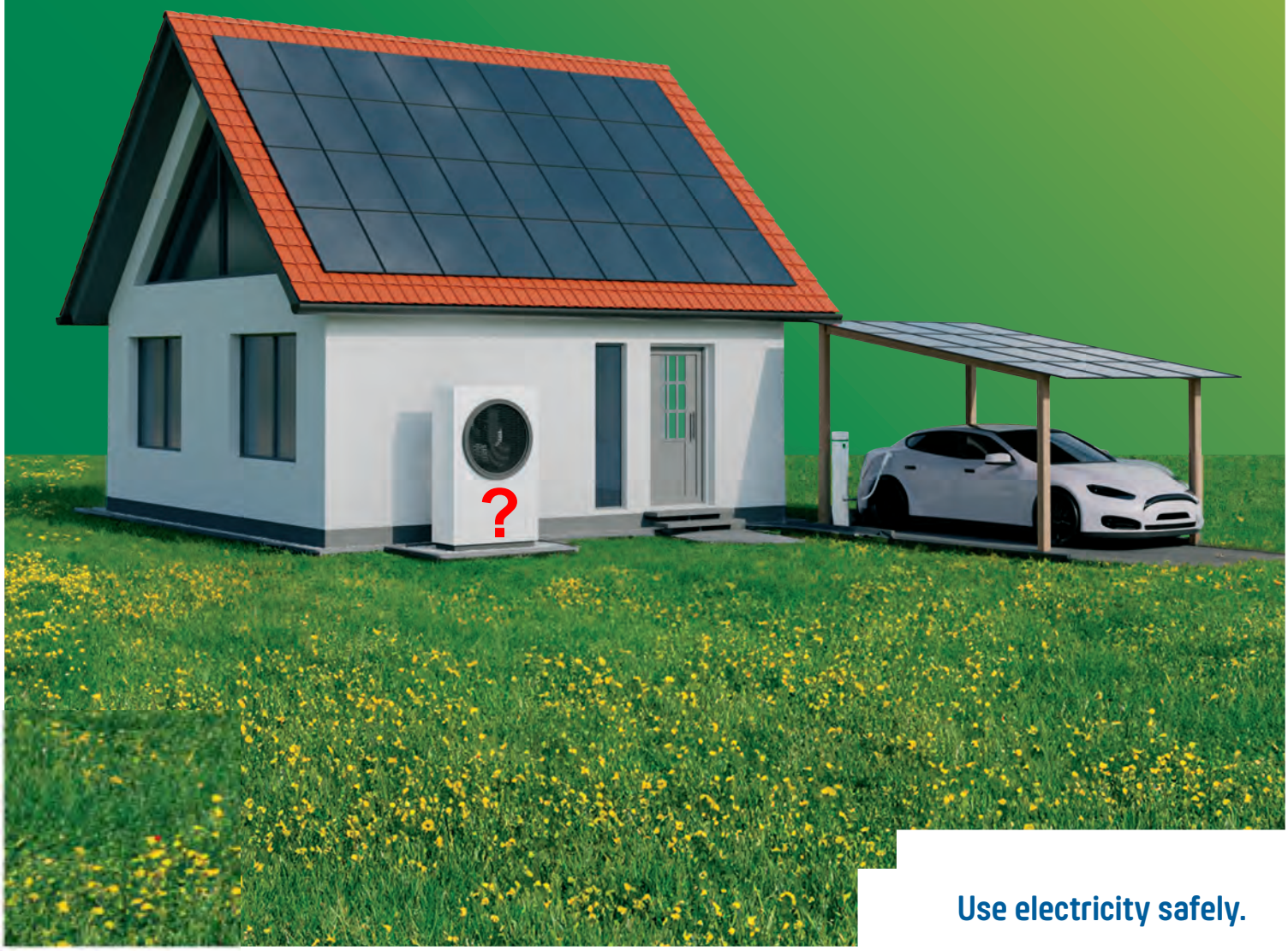
Doepke

Residual current protection for UK Heat Pumps

Modern heat pumps utilise inverters to reduce energy consumption.
The IET Wiring Regulations specify that inverters can only be connected to circuits protected by specific "Types" of residual current device - Regulation 531.3.3 For this reason, residual current protection expert Doepke offers RCCBs specifically for heat pump applications.



Use electricity safely.

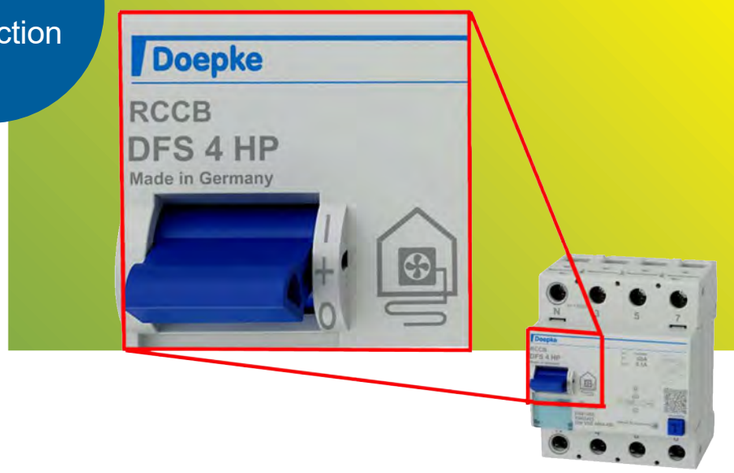
DFS HP – safe heat

residual current protection for heat pumps

The demand for heat pumps (HP) has grown worldwide, in 2023 France installed 500,000 HPs. The UK installed circa 40,000 providing ample opportunity for growth with a Government target set to install 600, 000 annually by 2028. To meet energy saving requirements and match the building heating requirements, modern HP designs* use frequency inverters to optimize the speed of the HP fan and compressor. Frequency inverters produce high frequency leakage currents and under fault conditions can generate smooth DC residual currents > 6 mA DC. Consequently connecting modern HPs to circuits containing Type A RCD protection is dangerous and does not meet the Wiring Regulations - ref 531.3.3.

* In the past, less efficient / old HPs designs with fixed speed fans and compressors, may have been used with Type A RCDs. Manufacturers of modern HPs, who understand the safety requirements of the UK wiring regulations (for example Vaillant, Worcester, Viessman..) specify the use of Type B RCDs, sometimes referred to as AC/DC sensitive residual current devices.
If the HP instructions do not give specific details on the Type of RCD that can be used safely with the equipment, the Installer must contact the HP Manufacturer for advise - See Regulation 510.3

HP-optimised protection



Doepke's New DFS HP RCCB offers optimum protection for HP applications

The HP AC/DC Type B sensitive residual current device has been specifically developed for heat pump applications. The protection level exceeds the current Type B product standard, making the HP RCCB suitable for use with modern inverters which operate at switching frequencies > 1 kHz. Many Type B RCCBs are not designed to operate above 1 kHz, resulting in unpredictable performance when associated with HPs - refer to the manufacturers instructions.

Transients associated with inverter controlled equipment can result in unwanted tripping of residual current protection devices. The Doepke HP optimised short-time delay and 3 kA surge resistance features ensures increased system availability - without compromising personal protection. These combined features ensure heat pump system availability with a reliably maintained electrical supply.

- DFS HP meets the requirements of energy efficient heat pumps
- Easy to identify in the system due to clear HP labeling
- Standard sensitivities available - check HP instructions

Example references - please see below:

product reference	description
DFS 2 040-2/0.03-HP	2P, 40A, 30mA, HP Type B
DFS 2 040-2/0.30-HP	2P, 40A, 300mA, HP Type B
DFS 4 040-4/0.03-HP	4P, 40A, 30mA, HP Type B
DFS 2 063-2/0.03-HP	2P, 63A, 30mA, HP Type B
DFS 2 063-2/0.30-HP	2P, 63A, 300mA, HP Type B
DFS 4 063-4/0.30-HP	4P, 63A, 300mA, HP Type B

DCM split load CU with HP RCCB – compact design for addition to existing installations

RCCB/MCB combinations

Flexible combination of residual current protection and miniature circuit breaker

Available with single or dual RCCBs based on the HP installation system design:

Examples 1:

Basic HP system - supply for ASHP and no ancillary pumps or immersion heaters

CU c/w 1 x 30mA Type B HP RCCB

Examples 2:

Complex HP system - supply for ASHP, ancillary single speed pumps, cylinder and buffer immersion heaters

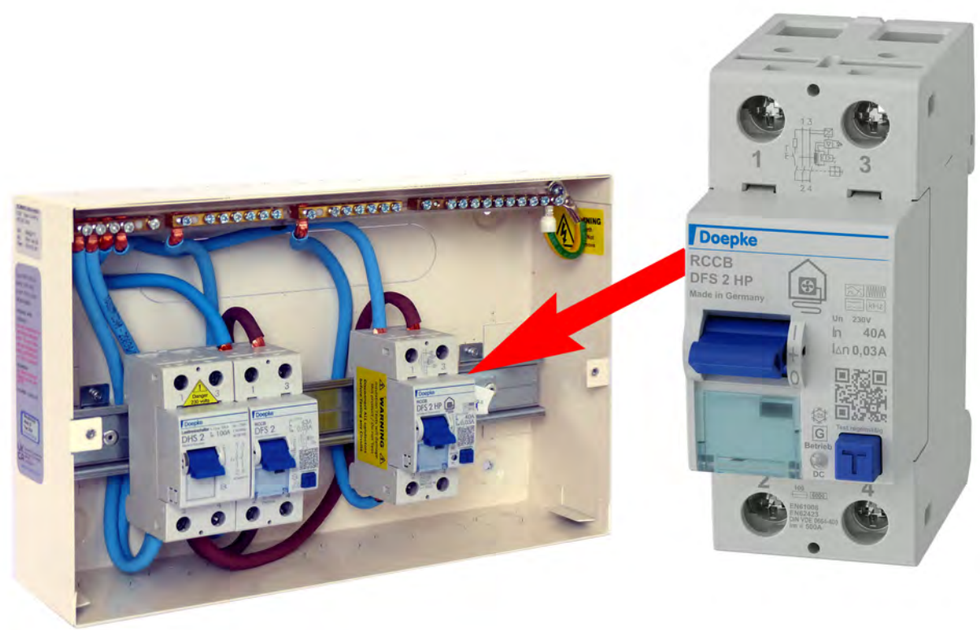
*CU c/w 1 x 30mA Type B HP RCCB and 1 x 30mA Type A RCCB for ancillary loads**

If the HP RCCB trips, the ancillary circuits still need to be powered to provide essential hot water / heating.

Type B HP RCCB 40A or 63A for inverter controlled heat pumps

Type A RCCB 63A for single speed pumps and immersion heaters

product reference	description
DCM06SL040HP	6 U/Ways, 30mA, 40A HP Type B
DCM06SL063HP	6 U/Ways, 30mA, 63A HP Type B
DCM08SL063A/040HP	8 U/Ways, 30mA, 63A Ty A, 40A HP Type B
DCM08SL063A/063HP	8 U/Ways, 30mA, 63A Ty A, 63A HP Type B



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