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WHR Single Module Heat Pump RCBO 10kA Data Sheet

Description and Features

The WHR Range RCBOs is specifically designed to meet the advanced electrical safety requirements of modern heat pump systems. While meeting the Type B device standard, WHP RCDs are also engineered to function at frequencies greater than 20k Hz, ensuring a minimum tripping threshold of 150 mA for frequencies above 1k Hz

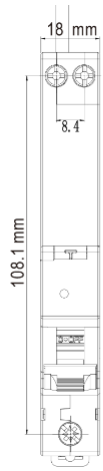
B Type HP RCBOs are Specifically Designed to:

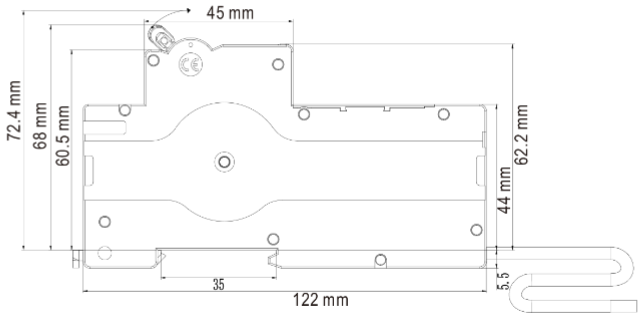
- Detect and protect against smooth DC faults.
- Operate effectively at high frequencies, such as 20k Hz or greater, making them ideal for heat pump applications.
- Ensure safety and compliance with BS 7671 standards, offering robust protection in modern electrical systems

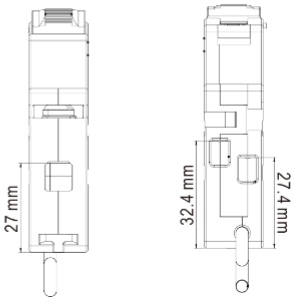
Part No	Description
WHR116B-030	B HP type Single Module 1P+N 16Amps B Curve 30mA Heat Pump RCBO 10kA
WHR120B-030	B HP type Single Module 1P+N 20Amps B Curve 30mA Heat Pump RCBO 10kA
WHR125B-030	B HP type Single Module 1P+N 25Amps B Curve 30mA Heat Pump RCBO 10kA
WHR132B-030	B HP type Single Module 1P+N 32Amps B Curve 30mA Heat Pump RCBO 10kA
WHR140B-030	B HP type Single Module 1P+N 40Amps B Curve 30mA Heat Pump RCBO 10kA

Main features

Detect smooth DC residual currents
Operate at frequencies up to 20kHz
Handle high-frequency leakage without nuisance tripping
30mA sensitivity for additional protection
Minimum 150mA trip threshold for signals exceeding 1kHz
BI-Directional
Switched Live and Neutral
Fully BS 7671 compliant – Meets UK wiring regulations







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Electrical features	Standard	IEC62423, BS EN 62423 IEC61009-1 , BS EN61009-1
	Rated current In (A)	2,4, 6, 10, 16, 20, 25, 32, 40,50
	Type	Electronic
	Type (wave form of the earth leakage sensed)	B HP Type
	Poles	1P+N(Switched Live and Neutral)
	Rated voltage Ue(V)	230
	Rated sensitivity I▲n	30mA
	Insulation voltage Ui (V)	500
	Rated frequency	50/60Hz(Operate at frequencies up to 20kHz)
	Rated breaking capacity	10kA
	Rated residual making and breaking capacity I▵m (A)	3000
	Rated impulse withstand voltage(1.2/50) Uimp (V)	4000
	Break time under I▵n (s)	≤0.1
	Dielectric test voltage at ind. Freq. for 1 min (kV)	2
	Pollution degree	2
	Thermo-magnetic release characteristic	B, C
Mechanical features	Electrical life	2, 000
	Mechanical life	10, 000
	Contact position indicator	Yes
	Protection degree	IP20
	Reference temperature for setting of thermal element (°C)	30
	Ambient temperature (with daily average ≤35 °C)	-5...+40
	Storage temperature (°C)	-25...+70
Installation	Terminal connection type	Cable/U-type busbar/Pin-type busbar
	Terminal size top for cable	10mm²
	Terminal size bottom for cable	16mm² / 18-8 AWG
	Terminal size top/bottom for Busbar	10mm² / 18-8 AWG
	Tightening torque	2.5 N*m / 22 In-lbs.
	Mounting	On DIN rail EN 60715 (35mm)
	Connection	From bottom

Temperature derating

The maximum permissible current in a circuit breaker depends on the ambient temperature where the circuit breaker is placed. Ambient temperature is the temperature inside the enclosure or switchboard in which the circuit breakers are installed. The reference temperature is 30°C Ambient temperature: -5°C~+40°C.

Temperature	- 10°C	0°C	10°C	20°C	30°C	40°C	50°C	60°C
Temperature compensation coefficient of rated current	1. 20	1. 15	1. 10	1. 05	1. 00	0. 95	0. 90	0. 85

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The WHR1 B Type RCBOs is designed to detect and trip under smooth DC faults at any level. Tested to operate at frequencies above 20kHz, with a minimum tripping threshold of 150 mA for frequencies over 1 kHz

Type B High-Performance RCBOs: Technical Overview

• **Single module:** Space saving design enables easier installation using standard busbar.

• **Compliance with BS 7671 Standards:** These devices meet the requirements set out in BS 7671, ensuring they provide the necessary protection in modern electrical installations.

• **Effective Operation at High Frequencies:** Designed to function reliably at frequencies of 20 kHz and above, making them suitable for applications involving variable-speed drives and heat pump systems.

• **Detection of Smooth DC Fault Currents:** Capable of detecting and interrupting continuous smooth DC residual currents, which is essential for comprehensive fault protection in systems

Why Type B HP RCBOs Are Important for Heat Pumps

Modern heat pumps, especially those with inverter-driven compressors, create high frequency electrical currents when converting AC to DC power. These can include smooth DC and high-frequency residual currents that regular Type B RCBOs/RCDs (designed for 50 Hz)
may not detect properly.

Not all Type B+ devices are suitable for heat pumps. That's why Whitecliffe Type B HP RCBOs designed specifically for these conditions,
are the right choice for safe and compliant installations.

What Makes Type B HP RCBOs Different?

Type B HP RCBOs are specially developed for use with heat pump systems. They meet all the requirements of standard Type B RCBOs, but go a step further—they're built to operate at frequencies above 20 kHz, which are common in modern heat pumps.

They also ensure reliable protection by tripping at a minimum threshold of 150 mA for frequencies over 1 kHz, offering an added layer of safety in high-frequency environments.

Why Some Type B RCDs/RCBOs Trip at 1 kHz

Not all Type B RCDs/RCBOs are built to cope with the high-frequency currents produced by modern heat pumps. Some models are only rated to handle frequencies up to 1 kHz, which means they can trip unnecessarily when exposed to the higher-frequency residual currents these systems generate.

This can cause nuisance tripping and unexpected downtime. That's why it's important to use a Type B HP RCBO/RCD—specifically designed to handle higher frequencies without compromising performance or reliability

Type 'B' devices are also suitable for type 'AC', type 'A' and type 'F' applications

AC - not suitable for heat pumps

A - unreliable tripping under smooth DC faults or high-frequency currents.

F - Limited high-frequency performance;
Ineffective against smooth DC faults.

B - Reliably detects and trips on smooth DC faults at all levels, though limited to frequencies up to 1 kHz.

B HP - Detects and trips on smooth DC faults at all levels. Verified to handle frequencies above 20 kHz with a minimum Tripping threshold of 150mA above 1 kHz