Amber Switch - Independent Type

Frequency Sensing Load Controller (Overfrequency)

Amber Switch is an automatic, frequency-sensing load control device. It can be used in small islanded (off-grid) power systems with renewable generation which produce a variable system frequency.

Amber Switch Independent Type (CAS-I-B*) can switch on additional loads to absorb surplus renewable generation which might otherwise be wasted. Amber Switch identifies that there is surplus generation by detecting a rise in the system frequency. This may be caused by battery inverters increasing system frequency to signal a high state of battery charge, or by low load on a generator with frequency droop.

Application of Independent Type Amber Switch

Each Amber Switch will control one appliance and is wired into the supply cord. The Amber Switch will automatically switch the appliance on when the system frequency is high and switch it off when the frequency is low. The frequency setpoint can be adjusted during installation. LED lamps indicate whether the appliance is switched on or off, and when it is about to switch. If several loads are available, and particularly on larger systems, more than one Amber Switch can be installed.

Amber Switch incorporates a number of features to help ensure stable operation of an islanded power system:

- A range of switch-on setting frequencies are available, to create a prioritised system.
- The switch-off frequency is lower than the switch-on frequency, to avoid constant switching, and provide stability.
- When the frequency goes above the switch-on setting, there is a delay before the load is connected, with a higher frequency causing a shorter delay. A similar delay applies when frequency falls and the load is switched off.
- The delays are randomised to allow several switches to be installed without multiple devices switching simultaneously.

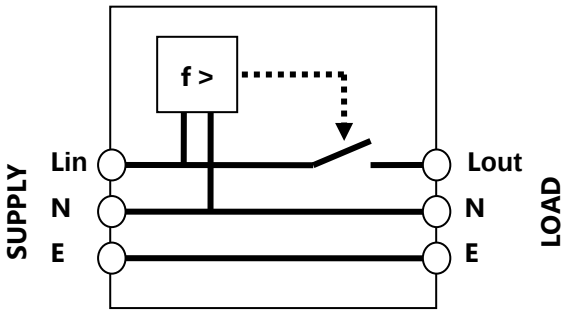
Each time the Amber Switch operates, a new random time factor is chosen, to help ensure fairness across the entire power system.

Suitable Loads

Each Amber Switch can control a load up to 13A (3kW at 230V; 1.5kW at 120V). The most appropriate loads are heaters (water heaters, storage heaters, space heaters).

Appliances with pumps (air conditioners, fridges, freezers) may not be appropriate because under some circumstances, loads may switch on and off frequently. Careful system design can enable the use of such appliances use with the Amber Switch.

Connection Diagram



*Load Shedding Type CAS-S-B is also available, with lower frequency settings, faster switch-off time and a much slower switch-on delay.

Specification

Regulatory Compliance

LV Directive	2006/95/EC
EMC Directive	2004/108/EC
RoHS Directive	2011/65/EU

Electrical Limits

Supply voltage		205 – 255 VAC
Supply frequency	f	45 – 65 Hz
Maximum Load	I_{max}	15 A
		pf > 0.95
Rated impulse voltage		1.5 kV

Environmental conditions

IP Rating	IP20
Ambient temperature	0 – 30 ºC
No. of cycles	30,000
Aging	60,000 hrs
Mounting	Independent surface mounting

Electrical connections

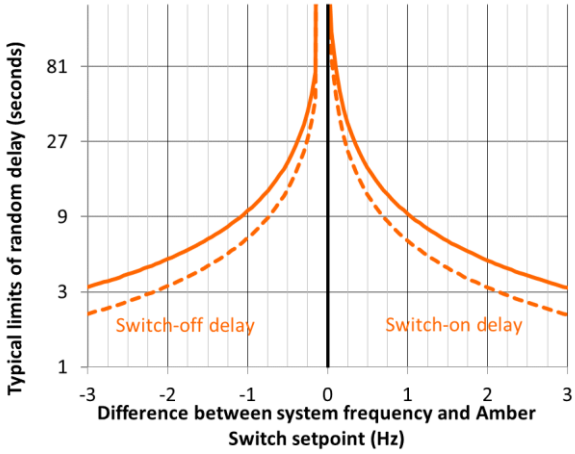
Stranded cable	all terminals	0.2 – 2.5 mm^2
		30 – 12 AWG
Cable glands	cable diameter	5 – 10 mm

(five available cable pushouts in casing)

Characteristics

Switch-on	f_{on}	50.25 to 51.75 Hz and 60.25 to 61.75 Hz in 0.25 Hz steps
Switch-off	f_{off}	< f_{on} - 0.25 Hz

The graph below shows the upper and lower limits of the random switch-on and switch-off delay, as the applied frequency changes with respect to the setting.



Physical

Dimensions (excluding glands)	80 x 60 x 45 mm
Mass	0.2 kg
Enclosure material	High impact polystyrene
Colour	RAL 9002 (off-white)
Mounting holes	4-off ϕ4 mm

Ordering Information

Product Code	Description
CAS-I-B	Amber Switch, Independent Type, Surface-mount Wallbox with two cable glands

For applications advice, instructions, prices and ordering, please contact our UK distributor:

For wholesale enquiries, please contact sales@ambercontrol.com

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