

HomeSafe



Residential Catalogue - 2011

- Consumer Units
- Integrated MID Approved Meters
- Protective Devices
- Control and Switching Devices



HAVELLS

HAVELLS

The new Brand for Circuit Protection and Control for the UK

Havells is a Global manufacturer of Electrical and Power Distribution Equipment, with a focus on Industrial & Domestic Circuit Protection, Switchgear, Cables & Wires, Motors, Fans, Power Capacitors, CFL Lamps and Luminaires for Domestic, Commercial & Industrial applications. With sales over \$1Bn and serving customers in over 50 countries, Havells is well placed to deliver UK market optimised solutions to meet local standards and regulatory requirements.

In the UK, Havells Switchgear brings a local market focus to its UK customers, with UK specific solutions, addressing the real challenges in creating optimised, compliant and cost effective Electrical Distribution solutions.





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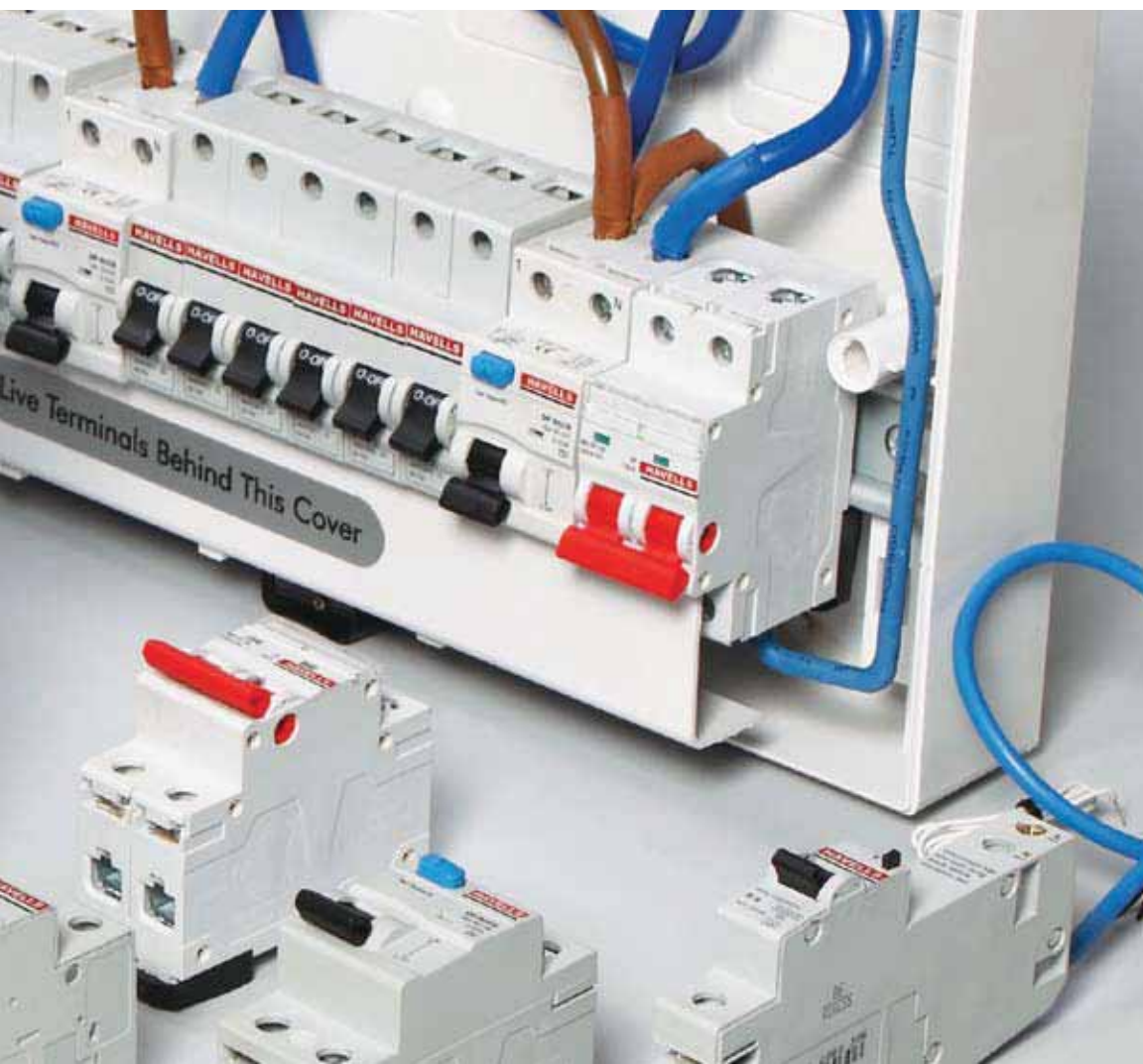
Domestic Consumer Units

The IET (Institution of Engineering and Technology) publish the wiring regulations BS 7671 : 2008, which is the national standard to which all Industrial and Domestic wiring must now conform. The regulation is having its first amendment finalised in July 2011. The current regulation contains major changes from the previous 16th edition regulation. BS 7671: 2008 has led to a significant increase in the use of RCD protection devices in Domestic Consumer units. For Domestic applications, a number of alternative technical approaches are available to meet the expectations of the regulations.

The basic choice is the use of 'group protected' MCBs using two RCDs, or individual RCBOs on all circuits requiring earth fault protection. A third option is a hybrid of the two, having two RCDs, plus space to accommodate additional RCBOs or MCBs. The group protected solutions using two RCDs generally provide the lowest cost solution, whilst individual RCBOs on each circuit, ensure that only the circuit affected, 'trip' due to an Earth fault, causing the least level of disturbance to the domestic accommodation in the event of a fault. In addition, the individual RCBO approach potentially makes fault finding of the Earth fault a lot easier for the Electrician.

Havells offer a number of alternative Consumer unit formats and associated devices to help designers and Installers meet the needs of the new regulations.

In addition to standard products, Havells can also offer customised solutions on request.



Under the 17th edition wiring regulations:

- All socket outlets should be protected by 30 mA RCD whether on the ground floor of a house or the top floor of a high rise apartment block*
- All circuits in a room with a fixed bath or shower should be protected by one or more 30 mA RCDs**
- All cables buried beneath the plaster surface of a wall or partition (at less than 50 mm) should be protected by 30 mA RCDs***
- All cables concealed in metal stud partitions (common in new builds) should be protected by 30 mA RCDs***
- Installations should be divided up into circuits so as to take account of danger and inconvenience caused by a single fault - e.g. such as a lighting circuit ****
- Installations should be designed and arranged so as to prevent unwanted tripping of RCDs****
- Safety services such as smoke alarms should be on independent circuits*****

Summary Table

Regulation	Relating to	Examples	Additional Protection
411.3.3	Sockets up to 20 A rating for general use by ordinary persons	Upstairs Sockets Downstairs Sockets Kitchen Sockets Cooker outlet with integral 13 A socket Garage Sockets <i>Plus any other sockets up to 20 A rated</i>	30 mA RCD
701.411.3.3	All circuits in a room with a fixed bath or shower	Shower circuit Lighting circuit Heating circuit Ventilation circuit Shaver Socket <i>Plus other circuits</i>	30 mA RCD
522.6.6 522.6.7 522.6.8	All circuits buried in a wall or partition at less than 50 mm and without mechanical protection	Downstairs Lighting Upstairs Lighting Immersion heater Burglar Alarm Smoke Alarms <i>Plus any other circuits</i>	30 mA RCD

Note: Each circuit may have more than one reason for additional protection by 30 mA RCD eg: firstly because of the equipment a socket outlet and secondly because of the cable installation method. Additional protection is provided as additional protection. It does not obviate the need for circuit protection by circuit breakers or fuses.

* Regulation 411.3.3 socket outlets with a rated current not exceeding 20 A that are for general use by ordinary persons (exemption may be permitted).

** Regulation 701.411.3.3 Additional protection shall be provided for all circuits of the location by use of one or more 30 mA RCD.

*** Regulations 522.6.6 522.6.7 522.6.8 cables concealed in a wall or partition at less than 50 mm depth and without earthed mechanical protection e.g. conduit.

**** Regulation 314.1 Every installation shall be divided into circuits as necessary to avoid danger and inconvenience in the event of a fault, take account of danger that may arise from the failure of a single circuit such as a lighting circuit, reduce the possibility of unwanted tripping of RCDs etc.

**** Regulation 314.2 Separate circuits to be provided for parts of the installation that need to be separately controlled in such a way that those circuits are not affected by the failure of other circuits.

***** Regulation 560.7.1 Chapter 56 circuits for safety services shall be independent of other circuits.

In addition Chapter 51 requires designers/installers to take account of all relevant British Standards and manufacturers instructions. For example BS 5839 Part 6 is the British Standard for fire detection and alarm systems in dwellings. It states that power supplies to Grade D smoke alarms should be an independent circuit at the consumer unit, or a separately electrically protected local lighting circuit.

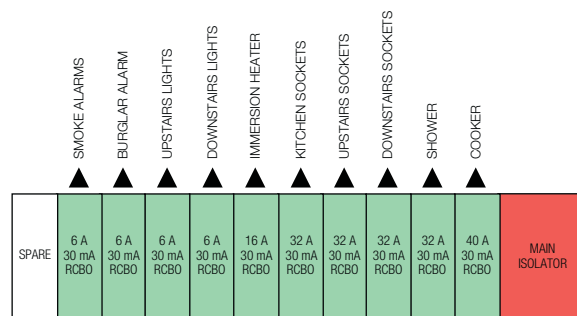
British Standards and IEE regulations are subject to change and amendments. This guide to Havells consumer units is not a substitute for the regulations which should always be used for all types of electrical installation design and installation work.

Havells Main Switch - All Independant Circuits

Utilising RCBOs throughout would provide a secure dedicated 30 mA protected supply to every circuit.



HS12

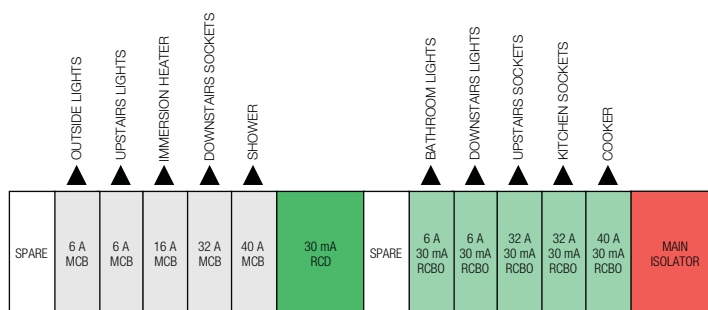


Havells Split Load Units - Half Independant Circuits

Split Load consumer unit with a small group of circuits on the RCD and all others on independent devices (RCBO).



HSSL10

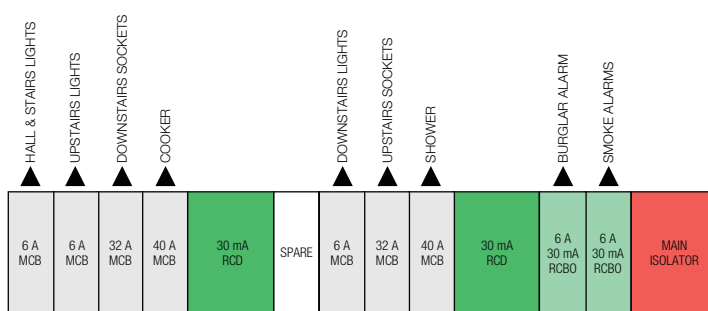


Havells High Integrity Units - Some Independant Circuits

Uses two RCD protected sections and a number of ways for dedicated (High Integrity Circuits) using 30 mA RCBOs.



HSHI12

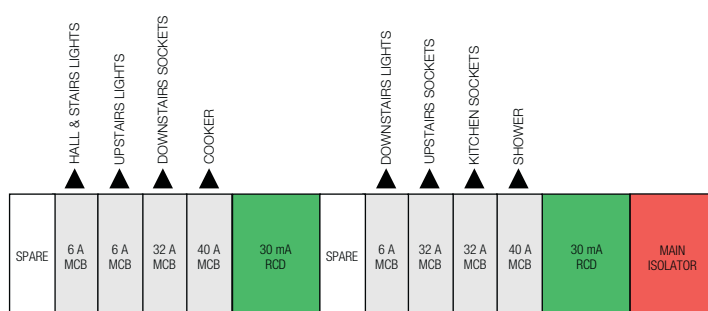


Havells Dual RCD Units - No Independant Circuits

Dual RCD unit with two sections - each protected by a 30 mA RCD. Suitable for smaller dwellings.



HSDRCD12



Havells HomeSafe - Insulated Consumer Units



HS12

Insulated Consumer units - 100 A main incomer

Description	Rating	No. Ways	Part No.
6 way consumer unit	100 A	6	HS06
8 way consumer unit	100 A	8	HS08
12 way consumer unit	100 A	12	HS12
16 way consumer unit	100 A	16	HS16
20 way consumer unit	100 A	19	HS20



HSSL10

Insulated Consumer units - Split Load - 100 A main incomer/63 A RCD

Description	Rating	No. Ways	Part No.
6 way split load consumer unit	100 A	6	HSSL06
10 way split load consumer unit	100 A	10	HSSL10
14 way split load consumer unit	100 A	14	HSSL12



HSHI12

Insulated Consumer units - High integrity 17th edition - 100 A main incomer/63 A RCD x2

Description	Rating	No. Ways	Part No.
12 way high integrity consumer unit	100 A	10 + 2	HSHI12
16 way high integrity consumer unit	100 A	14 + 2	HSHI16



HSDRCD12

Insulated Consumer units - Dual RCD 17th edition - 100 A main incomer/63 A RCD x 2

Description	Rating	No. Ways	Part No.
8 way dual RCD consumer unit	100 A	8	HSDRCD08
12 way dual RCD consumer unit	100 A	12	HSDRCD12
16 way dual RCD consumer unit	100 A	16	HSDRCD16

IP 55 Modular Enclosure



HS3IP55/HS5IP55

IP55 Modular Enclosure

Description	No. Ways	Part No.
3 way IP55 modular enclosure	3	HS3IP55
5 way IP55 modular enclosure	5	HS5IP55

Double pole RCCB module, 6 kA, BS EN 61008



HS3IP55

RCCB Double Pole 'A' Type

Description	Rating	No. Ways	Part No.
Double Pole RCCB module	25 A	30 mA	HS225R30
Double Pole RCCB module	40 A	30 mA	HS240R30
Double Pole RCCB module	63 A	30 mA	HS263R30

Havells HomeSafe - Insulated Consumer Units

Insulated Consumer Units with Integrated MID Approved Meters

For billing applications it is a legal requirement to use either meters that are MID approved, or approved under UK National legislation.

In some Consumer unit applications where the landlord or building owner is billing a tenant for Electricity e.g. Student accommodation, key worker accommodation or social housing etc, it can be convenient to meter the tenants supply at the consumer unit. This meter can either be read locally and/ or the information collected remotely via a communication link. A number of communication options from simple pulsed output of kWh information, to Modbus or M bus are available.

Havells offer a number of consumer unit options with integrated MID approved meters already fitted, making installation simple. The consumer unit function and meter / communication module are contained in a single enclosure solution.



HS04MID

Insulated Consumer units - 80 A MID Approved Meter with Isolator Incomer

Meters have pulsed output as standard. For serial communication see below.

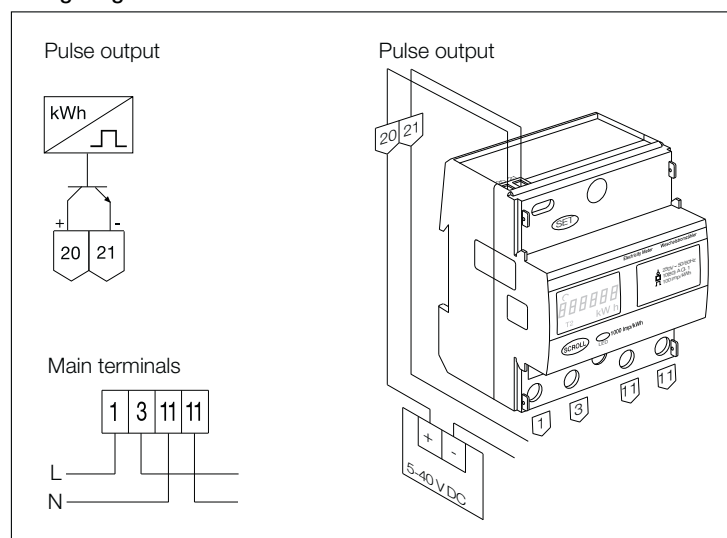
Description	Rating	No. Ways	Part No.
4 way consumer unit	80 A	4	HS04MID
8 way consumer unit	80 A	8	HS08MID
12 way consumer unit	80 A	12	HS12MID
16 way consumer unit	80 A	16	HS16MID

Modbus Infrared Communication Module - 2 Module Unit

Description	Rating	No. Ways	Part No.
Modbus Infrared Communication Module*			PSMCOMM

*Communication module reduces board capacity by 2 ways

Wiring Diagram



Havells HomeSafe - Protective Devices



HSL106B

Outgoing devices - MCBs - 6 kA, Single Pole

Description	Current (A)	Type B	Type C
Miniature Circuit Breaker 6 kA	4 A	–	HSL104C
Miniature Circuit Breaker 6 kA	6 A	HSL106B	HSL106C
Miniature Circuit Breaker 6 kA	10 A	HSL110B	HSL110C
Miniature Circuit Breaker 6 kA	16 A	HSL116B	HSL116C
Miniature Circuit Breaker 6 kA	20 A	HSL120B	HSL120C
Miniature Circuit Breaker 6 kA	25 A	HSL125B	HSL125C
Miniature Circuit Breaker 6 kA	32 A	HSL132B	HSL132C
Miniature Circuit Breaker 6 kA	40 A	HSL140B	HSL140C
Miniature Circuit Breaker 6 kA	50 A	HSL150B	HSL150C
Miniature Circuit Breaker 6 kA	63 A	HSL163B	HSL163C



HSL106BR30

Outgoing devices - RCBOs - 6 kA, Single Pole 30 mA

Description	Current (A)	Type B	Type C
RCBO 6 kA	6 A	HSL106BR30	HSL106CR30
RCBO 6 kA	10 A	HSL110BR30	HSL110CR30
RCBO 6 kA	16 A	HSL116BR30	HSL116CR30
RCBO 6 kA	20 A	HSL120BR30	HSL120CR30
RCBO 6 kA	32 A	HSL132BR30	HSL132CR30
RCBO 6 kA	40 A	HSL140BR30	HSL140CR30
RCBO 6 kA	50 A	HSL150BR30	HSL150CR30

General Accessories

Description	Part No.
Unused Ways Blanking Strip	HSBS
MCB Blanking module (18 mm)	PSBM
Universal device lockout attachment	PSUDLA

Havells HomeSafe - Control and Switching Devices



PSTDWCO

Timers

Description	Configuration	Width	Part No.
Digital week timer	1 channel, quartz, CO,	36 mm	PSTDWCO
Multifunction staircase timer	–	18 mm	PSMST



PSC202NC

Contactors 20 A Double Pole - 230 Vac coil 18 mm module

Description	Configuration	Part No.
Contactors	1 NO+1 NC	PSC201NO1NC
Contactors	2 NC	PSC202NC
Contactors	2 NO	PSC202NO

Contactors 25 A 3 Pole - 230 Vac coil 36 mm module

Description	Configuration	Part No.
Contactors	2 NO	PSC252NO
Contactors	4 NC	PSC254NC
Contactors	4 NO	PSC254NO

Contactors 40 A - 230 Vac/220 Vdc coil 54 mm module

Description	Configuration	Part No.
Contactors	2 NO	PSC402NO
Contactors	4 NC	PSC404NC
Contactors	4 NO	PSC404NO

Contactors 63 A - 230 Vac/220 Vdc coil 54 mm module

Description	Configuration	Part No.
Contactors	2 NO	PSC632NO
Contactors	4 NC	PSC634NC
Contactors	4 NO	PSC634NO



HSBT12V

Bell Transormer

Description	Voltage	Width	Part No.
Bell Transformer	12 V	36 mm	HSBT12V



Technical Data

Insulated Consumer Unit range – BS EN/IEC 60439 - 3

Switch-Disconnecter Incomer (Isolator) – IEC 60947-3

RCCB devices – IEC 61008

MCB devices – IEC 60898-1

RCBO devices – IEC61009



Havells HomeSafe - Insulated consumer units

Insulated Consumer units - 100 A main incomer

Cat No.	width	height	depth	a	b	c	d	e	f
HS06	148.5	245	120	132	40	11.5	122	178.5	90.5
HS08	221.5	245	120	132	40	11.5	194	178.5	163.5
HS12	256.5	245	120	132	40	11.5	230.5	178.5	199
HS16	330.5	245	120	132	37	12.5	302	178.5	272.5
HS20	400.5	245	120	132	40	11.5	373.5	178.5	342

Insulated Consumer units - Split Load - 100 A main incomer/63 A RCD

Cat No.	width	height	depth	a	b	c	d	e	f
HSSL06	221.5	245	120	132	40	11.5	194	178.5	163.5
HSSL10	256.5	245	120	132	40	11.5	230.5	178.5	199
HSSL14	330.5	245	120	132	37	12.5	302	178.5	272.5

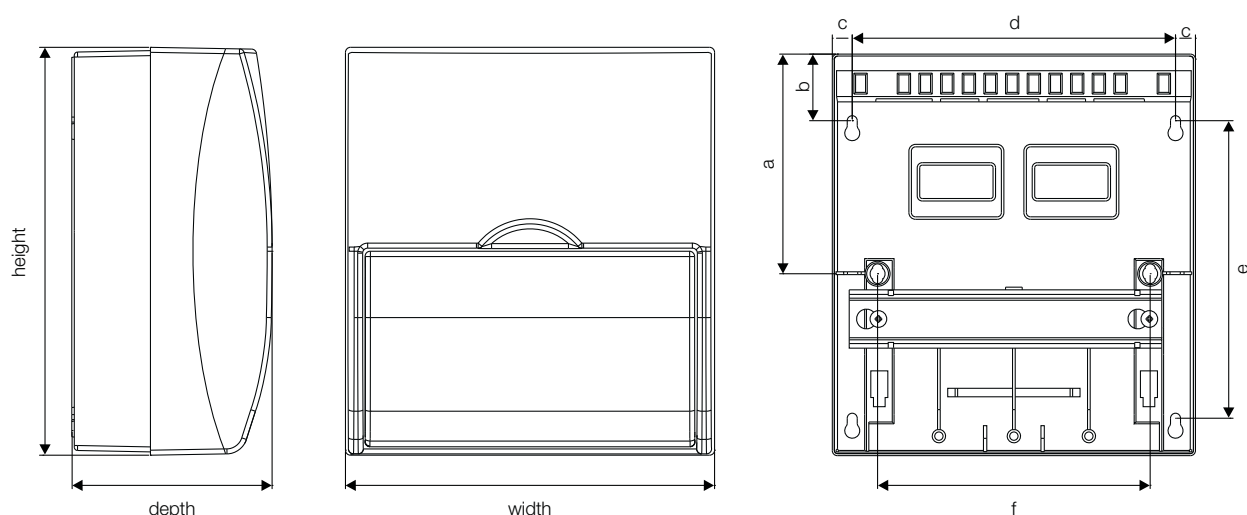
Insulated Consumer units - High integrity 17th edition - 100 A main incomer/63 A RCD x2

Cat No.	width	height	depth	a	b	c	d	e	f
HSII12	330.5	245	120	132	37	12.5	302	178.5	272.5
HSII16	400.5	245	120	132	40	11.5	373.5	178.5	342

Insulated Consumer units - Dual RCD 17th edition - 100 A main incomer/63 A RCD x 2

Cat No.	width	height	depth	a	b	c	d	e	f
HSDRCD08	256.5	245	120	132	40	11.5	230.5	178.5	199
HSDRCD12	330.5	245	120	132	37	12.5	302	178.5	272.5
HSDRCD16	400.5	245	120	132	40	11.5	373.5	178.5	342

Dimensions (in mm)

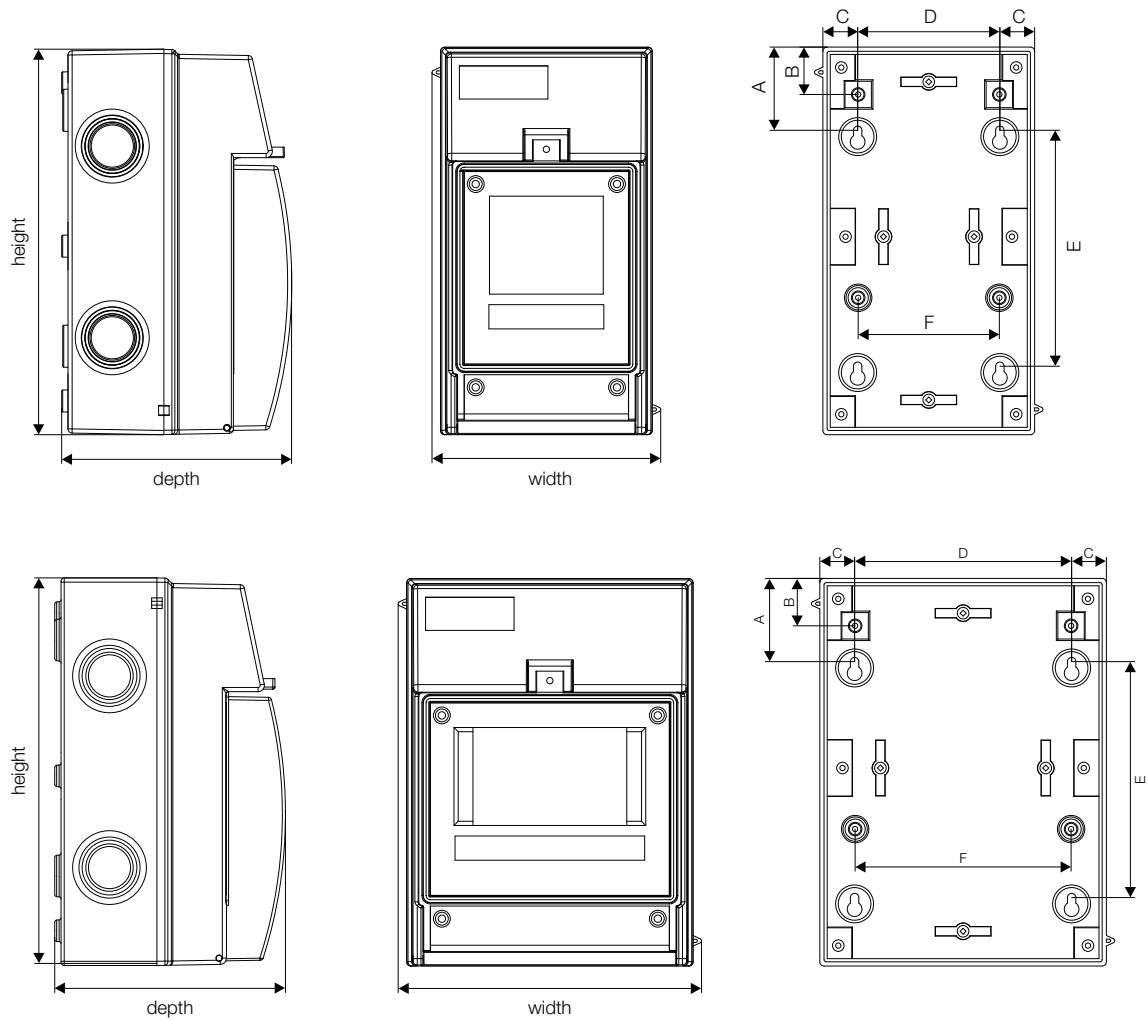


IP55 Garage Unit



Cat No.	width	height	depth	a	b	c	d	e	f
HS3IP55	108.5	183	109	39.5	22.5	16.5	67.5	112	67
HS5IP55	144	183	109	39.5	22.5	16.5	103	112	102.5

Dimensions (in mm)

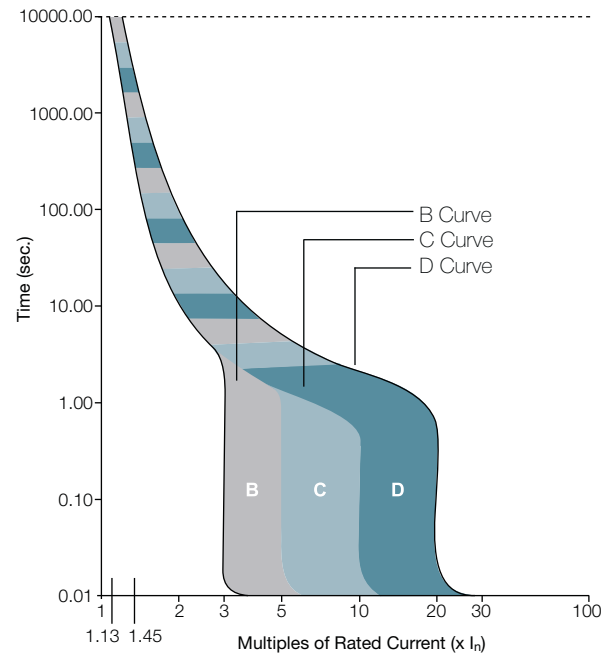


Havells HomeSafe - MCB

Characteristics Curves

As per	Thermal Tripping			Magnetic Tripping		
	No tripping	Tripping	Time	Hold	Trip	Time
IS / IEC 60898-1	Current	Current	Limits	Current	Current	Limits
	I_1	I_2	t	I_4	I_5	t
B Curve	$1.13 \times I_n$		$\geq 1h$	$3 \times I_n$		$\geq 0.1s$
		$1.45 \times I_n$	$< 1h$		$5 \times I_n$	$< 0.1s$
C Curve	$1.13 \times I_n$		$\geq 1h$	$5 \times I_n$		$\geq 0.1s$
		$1.45 \times I_n$	$< 1h$		$10 \times I_n$	$< 0.1s$
D Curve	$1.13 \times I_n$		$\geq 1h$	$10 \times I_n$		$\geq 0.1s$
		$1.45 \times I_n$	$< 1h$		$20 \times I_n$	$< 0.1s$
$I_3 = 2.55 \times I_n$		$1s < t < 60s$ for $I_n < 32 A$				
		$1s < t < 120s$ for $I_n > 32 A$				

* s = second



Tripping Characteristics

Based on the Tripping Characteristics, MCBs are available in 'B', 'C' and 'D' curve to suit different types of applications.

'B' Curve: for protection of electrical circuits with equipment that does not cause surge current (lighting and distribution circuits). Short circuit release is set to (3-5) I_n

'C' Curve: for protection of electrical circuits with equipment that causes surge current (inductive loads and motor circuits). Short circuit release is set to (5 - 10) I_n

Short circuit release is set to (5 - 10) I_n

'D' Curve: for protection of electrical circuits which causes high inrush current, typically 12-15 times the thermal rated current (transformers, X-ray machines etc.) Short circuit release is set to (10 - 20) I_n

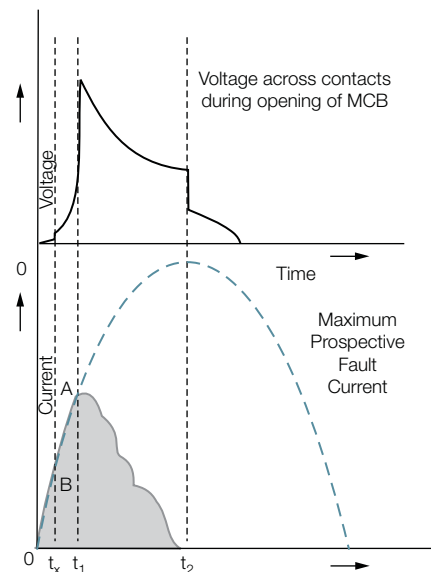
CURRENT LIMITING DESIGN

In a current limiting breaker, the tripping & arc control mechanism are so designed that under short circuit conditions, the contacts are physically separated and the electrodynamic forces set up by fault current, assist the extinction in less than half cycle.

The figure shows the current limiting effect of circuit breakers.

Fault Traces for Voltage & Current

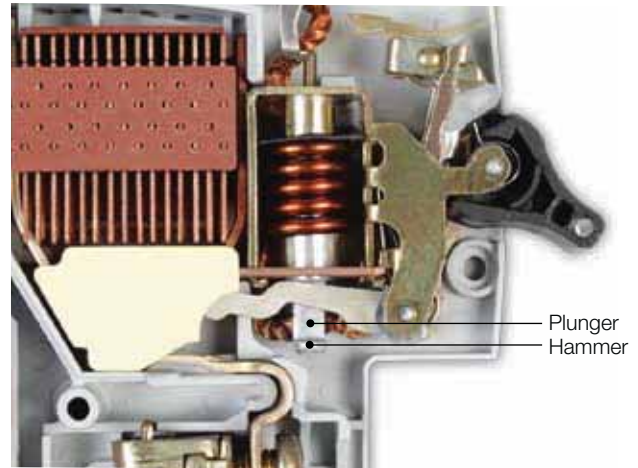
- 0 = Point of fault initiation
- t_x = Contact opening time (i.e., creation of arc)
- t_1 = Current / Voltage peak (i.e., current limitation)
- t_2 = Time to total extinction of arc (i.e., complete shutdown of fault current)



Hammer Trip Mechanism

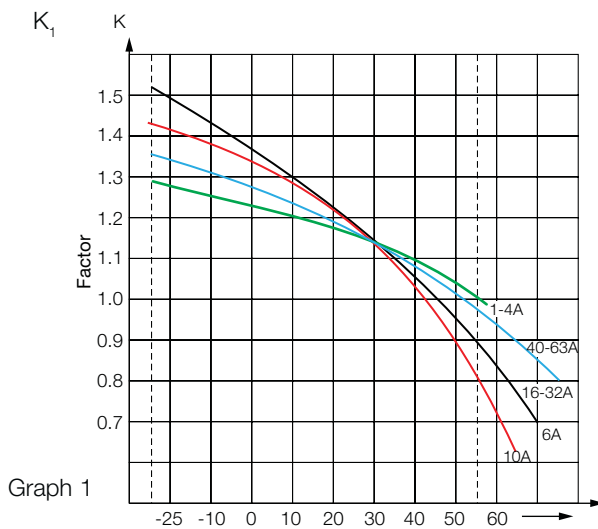
Current Limiting design in itself may not fulfill the requirement of quick breaking (instantaneous action) mainly due to inertia of the Latch mechanism and interconnected sequence of operations.

A Hammer directly connected to the plunger strikes the moving contact arm with a force proportional to the peak current there by forcibly separating the moving contact from the fixed contact much before the latch mechanism operates. This further reduces the opening time of the circuit breaker.

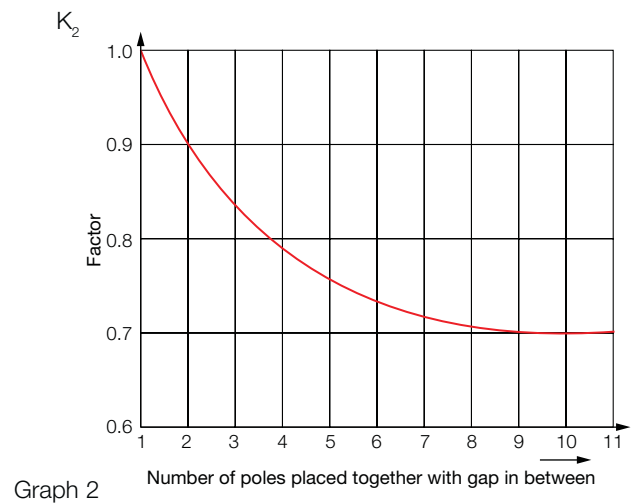


Ambient Temperature Compensation / Diversity Factor Chart

Maximum Permissible Rated Current (K_1 Factor)



Diversity Factor (K_2 Factor)



Calculation $I_n / \text{MCB} = K_1 \times K_2 \times I_n$

Example 4 MCBs with $I_n = 10$ A, and the amb. temp. is 50°C kept with no gap in between

Solution $K_1 = 0.89$ (from graph 1)
 $K_2 = 0.78$ (from graph 2)
 $I_n / \text{pole} = 0.89 \times 0.78 \times 10 = 6.94$ A

Effect Of Frequency Variation

MCBs are designed to operate at AC frequency 50/60 Hz. However, MCBs specially suitable for DC applications and for frequencies upto 400 Hz can be supplied on request.

These can be used on different frequencies in supply from $16 \frac{2}{3}$ - 60 Hz without any deration.

For higher frequencies, normal MCBs can be used with a multiplication factor which shall only affect its magnetic trip current.

Supply	AC			DC
Frequency	100 Hz	200 Hz	400 Hz	
Multiplication Factor	1.1	1.2	1.5	1.5

Havells HomeSafe - RCCB







The use of exposed, substandard, badly wired, wrongly connected or damaged equipment as well as frayed or badly repaired cables reduces the safety of an installation and increases the risk of person receiving an electric shock.

Electrocution is a passage of current through human body, which is dangerous. The flow of current through human body effects vital functions.

1. Breathing
2. Heartbeat

A correctly chosen RCCB can detect small currents flowing to earth and reduces the risk of electrocution. Effect of electric current through human body has been well researched and following chart summarizes the results:

Effect of electric current through human body has been well researched and following chart summarizes the results:

500 mA			Immediate cardiac arrest resulting in death
70-100 mA			Cardiac fibrillation; the heart begins to vibrate and no longer beats at a steady rate. This situation is dangerous since it is irreversible
20-30 mA			Muscle contraction can cause respiratory paralysis
10 mA			Muscle contraction : the person remains "stuck" to the conductor
1-10 mA			Prickling sensations

However, electrocution should not be viewed in terms of "current" alone, but in terms of "contact voltage". A person gets electrocuted by coming in contact with an object that has a different potential from his/her own. The difference in potential causes the current to flow through the body.

The human body has known limits:

- Under normal dry conditions, voltage limit = 50 V
- In damp surroundings, voltage limit = 25 V

Against Indirect Contact

Over current protection devices like MCB are unable to act promptly on small earth leakage currents. To comply with wiring regulations, the earth fault loop impedance in Ohms, multiplied by the rated tripping current of the RCD in amperes must not exceed 50.

Rated Tripping Current of the RCD	Maximum permissible earth fault loop impedance in
10 mA	5,000
30 mA	1,666
100 mA	500
300 mA	166

Example

For an RCD with a rated tripping current of 30 mA, the maximum permissible earth fault loop impedance is calculated as follows: $Z_s (\text{max}) = 50 / I_n = 50 / 0.03 = 1,666$

Against Fire

The majority of fires which occur as a result of faulty wiring are started by current flowing to earth. Fire can be started by fault current of less than 1 amp.

The normal domestic overload protective device such as a fuse or MCB will not detect such a small current. A correctly chosen RCD will detect this fault current and interrupt the supply, hence, reducing the risk of a fire starting.

Technical Information



Two Pole

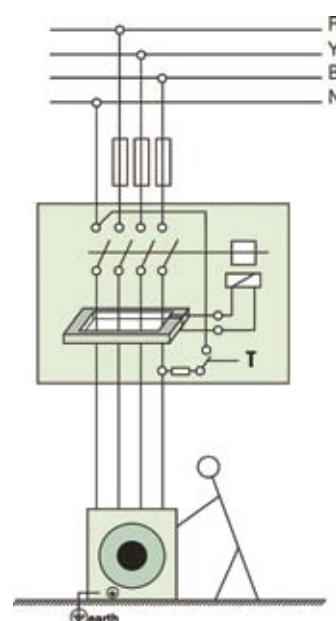
Standard Conformity		IS 12640-1: IEC 61008-1
Rated Current (In)	A	25, 40, 63
Sensitivity (In)	mA	30
Rated Voltage (Un)	Vac	240
Rated Insulation Voltage (Ui)	V	660
Rated Frequency	Hz	50
Short circuit Withstand Capacity	kA	6
Residual Making Breaking Capacity	A	500 A or 10 In whichever is greater
Ambient Temperature	°C	-25°C to + 55°C
Shock Resistance		40 mm free fall
Vibration Resistance	g	3
Electrical /Mechanical operations		10000
Mounting		Din Rail (35 x 7.5) mm
Degree of Protection		IP 20
Terminal Capacity (max)	mm ²	25

*500 mA is available on request

Working Principle

The RCCB works on the current balance principle. The supply conductors, i.e. the phases and the neutral, are passed through a toroid and form the primary windings of a current transformer. Its secondary winding is connected to a highly sensitive electromagnetic trip relay, which operates the trip mechanism.

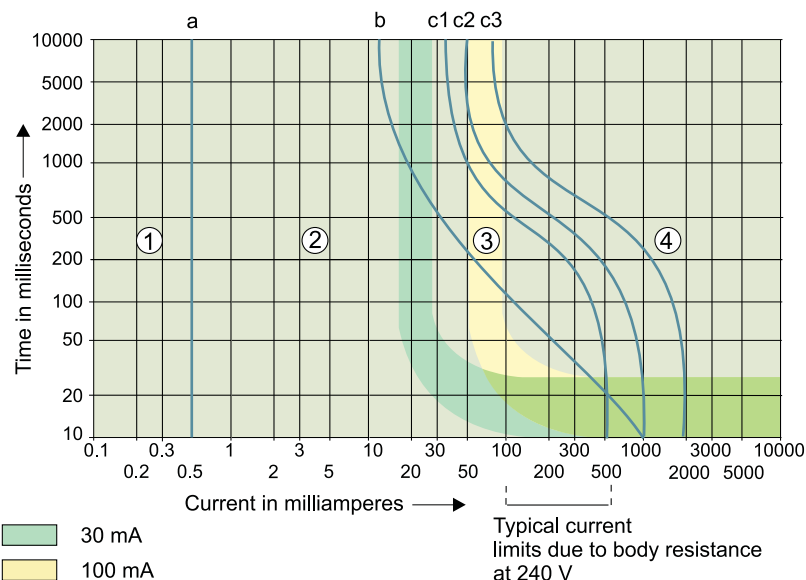
In a healthy circuit, sum of the currents in phases, is equal to the current in the neutral and the vector sum of all currents is equal to zero. If there is any insulation fault in the current and leakage current flows to earth, the currents do not balance and their vector sum is not equal to zero. This imbalance is detected by the core balanced current transformer, the RCCB is tripped and supply to load is interrupted. The trip mechanism is operated at a residual current between 50-100 % of its rated tripping current.



SELECTION

30 mA

A 30 mA RCCB will provide a high degree of protection against electrocution in an accidental shock hazard situation. The current flowing through human body could be between 80mA and 240mA depending on the resistance of the human body and the voltage across it.



Zone Physiological Effects

Zone 1 Usually no reactions

Zone 2 Usually no harmful physiological effects

Zone 3 Usually no organic damage to be expected. Likelihood of muscular contraction and difficulty in breathing, reversible disturbances of formation and conduction of impulse in the heart and transient cardiac arrest without ventricular fibrillation increases with current magnitude and time.

Zone 4 In addition to the effects of Zone 3, probability of ventricular fibrillation increased upto 5% (curve C₂) upto 50% (curve C₃) and above 50% beyond curve C₃. It increases with magnitude and time, and pathophysiological effects such as cardiac arrest, breathing arrest and heavy burns may occur.

To be within zone of the IEC curve as shown below. It is necessary for the RCCB to operate within 50 ms at 240 mA and 150ms at 80 mA. Both these conditions are satisfied by 30 mA RCCB.

For households, individual outlets, wet areas and temporary installations, RCCB with sensitivity not exceeding 30 mA is advisable.

100 mA

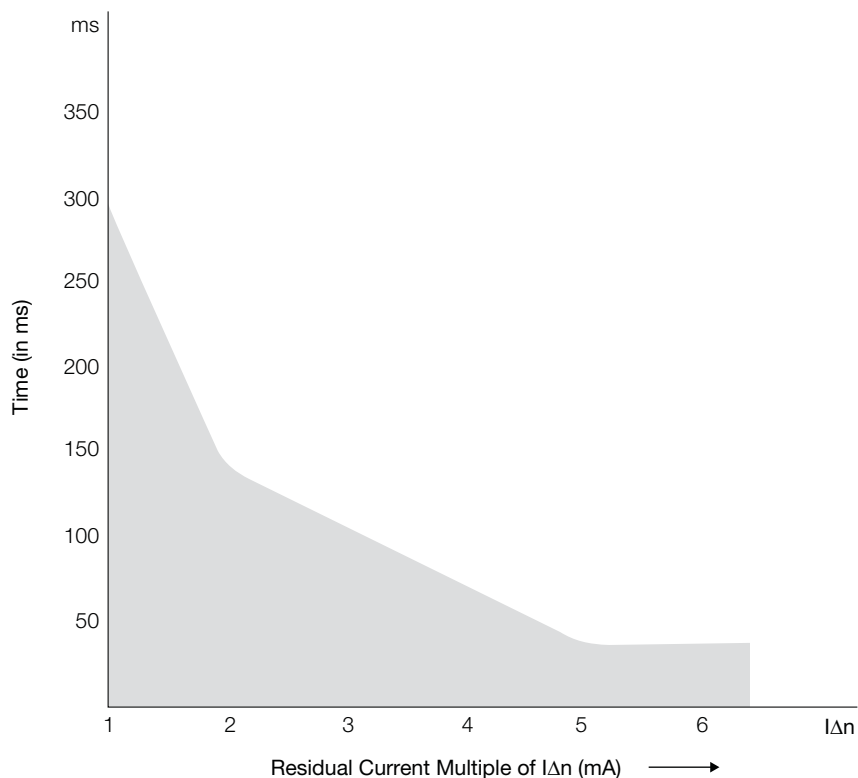
A 100 mA RCCB will normally give high degree of protection against electrocution but there is a possibility that the shock current could fall below the tripping level of RCCB. This could occur if additional resistances to that of human body are included in the earth path.

The 100 mA RCCB protects against leakage currents and indirect contact with earth loop impedance upto 500 Ohms.

300/500 mA

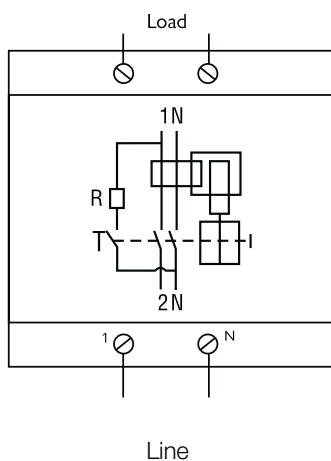
A 300/500 mA RCCB may be used where only fire protection is required. eg., on lighting circuits, where the risk of electric shock is small. 300/500 mA RCCB will not give any protection against electrocution.

Actuation Time Characteristics

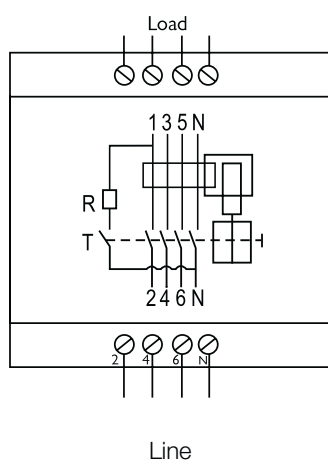


Wiring Diagram

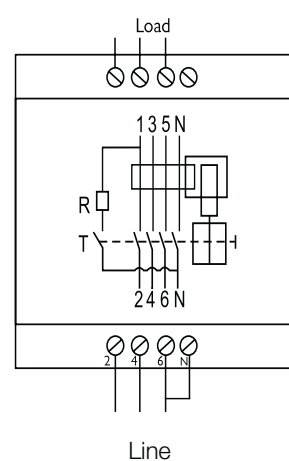
For Single Phase - 2 Wire connections



For Three Phase - 4 Wire connections



For Three Phase - 3 Wire connections



The Havells range of four pole RCCBs can be used to provide residual current protection in 3 phase, 3 wire circuits (no neutral), however a link from the neutral to an incoming should be made on the supply side of the RCCB, to enable the operation of the RCCB.

Havells HomeSafe - Digital week timers

Automatic change of set time with settable astro mode. It is an astronomical time switch designed to handle time functions in electrical utilities for the regulation of time settings from sunrise to sunset in the geographical area of installation, without the need for outside sensors.

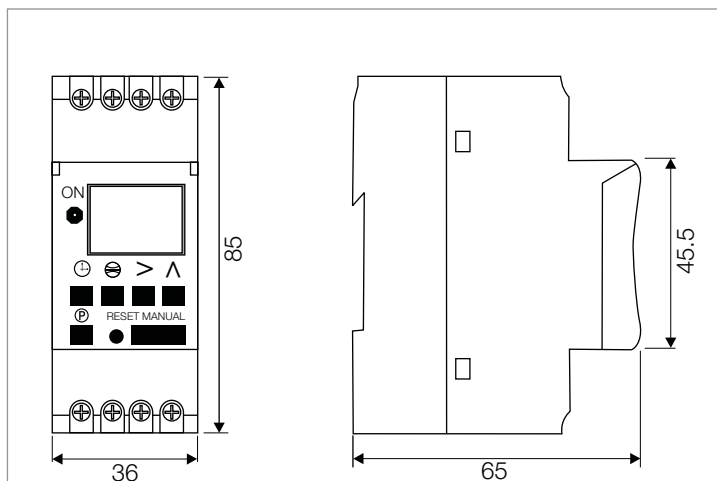
8 programs to control ON and OFF of electric appliance could be Set. Astro function could be enabled or disabled to each program. Automatic change of summer/winter time with settable change mode. It is most suitable to be used for controls of advertisement lantern box, Street lights etc Din standard dimension, guide rail assembly.

Technical Specification

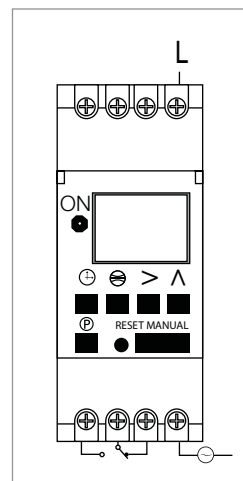
Voltage	AC 200 V–240 V 50 Hz
Clock precision	2 Second/day (25)
Set numbers for on/off	1 ON and 1 OFF
Power Consumption	4 VA
Display	LCD Display
Electric life	10 ⁵
Mechanical life	10 ⁷
Number of contacts	2NO 2NC
Control current	Resistance Load: 16 A/250 VAC COSØ=1 Induction Load 8 A/250 VAC COSØ=0.6
Operation temperature	0–40 °C
Humidity	35–85 % RH
Weight	About 125 g
Charge Reserve (With Lithium Battery)	2 years approx (if not powered)



Dimensions (in mm)



Connections



Havells HomeSafe - Digital week timers

- Find out the latitude of the city installed on the websites.
- Read this manual carefully before installing the appliance.
- Please powered under the voltage specified, and do not power or connect the appliance if any part of it is damaged.
- Avoid to use in the applications of dust, corrosive gas, direct sunlight and rain water.

Operation Sequence

		Display	Remarks	Way of entry
Preparation	1. Find out latitudes in the region, accuracy is one degree.			
	2. Check the on/off time in the day and record them.			
	3. Find out the date			
Reset	Press reset (display all)	display all area	When first use	
	Press > button, to select north or south	n 01		
latitude Set	Press ^ button to change N-S	n glitter	n symbolizes north S symbolizes south	Press ☰ > button simultaneously to set latitude
	press > button to set latitude			
	Press ^ button to change latitude	01 glitter	Press and hold ^ button number will increase.	
	Press P to enter date set			
Date set	Press > to set month	01 01		Press ☰ > button simultaneously to set date
	Press ^ to change month	month glitter	Press and hold ^ button number will increase.	
	Press > to set day			
	Press ^ to change day	day glitter	Press and hold ^ button number will increase.	
	Press P to enter time programs			
Time set for on/off	Press > to set hour		Set the on time	Press P to enter
	Press ^ to change			If the astro function is not needed, press ☹ button to extinguish ☹ in the display. So the programs of time will not be automatically adjusted to the astro function.
	Press > to set minute			
	Press P to enter			
	Press ^ to change		Set the off time	
	Press > to set minute			
	Repeat the above procedure to set 2--8			
	Press ☰ > button simultaneously to set current time			
Set the current time	Press ^ to change	Hour glitter	Press and hold ^ button number will increase.	Press ☰ > button simultaneously
	Press > to set minute	minute glitter		
	Press ☰ exit menu			

Check Press button to check if time setting is correct.

Set the working status: Press MANUAL to set the current working status.

ON AT: Automatic on/off state, it is on now ; ON: Always on

OF: Always off; OFF AT: Automatic on/off state, it is off now

Manual control£ Press MANUAL button, to change working status.

If it is not set within 30 seconds, this time controller will return to the time display, you could enter the designated procedures according to the instruction manual.

Power off: Press & simultaneously a few second to run power saving mode.

Precautions for Safety

- Do not open time switch
- This may lead to electrical shock
- Only qualified persons may open the time switch.
- Warranty will be null and void if seal is broken.

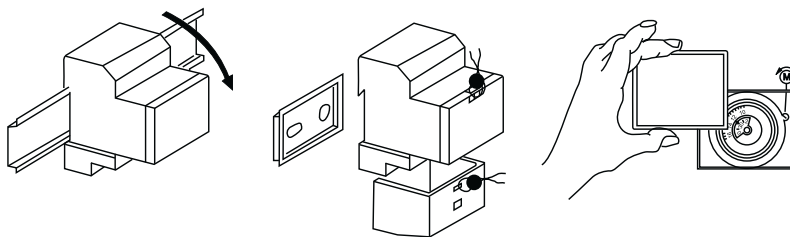
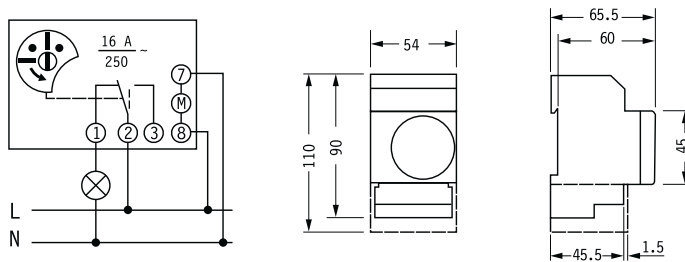
Technical Characteristics

- Quartz movement
- **TS18:** 200 hours power reserve after being connected to the main supply for 120 hours, starts automatically a few minutes after mains connection.
- **TS18A:** No power reserve – starts immediately after being connected to the mains supply.
- Operating Temperature range: -10°C to $+50^{\circ}\text{C}$.
- Frequency: 50/60 Hz
- Power Consumption: Approx. 0.5 VA
- Contact rating: Resistive Load 16 A 230 VAC

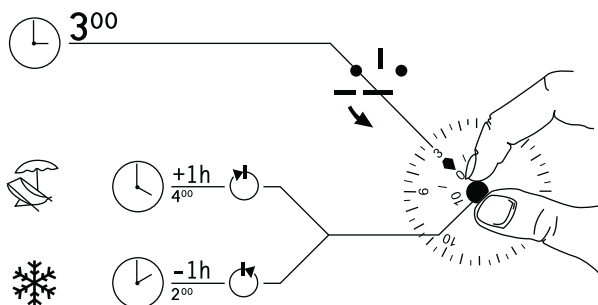


Installation

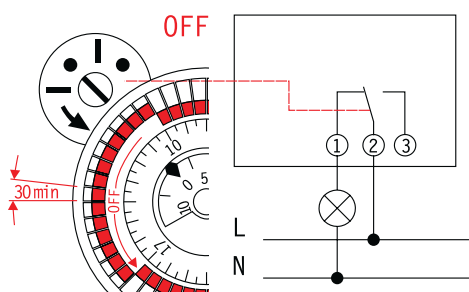
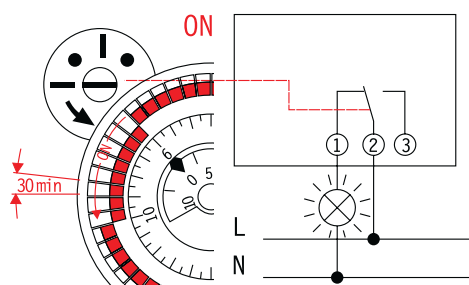
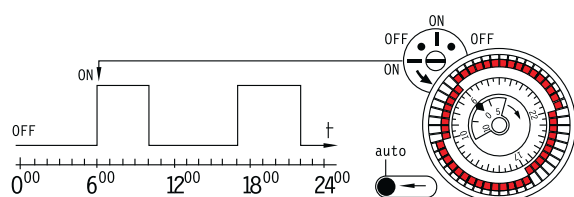
Electrical equipment should only be installed and con



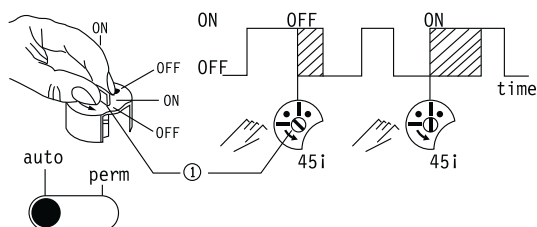
Setting the Time



24 Hours Programming



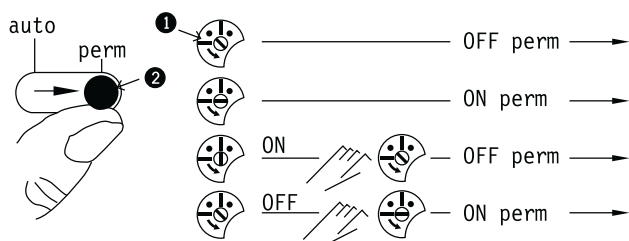
Manual Setting



Manual Control ON/OFF (Over-ride Control)

Turn the control axis (1) in direction of arrow by one notch. The manual control is automatically cancelled by the following counter-acting command of the program sequence.

Permanent ON/OFF



Manual Control ON/OFF (Over-ride Control)

Set the hand lever (2) to perm = permanent control; and turning the control axis (1) in the direction of the arrow; the required permanent control ON or OFF can now be adjusted. Turning the hand lever to Auto = Automatic control, the permanent control is cancelled. The actual switch position is maintained until the next counter-acting command of the automatic program sequence is triggered.

An immediate correction can be carried out by means of the manual control (Over-ride control).

Meter Technical Specification

Voltage (V) Voltage AC Voltage range Current (A) - base - max Starting current (mA) Power consumption of current circuits (VA)	230 -23 % to + 20 % of nominal voltage 10 80 25 <1.3
General data Frequency (Hz) Accuracy class	 50/60 (±5 %) B (Cl. 1)
Standards	IEC 62052-11, IEC 62053-21 (IEC 61036) EN 50470-1, EN 50470-3
Memory back-up	EEPROM
Clock back-up	Super Cap. 168 hours back-up at +20 °C, min 48 hours over operating temperature range
Clock accuracy	IEC 62052-21, IEC 62054-21
Temperature range (°C) • Operating • Storing	-40 to +55 -40 to +70
Environment Resistance to heat and fire	According to IEC 60695-2-1: • Terminal 960 °C • Cover 650 °C
Enclosure material Upper Lower	Polycarbonate Polycarbonate/glass fibre
Humidity	75 % yearly average, 95 % on 30 days/year
Connection area, main terminals • Flexible 1 x mm ² • Solid 1 x mm ²	4 - 25 4 - 25
Protection against penetration of dust and water	According to IEC 60529: • IP20 on terminal block without protective enclosure*)
Pulse output Connection area, main terminals • Flexible 1 x mm ² • Solid 1 x mm ² External pulse voltage (V) DC Max. current (mA) Pulse length (ms) Pulse frequency (imp/kWh) Standard	0 - 2.5 0 - 2.5 5 - 40 (transistor output) 100 100 100 IEC 62053-1 (SO)
LED Pulse frequency (imp/kWh) Pulse length (ms) Display of energy	1000 40 LCD with 6 digits, height 6 mm
Dimensions Width (mm) Height (mm) Depth (mm) DIN modules	72 95 63.6 4

SYLVANIA ***Lumiance*** Concord

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