



**HAVELLS**

Experience the Latest & Safest  
in Building Circuit Protection



**Catalogue 2018**

- Protection Device
- Control & Monitoring Device
- Photovoltaic Switchgear Device
- Industrial Plug & Socket
- Distribution Boards



Havells India Limited is a leading Fast Moving Electrical Goods (FMEG) Company and a major power distribution equipment manufacturer with a strong global presence. Havells enjoys enviable market dominance across a wide spectrum of products, including Industrial & Domestic Circuit Protection Devices, Cables & Wires, Motors, Fans, Modular Switches, Home Appliances, Air Conditioners, Electric Water Heaters, Power Capacitors, CFL Lamps, Luminaires for Domestic, Commercial and Industrial Applications.

Today, Havells owns some of the most prestigious brands like Havells, Lloyd, Crabtree, Standard and Promptec. Its network constitutes of 4000 professionals, over 7575 dealers and 40 branches in the country. Our products are available in 40 countries. The company has twelve state-of-the-art manufacturing plants in India located at Haridwar, Baddi, Sahibabad, Faridabad, Assam, Alwar and Neemrana, manufacturing globally acclaimed products, synonymous with excellence and precision in the electrical industry.

The company pioneered the concept of exclusive brand showroom in the electrical industry with 'Havells Galaxy'. Today over 415 Havells Galaxies across the country are helping customers, both domestic and commercial, to choose from a wide variety of products for different applications. Havells became the first FMEG Company to offer door step service via its initiative 'Havells Connect'. Thanks to the quality of products and quicker service, it has minimum customer complaints and highest customer satisfaction.

Today, Havells alongwith its brands, have earned the distinction of being the preferred choice of electrical products for discerning individuals and industrial consumers both in India and abroad. Havells offers same quality products for both Indian and International markets. It is committed to keep powering the world with its state-of-the-art innovations and energy-efficient solutions. Currently over 90% of its product offerings are energy efficient and manufactured in-house.

Social and environmental responsibility has been at the forefront of Havells Operating Philosophy and as a result the company consistently contributes to socially responsible activities. For instance, the company is providing mid-day meal in government schools in Alwar district, covering more than 57000 students per day. The group company, QRG Healthcare runs a 140 bed hospital in Faridabad. In the past, the company has generously contributed to the society during various national calamities like the Bihar Flood, Tsunami and Kargil National Relief Fund, etc.

The essence of Havells' success lies in the expertise of its fine team of professionals, strong relationships with associates and the ability to adapt quickly & efficiently, coupled with the vision to always think ahead.

## ◆ ABOUT HAVELLS



A Billion-Dollar-Plus Fast Moving Electrical Goods (FMEG) Company

Over 4000 Professionals, over 7575 dealers and 40 branches in the country & 12 state-of-the-art manufacturing plants in India

A 20000 strong global Distribution Network continuously strives to set new benchmarks in prompt delivery and service to customers

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B

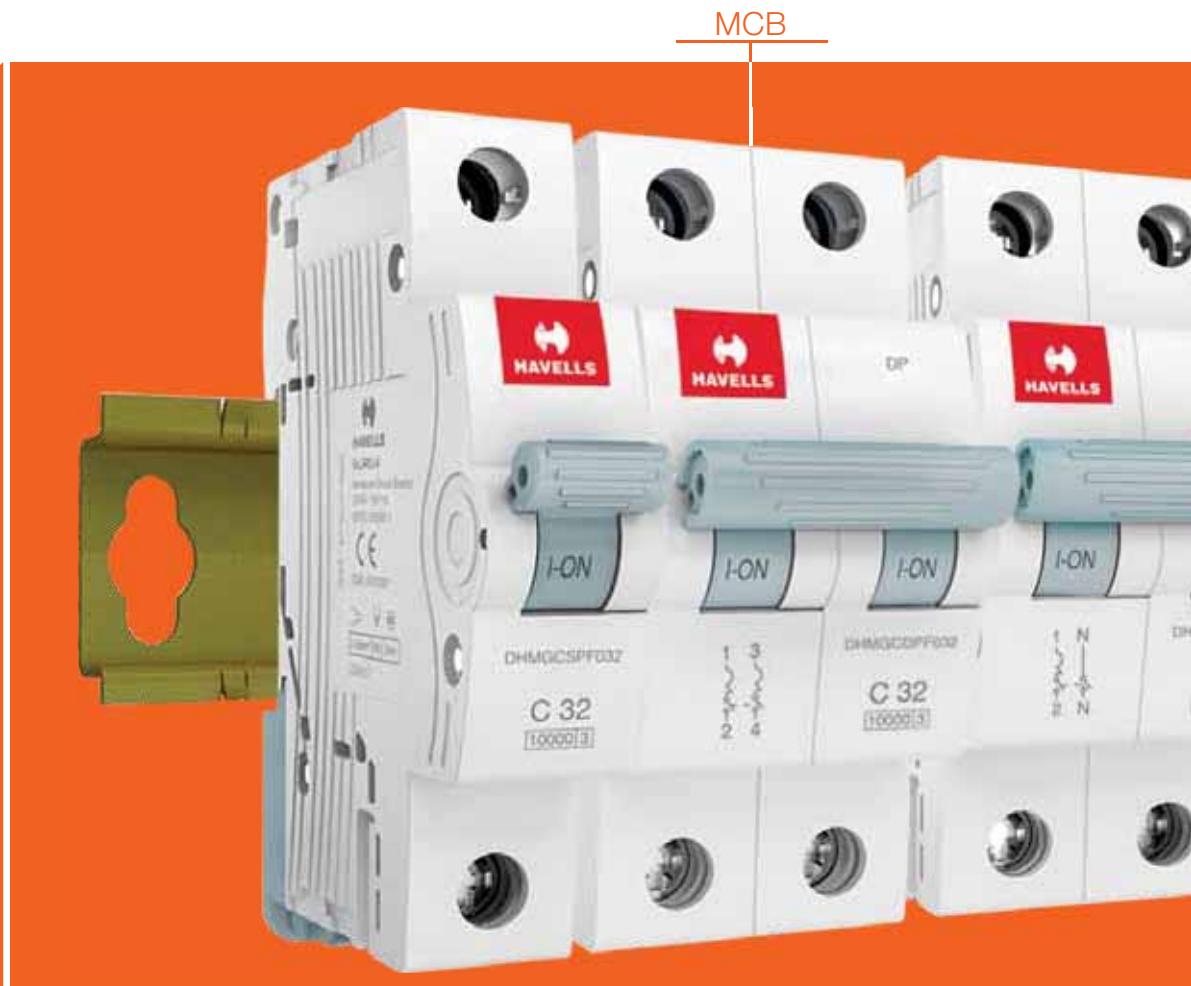


C



D





## ◆ PRODUCT OVERVIEW



#### MCB Range

6A to 63A - 'B' Curve  
 0.5A to 63A - 'C' Curve  
 0.5A to 63A - 'D' Curve  
 0.5A to 63A for DC Application

#### Execution

Single Pole (1P), Single Pole & Neutral (1P+N),  
 Double Pole (2P), Three Pole (3P),  
 Three Pole & Neutral (3P+N) & Four Pole (4P)

#### Specification

IS / IEC 60898-1, IEC 60898-2, IEC 60947-2

#### Isolator Range

40A - 125A

#### Execution

Single Pole (1P), Double Pole (2P)  
 Three Pole (3P), & Four Pole (4P)

#### Specification

IS / IEC 60947 - 3

#### RCCB Range

16A, 25A, 32A, 40A & 63A - Type 'A' / Type 'AC'  
 80A & 100A - Type 'AC'

#### Execution

Double Pole (2P), Four Pole (4P)

#### Specification

IS 12640 Part 1  
 IEC 61008-1 / EN 61008 - 1

#### SPD Range

AC SPD's  
 Type 1+2, Type 2  
 DC SPD's  
 Type 1+2, Type 2  
 Dataline SPD  
 6, 12, 24, 48 V



## ◆ MINIATURE CIRCUIT BREAKER



Electrical Distribution needs are continuously evolving in residential, commercial and industrial sectors. Improved operational safety, continuity of service, greater convenience and operating cost have assumed a tremendous significance. Miniature Circuit Breakers have been designed to continuously adapt to these changing needs.

#### Features

- Precise hammer action
- Low power consumption, thus cost effective & energy saving
- 13 Plates Arc Chute for effective arc quenching
- Dual termination for bus-bar as well as cable connection.
- Easy DIN-Rail extraction
- Energy Limiting Class 3 to ensure low let through energy to limit thermal & mechanical stress on cables.
- Trip free mechanism : MCB trips even if held in ON position.
- Longer electrical life
- ISI and CE marking. RoHS Complaint, 'Green Product'

#### Range

- 6A to 63A - 'B' Curve
- 0.5A to 63A - 'C' Curve
- 0.5A to 63A - 'D' Curve
- 0.5A to 63A for DC Application

#### Accessories

- Auxiliary Switch
- Shunt Trip

#### Execution

- Single Pole (1P)
- Single Pole & Neutral (1P+N)
- Double Pole (2P)
- Three Pole (3P)
- Three Pole & Neutral (3P+N)
- Four Pole (4P)

#### Specification

- IS / IEC 60898 - 1
- IEC 60898 - 2 for DC Application
- IEC 60947 - 2 for Industrial Application



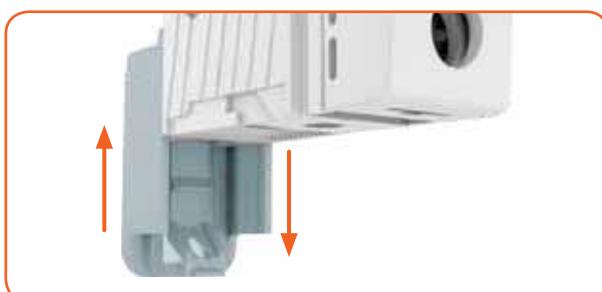
#### Safety Terminals

To avoid improper cable termination, the safety terminals guide the cable towards the cage terminal for systematic termination



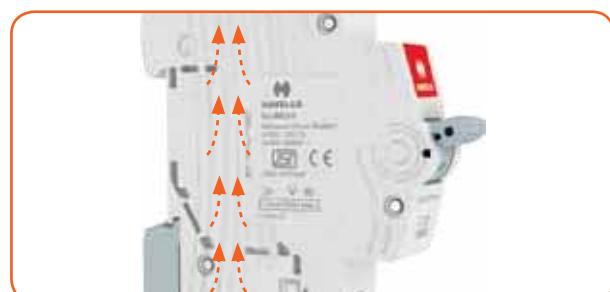
#### Large Cable Terminals

Suitable for copper and aluminum cables, these terminals are compatible with cables upto 35mm<sup>2</sup> cross section area



#### Bi Stable Clip

Every device is provided with a dual position DIN rail clip, so it becomes much easier to change a device from a device bank connected to a bus-bar, without disturbing the existing wiring



#### Cooler Operation

Grooves provided on outer body, so that when individual poles are placed adjacent to each other in a distribution board it forms a very effective channel for better air circulation, resulting into a cooler operation

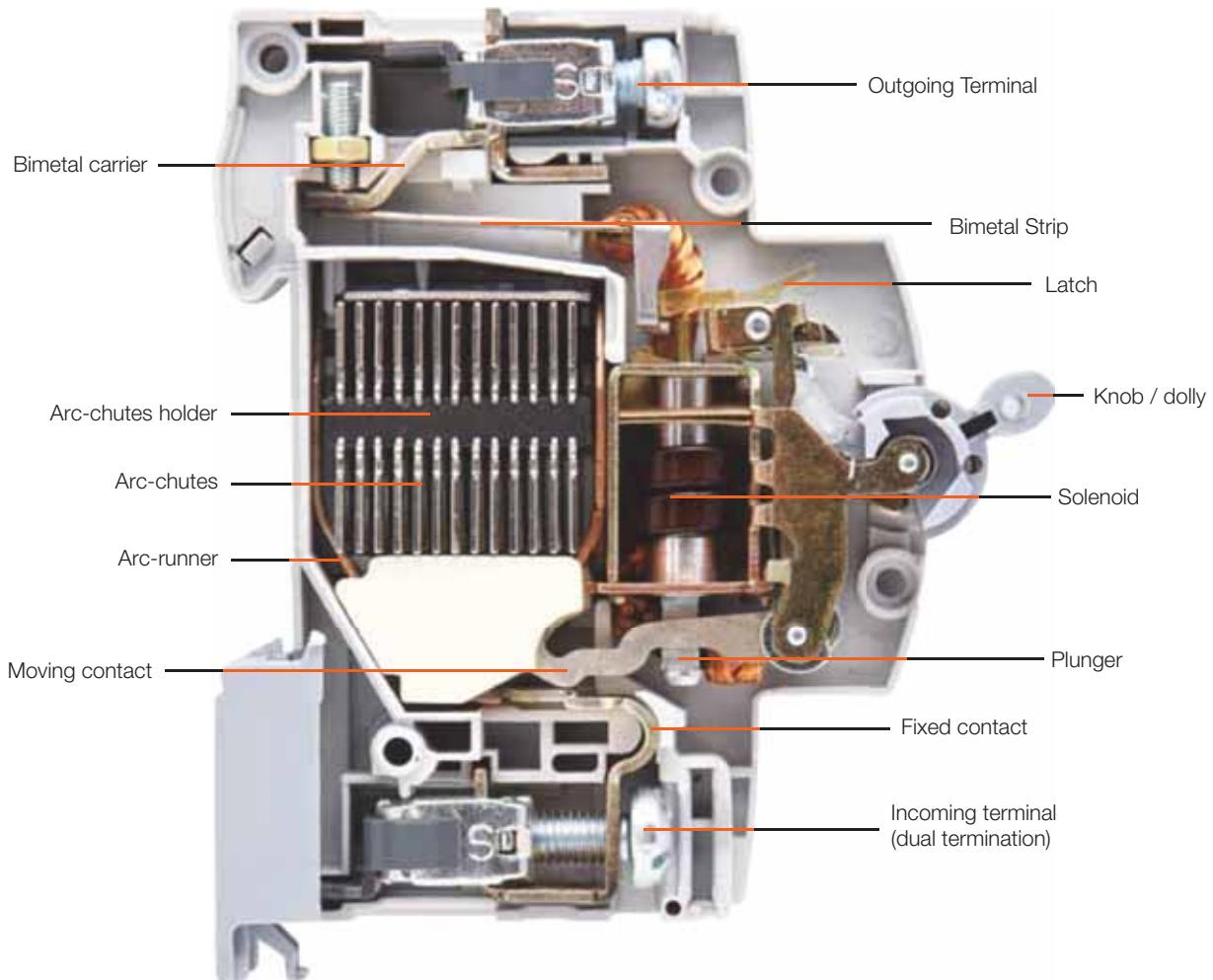
### Construction

Miniature Circuit Breakers have precisely formed moulded case & cover of flame retardant high strength thermo-plastic material having high melting point, low water absorption, high dielectric strength and temperature withstand.

The Switching Mechanism is independent, manual and trip free, i.e., the breaker trips internally even if the operating knob is held in ON position.

The Contact Mechanism comprises of fixed & moving contacts specially designed for reliability, long life and anti-weld properties. The Arc Extinguishing Device comprises of 13 plates arc chute. The arc under the influence of the magnetic field and arc guide is moved into the arc chute where it is rapidly split and quenched. The tripping mechanism is Thermal Magnetic Type.

### Internal View



### Thermal Operation

The thermal operation provides protection from moderate overloads. Under overload condition, a thermo-metallic element (bimetallic strip) deflects until it operates a latching mechanism allowing the main contacts to open.

### Magnetic Operation

In magnetic operation, large overloads or short circuit current actuates a solenoid causing a plunger to strike the latching mechanism rapidly opening the main contacts.

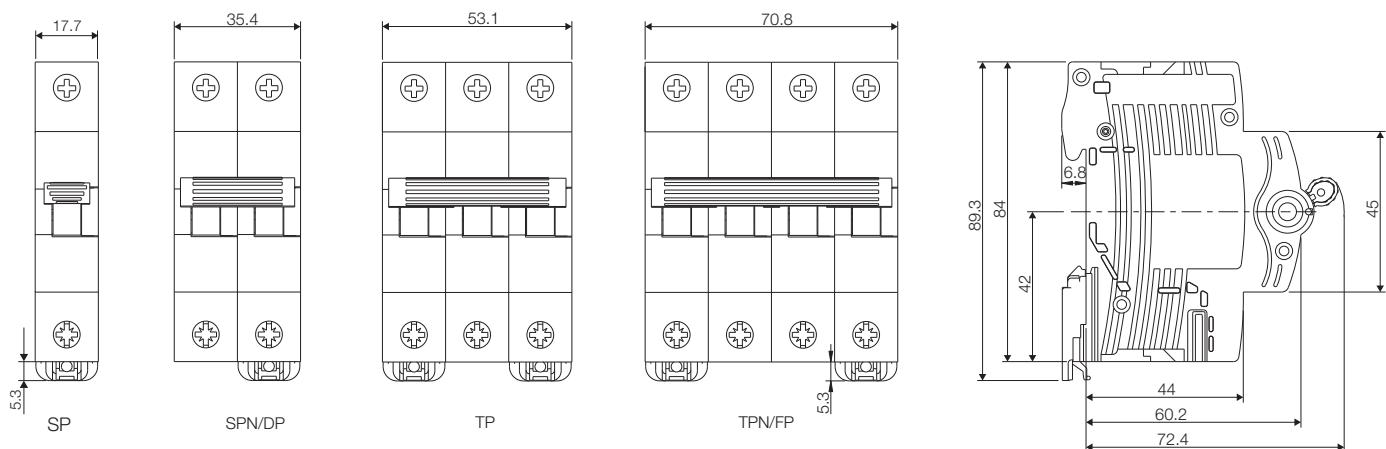
Technical Specification			
Standard Conformity		IS / IEC 60898 - 1	
Type / Series	B	C	D
Rated Current (In)	A	6-63*	0.5 - 63*
Rated Voltage (Ue)	V~	240/415	240/415
Rated Frequency (f)	Hz	50	
No. of Poles (Execution)		1P, 1P+N, 2P, 3P, 3P+N, 4P**	
Rated Short Circuit Breaking Capacity	kA	10	10 0.5-32A-10 kA 40A-63A-4.5kA
Magnetic Release Setting		(3-5) In	(5-10) In (10-20) In
Rated Insulation Voltage (Ui)	V	690	
Rated Impulse Voltage (Uimp)	kV	4	
Electrical / Mechanical Endurance ≤32A (No. of operations)		20000	
Electrical / Mechanical Endurance >32A (No. of operations)		10000	
Ambient Working Temperature	°C	-5 to + 55	
Terminal Capacity (max)	mm <sup>2</sup>	35	
Vibration	g	3	
Shock Resistance		40mm free fall	
Protection Class		IP-20	
Installation Position		Vertical / Horizontal	
Mounting		Clip on DIN Rail (35mm x 7.5mm)	
Case & Cover		Moulded, flame-retardant thermoplastic material	
Auxiliary Contacts		Yes	
Shunt Trip		Yes	

\* Current Ratings (A) -

0.5, 1, 2, 3, 4, 5, 6, 8, 10, 13, 16,  
20, 25, 32, 40, 50, 63

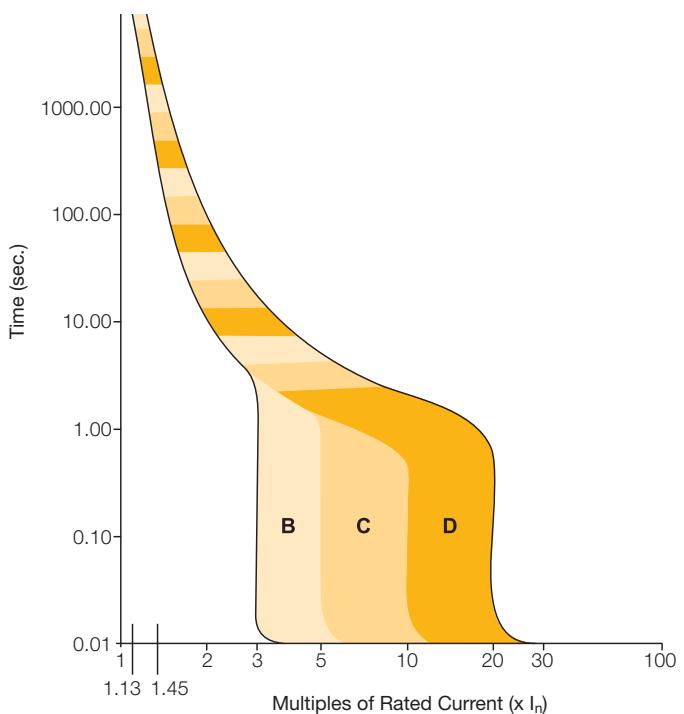
\*\* 1P Single Pole  
1P+N Single Pole Neutral  
2P Double Pole  
3P Three Pole  
3P+N Three Pole Neutral  
4P Four Pole

#### Dimensions (in mm)



## 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	$1.13 \times I_n$		$\geq 1h$	$10 \times I_n$		$\geq 0.1s$
		$1.45 \times I_n$	$< 1h$		$20 \times I_n$	$< 0.1s$
$I_3 = 2.55 \times I_n$	$1 s < t < 60s$ for $I_n$ ( $I_n \leq 32A$ )			$1 s < t < 120s$ for $I_n$ ( $I_n > 32A$ )		



## 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)  $I_n$

**'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)  $I_n$

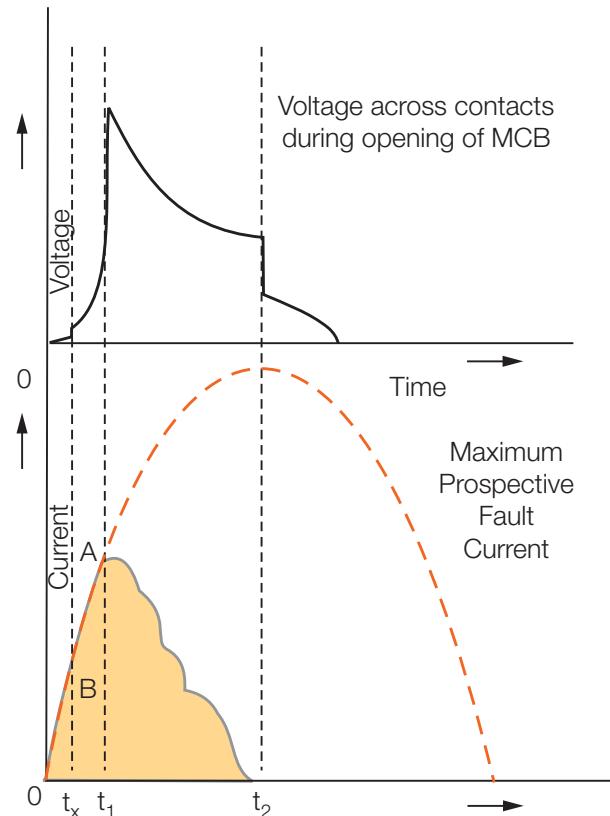
## Current Limiting Design

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 electrodynamics 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

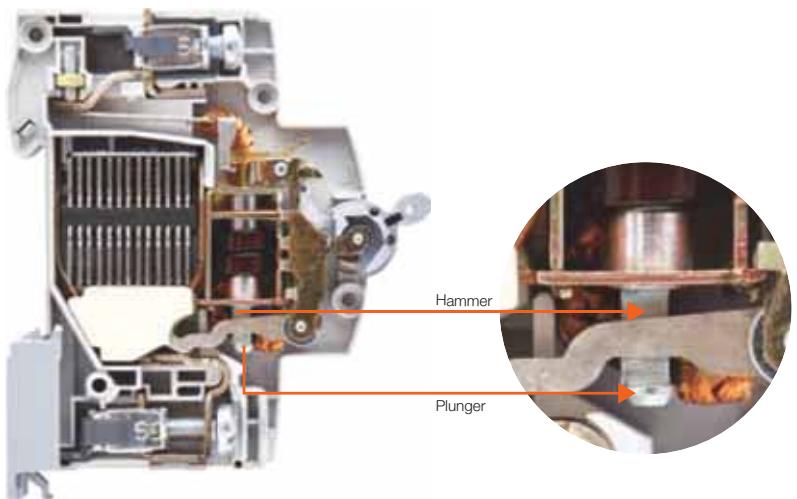
- 0 = Point of fault initiation
- $t_x$  = Contact opening time (i.e., creation of arc)
- $t_1$  = Current / Voltage peak (i.e., current limitation)
- $t_2$  = Time to total extinction of arc (i.e., complete shutdown of fault current)



### Hammer Trip Mechanism

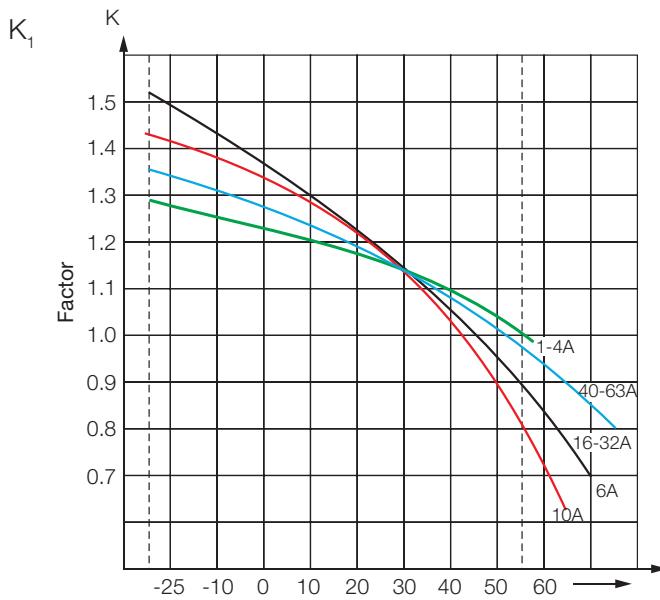
Current Limiting design in itself may not fulfil the requirement of quick breaking (instantaneous action) mainly due to inertia of the Latch mechanism and interconnected sequence of operations.

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



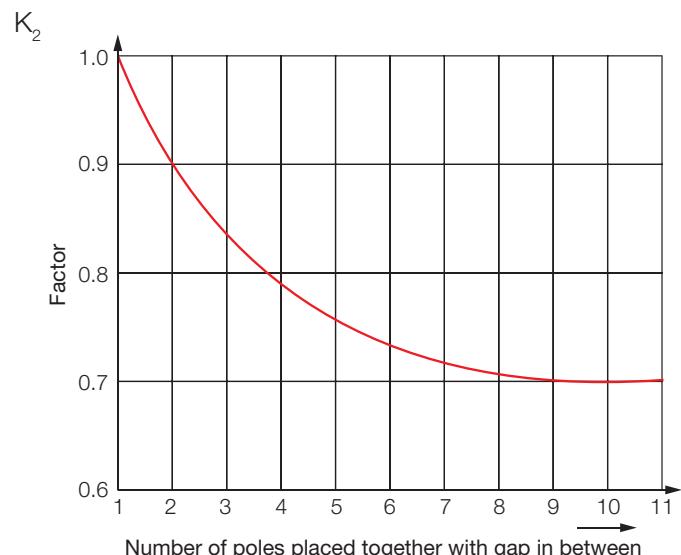
### Ambient Temperature Compensation / Diversity Factor Chart

Maximum Permissible Rated Current ( $K_1$  Factor)



Graph 1

Diversity Factor ( $K_2$  Factor)



Graph 2

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

Example 4 MCBs with  $I_n = 10A$ , and the amb. temp. is  $50^\circ\text{C}$  kept with no gap in between

Solution  $K_1 = 0.89$  (from graph 1)

$K_2 = 0.78$  (from graph 2)

$I_n / \text{pole} = 0.89 \times 0.78 \times 10 = 6.94 \text{ A}$

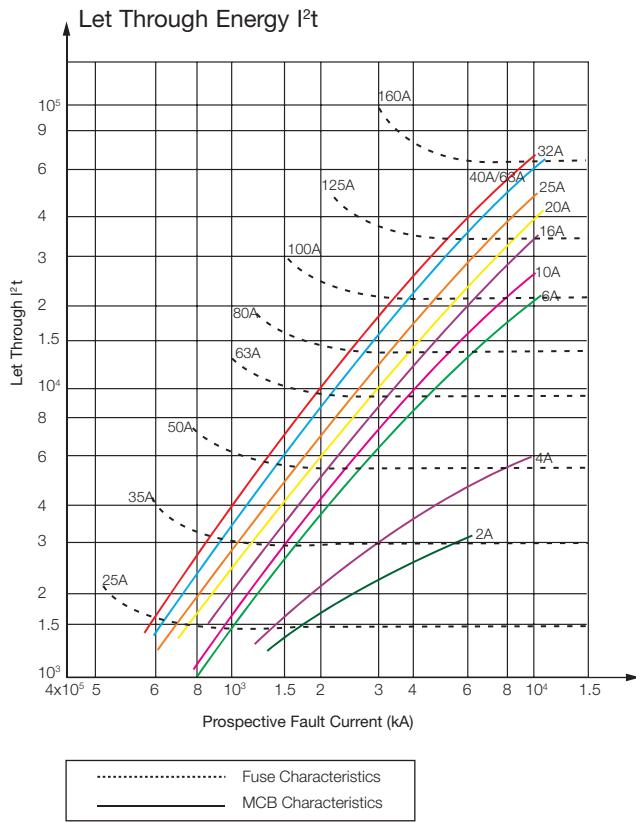
### Effect Of Frequency Variation

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

These can be used on different frequencies in supply from 50-60 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
	100Hz	200Hz	400Hz	
Frequency	1.1	1.2	1.5	1.5
Multiplication Factor				



#### Cold Resistance & Power Loss Details

The power loss value declared are at rated current.

Rated Current $I_n$ (A)	Cold Resistance $R_i$ (mΩ)	Power Loss per Pole $P_v$ (W)
0.5	3100.00	0.8
1	860.80	1.0
2	280.00	1.2
4	70.00	1.2
6	25.00	1.3
10	11.68	1.4
13	10.10	1.6
16	8.00	2.2
20	4.50	2.3
25	3.78	3.1
32	2.57	3.3
40	1.94	3.6
63	1.30	6.2

Remarks:- Tolerance  $\pm 5\%$

#### DC Application

MCBs for DC application are specially designed to meet tough arc quenching conditions. While selecting circuit breaker for DC applications following parameters have to be taken into consideration.

#### Normal Circuit Currents

The rating and normal running temperature of the MCB are unaffected by DC. The MCB can be selected using the thermal section of the standard time / current curves.

Magnetic tripping on DC is different from the equivalent AC by a peak factor of 1.4

ie., for 'B' curve AC MCB, magnetic range	$= (3-5) I_n$
for DC MCB, magnetic range	$= 1.4(3-5)I_n = (4-7)I_n$
for 'C' curve AC MCB, magnetic range	$= (5-10)I_n$
for DC MCB, magnetic range	$= 1.4(5-10)I_n = (7-14)I_n$

#### Energy Limiting Class 3

MCBs are designed to have low-let through energy during faults, thus ensuring a better protection of cables and equipment.

#### Maximum Backup Protection

At site, no. of MCBS are used for outgoing connection. To protect the MCBS under short circuit (higher breaking capacity), we need to put fuses in the incoming side. The current rating of fuses should not be more than the values given in the table.

MCB Current Rating	Backup Fuse Rating
1 A	25 A
2 A	35 A
4 A	50 A
6 A	80 A
10 - 63 A	100 A



## Short Circuit Currents

The maximum short circuit current possible on a DC system is determined by the voltage of the battery and the total internal resistance of the cells.

It is given by Ohm's law :  $I_{sc} = V_b / R_b$

Where,  $I_{sc}$  is the Short Circuit Current

$V_b$  is the voltage of the battery (with 100% charged battery)

$R_b$  is the internal resistance of the battery cells

(this is usually stated by the manufacturer)

## Circuit Time Constant

The time constant is given by :  $L / R = 15\text{ms}$  max where  $L$  is the inductance of the circuit

## R is The Resistance Of The Circuit

The time constant is usually given in milliseconds (ms.). Ideally, DC circuits would be mainly resistive (i.e. a low number), as inductive circuits produce a back emf when the current suddenly falls. This in turn tends to prolong arcing during switching operations, and so reduce contact life.

## Circuit Voltage

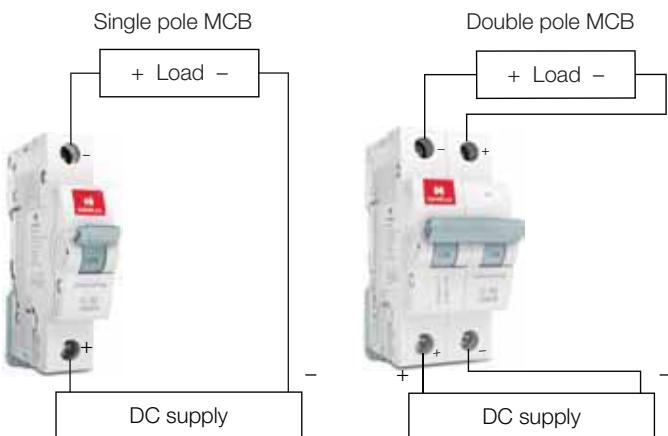
The voltage of the circuit is dependent upon the power supply. The lower the voltage the easier switching operations will be, but the voltage makes no difference to the running of the MCBS.

Contact life can be significantly increased by reducing the voltage, drop across each pole. This can be achieved by wiring poles in series.

## Technical data

Correct polarity connections for DC MCBS

- Connection diagram



Standard Conformity	IS / IEC 60947 - 2	
Rated Current (In)	A	0.5-63
Rated Voltage (Ue)	V <sub>—</sub>	220
No. of Poles (Execution)		1P, 2P
Rated Short Circuit Breaking Capacity	kA	3

\*Also available in 130V DC

## Shunt Trip

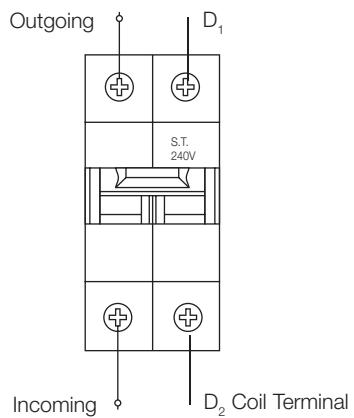
Attachment Used For Remote Tripping		
Standard Conformity		IS / IEC 60947-3
Coil Consumption	VA	6
Rated Voltage	(ac) (Ue) (dc) (Ue)	V 240 V 48, 24, 12
Frequency	Hz	50
Operating Voltage Range		70% - 110% of rated voltage
Electrical Endurance (No. of operations)		10000
Terminal Capacity (Max)	mm <sup>2</sup>	35
Protection Class		IP-20 as per IS-2147 & IEC 60529
Mounting		Right side of MCB (Factory assembled)



## Shunt Trip Coil

1. To trip the Circuit Breaker through Shunt Trip Coil, 70% to 110% of the rated voltage is to be applied across D1 & D2.
2. The Shunt Trip coil is supplied for a short time rated voltage and it trips the breaker instantaneously. (i.e., continuous duty not required).

## Shunt Trip Connection Diagram



## Discrimination Data

MCB Downstream		MCB Upstream C Curves							
C curve	10A	13A	16A	20A	25A	32A	40A	50A	63A
0.5 to 5A	50	65	80	100	125	160	200	250	315
6A		65	80	100	125	160	200	250	315
10A				100	125	160	200	250	315
13A					125	160	200	250	315
16A						160	200	250	315
20A							200	250	315
25A								250	315
32A									315
40A									
50A									

MCB Downstream		MCB Upstream B Curves									
B curve	6A	10A	13A	16A	20A	25A	32A	40A	50A	63A	
0.5 to 5A		30	39	48	60	75	96	120	150	189	
6A		30	39	48	60	75	96	120	150	189	
10A				48	60	75	96	120	150	189	
13A					60	75	96	120	150	189	
16A						75	96	120	150	189	
20A							96	120	150	189	
25A								120	150	189	
32A										189	

MCB Downstream		MCCB Upstream																			
C curve	16A	20A	25A	32A	40A	50A	63A	80A	100A	125A	160A	200	250A	320A	400A	500A	630A	800A	1000A	1250A	1600A
0.5 to 6A	1100	1200	1400	1700	2000	2500	3400	4800	5800	6700	T	T	T	T	T	T	T	T	T	T	
10A	-	1100	1200	1400	1700	2100	2500	3000	3500	4300	T	T	T	T	T	T	T	T	T	T	
16A	-	-	-	1300	1600	1900	2100	2400	2700	3200	8300	T	T	T	T	T	T	T	T	T	
20A	-	-	-	-	1600	1900	2100	2400	2700	2500	8300	T	T	T	T	T	T	T	T	T	
25A	-	-	-	-	-	1700	1800	2000	2200	2500	5400	8700	T	T	T	T	T	T	T	T	
32A	-	-	-	-	-	-	1800	2000	2200	2500	5400	8700	T	T	T	T	T	T	T	T	
40A	-	-	-	-	-	-	-	1500	1700	2000	4300	7000	T	T	T	T	T	T	T	T	
50A	-	-	-	-	-	-	-	-	1300	1500	3600	5900	9000	T	T	T	T	T	T	T	
63A	-	-	-	-	-	-	-	-	-	1100	2800	5200	8200	T	T	T	T	T	T	T	

Prospective Fault Levels to which selectivity is achieved ( T = Total Selectivity )

#### Discrimination With Fuses

HRC Fuse Upstream Type gG

MCBs Downstream	HRC Fuse Link Upstream									
	20A	25A	32A	40A	50A	63A	80A	100A	125A	160A
0.5 to 6A	700	850	960	1200	1350	1750	2800	4500	5200	6000
10A	700	960	1200	1350	1750	2800	4500	5200	6000	
13A		850	1200	1200	1750	2800	4500	5200	6000	
16A		960	1100	1500	2500	3200	5200	6000		
20A			1100	1500	2500	3200	4500	5200		
25A			960	1350	2000	3200	4500	5200		
32A				1200	1750	2800	4500	5200		
40A					1750	2800	4500	5200		
50A						2500	3200	4500		
63A						3200	4500			

## MCB Selection Chart For Household Applications

Appliances	Capacity / watt (Load) (240V~1ph)	Current Rating of MCB	Type of MCB
Air Conditioner	1.0 ton	10A*	"C" series
	1.5 ton	16A*	"C" series
	2.0 ton	20A*	"C" series
Refrigerator	165 litres	3A*	"C" series
	350 litres	4A*	"C" series
Oven cum Griller	4500W	32A	"B" series
	1750W	10A	"B" series
Oven only Hot Plate only Room Heater	750W	6A	"B" series
	2000W	10A	"B" series
	1000W	6A	"B" series
	2000W	10A	"B" series
Washing Machine	300W	2A	"C" series
Washing Machine (with heater)	1300W	8A	"C" series
(storage/instant)	1000W	6A	"B" series
	2000W	10A	"B" series
	3000W	16A	"B" series
	6000W	32A	"B" series
Electric iron	750W	6A	"B" series
	1250W	8A	"B" series
(2 slices)	1200W	8A	"B" series
Electric Kettle	1500W	10A	"B" series

\* It may vary from manufacturer to manufacturer. Please check before installation.

## Rating Of MCBs For Specified No. of Fittings ("B" Series MCBs)

Lamp (Watt)	Number of Lamps	Rating (A)
20W	8	1
	12	1.5
40W	2	0.5
	10	2
60W	12	2.5
	1	0.5
80W	4	1.5
	8	3
100W	12	4
	1	0.5
80W	2	1
	5	2
100W	8	4
	12	5
100W	1	1
	2	1.5
	4	2.5

"B" series MCB is used for all Lighting Applications

## MCB Selection Chart For Motor Protection

S. No.	kW	HP	1 Phase 230V DOL Starting		3 Phase 400V DOL Starting		3 Phase 400V Assisted Starting Star Delta		
			Full Load Current	MCB Selection	Full Load Current	MCB Selection	Full Load Current	MCB Selection	MCB Selection
1	0.18	0.24	2.8	10	0.9	2	—	—	—
2	0.25	0.34	3.2	10	1.2	2	—	—	—
3	0.37	0.50	3.5	10	1.2	2	—	—	—
4	0.55	0.74	4.8	16	1.8	3	—	—	—
5	0.75	1.01	6.2	20	2.0	3	—	—	—
6	1.1	1.47	8.7	25	2.6	6	—	—	—
7	1.5	2.01	11.8	32	3.5	10	—	—	—
8	2.2	2.95	17.5	50	4.4	10	—	—	—
9	3	4.02	20.0	63	6.3	16	6.3	16	10
10	3.75	5.03	24.0	80	8.2	20	8.2	20	10
11	5.5	7.37	26.0	80	11.2	25	11.2	32	16
12	7.5	10.05	47.0	125	14.4	40	14.4	40	25
13	10	13.40	—	—	21.0	50	21.0	50	32
14	15	20.11	—	—	27.0	100	27.0	63	40
15	18.5	24.80	—	—	32.0	125	32.0	—	50
16	22	29.49	—	—	38.0	125	38.0	—	63
17	30	40.21	—	—	51.0	125	51.0	—	63

## Calculation Formulae :

Incomer Current Rating, For Single Phase :

$$\frac{\text{Total Load in Watts}}{240V}$$

Incomer Current Rating, For Three Phase :

$$\frac{\text{Total Load in Watts}}{\sqrt{3} \times 240V}$$

"C" series MCB is used for all Motor Applications

Note :One lighting circuit can have up to 800W or up to 10 lighting points

One power circuit can have up to 2000W or 1 power points

## 'B' Series MCB



## 'B' Series SP MCB

(In accordance with IS/IEC 60898-1) 240V, 50Hz, 10kA Suitable for lighting and other domestic loads.

Rating	Pack Qty.	SP Cat. No.
6-32A	12	DHMG BSPF006-032
40-63A	12	DHMG BSPF040-063

## 'C' Series MCB



## 'C' Series SP MCB

(In accordance with IS/IEC 60898-1) 240V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	SP Cat. No.
0.5-5A	12	DHMG CSPF0x5-005
6-32A	12	DHMG CSPF006-032
40A	12	DHMG CSPF040
50A	12	DHMG CSPF050
63A	12	DHMG CSPF063



## 'C' Series SPN MCB

(In accordance with IS/IEC 60898-1) 240V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	SPN Cat. No.
0.5-5A	6	DHMG CSNF0x5-005
6-32A	6	DHMG CSNF006-032
40A	6	DHMG CSNF040
50A	6	DHMG CSNF050
63A	6	DHMG CSNF063



## 'C' Series DP MCB

(In accordance with IS/IEC 60898-1) 240/415V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	DP Cat. No.
0.5-5A	6	DHMG CDPF0x5-005
6-32A	6	DHMG CDPF006-032
40A	6	DHMG CDPF040
50A	6	DHMG CDPF050
63A	6	DHMG CDPF063


**'C' Series TP MCB**

(In accordance with IS/IEC 60898-1) 240/415V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	TP Cat. No.
0.5-5A	4	DHMGCTPF0x5-005
6-32A	4	DHMGCTPF006-032
40A	4	DHMGCTPF040
50A	4	DHMGCTPF050
63A	4	DHMGCTPF063


**'C' Series TPN MCB**

(In accordance with IS/IEC 60898-1) 240/415V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	TPN Cat. No.
0.5-5A	3	DHMGCTNF0x5-005
6-32A	3	DHMGCTNF006-032
40A	3	DHMGCTNF040
50A	3	DHMGCTNF050
63A	3	DHMGCTNF063


**'C' Series FP MCB**

(In accordance with IS/IEC 60898-1) 240/415V, 50Hz, 10kA Suitable for Motor and other Inductive loads.

Rating	Pack Qty.	FP Cat. No.
0.5-5A	3	DHMGCFPF0x5-005
6-32A	3	DHMGCFPF006-032
40A	3	DHMGCFPF040
50A	3	DHMGCFPF050
63A	3	DHMGCFPF063

**'D' Series MCB****'D' Series SP MCB**

(In accordance with IEC 60898-1) 240/415V, 50Hz Suitable for high inrush current loads.

Rating	Pack Qty.	SP Cat. No.
0.5-5A	12	DHMGDSPF0x5-005
6-32A	12	DHMGDSPF006-032
40A	12	DHMGDSPF040
50A	12	DHMGDSPF050
63A	12	DHMGDSPF063

**'D' Series DP MCB**

(In accordance with IEC 60898-1) 240/415V, 50Hz Suitable for high inrush current loads.

Rating	Pack Qty.	DP Cat. No.
0.5-5A	6	DHMGDDPF0x5-005
6-32A	6	DHMGDDPF006-032
40A	6	DHMGDDPF040
50A	6	DHMGDDPF050
63A	6	DHMGDDPF063

**'D' Series TP MCB**

(In accordance with IEC 60898-1) 240/415V, 50Hz Suitable for high inrush current loads.

Rating	Pack Qty.	TP Cat. No.
0.5-5A	4	DHMGDTPF0x5-005
6-32A	4	DHMGDTPF006-032
40A	4	DHMGDTPF040
50A	4	DHMGDTPF050
63A	4	DHMGDTPF063

**'D' Series FP MCB**

(In accordance with IEC 60898-1) 240/415V, 50Hz, 10kA Suitable for high inrush current loads.

Rating	Pack Qty.	FP Cat. No.
0.5-5A	3	DHMGDFPF0x5-005
6-32A	3	DHMGDFPF006-032
40A	3	DHMGDFPF040
50A	3	DHMGDFPF050
63A	3	DHMGDFPF063

**'DC' Series MCB****'DC' Series SP MCB**

For DC Supply, upto 220V (IS/IEC 60947-2)

Rating	Pack Qty.	SP Cat. No.
0.5-5A	12	DHMCESPF0x50013 - 0050013
6-32A	12	DHMCESPF0060013 - 0320013
40A	12	DHMCESPF0400013
50A	12	DHMCESPF0500013
63A	12	DHMCESPF0630013

**'DC' Series DP MCB**

For DC Supply, up to 220V (IS/IEC 60947-2)

Rating	Pack Qty.	DP Cat. No.
0.5-5A	6	DHMCEDPF0x50013 - 0050013
6-32A	6	DHMCEDPF0060013 - 0350013
40A	6	DHMCEDPF0400013
50A	6	DHMCEDPF0500013
63A	6	DHMCEDPF0630013

**'DC' Series Railway MCB**

For Railway Applications (with extended terminals &amp; mounting brackets)

Rating	Pack Qty.	TP Cat. No.
0.5-5A	12	DHMCRSPF0x50013 - 0050013
6-35A	12	DHMCRSPF0060013 - 0350013
40A	12	DHMCRSPF0400013
50A	12	DHMCRSPF0500013
60A	12	DHMCRSPF0600013

Suitable for Railway application as per RDSO, Drg. SKEL. 3700 alt-1 and specification No. SPEC/E-12/1/04 (with extended terminals and mounting brackets)



◆ MINIATURE CIRCUIT  
BREAKER (80A-125A)

Electrical Distribution needs are continuously evolving in residential, commercial and industrial sectors. Improved operational safety, continuity of service, greater convenience and operating cost have assumed a tremendous significance. Miniature Circuit Breakers have been designed to continuously adapt to these changing needs.

**Features**

- Trip Free mechanism
- Positive Contact Indication
- Thermal and Magnetic trip function
- Current Limiting design for short circuit fault protection
- CE marking. RoHS Complaint, 'Green Product'

**Range**

80A, 100A & 125A - 'C' Curve

**Execution**

Single Pole (1P), Double Pole (2P)  
Three Pole (3P), Four Pole (4P)

**Specification**

IS / IEC 60947-2



**Positive Contact Indication**

It clearly indicates true contact position through Flag Indication (Red-ON, Green-OFF) thus enhancing safety



**Large Cable Terminals**

Suitable for copper and aluminum cables, these terminals are compatible with cables upto 35mm<sup>2</sup> cross section area

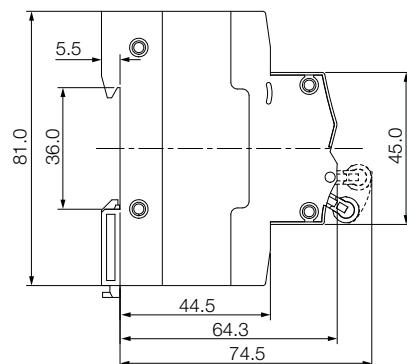
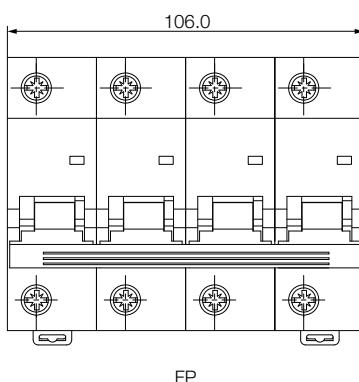
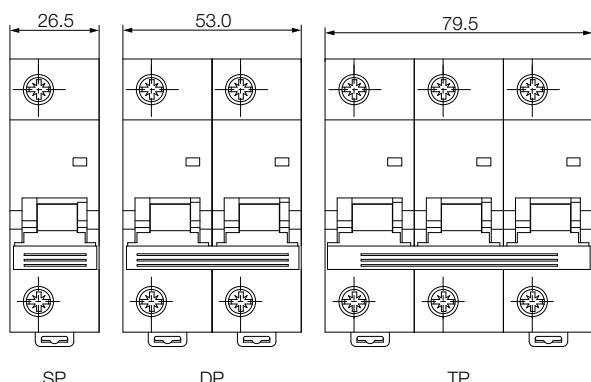
Technical Specification		
Standard Conformity		IS / IEC 60947 – 2
Type / Series		C
Rated Current (In)	A	80 – 125*
Rated Voltage (Ue)	V~	240/415
Rated Insulation Voltage (Ui)	V	690
Rated Impulse Withstand Voltage (Uimp)	kV	6
Rated Frequency	Hz	50 / 60
No. of Poles		1P, 2P, 3P, 4P**
Rated Short Circuit Breaking Capacity (Icn)	kA	10
Rated Ultimate Short Circuit Breaking Capacity (Icu)	kA	10
Rated Service Short Circuit Breaking Capacity (Ics)		75% of Icu
Magnetic Release Setting (In)	A	(5 - 10)
Mechanical Life	No. of Operations	20000
Electrical Life	No. of Operations	5000
Ambient Temperature	°C	- 5 to + 55
Terminal Capacity	mm <sup>2</sup>	50
Tightening Torque	Nm	3.5
Protection Class		IP 20
Installation Position		Vertical / Horizontal
Mounting		Clip on DIN Rail (35mm x 7.5mm)

\* Current Ratings: 80 A, 100 A, 125 A

\*\* 1P Single Pole 3P Three Pole

2P Double Pole 4P Four Pole

### Dimensions (in mm)



## Higher Rating MCB



Higher Rating SP MCB (80A - 125A) 'C' Series,  
(In accordance with IS/IEC 60947-2) 240/415V, 50 Hz, 10kA

Rating	Pack Qty.	SP Cat. No.
80A	6	DHMJCSPF080
100A	6	DHMJCSPF100
125A	6	DHMJCSPF125



Higher Rating DP MCB (80A - 125A) 'C' Series,  
(In accordance with IS/IEC 60947-2) 240/415V, 50 Hz, 10kA

Rating	Pack Qty.	DP Cat. No.
80A	3	DHMJCDPF080
100A	3	DHMJCDPF100
125A	3	DHMJCDPF125



Higher Rating TP MCB (80A - 125A) 'C' Series,  
(In accordance with IS/IEC 60947-2) 240/415V, 50 Hz, 10kA

Rating	Pack Qty.	TP Cat. No.
80A	2	DHMJCTPF080
100A	2	DHMJCTPF100
125A	2	DHMJCTPF125



Higher Rating FP MCB (80A - 125A) 'C' Series,  
(In accordance with IS/IEC 60947-2) 240/415V, 50 Hz, 10kA

Rating	Pack Qty.	FP Cat. No.
80A	1	DHMJCFPF080
100A	1	DHMJCFPF100
125A	1	DHMJCFPF125



◆ **RESIDUAL CURRENT  
CIRCUIT BREAKER  
(16A-63A)**

The flow of current through electrical facilities always involves risks. Poorly insulated equipment, faulty wires and incorrect use of an electrical device can cause current to flow through the wrong path (i.e. through the insulation/human body) to the earth.

RCCB (also popularly known as ELCB) is a mechanical switching device designed to make, carry and break currents under normal service conditions and to cause the opening of the contacts when the leakage current attains a given value under specified conditions. Havells offers a wide range of RCCBs for protecting human life against fatal electric shocks as well as for providing protection against fire caused by earth faults.

**Features**

- Type AC and Type A RCCB
- Simple and Robust operating mechanism
- Rotary handle with ON/OFF indication in FP
- Dual termination for Bus Bar as well as cable connection
- Advance Neutral
- Test button for regular inspection
- Conditional Short-circuit current capacity 10kA
- ISI and CE marking, RoHS Complaint, 'Green Product'

**Range**

16A - 63A

**Sensitivity**

30mA, 100mA & 300mA

**Execution**

Double Pole (2P)  
Four Pole (4P)

**Specification**

IS 12640 Part 1 / IEC 61008-1  
/ EN 61008 - 1



**Safety Terminals**

To avoid improper cable termination, the safety terminals guide the cable towards the cage terminal for systematic termination



**Large Cable Terminals**

Suitable for copper and aluminum cables, these terminals are compatible with cables upto 35mm<sup>2</sup> cross section area



**Bi Stable Clip**

Every device is provided with a dual position DIN rail clip, so it becomes much easier to change a device from a device bank connected to a bus-bar, without disturbing the existing wiring



**Cooler Operation**

Grooves provided on outer body, so that when individual poles are placed adjacent to each other in a distribution board it forms a very effective channel for better air circulation, resulting into a cooler operation

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. RCCBs are electrical devices which afford a very high degree of protection against the risks of electrocution and fire caused by earth faults.

#### Protection Against Electrocution

Electrocution is a passage of current through human body, which is dangerous. The flow of current through human body affects vital functions of breathing & heartbeat.

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 = 50V
- In damp surroundings, voltage limit = 25V

A correctly chosen RCCB can detect small currents flowing to earth and reduces the risk of electrocution.

#### Protection 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.

#### Example

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

#### Protection 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.

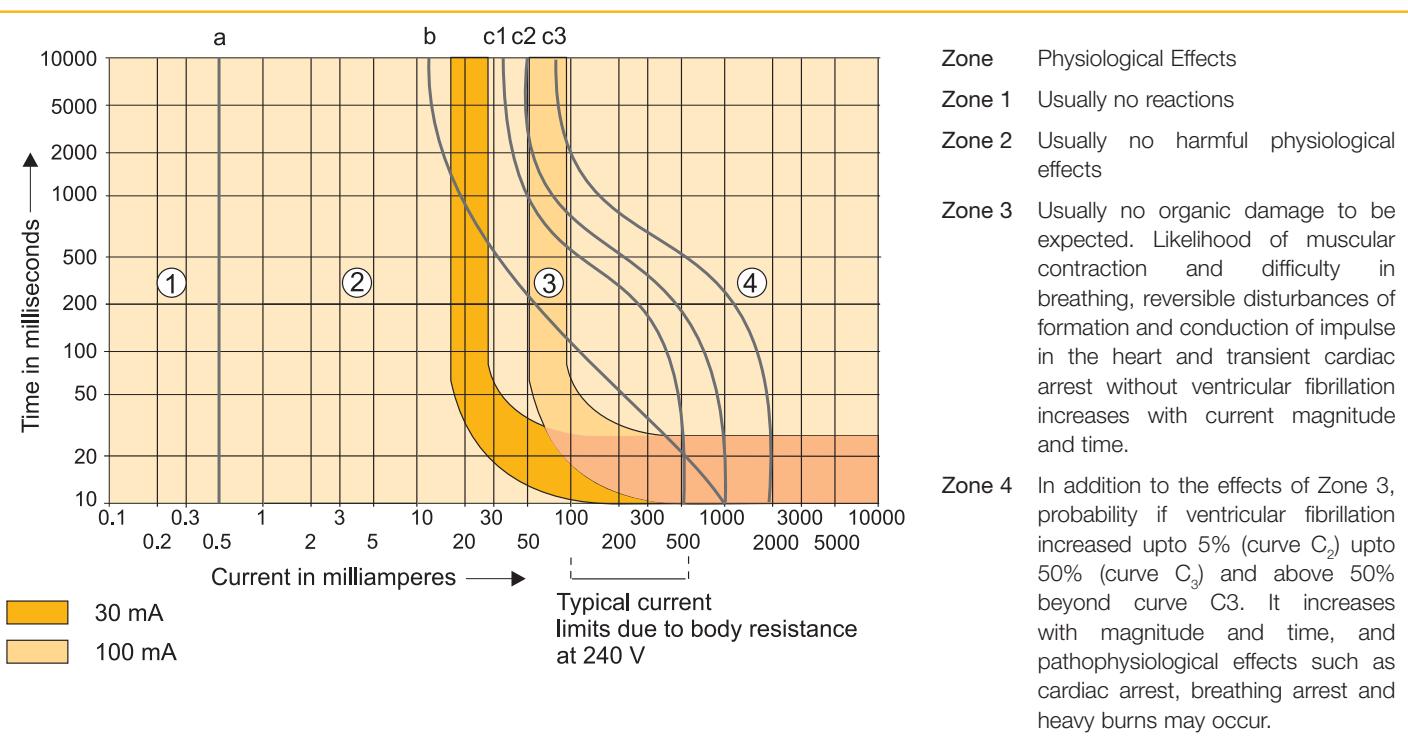
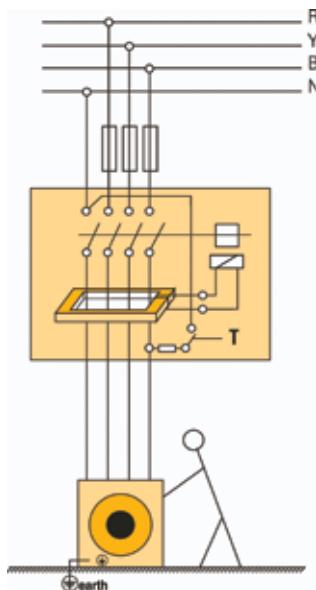
Rated Tripping Current of the RCD		Maximum permissible earth fault loop impedance in
10	mA	5,000
30	mA	1,666
100	mA	500
300	mA	166

### 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.



**Sensitivity Selection**

- 30 mA

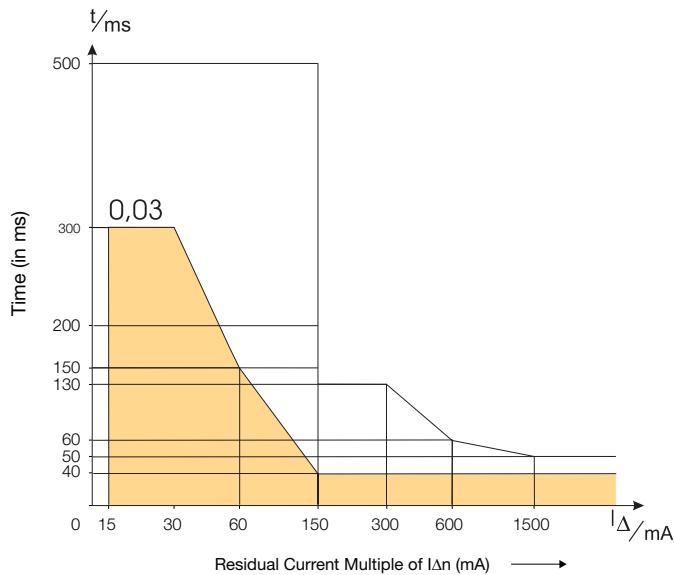
A 30 mA RCCB will provide a high degree of protection against electrocution in an accidental shock hazard situation. The current flowing through human body could be between 80mA and 240mA depending on the resistance of the human body and the voltage across it.

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

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

- 100 mA

A 100mA 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.

**Actuation Time Characteristics**

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

- 300 / 500mA

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

**Selection of RCCB Type****RCCB Type AC**

AC Type RCCB are used for residual sinusoidal alternating current.

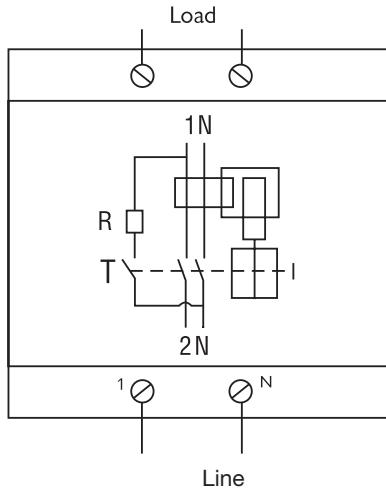
**RCCB Type A**

A Type RCCB is used for residual sinusoidal alternating currents and residual pulsating direct currents, whether suddenly applied or slowly rising. It can therefore handle the residual current waveforms which can occur in the power supply units of single-phase loads with electronic components (e.g. ECG, dimmer switches). This type of residual current protective device is suitable for electronic equipment with input current circuits 1 to 6 in table 1.

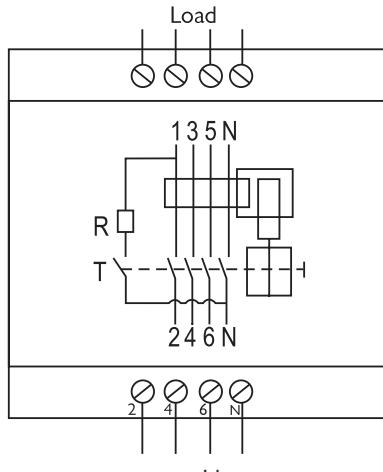
Suitable RCD-Type		Circuit	Load Current	Residual Current
A 	AC 	1		
		2		
		3		
		4		
		5		
		6		

### Wiring Diagram

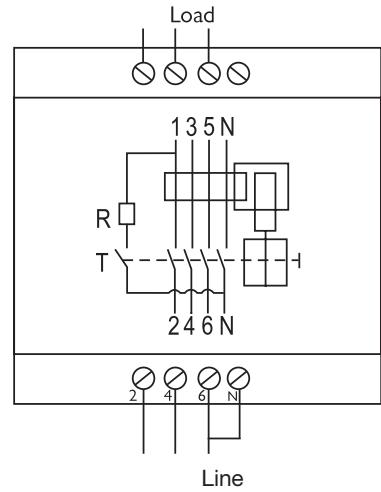
For Single Phase - 2 Wire



For Three Phase - 4 Wire



For Three Phase - 3 Wire

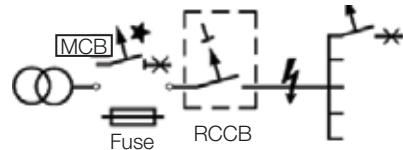


The Havells range of four pole RCCBs can be used to provide residual current protection in 3 phase, 3 wire circuits (no neutral), however a link from the neutral to an incoming should be made on the supply side of the RCCB, to enable the operation of the RCCB.

Technical Specifications		DP	FP
Standard		IS 12640 Part 1/ IEC 61008-1 / EN 61008 - 1	IS 12640 Part 1/ IEC 61008-1 / EN 61008 - 1
Type		A, AC	A, AC
Rated Current (In)	A	16, 25, 32, 40, 63	25, 40, 63 (Type AC) 16, 25, 32, 40, 63 (Type A)
Sensitivity (In)	mA	30, 100, 300*	30, 100, 300*
Rated Voltage (Un)	Vac	240	415
Rated Insulation Voltage (Ui)	V	690	690
Rated Frequency	Hz	50	50
Conditional short circuit capacity (I <sub>nc</sub> )**	kA	10	10
Residual Making Breaking Capacity	A	500 A or 10 In whichever is greater	500 A or 10 In whichever is greater
Ambient Temperature	°C	-25 to + 55	-25 to + 55
Shock Resistance		40 mm free fall	40 mm free fall
Vibration Resistance	g	3	3
Electrical /Mechanical (No. of operations)		10000	10000
Mounting		Din Rail (35 mm x 7.5 mm)	Din Rail (35mm x 7.5mm)
Degree of Protection		IP 20	IP 20
Terminal Capacity (max)	mm <sup>2</sup>	35	35

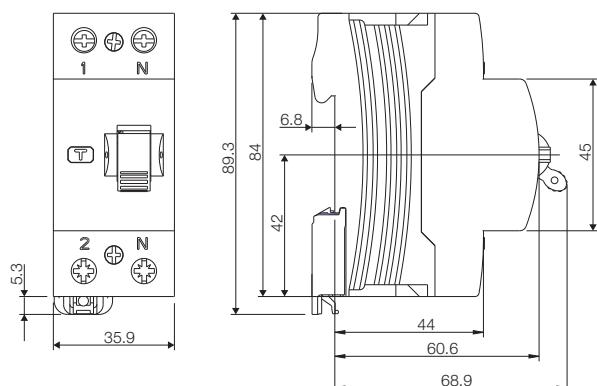
\*500 mA is available on request

\*\* In combination with an upstream SCPD (Fuse gL/MCB) of same or higher rating w.r.t. RCCB, to achieve the minimum values of I<sub>2t</sub> and I<sub>p</sub> to be withstood by the RCCB (as per IEC)"

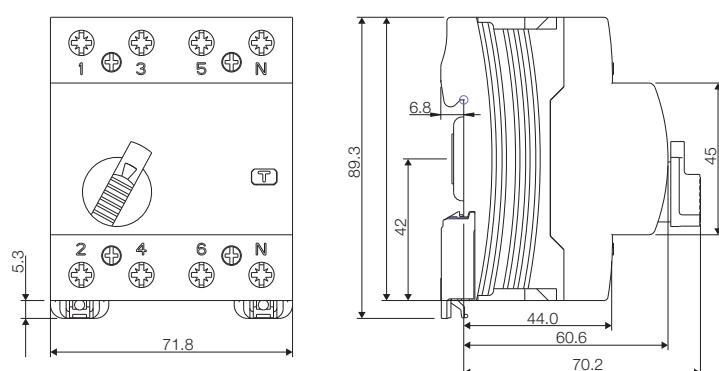


#### Dimensions (in mm)

2 POLE



4 POLE



## RCCB - 'AC' Type



## RCCB - 'AC' Type DP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 240V, 50Hz with 10kA conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
16A	DHRGCTDF030016	DHRGCTDF100016	DHRGCTDF300016
25A	DHRGCTDF030025	DHRGCTDF100025	DHRGCTDF300025
32A	DHRGCTDF030032	DHRGCTDF100032	DHRGCTDF300032
40A	DHRGCTDF030040	DHRGCTDF100040	DHRGCTDF300040
63A	DHRGCTDF030063	DHRGCTDF100063	DHRGCTDF300063



## RCCB - 'AC' Type FP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 415V, 50Hz with 10kA conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
25A	DHRGCRFF030025	DHRGCRFF100025	DHRGCRFF300025
40A	DHRGCRFF030040	DHRGCRFF100040	DHRGCRFF300040
63A	DHRGCRFF030063	DHRGCRFF100063	DHRGCRFF300063

## RCCB - 'A' Type



## RCCB - 'A' Type DP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 240V, 50Hz with 10kA Conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
16A	DHRMAMDF030016	DHRMAMDF100016	DHRMAMDF300016
25A	DHRMAMDF030025	DHRMAMDF100025	DHRMAMDF300025
32A	DHRMAMDF030032	DHRMAMDF100032	DHRMAMDF300032
40A	DHRMAMDF030040	DHRMAMDF100040	DHRMAMDF300040
63A	DHRMAMDF030063	DHRMAMDF100063	DHRMAMDF300063



## RCCB - 'A' Type FP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 415V, 50Hz with 10kA Conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
16A	DHRMAMFF030016	DHRMAMFF100016	DHRMAMFF300016
25A	DHRMAMFF030025	DHRMAMFF100025	DHRMAMFF300025
32A	DHRMAMFF030032	DHRMAMFF100032	DHRMAMFF300032
40A	DHRMAMFF030040	DHRMAMFF100040	DHRMAMFF300040
63A	DHRMAMFF030063	DHRMAMFF100063	DHRMAMFF300063



◆ RESIDUAL CURRENT  
CIRCUIT BREAKER  
(80A-100A)

The flow of current through electrical facilities always involves risks. Poorly insulated equipment, faulty wires and incorrect use of an electrical device can cause current to flow through the wrong path (i.e. through the insulation/human body) to the earth.

RCCB (also popularly known as ELCB) is a mechanical switching device designed to make, carry and break currents under normal service conditions and to cause the opening of the contacts when the leakage current attains a given value under specified conditions. Havells offers a wide range of RCCBs for protecting human life against fatal electric shocks as well as for providing protection against fire caused by earth faults.

**Features**

- Conditional short circuit capacity 10kA
- Different knob position to indicate whether it is switched by a fault or manually switched OFF (Mid Trip)
- Test button for regular inspection
- Positive contact indication
- Dual termination for simultaneous connection of bus-bars and wires.
- CE marking, RoHS Complaint, 'Green Product'

**Range**

80A - 100A

**Sensitivity**

30mA, 100mA & 300mA

**Execution**

Double Pole (2P)  
Four Pole (4P)

**Specification**

IS 12640 Part 1 / IEC 61008-1  
/ EN 61008 - 1



**Mid Trip**

Different knob position to indicate whether the device is Switched OFF by a fault or Switched OFF manually



**Positive Contact Indication**

It clearly indicates true contact position through Flag Indication (Red-ON, Green-OFF) thus enhancing safety



**Large Cable Terminals**

The terminals are suitable for cables up to 50mm<sup>2</sup> cross section area thus making it suitable for copper and aluminium cables



**Test  
Regularly**

**Test Button**

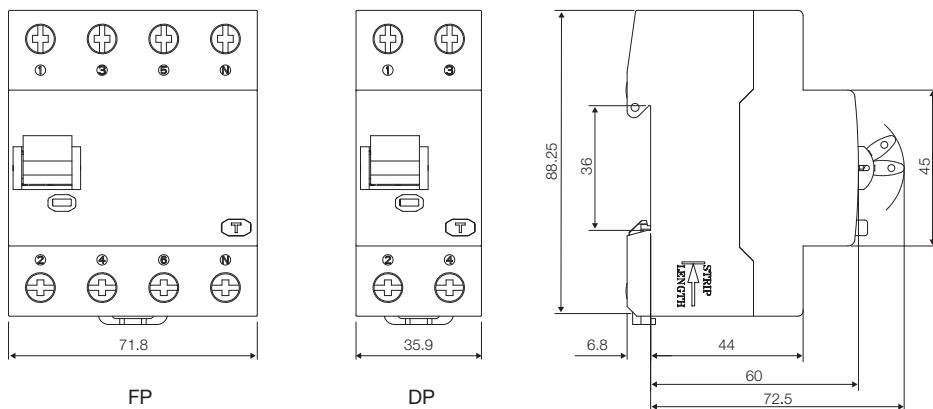
Test button for regular inspection/testing

Technical Specification		DP	FP
Specification Reference		IEC 61008-1 & IS 12640-1	IEC 61008-1 & IS 12640-1
Type		AC	AC
Rated current (In)	A	80, 100	80, 100
Sensitivity (IDn)	mA	30, 100, 300	30, 100, 300
Rated Voltage (Ue)	V~	240	415
Rated Insulation voltage (Ui)	V	690	690
Rated Frequency	Hz	50	50
Trip Time		$I\Delta n < 300\text{ms}$ , 5 $I\Delta n < 40\text{ms}$	$I\Delta n < 300\text{ms}$ , 5 $I\Delta n < 40\text{ms}$
Conditional short circuit Capacity**	kA	10	10
Residual Making Breaking capacity	A	10 $I_n$	10 $I_n$
Ambient Working Temperature	°C	-25 to +55	-25 to +55
Shock Resistance		40mm free fall	40mm free fall
Vibration Resistance	g	5	5
Electrical Endurance	(No. of operations)	>2000	>2000
Mechanical Endurance	(No. of operations)	>3000	>3000
Mounting		Din Rail (35mm x 7.5 mm)	Din Rail (35mm x 7.5 mm)
Degree of protection		IP 20	IP 20
Terminals Capacity (Max)	mm <sup>2</sup>	50	50

\*\* In combination with an upstream SCPD (Fuse gL/MCB) of same or higher rating w.r.t. RCCB, to achieve the minimum values of  $I2t$  and  $I_p$  to be withstood by the RCCB (as per IEC)"



#### Dimensions (in mm)



## Higher Rating RCCB



## Higher Rating RCCB (80 - 100A) DP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 415V, 50Hz with 10kA Conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
80A	DHRMCMDF030080	DHRMCMDF100080	DHRMCMDF300080
100A	DHRMCMDF030100	DHRMCMDF100100	DHRMCMDF300100



## Higher Rating RCCB (80 - 100A) FP

(In accordance with IS 12640-1 &amp; IEC 61008-1) 415V, 50Hz with 10kA Conditional short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
80A	DHRMCMFF030080	DHRMCMDF100080	DHRMCMDF300080
100A	DHRMCMFF030100	DHRMCMDF100100	DHRMCMDF300100



◆ **RCBO - RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD & SHORT CIRCUIT PROTECTION**

Havells New RCBO is a single composite device which provides protection against over currents, short circuit and earth leakage faults. It comes in the same width and profile as that of a standard MCB. It is designed for use in domestic, commercial and industrial distribution systems at the most downstream circuit for ensuring high degree of protection to the user for a particular circuit. In normal use, it is safe to use and free of threat to user as well as to environment.

**Features (Electromechanical RCBO)**

- Proper cable termination with 25mm<sup>2</sup> slot and safety shutter
- Dual termination on the outgoing terminal
- Field fittable auxiliary contact
- Inscription window with On and Off Indication

**Features (Electronic RCBO)**

- Pulsating DC protection - Type A
- Discrimination using time delay - Type S RCBO
- Controlled response VD RCBO (Electronic)
- Short-circuit breaking capacity 10kA Protection in case of N-E faults Higher stacking density in distribution boards
- Enhanced immunity to nuisance tripping
- ISI and CE marking. RoHS Complaint, 'Green Product'

**Execution**

- Electromechanical RCBO (SPN & 2P RCBOs)  
Electromechanical RCBO (TPN & FP RCBOs)  
Electronic RCBO - A Type (SPN - 2M)  
Electronic RCBO - A Type (TPN - 4M)

**Range**

- 32A, 40A & 63A  
6A to 40A

**Specification**

IS 12640 : Part 2/ IEC 61009-1 / EN : 61009-1

**Sensitivity**

30mA, 100mA & 300mA



**Test Button**

Test button for regular inspection/testing



**Inscription Window**

Inscription window with ON & OFF indication



**Proper Cable Termination**

Proper cable termination with 25mm<sup>2</sup> slot and safety shutter

## Construction

Havells new RCBO is a single composite device which provides protection against over currents, short-circuit and earth leakage faults, it comes in the same width and profile as that of a standard MCB. It is designed for use in domestic, commercial and industrial distribution systems at the most downstream circuit for ensuring high degree of protection to the user for a particular circuit. In normal use, it is safe to use and poses no threat to user as well as to environment.

## Features

- Positive contact indication: Red for ON, Green for OFF
- Short circuit breaking capacity 10 kA.
- Large terminal capacity: RCBOs have 35 mm<sup>2</sup> for cool running while in operation.
- Protection in case of loss of supply neutral: Even in event of loss of supply neutral, Havells RCBO provides protection against earth faults. The Functional Earth (FE) white color wire connected to earth provides this protection.
- Controlled response & immunity to nuisance tripping: The trip level and the response time of the Havells VD (Voltage Dependent) RCBO using electronic circuit is set to very precise values and thereby provide greater immunity to nuisance tripping that can be caused by mains borne noise, surge voltages, lighting surges, reactive loads, mains filters, etc.
- Neutral to earth faults: A connection that occurs between N and E on the load side of any RCBO will impact on its performance and cause the trip level to increase. In the case of a N - E fault, the user may have no way of knowing that this fault exists and that the RCBO has been desensitized. Under this condition, the Havells VD RCBO provides a far greater level of protection than a normal VI (Voltage Independent) RCBO.

## Aesthetics & Convenience

- The new module's unique compact construction enables far more devices to be fitted into a distribution board than previously possible, and 2 Module RCBO can simply replace existing MCB 2 pole when upgrading a board.
- High stacking density = smaller chassis & distribution boards.

## Reliability & Continuity Of Service

- Enhanced discrimination with Havells MCBs
- Retrofits Havells MCBs in distribution boards with no modifications in general
- Robust construction.

## Energy Limiting

Havells RCBO meets the requirements for energy let through by IEC & British Standard for energy limiting class 3.

## Additional Range - Type A & S

Type A - Pulsating DC Protection: Any electrical appliance with power control has the ability to produce earth fault currents with pulsating DC (rectified AC) components. RCBOs that provide this type of protection are referred to as Type A RCBOs.

Standard VI RCBOs do not provide this protection, and are referred to as Type AC RCBOs. Havells VD RCBOs have been specifically designed to provide protection against pulsating DC fault currents.

- Type S- Selective or Time Delay: RCBOs are also divided into two categories determined by their response time to an earth fault current, as follows
- General Type - having a trip time < 300ms for fault currents of  $I_{\Delta n}$  and < 40ms for fault currents >  $5I_{\Delta n}$ .

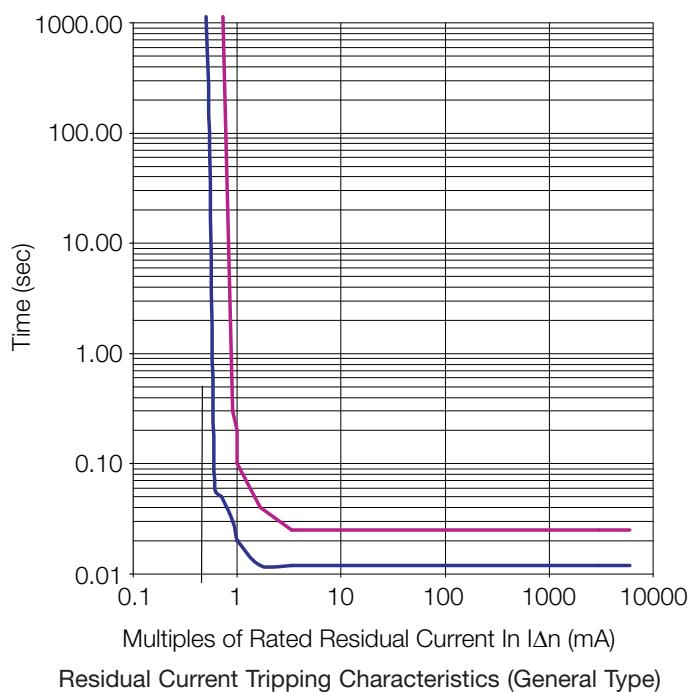
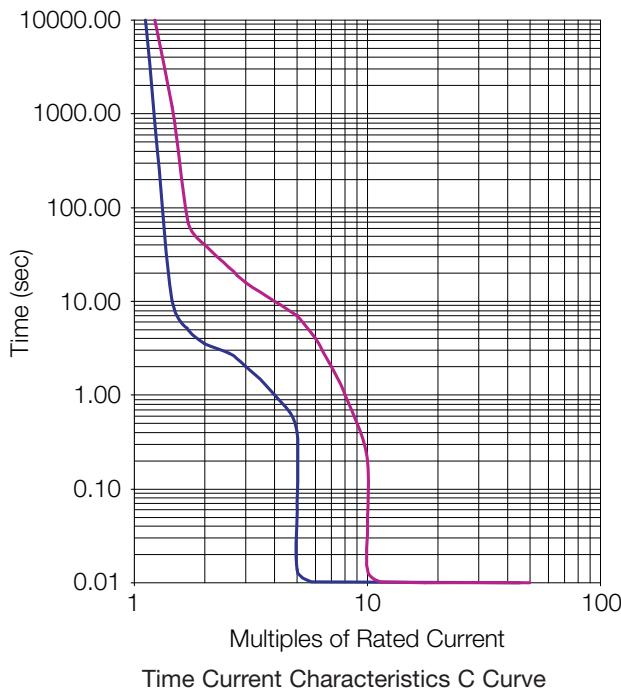
Technical Information	Electromechanical 2P RCBOs used as (SPN & 2P RCBOs)	
Specification Reference		IS 12640 (Part 2) & IEC 61009 - 1
Rated Current (I <sub>n</sub> )	A	32, 40 & 63
Rated Residual Operating Current (I <sub>Δn</sub> )	mA	30, 100, 300
Instantaneous Tripping Current		'C' curve
Rated Voltage (U <sub>n</sub> )	V~	240
Rated Insulation Voltage (U <sub>i</sub> )	V	660
Rated impulse withstand voltage	kV	4
Rated Frequency	Hz	50
No. of Pole		2 Pole
Rated Short Circuit Capacity (I <sub>cn</sub> )	kA	10
Rated Service Short Circuit Capacity (I <sub>cs</sub> )	kA	7.5
Rated Residual Making Breaking Capacity (I <sub>Δm</sub> )		630A for 63A (500A – 32A to 40A)
Operating Characteristics in case of Residual Currents		'A' & 'AC' Type
Nature of Supply		Pulsating DC
Method of Mounting		Panel Board Type (DIN Rail)
Degree of Protection		IP 20
Terminals for External Conductors	mm <sup>2</sup>	25
Net Weight	Kg	0.424
Ambient Working Temperature	°C	-5 to + 55
Electrical & Mechanical Endurance	(No. of Operations)	4000
Trip Time	(milli Second)	<40
Shock Resistance		40mm free fall
Vibration Resistance	g	3

- S Type - having a trip time of 150 - 500mS for  $I\Delta n$ , and 40 - 130mS for  $>5I\Delta n$ .

( $I\Delta n$  is the rated residual operating current of the RCBO)

As the name implies, general types are intended for general purpose use. However, S (selective) types are normally used in conjunction with downstream general type RCBOs.

The S type effectively provides discrimination in terms of the response time to earth fault currents for upstream and downstream RCBOs. For example, when two RCBOs are connected in series the first RCBO will often be an S type.



Electromechanical 4P RCBOs used as (TPN & FP RCBOs)	Electronic RCBO - A Type (SPN - 2M)	Electronic RCBO - A Type (TPN - 4M)
IS 12640 (Part 2) & IEC 61009 - 1	IS 12640 (Part 2) & IEC 61009 - 1	IS 12640 (Part 2) & IEC 61009 - 1
32, 40 & 63	6, 10, 16, 20, 25, 32, 40	6, 10, 16, 20, 25, 32, 40
30, 100, 300	30, 100, 300	30, 100, 300
'C' curve	'C' curve	'C' curve
415	240	415
660	660	660
4		
50	50	50
4 Pole	1P+N	3P+N
10	10	10
7.5		
630A for 63A (500A – 32A to 40A)	500A	500A
'A' & 'AC' Type	'A' Type	'A' Type
Pulsating DC		
Panel Board Type (DIN Rail)	Panel Board Type (DIN Rail)	Panel Board Type (DIN Rail)
IP 20	IP 20	IP 20
25	35	35
0.740	0.420	0.84
-5 to + 55	-5 to + 55	-5 to + 55
4000	4000	4000
<40	<40	<40
40mm free fall	40mm free fall	40mm free fall
3	3	3

## RCBO - SPN &amp; 2P

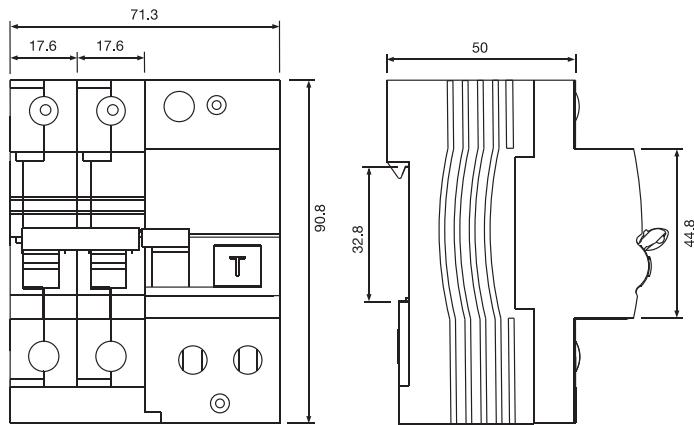


## Electromechanical 2P RCBOs used as (SPN &amp; 2P RCBOs)

(In accordance with IS 12640-2 &amp; IEC 61009-1) 240V, 50Hz, with 10 kA short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
32A	DHBMACDP4030032	DHBMACDP4100032	DHBMACDP4300032
40A	DHBMACDP4030040	DHBMACDP4100040	DHBMACDP4300040
63A	DHBMACDP4030063	DHBMACDP4100063	DHBMACDP4300063

## Dimensions (in mm)



## RCBO - A Type SPN

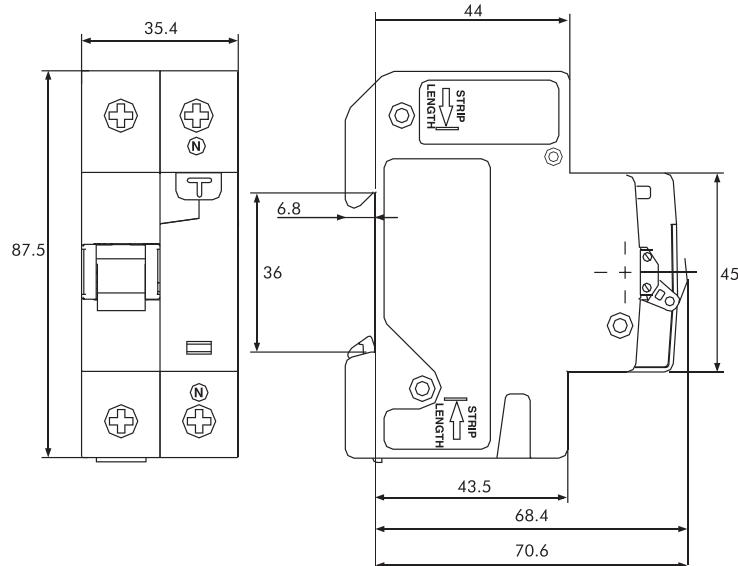


## RCBO - A Type (SPN - 2M)

(In accordance with IS 12640-2 &amp; IEC 61009-1) 240V, 50Hz, with 10 kA short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
6A	DHCEACSN2030006	DHCEACSN2100006	DHCEACSN2300006
10A	DHCEACSN2030010	DHCEACSN2100010	DHCEACSN2300010
16A	DHCEACSN2030016	DHCEACSN2100016	DHCEACSN2300016
20A	DHCEACSN2030020	DHCEACSN2100020	DHCEACSN2300020
25A	DHCEACSN2030025	DHCEACSN2100025	DHCEACSN2300025
32A	DHCEACSN2030032	DHCEACSN2100032	DHCEACSN2300032
40A	DHCEACSN2030040	DHCEACSN2100040	DHCEACSN2300040

## Dimensions (in mm)



## RCBO - TPN &amp; FP

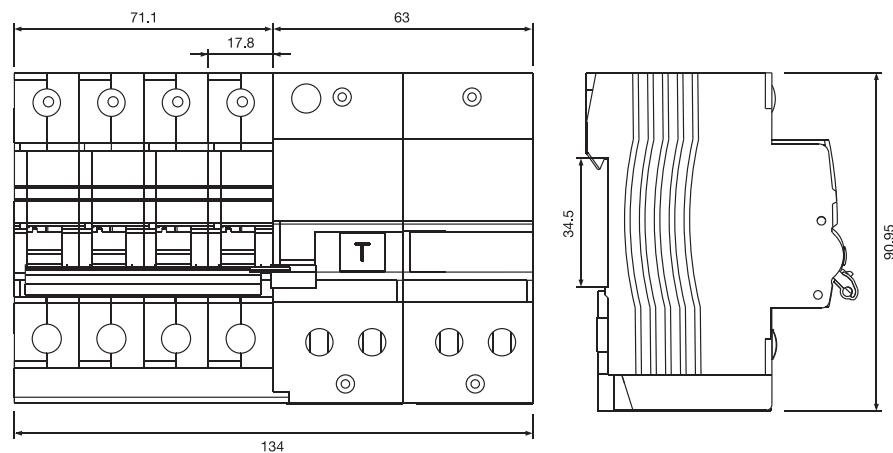


## RCBO - A Type (TPN - 4M)

(In accordance with IS 12640-2 &amp; IEC 61009-1) 415V, 50Hz, with 10 kA short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
32A	DHBMACTN8030032	DHBMACTN8100032	DHBMACTN8300032
40A	DHBMACTN8030040	DHBMACTN8100040	DHBMACTN8300040
63A	DHBMACTN8030063	DHBMACTN8100063	DHBMACTN8300063

## Dimensions (in mm)



## RCBO - A Type TPN

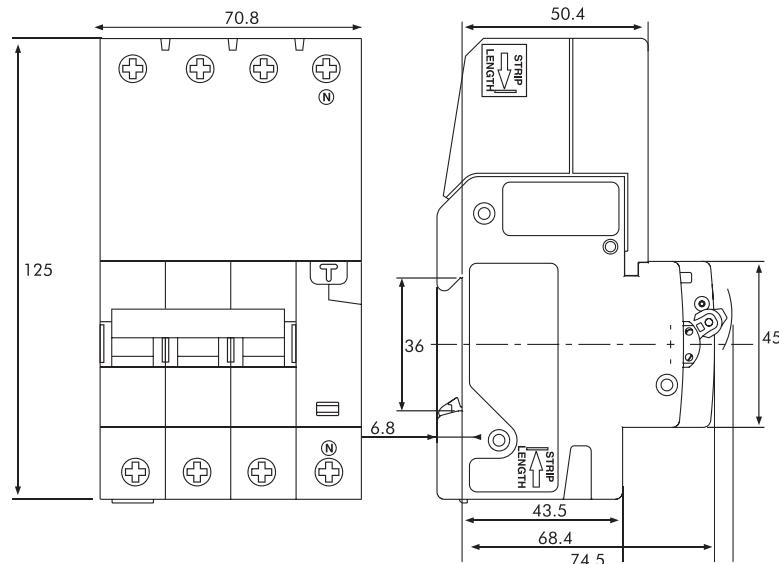


## RCBO - A Type (TPN - 4M)

(In accordance with IS 12640-2 &amp; IEC 61009-1) 415V, 50Hz, with 10 kA short circuit capacity

Rating	30mA Cat. No.	100mA Cat. No.	300mA Cat. No.
6A	DHCEACTN4030006	DHCEACTN4100006	DHCEACTN4300006
10A	DHCEACTN4030010	DHCEACTN4100010	DHCEACTN4300010
16A	DHCEACTN4030016	DHCEACTN4100016	DHCEACTN4300016
20A	DHCEACTN4030020	DHCEACTN4100020	DHCEACTN4300020
25A	DHCEACTN4030025	DHCEACTN4100025	DHCEACTN4300025
32A	DHCEACTN4030032	DHCEACTN4100032	DHCEACTN4300032
40A	DHCEACTN4030040	DHCEACTN4100040	DHCEACTN4300040

## Dimensions (in mm)





## ◆ SURGE PROTECTION DEVICES

Today's residential, commercial and industrial set-ups are heavily reliant on the continuous and efficient running of electrical and electronic systems. Over-voltage surges are a major cause of failure of these equipment.

Such transient over-voltage surges are often generated due to direct/indirect effects of lightning strikes, switching of utility grid or capacitor banks, electrical accidents, turning on/off of nearby heavy load machines, AC chillers, motors, pumps, circuit-breaker tripping etc.

Surges can cause destruction of electronic circuitry components, logic failures and breakdowns. Loss of operation, loss of service, loss of data, and loss of production can be huge and by far higher than the cost of damaged equipment. Long term exposure to lower level transient over-voltages can also lead to premature ageing of equipment.

Havells offers a comprehensive range of Surge Protection Devices designed to protect your installation by limiting transient over-voltages and diverting surge currents to ground.

**Features:**

- Visual as well as Remote end-of-life indicators.
- Simple, Professional Installation of Arrester Modules
- High Terminal Capacity - 35sqm for Ease of Installation.
- Bi-stable Snap-pusher for Easy Installation and Extraction from DIN-rail.
- Finger Touch-Proof IP-20.
- TUV Tested and approved. CE compliant.

**Range**

AC SPD's

Type 1+2

Type 2

**DC SPD's**

Type 1+2

Type 2

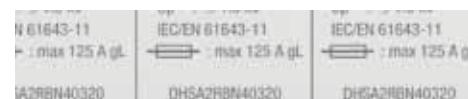
**Dataline SPD**

6, 12, 24, 48 V



**Remote Signaling Contact**

- Option to remotely monitor the status of the surge protector.
- Simplified cabling thanks to a single terminal for monitoring all poles.



- Satisfactory operation
- Cartridge must be replaced

**End of Life Indicator**

Green shows the satisfactory operation and Red indicates that Cartridge must be replaced.



**Pluggable Cartridges**

- Faulty cartridges can be replaced without changing the entire SPD.
- Cartridges can be replaced with mains voltage ON.
- All cartridges are marked with characteristics for ease of maintenance.



**Dedicated Protection of the Neutral**

The 1P+N and 3P+N SPDs with dedicated protection of the neutral pole discharge the common and differential mode overvoltages that may occur in installations with TT and TNS systems, when there is a voltage surge.

## Type 1+2 AC Surge Protection Devices

These are very compact SPDs which protect both from overvoltage surges due to direct lightning strikes (10/350 $\mu$ s waveform) as well as indirect lightning strikes and switching surges (8/20 $\mu$ s waveform). They are an integrated solution, equivalent to an automatically coordinated Type 1 and Type 2 SPDs.

They are used as the first step of protection in incoming power supply panels and areas with exposure to the atmosphere, where installations are usually provided with an external lightning protection system.



Configuration  
SPN, TPN

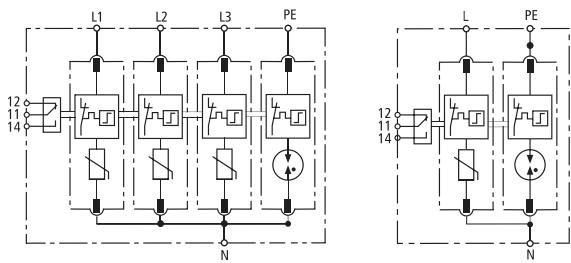
Specification  
IEC 61643-11: 2011, EN 61643-11: 2012

### Features

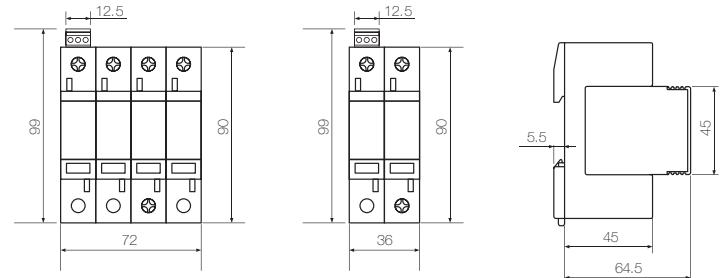
- Tested and approved by TUV.
- High Discharge Current (Imax 50 kA (L – N) 70 kA (N – E)).
- Compact Size Integrated Type-1 & Type-2 protection in small module width (Ideal in all reduced-size spaces).
- Better Protection due to reduced Up(Voltage protection level 1.5 kV).
- Both Common & Differential Mode Protection.

Technical Specification	
Standard Compliance	IEC/EN 61643-11
Type / Class	Type 1+2 / Class I+II
Max Continuous Operating AC Voltage Uc	320 V (L - N), 255 V (N - PE)
Lightning Impulse (10/350 microsecond) limp	12.5 kA
Nominal Discharge Current (8/20 microsecond) In	20 kA (L - N), 40 kA (N - PE)
Max Discharge Current (8/20 microsecond) Imax	50 kA (L - N), 70 kA (N - PE)
Voltage Protection Level Up	<1.5 kV
Voltage Protection Level 5kA Up	<1.2 kV
Max Backup Fuse	125 A gL/gG
Temporary Overvoltage Charactersits (5 second) Ut	335 V
Residual Current At Uc - Ipe	<100 $\mu$ A
Response Time	<25 ns
Short Circuit Current Rating IsCCR	3 kA
Follow Current extinguishing Capability [N-PE] a.c. Ifi	100 Arms
Number of Ports	One Port SPD
Location	Indoor
Humidity	5-95%
Operating Temperature Range	-40°C - 80°C
Operating State/Fault Indication	Green/Red
Cross-section Area	4-35 sq mm
For Mounting on	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0
Degree of Protection	IP20

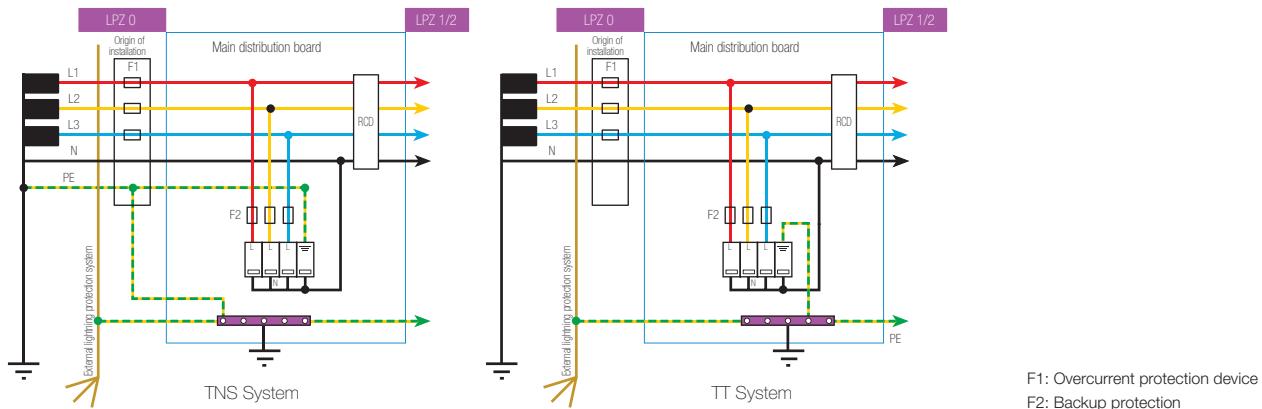
Circuit Diagram:



Dimensions:



Connections:



Type 1+2 AC Surge Protection Device

Order Code	Poles	Uc (V)	In (kA)	Iimp (kA)	Imax (kA)	Up (kV)	Remote Signaling
DHSAANBC50320	TP+N	320	20	12.5	50	1.5	No
DHSAANAC50320	1P+N	320	20	12.5	50	1.5	No
DHSAARBC50320	TP+N	320	20	12.5	50	1.5	Yes
DHSAARAC50320	1P+N	320	20	12.5	50	1.5	Yes

Cartridges

Order Code	Pole	Uc (V)	In (kA)	Iimp (kA)	Imax (kA)	Up (kV)
DSSRCX0149	L - N	320	20	12.5	50	1.5
DSSRCX0150	N - PE	255	40	12.5	70	1.5

## Type 2 AC Surge Protection Devices

Type 2 SPDs provide protection from over-voltage surges due to indirect lightning strikes hitting the building or surrounding area and switching surges (8/20 $\mu$ s waveform). They are necessary for second level of protection in applications where Type 1 protectors are installed upstream. They are also used for first stage of protection in residential, commercial or industrial applications not exposed to direct strikes or with no external lightning protection system.

Type 2 SPDs are suitable for use at the entrance of the installation (main DB), in intermediate distribution boards (sub DB) and by the terminal equipment.



## Configuration SP, SPN, TPN

## Specification

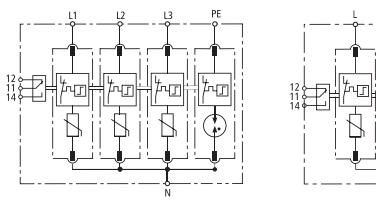
## Features

- Tested and Approved by TUV.
  - Applicable in Two Voltage Rating - Uc 320 V & 275 V.
  - Both Common & Differential Mode Protection.
  - Better Protection (Voltage protection level Up upto 1.3 kV, suitable for protection of all terminal equipments).

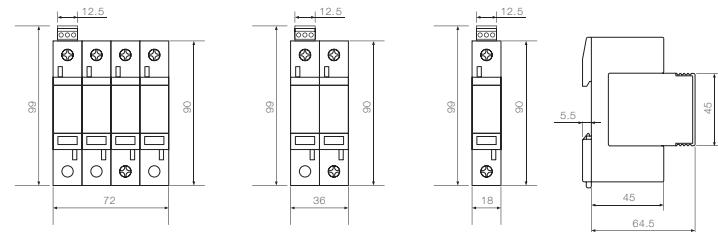
## Technical Specification

Standard Compliance	IEC/EN 61643-11	IEC/EN 61643-11
Type / Class	Type 2 / Class II	Type 2 / Class II
Max Continuous Operating AC Voltage Uc	275 V	320 V
Max Continuous Operating AC Voltage [N-PE] Uc	255 V	255 V
Nominal Discharge Current (8/20 microsecond) In	20 kA	20 kA
Max Discharge Current (8/20 microsecond) Imax	40 kA	40 kA
Voltage Protection Level Up	<1.3 kV	<1.5 kV
Voltage Protection Level 5kA Up	<1 kV	<1.2 kV
Voltage Protection Level [N-PE] Up	<1.5 kV	<1.5 kV
Temporary Overvoltage with Stand (5 second) Ut	335 V	335 V
Residual Current At Uc- Ipe	<100 µA	<100 µA
Short Circuit Current Rating Isccr	3 kA	3 kA
Follow Current extinguishing Capability [N-PE] a.c. Ifi	100 Arms	100 Arms
Max Backup Fuse	125 A gL/gG	125 A gL/gG
Response Time	<25 ns	<25 ns
Response Time [N-PE]	<100 ns	<100 ns
Operating Temperature Range	-40°C - 80°C	-40°C - 80°C
Operating State/Fault Indication	Green/Red	Green/Red
Cross-section Area	4-35 sq mm	4-35 sq mm
For Mounting on	35 mm Din Rail	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0	Thermoplastic UL94-V0
Degree of Protection	IP20	IP20

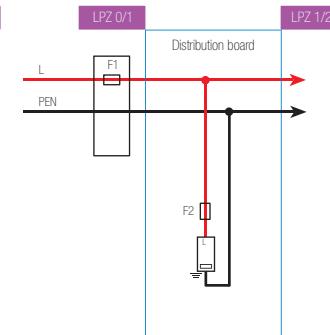
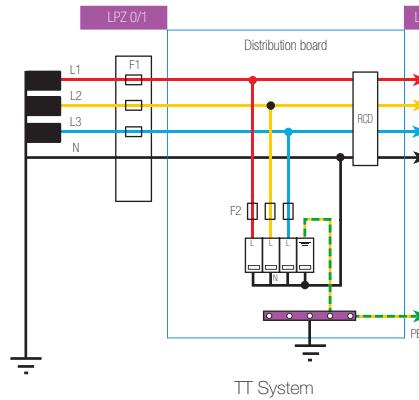
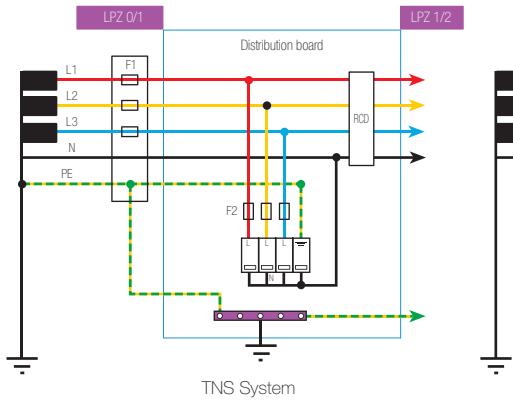
Circuit Diagram:



Dimensions:



Connections:



F1: Overcurrent protection device  
F2: Backup protection

Type 2 AC Surge Protection Device



Order Code	Poles	Uc (V)	In (kA)	Imax (kA)	Up (kV)	Remote Signaling
DHSA2N1N40320	1P	320	20	40	1.5	No
DHSA2N1N40275	1P	275	20	40	1.3	No
DHSA2NAN40320	1P+N	320	20	40	1.5	No
DHSA2NAN40275	1P+N	275	20	40	1.3	No
DHSA2NBN40320	TP+N	320	20	40	1.5	No
DHSA2NBN40275	TP+N	275	20	40	1.3	No
DHSA2R1N40320	1P	320	20	40	1.5	Yes
DHSA2R1N40275	1P	275	20	40	1.3	Yes
DHSA2RAN40320	1P+N	320	20	40	1.5	Yes
DHSA2RAN40275	1P+N	275	20	40	1.3	Yes
DHSA2RBN40320	TP+N	320	20	40	1.5	Yes
DHSA2RBN40275	TP+N	275	20	40	1.3	Yes

Cartridges

Order Code	Pole	Uc (V)	In (kA)	Imax (kA)	Up (kV)
DSSRCX0151	L - N	320	20	40	1.5
DSSRCX0152	L - N	275	20	40	1.3
DSSRCX0153	N - PE	255	20	40	1.5

## Data Line Surge Protection Devices

Lightning can also propagate through telecommunications and data networks. It can damage all the equipment connected to these networks: telephones, modems, computers, servers, faxes, fire alarms etc.

Today's telecommunication and data transmission devices are increasingly more vulnerable to lightning induced voltage surges due to their sensitive and complex nature as well as possible connection across several different networks. As these devices are critical to a company's communications and information processing, it is advisable to insure them against potentially costly and disruptive events.

A data line SPD installed in-line, directly in front of a sensitive piece of equipment will increase their useful life and maintain the continuity of flow of your information.



### Range

Data Line Surge Protection Devices (6, 12, 24, 48V)

### Specification

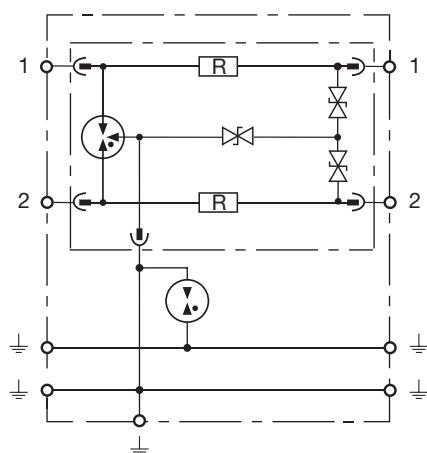
IEC 61643-21

### Features

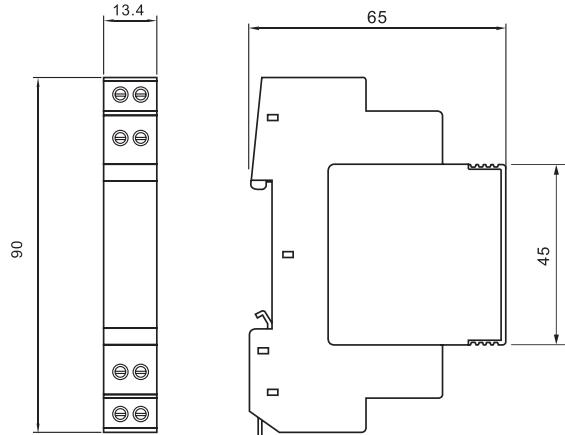
- Reduced Dimensions (only 13.4mm module width).
- Pluggable Cartridges.
- Operational Continuity (Faulty module can be changed with mains voltage ON).
- Quick Response (Less than 1 nano second).
- Shield wire protection facility.

Technical Specification				
Nominal Voltage type	6V	12V	24V	48V
Network	RS422	RS232, RS485	4-20mA, Analog Signals, Digital Signals	ISDN, 48V Line
SPD Configuration	1 Pair + Shielded	1 Pair + Shielded	1 Pair + Shielded	1 Pair + Shielded
Nominal Line Voltage Un	6 V	12 V	24 V	48 V
Max DC Operating Voltage Uc	8 V	15 V	28 V	53 V
Max Load Current Il	300 mA	300 mA	300 mA	300 mA
Max Frequency fmax	>3 MHz	>3 MHz	>3 MHz	>3 MHz
Insertion Loss	<1dB	<1dB	<1dB	<1dB
Nominal Discharge Current (8/20 Microsec) In	5 kA	5 kA	5 kA	5 kA
Max Discharge Current (8/20 Microsecond) Imax	20 kA	20 kA	20 kA	20 kA
Impulse Current (10/350 microsecond) limp	5 kA	5 kA	5 kA	5 kA
Voltage Protection Level Up	20 V	30 V	40 V	70 V
Response Time	<1 ns	<1 ns	<1 ns	<1ns
Series Resistance	2Ω	2Ω	2Ω	2Ω
Humidity	5-95%	5-95%	5-95%	5-95%
Operating Temperature Range	-40°C - 80°C			
For Mounting on	35 mm Din Rail			
Cross-section Area	0.4-2.5 sq mm			
Enclosure Material	Thermoplastic UL94-0			
Degree of Protection	IP20			

Circuit Diagram:



Dimensions:



Dataline Surge Protection Device

Order Code	Un (V)	In (kA)	Imp (kA)	Imax (kA)	Up (V)	Remote Signaling
DHSDDN1A20006	6	5	5	20	20	No
DHSDDN1A20012	12	5	5	20	30	No
DHSDDN1A20024	24	5	5	20	40	No
DHSDDN1A20048	48	5	5	20	70	No



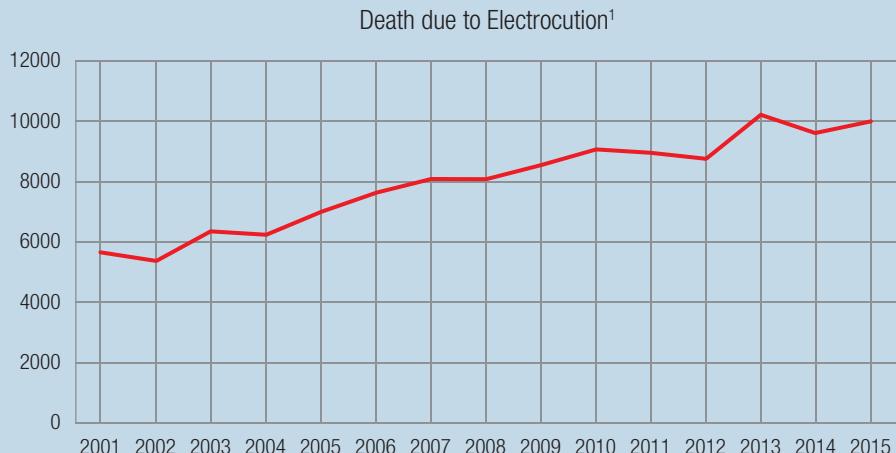
◆ **DOWNSTREAM  
PROTECTION DEVICES**



Electricity is an indispensable part of our daily lives. Its safe use is a blessing for mankind. At the same time, its improper handling can have catastrophic consequences in the form of accidents, fire, or death.

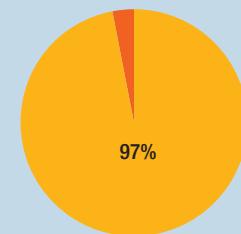
Havells has always been at the forefront of providing safe, reliable and innovative circuit breakers for protection of electrical installations. Our range of downstream protection devices is the latest technical solution that seamlessly covers all potential hazards in electrical installation (protecting life and assets) and ensures best level of service continuity with highest level of safety. Downstream protection is advantageous in all installations due to their comfort and hassle free nature. However it is fundamental in installations requiring high level of availability to the user.

## Electricity can be a **LIFELINE** as well as a **LIFE-TAKER**



Approx **25** people die in India daily due to electrocution

- The number could be much higher due to many cases of unreported deaths!
- If we analyse the frequent cases of non-fatal accidents, the number would be shockingly huge!



97% of all electricians have been shocked or injured on the job.

Central Electricity Authority (CEA): amendment regulation 2015, Rule 42 - "Earth Leakage protection devices" states that: 'The supply of electricity to every installation other than voltage not exceeding 250 V, below 2 KW, shall be controlled by an 30 mA Earth Leakage protection device for domestic connection and 100 mA for all other installation so as to disconnect the supply instantly on occurrence of earth fault or leakage of current.'

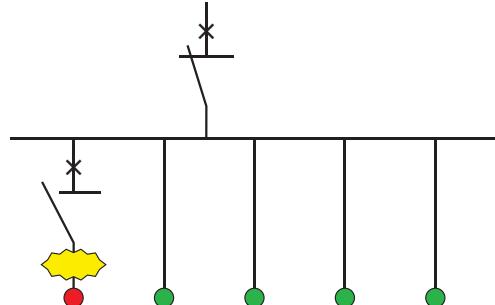
However millions of old and new installations in India do not have RCDs and continue to be unsafe.

## Benefits of Downstream Protection Devices

### 1. High level of protection

Downstream protection can be used to achieve **discrimination**, when used in coordination with upstream breaker.

In case of any fault, the downstream device will provide **first level of protection (sensitive and accurate fast trip action)** and upstream breaker will give second level **back-up protection**. This is quite useful for sensitive appliances.



### 2. Relief from nuisance tripping & Higher service continuity

An RCD (either RCCB or RCBO) installed at the switchboard mains is often the best option as it protects all the electrical wiring and appliances used in the house. But nuisance tripping of RCDs is a common complaint. Main reasons behind this are supply transients (e.g. lightning) and harmonics, accumulation of earth leakage currents due to lowered insulation resistance (typical problem of old equipment/ moisture tracking in rainy season), incorrect installation design and segregation of circuit etc.

Thus, in many of the old and new electrical installations, **incomer ELCBs are not installed or bypassed** because they cause frequent power-cut of entire house. Sometimes **ELCBs with a higher sensitivity (100mA, 300mA etc.) are installed** which are insufficient to give electric shock protection. All these are not recommended as user remains open to risk from electrocution.

In such installations, it is advisable to use dedicated downstream residual current devices, especially in the high risk areas like kitchen, bathroom etc.

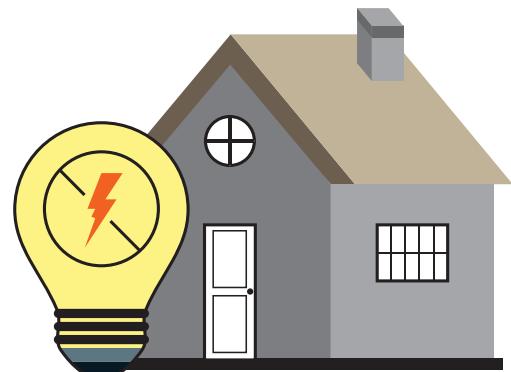
This would give following advantages:

- **Selective tripping : only faulty appliance is disconnected**
- **Higher level of service continuity**
- **Easy and quick fault identification**

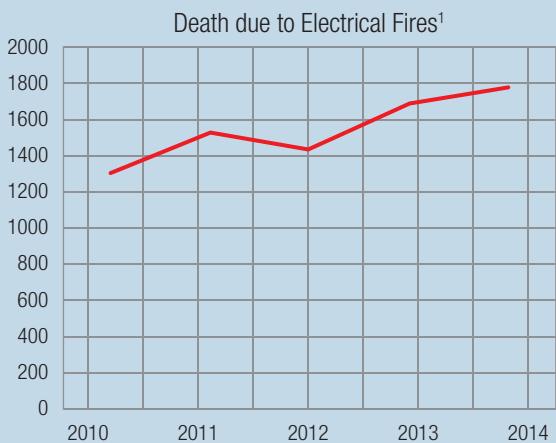
### 3. Close to user: Easy and immediate resetting

These devices are installed at the **exact point-of-use**, so user can reset them easily and immediately once the fault is cleared.

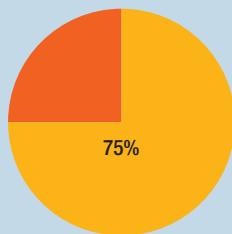
- This saves time to go, identify and turn-on the tripped breaker located in distribution board elsewhere.
- It also avoids any possible risk of operating circuit breakers in a live switchboard.



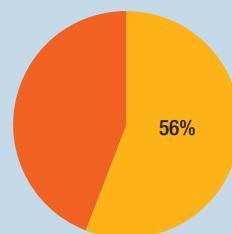
## It's better to **PLAY SAFE** - and **STAY SAFE**.



Electric defaults are a major cause of fires. From 2010 to 2014, 7743 people died due to fires caused by electrical short circuit



According to a survey<sup>2</sup>, approx 75% fire-related accidents in Mumbai are due to electrical defaults and short-circuit



56% of industrial fire accidents in India are caused by electrical faults.<sup>3</sup>

1. National Crime Records Bureau : Annual report on 'Accidental Deaths & Suicides in India'.

2. Fire Risk Survey (FRS) 2013, carried out by Pinkerton & Federation of Indian Chambers and Industry

3. Fire and Security Association of India (FSA)

### 4. Peace of mind: Easy to 'test'

Residual current devices save lives and should be tested once a month to ensure they are working properly. Proximity and thus higher visibility of downstream RCDs means that one is likely to test (using the 'Test button') them more frequently and easily, thus always remaining sure of his safety.



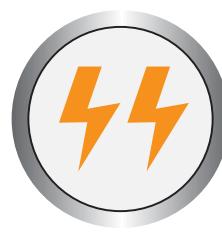
### 5. Best suited for unplanned additions

Downstream protection devices can be added to protect sensitive areas or appliances which were not provided for when designing mains electrical distribution board.



### 6. Protection From All Possible Hazards

Different devices are offered for different requirements: protecting human beings from electric shock hazards, protecting appliances from over-current and short circuit faults, or both.



### 7. Retro-fittable Plug-and-Play Solutions

Downstream socket protection devices are designed such that they can replace existing socket boards. Hence house owners of existing installations can also easily upgrade their electrical installation and get added built in protection of MCB/RCCB/RCBO.





◆ **RCDs - DOWNSTREAM  
RESIDUAL CURRENT DEVICES**

Electricity is a ubiquitous energy agent and life without it is unimaginable. Many people know that the principal danger from electricity is that of electrocution, but few really understand how minute a quantity of electrical energy can be fatal. It is one of the most under-estimated cause of accidents in India.

Thus, Havells has designed a range of downstream residual current devices to protect people from electric shock due to direct or indirect contact with electricity. These are fast-trip safety devices which are easy to install and can also be easily fitted in place of existing switch boards.

**Features:**

- Provide protection from the risks of leakage current (life saving).
- All-in-one devices (SRCD DBOxx & HofeSafe SRCD), which also provide protection from overload & short circuit faults
- Manual reset and test button for safety checks.
- In case of fault it disconnects both line & neutral of output supply.

**Range:**

- HomeSafe SRCD
- SRCD DBOxx
- 2-Way SRCD
- 1-Way SRCD

Specification  
IEC 62640



## HomeSafe SRCD:

Havells HomeSafe SRCD is ready to use all-in-one device that provides protection to humans from electric shock due to direct or indirect contact as well as also provide protection from overload and short circuit.

It is a one stop solution to protect appliances as well as humans operating it.

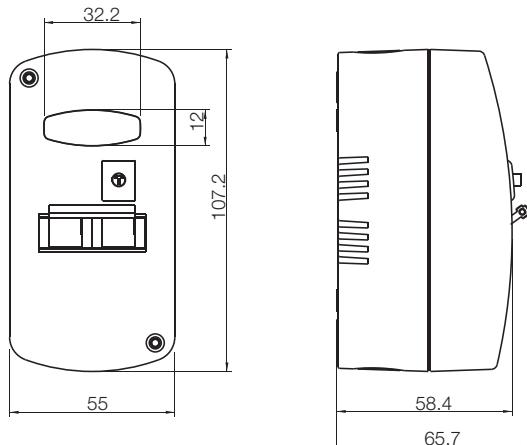
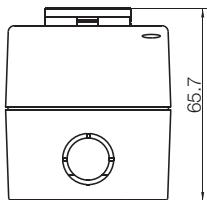
### Applications:

Can be used as dedicated protecting device with appliances such as Water cooler, AC, Fridge etc.

### Features:

- Provide protection from the risks of leakage current (life saving).
- Protects appliances from possible fire hazard.
- Provide protection from overload & short circuit.
- Type A: Residual current faults of AC as well as pulsating DC
- Manual reset and test button for safety checks.
- In case of fault it disconnects both line & neutral of output supply.
- Red indicator shows when the device is ON.
- Finger touch proof (IP-20).

### Dimensions (in mm)



### Technical Specification:

Rated Current	16A	20A	25A
Ref. Standard	IEC 62640	IEC 62640	IEC 62640
Rated Voltage	230 V	230 V	230 V
Rated Residual Current	30mA	30mA	30mA
Tripping Curve	C	C	C
Rated Insulation Voltage	500 V	500 V	500 V
Rated Frequency	50 Hz	50 Hz	50 Hz
No. of Pole	SPN	SPN	SPN
Rated Short Circuit Capacity	3kA	3kA	3kA
Rating	Description		Cat. Number
25A	Havells SRCD WOCP HomeSafe		DHDPAESN2030025
20A	Havells SRCD WOCP HomeSafe		DHDPAESN2030020
16A	Havells SRCD WOCP HomeSafe		DHDPAESN2030016

## SRCD DBOXX (Socket Residual Current Device):

Havells DBOXX SRCD is ready plug & play all-in-one device that provides protection to humans from electric shock due to direct or indirect contact as well as provides protection from overload and short circuit faults.

It is designed such that user can easily upgrade his installation by replacing existing socket boxes and get built-in protection.

### Applications:

1. With Dedicated appliances such as Water cooler, AC, Fridge, Geyser etc.
2. Also can be used as a plug and play box in Kitchen, bathroom etc.

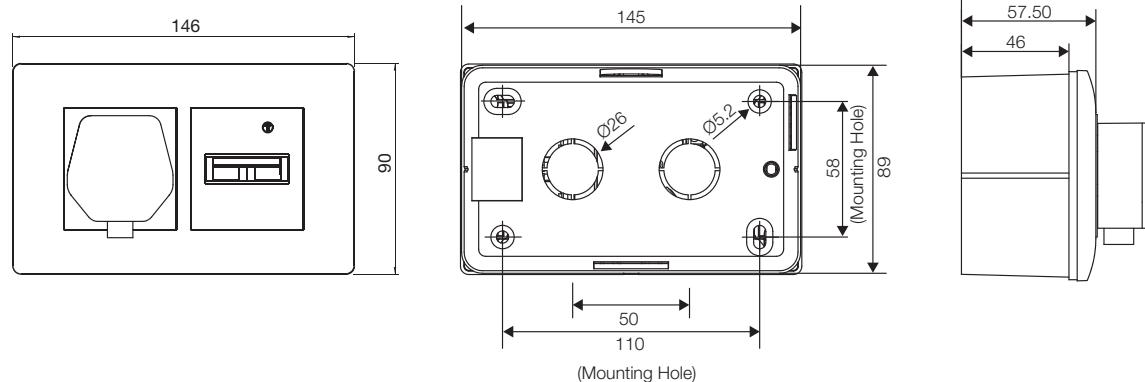
### Features:

- Provide protection from the risks of leakage current (life saving).
- Protects appliances from possible fire hazard.
- Provide protection from overload & short circuit.
- Manual reset and test button for safety checks.
- Type A: Residual current faults of AC as well as pulsating DC
- Easy to fit in existing switch boards.
- In case of fault it disconnects both line & neutral of output supply.

**LIFE SAVING DEVICE**



### Dimensions (in mm)



### Technical Specification:

Rated Current	16A	20A	25A	
Ref. Standard	IEC 62640	IEC 62640	IEC 62640	
Rated Voltage	230 V	230 V	230 V	
Rated Residual Current	30mA	30mA	30mA	
Tripping Curve	C	C	C	
Rated Insulation Voltage	500 V	500 V	500 V	
Rated Frequency	50 Hz	50 Hz	50 Hz	
No. of Pole	SPN	SPN	SPN	
Rated Short Circuit Capacity	3kA	3kA	3kA	
Rating	Description			Cat. Number
<b>DBOXX SRCD Protected Socket (With Steel Enclosure)</b>				
16A	Havells SRCD WOCP Dboxx Steel Encl		DHDDCDP0252016030	
20A	Havells SRCD WOCP Dboxx Steel Encl		DHDDCDP0252020030	
25A	Havells SRCD WOCP Dboxx Steel Encl		DHDDCDP0252025030	
<b>DBOXX SRCD Protected Socket (With Plastic Enclosure for surface mounting)</b>				
16A	Havells SRCD WOCP Dboxx Plastic box		DHBCDP0252016030	
20A	Havells SRCD WOCP Dboxx Plastic box		DHBCDP0252020030	
25A	Havells SRCD WOCP Dboxx Plastic box		DHBCDP0252025030	
<b>DBOXX MCB Protected Socket (Without Enclosure)</b>				
16A	Havells SRCD WOCP Dboxx Plastic box		DHDACDP0252016030	
20A	Havells SRCD WOCP Dboxx Plastic box		DHDACDP0252020030	
25A	Havells SRCD WOCP Dboxx Plastic box		DHDACDP0252025030	

## 2-Way SRCD (Socket Residual Current Device):

Havells 2-Way SRCD is ready plug & play device that provides protection to humans from electric shock due to direct or indirect contact.

It is designed such that user can easily upgrade his installation by replacing existing socket boxes and get built-in protection.

**Retro Fit**



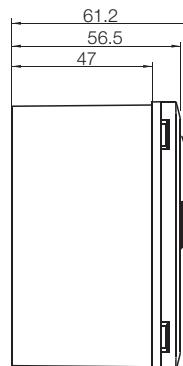
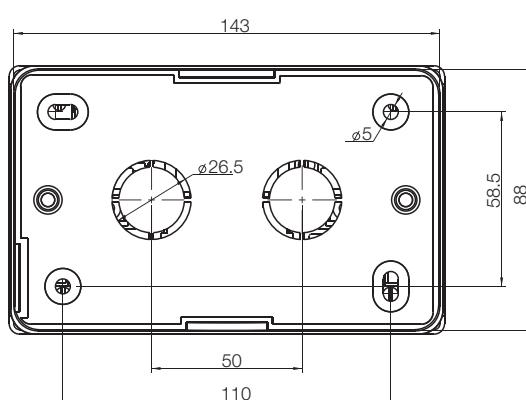
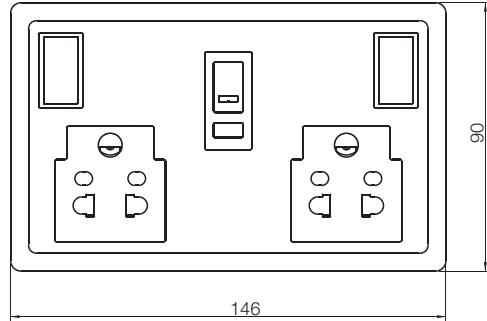
### Applications:

1. With Dedicated appliances such as Washing machine, Water coolers, Fridge, Geyser etc.
2. Also can be used as a plug and play box in Kitchen, bathroom etc.

### Features:

- Provide protection from the risks of leakage current (life saving).
- Type A: Residual current faults of AC as well as pulsating DC
- Manual reset and test button for safety checks.
- Easy to fit in existing switch boards.
- In case of fault it disconnects both line & neutral of output supply.
- Indicator light glows when the device is ON.

### Dimensions (in mm)



### Technical Specification:

Rated Current		6A x 2 / 10A x 2
Ref. Standard		IEC 62640
Rated Voltage		230 V
Rated Residual Current		30mA
Rated Insulation Voltage		500 V
Rated Frequency		50 Hz
No. of Pole		SPN
Supply Indication		Yes
Rating	Description	Cat. Number
6A x 2	Havells 2-Way SRCD	DHDEUTW0102006030
10A x 2	Havells 2-Way SRCD	DHDEUTW0102010030

## 1-Way SRCD (Socket Residual Current Device):



**LIFE SAVING DEVICE**

Havells 1-Way SRCD is ready plug & play device that provides protection to humans from electric shock due to direct or indirect contact.

It is designed such that user can easily upgrade his installation by replacing existing socket boxes and get built-in protection.

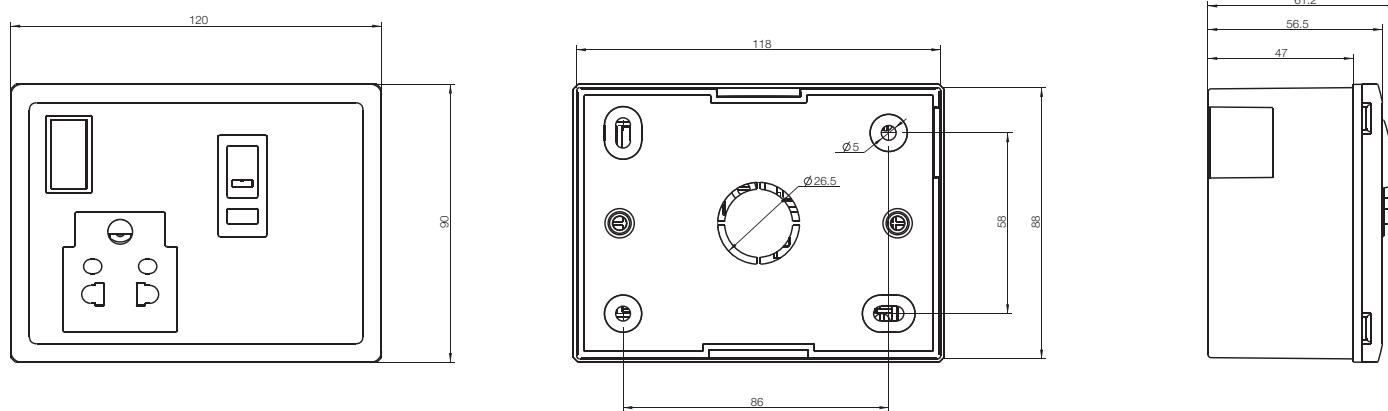
### Applications:

1. With Dedicated appliances such as Washing machine, Water coolers, Fridge, Geyser etc.
2. Also can be used as a plug and play box in Kitchen, bathroom etc.

### Features:

- Provide protection from the risks of leakage current (life saving).
- Type A: Residual current faults of AC as well as pulsating DC
- Manual reset and test button for safety checks.
- Easy to fit in existing switch boards.
- In case of fault it disconnects both line & neutral of output supply.
- Indicator light glows when the device is ON.

### Dimensions (in mm)



### Technical Specification:

Rated Current	6A / 10A	
Ref. Standard	IEC 62640	
Rated Voltage	230 V	
Rated Residual Current	30mA	
Rated Insulation Voltage	500 V	
Rated Frequency	50 Hz	
No. of Pole	SPN	
Supply Indication	Yes	
Rating	Description	Cat. Number
6A	Havells 1-Way SRCD	DHDEUSW0102006030
10A	Havells 1-Way SRCD	DHDEUSW0102010030



## MCBs - DOWNSTREAM MINIATURE CIRCUIT BREAKER

Downstream miniature circuit breakers are an important part of new age domestic, commercial and industrial distribution systems. These devices fulfill the requirement of dedicated localized protection of valuable appliances. They are installed at the most downstream circuit, ensuring even higher degree of protection for discriminating applications.

#### Features

- Suitable for both DESB (Decorative Electrical Switch Board) & switch board
- Mini MCB offers protection in switchboard against overload and short-circuit with a short-circuit capacity 3kA
- Reliability & Continuity of service
- Compact in size
- Low watt loss thus cost effective and energy saving
- Longer electrical life
- Finger touch proof terminals (IP 20)

#### Range:

- HomeSafe MCB
- DBOXX MCB
- Plug & Socket Box
- Mini MCB/Isolator

#### Specification

IEC 60898-1



Separate the front plate from Mini MCB/ Mini Isolator by pulling off.



Screw mount its front plate on the switchboard.

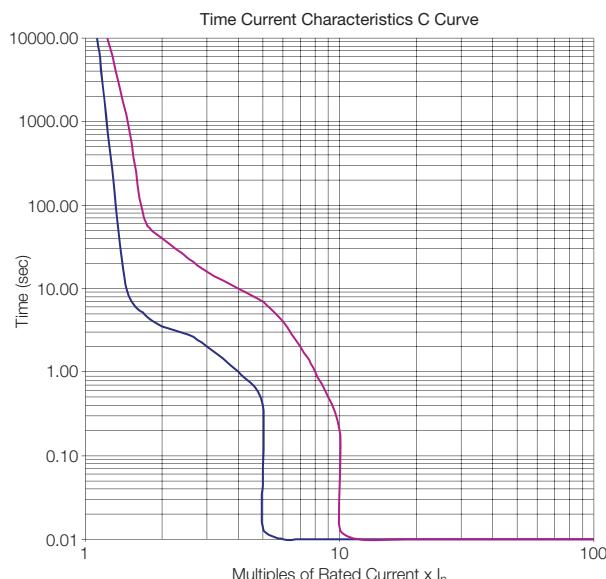


Connect the outgoing phase wire on upper terminal & tight it. Similarly connect the incoming phase wire on lower terminal & tight it.

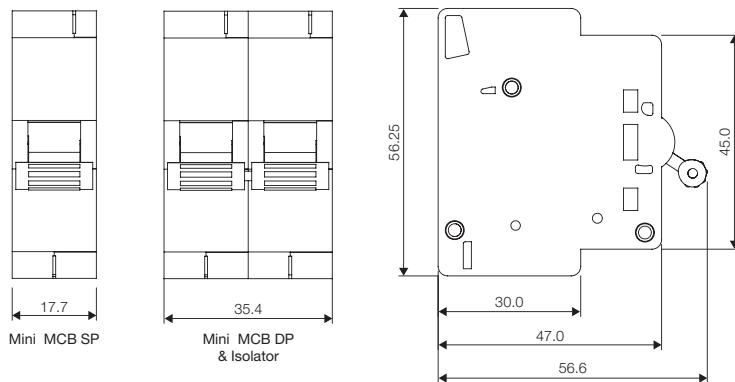


Push fit Mini MCB/ Mini Isolator onto the front plate. It is now successfully installed.

Technical Specification	Mini Single Pole MCB (1P)	Mini Double Pole MCB (2P)	Mini Double Pole Isolator (2P)
Reference	IS / IEC : 60898-1	IS / IEC : 60898-1	IS / IEC : 60947-3
Rated Current In	A	6, 10, 16, 20, 25, 32	6, 10, 16, 20, 25, 32
Rated Voltage Un	V~	240	240/415
Tripping Curve		C	C
Rated Insulation Voltage	V	500	500
Rated Frequency	Hz	50	50
No. of Pole		Single Pole	Two Pole
Rated Short Circuit Capacity Icn	kA	3	3
Conditional Short Circuit withstand Capacity	kA	-	3



Dimensions (in mm)



Mini MCB



Mini MCB SP / DP

Rating	Pack Qty.	SP Cat. No.	DP Cat. No.
6A	6	DHMNCSPA006	DHMNCSPA006
10A	6	DHMNCSPA010	DHMNCSPA010
16A	6	DHMNCSPA016	DHMNCSPA016
20A	6	DHMNCSPA020	DHMNCSPA020
25A	6	DHMNCSPA025	DHMNCSPA025
32A	6	DHMNCSPA032	DHMNCSPA032

Mini Isolator



Mini DP Isolator

Rating	Pack Qty.	DP Cat. No.
40A	6	DHMNIDPX040

## Mini MCB DP with Enclosure **HOME<sup>SAFE</sup>**



Havells launches HomeSafe a compact & aesthetic protection device which provides protection against overload & short circuit with help of MCB. It is designed for quick & easy installation.

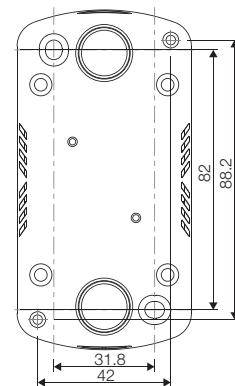
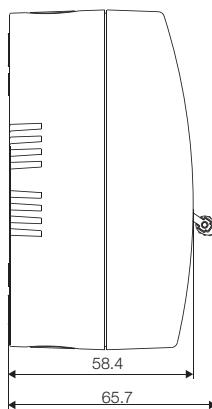
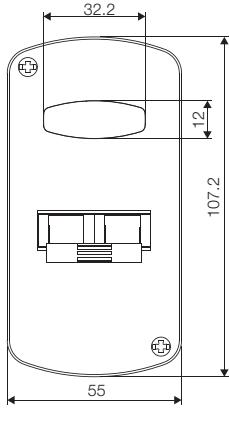
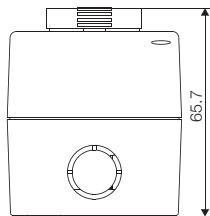
### Features

- Appealing & Contemporary Aesthetics
- Compact & Space saving design
- Overload & Short Circuit Protection
- Proven MCB mechanism for longer life
- Easy to Operate & replace
- Completely insulated design
- Indication of Supply

### Specification

Reference	:	IS/IEC: 60898-1
Rated Current In	:	32A
Rated Voltage Un	:	240V AC
Rated Insulation Voltage	:	500V AC
Rated Frequency	:	50 Hz
No. of Poles	:	DP
Rated Short Circuit Capacity	:	3kA
Degree of Protection	:	IP 20
Line / Load terminals	:	6 mm <sup>2</sup>

Dimensions (in mm)



Mini MCB DP with Enclosure Home Safe

Rating	Description	Cat No.
32A	DP C 32A Mini MCB with Enclosure	DHMPDCPA032

## DBOXx MCB Protected Socket



### Range

MCB Protected Socket – 16A, 20A & 25A

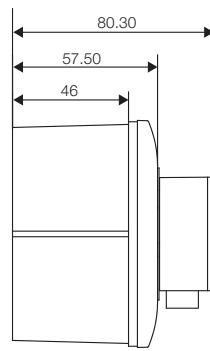
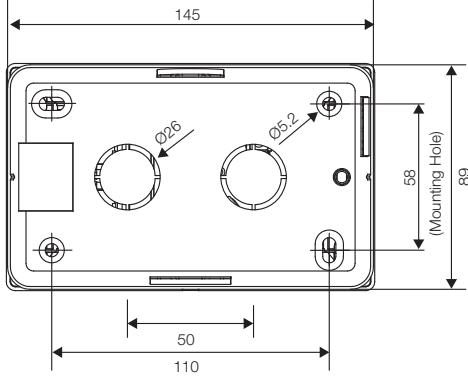
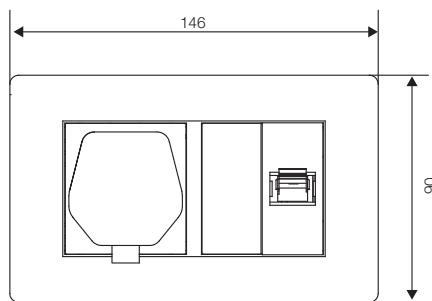
### Specification

IS:13032 & IS:8623

### Features

- Aesthetic appeal
- Ideal for local sectioning - Selectivity
- High quality contacts of single phase starter ensures reliability & long life during operations
- Built in MCBs protection, short circuit breaking capacity (3kA)
- Suitable for protection of home appliances like ACs, LCD Geyser, Microwave & Computer etc.

### Dimensions (in mm)



### DBOXx MCB Protected Socket

No. of Ways	Cat. No.	Description
<b>(With Sheet Steel Enclosure)</b>		
16A	DHDMSN0251016	16A MCB DBOXX COMBO
20A	DHDMSN0251020	20A MCB DBOXX COMBO
25A	DHDMSN0251025	25A MCB DBOXX COMBO
16A	DHDMCDP0253016	16A MCB DBOXX COMBO DP
20A	DHDMCDP0253020	20A MCB DBOXX COMBO DP
25A	DHDMCDP0253025	25A MCB DBOXX COMBO DP
<b>With Plastic Enclosure (for surface mounting)</b>		
16A	DHDTCN0251016	16A MCB DBOXX COMBO Plastic
20A	DHDTCN0251020	20A MCB DBOXX COMBO Plastic
25A	DHDTCN0251025	25A MCB DBOXX COMBO Plastic
<b>Without Enclosure</b>		
16A	DHDWCSN0251016	16A MCB DBOXX COMBO W/O ENCL.
20A	DHDWCSN0251020	20A MCB DBOXX COMBO W/O ENCL.
25A	DHDWCSN0251025	25A MCB DBOXX COMBO W/O ENCL.
16A	DHDWCM30251016	16A MCB DBOXX COMBO 3M W/O ENCL.
20A	DHDWCM30251020	20A MCB DBOXX COMBO 3M W/O ENCL.
25A	DHDWCM30251025	25A MCB DBOXX COMBO 3M W/O ENCL.

## DBOXx MCB Protected Power Unit



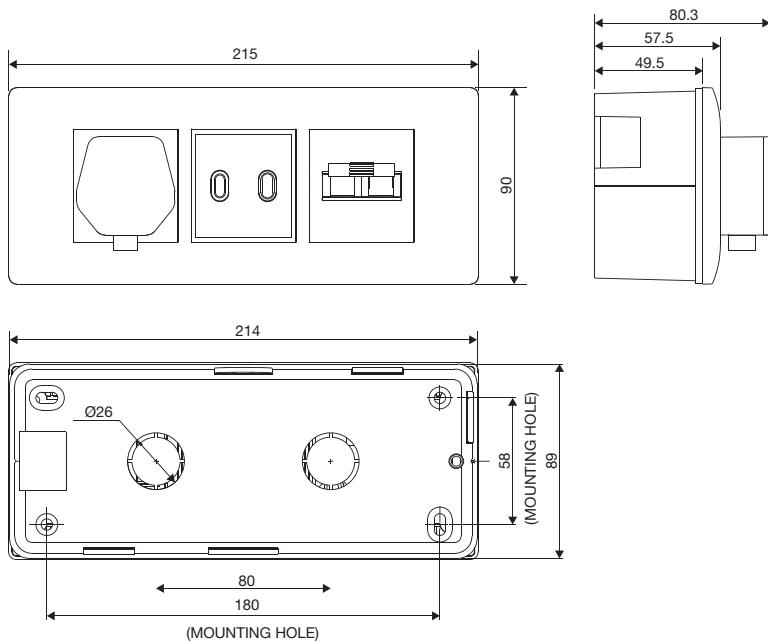
**Range**  
DBOXx MCB Protected Power Unit

**Specification**  
IS:13032 & IS:8623

**Features**

- Aesthetic appeal
- Ideal for local sectioning - Selectivity
- High quality contacts of single phase starter ensures reliability & long life during operations
- Built in MCBs protection, short circuit breaking capacity (3kA)
- Suitable for protection of home appliances like ACs, LCD Geyser, Microwave & Computer etc.

Dimensions (in mm)



DBOXx MCB Protected Power Unit

Rating	Description	Cat. No.
16A	16A MCB Protected Power Unit	DHDUCDP0253016
20A	20A MCB Protected Power Unit	DHDUCDP0253020
25A	25A MCB Protected Power Unit	DHDUCDP0253025

## Plug &amp; Socket



## Range

SPN – 20A SP, 20A DP &amp; 30A TP

## Color

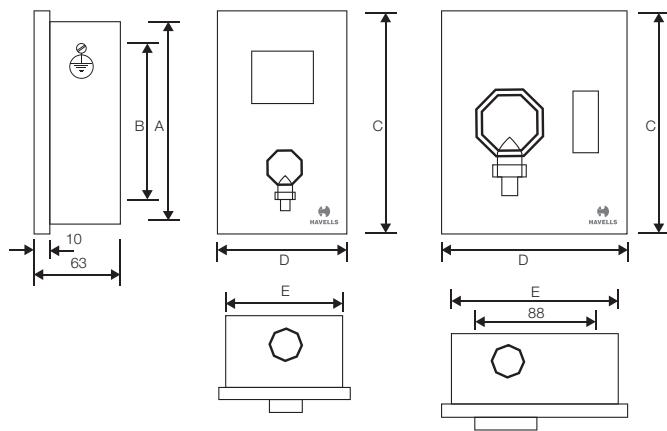
Regal Grey

## Specification

IS:13032 &amp; IS:8623

## Features

- Compact DBs which occupy minimum space
- Suitable for surface mounting
- Suitable for the protection of application like ACs, Motors etc.



## Dimensions (in mm)

No. of Ways	A	B	C	D	E	Top	Bottom	Sheet Thickness
20A SP	152	116	167	139	124	2	2	1
20A DP	152	116	167	139	124	2	2	1
30A TP	278	230	293	129	114	1	1	1

## Knockout Holes (Ø25)

## Plug &amp; Socket Boards

SPN enclosure with 2 Pole and Earth Metal Plug & Socket for incorporating 10A / 20A SPN / DP MCB		TPN enclosure with 3 Pole and Earth Metal Plug & Socket for Incorporating TP MCB	
Amp	Cat. No.	Amp	Cat. No.
20	DHDPUTN020 / DHDPUTP020	30	DHDPUTN030 / DHDPUTN030

## DBOXx Plug & Socket DB



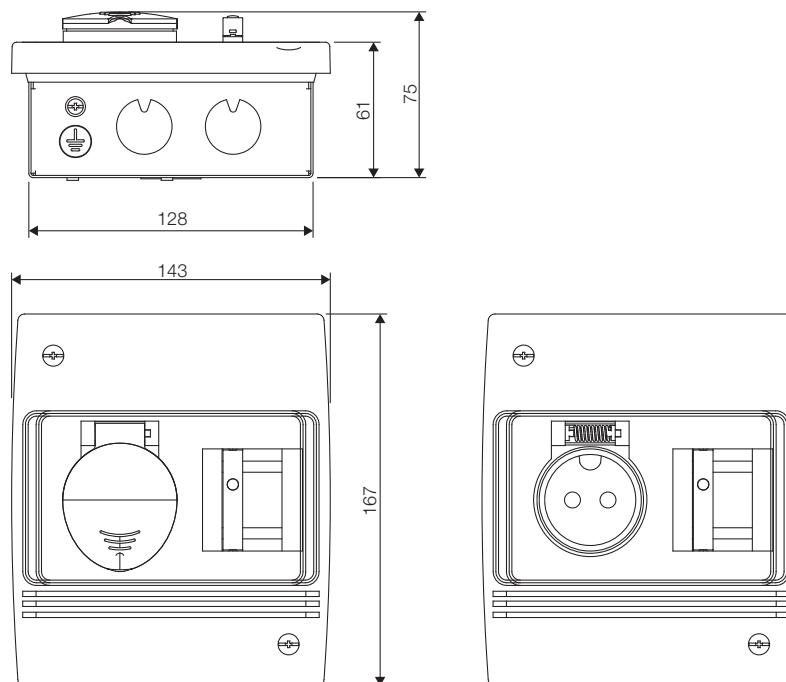
### Applications

Air Conditioner  
Refrigeration  
Motors  
Commercial Loads  
Test Equipment

### Features

- Insulated Engineered plastic Cover prevents Electric Shock
- Auto-shut Spring loaded Shutter Cap
- Indicator for Power ON-OFF Indication
- Metal base for proper Earthing
- Din Mounted Shrouded Neutral
- Elegant Aesthetics
- Ample space for wiring
- Complete Din Mounting arrangement
- IP 42

Dimensions (in mm)



DBOXx Plug & Socket DB

Rating	Cat. No.	Description
20A	DHDCUDP020	Plug & socket 20A DP With Plastic Cover D
20A	DHDCUSN020	Plug & socket 20A SPN With Plastic Cover D

## Plug &amp; Socket Box with Plastic Plug



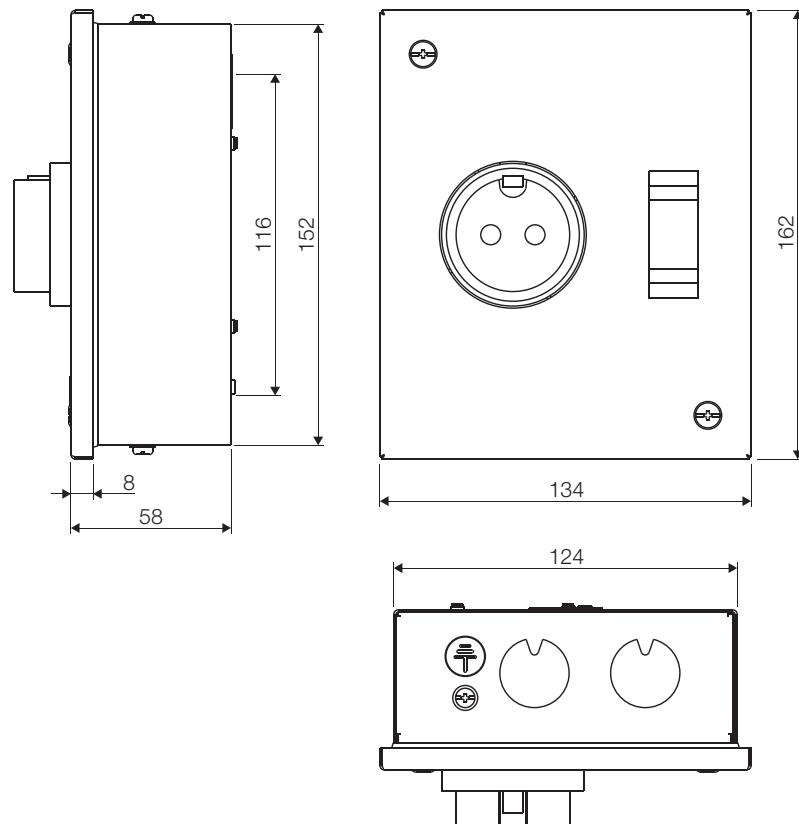
## Applications

Air Conditioner  
Refrigeration  
Motors  
Commercial Loads  
Test Equipment

## Features

- Insulated plastic plug & socket prevents Electric Shock
- Metal body for proper Earthing
- Din Mounted Shrouded Neutral
- Ample space for wiring
- Complete Din Mounting arrangement
- IP 40

Dimensions (in mm)



Plug &amp; Socket Box with Plastic Plug

Rating	Cat. No.	Description
20A	DHDPHDP020	Plug & socket 20A DP With Plastic Plug
20A	DHDPSHN020	Plug & socket 20A SPN With Plastic Plug





◆ MCB ISOLATOR  
SWITCHING DEVICES

They are switch disconnectors with independent manual operation, capable of making, carrying and breaking currents under normal circuit conditions, which may includes operating under overload condition and also carry currents under specified abnormal circuit conditions such as those of short circuit for a specified time.

**Features**

- Low Watt Loss
- Longer Electrical Life
- Wide Range
- Value for Money
- Low power consumption, thus cost effective & energy saving
- Dual termination for simultaneous connection of bus-bars and wires.
- CE and RoHS Complaint. 'Green Product'

**Range**

40A - 63A  
80A - 125A

**Specification**

IS/IEC 60947-3

**Execution**

Single Pole (1P)  
Double Pole (2P)  
Three Pole (3P)  
Four Pole (4P)



**Safety Terminals**

To avoid improper cable termination, the safety terminals guide the cable towards the cage terminal for systematic termination



**Large Cable Terminals**

Suitable for copper and aluminum cables, these terminals are compatible with cables having cross-section area upto 35mm<sup>2</sup> (below 63A) and upto 50mm<sup>2</sup> (80A-125A)



**Bi Stable Clip**

Every device is provided with a dual position DIN rail clip, so it becomes much easier to change a device from a device bank connected to a bus-bar, without disturbing the existing wiring



**Cooler Operation**

Grooves provided on outer body, so that when individual poles are placed adjacent to each other in a distribution board it forms a very effective channel for better air circulation, resulting into a cooler operation

Technical Specification		
Standard Conformity		IS / IEC 60947-3
Rated Current (In)	A	40 - 63 & 80 - 125
Rated Voltage (Ue)	V~	240/415
Rated Frequency (f)	Hz	50
No. of Poles (Execution)		1P, 2P, 3P, 4P
Utilization Category		AC 22 A
Rated Insulation Voltage (Ui)	V	690
Rated Impulse Voltage (Uimp)	kV	4
Electrical / Mechanical Endurance	(No. of operations)	10000
Ambient Temperature	°C	-5 to + 55
Terminal Capacity (Max)		35 mm <sup>2</sup> upto 63A & 50 mm <sup>2</sup> for 80A-125A
Vibration	g	5
Shock Resistance		40mm free fall
Protection Class		IP-20
Installation Position		Vertical / Horizontal
Mounting		Clip on DIN Rail (35mm x 7.5mm)
Case & Cover		Molded, flame retardant thermoplastic material

## MCB Isolator



## SP MCB Isolator (Switching Devices)

MCB Isolators (AC-22A, In accordance with IS/IEC 60947-3) 240V, 50Hz

Rating	Pack Qty.	SP Cat. No.
40A	12	DHMGISPX040
63A	12	DHMGISPX063



## DP MCB Isolator (Switching Devices)

MCB Isolators (AC-22A, In accordance with IS/IEC 60947-3) 240/415V, 50Hz

Rating	Pack Qty.	DP Cat. No.
40A	6	DHMGIDPX040
63A	6	DHMGIDPX063
80A	6	DHMGIDPX080
100A	6	DHMGIDPX100
125A	6	DHMGIDPX125



## TP MCB ISOLATOR (Switching Devices)

MCB Isolators (AC-22A, In accordance with IS/IEC 60947-3) 240/415V, 50Hz

Rating	Pack Qty.	TP Cat. No.
40A	4	DHMGITPX040
63A	4	DHMGITPX063
80A	4	DHMGITPX080
100A	4	DHMGITPX100
125A	4	DHMGITPX125

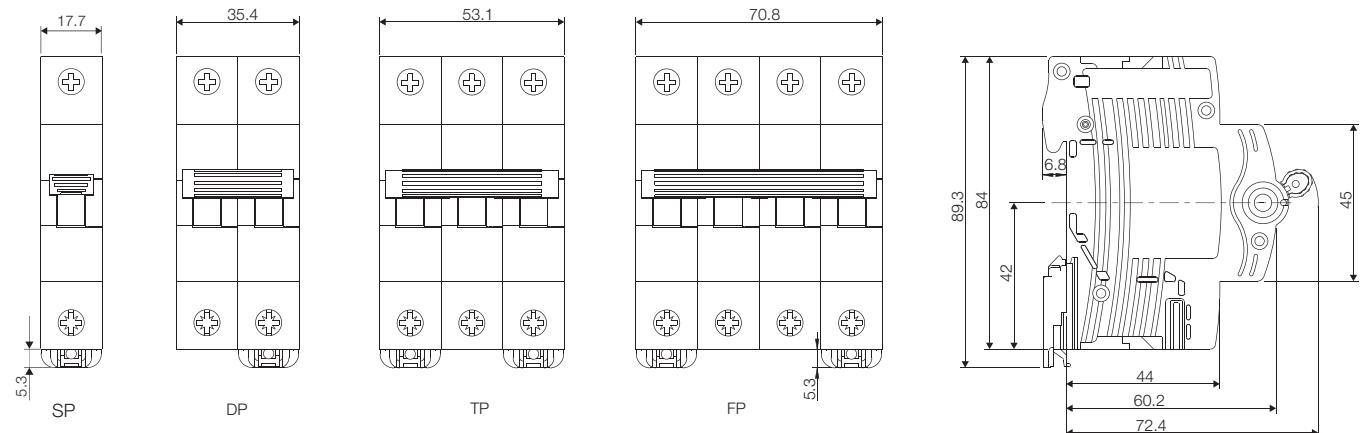


## FP MCB ISOLATOR (Switching Devices)

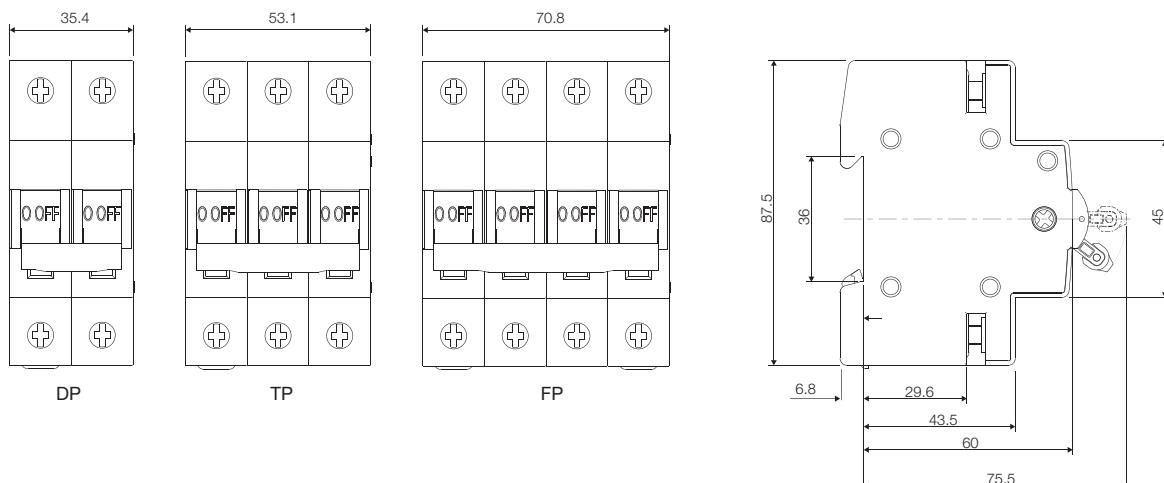
MCB Isolators (AC-22A, In accordance with IS/IEC 60947-3) 240/415V, 50Hz

Rating	Pack Qty.	FP Cat. No.
40A	3	DHMGIFPX040
63A	3	DHMGIFPX063
80A	3	DHMGIFPX080
100A	3	DHMGIFPX100
125A	3	DHMGIFPX125

## Dimensions (in mm) for 40A &amp; 63A



## Dimensions (in mm) for 80A, 100A &amp; 125A





## MCB CHANGEOVER

MCB Changeover switch finds wide & varied applications in industries as well as in domestic sphere for use in low voltage distribution circuits, wherever continuity of supply is necessary, for switching to an alternate source of supply from main supply and vice - versa.

**Features**

- Compact construction
- Double break contacts
- Silver cadmium oxide contact tips
- Shrouded terminals
- Can be mounted with other products viz. MCB, RCCBs, Isolator in Distribution Board
- CE and RoHS Complaint. 'Green Product'

**Range**

25A, 40A & 63A

**Execution**

Double Pole (2P), Four Pole (4P)

**Specification**

IS / IEC 60947-3



**Compact Size**

Optimized space in the distribution board.



**Center Position OFF**

Front operation with three stable positions I-O-II, where center position is OFF.



**Large Cable Terminals**

Suitable for copper and aluminum cables, these terminals are compatible with cables 10mm<sup>2</sup> upto 40A / 25mm<sup>2</sup> for 63A cross section area



**Cooler Operation**

Grooves provided on outer body, which form an effective channel for better air circulation, resulting into a cooler operation

**Construction**

The entire switching mechanism along with the fixed and moving contact assembly are housed in FR thermo plastic moulded case / cover, having high dielectric strength, excellent mechanical & thermal properties.

The switching mechanism is double break type. The contacts tips are made of Silver Cadmium oxide for long electrical life, sustained current carrying capacity and they ensure temperature rise is within specified limits.

Technical Specification		
Standard Conformity		IS / IEC 60947-3
No. of Poles (Execution)		2 Pole, 4 Pole
Rated Current (In)	A	25, 40, 63
Rated Voltage (Ue)	V~	240 /415
Rated Frequency	Hz	50
Rated Insulation Voltage	V	690
Dielectric Strength	kV	2.5
Rated Impulse Voltage	kV	4
Utilization Category		AC 21A
Ambient Temp.	°C	-5 to +55
Mechanical Life	(No. of operations)	10000
Electrical Life	(No. of operations)	10000
Mounting		Clip on DIN Rail (35mm x 7.5 mm)
Mounting Position		Vertical / Horizontal
Terminal Capacity 25A & 40A	mm <sup>2</sup>	10
Terminal Capacity 63A	mm <sup>2</sup>	25
Weight Double Pole 40A	g	134
Weight Four Pole 40A	g	268
Weight Double Pole 63A	g	156
Weight Four Pole 63A	g	314

**Connection Diagrams / Terminal Marking**

Two Pole



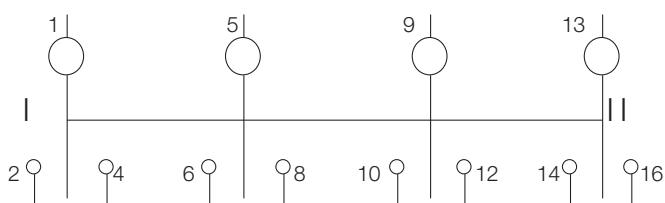
"I" - Incoming terminals (main supply) - 2 & 6

"II" - Incoming terminals (standby supply) - 4 & 8

Outgoing terminals (to load) - 1 & 5

\*Mid position of knob is 'OFF' position

Four Pole



"I" - Incoming terminals (main supply) - 2 , 6, 10 & 14

"II" - Incoming terminals (standby supply) - 4 , 8, 12 & 16

Outgoing terminals (to load) - 1, 5, 9 & 13

\*Mid position of knob is 'OFF' position

## MBC Changeover

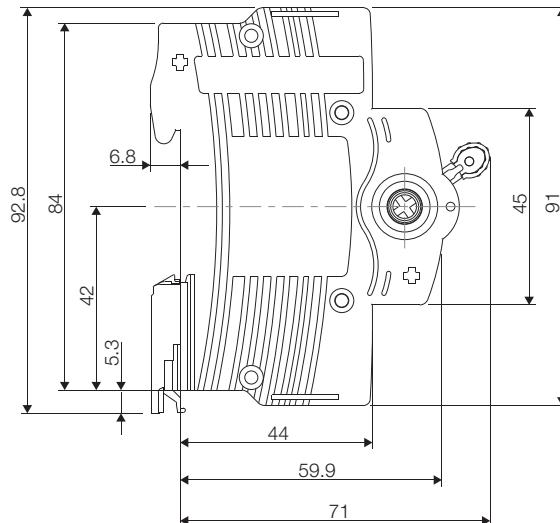
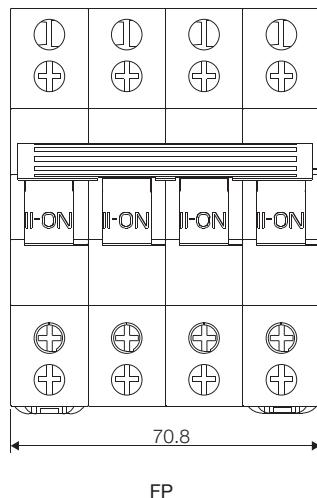
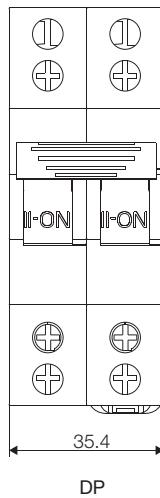


## Two Way Centre Off MCB Changeover

For Dual Electricity Supply Management (In accordance with IS/IEC 60947-3)

Rating	DP Cat. No.	FP Cat. No.
25A	DHMGODPX025	DHMGOFPX025
40A	DHMGODPX040	DHMGOFPX040
63A	DHMGODPX063	DHMGOFPX063

## Dimensions (in mm)





◆ AUTOMATIC SOURCE  
CHANGEOVER  
DEVICES

The power instability in developing countries along with changing modern lifestyle creates a need for alternative power sources such as gen-sets to back-up the utility supply. Most residential and commercial complexes today go for automatic solutions to meet 24 x 7 power.

Havells offers its wide range of modular and compact Automatic Changeover solutions to meet the ever-changing requirements. These devices overcome the disadvantages of manual changeovers such as increased downtime, disruption in key activities as well as possible damage of expensive equipment, human error, accidents etc. In addition, ACCL devices also offer current limiting function, thereby ensuring proper rationalization of generator power between multiple users.

With these inherent strengths along-with a host of user-friendly features, Havells Automatic Changeover devices have proven to be strong and effective power distribution management tools for all sectors.

#### Features for ACCL

- Automatic Changeover between Mains and Generator supply
- Current limiting function on Generator side
- Provision of automatic reset\*
- Operational Status Indication through LEDs
- Consumes less power
- Easy maintenance
- Microcontroller based design
- Provision of auto/manual mode (TPN ACCL)

\*Available in basic version

#### Range

- Mains 40A/63A/80A, Gen 10A - 80A (TPN)
- Mains 30A/Gen 1.5A to 20A (SPN)
- Mains 30A/Gen 30A (Automatic Changeover)

#### Execution

- Three Pole with Neutral (TPN)
- Single Pole with Neutral (SPN)

#### Specification

IEC 60947-6-1



#### Reset Button

Manual reset provision for restoring supply, when in sleep mode



#### Mountable in Distribution Boards

Modular design - easy to mount in distribution boards



#### LEDs Indication

Operational Status Indication through LEDs- Mains ON, Genset ON, Genset Overload etc.



#### Cable Terminals

Staggered terminal design with bottom wiring for better isolation between phase & neutral

## SPN ACCL

Havells offers SPN ACCL for single phase systems - fully automatic high precision microcontroller based source changeover devices which also have current limiting function and offer easy and 'controllable' changeover between main power supply and generator supply. They are ideally suited for efficient utilization of standby generator used in multi-storied apartments, commercial complexes etc.

They are available in two versions – Basic and Premium to meet the varying needs of commercial/ residential installations.



Premium SPN ACCL

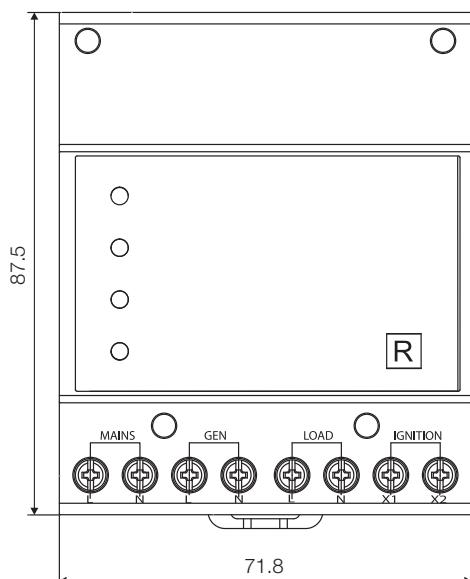


SPN ACCL 3 Module (basic)

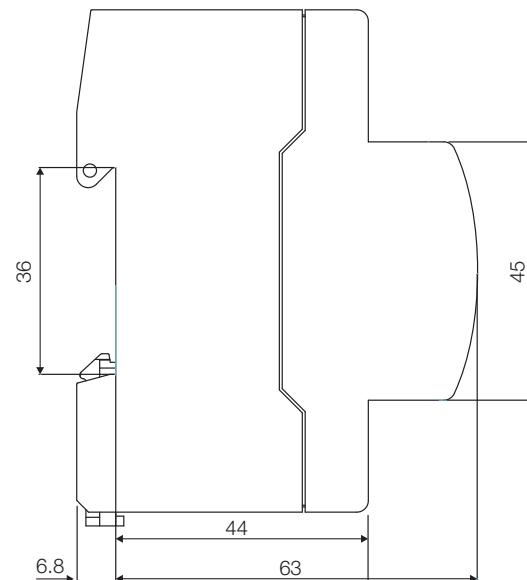
Features	Havells Premium SPN ACCL		Havells 3 Module SPN ACCL		Other Competitor Products	
OFF loadChangeover	✓	First Load is disconnected then changeover to other supply takes place, ensuring the isolation of two power supplies hence there is no chance of short circuiting between them.	✓	ON Load Changeover	✓	ON Load Changeover
Zero Crossing Detection Technology	✓	Relay changeover takes place during zero crossing mark of the sinusoidal AC supply. Which reduces the danger of Transient surges and Increases life of relay.	✗	Can takes place on peak of sinusoidal AC supply which may result in harsh effect of Transient surges and decrease in life of relay.	✗	Can takes place on peak of sinusoidal AC supply which may result in harsh effect of Transient surges and decrease in life of relay.
Advance Neutral	✓	First Neutral makes and last neutral breaks	✗	Neutral makes and break with phase.	✗	Neutral makes and break with phase.
Terminal for external conductors	✓	Indirect pressure type terminals	✓	Indirect pressure type terminals	✗	Direct Pressure type
Bottom Wiring	✓	Yes	✓	Yes	✗	No
Staggered Wiring	✓	Provides better isolation between phase and neutral	✓	Provides better isolation between phase and neutral	✗	Not Available
Conditional Shortcircuit current	✓	3kA	✓	3kA	✗	Not Mentioned
Eco friendly housing	✓	Thermoplastic, PA6 FR grade	✓	Thermoplastic, PA6 FR grade	✓	Thermoplastic
Local reset facility	✓	Reset button Provided, for restoring supply	✗	Not Provided	✗	Not Provided
Overload indication facility	✓	Separate LED for Overload condition	✓	Generator LED blinks to show overload condition	✗	Not Provided
Standard conformity	✓	IEC-60947-6-1	✓	IEC-60947-6-1	✗	No marking on product
Rated impulse voltage	✓	2.5kV	✓	2.5kV	✗	Not mentioned
Operational voltage	✓	80-300Vac	✓	150-270Vac	✓	180-240Vac
Pre trip indication in overload condition	✓	Provided	✗	Not Provided	✗	Not Provided
Compact design	✓	87.5*71.8*63	✓	87.5*53.1*63	✓	108*72*68

Technical Specification	Premium SPN ACCL	SPN ACCL 3 Module	
Standard Conformity	IEC 60947-6-1	IEC 60947-6-1	
No. of Poles	1P+N	1P+N	
Rated current (In)	30A on mains, 1.5-20A on generator	30A on mains, 1.5-20A on generator	
Rated voltage (Ue)	V~	240	240
Rated frequency	Hz	50	50
Rated insulation voltage	V	500	500
Transfer time	sec.	8-12	8-12
Restoring time	sec.	2-4	0-2
Utilization category	AC 31A	AC 31A	
Class of equipment	PC	PC	
Environment	B	B	
Indication	Mains, Generator, Load, Overload	Mains, Generator, Overload	
Ambient temp.	°C	-5 to + 55	-5 to + 55
Electrical life	(No. of operations)	6000	6000
Rated impulse voltage	kV	2.5	2.5
Duty		Uninterrupted	Uninterrupted
Pollution degree		2	2
Conditional short circuit current (I <sub>sc</sub> )	kA	3	3
Protection class		IP20	IP20
Mounting		standard mounting RAIL (35mmx7.5mm)	standard mounting RAIL (35mmx7.5mm)
Mounting position		Vertical /Horizontal	Vertical /Horizontal
Terminal Capacity	mm <sup>2</sup>	10	10
Weight	g	350	350

Dimensions (in mm) - Premium SPN ACCL

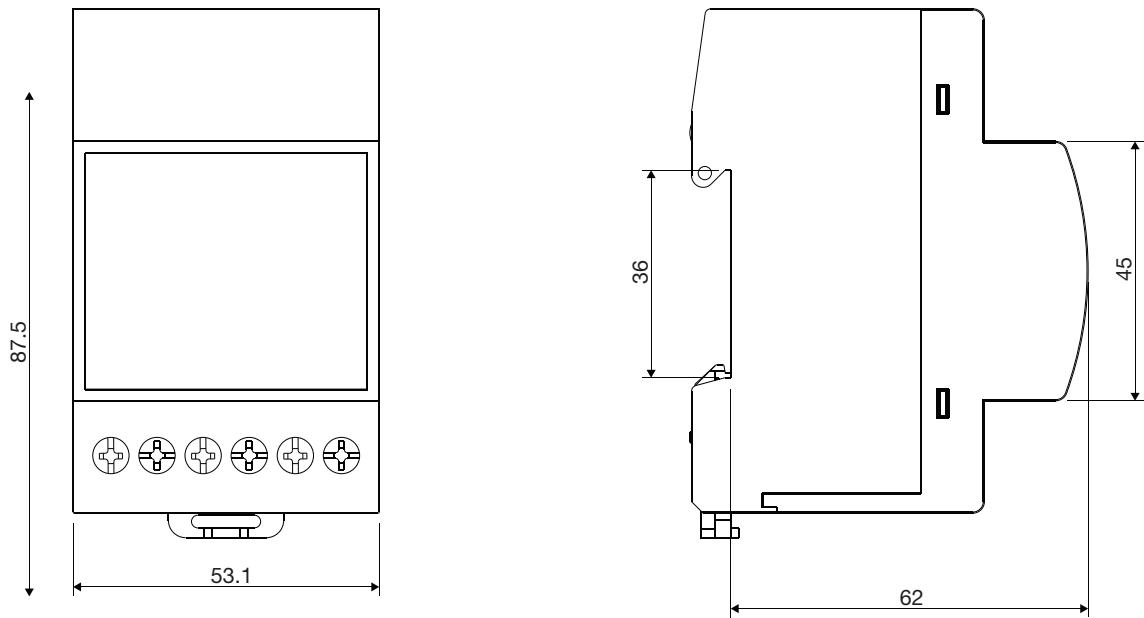


Front view



Side view

## Dimensions (in mm) - SPN ACCL 3 Module (basic)



## PREMIUM SPN ACCL

## PREMIUM SPN ACCL



Gen Rating	Description	Cat. No. w/o GEN Start/Stop	Cat. No. with GEN Start/Stop
SPN 1.5 (300W)	30A/1.5A ACCL	DHABOSN301X	–
SPN 2.5 (500W)	30A/2.5A ACCL	DHABOSN302X	–
SPN 3 (600W)	30A/03A ACCL	DHABOSN3003	DHABWSN3003
SPN 4 (800W)	30A/4A ACCL	DHABOSN3004	–
SPN 5 (1000W)	30A/5A ACCL	DHABOSN3005	–
SPN 6 (1200W)	30A/06A ACCL	DHABOSN3006	DHABWSN3006
SPN 9 (1800W)	30A/09A ACCL	DHABOSN3009	DHABWSN3009
SPN 12 (2400W)	30A/12A ACCL	DHABOSN3012	DHABWSN3012
SPN 15 (3000W)	30A/15A ACCL	DHABOSN3015	DHABWSN3015
SPN 20 (4000W)	30A/20A ACCL	DHABOSN3020	DHABWSN3020

## SPN ACCL

## SPN ACCL (3 Module)



Mains Rating	Gen Rating	Product Code	Description
SPN 30 (6000 W)	SPN 1.5 (300W)	DHADOSN301X	30A/1.5A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 2.5 (500W)	DHADOSN302X	30A/2.5A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 3 (600W)	DHADOSN3003	30A/03A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 4 (800W)	DHADOSN3004	30A/4A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 5 (1000W)	DHADOSN3005	30A/5A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 6 (1200W)	DHADOSN3006	30A/06A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 9 (1800W)	DHADOSN3009	30A/09A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 12 (2400W)	DHADOSN3012	30A/12A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 15 (3000W)	DHADOSN3015	30A/15A ACCL W/O GEN START/STOP
SPN 30 (6000 W)	SPN 20 (4000W)	DHADOSN3020	30A/20A ACCL W/O GEN START/STOP

## TPN ACCL

Havells offers TPN ACCL for three phase systems - fully automatic high precision microcontroller based source changeover devices which also have current limiting function and offer easy and 'controllable' changeover between main power supply and generator supply. They are ideally suited for efficient utilization of standby generator used in multi-storied apartments, commercial complexes etc.

They are available in two versions – Basic and Compact to meet the varying needs of users.



TPN ACCL



Compact TPN ACCL

### FUNCTIONS

#### 1. When mains supply is available

The device will run the load on mains supply if the R phase is available irrespective of the availability of all other phases. It is recommended to connect the entire essential load to R phase.

#### 2. When mains supply fails

If mains supply goes off (detected by R phase), the device will automatically sense and actuate the inbuilt changeover mechanism to the generator supply. This takes 8-12sec so as to avoid sudden loading on generator. TPN ACCL also allows user to opt for manual mode for manual transfer of load to gen-set.

**Current Limiting feature on Generator side:** If load current exceeds the preset allowable limit, then Overload LED will start glowing, but load will remain connected for 5 sec to ignore the surge current. But if load still persists beyond the preset limit, it is disconnected for 8 sec as a warning and then automatically reconnected. Such cycle of interruptions continue for a number of times during which the user is expected to switch off nonessential loads.

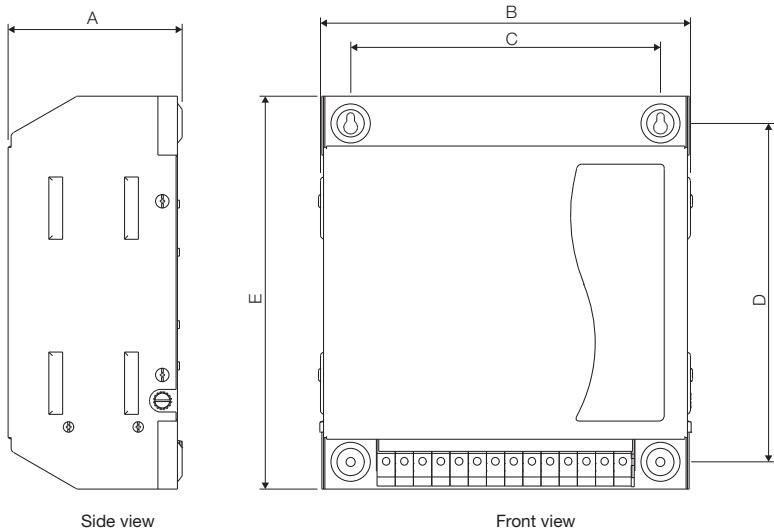
#### 3. When mains supply restores

On resumption of mains, the load is automatically transferred to main supply after a time delay of 2-4 sec.

Parameters	TPN ACCL (TPN ACCL in Sheet metal)		Compact TPN ACCL (TPN ACCL in Thermoplastic)	
Automatic Changeover	✓		✓	
Overload Protection on Gen side	✓		✓	
Range	Mains	Gen	Mains	Gen
	TPN 63A	TPN/SPN 2.5-50A	TPN 63A	TPN 2.5-40A
	TPN 40A	TPN/SPN 2.5-40A	TPN 40A	TPN 2.5-40A
Dimensions	260x243x115 mm for 40A TPN ACCL 260x243x150 mm for 63A TPN ACCL		175x130x80.4mm	
Mode selection	✓		✗	
Local reset facility	Required, as ACCL goes into the sleep mode after 5 cycles of interruption		Not required, as overload tripping continues till current is not within the limit	
Indications	Mains, Gen, Load, Overload on R, Y and B phase, Auto/manual mode through membrane keypad		Mains, Gen, Overload on R, Y and B phase, Pre-trip Indication	
Mounting	Surface mounted		1. Surface mounted, 2. DIN Rail mounted (35mm and 75mm DIN Rail)	
Housing	Sheet metal		Thermoplastic	

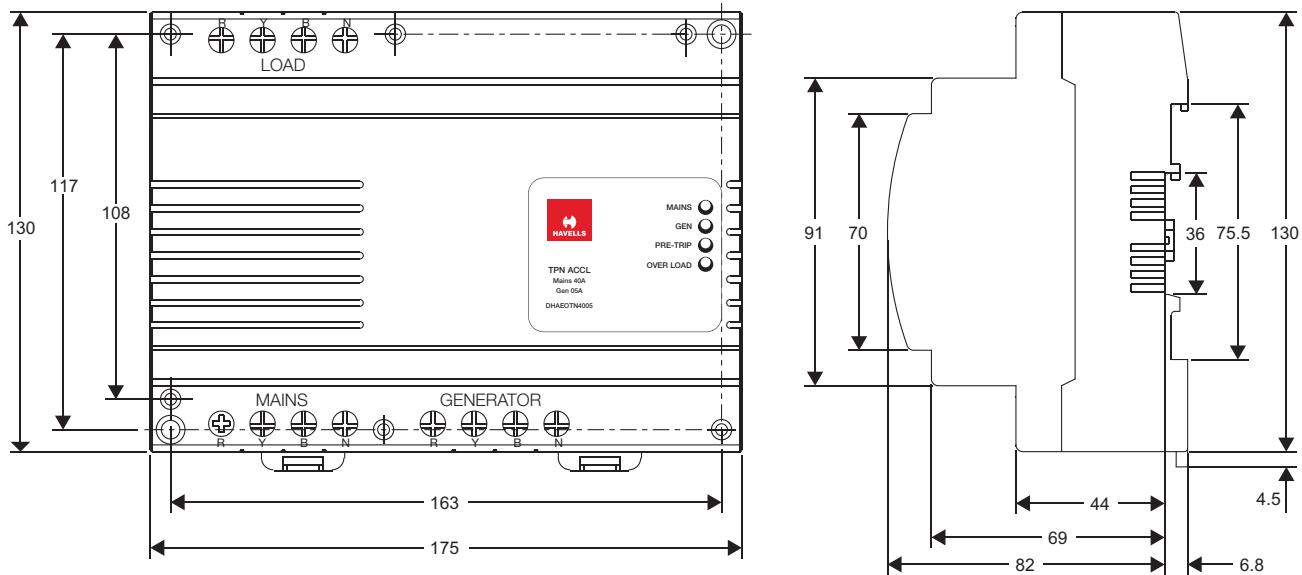
Technical Specification		TPN ACCL	Compact TPN ACCL
Standard Conformity		IEC 60947-6-1	IEC 60947-6-1
No. of Poles		3P+N	3P+N
Rated current (In)		40A/63A/80A on mains, 10-63A on gen	40A on mains, 2.5-40A on gen
Rated voltage (Ue)	V~	415/220 Vac	415/240 Vac
Rated frequency	Hz	50	50
Transfer time	sec.	8-12	2-4 (main to load), 8-12 (gen to load)
Restoring time	sec.	2-4	2-4
Utilization category		AC 31A	AC 31A
Class of equipment		PC	PC
Environment		B	B
Indication		Mains, Generator, Load, Overload (R,Y,B), mode of operation (auto/manual)	Mains, Generator, Pre-trip, Overload (R, Y, B)
Ambient temp.	°C	-5 to + 55	-5 to + 40
Electrical life	(No. of operations)	6000	6000
Rated impulse voltage	kV	6	4
Duty		Uninterrupted	Uninterrupted
Pollution degree		2	2
Conditional short circuit current (Isc)	KA	5	5
Protection class		IP20	IP20
Mounting		surface mounting	din-rail (35mm & 75mm), surface mounting
Mounting position		Vertical	Vertical /Horizontal
Terminal Capacity	mm <sup>2</sup>	16/35	25
Weight	kg	4.5/9.4	1.5

Dimensions (in mm) - TPN ACCL



Rating	A	B	C	D	E
40A TPN ACCL	115	243	205	224	260
63A TPN ACCL	150	243	205	224	260
80A TPN ACCL	150	333	293	337	383

## Dimensions (in mm) - Compact TPN ACCL



## TPN ACCL

**TPN ACCL (TPN/SPN)**  
(Automatic Source Changeover with Current Limiter)



Gen Rating	Description	Cat. No.	Cat. No. with GEN Start/Stop
20A	40A/20A TPN/SPN ACCL	DHACOTN4020	DHACWTN4020
25A	40A/25A TPN/SPN ACCL	DHACOTN4025	DHACWTN4025
30A	40A/30A TPN/SPN ACCL	DHACOTN4030	DHACWTN4030
40A	40A/40A TPN/SPN ACCL	DHACOTN4040	DHACWTN4040
20A	63A/20A TPN/SPN ACCL	DHACOTN6320	DHACWTN6320
25A	63A/25A TPN/SPN ACCL	DHACOTN6325	DHACWTN6325
30A	63A/30A TPN/SPN ACCL	DHACOTN6330	DHACWTN6330
40A	63A/40A TPN/SPN ACCL	DHACOTN6340	DHACWTN6340
63A	80A/63A TPN/SPN ACCL	DHACOTN8063	-

**TPN ACCL (TPN/TPN)**  
(Automatic Source Changeover with Current Limiter)



Gen Rating	Description	Cat. No.	Cat. No. with GEN Start/Stop
20A	40A/20A TPN/TPN ACCL	DHACOTT4020	DHACWTT4020
25A	40A/25A TPN/TPN ACCL	DHACOTT4025	DHACWTT4025
30A	40A/30A TPN/TPN ACCL	DHACOTT4030	DHACWTT4030
40A	40A/40A TPN/TPN ACCL	DHACOTT4040	DHACWTT4040
20A	63A/20A TPN/TPN ACCL	DHACOTT6320	DHACWTT6320
25A	63A/25A TPN/TPN ACCL	DHACOTT6325	DHACWTT6325
30A	63A/30A TPN/TPN ACCL	DHACOTT6330	DHACWTT6330
40A	63A/40A TPN/TPN ACCL	DHACOTT6340	DHACWTT6340
63A	80A/63A TPN/TPN ACCL	DHACOTT8063	-

## CompactTPN ACCL



**COMPACT TPN ACCL**  
(40A Compact TPN ACCL)

Gen Rating	Cat. No.	Description
40A	DHAEOTT402X	40A/2.5A Compact TPN/TPN ACCL
40A	DHAEOTT4003	40A/03A Compact TPN/TPN ACCL
40A	DHAEOTT4004	40A/04A Compact TPN/TPN ACCL
40A	DHAEOTT404X	40A/4.5A Compact TPN/TPN ACCL
40A	DHAEOTT4005	40A/05A Compact TPN/TPN ACCL
40A	DHAEOTT4006	40A/06A Compact TPN/TPN ACCL
40A	DHAEOTT4008	40A/08A Compact TPN/TPN ACCL
40A	DHAEOTT4010	40A/10A Compact TPN/TPN ACCL
40A	DHAEOTT4015	40A/15A Compact TPN/TPN ACCL
40A	DHAEOTT4020	40A/20A Compact TPN/TPN ACCL
40A	DHAEOTT4025	40A/25A Compact TPN/TPN ACCL
40A	DHAEOTT4030	40A/30A Compact TPN/TPN ACCL
40A	DHAEOTT4040	40A/40A Compact TPN/TPN ACCL

## Automatic Changeover

Havells Automatic Changeover is a fully automatic high precision microcontroller based device and is ideally suited for unmanned power transfer operations between two sources in bungalows, multi storied apartments, commercial complexes, etc.



30A Automatic Changeover



63A Automatic Changeover

### Functions

#### 1. When the Mains Supply is available:

- Load is connected to mains supply after time delay of 1 to 2 sec. (63A) / 2 to 4 sec. (30A) allows to draw full load current.

#### 2. When the Mains supply fails:

##### (a) With AGS (automatic generator stop features)

- When the mains supply goes off i.e. fails, automatic changeover will sense Gen supply and actuate the inbuilt changeover mechanism.
- A consumer is automatically connected to the Generator supply after a time delay of 6 to 12 sec. (63A) / 12 to 15 sec. (30A) in order to limit the sudden load on the Generator.

##### When the Mains supply is restored:

- On resumption of the mains supply, the load is automatically transferred to the main supply after a time delay of 1 to 2 sec. (63A) / 2 to 4 sec. (30A) and stop signal is sent to Gen.

##### (b) Without AGS (automatic generator stop features)

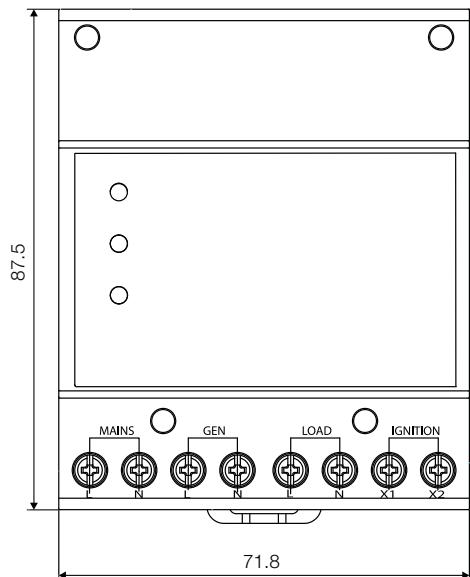
- When the mains supply goes off i.e. fails, automatic changeover will sense Gen supply and actuate the inbuilt changeover mechanism.
- A consumer is automatically connected to the Generator supply after a time delay of 6 to 12 sec. (63A) / 12 to 15 sec. (30A) in order to limit the sudden load on the Generator.

##### When the Mains supply is restored:

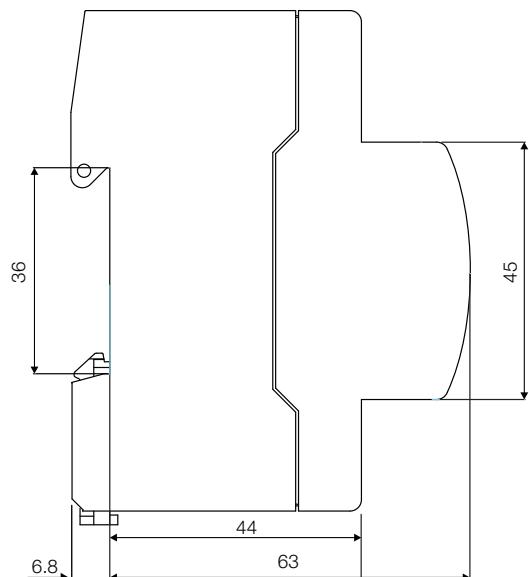
- On resumption of the mains supply, the load is automatically transferred to the main supply after a time delay of 1 to 2 sec. (63A) / 2 to 4 sec. (30A).

Technical Specification	30A Automatic Changeover	63A Automatic Changeover
Standard Conformity	IEC 60947-6-1	IEC 60947-6-1
No. of Poles	1P+N	1P+N
Rated current (In)	30A	63A
Rated voltage (Ue)	V~	240 Vac
Rated frequency	Hz	50
Mains to Gen transfer time	sec.	12-15
Restoring time	sec.	2-4
Utilization category	AC 31A	AC 31A
Indication	Mains, Generator, Load	Mains, Generator, Load
Ambient temp.	°C	-5 to + 55
Electrical life	(No. of operations)	6000
Rated impulse voltage	kV	2.5
Rated insulation voltage	V	500
Conditional short circuit current (I <sub>co</sub> )	KA	3
Protection class		IP20
Mounting	din-rail (35mmx7.5mm)	wall mounting
Mounting position	Vertical /Horizontal	Vertical /Horizontal
Terminal Capacity	mm <sup>2</sup>	10
		16

Dimensions (in mm) - 30A Automatic Changeover

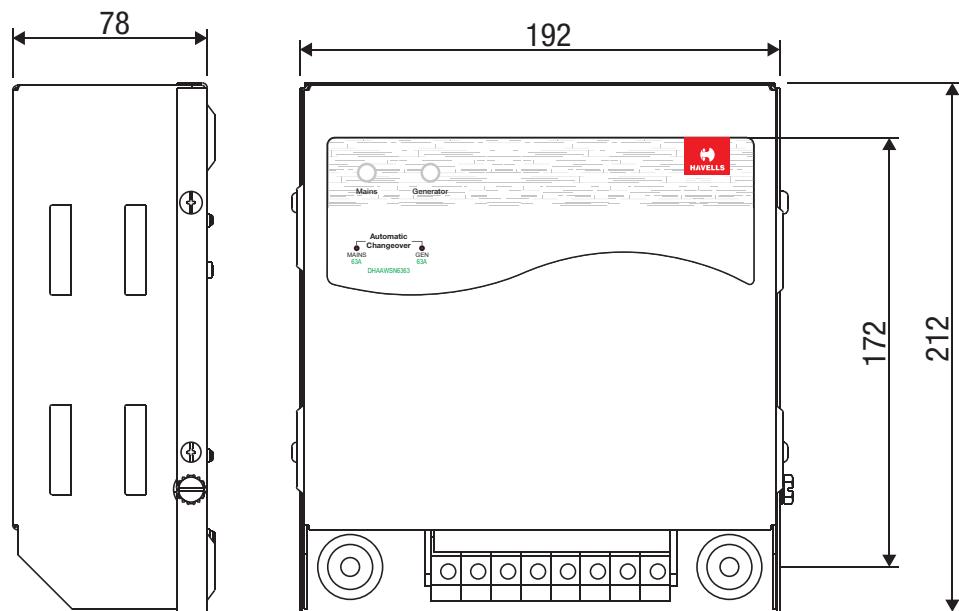


Front view



Side view

Dimensions (in mm) - 63A Automatic Changeover



Automatic Changeover



30A Automatic Changeover

Gen Rating	Description	Cat. No. w/o GEN Start/Stop	Cat. No. with GEN Start/Stop
SPN 30 (6000 W)	SPN 30 (6000 W)	DHAAOSN3030	DHAWSN3030



63A Automatic Changeover

Gen Rating	Description	Cat. No. w/o GEN Start/Stop	Cat. No. with GEN Start/Stop
SPN 63 (6000 W)	SPN 63 (6000 W)	DHAAOSN6363	DHAWSN6363



## TIME SWITCH

Time switches are used in residential, commercial and industrial premises to improve comfort and save energy by switching loads automatically as per real time. Havells offers a variety of time switches to precisely meet the requirements of different applications. The range offers several feature benefits such as different options of minimum switching time, internal battery to enable the timing function in case of power failure, daily and weekly versions, simple and compact design.

**Features**

- Digital and analog version
- Easy time setting
- Helps in saving energy & time
- Text oriented user guidance in display
- Modular, compact & din-rail mountable design

**Range**

- 24 Hour Analog Time Switch
- Programmable Time Switch 24 Hour
- Digital Weekly Programmable Time Switch
- Astronomical Programmable Time Switch
- Staircase Light Time Switch



**Large LCD Display**

Easy snap on din-rail mounting



**Protective Cover**

For protecting the LCD from mechanical shocks & scratches



**Manual Override Option**

All time switches have the option to manually override the programming and permanently ON/OFF the circuit for emergent situations (without disturbing the pre-set program).

Technical Specification	
Operating Voltage	220 - 240 Vac
Rated Frequency	50 - 60 Hz
Width	54.5 mm
Weight	0.2 kg
Installation Type	DIN Rail
Type of Contact	Changeover Contact
Program Functions	ON / OFF
Number of Memory Locations	48
Power Reserve	150 Hrs
Max. Switching Capacity at 250 VAC, $\cos\Phi = 1$	16 A
Max. Switching Capacity at 250 VAC, $\cos\Phi = 0.6$	4 A
Shortest Switching Time	30 Min
Mechanical Life	$10^7$
Electrical Life	$10^5$
Time Accuracy	$\leq 1$ s/day Quartz
Power Consumption	5 VA
Degree of Protection	IP 20
Ambient Temperature	-10 °C to + 55 °C

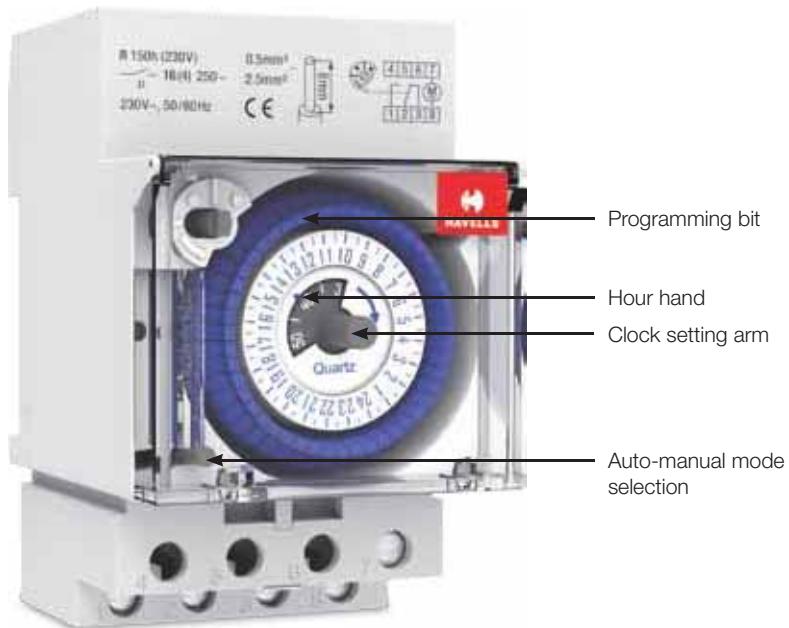
## 24 Hour Analog Time Switch

24-Hour Analog Time Switch has a 24-hour dial and is used to switch an electrical circuit "ON" or "OFF" at selected times, during the day, programmed in advance. The start of the programme has to be set on the dial by pulling a segment on the desired time.

### Applications:

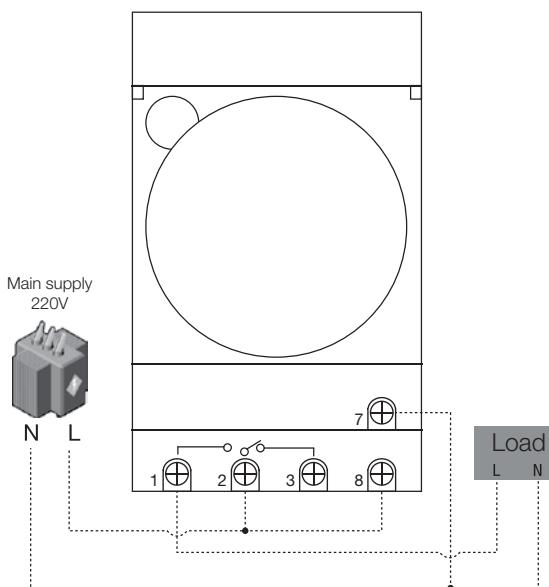
The 24 Hour Analog Time Switch is used in pre-programmed switching of:

- Lighting (car parking, advertising sign boards)
- Heating equipment (home & work environment, water heating, etc.)
- Motors for pumps & fans

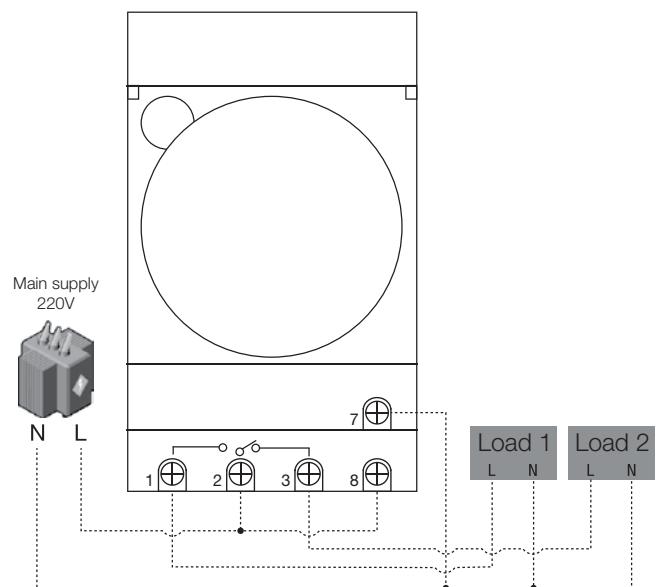


**Wiring Diagram**

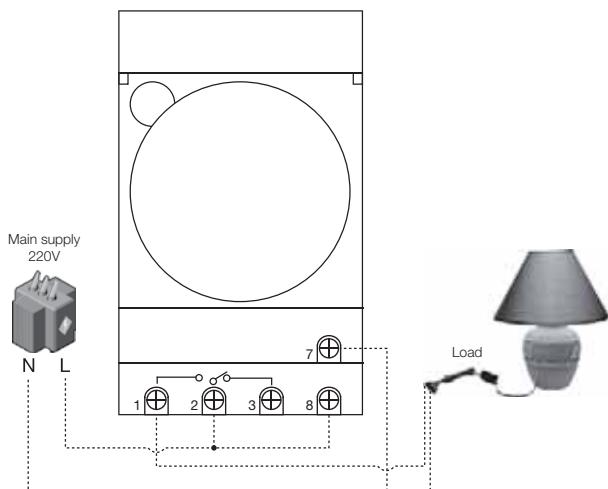
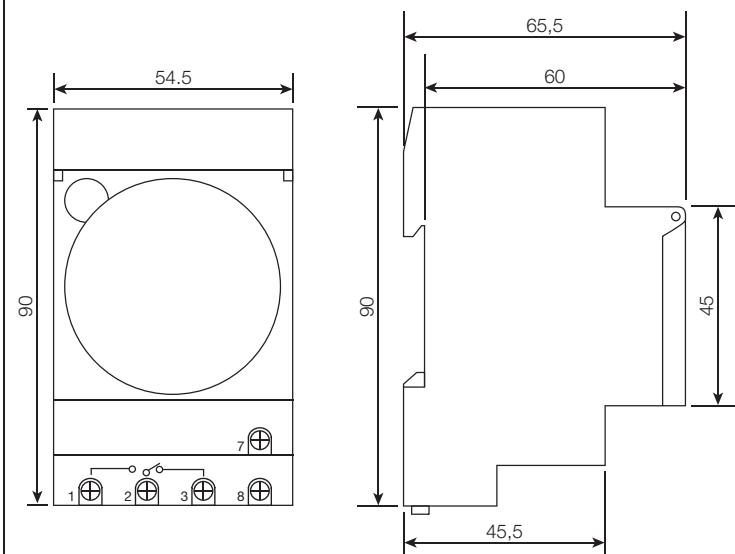
Single Load



Multiple Load

**For example**

Consider an Electric lamp in connection with  
Analog Time Switch

**Dimensions (in mm)****Time Switch****24 Hour Analog Time Switch**

Description	Cat. No.
24 Hour Analog Time Switch	DHTED30016

Technical Specification	
Operating Voltage	220 - 240 Vac
Rated Frequency	50 Hz
Width	54.5 mm
Weight	0.2 kg
Installation Type	DIN Rail
Type of Contact	Changeover Contact
Program Functions	ON / OFF
Number of Memory Locations	48
Power Reserve	150 Hrs
Max. Switching Capacity at 250 VAC, $\cos\Phi = 1$	16 A
Max. Switching Capacity at 250 VAC, $\cos\Phi = 0.6$	10 A
Incandescent / Halogen Lamps	2300 watt
Shortest Switching Time	15 Min
Mechanical Life	$10^7$
Electrical Life	$10^5$
Time Accuracy	$\leq 1$ s/day
Power Consumption	5 VA
Degree of Protection	IP 20
Ambient Temperature	-10 °C to + 55 °C

### Programmable Time Switch 24 Hour

Programmable Time Switch 24 Hour has a 24h dial and is used to switch an electrical circuit "ON" or "OFF" at selected times during the day, programmed in advance. A program consists of a closing time and an opening time for a circuit.

#### Applications:

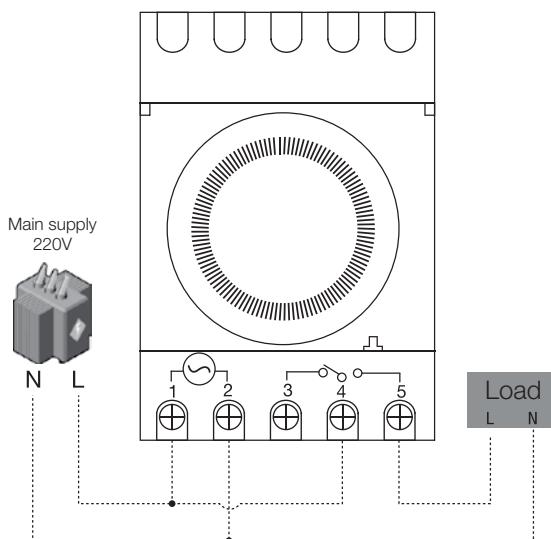
The Programmable 24 Hour Electronic Time Switch is used in pre-programmed switching of:

- Lighting (car parking, advertising sign boards)
- Heating equipment (home & work environment, water heating etc.)
- Motors for pumps & fans

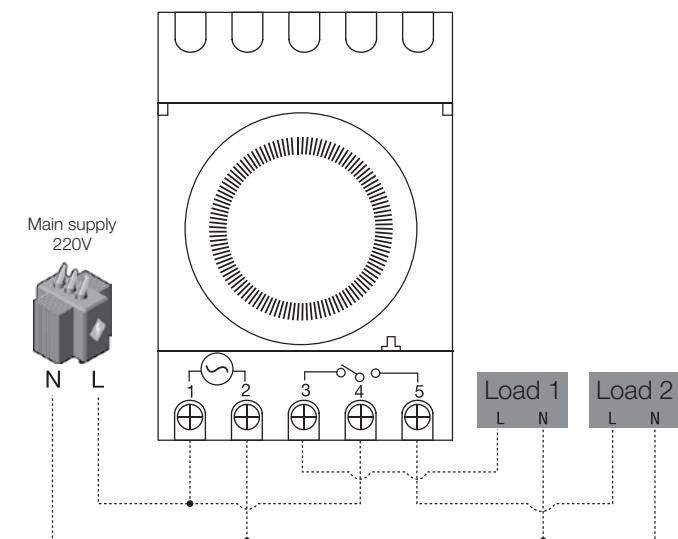


**Wiring Diagram**

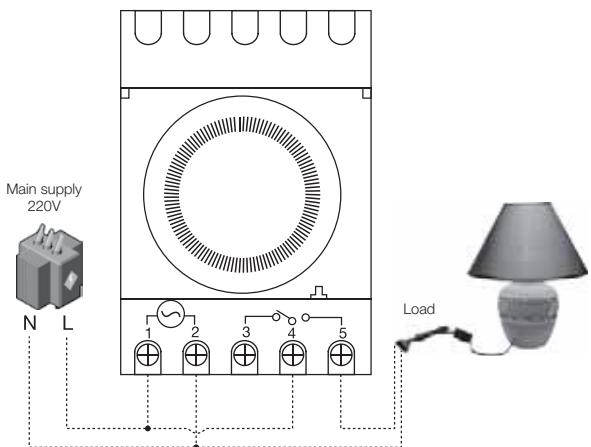
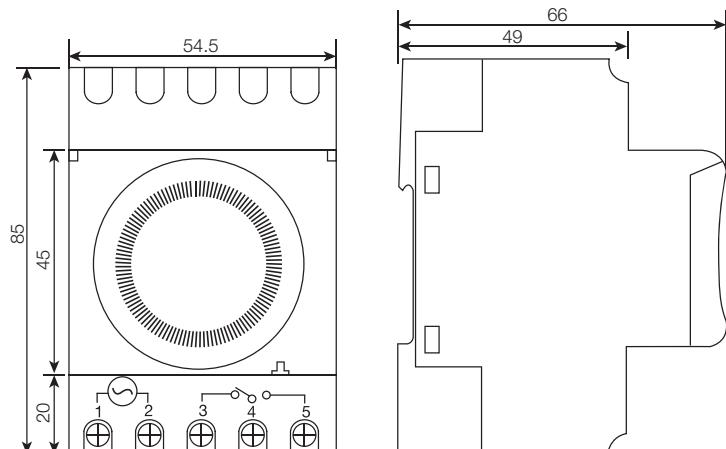
Single Load



Multiple Load

**For example**

Consider an Electric lamp in connection with  
Programmable Time Switch 24 Hour

**Dimensions (in mm)****Time Switch****Programmable Time Switch 24 Hour**

Description	Cat. No.
Programmable Time Switch 24 Hour	DHTDD15016

Technical Specification	
Operating Voltage	240 Vac
Rated Frequency	50 Hz
Width	36 mm
Weight	0.150 kg
Installation Type	DIN Rail
Type of Contact	Changeover Contact
Program	Weekly Program
Program Functions	ON / OFF
Number of Programming	8 ON / 8 OFF
Power Reserve	150 Hrs
Max. Switching Capacity at 250 VAC, cos = 1	16 A
Max. Switching Capacity at 250 VAC, cos = 0.6	10 A
Incandescent / Halogen Lamps	2300 watt
Shortest Switching Time	1 Min
Mechanical Life	$10^7$
Electrical Life	$10^5$
Time Accuracy	$\leq 1$ s/day
Power Consumption	5 VA
Degree of Protection	IP 20
Ambient Temperature	-10 °C to + 55 °C



### Digital Weekly Programmable Time Switch

Digital Weekly Programmable Time Switch automatically turns lighting or other loads on/off when the programmed on/off time expires. Depending on the day of the week (Mon - Sun) different daily programs can be configured.

#### Applications

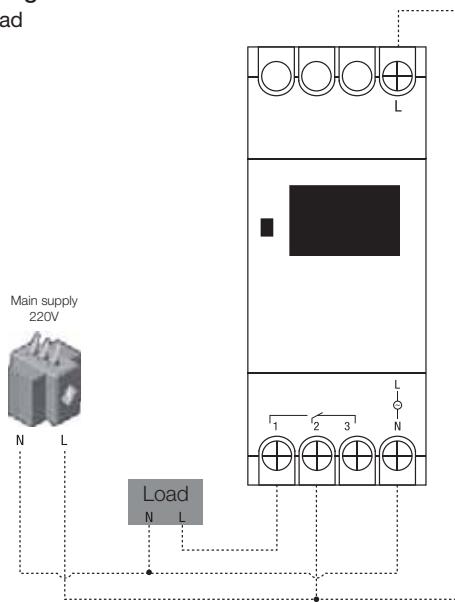
The Digital Weekly Programmable Time Switch can be used in pre – programmed switching of:

- Lighting (car parking, advertising sign boards)
- Heating equipment (Home & work environment, water heating etc.)
- Motors for pumps & fans

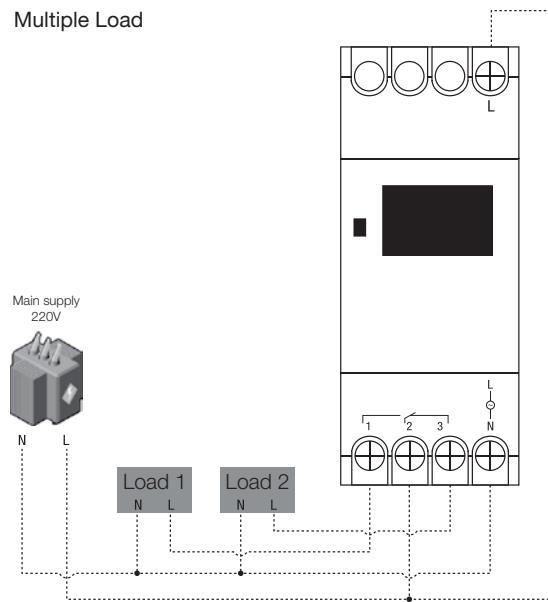


**Wiring Diagram**

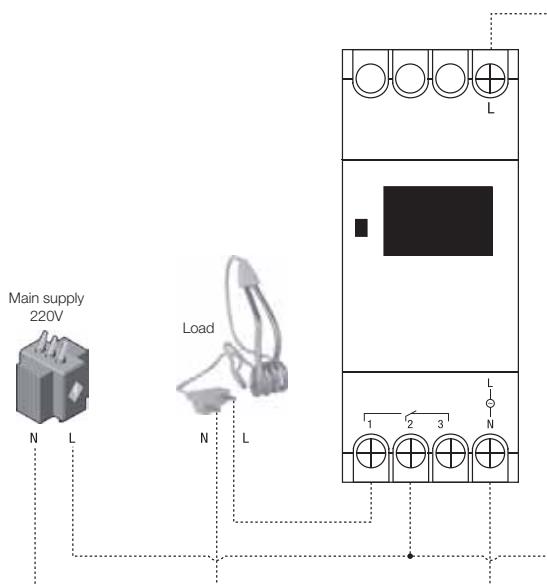
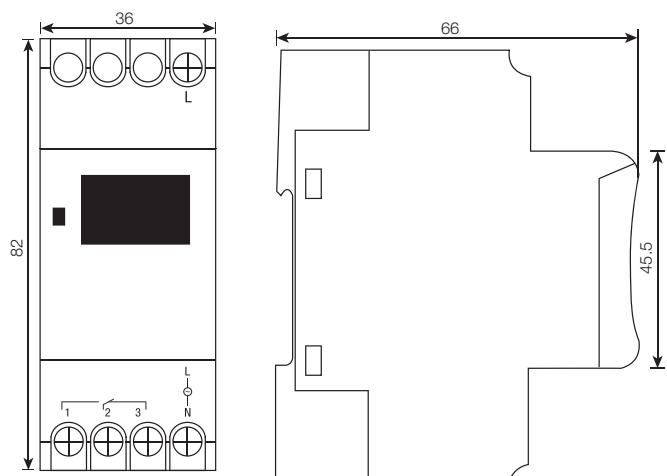
Single Load



Multiple Load

**For example**

Consider an Electric Heater in connection with  
Programmable Time Switch

**Dimensions (in mm)****Time Switch****Digital Weekly Programmable Time Switch**

Description	Cat. No.
Digital Weekly Programmable Time Switch	DHTAW01016

Technical Specification	
Operating Voltage	240 Vac
Rated Frequency	50 Hz
Width	36 mm
Weight	0.125 kg
Installation Type	DIN Rail
Type of Contact	Changeover Contact
Program Functions	ON / OFF
Number of Programming	8 ON / 8 OFF
Power Reserve	48 Hrs
Max. Switching Capacity at 250 VAC, cos = 1	16 A
Max. Switching Capacity at 250 VAC, cos = 0.6	10 A
Incandescent / Halogen Lamps	1000 watt
Shortest Switching Time	1 Min
Mechanical Life	$10^7$
Electrical Life	$10^5$
Time Accuracy	$\leq 2$ s/day
Power Consumption	< 4 VA
Degree of Protection	IP 20
Ambient Temperature	-10 °C to + 40 °C

### Astronomical Weekly Programmable Time Switch

Astronomical Programmable Time Switch automatically adjusts the set time along with seasonal variation. For example it can be programmed such that light is turned on when sun sets & turned off when sun rises.

#### Applications

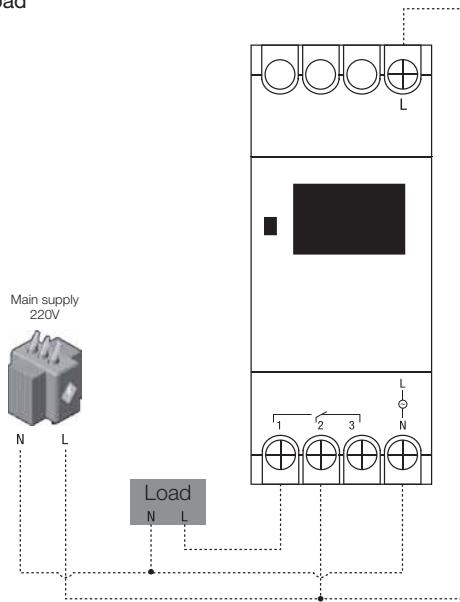
The Astronomical Time Switch is used in controlling:

- Street lights
- Advertising sign boards
- Car parking lights
- Garden lights
- Lights in shop windows

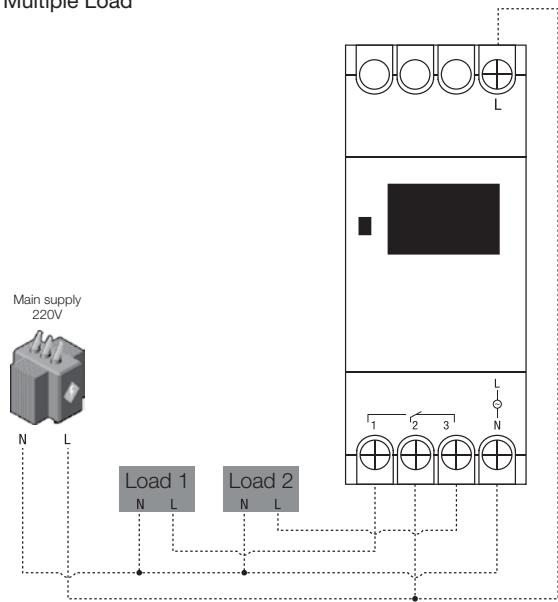


**Wiring Diagram**

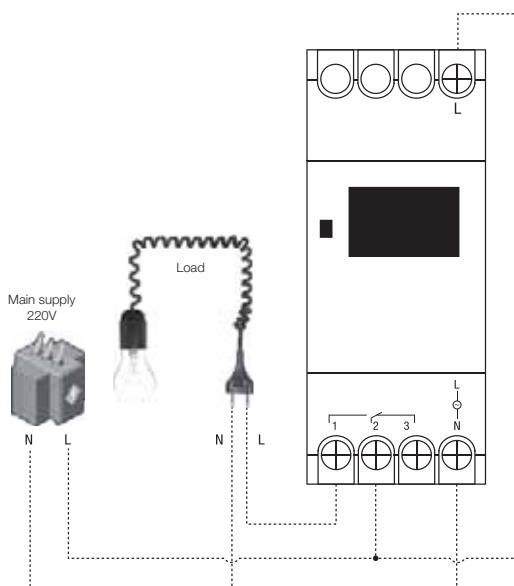
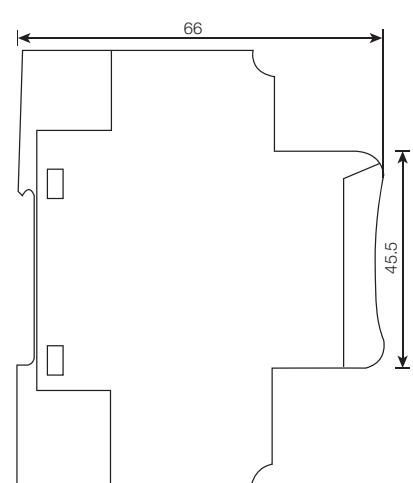
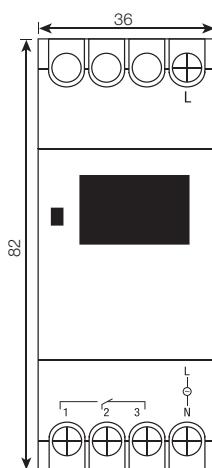
Single Load



Multiple Load

**For example**

Consider an Electric Bulb in connection with  
Astronomical Weekly Programmable Time Switch

**Dimensions (in mm)****Time Switch****Astronomical Weekly Programmable Time Switch**

Description	Cat. No.
Astronomical Weekly Programmable Time Switch	DHTBW01006

Technical Specification	
Operating Voltage	240 Vac
Rated Frequency	50 Hz
Width	17.5 mm
Weight	0.075 kg
Installation Type	DIN Rail
Adjustment Range	0.5 - 20 Min
Type of Contact	NO Contact
Type of Connection	3-4- conductor
Max. Switching Capacity at 250 Vac, cos = 1	16 A
Max. Switching Capacity at 250 Vac, cos = 0.6	10 A
Incandescent / Halogen Lamps	2300 watt
Switch for Permanent Light	Sliding Switch
Degree of Protection	IP 20
Ambient Temperature	-10 °C to + 55 °C

### Staircase Light Time Switch

Staircase Light Time Switch is a variable delay timer to control stairwell lighting. A momentary action push button will initiate its output, which will then 'time out' after a pre - set delay has elapsed.

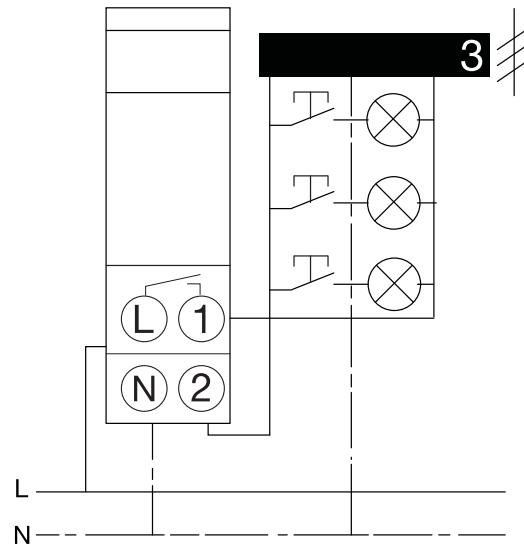
#### Applications:

The Staircase Light Time Switch is specifically used in controlling stairwell lighting in multiplexes, hotels, offices etc. It can also be used as a delay timer, to turn on/off any connected load after a pre-set delay. For example, turn-off motor after 15 minutes automatically.

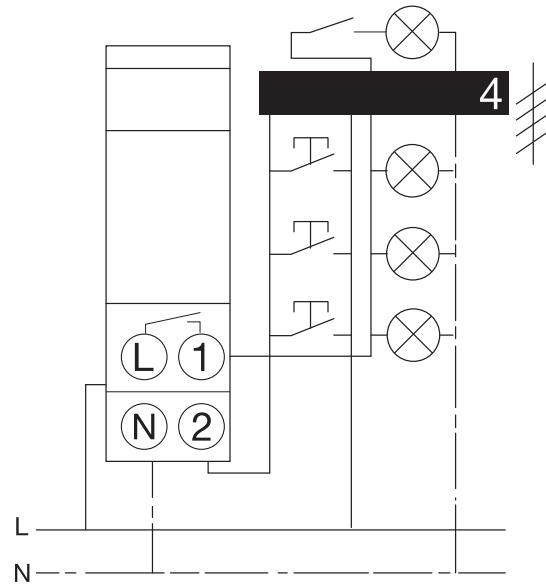


## Wiring Diagram

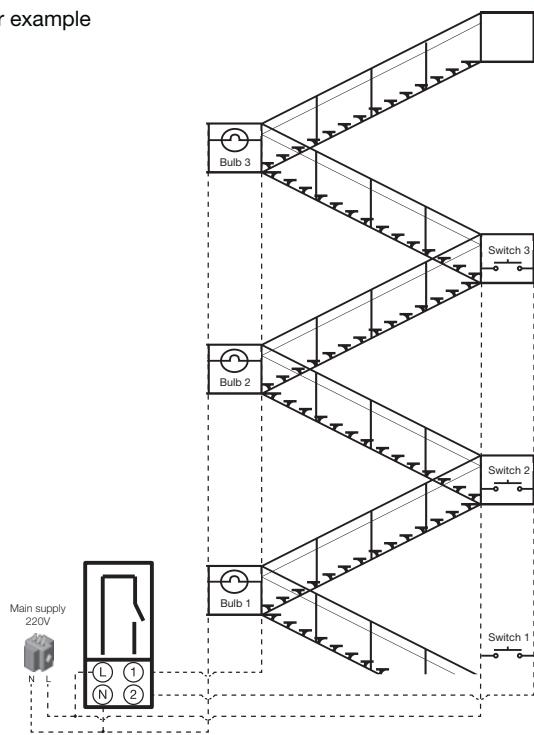
3 Wire Connection



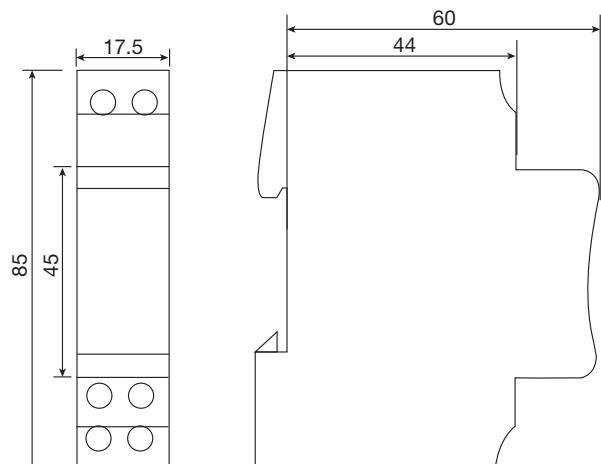
4 Wire Connection



For example



Dimensions (in mm)



Time Switch

## Staircase Light Time Switch

Description	Cat. No.
Staircase Light Time Switch (0.5 - 20 Min)	DHTCNX5016



## MODULAR CONTACTORS



Nowadays there is a growing trend of automation processes in building wiring and installation. Thus there is a need for compact and energy efficient load controlling devices which can be integrated in the existing building infrastructure.

Havells has designed a wide range of Modular Contactors for centralized control and remote switching of electric devices used in buildings such as hotels, hospitals, shopping centers, offices, public buildings, sport centers, domestic applications etc. They are used for remotely controlling electric circuits for lighting, HVAC, pumps and other building automation systems. Modular Contactors are the latest offering in Havells Euro II range of control and protection devices. Available in 16A-63A rating, single pole or multi-pole, automatic and manual versions and having various contact configurations, the range offers a complete package for meeting diverse application needs of modern times.



## ◆ FEATURES & BENEFITS

Homogenous with the entire Havells Modular products.

**Retro Fittable Auxiliary:** Simple, Clip-ON, Toolfree attachment with contactor



**Operating Mode Selection:** Manual contactors have four position selector on front face to choose between: - Automatic operating mode / Temporary “ON” mode / Permanent “ON” mode / Shutdown mode



**Contact Status Indicator:** Quick identification of operating status by mechanical indicator- RED when ON



**Reduced Noise:** Leads to better comfort in building segment applications



Best in class features  
with quality design

## Principle of operation

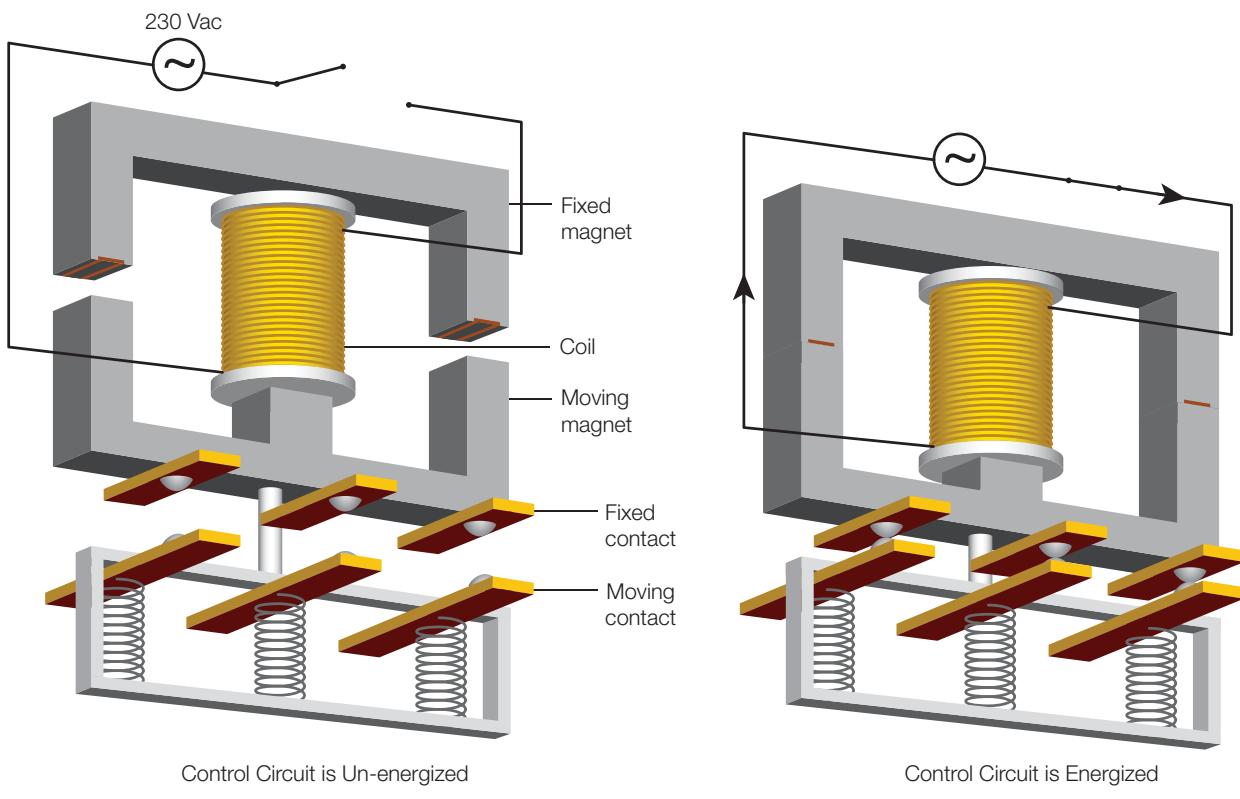
Contactors are electromechanically actuated switches comprising of main circuit and control circuit. They are used to control single or multi-phase high power loads in main circuit, via a very low powered control circuit.

A contactor's **control circuit** basically comprises of electromagnet and coil assembly. There are two E-shaped electromagnets - Fixed Core & Moving Core, and a coil is wound on their central limbs. The **main circuit** basically consists of the contact assembly i.e. fixed contacts and moving contacts. Contactor may be single-pole or multi-pole. Its contacts may be a combination of normally open (NO) and normally closed (NC) type, depending on their natural status when control circuit is un-energized. The **interlinking** between moving core and moving contacts helps in opening or closing of power contacts.

Figure shows, in a simplified manner, the working principle of a three pole contactor with NO type main contacts.

When an energy supply is connected to the coil connections, it draws current, and produces a magnetic field. An upward electromagnetic force acts on the moving magnet, which moves towards the fixed magnet in order to reduce the overall reluctance of flux path. As the moving core's movement is linked to moving contacts, they too come in complete contact with the fixed contacts. This closes the main/power circuit and provides output to the connected load. By interruption of the coil control circuit the movable magnet core and thus also the contact assembly returns to their starting position. Contact spring returns the contacts to their normal state.

Modular contactors belong to the class of air-break switches. If coil power is removed, an arc is created as the contacts open. It is extinguished by separating the contacts by a sufficient distance. Air-break contactors are economic and have lesser maintenance costs in comparison to other classes of contactors (e.g. oil immersed, vacuum etc.).



Working principle of contactor (explained w.r.t. NO contacts)

## Advantage 'Modular'

Modular DIN rail components are devices designed to be used with a standardized mounting rail having dimensions 35 mm x 7.5 mm (EN 50022). Such components are designed for a high degree of safety and finger protection. They are designed using the concept of modular width, and are either a fraction of, or multiples of, a single "module", which is standardized at 18 mm. Their compact construction saves space and increases customer benefits in building segment applications.

Havells modular contactors are the latest addition to our family of din-rail modular devices. In comparison to industrial contactors, they occupy a significantly reduced space. Modular contactors are suited for installation in a variety of day-to-day enclosures - distribution panels, switchboards, distribution boxes, consumer units etc.



## Utilization categories

Contactors are a common electromechanical switching device used in industrial, commercial and residential applications. Utilization category plays an important role in their correct selection. Each category refers to different applications according to the switching conditions delivered by contactor (voltage, current, power factor, in-rush current, switching frequency, etc.)

Utilization categories of contactors as defined in IEC 60947-4-1	
Category	Typical applications
AC-1	Non-inductive or slightly inductive loads, resistance furnaces
AC-2	Slip-ring motors: starting, switching off
AC-3	Squirrel-cage motors: starting, switching off motors during running
AC-4	Squirrel-cage motors: starting, plugging, inching
AC-5a	Switching of electric discharge lamp controls (ballast)
AC-5b	Switching of incandescent lamps
AC-6a	Switching of transformers
AC-6b	Switching of capacitor banks
AC-7a	Slightly inductive loads in household appliances and similar applications
AC-7b	Motor-loads for household applications
AC-8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases
AC-8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases
DC-1	Non-inductive or slightly inductive loads, resistance furnaces
DC-3	Shunt-motors: starting, plugging, inching. Dynamic breaking of d.c. motors
DC-5	Series-motors: starting, plugging, inching. Dynamic breaking of d.c. motors
DC-6	Switching of incandescent lamps

- Plugging means stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.
- Inch (jogging) means energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.
- Both AC-3 and AC-7a category may be used for occasional inching (jogging) or plugging for limited time periods such as machine set-up; during such limited time periods, the number of such operations should not exceed five per minute or more than ten in a 10-min period.

**Modular contactors are compliant to IEC 61095.** (This standard IEC 61095 applies to electromechanical air break contactors for household and similar purposes provided with main contacts intended to be connected to circuits the rated voltage of which does not exceed 440 V a.c. (between phases) and with rated operational currents less than or equal to 63 A for utilization category AC-7a and 32 A for utilization categories AC-7b and AC-7c, and rated conditional short-circuit current less than or equal to 6 kA).

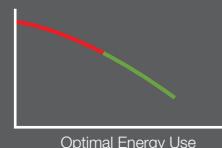
The modular contactor's utilization category **AC-7a is comparable to AC-1**, but the slightly inductive loads find their use in household-like conditions. Their utilization category **AC-7b is comparable to AC-3**, but the motor loads find their use in household-like conditions.



### Building Automation in focus...

As users are becoming more conscious about energy saving and efficiency, electrical installations in modern buildings are being adapted to meet these requirements.

Modular contactors are a step in this direction as they can be easily integrated in building automation systems. Using contactors with multiple-function timers, push-buttons, switches, other centralized management systems etc. can save precious time, resources and energy.



Optimal Energy Use



Greater Savings



Towards Sustainability

**Making & Breaking Capacities**

Switching devices must always be selected based on the loads to be controlled, which differ in regards to making and breaking currents.

Categories	Making and breaking conditions						Reference standard
	$I_c/I_e$	$U_r/U_e$	$\cos \varphi$	On-time (s)	Off-time (s)	Number of operating cycles	
AC-1	1.5	1.05	0.8	0.05 <sup>(7)</sup>	(1)	50	IEC 60947-4-1
AC-2	4.0 <sup>(4)</sup>	1.05	0.65 <sup>(4)</sup>	0.05 <sup>(7)</sup>		50	IEC 60947-4-1
AC-3	8.0	1.05	"0.45 ( $I_e \leq 100A$ ) 0.35 ( $I_e > 100A$ )"	0.05 <sup>(7)</sup>		50	IEC 60947-4-1
AC-4	10	1.05		0.05 <sup>(7)</sup>		50	IEC 60947-4-1
AC-5a	3	1.05	0.45	0.05 <sup>(7)</sup>		50	IEC 60947-4-1
AC-5b	1.5 <sup>(2)</sup>	1.05	(2)	0.05 <sup>(7)</sup>		50	IEC 60947-4-1
AC-6a	(3)						
AC-6b	1.5 <sup>(6)</sup>	1.05		(6)	(6)	50	IEC 60947-4-1
AC-7a	1.5	1.05	0.8	0.05 <sup>(7)</sup>	(1)	50	IEC 61095
AC-7b	8.0	1.05	0.45	0.05 <sup>(7)</sup>		50	IEC 61095
AC-8a	6.0	1.05	"0.45 ( $I_e \leq 100A$ ) 0.35 ( $I_e > 100A$ )"	0.05 <sup>(7)</sup>	(1)	50	IEC 60947-4-1
AC-8b	6.0	1.05		0.05 <sup>(7)</sup>		50	IEC 60947-4-1

**Conventional Operations**

Conventional Operational Performance covers the load test, which shows the circuit behavior under normal use. The contactor must be able to switch on and switch off under agreed conventional conditions and an agreed number of cycles without failure of the device.

Categories	Making and breaking conditions						Reference standard
	$I_c/I_e$	$U_r/U_e$	$\cos \varphi$	On-time (s)	Off-time (s)	Number of operating cycles	
AC-1	1.0	1.05	0.8	0.05 <sup>(7)</sup>	(1)	6000 <sup>(5)</sup>	IEC 60947-4-1
AC-2	2.0	1.05	0.65	0.05 <sup>(7)</sup>		6000 <sup>(5)</sup>	IEC 60947-4-1
AC-3	2.0	1.05	0.45 ( $I_e \leq 100A$ ) 0.35 ( $I_e > 100A$ )	0.05 <sup>(7)</sup>		6000 <sup>(5)</sup>	IEC 60947-4-1
AC-4	6.0	1.05				6000 <sup>(5)</sup>	IEC 60947-4-1
AC-5a	2.0	1.05	0.45	0.05 <sup>(7)</sup>		6000 <sup>(5)</sup>	IEC 60947-4-1
AC-5b	1.0 <sup>(2)</sup>	1.05	(2)	0.05 <sup>(7)</sup>		6000 <sup>(5)</sup>	IEC 60947-4-1
AC-6a	(3)						
AC-6b	1 <sup>(6)</sup>	1.05		(6)	(6)	6000	IEC 60947-4-1
AC-7a	1.0	1.05	0.8	0.05 <sup>(7)</sup>	(1)	30000	IEC 61095
AC-7b	6.0 (making) 1.0 (breaking)	1.0 (making) 0.17 (breaking)	0.45	0.05 <sup>(7)</sup>		30000	IEC 61095
AC-8a	1.0	1.05	0.8	0.05 <sup>(7)</sup>	(1)	30000	IEC 60947-4-1
AC-8b	6.0	1.05	"0.45 ( $I_e \leq 100A$ ) 0.35 ( $I_e > 100A$ )"	1	9	5900	IEC 60947-4-1
				10	<200	100	IEC 60947-4-1

(1) Off time : 10s ( $I_c \leq 100A$ ), 20s ( $100 < I_c \leq 200$ ), 30s ( $200 < I_c \leq 300$ ), 40s ( $300 < I_c \leq 400$ ) ... [Table 8 : IEC 60947-4-1]

(2) Use incandescent load during test

(3) Test with a transformer or derive the rating from the AC-3 values according to Table 9 (IEC 60947-4-1)

(4) The values shown are for stator contactors. For rotor contactors, test with  $I_c/I_e = 4$  and power factor 0.95

(5) For manually operated switching devices, the number of operating cycles shall be 1000 on-load, followed by 5000 off-load

(6) The load shall consist of commercially available capacitor combinations. Refer IEC 60947-4-1 for details.

(7) The time may be less than 50ms, provided that contacts are allowed to become properly seated before reopening.

$I_c$ : current made and broken, expressed in r.m.s. symmetrical values, but it is understood that the actual peak value in the making operation may assume a higher value than the symmetrical peak value.

$I_e$ : rated operational current.

$U_r$ : power frequency recovery voltage.

$U_e$ : rated operational voltage.

$\cos \varphi$ : power factor of the test circuit.

## Applications

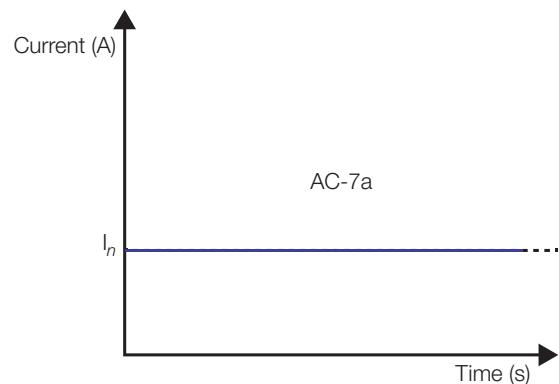
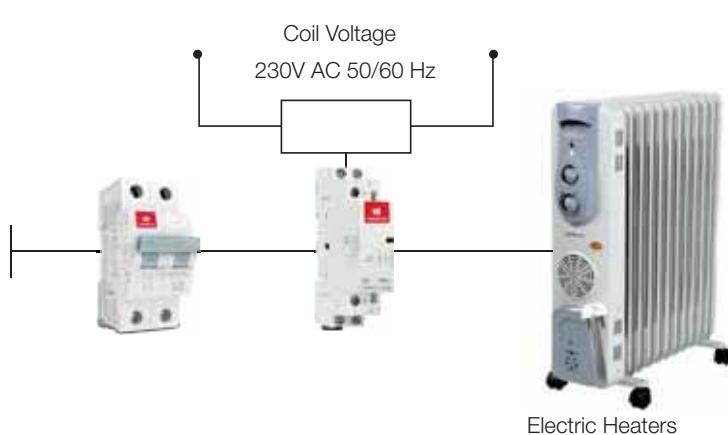
Modular contactors act as an interface between the order giver (e.g. centralized technical management, power utility signal, load-shedding device, push-button, programmable time switch...) and the power circuit for final circuits.

Some typical examples are:

- o Power control of final circuits for housing and the tertiary sector:
  - Lighting (luminous signs, shop windows, safety lighting etc.)
  - Heating, heat pumps, ovens
  - Hot water for domestic use
  - Small utility motors (pumps, fans, barriers, garage doors, roller blinds, mechanical ventilation systems etc.)
  - Air conditioning
- o Energy distribution and control:
  - Load shedding and restoration
  - Source changeover, etc.

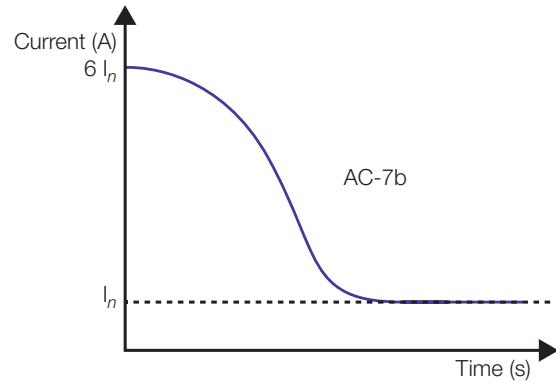
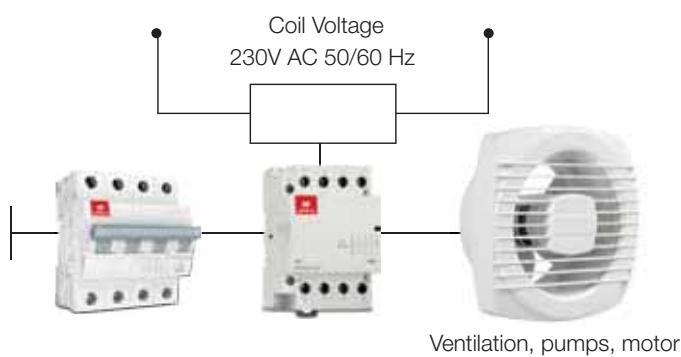
### Resistive/ Slightly inductive loads

Loads such as electric heating, water heaters etc. have starting current virtually the same as operating current. Such loads come under utilization category AC-7A and can be controlled by modular contactors.



## Motor Loads

Motor starting causes high inrush currents that can reach 6 to 8 times the operating current in a time range up to 10s. Such motor loads used in household like conditions come under utilization category AC-7B and can be controlled by modular contactors. Examples are – ventilation, pumps etc.



## Mixed loads

More and more buildings use automatic systems for energy control. For eg., hotel rooms have to be powerless if nobody is inside and the power has to be switched on after entry of people.

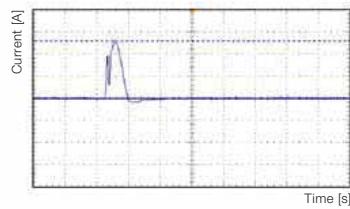
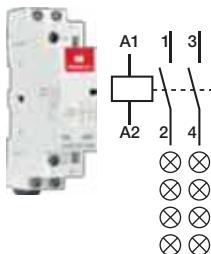
Mixed loads include a variety of different inrush currents. The switching of such mixed loads, typically required for apartments, hotels, shops, ships etc entails that multiple requirements for modular contactors are met. As all loads are centrally controlled in the switch cabinet, the switching devices should be of the same design which is offered by modular contactors. Further, modular contactors also offer the possibility of easy integration into the existing power supply system of a house, because their control circuit is rated for 230V.

Some applications are load shedding circuits and access control with key-cards.

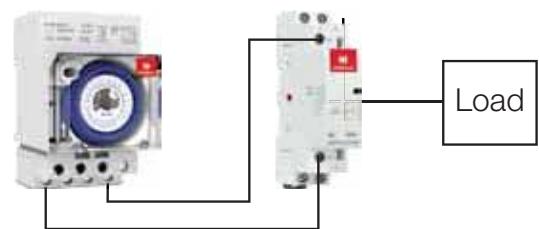


## Lamp loads

Conference rooms, shopping centers and official buildings use a lot of rows of lighting load, which can be controlled by multi-pole contactors to save costs. Lamp loads cause capacitive inrush current peaks that can be a multiple of the operating current. Therefore the right selection of contactor rating is important. Lamp table helps to make selection and planning easier.



Lighting control via contactors



Automatic control via contactor & Time switch

## Automated control with time switches

Modular contactors act as soldiers of time switch when they are applied to follow orders from time switches to control multiple circuits (or channels) of much heavier current appliances. The range of 16A to 63A allows for the reliable control of many different load types (i.e. motors, lighting, or pumps) and levels of loading without affecting the operation or the life expectancy of the Time Switch.

Used for an array of electrical applications in residential/commercial setups, Havells family of Time Switches is a fantastic energy saver. When paired with Modular Contactors, the Time Switches operate with utmost precision.



Automatic garden sprinkling system



## AUTOMATIC MODULAR CONTACTOR

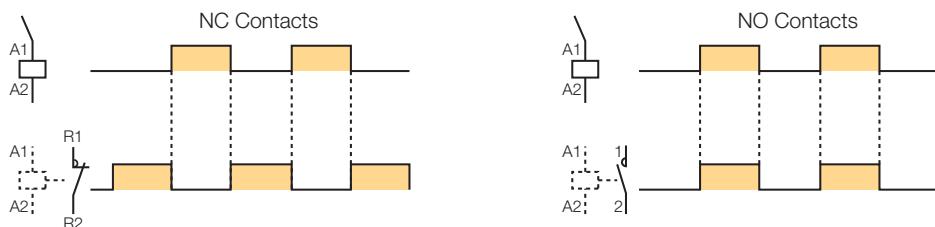


In automatic contactors the switching operation depends solely on the availability of coil supply. When coil supply is provided sufficient electromagnetic force is generated for closing the NO main contacts or opening the NC main contacts. In the absence of coil supply, the contacts revert to their original position.

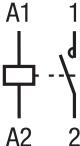
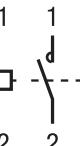
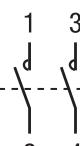
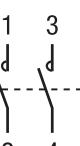
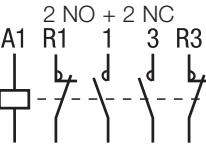
## Technical Specifications

Product		Automatic Contactors			
Rating In	(A)	16	25	40	63
<b>Main contacts</b>					
Standard		IEC/EN 61095	IEC/EN 61095	IEC/EN 61095	IEC/EN 61095
Rated operational voltage Ue	(Vac)	Single phase-250, Three phase-400	Single phase-250, Three phase-400	Single phase-250, Three phase-400	Single phase-250, Three phase-400
Rated operational current Ie (A)	AC-7a	16	25	40	63
	AC-7b	6	8.5	15	20
Electrical endurance		100,000	100,000	100,000	100,000
Switching operations frequency (per day)		100	100	100	100
Rated breaking & making capacity (A)	(AC-7b)	48	68	120	160
Conditional Short Circuit Current (kA)		3	3	3	3
Type of Protection Device		MCB or gG fuse of adequate rating			
Rated duty		Continuous duty			
<b>Control circuit</b>					
Rated Control circuit voltage Uc	(Vac)	230	230	230	230
Rated frequency	(Hz)	50/60	50/60	50/60	50/60
Control circuit voltage limits		0.2...0.75 Uc at <= 50°C drop-out, 0.85...1.1 Uc at <= 50°C operational			
Coil Heat Dissipation (W)	SP, DP	1.2	1.2	1.6	1.6
	TP, FP	-	1.6	2.1	2.1
<b>Environment</b>					
Operating temperature	(°C)	-5...+60	-5...+60	-5...+60	-5...+60
Storage temperature	(°C)	-40...+70	-40...+70	-40...+70	-40...+70
Pollution Degree		2	2	2	2
Degree of Protection		IP-20	IP-20	IP-20	IP-20
<b>Insulation</b>					
Rated insulation voltage	(Vac)	500	500	500	500
Rated impulse withstand voltage	(kV)	4	4	4	4
Dielectric Strength	(kV)	2.5	2.5	2.5	2.5
<b>Terminals</b>					
Tightening Torque (N-m)	Control	0.8	0.8	0.8	0.8
	Power Contacts	0.8	0.8	3.5	3.5
Terminal Capacity (mm <sup>2</sup> )	Control	2 x 2.5 (Flexible), 2 x 1.5 (Rigid)			
	Power Contacts	Flexible	4	16	16
		Rigid	6	25	25

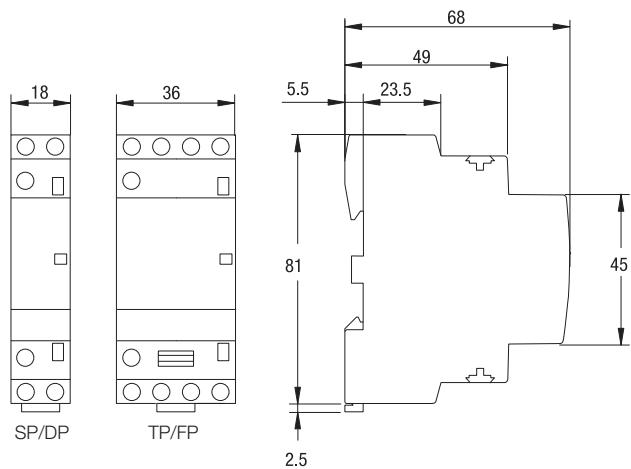
## Operation



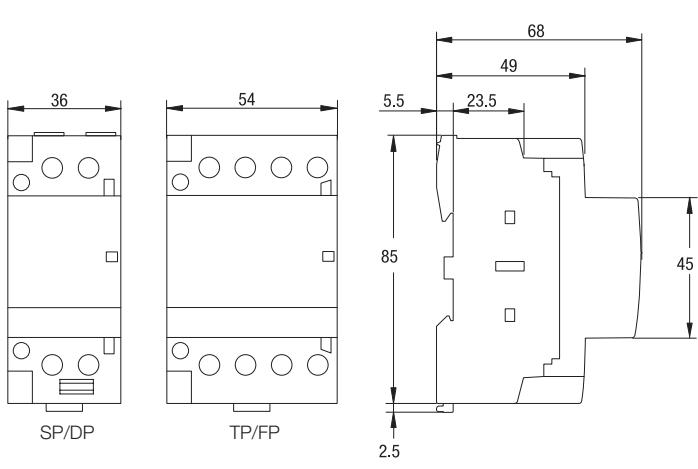
## Ordering Details

Poles	Rating (A) AC-7a	Rating (A) AC-7b	No. of Contacts	Width in Terms of Modular Size (18 mm)	Product Code
1P	25	8.5	1 NO 	1	DHPRG025110M
2P	16	6	2 NO 	1	DHPRF016120M
	25	8.5		1	DHPRF025120M
	40	15		2	DHPRF040220M
	63	20		2	DHPRF063220M
3P	25	8.5	3 NO 	2	DHPRA025230M
	40	15		3	DHPRA040330M
	63	20		3	DHPRA063330M
4P	25	8.5	4 NO 	2	DHPRC025240M
	40	15		3	DHPRC040340M
	63	20		3	DHPRC063340M
4P	63	20	2 NO + 2 NC 	3	DHPRC063322M

## Dimensions (mm)



Automatic Modular Contactor 16/25 A



Automatic Modular Contactor 40/63 A



◆ AUTOMATIC MODULAR  
CONTACTOR WITH  
MANUAL OVERRIDE



Automatic Contactors with manual override knob have a manual over-ride switch to select between three function modes and 4 operating positions.

- **Automatic Mode:** It is the normal operating mode i.e. Contactor is operational (ON) when Coil voltage is applied and vice versa.
- **ON Mode :**
  - Temporary "ON" position: When manual knob is not locked at ON position – the main contacts remain ON as long as coil supply is absent. When coil supply becomes available, the contactor automatically reverts to automatic mode.
  - Permanent "ON" position: Here, the contactor is operational (ON) irrespective of the availability of coil supply.
- **OFF Mode:** Here, the contactor is shutdown irrespective of the availability of coil supply.

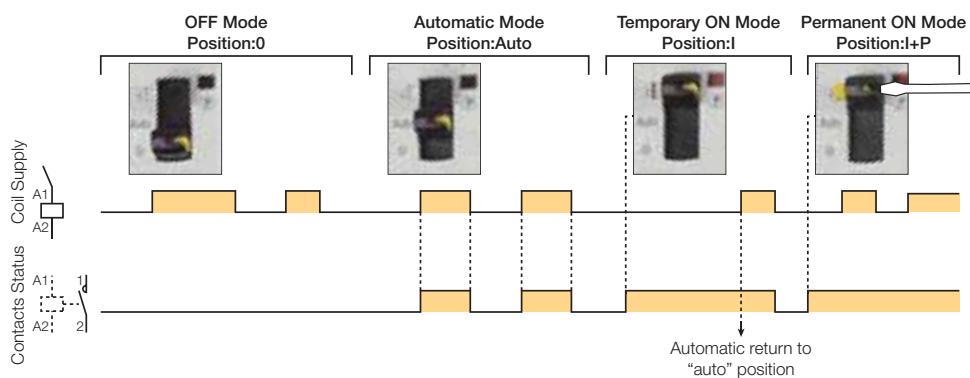
Manual override option provides customers with the following features:

- Functional test prior to start/commissioning
- High degree of safety and availability in case of automation system failure
- Testing or repairs can be carried out safely, reliably and quickly without interrupting other automatic functions.
- Force ON and Force OFF feature allows user to run high energy load during low tariff periods only, thereby over-ruling the normal operation of contactor at all times.

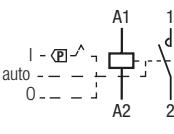
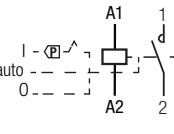
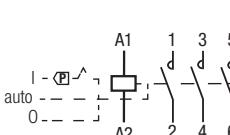
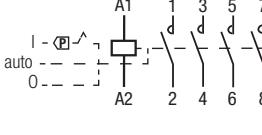
## Technical Specifications

Product		Automatic Contactors with Manual Override			
Rating In	(A)	16	25	40	63
<b>Main contacts</b>					
Standard		IEC/EN 61095	IEC/EN 61095	IEC/EN 61095	IEC/EN 61095
Rated operational voltage Ue	(Vac)	Single phase-250, Three phase-400	Single phase-250, Three phase-400	Single phase-250, Three phase-400	Single phase-250, Three phase-400
Rated operational current Ie (A)	AC-7a	16	25	40	63
	AC-7b	6	8.5	15	20
Electrical endurance		100,000	100,000	100,000	100,000
Switching operations frequency (per day)		100	100	100	100
Rated breaking & making capacity (A) (AC-7b)		48	68	120	160
Conditional Short Circuit Current (kA)		3	3	3	3
Type of Protection Device		MCB or gG fuse of adequate rating			
Rated duty		Continuous duty			
<b>Control circuit</b>					
Rated Control circuit voltage Uc	(Vac)	230	230	230	230
Rated frequency	(Hz)	50/60	50/60	50/60	50/60
Control circuit voltage limits		0.2...0.75 Uc at <= 50°C drop-out, 0.85...1.1 Uc at <= 50°C operational			
Coil Heat Dissipation (W)	SP, DP	1.2	1.2	1.6	1.6
	TP, FP	-	1.6	2.1	2.1
<b>Environment</b>					
Operating temperature	(°C)	-5...+60	-5...+60	-5...+60	-5...+60
Storage temperature	(°C)	-40...+70	-40...+70	-40...+70	-40...+70
Pollution Degree		2	2	2	2
Degree of Protection		IP-20	IP-20	IP-20	IP-20
<b>Insulation</b>					
Rated insulation voltage	(Vac)	500	500	500	500
Rated impulse withstand voltage	(kV)	4	4	4	4
Dielectric Strength	(kV)	2.5	2.5	2.5	2.5
<b>Terminals</b>					
Tightening Torque (N-m)	Control	0.8	0.8	0.8	0.8
	Power Contacts	0.8	0.8	3.5	3.5
Terminal Capacity (mm <sup>2</sup> )	Control	2 x 2.5 (Flexible), 2 x 1.5 (Rigid)			
	Power Contacts	Flexible	4	4	16
		Rigid	6	6	25

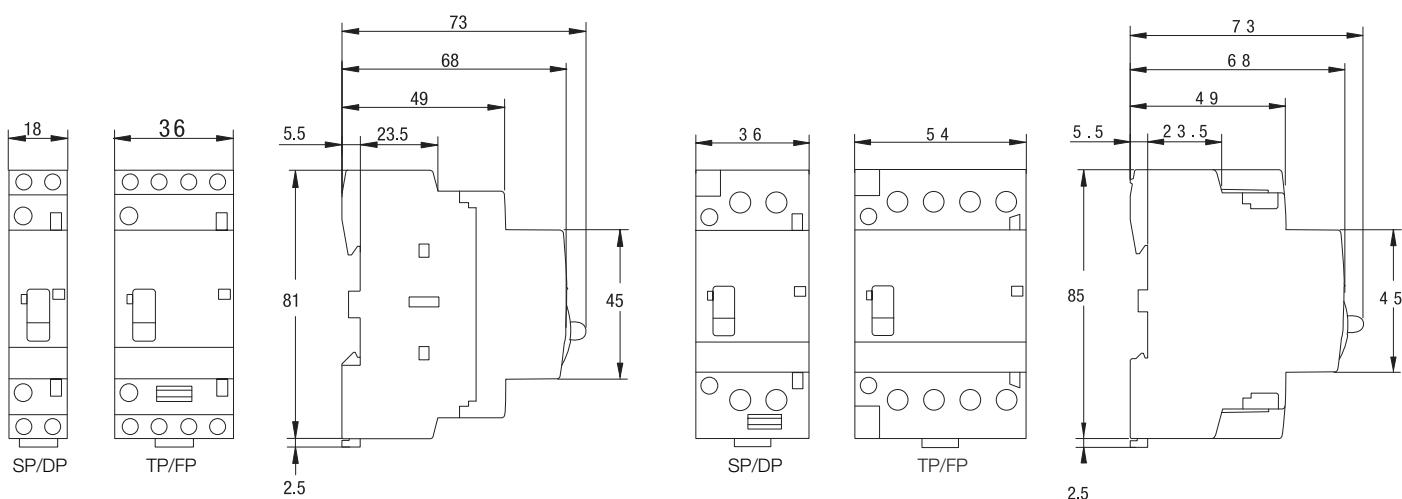
## Operation (Explained w.r.t. NO Configuration)



## Ordering Details

Poles	Rating (A) AC-7a	Rating (A) AC-7b	No. of Contacts	Width in Terms of Modular Size (18mm)	Product Code
1P	25	8.5	1 NO 	1	DHPMG025110M
2P	16	6	2 NO 	1	DHPMF016120M
	25	8.5		1	DHPMF025120M
	40	15		2	DHPMF040220M
	63	20		2	DHPMF063220M
3P	25	8.5	3 NO 	2	DHPMA025230M
	40	15		3	DHPMA040330M
	63	20		3	DHPMA063330M
4P	25	8.5	4 NO 	2	DHPCM025240M
	40	15		3	DHPCM040340M
	63	20		3	DHPCM063340M

## Dimensions (mm)



Automatic + Manual Modular Contactor 16/25 A

Automatic + Manual Modular Contactor 40/63 A

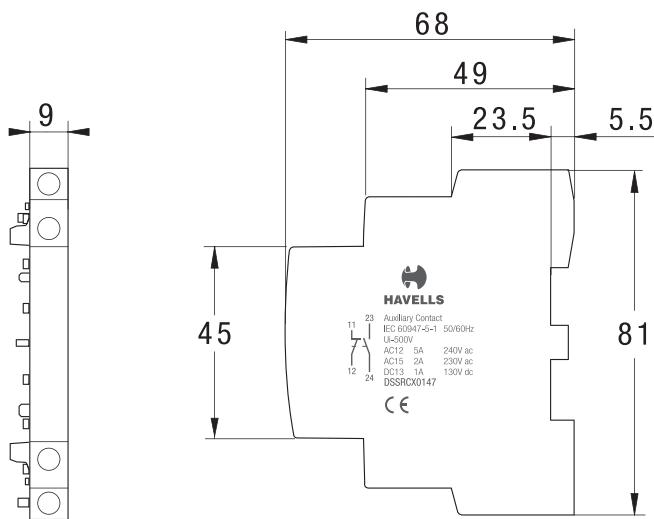
## Auxiliary Contact

This Auxiliary allows indication of the "OPEN" or "CLOSED" position of the contactor power contacts. Auxiliary changeover contacts i.e. 1NO / 1NC version is available which can be fitted on the right side of the device without needing any tools.

## Technical Specification

Type	Indication
Standard Compliance	IEC 60947-5-1
Contacts Configuration	1NO+1NC
Mounting	On the right side of the contactor
Control Voltage	AC-12-240V, AC-15-230V, DC-13-130V
Operating Frequency	50/60Hz
Contacts (Breaking capacities)	5A at 240V AC, COS $\Phi$ =1, 2A at 230 V, COS $\Phi$ =1, 1A at 130V,DC
Operating Temperature	-5° to 50°C
Storage Temperature	-40° to 70°C
Insulation Voltage	500V
Terminal Capacity	2.5 mm <sup>2</sup>
Product Code	DSSRCX0147

## Dimensions (mm)



### Attachment

Fasten the auxiliary contact by slightly pressing it in place.



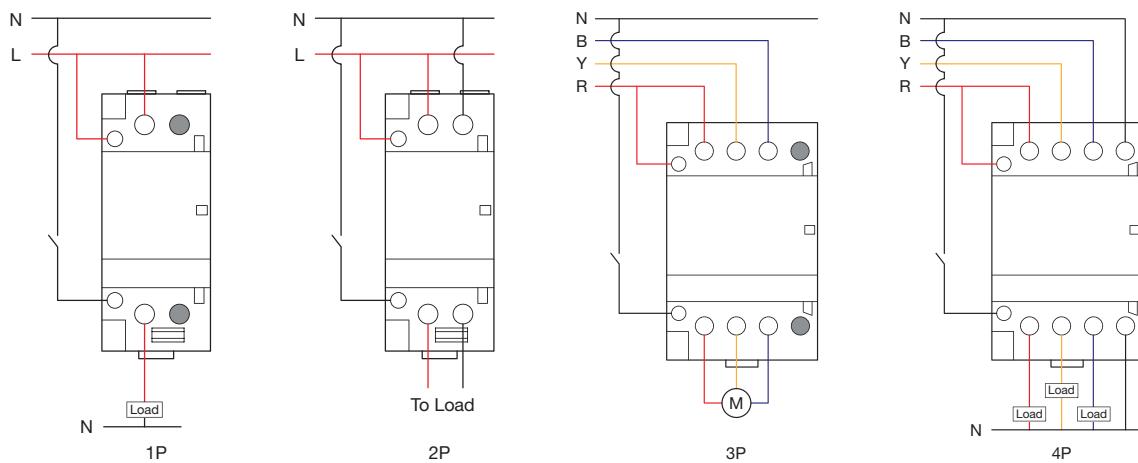
### Removal

Release the catch using a screwdriver.

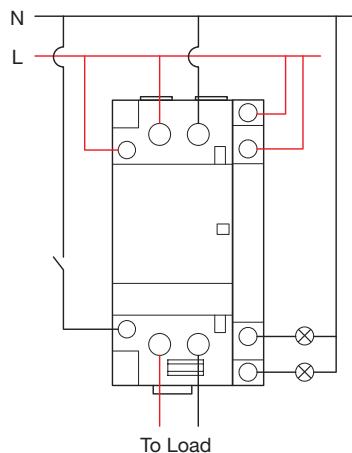


## Circuit Diagram

### Modular Contactors



### Contactor with auxiliary contact



### Example

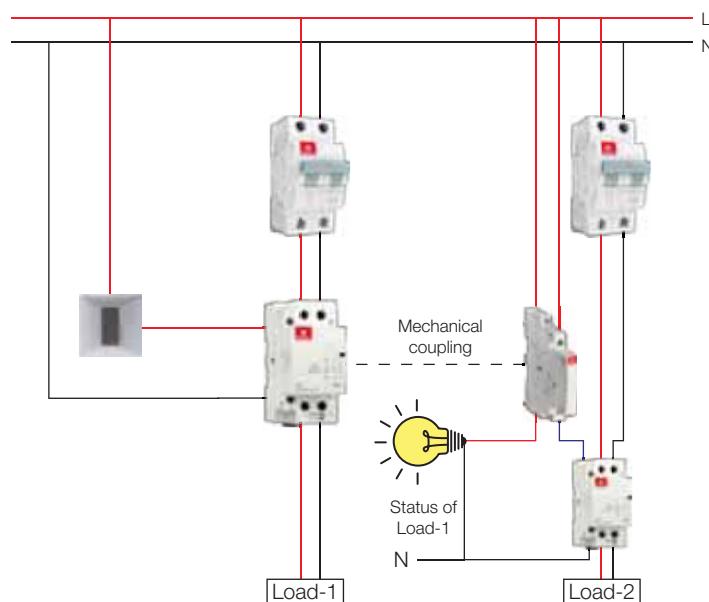


Figure shows the application of modular contactor with auxiliary contact: 1NO + 1NC contact of auxiliary can be used for remote monitoring of contactor's status and control of alternate loads.

## Modular Contactors Choice Table

Heating Application: Contactors rating to be chosen according to the power to be controlled and the number of operations a day.

Number of Operations/ day	Maximum power for a given rating (kW)			
<b>250V Rated Voltage</b>				
	<b>16 A</b>	<b>25 A</b>	<b>40 A</b>	<b>63 A</b>
25	3.4	5.4	8.6	14
50	3.4	5.4	8.6	14
75	2.9	4.6	7.3	12
100	2.7	4	6	9.5
<b>400V Rated Voltage</b>				
	<b>10.5</b>	<b>16</b>	<b>26</b>	<b>41</b>
25	10.5	16	26	41
50	8.9	14	22	35
75	6.7	11	17	26

Small Motor Application: Contactor rating to be chosen according to the power to be controlled.

Load and Rated Voltage	Maximum power for a given rating (kW)			
	<b>16A</b>	<b>25 A</b>	<b>40 A</b>	<b>63 A</b>
250V Asynchronous single-phase motor	0.95	1.4	2.5	4
400V Asynchronous three-phase motor	2.7	4	7.5	15
250V Universal motor	0.6	0.9	1.4	2.2

## Lighting Application

- Modern Lighting system generate a high inrush current. Therefore, It is recommended to use the following choice table to calculate maximum lamp load that can be connected per current path on 230V, 50Hz Circuits.
- The table below shows the permissible number of lamps for each contactor considering the type, power and configuration of a given lamp.
- In case a 4 pole-contactor is used (3 Ph+N), the below mentioned quantity of lamps need to be multiplied by 1.73 to obtain maximum number of lamps for the contactor. The obtained quantity has to be divided by 3 to evaluate maximum lamps per pole.

Type of lamp	Lamp Load and Power Factor Correction capacitance	Permissible number of Lamp fittings for a single phase 230V, 50Hz Circuit and Acceptable Power per circuit.			
		<b>16A</b>	<b>25A</b>	<b>40A</b>	<b>63A</b>

### Compact Fluorescent lamps(CFLs)

CFL with external electronic ballast		<b>1120W-1400W</b>	<b>1750W-2190W</b>	<b>3640W-4300W</b>	<b>5250W</b>
	5W	210	330	670	1025
	7W	150	222	478	750
	9W	122	194	383	583
	11W	104	163	327	477
	18W	66	105	213	291
	26W	50	76	153	202
CFL with integrated electronic ballast		<b>800W-900W</b>	<b>1150W-1300W</b>	<b>2400W-2675W</b>	<b>3940W-4000W</b>
	5W	160	230	470	710
	7W	114	164	335	514
	9W	94	133	266	411
	11W	78	109	222	340
	18W	48	69	138	213
	26W	34	55	100	151

**Incandescent lamps**

		1600W-2050W	2300W-2900W	4600W-5200W	6900W-7500W
Tungsten halogen lamps 230V	40W	38	57	115	172
	60W	30	45	85	125
	75W	25	38	70	100
	100W	19	28	50	73
	150W	12	18	35	50
	200W	10	14	26	37
		<b>2100W</b>	<b>3000W</b>	<b>6000W</b>	<b>8000W</b>
	300W	7	10	18	25
	500W	4	6	10	15
	1000W	2	3	6	8
Halogen ELV(12 OR 24V) with electronic transformer		<b>1350W-1730W</b>	<b>1800W-2250W</b>	<b>3650W-4250W</b>	<b>5500W-6000W</b>
	20W	67	97	196	297
	25W	27	42	82	123
	75W	22	30	57	84
	100W	17	24	45	64.8
Halogen ELV(12 OR 24V) with Ferromagnetic Transforemer		<b>300W-600W</b>	<b>450W-900W</b>	<b>850W-1950W</b>	<b>1250W-2850W</b>
	20W	5	23	42	63
	25W	10	15	27	42
	75W	8	12	23	35
	100W	6	8	18	27

**Fluorescent Tubes**

		350W-870W	490W-1295W	1130W-2500W	1500W-3800W
Single tube without parallel compensation	15W	22	30	70	100
	18W	22	30	70	100
	20W	22	30	70	100
	36W	20	28	60	90
	40W	20	28	60	90
	58W	13	17	35	56
	65W	13	17	35	56
	80W	10	15	30	48
	115W	7	10	20	32
Single tube with parallel compensation		<b>200W-800W</b>	<b>325W-1290W</b>	<b>650W-2500W</b>	<b>970W-3550W</b>
	15W,5µF	15	20	40	60
	18W,5µF	15	20	40	60
	20W,5µF	15	20	40	60
	36W,5µF	15	20	40	60
	40W,5µF	15	20	40	60
	58W,7µF	10	15	30	43
	65W,7µF	10	15	30	43
	80W,7µF	10	15	30	43
Single tube with electronic ballast	115W,7µF	5	7	14	20
		<b>1300W-1400W</b>	<b>2000W-2200W</b>	<b>4000W-4400W</b>	<b>6000W-6600W</b>
	18	74	111	222	333
	36	38	58	117	176
	58	25	37	74	111

## MODULAR CONTACTOR

Double tube with electronic ballast		1300W-1400W	2000W-2200W	4000W-4400W	6000W-6600W
	2x18	29	59	120	180
	2x36	22	32	64	97
	2x58	13	20	41	62
<b>LEDs</b>					
Double tube with electronic ballast LED 230 V without driver, Not dimmable		120W-520W	170W-760W	300W-1360W	500W-1880W
		24	34	61	100
	7W	22	32	57	94
	9W	22	32	57	94
	12W	22	32	57	94
	18W	21	30	54	77
	22W	20	28	51	67
	30W	16	23	42	53
	40W	13	19	34	47
LED 230V integrated driver, Dimmable		215W-800W	320W-1200W	575W-2080W	1440W-2100W
	5W	46	64	115	180
	7W	46	64	115	180
	9W	4	5	10	176
	12W	44	61	110	176
	18W	34	48	87	145
	22W	30	42	76	119
	30W	25	35	64	64
	40W	20	29	52	82
<b>Discharge lamps</b>					
High pressure Sodium lamp /Metal Iodide lamps with ferromagnetic ballast		600W	850W-1200W	1450W-2000W	2250W-3200W
	35W	16	24	42	64
	70W	8	12	20	32
	150W	4	7	13	18
	250W	2	4	8	11
	400W	1	3	5	8
High pressure Sodium lamp /Metal Iodide lamps, ferromagnetic ballast with parallel compensation.		1000W	1	2	3
		450W-1000W	650W-2000W	1100W-4000W	1750W-6000W
	35W,6mF	12	18	31	50
	70W,12µF	6	9	16	25
	150W,20µF	4	6	10	15
	250W,32µF	3	4	7	10
	400W,45µF	2	3	5	7
High pressure Sodium lamp /Metal Iodide lamps with electronic ballast		1000W,60µF	1	2	3
		830W-1400W	1350W-2200W	2400W-4000W	3600W-6000W
	35W	23	38	68	102
	70W	17	29	51	76
	150W	8	14	26	40

		750W-1000W	1000W-1600W	1700W-2800W	2650W-4200W
High pressure Mercury Vapour lamp with Ferromagnetic Ballast	50W	15	20	34	53
	80W	10	15	27	40
	125W	8	10	20	28
	250W	4	6	10	15
	400W	2	4	6	10
	700W	1	2	4	6
High pressure Mercury Vapour lamp with Ferromagnetic Ballast and parallel compensation.		500W-1400W	750W-1600W	1400W-3500W	2150W-5000W
	50W,7µF	10	15	28	43
	80W,8µF	9	13	25	38
	125W,10µF	9	10	20	30
	250W,18µF	4	6	11	17
	400W,40µF	3	4	8	12
	700W,60µF	2	2	5	7
Low pressure Sodium Vapour lamp		270W-360W	320W-720W	500W-1100W	850W-1800W
	35W	5	9	14	24
	55W	5	9	14	24
	90W	3	6	9	19
	135W	2	4	6	10
	180W	2	4	6	10
Low pressure Sodium Vapour lamp with parallel compensation		100W-180W	175W-360W	350W-720W	550W-1100W
	35W,20µF	3	5	10	15
	55W,20µF	3	5	10	15
	90W,25µF	2	4	8	11
	135W,40µF	1	2	5	7
	180W,45µF	1	2	4	6

The given information is entirely indicative, Considerable variations may occur depending on the electrical installation and equipments used. It is recommended that the implementation or configuration of the circuits must be done by experienced professionals with the expertise to determine the characteristics of the electrical installation (General characteristics of installations, In rush Current duration and value, Load etc). The manufacturer accepts no liability for the use made of this information.

## INDICATORS LIGHTS

Havells Indicator Light is a new addition to the product range and can be used in both building and industrial installations. Indicator lights are designed for signaling the incoming supply.

### Applications

- Distribution Box • Three Phase Tier DB • Kiosks • Load Line DB
- Meter Boxes • Testing Panels • Switch Boards • MIMIC Panels
- Control panels

### Features

- Modular Design enables Indicator Lamp replacement with lens of different varieties Very simple installation and easy to replace
- Easy mounting on DIN rail 35 X 7.5 mm long life & durable

### Color

Red, Amber, Blue, Green & Clear

### Execution

Single Pole (1P)

### Specification

IS / IEC 60947- 5-1



### Technical Specification

Standard Conformity	IS / IEC 60947-5-1	IS / IEC 60947-5-1
Contacts	Rated Operation Voltage	240 V~
	Rating Electrical Power	1.2 watt
	Frequency	50 Hz
	Type of Lamp Socket	E - 10 Thread
	Terminal Capacity	10 mm <sup>2</sup>
Light Indication	Color	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
	Light	Permanent
	Source	Neon Lamp
Other Data	Mounting on DIN Rail	35 mm x 7.5 mm
	Degree of Protection	IP 20
	Ambient Temperature	-5° to 55°C

## Indicator Light



**Indicator Light**  
(In accordance with IS/IEC 60947-5-1) 240V~, 50 Hz

Colour	Pack Qty.	TP Cat. No.
Red	12	DHMCYSPX000
Amber	12	DHMCXSPX000



**Indicator Light**  
(In accordance with IS/IEC 60947-5-1) 240V~, 50 Hz

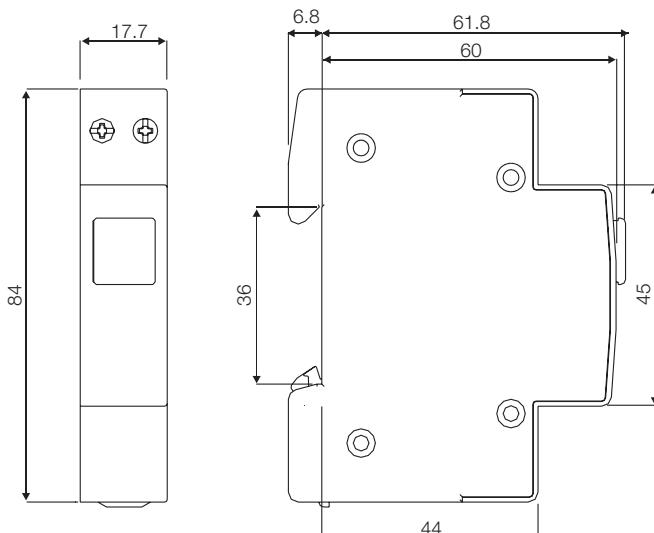
Colour	Pack Qty.	TP Cat. No.
Blue	12	DHMCVSPX000
Green	12	DHMCZSPX000
Clear	12	DHMCWSPX000



**Indicator Light (Colour cap)**  
Indicator Light - Spares

Colour	Pack Qty.	TP Cat. No.
Red	1	DCELDMCL001
Amber	1	DCELDMCL001
Blue	1	DCELDMCL001
Green	1	DCELDMCL001
Clear	1	DCELDMCL001

## Dimensions (in mm)



## Easy To Replace Spares



- The whole module
- Color Cap
- Old Lamp



## Photovoltaic Systems in Focus

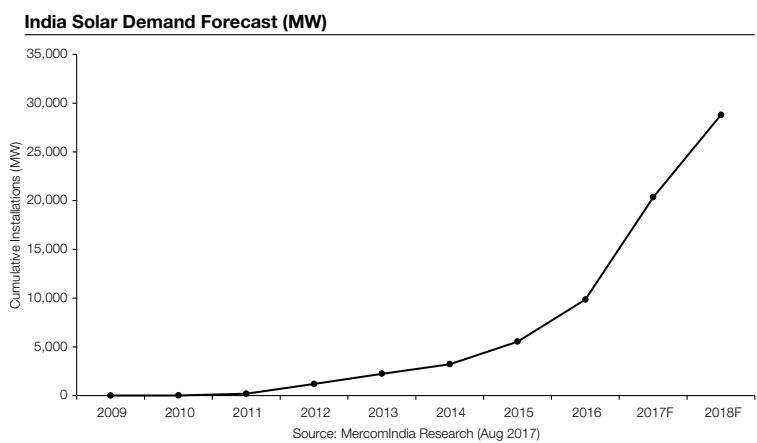


Solar energy is growing at a fast pace in India. And it will continue to do so in coming years across all its different applications - be it residential, commercial, or power plants.

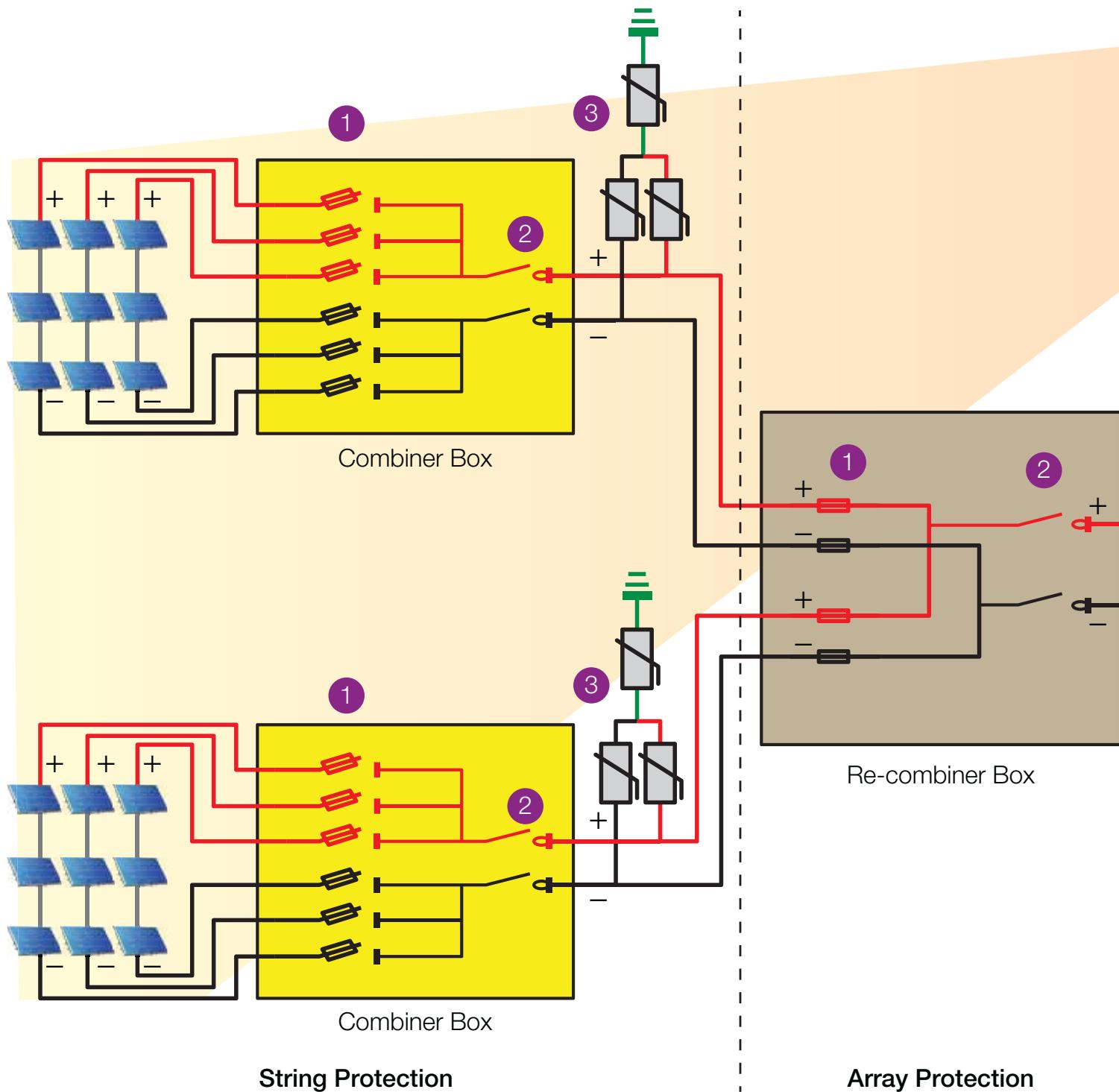
Driving this growth is the ever-improving performance of photovoltaic (PV) systems which now guarantee economic soundness as well as profitability. Further it is a prime source of clean energy that helps reduce carbon footprint and build environmental sustainability. Assembled in solar modules and arrays, PV cells are silent, combustion-free, and emit no pollution. Absence of moving parts means they require little maintenance over their long life spans. Another attractive feature of PV systems is their versatility and convenience. They can be used in standalone applications and installed in places that are difficult and uneconomical to supply with traditional power lines. They can be installed virtually anywhere; on the ground, on flat or pitched roofs or attached to the sides of buildings.

The Indian government has also taken aggressive, long term stance for the promotion of PV electricity generation through a number of regional and national incentives and rebate plans.

However, for it to be considered a good investment, a photovoltaic system must be able to function efficiently for at least 20 years in all weather conditions and under blazing sun. This has challenged the system designers, manufacturers and standard organizations due to special conditions associated with PV system. These requirements have also been considered in the development of international protection standards for PV installations, which Havells, a leading name in electrical industry, has used to develop PV specific switchgear devices.



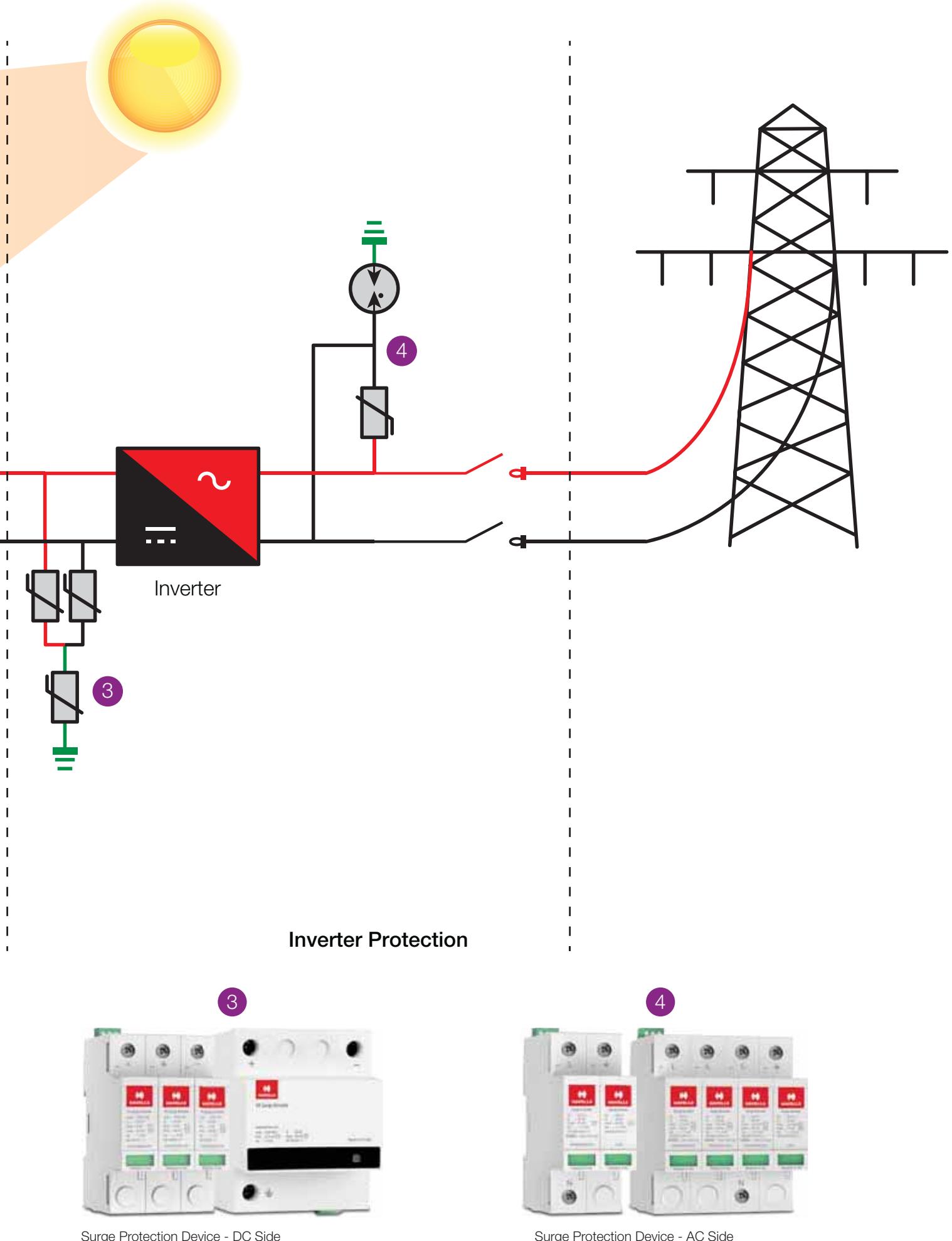
## Photovoltaic Powered Distribution Network



String Protection

Array Protection







◆ Photovoltaic Fuse Link  
& Fuse Disconnector

Havells gPV fuse range is dedicated to the protection of photovoltaic modules, strings or arrays and their connecting cables from reverse over-current and short-circuits and help minimize safety hazards. The PV fuse-link and fuse-disconnector will isolate the faulted PV string so the balance of the PV system can continue to generate electricity.

Today PV systems are growing in size, so have the corresponding voltage requirements. This increase in system voltage has typically been intended to minimize power loss associated with long conductor runs. Havells Photovoltaic devices are TUV tested to safely interrupt faulted circuits upto the demanding voltage level of 1000 Vdc and 40 kA short circuit faults.

#### Benefits

- Protects the modules and their connecting cables in the event of reverse currents
- Safely trips in case of fault current and reduce the risk of fire due to DC electric arcs
- Safely isolate the system when the fuse disconnector is open

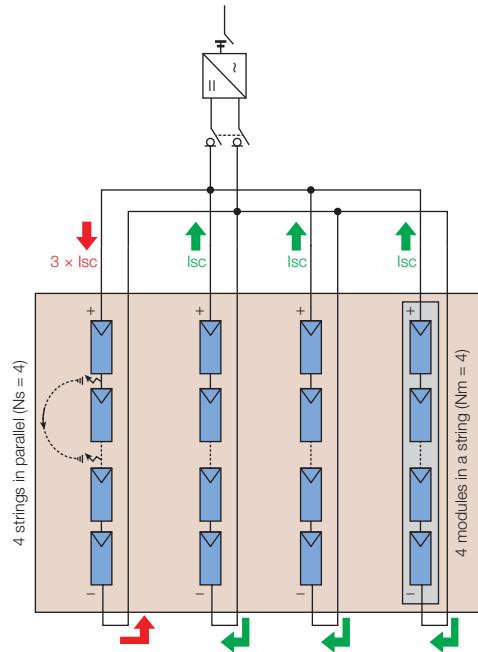


## Over-Current Faults in PV System

Unlike with other power sources, short-circuiting of the load would not result in dangerous over-currents in a PV system. Over-currents may, however, result from short-circuit faults in modules, junction boxes and module wiring or from earth faults in array wiring. Though PV modules are current-limited sources, they can be subjected to reverse over-currents supplied by either multiple parallel PV strings or from external sources (e.g. batteries) or both.

Figure shows a short-circuit fault in a PV module which causes reverse current to flow in that string. This occurs as the open-circuit voltage of faulted string is significantly lower than the open voltage of other parallel strings connected to the same inverter. The current flows from the healthy strings to the faulty one instead of flowing to the inverter and supplying power to the downstream load.

The effects of reverse currents may range from permanent damage of PV modules and reduced efficiency to broken conductors resulting in dangerous temperature rises, electric arcing and fire. PV module withstand capability is therefore tested in accordance with IEC 61730-2 standard and the PV module manufacturers provide the maximum reverse current value ( $I_{mod\_reverse}$ ). PV modules are tested at a value equal to:  $135\% \times I_{mod\_reverse}$  for 2 hours: the module has to withstand this condition. It may also be specified in module specification sheet as the maximum series fuse rating.

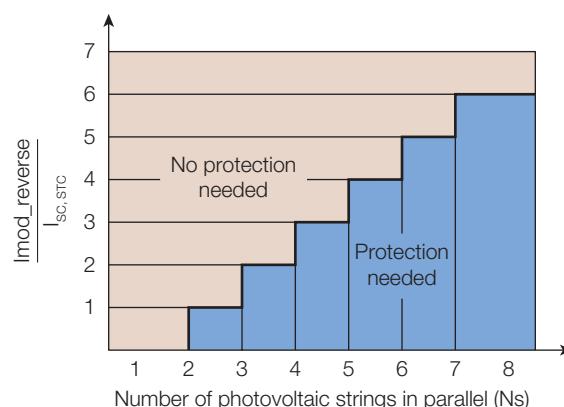


$$\text{Reverse current in the faulty string} = \text{Total current of the remaining strings} = (N_s - 1) * I_{sc}$$

- There is no risk of reverse current when there is only one string.
- When there are two strings with same number of PV modules connected in parallel, the reverse current will be always lower than the maximum permissible reverse current.

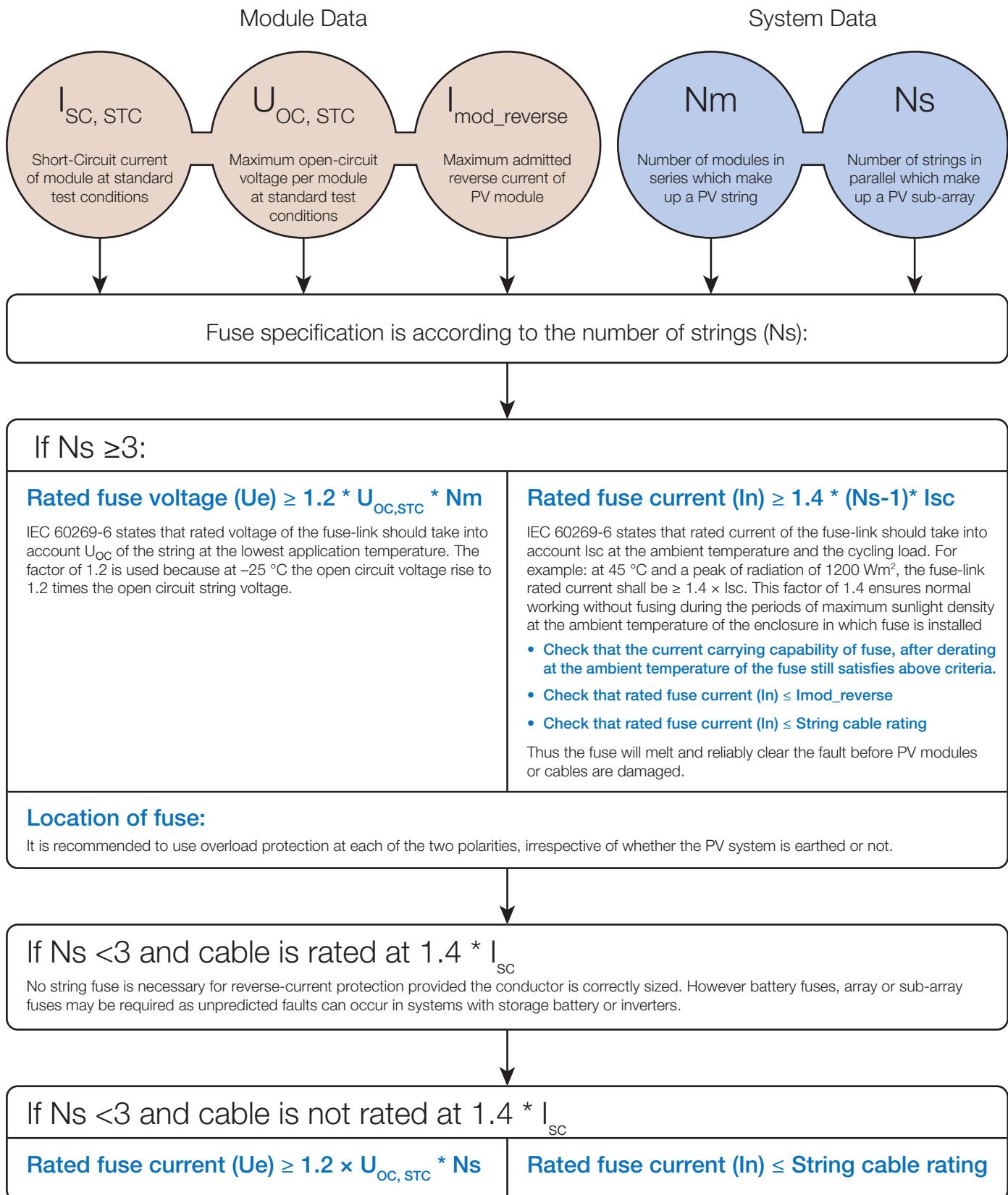
In both these cases there is no need for reverse current protection.

$$\text{Maximum number of strings that can be connected in parallel without string fuse protection} = 1 + \frac{I_{mod\_reverse}}{I_{sc, STC}}$$



Following section seeks to provide a thumb rule for selection of fuse rating.

## Fuse Rating Selection



**Note:** The same calculation has to be applied for selecting gPV fuses at the recombination level or at the input of the inverter.

## Photovoltaic Fuse Link

Havells offers PV cylindrical fuses of size 10.3 mm x 38 mm and rated current from 2-30A, a special space-saving solution for protection of photovoltaic strings.

### Applications

- PV string/array level protection
- In-line PV module protection
- Inverters
- Combiner/ Re-combiner boxes
- Battery charge controllers



### Features

- High Breaking Capacity: for faults upto 40kA
- High reliability: No downgrading of fuse characteristics over time.
- The energy released whilst eliminating the fault (fuse blowing) is contained within the cartridge (no degassing).
- Product dedicated to PV installations: Operating ranges adjusted for small over-currents specific to PV installations.
- Durable construction for enhanced system longevity
- Temperature cycle withstand capability

### Standard Compliance

- IEC 60269-6 : 2010
- TUV Tested and approved
- CE marked

### IEC 60269-6: Special operational class of gPV Fuses

Unlike typical AC systems, protection of PV strings poses unusual challenges due to high DC rated voltages, low load and low fault currents with the exception of capacitor discharge from the inverter or batteries which have a high peak and rate of rise. Normally the fault currents are only fractionally higher than system currents and the elimination of such low level overloads is a very challenging task for the fuse. Also current output varies rapidly depending on the irradiance incident on the modules during the day time and shading by cloud cover. PV fuses should not age in such situations in order to ensure high plant availability throughout the service life of the PV system. They must also be able to withstand high temperature fluctuations without damage. All this led to the development of gPV fuse-link ranges dedicated for photovoltaic string, sub array and array protection under such onerous conditions.

IEC 60269-6 Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems, standardizes the performance and dimensions of fuse-links specifically designed to protect these new applications. IEC stipulates a minimum rated breaking capacity of 10 kA. Havells fuse-links are tested to qualify IEC 60269-6 and also meet high breaking capacity of 40kA for effective protection.



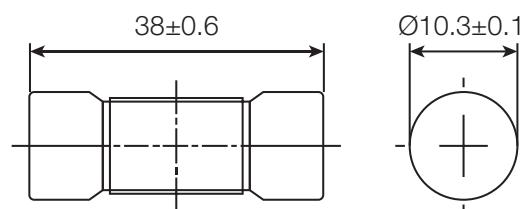
Commonly used symbol for PV fuses - it is a combination of PV string & fuse symbol.



## Technical Specification

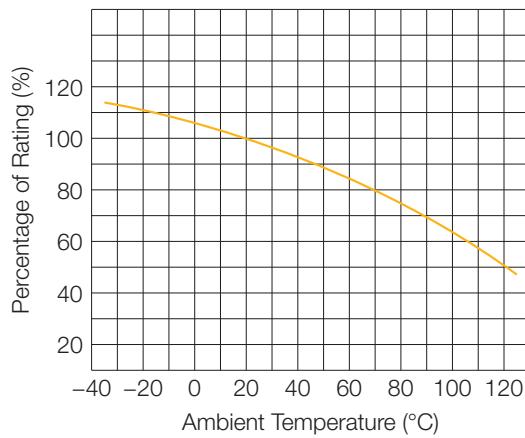
Rated Voltage	V(dc)	1000
Rated Current (In)	A	2,3,4,5,6,8,10,12,15,20,25,30
Standard		IEC 60269-6 : 2010
Max. Interrupting Rating	kA	40
Dimensions	mm	ø10.3 x 38
Class of operation		gPV (Photovoltaic fuses)
Power Dissipation	W	≤ 4.5W at 0.7 In, ≤ 6.5W at In

### Dimensions (mm)



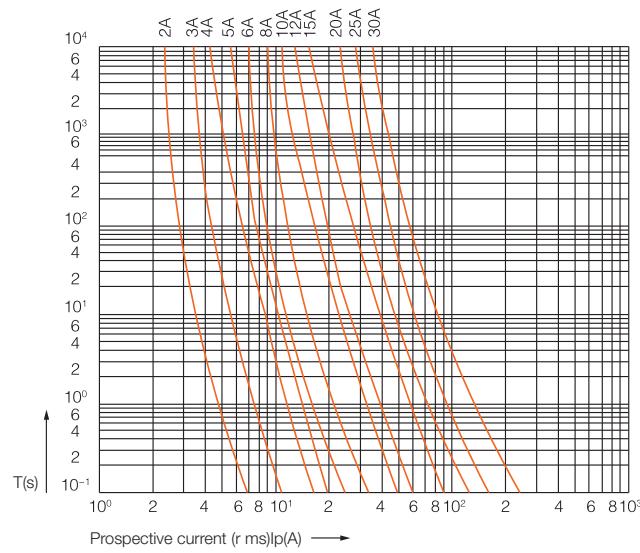
## Ambient Temperature Compensation

PV module's output changes with the module temperature and also the amount of sun it is exposed to. The exposure is dependent on irradiance level, incline as well as shading effect from trees, buildings or clouds. Fuse links being thermal devices, they are influenced by ambient temperature. The current capability of the PV fuse links should be derated according to the curve shown:



## Time-Current Characteristics

Conventional Non-fusing current ( $I_{nf}$ )	$1.13 * I_n$	Test current at which the fuse must not trip for one hour
Conventional fusing current ( $I_f$ )	$1.45 * I_n$	Test current at which the fuse must trip within one hour



## Ordering Details

S. No.	Rated Current (A)	Ordering Code	Pack Qty
1	2	DHHRHP0002	10
2	3	DHHRHP0003	10
3	4	DHHRHP0004	10
4	5	DHHRHP0005	10
5	6	DHHRHP0006	10
6	8	DHHRHP0008	10
7	10	DHHRHP0010	10
8	12	DHHRHP0012	10
9	15	DHHRHP0015	10
10	20	DHHRHP0020	10
11	25	DHHRHP0025	10
12	30	DHHRHP0030	10

## Photovoltaic Fuse-Disconnect

Havells offers Photovoltaic Fuse Disconnector for safe disconnection and protection of solar systems, from small installations to large PV farms. It is not designed for load break but is ideal for isolating photovoltaic module strings for maintenance. It has been designed for up to 1000 V direct current voltage with DC-PV0 utilization category. It is suitable to house cylindrical gPV 10.3 x 38 mm fuse up to 30A.

### Standard Conformity

- IEC 60947-3:2008, Amd. 1:2012, Amd. 2:2015 in conjunction with IEC 60947-1:2007, Amd. 1:2010, Amd. 2:2014
- TUV Tested and Certified
- CE Marked

### High Short-Circuit withstand rating – 40kA



No fuse pullers or tools required for fuse removal.

Venting grooves allow **better heat dissipation** which reduces operating temperature inside fuse-holders and ensures durability and reliability of the device over time.

Local **fuse tripping signal** is available via an indicator light which turns ON when fuse is blown (open circuit).

All plastic parts are made of material **resistant to extremely high temperatures**. Glow wire 960 °C for insulating material that is retaining current carrying parts and 650 °C otherwise.



**Safety terminals** guide the cable towards cage terminal, ensuring proper error-free connections.



**Bi-stable din-clip** for easy mounting on a 35mm Din rail & convenient removal.



**Complete protection against touch** according to IP20.

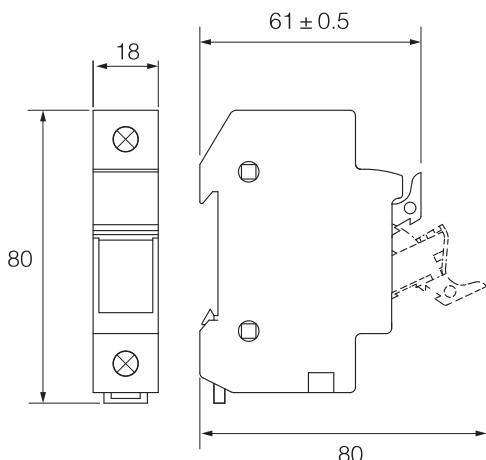


**Convenient opening.**

## Technical Specification

Reference standard	IEC 60947-3:2008, AMD1:2012, AMD2:2015	
Rated operational voltage $U_e$ (Vdc)		1000
Rated insulation voltage $U_i$ (Vdc)		1000
Rated impulse withstand voltage $U_{imp}$ (kV)		8
Rated operational current $I_e$ (A)		30
Utilization Category	DC-PV0	
Suitable for Isolation	Yes	
Load break disconnect	No	
Fuse rating (A)		$\leq 30$
Rated conditional short-circuit current (kA)		40
Conventional free air thermal current $I_{th}$ (A)		30
Kind of protective device	gPV fuse-link, ø10.3*38mm	
Blown fuse indicator operating voltage (Vdc)		50-1000
Rated power acceptance (W)		$\leq 6.5$
Degree of protection	IP-20	
Working Temperature (°C)		-5 to +40
Pollution degree	3	
Altitude above sea (m)		$\leq 2000$
Mounting	35mm DIN Rail	
Tightening torque (Nm)		2
Terminal Capacity (sq. mm)		1 - 16

## Dimensions (mm)



## Ordering Details

Rating	Poles	Blown fuse indicator	Product Code	Pack Qty
30A	1P	No	DHFCSN301K	10
30A	1P	Yes	DHFDSN301K	10



## ◆ SURGE PROTECTION DEVICES

Photovoltaic systems are often located in isolated and exposed locations and generally have a large surface area. Thus the threat of lightning is quite common. The risk is multiple: direct effect (lightning strike on the panels) and indirect (surge on cells, solar chargers, inverters), or on other lines (data communication). Lightning surges and switching operations or power line faults in the upstream power supply system must also be taken into account.

The most noticeable effects from discharges are catastrophic damage with visible carbonization of system components. Less noticeable are the effects on the electrical system caused by the long term exposure to repeated high transient voltages. These transients may cause premature failure of modules and inverters, resulting in substantial repair and/or replacement costs, as well as lost generation revenue. While solar systems will always remain in highly exposed environments, protection against over-voltage surges can help ensure a long operational life.

SPDs installed at key locations will protect major components such as inverters, arrays, equipment in combiner boxes, measurement and control equipment, instrumentation systems, and communications systems from being affected by lightning induced current surges. These devices have an added benefit of protecting against utility generated transients. **Surge protection should be applied to both the AC and DC sides of the inverter**, as well as on applicable control and communication circuits.

#### Features:

- Visual as well as Remote end-of-life indicators.
- Cartridge's connection with base is secure & foolproof. Cartridge's mechanically loded for correct fitment with base.
- Simple, Professional Installation of Arrester Modules
- High Terminal Capacity - 35sqm for Ease of Installation.
- Bi-stable Snap-pusher for Easy Installation and Extraction from DIN-rail.
- TUV Tested and approved. CE compliant.

#### Range

DC SPD's

Type 1+2

Type 2

AC SPD's

Type 1+2

Type 2

Dataline SPD

6, 12, 24, 48 V



█ Satisfactory operation  
█ Cartridge must be replaced

#### Remote Signaling Contact

- Option to remotely monitor the status of the surge protector; get a signal when cartridge has reached end of life.
- Simplified cabling thanks to a single terminal for monitoring all poles.

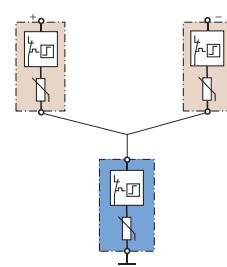


#### Pluggable Cartridges

- Faulty cartridges can be replaced without changing the entire SPD.
- All cartridges are marked with characteristics for ease of maintenance.

#### End of Life Indicator

Local Indication on Cartridge: Green shows satisfactory operation and Red indicates that Cartridge must be replaced.



#### Y-configuration for better protection

PV SPDs have a series connection of two MOVs between all potentials. Even in extreme cases, when one of the varistor fails, the flow of current can reliably continue through the second without being interrupted, thus ensuring maximum safety.

## Surge Protection in Photovoltaic Installations

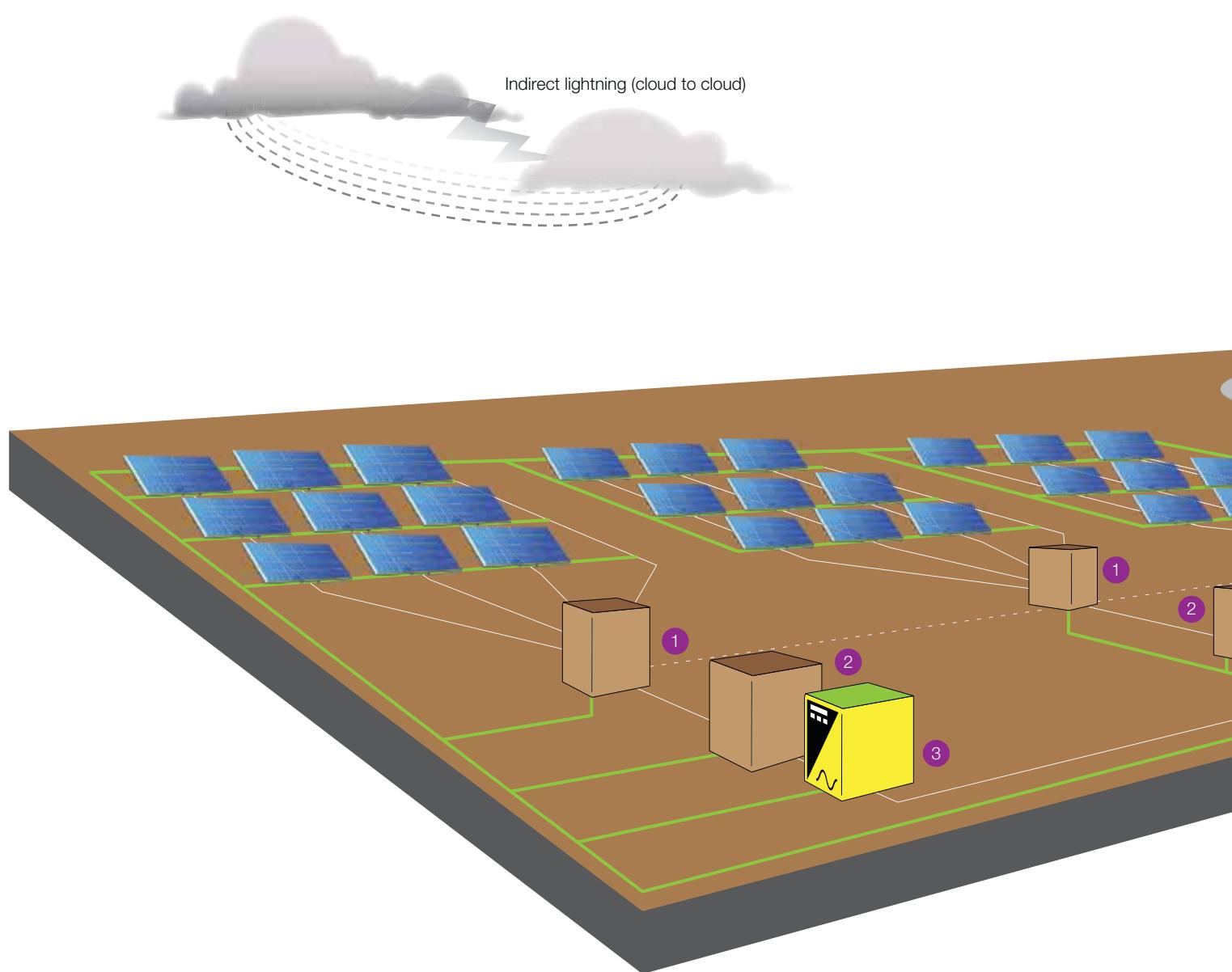
The appropriate SPD selection to protect PV installation verity is dependent on whether the PV array is protected by an external Lightning protection system (LPS), and if so, whether the minimum separation distance (IEC 62305-3) between the LPS and the metallic parts of the PV array has been kept.

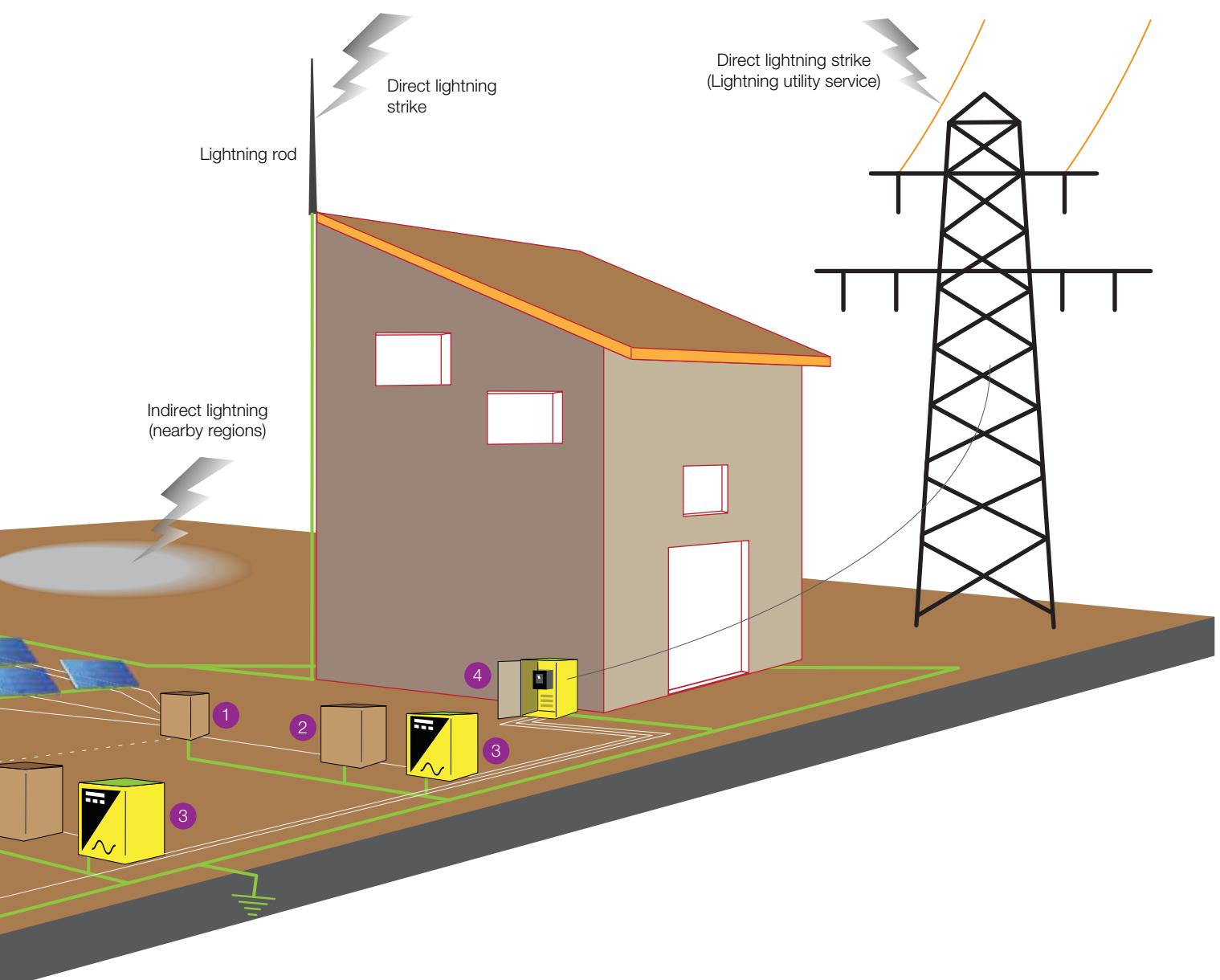
	DC Side		AC Side	
Location	1 Field Combiner Box	2 Re-combiner Box (DC side of inverter)	3 AC Box (AC side of inverter)	4 Main LV switch board (Delivery point)
Protection function	SPD protects panels and strings from atmospheric surges	SPD protects inverter from atmospheric surges	SPD protects inverter from atmospheric surges and grid-generated surges	SPD protects the AC side of electrical installation from atmospheric surges and grid-generated surges
SPD Requirement	Required if $L_{DC} < 10m$	Always required	Required if $L_{AC} < 10m$	Always required
Type of SPD	Use Type 1+2 SPD if separation distance according to IEC 62305 is not observed. Else use Type 2 SPD.		Type 2 SPD	Type 1+2 SPD if there is risk of direct lightning strike on the system (e.g. installations with lightning rods/ mains overhead line). Else use Type 2 SPD.

$L_{DC}$  = Distance between solar panels and inverter

$L_{AC}$  = Distance between inverter and mains LV Switch-board

Note: To be efficient, SPD connection cables to the upstream network and between the SPD's earth terminal block and ground bus-bar must be as short as possible.





## Type 1+2 Photovoltaic Surge Protection Devices

The Type 1+2 PV SPD range allows the DC side of each PV installation i.e. arrays and inverters, to be effectively protected against over voltages, both due to direct lightning strikes (10/350  $\mu$ s discharge current wave) as well as indirect lightning strike and switching surges (8/20  $\mu$ s discharge current wave).



### Range

Type 1+2 Photovoltaic Surge Protection Devices

### Specification

EN 50539-11: 2013

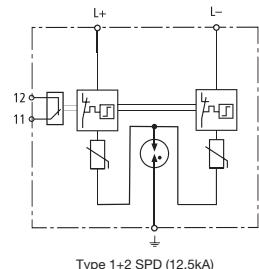
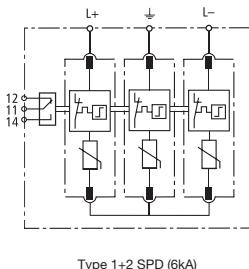
### Features

- Tested and Approved by TUV.
- High operating voltages 1200Vdc.
- High Discharge Current:  
I<sub>max</sub> 60 kA for 4-module SPD (I<sub>imp</sub> 12.5 kA)  
I<sub>max</sub> 40 kA for 3-module SPD (I<sub>imp</sub> 6 kA)
- Remote signalling contact allows alarm report of cartridge failure to a supervision station.
- "Y" type circuit for a better protection.
- Both common & differential mode of protection

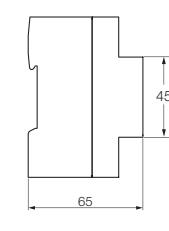
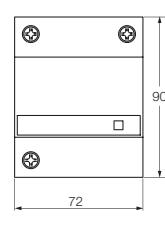
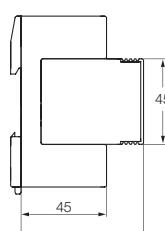
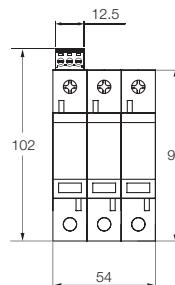
### Technical Specification

	Type 1+2 (12.5 kA)	Type 1+2 (6 kA)
Standard Compliance	EN 50539-11	EN 50539-11
Type	Type 1+2	Type 1+2
Max Continuous Operating DC Voltage U <sub>cpv</sub>	1200 Vdc	1200 Vdc
Lightning Impulse (10/350 microsecond) I <sub>imp</sub>	12.5 kA	6 kA
Nominal Discharge Current (8/20 microsecond) I <sub>n</sub>	20 kA	20 kA
Max Discharge Current (8/20 microsecond) I <sub>max</sub>	60 kA	40 kA
Voltage Protection Level Up	<4 kV	<4 kV
Short Circuit Current with Stand I <sub>scpv</sub>	1000 A	1000 A
Leakage Current	<100 $\mu$ A	<100 $\mu$ A
Response Time	<25 ns	<25 ns
Operating State/Fault Indication	Green/No Light	Green/Red
Thermal Disconnector	Internal	Internal
Fuses	Without	Without
Operating Temperature Range	-40°C - 80°C	-40°C - 80°C
Cross-section Area	4-35 sq mm	4-35 sq mm
For Mounting on	35 mm Din Rail	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0	Thermoplastic UL94-V0
Degree of protection	IP20	IP20
Mode of Protection	I <sub>PE</sub> residual current	I <sub>cpv</sub>

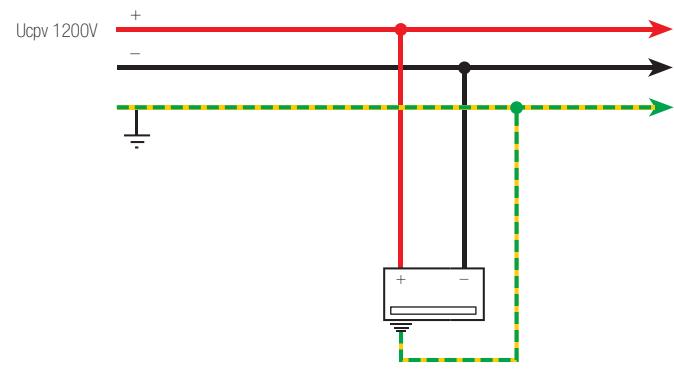
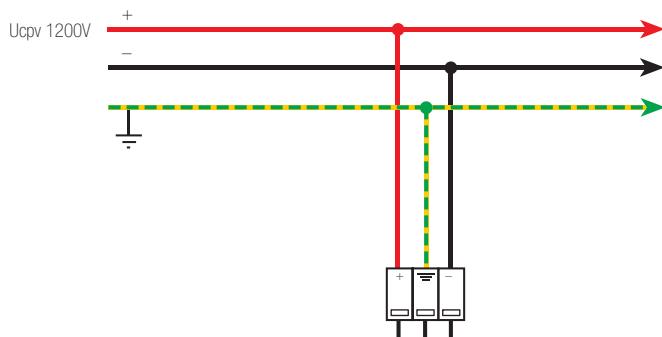
## Circuit Diagram:



## Dimensions:



## Connections:



Type 1+2 Photovoltaic Surge Protection Device (lmp 12.5 kA)

Order Code	Ucpv (V)	In (kA)	lmp (kA)	Imax (kA)	Up (kV)	Remote Signaling
DHSDANCC6012H	1200 Vdc	20	12.5	60	4	No
DHSDARCC6012H	1200 Vdc	20	12.5	60	4	Yes



Type 1+2 Photovoltaic Surge Protection Device (lmp 6 kA)

Order Code	Ucpv (V)	In (kA)	lmp (kA)	Imax (kA)	Up (kV)	Remote Signaling
DHSDANCB4012H	1200 Vdc	20	6	40	4	No
DHSDARCB4012H	1200 Vdc	20	6	40	4	Yes

## Cartridges

Order Code	Pole	Ucpv (V)	In (kA)	lmp (kA)	Imax (kA)	Up (kV)
DSSRCX0154	-	1200 Vdc	20	6	40	4

## Type 2 Photovoltaic Surge Protection Devices

The Type 2 PV SPD range allows the DC side of each PV installation to be effectively protected against over voltages due to indirect lightning strikes and switching surges (8/20  $\mu$ s discharge current wave).



### Range

Type 2 Photovoltaic Surge Protection Devices

### Specification

EN 50539-11: 2013

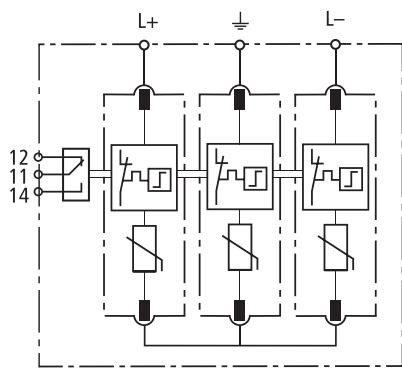
### Features

- Tested and Approved by TUV.
- High operating voltages 1200 Vdc
- Remote signalling contact allows alarm report of cartridge failure to a supervision station.
- High Discharge Current: Maximum discharge current 40 kA.
- Both Common and Differential Mode Protection.
- Remote Monitoring Option.

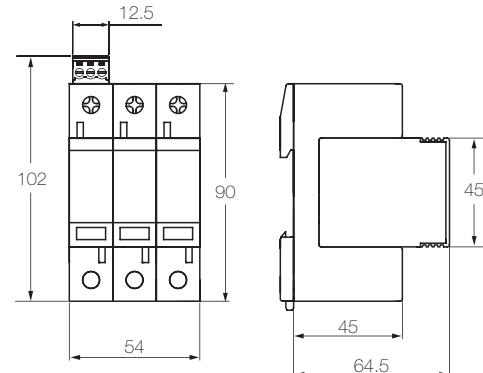
### Technical Specification

Standard Compliance	EN 50539-11
Type	Type 2
Max Continuous Operating DC Voltage Ucpv	1200 Vdc
Nominal Discharge Current (8/20 microsecond) In	20 kA
Max Discharge Current (8/20 microsecond) Imax	40 kA
Voltage Protection Level Up	<4 kV
Short Circuit Current Withstand Iscpv	1000 A
Leakage Current	<100 $\mu$ A
Response Time	<25 ns
Operating Temperature Range	-40°C - 80°C
Humidity	5-95%
Installation	Indoor
Thermal Disconnector	Internal
Fuses	Without
Operating State/Fault Indication	Green/Red
Cross-section Area	4-35 sq mm
For Mounting on	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0
Degree of protection	IP20

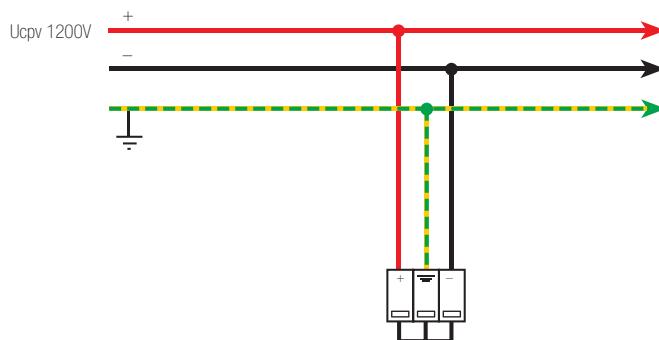
## Circuit Diagram:



## Dimensions:



## Connections:

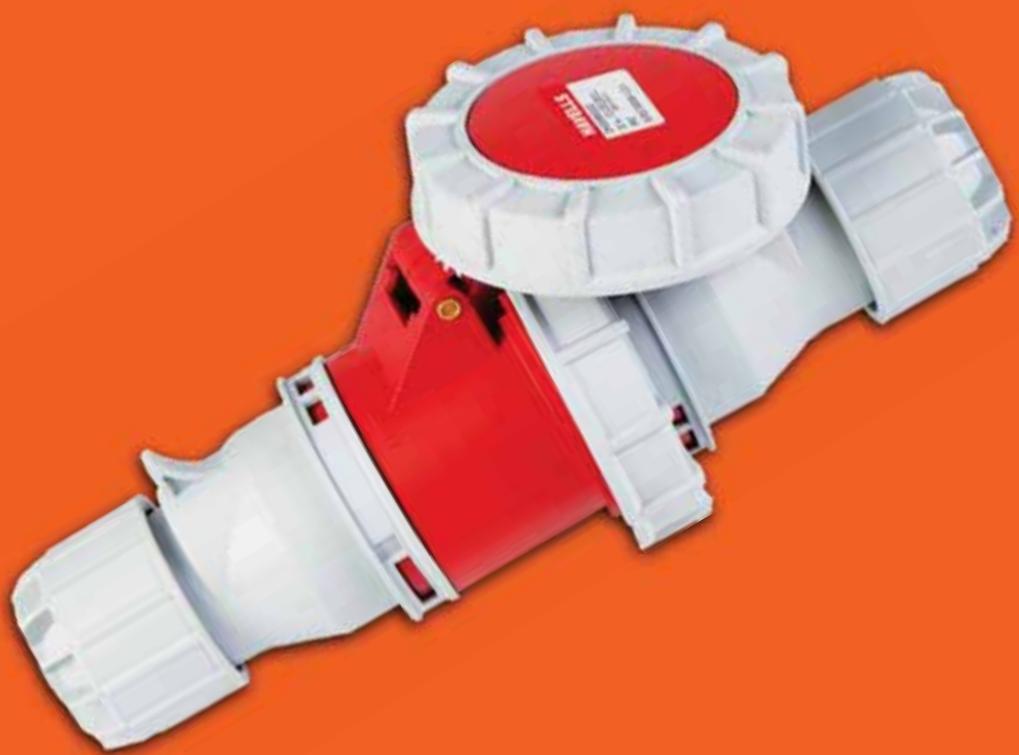


Type 2 Photovoltaic Surge Protection Device

Order Code	Ucpv (V)	In (kA)	I <sub>max</sub> (kA)	U <sub>p</sub> (kV)	Remote Signalling
DHSD2NCN4012H	1200 Vdc	20	40	4	No
DHSD2RCN4012H	1200 Vdc	20	40	4	Yes

Cartridges

Order Code	Pole	Ucpv (V)	In (kA)	I <sub>max</sub> (kA)	U <sub>p</sub> (kV)
DSSRCX0155	-	1200 Vdc	20	40	4



## INDUSTRIAL PLUG & CONNECTOR

Standard Compliance	IS/IEC 60309-1, 2
Current Rating	16 to 63A
Pin Configurations	2P+E, 3P+E*, 3P+N+E
Earth Contact Position	6H, 3H*
Rated Frequency	50/60 Hz
Rated Voltage	220-250V~(2P+E), 380-440V~(3P+E)*, 220/380-240/415V~(3P+N+E)
Insulation Voltage	690V
Housing Material	Flame Retardant PA6
Contact Material	Nickel Plated Brass
Glow Wire Test	850°C for insulated parts necessary to retain current carrying parts, 650°C for housing
Protection Degree CC	IP 44, IP 67
Operating Temperature	-25°C to +40°C

\*Refer Page 111 for detailed specification of special plug & connectors for reefer application.

These are heavy-duty industrial plugs and connectors, used to provide power in areas exposed to dust, water or rough use having high demands for safety, reliability and durability.

The plugs and connectors adopt 'preventing incorrect insertion' design and their high grade thermoplastic material ensures flame-retardant properties, good electric insulation, high impact resistance, dustproof, damp-proof and watertight connections. They have an ergonomic design and ample wiring space for comfortable installation. Further, they provide high protection from indirect contact since ground contact is the first to be established and the last to separate.



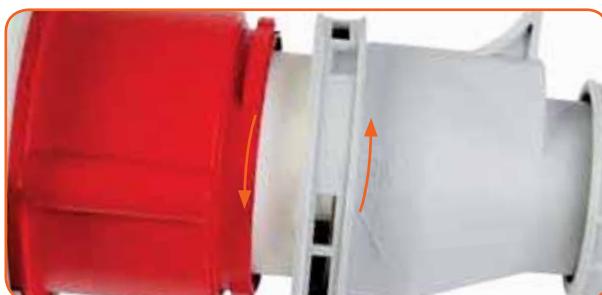
#### Safe Unlocking

Unlock with just a tool. Marking indicates the location of locking clip.



#### Superior Cable Retention

Cable glands seal the cable as well as secure a safe grip, thus protecting against undue loosening.



#### Fast Assembly

Base and cover can be fixed with quick lock system without using screws, thereby saving time.

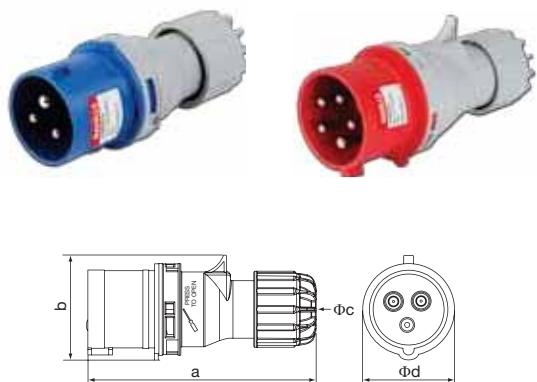


#### Secure Connections

Nickel plated brass pins and contact tubes for high quality electrical contact as well as convenient insertion and withdrawal

## Industrial Plug

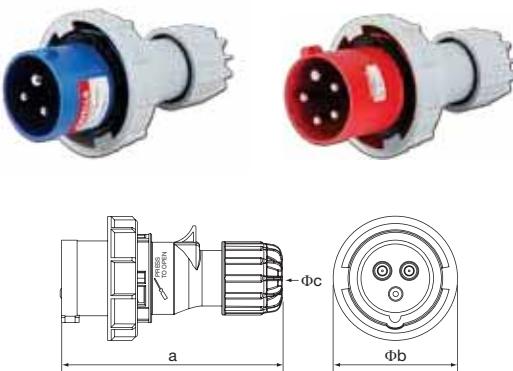
△ IP-44



Low Rating (16A &amp; 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	120	133	150	155
b	57	75.5	80.5	89.5
c	15	17	22	22
d	53.5	68	72	79.5
Cable Size (sq. mm)	1~2.5	1~2.5	2.5~6	2.5~6
Order Code	DHQBA63016	DHQBA65016	DHQBA63032	DHQBA65032
Pcs / Pckg	4	4	4	4

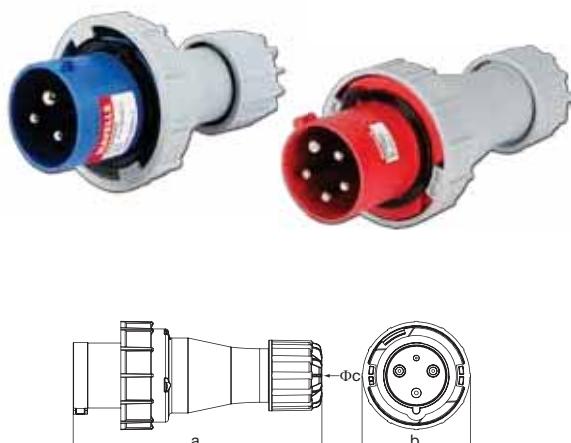
◆◆ IP-67



Low Rating (16A &amp; 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	120	133	150	155
b	71	87	93	99.5
c	15	17	22	22
Cable Size (sq. mm)	1~2.5	1~2.5	2.5~6	2.5~6
Order Code	DHQBB63016	DHQBB65016	DHQBB63032	DHQBB65032
Pcs / Pckg	4	4	4	2

◆◆ IP-67

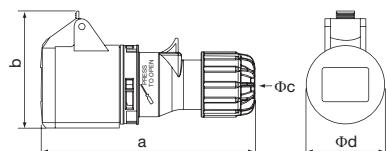


High Rating (63A)

	63 A	
	2P + E	3P + N + E
Dimensions (mm)		
a	260	260
b	113.5	113.5
c	32	32
Cable Size (sq. mm)	6~16	6~16
Order Code	DHQBB63063	DHQBB65063
Pcs / Pckg	1	1

# Industrial Connector

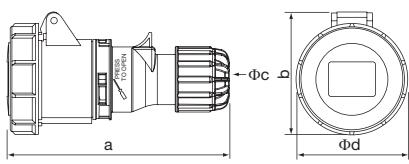
△ IP-44



Low Rating (16A & 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	130	142	162	163.5
b	75.6	89.5	94	100
c	15	17	22	22
d	52	62.8	64.6	71
Cable Size (sq. mm)	1~2.5	1~2.5	2.5~6	2.5~6
Order Code	DHQDA63016	DHQDA65016	DHQDA63032	DHQDA65032
Pcs / Pckg	4	4	4	4

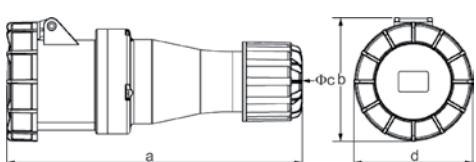
◆◆ IP-67



Low Rating (16A & 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	134	146	166	171
b	78.5	93	98	104
c	15	17	22	22
d	71	86.5	93.5	99.5
Cable Size (sq. mm)	1~2.5	1~2.5	2.5~6	2.5~6
Order Code	DHQDB63016	DHQDB65016	DHQDB63032	DHQDB65032
Pcs / Pckg	4	4	4	2

◆◆ IP-67



High Rating (63A)

	63 A	
	3P + N + E	
Dimensions (mm)		
a	260	
b	113.5	
c	32	
c	111	
Cable Size (sq. mm)	6~16	
Order Code	DHQDB65063	
Pcs / Pckg	1	



◆ INDUSTRIAL WALL-MOUNTED SOCKET & PANEL SOCKET

Standard Compliance	IS/IEC 60309-1, 2
Current Rating	16 to 63A
Pin Configurations	2P+E, 3P+E*, 3P+N+E
Earth Contact Position	6H, 3H*
Rated Frequency	50/60 Hz
Rated Voltage	220-250V~(2P+E), 380-440V~(3P+E)*, 220/380-240/415V~(3P+N+E)
Insulation Voltage	690V
Housing Material	Flame Retardant PA6
Contact Material	Nickel Plated Brass
Glow Wire Test	850°C for insulated parts necessary to retain current carrying parts, 650°C for housing
Protection Degree CC	IP 44, IP 67
Operating Temperature	-25°C to +40°C

\*Refer Page 111 for detailed specification of special sockets for reefer application.

Havells provides a comprehensive range of wall-mounted sockets and panel-mounted sockets, used to provide power in areas exposed to dust, water or rough use having high demands for safety, reliability and durability.

They adopt 'preventing incorrect insertion' design and their high grade thermoplastic material ensures flame-retardant properties, good electric insulation, high impact resistance, dustproof, damp-proof and watertight connections. Nickel plated contacts provide better corrosion resistance in aggressive environments and at high degrees of air humidity. They have an ergonomic design and ample wiring space for comfortable installation. Further, they provide high protection from indirect contact since ground contact is the first to be established and the last to separate.



#### Quick Installation

During installation, it is only required to dismantle the cover top of the enclosure.



#### Hinged Cover

Auto locking of socket flap on plug removal. Reduces potential for accumulation of dust and moisture inside cover.



#### Ease of Assembly

Separable and sealed type design structure for the enclosure of sockets, which can be disassembled and assembled conveniently, safely and quickly.



#### Terminal Identification

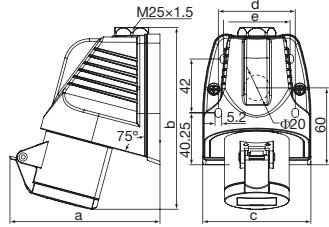
Clear terminal marking for phase, neutral & earth.

#### Double Secure Wiring

Higher rating has two screws per terminal for fail-safe connections.

## Industrial Wall-mounted Socket

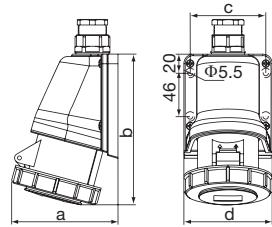
⚠ IP-44



## Low Rating (16A &amp; 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	117	118.5	120	119
b	142	114.5	156	158
c	84.4	84.4	84.4	84.4
d	60	60	60	60
e	52	52	52	52
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10
Order Code	DHQSA63016	DHQSA65016	DHQSA63032	DHQSA65032
Pcs / Pckg	2	2	2	2

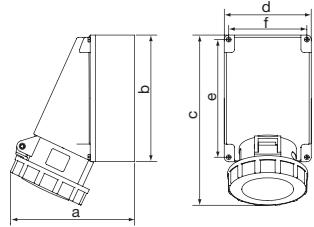
💧 IP-67



## Low Rating (16A &amp; 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	101	107	114	116
b	150	151	162	163
c	80	80	80	80
d	93.5	93.5	93.5	93.5
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10
Order Code	DHQSB63016	DHQSB65016	DHQSB63032	DHQSB65032
Pcs / Pckg	2	2	2	2

💧 IP-67

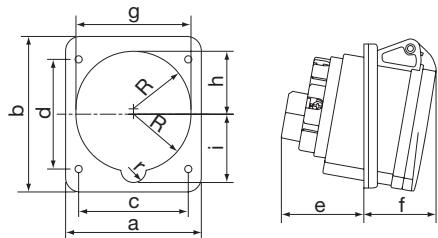


## High Rating (63A)

	63 A
	3P + N + E
Dimensions (mm)	
a	171
b	170
c	230
d	118
e	135
f	105
Cable Size	6~25 (sq. mm)
Order Code	DHQSB65063
Pcs / Pckg	1

# Industrial Panel Socket

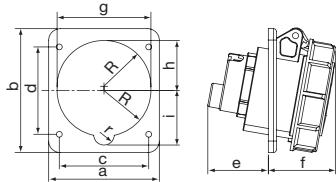
⚠ IP-44



Low Rating (16A & 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	75.5	75.5	75.5	80
b	86.5	86.5	86.5	90
c	61	61	61	65
d	61	61	61	70
e	36	40	55	51
f	37	41	42	45
g	57.5	64	64	70
h		35	35	37.5
i		38	38	40.5
R		32	32	35
r		7	7	7
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10
Order Code	DHQCA63016	DHQCA65016	DHQCA63032	DHQCA65032
Pcs / Pckg	6	4	4	4

⚠ IP-67



Low Rating (16A & 32A) and High Rating (63A)

	16 A		32 A		63 A
	2P + E	3P + N + E	2P + E	3P + N + E	3P + N + E
Dimensions (mm)					
a	75.5	75.5	75.5	80	100
b	86.5	86.5	86.5	90	110
c	61	61	61	65	80
d	61	61	61	70	85
e	41	41.5	52.5	51.5	66.5
f	45	46	49.5	52.5	77.5
g	64	64	64	70	81
h	35	35	35	37.5	42.5
i	38	38	38	40.5	45.5
R	32	32	32	35	9
r	7	7	7	7	40.5
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10	6~25
Order Code	DHQCB63016	DHQCB65016	DHQCB63032	DHQCB65032	DHQCB65063
Pcs / Pckg	4	4	4	3	1

High Rating (63A)



◆ **INDUSTRIAL  
INTERLOCKING  
SOCKET**

Standard Compliance	IS/IEC 60309-1, 2, 4
Current Rating	16 to 63A
Pin Configurations	2P+E, 3P+E*, 3P+N+E
Earth Contact Position	6H, 3H*
Rated Frequency	50/60 Hz
Rated Voltage	220-250V~(2P+E), 380-440V~(3P+E)*, 220/380-240/415V~(3P+N+E)
Insulation Voltage	690V
Housing Material	Flame Retardant PA6
Contact Material	Nickel Plated Brass
Glow Wire Test	850°C for insulated parts necessary to retain current carrying parts, 650°C for housing
Protection Degree CC	IP 44, IP 67
Operating Temperature	-25°C to +40°C

\*Refer Page 111 for detailed specification of special sockets for reefer application.

These are heavy-duty industrial sockets with additional safety due to mechanical interlocking feature. They are used to provide power in areas exposed to dust, water or rough use having high demands for safety, reliability and durability.

The interlocking sockets also adopt 'preventing incorrect insertion' design and their high grade thermoplastic material ensures flame-retardant properties, good electric insulation, high impact resistance, dustproof, damp proof and watertight connections. Nickel plated contacts provide better corrosion resistance in aggressive environments and at high degrees of air humidity. Further, they provide high protection from indirect contact since ground contact is the first to be established and the last to separate.



#### Key-Lock Facility

Switch with handle which can be padlocked from outside in position 'O' and 'I'.



#### Comfortable Installation

Ample wiring space is provided.



#### Mechanical Interlocking

Switch can be operated only when it is plugged-in properly. The plug can only be pulled out when the switch is 'OFF'. This prevents unintended withdrawal and ensure safe operation.

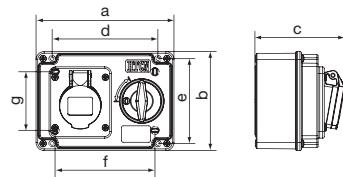


#### Sockets with MCB/RCCB/RCBO Protection

Provision to install protection devices (upto 4 module width) for overload/short-circuit/leakage fault protection. Transparent window allows user to easily view the status of switching devices.

# Industrial Interlocking Socket

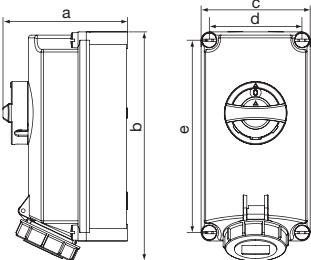
⚠ IP-44



Low Rating (16A & 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	167	167	167	167
b	120	120	120	120
c	108	112	118	120.5
d	128	128	128	128
e	102.8	102.8	102.8	102.8
f	121	121	121	121
g	71	71	71	71
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10
Order Code	DHQIA63016	DHQIA65016	DHQIA63032	DHQIA65032
Pcs / Pckg	1	1	1	1

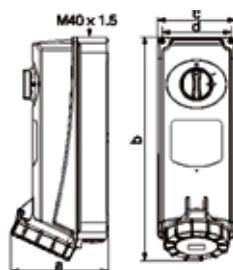
💧 IP-67



Low Rating (16A & 32A)

	16 A		32 A	
	2P + E	3P + N + E	2P + E	3P + N + E
Dimensions (mm)				
a	135.8	135.8	142.5	147
b	248	248	256.5	256.5
c	119	119	119	119
d	101	101	101	101
e	208	208	208	208
Cable Size (sq. mm)	1.5~4	1.5~4	2.5~10	2.5~10
Order Code	DHQWB63016	DHQWB65016	DHQWB63032	DHQWB65032
Pcs / Pckg	1	1	1	1

💧 IP-67



High Rating (63A)

Provision to install switching devices (MCB/RCCB/RCBO) upto 4 module width

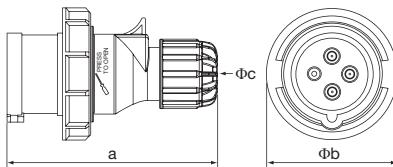
	63 A	
	2P + E	3P + N + E
Dimensions (mm)		
a	203	203
b	467	467
c	162.5	162.5
d	115	115
Cable Size (sq. mm)	6~25	6~25
Order Code	DHQEB63063	DHQEB65063
Pcs / Pckg	1	1

## Plug & Socket for Reefer Container

On ships and in harbor terminals, power loss spells disaster. To meet with strict requirement of these applications, Havells has watertight (IP-67) plug & sockets, with earth sleeve in 3 O'clock position, according to IEC/EN 60309-2.

### Plug

(32A, 380-440V~, 3P+E)

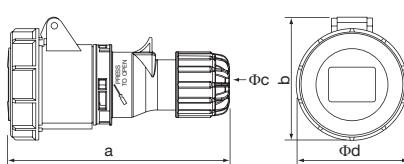


#### Dimensions (mm)

a	150
b	93
c	22
Cable Size	2.5~6 (sq. mm)
Order Code	DHQBB34032
Pcs / Pckg	4

### Connector

(32A, 380-440V~, 3P+E)

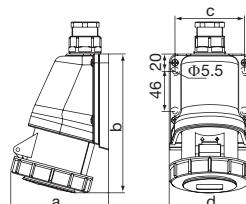


#### Dimensions (mm)

a	166
b	98
c	22
d	93.5
Cable Size	2.5~6 (sq. mm)
Order Code	DHQDB34032
Pcs / Pckg	4

### Wall Mounted Socket

(32A, 380-440V~, 3P+E)

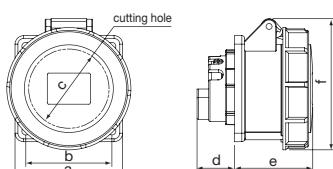


#### Dimensions (mm)

a	114
b	162
c	80
d	93.5
Cable Size	2.5~10 (sq. mm)
Order Code	DHQSB34032
Pcs / Pckg	2

### Panel Socket

(32A, 380-440V~, 3P+E)

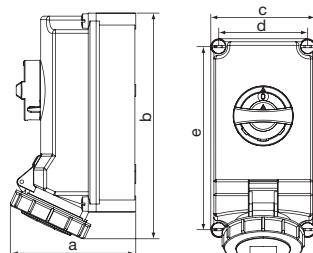


#### Dimensions (mm)

a	75
b	60
c	57.5
d	29.2
e	64.5
f	97.5
Cable Size	2.5~10 (sq. mm)
Order Code	DHQCB34032
Pcs / Pckg	4

### Inter locking Socket

(32A, 380-440V~, 3P+E)



#### Dimensions (mm)

a	142.5
b	256.5
c	119
d	101
e	208
Cable Size	2.5~10 (sq. mm)
Order Code	DHQWB34032
Pcs / Pckg	1



◆ **SOLUTION WITH  
INSULATED PLUG &  
SOCKET**

Industrial plug and socket solutions are an important part of new age manufacturing, hospitality and construction industry. These devices extend a high grade of protection, with flexibility of installation near to the site. Havells industrial plug and socket solutions are designed with an in-depth understanding of Indian subcontinent conditions. The solution is IS 8623 compliant and fulfills the requirement of safe and durable connection in rough environments – whether commercial or industrial. User can conveniently choose and install any of the switchgear devices (MCB/RCCB or Isolator) for protection of downstream equipment. The solution comes with factory-fitted industrial plug and internal wiring kit for easy and quick assembly.

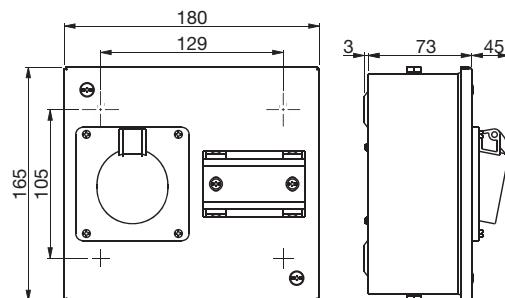
**Features :**

- Conforms to IS 8623, IS/IEC 60309-1/2.
- IP40 ingress protection. Plugs and sockets are IP44 compliant.
- Suitable for surface and flush mounting.
- Havells 7T powder coating process ensures excellent aesthetics and long life.



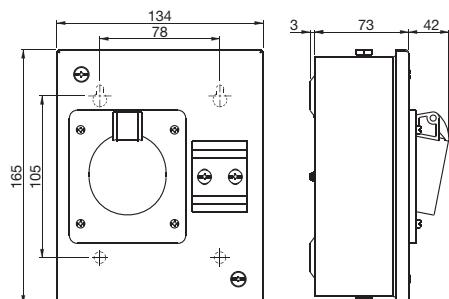
## Solution with Insulated Plug & Socket

32A 3P+N+E



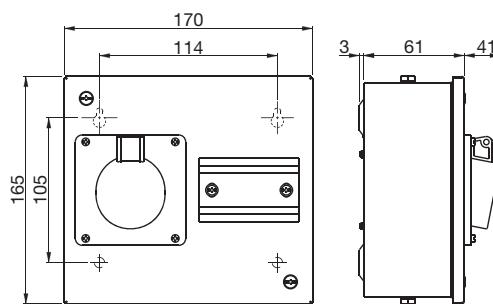
Current : 32A  
Voltage : 415V AC  
Pins : 5PIN (3P+N+E)  
Pcs/Pckg : 1  
Order Code : DHDPBTN032

32A 2P+E



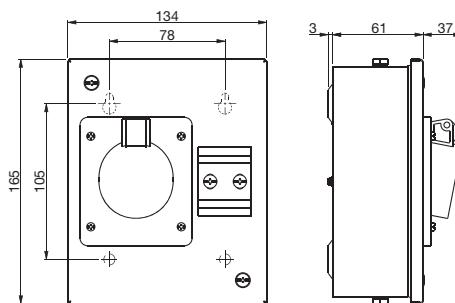
Current : 32A  
Voltage : 240V AC  
Pins : 3PIN (2P+E)  
Pcs/Pckg : 1  
Order Code : DHDPBDP032

## 16A 3P+N+E



Current : 16A  
 Voltage : 415V AC  
 Pins : 5PIN (3P+N+E)  
 Pcs/Pkg : 1  
 Order Code : DHDPBTN016

## 16A 2P+E



Current : 16A  
 Voltage : 240V AC  
 Pins : 3PIN (2P+E)  
 Pcs/Pkg : 1  
 Order Code : DHDPBDP016

Note: MCB/RCCB/Isolator are not a part of standard solution and have to be ordered separately.



## DCORA DISTRIBUTION BOARDS

After the huge success of the Metalica and QVE Distribution Board ranges, Havells is set to launch a new distribution board range – DCORA.

Much like their title, these distribution boards will add to the beauty of our walls, our homes. The new series has been designed to cater the aesthetic needs of one's home while maintaining the performance standards and simplicity of use requirements.

DCORA has been engineered to ensure safety of electrical appliances as well as human life from electrical hazards, while giving the user the opportunity to stand out among his peers. DCORA offers the user to choose between 3 distribution board doors- DCORA Klass Leather, DCORA Sepia Rosewood and DCORA Pearl Stone. All of these doors have been designed with such class that they blend themselves with their surroundings with absolute ease; making it the distribution board of choice.



Magnetic door lock with easy to open door handle



Provided with transparent Cement Guard to protect your DB from construction spill over

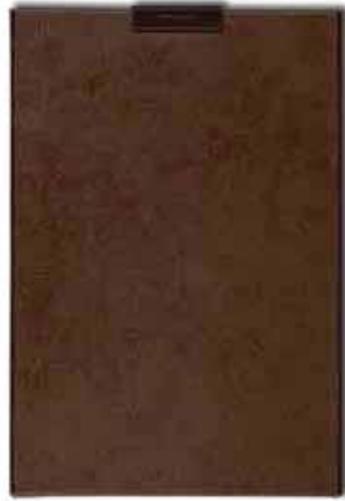


Remove link to use split neutral provision

- Use 1st neutral link for mains supply
- Use 2nd neutral link for stand by supply

## Common Base & Separate Door Concept

Dcora Klass Leather



Dcora Pearl Stone



Dcora Sepia Rosewood



Common Distribution  
Board Base



QVE Regal Grey  
Split Neutral Feature



QVE Pearl Ivory



Metalica Sparkling White



Metalica Sparkling Gold



Metalica Silverish Grey

#### Advantages

- Flexibility to Choose from wide range of Color options
- Feasibility of replacing the old DB door with new door\*
- Low Investment
- No Threat of Theft of Door or Components of DB

## Common Distribution Board Base - SPN



## Range

SPN - 4, 6, 8, 12 &amp; 16W

## Color

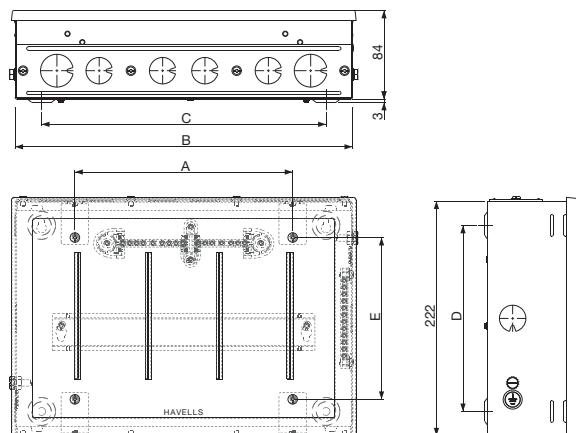
Regal Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable din bar with end stoppers for easy assembly of breakers
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	D	E
4	62	175	125	172	165
6	98	211	151	166	153
8	134	247	187	166	153
12	206	319	269	176	153
16	278	391	341	172	153

## Common Distribution Board Base Suitable for DCORA / Metalica / QVE Door

No. of Ways	SPN-Base Cat. No.
4	DSSDBX0240
6	DSSDBX0241
8	DSSDBX0242
12	DSSDBX0243
16	DSSDBX0244

## Common Distribution Board Base - TPN



### Range

TPN – 4, 6, 8 & 12W

### Color

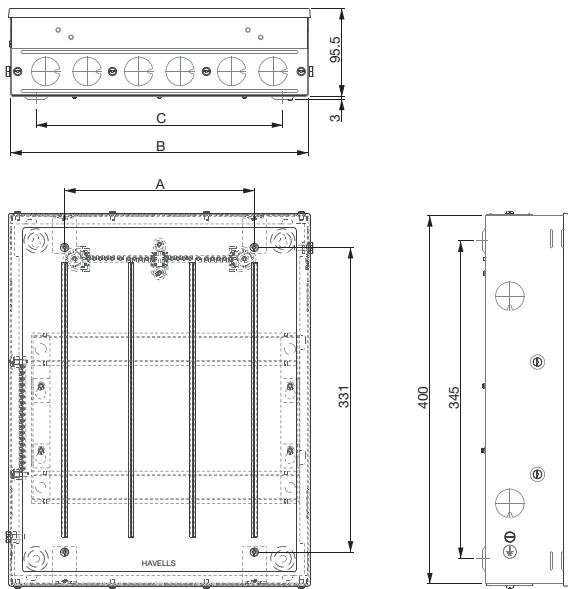
Regal Grey

### Specification

IEC 61439-3, IS:13032 & IS:8623

### Features

- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable din bar assy with end stoppers for easy assembly of breakers
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42



### Dimensions (in mm)

No. of Ways	A	B	C
4	134	251	196
6	206	323	268
8	278	395	340
12	417	534	479

### Common Distribution Board Base Suitable for DCORA / Metalica / QVE Door

No. of Ways	SPN-Base Cat. No.
4	DSSDBX0250
6	DSSDBX0251
8	DSSDBX0252
12	DSSDBX0253

## SPN DCORA DB DOOR - Range



Klass Leather



Sepia Rosewood



Pearl Stone

## Range

SPN - 4, 6, 8,12 &amp; 16W

## Color

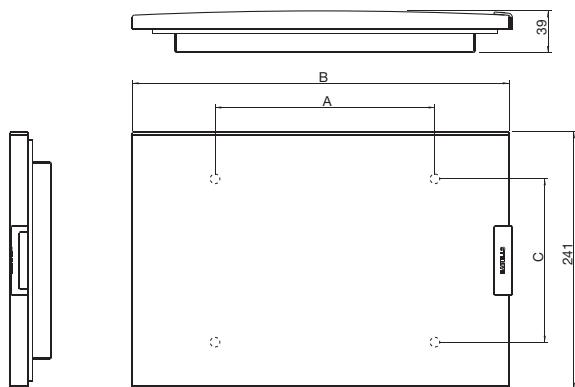
Klass Leather, Sepia Rosewood &amp; Pearl Stone

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Magnetic door lock with easy-to-open door handle
- Versatile design



## Dimensions (in mm)

No. of Ways	A	B	C
4	62	209	165
6	98	245	153
8	134	281	153
12	206	353	153
16	278	425	153

## SPN DCORA Distribution Board Door

No. of Ways	O/G	Klass Leather Cat. No.	Sepia Rosewood Cat. No.	Pearl Stone Cat. No.
4	4	DSSDBX0159	DSSDBX0164	DSSDBX0169
6	6	DSSDBX0160	DSSDBX0165	DSSDBX0170
8	8	DSSDBX0161	DSSDBX0166	DSSDBX0171
12	12	DSSDBX0162	DSSDBX0167	DSSDBX0172
16	16	DSSDBX0163	DSSDBX0168	DSSDBX0173

## TPN DCORA DB DOOR - Range



Klass Leather



Sepia Rosewood



Pearl Stone

## Range

TPN - 4, 6, 8 &amp; 12W

## Color

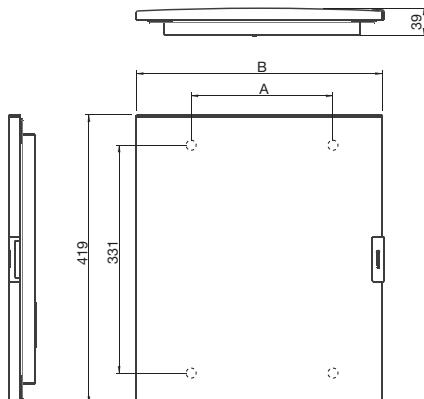
Klass Leather, Sepia Rosewood &amp; Pearl Stone

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Magnetic door lock with easy-to-open door handle
- Versatile design



Dimensions (in mm)

No. of Ways	A	B
4	134	285
6	206	357
8	278	429
12	417	568

TPN DCORA Distribution Board Door (for Single Phase Outgoing) suitable for MCB / RCCB / Isolator as incomer

No. of Ways	I/C+O/G	Klass Leather Cat. No.	Sepia Rosewood Cat. No.	Pearl Stone Cat. No.
4	4+12	DSSDBX0204	DSSDBX0208	DSSDBX0212
6	8+18	DSSDBX0205	DSSDBX0209	DSSDBX0213
8	8+24	DSSDBX0206	DSSDBX0210	DSSDBX0214
12	8+36	DSSDBX0207	DSSDBX0211	DSSDBX0215

## SPN Metalica DB DOOR



## Range

SPN – 4, 6, 8, 12 &amp; 16W

## Color

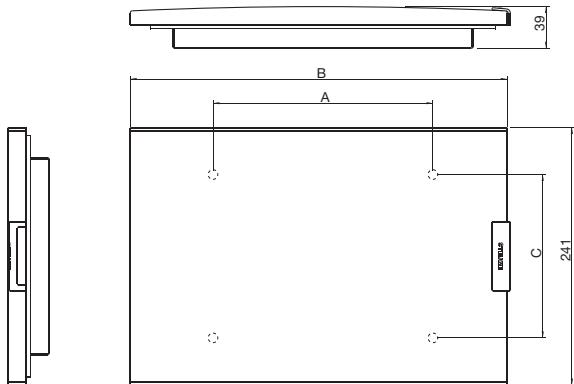
Sparkling White, Sparkling Gold &amp; Silverish Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Magnetic door lock with easy-to-open door handle
- Versatile design
- Scratch resistant glossy surface



## Dimensions (in mm)

No. of Ways	A	B	C
4	62	209	165
6	98	245	153
8	134	281	153
12	206	353	153
16	278	425	153

## SPN Metalica Distribution Board Door

No. of Ways	O/G	Sparkling White Cat. No.	Sparkling Gold Cat. No.	Silverish Grey Cat. No.
4	4	DSSDBX0179	DSSDBX0189	DSSDBX0184
6	6	DSSDBX0180	DSSDBX0190	DSSDBX0185
8	8	DSSDBX0181	DSSDBX0191	DSSDBX0186
12	12	DSSDBX0182	DSSDBX0192	DSSDBX0187
16	16	DSSDBX0183	DSSDBX0193	DSSDBX0188

## TPN Metalica DB DOOR



## Range

TPN – 4, 6, 8 &amp; 12W

## Color

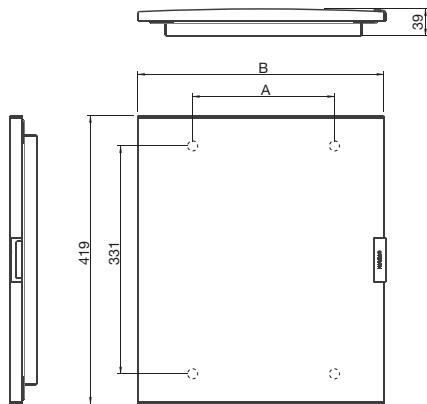
Sparkling White, Sparkling Gold &amp; Silverish Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Magnetic door lock with easy-to-open door handle
- Versatile design
- Scratch resistant glossy surface



## Dimensions (in mm)

No. of Ways	A	B
4	134	285
6	206	357
8	278	429
12	417	568

TPN Metalica Distribution Board Door (for Single Phase Outgoing) suitable for MCB / RCCB / Isolator as incomer

No. of Ways	I/C+O/G	Sparkling White Cat. No.	Sparkling Gold Cat. No.	Silverish Grey Cat. No.
4	4+12	DSSDBX0220	DSSDBX0228	DSSDBX0224
6	8+18	DSSDBX0221	DSSDBX0229	DSSDBX0225
8	8+24	DSSDBX0222	DSSDBX0230	DSSDBX0226
12	8+36	DSSDBX0223	DSSDBX0231	DSSDBX0227

## SPN QVE DB DOOR



## Range

SPN – 4, 6, 8, 12 &amp; 16W

## Color

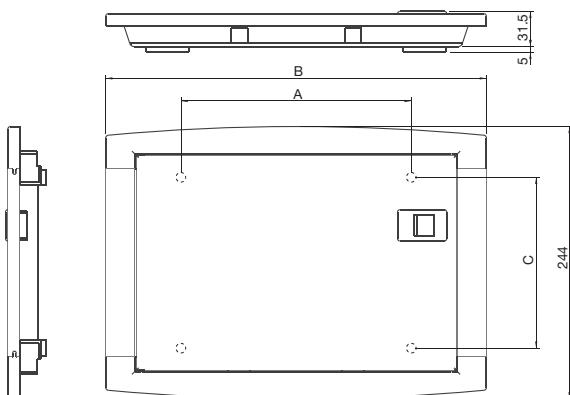
Regal Grey &amp; Pearl Ivory

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Compact DBs which occupy minimum space



## Dimensions (in mm)

No. of Ways	A	B	C
4	62	197	165
6	98	233	153
8	134	269	153
12	206	341	153
16	278	413	153

## SPN QVE Distribution Board Door

No. of Ways	O/G	Regal Grey Cat. No.	Pearl Ivory Cat. No.
4	4	DSSDBX0194	DSSDBX0199
6	6	DSSDBX0195	DSSDBX0200
8	8	DSSDBX0196	DSSDBX0201
12	12	DSSDBX0197	DSSDBX0202
16	16	DSSDBX0198	DSSDBX0203

## TPN QVE DB DOOR



## Range

TPN – 4, 6, 8 &amp; 12W

## Color

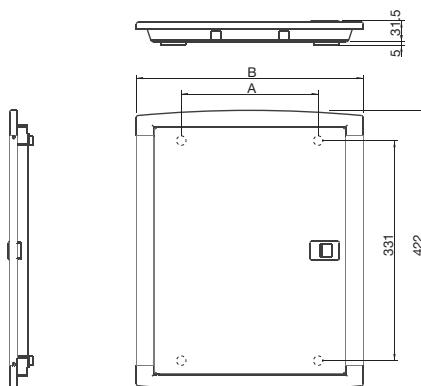
Regal Grey &amp; Pearl Ivory

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Compact DBs which occupy minimum space



## Dimensions (in mm)

No. of Ways	A	B
4	134	269
6	206	341
8	278	413
12	417	557

TPN QVE Distribution Board Door (for Single Phase Outgoing) suitable for MCB / RCCB / Isolator as incomer

No. of Ways	I/C+O/G	Regal Grey Cat. No.	Pearl White Cat. No.
4	4+12	DSSDBX0232	DSSDBX0236
6	8+18	DSSDBX0233	DSSDBX0237
8	8+24	DSSDBX0234	DSSDBX0238
12	8+36	DSSDBX0235	DSSDBX0239

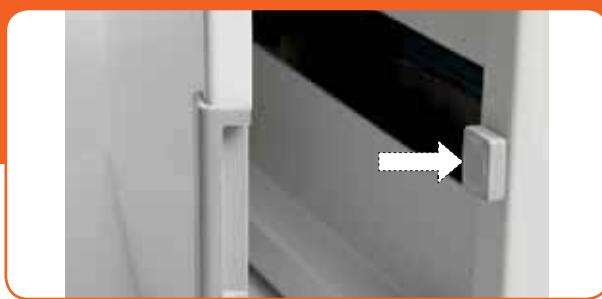
◆ METALICA  
DISTRIBUTION  
BOARDS



Metalica series of Distribution Boards is yet another testimony to the advanced Havells research which focuses on user-centered design especially in its aesthetics & engineering qualities, and pivots on the concepts of variety, performance and simplicity of use. The series has been designed to meet the aesthetic requirements of the modern interiors which demand that a distribution board should blend perfectly with other decorative elements of the room, be it the living room of a house or a corporate office or a showroom.

The unique design and 'ease of use' of Metalica Distribution Boards truly set them apart. The premium metallic finish, specially designed curved surface on the front cover and 'Pull To Open' type magnetic door handle reflect that even the smallest of detail has been perfected to ensure superior user experience. The provision for split neutral to provide for two different types of power supply is again a testimony to our extensive research and customer understanding.

Havells Metalica Distribution Boards have been designed using the latest available technology and comply with the following standards: IEC 61439 - 3.



Magnetic door lock with easy to open door handle



Scratch resistant glossy surface



Provided with transparent Cement Guard to protect your DB from construction spill over



Remove link to use split neutral provision  

- Use 1st neutral link for mains supply
- Use 2nd neutral link for stand by supply

## SPN Metalica DB



## Range

SPN – 4, 6, 8, 12 &amp; 16W

## Color

Silverish Grey, Sparkling White &amp; Sparkling Gold

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

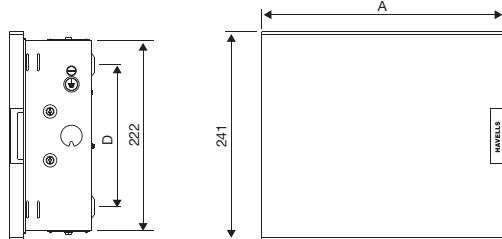
## Features

- Magnetic door lock with easy to open door handle
- Scratch resistant glossy surface
- Remove link to use split neutral provision
  - Use 1st neutral link for mains supply
  - Use 2nd neutral link for stand by supply
- Provided with transparent Cement Guard to protect your DB from construction spill over
- IP 42

## Dimensions (in mm)

No. of Ways	A	B	C	D	Top		Bottom		Side	Sheet Thickness
					Ø25	Ø31	Ø25	Ø31		
4	209	175	125	172	3	-	3	-	1	1
6	245	211	151	166	3	-	3	-	1	1
8	281	247	187	166	2	2	2	2	1	1
12	353	319	269	176	4	2	4	2	1	1
16	425	391	341	172	4	2	4	2	1	1

## Knockout Holes (Ø25 &amp; Ø31)



## SPN Metalica DB

No. of Ways	O/G	Sparkling White Cat. No.	Sparkling Gold Cat. No.	Silverish Grey Cat. No.
4	4	DHDNSHODAW04	DHDNSHODGW04	DHDNSHODDW04
6	6	DHDNSHODAW06	DHDNSHODGW06	DHDNSHODDW06
8	8	DHDNSHODAW08	DHDNSHODGW08	DHDNSHODDW08
12	12	DHDNSHODAW12	DHDNSHODGW12	DHDNSHODDW12
16	16	DHDNSHODAW16	DHDNSHODGW16	DHDNSHODDW16

## TPN Metalica DB



## Range

TPN – 4, 6, 8 &amp; 12W

## Color

Silverish Grey, Sparkling White &amp; Sparkling Gold

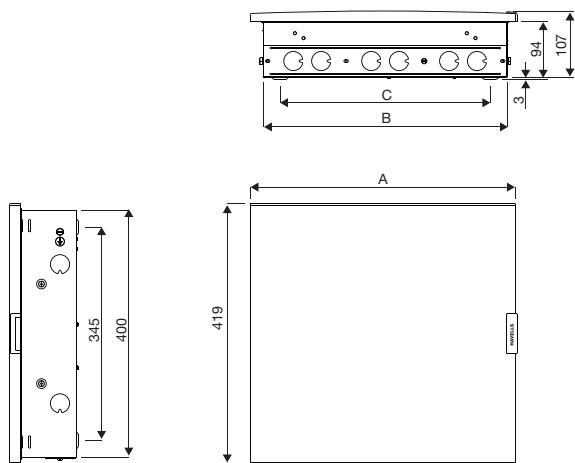
## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Magnetic door lock with easy to open door handle
- Scratch resistant glossy surface
- Remove link to use split neutral provision
  - Use 1st neutral link for mains supply
  - Use 2nd neutral link for stand by supply
- Provided with transparent Cement Guard to protect your DB from construction spill over
- IP 42

## Dimensions (in mm)



## Knockout Holes (Ø31)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
				Ø31	Ø31		
4	285	251	196	4	4	2	1
6	357	323	268	6	6	2	1
8	429	395	340	6	6	2	1
12	568	534	479	8	8	2	1

## TPN Metalica DB

No. of Ways	I/C+O/G	Sparkling White Cat. No.	Sparkling Gold Cat. No.	Silverish Grey Cat. No.
4	4+12	DHDNTHODAW04	DHDNTHODGW04	DHDNTHODDW04
6	8+18	DHDNTHODAW06	DHDNTHODGW06	DHDNTHODDW06
8	8+24	DHDNTHODAW08	DHDNTHODGW08	DHDNTHODDW08
12	8+36	DHDNTHODAW12	DHDNTHODGW12	DHDNTHODDW12



## QVE PLUS DISTRIBUTION BOARDS

# AFTER ALL, A PROTECTOR NEEDS TO BE TOUGH.

Introducing QVE Plus Distribution Boards

## Features

- Robust core with smooth curve semantic
- Innovative textured finish with optimized play of matte and gloss
- Multiple premium colour finishes



## Common Distribution Board Base - SPN



## Range

SPN - 4, 6, 8, 12 &amp; 16W

## Color

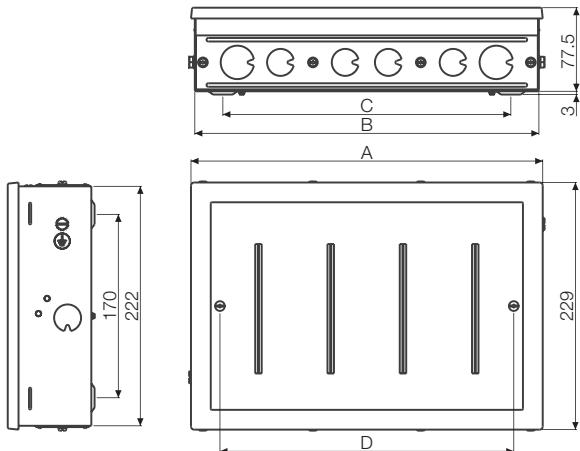
Regal Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable din bar with end stoppers for easy assembly of breakers
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	D	Top		Bottom		Side
					025	031	025	031	
4	182	175	123	128	-	2	-	2	1
6	218	211	159	164	3	-	3	-	1
8	254	247	195	200	2	2	2	2	1
12	326	319	267	272	4	2	4	2	1
16	398	391	339	344	4	2	4	2	1

## Distribution Board Base Suitable for QVE Plus Door

No. of Ways	DB Base for SPN Door Cat. No.
4	DSSDBX0245
6	DSSDBX0246
8	DSSDBX0247
12	DSSDBX0248
16	DSSDBX0249

## Common Distribution Board Base - TPN



### Range

TPN – 4, 6, 8 & 12W

### Color

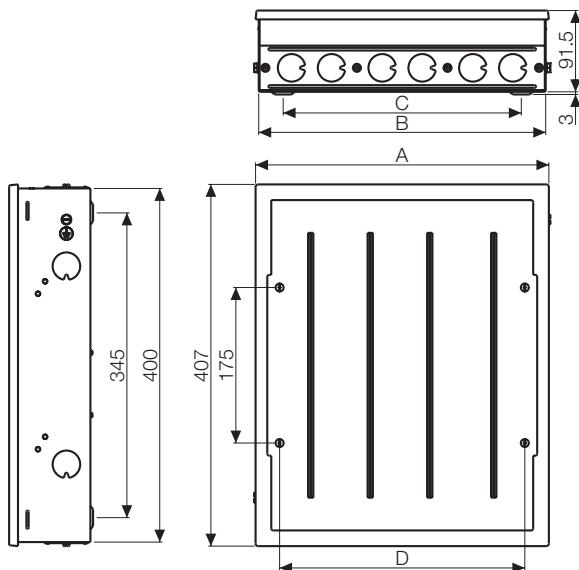
Regal Grey

### Specification

IEC 61439-3, IS:13032 & IS:8623

### Features

- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable din bar assy with end stoppers for easy assembly of breakers
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42



### Dimensions (in mm)

No. of Ways	A	B	C	D	Top	Bottom	Side
					Ø31	Ø31	
4	258	251	196	204	4	4	2
6	330	323	268	276	6	6	2
8	402	395	340	348	8	8	2
12	546	539	484	492	8	8	2

### Distribution Board Base Suitable for QVE Plus Door

No. of Ways	DB Base for TPN Door Cat. No.
4	DSSDBX0254
6	DSSDBX0255
8	DSSDBX0256
12	DSSDBX0257

## SPN QVE PLUS DOOR - Range



Super White



Perdo Ivory



Mineral Grey

## Range

SPN – 4, 6, 8,12 &amp; 16W

## Color

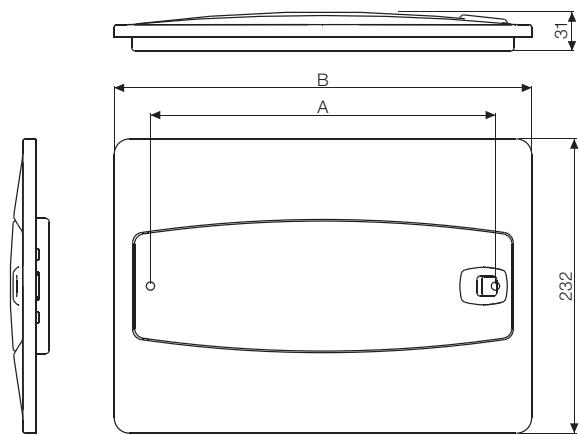
Super White, Perdo Ivory &amp; Mineral Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Robust core with smooth curve semantic
- Innovative textured finish with optimized play of matte and gloss
- Multiple premium colour finishes



Dimensions (in mm)

No. of Ways	A	B
4	128	186
6	164	222
8	200	258
12	272	330
16	344	402

## SPN QVE Plus Distribution Board Door

No. of Ways	O/G	Mineral Grey SPN Door Cat. No.	Perdo Ivory SPN Door Cat. No.	Super White SPN Door Cat. No.
4	4	DSSDBX0268	DSSDBX0277	DSSDBX0299
6	6	DSSDBX0269	DSSDBX0278	DSSDBX0300
8	8	DSSDBX0270	DSSDBX0279	DSSDBX0301
12	12	DSSDBX0271	DSSDBX0280	DSSDBX0302
16	16	DSSDBX0272	DSSDBX0281	DSSDBX0303

## TPN QVE PLUS DOOR - Range



Super White



Perdo Ivory



Mineral Grey

## Range

TPN – 4, 6, 8 &amp; 12W

## Color

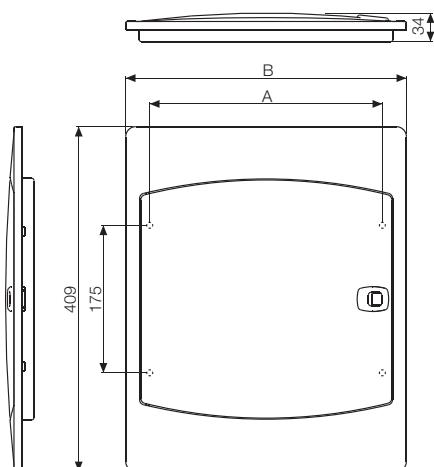
Super White, Perdo Ivory &amp; Mineral Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Robust core with smooth curve semantic
- Innovative textured finish with optimized play of matte and gloss
- Multiple premium colour finishes



Dimensions (in mm)

No. of Ways	A	B
4	204	262
6	276	334
8	348	406
12	492	550

TPN QVE Plus Distribution Board Door (for Single Phase Outgoing) suitable for MCB / RCCB / Isolator as incomer

No. of Ways	I/C+O/G	Mineral Grey TPN Door Cat. No.	Perdo Ivory TPN Door Cat. No.	Super White TPN Door Cat. No.
4	4+12	DSSDBX0273	DSSDBX0282	DSSDBX0304
6	8+18	DSSDBX0274	DSSDBX0283	DSSDBX0305
8	8+24	DSSDBX0275	DSSDBX0284	DSSDBX0306
12	8+36	DSSDBX0276	DSSDBX0285	DSSDBX0307



◆ **DISTRIBUTION BOARDS  
WITH LOCK**

Havells research focuses on user-centered design especially engineering qualities, and pivots on the concepts of variety, performance and simplicity of use. The DB series with key lock feature has been designed to meet the demand of a secure distribution board placed at a location accessible to strangers .The user can access full control Of DB operation to secure it from any misuse or theft of components .  
The DB styled to meet the modern day aesthetics is yet another state of art product from the leader in customer driven innovation .

### Range

- Distribution Board With Metal Key Lock (SPN)
- Distribution Board With Metal Key Lock (TPN)



## SPN Metal Key Lock DB



Range  
SPN – 8 & 12W

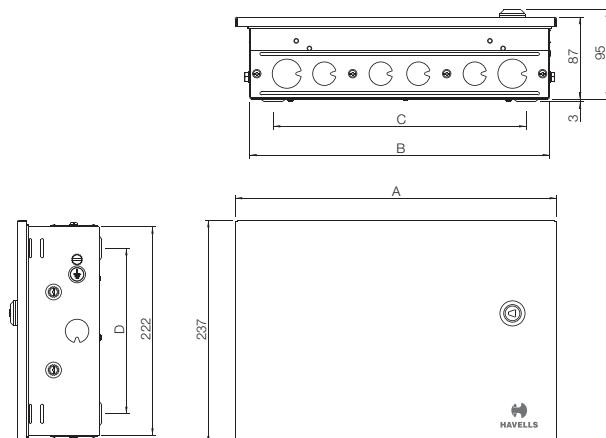
Color  
Regal Grey

Specification  
IEC 61439-3, IS:13032 & IS:8623

### Features

- Metal key lock
- Remove link to use split neutral provision
  - Use 1st neutral link for mains supply
  - Use 2nd neutral link for stand by supply
- Provided with transparent Cement Guard to protect your DB from construction spill over
- IP 42

### Dimensions (in mm)



No. of Ways	A	B	C	D	Knockout Holes				Side	
					Top		Bottom			
					Ø25	Ø31	Ø25	Ø31		
8	270	247	197	166	2	2	2	2	1	
12	342	319	269	176	4	2	4	2	1	

No. of Ways	SAP Code	Description
8	DHDMSHODCW08	SPN 8W DD DB WITH LOCK
12	DHDMSHODCW12	SPN 12W DD DB WITH LOCK

## TPN Metal Key Lock DB



Range  
TPN – 4, 6 & 8W

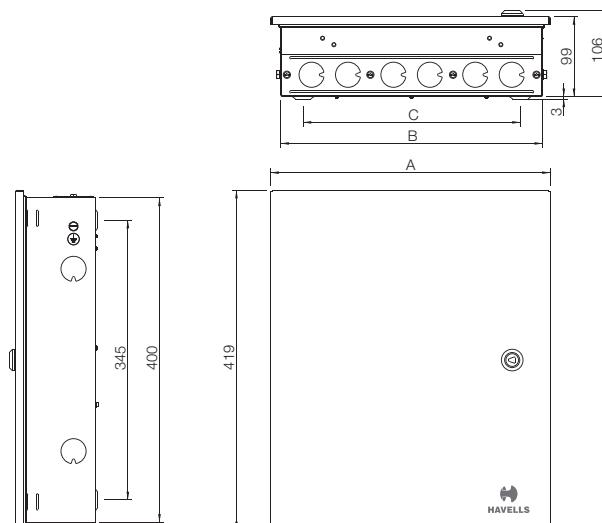
Color  
Regal Grey

Specification  
IEC 61439-3, IS:13032 & IS:8623

### Features

- Metal key lock
- Remove link to use split neutral provision
  - Use 1st neutral link for mains supply
  - Use 2nd neutral link for stand by supply
- Provided with transparent Cement Guard to protect your DB from construction spill over
- IP 42

### Dimensions (in mm)



No. of Ways	A	B	C	Knockout Holes		
				Top	Bottom	Side
				Ø25	Ø31	
4	270	251	196	4	4	2
6	345	323	268	6	6	2
8	417	395	340	6	6	2

No. of Ways	SAP Code	Description
4	DHDMTHODCW04	TPN 4W DD DB WITH LOCK
6	DHDMTHODCW06	TPN 6W DD DB WITH LOCK
8	DHDMTHODCW08	TPN 8W DD DB WITH LOCK



◆ **PHASE SELECTOR  
DISTRIBUTION  
BOARDS**

The power instability in developing countries creates the need for phase selection to back up the utility supply. In such systems, in case of phase outage, the load can be shifted to healthy phase, to maintain continuity of supply. Havells offers Phase Selector Distribution Board and retrofittable Phase Selector Units to serve this purpose. They are available in two versions – manual and automatic.

**Range:**

- Manual Phase Selector DB (Horizontal - 4 Quadrant)
- Manual Phase Selector DB (Vertical)
- Automatic Phase Selector DB
- Phase Selector Enclosure (Vertical)
- Automatic Phase Selector Unit

**Specification**

IEC 61439-3, IS:13032 & IS:8623



Automatic changeover to healthy phase in case of phase outage/ over-voltage/ under-voltage. Operational status indication through LEDs



Manual phase selector DB which allows shifting to healthy phase using phase selector switches



Easy Retro-fit Solutions - Provision to change your existing TPN DB to automatic/manual phase selector DB in a simple, economical and easy to use manner.

## Automatic Phase Selector DB

The power instability in developing countries creates the need for phase selection to back up the utility supply. Today there is a growing need of automation in distribution system as the rate of power outage and low voltage output becomes predominantly high.

Automatic Phase Selector DBs offers several advantages over manual phase selector DBs. Most of the residential and commercial applications are dependent on power supply and if the process of changeover is manual, a considerable time is wasted, and it may also cause hindrance in important activities. Moreover manual changing is not possible every time as identifying the phase of power interruption is difficult.

In addition to above, this DB introduces an automatic solution to overcome problems of not just phase outage but also power fluctuations (over-voltage/ under-voltage) by selecting the next most healthy phase available.

It maintains a constant output power supply irrespective of the available input supply by continuously monitoring each phase, automatically switching between them and returning to the priority phase as necessary.

Working of Automatic Phase Selector DB:

Phase Priority Selection:

The phase priority selection is manually carried out by the user through a priority selector switch present on the front facia of Automatic Phase selector. The user can select the desired priority sequence according to its own choice i.e. RYB, YBR or BRY.

Phase loss Protection:

- In case of phase failure (if RYB priority sequence is selected), the Automatic switching equipment will first check the R phase. If the R phase is present and its phase voltage is in the required range, then the load will run on the R phase only, which will be indicated by the R phase LED blinking at the rate of 1 sec.
- But if the R phase goes off i.e. fails (the LED will stop glowing), then the Automatic switching equipment will check the voltage in the Y phase. If the Automatic switching equipment finds Y phase as the healthiest phase, then it will do the necessary switching to the Y phase within 3 sec (and Y phase LED will start blinking at the rate of 1 sec).
- If it does not find Y phase healthy, it will repeat the above procedure with the B phase.

Restoration of highest priority phase:

- In the event of restoration of highest priority phase (say R phase), the entire load will be automatically transferred to that phase within 3 sec.

Under-voltage protection:

- If the voltage level of the supplying phase falls below the undervoltage limit of 150V (factory sealed), then the Automatic switching equipment shifts the entire load to the next healthiest phase according to its priority. The under voltage condition on a particular phase is indicated by the LED of the respective phase blinking at the rate of 3 sec.
- The fault LED will also glow indicating the system under fault.

Over-voltage Protection:

- The overvoltage limit is factory sealed or fixed at 300V. So if the voltage of the supplying phase goes above 300V, then the Automatic switching equipment will shift the entire load to the next available healthiest phase according to the priority set by the user. The over voltage condition on a particular phase is indicated by the LED of the respective phase blinking at the rate of 0.5 sec.
- The fault LED will also glow indicating the system under fault.

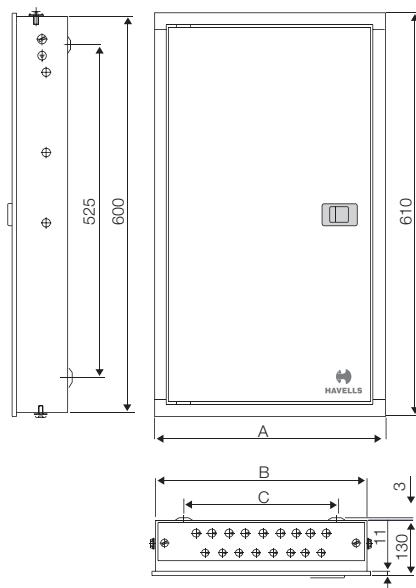


**Range**  
Automatic Phase Selector

**Specification**  
IEC 61439-3, IS:13032 & IS:8623

**Features**

- Phase loss Protection
- Under voltage & overvoltage protection
- Manual phase priority selection
- Operational status indication through LEDs
- Incomer with prewired TPN MCB 63A
- IP 42



Dimensions (in mm)

No. of Ways	A	B	C	Top		Bottom		Side Ø31	Sheet Thickness
				Ø25	Ø20	Ø25	Ø20		
4	261	251	211	5	4	5	4	3	1.2
6	261	251	211	5	4	5	4	3	1.2

Knockout Holes (Ø20, Ø25 &amp; Ø31)

#### Automatic Phase Selector DB

Incoker Rating	Rating APS	Ways	I/C + O/G	Cat. No.	Description
63A TPN MCB	32A	4	8+12	DHDANVDRZ04032	Auto Ph-Sel DB 4W D/D 32A
63A TPN MCB	32A	6	8+18	DHDANVDRZ06032	Auto Ph-Sel DB 6W D/D 32A

## Automatic Phase Selector Unit

These are retrofittable add-ons to existing TPN DBs to convert them into automatic phase selector DBs in a simple, easy to use and reliable manner.



#### Range

Automatic Phase Selector Unit

#### Specification

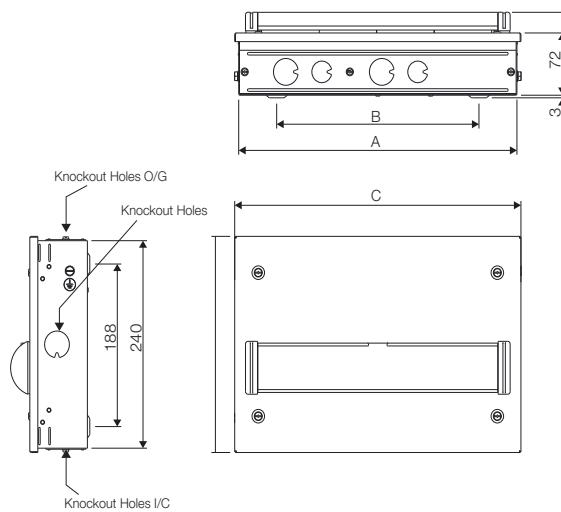
IEC 61439-3, IS:13032 & IS:8623

#### Features

- Can be easily connected with your existing DB
- Automatic Phase selection
- Phase loss Protection
- Under voltage & overvoltage protection
- Manual phase priority selection
- Operational status indication through LEDs
- It comes with prewired TPN MCB of 63A
- IP 40

Technical Specification	
Incomer MCB	TPN 63A
Standard Conformity	IEC 60947-6-1
No. of poles	3P+N
Rated voltage (Ue)	415 Vac
Operating voltage range	200 to 415 Vac
Rated frequency	50 Hz
Time delay for phase changeover	3 seconds
Utilization category	AC31A
Indication	Individual phase (R, Y, B), load, fault, type of fault (i.e. Undervoltage or overvoltage)
Ambient temp	-5° C to +55° C
Electrical life	6000 operations
Rated impulse withstand voltage (Uimp)	2.5 kV
Conditional short circuit breaking capacity	3 kA
Mounting	DIN rail mounting
Terminal capacity	10 mm <sup>2</sup>
Phase Priority selection	Manual (RYB, YBR, BRY)
Undervoltage Protection (L-N)	150 V (factory sealed)
Overvoltage Protection (L-N)	300 V (factory sealed)

**Note:** The switching capacity of the individual unit (APS) is 32 A. But the total load carrying capacity of APS on any single phase is 63 A (as incomer MCB is of 63 A).



Dimensions (in mm)										
Incomer Rating TPN MCB	APS Rating	A	B	C	Top (O/G)		Bottom (I/C)		Side Ø31	Sheet Thickness
					Ø25	Ø31	Ø25	Ø31		
63A	32A	348	253	358	2	2	2	2	1	1

## Automatic Phase Selector Unit

Rating	Cat. No.
32A	DHDAMHSCZ00032

## Manual Phase Selector DB

Havells offers TPN DBs with inbuilt phase selector switches to easily and manually shift the load to healthy phase in case of phase outage. These are recommended for residential and commercial applications for phase selection to back-up power in situations of utility phase outage.

### Phase Selector DB (Horizontal - 4 Quadrant)



#### Range

Phase Selector (Horizontal - 4 Quadrant) - 4, 6 & 8W

#### Specification

IEC 61439-3, IS:13032 & IS:8623

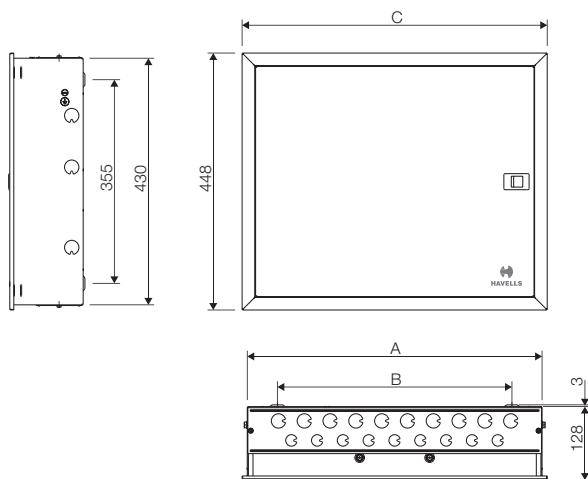
#### Features

- With inbuilt 3 nos. of 40A/63A phase selector switches and 3 nos piano switches
- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar for each phase
- With neutral bar, earth bar and cable ties for cable management
- Fully insulated busbar and neutral bar
- Provision for 8W incomer, indicator light R, Y, B (FP MCB/ Isolator/RCCB)
- Supplied with wire set
- IP 42

Dimensions (in mm)

No. of Ways	A	B	C	D	E	Top		Bottom		Side Each Side	Sheet Thickness
						Ø20	Ø25	Ø20	Ø25		
4	478	373	496	430	355	8	9	8	9	3	1
6	514	409	532	430	355	9	10	9	10	3	1
8	550	445	568	430	355	10	11	10	11	3	1

Knockout Holes (Ø20 & Ø25)



Phase Selector (Horizontal - 4 Quadrant)  
(with rotary switches, duly wired)

No. of Ways	Rating	Regal Grey Cat. No. (DD)	I/C
4	40A	DHDSCHDRZ04040	Eight way
4	63A	DHDSCHDRZ04063	Eight way
6	40A	DHDSCHDRZ06040	Eight way
6	63A	DHDSCHDRZ06063	Eight way
8	40A	DHDSCHDRZ08040	Eight way
8	63A	DHDSCHDRZ08063	Eight way

## Phase Selector DB (Vertical)



## Range

Phase Selector (Vertical) – 4, 6 &amp; 8W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

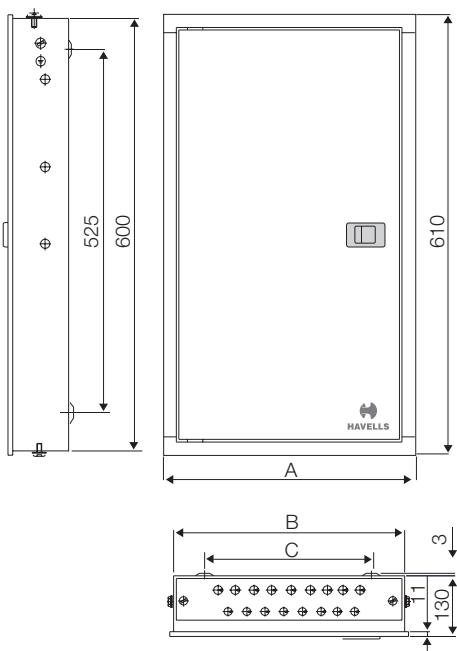
## Features

- With inbuilt 3 nos. of 63A phase selector switches and 3 nos. piano switches
- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar for each phase
- With neutral bar, earth bar and cable ties for cable management
- Fully insulated busbar and neutral bar
- Provision for 8W incomer, indicator light R, Y, B (FP MCB/ Isolator/RCCB)
- Supplied with wire set
- IP 42

## Dimensions (in mm)

No. of Ways	A	B	C	Top		Bottom		Side	Sheet Thickness
				Ø25	Ø20	Ø25	Ø20		
4	333	323	248	9	8	9	8	3	1.2
4	333	323	248	9	8	9	8	3	1.2
6	405	395	320	9	8	9	8	3	1.2
6	405	395	320	9	8	9	8	3	1.2
8	405	395	320	9	8	9	8	3	1.2
8	405	395	320	9	8	9	8	3	1.2

## Knockout Holes (Ø20 &amp; Ø25)



## Phase Selector (Vertical)

(with rotary switches, duly wired &amp; provision for 8W I/C)

No. of Ways	Rating	Regal Grey Cat. No. (DD)	Pearl Ivory Cat. No. (DD)
4	40A	DHDSNVDRZ04040	DHDSNVDZ04040
4	63A	DHDSNVDRZ04063	DHDSNVDZ04063
6	40A	DHDSNVDRZ06040	DHDSNVDZ06040
6	63A	DHDSNVDRZ06063	DHDSNVDZ06063
8	40A	DHDSNVDRZ08040	DHDSNVDZ08040
8	63A	DHDSNVDRZ08063	DHDSNVDZ08063

## Phase Selector Enclosure (Vertical)

These are retrofittable add-ons to existing TPN DBs to convert them into manual phase selector DBs in a simple, easy to use and reliable manner.

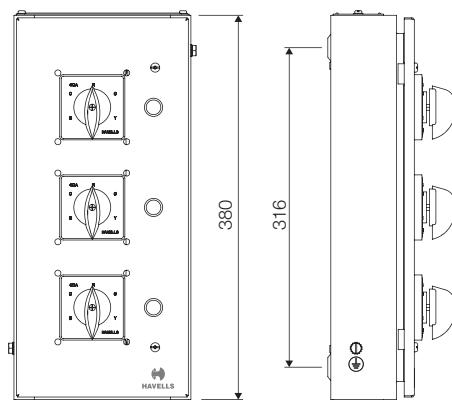


**Range**  
40A to 63A

**Specification**  
IEC 61439-3, IS:13032 & IS:8623

### Features

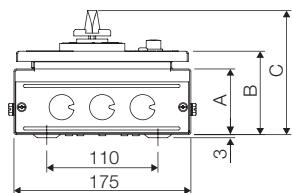
- Compact DBs which occupy minimum space
- TPN DB can be used as a Phase Selector DB after attaching the Phase Selector Enclosure.
- Suitable for surface & flush mounting
- Cost Effective Solution
- Supplied with rotary switches, duly wired
- Suitable for use on 240/415V, 50Hz supply
- IP 40



Dimensions (in mm)

Rating	A	B	C	Top	Bottom	Sheet Thickness
40A	65	83	123	3	3	1.2
63A	91	109	144	3	3	1.2

Knockout Holes (Ø25)



Phase Selector Enclosure (Vertical)  
(with rotary switches, duly wired)

Rating	Regal Grey Cat. No. (DD)
40A	DHDATVFS40
63A	DHDATVFS63



◆ **UTILITY  
DISTRIBUTION  
BOARDS**

Havells offers a wide range of compact, elegant & economical distribution boards with unique features, designed & engineered to provide user safety, convenience and operational / maintenance advantages.

With these inherent strengths, Havells Utility DB Range has been increasingly adopted by leading power consumers in residential, commercial and industrial installations, as a strong, simple and reliable power distribution method.

**Range:**

- QVE Series SPN/TPN Distribution Boards
- Consumer Units
- MCB Enclosure SPN
- MCB Enclosure (Plastic & Sheet Steel)

**Specification**

IEC 61439-3, IS:13032 & IS:8623



## QVE Series SPN DB



## Range

SPN – 4, 6, 8,12 &amp; 16W

## Color

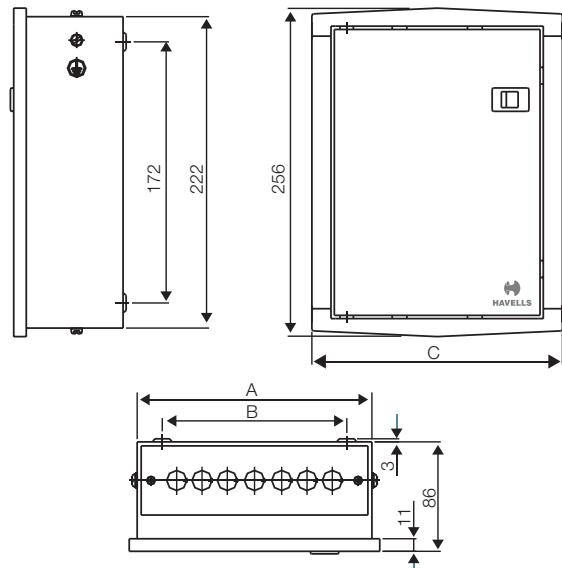
Pearl Ivory &amp; Regal Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Compact DBs which occupy minimum space
- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable din bar with end stoppers for easy assembly of breakers
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	Top Ø25	Ø31	Bottom	Side	Sheet Thickness
4	175	125	197	3	-	3	1	1
6	211	151	233	3	-	3	1	1
8	247	187	269	2	2	5	1	1
12	319	269	341	4	2	7	1	1
16	391	341	413	4	2	9	1	1

## Knockout Holes (Ø25 &amp; Ø31)

## SPN Distribution Boards

No. of Ways	I/C+O/G	Regal Grey Cat. No. (SD)	Regal Grey Cat. No. (DD)	Pearl Ivory Cat. No. (DD)
4	4	DHDPSHOSRW04	DHDPSHODRW04	DHDPSHODPW04
6	6	DHDPSHOSRW06	DHDQSHODRW06	DHDQSHODPW06
8	8	DHDPSHOSRW08	DHDPSHODRW08	DHDPSHODPW08
12	12	DHDPSHOSRW12	DHDPSHODRW12	DHDPSHODPW12
16	16	DHDPSHOSRW16	DHDPSHODRW16	DHDPSHODPW16

## QVE Series TPN DB

Suitable for MCB / RCCB / Isolator as Incomer



### Range

TPN – 4, 6, 8 & 12W

### Color

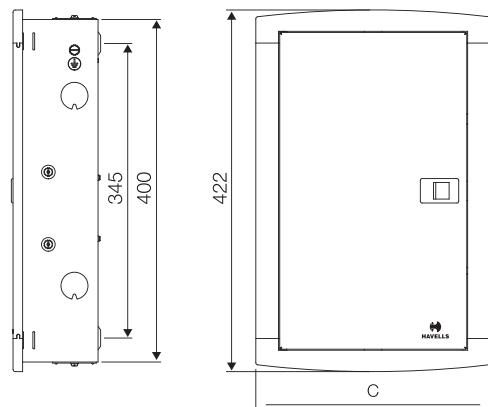
Pearl Ivory & Regal Grey

### Specification

IEC 61439 - 3, IS:13032 & IS:8623

### Features

- Compact DBs which occupy minimum space
- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable Din Bar with end stoppers for easy assembly of breakers
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42

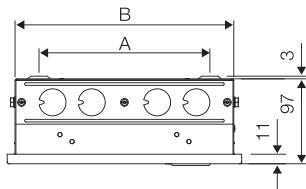


### Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	251	196	269	4	4	2	1
*4	323	268	341	6	6	2	1
6	323	268	341	6	6	2	1
8	395	340	413	6	6	2	1
12	534	479	552	8	8	2	1

Knockout Holes (Ø31)

\*8 way Incomer provision



TPN Distribution Boards (for Single Phase Outgoing) Suitable for MCB / RCCB / Isolator as Incomer

No. of Ways	I/C+O/G	Regal Grey Cat. No. (SD)	Regal Grey Cat. No. (DD)	Pearl Ivory Cat. No. (DD)
4	4+12	DHDQTHCSRW04	DHDNTHCDRW04	DHDNTHCDPW04
6	8+18	DHDQTHCSRW06	DHDNTHCDRW06	DHDNTHCDPW06
8	8+24	DHDQTHCSRW08	DHDNTHCDRW08	DHDNTHCDPW08
12	8+36	DHDQTHCSRW12	DHDNTHCDRW12	DHDNTHCDPW12

## QVE Series TPN DB



## Range

TPN – 4, 6, 8 &amp; 12W

## Color

Pearl Ivory &amp; Regal Grey

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

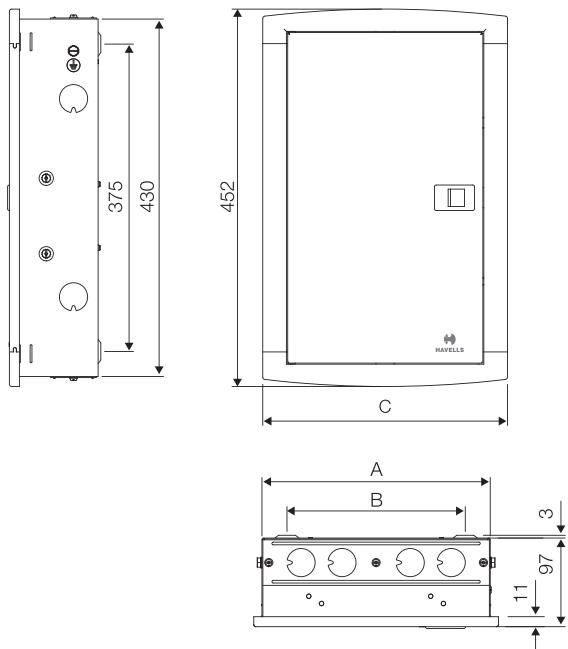
- Compact DBs which occupy minimum space
- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Detachable Din Bar with end stoppers for easy assembly of breakers
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- Supplied with masking sheet to protect components from cement during plastering
- IP 42

## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	251	196	269	4	4	2	1
*4	323	268	341	6	6	2	1
6	323	268	341	6	6	2	1
8	395	340	413	6	6	2	1
12	534	479	552	8	8	2	1

Knockout Holes (Ø31)

\*8 way Incomer provision



## TPN Distribution Boards (for Single Phase Outgoing)

No. of Ways	I/C+O/G	Regal Grey Cat. No. (SD)	Regal Grey Cat. No. (DD)	Pearl Ivory Cat. No. (DD)
4	4+12	DHDPTHOSRW04	DHDPTHODRW04	DHDPTHODPW04
6	8+18	DHDPTHOSRW06	DHDPTHODRW06	DHDPTHODPW06
8	8+24	DHDPTHOSRW08	DHDPTHODRW08	DHDPTHODPW08
12	8+36	DHDPTHOSRW12	DHDPTHODRW12	DHDPTHODPW12

## Consumer Units



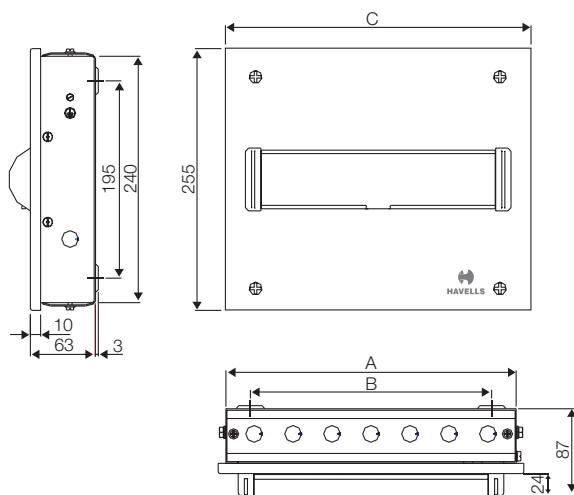
**Range**  
SPN – 4, 8, 12 & 16W

**Color**  
Regal Grey

**Specification**  
IEC 61439-3, IS:13032 & IS:8623

### Features

- Compact DBs which occupy minimum space
- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- DIN-bar
- Supplied with fully shielded bus-bars
- Supplied with neutral & earth link, top & bottom detachable plates
- IP 40



### Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	139	89	154	3	3	1	1
8	211	161	226	5	5	1	1
12	283	233	298	7	7	1	1
16	355	305	370	9	9	1	1

### Knockout Holes (Ø25)

#### Single Door with Acrylic Window

Sheet Steel, Phosphatized, Powder Painted MCB DBs with Bus Bar, Neutral Link, Earth Bar and Din Rail  
(In accordance with IS 13032, IS 8623, IEC/BSEN 60439-3)

No. of Ways	Regal Grey Cat. No.
4	DHDMHOSRA04
8	DHDMHOSRA08
12	DHDMHOSRA12
16	DHDMHOSRA16

## MCB Single Door Consumer



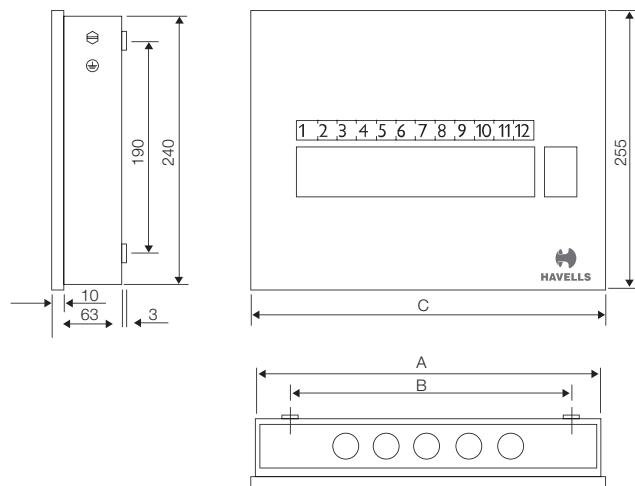
**Range**  
SPN – 2+4, 2+8 & 2+12

**Color**  
Regal Grey

**Specification**  
IEC 61439-3, IS:13032 & IS:8623

**Features**

- Compact DBs which occupy minimum space
- Raised neutral link for easy wiring
- Suitable for surface & flush mounting
- Supplied with fully shielded bus-bars
- Level marks for providing indication for fitment in wall
- Supplied with neutral & earth link, top & bottom detachable plates
- IP 40

**Dimensions (in mm)**

No. of Ways	A	B	C	Top	Bottom	Sheet Thickness
2 + 4	211	161	226	5	5	1
2 + 8	283	233	298	7	7	1
2 + 12	355	305	370	9	9	1

Knockout Holes (Ø25)

## Single Door Consumer unit without Isolator

No. of Ways	Regal Grey Cat. No.
2+4	DHDCSHOSRW04
2+8	DHDCSHOSRW08
2+12	DHDCSHOSRW12

## MCB Enclosure (Plastic & Sheet Steel)



MCB Plastic Enclosure



MCB Sheet Steel Enclosure

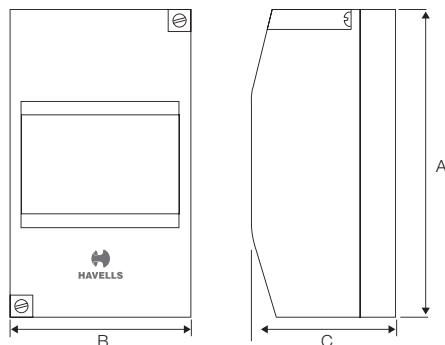
Range  
2 Pole & 4 Pole

Color  
Regal Grey

Specification  
IS:13032 & IS:8623

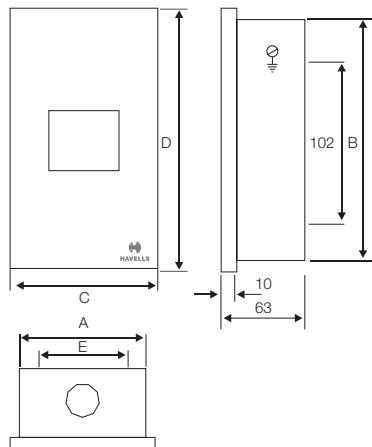
### Features

- Suitable for surface
- Enclosures for independent cutoff / connection of the electrical appliances



Dimensions (in mm)

No. of Ways	A	B	C
2	140	45	65
4	140	81	65



Dimensions (in mm)

No. of Ways	A	B	C	D	E	Top	Bottom	Sheet Thickness
2	60	160	70	170	30	1	1	1
4	98	180	108	190	62	2	2	1

Knockout Holes (Ø25)

### MCB Plastic Enclosure (Cutout)

No. of Poles	Cat. No.
2	DHDEPDP
4	DHDEPFP

### MCB Sheet Steel Enclosure (Cutout)

Sheet Steel, Phosphatized, Powder Painted MCB DBs with Bus Bar, Neutral Link, Earth Bar and Din Rail

No. of Poles	Cat. No.
2	DHDESDP
4	DHDESFP



## DESIGNER DISTRIBUTION BOARDS

Havells offers Designer Distribution Boards – blending aesthetics and functionality in a perfect combination which is compact, elegant, economical and easy to use. The range has been designed with unique features ensuring user safety, convenience, easy handling, and quick, simple installation.

**Range:**

- DBOXx SPN/TPN Distribution Boards
- Translucent Distribution Boards
- Transparent Distribution Boards

**Specification**

IEC 61439-3, IS:13032 & IS:8623



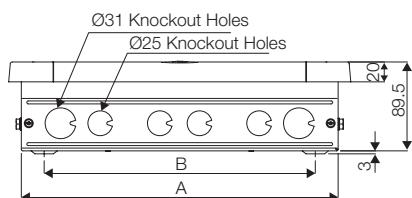
## DBOXx Range



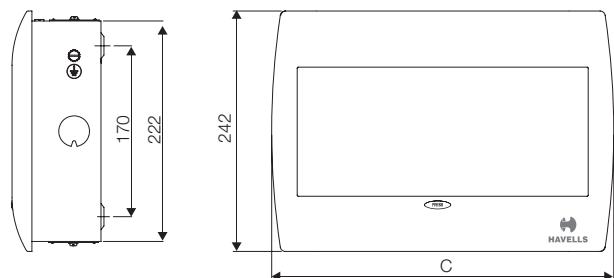
Mist White



Coin Grey



Dimensions SPN (in mm)



No. of Ways	A	B	C	Top		Bottom		Side	Sheet Thickness
				Ø25	Ø31	Ø25	Ø31		
8	247	195	272	2	2	2	2	1	0.8
12	319	267	344	4	2	4	2	1	0.8
16	391	339	415	4	2	4	2	1	0.8

Knockout Holes (Ø25 &amp; Ø31)

## DBOXx SPN

The New Style statement for your DBs

No. of Ways	I/C+O/G	Mist White SPN Cat. No.	Coin Grey SPN Cat. No.
8	8	DHDNSHCDOW08	DHDNSHCDDW08
12	12	DHDNSHCDOW12	DHDNSHCDDW12
16	16	DHDNSHCDOW16	DHDNSHCDDW16

**Range**

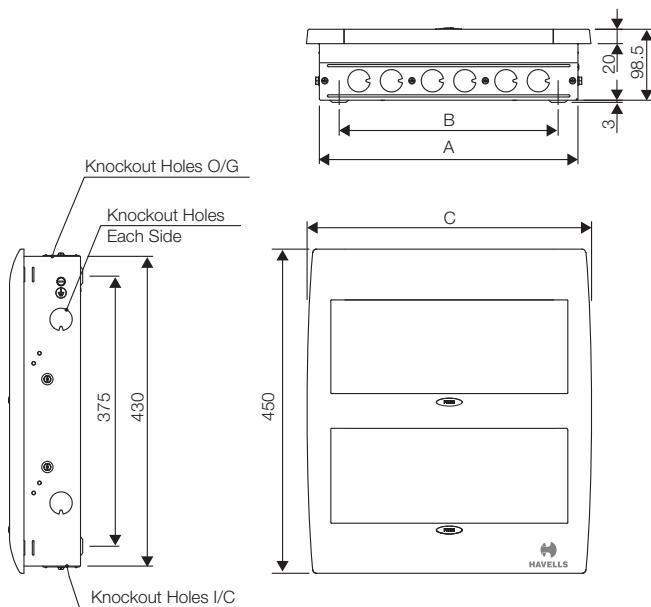
DBOXx – (SPN) 8,12 & 16W  
 DBOXx – (TPN) 4, 6, 8 & 12W

**Specification**

IEC 61439-3, IS:13032 & IS:8623

**Features**

- These are most elegantly designed DBs, to suit the decor of homes
- Raised neutral link for easy wiring
- Spring loaded outer cover swings open by just pressing the lock as in case of DBOXx
- Supplied with masking sheets to protect components from cement during plastering
- Supplied with neutral & earth link, top & bottom detachable plates
- IP 42



Dimensions TPN (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4 / 6	359	304	395	6	6	2	1
8	395	340	431	6	6	2	1
12	539	484	575	8	8	2	1

Knockout Holes (Ø31)

**DBOXx TPN**

The New Style statement for your DBs

No. of Ways	I/C+O/G	Mist White TPN Cat. No.	Coin Grey TPN Cat. No.
4/6	8 + 18	DHDNTHCDDW06	DHDNTHCDDW06
8	8 + 24	DHDNTHCDDW08	DHDNTHCDDW08
12	8 + 36	DHDNTHCDDW12	DHDNTHCDDW12



◆ **SPECIAL  
APPLICATION  
DISTRIBUTION  
BOARDS**

Havells offers a wide range of special application distribution boards, engineered with deep thought and precision to meet the specific needs of different applications. These DBs seamlessly blend aesthetics, functionality and safety, guaranteeing easy installation, operational and maintenance advantages to discerning clientele.

**Range:**

- 7 Segment Distribution Boards
- TPN Vertical Distribution Boards
- TPN Vertical Loadline Distribution Boards
- SPN/TPN (IP 54)
- SPN/TPN Prewired Distribution Boards
- TPN Prewired (with Cable End Box)
- Per Phase Isolation (PPI) Vertical - 4 Tier
- Per Phase Isolation (PPI) - QVE Series

**Specification**

IEC 61439-3, IS:13032 & IS:8623



## 7 Segment



## Range

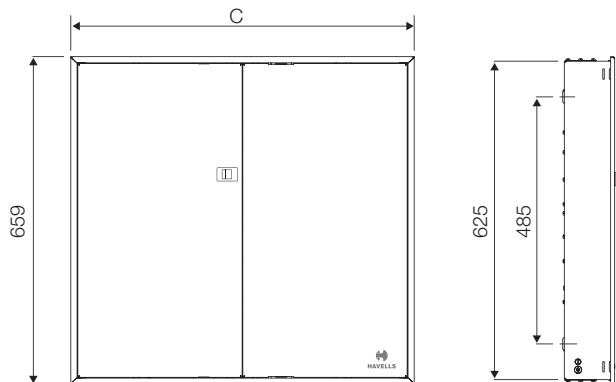
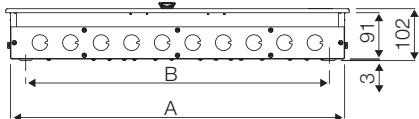
7 Segment DB - 4, 6, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- DBs with separate compartments to fully segregate & isolate incomer and outgoing devices in each phase, which also facilitates easy and quick maintenance
- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar for each phase
- With separate neutral bar, earth bar
- Fully insulated busbar
- Main Incomer FP Isolator & FP Changeover, DP RCCB as subincomer and SP MCBs as outgoing
- Supplied with wire set
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Sheet Thickness
4	440	380	474	7	7	1.2
6	548	488	582	8	8	1.2
8	656	596	690	10	10	1.6
12	872	812	906	13	13	1.6

Knockout Holes (Ø31)

## 7 Segment

No. of Ways	Regal Grey Cat. No. (DD).
4	DHDMTHDDRW04
6	DHDMTHDDRW06
8	DHDMTHDDRW08
12	DHDMTHDDRW12

## TPN Vertical



## Range

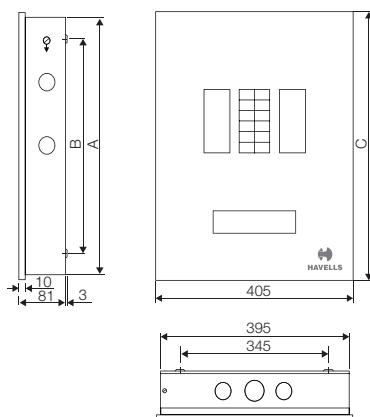
TPN Vertical DB - 4, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

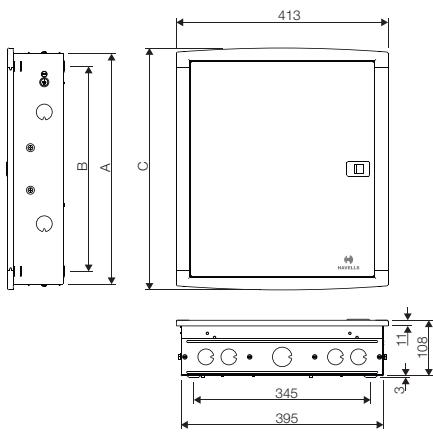
- Suitable for Flush mounting and Surface mounting
- With 125A copper busbar flat type
- With neutral & earth bars
- Pan assembly for ease of installation
- With provision for FP Isolator/RCCB as incomer and SP / TP MCBS as outgoing
- IP 40 (for Single Door)
- IP 42 (for Double Door)



Dimensions (in mm) Single Door

No. of Ways	A	B	C	Top	Bottom Ø31	Bottom Ø38	Side	Sheet Thickness
4	450	400	460	5	2	1	2	1.0
8	558	508	568	5	2	1	2	1.0
12	666	616	676	5	2	1	2	1.0

Knockout Holes (Ø31 &amp; Ø38)



Dimensions (in mm) Double Door

No. of Ways	A	B	C	Top	Bottom Ø31	Bottom Ø38	Side	Sheet Thickness
4	450	400	472	5	2	1	2	1.0
8	558	508	580	5	2	1	2	1.0
12	666	616	688	5	2	1	2	1.0

Knockout Holes (Ø31 &amp; Ø38)

## TPN Vertical

No. of Ways	I/C+O/G	Single Door	Double Door
4	8+12	DHDMTVOSRW04	DHDPTVODRW04
8	8+24	DHDMTVOSRW08	DHDPTVODRW08
12	8+36	DHDMTVOSRW12	DHDPTVODRW12

## TPN Vertical Loadline



## Range

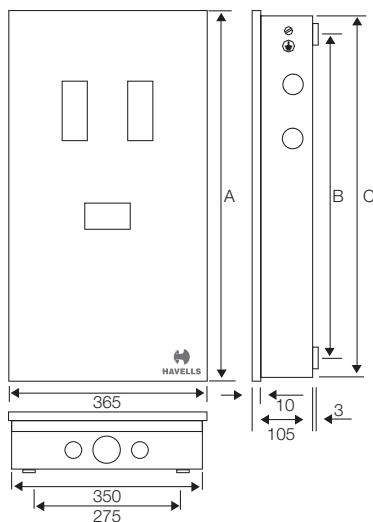
Loadline DB - (TPN SD/DD) - 4, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Suitable for Flush mounting and Surface mounting
- With 160A & 250A copper busbar
- With neutral bars & earth bars
- With provision for TP/FP 160 MCCB as incomer and SP / TP MCBs as outgoing
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom Ø31	Bottom Ø38	Side	Sheet Thickness
4	685	595	670	7	4	1	2	1.2
8	793	703	778	7	4	1	2	1.2
12	901	811	886	7	4	1	2	1.2

Knockout Holes (Ø31 &amp; Ø38)

## TPN Vertical Loadline

Loadline DBs are fitted with Bus Bars, Neutral Links, Blanking Plates (without MCCB) (Suitable for TP/FP)

No. of Ways	Cat. No.	Description						
		SUITABLE FOR TP/FP 'G FRAME' MCCB						
4	DHDLVSRWGOFO04	DB LL 4W SD VERT W/O MCCB						
8	DHDLVSRWGOFO08	DB LL 8W SD VERT W/O MCCB						
12	DHDLVSRWGOFO12	DB LL 12W SD VERT W/O MCCB						
DOUBLE DOOR		SUITABLE FOR TP/FP 'G FRAME' MCCB						
4	DHDLVDRWGOFO04	DB LL 4W DD VERT W/O MCCB						
8	DHDLVDRWGOFO08	DB LL 8W DD VERT W/O MCCB						
12	DHDLVDRWGOFO12	DB LL 12W DD VERT W/O MCCB						
DOUBLE DOOR		SUITABLE FOR TP/FP 'A FRAME' MCCB						
4	DHDLVDRWAFO04	DB LL 4W DD VERT W/O MCCB						
8	DHDLVDRWAFO08	DB LL 8W DD VERT W/O MCCB						
12	DHDLVDRWAFO12	DB LL 12W DD VERT W/O MCCB						

Note: (i) MCCBs &amp; Accessories Should Be Selected And Purchased Separately

(ii) For Any Other Configuration Contact Us

(iii) For Appropriate MCCB Price, Please see Havells IP Price List

## SPN (IP 54)



## Range

IP - 54 (SPN DD) - 4, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

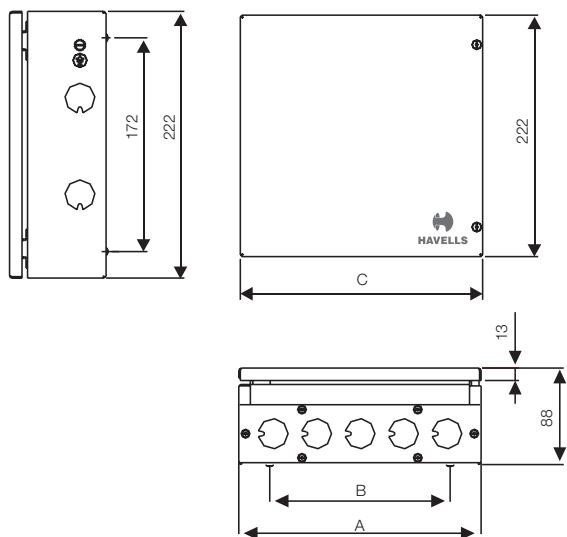
## Features

- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar
- With neutral bars & earth bar
- Fully insulated busbar
- IP 54

## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	175	125	175	3	3	1	1.6
8	247	197	247	5	5	1	1.6
12	319	269	319	7	7	1	1.6

## Knockout Holes (Ø31)



## SPN (IP 54)

No. of Ways	Description	Horizontal Cat. No.
4	SPN DB DD 04W	DHDMSHODRW040002
8	SPN DB DD 08W	DHDMSHODRW080002
12	SPN DB DD 12W	DHDMSHODRW120002

## TPN (IP 54)



## Range

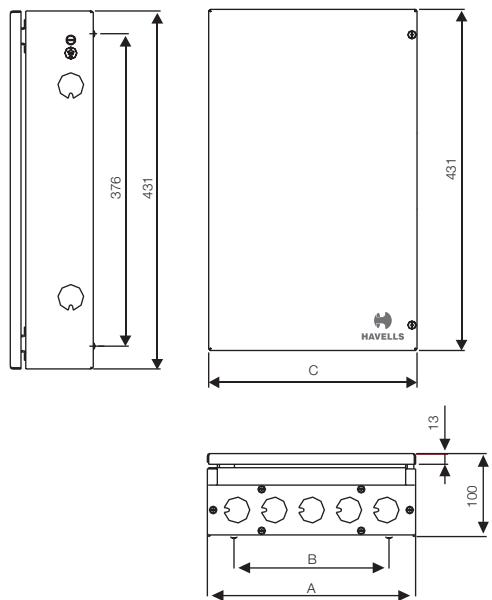
IP - 54 (TPN DD) - 4, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar
- With neutral bars & earth bar
- Fully insulated busbar
- IP 54



## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	251	196	251	5	5	2	1.6
8	395	340	395	8	8	2	1.6
12	534	479	534	11	11	2	1.6

Knockout Holes (Ø31)

## TPN (IP 54)

No. of Ways	Description	Horizontal Cat. No.	Vertical Cat. No.
4	TPN DB DD 04W	DHDMTHODRW040002	DHDMDT VODR040002
8	TPN DB DD 08W	DHDMTHODRW080002	DHDMDT VODR080002
12	TPN DB DD 12W	DHDMTHODRW120002	DHDMDT VODR120002

## SPN Prewired



## Range

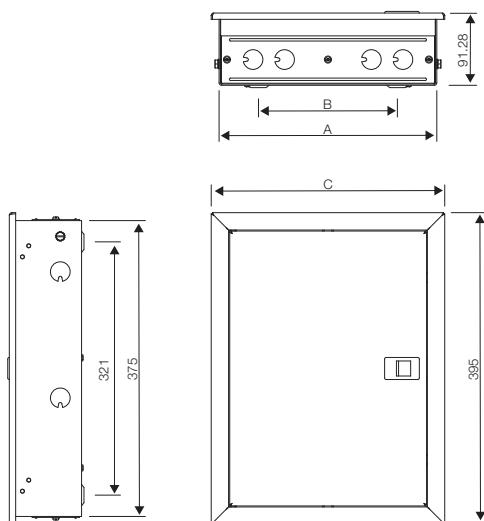
SPN DD – 6, 8, 10, 12 &amp; 16W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Phase/Neutral terminal block for termination of incoming and outgoing wires
- Colored flame retardant Polyamide terminal blocks and FRLS wiring for easy identification, Phases & Neutral
- A detachable cassette is provided for safe removal of MCB/RCCB from DB without loosening the internal cable connection of Phase & Neutral Circuit
- DBs are provided with integral loose wire box in SPN for accommodating extra bunch of wires
- IP 42



## Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
6	276	176	296	4	4	2	1.6
8	312	212	332	4	4	2	1.6
10	348	248	368	4	4	2	1.6
12	384	284	404	6	6	2	1.6
16	456	356	476	8	8	2	1.6

Knockout Holes (Ø25)

SPN Prewired  
(with cable end box)

No. of Ways	IC/OG	DD Cat. No.
6	2+6	DHDMSHMLRW06
8	2+8	DHDMSHMLRW08
10	2+10	DHDMSHMLRW10
12	2+12	DHDMSHMLRW12
16	2+16	DHDMSHMLRW16

## TPN Prewired



## Range

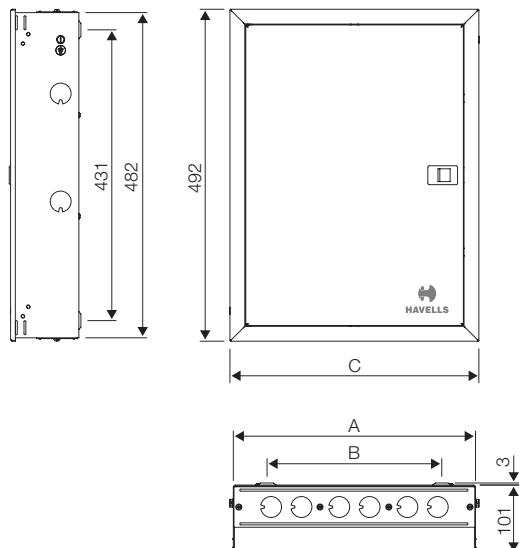
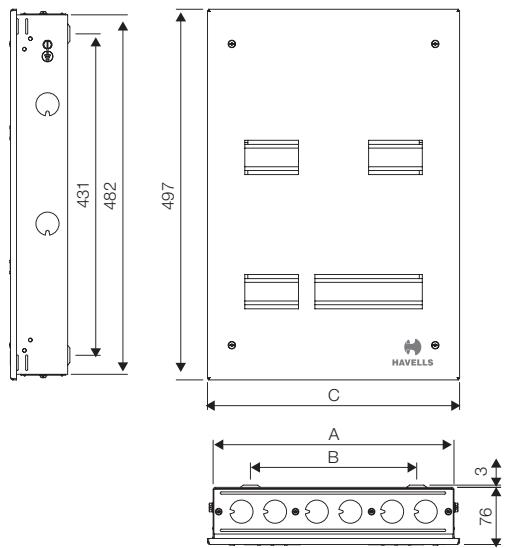
TPN SD – 4, 6, 8 &amp; 12W

## Specification

IEC 61439-3, IS:13032 &amp; IS:8623

## Features

- Phase/Neutral terminal block for termination of incoming and outgoing wires
- Colored flame retardant Polyamide terminal blocks and FRLS wiring for easy identification of R, Y & B Phases & Neutral
- A detachable cassette is provided for safe removal of MCB/RCCB from DB without loosening the internal cable connection of Phase & Neutral Circuit
- IP 42



Single Door Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	323	223	338	6	6	2	1.6
6	359	259	374	6	6	2	1.6
8	423	323	438	6	6	2	1.6
12	567	467	582	8	8	2	1.6

Knockout Holes (Ø25)

Double Door Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	323	223	333	6	6	2	1.6
6	359	259	369	6	6	2	1.6
8	423	323	433	6	6	2	1.6
12	567	467	577	8	8	2	1.6

Knockout Holes (Ø31)

## TPN Prewired

(without cable end box)

No. of Ways	IC/OG	DD Cat. No.
4	8+12	DHDMTHMKDRA04
6	8+18	DHDMTHMKDRA06
8	8+24	DHDMTHMKDRA08
12	8+36	DHDMTHMKDRA12

## TPN Prewired (with Cable End Box)



### Range

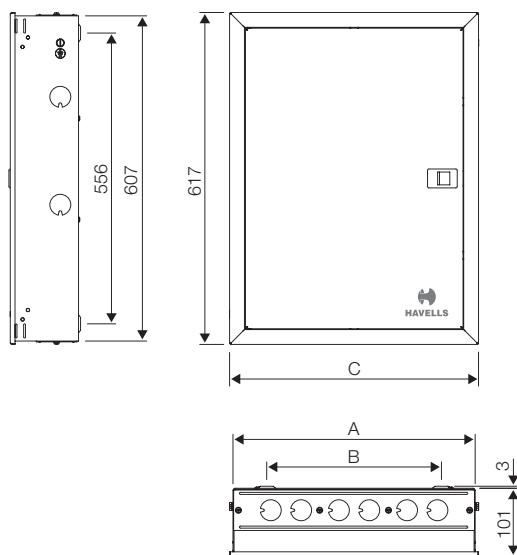
TPN DD – 4, 6, 8 & 12W

### Specification

IEC 61439-3, IS:13032 & IS:8623

### Features

- Phase/Neutral terminal block for termination of incoming and outgoing wires
- Colored flame retardant Polyamide terminal blocks and FRLS wiring for easy identification of R, Y & B Phases & Neutral
- A detachable cassette is provided for safe removal of MCB/RCCB from DB without loosening the internal cable connection of Phase & Neutral Circuit
- DBs are provided with integral loose wire box in TPN for accommodating extra bunch of wires
- IP 42



### Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
4	323	223	333	6	6	2	1.6
6	359	259	369	6	6	2	1.6
8	423	323	433	6	6	2	1.6
12	567	467	577	8	8	2	1.6

Knockout Holes (Ø31)

### TPN Prewired (with cable end box)

No. of Ways	IC/OG	DD Cat. No.
4	8+12	DHDMTHMLXW04
6	8+18	DHDMTHMLXW06
8	8+24	DHDMTHMLXW08
12	8+36	DHDMTHMLXW12

## Per Phase Isolation (PPI) Vertical - 4 Tier

PPI DBs provide earth leakage protection in each phase. In case of leakage fault in one particular phase, only that phase gets isolated while the other two phases do not have power outage.



### Range

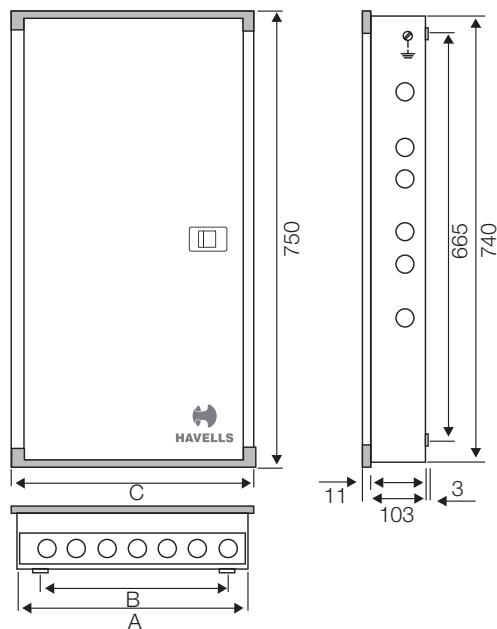
PPI Vertical DB - 4 Tier - 2+8 & 2+12W

### Specification

IEC 61439-3, IS:13032 & IS:8623

### Features

- DBs with phase segregation and separation between incomer and outgoings
- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar for each phase
- With neutral bar, earth bar and cable ties for cable management
- Fully insulated busbar
- With per phase neutral & earth bar
- Supplied with wire set
- IP 42



### Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
2 + 8	323	248	338	7	7	6	1.2
2 + 12	395	320	405	7	7	6	1.2

### Knockout Holes (Ø31)

### Per Phase Isolation (PPI) Vertical - 4 Tier

No. of Ways	I/C + O/G	Regal Grey Cat. No. (DD).
2+8	8+6+24	DHDPTVPDRW08
2+12	8+6+36	DHDPTVPDRW12

## Per Phase Isolation (PPI) - QVE Series

PPI DBs provide earth leakage protection in each phase. In case of leakage fault in one particular phase, only that phase gets isolated while the other two phases do not have power outage.



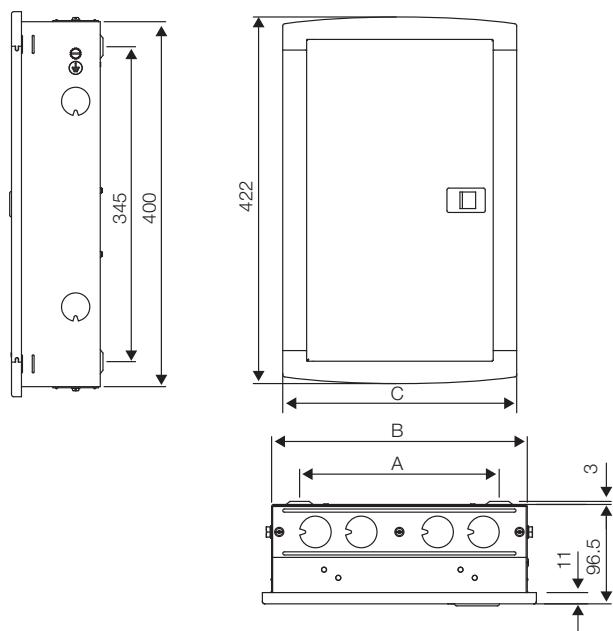
**Range**  
TPN – 4, 6 & 8W

**Color**  
Pearl Ivory & Regal Grey

**Specification**  
IEC 61439-3, IS:13032 & IS:8623

### Features

- DBs with phase segregation and separation between incomer and outgoings
- Suitable for Flush mounting and Surface mounting
- With 100A copper busbar for each phase
- With neutral bar, earth bar and cable ties for cable management
- Fully insulated busbar
- Suitable for MCB / RCCB / Isolator as Incomer
- With per phase neutral & earth bar
- Supplied with wire set
- IP 42



Dimensions (in mm)

No. of Ways	A	B	C	Top	Bottom	Side	Sheet Thickness
2+4	323	268	341	6	6	2	1
2+6	395	340	413	8	8	2	1
2+8	534	479	552	11	11	2	1

Knockout Holes (Ø31)

### Per Phase Isolation (PPI) - QVE Series

No. of Ways	I/C + O/G	Regal Grey Cat. No. (DD)
2+4	4+6+12	DHDPTHDRW04
2+6	4+6+18	DHDPTHDRW06
2+8	4+6+24	DHDPTHDRW08

## Cable End Box

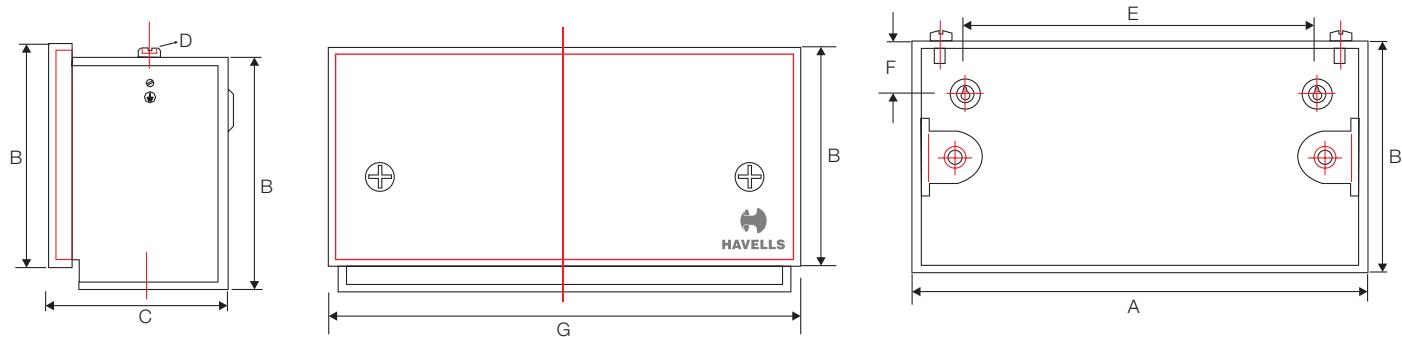
No. of Ways	Item	Cat No.	
		Single Door	Double Dor
4	SPN	DHDASHOS04	DHDASHOD04
8	SPN	DHDASHOS08	DHDASHOD08
12	SPN	DHDASHOS12	DHDASHOD12
16	SPN	DHDASHOS16	DHDASHOD16
4	TPN - Horizontal	DHDATHOS04	DHDATHOD04
6	TPN - Horizontal	DHDATHOS06	DHDATHOD06
8	TPN - Horizontal	DHDATHOS08	DHDATHOD08
12	TPN - Horizontal	DHDATHOS12	DHDATHOD12
4/8/12	TPN - Vertical	DHDATVOS04	DHDATVOD04
4/8/12	Loadline	DHDATVLS04	DHDATVLD04
2+8	PPI	DHDATVTS10	DHDATVTD10
2+12	PPI	DHDATVTS14	DHDATVTD14



## A. Single Door DB

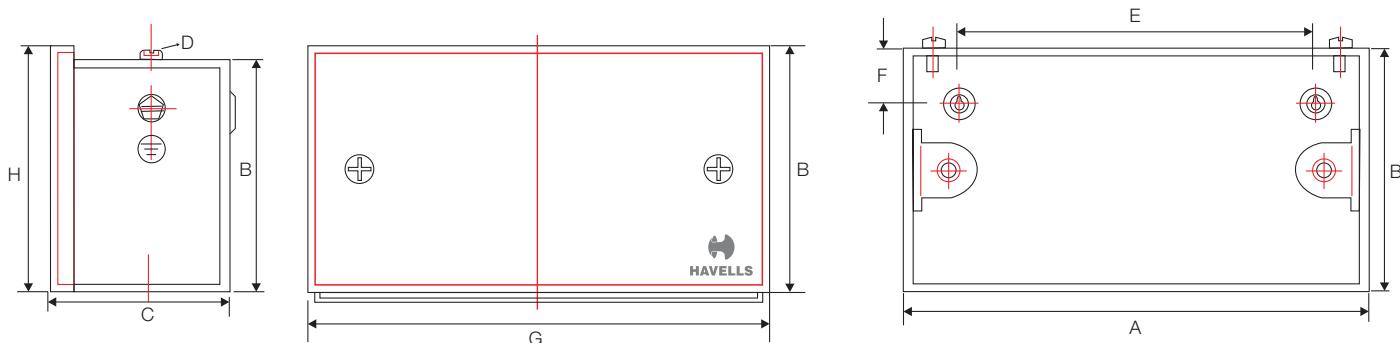
No. of Ways	Item	Dimensions							T (Sheet Thickness)	Cat. No.
		A	B	C	D	E	F	G		
4	SPN	139	100	61	3	89	25	154	1.0	DHDASHOS04
8		211	100	61	5	161	25	226	1.0	DHDASHOS08
12		283	100	61	7	233	25	298	1.0	DHDASHOS12
16		355	100	61	9	305	25	370	1.2	DHDASHOS16
4	TPN	323	125	66	4	268	37.5	338	1.2	DHDATHOS04
6		359	125	66	6	304	37.5	374	1.2	DHDATHOS06
8		395	125	66	6	340	37.5	410	1.2	DHDATHOS08
12		539	125	66	8	484	37.5	554	1.2	DHDATHOS12
4/8/12	Vertical	350	125	87	7	275	37.5	365	1.2	DHDATVOS04
4/8/12	Loadline	350	125	102	7	275	37.5	365	1.2	DHDATVLS04
2 + 8	PPI	323	125	78	6	248	37.5	338	1.2	DHDATVTS10
2 + 12		395	125	78	7	320	37.5	410	1.2	DHDATVTS14
10	Tier	323	125	78	6	248	37.5	338	1.2	DHDATVTS10
14		395	125	78	7	320	37.5	410	1.2	DHDATVTS14

## Dimensions (in mm)



## B. Double Door DB

No. of Ways	Item	Dimensions								T (Sheet Thickness)	Cat. No.
		A	B	C	D	E	F	G	H		
4	SPN	175	100	74	3	125	25	190	107.5	1.0	DHDASHOD04
8		247	100	74	4	197	25	262	107.5	1.0	DHDASHOD08
12		319	100	74	6	269	25	334	107.5	1.0	DHDASHOD12
16		391	100	74	6	341	25	406	107.5	1.2	DHDASHOD16
4	TPN	251	125	85	4	196	37.5	266	132.5	1.2	DHDATHOD04
6		323	125	85	6	268	37.5	338	132.5	1.2	DHDATHOD06
8		395	125	85	6	340	37.5	410	132.5	1.2	DHDATHOD08
12		534	125	85	8	479	37.5	549	132.5	1.2	DHDATHOD12
4/8/12	Vertical	395	125	98	8	320	37.5	405	130	1.2	DHDATVOD04
4/8/12	Loadline	350	125	130	7	275	37.5	380	130	1.2	DHDATVLD04
2 + 8	PPI	323	125	89	6	248	37.5	333	130	1.2	DHDATVTD10
2 + 12		395	125	89	7	320	37.5	405	130	1.2	DHDATVTD14
10	Tier	323	125	89	6	248	37.5	333	130	1.2	DHDATVTD10
14		395	125	89	7	320	37.5	405	130	1.2	DHDATVTD14



## Comb Bus Bar

No. of Ways Three Phase	Capacity of 17.8 mm module	Features	Cat No.
2	6	TP I/C & TP O/G	DSCCPADBX022
3	9	TP I/C & TP O/G	DSCCPADBX023
4	12	TP I/C & TP O/G	DSCCPADBX024
5	15	TP I/C & TP O/G	DSCCPADBX025
10 SP*	10	SP O/G	DSCCPADBX026
14 SP*	14	SP O/G	DSCCPADBX027

\*For Tire DBs



## Plug &amp; Sockets

Description	Cat. No.
20 A DP PLUG ASSEMBLY	DSSPLX0035
20 A DP SOCKET ASSEMBLY	DSSPLX0036
30 A TP PLUG ASSEMBLY	DSSPLX0037
30 A TP SOCKET ASSEMBLY	DSSPLX0038



## Rotary Switch

Description	Cat. No.
40A PHASE-SEL. SWITCH	DSCCPAMCX010
63A PHASE-SEL. SWITCH	DSCCPAMCX009



Cat. No.	Description	Where used in List
DSCPGMDBX099	P-Channel SPN 12W Flat Grey	DHDSNVDRZ04040 DHDSNVDRZ04063 DHDPPTVDRW08
DSCPGMDBX100	P-Channel SPN 16W Flat Grey	DHDPTVODRW04 DHDPTVODRW08 DHDPTVODRW12 HDSNVDRZ06040 DHDSNVDRZ06063 DHDSNVDRZ08040 DHDSNVDRZ08063 DHDPPTVDRW12
DSCPGMDBX105	P-Channel SPN 12W Flat Ivory	DHDSNVDPZ04040 DHDSNVDPZ04063
DSCPGMDBX106	P-Channel SPN 16W Flat Ivory	DHDSNVDPZ06040 DHDSNVDPZ06063 DHDSNVDPZ08040 DHDSNVDPZ08063
DSCPGMDBX126	P-Channel SPN 4W Curve Grey	DHDPSHODRW04
DSCPGMDBX127	P-Channel SPN 8W Curve Grey	DHDPSHODRW08 DHDPTHODRW04
DSCPGMDBX128	P-Channel SPN 12W Curve Grey	DHDPSHODRW12 DHDPTHODRW06
DSCPGMDBX129	P-Channel SPN 16W Curve Grey	DHDPSHODRW16 DHDPTHODRW08
DSCPGMDBX131	P-Channel TPN 12W Curve Grey	DHDPTHODRW12
DSCPGMDBX132	P-Channel SPN 4W Curve Ivory	DHDPSHODPW04
DSCPGMDBX133	P-Channel SPN 8W Curve Ivory	DHDPSHODPW08 DHDPTHODPW04
DSCPGMDBX134	P-Channel SPN 12W Curve Ivory	DHDPSHODPW12 DHDPTHODPW06
DSCPGMDBX135	P-Channel SPN 16W Curve Ivory	DHDPSHODPW16 DHDPTHODPW08
DSCPGMDBX137	P-Channel TPN 12W Curve Ivory	DHDPTHODPW12



## Miscellaneous

Description	Cat. No.
N/L BASE	DSCPGMDBX019
Dummy(Blanking)Plate 18mm	DSCPGMDBX001
KNOB SNAP TYPE GREY	DSCPGMDBX045
KNOB SNAP TYPE PI	DSCPGMDBX046
GREEN INDICATOR SWITCH SMALL	DSCCPAMCX005



## Blanking Plate

No. of Ways	Length	Cat No.
1P	18 mm	DSCPGMDBX001

## Single Phase Bus Bar

No. of Ways	Cat No.
4	DSCCUPDBP028
6	DSCCUPDBP032
8	DSCCUPDBP029
12	DSCCUPDBP030
16	DSCCUPDBP031



## Spare Din Rails

No. of Ways	Length of DIN Rail	Cat No.
4	104 mm	CFEFDBX320
6	140 mm	CFEFDBX459
8	176 mm	CFEFDBX321
12	248 MM	CFEFDBX322
16	320 MM	CFEFDBX323



## Spare Neutral Links

No. of Ways	Cat No.
2 P&S	DSCBRCDBX002
4 SPN	DSCBRCDBX011
6 SPN	DSCBRCDBX090
8 SPN	DSCBRCDBX012
12 SPN	DSCBRCDBX013
16 SPN	DSCBRCDBX014
4 TPN	DSCBRCDBX013
6 TPN	DSCBRCDBX015
8 TPN	DSCBRCDBX016
12 TPN	DSCBRCDBX017



## Spare Earth Links

No. of Ways	Cat No.
4 SPN	DSCBRCDBX006
6 SPN	DSCBRCDBX093
8 SPN	DSCBRCDBX007
12 SPN	DSCBRCDBX003
16 SPN	DSCBRCDBX004
4 TPN	DSCBRCDBX003
6 TPN	DSCBRCDBX005
8 TPN	DSCBRCDBX009
12 TPN	DSCBRCDBX008



### Ingress Protection

The IP (Ingress Protection) rating given to an enclosure states the degree of protection it offers by means of two digits. A summary of these is shown below, for a more detailed definition, see IEC 60529 : 2000, BS EN 60529 : 1992.

#### First Digit

Protection against solid foreign objects and access to hazardous parts: The first digit covers protection against penetration by solid objects, which includes hands and tools such as screwdrivers. At the lowest of seven levels, 0, no protection is offered, either of the equipment itself from damage by intrusion or of a person contacting live or moving parts. At the highest, there shall be no entry of dust.

0. No Protection



1. Protected against solid objects up to 50 mm  
e.g. accidental touch by hands



2. Protected against solid objects up to 12 mm  
e.g. fingers



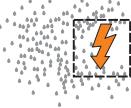
3. Protected against solid objects over 2.5 mm  
e.g. tools and wires



4. Protected against solid objects over 1 mm  
e.g. tools, wires and small wires



5. Protected against dust -limited ingress,  
no harmful deposits



6. Totally protected against dust.



#### Second Digit

Protection against ingress of water: The second digit covers the degree of protection against the entry of water, on a progressive scale. For example, number 1 indicates that dripping water shall have no harmful effect, and number 6, that water projected in powerful jets against the enclosure from any direction shall have no harmful effects.

0. No Protection



1. Protected against vertically falling  
drops of water eg. condensation



2. Protected against direct sprays of  
water up to 15° from the vertical



3. Protected against sprays of water  
up to 60° from the vertical



4. Protected against after splashed  
from all directions -limited ingress  
permitted



5. Protected against low pressure jets  
of water from all directions -limited  
ingress permitted



6. Protected against strong jets of  
water e.g. for use on ship decks  
-limited ingress permitted



The letter X can be used in place of the first or second digit to indicate that tests have either not been made or are not applicable.

### Category Of Duty

The category of duty defines the basic type of circuit and switching capability of the device, and selection should be made accordingly.

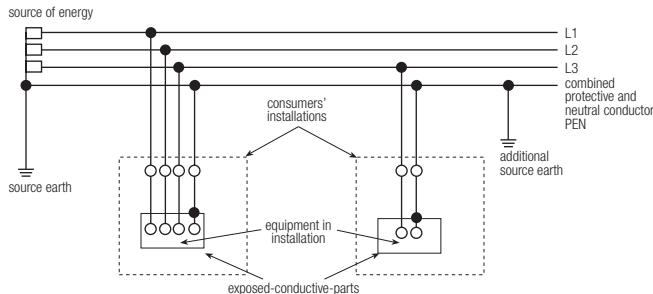
Utilisation Category Typical Applications

AC20/DC20	Connecting and disconnecting under no-load. Assumes all switching operations are carried out by other capable devices before this device is operated.
AC21/DC21	Switching of resistive loads including moderate overloads. Suitable for purely resistive type loads devices can switch 150% of its rated current under fault conditions
AC22/DC22	Switching of mixed resistive / inductive loads, including moderate overloads. Suitable for mixed resistive / inductive loads. Devices can switch 300% of its rated current under fault conditions.
AC23/DC23	Switching of highly inductive loads. Devices complying with AC23/DC23 are provided mainly as back-up to other means of switching, e.g. contacts. In the event of failure of functional devices, an AC23/DC23 type device can safely interrupt a stalled motor current. Where devices are the only means of controlling individual motors, they should comply with the requirements of appendix A of the standard. (IEC 60947-3)

## Earthing System

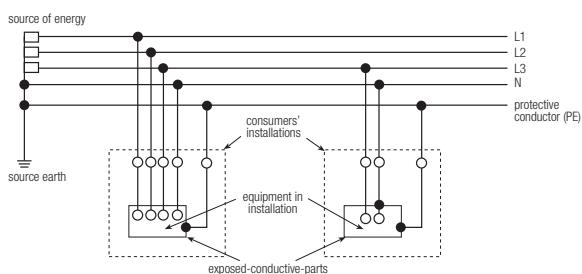
### TN-C system

In this grid system, the neutral point of the transformer supplying the energy is directly grounded. The neutral conductor and protective conductor are routed to the consumer system in one conductor (PEN). A three-phase power supply consists of four conductors: L1, L2, L3, and PEN.



### TN-S system

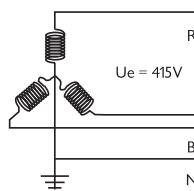
In this grid system, one point – usually the neutral point – of the transformer supplying the energy is usually directly grounded. The neutral conductor (N) and protective conductor (PE) are routed to the consumer system in separate conductors. A three-phase power supply consists of five conductors: L1, L2, L3, N, and PE.



### Important Definitions

#### 1. Ue = Rated Operational Voltage

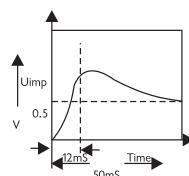
The normal line-to-line voltage (3 Phase) or line to neutral voltage (1 Phase) of the system should not exceed (Ue)



#### 2.Ui = Rated Insulation Voltage

The voltage on which the dielectric properties have conventionally been based using tests at high voltage and mains frequency.

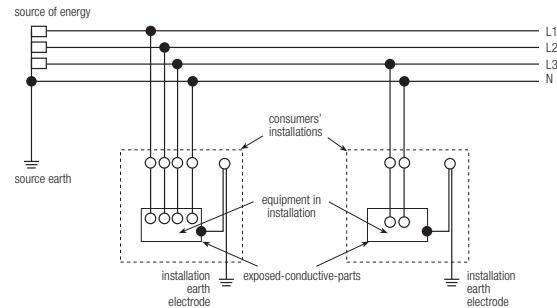
Ui = 660V  
Tested@  
2500V ac 50Hz



3. Uimp = Rated impulse withstand voltage  
The voltage on which clearance distances are based. The value of transient peak voltage the circuit breaker can withstand from switching surges or lightning strikes imposed on the supply. e.g. Uimp = 8kV, Tested @8kV peak with 1.2/50m (ms)S impulse wave

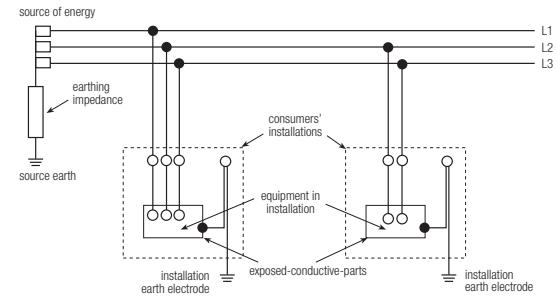
### TT system

In this grid system, the grounded point of the transformer is routed to the system solely as a neutral conductor. The parts of the electrical system are connected to a local grounding system that is separated from the grounded point of the transformer. The neutral conductor and the local protective conductor are routed to the consumer system in separate conductors. A three- phase power supply consists of five conductors: L1, L2, L3, N, and local PE.



### IT system

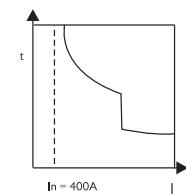
In this grid system, the neutral point of the transformer supplying the energy is not grounded, or only grounded via a high impedance. The parts of the electrical system are connected to a local grounding system that is separated from the grounded point of the transformer. If a neutral conductor is also routed from the neutral point of the transformer supplying the energy, this is routed separately from the local protective conductor. A three-phase power supply consists of four or five conductors: L1, L2, L3, if appropriate, N, and local PE.



#### 4. In = Rated Current

The current which the circuit breaker will carry continuously under specified conditions and on which the time / current characteristics are based.

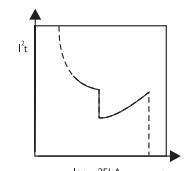
Unless otherwise stated (In) is based on a reference ambient temperature of 30° centigrade.



#### 5. Icu-Rated Ultimate Short Circuit Breaking Capacity in kA

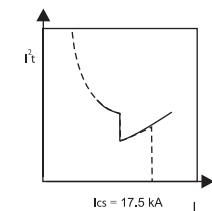
The calculated prospective fault current at the incoming terminals of the circuit breaker should not exceed (Icu).

Exception: Using back-up protection as specified by the manufacturer.



#### 6. Ics-Rated Service Short Circuit Breaking Capacity in kA

The maximum level of fault current operation after which further service is assured without loss of performance.

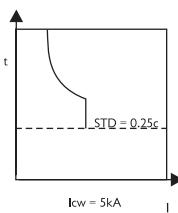


## Glossary

### 7. Icw-Rated Short-time Withstand Current

Circuit breakers of utilisation category 'B' have a short-time delay allowing time-graded selectivity between circuit breakers in series.

(Icw) is the current the circuit breaker will withstand for the maximum short-time delay time. Preferred times are 0.05, 0.1, 0.25, 0.5 and 1.0 second.



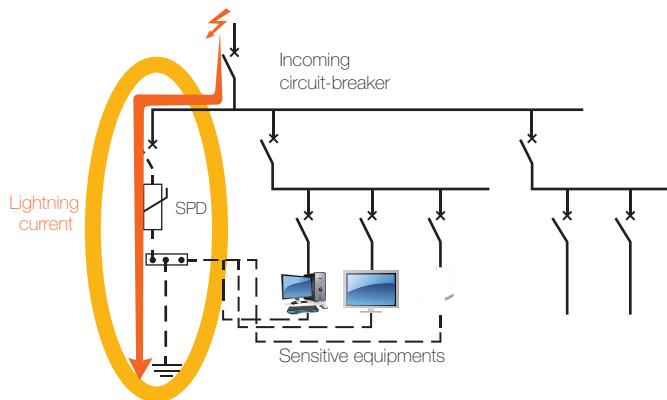
## Terminology Related to SPD

### General Operations of SPD

The Surge Protection Devices (SPD) is a device used to limit transitory overvoltage surges and to divert impulse currents away. They contain at least one non-linear component (such as varistor and/or GDT).

They are installed in parallel to the load:

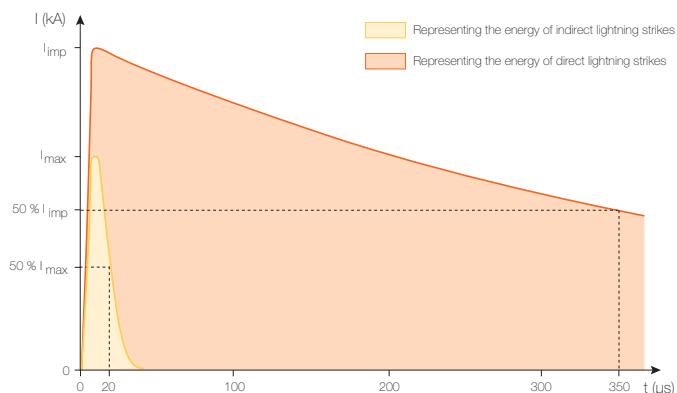
- during normal operation (in absence of surges), SPD shall have no influence on the system to which it is applied. SPD acts as an open circuit and maintains insulation between the line and earth.
- when surge occurs, the SPD lowers its impedance in some nanoseconds and diverts the surge current. SPD behaves as a closed circuit, the surge voltage is short circuited. The overvoltage is limited to an admissible value for the electrical equipment located downstream.
- after surge occurrence, the SPD recovers its high impedance and behaves as an open circuit.



### Discharge Current Waveform

Wave 8/20: Current impulse with a 8  $\mu$ s rising edge (from 10-90% of maximum value) and a time to decrease to half value of 20  $\mu$ s. It is used to represent indirect lightning strike. They are used to test Type-2 SPD.

Wave 10/350: Current impulse with a 10  $\mu$ s rising edge (from 10-90% of maximum value) and a time to decrease to half value of 350  $\mu$ s. It is used to represent direct lightning strike. They are used to test Type-1 SPD



Maximum Continuous Operating Voltage (Uc/Ucpv)- The maximum continuous operating voltage Uc is the maximum r.m.s/ dc voltage which may be applied continuously to the SPD. It has to take into account the network nominal voltage Un plus the possible tolerances.

Nominal discharge current (In)- This is the discharge current with 8/20  $\mu$ s waveform that the Class 2 SPD is able to divert (towards earth) at least 15 consecutive times, without deteriorating.

The higher it is, the longer the life of the SPD will be.

Impulse current (Iimp)- The impulse current (Iimp), used in Class I test is the maximum impulse 10/350  $\mu$ s current a surge protector can withstand without destruction. This test simulates the effect, of a direct lightning strike on an installation.

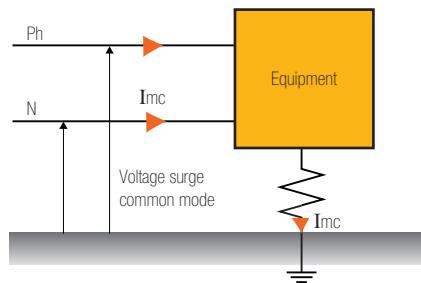
Maximum Discharge current (Imax)- The maximum discharge current (Imax), applicable to Type 2 SPD, is the maximum impulse current 8/20  $\mu$ s a surge protector can withstand without destruction.

The higher the Imax is, for the same In, the safer the SPD is working, far away from its performance limits.

Protection Level (Up)- The residual voltage that is measured across the terminal of the SPD when In is applied. Surge protection needs to be selected such that their voltage protection level (Up) is lower than the impulse withstand capability of the equipment to be protected.

Follow-through current (If)- Current supplied by the electrical supply grid, which flows through the SPD following an impulse current.

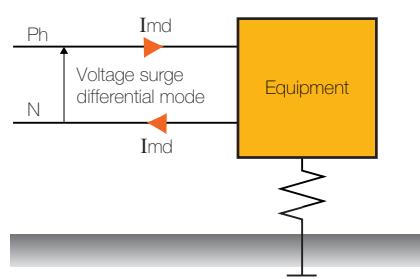
Follow current interrupting rating (Ifi): It is a parameter for spark-gaps and gas discharge tubes and does not concern varistors. Ifi is the rms-value of



the follow current, which can be interrupted by the SPD under Uc.

Common mode surge: Common mode voltage surges occur between the live parts and the earth: phase/earth or neutral/earth. They are especially dangerous for devices whose frame is earthed due to the risk of dielectric breakdown.

Differential mode surge: Differential mode voltage surges circulate between live conductors: Phase to phase or phase to neutral. They are especially dangerous for electronic equipment, sensitive computer equipment, etc.



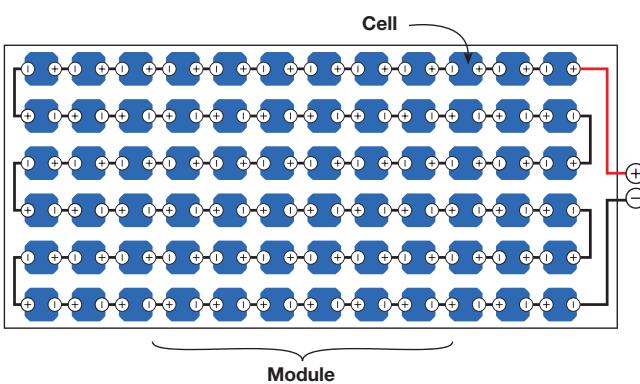
## PV System Architecture

A **photovoltaic cell** is the basic building block that converts solar radiation into electricity. The most common type of cell is made from silicon doped with minute quantities of boron, phosphorous, gallium, arsenic, or other materials. Each cell develops about 0.5V to 0.7V DC voltage and a current of  $30\text{mA/cm}^2$ . The maximum amperage of the cell is proportional to its surface area, and depends on the intensity of the light.

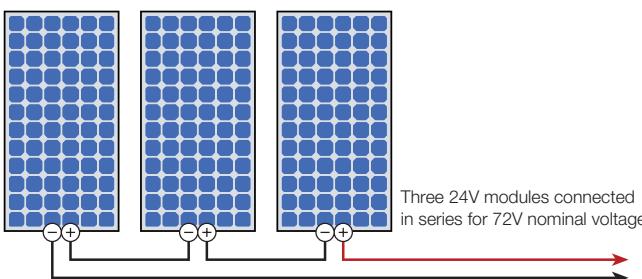


A **PV module** is a grouping of cells. For example, modules with 36 cells are quite common, producing 18 to 22 volts for a 12-volt nominal output. PV module is the smallest completely environmentally protected assembly of interconnected PV cells

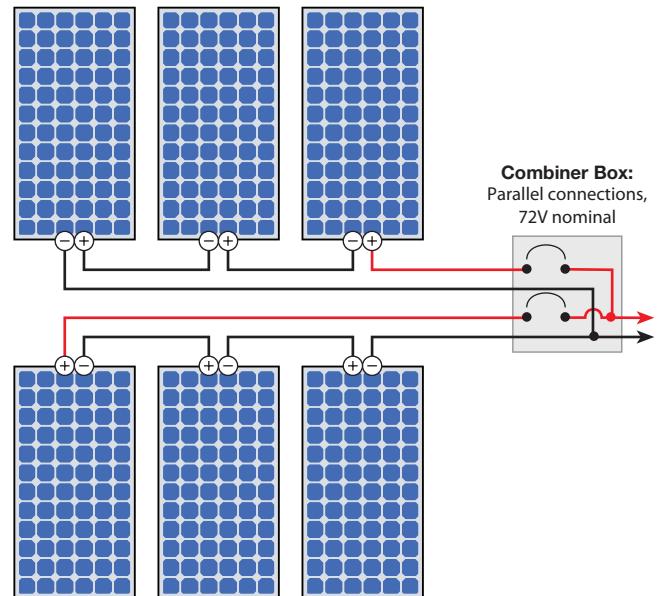
Several modules mechanically and electrically connected form a **PV panel**, that is a common structure which can be anchored to the ground or to a building



A **PV string** is a grouping of modules wired in series. A series string can then be used on its own or paralleled with other series strings, either to charge batteries or feed the utility grid.



A **PV array** is a group of strings connected in parallel to generate higher current and consequently higher power.



The electricity generated by the solar system is then fed into a power inverter (PV inverter) that converts and regulates the DC source into usable AC power. The AC power can then be used locally for specific remote equipment, back-up power in residential and commercial places or fed directly back into the power grid and used as environmentally clean energy.

# Certifications



(India)



(Holland)



(Europe)



Manufacturing plants compliant to ISO 9001: 2015 ; ISO 14001:2004 ; OHSAS 18001:2007

Accredited by national / international bodies – BIS, CPRI, DEKRA, INTERTEK, TUV, UL

IS/IEC 60898-1 / EN 60898-1  
IS 12640-1 : 2000 / IEC 61008-1 / EN 61008-1  
IS 12640-2 : 2001 / IEC 61009-1 / EN 61009-1  
IS/IEC 60947-3 / IEC 60947-3  
IEC 61643-11 / EN 50539-11

...and in the process of attaining other International certifications



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