

MINIATURE CIRCUIT BREAKERS



IEC / EN 60898-1
CE

Mounting Position : Free
Altitude : 2000m (max)
Relative Humidity : %50 (40°C), %90 (20°C)
Ambient Temperature : between -25°C and 60°C[⊕]
Pollution Degree : II
Protection Degree : IP20

IEC / EN 60947-2
CE

Mounting Position : Free
Altitude : 2000m (max)
Relative Humidity : %50 (40°C), %90 (20°C)
Ambient Temperature : between -25°C and 60°C[⊕]
Pollution Degree : II
Protection Degree : IP20

IEC / EN 60947-3
CE

Mounting Position : Free
Altitude : 2000m (max)
Relative Humidity : %50 (40°C), %90 (20°C)
Ambient Temperature : between -10°C and 60°C[⊕]
Pollution Degree : III
Protection Degree : IP20

IEC / EN 60947-4-1 IEC / EN 61095
CE

Mounting Position : Face Down
Altitude : 2000m (max)
Relative Humidity : %50 (40°C), %90 (55°C)
Ambient Temperature : between 25°C and 60°C[⊕]
Pollution Degree : III
Protection Degree : IP20

All these given information are general. We have always right to change them.

Miniature Circuit Breakers

FM4E - FM6E - FM10
0,5A ... 63A



FM6L - FM10L
80A ... 125A



FM10 DC
0,5A ... 63A



FM10L DC
80A ... 125A



Miniature Circuit Breakers Boxes



ATS with MCB



FIR (Impulse Relay)
16A



FMS Disconnectors
40A ... 100A

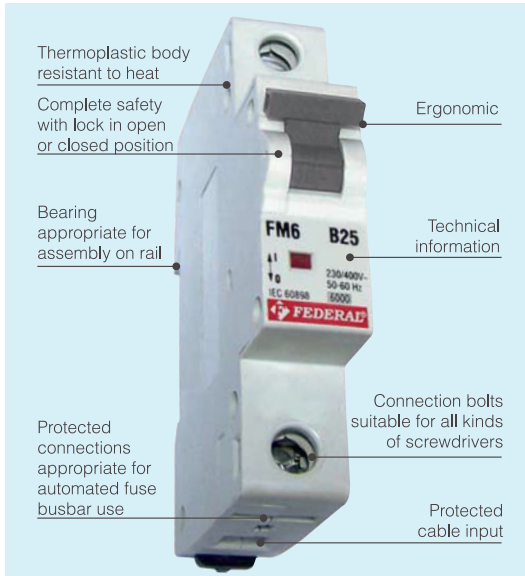


Installation Contactors

20A ... 63A



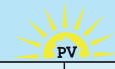
MINIATURE CIRCUIT BREAKERS



Federal miniature circuit breakers protect the electrical circuit they are connected to against over current and short circuits. They allow easy open-close of the circuit. Miniature circuit breakers are manufactured with 1, 2, 3, 4 poles and 1 phase + neutral, 3 phase + neutral from 6A to 125A in accordance **CE**. There are two separate types as B, C and D. In case of a short circuit, B types open the circuit at 3 or 5 times more than nominal current, C types open the circuit at 5 or 10 times more than the nominal current and D types open the circuit at 10 or 20 times more than the nominal current. Miniature circuit breakers with 2, 3, 4 poles disable the device they are connected to, thanks to their mechanisms in case of a failure in any phase.

B curve: Used in illumination of houses, plugs and control circuit
C / D curve: Used in inductive loads like transformer, several fluorescent lamps etc.

The device opening the current is enabled by lifting the lever in case of any failure. Lever-free opening mechanism shall open the current again as the failure continues. Federal miniature circuit breakers open the circuit in a very short time in case of a short circuit current are limited. It provides ease in assembly thanks to the desing of connection terminals, accidentally touches are eliminated. Federal miniature circuit breakers resist an ambient temperature of 55 °C and resist a relative humidity of 95%. 25mm cable can be connected to specially-designed cable inputs.

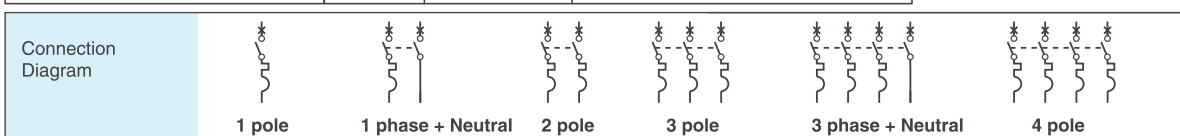


Type	FM4E	FM6E	FM10	FM6L	FM10L	FM10 DC	FM10L DC
Standard	IEC 60898-1			IEC 60947-2			
Rated Current - In	A	0,5-63	0,5-63	0,5-63	80-125	80-125	0,5-63
Number of Poles		1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Rated Insulation Voltage - Ui	V	630	630	630	630	630	630
Rated Impulse Withstand Voltage - Uimp	kV	6	6	6	6	6	6
Rated Operating Voltage	50-60 Hz (1p)	230/400	230/400	230/400	230	230	-
Ue	50-60 Hz (2p, 3p, 4p)	400	400	400	400	400	-
(V)	DC (1p)	60	60	60	60	60	250*
Rated Short - Circuit Breaking Capacity	kA	4,5	6	10	6	10,15***	10
Protection Characteristics	Thermal	In	In	In	In	In	In
	Magnetic**	B,C,D	B,C,D	B,C,D	8In	10In	10In
Mechanical Life	Operation	>20000					
Electrical Life	Operation	>4000					
Min-Max Connection Sections	mm ²	1-25	1-25	1-25	1-50	1-50	1-25
Min-Max Tightening Torque	Nm	2-3	2-3	2-3	3-5	3-5	2-3
Shunt Trip Release		-	-	□230 V	-	□230 V	-
Auxiliary Contact Block		-	-	□1NO+1NC	-	□1NO+1NC	-

□ : Upon request * : 2P: 500V, 3P: 750V, 4P: 1000V ** : B: 3-5In, C: 5-10In, D: 10-20In *** : 15kA / 230V

Rated current In (A)	Breaking capacity Ics (kA)	Order Codes
		Characteristic B / C / D
2-63	3	9EC-△033□-0D##
0,5-63	4,5	9ED-△043□-0D##
0,5-63	6	9E☆-△063□-0D##
0,5-63	10	9EE-△103□-0D##

△ : For type B (B), for type C (C), for type D (D)
 □ : Number of poles (1,2,3,4)
 ## : Fuse rated current (0,5...125)
 ☆ : G for FM6E or FM10E, D for FM6 or FM10.



*At DC voltage

- Overload protection (thermal) characteristic is same as AC voltage.
 - Short circuit protection (magnetic) characteristic is %40 higher than AC voltage.
- Circuit Breakers produced for AC system, work at DC 60V voltage per pole.

MINIATURE CIRCUIT BREAKERS

Temperature Effect in Automatic Fuses:

The thermal overload protection characteristics change due to the temperature of the automatic fuses. From the calibrated temperature it will trip earlier than its nominal value if it operates in a warmer environment. If you work in a cooler environment it opens later. Federal automatic fuses are calibrated to 30 ° C as standard. Different on request calibration can also be performed for ambient temperatures. The table below shows the calibrated automatic fuse according to 30 ° C operating currents are given for different ambient temperatures. 40 A calibrated to ambient temperature of 30 ° C the operating current of the fuse at 50 ° C is found on the table 36A.

In (A)	Compensation Factor According to Ambient Temperature (k) (Calibration Temperature 30°C)						
	10°C	20°C	30°C	40°C	50°C	55°C	60°C
0,5	0,6	0,5	0,5	0,5	0,5	0,4	0,4
1	1,1	1,1	1,0	1,0	0,9	0,9	0,9
2	2,2	2,1	2,0	1,9	1,8	1,8	1,7
3	3,3	3,2	3,0	2,9	2,7	2,6	2,6
4	4,4	4,2	4,0	3,8	3,6	3,5	3,4
6	6,6	6,3	6,0	5,7	5,4	5,3	5,1
10	11,0	10,5	10,0	9,5	9,0	8,8	8,5
16	17,6	16,8	16,0	15,2	14,4	14,0	13,6
20	22,0	21,0	20,0	19,0	18,0	17,5	17,0
25	27,5	26,3	25,0	23,8	22,5	21,9	21,3
32	35,2	33,6	32,0	30,4	28,8	28,0	27,2
40	44,0	42,0	40,0	38,0	36,0	35,0	34,0
50	55,0	52,5	50,0	47,5	45,0	43,8	42,5
63	69,3	66,2	63,0	59,9	56,7	55,1	53,6
80	88,0	84,0	80,0	76,0	72,0	70,0	68,0
100	110,0	105,0	100,0	95,0	90,0	87,5	85,0
125	137,5	131,3	125,0	118,8	112,5	109,4	106,3

Since a large number of auto fuses running side by side in a box will affect each other, it will fall even further. In this case, the rated current of the auto-fuse is multiplied by 0.8 to obtain the new rated current. For example, if the 25A automatic fuse runs side-by-side with many fuses in a 40 ° C environment, the current is found to be $23.8 \times 0.8 = 19 \text{ A}$.

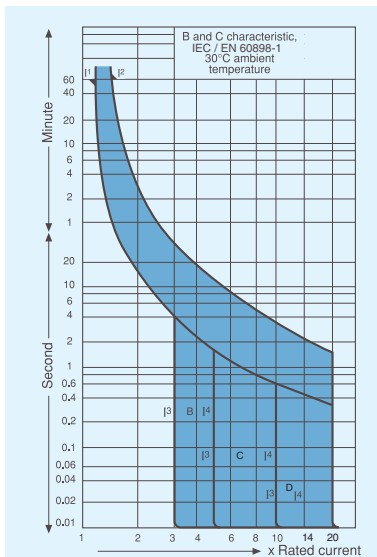


Fig-1 Current-Time Curve (FM3, FM6E In < 40A)

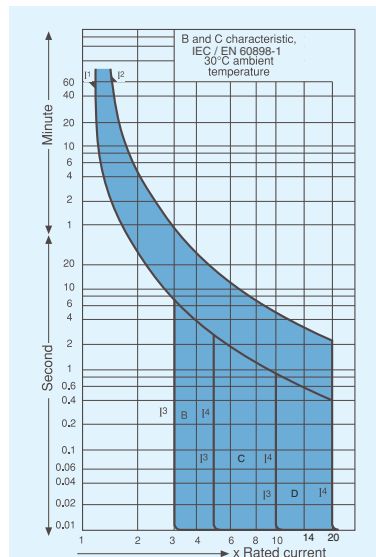


Fig-2 Current-Time Curve (FM3, FM6E In = 50A, 63A)

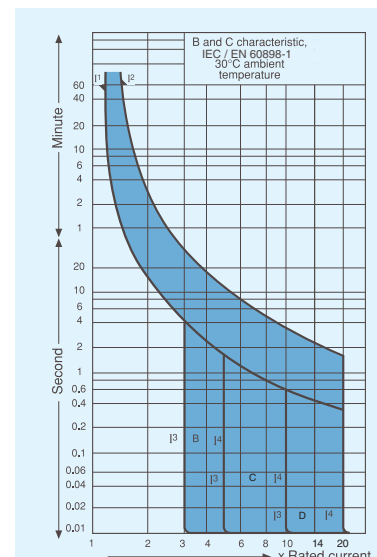


Fig-1 Current-Time Curve (FM6, FM10)

Characateristic	B	C	P
I1 (t > 1h)	1,13 x In	1,13 x In	1,13 x In
I2 (t < 1h)	1,45 x In	1,45 x In	1,45 x In
I3 (t > 0,1s)	3 x In	5 x In	10 x In
I4 (t < 0,1s)	5 x In	10 x In	20 x In

MINIATURE CIRCUIT BREAKERS

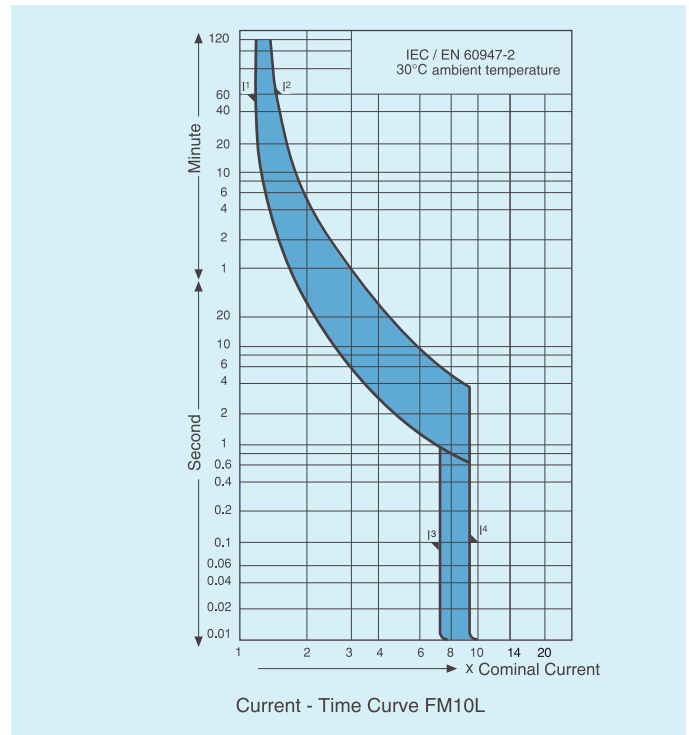






Miniature Circuit Breakers protect electrical circuits against overload and short-circuit current. They provide ON-OFF switching easily. 6,10 kA Federal Miniature Circuit Breaker is manufactured between the ranges 80A - 125A and 1, 2, 3, 4 poles. It is manufactured in accordance with IEC 60947-2 standard and CE norms. In the event of failure on any phase, 1, 2, 3, 4 poles circuit breakers obtain to not being put into use of device.

Technical Specifications::

Type	FM6L / FM10L	
Breaking capacity kA_{rms}	FM6L	400V 6kA /
	FM10L	230V 15kA - 400V 10kA
Rated current	A	80,100,125
Rated operating voltage - U_e	V	230/400
Rated insulation voltage - U_i	V	630
Rated impulse withstand voltage - U_{imp}	kV	6
Number of poles		1,2,3,4
Frequency	Hz	50 - 60
Mechanical life	operation	>20.000
Electrical life	operation	>4.000
Min. - max. connection section	mm ²	1 ... 50
Min. - max. clamping torque	Nm	3 - 5
Standard		IEC / EN 60947-2

	Current
I_1 ($t \geq 2h$)	$1,05 I_n$
I_2 ($t < 2h$)	$1,3 I_n$
I_3 ($t > 0,2s$)	$8 \times 0,8 \times I_n$
I_4 ($t < 0,2s$)	$8 \times 1,2 \times I_n$



FM10L	Rated current I_n (A)	Breaking capacity I_{cs} (kA)	Order codes
	80	6	9EF-C033 □-0D80
	100	6	9EF-C033 □-D100
	125	6	9EF-C033 □-D125
	80	10	9EF-C103 □-0D80
	100	10	9EF-C103 □-D100
	125	10	9EF-C103 □-D125

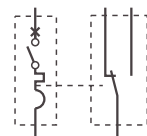
For FM6L-FM10L, desired number of poles is written in □ part (1,2,3,4)

Accessories

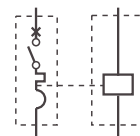


Type	Order Code
Shunt Trip - FM6 - FM10 - FM10L-AB	AC 230V 9EF-BA□00-D220
Auxiliary Contact - FM6 - FM10 - FM10L-YK	1NO / 1NC 9EF-A□11-D000

□ : 1 for FM6-FM10; 0 for FM10L.



Auxiliary Contact



Shunt Trip

MINIATURE CIRCUIT BREAKERS BOXES - ATS with MCB

ATS with MCB



Technical Features:

Standard	TS EN 60947-6-1
Circuit Breaker Rated Current (In)	0,5A ~ 125A
Pole number	1, 2, 3, 4
Control Voltage	140 - 270V
Auxiliary Control Voltage	10 - 15V DC
Generator Start-Stop Time Adjustment	0,5 - 90 seconds (adjustable)
System Voltage	415V
Mechanical Life	10.000
Operating Temperature	-20 ~ +60°C
Protection Class	IP20
Pollution Level	III / 2

Product Types and Amps

FM6 / 6kA	0,5A ... 63A
FM10 / 10kA	0,5A ... 63A
FM10L / 10kA	80A ... 125A

MINIATURE CIRCUIT BREAKERS BOXES

General Technical Specifications

- Material: Thermoplastic
- Standard color: White
- Recommended assembly temperature: before -15°C and + 60°C
- Field of use: Flush mounted and surface mounted installations

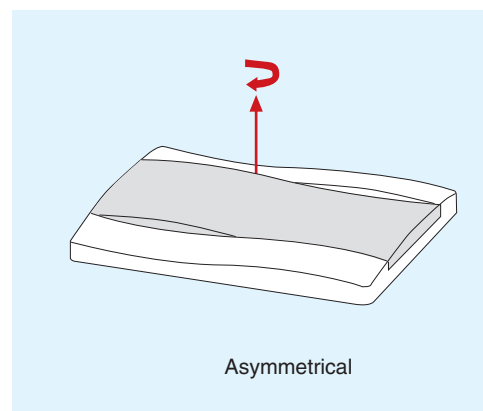
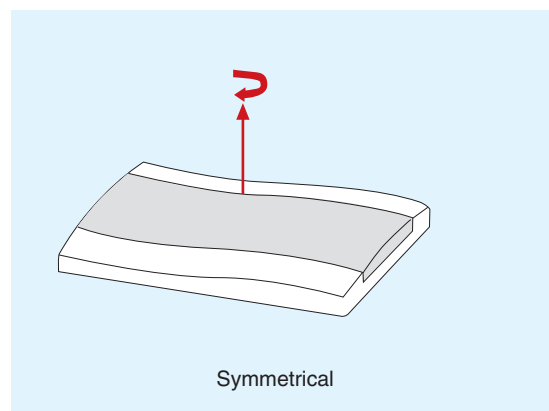
-Circuit labels, ground busbars, automated assembly rail are present.

- Model of 1, 2, 3, 4, 6, 8, 9, 12, 18, 24
- Cover opening towards right or left.
- High-strength cover.
- Opening direction of covers may be reversed to right or left.



- 1, 2, 3, 4, 6, 8 ways
- Surface mounted
- Sealable cover

- 9, 12, 18, 24 ways
- Flush mounted and surface mounted



Symmetrical and asymmetrical used cover

IMPULSE RELAY - DISCONNECTORS

IMPULSE RELAY



Impulse Current Breakers are used to control lightning from two or more points. Traditionally, the need for controlling lightning circuits in larger areas from various points was met by using vavien-key system. Limited number of keys, high material and installation costs creates a need for more economical and comfortable solutions. The product were developed to overcome this deficiency and presented to the end-users. According to the changing position principle of contacts when switched as the number of connection terminals will be the same regardless of the number of keys, 80% of the time during cable pulling and 50% savings in cable length is achieved.

Specifications of Impulse Current Breaker:

- 24V-48V-230V coil voltage
- The modularity
- Rail mounting feature
- Auxiliary contacts can be added

Connection Capacity:

- Rigid Conductor 10mm²
- Flexible Conductor 6mm²

Description:

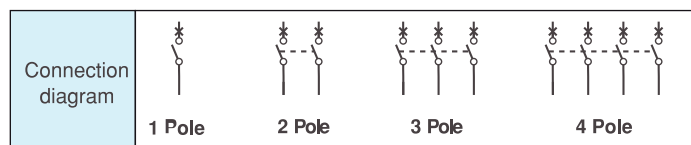
For control of lighting circuits in private buildings, small industry buildings. Latching relays operate when pulsed by a signal voltage. The pulse can be provided via a push button or switch. The first impulse sets the relay into its set (opposite) state, the next impulse returns it to its reset (original) state.

Type	Coil VAC 50 / 60 Hz	Coil VDC	Power Circuit AC1	Order Code
1NO	230	110	16A-250V	9DA-0001-0000
2NO	230	110	16A-250V	9DA-0022-0000
1NC+1NO	230	110	16A-250V	9DA-0011-0000

DISCONNECTORS



On-off switches without thermal and magnetic protection feature are called disconnectors. Federal switches are manufactured in accordance with TS EN 60947-3 standard and **CE** norms from 40A to 100A with 1, 2, 3 and 4 poles. Thanks to their 2, 3 and 4-pole switch lever mechanisms, they break the system simultaneously. They can be used safely with distribution and control elements.



Technical Characteristics:

Number of poles	1,2,3,4	Short-time withstand current	A/1s	12xIn
Utilization class	AC-22A	Short circuit making capacity	A	20xIn
Rated current In	A 40,63,80,100	Mechanical life	Operation	20.000
Rated insulation voltage Ui	V 750 V	Electrical life	Operation	4.000
Rated impulse withstand voltage - Uimp Ith	kV 6	Min. - max. connection sections	mm ²	6-35
Rated frequency	Hz 50/60	Min. - max. clamping torque	Nm	2-3
Standard	IEC / EN 60947-3			

Order Codes :

Rated Current In (A)	1 Pole	2 Pole	3 Pole	4 Pole
40	9RA-00201-0040	9RA-00202-0040	9RA-00203-0040	9RA-00204-0040
63	9RA-00201-0063	9RA-00202-0063	9RA-00203-0063	9RA-00204-0063
80	9RA-00201-0080	9RA-00202-0080	9RA-00203-0080	9RA-00204-0080
100	9RB-00201-0100	9RB-00202-0100	9RB-00203-0100	9RB-00204-0100
Connection diagram				

INSTALLATION CONTACTORS

Installation Contactors

Area of Usage

- Small engines
- At residential and office, at the power control of the last distribution circuit.
- Lighting
- Heating, pumps and furnaces
- Water heating for home using



Impact voltages and currents, which occur in illumination applications from time to time, may force the contactor.

It has been classified in terms of type behavior and closing-breaking operation for selection. While contactor is selected for illumination circuits, important factors are bulb type, connection, whether there is compensation or not, start-up and operating current and power factor. While the contactor is loaded up to 15 times of the lamp rated current during closing in filament lamps, breaking current is equal to rated current.

Compensation is very important in discharge and florescent lamps. In high pressure mercury vapor lamps, a current occurs at two times of the operating current during pre-heating period (approximately 5 minutes). This regime period is about 10 minutes in halogen lamps and sodium vapor lamps.

Technical Features:

Type	Using Category	Insulation Voltage Ui (V)	Operating Voltage Ue (V~)	Rated of Heat Current (A)	Ie (A)	Control Power (kW)
FCR2020	AC-1,AC-7a	500	230	20	20	3,6
FCR4040	AC-1,AC-7a	500	400	40	40	22
FCR6340	AC-1,AC-7a	500	400	63	63	34

Type	Number of Poles	Ie (A) AC1 / AC7A	Operating Voltage (AC) V	Contact Type	Order Code
 2 poles	2	20	230	2NA	9DT-K3202-0020
 4 poles	4	40	400	4NA	9DT-K3404-0040
		63	400	4NA	9DT-K3404-0063

Effect of ambient temperature to rated operating current of installation contactors:

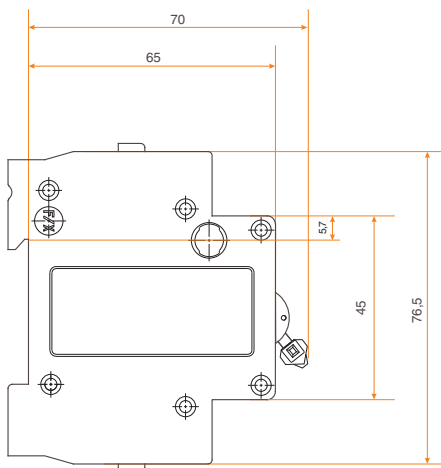
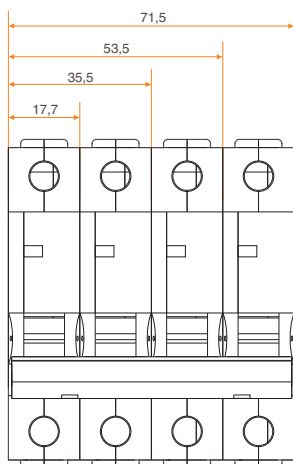
Rated Current (A)	40°	50°	60°	70°
Ie=20	20A	18A	16A	14A
Ie=40	40A	38A	36A	32A
Ie=63	63A	57A	50A	46A

Number of Lamp which can be controlled by installation contactors:

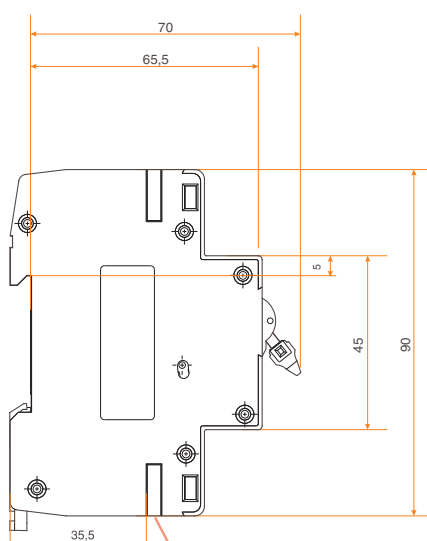
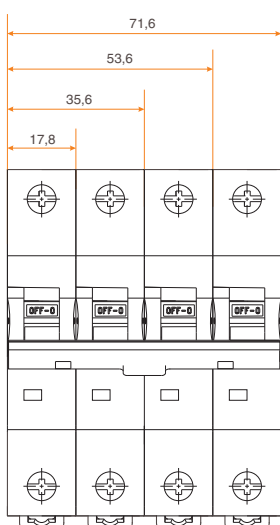
Tungsten Filamanlı ve Halojen Ampuller 230V									
Güç	40W	60W	75W	100W	150W	200W	300W	500W	1000W
20A	45	35	29	29	14	12	8	5	2
40A	118	87	72	72	36	26	18	11	7
63A	150	112	95	95	47	34	25	15	8

MINIATURE CIRCUIT BREAKERS

FM3

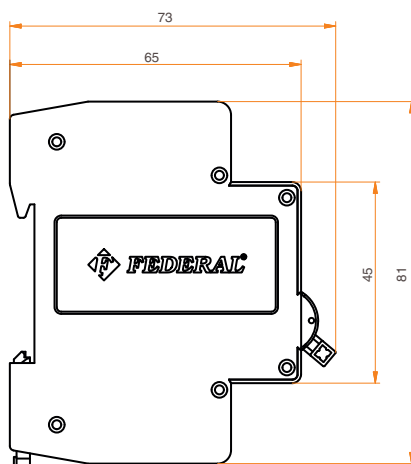
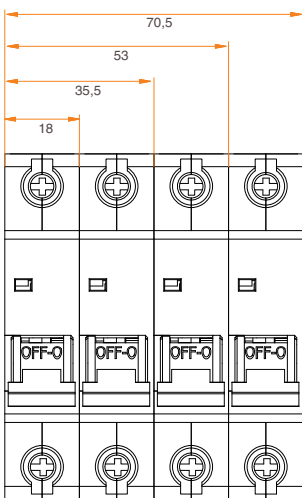


FM6 - FM10



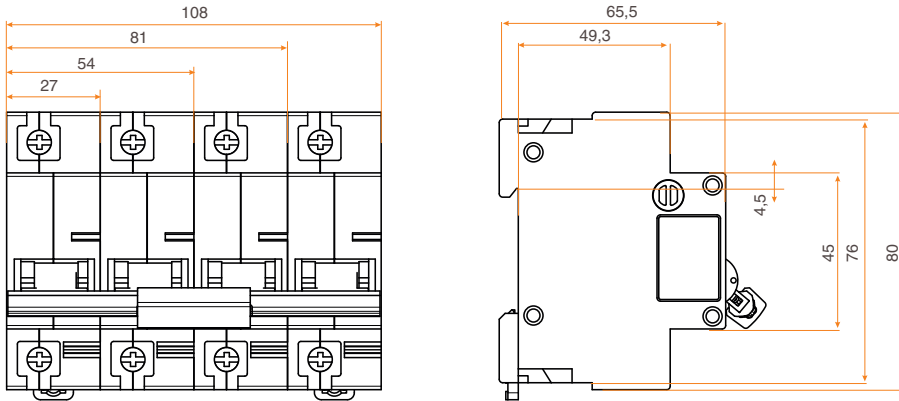
Federal Electric FM6, FM10 miniature circuit breakers may be used with FK2, FK4 residual current circuit breakers, thanks to automat busbar.

FM6E - FM10E

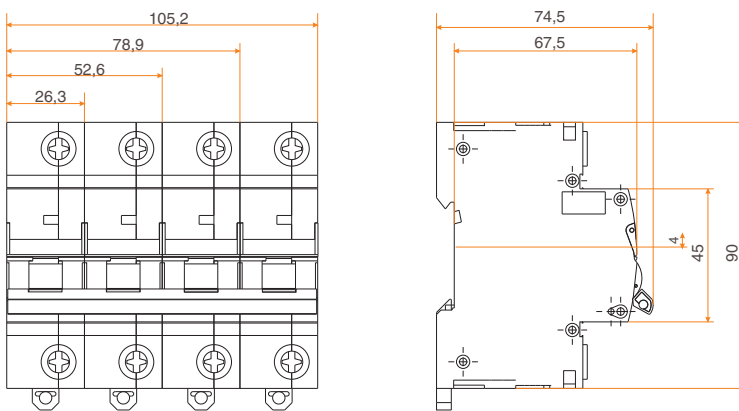


MINIATURE CIRCUIT BREAKERS MINIATURE CIRCUIT BREAKERS BOXES

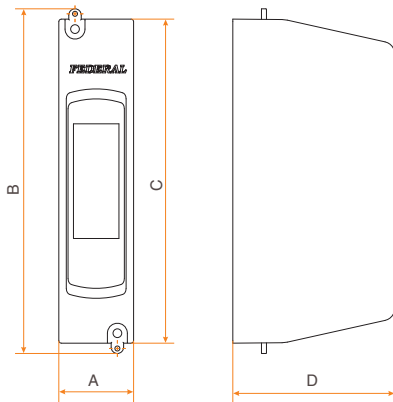
FM6L



FM10L

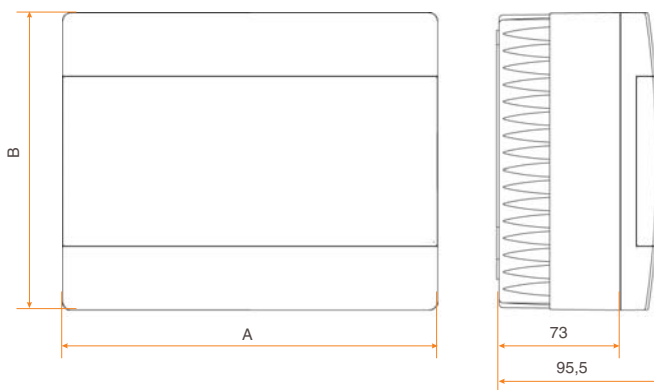


Surface Mounted Series



MODEL	A	B	C	D
FEB1 - FEB2	50,5	133	127	60,65
FEB3 - FEB4	86,60	133	127	60,65
FEB6 - FEB8	180	170	160	63

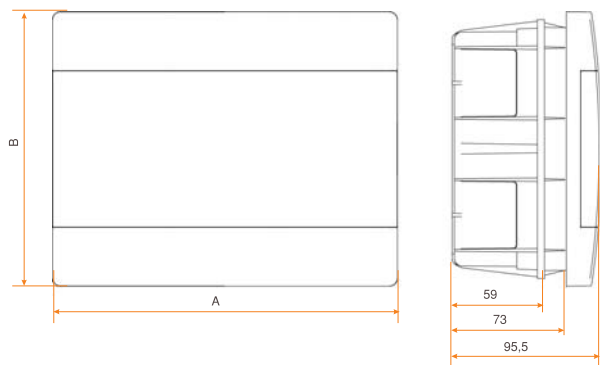
Surface Mounted Series



MODEL	A	B
FVK SA 9	220	175
FVK SA 12	274	210
FVK SA 18	220	290
FVK SA 24	274	335

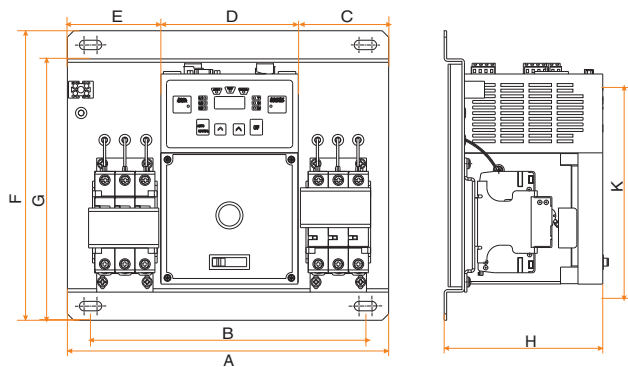
MINIATURE CIRCUIT BREAKERS BOXES MINIATURE CIRCUIT BREAKERS

Flush Mounted Series



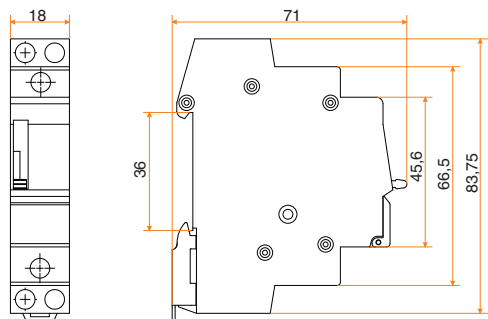
MODEL	A	B
FVK SU 9	220	175
FVK SU 12	274	210
FVK SU 18	220	290
FVK SU 24	274	335

ATS With Miniature Circuit Breakers

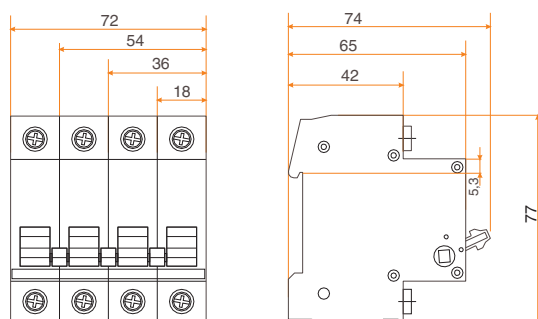


Type	Dimensions									Ampere Ranges
	A	B	C	D	E	F	G	H	K	
FM6	286	244	80	122	83	257	232	141	187	1A ... 63A
FM10	286	244	80	122	83	257	232	141	187	1A ... 63A
FM10L	390	324	119	122	149	265	242	142	187	80A ... 125A

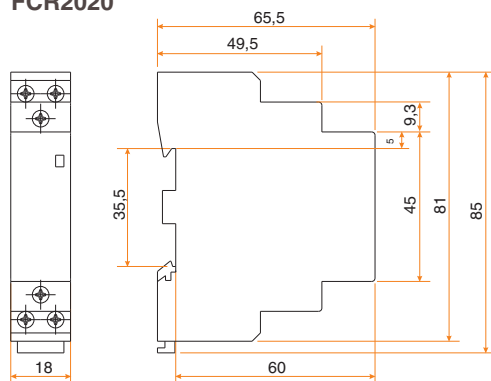
FIR



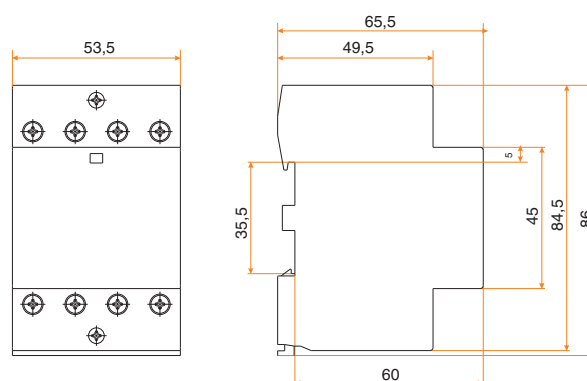
FMS



FCR2020



FCR4040 / FCR6340



INSTALLATION CONTACTORS



Installation Contactors



FCR2020



FCR4040



FCR6340

IEC / EN 60947-4-1
IEC / EN 61095
CE

Mounting Position : Front face downwards
Altitude : 2000 m (max)
Relative Humidity : %50 (40°C) , %90 (55°C)
Ambient Temperature : between -25°C and +60°C
Pollution Degree : III

All these given information are general. We have always right to change them.

INSTALLATION CONTACTORS

Area of Usage

- Small engines
- At residential and office, at the power control of the last distribution circuit.
- Lighting
- Heating, pumps and furnaces
- Water heating for home using



Impact voltages and currents, which occur in illumination applications from time to time, may force the contactor. It has been classified in terms of type

behavior and closing-breaking operation for selection. While contactor is selected for illumination circuits, important factors are bulb type, connection, whether there is compensation or not, start-up and operating current and power factor. While the contactor is loaded up to 15 times of the lamp rated current during closing in filament lamps, breaking current is equal to rated current. Compensation is very important in discharge and florescent

lamps. In high pressure mercury vapor lamps, a current occurs at two times of the operating current during pre-heating period (approximately 5 minutes). This regime period is about 10 minutes in halogen lamps and sodium vapor lamps.

Technical Features:

Type	Using Category	Insulation Voltage Ui (V)	Operating Voltage Ue (V~)	Rated of Heat Current (A)	Ie (A)	Control Power (kW)
FCR2020	AC-1,AC-7a	500	230	20	20	3,6
FCR4040	AC-1,AC-7a	500	400	40	40	22
FCR6340	AC-1,AC-7a	500	400	63	63	34

Type	Number of Poles	Ie (A) AC1 / AC7A	Operating Voltage (AC) V	Contact Type	Order Code
 2 poles	2	20	230	2NO	9DT-K3202-0020
 4 poles	4	40	400	4NO	9DT-K3404-0040
		63	400	4NO	9DT-K3404-0063

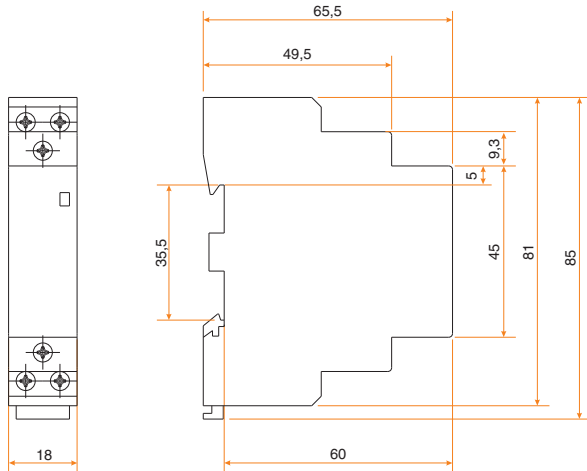
Effect of ambient temperature to rated operating current of installation contactors:

Rated Current (A)	40°	50°	60°	70°
Ie=20	20A	18A	16A	14A
Ie=40	40A	38A	36A	32A
Ie=63	63A	57A	50A	46A

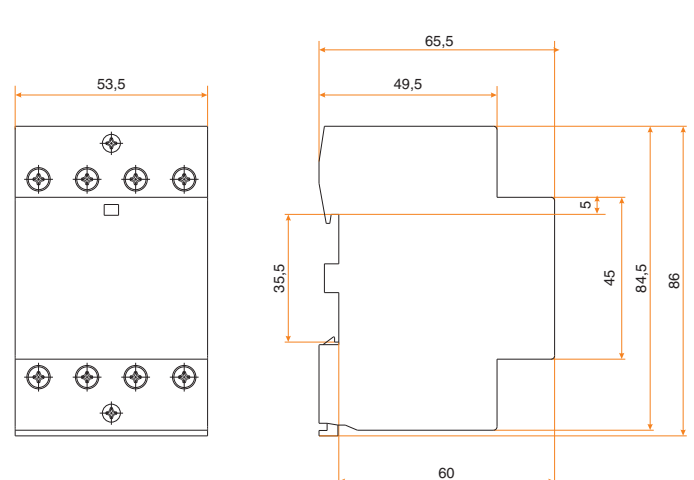
Number of Lamp which can be controlled by installation contactors:

Tungsten Filament and Halogen Lamps 230V									
Power	40W	60W	75W	100W	150W	200W	300W	500W	1000W
20A	45	35	29	29	14	12	8	5	2
40A	118	87	72	72	36	26	18	11	7
63A	150	112	95	95	47	34	25	15	8

FCR2020



FCR4040 / FCR6340



SURGE PROTECTIVE DEVICE



Surge Protective Device



FSPD-B100



FSPD-BC25



FSPD-C40
FSPD-C40 DC



FSPD-D20

SURGE PROTECTIVE DEVICE

Devices which prevent the effect of damage of high-voltage fluctuation which has resulted from the reasons as High-Voltage Line Faults, lightning and breaker open occur in power transmission lines or shortly surge protection device calls protection element which discharge over voltage into the ground which occur in power transmission lines. Surge protection device does not allow current passage into the ground in normal case. When over-voltage comes the surge protection device discharges coming high-voltage to the ground as turning on swiftly. It returns normal operating again when effect of over-voltage is out. In normal operating surge protection device is a circuit element at open position.

Types of surge protection device

B class (Class 1- Type 1) If there is a lightning rod application in your or 50m around of your building type 1 surge protection device selection should be done. Type 1 surge protection device is used in nearest enter point of power supply line in low voltage installation to the building. It's protection surge protection device class against lightning for Low voltage facilities. It should be used before electrical meter.

C class (Class 2- Type 2) "Type 2" surge protection device should be additionally placed in each distribution board at wiring against internal sourced over voltages. This surge protection device is the limiter of over voltage at low voltage facilities. It uses after electrical meter.

D class (Class 3- Type 3) This surge protection device is the limiter of over voltage at low voltage facilities. It's using for protection of electronic devices. Type 3 application should be made for sensitive electronic devices which we want to protect as Computer, copiers, television, telecommunication systems if these devices are over 30m far away from distribution board which contain type 2 surge protection device

B+C class (Class 1+2 - Type 1+2) It's a combination of Type 1 and Type 2 surge protection devices. It is advised to use in case of over

distance of 10 meter between main distribution panels and sub distribution panels.

As a summary, if there is lightning rod application in the building, Type 1 and Type 2 surge protection devices at the enter of the building, Type 2 surge protection device in sub distribution panels and if the distance is over than 30m between sensitive loads and distribution panel then type 3 surge protection device protection should make at the end-point of the distribution.

Iimp: Maximum impulse current for Type 1 surge protection devices.

Imax: Maximum impulse current for Type 2 surge protection devices.

In: Nominal discharge current for Type 1 and Type 2 surge protection devices.

Up: Maximum protection voltage. Voltage rates between terminals of surge protection device at the moment of carrying nominal discharge current into the ground by surge protection device. It means If a protection voltage of surge protection device is lower the protection of it will be higher.

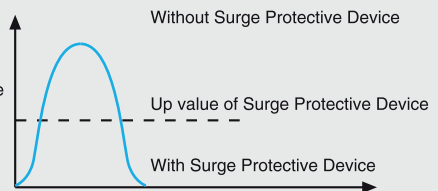
Uc: Sustained operating voltage. It is sustained maximum voltage rating which can be applied to surge protection device

Varistor technology inside the Surge Protective Device

There are thousand of zinc oxide particles inside a Surge Protective Device. When there is no over voltage these particles provide a full resistance. (No current flows except streak of lightning). In the event of over voltage these particles unite and compose lots of connection so that they provide a way for the current. The stronger the over voltage is, the lower resistance of particles gets. The name of "varistor" comes from this.

Working principle of Varistor

Varistor inside the installation including surge protective device limits over voltage at Up value



Selectin of Surge Protective Device

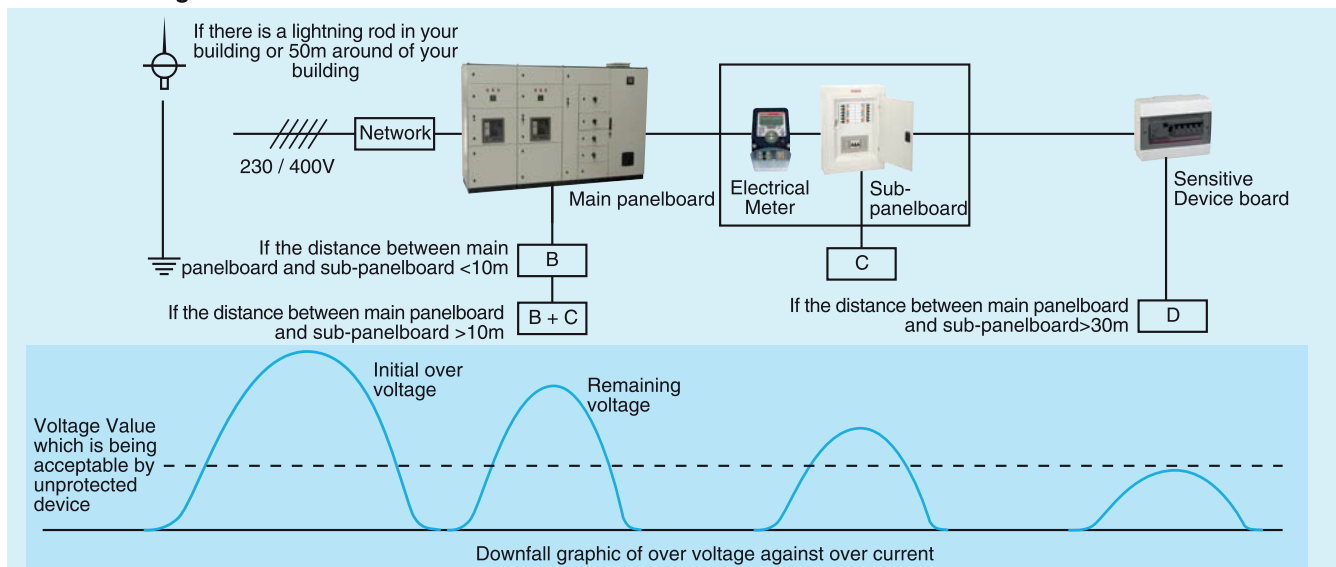


Fig 1:

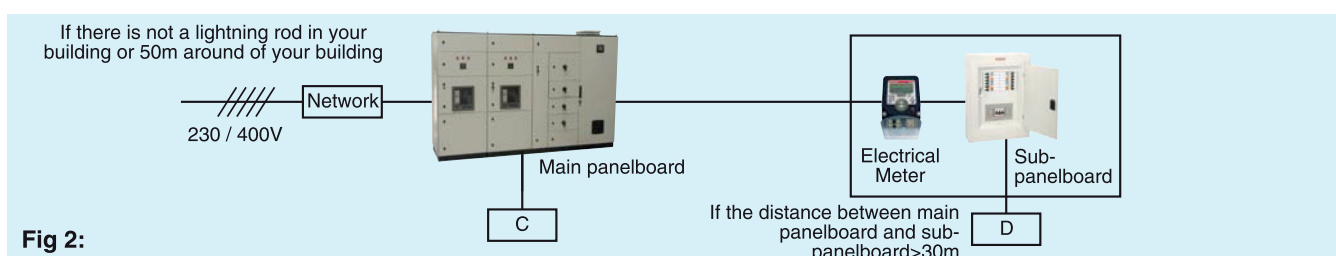


Fig 2:

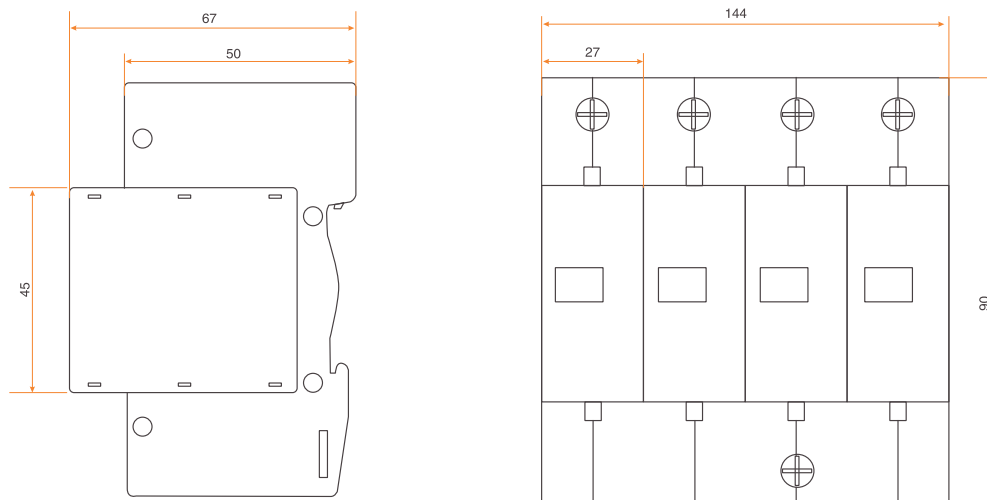
SURGE PROTECTIVE DEVICE



Type	FSPD-B50	FSPD-BC25	FSPD-C40	FSPD-D20	FSPD-C40-DC
Maximum continuous operating voltage U_c	V 275 AC	300 AC	440AC	440 AC	500/800/1000 DC
Voltage protection level U_p	kV 2	1,2	2	1,6	1,8/2,6/3,8
Lighting impulse current (10/350 μ s) I_{imp}	kA 50	25	-	-	-
Charge Q	As 25	12,5	-	-	-
Specific energy W/R	kJ/Ω 625	156	-	-	-
Max. discharge current (8 / 20 μ s) I_{max}	kA -	-	40	20	40
Nominal discharge current (8 / 20 μ s) I_n	kA 100	25	20	10	20
Response time t_A	ns <100	<25	<25	<25	<25
Pole	3P+N	3P+N	1P+N, 3P+N	1P+N	1P+N
The cross section (L/N)	mm^2 16-25	16-25	10-16	6	10-16
The cross section (PE)	mm^2 25-35	25-35	10-25	10	10-25
Fuse or switch	A 100	100	32	25	32
Operating environment	-40 ~ +85 °C				
Relative humidity (25 °C)	≤95%				
For mounting On	DIN rail 35mm				
Material of outer covering	Fiber glass reinforced plastic				
Test standard	IEC 61643-11				

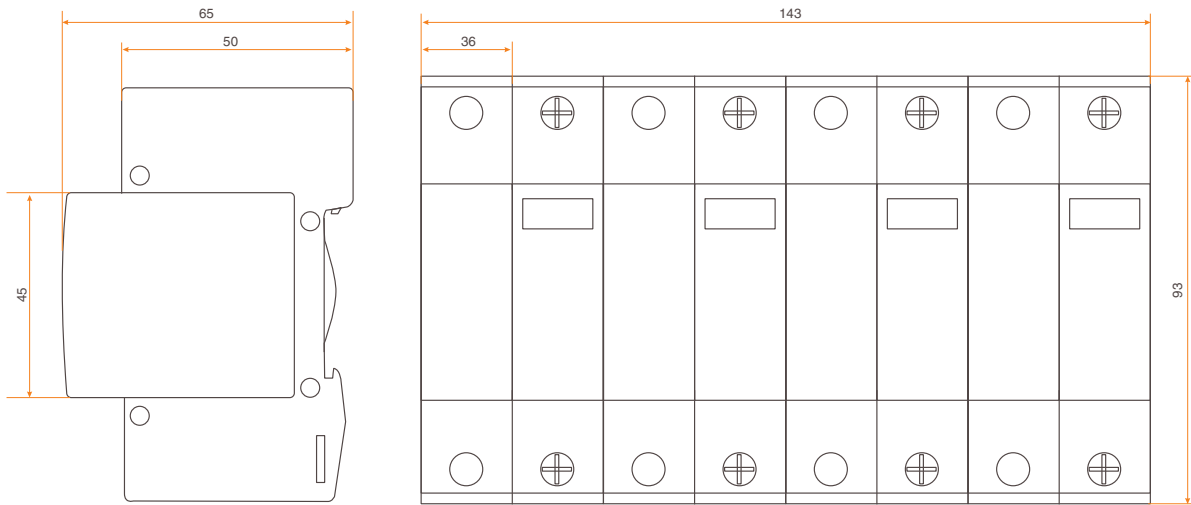
Technical Drawings

FSPD-B50

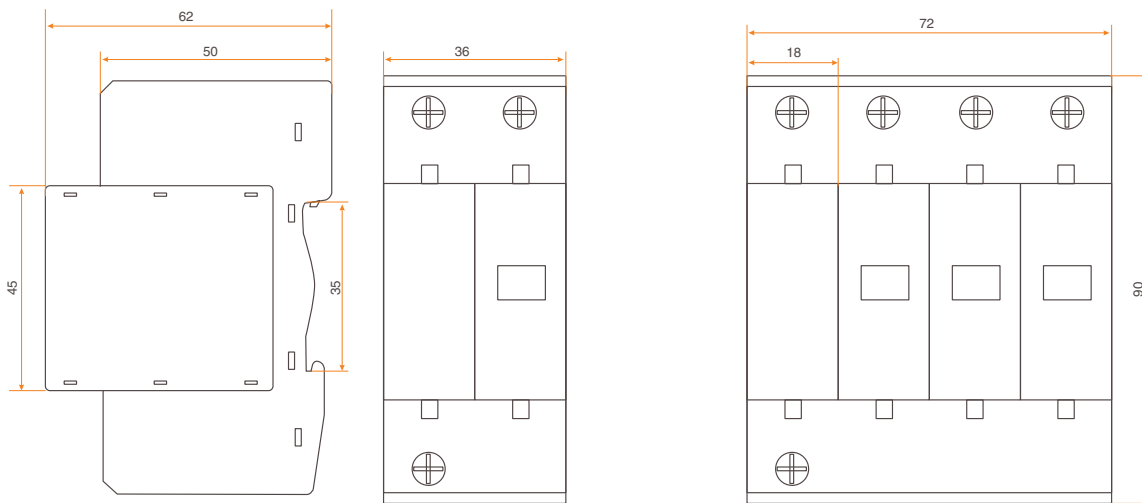


SURGE PROTECTIVE DEVICE

FSPD-BC25



FSPD-C



FSPD-D20

