



*“ All Over the World ”*

[www.federal.com.tr](http://www.federal.com.tr)



**RoHS**  
COMPLIANT



ASTA



# Low Voltage Protection, Control and Measurement Devices

## 4000 KINDS OF LOW-VOLTAGE PRODUCTS AT “FEDERAL”

Federal Elektrik has become one of the world's leader Low-Voltage Switchgear Equipment manufacturer.

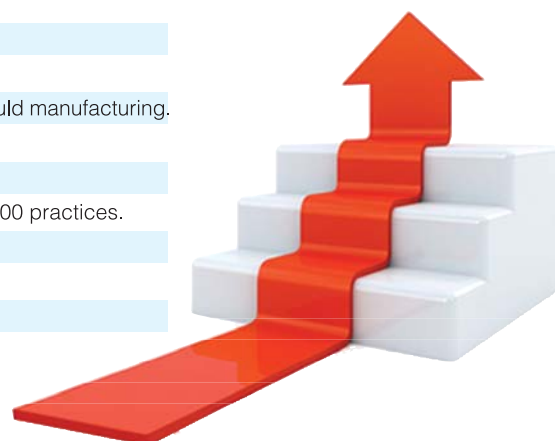
4000 kinds of products is being manufactured at the factory; within the frame of globally approved ISO 9001:2015 quality management system.

Quality of its products certified by number of world's most famous laboratories such as ASTA, IPH, KERI, IHP, BÜSTYAL, ANAB, NSF, INTERTEK, TSE, ROHS, CE certificates.



## HISTORY










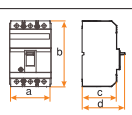
- 2018 Government approved and supported R & D Centre established.
- 2017 Federal Academy established for entry-level youngsters.
- 2016 4,000 types of products have been reached in the Low Voltage range.
- 2015 Distribution network reached to 50 countries.
- 2014 İstanbul Foreign Trade Office was established.
- 2011 3,250 types of products have been reach in the Low Voltage range.
- 2010 Type Test Laboratory for Gas Meter established.
- 2008 Mass production of G4 type Natura Gas Meter have begun after being designed in the company.
- 2008 Accepted as a "Recognized Brand" world-wide.
- 2007 1100 people have been employed throughout the group.
- 2006 Low Voltage product line have been completed by the Federal R&D team.
- 2005 Federal Group have invested in sockets, electronic ballasts, automotive and ornamental plants.
- 2004 "Federal Electric Egypt" factory have started production in Egypt.
- 2002 İstanbul Sales Office for domestic market established.
- 1999 Federal Electric established a new 25,000sqm factory.
- 1999 International Low Voltage Type Test laboratory was established.
- 1998 Marble factory investment completed.
- 1996 Unigraphics 3D solid modeling have begun to be used in product design and mould manufacturing.
- 1996 FEDERAL ERP software launched.
- 1994 Distribution in the International Market launched.
- 1994 Federal Electric received the Quality Award in Belgium for having the best ISO9000 practices.
- 1992 Mass production have begun.
- 1990 The first domestic design compact type circuit breaker was produced.
- 1990 Federal Electric Investment & Trade Co. was established.



# CONTENTS

Molded Case Circuit Breakers	01
Air Type Circuit Breakers	05
Automatic Transfer Switches	07
Miniature Circuit Breakers	08
Residual Current Circuit Breakers	09
Residual Current Circuit Breakers With Overcurrent Protection (RCBO)	10
Isolators	10
Impulse Relays	10
Plastic Boxes	10
Surge Protective Devices	11
Motor Protection Switches	12
Thermal Overload Relays	12
Contactors	13
High Current Contactors	16
Power Capacitors	17
Harmonic Filters / Shunt Reactors	17
Current Transformers	18
Analogue / Digital Measurement Devices	19
Cam Switches	19
Fuse and Base	20
Fuse Switch Disconnectors / Fuse Rail	23
Load Break Switches With and Without Fuses	29
Fiber Glass Reinforced Polyester Cabinets	34
EasyPan Distribution Boards	34
Polyester Floor - Standing Enclosures	34
EasyPan Ready Busbar Systems	35
Modular Main Distribution Panel Boards	35
Relays	35
Plugs & Sockets	36
Combination Boxes	38
Signal Lamps	39
Cable Lugs	39
Insulators	39
Gas Meters	40
Electronic Ballasts	40

**THERMAL-MAGNETIC CIRCUIT BREAKERS (IEC / EN 60947-2)**

																		
Type			F01		F02		F12/N			F12R (ELCB)			F31/N		F32/N		F33/N	
Rated current - In			A		16 - 225		16 - 160			16 - 160			16 - 250					
Number of poles					1		3 / 4 ⑤			4⑤			3 / 4 ⑤					
Rated insulation voltage - Ui 50-60 Hz			V		800		800			800			800					
Rated impulse withstand voltage - Uimp			kV		8		8			8			8					
Rated ultimate short - circuit breaking capacity - Icu ①																		
(a.c.) 50-60 Hz 220/240 V (kA rms)			35		65		21 25 35			35			65 85		100			
(a.c.) 50-60 Hz 380/415 V (kA rms)			12		14		15 18 25			25			35 50		70			
(a.c.) 50-60 Hz 440 V (kA rms)			-		-		12 14 20			20			25 32		40			
(a.c.) 50-60 Hz 500 V (kA rms)			-		-		7 9 12			12			18 22		25			
(a.c.) 50-60 Hz 690 V (kA rms)			-		-		5 6 8			8			12 13		14			
DC (2p) 690 V② (kA rms)			10		10		8 10 15			15			22 22		22			
Rated short circuit breaking capacity - Ics 415V~ (kA rms)			%100				%75 %75 %100			%75			%100					
Breaking duration (in short circuit)			ms		<7		<10			<10			<7					
Category (EN / IEC 60947-2)			A				A			A			A					
③ Trip Mechanism & Protection Characteristics	Thermal - Magnetic	Thermal Fixed	In				□			□			□					
		Thermal Adjusted	-				(0,8-1)In			(0,8-1)In			(0,7-1)In					
		Magnetic Fixed	≤63A:10In (min 300A) >63A: 8In (min 1000 A)				8In (min 600A)⑦			8In (min 600A)⑦			≤63A:10In (min 300A) >63A: 8In (min 1000A)					
		Magnetic Adjusted	-				-			-			□ ≥80A: (5-10) In ④					
	Electronic	Long time delay	-				-			-			-					
		Short time delay	-				-			-			-					
		Instantaneous	-				-			-			-					
Residual current threshold (only for F12R-F31R) mA			-				-			30 - 100 - 300			-					
Residual current time delay (only for F12R-F31R) ms			-				-			50 - 150 - 300			-					
Current limiting																		
Mechanical life Operation			15.000				15.000			15.000			15.000					
Electrical life Operation			3.000				5.000			3.000			5.000					
Weight kg			0,85				1 / 1,5			1,7			2,3 / 3,1					
Min - Max connection sections mm²			2,5 - 95				2,5 - 70			2,5 - 70			2,5 - 120					
Minimum - maximum tightening torque Nm			7 - 10				4 - 6			4 - 6			7 - 10					
Undervoltage release			-				-			□			□					
Shunt trip release			-				□			□			□					
Auxiliary contact block			-				□			□			□					
Motor control mechanism			-				-			-			□					
Extended rotary handle			-				-			-			□					
Lock Mechanism with key			-				□			-			□					
Extension bar			□				□			□			□					
Terminal cover			-				□			□			□					
Trip Contact			-				□			□			□					
Inverser (mechanical) lock			-				-			-			□					
Phase Barrier			-				□			□			□					
Extension handle			-				-			-			-					
			a (mm)	40				90 / 120			120			106 / 140				
			b (mm)	169				130 / 157			157			165 / 204				
			c (mm)	90				71			71			91				
			d (mm)	109				92			92			126				

•  standard,  upon request.

• ① Icu: O-t-CO test (O: Open maneuver, CO : Close - Open maneuver, t : Waiting duration)

• ② For serial connected two poles of the breaker.

• ③ See technical characteristic tables on our web site, for products with value.

• ④ Only for 3 pole (optional) circuit breakers.



















• ⑤ Models with N refers to 4 pole.

• ⑥ For 300 and 400A: 121.5 for 3 poles; 156.5mm for 4 poles.

• ⑦ 10xIn can be made optional.

• ⑧ Manufactured up to 50kA for 400A.

**THERMAL-MAGNETIC CIRCUIT BREAKERS (IEC / EN 60947-2)**





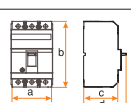
									
<b>F31R (ELCB)</b>	<b>F51/N</b>	<b>F52/N</b>	<b>F53/N</b>	<b>F61</b>	<b>F62</b>	<b>F71</b>	<b>F72</b>	<b>F82/N</b>	<b>F83/N</b>
80 - 250	125 - 400 ⑧			300 - 400		300 - 800		300 - 800	
4 ⑤	3 / 4 ⑤			3		3		3 / 4 ⑤	
800	800			800		800		800	
8	8			8		8		8	
65	65	85	100	50	65	52	70	75	100
35	35	50	70	25	35	35	50	50	70
25	25	35	50	20	25	30	40	40	50
18	20	25	40	12	18	25	35	30	42
12	14	16	18	8	12	20	25	20	25
22	22	22	22	15	22	20	20	20	20
%75	%100	%100	%100	%100	%75	%100	%75	%100	%75
<7	<10			<10		<20		<10	
A	A			A		A		A	
□	□			□		□		□	
(0,7-1)In	(0,7-1)In			(0,7-1) In		(0,7-1) In		300-630A: (0,7-1) In 800A: (0,6-1) In	
8In (min 1000A) ⑦	□			□		□		□	
-	≤320A: (5-10)In >320A: (4-8)In			(5-10)In		(5-10)In		(5-8)In	
-	-			-		-		-	
-	-			-		-		-	
-	-			-		-		-	
300-500-1000-1500	-			-		-		-	
50-150-300	-			-		-		-	
						-			
15.000	15.000			15.000		15.000		15.000	
3.000	3.000			3.000		3.000		3.000	
3,1	5 / 6,5			5,8		8		10 / 15	
16 - 120	35 - 240			120 - 240		120 - (2x240)		120 - (2x240)	
7 - 10	18 - 25			18 - 25		30 - 40		30 - 40	
-	□			□		□		□	
□	□			□		□		□	
-	□			□		□		□	
-	-			-		□		□	
-	□			-		□		□	
-	□			□		□		□	
□	□			□		□		□	
□	□			□		□		□	
□	□			□		□		□	
-	-			-		□		□	
									
-	-			-					
140	105 / 140 ⑥			140		210		210 / 280	
204	255			257		270		280	
91	105,5			103		111		111	
126	145			156		159		159	



**ELECTRONIC CIRCUIT BREAKERS (IEC / EN 60947-2)**

• ③ As an additional protection against short circuit currents in Federal electronic circuit breakers, mechanical opening mechanism operating with magnetic field of the short circuit current has been placed on each phase. In this way, mechanical opening unit is tripping in over currents such as short circuit and risk of not tripping in case of electronic card failure has been eliminated. This is a great advantage of Federal circuit breakers.



Type			F82E/N	F83E/N	F91E/N	F92E/N	F101E	F102E	F111E	F112E
Rated current - In A			300 - 800		800 - 1250		800 - 1600		1250 - 2500	
Number of poles			3 / 4 ⑤		3 / 4 ⑤		3		3	
Rated insulation voltage - Ui 50-60 Hz V			800		800		800		800	
Rated impulse withstand voltage - Uimp kV			8		8		8		8	
Rated ultimate short - circuit breaking capacity - Icu ①										
(a.c.) 50-60 Hz 220/240 V (kA rms)			75	100	80	100	80	100	85	125
(a.c.) 50-60 Hz 380/415 V (kA rms)			50	70	50	65	50	70	50	70
(a.c.) 50-60 Hz 440 V (kA rms)			40	50	35	45	40	45	35	50
(a.c.) 50-60 Hz 500 V (kA rms)			30	42	25	35	25	35	30	42
(a.c.) 50-60 Hz 690 V (kA rms)			20	25	18	25	20	25	20	25
DC (2p) 690 V② (kA rms)			-	-	-	-	-	-	-	-
Rated short circuit breaking capacity - Ics 415v~ (kA rms)			%100	%75	%50	%50	%100	%50	%100	%50
Breaking duration (in short circuit) ms			<10		<20		<20		<20	
Category (EN / IEC 60947-2)			A-B		A-B		A-B		A-B	
③ Trip Mechanism & Protection Characteristics	Thermal - Magnetic	Thermal Fixed	-		-		-		-	
		Thermal Adjusted	-		-		-		-	
		Magnetic Fixed	-		-		-		-	
		Magnetic Adjusted	-		-		-		-	
	Electronic	Long time delay	I1=(0,4-1)In		I1=(0,4-1)In		I1=(0,4-1)In		I1=(0,4-1)In	
		Short time delay	□I2=(2-10)I1		□I2=(2-10)I1		□I2=(2-10)I1		□I2=(2-10)I1	
		Instantaneous ④	I3=(2-10)I1		I3=(2-10)I1		I3=(2-10)I1		I3=(2-10)I1	
Residual current threshold (only for F12R-F31R) mA			-		-		-		-	
Residual current time delay (only for F12R-F31R) ms			-		-		-		-	
Current limiting 					-					
Mechanical life Operation			15.000		10.000		10.000		10.000	
Electrical life Operation			3.000		3.000		3.000		3.000	
Weight kg			10 / 15		18 / 37		27		54	
Min - Max connection sections mm²			120 - (2x240)		(2x240)-2x(40x15)		2x(40x10)-2x(40x15)		(80x15)-2x(80x15)	
Minimum - maximum tightening torque Nm			30 - 40		35 - 50		35 - 50		35 - 50	
Undervoltage release			□		□		□		□	
Shunt trip release			□		□		□		□	
Auxiliary contact block			□		□		□		□	
Motor control mechanism			□		□		□		□	
Extended rotary handle			□		□		-		-	
Lock Mechanism with key			□		□		■		■	
Extension bar			□		■		■		■	
Terminal cover			□		□		□		□	
Trip Contact			□		□		□		□	
Inverser (mechanical) lock			□		□		□		□	
Phase Barrier			■		■		■		■	
Extension handle			■		■		■		■	
<div>Dimensions</div> <div></div> <div>a (mm)</div> <div>b (mm)</div> <div>c (mm)</div> <div>d (mm)</div>			210 / 280		210 / 280		210		392	
			280		370		370		412	
			111		124		155		250	
			162		180		203		320	

• □ standard, □ upon request.

• ① Icu: O-t-CO test (O: Open maneuver, CO : Close - Open maneuver, t : Waiting duration)

• ② For serial connected two poles of the breaker.

• ③ See technical characteristic tables on our web site, for products with value.

• ④ As an additional protection against short circuit currents in federal electronic circuit breakers, mechanical opening mechanism operating with magnetic field of the short circuit current has been placed on each phase. In this way, mechanical opening unit is open in over currents such as short circuit and risk of not opening in case of electronic card failure has been eliminated. This is a great advantage of Federal circuit breakers.

• ⑤ Models with N refers to 4 pole.

\*Electronic circuit breakers are manufactured as a Standard with adjustable overload and adjustable short circuit protection.

Adjustable overload time delay, adjustable short-circuit protection and short-circuit time delay can be added according to the customer's request.

## MOLDED CASE CIRCUIT BREAKER ACCESSORIES



Earth leakage protection relays  
0,03 - 30A



Toroidal Transformers  
60mm - 110mm - 160mm - 210mm



Motor Control Mechanisms



Changeover Relays



Extended Rotary Handles



Undervoltage Releases



Shunt Trip Releases



Auxiliary Contact Blocks



Lock Mechanisms with key



Operating Extension  
Handles



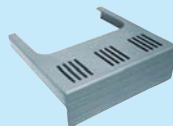
Mechanical Locks



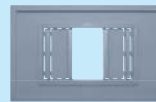
Extension Bars



Connection Terminals



Terminal Covers



Panel Frames






Phase Separators



Trip Contacts

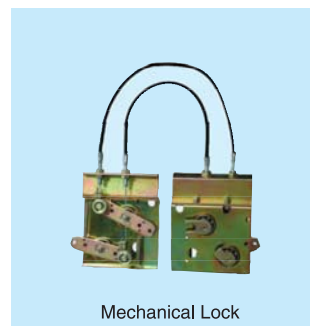
**AIR TYPE CIRCUIT BREAKERS (IEC / EN 60947-2)**

													
Type (LSIG)		F121E	F122E	F123E	F131E	F132E	F133E	F141E	F142E	F143E	F151E	F152E	F153E
Rated current - In	A	630,800,1000 1250,1600,2000			2500, 3200			4000*			5000, 6300		
Number of poles		3 / 4			3 / 4			3 / 4			3 / 4		
Rated operating voltage - Ue (a.c.) 50-60 Hz	V	415			415			415			415		
Rated insulation voltage - Ui (a.c.) 50-60 Hz	V	1000 V			1000 V			1000 V			1000 V		
Rated impulse withstand voltage - Uimp	kV	8			8			8			8		
Test voltage (1 min) (a.c.) 50-60 Hz	kV	3			3			3			3		
Rated Current Adjustment field	In	(0,4-1)In			(0,4-1)In			(0,4-1)In			(0,4-1)In		
Rated ultimate short circuit breaking capacity - Icu 415V~	(kA rms)	70	80	100	70	80	100	70	80	100	70	80	120
Rated service short circuit breaking capacity - Ics 415V~	(kA rms)	35	50	65	35	65	80	35	65	80	35	65	100
Rated short time withstand capacity - Icw 1s 415 V~	(kA rms)	35	50	65	35	65	80	50	65	80	50	65	100
Category (EN 60947-2 / IEC 60947-2)		A, B			A, B			A, B			A, B		
Opening type		Electronic			Electronic			Electronic			Electronic		
Assembly method		Fixed / Drawout			Fixed / Drawout			Fixed / Drawout			Drawout		
Long time delay current (Lt)	Ir1	(0,4-1)In			(0,4-1)In			(0,4-1)In			(0,4-1)In		
Long time delay interval	tl s	15-480			15-480			15-480			15-480		
Short time delay current (Ls)	Ir2	(0,4-15)In			(0,4-15)In			(0,4-15)In			(0,4-15)In		
Short time delay interval	ts s	0,1 - 1			0,1 - 1			0,1 - 1			0,1 - 1		
Instantaneous breaking current (Li)	Ir3	In-50 kA			In-50 kA			In-50 kA			In-50 kA		
Ground fault current (Lg)	Ir4	(0,2-0,8)In			(0,2-0,8)In			(0,2-0,8)In			(0,2-0,8)In		
Mechanical life	With maintenance	10000			10000			10000			10000		
	Without maintenance	3000			3000			3000			3000		
Power losses per pole	Drawout	38, 47, 77, 110, 150, 160			210, 240			320			350, 420		
	Fixed	15, 21, 35, 50, 75, 85			90, 150			230			-		
Accessories													
Undervoltage release **		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Undervoltage release with time delay		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Shunt trip		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Closing coil		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Auxiliary contact block		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Motor control mechanism		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		
Inverser lock		<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>			<input type="checkbox"/>		

\* 4 pole 4000A switch is produced with drawer.

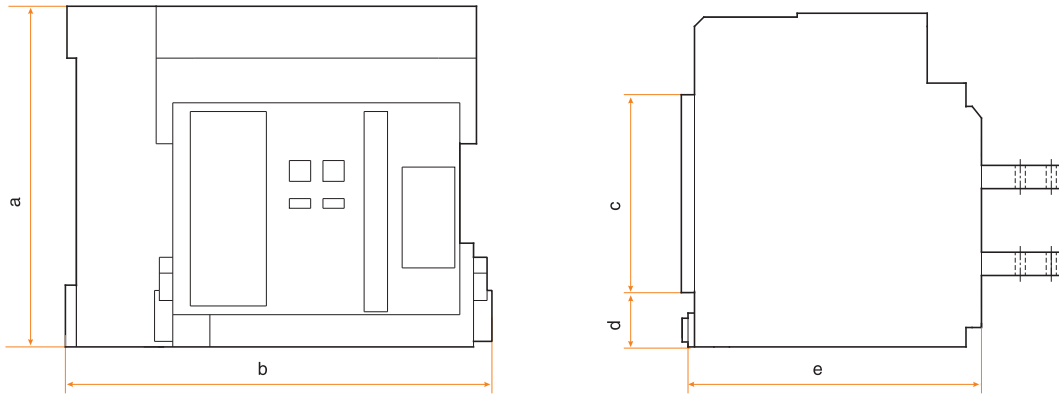
☒ standards, ☐ optional

\*\* Opening time can be set as 1s, 3s, 5s, 7s, 9s, 10s.

**AIR TYPE CIRCUIT BREAKER ACCESSORIES**








## AIR TYPE CIRCUIT BREAKERS TECHNICAL DIMENSIONS

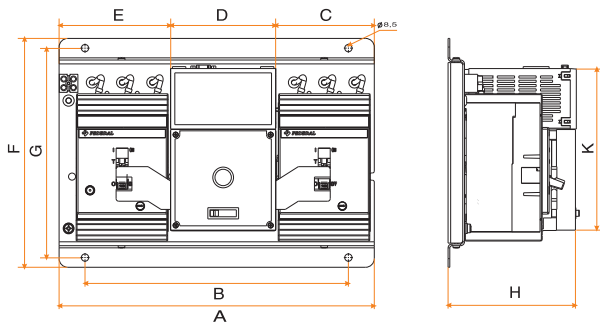
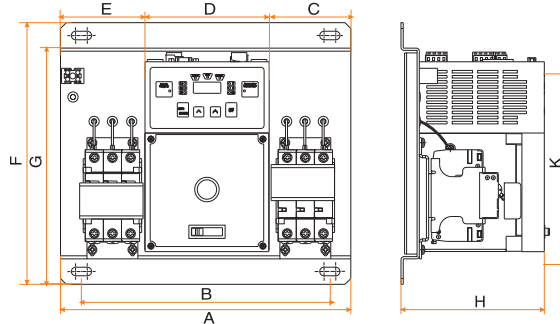


Type	Mounting Method	Pole Number	Dimensions (mm)				
			a	b	c	d	e
F121E/F122E/F123E	Fixed	3	402	340	258	34	290
F121E/F122E/F123E	Fixed	4	402	435	258	34	290
F121E/F122E/F123E	Drawout	3	439	375	258	70	374
F121E/F122E/F123E	Drawout	4	439	470	258	70	374
F131E/F132E/F133E	Fixed	3	402	400	258	34	290
F131E/F132E/F133E	Fixed	4	402	515	258	34	290
F131E/F132E/F133E	Drawout	3	439	435	258	70	374
F131E/F132E/F133E	Drawout	4	439	550	258	70	374
F141E/F142E/F143E	Fixed	3	402	515	258	34	290
F141E/F142E/F143E	Drawout	3	439	550	258	70	374
F141E/F142E/F143E	Drawout	4	439	788	258	70	374
F141E/F142E/F143E	Drawout	3	449	835	258	34	290
F151E/F152E/F153E	Drawout	4	449	950	258	34	290

**AUTOMATIC TRANSFER SWITCHES (IEC / EN 60947-2)**

In the enterprises where power cuts are frequent, where uninterrupted power is needed and where interruption can cause huge damages (such in hospitals, shopping centers, banks , factories etc...), these can be securely used in order to realize the load transfer.









<b>ACCESORIES</b> <b>Remote Controller</b> 				
<b>Type</b>		<b>MCCB</b>	<b>MCB</b>	<b>SWITCH</b>
Standard		EN 60947-6-1	EN 60947-6-1	EN 60947-6-1
Circuit Breaker Rated Current (In)		16A ~1600A	0,5A ~125A	16 ~ 3200A
Number of Poles		3, 4	1,2,3,4	3,4
Control Voltage		140 - 270V	140 - 270V	220 - 240V
Auxiliary Control Voltage		10 - 15V DC	10 - 15V DC	-
Jenerator Start-Stop Time Adjustment		5 - 90 sec. (adjustable)	5 - 90 sec. (adjustable)	0,3 - 2,4 sec. (adjustable)
Operating Voltage		415V	415V	415V
Mechanical Life		10.000	10.000	3.000
Operating Temperature		-20 ~+60	-20 ~+60	-20 ~+60
Protection Class		IP20	IP20	IP20
Pollution Level		3	2	3

**MCCB Technical Drawings**  
**Molded Case Circuit Breaker**

**MCB Technical Drawings**  
**Miniature Circuit Breakers**

**Compact and Miniature Circuit Breaker Measurements**

Type	Dimensions									Amperage Ranges
	A	B	C	D	E	F	G	H	K	
FATS-F1	365	293	106,4	122	136,6	274,4	224,9	151,5	186,5	16A ... 160A
FATS-F1N	425	353	136,4	122	166,6	259,2	236,7	151,5	186,5	16A ... 160A
FATS-F3	380	340	114	122	145	265	242	147	247	16A ... 250A
FATS-F5	460	419	151	122	187	342	311	206	247	125A ... 400A
FATS-F5N (4 Pole)	495	454	151	122	221	342	311	206	247	125A ... 400A
FATS-F7	600	550	219	122	259	346	315	216	247	300A ... 800A
FATS-F8	600	550	219	122	259	346	315	216	247	400A ... 800A
FATS-F8N (4 Pole)	740	689	296	122	321	346	315	216	247	300A ... 800A
FATS-F9	600	550	219	122	259	436	405	235	247	1000A...1250A
FATS-F9N (4 Pole)	740	689	289	122	329	436	405	235	247	1000A...1250A
FATS-F10	600	550	219	122	259	436	405	260	247	1000A...1600A
FM10	286	244	80	122	83	257	232	141	187	1A ... 63A
FM10L	390	324	119	122	149	265	242	142	187	80A ... 125A

(\*) Note: If it is desired to check the first start time while ATS is in the generator position, 10-15V DC supply must be applied. If there is no DC supply, the generator start time delay will be "0" seconds. There is no need to supply external DC supply if this time delay is not requested by the generator.

**MINIATURE CIRCUIT BREAKERS (IEC / EN 60898-1), (IEC / EN 60947-2)**

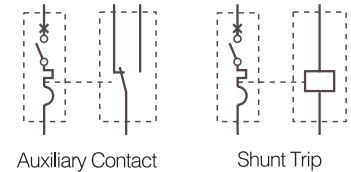
<div></div>								
Type	FM4E	FM6E	FM10	FM6L	FM10L	FM10 DC	FM10L DC	
Standard	IEC 60898-1			IEC 60947-2				
Rated Current - In	A	0,5-63	0,5-63	0,5-63	80-125	80-125	0,5-63	80-125
Number of Poles		1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4
Rated Insulation Voltage - Ui	V	630	630	630	630	630	630	630
Rated Impulse Withstand Voltage - Uimp	kV	6	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*	250*
Rated Short - Circuit Breaking Capacity	kA	4,5	6	10	6	10,15***	10	10
Protection Characteristics	Thermal	In	In	In	In	In	In	In
	Magnetic**	B,C,D	B,C,D	B,C,D	B,C	10In (±20%)		
Mechanical Life	Operation	>20000						
Electrical Life	Operation	>4000						
Min-Max Connection Sections	mm²	1-25	1-25	1-25	1-50	1-50	1-25	1-50
Min-Max Tightening Torque	Nm	2-3	2-3	2-3	3-5	3-5	2-3	3-5
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

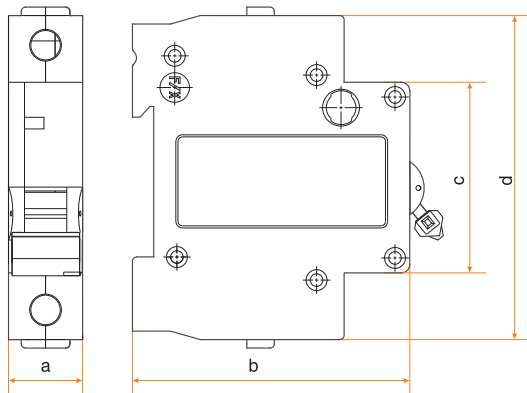
**Accessories:**



Type	
Shunt Trip - FM10 - FM10L-AB	AC 230V
Auxiliary Contact - FM10 - FM10L-YK	1NO / 1NC



**MINIATURE CIRCUIT BREAKERS TECHNICAL DIMENSIONS**

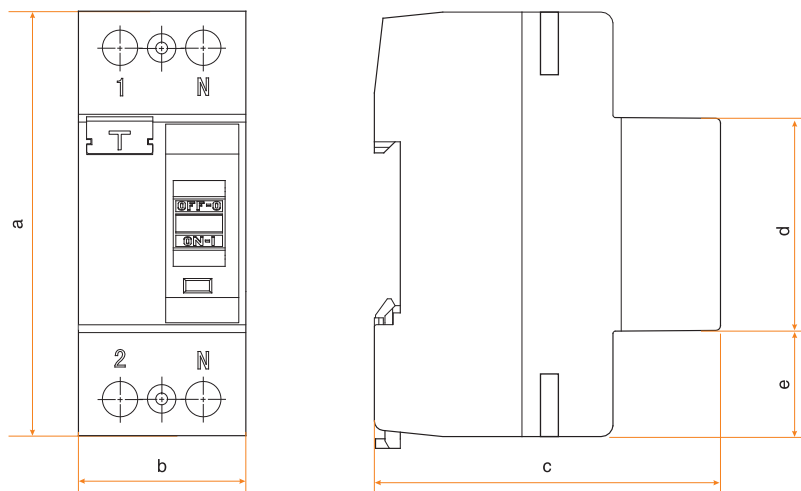


Type	Pole	Dimensions (mm)			
		a	b	c	d
FM4E - FM6E	1	18	65	45	81
FM4E - FM6E	2	35,5	65	45	81
FM4E - FM6E	3	53	65	45	81
FM4E - FM6E	4	70,5	65	45	81
FM10 - FM10 DC	1	17,8	65,5	45	90
FM10 - FM10 DC	2	35,6	65,5	45	90
FM10 - FM10 DC	3	53,6	65,5	45	90
FM10 - FM10 DC	4	71,6	65,5	45	90
FM6L	1	27	65,5	45	80
FM6L	2	54	65,5	45	80
FM6L	3	81	65,5	45	80
FM6L	4	108	65,5	45	80
FM10L - FM10L DC	1	26,3	67,5	45	90
FM10L - FM10L DC	2	52,6	67,5	45	90
FM10L - FM10L DC	3	78,9	67,5	45	90
FM10L - FM10L DC	4	105,2	67,5	45	90

**RESIDUAL CURRENT CIRCUIT BREAKERS (IEC / EN 61008-1), (IEC / EN 61008-2-1)**


Type	FK2-FK2E	FK2L	FK4-FK4E	FK4L
Nominal residual current (mA)	30, 300	30, 300	30, 300	30, 300
Rated current (A)	25, 40, 63	80, 100, 125	25, 40, 63	80, 100, 125
Rated voltage (V)	230	230	400	400
Closing-breaking capacities ( $I_m/I_{\Delta m}$ ), (A)	630	1250	630	1250
Fused short circuit current ( $I_{nc}/I_{\Delta c}$ ), (A)	10000	10000	10000	10000
Frequency (Hz)	50-60	50-60	50-60	50-60
Number of poles	2	2	4	4
Weight (gr)	250	260	470	530

\*If FM10 miniature circuit breakers are used, FK2 or FK4 must be selected.

**RESIDUAL CURRENT CIRCUIT BREAKERS TECHNICAL DIMENSIONS**


Type	Dimensions (mm)				
	a	b	c	d	e
FK2	90	36	73	45	22
FK2E	81	35,2	65,8	45	17
FK2L	90	35,5	69,5	45	22
FK4	90	71	73	45	22
FK4E	81	70,5	65,8	45	17
FK4L	90	70,5	69,5	45	22


## RESIDUAL CURRENT CIRCUIT BREAKERS WITH OVERCURRENT PROTECTION (RCBO)



Technical Specification		
Nominal residual current	mA	30 - 300
Rated current	A	6, 10, 16, 20, 25, 32
Rated voltage	V	230V AC
Rated short-circuit capacity	A	10.000
Frequency	Hz	50 - 60
Number of poles		1P + N
Characteristic		B, C
Tripping duration	s	Instantaneous ≤ 0.1
Mechanical / Electrical life		20.000 / 10.000

## ISOLATORS DC (IEC / EN 60947-3)



Type	FMS	FMS-DC 
Number of poles	1, 2, 3, 4	1, 2, 3, 4
Utilization class	AC-22A	DC-21
Rated current In	40, 63, 80, 100, 125	40, 63, 80, 100, 125
Rated operating voltage Ue	400V AC	250V DC
Rated insulation voltage Ui	800V	800V
Short-time withstand current	12xIn	12xIn
Short circuit making capacity	20xIn	20xIn
Mechanical / Electrical life	20.000 / 10.000	20.000 / 10.000

## INSTALLATION CONTACTORS (IEC / EN 60947-4-1), (IEC / EN 61095)



Number of Poles	Ie (A) AC1 / AC7a	Operating Voltage (AC) V	Isolation Voltage Ui (V)	Contact Type
2	20	230	500	2NO
4	40	400	500	4NO
	63	400	500	4NO

## IMPULSE RELAY (IEC 669-1, EN 669-2-2)



Type	Coil VAC 50 / 60 Hz	Coil VDC	Power Circuit AC1	Width in 17,5 mm
1NO	230	110	16A-250V	1
2NO	230	110	16A-250V	1
1NC+1NO	230	110	16A-250V	1

## PLASTIC BOXES (IEC / EN 60670-1)



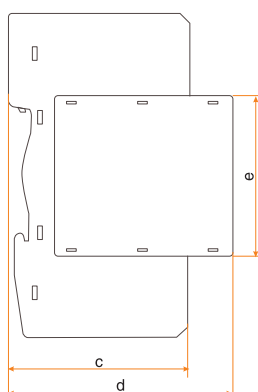
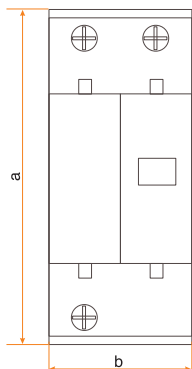
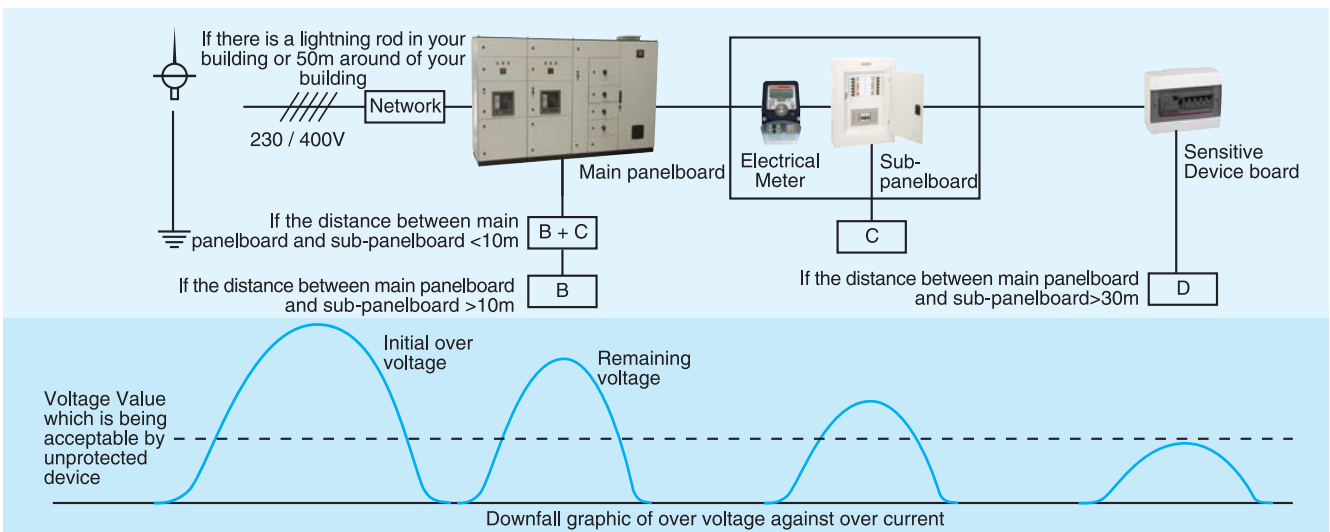
Technical Specification	
Material	Thermoplastic
Number of ways	1, 2, 3, 4, 6, 8, 9, 12, 18, 24
Recommended ambient temperature	-15°C +60°C
Field of use	Flush mounted / Surface mounted
Color	White

Symmetrical and asymmetrical used cover. 180° opening cover.



**SURGE PROTECTIVE DEVICES (IEC 61643-11)**


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 $\mu$ s) $I_{imp}$ kA	50	25	-	-	-
Charge Q As	25	12,5	-	-	-
Specific energy W/R $\text{kJ}/\Omega$	625	156	-	-	-
Max. discharge current (8 / $\mu$ 20 $\mu$ s) $I_{max}$ kA	-	-	40	20	40
Nominal discharge current (8 / $\mu$ 20 $\mu$ s) $I_n$ kA	100	25	20	10	20
Response time tA ns	<100	<25	<25	<25	<25
Pole	3P+N	3P+N	1P+N, 3P+N	1P+N	1P+N
The cross section (L/N) $\text{mm}^2$	16-25	16-25	10-16	6	10-16
The cross section (PE) $\text{mm}^2$	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				



Type	Pole	Dimensions (mm)				
		a	b	c	d	e
FSPD-B50	3P+N	90	144	50	67	45
FSPD-BC25	3P+N	93	143	50	65	45
FSPD-C40	1P+N	90	36	50	62	45
FSPD-C40-DC	1P+N	90	36	50	62	45
FSPD-C40	3P+N	90	72	50	62	45
FSPD-D20	1P+N	90	36	50	62	45

## MOTOR PROTECTION SWITCHES (IEC / EN 60947-4-1)



Type	Thermal adjustment area (A)	Short circuit current (A)	Short circuit breaking capacity $I_{cu} = I_{cs} = I_q$ (kA)				Frontal protection insurance gL, gG (A) (for $I > I_{cu}$ )			
			220-240V	380-415V	500V	660-690V	230V	400V	500V	690V
FMK 25-0,16	0,1...0,16	2	100	100	100	100	—	—	—	—
FMK 25-0,25	0,16...0,25	2,6	100	100	100	100	—	—	—	—
FMK 25-0,4	0,25...0,4	4,4	100	100	100	100	—	—	—	—
FMK 25-0,63	0,4...0,63	8	100	100	100	100	—	—	—	—
FMK 25-1	0,63...1	11	100	100	100	100	—	—	—	—
FMK 25-1,6	1...1,6	19	100	100	100	100	—	—	—	—
FMK 25-2,5	1,6...2,5	30	100	100	3	2,5	—	—	25	20
FMK 25-4	2,5...4	42	100	100	3	2,5	—	—	35	25
FMK 25-6,3	4...6,3	69	100	100	3	2,5	—	—	50	35
FMK 25-10	6...10	110	100	6	3	2,5	—	80	50	35
FMK 25-14	9...14	170	6	4	2,5	2	80	80	63	35
FMK 25-16	10...16	210	6	4	2,5	2	80	80	63	35
FMK 25-18	13...18	223	6	4	2,5	2	80	80	63	35
FMK 25-23	17...23	327	6	4	2,5	2	80	80	63	50
FMK 25-25	20...25	330	6	4	2,5	2	80	80	63	50
FMK 25-32	24...32	420	6	4	2,5	2	80	80	63	50

Dimension Length x width x depth: 88x45x75mm

## ACCESSORIES



Auxiliary switch



Shunt Trip Relay



Under-voltage release



Storage box



Storage box with emergency stop button

## THERMAL OVERLOAD RELAYS (IEC / EN 60947-4-1)



Type	FTR25	FTR95	FTR150	FTR200	FTR630
Current Adjustment Area (A)	0.1 - 32	30 - 93	80 - 150	80 - 200	160 - 630
Opening Class Class (A)	10	10	10	10	10
Rated Insulation Voltage (Ui) (V)	690	690	690	690	690
Rated Impulse Withstand Voltage (Uimp) kV	6	6	6	6	6
Operating Height m	2000	2000	2000	2000	2000
Operating Temperature °C	-25 ... +55	-25 ... +55	-25 ... +55	-25 ... +55	-25 ... +55
Operating Frequency Hz	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Auxiliary Contact Ie 220V	2.73	2.73	2.73	2.73	2.73
1NO+1NC AC15 380V	1.58	1.58	1.58	1.58	1.58

## ACCESSORIES











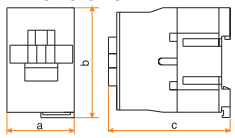











FTR25 mounting base



FTR95 mounting base















**CONTACTORS (IEC / EN 60947-4-1)**

												
Type		FC06M	FC09M	FC09D	FC12D	FC18D	FC25D	FC32D	FC38D	FC40D	FC50D	
Number of Poles		A 3	3	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3	3 - 4	3 - 4	
Utilization Class - Ie (≤440V) A	AC-3	6	9	9	12	18	25	32	38	40	50	
	AC-5a	8	10	12	16	25	35	45	50	55	70	
	AC-1	16	16	25	25	32	40	50	55	60	80	
Rated Thermal Current - Ith ≤ 55°C		A 16	16	25	25	32	40	50	55	60	80	
Rated Insulation Voltage-Ui 50-60Hz		V 800	800	800	800	800	800	800	800	800	800	
Rated Impulse Withstand Voltage-Uimp kV		8	8	8	8	8	8	8	8	8	8	
<div>Motor Control 3 ~ AC3 Driving Stopping kW</div>	230 V	1,5	2,2	2,2	3	4	5,5	7,5	9	11	15	
	400 V	2,2	4	4	5,5	7,5	11	15	18,5	18,5	22	
	440 V	2,2	4	4	5,5	9	11	15	18,5	22	25	
	500 V	3	4	5,5	7,5	10	15	18,5	18,5	22	30	
	690 V	3	4	5,5	7,5	10	15	18,5	18,5	30	33	
Weight	3 pole	kg. 0,16	0,16	0,33	0,33	0,33	0,345	0,52	0,55	1,14	1,14	
	4 pole	-	-	0,33	0,33	0,33	0,59	0,59	-	1,29	1,29	
Number of Auxiliary Contacts	3 pole	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO or 1 NC	1 NO + 1 NC	1 NO + 1 NC	
	4 pole	-	-	-	-	-	-	-	-	-	-	
Coil Power Consumption (VA)	AC Coil Holding	7	7	9,5	9,5	9,5	9,5	11	11	30	30	
	AC Coil Pull	50	50	75	75	75	75	110	110	225	225	
	DC Coil	-	-	9	9	9	9	11	11	20	20	
Power Loss Per Pole (AC-3)		W 0,15	0,33	0,30	0,50	1,2	2,1	2,3	2,9	2,8	4,1	
Max. - min. Tightening Torque		Nm 1-1,5	1-1,5	1-1,5	1-1,5	1-1,5	1-1,5	1,2-2	1,5-2,5	3,5-4,5	3,5-4,5	
<div>Dimensions</div> 	a (width) (mm)	45,5	45,5	47 / 47	47 / 47	47 / 47	47 / 57	57 / 57	57	77 / 85	77 / 85	
	b (height) (mm)	58	58	76 / 76	76 / 76	76 / 76	76 / 86	86 / 86	86	129 / 129	129 / 129	
	c (depth) (mm)	57	57	82 / 82	82 / 82	82 / 82	87 / 95	95 / 95	100	115 / 115	115 / 115	
	DC Coiled c (depth) (mm)	-	-	116 / 116	116 / 116	116 / 116	120 / 130	130 / 130	135	175 / 174	175 / 174	
Easily replaced coils												
Auxiliary contact blocks (Side assembly) 1st figure is number of NO contacts 2nd figure is number of NC contacts				<div>FCBS-F11 FCBS-F20 FCBS-F02</div> 								
Auxiliary contact blocks (Front assembly) 1st figure is number of NO contacts 2nd figure is number of NC contacts				 <div>FCB-F20 FCB-F02 FCB-F11</div>				 <div>FCB-F40 FCB-F31 FCB-F22 FCB-F13 FCB-F04</div>				
Mechanical Lock												

**Note:** Auxiliary contact blocks are assembled on front face of the contactor

**NO** : Normally open contact

**NC** : Normally closed contact





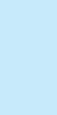

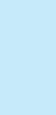



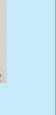

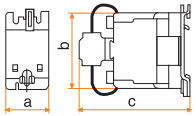
												
FC65D	FC80D	FC95D	FC115D	FC150D	FC220D	FC260D	FC300D	FC400D	FC475D	FC580D	FC650D	FC750D
3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4	3 - 4
65	80	95	115	150	220	260	300	400	475	580	650	750
80	100	115	140	180	260	300	350	470	560	680	760	880
80	125	125	200	200	300	315	400	600	650	750	850	1000
80	125	125	200	200	300	315	400	600	650	750	850	1000
800	800	800	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	8	8	8	8	8	8	8	8	8	8	8	8
18,5	22	25	30	40	60	80	90	110	140	180	200	220
30	37	45	55	75	110	140	160	200	250	315	355	400
37	45	45	59	80	129	150	160	220	250	315	355	450
37	55	55	75	90	132	180	200	257	290	360	410	470
37	45	45	80	100	160	200	250	280	375	470	530	650
1,14	1,38	1,38	2,1	2,1	4,7	4,7	8,5	8,5	10,8	17,4	17,5	19
1,29	1,54	1,54	4,3	4,5	5,7	5,7	10	10	12,9	20,5	20,5	22,4
1 NO + 1 NC	1 NO + 1 NC	1 NO + 1 NC	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
30	30	30	22/55	22/55	55	55	13	20	24	22	22	22
225	225	225	300	300	750	750	1100	1100	1250	1600	1600	1600
20	20	20	-	-	-	-	-	-	-	-	-	-
6	7,7	10,9	10	17	24	33	35	44	37	37	46	62
3,5-4,5	6-10	6-10	8-12	8-12	15-20	15-20	20-25	20-25	20-25	30-40	30-40	30-40
77/85	87/97	87/97	120/204	120/204	170/211	170/211	218/261	215/261	235/288	310/389	310/389	310/389
129/129	129/129	129/129	154/163	154/171	175/175	175/175	210/210	210/210	240/240	304/304	304/304	304/304
115/115	127/127	127/127	121/172	121/172	183/183	183/183	223/223	223/223	235/235	257/257	257/257	257/257
175/174	183/180	183/180	-	-	-	-	-	-	-	-	-	-
												
 FCBS-F11 FCBS-F20 FCBS-F02												
					 FCB-F20 FCB-F02 FCB-F11							
					 FCB-F40 FCB-F31 FCB-F22 FCB-F13 FCB-F04							
												

Give coil voltages of the contactors in accordance with the table below

	24V	42V	48V	110V	220V	230V	240V	380V	415V	440V	500V
AC	A5	D5	E5	H5	K5	N5	R5	S5	T5	U5	V5
DC	A6		E6	H6	K6					U6	

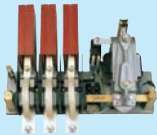
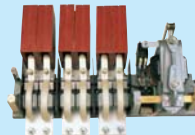
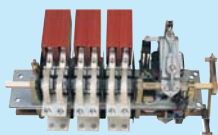
Example: 9DD-A5013-0018 means 24V coil voltage 18A (AC3) 1NC contactors.

**CONTACTORS (IEC / EN 60947-4-1)**

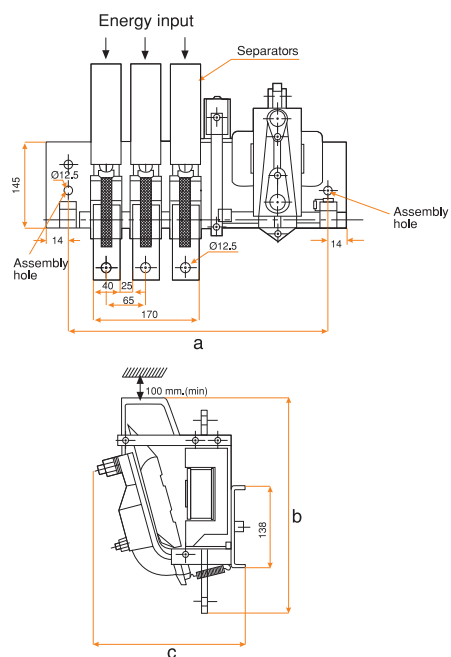
														
Contactor Type (DK)		FC09	FC12	FC18	FC25	FC32	FC38	FC40	FC50	FC65	FC80	FC95	FC115	FC150
Number of Poles		3	3	3	3	3	3	3	3	3	3	3	3	3
Utilization Class AC-6b I <sub>e</sub> max 440V	A	13	16	20	22	26	33	44	52	59	79	85	92	105
Rated Thermal Current - I <sub>th</sub>	A	25	25	32	40	50	55	60	80	80	125	125	200	200
Rated Insulation Voltage - U <sub>i</sub> 50-60 Hz	V	630	630	630	630	630	630	630	630	630	630	630	630	630
Rated Impulse Withstand Voltage	kV	8	8	8	8	8	8	8	8	8	8	8	8	8
Rated Power	220/240 V	5	7	8	9	10	15	20	25	25	35	40	45	50
3 ~ AC-6b	400/440 V	10	12,5	15	16,7	20	25	33,3	40	45	60	65	70	80
55°C - kVAr	480/525 V	12,5	15	16,7	20	24	25	36	45	45	60	65	70	80
Weight	kg	0,39	0,39	0,39	0,4	0,58	0,6	1,2	1,2	1,2	1,5	1,5	2,2	2,2
Number of Auxiliary Contacts		1NO+1NC						2NO+1NC				1NO / 1NC		
Coil Power Consumption (holding)	VA	9,5	9,5	9,5	9,5	11	11	30	30	30	30	30	22	22
Power Loss Per Pole (AC-6b)	W	0,6	1	1,4	1,7	2,5	3,9	3,4	4,5	5	7,5	8,8	6,5	8,5
Min-Max Tightening Torque	Nm	1-1,5	1-1,5	1-1,5	1-1,5	1,2-2	1,5-2,5	3,5-4,5	3,5-4,5	3,5-4,5	6-10	6-10	8-12	8-12
Dimensions														
	a (mm)	47	47	47	47	57	57	77	77	77	87	87	120	120
	b (mm)	76	76	76	76	86	86	129	129	129	129	129	154	154
	c (mm)	117	117	117	122	131	136	150	150	150	158	158	158	158



## HIGH CURRENT CONTACTORS (IEC / EN 60947-4-1)





										
<b>Type</b>			<b>EC 300</b>	<b>EC 400</b>	<b>EC 630</b>	<b>EC 800</b>	<b>EC 1250</b>	<b>EC 1600</b>	<b>EC 2000</b>	<b>EC 2500</b>
Utilization class (Ith) AC1 le max ≤ 40°C A			300	400	630	800	1250	1600	2000	2500
Number of poles *			1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3	1,2,3	1,2,3	1,2,3
Rated impulse withstand voltage kV			8	8	8	8	8	8	8	8
For motor control (Squirrel cage motors) <b>3 ~ AC3</b>	220 / 230 V kW		75	110	160	200	370	470	580	730
	380 / 400 V kW		132	200	280	335	630	790	980	1230
	500 V kW		180	257	355	450	740	960	1190	1490
In compensation circuits 380 / 400 V kVAr			150	200	250	300	450	525	655	820
Rated insulation voltage Ui ~ V			690	690	690	690	690	690	690	690
Coil voltage	Us (AC) ~ V		24, 48, 110, 220, 240, 380, 415							
	Us (DC) – V		24, 48, 110, 220, 240, 380, 415							
Coil voltage operating interval xUs ~ V			0,72 - 1,1							
Auxiliary contacts	NA (10A) Ad		2	2	2	2	2	2	4	4
	NK (10A) Ad		2	2	2	2	2	2	4	4
Coil power consumption	pulling W		800	800	800	800	880	880	1760	1760
	holding W		26	26	26	26	35	35	70	70
Mechanical life Operation			50000	50000	50000	50000	50000	50000	50000	50000
Dimensions	depth mm		245	245	245	245	245	245	500	500
	width mm		462	462	462	462	577	577	710	710
	height mm		370	370	370	370	370	370	370	370
Weight kg			28,6	29,2	29,8	30,4	44,2	44,8	88,4	89,6
Power loss per pole W			6	11	26	42	52	85	80	125

**Us:** Control supply voltage. \* High Current Contactors are manufactured with 3 poles as standard.



Type	Number Poles	Dimensions (mm)		
		a	b	c
EC300...EC800	1	333	370	245
EC300...EC800	2	398	370	245
EC300...EC800	3	463	370	245
EC300...EC800	4	528	370	245
EC1250 - EC1600	1	356	370	245
EC1250 - EC1600	2	467	370	245
EC1250 - EC1600	3	578	370	245
EC1250 - EC1600	4	689	370	245
EC2000 - EC2500	1	450	370	500
EC2000 - EC2500	2	561	370	500
EC2000 - EC2500	3	672	370	500
EC2000 - EC2500	4	783	370	500

**POWER CAPACITORS (IEC / EN 60831-1), (IEC / EN 60831-2)**

Type		Phase	Power (kVAr)			Dimension Ø(D)xH (mm)
M Series Mono-Phase			230V	400V		
	MKP technology					
	FEKM 0,4/1.67	1	0,55	1,67		45x115
	FEKM 0,4/2.50	1	0,83	2,50		50x115
	FEKM 0,4/4.17	1	1,38	4,17		50x150
M Series Mono-Phase			230V	415V	440V	
	FEKM 0,44/0.91	1	0,25	0,81	0,91	63,5x75
	FEKM 0,44/1.83	1	0,50	1,63	1,83	63,5x75
	FEKM 0,44/3.66	1	1,00	3,26	3,66	63,5x87
	FEKM 0,44/5.49	1	1,50	4,88	5,49	63,5x145
	FEKM 0,44/9.15	1	2,50	8,14	9,15	63,5x145
	FEKM 0,44/18.30	1	5,00	16,28	18,30	75x205
K Series Three-Phase			400V	415V	440V	
	MKP technology					
	FEK13 0,44/1.2	3	1,0	1,08	1,21	63,5X87
	FEK13 0,44/1.8	3	1,5	1,61	1,81	63,5X95
	FEK13 0,44/3.1	3	2,5	2,69	3,03	63,5X95
	FEK13 0,44/6.1	3	5,0	5,38	6,05	75x145
	FEK13 0,44/9.1	3	7,5	8,07	9,08	75x145
	FEK13 0,44/12.1	3	10,0	10,76	12,10	75x205
	FEK13 0,44/15.1	3	12,5	13,46	15,13	85x205
	FEK13 0,44/18.2	3	15,0	16,15	18,15	85x205
	FEK13 0,44/24.2	3	20,0	21,53	24,20	95x210
	FEK13 0,44/30.3	3	25,0	26,91	30,25	116x247
	FEK13 0,44/36.3	3	30,0	32,29	36,30	116x247
	FEK13 0,44/48.4	3	40,00	43,06	48,40	116x247
	FEK13 0,44/60.5	3	50,00	53,83	60,50	136x247
K Series Three-Phase			480V	525V		
	MKP technology					
	FEK13 0.52/11.97	3	10,0	11,97		75x210
	FEK13 0.52/17.94	3	15,0	17,94		85x210
	FEK13 0.52/23.93	3	20,0	23,93		95x247
	FEK13 0.52/29.91	3	25,0	29,91		116x247

**HARMONIC FILTERS, SHUNT REACTORS and LINE & LOAD REACTORS (EN 60076-6, EN61558-2-20)**

**General Features**

According to filter power thermal clamp or busbar connection in output
Production with three or single phases
Design with iron core, air gap
Heat protection with thermo contact
Copper or aluminum winding
Protection degree IP 00
F class isolation

**Harmonic Filter:**

Mono phase : 189Hz, Uk = 250V, 0,5 to 10 kVar

Three phase : 189Hz, Uk = 440V / 525V, 1 to 100 kVar

**Shunt Reactor:**

Mono phase : 0,1 to 10 kVar

Three phase : 0,5 to 50 kVar

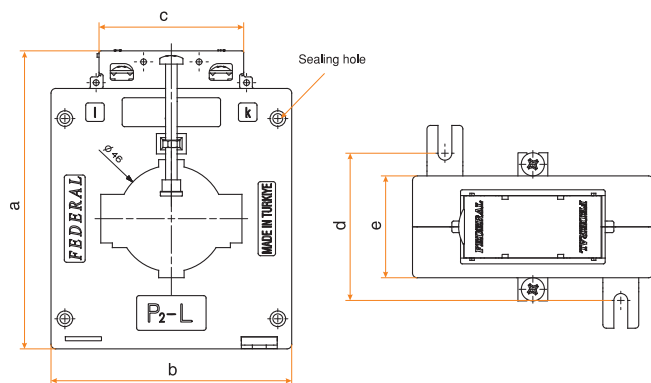
**Line & Load Reactor:**

Mono phase : 0,37 to 4 kVar

Three phase : 0,37 to 160 kVar





**CURRENT TRANSFORMERS (IEC / EN 60044-1)**

Type	Ct mounting method	Rated current (A)	Rated Power (VA) Class				Weight (kg)	Cable (max) mm.	Busbar (max) mm.	Highest voltage for equipment (V)	Rated short-time thermal current (I <sub>th</sub> ) (1 sec.)	Rated continuous thermal current (I <sub>cth</sub> )
			0,2s	0,2	0,5s	0,5						
FAT-30B	with busbar	30	-	2,5	5	10	0,60	-	-	720	60 x I <sub>n</sub>	1,2 x I <sub>n</sub>
		40	-	2,5	5	10						
		50	-	2,5	5	10						
		60	-	2,5	5	10						
		75	-	2,5	5	10						
		80	-	2,5	5	10						
		100	-	2,5	5	10						
		125	-	2,5	5	10						
		150	-	2,5	5	10						
		200	-	2,5	7,5	10						
		250	2,5	2,5	10	10						
FAT-30C	without busbar	150	-	-	2,5	5	0,63	Ø31	30x10	720	100 x I <sub>n</sub>	1,2 x I <sub>n</sub>
		200	-	2,5	5	10						
		250	2,5	2,5	10	10						
		300	2,5	5	10	10						
FAT-30	without busbar	150	-	-	5	7,5	0,60	Ø24	30x10	720	100 x I <sub>n</sub>	1,2 x I <sub>n</sub>
		200	-	2,5	7,5	10						
		250	2,5	5	10	10						
		300	5	10	10	10						
FAT-40	without busbar	200	-	-	2,5	5	0,38	Ø33	40x10	720	50 kA	1,2 x I <sub>n</sub>
		250	-	-	5	10						
		300	-	2,5	7,5	10						
		400	2,5	5	10	10						
		500	5	10	10	10						
		600	7,5	10	10	10						
FAT-40C	without busbar	200	-	-	2,5	5	0,38	Ø41	40x10	720	50 kA	1,2 x I <sub>n</sub>
		250	-	-	5	10						
		300	-	2,5	7,5	10						
		400	2,5	5	10	10						
		500	5	10	10	10						
		600	7,5	10	10	10						
FAT-60	without busbar	500	-	2,5	7,5	10	0,60	Ø46	60x20	720	50 kA	1,2 x I <sub>n</sub>
		600	-	2,5	10	10						
		750	2,5	7,5	10	10						
		800	5	7,5	10	10						
		1000	7,5	10	10	10						
		1200	10	10	10	10						
		1250	10	10	10	10						
FAT-100	without busbar	1000	5	10	15	15	0,94	Ø62	80x30 100x10	720	50 kA	1,2 x I <sub>n</sub>
		1200	7,5	15	15	15						
		1250	7,5	15	15	15						
		1500	10	15	15	15						
		1600	10	15	15	15						
		2000	10	15	15	15						
FAT-130	without busbar	1500	15	15	15	15	1,50	Ø125	125x58	720	50 kA	1,2 x I <sub>n</sub>
		1600	15	15	15	15						
		2000	20	20	20	20						
		2500	30	30	30	30						
		3000	30	30	30	30						
		3200	30	30	30	30						
		4000	40	40	40	40						






Type	Dimensions (mm)				
	a	b	c	d	e
FAT 30B	104,2	88	78	69,5	48
FAT 30C	89	74	62,5	79	55
FAT 30	104,2	88	64,5	68,5	48
FAT 40	99	78	64,5	61,6	42
FAT 40C	99,25	78	62,5	61,5	42
FAT 60	129	104	62,5	63,6	44
FAT 100	156,25	146,5	64,5	63,6	44
FAT 130	210	191	60	63,5	42

**ANALOGUE MEASUREMENT DEVICES (EN 60051-2, EN 60051-4)**

								
	Ammeters		Max. Demand Ammeters		Voltmeters		Frequencymeters	
Type	FA 72	FA 96	FMA 72	FMA 96	FV 72	FV 96	FF 72	FF 96
Measurement wave form	AC (r.m.s)		AC (r.m.s)		AC (r.m.s)		AC (r.m.s)	
Measuring range	From 10A to 100A (direct) From 30/5A to 4000/5A (current trans)		From 200/5A to 4000/5A with current trans. (15min)		250 V ve 500 V		45 - 65Hz 55 - 65Hz	45 - 55Hz 45 - 65Hz 55 - 65Hz
Accuracy class	1.5		3		1.5		1.5	
Operating method	Moving iron		Bimetal		Moving iron		Moving coil	
Operating frequency	45 - 65 Hz		45 - 65 Hz		45 - 65 Hz		45 - 55 Hz	
Continuously overload (2hour)	1.2 x In		1.2 x In		1.2 x Un		1,2 x Un, 1,2 x 55 Hz	
Short-time overload	10 x In		10 x In		2 x Un		2 x Un	
Consumption (max.)	1 VA		2.2 VA		3 VA		1 VA	
Insulation testing voltage	2000 V		2000 V		2000 V		2000 V	
Operating position	Scale vertical position		Scale vertical position		Scale vertical position		Scale vertical position	
Dimensions	72 X 72	96 X 96	72 X 72	96 X 96	72 X 72	96 X 96	72 X 72	96 X 96







**DIGITAL MEASUREMENT DEVICES (IEC / EN 61010-1)**

					
	<b>Ammeter</b>	<b>Ammeter (with 2 relays)</b>	<b>Voltmeter</b>	<b>Voltmeter (with 2 relays)</b>	<b>Multimeter</b>
<b>Type</b>	<b>FYA72 - FYA96 FYA96 - 200</b>	<b>FYA72 - 2R / FYA96 - 2R FYA96 - 2R 200</b>	<b>FYV72 - FYV96</b>	<b>FYV72 - 2R FYV96 - 2R</b>	<b>FMM50 - FMM50R</b>
Measurement wave form	AC (rms)	AC (rms)	AC (rms)	AC (rms)	AC ( rms)
Measurement Range	0-5A MAX.6A direct (FYA72, 96) 0-9999A with Current Transformers (FYA72, 96) 0-200A MAX.250A direct (FYA72, 96 - 200)		0-500V AC MAX.600V AC 0-36kV AC with voltage transformer		0-500V AC MAX.600V AC 0-36kV AC with voltage transformer 0-9999A with Current Transformers
Accuracy class	1	1	1	1	1
Operating frequency	0 / 50 ... 60 Hz	0 / 50 ... 60 Hz	0 / 50 ... 60 Hz	0 / 50 ... 60 Hz	0 / 50 ... 60 Hz
Operating temperature	-10°C ... +85°C	-10°C ... +85°C	-10°C ... +85°C	-10°C ... +85°C	-10°C ... +85°C
Feeding voltage	85 ... 265V AC 10 ... 300V DC	85 ... 265V AC 10 ... 300V DC	85 ... 265V AC 10 ... 300V DC	85 ... 265V AC 10 ... 300V DC	85 ... 265V AC 10 ... 350V DC
Dimensions	72 x 72 / 96 x 96	72 x 72 / 96 x 96	72 x 72 / 96 x 96	72 x 72 / 96 x 96	96 x 96







**CAM SWITCHES (IEC / EN 60947-3)**


	<b>FCS1</b>				<b>FCS2</b>			<b>Number of poles</b>
<b>Rating (A)</b>	10	16	20	25	32	40	63	
On-Off Switches	✓	✓	✓	✓	✓		✓	1, 2, 3, 3+1
Changeover Switches	✓	✓	✓	✓	✓		✓	1, 3
Star Delta Starters		✓		✓				3
Motor Reversing Switches	✓	✓	✓	✓				1, 3
Voltmeter Switches			✓					4, 7
Ammeter Switches			✓					3
Safety Switches			✓		✓	✓	✓	3

## NH (H.R.C.) FUSES (Single and Dual Indicators) (IEC / EN 60269-1)

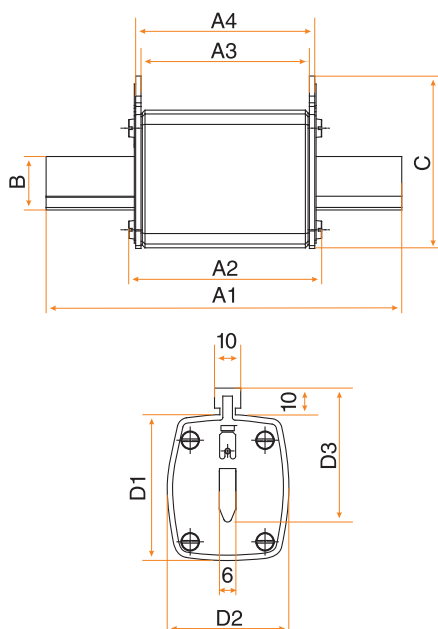
						
<b>Type</b>	<b>NH00</b>	<b>NH0</b>	<b>NH1</b>	<b>NH2</b>	<b>NH3</b>	<b>NH4</b>
Rated current In(A)	6 - 160	25 - 160	40 - 250	63 - 400	125 - 630	800 - 1250
Rated short circuit breaking capacity (kA) (500V)	120	120	120	120	120	120
Rated Voltage (V)	500	500	500	500	500	500
Rated Insulation Level (V)	690	690	690	690	690	690
Rated operating frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Class	gG	gG	gG	gG	gG	gG
Indicator	Single / Dual	Single / Dual	Single / Dual	Single / Dual	Single / Dual	Single / Dual

### Compact Type NH Fuses

						
<b>Type</b>	<b>NHC00</b>	<b>NHC1</b>	<b>NHC2</b>	<b>Dual Indicator</b>		
				<b>NHC00</b>	<b>NHC1</b>	<b>NHC2</b>
Rated current In(A)	6 - 100	25 - 160	40 - 250	6 - 100	25 - 160	40 - 250
Rated short circuit breaking capacity (kA) (500V)	120	120	120	120	120	120
Dimensions	000	1/0	2/1	000	1/0	2/1
Rated Voltage (V)	500	500	500	500	500	500
Rated Insulation Level (V)	690	690	690	690	690	690
Rated operating frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Class	gG	gG	gG	gG	gG	gG
Indicator	Single	Single	Single	Dual	Dual	Dual

**Note:** Material of NH00-NH1-NH2 fuse blades is brass as a standard. NH3 types fuse blades are produced from copper as a standard. Upon customer request blades can be produced from copper alternatively.







**Note:** NH body is produced as **steatite** and **glazed ceramic** according to customer and specification expectations.

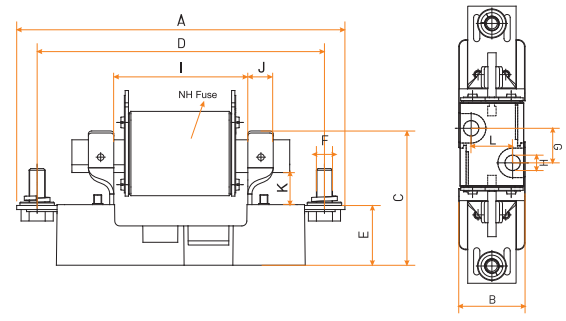
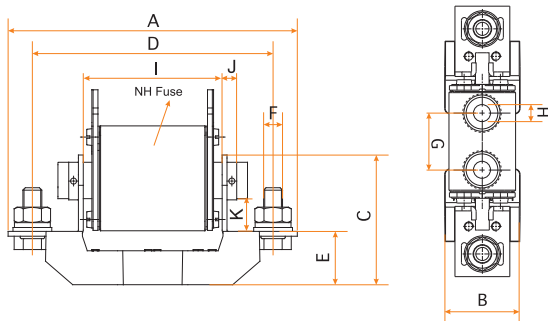


Type	Dimensions (mm)								
	A1	A2	A3	A4	B	C	D1	D2	D3
NH00-FB	78,5	54	45	50	15	58	48	29,5	45
NHC00-FB	78,5	54	45	49	15	47	36	21	45
NH0-FB	125	71	62	68	15	58	48	29,5	45
NH1-FB	135	72,5	62	68	20	64	52	46	50
NHC1-FB	135	71	62	68	15	58	48	29,5	45
NH2-FB	150	73,5	62	68	25	70	60	59	58
NHC2-FB	150	72,5	62	68	20	64	52	46	50
NH3-FB	150	73,5	62	68	32	85,5	75	69,5	70
NH4-FB	200	84,5	61,5	76	50	113	103	86	84



**NH FUSE BASES (BMC / STEATITE) (IEC / EN 60269-1)**

						
Type	NH00	NH0	NH1	NH2	NH3	NH4
Rated current In(A)	6 - 160	25 - 160	40 - 250	63 - 400	125 - 630	800 - 1250
Rated voltage (V)	500	500	500	500	500	500
Rated insulation voltage (V)	690	690	690	690	690	690
Rated operating frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Utilization system	A	A	A	A	A	A




Type	Dimensions (mm)										
	A	B	C	D	E	F	G	H	I	J	K
NH00	120	32,5	54	101	23,5	M8	25	7,5	57	2	13
NH0	170	32	64,5	150	30,5	M8	25	7,5	76	2	13

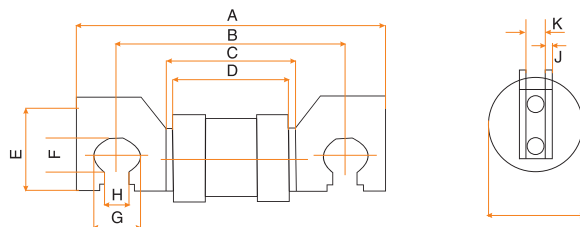
Type	Dimensions (mm)											
	A	B	C	D	E	F	G	H	I	J	K	L
NH1	200	47,5	82	175	35	M10	25	10,5	80	15	20,5	30
NH2	225	47,5	88	200	35	M10	25	10,5	83,5	15	20	30
NH3	240	47,5	99	210	37	M12	25	10,5	81,5	15	19	30
NH4	309	87	134,5	268,5	48,5	M16	45	10,5	104	45	29	30

**J TYPE FUSES**

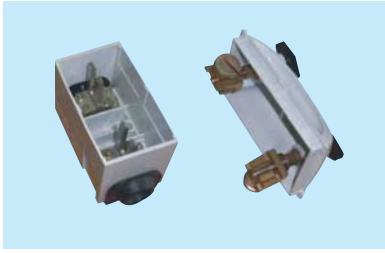
J type feeder pillar fuse links are designed to be used with wedge type fuse carriers. Type J fuse links are to be used in a.c. electricity supply networks. They are installed in distribution boards, feeder pillars, link boxes, pole mounted cut-outs and heavy duty service intakes, open type substation boards and underground connection boxes. They can also be fitted in hole or wall mounted outdoor service fuse links.

	Type	Current	A	B	C	D	E	F	G	H	I	J	K
	FJF82030	63A - 200A	110	82	45.2	40.5	30	14.5	17.5	9.8	30.9	2.4	6.45/6.53
	FJF82038	250A - 315A	110	82	45.2	40.5	30	14.5	17.5	9.8	38	2.4	6.45/6.53
	FJF92040	300A - 400A	131	92	46.7	40.3	38	14.5	20	10	40	3.1	8.05/8.75

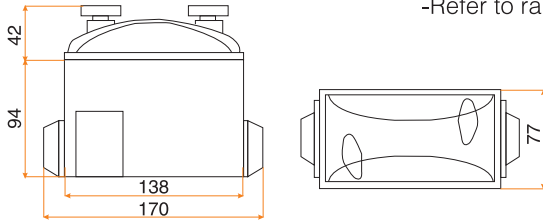
Rated Voltage	415V AC
Breaking Capacity	80kA
Class	gU
Cartridge	Ceramic
Connection	Bolted
Standard	IEC60269



## NH FUSE BASES & FUSE CARRIER



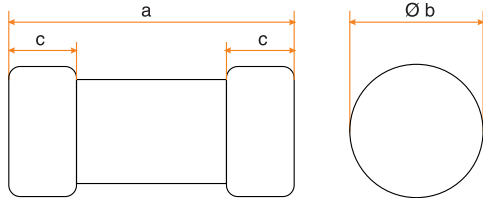
- Maximum rating 300A
- Fuse carrier with 83mm centers
- Moulded in white glass filled polyester thermoset material
- All contacts manufactured from solid brass
- Fuse Holder to use with J type fuse links
- Cable entry and exits through PVC grommet
- Maximum cable size 185mm<sup>2</sup>
- Refer to rage 14 for fuse bases, contacts and fuse handles



## CYLINDRICAL FUSES (IEC / EN 60269)



Type	FCF 10-38	FCF 14-51	FCF 22-58	FCF-DC 10-38
Sizes mm	10x38	14x51	14x51	10x38
Operation Class	gG	gG	gG	gPV
Rated Voltage - Un V	500 AC	500 AC	500 AC	1000 DC
Rated Current - In A	2-25	2-50	10-100	1-20
Breaking Capacity kA	100	100	100	30
Standard	IEC 60269-2			IEC 60269-6



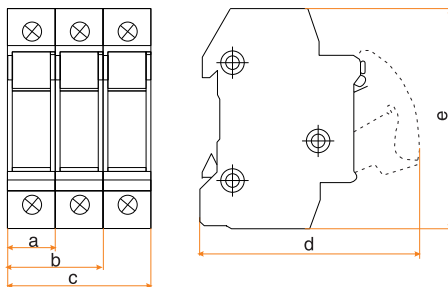
### Dimensions

Type	FCF10	FCF14	FCF22
a (mm)	38	51	58
b (Ø)	10,3	14,3	22,2
c (mm)	10	12	14

## CYLINDRICAL FUSE BASES (IEC / EN 60269)



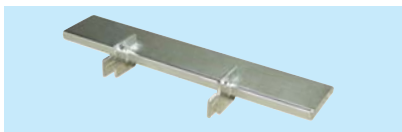
Type	FCFB 10-38	FCFB 14-51	FCFB 22-58
Sizes mm	10x38	14x51	22x58
Utilization Category	AC21B, DC20B		
Rated Voltage - Un V	690 AC, 1000 DC		
Rated Current - In A	32	50	100
Degree of Protection	IP20	-	-
Conductor Cross-Sections	10	16	50
Tightening Torques Nm	1,2	2	2,5
Poles	1P, 1P+N, 3P	1P, 1P+N, 3P	1P, 1P+N, 3P, 3P+N



### Dimensions

Type	a	b	c	d	e
FCFB 30-38	17	34	51	79,5	78,3
FCFB 14-51	26,7	53,4	80,1	95	97
FCFB 22-58	34,7	69,4	104,1	104	127

## SOLID LINKS

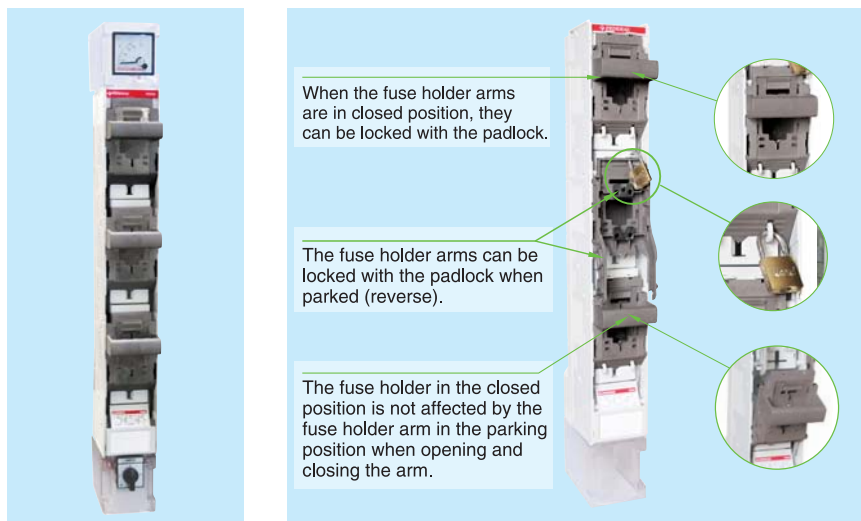


Solid Link is used by NH Fuse Bases for direct connection of contacts without fuse link. It's non-isolated type. NH00 - NH1 - NH2 - NH3

**FUSE SWITCH DISCONNECTORS / RAIL (IEC / EN 60947-3)**


Type		FVS160	FVS250 / FVSB 200-250	FVS400 / FVSB 400	FVS630 / FVSB630	FVS800	FVS1000	FVS1250
Conventional thermal current (I <sub>th</sub> ) 55 °C	A	160	250 / 200-250	400	630	800	1000	1250
Number of poles		3	3	3	3	3	3	3
Insulation voltage (U <sub>i</sub> )	V	1000	1000	1000	1000	1000	1000	1000
Impulse withstand voltage (U <sub>imp</sub> )	kV	12	12	12	12	12	12	12
Operational voltage (U <sub>e</sub> ) (50-60Hz) Utilization Category	400V	AC23B	AC23B / -	AC23B / -	AC22B / -	AC22B	AC22B	AC22B
	500V	AC22B	AC22B / -	AC22B / -	AC22B / -	AC22B	AC22B	AC22B
	690V	AC21B	AC21B / -	AC21B / -	AC21B / -	AC21B	AC21B	AC21B
Operational current (I <sub>e</sub> )	A	160	250 / 200-250	400	630	800	1000	1250
Conditional short-circuit current (with NH Fuse) kA		85	85	85	70	85	70	70
Fuse type (dispatched without fuse)	NH	000,00	1,2 / 1,2,3	1,2 / 1,2,3	1,2,3	1,2	1,2,3	1,2,3
Mechanical durability	operation	> 30000	> 20000 / -	> 20000 / -	> 20000 / -	> 20000	> 20000	> 20000
Electrical durability	operation	> 200	> 200 / -	> 200 / -	> 200 / -	> 200	> 200	> 200
Connection conductor cross-section	mm <sup>2</sup>	70	120 / 95 -120	240	2x185	2x240	4x150	4x185
Power loss per pole	W	9	11 / 7- 11	19	36	40	46	75
Max- Min tightening torques	Nm	7..10	14..20	17..25	28..40	17..25	28..40	28..40
Hole diameter	Ø	M8	M10	M10	M12	M10	M12	M12
Distance between main busbar terminals	mm	185	185 - 210	185 - 210	185 - 210	185 - 210	185 - 210	185 - 210
Weight	kg	2,4	5,6 / 3	5,6 / 3,2	6,9 / 4,3	12	15	15
Protection Degree		IP20	IP20	IP20	IP20	IP20	IP20	IP20

**FVS 800A - 1000A - 1250A** : Vertical Switch fuses are parallel connected.

**FVS 1250**


## FUSE SWITCH DISCONNECTORS (IEC / EN 60947-3)

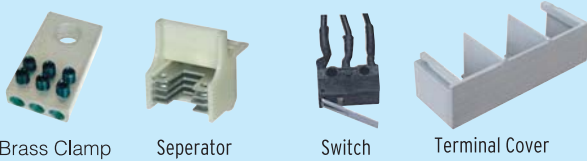


		FHS1 160			FHS1 250			FHS1 400			FHS1 630		
Conventional thermal current (Ith)	A	160			250			400			630		
Number of poles		1			1			1			1		
Insulation voltage (Ui)	V	750			750			750			750		
Impulse withstand voltage (Uimp)	kV	8			8			8			8		
Frequency	Hz	50- 60			50- 60			50- 60			50- 60		
Operational voltage (Ue) (phase-neutral)	V	240	290	400	240	290	400	240	290	400	240	290	400
Utilization category		AC22B	AC22B	AC21B	AC22B	AC22B	AC21B	AC22B	AC22B	AC21B	AC22B	AC22B	AC21B
Operational current (Ie)	A	160			250			400			630		
Conditional short-circuit current (NH Fuse)kA		65			65			65			65		
Fuse type	NH	00 - 000			1			1 - 2			1 - 2 - 3		
Mechanical durability	operation	> 30000			> 20000			> 20000			> 20000		
Electrical durability	operation	200			200			200			200		
Connection conductor cross-section	mm <sup>2</sup>	70			120			240			2x185		
Power loss per pole	W	4			8			14			25		
Max- Min tightening torques	Nm	5..8			14..20			17..25			28..40		
Hole diameter	Ø	M6			M10			M10			M12		
Weight	kg	0,29			0,74			1,27			1,49		
Protection Degree		IP20			IP20			IP20			IP20		

## FUSE SWITCH DISCONNECTORS (IEC / EN 60947-3)



		FHS 160			FHS 250			FHS 400			FHS 630		
Conventional thermal current (Ith)	A	160			250			400			630		
Number of poles		3			3			3			3		
Insulation voltage (Ui)	V	750			750			750			750		
Impulse withstand voltage (Uimp)	kV	8			8			8			8		
Frequency	Hz	50- 60			50- 60			50- 60			50- 60		
Operational voltage (Ue) (phase-phase)	V	400	500	690	415	500	690	415	500	690	415	500	690
Utilization category		AC23B	AC22B	AC21B	AC22B	AC22B	AC21B	AC22B	AC22B	AC21B	AC22B	AC22B	AC21B
Operational current (Ie)	A	160	160	125	250	250	200	400	400	315	630	630	500
Conditional short-circuit current (NH Fuse) kA		70	70	70	70	70	70	70	70	70	70	70	70
Fuse type	NH	00-000			1			1 - 2			1 - 2 - 3		
Mechanical durability	operation	>20000			> 20000			> 20000			> 20000		
Electrical durability	operation	200			200			200			200		
Connection conductor cross-section	mm <sup>2</sup>	70			120			240			2x185		
Power loss per pole	W	4			8			14			25		
Max- Min tightening torques	Nm	7..10			14..20			17..25			28..40		
Hole diameter	Ø	M8			M10			M10			M12		
Weight	kg	0,70			1,51			3,27			3,85		
Protection Degree		IP20			IP20			IP20			IP20		

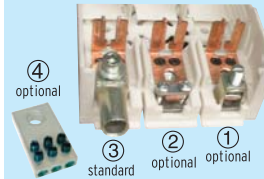
**FUSE SWITCH DISCONNECTORS ACCESSORIES (IEC / EN 60947-3)**
**Accessories**


Brass Clamp

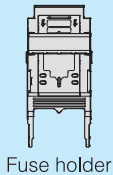
Separator

Switch

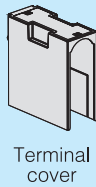
Terminal Cover

**Connection Type**


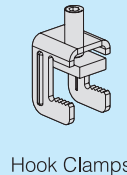
- ① Clamp terminal (optional)
- ② Bridge Clamp (optional)
- ③ Available for cable lugs, screw and bolt connection (standard)
- ④ Brass Clamp (optional)



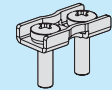
Fuse holder



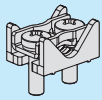
Terminal cover



Hook Clamps



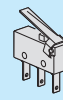
Bridge Clamps



Circle Sliced Clamps



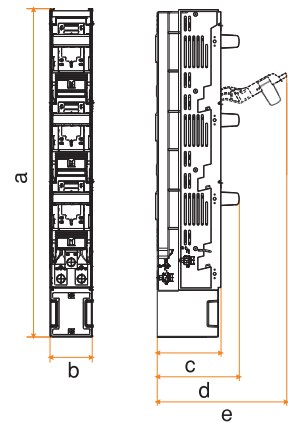
V Clamps



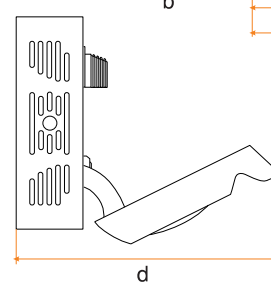
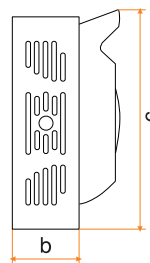
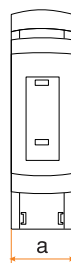
Micro Switch


**FUSE SWITCH DISCONNECTORS (IEC / EN 60947-3)**

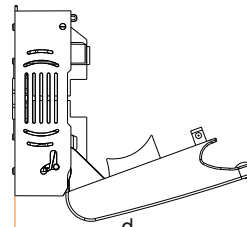
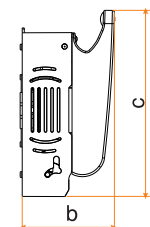
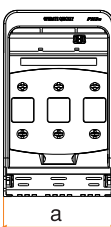
Type	Dimensions (mm)				
	a	b	c	d	e
FVS160 (With three separate handles)	765	49	126	137	205
FVS160 (With one handle)	765	49	126	147	212
FVS250 / FVS400 / FVS630 (With three separate handles)	770	99	150	197	308
FVS250 / FVS400 / FVS630 (With one handle)	770	99	150	204	457
FVSB200-250 / FVSB400 / FVSB630	668	99	150	-	-



Type	Dimensions (mm)			
	a	b	c	d
FHS160	40	47	175	205
FHS250	62	64	247	290
FHS400	90	87	280	340
FHS630	90	87	280	340



Type	Dimensions (mm)			
	a	b	c	d
FHS160	106,5	89	180	205,7
FHS250	187	112	238	285
FHS400	250	137	275	340
FHS630	250	137	275	340





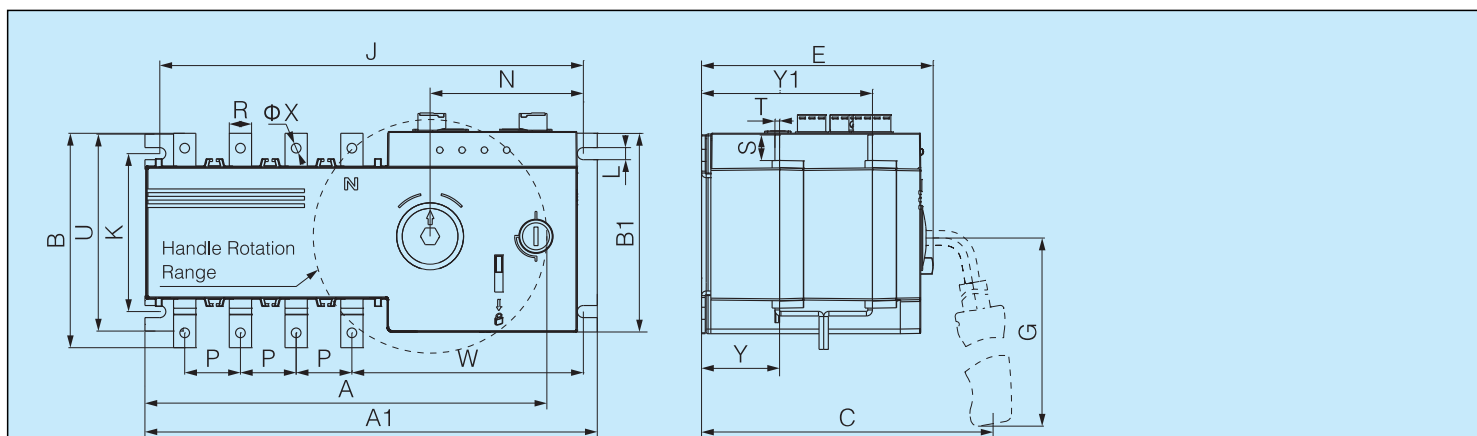
## AUTOMATIC TRANSFER SWITCHES (IEC / EN 60947-6-1)

Auto transfer switch mainly used for electric distribution network or motor network with rated voltage AC 380V, 50Hz, DC rated voltage 220V, rated current 16A to 3200A, change over between main power and backup power system ,power grid and genset. Meanwhile can be used as isolation of unfrequency making and breaking circuit. It is widely used in the transmission and distribution system and automation system of the important places, which need uninterrupted power,such as fire-fighting,Hospital, Bank, high building etc.

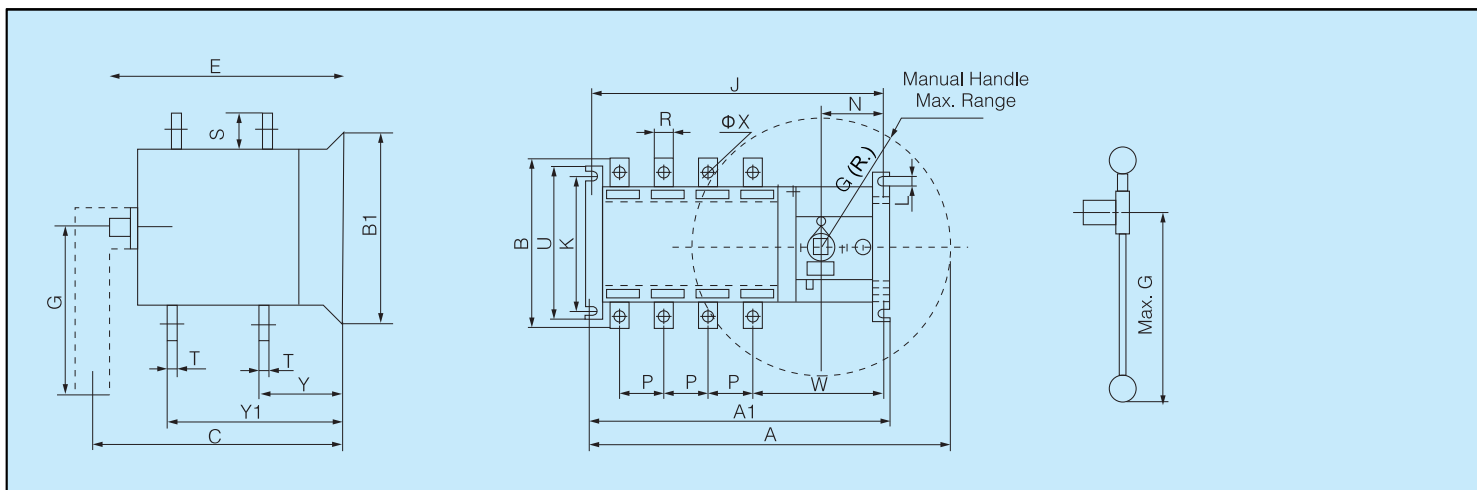


100 - 3200A series Auto transfer switch electric properties and mechanical properties

Rated Thermal Current I <sub>th</sub>		100A						160A		250A		630A		1000A		1600A		2000A	2500A	3200A
Rated Current I <sub>n</sub> (A)		16	20	40	63	80	100	125	160	200	250	400	630	800	1000	1250	1600	2000	2500	3200
Rated Insulation Voltage U <sub>i</sub> (V)		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	1000	1000	1000
Dielectric Strength (V)		5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	10000	10000	10000	10000	10000	10000	10000
Rated Impulse Withstand Voltage U <sub>imp</sub> kV		8	8	8	8	8	8	8	8	8	8	8	12	12	12	12	12	12	12	12
Rated Short Time Withstand Current I <sub>cw</sub> (kA Rms) 0.1s/1s		9/5	9/5	9/5	9/5	9/5	9/5	20/10	20/10	25/12	25/12	40/20	50/25	90/50	90/50	90/50	90/50	50	50	55
Rated Breaking Capacity (A Rms) 380V		128	160	320	500	640	800	1000	1280	1600	2000	3200	5000	6400	8000	10000	12800	16000	20000	25600
Rated Making Capacity (A Rms) 380V		160	200	400	630	800	1000	1250	1600	2000	2500	4000	6300	8000	1000	1250	16000	20000	25000	32000
Transfer Time	I-O-II	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	2.4	2.4	2.4
	I-O-II (s)																			
	I-O II-O (s)	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6
Weight (kg)	3 Poles	4.15	4.15	4.25	4.35	4.45	4.45	8.2	8.2	10.4	10.4	17.8	19	28	31	31	34	-	-	-
	4 Poles	4.2	4.2	4.3	4.4	4.5	4.5	8.7	8.7	11.3	11.3	20.2	22	32	36	36	40	95	98	135
Utilization Categeory		AC-32B (PC)																		

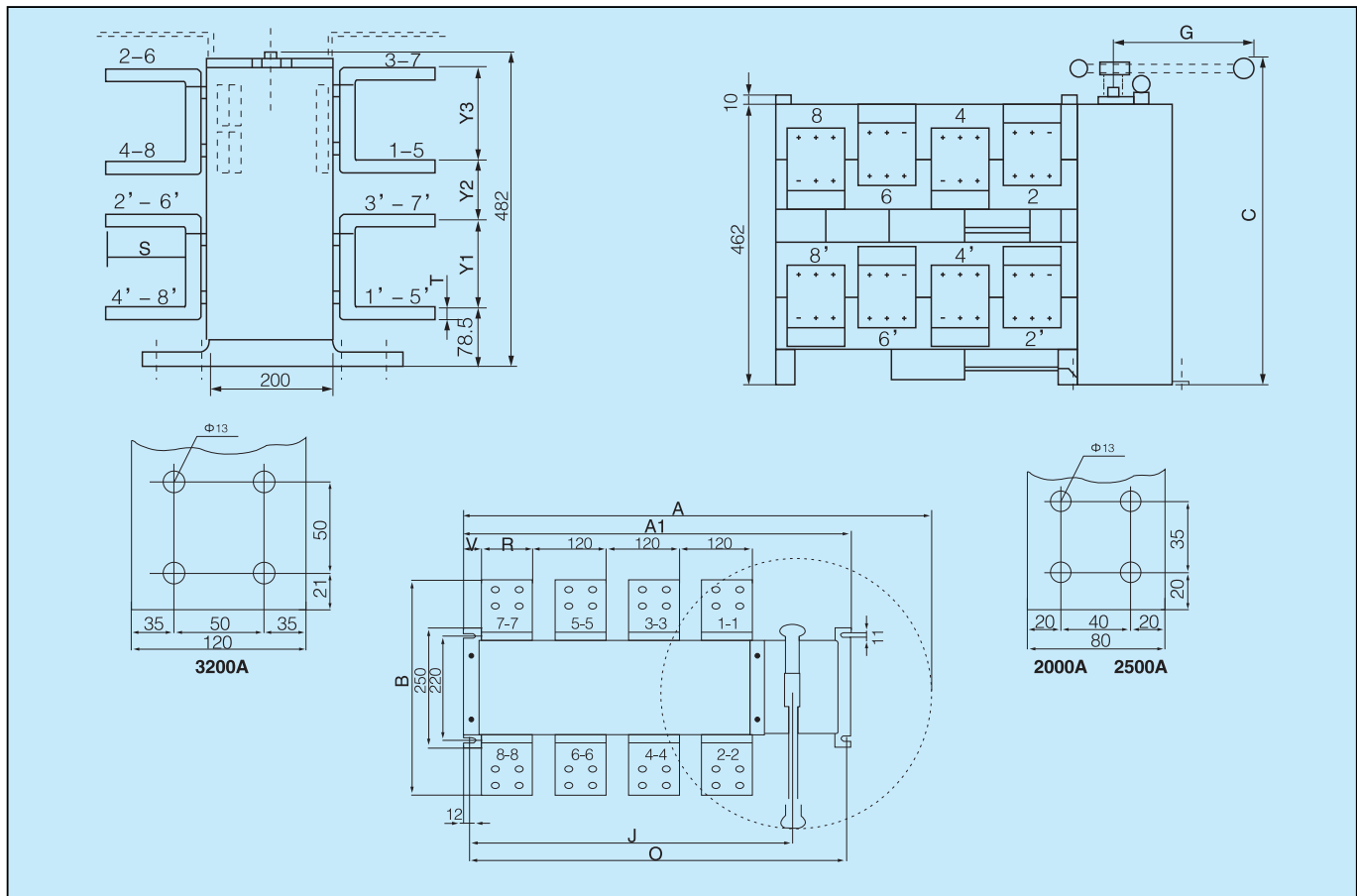
**16A - 630A OUTLINE AND MOUNTING SIZE**


Specification	Outline and mounting size (mm)																			
In	A	A1	B	B1	C	E	G	J	K	L	N	P	R	S	T	U	W	ΦX	Y	Y1
FATS-L100A	330	244	135	115	165	125	228	228	85	6.5	83	30	12	18	(2.5)5	(2.99)	125	6.5	41.5	91.5
FATS-L160A	374	301	175	140	200	150	174	285	102	7	94	36	20	18	(2.5)5	99	125	8.5	55.5	125.5
FATS-L250A	436	436	178	134	240	198	174	344	108	7	99	50	24	30	(3.5)7	148	173	11	72	157
FATS-L630A	502	433	260	222	282	244	174	416	176	9	101	65	40	50	(5)10	222	185	12	83	193

**800A - 1600A OUTLINE AND MOUNTING SIZE**


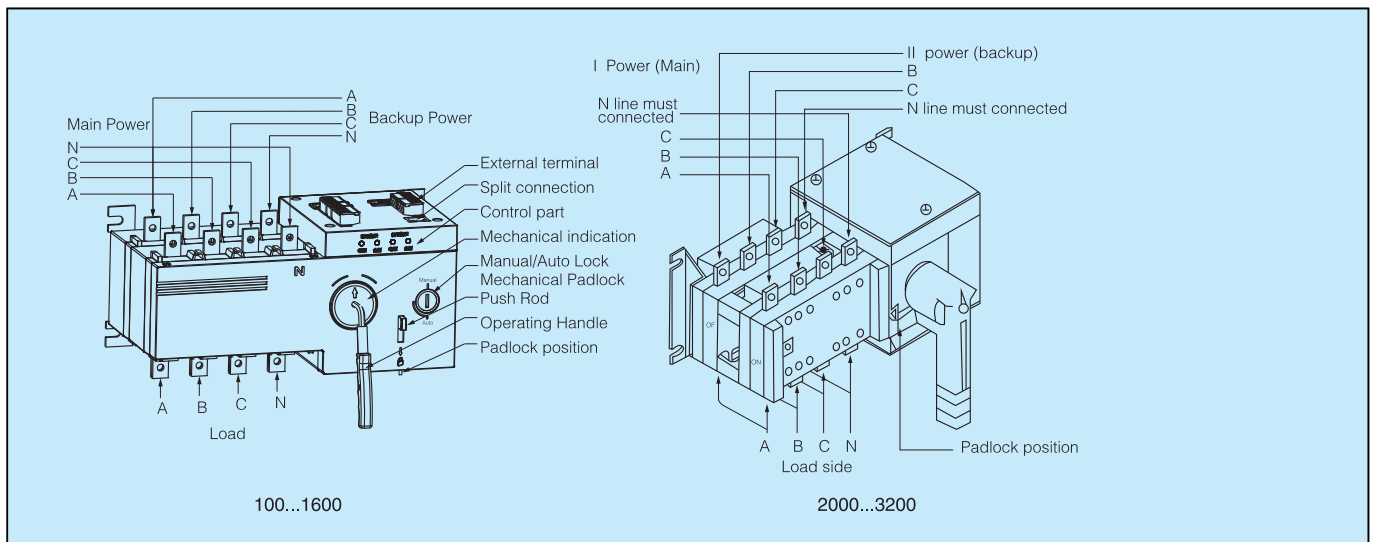
Specification	Outline and mounting size (mm)																			
In	A	A1	B	B1	C	E	G	J	K	L	N	P	R	S	T	U	W	ΦX	Y	Y1
FATS-L800A/3	871.5	524	340	250	387	319.5	448	499	212	13	88	120	60	69	8	250	198.5	12.5	84	252
FATS-L800A/4	975.5	637.5	340	250	387	319.5	448	612.5	212	13	88	120	60	69	8	250	207	12.5	107	252
FATS-L1000A/3	871.5	524	340	250	387	319.5	448	499	212	13	88	120	60	69	8	250	198.5	12.5	107	252
FATS-L1000A/4	975.5	637.5	340	250	387	319.5	448	612.5	212	13	88	120	60	69	8	250	207	12.5	107	252
FATS-L1250A/3	871.5	524	369	250	387	319.5	448	499	212	13	88	120	60	69	8	250	198.5	13	107	252
FATS-L1250A/4	975.5	637.5	369	250	387	319.5	448	612.5	212	13	88	120	60	69	8	250	207	13	107	252
FATS-L1600A/3	871.5	524	376	250	387	319.5	448	499	212	13	88	120	60	69	10	250	198.5	13	109	253.5
FATS-L1600A/4	975.5	637.5	376	250	387	319.5	448	612.5	212	13	88	120	60	69	10	250	207	13	109	253.5

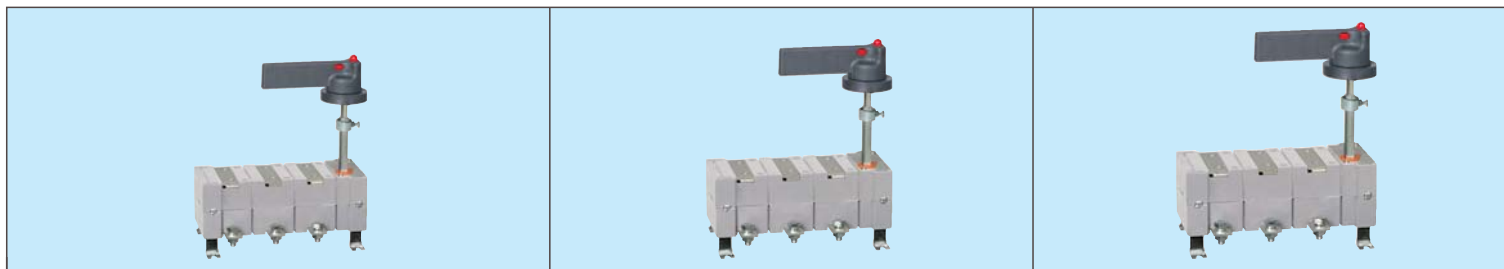
## 2000A - 3200A OUTLINE AND MOUNTING SIZE



Spec	Size																		
	A	A1	B	C	E	G	H	J	K	L	N	O	P	R	S	T	U	V	Y
FATS-L2000A	1007	633	455	562	495	470	53	467	220	11	84.5	524	120	80	80	10	250	33	147
FATS-L2500A	1007	633	455	562	495	470	28	467	220	11	84.5	524	120	80	100	10	250	13	152
FATS-L3200A	1007	633	505	562	495	470	28	467	220	11	84.5	524	120	100	100	14	250	13	152

## WIRING INSTRUCTION

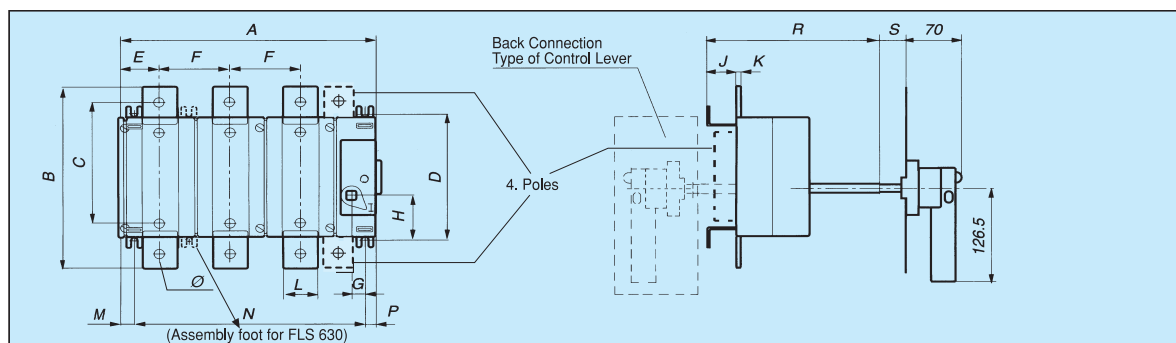


**LOAD BREAK SWITCH WITHOUT FUSES (IEC / EN 60947-3)**

**Technical Specifications**

TYPE		FLS 160			FLS 250			FLS 400			FLS 630		
Conventional Thermal Current (I <sub>th</sub> )	60°C A	160			250			400			630		
Number of Poles		3 - 4			3 - 4			3 - 4			3 - 4		
Insulation Voltage (U <sub>i</sub> )	V	1000			1000			1000			1000		
Impulse Withstand Voltage (U <sub>imp</sub> )	kV	8			8			8			8		
Operational Voltage (U <sub>e</sub> ) (phase-phase)	V	400	500	690	400	500	690	400	500	690	400	500	690
Utilization Category		AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A
Operational Current (I <sub>e</sub> )	A	160	160	125	250	250	200	400	400	315	630	630	500
Conditional Short - Circuit Current (with NH Fuse)	kA	65			65			65			65		
Short Time Withstand	kA	8			15			18			25		
Fuse Type (Dispatched Without Fuse)	NH	-			-			-			-		
Mechanical Durability	Operation	>10.000			>10.000			>10.000			>8000		
Electrical Durability	Operation	>1000			>1000			>1000			>1000		
Connection Conductor Cross - Section	mm <sup>2</sup>	70			120			240			2x185		
Power Loss Per Pole	W	12			25			35			65		
Max - Min Tightening Torques	Nm	7-10			14-20			17-25			28-40		
Hole Diameter	Ø	M8			M10			M10			M12		
Distance Between Main Busbar Terminals	mm	-			-			-			-		
Weight	Kg	2,4 - 2,7			3,8 - 4,2			3,9 - 4,3			9 - 9,5		

Rated Breaking Capacity : 8xle for AC23A, 3xle for AC22A, 1,5xle for AC21A, 1,5xle for AC21B.

Rated Closing Capacity : 10xle for AC23A, 3xle for AC22A, 1,5xle for AC21A, 1,5xle for AC21B.



Tip	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	Ø
FLS 160	185	142	123	105,5	37	43.5	15	32	28	3	20	13	160	12	152	10-70	8
FLS 250	255.5	163	138.5	128	43.5	65	15.5	33	32	4	25	15	224	20.5	197		
FLS 400											30						
FLS 630	317	243	202	168	50	89	16.5	54	37	6	40	83.5	224	14	222.5		
FLS 800		355	315						35	8							
FLS1000									33	8							
FLS1250									31	10							
FLS1600																	
FLS1800																	
FLS2000																	

**LOAD BREAK SWITCH WITHOUT FUSES (IEC / EN 60947-3)**



FLS 800			FLS 1000			FLS 1250			FLS 1600			FLS 1800			FLS 2000		
800			1000			1250			1600			1800			2000		
3 - 4			3 - 4			3 - 4			3 - 4			3			3		
1000			1000			1000			1000			1000			1000		
8			8			8			8			8			8		
400	500	690	400	500	690	400	500	690	400	500	690	400	500	690	400	500	690
AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC21A	AC21A	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B
800	800	630	1000	1000	800	1250	1250	1000	1600	1600	1250	1800	1800	1600	2000	2000	1750
65			65			65			65			65			65		
35			35			35			35			35			35		
-			-			-			-			-			-		
>8000			>8000			>8000			>8000			>8000			>8000		
>500			>500			>500			>200			>150			>150		
2x240			40x15			2x(40x10)			2x(50x10)			3x(50x10)			3x(50x10)		
55			80			125			165			210			260		
28-40			28-40			28-40			28-40			28-40			28-40		
M12			M12			M12			M12			M12			M12		
-			-			-			-			-			-		
12,5 - 13			12,6 - 13,1			13 - 13,5			13,2 - 13,7			14			14		

**CHANGEOVER ISOLATION SWITCH (VERTICALLY / HORIZONTALLY INSTALLED) (IEC / EN 60947-3)**
**FLS EV**

**FLS EH**

**Technical Specifications**

TYPE		FLS 160EV / EH			FLS 250EV / EH			FLS 400EV / EH			FLS 630EV / EH		
Conventional Thermal Current (Ith)	60°C A	160			250			400			630		
Number of Poles		3 - 4			3 - 4			3 - 4			3 - 4		
Insulation Voltage (Ui)	V	1000			1000			1000			1000		
Impulse Withstand Voltage (Uimp)	kV	8			8			8			8		
Operational Voltage (Ue) (phase-phase)	V	400	500	690	400	500	690	400	500	690	400	500	690
Utilization Category	EV	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A
	EH	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A
Operational Current (Ie)	A	160	160	125	250	250	200	400	400	315	630	630	500
Conditional Short - Circuit Current (with NH Fuse)	kA	65			65			65			65		
Short Time Withstand	kA	8			8 / 15			15 / 18			15 / 25		
Fuse Type (Dispatched Without Fuse)	NH	-			-			-			-		
Mechanical Durability	Operation	>10.000			>10.000			>10.000			>10.000 / 8000		
Electrical Durability	Operation	>1000			>1000			>1000			>1000		
Connection Conductor Cross - Section	mm²	70			120			240			2x185		
Power Loss Per Pole	W	9 / 12			12 / 25			25 / 35			47 / 65		
Max - Min Tightening Torques	Nm	7-10			7-10 / 14-20			17-25			17-25 / 28-40		
Hole Diameter	Ø	M8			M8 / M10			M10			M10 / M12		
Distance Between Main Busbar Terminals	mm	-			-			-			-		
Weight	Kg	EV			6 - 6,8			9,2 - 10			9,2 - 10		
		EH			9 - 9,8			9,2 - 10			19 - 20		

Rated Breaking Capacity : 8xle for AC23A, 3xle for AC22A, 1,5xle for AC21A, 1,5xle for AC21B.  
 Rated Closing Capacity : 10xle for AC23A, 3xle for AC22A, 1,5xle for AC21A, 1,5xle for AC21B.

The diagram illustrates the dimensions of the FLS EH switch. The front view (left) shows a symmetrical design with a central vertical component. Dimensions include: A (total width), H (distance from center to side terminals), J (distance between side terminals), L (terminal width), D (main body height), E (terminal height), T (terminal spacing), F (terminal width), G (terminal spacing), C (main body width), B (terminal width), and Ø (central opening diameter). The side view (right) shows the switch's profile with dimensions: K (main body width), M (terminal width), N (main body depth), P (terminal depth), R (total depth), and S (terminal depth).

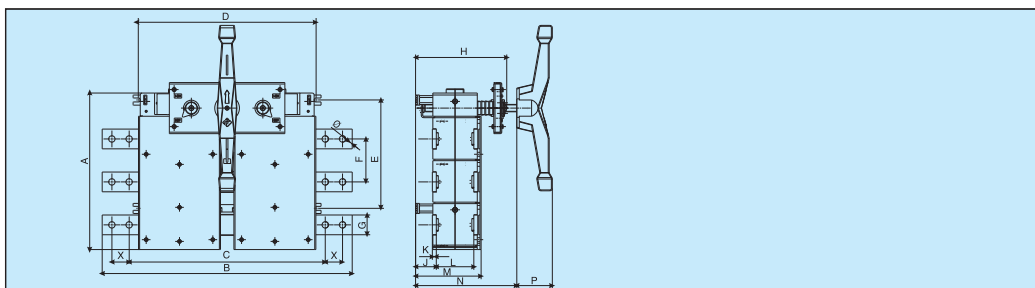
Type	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	Ø
FLS 160EH	412	142	123	106	101	37	43	160	68	28	20	3	100	150	195	42		8
FLS 250EH	545	162	136	128	116	43	65	220		42	25	4	131	177	215	72	88	11
FLS 400EH											30							
FLS 630EH	671	243	202	168	166	50	87			65	36	40	6	133	186	217		108



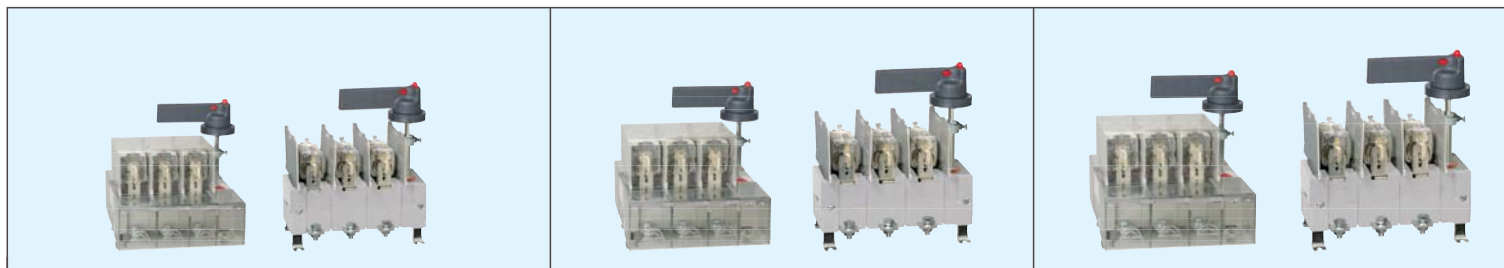
**CHANGEOVER ISOLATION SWITCH (VERTICALLY INSTALLED) (IEC / EN 60947-3)**



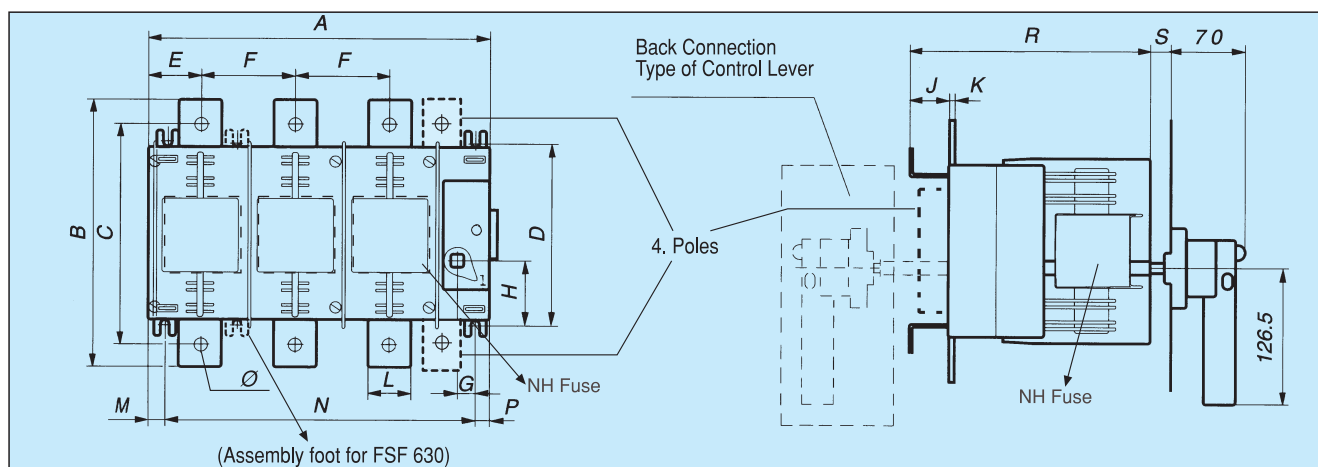
FLS 800EV			FLS 1000EV			FLS 1250EV			FLS 1600EV			FLS 1800EV			FLS 2000EV		
800			1000			1250			1600			1800			2000		
3 - 4			3 - 4			3 - 4			3 - 4			3			3		
1000			1000			1000			1000			1000			1000		
8			8			8			8			8			8		
400	500	690	400	500	690	400	500	690	400	500	690	400	500	690	400	500	690
AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC22A	AC21A	AC21A	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B	AC21B
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	800	630	1000	1000	800	1250	1250	1000	1600	1600	1250	1800	1800	1600	2000	2000	1750
65			65			65			65			65			65		
35			35			35			35			35			35		
-			-			-			-			-			-		
>8000			>8000			>8000			>8000			>8000			>8000		
>500			>500			>500			>200			>150			>150		
2x240			40x15			2x(40x10)			2x(50x10)			3x(50x10)			3x(50x10)		
55			80			125			165			210			260		
28-40			28-40			28-40			28-40			28-40			28-40		
M12			M12			M12			M12			M12			M12		
-			-			-			-			-			-		
26 - 27			26,2 - 27,2			27 - 28			27,4 - 28,4			29			29		
-			-			-			-			-			-		



Type	A	B	C	D	E	F	G	H	J	K	L	M	N	P	X	Ø
FLS160EV	185	280	260	242	160	43	20	160	41	56	56	110	205	41	-	8
FLS250EV		305	280						38	62	62					11
FLS400EV	254	307	282	272	220	65	30	178	46	68	68	128	203	72	-	11
FLS630EV									42	76	76					13
FLS800EV	317	436	397	360	220	87	40	185	42	8	76	133	203	72	35	13
FLS1000EV																
FLS1250EV										10						
FLS1600EV																
FLS1800EV										12						
FLS2000EV																

**LOAD BREAK SWITCH WITH FUSE (IEC / EN 60947-3)**

**Technical Specifications**

TYPE		FSF 160			FSF 250			FSF 400			FSF 630		
Conventional Thermal Current (I <sub>th</sub> )	60°C A	160			250			400			630		
Number of Poles		3 - 4			3 - 4			3 - 4			3 - 4		
Insulation Voltage (U <sub>i</sub> )	V	1000			1000			1000			1000		
Impulse Withstand Voltage (U <sub>imp</sub> )	V	8			8			8			8		
Operational Voltage (U <sub>e</sub> ) (phase-phase)	kV	400	500	690	400	500	690	400	500	690	400	500	690
Utilization Category		AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A	AC23A
Operational Current (I <sub>e</sub> )	A	160	160	125	250	250	200	400	400	315	630	630	500
Conditional Short - Circuit Current (with NH Fuse)	kA	65			65			65			65		
Short Time Withstand	kA	-			-			-			-		
Fuse Type (Dispatched Without Fuse)	NH	000, 00			1,2			1,2			1,2		
Mechanical Durability	Operation	>10.000			>10.000			>10.000			>8000		
Electrical Durability	Operation	>1000			>1000			>1000			>1000		
Connection Conductor Cross - Section	mm <sup>2</sup>	70			120			240			2x185		
Power Loss Per Pole	W	12			25			35			65		
Max - Min Tightening Torques	Nm	7-10			14-20			17-25			28-40		
Hole Diameter	Ø	M8			M10			M10			M12		
Distance Between Main Busbar Terminals	mm	-			-			-			-		
Weight	Kg	2,6 - 2,9			4,2 - 4,6			4,3 - 4,7			9,6 - 10,1		



Type	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	Ø
FSF 160	185	142	123	109	37	43,5	15	32	28	3	20	13	160	12	152	10-70	8
FSF 250	255.5	163	138.5	128	43.5	65	15.5	33	32	4	25	15	224	20.5	197		11
FSF 400											30						
FSF 630	317	243	202	168	50	89	16.5	54	37	6	40	83.5	224	14	222.5		13

## FIBER GLASS REINFORCED POLYESTER CABINETS (IEC/EN 61439-1)



### Technical Specifications

	Type-1	Type-3
Width	585	790
Height	880	880
Depth	320	320
Base Length	900	900
IP Protection	IP54	IP54
Total weight (kg)	37	45
RAL	7035	7035

## EasyPan DISTRIBUTION BOARDS (IEC / EN 61439-1, IEC/EN 61439-3)



### Technical Specifications

IP Protection	: IP40
Thickness	: 1,00 mm
Number of ways	: 12 - 18 - 24 - 30 - 36
Input Circuit	: L.V. Circuit Breakers
	Residual Current Circuit Breakers
	Miniature Circuit Breakers
	Disconnectors
Standard	: IEC 60439-1

## POLYESTER FLOOR - STANDING ENCLOSURES



GRP floor-standing enclosures  
Dimensions: 720mmx760mmx320mm

For Indoor and Outdoor use.  
Protection degree IP54 according to IEC 60529.  
Impact resistance IK10 for the plain doors and all sides  
Locking system 3 points.  
Door opening to 120°.

### Characteristics of the material

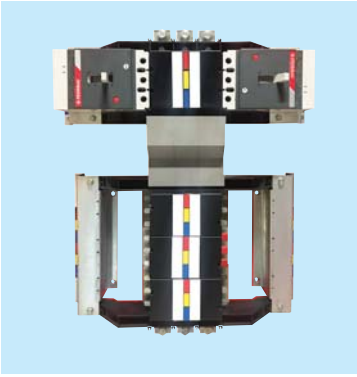
The floor-standing enclosures are made from polyester reinforced with fiberglass, moulded by hot compression, in RAL 7032 grey color.

- This material is insulating: several kV per mm.
- Can be machined easily.
- Is resistant to corrosion: does not rust and can withstand many chemical substances.
- Highly resists to corrosion in harsh weather conditions (rain, UV).
- Withstands temperatures between -50 °C + 150 °C.
- Does not soften under heat (ball resistance at +150 °C).
- Is self-extinguishing (does not propagate fire: self-extinguishing in several seconds during the glow-wire test at 960 °C during 30 s.).
- Does not contain halogens.
- Releases little smoke and nontoxic smoke in the case of combustion.

### Enclosure obtained by assembling:

- 1 sealed top part.
- 1 sealed bottom part.
- 1 sealed side part.
- 1 sealed rear part
- 1 door

## EasyPan READY BUSBAR SYSTEMS (IEC 61436-1)



- 250 A, 400A ve 630A main switch connection means
- 2, 4, 6, 10, 12 ways (3 pole) Federal F10, F11, F31 type switch output means
- Conformity with IEC 60439-1 and CE norms
- Easy and reliable maintenance
- Aesthetic apperance
- Completely equipped
- Dispatch in optional panel
- Direct connection without main switch
- Phases shown with colored labels
- Accidental contact has been prevented in compliance with IP20 protection degree according to IEC standards and ensured complete life security.

## MODULAR MAIN DISTRIBUTION PANEL BOARDS (IEC / EN 61439-1) (IEC / EN 61439-2)



### Electrical characteristics of Federal panel

Current Capacity	: 2500 A
Rated Voltage	: 415 V
Isolated Voltage	: 1000 V
Impact Resistance Voltage	: 8kV
Peak Resistance Voltage	: 143kApk
Short-time Withstand Current	: 65kArms
Usage Factor	: 1
Protection Degree	: IP54
Form	: 4b
Standard	: IEC 61439-1 and IEC 61439-2
Type	: Type1, Type2, Type3 Type4, Type5, Type6

## RELAYS



Type	Description
<b>Phase Protection Relays</b>	
FMFK	Phase Sequence and Motor Protection (Adjustable)
MTPR1	Phase Protection
FSMK	Phase Sequence and Motor Protection
<b>Liquid Level Relay</b>	
FSSR	Liquid Level Relay
<b>Time Relays</b>	
FT30	0-30 sec.
FT24R	Charge reserve approx 100 h max
<b>Photoelectric Switches with Sensor</b>	
FPS	Has manually adjustable Lux scale (1-3 Lux). The activation-deactivation delay is set to 5-40 sec. on relay output.
<b>Digital Thermostats</b>	
FDT72	72x72
FDT96	96x96
<b>Microprocess Counters</b>	
FS72	72x72

## PLUGS & SOCKET

FEDERAL CEE plugs and sockets, with their number of poles (2P+E; 3P+E; 3P+N+E) connecting to almost every electric circuits which meet the requirements appropriately. They are adapted to operate at low voltage (110V, 220V 380V, 450V) and colored according to their feeding. Different execution styles (wall mounting, angled, straight, with box) are available like high protection degrees (IP44 and IP67) and different nominal currents (16A, 32A, 63A)

### PANEL MOUNTING SOCKET



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	110-130 / 200-250	4 / 6	● ●	IP44
	32	200-250	6	●	IP44
3P+E	16-32-63	380-415	6	●	IP44
3P+N+E	16-32-63	380-415	6	●	IP44

### PANEL MOUNTING SOCKET WITH LOCKED COVER



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	32	200-250	6	●	IP67
3P+E	16-32-63	380-415	6	●	IP67
3P+N+E	16-32-63	380-415	6	●	IP67

### WALL MOUNTING SOCKET WITH STRAIGHT BOX



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	110-130 / 200-250	4 / 6	● ●	IP44
	32	200-250	6	●	IP44
3P+E	16-32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44

### WALL MOUNTING SOCKET WITH STRAIGHT BOX AND WITH LOCKED COVER



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	32	200-250	6	●	IP67
3P+E	16-32	380-415	6	●	IP67
3P+N+E	16-32	380-415	6	●	IP67

### WALL MOUNTING SOCKET WITH ANGLED BOX



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	110-130 / 200-250	4 / 6	● ●	IP44
3P+E	16	200-250	6	●	IP44
3P+N+E	16	200-250	6	●	IP44

### WALL MOUNTING SOCKET WITH ANGLED BOX AND LOCKED COVER



Type	Amper (A)	(V)	(h)	Color	IP
3P+N+E	16	380-415	6	●	IP67

### WALL MOUNTING SOCKET WITH ANGLED BOX + SCHUKO



Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	200-250	6	●	IP44
3P+E	16	380-415	6	●	IP44
3P+N+E	16	380-415	6	●	IP44

**WALL MOUNTING SOCKET WITH ANGLED BOX AND LOCKED COVER + SCHUKO**


Type	Amper (A)	(V)	(h)	Color	IP
3P+N+E	16	380-415	6	●	IP67

**ANGLED WALL MOUNTING SOCKET**


Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	200-250	6	●	IP44
3P+E	16	380-415	6	●	IP44
3P+N+E	16	380-415	6	●	IP44

**ANGLED PLUG**


Type	Amper (A)	(V)	(h)	Color	IP
3P+N+E	16	380-415	6	●	IP64

**CONNECTOR**


Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	110-130 / 200-250	4 / 6	● ●	IP44
	32	200-250	6	●	IP44
3P+E	16-32-63	380-415	6	●	IP44
3P+N+E	16-32-63	380-415	6	●	IP44

**CONNECTOR WITH LOCKED COVER**


Type	Amper (A)	(V)	(h)	Color	IP
3P+E	16	380-415	6	●	IP44
3P+E	63	380-415	6	●	IP67
3P+N+E	63	380-415	6	●	IP67

**PLUG**

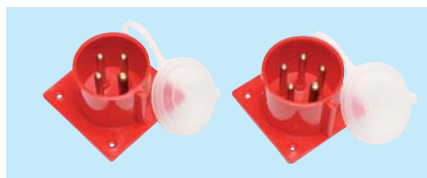

Type	Amper (A)	(V)	(h)	Color	IP
2P+E	16	110-130 / 200-250	4 / 6	● ●	IP44
	32	200-250	6	●	IP44
3P+E	16-32-63	380-415	6	●	IP44
3P+N+E	16-32-63	380-415	6	●	IP44

**PLUG WITH LOCK**


Type	Amper (A)	(V)	(h)	Color	IP
2P+E	32	200-250	6	●	IP44
3P+E	16-32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44
3P+E	63	380-415	6	●	IP67
3P+N+E	63	380-415	6	●	IP67



## WALL MOUNTING INLET



Type	Amper (A)	(V)	(h)	Color	IP
3P+E	32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44

## WALL MOUNTING INLET WITH STRAIGHT BOX



Type	Amper (A)	(V)	(h)	Color	IP
3P+E	32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44

## WALL MOUNTING INLET WITH ANGLED BOX



Type	Amper (A)	(V)	(h)	Color	IP
3P+E	32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44

## WALL MOUNTING INLET WITH ANGLED BOX + SCHUKO



Type	Amper (A)	(V)	(h)	Color	IP
3P+E	32	380-415	6	●	IP44
3P+N+E	16-32	380-415	6	●	IP44

## COMBINATION BOXES (IP44 - IP65 - IP67)



### Combination Boxes

260x350x115

### Combination Boxes

210x280x100

### Combination Boxes

113x210x90

### Coverless Combination Boxes

113x210x70

### Combination Boxes Without MCB

210x280x100

### Distribution Board With Metal Mounting Plate

### Distribution Board With Plate For MCB

### Outdoor Distribution Board For Telephone Modules

210x300x130, 260x350x150, 300x400x130, 300x400x170, 400x500x200, 400x600x200, 500x700x250

### Distribution Board With Plate For Three Phase Energy Meter And MCB

### Distribution Board With Plate For Compact Switch

### Distribution Board For Water Pump

400x500x200, 400x600x200, 500x700x250

### Distribution Board With Plate For Single Phase Energy Meter

210x300x130, 260x350x150, 300x400x130, 300x400x170

### Distribution Board With Plate For Three Phase Energy Meter

300x400x130, 300x400x170, 400x500x200, 400x600x200, 500x700x250

### Distribution Board For Construction Site

400x600x200, 500x700x250

## SIGNAL LAMPS



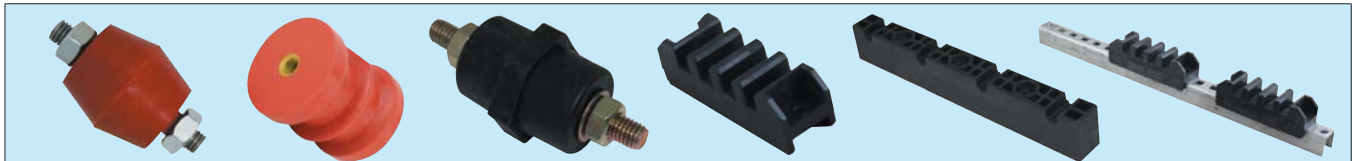
<b>Rated Voltage</b>	220V AC / 24V AC/DC
<b>LED Light</b>	● ● ●
<b>Installation Ø</b>	22 mm
<b>Min. Operating Temperature</b>	-25 °C
<b>Max. Operating Temperature</b>	70 °C

## CABLE LUGS





<b>FCL0</b>	Cross - Section mm <sup>2</sup>	10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 600
	Bolt ø	M5, M6, M8, M10, M12, M14, M16, M20
<b>FCL1</b>	Cross - Section mm <sup>2</sup>	10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240
	Bolt ø	M5, M6, M8, M10, M12, M14, M16, M20
<b>FCLD</b>	Cross - Section mm <sup>2</sup>	10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 625
	Bolt ø	M5, M6, M8, M10, M12, M14, M16, M20
<b>But Connector</b>	Cross - Section mm <sup>2</sup>	6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300, 400, 500, 625

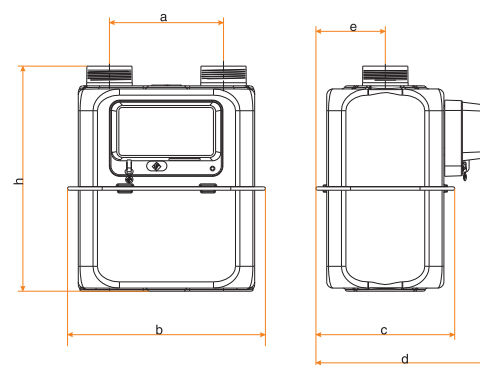
## INSULATORS



	FIBER GLASS SUPPORT INSULATORS		PLASTIC BUSBAR SUPPORT INSULATORS (V0)	
<b>Specific Weight</b>	DIN 53479	1,75 g/cm <sup>3</sup>		1,56 g/cm <sup>3</sup>
<b>Martens Degree</b>	DIN 53462	>200 °C	DIN 53462	>200 °C
<b>Flexural Strength</b>		90 N/mm <sup>2</sup>	ISO 178	205 N/mm <sup>2</sup>
<b>Impact Strength</b>	DIN EN ISO 179	25 - 30 kJ/m <sup>2</sup>	ISO 180 / 1A	14 kJ/m <sup>2</sup>
<b>Flammability</b>	UL 94	V0	UL 94	V0
<b>Glow-Wire Flammability</b>	DIN EN 60945	960 °C		
<b>Temperature Range</b>		-40 °C + 130 °C		-40 °C + 130 °C
<b>Surface Resistivity</b>	DIN IEC 60093	10 <sup>14</sup> 0 cm	IEC 93	10 <sup>13</sup> 0 cm
<b>Volume Resistivity</b>	DIN IEC 60093	10 <sup>14</sup> 0 cm	IEC 93	10 <sup>13</sup> 0 cm
<b>Water Absorption</b>	DIN EN ISO 62	<0,2 % (<25mg)	DIN EN ISO 62	<0,2 % (<25mg)

## GAS METERS (EN 1359)

		
		
<b>Type</b>	<b>FN G2.5</b> <b>FN G2.5-HT</b>	<b>FN G4</b> <b>FN G4-HT</b>
Gas Types	Natural Gas - LPG, Air Gas	
Q Min	0.025m <sup>3</sup> / h	0.04m <sup>3</sup> / h
Q Max	4m <sup>3</sup> / h	6m <sup>3</sup> / h
Measuring Interval	0.025m <sup>3</sup> /h - 4m <sup>3</sup> /h	0.040m <sup>3</sup> /h - 6m <sup>3</sup> /h
Max. Operating Pressure	0.5 bar	
Leakage Test Pressure Value	750 mbar	
Measuring Volume	1.2 dm <sup>3</sup>	
Operating Temperature	-25 C°, +55 C°	
Storage Temperature	-30 C°, +70 C°	
Body	Galvanized 0,8mm Deep Extrusion Steel	
Weight	2 kg.	








Type	Connection					
	DN			Connection Size		
FN G2,5	32	25	20	G 1 1/4"	G 1"	G 3/4"
FN G4				ISO 228-1:G 3/8"		
FN G2,5-HT						
FN G4-HT						

	Dimensions					
Type	h	a	b	c	d	e
FN G2,5 FN G4	215-220	110	193	135	167	67.5
FN G2,5-HT FN G4-HT	236					










- Connection points; manufactured as two outlet fittings
- As inner volume of 1.2 dm<sup>3</sup> suits best to operating conditions, it can operate in optimal rates during high haulage.

## ELECTRONIC BALLASTS (EN 61347-2-3)

### Professional Electronic Ballasts

	Type	Power (W)
	<b>T5 Class</b>	
	FDR5-FDH-1/LW	1x4, 6, 8, 13
	FDR5-FDH-2/LW	2x4, 6, 8, 13
	FDR5-FDH-1/MW	1x14, 21, 28, 35
	FDR5-FDH-2/MW	2x14, 21, 28, 35
	FDR5-FDH-4/14	4x14
	FDR5-FDH-1/54	1x54
	FDR5-FDH-2/54	2x54
	<b>T8 Class</b>	
	FDR8-FDH-1/15	1x15
	FDR8-FDH-2/15	2x15
	FDR8-FDH-1/18	1x18
	FDR8-FDH-2/18	2x18
	FDR8-FDH-3/18	3x18
	FDR8-FDH-4/18	4x18
	FDR8-FDH-1/30	1x30
	FDR8-FDH-2/30	2x30
	FDR8-FDH-1/36	1x36
	FDR8-FDH-2/36	2x36
	FDR8-FDH-3/36	3x36
	FDR8-FDH-1/58	1x58
	FDR8-FDH-2/58	2x58
	<b>TC-L Class</b>	
	FDRL-FSD-1/MW	1x18, 24
	FDRL-FSD-2/MW	2x18, 24
	FDRL-FSD-1/36	1x36
	FDRL-FSD-2/36	2x36
	FDRL-FSD-3/36	3x36
	FDRL-FSD-1/40	1x40
	FDRL-FSD-2/40	2x40
	FDRL-FSD-1/55	1x55
	FDRL-FSD-2/55	2x55
	<b>TC- DEL Class</b>	
	FDRC-FSM-1/MW	1x10, 13, 18
	FDRC-FSM-2/MW	2x10, 13, 18
	FDRC-FSM-1/26	1x26
	FDRC-FSM-2/26	2x26
	<b>TR- DEL UV Class</b>	
	FDRZ-UVL-1/21	1x21
	FDRZ-UVL-1/40	1x40

### Basic Electronic Ballasts

	Type	Power (W)
	<b>T8 Class</b>	
	FDR8-BSC-1/15	1x15
	FDR8-BSC-2/15	2x15
	FDR8-BSC-1/18	1x18
	<b>T5 Class</b>	
	FDR5-BSC-1/LW	1x4,6,8,13
	FDR5-BSC-2/LW	2x4,6,8,13
	FDR5-BSC-1/MW	1x14,21
	FDR5-BSC-1/24	1x24
	<b>T5C Class</b>	
	FDR5-BSC-1/22	1x22
	<b>TC-L Class</b>	
	FDRL-BSC-1/MW	1x18,24
	<b>TC-DEL Class</b>	
	FDRC-BSC-1/MW	1x10,13,18
	FDRC-BSC-2/MW	2x10,13,18
	FDRC-BSC-1/26	1x26
	<b>TC-SEL Class</b>	
	FDRS-BSC-1/MW	1x5,7,9,11
	FDRS-BSC-2/MW	2x5,7,9,11
	<b>TC-TEL Class</b>	
	FDRT-BSC-1/26	1x26
	<b>TC-F Class</b>	
	FDRE-BSC-1/MW	1x18,24
	<b>TC-DD Class</b>	
	FDRE-BSC-1/MW	1x10,16
	FDRE-BSC-2/10	2x10