



Switch Disconnectors

Type FN & FG



LARSEN & TOUBRO

It's all about Imagineering

About us

Larsen & Toubro is a technology-driven USD 7 billion company that infuses engineering with imagination. The Company offers a wide range of advanced solutions in the field of Engineering, Construction, Electrical & Electronics, Machinery and Information Technology.

L&T Switchgear, which forms part of the Electrical & Automation business, is India's largest manufacturer of low voltage switchgear, with the scale, sophistication and range to meet global benchmarks. With over four decades of experience in this field, the Company today enjoys a leadership position in the Indian market with growing presence in international markets.

It offers a complete range of products including controlgear, powergear, motor starters, energy meters, wires and host of other accessories. Most of our product lines conform to international standards, carry CE markings and are *KEMA* certified.



Switchgear Factory, Mumbai

L&T offers wide range of switch disconnectors for manual operation. The range of switch disconnector fuse conforms to the latest IEC/IS standards. The products are in line with design and quality standard associated with L&T switchgear products.

Switch Disconnector - Type FN

Range - 32 A to 1000 A



Features and Benefits

- Conforms to IEC 60947-3 / EN 60947-3 / IS13947 (PART 3)
- Full AC - 23 A rating
- Compact size
- Quad break contact system
- Separate arcing / current carrying zone
- Quick make / Quick break mechanism
- High clearance & creepage distances
- Generous terminal capacity
- Built-in neutral
- Provision for add-on auxiliary contact
- Clear ON / OFF indicator
- Front operated mechanism
- Suitable for aluminum termination
- Shroud for links
- Easy inspection & replacement of contacts
- Handle coupling arrangement conforming to IS-8623 (1977)
- Suitable for vertical and horizontal orientation

Switch Disconnector - Type FG

Range - 160 A to 3150 A



Features and Benefits

- Compact size saves panel space
- High reliability
- Convenience of operation
- Wide range of accessories to enhance safety
- High electrical and mechanical life
- Conforms to IS 13947-3 & IEC 60947-3
- Robust and rugged construction makes it suitable for tropical conditions
- Clear indication of switch position
- Quick make & Quick break mechanism

Technical Data

Type Designation	FN 32	FN 63	FN 100	FN 125	FN 200	FN 250	FN 315	FN 400	FN 630	FN 800	FN 1000	FN 1000H
No. of poles	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral
Neutral	Switched	Switched	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable	Isolable
Service temperature (°C)	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50	-20 to 50
Rated operational voltage (U _e) (V)	415	415	415	415	415	415	415	415	415	415	415	415
Rated insulation voltage (U _i) (V)	690	690	690	690	690	690	690	690	690	690	690	690
Rated impulse withstand voltage (Imp) (kV)	8	8	8	8	8	8	8	8	8	8	8	8
Rated frequency (Hz)	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60
Conventional enclosed thermal current at 40°C (A)	32	63	100	125	200	250	315	400	630	800	1000	1000
Rated operational current I _e												
AC 20 A utilization category	32	63	100	125	200	250	315	400	630	800	1000	1000
AC 21 A utilization category	32	63	100	125	200	250	315	400	630	800	1000	1000
AC 22 A utilization category	32	63	100	125	200	250	315	400	630	800	1000	1000
AC 23 A utilization category	32	63	100	125	200	250	315	400	630	800	1000	—
DC rating at 220 V DC												
No. of poles in series, utilization category at rated current	3, DC 23 A	3, DC 23 A	2, DC 23 A	2, DC 23 A	2, DC 23 A	2, DC 23 A	2, DC 22 A	2, DC 22 A	2, DC 22 A	2, DC 22 A	2, DC 22 A	---
Rated making capacity (436 V, cosφ=0.35) (A)	320	630	1000	1250	2000	2500	3150	4000	6300	8000	10000	10000
Rated breaking capacity (436 V, cosφ=0.35) (A)	256	504	800	1000	1600	2000	2520	3200	5040	6400	8000	3000
Capacitor duty - 415 V 50 - 60 Hz (kVAR)	14	29	45	57	92	115	145	175	270	270	270	---
Mechanical life (operating cycles)	15000	15000	15000	15000	10000	10000	10000	10000	10000	10000	5000	5000
Terminal capacity (main) (mm ²)	35	35	95	95	240	400	400	2 x 400	2 x 625	2 x 625	2 x 625	2 x 625
Terminal capacity (neutral) (mm ²)	35	35	50	50	120	120	120	240	400	400	400	400
Terminal screw (mm)	M 6 x 12	M 6 x 12	M 8 x 20	M 8 x 30	M 10 x 30	M 10 x 30	M 10 x 30	M 12 x 40	M 16 x 50	M 16 x 50	M 16 x 50	---
Short circuit withstand current (duration 1 sec) (kA)	1.5	1.5	4	4	6	10	14	14	20	20	25	50
Catalogue No. (Interior version)	SK95541	SK95540	SK95571	SK95405	SK95607	SK95683	SK95609	SK95610	SK95611	SK95551	SK95710	SK95992

Technical Data

Type Designation	FG 160	FG 200	FG 250	FG 315	FG 400	FG 630	FG 800	FG 1000	FG 1250	FG 1600	FG 2000	FG 2500	FG 3150
No. of poles													
Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral	3+Neutral
Service temperature	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50	Switchable -20 to 50
Rated operational voltage (U _e)	400	400	400	400	400	400	400	400	400	400	400	400	400
Rated insulation voltage (U _i)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage (U _{imp})	8	8	8	8	8	12	12	12	12	12	12	12	12
Rated frequency	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60
Conventional enclosed thermal current at 40°C	160	200	250	315	400	630	800	1000	1250	1600	2000	2500	3150
Rated operational current I _e													
AC 20 A utilization category	160	200	250	315	400	630	800	1000	1250	1600	2000	2500	3150
AC 21 A utilization category	160	200	250	315	400	630	800	1000	1250	1600	2000	2500	3150
AC 22 A utilization category	160	200	250	315	400	630	800	1000	1250	1600	2000	2500	2500
AC 23 A utilization category	160	160	250	315	400	630	800	1000	1000	1000	1400	1400	1600
DC rating at 220 V DC													
No. of poles in series, utilization category at rated current	3, DC 21 A	--	3, DC 23 A	3, DC 21 A	3, DC 21 A	3, DC 23 A	3, DC 21 A	3, DC 23 A	3, DC 21 A	3, DC 21 A	3, DC 21 A	--	--
Rated making capacity (400 V, cosφ=0.35)	1600	1600	2500	3150	4000	6300	8000	10000	10000	10000	14000	14000	16000
Rated breaking capacity (400 V, cosφ=0.35)	1280	1280	2000	2520	3200	5000	6400	8000	8000	8000	11200	11200	12800
Capacitor duty - 400 V 50 - 60 Hz	72	72	112	141	180	283	360	450	450	450	630	630	720
Mechanical life (operating cycles)	30000	30000	20000	20000	20000	10000	10000	10000	10000	10000	2500	2500	2500
Terminal capacity (main)	95	120	185	185	240	2 x 240	2 x 240	--	--	--	--	--	--
Terminal capacity (neutral)	95	120	185	185	240	2 x 240	2 x 240	--	--	--	--	--	--
Short circuit withstand current (duration 1 sec)	6	6	10	10	10	16	19	35	35	35	46	46	46
Catalogue No. (Interior version)	ST30190	ST30191	ST30192	ST30193	ST30194	ST30195	ST30196	ST30197	ST30198	ST30199	ST30200	ST30201	ST30202

* Thickness / width in mm

Technical Data

FG range of isolators with • Direct Handle • Auxiliary contact

Switch Rating (Amp)		A	160	250	400	630	800
Switch catalogue no (3P)			ST421950000	ST421970000	ST421990000	ST422010000	ST422030000
Switch catalogue no (3P+N)			ST421960000	ST421980000	ST422000000	ST422020000	ST422040000
Thermal current	I _{tn}	A	160	250	400	630	800
		Ambient at 40° C					
		Ambient at 50° C	160	250	400	600	800
		Ambient at 65° C	110	175	280	440	560
Rated insulation voltage	V _i	V	1000	1000	1000	1000	1000
Rated dielectric strength		V	4000	5000	5000	8000	8000
Rated impulse withstand current	V _{imp}	kV	8	8	8	12	12
AC rated operational current	I _e	A	160	250	400	630	800
Rated operational frequency 50/60 Hz		A	160	250	400	630	800
Rated capacitor power		kVar	72	72	180	283	360
		400V, sin Ø=0,65					
Rated breaking capacity		A	1280	1280	3200	5000	6400
		400V, cos Ø=0,35-0,45					
Rated making capacity		A	1600	1600	4000	6300	8000
		400V, cos Ø=0,45					
Short-circuit behaviour							
Short time withstand current 1s.		kA rms	6	6	10	16	19
Conditional short-circuit current ^(a)	I _{cw}	kA rms	100	100	100	100	72
AC rated operational current ^(a)		kW	88.6	88.6	221.7	349.1	443.4
Conditional short-circuit current ^(a)	P _e	kA rms	100	100	100	100	72
Maximum cut-off current (peak value)		kA (peak)	20	20	33	39	55
Maximum power dissipation (ft ¹)		A's (x10 ³)	198	198	1000	1600	4900
Maximum number of mechanical operation		Cycles	30000	30000	20000	10000	10000
Maximum number of electrical operation		Cycles	1000	1000	1000	1000	1000
Connecting capacity							
Rigid cable (Cu) (maximum)		mm ²	95	120	240	2 x 240	2 x 240
Copper bar (Thickness/width)		mm	5 / 25	5 / 30	7 / 35	2 x 5 / 40	2 x 10 / 50
Tightening torque		Nm	4 / 13	13 / 18	24	24	45
Weight							
Three pole		Kg	0.85	0.9	1.9	4.2	4.2
Four pole		Kg	1	1	2.1	4.5	4.5

Note: (a) These cat. nos. include isolators with direct handle & auxiliary contact
(b) (1) With limiting protection device which limits the cut-off current

Accessories for FN Range

Versions	FN 32	FN 63	FN 100	FN 125/160	FN 200	FN 250	FN 315	FN 400	FN 630	FN 800
Terminal Shroud Kit	SK91190		SK91137		SK91335		SK91346		SK91347	
Switched Neutral Kit	Built-in		SK95233		SK95516		SK95517		SK95546	
Aux. Contact (1 NO + 1 NC)	SK91302		SK91328		SK91329		SK91330			
Handle Coupling (Type - A)	SK91257		SK91258				SK91259			
Handle Coupling (Type - B)	SK91277		SK91278				SK91279			
Handle Coupling (Type - CE)	SK91337		Not Available				Not Available			
Shaft Extension Kit	Not Available		SK95600				SK91331			
Mechanical Interlock Kit	Not Available		SK95232				SK95545			
Castell Lock (Type A-Type M)	Not Available		SK00333-SK00344				SK00345-SK00356			

Ordering Suffix - 0000 for all

Selection Table for Handle Coupling for FN

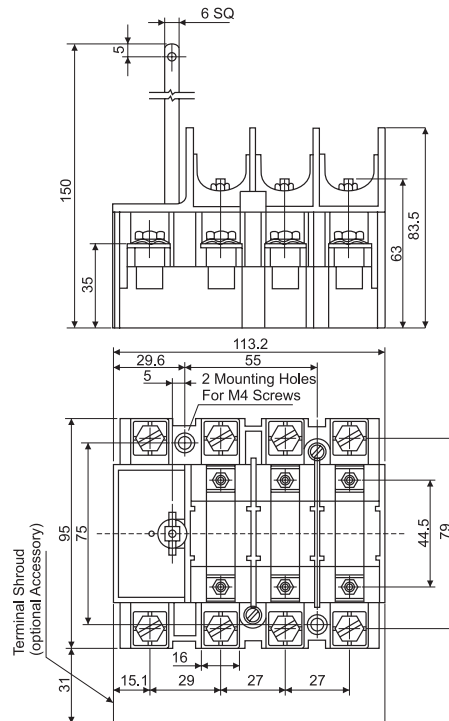
for handle position as seen from front of the door

Sr. No.	Handle (off) Position	Operating Quadrant (hand)	Switch Orientation	Door Cut-out	Handle Coupling Type
1					A
2					B
3					B
4					A
5					A
6					B
7					B
8					A

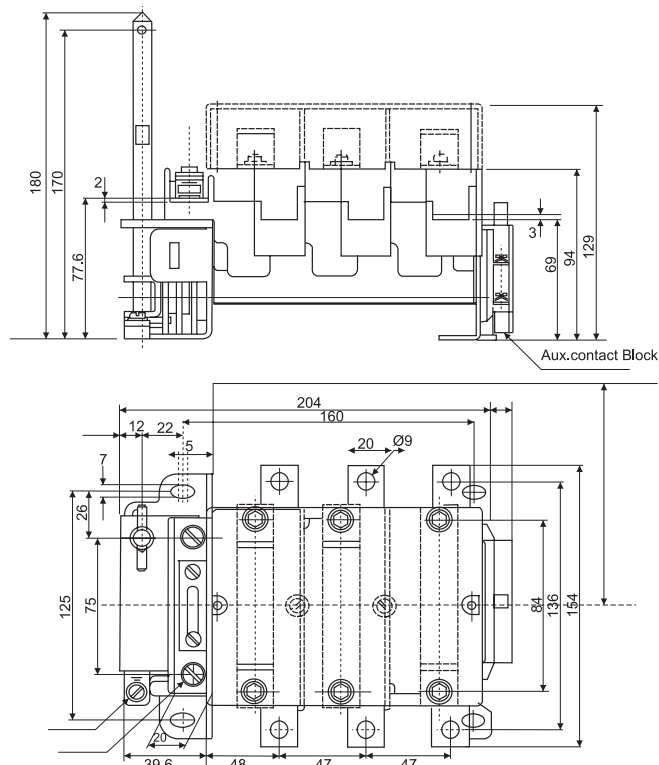
Note : Arrow (←) indicates position of Interlock defeat key
Type A : supplied as standard with all S-D-Fs
Type B : supplied on request

Overall Dimensions

Switch-Disconnecter Type DIN FN 32 / FN 63



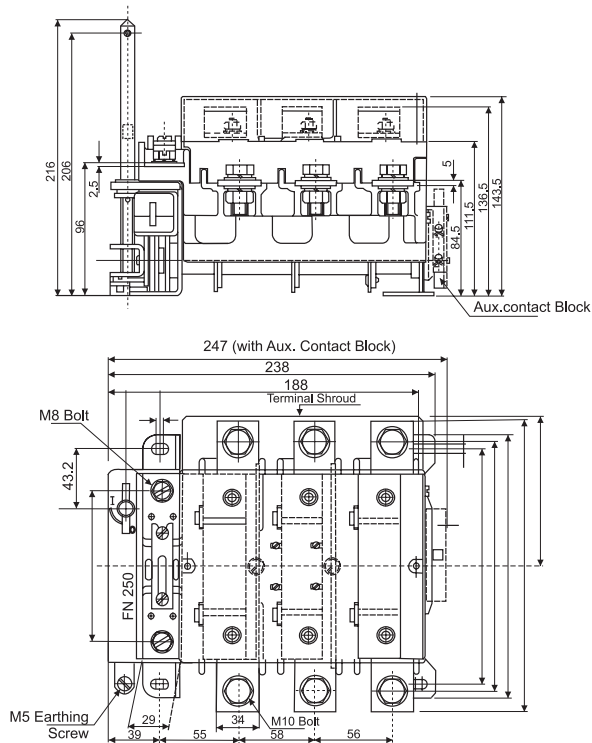
Switch-Disconnecter Type DIN FN 100 / 125



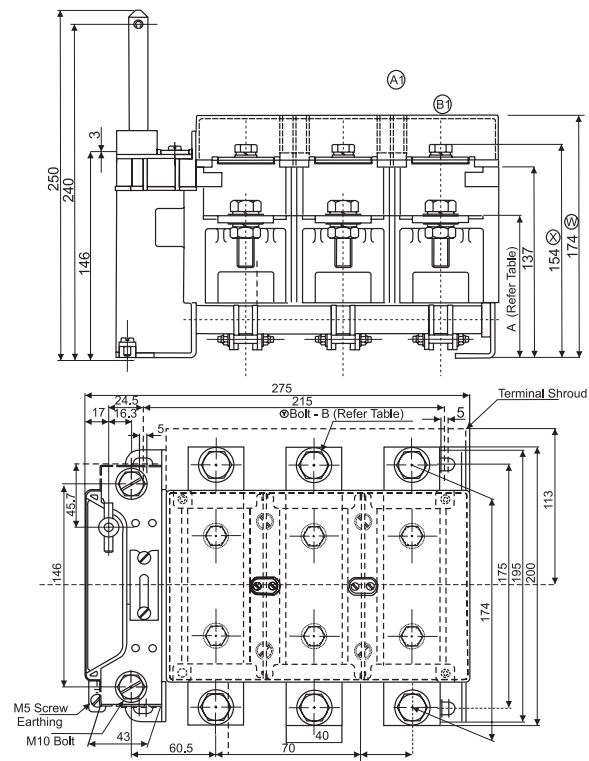
Note : All dimensions are in mm.

Overall

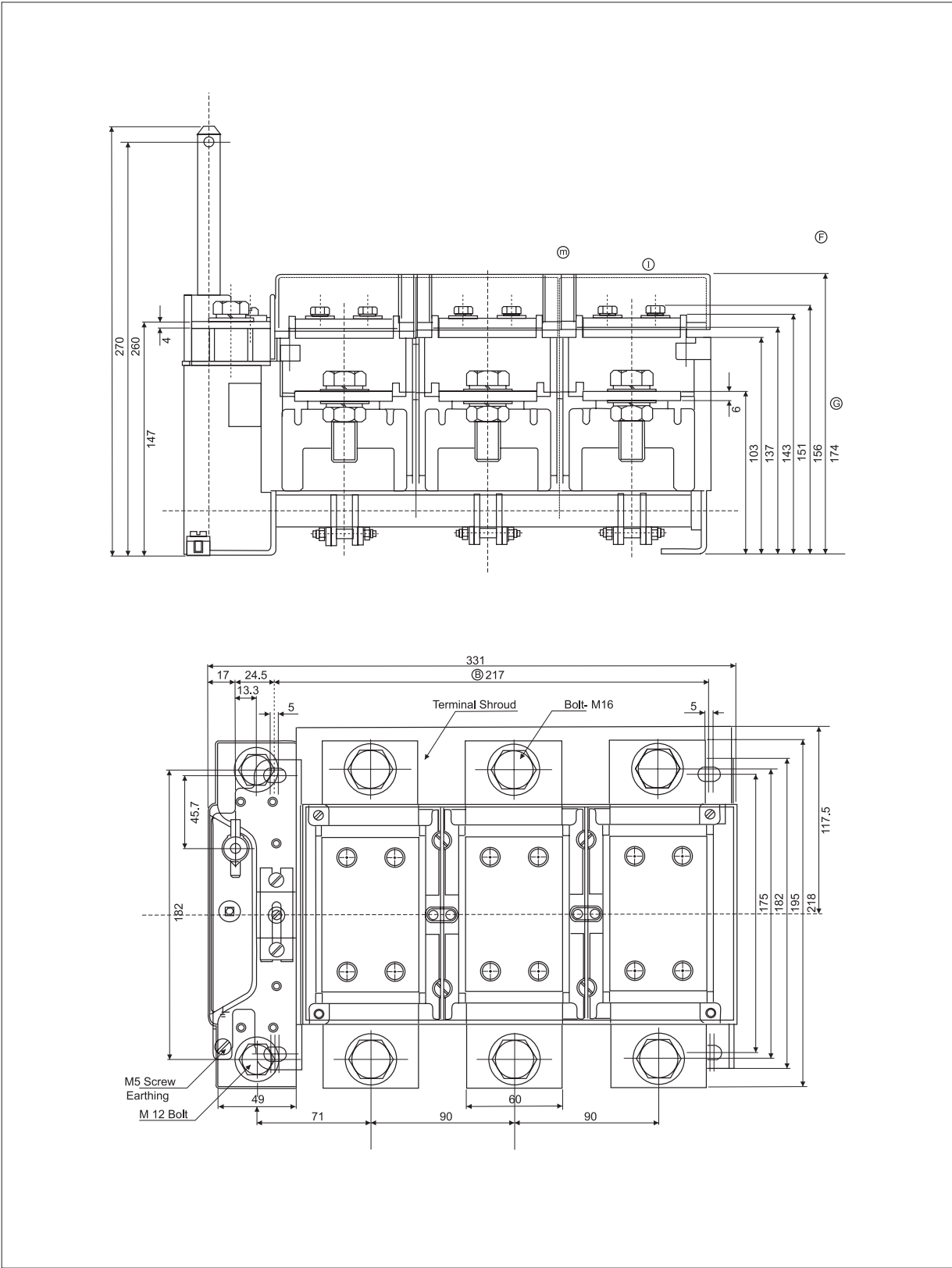
Switch-Disconnecter Type DIN FN 200 / 250



Switch-Disconnecter Type DIN FN 315 / 400



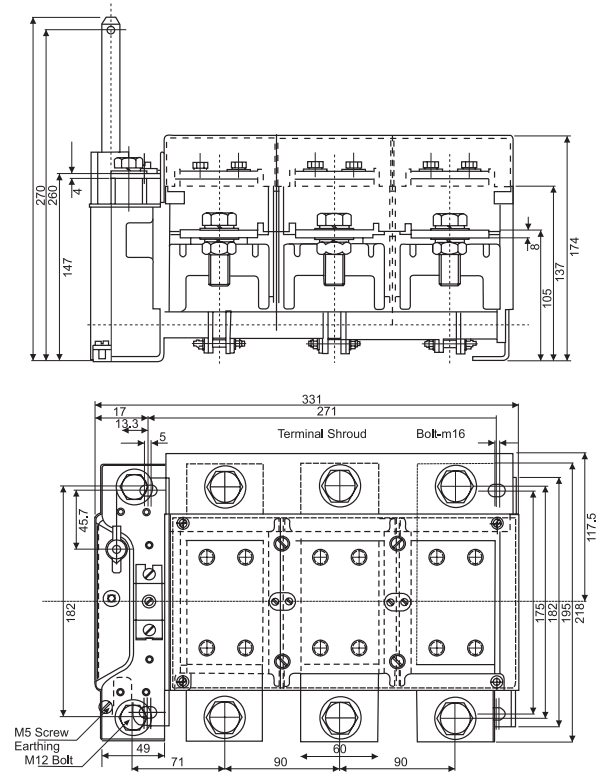
Note : All dimensions are in mm.



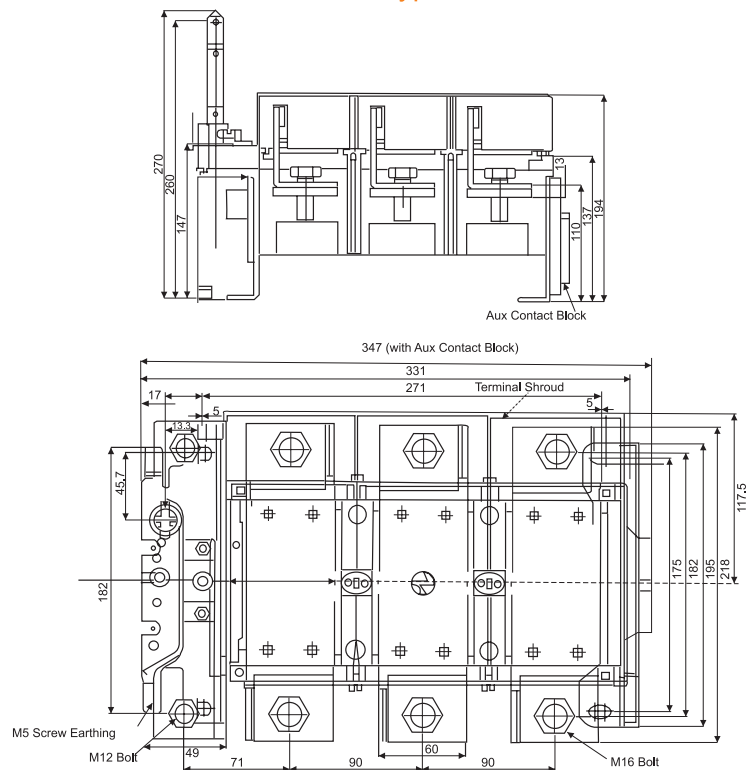
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Overall Dimensions

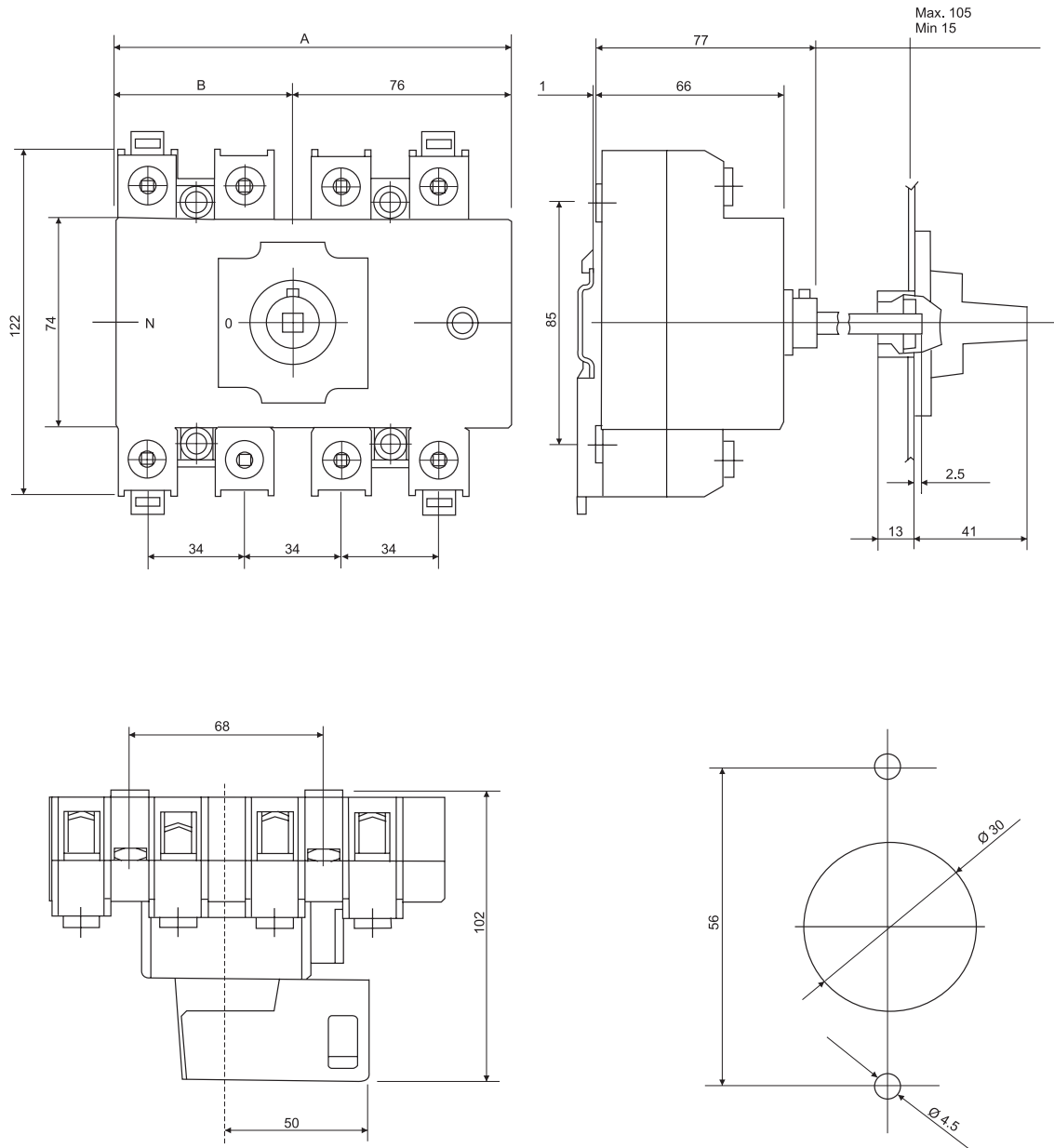
Switch-Disconnecter Type DIN FN 1000



Switch-Disconnecter Type DIN FN 1000 H

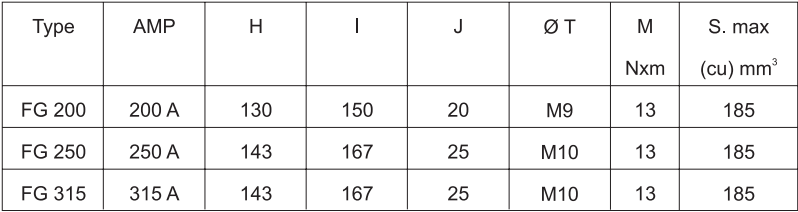


Switch-Disconnecter Type FG 160



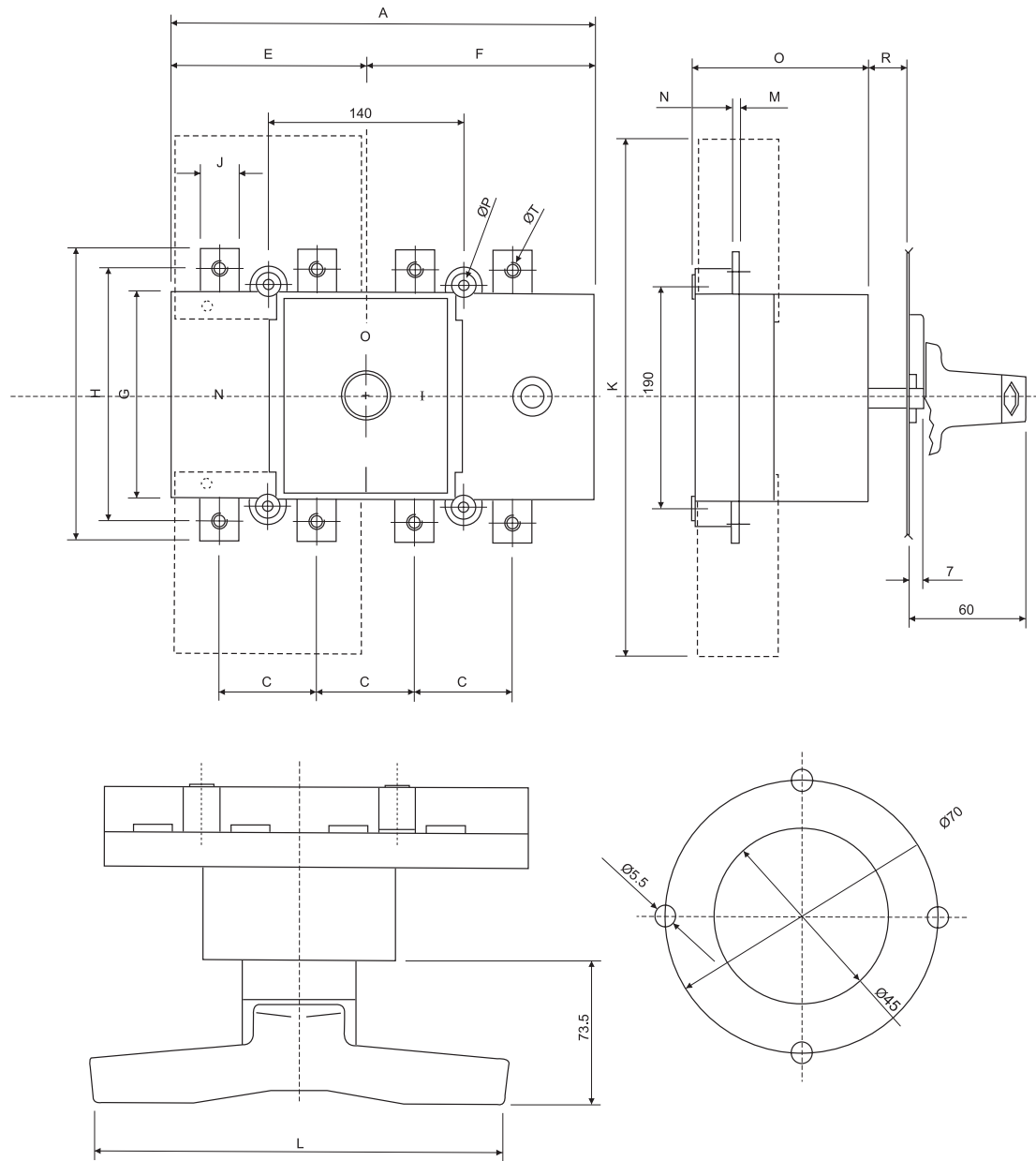
Type	AMP	A		B		M Nxm	3 max mm ³
		3 Poles	4 Poles	3 Poles	4 Poles		
FG 160	160 A	122	140	53	64	4	55

Note : All dimensions are in mm



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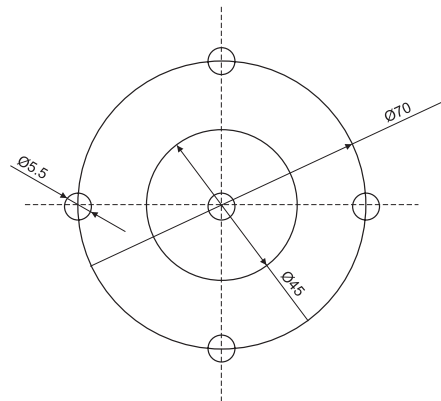
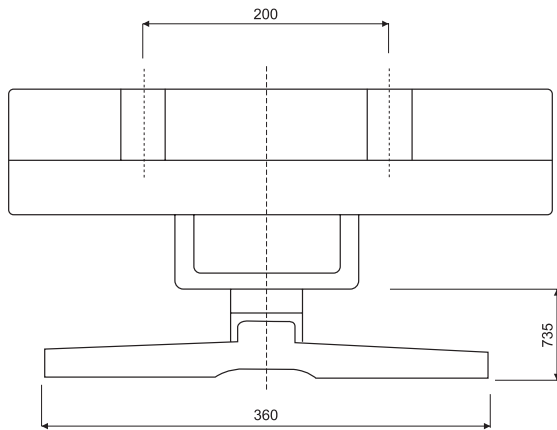
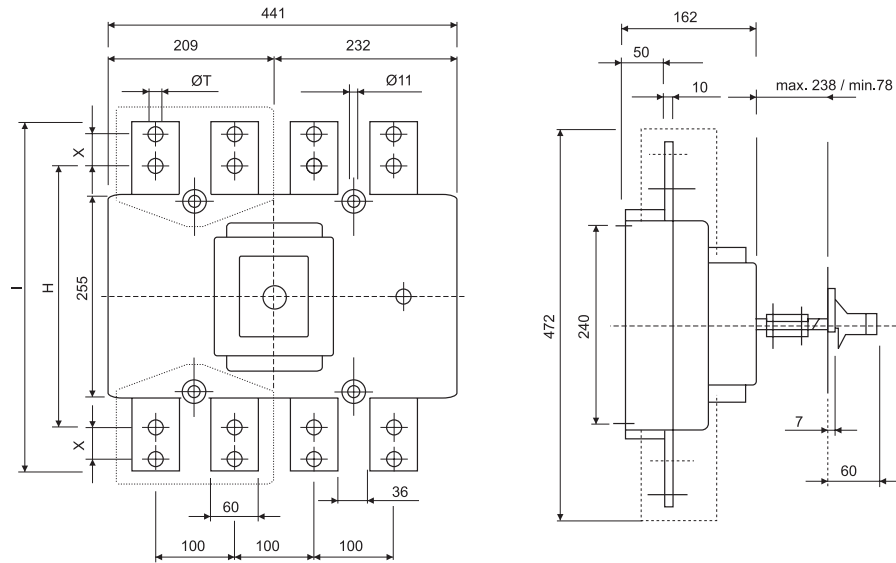
Switch-Disconnecter Type FG 400 / FG 630 / FG 800



Type	AMP	A	C	E	F	G	H	I	J	K	L	M	N	O	MØ T	M Nxm	S max (cu) mm ³
FG 400	400 A	275	65	130	145	160	190	220	25	290	245	5	30	121	M10	13	185
FG 630	630 A	275	65	130	145	160	205	235	30	290	245	5	30	121	M10	13	185
FG 800	800 A	325	75	150	175	190	250	290	40	340	285	8	34	132	M14	13	185

Note : All dimensions are in mm

Switch-Disconnecter Type FG 1000 / FG 1250 / FG 1600



Type	AMP	H	I	J	Ø T
FG 1000	1000 A	330	381	-	M16
FG 1250	1250 A	330	381	-	M16
FG 1600	1600 A	330	441	40	M14

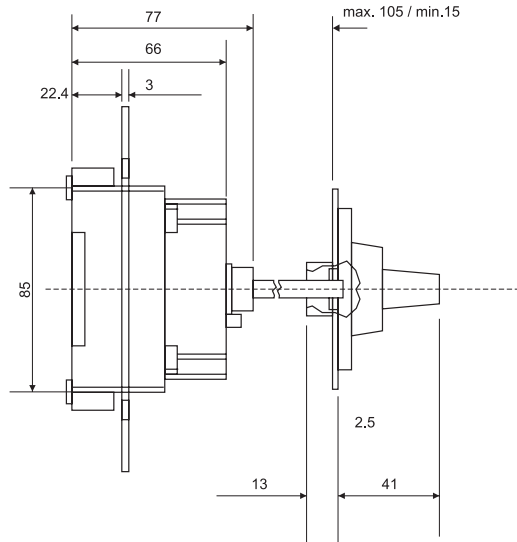
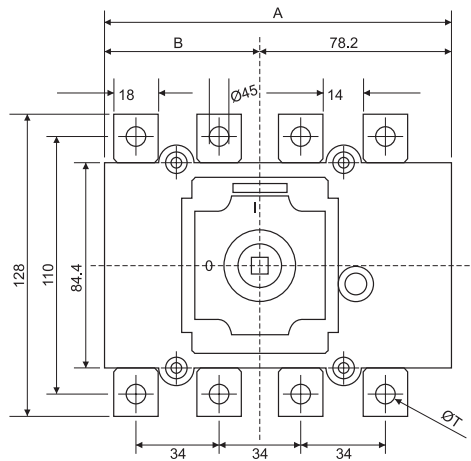
Note : All dimensions are in mm

Type	AMP	I	X	A	D	J	N	T	M	ØT	M Nxm
FG 2000	2000 A	543	40	20	85	80	106	117	10	M12	45
FG2500	2500 A	543	40	20	85	80	106	117	10	M12	45
FG 3150	3150 A	603	50	25	95	100	126	102	15	M12	45

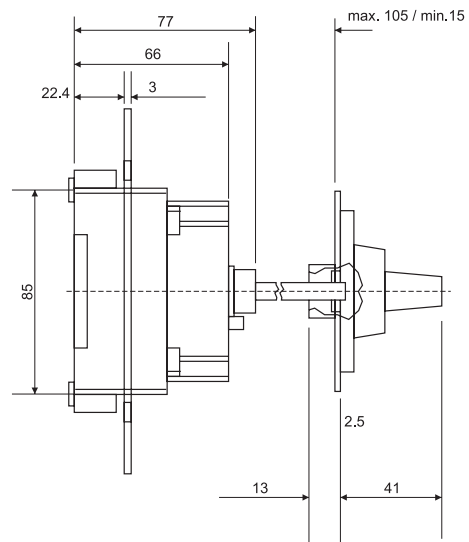
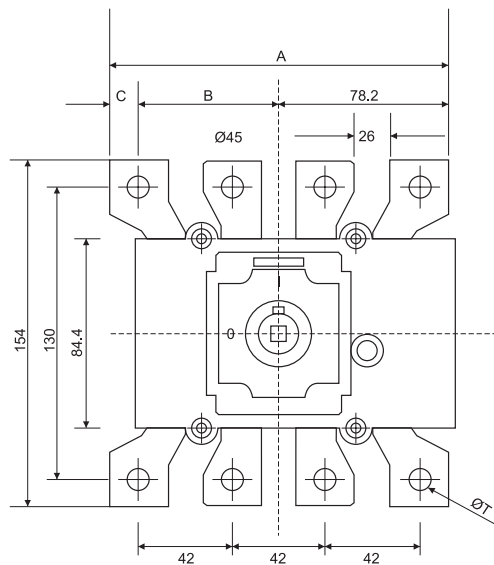
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Switch-Disconnecter Type FG 160 / FG 250

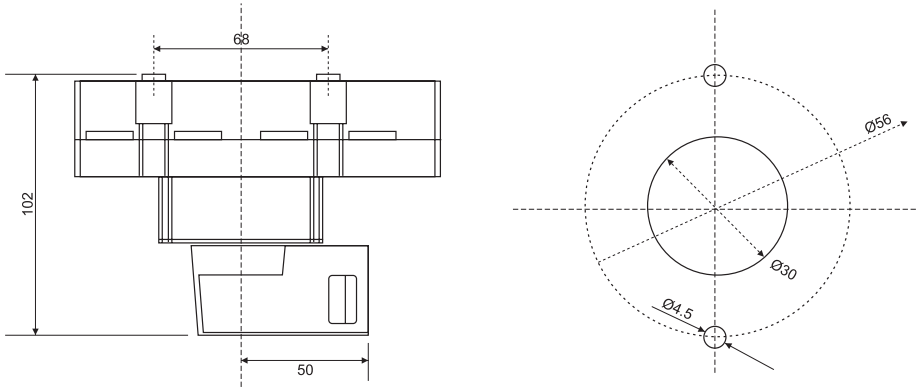
ST421950000 (3P 160A)
ST421960000 (3PN 160A)



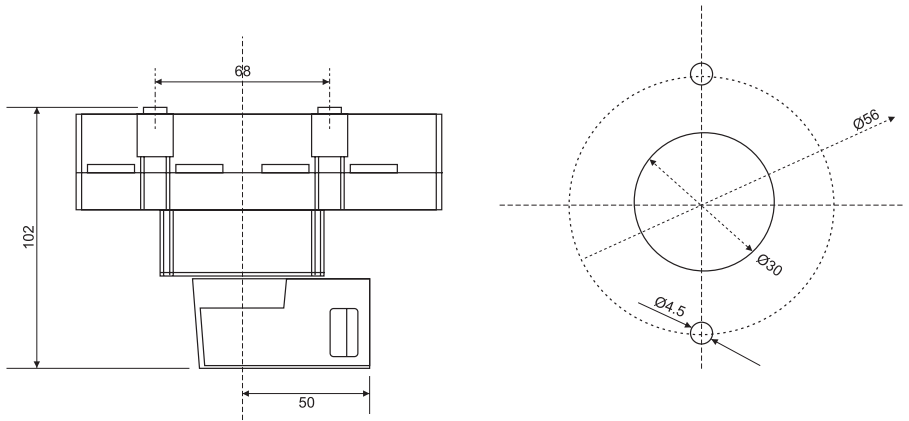
ST421970000 (3P 250A)
ST421980000 (3PN 250A)



Switch-Disconnecter Type FG 160 / FG 250



	A		B		
160 A	3 Poles	4 Poles	3 Poles	4 Poles	ØT
	131	142	53	64	38



	A		B		C		
250 A	3 Poles	4 Poles	3 Poles	4 Poles	3 Poles	4 Poles	ØT
	131	142	53	64	-	11.8	M10

ST421990000 (3P 400A)
ST422000000 (3PN 400A)

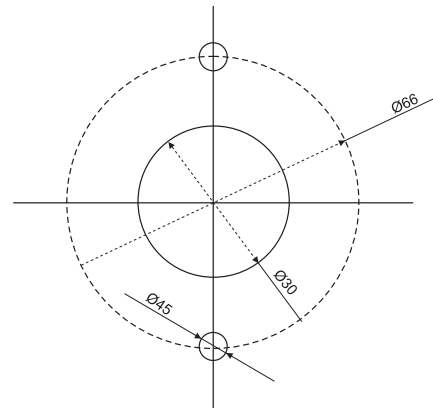
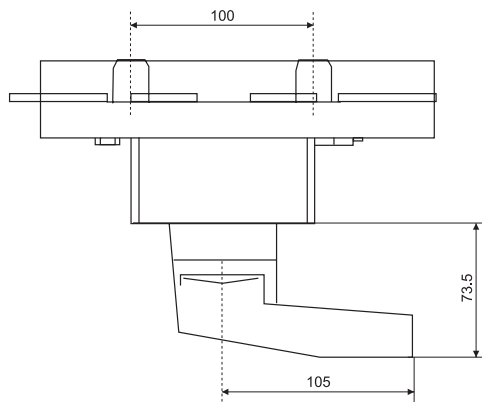
Technical drawings of the ST421990000 (3P 400A) and ST422000000 (3PN 400A) circuit breakers. The front view (left) shows a square main body with a central square opening. It has six mounting ears: three on the top and three on the bottom. Dimensions include a total width of 217 mm, a central width of 100 mm, and a distance of 117 mm from the center to the right edge. The height is 193 mm, with a mounting ear height of 168 mm and a main body height of 106 mm. The distance between mounting ears is 65 mm. The side view (right) shows the profile of the breaker. It has a total width of 90 mm and a maximum height of 150 mm (minimum 18 mm). The mounting ear height is 20 mm, and the main body height is 114 mm. The distance from the center to the right edge is 60 mm, and the distance from the center to the left edge is 7 mm.

ST422010000 (3P 630A)
ST422020000 (3PN 630A)

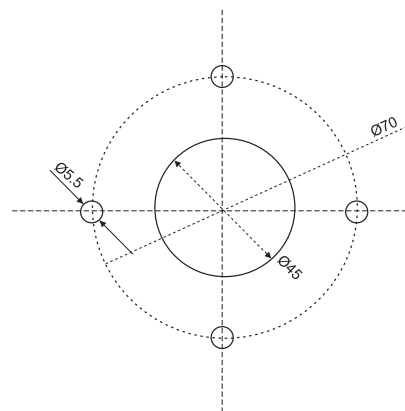
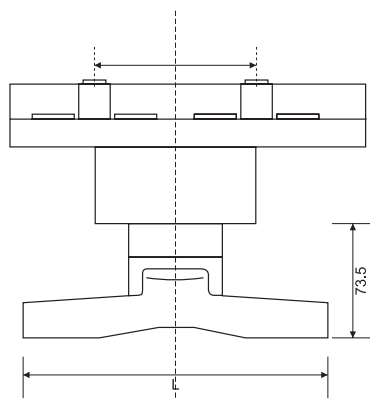
ST422030000 (3P 800A)
ST422040000 (3PN 800A)

Technical drawings of the ST422010000 (3P 630A), ST422020000 (3PN 630A), ST422030000 (3P 800A), and ST422040000 (3PN 800A) circuit breakers. The front view (left) shows a square main body with a central square opening. It has six mounting ears: three on the top and three on the bottom. Dimensions include a total width of A mm, a central width of E mm, and a distance of F mm from the center to the right edge. The height is I mm, with a mounting ear height of H mm and a main body height of G mm. The distance between mounting ears is C mm. The side view (right) shows the profile of the breaker. It has a total width of O mm and a maximum height of 190 mm. The mounting ear height is N mm, and the main body height is K mm. The distance from the center to the right edge is R mm, and the distance from the center to the left edge is M mm. The distance from the center to the right edge is 60 mm, and the distance from the center to the left edge is 7 mm.

Switch-Disconnecter Type FG 400 / FG 630 / FG 800



400 A	C		ØT
	3 poles	4 poles	
	-	15	38



	A	C	E	F	G	H	I	J
630 A	275	65	130	145	160	205	235	30
800 A	325	75	150	175	190	250	290	40

	K	L	M	N	O	max	min	Øp	Øp
630 A	290	245	5	30	121	119	18	6.5	M10
800 A	340	285	8	34	132	108	18	9	M14

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