

Raysan

Load Centers



ISO 9001:2008
Certificate No: 34039



PARTNERSHIP

SAFETY

DURABILITY

APPLICATION

Raysan Load Centers are designed for reliable distribution and control of electrical power as the service entry point in residential, commercial and light industrial premises. Raysan Load Center is available as a plug-in design for indoor application, with main MCB & MCCB up to 225A.

Knockouts of various sizes and removable top and bottom gland plates for ease of cable entry

Keyhole fixing for ease of wall mounting

Fully shrouded busbars

ETP copper busbars Tin plated without any joints

Polycarbonate for busbar support and insulation

Ample earth terminals

Enclosure made of high quality electro-galvanized steel sheet

Matt-finish polyester powder coated in RAL-7035 light grey colour

Depth of pan assembly is adjustable for easy installation

Spacious enclosure for easy wiring

Ample neutral terminals

Main breaker

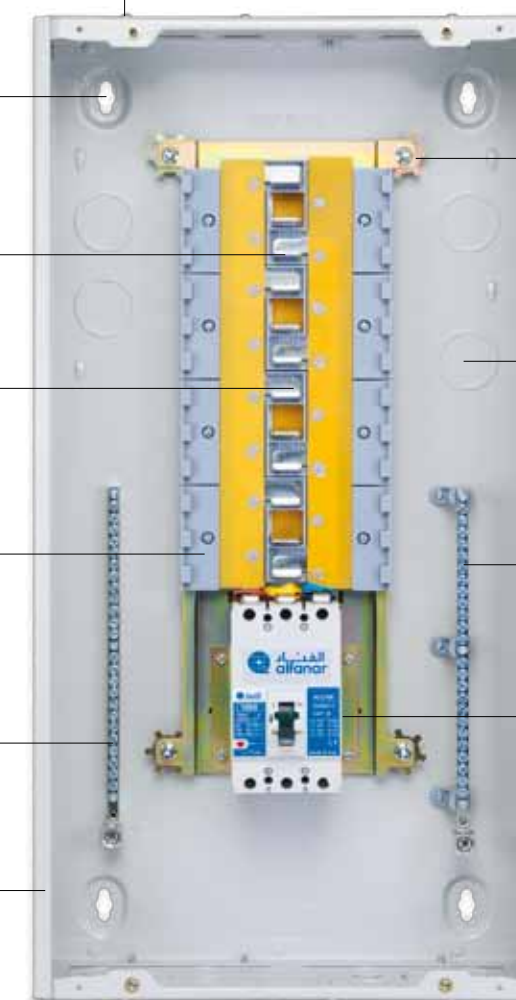


Figure 1



FEATURES

- Made of high quality electro-galvanized steel sheets
- ETP copper busbar Tin plated without any joints
- Matt-finish polyester powder coated in RAL-7035 light grey colour
- Available cable tie & cable holding for easy wiring installations
- Cement Guard

ITEM	DESCRIPTION	
Standard	IEC 61439-1, IEC 61439-2, & IEC 61439-3	
Busbar rating	100A and 225A	
Busbar type	ETP copper Tin plated flat fully shrouded	
Voltage rating	110-415V AC 50/60 Hz	
No. of ways	3PH : 12, 18, 24, 30, 36, 42	
Degree of protection	IP40	
Enclosure material	Electro-galvanized steel sheet (Corrosion resistant)	
Steel thickness	Up to 1.2 mm	
Knockout sizes	See details on page 8, figure 6	
Enclosure colour	Polyester powder coated in RAL-7035 light grey colour	
Paint thickness	70-90 Microns	
Main breaker (Incomer)	MCB & MCCB	
Terminal capacity	MCB frame size 100A	: 50 sq.mm
	MCCB frame size 100A	: 50 sq.mm
	MCCB frame size 225A	: 120 sq.mm
Branches	1, 2 & 3 Pole plug-in MCBs	
Neutral terminal bar	Incoming cable lug	: 100A - 50 sq.mm 225A - 120 sq.mm
	Outgoing terminals	: 16 sq.mm
	No. of outgoing terminals :	Equivalent or more than no. of ways
Earth terminal bar	Incoming cable lug	: 100A - 225A - 50 sq.mm
	Outgoing terminals	: 16 sq.mm
	No. of outgoing terminals :	Equivalent or more than no. of ways
Rated insulation voltage	690V AC	
Ambient temperature	50 °C	

Table 1

Raysan Three-Phase LC with MCB Main AZM 63-100 A

Standard Load Center IEC Compliance Distribution Board



Figure 2

NO. OF WAYS	ORDERING NUMBER, TYPE, AND DIMENSIONS					
	FLUSH	H	h	W	w	D
12	42-T12100PF	557	515	390	343	105
18	42-T18100PF	634	591	390	343	105
24	42-T24100PF	710	667	390	343	105
30	42-T30100PF	786	743	390	343	105
36	42-T36100PF	890	848	390	343	105
42	42-T42100PF	972	930	390	343	105

Table 2

Main Breaker: Ranges from 63-100A
To construct a product code, refer the coding key on page 20.
Refer the Dimension on page no.8, figure number 5

Raysan Three-Phase LC with MCCB Main ALC 30-100 AT

Standard Load Center IEC Compliance Distribution Board



Figure 3

NO. OF WAYS	ORDERING NUMBER, TYPE, AND DIMENSIONS					
	FLUSH	H	h	W	w	D
12	42-L12100PF	557	515	390	343	105
18	42-L18100PF	634	591	390	343	105
24	42-L24100PF	710	667	390	343	105
30	42-L30100PF	786	743	390	343	105
36	42-L36100PF	890	848	390	343	105
42	42-L42100PF	972	930	390	343	105

Table 3

Main Breaker: Ranges from 30-100A
 To construct a product code, refer the coding key on page 20.
 Refer the Dimension on page no.8, figure number 5

Raysan Three-Phase LC with MCCB Main ALD 125-225 AT

Standard Load Center IEC Compliance Distribution Board



Figure 4

NO. OF WAYS	ORDERING NUMBER, TYPE, AND DIMENSIONS					
	FLUSH	H	h	W	w	D
12	42-L12225PF	634	591	390	343	105
18	42-L18225PF	710	667	390	343	105
24	42-L24225PF	786	743	390	343	105
30	42-L30225PF	890	848	390	343	105
36	42-L36225PF	972	930	390	343	105
42	42-L42225PF	1052	1010	390	343	105

Table 4

Main Breaker: Ranges from 125-225A
 To construct a product code, refer the coding key on page 20.
 Refer the Dimension on page no.8, figure number 5

Indoor Type - Dimensions

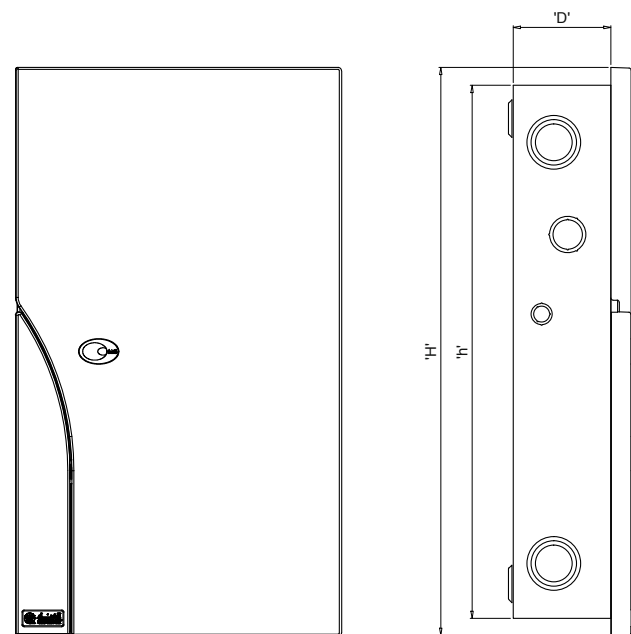
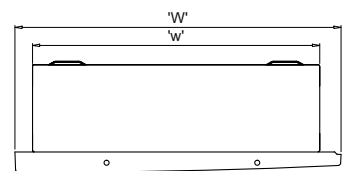


Figure 5



- A - $\varnothing 21 / \varnothing 27$ Double Knockout - 2 nos.
B - $\varnothing 38.5 / \varnothing 44$ Double Knockout - 6 nos.
C - $\varnothing 19 / \varnothing 25$ Double Knockout - 16 nos.
D - $\varnothing 44 / \varnothing 54.5 / \varnothing 64$ Triple Knockout - 4 nos.
E - $\varnothing 23 / \varnothing 28 / \varnothing 33$ Triple Knockout - 4 nos.
F - $\varnothing 44 / \varnothing 50 / \varnothing 62$ Triple Knockout - 2 nos.
G - Wall mounting emboss with key hole - 4 nos.

Notes:

- All dimensions are in mm.
- The details in this drawing indicate dimensions and knockout positions for one type of Raysan load center. Knockout details for other load center types shown in this catalogue are available upon request.

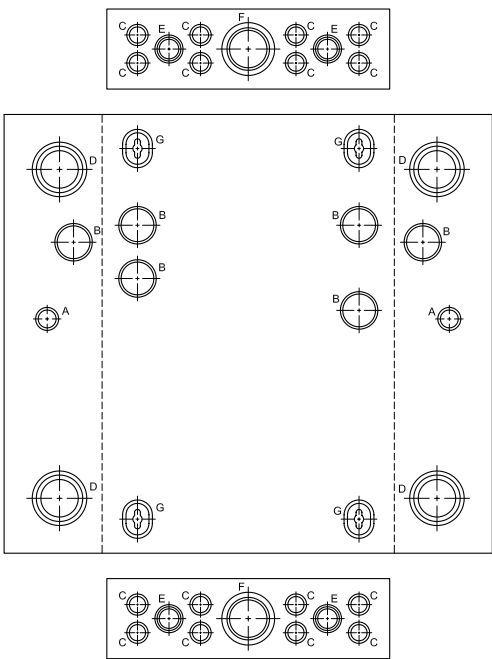


Figure 6

All **Raysan** Load Centers are type tested for complete sequence as per international standards. Each of our products undergoes a strict quality control check and is routinely checked for construction and performance

Dielectric Properties : A high voltage routine test
Electrical Continuity Test : To confirm correct assembly & operation
Insulation Resistance Test : To ensure high insulation resistance

alfanar Miniature Circuit Breaker (MCB)

alfanar Miniature Circuit Breaker (MCB) AZM

alfanar Miniature CIRCUIT BREAKER AZM TYPE	
Number	Description
1	alfanar MCB 3P (AZM) 63A
2	alfanar MCB 3P (AZM) 100A

Table 5



Figure 7

TECHNICAL SPECIFICATIONS

alfanar MCB Technical Details AZM	
Ampere Frame (AF)	100
Type reference	AZM
Number of poles (P)	3
Standard	Confirming to EN / IEC 60947-2
Rated voltage	415V AC, 50/60Hz
Rated current In (A)	63 & 100
Breaking capacity	10 kA @ 415V
Protection	Against overload and short circuit
Characteristic	C Type
Type of trip	Thermal & Magnetic release
Terminal capacity	Flexible cable: 1.5 to 35 sq.mm Rigid cables: 1 to 50 sq.mm
Installation	Din-Rail
Width	27mm per pole
Ref. calibration temperature (°C)	50
Service life (number of operations)	10,000
Weight (Kg)	0.5
Certification (Type test)	CPRI

Table 6

alfanar Moulded Case Circuit Breaker (MCCB)

alfanar Moulded Case Circuit Breaker (MCCB) ALC

alfanar MOULDED CASE CIRCUIT BREAKER ALC TYPE	
Number	Description
1	alfanar MCCB 3P (ALC) 30A
2	alfanar MCCB 3P (ALC) 40A
3	alfanar MCCB 3P (ALC) 50A
4	alfanar MCCB 3P (ALC) 60A
5	alfanar MCCB 3P (ALC) 75A
6	alfanar MCCB 3P (ALC) 100A

Table 7



Figure 8

alfanar Moulded Case Circuit Breaker (MCCB) ALD

alfanar MOULDED CASE CIRCUIT BREAKER ALD TYPE	
Number	Description
1	alfanar MCCB 3P (ALD) 125A
2	alfanar MCCB 3P (ALD) 150A
3	alfanar MCCB 3P (ALD) 175A
4	alfanar MCCB 3P (ALD) 200A
5	alfanar MCCB 3P (ALD) 225A

Table 8



Figure 9

alfanar Moulded Case Circuit Breaker (MCCB)

TECHNICAL SPECIFICATIONS

alfanar MCCB Technical Details			
Ampere Frame (AF)		100	225
Type reference		ALC	ALD
Number of poles (P)		3	3
Rated current (A)		30,40,50, 60,75,100	125, 150,175, 200, 225
Ref. calibration temperature (°C)		55	55
Technical data conforming to IEC/EN60947-2		YES	YES
Rated operational voltage (V) Ue (50/60Hz)		415	415
Rated insulation voltage (V) Ui (50/60Hz)		690	690
Rated impulse withstand voltage (kV), Uimp		6	6
Ultimate breaking capacity (kA). Icu			
AC 50/60Hz	220/240V	25	25
	380/415V	14	14
Service breaking capacity (%Icu). Ics		50	50
Category of use		A	A
Endurance (number of operations)	Mechanical	8500	7000
	Electrical	1500	1000
Type of trip unit		Thermal & magnetic release	Thermal & magnetic release
Terminal capacity (Sq.mm)		50	120
Thermal-magnetic release		Fixed	Fixed
Dimension (WxHxD mm)		3 pole breaker 75x130x60	105x165x60
Weight (Kg)		1.1	1.3
Certification (Type test)		ASTA	ASTA

Table 9

**MCCB ALC 30 - 100A
TIME/CURRENT
CHARACTERISTICS CURVE**

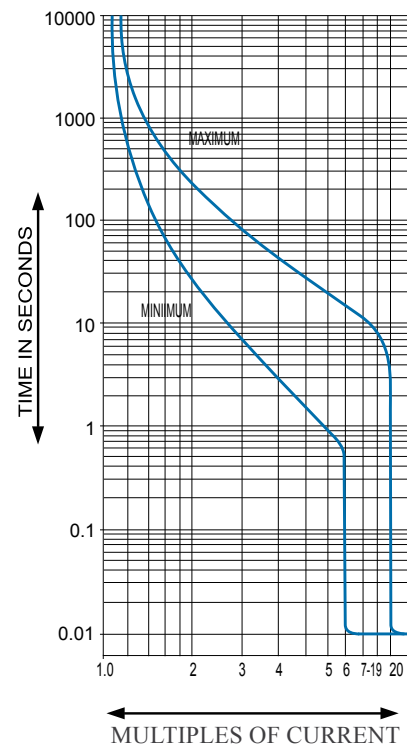


Figure 10

**MCCB ALD 125 - 225A
TIME/CURRENT
CHARACTERISTICS CURVE**

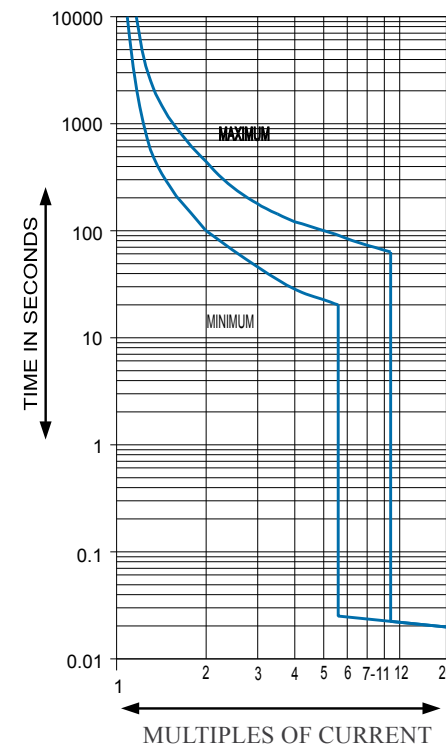


Figure 11

**MCB AZM 63 & 100A
TIME/CURRENT
CHARACTERISTICS CURVE**

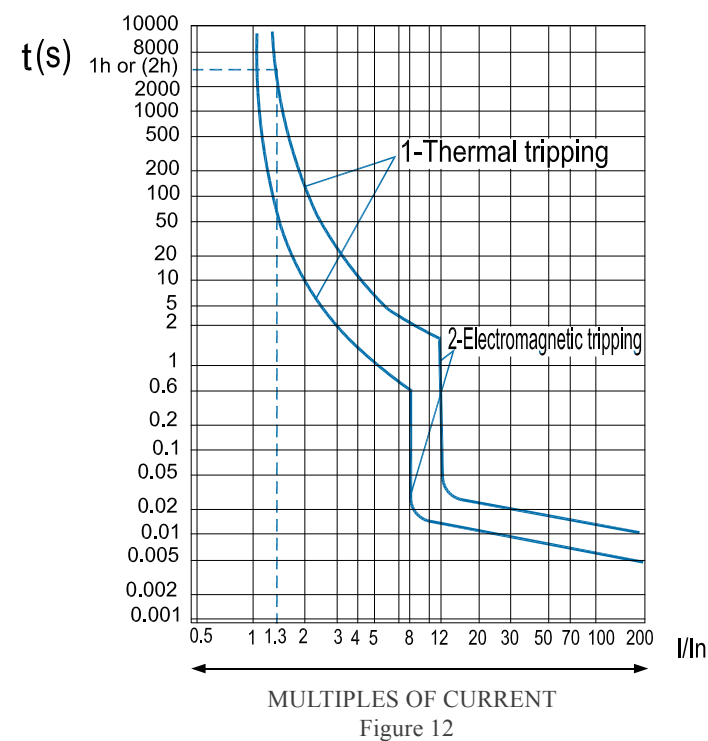


Figure 12

Plug-in Miniature Circuit Breakers

Pioneering IEC compliant product by **alfanar**

alfanar Plug-in Miniature Circuit Breakers – one of the several outstanding products manufactured by **alfanar** – are reliable, economical and technically superior.

alfanar MCBs comply with the stringent IEC* standard.

alfanar's pioneering MCB technology is the outcome of a sharp focus on creating flawless designs, adherence to stringent quality measures and application of best production practices on the shop floor of its ultra-modern manufacturing units together with impeccable engineering skills.

All-in-all, **alfanar** sets new benchmarks in quality, safety, reliability, adaptability and modernity in manufacturing electrical products that are simply world-class.



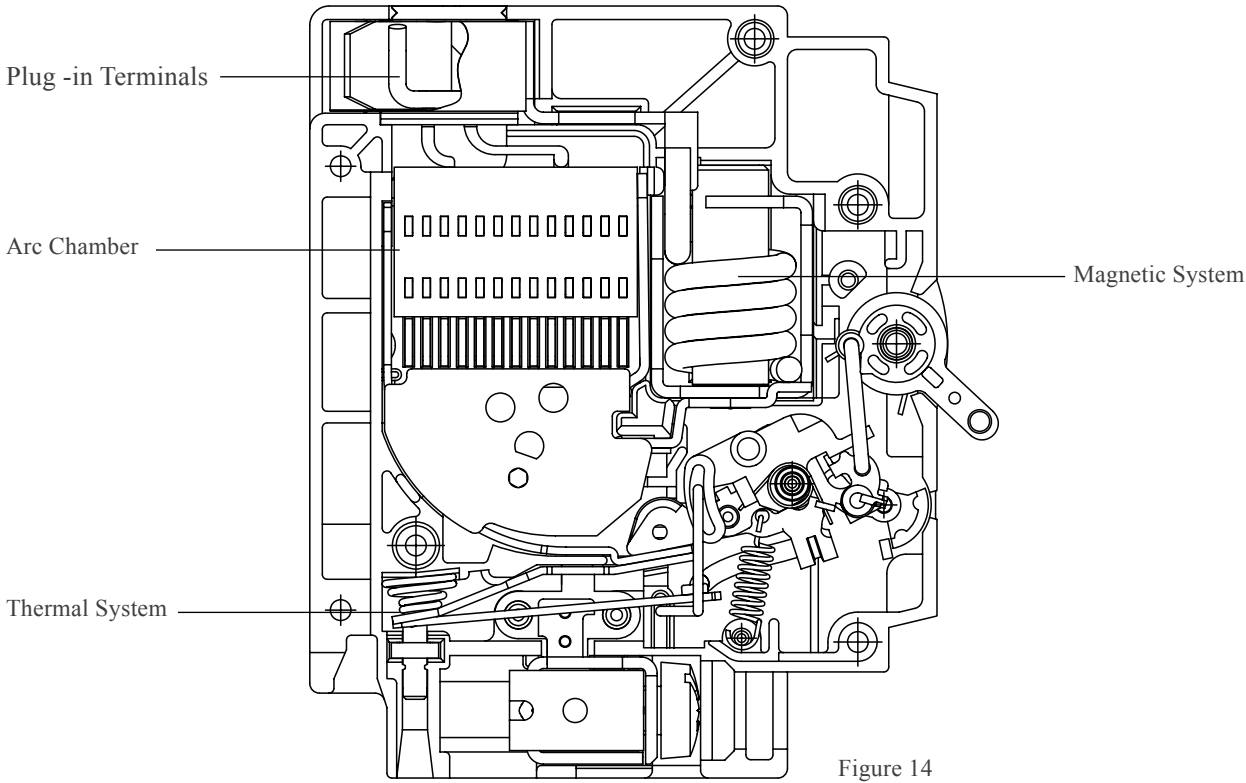
Figure 13

*Note :

alfanar Plug-in MCBs conform to International Electrotechnical Commission EN / IEC 60898.

Plug-in Miniature Circuit Breakers

alfanar is the first manufacturer to combine IEC features in NEMA Dimension in one plug-in MCB



SPECIAL FEATURES

- Let-through energy is considerably less than the requirements of Energy Limiting class 3 of the IEC standard resulting in enhanced lifespan of electrical installation
- Rapid closing design for quick make operation
- Uniform box terminals for connecting cables up to 25 sq.mm for input terminal for 6-63A MCB rating
- Deep serration on input terminals that facilitates firm connection of cables thereby preventing sparks due to loose connections
- Finger protection.
- Superior quality silver graphite tips are used for fixed contacts that extend the contact life and prevent early wearing out of contact welds
- Trip-free mechanism
- Critical operational mechanical parts are made of special engineering plastics with superior mechanical and thermal properties, facilitating accurate operation of MCBs during their service life
- Special angular vents prevent penetration of dust and enable diversion of gases that are induced at the time of fault clearance – away from the internal mechanism quickly and effectively.

Plug-in Miniature Circuit Breakers

alfanar MCB Technical Details	
Type reference	ELPR
Number of poles (P)	1, 2, 3
Characteristics	B* and C as per IEC standard 60898
Rated current (A)	6*, 10, 16, 20, 25, 32, 40, 50, 63
Rated voltage (V) (50/60Hz)	110/220, 220/380, 240/415
Rated short circuit breaking capacity (Icn)	10kA @ 415V
Ref calibration temperature (°C)	50
Energy limiting class	3
Service life (number of operations)	10,000
Resistance to climate	As per IEC standard 60898
Terminal capacity (sq.mm)	25
Terminal protection	Finger and Hand touch safe
MCB color	RAL 7035

*Upon Request

Table 10



Figure 15 (A)

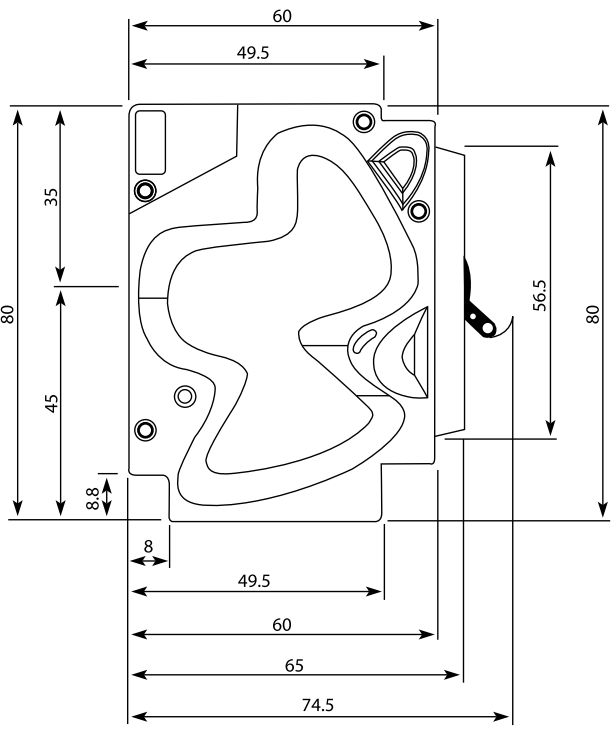


Figure 15 (B)

POWER LOSS (SINGLE AND MULTI POLE MCBs)

The table below shows the power loss of the devices in watts against each rating per pole for the rated currents.

MCB rating	6A	10A	16A	20A	25A	32A	40A	50A	63A
1 pole (watts)	1.8	2.1	2.0	2.9	3.1	3.1	4.2	4.6	5.3
2 pole (watts)	3.6	4.2	4.2	6.1	6.5	6.8	9.2	10.1	11.7
3 pole (watts)	5.5	6.4	6.2	9.0	9.6	10.2	13.9	15.2	17.5

Table 11

EFFECT OF THE AMBIENT TEMPERATURE ON THERMAL TRIPPING BEHAVIOR (TEMPERATURE DE-RATING)

- The maximum permissible current in the circuit breaker depends on the ambient temperature when the circuit breaker is placed
- As per the IEC standard 60898, the reference temperature is 30 °C but alfanar Plug-in MCB is calibrated at 50 °C as its reference temperature

The table below shows current with correction factor applied at different temperatures

(De-rating Chart):

MCB rating in (A)	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C	65°C
6	6,96	6,84	6,72	6,60	6,48	6,36	6,24	6,12	6,00	5,88	5,76	5,64
10	11,60	11,40	11,20	11,00	10,80	10,60	10,40	10,20	10,00	9,80	9,60	9,40
16	18,56	18,24	17,92	17,60	17,28	16,96	16,64	16,32	16,00	15,68	15,36	15,04
20	23,20	22,80	22,40	22,00	21,60	21,20	20,80	20,40	20,00	19,60	19,20	18,80
25	29,00	28,50	28,00	27,50	27,00	26,50	26,00	25,50	25,00	24,50	24,00	23,50
32	37,12	36,48	35,84	35,20	34,56	33,92	33,28	32,64	32,00	31,36	30,72	30,08
40	46,40	45,60	44,80	44,00	43,20	42,40	41,60	40,80	40,00	39,20	38,40	37,60
50	58,00	57,00	56,00	55,00	54,00	53,00	52,00	51,00	50,00	49,00	48,00	47,00
63	73,08	71,82	70,56	69,30	68,04	66,78	65,52	64,26	63,00	61,74	60,48	59,22

Table 12

CURRENT LIMITING ACTION

The high speed current-limiting action ensures that the MCB operates before the full prospective fault current is allowed to develop.

Under the fault conditions, damage can be sustained to the installation and to associated equipment due to the fact that the amount of energy that passes before the current is completely interrupted.

The total energy let-through depends on the value of current and the time for which it flows, which is denoted by the symbol I^2t .

The high speed limiting action of **alfanar** MCBs ensure that the energy let-through and any subsequent damage is minimized.

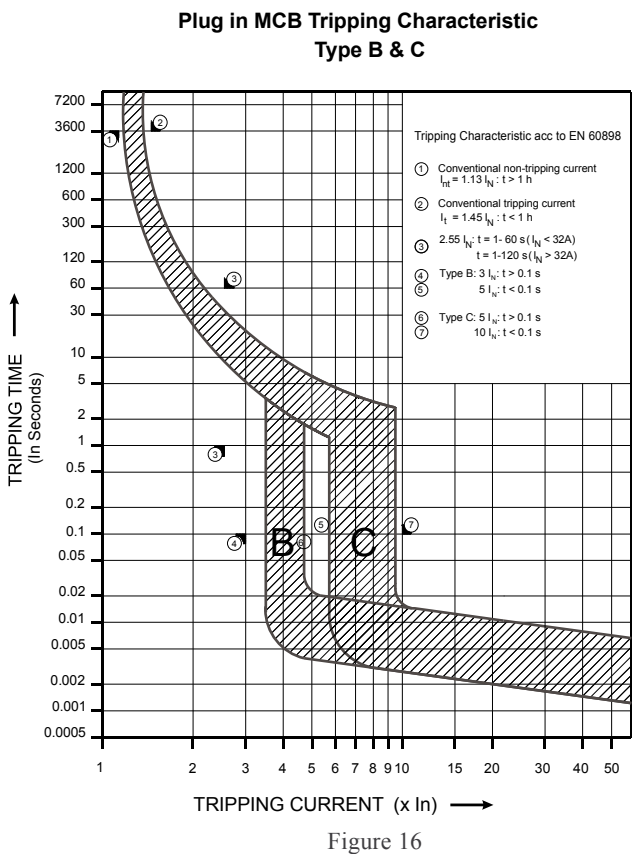


Figure 16

LET-THROUGH ENERGY

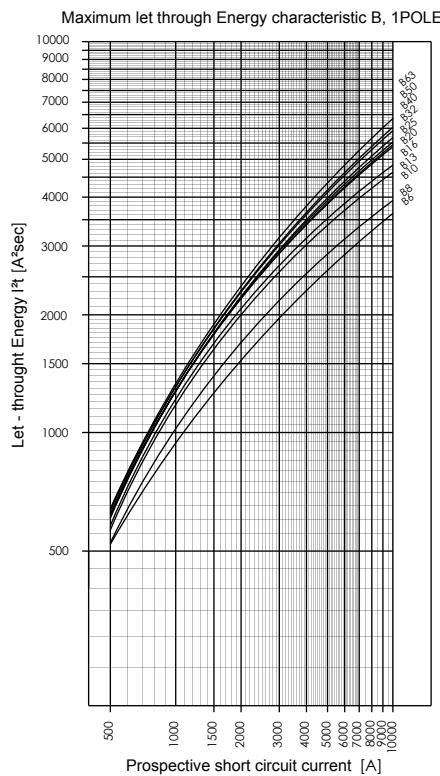


Figure 17

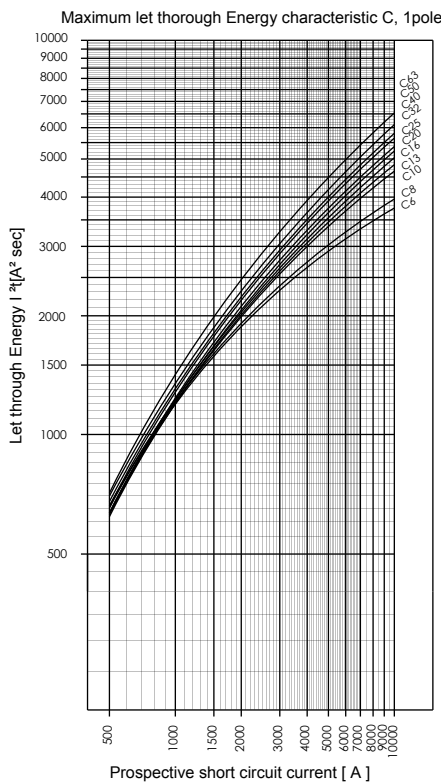


Figure 18

ROUTINE TESTS

The routine tests are conducted on each MCB to ensure that every circuit breaker is in conformity with standard.

The following routine test conducted as per the standard guideline on each circuit breaker:

1- Tripping tests

a) Verification of time current characteristics

Each circuit breaker is subjected to time current test to ensure the tripping characteristics are within the specified limit.

b) Verification of instantaneous tripping.

Each circuit breaker is subjected instantaneous tripping characteristics verification to ensure the compliance.

2- Verification of clearance between open contacts

With the circuit-breaker in the open position a voltage of substantially sine-wave form of 1500V, having a frequency of 50 Hz or 60 Hz, is applied for 1 s between the terminals which are electrically connected together when the circuit-breaker is in the closed position. No flashover or breakdown shall occur.

ORDERING NUMBER FOR BRANCH BREAKER ELPR

Product reference : Plug-in MCB C type characteristic
Tested as per : Standard EN / IEC 60898
Breaking capacity : 10 kA According to 240/415V AC

Single Pole (Type C) ELPR	
Rated Current In	Catalogue number
6A	42-00106P
10A	42-00110P
16A	42-00116P
20A	42-00120P
25A	42-00125P
32A	42-00132P
40A	42-00140P
50A	42-00150P
63A	42-00163P

Table 13

Two Poles (Type C) ELPR	
Rated Current In	Catalogue number
6A	42-00206P
10A	42-00210P
16A	42-00216P
20A	42-00220P
25A	42-00225P
32A	42-00232P
40A	42-00240P
50A	42-00250P
63A	42-00263P

Table 14

Three Poles (Type C) ELPR	
Rated Current In	Catalogue number
6A	42-00306P
10A	42-00310P
16A	42-00316P
20A	42-00320P
25A	42-00325P
32A	42-00332P
40A	42-00340P
50A	42-00350P
63A	42-00363P

Table 15



Figure 19



Figure 20



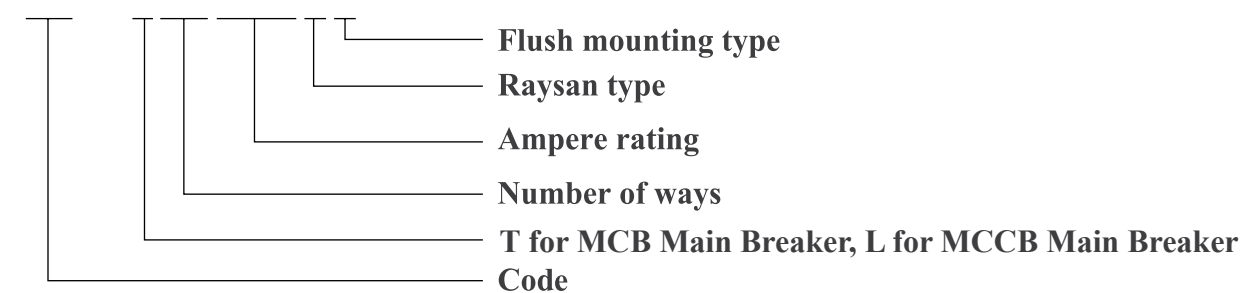
Figure 21

Coding Key

Notes

LOAD CENTER CODING KEY

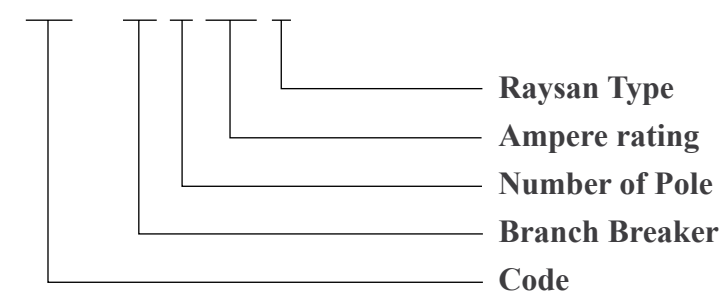
4 2 - LXXXXXPF



For example, item code 42-L12100PF represents load center, 12-way, with 100AT main - Flush type.

BRANCH BREAKER CODING KEY

4 2 - 00 X X X P



For example, item code 42-00132P represents Raysan Branch Breaker, 1 Pole, and 32A.

Certifications



alfanar PRODUCTS ARE APPROVED BY:

- SEC
Saudi Electric Company
- SAUDI ARAMCO
Saudi Arabian Oil Company
- SABIC
Saudi Basic Industries Corporation
- SASO
Saudi Arabian Standards Organization
- Several Ministries, Universities And
Governmental Organizations In Saudi
Arabia
- Abu Dhabi Water And Electricity
Board
- Ministry Of Electricity, Bahrain
- State Electricity Board Of Qatar
- Public Electricity Corporation,
Ministry Of Electricity, Yemen

OUR OBJECTIVE:

WE REACH EXACTING

STANDARDS IN THE

SAFETY AND DISTRIBUTION OF

POWER AND GO WELL

BEYOND A CUSTOMER'S

EXPECTATIONS.

THIS IS DONE BY FOCUSING

OUR TECHNOLOGY AND

EXPERTISE ON THE ULTIMATE

REWARD WE CAN GET.

COMPLETE SATISFACTION OF

OUR CUSTOMERS.



alfanar PRODUCTS

- Switches and Socket Boxes
- Junction Boxes
- Metal Enclosures IP65
- Stainless Steel Enclosures NEMA-4X
- Telephone Enclosures
- Circuit Breaker Enclosures – NEMA 1 & NEMA 3R
- Busbar chambers
- Modular Enclosures
- **Raysan** Load Centers
- NEMA Type LA Load Centers
- IEC Type LD Load Centers
- Split Busbar Unit Type LAS/LDS Load Centers
- MCCB Distribution Boards
- Pump Control Panels
- Motor Control Centers
- LV Switchboards up to 6300A, Tested for
100KA, 1 Sec Short Circuit Withstand
- AC/DC Panels up to 5000A, Tested for 85kA, 1
Sec Short Circuit Withstand
- Pole Mounted Metering Structures
- Package Substations
- Oil-Immersed Distribution Transformers
- Extendable and Non-Extendable Ring Main Units
- Control and Automation Panels
- Relay and Control Panels
- Medium Voltage Switchgears

QUALITY POLICY

The Quality Policy of **alfanar** is to:

- Provide products conforming to
governing standards and of consistent
quality
- Excel in all our operations to achieve
customer's satisfaction for products
and services through continual
improvement
- Develop and maintain a motivated
team of competent employees and
vendors
- Redefine and execute new processes/
systems that meet the changing
market requirements.



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www.alfanar.com

Continuous efforts
are being made to
improve the design
and quality of our
products. Hence, the
products supplied
may slightly differ
from those illustrated
in this catalogue.