Technical Document for
3 Phase AC Distribution box
DBA30225A1200

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Preface

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Revision history

Name	Description of Change	Date	Version
Mayur Sailor	Draft For First Time	18-04-2019	1.0

Approval

Name	Position	Signature	Date
Ujjaval Shah	Project Manager	urshah@slscorp.com	19-04-2019

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1 Introduction

ACDB (AC Distribution Box) is a central power management box. It connects MCCB (Moulded Case Circuit Breaker), MCB (Miniature Circuit Breaker), SPD (Surge protection Device), AC Power Socket, Gateway, Power adapter etc. There are various types of junction boxes based on system capacity. This solar AC distribution box have strong capabilities of ageing resistance and UV resistance. It is durable, everlasting, waterproof and dust proof.

It mainly uses AC supply from the GRID & supplies it to the inverters through MCB & SPD. All components are placed according to their significance of providing complete protection during abnormal conditions like Short circuit & Over voltages. This ACDB is mainly designed for1.5 KW to 22.5 KW capacity.

1.1 Working Principle

ACDB mainly works on the principle of quick isolation of the faulty part of the system during unhealthy/abnormal circumstances. Main 4 Pole MCB performs two actions simultaneously. Firstly, it gives electrical connection between Inverter system & GRID supply system. Second, it separates the 3 Phase supply into 3 individual phases. During abnormal situations (e.g. Short Circuit & Over Voltages) tripping of this MCB will disconnect complete system & prevents fault spreading to the further phases/system.

SPD (Surge Protection device) is used here to protect the circuit from over voltages caused by utility-switching functions, expose electrical and electronic equipment to very high over voltages & other lightening conditions. It usually connect in parallel with the MCB & it also has earthing terminal in it.

MCB (Miniature circuit breaker) is mainly used in ACDB to have individual spreading of phases from 3 phase supply connection in MCB. On Grid inverters will have electrical supply through this MCB (Maximum 5 Inverters per MCB) & It trips during the situations of Short circuit & Over voltage in the system. In ACDB, 3 MCB of same rating for 3 Phase supply is connected.

2 Technical Specifications of components used

2.1 List of Components & their ratings

Component	Description	Quantity
MCB	32 Amp, 4 Pole MCB	1
MCB	32 Amp, 2 Pole MCB	3
SPD	Surge Protection Device, 3P+N, 40KA	1
Power Socket	230V/415V AC Input/Output	1
NLG2200 Gateway	Nebulae Gateway V5(Industrial Gateway),Rev2.0	1
Power Adapter	O/P Voltage: 5V,230/415VAC Input	1
RF Antenna	Frequency Range (MHz): 2400-2500MHZ Bandwidth (MHz): 100 Input Independence (Ω): 50	2

2.2 4 Pole 32 Amp MCB

Specifications	Ratings
Operating Voltage	230/415 V
Operating Frequency	50/60 Hz
Cable capacity	35 mm2
Current Rating	32 A
Dimensions(H*W*D) in mm	85*72*77.5

Table 2-1: Technical Specifications of MCB

2.2.1 2 Pole 32 Amp MCB

Specifications	Ratings
Operating voltage	110/230 V
Operating frequency	50/60 Hz
Cable capacity	35 mm2
Current Rating	32 A
Dimensions(H*W*D) in mm	85*36*78.5

Table 2-2: Technical Specifications of MCB

2.2.2 Surge Protection Device

Specifications	Ratings
Number of Pole	3 P + N
In (Nominal Discharge Current)	20 KA
Imax (Maximum Discharge Current)	40 KA
Uc (Maximum Continuous Voltage)	335 V_{ac}
Up (Protection level at In)	1.5 kV
Operating frequency	50/60 Hz
Dimensions(H*W*D) in mm	90*67*44

Table 2-3: Technical Specifications of SPD

3 Mechanical Specifications of components used

Parameters	Description
Operating Ambient Temp. Range	-10 to 60 Celsius
Dimensions	400mm X 400mm X 180mm
Weight Pending	3.5 Kg Approximate
Enclosure Environment Rating	IP65
Minimum distance from Inverter installed area	10 meters

Table 3-1: Mechanical Specifications of 3 Phase ACDB

4 Electrical connection diagram of 3 Phase ACDB

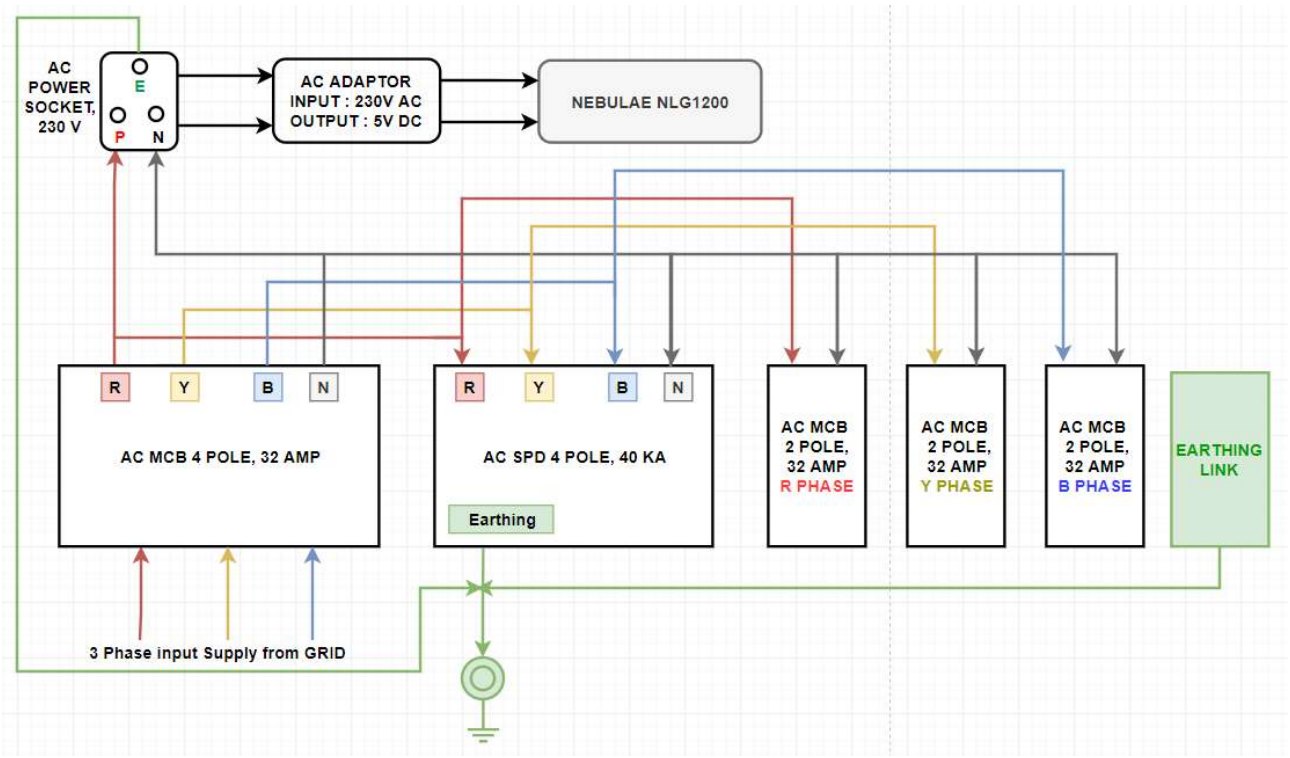

Diagram 4-1: Electrical connection diagram for 3 Phase ACDB

5 Single Line Diagram for 3 Phase ACDB

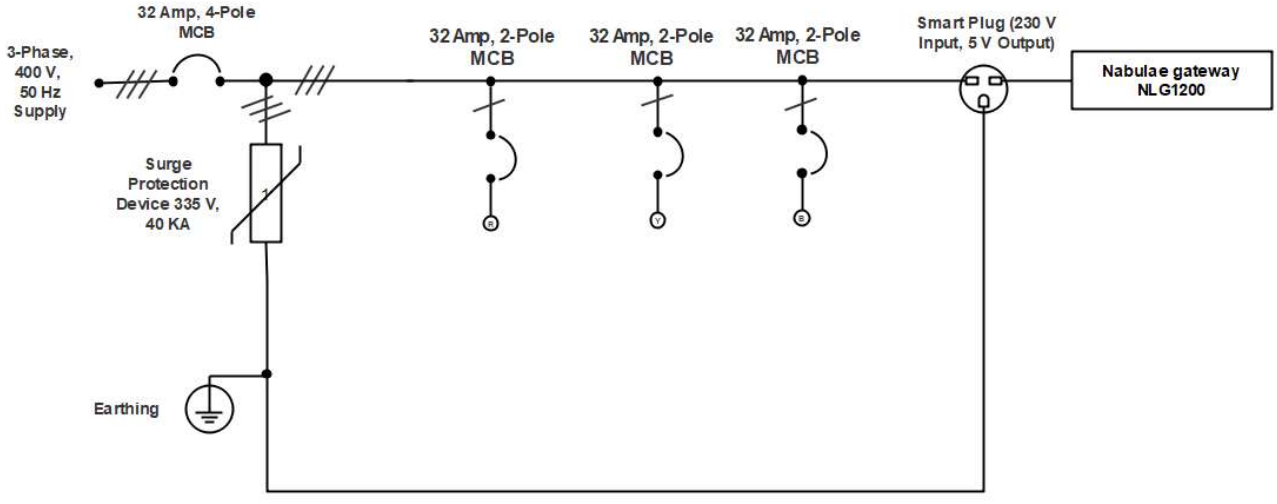

Diagram 5-1: Single Line Diagram for 3 Phase ACDB

6 Physical overview of 3 Phase ACDB

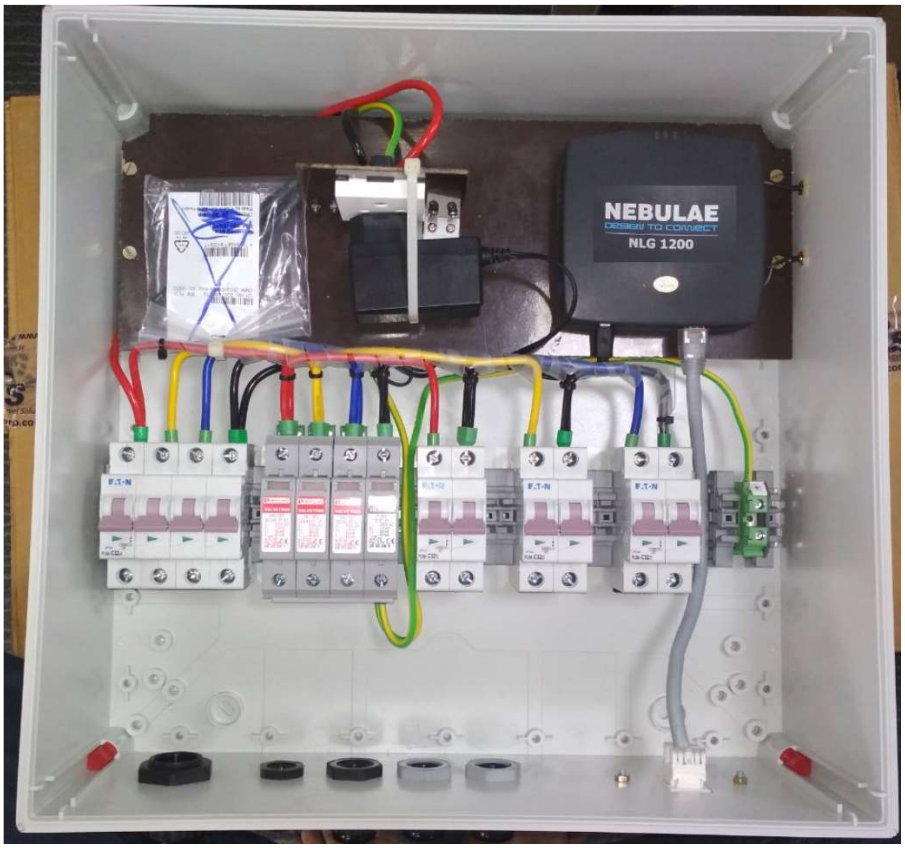

Diagram 6-1: Top View of ACDB (Without Enclosure)

Diagram 6-2: Side View of ACDB (With Enclosure)

Diagram 6-3: Top View of ACDB (With Enclosure)

7 BOM details for 3 Phase ACDB

Components	Description	Quantity
MCB	32 Amp 4-Pole MCB	1
MCB	32 Amp 2-Pole MCB	3
SPD	Surge Protection Device 400V	1
Power Socket	230/415VAC Input/Output	1
NLG2200 Gateway	Nebulae Gateway V5(Industrial Gateway), Rev2.0	1
Power Adapter	O/P Voltage: 5V,230/415VAC Input	1
RF Antenna	Frequency Range (MHz): 2400-2500MHZ Bandwidth (MHz): 100 Input Independence (Ω): 50	2

Table 7-1: BOM details of 3 Phase ACDB