

## DETAIL SPECIFICATION OF 15 HP MINING TYPE NFLP DOL STARTER

Mining type NFLP DOL Starter suitable for 415V, 50 Hz, 3-phase, 3-wire power supply and suitable for use in underground mines as per DGMS approved design.

**Enclosure:** The starter enclosure shall be of skit mounted/ Angle base frame type duly painted with 02 coats of anti corrosive lead oxide/ redoxide primer & 02 coats of light grey synthetic enamel paint, fabricated from 3mm MS sheet steel (CRCA) having two compartment conforming to the degree of protection IP54. The upper compartment will house an Isolator & Through-going bus bars, while the lower compartment shall house rest of all electrical components i.e. contactors, power fuses, protective relays, etc. as detailed below:

1. **Bus- Bars:** Triple pole through-going electrolyte Copper bus-bars of 200A rating and current density 1.6 Amps/Sq.mm, duly insulated with heat shrink type PVC sleeves and with adequate insulated supports.
2. **Isolator:** Triple pole off-load type ON-OFF isolator of suitable rating for continuous operation duty (not less than 100A). The isolator handle shall be mechanically interlocked with the bottom compartment-front cover, in such a-way that the isolator handle can't be put ON-position when the bottom compartment-cover is open or vice-versa. The isolator also have an electrical interlock with the main contactor i.e. in that event the isolator being inadvertently switched off to stop the motor, in such case, the contactor shall switch off before the isolator contact open, insuring the isolator to operate under NO-load condition. Mechanical indication of ON & OFF position of isolator shall be provided.
3. **Main contactor:** 01 No. Triple pole 70A, Air Break Contactor (Cat. No.- LC1D38N7) fitted with 415V inherent U/V coil having no-volt, no-close feature shall be provided. Make: Schneider Electric
4. **Over Load Relay:** Triple pole directly operated bimetallic thermal overload relay (Cat. No.- LRD22) having an adjustable setting of 16-24A shall be provided. Make: Schneider Electric
5. **Earth Leakage Relay:** CBCT operated sensitive Earth Leakage Relay suitable for 415V, 50Hz power supply having a setting range in steps of 50-100-200-300-400-500-600-750mA with variable time setting in steps of 100-200-300-400-500-600-700-800-900-1000ms. The relay shall be provided with Test & Reset facility and a visual indication for relay "healthy & trip". The ELR shall be flush mounted on the front door, Bezel: 96x96mm.
6. **Short-circuit Protection:** 03 Nos. of 63A rated HRC/HBC fuses (confirming to IEC 60269-1 & 2-1 / IS 13703-1 & 2-1) mounted on DMC Post Insulators as back-up protection for power circuit shall be provided. Make: L&T/SIEMENS/BUSMANN/HAVELS
7. **Single Phase Preventer:** Current sensing type negative sequence SPP shall be provided.
8. **Ammeter & Voltmeter:** Suitably scaled combined digital ammeter & voltmeter shall be provided. For this purpose proper CTR, VA with Class1 CT must be provided. Make: Schneider.
9. LED type indicating lamp shall be provided for ON, OFF & O/L Trip. Make: Schneider/BCH/Siemens
10. **Push Buttons:** Start, Stop push button shall be provided. Make: Schneider/BCH/Siemens
11. **Power Wiring:** Power wiring shall be made with 35sqmm electrolytic Copper PVC insulated flexible single core cable.
12. **Control Wiring:** Control wiring shall be made from 2.5sqmm PVC insulated FRLS flexible Copper wire with required cable marker & lugs.
13. **Cable Entry:** Incoming, Outgoing, Through-going termination & sealing boxes fitted with double conical brass glands shall be provided. Incoming & throughgoing glands shall be suitable for 3.5Cx35 to 3.5Cx120 sqmm round armoured cable and outgoing glands shall be suitable for 4Cx16 to 3.5Cx35 sqmm round armoured cable.

A separate auxiliary termination chamber with sealing box fitted with 01 No. brass gland shall be provided for external connection to the probes of liquid level controller.

The cable sealing boxes shall have provision for pouring cable compound. Separator of not less than 3mm thickness shall be rigidly fitted in the cable entry boxes to prevent compound from flowing over to terminal box.

The construction of the enclosure shall be such that the Incoming, Outgoing and Through-going Terminal & Cable Entry Boxes are interchangeable.

14. Control Circuit Protection: 2/4Amps Single Pole MCBs shall be provided. Approx. 05Nos.
15. **Liquid Level Controller:** Liquid Level Controller of 415V, 50Hz power supply shall be provided in the panel with suitable wiring. Model: WLCD1, Make: minilec.
16. All the Insulators shall be of DMC & non-hygroscopic.
17. Laminated Circuit Diagram shall be affixed on the inside of the cover.
18. A bilingual (Devnagri & English) Metallic Danger Board of 415V shall be fitted on the front cover of the starter panel as per Indian Standards.
19. Space heater should be provided inside the panel with suitable DP MCB protection.
20. All the components of the lower compartment, shall be mounted on vertically fixed base plate of 3mm thick sheet steel.

The starter shall be free floor standing and mounted on a Base frame of minimum height 300mm made from M.S. Angle and the height of the centre of operating handle of the isolator shall not less than 800mm.

**Note:** Drawing may be submitted for approval before manufacturing.

