

WATER SUPPLIES DEPARTMENT

STANDARD SPECIFICATION E-12-01

WALL MOUNTED MOTOR STARTER FOR MOTORS UP TO 16 kW

1. GENERAL

This specification covers the design of a wall mounted starter for a single motor or for a pair of duty/standby motors each of rating up to 16 kW.

2. DESIGN

The equipment shall meet the following requirements: -

- (a) Type : A metal enclosure having a protection rating of IP55 to IEC 60529 assembled with contactor-starter suitable for direct-on-line or star-delta motor starting as specified in the Specification. Starters installed in chemical contaminated areas or at outdoors shall have weather proof enclosures with degree of protection IP67 to IEC 60529
- (b) Main isolator : One 32A AC23 triple-pole and integral neutral metalclad main isolator to IEC 60947 shall be provided for supply isolation. The main isolator shall be fitted with an external operating handle interlocked with the panel door and lockable at "Off" position
- (c) Main protection fuse : One 3-phase set of 32A plug-in type fuses to IEC 60269-1 shall be provided for each motor
- (d) Contactor : One set of 32A triple-pole air break, AC3, electrically held, block type contactors for direct-on-line/star-delta motor starting shall be provided for each motor. For frequent start application (where the time in between consecutive starts shall be less than 10 minutes), the contactor duty shall be of AC4. The rating of the main protection fuse and the contactor shall be selected for type '2' coordination to IEC 60947-4-1
- (e) Ambient temperature : 40°C maximum continuous for 4 hours
35°C average over 24 hours
- (f) Electricity supply : 380V 3-phase, 50 hertz, 4-wire system with solidly earthed neutral
- (g) Voltage variations : $\pm 6\%$
- (h) Frequency variations : $\pm 2\%$

3. CONSTRUCTION

The enclosure shall be of standard mass produced product. For the panel installed at indoors, the enclosure shall be made of fine coated sheet steel of not less than 1.5 mm thick with stoved enamel paint finish and light grey in colour. For the panel installed at chemical contaminated areas or at outdoors, the enclosure shall be made of stainless steel 316 of not less than 1.5 mm thick. A gasketed front-access door hinged at one side with a chromium plated handle shall be provided.

Indicating lamps and push-buttons shall be flush mounted on the front of the starter. They shall be circular with nominal diameter not less than 22 mm. The indicating lamps shall be of LED type.

Thermal overload protection and single phasing protection shall be provided. The thermal overload relay shall be of hand-reset type and shall have a setting range of 70-110 % rated motor current.

For duty and standby motor starters, automatic changeover circuits for duty and standby motors shall be provided.

4. ELECTRICAL EQUIPMENT

The following equipment shall be fitted in the control circuitry of the starter cubicle where shown in the Specification Drawings:-

- (a) Panel supply main isolator, main protection fuses, contactors and motor protection relays
- (b) Indicating lamps - green for 'On' and 'Running'; red for 'Off' and 'Tripped On Fault'
- (c) Push-buttons - green for 'Start'; red for 'Stop' and black for 'Reset' and 'Lamp Test'
- (d) Loose supply of red 'Emergency Stop' push-buttons (quantity to be specified)
- (e) Selector switches for 'Auto/Off/Manual' and motor duty selection
- (f) 'Tripped On Fault' relay, auto control relays and auxiliary relays
- (g) Relays, timers, indicating lamps and reset push-button for no-flow protection (where specified)
- (h) HBC fuses and links in fuse holders for motor supply, control and indication/alarms
- (i) Anti-condensation heater with thermostat and isolating switch
- (j) Labels for panel, circuit and components
- (k) Terminals for power supply shall be suitable for minimum 4 mm² XLPESWAPVC or PVCSWAPVC 4-core cable. Terminals for control and auxiliary switches shall be suitable for 1.5 mm² PVCSWAPVC multi-core cable