CHAPTER 10

MOTOR CONTROL CENTRE

List of Contents

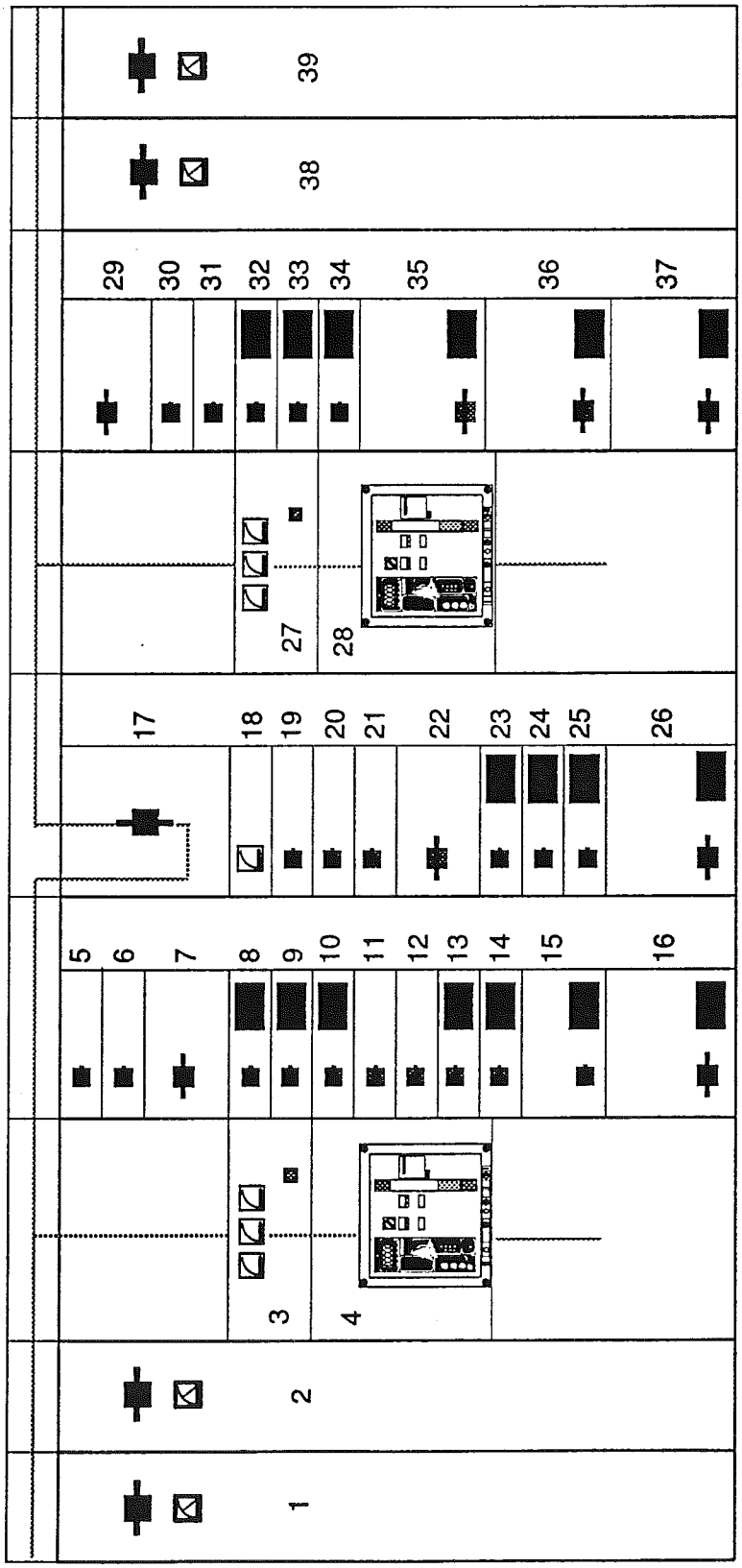

Figure 10.1 - Motor Control Cabinets

1 GENERAL

The motor control cabinet contains the distribution, switching and protection fuses for the 380 volt ac three-phase circuits for the installation. The cabinets contain, where applicable, draw out modules.

2 MODULES

The Motor Control Cabinet contains the following modules with the respective Operator Facilities:

BOILER PUMP (P409A) MODULE (1)
This panel contains a rotary three-pole switch to enable the circuit to be isolated. This circuit is fused to a rating of 250 Ampere.

A continuous-scale Ammeter is provided to observe the current in this circuit. The Ammeter has a scale of 0 - 6 ampere. A moveable indicator on this ammeter enables an visual indication to be set for normal or alarm level.

STARTER MOTOR MODULE (2)
This panel contains a rotary three-pole switch to enable the circuit to be isolated. his circuit is fused to a rating of 400 Ampere.

A continuous-scale Ammeter is provided to observe the current in this circuit. The Ammeter has a scale of 0 - 6 ampere. A moveable indicator on this ammeter enables an visual indication to be set for normal or alarm level.

METERING MODULE (3)
This panel contains three meters:

Cable Voltage This continuous-scale meter indicates the incoming feeder voltage. The scale is graduated in volts in the range 0 - 400 volt.

Ampere This continuous-scale meter indicates the current flow across the Circuit-breaker. The scale is graduated in ampere in the range 0 - 1000 Ampere.

Bus Voltage This continuous-scale meter indicates the voltage in the bus. The scale is graduated in volts in the range 0 - 400 volt.

Also mounted on the panel is:

Feeder Circuit-breaker Trip This push-button switch, when depressed, will trip the remote circuit-breaker for this feeder circuit.

CIRCUIT-BREAKER (4)
This panel contains a circuit-breaker for the incoming feeder. Refer to Paragraph 3 of this Chapter for a detailed description of the Operator facilities.

Enclosed within the cabinet below the circuit-breaker is the incomer transformer.

HVAC SYSTEM MODULE (5)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 35 Ampere.

BATTERY CHARGER (4n1) MODULE (6)
This module contains a rotary three-pole switch for the isolation of the Battery Charger circuit. This circuit is fused to a rating of 10 Ampere.

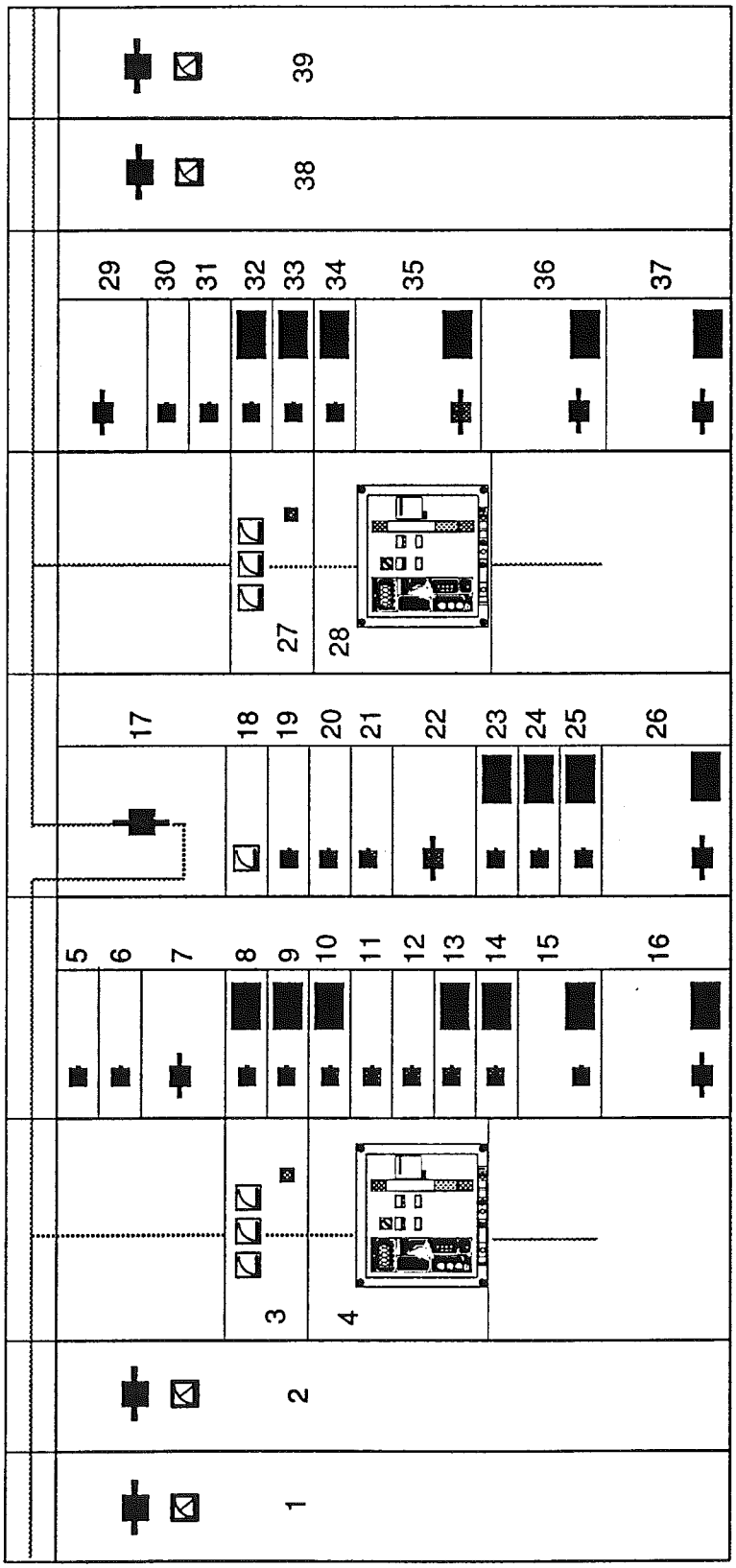

Figure 10.1 - Motor Control Cabinets

SPARE MODULE (7)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

GENERATOR LUBRICATING OIL PUMP A MODULE (8)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 25 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

LUBRICATING OIL RESERVOIR EDUCTOR MODULE (9)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 4 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

TURBINE ENCLOSURE HEATER MODULE (10)
This module contains a rotary three-pole switch for the isolation of the Turbine Enclosure Heater circuit. This circuit is fused to a rating of 10 Ampere.

STEP UP TRANSFORMER MODULE (11)
This module contains a rotary three-pole switch for the isolation of the Step-up Transformer (4m3) circuit. This circuit is fused to a rating of 10 Ampere.

RELAY CABINET TBV TRACING MODULE (12)
This module is equipped with a rotary three-pole switch for the isolation of the Relay Cabinet TBV Tracing.

HYDRAULIC CONTROL OIL PUMP A MODULE (13)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 25 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

DSM BOILER MODULE (14)
This module contains a rotary three-pole switch for the isolation of the DSM Boiler circuit. This circuit is fused to a rating of 50 Ampere.

SPARE MODULE (15)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

DSM BOILER 1 SEALING AIR FAN MODULE (16)
This module contains a rotary three-pole switch for the isolation of the DSM Boiler 1 Sealing Air Fan circuit. This circuit is fused to a rating of 160 Ampere.

BUS COUPLER MODULE (17)
This module contains a rotary three-pole switch that enables the connection/disconnection of the motor control cabinet busses for the right and left-hand busbars within the motor control cabinets.

BUS COUPLER AMMETER MODULE (18)
This module contains an Ammeter to enable the Operator to monitor the current flow across the Bus Coupler Switch (in Module 17). The meter has a continuous-scale and measures in Ampere with a range of 0 - 1000 Ampere.

220/380 VAC DISTRIBUTION PANEL MODULE (19)
This module contains a rotary three-pole switch for the isolation of the 220/380 volt ac Distribution Cabinet circuit. This circuit is fused to a rating of 35 Ampere.

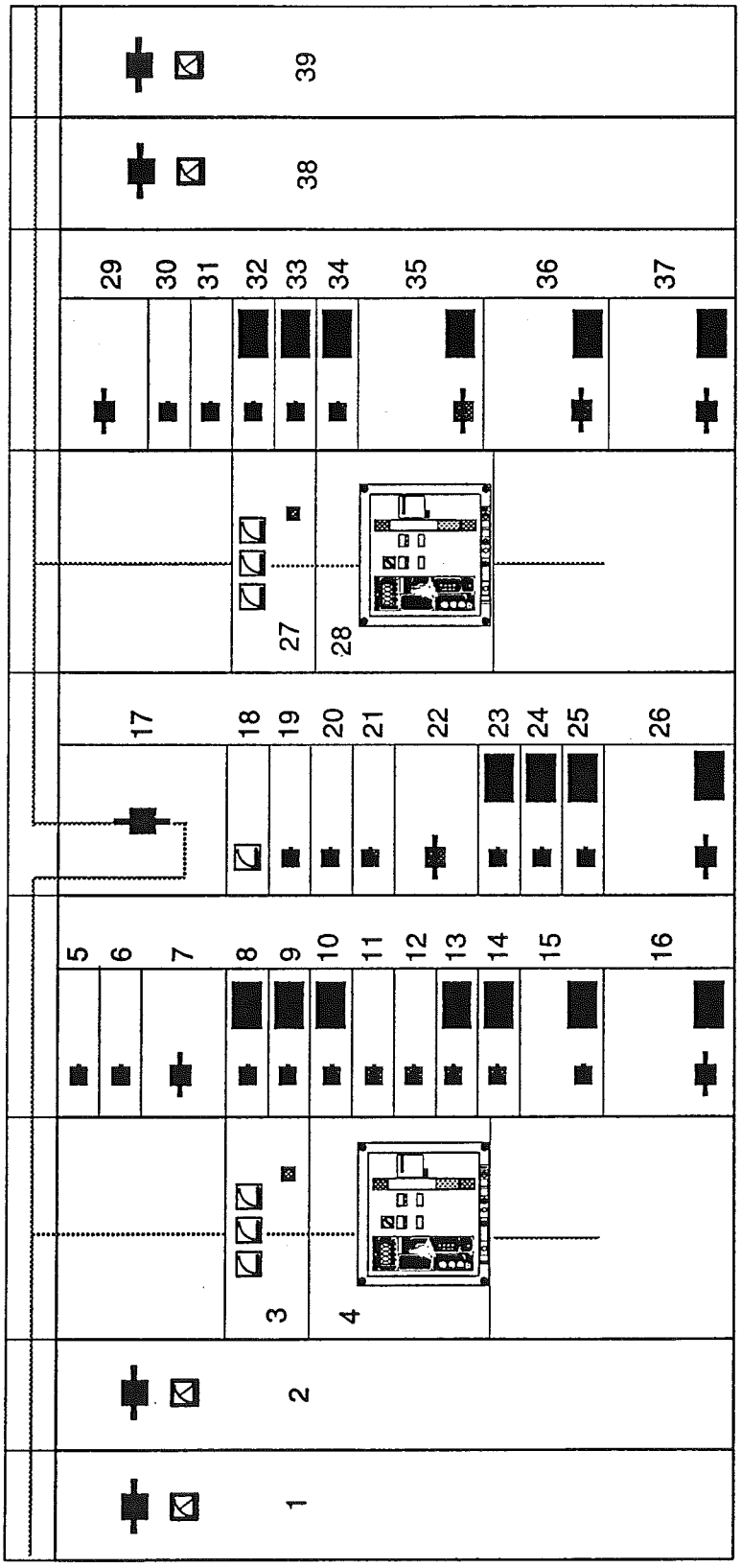

Figure 10.1 - Motor Control Cabinets

FANS STEP UP TRANSFORMER MODULE (20)
This module contains a rotary three-pole switch for the isolation of the Fans Step-up Transformer (4m3) circuit. This circuit is fused to a rating of 10 Ampere.

APPARATUS CABINET HVAC E/BP ROOM MODULE (21)
This module is equipped with a rotary three-pole switch for the isolation of the Apparatus Cabinet Heating Ventilation and Air Conditioning for the E/BP Room.

UPS MODULE (22)
This module contains a rotary three-pole switch for the isolation of the UPS circuit. This circuit is fused to a rating of 100 Ampere.

SPARE MODULE (23)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

SPARE MODULE (24)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

WATER WASH HEATER MODULE (25)
This module contains a rotary three-pole switch for the isolation of the Water Wash Tank Heater circuit. This circuit is fused to a rating of 25 Ampere.

SPARE MODULE (26)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

METERING MODULE (27)
This panel contains three meters:

Cable Voltage This continuous-scale meter indicates the incoming feeder voltage. The scale is graduated in volts in the range 0 - 400 volt.

Ampere This continuous-scale meter indicates the current flow across the Circuit-breaker. The scale is graduated in ampere in the range 0 - 1000 Ampere.

Bus Voltage This continuous-scale meter indicates the voltage in the bus. The scale is graduated in volts in the range 0 - 400 volt.

Also mounted on the panel is:

Feeder Circuit-breaker Trip This push-button switch, when depressed, will trip the remote circuit-breaker for this feeder circuit.

CIRCUIT-BREAKER (28)
This panel contains a circuit-breaker for the incoming feeder. Refer to Paragraph 3 of this Chapter for a detailed description of the Operator facilities.

Enclosed within the cabinet below the circuit-breaker is the incommer transformer.

UPS MODULE (29)
This module contains a rotary three-pole switch for the isolation of the UPS circuit. This circuit is fused to a rating of 100 Ampere.

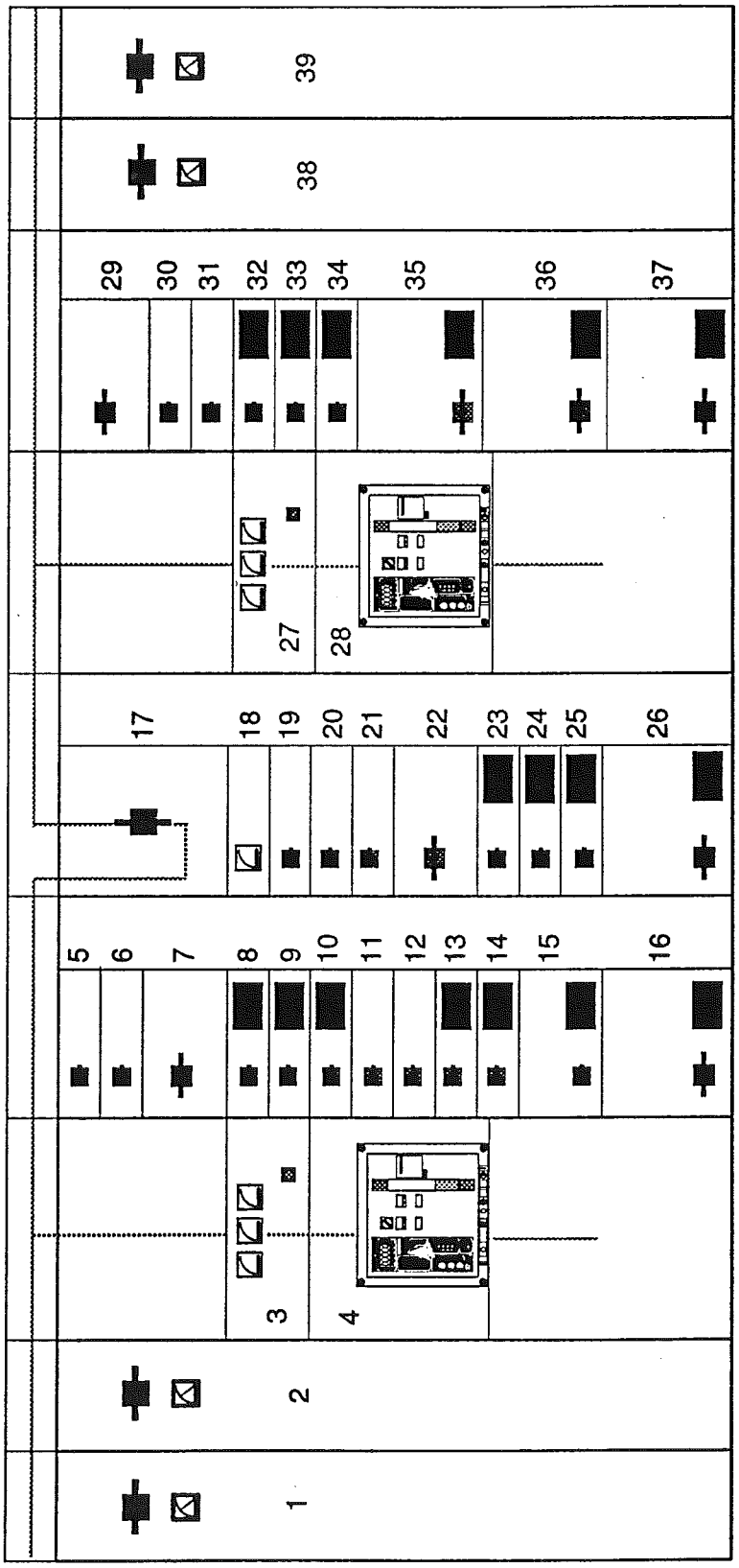

Figure 10.1 - Motor Control Cabinets

WELDING SOCKET MODULE (30)
This module contains a rotary three-pole switch for the isolation of the Welding Socket circuit. This circuit is fused to a rating of 35 Ampere.

BATTERY CHARGER (4n2) MODULE (31)
This module contains a rotary three-pole switch for the isolation of the Battery Charger circuit. This circuit is fused to a rating of 10 Ampere.

GENERATOR SPACE HEATER MODULE (32)
This module contains a rotary three-pole switch for the isolation of the Generator Space Heater circuit. This circuit is fused to a rating of 10 Ampere.

GENERATOR LUBRICATING OIL PUMP B MODULE (33)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 25 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

HYDRAULIC CONTROL OIL PUMP B MODULE (34)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 25 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

TURBINE ENCLOSURE VENTILATION FAN MODULE (35)
This module contains a rotary three-pole switch for the isolation of the circuit. This circuit is fused to a rating of 125 Ampere.

The pump may be manually operated, for maintenance purposes, by a switch installed adjacent to the pump.

DSM BOILER 2 SEALING AIR FAN MODULE (36)
This module contains a rotary three-pole switch for the isolation of the DSM Boiler 2 Sealing Air Fan circuit. This circuit is fused to a rating of 160 Ampere.

SPARE MODULE (27)
This module is not used at the time of installation. The module is equipped with a rotary three-pole switch for future use.

BOILER PUMP MODULE (38)
This panel contains a rotary three-pole switch to enable the circuit to be isolated. This circuit is fused to a rating of 250 Ampere.

A continuous-scale Ammeter is provided to observe the current in this circuit. The Ammeter has a scale of 0 - 6 ampere. A moveable indicator on this ammeter enables an visual indication to be set for normal or alarm level.

BOILER PUMP (P409B) MODULE (39)
This panel contains a rotary three-pole switch to enable the circuit to be isolated. This circuit is fused to a rating of 250 Ampere.

A continuous-scale Ammeter is provided to observe the current in this circuit. The Ammeter has a scale of 0 - 6 ampere. A moveable indicator on this ammeter enables an visual indication to be set for normal or alarm level.

3 CIRCUIT-BREAKERS

There are two circuit-breakers in the Motor Control Panel for the respective Incoming Feeders. They are both identical in design and the following descriptions apply equally to both.

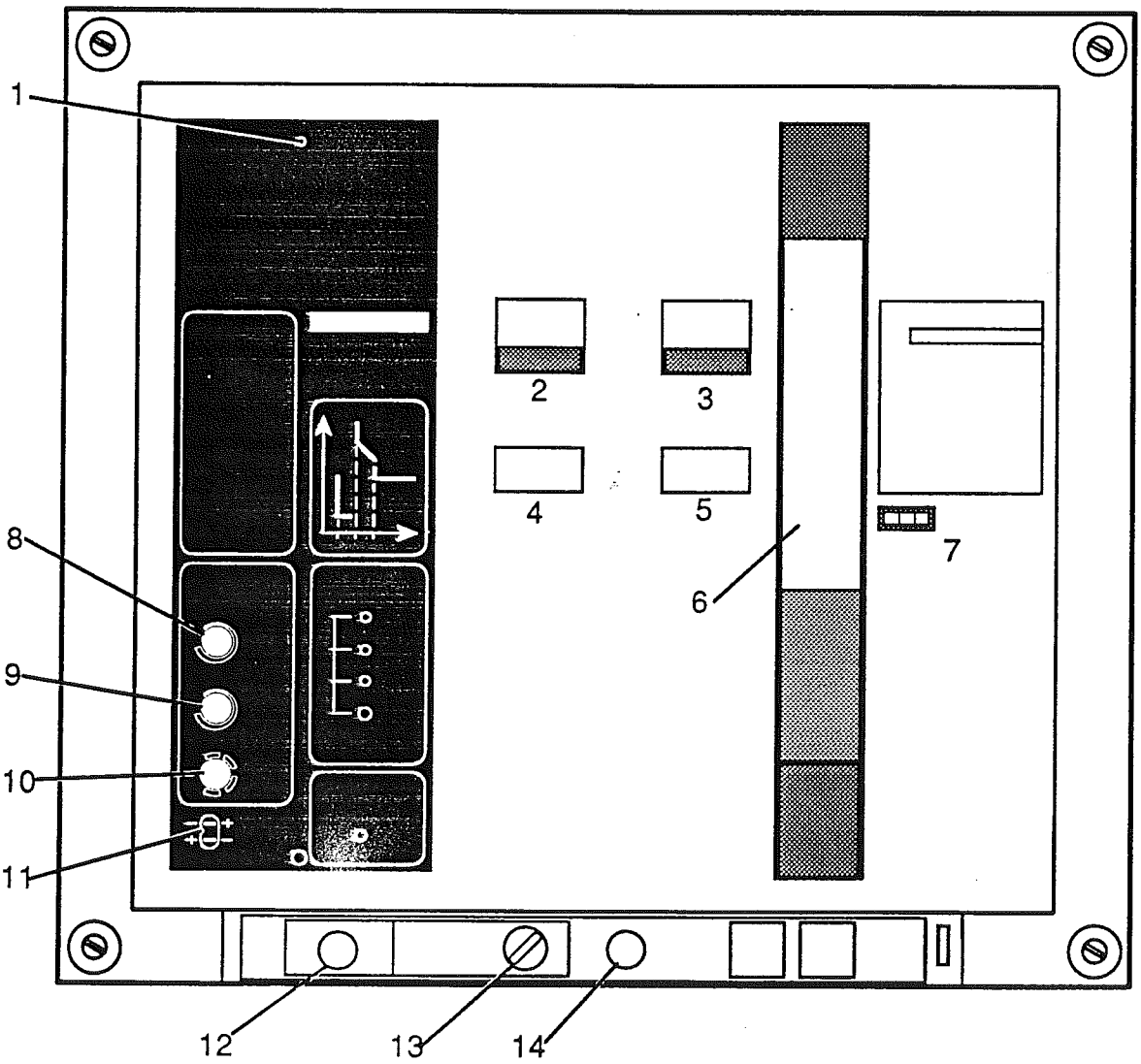

Figure 10.2 - Circuit-breaker

NOTE: When carrying out maintenance work in the environs of the Turbine and Generator these Circuit-breakers should be withdrawn and locked in the disengaged position.

RESET SWITCH (1)
This push-button switch is used after the fault that tripped the circuit-breaker has been corrected. After the circuit-breaker has been tripped by a fault it will not be possible to close the circuit-breaker until this button has been pressed.

OPENING PUSH-BUTTON (2)
This red push-button enables the circuit-breaker to be manually tripped.

CLOSING PUSH-BUTTON (3)
This black push-button enables the circuit-breaker to be manually closed.

MAIN CONTACT POSITION INDICATOR (4)
This indicator will show if the circuit-breaker is closed (I) or tripped (O).

STORED ENERGY INDICATOR (5)
This indicator will show the condition of the spring tension in circuit-breaker spring mechanism.

SPRING CHARGING HANDLE (6)
This lever is used to manually wind the spring of the spring mechanism. It may be used in the event of failure in the spring winding motor to enable continued operation of the system until a convenient time for repairs to be carried out.

OPERATIONS COUNTER (7)
This mechanical totaliser records the number of 'make and break' operations of the circuit-breaker contacts for the purpose of correctly identifying maintenance periods.

LONG TIME SETTING ADJUSTMENT (8)
This rotary control is used to set the long time setting.

SHORT TIME SETTING ADJUSTMENT (9)
This rotary control is used to set the short time setting.

SHORT TIME DELAY SETTING ADJUSTMENT (10)
This rotary control is used to set the short time delay setting.

TEST SOCKET (11)
This test socket enables the connection of a test meter for maintenance procedures.

RACKING HANDLE STORAGE (12)
This socket provides a storage recess for the racking handle that is used to wind the circuit-breaker in and out of engagement with the busbars.

FUNCTIONAL POSITION INDICATOR (13)
This mechanical indicator will indicate the position of the circuit-breaker engagement with the busbars as Engaged; Test or Disconnected as appropriate.

RACKING HANDLE SHAFT (14)
This racking handle engages with this shaft to wind the circuit-breaker in and out of engagement with the busbars.