



CONTENTS

Introduction	2
General Product Description	3
Written Specifications	5
Charts	13
Site Requirements	15

High efficiency air handling units

Introduction

Jet AHU Ltd. was born from the requirement for a high quality Air Handling Unit (AHU), that was reliable, engineered to the highest standards, but was affordable. With these requirements in mind, Jet AHU Ltd. was founded to service the needs of the market, not only within the UK, but internationally as well.

Because of the demands and varied requirements throughout the market place, Jet AHU Ltd. uses specially designed software to aid with the specification, design and build of the units, thus creating detailed drawings and technical specifications within a short period of time.

The quality of the unit is built from a combination of in-house technical expertise, coupled with high quality production facilities and an experienced workforce, dedicated to delivering a quality product.

With the emphasis on quality and efficiency, a wide range of both single and modular section construction units are available, all tested to withstand 2000pa under negative and positive pressure applications, and can be supplied with any combination of standard components, including filtration, heating (water, steam, gas [direct or indirect] or oil), cooling (water or DX) and heat recovery.

Units supplied by Jet AHU Ltd. have major advantages over the majority of other units used within similar applications, including integral controls and extended warranty cover.

Control equipment offered, is based on the Honeywell range of controllers, giving advanced energy saving and convenience features, including sequential control of output signals to heating, fan speed, fresh air, cooling and energy recovery, discharge air or room temperature control, optimum start and plant override.

For a quality product that offers that little bit extra, Jet AHU Ltd. are the people to contact.

General Product Description



General Specification

The Jet range of air handling units are designed to provide all the heating ventilation and air conditioning requirements for commercial and industrial buildings meeting with current standards for construction and operation for both the UK and international markets

There is a selected range of units with construction, performance and dimensional data noted in this brochure.

The units are of single or modular section construction dependant upon the unit performance requirements and space limitations.

The sectional units are divided to provide ease of handling with each section having an independent base frame with inbuilt lifting facilities and full structural stability with no section distortion and full alignment with other unit sections for site fixing and service connections .

Full access is incorporated into the unit sections for servicing and replacement of equipment with the availability of external viewing ports as required.

Base Frame Construction

The base frame is constructed from hot dip galvanised steel section with welded longitudinal and cross members, the frame incorporates lifting points (full details of the lifting instructions can be provided). The unit space frame is bolted to the base frame providing full structural stability during lifting and installation.

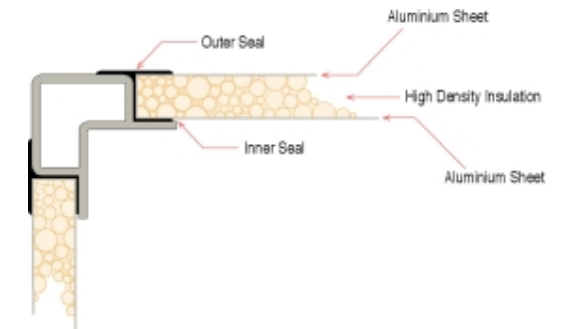
Materials

The frame is a pentapost rigid closed section in marine grade aluminium alloy. The framework provides a light weight structure with high frame strength and stability. The panels have perimeter inner and outer seals with the unit panels seals seating onto the pentapost section ensuring that there is no air leakage under positive or negative pressure conditions within the air handling unit. The unit has been tested to withstanding pressures of 2000 pa under negative and positive pressure applications.

The closed section framework provides air gap insulation within the cavity.

The unit panels are 25mm or 50mm double skin insulated panels

The panel insulation is either of high density CFC free cellular foam fully compliant with the latest Montreal protocol requirements or high density mineral wool slab, dependent on application.



Special finishes can be incorporated to meet specific requirements for pharmaceutical , hospital and other specification related applications .

External Air Handling Units

Units required for mounting externally to the building are provided with full weatherproof facilities

The units have integral rigid weatherproof roof complete with gutter profile allowing clear drainage with all sections fully sealed to prevent the ingress of water through any panels or the fresh air , recirculation air or discharge air connections .

Written Specifications



Inlet Sections

External or internal units can be provided with grilles or louvres to suit the application. This can be in the form of a weatherproof louvre, inlet grille or bird/insect mesh as appropriate. Dampers will be opposed blade multi leaf type

with low pressure drop characteristics when open. Opposed blade dampers will have an interlocking gear drive on each blade.

Damper blades can be provided in steel with special paint finishes or stainless steel in accordance with particular specification requirements.

Sealing edge strips are provided for low air leakage operation.

Typically units will have the dampers located internally with an access door to the section.



The mixing box will have a single compartment for re circulation and fresh air mode of operation and a twin compartment for recirculation, exhaust and fresh air.

Filtration

The filter section will incorporate panel and/or bag filters suitable for front withdrawal. The panel type filters will be disposable or washable in accordance with specification requirements. Filter panels will be held in rigid galvanised steel holding frames complete with seals to prevent leakage.

Automatic Roll filters, Activated carbon filters, HEPA filters and other special filter types can be fitted into the range of air handling units.

All filters will comply with the latest Eurovent and British Standard test requirements for dust arrestance, efficiency and odour absorption.

Filter banks will be provided with filter condition indication as appropriate, this will generally be via a differential pressure switch with visual indication at the control panel. Manometer gauge can be provided if required. Each filter section will be provided with a full access section to allow ease of filter replacement.

Heating Types

wide range of heating mediums are available and a description of each type of heating is noted as follows:

Coils – Hot water coils are available for low, medium, high pressure hot water and steam applications. Coils are fabricated by expanding copper tube to aluminium collar spaced fins at a suitable pitch to meet design performance requirements. Coils are pressure tested to xxbar. The fins are mechanically bonded

providing excellent heat transfer characteristics with staggered tubes in the direction of airflow. Special fin materials and finishes can be provided such as copper fins and electro tinning to meet particular specification requirements.

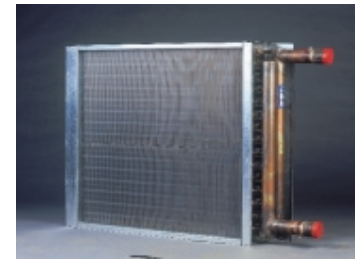
The coil framework is a rigid galvanised formed section and the coil tubes are brazed to copper headers with flow and return screwed or flanged connections.

All pipe and drain connections are fitted with flexible bushes to ensure an airtight seal and good vibration isolation. All coils are fitted with an air vent and drain plug as standard.

Direct gas – Direct gas fired heaters are manufactured in accordance with the requirements of European Standard EN525 and are CE certified. Direct gas firing provides the most efficient means of heating with combustion efficiencies of 93%.

The burner consists of a cast steel manifold and stainless steel mixing plates that are perforated to provide progressive mixing of the fresh air to provide optimum combustion at all levels of operation. The burner has its own combustion fan providing fresh air for combustion in accordance with CE requirements. Fully modulating control with up to 25:1 modulation is provided using a microprocessor controller that monitors the space temperature and heater discharge temperature.

The burner controls have a fully automatic ignition system and airflow proving with full safety controls providing automatic safety shut down.



Indirect Gas and Oil – Indirect fired heat modules are suitable for natural gas, LPG or oil.

Gas-fired modules are CE marked and comply with all relevant standards. A heavy gauge, high quality stainless steel (316 grade) combustion



chamber / heat exchanger is used. Heater efficiencies will be in excess of 85% across the output range, condensing heater modules are also available to provide higher combustion efficiencies.

For large output units, up to 920kW, a forced draught burner is supplied, installed with all controls to meet the particular specification requirements. For smaller output duties atmospheric burner modules can be provided, singularly or in multiple modules.

Exhaust gases are expelled using a flue fan. An in-built draught diverter is included.

Gas fired coils can be provided as multi tubular heat exchangers in aluminised steel or stainless steel with a large surface area for high thermal efficiency.

Heaters are provided with full safety controls including gas pressure proving, flame detection, airflow proving and high temperature cut-out. Burner control can be provided as on/off, high/low/off or modulating as appropriate.

means that the burner can operate at optimum efficiency no matter.

Electric – The electric heater elements are designed for black heat operation with 80/20 nickel chrome resistance wire centred in a protected metal tube packed with magnesium oxide. The element tubes are copper coated mild steel tubular or finned to meet the particular application. Stainless steel or incoloy can be provided.

The units are complete with safety cut outs with manual reset. The control enclosure complies with IP42 and special terminal boxes are available to IP/NEMA specification.

The control system operation is from remote thermostat or step control with pre wired switching and overheat protection. Thyristor/SCR control can be provided with energise and de energise cycling.

Heat Recovery –

Thermal wheel exchangers

have a rotating wheel that will recover both sensible and latent heat with efficiencies up to 85%.

Plate Heat Exchanger

– Cross flow type heat recovery will provide up to 80% efficiency with warm discharge air being passing through the heat exchanger to atmosphere with heat transfer to the cooler fresh air passing through the heat exchanger. Summer bypass facilities are installed. The heat exchanger plates are manufactured in aluminium,

special epoxy coatings or stainless steel plates are available.

Run Around Coils – Waste heat recovery is available with liquid coupled run around coils, the coil construction is to the same specification as the heating coils a water glycol medium is pumped through the coupled coil circuit to provide up to 65% heat recovery. The pump set can be provided within the air handling unit with a control interface or this facility can be provided by others.

Cooling

A choice of chilled water or direct expansion heat exchangers is available.

Chilled Water Coils – Coils are fabricated by expanding copper tube to aluminium collar spaced fins at a suitable pitch to meet design performance requirements. The fins are mechanically bonded providing excellent heat transfer characteristics with staggered tubes in the direction of airflow.

Special fin materials and finishes can be provided such as copper fins and electro tinning to meet particular specification requirements. The coil framework is a rigid galvanised formed section and the coil tubes are brazed to copper headers with flow and return screwed or flanged connections.



DX Coils – Coils are fabricated by expanding copper tube to aluminium collar spaced fins at a suitable pitch to meet design performance requirements. The fins are mechanically bonded providing excellent heat transfer characteristics with staggered tubes in the direction of airflow.

Special fin materials and finishes can be provided such as copper fins and electro tinning to meet particular specification requirements.

The coil framework is a rigid galvanised formed section and the coil is interlaced to suit the compressor load requirements and the liquid lines are brazed to the distributors.

Moisture droplet eliminators and drain pans are fitted as standard to all sections.

All pipe and drain connections are fitted with flexible bushes to ensure an airtight seal and good vibration isolation. Chilled water coils are fitted with an air vent and drain plug as standard.



Fans

This section incorporates a fan and motor assembly to meet the specific air volume and pressure requirements

for the application.

A comprehensive range of fan types are available including centrifugal forward and backward curved fans, plug type, axial or mixed flow type fans. Special fan finishes construction and control elements can be incorporated to meet the particular specification and application requirements.

The fan and motor assembly is mounted onto an independent sub frame with anti vibration mount isolation from the main unit frame and a flexible connection on the fan discharge preventing noise and vibration transmission.

If direct drive fans are installed then anti vibration mounts would only be fitted as required dependant upon the fan selection and application.

Motors will be cage rotor type with an aluminium or steel frame construction and will comply with current British and European standards .Motor sizes up to and including 5.5 kW shall be suitable for D.O.L starting, above 7.5 kW motors shall be suitable for Star-Delta starting. Various methods of speed control are available as an option.

Motors shall have Class `F` insulation to BS 2757 and shall be provided as standard with an IP54, TEFV enclosure.

Thermistor protection can be provided and shall be set to operate at not more than 120 deg C and shall comply with BS 4999: part 72 .

The fan motor drive will be a pulley belt drive with taper lock pulleys used on motor ratings up to and including

30 kW. Drives above 30 kW shall have key secured pulleys.

A minimum of two belts shall be used on each drive and shall be endless V belts manufactured in accordance with BS 3790 utilising `A` , `B` or `C` sections .

The pulleys shall be close grained cast iron machined type.

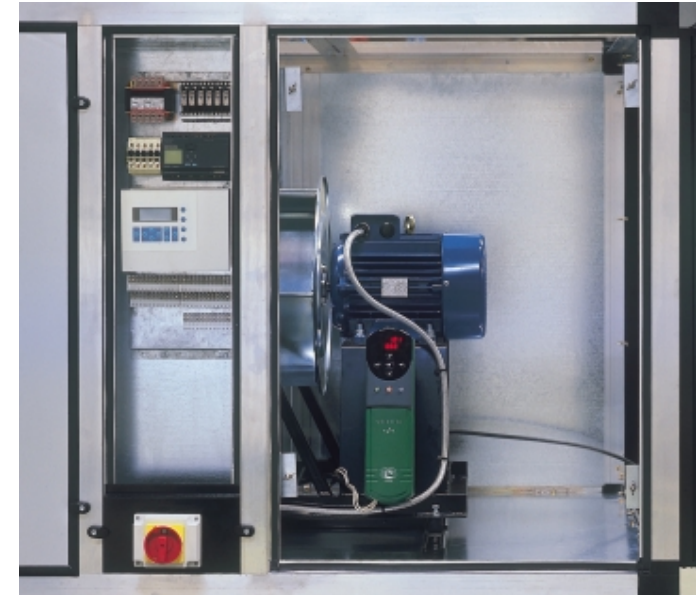
Fan sections shall be provided with a secondary guard to prevent direct access to the fan drive.

Integrated Controls Package

The integrated range of control equipment is perfectly compatible with Jet High Efficiency AHUs'. Standard control equipment is based on the Honeywell range of controllers. Many advanced energy saving and convenient features are available as standard, these include:

- Sequential control of output signals to heating, fan speed, fresh air, cooling and energy recovery.
- Discharge air temperature control with room temperature reset (cascade control)
- Extensive yet easy to use time control
- Optimum start
- Winter compensation of discharge air temperature
- Summer compensation of room temperature
- Manual plant override by auto/manual switch

Once programmed and supplied with electrical power the AHU is capable of operation, independent of any other external control devices.



Elimination of site wiring – All AHUs are completely factory pre-wired. This is more cost and time effective than fitting control equipment on-site. It also ensures that the integrity of the air handling unit is preserved as cable entries and connections can be properly protected and sealed. A full range of control accessories including damper actuators, pressure switches, valves, transmitters and signal conditioners can be fitted. With the units being supplied with full controls and wiring, the units are fully function tested in the factory, this will also minimise site commissioning activities.

Accessories

Attenuation – Sound absorbent elements are arranged within the unit casing providing a series of vertical splitters with central and side airways with dimensions to suit the acoustic requirements. The splitter frames are manufactured from 20g galvanised steel and contain a faced fibrous infill that is non shredding , non combustible with a class 1 rating , non hygroscopic and chemically inert. The sound absorbent elements have bull nosed farings on the air entry side. The facing is a tear resistant material , perforated facings and melanex facings can be provided on request.

Humidification –

Jet Spray humidification is available with water atomisation by compressed air to provide air humidification and adiabatic cooling. The system utilises mains softened or de mineralised water with a nozzle purge facility and the option for ultra violet sterilisation. The controls incorporate status indication, controlled cleaning and purge timing with a BMS interface. A rotary air compressor with after coolers receivers and filtration can be provided and interfaced with the system controls.

Steam Humidification – The steam humidifier has injection tubes with a steam jacket and condensate separator providing efficient operation and maintenance. The system

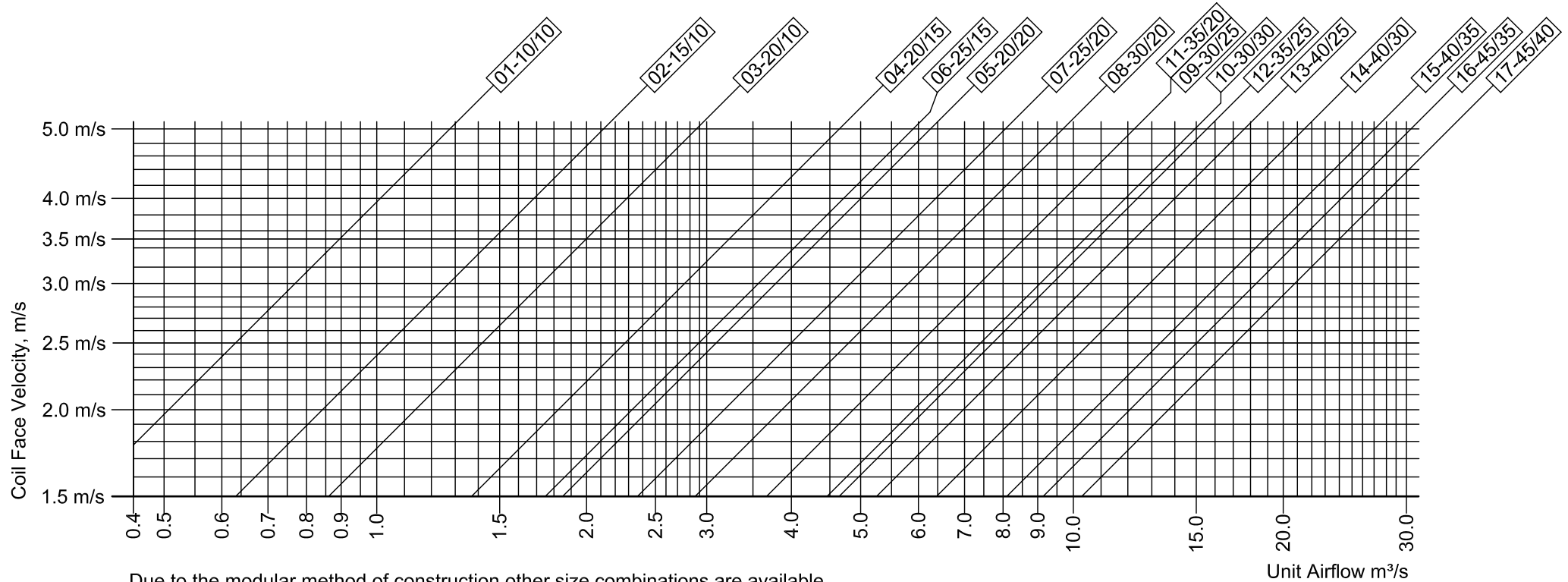
provides clean sterile humidification without wetting and corrosion. Steam valves are fitted with a stainless steel parabolic plug for low capacity modulation. Valve actuators are pre wired for automatic system control.

Gas fired and electric steam generators can be provided with the interface controls or direct steam humidification from an external source.

Evaporative Humidification –

The evaporative humidifier has a modular matrix that provides fast moisture evaporation with no requirement for chemical water treatment. the matrix is a flame resistant composite housed in a stainless steel frame with a pumped water distribution system to the evaporative surface with water level control and drainage. The unit is installed with a ultra violet sterilisation unit and auto drain to flush the reservoir each day.

Jet AHU Standard Range



Due to the modular method of construction other size combinations are available
 For design volumes outside the above range please contact the Jet AHU sales office.

Recommended unit design velocities:
 Cooling coil (without eliminator) = 2.5 m/s
 Cooling coil (with eliminator) = 3.0 m/s
 Heating only = 3.5 m/s

Jet AHU Ltd,
 Touchstone, Pinewood Business Park,
 Coleshill Road, Solihull,
 Birmingham. B37 7HG
 Tel: +44 (0)121 770 6776
 Fax: +44 (0)121 770 6886
 Email: info@jetahu.com

Site Requirements

General

- 1** All air handling units are inspected prior to despatch and will be complete on arrival at site, unless otherwise stated.
- 2** Each individual section of the air handling unit will be clearly labelled, identifying unit reference, section, direction of air flow and weight.
- 3** Individual sections are fully enclosed in a polythene film, to prevent moisture or dirt ingress and minor paint damage during transport. Alternative protection can be fitted on specific contracts.
- 4** Before off loading a visual inspection in conjunction with the supplied drawings and the detailed information on the delivery document must be carried out. Any damaged or missing components must be reported immediately to the Production Manager.
- 5** All unit sections are fitted with a base skid and drilled with holes for lifting purposes, unless otherwise stated on the manufacturing drawing.
- 6** We strongly emphasise that qualified lifting contractors, with the correct lifting equipment, should be employed to unload and position the air handling units.
- 7** Important:
 - a. All work must be in accordance with the current Health and Safety At Work Act and relevant HSE guidance notes and codes of practice. When cranes are used we recommend that the requirements of BS7121 be observed and adhered to.

- b. Non metal slings only must be used. These must be used in conjunction with a lifting frame or beam to ensure even load distribution and to ensure correct positioning of slings. Wooden packing pieces must be inserted between the sling and the framework to avoid damage. The framework of the air handling unit has not been designed to withstand the possible forces imposed with a single point lift and serious damage will occur.
- c. Where units are off- loaded with the use of a fork lift truck it is important to ensure the forks traverse the base skid of the air handling unit and no contact is made with the base panels or structure.
- d. The air handling units must be lifted in the horizontal plane at all times.
- e. A firm, level and structurally rigid base must be provided.
- f. All condensate drains must be trapped in accordance with diagram 'Standard Drain Couplings'
- 8** Storage. The units are supplied with a cling film covering which is not intended for permanent protection. Should the units be stored for long periods of time permanent protection must be provided by means of tarpaulin or similar. The units must not be used as site storage chambers or used as work platforms. Either activity will result in the unit becoming damaged.
- 9** Weatherproof Units. Weatherproof

Units are factory fitted with a weather cover, fixed and sealed to each section. Each section will be provided with a metal flashing strip. After unit assembly, apply a silicone seal to both edges of a section joint, laying the metal flashing strip on top, drill and rivet at approximately 300mm centres.

10 Ductwork Connections. Please refer to the manufacturing drawing for the duct connection type. The fitting of flexible duct connections is not required as all vibration is isolated at source within the cabinet.

Location

- 1** Equipment must be positioned allowing sufficient access for routine and major maintenance, e.g. access door opening and coil withdrawal.

Assembly

1 With the assistance of the general arrangement drawing, ensure the sections are in the correct sequence.

2 Adhere the supplied neoprene gasket to one face of the joint and with the clamps provided assemble each joint ensuring section alignment, see diagram 'Section Assembly and Clamping Detail'.

3 Note:

- Do not use the clamping system to pull the section together.
- Discharge and intake connections shall be connected to using a mating flange of the type stated or similar approved.
- Do not hang the ductwork on the spigots.

Commissioning & Testing

1 All claims pertaining to inadequate performance or component failure must be supported by a comprehensive commissioning report (see below).

2 Checks in accordance with the recommendations stated in the instructions under separate section headings, must be first carried out before start up.

3 It is imperative to the operation and life of the equipment that the equipment be commissioned before

putting into service. This commissioning procedure should be carried out by a qualified engineer, in accordance with the recommendations laid down by B.S.R.I.A.

4 After commissioning and testing and the plant has been running for one hour, the plant should be stopped, all assembly bolts should be tightened, **all drives checked for allen screw tightness and belt tension** and all access doors securely fastened. The plant can then be re-started.

Wiring

1 All equipment, unless otherwise stated, is complete with incoming isolator and pre-wired internally in accordance with the relevant general arrangement drawing. Care must be taken when drilling off the isolator enclosure, to prevent swarf entering the isolator contact block.

2 Remote wiring must be installed in accordance with the specification laid down by the engineer responsible for the plant and guide lines of the Health and Safety Act.

