

Karara Mining Limited

**200 kW custom-made mining specification two-stage water circulation industrial
air-cooled chiller**

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1 Introduction and Scope

ⁱⁱThis specification outlines the minimum technical requirements, safety, documentation, testing, and certification requirements for the procurement of three units of custom-made, mining-specification, two-stage water circulation industrial air-cooled chiller, designed for continuous and reliable operation at the Karara Mining Site in Western Australia.

The purpose of this document is to:

- Ensure all industrial air-cooled chillers procured via tender market meet Australian statutory and mining safety standards.
- Establish a single, binding technical reference used in the tendering process, evaluation, contract award, and acceptance testing.
- Define design life, performance standards, durability, safety features, and compliance expectations under harsh mine-site operating conditions.

All equipment and components must be:

- New, unused, and free of defects in material and workmanship.
- Designed for outdoor operation, with resistance to dust, UV, vibration, rain, and temperature extremes.
- Compliant with all relevant Australian and International Standards and designed for fit-for-purpose operation.

The scope of supply shall include the complete 200 kW industrial air-cooled chiller, factory-assembled and tested, meeting the specified specifications.

This technical agreement covers the system's minimum components, design minimum specification, standards, testing, certifications, and documentation requirements as specified in the following sections. All equipment and installation meet all applicable Australian, ISO, and IEC standards, as well as all applicable RCM certifications (RCM, SAA), allowing for use in Western Australia without further testing and certification.

Any deviation from this specification shall be clearly identified in the Supplier's submission, accompanied by valid technical justifications to obtain written approval from the Company.

2 Applicable Standards and Regulations

All industrial air-cooled chillers and associated equipment provided under this specification shall be:

- Designed, manufactured, tested, and certified by the latest editions of all applicable Australian Standards (AS/NZS), relevant Western Australian regulations, and, where appropriate, international standards including ISO, IEC, and SAE, as well as required RCM certifications.
- Compliant with mining-specific safety, environmental, and electrical codes for Western Australia.
- Comply with MEPS (Australian Minimum Energy Performance Standards) – tested to AS 3823.1 before shipping.
- Suppliers must be certified under the ISO 9001 Quality Management System.

2.1 Minimum Applicable Standards

The following standards apply to this project and shall be adhered to as a minimum, but not limited to:

Electrical Standards

- AS/NZS 1125 – Conductors in insulated electric cables and flexible cords
- AS/NZS 3000 – Wiring Rules
- AS/NZS 3008.1 – Cable Selection
- AS/NZS 3760:2010 – Fire protection for electrical equipment
- AS/NZS 5000.1 – Electric cables – Polymeric insulated
- AS/IEC 60034 – Rotating Electrical Machines
- AS/NZS 60947 – LV circuit breakers and switching devices
- AS 60529 – IP Ratings (enclosure protection)

Mechanical Standards

- AS 1210 – Pressure vessel design
- AS /NZS 5149 – Refrigerating systems and heat pumps-Safety and environmental requirements
- AS 60079.14 – Explosive Atmospheres - Design selection, erection and initial inspection
- AS/NZS 5149 Refrigerating systems and heat pumps
- AS/NZS ISO 817:2016 Refrigerants – Designation and safety classification

- [Government of Western Australia Department of Mines, Industry Regulation and Safety – Flammable refrigerant gases - Position paper](#)
- MEPS - Chillers: Final policy positions
- AS/NZS IEC 60079.0:2019 Explosive atmospheres - General requirements

Structural and Lifting Standards

- AS 4991 – Lifting Devices
- AS 1170.2 – Wind Loads
- ISO 7000, ISO 9244 – Labelling and Safety Symbols
- AS 4024 – Machinery Safety Design

Acoustic and Emission Standards

- AS 1055 – Environmental Noise

Other Standards

- Suppliers must be certified under the ISO 9001 Quality Management System.
- AS/NZS 1851 – Portable Fire extinguisher

All required Certificates of Conformity (CoC), compliance declarations, test reports, and third-party certifications shall be provided in accordance with the provisions outlined in the Testing and Certification sections of this specification.

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3 Industrial air-cooled chillers Requirements and Configuration

Each industrial air-cooled chiller shall be a complete, self-contained, weatherproof unit suitable for long-term outdoor deployment in the remote mining conditions of Western Australia.

3.1 Minimum System Components

This section states a summarised list of minimum system components that each unit shall include, but is not limited to. The detailed design and technical requirements for components are indicated in the following sections.

Compressor

Brazed Plate-type Heat Exchanger stainless steel AISI 316 made-Refrigerant/Chilled Water.

Serviceable Plate Heat Exchanger – Chilled Water/Process Cooling Water

EC axial fan with Fan speed controller IP55

Condenser – Guntner floating-coil leak-proof V-shape condenser or equivalent

Controller

Mine spec Water Pump

Insulated Dual Buffer Tanks – Chilled Water

Insulated Dual Buffer Tanks – / Process Cooling Water

Carel EEV control

Control System

Main Load Circuit Breaker

Main Switchgear

Intermittent relay

Emergency Stop Button

Changeover Button

Instrumental 3-Way Actuated Divert Valve - Belimo

STAD – Balancing Valve

High/Low Pressure Switch

Tank Water Level Sensor

S316 Stainless Steel Water Tank for Chilled and Process cooling water

Electromechanical water flow switch

Air vent valve

Sacrificial anode installed inside the unit

R32/R410A rated copper refrigerant pipework.

Lockable butterfly and ball valves

Hot-dipped galvanised high-strength steel base frame for the chiller

Water circuit made from copper material.

Burkert Flowmeter for process cooling water circuit.

Explosive proof Wattmaster Anaconda wiring conduits with cable/conduit identification numbers

Pressurisation fans for the electrical compartment (High dust applications)

Labelling

Battery Backup module Uninterruptible 24VDC DIN Rail Power Supply unit

IP55 switchboard c/w Perspex panel

Phase ID external panel

S316 Stainless Steel cabinet fixings

Shock Indicators

Access panel with Cam-Locks.

4 Environmental and Operational Design Conditions

4.1 Environmental Conditions

The industrial air-cooled chillers supplied under this Agreement shall be designed and manufactured to operate reliably and continuously under the following environmental conditions typical of remote Western Australian mining operations:

- Ambient Temperature: 0 to 50 degrees Celsius
- Relative humidity: Maximum 95%
- Altitude: less than 1000m
- Maximum Solar Radiation Intensity: 1.1kW/m²
- Wind Loading: 50 m/s
- Pollution: Atmospheric dust with fine abrasive particles, slurry spillage and saline, high-pressure washdown water.
- Location: outdoors

4.2 Design Life & Durability

The industrial air-cooled chillers shall conform to the following design life and durability requirements.

Minimum Design Life: 20 years of continuous or standby operation

Construction Quality: Highest-grade materials and assembly suited for rugged site conditions

Corrosion Protection:

- Powder-coated or stainless-steel enclosures
- Rust-proof base frame, painted or galvanised

Ingress Protection (IP):

The industrial air-cooled chillers shall comply with AS/IEC 60529 in relation to ingress protection requirements. Each component shall meet or exceed the minimum IP ratings specified in this document. The complete industrial air-cooled chiller shall be suitable for outdoor installation in high-dust and wet environments, providing adequate protection against wind-driven rain, airborne dust, and routine washdown exposure.

- IP55 minimum for electrical enclosure and control panel.

4.3 Structural Strength

All industrial air-cooled chillers shall be structurally capable of:

- Withstanding the forces associated with transportation, including loading and unloading via crane truck or forklift.
- Supporting their full operational weight without deformation or failure.
- Lifting via integrated certified lifting points under AS 4991 and AS 4024, without risk to personnel or damage to the equipment.
- Withstanding shock, vibration, and minor impact loads encountered in transit and during repositioning on-site.
- Withstanding the specified winding load onsite
- Lifting lugs supplied for craneage.
- Welding traceability and steel frame Non-Destructive Testing (NDT) Compliance with Australian Regulations and Standards

5 Electrical and Control System Design

5.1 General Requirements

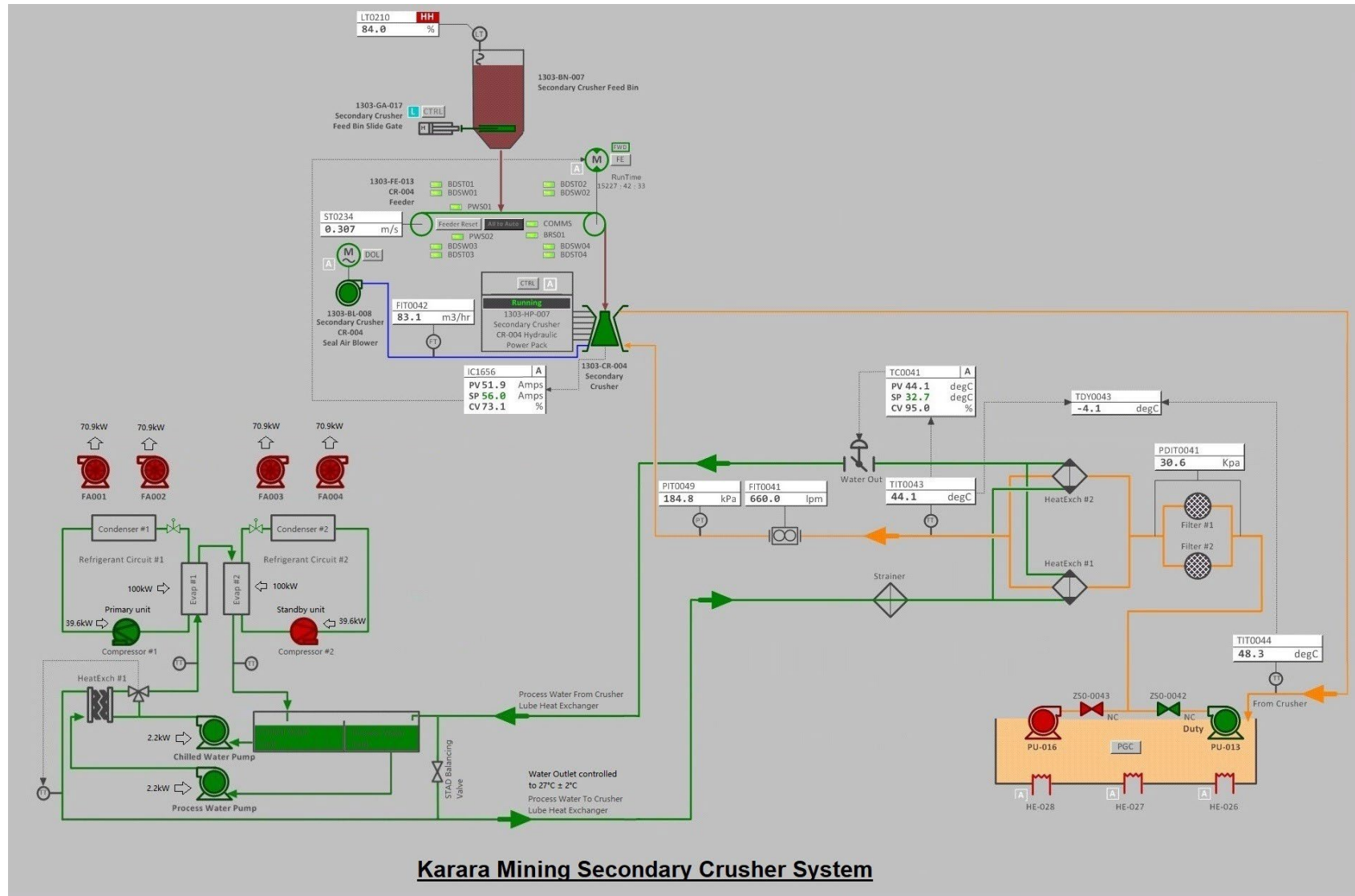
The industrial air-cooled chillers shall be designed for integration with a Low Voltage (LV) three-phase, 415V, 50Hz, MEN earthed power system, compliant with AS/NZS 3000 and AS/NZS 3010.

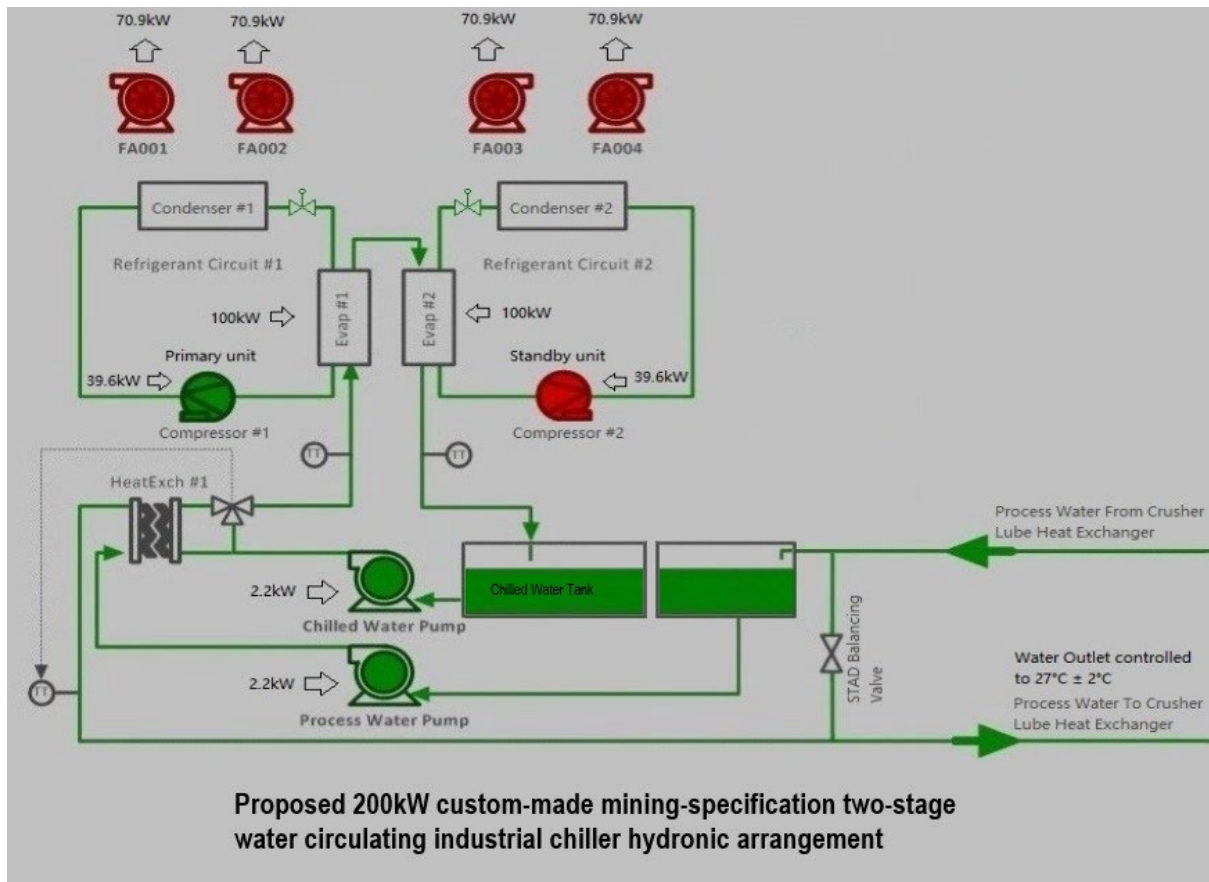
The refrigeration system shall be capable of continuous and reliable operation within the following tolerances. Provide an air-cooled chiller that meets the following design standards:

- The total power of each chiller is designed to be 200kW.
- Design cooling power 200kW. (100kW duty / 100kW standby)
- Design ambient dry bulb temperature is 50.0°C.
- The chiller process cooling water inlet temperature is 33.0°C.
- The chiller process cooling water outlet temperature is 27.0°C.
- The process cooling water flow rate requirement is 5.7 l/s.
- Depending on the chilled water temperature, the water temperature controller will stage compressor operation to maintain 12°C chilled water in the tank consistently.
- All industrial air-cooled chiller units shall be refrigerated cooling only, air-cooled packaged type.
- The complete systems (primary and standby subsystems) shall incorporate all the required components for stand-alone operation.
- On failure of the chiller duty compressor unit, the stand-by compressor unit shall be automatically energised, and an alarm shall be raised at the PCS (Process Control System). The Standby compressor systems shall incorporate all the required components for standalone operation.
- Industrial air-cooled chiller shall be sized at least 15% greater than the combined ambient and heat loads
- The insulated dual buffer tanks – Chilled Water tank/ Process Water tank must be sized to maintain the system Leaving Water Temperature whenever the chiller's compressor cycles off to preserve and protect the load without short cycling and temperature fluctuation.
- The industrial air-cooled chiller units shall be tested in accordance with AS 3823.1 1 prior to dispatch to the site.

- Copper pipe brazing is achieved by using nitrogen gas to displace oxygen during the brazing process, preventing oxidation and ensuring a clean, strong joint.
- Refrigeration pipework shall be manufactured from copper refrigerant grade and shall be tested for 24 hours with dry Nitrogen without loss of pressure prior to insulating and charging with refrigerant.
- Refrigeration system dehydration evacuation standard: 200 microns or below.
- All pipework shall be insulated with Thermobreak - Rubber/Foil Insulation, Armaflex or equivalent.
- The diameter and location of the water pipe inlet and outlet must be consistent with the original design (Appendix A). It can be connected to the original inlet and outlet pipes without requiring any additional modifications.
- The power cable location must remain consistent with the original design (Appendix A) and can be connected to the original cable entrance and exit without additional modifications.
- The industrial air-cooled chiller units shall be provided with a lockable power isolator. Isolators shall be of utilisation category AC23 and shall be located on the wall adjacent to the unit.
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5.2 Design Overview





Custom-Made Mining-Specification Two-stage Cycle Industrial Air-cooled Chiller
Description:

The MP1000 rock crusher lubricating oil will be cooled in an environment with a maximum dry bulb temperature of 50°C. The chiller is an independent air-cooled refrigeration unit that operates independently of the Metso rock crusher.

The first-stage water pump will circulate the first stage of chilled water from the water chiller through the heat exchanger (refrigerant evaporator/chilled water). The chilled water is cooled from 20°C to 12°C.

The second stage of the process cooling water of the water chiller is circulated by the second-stage water pump through the three-way actuating valve to the heat exchanger (chilled water/process cooling water) for electric regulation. The cooling water is cooled from 33°C to 27°C.

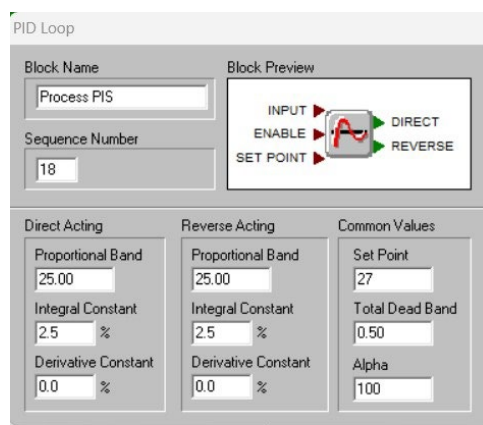
5.3 Control and Automation

Each industrial air-cooled chiller shall be provided with a system controller from a globally recognised manufacturer, and shall support the following functions as a minimum:

- Manual and automatic start/stop operation (hard-wired)
- The **primary/standby unit start/stop** sequence shall have a manual override.
- All outdoor electrical enclosure units shall be of weatherproof construction with a positive pressure unit, minimum IP55 rated
- The unit design has a combination of control voltages of 24VDC for the controller, 24VAC for the relays and 240VAC for the switchgear.
- Voltage, frequency, and current monitoring and protection trip
- System fault alarms and protection trip logs
- Refrigeration overload and overheat protection
- Remote start/stop signals capability (hard-wired)
- Integration capability with SCADA/PLC systems through Modbus and Ethernet.
- Uninterruptible 24VDC DIN Rail Power Supply unit

The control system shall be supplied with software, programming cables, and a permanent license to allow full access to control logic modification, parameter tuning, and fault diagnostics.

The control system needs to be seamlessly integrated with the existing PID settings.



Existing PID setting

5.4 Power Distribution and Protection

Each industrial air-cooled chiller shall be equipped with the following protective and switching devices:

Main Load Circuit Breaker

The industrial air-cooled chiller shall be equipped with a main load circuit breaker, appropriately rated to match the industrial air-cooled chiller's nominal three-phase output. The circuit breaker shall be:

- A 3-pole moulded case circuit breaker (MCCB) supplied by an internationally recognised manufacturer.
- Regulatory Compliance Mark (RCM) certified.
- Fitted with a lockable OFF position for mechanical isolation and safe lockout/tagout procedures
- Thermal and magnetic trip parameters shall be adjustable, allowing coordination with downstream protection settings
- Equipped with an earth leakage protection module (RCD accessory) for personnel and equipment safety
- Compliant with AS/NZS 60947 series, including:
 - AS/NZS 60947.2 – Circuit breakers
 - AS/NZS 60947.4.1 – Contactors and motor starters (if integrated)
 - AS/NZS 61009 – Residual current protection (for RCD functionality)

The circuit breaker and associated protection components shall be pre-certified and bear the Regulatory Compliance Mark (RCM). Certification documents must be included in the industrial air-cooled chiller's compliance documentation pack.

5.5 Emergency Protection

A clearly marked, externally mounted Emergency Stop (E-Stop) device shall be installed in accordance with AS 4024.1604 and ISO 13850. The device shall be manually latched, fail-safe, non-resettable except by manual intervention, and operable at ground level.

An externally mounted Emergency Stop (E-Stop) button shall:

- Be red with a yellow background
- Be non-resettable except by deliberate manual action
- Operate on extra low voltage and be fail-safe
- Be clearly labelled "Emergency Stop"

5.6 Refrigeration protection system

The protective devices provided shall include all those required to comply with the relevant Statutory Authority's regulations for exemption from certified attendance and shall minimally include the following:

- Electrically operated emergency stop (manual hard-wired button with twist reset)
- Primary system compressor's alarm and trip (hard-wired indicator and manual override's AUTO/OFF, 2-position rotary switch)
- Standby system compressor's alarm and trip (hard-wired indicator and manual override's AUTO/OFF, 2-position rotary switch)
- Chilled water pump's alarm and trip (hard-wired indicator and manual override's AUTO/OFF/MANUAL, 3position rotary switch)
- Process cooling water pump's alarm and trip (hard-wired indicator and manual override's AUTO/OFF/MANUAL, 3position rotary switch)
- Primary system condenser fans' alarm and trip (hard-wired indicator and override AUTO/OFF/MANUAL, 3position rotary switch)
- Standby system condenser fans' alarm and trip (hard-wired indicator and override AUTO/OFF/MANUAL, 3position rotary switch)
- Primary system refrigerant low-pressure alarm and trip Refrigerant low-pressure alarm and trip
- Standby system refrigerant low-pressure alarm and trip Refrigerant low-pressure alarm and trip
- Primary system refrigerant high-pressure alarm and trip
- Standby system refrigerant high-pressure alarm and trip
- Chilled water temperature alarm and trip
- Process cooling water temperature alarm and trip
- Chilled water flow switch alarm and trip
- The Chilled/Process cooling water tank's low water level alarm and trip
- Compressor crankcase oil levels' alarms and trips.
- Fault reset button (hard-wired momentary push button)
- Primary compressor hour meter
- Standby compressor hour meter
- Compressor Duty Switch over (manual override's 1-2/AUTO/2-1, 3position rotary switch)

5.7 Cable

All electrical cables used in the industrial air-cooled chiller set shall be compliant with AS/NZS standards AS/NZS 5000.1, AS/NZS 1125, and AS/NZS 3008.1, and shall carry the RCM (Regulatory Compliance Mark).

All power and control cables used in the industrial air-cooled chiller system shall be selected and installed to withstand the environmental and operational conditions specified. All control and signal cables must be clearly marked and terminated with heat-shrink labels or permanent tags.

The colour coding shall be as follows:

- Three Phase:
 - Phase L1: Red
 - Phase L2: White
 - Phase L3: Blue
 - Neutral: Black
 - Earth (PE): Green/Yellow
- Control Wiring:
 - 24VDC control – Red/Black (or Blue per IEC)
 - 24VAC control – Red/Black (or Blue per IEC)
 - 240VAC control – Red/Black (or Blue per IEC)
 - Interlock/signal – Orange or Yellow (labelled clearly)
 - Earthing of signal shield – Green with white stripe or per schematic
- Bonding Earth
 - Green/Yellow
- The motors comply with IE3 energy efficiency values and Karara motor technical specifications (Appendix B)

6 Mechanical Design, Cooling, Safety System and Guard

The industrial air-cooled chiller shall be constructed to facilitate reliable operation, ease of maintenance, and compliance with relevant safety standards under continuous duty in remote mining conditions.

6.1 Frame

The industrial air-cooled chiller shall be mounted on a heavy-duty skid base frame, designed to support the complete unit assembly under static and dynamic loads during transportation, lifting, and installation. The skid base shall be constructed from high-strength structural steel.

The chiller is installed in the original design location (Appendix A), and the height can be adjusted to 3 meters. The overall foot frame size is consistent with the original design (L3650mm x W2400mm), and there is no need to change the foot foundation during installation.

The frame shall incorporate clearly marked and reinforced lifting lugs, tie-down points, and winching points, suitable for multi-point lifting via crane and secured land transport. These features shall be designed and certified in accordance with AS 4991 (Lifting Devices) and AS 4024 (Safety of Machinery – Design Principles).

Lifting lugs installed shall:

- Avoid sharp edges or pinch points
- Be located to avoid rotation or tipping
- Include visible Safe Working Load (SWL) markings
- Be compatible with standard lifting equipment (hooks, shackles)

All lifting, tie-down, and handling points shall:

- Be rated with visible permanent markings indicating Safe Working Load (SWL) and lifting method
- Be designed with an adequate structural margin (typically $\geq 1.5 \times$ SWL) based on worst-case lifting angle and load case
- Undergo design verification by finite element analysis (FEA) or equivalent mechanical stress analysis
- Be load tested and certified by a qualified third-party body or the original equipment manufacturer (OEM) operating under a certified ISO 9001 quality system under AS 4991 (Lifting Devices) and AS 4024 (Safety of Machinery – Design Principles).
- The external frame of the industrial air-cooled chiller should have a cable entry with a pre-installed gland plate. The installation position of the electrical panel, box, and cabinet should be consistent with the original design in the accessories.

It can be connected to the original power, control and communication cable lines without additional modifications.

- The external frame of the industrial air-cooled chiller should have the cable entry with a pre-installed gland plate. The installation position of the electrical panel, box, and cabinet should be consistent with the original design in the accessories, allowing for connection to the original power, control, and communication cable lines without additional modifications.
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6.2 Cooling System

The cooling system shall include oversized condensers and the EC fan configuration designed to maintain operational temperature under a 50°C ambient condition. A fouling margin of 10% and a safety factor of 10% must be incorporated into the heat exchanger and condenser design.

Fans shall be of corrosion-resistant metal construction with a minimum IP55 protection rating. Plastic fan blades are not permitted.

Condenser systems shall include openable window panels to facilitate maintenance and internal flushing.

6.3 Guard

All rotating parts, including fans, shall be fully enclosed by mechanical guards in accordance with AS 4024, ISO 3457, and other applicable standards. The guards shall be removable only with tools. Where guarding is not practicable, equivalent engineering controls shall be applied to ensure no access is possible to rotating parts while in operation.

Hot surfaces exceeding 75°C during regular operation shall be shielded with thermal guards to prevent accidental contact and meet personnel safety requirements.

All mechanical guard surfaces shall be affixed with permanent warning signage in accordance with AS 4024.1901 (Safety of Machinery – Principles for the Design and Selection of Warning Signs).

7 Labelling

All equipment delivered under this Agreement shall be permanently and clearly labelled in the English language, using engraved stainless-steel tags or UV-stable decals.

Labels shall be:

- Complying with AS 1319 and ISO 7000
- Legible from a minimum distance of 1 metre
- Resistant to UV exposure, abrasion, solvents, and high-pressure water cleaning
- Affixed using rivets, bolts, or industrial-grade adhesive

Labels shall include, but not be limited to:

- Electrical hazard warnings and voltage indications (marked with "Danger, High Voltage, Authorised Personnel Only" and "No Smoking, No Open Flames").
- Hydrocarbon and safety precautions
- Component identification (circuit breakers, switches, filters, etc.)
- System components, compressor model and serial number
- Industrial air-cooled chiller specifications
- Emergency procedures (e.g. CPR and Fire Extinguisher signage)
- All cables should be marked at both ends and at all points where they penetrate walls or bulkheads or enter or leave conduits.
- High-visibility reflective strips on the outer case in all directions

Weight markings ("WET WEIGHT: XXXX KG") must be prominently displayed on both sides of the enclosure using stencils or decals, compliant with Australian transport standards. Markings must account for:

- Industrial air-cooled chiller
- Any attached standard accessories and modifications
- Factory-mounted fire extinguishers or ballast weights

All lifting, tie-down, and winching points shall be visibly labeled with their rated load capacity and function (e.g. "LIFT ONLY," "NO WINCHING," "TIE-DOWN"). Obsolete or non-use points shall be marked "NOT A LIFTING POINT."

8 Design Submission

8.1 Design Submission and Approval Process

The Supplier shall submit a full design package for approval by the Company within thirty (30) calendar days from the date of contract execution. The package shall include, but not be limited to:

- Equipment data sheets
- Bill of Materials (BOM) - Full list of installed components and models
- General arrangement drawings and dimensions
- Industrial air-cooled chiller technical specifications
- Electrical wiring diagrams (compliant with Australian standards)
- Control logic flow and programming access
- Certificate of Conformity
- Software licenses and configuration tools

No manufacturing shall commence prior to the Company's written approval of the design documentation. The Supplier shall revise and resubmit any non-compliant design at its own cost until full compliance is achieved.

Failure to obtain design approval prior to fabrication shall constitute a breach of contract and may result in termination without compensation.

8.2 Documentation and File Format Requirements

All documentation submitted shall be:

- In PDF format for text, DWG format (AutoCAD 2010–2019) for drawings
- Clearly marked with revision history, author, and date
- Digitally signed or stamped with the Supplier's official company seal

The Company will not accept encrypted or read-only files. Electronic files shall be transmitted by email, USB flash drive, or cloud transfer with a file index included. Each batch of documents must include a summary list signed by both parties.

The Supplier shall remain responsible for promptly submitting any missing or supplementary documents necessary for installation, repair, commissioning, or maintenance, even if such documents are not expressly listed in the original specification.

9 Testing and Acceptance

9.1 Factory Acceptance Testing (FAT)

The Supplier shall conduct a Factory Acceptance Test (FAT) on each industrial air-cooled chiller prior to shipment. The FAT shall include:

- Full-load functional testing at the rated continuous power output for a minimum duration of three (3) hours
- Verification of all control functions, protection devices, alarm systems, and output characteristics
- Confirmation that all equipment and components conform to the technical specifications herein, including noise emission.
- All data, such as temperatures and compressor pressures, will be recorded to confirm that components start with no malfunctions.

The Supplier shall issue a FAT report in both English and Chinese, including:

- Serial numbers
- Test results
- Calibration certificates
- Evidence of compliance with AS/ISO standards
- Signed certificate of conformity

The Company reserves the right to appoint a third-party inspector or representative to witness the FAT. Any non-conformances identified during testing must be corrected prior to shipment at the Supplier's expense.

A chiller run test will be carried out and documented under a thermal load in the manufacturer's workshop.

All data, such as temperatures and compressor pressures, will be recorded to confirm that components start with no malfunctions. Please note that, due to the inability to maintain a constant thermal load in the workshop, this is not a true representation of site conditions; however, it demonstrates the chiller's functionality and communication capabilities.

This test runs for approximately 2-3 hours and can be witnessed by the client and their engineers as part of the Inspection and Test Plan devised in consultation with the customer.

The final performance testing will need to be carried out on site, as a constant cooling load is required. A refrigeration technician will need to be present on the nominated day of chiller testing.

9.2 Industrial air-cooled chiller System Documentation Requirements for Acceptance

The Supplier shall provide a complete documentation package for review and approval prior to delivery. This package shall demonstrate full compliance with all specified technical, functional, and regulatory requirements applicable to the industrial air-cooled chiller set and its components. The documentation shall include certificates of conformity, compliance declarations, accredited test reports, installation records, and manufacturer datasheets as outlined in the subsections below. All submitted documents must be current, traceable, and verifiable against the relevant Australian, ISO, and IEC standards.

If a licensed Australian third party is in place to review, assess and certify the design, manufacture, and installation of the industrial air-cooled chiller, the final Certificate of Conformity issued by this third party shall be provided in conjunction with the list of documents below. If this third party refuses to issue the Certificate of Conformity, the Supplier will bear the cost of modifying the system until it is issued.

1. Documents for the Entire industrial air-cooled chiller
 - Bill of Materials (BOM) - Full list of installed components and models
 - Technical data sheets for all components
 - Layout and wiring diagrams compliant with Australian standards
 - Installation, Operation and Maintenance manual (English)
 - Communication protocols and software user guides
 - Control system configuration files and editable logic
 - Site commissioning checklist template
 - Packing list, serial numbers, and asset ID plate photo
 - Nameplate photo with rating details

- Declaration of Conformity (DoC)
- Certificate of Conformity (CoC)
- RCM Compliance Registration Proof for electrical components supplied into Australia
- ISO 9001 Certification of Manufacturer
- NATA-accredited Test Reports - IP ratings
- Routine factory test report (pre-dispatch FAT)
- Comply with MEPS (Australian Minimum Energy Performance Standards) – tested to AS 3823.1 before shipping.

2. Component-Level Certification (Pre-Certified Items)

Component	Documents Required
Main Circuit Breaker	• RCM Compliance Certification
Compressor	• RCM Compliance Certification
RCBOs	• RCM Compliance Certification
Sockets & Isolators	• RCM Compliance Certification
Low Voltage (LV) Cable	• RCM Compliance Certification
Fire Extinguisher	• Compliance Certificate to Australian Standards
Gas detector	• Compliance Certificate to ANZ EX
EC axial fan with Fan speed controller IP55	• RCM Compliance Certification
Condenser - Guntner floating-coil leak-proof V-shape condenser	• RCM Compliance Certification
Main Switchgear	• RCM Compliance Certification
	•

3. Components Requiring Declaration or Testing (Not Pre-Certified)

Component	Documents Required
Base Frame	• Load Test Report or FEA Analysis • Welding traceability and steel frame Non-Destructive Testing (NDT) Compliance with Australian Regulations and Standards • Compliance Declaration to Australian Standards
Guards for Rotating/Hot Surfaces	• Compliance Declaration to Australian Standards
Electrical Installation	• Compliance Certificate to Australian Standards, by a licensed Australian electrical contractor

9.3 Commissioning and Training

The Supplier shall provide technical assistance for on-site installation, commissioning, and verification testing. The Supplier shall also conduct at least two (2) full days of free operation and maintenance training for the Company's personnel. Training shall include:

- Theoretical instruction
- Hands-on operation
- Fault diagnostics and maintenance procedures

The Company shall provide transportation from Perth to site, accommodation, and meals for Supplier personnel during the training period.

9.4 Performance Acceptance Testing

Within sixty (60) days of equipment installation and site commissioning, the Supplier and Company shall conduct a Performance Acceptance Test to confirm full compliance with contractual specifications.

If the Company is unable to conduct the test within the specified period due to internal reasons, successful commissioning shall be deemed to satisfy acceptance. If the Supplier delays the test beyond the stated period, the Company's operational data shall be deemed binding.

The Acceptance Test shall result in a jointly signed Performance Acceptance Report. In the event of test failure, the Supplier shall make all necessary corrections at their cost and repeat the test until compliance is achieved.

10Warranty and After-Sales Support

The industrial air-cooled chiller shall be covered by a warranty period of twenty-two (22) months commencing from the date of site acceptance, or twenty-four (24) months from delivery, whichever occurs first.

During the warranty period, the Supplier shall:

- Respond within four (24) hours of any service request
- Provide remote technical support as required
- Replace or repair defective parts with original equipment

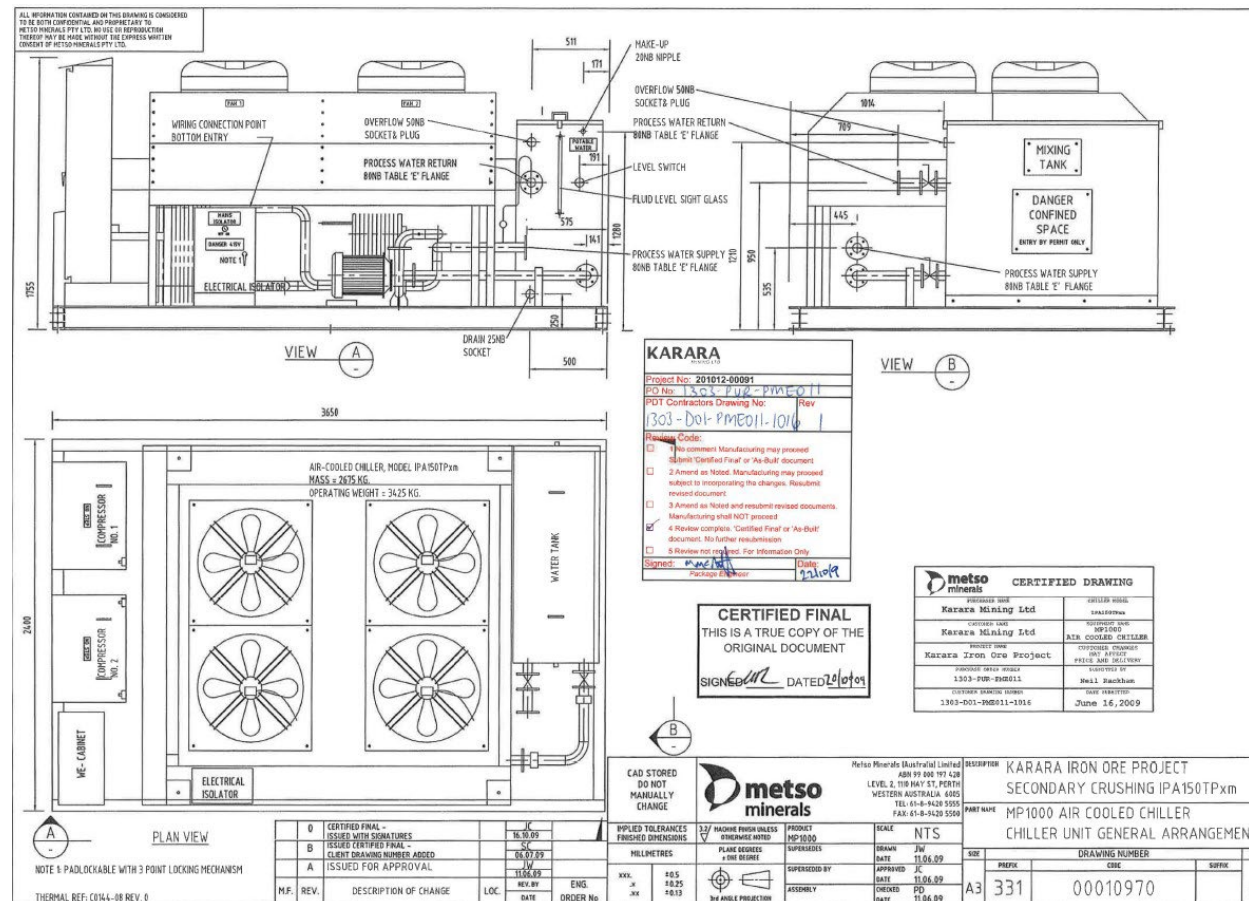
The Supplier shall nominate a licensed Western Australia-based service provider to perform all servicing and repairs for the supplied industrial air-cooled chiller within the warranty period.

If a part fails due to manufacturing or material defects, the Supplier shall replace it at no additional charge. The warranty period for the replacement part shall be reset from the date of installation.

Following the warranty period, the Supplier shall offer continued technical support and parts availability for a minimum of five (5) years.

11 Appendix

11.1 Appendix A - The original design



Holes in top flange to be workshop drilled to suit air cooled chiller unit

Ø24 holes req'd bottom flanges of base frame. Typ six (6) places

30

2340

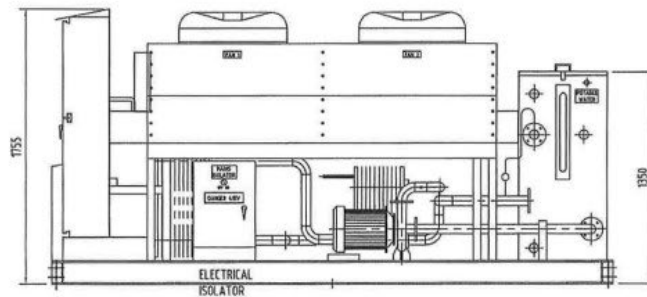
2400

VIEW B

MIXING TANK

DANGER CONFINED SPACE

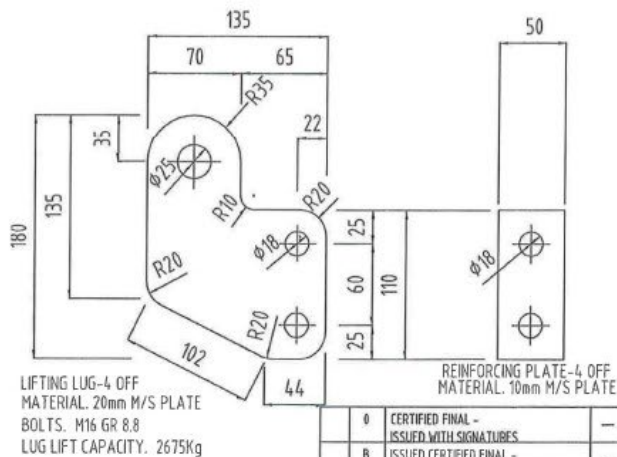
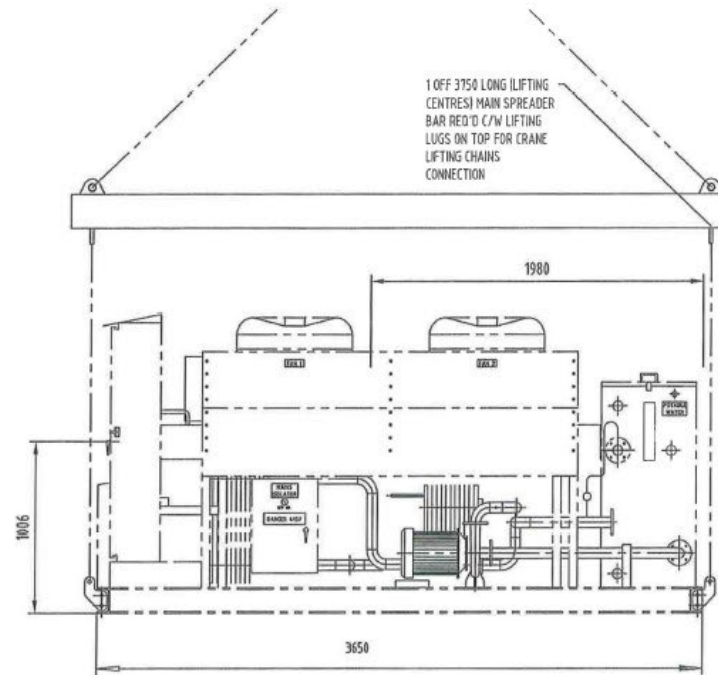
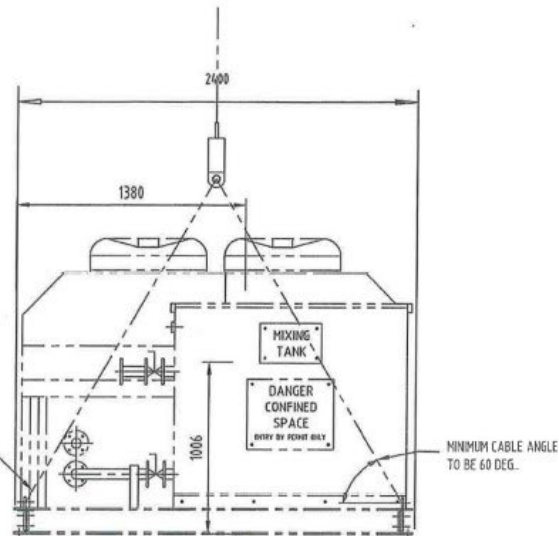
ENTRY BY HEAVY ONLY



		CERTIFIED DRAWING	
PROJECT NO: KAZANA Mining Ltd		DRAWING NO.: 23A150272	
CONTRACT NO: KAZANA Mining Ltd		PROJECT NO: 000000	
PROJECT NAME: Kazana Iron Ore Feedstock		AFRICA COLORED COUNTRY: CHAD	
PROJECT TYPE: 1303-900-P0001		CHARGE CODE: 00000000000000000000	
PROJECT NUMBER: 1300-001-000011-1000		PROJECT NO: 00000000000000000000	
PROJECT DATE: June 16, 2011		PROJECT NO: 00000000000000000000	

VIEW 

SIZE	DRAWING NUMBER			REV
	PREFIX	CODE	SUFFIX	
A3	331	00010962		0



		CERTIFIED DRAWING	
FINANCING NAME Karara Mining Ltd		OUTLIER MODEL 2AAS589000	
CUSTOMER CODE Karara Mining Ltd		EQUIPMENT NAME MP1000 AIR COOLED CHILLER	
PROJECT NAME Karara Iron Ore Project		CUSTOMER CHANGES HAY AVENUE PRICE AND DELIVERY	
PURCHASE ORDER NUMBER 1303-PUR-PME011		ISSUED BY Neil Rackham	
CUSTOMER DRAWING NUMBER 1303-MD3-PME011-1001		DATE REVISED June 16, 2009	

AIR-COOLED CHILLER MODEL IPA150TPxm
 DRY WEIGHT = 2675KG
 OPERATING WEIGHT = 3425KG

CERTIFIED FINAL
THIS IS A TRUE COPY OF THE
ORIGINAL DOCUMENT
SIGNED [Signature] DATED 23/10/09

	0	CERTIFIED FINAL - ISSUED WITH SIGNATURES	—	JC 16.10.09
	B	ISSUED CERTIFIED FINAL - CLIENT DRAWING NUMBER ADDED	—	SC 06.07.09
	A	ISSUED FOR APPROVAL	—	JW 11.06.09
M.F.	REV.	DESCRIPTION OF CHANGE	LOC.	REV. BY DATE

CAD STORED
DO NOT
MANUALLY
CHANGE

IMPLIED TOLERANCE FINISHED DIMENSION	
MILLIMETRES	
XXX.	±0.
.XX	±0.
.XX	±0.

	3. MACHINE FINISH UNLESS OTHERWISE NOTED
	PLANE DEGREES & ONE DEGREE
	3rd ANGLE PROJECTION

PRODUCT	MP1000
SUPERSEDES	
SUPERSEDED BY	
ASSEMBLY	

(Australia) Limited
 ABN 99 830 197 428
 2, 1110 HAY ST, PERTH
 WESTERN AUSTRALIA 6015
 TEL: 61-8-9620 5555
 FAX: 61-8-9620 5508

SCALE	NTS
DRAWN	TE JW
DATE	02.04.0
APPROVED	TE PD
DATE	02.04.0
CHECKED	TE PD
DATE	02.04.0

	DESCRIPTION	KAR
		SEC
	PART NAME	MP
		LIFT
19	SIZE	
19		PREFIK
19	A3	331

DRAWING	
00010	00

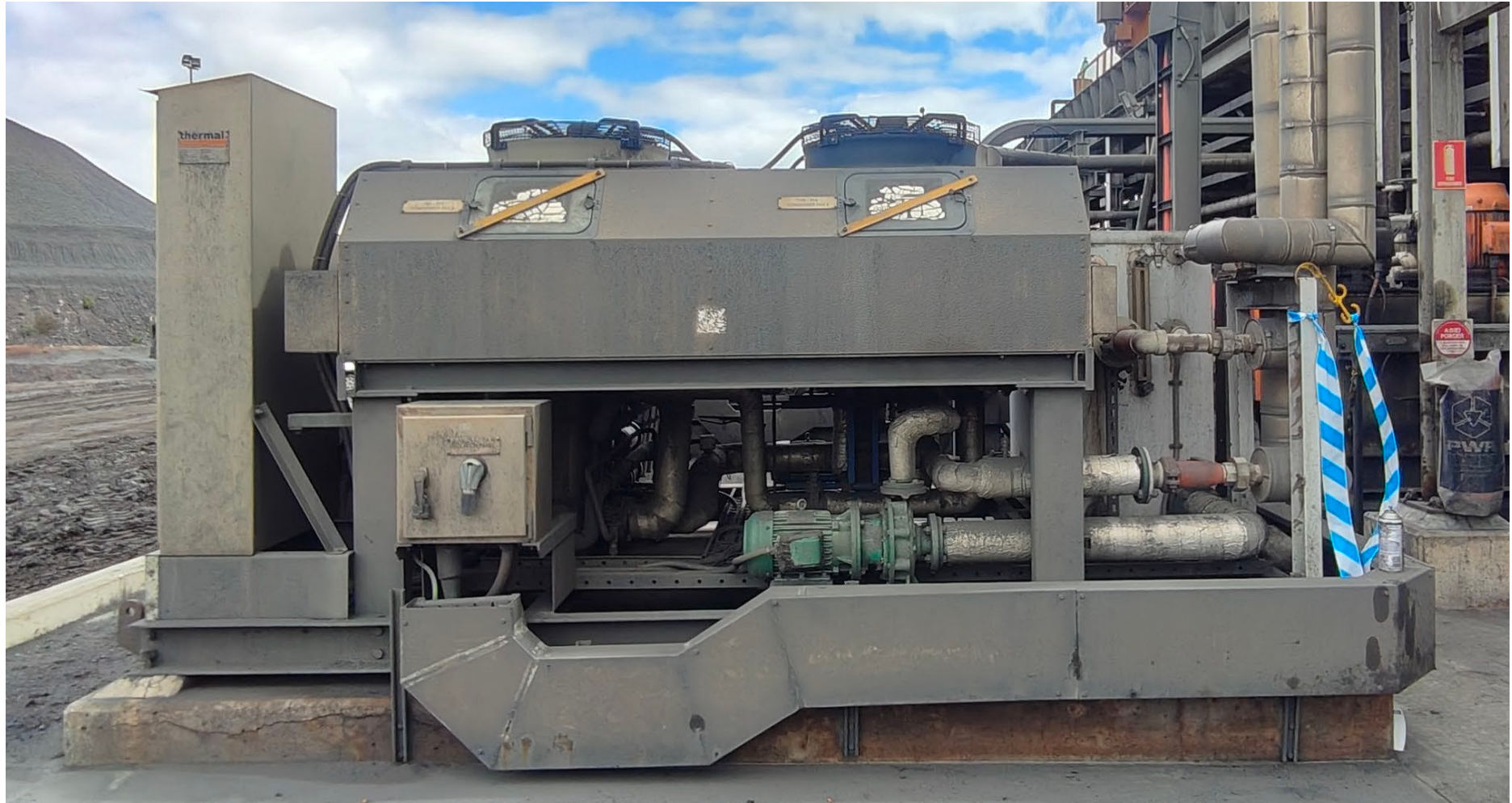
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50TPxm	
R EMENT	
	REV
SUFFIX	0

THERMAL REF: COM4-09 REV. 0



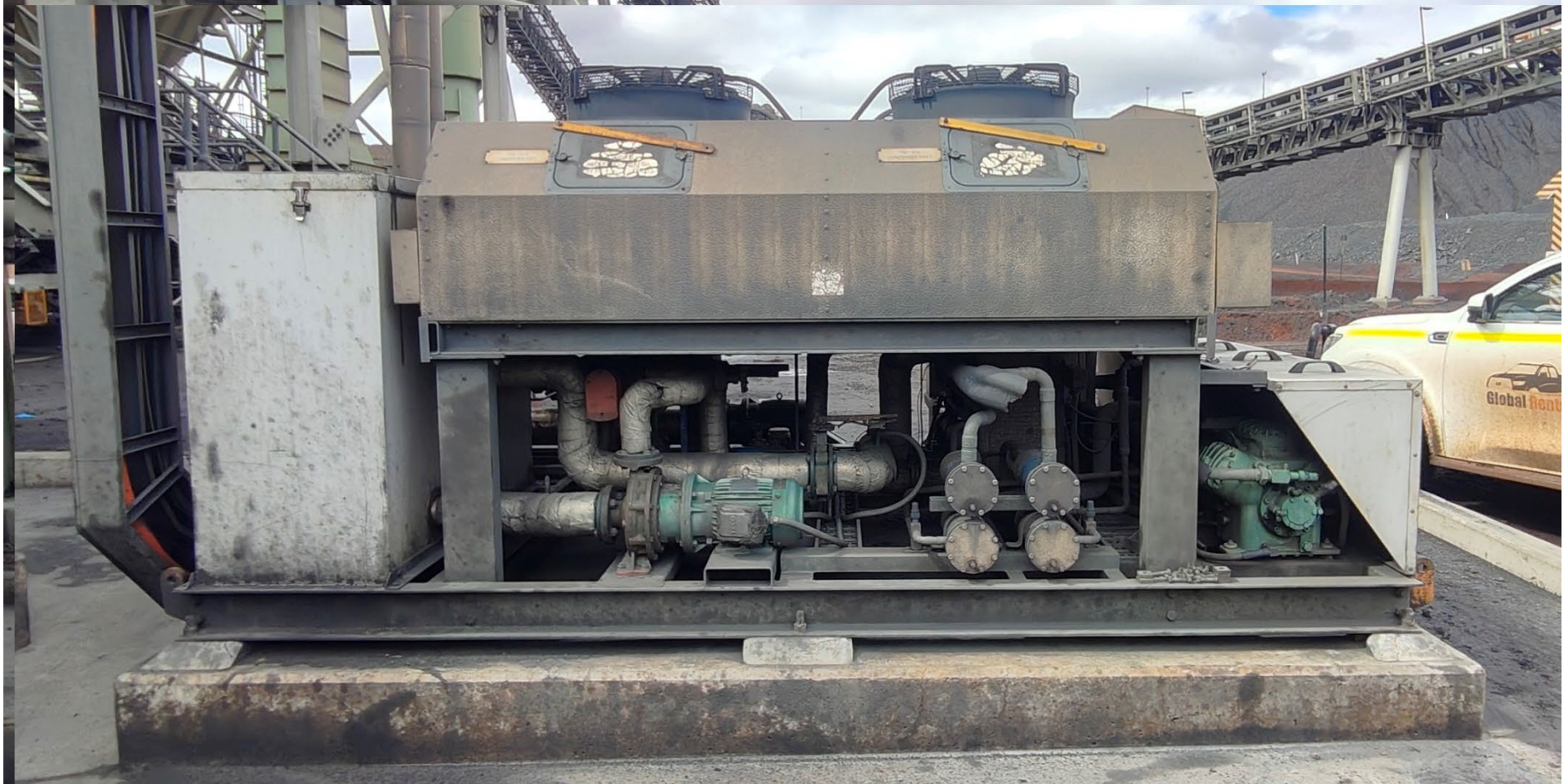
0° position



90° position



180° position



270° position

11.2 Appendix B

- [CORP-EL-SPC-1008 0 SPECIFICATION FOR ELECTRIC MOTORS](#)
- [Government of Western Australia DMIRS – Flammable refrigerant gases - Position paper](#)
- [MEPS - Chillers: Final policy positions](#)
- [Secondary Crusher Chiller Manual](#)
- [OEM chiller controller readable program](#)
- [OEM chiller Maxim 1 controller program](#)
- [Maxim programming app – MAXIM v5.70 rel2](#)
- [3-way divert valve photo #01](#)
- [3-way divert valve photo #02](#)
- [3-way divert valve photo #03](#)
- [3-way divert valve PID setting](#)
- [CORP-GE-BOD-1001 A BASIS OF DESIGN](#)
- [Airah buffer tank sizing](#)
- [Existing buffer tank dimension](#)
- [Refrigerant Selection](#)
- [MP1000 Cone Crusher Mechanical Control Logic](#)
- [MP1000 Air-Cooled Chiller Control Logic](#)