



Ergon Energy Corporation Limited

Technical Specification for Low Voltage Regulator

ETS02-05-01

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1. Purpose and Scope

This specification sets out the technical requirements for the manufacture, testing at works, supply and delivery of a low voltage regulator for use in the Ergon Energy's distribution network in Queensland.

2. References

2.1 Applicable Standards

The low voltage regulator shall be constructed, manufactured and tested in accordance with the relevant parts of the following Australian and International Standards and all amendments issued from time to time except where varied by this specification.

STANDARD	TITLE
AS / NZS 61000	Electromagnetic compatibility (EMC)
IEC 60664	Insulation coordination for equipment within low-voltage systems
AS 2650	Common specifications for high-voltage switchgear and controlgear standards
AS / NZS 4417	Marking of electrical products to indicate compliance with regulations
AS 3439	Low-voltage switchgear and controlgear assemblies
AS 60529	Degrees of protection provided by enclosure
AS 4362	High-voltage test techniques for low-voltage equipment
AS 2700	Colour for Specific Purposes
AS 4068	Flat Pallets for Materials Handling
AS 4360	Risk Management
AS / NZS 9001	Quality management systems - Requirements

Should inconsistencies be identified between standards and / or this specification, the Supplier shall immediately refer such inconsistencies to the Purchaser for resolution.

If the Supplier offers any equipment not complying with these standards, detailed description shall be given of the differences between the equipment offered and the standard requirements.

3. Drawings

3.1 Drawings by the Purchaser

There are no drawings attached to this specification.

3.2 Drawings by the Tenderer

The Supplier shall supply with the tender, drawings, sketches or pamphlets showing detailed dimensions of the regulator.

4. Service Conditions

The service conditions under which the low voltage regulator will be required to operate shall be in accordance with AS 3439.1 and the following:

ENVIRONMENT	DESCRIPTION
Ambient Temperatures	+50°C summer day time -10° winter night time
Solar Radiation Level	1100 W/m ² with high ultraviolet content
Precipitation	Tropical summer storms with gust wind speeds above 160km/h, and an annual rainfall in excess of 1500mm
Humidity	Extended periods of relative humidity in excess of 90% R.H.
Altitude	Not exceeding 1000m above sea level
Atmospheric Classification	Areas of coastal salt spray and / or industrial pollution with equivalent salt deposit densities in the range of 2.0 – 3.0 g/m ²
Isokeraunic Level	40 thunder days annual average

5. Design and Construction

5.1 General

The design of the equipment shall meet the requirements of the National Electricity Rules, the Electricity Act 1994 (QLD), Electricity Regulations 1994 (QLD) and the Provision and Use of Work Equipment Regulations 1998, for the maximum safety of all personnel.

5.2 Operational Requirements

The voltage regulators outlined in this specification shall be able to be mounted on a single wooden pole and capable of increasing (boosting) or decreasing (bucking) to maintain the single phase line voltage at 235V_{rms} +1%, 50Hz supply. The regulator shall be suitable for fully automatic operation and as far as practicable maintenance free operation.

5.2.1 Ratings

The regulator ratings shall be in accordance with Table 5.2.1 below under the conditions set out in AS 3439.1, AS 61010.1 and Clause 4 of this technical specification.

Output Capacity:	
<ul style="list-style-type: none"> • Continuous Power Rating (i.e. 80A @ 240V) • Continuous Current Rating 	20kVA _{rms} 80A _{rms}
Current Overload Rating: (time at 90A)	1 hour
Output Voltage	235V _{rms} ±1%
Maximum Controllable Input Voltage:	275V _{rms}
Minimum Controllable Input Voltage:	215V _{rms}
Motor Starting Current	230A _{rms} – 330A _{peak}
Overcurrent Lockout	Doubles delay time – Software settable

Slow Reset Ramp	1 second minimum – Software settable
DC Voltage Offset Immunity	Not less than 1%
Voltage Flicker Severity	The device output must comply with applicable AS / NZS 61000 for voltage disturbances extending beyond 30 cycles.
Frequency Range	50Hz ± 1Hz
Load Power Factor (PF): Leading & Lagging	0.8
Reverse Power Capability	Be able operate effectively under reverse power conditions
Harmonic Current (A)	In accordance with relevant equipment standard
Fault Current Rating: (Withstand for 1 sec)	6kA _{rms}
Insulation Level (Momentary Application)	3kV _{rms}

Table 5.2.1 Voltage Regulator Ratings

5.2.2 Failure Mode

In the event of the primary voltage supplied to the regulator being out of its controllable range for a defined period of time, the regulator shall fail to a safe condition and should not disconnect its output. The regulator shall remain in the safe condition until such time that controllable primary voltage is re-established for a defined period of time. In the event of electronic control failure, the device shall enter a by-pass mode such that the output voltage is the same as the input voltage.

In addition the regulator design shall incorporate an indicating lamp “Green” in colour visible up to a height of 15 metres from the ground. Under normal operating condition the indicating lamp shall be in the “On” position, under abnormal operating conditions and detectable component failure the indicating lamp shall “Flash” intermittently and under “Failure Mode” shall be in the “Off” position.

5.2.3 Total Harmonic Distortion

Injection of harmonic distortion into the distribution system shall be within limits specified in AS / NZS 61000.

5.2.4 Electro-Magnetic Compatibility

The regulator shall conform to Class 2 electromagnetic compatibility as outlined in AS / NZS 61000.

5.2.5 Protection

The Supplier shall state any protection requirement and / or incorporated in the regulator design. Overload protection shall be included to prevent damage to the unit.

5.2.6 Earthing

The Supplier shall state the minimum earthing requirement to guarantee the performance of the regulator.

5.2.7 Noise

The Supplier shall state the sound power level of the regulator and shall not exceed the value of 45dBA when measured at a distance of 1 metre away from the regulator.

5.2.8 Impact on Customer Protective Devices

The Supplier shall state whether there are any impacts on customer protective devices such as earth leakage circuit breakers or fault current limiting device.

5.2.9 Routine Maintenance and Operational Management

The Supplier shall state the expected routine maintenance requirements, isolation, discharge procedures and consumables that need replacement during its operational life. The low voltage regulator shall be as far as practicable maintenance free.

5.2.10 Fault Logging

The low voltage regulator shall have the facility to fault log with time stamp. Details shall be provided on the information stored during fault log. The Supplier shall provide information in accessing the storage device and the maximum number of events recorded. Preference will be given to storage devices that offer portability and 'Plug and Play' feature.

5.3 Regulator Construction

5.3.1 Regulator Construction and Fittings

The construction of the regulator, cover, bushing fixing and auxiliary equipment shall be such that water will not interfere with their operation and will drain off effectively. The equipment shall have IP54 degree of protection as per AS 60529.

All pieces of metal work on the regulator shall be earthed and, where this cannot be done safely, suitable insulating material shall be used in lieu of metal.

Facilities shall be provided to permit lifting all parts, which have to be removed for inspection or repair. Lifting lugs shall be provided to lift the units as a whole, or to tie down the units during transport. They shall be positioned such that slings attached thereto do not foul with any part of the regulator and when suspended by them the regulator shall hang without tilting in the same orientation as it is to be mounted. Fully dimensioned drawing showing the lifting lugs shall be included in the tender documentation.

To reduce the possibility of rusting of the regulator channels, angle brackets or similar, the materials shall be attached to the regulator to ensure that the base is not in contact with any other surface while in storage or while being transported.

A stainless steel M12 earthing stud (or acceptable equivalent) with 40mm of thread complete with two stainless steel washers and two stainless steel nuts, for connecting an earth down lead, shall be provided near the bottom of the regulator. The earth stud shall be well secured or welded to the regulator, i.e. the Purchaser prepares that there are to be no bolted connection in the electrical path between the stud and the regulator. The stud shall be coated with an anti-seizing compound. Painting and other non-conductive coatings are unacceptable.

The regulators shall be supplied with a pole mounting bracket allowing it to be mounted onto a single wooden distribution pole. Allowance for an M20 king bolt and M12 coach screw shall be provided for attaching the regulator bracket to the pole. Fully dimensioned drawing of the pole mounting bracket shall be included in the tender documentation.

The bushings shall be adequately spaced, with palm type terminals suitable for the connection of bare copper or aluminium conductors and designed to minimise the risk of

accidental short circuit due to animals, birds, vermin, reptiles and wind-blown debris. The clearance between live metal on the bushing and the surface of the regulator mounting bracket or regulator housing (phase to earth) shall be nominated by the Supplier, in accordance with IEC 60664 for heavy polluted environments and agreed with the Purchaser. The porcelain LV bushings shall be glazed with suitable colour and fully vitrified.

The bushing identifications shall consist of metallic plate highly resistant to corrosion permanently stamped with "Line In", "Line Out" and "Neutral" respectively.

5.3.2 Nameplate

The Supplier's nameplate shall consist of a metallic plate highly resistant to corrosion permanently stamped with the following:

- (a) Manufacturer's name or trademark
- (b) Manufacturer's part number serial number or type
- (c) Rated input voltage ranges
- (d) Full load current
- (e) kVA rating
- (f) Date of manufacture
- (g) Purchaser's stock code and Structured Plant Number (This will be an 8 digit number prefixed by 2 alphas and it will be nominated in the purchase orders to the successful Tenderer)
- (h) Any Safety Warnings
- (i) Impedance and losses

Ergon Energy stock code shall be added to the technical details supplied on the Supplier's nameplate for each regulator. The stock code shall be applied at the manufacturer's works.

5.3.3 Protective Coating

The Purchaser requires all internal and external surfaces to be treated with a coating, which provides protection against corrosion induced by water, salt laden atmosphere and low levels of industrial pollutants.

The protective coating shall comply with the following requirements:

- Finished coatings shall be oil resistant, heat resistant and non-corrosive.
- Exterior coatings shall have heavy duty protective coating to meet the requirements of a "Long Term" corrosion protection system in Category E-M atmospheric environment as per AS 2312.
- All coatings (except the interior surface of the regulator and the anodised aluminium heat sink) where coloured, shall be white colour.
- All coatings (except the interior surface of the regulator) shall be capable of being maintained on-site.
- The materials used and method of application shall be suitable for the base metal to be coated, and shall be supplied by a reputable manufacturer and shall be applied in accordance with his recommendation for this particular application.
- The Supplier shall guarantee that after five years from acceptance the extent of corrosion at any one site on the equipment shall not exceed an area of five square centimetres nor penetrate the base metal by more than one tenth of the thickness of the base metal.

The Supplier shall supply sufficient details to allow evaluation of the protective coating by the Purchaser, and shall include:

- Description of base metals to be coated.
- Make and type of materials used for cleaning, priming and finishing.

- Details of the surface cleaning process used for removing rust, oil, grease, dirt and other foreign matter and of the surface preparation process.
- Details of all tests (accelerated aging, scab corrosion, salt spray, fog impact, etc.) performed which prove the effectiveness of the proposed protective coating and how the proposed protective coating compared with other test samples. Testing to be carried out in accordance with AS 1580.
- Details of coating application process including measures taken to ensure adequate coating of edges, shadow areas and welds.
- The standards and test criteria used to check acceptance at each stage of the process.
- Estimated life of the protective coating in the environment specified in Section 2 “Service Conditions”.
- Minimum thickness of protective coating.
- Recommendations for on-site repair of damaged coating eg. Scratches, chips, etc. from handling, necessary to achieve the estimated life of the protective coating.

5.4 Tools

The Supplier shall include in **Attachment 2** a separate price for any special tools and gauges required for the erection, operating and maintenance of the equipment.

5.5 Spares

The Supplier shall also state in **Attachment 3** prices for recommended spares which shall be itemised and shall state if such spares are available from stocks held in Australia.

The Supplier shall include an itemised price list of other recommended spares, which must include one (1) bushing as well as the individual prices for the associated terminal palms, etc.

5.6 Chemicals and Chemical Substances

The Queensland Government Occupational Health and Safety Act requires the Purchaser to assess the possible effects on health, safety and environment of chemical substances which are used in the manufacture of the plant and materials.

Suppliers are required to provide with their tender documentation a Safety Data Sheet for every chemical substance used for electrical and thermal insulation, impregnation, and paint finish or for any other purpose.

5.7 Instruction Manuals

Within two (2) weeks of awarding the tender, the successful Tenderer shall supply three (3) copies of the following:

- General arrangement drawing
- Operations and maintenance manual

Ergon Energy will approve only the drawings or sections thereof which relate directly to the integration with Ergon Energy supplied equipment. The Supplier shall amend the drawings as directed and resubmit them for approval within fourteen days.

6. Performance and Testing

6.1 General

All designs, materials and workmanship shall be guaranteed by the Tenderer and shall be subject to inspection and satisfaction by the Purchaser.

All tests shall be in accordance with AS 4362.1, AS / NZS 3439.1, IEC 61000 and IEC 60664-1.

6.2 Type Tests

The following type tests shall be carried out:

- Temperature rise tests (no load / 0.25 / 0.5 / 0.75 and full load across the PF range – Temperature measurements on transformer windings and internal power lead connections)
- Withstand required fault level
- Voltage regulation at the limits of control i.e. max. and min. input voltage @ No load / 0.25 / 0.5 / 0.75 and full load across the PF range
- Over voltage tests
- Fail safe performance
- Voltage Regulation at defined climatic conditions
- Ingress Protection (IP) Rating
- Regulator impedance
- Losses

Details of the type test results shall be submitted with the Tender.

6.3 Routine Tests

The following routine tests shall be carried out:

- Certification to prove voltage regulation at the limits of control i.e. maximum and minimum input voltage.
- DC insulation resistance test – results and test certificates supplied.

The test certificate shall include the Manufacturer's serial number and the Purchasers Structured Plant Number.

One copy of the routine test results shall accompany each unit of switchgear delivered. A second copy of the test certificates shall be forwarded to the Purchaser via electronic mail to: inventory.nameplatedata@ergon.com.au

The test certificates shall also be accompanied with the completed **Attachment 6**

7. Risk Assessment

The Tenderer warrants (without limiting any other warranties or conditions implied by law) that all Goods have been produced, sold and delivered to the Principal in compliance with all applicable laws (including all workplace health and safety and electrical safety legislation, codes of conduct and the Principal's Workplace Health & Safety and Electrical Safety Conditions).

Offered items shall be subjected to a formal risk assessment prior to acceptance. It is preferred that the suppliers perform the risk assessment themselves and provide the resultant documentation with their offer. Where risk assessment documentation is not provided with the offers, or does not meet the required standard, such offers shall have their price loaded with the estimated costs associated with the Purchaser conducting the assessments. Any documented risk assessment which accompanies the offer must meet the requirements of AS / NZS 4360 as a minimum standard. It is preferred that the risk assessment methodology uses an energy model to identify hazards.

The risk assessment/s must identify hazards to the corporation personnel, public and property associated with:

- (a) The installation of the equipment
- (b) The operation and maintenance of the equipment during life expectancy
- (c) Dismantling / disposal of equipment at end of life
- (d) The risk assessment schedule in **Attachment 5** included with this specification is to be completed by the Supplier. Note the schedule contains a generic set of questions designed to cover all the Purchaser's plant and materials and the supplier is only required to complete those items applicable to the product offered.

8. Quality Assurance

8.1 Purchasers Policy

It is the Purchaser's policy to procure goods, equipment and services from sources that demonstrate the ability to supply quality products.

8.2 Documentary Evidence

Suppliers are required to submit evidence that the design and manufacture of the regulators is in accordance with AS / NZS ISO 9001 and shall include the Capability Statement associated with the Quality System Certification.

If the Supplier is a non-manufacturing Tenderer, the documentary evidence shall include the quality system certifications of both the Tenderer and the manufacturer.

Tenderer's attention is drawn to [MP000801F100](#): Management Systems Information Schedule (Form) which forms an integral part of this specification.

9. Samples

9.1 Production Samples

When requested production sample(s) shall be submitted to assist in the evaluation of the offer.

10. Packaging and Marking

10.1 General

The regulators shall be packed individually, complete with accessories. Two copies of the instruction manuals must be included in each package. The packaging of the regulators by the Suppliers must ensure that the units are delivered undamaged giving due consideration to the quantity, distance and the mode of transportation, and the preferred method of handling at each location.

10.2 Marking

The regulator package shall be marked with the following:

- (a) Manufacturer's name or trademark
- (b) Manufacturer's address
- (c) Manufacturer's part number or type
- (d) Description of item
- (e) Purchaser's stock code, order number and store delivery location
- (f) Gross Weight
- (g) Date of Supply

10.3 Quarantine

Should the regulator be supplied from an overseas manufacturer, then it is mandatory that all conditions and inspections required by the Australian Quarantine Act be met and that all these costs be included in the tendered price. In particular, timber drums must be fumigated with methyl bromide with a concentration of 48 grams per cubic metre for 24 hours at 21oC. The Supplier shall ensure that the procedure does not produce any deleterious effects to the regulator supplied.

11. Service Performance

Suppliers shall state:

- (a) The period of service achieved by the items offered within Australian service conditions
- (b) Electricity utilities who have a service history of the items offered.
- (c) Contact names and phone numbers of relevant employees of those supply authorities who can verify the service performance claimed.
- (d) Suppliers are also requested to submit proposal for improving the service life of the regulators.

12. Reliability

12.1 Service Life

Comments on the reliability and performance of the items offered for a minimum service life of 10 years under the specified system and environmental conditions shall be submitted with the offer.

12.2 Evidence in Support of Reliability

Such comments shall include evidence in support of the reliability and performance claimed including information on Failure Mode and Effect Analysis.

The Tenderer shall provide evidence on the reliability of the low voltage regulator and shall include:

- (a) Details of reliability studies including reports and calculations
- (b) Statistics on reliability obtained from field experience and accelerated life tests with the low voltage regulator or a close model of similar design.
- (c) Details of the service conditions from which the reliability was determined.

13. Training

The Tenderer shall state the recommended training requirement, technical level of personnel to be trained, duration of training course and the associated cost.

Training materials in the form of drawings, instructions and / or audio visuals shall be provided for the items accepted under the offer.

This material shall include but is not limited to the following topics:

- Handling
- Storage
- Application
- Installation
- Commissioning
- Operating and isolating procedures
- Maintenance
- Environmental performance
- Electrical performance
- Mechanical performance
- Disposal
- Diagnostic software

14. Environmental Considerations

Suppliers are required to comment on the environmental soundness of the design and the materials used in the manufacture of the items offered. In particular, comments should address such issues as recyclability and disposability at the end of service life, and also disposal of packaging material.

15. Information to be Provided

15.1 Specific Technical Requirements

The specific regulator technical requirements for the items offered shall be as stated in **Attachment 1** of this specification. The tenderer shall fill in all data requested by the Attachment and shall guarantee such data.

15.2 Checklist of Supporting Documentation

Attachment 4 details a checklist of supporting technical documentation which is required to be submitted with the tender.

15.3 Documentation to be Supplied During the Course of the Contract

- **Attachment 1** is a schedule of the regulator technical details that the successful Tenderers are required to provide.
- Test certificates and the **Attachment 6** as required in Clause 7 with each delivery.
- Training material as required in Clause 14.
- Dimensioned drawings for the equipment in CAD format

15.4 Documentation to be Supplied with the Offer

- **Attachments 2 and 3** are schedules of recommended spares, special tools etc required for erection, operating and maintenance of the equipment which the Tenderers are required to complete and return with their offer.
- **Attachment 5** is a risk assessment schedule that the Tenderers are required to complete and submit with their offer.

16. Attachment 1 – Regulator Technical Details

Name of Manufacturer:	
Place of Manufacture:	
Rated Continuous Current at 240V (A)	
Minimum Controllable Input Voltage (V)	
Maximum Controllable Input Voltage (V)	
Output Voltage (V)	
Losses (No Load, Full Load)	
Operating Frequency Range (Hz)	
Load Power Factor (p.f.)	
Reverse Power Capability (Yes/No)	
Harmonic Current (A)	
Current Overload Rating (A)	
Fault Current Rating for 1 Second (A)	
Insulation Level (Momentary Application) (kV _{rms})	
Overall Dimension (Height / Length / Width) (mm)	
Weight Weight of Complete Regulator (kg) Gross Weight During Transport (kg)	
Make and Type of Bushing Manufacturer: Catalogue Number:	
Clearances Phase to phase clearance between “Line In” and Neutral” (mm) Phase to phase clearance between “Neutral” and “Line Out” (mm) Phase to phase clearance between “Line In” and “Line Out” (mm)	
Clearances Con’t. Phase to earth clearance from “Line In” (mm) Phase to earth clearance from “Line Out” (mm)	
Are lifting arrangements in accordance with Clause 5.3.1.3 (YES / NO)	
Are surge suppression devices provided? (YES / NO) Is surge suppression mounted internally or externally? If provided include details of surge suppression device?	

SIGNATURE OF TENDERER: _____



17. Attachment 2 – Tools

List all special tools required and item price on the table below.

Tools	Item Price (AU\$)

SIGNATURE OF TENDERER:



18. Attachment 3 – Spares

List all recommended spares, availability in Australia and item price on the table below.

Recommended Spare	Available in Australia	Item Price (AU\$)
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	
	YES / NO	

SIGNATURE OF TENDERER: _____

19. Attachment 4 – Technical Document Checklist

Clause Reference	Particulars	Response
3.2	Drawings from the Supplier	Yes / No
5.2.1	Ratings	Yes / No
5.2.2	Failure Mode	Yes / No
5.2.3	Total Harmonic Distortion	Yes / No
5.2.4	Electro-Magnetic Compatibility	Yes / No
5.2.5	Protection	Yes / No
5.2.6	Earthing	Yes / No
5.2.7	Noise	Yes / No
5.2.8	Impact on Customer Protective Device	Yes / No
5.2.9	Routine Maintenance and Operational Management	Yes / No
5.2.10	Fault Logging	Yes / No
5.3.1	Regulator Construction and Fittings	Yes / No
5.3.2	Nameplate	Yes / No
5.3.3	Protective Coating	Yes / No
5.4	Tools	Yes / No
5.5	Spares	Yes / No
5.6	Safety Data Sheets	Yes / No
5.7	Instruction Manuals	Yes / No
6	Test Certificates	Yes / No
7	Risk Assessment	Yes / No
8	Quality Assurance	Yes / No
10	Packaging and Marking	Yes / No
11	Service Performance and History	Yes / No
12	Reliability	Yes / No
13	Training Materials	Yes / No
14	Recyclability and Disposability	Yes / No
15	Information to be Provided and Technical Details	Yes / No

NAME OF TENDERER: _____

ADDRESS OF TENDERER: _____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____

20. Attachment 5 – Risk Assessment

This schedule details the risk assessment parameters to be provided by the Tenderer for items covered by this specification. This schedule shall be completed and submitted with the offer. The Tenderer shall complete the relevant items (as applicable):

REF.	PARTICULARS	RESPONSE
1.	Have Risk Assessments been carried out on equipment tendered which met the requirements of AS 4360?	Yes / No
2.	Have copies of such risk assessments been included with the tender?	Yes / No
3.	What is the weight of the components to be moved?	
4.	How often do the components have to be moved?	
5.	Are space restrictions associated with:	
5.1	Manual/materials handling tasks	
5.2	Installation/maintenance	
5.3	Operating procedures?	
6.	Is there provision for the use of mechanical lifting devices?	Yes / No
7.	Is the load stable?	Yes / No
8.	What is the level of coupling? (poor/fair/good) (eg. Are operating handles fitted with grips)	
9.	What are the push/pull/rotational forces required to operate the equipment:	
9.1	When new?	
9.2	During life expectancy?	
10.	Do “above “ground” work surface have adequate fall protection (eg. Slip resistant surface, hand rails)?	Yes / No
11.	Do the work positions require undesirable postures such as:	
11.1	Bending	Yes / No
11.2	Stretching	Yes / No
11.3	Twisting	Yes / No

Attachment 5 – Risk Assessment... (Cont'd)

REF.	PARTICULARS	RESPONSE
12.	What postures are required to be sustained over what period of time?	
13.	What movements are repetitive and for what duration?	
14.	What are the sound pressure levels (expressed in dBA)?	
18.	What are the expected hazardous changes/by-products associated with the deterioration of a substance?	
19.	Is there any possible contact with energised components?	
20.	What are the levels of radiation emitted?	
21.	When in service, are any normally accessible areas hot/cold enough to be a hazard?	
22.	Are there any biological hazards?	
23.	Are there any mechanical hazards (eg. Nip in points, exposed moving components)?	
24.	Are mechanical hazards appropriately controlled (eg. guarding, lockouts)?	
25.	Are load limits established and clearly identified?	
26.	Are gauges clearly visible and easily interpreted?	
27.	Are control movements consistent with established Australian conventions (eg switch "UP" position is "OFF")?	
28.	What is the degree of whole body or hand/arm vibration (Hz)	
29.	Are projectiles generated?	
30.	Are special tools required/identified/supplied?	
31.	What are the hazards associated with equipment failure?	

NAME OF TENDERER:

ADDRESS OF TENDERER: _____

SIGNATURE: _____ FOR AND ON BEHALF OF TENDERER

DATE: _____

21. Attachment 6 - Nameplate Details



LV reg
Nameplate.xls (41 KB)