

MAY, 1988

CLEMENTS

HOSPITAL HIGH SUCTION UNIT

SUC84100

OPERATION & MAINTENANCE
MANUAL

FROM SERIAL NO. SUC84100 0588 2049

Part No. SUC91005403

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- SECTION 1 -

Specifications

- Power Source - 220 - 240v 50Hz
- Switch - Neon rocker switch
- Suction - 720mmHg (98-kPa) at sea level
- Flowrate - 0-35 litres of free air per minute
- Filter (Exhaust) - Cotton wool - 10gms (Bleached hospital cotton wool)
- Pump Type - Rotary type, oil sealed with positively driven vanes. Stabilised cast iron rotor. Heat treated wear resistant aluminium pump body.
- Body Housing - H.D. Polyethylene, rotary cast
- Motor - 4 Pole 1450rpm 220/240volts. 50Hz, 1.6amps with auto-reset thermal overload. Totally enclosed with sealed ball bearings.
- Collection Jar - High temperature polycarbonate jar with non-static polypropelene bung
- Regulator - Spring & ball by-pass type
- Gauge - Bourden tube 0-760mmHg = 0 to -100kPa
- Operating - Continuous up to ambient of 35°C
- Standard - To BS4199 Pt.1. Sparkless enclosure
- Markings & Calibrations - To conform with international standards, all gauges are dual scale reading in both -kPa and mmHg.

- SECTION 2 -

Accessories / Spares

| | |
|-------------|--------------------------------|
| SUC80301 | 2 Litre Suction Jar |
| SUC80321 | Bung Assembly |
| SUC81005 | Float & Cage Assembly |
| SUC81006 | Filter Seals |
| SUC80297 | Suction Tubing |
| SUC80490 | Plain Metal Handpiece |
| SUC80350 | Fingervalve Handpiece |
| SUC80101 | VP10 Oil - 20 litres |
| SUC80102 | VP10 Oil - 4.5 litres |
| SUC80103 | VP10 Oil - 500 mls |
| MUL94003654 | Switch |
| SUC84100012 | Gauge Assy - High Suction |
| SUC84100018 | Supply Cable - Mains to Switch |
| SUC84100021 | Rear Compartment Cover |
| SUC84100023 | Pump Body Assembly |
| SUC84100028 | Power Lead - Motor to Switch |
| SUC84100039 | Instruction Plate |
| SUC84100045 | Oil Tank Cover Assembly |
| SUC84100049 | Filter Assembly |
| SUC84100055 | Motor Assembly |
| MUL91000711 | Drain Cock |
| SUC84100050 | Regulator Body Assembly |
| SUC84100034 | Regulator Screw Assembly |
| SUC83100112 | Oil Filler Plug |
| SUC81500008 | Overload Switch |
| SUC81500012 | Bearing O.D.E. |
| SUC81500013 | Bearing D.E. |

Accessories / Spares (Continued)

| | |
|-------------|----------------------------|
| SUC81500022 | Oil Seal |
| SUC81500023 | Inner Wear Plate |
| MUL81500033 | 'O' Ring - Pump body |
| MUL81500034 | 'O' Ring - Oil Tank Cover |
| SUC81500036 | Foot - Motor Feet |
| SUC81500054 | Circlip - D.E. Seal |
| MUL81500058 | 'O' Ring - Regulator |
| SUC81500079 | Oil Observation Glass Kit |
| SUC81500103 | Gauge Cover Disc. (Ametek) |
| SUC81500118 | 'O' Ring Set - Pump |
| SUC81500137 | Ported Cover Plate |
| SUC83100025 | Key - Woodruff |
| SUC83100026 | Pump Rotor |
| SUC83100035 | Tube Nozzle |
| SUC83100039 | Cotton Wool - Filter |
| MUL83100067 | Tank Securing Screws |
| MUL83100068 | Pump Securing Screws |
| MUL94003702 | Fuse 5.0amp Slow Blow |
| SUC83100093 | Vane Package Set |
| SUC83100095 | Vane Locating Ring |
| MUL96241065 | 'O' Ring - Oil Filler Plug |

Installation & Operation

The Clements Hospital High Suction Unit SUC84100 comes complete with:-

- a) 2 x SUC80404 Disposable Handpieces
- b) 1 x 500ml bottle of VP10 Oil
- c) 2 x 2 metre lengths of Suction Tubing connected to each bung and one 400mm length for connecting the collection jars in series.

This particular pump is the top of the range of Clements High Suction pumps. It's main feature is that we utilise the extremely reliable and long proven, rotary vane pump for it's suction source. This gives the operator the flexibility of suction strengths from 0 to 720mmHg with flowrate capability of up to 35 ltrs/min. This makes the unit ideal for any procedure in hospitals requiring suction.

Being mobile, it can easily be moved to any part of the hospital, with storage at rear, to place additional tubing, handpieces, etc.

This unit can be run for lengthy periods without being detrimental to the pump and motor, although Clements do recommend periodic maintenance. The flameproof version of this pump is suitable for use in minor operating theatres.

How to Operate

1. When you first receive your unit, the pump will need filling with oil. Refer to Routine Maintenance section of this manual.
2. Prior to using the pump, always check the bung and tubing. Be sure they fit correctly to avoid leaks.
3. Connect unit to 220/240volt 50 Hz AC power supply. Press rocker switch to the "ON" position (the neon switch will illuminate), and select suction strength accordingly.

To select suction strength quickly, place finger over the end of the tubing and watch the gauge. Adjust the suction regulator accordingly.

4. Although the collection jars are fitted with an overflow protection device, keep fluid levels to a minimum to prevent any possible spillover into pump unit.
5. DO NOT turn pump off with suction handpiece occluded.

Routine Maintenance

Every 100 hours of operation or every two months, or after infectious patients, or when oil looks contaminated:-

1. To fill or replenish with oil:
 - a) Release toggle latches on the rear of the unit
 - b) Push the housing forward
 - c) Remove oil filler plug
 - d) Fill with oil to level marked on front of pump
 - e) Replace oil filler plug
 - f) Close housing and secure toggle latches
2. Change exhaust filter by unscrewing filter caps, emptying filter and repacking with bleached cotton wool (10 gms weight).
3. Check tubing and replace if perished, soft or discoloured.
4. Check the seal between the collection jar and bung.
5. Check float valve seal and replace if necessary.
6. Check inlet nipple sealing surface and replace if damaged.
7. Generally clean pump unit. Use a damp soapy disinfected cloth and wipe over. NEVER use an abrasive cleaning agent, as this will scratch the plastic.

Fault Finding

1. No Suction - motor apparently working

Check: Tubing blocked
Float valve in 'OFF' position
Inlet blocked
Gauge blocked - dismantle & check
Regulator blocked - dismantle
Bung and collection jar not sealing
Regulator set at zero - adjust

2. No Suction - motor not running though electricity available and no humming is heard from machine

Check: Mains fuse
Faulty electrical lead
Pump fuse
Unit switched on
Thermal overload - dismantle motor
Faulty power outlet

3. No Suction - motor not running though humming is heard from motor when pump is switched on.

Check: Blocked pump - dismantle pump and clean out
Motor switch gear - dismantle motor
Motor starting winding - dismantle motor

4. No Suction - intermittent hum from motor

Check: Partially blocked - dismantle pump and clean out

5. Suction - but intermittent running of motor
(Refer to heading under HIGH SURFACE TEMPERATURE first)

Check: Thermal overload - dismantle motor
If thermal overload okay, check running winding

6. Dirty oil and apparent oil leaks

Change filter
Change oil
Dismantle pump (foreign matter)
Replace 'O' Rings and/or oil seal
Oil may darken during the first 50 hours of operation as the pump 'runs in'.

Fault Finding - (Continued)

7. Will not give enough suction

Check: Regulator turned fully clockwise
Suspect leaks in bung, tubing or collection jar,
or reduced air volume through partial blockage
in tubing.

A worn pump gives increased noise and oil
consumption but suction is not materially
affected unless wear is very great.

8. Excessive Oil Consumption

ie. reduced oil level, emitting oil fumes,
continually soiled filter, etc.

If consumption is over 2 grams/hour suspect
worn pump or faulty oil seal.

Check: Oil seal (replace)
Inner and outer cover plates (skim and replace)
Pump body for scoring (replace body and vanes)

9. Noisy at any load

Check: Worn pump
Debris in pump rotor
Incorrectly fitted parts

10. Noisier with increased load

Bearings, possibly in combination with (7)

DO NOT confuse with hydraulic knock discernable
at about 700mmHg.

11. High Surface Temperature

High surface temperature is normal and is designed to
assist in bacterial decontamination. Surface parts are
designed to operate in surface temperature to 85°C (as
in British Standards).

The apparatus is protected by thermal overload.

In very high ambient conditions should the thermal
overload keep on tripping out ensure that suction is
being backed off to about 400mmHg.

Technical Maintenance

Dismantling and Rectification

Most faults are of mechanical origin in the pump unit, rather than of electrical origin in the motor. It is rarely necessary to dismantle the electrical motor.

NOTE:

Pumps which require replacement wearing parts such as vanes, rotor, etc, will frequently require careful assembly to 'bed in' new components with the existing sound but partially worn and grooved ones.

In particular check that the rotor is level with the top of the pump body. If oversize then rub down carefully on a flat surface with coarse emery paper. The pump vanes should be a smooth sliding fit and to achieve this it may be necessary to 'relieve' the slots of the rotor with a 'ward' file or slightly smooth the edges of the vanes.

1.a) Dismantling the Pump

Tools required: 1 large screwdriver (oil tank cover)
 1 medium screwdriver (other screws)
 1 plastic mallet

1. Remove collection jars and tubing
2. Release toggle latches, push housing forward
3. Open drain cock & drain oil, close drain cock
4. Unscrew the two oil tank securing screws
5. Remove oil tank cover - a tap with the back of the hand or with mallet will assist
6. Unscrew the five ported cover plate screws and remove cover plate
7. Remove pump body complete. Pullers may be necessary
8. Remove control rings and vanes
9. Remove pump rotor. Pullers may be necessary if pump is corroded
10. Remove inner control ring
11. Remove inner wear plate

If the inner wear plate is worn it may be refaced on a lathe or turned over

Technical Maintenance - (Continued)

If Oil Seal Needs Replacing or Examination

1.b) Dismantle the motor

1. Unscrew four motor stud bolts
2. Remove motor drive endshield.
3. Remove oil seal from seal housing
4. Fit new seal
5. Replace drive endshield in correct position
6. Replace and secure motor studs

1.c) Re-assembling the Pump

We recommend replacing all 'O' Rings whenever the pump is dismantled. If, however, any are being re-used, examine their condition thoroughly and be careful not to damage them when resetting the joints.

Be sure all surfaces and components are clean.

1. Replace inner wear plate
2. Replace - Pump body
- Control ring - inner
- Rotor
- Vanes (check correct positioning)
- Control ring - outer - oil rotor and interior of pump ported cover plate
- 5 x Pump securing screws

Check: Pump running smoothly

Retighten: Screws on ported cover plate, evenly

Check: Pump running again

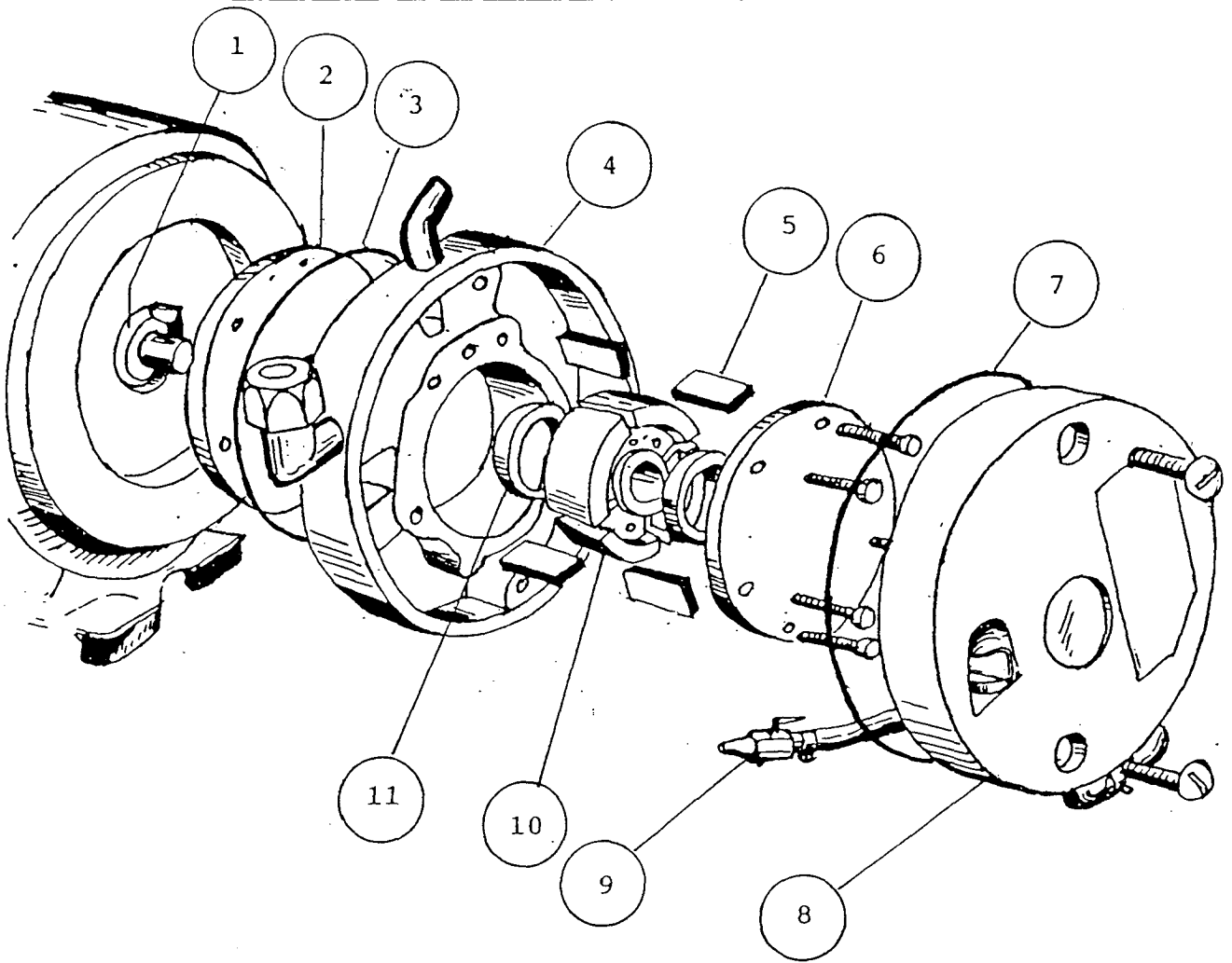
Reassemble: Oil tank cover and fill with oil

2.a) Dismantling Electric Motor

Tools as pump unit

1. Remove pump unit as in Section 6(a)/Items 1 to 11
2. Mark position of O.D.E. endshield in relation to motor
3. Remove rotor from stator

EXPLODED DRAWING OF PUMP ASSEMBLY

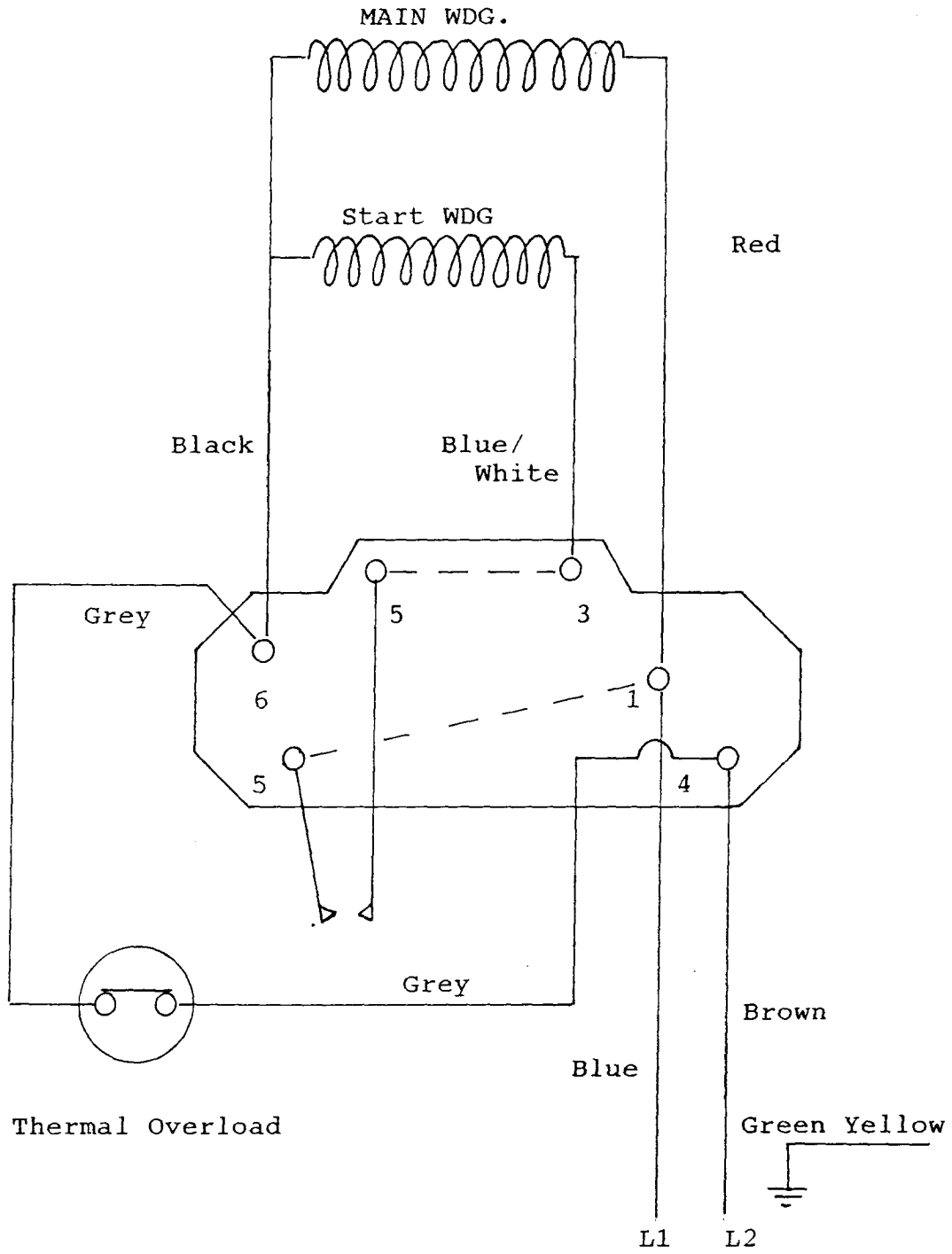


- | | | |
|-----|-------------|----------------------|
| 1. | SUC81500022 | Seal - Oil |
| 2. | SUC81500023 | Plate - Inner |
| 3. | MUL81500033 | 'O' Ring |
| 4. | SUC84100023 | Assy. Pump Body |
| 5. | SUC83100027 | Vanes |
| 6. | SUC81500137 | Plate - Ported Cover |
| 7. | MUL81500034 | 'O' Ring |
| 8. | SUC84100045 | Assy. Oil Tank Cover |
| 9. | MUL91000711 | Drain Cock |
| 10. | SUC83100026 | Rotor - Pump |
| 11. | SUC83100095 | Ring - Control |

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SCHEMATIC DIAGRAM OF MOTOR



Cleaning/Sterilisation Procedures

1. Housing

Clean with a damp soapy disinfected cloth and wipe over. NEVER use an abrasive cleaning agent, as this will scratch the plastic.

2. Suction Tubing

Autoclave to a maximum of 121°C. Higher temperature may result in the tubing not regaining its original memory.

3. Collection Jars

Place jar upright or upside down in autoclave (not on it's side) and autoclave to a maximum of 136°C. A hot soapy water solution may also be used.

NOTE:

The use of chemical cleaning agents on plastics will eventually reduce the expected performance of that item.

4. Bung

Disconnect float cage and float from Bung. Place all items in autoclave and sterilise at a maximum of 136°C.

A hot soapy water solution may also be used.

CLEMENTS STANSEN MEDICAL

WARRANTY AND SERVICE POLICY

- I. Clements Stansen Medical warrants, to the original owner/purchaser, the SUC84100 Suction Pump to be free of defects in material and workmanship for a period of twelve (12) months from the date of shipment. This warranty covers all parts and labour charges for the twelve (12) months period. Additionally, should on-site repairs be deemed necessary, Clements Stansen Medical will bear all travel related expenses for a Clements Stansen Medical customer service representative during the first thirty (30) days of the warranty period.

Alternatively, the customer may elect to ship the instrument or component, freight prepaid, to Clements Stansen Medical Service Centre for repairs.

After the initial thirty (30) day period the warranty is factory based (customer pays incoming freight only).

Replacement assemblies can be provided on an exchange basis. Clements Stansen Medical will provide the technical assistance necessary to locate and correct defective assemblies.

- II. No other warranty is expressed or implied. The liability of Clements Stansens Medical does not extend to consequential damages.
- III. Specific conditions and limitations of this warranty are as follows:
- * Any equipment not manufactured by Clements Stansen Medical shall retain its manufacturer's warranty.
 - * Those items consumed through normal, usage, are not warranted.
 - * Malfunctions resulting from obvious abuse, negligence, unauthorised modification or from exceeding any instrument specification are not warranted.
- IV. Clements Stansen Medical reserves the right to change the design or construction of its products without incurring any obligation to make such changes to units previously shipped.
- V. Replacement parts and instrument repairs are warranted for a period of sixty (60) days, and in no way extend the warranty of the instrument beyond its normal twelve (12) month period.

CLEMENTS STANSEN MEDICAL BRANCHES

In communication with Branches, it is essential that both catalogue and serial number of the machine be quoted, as components are continually being improved and changed.

Any problem concerning the servicing of products should be directed to the Service Centre in your state as listed below:-

| | | |
|---------------------------------------|--------------------------------------|--------------------------------------|
| N.S.W. SERVICE DEPT. "CLEMSERV" | 50 JOHN STREET RYDALMERE NSW 2116 | PH: (02)638.5577 FAX:(02)684.2440 |
|---------------------------------------|--------------------------------------|--------------------------------------|

| | | |
|--------------------------------|--|--|
| HEAD OFFICE (MANUFACTURING) | 109 WICKS ROAD, NORTH RYDE NSW 2113 | PH: (02)888.1555 PH: (02)887.2166 PH: (02)887.3377 FAX:(02)888.6018 TLX:AA24457 CLEMED |
|--------------------------------|--|--|

| | | |
|----------------------------|---------------------------------------|---|
| N.S.W. SALES CLEMED | 28 CORUNNA ROAD, EASTWOOD NSW 2122 | PH: (02)858.5800 FAX:(02)804.6885 TLX:AA24457 |
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| VICTORIA | 69/73 CUBITT STREET RICHMOND VIC 3121 | PH: (03)429.3533 FAX:(03)429.3743 |
|----------|--|--------------------------------------|

| | | |
|------------|--|--------------------------------------|
| QUEENSLAND | 59 ROBERTSON STREET FORTITUDE VALLEY QUEENSLAND 4006 | PH: (07)2529.855 FAX:(07)2529.139 |
|------------|--|--------------------------------------|

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|----------------------|---|--------------------------------------|
| WESTERN AUSTRALIA | 21 ROBERTS STREET OSBORNE PARK WA 6017 | PH: (09)443.1788 FAX:(09)443.1817 |
|----------------------|---|--------------------------------------|

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|--------------------|--------------------------------------|--------------------------------------|
| SOUTH AUSTRALIA | 54 SHELDON STREET NORWOOD SA 5067 | PH: (08)363.1099 FAX:(08)363.0075 |
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OVERSEAS:

Overseas users should contact their local distributor.

If there is no local distributor, please contact
Head Office:- New South Wales, AUSTRALIA.