EBSRAY PUMPS

Rotary Sliding Vane Pump
V Series—Model V20

Positive Displacement—Self Priming Pumps
for General Purpose Industrial Applications

EBSRAY PUMPS PTY. LIMITED,
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Cables: EBSRAY BROOKVALE.

EBSRAY AUSTRALIA
V Series—Model V20
Rotary Sliding Vane Pump

Designed and precision built for efficient transfer of a variety of liquids having lubricating or non-lubricating characteristics.

**Performance Data**
- **Flow to**: 430 Lit/min (7.2 Lit/sec)
- **Differential Pressure to**: 850 kPa
- **Viscosity Range**: 1 to 10,000 cSt
- **Temperatures to**: 100°C

**Features**
- Quiet Operation
- High Overall Efficiency
- Low Maintenance — Long Life
- Easy Pull Out Construction
- Replaceable Internal Wearing Parts
- Direct Coupling to Synchronous Speed Motors
- Rotation to suit Fluid Flow C.W. or C.C.W.
- Variable Mounting Orientation
- Lightweight — Robust — Compact
- Vanes Positively Actuated
- Integral Adjustable Bypass Valve

**Typical Services**
- Transport Tanker Services
- Petroleum and Fuel Oil Industries
- Liquified Gas Industry
- Chemical and Pharmaceutical Industries
- Power Stations
- Paint Industry
- Public Utilities
- Edible Oil Industry

**Common Liquid Applications**
- Fuel Oils
- Lube Oils
- Distillate
- Petrol
- Kerosene
- L.P. Gas
- Transformer Oils
- Solvents
- Chemicals
- Vegetable Oils
- Paints

**Assured Performance**
ALL EBSRAY V SERIES MODEL V20 pumps are run tested prior to despatch thus guaranteeing performance in accordance with the pump specifications.
The design features of the pump enable reliable operation over a long working life, and trouble-free service expectancy is achieved by utilizing low maintenance components within the pump.
EBSRAY spare parts are closely tolerated ensuring quick replacement and interchangeability. All standard spare parts are readily available thus guaranteeing continuity of pump maintenance services.

**Special Constructions**
Contact EBSRAY or your local representative for advice on alternate arrangements to meet applications not outlined in this catalogue.
EBSRAY Pumps are all designed and manufactured in AUSTRALIA.
Variations of Construction

To meet specific duties ‘EBSRAY’ have introduced a number of variations as standard to their V Series Model V20 (Refer Table). As well as these standard variations ‘EBSRAY’ or your local representative can advise on alternate non standard constructions.

<table>
<thead>
<tr>
<th>Type</th>
<th>Body</th>
<th>Bearings</th>
<th>Shaft Seals</th>
<th>Porting Flanges</th>
<th>Bypass Valve</th>
<th>Shaft</th>
<th>Trim and Elastomers</th>
<th>Main Materials of Construction</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>AL</td>
<td>2BB</td>
<td>2MS</td>
<td>ADP1</td>
<td>POP</td>
<td>SS</td>
<td>STD</td>
<td>AL, Br, C.I.</td>
<td>Preferred</td>
</tr>
<tr>
<td>22</td>
<td>Cl</td>
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</tr>
<tr>
<td>31</td>
<td>AL</td>
<td>1BB/1SB</td>
<td>1MS</td>
<td>ADP1</td>
<td>POP</td>
<td>ZH</td>
<td>STD</td>
<td>AL, Br, C.C.I.</td>
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<td>32</td>
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</tr>
<tr>
<td>41</td>
<td>AL</td>
<td>1BB/1SB</td>
<td>LS</td>
<td>ADP1</td>
<td>POP</td>
<td>ZH</td>
<td>STD</td>
<td>AL, Br, C.C.I.</td>
<td>Preferred</td>
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<tr>
<td>42</td>
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<td>43</td>
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</tbody>
</table>

Abbreviations:
- Al: Aluminium
- C.I.: Cast Iron
- Br: Bronze
- C: Carbon
- S.S.: Stainless Steel
- S.B.: Sleeve Bearing
- M.S.: Mechanical Seal
- L.S.: Lip Seals
- B.B.: Ball Bearing
- ADP1: Adapter Flange
- ZH: Zone Hardened
- Pop: Poppet
- BAL: Hydraulically Balanced
- STD: Carbon Steels, Nitrile and Ylkon Rubbers

Integral Balanced Bypass Valve

Exclusive pressure reducing characteristics for relief on sensitive systems. Fully adjustable and reversible for change of rotation and flow direction. (An optional extra).

Patented 'Pulse Flow System'

Flow lubrication and cooling of sleeve bearing is assured under all operating conditions. Pressure differential within the pump forces fluid through the bearing ducts as the vane slot within the rotor passes over the collector cell. The displacement elements regulate pulses of fluid into the bearing ducts. The 'Pulse Flow' eliminates a continuous path between suction and discharge chambers thus maintaining optimum suction lift capabilities.

Shaft Sealing

Pressure in seal zone is minimised by diverting flow via internal pressure relief ducts utilising the pressure differential of the pump. By effecting a long and short plug screw changeover low pressure is maintained on shaft seals when drive rotation (and fluid flow) is reversed.

Australian Patent No. 33668/78.
Example
Flow 300 Lit/min
Differential Pressure 100 kPa
Viscosity 1 cSt

Select 1 cSt graph. Trace 300 Lit/min horizontally to its point of intersection with 100 kPa FLOW curve. Read required pump speed directly below, i.e. 690 Rev/min. Transfer vertically upwards to point of intersection with 100 kPa POWER INPUT curve. Read off required POWER INPUT, i.e. 0.85 kW. Motor selection 1.1 or 1.5 kW at indicated speed or direct coupled to 720 Rev/min synchronous speed motor.
High Pump Efficiency

Being of the "Sliding Vane Principle" all EBSRAY V SERIES pumps will operate efficiently over a wide range of pressures, viscosities and speeds.

A typical illustration is shown in the diagram opposite, and under ideal conditions it is possible to attain higher efficiency than indicated here.

The diagram shows a typical performance of V SERIES MODEL V20.

Speed = 720 Rev/min
Kinematic Viscosity = 1 cSt

Application Data (Recommended maximums)

<table>
<thead>
<tr>
<th>pump model</th>
<th>flow lit/min</th>
<th>speed rev/min</th>
<th>differential pressure kPa</th>
<th>viscosity sSt</th>
<th>temperature ºC</th>
<th>nom. port size mm</th>
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<tbody>
<tr>
<td>V15</td>
<td>330</td>
<td>1440</td>
<td>650</td>
<td>10,000</td>
<td>100</td>
<td>50</td>
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<tr>
<td>V20</td>
<td>430</td>
<td>960</td>
<td>650</td>
<td>10,000</td>
<td>100</td>
<td>55</td>
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<tr>
<td>V30</td>
<td>950</td>
<td>960</td>
<td>650</td>
<td>10,000</td>
<td>100</td>
<td>75</td>
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<tr>
<td>V35</td>
<td>1300</td>
<td>960</td>
<td>659</td>
<td>10,000</td>
<td>100</td>
<td>88</td>
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<tr>
<td>V40</td>
<td>2000</td>
<td>720</td>
<td>650</td>
<td>10,000</td>
<td>100</td>
<td>100</td>
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<tr>
<td>V60</td>
<td>3800</td>
<td>720</td>
<td>659</td>
<td>10,000</td>
<td>100</td>
<td>150</td>
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<tr>
<td>V80</td>
<td>6200</td>
<td>500</td>
<td>659</td>
<td>10,000</td>
<td>100</td>
<td>200</td>
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</tbody>
</table>

Notes

1. POWER INPUT (kW) specified is measured under precisely controlled testing conditions of speed, kinematic viscosity and differential pressure. Any variation in these parameters will alter POWER INPUT. Therefore adequate allowances must be made over and above POWER INPUTS indicated for losses due to drives, couplings, gearboxes, etc, as well as margins for variables such as viscosity change, bypass valve overpressure when determining motor power required.

2. SPEED (Rev/min) specified is the safe recommendation which the pump can attain when delivering full flow at the stated viscosity. Refer performance graphs.

3. For parameters outside those printed above contact EBSRAY or representative for details.
### Parts Designation V Series Model V20 Type 21

![Diagram of V Series Model V20 Type 21]

When ordering spare parts, PUMP SERIAL NUMBER must be quoted to ensure correct material replacement to original specification.

### Parts List and Material Code

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>V20-21</th>
<th>V20-31</th>
<th>V20-41</th>
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<td>100</td>
<td>Body</td>
<td>AL601</td>
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<td>Vane Assembly</td>
<td>C1-12</td>
<td>C1-12</td>
<td>C1-12</td>
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<tr>
<td>167</td>
<td>Weirplate</td>
<td>C1-12</td>
<td>C1-12</td>
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<tr>
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<td>Vane</td>
<td>Synthetic</td>
<td>Synthetic</td>
<td>Synthetic</td>
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<tr>
<td>113</td>
<td>Vane Push Rods</td>
<td>C1-12</td>
<td>C1-12</td>
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<td>D.E. Bearing Housing</td>
<td>AL601</td>
<td>AL601</td>
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<td>D.E. Bearing Housing</td>
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<td>Ball Bearing</td>
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<td>S17L14</td>
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<td>C1-12</td>
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</table>

* Refer inset B.P.V. Bypass Valve

### Optional Balanced Bypass Valve Assembly

![Diagram of Optional Balanced Bypass Valve Assembly]

1. **408**
2. **407**

### V Series Model V20 Type 31

![Diagram of V Series Model V20 Type 31]

### V Series Model V20 Type 41

![Diagram of V Series Model V20 Type 41]

### Parts List and Material Code

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
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<th>V20-31</th>
<th>V20-41</th>
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<tbody>
<tr>
<td>304</td>
<td>I.E. Bearing</td>
<td>(Ball Bearing)</td>
<td>Carbon</td>
<td>Carbon</td>
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<td>305</td>
<td>Spacer—I.E. Bearing</td>
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<td>N.A.</td>
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<td>313</td>
<td>Extractor Plate</td>
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<td>S12L14</td>
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<td>Cover—B.P.V. Housing</td>
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<td>AL601</td>
<td>AL601</td>
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<tr>
<td>403</td>
<td>B.P.V. Adjusting Screw</td>
<td>C.M. Steel</td>
<td>C.M. Steel</td>
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<td>404</td>
<td>LOCK Nut B.P.V. Adjusting Screw</td>
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<td>G.M. Steel</td>
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<td>410</td>
<td>Valve Seat—B.P.V.</td>
<td>52—30</td>
<td>52—30</td>
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<td>412</td>
<td>Spring—B.P.V.</td>
<td>Spring Steel</td>
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<td>S17L14</td>
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<td>STC</td>
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* Refer inset I.E. Inspection End

### N.A. Not Applicable

**D.E. Drive End**
Dimensions V Series Model V20

Bare Shaft Pump

<table>
<thead>
<tr>
<th>Pump Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Approx. Bare Shaft Pump Wgt. (kg)</th>
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<td></td>
<td></td>
<td></td>
<td>Alum. Const.</td>
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<td>8</td>
<td>4</td>
<td>65</td>
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<td>V20-30</td>
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<td>V20-40</td>
<td>25</td>
<td>4</td>
<td>1</td>
<td>63</td>
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</table>

Notes: Bypass valve adjusting screw position - C.W. rotation - opposite drive end; C.C.W. rotation - drive end. All drawing and dimensions are typical only. Not certified for construction. Certified drawings available on request.

Pump Units

Materials of Construction

<table>
<thead>
<tr>
<th>Code</th>
<th>Materials</th>
<th>Specification</th>
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<tr>
<td>AL313</td>
<td>Aluminium</td>
<td>AS1874</td>
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<tr>
<td>AL501</td>
<td>Aluminium</td>
<td>AS1874</td>
</tr>
<tr>
<td>CI-12</td>
<td>Cast Iron</td>
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<tr>
<td>CI-12-14</td>
<td>Continuous Cast Iron</td>
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</tr>
<tr>
<td>Br</td>
<td>Bronze</td>
<td>AS1646</td>
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<tr>
<td>SG1-30</td>
<td>Spheroidal Graphite Iron</td>
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<tr>
<td>431</td>
<td>Stainless Steel</td>
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<td>CS1040</td>
<td>Steel</td>
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<td>AS1442</td>
</tr>
<tr>
<td>STQ</td>
<td>Carbon/Nirosta</td>
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Notes: Equivalent or upgraded materials may be substituted at the manufacturer's discretion. Alternative materials to specification upon request.

Standard Porting Configurations
EBSRAY’s Range of Liquids Transfer Pumps

**Internal Gear Pumps**
- **HD Series**
  - Q to 39 Lit/sec
  - P to 2,000 kPa
  - ν to 100,000 cSt
- **MD Series**
  - Q to 19 Lit/sec
  - P to 1,300 kPa
  - ν to 100,000 cSt

**LD Series**
- Q to 22 Lit/sec
- P to 700 kPa
- ν to 100,000 cSt

**Z Series**
- Q to 0.4 Lit/sec
- P to 2,000 kPa
- ν to 10,000 cSt

**Lobe Pumps**
- **L Series**
  - Q to 83 Lit/sec
  - P to 2,000 kPa
  - ν to 1,000,000 cSt
- **T Series**
  - Q to 30 Lit/sec
  - P to 2,000 kPa
  - ν to 1,000,000 cSt

**Vane Pumps**
- **V Series (Sliding)**
  - Q to 100 Lit/sec
  - P to 850 kPa
  - ν to 10,000 cSt
- **B Series (Swinging)**
  - Q to 13 Lit/sec
  - P to 700 kPa
  - ν to 2,000 cSt

**Regenerative Pumps**
- **TT5 Series**
  - Q to 2 Lit/sec
  - H to 180m
  - ν to 50 cSt
- **TT4 Series**
  - Q to 13 Lit/sec
  - H to 250m
  - ν to 50 cSt

**Compressor Vacuum Pumps**
- **CV Series**
  - Capacity to 47 Lit/sec
  - Pressure to 105 kPa
  - Vacuum to 7 kPa (Abs)

**Distributed By**

EBSRAY PUMPS PTY. LTD.
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Cables: EBSRAY Brookvale.

Illustrations are typical only. All specifications and illustrations are subject to revision without notice.

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