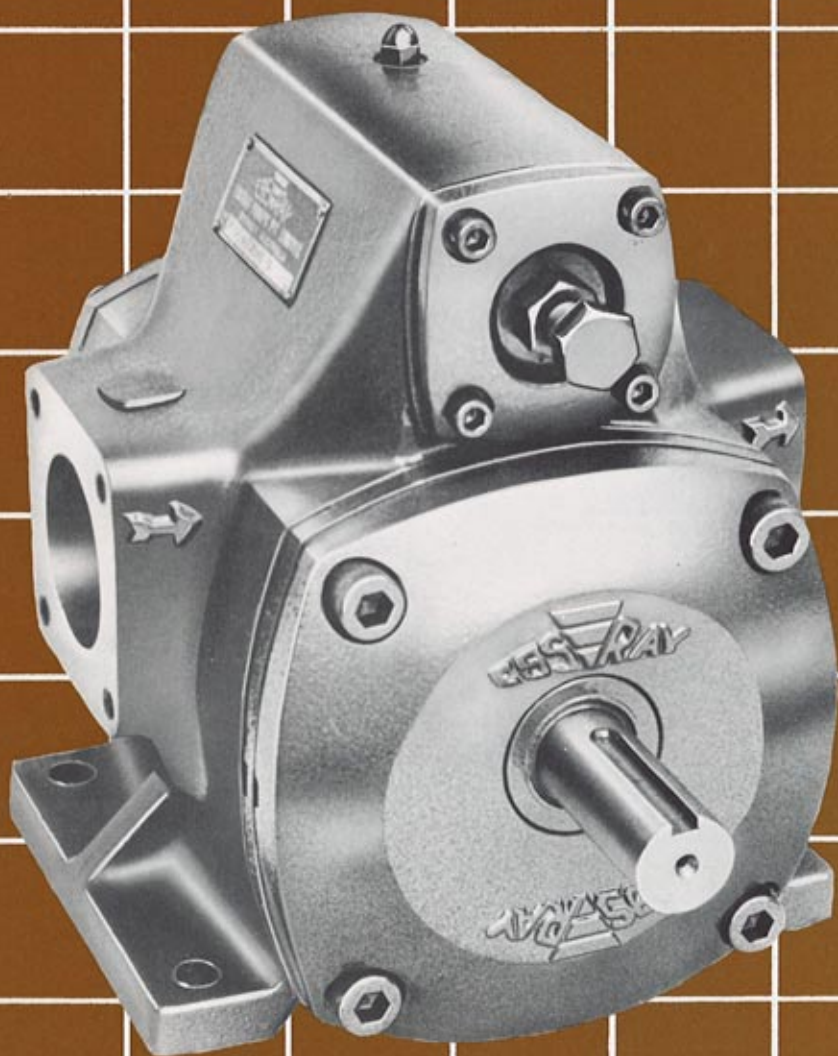


# EBSRAY PUMPS

Rotary Sliding Vane Pump  
V Series—Model V20

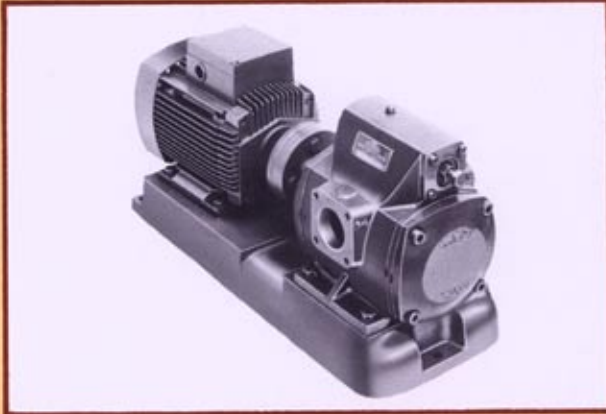


Positive Displacement—Self Priming Pumps  
for General Purpose Industrial Applications

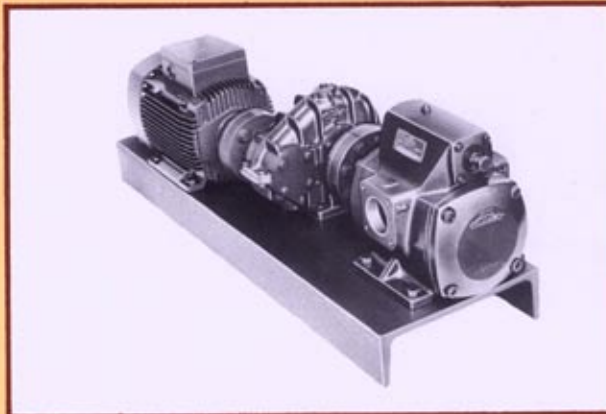
**EBSRAY**  
AUSTRALIA

EBSRAY PUMPS PTY. LIMITED,  
628 Pittwater Road, Brookvale,  
N.S.W. 2100. Australia.  
Telephone: (02) 93-0234. Telex: AA70131.  
Cables: EBSRAY BROOKVALE.





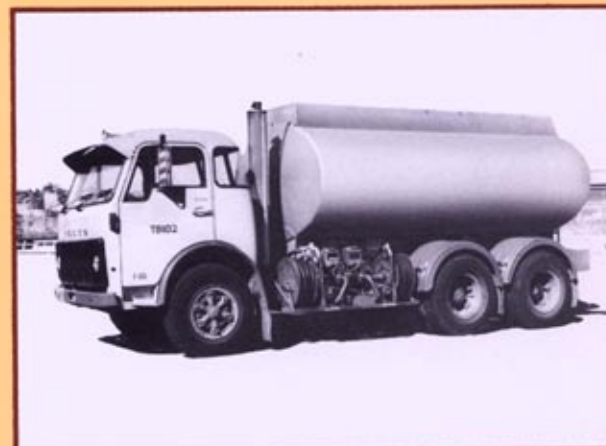
Direct Coupled Pump Units



Gearbox Drive Pump Units



Petrol or Diesel Engine Driven Units



Tanker Mounted Pumps

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  
Vaness 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	Transformer Oils
Lube Oils	Solvents
Distillate	Chemicals
Petrol	Vegetable Oils
Kerosene	Paints
L.P. Gas	

**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 toleranced 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.



# V Series Model V20 Rotary Sliding Vane Pump

## V20 — All Types

### Pipe Connections

- Welding type or screwed adaptor flanges available on standard pump porting configurations.

### Body

- High quality aluminium.
- High tensile cast iron.
- Special alloys to specification.

### Bypass Valve Assembly — All Types

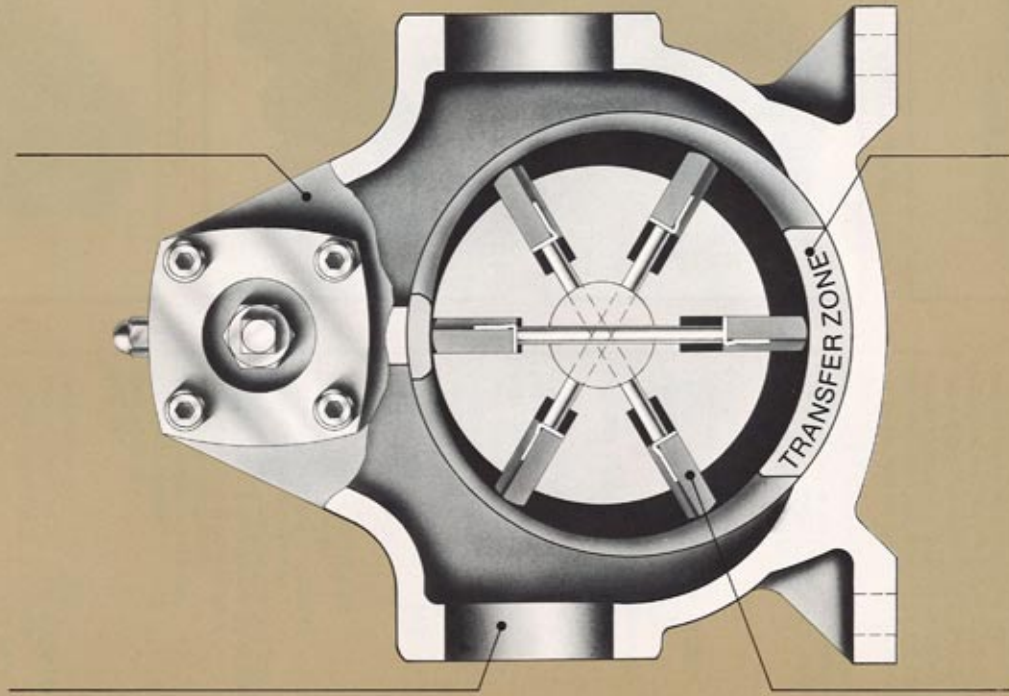
- Precise and easily adjustable setting designed to limit excessive pressure rise on full bypass.
- Repeatability assured (Standard poppet valve illustrated).

### Shaft Seals

- Two compact proven 'EBSRAY' balanced mechanical seals designed for simplicity, reliability and economy.
- Carbon against Niresist standard sealing faces.
- Lapped to precision tolerances.

### Drive Shaft

- Heavy duty, stainless steel — standard.
- Corrosion resistant.
- Precision ground.



### Vaness

- Synthetic — non metallic, fitted as standard.
- Self compensating for wear throughout long service life.
- Replacement without disturbing pipeline or driver.
- Efficient pumping is promoted and self priming greatly enhanced by hydraulic relief embossed in the vane.

### Liner

- Precise fit in body readily removed and replaceable.
- Close grained cast iron fitted as standard.
- Cam form liner provides concentric path for vane during transfer cycle eliminating sliding action of vane in rotor slot whilst subject to pressure load.
- Design features promote high efficiency and long life

### Drive End and Inspection End Covers

- Minimise dust, road grime and other extraneous materials from bearing zone.

### Accurate Fits

- Maintain positive alignment of bearings, rotor and seals ensuring reliable operation.

### Wearplates

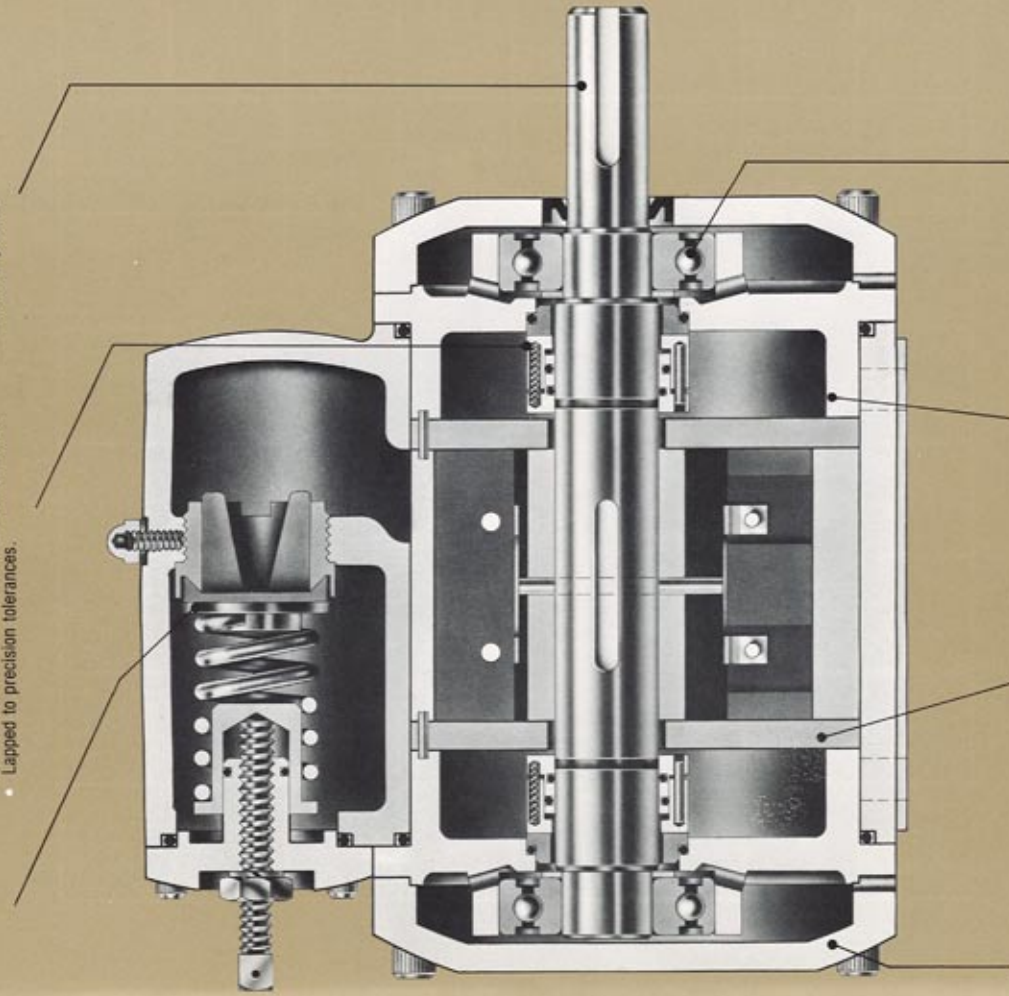
- Provide an economical replaceable wearing surface facing rotating elements of the pump.
- Close grained cast iron — standard.
- Precision ground.

### Drive End and Inspection End Bearing Housings

- Drain incorporated to protect bearings against the most minute pumpage seep (in all mounting positions).
- Provides positive location for bearings.

### Drive End and Inspection End Bearings

- Low maintenance — sealed grease packed ball bearings.
- Positive axial clearance positioning of pump rotor.
- Provides smooth running over a long working life.





## V20 — Type 30

### Flow Direction — all Types

- is changed by reversing pump rotation and effecting a simple reassembly of the pump (Refer Installation, Operation and Maintenance instructions).

### Shaft Seal

- A compact proven 'EBSRAY' balanced mechanical seal.
- Carbon against Niresist—standard sealing faces.
- Lapped to precision tolerances.

### Drive Shaft

- Heavy duty — zone-hardened in shaft seal and bearing areas.
- Precision ground.

### Positive Sealing on Body Faces — all Types

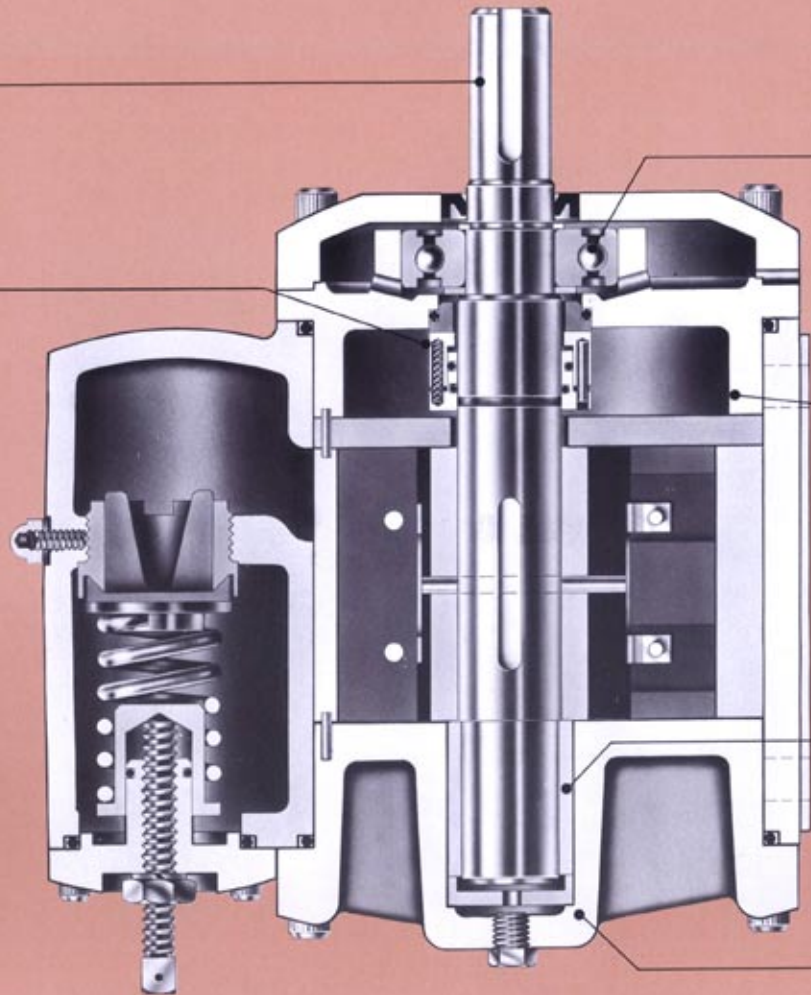
- All faces subject to pressure are 'O' ring sealed thus preventing leakage and facilitating simple maintenance.

### Shaft Seals

- Economical, bi directional, wave pattern contact radial lip seals.
- Pressure relieved and product flushed by integral duct returning to suction ensures long seal life.
- Readily replaceable.

### Drive Shaft

- Heavy duty — zone-hardened in shaft seal and bearing areas.
- Precision ground.



### Inspection End Bearing Housing

- Speedy removal by release of four high tensile set screws.

### Replacement Parts

- Precision machined to close tolerances assures interchangeability for fast on site service.

### Inspection End Bearing

- Carbon graphite—standard lubricating and non lubricating liquids
- Bearing cooling is facilitated by 'EBSRAY' patented 'Pulse Flow System', ensuring adequate circulation under all operating conditions.

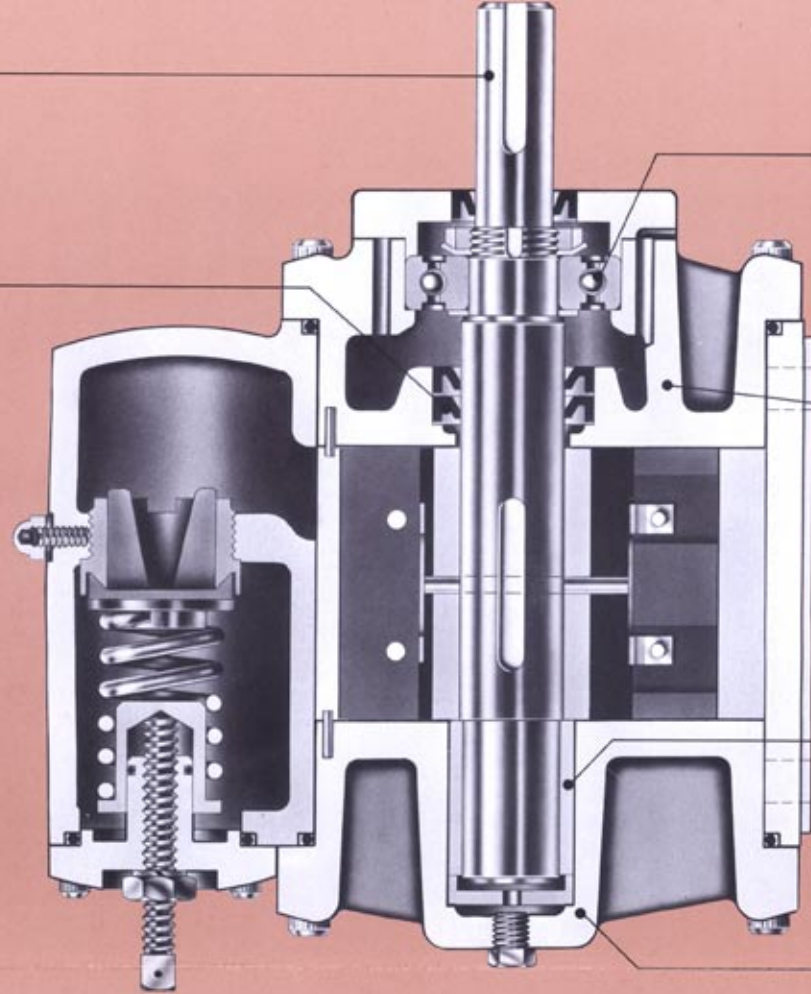
### Drive End Bearing Housing

- Drain incorporated to protect bearing against the most minute pumpage seep (in all mounting positions).
- Provides location for bearing.

### Drive End Bearing

- Low maintenance—sealed grease packed ball bearing.
- Positive axial clearance positioning of pump rotor.
- Provides smooth running over a long working life.

## V20 — Type 40



### Inspection End Bearing Housing

- Speedy removal by release of four high tensile set screws.

### Testing

- Each pump is run tested to guarantee performance in accordance with indicated curves.

### Inspection End Bearing

- Carbon graphite—standard lubricating and non lubricating liquids.
- Bearing cooling is facilitated by 'EBSRAY' patented 'Pulse Flow System', ensuring adequate circulation under all operating conditions.

### Drive End Bearing Housing

- Drain incorporated to protect bearing against the most minute pumpage seep.
- For inverted pump mounting, cap must be rotated to suit (Refer Installation, Operation and Maintenance instructions).

### Drive End Bearing

- Low maintenance—sealed grease packed Ball Bearing.
- Positive axial clearance positioning of pump rotor.
- Provides smooth running over a long working life.



# 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.

Type	Body	Bearings	Shaft Seals	Porting Flanges	Bypass Valve	Shaft	Trim and Elastomers	Main Materials of Construction	Remarks
21	AL	2BB	2MS	ADP <sup>1</sup>	POP	SS	STD	AL, Br, C.I.	Preferred
22	CI	"	"	"	"	"	"	"	Preferred
23	AL	"	"	"	BAL	"	"	"	—
24	CI	"	"	"	"	"	"	"	—
31	AL	1BB/1SB	1MS	ADP <sup>1</sup>	POP	ZH	STD	AL, Br, C, C.I.	Preferred
32	CI	"	"	"	"	"	"	"	—
33	AL	"	"	"	BAL	"	"	"	—
34	CI	"	"	"	"	"	"	"	—
41	AL	1BB/1SB	LS	ADP <sup>1</sup>	POP	ZH	STD	AL, Br, C, C.I.	Preferred
42	CI	"	"	"	"	"	"	"	—
43	AL	"	"	"	BAL	"	"	"	—

### Abbreviations:

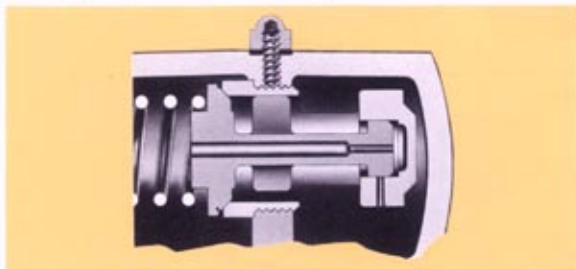
AL Aluminium  
C.I. Cast Iron  
Br. Bronze  
C. Carbon

S.S. Stainless Steel  
ZH Zone Hardened  
M.S. Mechanical Seal  
L.S. Lip Seals

B.B. Ball Bearing  
S.B. Sleeve Bearing-carbon standard  
ADP<sup>1</sup> Adaptor Flange

POP Poppet  
BAL Hydraulically Balanced  
STD Carbon Steels, Nitrile and Viton Rubbers

## Integral Balanced Bypass Valve



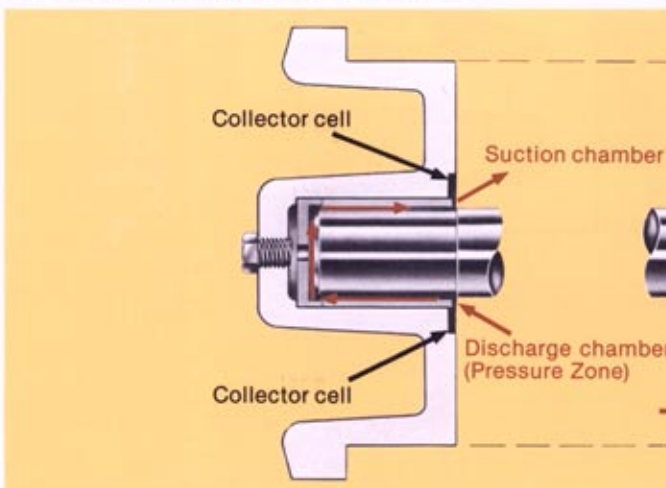
Exclusive pressure reducing characteristics for relief on sensitive systems. Fully adjustable and reversible for change of rotation and flow direction. **(An optional extra).**

## Shaft Sealing — Mechanical Seals



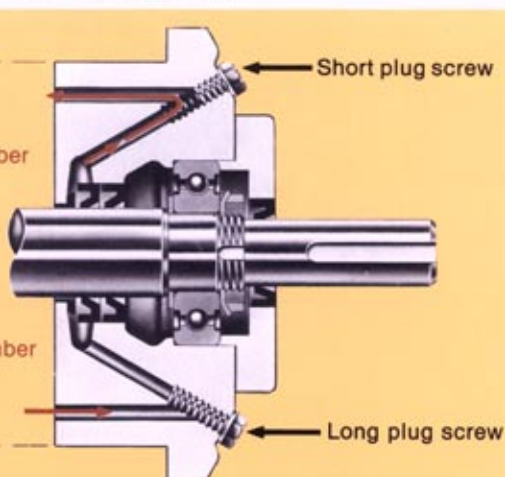
High quality precision component as illustrated. Standard sealing faces are carbon against Niresist using resilient compatible 'O' rings. Alternative materials, if necessary are available on request.

## 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

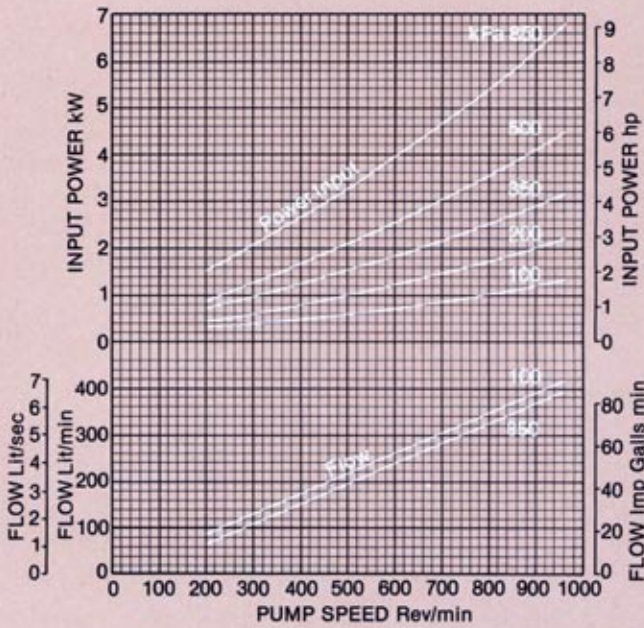


Pressure in seal zone is minimised by diverting flow via internal pressure relief ducts utilising the pressure differential of the pump. By effecting a long and short plug screw changeover low pressure is maintained on shaft seals when drive rotation (and fluid flow) is reversed.

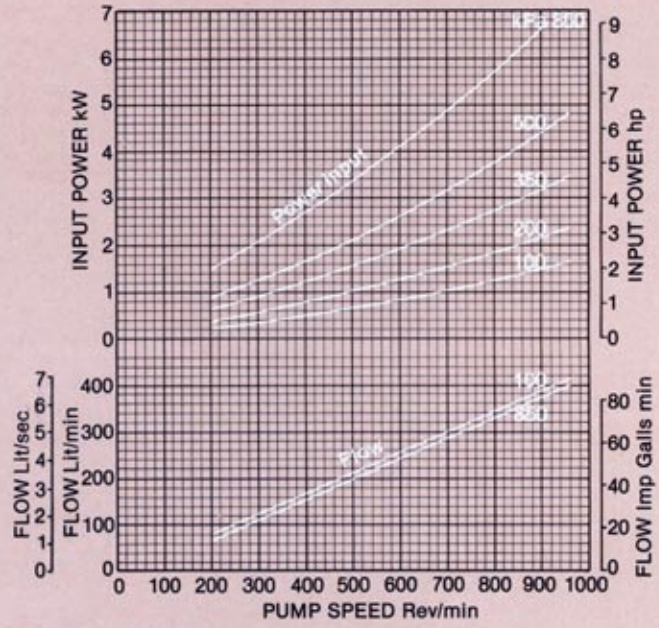


# V Series Model V20 Performance Data

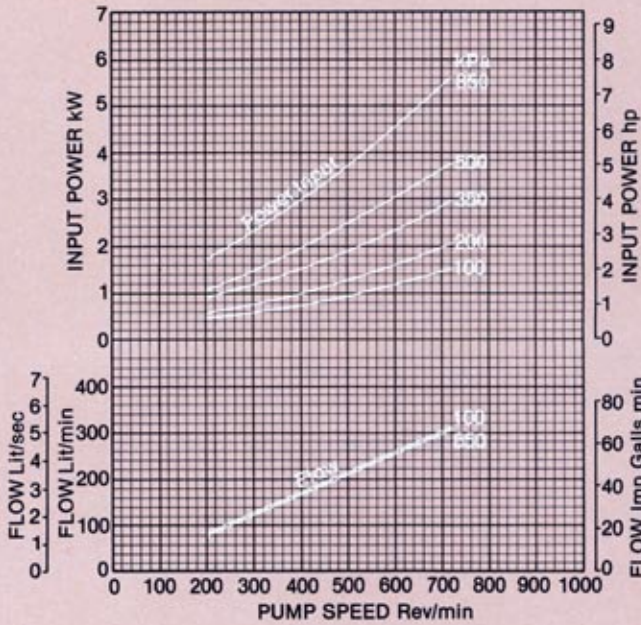
1cSt



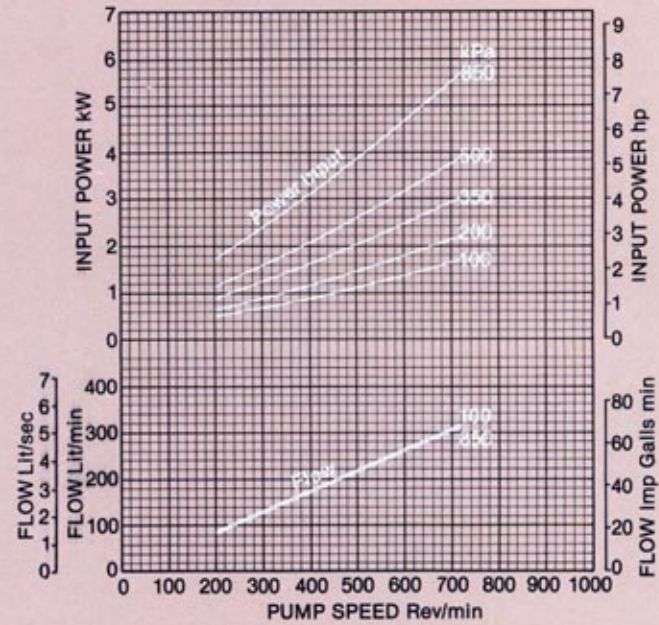
10cSt



100cSt



500cSt



**Example**

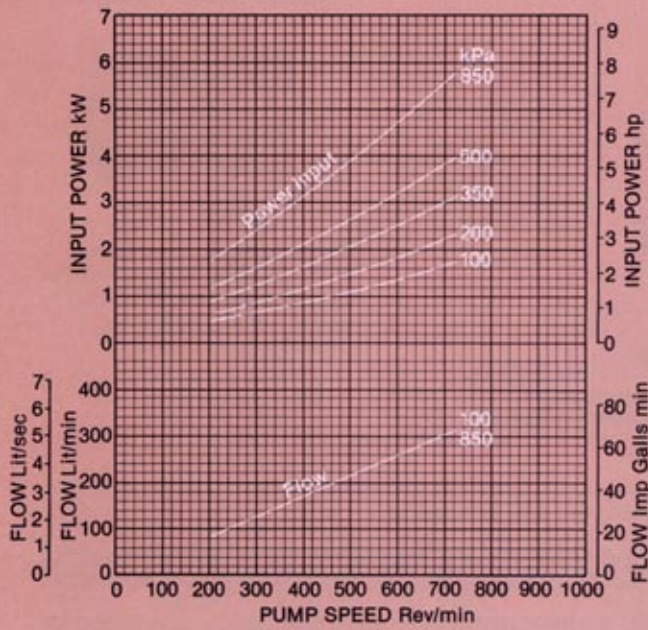
Flow 300 Lit/min  
 Differential Pressure 100 kPa  
 Viscosity 1 cSt

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. 8

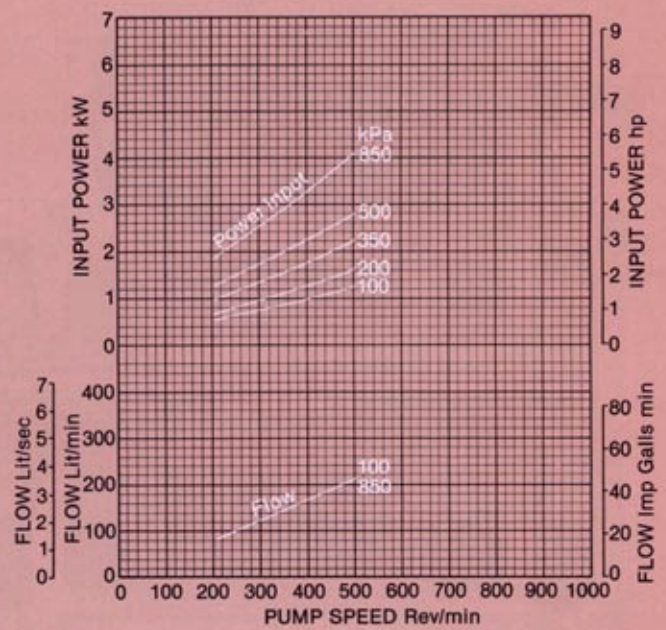


# V Series Model V20 Performance Data

1000cSt



2000cSt



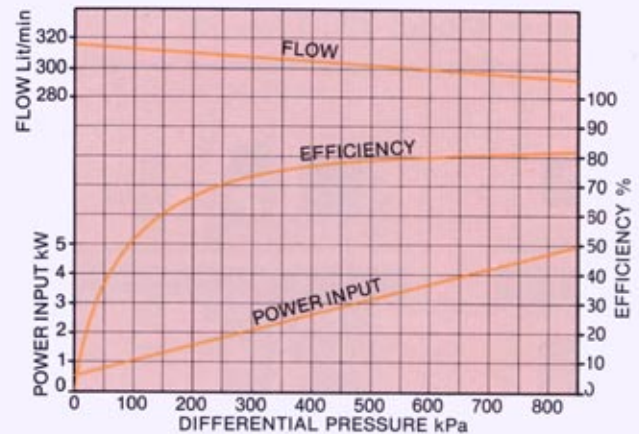
## High Pump Efficiency

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



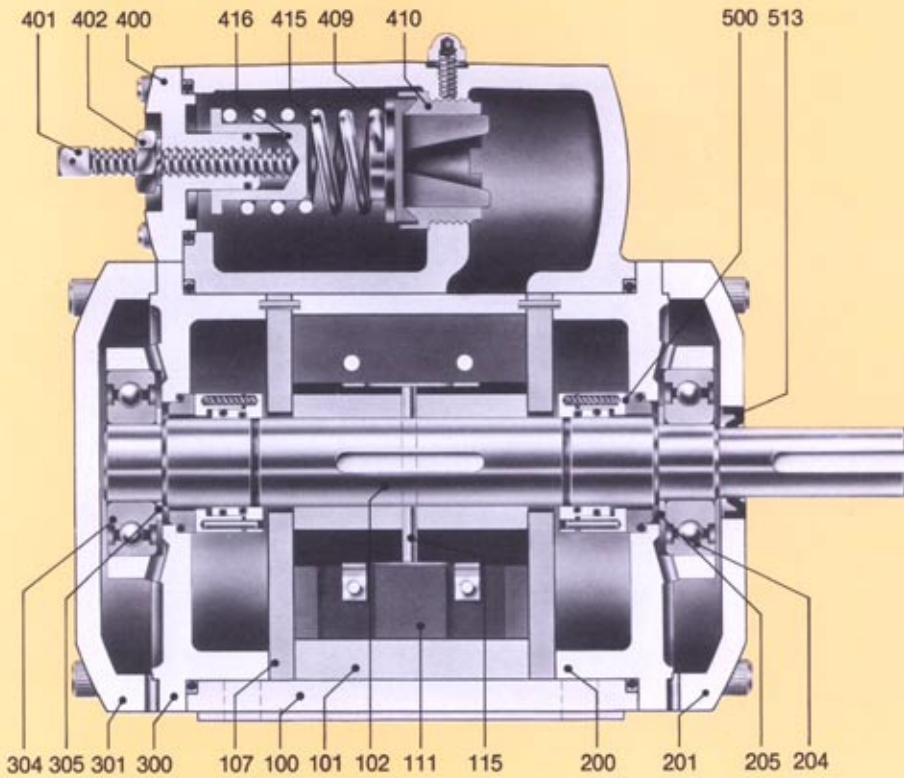
## Application Data (Recommended maximums)

pump model	flow lit/min	speed rev/min	differential pressure kPa	viscosity cSt	temperature °C	nom. port size mm
V15	330	1440	850	10,000	100	50
V20	430	960	850	10,000	100	55
V30	950	960	850	10,000	100	75
V35	1300	960	850	10,000	100	88
V40	2000	720	850	10,000	100	100
V60	3800	720	850	10,000	100	150
V80	6200	500	850	10,000	100	200

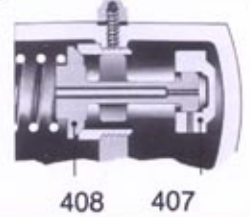
## Notes

- 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.
- SPEED (Rev/min) specified is the safe recommendation which the pump can attain when delivering full flow at the stated viscosity. Refer performance graphs.
- For parameters outside those printed above contact EBSRAY or representative for details.





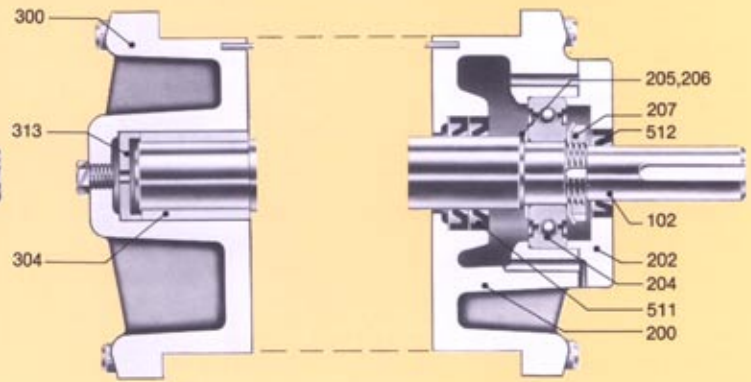
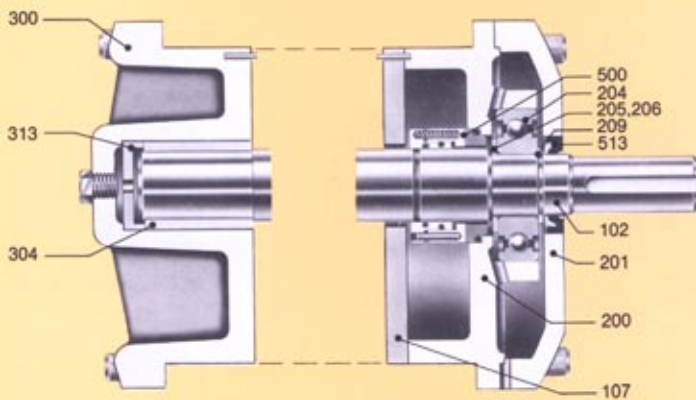
### Optional Balanced Bypass Valve Assembly



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

## V Series Model V20 Type 31

## V Series Model V20 Type 41



## Parts List and Material Code

Item No.	Description	V20-21	V20-31	V20-41	Item No.	Description	V20-21	V20-31	V20-41
100	Body	AL601	AL601	AL601	304	I.E. Bearing	(Ball Bearing)	Carbon	Carbon
101	Liner	CI-12	CI-12	CI-12	305	Spacer—I.E. Bearing	S12L14	N.A.	N.A.
102	Rotor/Shaft Assembly	CI-12-14/431	CI-12-14/K1050	CI-12-14/K1050	313	Extractor Plate	N.A.	S12L14	S12L14
107	Wearplate	CI-12	CI-12	N.A.	400	Cover—B.P.V. Housing	AL601	AL601	AL601
111	Vane	Synthetic	Synthetic	Synthetic	401	B.P.V. Adjusting Screw	C'ml Steel	C'ml Steel	C'ml Steel
115	Vane Push Rods	CS1040	CS1040	CS1040	402	Lock Nut-B.P.V. Adjusting Screw	C'ml Steel	C'ml Steel	C'ml Steel
200	D.E. Bearing Housing	AL601	AL601	CI-12	407*	Cartridge—B.P.V.	Br.	Br.	Br.
201	Cover—D.E. Bearing Housing	AL313	AL313	N.A.	408*	Bypass Valve—Balanced	Br.	Br.	Br.
202	Cap—D.E. Bearing Housing	N.A.	N.A.	CI-12	409	Bypass Valve—Poppet	Br.	Br.	Br.
204	D.E. Bearing	(Ball Bearing)	(Ball Bearing)	(Ball Bearing)	410	Valve Seal—B.P.V.	SGI-30	SGI-30	SGI-30
205	Spacer—D.E. Bearing	S12L14	S12L14	S12L14	415	Spring—B.P.V.	Spring Steel	Spring Steel	Spring Steel
206	Shims—D.E. Bearing	N.A.	Polyester	Polyester	416	Retaining Washer—B.P.V.	S12L14	S12L14	S12L14
207	Locking Nut—D.E. Bearing	N.A.	N.A.	C'ml Steel	500	Mechanic Seal Assy	STD	STD	N.A.
209	Circlip—D.E. Bearing	N.A.	C'ml Steel	N.A.	511	Oil Seal-D.E. Bearing Housing	N.A.	N.A.	Viton
300	I.E. Bearing Housing	AL601	CI-12	CI-12	512	Oil Seal-D.E. " " Cap	N.A.	N.A.	Nitrile
301	Cover—I.E. Bearing Housing	AL313	N.A.	N.A.	513	Oil Seal-D.E. " " Cover	Nitrile	Nitrile	N.A.

\* Refer Inset

I.E. Inspection End

N.A. Not Applicable

B.P.V. Bypass Valve

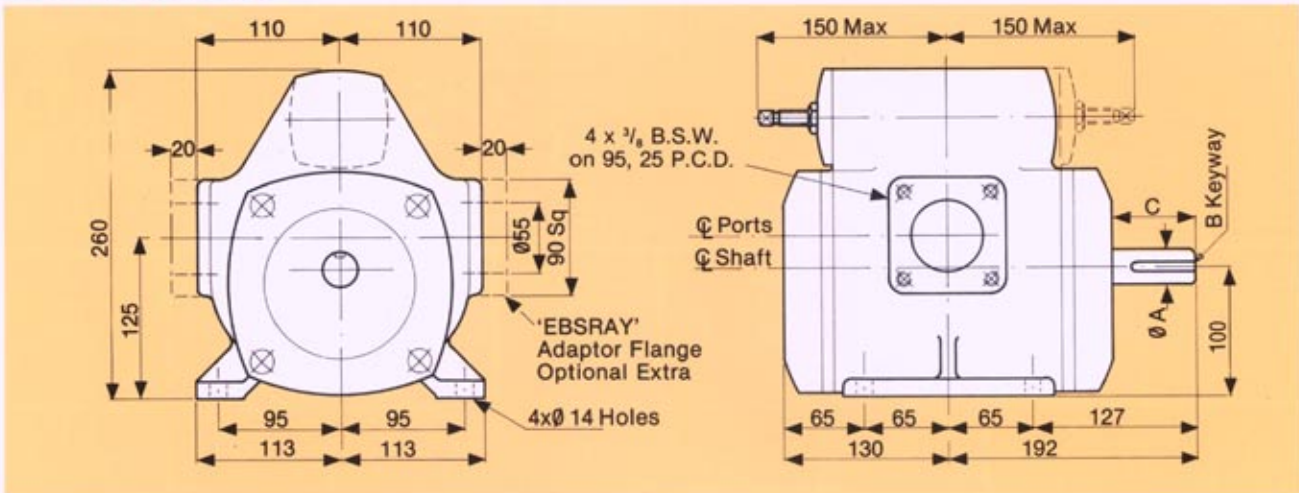
D.E. Drive End



# Dimensions V Series Model V20



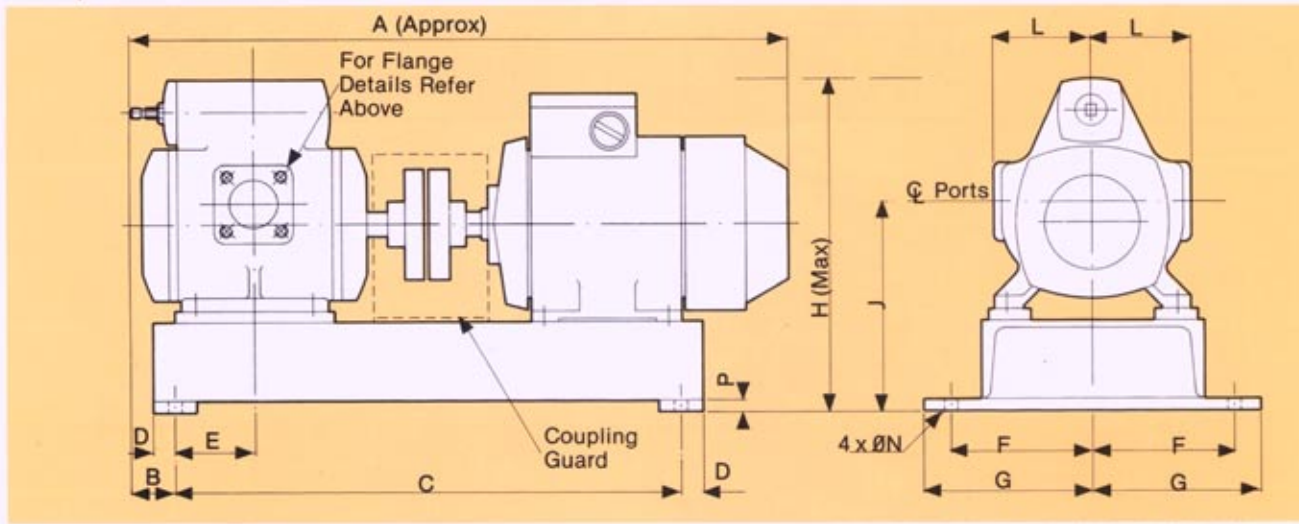
## Bare Shaft Pump



Pump Type	A	B	C	Approx. Bare Shaft Pump Wgt (kg)	
				Alum. Const.	C.I. Const.
V20-20	28	8 x 4	65	25	35
V20-30	25,4 (1")	6,3 x 3,6	60	37	39
V20-40	25,4 (1")	6,3 x 3,6	62	31	42

**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

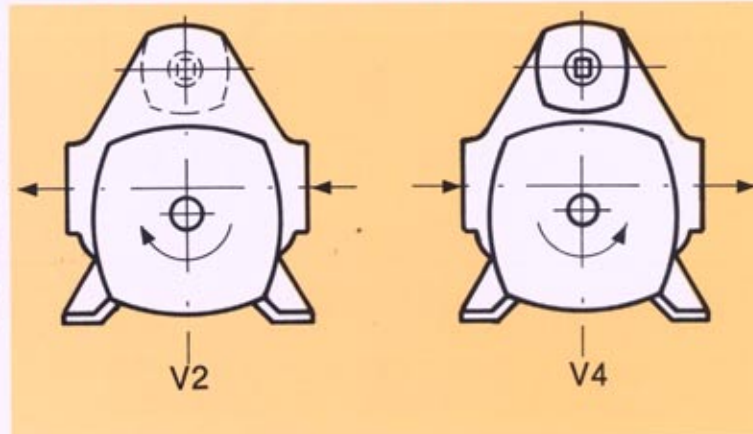


Motor Frame	A	B	C	D	E	F	G	H	J	L	N	P	Pump Unit Wgt (kg)	
112M	750	60	570	25	90	160	190	385	240	110	16	12	105	Approx.
132S	810	67,5	635	32,5	82,5	200	230	440	260	110	19	12	139	Unpacked
132M	845	67,5	635	32,5	82,5	200	230	440	260	110	19	12	152	Aluminium Pump
160M	975	72,5	775	37,5	77,5	230	265	515	305	110	19	16	221	Construction

## Materials of Construction

Code	Materials	Specification
AL313	Aluminium	AS1874
AL601	Aluminium	AS1874
CI-12	Cast Iron	AS1830
CI-12-14	Continuous Cast Iron	AS1830
Br.	Bronze	AS1565
SGI-3D	Spheroidal Graphite Iron	AS1831
431	Stainless Steel	ASG18
CS1040	Steel	AS1442
K1050	Steel	AS1442
S12L14	Steel	AS1442
STD	Carbon/Niresist	—

## Standard Porting Configurations



**Notes:** Equivalent or upgraded materials may be substituted at the manufacturer's discretion. Alternative materials to specification upon request.



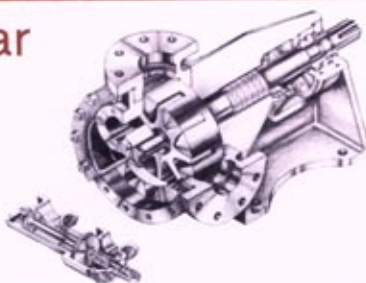
# EBSRAY's Range of Liquids Transfer Pumps



## Internal Gear Pumps

### HD Series

Q to 39 Lit/sec  
P to 2,000 kPa  
 $v$  to 100,000 cSt



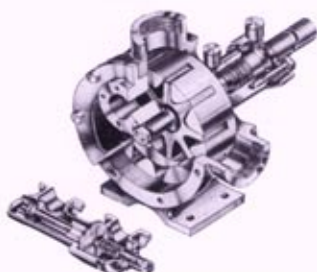
### MD Series

Q to 19 Lit/sec  
P to 1,300 kPa  
 $v$  to 100,000 cSt



### LD Series

Q to 22 Lit/sec  
P to 700 kPa  
 $v$  to 100,000 cSt



### Z Series

Q to 0.4 Lit/sec  
P to 2,000 kPa  
 $v$  to 10,000 cSt



## Lobe Pumps

### L Series

Q to 83 Lit/sec  
P to 2,000 kPa  
 $v$  to 1,000,000 cSt



### T Series

Q to 30 Lit/sec  
P to 2,000 kPa  
 $v$  to 1,000,000 cSt



## Vane Pumps

### V Series (Sliding)

Q to 100 Lit/sec  
P to 850 kPa  
 $v$  to 10,000 cSt



### B Series (Swinging)

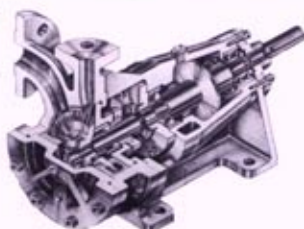
Q to 13 Lit/sec  
P to 700 kPa  
 $v$  to 2,000 cSt



## Regenerative Pumps

### TT5 Series

Q to 2 Lit/sec  
H to 180m  
 $v$  to 50 cSt



### TT4 Series

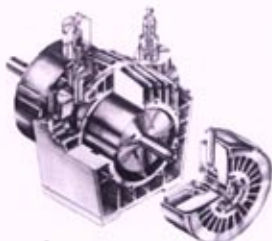
Q to 13 Lit/sec  
H to 250m  
 $v$  to 50 cSt



## 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.**

628 Pittwater Road,  
Brookvale, N.S.W. 2100, Australia.

Telephone: (02) 93 0234. Telex: AA70131.  
Cables: EBSRAY Brookvale.

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

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