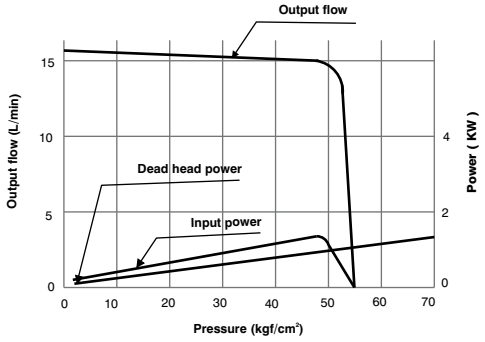
J - PVR - 1 17 - 55

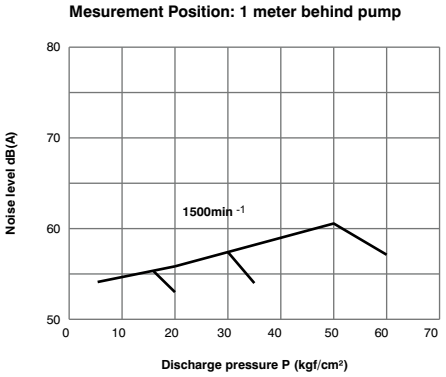
- **VELJAN**
- **Variable Displacement Vane Pump**
- **Series Code**
- **Flow Rate**
- **Maximum Adjusting Pressure**

JPVR 1 1755

Performance charecteristics

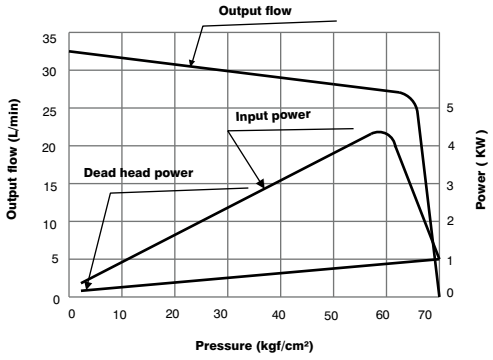


Noise Characteristics

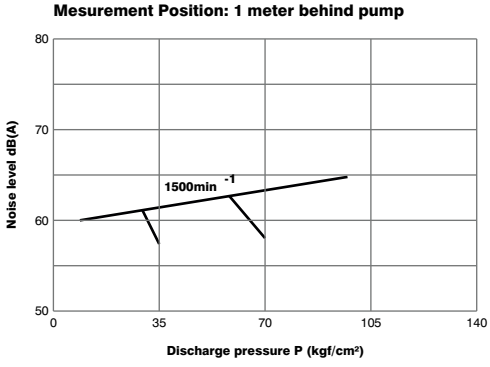


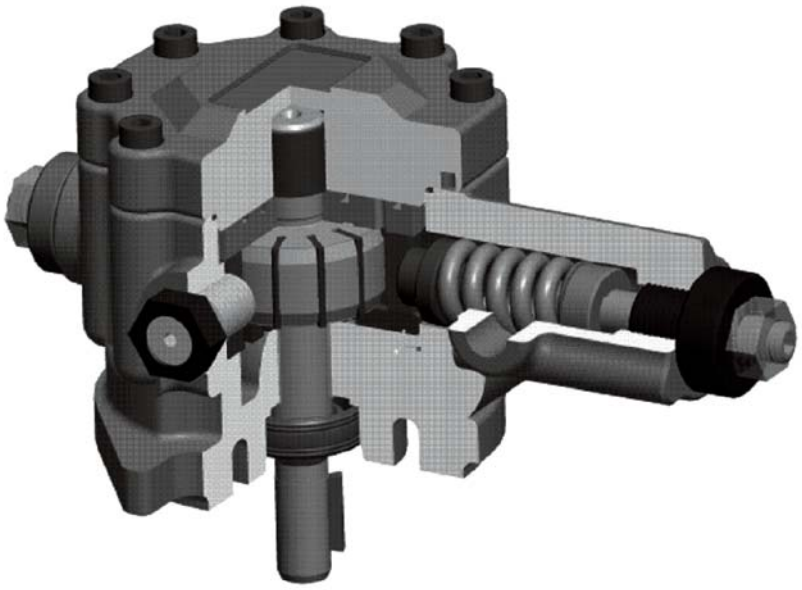
JPVR 1 3570

Performance charecteristics



Noise Characteristics





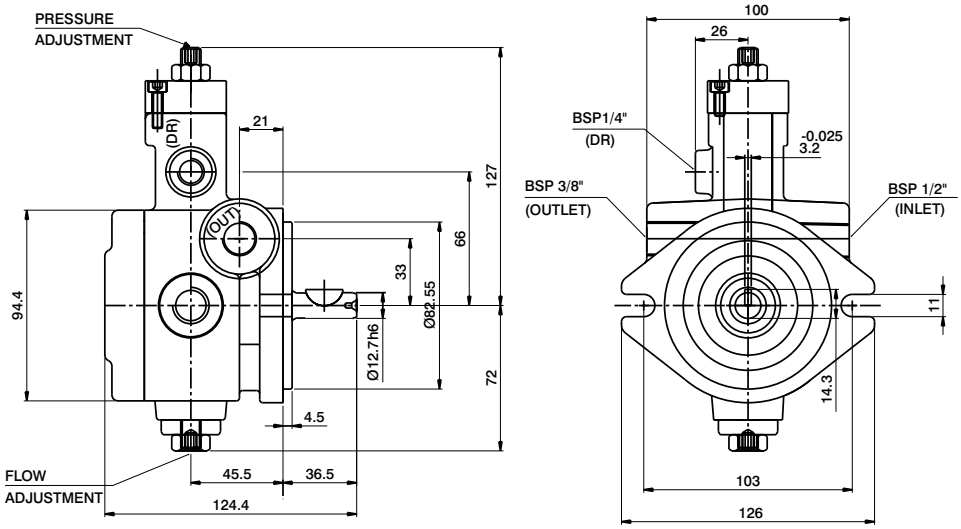
VVVP

GENERAL SPECIFICATIONS:

Model Code	Maximum Operating Pressure (bar)	Flow Rating (cm^3/rev)	Flow in l/min @1500 RPM under no load	Pressure Adjustment range (bar)	Shaft Speed Range (RPM)	Weight (kg)
JPVR1 10 20	20	6.7	10	10 - 20	800 - 1500	5
JPVR1 10 35	35			10 - 35		
JPVR1 10 55	55			10 - 55		
JPVR1 10 70	70			10 - 75		
JPVR1 17 20	20	11.1	17	10 - 20	800 - 1500	5
JPVR1 17 35	35			10 - 35		
JPVR1 17 55	55			10 - 55		
JPVR1 17 70	70			10 - 75		
JPVR1 25 20	20	16.7	25	10 - 20	800 - 1500	9
JPVR1 25 35	35			10 - 35		
JPVR1 25 55	55			10 - 55		
JPVR1 25 70	70			10 - 75		
JPVR1 35 20	20	22.2	35	10 - 20	800 - 1500	9
JPVR1 35 35	35			10 - 35		
JPVR1 35 55	55			10 - 55		
JPVR1 35 70	70			10 - 75		

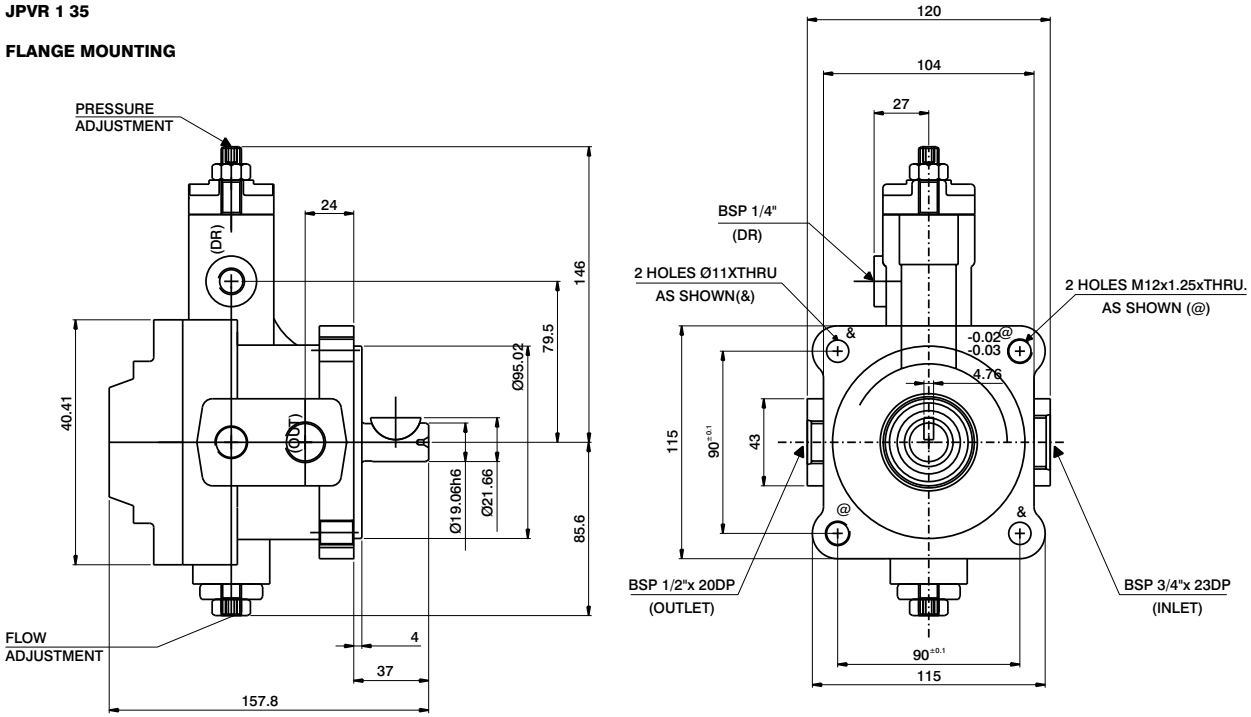
INSTALLATION DIMENSION DRAWINGS

JPVR 1 17
FLANGE MOUNTING



JPVR 1 35

FLANGE MOUNTING



VVVP

FEATURES:

High efficiency with minimum power loss

JPVR variable volume vane pumps are middle and low pressure vane pumps with pressure and flow compensation for maximum system efficiency. .Specially selected materials and precise machining of components provide out standing durability while minimizing power loss to provide users with significant energy savings.

Lower Noise

Super finished surfaces, well proven self Lubricating D.U. Bush bearings, and optimal suction and discharge port configurations reduce operating noise and vibrations.

Compact and Simple Design

These vane pumps are light and compact which makes them economical and easy to handle. Their simple design makes them suitable for a wide variety of hydraulic systems.

Precise characteristics :

Prompt response at both ON-OFF and OFF-ON ensures instantentaneous, stable and high precision operation.

APPLICATION

1. Power pack machine tools .
2. CNC lathe machine.
3. LPG cylinder filling.
4. Auto industries.

PUMP OPERATING PRINCIPLE

The variable volume vane pump consists of Housing, Cover plate, Integrated shaft with rotor, Vanes, Port plates, Ring, Spring, Pressure adjustment screw and Flow adjustment screw. Cross sectional drawings show how the ring provides variable volume and constant pressure.

As the rotor rotates with in the ring, the vanes are pressed against the inside diameter of the ring by centrifugal force. As the rotor turns clockwise, the volume between two adjacent vanes (chamber) increases at the suction port. When these chambers enter the discharge port area, the volume is reduced and forces the fluid out through the discharge port. When the system requirements are less than the maximum pump output, system pressure forces the ring against the spring reducing eccentricity and resulting in less flow. Maximum output occurs when the ring is in extreme eccentric position. When the system volume demand falls to zero, the system pressure drives the ring to a concentric position, there by changes the displacement to zero. Constant pressure from zero to full displacement is maintained by spring.

NOTE: DIRECTION OF ROTATION.

Note : Direction of rotation is clock wise when viewed from shaft end

TROUBLE SHOOT

VARIABLE DISPLACEMENT VANE PUMPS

VARIABLE VOLUME VANE PUMP
POSSIBLE FAULTS IN PUMP COMPONENTS AND THEIR CAUSES AND EFFECTS

COMPONENT NAME	CAUSES	EFFECTS
1. Oil seal	**1. Wear out**	a) Results in Oil leakage. b) If negative inlet pressure is present air will enter the pump
2. Integrated shaft with rotor	**1. Bad coupling**	a) When the shaft is not properly coupled, the shaft tries to rotate the shaft in the key way leading to Torsional Fatigue. b) If the coupling is not properly cleaned, and if dust particles get in resulting infrettage corrosion. It occurs, when the grease picks up grit and the small amplitude vibration makes the contaminated grease to act like sandpaper. That will weaken the structure of the component and will start the fatigue rupture.
	2. Hydraulic shock and excessive pressure	a) Where the shaft diameter is small ,the area is not enough to withstand the torsional stress generated by the higher pressure and hydraulic shocks.
	3. Cavitation	a) This is occurred when the pressure suddenly decreased . When the cavitation occurred the air bubble collapse on the metal surface and it creates a pitting corrosion on the rotor face.
3. Port plate	**1. Misalignment of port plate**	a) When the port plate alignment is improper dis symmetrical wear occurs on the port late.
	2. Misalignment of vanes	a) Parallel marks takes on the port plate because of 1. Tilted vanes marked the port plate but the pump did not rotate 2. Tilted vanes but the pump did rotate. The result is scars on the port plate.
	3. Improper cleaning	a) Due to this external parts (scrap, small particles of material)will entering and it creates scratches on port plate.
	4. Instant high pressure	a) If the instant high pressure is entering into the system that will leads to exceeded the mechanical Strength of the material. This will cause some dangerous failures of components such as port plate (i.e. on high pressure distribution area)
	5. Aeration	a) When some air brought into the system it will creates turbulence flow so it will unbalance the vanes .The unbalanced vanes get start to scratch the port plate. b) When the quantity of air is erratic or not really heavy this will scores the port plate in the suction area.
	6. Cavitation	a) Due to this port plate and rotor seizure b) When the air bubbles implode intense shock waves bombard the surface of the wear plates. The shock waves erode the plates surfaces on the high pressure side and trapping groove area. c) The presence of air can also reduce the volume of oil available to carry away heat that is produced by mechanical friction.

VARIABLE VOLUME VANE PUMP
POSSIBLE FAULTS IN PUMP COMPONENTS AND THEIR CAUSES AND EFFECTS

COMPONENT NAME	CAUSES	EFFECTS
4. Vanes	**1. Contamination of oil**	a) The particles in the fluid will have a grinding effect between the top of the vane lip and the cam ring profile. When the contaminant is too big or too stiff, the vane lip edges can break. b) The film of oil between the vanes and the rotor being contaminated, there will be a rubbing effect in this area. These rubbing marks (pollution marks) will be vertical and of the height of the vanes translation (displacement).
	2. Cycled over pressurization	a) This will give a fatigue failure on the long term. It is the sum of pressure exceeding limits that will weaken the mechanical strength of the components. When the rotor is rotating the vanes lips get wear.
	3. Unbalancing	a) When the vane losses balance, it results in very high instant acceleration of the pins and the pins during their radially inward movement may hit the rotor insert (ring) until it gets damaged finally damaging the shaft. b) Even the vane may also break c) Pump may also noisy d) Vanes wear out
	4. Improper cleaning and burrs on sides	a) Foreign bodies entering between the vane and vane slots in the rotor leads to create scratches and rupture the port plate. b) Some times vanes get seized in the rotor slot.
	5. Misalignment of vanes	a) It leads to unbalancing the vane and wear.
	6. Viscosity failure	a) Under heavy viscosity the vanes can stick and remain stuck in the rotor slots.
5. Ring	**1. High pressure**	a) If the instant high pressure is entering into the system that will leads to exceeded the mechanical Strength of the material so the cam ring gets cracks. b) Due to over pressure the cam ring outer diameter get deflected. When it deflects the space between the cam ring ID and rotor OD. When this gap is too narrow, the rotor may come and contact with cam ring. so that the cam ring id will get damaged.
	2. Contaminated oil	a) The contaminated oil film will enter in between the ring and vane lip so that the inner surface of the cam ring wear off.
	3. Cavitation	a) Under suction cycle, the vane pin compensates the out of balance load due to the cam profile. when the depression over the design limits, the vanes bounces, creating ripples on the cam ring profile. The depth of these marks is proportional to the strength of the depression.
6. Housing	**1. Casting defects**	a) Results in oil leakage.
	2. Over torque limits	a) When the cartridge is not properly installed in housing due to high torque it try to rotate the cartridge so that the dowel pin will break.
	3. Inspection fault	a) Here inspection of housing is important because where the cartridge seated area must be a radius and smooth finish. If the radius is not there the stress concentration increases. So the casting will crack.