

HiFlow Series R75/R77 & R80/R82

REGENERATIVE TURBINE PUMPS | PRODUCT BROCHURE – LPG



Ebsray

Where Innovation Flows



The Ebsray® HiFlow Series Regenerative Turbine Pumps have been specifically designed for large truck-transport and base-mounted handling of LPG, propane, butane and Autogas. LPG, in any derivative, is unique in that it can be transported and stored as a liquid, but when released to the atmosphere it will vaporize and burn as a gas, which makes it very difficult to pump. But Ebsray Regenerative Turbine Pumps excel at this pumping challenge.

HIGH FLOW PUMPING SOLUTIONS FOR LIQUEFIED GAS



Ebsray® HiFlow Series R75/R77 & R80/R82 Regenerative Turbine Pumps

To optimize the transport and handling of LPG in all forms, Ebsray offers its HiFlow Series R75 and R77 Regenerative Turbine Pumps for use on large transport trailers and R80 and R82 models for use in base-mounted setups. The R75/R77 models can be driven by electric drive, hydraulic drive or high-speed PTOs, and feature 75 mm (3") inlet and 50 mm (2") discharge and auxiliary ports. The R80/R82 models are stationary high-flow pumps with 75 mm (3") inlet and discharge ports. The R75 and R80 models offer flow rates of 150 to 500 L/min (40 to 132 gpm) while the R77 and R82 models delivering flow rates of 180 to 600 L/min (48 to 159 gpm). All models top out at 3,500 rpm, and can handle temperatures ranging from -40°C to 100°C (-40°F to 212°F).

Ebsray HiFlow Series Regenerative Turbine Pumps excel in LPG handling because their design has very low NPSHr requirements. So when the NPSHa (available) does become low, which can happen at low tank levels when pumping liquids at or near their boiling point, the pumps can withstand any cavitation that occurs incurring no damage at all. Additionally, cavitation within the HiFlow Series Pumps will not transmit vibration or pulsation into the system as a whole.

So, if you're looking to elevate your LPG-handling operation, choose the Ebsray HiFlow Series Regenerative Turbine Pumps in the form of the R75 and R77 transport and R80 and R82 base-mounted models.



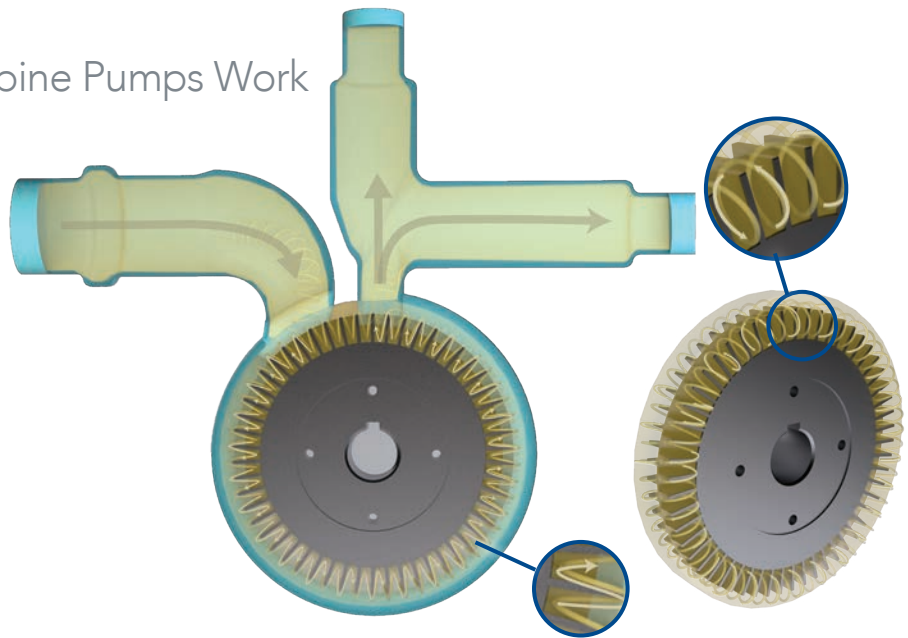
About Regenerative Turbine Pumps

Ebsray® Regenerative Turbine Pumps excel at transferring fluids with high pressure, low flow and low viscosity, while handling entrained vapors or fluids at or near their boiling point. These fluid conditions generally hamper the performance and reliability of most pump technologies, but regenerative turbine pumps maintain their efficiency in any pumping and fluid conditions, eliminating the damaging impact of cavitation and pulsation.

Though considered rotodynamic pumps, the operation of regenerative turbine pumps more closely resembles that of a positive displacement (PD) pump. Regenerative turbine pumps offer multi-stage performance from a single-stage impeller that optimizes hydraulic performance, resulting in high differential pressures even at low flow rates. The pumps feature a compact design with few rotating and wearing components, which eases maintenance and repair demands.

How Ebsray® Regenerative Turbine Pumps Work

Ebsray Regenerative Turbine Pumps have a rotating, non-contact, free-wheeling impeller disc that has around 60 small cells on its periphery. When liquid enters the suction port it is picked up by the impeller and accelerated around in the narrow hydraulic channel surrounding the cells. Kinetic energy carries the liquid radially around the channel. The spiraling of the liquid many times within one revolution builds energy and pressure. This continuous regeneration of the numerous small liquid cells creates the differential pressure capability of the pump – hence the name regenerative turbine pump.



Advantages of Regenerative Turbine Technology:

Overall Advantages

- Diminishes the damaging effects of cavitation by smoothing the fluid through gentle collapse of vapor bubbles
- Excellent self-priming and vapor-handling abilities
- Operates without vibration and noise in all pumping situations
- Smooth, pulsation-free discharge of fluid that is gentle on the whole pump system
- Maximum allowable working pressure to 29 bar (425 psi) for handling liquids with high vapor pressures
- Repairs can be performed in the field

Regenerative Turbine Technology vs Competitive Technology

- Low NPSHr for difficult suction conditions with low NPSHa
- Small, compact footprint when compared to competing technologies

- Single-stage pump engineered to perform reliably and safely at motor speed
- Wide performance range within various conditions allows for system flexibility
- Increased flow rates and faster loading/unloading times when compared to other pump technologies

Regenerative Turbine Technology vs Competition

- Operates without a Best Efficiency Point (BEP) for PD-pump performance curve flexibility
- Durable design for continuous-duty operation
- The mechanical seal is the only wear component
- Less complex to operate, maintain, repair and rebuild, with easy seal and impeller access
- Less operational costs due to a smaller motor than competitive brands
- Easy installation with no additional adjustments to maintain performance
- Motor interchangeability for flexibility in motor options

Ebsray® HiFlow Series R75 & R77

Ebsray Turbine

About the HiFlow Series R75/R77 Regenerative Turbine Pumps

As part of the Ebsray HiFlow Series, the R75 & R77 Regenerative Turbine Pumps are designed for truck loading and unloading. These truck flange mounted pumps are built for the rigors of fluid delivery. For fast, smooth, and quiet transfer of fluids, the HiFlow R75 & R77 Series Pumps provide much needed speed and efficiency in the time sensitive nature of deliveries. Both pumps feature a 75 mm (3") inlet port flange, 50 mm (2") discharge port and a 50 mm (2") auxiliary inlet port and operate within the speed range from 2,100 to 3,500 rpm. The R75 features flow rates of 150 to 500 L/min (39.6 to 132 gpm) and features an integral bypass valve. R77 offers increased flow rates of 180 to 600 L/min (47.6 to 159 gpm).

Mechanical Seal

- Balanced multi-spring carbon vs. silicon carbide mechanical seal provides years of trouble-free operational service
- Simple impeller and seal removal/replacement via front cover without the need to disconnect pipework or drive motor
- Cartridge seal arrangement allows for simple replacement of mechanical seal assembly if required, from front of pump without the need to disconnect the pump or drive, simply remove the front cover

Bearings

- Sealed for life bearings protected from LPG ingress, require no routine maintenance

Drive

- Designed to be driven by either electric or hydraulic drive or high-speed PTOs

Inlet & Outlet Ports

- 300# ANSI flange 3-in inlet and 2-in flanged outlet ports are constructed of full ductile iron making the pump robust and providing maximum working pressure of 30 bar (435 psi)

Ni-Resist Turbine Impeller

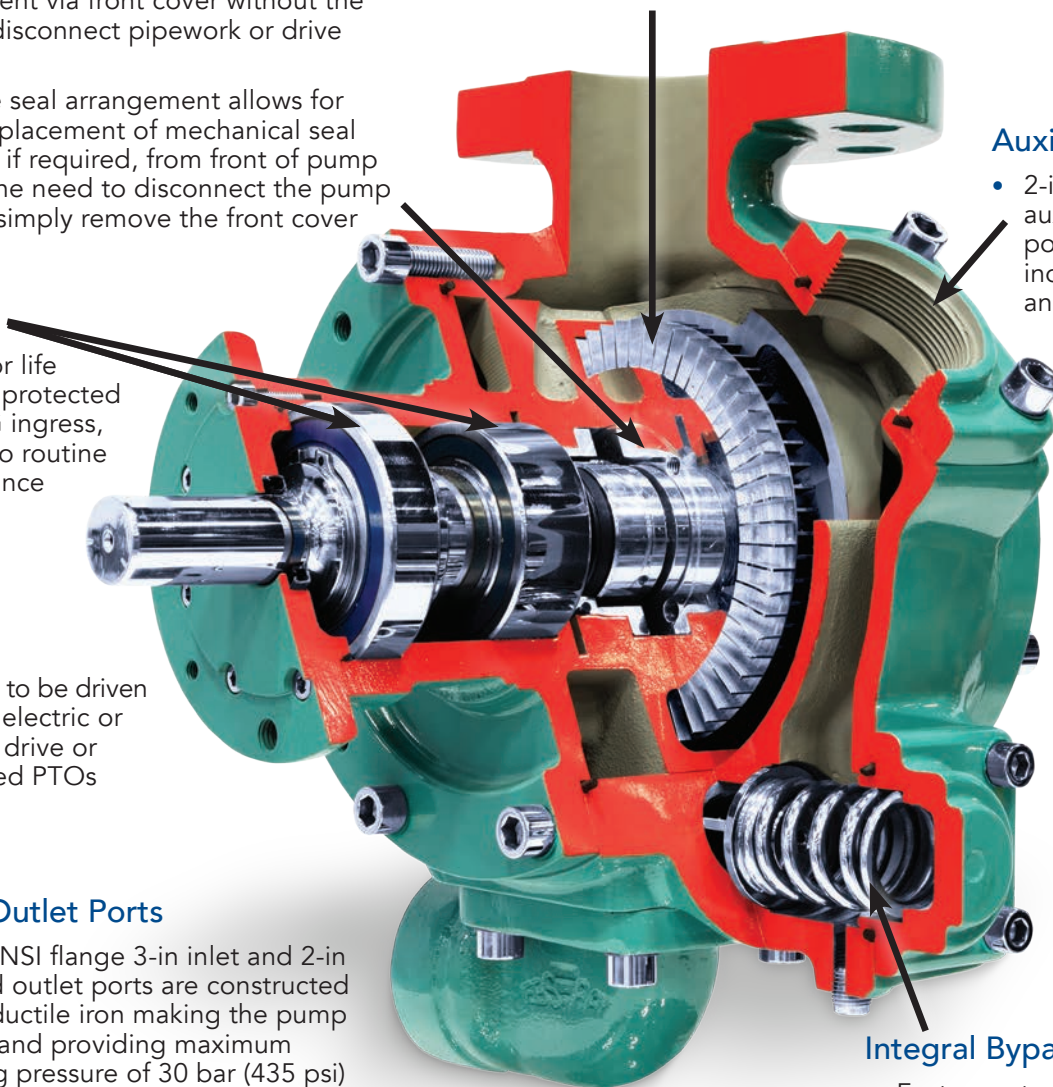
- Unmatched durability and long operating life with no performance drop due to the hard Ni-Resist single stage turbine impeller

Auxiliary Inlet Port

- 2-inch flanged auxiliary inlet port allows for independent transfer and self-loading

Integral Bypass Valve

- Factory set at 14 bar (200 psi) – only available on R75 model



Ebsray® HiFlow Series R80 & R82

About the HiFlow Series R80/R82 Regenerative Turbine Pumps

The HiFlow Series R80 & R82 Regenerative Turbine Pumps are base mounted for large volume fluid transfer. Due to their ability of transferring fluids with high pressure, low flow, and low viscosity, while handling entrained vapors or fluids at or near their boiling point, the R80 and R82 pumps are designed to compete with competing technologies like side-channel pumps. With their compact footprint and simple design, these single stage regenerative turbine pumps are easy to repair in the field, and feature only one wear component, the mechanical seal. The R80 & R82 pumps feature 75 mm (3") porting on both inlet and discharge ports and operate within the speed range from 2,100 to 3,500 rpm. The R80 features flow rates of 150 to 500 L/min (39.6 to 132 gpm), while the R82 offers increased flow rates of 180 to 600 L/min (47.6 to 159 gpm).

Ni-Resist Turbine Impeller

- Unmatched durability and long operating life with no performance drop due to the hard Ni-Resist single stage turbine impeller

Mechanical Seal

- Balanced multi-spring carbon vs. silicon carbide mechanical seal provides years of trouble-free operational service
- Simple impeller and seal removal / replacement via front cover without the need to disconnect pipework or drive motor
- Cartridge seal arrangement allows for simple replacement of mechanical seal assembly if required, from front of pump without the need to disconnect the pump or drive, simply remove the front cover

Inlet & Outlet Ports

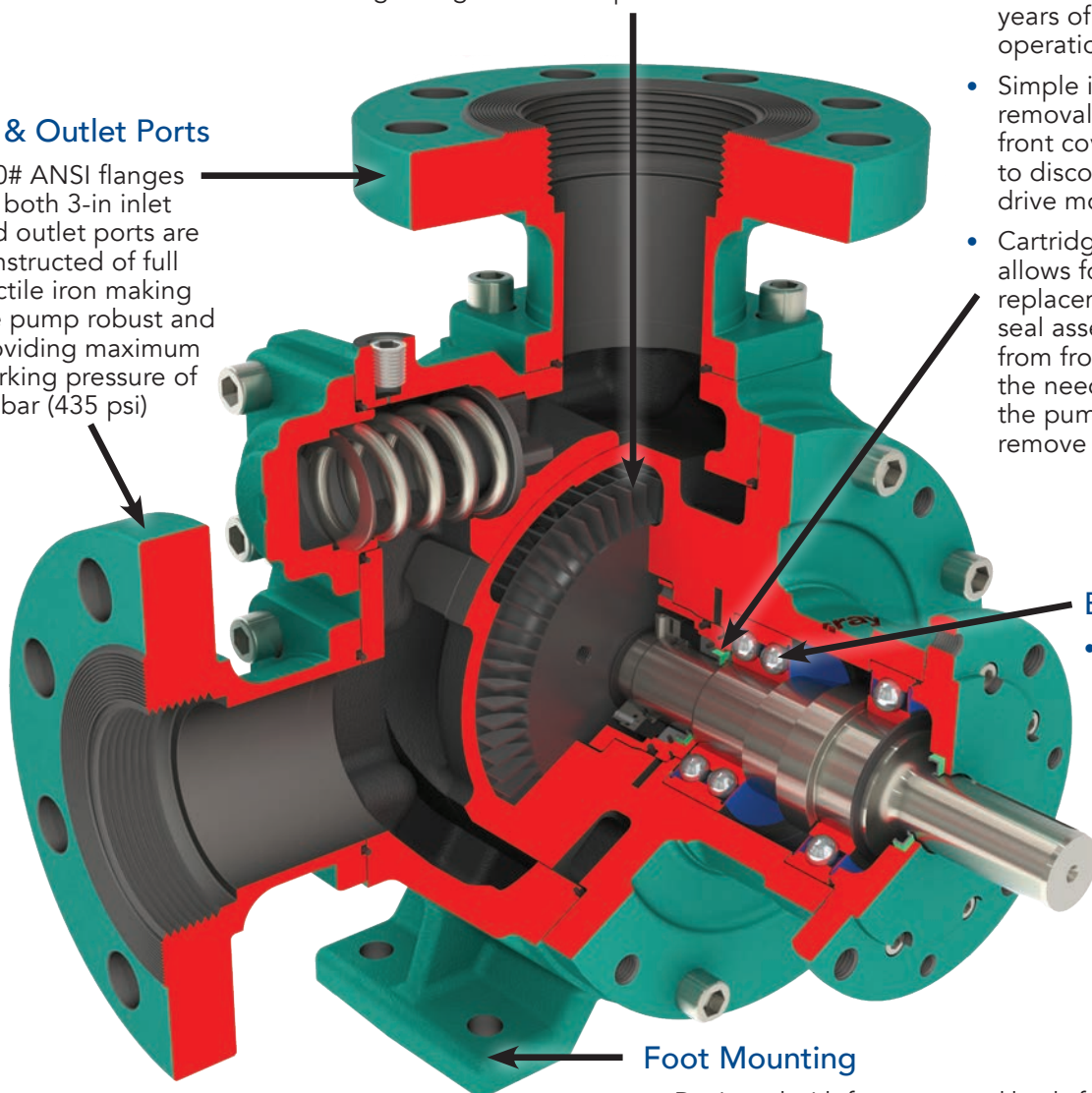
- 300# ANSI flanges for both 3-in inlet and outlet ports are constructed of full ductile iron making the pump robust and providing maximum working pressure of 30 bar (435 psi)

Bearings

- Sealed for life bearings protected from LPG ingress, require no routine maintenance

Foot Mounting

- Designed with foot mounted body for base-mounting to any drive arrangement



Regenerative Turbine Pumps

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Turbine

Operating Limits

Pump Model	Maximum Differential Pressure	Maximum Working Pressure	Hydrostatic Test Pressure	Nominal Flow Rate Range	Temperature Limits	Maximum Temperature	Maximum Speed
R75 R80	14 bar (203 psi)	30 bar (435 psi)	70 bar (1015 psi)	150 to 500 L/min (39.6 to 132 gpm)	-40°C (-40°F)	100°C (212°F)	3500 rpm
R77 R82	14 bar (203 psi)	30 bar (435 psi)	70 bar (1015 psi)	180 to 600 L/min (47.6 to 159 gpm)	-40°C (-40°F)	100°C (212°F)	3500 rpm

Porting Connection Options

Pump Model	Inlet Port	Alternate Inlet Port	Outlet Ports	Gauge Ports
R75/R77	DN80 (3") ANSI Class 300 Raised Face	2" Flanged (2" NPT adaptor available)	2" Flanged (2" NPT adaptor available)	1/4" NPT
R80/R82	DN80 (3") ANSI Class 300 Raised Face	—	DN80 (3") ANSI Class 300 Raised Face	1/4" NPT

Materials of Construction

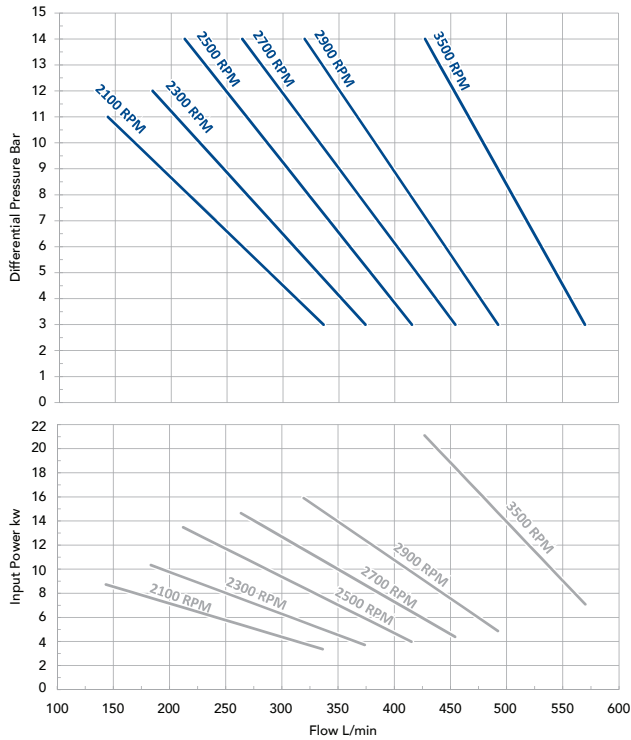
Description	Standard Materials
Body Cover Bearing Housing	Ductile Iron ASTM A536
Impeller	Ni-Resist
Shaft	Carbon Steel
O-Ring Cover	Fluoroelastomer (FKM)
Primary Seal O-Ring Cartridge	Fluoroelastomer (FKM)
Secondary Seal O-Ring Cartridge	Fluoroelastomer (FKM)
Impeller Key	Key Steel
Ball Bearing	Commercial
Ball Bearing Circlip	Spring Steel
Oil Seal	Nitrile (NBR)
Mechanical Seal Assembly	Carbon/Silicon Carbide/ Fluoroelastomer (FKM)
Mechanical Seal Cartridge	Ductile Iron ASTM A536
Mechanical Seal Circlip	Spring Steel



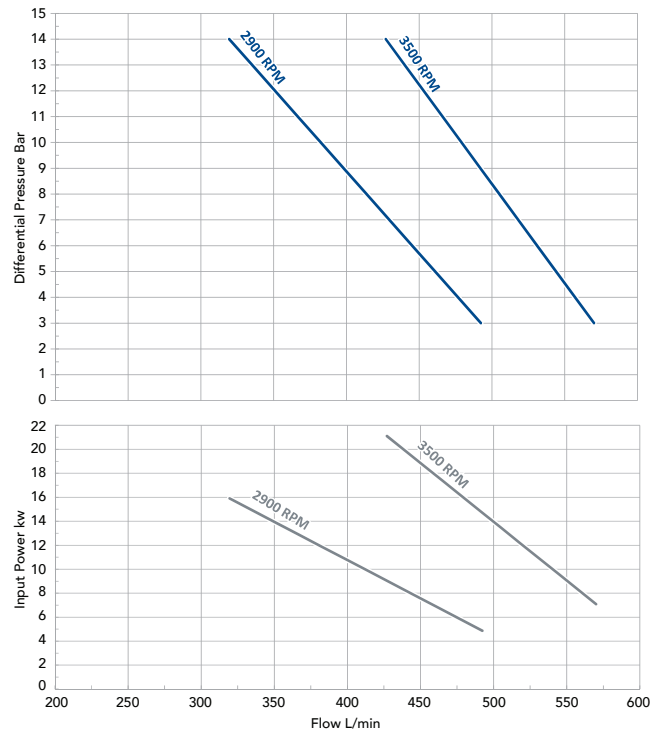
Regenerative Turbine Pumps

Performance Curves

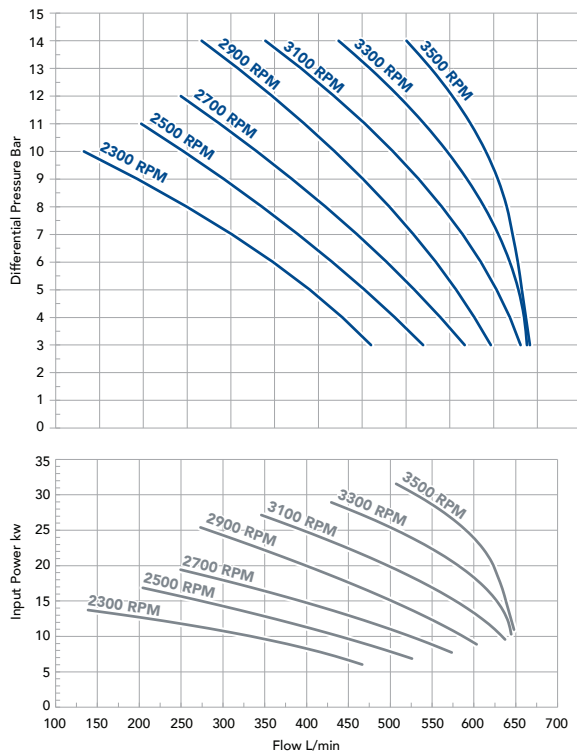
R75 Performance



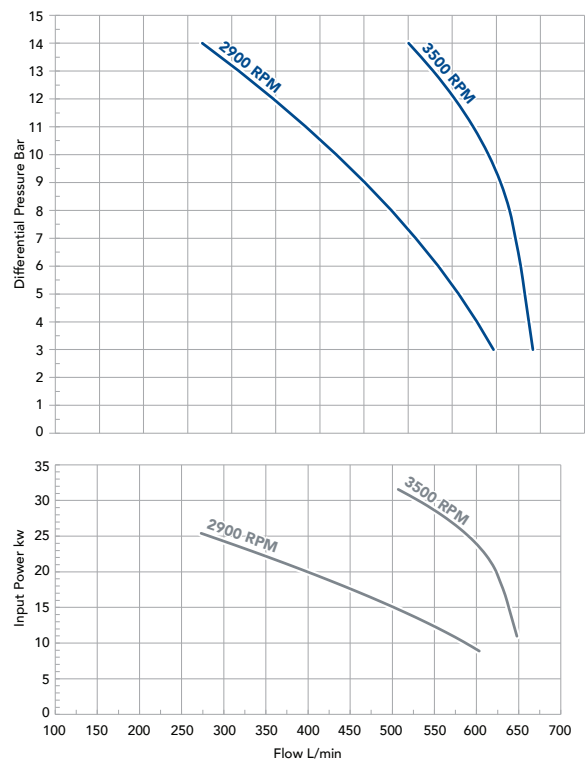
R80 Performance



R77 Performance



R82 Performance





PSG Australia
156 South Creek Road
Cromer NSW 2099
Australia
P: (+61 2) 9905 0234
F: +1 (616) 241-3752
sy.sales@psgdover.com
ebsraypumps.com



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