

# Industrial Fluids

REGENERATIVE TURBINE PUMPS | PRODUCT BROCHURE



***Ebsray***<sup>®</sup>

Where Innovation Flows



Transfer of liquefied gases provide unique challenges and issues that must be overcome – high pressure, low flow, low NPSHA, cavitation amongst others. Ebsray® is meeting the challenge by providing a portfolio of precision-built, efficient, high-pressure pumping solutions designed for low-flow, high-pressure duties on low-viscosity liquids and liquefied gases.

## PRODUCT TRANSFER SOLUTIONS FOR LIQUEFIED GAS



### Ebsray Regenerative Turbine Pumps

Ebsray Regenerative Turbine Pumps are not only designed for LPG and Autogas, but they also excel with other liquids that share similar characteristics such as butane, DME, CO<sub>2</sub>, refrigerants, anhydrous-ammonia, boiler feedwater and more. In fact, most clean, low viscosity liquids can be pumped by Ebsray Regenerative Turbine Pumps.

Ebsray Australian-made Regenerative Turbine Pumps, provide exceptional performance and reliability even under extremely low NPSH operating conditions combined with the ability to handle entrained vapours without undue loss of performance, efficiency or internal damage.

These pumps are versatile enough to be used in a wide range of aboveground and belowground applications such as cylinder filling, vapourizer feeding, Autogas dispensing, bulk transfer, truck transport loading and unloading and transfer or injection duties.

### About Ebsray

As a Dover PSG® Company brand and leading manufacturer of regenerative turbine pumps, Ebsray specializes in the design and manufacture of pump technology ideal not just for liquefied gasses but also broader industrial applications.

Ebsray, first founded in Australia in the late 1930s, has an exceptional reputation built upon decades of unparalleled quality, efficiency, innovation and reliability whilst maintaining the highest level of customer service excellence. This combined with a strong commitment to technological innovation, has positioned Ebsray as a **global leader in pumping solutions.**





# Regenerative Turbine Technology

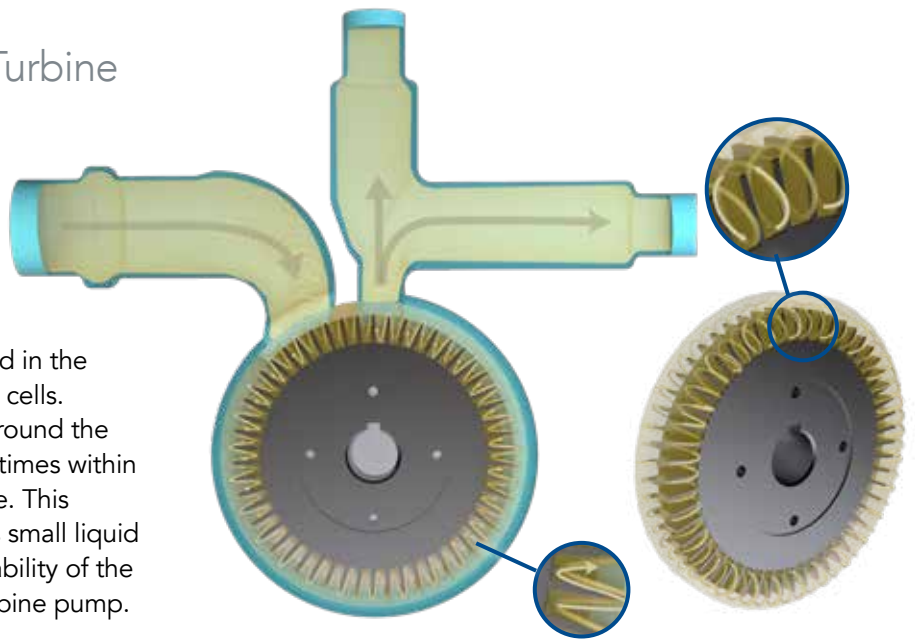
## About Regenerative Turbine Pumps

Ebsray® Regenerative Turbine Pumps excel at transferring fluids with high pressure, low flow and low viscosity, while handling entrained vapours 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 vapour bubbles
- Excellent self-priming and vapour-handling abilities
- Operates without vibration or excess noise in all pumping situations
- Smooth, pulsation-free discharge of fluid that is gentle on the whole pump system
- Maximum allowable working pressure to 34 bar\* (493 psi) for handling liquids with high vapour 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 than any other pump to operate, maintain, repair and rebuild, with easy seal and impeller access
- Lower operational costs due to a smaller motor than competitive brands
- Easy installation with no ongoing adjustments required to maintain performance
- Motor interchangeability for flexibility in motor options

\* 27.5 bar (400 psi) in regions where UL51 applies

Ebsray HiFlow Series | Regenerative Turbine Pumps

Ebsray HiFlow Series of Regenerative Turbine Pumps include the R75 & R77 transport models and the R80 & R82 base mounted models. Designed to suit the demands of liquefied gas applications, the HiFlow Series delivers on its name by providing high volume flow rates up to 650 L/min. The operation of the HiFlow Series models do not have any contact between the impeller and pump body, resulting in less wear and vastly increased mean time between repair (MTBR) while still achieving the elevated flow rates required for high-speed fluid transfer. These large regenerative turbine pumps provide all the benefits of regenerative turbine technology such as smooth non-pulsing flow, and excellent performance even in conditions of cavitation without having to worry about additional wear or damage.

- RC75/R80 Max Flow 550 L/min
- R77/R82 Max Flow 650 L/min

Operating Limits

Pump Model	Maximum Differential Pressure	Maximum Working Pressure <sup>1</sup>	Hydrostatic Test Pressure	Nominal Flow Rate Range	Minimum Temperature	Maximum Temperature	Maximum Speed
R75 R80	14 bar	34 bar	70 bar	150 to 550 L/min	-40°C	120°C	3500 rpm
R77 R82	14 bar	34 bar	70 bar	180 to 650 L/min	-40°C	120°C	3500 rpm

<sup>1</sup> 27.5 bar (400 psi) in regions where Underwriters Laboratories UL51 applies



R75/R80



R77/R82

## Ebsray RC Series | Regenerative Turbine Pumps

RC Series Regenerative Turbine Pumps from Ebsray® are built for liquefied gases. All RC Series models feature two discharge ports, either of which can be used as a bypass connection. Additionally all models have a low-maintenance single-stage impeller designed for high-pressure transfer applications. The Ebsray RC Series line incorporating the RC20, RC25, and RC40 are up to the challenge by providing fast, quiet, smooth, pulsation-free transfer of liquefied gases in the most challenging pumping conditions.

The RB10 model provides another option in LPG transfer. This pump specifically excels in high suction lift applications, generally fluid transfer from underground or semi-buried storage tanks.

- RC40 Max Flow 200 L/min
- RC25 Max Flow 106 L/min
- RC20 Max Flow 60 L/min
- RB10 Max Flow 180 L/min

### Operating Limits

Pump Model	Maximum Differential Pressure	Maximum Working Pressure <sup>1</sup>	Hydrostatic Test Pressure	Nominal Flow Rate Range	Minimum Temperature	Maximum Temperature <sup>2</sup>	Maximum Speed <sup>3</sup>
<b>RC40</b>	14 bar	34 bar	70 bar	85 To 200 L/min	-40°C	120°C	3600 rpm
<b>RC25</b>	14 bar	34 bar	70 bar	35 To 106 L/min	-40°C	120°C	3600 rpm
<b>RC20</b>	12 bar	34 bar	70 bar	20 To 60 L/min	-40°C	120°C	3600 rpm
<b>RB10</b>	11 bar	34 bar	70 bar	25 To 180 L/min	-40°C	120°C	3500 rpm

<sup>1</sup> 27.5 bar (400 psi) in regions where Underwriters Laboratories UL51 applies

<sup>2</sup> Elastomer dependent

<sup>3</sup> 3600 RPM in regions where Underwriters Laboratories UL51 applies



RC20

RC25

RC40

Ebsray RV Series | Differential Bypass Valves

Ebsray RV Differential Bypass Valves provide primary pressure control and are designed to maximize the dispensed flow rate of the overall system.

When downstream connections restrict the flow of product less than what is displaced by the pump, the remaining liquid flow is safely returned to the supply tank through the bypass valve connection which avoids damage to the pump.

- RV18 (1 inch) used with RC Series Regenerative Turbine Pumps
- RV19 (1.5 inch) used with HiFlow Series Regenerative Turbine Pumps

Operating Limits

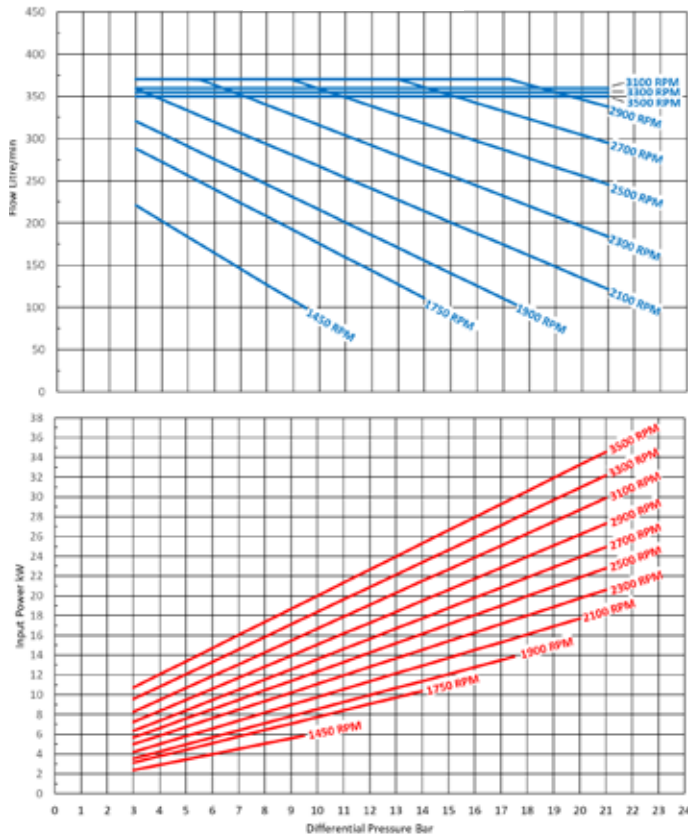
Performance Data	RV18	RV19
Max. Flows	200 L/min	600 L/min
Differential Pressure To:	14 bar	20 bar
Temperature	-40°C to 200°C	



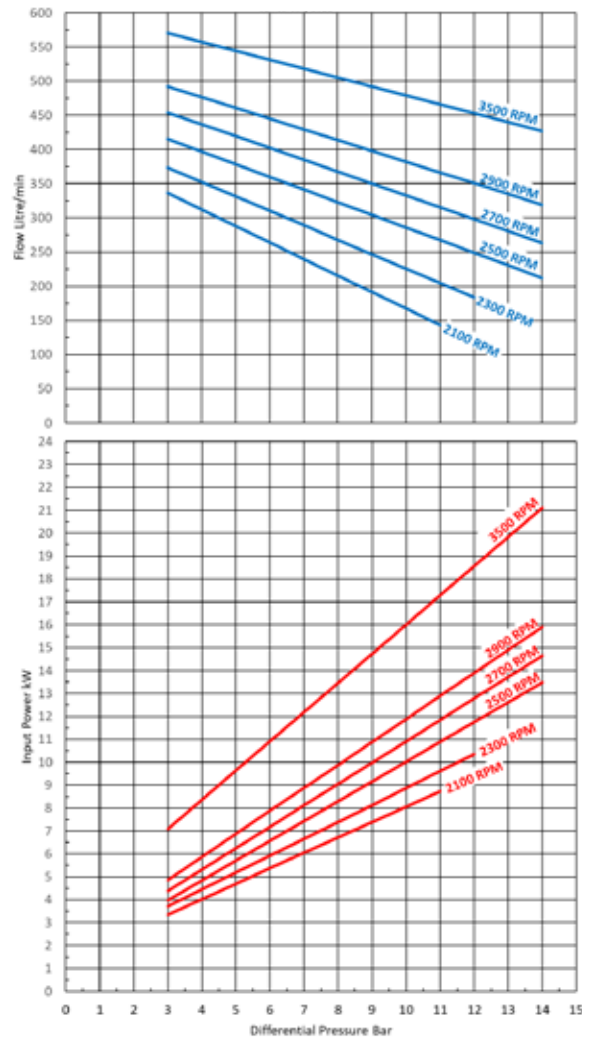


# Ebsray® R75/R80 | Performance

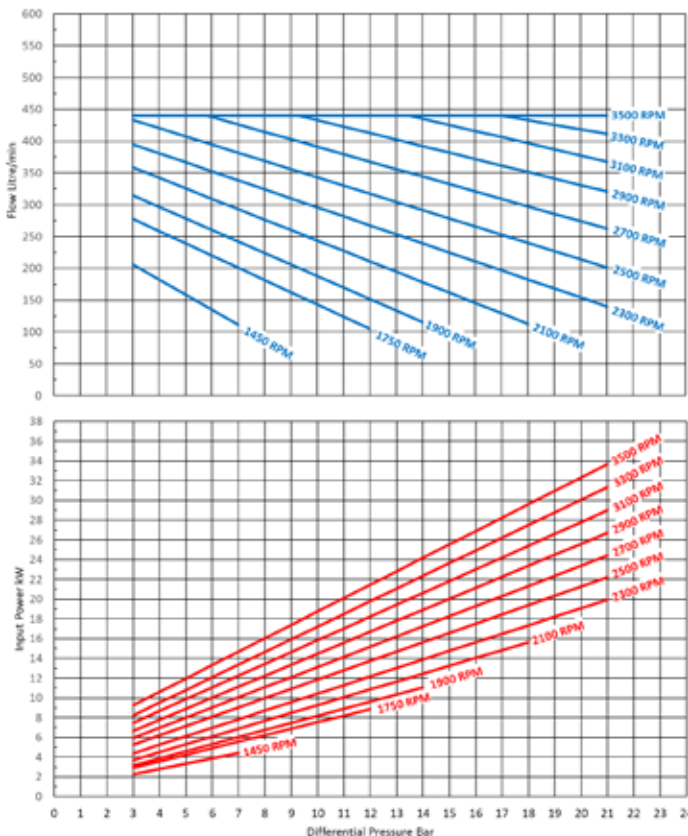
**R75 AND R80 PERFORMANCE**  
Liquid: 1.0 S.G. - 1 cSt



**R75 AND R80 PERFORMANCE**  
Liquid: Propane 0.5 S.G.



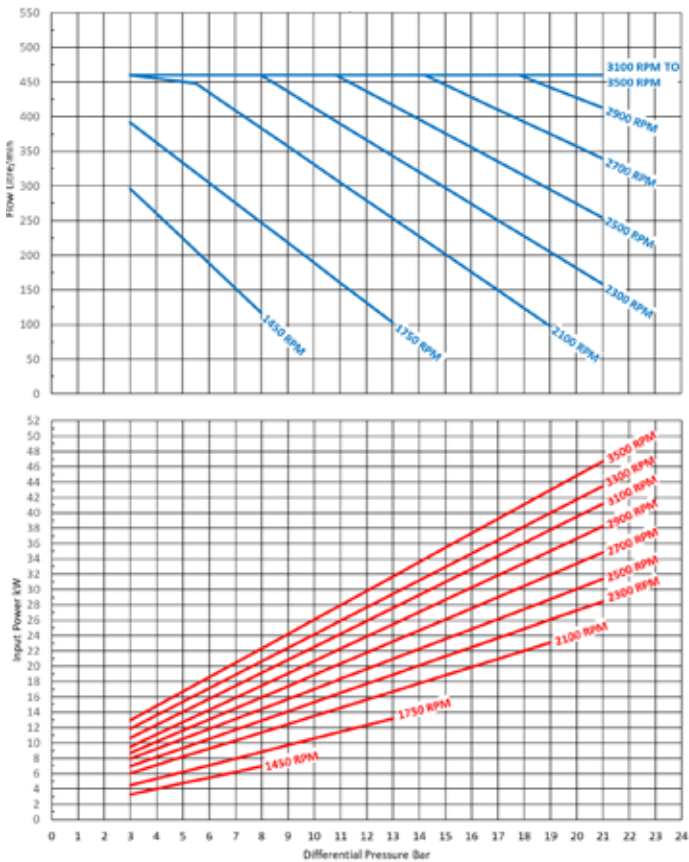
**R75 AND R80 PERFORMANCE**  
Liquid: 0.8 S.G. - 5 cSt



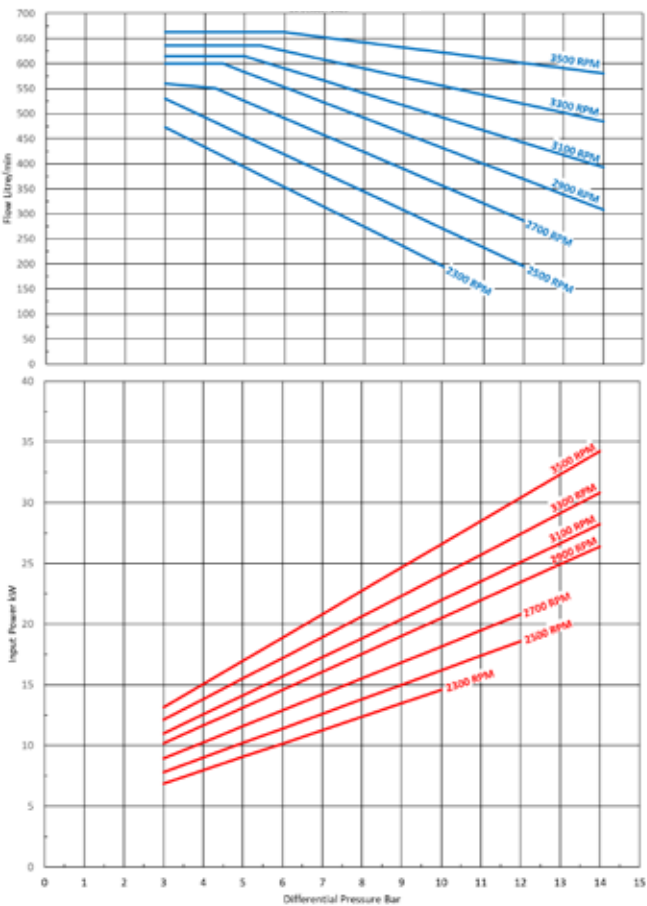
# Ebsray® R77/R82 | Performance



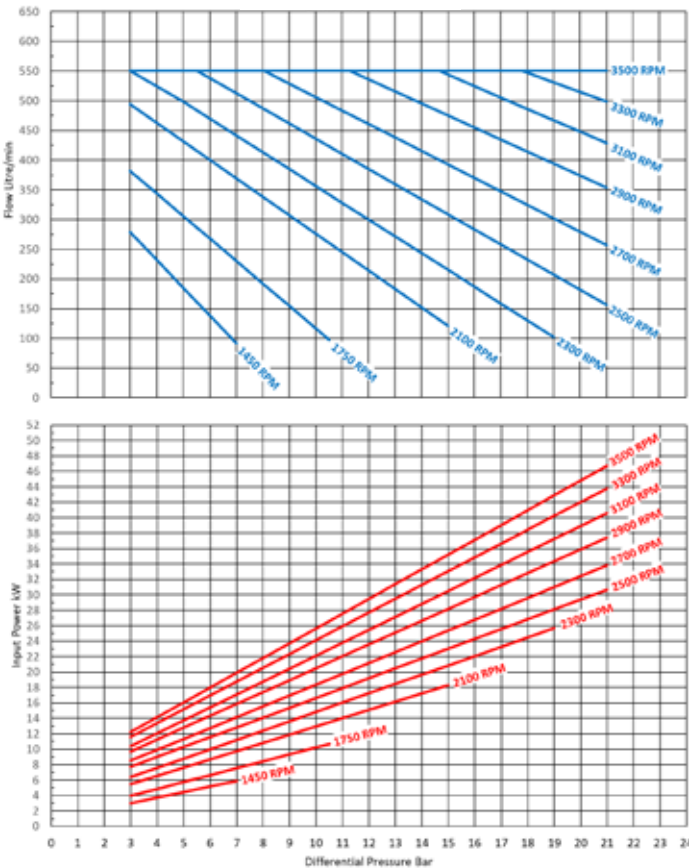
**R77 AND R82 PERFORMANCE**  
Liquid: 1.0 S.G. - 1 cSt



**R77 AND R82 PERFORMANCE**  
Liquid: Propane 0.5 S.G.



**R77 AND R82 PERFORMANCE**  
Liquid: 0.8 S.G. - 5 cSt



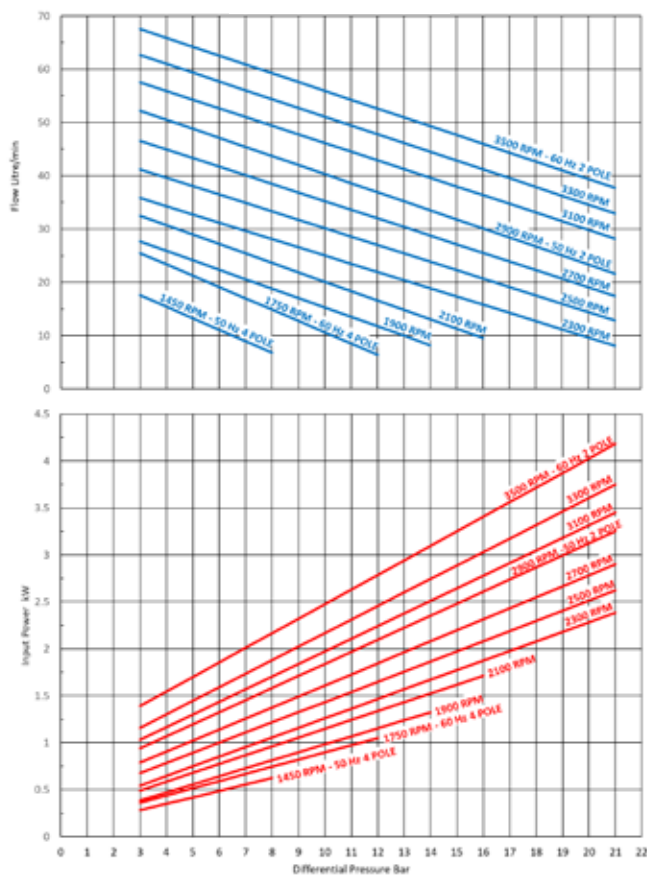
R77/R82



# Ebsray® RC20 | Performance

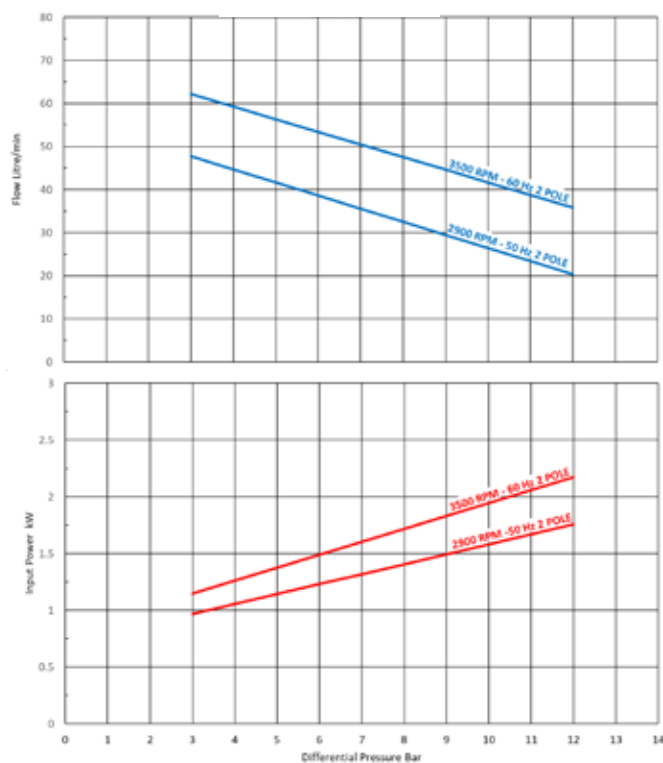
## RC20 PERFORMANCE

Liquid: 1.0 S.G. - 1 cSt



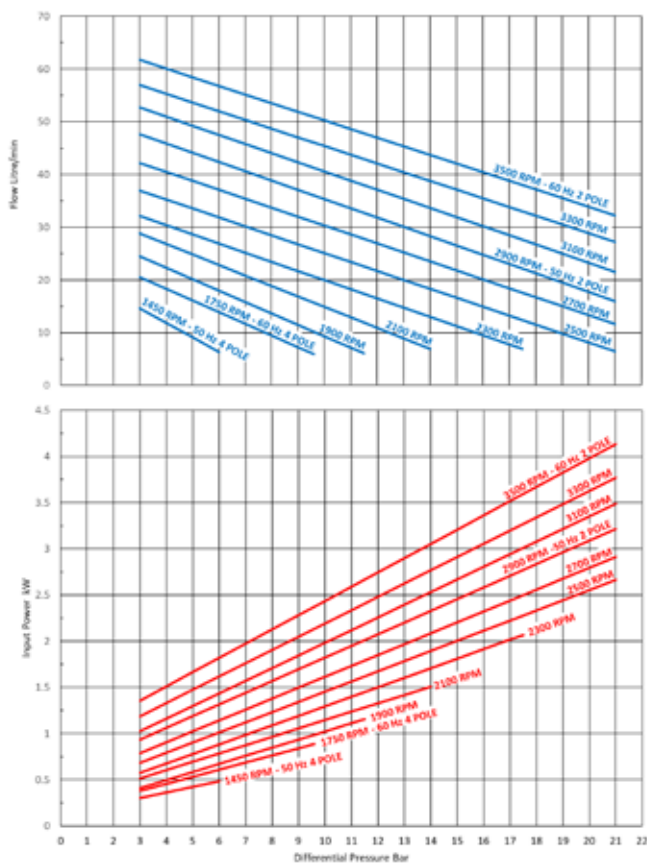
## RC20 PERFORMANCE

Liquid: Propane 0.5077 S.G.



## RC20 PERFORMANCE

Liquid: 0.8 S.G. - 5 cSt

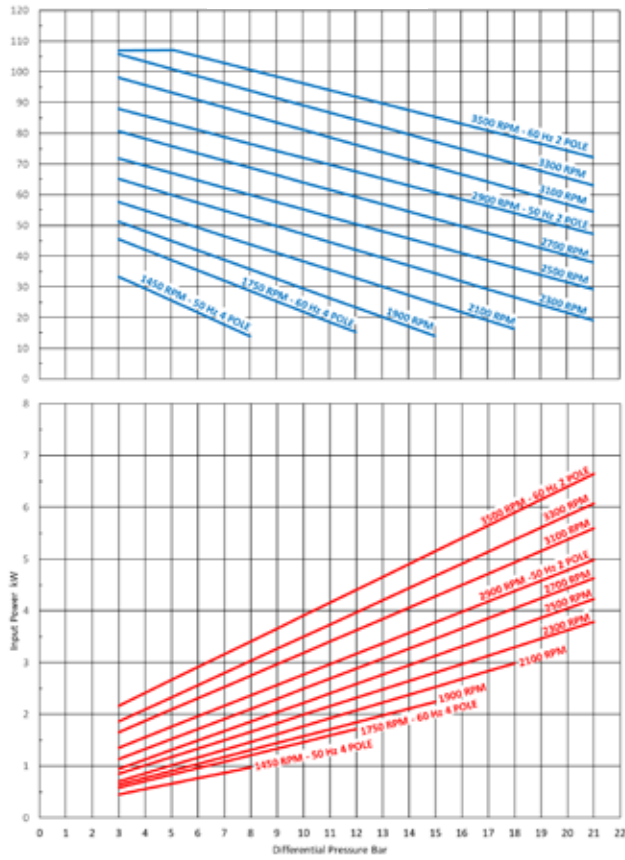


RC20

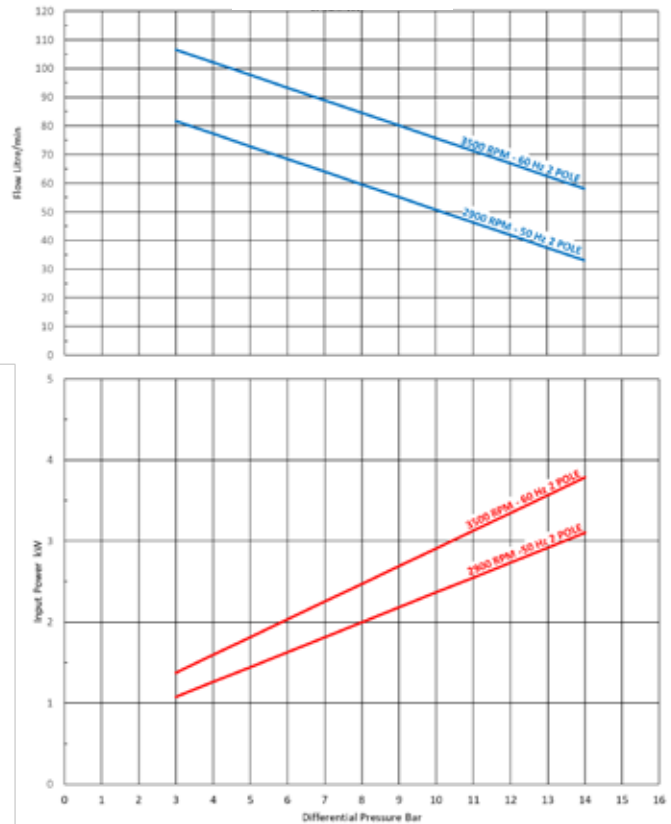
# Ebsray® RC25 | Performance

Ebsray  
Turbine

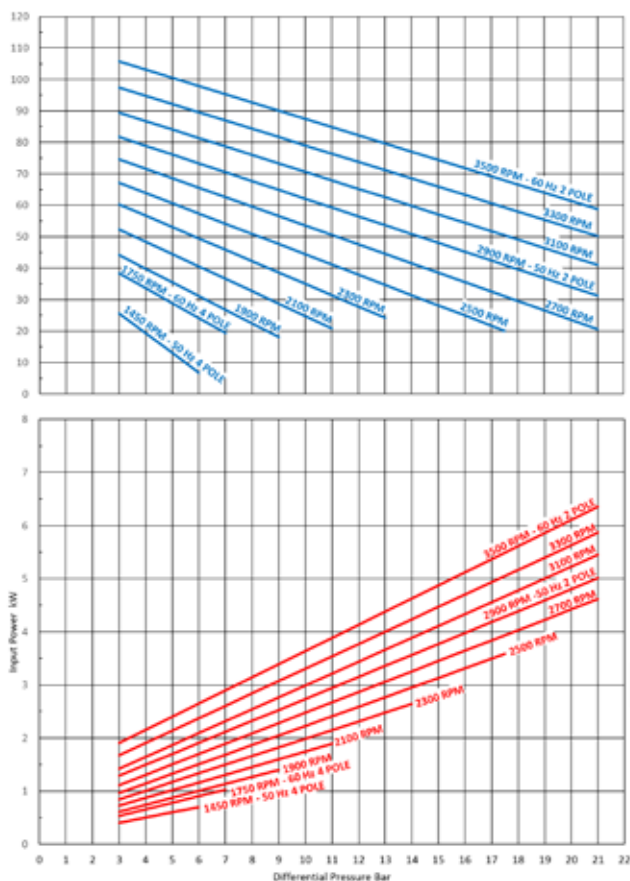
**RC25 PERFORMANCE**  
Liquid: 1.0 S.G. - 1 cSt



**RC25 PERFORMANCE**  
Liquid: Propane 0.5077 S.G.



**RC25 PERFORMANCE**  
Liquid: 0.8 S.G. - 5 cSt

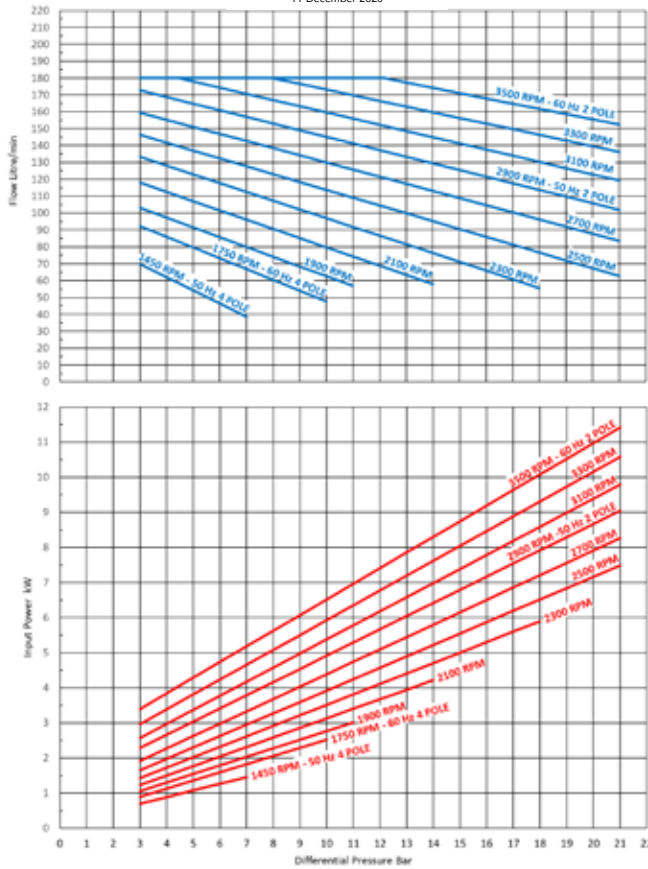


RC25

# Ebsray® RC40 | Performance

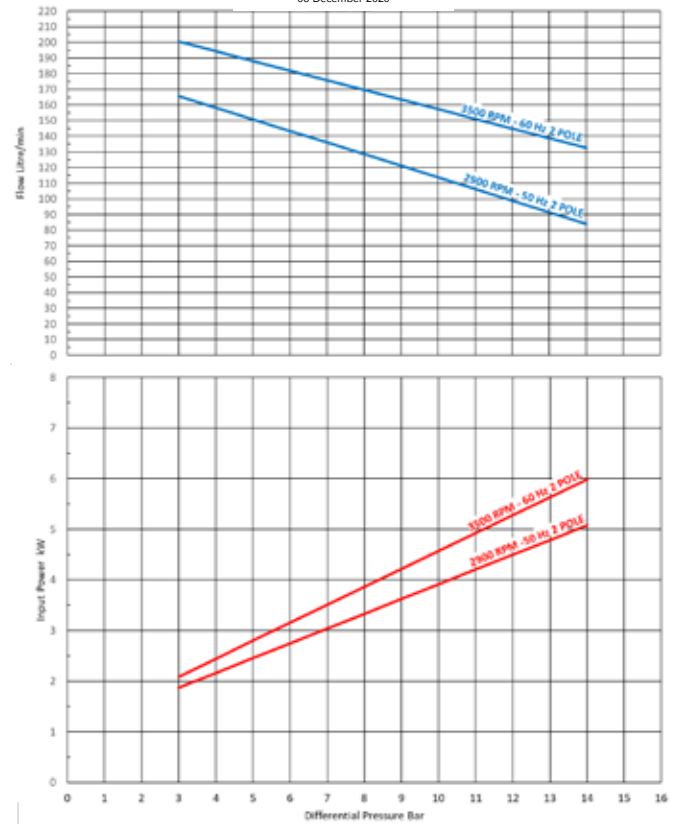
## RC40 PERFORMANCE

Liquid: Water 1.0 S.G. - 1 cSt  
11 December 2020



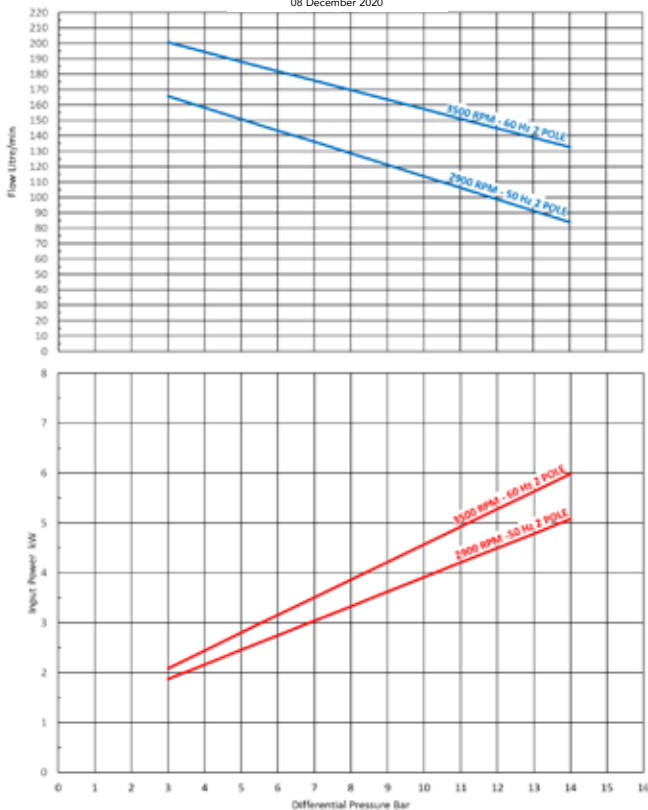
## RC40 PERFORMANCE

Liquid: Propane 0.5077 cSt  
08 December 2020



## RC40 PERFORMANCE

Liquid: 0.8 S.G. - 5 cSt  
08 December 2020



RC40





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