

JANUS PUMPS

HIGH PRESSURE
DESALINATION PUMP
AXIAL PISTON

The
Water
Hydraulics
Co. Ltd.



FM 87247

JANUS PUMPS

DESALINATION AXIAL PISTON

Design

Our Janus desalination axial piston pumps are totally oil free, clean and completely safe to use. As a result of employing advanced materials, high velocity and loaded sliding surfaces, the range of pumps can operate effectively with seawater as their only coolant/lubricant therefore, this removes the potential for cross contamination of the system fluid or lubricating oil. Each pump employs technology that minimises vibration and ensures a low noise yet high efficiency operation. The result is an exceptionally small, light-weight product ideally suited for the RO market.

ATEX approved to comply with regulations of Directive 94/9/EC for equipment or protection systems intended for use in potentially explosive atmospheres. Product group, category, zones: II 2GD ck T6 T85°C +1°C≤TA≤+40°C.

Materials of construction can be modified to suit use, environment and duty thereby, ultimately offering the most cost effective solution. The two basic forms are;

1. Duplex Build, bar stock Duplex 2205 material (no cast components) used throughout all water contacting parts, giving the highest possible corrosion resistance for extreme salt concentrations.
2. Hybrid Build, components are manufactured in 316 L stainless steel with strategic internal parts i.e. bearing surfaces, in bar stock Duplex 2205.

Minimal pulsation is experienced with these units due to the multiple piston design and the high operational speeds. Accurate flow metering is simply achieved with the control of the output shaft speed. For integral energy recovery version please see our Janus Power Centre catalogues or consult TWHC.

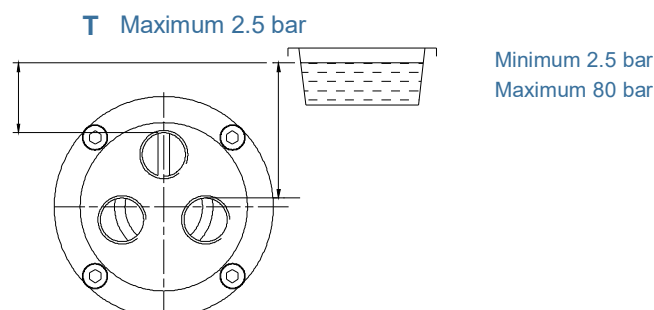
We would advise all desalination pumps are flushed on a routine basis. Any period of non operation (short or long) the system must run on permeate to ensure the sea water is flushed from the system. Even with the adoption of such high grade corrosion material, we would advise a weekly (if not sooner) fresh water flushing regime is undertaken especially if the system will be non-operational for any period.

Inlet Conditions 3 Port Design

The 3 port boosted pumps are designed for pressurised feed water supply at a minimum of 2.5 bar by either an external boost pump, very high pressure water main or a head /column of water in excess of 25m in height .The 3 port design separates the feed water from the pump internal leakage water which must be piped away to a low pressure sump or drain. The advantages of this design are;

- 1.The pump drive must only produce the differential pressure i.e. for a system with 5 bar feed pressure, 60 bar system pressure the pump drive is only required to produce equivalent of 55 bar.
- 2.As the feed pressure and internal leakage are separated, the mechanical shaft seal will not see the full feed pressure therefore reducing required maintenance as low casing pressure will prolong the mechanical seals life and prevent low pressure cavitation issues; the minimum casing pressure and maximum inlet pressure is desired.

A minimum positive inlet pressure of 2.5 bar above casing 'T' pressure is required at all times. The desalination pumps can rotate anti-clockwise viewed on pump shaft.



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DESALINATION AXIAL PISTON

		SPECIFICATION					
Pumps		P6	P15	P30	P60	P180	P600
Displacement (cc/rev)	Max:	6.0	19.0	35.0	70.0	225	625
	Min:	4.6	12.0	23.0	35.0	135	-
Max. RPM							
	Boosted: *	2000	2000	2000	2000	2000	1250
Max. Input Power (kW)		3.8	11	19.5	42	114	136
Max. Water Flow (m ³ /hr)		0.72	2.23	3.96	8.76	25.80	55.8
Max. Cont. Pressure (Barg)		80	80	80	80	80	80
Weight (kg)		2.2	6	10	19	82	120
Temperature (°C)	Max: **	50	50	50	50	50	50
	Min: ***	2	2	2	2	2	2

* Pump speeds above Max. RPM are possible under higher boost conditions, consult TWHC for details. ** Higher temperature operation is possible, consult TWHC for details. *** Consult TWHC for lower temperature conditions.

Motor Pump Assemblies

A standard range of bell housings and couplings are available for connecting the pumps to the B5 electric motor flange. See our Desalination Motor Pump Assembly datasheet for further information on potential combinations. The pumps are not capable of operating with induced axial or radial loads on the output shaft; always adopt the use of a 3 part gear style coupling where possible. If the drive shaft/spigot location is within 0.05mm concentricity, direct inline drive assemblies are permissible.

Temperature

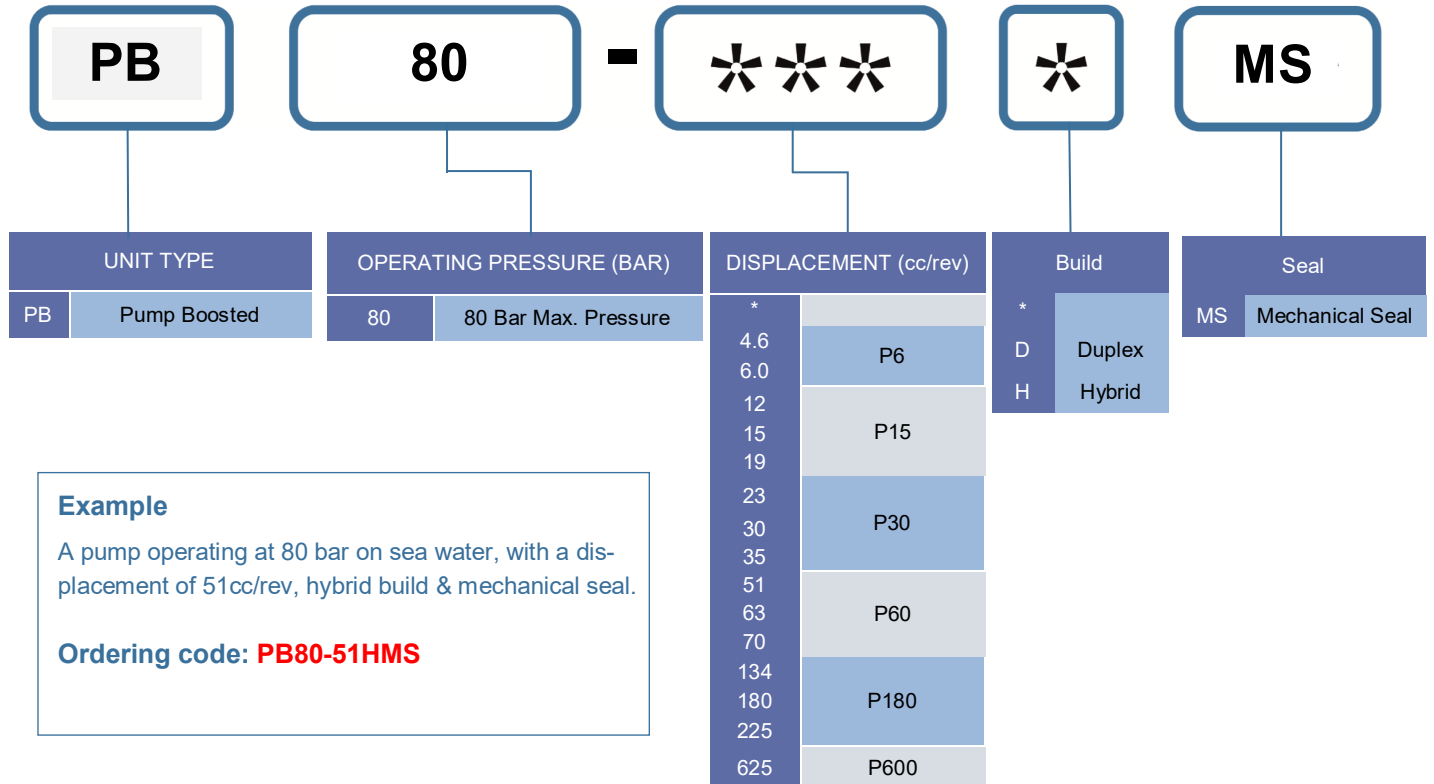
The units will generate full performance from 2°C to 50°C. For operation above 50°C is possible however, the volumetric efficiency of the unit will be affected. Consult TWHC and specify the maximum operating temperature.

Filters

All incoming water to the pump must be pre-filtered to a nominal rating of 5µm with a filter element rating of β10 = 75 or better. Pump feed pressure must be a minimum of 2.5 bar measured after filtration. We advise a protection switch is utilised at the pump inlet to shut down the system if feed pressure falls below this minimum.

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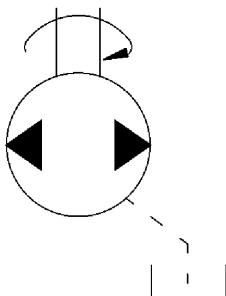
PUMP ORDERING CODE



Materials of construction can be modified to suit use, environment and duty thereby, ultimately offering the most cost effective solution. The two basic forms are:

1. Duplex Build — bar stock Duplex 2205 material (no cast components) used throughout all water contacting parts, giving the highest possible corrosion resistance for extreme salt concentrations. To denote full Duplex 2205 build include D on ordering code e.g. PB80-6.0DMS
2. Hybrid Build — components are manufactured in 316 L stainless steel with strategic internal parts i.e. bearing surfaces, in bar stock Duplex 2205. To denote Hybrid build include H on ordering code e.g. PB80-6.0HMS

Circuit Symbol



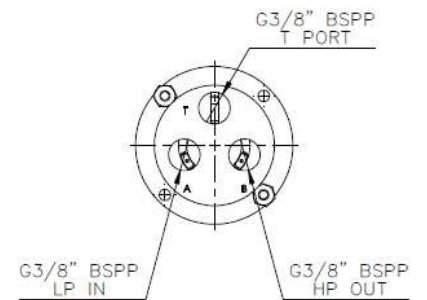
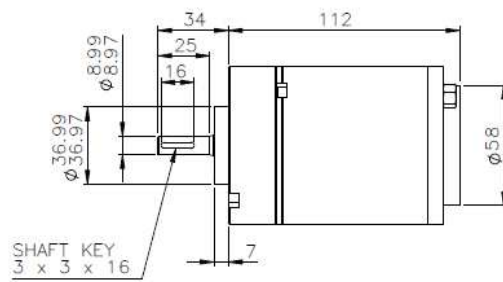
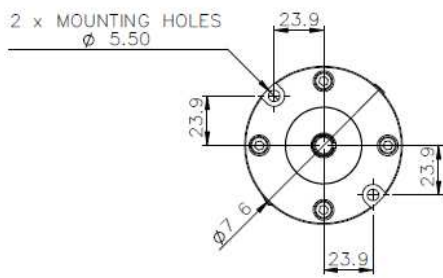
Boosted Inlet, Anti-Clockwise Rotation Viewed on Pump Shaft

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PUMP DIMENSIONS

PB80-6.0DMS & PB80-4.6DMS

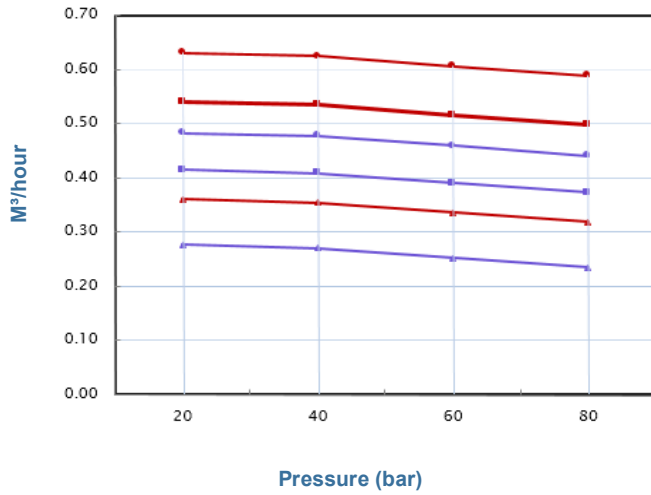
PB80-6.0HMS & PB80-4.6HMS



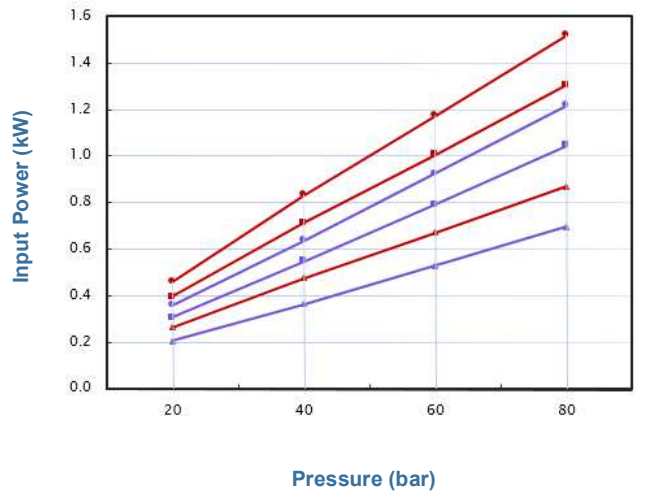
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P6 PUMP PERFORMANCE DATA

Output Flow



Input Power kW



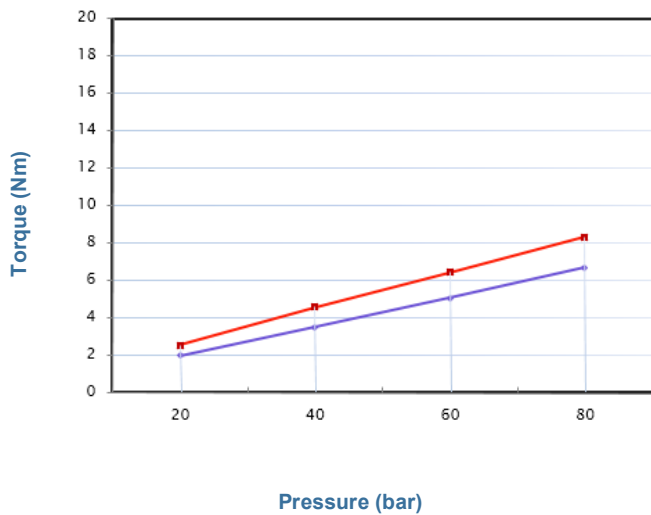
Pressure (bar)

—■ 6cc 1750rpm —■ 6cc 1500rpm —■ 6cc 1000rpm
—■ 4.6cc 1750rpm —■ 4.6cc 1500rpm —■ 4.6cc 1000rpm

Pressure (bar)

—■ 6cc 1750rpm —■ 6cc 1500rpm —■ 6cc 1000rpm
—■ 4.6cc 1750rpm —■ 4.6cc 1500rpm —■ 4.6cc 1000rpm

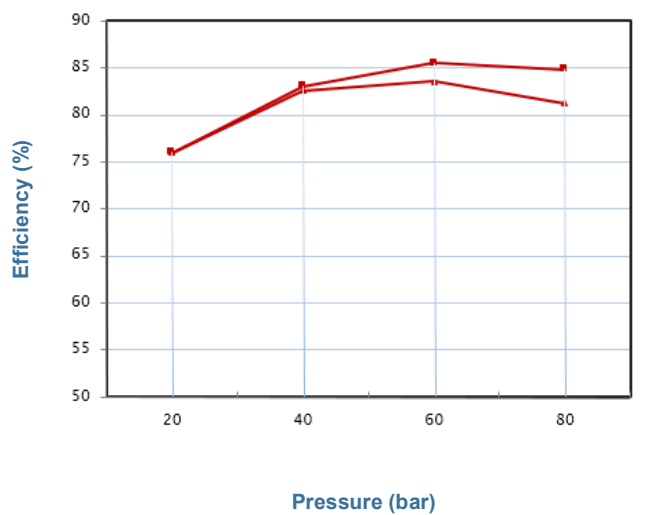
Input Torque



Pressure (bar)

—■ 6cc 1500rpm —■ 4.6cc 1500rpm

Overall Efficiency



Pressure (bar)

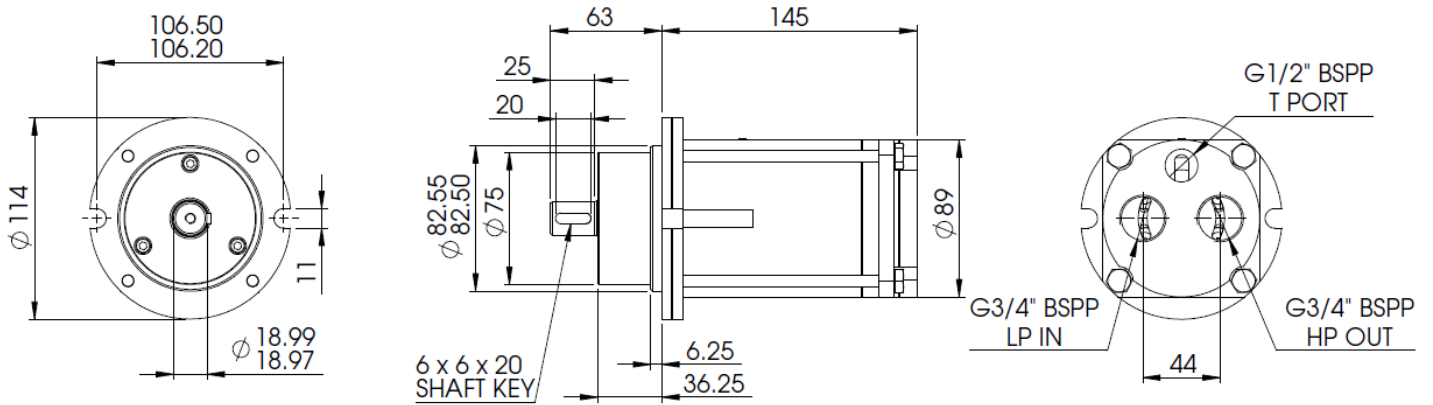
—■ 6cc 1000rpm —■ 6cc 1500rpm

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P15 PUMP DIMENSIONS

PB80-12DMS, PB80-15DMS & PB80-19DMS

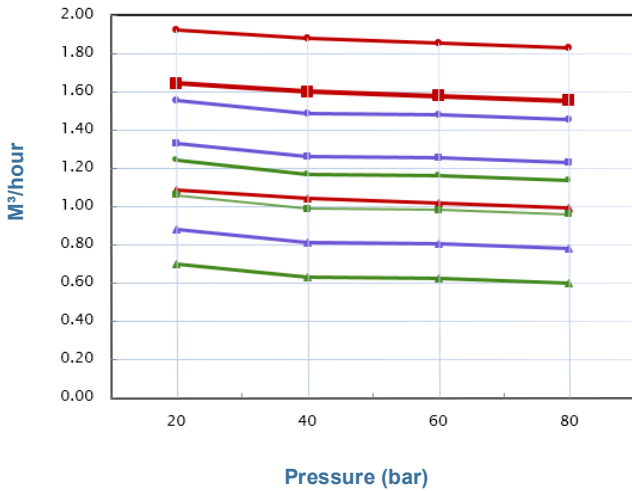
PB80-12HMS, PB80-15HMS & PB80-19HMS



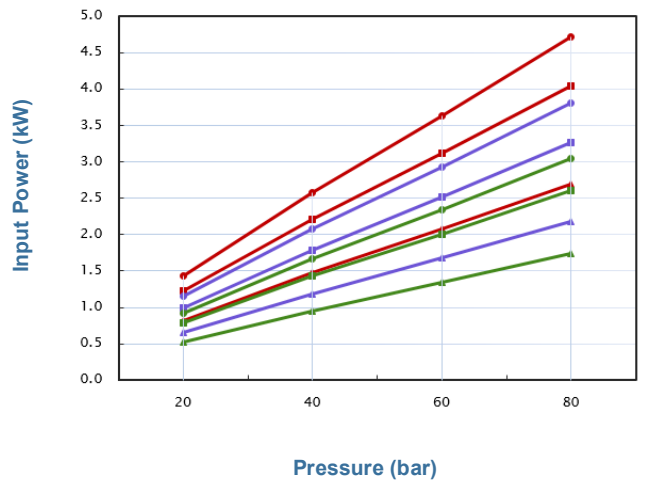
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P15 PUMP PERFORMANCE DATA

Output Flow



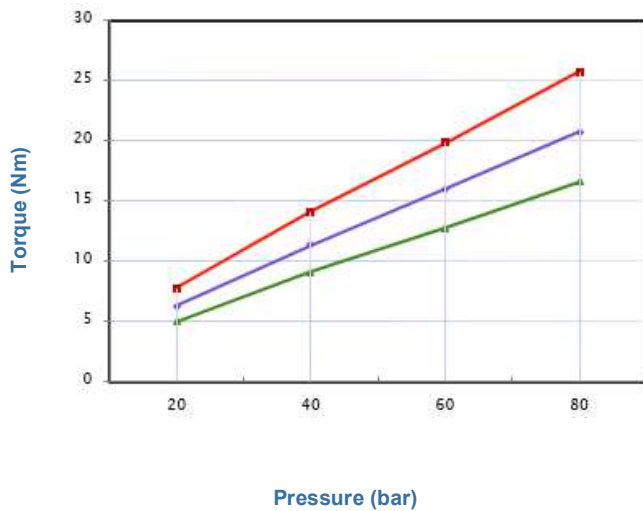
Input Power kW



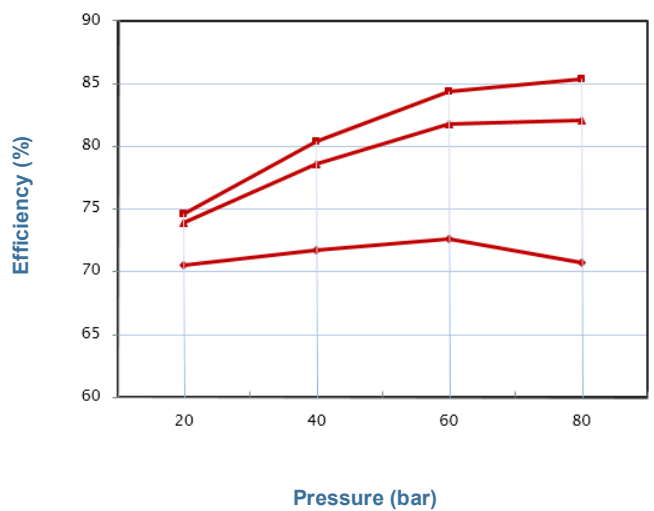
- 19cc 1750rpm —■— 19cc 1500rpm —▲— 19cc 1000rpm
- 15cc 1750rpm —■— 15cc 1500rpm —▲— 15cc 1000rpm
- 12cc 1750rpm —■— 12cc 1500rpm —▲— 12cc 1000rpm

- 19cc 1750rpm —■— 19cc 1500rpm —▲— 19cc 1000rpm
- 15cc 1750rpm —■— 15cc 1500rpm —▲— 15cc 1000rpm
- 12cc 1750rpm —■— 12cc 1500rpm —▲— 12cc 1000rpm

Input Torque



Overall Efficiency



- 19cc 1500rpm —●— 15cc 1500rpm —▲— 12cc 1500rpm

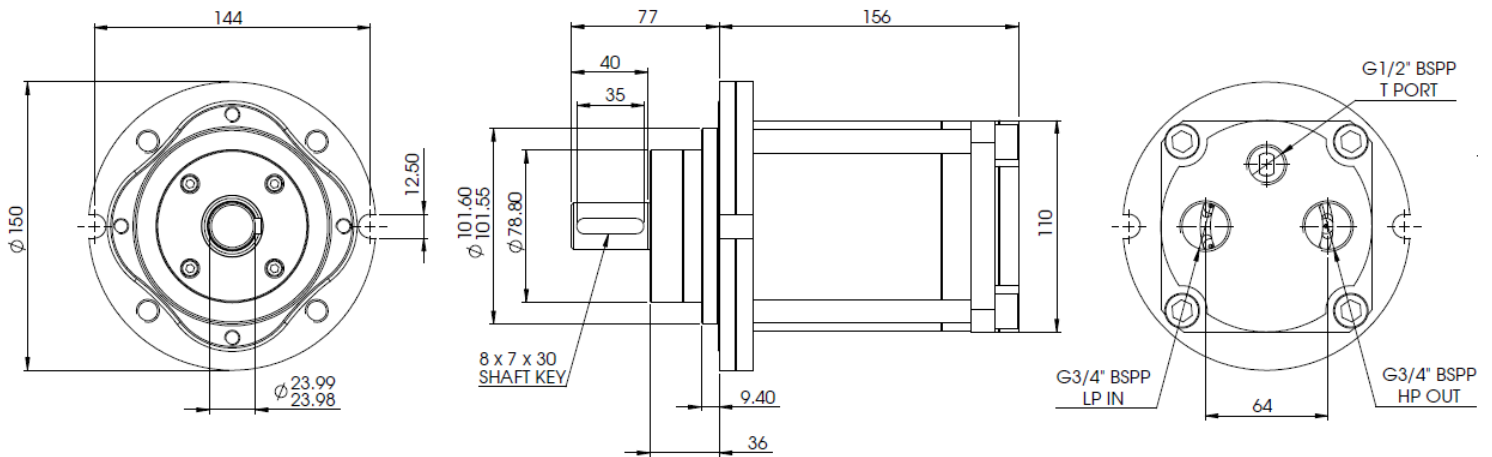
- 19cc 500 rpm —■— 19cc 1000rpm —▲— 19cc 1500rpm

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P30 PUMP DIMENSIONS

PB80-23DMS, PB80-30DMS & PB80-35DMS

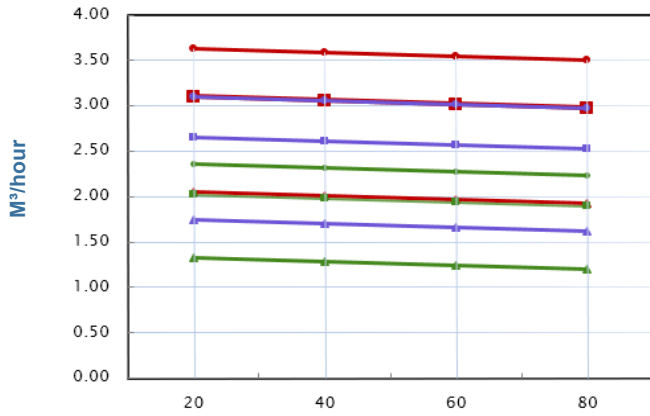
PB80-23HMS, PB80-30HMS & PB80-35HMS



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P30 PUMP PERFORMANCE DATA

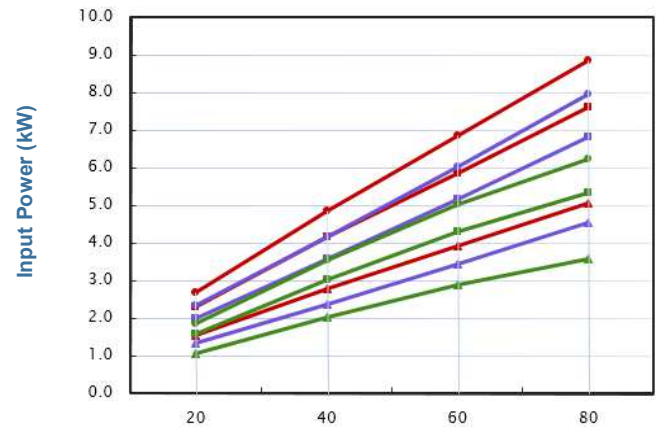
Output Flow



Pressure (bar)

■ 35cc 1750rpm ■ 35cc 1500rpm ■ 35cc 1000rpm
■ 30cc 1750rpm ■ 30cc 1500rpm ■ 30cc 1000rpm
■ 23cc 1750rpm ■ 23cc 1500rpm ■ 23cc 1000rpm

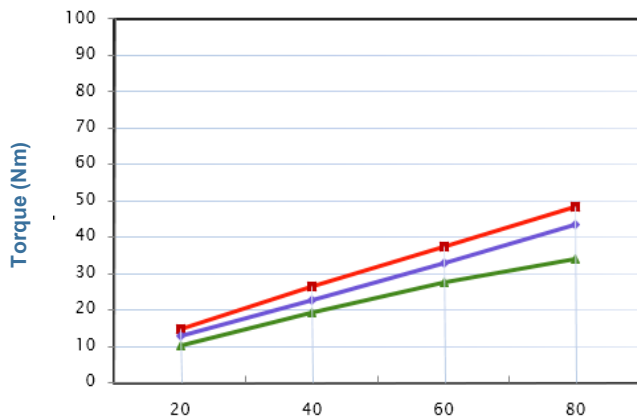
Input Power kW



Pressure (bar)

■ 35cc 1750rpm ■ 35cc 1500rpm ■ 35cc 1000rpm
■ 30cc 1750rpm ■ 30cc 1500rpm ■ 30cc 1000rpm
■ 23cc 1750rpm ■ 23cc 1500rpm ■ 23cc 1000rpm

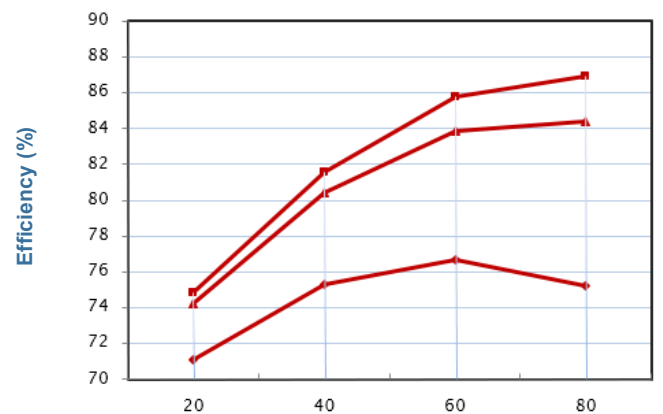
Input Torque



Pressure (bar)

■ 35cc 1500rpm ■ 30cc 1500rpm ■ 23cc 1500rpm

Overall Efficiency



Pressure (bar)

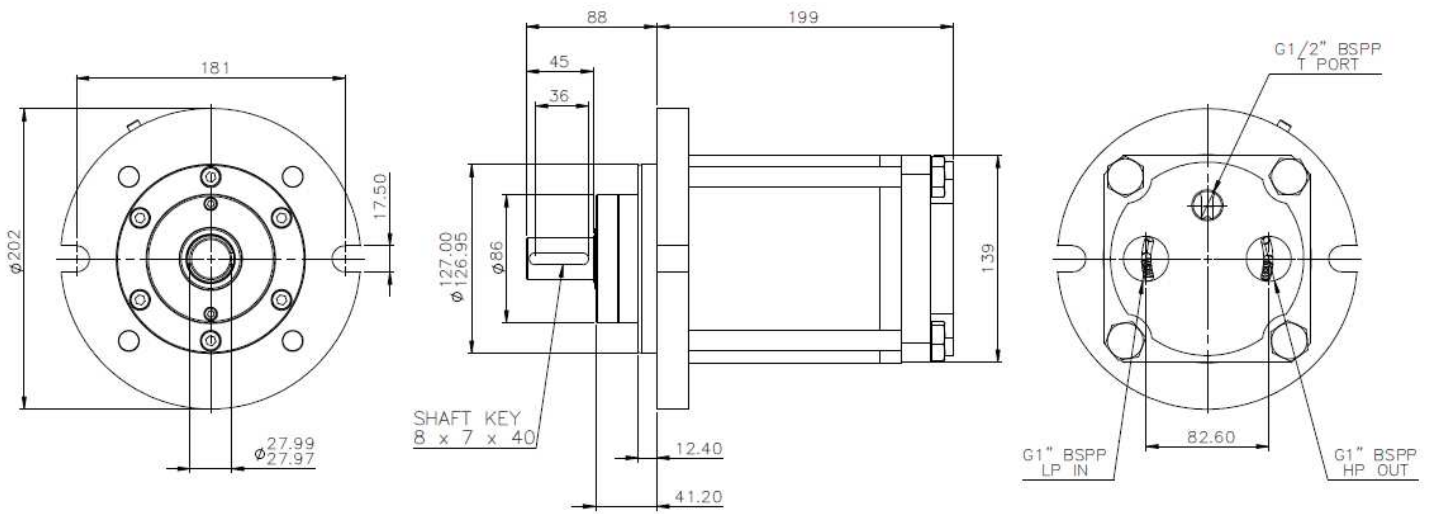
■ 35cc 500 rpm ■ 35cc 1000rpm ■ 35cc 1500rpm

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P60 PUMP DIMENSIONS

PB80-51DMS, PB80-63DMS & PB80-70DMS

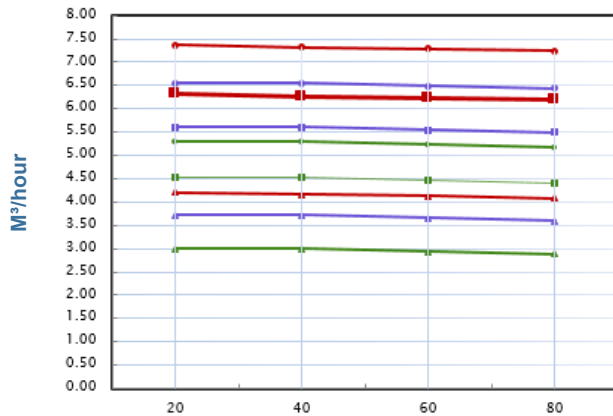
PB80-51HMS, PB80-63HMS & PB80-70HMS



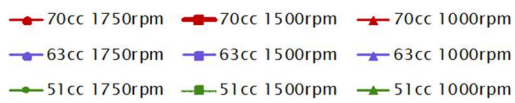
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P60 PUMP PERFORMANCE DATA

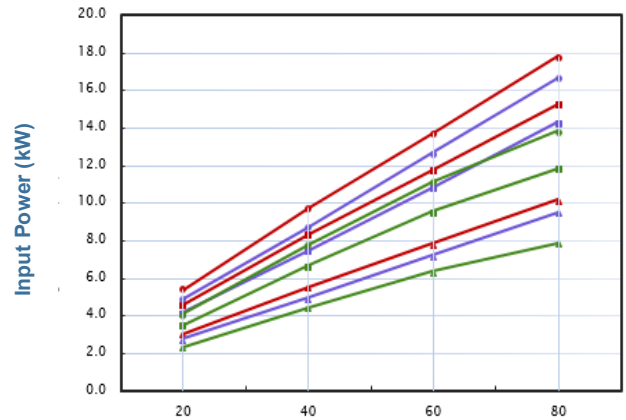
Output Flow



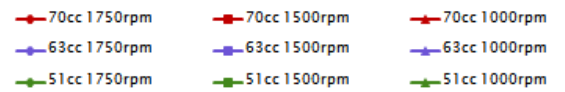
Pressure (bar)



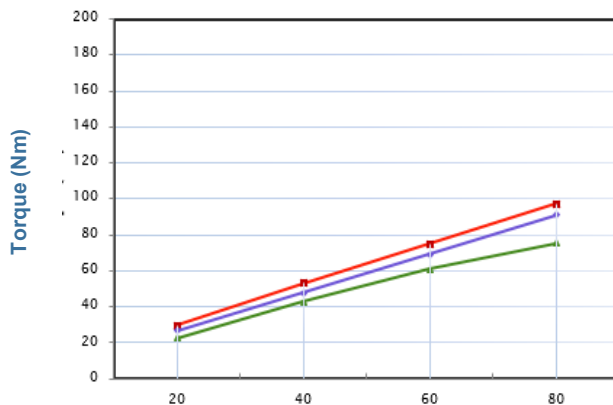
Input Power kW



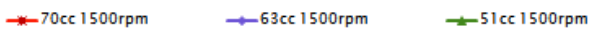
Pressure (bar)



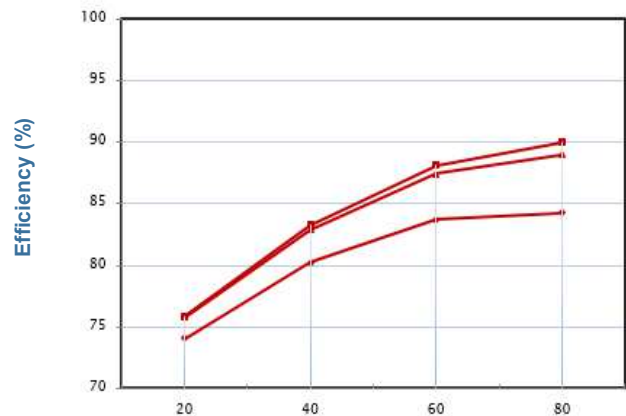
Input Torque



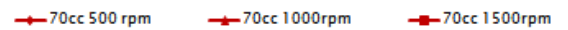
Pressure (bar)



Overall Efficiency



Pressure (bar)

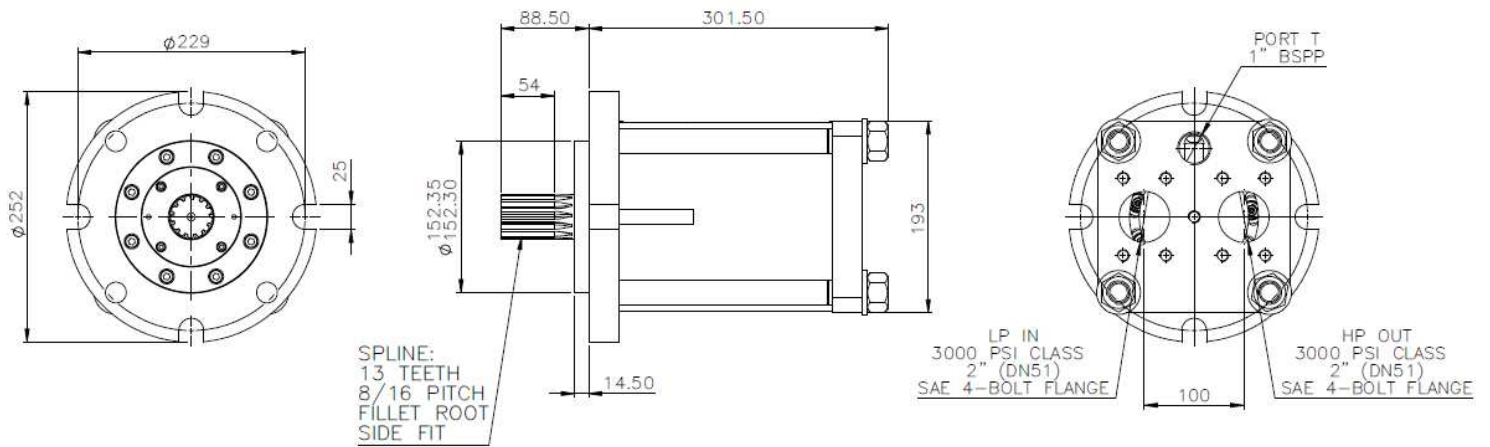


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P180 PUMP DIMENSIONS

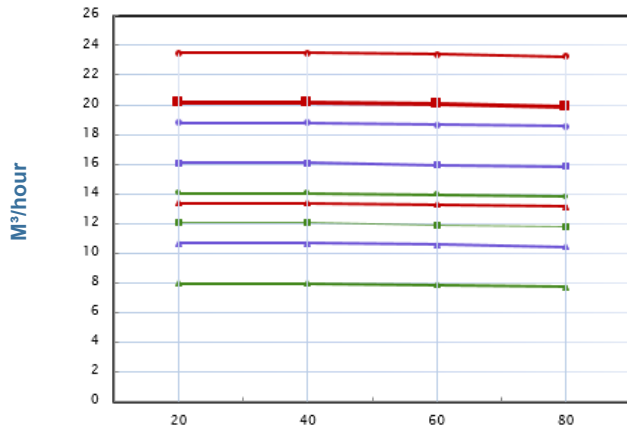
PB80-135DMS, PB80-180DMS & PB80-225DMS

PB80-135HMS, PB80-180HMS & PB80-225HMS



JANUS PUMPS P180 PUMP PERFORMANCE DATA

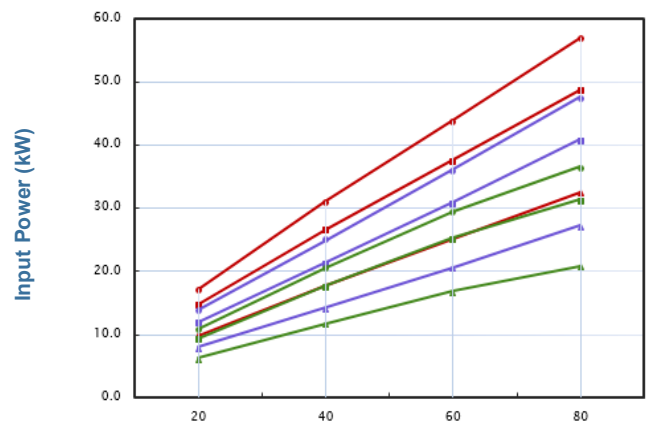
Output Flow



Pressure (bar)

— 225cc 1750rpm — 225cc 1500rpm — 225cc 1000rpm
 — 180cc 1750rpm — 180cc 1500rpm — 180cc 1000rpm
 — 135cc 1750rpm — 135cc 1500rpm — 135cc 1000rpm

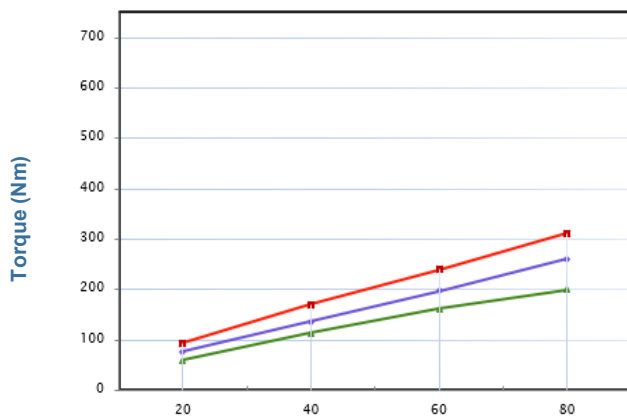
Input Power kW



Pressure (bar)

— 225cc 1750rpm — 225cc 1500rpm — 225cc 1000rpm
 — 180cc 1750rpm — 180cc 1500rpm — 180cc 1000rpm
 — 135cc 1750rpm — 135cc 1500rpm — 135cc 1000rpm

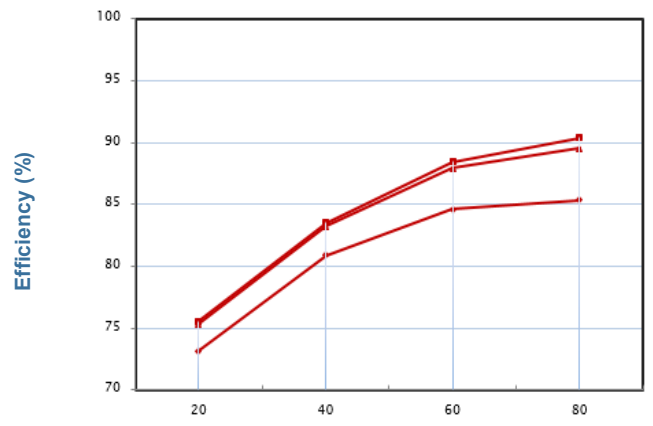
Input Torque



Pressure (bar)

— 225cc 1500rpm — 180cc 1500rpm — 135cc 1500rpm

Overall Efficiency



Pressure (bar)

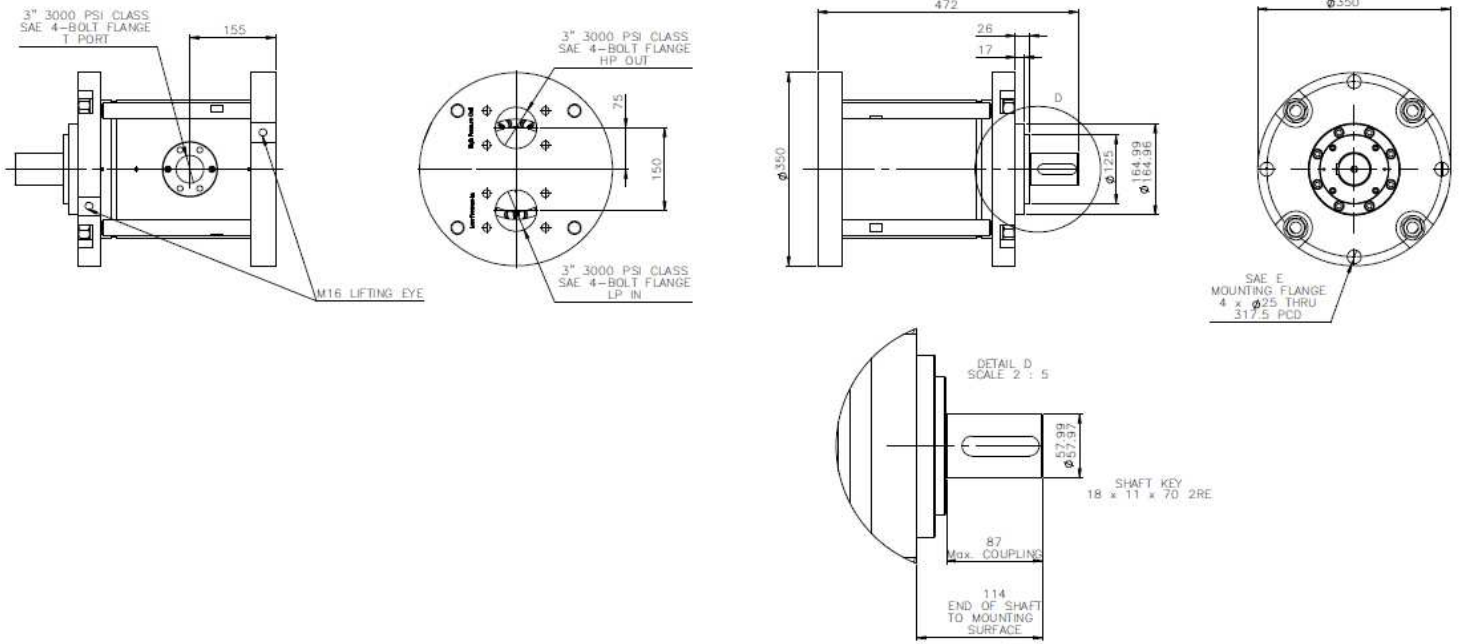
— 225cc 500 rpm — 225cc 1000rpm — 225cc 1500rpm

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P600 PUMP DIMENSIONS

PB80-625DMS

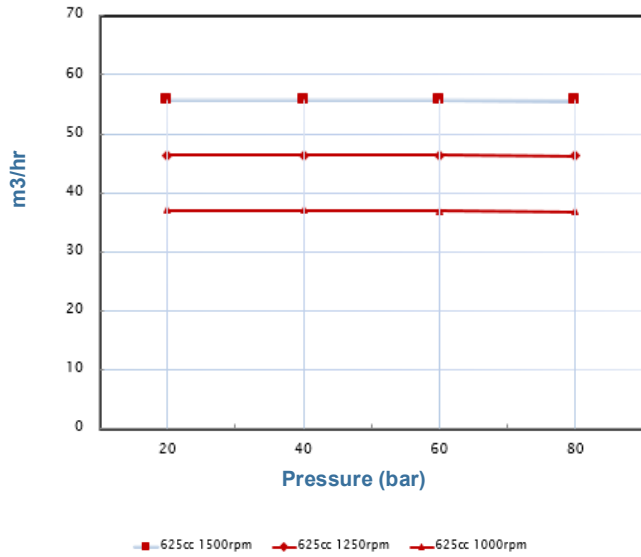
PB80-625HMS



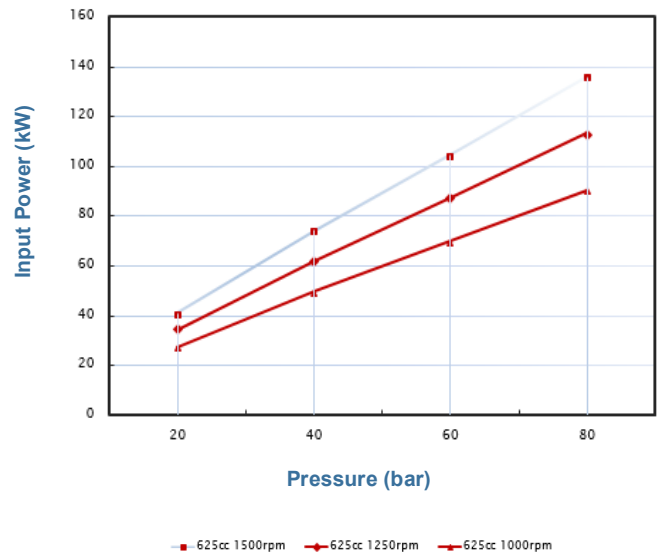
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P600 PUMP PERFORMANCE DATA

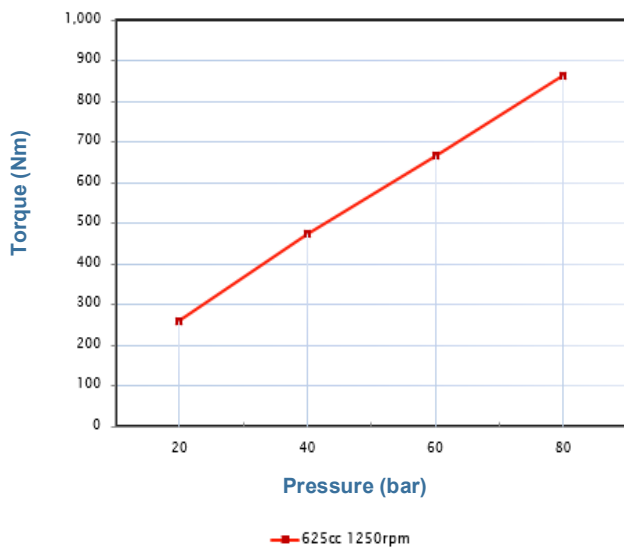
Output Flow



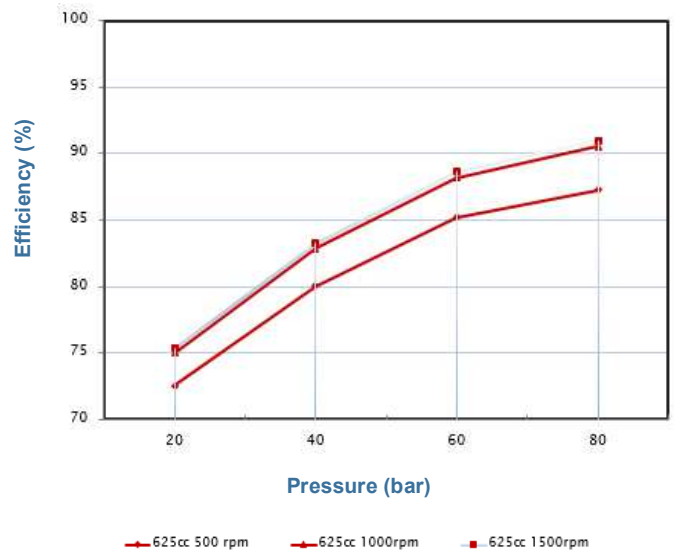
Input Power kW



Input Torque



Overall Efficiency



* Pump speeds above Max. RPM are possible, consult TWHC for details.

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Whilst every endeavour has been made to ensure accuracy, this publication cannot be considered to represent



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