



JANUS PUMPS

HIGH PRESSURE
DESALINATION PUMP
AXIAL PISTON

The
Water
Hydraulics
Co. Ltd.



F4N
Fit For Nuclear



FM 87247

JANUS PUMPS

DESALINATION AXIAL PISTON

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.

Manufactured in 2205 Duplex stainless steel as standard, the product offers excellent resistance to seawater applications. 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 energy recovery version please see our JANUS Power Centre catalogue or consult TWHC.

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. Hybrid—External components, all 316 L stainless steel with strategic internal components i.e. bearing surfaces, in duplex 2205
2. All Duplex—Total 2205 duplex material throughout, giving the highest possible corrosion resistance for extreme salt corrosion.

Flushing

We would advise that all desalination pumps are flushed on a routine basis. Any period of non operation, either short or long, the system is run on permeate to ensure the sea water is flushed from the system.

PUMP ORDERING CODE

Circuit Symbols

UNIT TYPE		OPERATING PRESSURE (BAR)		DISPLACEMENTS (cc/rev)			FLUID	
*		*		*			*	
PB	Pump Boosted	060	60.0	4.6	4.6	P6	D	Duplex
		Min	.....	6.0	6.0		HY	Hybrid
		.....	.....	12	12.0	P15		
		160	160.0	15	15.0			
		Max		19	19.0			
				23	23.0	P30		
				30	30.0			
				35	35.0	P60		
				51	51.0			
				63	63.0	P180		
				70	70.0			
				134	134.0			
				180	180.0			
				225	225.0			

Example

A pump operating at 160 bar on sea water.
Rotation in either direction with a displacement of 51cc/rev

Ordering code: PB160—51.0D

Even with the adoption of such high grade corrosion material, we would advise that a weekly (if not sooner) fresh water flushing regime is undertaken especially if the system will be non-operational for any period.

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		SPECIFICATION				
Pumps		P6	P15	P30	P60	P180
Displacement (cc/rev)	Max:	6.0	19.0	35.0	70.0	225
	Min:	4.6	12.0	23.0	35.0	135
Max. RPM						
	Boosted: *	2000	2000	2000	2000	2000
Max. Input Power (kW)		3.8	11	19.5	42	114
Max. Water Flow (m ³ /hr)		0.72	2.23	3.96	8.76	25.80
Max. Cont. Pressure (Barg)		160	160	160	160	160
Weight (kg)		2.2	6	10	19	82
Temperature (°C)	Max: **	50	50	50	50	50
	Min: ***	2	2	2	2	2

* Pump speeds above 2000 rpm are possible under higher boost conditions, consult TWHC for details. ** Higher temperature operation is possible, consult TWHC for details. *** Consult TWHC for antifreeze option and 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 Pick -A-Pack 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 temperatures below freezing, an environmentally friendly antifreeze is available; ask for the Monopropylene Glycol datasheet. Operation above 50°C is possible however, the volumetric efficiency of the unit will be affected. Consult TWHC and specify the maximum operating temperature.

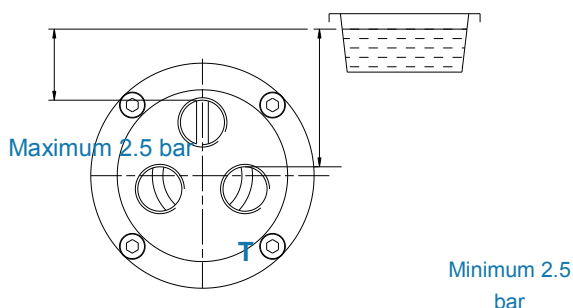
Filters

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. Return line filtration is advisable on closed loop systems. High pressure filtration may also be considered but as these are manufactured in stainless steel, we consider this an expensive option.

INLET CONDITIONS

3 Port Design

When water is fed to the pump at a minimum of 2.5 bar by either a very high pressure water main, a head or column of water in excess of 25m in height or by an external boost pump, then the 3 port design unit should be incorporated. It separates the inlet water of the pump from the internal leakage water which must be piped away to a low pressure sump or drain if possible. Low casing pressure will prolong the shaft seals life and prevent low pressure cavitation issues. The minimum case pressure and maximum inlet pressure is desired, a minimum positive inlet pressure of 2.0 bar above T pressure is required at all times.



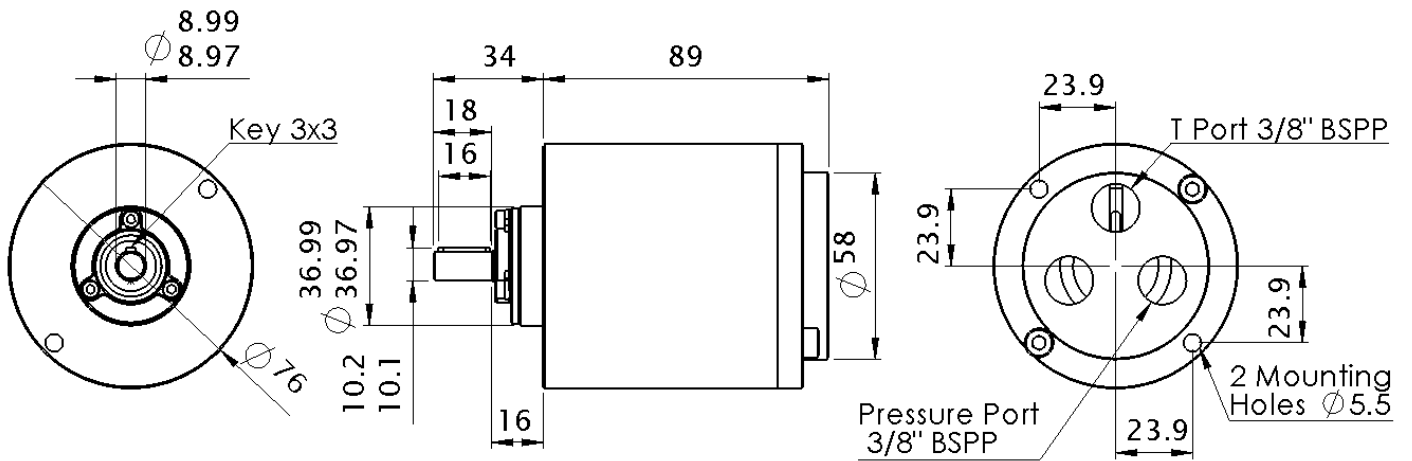
Boosted

Boosted pumps can rotate in either direction. Inlet and outlet ports change according to shaft rotation. Maximum casing pressure 2.5 bar.

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P6 PUMP DIMENSIONS

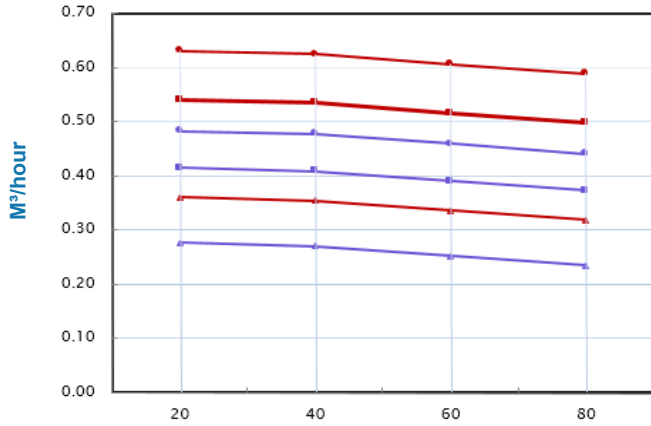
PB160-6.0D & PB160-4.6D



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P6 PUMP PERFORMANCE DATA

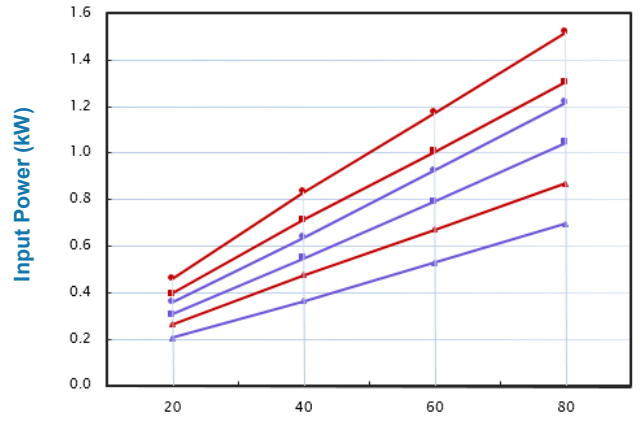
Output Flow



Pressure (bar)

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

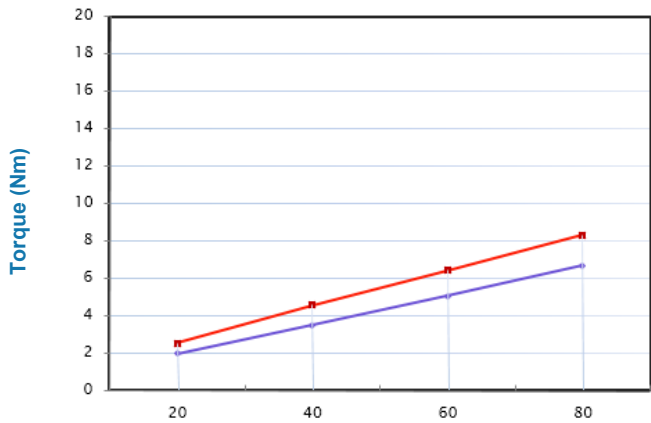
Input Power kW



Pressure (bar)

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

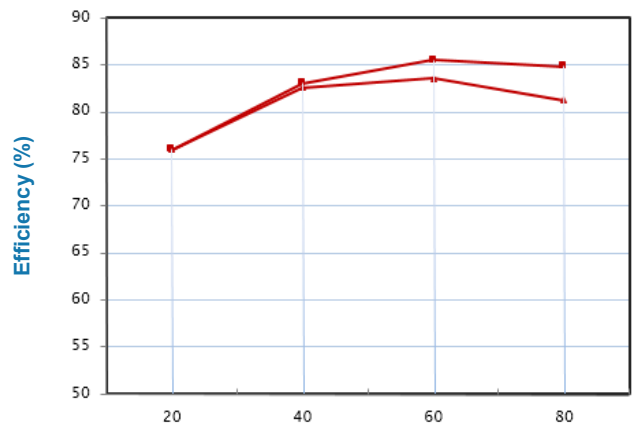
Input Torque



Pressure (bar)

—■— 6cc 1500rpm
 —▲— 4.6cc 1500rpm

Overall Efficiency



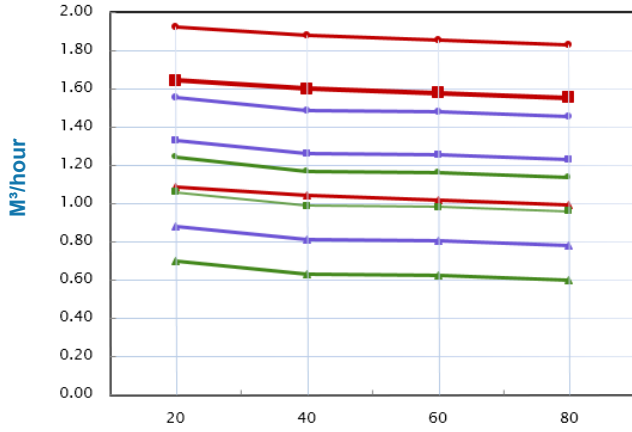
Pressure (bar)

—▲— 6cc 1000rpm
 —■— 6cc 1500rpm

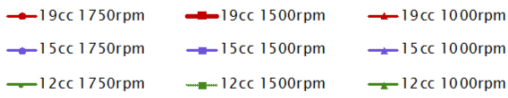
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P15 PUMP PERFORMANCE DATA

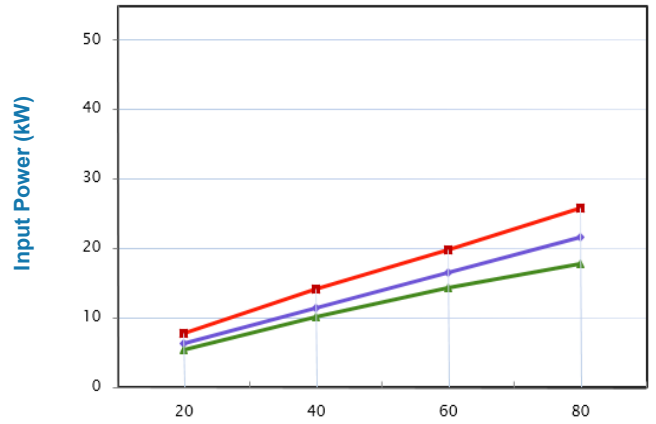
Output Flow



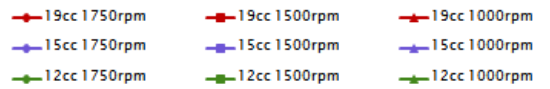
Pressure (bar)



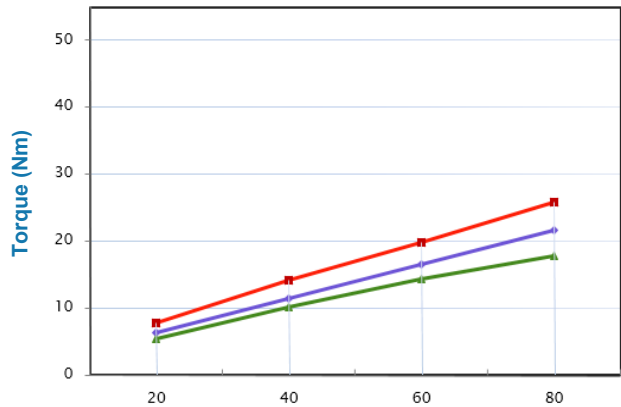
Input Power kW



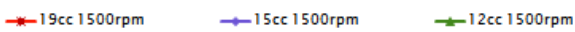
Pressure (bar)



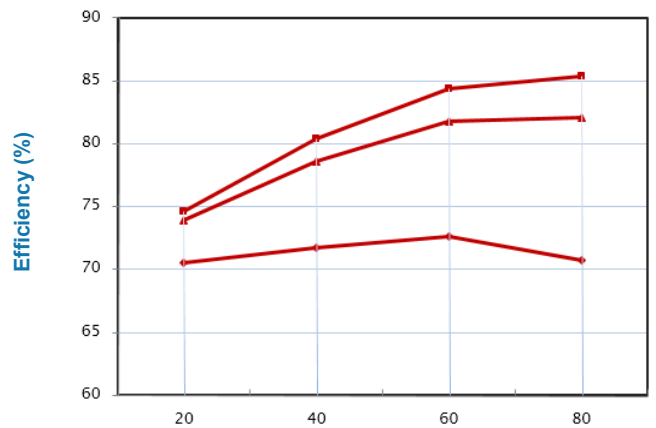
Input Torque



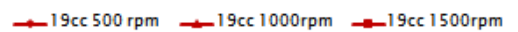
Pressure (bar)



Overall Efficiency

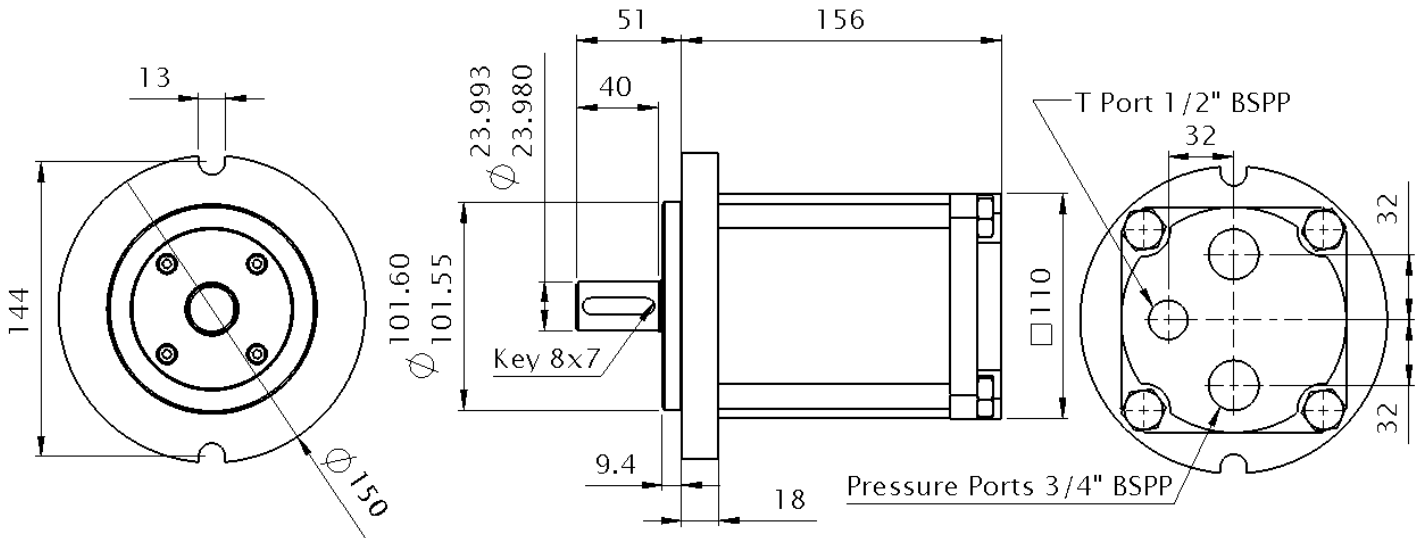


Pressure (bar)



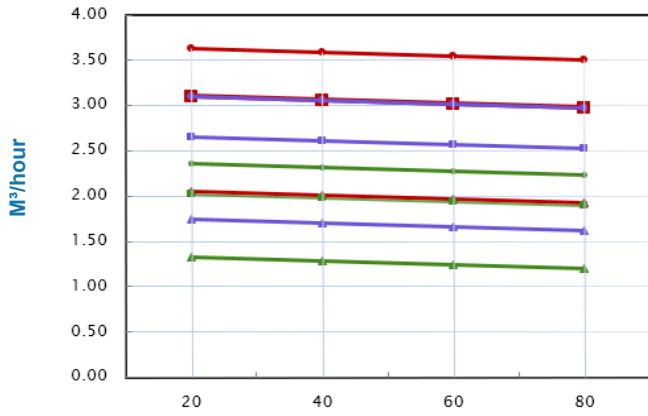
JANUS PUMPS P30 PUMP DIMENSIONS

PB160-23D, PB160-30D & PB160-35D



JANUS PUMPS P30 PUMP PERFORMANCE DATA

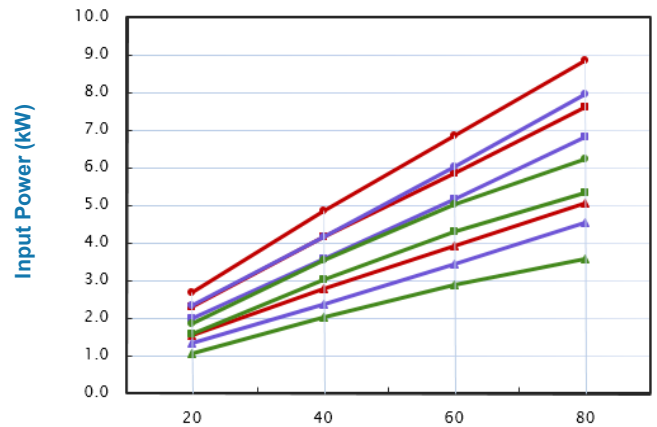
Output Flow



Pressure (bar)

—◆— 35cc 1750rpm —■— 35cc 1500rpm —▲— 35cc 1000rpm
—◆— 30cc 1750rpm —■— 30cc 1500rpm —▲— 30cc 1000rpm
—◆— 23cc 1750rpm —■— 23cc 1500rpm —▲— 23cc 1000rpm

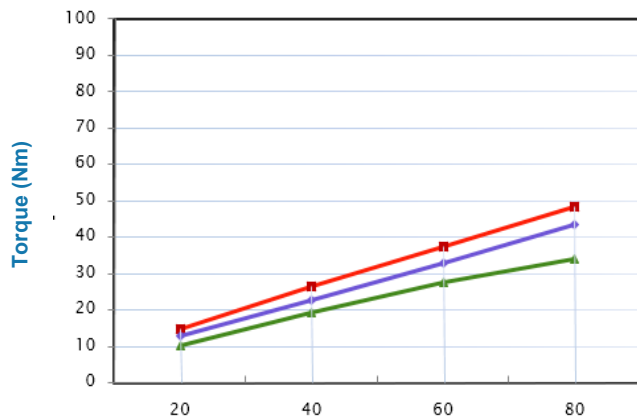
Input Power kW



Pressure (bar)

—◆— 35cc 1750rpm —■— 35cc 1500rpm —▲— 35cc 1000rpm
—◆— 30cc 1750rpm —■— 30cc 1500rpm —▲— 30cc 1000rpm
—◆— 23cc 1750rpm —■— 23cc 1500rpm —▲— 23cc 1000rpm

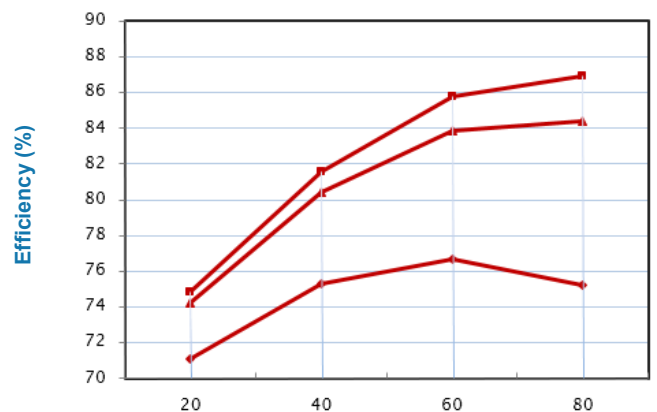
Input Torque



Pressure (bar)

—■— 35cc 1500rpm —▲— 30cc 1500rpm —▲— 23cc 1500rpm

Overall Efficiency



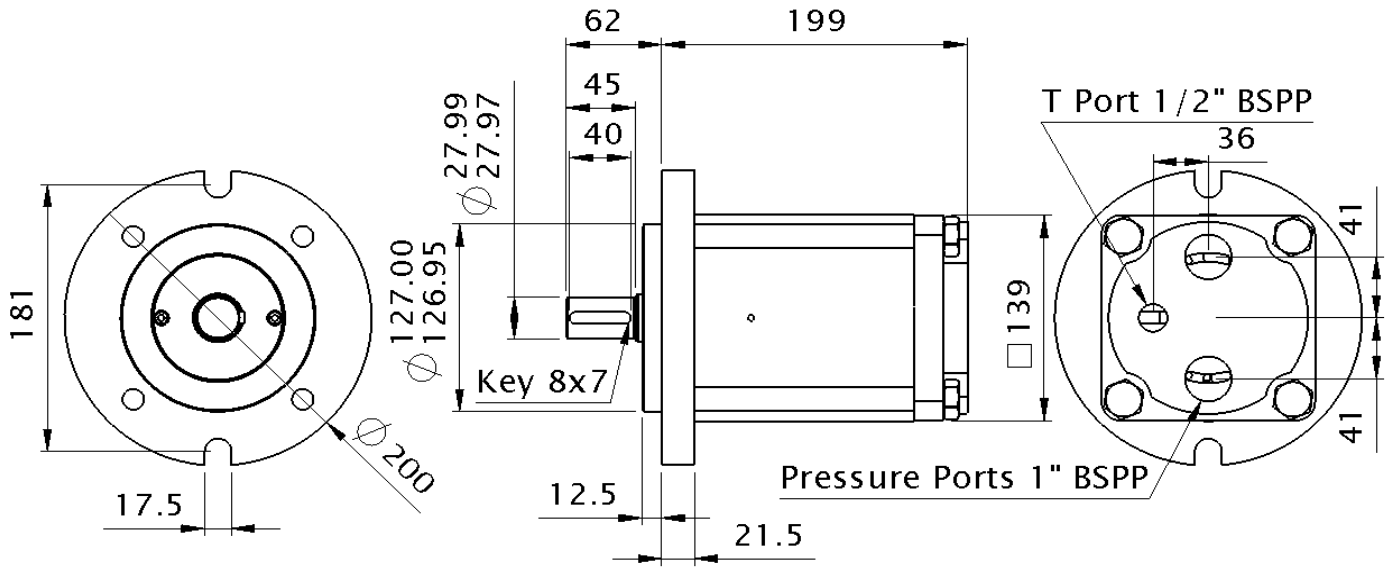
Pressure (bar)

—◆— 35cc 500 rpm —▲— 35cc 1000rpm —■— 35cc 1500rpm

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P60 PUMP DIMENSIONS

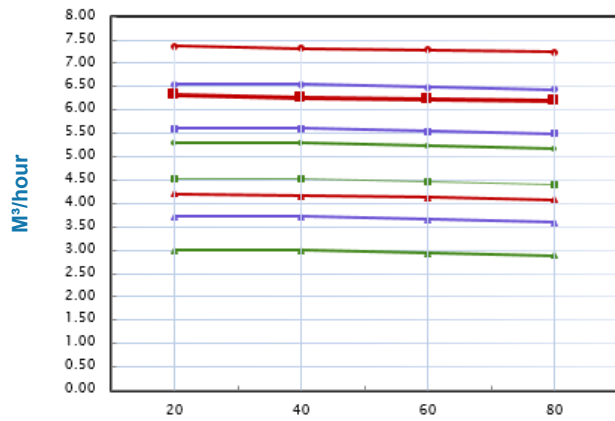
PB160-51D, PB160-63D & PB160-70D



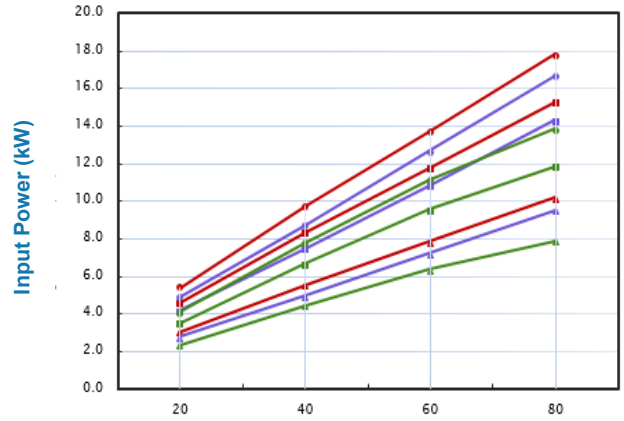
JANUS PUMPS

P60 PUMP PERFORMANCE DATA

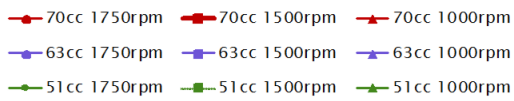
Output Flow



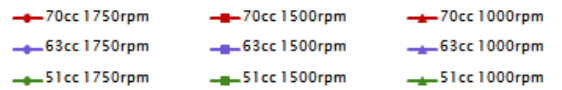
Input Power kW



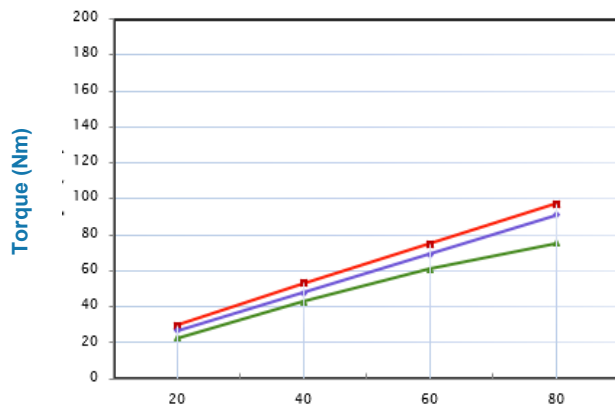
Pressure (bar)



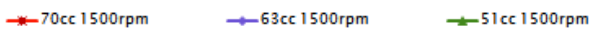
Pressure (bar)



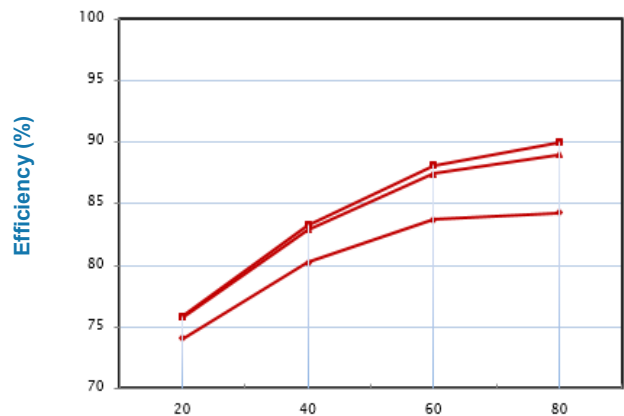
Input Torque



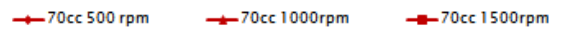
Pressure (bar)



Overall Efficiency



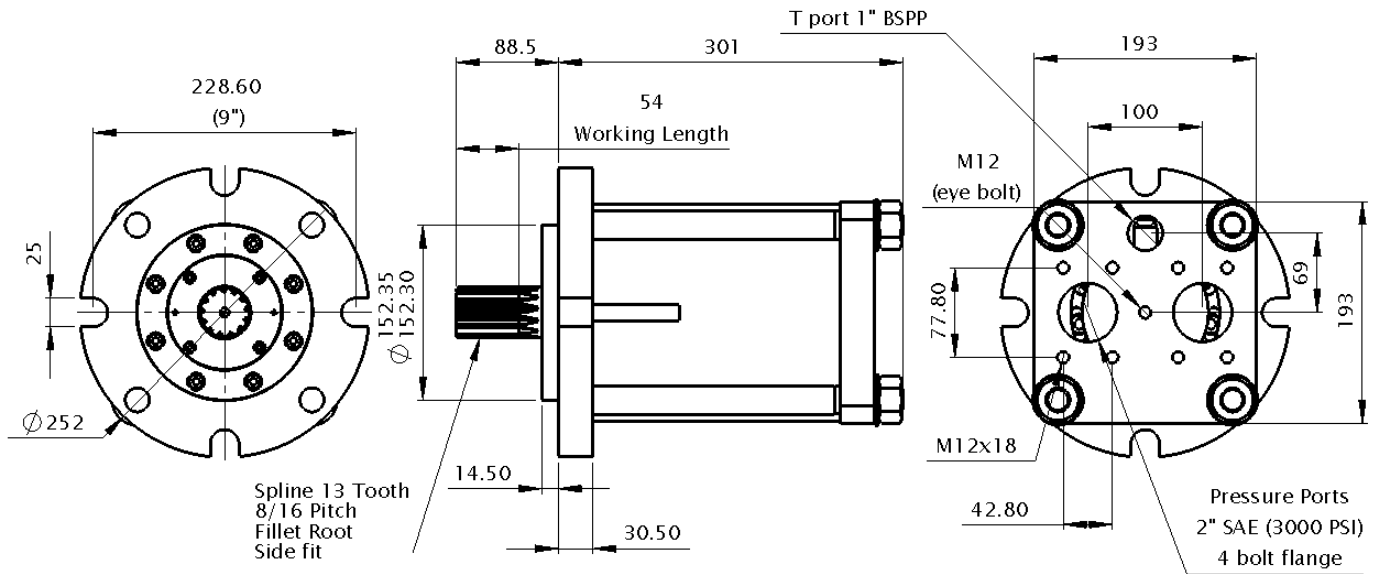
Pressure (bar)



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P180 PUMP DIMENSIONS

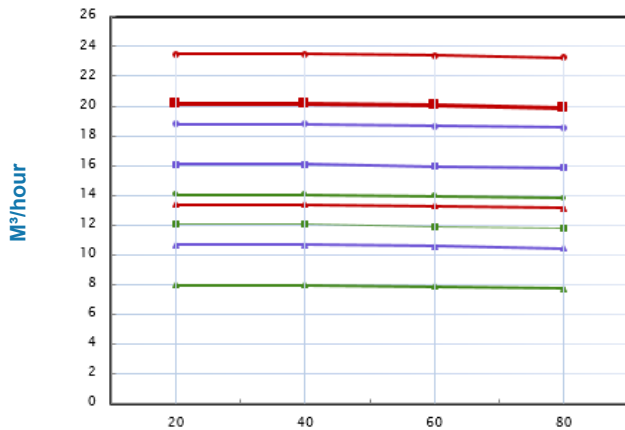
PB160-134D, PB160-180D & PB160-225D



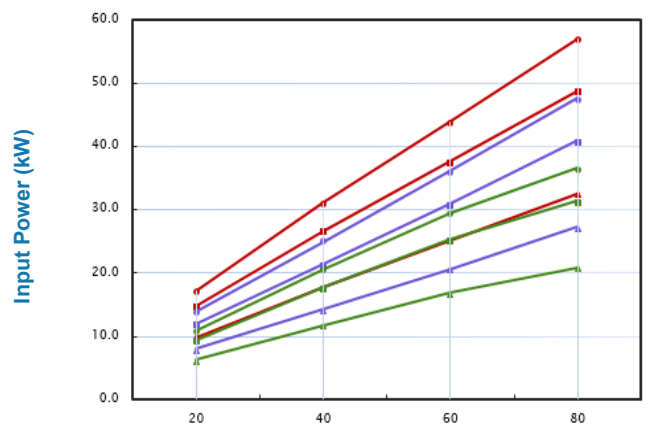
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P180 PUMP PERFORMANCE DATA

Output Flow



Input Power kW



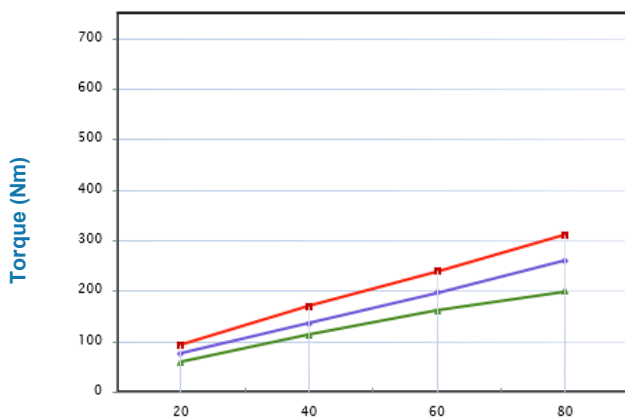
Pressure (bar)

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

Pressure (bar)

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

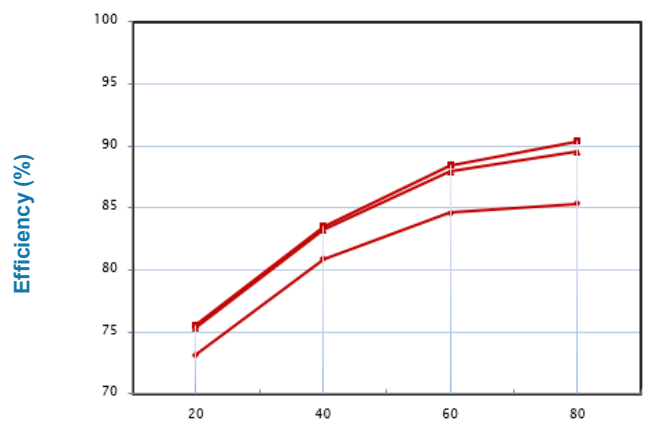
Input Torque



Pressure (bar)

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

Overall Efficiency



Pressure (bar)

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