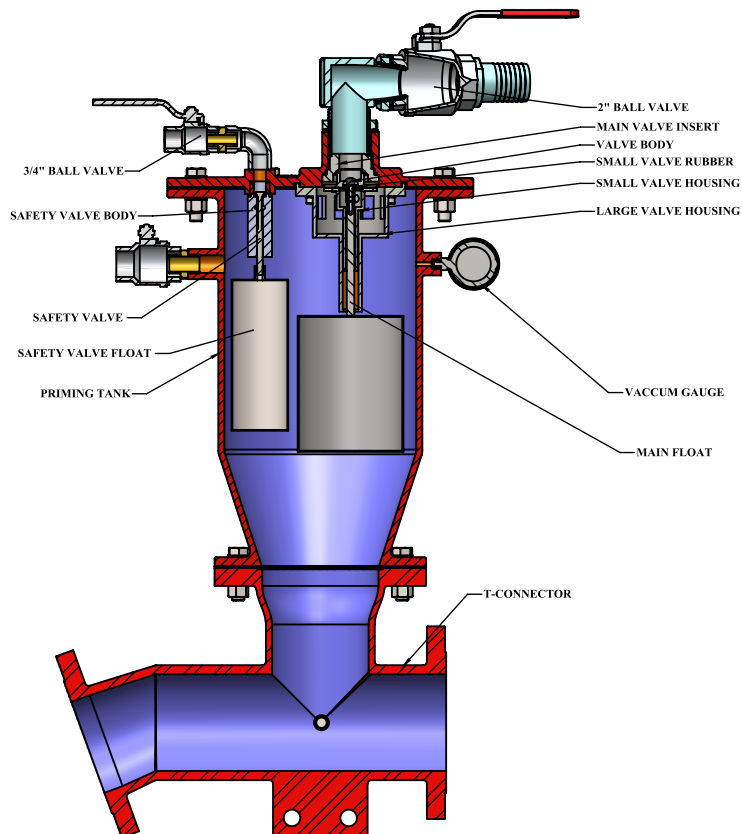


SINGLE DIAPHRAGM



PRIMING TANK - AIR AND WATER SEPARATOR



Updated on 02-04-2022

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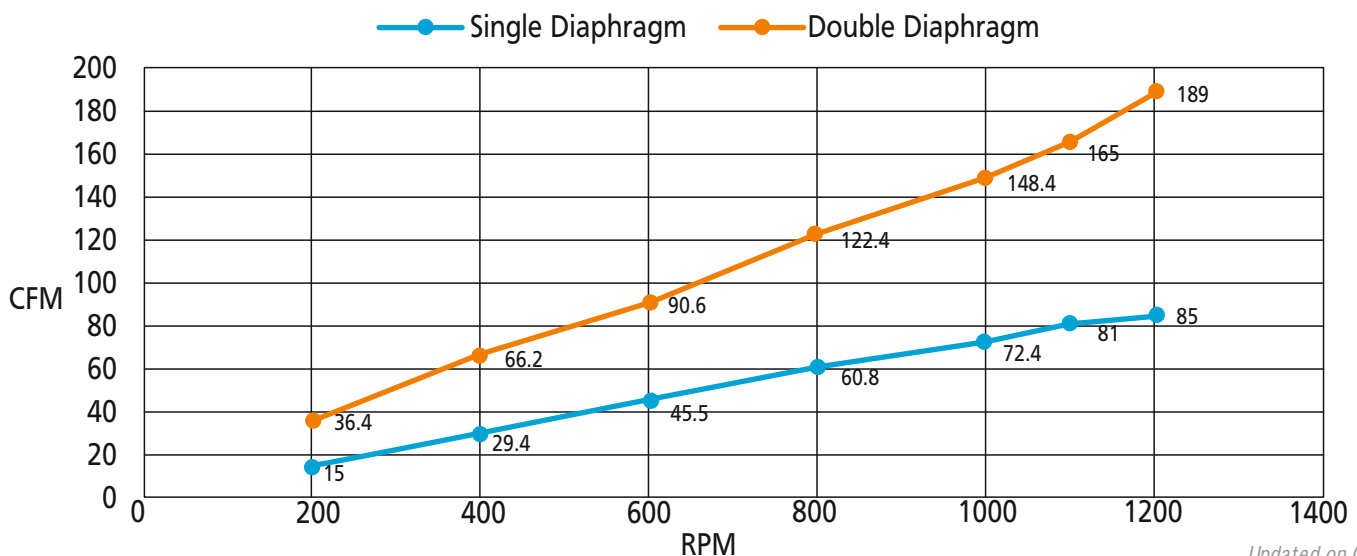
SMART PRIME

(60 Cfm @ 800 RPM from Single Diaphragm Pumps & 120 Cfm@800 RPM- Double Diaphragm Pumps)
The priming system will create a vacuum in the pump and in the suction hose allowing the water to be drawn upwards towards the pump. After a short priming time the water will reach the main centrifugal pump and also enter the priming chamber of the priming tank. The float in the priming chamber will now raise when it reached approximately halfway up the chamber it will fits close the small valve followed by closing of the large valve. The main centrifugal pump is now also pumping water through the system. The status of the system is now as follows

1. **Small valve is closed**
2. **Large valve is closed**
3. **Main float is highest position**
4. **Non return valve on the pumps discharge is fully open**
5. **Vacuum pump remains operating [Consumes very little power]**
6. **System is now full of water**
7. **Centrifugal pump is pumping water**

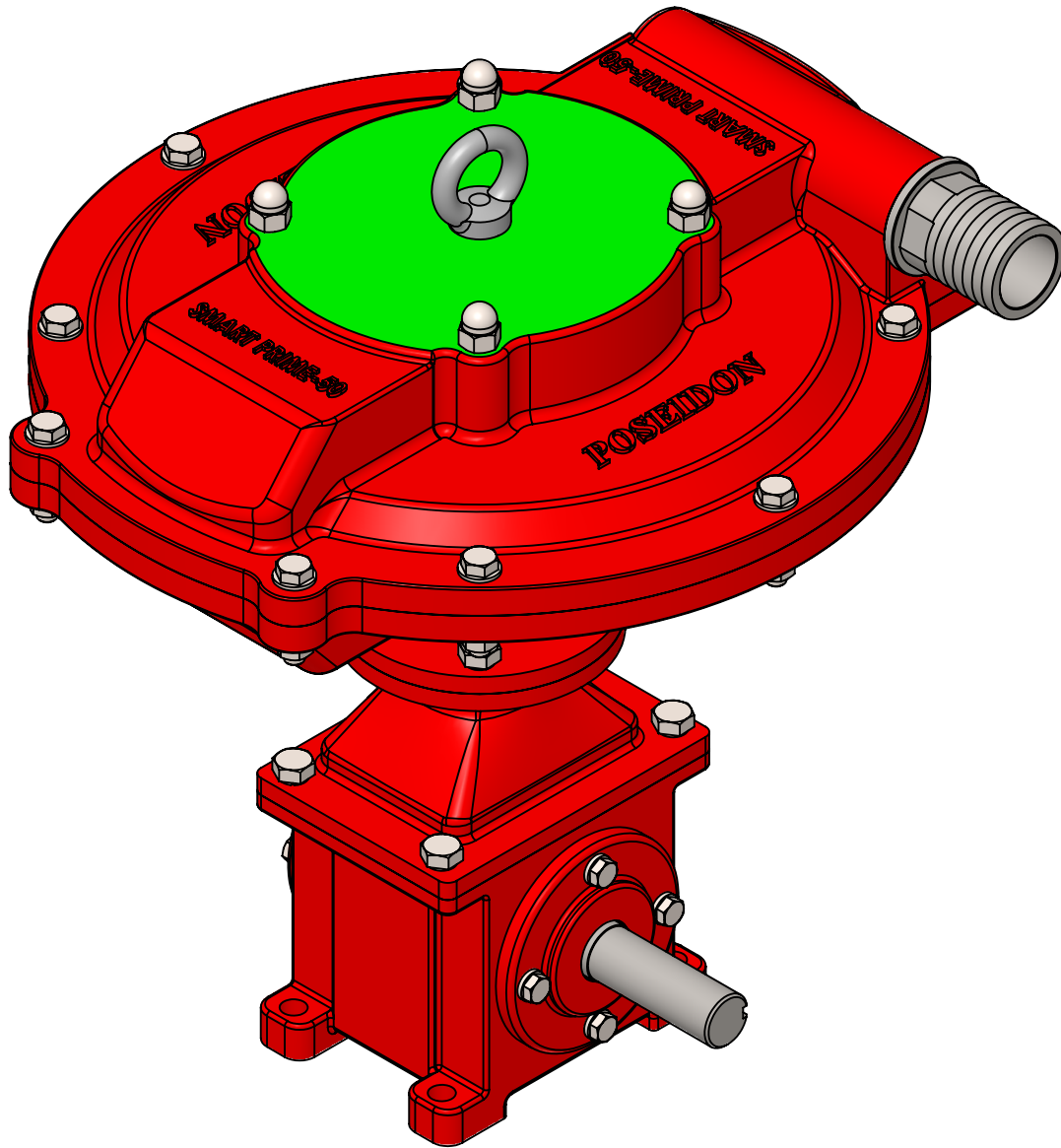
Should some further air accumulates in the priming chamber than small valve will open to evacuate this air and then seal the chamber again. Should there be a sudden influx of lot of air , then large valve will also open for faster air evacuation. This priming system is totally clean system in that no oils are evacuated or deposited into environment. It is also important to note that none of the pumped fluids enter the vacuum pump which although if this happen in quantities, it will not hurt the diaphragm pump, It will discharge such fluids into environment Creating Pollution. This could typically happen if some dirt enters the valve system of any vacuum pump (Both in our or our competitors system) hence , the valve will leak and eventually will start to draw the pumped fluid through the vacuum pump spilling out into the environment. The Poseidon Smart prime system we have provided for this eventually and we are only company in the market that has an additional safety valve build into the tank. Should the water level in the chamber reach a too high a level, than the safety valve which has a secondary stainless steel float, will let some air into chamber dropping down the fluid level in the chamber. This will not affect the operation of the centrifugal pump but it will keep it safe and operating properly. With this system, it impossible for any fluid to enter into valve system and or into priming pump

Single and Twin Diaphragm RPF vs CFM



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Priming time 60 cfm

Pipe internal diameter mm	Area m2	60cfm Volume pumps m3/sec	Pipe fluid speed m/sec	time for priming in seconds								
				10m	20m	30m	40m	50m	60m	100m	200m	300m
80	0.005029	0.02359	4.691193	2.13	4.26	6.39	8.53	10.66	12.79	21.32	42.63	63.95
100	0.007857	0.02359	3.002364	3.33	6.66	9.99	13.32	16.65	19.98	33.31	66.61	99.92
150	0.017679	0.02359	1.334384	7.49	14.99	22.48	29.98	37.47	44.96	74.94	149.88	224.82
200	0.031429	0.02359	0.750591	13.32	26.65	39.97	53.29	66.61	79.94	133.23	266.46	399.69

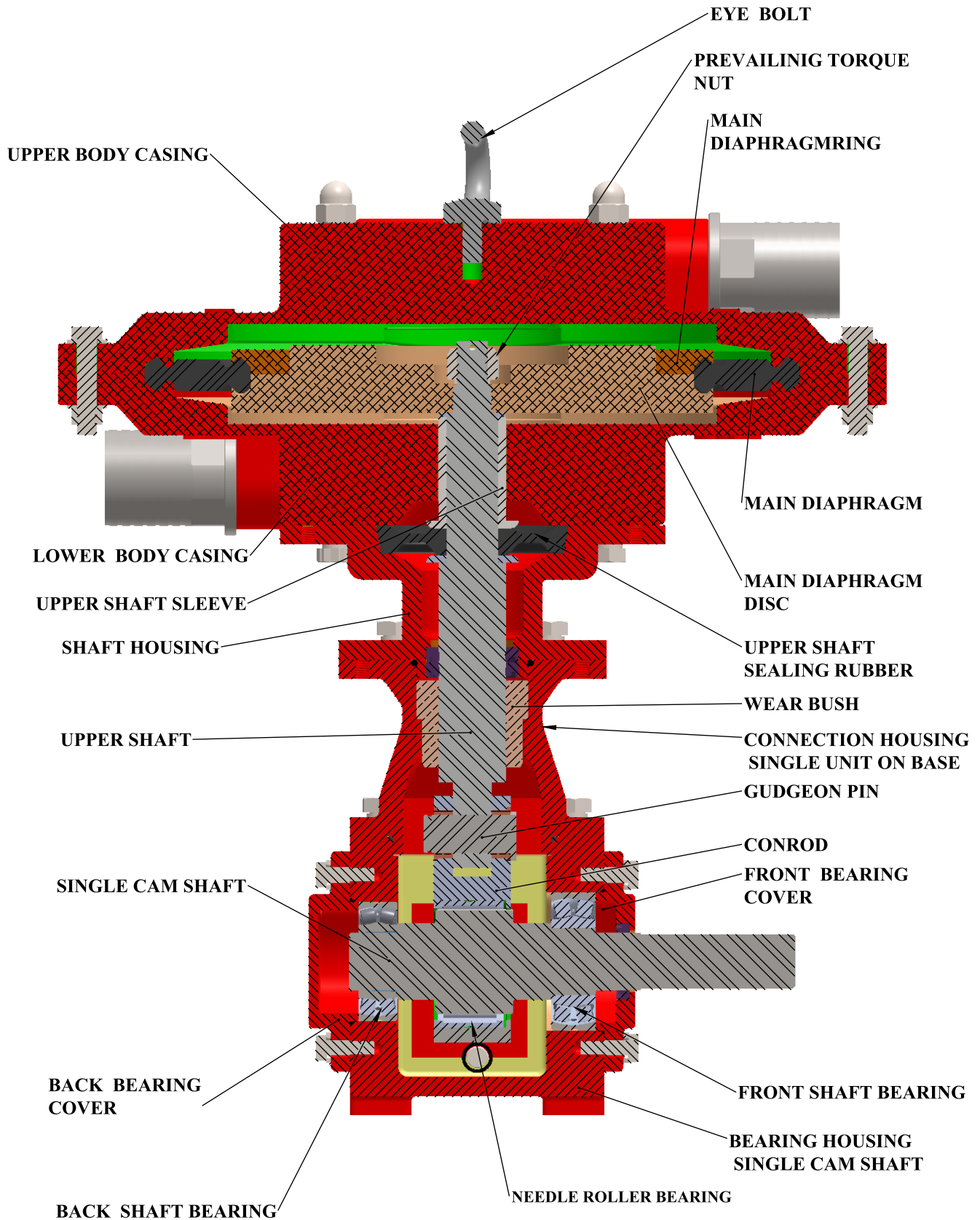
Priming time 120 cfm

Pipe internal diameter mm	Area m2	120cfm Volume pumps m3/sec	Pipe fluid speed m/sec	time for priming in seconds								
				10m	20m	30m	40m	50m	60m	100m	200m	300m
80	0.005029	0.04718	9.382386	1.07	2.13	3.20	4.26	5.33	6.39	10.66	21.32	31.97
100	0.007857	0.04718	6.004727	1.67	3.33	5.00	6.66	8.33	9.99	16.65	33.31	49.96
150	0.017679	0.04718	2.668768	3.75	7.49	11.24	14.99	18.74	22.48	37.47	74.94	112.41
200	0.031429	0.04718	1.501182	6.66	13.32	19.98	26.65	33.31	39.97	66.61	133.23	199.84

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EXPLODED VIEW

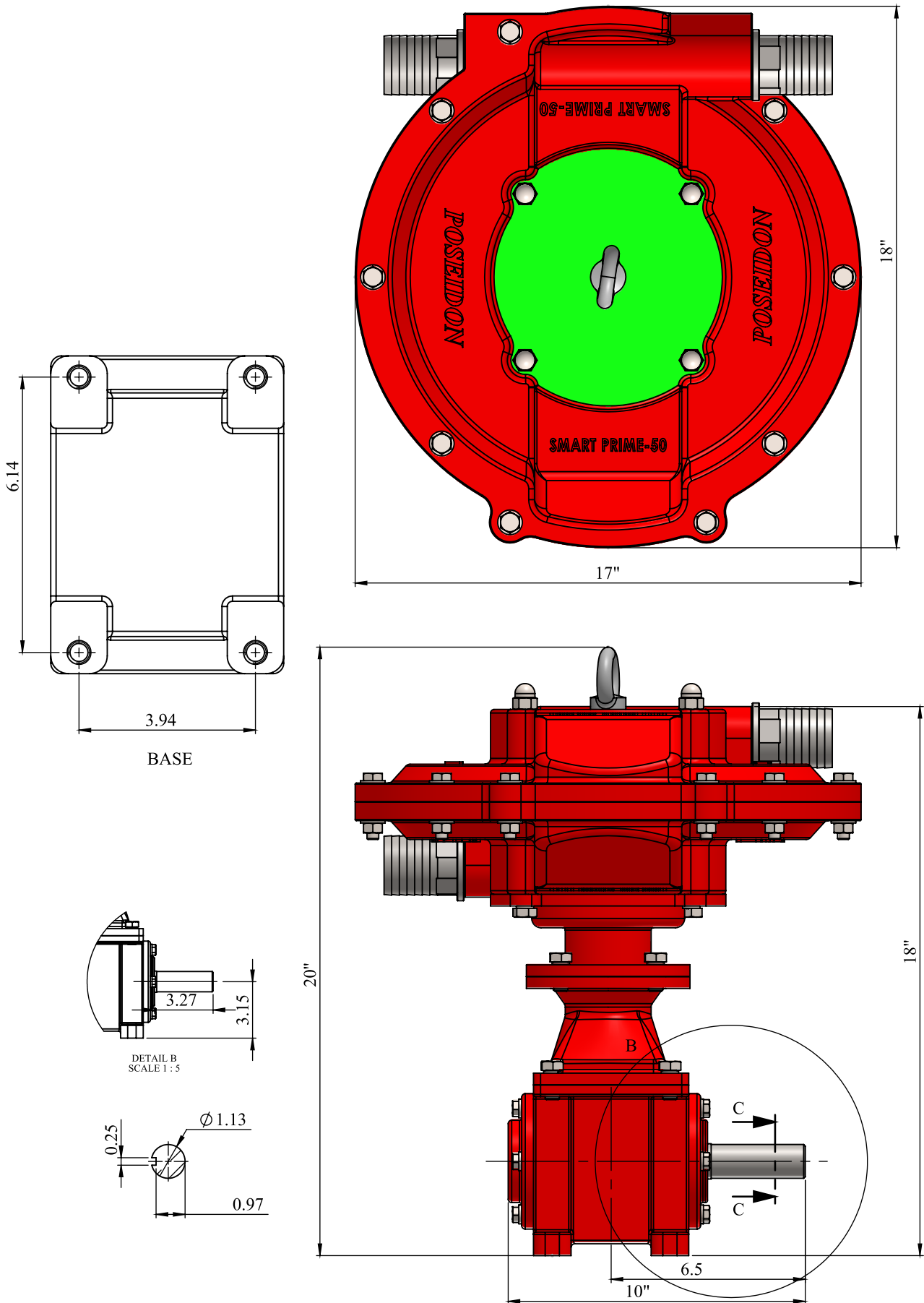


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No.85/M, Ground Floor, Industrial Suburb, 2nd Stage Gautham Nagar, Tumkur Road Yeshwanthpur, Bangalore 560 022, Karnataka, INDIA
 Tel. : +91 80 4163 5638, Mobile: +91 94835 26899 / 80736 22800, Email : sales@ihpumps.in, Web : www.ihpindia.in | www.ihpumps.in

DIMENSIONS

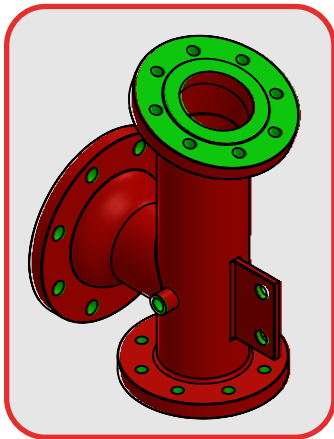
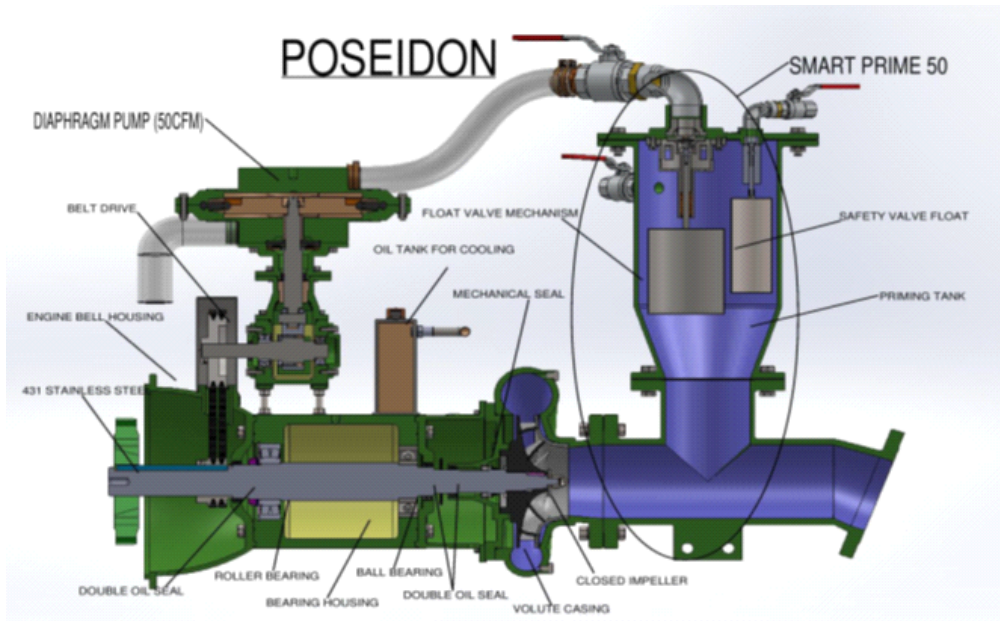


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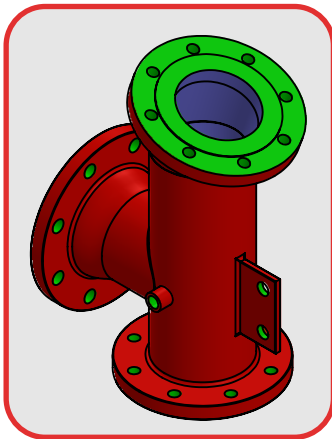
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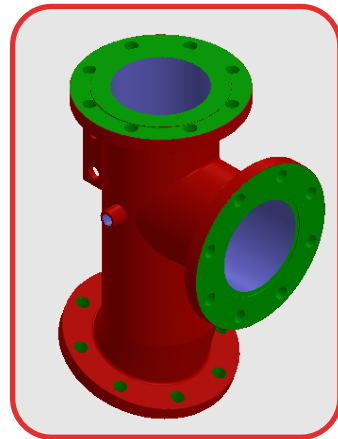
SMART PRIME - ASSEMBLY VIEW



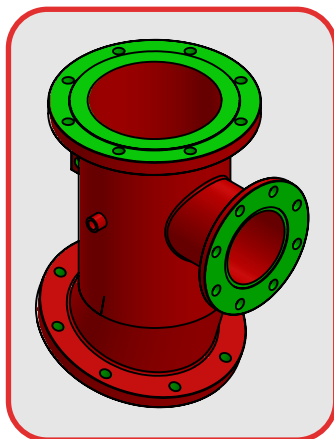
TEE CONNECTOR
TDR100



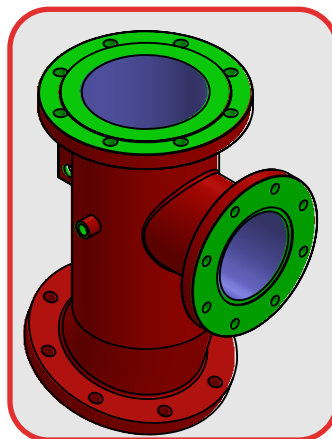
TEE CONNECTOR
TDR125



TEE CONNECTOR
TDR150



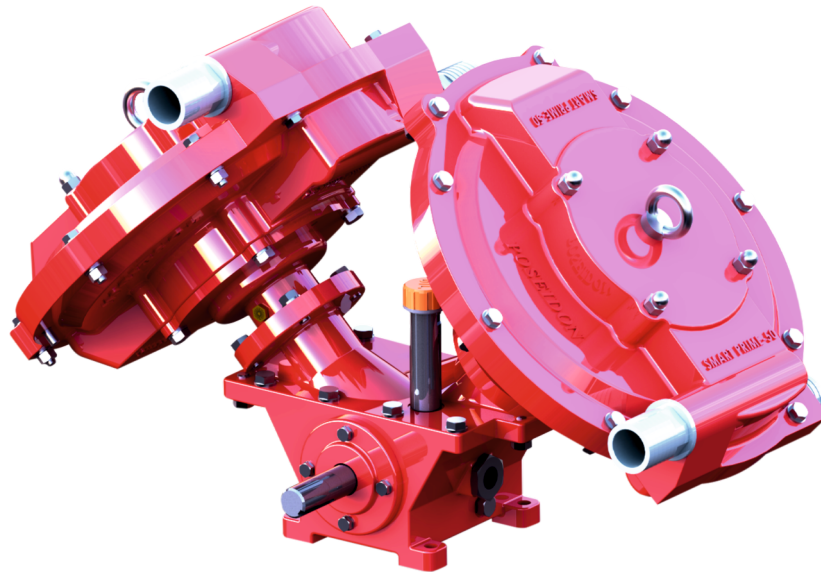
TEE CONNECTOR
TDR250



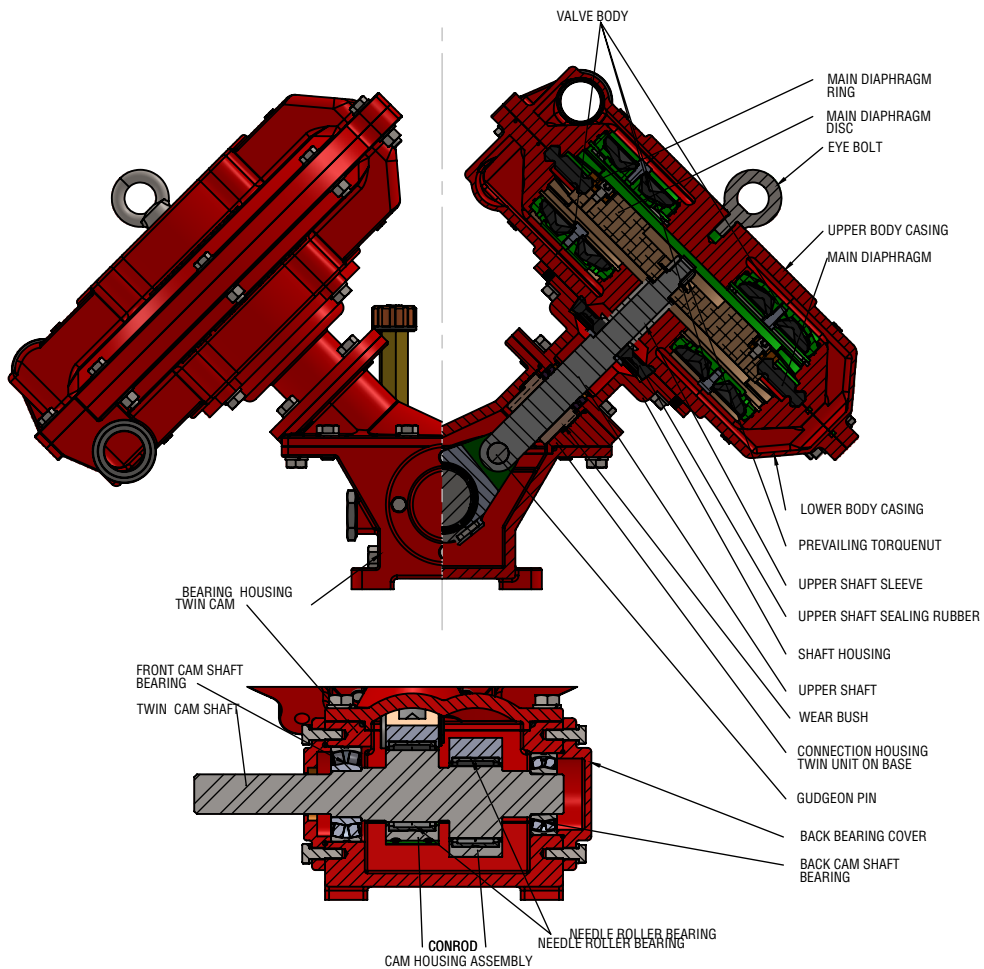
TEE CONNECTOR
TDR200

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SMART PRIME-DOUBLE

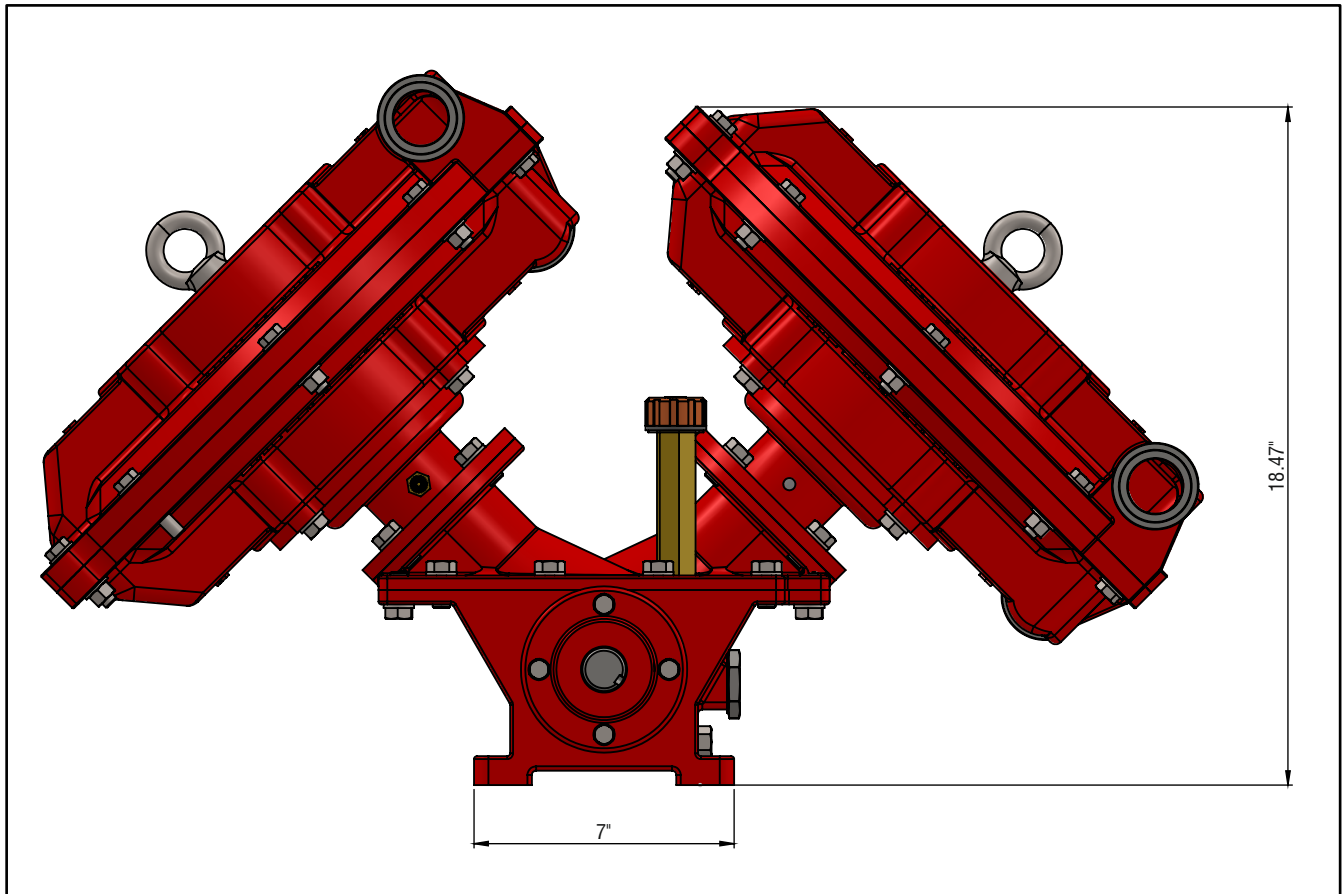
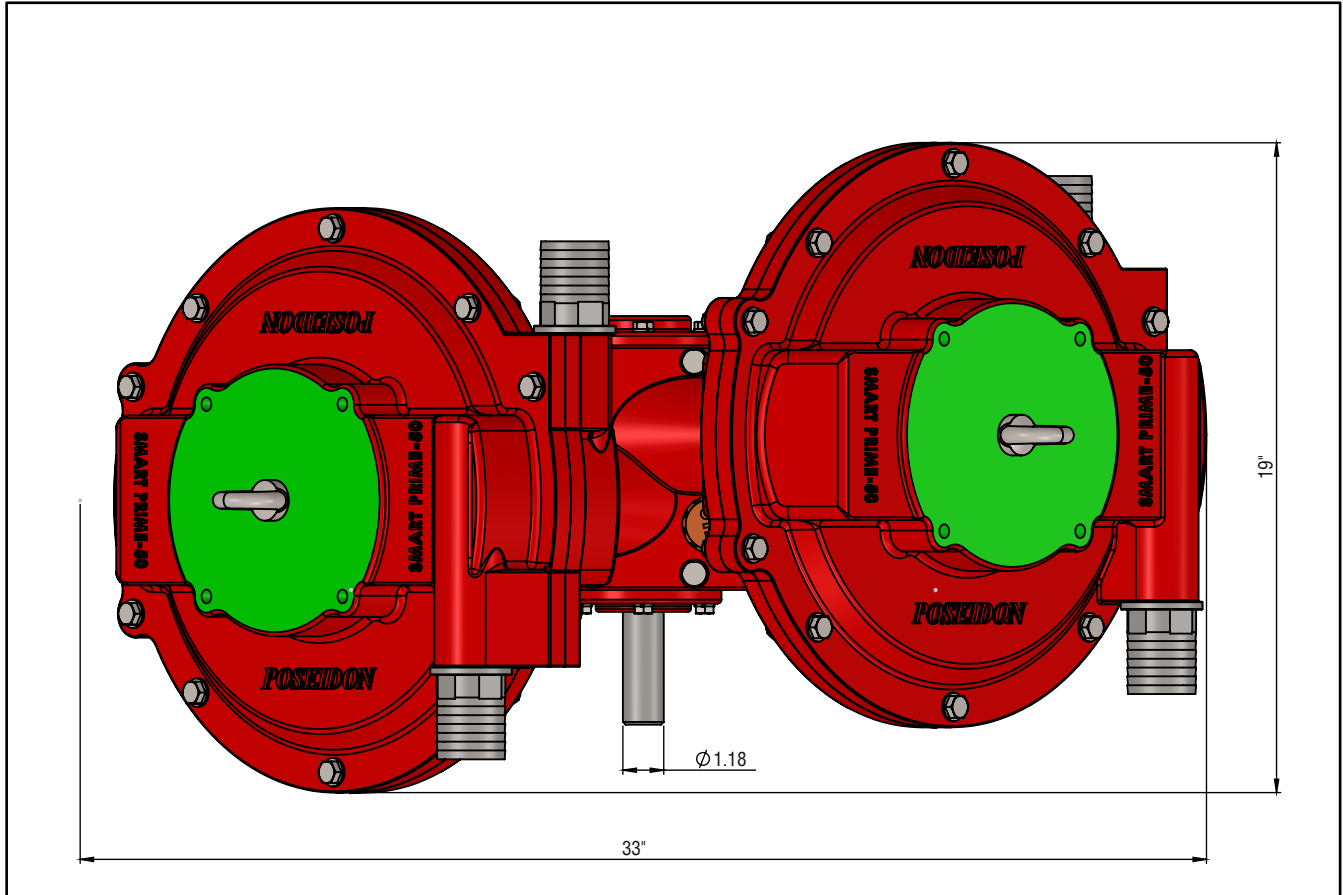


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DIMENSIONS

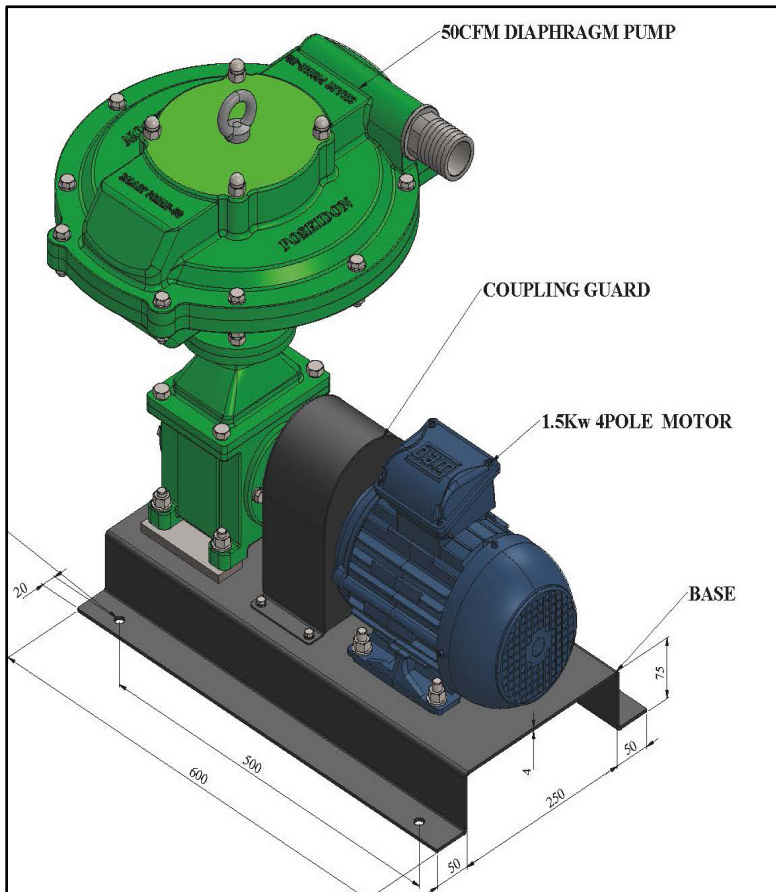
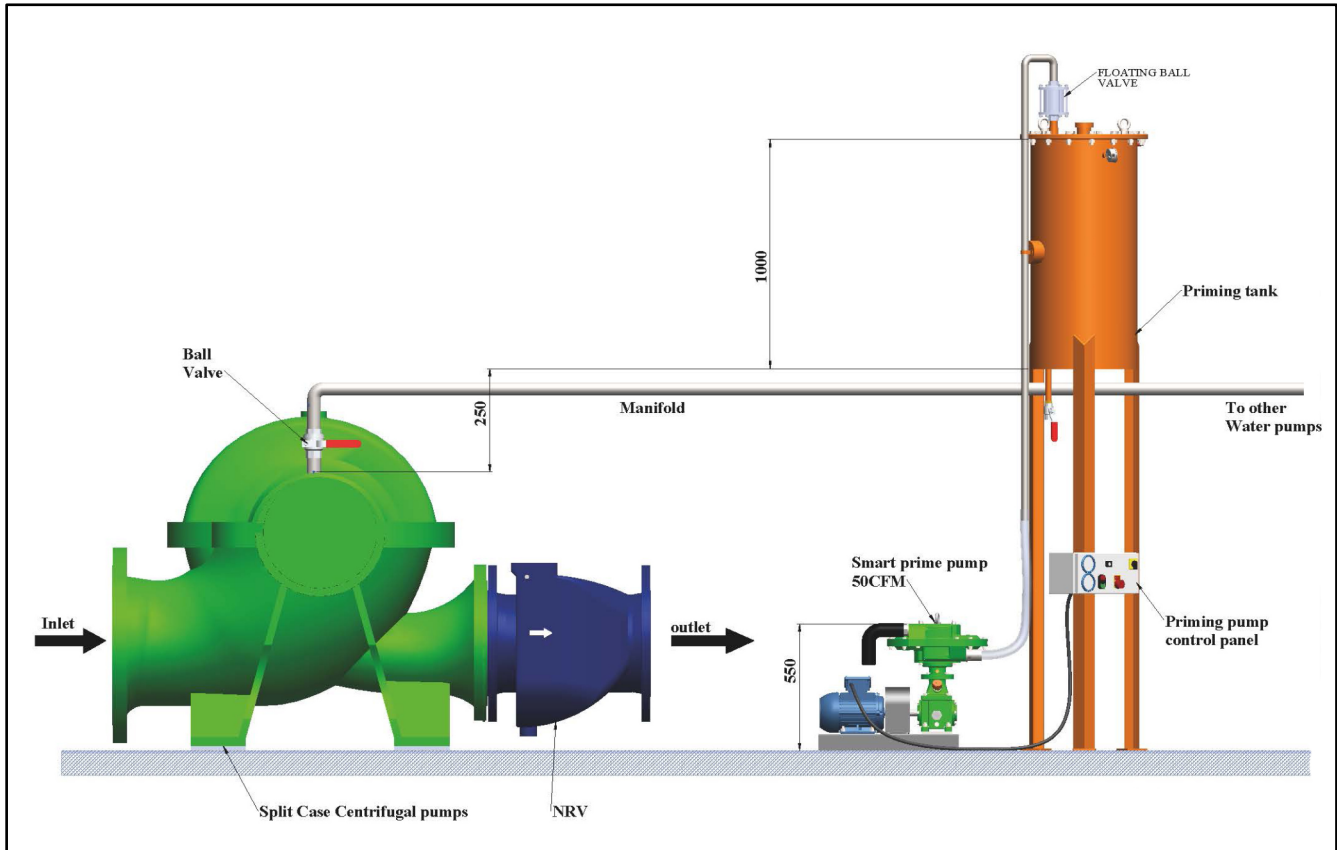


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PUMP STATION PRIMING SYSTEM



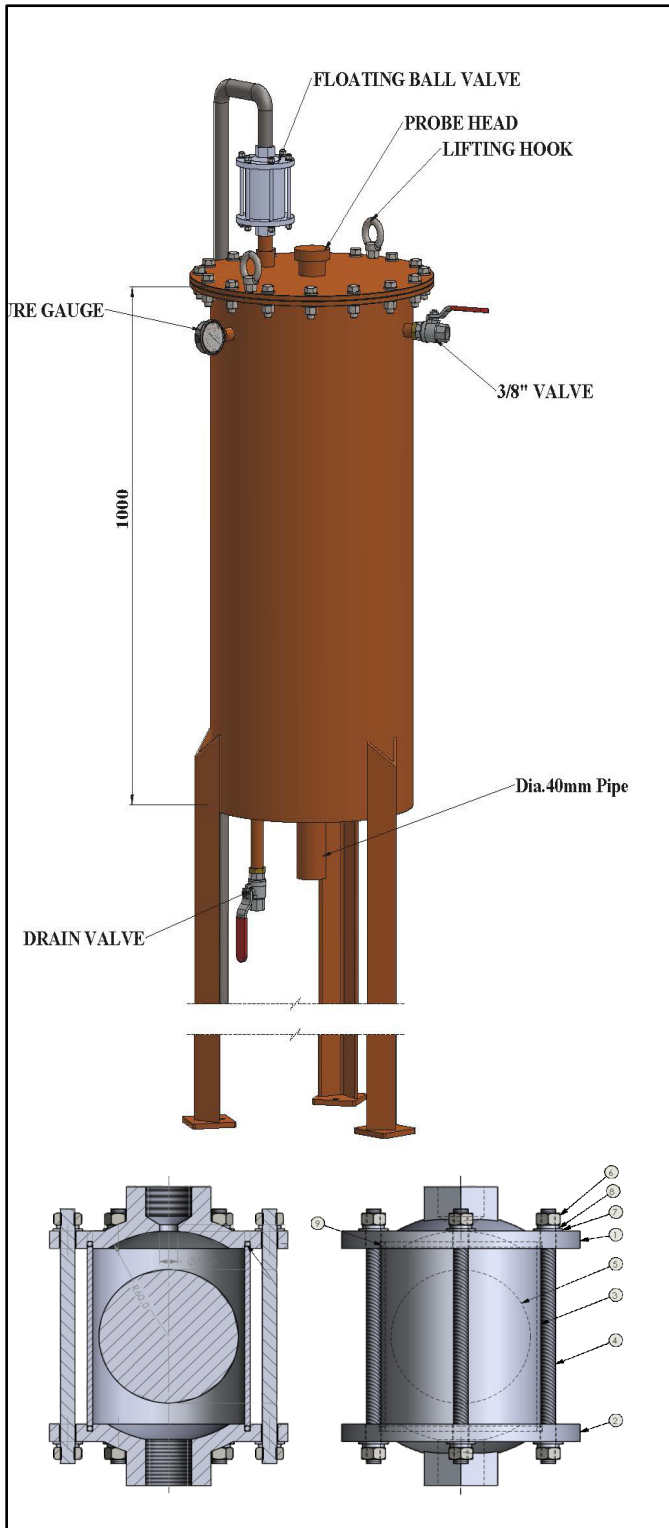
Major components of priming system:

The heart of the priming system is the priming vacuum pump. The Poseidon “Smartprime™” diaphragm vacuum pump is specifically designed for priming large electrically and diesel driven water pumps.

The Poseidon “Smartprime™” is available in 50 and 100cfm configurations. Where the priming pump is used with large electrically driven water pumps, the priming pump is powered by its own single phase electrical motor (1.5kw 4pole for the 50cfm pump and 2.2kw for the 100cfm pump). For diesel driven water pumps, the Smartprime™ vacuum pump is usually driven directly by the diesel engine.

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The other major part of the priming system, is the priming tank. The priming tank and the priming vacuum pump can be used to automatically prime a number of “different” end suction centrifugal, or split case pumps at the same time.

The tank is fitted with 3 electrical probes (common, high water level and low water level) to automate the priming system.

The bottom of the priming tank is usually placed around 250mm above the highest pump priming point in the pumping station. This ensures that all water pump mechanical seals are adequately flooded before the water pumps are started.

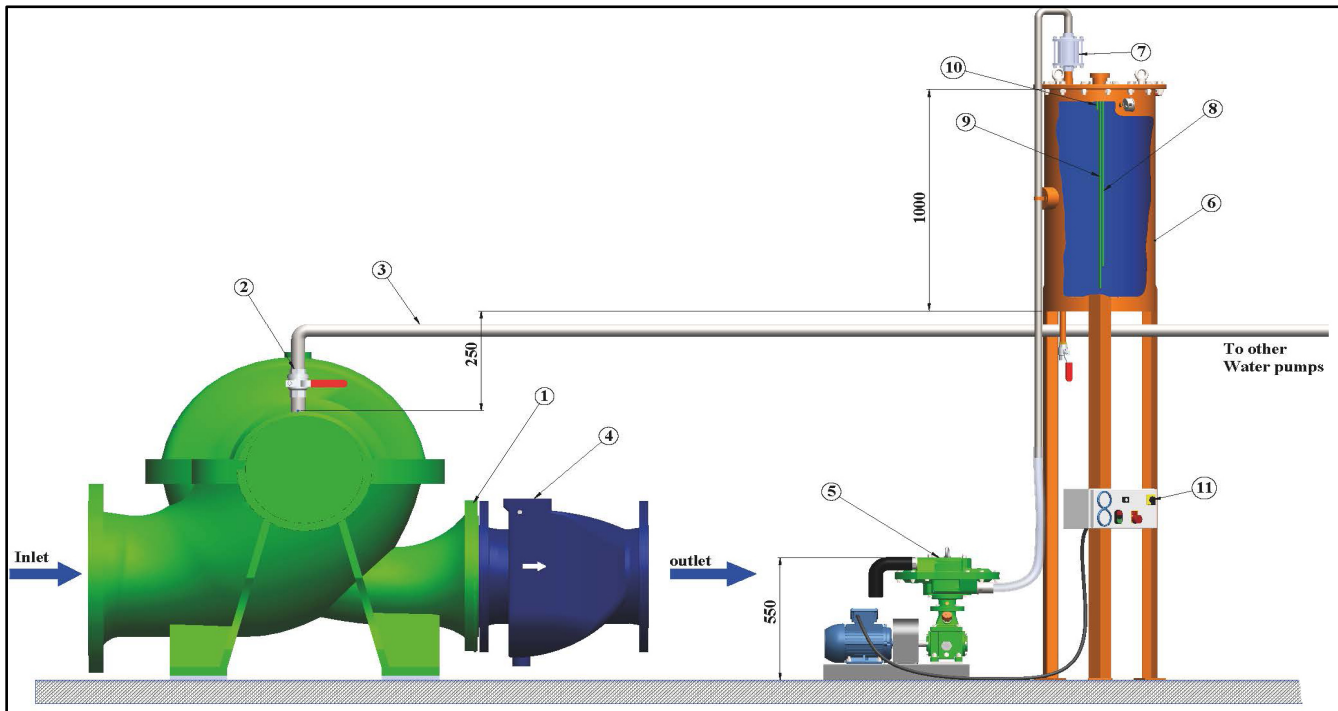
The tank is fitted with an internal baffle to allow the water entering the tank to reduce the entry speed and calm the water in the tank.

The top of the priming tank will be fitted with a floating ball valve. The “ball” in the valve is a wooden, rubber coated, ball that will float in water. The purpose of the floating ball valve is two fold:

Firstly when the system is primed, the ball will fall to the lowest position and will maintain the vacuum in the tank (even if the vacuum pump leaks air back into the system).

Secondly, if the probes fail to switch off the priming pump, then the ball would float to the top of the valve and seals the outlet preventing any priming water to enter the vacuum priming pump

SYSTEM OPERATION



Operational sequence:

Before the main water pump (item 1) can be started, the casing of the pump needs to be primed with water.

When the start button for the main pump is pressed, the electrical controls of the main pump panel will first check if the system is primed. A simple voltage free contact will be available in the priming pump control panel (item 11) for this purpose.

Priming - when the priming system (item 5) is first switched on the 50cfm (free air) is drawn out of the suction pipework and pump casing.

Note: The pump must be fitted with a suitable discharge check valve (item 4 - preferably with a rubber seated seal in the clapper) for the priming system to work. Water will be drawn up into the pump casing and out into the priming manifold (item 3) and subsequently into the priming tank. When the primed water reaches the highest probe (item 10) in the tank (item 6) the vacuum priming pump (item 5) will stop. Should the water level in the tank drop over time, then the priming pump will automatically start and reprime the tank.

The priming control panel will be fitted with a delay timer to prevent the main pump being shut down due to a drop in the water level in the tank. Should the delay time be exceeded and the tank (item 6) is not fully primed, then the signal to the main panel will be altered and the main water pump(s) can be shut down as it may have run out of water (client discretion in how he wants this to work).

If there are multiple pumps on the priming manifold and a particular pump is to be switched off for maintenance etc., the priming system can be isolated via a ball valve (item 2).

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