VARNA Products

Engineered | Innovation

XD-4 Whisper Vane Transfer Pump

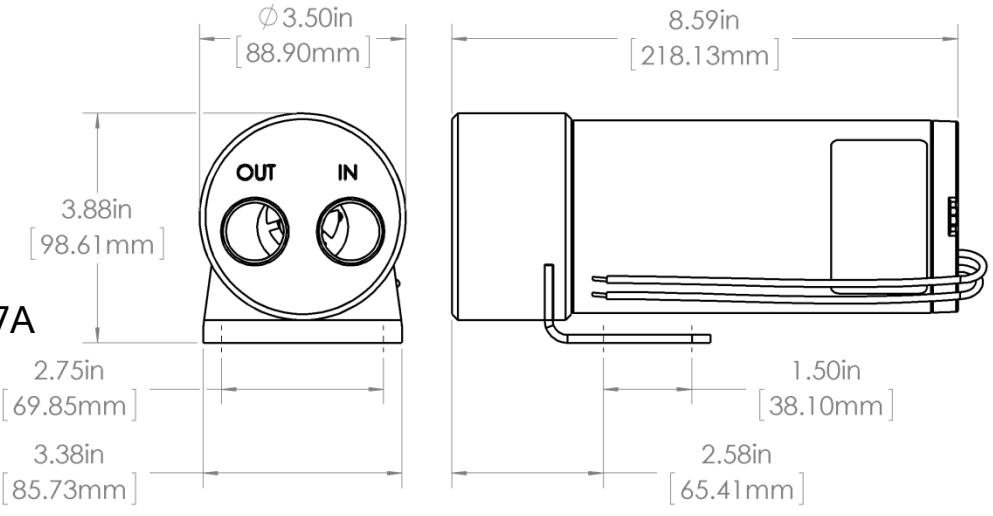
Compact, Heavy Duty, Industrial, Quality

High Torque, Permanent Magnet, DC Motor
Flow rate up to 4 GPM or 15 LPM
Direct Shaft Coupling, Simple, Long Life

Feature and Specifications Comparison	XD4-24	XD4-12
Operating voltage	24vdc	12vdc
Flow rate at 30psi (2 bar)	4 GPM (15 LPM)	1.75 GPM (6.6 LPM)
Attainable Pressure	>60psi (4 bar)	
Whisper-Vane positive displacement technology, Self Priming	>5ft (1.5m)	
Port Size, SAE straight thread O-ring (*Not compatible with pipe thread*)	3/4"	
Max temperature measured at outside of motor case	175°f (80°c)	
Max Load for continues duty at 75°f ambient air tempriture	7 Amps.	
Pressure at pump inlet may not be lower than:	-7.5 PSIg (-.5 barg)	
Max oil temperature	392°f (200°c)	
Max oil viscosity	~6,000 cSt	

Wetted Materials:

- Carburized Carbon Steel
- Hard Anodized Aluminum
- Viton



ESE bv
HOOFDORPWEG 667A
2131 BB HOOFDORP
NETHERLANDS
esenl@fastmail.com
tele 31 715173947

General

The XD4 pump delivers up to 4 gpm (15 l/m) of oil flow. It is a self-priming and quiet-running vane pump for use in a wide variety of transfer applications with non-corrosive fluids such as oils and coolants. It can produce over 60 psi (4.1 bar) pressure at nominal voltages of 12 thru 24vdc.

Plumbing Considerations

Excessive pressure drop caused by small pipes can be detrimental to system performance. Relative to 'hydraulic pumps' this is a high flow, low pressure pump. It is optimized for efficiency in transfer applications. Small suction pipes will starve the pump and reduce output flow by causing cavitation. Small pressure pipes will create excessive backpressure that will reduce output flow and system efficiency by loading and slowing down the pump motor. Therefore, elbows and long runs of pipe should be avoided. Each elbow and each inch of pipe has a cumulative effect. Pluming loses with cold or high viscosity fluid can easily add up to a large percent of available pressure when the plumbing is too restrictive.

The pump itself produces flow not pressure. Like a turnstile, every rotation of the pump delivers a metered volume to the other side. Whatever system is connected to the pump has flow resistance, which is the source of the backpressure as the pump works to maintain flow.

It is recommended that hose or pipe no smaller than ¾" (19mm) at 24v or ½" at 12v be used and that the suction hose in particular is kept as short as possible and no longer than 36".

Duty Cycle and Circuit Protection

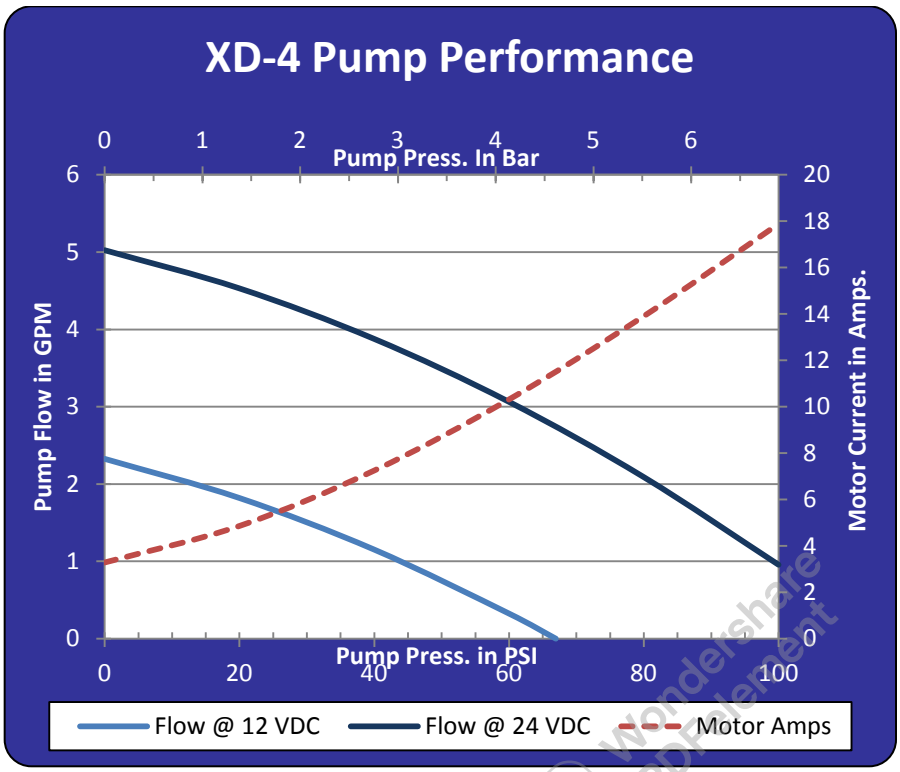
The XD4 pumps permanent magnet motor is capable of doing an extraordinary amount of work for its size but it is also the limiting factor for duty cycle. When it is loaded beyond about 7 amps. at room temperature it will begin to *make* heat at a rate that is higher than it can *dissipate* heat. There are a number of factors that come into play in determining a safe duty cycle such as ambient temperature and airflow. In complex applications, the simplest way to determine the duty cycle may be thru direct experimentation. See chart 2 for basic duty cycle guidelines. Adding active cooling to the motor can substantially improved duty cycle.

The motor current varies with the viscosity and the pressure required to pump the fluid through the system. Many oil-based fluids have a substantial viscosity response to cold temperatures causing high motor current draws. We recommend the Bussmann CB251-15 breaker be used on the power supply line to protect the motor from thermal overload under adverse conditions. These particular breakers have an amp/time curve that closely matches the motor/pump combination to properly protect the pump within its operating envelope for up to 3 minutes of cumulative motor on time.

Application Engineering

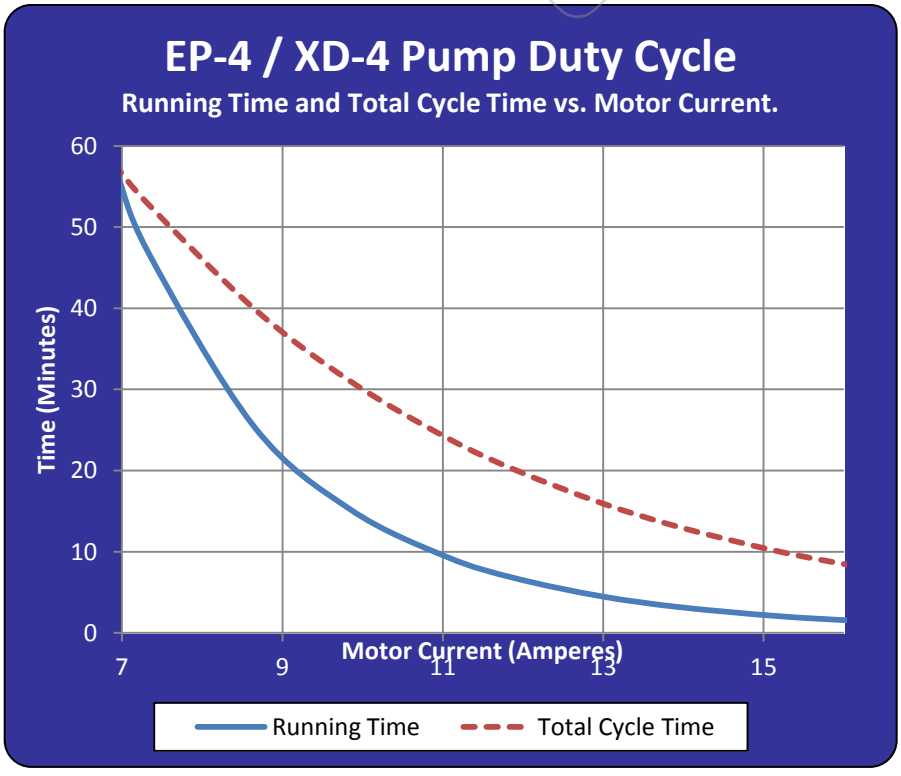
It is challenging to address every possible installation type. We are always happy to help in choosing an appropriate installation setup. Give us a call for engineering assistance and support. 888-676-7774

Chart 1- Pump Performance, Pump Flow as a function of Pressure.



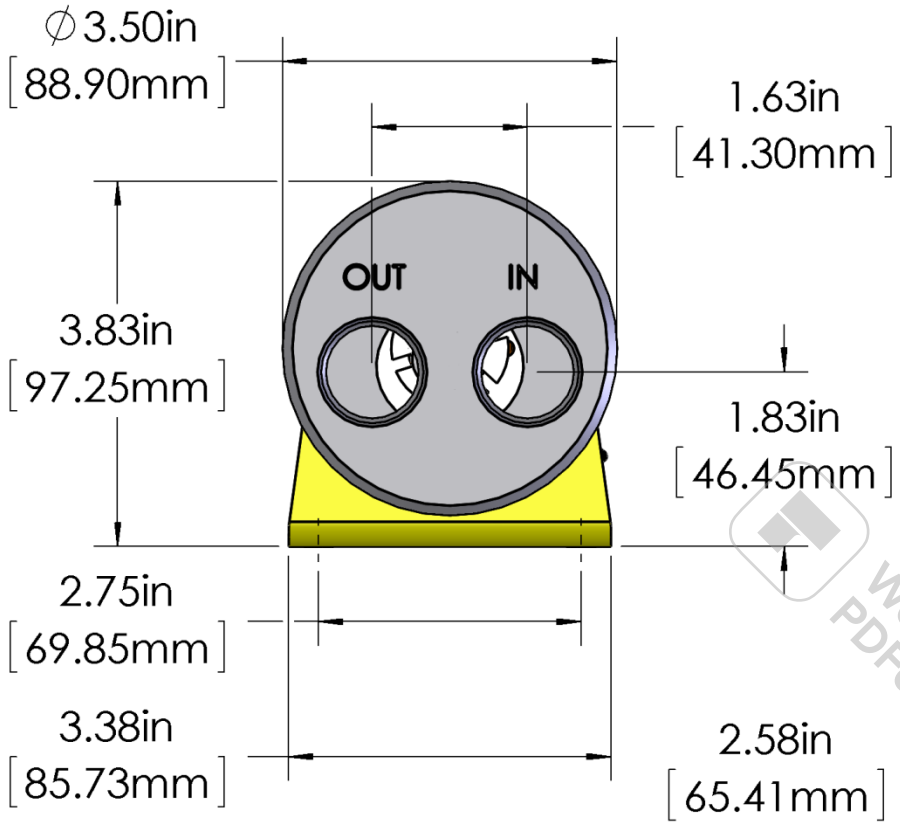
This chart shows the approximate flow and motor load for a given pressure. The drop in the flow is caused by a combination of volumetric losses in the pump and the reduction in motor speed as it loads up. Note that at about 35 PSI the current crosses the 7 amp line where duty cycle comes into play. See the following chart.

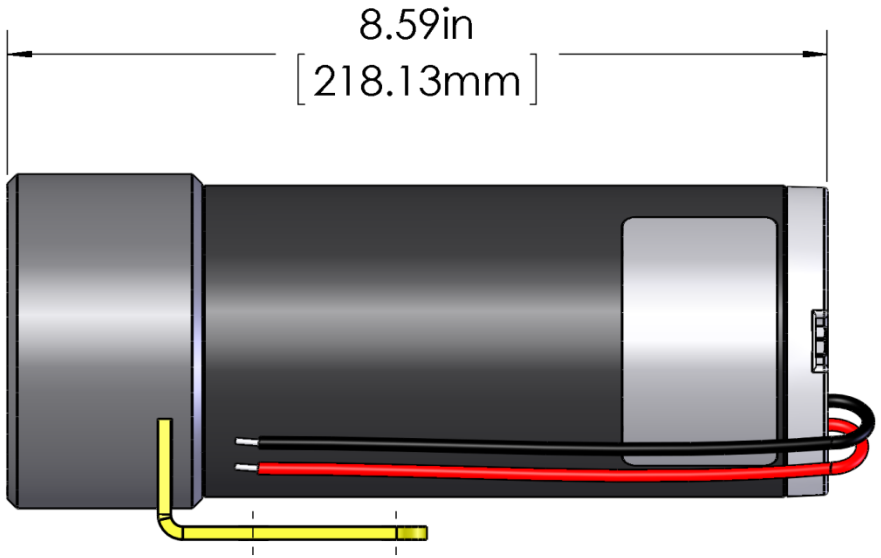
Chart 2- Duty Cycle, Run-Time and Total Cycle Time as a function of Motor Current.

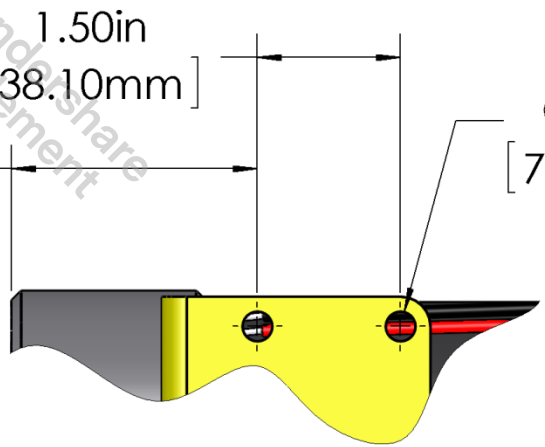


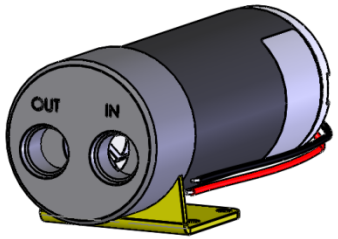
This chart shows the duty cycle for the pumps motor under steady running conditions for a given motor load. It does not take into account a cold motor on the first cycle, which would be somewhat longer. In addition, adding active cooling can substantially improve duty cycle. Running time is the length of time where the pump is running. Total Cycle time is the time from turning on to the time it is next tuned on.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED









NOTES:
1. VOLTAGE 10-27 VDC
2. SELF PRIMING, LIFT IN EXCESS OF 5 FT (1.5) DEPENDING ON FLUID VISCOSITY, UP TO 20ft (6m) WET.
3. CONTINUES DUTY BELOW ~7AMPS @ ROOM TEMP. CAN BE INCREASED WITH ACTIVE COOLING. CYCLE TIME MUST BE LIMITED PER APPLICATION.
4. MOTOR LIFE @ 7AMPS ESTIMATED AT 10,000 Hr.
5. ATTAINABLE PRESSURE OVER 60psi (4bar).
6. FLOW @ 12VDC: 1 ¾ GPM (6.6LPM).
7. FLOW @ 24VDC: 4 GPM (15LPM).
8. WETTED MATERIALS: TYPIII HARD ANODIZED ALUMINUM, CARBURIZED CARBON STEEL, VITON.
9. 3/4 SAE STRAIGHT THRD. O-RING PORTS. *(NOT COMPATIBLE WITH PIPE THREAD)*
10. MAX. TEMP. 392°F (200°C) SHORT PERIODS 428°F (220°C).
11. MAX. FLUID VISCOSITY ~25,000 cSt
12. WEIGHT ~9LBS (4kg)

Material: SEE NOTE 8.	Transportation Research Corp. (TRC) VARNA Products		Voice: 530-676-7770 Fax: 530-676-7796
Approvals	Date	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: .X = ± .030 .XX = ± .015 .XXX = ± .005 ANGLES = ± .5° FINISHES INDICATED ARE MAXIMUM VALUES	ASSEM, XD-4 Pump
DWN. MSA	3.31.11		
ECEA #			
SCALE:1:2			Part No. 6770 Rev.

SOLID MODEL FILES AVAILABLE ON REQUEST