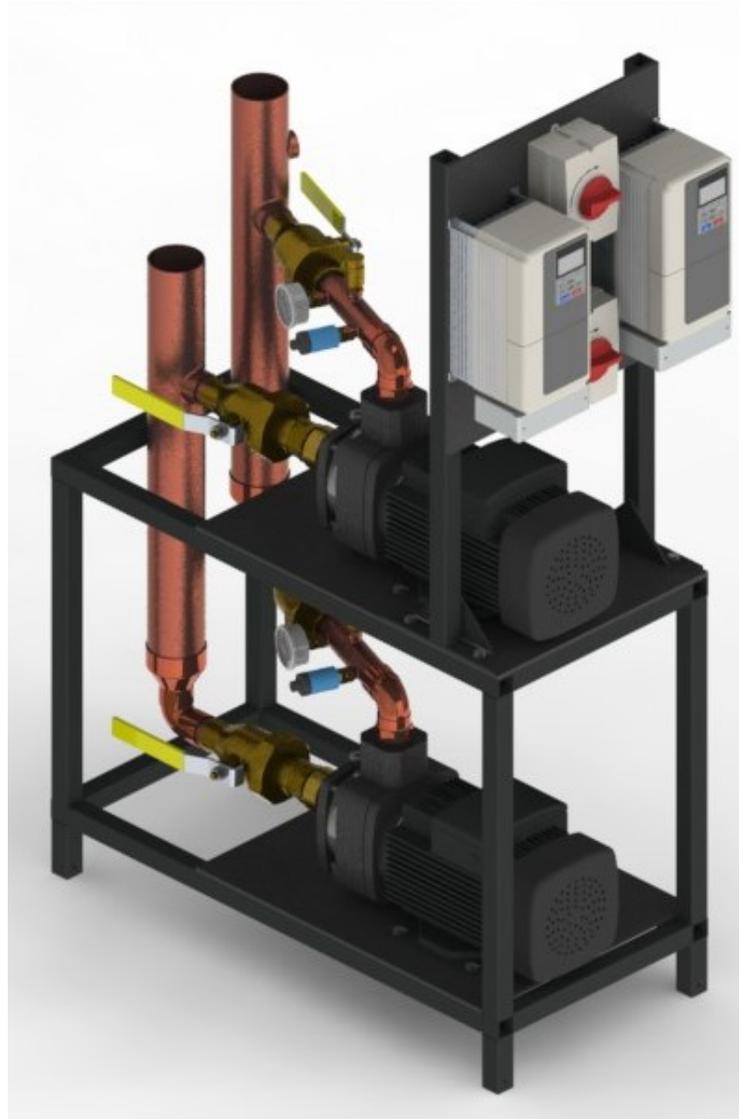




**TOWLE WHITNEY LLC**



**TW2000U-100W-50 COMPACT  
DUPLEX VARIABLE SPEED  
BOOSTER PUMP SYSTEM**



The **TW2000U-100W-50 Compact Duplex Booster Pump System** is equipped with centrifugal pumps regulated by variable frequency drives that control the pump to maintain constant pressure regardless of varying demand or fluctuating incoming pressure. This system will supply **100 GPM with a 50 PSI overboost**.

System is custom built on a compact over/under frame.

VFD drives will **ALTERNATE** lead pump every 24 hours of run time and 2nd pump remains in standby until needed.

### Lead-Free (Wetted) components:

- Centrifugal Pumps: Cast Iron or SS Option
- Relief valves: Lead Free Brass or SS
- Pressure Gauges: Stainless Steel
- Transducer: Stainless Steel
- Check valves: Lead Free Brass
- Ball Valves: Lead Free Brass
- Manifolds: Lead Free Type L Copper
- Fittings: Lead Free Copper or SS

\* All lead-free brass shall contain <.25% Pb

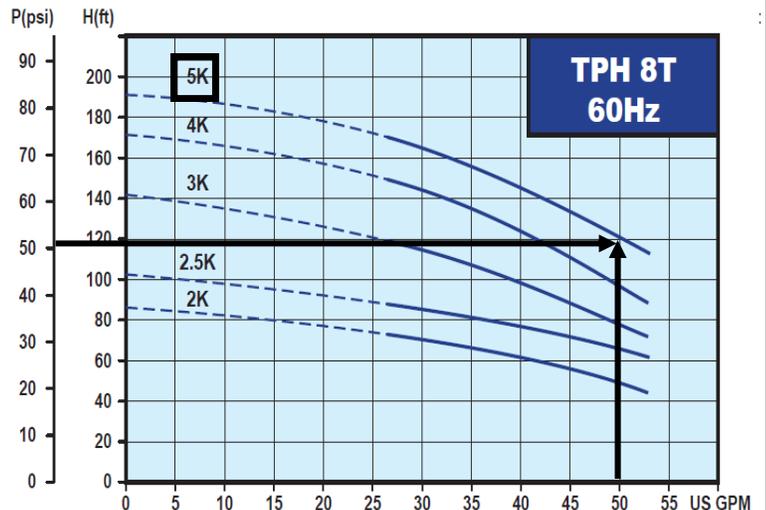


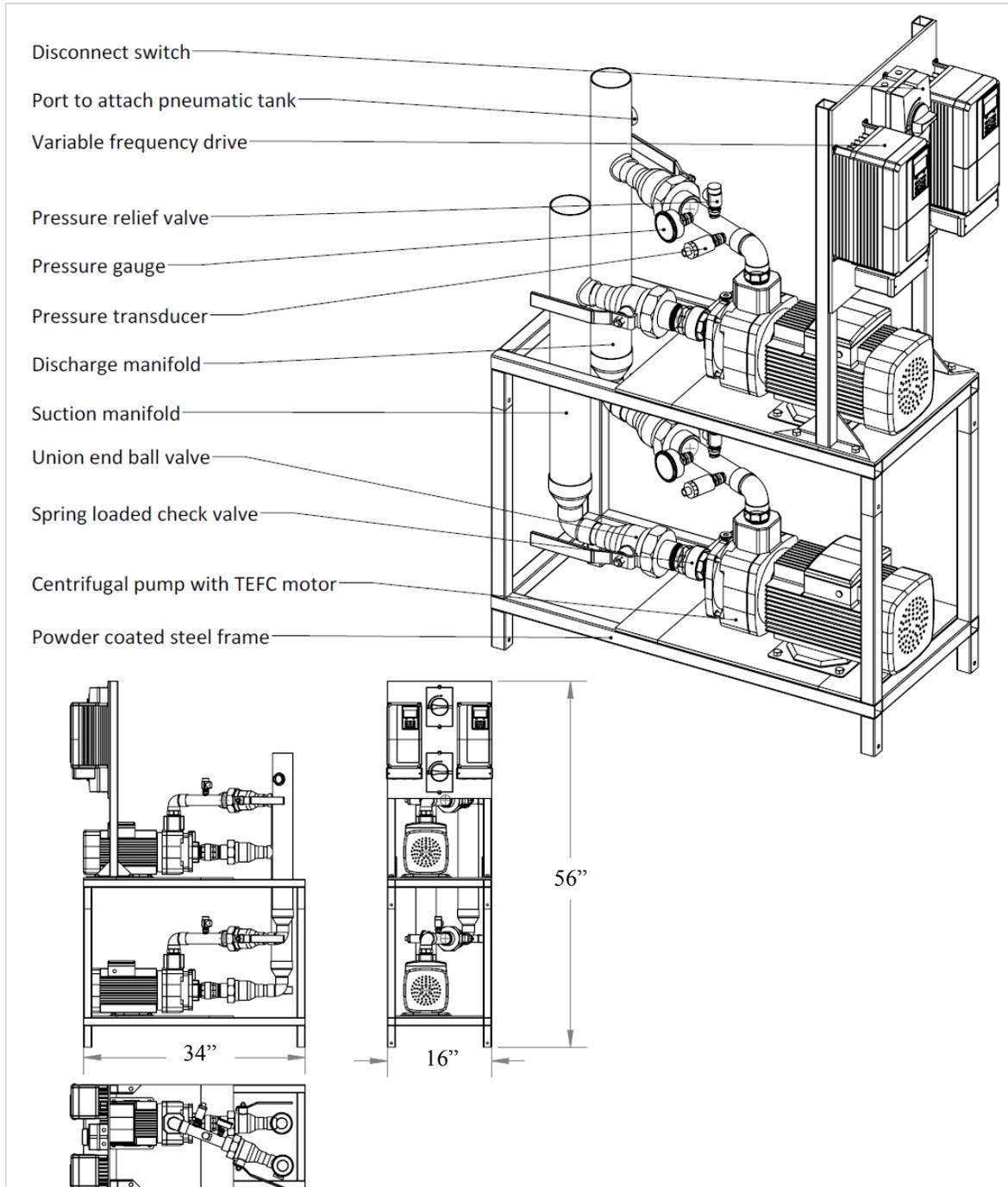
*All parts shown included  
Actual system components may vary  
Some assembly required*

### Technical Specifications:

- Pumps:** Walrus [8T-5K]
- Controllers:** Yaskawa or equal
- Flow Rate:** 100 GPM (50 GPM per pump)
- Boost:** 50 Overboost
- Set Pressure:** 65 PSI (unless otherwise requested)
- Horse Power:** 2 HP per pump
- Manifolds:** 3 inch Type L Copper
- Tank:** Watts PLT-35 (14 Gal)
- Frame Size:** 34" D x 56" H x 16" W
- Power Options:** Two Independent circuits required  
208-220V/1PH or  
208-220V/3PH or  
360-480V/3PH

*Performance curve for each 2Hp pump*





PROPRIETARY AND CONFIDENTIAL  
 THE INFORMATION CONTAINED IN THIS  
 DRAWING IS THE SOLE PROPERTY OF  
 TOWLE WHITNEY LLC. ANY  
 REPRODUCTION IN PART OR AS A WHOLE  
 WITHOUT THE WRITTEN PERMISSION OF  
 TOWLE WHITNEY LLC IS PROHIBITED.

DIMENSIONS ARE SUBJECT TO  
 CHANGE  
 DO NOT USE FOR  
 CONSTRUCTION  
 UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	VID	3/27/14
CHECKED		
COMMENTS:		

**TOWLE WHITNEY LLC**

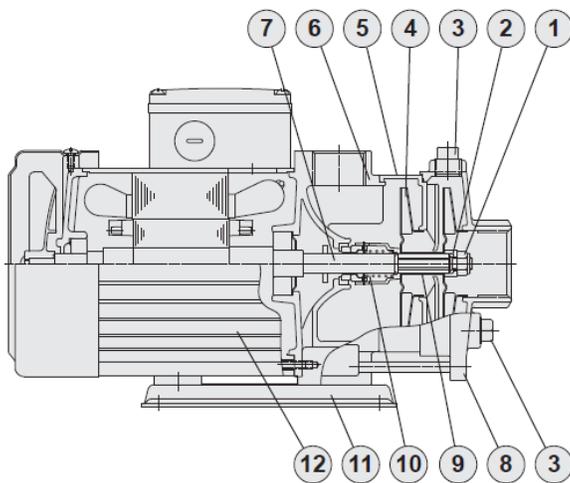
Compact Overunder Variable  
 Speed Booster System

SIZE	DWG. NO.	REV.
A	32714B	
SCALE:1:20	WEIGHT:	SHEET 1 OF 1



# MULTISTAGE CENTRIFUGAL PUMP

## TPH2T/4T/8T/12T



### **Motors:**

- The pump is coupled with (TEFC) Totally Enclosed Fan Cooled, squirrel-cage motor.
- Nominal speed: 3500 rpm at 60Hz
- Protection class: IP54
- Insulation class: F

### **Pumps:**

- Horizontal multi-stage centrifugal pump
- Non self-priming
- close coupled design
- Impellers mounted on extended motor shaft.

### *Materials*

No.	Part name	Material		
		Standard	S series	N series
1	Lock Nut	SUS 316	SUS 316	SUS 316
2	Sleeve(Shaft End)	SUS 304	SUS 304	SUS 316
3	Water Plug	FC 20	SUS 304	SUS 316
4	Impeller	SUS 304	SUS 304	SUS 316
5	Intermediate Chamber	SUS 304	SUS 304	SUS 316
6	Pump Casing	FC 20	SUS 304	SUS 316
7	Shaft	SUS 304	SUS 304	SUS 316
8	Suction Chamber	FC 20	SUS 304	SUS 316
9	Sleeve	SUS 304	SUS 304	SUS 316
10	Mechanical Seal	Tungsten carbide + HNBR		
11	Mounted Base	Coating Steel	SUS 316	
12	Motor Shell	Aluminum alloy		

SUS 304 may be replaced by SUS316 depended on stock availability.

### **Operating Limits:**

- Ambient temperature: Max. 104°F (40°C)
- Liquid temperature range: 32°F (0°C) to 194°F (90°C)
- Operating pressure: Max. 142 psi
- Inlet pressure: Max 85 psi

### **Suitable Liquids:**

- Clean or other non-corrosive liquids





### Assembled Units:

- All “wetted surfaces” shall be lead free (<.25% Pb) in conformance with the 1/4/14 federal law
- Shall include a separate and independent variable frequency drive (VFD) for each pump with a pressure transducer, pressure gauge, and relief valve. Piping and frame shall not interfere with access to the controls
- Each pump shall include isolation valves on both the suction and discharge piping
- Each pump shall have a separate and independent disconnect box

### Variable frequency drive:

- Will ALTERNATE the lead pump every 24 hours (field adjustable) of run time. The remaining pump(s) shall be in standby
- Shall have lead/lag & alternation feature without an external control panel or PLC
- Shall have hands-off automatic (HOA) capability
- Rated to operate using specified power requirement. The drive efficiency shall be 98% or better
- Have UL approval with all factory installed options and preset values and/or last saved data values will remain available to the operator after power outage
- Shall have at least NEMA 1 rated conduit enclosure
- The program will protect the pumps against damaging hydraulic conditions such as:
  - Motor overload, Pump overflow surges, Loss of prime due to incoming water supply interruption, Hunting
  - Protection from overload through frequency/current optimization
  - Protection from hydraulic damage by restricting the pumps to operate beyond their published end of curve
- Shall have the ability to automatically restart after an over-current, over-voltage, under-voltage or loss of input signal
- Shall have an operator control panel [keypad] for customization of parameters
- Shall include a feature to upload/download parameters into an external device to be used with another drive or the same drive
- Shall have a removable non-volatile memory device
- Shall be capable of accepting individual analog inputs from transducer. All transducer inputs must be wired to the variable frequency drive for continuous scan and comparison function
- Ladder logic program shall utilize a proportional - integral - derivative control function
- Shall display the following values:
  - Pump running/standby, Pump speed in Hz, User adjustable parameters such as PID set points, Motor frequency, Motor current, Threshold set points for PID error, Min operating frequency, Troubleshooting and diagnostics of faults

### Transducer:

- The transducer shall be rated for required system pressure and shall be 4-20 mA analog
- Separate transducers shall be supplied for each variable frequency drive to ensure redundancy

### Centrifugal pump:

- Shall have a cast iron casing with 304 stainless steel impellers. (All Stainless Steel pumps are an available upgrade)
- Shall have a 316 stainless steel shaft sleeve. Mechanical seal shall be rated to withstand pressure of up to 142 PSI
- Motor shall be to totally enclosed fan cooled (TEFC). and manufactured in compliance with CE, RoHS and CSA

### Pneumatic expansion tank:

- Pneumatic expansion tank shall be rated for use with potable water with an operating pressure of a maximum 125 PSI
- Shall be pre-charged to a pressure of 10 PSI below system operating pressure for system to run properly

### Manifolds, valves and fittings:

- Shall be sized appropriately to allow water velocity not exceeding 10 ft/sec, to minimize cavitation and turbulence
- All shut off valves shall be standard port ball valves and check valves shall be silent and spring-loaded

### Installation:

- Equipment shall be installed in accordance with applicable local building, electrical and plumbing codes
- Shall be installed indoors (unless otherwise specified) and protected from water spray



## VARIABLE FREQUENCY DRIVE WARRANTY AND SPECIFICATIONS



### Pump Protective Features:

- Dry Well
- Air in System
- Blocked Impeller
- Pump over Cycling
- No Flow Protection
- Loss of Prime
- Transducer Loss
- Over Torque

### Performance Features:

- Overload capacity: nominal 110% for 60sec. (150% peak)
- Starting torque: 100% at 3 Hz
- Motor preheat function
- Adjustable accel/decel: 0.1 to 6000 sec.
- Critical frequency rejection: 3 selectable, adjustable bands
- Torque-limiting: 30-180%
- Energy Saving control
- Torque boost: full range, auto
- Power loss ride-thru: 2 sec
- Auto restart after power loss or resettable fault, selectable, programmable
- Feedback signal loss detection
- Serial communications loss detection
- "Up/Down" floating point control capability (PI)
- Stationary motor auto-tuning
- Pump Sleep function
- Run-permissive input

### Service Conditions:

- Ambient Temperature: -10°C to 40°C (14°F to 104°F) NEMA 1,
- Humidity: 95% RH, non-condensing
- Altitude: 3300 ft; higher by derate
- Input voltage: +10%/-15%
- Input frequency: 50/60 Hz ± 5%
- 3-phase, 3-wire, phase sequence insensitive

### Design Features:

- LCD keypad display, 5 lines x 16 characters, backlit, 6 languages, copy function
- Multi-step speed settings: 5 available
- Set point (PI) control
- 32-bit microprocessor logic
- Nonvolatile memory, program retention
- Displacement power factor: 0.98
- Output frequency: 0.1 to 120 Hz
- Frequency resolution: 0.06 Hz
- Frequency regulation: 0.1%
- Control Terminal Board: Quick disconnect
- Carrier frequency: selectable to 15 kHz
- 24 VDC control logic, PNP / NPN selectable
- Transmitter/Option power supply
- Input/output terminal status
- Timer function: Elapsed time, Delay on start, Delay on stop
- RS-422/485 port: Modbus protocol
- Volts/hertz ratio: Preset and programmable V/Hz patterns
- Meter Functions: Volt, amp, kilowatt, elapsed run time, speed command
- NEMA 1 or protected chassis
- UL, cUL listed and CE marked; IEC 146;
- MTBF: exceeds 28 years



IS-PLT-35

# Watts PLT-35



Certified to  
ANSI/NSF 61  
(73°F/23°C)

PLT-35

### Pressure — Temperature PLT-35 Order No. 0067373

Max. Pressure: 150 psi  
 Max. Temp: 200 °F (93°C)  
 Tank Volume: 14.0 gal. (53 liters)  
 Tank Acceptance: 5.6 gal. (21.2 liters)  
 Air Pre-charge: 20psi (138 kPa)  
 Connections Size: 1" (25mm)  
 Diameter: 16.0" (406mm)  
 Length: 21.7" (551mm)  
 Weight: 32 lbs. (15 kgs.)

### Acceptance Volume

AIR SIDE PRE-PRESSURE		WATER SIDE VOLUME AT 150 psi (gallons)
psi	kPa/bar	PLT -35
20	138 kPa	10.7
40	276 kPa	9.2
60	413 kPa	7.6
80	551 kPa	6.1

### WARNING!

Improper installation, adjustment, alteration, service or maintenance may cause property damage, serious bodily injury or death. Read instructions completely before proceeding with installation. Only qualified personnel should install or service this equipment in accordance with local codes and ordinances.

This Expansion Tank is designed and intended for water storage at a maximum pressure of 150psi (10.3 bar) and a maximum temperature of 200°F. (93°C) Any use other than for potable water or at a sustained or instantaneous pressure in excess of 150psi or 200°F is **UNSAFE** and may cause property damage, serious bodily injury or result in death.

Do not exceed 80psi (5.5 bar) air charge. Air charge pressures exceeding 80psi (5.5 bar) could become hazardous and will void any and all warranties, either written or implied. Failure to follow these instructions may cause property damage, serious bodily injury or death.

**Disclaimer:** The manufacturer of this tank does not accept any liability or other responsibility for personal injury or property damage resulting from improper use, installation or operation of this tank or the system of which it is a part.

**Notice:** This Expansion Tank, like all Expansion Tanks, may eventually leak. Do not install without adequate drainage provisions where water flow will cause damage.



21 Londonderry Turnpike, Hooksett, NH 03106

Tel: 603-626-7371/1-800-807-9827 Fax: 603-626-7372

www.towle-whitney.com info@towle-whitney.com



## Booster Pump Systems

### Three Year Limited Warranty

This warranty applies to booster pump systems built by Towle Whitney LLC, and shall:

- Exist 36 months from the date of shipment.
- Be in effect only after installation photographs are received by Towle-Whitney LLC.

Towle-Whitney LLC liability under this warranty shall be limited to the repair or replacement of any part or parts found to be defective (material or workmanship) within the warranty period. Towle-Whitney LLC shall determine whether the part needs to be returned, or field scrapped. The warranty excludes:

- Any water damage or consequential damage.
- Transducers.
- Pump Seals.
- Debris in water causing internal pump damage.
- Systems not installed in accordance with Installation and Maintenance Instructions.
- Labor, transportation, and related costs incurred by the customer.
- Misuse, negligence, inappropriate chemicals or additives in water.
- Inadequate protection from freezing.
- Lightning, high voltage spikes, accidents, floods, or acts of God.
- Re-Installation costs of repaired or replacement equipment.
- Re-Imbursement for the loss caused by interruption of service.

This warranty applies to all states and territories of the United States and Canada only. There are no express or implied warranties, including merchantability or fitness for a particular purpose, which extend beyond those warranties described or referred to above.

Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages and some jurisdictions do not allow limit actions on how long implied warranties may last. Therefore, the above limitations or exclusions may not apply. This warranty gives you specific legal rights and you may also have other rights which vary from jurisdiction to jurisdiction.