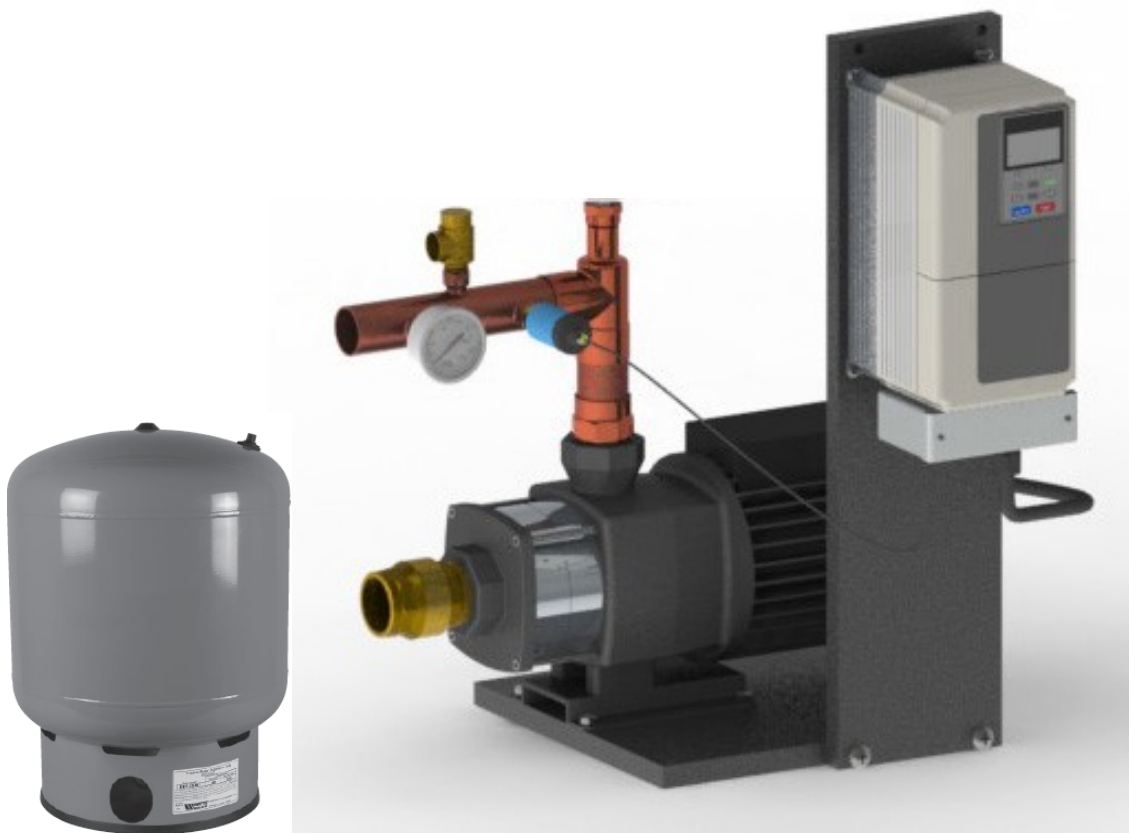




TOWLE WHITNEY LLC



**TW1000-70W-50 FLAG FRAME
VARIABLE SPEED BOOSTER SYSTEM**



The ***TW1000-70W-50 Flag Frame Booster System*** is equipped with a centrifugal pump regulated by a variable frequency drive that controls the pump operation to maintain constant pressure regardless of varying demand or fluctuation in incoming pressure. This system will supply 70 GPM with a 50 PSI overboost.

Features and Benefits:

- Residential & Commercial application
- Quiet, Compact & Powerful
- Variable Frequency Drive controlled pump
- Energy efficient operation
- Prewired & Factory Tested

Lead-Free* (Wetted) components:

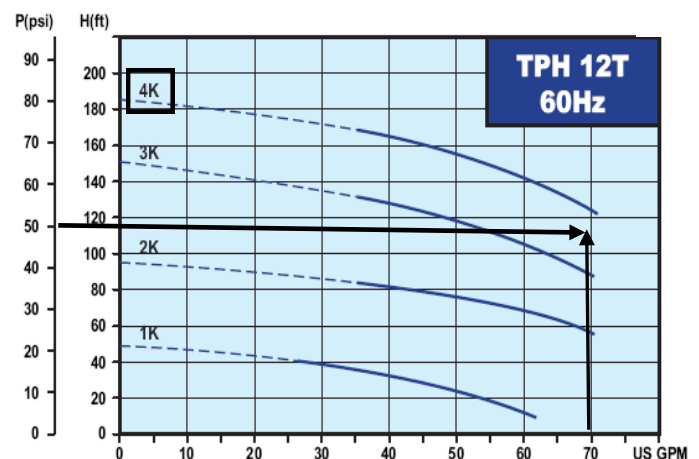
- Centrifugal Pump: SS and Cast Iron
- Relief valve: Lead Free Brass
- Pressure Gauge: Lead Free Brass
- Transducer: Stainless Steel
- Tee: Lead Free Brass
- Check valve: Lead Free Brass
- Fittings: Lead Free Copper
- Nipple: SS or Lead Free Brass
- Plugs: SS or Lead Free Brass

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



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

Pump performance curve

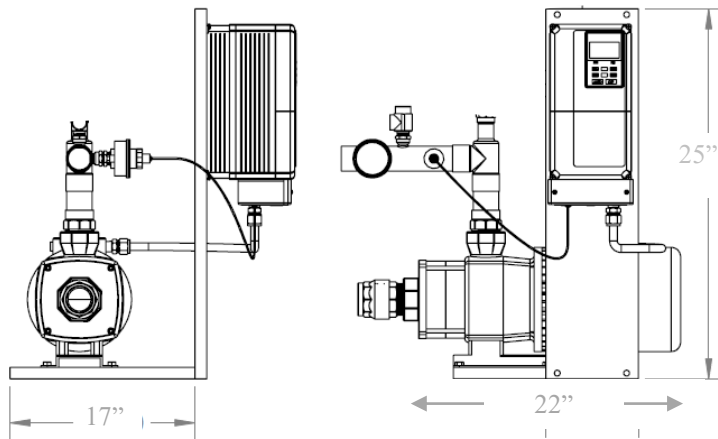
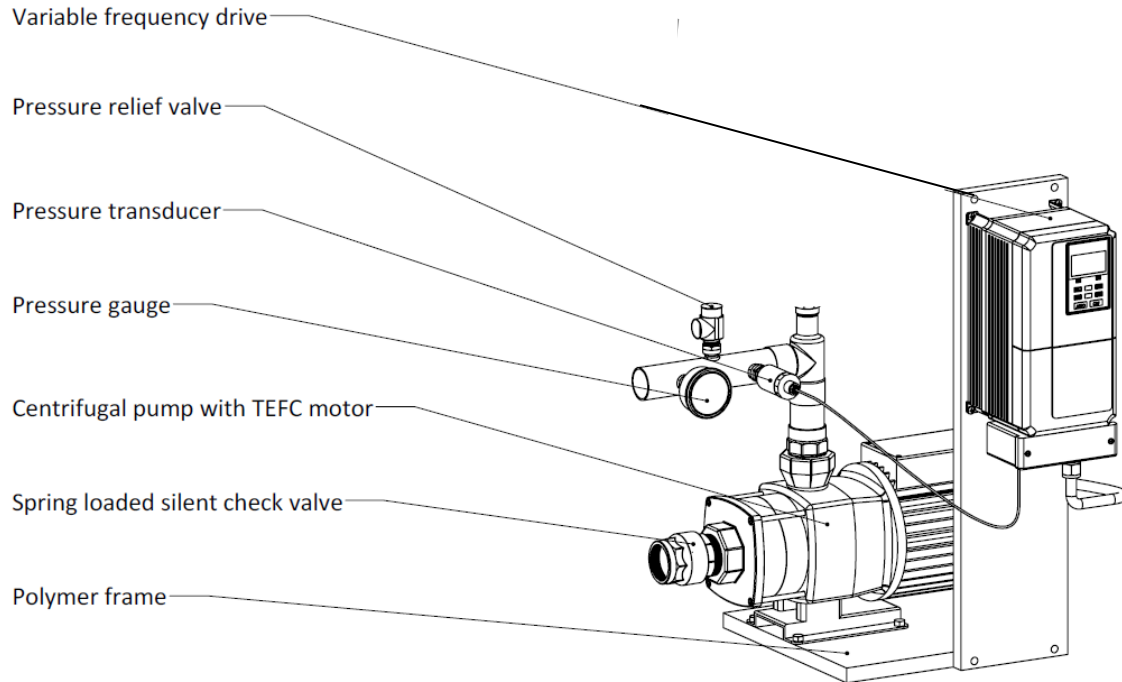


Technical Specifications:

Pump: Walrus of America [12T-4K]
Controller: Yaskawa
Flow Rate: 70 GPM
Boost: 50 PSI Overboost
Horse Power: 3 HP
Suction: 1 1/2 inch
Discharge: 1 1/2 inch
Tank: Watts PLT-35 (14 Gallon)
Frame Size: 22" W x 24" H x 17" D
Decibel rating: <80 db @ 3500 RPM
Power Options: Independent circuit required
208-220V/1 PH
208-220V/3PH
360-480V/3PH



BOOSTER SYSTEM DIMENSIONS



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	9/30/14
CHECKED		
COMMENTS:		

TOWLE WHITNEY LLC

Flag Frame Variable Speed
Booster System on Polymer
Frame

SIZE	DWG. NO.	REV.
A	93014A	
SCALE: 1:20		WEIGHT:
SHEET 1 OF 1		

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



Assembled Units:

- All “wetted surfaces” shall be lead free (<.25% Pb) in conformance with the 1/4/14 federal law
- Shall have a variable frequency drive (VFD) with a pressure transducer, pressure gauge, and relief valve
- Each system shall have a properly sized air charged pneumatic tank
- Pump shall be connected to a separate and independent disconnect box [supplied by others]

Variable Frequency Drive (VFD) shall:

- Shall be rated using specified power requirement, efficiency shall be 98% or better at full speed
- All factory preset values and/or last saved data values must remain available to the operator in the event of a complete power outage
- NEMA 1 rated conduit enclosure
- Operate to a program that protects the pump against damaging hydraulic conditions such as:
 - Motor overload, pump overflow surges, loss of prime due to incoming water supply interruption, hunting, overload through frequency/current optimization, hydraulic damage by restricting the pumps to operate beyond their published end of curve
- Automatically restart after an over-current, over-voltage, under-voltage or loss of input signal protective trip
- Have an operator control panel [keypad] for customization of parameters
- Include a feature to upload / download parameters into an external device to be used with another drive or the same drive
- Have a removable non-volatile memory device
- 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
- Utilize a proportional ladder logic program - integral - derivative control function
- 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, minimum operating frequency
 - Troubleshooting and diagnostics of faults

Transducer:

- Shall be provided to supply all pressure signals to the variable frequency drive
- Shall be rated for required system pressure and shall be 4-20 mA analog

Centrifugal pump:

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

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

Valves and fittings:

- Shall be sized appropriately to allow water velocity not exceeding 10 ft/sec, to minimize cavitation and turbulence
- Check valve shall be spring-loaded and silent

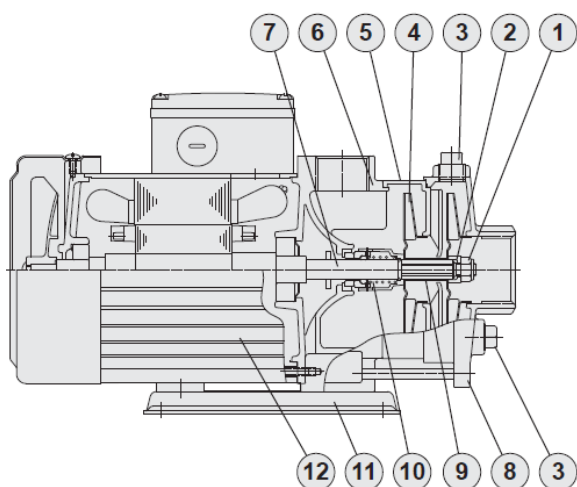
Installation:

- 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



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





VARIABLE FREQUENCY DRIVE WARRANTY AND SPECIFICATIONS



Warranty: Provide VFD warranty, for one year from startup, not to exceed 18 months from the date of shipment. Warranty shall include parts, and labor allowance for repair hours.



Performance Features (Drive)

- Ratings:
 - 1 to 5 HP at 200-240 VAC 1-Ph.
 - 1 to 25 HP (ND) at 200-240 VAC 3-Ph.
 - 1 to 25 HP (ND) at 380-480 VAC 3-Ph.
- Overload Capacity:
 - 120% for 60 sec. (Normal Duty)
- Control Methods: V/f Control, Open Loop Current Vector Control
- DC injection braking, ramp to stop
- Electronic reversing
- Adjustable accel/decel: 0.01 to 6000 seconds
- Controlled speed range:
 - 40:1⁽¹⁾ 100:1⁽²⁾
- Speed Regulation:
 - ± 0.5 to 1% with slip compensation⁽¹⁾
 - ± 0.2%⁽²⁾
- Displacement power factor: 0.98
- Output frequency: 0 to 400 Hz
- Frequency resolution:
 - 0.01 Hz with digital reference
 - 0.06 / 60 Hz with analog reference
- Frequency accuracy:
 - 0.01% with digital command
 - 0.5% with analog command
- Volts / hertz ratio: infinitely adjustable pattern
- DC Injection braking: adjustable amplitude, duration, current limited
- Torque boost: full range, auto
- Power loss ride-thru: 0.5 sec.
- Speed search
- Auto restart
- 3 Critical frequency rejection settings
- Slip Compensation
- Energy Savings Function
- Enhanced PID with loss of feedback function

⁽¹⁾ V/f Mode

⁽²⁾ Open Loop Current Vector Mode

Design Features (Drive)

- Dual microprocessor logic
- Digital keypad operator, 5 digits
- LED status display
- Remote Mount Keypad Capability
- RJ-45 Style Digital Operator Connector
- 7 multifunction digital inputs
- 3 multifunction digital outputs
- Hardwire baseblock (EN954-1 Cat. 3)
- Programmable form C output contact for customer use: 1A at 250 VAC or 30 VDC
- 24 VDC control logic compatible with sourcing or sinking outputs (PNP or NPN)
- Carrier frequency: 15 kHz max; swing PWM
- 2 Remote speed references:
 - 0-10 VDC (20 kohms) or isolated 4-20 mA (250 ohms)
- Signal follower: bias and gain
- 2 programmable open collector outputs
- Analog monitor output:
 - 0-10 VDC proportional to output frequency or output current
- Approx. 400 parameters and monitors
- Digital pulse train input (33 kHz max.)
- Cooling fan controlled by drive run/stop
- RS-422/485 Modbus 115 kbps
- UL recognized electronic overload
- MTBF: 28 years
- NEMA 1 enclosure
- Side-by-Side mounting
- Maintenance monitors

Protective Features (Drive)

- Current limit, stall prevention during accel, decel, and run
- Motor and drive overload
- Over voltage prevention function
- Instantaneous over current
- Short circuit
- Under voltage
- Heatsink overheat
- Ground fault protection
- Over/under torque
- Short circuit current rating: 30kA rms sym.

Pump Control Features

- Operator keypad with intuitive pump language
- Hand-Off-Auto
- Programmable pump process set point
- Pump start level and start time
- Sleep protection
- Simplex, duplex and triplex control
- Automatic system restart
- No flow detection
- Low and high feedback set points
- Pre-charge low level control
- Thrust bearing control
- Automatic system stabilization
- Motor condensation pre-heat function

Pump Protective Features

- Dry well
- Air in system
- Blocked impeller
- Pump over cycling
- No flow protection
- Loss of prime
- Transducer loss
- Over torque

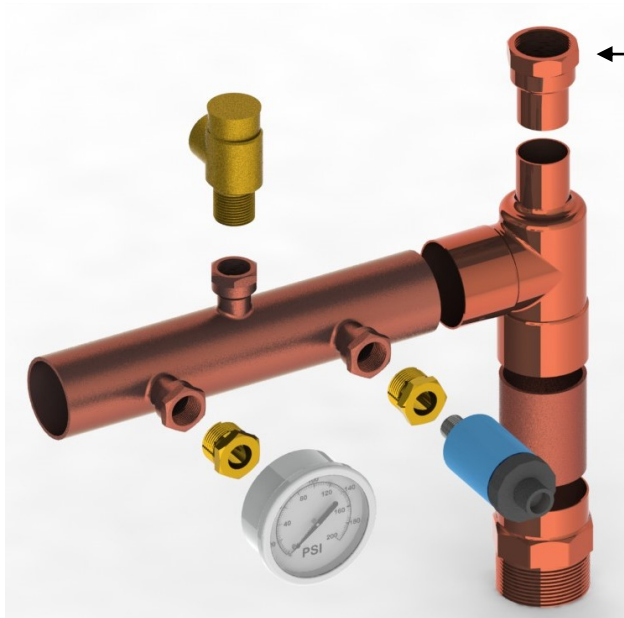
Pump Alarms and Messages

- Low feedback
- High feedback
- Low level
- Low water
- Pump over cycling
- No flow detection
- Loss of prime
- Pump fault
- Motor thermostat
- Pre-charge mode
- Thrust bearing active
- Start mode active
- Sleep mode active



Discharge Manifold

IS-PLT-35



Tank Attaches here and can be placed where convenient



PLT-35

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

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.