



TOWLE WHITNEY LLC



**TW1000-20W-70 FLAG FRAME
VARIABLE SPEED BOOSTER PUMP SYSTEM**



The *TW1000-20W-70 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 20 GPM with a 70 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: Cast Iron [SS Option]
- Relief valve: LF Brass or SS
- Pressure Gauge: Stainless Steel
- Transducer: Stainless Steel
- Check valve LF Brass or SS
- Fittings: LF Copper or SS

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



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

Technical Specifications:

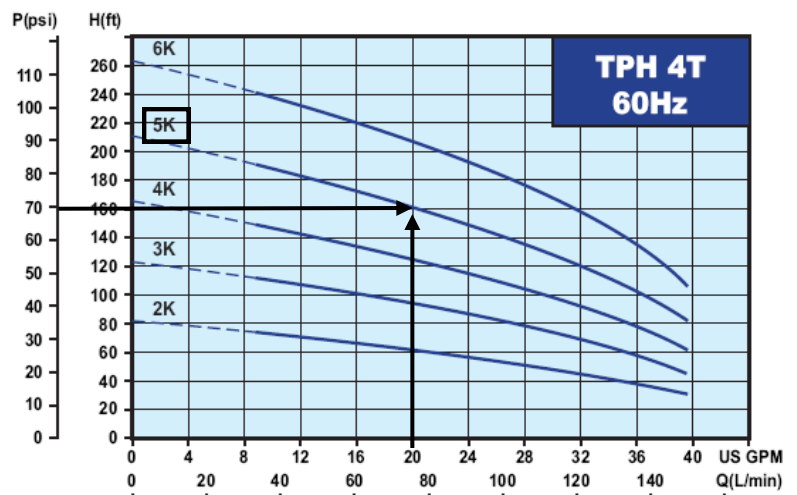
- Pump:** Walrus (TEFC) [4T-5K]
- Horse Power:** 1-1/2 HP
- Controller:** Vacon 20 - NEMA 1 Rating
- Flow Rate:** 20 GPM
- Boost:** 70 PSI Overboost
- Suction:** 1-1/4 inch
- Discharge:** 1 inch
- Tank:** 5 Gallon [PLT-5]
- Frame Size:** 17" W x 25" H x 17" D
- Decibel rating:** <70 db @ 3500 RPM
- Weight:** 65 lbs (approx.)

SPECIFY WHEN ORDERING

1. Discharge Pressure: _____ PSI
2. Power: Independent circuit recommended

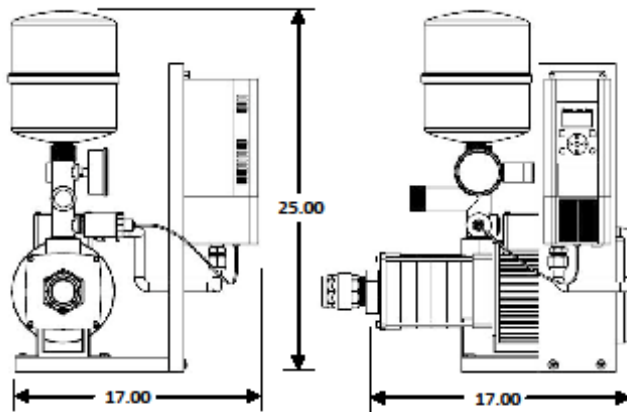
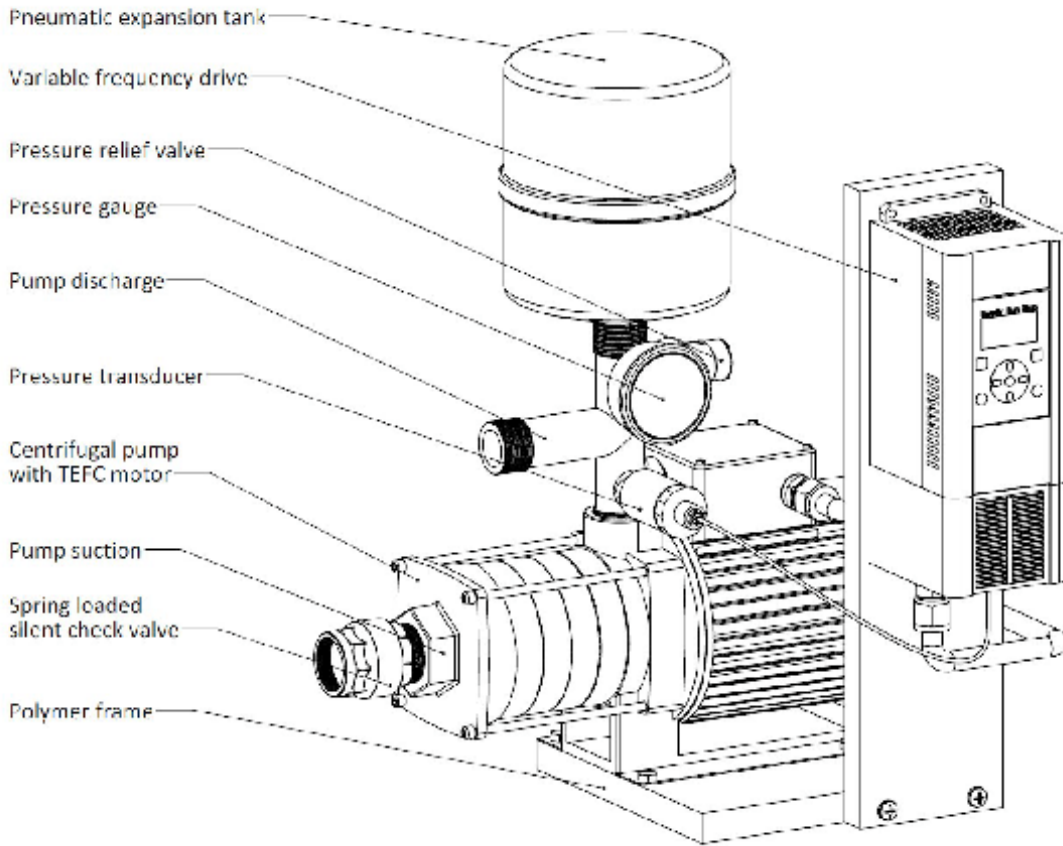
Options	Input Current (Amps)
208-220V/1	22.1
208-220V/3	13.4
360-480V/3	5.6

Pump performance curve





BOOSTER SYSTEM DIMENSIONS



TOWLE WHITNEY LLC

<p>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF TOWLE WHITNEY LLC. ANY REPRODUCTION IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF TOWLE WHITNEY LLC IS PROHIBITED.</p>	<p>DIMENSIONS ARE SUBJECT TO CHANGE DO NOT USE FOR CONSTRUCTION UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES</p>	<p>NAME DATE</p> <p>ISSUED BY VID 12/5/14</p> <p>DATE</p> <p>SCALE</p>	<p>FIG. NO. 120514A</p> <p>REV. 1</p>
		<p>DO NOT SCALE DRAWING</p>	<p>SCALE 1:1</p>



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



VACON 20 - NEMA 1 RATING

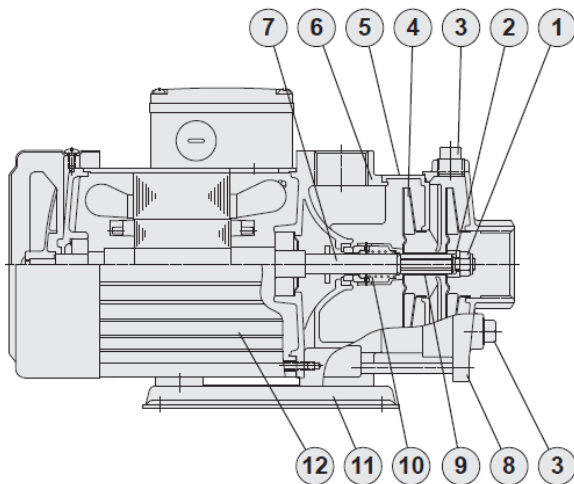


Supply voltage	AC drive type	Output Power and Current High Overload (150%)		
		HP	kW	I _N (A)
110-120 VAC, 1-phase	VACON0020-1L-0001-1-R02	0.33	0.25	1.7
	VACON0020-1L-0002-1-R02	0.5	0.37	2.4
	VACON0020-1L-0003-1-R02	0.75	0.55	2.8
	VACON0020-1L-0004-1-R02	1	0.75	3.7
	VACON0020-1L-0005-1-R02	1.5	1.1	4.8
208-240 VAC, 1-phase	VACON0020-1L-0001-2-R02	0.33	0.25	1.7
	VACON0020-1L-0002-2-R02	0.5	0.37	2.4
	VACON0020-1L-0003-2-R02	0.75	0.55	2.8
	VACON0020-1L-0004-2-R02	1	0.75	3.7
	VACON0020-1L-0005-2-R02	1.5	1.1	4.8
	VACON0020-1L-0007-2-R02	2	1.5	7
	VACON0020-1L-0009-2-R02	3	2.2	9.6
208-240 VAC, 3-phase	VACON0020-3L-0001-2-R02	0.33	0.25	1.7
	VACON0020-3L-0002-2-R02	0.5	0.37	2.4
	VACON0020-3L-0003-2-R02	0.75	0.55	2.8
	VACON0020-3L-0004-2-R02	1	0.75	3.7
	VACON0020-3L-0005-2-R02	1.5	1.1	4.8
	VACON0020-3L-0007-2-R02	2	1.5	7
	VACON0020-3L-0011-2-R02	3	2.2	11
	VACON0020-3L-0017-2-R02	5	4	17.5
	VACON0020-3L-0025-2-R02	7.5	5.5	25
	VACON0020-3L-0031-2-R02	10	7.5	31
	VACON0020-3L-0038-2-R02	15	11	38
380-480 VAC, 3-phase	VACON0020-3L-0001-4-R02	0.5	0.37	1.3
	VACON0020-3L-0002-4-R02	0.75	0.55	1.9
	VACON0020-3L-0003-4-R02	1	0.75	2.4
	VACON0020-3L-0004-4-R02	1.5	1.1	3.3
	VACON0020-3L-0005-4-R02	2	1.5	4.3
	VACON0020-3L-0006-4-R02	3	2.2	5.6
	VACON0020-3L-0008-4-R02	5	3	7.6
	VACON0020-3L-0009-4-R02	6	4	9
	VACON0020-3L-0012-4-R02	7.5	5.5	12
	VACON0020-3L-0016-4-R02	10	7.5	16
	VACON0020-3L-0023-4-R02	15	11	23
	VACON0020-3L-0031-4-R02	20	15	31
	VACON0020-3L-0038-4-R02	25	18.5	38



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





PNEUMATIC EXPANSION TANK SPECIFICATIONS

Models: PLT-5, PLT-12, PLT-20

Air Side Pre-pressure (psi) (bar)	Water Side Volume at 150psi (10.3 bar) (gallons)		
	PLT-5	PLT-12	PLT-20
20 (1.4)	1.48	3.42	7.102
40 (2.8)	1.26	2.88	5.882
60 (4.1)	1.0	2.49	4.705
80 (5.5)	.80	1.85	4.009

Description	PLT-5 Order No. 0067370	PLT-12 Order No. 0067371	PLT-20 Order No. 0067372
Max. Pressure - psi	150	150	150
Max. Temp. - °F	200	200	200
Tank Volume - gal.	2.1	4.5	8.5
Tank Acceptance - gal.	1.26	2.8	3.4
Air Pre-charge - psi	20	20	20
Connections Size - in.	3/4 male	3/4 male	3/4 male
Diameter - in.	8	10.5	12 1/2
Length - in.	11	13.5	19 3/16
Weight - lbs.	5.5	10	15



Certified to ANSI/NSF 61
(73°F/23°C)



Listed by IAPMO

CALIFORNIA PROPOSITION 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. (California law requires this warning to be given to customers in the State of California.)

For more information: www.watts.com/prop65

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: The expansion tank, piping and your connections may in time leak. Select a location to install the expansion tank where a water leak will not damage the surrounding area. The manufacturer is not responsible for any water damage in connection with this expansion tank.

Limited Warranty: Watts Regulator Co. (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**



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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 and 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.
- Adjusting drive parameters without consulting factory.

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.