

**TW1000-100G-30 FLAG FRAME
VARIABLE SPEED BOOSTER SYSTEM**

TW1000-100G-30 FLAG FRAME

The *TW1000-100G-30 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.

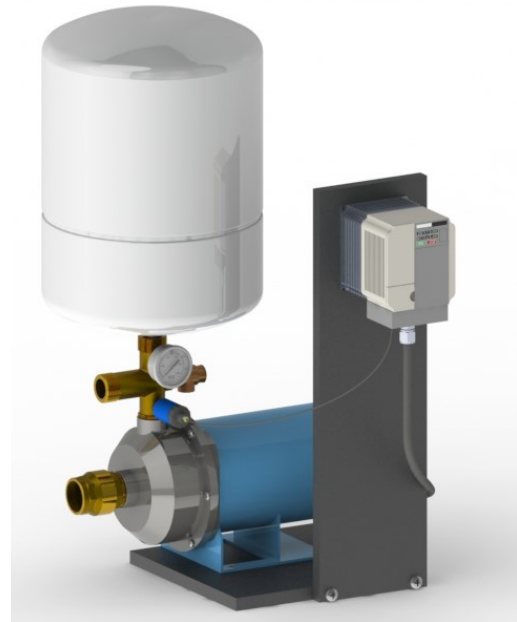
Features and Benefits:

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

Lead-Free* (Wetted) components:

- Centrifugal Pump: Stainless Steel
- Relief valve: Lead Free Brass
- Pressure Gauge: Lead Free Brass
- Transducer: Stainless Steel
- Tee: Stainless Steel
- Check valve: Stainless Steel
- Fittings: Stainless Steel

*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: Gould 125MS
Horse Power: 3 HP

Controller: Vacon

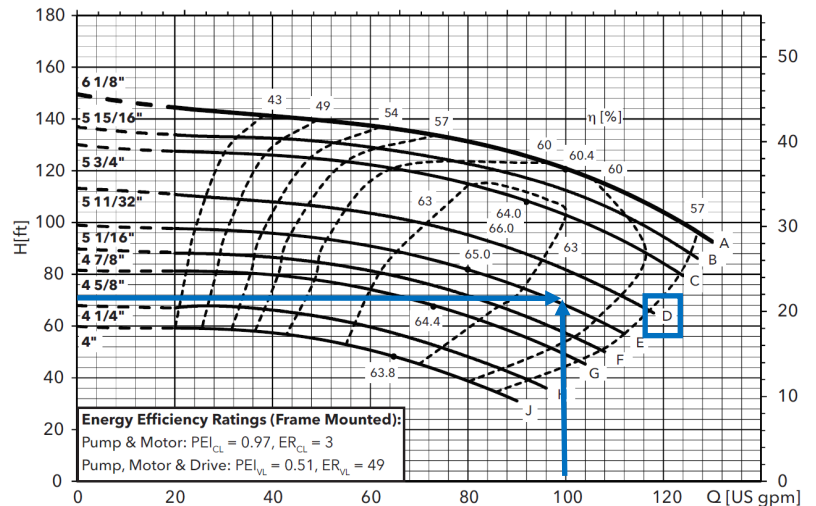
Flow Rate: 100 GPM
Boost: 30 PSI

Suction: 1 1/2 inch
Discharge: 1 1/4 inch

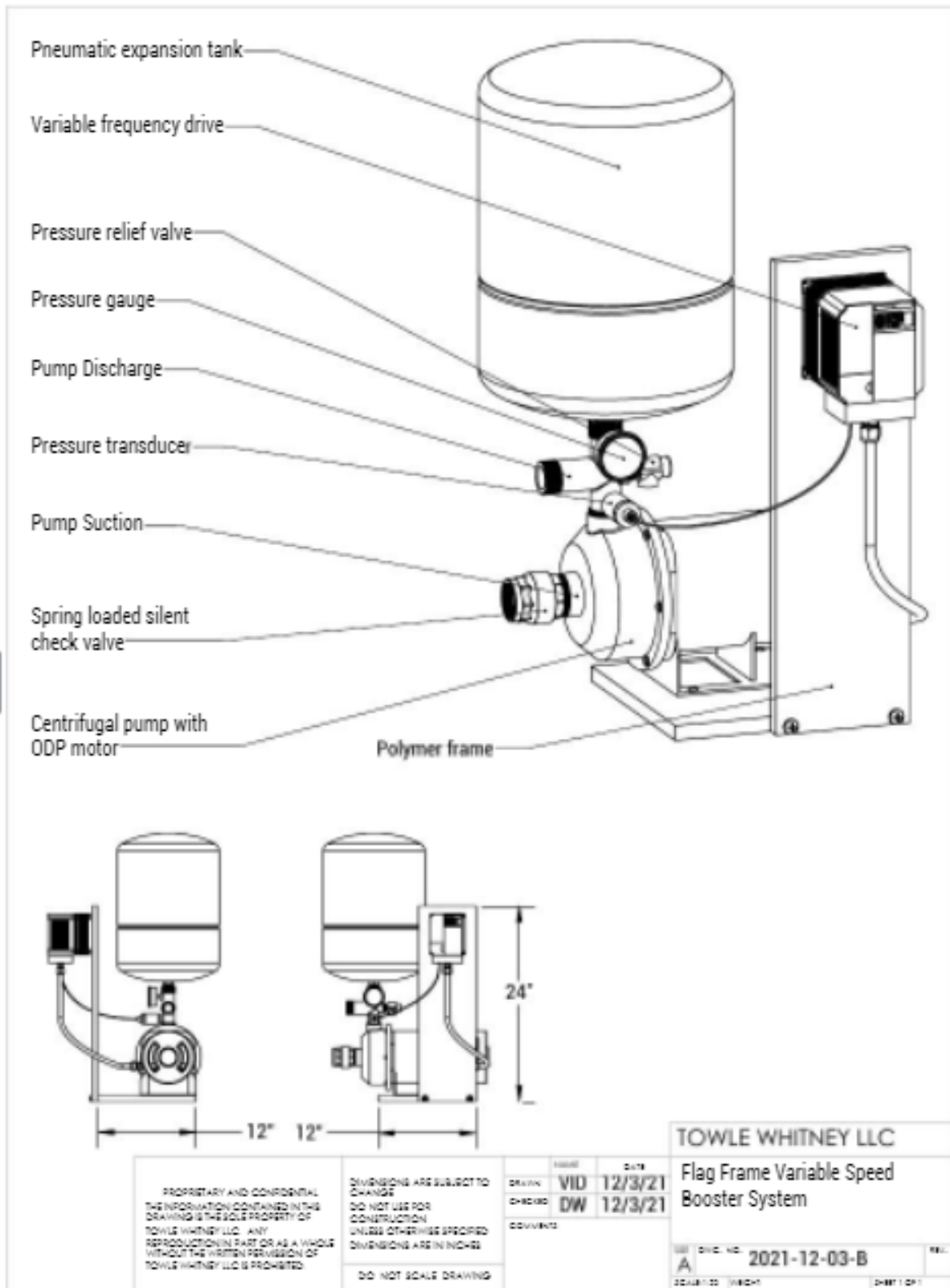
Tank: 8.5 Gallon [PLT-20]
Frame Size: 22" W x 24" H x 17" D
Decibel rating: <80 db @ 3500 RPM

Power Options: Independent circuit required
208-220V/ 1PH
208-220V/ 3PH
360-480V/3PH
Specify when ordering

Performance curve for each pump



SYSTEM CONFIGURATION



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 stainless steel casing with 304 stainless steel impellers.
- 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

COMPONENT COMPLIANCE

Electrical

Yaskawa VFD	UL 508C Power Conversion CSA 22.2 Industrial Controls		CE	RoHS
Lovato Shut-off	NEMA4		CE	RoHS

Pumps

Grundfos CM(I) SS Series	NSF 61		CE	
Grundfos CR(I) SS Series	NSF 61		CE	
Goulds 125MS Series	NSF 61		CE	
Goulds BF Series	NSF 61		CE	
Walrus TPH Series	NSF 372		CE	RoHS

Plumbing

Bluefin BVT200 Ball Valves	NSF 61			
Webstone BVT200 Ball Valves	NSF 61			
Bonomi Check 1000012	NSF 61		CE	
Flomatic VFD Check	NSF 61			
Victaulic 607 "E" Coupling	NSF 61			
Victaulic 660 Cap	NSF 61			
Amtrol PL Tank	NSF 61			
Watts PLT Tank	NSF 61			
Manifolds / piping	Type L Copper			
Fittings	Copper			
Discharge Riser	Copper		CE	
- Pressure Relief valve:				
- SS 4-20mA Transducer:				
- Pressure Gauges:	CA AB1953			

Sealants

Rectorseal Nokorode Flux	NSF 61
Worthington SILVER Solder	NSF 61
LocTite 567 Thread Sealant	NSF 61
Gasoil Thread Sealant	NSF 61



The VACON® 20 AC drive comes packed with functionality and possibilities to bring any machine control to a completely new level. The compact size in combination with a wide power range is the base, but the VACON® 20's possibilities do not end there. A built-in PLC functionality, which is one of the most flexible on the market, makes this product adapt to every task and bring cost savings to the user.

In order for machine builders to be able to compete in an increasingly competitive market, it is important to continuously seek solutions to further improve performance and cost efficiency – VACON® 20 offers new possibilities here.

WIDE POWER RANGE

The VACON® 20 is available in all common voltages in the range of 110-600V. Combined with a wide power range up to 18.5kW /25 HP. The VACON® 20 has something for customers all over the globe. Customers can reduce costs by implementing our harmonized product range and increase efficiency in their manufacturing processes. In currents above 16A the drive is available with a built-in harmonic filtering choke for public networks according to IEC61000-3-12.

CUTTING-EDGE PERFORMANCE

Machinery performance is very much dependent on the performance of the AC drive. In the VACON® 20 we have done our best to cut cycle times and maximize the control performance of the drive. The built-in RS-485 interface offers a cost effective and simple serial control interface for the drive. With optional modules, the Vacon 20 can be connected to almost any fieldbus system including CANOpen, DeviceNet and Profibus DP.

FAST INSTALLATION AND SET-UP

The VACON® 20 is designed for efficient volume manufacturing where every second in installation and configuration time counts. Easy access terminals, built-in DIN rail mounting and the MCA parameter copying tool which can clone settings without main power in the drive are all examples of features that help reduce start-up time.

WRITE CUSTOM APPLICATIONS USING VACON PROGRAMMING

The ability to customize functionality presents OEMs an opportunity to increase machine performance and save costs. The customer can build his own control logic in the drive and utilize unused I/O of the drive for performing other machine related tasks. In addition, the parameter list can be freely modified and application specific parameter sets and default settings can be created. By utilizing the VACON Programming* PC Tool, VACON® 20 can help make better and more cost effective machine designs.

*Contact your local Vacon office for more information.

KEY BENEFITS:

- Fieldbus connectivity
- Parameter copying without main power
- Custom-made software possible

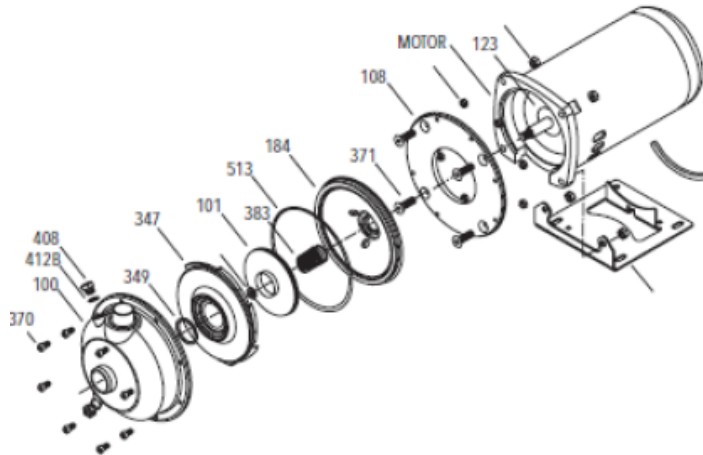
TYPICAL APPLICATIONS:

- Pumps & Fans
- Conveyors
- Packaging, processing and washing machines

TECHNICAL HIGHLIGHTS:

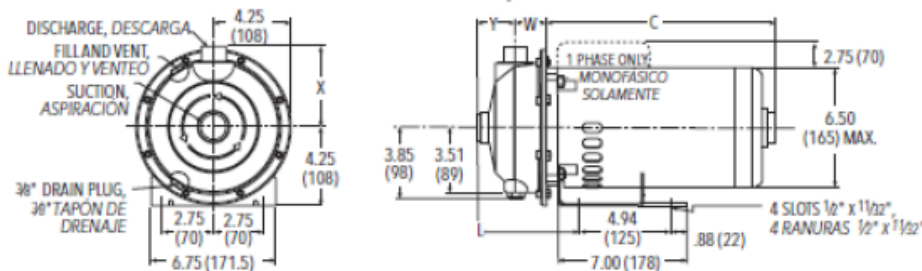
- Wide power range up to 25HP/18.5kW
- High performance and functionality
- Full I/O + option board support
- Fast installation and setup
- Optional Integral DC Choke available for MI4 - MI5

MCS CLOSE COUPLED PUMP MAJOR COMPONENTS: MATERIALS OF CONSTRUCTION
MATERIALES DE CONSTRUCCIÓN DE LOS PRINCIPALES COMPONENTES DE LA BOMBA
MCS DE ACOPLAMIENTO CERRADO



Item No., Parte No.	Description, Descripción	Materials, Materiales
100	Casing, Carcasa	AISI 316L SS,
101	Impeller, Impulsor	AISI 316L Acero inoxidable
108	Motor adapter, Adaptador del motor	Aluminum, Aluminio
123	Deflector, Deflector	BUNA-N
184	Seal housing, Alojamiento del sello	AISI 316L SS, AISI 316L Acero inoxidable
347	Guidevane, Difusor	
349	Seal ring, guidevane; Anillo del sello, difusor	BUNA-N
370	Socket head screws, casing; Encajes de tornillos, carcasa	AISI 410 SS, AISI 410 Acero inoxidable
371	Bolts, motor; Bulones, motor	Steel, Acero
383	Mechanical seal, Sello mecánico	see chart, ver tabla
408	Drain and vent plug, casing; Tapones de drenaje y ventilación, carcasa	AISI 316L SS, AISI 316L Acero inoxidable
412B	O-ring, drain and vent plug; Anillo 'O', tapón de drenaje y ventilación	Viton
513	O-ring, casing; Anillo 'O', carcasa	
Motor	NEMA standard, 56Y flange; Motor	NEMA estándar, brida 56Y

MCS CLOSE COUPLED - DIMENSIONS, WEIGHTS AND SPECIFICATIONS
MCS ACOPLAMIENTO CERRADO - DIMENSIONES, PESOS Y ESPECIFICACIONES



Clockwise rotation viewed from drive end. Rotación en dirección de las agujas del reloj visto desde el extremo del motor.

- NOTES:**
1. Pumps will be shipped with top vertical discharge as standard. For other orientations, remove casing screws, rotate to desired position, and tighten 6mm screws to 5 - 6 lbs./ft. (6.8-8 N-m).
 2. Dimensions in inches and millimeters (mm). Weight in pounds and kilograms (kg).
 3. Motor dimensions may vary with motor manufacturer.
 4. Not to be used for construction purposes unless certified.

Dimensions and Weights - Determined by Pump, Dimensiones y peso - Determinados por la bomba

Pump, Bomba	Suct., Aspiración	Disch., Descarga	HP	W	X	Y	L	Wt. Less Motor, Peso sin motor
100 MS	1.25 (32)	1.00 (25)	1/2-3	1.64 (42)	4.37 (111)	2.00 (51)	5.18 (131)	6 (2.7)
125 MS	1.50 (38)	1.25 (32)	1.50-7.50	2.08 (53)	4.45 (113)	2.13 (54)	5.74 (146)	7 (3.2)
150 MS	2.00 (51)	1.50 (38)	1.50-5	2.08 (53)	4.45 (113)	2.13 (54)	5.74 (146)	7 (3.2)

Dimensions and Weights - Determined by Motor, Dimensiones y peso - Determinados por el motor

HP	Motor Length and Weights, Longitud y peso del motor							
	1 Phase, Monofásicos				3 Phase, Trifásicos			
	ODP*		TEFC*		ODP*		TEFC*	
	C	Weight, Peso	C	Weight, Peso	C	Weight, Peso	C	Weight, Peso
1/2	9.88 (251)	21 (9.5)	11.34 (288)	34 (15.4)	9.79 (249)	19 (8.6)	8.60 (218)	20 (9.1)
3/4	10.63 (270)	26 (11.8)	11.59 (294)	33 (14.9)	9.79 (249)	25 (11.3)	10.34 (263)	21 (9.5)
1	10.88 (276)	28 (12.7)	12.09 (307)	37 (16.8)	9.79 (249)	26 (11.8)	10.84 (275)	30 (13.6)
1 1/2	11.13 (283)	28 (12.7)	12.59 (320)	42 (19)	10.54 (268)	28 (12.7)	11.09 (282)	33.75 (15.3)
2	11.73 (298)	40 (18.1)	12.84 (326)	42 (19)	11.04 (280)	34 (15.4)	11.81 (300)	36 (16.3)
3	12.48 (317)	43 (19.5)	13.34 (339)	48 (21.7)	12.29 (312)	34 (15.4)	12.56 (319)	41 (18.6)
5	13.14 (334)	49 (22.2)	-	-	13.79 (350)	46 (20.8)	-	-

* Premium efficiency where required by Department of Energy regulations.
* Eficacia superior donde se requiera por el Ministerio de regulaciones de la Energía.

- NOTAS:**
1. Las bombas se entregan con la descarga vertical superior estándar; para una orientación diferente, retire los tornillos de la carcasa, haga girar hasta la posición deseada y ajuste los bulones de 6 mm a 5-6 libras/pie (6,8-8 N-m).
 2. Dimensiones en pulgadas y milímetros (mm), peso en libras y kilogramos (kg).
 3. Las dimensiones del motor pueden variar de acuerdo al fabricante.
 4. No utilizar para fines de construcción a menos que estén certificadas.

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.	¾ male	¾ male	¾ male
Diameter - in.	8	10.5	12½
Length - in.	11	13.5	19¾
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.**





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 damage to pump internal parts.
- 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 Towle Whitney.

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.