

BTW4018T-468G-50 VARIABLE SPEED BOOSTER PUMP SYSTEM



The **BTW4018T.468G.50 Quadplex 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.

VFD drives will ALTERNATE lead pump every 24 hours of run time.

PLC not required with networked Yaskawa VFD's.

UL508 Panel not required with two independent disconnect switches (wire to independent circuit breakers).

Lead-Free (Wetted) components:

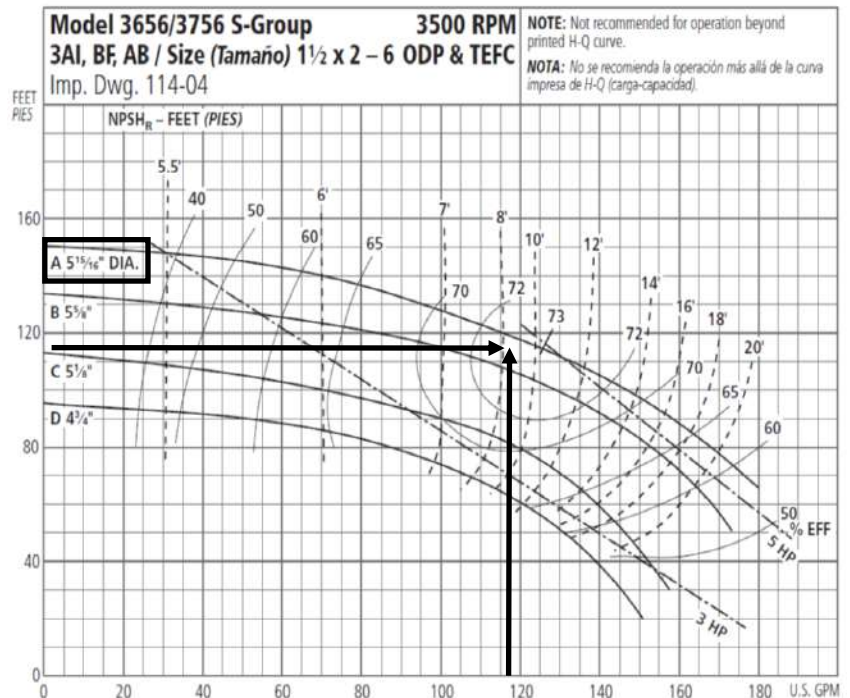
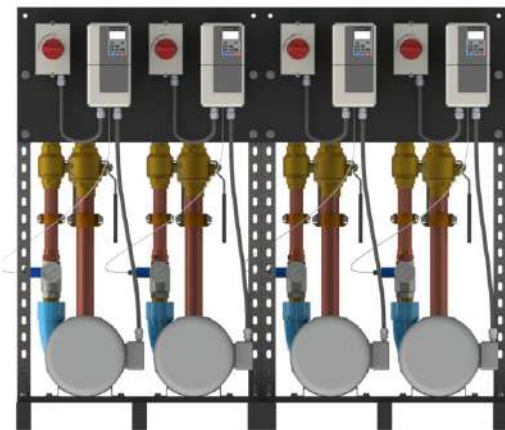
- Pumps: Bronze Fitted Cast iron
- Relief valves: LF Brass
- Pressure Gauges: LF Brass
- Transducers: Stainless Steel
- Check valves: LF Brass
- Ball Valves: LF Brass
- Manifolds: Copper
- Fittings: LF Brass, Copper, or SS

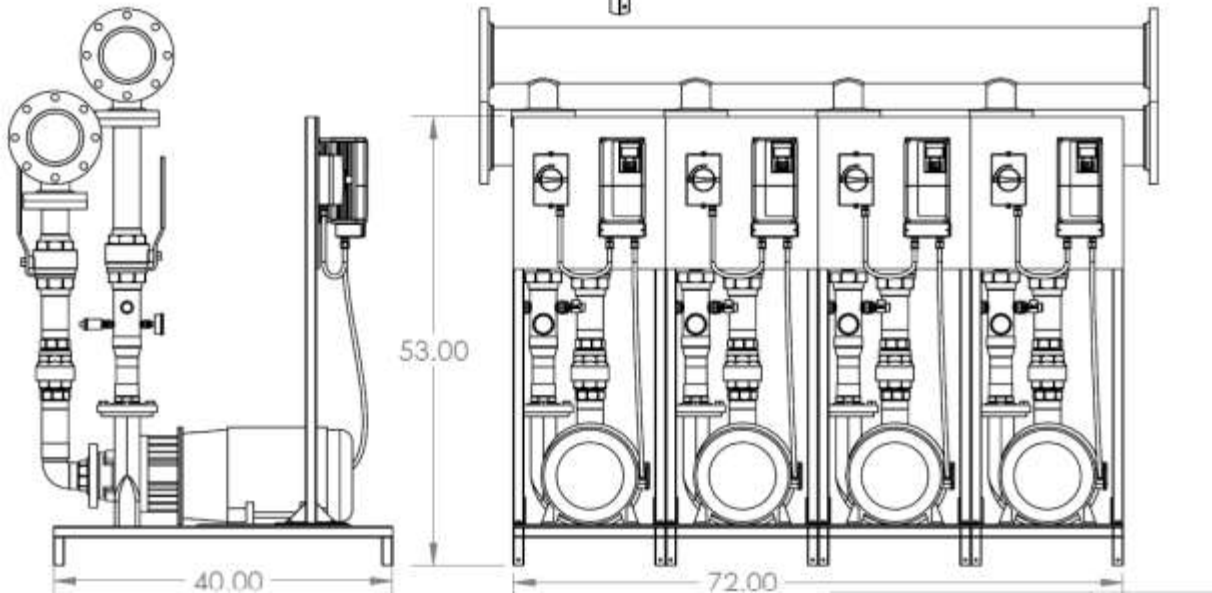
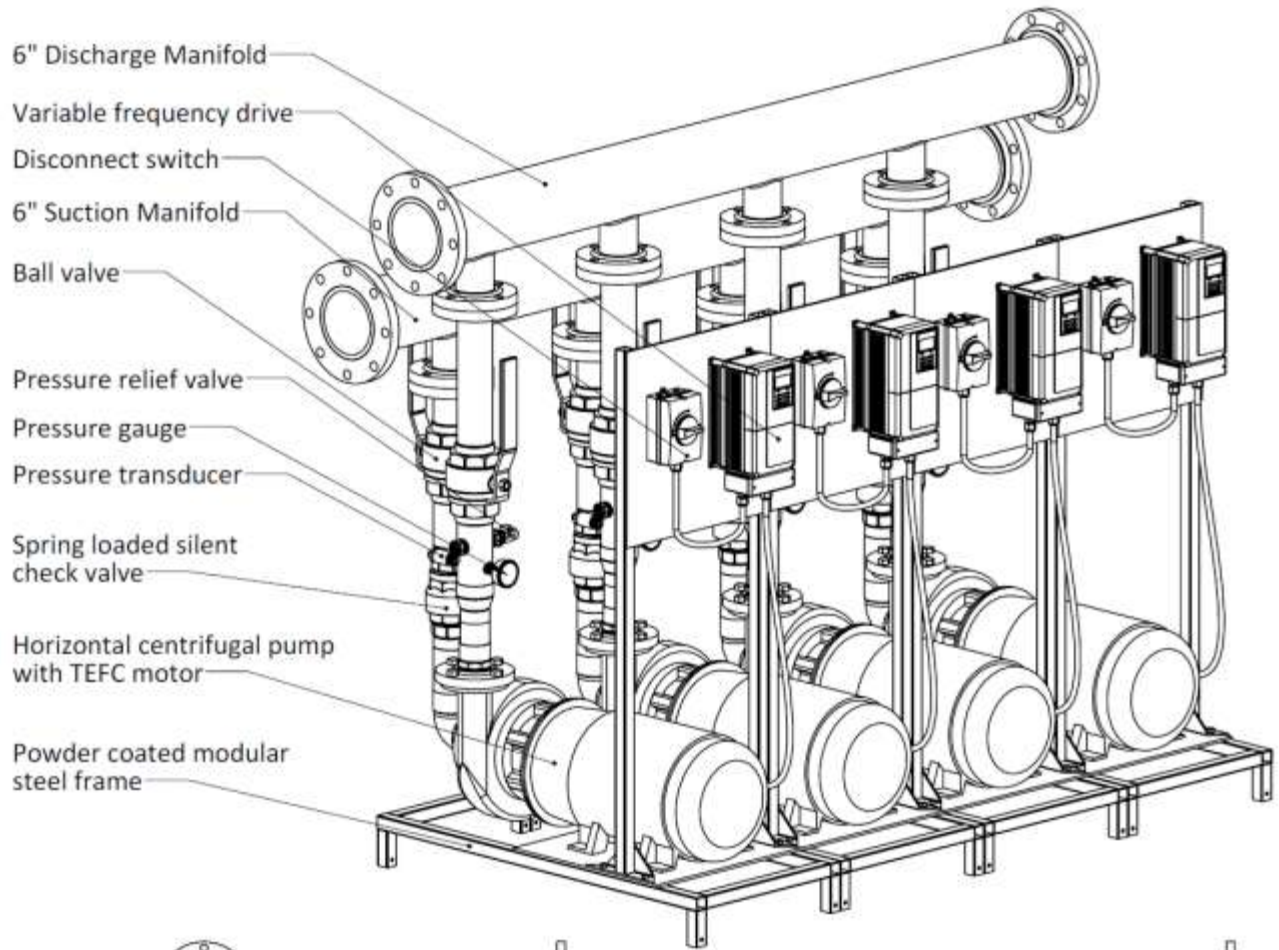
* NSF details on page 3

Technical Specifications:

- Pumps:** Gould 3BF
- Horse Power:** 5 HP per pump
- Controllers:** Yaskawa
- Flow Rate:** 468 GPM (117 GPM per pump)
- Boost:** 50 PSI
- Set Pressure:** TBD
- Manifolds:** 6 inch
- Tank:** 32 Gallon
- Frame Size:** 58" W x 50" H x 40" D
- Power:** Four independent circuits required
208-240V/ 1 Phase
208-240V/ 3 Phase
360-480V / 3 Phase
Specify when ordering

Performance curve for each pump





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
- Shall be mounted on a frame for ease of transport and installation.

Variable frequency drive:

- Will ALTERNATE the lead pump every 24 hours (field adjustable) of run time. The lag pump shall be in standby
- 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 bronze trimmed impellers.
- 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
- Pre-charged to a pressure of 10 PSI below system operating pressure for system to run properly

Manifolds, valves and fittings:

- Manifolds are designed for either right or left access
- Shall be sized appropriately to allow water velocity not exceeding 10 ft/sec, to minimize cavitation and turbulence
- 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

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
 Grundfos CR(I) SS Series NSF 61
 Goulds 3BF Series NSF 61
 Walrus TPH Series NSF 372



CE



CE



CE



CE

RoHS
Plumbing

Bluefin BVT200 Ball Valves NSF 61
 Wilkins 375XL RPZ: NSF 61
 Watts LF777SM3 Strainer NSF 61
 Bonomi Check 1000012 NSF 61
 ThermOmega Thermal Valve NSF 61
 Victaulic 607 "E" Coupling NSF 61
 Victaulic 660 Cap NSF 61
 Flexcon H2P25 Tank NSF 61
 Manifolds / piping Type L Copper
 Fittings Copper
 Discharge Riser Copper
 - Pressure Relief valve:
 - SS 4-20mA Transducer:
 - Pressure Gauges: CA AB1953

CE

Sealants

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



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

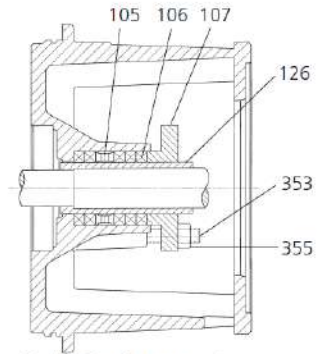
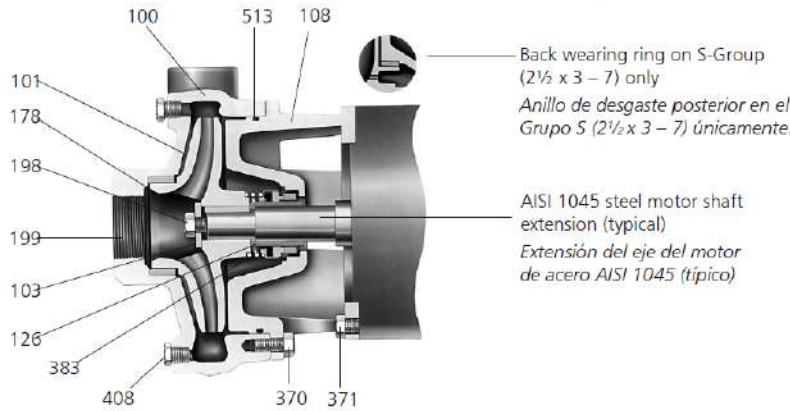
Pump Protective Features

- 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

3656 S-GROUP MATERIALS OF CONSTRUCTION MATERIALES DE CONSTRUCCIÓN - GRUPO S, MODELO 3756



Packed Box Arrangement
Caja prensaestopas

Item No. No. ítem	Description Descripción	Materials, Materiales		
		All Iron Todo hierro	Bronze Fitted Accesorios de bronce	All Bronze Todo bronce
100	Casing, Carcasa	1001	1001	1101
101	Impeller, Impulsor		1101	
103	Casing wear ring, Anillo de desgaste de la carcasa		1618	1618
108	Adapter, Adaptador		1001	1001
184	Seal housing, Cubierta del sello ①	One piece with adapter, Una pieza con adaptador		1101
126	Shaft sleeve, Camisa del eje	AISI Type 300 series stainless steel Acero inoxidable serie AISI tipo 300		
198	Impeller bolt, Perno del impulsor	AISI Type 300 series stainless steel Acero inoxidable serie AISI tipo 300		
199	Impeller washer, Arandela del impulsor	Carbon Steel, Acero al carbono		
178	Impeller key, Chaveta del impulsor	Carbon Steel, Acero al carbono		
370	Hex head cap screw (adapter to case), Tornillo de cabeza hexagonal (del adaptador a la cubierta)	Steel SAE 1200 Grade 5 Acero SAE 1200 grado 5		
371	Hex head cap screw (adapter to motor), Tornillo de cabeza hexagonal (del adaptador al motor)	Steel SAE 1200 Grade 5 Acero SAE 1200 grado 5		
383	Mechanical seal, Sello mecánico	See seal chart, Ver tabla del sello		
408	Pipe plug ¼" or ⅜", Tapón de tubos de ¼ de pulgada ó ⅜ de pulgada	Steel, Acero		Bronze, Bronce
513	O-ring, Anillo en O	BUNA-N, BUANA-N		

Material Code, Código de material	Engineering Standard, Norma de Ingeniería
1101	Cast iron ASTM A48 CL20, Hierro fundido ASTM A48 CL20
1101	Silicon bronze ASTM B584, C87500, Silicio de bronce ASTM B584, C87500
1618	Bismuth brass, Latón al bismuto

Packed Box Arrangement, Caja prensaestopas			
Item No., No. ítem	Description, Descripción	Materials, Materiales	
105	Lantern ring, Aro de linterna	Teflon™	
106	Packing, 5 rings; Empaquetadura, 5 aros	Teflon Impregnated, impregnado de Teflon	
107	Gland, Casquillo	AISI 316SS	
126	Shaft sleeve, Camisa del eje	AISI Type 300 Series Stainless Steel	
353	Gland stud, Perno del casquillo	Acero inoxidable serie AISI tipo 300	
355	Gland nut, Tuerca del casquillo		

Type 21 Mechanical Seal, Tipo 21 sello mecánico						
Seal Code, Código del Sello	Rotary, Rotativo	Stationary, Estacionario	Elastomers, Elastómeros	Metal Parts, Partes Metálicas	Part No., Pieza Número	
0	Carbon, Carbón	Ceramic, Cerámica	BUNA-N	316 SS, 316 Acero inoxidable	10K13	
1		Sil-Carbide, Carburo de silicio	EPR		10K19	
3			Viton		10K27	
5	Sil-Carbide				10K64	
9	Packed Box Design with BUNA O-Ring, Diseño de prensaestopas empacado con anillo en O de BUNA					15K16

① For separate seal housing and adapter construction, all bronze material only, see repair parts page.

Para la construcción separada del compartimiento del sello y el adaptador, materiales de bronce únicamente, consulte la página de piezas de repuesto.

NOTE:

Pumps will be shipped with top-vertical discharge position as standard. For other orientations, remove casing bolts – rotate discharge to desired position – replace and tighten bolts to 25 ft./lbs. Note that discharge may extend below motor mounting surface in bottom-horizontal position; adequate clearance must be provided.

CLOSE-COUPLED UNITS

- Units may be installed horizontally, inclined or vertically with the motor above the pump.

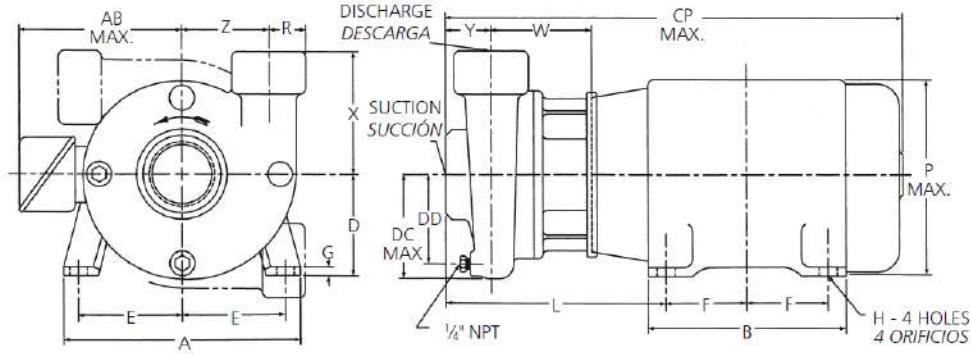
- The motor feet **MUST** be bolted to a substantial surface (horizontal or vertical) that is capable of complete and rigid support for the pump and motor. For I-Group pumps, the motor adapter feet must also be bolted to the supportive surface.

- For vertical operation, the motor should be fitted with a drip cover or otherwise protected against liquid entering the motor (rain, spray, condensation, etc.)

NOTICE: DO NOT INSTALL WITH MOTOR BELOW PUMP. ANY LEAKAGE OR CONDENSATION WILL AFFECT THE MOTOR.

3656 S-GROUP DIMENSIONS AND WEIGHTS GRUPO S, MODELO 3656 - PESO Y DIMENSIONES

MECHANICAL SEAL SELLO MECÁNICO



Pump Dimensions and Weights (Dimension "L" determined by Pump and Motor)
Peso y dimensiones de la bomba (la dimensión "L" está determinada por la bomba y el motor)

Pump Bomba	Succión Succión	Discharge Descarga	CP Max.	DC Max.	DD	R	W	X	Y	Z	Wt. (lbs.) Pesos (libras)	Motor Frame Size, Bastidor				
												140	180	210	250	
1 x 2 - 7	2	1	27	4 1/4	3 1/2	1 1/16	4 7/8	5 1/2	3	4	52	10	10 3/4	—	—	
1 x 2 - 8					4		3 15/16	5 3/4	3 3/16	4 1/4	52			—	—	
1 1/2 x 2 - 6					3 1/2	1 1/4	4 1/2	2 5/8	3 1/2	34	9 3/4			10 1/2	—	—
1 1/2 x 2 - 8					4 7/8	4 1/4	5	4 1/4	54	11 3/8	11 3/8					
2 1/2 x 3 - 7	3	2 1/2	25 3/8	5 1/8	4 1/2	1 13/16	6	3	4	49	10 1/8	10 3/4	11 3/4	—		
3 x 4 - 7	4*	3*	25 1/4	5 3/4	5 1/8	3 3/4	4 3/8	6	2 1/2	4 1/2	82	9 3/4	10 3/8	11 3/8	—	

*For use with ANSI class 150 mating flange. All others are NPT connections.
* Para uso con brida de contacto ANSI clase 150. Todas las demás son conexiones NPT.

Motor Dimensions and Weights (may vary with manufacturer)*
Peso y dimensiones del motor (pueden variar de acuerdo al fabricante) *

Frame Size JM Tamaño del bastidor JM	A	AB (Max.)	B	D	E	F	G	H	P (Max.)	Weight (lbs.) Pesos (libras)
143	6 1/2	5 1/4	6	3 1/2	2 3/4	2	1/8	1 1/32	6 5/8	41
145						2 1/2				57
182	8 1/2	5 7/8	6 1/2	4 1/2	3 3/4	2 1/4	3/16	1 3/32	7 7/8	77
184						2 3/4				97
213	9 1/2	7 3/8	8	5 1/4	4 1/4	2 3/4	7/32	1 3/32	9 5/8	122
215						3 1/2				155
254 TCZ	11 1/4	9	9 1/2	6 3/4	5	4 7/8	1/4	1 7/32	11 1/2	265
256 TCZ			11 3/4			5				320

NOTE:
All pumps shipped in vertical discharge position. May be rotated in 90° increments. Tighten casing bolts to 25 ft./lbs. torque.

NOTA:
Todas las bombas se embarcan con la descarga en posición vertical. Esta posición puede rotarse en incrementos de 90°. Ajustar los pernos de la carcasa a una torsión de 25 pies/libras.

Motor Frames and Horsepower
Bastidores del motor y potencia en HP

Motor Frame Bastidor del motor	3500 RPM				1750 RPM			
	1 Phase		3 Phase		1 Phase		3 Phase	
	ODP	TEFC	ODP	TEFC	ODP	TEFC	ODP	TEFC
143	—	3/4, 1, 1 1/2	3/4, 1, 1 1/2	3/4, 1, 1 1/2	—	1/2, 3/4	1/2, 3/4, 1	1/2, 3/4, 1
145	—	2	2, 3	2, 3	—	1, 1 1/2	1 1/2, 2	1 1/2, 2
182	3	3	5	3	3	2, 3	3	3
184	5	3, 5	7 1/2	5	—	—	5	5
213	7 1/2	—	10	7 1/2	5	—	7 1/2	7 1/2
215	10	—	15	10, 15	—	—	—	—
254TCZ	—	—	20	—	—	—	—	—
256TCZ	—	—	25	20, 25	—	—	—	—

All dimensions in inches and weights in lbs. Do not use for construction purposes.
Todas las dimensiones están en pulgadas, el peso en libras. No utilizar para fines de construcción.



PRO-LINE® Diaphragm Well Tanks: PL Series

125 PSIG Working Pressure

Construction

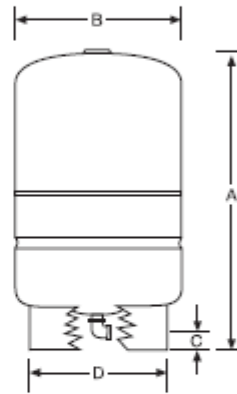
Shell	Deep Drawn Steel
Diaphragm	Butyl
Liner	Polypropylene
System Connection	304L Stainless Steel
Finish	Tan
Water Circulator	Turbulator™
Air Valve	Projection Welded
Factory Precharge	38 PSIG (2.6 bar)

Application

- Controls pump cycling in residential well water systems.

Performance

Maximum Operating Temperature	200°F (93°C)
Maximum Working Pressure	125 PSIG (8.6 bar)
Maximum Relief Valve Setting	100 PSIG (6.9 bar)
Warranty	5 Year



Stand Models

Model	Tank Volume		Max. Accept. Factor	A Tank Height		B Tank Diameter		C Sys. Conn. Centerline		D Stand Diameter		System Conn. (NPTF)	Shipping Weight	
	Gal	Lit		in	mm	in	mm	in	mm	in	mm		in	Lbs
PL-14	14.0	53	0.81	25	635	15	381	1 1/8	40	12	304	1	22	10
PL-20	20.0	76	0.57	32	813	15	381	1 1/8	40	12	304	1	28	13
PL-26	26.0	98	0.44	39	991	15	381	1 1/8	40	12	304	1	34	15
PL-32	32.0	121	0.35	47	1194	15	381	1 1/8	40	12	304	1	40	18
PL-34	34.0	129	1.00	30	762	22	559	1 1/8	49	20 1/2	521	1 1/4	50	23
PL-44	44.0	167	0.77	36	914	22	559	1 1/8	49	20 1/2	521	1 1/4	57	26
PL-62	62.0	235	0.55	47	1194	22	559	1 1/8	49	20 1/2	521	1 1/4	75	34
PL-81	81.0	301	0.41	57	1448	22	559	1 1/8	49	20 1/2	521	1 1/4	92	42
PL-86	86.0	326	0.54	47	1194	26	660	2 1/8	52	20 1/2	521	1 1/4	99	45
PL-119	119.0	450	0.39	62	1575	26	660	2 1/8	52	20 1/2	521	1 1/4	133	60

All dimensions and weights are approximate.