BOESCH

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VARIABLE SPEED BOOSTER SYSTEMS

BTW SERIES

60 HZ

BOESCH PUMPS INC
Art Chibli
(305) 999-1769
achibli@boeschpumps.com
14031 SW 143rd Court Miami, FL 33186

BTW2018T-270G-45
DUPLEX VARIABLE SPEED
BOOSTER PUMP SYSTEM

Boesch Pumps Inc. 14031
SW 143rd Ct
Miami, FL 33186
Art Chibli
(305) 999-1769
achibli@boeschpumps.com

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BTW2018T-270G-45 DUPLEX

The ***BTW2018T-270G-45 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.

System is built to fit through a 30" doorway.

VFD drives will ALTERNATE lead pump every 24 hours of run time. Second pump will remain on standby.

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

Lead_Free (Wetted) components:

- Pumps: Cast Iron
- Relief valves: LF Brass
- Pressure Gauges: LF Brass
- Transducers: Stainless Steel
- Check valves Stainless Steel
- Ball Valves: LF Brass
- Manifolds: Type L Copper
- Fittings: LF Brass or SS

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

Technical Specifications:

Pumps: Gould 3BF
Horse Power: 5 HP per pump

VF Drives: Yaskawa

Flow Rate: 270 GPM (135 GPM per pump)
Boost: 45 PSI
Set Pressure: 80 PSI (unless otherwise specified)

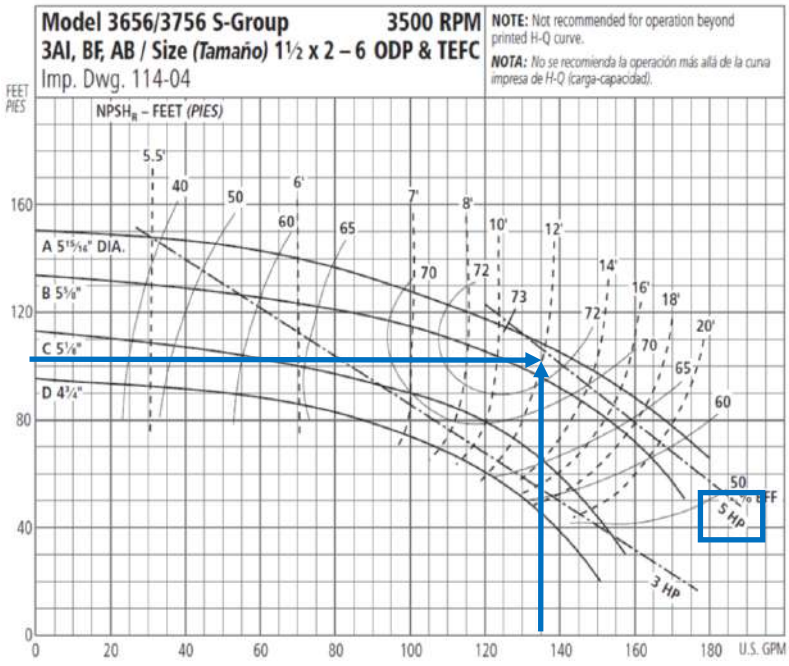
Manifolds: 3 Inch
Tank: 32 Gallon expansion tank

Frame: 29"W X 42"H X 36"D

Power: 360-480V/3PH

Two Independent circuits required

Performance curve for each pump



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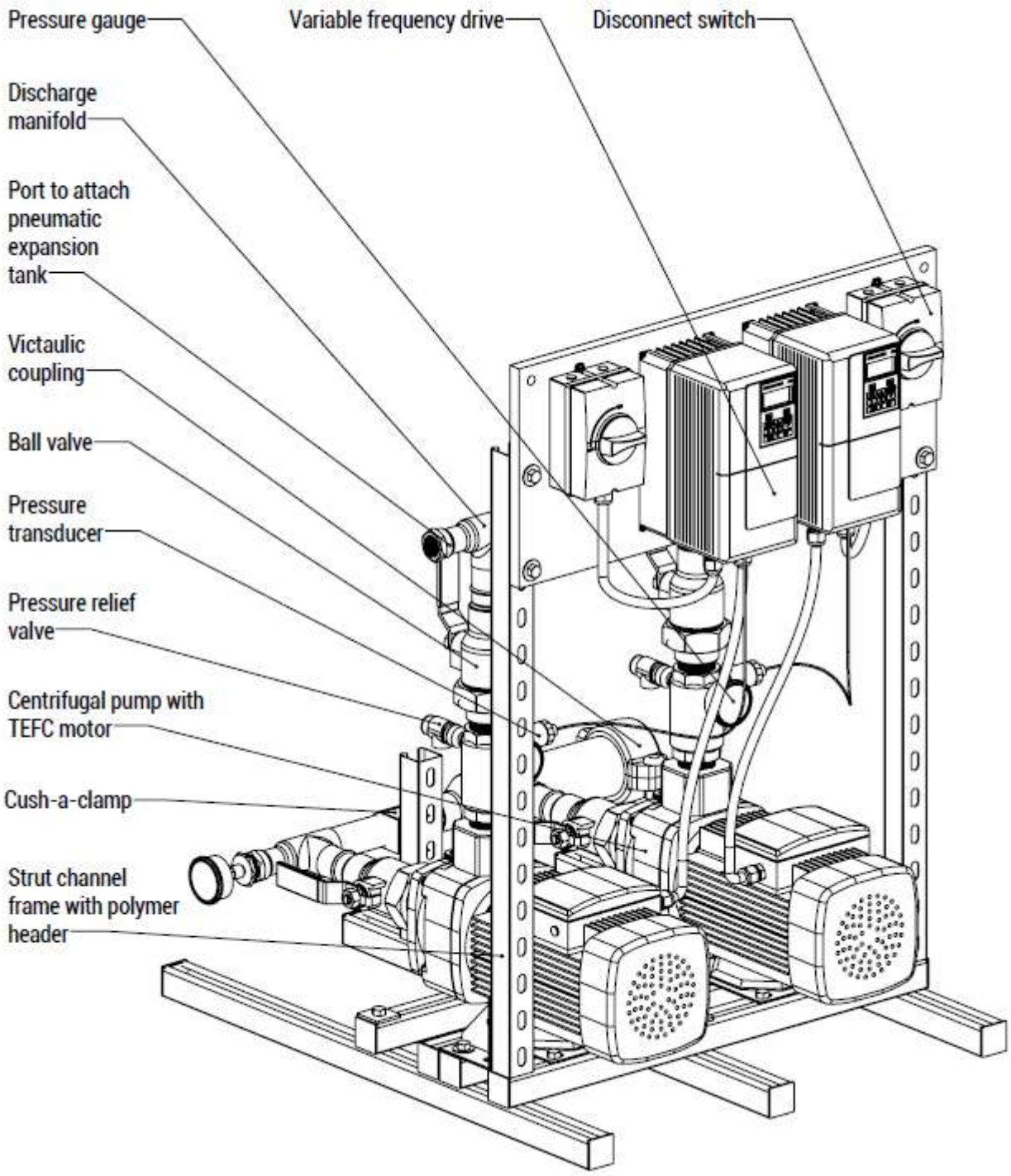

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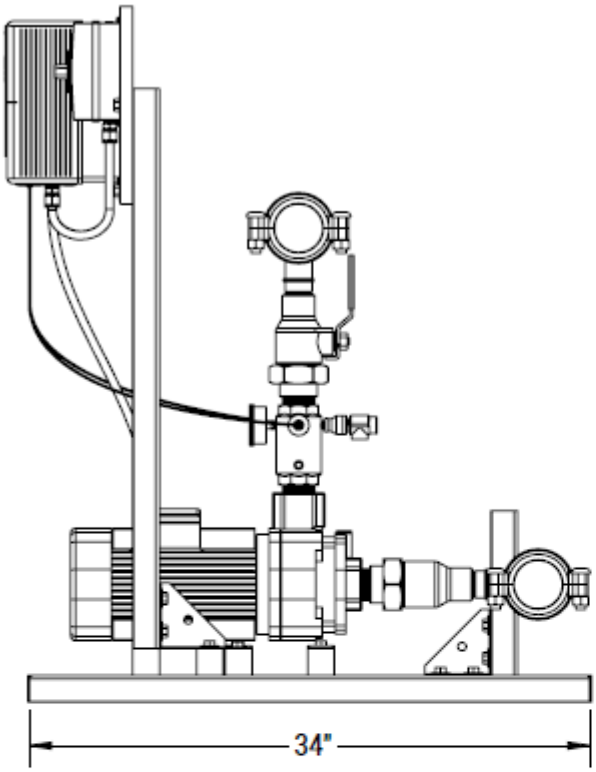
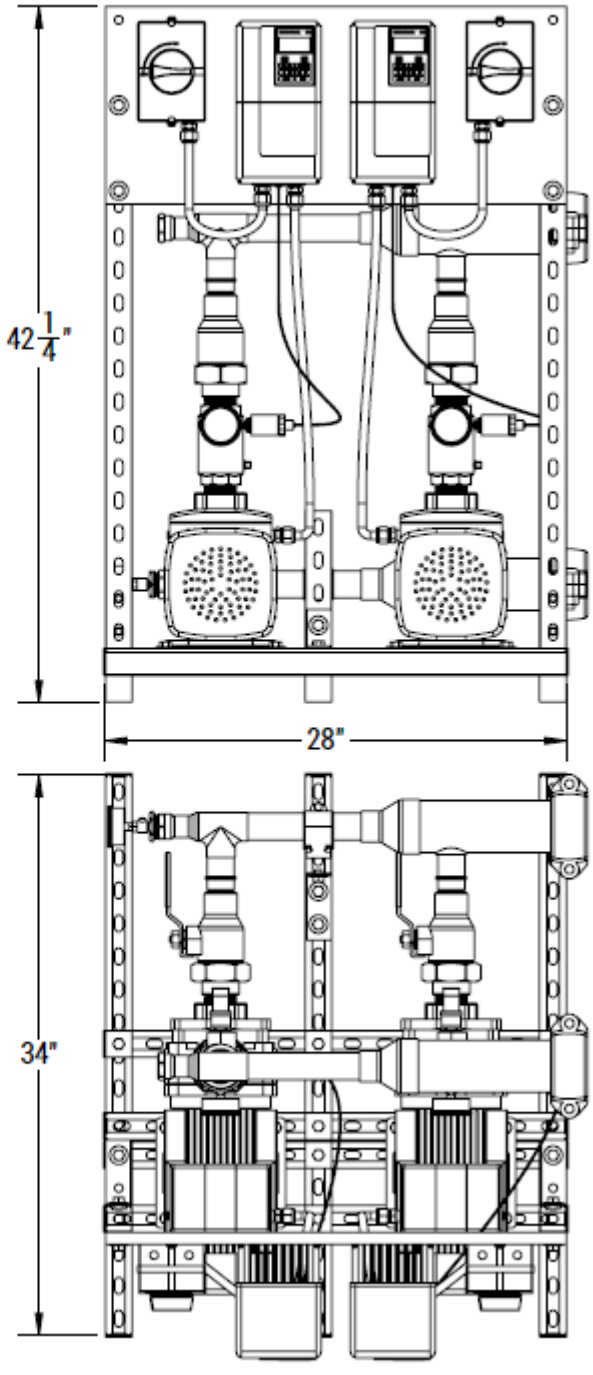
SYSTEM DIMENSIONS





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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 fitted 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

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Electrical

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

Pumps

Grundfos CM(I) SS Series	NSF 61	c UL us LISTED	CE	
Grundfos CR(I) SS Series	NSF 61	c UL us LISTED	CE	
Goulds 125MS Series	NSF 61	c UL us LISTED	CE	
Goulds BF Series	NSF 61			
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
Gasoila Thread Sealant	NSF 61

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VFD 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.

YASKAWA

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 $avings 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

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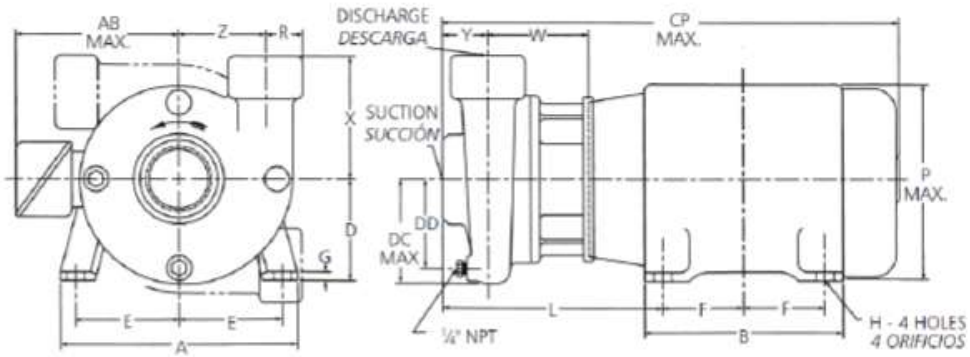
PUMP SPECIFICATIONS

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*	Suction *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
												L			
1 x 2 – 7	2	1	27	4¼	3½	1⅛	4⅛	5½	3	4	52	10	10¾	—	—
1 x 2 – 8					4		3¹⁵⁄₁₆	5¾	3⅛	4¼	52			—	—
1½ x 2 – 6		1½	23¾		3½	1¼	4¼	4½	2⅛	3½	34	9¾	10½	—	—
1½ x 2 – 8			27⅛	5⅛	4⅞			5		4¼	54			11⅛	11⅛
2½ x 3 – 7	3	2½	25⅛	5¼	4½	1¹⁵⁄₁₆		6	3	4	49	10⅛	10¾	11¾	—
3 x 4 – 7	4"	3"	25¼	5¼	5⅛	3¼	4⅛		2½	4½	82	9¾	10⅜	11⅜	—

*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 NTP.*

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	6½	5¼	6	3½	2¼	2	1/8	11/32	6⅛	41
145						2½				57
182	8½	5⅞	6½	4½	3¾	2¼	5/16	13/32	7⅛	77
184						2¾				97
213	9½	7⅛	8	5¼	4¼	2¾	7/32	15/32	9⅛	122
215						3½				155
254 TCZ	11¼	9	9½	6¼	5	4⅛	¼	17/32	11½	265
256 TCZ			11¼			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	—	¾, 1, 1½	¾, 1, 1½	¾, 1, 1½	—	½, ¾	½, ¾, 1	½, ¾, 1
145	—	2	2, 3	2, 3	—	1, 1½	1½, 2	1½, 2
182	3	3	5	3	3	2, 3	3	3
184	5	3, 5	7½	5	—	—	5	5
213	7½	—	10	7½	5	—	7½	7½
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.

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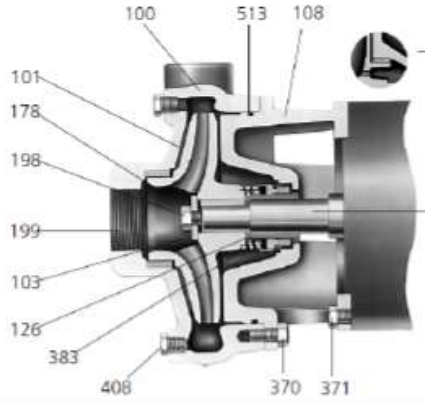
3656 S-GROUP MATERIALS OF CONSTRUCTION
MATERIALES DE CONSTRUCCIÓN - GRUPO S, MODELO 3756



Back wearing ring on S-Group (2½ x 3 – 7) only
Anillo de desgaste posterior en el Grupo S (2½ x 3 – 7) únicamente.

AISI 1045 steel motor shaft extension (typical)
Extensión del eje del motor de acero AISI 1045 (típico)

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*			
199	Impeller washer, *Arandela del impulsor*			
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)*			
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, *BUNA-N*		

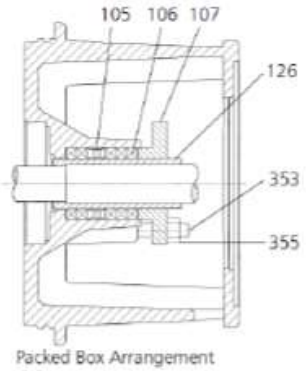
Material Code, *Código de material*	Engineering Standard, *Norma de ingeniería*
1101	Cast iron ASTM A48 CL20, *Hierro fundido ASTM A48 CL20*
1101	Silicon bronze ASTM B584, C87500, *Silicuro de bronce ASTM B584, C87500*
1618	Bismuth brass, *Latón al bismuto*

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 *Acero inoxidable serie AISI tipo 300*
353	Gland stud, *Perno del casquillo*	
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 silicona*	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



Packed Box Arrangement
Caja prensaestopas

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.

NOTA:
Las bombas salen de la fábrica con la descarga orientada en posición vertical superior de manera estándar. Para modificar la orientación, retirar los pernos de la carcasa, hacer girar la descarga hasta la posición deseada y volver a colocar los pernos, ajustándolos a una torsión de 25 pies/libras. Se ha de notar que la descarga se puede extender por debajo de la superficie de montaje del motor en la posición horizontal inferior; por lo tanto, debe proveerse suficiente espacio.

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PNEUMATIC EXPANSION TANK SPECIFICATIONS

AMTROL

PRO-LINE®

Diaphragm Well Tanks: PL Series

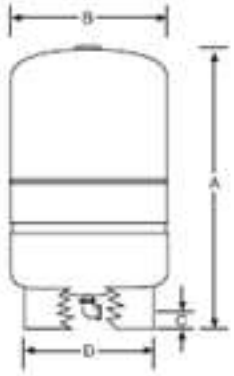
125 PSIG Working Pressure

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. (MPTF)	Shipping Weight	
	Gal.	Lit		in.	mm	in.	mm	in.	mm	in.	mm	in.	Lbs.	Kg
PL-14	14.0	53	0.81	25	635	15	381	1 7/16	40	12	304	1	22	10
PL-20	20.0	76	0.57	32	813	15	381	1 7/16	40	12	304	1	28	13
PL-26	26.0	98	0.44	39	991	15	381	1 7/16	40	12	304	1	34	15
PL-32	32.0	121	0.35	47	1194	15	381	1 7/16	40	12	304	1	40	18
PL-34	34.0	129	1.00	30	762	22	559	1 15/16	49	20 1/2	521	1 1/4	50	23
PL-44	44.0	167	0.77	36	914	22	559	1 15/16	49	20 1/2	521	1 1/4	57	26
PL-62	62.0	235	0.55	47	1194	22	559	1 15/16	49	20 1/2	521	1 1/4	75	34
PL-81	81.0	301	0.41	57	1448	22	559	1 15/16	49	20 1/2	521	1 1/4	92	42
PL-86	86.0	326	0.54	47	1194	26	660	2 1/16	52	20 1/2	521	1 1/4	99	45
PL-119	119.0	450	0.39	62	1575	26	660	2 1/16	52	20 1/2	521	1 1/4	133	60

All dimensions and weights are approximate.

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