

Four Inch Stainless Steel Submersible Pumps Safety Instructions Installation and Operation Guide 5 - 75 GPM



A Pump Selection & Inspection	3
B Pre-Installation Preparation	3
C Electrical Preparation	4
D Motor and Cable Information	4-6
E Installation of Pump in Well	6
F Above Ground Pipe & Tank Connections	7
G Connecting Bleed Back Valve System	8
H Controlling Weak Wells	8
I Trouble-Shooting	8-9

WARNING! IMPORTANT SAFETY INSTRUCTIONS! READ CAREFULLY BEFORE INSTALLATION. This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often



FAILURE TO FOLLOW THESE INSTRUCTIONS AND COMPLY WITH ALL CODES MAY CAUSE SERIOUS BODILY INJURY, DEATH AND/OR PROPERTY DAMAGE

⚠️ 1) Before installing or servicing your pump,

BE CERTAIN THE PUMP POWER SOURCE IS TURNED OFF AND DISCONNECTED.

⚠️ 2) All installation and electrical wiring must adhere to state and local codes. Check with appropriate community agencies, or contact your local electrical and pump professionals for help.

⚠️ 3) CALL AN ELECTRICIAN WHEN IN DOUBT. Pump must be connected to a separate electrical circuit directly from the entrance box. Have the electrical outlet checked by an electrician to make sure it is properly grounded. There must be an appropriately sized fuse or circuit breaker in this line. Tying into existing circuits may cause circuit overloading, blown fuses, tripped circuit breakers, or a burned up motor.

⚠️ 4) Do not connect pump to a power supply until the pump is grounded. For maximum safety, a ground fault interrupter should be used. CAUTION: FAILURE TO GROUND THIS UNIT PROPERLY MAY RESULT IN SEVERE ELECTRICAL SHOCK.

⚠️ 5) WARNING: Reduced risk of electric shock during operation of this pump requires the provision of acceptable grounding:

a) If the means of connection to the supply-connection box is other than grounded metal conduit, ground the pump back to the service by connecting a copper conductor, at least the size of the circuit conductors supplying the pump, to the grounding screw provided within the wiring compartment.

b) This pump is provided with a means for grounding. To reduce the risk of electric shock from contact with adjacent metal parts, bond supply box to the pump-motor-grounding means and to all metal parts accessible at the well head, including metal discharge pipes, metal well casing, and the like, by means of:

(1) An equipment-grounding conductor at least the size of the well cable conductors, or the equivalent, that runs down the well with the well cable and,

(2) A clamp, a weld, or both if necessary, secured to the equipment grounding lead, the equipment grounding terminal, or the grounding conductor on the pump housing. The equipment-grounding lead, if one is provided, is the conductor that has an outer surface of insulation that is green with or without one or more yellow stripes.

⚠️ 6) The voltage and phase of the power supply must match the voltage and phase of the pump.

⚠️ 7) Do not use an extension cord; splices must be made with an approved splice kit and should be checked for integrity before submerging in water, above ground joints must be made in an approved junction box.

⚠️ 8) Do not work on this pump or switch while the power is on.

⚠️ 9) Never operate a pump with a frayed or brittle power cord, and always protect it from sharp objects, hot surfaces, oil and chemicals. Avoid kinking the cord.

⚠️ 10) Never service a motor or power cord with wet hands or while standing in or near water or damp ground.

⚠️ 11) The three phase units must be wired by a qualified electrician, using an approved starter box and switching device.

⚠️ 12) Do not use this pump in or near a swimming pool, pond, lake or river.

⚠️ 13) Single phase motors are either two wire units (two black power wires and a green ground), or three wire units (three power leads red, black, & yellow and a green ground). The three wire units require a control box. Make sure the control box matches the motor in voltage, horsepower, and phase.

⚠️ 14) Single phase motors are equipped with automatic resetting thermal protectors. The motor may restart unexpectedly causing the leads to energize or pump to turn. Three phase motors should be protected by proper, thermal and amperage protection. (Check local codes.)

⚠️ 15) Check for nicks in the wire and pump insulation by using an ohm meter and checking resistance to ground before installing the pump and after installing the pump. If in doubt on the proper procedure check with a qualified electrician.

⚠️ 16) Do not pump gasoline, chemicals, corrosives, or flammable liquids; they could ignite, explode, or damage the pump, causing injury and voiding the warranty.



⚠️ 17) Do not run this pump with the discharge completely closed this will create superheated water, which could damage the seal, and shorten the life of the motor. This superheated water could also cause se-

vere burns. Always use a pressure relief valve, set below the rating of the tank or system.

⚠️ 18) Pump is capable of building pressures in excess of 100 psi. Always use a pressure relief valve.

⚠️ 19) The well, cistern, or pit must be sealed to prevent a child, animal or foreign object from falling in.

⚠️ 20) The following may cause severe damage to the pump and void warranty. It could also result in personal injury:

- Running the pump dry. This will damage the pump seal. Follow priming instructions.
- Failure to protect the pump from below freezing temperatures.
- Running the pump with the discharge completely closed.
- Pumping chemicals or corrosive liquids.

⚠️ 21) Never work on the pump or system without relieving the internal pressure.

⚠️ 22) Do not pump water above 120° Fahrenheit.

⚠️ 23) Never exceed the pressure rating of any system component.

⚠️ 24) While installing the pump, always keep the well covered to prevent foreign matter from falling into the well and contaminating the water and/or causing possible serious damage to the mechanical operation of the pump.

⚠️ 25) Always test well water for purity before using. Check with local health department for proper testing.

⚠️ 26) After carefully removing your pump from the carton, make a visual inspection for any apparent shipping damage.

A Pump Selection & Inspection

1. Select the right pump & motor

Gallons per minute desired + pressure required + depth to pumping level determines which pump size and model is right for your water well system.

2. Inspect your new pump & motor

After purchase, check the pump and motor and other contents of the shipping container for possible damage. Do NOT lift the submersible pump by its attached electric motor cables.

Find the loose owner's information plate and check the listed model number against the label data on the outside shells covering the motor and the pump.

The entire pump was thoroughly tested at the factory. However, to make sure there is no hidden damage caused during shipment, we suggest checking for free rotation of the shaft prior to installation.

B Pre-Installation Preparation

1. New wells

a) Location of pump. Your submersible pump can be installed at nearly any well location for years and years of dependable, trouble-free service. For new wells, always locate well to provide for easy removal and replacement of pump. The water tank and electrical controls can, of course, be located some distance from the well.

b) Determine depth of pump in well in order to purchase electrical cables of sufficient gauge and length to reach from pump motor to electrical motor control box - and to purchase galvanized iron pipe, PVC rigid plastic pipe or flexible plastic pipe of sufficient length to reach from pump discharge to water tank. (See cable length and cable-size charts in Sections C2 and C3.)

c) Location of water tank and electrical controls. Always install

the pressure tank and electrical controls in a clean dry basement or utility room to avoid dampness and temperature extremes. In any installation where the pump pressure could exceed the storage tank pressure, provide a pressure relief valve piped to a suitable drain.

2. Replacing pump (or motor only) in existing well

a) Turn off power at electrical control box.

b) Remove well seal from top of well.

c) Remove old pump from well.
1. If galvanized iron or rigid plastic PVC pipe was used originally, you'll find a number of rigid sections joined together. Pull pipe upward and dismantle each section as you go, untaping or unbanding electrical motor cables from each section until you reach pump.

2) If flexible plastic pipe was used originally, pull pipe upward - coiling pipe and cables in a big circle as you go - until you reach the pump.

3) When old pump is out of well, cut electrical cables as close to original splice connection as possible.

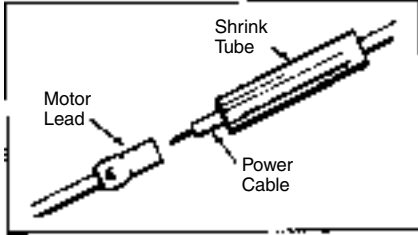
4) While new cable is preferred (because it will remain submerged for a number of years), you may wish to reuse the old cable. Wipe off and clean the insulation, examining carefully for cuts, cracks and abrasions. If in doubt, purchase new cable.

5) If new cable is necessary, measure length of old cable (from pump motor to electrical control box) and purchase sufficient replacement lengths. (See wire-size and cable-length selection charts in sections C2 and C3.)

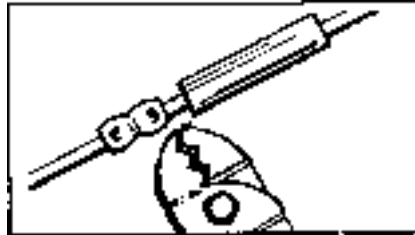
C Electrical Preparation

1. Splicing power cables to pump

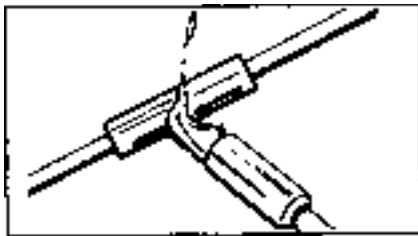
After making sure your power cables are the proper AWG size and specified length, splice them to the pump cables (see illustrations):



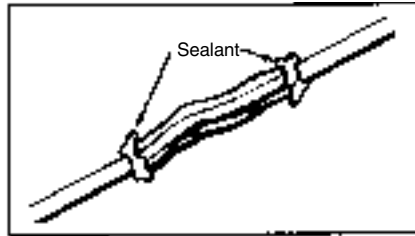
a Slip shrink tube over end of each power cable.



b Match pump cables to power cables and crimp connectors on each pair.



c Slide shrink tubes over center of crimped connectors and apply heat (from propane torch) from center to both ends of shrink tubes.



d Splice is complete when sealant flows from ends of shrink tubes.

NOTE: Splice kits are not included with pumps.

WARNING! Splice and wires should be checked for nicks and insulation breakdown prior to installation.

To isolate ground leakage in splice and cable, refer to Figure 3 and proceed as follows:

1. Set selector switch on the highest scale (RX 100K) and follow general instructions for ohmmeter tests.

2. Immerse motor, pigtail, splice and cable in tank of water with leads out of water. If cable *only* is being tested, be sure to have both ends of the cable out of water and the ends connected as shown in Figure 3.

3. Slowly remove cable from water starting with the end which is connected to the ohmmeter. Observe the needle, and when it falls back to left toward infinity or no reading, the damage will be at the point where the cable, splice or pigtail is just above the water.

4. Repair damaged cable, splice or pigtail.

5. If the motor is grounded, it must be replaced.

WARNING! After the pump is installed in the well insulation test and motor continuity test should be run.

D Motor/Cable Information

Two-Wire, Single Phase Specifications

HP	Volts	Max. Amps	Line-to-Line Resistance	Lock Rotor Amps	Dual Element Fuse Size
1/3	115	9.2	1.4 - 1.8	48.4	10
1/3	230	4.6	6.0 - 7.4	24.2	5
1/2	115	12.0	1.0 - 1.3	64.8	15
1/2	230	6.0	4.2 - 5.2	32.4	7
3/4	230	8.4	3.0 - 3.6	40.7	9
1	230	9.8	2.2 - 2.7	48.7	12
1½	230	13.1	1.5 - 1.9	56.8	15

Three-Wire, Single Phase Specifications

HP	Volts	Max. Amps	Line-to-Line Resistance	Lock Rotor Amps	Dual Element Fuse Size
1/3	115	Y- 9.2 B- 9.2 R- 0	(M) 1.4 - 1.8 (S) 5.7 - 7.1	34.8	10
1/3	230	Y- 4.6 B- 4.6 R- 0	(M) 6.5 - 7.9 (S) 26.1 - 31.9	17.2	5
1/2	115	Y- 12.0 B- 12.0 R- 0	(M) 1.0 - 1.3 (S) 4.1 - 5.1	50.5	15
1/2	230	Y- 6.0 B- 6.0 R- 0	(M) 4.2 - 5.2 (S) 16.7 - 20.5	23.0	7
3/4	230	Y- 8.2 B- 8.2 R- 0	(M) 3.0 - 3.6 (S) 11.0 - 13.4	34.2	10

HP	Volts	Max. Amps	Line-to-Line Resistance	Lock Rotor Amps	Dual Element Fuse Size
1	230	Y- 9.8 B- 9.8 R- 0	(M) 2.2 - 2.8 (S) 9.5 - 11.7	41.8	12
1½	230	Y- 11.5 B- 11.0 R- 1.3	(M) 1.5 - 2.3 (S) 6.2 - 12.0	52.8	15
2	230	Y- 13.2 B- 11.9 R- 2.6	(M) 1.6 - 2.3 (S) 5.2 - 7.2	51.0	15
3	230	Y- 17.0 B- 14.5 R- 4.5	(M) 0.9 - 1.5 (S) 3.0 - 4.9	71.0	20
5	230	Y- 27.5 B- 23.2 R- 7.8	(M) 0.7 - 1.0 (S) 2.1 - 2.8	118.0	30

(M) Main winding resistance: Yellow-Black
(S) Start winding resistance: Yellow-Red

115/230 Volt, 1 Phase Cable Selection (Copper Wire Size)

AWG

Volts	HP	14	12	10	8	6	4	2	0	00	000
115	1/3	130	210	340	540	840	1300				
	1/2	100	160	250	390	620	960	1460			
230	1/3	550	880	1390							
	1/2	400	650	1020							
	3/4	300	480	760	1200						
	1	250	400	630	990	1540					
	1½	190	310	480	770	1200					
	2	150	250	390	620	970	1530				
	3	120	190	300	470	750	1190	1850			
	5	0	110	180	280	450	710	1110	1740	2170	
	7½	0	0	120	200	310	490	750	1140	1410	1720
	10	0	0	0	160	250	390	600	930	1160	1430
15	0	0	0	0	170	270	430	660	820	1020	

Four Inch Three Phase Specifications

HP	Volts	Max. Amps	Line-to-Line Resistance	Lock Rotor Amps	Dual Element Fuse Size
1½	230	6.3	3.2 - 4.1	34	8
1½	460	3.1	11.3 - 15.0	17	4
2	230	8.1	2.4 - 3.0	46	10
2	460	4.1	9.7 - 12.0	23	5
3	230	10.9	1.8 - 2.2	61	15
3	460	5.5	7.0 - 8.7	31	7
5	230	17.8	.9 - 1.2	104	20
5	460	8.9	3.6 - 4.4	52	10
7½	230	26.4	.6 - .8	164	30
7½	460	13.2	2.4 - 3.4	82	15
10	460	18.8	1.8 - 2.3	116.0	20

Three Phase Overload Selection - 230V

HP	Volts	NEMA Starter	Furnas Innova 45	Allen Bradley	G.E.
1½	230	00	K41	J22	L750A
2	230	0	K49	J25	L910A
3	230	0	K52	J28	L122B
5	230	1	K61	J32	L199B
7½	230	1	K67	J36	L293B
10	230	2	K70	J38	L390B

Three Phase Overload Selection - 460V

HP	Volts	NEMA Starter	Furnas Innova 45	Allen Bradley	G.E.
1½	460	00	K29	J15	L380A
2	460	00	K33	J18	L463A
3	460	0	K37	J20	L618A
5	460	0	K49	J25	L100B
7½	460	1	K55	J29	L147B
10	460	1	K61	J32	L181B

230 Volt, 3 Phase, 3-Wire Cable Selection (Copper Wire Size)

AWG

HP	14	12	10	8	6	4	2	0	00	000	0000
1½	420	670	1070	1670	2610						
2	320	510	810	1280	2010	3130					
3	240	390	620	990	1540	2400	3660				
5	140	230	370	590	920	1430	2190				
7½	0	160	260	420	650	1020	1560	2340			
10	0	0	190	310	490	760	1170	1760	2160		

460 Volt, 3 Phase, 3-Wire Cable Selection (Copper Wire Size)

AWG

HP	14	12	10	8	6	4	2
1½	1700	2710					
2	1300	2070					
3	1000	1600	2520				
5	590	950	1500	2360			
7½	420	680	1070	1690	2640		
10	310	500	790	1250	1960	3050	

E Installation of Pump in Well

1. Attach the safety hook to the pump

Connect the safety hook to the pump using pliers to squeeze the sides of the hook so it fits into the slot in the pump.

2. Attach the pump to the pipe

A back-up wrench should be used when riser pipe is attached to the pump. The pump should only be gripped by the flats on the top of the discharge chamber. Under no circumstances grip the body of the pump, cable guard or motor.

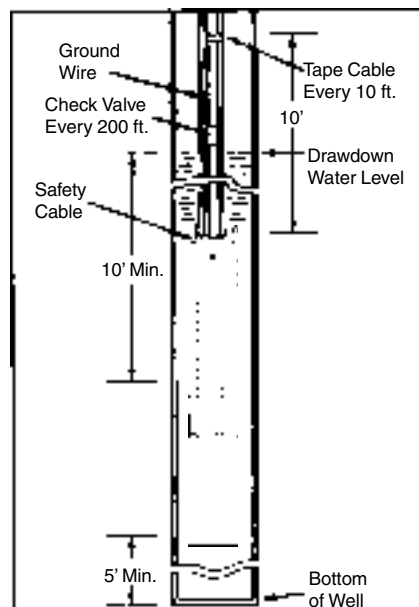
When tightened down, the threaded end of the first section of the riser pipe or the nipple must not come in contact with the check valve retainer in the discharge chamber of the pump.

3. Before lowering pump

a) Smooth out any rough spots or sharp edges on the top lip of the well casing with a hammer or metal file to prevent damage to the pump or power cables when lowering into well.

b) As you add additional sections of galvanized iron pipe or rigid plastic PVC pipe, apply pipe compound only to the male threaded ends of each section and tighten to next section.

c) Tape the power cables and safety lifting cable to the pipe, straight up from bottom to top. Do NOT spiral cable around the pipe. Use waterproof tape or nylon lock bands every 20 feet on galvanized iron pipe. Do not allow any excess cable between bands; cable must be as flat against pipe as possible.



4. Lowering the pump

a) Align pump carefully when beginning to lower it down the well casing. Do not let the pump, cables or pipe rub against the well casing.

Take care that cable insulation is not dragged or scraped over the top lip of the well casing.

b) Depth of pump setting. Lower pump into well slowly without forcing. Use foot clamp to hold galvanized iron or plastic PVC pipe while connecting the next length of pipe and taping the power cables.

(On deep settings, we recommend that a check valve be installed in the pipe 200 ft. above the pump and every 200 ft. thereafter to prevent water shock from traveling back to pump.)

Lower pump to at least 10 ft. below the maximum drawdown of the water level, if possible, and never closer than 5 ft. from the bottom of the well.

c) Pipe fitting to support pump. When a well seal is used, either a coupling, elbow or tee is installed on the top end of the last vertical length of pipe and is allowed to rest on the outside of the well seal to support the pipe, power cables, safety cable and pump. Most well seals provide a fitting to seal the power cables; but if no such fitting is provided, conduit must be used to protect cables and to prevent water and any foreign matter from leaking into well around cable.

d) Frost-proof pitless installation. In installation where the pipe from the well seal to the water tank is subject to frost or freezing conditions, a pitless installation is recommended.

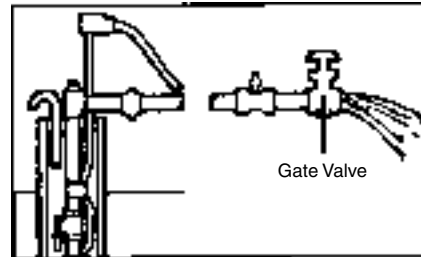
F Above-Ground Pipe & Tank Connections

1. Check pump before connecting piping to tank

With all electrical connections complete and pump now lowered to desired depth, install a gate valve in the discharge pipe near well for preliminary test run (see diagram). Turn on power. Gradually open gate valve and let pump run until water is clear of sand and other impurities.

Fully open gate valve. If pump lowers water in the well to a point at which the pump loses its prime, either:

- a) Lower pump further down well (if possible); or
- b) "Throttle" the pump to the capacity of the well by using a flow valve (see Section F).

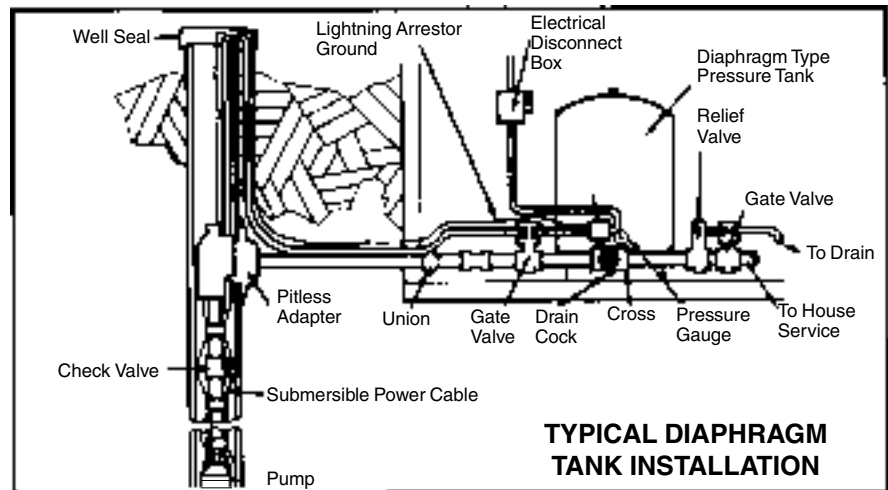


2. Connecting diaphragm tank system

- a) Connect all piping as shown in diagram.
- b) Precharge tank to specified pressure (see instructions furnished with tank). If the system is to be set to operate at 30/50 pressure settings, the tank should be precharged to 28 psi (or 18 psi if system pressure is to be 20/40). Tank precharge pressure should always be 2 psi below the "cut-in" of the pressure switch with no water in the tank.

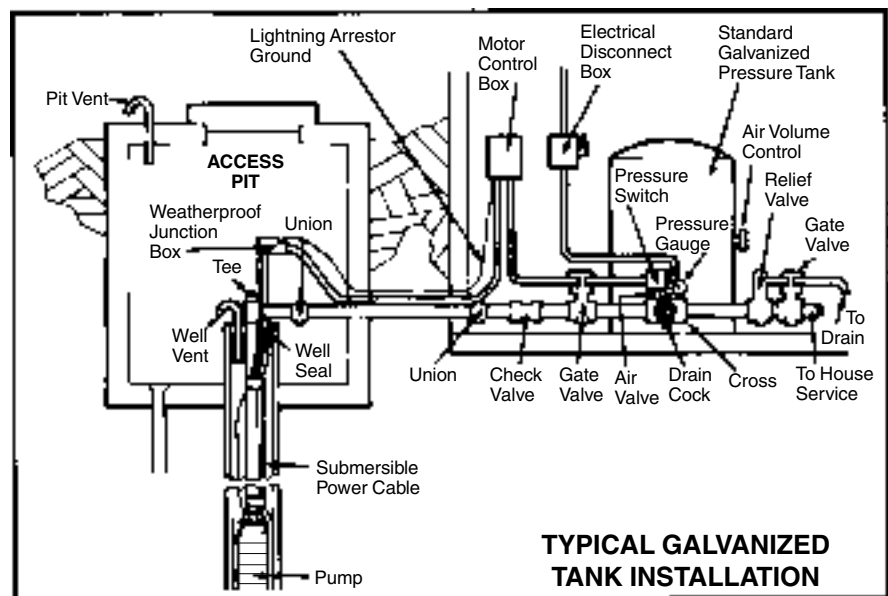
c) Start pump. Pressure in tank will build up to cut-off pressure of pressure switch setting.

d) The system should now operate automatically.



3. Connecting standard galvanized tank system

- a) Connect all piping as shown in diagram.
- b) Start pump. Pressure in tank will build up to cut-off pressure of switch setting.
- c) The system should now operate automatically.



G Connecting Bleed-back Valve System

a) Install the bleeder orifice 5 ft. or more below snifter valve. Check and snifter valves can be installed inside the well casing under the well seal or outside the casing just ahead of the pressure tank. Refer to installation diagram and the table at left for recommended distances on various tank sizes.

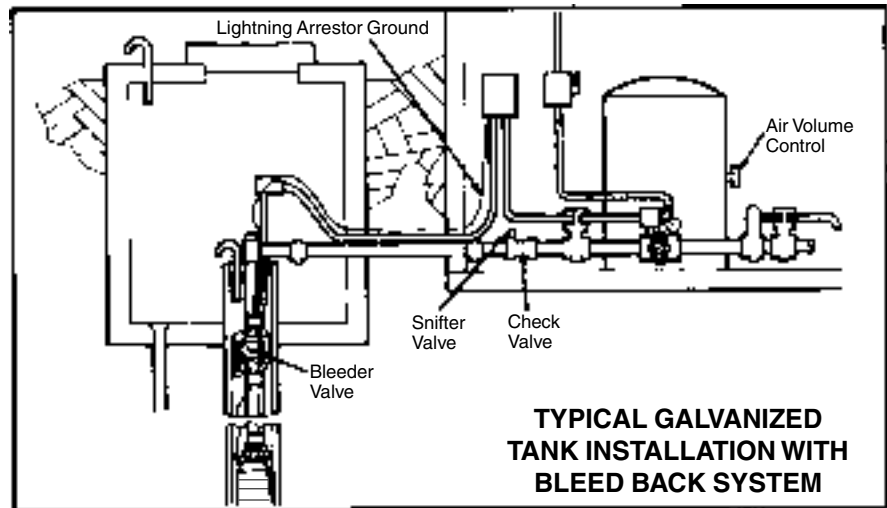
Distance From bleeder to snifter valve	Tank size
5 ft.	42 gallons
7 ft.	82 gallons
9 ft.	120 gallons
12 ft.	220 gallons
15 ft.	315 gallons

b) Connect all piping as shown in diagram.

c) Start pump. Pressure in tank will build up to cut-off pressure of switch setting.

d) After pump has cut-out, open faucet and drain tank pressure to cut-in point of pressure switch.

e) Run the automatic cycle several times and check the air charging cycle. Each time the pump



stops, the surface check valve closes and water starts to drain back through the bleeder valve. This causes a vacuum in the discharge pipe and air is drawn in through the snifter valve installed in the check valve. Water will drain down to the bleeder valve, filling the pipe between the check valve and bleeder valve with air. When the pump restarts, this air will be forced

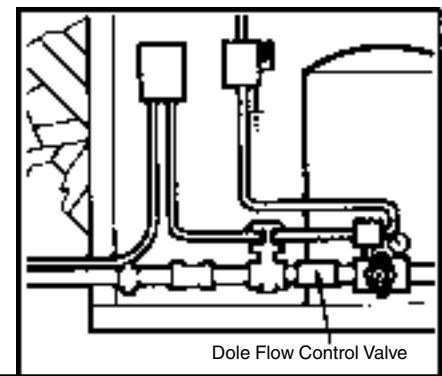
ahead of the water into the pressure tank. This method always supplies excess air which is vented off by the automatic air volume control.

f) To check proper operation, a vacuum should be felt at the snifter valve when pump stops. (See illustration for position of bleeder valve, check valve and snifter valve.)

H Controlling Weak Wells

The flow valve method is the simplest way to prevent drawdown to pump inlet. The capacity of the pump discharge is throttled to equal the well yield. A Dole® Flow Valve delivers a constant capacity regardless of pump discharge pressure. The flow valve is installed in the discharge line between the pump and the pressure tank. The usual way to determine what size of flow

valve to use is to throttle the discharge gate valve to a capacity that the well will yield without drawing down to pump inlet. After pump has operated at this capacity for a sufficient time to be sure it is suitable, measure the flow in gallons-per-minute and select a flow valve size nearest to this capacity. Install the flow valve and recheck to be sure operation is satisfactory.



I Trouble-Shooting

The vast majority of service calls on waterwell systems are caused by either waterlogged tanks or by problems which are electrical in nature.

The submersible pump and waterwell system should be checked periodically for quality of water, drawdown, pressure, GPM,

cycling periods (how often the pump starts and how long it runs) and proper operation of all automatic controls.

Never operate the pump for long periods of time with the discharge valve closed. This could cause overheating resulting in damage to the pump and its motor. A properly-

sized relief valve should be installed before the tank to prevent the pump from operating with the discharge valve closed.

Familiarize yourself with potential problems and trouble-shooting solutions.

PROBLEM	PROBABLE CAUSE	SOLUTION
Pump won't run	Blown fuse, broken (or loose) electrical connections.	Check fuses, capacitor, relays and all electrical connections.
	Pressure switch not closing	Adjust or replace.
	Motor overload protection contacts open.	Contacts will close automatically within short time.
	Incorrect control box.	Check and replace if necessary.
	Improper wiring connections.	Check wiring diagram.
	Low voltage.	Check voltage at control box.
	Pump stuck or clogged with foreign matter.	Pull pump and examine.
Pump runs, but no water pumped	Check valve installed backwards.	Reverse and reinstall.
	Setting too deep for rating of pump.	Check rating table.
	Pump not submerged; not deep enough in well.	Lower pump if possible. Check recovery of well.
	Pump in mud, impeller plugged or intake strainer clogged.	Pull pump and clean. Check well depth. Raise pump if necessary.
Reduced capacity	Strainer or impellers partially clogged or plugged.	Pull pump and clean.
	Corroded discharge pipe.	Replace pipe.
	Excessive pump wear.	Pull pump and replace worn parts; or replace pump.
Pressure switch won't cut out	Pressure switch not set correctly.	Revise settings: 20-lb cut-in, 40-lb. cut-out; or 30/50 (depending on tank size).
	Water level too low in well for rating of pump.	Check pump setting.
	Switch opening clogged.	Clean out openings or, if necessary, replace switch.
	Excessive wear on parts.	Replace worn parts.
Pump starts too often runs too long	Waterlogged tank (loss of air pressure).	Check tanks for leaks. Recharge with air pressure to proper level. Check air volume control.
	Check valve leaks.	Replace or repair.
	Pressure switch out of adjustment.	Adjust to proper setting and check to assure setting remains. If not, replace pressure switch.
	Leaks in pipe.	Check above-ground piping for leaks. If none, pull pump and check all pipe connections and connection of pipe to pump.

For your reference

Fill in the following information and keep this Installation & Operation Guide among your important papers. Information about your submersible pump will be found on the owner's information-plate. Whenever necessary to contact your dealer or installer, give him this information

Motor Model No. _____ Pump Model No. _____
 HP _____ Phase _____ Volts _____ Cycles _____
 Amps: L1 _____ L2 _____ Date of installation _____
 Well depth _____ ft. Pump depth _____ ft.
 Name of dealer/installer from whom pump was bought _____
 _____ Date purchased _____

LIMITED WARRANTY WATER SYSTEMS

During the time periods and subject to the conditions hereinafter set forth, **Manufacturer** will repair or replace to the original user or consumer any portion of your new **product which proves defective due to defective materials or workmanship of MANUFACTURER**. Contact your nearest Authorized Dealer for warranty service. At all times **MANUFACTURER** shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to lightning or conditions beyond the control of **MANUFACTURER** is NOT COVERED BY THIS WARRANTY.

WARRANTY PERIOD

Pumps & Galvanized Tanks: 12 months from date of purchase or 18 months from date of manufacture.

Diaphragm Tanks: 5 years from date of purchase.

Labor, etc. Costs: **MANUFACTURER** shall IN NO EVENT be responsible or liable for the cost of field labor or other charges incurred by any customer in removing and/or reaffixing any product, part or component thereof.

THIS WARRANTY WILL NOT APPLY: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and the parts used in connection with such service; (d) to units which are not installed in accordance with applicable local codes, ordinances and good trade practices; or (e) unit is used for purposes other than for what it was designed and manufactured, and (f) if three phase submersible motors are installed on a single phase power supply using a phase converter or if three phase power is supplied by only two transformers, making an open Delta system.

RETURN OR REPLACED COMPONENTS: Any item to be replaced under this Warranty must be returned to **MANUFACTURER** in Ashland, Ohio, or such other place as **MANUFACTURER** may designate, freight prepaid.

PRODUCT IMPROVEMENTS: **MANUFACTURER** reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such a change or improvement.

WARRANTY EXCLUSIONS: **MANUFACTURER** SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AFTER THE TERMINATION OF THE WARRANTY PERIOD SET FORTH HEREIN.

Some states do not permit some or all of the above warranty limitations and, therefore, such limitations may not apply to you. No warranties or representations at any time made by any representatives of Manufacturer shall vary or expand the provision hereof.

LIABILITY LIMITATION: IN NO EVENT SHALL MANUFACTURER BE LIABLE OR RESPONSIBLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES RESULTING FROM OR RELATED IN ANY MANNER TO ANY MANUFACTURERS PRODUCT OR PARTS THEREOF. PERSONAL INJURY AND/OR PROPERTY DAMAGE MAY RESULT FROM IMPROPER INSTALLATION. **MANUFACTURER** DISCLAIMS ALL LIABILITY, INCLUDING LIABILITY UNDER THIS WARRANTY, FOR IMPROPER INSTALLATION -- **MANUFACTURER** RECOMMENDS FOLLOWING THE INSTRUCTIONS IN THE INSTALLATION MANUAL. WHEN IN DOUBT, CONSULT A PROFESSIONAL.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

In the absence of suitable proof of this purchase date, the effective date of this warranty will be based upon the date of manufacture.

DETERMINATION OF UNIT DATE OF MANUFACTURE: Examples are; *Submersible* -- 7-29-99, Month - Day - Year on Motor nameplate and pump nameplate; *Sump, Centrifugal & Ejecto Pumps* -- 8-99, Month - Year stamped on pump nameplate; **MANUFACTURER Diaphragm Tanks** -- A95188581, 1st letter month A = 85 -- tanks are postdated by 3 months on label; *Galvanized* -- 3-0921 Year - Month - Day 1995-9-21 stamped on edge of head.