SENTRY I

Dry Pellet Chlorinator
Protecting Your Water 24 Hours a Day
Every Day of the Year

Fact: Everyone WANTS to believe that their water is great.
Unfortunately, ground water problems are becoming a nightmare because we just don't know what is underground. Remember, water is the universal solvent. Water can dissolve much of what it comes in contact with.

Fact: If you have a private well, YOU are the President of your own utility company.
If you are the President, who do you think is responsible for providing quality water to your home, farm or business?

Fact: problem water situations such as iron, algae, rotten egg smell, and bacteria exist in the well - not in the home.
How have you treated these problems in your home? Sentry I will solve these where they originate ... in the well. Furthermore, is your well safe? When was the last time it was tested? Can you afford to wait until tomorrow?

Fiction:
Your water problems "might just go away".

Even More Fiction:
Someone else will solve these problems for you. For years we have been attempting to treat water problems at the wrong place. We should be treating them where they exist - at the well.

BETTER WATER INDUSTRIES, INC.
PROTECTING YOUR WATER

Better Water Industries, Inc.

"We take pride in protecting your water"

INSTALLATION INSTRUCTIONS FOR THE SENTRY I CHLORINATOR

Better Water Industries, Inc., recommends that you have the proper tools handy that are necessary to install the SENTRY I. These tools are:

Flashlight	Mirror	9/16" Wrench	Rubber Hammer
10' 3/4" CPVC	Tape Measure	Hacksaw	Screwdriver
1 3/8" Hole Saw	Channel Locks	Pliers	2 Wire Nuts
5/16" Nut Driver	1/2" Wrence	1/2" Drill	7/8" Hole Saw
Electrical Tape	Wire & Vent Kit	Hose Clamp	

Before installing your SENTRY I, Better Water Industries, Inc. recommends that you work closely with your state agency as approval may be necessary.

PREPARING THE WELL

The following should be used when either preparing the well for installation or preparing the well in the event that the SENTRY I hasn't been in use for an extended period of time (over 30 days).

When you remove the sanitary seal well cap use a mirror or flashlight and see what kind of pitless adapter there is in the well. Slide the tapered end drop tube past the pitless adapter before dropping pellets. (See note below regarding tapered end drop tubes). Be careful so the drop tube doesn't accidently slip and fall down the well.

Drop 15-25 chlorine pellets down the 10' 3/4" CPVC drop tube to help satisfty the initial chlorine demands of the well. When dropping pellets you will hear a "plunk" sound as the pellets hit the water in the well.

MAKE SURE YOU HEAR THIS SOUND

It insures there is a clear passage to the water.

Note: Predrilled, tapered-end drop tubes are used to promote moisture release, prevent pellet clogging, help with the installation past the pitless adapter and venting of the well as the well "breathes".

Taper the drop tubes by using a hacksaw and cutting one end of the tube in a "V" shape about 1-1/2" long. Next, drill 1/4" holes in the bottom 2/3rds of the tube approximately 4" apart making sure there are no plastic shavings on the inside which might stop the pellet from dropping through. Drill all the way THROUGH the tubes so each drilling motion creates two holes. A minimum of 40 holes is necessary.

Most dealers inventory pre-drilled and pre-cut tubes to save installation time.

Pre-drilled Drop Tubes

DRILLING THE CAP

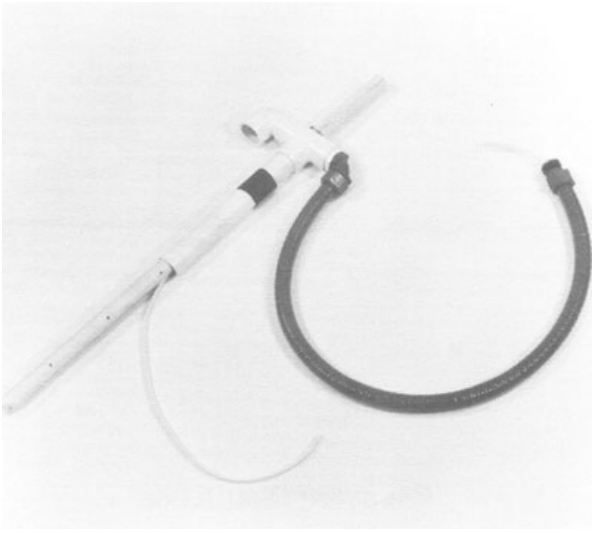
There are two ways to do this. You can either drill three holes (one for the drop tube, one for the electrical connection, and one for the vent) or drill one hole and use BWI's Wire and Vent Kit.

BWI recommends using the Wire and Vent Kit and drilling a single hole. We recommend this because it is important to have adequiate venting with each installation. This speeds up the installation time and gives the installation a professional look.

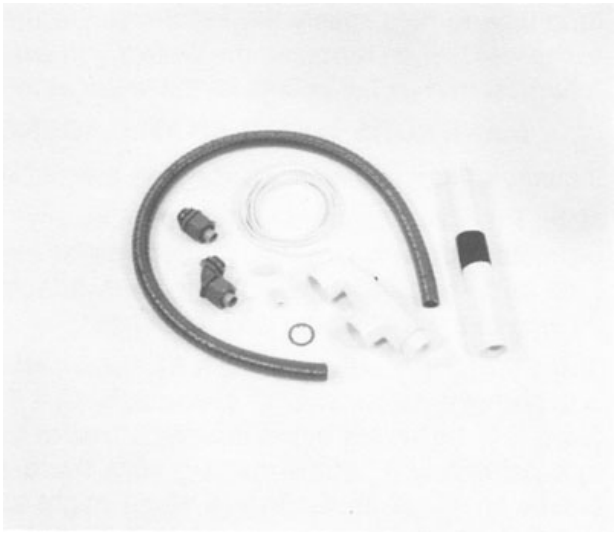
Remove the well cap when drilling and place it on the ground and drill straight down into the cap with a 1-3/8" hole saw. This hole should line up with the hole in the pitless adapter so that the chlorine tablets will have a straight drop to the water in the well.

Drill straight down, slightly off the middle of the cap. You will get a "feel" as to where to drill the hole as you install more SENTRY I's. Make sure that the hole is drilled straight and not at an angle -- as this will help with the alignment of the Wire and Vent Kit and Drop Tube.

For your first few installations, you may want to line up the hole by attaching the bracket before you start to drill. Install the SENTRY I from the well casing up to the Sentry I system. After a few installations you will know by the sight as to where the single hole should be drilled.



Wire and Venting Kit used with droptube

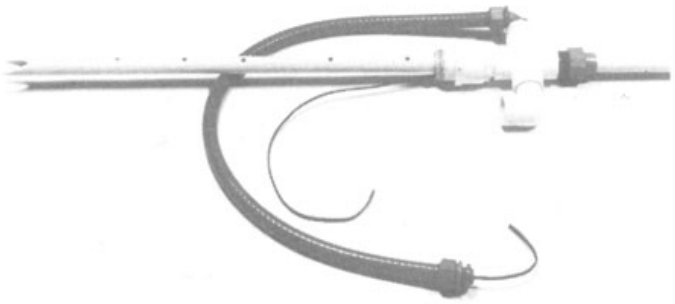


BWI's Wire and Venting Kit

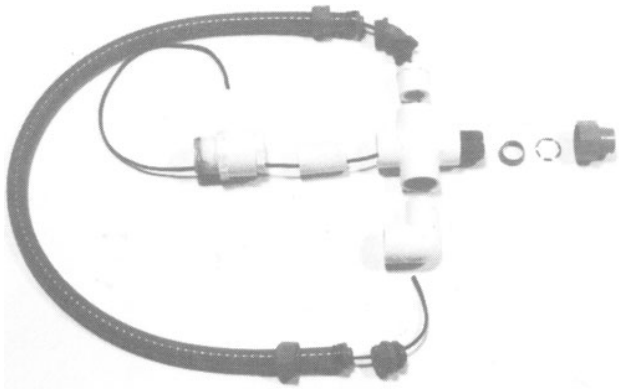
When installing the SENTRY I with the pre-drilled, vermin-proof, water-tight cap with the 1-1/4" threaded hole, use the SENTRY I Wire and Vent Kit.

We recommend this because it is important to have adequate venting with each installation. A minimum additional vent surface area of .75 square inches is provided with the SENTRY I Wire and Venting Kit itself. This must be used in the installation.

In all cases the well cap being used must be an approved sanitary seal or an approved vermin-proof, water-tight cap. BWI has worked with several states getting the Baker cap approved. In many applications this Baker cap is necessary and can be ordered from BWI.



Wire and Venting Kit used with droptube



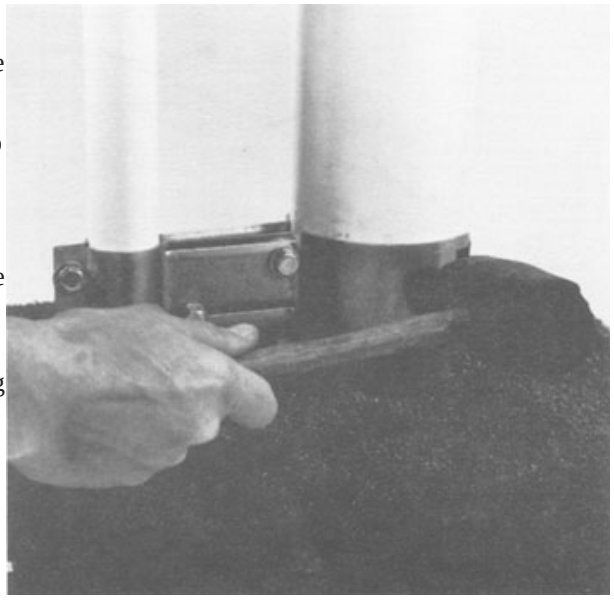
BWI's Wire and Venting Kit

ATTACHING THE BRACKET

Place the two casing adapters around the well casing. You will notice that the casing adapters
are sized to fit perfectly around a 4" well casing. For larger size casings use your rubber hammer to "shape" the casing adapter to the arc of that particular well casing.

Included with the SENTRY I are two 18" pieces of 2000# tensil strength strapping. Measure the
strapping between the eyelets of the casing adapter once you have fitted the casing adapter around the well casing. Add 2 inches to the length between the eyelets and cut off the excess strapping. Bend the strapping with a pliers one inch from each end of the strapping. Place the strapping in each eyelet with the 1" bend facing the well casing (on the inside) and tighten snug the bolts on the casing adapter.

You will be able to put the standpipe in the casing adapter and be able to "swing" the entire adapter assembly around the well if necessary. (It is important to line up the drop tube straight down through the well casing as it extends from the bottom plate. Final tightening shouldn't be done until the bottom plate is attached).



Use a Rubber Hammer to "Shape" the Casing Adapter to the arc of the well casing.

LINING UP THE DROP TUBE

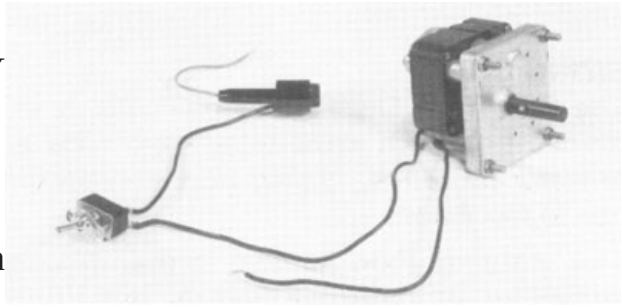
Place the SENTRY I bottom plate ont he standpipe and turn the bracket so that the drop tube extends through the hole in the "T" of BWI's Wire and Vent Kit into the hole on the underside of the bottom plate. It is important to have a straight drop into the well.

Make sure the SENTRY I bottom plate is pushed all the way on the standpipe. Once it is on the standpipe, tighten the hose clamp over the fitting that covers the standpipe with a 5/16" nut driver.

Bolt the 3" bolts into the casing adapter on the inside--tightening the casing adapter around the well casing. Snug the bolts up good and tight. You should NOT be able to move the casing adapter at this point.

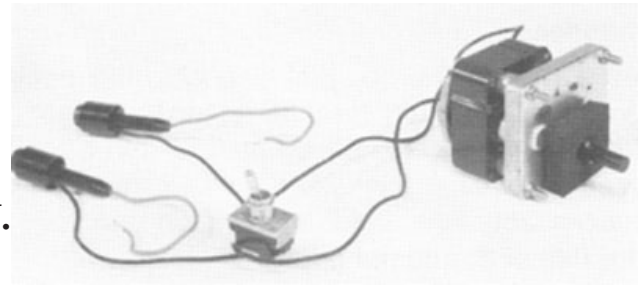
Better Water Industries, Inc., recommends that a LICENSED ELECTRICIAN make the electrical connections. The SENTRY I is available in both 110V and 220V to match the voltage of the pump.

When arriving at the job site make sure that you have the right voltage SENTRY I with you. Motors are interchangeable between the 110V and 220V and can be ordered separately from BWI.



SENTRY I 110 volt Motor and Fuse

In most instances, a SENTRY I system can be installed in less than an hour....providing you have the proper tools.



SENTRY I 220 volt Motor and Fuse

IMPORTANT

MAKE SURE THE ELECRICITY IS OFF TO THE PUMP BEFORE STARTING YOUR INSTALLATION.

THE ELECTRICAL CONNECTION

Remove the motor cover on the bottom of the bottom plate for access to the wires.

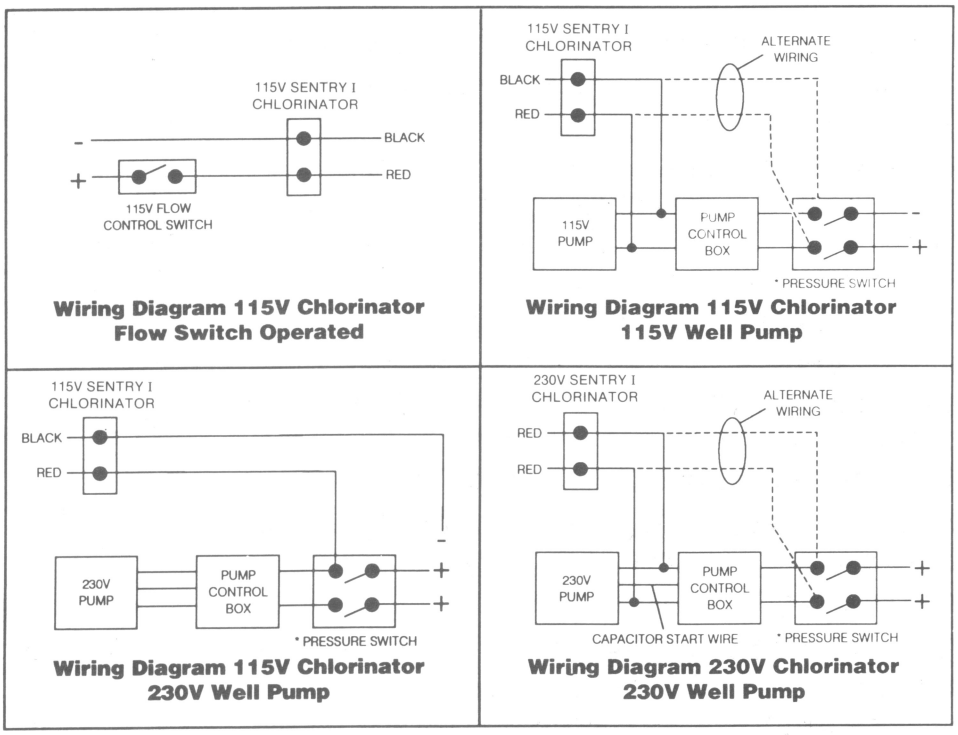
Connect the wires from the BWI Wire and Vent Kit to the wires on the motor with the wire nuts. Tug on them to make sure that it is a good connection.

Put the conduit fitting int he hole of the motor cover and tighten.

Pull the wires out of the well and tie in the wires from BWI's Wire and Vent Kit to the wires on the pump.

(Most generally you will find red, black, and yellow wires. Red is normally the starter wire that is tied into the capacitor. Usually you will use the black and yellow wires for a 220V application.)

Connect the well pump wires to the conduit wires on the SENTRY I. Again, make sure the connection is secure. Place the wires back in the well casing.Replace the well cap. Make sure the switch is in the "on" position and run water until the pumps runs. The motor gear should turn.Be sure the drop tube is securely inserted in the drop tue hole on the bottom plate. You may want to drop another chloring pellet to make sure the pellet is reaching the water.



SIZING CHART

The SENTRY I Dry Pellet Chlorinator is one of the most effective ways to handle a wide variety of water problems ranging from iron bacteria to iron to foul smells.

The major reason for this is that chlorine is known as an excellent oxidizer and dry pellet chlorination does this in a very inexpensive manner.

As a rule of thumb, just one chlorine pellet (1 gram) will normally treat 30 gallons of water. This "30 gallon figure" is based on "trial and error" field testing over a five year period and is by no means absolute. Each application can vary and the rule of thumb may not apply.

If you should find this true, you may need to adjust the amount of chlorine being dropped by selecting a different letter on the chart. For example, if you are using "C" and not getting enough residual free chlorine, we suggest that you go to sizing chart "D" or "E".

21 Second Pellet Drop -- 3:1 Ratio

Pump Rate -- Gallons Per Min.	Gallons per Tablet				
	10	20	30	40	50
3	F	C	B	B	A
5	G	D	C	C	B
7	I	F	E	D	C
8	I	G	F	D	C
9	J	G	F	E	D
10	J	G	F	E	D
12	J	H	G	F	E
15	K	I	G	G	F
20	K	J	H	G	G
25	L	K	I	H	G
35	L	K	J	I	I
50	L	L	K	J	J

When using the 3:1 gear rathio and ALL the plugs are removed, a pellet will drop every 21 seconds. (One entire revolution takes 21 minutes)

We advise that water should have 20 minutes of contact time with the chlorine. Test the water at that point for the amount of free chlorine residual. Ideally the residual should be between 1.5 ppm and 3.0 ppm. If you find the taste objectionable at higher levels, you may opt for an activated charcoal filter in addition to your SENTRY I.

Different constituents in water had different chlorine demands. The various constituents are listed below:

It takes .6 ppm of chlorine to oxidize 1 ppm of iron. It takes 1.2 ppm of chlorine to oxidize 1 ppm of manganese. it takes 3 ppm of chlorine to oxidize 1 ppm of sulphur and 3 ppm of chlorine to oxidize 1 ppm of iron bacteria or algae.

In a 6" well casing there are 1.4 gallons of water per every foot of pipe. So, if there is 200 feet of water in the casing, and the casing is 6" casing, you have 280 gallons of water to chlorinate.
As you can see, problem water problems can be solved easily and inexpensively by the SENTRY I and by using this rule of thumb.

By using this handy sizing chart and determing the pump rate, it is easy to accurately keep hte chlorine residual level constant.

7 Second Pellet Drop -- 1:1 Ratio

Pump Rate -- Gallons Per Min.	Gallons per Tablet				
	10	20	30	40	50
10	F	D	B	B	B
12	G	D	C	B	B
15	G	E	D	C	B
20	H	F	E	D	C
30	J	G	F	E	D
40	J	G	G	G	F
50	J	I	H	G	F
60	L	J	I	G	G
70	L	K	I	H	G
90	L	K	J	I	H
100	L	K	J	J	I
120	L	L	K	J	J

When using the 1:1 gear rathio and ALL the plugs are removed, a pellet will drop every7 seconds. (One entire revolution takes 7 minutes)

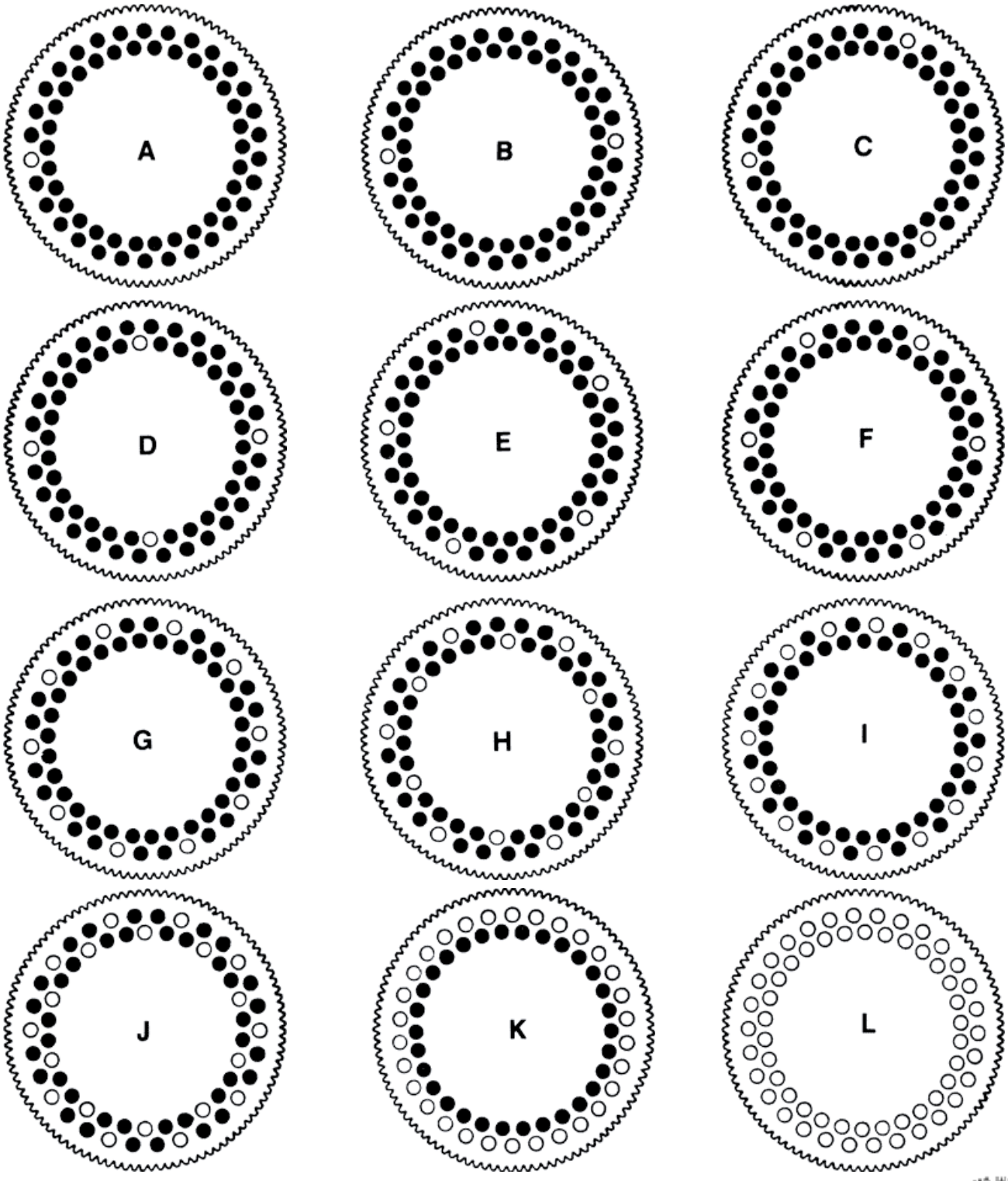
If the Sentry I Flow Meter is not being used, use the following formula to determine pump rate.

To determine pump rate:
1. Run water until pump starts.
2. Allow pump to run until it stops.
3. Measure water by gallon until pump starts again.
4. Time pump until it stops.

This is the formula for determining the amount of gallons the pump is producing that determines your pump rate:
_____ gallons ÷ _____ seconds x 60 = _____gpm
(in step 3) .....(in step 4)
Note: Pumping time must be measured in seconds-NOT minutes

Plugs removed:

A - 1
B - 2
C - 3
D - 4
E - 5
F - 6
G - 10
H - 12
I - 15
J - 20
K - 30
L - 60



INSTALLING THE IDLER GEAR

Determine if you want the idler gear in the 1:1 gear ratio or the 3:1 gear ratio and put it into place. Note that there is an overlap between the 1:1 chart and the 3:1 chart. Rarely will the 1:1 chart be necessary. **The only time the 1:1 ratio should be used** is when adequate chlorine level cannot be achieved using 3:1 ratio.

PLUGS REMOVED

The following shows the amount of plugs removed for each setting along with the time between pellet drops:

SETTING	PLUGS REMOVED	TIME IN-BETWEEN PELLET DROPS	
		1:1 GEAR RATIO	3:1 GEAR RATIO
A	1	7 minutes	21 minutes
B	2	3 min. 30 sec.	10 min. 30 sec.
C	3	2 min. 20 sec.	7 minutes
D	4	1 min. 45 sec.	5 min. 15 sec.
E	5	1 min. 24 sec.	4 min. 12 sec.
F	6	1 min. 10 sec.	3 min. 30 sec.
G	10	42 seconds	2 min. 6 sec.
H	12	35 seconds	1 min. 45 sec.
I	15	28 seconds	1 min. 24 sec.
J	20	21 seconds	1 min. 5 sec.
K	30	14 seconds	42 seconds
L	60	7 seconds	21 seconds

With the 3:1 gear ratio setting, the idler gear sits on top of the Bottom Plate.

The idler gear sits on the Middle Plate with 1:1 gear ratio setting.

CHLORINE DEMAND

Each chlorine pellet (1 gram) contains 700 mg of chlorine, which is enough chlorine to dose 180 gallons of water with 1 ppm of chlorine.

The SENTRY I is capable of dropping 8 tablets per minute or 5600 mg of chlorine per minute. Assuming that the "average" is 30 gallons of water per pellet, this means the SENTRY I could possibly treat 345,600 gallons of water per day. (30 gallons x 8 per minute x 60 minutes x 24 hours). Remember, this is ONLY at the 30 gallons per pellet figure.

To figure out how many gallons are treated for your specific application you need to know these specifics:
.6 ppm of chlorine is needed to treat 1 ppm of Iron
3.0 ppm of chlorine is needed to treat 1 ppm of Sulphur
1.2 ppm of chlorine is needed to treat 1 ppm of Manganese
1-3 ppm of chlorine is needed to treat 1 ppm of Alga Bacteria

Not all water corresponds to the 30 gallon/per/pellet figure. If your water happened to be the following:

4 ppm iron	- 4 x .6	= 2.4 ppm chlorine demand
2 ppm sulphur	- 2 x 3	= 6.0 ppm chlorine demand
3 ppm manganese	- 3 x 1.2	= 3.6 ppm chlorine demand
3 ppm iron bacteria or algae	- 3 x 2	= 6.0 ppm chlorine demand
1 ppm chlorine (for residual)		= 1.0 ppm chlorine demand
Total		=19.0 ppm chlorine demand

(Note: Chlorine demand & chlorine residual = chlorine dosage)

To determine the number of gallons that each tablet would treat do the following calculations: 180 ÷ chlorine dosage = gallons treated

In the above example - 180 ÷ 19.0 = 9.5 gallons/tablet

To determine the maximum flow rates (in gpm) and still be able to treat the water do the following calculations:
60 x gallons treated ÷ time in-between pellet drops (in seconds) = max flow rate (in gpm's)

Assuming a "1:1 gear ratio" with an "L" setting for the above example, the maximum flow rate would be:
60 x 9.5 ÷ 7 = 81 gpm

Assuming a "3:1 gear ratio" with an "A" setting, the maximum flow rate would be:
60 x 9.5 ÷ 1260 = 0.5

Turn on the electricity to the pump and turn the switch on the motor cover to "ON" and make sure the motor drive gear and idler gear move.

Snap the top plate onto the middle plate making sure the tabs are in place.
If you haven't put the 5 or 10 pound jar of chlorine in yet, turn the middle plate/top plate upside down and screw on the chlorine jar.

By putting your index fingers on the two tabs on the bottom of the middle plate and lining up the hole for the motor gear, place the assembly back on the bottom plate. Make sure the two fit together without "rocking".
Finally, put the cover over the entire assembly and tighten it by twisting it. (Note: The SENTRY I label should be on the same side as the drop tube)

Your SENTRY I is now ready for operation. Make sure that the switch is in the "ON" position.

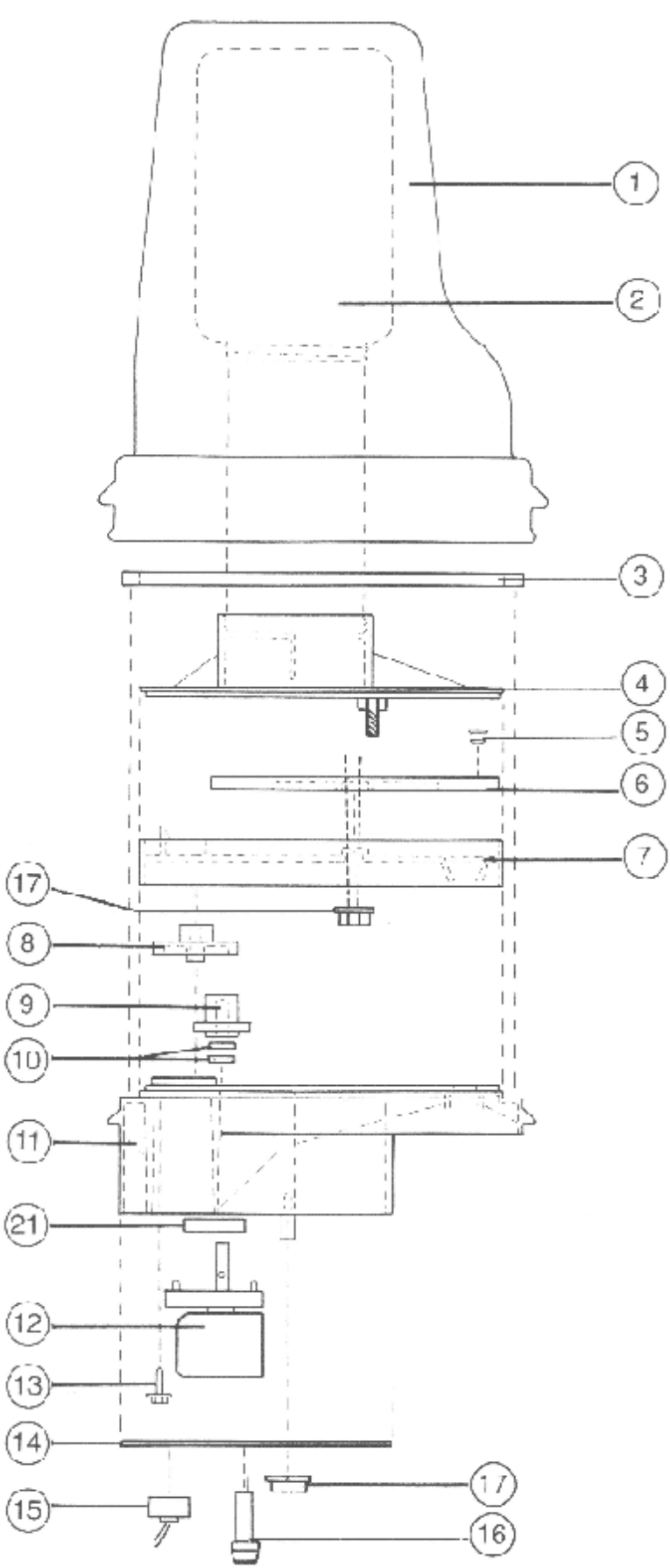
Before leaving the installation and turning on the SENTRY I, make sure the entire installation is watertight and vermin proof. If the installation does not meet this criteria, it will not be approved by some states.

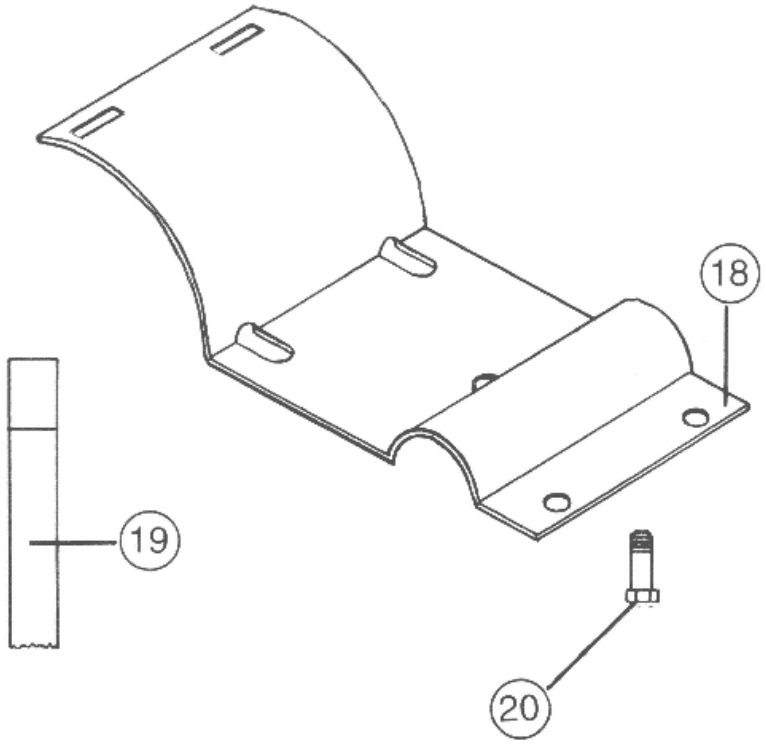
Chlorine
6 - 5 pound Jars
4 - 10 pound Jars
2 - 25 pound Jars
1 - 35 pound Jars
1- 100 pound Jars

Better Water Industries, Inc. recommends purchasing chlorine from your SENTRY I dealer. The chlorine is in the form of 70% Calcium Hypochlorite.

If your dealer cannot provide you with this product, please call BWI at 507-247-5929 for the location of another dealer. Chlorine is available in the above sizes.

THIS IS AN EXPLODED VIEW OF THE SENTRY I ALONG WITH THE PART NUMBERS OF THE UNIT.





NO.	QTY.	PART NO.	DESCRIPTION
1	1	S-124701	COVER
2	1	S-124702	PELLET JAR
3	1	S-124703	COVER SEAL
4	1	S-124704	TOP PLATE
5	60	S-124705	PELLET PLUG
6	1	S-124706	PELLET GEAR
7	1	S-124707	MIDDLE PLATE
8	1	S-124708	IDLER GEAR
9	1	S-124709	MOTOR GEAR
10	2	S-124710	MOTOR GEAR SEAL
11	1	S-124711	BOTTOM PLATE
12	1	S-124712	MOTOR
13	3	S-124713	MOTOR SCREWS
14	1	S-124714	MOTOR COVER
15	1	S-124715	SWITCH
16	1	S-124716	FUSE HOLDER
17	1	S-124717	PVC NUT & WASHER
18	2	S-124718	CASING ADAPTER
19	2	S-124719	CASING BAND
20	1	S-124720	BOLT PACK ASSBY.
21	1	S-124721	MOTOR SHAFT SEAL
22	1	S-124722	COVER LOCK