

DURO



*Red
Book*



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*A Catalog of
World Famous
Duro Products*

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DURO PRODUCTS ARE KNOWN THE WORLD OVER

The Duro Factory at Dayton, Ohio



The Home of Duro Products—World's largest makers, World's largest sellers; automatic electric pumps, automatic water systems, and automatic water softeners.

Offices in All Principal Cities

Duro maintains offices in all principal cities in the United States and Canada. More than two hundred Duro-trained Pump and Water Softener Engineers operate out of these cities.

More than twenty-two thousand local Duro Dealers sell the world-famous Duro Products. It may be truly stated that Duro Service is around almost every corner, or as near as your telephone.

Duro is a manufacturer—not an assembler. Duro makes its own switches, motors, pumps, tanks, water softeners; in fact, everything that goes into the makeup of these products. Duro's growth has been remarkable. Its products are tried and proved.

Duro manufactures a complete line of water systems and water softeners; a system to fit every condition exactly.

Dealers and Architects are urged to use Duro Advisory Service, a nationwide consultation engineering service for which there is neither charge nor obligation. Duro's vast production and sales make such a free service possible.

WORLD'S
LARGEST
MAKERS

The Duro Company
Dayton, Ohio

WORLD'S
LARGEST
SELLERS

Guide to the Selection of a Water System

Its Purpose—The following elementary information will be found useful in aiding you to select the right type of water system, as well as the pumping capacity and pressure tank sizes.

You should study this information carefully so that you can recommend the proper type and size best adapted to the particular requirements of the job.

We would suggest that you write for Duro Advisory Service Consultation Blanks, which is a form designed so that all of the necessary information can be filled in for your permanent record.

Shallow Well Pumps

A perfect vacuum at sea level will permit atmospheric pressure to sustain a column of water approximately 34 ft. in height.

Suction Pump Principle—Governed by this law, pump designers have developed an apparatus whereby the air in a cylinder is exhausted through the action of a piston rod fitted with pliable cup leathers.

This cylinder, directly connected with an air-tight pipe extending to and downward into a well or cistern, creates a vacuum. Atmospheric pressure operating on the surface then forces the water into and up through the pipe and into the pump cylinder. An arrangement of valves, and the piston in turn operate to force it out of the pump proper and into the compression tank and service lines. This is known as a suction or shallow well pump.

Average 22 Feet—Twenty-five feet at sea level is the maximum efficient depth below pump at which a suction pump will draw water satisfactorily. As elevation above sea level increases, this distance decreases. At 2,600 feet above sea level this is approximately 18 feet. At 5,000 feet, 16 feet. At 8,000 feet, 12 feet.

Location of Pump and Well—"DURO" Suction (Shallow Well) Pumps do not need to be placed immediately over

the well. In fact, they will draw water through a horizontal pipe 100 feet long and 22 feet vertically. Should the distance to the well be greater than 100 feet, the vertical lift should be lessened. For example, if the distance runs to 400 or 500 feet horizontally, the vertical suction lift should not exceed 10 to 12 feet unless pipe diameters are increased.

Location of Tank—In cistern and shallow well systems place tanks as close to the pump as possible to obtain best results. If it is necessary to place the tank at some distance from the pump, the discharge pipe must be as straight as possible and should be increased to the next size larger.

Forcing Water to Upper Floors—The water may be forced horizontally to almost any distance, but vertically water can be elevated in the house only one foot to each .43 of a pound theoretically. A practical method of calculating is to figure that each pound in pressure as shown on a pressure gauge, will elevate water vertically two feet including friction, i. e., 50 pounds pressure will elevate water 100 feet vertically.

Duro automatic switches are set to start the motor at 25 and stop at 40 pounds pressure, thus insuring a vertical elevation of water from pressure tank of from 50 to 80 feet ordinarily. Other pressure ranges can be had but this may necessitate changing of the motor.

Deep Well Pumps

Where water must be drawn from a depth greater than 22 feet, or in cases where the fall of the water in the well brings it beyond the shallow well pump range—a deep well pump must be used.

Where Installed—Unlike the shallow well suction pump, the deep well pump and head must be installed directly over the well.

In deep well pump construction the pump unit or cylinder is lowered into the water and connected to the power unit or head by means of a long piston rod, usually of wood. The power head or body therefore must be located directly over the well.

Frost-proof—As the location of a deep well is usually some distance away from the house foundation, provision must be made to protect the pump against freeze-ups, where climatic conditions warrant.

Absolutely Frost-proof—This is accomplished by means of a seepage-proof pump pit—or, by means of the Duro PATENTED Frost-Proof Set-Length (see illustration on page 42). The feature which insures against freezing is the fact that the air pump is also lowered below the frost line. This eliminates the old trouble with so-called "frost-proof" set lengths where the water backed up into the air tube and froze, or where condensation caused freezing. The Duro Set-length is strictly frost-proof. The regular length of the frost-proof set-length is four feet. However, it can be furnished any length desired.

Drop Pipe and Sucker Rod—Deep Well Systems specified on the following pages do not include sucker rod and drop

pipe. Since depths and diameters of wells vary greatly this cannot be included with any degree of uniformity. When desired we can furnish drop pipe and sucker rod in the sizes specified, prices of which will be found in the price sheet. When ready to leave the factory the pipe and sucker rod are cut to the proper lengths ready to screw together. Where an open type of cylinder is used the pipe is plugged and reamed so the plunger and rod in cylinder can be withdrawn without injury. Sucker rod is threaded as follows: $\frac{3}{8}$ " pipe standard; $1\frac{1}{8}$ " wood, with $\frac{5}{8}$ " by 12 thread; $1\frac{5}{8}$ " wood, $\frac{7}{8}$ " by 10 thread; $1\frac{7}{8}$ " wood, with 1" by 10 thread.

When To Use—If the vertical distance from the bottom of the pump to water level is more than 22 feet, a Deep Well Pump must be used.

The essential difference between a Deep Well Pump and a Shallow Well Pump is that the cylinder, or working barrel should be submerged under the water at all times, and the power head which furnishes the power for operating the pump, must be located directly over the deep well. The power head is connected with the cylinder by means of a sucker rod. When the system operates the water in the cylinder is forced upward to the surface through the drop pipe, and then into the pressure tank.

After the water is in the pressure tank, it is forced up through the house pipes and to the fixtures just exactly as in the case of a shallow well system—by the pressure of the air in the tank.

How To Compute Water Requirements

The following figures are given as a guide in computing the amount of water required for a given condition and in selecting the proper Duro pump or system to fit that condition. The maximum capacity of a system for an hour is the sum of the pump capacity in gallons per hour and one-fifth of the capacity of the tank.

For drinking and cooking.....	25 gal. per person per day
To fill ordinary lavatory.....	1½ gal.
To fill average bathtub.....	30 gal.
To flush water closet.....	4 to 6 gal.

For each shower bath.....	30 gal. per bath
Continuous flowing drinking fountains.....	50 gal. per hour
For sprinkling (½ in. hose).....	250 gal. per hour
(10 gal. will sprinkle 100 sq. ft., 20 gal. will soak 100 sq. ft.)	
Horses.....	8 gal. per head per day
Cattle.....	9 gal. per head per day
Hogs.....	2½ gal. per head per day
Sheep.....	1½ gal. per head per day

By dividing pump capacity into average daily usage, average daily pumping hours can be determined. Pump capacity should be greater than maximum usage during any one hour.

Specifying The System

The size pump and tank to be specified depends upon the average daily requirements; the maximum amount of water required during any one hour, and the storage desired.

Fresh Water System—For jobs where the maximum hourly requirements do not exceed 200 gallons per hour, and where no storage is required, the "Duro" No. 77 Fresh Water System is ideal, as every time a fixture is used the motor starts operating, and fresh water is pumped directly from the well.

Suburban—Most suburban homes require the "Duro" Vertitank of either 200, 250 or 400 gallons per hour. If a greater amount of storage is required, a No. 880, 250 or 400 system, with either 42, 80 or 120 gallon tank is generally used.

Farm—Farms usually require a Vertitank System, or a No. 400 system with an 80 or 120 gallon tank, or, for larger Dairy and Stock Farms a No. 500 System with a 220, 315 or 525 gallon tank.

Schools—Schools, large Country Homes and other institutions usually require a No. 500 System with 525 gallon or larger tanks.

Sprinkling—A ½-inch hose uses 250 gallons of water per hour. Therefore, whenever satisfactory fire protection and sprinkling are desired, never specify less than a 400 gallon per hour pump.

Computations—If a family uses an average of 500 gallons per day, a style No. 400 system will give 400 gallons per hour, plus one-fifth of the tank capacity—which is 16 gallons, when an 80 gallon tank is used.

This represents a total of 416 gallons of water during any one hour. On the basis of using 500 gallons a day, the pump would operate approximately an hour and thirteen minutes every twenty-four hours to supply the requirements.

Tank Capacities—"Duro" standard tank capacities range from 30 gallon to 1500 gallon and larger sizes.

Duro, however, has designed its tanks to operate with one-half air and one-half water, thereby increasing the quantity of water which can be discharged between pressures from a tank. This means that in some instances by using Duro equipment, a smaller tank can be specified, and still give the same tank discharge capacity as larger tanks that are arranged for one-third air and two-thirds water.

When in doubt about which of two sizes of tanks to specify always be safe and specify the larger size tank.

Deep Well Systems—The same rules as above apply to Deep Well Pumps, although the conditions in the well, in addition to the amount of water required daily, must be taken into consideration.

Duro Advisory Service—Duro maintains an Engineering Advisory Service, and will be happy to make recommendations upon receipt of the necessary facts concerning the proposed job. Duro Sales Engineers will also be happy to go over the proposed job on the ground, or to consult with dealers and architects.

Selecting The Deep Well System

The selection and specification of Deep Well Pumps and Systems depends absolutely upon the following conditions:

- 1—Inside diameter of well.
- 2—Total depth of well.
- 3—Normal depth of water.
- 4—Fall in water level when being pumped.
- 5—Flow of well in gallons per minute.
- 6—Highest point to which water must be elevated above pump.
- 7—Average daily water consumption.

The size of storage tank depends upon the amount of water requirements.

Consultation Service—Before specifying deep well pumps or systems, get the above information from the well driller or owner. Then unless you are thoroughly familiar with the

specifications of deep well pumps or systems, consult the Duro factory-trained deep well specialist. Simply write the nearest DURO office and a pump engineer will be glad to call and work with you—whether you specify "DURO" or not.

Installation Guaranteed—This is a part of our free consultation service which has proven so helpful to plumbers and sanitary engineers in the past. It gives you the definite assurance that the pump or system specified is absolutely correct, and we stand back of this to the limit. Over two hundred factory representatives throughout the United States and Canada insure a prompt personal response to your inquiry.

Capacities—"DURO" Deep Well Pumps are made in varying sizes with capacities from 100 to 2100 gallons of water per hour.

Types of Deep Well Cylinders

There are two types of deep well cylinders, the single-acting and the double-acting.

Single-Acting Cylinder—In the case of the single-acting cylinder, on the down stroke, water in the cylinder chamber is forced through the plunger valve into the drop pipe.

On the up stroke, the water discharged into the drop pipe is forced upward and at the same time, water is drawn into the cylinder chamber below the plunger.

In addition, the differential plunger in the base of the power head discharges water on the down stroke, evening the load on the motor, and giving a constant stream of water.

Double-Acting Cylinder—A double-acting cylinder is simply two single-acting cylinders built to operate together—the one inverted to operate on the down stroke.

The "DURO" double-acting cylinder has many advantages over the single-acting type, because it delivers twice the amount of water from the same size well. It permits the use of a smaller drop pipe. It makes a well balanced pump in operation. In addition, the cost is sometimes lower as a smaller well can be drilled and smaller casing used to produce the capacity of a larger drilled well. Also, the cost per gallon of water pumped is considerably less.

How To Use The Demonstration Section

The dawn of a new era has been reached in the plumbing business. Conditions have changed. Progress necessitates changing with them.

With such products as electric pumps, automatic water systems, automatic water softeners, as well as a few others, you cannot afford to depend upon the business that normally "just comes along." Creative sales work, merchandising—represents the big opportunity of the plumbing business today. Study and proper usage of the material in this catalog will effectively aid you in such a program.

Embodied in the section comprising pages

7 to 17 inclusive, will be found an entirely new feature in the form of selling help in a catalog. It is a "picture story" leading to the sale.

With this demonstrating album you or your salesman can call upon prospects, following up direct mail letters; and in a short space of time, convince them of their need for fresh running water under pressure. You can easily complete the first stage of the sale—that of dissatisfying the prospect with his present conditions. You can make an appointment for him to come to your salesroom to **SEE** the Duro Automatic Water System in *actual operation*.

Undivided Responsibility

Show the prospect the Written Guarantee on the opposite page. Tell him Duro makes nothing but water systems. That Duro is the World's Largest Maker—the World's Largest Seller. That means more people are deciding to buy DURO than systems of any other make. Duro's responsibility is **UNDIVIDED** because Duro makes all of its pumps, tanks, motors, switches—everything that goes into the making of a water system. Duro guarantees it all, and accepts full responsibility. They do not refer you to the motor manufacturer to try to settle motor trouble. Or to the tank manufacturer, and so on. And further, you can expect and you will **RECEIVE** longer life, better service and complete satisfaction from Duro products. Why? Because Duro *controls* the quality, **CONTROLS** the making of every piece or part that goes into the completed pump or system—Duro makes **ALL** of it. There is **NO DIVIDED RESPONSIBILITY**.

Then comes the "picture story." How the problem of water was the first concern of humans from the beginning of time. How folks for centuries slaved for their water. Then came pumping systems and municipal waterworks—a great blessing. But the water mains stopped at the edge of the city. Suburban, town and country folk had noth-

ing but antiquated hand pumps, oaken buckets and windmills. Then—along came DURO with an Automatic Electric Water System—a private water works for individual homes, banishing forever the drudgery, the slavery, the work and worry occasioned by the use of obsolete methods of getting water. Our great grandfathers used them, it's true—because they could get nothing better.

Then the contrasting views of Duro-equipped homes, and homes without Duro. Pointing out its small cost—that the average cost of supplying water with Duro is **LESS** than the average cost of city water service. That the prospect **CANNOT AFFORD** to be without DURO. That it settles the water supply problem once and for all.

When you sell Duro you have done the prospect a great favor—one for which he will thank you a thousand fold. There is **NO ONE OTHER SINGLE THING** that you could have sold him that will give him so much genuine satisfaction, dollar for dollar invested. Health, comfort, sanitation, fire-protection, release from drudgery, leisure time, convenience, happiness—why the benefits of Duro and all that it makes possible should be enjoyed by everyone. Go out and sell them. Show them the "picture story" page by page.

Guarantee No.

Guarantee Certificate

The Duro Company

DAYTON, OHIO

U. S. A.

This Certifies that

of
St. and No., or R. F. D. Town

.....
County State

has purchased "DURO" WATER SYSTEM, Serial No.

In consideration whereof, we hereby guarantee this equipment free from defects in workmanship, material or design and for a period of one year, any part or machine proving defective within that period will be replaced without charge F. O. B., Dayton, Ohio; misuse, accidents and freeze-ups excepted.

The Duro Company

.....
President

Signed at Dayton, Ohio, this day

of 19

Sold by

Address

Date

Water---A Problem Since Life Began



Far away, in India, natives
"Walk the Plank" to raise
water to the ground level.



A good Samaritan' woman at the
famous Jacob's well, in Palestine
She, too, slaves for water.



The old well at Thebes, Egypt,
where for centuries filthy water
has been raised with a counter-balanced
pole.



The never-ending grind to lift water
in Egypt. The water obtained even
in this crude way transforms bleak
deserts into thriving grain fields.

Everything That Lives Needs Water



© EWING GALLOWAY
© UNDERWOOD & UNDERWOOD

Even the donkey enjoys a life of comparative ease when one considers the unnecessary slavery of man-and-woman toil in getting water this way.



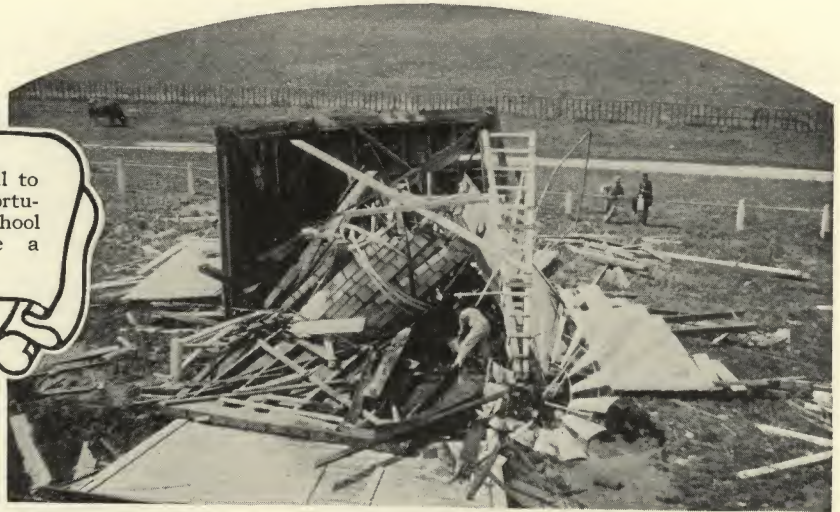
Public shower baths, like this in Japan, are found in some villages. But even in Japan, Duro is lightening the burdens, and bringing gladness to the hearts of many.



The historic aqueduct of Claudius, near Rome, built centuries ago, to transport that vital element of life — water.

Relics of Grandmother's Time

High winds caused the windmill to topple on this schoolhouse. Fortunately, it happened after the school session had closed. Otherwise a tragedy would have occurred.



The farm home above burned to the ground. Only the brick foundation, and the useless windmill, remained. Water under strong pressure might have saved this home.

To the left—the old oaken bucket—a relic of primitive insanitary water supply.

Folks Still Slave for Water



Boys and girls leave their homes on the farm, in the suburbs or in the villages to escape drudgery such as this. They are entitled to the advantages of modern improvements.

DURO—WORLD'S LARGEST MAKERS—WORLD'S LARGEST SELLERS

Granddad Thaws the Old Pump



“This thing musta friz’d plumb to China, and that consarned pump handle and my rheumatism don’t get along together no how. ’Spect I ought to get me a Duro. I’ll do it and surprise them.”

DURO—WORLD'S LARGEST MAKERS—WORLD'S LARGEST SELLERS

Anyone Can Have A Duro System

“And to think I used to work and wear myself out pumping and carrying water. Now Duro has settled the water supply problem forever. Granddad was certainly an old dear to get it.”



Hands In Water All Day Long



*Back-breaking
Drudgery and
Slavery—No
time for rest
— Surely
there is a
better way.*



“For six years I’ve slaved ‘out here.’ From the minute I awake in the morning until all the kiddies are scrubbed and put to bed I pump, pump, pump water, lug it in and then out again. How can I stand it much longer?”



Men Know Duro As An Investment



Running water under pressure in the barn, for cleaning cow stalls and for supplying fresh, pure drinking water at an even temperature insures sanitary conditions, and an increased milk yield.

Tired horses and tired men know what a fresh, cool drink of water means during a hard day's work. Duro can supply the needs of a hundred head of cattle with no work, worry or effort on your part.



It's pretty nice to attach the hose and water the vegetable and flower gardens. You can have rain whenever you want it—if you're Duro-wise—water right in the poultry houses too.

It doesn't take long to clean the "old buss" when you have running water under pressure, the Duro-way—simply turn the faucets, that's all. And don't forget the importance of Duro as a means for fire protection.





*The Entire Family
Wants Duro*



Give your children the same advantages that other children enjoy. Let them get under the shower on a smothering hot day, or, even during the coldest spells in Winter. See how much more they enjoy their home life with a Duro.

You'll never know all of the advantages of a Duro System until you have one. If you put off installing a Water System now, you may never have one; and you will miss an important part of the sheer joy of living which Duro affords. There will never be a better time than now to decide this important question.



Decide To Install DURO Today!

There is no other single thing that will give you so much genuine satisfaction and service dollar for dollar invested as will a Duro Automatic water System.

It benefits every member of your family and every living thing on your place. It protects your health; it provides sanitation; it will give you a greater measure of comfort. It will release you from the slavery of pumping; it will give you more leisure time for other things. It is convenient and ever at your service—morning or evening—day or night. Fire insurance only partially covers a loss—by getting to the fire quickly in the start before it makes headway, you have a powerful fire-fighting apparatus in the form of a Duro Pressure System. Many Duro users have written us stating instances of where DURO has saved their home, or their barn and crops from possible complete destruction. It is only necessary to have a disastrous fire once to wipe out the savings of a lifetime.

The first consideration of any home owner should be the water supply—water is a most vital element of life itself—therefore, why not have it handy, ready at the turn of a faucet any minute of the day or night?

DURO is not an expense—it is an investment. It will pay for itself many times over. Here is an example:

Suppose your daily consumption of water is as follows:

	Gallons
Family of 5 (25 gals. per person per day)	125
Eight cattle (at 9 gals.)	72
Six horses (at 8 gals.)	42
Twenty-five hogs (at 2½ gals.)	63
Twenty-five sheep (at 1½ gals.)	37
Total Daily Consumption	345

An ordinary hand pump will deliver about four gallons per minute. Therefore, it would take eighty-six minutes to pump 345 gallons.

A Duro will pump this amount of water automatically and without attention. It would save you an hour and twenty-six minutes daily. At this rate it would save you 31,034 minutes, or about 521 hours a year. A bricklayer earns anywhere from 80c to \$1.50 per hour. Surely you value your services, we will say for the sake of argument, at least at 40c an hour. If you do, a Duro would save you 40c times 521 hours, or \$208.40 a year, plus whatever you would earn by doing other things during the 521 hours you had saved.

As stated before your requirements would approximate 345 gallons per day. Your well is located about 20 feet from the house and about 45 feet from the barn. It is, therefore safe to say that you carry your water at least 25 feet. In going after water and returning with it you walk 50 feet.

Using two three-gallon buckets you would have to make fifty-seven trips and in so doing you would walk 2850 feet each day or 1,037,400 feet a year. Or, in other words, 196½ miles per year.

One gallon of water weighs approximately eight pounds.

Therefore, you carry 345 gallons of water a day or 2760 pounds, and in a year's time you would have carried 1,004,640 pounds or approximately 502 tons of water a distance of ninety-seven miles.

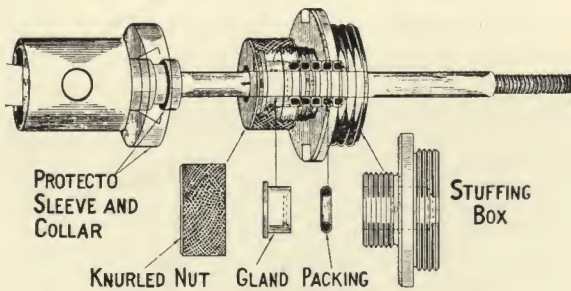
Think of how little I am asking you for this water system! Think of all the other advantages from the standpoint of comfort, happiness and convenience that is made possible by a Duro! Can you afford to be without it in view of what it will do for you?

Dependable, Superior and Up-to-date Duro Achievements!

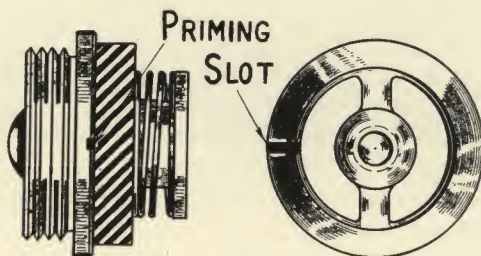
The steady, dependable performance of Duro Pumps is the result of the perfection of detail in manufacture. No finer pumps are built. No pumps equal Duro in accuracy and precision of manufacture.

A close study of just a few of the more important patented, exclusive features following will give you some idea why Duro is considered the pace-maker in pump construction, and incidentally why Duro is the world's largest maker, and the world's largest seller.

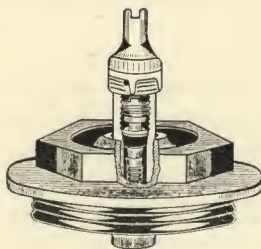
Familiarize yourself with these features so that you can explain their importance to the prospective purchaser.



① The Duro Stuffing Box is designed as near leak-proof as is mechanically possible. When packing becomes worn, a twist of the knurled knob tightens it immediately—there are no threads or obstructions to interfere. It never pays the plumber to make a call to fix a leaky stuffing box because whatever charge is made is considered exorbitant by the customer. Sell the Duro—it eliminates stuffing box service. Note how the Protecto Sleeve and Collar makes it impossible for water to get into the crank case.

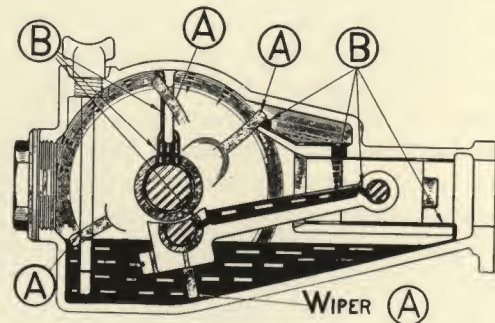


② Duro uses priming slots in the discharge valve seats which keep the pump continually primed. This slot is always washed clean by the action of the water passing over it, whereas, in the old type of priming tube the small holes become clogged and useless. The priming slots prevent air-binding by allowing air to pass from piston chamber into the tank.

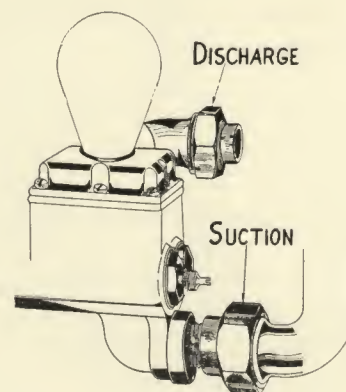


③ Duro originated the use of Schrader Bicycle Valves for air supply. This rubber type valve does not leak and insures perfect seating.

④ A wipe and splash, gravity feed oiling system insures perfect lubrication. Note how the wiper (A) distributes the oil at the ribs. It then runs down grooves (B) by gravity to all bearings and moving parts. The Duro oiling system is as positive and perfect as modern science and engineering skill can make it. The precision of the mechanism itself insures minimum oil requirements. Note the oil rod gauge. Oil level should rest at top notch on rod.



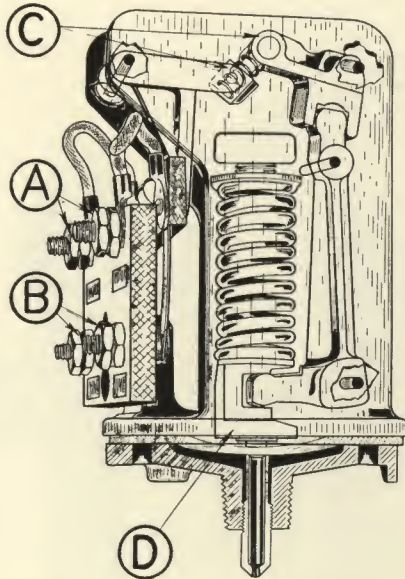
⑤ Both Suction and Discharge Unions are supplied with Duro. This eliminates extra cost to the plumber in installing. It enables you to connect and disconnect the system without worry or trouble. It permits easy drainage of the pump. Both suction and discharge unions are standard on all Duro Systems. Just another convenience which we have provided in your interests and for your economy.



Only In Duro Can These Many Refinements Be Found

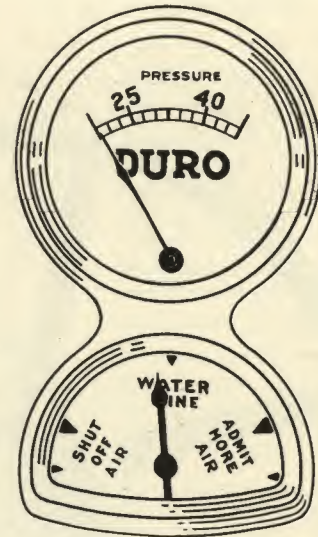
Duro alone has pioneered practically all of the important achievements in pump construction. Twenty-one major improvements, which are now generally used, were originated and developed by Duro. However, no one but Duro can use the many patented features incorporated only in Duro Pumps. This is your protection.

There are many features too numerous to mention, among which is the arrangement of one-half air and one-half water in tanks, giving greater withdrawal capacity. Also, the constant, self-primed pump by reason of the suction intake being higher than the discharge deck.

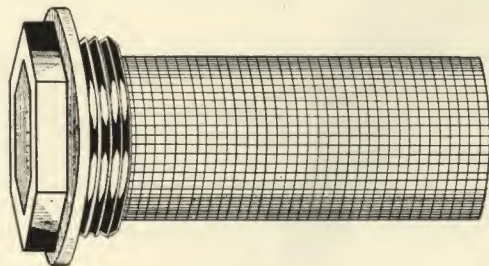


⑥ The Duro patented two-pole automatic switch is of the toggle joint principle (C). It starts and stops the pump automatically. The two-pole switch prevents grounding of motor. It eliminates burned-out motors due to lightning. The connections (A) from the motor to the switch are made at the Duro Factory, insuring against burn-outs and trouble due to wrong connections.

The patented toggle joint principle positively eliminates all possibility of the switch not operating because of friction. Duro uses a rubber diaphragm (D). Therefore, no trouble is experienced with crystallization as happens when metal diaphragms are used.



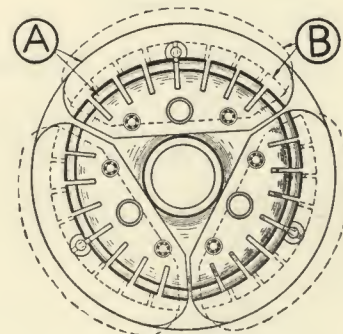
⑦ The Duro combination Water and Pressure Indicator is now standard on all Duro systems. It is an instrument similar to those on the dash board of your automobile. It eliminates broken water glasses and flooded basements due to that cause. It is simple, practical and reliable.



⑧ The Duro Strainer keeps dirt and foreign matter from getting under the valve seats of the pump. The mesh of the screen is small enough to prevent destructive foreign matter from entering the pump. The screen and plug are assembled together and are located so that the screen may be easily removed for cleaning. This construction also maintains the screen in its proper position in the vacuum chamber.

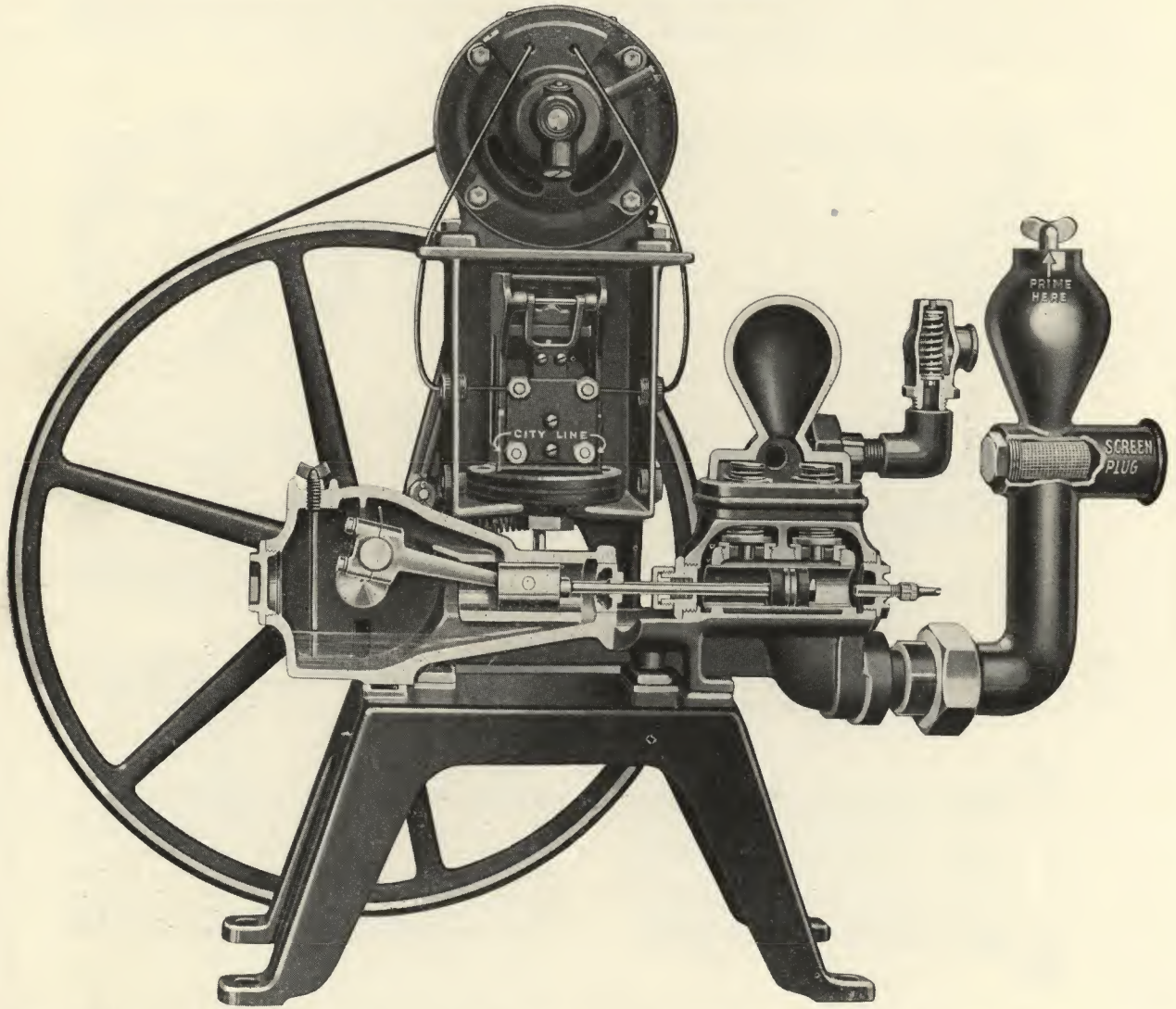
⑨ Duro-Made Repulsion-Induction Motors are equipped with the Duro patented short-circuiting device—an exclusive Duro feature. Its construction is simple. It is positive in action—and trouble-proof. Duro Repulsion-Induction Motors are made in the big Duro Factory. They greatly reduce current consumption at starting. They will not overheat and burn out in starting on heavy loads and under varying voltage conditions as do other types of motors.

Motor trouble in connection with Duro Repulsion-Induction motors is practically unknown. Any Duro dealer who has installed great numbers of Duro Pumps will testify to this indisputable fact. The returns on Duro Repulsion-Induction Motors are less than one-half of one percent for any cause whatsoever—a remarkable record.



NONE SHALL SURPASS DURO PRECISION AND QUALITY

Cross Section of The Famous Duro Pump



The No. 250 Is Typical of Duro Suction Pump Construction

Look at the simplicity of construction—the neatness—the compactness—all reflecting painstaking precision in manufacture, and extreme economy in operation.

The illustration is typical of the essential working parts of all types of Duro Suction Pumps. Conscientiously built to last a lifetime. Slower in operating speed. Above all, efficient and durable.

Notwithstanding the low selling price, it costs more to build a Duro Pump. There is no cumbersome bulkiness. No mass of purposeless cast-iron. Rather, all castings are perfectly moulded, machined and balanced for 200% over-strength.

Yes, it costs more to machine Duro working parts from

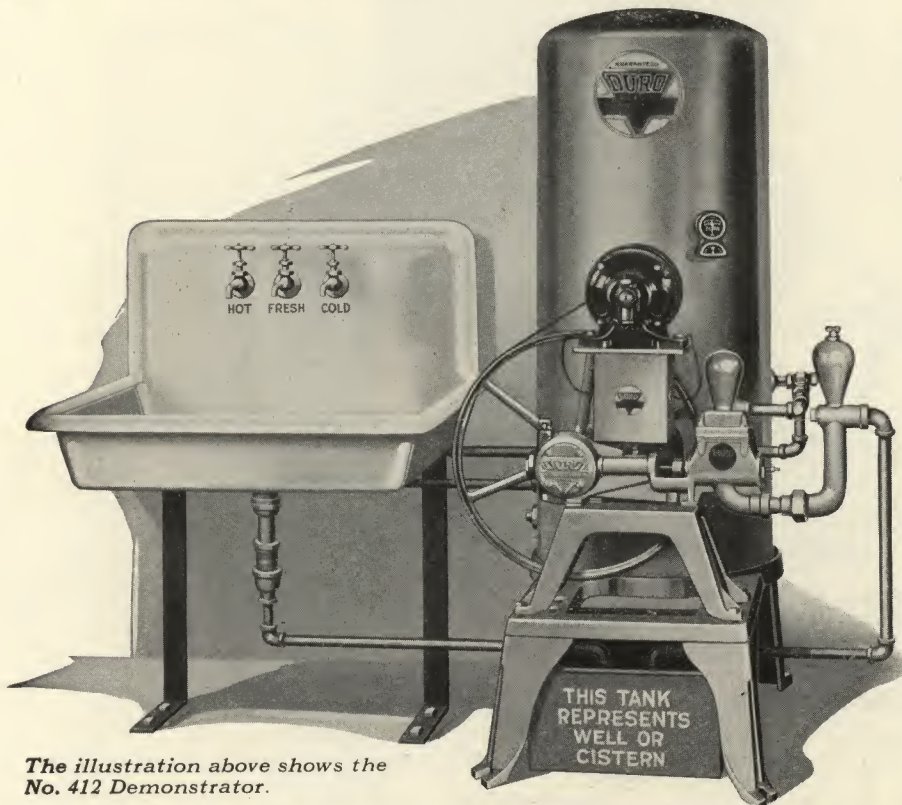
high-carbon steel, from phosphor bronze, and from brass to tolerances one-half the thickness of a human hair. But it pays.

Every part, every detailed operation, every movement in assembly must pass inspection after inspection. This inspection is simply insurance against trouble or service in operation. When finally assembled, all pumps are put on the test block for hours for the "run in" test. Then they are subjected to tests much more severe than is experienced in actual usage.

Every pump is tested to pull 26" of vacuum. This is equal to lifting and sustaining a column of water over 29 feet in height, although the pumps are recommended for not more than a 22 feet lift.

DURO Salesroom Demonstrators

The impressions received through the eye are twenty-one times as strong as those received through the ear. Hence the importance of a sales room demonstrator. When a prospect calls at your store he calls for one reason only, and that is to see what he intends to buy. If you are equipped to let him turn the faucet and see the splash of running water under strong pressure, desire is created immediately. Dealers who sell several hundred water systems a year invariably use demonstrators—either salesroom or automobile.



The illustration above shows the No. 412 Demonstrator.

Demonstrator No. 412

Consists of—

- 1—No. 252 "Vertitank" System complete with 250 gallon per hour capacity pump and 30 gallon galvanized tank.
- 1—Enameled kitchen sink, lettered as shown in illustration to the left.
- 3—Nicked sink faucets, as shown to the left.
- 1—Galvanized Surge Tank.
- 2—Iron standards for sink.
- 1—Set of pipes and fittings for all connections, complete as shown in illustration to the right.

This Demonstrator makes a neat and attractive display in the sales room. As it is equipped with fresh water valve the prospect can be shown how water is drawn direct from well for drinking purposes, or, through the system for general use.

Mysterious Faucet Demonstrator No. 414

The illustration to the right shows the Mysterious Faucet Demonstrator. It has action; it has mystery. It arouses curiosity. It directs attention to the article you want to sell and the service that it performs.

- It consists of:
- 1—No. 252 "Vertitank" system complete.
 - 1—Galvanized Surge Tank.
 - 1—Bell-shaped non-splash funnel.
 - 1—Faucet for sink.
 - 1—Mysterious Faucet Set complete.

All necessary fittings, as shown in illustration, are included.

Demonstrator No. 416

Not Illustrated

This Portable Automobile Demonstrator consists of the following:

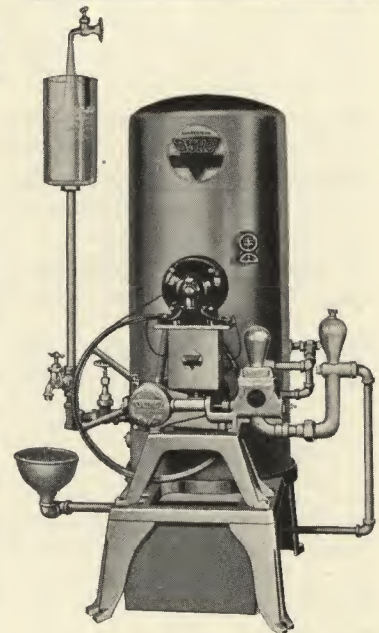
- 1—No. 250 Electric Pump of 250 gallons per hour capacity, equipped with 110-220 volt A. C. motor.
- 1—Extra 32 volt DC motor for above.
- 1—1" suction hose, 25 ft. long, to drop into the shallow well.
- 1—1/2" Discharge hose, 15 ft. long, for demonstrating purposes.

This outfit can be placed on the back of your automobile, permitting you to demonstrate from shallow wells in the prospect's home.

Demonstrator No. 415

This is the same as the Mysterious Faucet Demonstrator No. 414 except less the mysterious faucet arrangement.

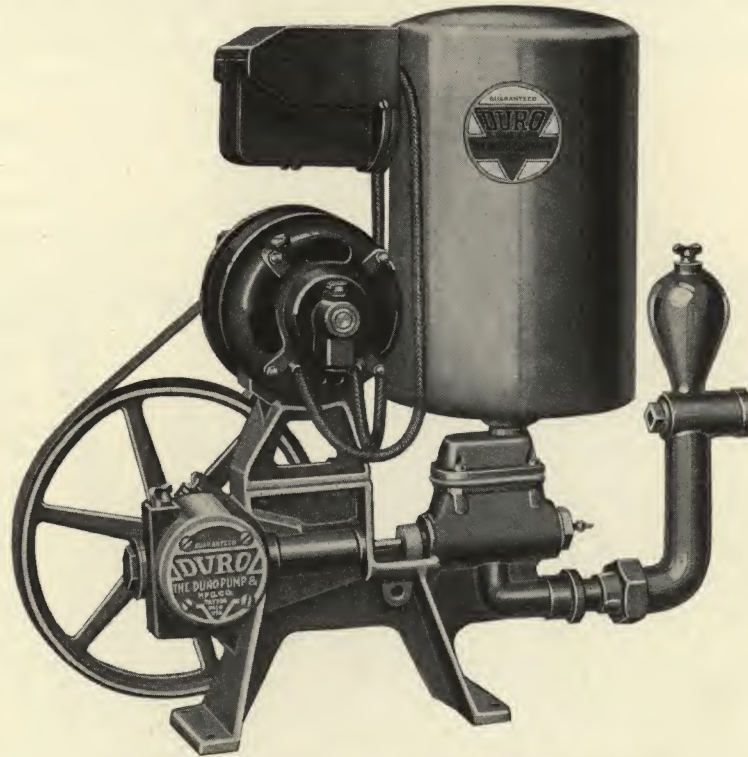
It is provided with a faucet and a non-splash funnel as is shown in the illustration to the right. It consists primarily of a No. 252 "Vertitank" system with a 250 gallon per hour pump.



No. 414 Demonstrator

Famous DURO "No. 77" Automatic Fresh Water System

Completely
Automatic
in
Operation



Fresh
Water
Direct
from
Well

CAPACITY 200 GALLONS PER HOUR

Suction, 1"; Discharge, 1/2"; Maximum Vertical Suction Lift, 22'; Shipping Weight, 100 lbs.
Overall Dimensions, 10" wide, 24" high, 26" long.

Its Use—For small homes, cisterns, yachts, camps and summer cottage service, where the source of supply is a shallow well, spring, stream, lake or cistern.

Type of Pump—Reciprocating, double-acting single cylinder, with 200 gallon per hour capacity.

Operating Pressure—Electric Pressure Controller set to cut in at about 25 pounds and to cut out at about 40 pounds.

Fresh Drinking Water—This system supplies fresh water direct from the well at all times.

Sprinkling—For lawn or garden hose, the pump will maintain a 1/2-inch hose with nozzle partially closed.

Operating Cost—10c per 1000 gallons with current at 10c per Kw. hour; which is less than the average cost of city water service.

Electric Motor—Special Duro Repulsion-Induction type with surplus power, furnished as standard. See price sheet for special voltages. Always specify voltage, cycles and phase, if alternating current; and voltage if direct current.

Specifications of No. 77 "DURO" Automatic Water System

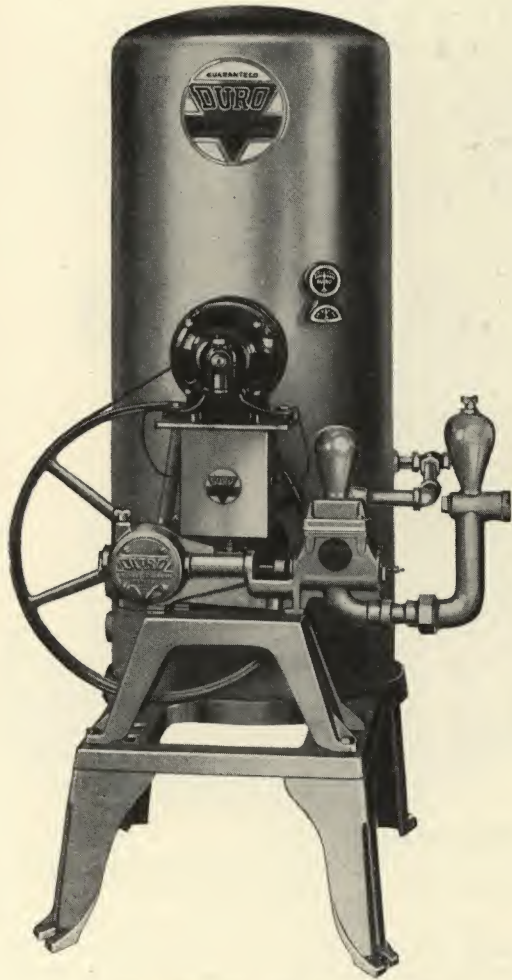
Size of Complete System	Cap. per Hr. Gals.	Suction	Discharge	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of System
No. 77	200	1"	1/2"	24x10x26	100 lbs.

Note—The Style No. 77 System is sold only as a complete unit. It is equipped with Relief Valve.

In Ordering—Give current specifications. If alternating current motor is wanted, specify cycle, phase and voltage. If direct current, specify voltage.

Wall Bracket—Can be supplied at extra cost; see price sheet.

DURO Automatic "Vertitank" Systems



This illustrates the No. 252 Vertitank. The No. 202 and No. 402 are similar in appearance, but have different pump capacities.

Duro "Vertitank" Systems are recommended where a complete automatic, electric, self-contained water supply system is needed to furnish fresh running water service under dependable pressure. They are made in sizes for small, medium and large homes. For shallow wells, springs, lakes, streams or cistern service, where the vertical depth to water does not exceed 22 feet.

Complete Outfit Includes

- 1—"Duro" Reciprocating, Double-acting, Suction Pump, complete with motor, automatic pressure controller, and relief valve.
- 1—30-gallon Galvanized Pressure Tank.
- 1—Duro Combined Pressure and Water Indicator.
- 1—High Grade Angle Valve.
- 1—Set of pipe fittings between pump and tank.
- 1—Container Base with legs, for pump and tank.

Note—If legs are not wanted a deduction in price is made. See Price Sheet.

Correct in Principle

The "Vertitank" is admittedly the best engineering practice. Less water surface to come in contact with and absorb air—preventing water logging. This principle is endorsed by all leading water supply engineers, architects and plumbers.

Cost of Operation

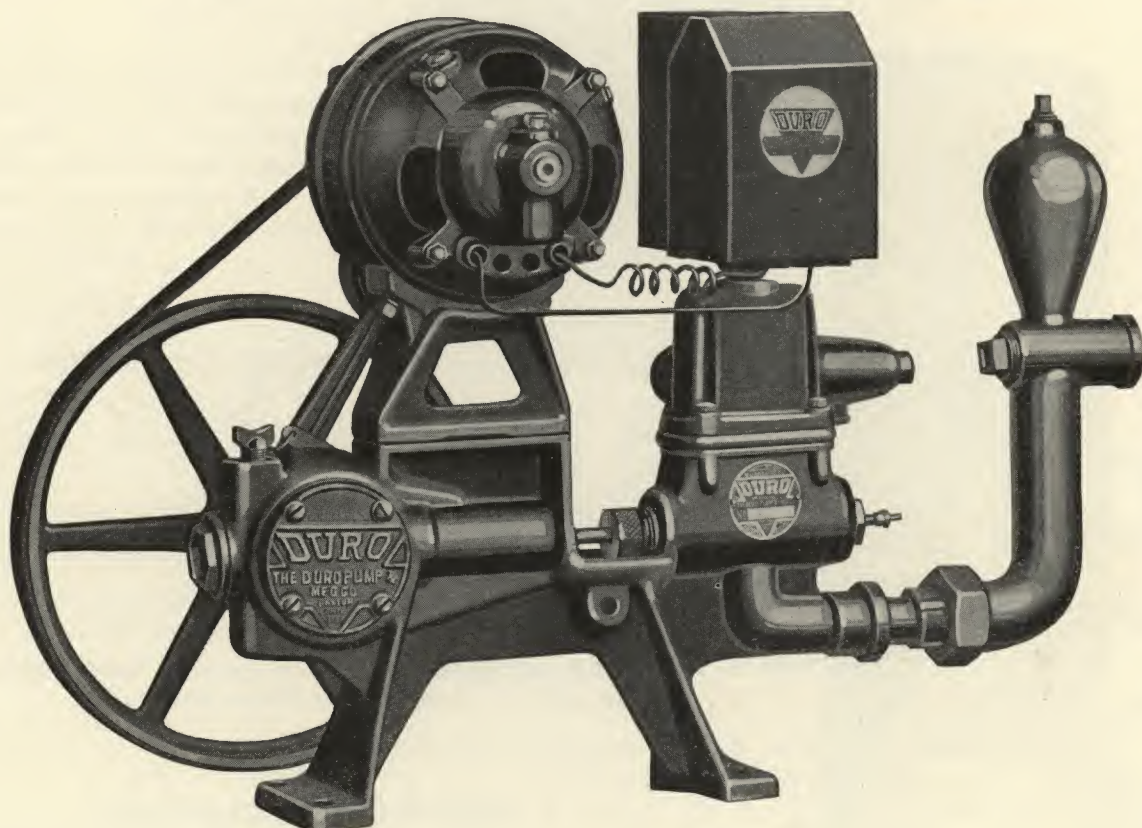
10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water service.

Specifications of "DURO" Automatic "Vertitank" Systems

Size of Complete System	Pump Cap. per Hr. Gals.	Style of Pump	Suction	Discharge	Capacity of Tank	Overall Dimensions, Inches Wth.-Dth.-Ht.	Shipping Weight of System
202	200	88	1 "	3/4"	30 gals.	26x32x47	190 lbs.
252	250	250	1 "	3/4"	30 gals.	29x32x47	205 lbs.
402	400	400	1 1/4"	1 "	30 gals.	29x32x47	230 lbs.

In Ordering—Specify "Vertitank" System Number, and specify voltage if Direct Current. If Alternating Current, specify voltage, cycles and phase.

No. 88 Double-Acting Single Cylinder Suction Pump



CAPACITY 200 GALLONS PER HOUR

Suction, 1"; Discharge, $\frac{3}{4}$ "; Maximum Vertical Suction Lift, 22'; Shipping Weight, 100 lbs.
Overall Dimensions, 10" wide, 24" high, 26" long.

Its Use—For summer cottages, cistern and small home service, where the source of supply is a shallow well, spring, stream, lake or cistern.

Type of Pump—Reciprocating, double-acting, single cylinder, suction pump, with drop forged high carbon steel crankshaft; phosphor bronze main bearing, connecting rod and connecting rod bearings, and tobin bronze piston rod.

Capacity—200 gallons per hour against 40 pounds pressure.

Operating Pressure—Electric Pressure Controller set to cut in at about 25 pounds and to cut out at about 40 pounds.

Sprinkling—For lawn or garden hose, the pump will maintain a $\frac{1}{2}$ -inch hose with nozzle partially closed.

Wall Bracket—Supplied at extra cost.

Operating Cost—10c per 1000 gallons with current at 10c per Kw. hour; which is less than the average cost of city water service.

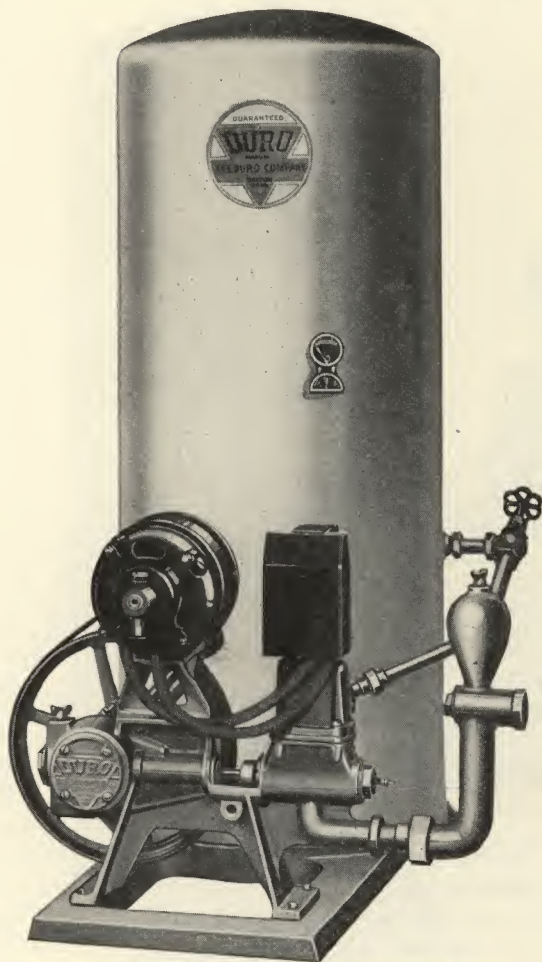
Fresh Drinking Water—Supplied by using a Duro Fresh Water Valve. (See pages on accessories.)

Electric Motor—Special Duro Repulsion-Induction type with surplus power, furnished as standard. See price sheet for special voltages. Always specify voltage, cycles and phase, if alternating current; and voltage if direct current.

Special Features and Construction—Elsewhere may be found details of patented, exclusive features; and, superiorities of quality, construction, and workmanship.

In Ordering—Specify No. 88 Pump, and give motor specifications. If complete system is wanted see opposite page.

Style 880 Automatic System



Capacity of Pump 200 gals. per hour
Suction, 1"; Discharge, $\frac{3}{4}$ "

Automatic, Electric, Self-contained System for small homes, summer cottage, camp and cistern service, where the requirements do not exceed 200 gallons per hour.

Complete Outfit Includes

- 1—No. 88 "Duro" Double-acting, Single Cylinder, Slow-speed Pump, complete with Motor and Automatic Pressure Controller.
- 1—Special Pneumatic Pressure Tank.
- 1—Duro Combined Pressure and Water Indicator.
- 1—Duro Pressure Relief Valve.
- 1—High Grade Angle Valve.
- 1—Set of pipe fittings between pump and tank.
- 1—Container Base for pump and tank—(for 42 and 80 gallon capacity tanks only).

Its Use

Style 880 Systems furnish the equivalent of city water service to small homes, yachts, summer cottages, camps, etc., also for cistern use. It pumps the water from shallow wells, springs, lakes, streams and cisterns. For use where vertical depth to water does not exceed 22 feet.

Cost of Operation

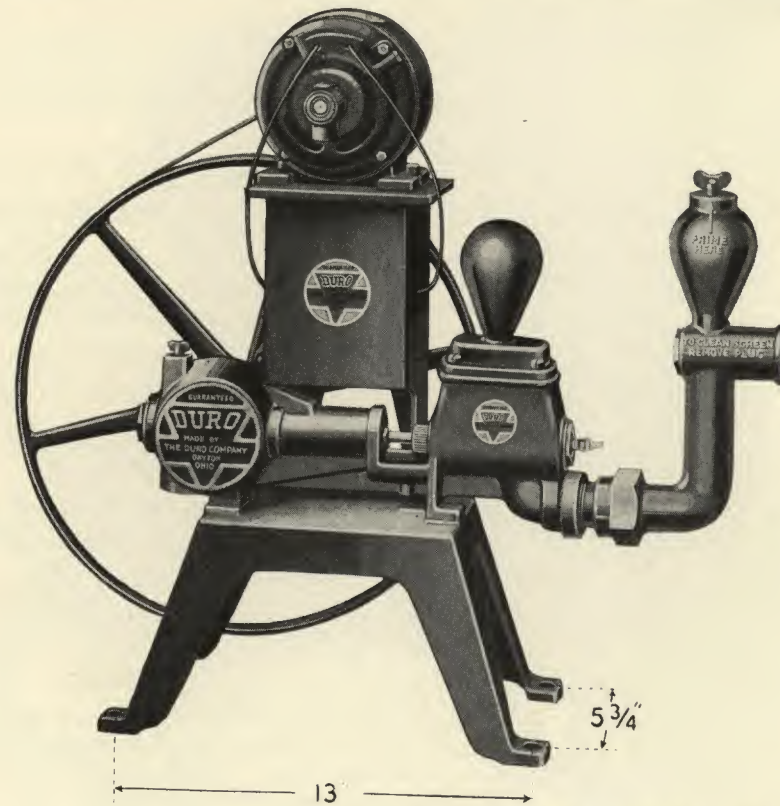
10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water service.

Specifications of No. 880 "DURO" Automatic Water Systems

Size of Complete System	Pump Cap. per Hr. Gals.	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of System
880-A-8	200	42	16x48	26x32x52	175 lbs.
880-B-8	200	80	20x60	26x32x64	224 lbs.
880-C-8	200	120	24x60	28x34x64	270 lbs.
880-D-8	200	220	30x72	30x36x76	455 lbs.

The above tanks are furnished vertical except when ordered horizontal. Specify exact size and state whether black or galvanized. Container base furnished with 42 and 80 gallon capacity tanks only. Also, specify voltage if Direct Current. If Alternating Current, specify voltage, cycles and phase.

No. 250 Double-Acting, Single Cylinder Suction Pump



USE $\frac{5}{16}$ " BOLTS

CAPACITY 250 GALLONS PER HOUR

Suction, 1"; Discharge, $\frac{3}{4}$ "; Maximum Vertical Suction Lift, 22'; Shipping Weight, 105 lbs.
Overall Dimensions, 11" wide, 24" high, 27" long.

Its Use—For average homes, and small farms and institutions where the source of supply is a shallow well, spring, stream, lake or cistern.

Type of Pump—Reciprocating, double-acting, Single Cylinder, Automatic, with drop forged high carbon steel crankshaft; phosphor bronze main bearings, connecting rod and connecting rod bearings, and tobin bronze piston rod.

Capacity—250 Gallons per hour against 40 pounds pressure.

Operating Pressure—Electric Pressure Controller set to cut in at about 25 pounds and to cut out at about 40 pounds.

Sprinkling—For lawn or garden hose, and fire protection, the pump will maintain a $\frac{1}{2}$ inch hose with nozzle practically wide open. Will give full flow from shower bath fixture.

Operating Cost—10c per 1000 gallons with current at 10c per Kw. hour; which is less than the cost of city water service.

Fresh Drinking Water—Supplied by using a Duro Fresh Water Valve. (See pages on accessories.)

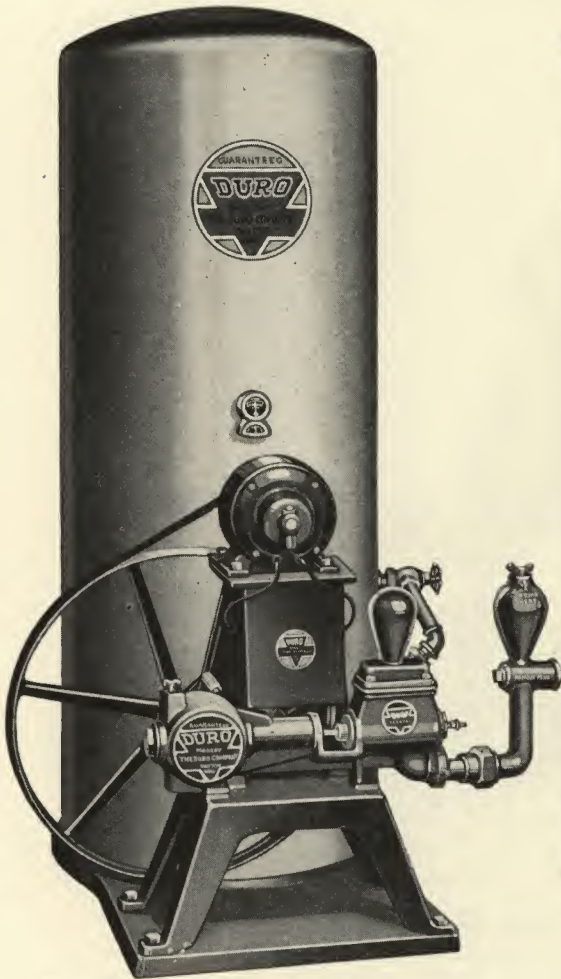
Electric Motor—Special Duro Repulsion-Induction type with surplus power, furnished as standard. See price sheet for special voltages. Always specify voltage, cycles and phase, if alternating current; and voltage if direct current.

Special Features and Construction—Elsewhere is shown patented exclusive features, as well as superiorities in construction, quality and workmanship.

In Ordering—Specify No. 250 Pump and give motor specifications. If complete system is wanted see opposite page.

Style 250 Automatic System

Automatic, Electric, Self-contained System for village, suburban and country homes, where an average amount of water is required.



Capacity of Pump 250 gals. per hour
Suction, 1"; Discharge, 3/4".

Complete Outfit Includes

- 1—No. 250 "Duro" Double-acting, Single Cylinder, Slow-speed Suction Pump, complete with Motor and Automatic Pressure Controller.
- 1—Special Pneumatic Pressure Tank.
- 1—Duro Combined Pressure and Water Indicator.
- 1—Duro Pressure Relief Valve.
- 1—High Grade Angle Valve.
- 1—Set of pipe fittings between pump and tank.
- 1—Container Base for pump and tank—(for 42 and 80 gallon capacity tanks only).

Its Use

Style 250 Systems furnish the equivalent of city water service to village homes and ordinary size suburban, farm, and country homes where electric current is available, pumping the water from shallow wells, springs, lakes, streams and cisterns. For use where vertical depth to water does not exceed 22 feet.

Cost of Operation

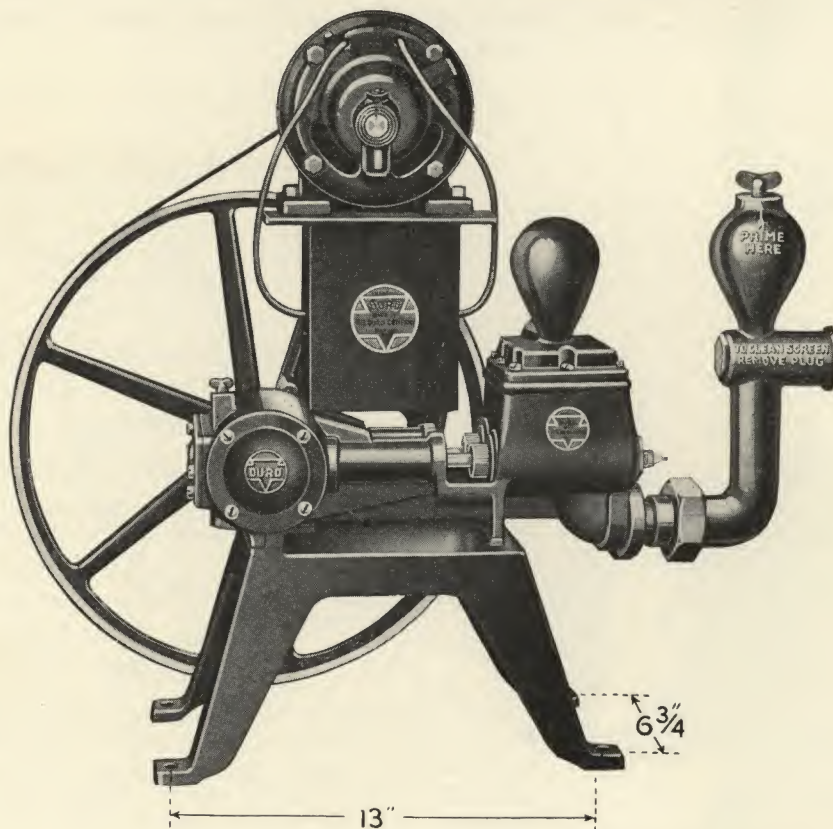
10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water service.

Specifications of No. 250 "DURO" Automatic Water Systems

Size of Complete System	Pump Cap. per Hr. Gals.	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of System
250-A-2	250	42	16x48	29x32x52	225 lbs.
250-B-2	250	80	20x60	29x32x64	280 lbs.
250-C-2	250	120	24x60	29x36x64	310 lbs.
250-D-2	250	220	30x72	30x44x76	510 lbs.
250-E-2	250	315	36x72	36x50x76	610 lbs.

The above tanks are furnished vertical except when ordered horizontal. Specify exact size and state whether black or galvanized. Container base furnished with 42 and 80 gallon capacity tanks only. Also, specify voltage if Direct Current. If Alternating Current, specify voltage, cycles and phase.

No. 400 Double-Acting Duplex Suction Pump



USE $\frac{5}{16}$ BOLTS

CAPACITY 400 GALLONS PER HOUR

Suction, $1\frac{1}{4}$ " ; Discharge, 1" ; Maximum Vertical Suction Lift, 22' ; Shipping Weight, 130 lbs.
Overall Dimensions, 12" wide, 25" high, 29" long.

Its Use—For larger homes, farms and institutions where the source of supply is a shallow well, spring, stream, lake or cistern.

Type of Pump—Reciprocating, double-acting; duplex, automatic, with drop forged high carbon steel crankshaft; phosphor bronze main bearing, connecting rod and connecting rod bearings, and tobin bronze piston rod.

Capacity—400 gallons per hour against 40 pounds pressure.

Operating Pressure—Electric Pressure Controller set to cut in at about 25 pounds and to cut out at about 40 pounds.

Sprinkling—For lawn or garden hose, and fire protection, the pump will maintain a $\frac{1}{2}$ -inch hose with nozzle wide open, or two $\frac{1}{2}$ -inch hose with nozzles partially closed. Will give full flow from shower bath fixture.

Operating Cost—10c per 1000 gallons with current at 10c per Kw. hour; which is less than the average cost of city water service.

Fresh Drinking Water—Supplied by using a Duro Fresh Water Valve. (See pages on accessories)

Electric Motor—Special Duro Repulsion-Induction type with surplus power, furnished as standard. See price sheet for special voltages. Always specify voltage, cycles and phase, if alternating current; and voltage if direct current.

Special Features and Construction—Elsewhere may be found details of patented, exclusive features; and, superiorities of quality construction and workmanship.

In Ordering—Specify No. 400 Pump, and give motor specifications. If complete system is wanted see opposite page.

Style 400 Automatic System



Capacity of Pump 400 gallons per hour
Suction, 1 1/4" Discharge, 1"

Automatic, Electric, Self-contained System for village, suburban and country homes, where a large amount of water is required.

Complete Outfit Includes

- 1—No. 400 "Duro" Double-acting, Duplex Suction Pump, complete with Motor and Automatic Pressure Controller.
- 1—Special Pneumatic Pressure Tank.
- 1—Duro Combined Pressure and Water Indicator.
- 1—Duro Pressure Relief Valve.
- 1—High Grade Angle Valve.
- 1—Set of pipe fittings between pump and tank.
- 1—Container Base for pump and tank—(for 42 and 80 gallon capacity tanks only).

Its Use

Style 400 Systems furnish the equivalent of city water service to village homes, and large size suburban and country homes where electric current is available, pumping the water from shallow wells, springs, lakes and streams. For use where vertical depth to water does not exceed 22 feet.

Cost of Operation

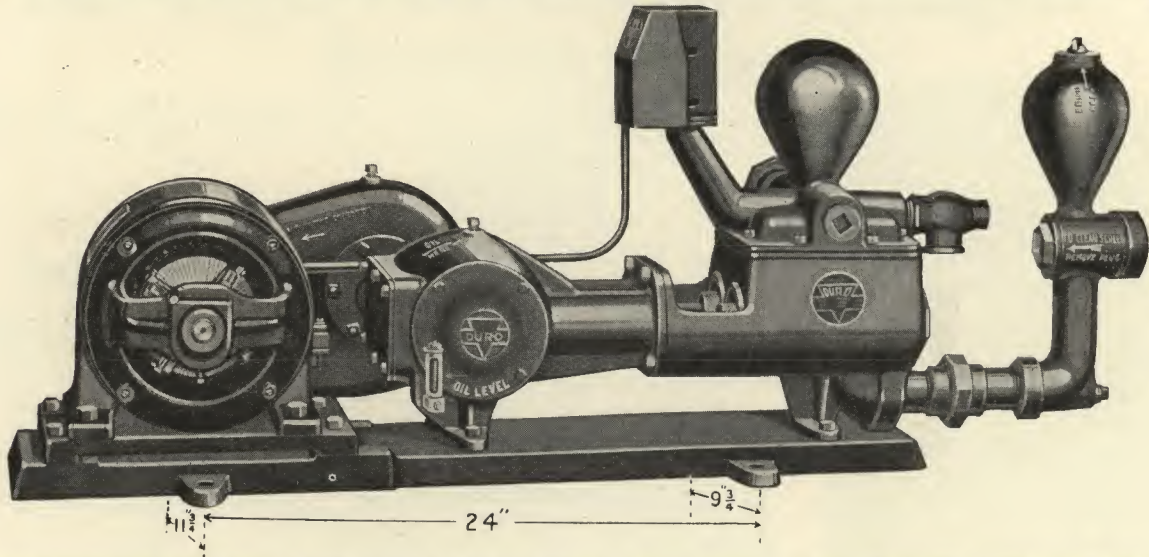
10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water service.

Specifications of No. 400 "DURO" Automatic Water Systems

Size of Complete System	Pump Cap. per Hr. Gals.	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of System
400-A-4	400	42	16x48	29x32x52	260 lbs.
400-B-4	400	80	20x60	29x32x64	315 lbs.
400-C-4	400	120	24x60	29x36x64	350 lbs.
400-D-4	400	220	30x72	30x44x76	550 lbs.
400-E-4	400	315	36x72	36x50x76	650 lbs.
400-H-4	400	525	36x120	60x120x36(horz.)	900 lbs.

The above tanks are furnished vertical except when ordered horizontal. Specify exact size and state whether black or galvanized. Container base furnished with 42 and 80 gallon capacity tanks only. Also specify voltage if Direct Current. If Alternating Current, specify voltage, cycles and phase.

No. 100 Heavy Duty Suction Pumps



Capacities 600, 900, 1200 and 1500 Gallons per Hour. See Specifications Below

Suction, $1\frac{1}{2}$ "; Discharge Openings on Either Side of Air Dome, $1\frac{1}{4}$ ".
 Maximum Vertical Suction Distance, 22'. Overall Dimensions, 20" wide, 24" high, 54" long.

Its Use

An individual waterworks plant for the larger Suburban and Country Homes, Small Truck Farms, Greenhouses, Factories, Office Buildings, Country Clubs, Country Schools, Dairies, Small Villages with overhead tanks, etc., where more than the average amount of water is needed. Furnished as standard with tanks ranging in capacities from 120 to 525 gallons. Larger tank sizes quoted upon application. See opposite page for complete system. Completely automatic, starting and stopping under standard pressures of 25 to 40 pounds. Built for 125 pounds pressure. From the standpoint of engineering, design and construction, Style 100 Heavy Duty Suction Pumps embody the latest improvements and developments in pump engineering. Note the special features.

Cost of Operation—10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water service.

Special Features

Repulsion-Induction Motors of greater starting torque.
 Silent Chain Drive with a double reduction.
 Two discharge openings.
 New Style Valve Construction. No tools required to take apart.
 New improved style Stuffing Box.
 Crank Case absolutely water proof.
 Improved style Piston which can be easily removed.
 Shafts are heavy high carbon forged steel, ground, with large phosphor bronze bushings on each end—automatically lubricated.
 Large Wrist Pin Bearings, and an adjustable Crank Pin Bearing.
 Union connections for both suction and discharge.

Supplied with two air devices in case extra large tanks are used.
 Rigidly constructed and massive.
 Very quiet running and efficient in operation.
 Pump is supplied with sight oil gauges. Insures proper oil level at all times.
 Two-pole Switch. Mounted on Air Chamber, but does not come in contact with the water.
 All wire connections from motor to switch are made.
 Relief valve is mounted in Air Chamber, insuring correct installation and proper functioning.
 Drain plugs provided to drain pump easily and prevent freezing.
 Provided with large suction Strainer. Prevents dirt getting into the Pump.

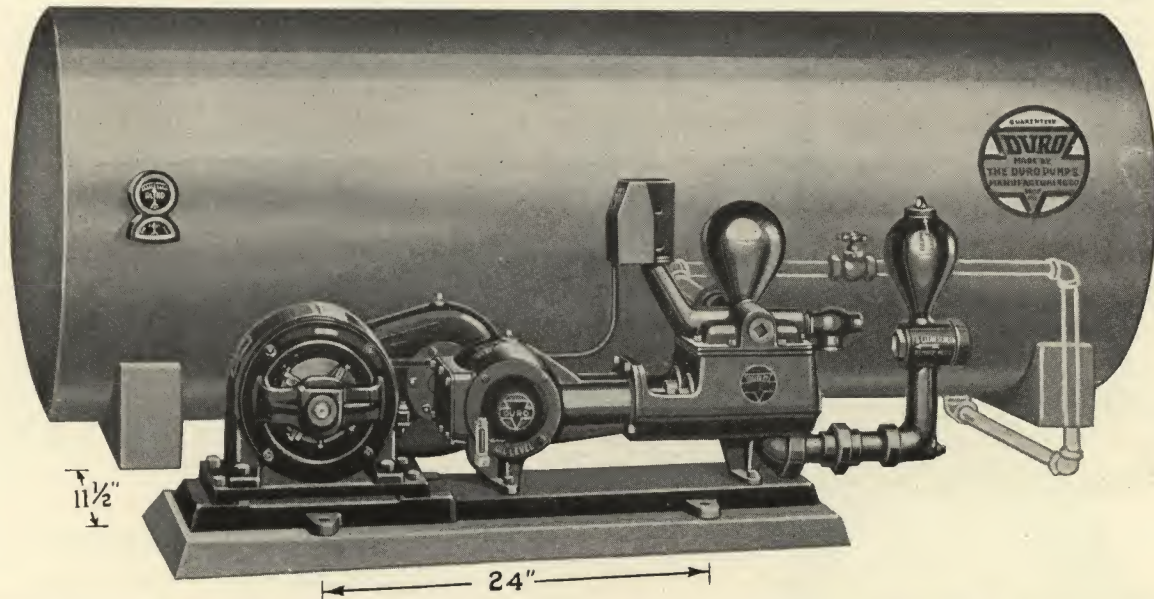
Specifications of No. 100 Heavy Duty Suction Pumps

Size No.	Pump Cap. Per Hr. Gals.	Pump R.P.M.	Size of Motor	Overall Dimensions, Inches, Wth.-Ht.-Lgth.	Pump Shipping Weight
105	600	150	$\frac{1}{2}$ H.P.	20x24x54	350 lbs.
115	900	150	$\frac{3}{4}$ H.P.	20x24x54	400 lbs.
125	1200	150	1 H.P.	20x24x54	400 lbs.
135	1500	150	$1\frac{1}{2}$ H.P.	20x24x54	410 lbs.

For odd cycle motors see price sheet. 32-volt motor supplied only with 105 Pumps and then it is recommended that light plant generator be started when operating pump.

In ordering specify size pump wanted. Also give voltage if Direct Current. If Alternating Current, give voltage, cycles and phase. To order complete system order pump and also tank and fittings on opposite page.

Style 500 Automatic System



Pump Made in Four Sizes and Capacities 600, 900, 1200 and 1500 Gallons per Hour
Listed as Standard with Four Different Size Tanks ranging in capacity from 120 to 525 gallons. Larger sized tanks quoted upon application.

Suction, 1 1/2"; Discharge Openings on Either Side of Air Dome, 1 1/4". Maximum Vertical Suction Distance, 22'.

Its Use

As this system consists of a No. 100 pump, described on the opposite page, it is suitable for the same requirements. In selecting the size system read carefully "Guide to the Selection of a Water System."

Complete System Includes

- | | |
|---|---------------------------------|
| 1—No. 100 Style "DURO" Double-Acting, Duplex Electric Pump complete with Motor and Pressure Controller. | 1—"DURO" Pressure Relief Valve. |
| 1—Pressure Gauge and Water Indicator combined. | 1—High Grade Gate Valve. |
| | 1—Heavy Gauge Pressure Tank. |

How To Order Complete System

Refer to opposite page and choose the capacity No. 100 pump wanted; give motor specifications. Then refer to tank and accessories specifications below. For instance, if you want a 600 gallon an hour pump with a 220 gallon tank and accessories you would order as follows: One (1) No. 105 Pump, 110-60 cycle, with D-5 galvanized (or Black) Tank, and accessories.

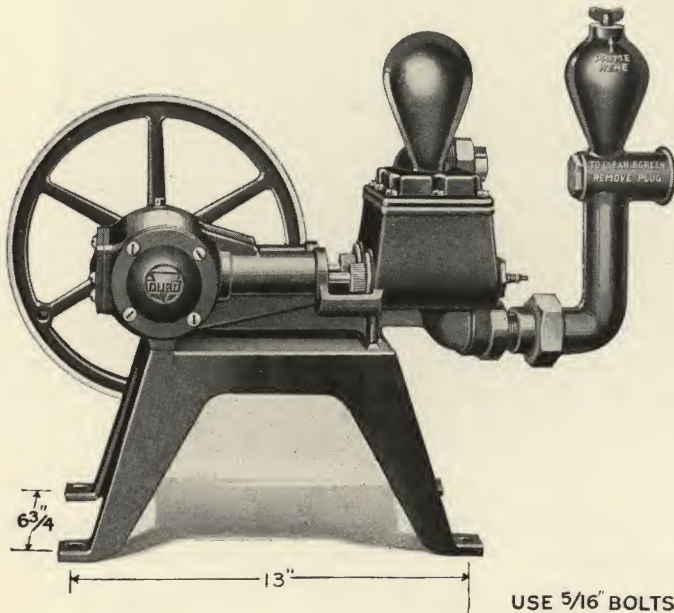
To get price of complete system add the price of the pump to the price of the tank and accessories, as shown on the price sheet.

Specifications of No. 500 "DURO" Automatic Water Systems

Size of Tank and Accessories	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of System
C-5	120	24x60	48x62x54	600 lbs.
D-5	220	30x72	54x74x54	800 lbs.
E-5	315	36x72	60x74x54	930 lbs.
H-5	525	36x120	60x40x120	1150 lbs.

All tanks 72 inches or less in length are furnished vertical unless ordered otherwise. Tanks over 72 inches in length are furnished horizontal. Specify whether black or galvanized.

No. 2400-P and No. 2250-P Belted Suction Pumps



Pump No. 2400-P

Capacity 400 Gallons per Hour
Maximum vertical suction lift 22 ft.

Suction $1\frac{1}{4}$ " , Discharge 1" , Discharge Pressure 40 lbs., $1\frac{1}{2}$ " Stroke; R.P.M. Pulley 222; Size of Pulley, diameter 11" , face 2" ; dimensions 12" high x 11" wide x 21" long; Shipping Weight 75 lbs.

Style No. 2400-P is the same as our No. 400 Electric Pump, excepting it is stripped of the motor stand, switch, motor, idler, and belt but equipped with a driving pulley and mounted so that it can be driven from a gasoline engine or an electric motor. It is a duplex double-acting pump.

Pump No. 2250-P

Capacity 250 Gallons per Hour
Maximum vertical suction lift 22 ft.

Suction 1" , Discharge $\frac{3}{4}$ " , Discharge Pressure 40 lbs., $1\frac{1}{2}$ " stroke; R.P.M. Pulley 222; Size of Pulley, diameter 11" , face 2" ; Dimensions, 12" high x 9" wide x 21" long; Shipping Weight 65 lbs.

Pump No. 2250-P is the No. 250 Electric Pump; mounted the same as the No. 2400-P shown above. It is a single cylinder, double-acting suction pump.

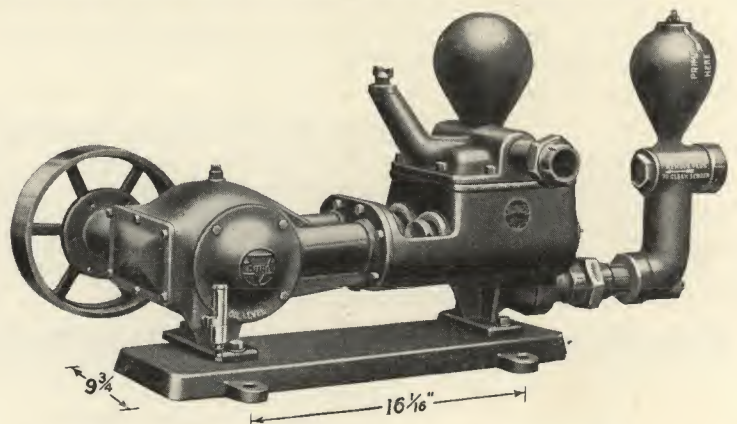
No. 100-P Belted Suction Pump

Its Use

The Style 100-P Power Pump is for use where the customer has his own power. These different pumps can be operated by electric motors equal in size to the ones listed with the No. 100 Pump complete; or from a line shaft. If engine is used as direct drive it should have twice the horse power of motor specified on page showing No. 100 Electric Pump Specifications. These pumps are suitable for pumping from any source of supply where the vertical suction lift is not more than 22 feet, and for a discharge pressure of 40 pounds.

Special Features

No. 100-P pumps embody all the good qualities of the No. 100 electric, automatic pumps. The pump is stripped of motor, chain drive and switch, mounted on a shorter base and equipped with driving pulley.



Suction $1\frac{1}{2}$ " ; Discharge Opening on either side of Air Dome $1\frac{1}{4}$ " ; Pulley Diameter $9\frac{1}{2}$ " ; 150 R. P. M. ; Pulley Face $2\frac{1}{2}$ " ; Maximum Suction Lift 22' ; Shipping Weight 275 lbs. ; Overall Dimensions 20" wide, 24" high, 42" long.

Size Number	Cap. in Gals.
105-P	600
115-P	900
125-P	1200
135-P	1500

Booster Installation

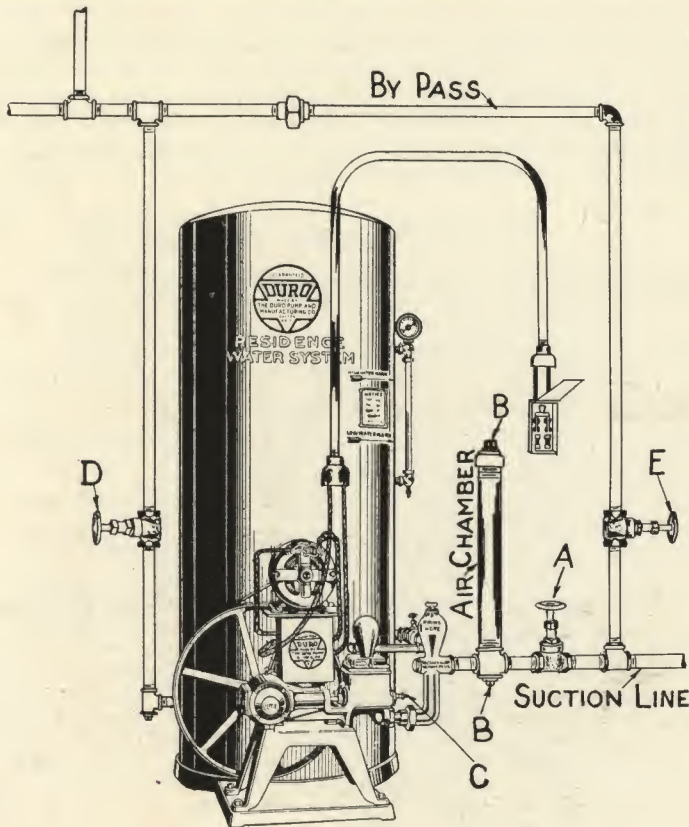
Where city water pressure is insufficient to provide good water service on uppermost floors of dwellings, apartments, schools, hotels, public buildings, etc., a DURO Booster System should be used.

The DURO Booster System "steps-up" the city water pressure and makes water available under good pressure upon the top floors.

If the city pressure fluctuates so that sometimes sufficient pressure may be had and at other times it is insufficient, the DURO Booster System may be operated only during such low-pressure periods. This is accomplished by valve arrangement and by-pass.

Where To Install

When water flows to the pump a head of water is on the suction side of the pump. This head may be one pound or more, but should always be as small as possible to give good pumping action. Pump should be placed at the highest possible point in order to reduce the head on the pump.



TABLE

Size Pump	Size Air Chamber
250.....	1½" dia. x 3' long
400.....	2 " dia. x 4' long
105.....	2½" dia. x 4' long
115.....	2½" dia. x 4' long
125.....	3 " dia. x 5' long
135.....	3 " dia. x 5' long

Air Chamber

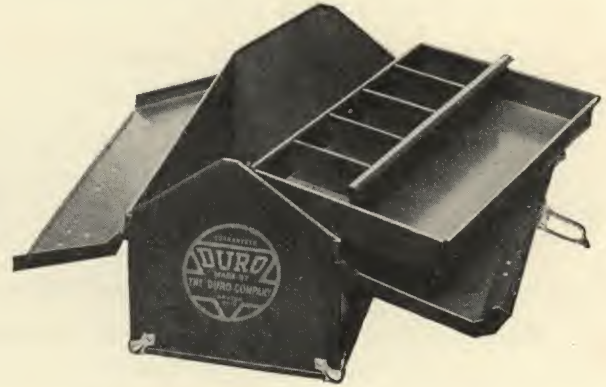
In some cases it is not possible to control this head on the suction side of the pump. The following instructions should then be followed:

First. Install an air chamber as shown in cut and dimensions given in the table. This air chamber serves to cushion the water on each stroke of the pump and eliminates water hammer. To replenish the air in this chamber, close valve A and remove plugs B. When all the water has been drained out replace plugs B and open valve A until a point is reached where the pump gives the best results.

Second. To replenish the air in storage tank, remove cap on valve C until the proper air level is reached. Then replace cap. Should valve C fail to give off a hissing noise, which indicates that it is pumping air, close valve A until it does. After air level has been reached, replace cap C and open valve A to original point.

Third. To by-pass the pump close valves A and D, and open valve E.

DURO Service Kits



Here's the Service Kit you've been wanting. In each case we are furnishing this material in a steel cabinet, built like a metal filing cabinet. This Steel Kit is sixteen inches long by nine inches wide by eleven inches deep—fitted with a steel compartment tray. A well-built job which will be found very handy and useful. Included with each kit is a set of Instruction Books. It is furnished with three separate sets of equipment. The No. 30 includes Pump special tools and service parts. The No. 35 includes Automatic Softener special tools and service parts. The No. 40 includes both Pump and Automatic Softener tools and service parts. The total cost is less than the net cost of the tools and repair parts.

No. 30 Pump Service Kit

It includes:

- 1—Crank Shaft Clamp, for holding crank shaft while removing or assembling pulley.
- 1—Double end Stuffing Box Tool, for removing stuffing boxes from No. 1901, 1902, 77, 88, 102, 250, 400 and 104 pumps.
- 1—Lever Handle for above tool.
- 1—Valve Seat Tool for Shallow Well Pumps.
- 1—Lever Handle for above tool.
- 1—Piston Nut Tool for Shallow Well Pumps.
- 1—Piston Rod Guide Tool, to prevent piston rod from damaging packing, for Shallow Well Pumps.
- 1—Packing Hook, to remove old packing from Stuffing Boxes.

Automatic Pump Service Parts

- 8—No. 161 Cups.
- 6—No. 53 Cups.
- 4—No. 329 Cups.
- 2—No. 165 Valve Insides.
- 12—No. 124 valves.
- 2—No. 141 Gaskets.
- 2—No. 257 Gaskets.
- 2—No. 112 Gaskets.
- 2—No. 212 Gaskets.
- 2—No. 150 Cups.
- 2—No. 25 Cups.
- 4—No. 29 Seldens.
- 2—No. 28 Dunces Caps.
- 2—No. 138 Diaphragms.
- 2—No. 226 Gaskets.
- 6—No. 20 Springs.

The tools and service parts are packed in the steel kit described above.

No. 35 Softener Service Kit

It includes:

- 1—Pressure Gauge to ascertain pressures.
- 1—Strainer and Testing Tube connection, for use with Pressure Gauge.
- 1—Valve Plug Tube for testing valves against leakage.
- 1—Spanner Wrench, for holding Valve Plates while tightening nuts.
- 1—Socket Wrench for tightening Valve Nuts.
- 1—Distance Gauge for checking the setting of the Diaphragm Plates.
- 1—Socket Wrench for removing Valve Seats.
- 1—Socket Wrench for removing Meter Box and Brine Assembly Valve seats.
- 1—Socket Wrench Lever Handle for above.
- 2—End Wrenches for adjusting Brine Assembly.

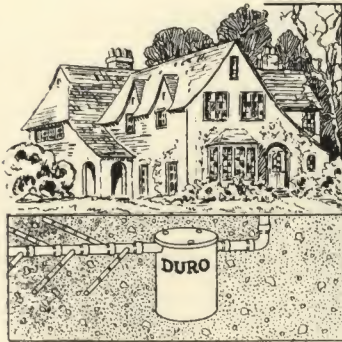
Automatic Softener Service Parts

- 6—No. 138 Diaphragms.
- 6—No. 27 Gaskets.
- 6—No. 4213 Valve Seat Gaskets.
- 2—No. 4050 Ball Valve Seats.
- 3—No. 4105 Meter Gaskets.
- 2—No. 2933 Manhole Gaskets.
- 3—Mineral Tank Head Gaskets—one each for sizes AS-1, AS-2 (or AS-3), and AS-4.
- 6—No. 57 Gaskets.
- 6—No. 4051 Valve Rubbers.
- 2—No. 4240 Meter Valve Springs.
- 2—No. 4069 Brine Valve Springs.
- 1—No. 4074 "A" Brine Valve Ball and stem.
- 1—No. 4034 "A" Meter Valve Ball and stem.
- 6—Sets $\frac{3}{8}$ Garlock Packing.

The tools and service parts are packed in the steel kit described above.

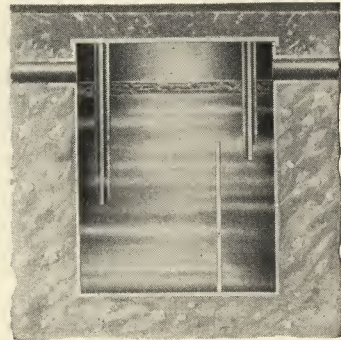
No. 40 Combined Pump and Softener Service Kit

Includes all of the pump and softener tools and parts as included in the No. 30 and No. 35 kits, furnished in the steel kit shown above.



DURO Septic Tanks

Provide Safe, Sanitary
Sewage Disposal Service



Its Use—The Duro Septic Tank takes the place of the old-fashioned outhouse and the insanitary cesspool. It provides safe sewage disposal for homes lying outside the reach of city sewers.

Material—Duro Septic Tanks are made of twelve and fourteen gauge copperoid iron, thickly coated with rust-proof mineral enamel.

Design—The design follows the specifications as outlined by the U. S. Public Health Service, and State Health Departments.

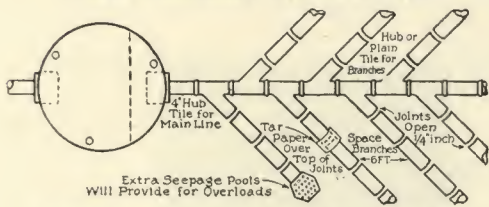
Durability—The mineral-enamel is applied to the tank walls, making them double thick and indestructible. It protects the tank against rust and makes it impervious to moisture.

Capacity—The chart below shows the capacities of the various sizes of Duro Septic Tanks, together with rating recommendations.

Sewage Disposal—The septic process eliminates the solids from sewage but it does not decrease the volume of sewage to be disposed of nor does it entirely remove organic life. Safe and adequate means for disposing of the septic treated liquid must be provided. Where the health restrictions prevent the use of streams or other natural outlets it is necessary to construct a filter bed or seepage pool. In providing either type, remember that approximately 200 gallons of liquid sewage must be disposed of from the ordinary home of five people—the same ratio applies to larger family groups.

Filter Bed—Ground View

Grade Branches 1 inch to 10 feet



Filter Bed Materials Not Furnished

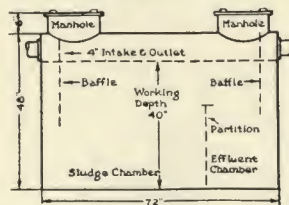
Hub tile for main line, plain or hub tile for branches.

20' per person for porous soil. If tight soil use 30' to 40' each and lay in stone filled trench.

Tar paper strips over top of open joints.

Filter bed not to be over 12" to 18" under surface. Grade 1" to 10'.

Horizontal Tanks



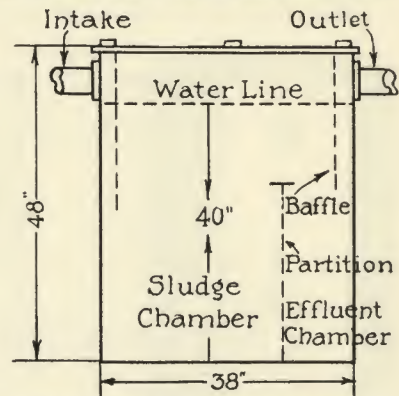
No. 505 and larger tanks are furnished horizontal.

See chart below for dimensions.

On 510 and larger, 6" openings. Special openings on request.

For systems larger than shown, write for prices, etc.

No. 502 Vertical Section



The No. 502 and 503 Tanks are furnished vertical. 4" openings.

No.	Net Gallons	Rating No. of People			Diameter	Depth	Shipping Wgt., lbs.
		Home	School	Factory			
502	200	6	12	10	38"	Depth 4 ft.	295
503	300	10	20	15	47"	Depth 4 ft.	325
505	500	20	35	30	48"	Length 6 ft.	420
510	1000	50	65	60	60"	Length 8 ft.	950
515	1500	75	100	90	5 ft.	Length 12 ft.	1300
520	2000	100	130	120	5 ft.	Length 16 ft.	1650
525	2500	125	165	150	5 ft.	Length 20 ft.	2000
530	3000	150	200	180	5 ft.	Length 24 ft.	2350
535	3500	175	230	210	5 ft.	Length 28 ft.	2700
540	4000	200	260	240	5 ft.	Length 32 ft.	3050

Shallow Well Pump Data

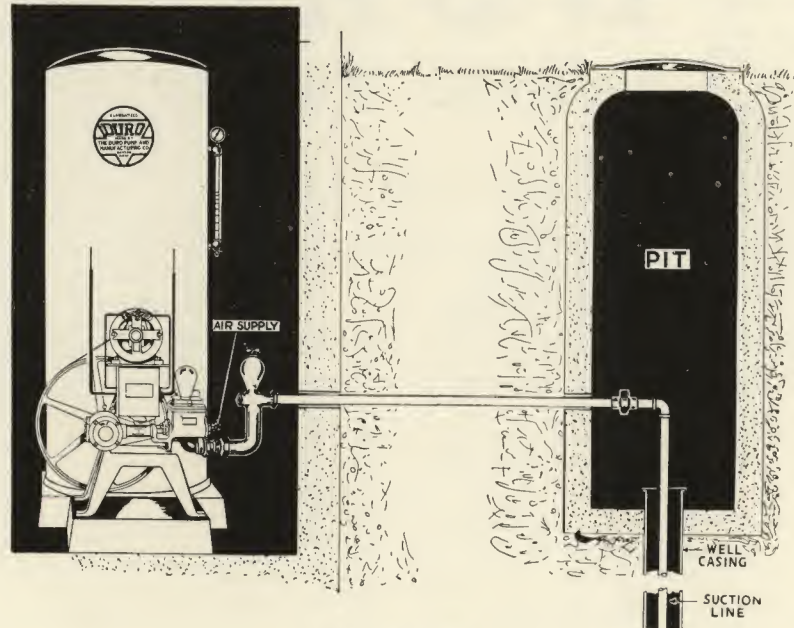


FIGURE No. 1

Figure No. 1 illustrates an ideal well installation. The pump and tank are in the basement, with the suction line running straight to the well pit and eliminating any up and down pipe lines, also any air pockets, and pipe elbows which cause noise and friction.

In the pit, the well casing is extended above the floor to prevent anything from getting into it. A union is also shown, which allows the suction pipe to be withdrawn from the well. The suction pipe should be run about four feet below the ground line to make it frost proof—where it becomes cold enough that this is necessary.

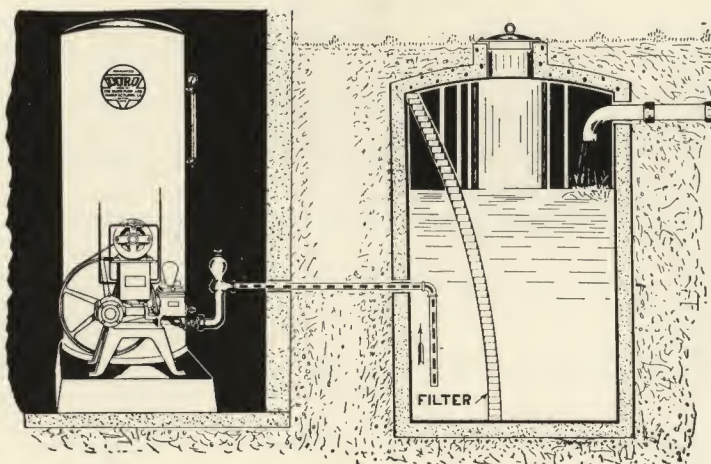


FIGURE No. 2

Figure No. 2 illustrates the usual cistern, lake or stream installation, everything being ideal, except the water flows to the pump under a small head, due to the water being higher than the pump. This sometimes causes noise, because the pump must on each stroke, stop the water flowing to it, which tends to produce a noise similar to closing a faucet quickly in the house. See Figure No. 3 for remedy.

Whenever possible the pump should be placed higher than the water level of the cistern.

Figure No. 3 shows a vacuum chamber made up of $1\frac{1}{4}$ pipe or greater and extending up at least 3 or 4 feet.

The air in this chamber is gradually absorbed by the water and should be replenished when the system seems to be getting noisy. To do this, close throttle valve tight, remove cap on air chamber made of pipe, and the plug in the pump air chamber. When the water is all drained out, replace cap and plug so no leaks occur. Then open throttle valve when pump is running to a point that gives the best sounding condition.

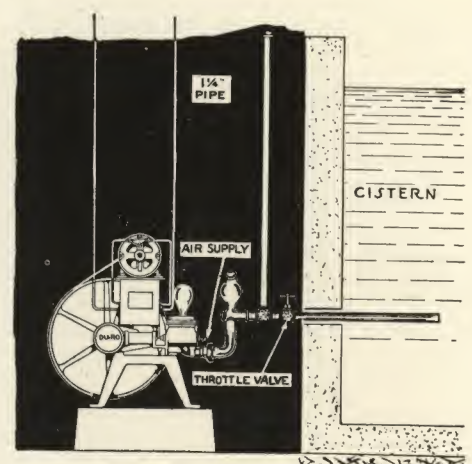


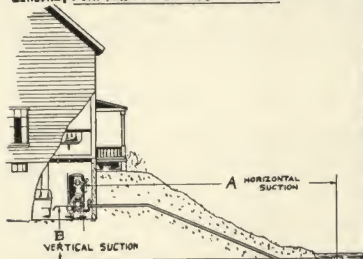
FIGURE No. 3

DURO Pump Data

HOW AND WHEN TO USE SHALLOW WELLS

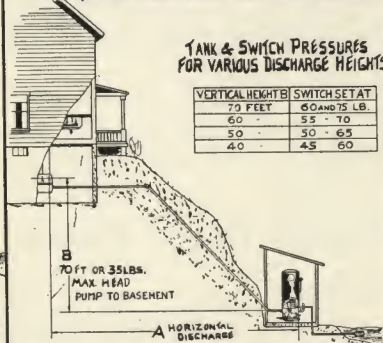
USE DEEP WELLS WHEN VERTICAL SUCTION DEPTH IS BEYOND 22 FT. EXCEPT IN THE FOLLOWING CONDITIONS

CONDITION NO 1 - CORRECT SUCTION DEPTH AND SIZE OF SUCTION PIPE CORRESPONDING WITH VARIOUS SUCTION LENGTHS, PUMP AND TANK LOCATED AT HOUSE



- 1ST FOR THE FIRST 100 FT OF HORIZONTAL SUCTION LENGTH 'A', AND 22 FT. OF VERTICAL SUCTION DEPTH 'B'. USE SIZE SUCTION PIPE AS PUMP IS TAPPED FOR.
- 2ND FOR EVERY ADDITIONAL 50 FT OF HORIZONTAL SUCTION 'A', DECREASE VERTICAL SUCTION DEPTH 'B' ONE FOOT.
- 3RD IF DEPTH 'B' CANNOT BE DECREASED, SUCTION PIPE DIAMETER MUST BE INCREASED AFTER THE FIRST 100 FT. ONE SIZE LARGER FOR EVERY 200 FT. OF HORIZONTAL LENGTH. SEE EXAMPLE ABOVE

CONDITION NO 2 - SUCTION DEPTH GREATER THAN 22 FT. PUMP AND TANK AT SOURCE OF SUPPLY. MAXIMUM VERTICAL HEIGHT DOES NOT EXCEED 70 FT

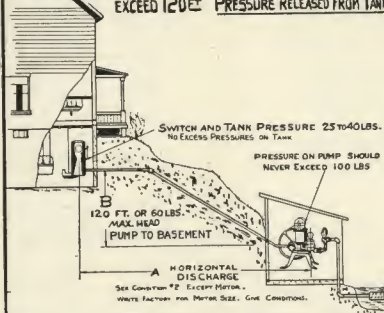


TANK & SWITCH PRESSURES FOR VARIOUS DISCHARGE HEIGHTS

VERTICAL HEIGHT	SWITCH SET AT
70 FEET	60 AND 75 LB.
60	55 - 70
50	50 - 65
40	45 - 60

- 1ST FOR THE FIRST 50 FT LENGTH OF HORIZONTAL DISCHARGE 'A' USE SIZE DISCHARGE PIPE AS PUMP IS TAPPED FOR
- 2ND FOR EVERY ADDITIONAL 200 FT. INCREASE DISCHARGE PIPE DIA. ONE SIZE.
- 3RD MOTOR MUST BE INCREASED ONE SIZE.

CONDITION NO 3 - SUCTION DEPTH GREATER THAN 22 FT. PUMP AT SOURCE OF SUPPLY AND TANK AT HOUSE. MAXIMUM VERTICAL HEIGHT FROM PUMP TO TANK DOES NOT EXCEED 120 FT. PRESSURE RELEASED FROM TANK



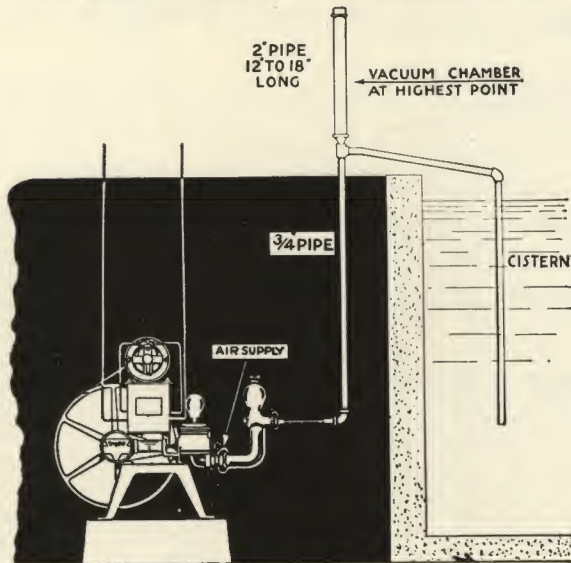
ALTITUDES AND PRACTICAL SUCTION LIFTS

ALTITUDES	PRACTICAL SUCTION LIFTS
10,000 FT.	10 FT.
8,000 FT.	12 FT.
6,000 FT.	14 FT.
5,000 FT.	16 FT.
4,000 FT.	18 FT.
3,000 FT.	20 FT.
SEA LEVEL	22 FT.

NOVADA, UTAH, COLORADO, WYOMING
 ROCKY MTS. & PLATEAU STATES
 APPALACHIAN MTS., CALIFORNIA
 EASTERN MIDDLE WEST & SOUTHERN STATES

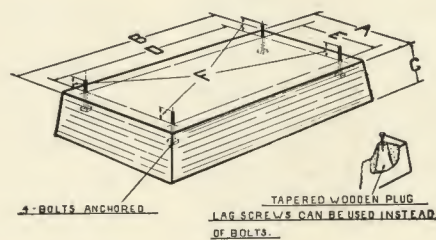
The above illustrations disregard the matter of frost-proof pits, which should be considered where frost-proof installations are necessary. The principles above, however, are applicable in all cases.

Figure No. 4 Installation



Sometimes you will find it necessary to run the suction line as shown above. When such is the case put an auxiliary vacuum chamber on the highest point to do away with a noisy pump. Air will collect at the highest point on a suction line and if there is not some method provided to collect the air the pump may pound or hammer. By placing the vacuum chamber on the suction line as shown you will not be bothered with a noisy pump.

Foundation Plan for Shallow Well Pumps



The base of the pump should be set on a solid level place, concrete preferred. See Fig. 2, and Table below for foundation dimensions.

Style Base	Size Base	A	B	C	D	E	F	Remarks
77-88	4x10 1/2"	8"	15"	8"	9 3/4"	3"	1"	1/8"x2 1/2" Bolts
250	7x14 1/2"	11"	18"	8"	13"	5 3/4"	1"	1/8"x2 1/2" Bolts
400	8x14 1/2"	12"	18"	8"	13"	6 3/4"	1"	1/8"x2 1/2" Bolts
100 Motor Drive	13 1/4 x 40 1/2"	18"	44 1/2"	9"	24"	11 1/2"	1 1/2"	1/2"x3" Bolts
100 Power Drive	11 1/4 x 24 1/8"	16"	28"	9"	16 1/8"	9 3/4"	1 1/2"	1/2"x3" Bolts

Accessories

No. 15 "DURO" Relief Valve



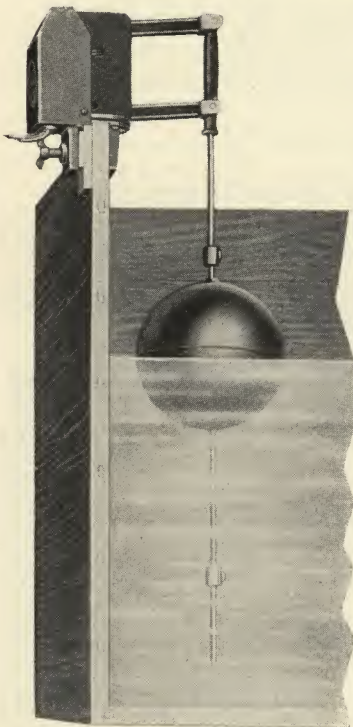
"Duro" Pressure Relief Valves are especially suitable for use on closed Hot Water Systems and Pneumatic Water Supply Systems as a protection against accident due to excessive pressure in the systems from any cause. They are designed to safeguard small Electric Pumping Systems against overload in case the automatic pressure control fails to operate.

"Duro" Relief Valves operate at a very close range of 10 pounds. In this particular they are not like other valves on the market which have a range of 50 or 60 pounds between the time they start to open until they are full open. This feature makes the "Duro" Valves especially valuable for the service intended.

When ordering specify: No. 15-B— $\frac{1}{2}$ " Relief Valve. No. 15-A—1" Relief Valve.

"Duro" Relief Valves are made non-adjustable. They are all regularly set to open at 70 pounds, although they can be made to operate at pressures from 35 to 100 pounds.

No. 1701 Automatic Open Tank Float Switch



The No. 1701 Automatic Float Switch is designed for use in operating pumps used for pumping water into open attic tanks or any elevated tanks. It is operated by means of a copper float which can be adjusted and is thoroughly reliable in every respect. Maximum variation in water level allowed for 30 inches.

Style No. 1701—(specify pump it is for use with)



Automatic Pressure Controller

The "Duro" Automatic Pressure Controller illustrated above is designed especially for use with "Duro" Pumps. It is satisfactory for other service however, and where sold separately for other kinds of work it will be fitted up as shown in the cut. All controllers are double pole and set to operate between pressures of 25 to 40 lbs.

Note—Order controller by number for pumps as listed below:

No. 1602 Double Pole Controller for Pump No. 100.

No. 1603 Double Pole Controller for Pumps Nos. 250 and 400.

No. 1604 Double Pole Controller for Pumps Nos. 88, 900, 990, 3000, and 3200.

Style 17 "DURO" Fresh Water Valve

The "Duro" Fresh Water Valve here illustrated enables the user to get fresh, cool water direct from the well at all times for drinking and cooking purposes. The water does not enter the tank.

This valve increases the value of a Pneumatic Water Supply System, as by its use it is possible to get from the system that one most delightful luxury, a cool drink of fresh sparkling water direct from the well.

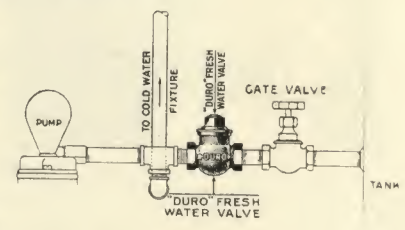
"Duro" Fresh Water Valves are made in three sizes:

Style 17-A, $\frac{1}{2}$ " See Parts Price Sheet

Style 17-B, $\frac{3}{4}$ " See Parts Price Sheet

Style 17-C, 1" See Parts Price Sheet

Note—Under no circumstance should a check valve be substituted for a Fresh Water Valve.



Pump and Tank Accessories

Special Couplings and Guides

For 990-3200 Pumps

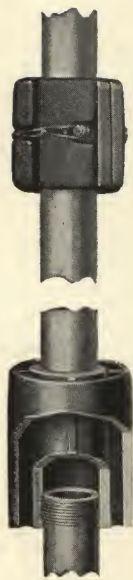
Sucker Rod Clamp Guides

Size	Pumps Used On
$\frac{3}{4}$ " x $2\frac{1}{4}$ "	991-992-3201-3202-3203
$\frac{3}{4}$ " x 3"	993-3204-3205
1" x 3"	3206
1" x $3\frac{1}{2}$ "	3207-3208
$1\frac{1}{4}$ " x 4"	3209
$1\frac{1}{4}$ " x $4\frac{1}{2}$ "	3210

Sucker Rod Guide Couplings

$\frac{3}{4}$ " x $2\frac{1}{2}$ "	991-992-3201-3202-3203
$\frac{3}{4}$ " x 3"	993-3204-3205
1" x 3"	3206
1" x $3\frac{1}{2}$ "	3207-3208
$1\frac{1}{4}$ " x 4"	3209
$1\frac{1}{4}$ " x $4\frac{1}{2}$ "	3210

"Duro" Clamp guides and guide couplings prevent buckling of sucker rods. Also, they eliminate the necessity of cutting and re-threading sucker rods in short lengths, as full length sucker rods may be used with clamp guides. This is a Duro patented feature.



Patent Applied For

Gauges for Tanks



New Style Water and Pressure Indicator

This "DURO" Combination Pressure and Water Indicator is furnished as standard equipment on all Duro Water Systems. A $1\frac{1}{4}$ " pipe-thread connection screws into tank. It is very similar in appearance and operation to the gauges as furnished on the dashboard of an automobile. It registers the pressure in the tank automatically, and also it indicates the proportion of air and water in the tank.

When the indicator points to 'Admit more Air' it is necessary to remove the air valve cap until the air again reaches the proper proportion. This eliminates the old Combination or Pressure Gauge and Water Glass. It is much neater and more compact and prevents breakage of water glass and fittings due to handling or accident, etc.

New Style Combination Water and Pressure Indicator—See Price Sheet.

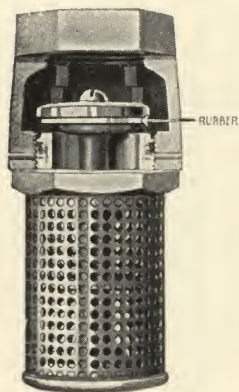
Old Style Combination Water and Pressure Gauge—See Price Sheet.

Old Style Water Gauge only—See Price Sheet.

Old Style Pressure Gauge only—See Price Sheet.

DURO Foot Valve and Strainer Combination

The DURO positive Foot Valve and Strainer Combination is used in connection with Shallow Well Pumps on the end of the suction line, especially where the suction line is long, and where it is likely to have a leak, or where the suction lift is extreme.



Duro Foot Valve and Strainer

In cases such as the above where the DURO Foot Valve and Strainer Combination is used, the suction valves in the pump are relieved of the burden of holding a high suction head. By taking this load off of the valves the pump will operate more satisfactorily, and the valves will last longer.

In case of the long suction line where little leaks are likely to develop in the line, the DURO FOOT VALVE will prevent the water from returning to the well.

The DURO Foot Valve has been successfully used on installations for many years, and has proved very satisfactory. A brass poppet, faced with a high-grade rubber disc, makes a perfect seating in the brass seat and an air tight joint.

The poppet guides and stops in the upper casting are so constructed that the seating of the poppet is positive, preventing it from seating improperly. There is ample water-way passage so that no friction is caused.

The strainer is of perforated sheet brass with holes of such size as to prevent most injurious particles from getting into the suction line. The bottom of the strainer is closed.

The DURO Foot Valve and Strainer Combination is furnished in $\frac{3}{4}$ "—1"— $1\frac{1}{4}$ " and $1\frac{1}{2}$ " sizes— $5\frac{3}{4}$ " long, except the $1\frac{1}{2}$ " size, which is 6" long. For prices see price sheet.

Amperes for Various Motors and Correct Size of Fuses

Size Motor	Volts D. C. with Fuse						Volts A. C. with Fuse Repulsion-Induction Only			
	32 V. Amp.	Fuse Amp.	110 V. Amp.	Fuse Amp.	220 V. Amp.	Fuse Amp.	110 V. Amp.	Fuse Amp.	220 V. Amp.	Fuse Amp.
$\frac{1}{8}$	3	3	1	1	.5	3	3	1.5	3	
$\frac{1}{6}$	4	6	1	3	.5	3	4	6	2	3
$\frac{1}{4}$	6	6	2	3	1	3	4.5	6	2.25	3
$\frac{1}{3}$	8	10	2.5	3	1.25	3	6.5	10	3.25	6
$\frac{1}{2}$	12	12	3.5	6	1.75	3	8	10	4	6
$\frac{3}{4}$	17.5	20	5	6	2.5	3	9.5	10	4.75	6
1	23	25	7	10	3.5	6	14	15	7	10
$1\frac{1}{2}$	35	40	10	10	5	6	20	20	10	10
2	46	50	14	15	7	10	25	25	12.5	15
3	69	70	20	20	10	10	40	40	20	20

Whenever you have a special problem on which you would like advice or suggestions, write to the factory, or, if it is necessary to have a Duro expert on the job, write to your nearest Duro representative or salesman. He will be glad to cooperate with you.

Examples:

- $\frac{1}{8}$ H. P. Motor, A. C., 110 Volts. Correct fuse 3 Amps.
 - $\frac{1}{4}$ H. P. Motor, A. C., 110 Volts. Correct fuse 4.5 Amps. Use 6 Amp. Fuse.
- The correct amperes will be found on the name plate of each motor.

Caution—Do not overfuse the motor. By doing so the motor might burn out before the fuse will blow. Never use a 15 or 30 amp. fuse where the motor only requires a 3 amp. fuse.

Correct Wire Size for 10-Volt Drop

FOR 100 VOLTS OR GREATER
Distance in Feet from Motor to Meter

	100	200	300	400	500	600	750	1000	1250	1500	1750	2000	2500
1 Amp.	14	14	14	14	14	14	14	14	14	14	14	14	12
2 Amp.	14	14	14	14	14	14	14	14	14	12	12	12	10
3 Amp.	14	14	14	14	14	14	14	12	12	10	10	10	8
4 Amp.	14	14	14	14	14	12	12	10	10	8	8	8	6
5 Amp.	14	14	14	14	12	12	10	10	8	8	6	6	6
6 Amp.	14	14	14	12	12	10	10	8	8	6	6	6	4
7 Amp.	14	14	12	12	10	10	8	8	6	6	6	4	4
8 Amp.	14	14	12	12	10	10	8	8	6	6	4	4	4
9 Amp.	14	14	12	10	10	8	8	6	6	4	4	4	2
10 Amp.	14	14	12	10	8	8	8	6	4	4	4	4	2
11 Amp.	14	12	10	10	8	8	6	6	4	4	4	2	2
12 Amp.	14	12	10	10	8	8	6	6	4	4	2	2	2
13 Amp.	14	12	10	8	8	8	6	4	4	4	2	2	2
14 Amp.	14	10	10	8	8	6	6	4	4	2	2	2	1
16 Amp.	12	10	10	8	8	6	6	4	4	2	2	2	1
18 Amp.	12	10	8	8	6	6	4	4	2	2	2	1	0
20 Amp.	12	10	8	8	6	6	4	4	2	2	1	1	0
22 Amp.	10	8	8	6	6	4	4	2	2	1	1	0	00
24 Amp.	10	8	8	6	4	4	4	2	2	1	0	0	00
26 Amp.	10	8	8	6	4	4	2	2	2	1	0	0	0
28 Amp.	8	8	6	6	4	4	2	2	1	0	0	00	00
30 Amp.	8	8	6	6	4	4	2	2	1	0	00	00	00
32 Amp.	8	6	6	4	4	4	2	1	0	0	00	00	00
34 Amp.	8	6	6	4	4	2	2	1	0	00	00	00	00
36 Amp.	6	6	6	4	4	2	2	1	0	00	00	00	00
38 Amp.	6	6	6	4	4	2	2	1	0	00	00	00	00
40 Amp.	6	6	6	4	2	2	2	1	00	00	00	00	00

Note—For the correct size wire, consult the above Table of Amperes for Various Motors. The first column under any voltage will give the necessary amperes required for the particular size motor being used. After obtaining the correct amperes required, consult the lower table in the ampere column, the number under the approximate distance in feet from the motor to the meter.

Friction Head or Loss and Comparative Discharging Power of Pipes

Discharge depends not only upon size of pipe but upon velocity of flow, a factor that changes with the relation of head of water to length of pipe. Inspection shows that doubling the diameter of a pipe increases the discharging power or capacity about 6 times.

A column of water 1 foot high and having a base equal in area to 1 square inch weighs about $\frac{1}{8}$ of a pound, and of course, presses that amount on the base. Double the height, and obviously both the weight and the pressure are doubled. Hence it may be taken for granted that the pressure of water at rest (static pressure or head) is in direct proportion to the vertical height or depth of the water.

Friction loss should not be greater than given in the following table:

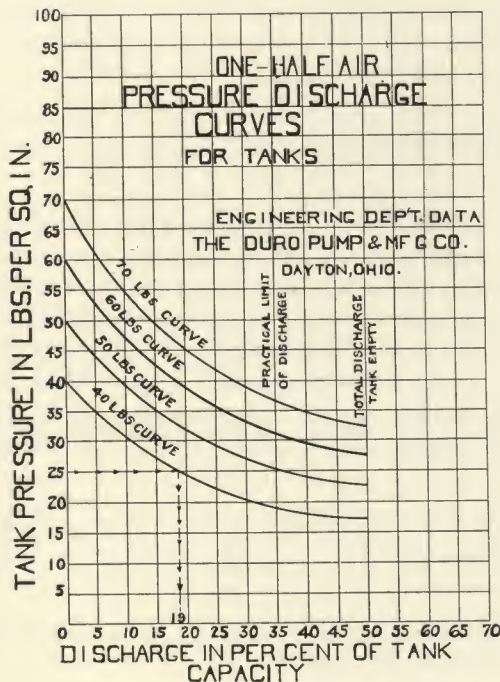
- 2 lbs. per 100 ft. for 500 ft. or less of pipe.
- 1 lb. per 100 ft. from 500 to 1000 ft. of pipe.
- $\frac{1}{2}$ lb. per 100 ft. from 1000 to 2000 ft. of pipe.

Disch. in gals. per min.	DIAMETER OF PIPE IN INCHES													
	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	
0.5	7.8													
1	28.0	6.4	2.1											
2	103.0	23.3	7.4	1.9										
3		49.0	15.8	4.1	1.26									
4			27.0	7.0	2.14	0.57	0.26							
5				41.0	10.5	3.25	.84	.40						
6					14.7	4.55	1.20	.56	0.20					
8					25.0	7.8	2.03	.95	.33	0.11				
10					38.0	11.7	3.05	1.43	.50	.17				
12						16.4	4.3	2.01	.70	.24				
14						22.0	5.7	2.68	.94	.32				
16						28.0	7.3	3.41	1.20	.41				
18							9.1	4.24	1.49	.50				
20							11.1	5.2	1.82	.61	0.25			
25							16.6	7.8	2.73	.92	.38	0.09		
30							23.5	11.0	3.84	1.29	.54	.13		
35								14.7	5.1	1.72	.71	.17		
40								18.8	6.6	2.20	.91	.22		
45								23.2	8.2	2.76	1.15	.28		
50									9.9	3.32	1.38	.34	0.11	
60									13.9	4.65	1.92	.47	.16	
70									18.4	6.2	2.57	.63	.21	
80									23.7	7.9	3.28	.81	.27	
90										9.8	4.08	1.00	.34	
100										12.0	4.96	1.22	.41	
120										16.8	7.0	1.71	.58	0.24
140										22.3	9.2	2.28	.76	.32
160											11.8	2.91	.98	.40
180											14.8	3.61	1.22	.50
200											17.8	4.4	1.48	.61
240											25.1	6.2	2.08	.86

Example

Eight gallons per minute (480 gallons per hour) through a 100 ft. length of 1" pipe shows 7.8 feet of friction loss. This divided by 2 equals 3.9 pounds. As 2 pounds is the limit of friction permissible per 100 ft. a larger pipe should be used.

Tank Discharge Between Pressures



The accompanying curves can be used to determine the amount of water discharged between various tank pressures for any size of Duro pressure tank.

Initial conditions, however, should be approximately true. The water level in all cases should be $\frac{1}{2}$ the tank height. For instance, in using the 40 lbs. curve, the tank should be one-half full of air when the tank pressure is 40 lbs.

Example: With a 30 gallon tank, what is the discharge in gallons, between tank pressures of 40 lbs. and 25 lbs., when at 40 lbs. water level is approximately one-half tank height?

See 40-lb. curve, and, at point where the 25 lbs. line crosses the curve read 19.0% below. With a 30 gallon tank, for example, discharge in gallons can be found as follows:

$$= 19.0\% \times 30 = 5.7 \text{ gallons discharged between 40 lbs. and 25 lbs.}$$

With a 120 gallon tank, the discharge would be

$$= 19.0\% \times 120 = 23.0 \text{ gallons, etc.}$$

Note—Duro Pressure Tanks are furnished standard for one-half air and one-half water, to insure more discharge capacity with smaller tanks. When figuring competitively with other makes using $\frac{1}{3}$ air and $\frac{2}{3}$ water, do not overlook the fact that a Duro Tank has greater discharge in gallons between pressures, which is a distinct sales advantage.

DURO "Super-Tested" Tanks

[Bare Tanks Only]

Duro "Super-tested" tanks are supplied either black or galvanized. When ordering be sure to specify which you desire.

Duro manufactures its own tanks and, therefore, is able to build a superior product at a consistently low price.

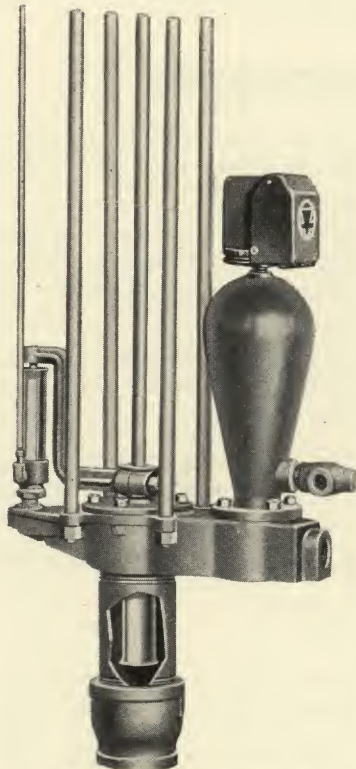
Size No.	Capacity	Remarks
A	40	Be sure to specify whether black or galvanized.
B	80	For prices, see Price Sheet.
C	120	Upon application, we will be glad to quote prices on larger
D	220	sized tanks.
F	315	The 1000 gallon tanks are furnished 48 in. diameter by 10
H	525	ft. long.
K	1000	For prices on 42 in. x 14 ft., 1000 gallon tanks, write factory.

How To Order—If bare tank only is wanted, order by letter, such as: "One (1) Style "A" 40 gallon galvanized (or black) tank." If fittings and gauges are wanted with tank, order as follows: "One (1) Style "A" 40 gallon galvanized (or black) tank, with fittings and gauges for No. System." In ordering be sure tank will go through basement opening.

Note—Tanks of 525 gallon capacity furnished Horizontal unless otherwise specified. Tanks 315 gallon capacity and smaller furnished Vertical unless ordered otherwise.

DURO Frost-Proof Set-Length

[Patented]



Frost-Proof Set-Length

Deep Well pumps must be placed directly over the well, and unless the pump is put in a frost-proof pit it is necessary to use the "DURO" Patented Frost-proof Set-Length to prevent freezing.

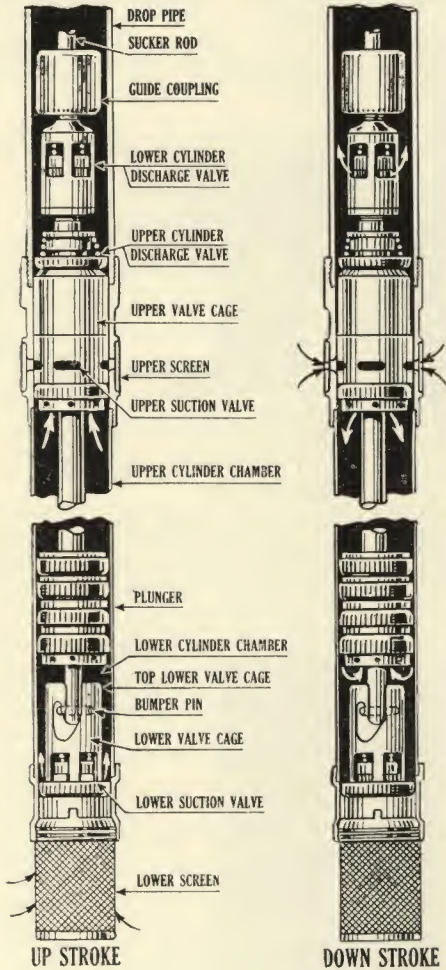
The "Duro" Frost-proof Set-Length is provided so that the deep well power head can be set on top of the ground and the discharge connections taken from below the frost line.

You will note from the illustration that the air pump is placed on the Frost-proof Set-length. This is done to eliminate an air tube connection from the air pump to the discharge line. This is an exclusive "Duro" Patented feature. If the air pump was placed on the power head on the surface of the ground there would be an air tube required running from the air pump to the discharge line in the Frost-Proof Set-Length. This air tube would become filled with water and in cold weather freeze, defeating the purpose of a Frost-proof Set-Length. The Duro therefore is a very decided improvement.

Regular length of the "Duro" Frost-proof Set-Length is 4 feet. However, it can be furnished any length desired. A charge is made for each additional foot over 4 feet.

"Duro" Frost-proof Set-Lengths are made for No. 900, 990, 3000 and 3200 Deep Well Pumps. For prices see price sheet.

Single and Double-Acting Cylinders



Double-Acting Cylinder

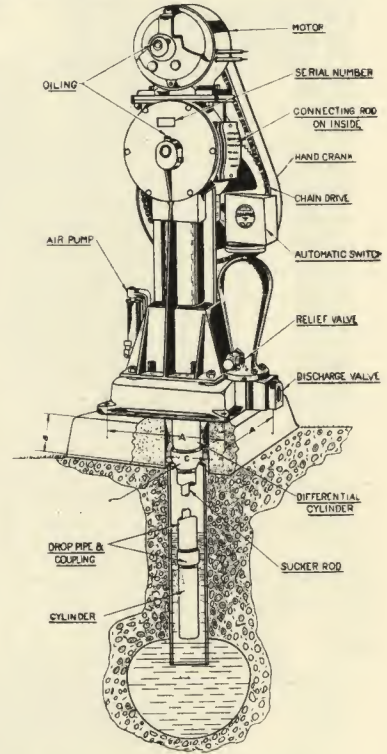
Patent Applied For

On The Up Stroke

water enters lower screen, and through lower suction valve (which is wedged into the cylinder in the same way as a single-action cylinder) and into lower cylinder chamber. At the same time the water in the upper cylinder chamber is forced upward through the upper cylinder discharge valve and into the drop pipe.

On The Down Stroke

water enters the upper screen and fills the upper cylinder chamber and at the same time water in the lower cylinder chamber is forced up through the tobin bronze piston rod (which is a tube) and out the lower cylinder discharge valve into the drop pipe.



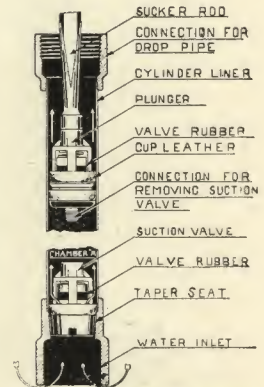
This shows the usual method of mounting a Deep Well Pump on foundation, and the arrangement of well casing and drop pipe.

Single-Acting Cylinders

To the right is shown detailed diagram of the Duro Single Acting Deep Well Cylinder. The lower cylinder cap will be tapped upon request when it is desired to use a suction screen.

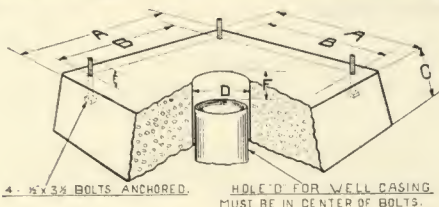
On the up stroke of the pump water is drawn into the Chamber "A" through the suction valve at the same time water above the plunger is being discharged.

On the down stroke the suction valve is closed and the water in the Chamber "A" is forced through the plunger valve into the drop pipe.



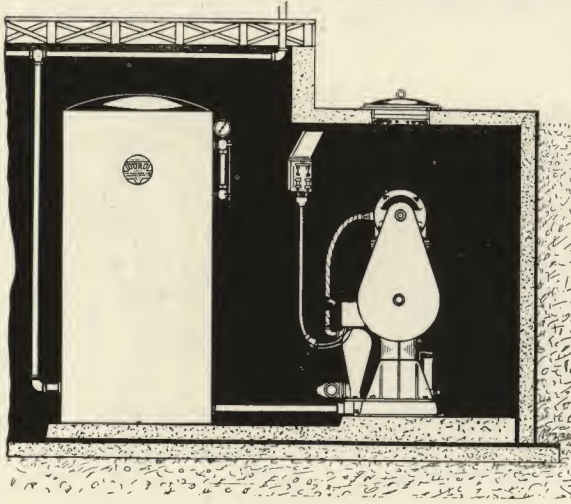
Single-Acting Cylinder Detail

Deep Well Pump Foundation Plans



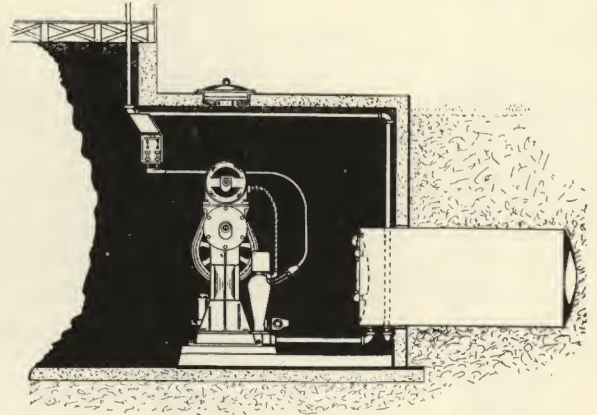
Pump	A	B	C	D	E	F
900	17"	11 1/4"	11"	4 1/2"	1 1/4"	11"
990	17"	11 1/4"	6"	6"	1 1/4"	1/4" above Foundation
3000	20"	14 1/4"	12"	6"	1 1/2"	11"
3200	20"	14 1/4"	6"	8"	1 1/2"	1/4" above Foundation

Deep Well Pump Data



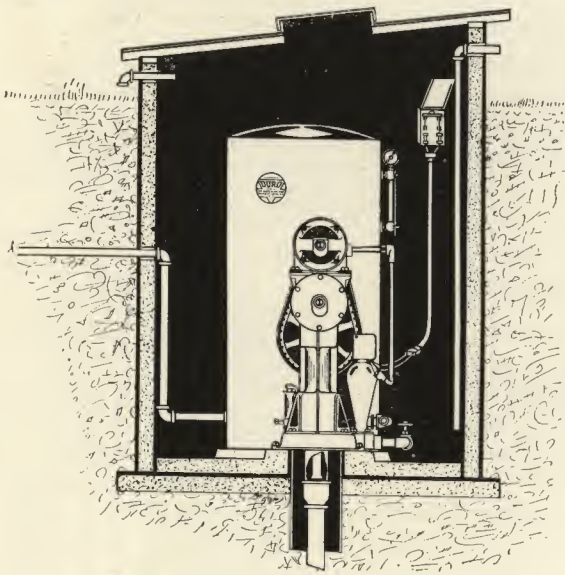
Plan No. 1

Installed in an extension of the house foundation, with a manhole, over center of pump, for withdrawing sucker rod or drop pipe. The tank in this case is shown in basement. This installation is a very desirable one.



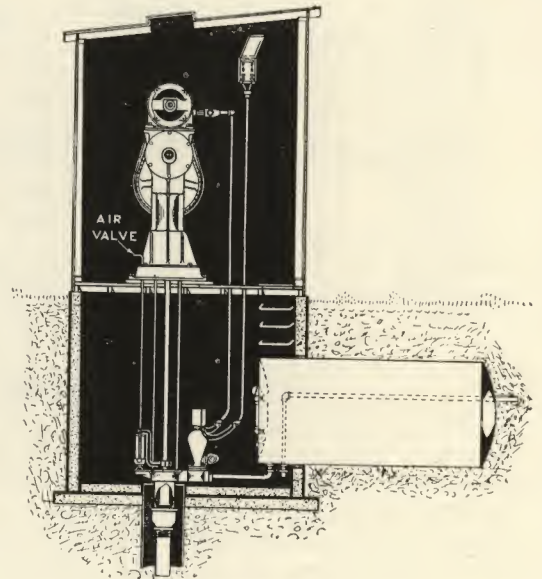
Plan No. 2

Plan No. 2 is similar to Plan No. 1 with the exception of the tank arrangement. Here the tank is buried in the ground and has the advantage of keeping the water cool. The tank, however, should be thoroughly painted to keep from corroding.



Plan No. 3

Similar to Nos. 1 and 2, except that the well is not located within the house foundation, due to different conditions, and is probably some distance from the house.



Plan No. 5

In this case an extension to the pump is made so the discharge pipe can be taken off below the frost line, so the pump is protected against freezing. Note use of frost-proof set-length.

Water-Proof Pit Construction

In order to make pits as nearly water-proof as possible, and to prevent seepage, we recommend the following method of construction:

1. Excavate 2 feet wider and longer than outside dimensions of pit.
2. Pour about three inches of concrete on complete bottom.
3. Coat top of bottom with tar thoroughly.

4. Set wall forms.
5. Pour Walls. Setting in any pipe first.
6. Coat outside of walls with tar thoroughly.
7. Pour 3 inches of concrete over tar on inside for floor.
8. Fill in dirt around walls.
9. Note drawing above. Tar makes a joint at bottom of walls and around well casing or any other pipe that goes through the walls.

Outstanding Achievements To Be Found Only In "World Famous" Duro Deep Well Pumps

They Have Made DURO Deep Well Pumps and Systems "The Standard of the World"

Lubrication—Perfect lubrication of the "piston type" cross-head is a Patented and exclusive Duro feature. Porous plugs in the cylindrical crosshead permit an even automatic oil flow. This feature is fool-proof and eliminates the possibility of excess lubrication.

Oiling—Each of the bearings (including the connecting rod) has its own oil reservoir with wool waste circulating system. This is an exclusive Duro feature eliminating troublesome grease cups with loss of lubrication through grease squeezing out. It eliminates manual lubrication as there are no grease cups.

Crank Shaft—The Duro one-piece, high-carbon, drop-forged ground steel crankshaft is of the center-throw type hung on two phosphor bronze bearings, insuring higher efficiency.

Frost-Proof—Another patented Duro feature is the frost-proof set-length. The power head may be installed on ground surface and the pump unit lowered below frost level. The feature which prevents freezing is that the air pump is lowered below the frost line, also eliminating the old trouble with so-called frost-proof set-lengths where water backs into air tube and freezes. No other set-length is strictly frost-proof. This eliminates driving arm breakage, common in other pumps. The Duro Air Pump will pump either air or water.

Differential—The Duro differential eliminates the necessity of the stuffing box. This principle results in an even motor load and an even flow of water, as it pumps on both up and down strokes. That's why Duro Deep Well Pumps are so quiet, and efficient.

Installation—Duro Deep Well Pumps are easy to install. Here are the operations:

- First—Hooking base to drop pipe.
 - Second—Hooking discharge line to base.
 - Third—Setting differential.
 - Fourth—Placing pump head on base and connecting sucker rod, and then bolting head to base with four bolts.
- Note that the heavy load is placed on base last.

Compactness—Duro Deep Well Pumps require very little room. They are easily gotten at from all sides. The motor is up high and away from all possible dampness. The square base permits setting pump head in any direction.

Completeness—Duro Deep Well Pumps are shipped complete with relief valve, check valve, air chamber assembled ready to install. Motor connections to switch are made at factory.

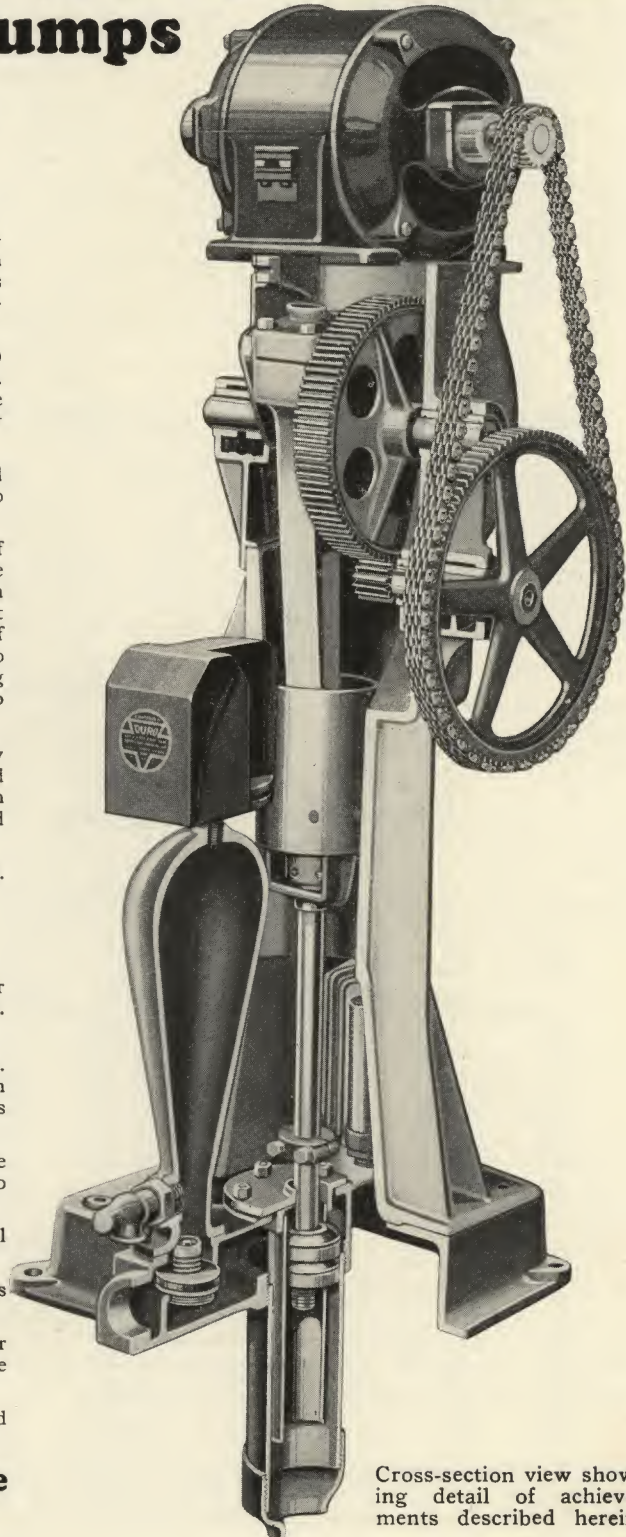
Chain Drive—The chain drive is standard on Duro Deep Well Pumps. There are no worm gears to reduce efficiency.

Adjustable—The connecting rod phosphor bronze bearings are adjustable.

Quiet—Duro construction eliminates noise. The plunger leathers are especially treated for long life and to minimize friction, thus preventing overload.

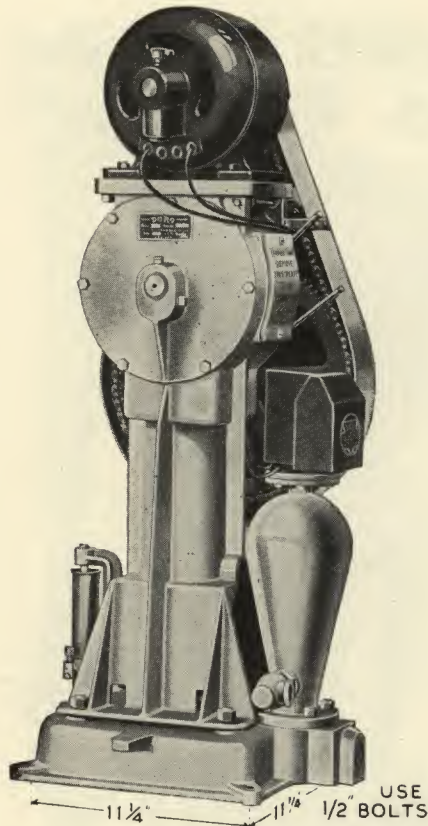
Safe—The pump mechanism is totally enclosed in one rigid casting, fully protected and guarded.

"When Better Deep Well Pumps Are Made DURO Will Make Them"



Cross-section view showing detail of achievements described herein.

No. 900 Deep Well Pump



Made in 18 sizes. Shipping Weight 260 pounds. Standard operating pressures. 25 to 40 pounds. Overall dimensions, 16x16 x36" high.

Its Use

Style 900 Pumps furnish city water service to suburban and country homes where electric current is available. They are suitable for wells when the depth to the water level ranges between 22 feet and 325 feet below the surface of the ground. See "Guide to the Selection of a Water System," for further information.

Method of Installation

It is recommended that "DURO" Deep Well Pumps be installed in frost-proof pump pits, with wooden tops. The correct size being about 4 x 4 feet, 5 to 8 feet deep, depending upon the geographical location. Full directions accompany each outfit. Ask for Deep Well Installation and Instruction Book.

Special Frost-Proof Outfits

"DURO" Deep Well Pumps can be equipped with a Frost-proof Set-Length so the Power Head can be set on top of the ground in a pump house, and the discharge connection taken from below the frost line. This Set-Length is extra. See accessories.

Special Features and Construction

Elsewhere may be found details of patented, exclusive features and superiorities of quality, construction and workmanship.

Specifications of No. 900 Deep Well Pumps

(With either Alternating or Direct Current Motors.)

Pumps With Open Type Well Cylinders

Size No.	Cap. per Hour Gals.	Smallest Dia. Well Cas. Cyl. Will Fit	Vertical Depth to Water	Size of Motor	Size of Open Type Cylinder	Size of Closed Type Cylinder	Kind and Size of Sucker Rod	Inside Diameter Drop Pipe	Size Disch. Pipe for 1st 100'
902	100	3 "	50'	1/4 HP	1 13/16"	----	1 1/8" Wood	2 "	3/4"
931	170	3 "	80'	1/3 HP	1 13/16"	----	1 1/8" Wood	2 "	3/4"
941	165	3 "	160'	1/2 HP	1 13/16"	----	1 1/8" Wood	2 "	3/4"
942	130	3 "	300'	3/4 HP	1 13/16"	----	1 1/8" Wood	2 "	3/4"
950	225	3 1/2"	40'	1/3 HP	2 1/4"	----	1 1/8" Wood	2 1/2"	1 "
961	280	3 1/2"	80'	1/2 HP	2 1/4"	----	1 1/8" Wood	2 1/2"	1 "
963	275	3 1/2"	160'	3/4 HP	2 1/4"	----	1 1/8" Wood	2 1/2"	1 "
971	325	4 1/4"	35'	1/2 HP	2 3/4"	----	1 5/8" Wood	3 "	1 "
973	400	4 1/4"	55'	3/4 HP	2 3/4"	----	1 5/8" Wood	3 "	1 "

Pumps With Closed Type Well Cylinders

905	100	2 "	50'	1/4 HP	----	1 13/16"	3/8" Pipe	1 "	3/4"
912	170	2 "	80'	1/3 HP	----	1 13/16"	3/8" Pipe	1 "	3/4"
921	165	2 "	160'	1/2 HP	----	1 13/16"	3/8" Pipe	1 "	3/4"
922	130	2 "	300'	3/4 HP	----	1 13/16"	3/8" Pipe	1 "	3/4"
952	225	2 1/2"	40'	1/3 HP	----	2 1/4"	1 1/8" Wood	1 1/2"	1 "
984	280	2 1/2"	80'	1/2 HP	----	2 1/4"	1 1/8" Wood	1 1/2"	1 "
985	275	2 1/2"	160'	3/4 HP	----	2 1/4"	1 1/8" Wood	1 1/2"	1 "
983	325	3 "	35'	1/2 HP	----	2 3/4"	1 1/8" Wood	2 "	1 "
986	400	3 "	55'	3/4 HP	----	2 3/4"	1 1/8" Wood	2 "	1 "

Note—See price sheet for odd cycle A. C. Motors. Sucker Rod and Drop Pipe Extra.

Note—Eureka cylinders of same diameter and capacity can be furnished to enter casings the same diameter as for the closed type cylinders.

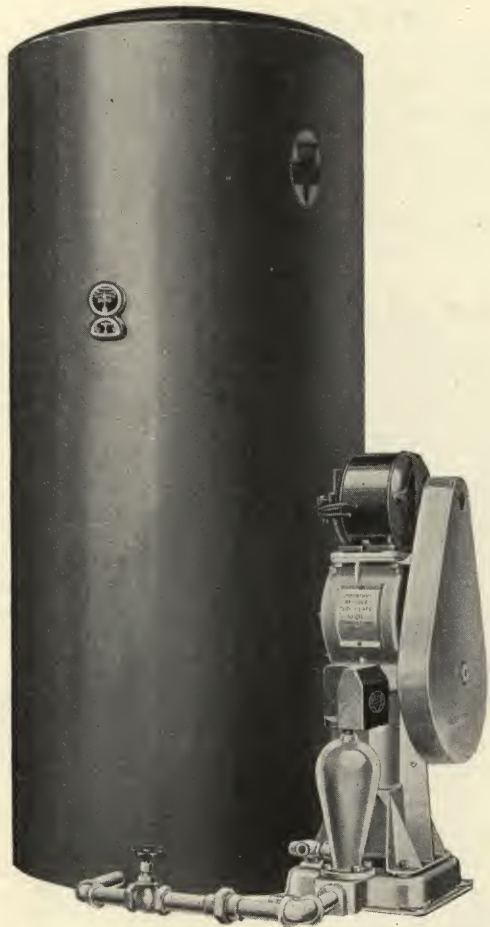
No. 900 Deep Well System

Its Use

Style 900 "DURO" Automatic Electric Deep Well Systems were designed especially for use in the average size suburban or country home for supplying water for all general purposes from wells where the depth to water level ranges from 22 to 325 feet. In selecting a "DURO" system, see "Guide to the Selection of a Water System."

Arrangement

"DURO" Deep Well Systems are arranged in the most convenient way possible. The connections between the Automatic Switch, Air Compressor and Motor are all made or provided for, and every part of the entire system is easily accessible, and every detail taken care of from a convenience standpoint. The automatic switch is set to start the pump at 25 pounds and stop at 40 pounds. For open tank use "DURO" Float Switch No. 1701, shown on accessory page.



This illustrates the 900 System which includes 900 Style Pump shown on opposite page, and Tank and Accessories listed below.

Complete System Includes

- 1—No. 900 "DURO" Automatic Deep Well Pump complete with single-acting cylinder.
- 1—"DURO" Heavy Gauge Pressure Tank.
- 1—Combined Water and Pressure Indicator.
- 1—"DURO" Relief Valve.
- 1—High Grade Gate Valve.

Note—Drop Pipe and Sucker Rod are extra. See Price Sheet.

How to Order Systems

Important —In ordering Complete Systems it is first necessary to select size Deep Well Pump wanted as listed on opposite page and then the size tank listed below, either Black or Galvanized. Then order by number such as No. 930 pump with C-9 (galvanized or black) tank or No. 910 pump with C-9 (galvanized or black) tank, for example. If Direct Current, what voltage? If Alternating Current, what voltage, cycles and phase? Also, specify the depth to lowest water level, and diameter of well casing.

Tanks and Accessories for No. 900 Deep Well Pumps

(Includes Combination Water and Pressure Gauge and Gate Valve)

Size of Tank and Accessories	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of Tank
A-9	42 gals.	16x48	22x38x52	115 lbs.
B-9	80 gals.	20x60	22x42x64	165 lbs.
C-9	120 gals.	24x60	30x46x64	215 lbs.
D-9	220 gals.	30x72	36x52x76	415 lbs.
E-9	315 gals.	36x72	42x58x76	490 lbs.
H-9	525 gals.	36x120(Horz.)	120x58x40	790 lbs.

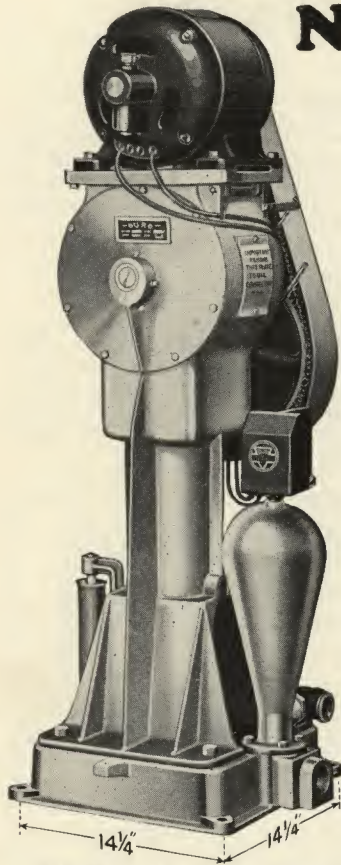
All tanks 72 inches or less in length are furnished vertical unless otherwise ordered. Tanks over 72 inches in length are furnished horizontal. Specify whether black or galvanized. Larger sized tanks quoted upon application.

Operating Costs

10c per 1000 gallons with current at 10c per Kw. hour, which is less than the average cost of city water.

Fresh Drinking Water—See Fresh Water Valves, on accessory pages.

No. 3000 Deep Well Pump



Made in sixteen sizes. Shipping weight approximately 500 lbs.
Operating Pressures, 25 to 40 lbs. Over All Dimensions of Pumps, 19 x 19 x 50" High.

Its Use

No. 3000 Deep Well Pumps furnish an abundance of fresh, running water under strong pressure, to farms, suburban homes, country estates, large buildings, country clubs, schools and institutions where a large amount of water is required. They are for wells ranging in depth from 22 feet to 500 feet below the surface of the ground.

Pump capacities range from 233 gallons of water per hour at 500-foot depth to 1143 gallons at 35-foot depth.

Method of Installation

It is recommended that "DURO" Deep Well Pumps be installed in frost-proof pump pits, with wooden tops, the correct size being about 6 x 6 ft., 5 to 8 feet deep, depending upon the geographical location.

Special Frost-Proof Outfits

"DURO" Deep Well Pumps can be equipped with a Frost-proof Set-Length so the Power Head can be set on top of the ground in a pump house, and the discharge connection taken from below the frost line. This Set-Length is extra. See page on accessories.

Special Features and Construction

Elsewhere may be found details of patented, exclusive features; and superiorities of quality, construction, and workmanship.

Note—See price sheet for odd cycle A. C. Motors. Sucker rod and drop pipe extra.

Specifications of No. 3000 Deep Well Pumps (With Alternating Current Motors.)

Pumps With Open Type Well Cylinders

Size No.	Cap. per Hour Gals.	Smallest Dia. Well Cas. Cyl. Will Fit	Vertical Depth to Water	Size of Motor	Size of Open Type Cylinder	Size of Closed Type Cylinder	Kind and Size of Sucker Rod	Inside Diameter Drop Pipe	Size Disch. Pipe for 1st 100'
3005	233	3 "	300'	1 HP	1 13/16 "	----	1 1/8 " Wood	2 "	1 "
3010	233	3 "	500'	1 1/2 HP	1 13/16 "	----	1 1/8 " Wood	2 "	1 "
3015	350	3 1/2 "	150'	1 HP	2 1/4 "	----	1 5/8 " Wood	2 1/2 "	1 "
3020	350	3 1/2 "	275'	1 1/2 HP	2 1/4 "	----	1 5/8 " Wood	2 1/2 "	1 1/4 "
3025	525	4 1/4 "	75'	1 HP	2 3/4 "	----	1 5/8 " Wood	3 "	1 1/4 "
3030	525	4 1/4 "	125'	1 1/2 HP	2 3/4 "	----	1 5/8 " Wood	3 "	1 1/4 "
3035	735	4 3/4 "	40'	1 HP	3 1/4 "	----	1 7/8 " Wood	3 1/2 "	1 1/4 "
3040	735	4 3/4 "	75'	1 1/2 HP	3 1/4 "	----	1 7/8 " Wood	3 1/2 "	1 1/4 "
3045	980	5 5/8 "	40'	1 1/2 HP	3 3/4 "	----	1 7/8 " Wood	4 "	1 1/2 "

Pumps With Closed Type Well Cylinders

3060	525	3 "	75'	1 HP	----	2 3/4 "	1 1/8 " Wood	2 "	1 1/4 "
3065	525	3 "	125'	1 1/2 HP	----	2 3/4 "	1 1/8 " Wood	2 "	1 1/4 "
3070	642	3 1/2 "	50'	1 HP	----	3 "	1 1/8 " Wood	2 "	1 1/4 "
3075	642	3 1/2 "	100'	1 1/2 HP	----	3 "	1 1/8 " Wood	2 "	1 1/4 "
3080	873	4 "	35'	1 HP	----	3 1/2 "	1 5/8 " Wood	2 1/2 "	1 1/4 "
3085	873	4 "	65'	1 1/2 HP	----	3 1/2 "	1 5/8 " Wood	2 1/2 "	1 1/4 "
3090	1143	4 1/2 "	35'	1 1/2 HP	----	4 "	1 7/8 " Wood	3 "	1 1/2 "

Style 3000 Deep Well System

Its Use

Style No. 3000 "DURO" Automatic Electric Deep Well Systems are for the larger suburban or farm homes where large quantities of water are desired for watering stock, sprinkling, etc. They will pump water from deep wells where the depth to water level ranges from 22 to 500 feet.

In selecting a "DURO" system, see "Guide to the Selection of a Water System."

Arrangement

"DURO" Deep Well Systems are arranged in the most convenient way possible. The connections between the Automatic Switch, Air Compressor and Motor are all made or provided for and every part of the entire system is easily accessible, and every detail taken care of from a convenience standpoint. The automatic switch is set to start the pump at 25 pounds and stop at 40 pounds.

Complete System Includes

- 1—No. 3000 "DURO" Automatic Deep Well Pump complete with single-acting cylinder.
- 1—"DURO" Heavy Gauge Pressure Tank.
- 1—Combined Water and Pressure Indicator.
- 1—Duro Relief Valve
- 1—High Grade Gate Valve.

Note—Drop Pipe and Sucker Rod are extra. See Price List.

How To Order Systems

Important—In ordering Complete Systems it is first necessary to select size Deep Well Pump wanted as listed on opposite page, and then the size tank listed below, either Black or Galvanized. Then order by number such as No. 3020 pump with D-3 (galvanized or black) tank or, 3025 pump with E-3 (galvanized or black) tank, for example. If Direct Current, what voltage? If Alternating Current, what voltage, cycles and phase? Also specify the depth to lowest water level, and diameter of well casing.

Cost of Operation

10c per 1000 gallons with current at 10c per Kw. hour, which is less than the average cost of city water.

Tanks and Accessories for No. 3000 Deep Well Pumps

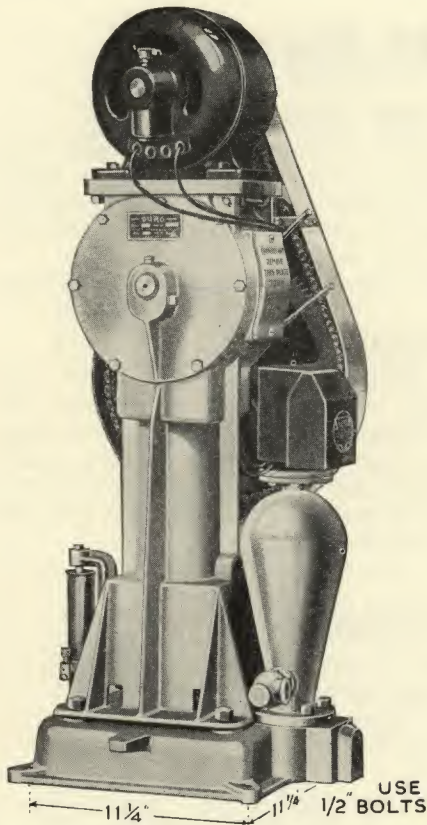
Includes Combination Water and Pressure Gauge and Gate Valve.

Size of Tank and Accessories	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Wt., comp. System
C-3	120 gals.	24x60	30x50x64	700 lbs.
D-3	220 gals.	30x72	36x56x76	900 lbs.
E-3	315 gals.	36x72	42x62x76	1000 lbs.
H-3	525 gals.	36x120(horz.)	120x62x40	1250 lbs.

All tanks 72 inches or less in length are furnished vertical unless otherwise ordered. Tanks over 72 inches in length are furnished horizontal. Specify whether black or galvanized. Larger sized tanks quoted upon application.

No. 990 "Steadiflo" Deep Well Pumps

(With Double-Acting Cylinders)



Made in 21 sizes. Shipping Weight 260 lbs. Operating pressures, 25 to 40 lbs. Overall dimensions, 16" wide, 16" deep, 36" high.

Its Use

No. 990 "Steadiflo" Deep Well Pumps are guaranteed to furnish the equivalent of city water service to large suburban and country homes, small truck farms, office buildings, hotels, country clubs, dairies and greenhouses, where more than the average amount of water is required. They are designed to draw water in very liberal quantities from deep wells where the depth to the water level ranges between 22 feet and 150 feet below the surface of the ground. Fire protection is also afforded by these Deep Well Systems.

Method of Installation

It is recommended that "Duro" Deep Well Pumps be installed in frost-proof pump pits. The correct size is about 4 x 4 feet, 5 to 8 ft. deep, depending upon the geographical location. Full instructions accompany each outfit.

Special Frost-Proof Outfits

"DURO" Deep Well Pumps can be equipped with a Frost-proof Set-Length so the Power Head can be set on top of the ground in a pump house, and the discharge connection taken from below the frost line. This Set-Length is extra. See price sheet.

Special Features

Elsewhere may be found details of patented, exclusive features, and superiorities of quality, construction and workmanship.

Specifications of No. 990 "Steadiflo" Deep Well Pumps

Size No.	Cap. per Hour Gals.	Smallest Dia. Well Cas. Cyl. Will Fit	Vertical Depth to Water	Size of Motor	Size of Open Type Cylinder	Inside Diameter Drop Pipe	Size Disch. Pipe for 1st 100'	Kind and Size of Sucker Rod	Size of Couplings
991	370	3 1/2"	75'	3/4 HP	2 1/4"	2 1/2"	1 "	3/4" W.I. Pipe	3/4 x 2 1/2"
992	360	3 1/2"	150'	1 HP	2 1/4"	2 1/2"	1 "	3/4" W.I. Pipe	3/4 x 2 1/2"
993	565	4 1/4"	60'	1 HP	2 3/4"	3 "	1 1/4"	3/4" W.I. Pipe	3/4 x 3 "

Note—Shipping weight of Style No. 990 Pumps, approximately 260 lbs.

Above prices cover pump complete with cylinder and with A. C. motor; and automatic pressure controller.

For odd cycle and D.C. motors see price sheet.

Drop Pipe, Sucker Rod, special sucker rod guide couplings and special sucker rod guides are extra. See price sheet.

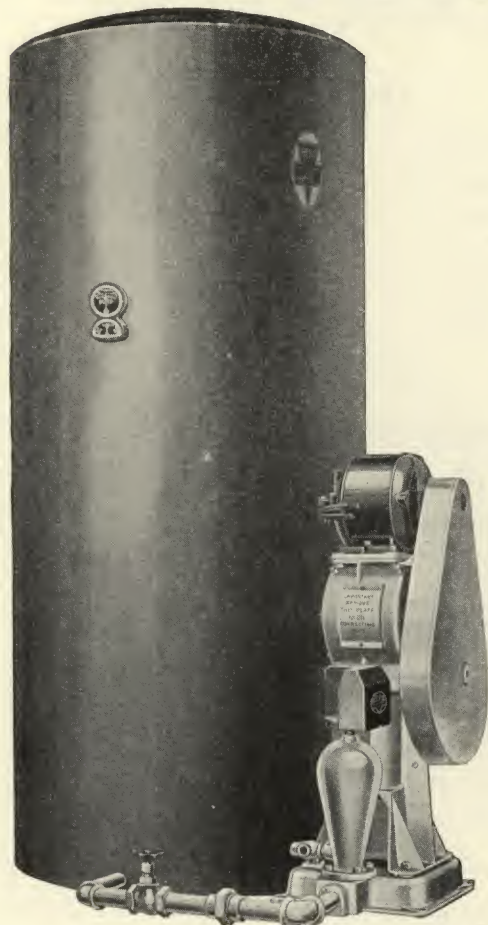
Cost of Operation

10c per 1000 gallons where the rate is 10c per Kw. hour, which is less than average cost of city water.

In Ordering

Specify size pump wanted, depth to lowest water level and diameter of well casing. Also give voltage if Direct Current. If alternating Current, give voltage and cycles.

Style 990 Deep Well Pumping System



This illustrates the 990 System which includes 990 "Steadiflo" Pump shown on opposite page, and tank and accessories listed below.

Its Use

Style 990 Duro "Steadiflo" Automatic, Electric, Deep Well Systems were designed especially for use in the average size suburban or country home for supplying an abundance of water for all general purposes from wells where the depth to water level ranges from 22 to 150 feet. In selecting a "DURO" system, see "Guide to the Selection of a Deep Well System."

Arrangement

"DURO" Deep Well Systems are arranged in the most convenient way possible. The connections between the Automatic Switch, Air Compressor and Motor are all made or provided for, and every part of the entire system is easily accessible, and every detail taken care of from a convenience standpoint. The automatic switch is set to start the pump at 25 pounds and stop at 40 pounds.

Complete System Includes

- 1—No. 990 Duro "Steadiflo" Automatic Deep Well Pump complete with cylinder as listed on opposite page.
- 1—"DURO" Heavy Gauge Pressure Indicator
- 1—Combined Water and Pressure Gauge.
- 1—Duro Relief Valve.
- 1—High Grade Gate Valve.

Note—Drop Pipe and Sucker Rod are extra. See Price Sheet.

How to Order Systems

(System includes Pump, Tank, Gauges and Gate Valve.)

Important—In ordering complete systems it is first necessary to select size Deep Well Pump wanted as listed below and then the size tank listed, either Black or Galvanized. Then order by number such as No. 991 Pump with C-99 (galvanized or black) tank.

Also specify depth to lowest water level and diameter of well casing. Also, give voltage if Direct Current. If Alternating Current, give voltage, phase and cycles.

Operating Cost—10c per 1000 gallons with current at 10c per Kw. hour, which is less than average cost of city water.

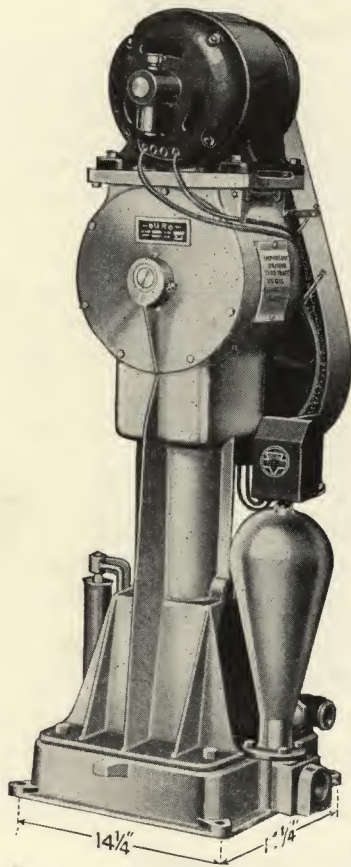
Tanks and Accessories for No. 990 Deep Well Pumps

(Includes Combination Water and Pressure Gauge and 1" Gate Valve.)

For Style 990	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of Tank
A-99	42 gals.	16x48	22x38x52	80 lbs.
B-99	80 gals.	20x60	22x42x64	135 lbs.
C-99	120 gals.	24x60	30x50x64	195 lbs.
D-99	220 gals.	30x72	36x56x76	400 lbs.
E-99	315 gals.	36x72	42x62x76	460 lbs.
H-99	525 gals.	36x120	120x62x40	750 lbs.

All tanks 72 inches or less in length are furnished vertical unless otherwise ordered. Specify whether black or galvanized. Tanks over 72 inches in length are furnished horizontal. Prices of larger sized tanks furnished upon request.

No. 3200 "Steadiflo" Super-Deep Well Pump (With double acting cylinder)



Made in sixteen sizes. Shipping weight approximately 500 lbs.
Operating pressures, 25 to 40 lbs. Over all dimensions, 19 x 19 x 59" high.

Its Use

No. 3200 "Steadiflo" Deep Well Pumps were designed particularly for use where very large quantities of water are required, as in hotels, hospitals, apartment houses, factories, office buildings, large country clubs, estates, large farms dairies, greenhouses and buildings housing swimming pools. They are guaranteed to pump water in very liberal quantities from deep wells where the depth to the water level ranges from 22 feet to 320 feet below the surface of the ground, at a very low cost. Fire protection is also afforded by these deep well systems.

Method of Installation

It is recommended that "DURO" Deep Well Pumps be installed in frost-proof pump pits. The correct size is about 6 x 6 feet, 5 to 8 feet deep, depending upon the geographical location. Full instructions accompany each outfit.

Special Features

Elsewhere may be found details of patented, exclusive features, and superiorities of quality, construction and workmanship.

Operation Cost

10 cents per 1000 gallons with current at 10 cents per Kw. hour, which is less than the average cost of city water.

In Ordering

Specify size pump wanted, depth to lowest water level and diameter of well casing. Also give voltage if Direct Current. If Alternating Current give voltage and cycles.

Specifications of No. 3200 "Steadiflo" Super-Deep Well Pumps

Size No.	Cap. per Hour Gals.	Smallest Dia. Well Cas. Will Fit	Vertical Depth to Water	Size of Motor	Size of Open Type Cylinder	Inside Diameter Drop Pipe	Size Disch. Pipe for 1st 100'	Kind and Size of Sucker Rod	Size of Guide Couplings
3201	630	3 1/2"	50'	1 HP	2 1/4"	2 1/2"	1 1/4"	3/4" W.I. Pipe	3/4"x2 1/2"
3202	610	3 1/2"	150'	1 1/2 HP	2 1/4"	2 1/2"	1 1/4"	3/4" W.I. Pipe	3/4"x2 1/2"
3203	580	3 1/2"	260'	2 HP	2 1/4"	2 1/2"	1 1/4"	3/4" W.I. Pipe	3/4"x2 1/2"
3204	905	4 1/4"	75'	1 1/2 HP	2 3/4"	3 "	1 1/4"	3/4" W.I. Pipe	3/4"x3 "
3205	875	4 1/4"	160'	2 HP	2 3/4"	3 "	1 1/4"	3/4" W.I. Pipe	3/4"x3 "
3206	825	4 1/4"	320'	3 HP	2 3/4"	3 "	1 1/4"	1 " W.I. Pipe	1 "x3 "
3207	1250	4 3/4"	85'	2 HP	3 1/4"	3 1/2"	1 1/2"	1 " W.I. Pipe	1 "x3 1/2"
3208	1200	4 3/4"	200'	3 HP	3 1/4"	3 1/2"	1 1/2"	1 " W.I. Pipe	1 "x3 1/2"
3209	1700	5 5/8"	125'	3 HP	3 3/4"	4 "	2 "	1 1/4" W.I. Pipe	1 1/4"x4 "
3210	2100	6 "	80'	3 HP	4 1/4"	4 1/2"	2 "	1 1/4" W.I. Pipe	1 1/4"x4 1/2"

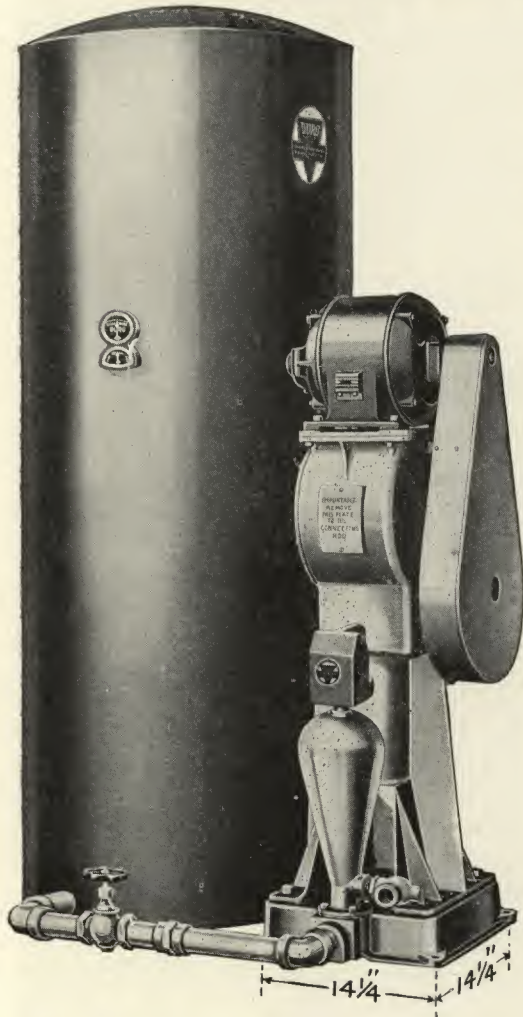
The No. 3210 is Special. Base must be removed to pull sucker rod and plunger. Opening in base is tapped 4 inches. Shipping weight, Style No. 3200 pump, approximately 500 lbs.

Above prices cover pump complete with cylinder, A. C. Motor, automatic pressure controller, chain drive, air pump and relief valve. For odd cycle and D. C. motors, see price sheet.

Sucker Rod, Drop Pipe, special Sucker Rod Guide Couplings and special Sucker Rod Guides are extra. See price sheet.

Note—Sizes 3207-8-9 and 10 are furnished with a separate check valve instead of supplying the check valve in the base.

Style 3200 Deep Well System



This illustrates the 3200 System which includes 3200 "Steadiflo" Pump shown on opposite page, and tank and accessories listed below.

Its Use

Style 3200 Duro "Steadiflo" Automatic Electric Deep Well Systems are for the larger suburban or farm homes, dairies, institutions, country clubs, greenhouses, etc., where large quantities of water are required. They will pump water from deep wells where the depth to water level ranges from 22 to 320 feet below the surface of the ground. They afford splendid fire protection.

Arrangement

"DURO" Deep Well Systems are arranged in the most convenient way possible. The connections between the Automatic Switch, Air Compressor and Motor are all made or provided for and every part of the entire system is easily accessible, and every detail taken care of from a convenience standpoint. The automatic switch is set to start the pump at 25 pounds and stop at 40 pounds.

Complete System Includes

- 1—No. 3200 Duro "Steadiflo" Automatic Super-Deep Well Pump complete with cylinder as listed on opposite page.
- 1—"DURO" Heavy Gauge Pressure Tank.
- 1—Combination Water and Pressure Indicator.
- 1—"DURO" Relief Valve.
- 1—High Grade Gate Valve.

Note—Drop Pipe and Sucker Rod are extra. See Price List.

How to Order Systems

(System includes Pump, Tank, Gauges and Gate Valve.)

In ordering complete systems it is first necessary to select size Deep Well Pump wanted (see opposite page) and then size tank listed, either Black, or Galvanized. Then order by number such as No. 3205 Pump with 32-D (black, or galvanized) tank, for example.

Important—Also specify depth to lowest water level and diameter of well casing. Also, give voltage if Direct Current. If Alternating Current give voltage, phase and cycles.

Tanks and Accessories for Above Deep Well Pumps

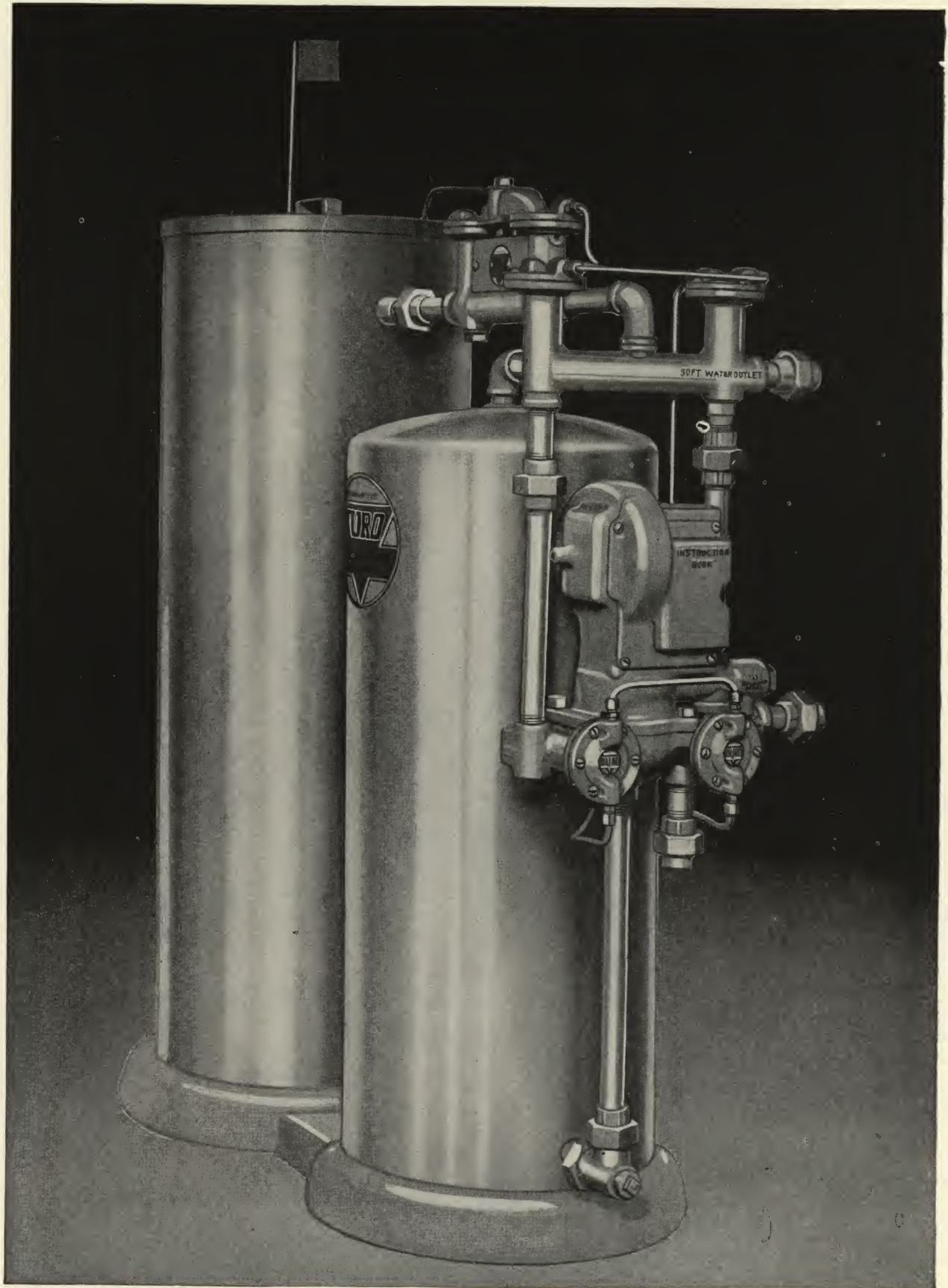
(Including Combination Water and Pressure Gauge and Gate Valve)

Size of Tank and Accessories	Capacity of Tank	Tank Dimensions, Inches, Dia.-Ht.	Overall Dimensions, Inches, Wth.-Dth.-Ht.	Shipping Weight of Tanks
32-C	120 gals.	24x60	30x50x64	195 lbs.
32-D	220 gals.	30x72	36x56x76	400 lbs.
32-E	315 gals.	36x72	42x62x76	460 lbs.
32-H	525 gals.	36x120	120x62x40	750 lbs.
32-K	1000 gals.	48x120	120x70x52	1750 lbs.

All tanks 72 inches or less in length are furnished vertical unless otherwise ordered. Tanks over 72 inches in length are furnished horizontal. Prices of larger sized tanks furnished upon request.

Cost of Operation—10c per 1000 gallons with current at 10c per Kw. hour, which is less than the average cost of city water.

The Duro Automatic Water Softener



It Obsoletes All Hand Operated Types

DURO Automatic Water Softeners

The greatest advent in the history of the plumbing business. The only household device we know of that does not add to the cost of living. Every month, like the rolling of a huge snowball, sales pass all previous records. Thousands of users in every hard water district testify to its steady, unfailing, automatic operation. Every softener backed by a written guarantee. Fully protected by patents, and patent applications.

What It Does

The Duro-Matic Softener, when connected in the city or well water line, softens city or well water perfectly. It operates automatically.

Easy To Install

Simply connect it in the city water line (unions are provided) and run a line to the floor drain. No muss—no bother. For old homes and new.

It is shipped completely assembled, ready to operate, making installation cost low.

Simplified Construction

The Hydraulic Valves and parts are manufactured with a precision unknown except in the production of the finest, accurate, high-grade mechanical products.

The valves themselves are duplicates of one another. There is very little possibility of service, in fact, much less than in the case of pumps and water systems.

Selecting Right Size

Three important things must be considered:

1. The average amount of water used weekly.
2. The heaviest rate of flow required.
3. Maximum usage during any one hour.

The average person will use about 15 gallons of softened water per day. If there are four people in the family the average daily requirements will be 60 gallons. Suppose the water is 18 grains hard. The chart below shows the AS-1 delivers 4230 gallons between salt fillings. This will supply the above family for a period of 70½ days, or approximately ten weeks.

Larger Homes

Where the family is unusually extravagant, and where there are servants and more than one bath, it is well to figure usage as high as 50 gallons per person per day.

Always be sure that the estimated time between salt fillings is six weeks or longer.

That the capacity in gallons per minute of the softener is sufficient to provide for maximum usage during any one hour.

That the softener is large enough to provide for the heaviest rate of flow required.

Specifications for DURO Automatic Softeners

Size	*Cap. in Gals. per Minute	Salt Req. per Refilling	Shipping Wt. Crated	Height-Width Length	Gallons capacity of softeners between salt fillings on water of various grains of hardness							
					10	12	14	16	18	20	22	24
AS-1	6	50	320	36x17x36	7880	6510	5530	4800	4230	3860	3400	3080
AS-2	10	100	395	46x17x37	15490	12830	10940	9530	8410	7520	6800	6200
AS-3	10	200	445	46x18x37	30980	25660	21880	19040	16820	15040	13600	12400
AS-4	16	200	540	46x18x42	31330	26050	22200	19390	17180	15390	13950	12710
					26	28	30	34	38	42	46	50
AS-1	6	50	320	36x17x36	2820	2600	2400	1920				
AS-2	10	100	395	46x17x37	5690	5250	4880	4250	3750	3350	3030	2750
AS-3	10	200	445	46x18x37	11380	10500	9760	8500	7500	6700	6060	5500
AS-4	16	200	540	46x18x42	11710	10820	10090	8840	7860	7060	6400	5850

*The above capacities in gallons per minute based on 50 lb. flowing city water pressure. All pipe connections are ¾ inch unions except on the AS-4, which are 1 inch unions.

A Word Regarding Hand-Operated Softeners

Like the hand-cranked automobile, the hand-operated softener is obsolete. However, there will always be a limited market for it. If there is such a market in your town, write for prices and folders on the Duro hand-operated type. Duro can furnish it at an extremely low price. We can frankly say that it is much better than any softeners of a similar nature. However, we do not think enough of ANY hand-operated softener to list it in this catalog.

It obsoletes all others. Hand-operated types now a thing of the past.

**FIVE
BASIC
SUPERIORITIES OF
DURO
AUTOMATIC WATER SOFTENERS**

Made by largest manufacturers of water systems and water softeners in the world.

①	②	③	④	⑤
PRINCIPLE	OPERATION	CONSTRUCTION	PERFORMANCE	GENERAL
<p>Hydraulic diaphragm Valve Principle.</p> <p>All water—both softened and that used in regenerating, is accurately measured.</p> <p>Full Automatic, it reconditions itself.</p> <p>Upward Softening—Downward Regeneration. Full use of mineral—no packing or channeling.</p> <p>The only softener automatically furnishing an unlimited supply of water at all times—including regenerating periods.</p> <p>Positive salt brine control—just the right amount of salt is used during regeneration.</p> <p>Zeolite Greensand Mineral used—the only mineral that can be efficiently used in automatic softening.</p>	<p>Self-operating—eliminates the human element.</p> <p>Valves operated by hydraulic pressure—not by water meter.</p> <p>Not limited to any certain city water pressure—operates equally well on any flowing pressure of from 15 to 125 pounds.</p> <p>Mineral particles constantly agitated, insuring high efficiency, greater capacities and lower operating cost.</p> <p>Quiet, positive, dependable—regardless of quantity of water used.</p> <p>During regeneration, salt brine cleanses mineral thoroughly, washing elements of hardness into sewer.</p>	<p>No restrictions or regulators stopping the flow of water.</p> <p>No salt brine or mineral can get into the house lines.</p> <p>All valve seats made of bronze.</p> <p>Rust and corrosion-resisting metals used throughout.</p> <p>Easily adjusted to correspond with hardness of water in any locality.</p> <p>All operating parts protected by strainer system.</p> <p>All working parts enclosed.</p> <p>Long life—should outlast many other plumbing fixtures.</p>	<p>Perfectly softened water supplied at city pressure.</p> <p>More softened water per pound of salt than any other domestic softener.</p> <p>More economical—delivers softened water at lower cost per 1000 gallons than any other domestic softener—hand-operated or automatic.</p> <p>Softens water perfectly, as fast as it can be drawn from fixtures.</p> <p>Insures water at all times—no cutting off supply while automatically regenerating.</p> <p>No inadequate, temporary, auxiliary pressure tank to water-log.</p>	<p>Easily installed—winter or summer—simply connect in city water line.</p> <p>Shipped completely assembled, ready to operate.</p> <p>Quick-acting Duro-lite mineral is used—proved, staple, non-deteriorating, non-caustic.</p> <p>Pure, clean rocksalt or pure, coarse Farmer's salt—less expensive than table salt—is used, although any pure salt may be used.</p> <p>Requires but small space.</p> <p>Your pure city or well water, delightfully softened, always free from discoloration.</p> <p>Fully covered by the Duro Guaranteed Bond</p>

— — ONLY IN THE DURO AUTOMATIC CAN THESE BASIC SUPERIORITIES BE HAD — —

Detailed Cross Section of the Famous Duro Automatic Water Softener

Showing A Masterpiece In Modern Engineering

A glance at the cross-sectional view is enough to convince most anyone familiar with fine construction that the DURO Automatic Softener is built right in every particular. Every small detail of construction is carefully worked out and manufactured with a precision unknown in most mechanical products.

Scores of inspections and tests insure that when the DURO Automatic Softener is installed in a home it will function properly from the beginning, and will render day-in and day-out service for years.

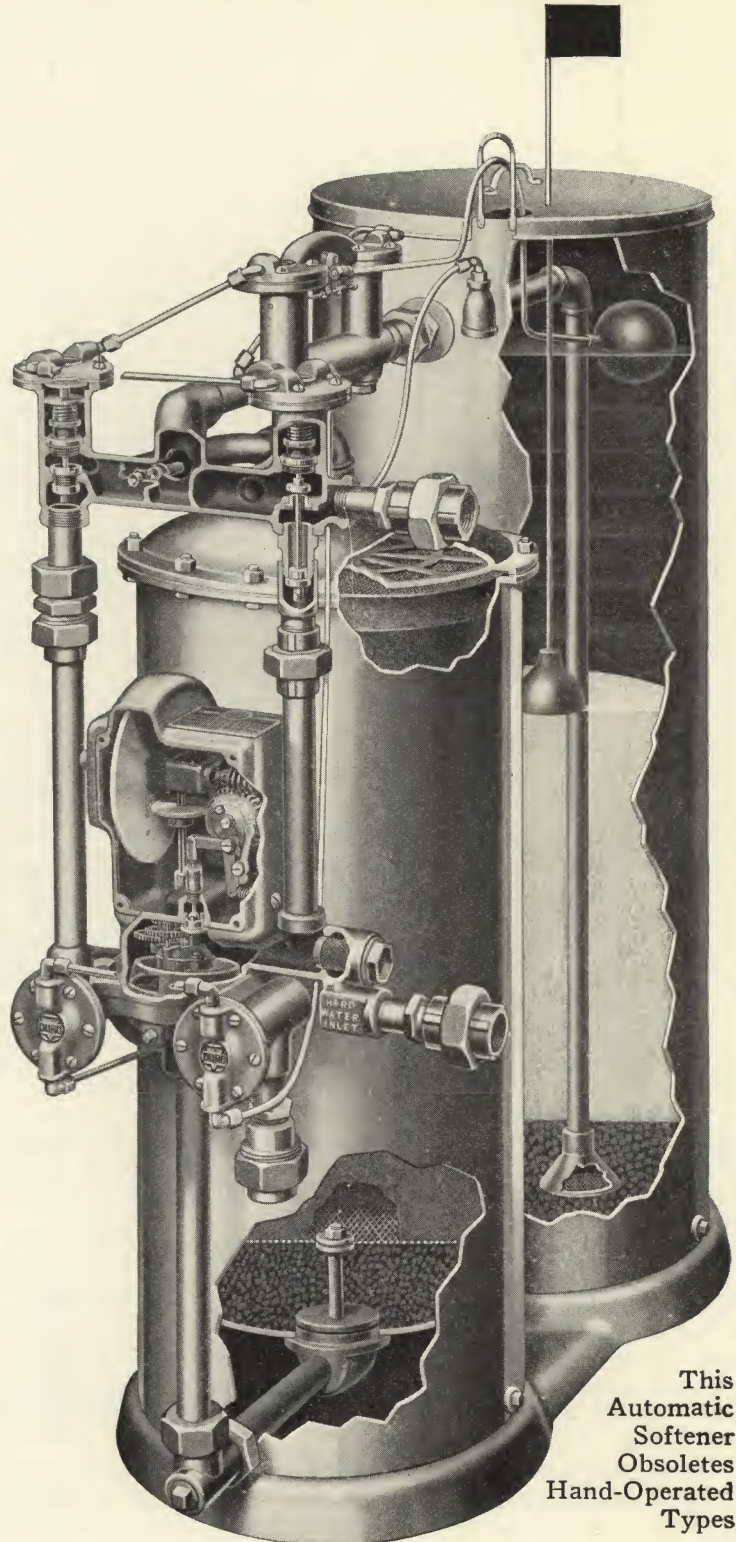
Simple Construction

After all, the Duro Softener is simplicity itself. There is no mystery about the operation once it is understood. The valves, of which there are six, are all of approximately the same construction and operate very similarly. When you know the detail of parts, and how one valve operates, then you can readily understand the operation of all of the other hydraulic valves.

A school is maintained for dealers at the Dayton, Ohio, plant, and occasionally schools are conducted in different parts of the country with the viewpoint of familiarizing every dealer with every detail of the automatic softener from an installation, sales and service standpoint.

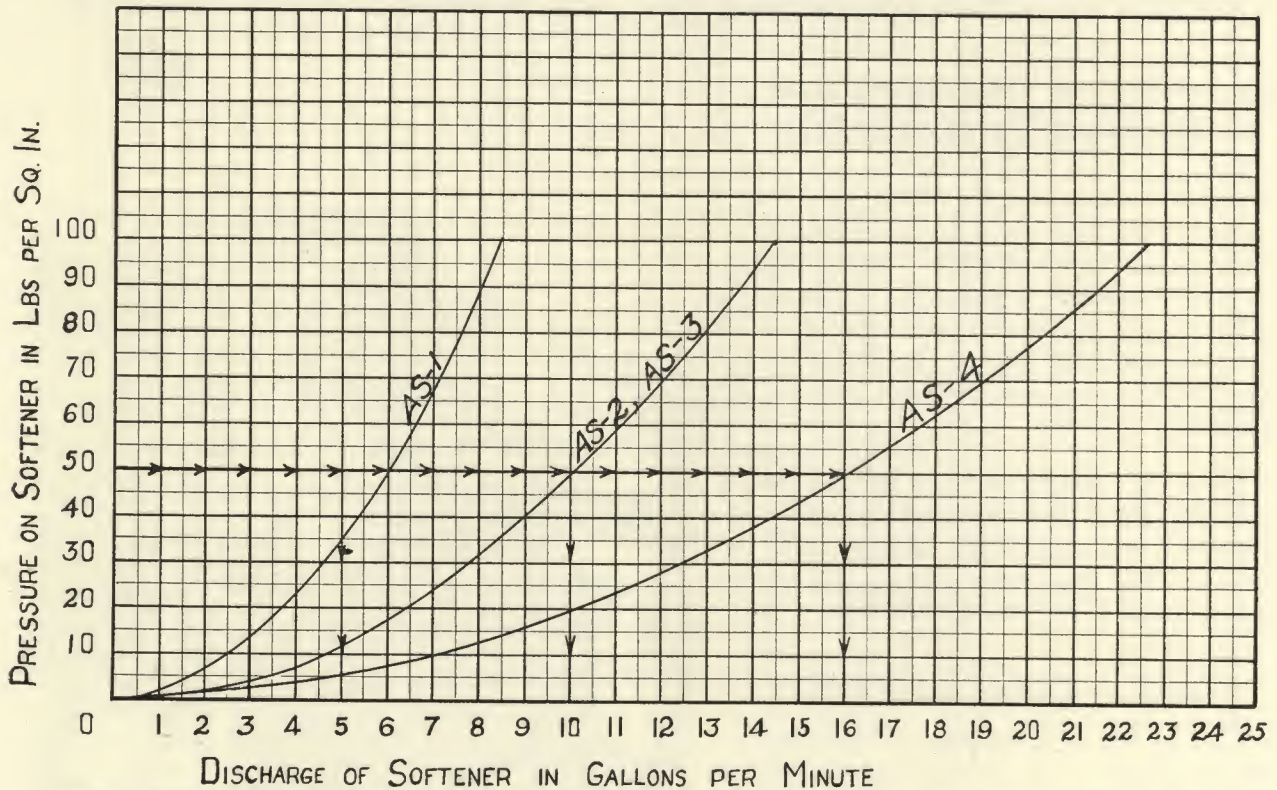
If you have not already attended one of these classes, write the Duro Company immediately, inquiring when the next one will be held in your vicinity.

Thousands of Enthusiastic Satisfied Users



This Automatic Softener Obsoletes Hand-Operated Types

Flow of Water On Varying Pressures



The above chart shows the possible rates of flow in Duro Automatic Softeners, on varying pressures. When in doubt always specify the next size softener.

The possible amount of water that can flow through a Duro Softener depends upon:

1. The main pressure.
2. The head on softener.
3. The size of the softener.
4. The friction of the piping.

Here is an example:

First—say you have a main pressure of 70 pounds. Second—the head to second story is 20 feet or 10 pounds. Third—you are figuring on an AS-2 size Softener, because its capacity between salt fillings on 20 grain water is 7520 gallons. Fourth—customer requires a 10 gallon per minute rate for two showers 50 feet away delivered through $\frac{3}{4}$ " piping.

From the friction table printed in the Pump Data Section you will find that 10 gallons a minute through 50 feet of $\frac{3}{4}$ " pipe will develop practically 10 pounds of friction. Therefore, 10 pounds head, plus 10 pounds pipe friction equals a total of 20 pounds. This deducted from 70 pounds main pressure leaves 50 pounds available pressure on softener.

Now note the curves at 50 pounds. An AS-2 or AS-3 will deliver 10 gallons per minute for the two showers.

Suppose in the above example the demand had been for a 12 gallons per minute rate instead of 10 gallons. The AS-2 or AS-3 would not have been able to deliver such a rate at the available pressure. (See curves.) As an AS-3 size is on the same curve, an AS-4 would then have to be recommended.

If this customer in the latter case, would have been willing to take less than a 12 gallon per minute rate for the showers an AS-2 or AS-3 would have been used, but the flow of water from the shower would have been restricted. In specifying a softener always figure the *Maximum demand in gallons at any single time*, as the rate of flow to determine the proper size of Softener.

As a matter of information by connecting a pressure gauge in the line at or near the point the Softener is to be installed and opening wide the fixture or fixtures which need the greatest amount of soft water, the pressure gauge will indicate the pressure which will be on the Softener. By this method the pipe friction and the head on the Softener will be taken care of automatically.

It is essential in specifying Softeners that you learn to use the above chart showing possible flow of water through Duro Automatic Softeners.

Selecting The Proper Size Softener

In the automatic water softener chart is shown a table of capacities in gallons of softened water between salt fillings on water of various grains of hardness on each of the different size softeners.

The customer usually wants to know how often he has to refill the salt tank. By dividing his weekly usage into the capacity between salt fillings you get the number of weeks the salt storage will last, approximately.

For example, a customer's water is 20 grains hard. He averages 500 gallons a week. You specify an AS-2 at 7520 gallons capacity. Therefore, one salt charge will last fifteen weeks.

In determining the correct size softener to specify there are three important things to consider:

First—Average weekly consumption of water.

Second—Peak loads at any interval.

Third—Maximum usage during any one hour.

While usage of softened water varies, research has shown us that it is safe to figure from 15 to 25 gallons of hot and cold water per person per day for average families. If softener is used on hot water line only, figure 15 to 20 gallons per person per day. Water should not be softened for flushing toilets or sprinkling lawn. Where there are servants and several baths and water is used extravagantly, figure from 25 to 50 gallons per person per day.

The AS-1 is limited for water of 34 grains hardness and under. At 30 grains the AS-1 will supply 2400 gallons of water, or enough for a forty day run between salt fillings, figuring on a family of three at 20 gallons per person per day.

The best practice in specifying water softener

size is to recommend an automatic softener that will not require more than one regeneration a day.

On the AS-1 on any hardness of water under 34 grains be sure that the time between salt fillings is not less than six weeks.

On the AS-2 on any water of 50 grains hardness or under be sure that the time between salt fillings is not less than a six week period.

On the AS-3, because of the larger salt storage, be sure that the time between salt fillings is not less than a twelve week period.

On the AS-4 a six week period.

This applies in all cases except where the by-pass is eliminated. In such cases regenerations and salt fillings can take place just as often as the conditions warrant.

Duro Softeners are rated in sizes according to their capacity in gallons per minute. The AS-1 is for the small sized home, with a capacity of six gallons per minute.

The AS-2 and AS-3 with a capacity of 10 gallons per minute, or 600 gallons an hour, is for the average sized home. It will take care of two shower heads and other average fixtures at the same time.

The AS-4 is for still larger homes with a capacity of 16 gallons per minute.

The rate of flow, of course, limits the maximum usage during any one hour. If the anticipated usage is greater than the rate of flow it is necessary to use the next size softener with an increased rate of flow, or to use two softeners in parallel arranged to regenerate alternately. For instance, two AS-2's in parallel will provide a rate of 20 gallons per minute, but regeneration periods will reduce hourly capacity.

Architects Standard Softener Specifications

General—The Plumbing Contractor shall supply and install one (1) Style ----- Duro Automatic Water Softener.

Rate of Flow—The Automatic Softener shall have a rate of flow of ---- gallons per minute, against ---- pounds flowing city (or well) water pressure.

Capacity—The Automatic Softener shall have a guaranteed capacity to soften between salt fillings ----- gallons of water containing a hardness of ---- grains per U. S. gallon, which is the hardness of the water supply to be softened.

Guarantee—The Softener shall be guaranteed in writing by the Manufacturer.

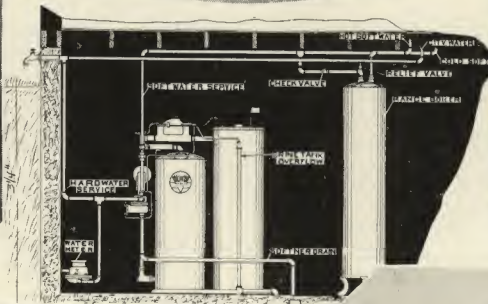
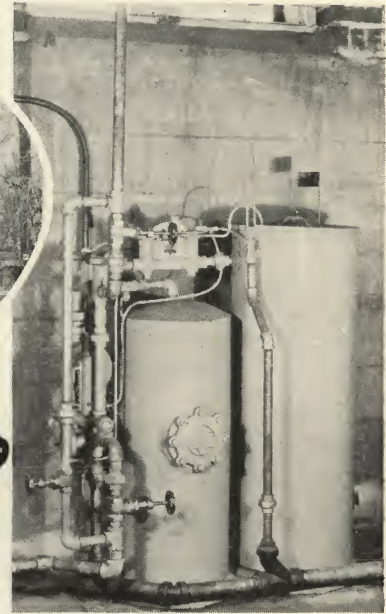
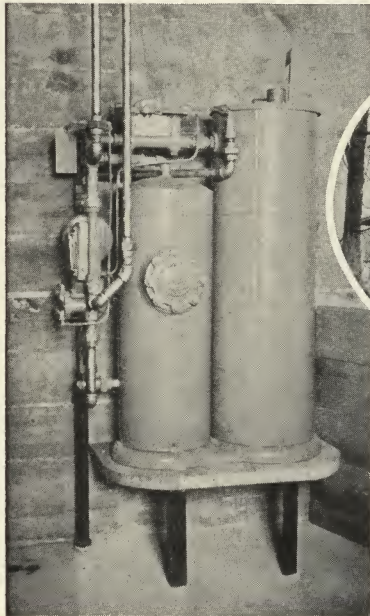
Installation—The Softener shall be installed as close to the meter as possible. In case of an AS-1, 2 or 3 Softener a direct $\frac{3}{4}$ " line is to be run from the meter to the softener to provide ample flowing pressure at the softener at all times. In case of the AS-4 a direct 1" line should be run from the meter to the softener.

The softener shall be installed so that the meter box assembly shall be easily accessible.

The Contractor shall make installation in accordance with the approved and highest standard of craftsmanship, and in accordance with the plumbing code. The contractor will be required to make suitable tests before final approval of the installation.

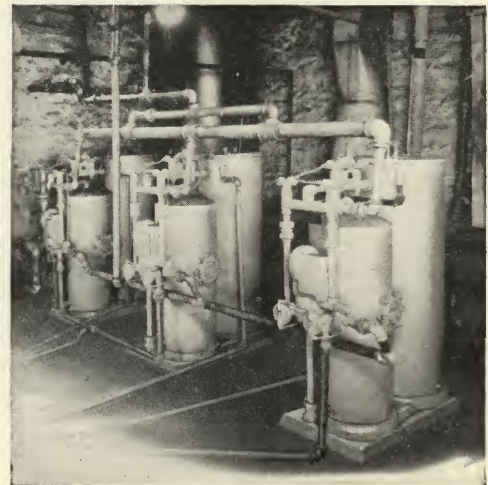
THE DURO AUTOMATIC OBSOLETES ALL HAND-OPERATED TYPES

Thousands of Duro Automatic Installations

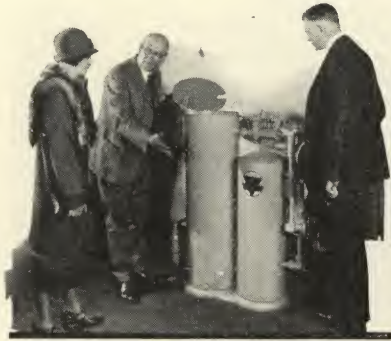


Here are a few typical installations of Duro Automatic Water Softeners, and homes in which they are installed. Note the installation diagram in center. At the lower right is a multiple installation, showing connections.

Every dealer selling Duro Automatic Water Softeners should have a Scrap Book and Photo Album. With very little practice you can take a good picture of an installation with an ordinary kodak. This photograph pasted on a page in your scrap book, together with a testimonial letter from the user, will represent one of the most effective sales helps that you could possibly use. Start a picture album today.



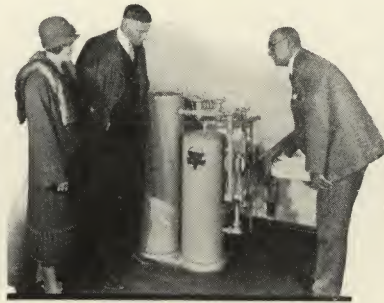
Folks Like the Duro-matic on Sight



“Just Dump in a Bag of Salt and Forget It”

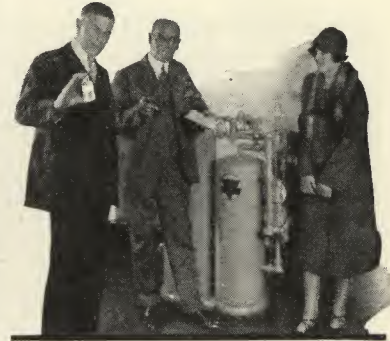
Fill up the salt tank with pure coarse Farmers Salt or pure rock salt, replace the cover and forget it for months. Then when the red flag again rests on the cover lid simply remove the cover and dump in another bag of salt and forget it for several more months. That's all there is to operating the Duro automatic softener. And you get more softened water per pound of salt than in any other type of Softener—hand-operated or otherwise.

It's ingenious—yet so simple.



“Now Watch It Regenerate Itself—There It Goes!”

This Duro Automatic regenerates itself without any attention. It can't forget when it is time to regenerate. No longer is it necessary to go to the basement and endeavor to untangle a confusion of valves; weigh out salt; fuss with rusty manhole covers; wasting valuable time and losing your temper in doing something that can and should be done automatically, without any attention. Go over the Duro-matic from a mechanical point of view. You'll be amazed.



Gosh! That Is Suds—When Can You Install It?

That suds with only one drop of soap as compared with twenty in hard water. Just install Duro and you'll be living in a new world of pure, softened city Water. Show your Softener to your neighbors and friends, when it is installed—send them around to the store and I'll be glad to demonstrate to them also. No home is truly modern without a Duro Automatic Softener.

Many Thousands In Use

Duro has proved itself to thousands of householders all over the United States. It is sold only on the basis that it will do exactly what we claim for it or it will be removed at once. Could anything be fairer?

Rough, irritated skin or soft and pliable—WHICH?



Operated by hydraulic pressure—not by water meter

FIVE BASIC ADVANTAGES OF DURO

AUTOMATICALLY SOFTENED CITY (or Well) WATER

Only Duro can give you a constant supply of water at all times

①

PERSONAL

Promotes Beauty and Health.
 Opens pores of skin so dirt, impurities and poisons can be removed.
 Prevents soap curds from sealing pores of skin and imprisoning dirt and impurities.
 Leaves the hair glossy and soft—removes surplus oil—removes dandruff, and hair becomes fluffy, radiant and brilliant.
 Used by all high grade Beauty Parlors, Barber shops and homes.
 Leaves face tender and pliable after shaving.
 Gets down to basic causes.
 It isn't the soap or facial, it's the water!

②

BATH

Eliminate the hazard of using stagnant, disease-breeding cistern water.
 Thoroughly cleanses the skin and pores, and helps prevent rough skin, blackheads, pimples, and eruptions.
 Keeps hands soft and beautiful, preventing redness and chapped and split skins.
 Protects baby's tender skin.
 Prevents "hard water itch" after bathing.
 Prevents the "ring around the tub."
 Cleans porcelain and enamel ware quickly and with less effort.
 Protects plumbing by preventing lime-scale

③

KITCHEN

Good for cooking.
 Saves time and labor
 Prevents grease film on dishes and silverware.
 Saves soap—no milky soap curds in dish-water.
 Prevents lime scale in tea-kettles, etc.
 Fruits and vegetables cook quickly—evenly and retain savory taste.
 In canning—it preserves delicate natural flavors.
 Less coffee or tea required and retains aroma and zest.
 Better for cleaning purposes.
 Pure as your city water—and safe
 Glassware and silver have a new brilliancy.

④

LAUNDRY

Protects fine linens and fabrics.
 Prevents soap curds from stiffening fabric particles which break and snap under hot iron pressure.
 Increases life of clothes more than one-half.
 Prevents soap curds from causing grey and yellow spots when ironed.
 Removes dirt thoroughly and in less time—clothes need not be boiled or washed and rubbed in tub nearly as long.
 Saves more than half the soap, and does away with the use of strong soap powders.
 Leaves clothes spotlessly clean, sweet-smelling, bright.
 Commercial laundries demand softened water.

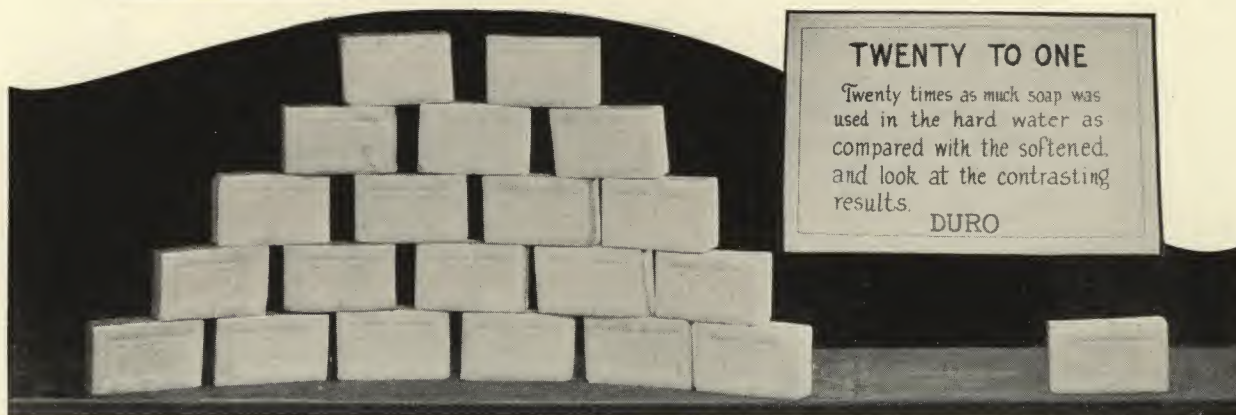
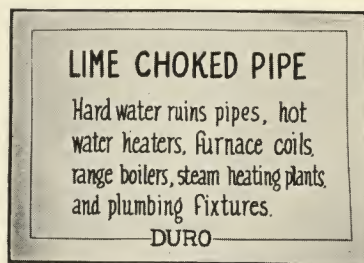
⑤

GENERAL

Good to drink
 Five times softer than rain water. Pure as your city water
 Eliminates foul, smelly, disease-breeding cisterns.
 Eliminates pump and double plumbing.
 Removes existing scale in plumbing.
 Prevents lime scale in hot water coils, boiler heaters.
 Saves many times more in plumbing bills than its operating cost. Saves furnace or steam boiler fuel.
 No other household appliance approaches its utility—softened water is the first essential to every member of the family.
 Made by The Duro Company, Dayton, Ohio, largest manufacturers of pumps, water systems, automatic water softeners in the world.

— THE DURO AUTOMATIC WATER SOFTENER OBSOLETE ALL OTHER TYPES —

A Convincing Window Display



Any dealer can readily secure the articles necessary for the above display. It visualizes the whole story.

Get three one gallon jugs. Use pure liquid soap to make the suds. Be careful not to get too much soap in the softened water. Add liquid soap in proportion and shake long and thoroughly to get clear water and suds which will last for hours. A teakettle cut in two, a piece of lime-scaled pipe and a number of bars of soap to correspond to the hardness of the water, make up the display. Write for a set of cards.

Guarantee No.

Guarantee Certificate

The Duro Company

DAYTON, OHIO

U. S. A.

This Certifies that

of
St. and No. or R. F. D. Town

.....
County State

has purchased "DURO" WATER SOFTENER, Size,
Serial No.

In consideration whereof we hereby guarantee this equipment free from defects in workmanship, material or design and for a period of one year, any part proving defective within that period will be replaced without charge F. O. B. Dayton, Ohio; misuse, accident and freeze-ups excepted.

In further consideration, we guarantee the softening mineral used in Duro Softeners to soften its full rated capacity as shown in our catalogs and folders for a period of three years, providing the customer uses the softener strictly according to instructions.

The Duro Company

.....
President

Signed at Dayton, Ohio, this day
of 19.....

Sold by

Address

Date

