

POCKET PUMP GUIDE



COMPLIMENTS OF



POCKET PUMP GUIDE / PUB0905
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Notes _____

MM RULER TO SCALE





Air & Train Travel

| | | |
|----------------------------|--------------|---------------------|
| American Airlines | 800-433-7300 | www.aa.com |
| Canadian Airlines | 800-426-7000 | |
| Continental Airlines | 800-231-0856 | www.continental.com |
| Delta Airlines | 800-221-1212 | www.delta.com |
| TWA (Trans World Airlines) | 800-221-2000 | www.aa.com |
| United Airlines | 800-241-6522 | www.ual.com |
| USAir | 800-428-4322 | www.usairways.com |
| Amtrak — US | 800-872-7245 | |
| Via Rail — Canada | 800-561-3949 | |

Auto Rentals

| | |
|---------------------------------|--------------|
| Avis Rent-A-Car (US, Canada) | 800-331-1212 |
| Budget Rent-A-Car | 800-527-0700 |
| Dollar Rent-A-Car | 800-800-4000 |
| Hertz Rent-A-Car | 800-654-3131 |
| National Car Rental | 800-328-4567 |
| Thrifty Car Rental (US, Canada) | 800-367-2277 |

Hotel/Motel Reservations

| | |
|---|--------------|
| Best Western (US, Canada) | 800-528-1234 |
| Days Inn (US, Canada) | 800-325-2525 |
| Embassy Suites (US, Canada) | 800-362-2779 |
| Hilton Hotels (US, Canada) | 800-445-8667 |
| Holiday Inn (US, Canada) | 800-465-4329 |
| Howard Johnson Hotels & Lodges (US, Canada) | 800-654-2000 |
| Hyatt Hotels (US, Canada) | 800-233-1234 |
| Marriott Hotels & Resorts (US, Canada) | 800-228-9290 |
| Radisson Hotels (US, Canada) | 800-333-3333 |
| Ramada Inn (US, Canada) | 800-228-2828 |
| Sheraton Hotels (US, Canada) | 800-325-3535 |

Credit Card Information

| | |
|--------------------------------------|--------------|
| American Express (US) | 800-528-4800 |
| Diners Club / Carte Blanche — US | 800-234-6377 |
| Diners Club / Carte Blanche — Canada | 800-363-3333 |
| MasterCard (US, Canada) | 800-826-2181 |
| Visa — US | 800-847-2911 |
| Visa — Canada | 800-336-8472 |

Traveler's Checks Information

| | |
|---------------------------------------|--------------|
| American Express (US, Canada) | 800-221-7282 |
| Interpayment (US, Canada) | 800-221-2426 |
| MasterCard International (US, Canada) | 800-223-7373 |



How Pumps Work

Many people think pumps pull water out of the ground. In reality, pumps are better “pushers” than “pullers.” Just as a horse pushes against its collar to pull a wagon, a pump pushes water away from it at high pressure. By doing so, it creates a partial vacuum that allows the atmospheric pressure to push down and force more water up to the pump in a continuing cycle.

FS SERIES DEWATERING and FOUNTAIN PUMPS

Munro FS Series pumps are ideal wherever there is a need to move water. Suitable for countless applications including construction, mining, utilities, industrial, marine and more!

LP SERIES HIGH-HEAD, SELF-PRIMING CENTRIFUGAL PUMP

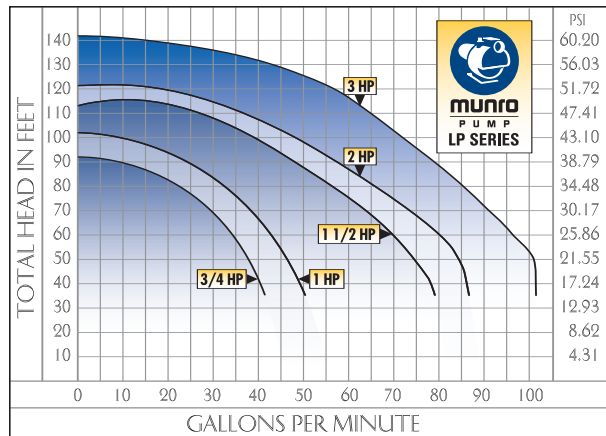
Built to standards professionals recognize — this self-priming design features high volume flows, durability and affordability. Old-world style and quality make the LP Series Pump unique



Reading Basic Pump Curves

Pump curves are designed to quickly and easily determine the capacity of a pump at any given point of distance. The horizontal line across the bottom of the chart indicates the gallons per minute (gpm) the pump can discharge.

The vertical line indicates the “head in feet” or pressure per square inch (psi) that the pump can produce. This vertical line is comprised of a calculation of three components – elevation, pressure and friction loss.



English Conversion Table

| Length | | Volume | | | |
|-----------|-----------|----------------------|-----------|-----------|-----------|
| inches | feet | .0833 | cu inches | cu feet | .0005787 |
| inches | yards | .0278 | cu inches | cu yards | .00002143 |
| feet | inches | 12 | cu inches | US gal | .004329 |
| feet | yards | .3333 | cu feet | cu inches | 1728 |
| feet | miles | .0001894 | cu feet | cu yards | .03704 |
| yards | feet | 3 | cu feet | US gal | 7.481 |
| yards | miles | .0005682 | cu yards | cu inches | 46,656 |
| | | | cu yards | cu feet | 27 |
| Area | | Weight (Avoirdupois) | | | |
| sq inches | sq feet | .00694 | grains | ounces | .002286 |
| sq inches | sq yards | .000772 | ounces | grains | 437.5 |
| sq feet | sq inches | 144 | ounces | pounds | .0625 |
| sq feet | sq yards | .11111 | pounds | ounces | 16 |
| sq yards | sq inches | 1296 | pounds | US tons | .0005 |
| sq yards | sq feet | 9 | pounds | long tons | .000446 |
| sq yards | acres | .000207 | US tons | pounds | 2000 |
| acres | sq feet | 43,560 | long tons | pounds | 2240 |
| acres | sq yards | 4840 | | | |

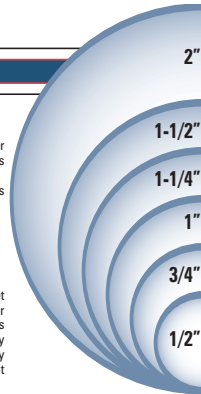
Circumference of circle = 3.1416 x dia = 6.2832 x radius
 Area of circle = .7854 x (dia)² = 3.1416 x (radius)²
 Area of Sphere = 3.1416 x (dia)²
 Volume of Sphere = .5236 x (dia)³
 1 lb per sq in is equivalent to .06804 atmospheres.

QUICK VIEW PIPE SIZE CHART (INSIDE DIAMETER)

WATER EQUIVALENTS TABLE

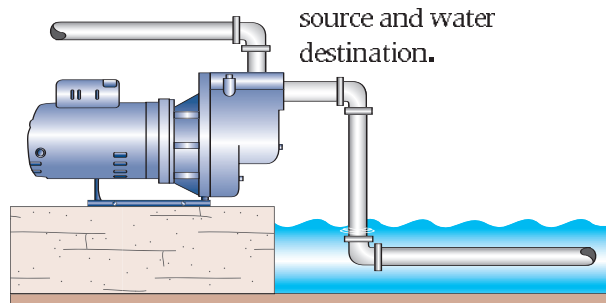
| | | | | |
|--|--------------------------|-----------------|--------------|----------------------|
| 1 gallon of water | 8.34422 pounds | 1 cubic foot | 7.48 gallons | 62.4 pounds of water |
| 1 acre-foot | 43,560 cubic feet | 325,580 gallons | | |
| <i>(NOTE - AN ACRE-FOOT COVERS 1 ACRE OF LAND 1 FOOT DEEP)</i> | | | | |
| 1 acre-inch | 3,630 cubic feet | 27,152 gallons | | |
| <i>(NOTE - AN ACRE-INCH COVERS 1 ACRE OF LAND 1 INCH DEEP)</i> | | | | |
| 1 cubic foot per second (cfs) | 450 gallons per minute | | | |
| 1 cfs | 646,320 gallons per day | | | |
| | For 24 hours | 1,983 acre-feet | | |
| | For 30 days | 59.5 acre-feet | | |
| | For 1 year | .724 acre-feet | | |
| 1 million gallons | 3.07 acre-feet | | | |
| 1 million gallons per day (mgd) | 1,120 acre-feet per year | | | |
| 1,000 gallons per minute (gpm) | 2.23 cfs | | | |
| 1,000 gallons per minute (gpm) | 4.42 acre-feet per day | | | |
| 1,000 gallons per minute (gpm) | 53.04 acre-inch per day | | | |
| At 10 cents per 1,000 gallons | \$32.59 per acre-foot | | | |

(NOTE - AN ACRE-FOOT SUPPLIES A FAMILY OF 5 FOR 1 YEAR)



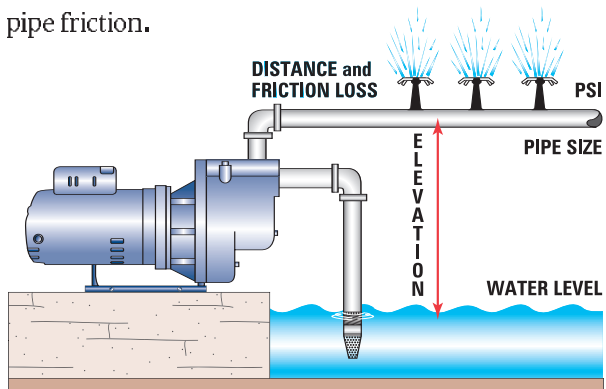
| Metric Conversion Table | | | | | |
|-------------------------|-----------|-------------|-----------------------|--------------|------------------------|
| To Convert From | To | Multiply By | To Convert From | To | Multiply By |
| Unit Weight | | | Unit Weight | | |
| gr/sq cm | lb/sq in | .01422 | lb/ft | kg/m | 1.4881 |
| gr/cu cm | lb/cu in | .0361 | lb/sq in | gr/sq cm | 70.31 |
| kg/sq cm | lb/sq in | 14.22 | lb/sq in | kg/sq cm | .07031 |
| kg/cu m | lb/cu ft | .0624 | lb/cu in | gr/cu cm | 27.68 |
| kg/m | lb/ft | .6720 | lb/cu ft | kg/cu m | 16.018 |
| Unit Volume | | | Unit Volume | | |
| liters/min | US gpm | .2642 | USgpm | liters/min | 3.785 |
| liters/min | cfm | .03531 | US gpm | liters/hr | 227.1 |
| liters/hr | US gpm | .0044 | US gpm | cu m/hr | .2271 |
| cu m/min | cfm | 35.314 | cfm | liters/min | 28.317 |
| cu m/hr | cfm | .5886 | cfm | cu m/min | .02832 |
| cu m/hr | US gpm | 4.4028 | cfm | cu m/hr | 1.6992 |
| Power | | | Power | | |
| watts | ft-lb/sec | .7376 | ft-lb/sec | watts | 1.356 |
| watts | hp | .00134 | hp | watts | 745.7 |
| kw | hp | 1.3410 | hp | kw | .7457 |
| cheval-vap | hp | .9863 | hp | cheval-vap | 1.0139 |
| Heat | | | Heat | | |
| gr-cal | Btu | .003969 | Btu | gr-cal | 252 |
| kg-cal | Btu | 3.9693 | Btu | kg-cal | .252 |
| kg-cal/kg | Btu/lb | 1.800 | Btu/lb | kg-cal/kg | .5556 |
| gr-cal/sq cm | Btu/sq ft | 3.687 | Btu/sq ft | gr-cal/sq cm | .2713 |
| kg-cal/cu m | But/cu ft | .1124 | Btu/cu ft | kg-cal/cu m | 8.899 |
| Work or Energy | | | Work or Energy | | |
| joule | ft-lb | .7376 | ft-lb | joule | 1.356 |
| meter-kg | ft-lb | 7.2330 | ft-lb | meter-kg | .1383 |
| gr-cal | ft-lb | 3.087 | ft-lb | gr-cal | .3239 |
| kg-cal | ft-lb | 3087 | ft-lb | kg-cal | .000324 |
| hp-hr | ft-lb | 1,980,000 | ft-lb | hp-hr | 5.05x10 ⁻⁷ |
| kw-hr | ft-lb | 2,655,000 | ft-lb | kw-hr | 3.766x10 ⁻⁷ |
| Btu | ft-lb | 778.0 | ft-lb | Btu | 001285 |

ELEVATION — The vertical difference, measured in feet, from the water source to the water discharge. This does not consider the length or diameter of the pipe or hose, only the vertical change between water



PSI — Since gravity causes air to have a weight, both a 300-mile high column of air and a 34-foot high column of water each exert the same pounds per square inch (psi) at sea level. Because pump impellers create a vacuum, this exertion of pressure is vital to the overall operation of a pump system. PSI can be converted into “head feet” by multiplying the PSI x 2.31. Desired PSI will be determined by the pump system requirements. High PSI requirements reduce the available gpm of a pump and vice versa. The performance line on the pump curve illustrates this variation.

FRICION LOSS — As water flows through a pipe system it is met with resistance from the walls of the pipe. The smaller the cross-sectional area of a pipe, the greater the friction loss over distance. Friction loss charts, such as the one on pages 16 - 17 help determine the additional head in feet needed to overcome the loss due to pipe friction.



PUMP DATA WORKSHEETS — Are useful tools when determining system requirements. In addition to the head in feet and gallons per minute, the worksheet provides room for basic electrical and source water information. Use a Pump Data Worksheet to ensure you're choosing the best pump for your application.

| Metric Conversion Table | | | | | |
|-------------------------|-----------|-------------|-----------------|-----------|-------------|
| To Convert From | To | Multiply By | To Convert From | To | Multiply By |
| Length | | | Length | | |
| mm | inches | .03937 | inches | mm | 25.40 |
| cm | inches | .3937 | inches | cm | 2.540 |
| meters | inches | 39.37 | inches | meters | .0254 |
| meters | feet | 3.281 | feet | meters | .3048 |
| meters | yards | 1.0936 | feet | km | .0003048 |
| km | feet | 3280.8 | yards | meters | .9144 |
| km | yards | 1093.6 | yards | km | .0009144 |
| km | miles | .6214 | miles | km | 1.609 |
| Area | | | Area | | |
| sq mm | sq inches | .00155 | sq inches | sq mm | 645.2 |
| sq cm | sq inches | .155 | sq inches | sq cm | 6.452 |
| sq meters | sq feet | 10.764 | sq feet | sq meters | .09290 |
| sq meters | sq yards | 1.196 | sq yards | sq meters | .8361 |
| sq km | sq miles | .3861 | sq km | sq km | 2.590 |
| hectares | acres | 2.471 | acres | hectares | .4047 |
| Volume | | | Volume | | |
| cu cm | cu inches | .06102 | cu inches | cu cm | 16.387 |
| cu cm | fl ounces | .0338 | cu inches | liters | .01639 |
| cu meters | cu feet | 35.314 | cu inches | cu meters | .02832 |
| cu meters | cu yards | 1.308 | cu feet | liters | 28.317 |
| cu meter | US gal | 264.2 | cu feet | cu meters | .7646 |
| liters | cu inches | 61.023 | cu yards | cu meters | .7646 |
| liters | cu feet | .03531 | fl ounces | cu cm | 29.57 |
| liters | US gal | .2642 | US gal | cu meters | .003785 |
| | | | US gal | liters | 3.785 |
| Weight | | | Weight | | |
| grams | grains | 15.432 | grains | grams | .0648 |
| grams | ounces | .0353 | ounces | grams | 28.350 |
| kg | ounces | 35.27 | ounces | kg | .02835 |
| kg | pounds | 2.2046 | pounds | kg | .4536 |
| kg | US tons | .001102 | pounds | tonnes | .000454 |
| kg | long ton | .000984 | US tons | kg | 907.2 |
| tonnes | pounds | 2204.6 | US tons | tonnes | .9072 |
| tonnes | US tons | 1.1023 | long tons | kg | 1016 |
| tonnes | long tons | .9842 | long tons | tonnes | 1.0160 |

| SIZE | PVC CLASS PIPE | | | | SCHEDULE PIPE | | | | | | | |
|-------|--------------------|--------|--------|--------|---------------|-------|-------|-------|--------|------|--------|------|
| | CL-160 | | SDR26 | | CL-200 | | SDR21 | | SCH-40 | | SCH-80 | |
| | WALL | | WALL | | WALL | | WALL | | WALL | | WALL | |
| | O.D. | I.D. | O.D. | I.D. | O.D. | I.D. | O.D. | I.D. | O.D. | I.D. | O.D. | I.D. |
| 1/2 | CL-230/315 .062 | | | | | | | | .840 | | | |
| | .840 | .716 | | | | | | | .840 | .546 | | |
| 3/4 | | | .060 | | .113 | | | | | | | |
| | | | 1.050 | .930 | 1.050 | .824 | | | | | | |
| 1 | | | .063 | | .133 | | .179 | | | | | |
| | | | 1.315 | 1.189 | 1.315 | 1.049 | 1.315 | .957 | | | | |
| 1-1/4 | .064 | | .079 | | .140 | | .191 | | | | | |
| | 1.660 | 1.332 | 1.660 | 1.302 | 1.660 | 1.38 | 1.680 | 1.278 | | | | |
| 1-1/2 | .073 | | .090 | | .145 | | .200 | | | | | |
| | 1.900 | 1.784 | 1.900 | 1.720 | 1.900 | 1.610 | 1.900 | 1.300 | | | | |
| 2 | .091 | | .113 | | .154 | | .218 | | | | | |
| | 2.375 | 2.193 | 2.375 | 2.149 | 2.375 | 2.067 | 2.375 | 1.939 | | | | |
| 2-1/2 | .110 | | .137 | | .203 | | .276 | | | | | |
| | 2.875 | 2.855 | 2.875 | 2.601 | 2.875 | 2.469 | 2.875 | 2.323 | | | | |
| 3 | .135 | | .167 | | .216 | | .300 | | | | | |
| | 3.500 | 3.230 | 3.500 | 3.166 | 3.500 | 3.068 | 3.500 | 2.900 | | | | |
| 4 | .173 | | .214 | | .237 | | .337 | | | | | |
| | 4.500 | 4.154 | 4.500 | 4.072 | 4.500 | 4.026 | 4.500 | 3.826 | | | | |
| 6 | .255 | | .316 | | .280 | | | | | | | |
| | 6.625 | 6.715 | 6.625 | 5.993 | 6.625 | 6.065 | | | | | | |
| 8 | .332 | | .411 | | .322 | | | | | | | |
| | 8.625 | 7.961 | 8.625 | 7.803 | 8.625 | 7.981 | | | | | | |
| 10 | .413 | | .511 | | | | | | | | | |
| | 10.750 | 9.924 | 10,750 | 9.728 | | | | | | | | |
| 12 | .490 | | .610 | | | | | | | | | |
| | 12.750 | 11.770 | 12.750 | 11.530 | | | | | | | | |

PUMP DATA WORKSHEET

COMPANY NAME _____
ADDRESS _____
CITY / STATE / ZIP _____
CONTACT PERSON _____ **PHONE** _____

HORIZONTAL CALCULATION _____
PUMPING REQUIREMENTS
 To size a pump, first figure total gallonage needed. _____ GPM

VERTICAL CALCULATION _____
ELEVATION
 To figure elevation, measure the distance from the water level at the suction end of the pump to the highest point in the system. _____ FEET

FRICITION LOSS
 To estimate friction loss, first determine the size of pipe used. Refer to friction loss chart on pages 2 and 3. _____ FEET

PSI - POUNDS PER SQUARE INCH
 Determine the pressure required at the end of the line of the largest zone. Convert to head in feet using the following equation. $PSI \times 2.31 = \text{HEAD IN FEET}$ _____ FEET

TOTAL HEAD IN FEET
 Total the sum of elevation, friction loss and PSI. _____ TOTAL

GENERAL INFORMATION

POWER SUPPLY
 VOLTAGE: 120 Volt 208 V 240 V 480 V
 PHASE: Single Phase 3 Phase

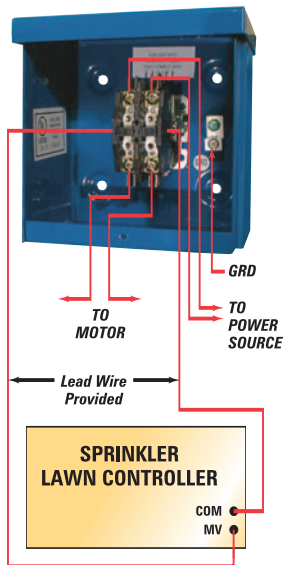
WATER SUPPLY
 Suction from Pond Pump in Well Flooded Suction Irrigation Ditch

The diagram illustrates a pump system. A pump is shown on the left, connected to a suction pipe that goes down into a water level. The suction pipe is labeled 'Suction'. Above the pump, there is a 'Filtration (flusher stream)' section. The pipe then goes up and right, labeled 'Discharge'. The distance from the water level to the highest point of the pipe is labeled 'ELEVATION FROM WATER TO HIGHEST POINT'. The pipe continues to the right, labeled 'SIZE OF PIPE'. There are three nozzles at the end of the pipe, labeled 'PSI'. The distance between the pump and the nozzles is labeled 'DISTANCE'. The water level is shown at the bottom of the diagram.

Full size version available for download at:
www.munropump.com

Pump Start Relays

Float switches, 24-hr timers and lawn controllers are all common devices that send out a signal to start a pump. The signal is received into a pump start relay (psr). The psr is coil voltage specific, according to the signal device, which allows a contactor to close and electricity to flow between a power source and pump motor.



SCHEDULE 40 FRICTION LOSS FOR WATER AT 60°F PER 100 FEET OF PIPE

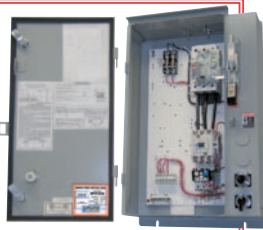
VALUES ARE FOR ESTIMATING PURPOSES ONLY & MAY NOT MEET NEC CODE. DESIGN SHOULD BE VERIFIED WITH A MUNRO REPRESENTATIVE.

| VEL. Ft. Per Sec. | 1-1/2" | | 2" | | 2-1/2" | |
|----------------------|----------------|---------|----------------|---------|----------------|---------|
| | Head Loss Feet | | Head Loss Feet | | Head Loss Feet | |
| | Steel | Plastic | Steel | Plastic | Steel | Plastic |
| 0.63 | 0.20 | 0.11 | | | | |
| 0.95 | 0.56 | 0.31 | 0.57 | 0.17 | 0.09 | |
| 1.26 | 0.96 | 0.52 | 0.77 | 0.28 | 0.15 | 0.54 |
| 1.58 | 1.06 | 0.78 | 0.96 | 0.43 | 0.23 | 0.12 |
| 1.89 | 2.04 | 1.10 | 1.15 | 0.60 | 0.33 | 0.80 |
| 2.37 | 3.09 | 1.67 | 1.53 | 1.03 | 0.56 | 0.98 |
| 2.84 | 4.31 | 2.33 | 1.92 | 1.38 | 0.69 | 1.29 |
| 3.15 | 5.24 | 2.83 | 1.91 | 1.55 | 0.84 | 1.34 |
| 3.80 | 7.30 | 3.94 | 2.85 | 2.73 | 1.47 | 1.63 |
| 4.72 | 11.00 | 5.34 | 3.74 | 3.29 | 1.78 | 2.17 |
| 5.51 | 14.70 | 7.94 | 3.35 | 4.37 | 2.36 | 2.35 |
| 6.30 | 18.30 | 9.98 | 3.82 | 5.60 | 3.02 | 2.68 |
| 7.03 | 23.20 | 12.53 | 4.30 | 6.96 | 3.76 | 3.02 |
| 7.87 | 23.40 | 12.64 | 4.78 | 8.46 | 4.57 | 3.35 |
| 8.66 | 34.00 | 18.36 | 5.26 | 10.10 | 5.45 | 3.24 |
| 9.44 | 39.60 | 21.98 | 5.74 | 11.90 | 6.43 | 4.02 |
| 10.23 | 45.90 | 24.79 | 6.21 | 13.70 | 7.40 | 4.36 |
| 11.02 | 53.00 | 28.62 | 6.69 | 15.80 | 8.53 | 4.69 |
| 11.80 | 60.00 | 32.40 | 7.17 | 17.90 | 9.67 | 5.03 |
| 12.59 | 68.00 | 36.73 | 7.65 | 20.20 | 10.91 | 5.39 |
| 13.38 | 75.00 | 40.50 | 8.13 | 22.60 | 12.20 | 5.70 |
| 14.71 | 84.00 | 45.36 | 8.61 | 25.10 | 13.55 | 6.03 |
| 14.95 | 93.00 | 50.22 | 9.08 | 27.70 | 14.96 | 6.37 |
| 15.74 | 102.00 | 55.08 | 9.56 | 30.50 | 16.47 | 6.70 |
| 17.31 | 122.40 | 65.98 | 10.50 | 33.40 | 18.06 | 7.03 |
| 18.89 | 143.00 | 77.22 | 11.50 | 42.70 | 23.06 | 8.04 |
| 20.48 | 166.00 | 89.64 | 12.40 | 48.60 | 28.78 | 11.289 |
| 22.04 | 190.00 | 102.60 | 13.40 | 56.90 | 30.73 | 9.38 |
| 23.60 | 218.00 | 117.72 | 14.30 | 64.70 | 34.94 | 10.00 |
| 25.20 | 245.00 | 132.30 | 15.30 | 72.80 | 39.31 | 10.70 |
| 26.80 | 275.00 | 148.50 | 16.30 | 81.40 | 43.96 | 11.40 |
| 28.40 | 305.00 | 164.70 | 17.20 | 90.50 | 48.87 | 12.10 |
| | | | 18.20 | 100.00 | 54.00 | 12.70 |
| | | | 19.10 | 110.00 | 59.40 | 13.40 |
| | | | 20.10 | 121.00 | 65.00 | 14.10 |
| | | | 22.90 | 154.00 | 83.16 | 16.10 |
| | | | 24.90 | 179.00 | 98.66 | 17.40 |
| | | | 26.80 | 205.00 | 111.70 | 18.80 |
| | | | 28.70 | 233.00 | 125.82 | 20.10 |
| | | | | | | 22.22 |
| 1.80 | 0.29 | 0.15 | | | | 23.53 |
| 1.92 | 0.37 | 0.18 | | | | 123.00 |
| 2.04 | 0.47 | 0.20 | | | | 167.00 |
| 2.18 | 0.41 | 0.22 | | | | 208.00 |
| 2.30 | 0.45 | 0.24 | | | | |
| 2.43 | 0.50 | 0.27 | | | | |
| 2.57 | 0.55 | 0.30 | 1.63 | 0.183 | 0.10 | |
| 2.88 | 0.69 | 0.37 | 1.83 | 0.228 | 0.12 | |
| 3.20 | 0.84 | 0.45 | 2.04 | 0.277 | 0.15 | |
| 3.52 | 1.00 | 0.54 | 2.24 | 0.330 | 0.18 | |
| 3.85 | 1.17 | 0.63 | 2.43 | 0.388 | 0.21 | |
| 4.17 | 1.36 | 0.73 | 2.64 | 0.450 | 0.24 | |
| 4.49 | 1.56 | 0.84 | 2.85 | 0.516 | 0.28 | |
| 4.81 | 1.77 | 0.96 | 3.06 | 0.586 | 0.32 | |
| 5.13 | 1.99 | 1.07 | 3.25 | 0.660 | 0.36 | |
| 5.45 | 2.23 | 1.20 | 3.45 | 0.750 | 0.41 | |
| 5.77 | 2.48 | 1.34 | 3.66 | 0.821 | 0.44 | 2.56 |
| 6.09 | 2.74 | 1.48 | 3.88 | 0.910 | 0.49 | 2.70 |
| 6.40 | 3.02 | 1.63 | 4.07 | 0.998 | 0.54 | 2.84 |
| 7.05 | 3.60 | 1.94 | 4.48 | 1.190 | 0.64 | 3.12 |
| 7.69 | 4.23 | 2.28 | 4.89 | 1.400 | 0.76 | 3.41 |
| 8.33 | 4.90 | 2.65 | 5.30 | 1.620 | 0.87 | 3.69 |
| 8.97 | 5.62 | 3.03 | 5.70 | 1.86 | 1.00 | 3.98 |
| 9.61 | 6.39 | 3.45 | 6.10 | 2.14 | 1.14 | 4.28 |
| 10.30 | 7.20 | 3.89 | 6.51 | 2.38 | 1.29 | 4.55 |
| 11.00 | 8.05 | 4.38 | 7.32 | 2.89 | 1.60 | 5.11 |
| 12.80 | 10.90 | 5.89 | 8.14 | 3.60 | 1.94 | 5.68 |
| 14.10 | 13.00 | 7.02 | 8.95 | 4.29 | 2.32 | 6.25 |
| 15.40 | 15.20 | 8.21 | 9.73 | 5.04 | 2.72 | 6.81 |
| 16.70 | 17.70 | 9.56 | 10.60 | 5.84 | 3.15 | 7.38 |
| 18.00 | 20.30 | 10.96 | 11.40 | 6.70 | 3.62 | 7.95 |
| 19.20 | 23.00 | 12.42 | 12.20 | 7.61 | 4.11 | 8.52 |
| 20.80 | 26.80 | 14.47 | 13.00 | 8.58 | 4.63 | 9.10 |
| 22.40 | 30.60 | 16.52 | 13.80 | 9.60 | 5.19 | 9.69 |
| 24.00 | 34.90 | 18.85 | 15.51 | 13.40 | 7.24 | 10.80 |
| 27.20 | 44.00 | 23.76 | 16.91 | 14.79 | 7.87 | 11.58 |
| 28.80 | 48.80 | 26.35 | 18.30 | 16.10 | 8.69 | 12.80 |
| 32.00 | 59.30 | 32.02 | 20.30 | 19.60 | 10.88 | 14.20 |
| 35.30 | 70.70 | 38.18 | 22.40 | 23.40 | 13.40 | 15.80 |
| | | | 24.40 | 27.50 | 14.85 | 17.00 |
| | | | 26.40 | 31.80 | 17.17 | 18.40 |
| | | | 28.50 | 36.50 | 19.71 | 19.90 |
| | | | | | | 22.70 |
| | | | | | | 19.40 |
| | | | | | | 10.48 |

PUMP CONTROL PANELS



Munro Pump Control Panels feature combination starters with accessories and custom modifications designed to meet the requirements of the irrigation, pumping and oil well industries.



SCHEDULE 40 FRICTION LOSS FOR WATER AT 60°F PER 100 FEET OF PIPE

VALUES ARE FOR ESTIMATING PURPOSES ONLY & MAY NOT MEET NEC CODE. DESIGN SHOULD BE VERIFIED WITH A MRNDU REPRESENTATIVE.

| Pipe Size | 3/4" | | | | 1" | | | 1-1/4" | | |
|-----------|-------------------------|-------------------|----------------|---------|-------------------|----------------|---------|-------------------|----------------|---------|
| | U.S. Gallons Per Minute | VEL. Ft. Per Sec. | Head Loss Foot | | VEL. Ft. Per Sec. | Head Loss Foot | | VEL. Ft. Per Sec. | Head Loss Foot | |
| | | | Steel | Plastic | | Steel | Plastic | | Steel | Plastic |
| 2 | 1.20 | 1.93 | 1.04 | 0.80 | 0.60 | 0.32 | | | | |
| 4 | 2.40 | 6.94 | 3.74 | 1.50 | 2.14 | 1.16 | 0.86 | 0.56 | 0.30 | |
| 6 | 3.60 | 14.70 | 7.36 | 2.20 | 4.34 | 2.45 | 1.29 | 0.85 | 0.46 | |
| 8 | 4.80 | 25.00 | 13.50 | 3.00 | 7.78 | 4.20 | 1.72 | 1.20 | 0.65 | |
| 10 | 6.00 | 37.80 | 20.40 | 3.70 | 11.70 | 6.32 | 2.15 | 2.04 | 1.10 | |
| 12 | 7.20 | 53.00 | 28.60 | 4.50 | 16.40 | 8.86 | 2.57 | 2.68 | 1.66 | |
| 15 | 9.00 | 80.00 | 43.30 | 5.60 | 24.80 | 13.39 | 3.17 | 4.54 | 3.53 | |
| 18 | 10.80 | 112.00 | 60.50 | 6.70 | 34.70 | 18.74 | 3.86 | 6.72 | 3.63 | |
| 20 | 12.00 | 136.00 | 73.50 | 7.40 | 42.10 | 22.73 | 4.29 | 9.13 | 4.93 | |
| 25 | | | | 9.30 | 63.60 | 34.34 | 5.36 | 11.10 | 5.99 | |
| 30 | | | | 11.10 | 89.20 | 48.17 | 6.43 | 16.00 | 9.79 | |
| 35 | | | | 13.00 | 119.00 | 64.26 | 7.51 | 23.50 | 12.69 | |
| 40 | | | | 14.90 | 152.00 | 82.08 | 8.58 | 31.20 | 16.85 | |
| 45 | 1.95 | 1.02 | 0.55 | 16.70 | 189.00 | 102.06 | 9.64 | 50.20 | 27.11 | |
| 50 | 2.17 | 1.24 | 0.67 | | | | 10.70 | 60.40 | 32.62 | |
| 55 | 2.39 | 1.47 | 0.79 | | | | 11.80 | 72.55 | 39.18 | |
| 60 | 2.60 | 1.74 | 0.94 | | | | 12.90 | 84.70 | 45.74 | |
| 65 | 2.82 | 2.01 | 1.09 | | | | 13.95 | 99.35 | 53.65 | |
| 70 | 3.04 | 2.31 | 1.25 | 1.76 | 0.62 | 0.33 | 15.00 | 114.00 | 61.56 | |
| 75 | 3.25 | 2.62 | 1.41 | 1.91 | 0.73 | 0.39 | 16.10 | 129.00 | 69.66 | |
| 80 | 3.47 | 2.96 | 1.60 | 2.02 | 0.79 | 0.43 | 17.20 | 144.00 | 77.76 | |
| 85 | 3.69 | 3.31 | 1.79 | 2.17 | 0.91 | 0.49 | 18.25 | 161.50 | 87.21 | |
| 90 | 3.91 | 3.67 | 1.98 | 2.27 | 0.98 | 0.53 | 19.30 | 179.00 | 96.66 | |
| 95 | 4.12 | 4.06 | 2.19 | 2.42 | 1.12 | 0.60 | | | | |
| 100 | 4.34 | 4.47 | 2.41 | 2.52 | 1.19 | 0.64 | | | | |
| 110 | 4.77 | 5.33 | 2.88 | 2.77 | 1.42 | 0.77 | | | | |
| 120 | 5.21 | 6.26 | 3.38 | 3.02 | 1.67 | 0.90 | | | | |
| 130 | 5.64 | 7.26 | 3.92 | 3.28 | 1.93 | 1.04 | | | | |
| 140 | 6.08 | 8.32 | 4.49 | 3.53 | 2.22 | 1.20 | 1.56 | 0.30 | 0.16 | |
| 150 | 6.51 | 9.45 | 5.12 | 3.78 | 2.53 | 1.37 | 1.70 | 0.36 | 0.19 | |
| 160 | 6.94 | 10.70 | 5.78 | 4.03 | 2.84 | 1.53 | 1.78 | 0.39 | 0.21 | |
| 170 | 7.17 | 13.30 | 7.18 | 4.29 | 3.18 | 1.72 | 1.92 | 0.45 | 0.24 | |
| 180 | 7.81 | 13.20 | 7.13 | 4.54 | 3.53 | 1.91 | 2.00 | 0.48 | 0.26 | |
| 190 | 8.63 | 15.50 | 8.37 | 4.79 | 3.90 | 2.11 | 2.16 | 0.55 | 0.30 | |
| 200 | 8.68 | 16.10 | 8.69 | 5.05 | 4.29 | 2.32 | 2.22 | 0.58 | 0.32 | |
| 220 | 9.20 | 18.20 | 10.37 | 5.55 | 5.12 | 2.76 | 2.44 | 0.68 | 0.38 | |
| 240 | 10.40 | 22.60 | 12.20 | 6.05 | 6.01 | 3.25 | 2.67 | 0.82 | 0.44 | |
| 260 | 11.30 | 26.20 | 14.15 | 6.55 | 6.97 | 3.76 | 2.89 | 0.95 | 0.51 | |
| 280 | 12.20 | 30.00 | 16.20 | 7.00 | 8.00 | 4.30 | 3.11 | 1.00 | 0.69 | |
| 300 | 13.00 | 34.10 | 18.41 | 7.57 | 9.09 | 4.91 | 3.33 | 1.24 | 0.97 | |
| 320 | 13.90 | 38.40 | 20.74 | 8.07 | 10.20 | 5.51 | 3.56 | 1.51 | 1.25 | |
| 340 | 14.80 | 43.00 | 23.22 | 8.58 | 11.50 | 6.21 | 3.78 | 1.56 | 0.84 | |
| 360 | 15.60 | 47.80 | 25.81 | 9.08 | 12.70 | 6.86 | 4.00 | 1.73 | 0.93 | |
| 380 | 16.50 | 52.80 | 28.51 | 9.59 | 14.10 | 7.45 | 4.22 | 1.92 | 1.04 | |
| 400 | 17.40 | 58.00 | 31.32 | 10.10 | 15.50 | 8.37 | 4.44 | 2.11 | 1.14 | |
| 450 | 20.40 | 78.00 | 42.12 | 11.49 | 19.00 | 10.26 | 5.00 | 2.62 | 1.41 | |
| 500 | 21.70 | 87.70 | 47.36 | 12.60 | 23.40 | 12.64 | 5.56 | 3.19 | 1.72 | |
| 550 | 23.50 | 105.00 | 56.70 | 13.90 | 27.90 | 15.07 | 6.11 | 3.80 | 2.05 | |
| 600 | 26.00 | 123.00 | 66.42 | 15.10 | 32.00 | 17.71 | 6.66 | 4.46 | 2.41 | |
| 650 | 28.20 | 143.00 | 77.22 | 16.40 | 38.00 | 20.52 | 7.22 | 5.17 | 2.79 | |
| 700 | | | | 17.03 | 43.60 | 23.54 | 7.78 | 5.93 | 3.20 | |
| 750 | | | | 18.90 | 49.50 | 26.73 | 8.34 | 6.74 | 3.64 | |
| 800 | | | | 20.20 | 55.80 | 30.13 | 8.90 | 7.60 | 4.10 | |
| 850 | | | | 21.40 | 62.40 | 33.70 | 9.45 | 8.50 | 4.59 | |
| 900 | | | | 22.70 | 69.30 | 37.42 | 10.00 | 9.44 | 5.10 | |
| 950 | | | | 24.00 | 76.60 | 41.36 | 10.50 | 10.20 | 5.61 | |
| 1000 | | | | 25.20 | 84.30 | 45.52 | 11.10 | 11.00 | 6.21 | |
| 1100 | | | | 27.70 | 101.00 | 54.54 | 12.20 | 13.70 | 7.40 | |
| 1200 | | | | | | | 13.50 | 16.10 | 8.59 | |
| 1300 | | | | | | | 14.40 | 18.60 | 10.04 | |
| 1400 | | | | | | | 15.60 | 21.40 | 11.56 | |
| 1500 | | | | | | | 16.70 | 24.30 | 13.12 | |
| 1600 | | | | | | | 17.80 | 27.40 | 14.80 | |
| 1800 | | | | | | | 20.00 | 34.10 | 18.41 | |
| 2000 | | | | | | | 22.20 | 41.40 | 22.36 | |
| 2200 | | | | | | | 24.40 | 49.40 | 26.68 | |
| 2400 | | | | | | | 26.70 | 58.00 | 31.32 | |

PSR System Protection

The next generation of pump start relays offers many more features than traditional psr's. Offering system, landscaping, and pump protection, the next generation of psr's will provide peace of mind to homeowners, irrigators, and landscapers.

THE NEXT GENERATION OF
PUMP START RELAY ...

The **SmartBOX**
BY MUNRO The Intelligent Way to Protect Your Pump



- Completely AUTOMATIC and HANDS-FREE pump protection.
- Bridges the gap between 24 volt lawn controllers and 110V/220V pump motors.
- Serves as a pump start relay PLUS offers pump shut-down protection if source water is not available.
- Model works for all pumps from 3/4 HP to 7-1/2 HP*
- Color coded wiring for easy installation.
- Optional high temperature protection ~ protects pipe workings and pump in "dead-head" situations. **ACTIVATES SHUT-DOWN PROCESS AT 105°**
- Available with thermal overload protection for pumps over 3 HP
- Automatically resets pressure switch at each cycle
- Switches lawn controller to a domestic water alternative if pump's primary source water is not available.

Pump Accessories

FOOT VALVES & CHECK VALVES — Pumps will prime more quickly with the addition of a foot valve or check valve located on the suction line. Both valves allow a one-way flow toward the pump and keep water inside the suction line to reduce the amount of lift and maintain prime for the next pump cycle. Foot valves offer a strainer and are threaded on one side. Check valves are threaded on both ends, allowing in-line positioning but do not have a strainer end.

Y-STRAINERS — Frequently used for fast convenient cleaning. Features include a ball valve for quick flushing or a solenoid for automatic flushing.



PVC FOOT VALVES *From 1" to 6"*

Munro's foot valves and check valves are made of high quality PVC and offer full port accessibility and low obstructions in the flow path. Stainless steel valve spring assembly, provide longer lasting life.



MECHANICAL SHAFT SEALS

Munro's seals are engineered to reduce maintenance and designed to provide a longer service life. Positively-driven mechanical seals provide absolute sealing — resulting in less pumping loss. No rubbing friction between shaft and seal parts ensures energy-efficient pump operation.

- AVAILABLE IN STANDARD OR HEAVY-DUTY SILICON-CARBIDE CONSTRUCTION TO FIT MOST COMMONLY USED PUMPS

How To Use a Friction Chart

A Friction Loss Chart helps to determine the head loss in feet for every 100 feet of pipe used in a project. Using the table on page 16, find the desired gpm, pipe size, and style used.

If a pipe system is 1600' long (*16 - 100' lengths*), using 2" plastic pipe at 50 gpm, the loss per 100 feet is 4.57'. Multiply this number by the quantity of 100' lengths in the system (16) to find the total loss of the system (73.12').

The "velocity feet per second" column measures the speed which water flows through the pipe. A velocity of 4 to 5 feet per second is recommended.

PUMP CABLE SELECTION CHART

VALUES ARE FOR ESTIMATING PURPOSES ONLY & MAY NOT MEET NEC CODE. DESIGN SHOULD BE VERIFIED WITH A MUNRO REPRESENTATIVE.

| Motor Rating Phase | HP | Circuit Size | Fuse Size | Full Load AMPS | KW | Copper Wire Size | | | | | | | | | | | |
|-----------------------|-------|--------------|-----------|----------------|-------|------------------|-----|------|------|------|------|------|------|------|------|------|------|
| | | | | | | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 0 | 00 | 000 | 0000 | |
| 115 (1 Ø) | 1/4 | 25 | 10 | 6 | 0.186 | 149 | 237 | 370 | 581 | 900 | 1386 | 2106 | 2600 | 3200 | 4100 | 5000 | |
| | 1/3 | 25 | 10 | 7.6 | 0.246 | 121 | 191 | 300 | 470 | 729 | 1117 | 1701 | 2295 | 2650 | 3370 | 4000 | |
| | 1/2 | 30 | 15 | 10.2 | 0.373 | 90 | 143 | 224 | 351 | 547 | 857 | 1269 | 1719 | 2300 | 2750 | 3300 | |
| | 3/4 | 40 | 15 | 13.4 | 0.559 | 54 | 85 | 153 | 239 | 374 | 573 | 900 | 1278 | 1530 | 2000 | 2500 | |
| | 1 | 50 | 20 | 17.6 | 0.746 | | 54 | 90 | 149 | 234 | 342 | 516 | 765 | 1035 | 1332 | 1650 | 2000 |
| | 1 1/2 | 60 | 25 | 21.6 | 1.12 | | 68 | 117 | 180 | 261 | 390 | 584 | 846 | 1080 | 1350 | 1620 | 2000 |
| 2 | 80 | 40 | 31 | 1.49 | | 30 | 77 | 117 | 180 | 261 | 390 | 584 | 846 | 1100 | 1320 | | |
| 230 (1 Ø) | 1/4 | 15 | 5 | 3 | 0.186 | 595 | 936 | 1485 | 2322 | 3618 | 5526 | 8420 | 9500 | | | | |
| | 1/3 | 15 | 5 | 3.8 | 0.246 | 480 | 765 | 1215 | 1899 | 2961 | 4523 | 6885 | 7000 | 9000 | | | |
| | 1/2 | 15 | 8 | 5.1 | 0.373 | 364 | 577 | 903 | 1418 | 2205 | 3375 | 5139 | 6000 | 7200 | | | |
| | 3/4 | 20 | 8 | 6.7 | 0.559 | 294 | 426 | 666 | 1045 | 1629 | 2494 | 3789 | 5112 | 6500 | 8000 | | |
| | 1 | 25 | 10 | 8.8 | 0.746 | 223 | 353 | 555 | 871 | 1356 | 2100 | 3159 | 4257 | 5328 | 6200 | 7500 | |
| | 1 1/2 | 30 | 15 | 13.5 | 1.12 | 185 | 293 | 459 | 721 | 1123 | 1728 | 2637 | 3555 | 4446 | 5500 | 6200 | |
| | 2 | 35 | 20 | 13 | 1.49 | 142 | 137 | 370 | 586 | 920 | 1407 | 2175 | 3330 | 3870 | 4500 | 5500 | |
| | 3 | 45 | 25 | 19 | 2.24 | 180 | 285 | 446 | 712 | 1130 | 1757 | 2475 | 3096 | 3870 | 4725 | | |
| | 5 | 60 | 30 | 28 | 3.73 | | 140 | 266 | 400 | 675 | 1029 | 1366 | 1733 | 2150 | 2589 | | |
| | 7 1/2 | 125 | 45 | 38 | 5.59 | | | | 120 | 295 | 465 | 712 | 1022 | 1278 | 1530 | 1890 | |
| 10 | 175 | 60 | 49 | 7.46 | | | | | 156 | 364 | 570 | 788 | 990 | 1017 | 1260 | | |
| 15 | 250 | 100 | 78 | 11.19 | | | | | 90 | 150 | 240 | 400 | 525 | 650 | 800 | | |

| Motor Rating Phase | HP | Circuit Size | Fuse Size | Full Load AMPS | KW | Copper Wire Size | | | | | | | | | | | |
|-----------------------|-------|--------------|-----------|----------------|-------|------------------|------|------|------|------|------|------|------|------|------|------|--|
| | | | | | | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 0 | 00 | 000 | 0000 | |
| 200 (3 Ø) | 1 1/2 | 20 | 10 | 6 | 1.12 | 480 | 780 | 1200 | 1900 | 3000 | 4500 | 6500 | 7500 | | | | |
| | 2 | 25 | 15 | 7.8 | 1.49 | 370 | 580 | 880 | 1500 | 2200 | 3400 | 5000 | 7000 | | | | |
| | 3 | 35 | 15 | 11 | 2.24 | 290 | 450 | 710 | 1110 | 1690 | 2600 | 3600 | 4700 | 6000 | 7000 | | |
| | 5 | 50 | 25 | 17.5 | 3.73 | 150 | 260 | 420 | 670 | 1040 | 1610 | 2200 | 3000 | 3600 | 4300 | | |
| | 7 1/2 | 80 | 35 | 25 | 5.59 | | 180 | 290 | 470 | 740 | 1125 | 1660 | 2100 | 2500 | 3000 | | |
| | 10 | 100 | 40 | 32 | 7.46 | | | | 138 | 350 | 550 | 840 | 1240 | 1540 | 1950 | 2200 | |
| 230 (3 Ø) | 1 1/2 | 20 | 10 | 6.3 | 1.12 | 660 | 1050 | 1650 | 2600 | 4025 | 6160 | 9170 | | | | | |
| | 2 | 20 | 10 | 8.2 | 1.49 | 510 | 790 | 1250 | 1940 | 2980 | 4600 | 7000 | 9500 | | | | |
| | 3 | 114 | 15 | 11.4 | 2.24 | 380 | 600 | 940 | 1470 | 2240 | 3500 | 5200 | 6500 | 8000 | 9500 | | |
| | 5 | 45 | 20 | 16.6 | 3.73 | 220 | 350 | 575 | 900 | 1400 | 2100 | 3100 | 4000 | 4800 | 5800 | | |
| | 7 1/2 | 70 | 30 | 23.9 | 5.59 | | | | 625 | 1000 | 1500 | 2200 | 2870 | 3440 | 4160 | | |
| | 10 | 90 | 35 | 32 | 7.46 | | | | 300 | 480 | 750 | 1150 | 1640 | 2050 | 2610 | 3160 | |
| 460 (3 Ø) | 15 | 125 | 50 | 41 | 11.19 | | | | 300 | 500 | 800 | 1150 | 1410 | 1680 | 2000 | | |
| | 20 | 175 | 70 | 61 | 14.91 | | | | | 375 | 600 | 880 | 1070 | 1280 | 1510 | | |
| | 25 | 200 | 80 | 75 | 18.64 | | | | | 190 | 475 | 700 | 870 | 1040 | 1230 | | |
| | 30 | 250 | 110 | 92 | 22.37 | | | | | 240 | 570 | 710 | 850 | 1000 | | | |
| | 1 1/2 | 15 | 5 | 3 | 1.12 | 2500 | 4100 | 6500 | | | | | | | | | |
| | 2 | 15 | 5 | 4 | 1.49 | 2030 | 3200 | 5000 | 8000 | 7000 | | | | | | | |
| 3 | 15 | 10 | 5 | 2.24 | 1530 | 2400 | 3900 | 6000 | 7000 | | | | | | | | |
| 5 | 25 | 10 | 8.3 | 3.73 | 900 | 1400 | 2300 | 3600 | 5600 | 7000 | | | | | | | |
| 7 1/2 | 35 | 11.9 | 5.59 | 5.59 | 650 | 1000 | 1600 | 2500 | 4000 | 6000 | 7500 | | | | | | |
| 10 | 45 | 20 | 16 | 7.46 | 475 | 775 | 1200 | 1900 | 3000 | 4600 | 6200 | 7500 | | | | | |
| 15 | 60 | 25 | 20.5 | 11.19 | 500 | 800 | 1300 | 2000 | 3100 | 4700 | 5800 | 7000 | 8200 | | | | |
| 20 | 80 | 35 | 30.5 | 14.91 | 600 | 1000 | 1500 | 2400 | 3400 | 4500 | 5400 | 6000 | 8000 | | | | |
| 25 | 100 | 40 | 37.5 | 18.64 | 700 | 1250 | 1900 | 2900 | 3500 | 4400 | 5000 | 5800 | | | | | |
| 30 | 125 | 50 | 46 | 22.37 | 800 | 1150 | 1690 | 2350 | 2850 | 3400 | 3900 | 4500 | | | | | |
| 40 | 150 | 70 | 60 | 29.83 | | | | 750 | 1200 | 1750 | 2200 | 2600 | 3100 | | | | |
| 50 | 200 | 90 | 75 | 37.29 | | | | 900 | 1400 | 1750 | 2100 | 2450 | | | | | |
| 60 | 250 | 100 | 88 | 44.74 | | | | 450 | 1150 | 1450 | 1750 | 2050 | | | | | |
| 75 | 350 | 150 | 108 | 55.93 | | | | | 950 | 1200 | 1450 | 1700 | | | | | |

• HEAD IN FEET = P.S.I. x 2.31
 • 1 CUBIC FOOT PER SECOND = 448 G.P.M.
 • P.S.I. = HEAD IN FEET x 2.31

• CHECK N.P.S.H.R. FOR SUCTION LOSS
 • B.H.P. = FEET OF HEAD x G.P.M. — x S.P.C.
 3300 x % OF EFFICIENCY

HOSE — In all pump applications, hose is used for either suction or discharge. Suction hose has a rigid outer wall to withstand a vacuum without collapsing. Available in rubber and plastic, suction hose offers the flexibility of a high-quality, general duty hose.

Discharge hose is usually collapsed hose that expands as water runs through it. Available in rubber and plastic, discharge hose is rated by wall thickness and offers various burst and working pressure options.

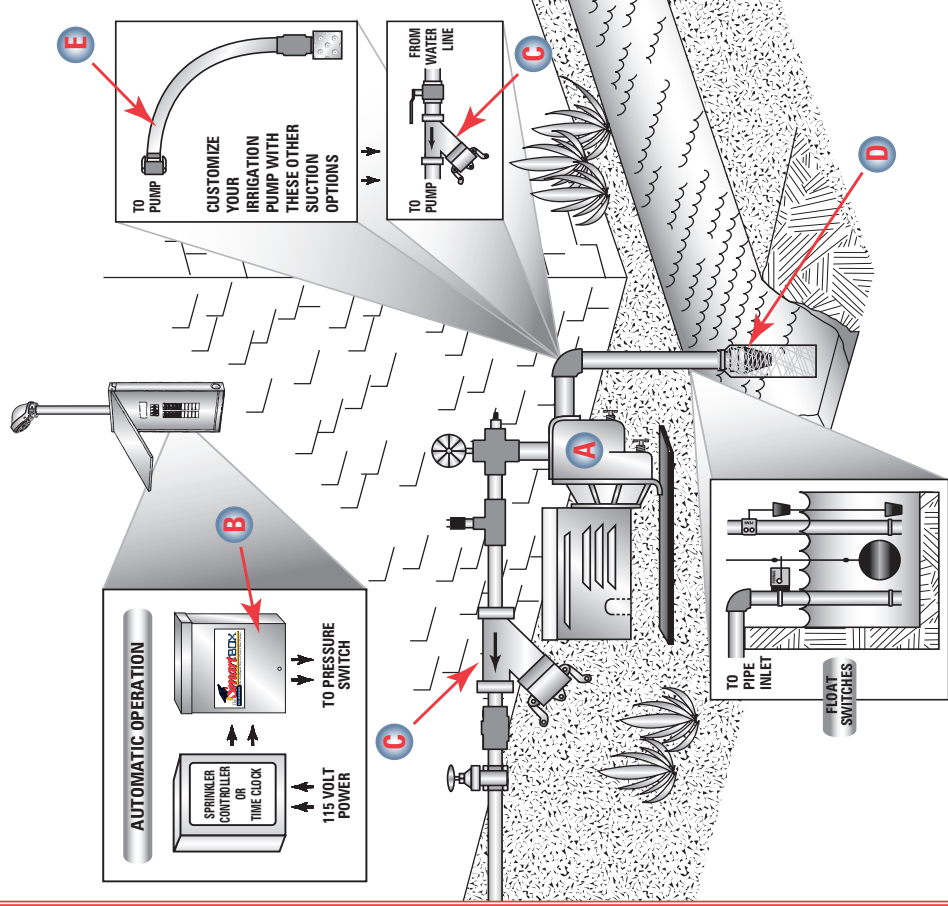
Different applications require different types of hose. Hose is available in a variety of specific-use styles.

SUCTION HOSE KIT ASSEMBLIES

A heavy-duty PVC foot valve conveniently offered pre-assembled on a PVC super-flex OD critical suction hose. Available in 5, 10, and 20 foot lengths.



Typical Lawn Pump Installation



A

LP SERIES HIGH-HEAD, SELF-PRIMING CENTRIFUGAL PUMP
(See Page 3)

B

PUMP START RELAYS (PSR's) & PSR SYSTEM PROTECTION
(See Pages 8-9)

C

Y-STRAINERS
(See Page 10)

D

PVC FOOT VALVES
(See Page 10)

E

SUCTION HOSE KIT ASSEMBLIES
(See Page 11)