

INSTALLATION AND OPERATING INSTRUCTIONS

Multistage Pressure Booster Systems with Hydrascan[®] CL



Please pass these instructions on to the operator of this equipment.

Congratulations on your purchase of a high quality, Davey pressure booster system. All components have been designed and manufactured to give trouble free, reliable operation.

Your new pressure booster system incorporates Hydrascan®CL, electronic flow control - a Davey designed feature that enables the use of a highly efficient pump design and offers the following benefits:-

1. Enables the pump to deliver a constant flow of water particularly at low flow rates - reducing the inconvenience of pressure variation in showers etc.
2. Provides automatic “cut-out” protection should the pump run out of water or overheat.

Before installing your new system, please read all instructions carefully as failures caused by incorrect installation or operation are not covered by the guarantee. Your Davey pump is designed to handle clean water. The system should not be used for any other purpose without specific referral to Davey. The use of the system to pump flammable, corrosive and other materials of a hazardous nature is specifically excluded.



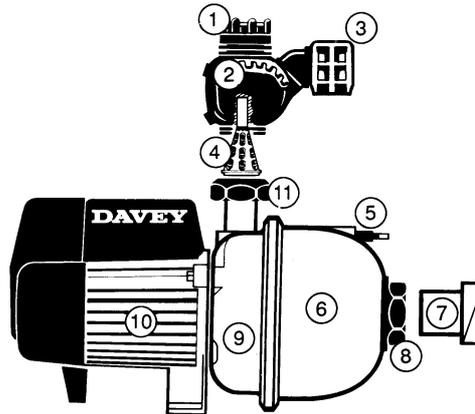
NOTE: Your Davey Multistage Pressure Boosting System is designed to operate as an automatic pressure system. The XP range come complete with an in-built pressure tank. The HS range is used in conjunction with a Davey “Supercell 8C” tank. The tank, supplied separately, needs to be fitted to the delivery outlet prior to operating. Alternatively you can use an existing pressure tank, instead of, or in addition to the tank supplied.



NOTE: BSP(F) threads will accept NPT(M) fittings. Always use thread tape.

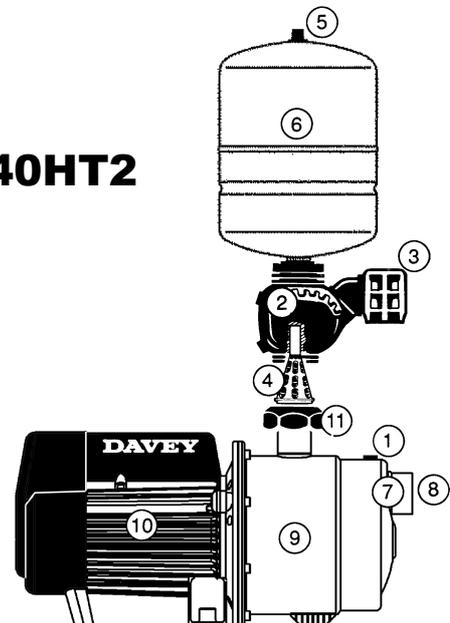
Models XP15-20H1, XP20-20H1 & XP30-20H2

1. Priming Plug
2. Hydrascan®CL Control Module
3. Discharge Socket (1”BSPF)
4. Flow Cone
5. Air Valve
6. Pressure Tank
7. Insertable Check Valve Chock
8. Suction Inlet (1¼”BSPF)
9. Pump Body
10. Motor
11. Locking Nut



Models HS12-30HT1, HS12-40HT1, HS18-30HT1, HT18-30HT2 & HS18-40HT2

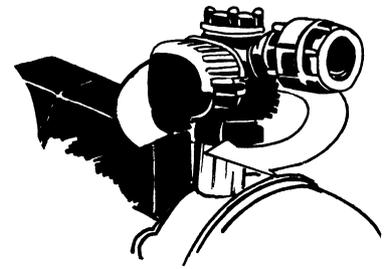
1. Priming Plug
2. Hydrascan®CL Control Module
3. Discharge Socket (1”BSPF)
4. Flow Cone
5. Air Valve
6. Pressure Tank
7. Removable Check Valve
8. Suction Inlet (1¼”BSPF)
9. Pump Body
10. Motor
11. Locking Nut



Assembly

Models XP15-20H, XP20-20H & XP30-20H2

On removing your pressure system from its carton you will need to position the Hydrascan®CL control module on top of the pump. Make sure the flow cone is secured in place in the Hydrascan®CL body, position Hydrascan®CL module on top of the pump and firmly hand tighten the locking nut.



The Hydrascan®CL unit is capable of 360° rotation to enable the most convenient positioning of the discharge piping. Loosening the locking nut enables convenient adjustment.

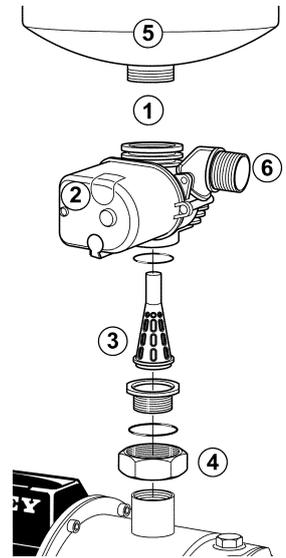
Models HS12-30HT1, HS12-40HT1, HS18-30HT1 & HS18-40HT2

The Hydrascan®CL control unit fits onto the outlet of the pump.

1. Tank connection inlet
2. Hydrascan®CL control unit
3. Flow cone
4. Connection nut
5. Supercell Pressure Tank
6. Hydrascan®CL outlet
7. Discharge socket (not illustrated)

Make sure the flow cone is secured in place in the Hydrascan®CL body. Position the Hydrascan®CL control unit on top of the pump and firmly hand tighten the connection nut.

The Hydrascan®CL control unit is capable of 360° rotation to enable the most convenient positioning of the discharge piping. Loosening the connection nut enables convenient adjustment.



Fit the Supercell pressure tank to the tank connection inlet with thread tape. Firmly hand tighten. Fit the socket to the discharge using thread tape.



Abrasive Materials

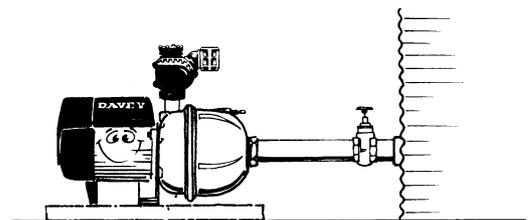
The pumping of abrasive materials will cause damage to the pump system which will then not be covered by the guarantee.



Do not use this pump to pump flammable fluids, such as gasoline or diesel fuels.

Choosing a Site

Choose a site with a firm base and as close to the water source as possible with correct power supply. Make sure your pressure system is always connected to an adequate, reliable source of clean water.



Housing your Davey Pressure System

To protect your pressure system from the weather, make sure the pump house is water proof, frost free and has adequate ventilation. The pump should be horizontally mounted on a firm base allowing for drainage, to avoid damage to flooring etc. that over time may occur from leaking pipe joints or pump seals. Do not mount the pump vertically.



WARNING: Some insects, such as small ants, find electrical devices attractive for various reasons. If your pump enclosure is susceptible to insect infestation you should implement a suitable pest control plan.

Electrical Connection



Connect lead to power supply designated on pump label. Do not use long extension leads as they cause substantial voltage drop, poor pump performance and may cause motor overload.

XP15-20H1, XP20-20H1, HS12-30HT1, HS12-40HT1 and HS18-30HT1 models are 115 volt 60Hz models, intended for direct connection to a three pin wall socket.

XP30-20H2, HS18-30HT2 and HS18-40HT2 models are 230 volt 60Hz only and is supplied with color coded bared end wires for easy connection. There is no need to open capacitor cover or rewire pressure switch connections.



Power connections and wiring must be carried out by an authorised electrician.



All wiring must conform to National (NEC), CSA, state, provincial, and local codes. Power supply voltage, phase and controls must match motor.



Never run a normal pump dry. The Hydrascan® CL will detect when your pump loses prime (no water available to pump). When it does this it will display the red warning (led) light and shut down the pump. Should this happen consult the troubleshooting guide.



The Davey Hydrascan® CL fitted to this pump has a low pressure indicator light mounted on its side panel, adjacent to the yellow button. This light will be illuminated whenever the Hydrascan® CL senses low pressure. The light will only work when unit is connected to the correct electrical supply.



This pump is not to be used by children or infirm persons and must not be used as a toy by children.

Adjustable cut-in screw setting

The Hydrascan® CL on your pressure booster system has a preset cut-in pressure, as per the table below. For **most** applications this will be satisfactory. In some cases a **different** cut-in pressure may be required. This can be achieved by following the instructions below.

These are some of the circumstances where adjustment to the cut-in may be required:

- High static (vertical) heads e.g. where the pump is more than 50 feet below the top outlet
- Large existing pressure tank used as well or instead of Davey Supercell 8C. In this case it may take some time for the system pressure to drop so the pump will start. This may cause inconvenience setting shower temperatures. By increasing the cut in pressure, you can reduce the delay before the pump starts, allowing you to set shower temperatures quicker.
- HS12-30HT1 or HS18-30HT1 used where a lower cut-in pressure may provide a larger tank draw-off capacity. These models may be set to cut-in at 30psi if desired. Tank pre-charge would need to be adjusted to 28psi in such circumstances.

Models	Cut-in Factory Setting
All XP Models	20 psi
HS12-30HT1, HS18-30HT1 & HS18-30HT2	38 psi
HS12-40HT1, HS18-40HT2	50 psi

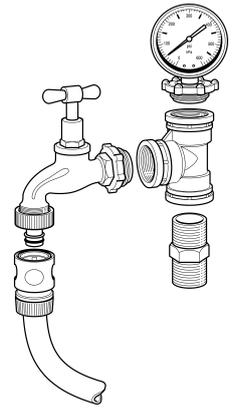


Always check air pre-charge in tank - see maintenance section.

Equipment required: Hydrascan®CL test kit (P/No. 31458) consisting of 1”BSP Plug with Pressure Gauge, 1”BSP Tee, 1”BSP Nipple, 1” tap with garden hose quick connector. Flat blade screwdriver.

OR

Pressure gauge installed in pipework near pump and outlet nearby.



Fit Hydrascan®CL test kit to top of Hydrascan®CL to allow test to be conducted at the pump.

Step 1 Fill the pump with water.

Step 2 Start pump and open tap to purge air out of pipework.

Step 3 Close tap and pump will turn off.

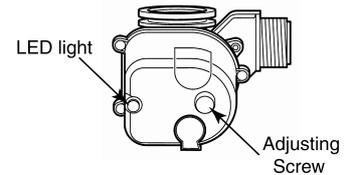
Step 4 Remove cut-in screw cover and gently turn the adjusting screw anti-clockwise until it comes to a stop.

NB If the pump starts during step 4, simply wait a few seconds until the pump stops then repeat step 4.

Step 5 Slowly open the tap and allow the pressure gauge to drop to the desired cut-in pressure. Close the tap to hold the system at this pressure.

Step 6 Slowly turn the adjusting screw clockwise until the pump starts. The pump will start for a few seconds and then stop. The low pressure indicator light will be illuminated momentarily when the pump first starts. If the pump stops and the light does not go off adjust to a lower cut-in pressure (turn screw anti-clockwise) or consult the trouble shooting guide.

Step 7 Replace the cut-in screw cover. Congratulations: Your pump is ready to use.



Always disconnect and lockout all electrical power when installing or working on pumps, motor or switches. Insure the power supply breaker is off or the disconnect (where used) is off.

⚠ WARNING

Hazardous voltage. Can shock, burn, or cause death.

Ground pump before connecting to power supply.



Ground motor before connecting to electrical power supply.



Failure to ground motor can cause severe or fatal electrical shock hazard.



Do not ground to a gas supply line.



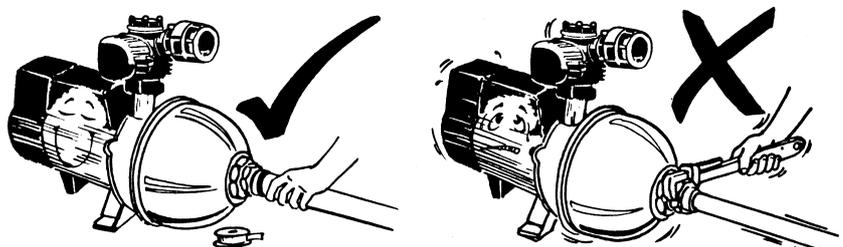
Supply voltage must be within +10% of nameplate voltage. Incorrect voltage can cause fire or seriously damage motor and voids warranty. If in doubt consult a licensed electrician.



If possible, connect pump to a separate branch circuit with no other appliances on it.

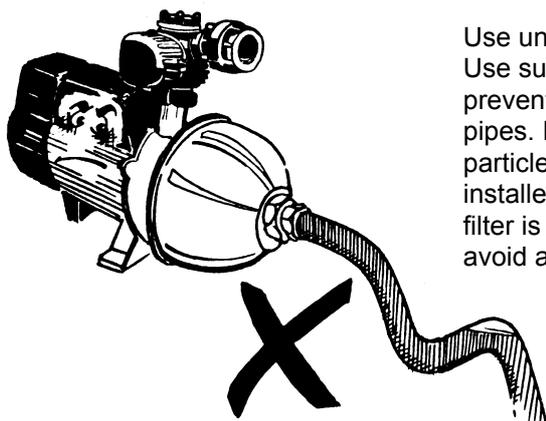
Pipe Connections

For best performance use P.V.C. or Polythene pipes at least the same diameter as the pump's inlet and delivery outlet openings. Larger diameter pipe may be used to minimise resistance to flow when pumping longer distances.





Do not use pipe thread sealing compound on any part of this pump. Only use teflon sealing tape.



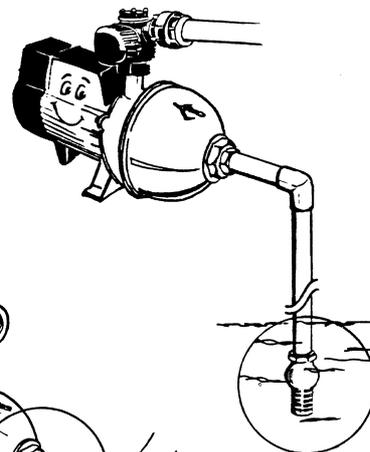
Use unions at pipe connections to enable easy removal and servicing. Use sufficient tape to ensure airtight seal and hand tighten only. To prevent strain on pump threads always support heavy inlet and outlet pipes. If there is a likelihood the water supply may contain solid particles such as pieces of plant or vegetable matter, a filter should be installed before the pump to avoid blocking of water ways. Ensure filter is cleaned regularly. Lay suction pipe at a constant gradient to avoid air pockets which may reduce pump efficiency.



NOTE: Suction leaks are the largest cause of poor pump performance and are difficult to detect. Ensure all connections are completely sealed using thread tape only. An air leak on the suction may not drip water!

Where to use Check Valves and Foot Valves

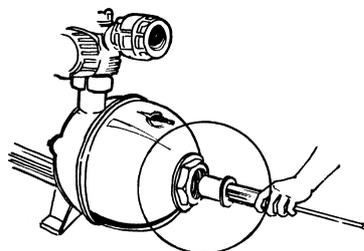
Installations with a suction lift over 3ft require a good quality foot valve to avoid loss of prime. In this case, the check valve inside the pump should be removed or overridden (see below).



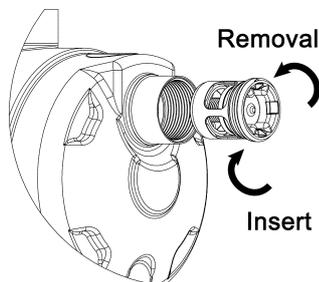
Inlet Check Valve Removal / Override

MODELS XP15-20H1, XP20-20H1 & XP30-20H2

The spring loaded swing check valve can be overridden by inserting the check valve chock supplied with the pump. The polymer chock must be fully screwed into the suction inlet before installing suction piping. This can easily be done using a standard screwdriver handle.



MODELS HS12-30HT1, HS12-40HT1, H18-30HT1, HS18-30HT2 & HS18-40HT2



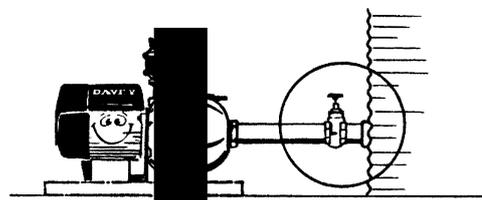
If your installation requires the removal of the in-built check valve or the in-built check valve requires removal for servicing, this can be achieved without difficulty. The in-built check valve is a cassette design, which is screwed in through the suction inlet.

Removal of the check valve cassette is achieved by inserting any suitable tool (eg. a pair of pliers or the handle from an adjusting spanner) into the inlet. The check valve cassette has various ribs and recesses to allow a variety of nonspecific tools to be used in the removal or insertion process.

Connection to your Water Source

FLOODED SUCTION

Installations with flooded suction require a gate valve so water supply can be turned off for pump removal and servicing.



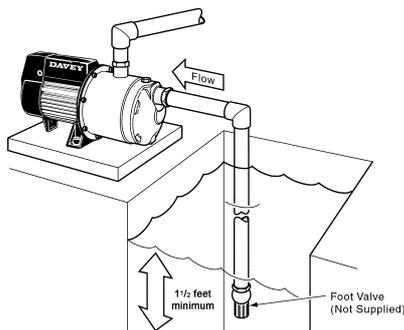
Use gate valve for flooded suction.

**Abrasive Materials**

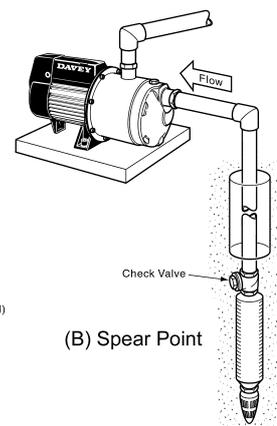
The pumping of abrasive materials will cause damage to the pressure system which will then not be covered by the guarantee.

BELOW GROUND WATER SOURCES

Whenever the installation position of the pump is higher than 3ft above the lowest water level, a foot valve must be used on the end of the suction pipe as illustrated in (A). Ensure that the foot valve is at least 1½ feet below minimum water level.



(A) Suction Lift



(B) Spear Point

SPEAR POINT INSTALLATIONS

When a Multistage Pressure Boosting System is installed on a spear or well point, a check valve must be fitted immediately on top of the spear point itself, as shown in (B). **DO NOT INSTALL THE CHECK VALVE AT THE PUMP OR AT THE TOP OF THE WELL. DO NOT RUN THE PUMP WITHOUT WATER. NOTE: Be certain to select the spear point to suit the well conditions and regulate the flow rate from the pump accordingly.**

SPEAR SIZE	MESH	APPROX. MAX. CAPACITY OF SPEAR POINT
1¼"	60	200 - 350 gal/hr
1½"	60	350 - 600 gal/hr
2"	60	600 - 1150 gal/hr



Spear point flow capacities vary considerably. Check with the supplier to ensure the pump and spear point are correctly matched.

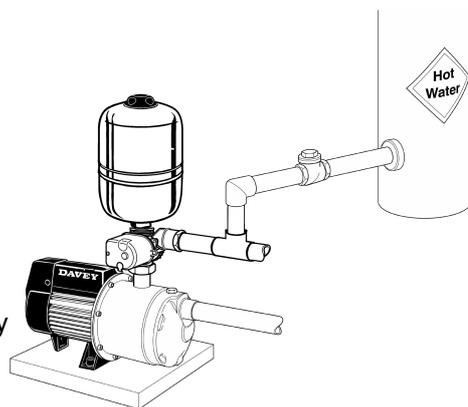
Pressure Warning

IMPORTANT: For Automatic Pressure Pumps installed with a mains pressure hot water system. Hot water system installation must comply with all local plumbing regulations.

A good quality non-return valve must be installed in the pressure pump outlet pipework before the hot water service. Failure to install this non-return valve may result in pump damage. Such damage is not covered by guarantee.

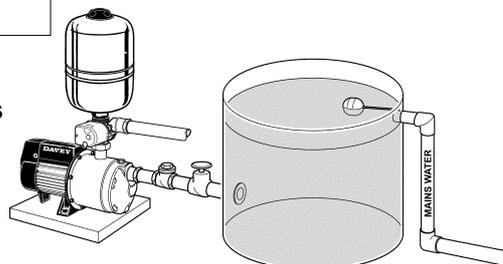
Connection of Mains Scheme or Town Water Supply to either Suction or Discharge of Pumps & Pressure Systems

Most Water Supply Authorities have strict regulations regarding direct connection of pumps to mains water supplies. In most cases an isolating tank is required between mains supply and pump. Davey also recommend this method. Directly applied mains pressure can exceed pump operating pressure and damage pump (see table below).



Models	Maximum Inlet Pressure
All XP Models	15 psi
HS12-30HT1, HS18-30HT1 & HS18-30HT2	50 psi
HS12-40HT1, HS18-40HT2	35 psi

Davey Products Pty Ltd can not accept responsibility for loss or damage resulting from incorrect or unauthorised installations.



When used with a Float Valve

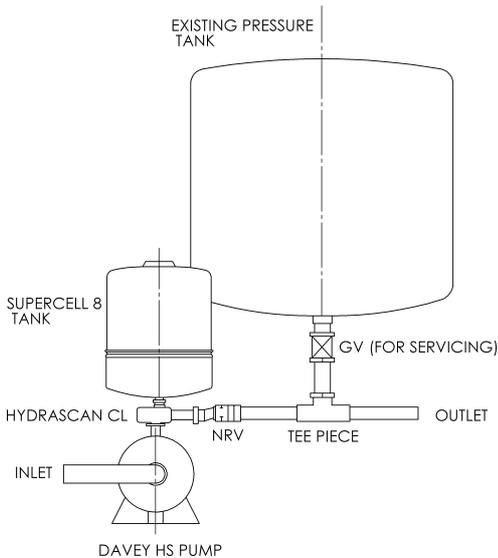
Where your pressure system is required to discharge through float valves filling tanks, the possibility of excessive cycling may occur. This can be overcome by fitting a larger Davey Supercell pressure tank in place of or in addition to the Supercell tank supplied.

Use of Existing Pressure Tanks

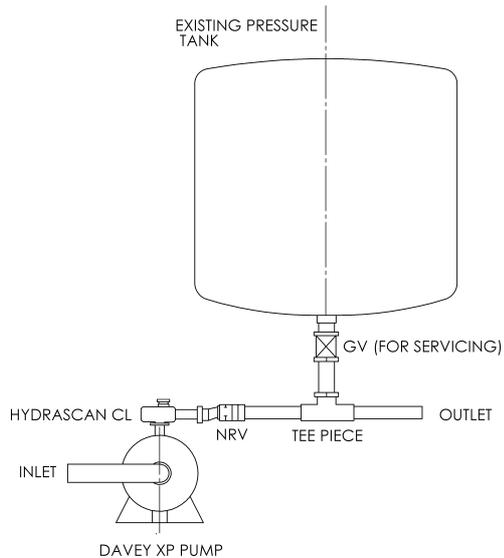
If you already have a pressure tank in good condition, you can use this tank to provide extra draw-off capacity (see Adjustable Cut-in Screw Setting on page 4).

You should connect such tanks on a tee on the discharge pipework. A check valve should be installed on the discharge of the Hydrascan®CL before the tee to the existing tank - see diagrams.

HS MODELS



XP MODELS



NOTE: See Maintenance on page 9 for tank pre-charge pressures.

Priming and Operation

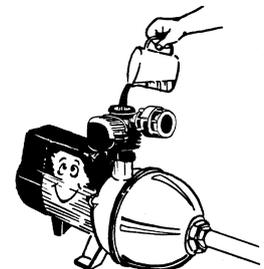
The Hydrascan®CL module fitted to your XP system is provided with a yellow push button. This button is used during initial priming of the pump and also acts as a reset button if the Hydrascan®CL switches out in pump protection mode.

1. Ensure outlet nearest to pump is open.

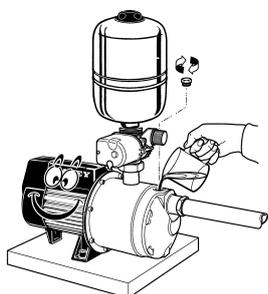


2. **For XP Models**

Remove priming plug, on top of Hydrascan®CL, and fill casing and suction line (on flooded suction, simply open gate valve to pump). When full, replace priming plug.



XP Models



HS Models

2. **For HS Models**

Remove priming plug, located above suction inlet, and fill casing and suction line (on flooded suction, simply open gate valve to pump). When full, replace priming plug.

3. Ensure all valves in suction line are open.



4. Switch on power - the low pressure indicator light will be illuminated for a few seconds and the pump will run. A full flow of water should be discharged from the open tap within a few seconds.

5. If the pump stops with the tap open and if the low pressure indicator light is illuminated go to steps 5a or 5b as applicable.

- a) If a partial flow only was established before the pump stopped itself, press the yellow button and hold until a full flow is evident from the open discharge. This should only take approximately 15 seconds.
- b) If no flow at all was established before the pump stopped itself, repeat the process from step 1.



6. Close the open outlet or tap. The pump should stop after a few seconds and the low pressure indicator light should not be illuminated. If the low pressure light stays on refer Troubleshooting checklist.

To Reset if Pump switches out in Pump Protection Mode

1. Make sure there is an adequate supply of water to the pump.
2. Make sure pump is primed.
3. Open tap, push button.
4. Close tap and pump will stop.



Never operate your Davey pump for more than a few seconds without discharge flow.

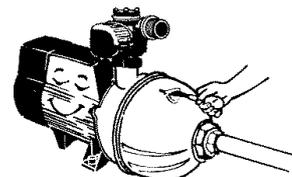
Maintenance

The only regular attention your new pressure system requires is to check the pressure tank's air charge every 6 months. This can be checked at the air valve with a tyre gauge. Do not charge tank to a higher pressure than those in the table below.

Model	Tank Pre-charge
XP (all models)	18psi (125kPa)
HS12-30HT1, HS18-30HT1 & HS18-30HT2	36psi (248kPa)
HS12-40HT1 & HS18-40HT2	48psi (330kPa)

To check air pressure in tank:

1. Switch off pump.
2. Open outlet nearest to pump to release water pressure.
3. Remove air valve cap from top of pressure tank and charge tank to the pre-charge pressure in the table, using air pump and check with tyre gauge.
4. Switch on.
5. Close outlet.



Where freezing may be a problem, all pipework should be buried and or lagged to prevent this happening. Your Davey pump should be housed in an enclosure which does not experience temperatures below freezing (32°F).



FREEZING CONDITIONS: In situations subject to freezing, drain water from pump, tank & pipework to avoid damage not covered under guarantee.

Trouble Shooting Check List

MOTOR RUNS FOR SHORT PERIOD ONLY WHEN SWITCHED ON BUT DOES NOT PUMP - LOW PRESSURE INDICATOR LIGHT REMAINS ILLUMINATED

1. Suction line and pump body not filled with water.
2. Air leaks in suction lines or suction pipe not under water.
3. Air trapped in suction lines (also possible with flooded suction due to uneven rise in piping: eliminate humps and hollows).
4. No water at source or water level too low.
5. Valve on suction lines closed.

PUMP SWITCHES ON AND OFF FREQUENTLY (CYCLING)

1. Check that tank air charge is correct..
2. Cycling may occasionally be caused by float valves filling tanks. This can be overcome by fitting more draw off capacity - talk to your Davey Dealer.
3. Leaking taps, float valves etc. check plumbing.
4. Leaking check valve/foot valve.

MOTOR DOESN'T START WHEN SWITCHED ON - LOW PRESSURE INDICATOR LIGHT NOT ILLUMINATED

1. Power not connected or no power available from supply outlet.
2. Supply voltage too low - check fuses or circuit breaker.
3. System already primed and pressurized (press yellow button to test motor).

MOTOR DOESN'T START WHEN SWITCHED ON - LOW PRESSURE INDICATOR LIGHT ILLUMINATED

1. Supply voltage too low.
2. "Over temperature" cut-out tripped - switch off, wait 10 minutes and switch on again.
3. Motor not free to turn - eg. a jammed impeller.
4. Internal motor fault.

PUMP WILL NOT STOP

1. Flow Cone not fitted in Hydrascan®CL.
2. Air lock in Hydrascan®CL.
3. Water leaks on discharge side of pump.

PUMP WILL OPERATE NORMALLY INITIALLY BUT WILL NOT RESTART ON WATER DEMAND - LOW PRESSURE INDICATOR LIGHT NOT ILLUMINATED

1. Power supply problem - see MOTOR DOESN'T START WHEN SWITCHED ON - LOW PRESSURE INDICATOR LIGHT NOT ILLUMINATED point 1 or 2.
2. Static discharge head too high - measure vertical height to top outlet.
 - i. Adjust the cut-in screw setting.
 - ii. If static height greater than maximum head of pump, consult your Davey Dealer for advice.
3. Hot water in suction pipe (170°F+).

PUMP WILL OPERATE NORMALLY INITIALLY BUT WILL NOT RESTART ON WATER DEMAND - LOW PRESSURE INDICATOR LIGHT IS ILLUMINATED

1. Suction depth too great.
2. Suction air leak - pump has lost prime.
3. Blocked impellers or suction.
4. Cut-in pressure set too high - must be at least 8psi below maximum pump pressure.



***NOTE:** For protection, the Davey® pump motor is fitted with an automatic "over temperature" cut-out. Constant tripping of this overload device indicates a problem e.g. low voltage at pump, excessive temperature (above 115°F) in pump enclosure.



NOTE: To protect the pump, the Hydrascan® CL fitted to your pump has a secondary over temperature function built-in. This function automatically stops the pump should the water in the pump reach 170°F. The pump will automatically restart once the water temperature drops below 170°F.



Motor normally operates at high temperature and may be too hot to touch. Before handling pump or motor, stop motor and allow it to cool.



WARNING: When servicing or attending pump, always ensure power is switched off and lead unplugged. Electrical connections should be serviced only by qualified persons.



Care should also be taken when servicing or disassembling pump to avoid possible injury from hot pressurized water. Unplug pump, relieve pressure by opening a tap on the discharge side of the pump and allow any hot water in the pump to cool before attempting to dismantle.



During servicing, use only approved, non-petrochemical based oring and gasket lubrication. If unsure, consult your Davey dealer for advice.



WARNING: Do not use hydrocarbon based or hydrocarbon propelled sprays around the electrical components of this pump.

After Sales Service

For professional after sales service or repair contact your Davey dealer.

For assistance in locating your nearest dealer contact the Davey Service Center on telephone number below.

DAVEY PRODUCTS LIMITED WARRANTY

1. The guarantee period commences on the date of original purchase of the equipment. Evidence of this date of original purchase must be provided when claiming repairs under guarantee. It is recommended you retain all receipts and your copy of the Warranty Registration Card in a safe place.
2. Davey products are warranted to the original user only to be free of defects in material and workmanship for a period of 12 months from date of installation, but no more than 24 months from date of manufacture. Davey's liability under this warranty shall be limited to repairing or replacing at Davey's option, without charge, FOB Davey's distribution center or authorized service agent. Davey will not be liable for any costs of removal, installation, transport or any other charges that may arise in connection with the warranty claim.
3. This guarantee is subject to due compliance by the original purchaser with all directions and conditions set out in the Installation and Operating Instructions. Failure to comply with these Instructions, damage or breakdown caused by fair wear and tear, negligence, misuse, incorrect installation, inappropriate chemicals or additives in the water, inadequate protection against freezing, rain or other adverse weather conditions, corrosive or abrasive water, lightning or high voltage spikes or through unauthorized persons attempting repairs are not covered under guarantee. The product must only be connected to the voltage shown on the nameplate.
4. Davey shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from the product or any defect, and the purchaser shall indemnify Davey against any claim by any other person whatsoever in respect of any such loss, damage or injury.
5. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. The warranty gives you specific legal rights and you may also have other rights which vary from state to state.
6. This guarantee applies to all states and territories of United States of America and Canada only.

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DEPEND ON
DAVEY

PUMP

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