

MULTISTAGE BOOSTER SYSTEMS WITH HYDRASCAN®

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

DEPEND ON

DAVEY

PUMPS

HS MULTISTAGE BOOSTER SYSTEMS

PRODUCT DESCRIPTION

Economical, compact, booster systems driven by a quiet, efficient multistage centrifugal pump.

The Hydrascan® control module replaces the conventional pressure switch and provides constant pressure without cycling. This feature also provides loss of prime protection and over-temperature cut out. Supplied complete with Supercell 8C (2 gallon) pressure tank.

APPLICATIONS

- Ideal for boosting water pressure in homes where the incoming municipal water supply pressure is inadequate
- Boosting pressure from underground or surface water supplies
- Automatic water transfer
- Applications where pressure “cycling” must be avoided or where the pump may have interrupted water supply
- Domestic & light industrial irrigation



DESIGN FEATURES

PUMP

Three or four stage centrifugal.
Closed vane impellers - “half blind design”.
Unique floating impeller neckrings.
High grade stainless steel pump shaft & casing.
Removable internal suction side check valve.
Rotatable discharge.
Mechanical shaft seal.
Oring casing seals.
Hydrascan® control with adjustable cut-in pressure.

MOTOR

Davey manufactured.
2 pole, 3420rpm, 60Hz.
TEFC with IP55 enclosure.
Class F insulation.
Permanently split capacitor design.
Double contact sealed C3-HTG rated ball bearings.
Heavy duty cast aluminium lantern bracket and drive end endshield.
Protected against both high operating temperatures and high current by a built-in automatically resetting thermal overload.

TANK

Coated steel shell.
Captive, heavy duty diaphragm meets EEC requirements for potable water.
Fully lined water cavity.

BENEFITS

- Manufactured from highest quality corrosion resistant materials
- Hydrascan® offers even pressure without cycling
- Adjustable cut-in pressure on Hydrascan® allows for installation on higher static head installations
- Pump protected from damage caused by dry running
- TEFC motor-corrosion resistant and excludes dust and dirt
- Motor and pump designed for frequent starts
- Discharge may be rotated through 360° - makes plumbing easier
- Quick and easy installation
- Low maintenance
- Easy to service if required
- Compact design
- Unique floating neckrings provide outstanding efficiency without compromising grit handling
- “Half blind” impellers maximize performance and help improve waterway clearances to reduce impeller blockages
- Low pressure loss through removable in-built check valve

OPERATING LIMITS

Capacities to (gpm)	27
Max. total head to (psi)	72
Cut-in pressure (factory setting)	44psi ± 3psi
Min. setting	17psi
Max. setting	80psi
Cut-out flow rate	1/2 GPM
Max. liquid temperate	150°F
Max. ambient temperature	120°F
Max. suction lift	25'
Inlet size (BSP)*	1 1/4" F
Outlet size (BSP)*	1" F
Max. pump casing pressure	145psi
Max. system pressure	120psi

* See note on page 2



TECHNICAL SPECIFICATIONS

MATERIALS OF CONSTRUCTION

PART	MATERIAL
Impellers	Glass filled polycarbonate
Lock nut	304 stainless steel
Pump casing	304 stainless steel
Pump backplate	304 stainless steel
Pump shaft	304 stainless steel
Neckrings	Polypropylene
Seal ring (stationary)	Ceramic
Seal ring (rotating)	Carbon (synthetic)
Seal spring	304 stainless steel
Orings	Nitrile rubber
Stage body	Glass filled noryl
Suction check valve	Polypropylene
Body	
Spring	304 stainless steel
Seal	Nitrile
Stage spacer (3 stage models)	Glass filled nylon
Priming plug	Chrome plated brass
Motor shell	Marine grade aluminium
Lantern / DE endshield	Marine grade aluminium
Shell & lantern bracket finish	Baked polyester
Pressure tank	Steel
Shell	
Shell finish	Epoxy powder coat
Diaphragm	Butyl rubber
Liner	Potable grade epoxy powder coat

ELECTRICAL DATA

	HS12-30HT1	HS12-40HT1	HS18-30HT1	HS18-40HT2
Supply voltage	115			230
Supply frequency	60Hz			
Input power (P ₁)	0.68kW	0.84kW	0.81kW	1.1kW
Output power (P ₂)	0.50kW	0.55kW	0.54kW	0.77kW
Full load current	6.2A	7.8A	7.5A	5.1A
Locked rotor current	19A	19A	19A	16A
Starting	PSC			
Insulation class	Class F			
IP rating	IP55			

INSTALLATION & PRIMING

- On installations with suction lifts over 3ft, a good quality foot valve should be fitted. In this case the factory fitted inlet check valve must be fully screwed out from the suction inlet before installing suction piping.
- The system is primed by filling the pump and suction line with water through the priming port, and replacing priming plug prior to switching on.
- The yellow push button on the Hydrascan® unit should be held in while the pump is establishing prime.

MODEL IDENTIFICATION

HS = Horizontal stainless steel multistage pressure booster pump

12-30 = Duty at max. flow 12gpm @ 30psi
 12-40 = 12gpm @ 40psi
 18-30 = 18gpm @ 30psi
 18-40 = 18gpm @ 40psi

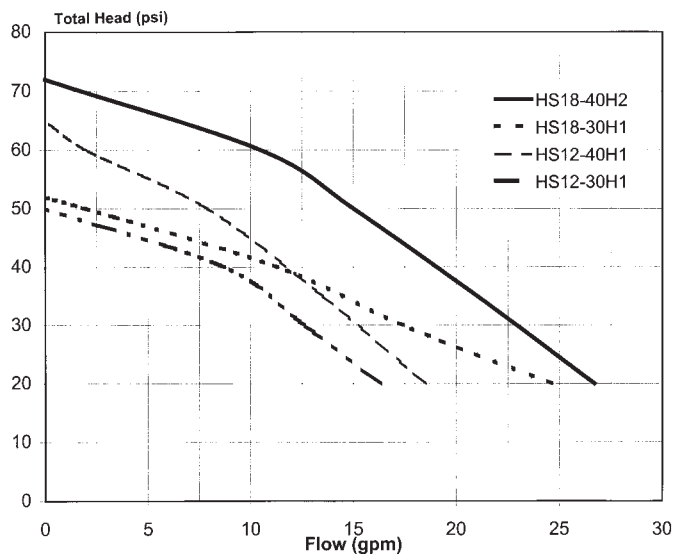
H = Hydrascan® control

T = Supercell 8C tank included

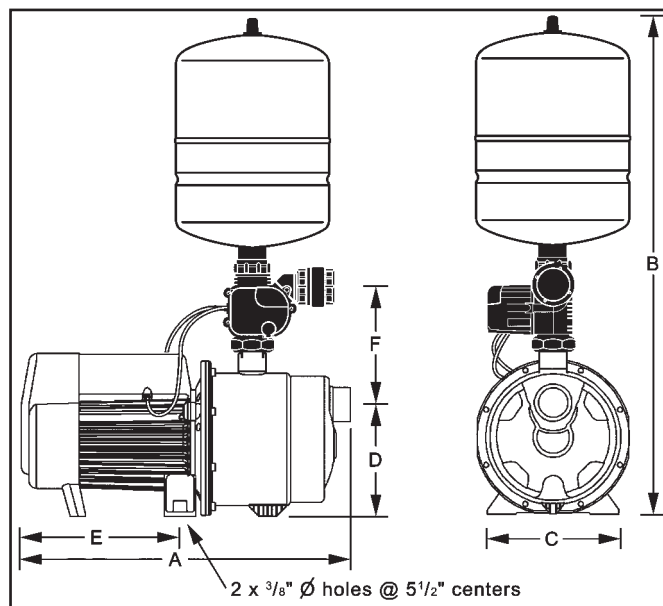
1 = Voltage
 1 = 115V 60Hz
 2 = 230V 60Hz

TECHNICAL SPECIFICATIONS

HYDRAULIC PERFORMANCE



DIMENSIONS





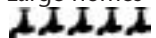

Model	A	B	C	D	E	F	Inlet BSP (see note below)	Outlet BSP	Net Weight (lbs)
HS12-30HT1	16.0	23.8	8.1	5.7	7.2	5.8	1 1/4" F	1" F	25.3
HS12-40HT1	16.0	23.8	8.1	5.7	7.2	5.8	1 1/4" F	1" F	25.4
HS18-30HT1	16.0	23.8	8.1	5.7	7.2	5.8	1 1/4" F	1" F	25.4
HS18-40HT2	17.0	23.8	8.1	5.7	8.2	5.8	1 1/4" F	1" F	28.5


All dimensions in inches unless otherwise stated.

Note: 1" BSP(F) threads will accept 1" NPT(M) fittings.

HS models have 1 1/4" BSP(F) inlets into which a 1 1/4" BSP x 1 1/4" NPT adaptor should be fitted - BSP side into pump inlet. Use thread tape supplied.

PERFORMANCE TABLE

	Discharge Pressure in psi	Capacity in US Gallons per Minute Suction Lift in Feet					Maximum Pressure in psi	
		0	5	10	15	20		25
HS12-30HT1 Small homes to weekenders 	20	16.3	16.1	15.3	14.3	13.6	12.8	50
	30	12.6	12.1	11.3	10.5	9.0	8.2	
	40	8.7	6.6	5.0	2.8	1.3	-	
HS12-40HT1 Small homes with double storeys or long runs of plumbing 	20	18.5	17.7	17.1	16.4	15.6	14.8	65
	30	14.8	14.2	13.7	12.4	11.9	11.1	
	40	11.3	10.5	10.0	8.9	8.2	7.4	
	50	7.4	7.1	6.1	5.0	3.4	1.3	
HS18-30HT1 Large homes 	20	22.6	21.5	20.6	19.3	17.9	17.2	52
	30	18.4	16.6	15.8	14.8	12.9	11.6	
	40	13.2	10.6	8.9	7.1	5.3	2.1	
HS18-40HT2 Average to large homes with double storeys or long runs of plumbing 	20	26.7	26.0	25.0	24.0	23.0	22.0	72
	30	22.7	22.2	21.5	21.1	20.1	19.0	
	40	19.0	18.5	17.7	16.6	16.1	15.6	
	50	15.0	13.5	12.6	12.1	10.8	9.7	

 To make selecting your Davey pressure booster system easier, Davey provide a guide to the number of taps that can be operated at the same time without substantially reducing performance, assuming an average delivery of three gallons per minute per tap and a 5ft suction lift.

HYDRASCAN® CONTROL

BACKGROUND

Traditional "pressure switch" controlled systems, often driven by jet pumps, have proved to be effective since their introduction several decades ago. However, these systems have two major disadvantages:

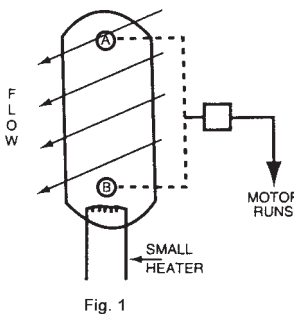
- Pressure system cycling (ie. start and stop at low flows), especially while using the shower, causing annoying pressure and temperature fluctuations.
- If the water supply to the pump dries up eg. if the storage tank runs out of water or the suction line is damaged, then the system will keep running until self-destruction takes place.

These two disadvantages triggered Davey to develop a pump control system that would overcome these two problems. As a result of years of research, development and product improvements the Hydrascan® control module is now used worldwide.

HYDRASCAN® - A DAVEY INNOVATION

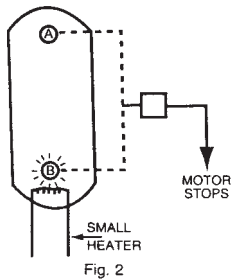
To overcome the problem of "cycling" it was necessary to move away from the traditional pressure-off system of control.

Hydrascan® operates on the basis of sensing pressure to switch the pump on (via an in-built traditional diaphragm type pressure switch), and then sensing flow to keep the pump running until a very low flow rate is reached (approximately 1/2 gallon per minute). Hydrascan® incorporates an ingenious flow sensor which has no moving parts in the flow path to malfunction in dirty water.



Water from the pump discharge flows across the surface of a specially treated, 316 Stainless Steel plate adjacent to, but not protruding into the water path. Bonded to the back of the plate are two temperature sensors (A & B). Sensor B has a small heater alongside it. While water is flowing (above 1/2 gallon per minute flow rate) the heat from the heater is removed and does not increase the temperature of sensor B. Sensor A & B are thus at the same temperature. This temperature equivalence is sensed by the electronic control and the pump motor keeps running (see Figure 1).

When the flow drops below 1/2 gallon per minute, sensor B will become warmer than sensor A, and the electronic control will stop the pump (see Figure 2). If pressure was higher than cut-in at that time the pump will wait in standby mode.



Because the pump will keep running down to very low flow rates - this overcomes problems of cycling, in showers etc.

LOSS OF PRIME PROTECTION - ANOTHER HYDRASCAN® ADVANTAGE

If the pump loses prime (storage tank runs out of water, suction line damaged etc.) there will be no flow over the sensor plate and this combined with the control system, sensing that the system has also lost pressure, triggers the pump to cut-out. After fixing the water supply problems, it requires a manual reset (switch "off" and "on" at the power point or by depressing the convenient yellow push button on the Hydrascan® lid). In this way the pump protects itself from damage caused by loss of water.

ADDITIONAL HYDRASCAN® FEATURES

- Absolute water temperature sensing. The Hydrascan® flow sensor will measure absolute water temperature and will cut the pump out when the water temperature exceeds 175°F. This is an extra safety feature and is built-in for two good reasons:
 - To protect the pump internals from damage by high temperatures water, eg. from long exposed suction lines in summer.
 - To protect the pump from high temperatures caused by rapid cycling in the event that the complete air charge is lost from the pressure tank. In both cases the problem needs to be fixed and the pump manually reset.
- Hydrascan® has a yellow rubber button on the lid for priming or reset. This forces the motor to run for as long as the button is depressed. When the pump has primed and the button is released the pump will run for as long as the demand is in excess of the cut-out flow rate.
- Hydrascan® has a status indicator light which glows whenever low pressure is detected. It also functions as a troubleshooting aid.

This literature is not a complete guide to product usage. Further information is available from your Davey dealer, Davey Customer Service Centre and from the relevant product Installation and Operating Instructions. This data sheet must be read in conjunction with the relevant product Installation and Operating Instructions and all applicable statutory requirements. Product specifications may change without notice.

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PUMPS