



HYDROFLO Variable Speed Booster Sets



VDI



VDB

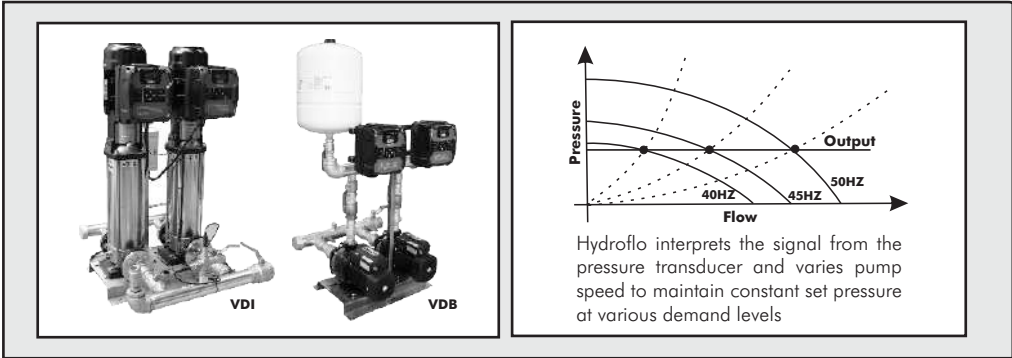
Installation & Operating Manual

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Thank you for choosing Dayliff Hydroflo Variable Speed Booster Set. The set has been manufactured to the highest standards and if operated correctly should give you many years of efficient and trouble free service. Careful reading of this instruction manual is therefore extremely important and if you have any queries please refer them to your retailer.

1. SPECIFICATIONS



Variable Speed control is a widely used technology for pump control and works by varying the pump speed to provide system water output at a constant pressure. This provides the following benefits:

- Constant pressure providing consistent, even supply to the consumer.
- Large energy cost savings as systems are always operating at peak efficiency for the demand conditions.
- Extended pump life due to reduced electrical and mechanical operating loads.
- Silent operation with no pressure shocks.
- Simplified installation due to compact dimensions and integral pump control - no separate panel is required.

Principle system components include the drive, which is mounted on the pump motor or on the pump skid, a quality Dayliff pump, a pressure sensor and a small surge tank to smooth the operating cycle. Controllers offer the following features:-

- Varies pump speed to maintain pre-set system pressure.
- Over voltage, under voltage, single phasing and electrical overload protection.
- Dry run protection with auto restart.
- Integral soft start/soft stop function which extends pump life, reduces system pressure loads and reduces mains power loadings on start up.

- One controller can control additional pumps and multiple controller systems can be synchronised for sequenced pump operation.
- Balanced pump operation ensuring equalised operating periods for each system pump.

All Dayliff booster sets use the latest technology controllers coupled to quality Dayliff pumps and are supplied complete frame mounted with inlet and outlet manifolds and valves for simple installation. Nominal system sizes are 2.5, 4 and 6 Bar, though pressures can be set to suit site conditions and the option of two and three pump configurations are available.

Three pump systems can be specified with three controllers or two controllers/1 DOL start unit. In all systems pump operation is sequenced with the number of pumps operating increasing with system demand.

Variable speed drive is now accepted as the most efficient way to provide on-demand water supply in all sorts of industrial commercial and domestic applications. Dayliff booster sets are the ideal solution in the application of this efficient technology.

SPECIFICATIONS

2.5Bar Systems

Pumps - Dayliff DB or equivalent horizontal multistage high efficiency centrifugal pumps with stainless steel impellers and impeller housings.

Controllers - Dayliff Pumpverter drives that provide pump control system using variable frequency drive technology (VFD) to provide constant pressure regardless of the demand flow requirements.

4.0 and 6.0Bar Systems

Pumps - Dayliff DIN or equivalent in-line vertical multistage pumps with stainless steel impellers and impeller housings.

Controllers - Options of pump mounted Dayliff Pumpverter to provide constant pressure control. Also available is integrated control panel that includes Schneider Electric Altivar for the large motors. They are high specification VFDs suitable for use in residential and industrial applications. Drives are air-cooled and installed on motor or remote mounted with complete pump protection against overloading and over/under voltage, sleep and wake up function and pump dry run protection via installed pressure sensor.

Schneider Electric Altivar Drives are premium VFDs with advanced application functions dedicated for water pumping applications in industrial and commercial

applications including embedded services such as energy and pump efficiency monitoring dashboards without additional softwares, and integral Modbus protocol connectivity interfaces allowing seamless integration to BMS systems. Control panel specification includes IP55 enclosure with thermal management fans, Incoming Isolator, individual pump fuses/breakers, ATV630 VFD Starters, 'On' and 'Trip' indicators, Start-Stop push button, Emergency push button and Auto-Off-Hand Selector Switch.

4.0 Bar Smart Pump Systems

Pump: Dayliff DBE5-40/12-40 pumps with integrated variable speed motor

Controller: Integrated variable speed drive that maintains constant pressure with variable demand.

2.5 BAR SYSTEMS

PUMP DETAILS		2 PUMP SYSTEMS							3 PUMP SYSTEMS							DIMENSIONS	
Pump	Power (kW)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Length (mm)	Height (mm)		
Dayliff DB 2-50	0.7x1ph	VDB2-6/25	6	24	1.5	1.5	600	45	VDB3-10/25	10	24	2.5	2.5	900	67	600	733
Dayliff DB 4-40	1x1ph	VDB2-10/25	10	24	2	1.5	600	50	VDB3-15/25	15	24	2.5	2.5	900	73	600	733
Dayliff DB 8-50	1.7x3ph	VDB2-20/25	20	60	2.5	2	600	85	VDB3-30/25	30	60	3.0	3.0	900	124	600	905

4.0 BAR SYSTEMS

PUMP DETAILS		2 PUMP SYSTEMS							3 PUMP SYSTEMS						
Pump	Power (kW)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)
Dayliff DIN 3-10	0.75x3ph	VDI2-7/40	7	24	2	600	80	600x927	VDI3-10/40	10	24	2.5	900	121	900x927
Dayliff DIN 5-10	1.5x3ph	VDI2-15/40	15	24	2	600	102	600x1083	VDI3-20/40	20	24	3	900	154	900x1083
Dayliff DIN 10-6	2.2x3ph	VDI2-25/40	25	60	2.5	650	133	900x1130	VDI3-40/40	40	60	3	1200	194	1200x1130
Dayliff DIN 15-5	4x3ph	VDI2-40/40	40	100	3	650	178	900x1235	VDI3-60/40	60	100	4	1300	272	1300x1235
Dayliff DIN 32-3	5.5x3ph	VDI2-60/40	60	100	4	650	271	1500x1276	VDI3-100/40	100	300	6	1800	422	1800x1645
Dayliff DIN 45-2	7.5x3ph	VDI2-80/40	80	300	6	650	318	1500x1645	VDI3-120/40	120	300	6	1800	440	1800x1645

6 BAR SYSTEMS

PUMP DETAILS		2 PUMP SYSTEMS							3 PUMP SYSTEMS						
Pump	Power (kW)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)
Dayliff DIN 3-15	1.1x3ph	VDI2-7/60	7	24	2	600	82	600x1016	VDI3-10/60	10	24	2.5	600	124	900x1016
Dayliff DIN 5-16	2.2x3ph	VDI2-15/60	15	24	2	600	110	600x1285	VDI3-20/60	20	60	3	600	170	900x1285
Dayliff DIN 10-9	3x3ph	VDI2-25/60	25	60	2.5	650	151	900x1198	VDI3-40/60	40	60	3	650	221	1200x1198
Dayliff DIN 20-5	5.5x3ph	VDI2-40/60	40	60	3	650	219	900x1218	VDI3-60/60	60	100	4	650	337	1300x1218
Dayliff DIN 32-4	7.5x3ph	VDI2-60/60	60	100	4	650	295	1500x1346	VDI3-90/60	90	300	6	650	458	1800x1645
Dayliff DIN 45-3	11x3ph	VDI2-100/60	100	300	6	650	424	1500x1645	VDI3-150/60	150	300	6	650	599	1800x1645

SMART PUMP SYSTEMS 4 BAR

PUMP DETAILS		1 PUMP SYSTEM							2 PUMP SYSTEM						
Pump	Power (kW)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)	Model No.	Nominal Output (m ³ /hr)	Tank Size (lit)	Inlet/Outlet (")	Width (mm)	Weight (kg)	Dimensions LxH(mm)
Dayliff DBE 5-40	1.1x1ph	VDBE1 5/40	5	3	1 1/4/1	360	30	400x700	VDBE2 10/40	10	3	1 1/4/1	600	50	450x700
Dayliff DBE 12-40	2.2x1ph	VDBE1 12/40	12	3	2	360	50	675x790	VDBE2 24/40	24	3	2	600	100	675x790

Unpacking

Check thoroughly to ensure that all required items have been received (as per the packing list) and that the booster set is free of any damage prior to signing the delivery notes.

2. INSTALLATION

2.1 Location

The set should be placed in a well-ventilated position to ensure adequate cooling of the pump motors. No special foundation is required, but the set should be positioned on a flat and solid surface, e.g. a concrete floor. Ensure that the frame is level horizontally.

2.2 Pipe Work

The suction and discharge pipes are connected directly to the respective terminations on the manifolds. Ensure that the pipes are of adequate size and that the levels are correct such that unnecessary stress is not imposed on the manifolds when tightening the unions. Flexible hose couplings may be used to reduce stressing and transmission of noise due to vibration.

3. OPERATION

The booster set comprises of 1/ 2 or 3 pumps mounted on a common base frame, complete with isolating valves, non-return valves, suction manifold, discharge manifold and one diaphragm tank with a pressure switch and a gauge. The systems are assembled for Duty assist pump operation, and provides for cyclical operation of the pumps at low demands.

3.1 Dayliff VFD Booster Set Controls

The VFD controller is mounted on top of the pump motor to provide adequate cooling. A pressure sensor feeds the controller which in turn regulates the pump speed to sustain set conditions.

3.2 Pressure Tanks

The assembly is equipped with diaphragm type pressure tank of 24, 60, 100 or 300 litre capacity at the delivery line to aid in smooth operation.

3.3 Working Mechanism

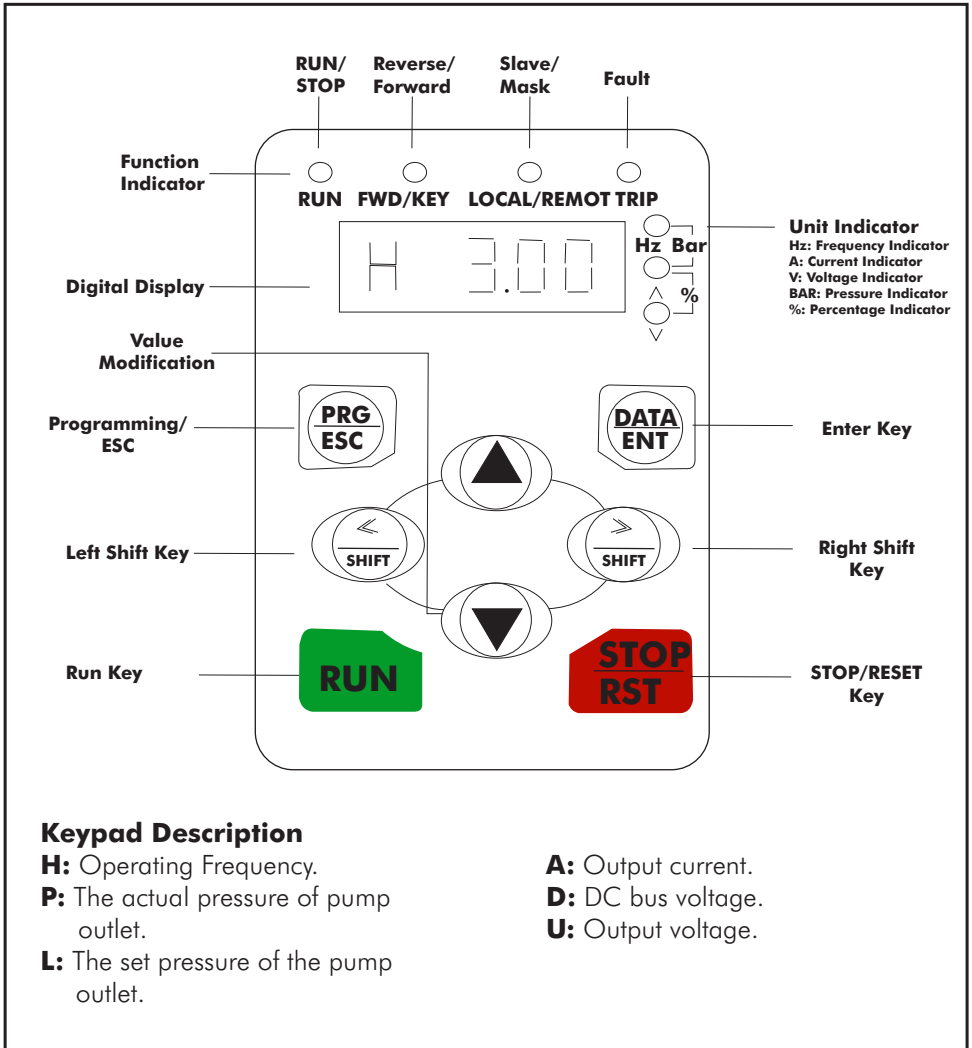
When water is drawn, pressure in the discharge line will drop below the set pressure; which prompts the controller to start one pump softly in proportion to the demand.

If the demand increases the controller increases the pump speed aiming to maintain the set pressure. As demand surpasses supply from the first pump then the second pump starts slowly to top up the deficit.

When there is reduced water demand the first pump stops softly, then the second pump will eventually stop and the system will remain pressurized at the set pressure.

Correct operation of the set is indicated when, after closing the main delivery gate valve, the pumps switch off automatically when the system has pressurized to the set pressure.

3.4 Operating Procedure



Power-on Initialization

- When power is switched on the system initializes and LED displays controller model. After the initialization is completed, the controller switches to standby mode.

Parameter Setting

- Three levels of menu are available as below:
 - Primary interface first-level function mode.
 - Secondary-level function code.
 - Function code setting value third-level function code setting value.
- Press **<</SHIFT** or **>>/SHIFT** to switch to display running/stop status monitoring parameters.
- At the primary interface, press **PRG/ESC** to enter the first-level menu then press **PRG/ESC** to return to primary interface.
- At first-level menu, press **DATA/ENT** to enter the second-level menu. Second-level menu press **PRG/ESC** and **DATA/ENT** to return to first level menu or enter third-level menu.
- At third-level menu, press both **PRG/ESC** and **DATA/ENT** to return to the secondary-level menu the difference being by:
 - Pressing DATA/ENT the controller saves the parameters and returns to the second-level menu with shifting to the next function code automatically.
 - Press PRG/ESC will return immediately to the second-level menu without saving the parameters; and stay at the current function code.

Example 1: change factory pressure setting 3.0 bar to 2.5 bar.

Method 1: Direct setting at the primary interface.

1. Press **▲** or **▼** at primary interface, the system will switch-over to display set pressure.
2. Press **▲** or **▼** again, to increase or decrease set pressure.
3. After completing the pressure setting, press **DATA/ENT** to save the value.
4. During operation press **<</SHIFT** or **>>/SHIFT** to scroll through the parameters in the left or right order until there are only two upper lights on.
5. Read out the pressure value.

Function Code	Name	Setting Range	Factory Setting	Description
b00.00	Debugging password	0-65535	65535	Set at b06.09, is 65535
b00.01	Pressure setting valve	0.0~100 bar	3.0 bar	Set according to the actual requirements
b00.02	Motor rotating direction	0~1	0	0: Forward 1: Reverse ensure pump motor is running correctly
b01.00	High water pressure/ level alarm value	0.0~100.0 bar	8.0 bar	When pressure is higher than the pre-set value, the controller will stop show alarms and display HP.
b01.01	Low water pressure/ level alarm value	0.0~100.0 bar	0.5 bar	When the pressure is lower than the pre-set value for the low pressure running time, the controller will stop, show alarms and display LP.
b03.00	Communication address	0.0~31	0.2 bar	E.g. If the rated max. Range of transducer is 10bar, b0. 05 should be set to 10.0
b03.08	Slave Quantity	0~5	0	0: None
b05.02	Terminal S1S2	0~3	2	0: Invalid. 1: Electric contact control S1- COM on: Frequency rise. S2- COM on: Frequency drop. 2: Manual/ Auto S2- COM off: Auto control. S2- COM on: Manual control. 3: Terminal run/ stop. S1- COM on: Run. S1- COM off: stop S2- COM off: Auto control. S2- COM on: Manual control.

Function Code	Name	Setting Range	Factory Setting	Description
	Set the password of b00.00			Randomly avoiding abnormal running and damages
b07.15	Password of Group Br 08	0~65535	65535	
b08.01	Motor rated power	0.4~350kW	Model set	Depending on model, set parameters according to nameplate of motor.
b08.02	Motor rated frequency	0~60 Hz	50Hz	
b08.03	Motor rated speed	0~36000 RPM	Model set	
b08.04	Motor rated voltage	0.0~2000A		

Automatic reset of error conditions

Display Indications	Display Indications	Description
bL	Blockage due to lack of water	<ul style="list-style-type: none"> One attempt every 10min for a total of 6 attempts One attempt every 1 hour for a total of 24 attempts One attempt every 24 hours for a total of 30 attempts
ot	Blockage due to overheating (>100°C)	<ul style="list-style-type: none"> Recovery happens when the power stages' temperature falls below 85°C
oF	Blockage due to overcurrent in output	<ul style="list-style-type: none"> One attempt every 10min for a total of 6 attempts
oF/ot	Lock activated by overcurrent in the output terminals with terminal temperature over 45°C	<ul style="list-style-type: none"> One attempt in every 10min or if the temperature drops by 10°C. The attempt count is shared by the oF lock

4. ROUTINE MAINTENANCE

Hydroflo sets may be fitted with either Diaphragm or Bladder type pressure tanks. For diaphragm tanks, no routine recharging is required. For bladder tanks however, it is necessary to check and recharge every six months.

- To check the pressure tank's air charge, switch off the electric power.
- Close the main gate valve on the outlet pipe as well as the gate valve on the suction piping.
- Drain water from the pressure tanks by opening the 'test' gate valve.

(If there is no 'test' gate valve provided, then loosen the union connecting the pressure tank to the piping will facilitate draining).

- Replenish the air if necessary and replace the valve cap.
- Repeated air loss may indicate a leaky air valve.

If these remedies fail, contact Dayliff Retailer.



Do not charge tank to a higher pressure than indicated as this will reduce the draw down available from the tank between pump stops and starts.

5. TROUBLE SHOOTING

Problem	Possible Cause	Solution
Low flow	Air leaking into suction	Prime pump
	Water level below suction pipe	Check the low level switch
Pump doesn't switch off/ takes long to switch off	Leak in discharge	Repair/ replace the discharge
	Tap turned on	Turn off the tap
	Blockage in suction pipe	Unblock suction pipe
	Blocked pump impeller	Unblock or replace pump impeller
	Pump rotating in wrong direction	Change pump connections

Problem	Possible Cause	Solution
P u m p s w i t c h e s o n a n d o f f f r e q u e n t l y	Leaking NRV	Replace NRV
	Suction line leaking	Repair/ replace suction line
	Burst diaphragm in pressure tank	Replace the tank Correct the pre-charge in the tank

6. TERMS OF WARRANTY

i) General Liability

- In lieu of any warranty, condition or liability implied by law, the liability of Dayliff (hereafter called the Distributor) in respect of any defect or failure of equipment supplied **is limited to making good by replacement or repair** (at the Distributors discretion) defects which under proper use appear therein and arise solely from faulty design, materials or workmanship within a specified period. This period commences **immediately after the equipment has been delivered to the customer** and at its termination all liability ceases. Also the warranty period will be assessed **on the basis of the date that the Distributor is informed of the failure.**
- This warranty applies solely to equipment supplied and **no claim for consequential damages**, however arising, will be entertained. Also the warranty specifically excludes defects caused by fair wear and tear, the effects of careless handling, lack of maintenance, faulty installation, incompetence on the part of the equipment user, Acts of God or any other cause beyond the Distributors reasonable control. Also, any repair or attempt at repair carried out by any other party **invalidates all warranties.**

ii) Standard Warranty

General Terms

If equipment failure occurs in the normal course of service having been competently installed and when operating within its specified duty limits warranty will be provided as follows:-

- **Components making up the plant or system are covered individually under the specific item's warranty terms.**
- **Consumable e.g. cartridges are not covered by warranty**

The warranty on equipment supplied or installed by others is conditional upon the defective unit **being promptly returned free to a Davis & Shirtliff office** and collected thereafter when repaired. No element of site repair is included in the warranty and any site attendance costs will be payable in full at standard chargeout rates.

DAYLIFF is a brand of **Davis & Shirtliff**

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