Official Distributor

LOWARA
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en GVF, GHV SERIES BOOSTER SETS installation and operating instructions

* PLEASE READ INFORMATION IN THIS MANUAL CAREFULLY BEFORE PUT INTO USE
* SAVE THIS MANUEL FOR FUTURE REFERENCE

« Translation of the original instructions »

WARNINGS FOR THE SAFETY OF PEOPLE AND PROPERTY

The following symbols mean:

DANGER
Failure to observe this warning may cause personal injury and/or equipment da- mage

ELECTRIC SHOCK
Failure to observe this warning may result in electric shock

ATTENZIONE

WARNING
Failure to observe this warning may cause damage to property or the environment

ENGLISH INSTRUCTIONS - CONTENTS

This manual consists of two parts: the first is intended for installers and users, the second for installers only.

Before proceeding to install the product, read these instructions carefully and adhere to the regulations locally in force.
The installation and maintenance operations must be performed by qualified personnel.

The pressure booster set is an automatic machine; the pumps may start up automatically without prior warning.
The set contains pressurized water, reduce the pressure to zero before servicing.

The electrical connections must comply with the regulations in force. Provide an efficient grounding system.
Disconnect the power supply before servicing.

If the set is damaged, disconnect the power supply to avoid any risk of electric shock.

If the set is damaged, close the on-off valves to prevent flooding.

1. Overview

The pressure booster sets of the GVF, GHV series are designed to transfer and boost clean water pressure in water systems for homes, offices, communities and industry.

Operating limits

Fluid temperature	**:** 0°C to +80 °C
Ambient temperature	**:** 0°C to + 40 °C
Operating pressure	**:** Max 10bar, 16bar, 25bar depending on the type of pump (see instructions handbook)
Minimum inlet pressure	**:** According to NPSH curve and flow resistance; level should be raised by a safety margin of at least 0.5 metres if water contains air.
Maximum inlet pressure	**:** The inlet pressure plus the pressure supplied by the pump against the closed valve must always be lower than the maximum operating pressure.
Starts per hour	**:** Do not exceed the number of starts per hour indicated in section 12.

WARNING

Limitations to fluid temperature and pressure may be imposed by the membrane tank. Observe the operating limits!

2. Product Description

The pressure booster set consists of identical electric pumps connected in parallel and mounted on a common stand, suction and delivery manifolds, on-off valves, check valves, pressure gauge, pressure transmitters, frequency converters and a Three-phase control panel.
The system must be equipped with a membrane tank. The delivery manifold is fitted with couplings de- signed for installation of tanks with on-off valve. Additional floor-standing tanks may be installed and connected to the manifold.

3. Operation

The pumps are controlled by the converters according to system requirements.
The membrane tank provides for initial water demand.
When the pressure drops to the control value, the first variable speed pump starts running.
If the water demand rises, the speed increases until the subsequent pumps also start.
If the demand drops, the speed decreases until the pumps stop.
If the demand drops further, the last pump fills the tank and then shuts down.

GVF, GHV Three-Phase Version

The three-phase version has a three-phase control panel, the frequency converters power the motors with variable frequency three-phase voltage.
On the control panel are installed automatic line protection circuit breakers for each frequency converter, as well as a main switch.

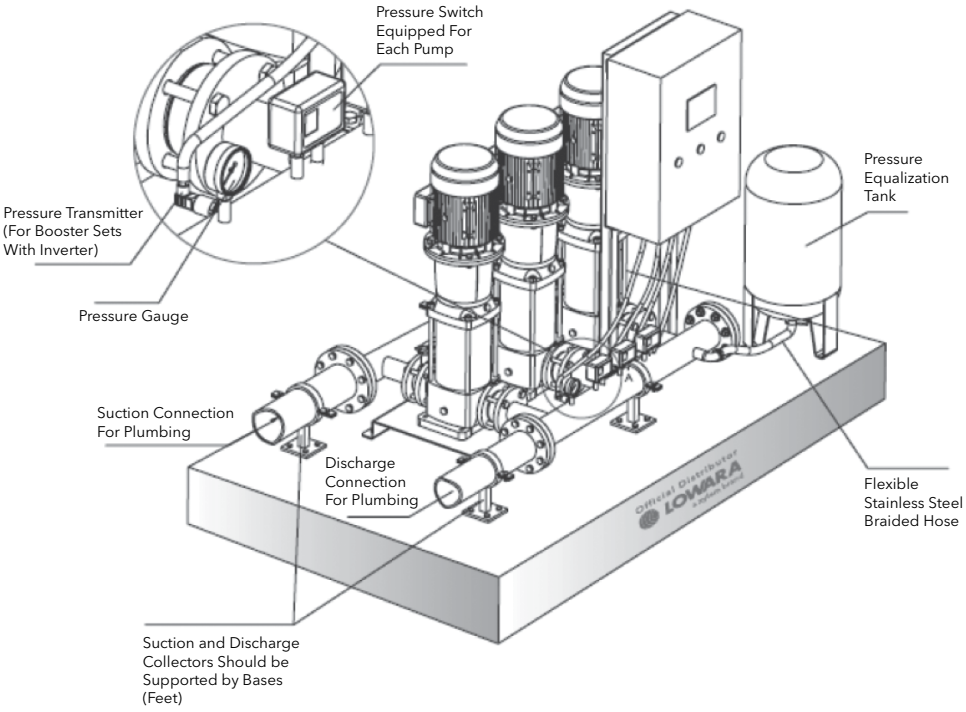
INFORMATION FOR INSTALLERS

4. Installation

Use suitable equipment to handle the set, avoid impacts, do not use the eyebolts on the motor for lifting purposes. Before installing the set, make sure it did not suffer any damage during transportation. Install the pressure booster set in a well-ventilated room, allowing adequate clearance (0.5 m) on all sides and front for maintenance. The tanks can be mounted on the set or floor. Place the set on a level and sturdy surface.

Piping

The pipes connected to the set must be adequately sized (if possible, according to manifold diameter). To prevent undue stress, expansion joints and suitable pipe supports should be provided. You can use either end of the manifold, but don't forget to plug the unused end.



The figure shows the positive suction connection.

WARNING The weight of the pipes and tanks increases when they are filled with water. Before starting the set, make sure you have closed and tightened all the unused couplings.

WARNING The sets are supplied with the protection disconnected (factory setting)

Tank Selection

Variable speed pressure booster sets can operate with smaller tanks compared to traditional systems. As a general rule, a tank with a capacity in litres amounting to about 10% of the flow rate of a single pump expres- sed in liters per minute is sufficient. The required water volume may be distributed among multiple tanks.

Electrical Connections

The electrical connections must be made by a qualified electrician in accordance with local codes.
Before making the connections, disconnect the power supply!

The wiring diagram and the labels on the panel provide the necessary information for connection and the required power supply values.

WARNING Fill the pumps with liquid before starting them. See the pump instructions manual.
Follow the start-up procedure described in section 6.

Three-Phase Version

The motor is protected against overload by the converter. Suitable cable of appropriate gauge must be connected to the panel:

- L1, L2, L3 to the main switch terminals
- PE to the ground terminal marked ⏚

5. Settings

Disconnect the power supply before making any adjustments.

For the settings, refer to the converter operating instructions

Operation

The starting and stopping of the pumps are determined based on the pressure settings of the controller. In the GHV Series each frequency converter is connected to a pressure transmitter, GVF series used one frequency converter.

The converters share all the information and provide for cyclic changeover.

The figure shows the operating method with the curves for two pumps
- The tank supplies water upon demand by a user.

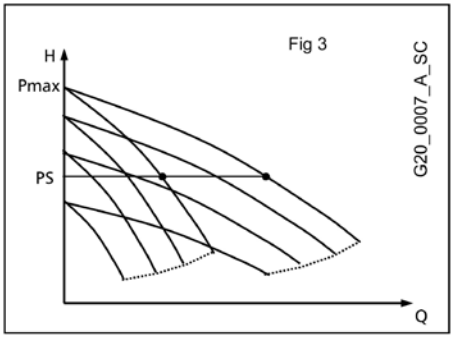


Fig 3

- When the pressure drops below the PS value, the first pump is started and the speed is adjusted to maintain a constant pressure as the demand increases
- If the demand keeps increasing and the pump reaches maximum speed, the second pump is started and the speed is adjusted to maintain a constant pressure.
- When the demand decreases the speed is reduced until minimum speed is reached; at this point one of the pumps is deactivated.
- If the demand decreases further the pump slows down, fills the tank and then stops when the PS value is reached

Converter Adjustments

If you need to modify the settings, refer to the converter operating instructions. Use the converter keypa- nel to set a new pressure adjustment value, select the language, view the latest alarms or access all the adjustment settings.

Tank Precharge

To ensure its proper operation, the membrane tank must be precharged to 0.9 x adjustment pressure value. The precharge operation must be performed with the tank empty.

6. Startup

To start the set, proceed as follows:

a) Connect the water supply
b) Connect the power supply
c) Check the tank precharge value
d) Close the pump delivery valves
e) Prime the set (see pump instructions manual) and suction manifold
f) Operate the switch on the panel to supply power and set the converter to manual mode operation.
g) Start the first pump
h) Slowly open the pump delivery valve and bleed the air
i) Repeat the above operations for the other pumps
j) Set the converters to automatic mode operation.

How to Modify the Settings

After the set has been started, proceed as follows to modify the settings within the maximum pressure li- mits of the pumps and/or system:

a) Determine the required pressure value
b) Set the new value on the control panel, the setting will be modified automati- cally on the other converter as well.

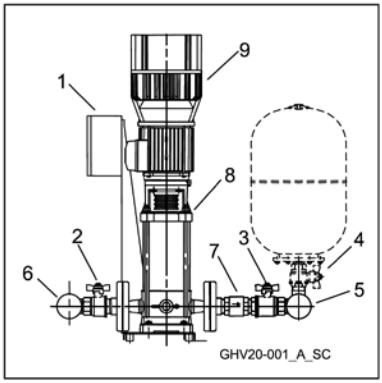
7. Maintenance

Electric Pump Maintenance
See the electric pump instructions manual.
Electric Panel and Converter Maintenance
The electric panels and converters do not require any maintenance.

Membrane Tank Maintenance
See the tank instructions manual, check the precharge at least two times a year.

8. Components List

Ref	Component	Qty
1	Electric panel	1
2	Suction on-off-valve	n
3	Delivery on-off valve	n
4	Tank connection	n
5	Delivery manifold	1
6	Suction manifold	1
7	Check valve	n
8	Electric pump	n
9	Converter (GHV)	n



In the GVF assembly, the inverter is inside the electrical panel.
n= total number of electric pumps in the set.

For the electric panel specifications, refer to LVS service manual document.

The check valve may be located on the delivery or suction side, depending on the type of set; the electric pump may be vertical or horizontal type. The tank is not included in the supply.

Connections may be threaded or flanged depending on the model of set. The frequency converter may be mounted on the pump or the panel depending on the model of set.

9. Repair- Spare Parts

WARNING Repairs must be made by qualified personnel using original spare parts.

10. Troubleshooting

The maintenance and repair operations must be performed by qualified personnel. Before servicing the set, disconnect the power supply and make sure there is no pressure in the hydraulic components.

The frequency converter memorizes the last alarms triggered. Refer to the frequency converter operating instructions for the types of malfunctions and directions on how to view the last alarms triggered.

Problem	Cause	Solution
1. Set is off	1. Power supply disconnected	Connect power supply
	2. Switch in OFF position	Set switch to ON
2. Motor does not start	1. Power supply disconnected	Connect power supply
	2. Triggering of motor thermal protector	Eliminate malfunction.
	3. Defective motor	Repair/replace motor
3. Frequent startups and stops	1. Defective tank	Repair/replace tank
4. The motor runs but no water is delivered	1. No water on suction side or inside pump	Fill the pump or suction piping / open the on-off valves
	2. Air in suction piping or pump	Bleed the pump, check the suction connections.
	3. Loss of pressure on suction side	Check the NPSH and, if necessary, modify the system
	4. Check valve jammed	Clean the valve
	5. Clogged pipe	Clean the pipe
5. Pump leaks water	1. Defective mechanical seal	Replace the mechanical seal
	2. Undue mechanical stress on pump	Support the pipes
6. Too noisy	1. Water return when pumps stop	Check the check valve
	2. Cavitation	Check suction
	3. Pump rotation hindered	Check for undue mechanical stress on pump

11. Disposal

Proceed in compliance with local codes and regulations pertaining to disposal of waste, including packa- ging materials.

12. Specifications

Data refer to standard-design products

Voltage rating	3 x 400 V +/- 10% , 50 Hz (Three-phase)				
Current rating	See rating plate on electric panel				
Protection class	Electric pump IP55 Electric panel IP55 Converter IP55 up to 22kW, IP54 above (GHV)				
Sound emission level	50Hz 2900 min -1	LpA (dB±2)			
	P2 (kW)	1P	2P	3P	4P
	2.2	<70	<70	<70	<71
	3	<70	<70	71	72
	4	<70	70	72	73
	5.5	<70	71	73	74
	7.5	<70	72	74	75
	11	73	76	78	79
	15	75	78	80	81
	18.5	75	78	80	81
	22	75	78	80	81
Liquid temperature	0°C to + 80 °C				
Ambient temperature	0°C to + 40 °C				
Installation	Indoor, protected from the weather. Away from heat sources. Max 1000 m ASL				
Operating pressure	Max 8 bar, 10 bar, 16 bar Depending on the type of pump (see in-structions)				
Minimum suction pressure	According to NPSH curve with a margin of at least 0.5 m for air-free water				
Maximum suction pressure	Make sure the inlet pressure plus the closed delivery pressure does not exceed the maximum operating pressure.				
Electric panel	Max power: see rating plate of electric panel Probe electrodes voltage 12Vac				
Pumps	See pump instructions manual				
Tanks	See tank instructions manual. If installed, they may limit the operating temperature and pressure				
Starts per hour	kW			n	
	0.25 – 0.37 – 0.55 – 0.75 – 1.1 – 1.5 – 2.2 – 3			60	
	4 – 5.5 – 7.5			40	
	11 - 15			30	
	18.5 – 22			24	
	30 – 37			16	
	45			8	

You can use the following chart to note down the model and code number of the pressure booster set, as shown in the rating plate. Please provide this information when requesting service.

Set Model	
Code	
Pumps	
Serial number	
Installation date	
Setting (bar)	

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