Center Pivot
50Hz End Gun Booster Pump

Instruction Manual

Key Points:

- Specific Vertical Mount Electric Motor design
- Fit into existing pipework and orientation
- Seal flush to reduce air locking.
- Engineered Stainless Steel volute and impeller
- IE2 and IP56 Motor
- Twin lifting eyes for ease of installation.
- NPT and BSP options

WARNING!!

This is a 50Hz End Gun Booster Pump
DO NOT Connect to 60Hz Power
Without Installing a Smaller Impeller

CONTENTS

WARNING

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

WARNING

Use lifting eyes to lift and position pump

WARNING

Pump mass
HC-EGBP5015 Gross mass 37kg
HC-EGBP5022 Gross mass 37kg
HC-EGBP5037 Gross mass 39kg

Take all necessary precautions when lifting the pump to prevent personal injury to self or others should the pump fall or topple.

WARNING

The use of this product requires experience with and knowledge of the product.

1. General

HC-EGBP series is an end suction single-stage centrifugal pump.
The pump has a compact structure with close-coupled motor.
The pump set is vertical mount only.
The pump is vertical mounted and used in pressure boosting of clean water for agricultural irrigation, including end gun booster.

2. Operating Conditions

- Applicable to transfer thin, clean, non-flammable liquid not containing solid particles and fibers.
- Applicable to transfer light corrosive media e.g. herbicides, fertilizer
- Liquid temperature: 0ºC-+40ºC
- Max. liquid temperature: +40ºC
- Altitude: Up to 1000 m
- Max. operation pressure: 10 bar

3. Receiving

Check Hydro Connect EGBP for shortages and damages immediately upon arrival. Companion Flanges are packaged in a separate container and shipped with the unit. If equipment is damaged in transit, immediately report the damage to the transport company agent. Make a complete report on the freight manifest to speed satisfactory adjustment by the carrier. Unload and handle the equipment with a sling or fork lift.

Temporary storage
If pump is not to be installed and operated soon after arrival, store it in a clean, dry area of moderate ambient temperature.

4. Pump Identification

Hydro Connect EGBP's are identified by Model and Serial Numbers. These are stamped on the pump nameplate as below affixed to each motor housing and should be referred to in all correspondence with the Company.

50 Hz END GUN BOOSTER PUMP		
HC-EGBP5015		S/N.
Q 20 m^3/h		H 23 m
1.5 kW		2900 RPM
415 V	IE2	SF 2.00
50 Hz	IP56	4.9 A
TEFC	ICL F	37 kg
www.hydroconnect.com.au		

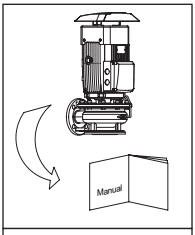
50 Hz END GUN BOOSTER PUMP		
HC-EGBP5022		S/N.
Q 30 m^3/h		H 23 m
2.2 kW		2900 RPM
415 V	IE2	SF 1.36
50 Hz	IP56	6.2 A
TEFC	ICL F	37 kg
www.hydroconnect.com.au		

50 Hz END GUN BOOSTER PUMP		
HC-EGBP5037		S/N.
Q 45 m^3/h		H 23 m
3.7 kW		2900 RPM
415 V	IE2	SF 1.08
50 Hz	IP56	8.3 A
TEFC	ICL F	39 kg
www.hydroconnect.com.au		

5. Warranty

Hydro Connect End Gun Booster Pumps are warranted to the original user only to be free of defects in material and workmanship for a period of 24 months from date of installation, but not more than 30 months from date of manufacture. Hydro Connect liability under this warranty shall be limited to repairing or replacing at Hydro Connect option, without charge, F.O.B. Hydro Connect factory or authorized distributor. Hydro Connect will not be liable for any costs of removal, installation, transportation, or any other charges which may arise in connection with a warranty claim. Hydro Connect will not be liable for damage or wear to products caused by abnormal operating conditions, accident, abuse, misuse, unauthorized alteration or repair, or if the product was not installed in accordance with Hydro Connect printed installation and operating instructions. To obtain service under this warranty, the defective product must be returned to the distributor or dealer of Hydro Connect products from which it was purchased together with proof of purchase and installation date, failure date, and supporting installation data. Unless otherwise provided, the distributor or dealer will contact Hydro Connect or an authorized distributor for instructions. Any defective product to be returned to Hydro Connect or a distributor must be sent freight prepaid; documentation supporting the warranty claim and/or a Return Material Authorization must be included if so instructed. HYDRO CONNECT WILL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, OR EXPENSES ARISING FROM INSTALLATION, USE, OR ANY OTHER CAUSES. THERE ARE NO EXPRESS OR IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WHICH EXTEND BEYOND THOSE WARRANTIES DESCRIBED OR REFERRED TO ABOVE.

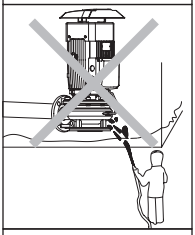
6. Safety Precautions



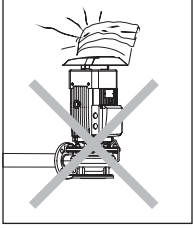
1. Please read the manual carefully before use, in order to ensure a normal and safe operation of the pump.

2. The electric pump should be reliably grounded.

3. It is strictly prohibited to touch the pump during operation.

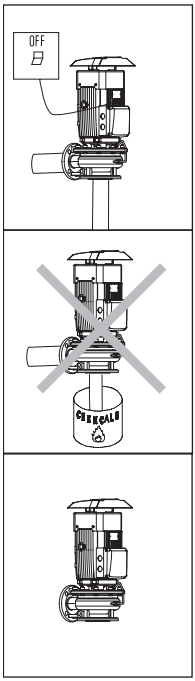


4. It is not recommended to allow pressurized water to be sprayed at the pump. Motor rating is IP56



5. Keep the pump in a well-ventilated place.

6. Safety Precautions Continued

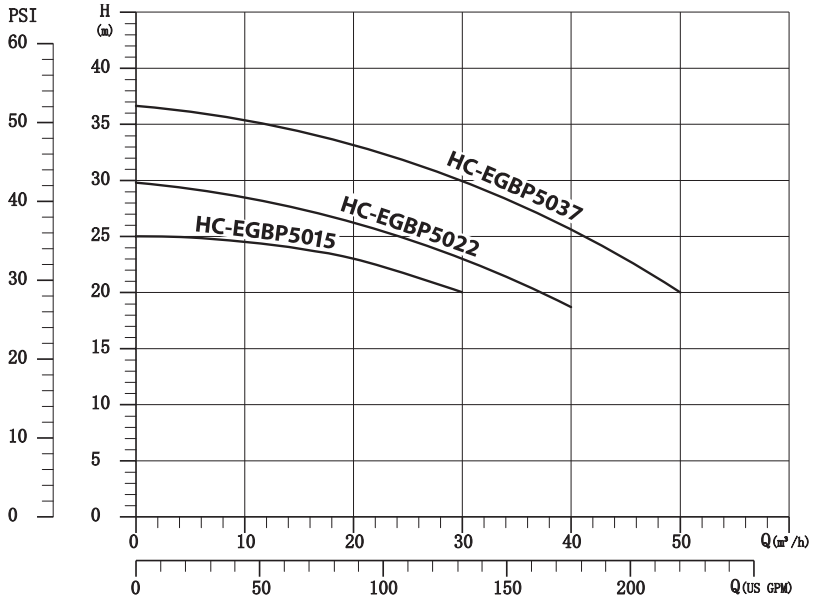


6. Turn off the power supply before maintenance.

7. Do not pump any flammable or explosive liquids.

8. Follow the voltage and frequency stated in the nameplate while using the pump.

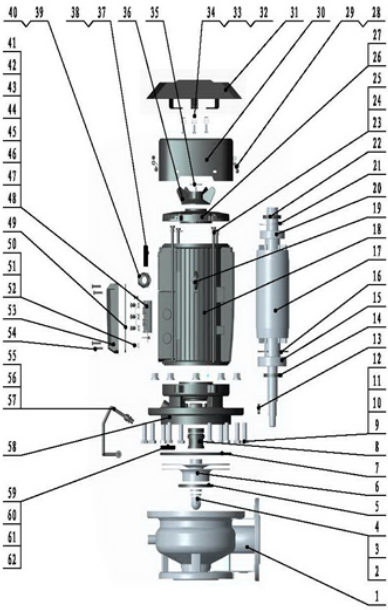
7. Performance Data



End Gun Nozzle Flow			Boost Pressure & Current Draw								
			HC-EGBP5015			HC-EGBP5022			HC-EGBP5037		
m3/hr	LPS	US GPM	M	PSI	Amps @415 V	M	PSI	Amps @415 V	M	PSI	Amps @415 V
0.0	0.0	0	24.8	35	3.1	29.7	42	3.6	36.6	52	4.1
5.0	1.4	22	24.7	35	3.4	29.1	42	4.1	35.8	51	4.6
10.0	2.8	44	24.2	35	3.7	28.4	41	4.4	35.0	50	5.1
15.0	4.2	66	23.7	34	4.1	27.5	39	4.8	34.1	49	5.8
20.0	5.6	88	22.8	33	4.4	26.4	38	5.2	33.0	47	6.4
25.0	6.9	110	21.5	31	4.7	25.0	36	5.6	31.6	45	6.9
30.0	8.3	132	19.8	28	4.9	23.2	33	5.9	30.2	43	7.3
35.0	9.7	154	-	-	-	21.2	30	6.1	28.1	40	7.7
40.0	11.1	175	-	-	-	18.7	27	6.2	26.1	37	8.1
45.0	12.5	197	-	-	-	-	-	-	23.6	34	8.2
50.0	13.9	219	-	-	-	-	-	-	19.8	28	8.3

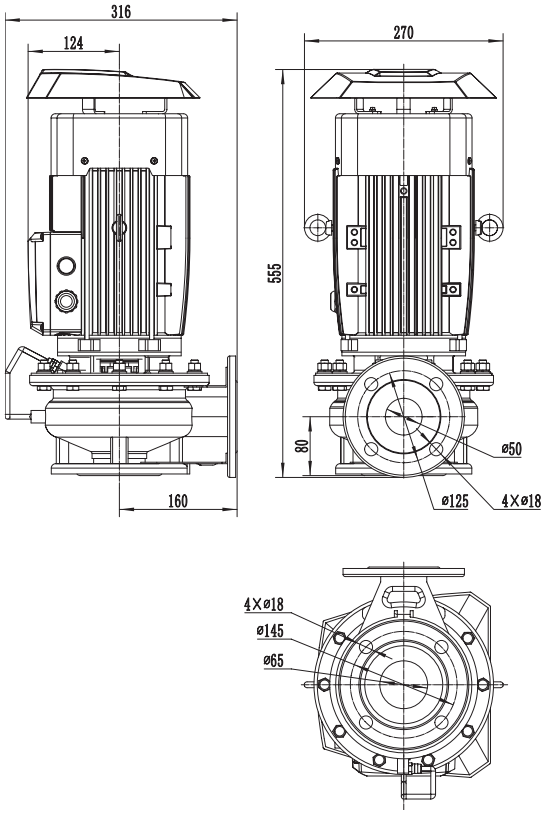
Suggested max end gun nozzle	0.6”	0.8”	1.0”
	15.2mm	20.3mm	25.4mm

8. Product Structure

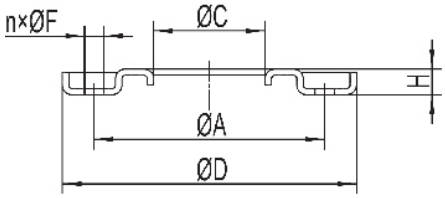


No.	Part
1	Pump Body - Volute
2	Nut
3	Spring Washer
4	Washer
5	Floating Seal Ring
6	Impeller
7	Seal Ring
8	Mechanical Seal
9	Spring Washer
10	Plain Washer
11	Nut
12	Bolt
13	Flat Key
14	Skeleton Oil Seal
15	Ball Bearing
16	Elastic Retaining Ring
17	Rotor
18	Stator
19	Eye Bolt
20	Ball Bearing
21	Wave Spring
22	Frame Work Seal
23	Bolt
24	Plain Washer
25	Spring Washer
26	End Plate
27	Body Seal Ring
29	Plain Washer
28	Screw
30	Fan Cover
31	Motor Cowl
32	Bolt
33	Washer
34	Nut
35	Elastic Retaining Ring
36	Fan
37	Name Plate
38	Rivet
39	Cable Connector
40	Body Seal Ring
41	Number Tube
42	Number Tube
43	Number Tube
44	Number Tube
45	Number Tube
46	Number Tube
47	Connecting Block
48	Connecting Block
49	Terminal Cover Seal
50	Screw
51	Locking Washer
52	Spring Washer
53	Terminal Cover
54	Screw
55	Tube Fitting
56	Tube Fitting
57	Seal Flush Tube
58	Backplate - Link Body
59	Guide Plate
60	Screw
61	Spring Washer
62	Plain Washer

9. Dimensions



10. Flange Dimension



DN	Ø A	Ø C	Ø D	n x ØF	H
Ø50	125	50	165	4xØ18	15
Ø65	145	65	185		16

11. Installation

Installation Mechanical

All installations should be performed by personnel experienced with the placement, connection, and alignment of pumping equipment. The following instructions are general in nature, and may not deal with the specifics of your installation. Read these instructions thoroughly before installing and operating your Hydro Connect EGBP.

Keep these instructions handy for future use.

Check the suction and delivery ports to ensure that any protective plugs or film (if fitted) are removed prior to installing the pump unit.

Vertical mounting instructions

The Hydro Connect EGBP is designed to be mounted vertically on a 2 1/2" NPT or BSP nipple and companion flange. The majority of installations have the companion flange threaded straight onto the nipple where the suction must be the same size (no decrease in pipe size at suction allowed). Discharge pipe size will be the same as the pump or may be one or two sizes larger depending on the length.

Mechanical seals

Hydro Connect EGBP's are equipped with mechanical seals that are matched to the conditions for which the pump was sold. Observe the following precautions to avoid seal damage and obtain maximum seal life. Do not exceed temperature or pressure limitations for the mechanical seal used. Do not run the pump dry or against a closed valve. Dry operation will cause seal failure within minutes. Purge all air from the seal chambers and recirculation lines prior to operating the pump. Clean and purge suction piping in new installations before installing and operating pump. Pipe scale, welding slag and other abrasives can cause rapid seal failure.

12. Electrical Connection

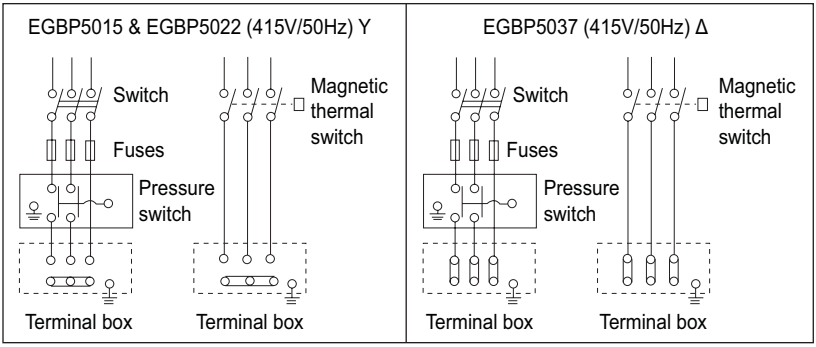
Warning

Whenever powered equipment is being used in explosive surroundings, the rules and regulations generally or specifically imposed by the relevant responsible authorities or trade organizations must be observed.

	Do not connect wires on terminal box unless the power is turned off. The pump should be reliably grounded. Install an electric leakage circuit breaker to prevent electric shock.

Installation wiring

Mount the control panel or motor starter in close proximity to the pump to provide convenient control and ease of installation. Wire panel or starter to motor and pilot device: Wires to the motor must be sized for at least 125% of the motor nameplate amps. Check incoming power source to ensure that it is the same as the voltage and phase of the motors. Verify that the starters are suitable to operate the pump motor on voltage and phase that is available.



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12. Electrical Connection cont.

Voltage regulation

The motor will operate satisfactorily under the following conditions for voltage and frequency variation, but not necessarily in accordance with the standards established for operation under rated conditions: The voltage variation may not exceed 10% above or below rating specified on the motor data plate. The frequency variation may not exceed 5% above or below motor rating. The sum of the voltage and frequency variations may not exceed 10% above or below motor rating, provided the frequency variation does not exceed 5%.

13. Use and Operation

Preparation before start-up
Check motor bolts and other connections are tightly fixed.

Never run the pump dry in the hope that it will prime itself.
Serious damage to the pump will result.

Make the following inspections before starting your Hydro Connect EGBP:

1. Make sure all wiring connections to the motor (and starting device) match the wiring diagram and produce clockwise rotation as viewed from the top of the motor.
2. Double check rotation. Rotation must be clockwise.
3. Check the voltage, phase, and line circuit frequency with the motor nameplate.
4. Check suction and discharge piping for leaks, and make sure all flange bolts are securely tightened.

Motor rotation

After the unit has been wired and checked to ensure that all components in the system (circuit breaker, magnetic starters, pilot devices and motors) are properly connected, check motor rotation as follows: Momentarily energize the motor to ensure that the rotation is correct as indicated by the arrow on the fan cover. If rotation is incorrect, interchange two wires at the motor starter terminals. IMPORTANT: The pumps must not be operated while dry. Use extreme caution that motors are energized only momentarily to determine proper rotation.

Starting the pump

1. Fill suction line with liquid and completely prime pump.
2. Start the motor (pump).
3. Immediately make a visual check of pump and suction piping for pressure leaks.
4. Check discharge piping for pressure leaks.

14. Maintenance

1. Cut off the power supply before maintenance.
2. If pressure, voltage, vibration, noise, etc. is different to usual, stop and check the pump immediately.
3. The max temperature allowed for the motor bearings is 95ºC
4. The leakage of mechanical seal is normally minimal. If the leakage is excessive and gradually increasing, stop and check the pump immediately.
5. Do not operate the pump in the event of no liquid inside the pump or air not completely exhausted. Otherwise it will cause damage of the mechanical seal.
6. Do not operate the pump beyond maximum flow rate (see performance curve) to avoid motor burn-out.
7. Do not start the pump too often. The maximum cycle is 40 times per hour.
8. Do not run the pump against a closed head. The risk of explosion exists if the water temperature in the pump chamber is too high.
9. In case of any possible frost and ice damages, drain all liquid inside the pump after the pump is stopped.

15. Disassembly and Assembly

Only qualified persons are allowed to assemble and disassemble as following.

Disassembly

1. Unscrew the bolts between pump body and bracket. Remove the pump body and gasket.
2. Loosen the impeller nut with a socket wrench. Remove the impeller.
3. Remove the rotating ring of the mechanical seal with care.
4. Remove the rear cover and the stationary ring of the mechanical seal. If necessary, remove the stationary ring from the rear cover. Do not scratch the mechanical seal surface.

Assembly

1. Wipe the hole on rear cover for stationary ring mounting. Press the stationary ring into the hole. Do not scratch the mechanical seal surface.
2. Clean the surface before installing the rotating ring.
3. Install the impeller, flat washer, spring washer and nut in sequence and tighten them.
4. Mount O-ring on the rear cover.
5. Fasten the pump body and bracket with bolts. Rotate the impeller with a screwdriver through pump inlet to ensure rotation of the impeller.

16. Troubleshooting

Check the pump

Symptom	Cause	Corrective Action
The motor cannot be started	Power failure.	Check power supply.
	Motor overload.	Check system.
	Electrical circuits problem.	Check electrical circuits.
	Foreign bodies clogged inside the pump.	Dismantle pump to remove foreign bodies.
Flow rate is insufficient	Incorrect pump rotation.	Adjust the motor wires.
	Low speed.	Check whether the voltage is too low.
	Incorrect model selection.	Select a correct model.
Pump consumes too much power.	Flow is too high. The pump is not used in the recommended range.	Adjust the flow rates.
	Serious wear of motor bearing.	Replace bearing or motor.
Pump is noisy.	Motor bearing damage.	Replace bearings.
	Pump parts damage.	Replace pump parts.
Pump has water leakage.	Mechanical seal is not properly installed.	Reinstall the mechanical seal.
	Mechanical seal worn or damaged.	Replace mechanical seal.
Motor temperature is too high or smoking.	Overload.	Adjusting the flow rate.
	Incorrect voltage.	Correct the voltage.
	Incorrect wiring.	Correct wiring.
	Bad electrical connections.	Rewiring.
	Foreign bodies clogged in fan.	Remove foreign bodies.

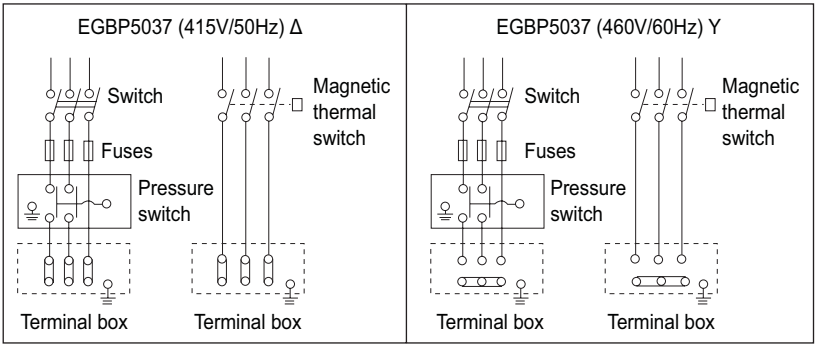
17. 60Hz Operation

If a Hydro Connect 50Hz End Gun Booster Pump is to be connected to a 60Hz power source, a smaller diameter impeller must be fitted:

EGBP Model	Impeller for **50Hz** Power Source		Impeller for **60Hz** Power Source	
	Size	Parts Code	Size	Parts Code
HC-EGBP5015	140mm	HC-EGBP6037IK	125mm	HC-EGBP6022IK
HC-EGBP5022	152mm	HC-EGBP5022IK	125mm	HC-EGBP6022IK
HC-EGBP5037	169mm	HC-EGBP5037IK	140mm	HC-EGBP6037IK

In addition to the impeller change, the terminal block for the HC-EGBP5037 3.7kW will need to be configured from Delta to Star connection:

Convert terminal block connection
EGBP5037 (415V/50Hz) Δ to (460V/60Hz) Y



18. Site Record

Only suitably qualified workers should perform this testing

Power Supply Test

Disconnect the motor from the power source.

- Ensure the power supply terminals are in good condition.
- Check the connection bars for terminal (U, V, and W) are correct

  For three phase motors, connection type is either Star (Y) HC-EGBP5015 & HC-EGBP5022 or Delta (Δ) HC-EGBP5037

Earth Continuity and Resistance Test*

- With a multimeter, measure the resistance between motor frame (body) and earth.
  - Any value greater than 0.5Ω indicates trouble with the motor.

*Earth resistance testing is a Hydro Connect manufacturing QA task and is measured at the time of manufacture to be <0.1Ω

General Inspections

- Examine the end gun and nozzle and record the details and operating pressure.
- Examine the name plate and record the model, serial number and nameplate amps.
- Check the appearance of the motor.
- Manually rotate the motor shaft to examine bearing condition.
  - Check for smooth and free shaft rotation.

Winding Resistance Test

Disconnect the motor from supply (L1, L2, L3)

- Check the motor winding resistance using a multimeter or ohmmeter for phase to phase terminals (U to V,V to W ,W to U).
  - The Ω reading for each winding should be the same (or nearly the same).

Winding Continuity Test

Remove the links linking terminals W2U2V2

- Checking the motor winding resistance using a multimeter or ohmmeter across the matrix of terminals will give the following readings for a good 3 phase motor:
  - Terminals W1W2, U1U2, V1V2 should indicate continuity
  - Every other terminal combination should indicate open
  - Readings between any of the six (6) terminals and the motor frame signifying earth (E) should indicate open.

Insulation Resistance Test*

During this measurement and immediately afterwards, do not touch any terminals of the motor as they may carry dangerous voltages that could be fatal.

Only suitably qualified workers should perform this testing

Disconnect the motor from supply (L1, L2, L3)

- Set the voltage setting of the insulation resistance tester to 500V.

  Check from phase to phase (U to V, V to W, W to U).

  Check from phase to motor frame (earth) (U to E, V to E , W to E).
  - Minimum test value of motor insulation resistance is 2MΩ.

* Insulation resistance testing is a Hydro Connect manufacturing QA task and is measured at the time of manufacture to be >50MΩ

Running Amps Test

Re-connect the terminal links in the correct configuration Star (Y) HC-EGBP5015 & HC-EGBP5022 or Delta (Δ) HC-EGBP5037

Re-connect the motor to the supply

For three phase motors, the expected voltage for a 240/415V system is 240V phase to neutral and 415V between each of the three phase supply lines.

With the motor running

- Check and record the full load amps (FLA) with a suitable meter and compare with the name plate amps.
- Check and record the voltage and frequency.
- Check and record the voltage per phase to ensure no imbalance is present.

HYDRO CONNECT

END GUN BOOSTER PUMP

(Only suitably qualified workers should perform this testing)

		Model	
		Serial#	
		Inspection Date	
Dealer		Contact	
		Phone	
Grower		Contact	
		Phone	
Electrician		Contact	
		Phone	

1. Power Supply Test	
Terminal Condition	
Wired Star or Delta	

2. Earth Continuity and Resistance Test	**Maximum**	**Site Reading**
Resistance – Motor Frame to Earth	<0.5Ω	
At Manufacture	<0.1Ω	

3. General Inspection	Make/Model	Nozzle Size	Site Pressure
End Gun Detail			
Motor Name Plate Amps			
Motor Inspection			
Fan & Bearing Inspection			

4. Winding Resistance Test (links in)	**U to V**	**V to W**	**W to U**
Phase to Phase Terminal Ω's - should be the same			

5. Winding Continuity Test (links out)	**U1 to U2**	**V1 to V2**	**W1 to W2**
Terminal Ω's -should be continuity			

	U to V	**V to W**	**W to U**
Terminal Ω's - should be open			

	U to Earth	**V to Earth**	**W to Earth**

6. Insulation Resistance Test (links out)	**U to V**	**V to W**	**W to U**
During the measurement and immediately afterwards, do not touch any terminals of the motor as they may carry dangerous voltages that could be fatal.			
Motor Insulation Minimum Resistance >2MΩ	**U to Earth**	**V to Earth**	**W to Earth**
At Manufacture >50MΩ			

7. Running Amps Test	**Line**	**Phase**	**Phase**	**Phase**
Voltage				
Frequency				
Running Amps				