STUART TURNER

12/50

CENTRIFUGAL PUMPS

FOR DC SUPPLY

OPERATING INSTRUCTIONS

Please leave this instruction booklet with the pump as it contains maintenance and safety information (Original Instructions)

MODELS

12/50

IMPORTANT NOTES

- **Please read these instructions fully before starting the installation:**
- **The installation must comply with the relevant water supply, electrical and building regulations and be installed by a competent person.**
- **If in doubt, consult Stuart Turner Ltd.**

APPLICATION

The range of centrifugal pumps is designed to pump clean fresh water. Other clean, non aggressive, non explosive liquids with similar characteristics to water may be pumped. Consult Stuart Turner for advice on such applications.

The pumps can be used for pressure boosting, fluid transfer and distribution. They are suitable for flooded suction applications. Alternatively a maximum suction lift of 4.6 metres is permitted when using a Stuart footvalve/strainer.

WARNING AGAINST MISUSE

- **This pump set must not be used for any other application without the written consent of Stuart Turner Limited. In particular, it must not be connected directly to the mains water supply, or used outside the conditions specified in the limits of application.**
- **This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.**
- **Children should be supervised to ensure that they do not play with the appliance.**

PRODUCT DESCRIPTION

Motor:

Permanent magnet D.C. motor, totally enclosed self vent cooling, continuously rated, class 'F' insulation. Motors comply with IEC 34-1. Enclosure ratings are given in the technical specification section.

The standard range of motors are suitable for a supply of either 12 V d.c. or 24 V d.c. dependant upon which model selected. Optional motors are available to suit different voltages, consult Stuart Turner Ltd for further details.

Pump:

Close coupled, end suction configuration and of single stage, centrifugal design. Standard pump materials of construction of major wetted parts are as follows:

Model	Body	Impeller	Shaft	Mechanical Seal
2/50	Brass	Acetal or Brass	Stainless Steel	Nitrile/Carbon Ceramic/Stainless Steel

Other seal options are available. Consult Stuart Turner for further details.

LIMITS OF APPLICATION

Model	Impeller	Voltage	Max. Liquid Temp. °C	Min. Liquid Temp. °C	Max. Ambient Air Temp °C	Max. Suction Lift (m)	Max. Head (Pump Closed Valve) (m)	Max. Viscosity		**Max. Working Pressure kPa (bar)	Max. Inlet Head (m)	Max. No. Starts/h
								(Redwood No. 1 Scale)	Centistokes			
12/50	Plastic	12	80	4	40	4.6*	13.0	50	9.5	500 (5)	38	30
12/50	Brass	12	80	4	40	4.6*	13.0	50	9.5	500 (5)	38	30
12/50	Plastic	24	80	4	40	4.6*	13.8	50	9.5	500 (5)	37	30
12/50	Brass	24	80	4	40	4.6*	13.8	50	9.5	500 (5)	37	30

*With footvalve fitted.

**Note: Max working pressure is the maximum pressure that can be applied to the pump internal casing under any installation conditions.

TECHNICAL SPECIFICATION

Model	Impeller	Voltage	Rating	Nominal Motor Speed (r.p.m.)	Nominal Watts Output (Motor)	Max. Watts consumed at full flow	Full Load (AMPS)	Starting Current (AMPS)	Enc. Rating	Dims (mm)			Gross Weight (packed) kg	Connections	
										L	W	H		Suction	Delivery
12/50	Plastic	12	Cont. (S1)	4300	160	228	19.0	170	IPX4	229	104	117	3.4	G ¾	G ¾
12/50	Brass	12	Cont. (S1)	4300	160	228	19.0	170	IPX4	229	104	117	3.4	G ¾	G ¾
12/50	Plastic	24	Cont. (S1)	4300	175	196	8.2	83	IPX4	229	104	117	3.4	G ¾	G ¾
12/50	Brass	24	Cont. (S1)	4300	175	196	8.2	83	IPX4	229	104	117	3.4	G ¾	G ¾

Stuart Turner reserve the right to amend the specification in line with its policy of continuous development of its products.

Note: For information on other voltages which are not shown, consult any supplementary instruction sheet supplied, or the rating label attached to the pump.

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SITING OF THE PUMP/PIPEWORK

WARNINGS:

- **Pump Location**
  If possible site the pump in a location where in the unlikely event of a liquid leak, any spillage is contained or routed to avoid electrics or areas sensitive to liquid damage.
- **Care should be taken to protect the pump from frost and freezing.**
- **Ensure pipework to and from pump is independently supported to prevent stress on the pump inlet and outlet branches.**
- **Do not fit a non-return valve, or devices which contain non-return valves, in the suction (inlet) pipework to the pump. Exceptions can be made in the case of suction lift installations when a footvalve is required.**
- **Always install isolating valves to both suction and delivery pipework.**
- **When a footvalve is required on installations that incorporate automatic pump control, it is recommended that a suitable pressure relief valve be fitted in the discharge (outlet) pipework from the pump.**
- **Do not run against a closed valve for periods longer than 5 minutes.**
- **Do not allow plastic pump parts to come into contact with oil or cellulose based paints, paint thinners or strippers, acid based descalents or aggressive cleaning agents.**
- **Do not introduce solder flux to pumps or pump parts manufactured from plastic. All solder joints should be completed and flux residues removed prior to pump connection.**
- **The motor casing can become very hot under normal operating conditions. Care should be taken to ensure it cannot be touched during operation.**

Site the pump in a dry, frost-free position where it cannot be sprayed with water and as close to the liquid source as possible.

The pump enclosure must be ventilated and there should be a minimum clearance of 80 mm between the pump and housing on all sides.

To prevent loss of pressure through pipework, use pipe size to match pump whenever possible, minimising 90° bends.

It must be ensured that storage capacity of the liquid supply is adequate for the flow rates required by the pump.

The pipework feeds to the storage tank should be of adequate size to ensure replenishment rate of tank is sufficient to meet the needs of the pump.

Isolating valves should be fitted in suction and delivery pipework to enable easy isolation and access to the pump.

When the pump is to be installed in areas where there is a risk of debris or scale build up within the system, it is recommended that the inlet pipework is fitted with an inline strainer.

Pump Mounted Above Liquid Source (Suction Lift)

The pumps can be used in a suction lift installation providing the height of lift is within the limits specified in the limits of application section.

A footvalve and strainer must always be used and the suction pipework size must match the pump.

Lay the suction piping over the shortest possible distance and ensure there is a constant rise from the liquid source to the pump. Any high spots will cause air pockets to form, reducing system efficiency.

Ensure all joints in suction pipework are completely airtight. Failure to comply will result in loss of prime.

The intake of the footvalve/strainer should be positioned such that it cannot be blocked with debris or silt that are frequently found in the bottom of sumps and wells.

When a footvalve is installed on installations that incorporate automatic pump control, it is recommended that a suitable pressure relief valve be fitted in the discharge (outlet) pipework from the pump.

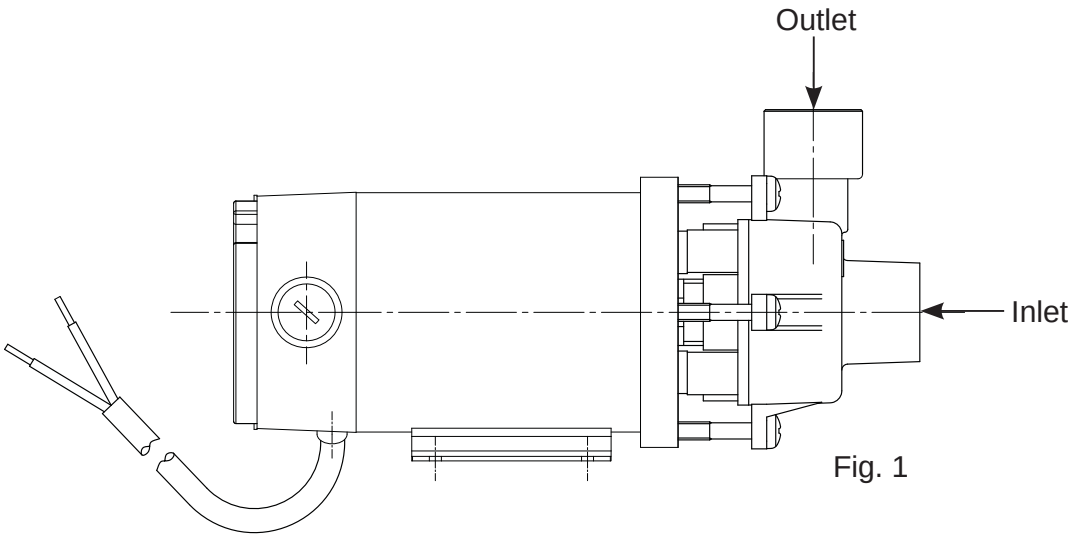

Fig. 1

ELECTRICAL INSTALLATION

WARNINGS:

- **The electrical installation must be carried out in accordance with the current national electrical regulations and installed by a competent person.**
- **Before starting work on the electrical installation ensure the power supply is isolated.**
- **This appliance must be earthed.**
- **The motor and wiring must not be exposed to water.**
- **Do not allow the supply cord to contact hot surfaces, including the motor shell, pump body or pipework. The cord should be safely routed and secured by cable clips.**

The standard pumps are suitable for a supply of 12 volt d.c. or 24 volt d.c. dependent upon which model selected. Other voltages are available on certain models and it is therefore very important to ensure the voltage on the pump rating plate matches the supply.

The motor should be provided with control equipment incorporating means for isolation of supply and protection against overload, eg: connection via a starter with suitable sized thermal overload.

The control equipment or starter to which the pump is connected should be mounted in an easily accessible position and labelled if confusion is possible to allow easy isolation of the unit.

When an alternator or generator is the supply source, ensure correct voltage is available at the motor when pump is operational.

Earthing

The d.c. supply source to the motor could be from a battery, transformer, altenator or generator, hence there is no requirement or facility for earthing via the supply cable.

However certain installations may require additional earthing arrangements to be considered.

Static protection & EMC compliance

The motor can be connected to earth via it's front mounting foot. This will maximise ability to discharge electro static energy and lightning interference. It will also assist EMC compliance.

Supplementary earth bonding

Metallic inlet and outlet pipework should be cross bonded where the system continuity has been broken by flexible hoses or plastic components.

Wiring

The motor is provided with a factory fitted power supply cord. This must be permanently connected to the supply source.

The wiring in the power supply cord is coloured in accordance with the following code:

Blue: Negative Brown: Positive

The pump must run in an anticlockwise direction when looking at the pump inlet port. To ensure this happens the pump supply cord must be connected as follows:

The wire coloured blue must be connected to the negative terminal of the supply source, marked with the symbol -.

The wire coloured brown must be connected to the positive terminal of the supply source, market with the symbol +.

Supply Cord Extension

The pumps are fitted with a supply cord to the following specification:-

HO5VV-F2 X 1.5 mm² - 16 Amp rated cable

If the supply cord is to be extended, a cord of the same specification should be used. Any connections or junction boxes used should be specifically suited for the application and installed in accordance with the manufacturers instructions.

Fuses

The following table gives the recommended fuse size.

Model	**Fuse Size (AMPS)**
12/50 (12 V)	15
12/50 (24 V)	15

Fuse type should be of the delayed action type (type T or motor rated) with good time delay characteristics.

The fuse performance variation in relation to ambient temperature should also be considered.

NOISE

The equivalent continuous A-weighted sound pressure level from the pumpset does not exceed 70 dB(A) at a distance of one metre.

COMMISSIONING

WARNINGS:

- **The motor casing can become very hot under normal operating conditions, care should be taken to ensure it cannot be touched during operation.**
- **Do not run pump without terminal/brush guard correctly fitted.**
- **The pump chamber must be full of liquid at all times. Seal damage will result if the pump runs dry.**

1. <u>System Flushing</u>
   Some pumps incorporate plastic components that must not come into contact with solder flux, acid-based descalents or aggressive cleaning agents. The pipework system should be flushed out prior to the pump being connected, to ensure any contaminants/chemical residues and foreign bodies are removed from elsewhere in the system.

2. <u>Liquid Supply</u>
   Always ensure that liquid storage capacity is adequate to meet the demand. Ensure the pump chamber is full of liquid before starting the pump. Failure to do this could result in seal damage. To ensure dry running does not occur the pumps must be primed as described in the priming section. **Do not run pump dry.**

3. Ensure electrical supply is compatible with the details that are stated on the pump rating plate. (The wrong voltage can be dangerous and may damage the pump.)

4. <u>Priming</u>
   a) Flooded suction installation (without priming plug).
   This pump range are self venting and hence no priming plugs are fitted. Turn on liquid supply and open outlet valve to allow pump to fill and vent.
   b) Flooded suction installation (with priming plug).
   The pump must be primed (filled with liquid) before starting. Turn on liquid supply, prime and vent the pump by unscrewing the priming plug (Fig. 6) slowly until all air escapes and liquid emerges. Re-tighten plug.
   c) Suction lift installation.
   Prime the suction pipework and pump by filling with liquid via the pump discharge connection or by filling the suction pipework before attaching to the pump.

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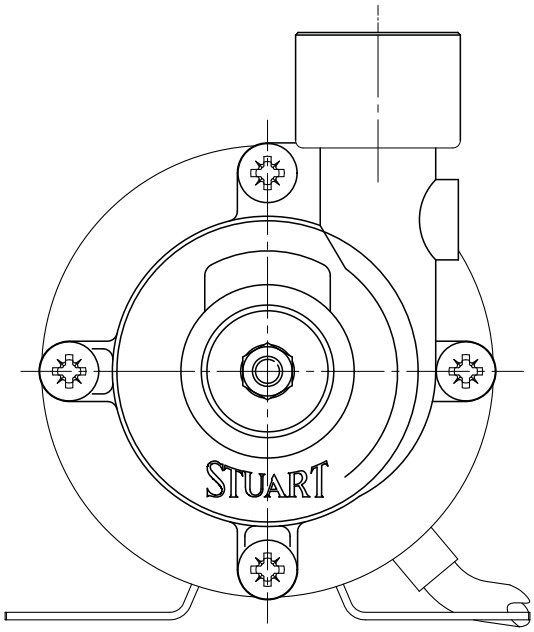
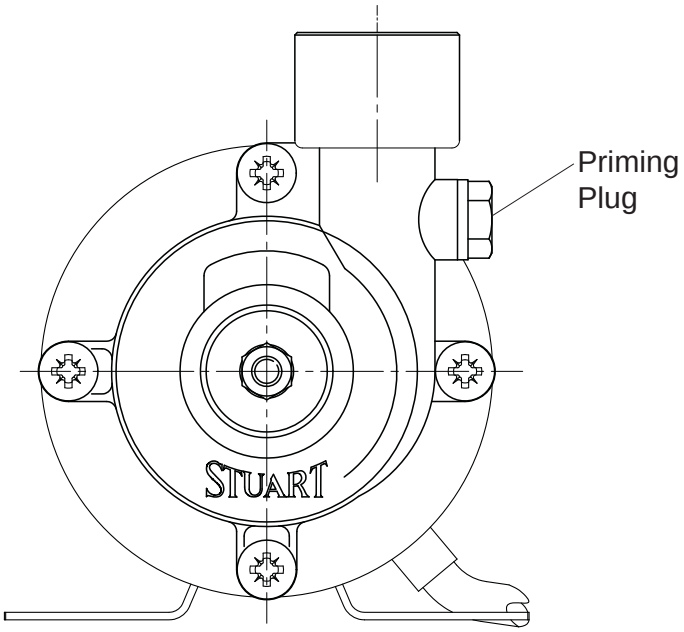


Without Priming Plug

Fig. 2



With Priming Plug

Fig. 3

5. Starting
   a) Switch on power to the pump which will now be operational.
   b) Confirm the direction of rotation is correct by stopping and observing over run. The correct direction of rotation is anticlockwise when looking directly at the front of the pump casing. To reverse rotation see wiring diagram section.
   c) The pump should now be fully operational.
   d) Carefully check pump and pipework for leaks whilst pump running and stationary before leaving the installation unattended.

For Further Technical Support

Phone the Stuart Turner Pump Assist team on 0844 98 000 97. Our staff are trained to help and advise you over the phone or arrange for a service engineer to call.

Note: When pumps are installed in another manufacturers original equipment, please contact the manufacturer for advice.

MAINTENANCE

WARNINGS:

- **Care should be taken to protect the pump from frost and freezing.**
- **Pump Location**
  If possible site the pump in a location where in the unlikely event of a liquid leak, any spillage is contained or routed to avoid electrics or areas sensitive to water damage.

1. Routine maintenance to replace motor brushes will be required, provision should be made for easy access to the pump to allow repairs due to normal wear and tear and brush replacement.
2. Disconnect electrical supply before working on pump.
3. Turn off liquid supplies to the pump and release pressure by opening outlets before attempting maintenance.

4. If the installation is fitted with a footvalve and strainer or inline suction strainer, the strainer must be cleaned as necessary to ensure the pump has unrestricted flow.
5. After maintenance is completed, refer to commissioning section for instructions on restarting pump.
6. Brush replacement procedure.

The pumps are fitted with brush motors. The brushes will require replacement when worn out. The brushes have a life expectancy of approximately 1000 hours running time, which will vary dependant upon motor loading.

The bushes are replaced in the following way:-

1. Locate suitable size screwdriver or flat blade into the Brush Retaining Cap slot.

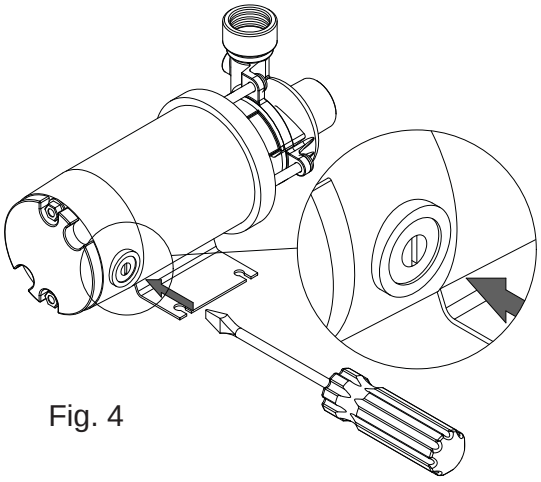


Fig. 4

2. Carefully un-screw the Brush Retaining Cap until loose.
   Note: The Cap will ‘pop’ out under the force of the Brush Assembly Spring.

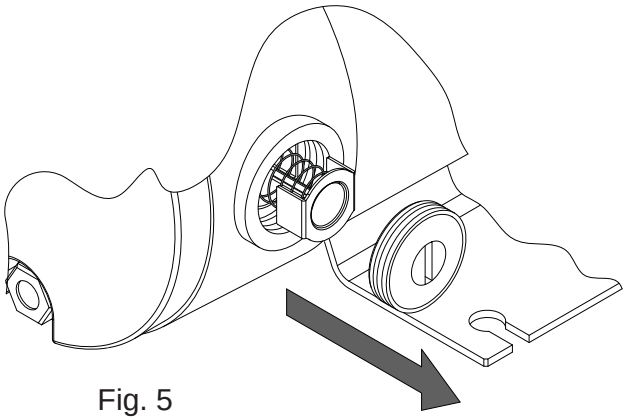


Fig. 5

3. Carefully remove worn Brush Assembly from motor.
   Note: Carefully clean carbon dust from aperture with a soft brush.

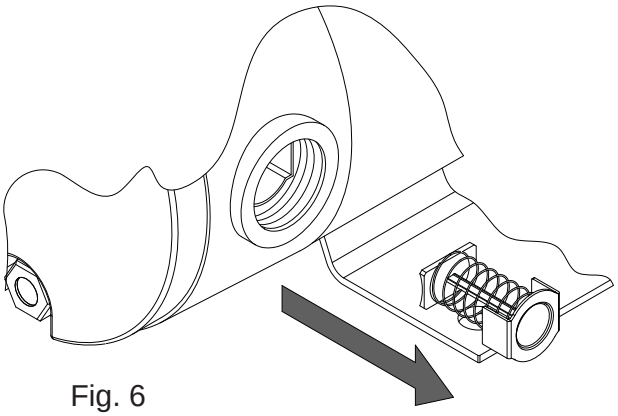


Fig. 6

4. Replace new Brush Assembly by fitting the carbon head into the retaining slot as shown.
   Note: the Brass Cap of the assembly also fits into this retaining slot - see section 5.

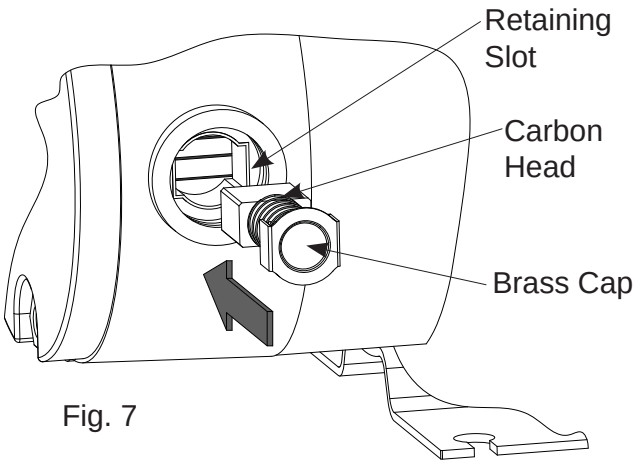


Fig. 7

5. Push the Brush Retaining Cap against the spring tension and screw firmly into place until tight, noting that the Brass Cap of the assembly is correctly located in the retaining slot as shown in section 4.
   Note: **DO NOT OVERTIGHTEN**

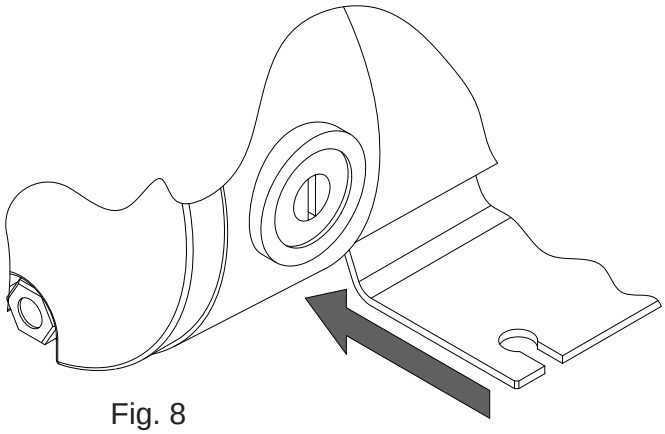


Fig. 8

6. Repeat the process for the opposite site.

Cleaners, Disinfectants and Descalents

On installations where chemical disinfectants or descalents are periodically used, the compatibility of the chemical solution regarding the pump must be considered.

Acid based descalents and aggressive cleaning agents must not come into contact with the pump. The pump must be removed from the system prior to the use of these products. The system should be flushed to remove all chemicals before the pump is re-connected.

If in any doubt as to the suitability of the chemical solutions, please contact our Pump Assist helpline.

STORAGE

If this product is not installed immediately on receipt, store in a dry, frost and vibration free location in its original packaging.

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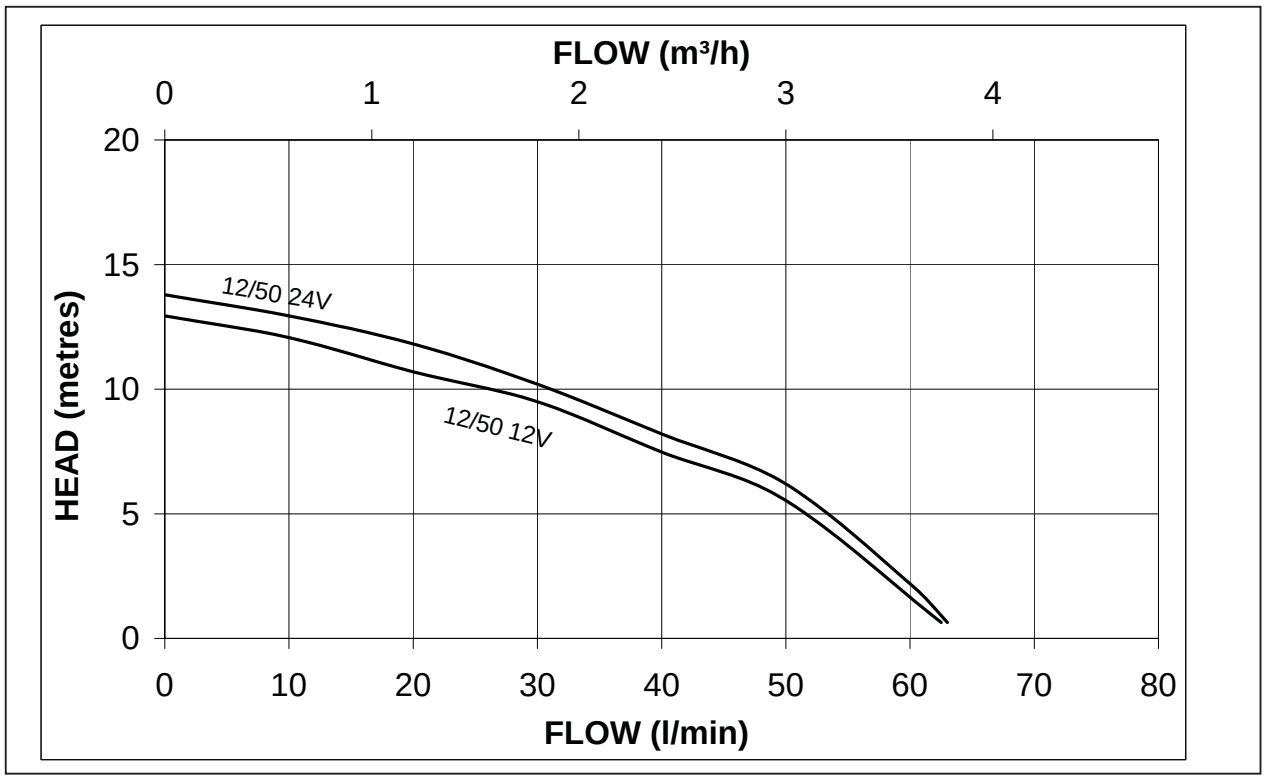
TROUBLE SHOOTING GUIDE

Symptoms	Probable Cause	Recommended Action
Pump will not start.	Electrical supply.	Check power to motor. Check circuit breaker is set. Check the correct fuse is being used.. Brush gear in need of replacement.
Pump runs, but no liquid is pumped.	Air locked.	Bleed pipework and pump to clear air.
	No liquid supply.	Check the supply valves are turned on. Check outlet not restricted or blocked.
	Motor running backwards.	Check motor is rotating in the correct direction, if not, reverse connections of the two incoming supply wires.
	Pump connections reversed.	Check liquid connections are on the right way round.
	No flooded suction.	Check the pump has a flooded suction and is primed.
	No footvalve.	If a suction list exists fit a Stuart footvalve/strainer and ensure suction pipework is airtight.
Pump running slow/low performance	Low voltage.	Check correct voltage is available at the pumps. Brush gear in need of replacement. Under size supply cable.

PERFORMANCE INFORMATION

Performance curves are based on liquids having the same specific gravity and viscosity as clean water at 20°C.



Voltage available must be at the rated nominal supply at the motor terminals.

ENVIRONMENT PROTECTION

Your appliance contains valuable materials which can be recovered or recycled.

At the end of the products' useful life, please leave it at an appropriate local civic waste collection point.

DECLARATION OF CONFORMITY

2006/42/EC

BS EN ISO 12100-1, BS EN ISO 12100-2, BS EN 809

2004/108/EC

BS EN 55014-1, BS EN 55014-2, BS EN 55022, BS EN 61000-3-2, BS EN 61000-3-3, BS EN 61000-4-2, BS EN 61000-4-3, BS EN 61000-4-4, BS EN 61000-4-5, BS EN 61000-4-6, BS EN 61000-4-11

IT IS HEREBY CERTIFIED THAT THE STUART ELECTRIC MOTOR DRIVEN PUMP AS SERIAL NUMBER BELOW, COMPLIES WITH THE ESSENTIAL REQUIREMENTS OF THE ABOVE E.E.C. RELEVANT DIRECTIVES.

( )

RESPONSIBLE PERSON
AND MANUFACTURER

STUART TURNER LIMITED
HENLEY-ON-THAMES, OXFORDSHIRE
RG9 2AD ENGLAND.

Signed. . . . . R. Ballard . . . . . Customer Relationship Manager

Stuart Turner are an approved company to BS EN ISO 9001:2000

YOUR 1 YEAR GUARANTEE

Stuart Pumps are guaranteed by Stuart Turner Limited to be free from defects in materials or workmanship for the applicable guarantee period from the date of purchase. The applicable guarantee period is stated in the installation booklet supplied with the pump. Within the guarantee period we will repair, free of charge, any defects in the pump resulting from faults in material or workmanship, repairing, exchanging parts or exchanging the whole unit as we may reasonably decide.

Not covered by this guarantee: Damage arising from incorrect installation, improper use, unauthorised repair, normal wear and tear and defects which have a negligible effect on the value or operation of the pump.

Reasonable evidence must be supplied that the pump has been purchased within the applicable guarantee period prior to the date of claim (such as proof of purchase or the pump serial number).

This guarantee is in addition to your statutory rights as a consumer. If you are in any doubt as to these rights, please contact your local Trading Standards Department or Citizen's Advice Bureau.

In the event of a claim please telephone Stuart Turner Limited on 0844 980 0097 or return your pump and flexible hoses with accessories removed, plugs, pipes etc. If you have any doubt about removing a pump, please consult a professional.

Proof of purchase should accompany the returned pump to avoid delay in investigation and dealing with your claim.

STUART TURNER

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