DUTYPOINT

PUMPS | SYSTEMS | SERVICING | KNOW-HOW

# MINIBREAK CAT 5 TANK AND BOOSTER SET

## Operation & maintenance manual

DOC-MB2OM2403


DUTYPOINT.COM

CE UK CA

## CONTENTS

## 1. ABOUT US

Applied knowledge.
Shared know-how.
Fearless innovation.

Together, we are Dutypoint. Since 1976, we've been building up industry-defining expertise in fluid technology.

This knowledge means we solve complex challenges with straightforward solutions that are built around meeting and exceeding our clients' needs. We approach everything with the same philosophy: how will we go above and beyond?

Our commitment to collaboration and sharing knowledge galvanises and cements robust relationships. Relationships that are built to last, because our clients are our partners.

Our focus for the future? Innovation. We want to be the future of our industry globally, where we benchmark thought leadership, expertise and customer care.

**We set the bar.**

## 2. INTRODUCTION

This document contains information to enable the safe installation and operation of the products mentioned above. The following instructions must be read and understood by all persons responsible for the installation, operation and maintenance of this product.

## 3. WARNING SYMBOLS

Safety instruction where noncompliance would affect safety.

Safety instruction where electrical hazard is involved.

Safety instruction where noncompliance could cause damage to the equipment.

## 4. SAFETY WARNINGS

**Instruction for safe use:** This product has been designed to boost cold water to the operating conditions shown and create an air gap arrangement that provides category 5 backflow protection. It should not be installed until this leaflet has been studied carefully. Handling, transportation, and installation of this equipment should only take place with the proper use of lifting equipment. This product must be stored in a dry, frost-free environment.

**Noise emissions:** This equipment operates at a noise level lower than 70 dBA.

**Inexperienced users:** This product must be operated by qualified personnel only.

Be aware of the following precautions: This product is not to be used by anyone with physical or mental disabilities or anyone without the relevant experience and knowledge unless they have received instructions on using the equipment and on the associated risk or are supervised by a responsible person.

Children must be supervised to ensure that they do not play on or around the product.

**Electrical connections:** The cable used for the incoming supply must be of adequate size to carry the motor's full load current. This is shown on the duty plate. A high-sensitivity differential switch (0.03 A) is also recommended.

All connections must be made using the appropriate wiring drawings for the equipment being installed, with particular attention being paid to the supply voltages.

**Never operate this product with the pump controller front panel or the motor terminal cover removed.**

**It is essential that this equipment is earthed to the building earth system. The pump operates at 230 V and 50 Hz.**

## 5. PRECAUTIONS BEFORE COMMENCING WORK

**Ensure that the following safety precautions are complied with before commencing work:**

- Ensure all safety guards are in place and secure.
- Ensure you have a clear path of exit.
- Ensure that the product cannot roll or fall over and cause damage to persons or property.
- Ensure all lifting equipment is in good condition and rated for the intended task.
- Ensure correct PPE is worn.

## 6. PPE

**Use personal safety equipment according to the site conditions and employer regulations. This may include, but may not be limited to:**

- Hard hat
- Safety goggles with side shields
- Protective footwear
- Protective gloves
- Ear protection
- First aid kit

## 7. INSTALLATION INSTRUCTIONS

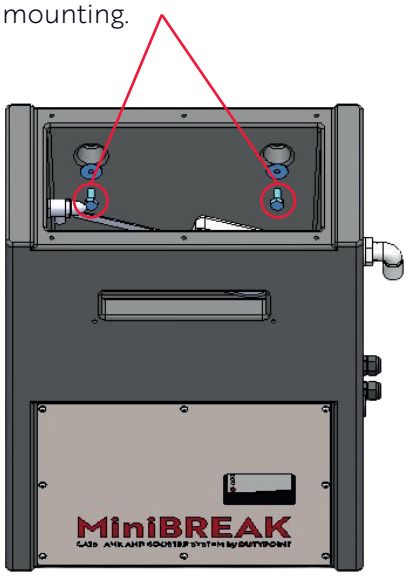
The Dutypoint MiniBREAK tank booster set is dispatched in a packaging box with adequate foam corner protectors; it is recommended that the unit be retained in the protective packaging until the product is installed. The unit will arrive pre-packaged, wired, and ready for installation. This product has been fully run-tested at our works under simulated site conditions. The unit should be thoroughly checked for physical damage that may have been caused during transit. If the unit is found to have damage, it must be reported immediately and should not be installed.

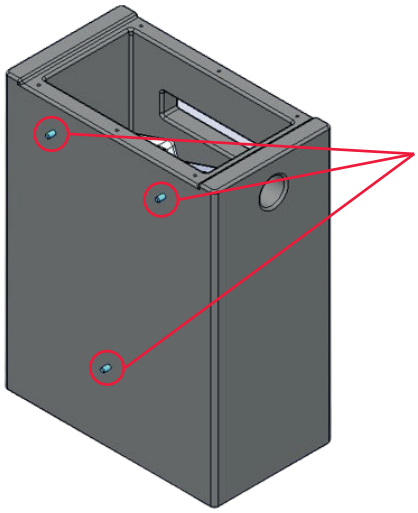
The unit should be positioned in a dry, frost-free environment, with a wall or floor mounted in a position that will allow adequate room for general maintenance and service.

The unit should be checked and serviced regularly.

**Wall mounting**

M8 wall fixings, screw bolts, or similar, along with penny washers, to be utilised for secure wall mounting.



The product's wet weight can weigh up to 40 kg, so ensure the drilled holes are sufficiently deep enough to withstand the pull-out force.

**FAILURE TO DO SO MAY LEAD TO IMPROPER INSTALLATION.**

## 8. WATER SUPPLY AND SYSTEM CONNECTION

Connect the Dutypoint MiniBREAK tank booster water inlet 15 mm compression (right side of cabinet) to a suitable water supply. The inlet should be provided with an isolation valve to aid maintenance, alongside a rubber return bush to securely maintain the pipe in position and ensure a sealed connection. If the pressure available at the ball valve is below 0.3 bar, a low-pressure orifice must be obtained and fitted.

Extend the 22 mm plastic overflow pipe from the right-hand side of the unit to a position where an overflow will be noticed and rectified.

The installer is responsible for ensuring that the overflow can keep up with the incoming water volume; if this is not the case, a pressure-reducing valve should be fitted to reduce the incoming mains water volume.

Connect the discharge port 15 mm push fit (right-hand side of cabinet) to the system inlet. The break tank can be drained by isolating the suction line ball valve on the flexible connector and removing the flexible end attached to the pump. The flexible connector can then be positioned over a container to collect the drained water.

The break tank is constructed to have a weir slot as required by the water bylaws to prevent backflow contamination. If the inlet ball valve or NRV suffers a catastrophic failure, the overflow may not be able to keep up with the inflow, in which case excess water will be ejected through the weir slot and onto the plant room floor. If this is not acceptable, then consideration should be given to fitting the wash-down set onto a tray with overflow to a drain.

## 9. PIPEWORK AND MECHANICAL COMPONENTS

1. Ensure that the mounting area and any associated groundwork provides adequate support for the pump set.
2. Ensure all supports/brackets are in place and secure.
3. Verify all pipe joints are sealed and tight.

## 10. VOLT FREE CONTACTS

Volt-free contact is available for low discharge pressure by way of a low-pressure switch. This is rated to 230 V 10 A and is normally open (closes on low pressure).

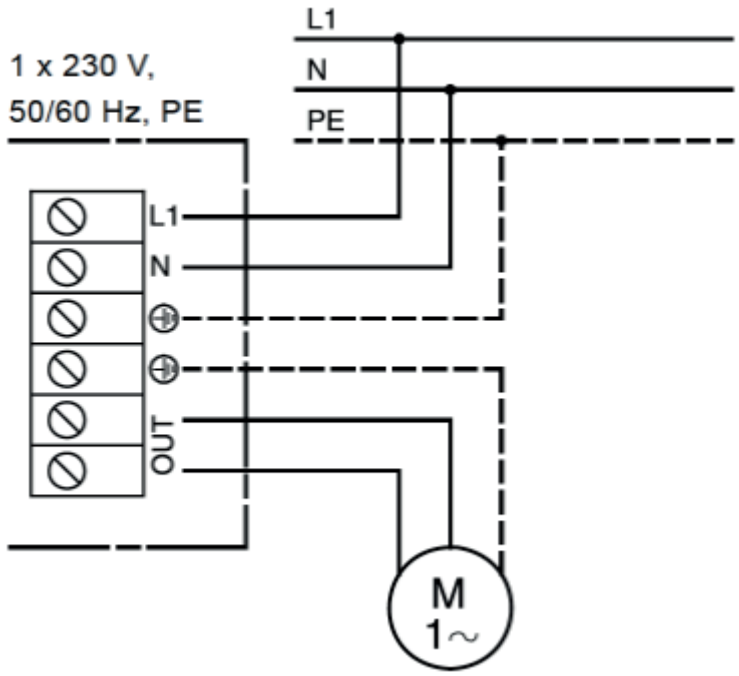
## 11. COMMISSIONING

1. Ensure the water tank is clean.
2. With the power supply off, open the water supply to the tank and fill it with water until the ball valve closes and stops further filling. Check that the water level is correct and that all joints are sound.
3. Check the pump has been fully evacuated from all air by removing the bleed screw and allowing water to escape until no air is present; replace the bleed screw.
4. Open discharge valve and power the product, the pump should start to run and push all air out of the discharge system, when free of air close the discharge valve and the flow will stop and the pump will switch off after approximately 10 seconds.

## 12. ELECTRICAL CONNECTION

Never make any connections in the unit unless the electricity supply has been switched off. The unit must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles.

A power supply cable is supplied pre-connected to the unit. This should be terminated into a suitable 13 A fused spur outlet.

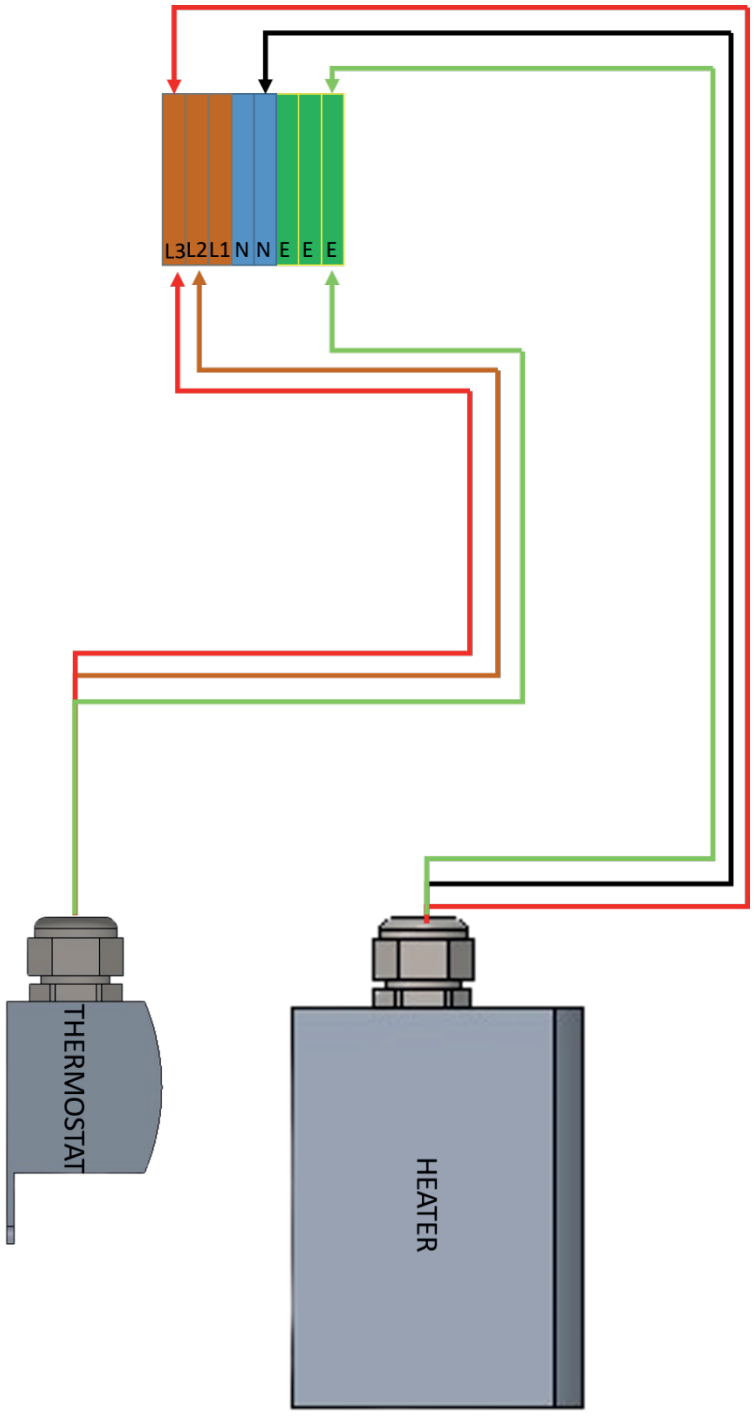



The electrical connections and protection must be carried out in accordance with local regulations.

Carry out the electrical connection as shown above.

**Note:** If the unit is incorporated in a system connected to an electricity supply system, which is/can be separated from the public supply, e.g. generator operation, the unit should be protected against overvoltage.

## 13. HEATER AND THERMOSTAT WIRING DIAGRAM




*Only applicable when MB1-FPKIT is ordered (not included in standard MiniBREAK).

## 14. MAINTENANCE

User to disconnect and lock out power source when working on the unit.

### Operation

When a draw-off point connected to the system is opened, the pressure will start to fall, and the pump will start to pressurise the system. The pump will continue to run until demand ceases completely and flow has stopped (< 3 l/m). The pump will run for approximately 10 seconds and will then shut down. The pressure will now be sitting at the pump closed valve head value.

### Lack of water

If the pump controller senses a lack of water the pump will be stopped automatically after approximately 10 seconds and the red failure light will be illuminated. If the water supply comes back online and a discharge is opened, the pump controller will automatically reset and start the pump.

If the water supply has been reinstated and the pump has not started automatically, the reset button can be operated, which will cause the pump to run for approximately 10 seconds and prime the system; if successful, the pump will then operate normally.

### Routine check (6 monthly intervals)

1. Check the pump produces the correct pressure.
2. Check that the pump operates without undue noise or vibration.
3. Check the break tank is clean and that the correct water level has been maintained.
4. Check that all screws are tight on electrical components.
5. Check that the earth connections are tight and make good contact.

### Pump removal

- Isolate power supply feeding pump set
- Isolate water inlet feeding pump set
- Open an outlet to release system pressure
- Isolate the valve located on each flexible connector and remove the flexible from the pump suction and discharge ports. The pump can now be unbolted from the base and pulled forward
- The electrical cable can now be removed from the pump terminal box
- The new pump can now be fitted by reversing the above procedure

## 15. DIMENSIONAL DRAWING

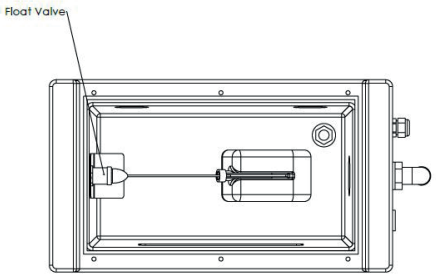
**RECOMMENDED CLEARANCE FOR ACCESS**
- FRONT: 500mm
- SIDES: 200mm
- TOP: 500mm

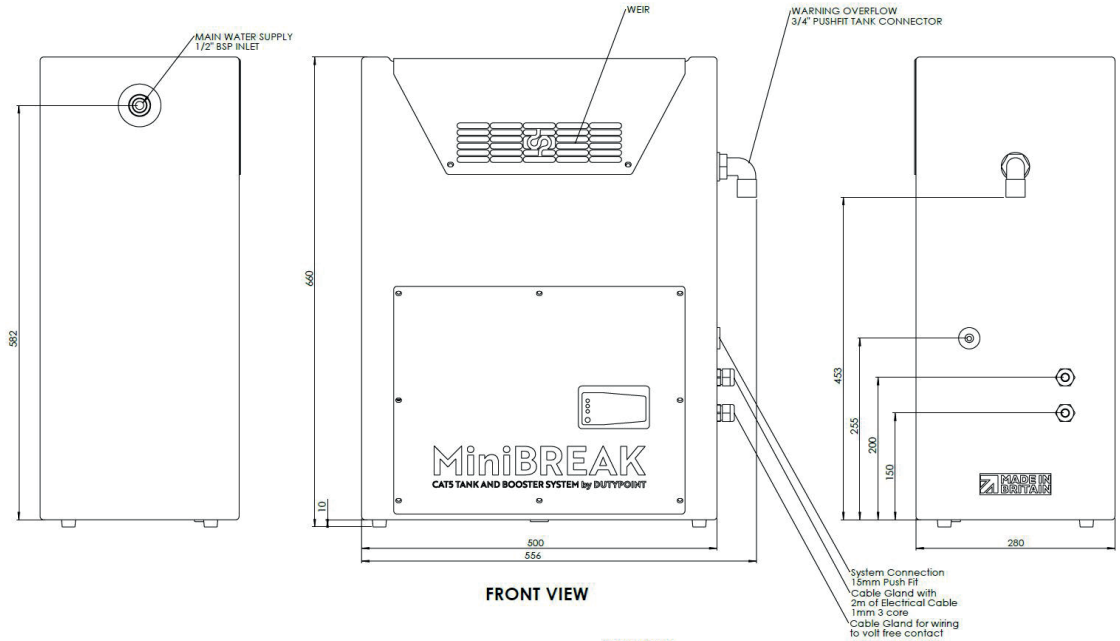
**USEABLE TANK VOLUME:**
- 12.5L

**WALL MOUNTING INSTRUCTIONS:**
M8 WALL FIXING SCREW BOLTS ALONG WITH PENNY WASHERS TO BE UTILISED FOR SECURE WALL MOUNTING.

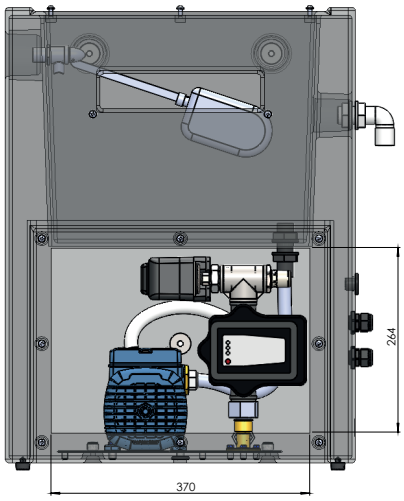
THE PRODUCT WEIGHS 45 KG, SO ENSURE THE DRILLED HOLES ARE SUFFICIENTLY DEEP TO WITHSTAND THE PULL-OUT FORCE.

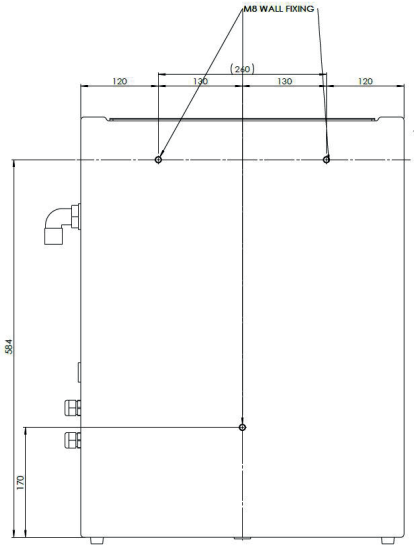
FAILURE TO DO SO MAY LEAD TO IMPROPER INSTALLATION.




FRONT VIEW



## 16. SPECIFICATION

| Model | Power (kW) | Input Current | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Q | [m³/h] | 0 | 0.3 | 0.6 | 0.9 | 1.2 | 1.5 | 1.8 | 2.1 | 2.4 |
| Single-phase | 0.37 | 2.5 A | | [l/m] | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| | | | H | [m] | 40 | 38 | 35 | 29 | 23.5 | 18 | 12.5 | 7 | 5 |

## 17. DECLARATION OF CONFORMITY

# Declaration of Conformity
# UKCA & CE

We: Dutypoint Limited

Of: Quedgeley West Business Park, Gloucester, Gloucestershire, United Kingdom

in accordance with the following directives:

- 2006/42/EC : Machinery Directive
- S.I. 2008:1597 : The Supply of Machinery (Safety) Regulations 2008

- 2014/30/EU : Electromagnetic Compatibility Directive
- S.I. 2016:1091 : Electromagnetic Compatibility Regulations 2016

- 2014/35/EU : Low Voltage Directive.
- S.I. 2016:1101 : Electromagnetic Compatibility Regulations 2016

- 2009/125/EC : Ecodesign Directive
- S.I. 2010:2617 : The Ecodesign for Energy Related Products Regulations 2010

- 2011/65/EC : Restriction of Hazardous Substances in EEE (RoHS) Directive
- S.I. 2012:3032 : Restriction of Certain Hazardous Substances in EEE Regulations 2012

Hereby declare that the equipment:

| Product Range | MiniBREAK |
|---|---|

Is in conformity with the applicable requirements of the following documents:

- EN 809:1998+A1:2009: Pumps and pump units for liquids - Common safety requirements
- EN 60204-1:2018: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- EN ISO 12100:2010: Safety of machinery - General principles for design
- EN 61000-6-2:2019: Electromagnetic compatibility (EMC) — Part 6-2: Generic standards
- EN 61000-6-4:2019: Electromagnetic compatibility (EMC) — Part 6-4: Generic standards

I hereby declare that the equipment described above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable essential requirements of the directives.

Nigel Freeman, Director

Dutypoint Ltd
Quedgeley West Business Park
Gloucester
Gloucestershire
United Kingdom

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## 18. WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT

### Disposal

At the end of its working life, this product should not be disposed of with standard household waste but rather dropped off at a collection point for the disposal of Waste Electrical and Electronic Equipment (WEEE) for recycling.

### Waste symbol

This is confirmed by the ***Waste Symbol*** found on the product, user manual or packaging.

## 19. TROUBLESHOOTING GUIDE

| Fault | Possible cause | Remedy |
|---|---|---|
| Pump fails to start | Power supply failure | Reinstate incoming power supply |
| Pump controller has no lights on | Isolator fuse blown/MCB tripped | Replace fuse/reset MCB |
| Pump fails to stop | User point left open causing flow to take place | Close user point |
| | Leak in system | Switch unit off until leak is repaired |
| Pump runs but will not make pressure | Pump air locked | Vent pump |
| | Passing too much water | Check system for leaks |
| Pump overheating | Pump partially seized | Remove pump and check for sediment build up or foreign objects |
| Break tank overflowing | Leaking ball valve | Replace ball valve seal |
| | Non-return valve letting by | Replace/clean non-return valve in the pump controller |
| Pump stops and pressure drops immediately | Non-return valve letting by | Replace non-return valve in pump controller unit |

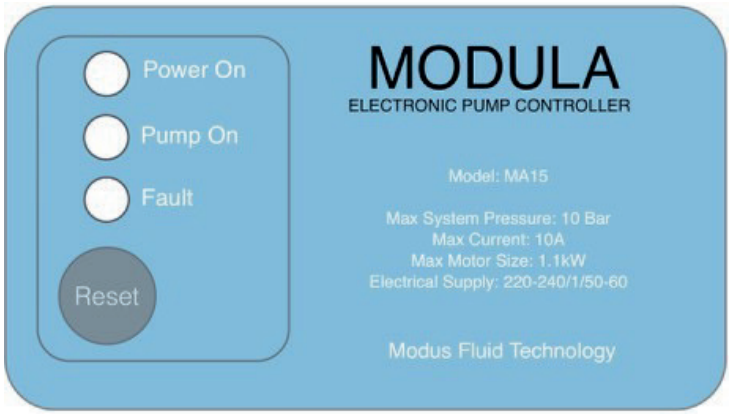
## 20. APPENDIX

**MA15 Electronic Pump Controller Operating Instructions**

**Applications**

The MA15 controller, which incorporates dry-running protection, is intended for mounting on pumps. It is used to automatically operate pumps in small water supply systems in single-family houses and blocks of flats, for garden watering, etc.

**Control panel**




Functions of indicator lights and button:

**Green indicator light/"Power on"** - on when the electricity supply is switched on

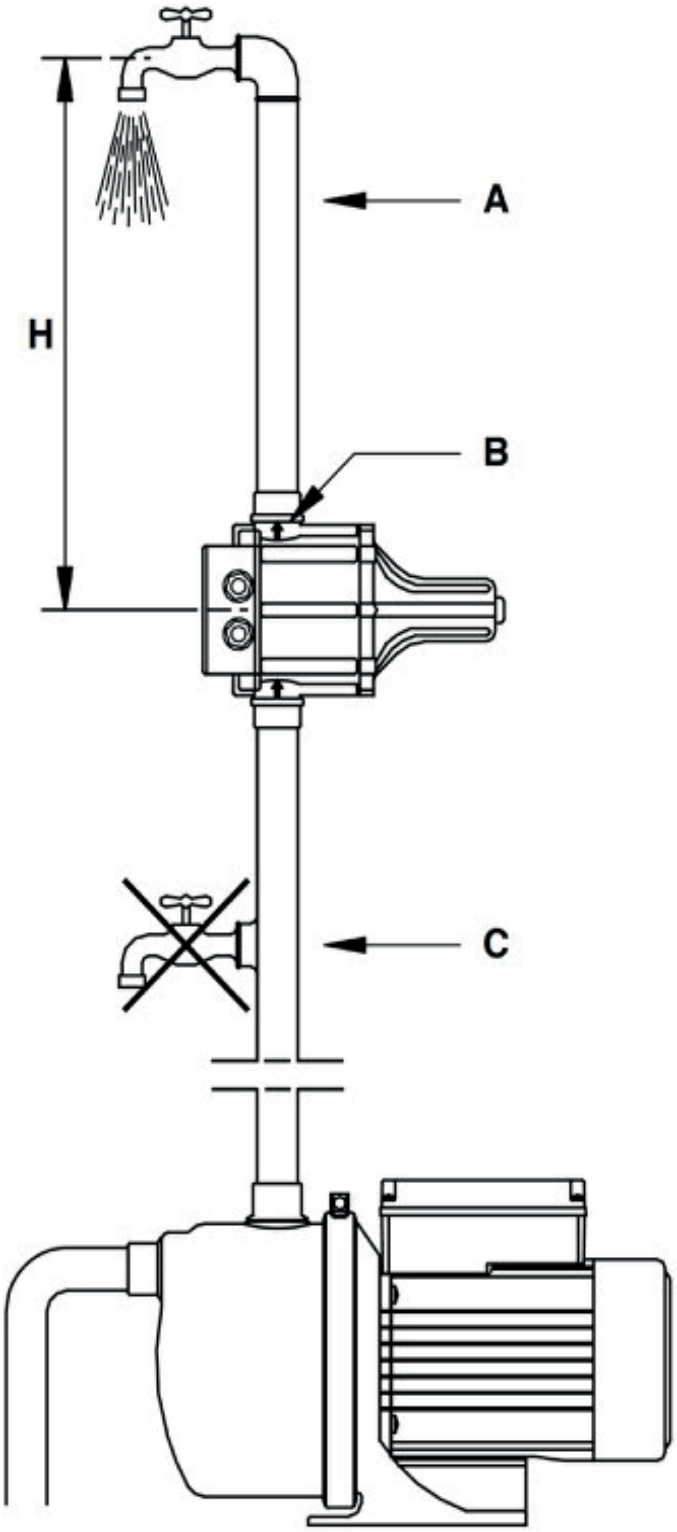
**Yellow indicator light/"Pump on"** - on when the pump is running

**Red indicator light/"Fault"** - on when there is operation failure. See fault finding chart.

## 21. INSTALLATION

Install the unit on the discharge side of the pump, see the following page.

When pumping from a well, borehole, etc., a non-return valve must always be fitted to the pump's suction pipe. It is recommended that the pump/unit be connected to the piping system by means of unions. The installation location must be clean and well-ventilated.




The unit can be fitted directly to the discharge port of the pump or between the pump and the first draw-off point.

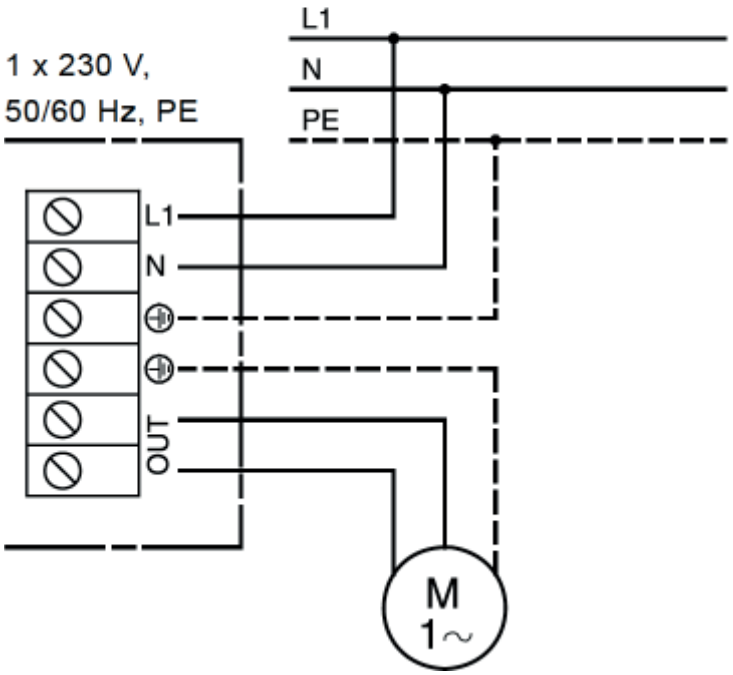
**A.** It is recommended that the unit be installed so that the height distance between the unit and the highest draw-off point does not exceed the values stated.

**B.** The arrows on the unit indicate the flow direction. Always install the unit with the arrows pointing upwards.

**C.** Do not install draw-off points between the pump and the unit.

## 22. ELECTRICAL CONNECTION

Never make any connections in the terminal box of the unit unless electricity supply has been switched off. The unit must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles.




The electrical connections and protection must be carried out in accordance with local regulations.

Carry out the electrical connection as shown above.

**Note:** If the unit is incorporated in a system connected to an electricity supply system, which is/can be separated from the public supply, e.g. generator operation, the unit should be protected against overvoltage.

## 23. START-UP

**1.** Switch on the electricity supply. The green and yellow indicator lights illuminate.

**2.** The pump runs for a few seconds until there is pressure on the system.

The pump stops and the yellow indicator light goes out. The system is ready for operation.
**Note:** If there is no pressure on the system and if the red indicator light illuminates, go to point 3.

**3.** Open a tap and press Reset/Restart until the red indicator light goes out.

**4.** Close the tap. The pump stops.

**5.** The green indicator light illuminates, the yellow indicator light goes out.

The unit is ready for operation.

## 24. NORMAL OPERATION

**6.** Open a tap

**7.** The unit starts the pump. The pump runs as long as water is consumed.

**8.** Close the tap.

**9.** The unit stops the pump at maximum pump pressure.

**10.** The unit is ready for operation.

**Note:** In case of minor system leakages, the pump starts.
**Note:** In case of a supply failure, the pump restarts automatically when the supply has been restored.

## 25. DRY RUNNING

**11.** Dry running!

The unit stops the pump after approx. 10 seconds. The red indicator light illuminates.

**12.** Water flow!

Press Reset/Restart

The unit is ready for operation.

## 26. FROST PROTECTION

If the unit is not being used during periods of frost, the unit and the pipework must be drained. The unit has no drain hole and has to be removed for drainage.

## 27. TECHNICAL DATA

| | |
|---|---|
| **Supply voltage** | 1 x 230 V ±10%, 50/60 Hz |
| **Ambient temperature** | +65°C |
| **Max liquid temp.** | +65°C |
| **Cut-in pressure** | MA15: 1.5 bar, MA22: 2.2 bar |
| **Max system pressure** | 1 MPa (10 bar) |
| **Contact load** | 8 A |
| **Enclosure class** | IP65 |

## 28. FAULT FINDING CHART

Before starting work on the pump/unit, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

| Fault | Cause | Remedy |
|---|---|---|
| 1. The pump does not start. | **a).** The fuses in the electric installation are blown.<br>**b).** The ELCB or the voltage-operated ELCB has tripped out.<br>**c).** No electricity supply.<br>**d).** The motor protection has cut off the electricity supply due to overload.<br>**e).** The pump is defective. | **a).** Replace the fuses. If the new ones blow too, the electric installation should be checked.<br>**b).** Cut in the circuit breaker.<br>**c).** Contact the electricity supply authorities.<br>**d).** Check whether the motor/pump is blocked.<br>**e).** Repair or replace the pump. |
| 2. The green indicator light is on, but the pump does not start when water is consumed. | **a).** Too high system pressure.<br>**b).** The height distance between the unit and the draw-off point is too big. | **a).** Reduce the pressure.<br>**b).** Adapt the installation. |
| 3. Frequent starts and stops. | **a).** Leakage in the pipework.<br>**b).** Non-return valve or foot valve leaking. | **a).** Check and repair the pipework.<br>**b).** Replace the non-return valve or foot valve. |
| 4. The pump does not stop. | **a).** The pump is not capable of delivering the right required discharge pressure.<br>**b).** The unit is defective. | **a).** Replace the pump.<br>**b).** Replace the unit. |
| 5. The red indicator light is on. | **a).** No water is available at the pump suction port.<br>**b).** The pump stars to self-prime (jet pumps only).<br>**c).** The pump or unit is defective. | **a).** Check the pipework.<br>**b).** See section “Start-up” on page 14<br>**c).** Replace the pump or unit. |

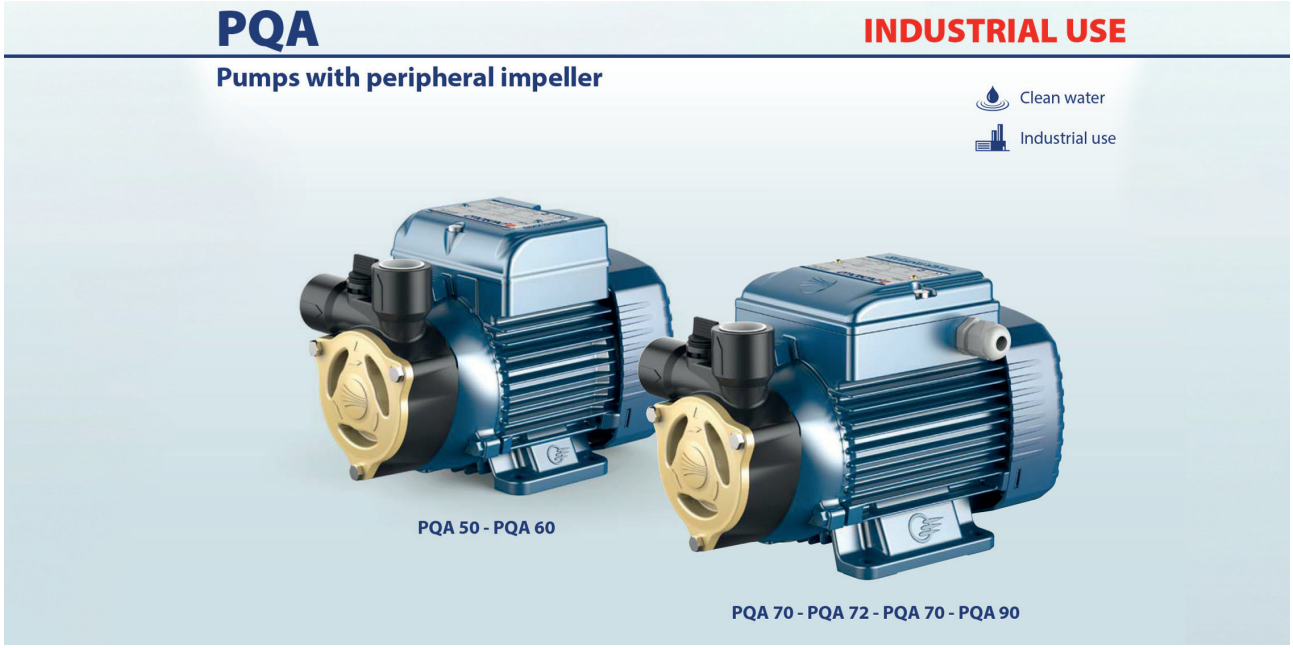
## 29. DISPOSAL

This product or parts of it must be disposed of in an environmentally sound way:

**1.** Use the public or private waste collection service.

**2.** If this is not possible, contact Dutypoint.

## 30. PQAM60 MANUAL




### PERFORMANCE RANGE
- Flow rate up to 50 l/min (3m³/h)
- Head up to 90 m

### APPLICATION LIMITS
- Manometric suction lift up to 8 m
- Liquid temperature between -10°C and +90°C
- Ambient temperature between -10°C and +40°C (+50°C for PQA 50-60)
- Max. working pressure 10 bar
- Continuous service S1

### CONSTRUCTION AND SAFETY STANDARDS
EN 60335-1 EN 60034-1
IEC 60335-1 IEC 60034-1 CE
CEI 61-150 CEI 2-3

### CERTIFICATIONS
Company with management system certified DNV ISO 9001: QUALITY

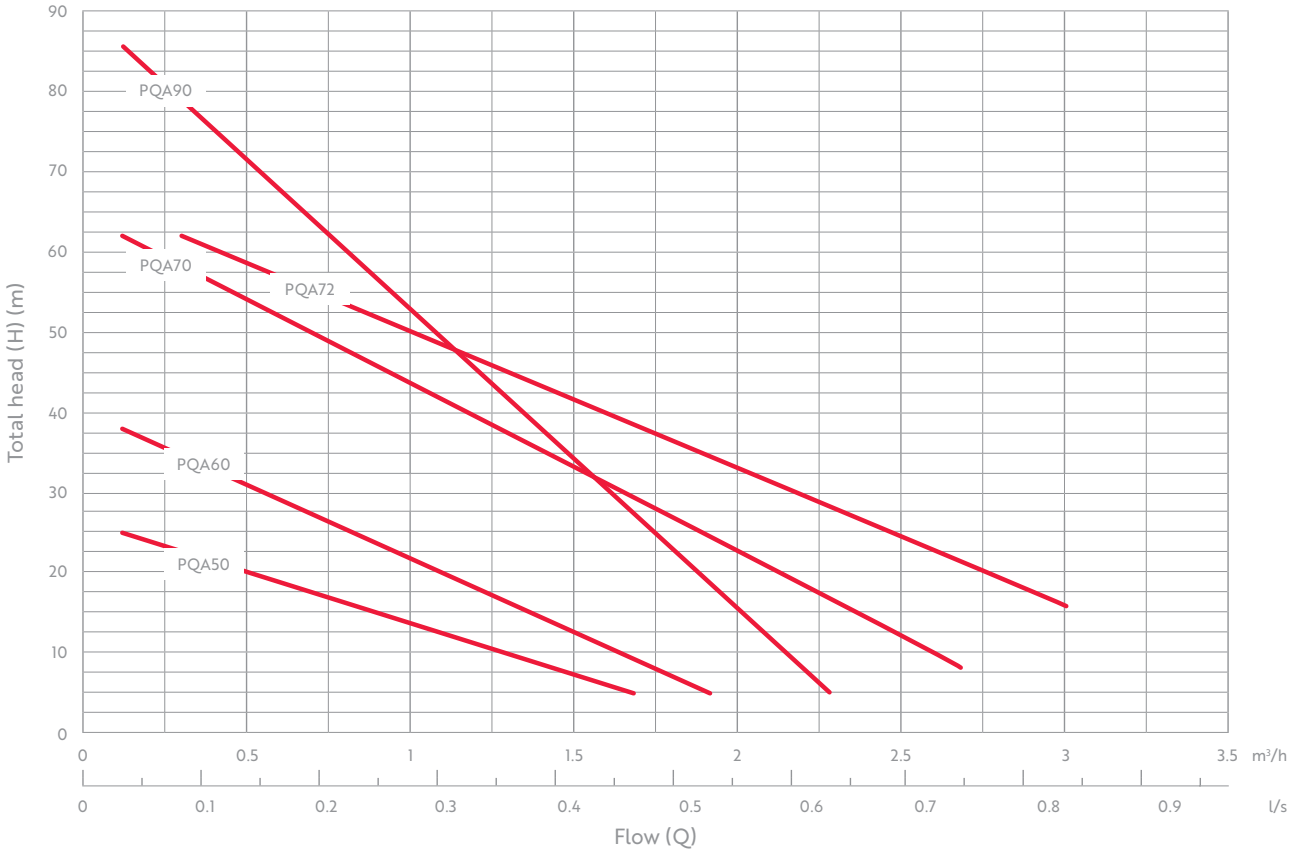
### GUARANTEE
2 years subject to terms and conditions

### INSTALLATION AND USE
The PQA pumps are recommended for pumping clean water without abrasive particles and liquids which are not chemically aggressive towards the materials with which the pump is made. The PPS and brass pump body construction guarantees against the formation of rust and oxidation. Because of these characteristics, these pumps are suitable for use in industrial applications such as cooling, air conditioning, laundry, etc. Installation needs to be undertaken in well-ventilated closed areas or in any way protected from bad weather.

### PATENTS - TRADEMARKS - MODELS
- Motor bracket: patent n.IT1243605
- Shaft: patent n.0000275945 (PQA 50-60)

### OPTIONS AVAILABLE ON REQUEST
- Special mechanical seal
- EN 10088-3 - 1.4401 (AISI 316) stainless steel pump shaft
- Other voltages
- IP X5 class protection for PQA 70-90

## 31. CHARACTERISTIC CURVES AND PERFORMANCE DATA

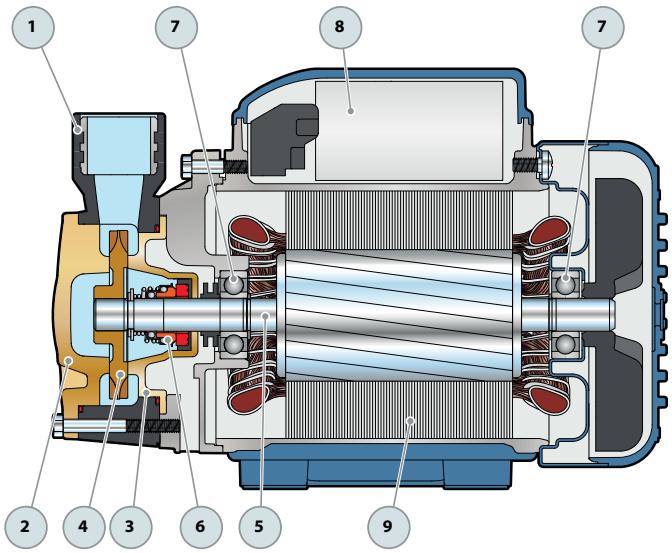



| Model | | Power (P2) | | | Q | (m³/h) | 0 | 0.1 | 0.3 | 0.6 | 0.9 | 1.2 | 1.5 | 1.7 | 1.8 | 1.9 | 2.3 | 2.7 | 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Single-phase** | **Three-phase** | **kW** | **HP** | **▲** | | **(l/s)** | 0 | 0.03 | 0.08 | 0.16 | 0.25 | 0.33 | 0.42 | 0.46 | 0.5 | 0.53 | 0.63 | 0.75 | 0.83 |
| PQAm 50 | PQA 50 | 0.18 | 0.25 | | | | 26 | 25 | 22 | 19 | 15 | 11 | 8 | 5 | | | | | |
| PQAm 60 | PQA 60 | 0.37 | 0.5 | | | | 40 | 38 | 35 | 29 | 23.5 | 18 | 12.5 | 9 | 7 | 5 | | | |
| PQAm 70 | PQA 70 | 0.55 | 0.75 | **IE3** | | **H (m)** | 65 | 62 | 58 | 52 | 45.5 | 39.5 | 33 | 30 | 27 | 24 | 17 | 8 | |
| PQAm 72 | PQA 72 | 0.55 | 0.75 | | | | 65 | - | 62 | 67 | 52 | 46 | 42 | 38 | 36 | 34 | 28 | 21 | 18 |
| PQAm 90 | PQA 90 | 0.75 | 1 | | | | 90 | 86 | 79 | 68 | 57 | 45 | 34 | 27 | 23 | 18 | 5 | | |

Q = Flow rate
H = Total manometric head
HS = Suction height
▲ Three-phase motor efficiency class (IEC 600 34-30-1)
Tolerance of characteristic curves in compliance with EN ISO 9906 Grade 3B.

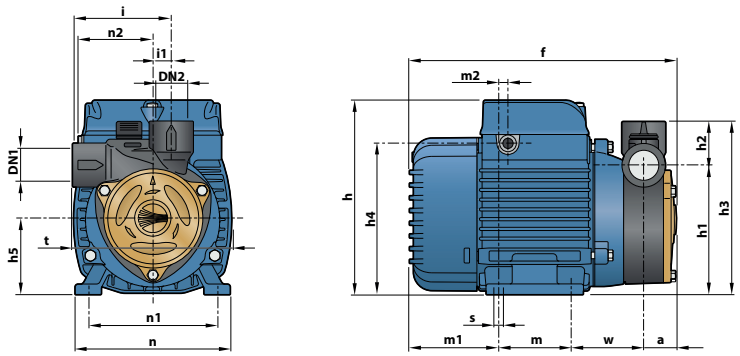
## 32. CHARACTERISTICS

| Pos. | Component | Construction characteristics | | | | |
|---|---|---|---|---|---|---|
| 1 | Pump body | PPS complete with threaded metallic port inserts in compliance with ISO 228/1 | | | | |
| 2 | Body plate | Brass | | | | |
| 3 | Motor bracket | Aluminium with brass insert (patented), reduces the risk of impeller seizure | | | | |
| 4 | Impeller | Brass with peripheral radial vanes | | | | |
| 5 | Motor shaft | Stainless steel AISI 431 | | | | |
| 6 | Mechanical seal | **Seal**<br>*Model*<br>ST1-12 | **Shaft**<br>*Diameter*<br>ø 12 mm | *Stationary ring*<br>Silicon carbide | **Materials**<br>*Rotational ring*<br>Graphite | *Elastomer*<br>NBR |
| 7 | Bearings | **Pump**<br>PQA 50-60<br>PQA 70-72-90 | **Model**<br>6201 ZZ/6201 ZZ<br>6203 ZZ/6203 ZZ | | | |
| 8 | Capacitor | **Pump**<br>*Single-phase*<br>PQAm 50-60<br>PQAm 70-72<br>PQAm 90 | **Capacitance**<br>*(220 V)*<br>10 µF - 450 VL<br>16 µF - 450 VL<br>20 µF - 450 VL | *(110 V or 127 V)*<br>25 µF - 250 VL<br>60 µF - 300 VL<br>60 µF - 300 VL | | |
| 9 | Electric motor | **PQAm:** single-phase 220 V - 60 with thermal overload protector incorporated into the winding.<br>**PQA:** three-phase 220/380 V - 60 Hz or 220/440 V - 60 Hz.<br>**The three-phase pumps are fitted with high-performance motors in class IE3 (IEC 60034-30-1).**<br>- Insulation: Class F<br>- Protection: IPX4 | | | | |

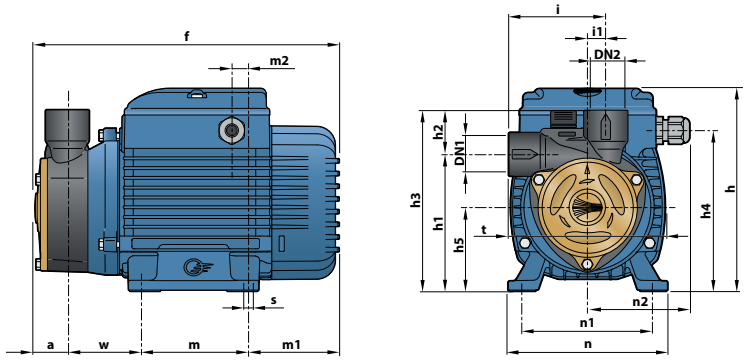


## 33. DIMENSIONS AND WEIGHT

**PQA 50-60**




**PQA 70-72-90**




| Model | | Ports | | Dimensions (mm) | | | | | | | | | | | | | | | | | | | Weight (kg) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single-phase | Three-phase | DN1 | DN2 | a | f | h | h1 | h2 | h3 | h4 | h5 | i | i1 | m | m1 | m2 | n | n1 | n2 | t | w | s | 1~ | 3~ |
| PQAm 50 | PQA 50 | ½" | ½" | 25 | 198 | 145 | 96 | 33 | 129 | 112 | 56 | 72.5 | 13.5 | 55 | 65 | 8 | 116 | 94 \| 100 | 55.5 | 117 | 53 | 7 | 4.7 | 4.7 |
| PQAm 60 | PQA 60 | | | | | | | | | | | | | | | | | | | | | | 4.7 | 4.7 |
| PQAm 70 | PQA 70 | | | 28 | 261 | 179 | 116.5 | 32.5 | 149 | 139 | 71 | 72.5 | 13.5 | 90 | 80.5 | 21 | 134 | 112 | 79 | 140 | 62.5 | | 9.3 | 9.3 |
| PQAm 72 | PQA 72 | 1" | 1" | | | | 121 | 30 | 151 | | | 83 | 20 | | | | | | | | | | 9.3 | 9.3 |
| PQAm 90 | PQA 90 | ½" | ½" | 26.5 | 259 | | | 35 | 156 | | | 76 | 16 | | | | | | | | 62 | | 9.4 | 9.4 |

| Model | Voltage (V) | | |
|---|---|---|---|
| Single-phase | 220 | 110 | 127 |
| PQAm 50 | 2.1 A | 4.2 A | 3.7 A |
| PQAm 60 | 2.6 A | 6 A | 5.2 A |
| PQAm 70 | 6.5 A | 13 A | 11.3 A |
| PQAm 72 | 6.5 A | 13 A | 11.3 A |
| PQAm 90 | 5.6 A | 11.2 A | 9.7 A |

| Model | Voltage (V) | | | |
|---|---|---|---|---|
| Three-phase | 220 | 380 | 220 | 440 |
| PQA 50 | 2 A | 1.15 A | 2 A | 1.1 A |
| PQA 60 | 2 A | 1.15 A | 2 A | 1.1 A |
| PQA 70 | 3.4 A | 1.95 A | 3.5 A | 2 A |
| PQA 72 | 3.4 A | 1.95 A | 3.5 A | 2 A |
| PQA 90 | 4.2 A | 2.4 A | 3.7 A | 2.2 A |

## 34. WARRANTY

Full warranty, including accidental damage, covers booster sets, pressurisation units, and glanded circulation pumps only in mainland England and Wales. 24-month warranty commences from the date of despatch. To receive the full 24 months warranty cover, the commissioning must be carried out in the first 12 months from the date of despatch. If commissioning is not carried out, the warranty period will remain at 12 months from the date of despatch. A servicing visit must be completed within 12 months from the date of commissioning. A servicing visit is not included. Please allow 2-3 weeks' notice to schedule a commissioning visit.

## 35. NOTES

# TALK TO THE TEAM

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