

TUCSON®

Plumbing & Heating Products



Superior Plumbing Products

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CONTENTS



TUCSON® A-Rated Circulating Pumps

General Information	3
5 & 6 Metre A-Rated Circulating Pump	4
8 Metre A-Rated Circulating Pump	7



TUCSON® Booster Pumps

General Information	14
SBP-90 Booster Pump	15
SBP-100 Booster Pump	22



TUCSON® Expansion Vessels

General Information	27
Heating Expansion Vessels	28
Potable Expansion Vessels	29



TUCSON® Motorised Valves

General Information	31
Motorised Valves With Detachable Heads	32



TUCSON® Automatic Air Bottle

General Information	34
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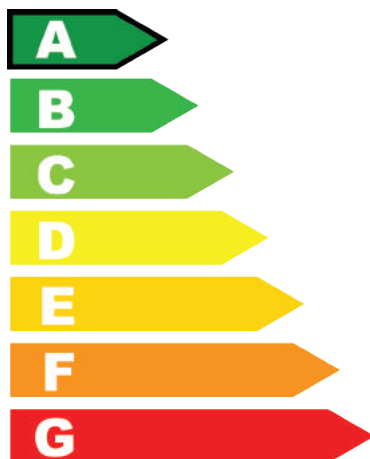


INSTANTOR® Press System	36
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All other products available.	37
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TUCSON® A-RATED CIRCULATING PUMP'S

Fluid Dynamics



TUCSON® A-RATED CIRCULATING PUMP'S

GENERAL INFORMATION

1. A-Rated Circulating Pump

Our A-Rated circulating pumps are designed for the circulation of water in heating systems. They can be used in the following installations:

- Underfloor heating systems
- One-pipe systems
- Two-pipe systems

They incorporate a permanent-magnet motor and variable-pressure control, enabling continuous adjustment of the pumps performance to the actual requirements.

NB: When the pump is being used for a solid fuel application, please ensure it is switched to a 'manual' setting ONLY

2. Advantages of installing an A-Rated Circulating Pump

- Our A-Rated Pumps are easy to install in most cases, with the factory setting allowing the pump to be started without making any adjustments.
- A high degree of comfort due to minimal noise from the pump and throughout the system.
- Low energy consumption compared to conventional circulating pumps. Our A-Rated pumps are fully compliant with the European Union ErP (Energy-related Products) directive, they exceed the bench mark for energy efficiency with an EEI rating of ≤ 0.20 .

3. Pump liquid

The water within the system and the pump must be clean, non-aggressive and non-explosive. It must also be free from solid particles, fibres or mineral oil. In heating systems, the water must meet the requirements of accepted standards for water quality in a heating system.

4. ErP (ecological design) directive

- The benchmark for the most efficient circulators is $EEI \leq 0.20$.
- Information on recycling/disposal: The product should be disposed of separately from household waste in line with local laws and regulations. When the product reaches its end of life, dispose of it at your local waste collection point/recycling centre.
- The separate collection and recycling of your product at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.

5. Warranty

Tucson® A-Rated circulating pumps are sold with a 2 year warranty effective from date of purchase. This warranty covers any manufacturing fault which may cause the pump to fail and not perform its designed operations correctly.

The warranty is valid on the assumption the following has been applied to the installation:

- Product installed correctly and used as specified in the instructions.
- It has been installed by a fully qualified tradesperson.
- The installation complies with the local building regulations and also any regulations which are relative to circulating pump installations.

The warranty of the pump is invalid if any of the following occurs during installation:

- The pump has been installed to operate for other purposes than what it is designed for.
- The pump is not installed by a qualified or competent person.
- The pump has been installed incorrectly or not to the installation instructions.
- The pump has failed outside of the warranty period.
- The pump has been damaged by outside interference such as bad workmanship or physical damage.

5 & 6 METRE HEAD A-RATED CIRCULATING PUMP

Code	771903(5M) / 771904(6M)
Efficiency	EEL≤0.20
Voltage	Single Phase, 230V +/- 10%
Frequency	50 Hz
Speed	1 to 3 Speed, Auto
Isolation Class	F
Fluid Temperature Working Range	-10°C to 110°C
Max Working Pressure	10 Bar
Ambient Temperature	-10°C to 50°C
Waterproof Rating	IP44
Pump Weight	2.2KG
Min Power Output	5W
Max Power Output	45W (5M) / 47W (6M)

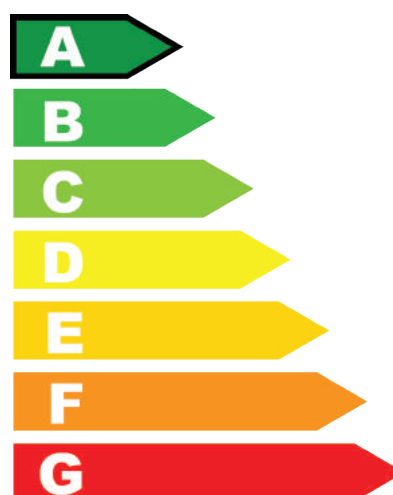


Type Key 5M

RS 25/6 EA 130
 Screwed pipe pump
 Nominal width (mm)
 15(=1"), 25(= 1½"), 32(=2")
 Maximum head (M)
 Electrical auto
 Port to port length (mm)

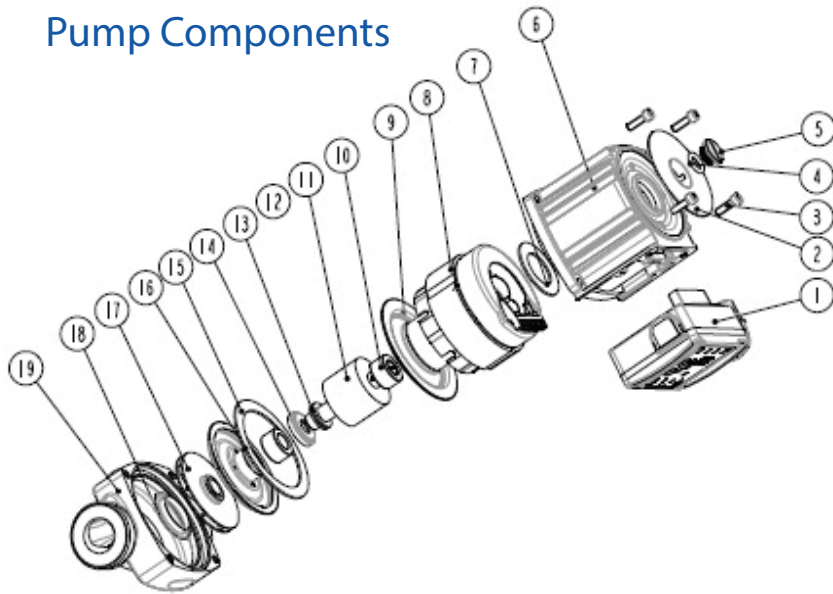
Type Key 6M

RS 25/7 EA 130
 Screwed pipe pump
 Nominal width (mm)
 15(=1"), 25(= 1½"), 32(=2")
 Maximum head (M)
 Electrical auto
 Port to port length (mm)



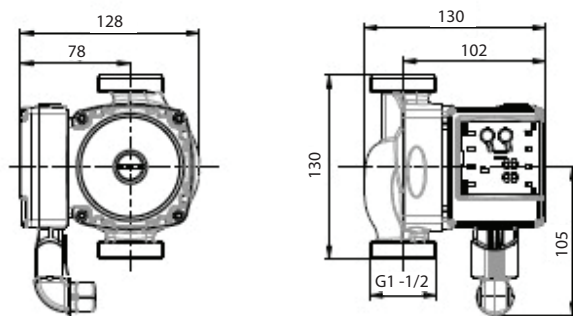
5 & 6 METRE HEAD A-RATED CIRCULATING PUMP

Pump Components

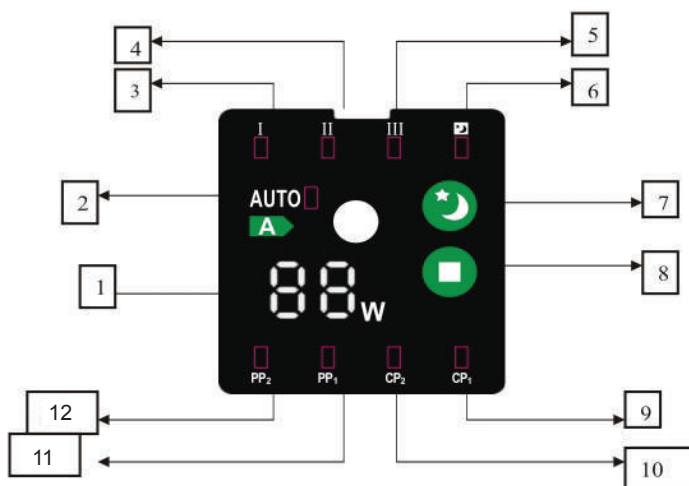


Ref	Description	Material
1	Connection Box	ABS+PC
2	Label Cover	ABS+PC
3	Screw	SUS304
4	Gasket	NBR
5	Bleed Screw	COPPER
6	Motor Housing	ZL104
7	Gasket	NBR
8	Stator With Wire	COPPER H62
9	Shield Cover 1	SUS304
10	Bearing	A1 ₂ O ₃ 97%
11	Rotor	MAGANET
12	Shaft	A1 ₂ O ₃ 97%
13	O-Ring	NBR
14	Thrust Ring	NBR
15	Gasket	NBR
16	Shield Cover 2	SUS304
17	Impeller	PES
18	Pump Body Parts	SUS304
19	Pump Body	IRON HT200

Pump Dimensions



Control Panel Elements



Ref	Description
1	Screen to show actual working power
2	Light fields indicating AUTO mode
3	Min speed for manual button
4	Mid speed for manual button
5	Max speed for manual button
6	Light fields indicating night mode
7	Push-button to select night mode
8	Push-button for selection of pump settings
9	CP1 indicating min constant pressure curve
10	CP2 indicating max constant pressure curve
11	PP1 indicating min proportion pressure curve
12	PP2 indicating max proportion pressure curve

This A-Rated Circulating Pump has nine optional settings which can be selected with the push-button. (Ref . 8 in above table) The pump setting is indicated when the light below the icon is illuminated.

Every time the push button is pressed, the pump setting is changed.

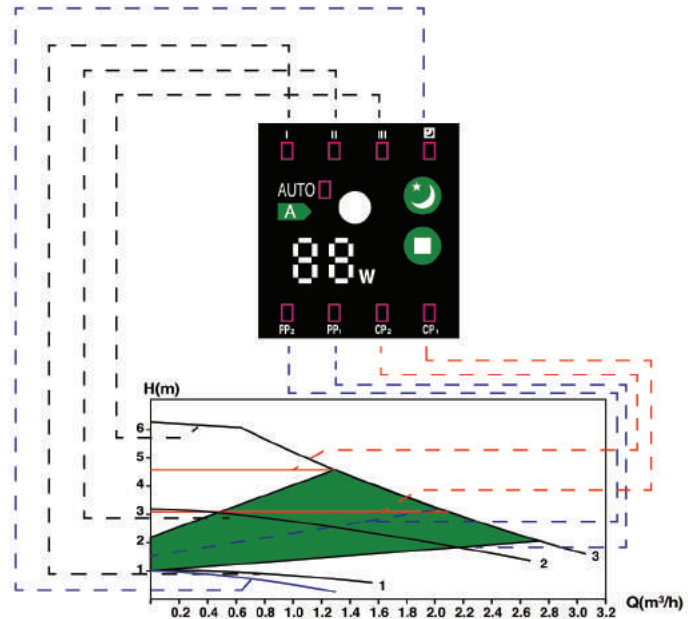
5 & 6 METRE HEAD A-RATED CIRCULATING PUMP


Relation between pump setting and pump performance

Definition of PP1, PP2, CP1, CP2

PP1/PP2 – If flow resistance in the distribution system is not negligible, proportional pressure control is recommended. The differential pressure across the circulator increases when flow increases. The proportional pressure control compensates for the flow resistance in the distribution and supply system with the result that the differential pressure across the control valves is nearly constant and a good control performance is obtained both at full loads as well as at partial loads operation. Different slopes of the proportional control curves can be selected to fit the pump to the resistance in the actual heating system, in which it is installed.

CP1/CP2 – Constant pressure controls is recommended if flow resistance in the distribution and supply system (pipe, boiler, heat exchanger etc.) is low. The differential pressure across the circulator is constant and independent of the flow. Due to the low flow resistance in the distribution system the differential pressure across the control valves is nearly constant and optimal control performance is obtained both at full loads as well as at partial loads operation.



Setting	Pump Curve	Function
PP1	Lowest proportional – Pressure curve	The duty point of the pump will move up or down on the lowest proportional-pressure curve, depending on heating demand. The head (pressure) is reduced at falling heating demand and increased at rising heating demand.
PP2	Highest proportional – Pressure curve	The duty point of the pump will move up or down on the highest proportional-pressure curve, depending on the heating demand. The head (pressure) is reduced at falling heating demand and increased at rising heating demand.
CP1	Lowest constant – Pressure curve	The duty of the pump will move out or in on the constant-pressure curve, depending on the heating demand. The head (pressure) is kept constant, irrespective of the heating demand.
CP2	Highest constant – Pressure curve	The duty of the pump will move out or in on the constant-pressure curve, depending on the heating demand. The head (pressure) is kept constant, irrespective of the heating demand.
III	Speed III	Pump runs at a constant speed and consequently on a constant curve. In speed III, the pump is set to run on the maximum curve under all operating conditions. Quick venting of the pump can be obtained by setting the pump to speed III for a short period.
II	Speed II	Pump runs at a constant speed and consequently on a constant curve. In speed II, the pump is set to run on the medium curve under all operating conditions.
I	Speed I	Pump runs at a constant speed and consequently on a constant curve. In speed I, the pump is set to run on the minimum curve under all operating conditions.
AUTO– Ex-Factory Setting		Under 'AUTO' mode, the power of the pump automatically alters up or down.
Night Mode 		Select night mode, after a period of time the power automatically alters. After two hours, it will be down lowest between 5-10 watt. After seven hours, the pump moves from night mode to its original setting.

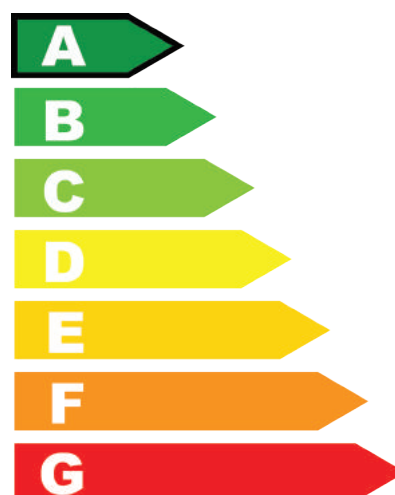
8 METRE HEAD A-RATED CIRCULATING PUMP

Code	771902
Efficiency	EEL≤0.23
Voltage	Single Phase, 230V +/- 10%
Frequency	50 Hz
Speed	1 to 6 Speed, Auto
Isolation Class	F
Fluid Temperature Working Range	-10°C to 110°C
Max Working Pressure	10 Bar
Ambient Temperature	-10°C to 50°C
Waterproof Rating	IP44
Pump Weight	3.3KG
Min Power Output	10W
Max Power Output	130W



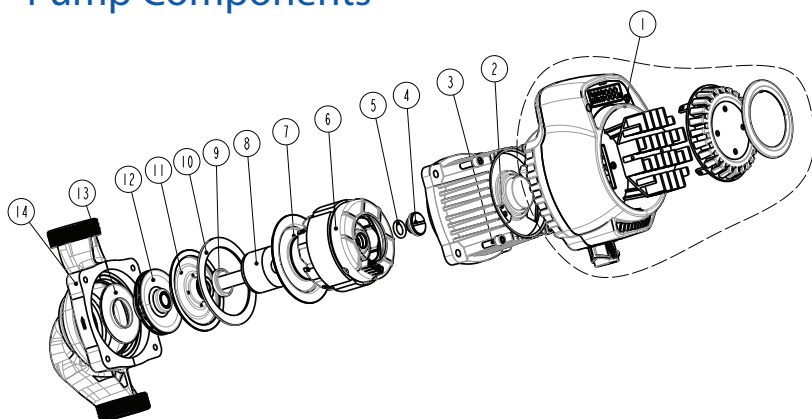
Type Key

	RS	25/8	EA	180
Screwed pipe pump	_____	_____	_____	_____
Nominal width (mm)	_____	_____	_____	_____
15(=1"), 25(= 1½"), 32(=2")	_____	_____	_____	_____
Maximum head (M)	_____	_____	_____	_____
Electrical auto	_____	_____	_____	_____
Port to port length (mm)	_____	_____	_____	_____



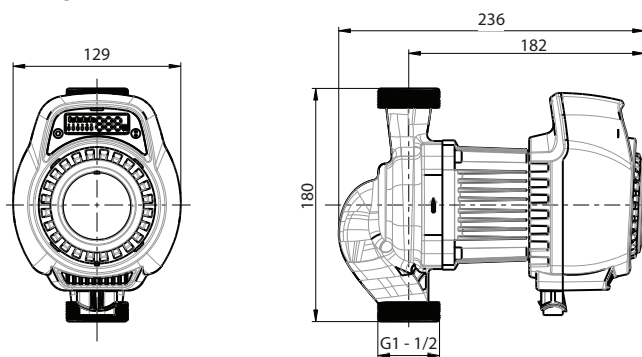
8 METRE HEAD A-RATED CIRCULATING PUMP

Pump Components

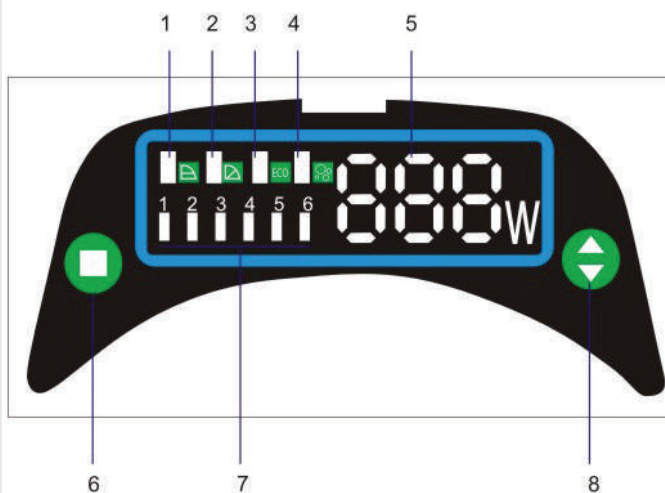


Ref	Description	Material
1	Terminal Box	ABS+PC
2	Pump Housing	ZL104
3	Screw	SUS304
4	Copper Screw	HPB59-1
5	Gasket	NBRNBR
6	Wiring	COPPER
7	Shielding Parts	SUS304
8	Rotor	SILICON
9	Thrust Parts	NBR+A1203 97%
10	Gasket	NBR
11	Shielding Cover	SUS304
12	Impeller	PES
13	Pump Body Parts	SUS304
14	Pump Body	HT304

Pump Dimensions



Control Panel Elements

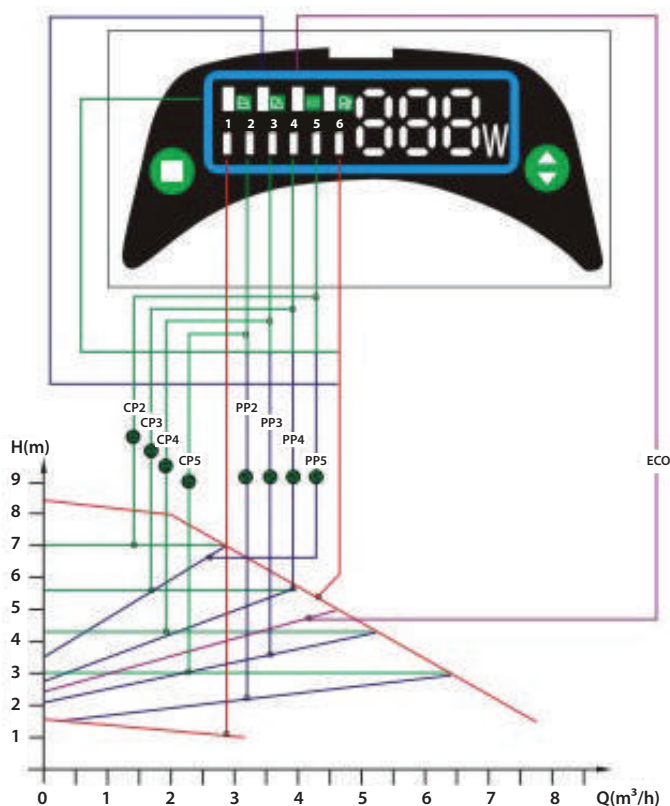






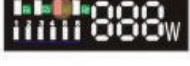
Ref		Description
1		Light in constant pressure
2		Light in proportional pressure
3		ECO mode
4		Pump Vent - When selected, the pump will run at full power to release trapped air.
5		Power Light
6		Control Mode - Button is used to change the pumps mode, for example, from constant pressure to proportional pressure, or to ECO mode, also for air-venting mode.
7		Speed Indicator - The 6 lights show the different working conditions. Only under two modes (constant pressure and proportional pressure) these lights can be chosen.
8		Set - This button is used for setting the different speeds (light in 1, 2, 3, 4, 5, 6) for two modes. Using this button, speeds from max. to min. can be chosen.

This A-Rated Circulating Pump has fourteen optional settings which can be selcted with the push-button. (Ref . 8 in above table) The pump setting is indicated when the light below the icon is illuminated.
Every time the push button is pressed, the pump setting is changed.

8 METRE HEAD A-RATED CIRCULATING PUMP

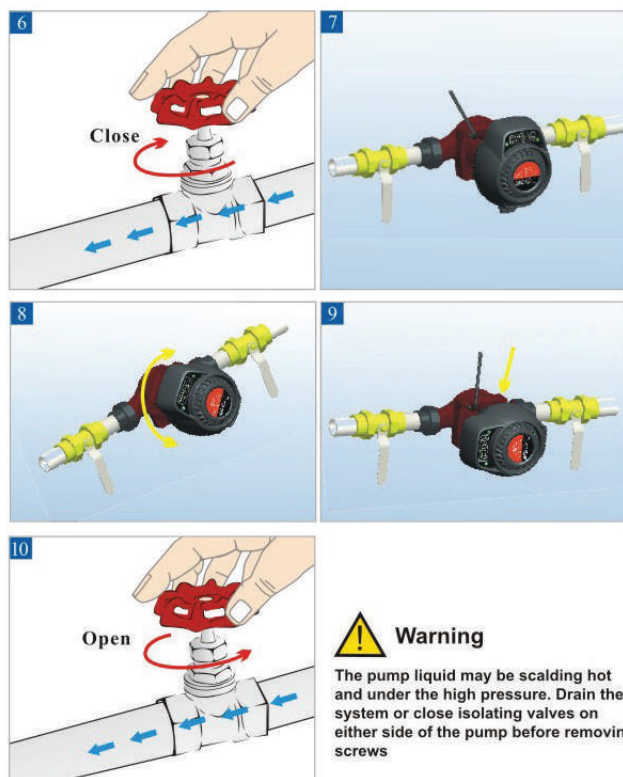
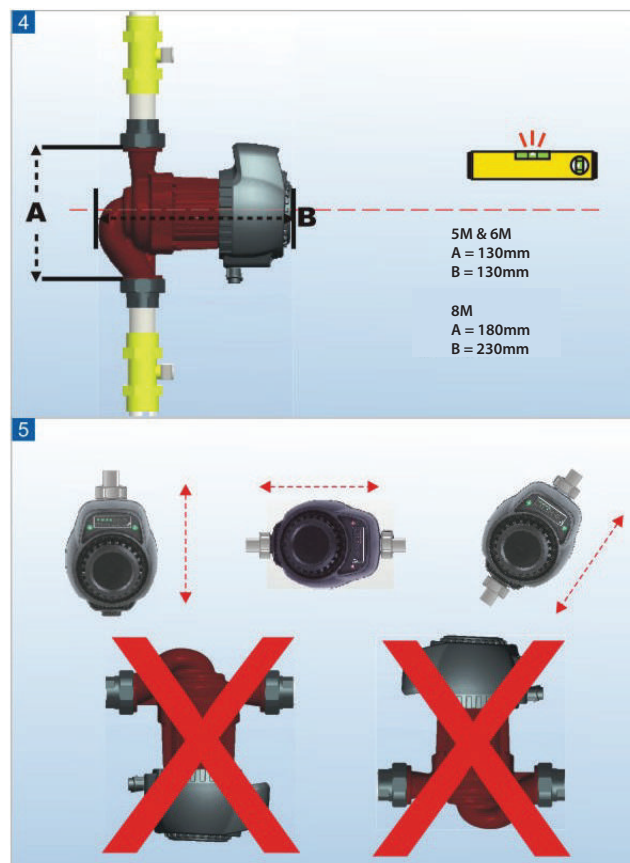
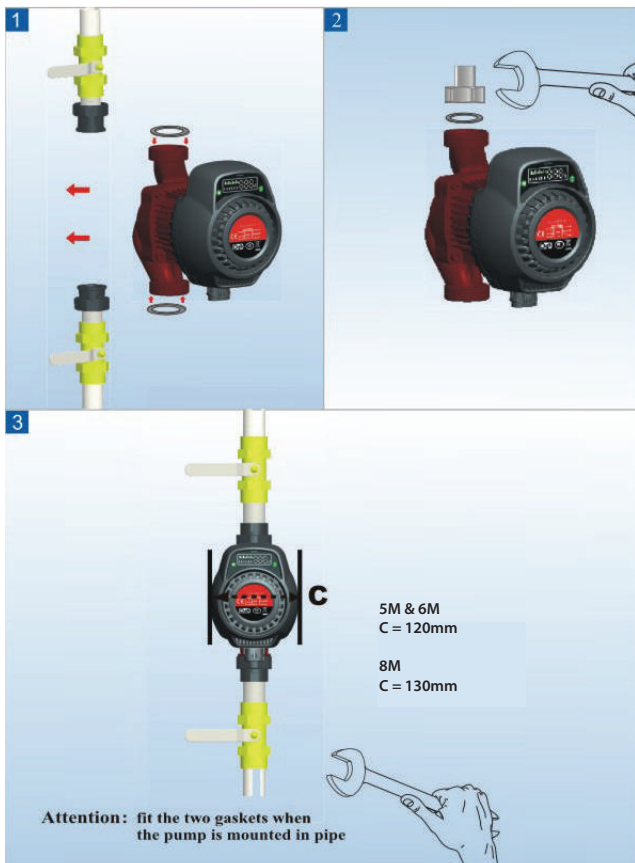
Relation between pump setting and pump performance



Control Panel Pump Curve	Description
 CP2, CP3, CP4, CP5	The operating point moves back and forth on the curve according to the volume of flow from the system. As shown in graph, the pressure remains constant and is not affected by the volume demands of flow.
 CP1 -- Min Speed CP6 -- Max Speed	The two speeds are the min. and max. under constant pressure, the curve shown as in graph can not keep constant. It rises and goes down as manual operation.
 PP2, PP3, PP4, PP5	The operating point moves back and forth on the proportional pressure curve according to the volume of flow from system. As shown in the graph, the pump is directly proportional to the flow demands.
 PP1 -- Min Speed PP6 -- Max Speed	The two speeds are the min. and max. under proportional pressure, the curve shown as in graph can not keep constant. It rises and goes down as manual operation.
 ECO	1. In this mode, the pump operates in 'autoadaptation', and adjusts to system requirements. 2. Under ECO mode, the pump is controlled by means of proportional pressure.

TUCSON® A-RATED CIRCULATING PUMP

Installation Instructions



Accessories



TUCSON® A-RATED CIRCULATING PUMP

Electrical Connection

- The electrical connection for the TUCSON® circulating pump must be installed correctly by a fully qualified tradesperson.
- An electrical connection for the TUCSON® circulating pump is supplied with every pump and must be used.
- The frequency and supply voltage must be the same as per instructions and control panel.
- All electrical connections must comply with local building regulations.
- Once power has been connected correctly to the pump and switched on, the control panel will illuminate to show the power supply is working correctly.

Commissioning

Before initial pump start up please ensure the following –

- The pump has been installed correctly and there are no leaks on the plumbing connections.
- The electrical connections have been installed correctly and the correct power is running to the pump when it is switched on and in operation.
- The liquid in the heating system is clean.
- Both service valves on each side of the pump are open to ensure the water will flow through the pump when running.
- Ensure the system is full with water and all air has been removed.
- **N.B** Do not run the pump without any water in the system as this may lead to failure and will not be covered under warranty.
- **N.B** Do not use the pump as a way to vent the system of air. We recommend that an automatic air bottle is installed at the highest point possible on the heating circuit to ensure the air can be removed from the system.

TUCSON® A-RATED CIRCULATING PUMP

Fault finding chart



WARNING

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

FAULT	CONTROL PANEL	CAUSE	REMEDY
1. The pump does not run	No display light	a) One fuse in the installation is blown	Replace the fuse
		b) The current-operated or voltage-operated circuit breaker has tripped over	Check circuit breaker & have replaced if necessary
		c) The pump is defective	Replace the pump
	Power light on	a) Electricity supply failure	Check that the electricity supply falls within the specified range
		b) The pump is blocked	Remove the impurities
2. Noise in the system	Ensure power and light field for pump setting are on	a) Air in the system	Vent the system
		b) The flow is too high	Reduce the suction head
3. Noise in the pump	Ensure power and light field for pump setting are on	a) Air in the pump	8M - Switch to pump vent setting & run for a short period of time 5/6M – Open bleed screw to release any trapped air.
		b) The inlet pressure is too low	Increase the inlet pressure. Check the air volume in the expansion tank, if installed
4. Insufficient circulation	Ensure power and light field for pump setting are on	a) The pump performance is too low	Increase the suction head

TUCSON® SBP BOOSTER PUMPS

TUCSON® SBP-90



Fluid Dynamics

TUCSON® SBP-100



TUCSON® SBP BOOSTER PUMPS

GENERAL INFORMATION

1. SBP Booster Pumps

The SBP Booster Pumps are designed for the boosting of water in the following applications – Domestic , Light Commercial and Irrigation use

Our range of booster pumps are designed to increase the pressure where needed in both cold and hot water(SBP90).

SBP90 - is a low noise, horizontal multi-stage centrifugal booster pump complete with automatic pressure control unit

The pump itself has three stainless steel impellers inside and a ½ HP motor which enables the pump to have a max head of 37M and a static pressure of 3bar.

The pump also has the following features when used with the automatic pressure control unit –

- Dry run protection
- Integrated non return valve in the pressure controller
- Low decibel rating of <45db(A) at 5 metres

SBP100 - is an all – in – one automatic booster pump which combines motor , pump , accumulator , pressure switch and flow switch all in one unit.

The pump has two impellers inside and a 1HP motor which enables the pump to have a max head of 32M and a static head pressure of 3bar.

The pump also has the following features –

- Dry run protection
- Motor thermal protection
- Suction lift of 5M
- Built in pressure tank – this reduces the number of starts and stops in case there is a small water discharge from a dripping tap or leak in the system, this in turn will cause less wear on your TUCSON® pump

2. Pump Liquid –

These pumps are designed to pump the following types of liquids –

Rainwater, potable water and other clean, thin, nonaggressive liquids, not containing solid particles or fibres.

3. Warranty

Tucson® A-Rated circulating pumps are sold with a 2 year warranty effective from date of purchase. This warranty covers any manufacturing fault which may cause the pump to fail and not perform its designed operations correctly.

The warranty is valid on the assumption the following has been applied to the installation:

- Product installed correctly and used as specified in the instructions.
- It has been installed by a fully qualified tradesperson.
- The installation complies with the local building regulations and also any regulations which are relative to booster pump installations.

The warranty of the pump is invalid if any of the following occurs during installation:

- The pump has been installed to operate for other purposes than what it is designed for.
- The pump is not installed by a fully qualified tradesperson.
- The pump has been installed incorrectly or not to the installation instructions.
- The pump has failed outside of the warranty period.
- The pump has been damaged by outside interference such as bad workmanship or physical damage.

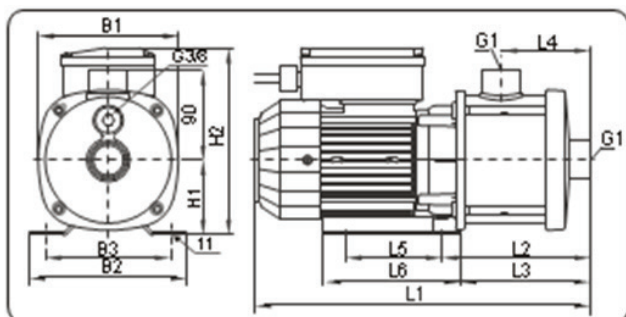
TUCSON® SBP-90 BOOSTER PUMP

Complete with automatic pressure control unit

Code	771909
Power	½ HP / 370W
Voltage	Single Phase, 230V +/- 10%
Frequency	50 Hz
Head Rated / Head Max	33M / 37M
Isolation Class	F
Fluid Temperature Working Range	-20°C to 104°C
Max Working Pressure	8 Bar
Max Environmental Temperature	50°C
Waterproof Rating	IP55
Pump Weight	9.2KG
Impeller	Stainless Steel
Motor	Air Cooled
Dry Run Protection	Yes
Non-Return Valve	Integrated in controller



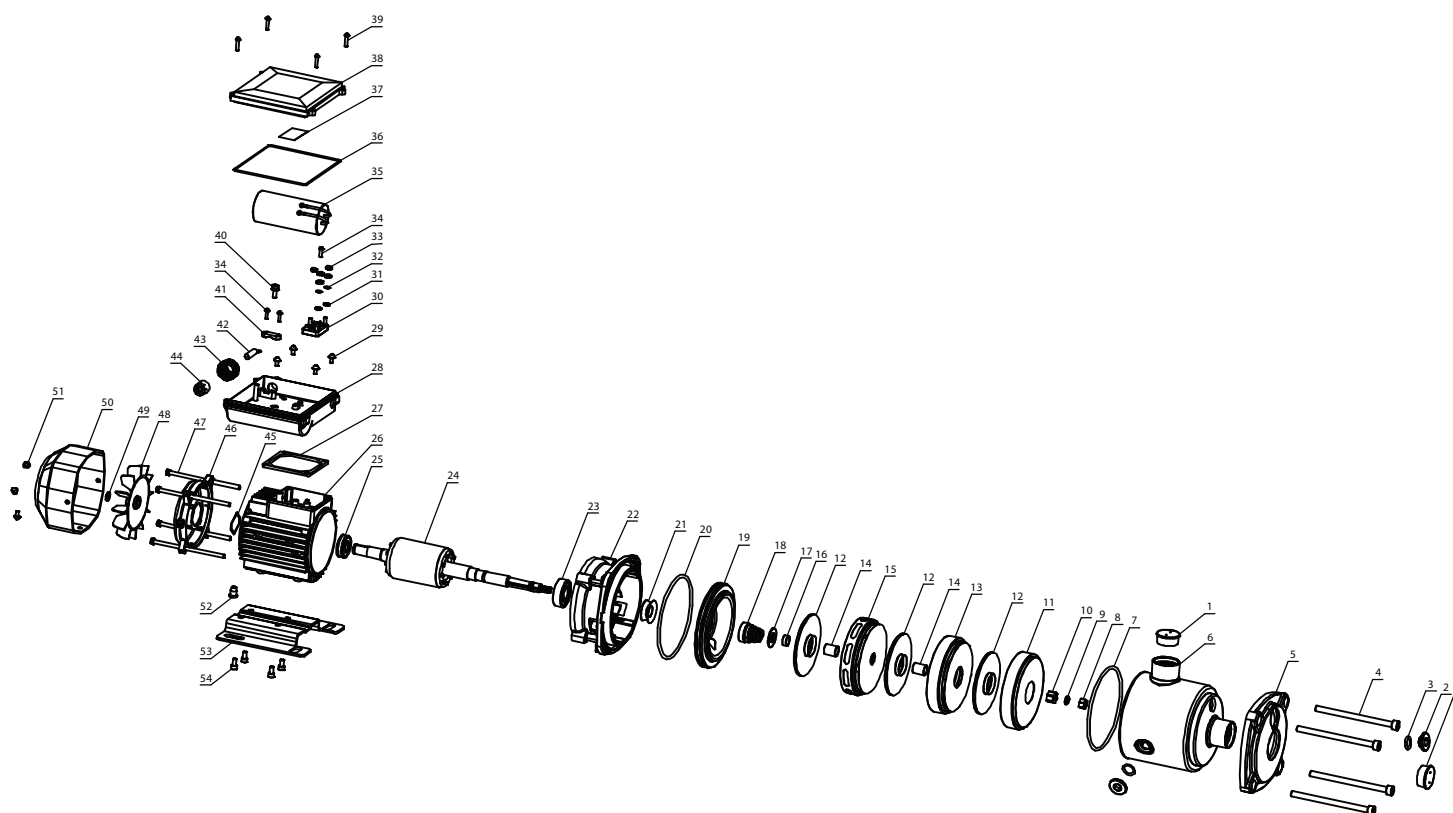
Pump Dimensions



B1	B2	B3	H1	H2	L1	L2	L3	L4	L5	L6
140	158	125	75	174	318	131	113	72	96	136

TUCSON® SBP-90 BOOSTER PUMP

Pump Components

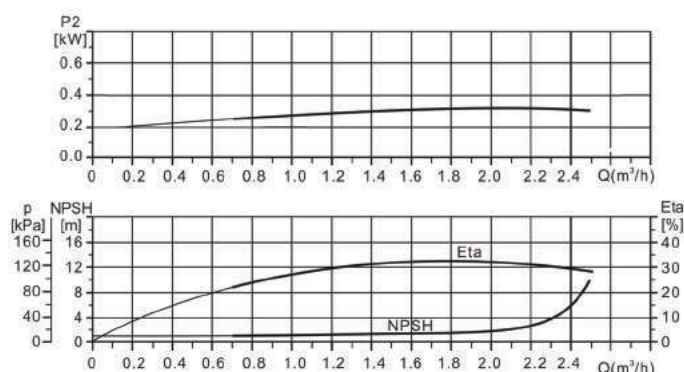
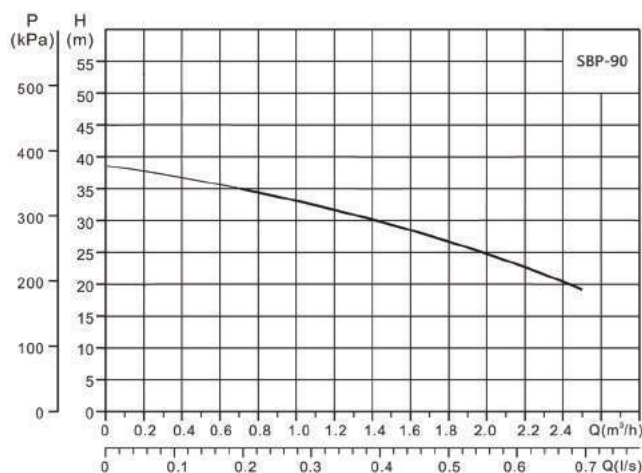


Ref	Description	Material	Qty
1	Dust cap	G1	2
2	Plug	G3/8	2
3	O - ring	D15x 2.4	2
4	Inside hexagonal bolt	M8 x 100	4
5	Clamp plate		1
6	Pump casing		1
7	O - ring	D116x4	1
8	Type 1 hexagonal nut	M8	1
9	Spring washer	8	1
10	Impeller press tube		1
11	Inlet section		1
12	Impeller		3
13	Diffuser		1
14	Long sleeve	L=17.5	2
15	Outlet section		1
16	Short sleeve	L=5.7	1
17	Shaft shield ring		1
18	Mechanical seal	LX155-15	1
19	Pump cover		1
20	O - ring	D108x1.8	1
21	Retaining ring		1
22	Front cover		1
23	Bearing	6202	1
24	Rotor assembling		1
25	Bearing	Ac6201	1
26	Frame assembly		1
27	Terminal box pad		1

Ref	Description	Material	Qty
28	Bottom part of terminal box		1
29	Cross recessed pan head screw and washer assemblies	M4x8	4
30	Connection pole		1
31	Serrated lock washer external teeth	4	2
32	Washer	4	2
33	Hexagonal nut	M4x8	5
34	Cross recessed pan head tapping screws	St3 5x16	4
35	Capacitor	15uf/450V	2
36	O - ring	d120x2	1
37	Wiring Diagram		1
38	Upper part of terminal box		1
39	Cross recessed pan head tapping screws	ST3. 5x6	4
40	Cross recessed pan head spring washer and plain washer assemblies	M5x12	1
41	Cable gland		1
42	Cable		1
43	Terminal box nut		1
44	Nut plug for terminal box		1
45	The three wave	D32	1
46	Back cover		1
47	Hexagon bolt	M5x125	4
48	Fan		1
49	Axial spring collare		1
50	Fan cover		1
51	Cross recessed pan head screw and washer assemblies	M4x8	3
52	Drain plug		1
53	Base		1
54	Inside hexagonal bolt	M6 x12	4

TUCSON® SBP-90 BOOSTER PUMP

Performance Curve



Fault finding chart



WARNING

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

Problem	Possible Reason	Solution
The pump does not run	a) The voltage is not correct b) Fuse or thermal protector prevents the pump from running	a) Check voltage on the name plate b) Check the fuse or terminal protector
The pump does not run properly	a) Head is too high b) Water level is too low c) No Water d) Leakage on inlet pipe	a) Check head is suitable b) Check the suction head c) Place the valve in water d) Check suction conditions
The pump runs but no water	a) The foot valve is blocked b) The impellar is corroded c) The bottom valve is not in water d) No priming water e) The impeller is seriously damaged	a) Clean or replace the foot valve b) Replace the impeller c) Fill the suction section with water d) Fill the pump with water e) Check the suction conditions
The flow is reduced	a) The foot valve is blocked b) The head is too high c) The water level is too low d) The impeller is seriously damaged	a) Clean or replace the foot valve b) Check the installation height c) Check the suction and re-install the pump. d) Replace the impeller
The motor is over heating	a) Low voltage b) Insufficient ventilation in pump room	a) Contact the electric power company to supply stable voltage b) Improve ventilation
The pump stops soon after starting	a) Low voltage b) Insufficient ventilation in pump room	a) Contact your electric power company to supply stable voltage b) Improve ventilation

TUCSON® SBP-90 BOOSTER PUMP

Electrical Connection

- The electrical connection for the TUCSON® booster pump must be installed correctly by a fully qualified tradesperson.
- Ensure the voltage(V), frequency (Hz), phase (PH) conforms to those marked on the data plate label.
- If there is a surge or drop in voltage by $\pm 10\%$, the motor will stop running to prevent damage to the pump.
- All electrical connections must comply with local building regulations.
- Once power has been connected correctly to the pump and switched on, the automatic pressure control unit will illuminate to show the power supply is working correctly.

Commissioning

Before initial pump start up please ensure the following –

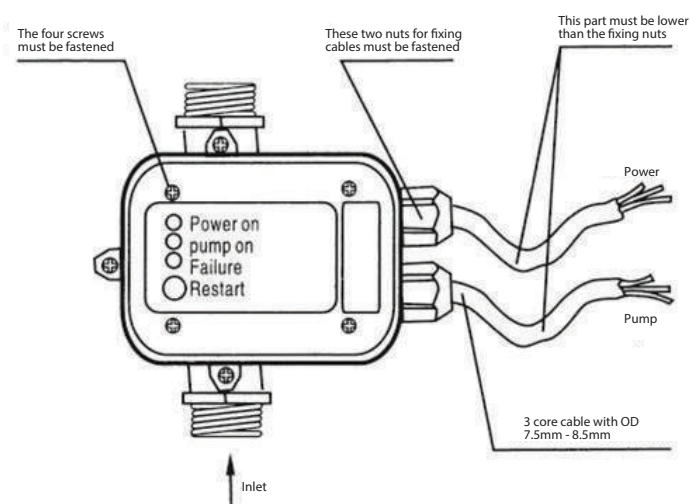
- The pump has been installed correctly and there are no leaks on the plumbing connections.
- The electrical connections have been installed correctly and the correct power is running to the pump when it is switched on and in operation.
- The liquid in the system is clean.
- Ensure both the system and pump is full with water and all air has been removed.
- For stable operation, please mount and bolt the booster pump securely.
- The place of installation must be dry with good ventilation and adequate space for future maintenance and service.
- A proper shelter is required for outdoor installation; exposure to rain will damage the insulation of electrical wiring.
- Be careful not to allow any foreign objects (PVC adhesive gum, dirt, sand etc.) into the pump, otherwise the pump will be damaged and its operating life shortened. It is recommended to use a strainer to prevent that.

TUCSON® AUTOMATIC PRESSURE CONTROL UNIT

Intensity Max	10A
Voltage	220V - 240V
Frequency	50 Hz
Max Working Pressure	10 Bar
Max Working Temperature	60°C
Protection Rating	IP65
Connection	1" Male
Restart Pressure	1.5 Bar



Do not remove the electronic board from the control box. The wiring diagram inside the terminal block shows how to make a correct connection. A wrong connection will destroy the electronic circuit. Cable used for connection must be 3 core with compulsory grounding end. It should have an outer diameter of 7.5mm min and 8.5mm max. One of the leading ends of the cable must be lower than the position of the fixing screws while the cable being connected to the power as shown in the drawing below here.



Starting Up

When the unit is connected to the power supply, the green LED "Power On" lights up and the yellow LED "On" (pump in operation) indicates that the pump has been started. The pump will continue to run while the system fills the pipes and the required pressure is achieved. If the red LED "Failure" lights up, keep the "Restart" button pressed and wait, with a tap opened, until the red LED turns off. When the Restart button is released, and the tap closed off, the unit stops the pump at its maximum pressure.

Functioning

After a successful start-up has been achieved, the unit is programmed to perform all the pump control operations automatically. If an operational breakdown should occur, such as water failure, obstruction of the suction pipe etc., the unit will recognise a breakdown and the red LED "Failure" will light up. Simultaneously, the pump will stop operating to prevent further damage. Rectify the failures that have caused the blockage and restart the system by pressing the 'Restart' button.

TUCSON® AUTOMATIC PRESSURE CONTROL UNIT

Installation Instructions

If the column of water between the pump and the highest tap exceeds 15M, the unit cannot be installed directly on the pump, but it has to be raised until the column of water between the unit and the highest tap does not exceed 15 M. I.E. If column of water is 20M from the pump, the unit must be placed 5M higher than the pump.

The unit is equipped with a check valve to prevent the pipeline from losing pressure.

No taps can be installed between the pump and the control unit.

Pump's Pressure:

The unit is pre-set by the manufacturer at a restarting pressure of 1.5 bar. The pressure produced by the pump must be normally 0.8 bar higher than the pre-set pressure. Before starting the unit check suction and ensure that the pump is primed.

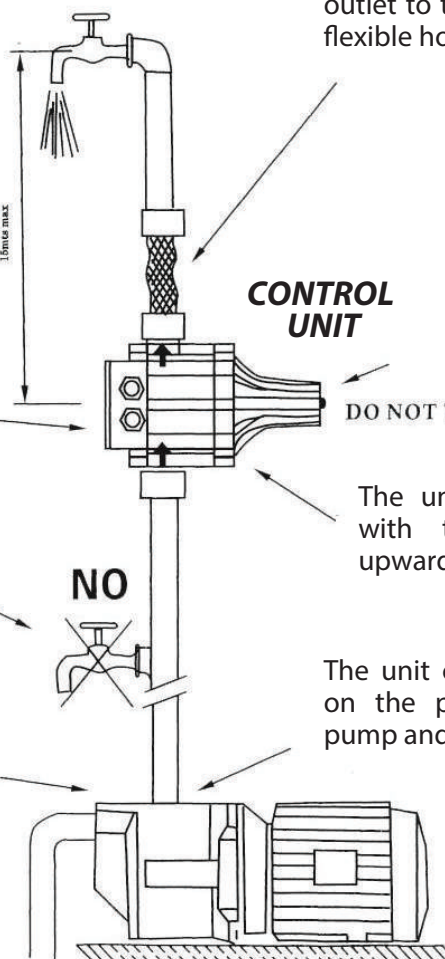
It is advisable to connect the unit outlet to the system by means of a flexible hose.

Safety valve preventing water emission in case diaphragm breaks.

DO NOT TOUCH

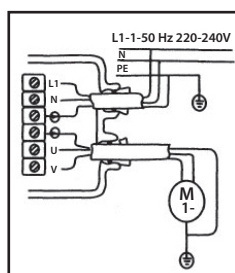
The unit must be installed with the arrows in the upward position.

The unit can be installed directly on the pump, or between the pump and the first tap.



Wiring Diagram

Connect the unit to the pump motor



Connection of single phase 220V pump up to 1.1 Kw.

Fault finding chart



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

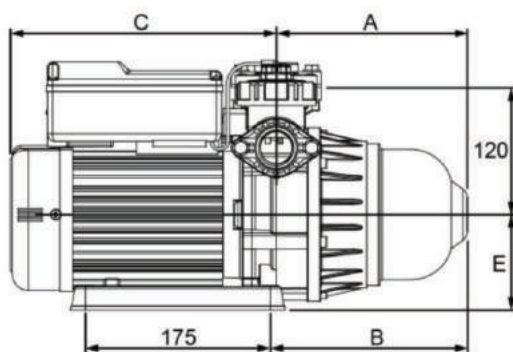
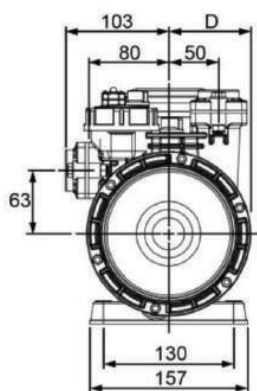
TYPE OF DEFECT	CAUSES DEPENDING ON THE UNIT	CAUSES NOT DEPENDING ON THE UNIT
The pump does not start	The electronic card is broken	Voltage failure Pump jammed Electric cables inverted(Line/Motor)
The pump does not stop	The electric card is broken The flow detector is blocked in the upper position The reset button is blocked The pump does not provide sufficient pressure	Presence of leaks which are higher than the minimum flow 0.6 l/min
Intermittent pump not working	The electronic card is broken The pump does not provide sufficient pressure	Presence of leaks which are higher than the minimum flow 0.6 l/min
The pump is jammed	The electronic card is broken The pump provides a pressure which is lower than the restarting pressure	Water failure

TUCSON® SBP-100 BOOSTER PUMP

Code	771908
Power	1 HP / 750W
Voltage	Single Phase, 220V - 240V
Frequency	50 Hz
Head Rated / Head Max	25M / 32M
Isolation Class	E
Fluid Temperature Working Range	5°C to 40°C
Max Working Pressure	6 Bar
Max Environmental Temperature	40°C
Waterproof Rating	IP44
Pump Weight	11.5KG
Impeller	Noryl
Motor	Air Cooled
Dry Run Protection	Yes
Non-Return Valve	Integrated



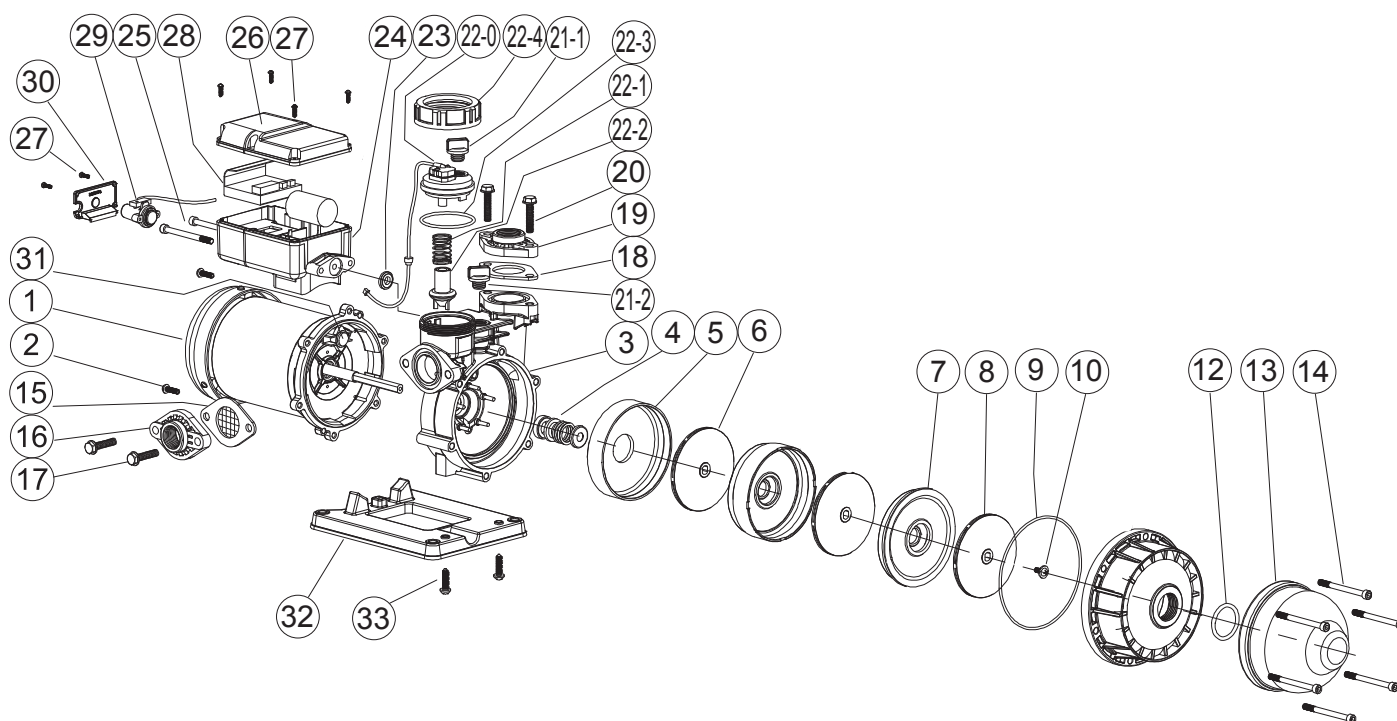
Pump Dimension



A	B	C	D	E
182	188	252	82	90

TUCSON® SBP-100 BOOSTER PUMP

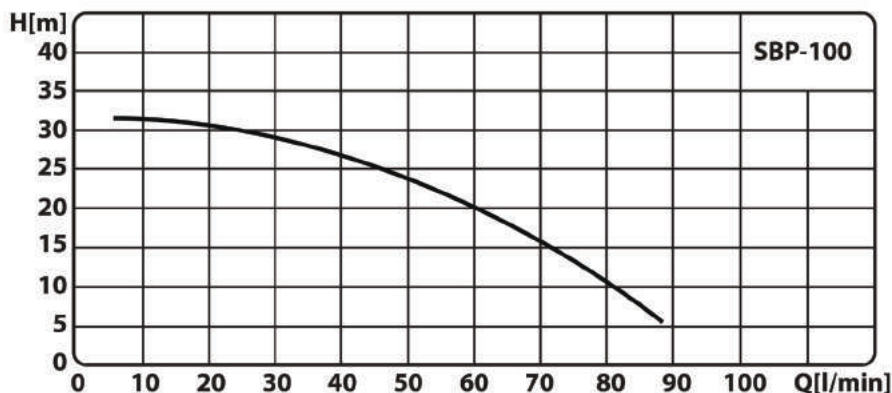
Pump Components



Item	Name	Description	Item	Name	Description	Item	Name	Description
1	Motor	1Φ 2 Poles	15	Inlet Flange Gasket	Rubber	25	Bolt	S45C
2	Bolt	S45C	16	Inlet Flange	NYLON	26	Wiring Box Cover	NYLON
3	Pump Casing	Noryl	17	Flange Bolt	SUS304	27	Bolt	S45C
4	Mechanical Seal	Ceramic+NBR +Carbon	18	Outlet Flange Gasket	Rubber	28	Controller	Triac-Based
5	Impeller Chamber	NORYL	19	Outlet Flange	NYLON	29	Pressure Switch	For Turn-On Pressure Setting
6	Impeller	NORYL	20	Flange Bolt	SUS304	30	Switch Cover	NYLON
7	Diffuser	NORYL	21-1	Priming Plug	NYLON	31	Thermal Protector	Auto Reset
8	Impeller	NORYL	21-2	Air Evacuation Plug	NYLON	32	Pump Base	ABS
9	O Ring	NBR	22-0	Flow Switch Set	Flow Detection	33	Bolt	S45C
10	Bolt	SUS304	22-1	Spring	SUS304			
			22-2	Stopper	NORYL			
			22-3	Seal O Ring	NBR			
12	O Ring	NBR	22-4	Locking Ring	NYLON			
13	Pressure Tank	SUS304	23	Seal Gasket	Rubber			
14	Pump Cover Bolt	SUS304	24	Wiring Box	NYLON			

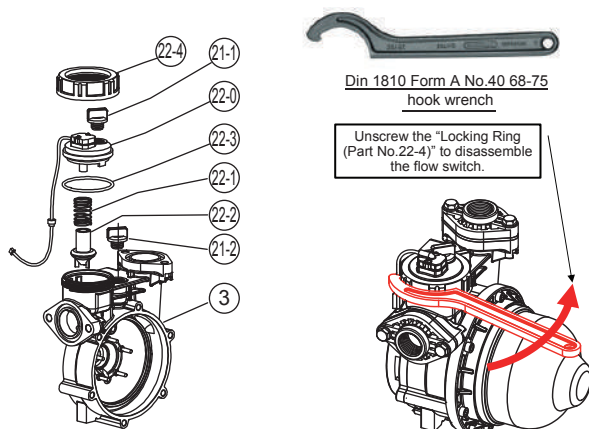
TUCSON® SBP-100 BOOSTER PUMP

Performance Curve



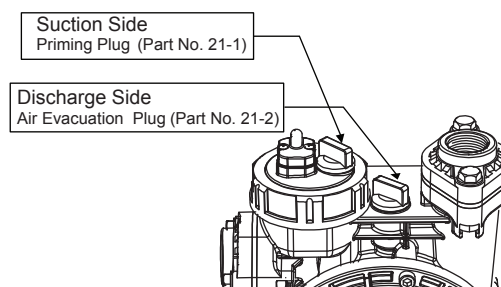
Flow switch disassembly

The flow switch can be disassembled or replaced by using a 'Din 1810 Form A No. 40 68-75 hook wrench' or another similar pipe wrench to unscrew the 'Locking Ring (Part No. 22-4)'



Pump trapped-air evacuation

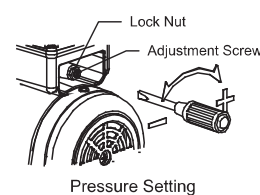
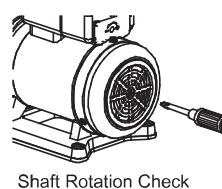
The filling of the suction piping and the pump chamber must be done very carefully to ensure there is no air inside. Trapped-air will cause pump low discharge/pressure, and result in abnormal operation. Trapped-Air evacuation can be accomplished by opening all discharge valves, or unscrewing the discharge side "Priming Plug (Part No. 21-2)" during pump operation.



Pressure switch adjustment

The pressure switch set is designed inside the control box. In general, the pressure has been set by the factory to meet most situations. However, in some special cases when the pump does not operate normally it can be adjusted easily. For pressure adjustment, first remove the switch cover and loosen the lock nut counterclockwise by using a 12mm wrench.

- 1. Motor fails to stop:** The pressure setting may be too high. By using a flat-end screwdriver, turn the screw counterclockwise slowly, until the motor stops; then, turn an extra small rotation, about 5 degrees. Finally, check if the motor can start normally.
- 2. Motor fails to start:** The pressure setting may be too low. By using a flat-end screwdriver turn the screw clockwise slowly until the motor starts, then an extra small rotation about 5 degrees is added. Finally check if the motor can stop normally.
- 3.** After the pressure has been set, screw the lock nut on, and put the cover back.



SBP-100 BOOSTER PUMP

Fault finding chart

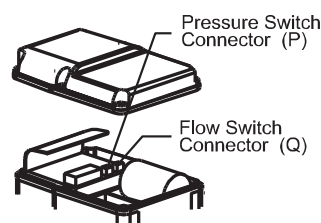


WARNING

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

CAUTION

PLEASE DO NOT ADJUST PRESSURE SWITCH SETTING UNLESS ALL THE TROUBLESHOOTING PROCESSES HAVE BEEN PERFORMED



© PROBLEM – Pumps fail to start when the discharge devices are opened.

Test	Schematic	Status	Causes / Solutions
A-1 <u>Input Voltage Check</u>		Voltage is normal	Go to test "A-2".
		No power	Check the controller power source and circuit breaker.
A-2 <u>Output Voltage Check</u>		Voltage is normal	1: Turn the power off, and check if the motor rotates manually. 2: If the motor or pump casing is overheating, the motor winding or pump casing thermostat might have tripped due to motor overloading or pump dry running. The motor will start running automatically, when the motor winding or pump casing temperature is back to normal.
		No power	Go to test "A-3".
A-3 <u>Short "P" Socket</u>		Motor still fails to start	Replace the controller.
		Motor starts running	1: Make sure the discharge device is fully opened, or discharge piping is not blocked. 2: Lower the pressure switch setting. 3: Replace the pressure switch.

© PROBLEM – Pumps fail to stop after all the discharge appliances are closed.

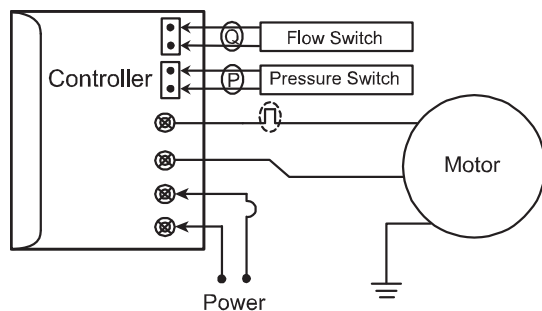
Test	Schematic	Status	Causes / Solutions
B-1 <u>Remove "P" & "Q" Plugs</u>		Motor stops	Go to test "B-2" and "B-3".
		Motor still running	Replace the controller.
B-2 <u>Remove "P" Plug</u>		Motor Stops	The flow switch function is normal.
		Motor still running	1: Check if the flow switch is activated due to leakage of discharge piping or devices. 2: Clean the inlet check valve to ensure the flow switch can go back to normal position. 3: Replace the flow switch.
B-3 <u>Remove "Q" Plug</u>		Motor Stops	The pressure switch function is normal.
		Motor still running	1: Make sure the inlet water source is adequate. 2: Check the suction piping for air-locks or leakage which can result in low pump output pressure. 3: Lower the pressure switch setting. 4: Replace the pressure switch.

© PROBLEM – Pump cycles frequently or is unstable when "Power ON"

Test	Schematic	Status	Causes / Solutions
C-1 <u>Short "Q" Socket</u>		Motor back to normal	1. Avoid small discharge of pipe leakage or any operation which will cause unstable switching of the flow switch from on to off. 2. Recharge pressure tank air up to 1~1.2kg/cm². 3. Replace the flow switch.
		Motor still unstable	Replace the controller.

TUCSON® SBP-100 BOOSTER PUMP

Electrical connection



(a) Single Voltage Model Wiring

- The electrical connection for the TUCSON® booster pump must be installed correctly by a fully qualified tradesperson
- Ensure the voltage(V), frequency (Hz), phase (PH) conforms to those marked on the data plate label.
- If there is a surge or drop in voltage by $\pm 10\%$, the motor will stop running to prevent damage to the pump.
- All electrical connections must comply with local building regulations.

Commissioning

Before initial pump start up please ensure the following –

- The pump has been installed correctly and there are no leaks on the plumbing connections.
- The electrical connections have been installed correctly and the correct power is running to the pump when it is switched on and in operation.
- Ensure both the system and pump is full with water and all air has been removed.
- For stable operation, please mount and bolt the booster pump securely.
- The place of installation must be dry with good ventilation and adequate space for future maintenance and service.
- A proper shelter is required for outdoor installation; exposure to rain will damage the insulation of electrical wiring.
- The pump should be installed as close as possible to the reservoir or well.
- Piping joints should be fitted carefully to prevent leaks.
- A leak in the suction piping will cause the pump to lose suction capacity, while a leak in the discharge piping will cause a high frequency ON/OFF motor operation while the outlets are closed.
- The protective rubber films within the centre of the suction/discharge flange gaskets (Part No. 15 & 18) must be removed during installation.
- Be careful not to allow any foreign objects (PVC adhesive gum, dirt, sand etc.) into the pump, otherwise the pump will be damaged and its operating life shortened. It is recommended to use a strainer to prevent that.
- Check the voltage and wiring of the motor power against the connecting diagram shown above or inside the cover. Be sure to arrange earth or circuit breaker against electric leakage in accordance with local electrical code.

TUCSON® EXPANSION VESSELS



TUCSON® EXPANSION VESSELS

GENERAL INFORMATION

1. Expansion Vessels

We have two main types of Expansion Vessels available dependent on what application you have. Normally you will be able to find a Red Vessel (Heating Vessels) used on a Sealed System Heating application whilst the most common use for our White Vessel (Potable Vessels) would be in a potable application such as an Unvented Water Heater or a Pumped System.

Our range of TUCSON® Potable Expansion Vessels are built from different materials than our range of Heating Expansion Vessels to ensure that the water is contaminant free and safe for human consumption. Expansion Vessels operate on the basis that the internal chamber is separated by a rubber membrane, Inside this membrane sits the water and surrounding this sits a pocket of air. As the water inside the sealed system is heated the water pressure increases due to water being non compressible. The air inside the air chamber of the Expansion Vessel will then become compressed thus leaving the system safe from over pressurisation. As water has the ability to increase by 4.5% in volume when heated from 0-100 DegC an Expansion Vessel is a vital part of any sealed heating system.

Expansion Vessels are commonly used on pumped systems to remove the requirements of a continuous pump. This works as the user will set a low and high pressure on the pump settings, when the water pressure reaches the lowest setting the pump will engage and fill the Expansion Vessel to the high pressure point and stop. Once this cycle has been completed the Expansion Vessel puts the stored water under pressure ensuring higher pressure water. This will continue until the Expansion Vessels pressure drops to the lower point and the pump starts its cycle again.

TUCSON® Expansion Vessels also come with a replaceable WRAS approved membrane.

2. Warranty

TUCSON® Expansion Vessels are sold with a 2 year warranty effective from date of purchase. This warranty covers any manufacturing fault which may cause the vessel to fail and not perform its designed operations correctly.

The warranty is valid on the assumption the following has been applied to the installation:

- Product installed correctly and used as specified in the instructions.
- It has been installed by a fully qualified tradesperson.
- The installation complies with the local building regulations and also any regulations which are relative to expansion vessel installations.

The warranty of the vessel is invalid if any of the following occurs during installation:

- The vessel has been installed to operate for other purposes than what it is designed for.
- The vessel is not installed by a fully qualified tradesperson.
- The vessel has been installed incorrectly or not to the installation instructions.
- The vessel has failed outside of the warranty period.
- The vessel has been damaged by outside interference such as bad workmanship or physical damage.

TUCSON® HEATING EXPANSION VESSELS



CODE	(L) CAPACITY	BAR PRESSURE	(D) DIAMETER	(H) HEIGHT	PRE CHARGE PRESSURE	MIN / MAX OPERATING TEMPERATURE	CONNECTION
710420	8L	8	200mm	330mm	2 bar	-20°C / 100°C	3/4"
710421	12L	8	240mm	360mm	2 bar	-20°C / 100°C	3/4"
710422	19L	8	300mm	365mm	2 bar	-20°C / 100°C	3/4"
710423	24L	8	300mm	430mm	2 bar	-20°C / 100°C	3/4"
710424	36L	10	350mm	450mm	2 bar	-20°C / 100°C	3/4"
710425	50L	10	350mm	610mm	2 bar	-20°C / 100°C	1"
710445	80L	10	425mm	930mm	2 bar	-20°C / 100°C	1"
710450	100L	10	460mm	990mm	2 bar	-20°C / 100°C	1"

Larger sizes available upon request



Flange Material: Galvansied Carbon Steel

Membrane: EPDM – Replaceable, WRAS approved #1504513



TUCSON® POTABLE EXPANSION VESSELS



CODE	(L) CAPACITY	BAR PRESSURE	(D) DIAMETER	(H) HEIGHT	PRE CHARGE PRESSURE	MIN / MAX OPERATING PRESSURE	CONNECTION
710427	8L	8	200mm	330mm	2 bar	-20°C / 100°C	¾"
710428	12L	8	240mm	360mm	2 bar	-20°C / 100°C	¾"
710429	19L	8	300mm	365mm	2 bar	-20°C / 100°C	¾"
710455	24L	8	300mm	430mm	2 bar	-20°C / 100°C	¾"
710456	36L	10	350mm	450mm	2 bar	-20°C / 100°C	¾"
710449	100L	10	460mm	990mm	4 bar	-20°C / 100°C	1"

Larger sizes available upon request

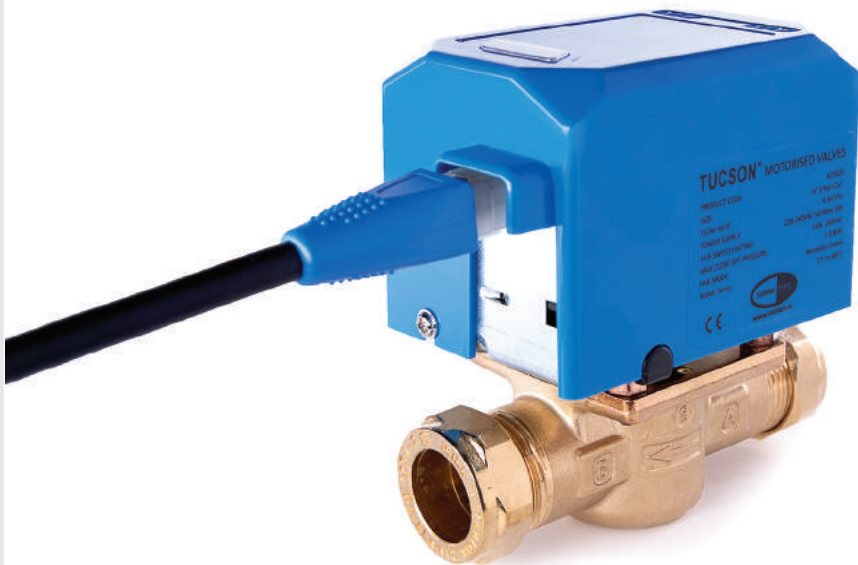


Flange Material: Stainless Steel 304

Membrane: EPDM – Replaceable, WRAS approved #1504513



TUCSON® MOTORISED VALVES



TUCSON® MOTORISED VALVES

GENERAL INFORMATION

1. Motorised Valves

- TUCSON® motorised valves are designed to allow or restrict the flow of water to certain areas or zones based on the system design and demands.
- The valve has 2 pipe connections (ports) and permits or blocks flow between the ports depending on whether it is actuated or not. Flow is permitted and the valve opened when the valve is actuated / powered.
- When the valve is powered a synchronous motor drives the valve to the open position until the motor stalls and reaches the fully open position.
- When the valve is required to close, the power will be switched off to the valve and a spring pulls the mechanism (and the motor) back, returning it to its original, closed, position.
- These valves can also be opened manually for filling or draining of the system along with any maintenance that may need to be carried out.

TUCSON® motorised valves come with the following features –

- Detachable head
- Detachable cable
- LED power light indicator
- CW617N high quality brass body
- NSAI approved INSTANTOR® nuts & olives

2. System Liquid –

These motorised valves are designed to pump the following types of liquids –

Rainwater, potable water or other clean, thin, nonaggressive liquids, not containing solid particles or fibres.

3. Warranty

TUCSON® Motorised valves are sold with a 5 year warranty effective from date of purchase. This warranty covers any manufacturing fault which may cause the pump to fail and not perform its designed operations correctly.

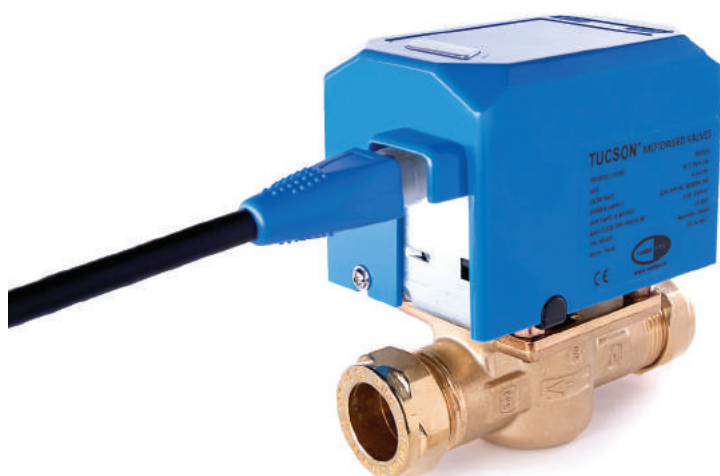
The warranty is valid on the assumption the following has been applied to the installation:

- Product installed correctly and used as specified in the instructions.
- It has been installed by a fully qualified tradesperson.
- The installation complies with the local building regulations and also any regulations which are relative to motorised valves installations.

The warranty of the motorised valves is invalid if any of the following occurs during installation:

- The motorised valve has been installed to operate for other purposes than what it is designed for.
- The motorised valve is not installed by a fully qualified tradesperson.
- The motorised valve has been installed incorrectly or not to the installation instructions.
- The motorised valve has failed outside of the warranty period.
- The motorised valve has been damaged by outside interference such as bad workmanship or physical damage.

TUCSON® MOTORISED VALVES



5 Year Warranty
Detachable Head
Quick Release Power Cable
NSAI Approved Instantor®
Nuts & Olives
Robust & Compact Design

PRODUCT CODE	619124	619126
SIZE	22mm - 2 Port CxC	28mm - 2 Port CxC
CABLE	1 Metre 5 Core	1 Metre 5 Core
FLOW RATE	4.3m ³ /hr	6.8m ³ /hr
POWER SUPPLY	220-240VAC 50/60HZ 5W	220-240VAC 50/60HZ 5W
FUSE/AUX. SWITCH RATING	3.0A 250VAC	3.0A 250VAC
MAX. CLOSE-OFF PRESSURE	1.0 bar	0.6 bar
FAIL MODE	Normally Closed	Normally Closed
WATER TEMP	5°C to 88°C	5°C to 88°C



Replacement Heads Available Separately
Product Code 619130

TUCSON® AUTOMATIC AIR BOTTLE



TUCSON® AUTOMATIC AIR BOTTLE

GENERAL INFORMATION

1. Automatic Air Bottle

- Automatic Air Bottles are used on central heating systems to help keep the system free from any unwanted air which can cause damage to your system.
- Recommended to be installed on the highest point possible of the system, when the water is circulating it will push the air towards the highest point where the valve will exhaust the unwanted air pockets.
- Our TUCSON® air bottles are also supplied with a non return valve which can be installed with the air bottle for easy maintenance if required.

2. Warranty

TUCSON® Automatic Air Bottles are sold with a 2 year warranty effective from date of purchase. This warranty covers any manufacturing fault which may cause the air bottle to fail and not perform its designed operations correctly.

The warranty is valid on the assumption the following has been applied to the installation:

- Product installed correctly and used as specified in the instructions.
- It has been installed by a fully qualified tradesperson.
- The installation complies with the local building regulations and also any regulations which are relative to automatic air bottle installations.

The warranty of the air bottle is invalid if any of the following occurs during installation:

- The air bottle has been installed to operate for other purposes than what it is designed for.
- The air bottle is not installed by a fully qualified tradesperson.
- The air bottle has been installed incorrectly or not to the installation instructions.
- The air bottle has failed outside of the warranty period.
- The air bottle has been damaged by outside interference such as bad workmanship or physical damage.

Code	771141
Max Working Pressure	10 Bar
Min Working Pressure	0.2 Bar
Max Temperature	120°C



Set Up / Maintenance

Turn the black cap anti-clockwise when initially filling the system.

Once filling is complete turn the cap to its original position.

DO NOT remove the cap whilst the system is running.

Inspect the air bottle regularly.

The system must be cold and de-pressurised when maintenance is being carried out.

Remove the air bottle from the non-return valve to avoid system losses when carrying out any maintenance.

INSTANTOR® PRESS SYSTEM



INSTANTOR® PRESS SYSTEM

INSTANTOR® PRESS-FIT FITTINGS

Straights



IP10 Straight Coupler



IP10 Straight Reducer



IP11 Straight Coupler
M.I x Pipe



IP12 Straight Coupler
F.I x Pipe

Tees



IP18 Equal Tee



IP18 Reducing Tee



IP 30 TEE

Elbows



IP15 Elbow



IP16 Elbow



IP17 Elbow
F.I x Pipe



IP19 Wallplate
Elbow

Sundry Fittings



IP51 Stop End



IP20 Nut And Insert To
Copper Compression



Brass Manifolds (With Adaptors)

Brass Manifold



Brass Manifolds With Iso Valves
(And Adaptors)

Tools & Accessories



Pipe Reamer



Pipe Cutter



TH Jaws



Press Gun



REMS Mini Press Gun 14.4V
Battery Complete Set

INSTANTOR® PEX-AL-PEX PIPE



Instantor® Pex-Al-Pex Pipe Coils



Instantor® Pex-Al-Pex Insulated Pipe



MULTILAYER
PIPING SYSTEMS

I.S. EN ISO 21003-1:2008

NSAI Certified



PRODUCTS ALSO INCLUDE....



Immersion Heaters



Compression Fittings



Kitchen & Bathroom Taps



Solder Ring & Endfeed Fittings



Thermostatic Radiator Valve Packs

4000+ Superior Plumbing Products

NOTES

Horizontal lines for notes, overlaid with a large light blue circle and a red triangle pointing right.



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