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ELECRO

OPTIMA PLUS COMPACT AQUATIC HEATER

INSTALLATION & OPERATING MANUAL

USA VERSION 10/2023



PLEASE READ CAREFULLY BEFORE INSTALLING

Incorrect installation will VOID your warranty.

DO NOT DISCARD. KEEP FOR FUTURE REFERENCE

Important Notes!

Thank you for purchasing the Optima Compact inline electric heater. Manufactured in England to the highest standards.

To ensure your new heater will give years of trouble free service **please carefully read the following instructions. Incorrect installation will VOID your warranty.**

Water Quality

The water quality **MUST** be within the following limits.
PH between 6.8 - 8.0
Total alkalinity 80 - 140ppm (parts per million)
Chloride Content MAX: 150 mg/litre
Free Chlorine: 2.0 mg/litre
Total Bromine: Max 4.5 mg/litre
TDS (Total Dissolved Solids) / Calcium hardness 200— 1,000ppm
Optima Compact Plus heaters are suitable for use with salt water.

Water chemistry is complicated if in doubt seek expert advise.

Product Overview

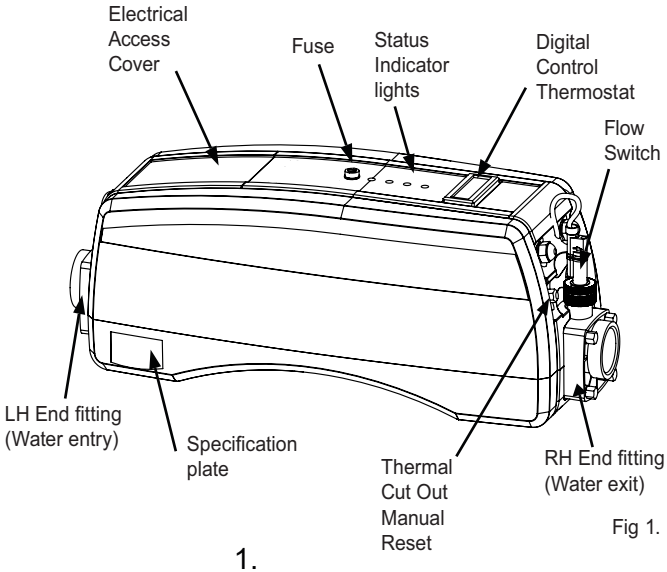


Fig 1.

Positioning

Your heater should be horizontally or vertically mounted allowing sufficient space for pipe connections and wiring.

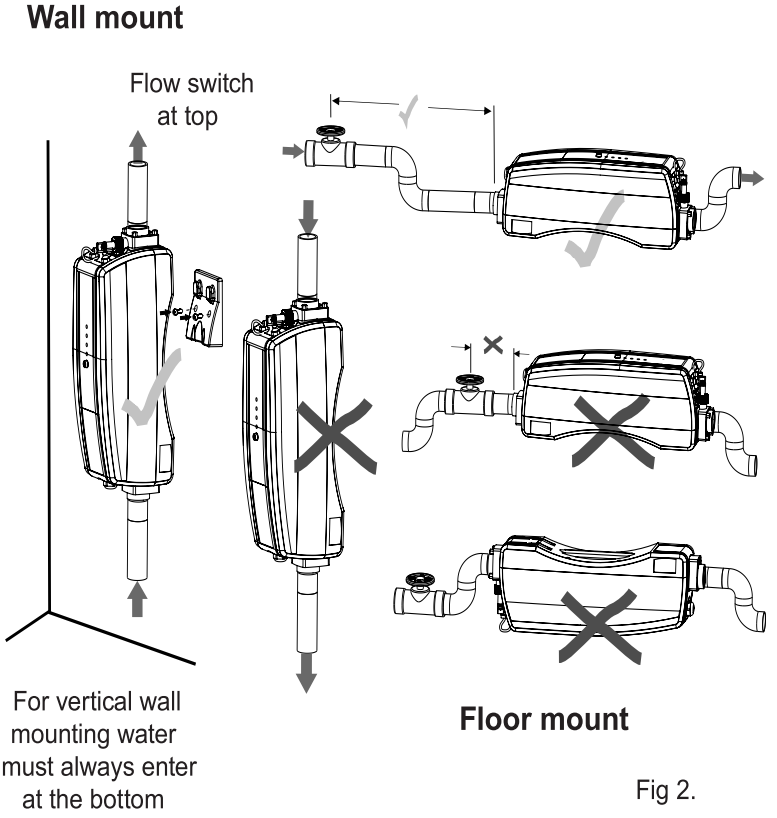


Fig 2.

The heater should be installed downstream of (after) the filter and upstream of (before) any dosing or other water treatment plant (see fig.3).

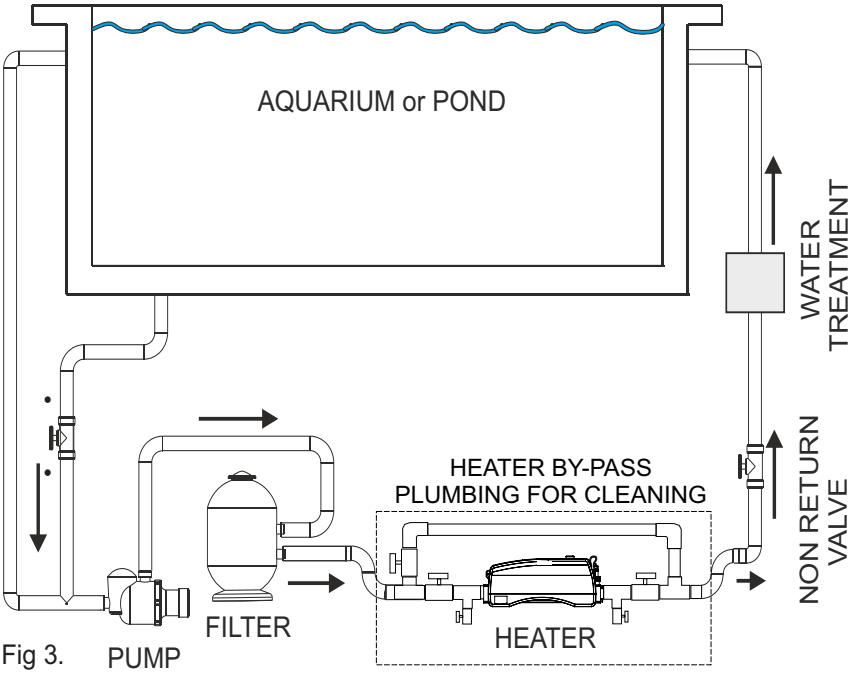


Fig 3.

Pipe Work

It is essential that the pipe size connecting to and from the heater has is minimum of 1¼". To assist correct air purging and ensure the heater remains completely full of water during operation, the water return pipe from the heater back to the aquarium or pond **MUST** incorporate a safety loop or kick-up' in the pipe as close as possible to the heater. (see fig 2.)

Also, it is suggested to add to the heater plumbing a by-pass for ease of cleaning. (see fig 3.) Go to page 10 for maintenance of the heater.

NOTE: When coupling to a flexible pipe a safety loop can simply be created by routing the pipe up and over an obstacle. Remember to use pipe hose clamps to securely fasten all hose connections.

Weather Protection

If located outdoors the heater **MUST** be installed within a dry weather proof enclosure and can not be exposed to the direct weather.

Caution! If the heater is not used during winter months it must be drained to prevent freeze damage.

Electrical Connection

The heater must be installed in accordance with the country / regional requirements and regulations. In any event the work must be carried out by a qualified electrician. For your safety, the heater **MUST** have a dedicated power circuit with a GFIC (Ground Fault Interruption Circuit).

If required your electrician may replace the supplied cable entry gland with a larger size to secure the cable powering to the heater, this will not affect your warranty if carried out by a qualified electrician.

Cable section: This should be calculated by the electrician for the load at the distances required for the heater size.

Remove Access Cover to make the electrical connections (Qualified electricians only)

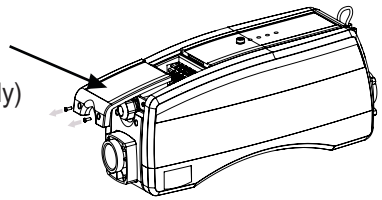


Fig 4.

Power Requirements

All Optima Compact heaters are fitted with their own specification plaque that details the power requirements for the heater. Below is a table of power requirements for standard 230/460V models - if your voltage is not listed please refer to the specification plaque on the product.

220 - 230V 1 Phase Output	Load (Amp)
6-kW	28
8-kW	37
12-kW	55
15-kW	69
18-kW	82

220 - 230V 3 Phase Output	Load (Amp)
6-kW	16
8-kW	22
12-kW	32
15-kW	40
18-kW	48

460 - 480V 3 Phase Output	Load (Amp)
9-kW	12
12-kW	15
17.5-kW	22
19.5-kW	25

Note:
For 208V 1 phase heating output and Amp draw is reduced by approx. 20%
For 240V 1 phase heating output and Amp draw is increase by approx. 10%

Flow Requirements

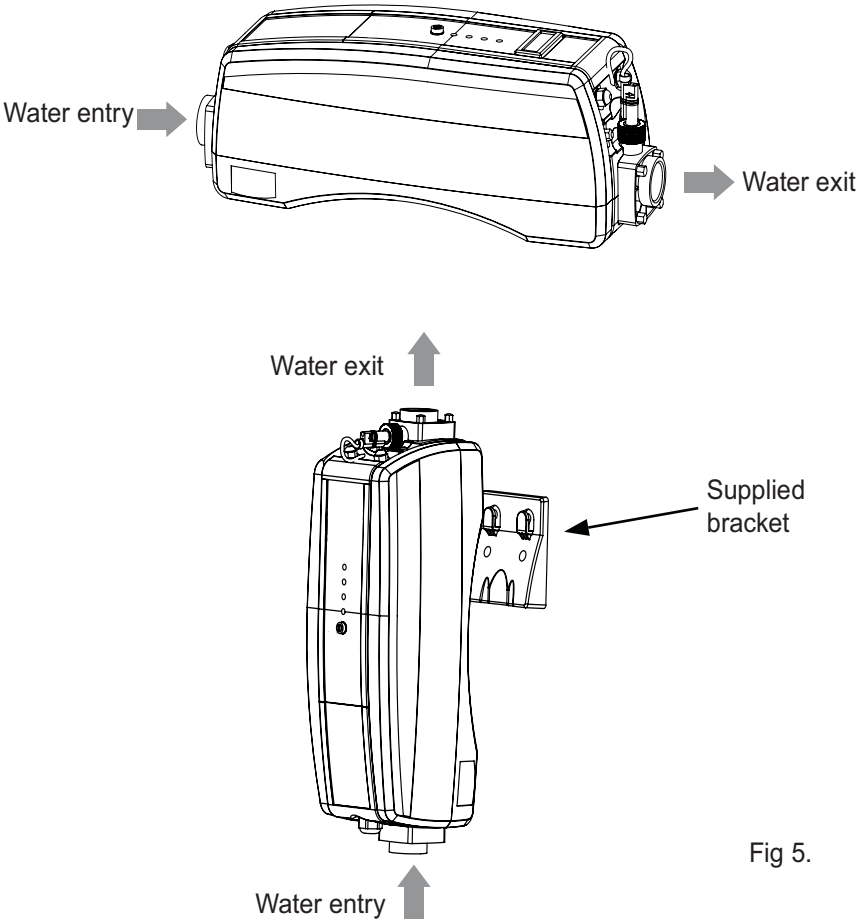


Fig 5.

The flow rate of water into the heater must not exceed 4500 gallons per hour (75 GPM) A higher flow rate will require the installation of a by-pass. The heater will not operate unless the following minimum flow rates are achieved ie:

Minimum 300 gallons per hour (5 GPM) for 6-kW and 8-kW
Minimum 1100 gallons per hour (18 GPM) for 9 thru 24 kW heaters.

Digital Thermostat Instructions

The digital thermostat displays the temperature in ºF

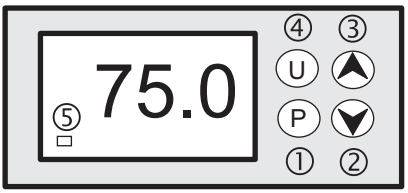


Fig 6.

Item	Description	Function
1	'P' button	To display / modify the required temperature
2	'Down' button	To decrease the value
3	'Up' button	To increase the value
4	'U' button	NOT USED
5	LED-OUT Continuously Illuminated	Indicates that the water temperature has fallen below the required temperature.
	If flashing	Indicates that the unit is in 'Time Delay Mode'

The digital thermostat fitted to your heater has been pre-programmed with all the necessary parameters to ensure reliable service and operation. All you need to do is set the temperature you would like your water to be maintained at, this is known as the required temperature.
To display / modify the required temperature, press and release the P button. The pre-programmed required temperature will be displayed.

Press ▲ (3) to increase or ▼ (2) to decrease the required temperature.

When the correct required temperature is displayed, press and release the P button. The unit will then revert to displaying the current water temperature, but will now control the water temperature, to a maximum of the required temperature.

Time switching delay:
To prevent overheating of the components within the heater caused by frequent 'On' and 'Off' switching (cycling) the digital thermostat has been pre-programmed with a time delay function. This prevents rapid fluctuations in water temperature from switching the heater 'On' and 'Off' more than once in a two minute period. The time delay mode is indicated by the flashing of the Red indicator (5) on the digital thermostat (see fig.6)

Differential:

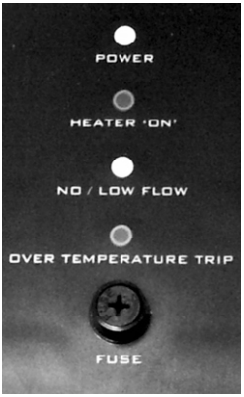
When the water has reached the required temperature the heater will switch off and will not switch back on until the water temperature has dropped by 1˚F. This value is known as the differential and is in place to prevent overheating to the switch components caused by cycling.

Operating Instructions

The heater will only switch 'On' (red heater on light illuminated) when the following criteria are met i.e.:

Water circulating pump is 'On' delivering in excess of the minimum flow rate (see flow requirement information - page 4)

Required temperature is set to a higher value than that of the water (via the digital thermostat - refer to page 5)



Light Indicators	Function
☼ Power	Normal operation
● Heater ☼	Off heating cycle On heating cycle
● NO/ Low Flow ☼	Off in heating cycle Normally ON when in the heating cycle is OFF and if there is no water flow.
● Over Temp Trip ☼	Normal operation Over temperature cutout due to lack of water flow. (See page 8)

Controller Display Calibration

In order to re-calibrate the digital thermostat please follow the below procedure: TLZ and Z31E control.

1.) Turn off the power to the heater.
For the next step you need to be fast to push & hold the 'P' button at the correct time – it may be easier with 2 people depending how far the isolation switch is from the heater.
2.) Turn the Power back on – QUICKLY – Press and hold the 'P' button when the blue light on the controller comes on but before the temperature or “NoFlo” is displayed.
3.) The controller should then show S.LS – Release the 'P' button (If it does not the 'P' button was not pressed quickly enough please go back to step 1)
4.) Use the arrow keys to scroll through the parameters until i.C1 is displayed.
5.) Press and release the 'P' button once – The screen will then show the current calibrations setting which is usually 0.0.
6.) Using the arrow keys scroll the value up or down as required to match the water temperature - i.e. if the water is 2 degrees higher than the heater then you need to scroll up to 2.0 (positive 2) if the water is 2 degrees colder than the heater then you will need to scroll down to -2.0 (negative 2)
7.) When the correct value is displayed press and release the 'P' button so the screen goes back to showing i.C1
8.) Do not press any buttons for approx 30 seconds or until the display has reverted to showing the water temperature again.

The calibration settings will now be permanently stored by the controller - even in the event of a power failure. If further adjustment is still required please follow the same process again with the new required value.

Contact Aqua Logic, Inc. for help.
PH: 858.292.4773 email: info@aqualogicinc.com

HEATER WILL NOT SWITCH TO 'Heater on' (RED LIGHT)

In most cases this will be the result of one of the following points not being met:

Possible cause 1: The required water temperature has been achieved.
Remedy: To confirm increase the required temperature by pressing the 'P' button to show the current required temperature, then use the arrow keys to increase the value above the current water temperature, press the P button again to store the required temperature. The digital thermostat 'OUT' light should then be illuminated to show that the digital thermostat is requesting the heater to switch on (see page 6).

Possible cause 2 : The 'Thermal Safety Cutout' has tripped.
Remedy: Remove the black button cover and press red button to re-set (see fig. 7) If a positive click is felt, the cause of the tripping **MUST** be investigated and could be caused by a debris build-up or air pocket trapped inside the flow tube of the heater.

NOTE: In some cases the thermal safety cut-out tripping and a low flow rate can be linked ie: when a filter becomes choked air can be drawn into the filtration system and become trapped inside the heater so causing the thermostat to trip.

Thermal Safety Cutout

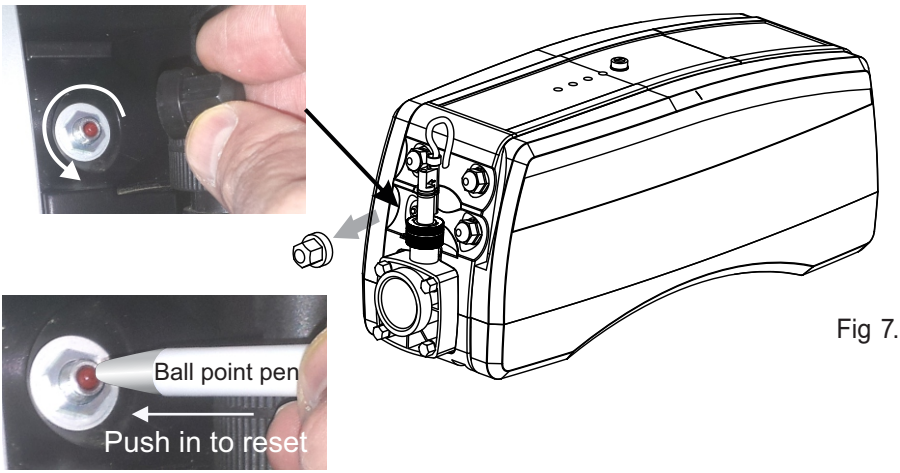


Fig 7.

Possible cause 3: Insufficient water flow.



If the temperature controller indicates a blinking “noF” on the display. This means that there is a low or no water flow. Check pumps and filters.

If using a cartridge filter: Confirm this by running the system with the cartridge removed from your pump & filter unit, this will supply the heater with the maximum flow rate that your unit is capable of. If the heater then switches ’On’ (ie: red light ’On’) a blocked cartridge can be confirmed to be the cause. The cartridge should be cleaned or replaced.

If using a sand filter: Check the pressure indicator on your sand filter and back wash if necessary.

NO LIGHT APPEARS ON THE HEATER WHEN IT IS SWITCHED ’ON’

Possible cause: Power failure external to the heater
Remedy : Check any fuses, GFI or other switch components installed in the supply cable.

Note: The heater is fitted with a 3 Amp glass fuse located on the top control panel assembly (see fig.6).

To check the fuse, carefully hold the fuse holder base and unscrew with phillips #2 screw driver the fuse holder cap. Inspect the fuse to see if it is blown. Replace as needed.

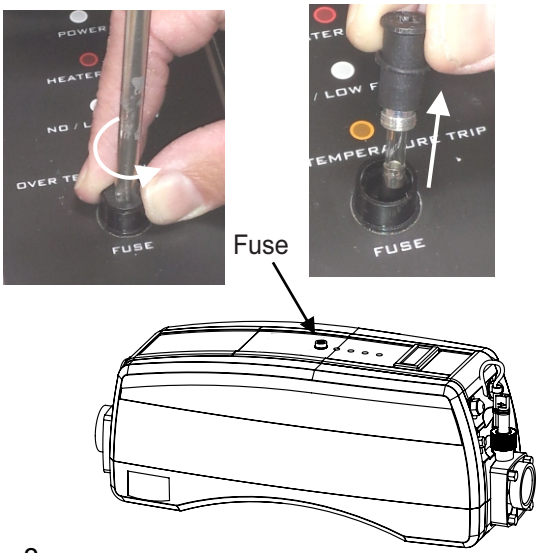


Fig 8.

Maintenance

Very Important

We recommend every three (3) months or as needed inspect and clean the heaters flow tube for debris and or mineral build-up. If NOT inspected on a regular bases this can cause the heater to fail prematurely.

Cleaning procedure for heater installed without by-pass plumbing:
Heater flow tube inspection and cleaning.

- Turn off power to the heater.
- Isolate heater with valves.
- Disconnect unions from heater.
- Use flashlight to inspect the flow tube for build-up of debris or minerals.
- Clean the flow tube and heating elements with large stiff plastic bristle bottle brush.
- Reinstall heater.
- Turn water pump on and check for leaks.
- Turn on the electric power and check for function.

FLUSH CLEANING METHOD
Use by-pass plumbing to circulate bleach or acid solution through heater.

Note: Even with this method the heater tube should be inspected at least every six (6) months for debris and or mineral build-up.

WARNING

When using bleach and acid special care **MUST** be observed.
Always wear hand, eye, and body protection. Use rubber gloves.

DO pour acid or bleach into water.
DO NOT pour water into acid or bleach solution.
DO NOT mix or perform acid and bleach flushing at the same time . the gas generated by the mixture is poisonous and can result in serious injury or death.

To remove organic deposits:

Mix one (1) part bleach to three (3) parts
distilled water in five gallon bucket or larger container. Circulate via pump the solution through the heater for approximately one to two hours.
Drain water and thoroughly flush with freshwater.

To remove mineral deposits:

Use the same steps as above, but use muriatic (pool) acid instead of bleach. Be sure to follow the manufacturer's instructions for use and safety.

Cleaning steps for heater used with by-pass plumbing:

Heater flow tube cleaning. (see fig 10.)

- Turn off power to the heater.
- Isolate heater. Open valve 1 and close valves 2 and 3.
- Open valves 4 and 5 to drain water from the heater.
- Attach hoses to valves 4 and 5.
- Carefully fill 5 gallon bucket 2/3 up with cleaning solution.
- Turn on submersible solution pump. Check for leaks.
- Circulate solution for approximately 30 minutes.
- Turn off solution pump.
- Discard cleaning solution in proper manner.
- Fill bucket with freshwater and rinse heater throughly for 30 minutes.
- Disconnect hoses and close valves 4 and 5.
- Open valves 2 and 3. Close valve 1.
- Turn on power to the heater. Check for function.

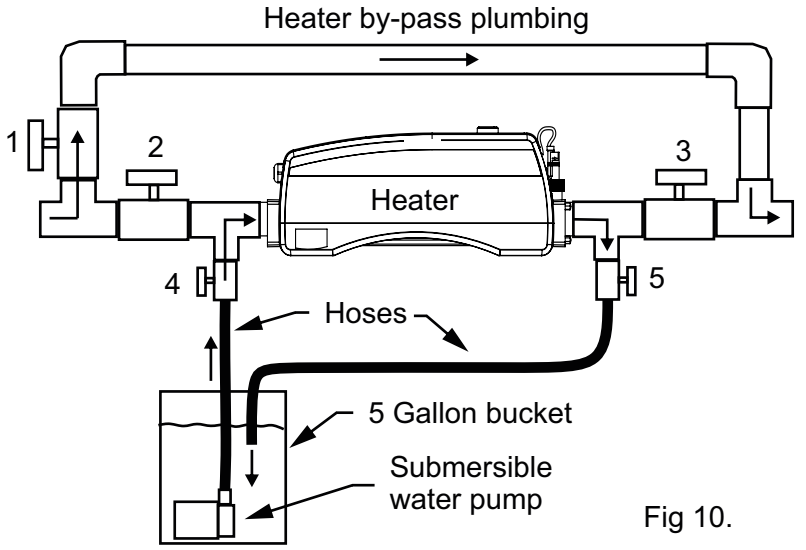
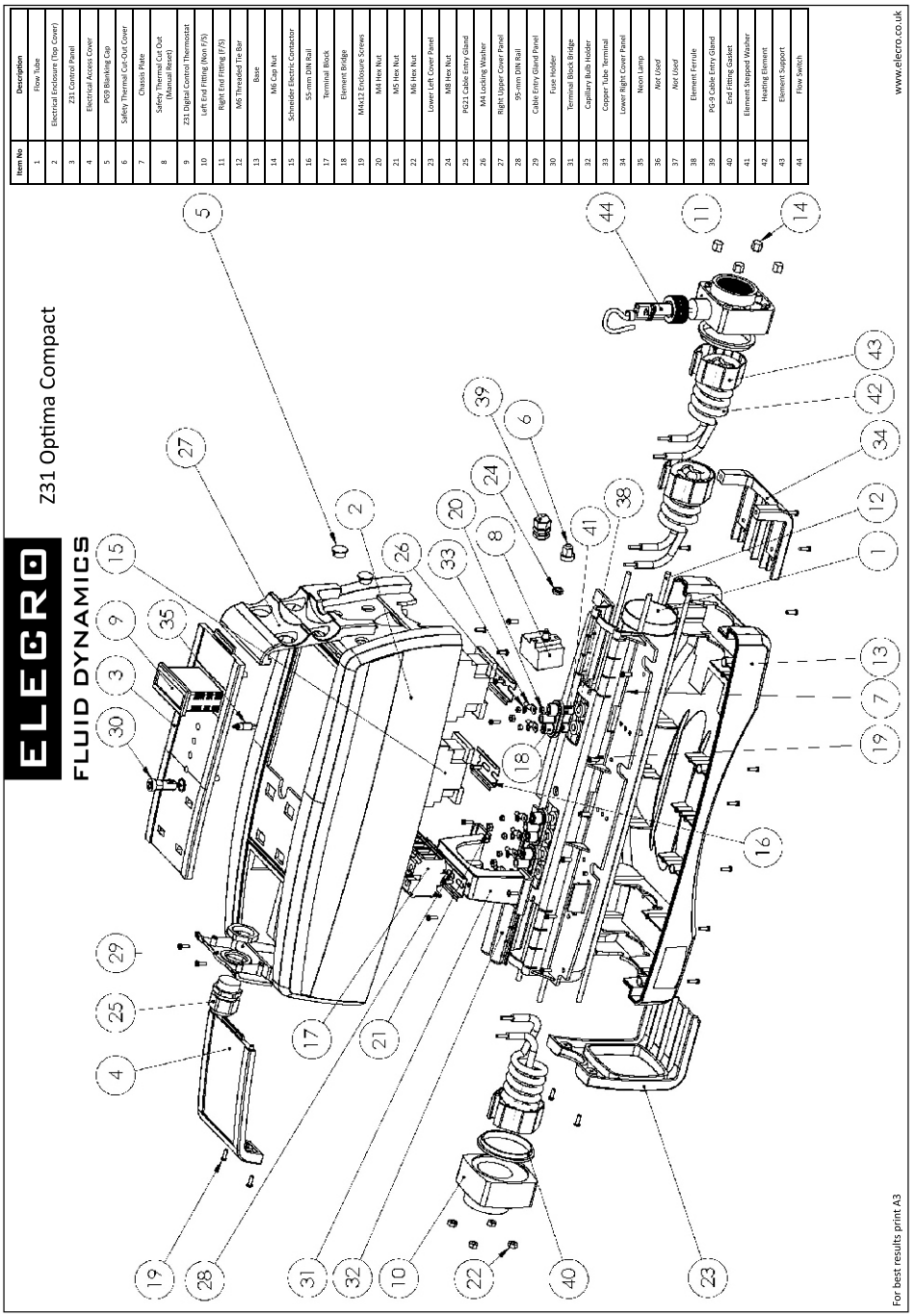


Fig 10.

Replacement Parts List



Item No	Description
1	Flow Tube
2	Electrical Enclosure (Top Cover)
3	Z31 Control Panel
4	Electrical Access Cover
5	PG9 Blanking Cap
6	Safety Thermal Cut-Out Cover
7	Chassis Plate
8	Safety Thermal Cut Out (Manual Reset)
9	Z31 Digital Control Thermostat
10	Left End Fitting (Non ES)
11	Right End Fitting (ES)
12	M6 Threaded Tie Bar
13	Base
14	M6 Cap Nut
15	Schneider Electric Contactor
16	55-mm DIN Rail
17	Terminal Block
18	Element Bridge
19	M4x12 Enclosure Screws
20	M4 Hex Nut
21	M5 Hex Nut
22	M6 Hex Nut
23	Lower Left Cover Panel
24	M8 Hex Nut
25	PG21 Cable Entry Gland
26	M4 Locking Washer
27	Right Upper Cover Panel
28	95-mm DIN Rail
29	Cable Entry Gland Panel
30	Fuse Holder
31	Terminal Block Bridge
32	Capillary Bulb Holder
33	Copper Tube Terminal
34	Lower Right Cover Panel
35	Neon Lamp
36	*Not Used*
37	*Not Used*
38	Element Ferrule
39	PG-9 Cable Entry Gland
40	End Fitting Gasket
41	Element Stepped Washer
42	Heating Element
43	Element Support
44	Flow Switch

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