

APPLICATION

The HF range of screwed immersion heaters is intended to heat light to medium oils and caustic solutions. Depending on the chemical properties, the HF range may be specified to heat other liquids. The range is specifically designed to allow the element to be withdrawn from the heater without removing the heater from the vessel. This is particularly advantageous where it is not practical to drain the vessel in order to inspect or replace the element. The heaters are suitable for horizontal mounting only unless specifically stated otherwise. To avoid localised boiling or over heating, care should be taken to ensure that the cold zone extends beyond any neck piece. Please check that the heater is suitable for your application. Refer to the supplied Data Sheet for the detailed construction, specification and wiring of the heater.

CONSTRUCTION

The element tube and thermostat pockets are welded into the flange. The removable element is constructed from high grade resistance wire wound inside ceramic formers. The flange comes complete with a fibre gasket. The terminal enclosure is stove enamelled cast aluminium and is rated to 'IP66' with two conduit entries (M20 & M25).

INSTALLATION

MECHANICAL INSTALLATION INSTRUCTIONS

- The heater will only heat the contents of the vessel above the immersion heater.
- The heater is supplied with a gasket, ready to be screwed to the appropriate flange on the vessel. It is not recommended that sealing compounds are used as they can harden and make sealing of a replacement immersion heater difficult.
- The heater, once installed, should have the thermostats, where possible, positioned above the elements.
- Heaters with immersed lengths of 1200mm and longer should be provided with an internal tank support.
- After fitting the heater into the vessel, the system should be filled with water and a check made for leaks around the joint. The Vessel should be filled according to your standard procedure ensuring that all air pockets are purged from the system. **It is important that the element is immersed at all times during operation.**
- Control thermostats should be set to suit site requirements. The Control thermostat is provided to regulate the temperature to the desired setting.
- The over-temperature manual reset cut-out thermostat, if fitted, is factory set and sealed.
- If any cleaning or sterilising solutions are to be 'flushed' through the system prior to commissioning, a check should be made to ensure that the solution will not damage the heater.
- Should the vessel be drained at any time and the heater removed, this installation procedure must be repeated before proceeding to switch the heater on.

Warning : Do not cover the heater terminal enclosure.

ELECTRICAL INSTALLATION INSTRUCTIONS

All electrical wiring must be carried out by a qualified person and must comply with the current I.E.E Regulations to B.S.7671.

We recommend that the insulation of the each circuit within the heater is checked prior to installation. The minimum insulation reading between live and earth should not fall below 1M Ω . Refer to the procedure in the Operational Faults section of this leaflet if the insulation is below 1M Ω .

- A terminal layout drawing is supplied on the Data Sheet to use as a guide when wiring the heater.
- Prepare the cables and fit the ring terminals and ferrules provided.
- Do not use an element to thermostat link wire unless the heater load is single phase and draws less than 16 Amps (3.8kW at 240V).
- The immersion heater **must** be connected to fixed wiring.
- Check all electrical connections to ensure that they are tight.
- After all electrical connections have been made replace the heater terminal enclosure.
- Immersion heaters are designed to operate **ONLY** when the heating elements are totally immersed and **must not** be switched on when the heating elements are exposed to air.

WARNING : THIS APPLIANCE MUST BE EARTHED.

OPERATIONAL FAULTS

Always isolate the electrical power at the mains switch before removing the terminal enclosure.

HEATER NOT OPERATING

Check :

- a) The control thermostat has been set correctly. To avoid nuisance tripping, the over-temperature thermostat should be set at least 15°C higher than the control thermostat.
- b) The over temperature thermostat for a trip. If the over-temperature thermostat has tripped, investigate and rectify the cause of the trip. Reset the over temperature thermostat by pressing the small button on the face of the thermostat.
- c) Main fuses. If the main fuses have tripped, check the element for a short circuit.
- d) Main Electrical Supply.
- e) Control Thermostat for failure in 'open' position.
- f) Wiring to heater (No loose connections).
- g) Element continuity (resistance) - if faulty, order a replacement heater (See spare parts section).

LOW ELEMENT INSULATION

Storage conditions after despatch are not always ideal. In particular, if there is a long delay between purchase and commissioning, there may be some degree of water ingress into the element. To avoid damage to your immersion heater, immersion heaters fitted with removable core elements should not be operated if the insulation resistance is below 1M Ω . The following rectification actions can be taken:

- The removable core element should be removed from the heater and dried in an oven set at a temperature of 75°C for 12 hours. The element should be re-installed into the heater, and re-tested to verify that the insulation resistance is above 1M Ω , before proceeding to switch the heater on.
- Alternatively, if a suitable oven is not available, the heater can be returned to H.D. Howden for drying out.
- To maintain the insulation during periods of low use it is advisable to switch the heater on, while fully immersed, approximately once a month for 48 hours.

When brought into operation, the element will naturally improve in insulation as the element heats up and dries out. Where the insulation readings are above 1M Ω but still within a low range, as the heater operates insulation readings will improve and no action needs to be taken.

SPARE PARTS & REPLACEMENTS

All spare parts should be ordered from H.D. Howden Ltd quoting the heater list number and serial number.

SPARE PARTS LIST

- Removable core heating element
- Control Thermostat
- Flange Gasket
- Over-temperature Cut-out Thermostat (If fitted)

GUARANTEE

The manufacturer will make good, by repair or at his option by the supply of a replacement, defects which, after proper product selection and installation, appear in the goods, within a period of twelve calendar months after the goods have been delivered and arise solely from faulty design, materials or workmanship. Provided always that defective parts are promptly returned by the user free to the manufacturer's works, unless otherwise arranged, the repaired or new parts will be repaired or new parts will be delivered by the manufacturer free of charge.

The policy of H.D. Howden Ltd is that of continuous improvement and development, the right is therefore reserved to change specifications without notice.

If you are in any way dissatisfied with this product please call sales on ++44 (0)1698 573 100 or email quality@howden-electric.com.

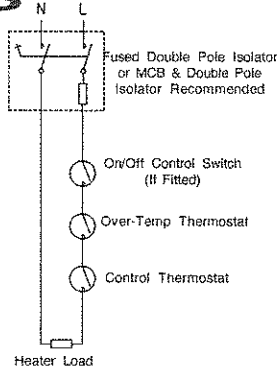
HF RANGE DATA SHEET

This data sheet applies to the 'HF' range of immersion heaters. The data sheet shows the heater terminal layout, a suggested wiring layout for the heater and also gives the detailed specification of the heater. All electrical wiring must be carried out by a qualified person and must comply with the current I.E.E. Regulations to B.S.7671.

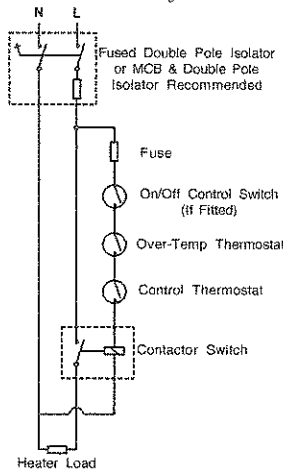
Appropriate control panels and contactors can be supplied. Contact sales for more information (see contact details below).

WARNING: THIS APPLIANCE MUST BE EARTHED

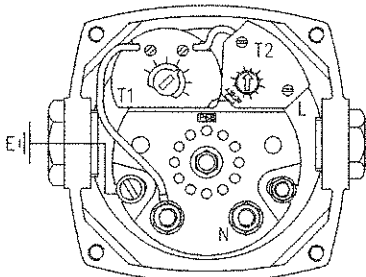
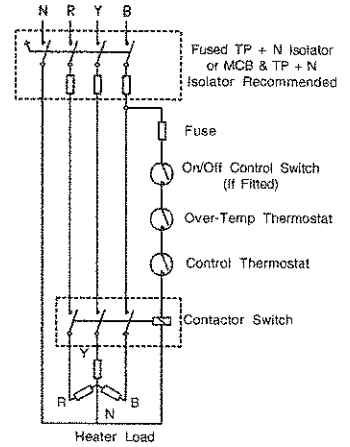
Suggested Wiring Layout
Where the mains incoming supply is single phase and the heater draws less than 16 Amps (3.8kW at 240V) per circuit a contactor switch is not required



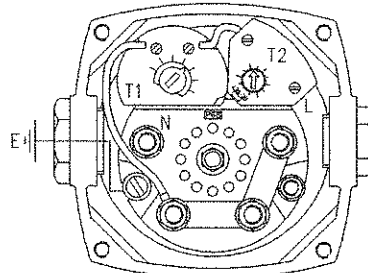
Suggested Wiring Layout
Where the mains incoming supply is single phase and the heater draws more than 16 Amps (3.8kW at 240V) per circuit a contactor switch is required, suitable for the rating of the circuit.



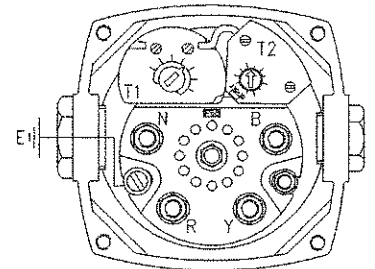
Suggested Wiring Layout
Where the mains incoming supply is three phase a contactor switch is required suitable for the rating of the circuit.



Single Phase Terminal Layout
With Two Thermostats



Single Phase Terminal Layout
With Two Thermostats



Three Phase Terminal Layout
With Two Thermostats

For heaters drawing more than 16 Amps (3.8kW at 240V) the element to thermostat link wire should be removed and the heater wired through a contactor.
See suggested wiring layout above

If the heater is wired for 1 or 3 phase remove the copper busbars and element to thermostat link wire for 3 phase.
See suggested wiring layout above

TECHNICAL SPECIFICATION

COMMON SPECIFICATION

Number of Circuits: One
Flange Size: B.S.4504 PN16 - 80mm bore
Element Fixing: Removable Element
Cold Zone: 40mm
Watts Density Rating: 1.5 Watts/cm²
Control Thermostat Type (T1): VK Control Range 0-40°C
Over Temp Thermostat Type (T2): . VKL Control Range 45-95°C
Terminal Cover: IP66 Painted Cast Aluminium
Max. Operating Temperature: 90°C
Max. Operating Pressure: 16 Bar

VARIABLE SPECIFICATION

LIST No. CARBON STEEL CONSTRUCTION	LIST No. STAINLESS STEEL CONSTRUCTION	kW LOAD @240/415V	PHASE	IMMERSED LENGTH mm(in)
HF101	HF201	1	1	480 (19")
HF102	HF202	1.5	1	685 (27")
HF103	HF203	2	1	890 (35")
HF104	HF204	3	1 or 3	1295 (51")
HF105	HF205	4.5	1 or 3	1950 (77")

Howden Electro Heating

Sunvic VKL2000 Product Selection, Installation & Operating Instructions

PRODUCT STANDARDS AND PRODUCT OPERATION

The Sunvic VKL2000 range of products are BEAB approved to the British and European control standard for thermostats, EN60730-2-9. When correctly installed in the correct Howden product the installation will also comply with the British and European Standard for domestic immersion heaters, EN60335-2-73. EN60335-2-73 requires that an immersion heater is fitted with an over-temperature protection device which will switch off the supply to the heating element should a fault occur with the control function and thereby prevent the cylinder from boiling.

The Sunvic VKL2000 range consists of two types of thermostat. The first type is a standard control thermostat which maintains the water at a desired temperature. The second type is a manual reset thermostat. This thermostat is fitted with a button that allows the thermostat to be reset. The contacts on the thermostat open once the set temperature is reached. To close the contacts the reset button must be pressed. On certain Howden products this thermostat is used as an over-temperature protection device. This type of product requires that a standard control thermostat is fitted to the heater and the reset thermostat is set higher than the control thermostat. Should the control thermostat fail in the 'ON' position then the over-temperature protection thermostat will trip and cut off the electrical supply to the heating element. The heating element can not be switched on until the over temperature protection thermostat is reset.

PRODUCT SUITABILITY

Before purchasing and installing this thermostat, please check that this thermostat is suitable for your application. Please refer to the table advising the type of thermostat and check the following points:

- The Sunvic VKL2000 range of thermostat is suitable only for domestic immersion heater installations consuming not more than 16 Amps. (In some industrial applications the VKL2000 reset models may be connected in a control circuit.)
- Sunvic VKL2000 control thermostats must not be used to operate the coil of a relay or contractor.
- Sunvic VKL2000 control thermostats are **only** suitable for installation into domestic immersion heaters that incorporate an over-temperature protection trip. This trip **must** be wired in series with the control thermostat. Please refer to the table that lists Howden products that are suitable for the Sunvic VKL2000 range. Do **not** install a VKL2000 thermostat in any Howden domestic immersion heater that does not appear in the list. Please read the Warning very carefully.
- All models of the Sunvic VKL2000 range are suitable for horizontal and vertical mounting.

RECOMMENDED TEMPERATURE SETTINGS

- The Sunvic VKL2000 range of thermostat will heat to relatively high temperature levels and may be used for thermal store applications. Please set the control thermostat temperature setting suitable for your application.

Minimum storage temperature to prevent legionella	60°C
Scald temperature of water on instantaneous contact	66°C
Recommended safe delivery temperature of water	43°C

It is recommended that a thermostatic mixer valve is used to supply water for bathing or showering purposes. If no mixer valve is installed always run the cold water first and add hot water to bring the contents of a bath to the desired temperature. Never run the hot first. Failure to follow this recommendation has resulted in serious and life threatening injuries. Babies, children, the elderly and infirm are particularly vulnerable.
- A temperature differential is required between the control thermostat and over temperature protection thermostat to prevent nuisance tripping. The recommended settings for manual reset, over-temperature protection thermostats is as follows:
 - 15°C above the control thermostat for a horizontal mounted heater.
 - 20°C above the control thermostat for a vertical mounted heater.

Note: 1) In an unvented installation the maximum setting must **not** exceed 80°C.

2) For heaters with a load greater than 3kW the differential settings may require to be increased.

Howden Electro Heating

Sunvic VKL2000 Product Selection, Installation & Operating Instructions

INSTALLATION INSTRUCTIONS

- It is recommended that installation is carried out by a qualified electrician.
- Check the suitability of the product. Refer to the section on Product Suitability.
- Isolate the electricity supply to the immersion heater, remove the immersion heater cap and check with a test instrument to ensure that there is no voltage present.
- Disconnect and remove the existing thermostat. Ensure that the correct thermostat is removed i.e. control or over-temperature.
- Install and connect the new thermostat. Ensure that the connections are tight.
- Replace the immersion heater cap and restore the electrical supply to the immersion heater.

WARNING

- The VKL2000 range of thermostat is only to be installed by a qualified electrician or person with equivalent qualifications.
- A VKL2000 control thermostat must **only** be installed in an immersion heater that is fitted with a **separate over-temperature** protection device and this device must be wired in **series** with the VKL2000 control thermostat. Failure to observe this guidance may result in **criminal** and / or **civil** prosecution.

OPERATING INSTRUCTIONS

- Should the temperature require adjusted, isolate the electrical supply to the immersion heater and remove the immersion heater cap. Adjust the thermostat with a small screw driver. Replace the immersion heater cap and restore the electrical supply to the immersion heater.
- Should the immersion heater fail to heat, check if the over-temperature protection on the thermostat has tripped. Isolate the electrical supply to the immersion heater before removing the cap and check with a test instrument to ensure that there is no voltage present. The over-temperature protection thermostat has tripped if the button above the temperature dial is fully protruding. Check if the control thermostat has failed in the 'ON' position by checking for continuity across the thermostat connections after the cylinder has cooled. Replace the control thermostat if necessary. Otherwise identify and correct the reason for the trip. The over-temperature thermostat is reset by pressing the button. If in doubt seek the advice of a qualified electrician or person with equivalent qualifications. Replace the immersion heater cap and restore the electrical supply to the immersion heater.

Howden List No.	Sunvic List No.	Length (in)	Temperature Range (oC)	Type
TH101	VKL2201	7	40 - 80	Control
TH102	VKL2301	11	50 - 80	Control
TH114	VKL2303	11	25 - 65	Control
TH103	VKL2401	18	50 - 80	Control
TH104	VKL2251	7	45 - 85	Reset
TH105	VKL2352	11	45 - 95*	Reset

* Supplied pre-set to 90°C and sealed with a "FACTORY SET" label.