



Installer manual

TITANIUM MEGACOIL/MEGACOIL-SOLAR

Air Source Heat Pump Domestic Hot Water Cylinders





Declaration of conformity

declare under our sole responsibility that the product

- Titanium Megacoil Solar 200L, 300L
 - Titanium Megacoil 160L, 200L, 300L
-

to which this declaration relates is in conformity with requirements of the following directives

EC directive on:

Electromagnetic Compatibility (EMC): 50366:2003 + A1:2006

Low Voltage Directive (LVD): 2006/95/EC

Restriction of Hazardous Substances (RoHS II): 2011/65/EU

Pressure Equipment (PE): 97/23/EF

The conformity was checked in accordance with the following EN-standards

Test standard:

IEC 60335-2-21: 2002 (Fifth Edition) (incl. Corr.1: 2007) + A1: 2004 + A2: 2008 used in conjunction with IEC 60335-1: 2001 (Fourth ed.) (incl. Corr.1: 2002) + A1: 2004 + A2: 2006 (incl. Corr. 1: 2006) and/or EN 60335-2-21: 2003 + A1: 2005 + A2: 2008 used in conjunction with EN 60335-1: 2002 + A11: 2004 + A1: 2004 + A12: 2006 + A2: 2006 + A13: 2008 and EN 50366: 2003 + A1: 2006
EN 12897:2006

Safety std:

- EN 60335-2-21:2003 +A1:2005 + A2:2008 in conjunction with EN 60335-1:2002 + A11:2004 + A1:2004 + A12:2006 + A2:2006 + A13:2008

EMF std:

- EN 50366:2003 + A1:2006

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1 Important information

Safety information

This manual describes installation and service procedures for implementation by specialists.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

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Symbols



NOTE

This symbol indicates danger to water heater or person.



Caution

This symbol indicates important information about what you should observe when maintaining your installation.



TIP

This symbol indicates tips on how to facilitate using the product.

Serial number

The serial number can be found next to the front cover.



Caution

Always give the product's serial number when reporting a fault.

Country specific information

Installer manual

This installer manual must be left with the customer.

Great Britain

This installation is subject to building regulation approval, notify the local Authority of intention to install. Use only manufacturer's recommended replacement parts.



Benchmark places responsibilities on both manufacturers and installers. The purpose is to ensure that customers are provided with the correct equipment for their needs, that it is installed, commissioned and serviced in accordance with the manufacturers instructions by competent persons and that it meets the requirements of the appropriate Building Regulations. The Benchmark Checklist can be used to demonstrate compliance with Building Regulations and should be provided to the customer for future reference.

Installers are required to carry out the installation, commissioning and servicing work in accordance with the Benchmark Code of practice which is available from the Heating and Hotwater Industry Council who manage and promote the Scheme. Visit www.centralheating.co.uk for information.

Warranty

Thank you for installing a new NIBE Megacoil. NIBE Megacoils are manufactured to the highest standard so NIBE are pleased to offer a comprehensive guarantee. The product is guaranteed for 24 months for parts and labour from the date of commissioning. The inner stainless steel vessel is guaranteed against material defect or manufacturing faults for a period of 25 years. The installer must complete and return the guarantee registration card, or completes the guarantee form on the NIBE website www.nibe.co.uk within 28 days from commissioning to activate this warranty.

The warranty is valid provided that:

The NIBE Megacoil has been correctly installed in accordance with our printed installation manual by a competent person and all relevant Codes, Best Practice and Regulations in existence at the time of installation have been adhered to.

Any disinfection of the cylinder has been carried out in accordance with BS6700.

The product has only been used for the storage of wholesome water (max.250mg/l chloride at 65° C).

The installer has fully completed the Benchmark Checklist at the end of the Installation Manual supplied with the product.

The product is serviced annually by a competent person and the relevant Service Record on the Benchmark Checklist completed after each service. The completed Benchmark Checklist & Service Record may be required in the event of a warranty claim and as supporting documentation invoices relating to servicing may also be required.

The unit is registered within 28 days of commissioning via the guarantee form on the NIBE website www.nibe.co.uk or by completing the enclosed warranty card supplied with the product. Failure to do so may result in a reduced or invalid warranty period.

No factory fitted parts have been removed for unauthorised repair or replacement. The unit has not been damaged by frost and/or freezing pipe work connected to the unit.

This guarantee does not confer any rights other than those expressly set out above and does not cover any claims for consequential loss or damage. This guarantee is offered as an extra benefit and does not affect your statutory rights as a consumer.

Please ensure that the installer has fully completed the Benchmark Checklist in the end of the Installation Instructions supplied with the product and that you have signed to say that you have received a full and clear explanation of its operation. The installer is legally required to complete a commissioning checklist as a means of complying with the appropriate Building Regulations (England and Wales).

All installations must be notified to Local Area Building Control either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer who should, on receipt, write the Notification Number on the Benchmark Checklist.

This product should be serviced regularly to optimise its safety, efficiency and performance. The service engineer should complete the relevant Service Record on the Benchmark Checklist after each service.

The Benchmark Checklist may be required in the event of any warranty work and as supporting documentation relating to home improvements in the optional documents section of the Home Information Pack.



Inspection of the installation

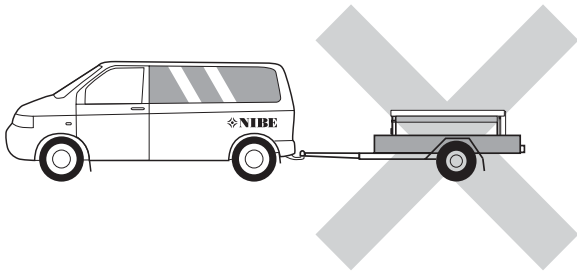
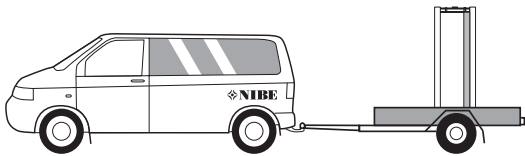
Current regulations require the heating installation to be inspected before it is commissioned. The inspection must be carried out by a suitably qualified person.

✓	Description	Notes	Signature	Date
Hot water (page 14)				
	Shut offvalves			
	Expansion vessel			
	T&P valve			
	Tundish			
Cold water (page 13 and 14)				
	Shut offvalves			
	Non-return valve			
	Mixing valve			
	Safety valve			
	Tundish			
Electricity (page 16)				
	Hot water sensor			
	Temperature limiter			
Miscellaneous				
	Benchmark checklist			

2 Delivery and handling

Transport

The Titanium Megacoil/Megacoil-Solar should be transported and stored vertically in a dry place.



Assembly

- The water heater is only designed for upright installation.
- Position the water heater on a firm base that can bear its weight, preferably on a concrete floor or foundation. Use the water heater's adjustable feet to obtain a horizontal and stable set-up.
- Pipes must be routed from the safety valve to a suitable drain.
- The water heater's installation area should always have a temperature of at least 10 °C and max 30 °C.
- Remember to rotate the cylinder in a direction that allows easy access to the immersion heater and the electrical box.

Supplied components

Titanium Megacoil/Megacoil-Solar



Elbow and drain cock - cold inlet



Tundish



Armoured hose (expansion vessel)



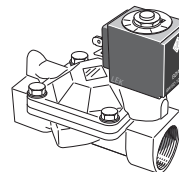
Expansion vessel with holder



Motorized valve (solar coil only)



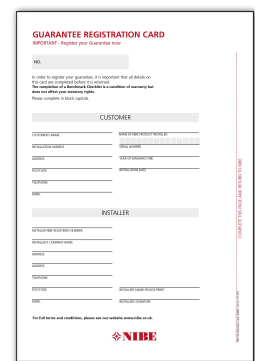
Cold water inlet combination Pressure reduction valve, check valve and expansion relief valve



Solenoid valve (Megacoil Only)



Installer manual



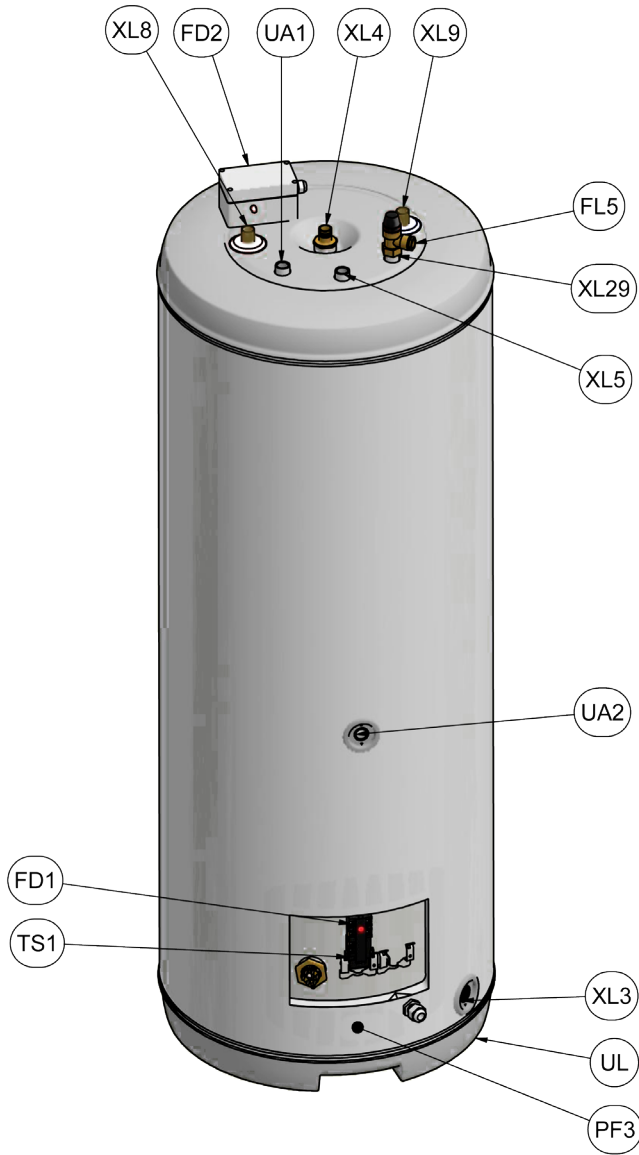
Warranty Card

Location

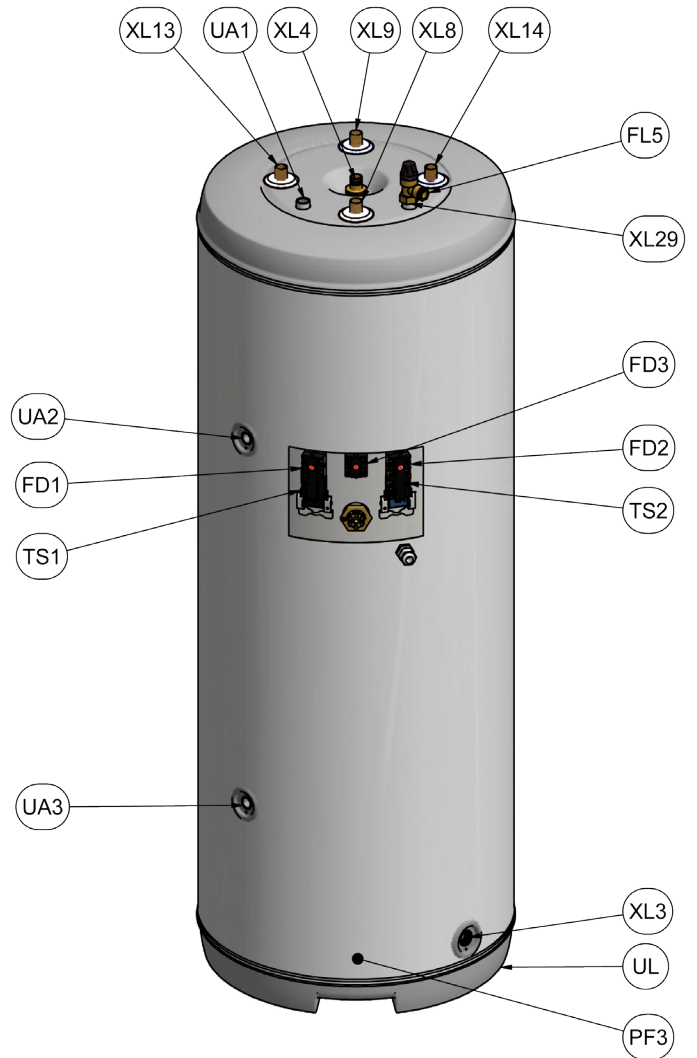
The kit of supplied items is supplied in a separate box.

3 The water heater design (See page 8 for explanations)

TITANIUM MEGACOIL 160, 200 & 300 L.



TITANIUM MEGACOIL-SOLAR 200 & 300 L.



Pipe connections

XL3	Connection, cold water, Ø 22 mm / 3/4"
XL4	Connection, hot water, Ø 22 mm
XL5	Connection, hot water circulation, Ø 1/2" (Not Megacoil 160 L. and Megacoil - Solar)
XL8	Docking connection, flow line (from heat pump*), Ø 22 mm
XL9	Docking connection, return line (to heat pump*), Ø 22 mm
XL13	Connection, flow line (from solar heating system) Ø 22 mm (Only Titanium Megacoil - Solar)
XL14	Connection, return line (to solar heating system) Ø 22 mm (Only Titanium Megacoil - Solar)
XL29	Connection, T&P valve, ø 15 mm

HVAC components

FL5	T&P valve Ø 15 mm
QM22	Venting, charge coil
UA1	Submerged tube for hot water sensor (display)
UA2	Submerged tube for hot water sensor (control)
UA3	Submerged tube for solar sensor (control) (only Titanium Megacoil - Solar)

Cleaning the climate system

When the water heater and the climate system have been filled with water, Titanium Megacoil/ Titanium Megacoil-Solar must operate at maximum normal temperature for at least one hour. Thereafter the system must be drained of water and refilled.

*or another external heat source

Electrical components

FD1	Temperature limiter immersion heater
FD2	Temperature limiter motorized valve
TS1	Working thermostat immersion heater
TS2	Optional working thermostat
FD3	Temperature limiter motorized valve (solar)

Miscellaneous

PF 3	Serial number plate
UL	Adjustable feet

Designations in component locations according to standard IEC 81346-1 and 81346-2.

4 Pipe connections

General

Pipe installation must be carried out in accordance with current norms and directives.

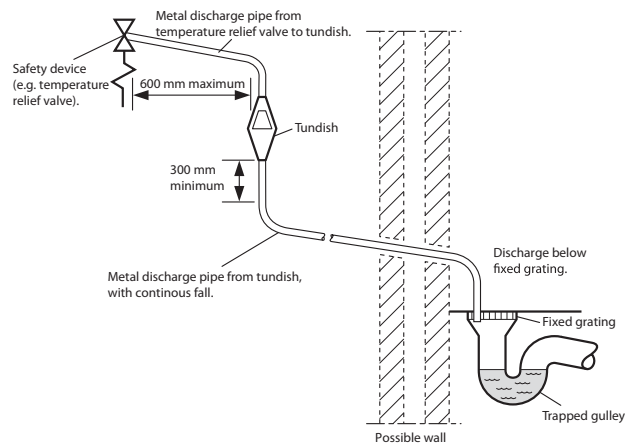
Internal support bushes should be fitted when a plastic pipe or annealed copper pipe is used. The water heater must be fitted with the requisite valves, such as a safety valve, shut-off valve, non-return valve, and vacuum valve. An overflow pipe must be routed from the safety valve to a suitable drain. The size of the overflow pipe must be the same as on the safety valve. Route the overflow pipe from the safety valve enclosed along its entire length and ensure that it is frost proof. The outlet of the overflow pipe should be visible and clearly away from any electrical components.

Overflow water from the safety valves goes via non-pressurised collecting pipes to a drain so that hot water splashes cannot cause injury. These non-pressurised collecting pipes shall not be used for anything else. A discharge pipe from the tundish connected to the expansion relief valve (safety valve) shall also be connected to a drain in the same way.

Please note that the connection of the T&P-valve should not be used for any other purpose.

Valves may not be positioned between the expansion valve and the vessel.

Discharge pipes from tundishes shall have a vertical section of pipe at least 300 mm long, before any elbows or bends in the pipework (see following picture).



NOTE

The expansion vessel accommodates expansion that results from heating the water inside the unit. The expansion vessel must be connected between the expansion valve and the cylinder. The location of the expansion vessel should allow access to recharge the pressure as and when necessary.

Valve outlet size	Minimum size of discharge pipe	Minimum size of discharge pipe from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15 mm	22 mm	up to 9 m	0.8 mm
G1/2	15 mm	28 mm	up to 18 m	1.0 mm
G1/2	15 mm	35 mm	up to 27 m	1.4 mm
G3/4	22 mm	28 mm	up to 9 m	1.0 mm
G3/4	22 mm	35 mm	up to 18 m	1.4 mm
G3/4	22 mm	42 mm	up to 27 m	1.7 mm
G1	28 mm	35 mm	up to 9 m	1.4 mm
G1	28 mm	42 mm	up to 18 m	1.7 mm
G1	28 mm	54 mm	up to 27 m	2.3 mm

Hard water areas

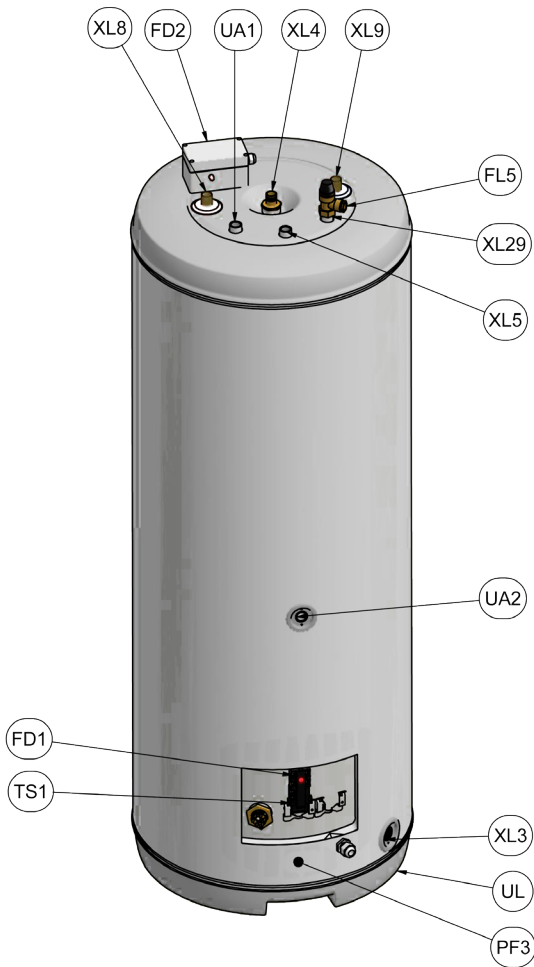
Usually, there should not be a problem in installing Titanium Megacoil/Megacoil - Solar Coil in areas of hard water as the operating temperature is 50-60 °C.

Emptying the system by

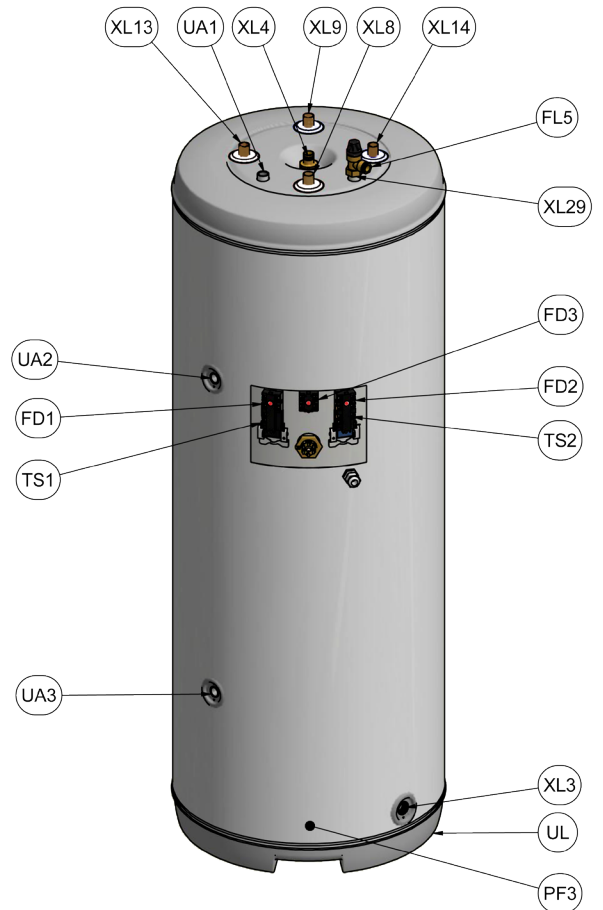
1. Open external filler valve and external drain valve.
2. Flush the system for some minute. Watch out for water splashes from the safety valve.
3. Close the valves and check the stainer.

Dimensions, pipe connections and setting-out coordinates

Titanium Megacoil 160, 200 & 300

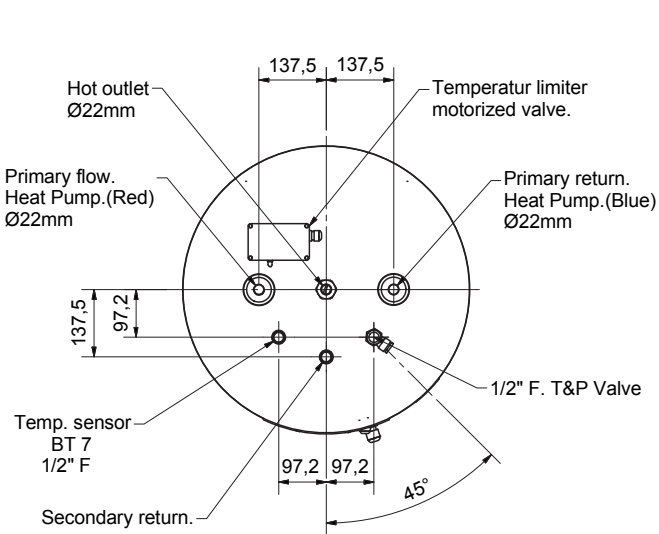
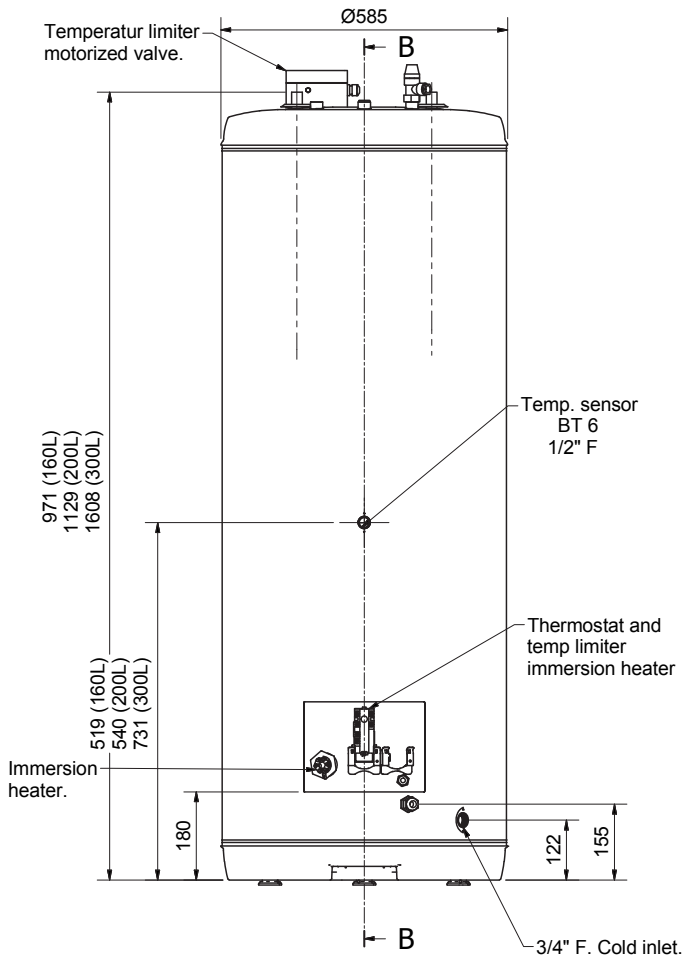


Titanium Megacoil-Solar 200 & 300

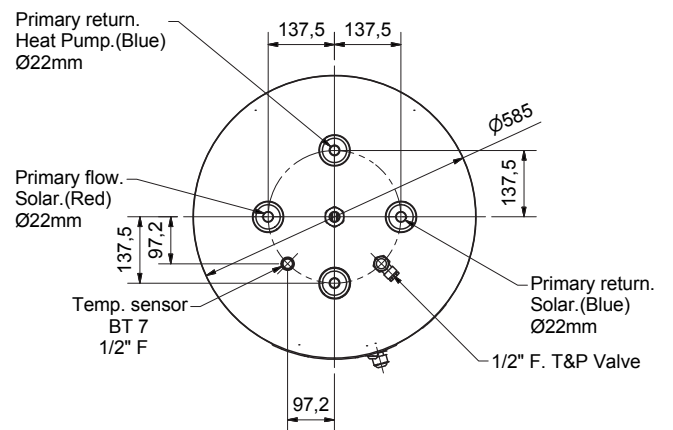
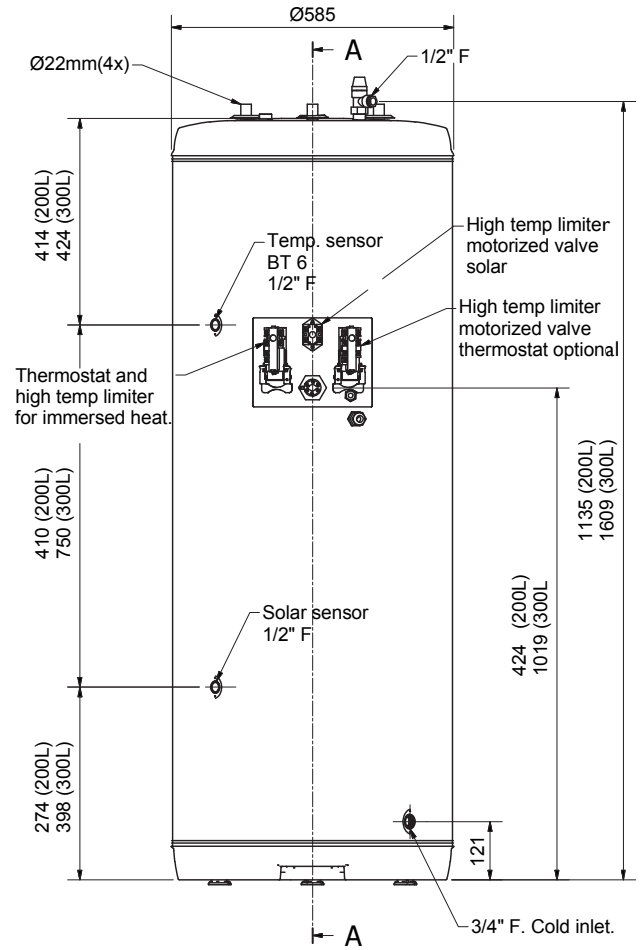


Connection		
XL3 Cold water Ø 3/4" F with elbow	mm	22
XL4 Hot water Ø	mm	22
XL5 Hot water circulation Ø		1/2" F
XL8 Docking connection, flow line Ø	mm	22
XL9 Docking connection, return line Ø	mm	22
XL13 Solar flow line Ø	mm	22
XL14 Solar return line Ø	mm	22
XL29 T&P valve Ø		1/2" F

Titanium Megacoil



Titanium Megacoil-Solar



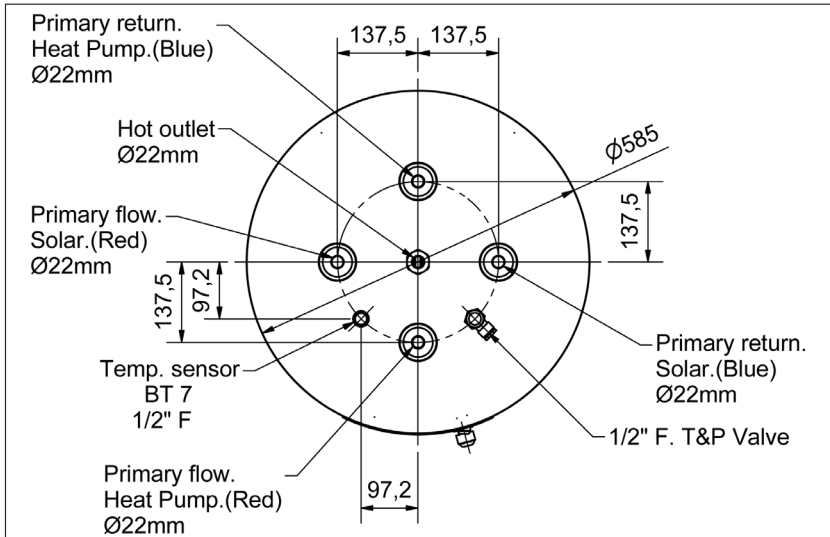
T&P valve

Install the pipe for the T&P valve as illustrated on page 9.

Solar connections

Connecting to solar power and heat pump

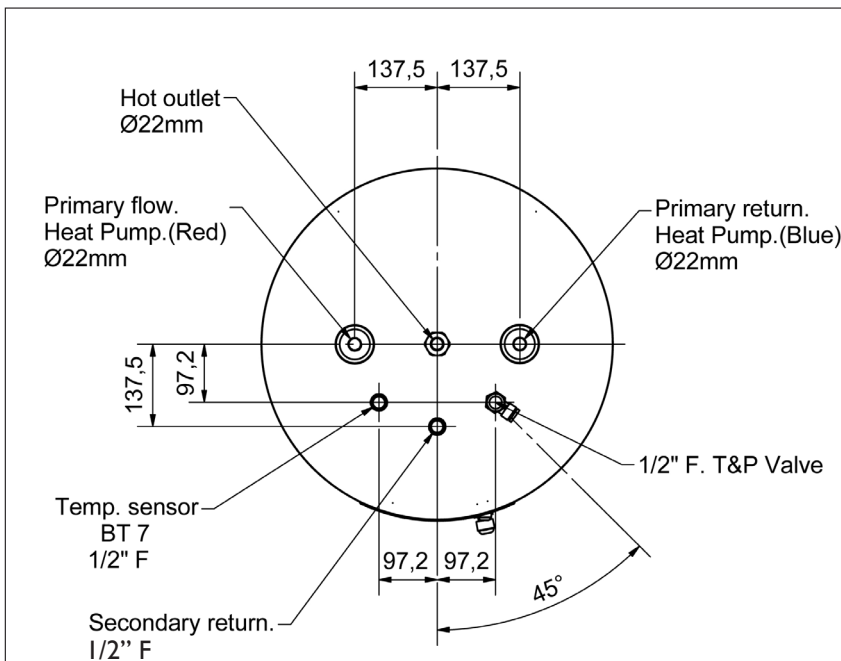
The solar heating system's supply and return are connected to the Titanium Megacoil- Solar Coil.



Heat pump connections

Connecting to heat pump

The heat pump supply and return are connected to Titanium Megacoil.

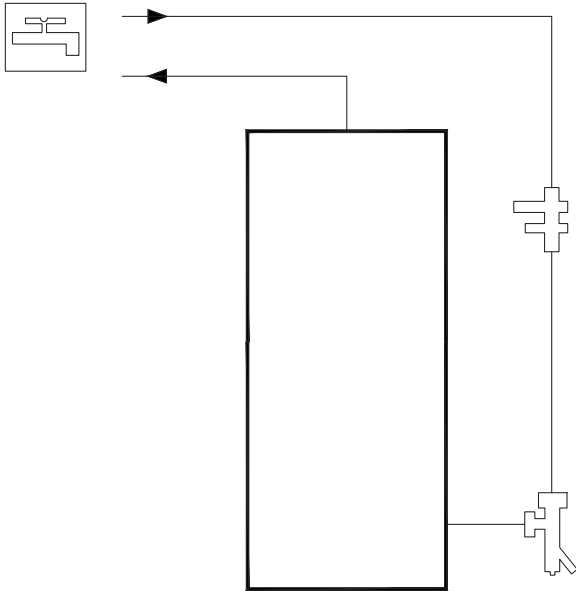


Cold and hot water

Connecting cold and hot water

There must be a mixing valve if the temperature can exceed 60 °C.

The flexible hose to the expansion vessel can be installed in the plugged connection on the safety valve.



Connecting hot water circulation

Titanium MegaCoil 200 & 300 have a connection that allows hot water circulation.

To reduce the risk of bacterial growth in systems with hot water circulation, the temperature of the circulating water should not fall below 50 °C. There should not be any non-circulatory hot water pipes. Adjust the hot water system so that the temperature does not fall below 50°C at the ends of the system.

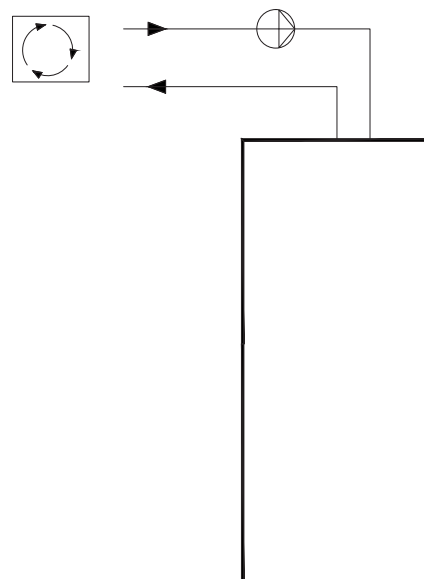
Docking

Titanium MegaCoil 200 & 300 can be connected in several different ways, one of which is shown here.

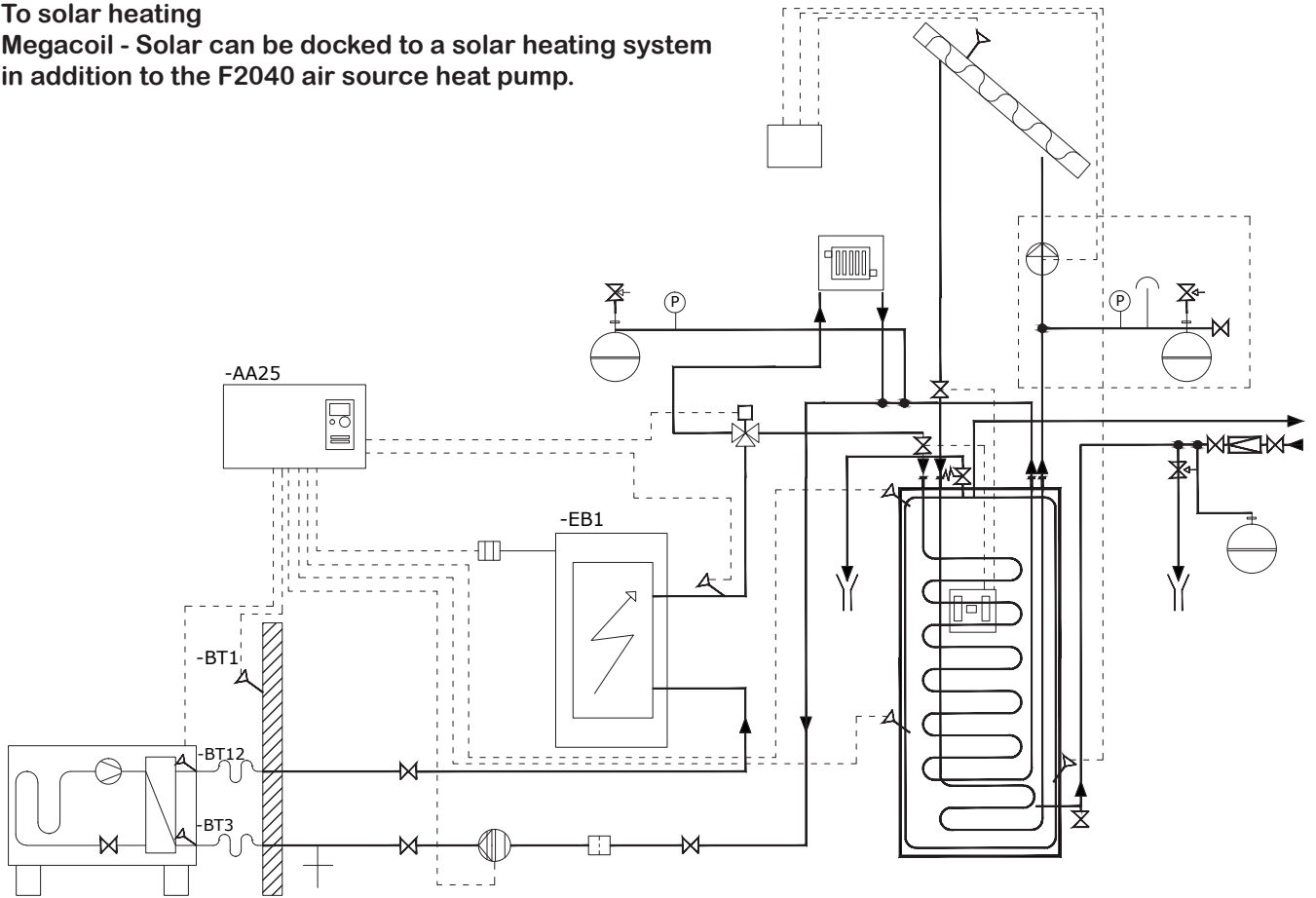
Further option information is available at www.nibe.co.uk and in the respective assembly instructions for the heat pumps used.

Symbol key

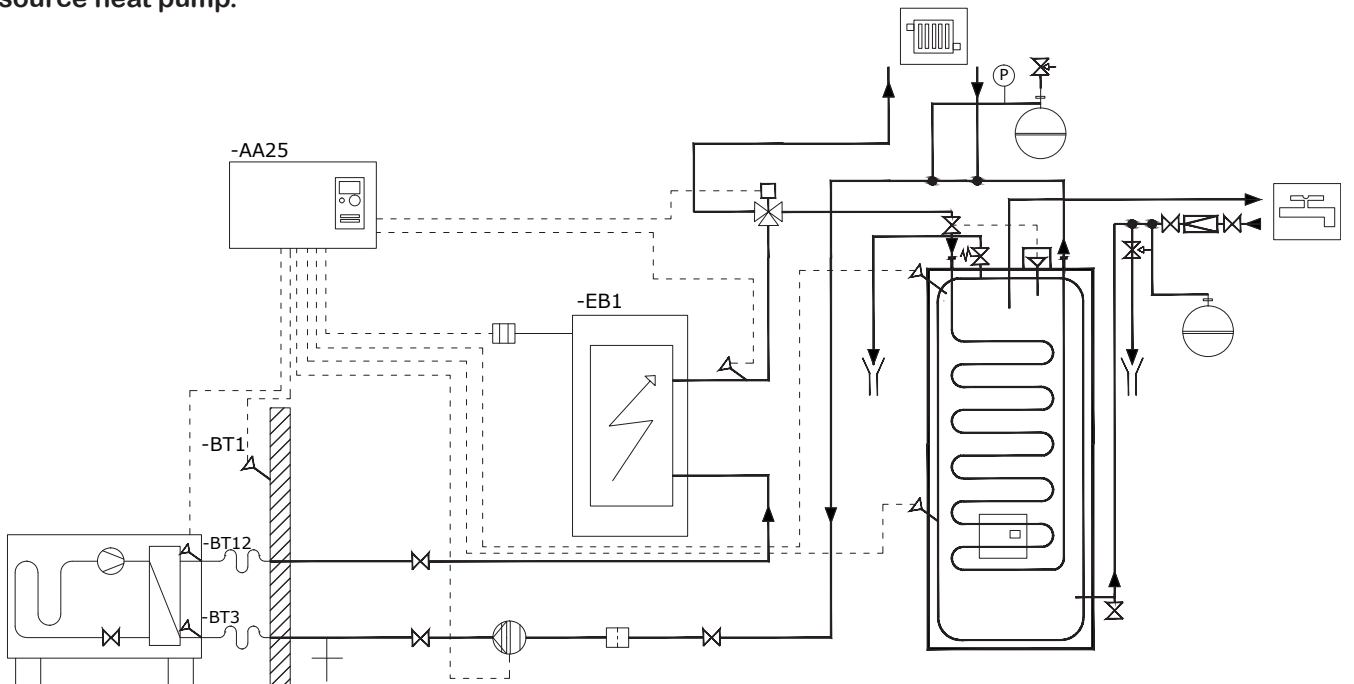
Symbol	Meaning
	Venting valve
	Shut-off valve
	Non-return valve
	Mixing valve
	Safety valve
	T&P valve
	Tundish
	Temperature sensor
	Circulation pump
	Particle filter
	Pressure reduction valve
	Motorized valve
	3/4"x22 Elbow and drain cock (see p. 6)
	Cold water inlet combination valve Pressure reduction valve, check valve and expansion relief valve (see p. 6)



To solar heating
Megacoil - Solar can be docked to a solar heating system
in addition to the F2040 air source heat pump.



To air source heat pump
Megacoil/Megacoil - Solar can be docked with F2040 air
source heat pump.



5 Electrical installation



NOTE

Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the stipulations in force.

Sensors (See page 10)

The Titanium Megacoil can accommodate up to two hot water sensors, one for SMO Controller display and one to control start and stop of heat pump.

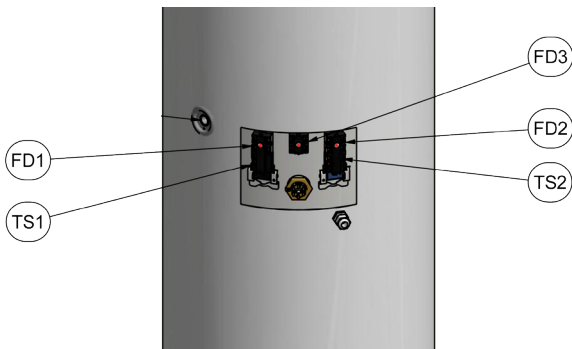
The display sensor is positioned in the submerged tube for the display sensor (UA1) and the control sensor in the submerged tube for control sensor (UA2). In cases where it is only possible to connect one sensor, use the submerged tube for control sensor (UA2).

Titanium Megacoil/Megacoil-Solar can also be supplemented with a solar sensor. This is placed in the submerged tube for solar sensor (UA3).

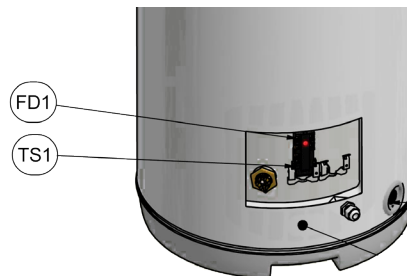
Use the sensors provided with the heat pump/control module. When no heat sensors have been provided, these must be ordered from the manufacturer of the heatpump/control module.

Thermostats and temperature limiter (Factory fitted)

TITANIUM MEGACOIL-SOLAR 200 & 300 L.



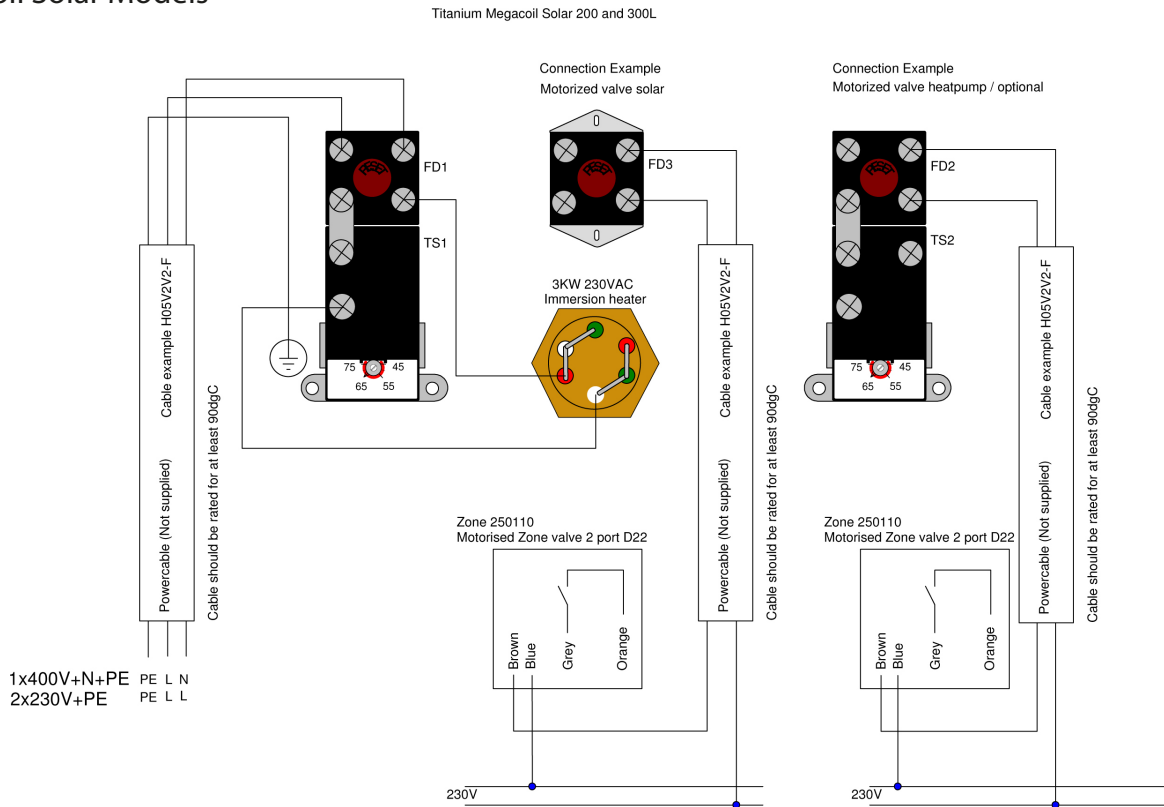
TITANIUM MEGACOIL 160, 200 & 300 L.



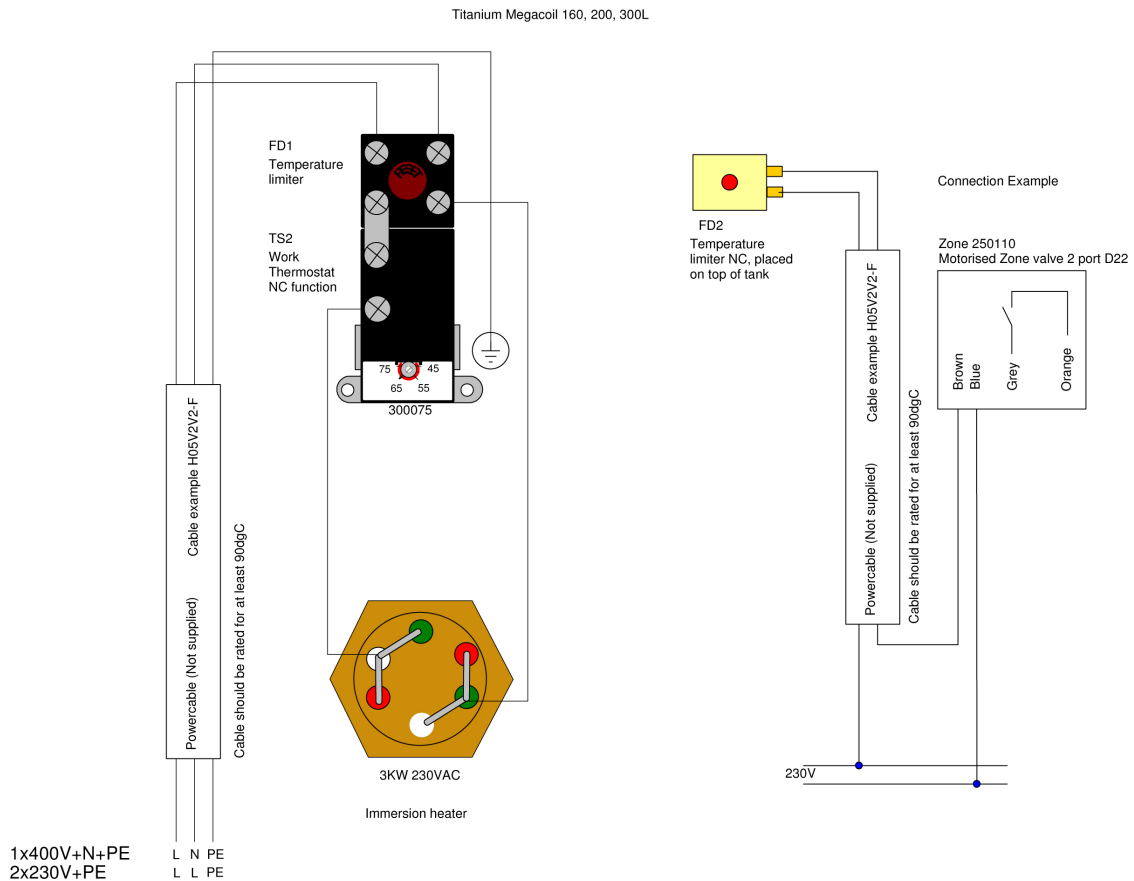
Temperature limiters

Power supply to temperature limiter (FD1) is 230 V. Connect temperature limiter (FD2 and FD3) electrically to the motorized valves one to each heat source

Megacoil Solar Models



Megacoil Models



Immersion heater wiring diagram

6 Commissioning and adjusting



NOTE

At the time of commissioning, complete all relevant sections of the Benchmark Checklist located at the back of this document.

Completion of the Benchmark Checklist is a condition of warranty. For full terms and conditions of warranty, please see our website www.nibe.co.uk.

Filling and venting the charge coil

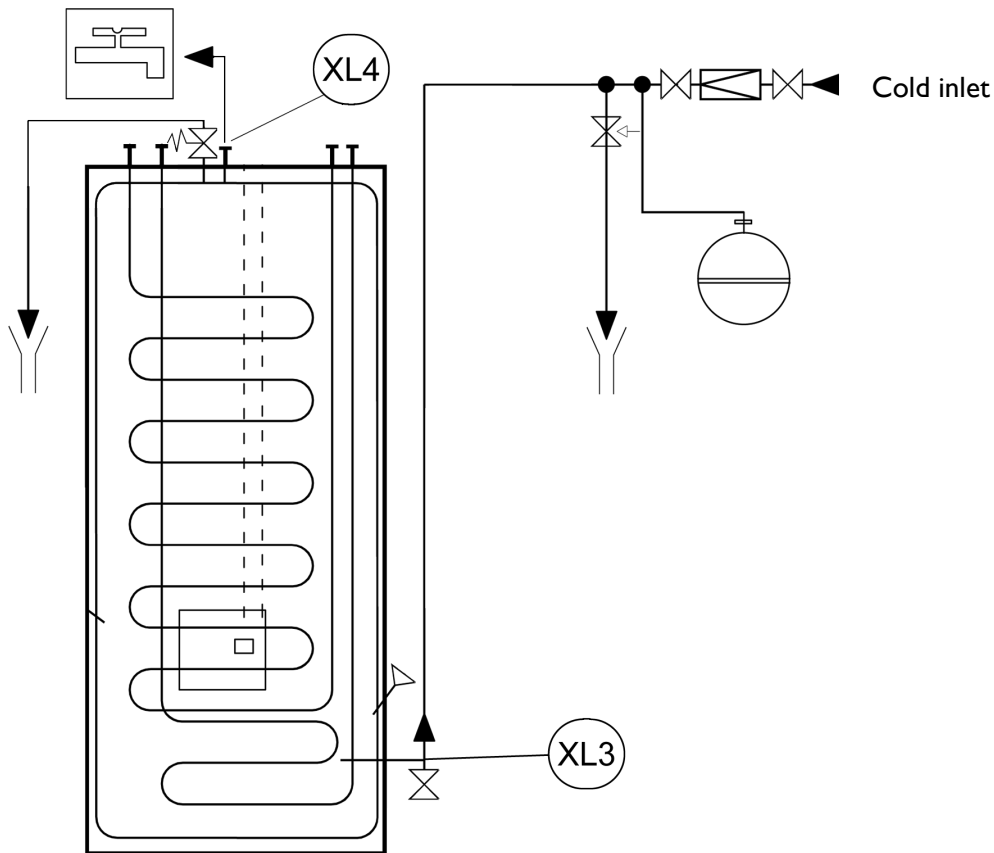
Filling and venting

1. Open the filling valve (external, not included with the product). Fill the coil in the hot water heater and the rest of the climate system with water.
2. Vent the coil and the rest of the climate system via the relevant venting valves.
3. Keep topping up and venting until all air has been removed and the pressure is correct.

Filling and venting

Filling the hot water heater

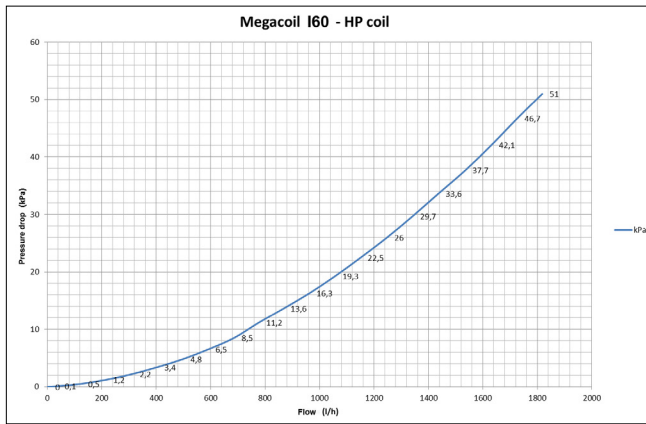
1. Open a hot water tap in the house. (XL4)
2. Fill the hot water heater through the cold water connection (XL3).
3. When the water that comes out of the hot water tap is no longer mixed with air, the water heater is full. Flush the system for several minutes and the tap can be closed.



Start-up and inspection

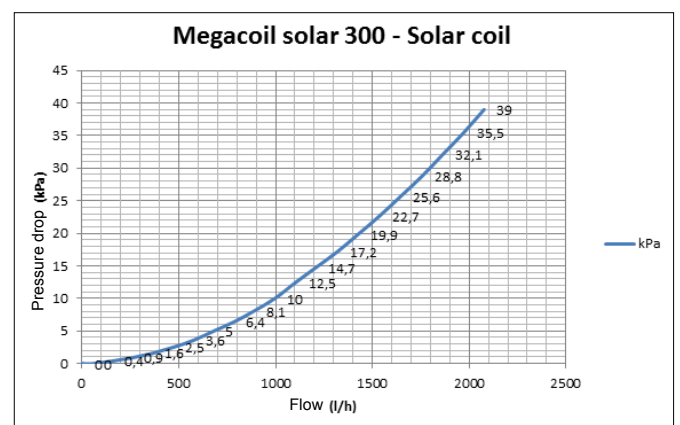
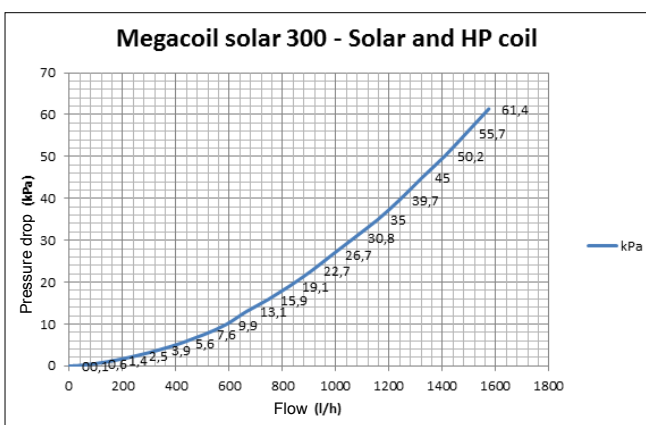
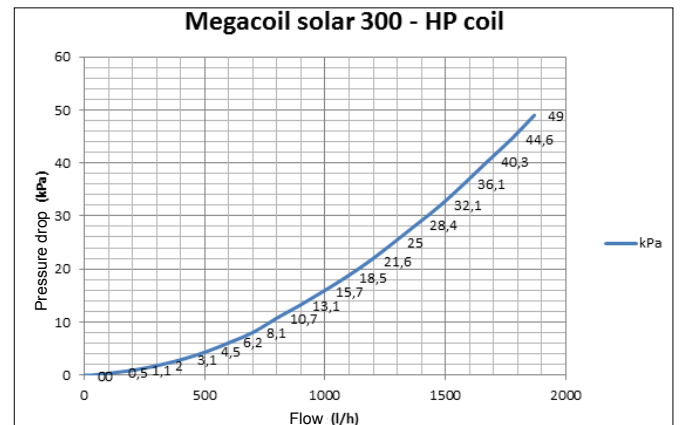
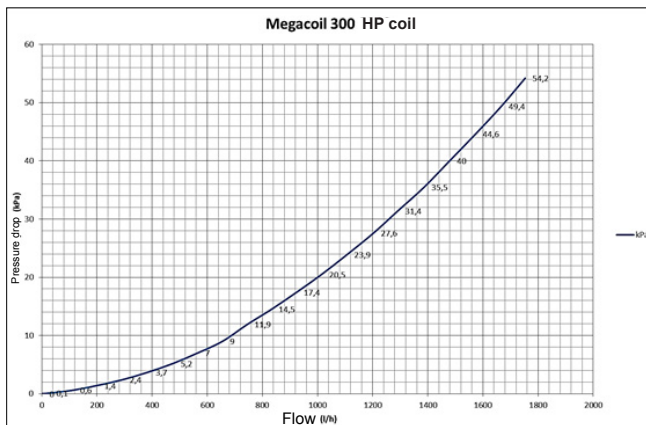
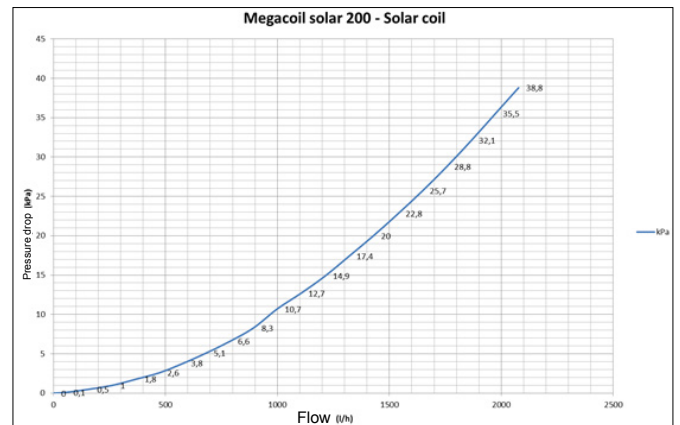
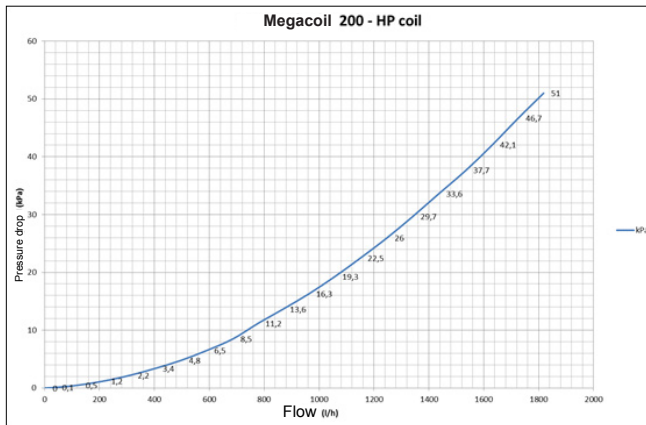
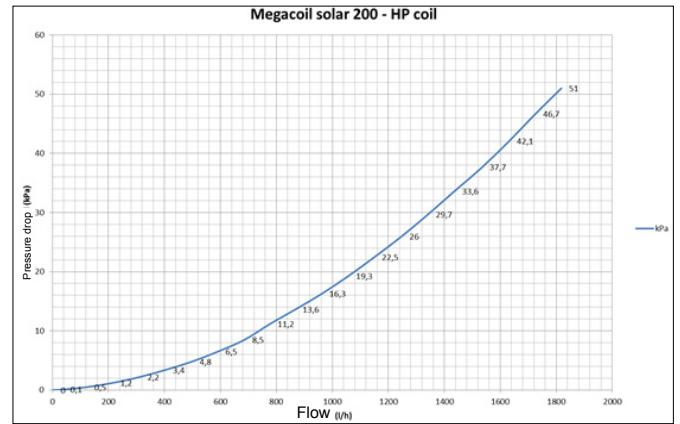
Pressure drop diagram, charge coil

Docking connection, flow line (XL8) and docking connection, return line (XL9).



Pressure drop diagram, solar coil

Connection, flow line solar heating system (XL13) and connection, return line solar heating system (XL14).



7 Service and maintenance



NOTE

After servicing, complete the relevant Service Interval Record section of the Benchmark Checklist located at the back of this document.

Completion of the Service Interval Record is a condition of warranty. For full terms and conditions of warranty, please see our website www.nibe.co.uk.



NOTE

Any servicing must be carried out by a competent person.

Maintenance

General inspection

Check the following:

1. Condition of casing.
2. Electrical connections.
3. Pipe connections.

Correct any fault before continuing.

Hot water heater

Check the following:

1. Expansion relief valve.
2. T&P valve.
3. Discharge pipe.
4. Expansion vessel.

Correct any fault before continuing.

Service actions

Safety valves

The function of the safety valves must be checked regularly. Perform checks as follows:

1. Open the valve by turning the knob anti-clockwise carefully.
2. Check that water flows through the valve.
3. Close the valve by releasing it. If it does not close automatically when released, turn it anti-clockwise slightly.



NOTE

Do not remove or adjust any components that are part of this pressurised water heater. Contact your installer!



NOTE

If this pressurised water heater develops a fault, e.g. a flow of hot water from the overflow pipe, turn the heat pump off and contact your installer.

Cleaning

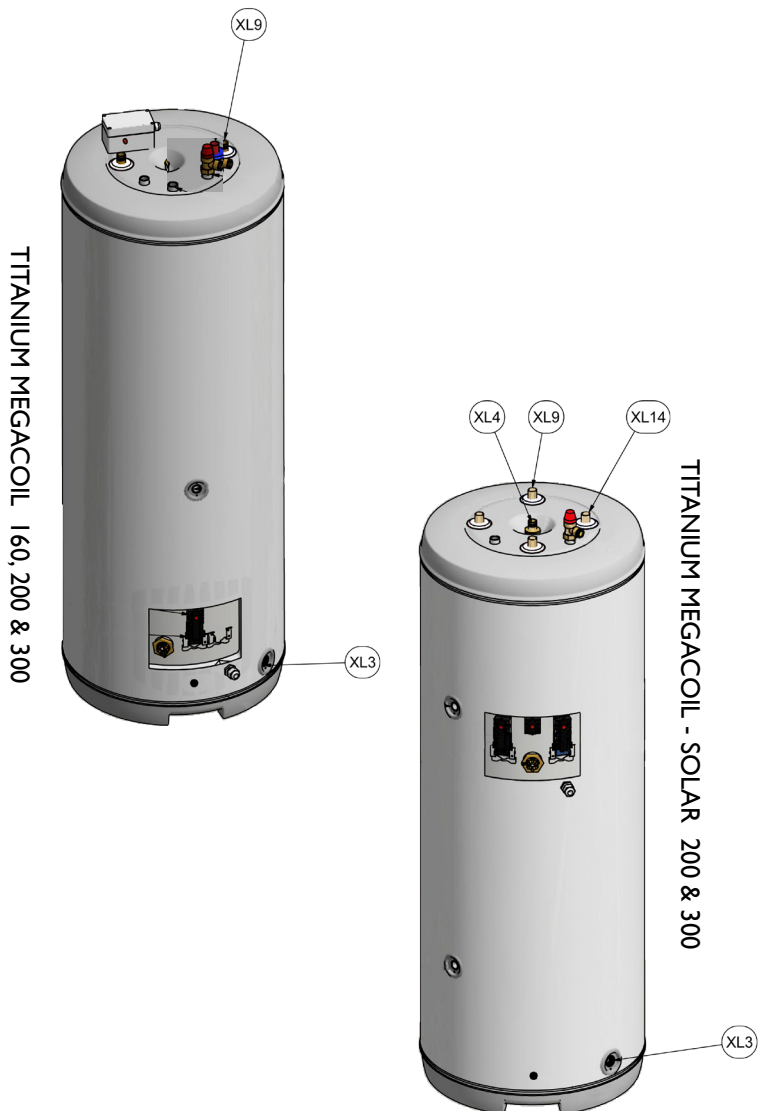
Inspect and clean the water heater by using a suitable instrument such as an endoscope. The hot water connection (XL4) must be removed to facilitate access.

Emptying

The water heater is emptied through the drain cock (with hose connection) in the cold water connection (XL3).

Drain the charge coil through the siphon (with hose) on the docking connection, return to heat pump (XL9).

Drain the solar coil through the siphon (with hose) on the connection, return to solar heating system (XL14).



8 Technical specifications

Titanium Megacoil		160 (156) litre	200 (187,6) litre	300 (281,7) litre
Volume (net)	litre	148,5	179	271
Volume, charge coil	litre	8,1	8,5	10,6
Net weight	kg	42	45	59
Gross weight	kg	190,5	224	330
Drawn off capacity	litre/%	126,9/85,5	150/83,9	214/79
Heat content at 50°C*	kWh	6,89	8,16	12,58
Equivalent amount of hot water (40°C)*	litre	198	234	361
Re-heat performance	kW	6,2	7,3	7,3
Re-heating time to 60°C, 70% of the total volume	min.	46	50	91
Max operating temperature	°C	85	85	85
Max pressure, primary side	bar/MPa	3/0.3	3/0.3	3/0.3
Max pressure, water heater	bar/MPa	5,5/0,55	5,5/0,55	5,5/0,55
Max water supply pressure	bar/MPa	16/1.6	16/1.6	16/1.6
Exp. vessel, tap water, charge pressure	bar/MPa	3.0/0.3	3.0/0.3	3.0/0.3
Expansion relief valve, setting	bar/MPa	6/0.6	6/0.6	6/0.6
Max operating pressure, T&P-valve	bar/MPa	7/0.7	7/0.7	7/0.7
Max operating temperature, T&P-valve	°C	95	95	95
Heat loss Δt 45°C	kW/24 hrs	1,72	1,85	2,59
Set pressure reducing valve	bar/MPa	3	3	3
Max temperature heat pump	°C	75	75	75
Max recommended heat pump size	kW	12	12	12
Volume expansion vessel	litre	18	18	24
Part No.		081005	081007	081008

* Cold water temperature = 10°C

Titanium Megacoil-Solar		200 (187,6) litre	300 (281,7) litre
Volume/dedicated solar storage	litre	174,5/79,5	267,4/92,5
Volume, HP coil	litre	8,5	8,8
Volume, solar coil	litre	4,6	5,5
Volume, expansion vessel	litre	18	24
Net weight	kg	49	61
Gross weight	kg	225	329
Heat transfer (60/50 °C at 50 °C hot water temperature)*	kW	8,1	8,5
Volume of water drawn off, above 40 °C	litre	165,5	262,5
Solar heat transfer (at 50 °C hot water temperature)**	kW	2,2	3,1
Heat content at 50°C	kWh	8,1	12,4
Equivalent amount of hot water (40°C)	litre	232	356
Re-heat time HP	min.	36	64
Re-heat time Solar	min.	175	264
Heat loss Δt 45°C	kW/24Hrs	1,85	2,59
Max operating temperature	°C	75	75
Max pressure, primary side	bar/MPa	3/0.3	3/0.3
Max pressure, water heater	bar/MPa	5,5/0,55	5,5/0,55
Maximum pressure, solar coil	bar/MPa	3/0.3	3/0.3
Max water supply pressure	bar/MPa	16/1.6	16/1.6
Max design pressure	bar/MPa	6,0/0.6	6,0/0.6
Exp. vessel, tap water, charge pressure	bar/MPa	3.0/0.3	3.0/0.3
Expansion relief valve, setting	bar/MPa	6/0.6	6/0.6
Max operating pressure, T&P-valve	bar/MPa	7/0.7	7/0.7
Max operating temperature, T&P-valve	°C	95	95
Max recommended heat pump size	kW	12	12
Part No.		081009	081010

*Primary flow to achieve the maximum capacity (12 kW): 1025 l/h

**Solar flow (3.3 kW): 300 l/h 70 °C

Tested according to standard EN 12897:2006.

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Item register

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MAINS PRESSURE HOT WATER STORAGE SYSTEM COMMISSIONING CHECKLIST

This Commissioning Checklist is to be completed in full by the competent person who commissioned the storage system as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions may invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____
 Address _____
 Cylinder Make and Model _____
 Cylinder Serial Number _____
 Commissioned by (print name) _____ Registered Operative ID Number _____
 Company Name _____ Telephone Number _____
 Company Address _____
 _____ Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate *: _____
 Building Regulations Notification Number (if applicable) _____

ALL SYSTEMS PRIMARY SETTINGS (indirect heating only)

Is the primary circuit a sealed or open vented system? Sealed Open
 What is the maximum primary flow temperature? _____ °C

ALL SYSTEMS

What is the incoming static cold water pressure at the inlet to the system? _____ bar
 Has a strainer been cleaned of installation debris (if fitted)? Yes No
 Is the installation in a hard water area (above 200ppm)? Yes No
 If yes, has a water scale reducer been fitted? Yes No
 What type of scale reducer has been fitted? _____
 What is the hot water thermostat set temperature? _____ °C
 What is the maximum hot water flow rate at set thermostat temperature (measured at high flow outlet)? _____ l/min
 Time and temperature controls have been fitted in compliance with Part L of the Building Regulations? Yes
 Type of control system (if applicable) Y Plan S Plan Other
 Is the cylinder solar (or other renewable) compatible? Yes No
 What is the hot water temperature at the nearest outlet? _____ °C
 All appropriate pipes have been insulated up to 1 metre or the point where they become concealed Yes

UNVENTED SYSTEMS ONLY

Where is the pressure reducing valve situated (if fitted)? _____
 What is the pressure reducing valve setting? _____ bar
 Has a combined temperature and pressure relief valve and expansion valve been fitted and discharge tested? Yes No
 The tundish and discharge pipework have been connected and terminated to Part G of the Building Regulations Yes
 Are all energy sources fitted with a cut out device? Yes No
 Has the expansion vessel or internal air space been checked? Yes No

THERMAL STORES ONLY

What store temperature is achievable? _____ °C
 What is the maximum hot water temperature? _____ °C

ALL INSTALLATIONS

The hot water system complies with the appropriate Building Regulations Yes
 The system has been installed and commissioned in accordance with the manufacturer's instructions Yes
 The system controls have been demonstrated to and understood by the customer Yes
 The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes

Commissioning Engineer's Signature _____
 Customer's Signature _____
 (To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

Competent Persons Scheme.





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