LSTHP
STORAGE TANK

Installation, Commissioning, User & Maintenance Instructions

Models:
LSTHP 66
LSTHP 100
LSTHP 110
LSTHP 130
LSTHP 165
LSTHP 220

Lochinvar®

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IMPORTANT INFORMATION

These instructions must be read and understood before installing, commissioning, operating or maintaining the equipment.

Read this manual carefully

Warning
Read this manual carefully before starting with the installation of the storage tank. Failure to read the manual and to follow the printed instructions may lead to personal injury and damage to the storage tank.

The supplier reserves the right to modify specifications stated in this manual.

Trademarks

Any brand names mentioned in this manual are registered trademarks of their respective owners.

Liability

The supplier accepts no liability for claims from third parties arising from unauthorised use, use other than that stated in this manual, and use other than in accordance with the General Conditions registered at the Chamber of Commerce.

Refer further to the General Conditions. These are available on request, free of charge.

Although considerable care has been taken to ensure a correct and suitably comprehensive description of all relevant components, the manual may nonetheless contain errors and inaccuracies. Should you detect any errors or inaccuracies in the manual, we would be grateful if you would inform us. This helps us to further improve our documentation.

More information

If you have any comments or queries concerning specific aspects related to the storage tank, then please do not hesitate to contact the supplier.

In the event of problems with your water supply connections, please contact the supplier and/or installation engineer of your installation.

Regulations

If the Lochinvar LSTHP is to be used in an unvented system installation, the system should follow the guidance given in BS6700, BS8558 and must comply with the Building Regulations 1992: Part G3, in England and Wales, P5 in Northern Ireland and P3 in Scotland and the Water Supply (Water Fittings) Regulations 1999, The Water Supply (Water Quality) Regulations (Northern Ireland) 2017 and the Public Water Supplies (Scotland) Amendment Regulations 2017.

A kit of parts is available from Lochinvar.

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1 Technical specifications

1.1 Floor load

Allow for the storage tank's weight and the maximum floor load; refer to the table (1.6 "General specifications").

1.2 Water composition

The storage tank is intended for heating drinking water. The drinking water must comply with the regulations governing drinking water for human consumption. The table gives an overview of the specifications.

Water specifications

Water composition	
Hardness (alkaline earth ions)	> 1,00 mmol/l: • German hardness > 5,6 °dH • French hardness > 10,0 °fH • English hardness > 7,0 °eH • > 100 mg/l $CaCO_3$
Conductivity	> 125 µS/cm
Acidity (pH value)	7,0 < pH value < 9,5

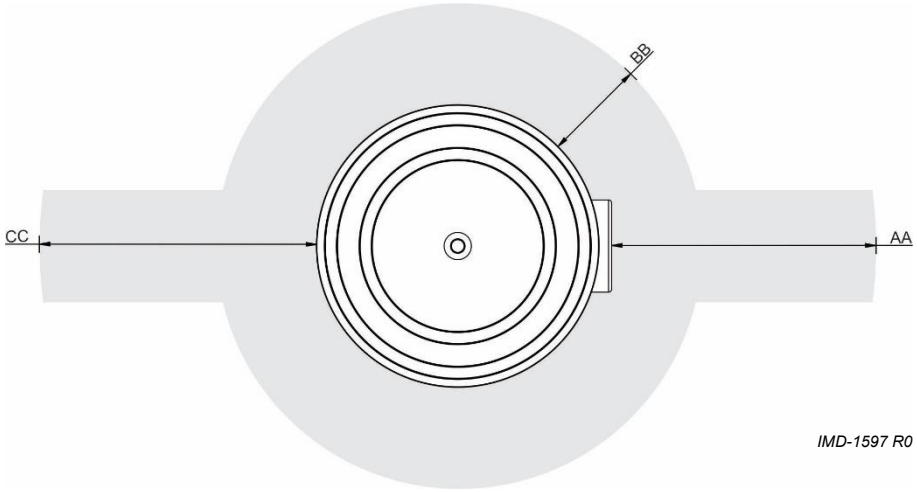
Note
If the water specifications deviate from those stated in the table, then the tank protection cannot be guaranteed (5 "Warranty").

1.3 Working clearance

For access to the storage tank, it is recommended that the following clearances are observed:

- AA: around the anode connection.
- CC: around the inlet pipe connection [K].
- BB: around the storage tank.
- top of the storage tank: 50 cm

Working clearance	**Unit**	**LSTHP 66 - 110**	**LSTHP 130 - 165**	**LSTHP 220**
AA	cm	95	110	125
BB	cm	50	50	50
CC	cm	85	100	115



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1.4 Packaging

The packaging prevents damage to the appliance during transport. The packaging material chosen is environmentally friendly, recyclable and relatively easy to dispose of in an environmentally aware way.

1.5 Disposal

Old end-of-life appliances contain materials that need to be recycled. When disposing of old devices that have reached the end of their service life, you should take account of local legislation relating to waste disposal.

You must therefore never dispose of your old appliance together with regular waste but should and it into a municipal waste collection depot for electrical and electronic equipment. Ask your dealer/installation engineer for advice if necessary. The old appliance must be stored out of reach of children.

1.6 General specifications

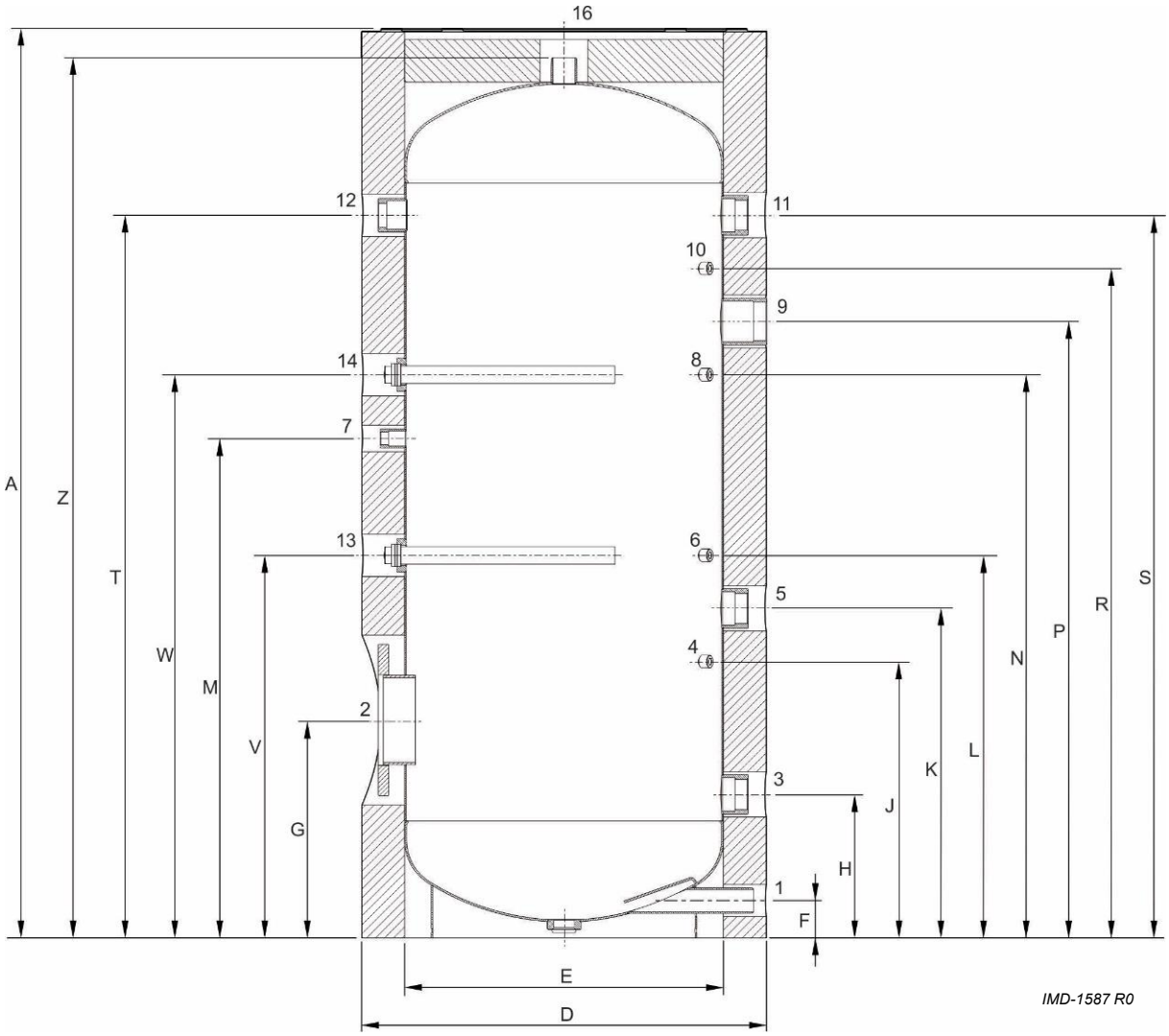
	Unit	LSTHP 66	LSTHP 100	LSTHP 110	LSTHP 130	LSTHP 165	LSTHP 220
Contents	litres	315	408	502	689	774	1078
Empty weight	kg	92	106	123	165	191	252
Maximum floor load	kg	407	514	625	854	965	1330
Energy Efficiency Class (Energy Label)	-	C	C	C	-	-	-
Heat Loss	W	100	100	104	126	126	146
Max. working pressure tank	kPa (bar)	800 (8)	800 (8)	800 (8)	800 (8)	800 (8)	800 (8)
Max. water temperature tank	ºC	95	95	95	95	95	95
Anodes	-	1	2	2	2	2	2
Insulation thickness	mm	70	70	80	80	90	100
Insulation material ≤ 0,032 W/mK	-	EPS	EPS	EPS	EPS	EPS	EPS
Fire class – (DIN 4102)	-	B2	B2	B2	B2	B2	B2

1.7 Dimensions

		Unit	LSTHP 66	LSTHP 100	LSTHP 110	LSTHP 130	LSTHP 165	LSTHP 220
A	Total height	mm	1370	1710	2050	1860	2055	2020
D	Diameter (with insulation)	mm	740	740	760	910	930	1200
E	Diameter (without insulation)	mm	600	600	600	750	750	900
F	Height cold water inlet	mm	70	70	70	85	85	95
G	Height inspection opening / electrical element	mm	365	410	410	450	450	500
H	Height heat pump return	mm	270	270	270	315	315	360
J	Height temperature sensor	mm	370	520	520	515	515	610
K	Height heat pump supply multi-pass	mm	500	620	620	615	615	710
L	Height temperature sensor	mm	600	720	720	715	715	810
M	Height recirculation return	mm	675	940	1280	1050	1245	1175
N	Height temperature sensor	mm	775	1060	1400	1170	1365	1295
P	Height electrical element	mm	850	1160	1500	1270	1465	1395
R	Height temperature sensor	mm	925	1260	1600	1370	1565	1495
S	Height heat pump supply one-pass	mm	1025	1360	1700	1470	1665	1595
T	Height T&P connection	mm	1025	1360	1700	1470	1665	1595
V	Height anode connection	mm	600	720	720	715	715	810
W	Height anode connection	mm	-	1060	1400	1170	1365	1295
Y	Height anode connection	mm	-	-	-	-	-	-
Z	Height warm water outlet	mm	1320	1657	1995	1806	2001	1968

		Unit	LSTHP 66	LSTHP 100	LSTHP 110	LSTHP 130	LSTHP 165	LSTHP 220
1	Connection Cold water inlet	-	R 1½"	R 1½"	R 1½"	R 1½"	R 1½"	R 2"
2	Diameter inspection opening	DN	150	150	150	150	150	150
3	Heat pump return	-	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"
4	Sensor connection	-	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"
5	Heat pump supply multi-pass	-	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"
6	Diameter inspection opening / electrical element	-	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"
7	Connection recirculation return	-	Rp ¾"	Rp ¾"	Rp ¾"	Rp ¾"	Rp ¾"	Rp ¾"
8	Sensor connection	-	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"
9	Electrical element connection	-	Rp 2½"	Rp 2½"	Rp 2½"	Rp 2½"	Rp 2½"	Rp 2½"
10	Sensor connection	-	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"	Rp ¼"
11	Heat pump supply one-pass	-	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"	Rp 2"
12	T&P connection	-	Rp 1½"	Rp 1½"	Rp 1½"	Rp 1½"	Rp 1½"	Rp 1½"
13	Anode connection	-	-	Rp 1¼"	Rp 1¼"	Rp 1¼"	Rp 1¼"	Rp 1¼"
14	Anode connection	-	Rp 1¼"	Rp 1¼"	Rp 1¼"	Rp 1¼"	Rp 1¼"	Rp 1¼"
15	Anode connection	-	-	-	-	-	-	-
16	Connection Warm water outlet	-	Rp 1½"	Rp 1½"	Rp 1½"	Rp 1½"	Rp 1½"	Rp 2"

Front sectional view LSTHP 66-220



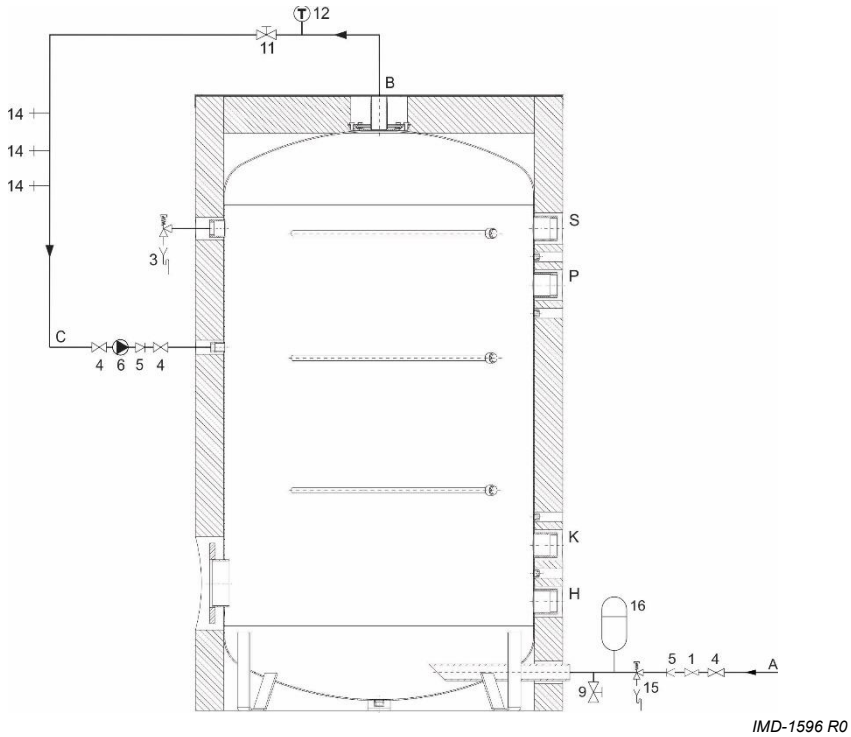
2 Installation

2.1 Installation diagram

This figure shows the installation diagram. This diagram is referred to in the sections describing the actual connection procedure.

Note
These products can be installed as vented and unvented. This manual only discusses unvented installations. For information about vented installations please contact your supplier.

Installation Diagram



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Legend
1. pressure relief valve (mandatory if mains water pressure is too high)
3. T&P-valve (mandatory)
4. stop valve (recommended)
5. non-return valve (mandatory)
6. circulation pump (optional)
11. service stop valve
12. temperature gauge (optional)
14. draw-off points
15. expansion valve (mandatory)
16. expansion vessel (mandatory)

A. cold water supply
B. hot water supply
C. circulation pipe
H. heat pump return
K. heat pump supply
P. connection electrical element
S. heat pump supply

2.2 Water connections

Warning
The installation should be carried out by a competent person, in compliance with general and locally applicable regulations.

2.2.1 Cold water side

See (A) in the installation diagram (2.1 "Installation diagram").
1. Fit an approved stop valve (4) on the cold water side as required by the applicable regulations.
2. The maximum working pressure of the storage tank is 8 bar. Because the pressure in the water pipe at times can exceed 8 bar, you must fit an approved pressure-reducing valve (1).
3. Fit a non-return valve (5) and an expansion vessel (16).
4. Fit an expansion valve (15) and connect the overflow side to an open waste water pipe.

2.2.2 Hot Water side

See (B) in the installation diagram (2.1 "Installation diagram").

Note
Insulating long hot water pipes prevents unnecessary energy loss.

1. Optional: fit a temperature gauge (12) so you can check the temperature of the tap water.
2. Fit the T&P valve (3).
3. Fit a stop valve (11) in the hot water outlet pipe for servicing.

2.2.3 Circulation pipe

See (C) in the installation diagram (2.1 "Installation diagram").

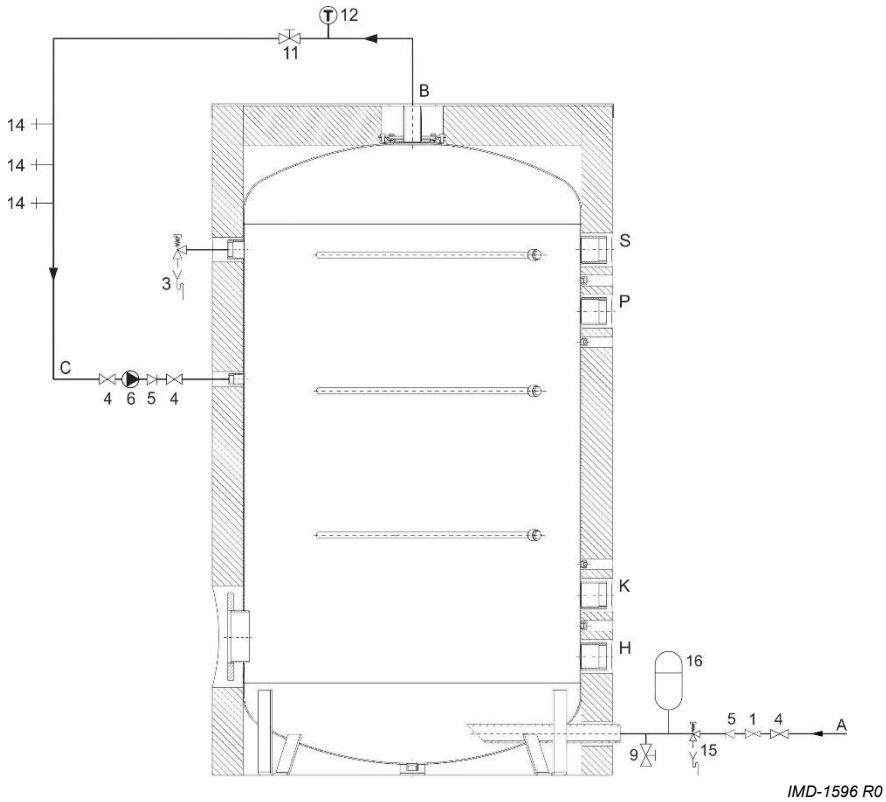
If an immediate flow of hot water is required at draw-off points, a circulation pump can be installed. This improves comfort and reduces water wastage.

1. Fit a circulation pump (6) of the correct capacity for the length and resistance of the circulation system.
2. Fit a non-return valve (5) after the circulation pump to guarantee the direction of circulation.
3. Fit two stop valves for servicing (4).
4. Connect the circulation pipe according to the installation diagram (2.1 "Installation diagram").

3 Filling and draining

Note
These products can be installed as vented and unvented. This manual only discusses unvented installations. For information about vented installations please contact your supplier.

Installation Diagram



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Legend
1. pressure relief valve (mandatory if mains water pressure is too high)
3. T&P-valve (mandatory)
4. stop valve (recommended)
5. non-return valve (mandatory)
6. circulation pump (optional)
11. service stop valve
12. temperature gauge (optional)
14. draw-off points
15. expansion valve (mandatory)
16. expansion vessel (mandatory)

A. cold water supply
B. hot water supply
C. circulation pipe
H. heat pump return
K. heat pump supply
P. connection for electrical element
S. heat pump supply

3.1 Filling

To fill the water heater, proceed as follows:
1. Open the stop valve (11) in the hot water supply pipe.
2. If applicable, open the stop valves (4) of the circulation pipe (C).
3. Make sure that the drain valve (2) is closed.
4. Open the nearest hot water draw-off point (14).
5. Open the stop valve (4) on the cold water side (A) so that cold water flows into the water heater.
6. Completely fill the water heater. When a full water jet flows from the nearest draw-off point, the water heater is full.
7. Bleed the entire installation of air, for example by opening all draw-off points.
8. The water heater is now under water supply pressure. There should now be no water coming out of the inlet combination expansion valve or (if used) out of the T&P valve (3). If there is, the cause might be:
   - The water supply pressure is greater than the specified value (1.6 "General specifications"). Rectify this by fitting a pressure reducing valve (1).
   - The expansion valve in the protected cold supply set-up is defective or incorrectly fitted.

3.2 Draining

1. Close the stop valve (4) between the cold water head tank and the cold water inlet (A).
2. Open the drain valve (9).
3. Bleed the water heater (or installation) so that it drains completely.

4 Maintenance

Warning
Maintenance may only be carried out by a competent person.

At each service, the storage tank undergoes maintenance on water side. The maintenance must be carried out in the following order.
1. Preparation for maintenance
2. Water-side maintenance
3. Finalising maintenance

Note
Before ordering spare parts, it is important to write down the installation type, storage tank model and the full serial number of the storage tank. These details can be found on the rating plate. Only by ordering with this information can you be sure receiving correct spare parts.

4.1 Preparation for maintenance

The preparation for maintenance consists of testing and checking if all components are still working properly by completing the following steps:
1. Test the operation of the overflow valve of the protected cold supply setup. The water should discharge out.
2. Check the drainage pipes from the discharge points of all valves and remove any scale deposits that may be present.
3. Drain the storage tank.

4.2 Water-side maintenance

Water-side maintenance consists of descaling and cleaning the tank and checking the anodes.

4.2.1 Descaling and cleaning the tank

Scale and lime build-up prevent effective conduction of the heat to the water. Periodic cleaning and descaling prevents build-up of these deposits. This increases the service life of the storage tank and also improves the heating process.

Take the rate of scale formation into account when deciding on the service interval. Scale formation depends on the local water composition, the water consumption and the water temperature setting. A water temperature setting of maximum 60°C is recommended for the prevention of excessive scale build-up.

Warning
Ensure that the temperature settings comply with local regulations.

To guarantee a good, watertight seal around the cleaning opening, replace the gasket, washers, bolts and, if necessary, the lid with new parts before reassembly. Spare parts are obtainable from the supplier/manufacturer.

To simplify descaling and cleaning of the tank, the storage tank is equipped with a cleaning opening.

Work order:

1. Undo bolts from the cover.
2. Remove cover and the gasket.
3. Inspect the tank and remove the loose scale deposits and contamination.
4. If the scale cannot be removed by hand, descale the storage tank with a descaling agent. Contact the supplier/manufacturer for advice on what descaling agent to use.
5. Close the cleaning opening. To avoid damage to the tank tighten the bolts, that fasten the lid, with a torque no greater than 50 Nm. Use suitable tools for this.

4.2.2 Checking anodes

Anodes ensure the protection of the tank by sacrificing themselves. Insufficient anode material may lead to poor protection and, hence, leakage of the tank.

1. Loosen the anodes one by one.
2. Check the diameter of each anode in different places. The diameter must be at least 60% of the original 1” diameter.
3. If the diameter is less than the minimum, the anode must be replaced. Please contact the supplier/manufacturer to order new anodes.
4. Mount the (new) anodes.

5 Warranty

Contact Lochinvar Ltd. or got to www.lochinvar.ltd.uk for the current warranty terms and conditions.

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