

DB15

INSTALLATION AND OPERATING INSTRUCTIONS



HIGH-EFFICIENCY - MULTI SOLID FUEL CENTRAL-HEATING STOVE WITH AUTOMATIC CONTROL ISSUED - 10/09/2013 (456)



PLEASE LEAVE THIS DOCUMENT WITH THE HOUSEHOLDER

CONGRATULATIONS

ON THE PURCHASE OF YOUR MORSØ DB15 PLEASE READ THESE INSTRUCTIONS CAREFULLY

TO FIND A QUALIFIED INSTALLER, FUEL SUPPLIER or CHIMNEY SWEEP, CONTACT:

UK:

HETAS Ltd Orchard Business Centre Stoke Orchard, Cheltenham Gloucestershire GL52 7RZ www.hetas.co.uk

Rol:

Irish Nationwide Fireplace Organisation, 162 Capel Street, Dublin 1 Tel:01-801-5959 www.fireplace.ie

The Morso DB15 may be used in smoke control areas strictly in accordance with these instructions. when burning:

- UK: Untreated wood logs. lignite briggettes or authorised smokeless fuels (Exempted from s20 of the Clean Air Act 1993]
- Rol: Wood logs, smokeless fuels or peat briquettes. but not petroleum coke (Control of Atmospheric Pollution Regulations, 1970)

THIS APPLIANCE BECOMES EXTREMELY HOT IN USE.

A fire-guard should be used if children or the infirm are present. The installer is required to EXACTLY follow these instructions and to completely comply with all local, national and international standards.

Building rules and regulations are available at www.soliftec.com

Specific rules apply where

vulnerable materials - take

chimney for cleaning through

provided. The chimney must:

· Generate a draught in use

of at least 12Pa (0.05ins wg)

the temperatures generated.

Be capable of withstanding

Be absolutely incapable

of leaking fumes into

Several different forms of

chimney may be suitable.

but they will commonly need

the dwelling

At least 5m high.

to be:

specialist advice. It is not

the stove, inspection and

sweeping access must be

the flue passes through

timber, thatch or other

possible to access the

YOUR CHIMNEY

INSTALLING a stove is

a 'controlled service'. the law expects that it is either supervised by a qualified installer or that the building inspector is informed. Check with your local authority. A certificate of installation must be issued by building control or a competent person scheme

ASBESTOS Your stove does not contain asbestos, but take care to avoid disturbing asbestos in an old installation.

WEIGHT Your stove is heavy (187kg) take great care when moving it and ensure that the intended fireplace can support the weightconsider fitting a load distributing plate.

YOUR FIREPLACE Stoves become VERY hot, the setting must be made entirely of durable non-combustable materials, take care to observe the safe distances to combustibles shown on the back page.

Terminating at least 1m above any roof ridge. Have an internal crosssection equivalent to not less than 150mm dia and not more than 0.14m² (eg 375 x 375mm)

· Be free from even the slightest crack or source of leakage.

- Have no bends sharper than 45° or comply with BS 15 287.
- · Be swept and entirely free of obstructions
- · Be connected only to this one appliance.
- · Be of thick masonry or otherwise adequately insulated
- · Conform to local and national building regulations.

AIR SUPPLY: The stove needs a fresh air supply complying with the requirements of building regulations to operate correctly. Where needed, it is wise to fit an outside vent as close to the fire as possible. Correctly sited and sized, air will only move between the vent and the stove, preventing unpleasant draughts.

An extractor fan, or another flue-using appliance, or an open fireplace or chimney, in the same building, may remove this air.

FITTING Fit the flue collar to the top of the stove and seal to the chimney using a short length of uninsulated pipe. Two possible ways of doing this are shown below.

Whichever method is used it is imperative that the route for gases from the stove to the chimney terminal is completely air-tight; even the tiniest gap or crack can spoil the updraught. Seal all joins with fireproof cement and/or heatproof rope.



HEATING SYSTEM DESIGN This appliance is for use with an open-vented water heating circuit at a maximum pressure of 2 Bar, equivalent to a static head of 18 metres. Suggested circuit designs are given on page 10 & 11.

IMPORTANT! CHECK THE INSTALLATION!

Once installed check that:

- 1) The route for gases from the stove to the chimney terminal is completely airtight, unobstructed and able to be swept. (access hatches may be required.)
- 2) The entire fireplace construction is of durable non-combustable materials
- 3) The flue presents a draught in use of at least 12Pa
- 5) A CO alarm is fitted
- 6) Flue data plate is completed and fixed in the fireplace recess or utility cupboard
- 7) The water system can never exceed 2 Bar pressure, has provision to dissipate or store surplus heat, can accommodate boiling, and has means to minimise the circulation of cool water through the boiler
- 8) Light stove and ensure it burns controllably and does not emit fumes to the room
- 9) Demonstrate the operation of the stove to the householder

GUARD AGAINST CONDENSATION!

Solid fuels contain water which can condense on cool boiler faces to cause rapid corrosion and failure. Always fit a device such as a low-level thermostat to minimise cool water circulating through the boiler. ALLOW FOR OVERHEATING! This boiler has automatic control, but there must be some way of dissipating surplus heat - fit a high-level thermostat to override controls and run the central heating if there is risk of boiling. Follow the rules given in this instruction booklet. An old-fashioned 'heat leak' radiator will not suffice. LIVING WITH YOUR STOVE Every fuel, chimney and condition of use is different. Only experience will show which are the best settings for you.

HOW THE DB15 WORKS

The Morsø DB15 is a 'downburn' stove where the waste gases pass down through the fire bed and into the 'afterburn' chamber (A) reaching temperatures of 1000°C at the back where the smoke is burned away. This system gives very clean combustion and extremely high efficiency on a wide range of fuels.



LIGHTING If lighting after a period of non-use, do check that the flueways and chimeny are completely clear. Place two or three firelighters close together, or screwed-up paper covered with dry kindling, at the back of the grate and light them. When they are burning well gently fill the fire with dry fuel. Downburn stoves ignite very quickly, but they begin to burn at the back, so the full flame may not be apparent for a few minutes.

STOKING Don't fill to the point where fuel touches roof of the stove.

CONTROL Correctly installed (see page 10) this stove will control itself for minimum fuel consumption. The manual control on the top of the door overrides the automatic control. It can be helpfully used when first lighting or refuelling, but keep it shut. or nearly so, in normal use, The Thermostat Dial on the lower right of the stove controls a device which senses the temperature of water in the boiler and automatically allows air in to make the fire burn more or less fiercely. so that water always leaves the boiler at about 50°C on the lowest setting to about 90°C at the highest. Once you have found the most appropriate setting for your house usually about midway it shouldn't be necessary to adjust it again. To adjust the house temperature, adjust the radiator thermostats (if fitted) or your central room thermostat. These controls will then automatically limit or allow the flow of water through the boiler, which will adjust itself accordingly. Your fire will die down or flare up and the central heating pump go on or off as needed in response to the temperature of rooms and water. When you adjust the central controls. wait an hour or two for the adjustment to 'stabilise' controls are deliberately made to react slowly to prevent rapid on-off-on-off cycling. EMPTYING ASHES If you're

using mineral fuels like anthracite or manufactured smokeless fuels - then empty the ash regularly, if it builds up it will severely damage the grates. If you mainly use wood, then do the opposite, let the ash and charcoal build up. To empty the ash agitate the firebed by using the tool to operate the riddling mechanism on the right-hand side. Use the ashpan tool to remove the ashpan. Remember to let ash cool before disposing in plastic sacks or dustbins. There is no need to empty every last speck, but ash from mineral fuels (coal etc) should never be allowed to build up so that it comes into contact with the underside of the grate EXTENDED BURNING Allow

the fire to burn down to a low, hot firebed. Empty the ash, fully fill with hard fuel such as anthracite and your stove can burn for up to twelve hours without attention.

KEEPING THE WINDOW CLEAN

Reduce the risk of staining by using only very dry fuel. Severe stains can be removed when cold with Morsø glass cleaner. D0 N0T use proprietary solventbased stove window cleaners. The window is not glass but a transparent ceramic, when using some solid fuels it may develop tiny hairline surface cracks, these are harmless, and a known characteristic of some mineral fuels.

OPENING THE DOOR

This stove is designed to be operated only with the door closed. Open the door very slowly to minimise fume emission and prevent hot fuel falling out.

SUMMER SHUT DOWN

Before a long period of non-use, empty fuel and ash and leave all the air controls open and the door slightly ajar to allow ventilation to reduce condensation.

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FUELS The Morso DB15 is one of very few stoves which can burn almost any solid fuel. But there is no 'perfect' fuel, so we strongly recommend that you try a selection of fuels (or mixtures) to find which suits you best. Do avoid dusty materials like sawdust, they can burn far too violently.



SMOKE CONTROL In certain areas rules apply to reduce smoke nuisance. Check with your local authority.

WOOD only emits as much carbon to the atmosphere as the tree took in when growing, so wood is considered the 'carbon neutral' fuel. When wood is cut down its cells are full of water. Burning such wet or 'green' wood wastes heat in making steam and produces flammable, acidic tars which will cling to, and rapidly damage, your stove and chimney. Split logs will typically take two years to become reasonably dry, round loas very much longer. Cracks in the ends, a hollow sound when tapped and bark falling away are all signs that a log may be ready for use. Alternatively use a Morsø moisture meter. The fine, white residue produced when wood hurns is not ash but the remains of cell walls which can burn if kept hot enough, so don't de-ash the fire until absolutely necessary when using wood. For best performance, and always for low smoke emission:

- Split logs length ways for drying
- Use logs no bigger than 100mm x 250mm
- Ensure logs are absolutely dry (less than 20% moisture)

- Fill the stove loosely, so air can circulate between logs.
 Fill 'little and often'
- When first lighting, or reviving a fire from embers, use only small pieces of wood.
- Keep a constant, deep, bed of charcoal and wood ash beneath the burning logs. This may need several firings to build up.

JOINERY WASTE Dry wood offcuts will burn well, but don't expects soft wood waste to burn as cleanly or for as long as hardwood logs. PEAT Sod turf must be thoroughly dry.

LIGNITE or BROWN COAL

is a natural mineral, between peat and coal. It lights easily and burns well, but produces much ash.

BITUMINOUS COAL

[Sold as 'Housecoal' or 'Polish'] (does NOT burn smokelessly, and is not permitted in smoke control areas of the UK and Rol] is raw, natural coal containing a high proportion of bitumen. The DB15 is one of very few stoves which can burn this fuel with high efficiency. But be aware that it makes lots of tarry smoke and large volumes of flammable gas which can sometimes make it difficult to control. ANTHRACITE is a natural hard, shiny form of coal. Slow to light, it can burn for very long periods with great heat. Despite its high priceper-bag it generally works out to be one of the cheapest of all fuels. Use the 'small nuts' size.

COKE is coal from which the smoke has been removed. Sometimes difficult to light, it burns very cleanly. BRIQUETTES Are compressed blocks of fuel, generally able to burn for long periods and remarkable for their consistency. 'Homefire' and 'Phurnacite' are smokeless types while other brands are made from lignite, peat or housecoal.

PETROLEUM COKE sold as 'Petcoke', 'Longbeach' and other names, is an industrial reagent made from oil sometimes simply sold as 'smokeless fuel' without any brand designation and identifiable by a structure of tiny cohered beads. Although the DB15 can burn this fuel safely, it WILL rapidly degrade interior parts and may damage the flue. HOUSEHOLD WASTES Some plastics give off toxic fumes when burned and

remember that batteries and aerosols explode! The stove is not an incinerator, so only ever use the recommended fuels and NEVER use liquid fuels in any form. PROBLEMS Problems like those listed here are usually due to some difficulty with the installation, chimney or fuels, so please check back through this leaflet carefully. If necessary seek specialist advice.

SMOKE FROM THE CHIMNEY It is quite normal for a little smoke to be emitted from the chimney, especially when the fire is cold.Use only VERY dry wood or smokeless fuels. Is the chimney high enough and hot enough to generate the necessary 12Pa draught?

POOR HEAT OUTPUT

This appliance is very easily capable of producing the guoted heat outputs given suitable fuels and a chimney capable of developing sufficient draught. Is the chimney too short or becoming cool or damp? Is the fuel completely dry? Have the central controls been set correctly? Is the building sufficiently well insulated? CONDENSATION onto cool surfaces inside the stove can be severe if fuel is in any way damp. Use only very dry fuel. It is vital that the heating circuit is fitted with a device, such as a low-limit thermostat, to minimise cold water circulating through the boiler.

SMOKE COMING INTO ROOM A little smoke leaking into the room during refuelling is normal, but fumes are poisonous and recurrent smoke emission must NEVER be tolerated, causes might be:

NEW STOVE There is often a smell and sometimes visible fumes as the paint cures. This normally stops after an hour or so.

INADEQUATE SEALS

Are all flue pipes and connectors absolutely gas-tight? Even the

tiniest crack or gap can spoil the draught.

BLOCKED FLUEWAYS

Has soot and ash collected above the inner back part of the firebox? UNSUITABLE, BLOCKED OR UN-SWEPT CHIMNEY

The first requirement for correct operation is a sound chimney. Check the requirements earlier in this document and in any case of doubt engage a professional sweep or chimney engineer. POOR AIR SUPPLY Lack of air to the fire is a common cause of smoking and poor performance. Air supply problems may be worse in certain wind conditions (often incorrectly ascribed to'downdraught', which is in fact verv rare), where air can be sucked out of the room. The answer is to fit an air vent as near to the fire as possible, facing into the usual wind direction

DOWN DRAUGHT Wind can blow down a chimney if there is something higher nearby such as a tree, hill or high building.

POOR CHIMNEY DRAUGHT-

Chimney draught in use MUST be at at least 12Pa.

CHIMNEY FIRE In the rare event of deposits inside the chimney igniting (roaring sound, plus dense smoke and sparks from the chimney) immediately close the door, shut all air controls and call the fire brigade.

MAINTENANCE

MONTHLY Open the fire door and inspect the top flue passages. Gain access for cleaning by using the tool to lift off the lid (B) on the diagram on page 5. ANNUALLY - SWEEP THE CHIMNEY

The entire length of the chimney from stove to outlet should be swept annually, more often if smoky fuels are used.

NEW PARTS Your stove has been extensively tested for safety - please don't try to modify it and always obtain genuine spare parts.

SURFACE FINISH Wipe the stove body with a slightly damp cloth when cool. NEVER use aerosol spray or wax near the hot fire -they can ignite. Painted steel parts can be refurbished using Morsø spray paint. Your stove generates VERY high temperatures. Eventually the internal parts will require replacement. Help parts to last by:

- Using only recommend, very dry, fuels.
- Emptying the ash very regularly when using mineral fuel -never allow it to touch the underside of the grate.
- Cleaning the flueways regularly.
 Avoiding 'over-firing'

PARTS AND ACCESSORIES Standard Spare Parts for Morso DB15 Central Heating Stove

KEY	SPARE PART	PART NUMBER
А	WINDOW	MOR0029
в	FRONT FIREBAR	MOR0032
С	RIDDLING BAR	MOR0031
D	THERMOSTAT ASSEMBLY	MOR0032
E	ROOF BRICK, PAIR, WITH SEALS	MOR0033
F	SIDE BRICK, PAIR, WITH SEALS	MOR0034
G	MID BRICK, WITH SEALS	MOR0035
н	FIREBAR, UPPER	MOR0036
к	FIREBAR, LOWER	MOR0037
м	ASHPAN	MOR0038
	TOUCH-UP PAINT	MOR0039
	OPERATING TOOL	MOR0040
	ROPE SEAL KIT	MOR0041
	MINERAL FIBRE SEALS BETWEEN BRICKS	MOR0042



BOILER STOVE CENTRAL HEATING SYSTEMS

This is a rough guide to specifying and fitting central heating using a solid fuel boiler stove with thermostatic control. It doesn't cover every detail, which will need to be determined on-site by a skilled heating engineer.

"Wet' solid fuel central heating systems use the same types of pipework (including microbore, plastic) and heat emitters (radiators, underfloor, etc), as other fuels and they can likewise come on in the morning, go off at night and regulate themselves. Systems must...

1. CONTROL THE HEATING SYSTEM

Stove boilers control their own water temperature by an internal thermostat, so controls such as time clocks and thermostats regulate flow through the heating circuit, not the boiler.

2. GUARD AGAINST CONDENSATION!

Solid fuels contain water which can condense on cool boiler faces to cause VERY rapid corrosion and failure. Use very dry fuel and always fit a device such as a low-level thermostat to minimise cool water circulating through the boiler.

3. ALLOW FOR EXCESS HEAT

The fire can close down automatically, but it can't completely stop combustion and output will vary considerably during a fuelling cycle. There must be some infallible means of dissipating, and preferably storing, surplus heat, for instance a hot water cylinder or a thermal store and always a system to run the central-heating pump if there is risk of boiling. Should thermostat and pump fail together, there must be infallible provision to cool the system, or allow it to boil, for instance through an open vent

(The old-fashioned idea of deliberately wasting heat through a permanent "heat leak" radiator not only throws heat away, it just will not suffice with powerful modern stoves.)

HEAT REQUIREMENT

GET THE RIGHT SIZE HEATERS

Guesswork won't do. A preliminary estimate of heat requirement for each room can be got from the table here. Example: A room 6m x 5m x 2.8m has volume of 84m³. If it was a ground floor room in the corner of a two-storey house, in which the adjacent rooms and the one above were also heated, then 2 unheated outsidewalls + 1 outside floor = 3 unheated faces. the factor in the table is 40 Watts per m³, so 84m³ x 40 = 3360 Watts, or 3.36kW. A radiator, or radiators, emitting at least 3.36kW should be specified. Don't forget that, with boiler stoves, the room output and water output go up and down together - turn the central heating down, and the whole stove goes cooler. It is usually wise to fit a radiator (with thermostatic valve) in the fireplace room. The actual value varies with the shape, exposure, draughtiness and temperatures. For larger installations or whole-house heating, use the more accurate 'U-Value method - an online heat-need calculator is available at www.soliftec.com.



APPROXIMATE HEAT REQUIREMENT OF ROOMS			NUMBER OF UNHEATED FACES					
	Watts per Cubic Metre							
INSULATION	No effective insulation eg: all-glass rooms with single glazing, barns, workshops, tents		132	145	158	170	183	
	Poor insulation eg; single glazing, little loft insulation, uninsulated cavity walls, draughts	62	70	78	86	94	102	
	Moderate insulation eg: thick solid walls, some loft insulation, some draught-proofing		35	40	44	48	53	
	Good Insulation eg: some wall insulation, thick loft insulation, double glazing, draught-proofing		24	27	31	34	37	
	Best insulation eg: properties built to 2008 UK standards		18	20	22	24	26	
		WATTS (W) PER CUBIC METRE						

CONTROLS

Your stove has a built-in mechanical thermostat to regulate its water temperature. A tiny vial of oil is fitted in the boiler. As the boiler water gets hotter, the oil expands along a fine tube, moves a bellow outward, moving an arm, which closes off air to the fuel and so slows combustion. So, if the time clock or room thermostat determines that no heat is needed, it stops the circulating pump; without

water circulation the boiler begins to get too hot, the oil expands, shuts off air and the fire dies down. If there is demand for heat, for instance in the morning, the pump comes on, colder water enters the boiler, the air-flap opens and the fire blazes up. The control dial on the stove does not directly turn the stove up and down, it sets the water temperature at which the thermostat will begin to shut the fire down.

We recommend a control system regulating the central-heating pump through (1) a single-channel time clock, (2) a centrallylocated room thermostat (not in the stove room) and (3) thermostatic radiator valves on all but one radiator. A low-level (about 50°C) pipe thermostat to prevent pumped circulation of cool water (which can cause condensation. rust. and deplete stored hot water) and a high level one

(about 90°C) to override controls and run the heating circuit to dissipate heat if there is a risk of boiling. Stored hot water for taps is not controlled, but accumulates during normal operation, especially during periods while central heating is not required.



Typical wiring layout through connector block (return dotted) 'Teddington' thermostat (Normal cold '0' setting - about 7mm open)

- A c90°C thermostat can close to override

allother controls and operate the central

heating pump to dissipate heat if there is

controls controlling the central-heating pump.

consider fitting a thermostatic mixing valve.

controlled, it may become scalding hot -

- An electric immersion heater is provided

for summer hot water. Temperatures are

- There are time and room-temperature

- Hot water for taps is not separately

approximate and will vary.

a risk of boiling.

WATER SYSTEM CONNECTIONS

Outlines of some possible installation schemes are shown here. In both of them:

- Possible boiling is safely accommodated by a vent pipe leading directly to an open feed and expansion tank.
- A c50°C low-level thermostat brings the pumped system 'on' only when the fire is hot. It prevents stored hot water from being depleted and cold water chilling the boiler. Vital to prevent corrosion.

SCHEME 1: TRADITIONAL 2-SIDE

Compact and guick to heat. Stores hot water for taps, but radiators will go cold if the fire goes out. Recommended for occasional use or where longburning mineral fuels are used. One side of the boiler feeds, by gravity circulation alone, an indirect coil to heat a hot-water storage cylinder and has feed and vent connections to a small open expansion tank. (Gravity piping requires careful calculation but will generally be at least 28mm diameter, rise continually and have a horizontal distance from the boiler of no more than its vertical distance above it.) The other side of the boiler

connects to the pumped central heating circuit, which activates only when a timeclock, room thermostat and c50°C pipe thermostat (on the domestic hot-waterside flow pipe near to the boiler), are all 'closed'. A second electrical supply feeds a pipe thermostat on the flow pipe to domestic water very near to the boiler and set to close above c90°C, such that if there is risk of boiling the central-heating pump will always operate to dissipate heat.



Scheme 1: Traditional 2-side system with gravity hot water. Recommended where mineral fuels are mainly to be used

SCHEME 2: THERMAL STORE

A large body of water is stored at a high temperature. to supply both taps and central heating when needed. High and low output phases are evened-out; heating can operate even if the fire is out, ea. next morning. Recommended for all uses. and always where wood is the main fuel. In one system. a 'combined' thermal store or 'heat bank' of about 300 litre capacity is directly heated by the boiler and has an indirect coil [1] in its highest (hottest) part to supply tap water, below which the central-heating flow is taken-off as needed. Pump (P1) circulates hot water from the boiler to the store only when a pipe thermostat on the boiler flow pipe is above c50°C.

LINK-UP TO ANOTHER BOILER

Your stove can be linked into an oil or gas central heating system and operate completely automatically. One method is to use a thermal store system, like Scheme 2 above, with a separate coil (for pressurised boilers) or extra direct connections (for open-vent boilers). Another method uses a 'neutral point manifold' where both boilers are connected to the manifold, which is in turn connected to the hot water and radiator circuits. Suitable devices come from www.esse.com and www.systemlink.ie.

The separate, central heating pump (P2) operates only when the time-clock, room thermostat and a second c50°C thermostat responsive to temperature in the store, areall 'closed'. A second thermostat towards the top of the store closes

at c90°C to dissipate heat if there is risk of boiling. Extra indirect coils may be provided at [2] to accommodate a supply from a second central-heating boiler, and at [3] to receive relatively low-grade heat from solar panels.



Scheme 2: Thermal store system. Recommended for all uses, and always where wood is the main fuel.



Outline of multiple boiler Link-Up using a neutral-point manifold

CE

These stoves exceed the safety and performance requirements of European Standards Intermittent burning solid fuel roomheaters for installation with a single dedicated chimney. Independently tested by SGS Nederland BV. Notified Body Oko8 - May 2011

	Morso DB15 Central Heating Stovewith DTRG Downburn Firebox						
Fuel	Anthracite	Biomass (Beech Logs)	Biomass (Joinery Waste)	Lignite	Bituminous Coal		
Test Standard	EN 13240:2001 +A2:2004						
Flue Draught Pa (ins WG)	12	12	12	12	12		
Efficiency %	80.7%	80.0%	78.2%	79.5%	80.7%		
Recommended Rating to room kW	5.8	5.7	6.2	7.8	9.1		
To water, kW	6.3	8.8	7.9	7.7	7.6		
Total Output, kW	12.1	14.5	4.1	15.5	16.7		
Mean Flue Gas Temp Rise °C	200 °C	263 °C	251 °C	276 °C	241 °C		
CO % @ 13% o ₂	0.06%	0.24%	0.07%	0.24%	0.23%		
Minimum room air entry requirement	8000 mm ²						
Minimum Clearance to combustibles	100mm at sides and back Temperature underneath can exceed 100°C - traditional hearth required						

MORSØ UK UNIT 7 THE IO CENTRE, VALLEY DRIVE RUGBY, WARWICKSHIRE CV21 1TW WWW.MORSO.CO.UK

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