

THE GLEMBRING HEATER

IG 92

0501

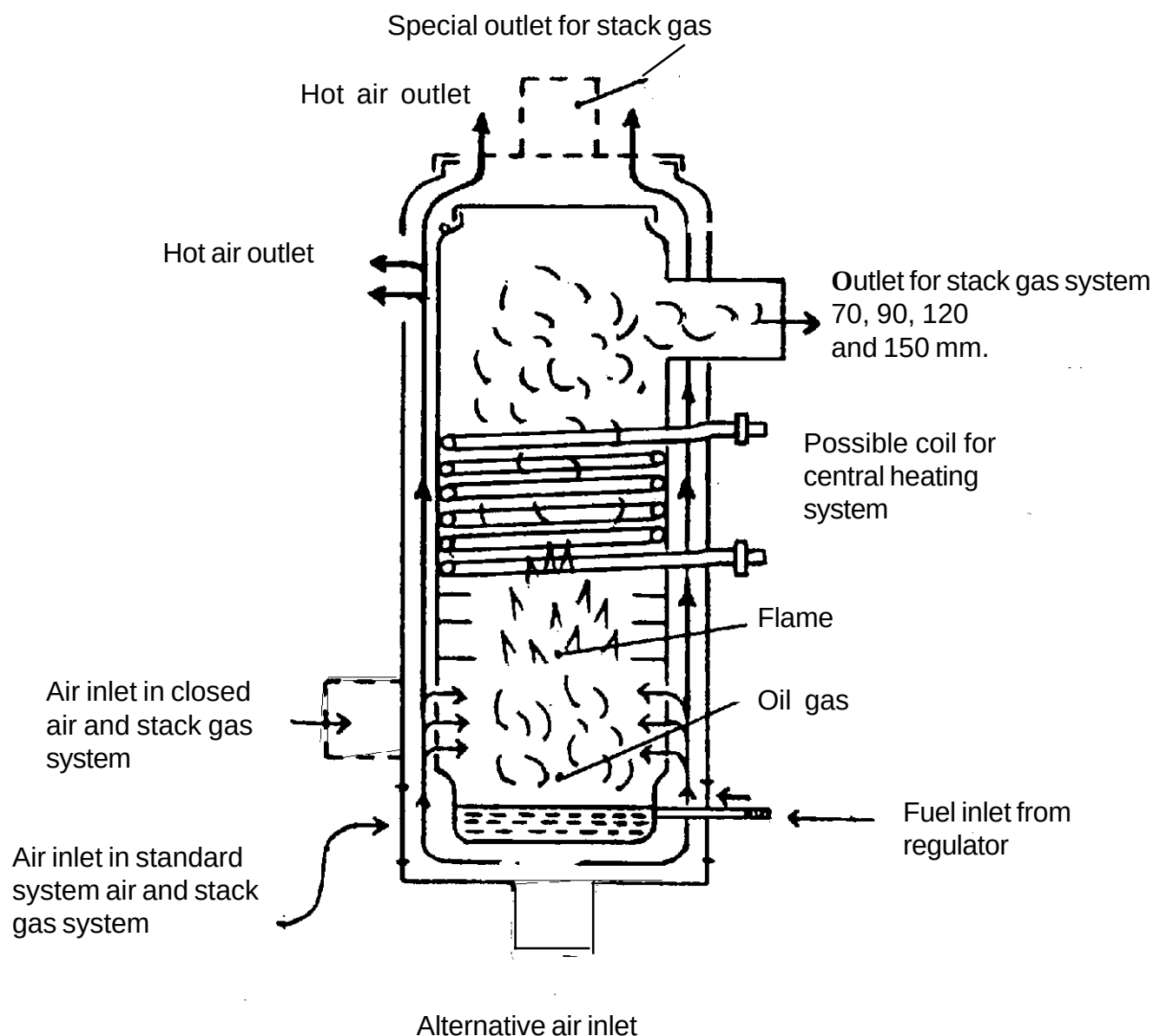


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Email: info@glembring.se

Internet: www.glembring.se



Description of function for Glembring heaters

The principle of the system is that floating fuel evaporates and mixes with air, before the actual combustion occurs. In our heaters we have a special turbo unit which efficiently mixes gas and air. This patented design of the carburation and combustion unit gives high effect and soot free burning.

As shown in the principle sketch, the heater can also be equipped with a built in coil to heat circling water, in a central heating system.

Air inlet for combustion can be fitted in different ways. As a standard the heater uses the air from the space where it is placed, but various regulations from local authorities, can demand a closed system of air and stack gas outlet, and then it is possible to arrange the inlet so as to meet the requirements.

Universal heater Glembring IG 92/5

In stainless polished steel alternatively in painted sheet iron

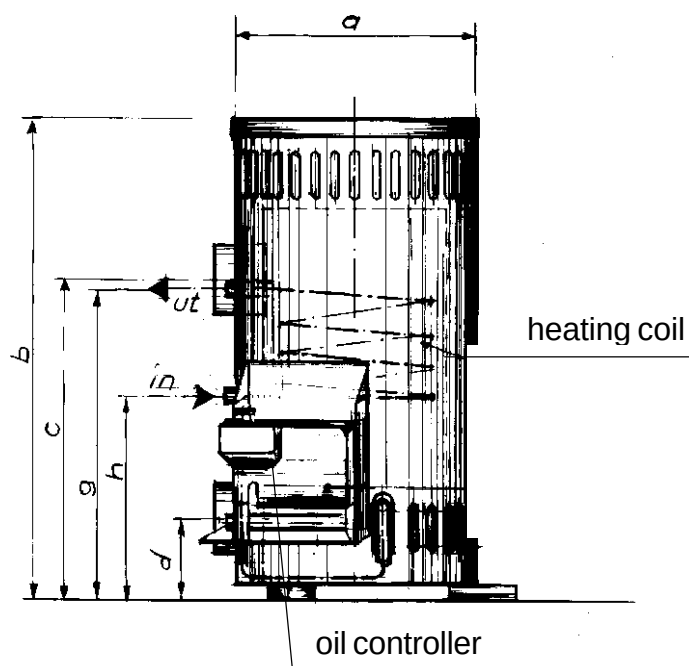
The heater is especially designed for boats, caravans and houses.

The heater can also be delivered with a built in coil for central heating system.

The heater has separate outlet and inlet for the exhaustgas and the combustion air.

Technical data:

Maximum output	1,8 kW
Minimum output	0,5 kW
Maximum fuel consumption	0,2 liter pro hour
Minimum fuel consumption	0,1 liter pro hour
Weight per heater unit	5,0 kg
Pipe diameter	70 mm



a = 175 mm

b = 425 mm

c = 325 mm

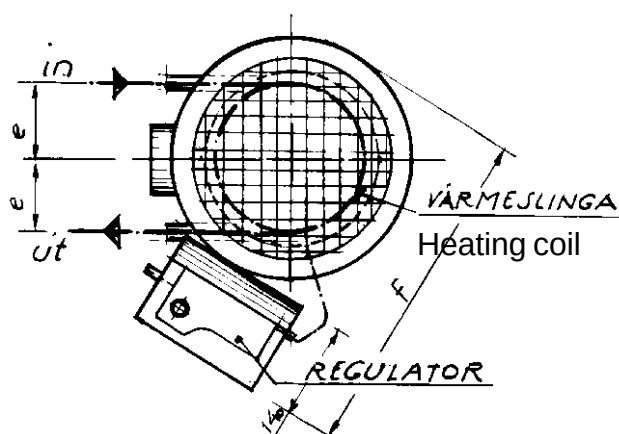
d = 90 mm

e = 80 mm

f = 260 mm

g = 290 mm

h = 110 mm



Universal heater Glembring IG 92/6

In stainless polished steel alternatively in painted sheet iron

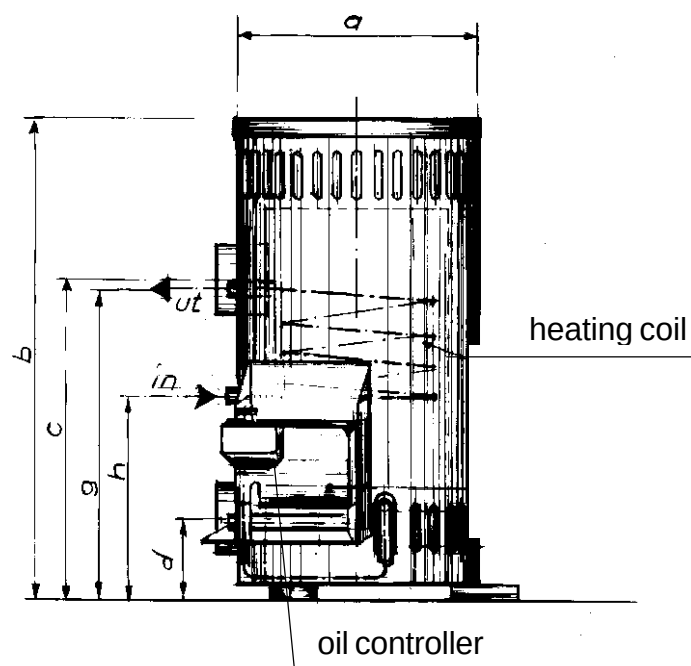
The heater is especially designed for boats, caravans and houses.

The heater can also be delivered with a built in coil for central heating system.

The heater has separate outlet and inlet for the exhaustgas and the combustion air.

Technical data:

Maximum output	2,0 kW
Minimum output	0,5 kW
Maximum fuel consumption	0,3 liter pro hour
Minimum fuel consumption	0,1 liter pro hour
Weight per heater unite	7,0 kg
Pipe diameter	70 mm



a = 245 mm

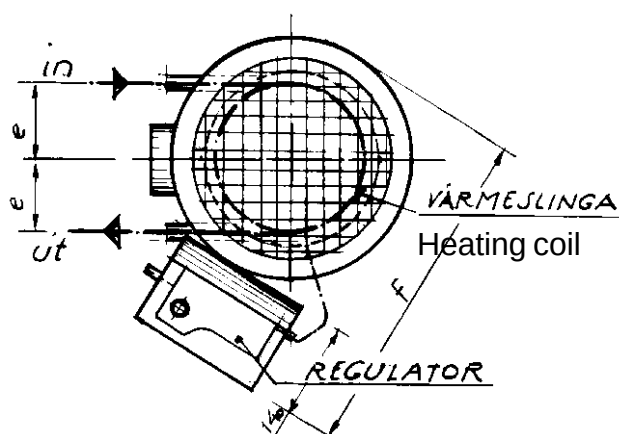
b = 450 mm

c = 355 mm

d = 115 mm

e = 78 mm

f = 346 mm



Universal heater Glembring IG 92/7

In stainless polished alternatively in painted sheet steel

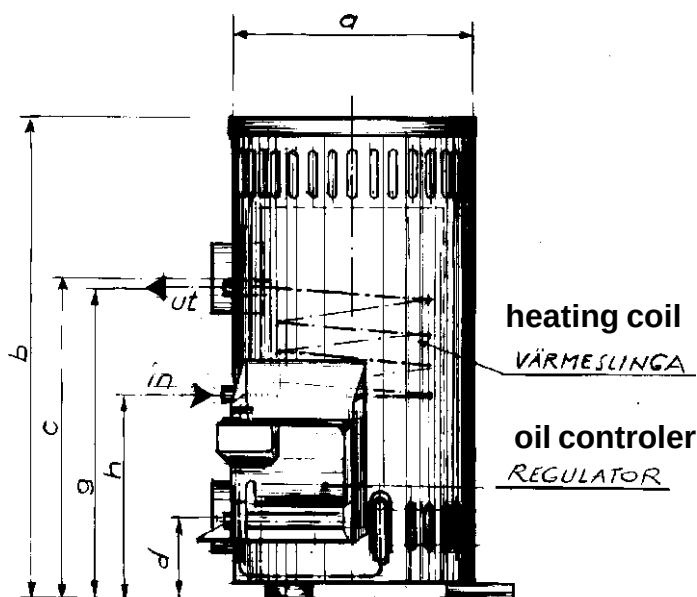
The heater is especially designed for boats, caravans and houses.

The heater can also be delivered with a built in coil for central heating system.

The heater has separate outlet and inlet for the exhaustgas and the combustion air.

Technical data:

Maximum output	4,0 kW
Minimum output	1,0 kw
Maximum fuel consumption	0,5 liter pro hour
Minimum fuel consumption	0,2 liter pro hour
Weight per heater unite	9,0kg
Pipe diameter	90 mm



a = 265 mm

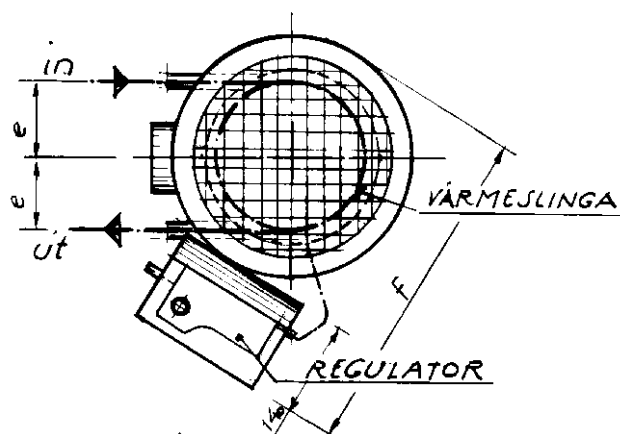
b = 600 mm

c = 455 mm

d = 125mm

e = 95 mm

f = 380 mm



Universal heater Glembring IG 92/8

In stainless polished steel alternatively in painted sheet iron

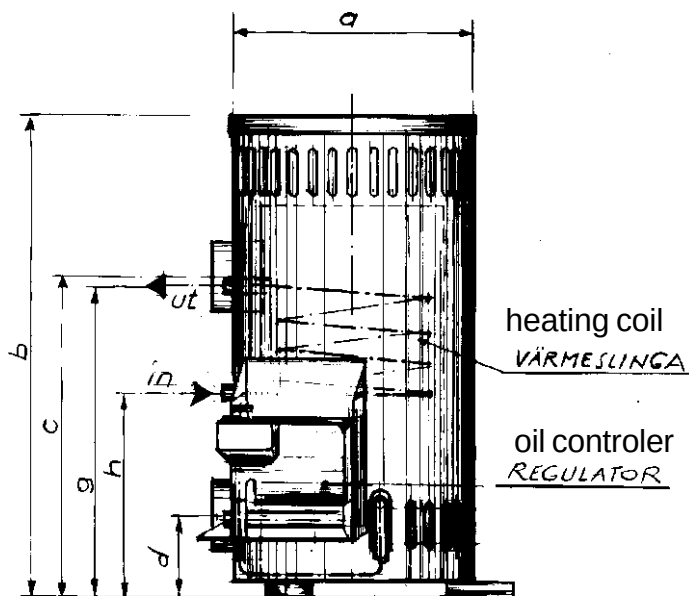
The heater is especially designed for boats, caravans and houses.

The heater can also be delivered with a built in coil for central heating system.

The heater has separate outlet and inlet for the exhaustgas and the combustion air.

Technical data:

Maximum output	8,0 kW
Minimum output	1,2kW
Maximum fuel consumption	1,0liter pro hour
Minimum fuel consumption	0,2 liter pro hour
Weight per heater unite	14,2kg
Pipe diameter	90 mm alt 120 mm



a = 325 mm

b = 680mm

c = 540 mm

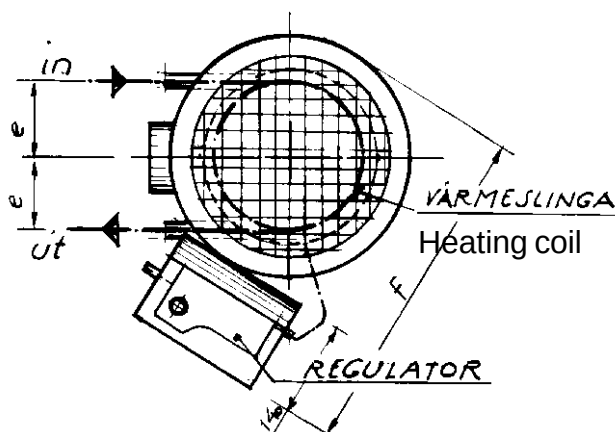
d = 120 mm

e = 30 mm

f = 440 mm

g = 525 mm

h = 290 mm



Universal heater Glembring IG 92/10

In stainless polished steel alternatively in painted sheet iron

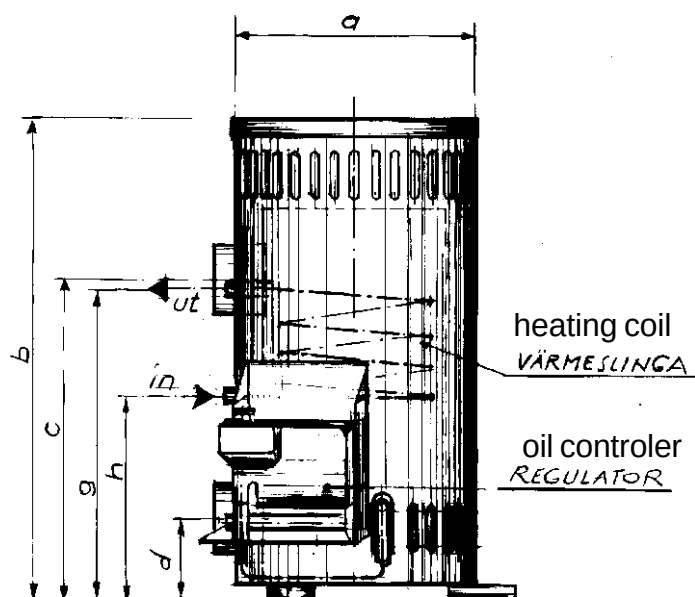
The heater is especially designed for boats, caravans and houses.

The heater can also be delivered with a built in coil for central heating system.

The heater has separate outlet and inlet for the exhaustgas and the combustion air.

Technical data:

Maximum output	12,0 kW
Minimum output	1,9 kw
Maximum fuel consumption	1,6 liter pro hour
Minimum fuel consumption	0,3 liter pro hour
Weight per heater unite	17,8kg
Pipe diameter	120 mm alt 150 mm



a = 390 mm

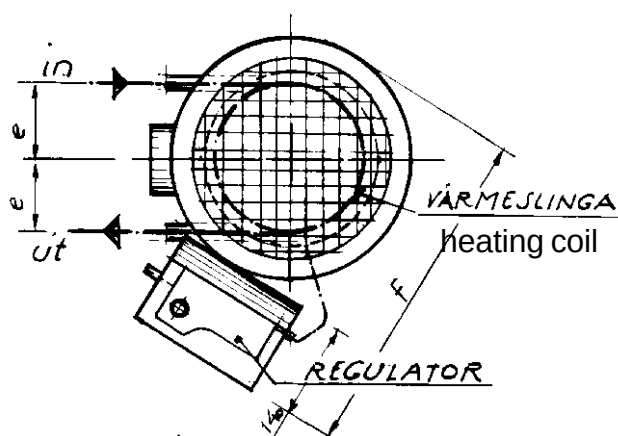
b = 765 mm

c = 545 mm

d = 155mm

e = 130 mm

f = 510 mm



To choose the size of convectors

A heater with an internal copper coil must always be connected to a system of convectors. The surface that radiates the heat from the water into the surrounding air, must be large enough. If not, the temperature of the circulating water will gradually increase, and eventually boil. The output of the heater then must be turned down and the maximum capacity of the heater cannot be used.

Each square metre of convector surface can radiate 515 kcal/h which is equal to 600 Watt. The difference in temperature between the outgoing flow of water to that of the returning water is approximately 20° C. These figures are very approximate and vary depending on several facts. As a basis for current calculations however, they are acceptable.

Temperature control by thermostat

The system can be provided with a thermostat which controls the heat output, thus keeping the temperature of the room at the desired level.

There are two ways to control the air temperature:

- A. A two metre long distant pipe with a sensor registering the temperature some distance away from the heater.
- B There is one more model for control of room temperature. A sensor in the wateroutlet from the stove registers the watertemperature. Using the controlknob on the aquastat you can choose at what watertemperature the capacity has to be reduced to the lowest one. If colder roomtemperature the funktion will be reversed.

The common thing for all models is that, by using a knob, it is possible to determine, that at a certain temperature, the thermostat will decrease the output to the low starting output. When increased output is necessary, the regulating function of the thermostat stops, and the temperature increases to the level, previously adjusted by the use of the knob.



For water model B
Article number 2300102

For air model A
with distant pipe
Article number 2300101



Supplemental electrical heating

Starting:

By using a switch, it is possible to regulate the capacities to 1000W or 2000W. The built in circulation pump works constantly in both positions.

When 220 V AC single phase is available it is possible to run the central heating system together with an electrical heating element of 2000 Watt

By connecting the element in series with the system, the only thing required is to connect the plug for the element to the electrical system.

The electrical element is built-in with the circulation pump, which gives a very effective circulation of the heat medium.

A built-in superheating cover provides safe operation conditions.

The element and the central heating system can be operated simultaneously, or separately.

The electric element can be controlled by the room thermostat.

Electrical installation:

This adapter for electrical heating shall be connected to 220 V Permanent installation of room thermostat or wall socket for 220 V must be done by an authorized electrician, according to local regulations.



Article number: 2763000

Heat Convectors

If heat has to be distributed to different rooms you will have to arrange a central heating system. This means a stove with a built in coil for heating the circulating water. This water, mixed with glycol, is transported out into the system and is continuously reheated through the circulation back into the stove. The convectors transport the heated water out into the environment, which gives a comfortable and even heating.

It is important that the convectors have a sufficient heating-surface. You also have to choose the best model of convector for your demand. It is also important to install the system to have the full capacity. Below on this page you will find suggestions and tips and in our manuals for each stove you will get more information.



Convector element with lamellae and pipe
22 mm of aluminium.
Measures: height 60 mm, deep 60 mm.
Capacity 400 watt/meter.
Length: 400, 700 and 1000 mm
Article number: 2910400, 2910700, 2911000



Convector element with lamellae of aluminium
and pipe 22 mm of copper.
Measures: height 60 mm, deep 40 mm. Capacity 400 watt/meter.
Length: 250, 500, 750 and 1000 mm
Article number: 2930250, 2930500, 2930750, 2931000
Those convectors are suitable to be built in or where
no damage can be caused. There are no protection sheets
on the front or on the rear.

Convector element with lamellae and pipe 22 mm
of aluminium. With front protection and flanges for
installation.
Measures: height 85 mm, deep 60 mm. Capacity 400 watt/meter.
Length: 600 and 900 mm.
Article number: 2900071, 2900101.



Convector element with lamellae of aluminium and
Pipe with 22 mm diameter of copper.
With front protection and flanged for installation.
Measures: height 100 mm, deep 50 mm. Capacity
450 watt/meter.
Length 250, 500, 750 and 1000 mm.
Article number: 2940250, 2940500, 2940750, 2941000.

Convector element with lamellae and pipe 22 mm diameter
of aluminium. With back protection of synthetic material.

Designed for built in use.
Measures: height 205 mm, deep 65 mm. Capacity 400 watt/meter.



Convactor element model P20 with lamellae of aluminium and double pipes 15 mm diameter of copper.
 Measures: height 141 mm, deep 32 mm. Capacity 385 watt/meter.
 Length: 250, 500, 750 and 1000 mm
 Article number: 2920250, 2920500, 2920750 and 2921000.
 This model is designed for small and narrow rooms where Other convectors cannot be installed.
 End cover for P20 article number 2920200



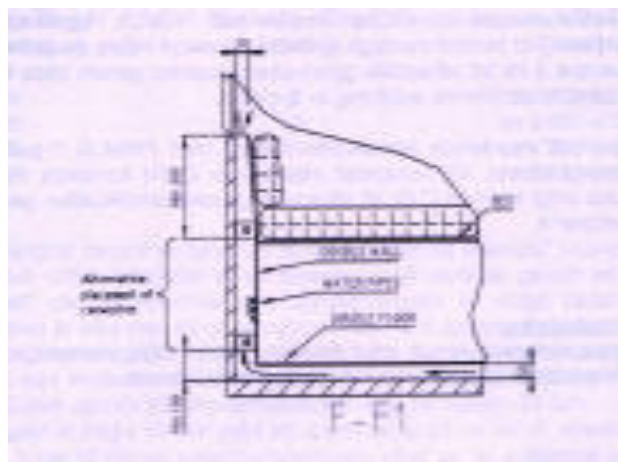
Convactor element model P90 with lamellae of aluminium and double pipes 22 mm diameter of copper. With front protection of aluminium,
 Measures: height 165 mm, deep 82 mm. Capacity 550 watt/meter.
 Length: 250, 500, 750 and 1000 mm
 Article number: 29990250, 2990500, 2990750 and 2991000

Back cover for model P90. Article number 2990100.
 Attachments complete. Article number 2990200.

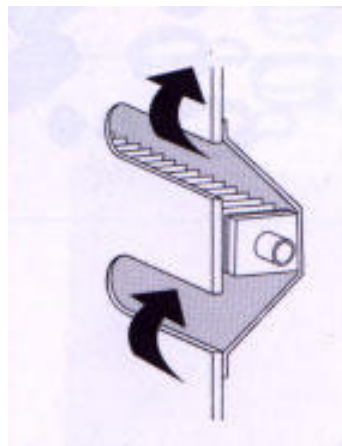
Advice for Mounting

A central heating system, described here, is normally made with a single pipe system. This means a pipe or tube is connected from the outlet of stove and around to the convector elements and back to the inlet of the stove coil. This has both advantages and disadvantages. The advantages are that there will be a much simpler and cheaper pipe connection. The disadvantages are that you cannot control or adjust the heating of each apace. Also the temperature of the circulating heating medium will be a little colder at the end of the system. You have to compensate this by a more effective convector. By using a circulation pump with good capacity this problem can be reduced considerably. For this system you must also ha en expansion tank to take care of the increased volume of the Heated circulating medium. Also an aqua stat temperature control unite gives you the possibility to control the temperature at the Rooms at your choice.

The following pages will give you more detailed information of equipments for the installing a suitable heating system.



Effective mounting in bench



Convactor element with back protection cover mounted in a bench

Circulation pumps



Pump house	material Noryl synthetic
Pump wheel	material Noryl synthetic
Bearings	water greased plain bearing
	build in in the house
Tube connections	22 mm diameter
Weight	245 gram
Motor capacity	maximum 2 watt
Voltage	12 V DC
Cable	2 x 0,75 mm ² 500 mm

This is a special pump, very electricity saving (0,16 A) max., high capacity pump for central heating system in boats, caravans and rooms without normal electricity.

Article number: 2400012

If the system circulating resistance is not more than 0,15 bar the flow will be 8 litre pro minute. The best place for the pump is the lowest point in the system just before the medium return into the stove.

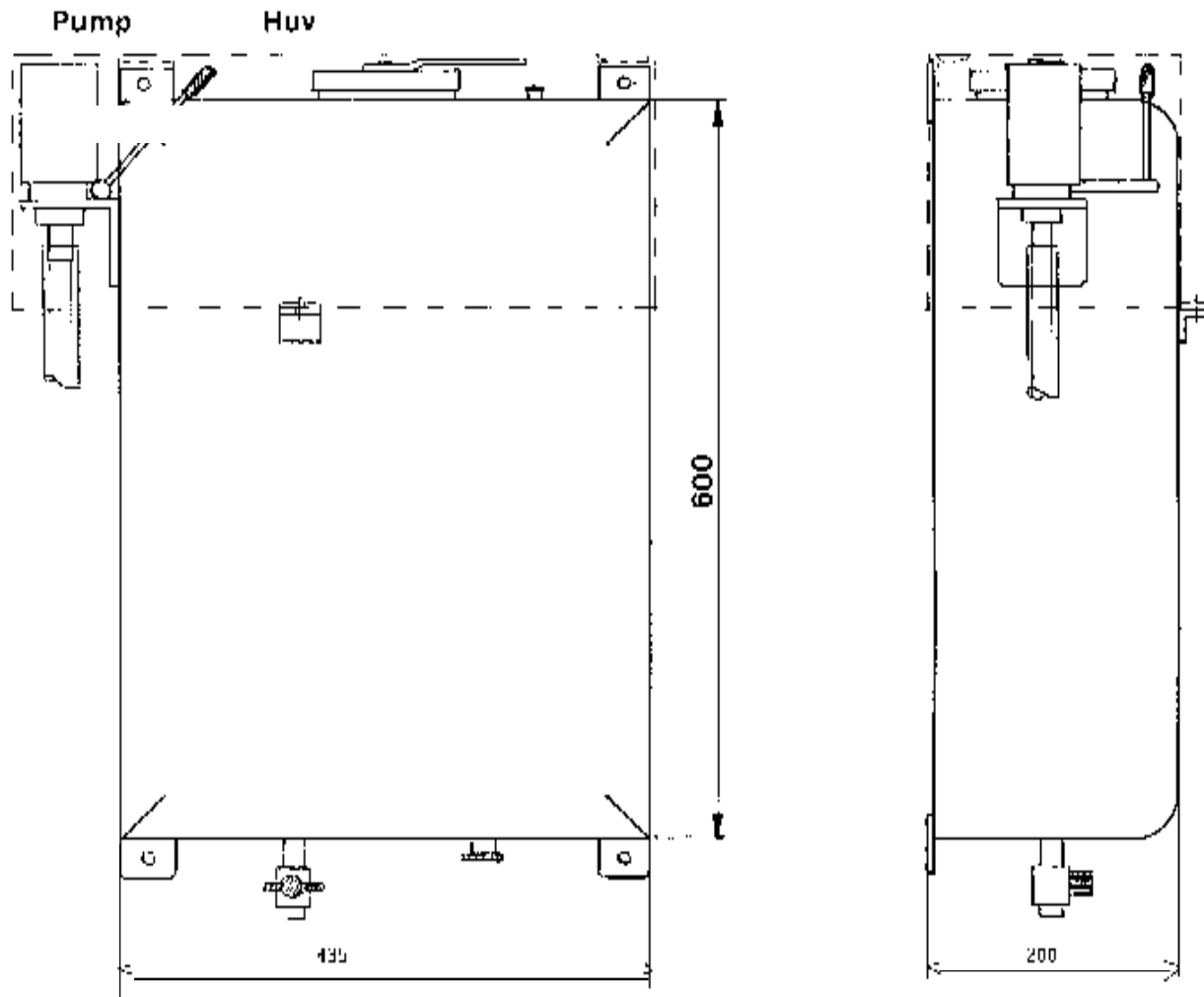


Tube connections	16 mm diameter
Motor capacity	14 watt
Max flow at 0,1 bar	15 litre pro minute
Voltage	12 and 24 V DC
Article number:	12 V 2400512, 24 V 2300524

This pump is intended to be used if the system is large and the circulation resistance for the medium is greater than 0,15 bar. The pump is specially useful if the system also has to warm up the engine.

If there is normal electricity available use a standard pump to be connected to the net.

Fuel tanks, galvanized and in synthetic material



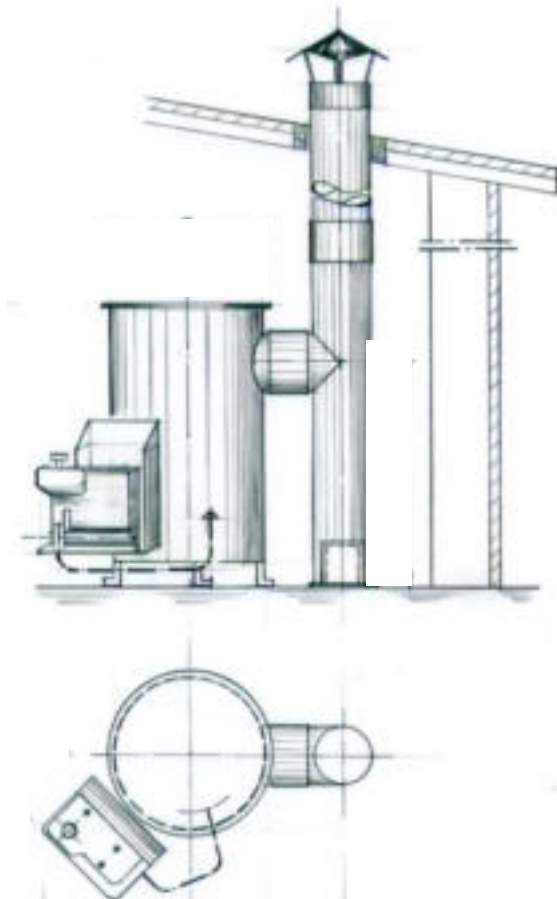
Volume 50 litre. Out- and inside hot zink dipped

A comfortable way of connecting external fuel storage is our system of flat-positioned PVC-can, made of approved material. The can has a volume of 15 litres and 2 self closing bayonet couplings, 2 self closing connecting nipples, one at the cover of the can and one at the connection of the regulator are included as well as an extra cap and a 3 metre fuel hose.



In order to create a larger supply of fuel it is possible to connect more cans and thanks to the self closing connections it is possible to switch cans without any spillage. One leak proof cap for each can is included to ensure any transport to be free from spillage.

Article number: 6BRMAT2

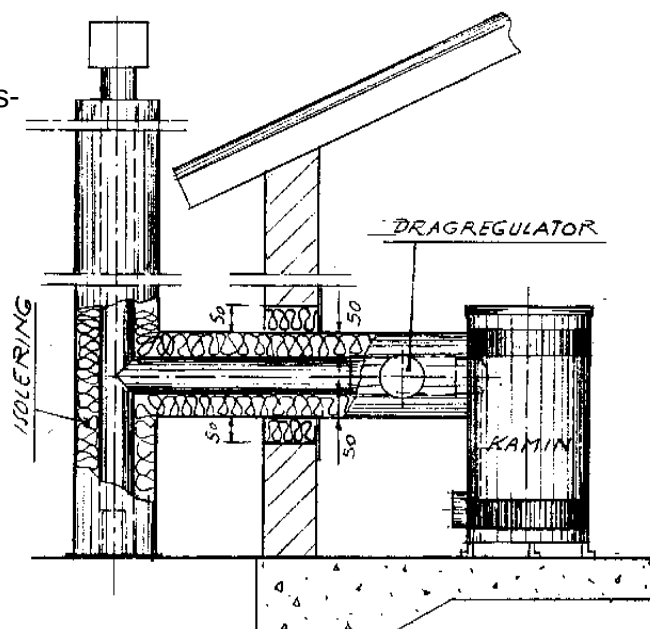


This is an example of installing the stackgaspipe through the attic, ceiling and roof. Depending on the construction of the building you must install the pipe through a shaft with insulation of walls of non-flammable material. For information and approval of the construction, the local chimney sweeper should be contacted.

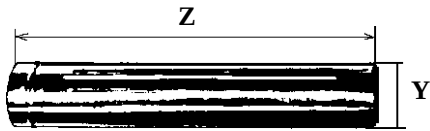
For simpler installations, e.g. pause sheds or premises with simple roofs, we can deliver suitable standard solutions.

The pipe should reach one metre above the rooftop.

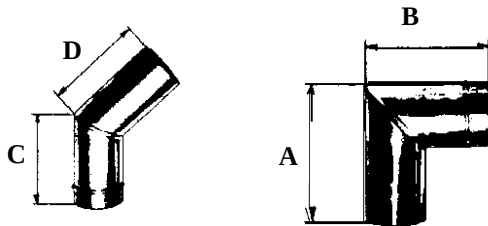
The simplest way is letting the stackgaspipe go through an outer wall. The horizontal part of the pipe, which goes through the wall, should be insulated by 50 mm non-flammable material. On the outside of this there should be a protective pipe and then a further 50 mm insulation, which in its turn, should be covered by a frame of non-flammable material. This means that the construction will require 200 mm of space, excluding the diameter of the pipe. The frame should be covered by an iron sheet both on the outside and on the inside of the wall.



The external stackgaspipe should be insulated against body contact, but also for increasing the draught. According to regulations, the pipe should perhaps end 1 metre above the rooftop.

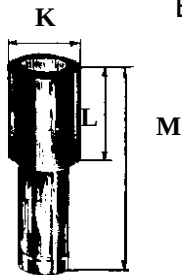


Smoke vent pipe

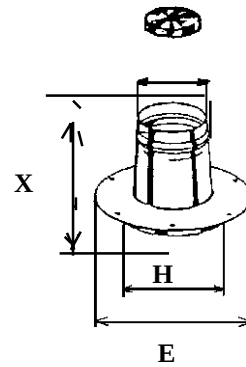


elbov 45°

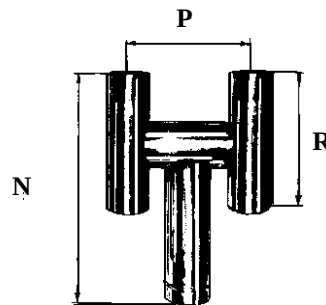
Elbow 90°



Chimney termination cylindric.



Passage unite for tube through deck or roof.



Chimney termination H-formed.

	Tube diameter	70	90	120	150
A	Elbow 90	165	180	200	
B	Elbow 90	170	180	200	
C	Elbow 45	160	165	200	
D	Elbow 45	160	165	200	
E	Flangediam.	150	180		
H	Openingdiam.	120	150		
K	Covertube	120	140		
L	Covertube.	200	200		
M	Covertube.	400	400		
N	Chimn. H-form.	350	450		
P	Chimn. H-form	240	320		
R	Chimn.H-form	230	300		
X	Totallheight	140	140		
Y	Ventpipe	70	90	120	150
Z	Ventpipe	L=1000 och 500 mm			





MODEL APPROVING CERTIFICATE

Handläggare, enhet/Handled by, department

Eddie Johansson, Energiteknik, am
Tel +46 (0)33 16 55 22

Datum/Date

1996-06-17

Beteckning/Reference

SP 539 MKI 02

Sida/Page

1 (1)

Product Oil heater produced by Engineering firm Glembring AB, model IG 92/6 civil, including smoke flues and protection pipe.
Producer Engineering firm Glembring AB, Mölndal, Sweeden.
Certificate SP 539MKI 02
Period of validity Model approving is valid in 5 years
Model testing done by SP
Certificate for model test 95E1 2521
Drawings 960102-1, -4, -5, -6, -7, 960402-1
Fuel Fuel oil nr 1 (Eo 1) and diesel oil
Capacity zone 0,18 - 0,41 kg/h
Fuel regulator Toby DVR 5 Typ 5211 C 101

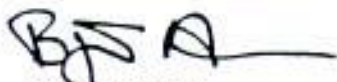
SP approves the refereed oilheater for installation in wagons according to " rules for model approving enterprice for heaters (RTE), note 1 and note 4, and admits the approving designation " SP 539MKI 02 " as long as the heater is valid in accordance to the referred rules.

THE MODEL APPROVING VALIDS BY FOLLOWING REQUIRMENTS:

1. Conditions in RTE, note 1 cap 3:7 are accepted.
2. The heater will be installed according to the directions for inatallations and for use nr. 95E1 2522A approved by SP.
3. Installation is made without draught regulator.
4. Construction correction, having effect for safety, makes only, if SP in writing approved the correction.
5. The direction for installation and for the use of the heater follows together with a copy for model approving certificate every delivered heater.

SP Swedish National Testing and Research Institute, Box 857, S 501 15 Borås Sweden.

SP- Sveriges Provnings- och Forskningsinstitut
Enheten för energiteknik


Björn Andersson


Eddie Johansson

Emergency Stove Glembring



Plinth block

This is our latest design of stoves for special needs which is an answer to the demand for simple, cheap, and easy to handle units for cooking and heating.

This stove is made of unpainted iron sheet without any connection for smoke tube and is designed for outdoor cooking. The stove can also be delivered with an electro zinc plated surface.

The stove can be fuelled with any kind of solid burnable material. We have used our experiences from our more advanced models for solid material firing when designing this model.

The time for reaching boiling temperature for one litre of water is about 5 minutes with maximum firing and with good fuel material. The time, of course, is depending on the surrounding circumstances.

Technical facts: Weight 600 gram
Height 250 mm
Diameter 135 mm

Stove for camping; reserve; disaster.

Can be fuelled with any combustibile material.

This stove is the result a new thinking for cooking in Special circumstances.

The stove can be lighted with solid fuel or anything you can find, that burns, no unnecessary transports, no fuel costs and you protect the environment by preventing damages while out in the countryside.

The stove is light, only 620 grams. It is small, put together it is only 135 mm in diameter and total height is 115 mm. Ready for operation the diameter is the same and height is 260 mm.

At normal running one litre of water can start boiling after few minutes. The stove consists of three parts which easily and quickly can be assembled to a compact, small and effective unite.

The stove is made of stainless high polished Sheets which secure long life. Please observe that the shiny surface can be blue annealed, which is no fault, but a normal process due to the high temperature.

The stove, which we have invented, is a novelty of global proportions and it is a great step in our efforts of becoming world leading in the field of stoves for heating and cooking, when you do not have access to electricity or gas.



Assembled for use



Assembled for transport.



Three parts of the stove.

Fuel dosage

What type of fuel?

Theoretically you can use all kind of liquid fuels, which can be gasified. In reality, however, there are three kinds of fuel to be used, which are diesel, heating oil and at some times, kerosene. Depending on which fuel you use, you can get different capacity on the stove, with the same regulator adjustment.

What is viscosity?

Viscosity is a measurement for the floating ability of a liquid and the measurement unit is cSt, pronounced centistokes. Water has cSt 1,0, environment diesel 1,8 – 2,5 and heating fuels 2,8 – 3,5. The temperature affects the viscosity so that a floating product floats easier at a higher temperature and worse at a lower one. How then does the different viscosity affect the capacity of the stove?

Fuel flow

The regulator is the brain of the stove. It controls among other things that sufficient fuel to the gasification part at the bottom of the stove. A dosage pipe, which can be raised and lowered with the regulation handle, has a narrow slit at its side. With the handle you thus control how big a part is open for the fuel flow and what amount of fuel flows into the stove per minute. Thus with a more viscous product of fuel, less amount of fuel flows into the stove, than compared with a fuel of low viscosity.

The regulator

If the stove should go out, the regulator closes the inflow of fuel. Should the temperature, for some reason or other, reach an abnormally high level and the danger of fire occur, a fuse will blow and the fuel flow will stop. Should the stove tilt, the fuel flow will immediately stop. This does not apply for stoves designed for marine use, which always tilt due to sea waves. If the inflow valve controlled by the floating body for some reason should not close, the floating body will reach too high a level, which immediately closes the inflow of the fuel.

Viscosity problems

Different countries have different types of fuels and thus different viscosity. Of course the viscosity can vary even within a country or a continent. After being delivered from our factory, the regulator has been calibrated according to the value of that of the region in question. As explained above this means that we cannot guarantee that the stove will burn with the allowed maximal capacity. It is rare however that this is notable, unless the viscosity varies unusually much. At too high a viscosity level the maximal efficiency will be too low and with the opposite situation, the maximal efficiency will be too high making the stove burn heavily, be overheated and produce smoke. This can temporarily be adjusted by switching the regulator handle to a lower level. For permanent usage with this viscosity you should calibrate the regulator according to the following.

Can the stove bear to be overheated?

Yes without any problems. Even at extremely high burning, when some parts of the stove can be red-hot there is no danger. At the test for approval, all of our stoves have gone through all possible situations and simulating disasters. Nor are we any kinder or more careful in our own laboratory.

Adjustment of the land regulator

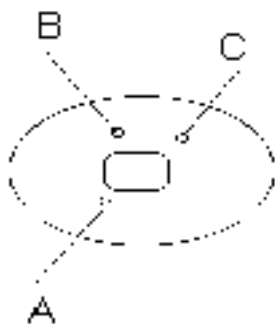
Stoves with different areas of capacity demand that the regulator has different lowest and highest level for fuel flow. See separate table for different sizes of stoves! As have been seen by the description above of the different viscosity for fuels, you must also be able to adjust the incoming quantity of fuel within each area of dosage. This is done with three adjustment screws placed at the cover of the regulator. Their positions on the cover are shown on the sketches below. Screw A regulates the maximum level and thus affects the maximum capacity. Screw B is an over-capacity lock; this is adjusted, at the delivery, so that it is impossible to adjust the maximum level with screw A above a certain level, at a certain viscosity, thus risking overheating. Screw C is for adjusting low effect level. If you use fuel with high viscosity and get low effect with a weak flame, you risk that the stove goes out. At every screw, there are markings with + and -.

Land regulator

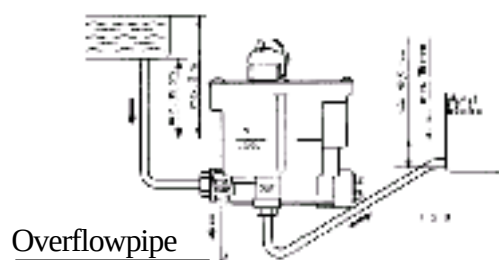
This description of adjustment applies for regulator DVR 5, which is most suitable for stoves on land. It has advantages for this purpose and it has a tip safe function. Should the stove for any reason come into an abnormal position, the regulator will immediately close the inflow of the fuel. This happens even if the level of the fuel in the regulator should be abnormally high. Resetting is done with the handle at the side of the regulator. Due to its design, it is not necessary to have an over-flow, which would require a collecting vessel below the stove.

Marine Regulator

For marine purposes we use a different regulator, which is safer at sudden and repeated movements. In boats the stove can get very different movements and then "the Trailer Control Regulator" is the most suitable. This one has a more watertight cover and also designed in such a way that no extra fuel will flow into the stove when leaning or at heavy movements. The increased fuel level in the regulator, caused by these movements, will be adjusted by an over-flow when returning to normal run. The outlet of the over-flow is connected to a nearby collecting vessel by a hose or a pipe. The volume does not have to be big; a few litres ought to be sufficient,



Land regulator



Marineregulator

Installation Details



If you place the fuel tank below the regulator of the heater, the fuel flow must be regulated by a day tank (permanent tank?), or a fuel pump. The most convenient alternative would be a pump, which soaks fuel from the main tank and pumps it to the heater's regulator. When the floating body of the regulator closes the inflow the pump will stop and will start again only when the regulator requires fuel, thus the pump will only run for some seconds per minute making the power supply next to neglect bal.

12 V Article number: 24010012

24 V Article number: 24010024



This expansion vessel is made of heat-resisting synthetic material. Its volume is 2 litres and it has a connection for a 15 mm hose. It is connected to the heating system with a T-joint. It should be placed at the top of the system preferably at the start of circulation system, close to the outlet of the heater.

Article number: 2600110



The fuse tap is a detail sensitive to temperature. If the surrounding temperature exceeds 70 degrees Centigrade, the fuse tap will close the fuel flow and the heater will die down. It should be at the inlet of the regulator. In normal use it works as an ordinary tap.

Article number: 2107000



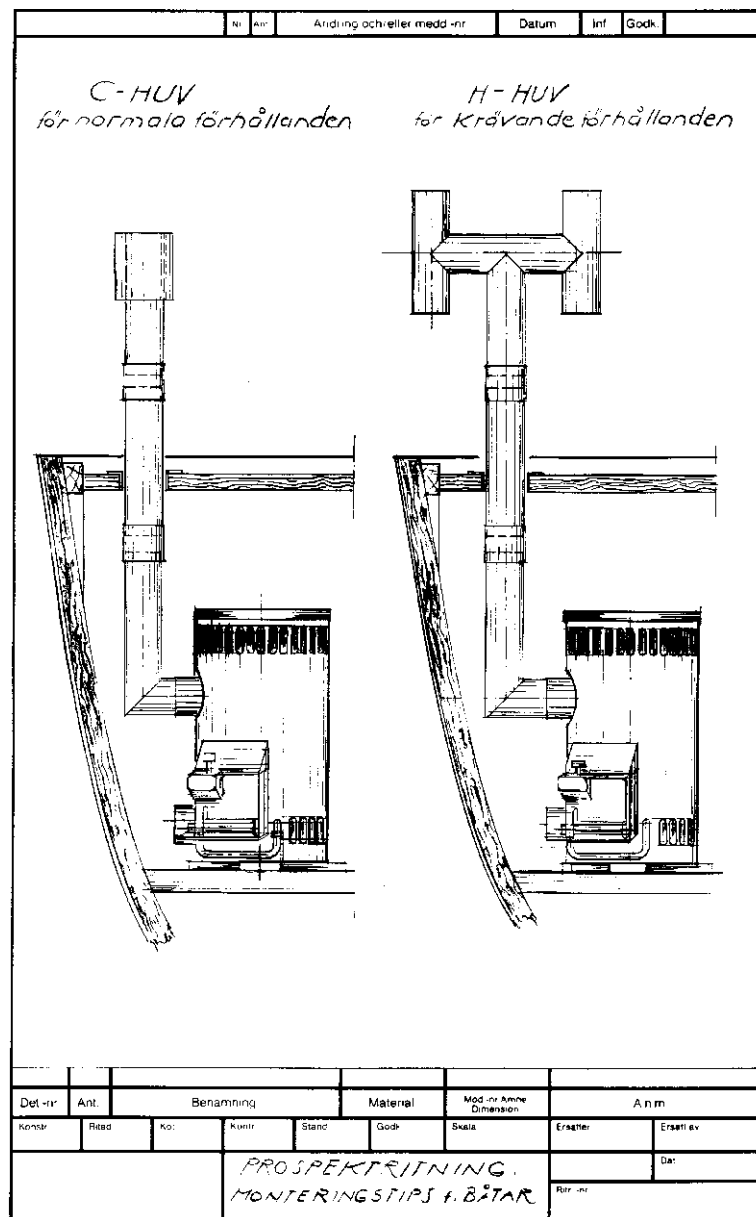
For certain installations the local authorities may have specific demands for placing the heater on a so-called collecting tray. Its measurements should meet the requiring demands. (It is also called a "trunk lady")



Installation details: Rubber bends, installation fittings, T-joints and hose connections.

Article number: See pricelist

Tips for installations in ships boats and yachts



The system works with draught, and it is therefore important that the stack gas system is designed in the best way possible.

The C-cowl is sufficient for most circumstances, but demands clear surroundings for an even and calm burning. Squalls and whirlwinds can cause an uneven draught, and if the cowl is to the leeward of something, the turbulence may be considerable, if the wind comes from the opposite direction.

The H-cowl is through its design less sensitive for the circumstances described above and is therefore used in more difficult draught circumstances. This type of cowl has been used for many years e.g. among professional fishermen, where it has proven to be very efficient even in very strong winds.

MANUFACTURER



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