# User and Installation Manual

## AP-1, AP-2, AP-3 Series

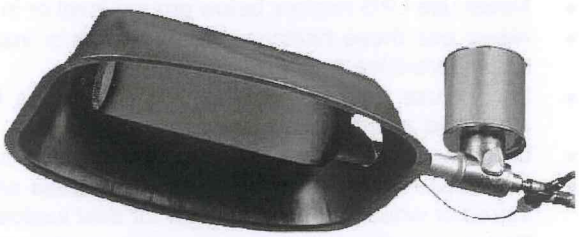
Atmospheric stainless steel gas infra red heaters for use in well ventilated areas

**AP-1, AP-3**



AP-1(..)TE
AP-1(..)TETH
AP-3(..)TE
AP-3(..)TETH

**AP-2**



AP-2(..)TE
AP-2(..)TETH

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# Warnings

**Do:**

- Read this manual carefully before installation and use and keep it for future reference. Make sure that all daily users know the content of this manual.
- Install these heaters only in according with all applicable local and/or national regulations for installation and ventilation of gas heaters.
- Use these heaters only in well ventilated environment.
- Before installation and use make sure that the required type of gas and gas pressure, as mentioned on the data plate, is in accordance with the local situation.
- Store gas cylinders always in accordance with national and local regulations.
- Use only gas cylinders with a gas isolation valve or gas lines with a main gas valve at the beginning. In case more than one heater is connected to a gas system, place also a gas tap directly before the heaters. Close these taps when the heaters are not in use.
- Installation and maintenance shall only be done by competent and experienced installers.
- Make sure that during service, maintenance, cleaning and other work on the heaters, gas lines and electricity are closed and the heaters are cooled down
- These heaters are intended for heating of animals, poultry, barns, workshops, local outside heating projects and other similar heating purposes in agro or industrial environment.
- When gas is smelled or a leak is detected, directly close the gas supply and immediately take care for good ventilation. Do not touch any electrical switch or do not create sparks in another way. Do not use the system before the leaks are solved and the system is safe again. Consult an installer.
- If a heater is not safe to use anymore, remove it so that nobody accidentally operates the heater. Store the heater in a safe place, mark that it cannot be used, and contact a service agent or gas installer to solve the problem.

**Do not:**

- These heaters are not intended for domestic use or for use in habitable parts of buildings and houses.
- Never use LPG heaters below ground level or in cellars or basements.
- Never use these heaters in small rooms or insufficient ventilated areas. This can be dangerous and is forbidden.
- Do not use these heaters for other purposes than room heating. Other use is not foreseen or evaluated and maybe will be dangerous.
- Do not use another gas or gas pressure than what is written on the data plate.
- Never use these heaters in rooms or areas where combustible liquids or vapours are used or stored or where there is a danger for dust explosions. These heaters are not ATEX approved.
- Never cover these heaters with cloths or other materials for drying purposes.
- Make sure that never gas lines, gas hoses, electric lines, etc. are mounted directly above the heaters or are heated by these.
- Take care that gas hoses are not heated above 40 degrees Celsius.
- Never modify heaters. The manufacturer does not take any responsibility for modified heaters.
- Bad installation, wrong adjustment or incorrect maintenance can cause damage, accidents or even personal injury or death.
- Do not touch, move, handle or service the heater when it is burning or in operation.

# General information

**Model identification**

The main identification of the different models is AP-1, AP-2 and AP-3. These are independent atmospheric stainless steel infra red heaters. Suffixes are used behind these model names to add additional type information about the models (e.g. AP-2 CESKTETHi).

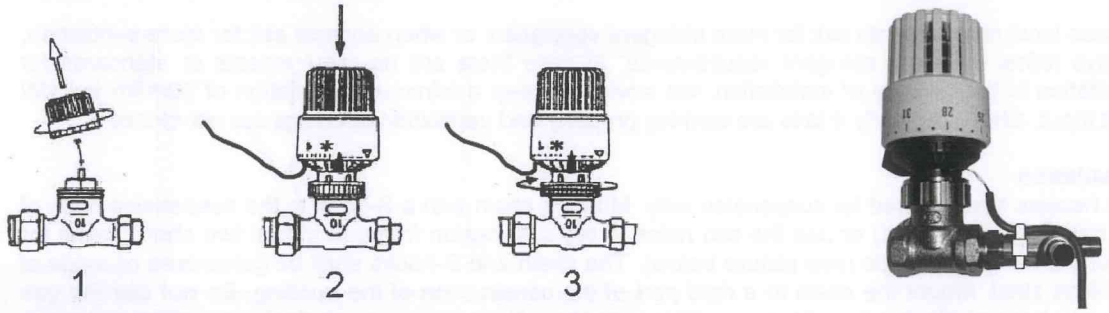
CE: that particular type is CE approved
SK: equipped with a single dust filter connection
DS: equipped with a dual dust filter connection
TE: equipped with a thermocouple safety device
TH: equipped with an independent thermostat and remote sensor (1,25 or 8 meter long)
THi: equipped with an independent thermostat and integrated sensor

**Packaging**
Normally (depending model and order quantity) the heaters are packed per 1, 2, 4 of 6 in a box. Always check the heaters for transport damage directly after receiving them. Note that the heaters will be a bit discoloured by temperature due to a 5 minutes quality check after manufacturing.

The heaters are pre-assembled. In some cases, if there is a risk for damaging during transport, the thermocouple sensor is separated from the gas safety device. Re-assembly can be simply done by screwing the M8 nut (29) of the sensor back on the safety device (14). Do not tighten too strong.

The thermostat knob is always delivered separated from the thermostat valve.
1) Remove the protection cover from the thermostat valve.
2) Turn the knob on maximum temperature and push the knob on the valve.
3) Fix the knob by turning the large metal screw ring till it stops (at least 2 turns, hand tight).

For thermostats with a remote sensor only: bend the sensor line carefully (no sharp bends) to the thermostat valve and secure the sensor line with a ty-rap around the red protection lining and the thermocouple safety device (see picture). Note that the tubing is hollow, a sharp bend will close the tubing and makes the sensor worthless. The chance of breaking the line at the entrance of the thermostat knob is largely limited now.




# Installation

**Place of installation**
The heaters are intended for use in well ventilated areas only. Do not install the heaters in situations that are not well ventilated. See also below for more ventilation information. Check also your local regulations for the ventilation and room size requirements. The amount of heaters per building is depending the type of building, the animals, the insulation, the climate and local wind conditions. Check with your installer or distributor for a heat transmission calculation to determine the amount of heaters needed.

Make sure that the place of installation is free of draft (less than 1 m/s). Too much draft will make the flames unstable and will result in a lower infra red heat efficiency. It is advisable to install an alarm system that reacts on temperature in case a temperature drop will cause damage. Find in the table below a rough guideline for the installation height to start with. Adjust later on to the height based on your personal preference and experience.

| Operational Distances | AP-1 | AP-2 | AP-3 |
|---|---|---|---|
| To the ground | 50-75 cm | 110-150 cm | 60-100 cm |

**Safety distance to combustible materials**
The heaters produce heat by radiation and by combustion gases. It is important to take the following distances in account from the heaters to combustible materials. This is to avoid fire or overheating. Do not use the heaters in situations were the distances to combustibles are smaller. Never store gases or inflammable liquids or easy combustible materials in close vicinity of the heaters.

| Safety Distances | AP-1, AP-3 | AP-2 |
|---|---|---|
| to the ceiling | >50 cm | >75 cm |
| in front of the heater | >80 cm | >100 cm |
| to the back | >50 cm | >75 cm |
| to side walls | >50 cm | >75 cm |
| to the ground. | >50 cm | >75 cm |

The minimum distance to non-combustible materials depends on the specific local situation. Keep in mind that there must be sufficient free space left to vent the combustion gases away. Otherwise, they will influence the combustion and proper function of the heater. On locations where the combustion gases can vent away easily, a minimum of 25 cm to the ceiling is advisable. Note: Be aware that some non-combustible materials can be subject to discolouring when they become too hot.

Warning: be careful with the use of heaters in places with storage of manure. Manure can contain large amounts of methane and other inflammable gases.

**Ventilation**
A proper ventilation is extreme important for safe and convenient operation. Lack of ventilation can cause production of carbon monoxide (very poisonous). Sufficient ventilation shall be guaranteed by a monitored fan or by permanent, non-adjustable, ventilation openings. Consult EN13410 for more details.

Beside other important requirements this standard states in short that a 1,5 times room air replacement per hour is sufficient in most situations. Also a maximum of 5W heat input per m3 room content is considered to be safe. If this is not the case make sure that a minimum of 10m3/h air replacement per 1 kW heat input is guaranteed by means of fans or ventilation openings.

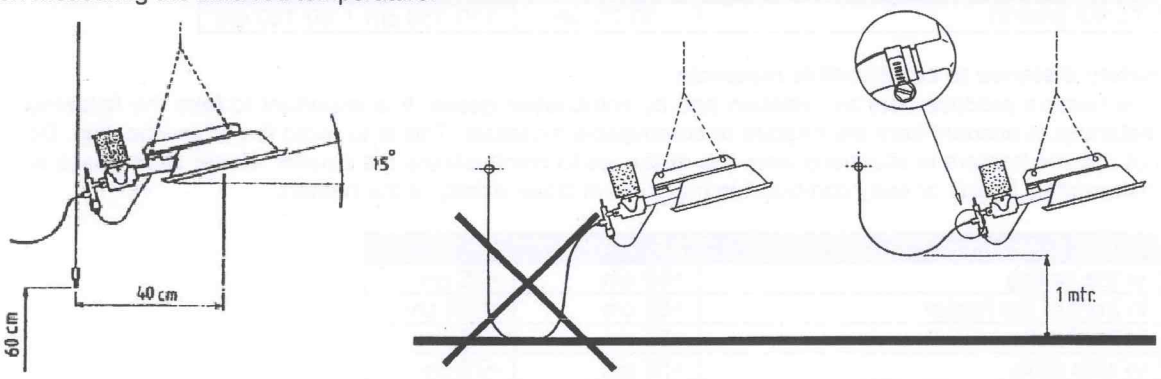
In case local requirements ask for more stringent ventilation, or when animals ask for more ventilation, always follow the most stringent requirements. In case there are no requirements or standards for ventilation in the country of installation, we advice to keep a minimum ventilation of 20m3/h per kW heat input. Check regularly if fans are working properly and ventilation openings are not closed.

**Installation**
The heaters are intended for suspension only. Mount a chain with a S-hook to the suspension hook of the heater (optional part) or use the two holes in the suspension frame to mount two short chains for making a hanging triangle (see picture below). The chain and S-hooks shall be galvanised or made of stainless steel. Mount the chain to a rigid part of the construction of the building. Do not use the gas line, gas hose or electric lines for suspension purposes. Never use rope or plastic mounting materials. Place the S-hooks at such a place that the heater reflector makes an angle of approximately 15 degrees to the horizontal and with the gas safety device at the lower end. Never hang the heater horizontally while in that case the flue gases will influence a proper combustion.

The gas safety device can handle a maximum temperature of 60 degrees Celsius. Be sure that the heater is not mounted in such away that this temperature will be reached (e.g. by other heaters in close vicinity). Take into account the safety distances mentioned on page 3. After installation always check if the gas type and gas pressure complies with the technical table and data plate information. Remove the black end cap from the safety device.

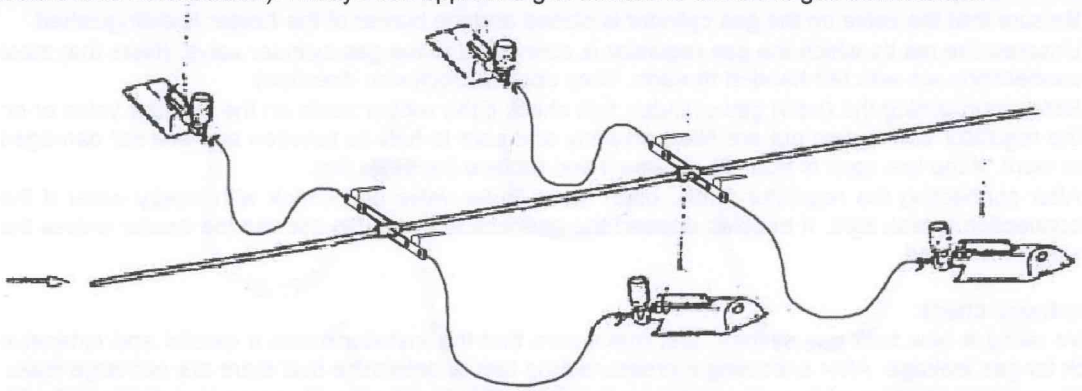
The gas hose shall be hanging free and have a distance of minimal 1 meter from the ground. This to make sure animals will not damage the hose. Connect the hose via an individual gas tap to the central gas supply.

A guideline for placement of the sensor of the temperature regulation is 60 cm above the ground and minimal 40 cm away from a heater. Use sensors with a black surface in case the regulation is based on measuring the infra red temperature.



**Gas line supply**
In case a main gas line supplies the gas to the heaters, make sure that an authorised company in your country, in accordance with the local rules and requirements, install the system. To avoid problems use galvanised or copper tubing for the gas line. First make a calculation to determine the capacity of the whole system and the diameters of the piping in each section. Use the common available calculation methods as written in most gas installation standards. Contact an installer or the distributor in case this calculation method is not available in your area. For data needed to calculate the dimensions of the gas line, see the technical table on the last page.

The most common way to install a gas line is in the centre of the barn (at least 2 meter high) with every 3 to 5 meter a "T" or "cross" connection for gas supply to the heaters. Always mount a (easy reachable) gas tap at the beginning of the gas hose to the heaters. This gas tap is needed to close the gas supply to the burners to extinguish the flames. In addition, it makes it possible to remove the heaters after use or to service the heaters safely. The gas inlet at the heater side is standard a 8 mm hose nipple (optional a smooth hose nipple or a G1/8" right handed thread. Other connections are possible after consultation). Always use approved gas sealant to close the gas connections.



**Gas cylinder supply**
The gas can also be supplied from LPG gas cylinders. The minimum size is a 11 kg cylinder or larger. Before buying a cylinder make sure that the connections of the gas regulator and the gas valve of the cylinder are of the same type. Check with your gas supplier for the correct size of gas regulator. Check the technical table for the maximum gas consumption and gas pressure.

Store the gas cylinders always on ground level in a well-ventilated place, preferably outside the room where the heater is. In case the gas cylinder is placed in a cylinder housing, or cover, make sure that there is enough ventilation as requested by the applicable regulations or standards. Never obstruct these ventilation holes. Make sure that the gas cylinders are used in upright position only and are secured again tipping over during use. Gas cylinders laying on their side will give liquid gas. This is very dangerous and will give a fire ball when it reaches the heaters.

In case the gas cylinder is placed in the same room as the heater is, keep it at a safe distance from the heater so it will not be over heated. Advisable is at least 2 meters. Make sure that the gas cylinder valve can easily be reached to close the gas supply in an emergency situation. Pay special attention how to change the gas cylinders in a safe way.

For the AP-1 and AP-3 it is sufficient to have one gas cylinder (11 kg or larger) per heater. For the AP-2 a minimum of 1,5 gas cylinders (of 11 kg) per heater is needed for a guaranteed gas supply. For a 45 kg gas cylinder a maximum of two AP-2 heaters is recommended. Having more heaters on the gas cylinders as recommended above will give gas capacity problems, especially when it becomes colder.

**Gas hose**
In most installations the heaters are not connected directly to the gas system but a gas hose is used. Keep the hoses always as short as possible, especially for natural gas and low pressure LPG. For high pressure LPG the maximum length (concerning capacity issues) is 5 meter.

The gas hoses must be inspected frequently and must be changed within the prescribed intervals. Check the hose at least every 6 weeks. Avoid twisting or stress of the gas hose. Twisting or stress will shorten the live time of the gas hose. During inspection, check the hose for damage, splitting, ageing and cracking. Pay special attention to the connections. If a defect is seen directly change the gas hose by a new one of the same type. Keep the hoses clean from dirt, moisture and dust.

Some countries have regulations that gas hoses must be replaced every 2 or 3 years. Please check with your gas supplier. Always use official approved gas hoses, suitable for the pressure concerning. Replace a gas hose always by a type of the same length, internal diameter and equivalent quality. For safety reasons: never use air hoses or water hoses, these are very dangerous for gas transportation and will leak soon!

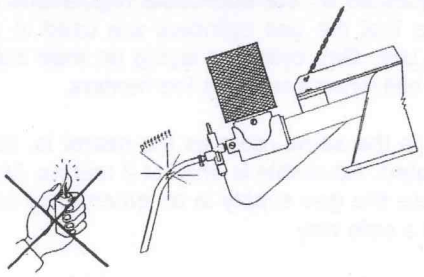
The gas hose shall always be connected to the heater with the help of hose clips. Not using hose clips at both ends of the gas hose is very dangerous. Make sure that the gas hose never is heated above 40 degrees Celsius.

**Changing gas cylinders**
In case gas cylinders are used, changing or connecting gas cylinders must be done preferably outside, or in a well ventilated area, in a flame-free environment and away from other people.

- Check if there are no other operating heaters, other gas heaters, burning candles or people smoking cigarettes in the area.
- Be sure that the valve on the gas cylinder is closed and the burner of the heater is extinguished.
- Unscrew the nut by which the gas regulator is connected to the gas cylinder valve. (Note that most connections are with left-handed threads. They open in clockwise direction).
- Before connecting the (new) gas cylinder, first check if the rubber seals on the cylinder valve or on the regulator connecting nut are fitted properly and able to fulfil its function and are not damaged or worn. If the last case is true, do not use it and replace the seals first.
- After connecting the regulator firmly, open the cylinder valve and check with soapy water if the connection is leak tight. If bubbles appear, the connection leaks. Do not use the heater unless the system is sound.

**Soundness check**
Before using a new built gas system, first make sure that the installer made a careful and extensive check for gas leakage. After executing a pressure drop test to determine that there are not large leaks, check every connection with soapy water or gas detection liquid with all gas valves open and with maximum gas pressure. Pay special attention to the hose connections. Maintain maximum air ventilation during the test. Repeat this check at least every year. This soundness check shall be done by a competent installer only.

**Gas leakage**
When a gas leak is detected, immediately close the gas supply and disconnect electricity. Keep flames away. Do not use the heater anymore. Contact an authorised gas technician, gas installer or gas service agent to determine if the gas leakage can be repaired. Never try to do gas repairs by yourself. Do not use the heater anymore until the problem is solved.



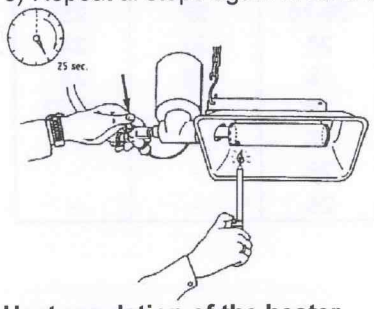
## Operation

**New heaters**
New heaters need a cleaning period before they are ready for operation. Turn the ventilation to maximum position or place the heaters outside in the open air. Fire the heaters for at least two hours on full capacity to burn-off oily and greasy remnants of the production. Make sure that after two hours all smoke and smell is disappeared. The smoke and smell can be unhealthy, so keep animals and human beings away till the heaters and the environment air is clean.

**Ignition of the heater**
Warning: after an heater is extinguished (intentionally or unintentionally) wait always for 3 minutes before (re)ignition. This is a worldwide safety rule and intended to ventilate unburned gases away and to leave enough time for the thermocouple device to close.

*TE, TETH and TETHi versions:*

1) Open all gas taps (and turn the thermostat or gas pressure regulator on maximum).
2) Keep a flame of a BBQ lighter (or long match) in the ignition hole of the burner tube.
3) Press the knob of the gas safety device and wait for 10-25 seconds after ignition before releasing the knob.
4) The burner will stay on now.
5) Repeat al steps again in case the burner directly extinguishes.




**Heat regulation of the heater**

*TE version:*

The heat input of this heater can only be changed by adjusting the pressure of the gas supply. Check the gas supply pressure information on the data plate of the heater for the minimum and maximum values. If only one pressure is mentioned, adjustment is not possible and only continuous operation or on-off operation is allowed.

*TETH, TETHi versions:*

Make sure that the gas supply pressure remains constant at the value indicated on the data plate. Adjust the heat input by setting the thermostat knob at the desired value. Note that the temperature on the ground will be several degrees higher than at the sensor. So use the setting on the thermostat knob as a rough guideline and always check the real temperature on the ground

| Approx. Ground temp | Temperature (THi) |
|---|---|
| Δ | = 15 °C |
| * | = 20 °C |
| 1 | = 22 °C |
| 2 | = 28 °C |
| 3 | = 33 °C |
| 4 | = 36 °C |
| 5 | = 38 °C |

**Extinguishing the heater**

*TE, TETH and TETHi versions:*

Close the gas tap or the central gas supply. The burner will extinguish now. The thermocouple safety valve will close after 60 seconds.

**Visual examination of the flame**

Check after every ignition (and also during regular barn inspection) if a heater still burns correctly. The flame shall remain always inside the burner tube. The burner tube shall be equal red/orange in high firing position and having a blue flame.

A burner does not operate well in case there is a (green)-blue cloud inside the reflector and/or a (green)blue flame tongue is coming out the exhaust hole in the reflector. Soot deposit on the reflector and yellow flames are also a sign of bad functioning and are not allowed. Cleaning will solve these problems in most cases. Note that yellow tipping in low fire is allowed.

In high fire position the flame makes a soft roaring noise. In case the burner makes a loud roaring noise and the burner tube does not become equal red/orange, the venturi gauze is damaged and the flame is burning inside the venturi tube (back firing). The venturi tube becomes very hot now behind the venturi. Directly extinguish the burner and replace the damaged venturi tube and gauze by a new one.

**Birds and temperature**
The following list gives a rough guideline about birds, days and temperature. Realize that this depends on the conditions in the barn, country and location and the kind and the breed of the birds.

| Age | Broilers | | Turkeys | | Guinea fowl | | Ducks | |
|---|---|---|---|---|---|---|---|---|
| (days) | Temp A | Temp B | Temp A | Temp B | Temp A | Temp B | Temp A | Temp B |
| 1 - 3 | 38 | 28 | 40 | 28 | 40 | 28-30 | 38 | 28 |
| 3 - 7 | 35 | 28 | 37 | 28 | 40 | 28-30 | 35 | 27 |
| 7 - 14 | 32 | 28 | 34 | 26 | 40 | 28-30 | 32 | 25 |
| 14 - 21 | 29 | 28 | 31 | 25 | 40 | 28 | 32 | 24 |
| 21 - 28 | - | 22-28 | 30 | 24 | 38 | 28 | 29 | 23 |
| 28 - 35 | - | 20-23 | 27 | 23 | 35 | 28 | - | 18-22 |
| 35 - 42 | - | 18-23 | - | 18-22 | 32 | 27 | - | - |
| 42 - 49 | - | 17-21 | - | - | - | 26 | - | - |
| 42 - 84 | - | - | - | - | - | 26 | - | - |

Temp A = Required temperature under gas brooder in °C
Temp B = Required ambient temperature in °C

# Maintenance

**General**
The frequency of maintenance is strongly depending on the quality of the combustion air and the intensity of use. When used in poultry houses, maintenance is advised every 6 weeks or by changing the animals. By use in clean environment conditions, the maintenance period can be extended but not longer than 6 months. In case heaters are not used for a long period, always do maintenance first before using them again. Wear safety goggles during cleaning with compressed air.

Parts that are broken, or are not functioning well, must be replaced directly by identical ones of same brand and type. Consult the dealer or manufacturer in case of doubt.

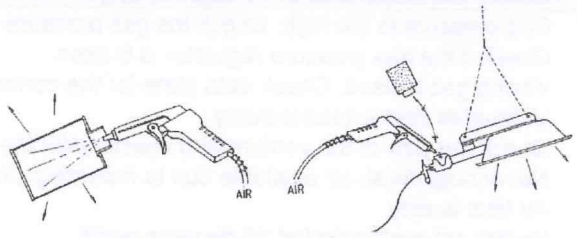
**Order of maintenance**
- First clean the heater and filter as described below by daily maintenance. Take the venturi out during cleaning to remove dust directly behind it.
- Clean the reflector and other parts (excluding the burner tube and venturi gauze) with water and mild detergent and a cloth or soft brush.
- Carefully inspect the burner tube and venturi gauze on damage, cracks and holes. Replace when needed.
- Check the injector for obstructions. Remove obstructions by brushing them away and by using a pin or drill to clean the injector hole. Make sure that the injector hole does not become wider by using a pin or drill that is larger than the size stamped on the side of the injector.
- Clean the inside of the gas safety device and injector with compressed air. Make sure that the pressure of the compressed air is not larger than the 1,5x the pressure stamped on the safety device (65 or 1400 mbar). Otherwise the rubber seals inside the safety device will become damaged.
- Check the condition of the thermocouple sensor. Replace in case the tip is burnt-in already to avoid unnecessary shut down later on.
- Check all gas carrying parts and connections for gas tightness with leak detection liquid or soapy water according the procedure in the standards applicable in the local installation situation. Never use a flame for soundness checks!
- In case a gas hose is used, check this carefully for cracks, wear and other signs of damage or alteration. Replace it also when the maximum lifetime printed on the hose, or the maximum allowed by local requirements, has passed.
- Commission the heater after maintenance and check it carefully during first ignition, firing and extinguishing.

In case the heaters need to be stored for a long time, make sure that no dust, spiders, etc. can enter the heater. Use the carton packaging box to store the heater, or a plastic bag if the box is not available anymore, and close this carefully.

**Daily maintenance**
In dusty or dirty environments check and clean a heater every day. In case a heater is not cleaned internally the heat efficiency will drop and the lifetime of the burner tube and venturi gauze will become shorter or they will be destroyed. Also there is a possibility that carbon monoxide (poisonous) will be produced and soot deposit will occur. To keep the heater free of dust is important.

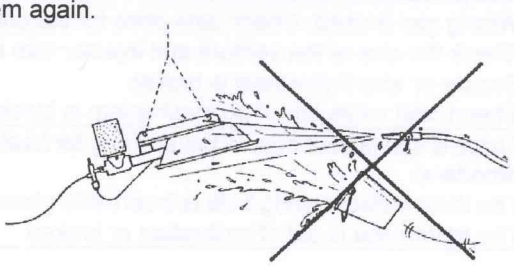
**Dust filter**
Dust filters must be check every day and cleaned in case needed. Remove a filter before cleaning. Dry dust can be removed by tapping the filter softly against a solid surface like the sole of a shoe. The dust will fall off easy now. In case the filter is still not clean, brush the surface gently with a brush or clean it with compressed air from inside to the outside. In case the dust is greasy, clean the filter in warm water with a bit detergent. Make sure that filters are dry before placing them back. Even with the use of a filter still check the heater regularly inside while very fine dust still will pass the filter and pollute the heater internally.

Advice: Lots of farmers use a second set of dust filters. They replace the dusty ones directly with the clean ones and clean the filters outside the barn to avoid unneeded disturbance of the animals.




**Internal cleaning**
The internal part of a heater can be cleaned with compressed air or with a tube brush. If needed do this every day. First clean the outside of the burner tube. Then the inside of the venturi and burner tube via the dust filter connection. Repeat this 3 times to be sure the dust is removed. Do not hit the venturi gauze while it becomes a bit brittle due to the temperature.

**Water**
Never clean the heater with water, steam or chemicals. Also do not use high pressure jets to clean the heater. The lifetime of the burner tube and venturi gauze will go down when it becomes wet and again hot afterwards. In case an heater becomes wet unintentionally, first make sure that they are dry completely before using them again.



**High fire**
The lifetime of infrared heaters in a dusty environment will be extended in case these heaters are operated on high fire every 12 to 24 hours for minimal 15 minutes. This burns off dust in the burner that accumulates during low-fire operation. This is only needed in case heaters operate on lower setting for a longer period. When a barn computer is used for heating and ventilation, it will be easy to modify the program to add a 15 minutes high fire operation every day. In case a mechanical thermostat is used a solution can be to put the sensor for 15 minutes in a bucket with cold water during daily inspection of the barn.

## Fault finding table

| Trouble | Action |
|---|---|
| *Burner does not light.* | • Check if gas valve of the gas cylinder or gas line is open<br>• Check if gas cylinder is empty<br>• First ignition will take up to 60 or more seconds before gas is available<br>• Check if the injector is blocked<br>• Check if the gas pressure/gas quality is identical to the pressure indicated on the data plate |
| *Burner extinguishes after lighting* | • Keep button safety device pressed for a longer period (up till 25 seconds)<br>• Check if the thermocouple is connected properly to the gas safety device<br>• Check if the thermocouple tip touches the flame<br>• Thermocouple or magnetic coil of the safety device is broken.<br>• Gas pressure lower than minimum requested<br>• Heater not suspended at 15 degrees angle |
| *Flames leave the*<br>*- confines of the burner,*<br>*- or are sooting,*<br>*- or a blue cloud is under the reflector* | • Gas pressure is too high. Check the gas pressure with the data plate<br>• Check if the gas pressure regulator is broken.<br>• Wrong gas is used. Check data plate for the correct gas supply<br>• Venturi/air inlet is blocked/dirty<br>• Check the size of the venture and injector with the table<br>• Not enough fresh air available due to mounting situation<br>• Air filter is dirty<br>• Heater not suspended at 15 degrees angle |
| *The burner is only partly glowing* | • Wrong gas or pressure is used. Check data plate with the gas supply<br>• Check if the injector or venturi are blocked or dirty<br>• Check the injector and venture size with the table<br>• Check if pipe sizes or gas hoses have sufficient capacity<br>• Check the setting of the termostat |
| *The burner makes a lot of noise after ignition or after several minutes* | • Wrong gas is used. Check data plate with the gas supply<br>• Check if the venturi gauze is broken or damaged so the flame burns inside the venturi tube |
| *The burner do not work at minimum position* | • Gas pressure is not correct. Check the gas pressure with the data plate<br>• Wrong gas is used. Check data plate for the correct gas supply<br>• Check the size of the venture and injector with the table<br>• Sensor or wire thermostat is broken<br>• Thermostat valve adjusting mechanism is blocked |
| *Heater will not attain the desired temperature* | • There is insufficient heat in the building for heat loss (i.e., not enough brooders).<br>• The thermostat sensing bulb is incorrectly placed<br>• The thermostat is out of calibration or broken |

**Declaration of conformity**
We, Alke B.V., located in Scherpenzeel, The Netherlands, hereby declare that the AP series, marked on their dataplates with CE and with CE approval/production supervision by Kiwa Gastec (number 0063) are in compliance with the following EU directive:

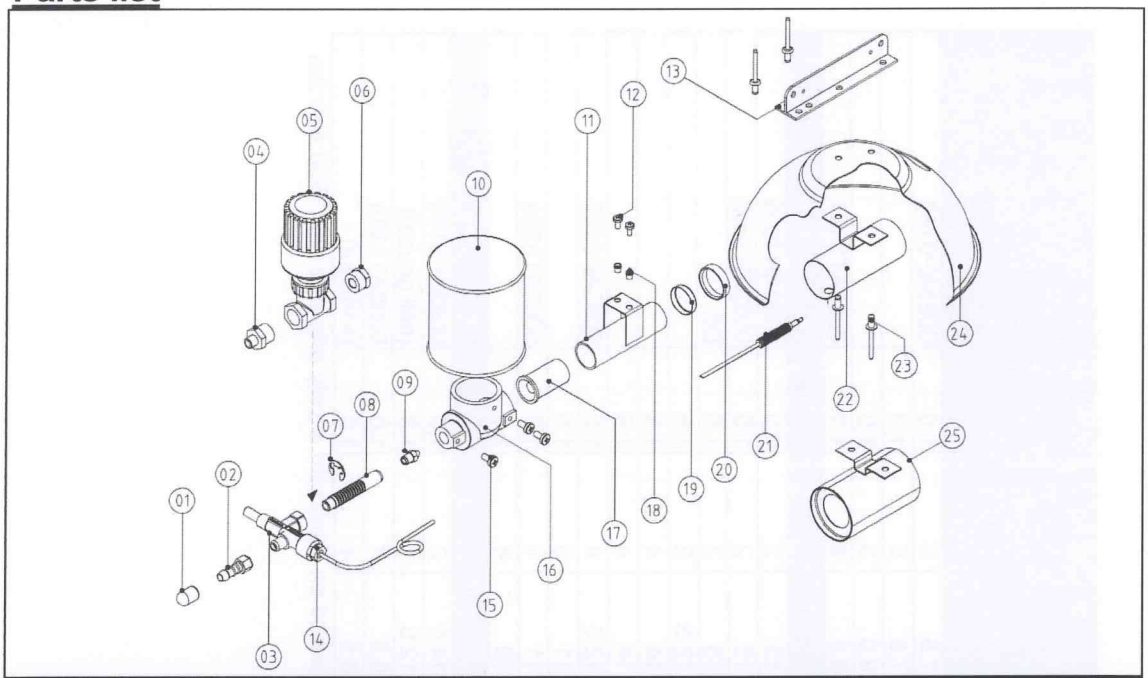
- Directive on appliances burning gaseous fuels (2009/142/EC) (ex 90/396/EEC)

Scherpenzeel, 01-01-2011

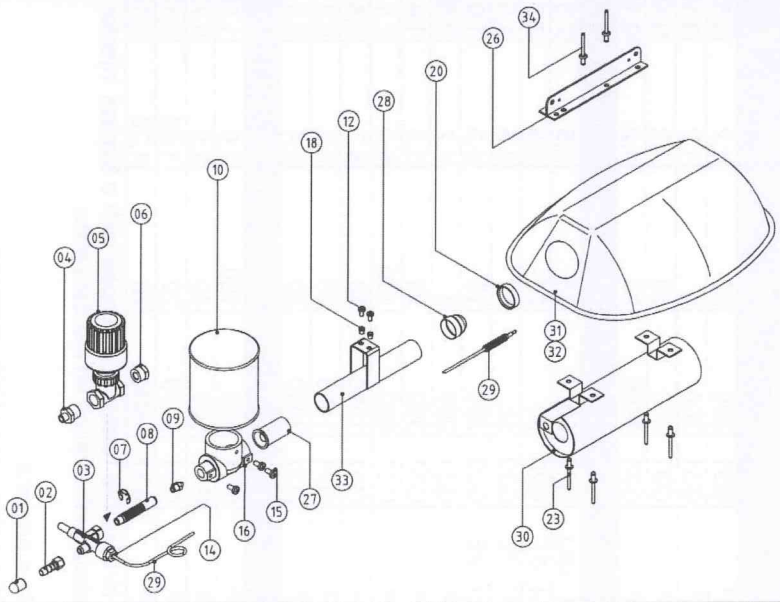
Adri van Alphen
Managing Director

Derk Jan Keurhorst
Managing Director

# Parts list



| No. | Part # | Description | No. | Part # | Description |
|---|---|---|---|---|---|
| 1 | 07000000 | End cap black PVC | 18 | 07073000 | Blind rivet nut M4 |
| 2 | 01327000 | Hose nipple 8mm | 19 | 02456000 | Venturi gauze (flat) |
| 2 | 01328000 | Hose nipple 8mm, smooth | 20 | 03880000 | Clamping ring venturi |
| 3 | 00101000 | Gas safety device 1/8" | 21 | 00200000 | Thermocouple M8x320 |
| 3 | 00106000 | Gas safety device w/hose nipple | 22 | 02505000 | Burner AP-1 36x85mm |
| 4 | 01429000 | Reducing nipple 1/8"-3/8" | 23 | 07060000 | Rivets 4,8x8,5 |
| 5 | 0092xxxx | Thermostat-consult factory | 24 | 02350000 | Reflector |
| 6 | 01405000 | Reducing ring 3/8"-1/8" | 25 | 02510000 | Burner AP-3 50x80 mm |
| 7 | 07005000 | Distance ring | 26 | 03856000 | Suspension frame 155mm |
| 8 | 01301000 | Injector holder | 27 | 013070xx | Venturi 25x62-consult factory |
| 9 | 01161xxx | Injector M8x0,75–consult factory | 28 | 02459000 | Venturi gauze (ball) |
| 10 | 02530000 | Dust filter small | 29 | 00202000 | Thermocouple M8x450 |
| 11 | 08893130 | Venturi tube (complete) | 30 | 02516000 | Burner AP-2 61x210mm |
| 12 | 07130000 | Screw SS M4x10 | 31 | 02351000 | Reflector Oval |
| 13 | 03855000 | Suspension frame 120mm | 32 | 02352000 | Reflector Square (not shown) |
| 14 | 00158000 | Safety device nut M8x1 | 33 | 08893100 | Venturi tube (complete) |
| 15 | 07135000 | Screw SS M5x10 | 34 | 07059000 | Rivets 4,8x8,8 SS Avinox |
| 16 | 01799000 | Connection piece 25mm | | 03903000 | Suspension hook AP1/AP2/AP3 |
| 17 | 013060xx | Venturi 25x40–consult factory | | | |



## Technical table

| Category | Gas | Maximum Supply pressure | Minimum Supply pressure ** | Maximum Heat Input | Minimum Heat Input | Gas consumption | Main Injector | By-pass injector TH ** | Venturi | Ring Injector Holder | Weight | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (-) | (-) | (mbar) | (mbar) | (kW Hs) | (kW Hs) | (g/h or m3/h) | (mm) | (mm) | (mm) | (-) | (kg) | (-) |
| **AP-1 series** | | | | | | | | | | | | |
| I3P | G31 | 200 | 60 | 1,2 | 0,55 | 86 g/h | 0,36 | x | 7,5 | 5 | 1,0 | 0063AP0160 |
| I3P | G31 | 200 | 5 | 1,2 | 0,19 | 86 g/h | 0,36 | x | 7,5 | 5 | 1,0 | |
| I3P | G31 | 300 | 30 | 1,2 | 0,40 | 86 g/h | 0,32 | x | 9,0 | 3 | 1,0 | |
| I3P | G31 | 1400 | 20 | 1,2 | 0,15 | 86 g/h | 0,22 | 0,16 | 6,5 | 3 | 1,0 | 0063AT3389 |
| **AP-2 series** | | | | | | | | | | | | |
| I2L, I2LL | G25 | 50 | 25 | 3,5 | 2,5 | 0,39 m3/h | 1,15 | - | 15 | 3 | 1,5 | 0063AR3606 |
| I2H, I2E | G20 | 50 | 25 | 3,5 | 2,5 | 0,33 m3/h | 1,05 | - | 15 | 2 | 1,5 | 0063AR3606 |
| I2H, I2E | G20 | 50 | 10 | 3,5 | 1,5 | 0,33 m3/h | 1,05 | 0,80 | 15 | 2 | 1,5 | DS |
| I2H, I2E | G20 | 300 | 10 | 5,3 | 1,0 | 0,50 m3/h | 0,77 | 0,45 | 12,5 | 2 | 1,5 | |
| I3P | G31 | 200 | 5 | 4,2 | 0,66 | 300 g/h | 0,71 | - | 14 | 4 | 1,5 | |
| I3P | G31 | 300 | 20 | 5,5 | 1,4 | 395 g/h | 0,68 | 0,25 | 14 | 4 | 1,5 | |
| I3P | G31 | 600 | 100 | 5,0 | 2,1 | 360 g/h | 0,58 | - | 12,5 | 4 | 1,5 | 0063AP0160 |
| I3P | G31 | 1000 | 20 | 5,7 | 0,8 | 410 gr/h | 0,52 | - | 11 | 6 | 1,5 | |
| I3P | G31 | 1400 | 20 | 5,5 | 0,6 | 395 g/h | 0,47 | 0,22 | 11 | 4 | 1,5 | 0063AT3389 |
| I3P | G31 | 2000 | 20 | 5,4 | 0,5 (TH 1,4) | 390 g/h | 0,41 | 0,22 | 10 | 4 | 1,5 | |
| **AP-3 series** | | | | | | | | | | | | |
| I3P | G31 | 200 | 100 | 2,0 | 1,55 | 145 g/h | 0,47 | - | 14,0 | 6 | 1,0 | 0063AP0160 |
| I3P | G31 | 300 | 40 | 2,0 | 0,73 | 145 g/h | 0,42 | - | 12,0 | 9 | 1,0 | (ball gauze)) |
| I3P | G31 | 1400 | 20 | 1,65 | 0,17 | 130 g/h | 0,27 | 0,18 | 6,5 | 4 | 1,0 | 0063AT3389 |
| I3P | G31 | 1400 | 20 | 1,20 | 0,14 | 86 g/h | 0,23 | - | 6,5 | 4 | 1,0 | (>1400m) |

** In case the heater is equipped with a bypass injector (TH and THi version) the heater shall be operated on maximum supply pressure only. See also the pressure information on the data plate

G31 = propane
G20 = natural gas (100% methane)