User and Installation Manual

Alke 21, 41, 61, 81, 3000

(Versions: -SKTE, -SKTETH, -SKTETHi)

21, 41

61, 81, 3000

Manufacturer:

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Warning

All purchasers, installers and users shall read the instructions and data plate carefully before installation, operation, use or servicing of the gas heater. Not following these instructions can result in death, serious injury, fire or property damage. In that case all responsibility of any accident whatsoever in connection with the purchase, installation, operation, using and servicing of the gas heater and accessories will be rejected. Keep this manual for future reference.

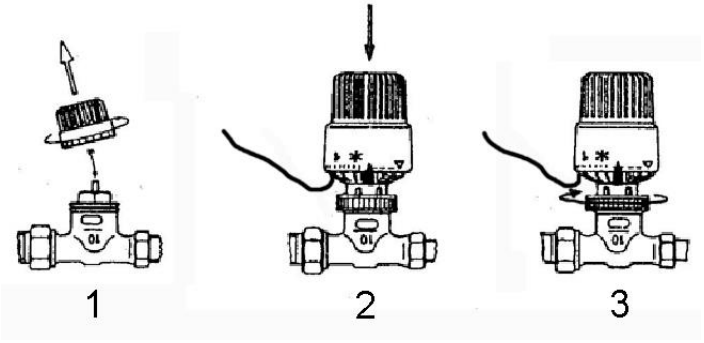
Safety advice

- The gas heater and accessories shall be installed and tested on site by a qualified, competent and approved gas installer, according this manual and according all applicable local and national regulations.
- The gas heater is designed for the brooding of selected livestock, like: chickens, piglets, game birds, ducks, etc. within livestock rearing housing, or for local heating projects outside, or in workshops or other industrial environment. It is not designed for any other heating applications. Do not use it inside habitable parts of buildings and houses or for domestic use.
- All air inlets in the livestock house shall be inspected and checked regularly to be clear of dust, dirt and any foreign material to allow the free flow of fresh air into the building.
- For safe operation a fresh air supply to the heater of at least 20 m^3/h per 1 kW installed heat input is needed. Note that in most situations animals need much more fresh air. A well ventilated area is very important for safe operation of a gas heater. Follow in non-agricultural situations the requirements of EN13410.
- 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.
- Do not use the heater in areas where gasoline or flammable liquids or gases may be present. Also keep a safe distance to other easy inflammable materials like curtains, etc.
- Do not touch, move, handle or service the gas heater while it is burning.

- Before doing any maintenance, installation or service, first close the gas supply and wait till the gas heater has cooled down.
- Propane gas and natural gas are very flammable and are scented with a strong smell. If any gas smell is noticed, immediately turn off the gas supply. Do not ignite or operate any gas heater in the area until the leak has been found and repaired. Never strike any match or lighter or create any spark when you smell gas. Immediately ventilate the building, open all doors, windows and air inlets. Call for your local qualified gas installer to solve the leakage.
- Check regularly with soapy water all gas carrying parts and connections on gas leaks.
- Do not use any portion of the gas heater manifold, gas valve pressure regulator or gas line as a structural support for the heater. Always use a galvanized support chain, and never rope or plastic materials.
- Never operate the gas heater with a broken ceramic stone. Repair or replace it directly.
- 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 it that it cannot be used, and contact a service agent or gas installer to solve the problem.

Thermostat
The thermostat knob TH is always delivered separated from the thermostat valve.
1) Remove the protection cover (if any) 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 TH 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 conditions
The gas heater has been produced and assembled in The Netherlands (Europe), using only high quality materials. Your gas heater will provide a high degree of operational safety and a long working life. All gas heaters are tested before leaving the factory. Therefore parts can be discoloured a bit due to the heat during testing. The gas heater is ready to operate and needs no further adjustment or assembly anymore. Please note that safe and proper working cannot be guaranteed anymore when alterations are made to the gas heater or non-original components are used. This is dangerous and forbidden to do.

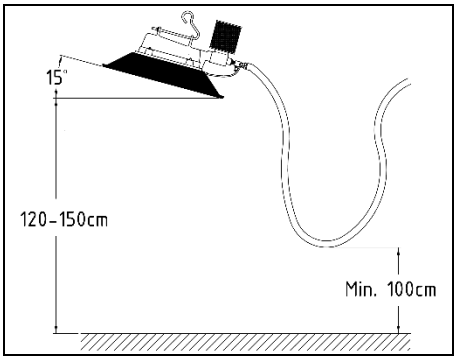
The heater is intended for use in well ventilated areas only. Do not install the heater in situations that are not well ventilated. Check also your local regulations for the ventilation and room size requirements. The amount of heaters per building depends on the type of building, the animals, the insulation, the climate and local wind conditions. Check with your installer or distributor for a calculation to determine the amount of heaters needed.

Check the data plate on the gas heater and check if the gas supply and gas pressure regulator are in correspondence with it. Never use it on other gases or pressures. Always connect the gas heater to the gas supply using an approved gas hose. Never use water hoses! Always secure the gas hose with hose clips. Make sure that the gas hose, gas lines, electric lines, lamps, etc. are not heated by the gas heater. If more gas heaters are connected to one gas pipe system, make sure that the pipe is large enough to maintain the correct gas pressure for all heaters in operation. Consult a qualified gas installer to calculate the pipe dimensions needed. Never use LPG appliances below ground level.

Keep always a safe distance around the gas heater to other materials and walls. See the table below for the minimum safety distances. The operational distances are guidelines to start with. Adjust later on to the correct height based on your personal preference and experience. For non-agricultural installations keep a distance of at least 2,0 meters from floor to the heater.

Operational Distances	**21**	**41**	**61**	**81/3000**
To the animals	50 – 80 cm	70 – 100 cm	110 – 150 cm	120 – 160 cm
Minimum Safety Distances to combustible materials	**21**	**41**	**61**	**81/3000**
To the ceiling	>50 cm	>50 cm	>50 cm	>50 cm
To the sides	>50 cm	>50 cm	>60 cm	>70 cm
Under the heater	>50 cm	>60 cm	>80 cm	>90 cm

Heater installation



The heater is intended for suspension only. Use only galvanized chain. Do not use the gas line, gas hose or electric lines for suspension purposes. Never use rope or plastic mounting materials. Make sure that the heater is mounted under an angle of 15 degrees with the gas safety device at the lower end.
Make sure that the location is free of air draft. In case there is air draft, turn the heater in such a way that its radiation surface is not influenced by the draft.
The gas hose shall be hanging free with a distance of minimal 1 meter from the ground, so that animals will not damage the hose. Connect the hose always via an individual gas tap to the central gas supply. Make sure that the hose is not under stress or twisted.
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 cylinders
Keep full or empty gas cylinders away from any heat source and keep them standing upright. Never leave cylinders lying flat on the ground, or in any hole, or a place below ground level (like cellars or basements). Store the gas cylinders always in accordance with the applicable local requirements. At the temperature of 10 degrees C approx. 9 till 14 kW per hour can be supplied from 1 gas cylinder of 45 kg or 5 kW per hour from a gas cylinder of 10 kg or more.

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.

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 normally an 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.

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 if there are not large leaks, check every connection with soapy water or gas detection liquid with all gas valves in open position 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.

Burner operation
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.

The gas heater burns properly when the colour of the ceramic stone and burner gauze is orange/red. In case the flame burns outside the burner gauze, check and clean the heater first and clean the filter. Also bad quality gas or wrong gas pressure can cause this. Consult a gas installer in this case. The installation of the heater in a draughty area may result in a loss of efficiency. If possible install in a draft free area or turn the face of the heater away from the draft.

Ignition procedure (always ignite on <u>maximum</u> gas pressure)
- Open the gas valve on the gas cylinder / gas tank / gas pipe and turn the gas pressure regulator at maximum capacity. Turn the thermostat on maximum temperature.
- Check all gas connections, hoses and gas regulators for leaks with soapy water.
- Ignite a safety match or BBQ gas lighter and keep the flame at the burner gauze (2).
- Press the button of the safety device (15). The gas heater shall ignite now within a few seconds.
- Continue to press the button of the safety device for approx 25 seconds and then release it.
- In case you have an appliance with adjustable heat input, adjust the pressure regulator to the setting required or set the thermostat on the requested temperature setting to obtain the heat output you need.
- If the gas heater goes out, wait for about 3 minutes and repeat the above ignition procedure.

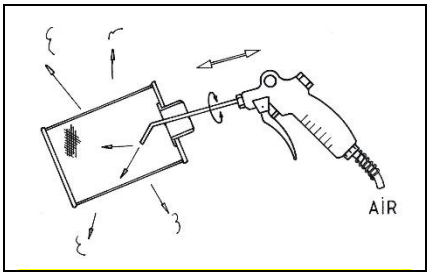
Shut off procedure
Turn down the gas pressure regulator and close the gas valve on the gas cylinder / gas tank / gas pipe. The gas heater will extinguish now and the safety device will close after 60 seconds. Wait 3 minutes before opening the gas valve and re-ignition of the gas heater.

Game rearing
Ceramic heaters are used a lot for game rearing. Especially for game rearing, due to the small cages and active birds, pay a lot of attention to <u>cleaning and ventilation</u>. While the cages are small, the effect of lack of ventilation and not cleaning will be directly cause the death of birds in a short time. While normally one heater is used for one cage, we advice to add an independent temperature alarm system for those situations where a temperature drop due to a (gas)failure will result in bird loss.

Maintenance
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.
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.
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.

Daily maintenance
In dusty or dirty environments check and clean a heater every day with a soft brush. Specially pay attention that the venturi (8) (or venturi tube if no venturi is needed) remains clean. In case a heater is not cleaned internally the heat efficiency will drop and the lifetime of the burner will become shorter. 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. Check also the condition of the gas hose daily for damage, cracks, ageing, etc.

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.

Sequence of periodic maintenance
Warning: Wear safety goggles during cleaning with compressed air.
Warning: Never use water to clean the heater or ceramic stones internally.
- First clean the heater and filter (11) as described by daily maintenance.
- Clean the reflector and other external parts with water, a mild detergent and a cloth or soft brush.
- Carefully inspect the ceramic stones on damage, cracks and holes. Replace when needed.
- To clean the burner (5), burner gauze (2) and ceramic stone (22) use an air hose (pressure max 2 bar/30 psi) and blow inside the venturi (8) and on the ceramic stone (22). Do this for 60 seconds and repeat 2-3 times. Never use water to clean your heater or any steel brush
- 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 more than the 1,5x the gas pressure mentioned on the data plate (20 till 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, or the copper tube is kinked, 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 and/or gas regulator is used, check these carefully for cracks, wear and other signs of damage or alteration. Replace it when the maximum lifetime printed on the hose and/or gas regulator (or the maximum allowed by local requirements) has been passed.
- Commission the heater after maintenance and check it carefully during first ignition, firing and extinguishing.

Fault finding table

Trouble	Action
Burner does not light.	• Check if the gas valve of the gas cylinder or gas line is open • Check if the gas cylinder is empty • Note that first ignition will take 60 or more seconds before gas is available • Check if the gas injector (12) is blocked • Check if the gas pressure / gas quality is identical to the data plate information
Burner extinguishes after lighting	• Keep button safety device (15) pressed for a longer period (up to 25 seconds) • Check if the thermocouple (19) is connected properly to the gas safety device • Check if the thermocouple tip (19) senses the heat of the burner • Thermocouple (19) or magnetic coil of the safety device (15) is broken • Gas pressure lower than minimum requested • Gas heater not suspended at 15 degrees angle
Flames leave the *- confines of the burner,* *- or are sooting,* *- or a blue cloud is under the reflector*	• Gas pressure is too high. Check the gas pressure with the data plate • Check if the gas pressure regulator is broken • Wrong gas is used. Check data plate for the correct gas supply • Venturi/air inlet is blocked/dirty • Check the size of the venture (8) and injector (12) with the table • Air filter (11) is dirty or not enough fresh air available • Check position axle bore (14) and move to correct position • Gas 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 • Check if the injector (12) or venturi (8) are blocked or dirty • Check the injector (12) and venture size (8) with the table • Check the setting of the thermostat (24) • Check if pipe sizes or gas hoses have sufficient capacity
Burner makes a lot of roaring noise (back flash)	• Check if ceramic stone (22) is broken • Check gas quality, and if gas pressure is to high, with data plate information • Check position axle bore (14) • Check size venturi (8) (Note that some types no separate venturi is needed: size is 15mm)
The burner do not work at minimum position	• Gas pressure is not correct. Check the gas pressure with the data plate • Wrong gas is used. Check data plate for the correct gas supply • Check the size of the venture (8) and injector (12) with the table • Injector (12) (partly) blocked • Check if the thermocouple tip (19) senses the heat • Sensor or wire thermostat TH (24) is broken • Thermostat TH valve adjusting mechanism (24) is blocked • By-pass hole thermostat (24) is blocked
Heater will not attain the desired temperature	• There is insufficient heat in the building for heat loss (i.e., not enough heaters). • The thermostat TH sensing bulb (24) is incorrectly placed • The thermostat TH (24) is out of calibration or broken • Injector (12) partly blocked

Declaration of conformity

We, Alke B.V., located in Scherpenzeel, The Netherlands, hereby declare that the 21, 41, 61 and 81 series, marked on their data plates with CE and with the CE approval/production supervision number 0063 of Kiwa Gastec are in compliance with the Directive on appliances burning gaseous fuels (2009/142/EC) (ex 90/396/EEC)

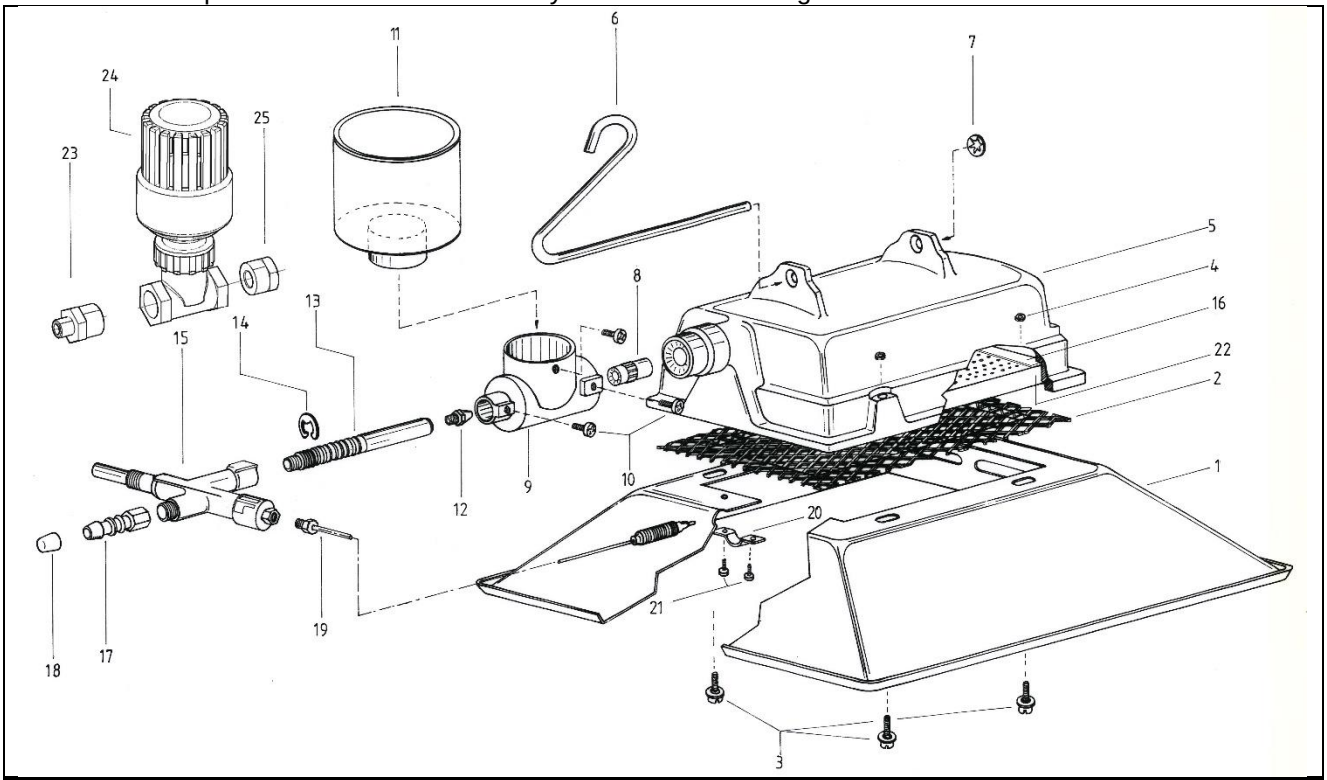
Scherpenzeel, 01-01-2011

Adri van Alphen
Managing Director

Derk Jan Keurhorst
Managing Director

Parts list

The parts list below is a combination list of all 21, 41, 61 and 81 models. Most parts of these models are identical. Consult the data plate to determine the model you have before using this list.



No	Amount	21 Part Number	41 Part number	61 Part Number	81/3000 Part Number	Description
1	1	02300000	02301000	02304000		Reflector (Enamel Black)
2	1	02400000	02401000	02403000		Burner gauze
3	4	07147000				Screw + washer M4x33 galv.
4	4	07401000				Nut M4 galv.
5	1	**)	**)	**)		Burner house Alu or Enamel Black
6	1	03901000				Suspension hook “Uni”
7	1	07010000				Star lock washer 6mm
8	1	01316xxx **)				Venturi 15x30 (if applicable)
9	1	01799000				Connection piece type “81” (small)
10	4	07135000				Screw M5x10 SS
11	1	02530000				Dust filter 35x80x90 SS (if applicable)
12	1	0120xxxx **)				Injector M8x0,75
13	1	01301000				Injector holder M8
14	1	07004000				Axle bore Ø 9mm
15	1	00101000				Safety Device w/o hose pillar*)
15a	1	00106000				Safety Device + hose pillar*)
16	1	X	X	02475000		Gas distribution plate
17	1	01327000				Hose pillar 1/8” female x 8mm (see 15)
18	1	07000000				Dust cap 9,5x16
19	1	00200000				Thermocouple M8x320mm
20	1	03905000				Thermocouple bracket 8mm
21	2	07013000				Parker screw 3.5x6.5 galv.
22	1	02621000	02622000	02623000	02624000	Ceramic stone HD (>50 mbar)
22a	1	02601000	02602000	02603000	02604000	Ceramic stone LD (<50 mbar)
22b	1	X	X	X	02604010	Ceramic stone effect (<50 mbar)
		02650010				Ceramic glue
23	1	01429000				Reducing nipple 1/8” x 3/8” (TH)(THi)
24	1	0092xxxx **)				Thermostat assembly (TH)(THi)
25	1	01405000				Reducing ring 3/8” x 1/8” (TH)(THi)

*) Hose pillar can be an integrated part of the safety device (see 15a)
**) Contact the dealer/manufacturer for the correct part number due to many different models

Technical table

Category	Gas	Supply pressure	Supply pressure **	Maximum Heat Input	Minimum Heat Input	Gas consumption	Main Injector	By-pass hole **	Venturi	Ring Injector Holder	Weight (TE)/(TH)	Remarks
(-)	(-)	(mbar)	(mbar)	(kW Hs)	(kW Hs)	(g/h or m3/h)	(mm)	(mm)	(mm)	(-)	(kg)	(-)
21 series												
I2L	G25	25	x	1,0	x	0,11 m3/h	0,76	x	15	0	2,6/2,9	
I2H, I2E	G20	20	x	1,1	x	0,10 m3/h	0,76	x	15	2	2,6/2,9	
I2E+	G20/G25	20/25	x	x	x	x	x	x	x	x	x	
I2ELL (LL)	G25	50	x	1,2	x	0,13 m3/h	0,71	x	9	2	2,6/2,9	
I2ELL (E)	G20	50	x	1,2	x	0,12 m3/h	0,64	x	9	3	2,6/2,9	
I3P	G31	28	x	0,72	x	52 gr/h	0,48	x	15	4	2,6/2,9	-
I3P	G31	50	x	1,0	x	72 gr/h	0,47	x	15	2	2,6/2,9	
I3P	G31	150	50	0,75	0,45	54 gr/h	0,33	x	9	4	2,6/2,9	-
I3P	G31	200	50	1,0	0,5	72 gr/h	0,33	x	9	5	2,6/2,9	-
I3P	G31	1400	350	1,0	0,5	72 gr/h	0,22	x	6,5	2	2,6/2,9	
41 series												
I2L	G25	25	x	1,9	x	0,21 m3/h	1,05	x	15	2	3,65	
I2H, I2E	G20	20	x	1,9	x	0,19 m3/h	0,95	x	15	2	3,65	
I2E+	G20/G25	20/25	x	x	x	x	x	x	x	x	x	
I2ELL (LL)	G25	50	25	1,8	1,3	0,20 m3/h	0,85	x	9	2	3,65	
I2ELL (E)	G20	50	25	1,8	1,3	0,17 m3/h	0,77	x	11	1	3,65	
I3P	G31	28	x	1,5	x	107 gr/h	0,64	x	15	4	3,65	-
I3P	G31	50	x	1,55	x	110 gr/h	0,59	x	11	5	3,65	-
I3P	G31	150	50	1,65	1,0	118 gr/h	0,46	x	10	6	3,65	-
I3P	G31	200	50	1,75	0,85	125 gr/h	0,44	x	9	4	3,65	-
I3P	G31	1400	500	1,7	1,0	120 gr/h	0,27	0,22	6,5	4	3,65	
61 series												
I2L	G25	25	x	2,4	x	0,27 m3/h	1,20	x	15	2	4,9	
I2H, I2E	G20	20	x	x	x	x	x	x	x	x	x	
I2E+	G20/G25	20/25	x	x	x	x	x	x	x	x	x	
I2ELL (LL)	G25	50	25	2,3	1,6	0,25m3/h	0,85	x	11	0	4,9	
I2ELL (E)	G20	50	25	2,3	1,6	0,22 m3/h	0,94	x	11	3	4,9	
I3P	G31	30	x	x	x	x	x	x	x	x	x	
I3P	G31	50	x	2,1	x	150 gr/h	0,74	x	15	2	4,9	
I3P	G31	150	50	2,6	1,5	185 gr/h	0,57	x	11	6	4,9	-
I3P	G31	200	50	2,3	1,2	165 gr/h	0,54	x	11	2	4,9	
I3P	G31	1400	350	2,5	1,3	179 gr/h	0,35	x	9	2	4,9	
81 series												
I2L	G25	25	x	3,5	x	0,39 m3/h	1,4	x	15	5	4,9	-
I2H, I2E	G20	20	x	3,1	x	0,33 m3/h	1,3	x	18	5	4,9	
I2E+	G20/G25	20/25	x	x	x	x	x	x	x	x	4,9	
I2ELL (LL)	G25	50	25	3,4	2,3	0,38 m3/h	1,15	x	15	1	4,9	-
I2ELL (E)	G20	50	25	3,5	2,4	0,33 m3/h	1,05	x	15	5	4,9	-
I3P	G31	28	x	2,65	x	190 gr/h	0,85	x	18	6	4,9	-
I3P	G31	30	x	2,75	x	195 gr/h	0,85	x	18	6	4,9	-
I3P	G31	50	25	3,0	1,9	215 gr/h	0,80	0,85	17	4	4,9	
I3P	G31	150	50	3,0	1,75	215 gr/h	0,61	0,47	11	6	4,9	-
I3P	G31	200	50	3,0	1,55	215 gr/h	0,58	0,50	11	2	4,9	
I3P	G31	1400	300	3,4	1,7	245 gr/h	0,38	0,27	9	2	4,9	-

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