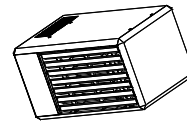
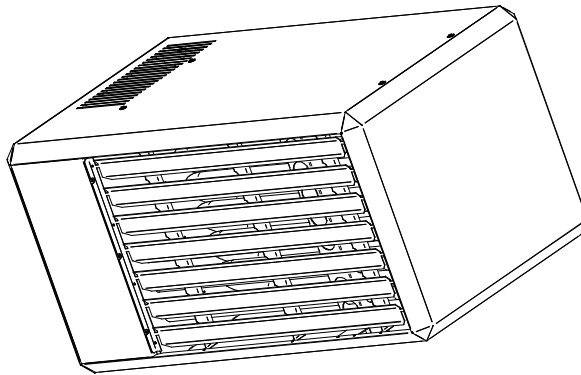


**INSTRUCTION MANUAL  
UNIT AIR HEATER  
TYPE TR**

Production from 2006-09



GB 122i



THIS DOCUMENT MUST ABSOLUTELY BE READ BEFORE STARTING THE  
INSTALLATION.  
INSTRUCT USER AND LEAVE THIS DOCUMENT WITH THE HEATER FOR  
REFERENCE.

Instruction manual version GB122i Argus  
Heaters for GB  
Date: 16-10-2008  
Heaters for natural gas G20 and Propane

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# 1 Introduction:

This installation and user manual contains the installation and users instructions for the standard and axial model of the TR-series. For the centrifugal, duct or air curtain models, additional instructions are provided in an appendix. This manual is produced specifically for the gas, electrical and mechanical installer. Also, it contains instructions how to install, use and maintain the heater. To assure a safe and efficient operation of this unit air heater, it is absolutely necessary to apply the instructions in the manual(s) correctly.

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## General

The TR unit air heaters are direct fired gas heaters with an output up to 100 kW. The heat exchanger is built with S-shaped tubes, each having its own atmospheric burner. Depending on the power of the heater, there are more burners and tubes in one appliance. Further the heater is provided with a sophisticated control sequence to maintain a comfortable room temperature and even air distribution.

It is imperative that the installation and maintenance of this appliance are carried out by qualified gas engineers, and strictly according to our instructions.

### 2.1 Guarantee

The guarantee is invalidated when the air heaters are not installed in accordance with this manual.

## 3 Application restrictions



### Important!

The installation and maintenance of this air heater should be performed by an authorised competent installer in accordance with this manual.

### 3.1 Pre-check

Before unpacking and installation, please check (i.e. on the data badge) if the heater corresponds to the order and if it is suitable for the local present provisions (gas type, gas pressure, electrical supply etc.)

The installation must comply with all applicable local and national standards.

The installation of the air heater must be in accordance with the relevant requirements of the Gas Safety Regulations (for example in GB; The Institute of Gas Engineers IGE UP-1 and 2), Building Regulations and the IIE Regulations also incorporating the gas safety (installation and use) regulations. Other national and/or local regulations may apply (the Local Authority, Fire Officer and Insurers)

The competent installer must make sure the heater operates correctly and must instruct the user about the safe operation of the heater.

A ventilation gap of 30 cm is required from the top and bottom of the heater to any flammable materials.

If this heater is taking its combustion air from within the room in which it is located, the necessary ventilation requirements must be followed for gas safety regulations.

The heater should not be installed in areas containing any corrosive or explosive vapours, high moisture or dust concentrations, negative pressures or temperatures higher than 30 °C; please consult Winterwarm or your supplier, otherwise the guarantee will become invalidated.

Make sure that the warm air can be blown out freely. There should absolutely be no (possibility of) materials within 5m from the front of the heater.

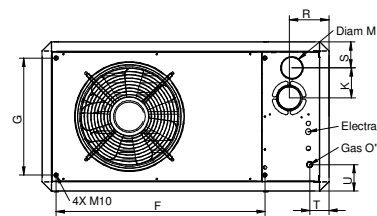
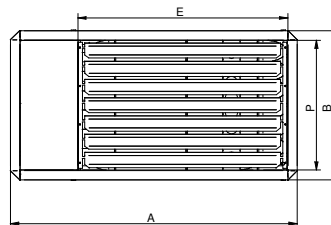
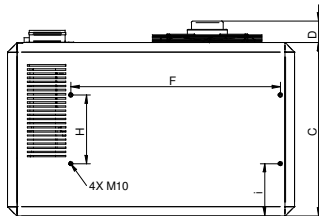
The heater has been tested in detail on safety and correct operating settings before leaving the factory. It has been adjusted for the type of gas that is stated on the data badge. Should there be any doubt, please contact your supplier.

### 3.2 Protection degree

The heater has a protection degree of IP20, which means it can be used in a dry and not very dusty environment. This also goes for the Winterwarm room-thermostat.

## 4 Technical details:

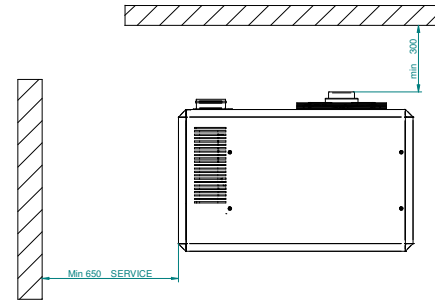
Type		TR10	TR15	TR20	TR24	TR28	TR40	TR50	TR60	TR80	TR100
Maximum nominal heat input (Nett)	kW	10,8	16,2	21,5	26,0	30,0	43,5	54,0	65,5	87,0	110,0
Minimum nominal heat input (Nett)	kW	6,5	9,7	14,5	17,5	20,5	30,0	36,5	44,0	59,0	73,5
Efficiency max power	%	91,9	91,6	91,8	92,1	92,3	91,7	91,6	91,8	92,4	92,0
Efficiency min power	%	87,9	87,4	88,6	89,1	89,5	88,7	88,4	88,9	89,7	90,0
Maximum heat output	kW	<b>9,9</b>	<b>14,9</b>	<b>19,7</b>	<b>23,9</b>	<b>27,7</b>	<b>39,9</b>	<b>49,5</b>	<b>60,1</b>	<b>80,4</b>	<b>101,2</b>
Minimum heat output	kW	5,7	8,5	12,8	15,6	18,3	26,6	32,3	39,1	52,9	66,2
Max air output (+ temp increase)	m3/h	2000	2000	2000	3000	3000	4000	5000	6000	8000	10.000
Throw horizontal (max)	m	12,0	12,0	12,0	16,0	16	22	26	28	30	30
Throw vertical (max. warm)	m	4,0	4,0	4,0	5,0	5	6	6	6	6	6
Sound level	dB(A)	42	42	42	45	45	48	50	50	52	54
Electric Connection	Vac	230	230	230	230	230	230	230	230	230	230
Thermostat communication bussystem (low voltage)		Argus Link									
Power Consumption	W	200	200	200	190	200	300	425	350	600	750
Power Consumption Amps	A	0,9	0,9	0,9	0,8	0,9	1,3	1,8	1,5	2,6	3,3
Gas connection	G"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"
pressure swich point	mbar	0,98	0,98	0,8	0,75	0,98	0,98	1,50	1,50	1,15	1,50
Flue / air connectionvoer	parallel	mm	80	80	80	80	100	100	130	130	130
Minimum suspension height horizontal throw	m	1,7	1,7	1,7	1,7	1,7	1,7	1,7	1,7	1,7	1,7
Minimum suspension height vertical throw	m	4,0	4,0	4,0	4,0	4	4	4	4	4	4
<b>Natural gas G20</b> Gas category II2H3P											
Min supply pressure	G20 (H) mbar	20	20	20	20	20	20	20	20	20	20
Class	Clas.	B22, C12, C32									
Max gas consumption	G20 (H) m3/h	1,1	1,7	2,3	2,8	3,2	4,6	5,7	6,9	9,2	11,6
d injectors	nx Ø mm	2x 2,1	3x 2,1	4x 2,1	5x 2,1	6x 2,1	8x 2,3	10x2,3	12x 2,3	16x 2,3	22x 2,3
burnerpressure high	(H) mbar	10,1	10,2	10,0	9,5	9,0	7,3	7,30	8,00	7,80	8,0
burnerpressure low	mbar	3,7	3,65	4,5	4,4	4,1	3,5	3,3	3,6	3,5	3,6
CO2 high (indication)	G20 (H) %	7,1	7,4	8	7,2	8,0	8,0	8	8,0	7,8	7,2
NOx class		3	3	3	3	3	3	3	3	3	3
<b>Propane G31</b> , Gas category II2H3P											
Min supply pressure	G31 (P) mbar	30	30	30	30	30	30	30	30	30	30
Class	Clas.	B22, C12, C32									
Max gas consumption	G31 (P) kg/h	0,9	1,3	1,7	2,1	2,4	3,5	4,3	5,2	6,9	8,8
d injectors	nx Ø mm	2x 1,4	3x 1,4	4x 1,4	5x 1,4	6x 1,3	8x 1,4	10x 1,4	12x 1,4	16x 1,4	22x 1,4
burnerpressure high	(P) mbar	23,8	24,2	22,7	20	27,5	23,0	22,40	23,5	22,80	20,1
burnerpressure low	mbar	8,9	9,0	10,5	9,5	13,0	11,0	10,4	10,5	10,5	9,0
CO2 high (indication)	G31 (P) %	7,9	8,6	9	8,3	9,5	9,2	9,4	9,1	9	8,6
NOx class		3	3	3	3	3	3	3	3	3	3
<b>Dimensions</b>											
A	mm	1110	1110	2000	1040	1040	1130	1130	1130	1130	1130
B	mm	290	290	290	540	540	540	670	1000	1000	1250
C	mm	630	630	630	630	630	700	700	700	700	700
D	mm	-	-	-	80	80	120	120	80	120	120
E	mm	760	760	760	760	760	760	760	760	760	760
F	mm	-	-	-	763	763	763	763	763	763	763
G	mm	-	-	-	426	426	426	550	875	875	1125
H	mm	250	250	250	250	250	250	250	580	580	580
I	mm	190	190	190	190	190	225	225	60	60	60
K	mm	110	110	110	110	110	140	140	225	225	225
M	mm	Ø 80	Ø 80	Ø 80	Ø 80	Ø 80	Ø 100	Ø 100	Ø 130	Ø 130	Ø 130
N	mm	Ø 80	Ø 80	Ø 80	Ø 80	Ø 80	Ø 100	Ø 100	Ø 130	Ø 130	Ø 130
O	mm	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"
P	mm	250	250	250	470	470	470	600	930	930	1180
R	mm	235	235	235	145	145	195	195	185	185	185
S	mm	80	80	80	95	95	95	95	175	175	300
T	mm	175	175	175	75	75	165	165	165	165	165
U	mm	50	50	50	80	80	70	80	90	90	60
weight	kg	50	50	55	67	70	85	100	135	150	200



## 5 Installation

### 5.1 Positioning

- Check and make sure that the support is solid enough.
- Keep sufficient distance between the heater and any obstruction, in connection with safety and access for service and maintenance. Pay particularly attention to any flammable materials. Please take into account the possibility to open the door of the heater for the necessary service and maintenance work. Make sure the airflow to and from the heater is unhindered. Any obstacles should be at least 5 metres away from the front of the heater.
- The heater can be installed horizontally or vertically, the positioning is almost completely free. See the drawings.
- The heater is provided with 3 times four M10 threaded sockets on the top, bottom and behind as fixing points. Use preferably the Winterwarm suspension kits.
- Make sure that after fitting, there is no mechanical tension on any connecting gas or electric supplies.
- If the heater is installed with the air stream vertically downwards, the maximum suspension height is 6 meters. Otherwise the warm air will not reach the floor.



#### Attention:

See the application-restrictions in this manual (Chapter 4) for more installation restrictions.

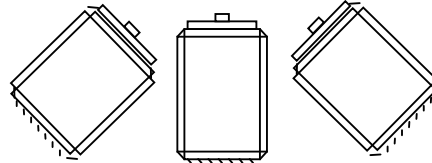
### 5.2 Positioning the heater

Horizontally



Horizontally upside down

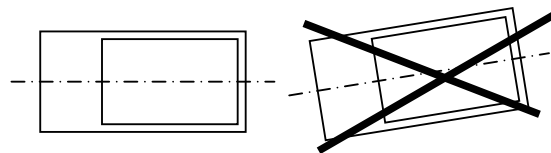
At an angle down  
0 - 90°



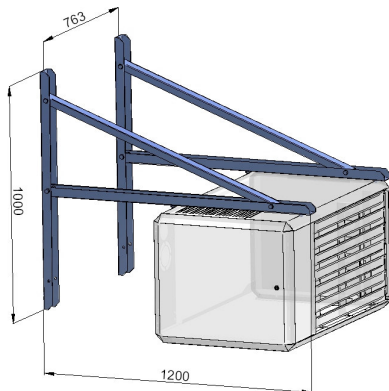
At an angle down  
0 - 90°

horizontal but not with an  
inclination.

Vertically

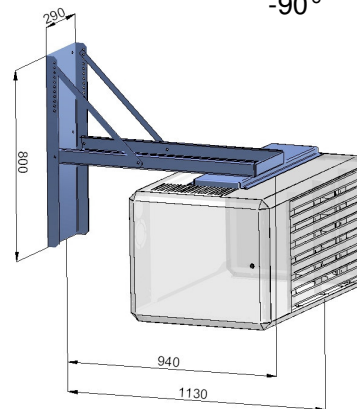
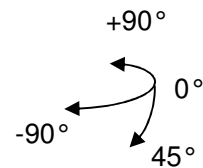


**Wall console (standard) art.nr. GA.8580**  
TR20 t/m TR100



**Wall console (turnable) art.nr. GA.8670**  
TR20 t/m TR50

turnable horizontal or  
turnable forward



### 5.3 Gas connection

The gas supply line has to meet the national valid requirements and possibly the local requirements of the building inspector, police or fire brigade. (In GB it must comply with Gas Engineers publication UP-1 and UP-2 together with BS 6891.)

A manual isolation valve in the supply line must be placed within reach of the heater, and all gas lines must be mounted without any mechanical tension.

When testing the supply lines with pressures above 60 mbar, this manual valve at the heater must be closed.

The working and standing supply pressure must be between 17mbar and 30mbar, measured at the inlet pressure nipple of the gas control in the heater.

The burner pressure is pre-adjusted (high/low, see technical details). The burner pressure can be measured on the P-out measure point on the gas valve.

### 5.4 Electrical connection

#### 5.4.1 230Vac supply

The installation must comply with local and national requirements, (as well as IEE regulations). The unit heater is delivered completely internally wired. Where controls of any type are to be added (e.g. room thermostat), the relevant wiring diagrams must be followed. Never use a room thermostat to interrupt the electrical supply to the heater!

Make provisions to completely isolate the heater for maintenance purposes. This can be an isolation switch (min. 3mm contact opening gap), a power plug or a non-switched fuse spur. The wiring diagram for the heater can be found towards the end of this manual.

The supply is 230Vac. with earth. The control circuit is a two wire low voltage Argus-link bus communication.

#### 5.4.2 Room thermostat

The heater can be controlled by special Winterwarm room thermostats:

**The DB8;** specially designed digital clock thermostat with optimizer. It can control 1 to 8 air heaters.

**The Multi Therm Standard;** specially designed digital thermostat. It can control 1 to 8 air heaters.

**The Interface board;** specially designed interface module for connecting the air heaters with other appliances. (0-10V signal, On/Off signal, high/low signal, reset and different outputs.

**ON/OFF thermostat;** The heater can be controlled with a simple on/off thermostat. In that case some important functions will not be available, like reset and modulation.

In all cases the communication between the heater and the thermostat is based on a two wire, low-voltage connection. In the appliance the wire for the thermostat has to be connected to connection 4 and 5 (see also electrical wiring diagram).



In all cases: make sure you use a screened cable.

Cable length:

0 – 50 m → min. 0,13 mm<sup>2</sup>

50 – 100 m → min. 0,25 mm<sup>2</sup>

100 – 250 m (max.) → min. 0,50 mm<sup>2</sup>

The given length is the maximum length between the units and the thermostats.



Never mount the thermostat near aerials of internal communication networks.

These emit radiation that could lead to disturbance of the thermostat. Always keep some meters distance.

In an EMC disturbance sensitive environment, a so-called sealed “twisted pair” cable must be used. Before connecting, switch off the tension from the heater. Connect the earth shield of the cable only to the earth terminal in the heater.

When mounting the thermostat, pay attention to the following items:

- Mount the thermostat in a place where the air can circulate freely pass the thermostat. Make sure that the sun does not shine directly upon the thermostat (in the winter). Do not place the thermostat on a cold wall. Place the thermostat on an inner wall, free from draught.
- Never place the thermostat into the throw of the heater.

### 5.4.3 Fuses

On the heater control (HC) there are two fuses. (See electrical wiring diagram.)

F1 and F2 are in the power supply of the heater. Replace the fuse only by a fuse of the same type.

## 5.5 Air intake / combustion products discharge

Check for compliance with local/national regulations.

The combined Winterwarm combustion-air supply/combustion-gas outlet device (roof terminal or wall terminal) has to be used, only then the installation is CE approved. See installation drawings.

Never connect a roof terminal for condensing appliances; rain can damage the heater through the discharge pipes.

Make sure the roof terminal is at least 0,5m above roof level. Use only pipes and bends for overpressure with profiled sealing-rings.

### 5.5.1 Maximum flue length

Vertical: 9 meters is the maximum length between the heater and its flue outlet.

Horizontal: 6 meters is the maximum length between the heater and the flue outlet.

When bends are used, the pressure drop will increase and therefore a 90° bend will count as 2 metres and a 45° bend as 1 metre. All flue pipes must be of the same diameter as the flue spigots on the heater, and all flue joints must be sealed. For further information regarding the flue system please contact your supplier.

### 5.5.2 Air intake from outside C12, C32

In case of a vertical flue outlet, the outlet must at least point out 0,5m above the roof surface.

Make sure that the air intake openings are free of any obstruction.

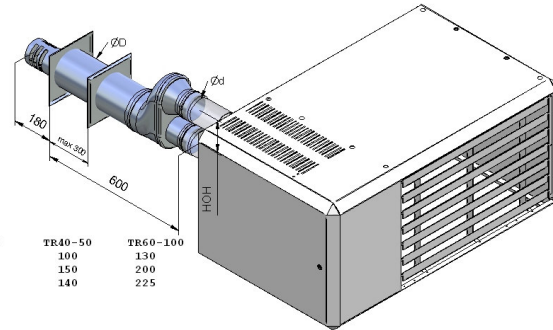
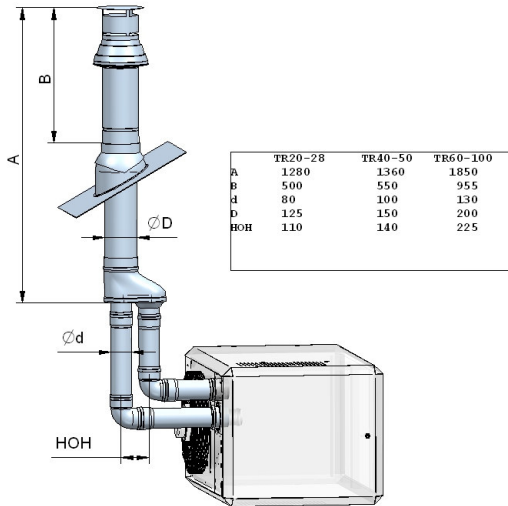
Always take the local regulations into account.

### Vertical discharge

TR20-28: DDV 80/125 art.nr. IA.8202  
 TR40-50: DDV100/150 art.nr. IA.8101  
 TR60-100: DDV130/200 art.nr. IA.8305

### Horizontal discharge

CT 80/125 art.nr. IA.8113  
 CT100/150 art.nr. IA.8112  
 CT130/200 art.nr. IA.8312

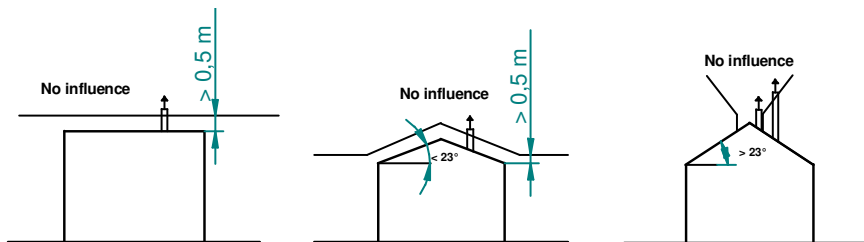


## 5.6 Air intake from inside B22

In case the unit is used as class B22 (air intake from inside the room) the air outlet needs to be placed in the area where there is less or little influence from the building. See drawing here below. In that case, the outlet must point out at least 0,5m above roof level. For details see local regulations.

In case the inclination is bigger than 23 ° please pay special attention to the combustion exit.

Put the delivered gauze in the air inlet stump of the heater, in order to avoid things to fall in. See drawing.



## 7 Functioning of the unit

### 7.1 General

The unit can heat as well as ventilate. By using the temperature-sensor on the unit and the one in the room-thermostat, the temperature-difference between the two in the room is monitored. Should the difference become higher than the set value, due to the fact that warm air has accumulated underneath the roof, the system-fan will start and push the warm air down, acting as a de-stratification fan.



---

## 7.2 Heat demand

If the thermostat indicates heat demand, the following cycle will start:

1. **Pre purge:** The electronic circuit board acknowledges the heat-demand and the flue booster fan will start running for 30 seconds. (Display print → 1)
2. **Ignition:** After 30 seconds of pre purge, the electrode will spark for max. 5 seconds, the gas valve is opened and the gas-air mixture will ignite. (Display print → 2)
3. **Burn:** When the flame is detected (Display print → b) the unit will modulate to the desired load after ca. 15 seconds. Depending on the given load, the system fan will start modulating (step-less) as well. The air heater will **always run for a minimum of 4 minutes**. This is to evaporate eventual condense in the discharge system.
4. **End of heat demand:** When the heat demand ends, the burner will switch off and the system fan will continue to run for ca. 3 minutes in order to cool the unit down (Display print → P).

The unit will try to ignite twice before lockout on flame fault.

In the case of flame failure during operation, the heater will attempt one restart.

When the heater is in lockout you see in the display intermittent A1. On the display of the room thermostat you see failure 1.

## 7.3 Delta-T-regulation (temperature controlled de-stratification fan)

In case there is no heat demand, the delta-T-regulation will be active.

When the temperature-difference between the sensor on the unit (the NTC) and the sensor in the thermostat is bigger than the set value (factory setting standard 8°C), the system fan will start, at a regulated speed, depending on the differential temperature difference. This operation ensures an even temperature distribution throughout the building, thus acting as a fully automatic variable de-stratification fan.

Should this delta-T-regulation not be required, this regulation can be switched off in the menu Program Settings on the room thermostat. See user manual of the special Winterwarm Room thermostat.

## 7.4 Summer ventilation

It is possible to let the ventilator run on a certain speed in the summer. Please follow the instructions in the manual of the thermostat.

## 7.5 High limit protection

The unit contains 2 temperature protections. The NTC thermostat monitors the air temperature electronically. Should the temperature, in a first step, become too high, the burner will modulate to the minimum input and the system fan will modulate to the maximum speed.

When the temperature still increases, the burner will switch off (on the display you see intermittent E1). When the heat exchanger has been cooled down to normal level, the burner will start automatically.

Should the temperature increase to an unacceptable level, the heater will stop (on the display you see intermittent A2). Only after a manual reset, the heater can start again. Manual reset can be done on the electronic circuit board or with the special Winterwarm room thermostat

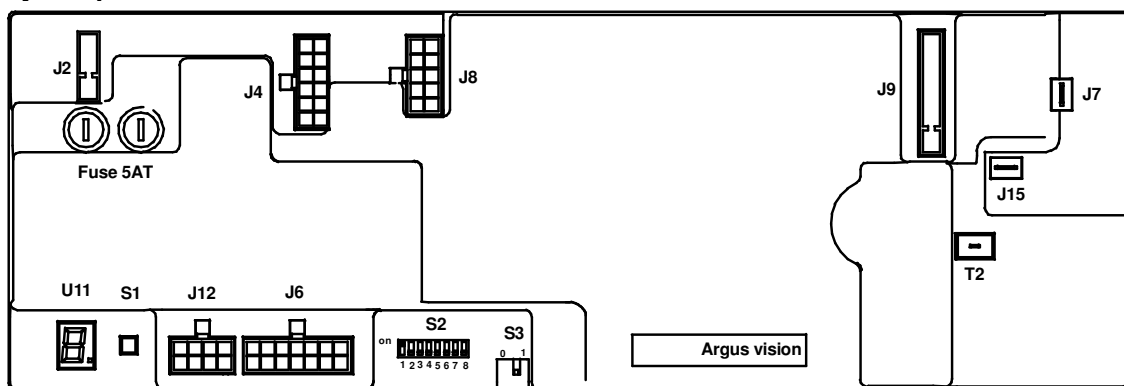
## 7.6 Description heater control HC

The heater control (HC) controls the unit and communicates with the room thermostat.

Functions integrated in the heater control HC are:

- two wire communication with room thermostat
- spark ignition on burner
- ionisation flame guard on burner
- controlling the gas valve
- modulating the burner
- modulating the system fan
- guarding the temperature of the heat exchanger
- LED signals status of heater, heat demand: green, failure: red
- Status of heater on 8 segment display on heater control HC
- reset of heater
- service mode function

### Lay-out print board



**J2** Main power connection 230V

**J4** Connection for gas valve and system fan

**J6** Connection for room thermostat, appliance recognition and the status LEDs green and red

**J7** Earth burner

**J8** Modulating coil gas valve, fluebooster

**J9** not used

**J12** Connections for temperature sensors

**J15** Ionisation selector

**F1 & F2** Fuses 2x 5AT

**U11** Status display

**S1** Reset service button

**S2** Micro switch heater no. Standard 1 to "on"

**S3** Power supply thermostat when S2 no.1 to "on", then S3 on 1, otherwise S3 to 0

**T2** Ignition transformer, connection for igniters

## 8 Putting into operation and adjustment

### 8.1 General

Prior to packaging, each unit is checked in detail on safety and well functioning. It is among other things adjusted to the right efficiency of combustion. In general, the heater does not need to be adjusted after installation, only a check of well functioning is necessary by a competent person.

The high/low burner pressures can be adapted, if necessary. However, only do this when the burner pressure turns out to be incorrect after measuring (differences smaller than 0,5mbar do not need to be adjusted). Never touch the adjusters injudiciously!

In case the installation is done following these instructions, the unit can be put on. Make sure the gas line is clean, gastight and free from air.

Turn on the electrical supply with the main switch, and leave the door of the heater open, in order to watch the first start and so become familiar with the functioning of the unit.

In case of warmth demand, the heater will always run for at least 4 minutes, even if the warmth demand is fulfilled within this time.

The heater will attempt twice to start again, before going on flame failure. Then reset is necessary.

Do not forget to instruct the end user about a safe use of the heater (presence of gas, place of the manual gas valve!), the operation of the heater (lock-out indication and reset) and about the necessary maintenance. This manual must be left with the end user.

### 8.2 Start by using the service-button

Press the service-button once for 10 seconds, and the unit will commence the ignition-cycle; (30 seconds pre-purge, ignition, 15 seconds flame stabilize, modulating operation)

The burner will then start on minimum load Display print → L/b.

By pressing the service-button again, the burner will go to maximum load. Display print → H/b

Pressing the service-button for a third time will put the unit into normal operation (depending on if there is warmth demand from the room thermostat).

### 8.3 Start by using the thermostat

Put the thermostat in the highest position. The start sequence is always the same as under 8.2.

### 8.4 To simulate a lock out condition

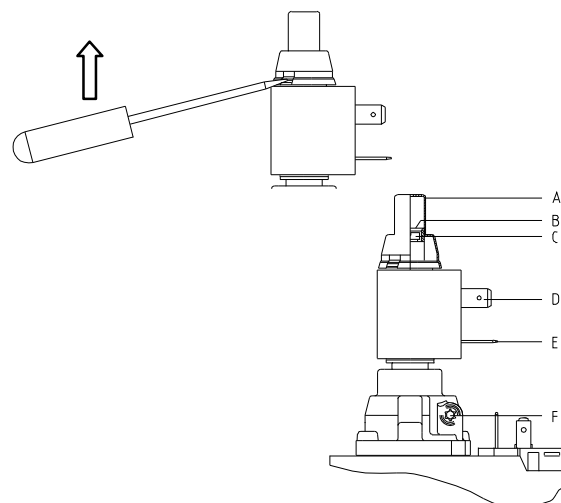
Close the manual gas supply valve. The heater will go on lock-out after a restart attempt. The display on the electronic circuit board shows [F I]. The red LED will light as well. Check also the function of the reset button (with gas valve open again), and observe if the heater starts smoothly.

Display on the print board

0	stand-by	Stand-by
1	Pre-purge	System checks and 30 sec. pre purge of the fluebooster
2	Ignition	The ignitioelectrode sparks 5 sec. and the gas valve opens, within 5 sec. flame detection should occur.
b	Burn	After 15 sec. stabilisation time, the heater will modulate to the desired power. The heater will run at least 4 minutes.
p	Post purge	The heater will cool the heat exchanger for 3 minutes, and the fluebooster will post purge for 1 minute.
F	Summer ventilation	The system fan is running on the summer ventilation mode.
F Blinking	Delta-T-regulation	The system fan is running on low position on Delta-T-regulation
L/ 1.2/ ... Blinking	Service Low	The heater is running on the service mode. When the heater runs, the heater will run on minimum power.
H/ 1.2/ Blinking	Service High	The heater is running on the service mode. When the heater runs, the heater will run on maximum power.

## 9 Adjusting the gas-control

In principle, it is **not** necessary to adjust the gas control after putting the unit into operation. In case it needs to be adjusted, (e.g. after fitting a new one), this must be done only by a qualified person. **Only use calibrated instruments!** A poor adjustment can lead to overheating and / or production of toxic carbon monoxide!



The burner pressures can be adjusted as follows:

- Remove the cover from the gascontrol with the help of a (small) screwdriver.
- Start the unit and first set the high burner pressure by turning screw 'B' (external 8mm). The High / low coil must be energised !
- De-energise coil (disconnect wire) and set low burner pressure by turning screw 'C' (slot for screwdriver) Do not set lower than 3 mbar in order to avoid problems with inter-lightning of burnerstrips.

Attention: Always check each burner pressure after any adjustment, as they influence each other.

Always check the CO production of the heater!!! Too much CO usually means the mixture is too rich. Adjust this if necessary with the two adjusters (see above)

## 10 Problem solving

### 10.1 General

When it turns out that the problem is **not** caused by the external circumstances (i.e. no electric supply power or no gas), please take the following instructions into account. Please remember the built in waiting times of the heater (do not react too soon!) and the code on the display on the electronic circuit board.

To simplify the investigation of the failing heater please check first:

- the fuses as well as the wires and plugs in the heater for possible loose contacts.
- Use first the service-button to put the heater in run mode, try later the room thermostat.

**Volatile lock out** : Can only be reset by hand

<b>R,0</b> Blinking	Internal failure	Defective print board
<b>R,1</b> Blinking	No flame	Within 5 sec flame, then flame failure: Cause 1 No flame: Cause 2
<b>R,2</b> Blinking	Exchanger too hot	Heater stops because the temperature of the heat exchanger is too high: Cause 3
<b>R,3</b> Blinking	Sensor error	Temperature sensor on heat exchanger error: Cause 4
<b>R,4</b> Blinking	Too many flame failures	Too many flame failures on ionization: Cause 1, 5
<b>R,5</b> Blinking	Internal error	Defective print board
<b>R,6</b> Blinking	Safety relays	2nd temperature limiter (optional) switched: Cause 3, 10

<b>A7</b> Blinking	Flame	Flame detection when there should not be a flame
<b>A8</b> Blinking	Fluebooster	Fluebooster does not run: Cause 6 Fluebooster runs: Cause 7

**Non volatile lockout:** will disappear when the error is cleared.

<b>E0</b> Blinking	Internal defect	Defective print board
<b>E1</b> Blinking	1st temperature safety	Heater stops because the temperature of the heat exchanger is too high. When the heater is cooled down, the heater will restart: Cause 3
<b>E2</b> Blinking	Selection resistance	Heater recognition does not work: Cause 8
<b>E3</b> Blinking	Selection resistance	Heater recognition does not work: Cause 8
<b>E9</b> Blinking	Reset error	Too many switches on reset button: Cause 9

**Cause 1:** Within 5 sec flame, then flames failure.

- The flame is not detected. Check the ignition cable and electrode. (cable resistance 1K ohm)
- The heater has electrically a poor earth.
- The print board is defective.

**Cause 2:**

- There is not enough gas pressure.
- The burner pressure is too low, adjust the gas valve
- The gas valve does not open, check during ignition on 230V on the valve.
- Check whether the ignition electrode sparks, replace cable, electrode

**Cause 3:** Heat exchanger too hot

- Check if the system fan blows enough air.
- Check the setting of the gas valve, the heater may be overloaded.

**Cause 4:** Temperature sensor on heat exchanger error.

- The sensor has internally 2 sensors. These differ too much. Measure the resistance from each sensor, the resistance should be 20K at 25° en 25K at 20°. If the measured values differ too much, replace sensor.
- Rotate the sensor ¼ turn, so that the contact point is different on the sensor housing.

**Cause 5:** Too many flame failures while burning

- The setting of the gas valve is not ok, adjust the gas valve
- The flue outlet is blocked

**Cause 6:** The fluebooster does not run

- fan is blocked or the wiring is bad
- fan is defective

**Cause 7:** The fluebooster fan runs.

- Check if the fan runs smoothly.
- Check if the fan is not polluted.
- Check if there is water (condense) in the hoses from the pressure switch.

**Cause 8:** Selection resistance error

- Check the appliance recognition part, replace if necessary

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**Cause 9:** Reset button error

- Too many switches on reset button in a short period of time. This error will disappear after some time, or if the main power is disconnected for a while.

**Cause 10:** 2nd STB (optional) switched

- Heaters equipped with 2 system fans have a second temperature limiter. The second limiter has switched. Check the fan where this sensor is mounted.
- Check the wiring.

**Heater does start, but shows other problems.**

- a) System fan (M1) does not start or does not vary in speed; Check first the functioning of this fan by connecting it to 230 Volt. Check with a multi-meter if the different lower tensions are present on the fan. The fuse could have failed. If the motor is OK, the cause of the problem must be in the heater control HC, as the heater control HC dictates the different voltages to the fan-motor. In that case, replace the heater control HC.

## **11 Maintenance / spare parts**

The heater must be inspected and cleaned regularly (once a year) by a qualified installer who understands this appliance.

This is all the more important when the circumstances are heavier, especially in case of dust, humidity, high frequency of switching on/off etc.

**Activities:**

### **11.1 General inspection**

- Check the overall condition of the installation. Check the heater, the thermostat, the wires and the gas line.
- Check the burner pressure and the CO<sub>2</sub> and CO levels from the flue. Do so when operating the heater in maximum and minimum load. (service mode: press 10 seconds on the reset button, the heater will run on minimum power, press the button again, the heater will run on maximum load.)

### **11.2 Inspection of the heater**

Before starting the inspection, switch off the electric power to the heater with the maintenance-switch and close the manual gas valve.

- Take out the burner, by unscrewing the 4 socket screws.
- Check the heat exchanger from the inside for dirt and/or damage.
- Check the burner on damage and clean the ignition electrode if necessary. CAUTION: do not twist the electrode out of shape!
- Check the air supply and the flue discharge.
- Clean if necessary the inside of the heater with a vacuum cleaner.
- In case the heat exchanger is dirty on the outside, clean it with a soft brush. Never use a steel wire brush!
- Clean the fan-grid with a vacuum cleaner and a brush.
- Put the burner back in (renew the gasket)

After this, check the heater on efficiency of combustion and adjust this if necessary. Check if the heater operates correctly.

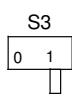
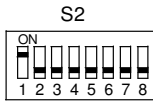
## 11.3 Spare parts

Description	TR10	TR15	TR20	TR24	TR28	TR40	TR50	TR60	TR80	TR100
Burner	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200	IB.3200
Ignition electrode	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400	IB.3400
Ignition cable	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460	IX.3460
Ionisation electrode	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402	IB.3402
Flue fan	IB.4500	IB.4500	IB.4500	IB.4500	IB.4500	IB.4512	IB.4512	IB.4516	IB.4516	IB.4516
Gas control valve	GA.3394	GA.3394	GA.3394	GA.3394	GA.3394	GA.3394	GA.3394	GA.3394	IB.3314	IB.3314
System Fan	IB.4816	IB.4816	IB.4816	IX.4200	IX.4200	IX.4203	IH.4206	IX.4200	IX.4203	IH.4206
Control board 166HA	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908	IB.5908
pressureswitch	IK.3994	IK.3994	IK.3996	IK.3996	IK.3994	IK.3994	IB.3902	IB.3902	IB.3906	IB.3902
NTC cable set	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902	GA.3902
Gasket set TR	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712	GA.6712

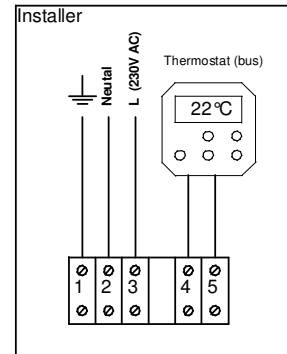
## 12 Examples electrical installation

### 12.1 Installation with modulating room thermostat

- Connect the heater to 230Vac
- Connect the thermostat to the terminals according to the diagram. (terminal 4 and 5)



- On the print the switches S2 and S3 need to be set as follows: S2 switch 1 at the ON position, and S3 at 1.



The changement of these switches need to be performed without power on the Heater, otherwise these settings take no effect.



In all cases: make sure you use a screened cable.

Cable length:

0 – 50 m → min. 0,13 mm<sup>2</sup>

50 – 100 m → min. 0,25 mm<sup>2</sup>

100 – 250 m (max.) → min. 0,50 mm<sup>2</sup>

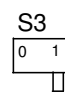
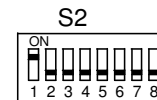
The given length is the maximum length between the units and the thermostats.

### 12.2 Installation of more heaters on one thermostat

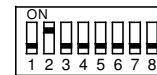
One room thermostat can control 8 heaters. To connect the heaters is very simple. The two wires for the thermostat can be connected to heater one, from heater one to heater two, from heater two to heater three etc. etc. Connect always on terminal 4 and 5. See also the diagram.

Standard factory setting: switch 1 “on”

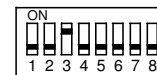
Each heater needs its own unique number to have the heater recognised by the room thermostat. The number of the heater can be set by the micro switch on the heater control HC in the heater. The number at the upper position of the switch is the given number for that heater. Make sure that each heater has its own unique number. If more than one heater have the same number, the system does not work.



Heater 1



Heater 2



Heater 3

The changement of these switches need to be performed without power on the Heater, otherwise these settings take no effect.



In all cases: make sure you use a screened cable.

Cable length:

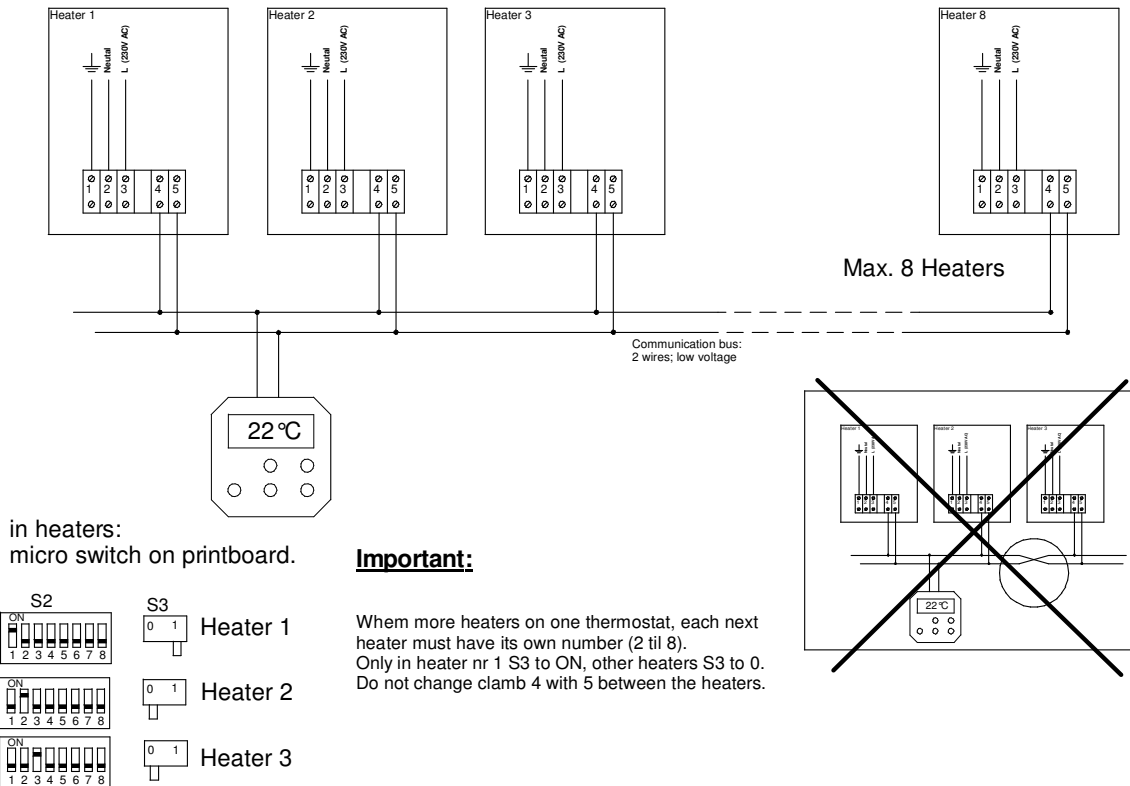
0 – 50 m → min. 0,13 mm<sup>2</sup>

50 – 100 m → min. 0,25 mm<sup>2</sup>

100 – 250 m (max.) → min. 0,50 mm<sup>2</sup>

The given length is the maximum length between the units and the thermostats.

## More heaters on one roomthermostat



### 12.3 Installation with ON/OFF Thermostat

The heater can be connected to an ON/OFF thermostat.

In this case, the heater runs on maximum power only. It will not modulate.

The manual reset in case of fan error will have to be done with the reset button on the main board.

The following settings have to be made on the main board in the heater:

- The micro switches on the main board have to be set to OFF, see example.
- The switch S3 has to be set to 1.
- The thermostat has to be connected to the clamps 4 and 5 in the heater.
- In the case that more than 1 heater is connected to 1 thermostat, do not exchange clamp 4 with clamp 5 between the heaters. This will result in permanent burning of the heaters.
- The changement of these switches need to be performed without power on the Heater, otherwise these settings take no effect.





# 13 Electrical diagram

