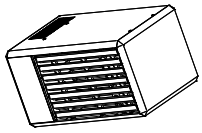
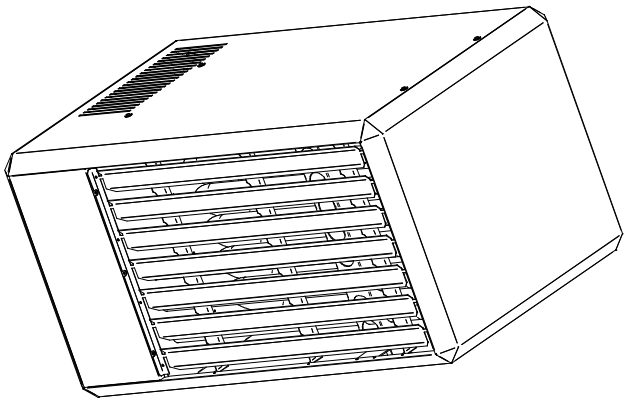
INSTRUCTION MANUAL
UNIT AIR HEATER

TYPE TR

GB 122s





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

Instruction manual version GB122s
TR-3.5 Heaters for GB
Date: 09-01-2019
Heaters for natural gas G20 and Propane

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.

2 Content:

		Page
1	**INTRODUCTION:**	**2**
2	**CONTENT:**	**2**
2.1	GUARANTEE	3
3	**APPLICATION RESTRICTIONS**	**3**
3.1	PRE-CHECK	3
3.2	PROTECTION DEGREE	4
4	**TECHNICAL DETAILS:**	**5**
5	**INSTALLATION**	**9**
5.1	POSITIONING	9
5.2	POSITIONING THE HEATER	9
5.3	GAS CONNECTION	10
5.4	ELECTRICAL CONNECTION	10
5.5	AIR INTAKE / COMBUSTION PRODUCTS DISCHARGE	11
7	**FUNCTIONING OF THE UNIT**	**13**
7.1	GENERAL	13
7.2	HEAT DEMAND	13
7.3	DELTA-T-REGULATION (TEMPERATURE CONTROLLED DE-STRATIFICATION FAN)	14
7.4	SUMMER VENTILATION	14
7.5	HIGH LIMIT PROTECTION	14
7.6	DESCRIPTION HEATER CONTROL HC	14
8	**PUTTING INTO OPERATION AND ADJUSTMENT**	**15**
8.1	GENERAL	15
8.2	START BY USING THE SERVICE-BUTTON	15
8.3	START BY USING THE THERMOSTAT	15
8.4	TO SIMULATE A LOCK OUT CONDITION	16
9	**ADJUSTING THE GAS-CONTROL**	**16**
10	**PROBLEM SOLVING**	**17**
10.1	GENERAL	17
11	**MAINTENANCE**	**19**
11.1	GENERAL INSPECTION	19
11.2	INSPECTION OF THE HEATER	20
12	**EXAMPLES ELECTRICAL INSTALLATION**	**20**
12.1	INSTALLATION WITH MODULATING ROOM THERMOSTAT	20
12.2	INSTALLATION OF MORE HEATERS ON ONE THERMOSTAT	21
12.3	INSTALLATION WITH ON/OFF THERMOSTAT	22
13	**ELECTRICAL DIAGRAM**	**23**
13.1	ELECTRICAL DIAGRAM TR10 - TR80	23
13.2	ELECTRICAL DIAGRAM TR100 - TR150	24
14	**SPARE PARTS / EXPLODID VIEW DRAWING**	**25**

14.1 SPARE PARTS 25
14.2 EXPLODED VIEW TR10 - TR20 26
14.3 EXPLODED VIEW TR24 – TR50 27
14.4 EXPLODED VIEW TR60 - TR100 28
14.5 EXPLODED VIEW TR125 & TR150 29
15 CERTIFICATE & DECLARATION 30

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.

- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

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.

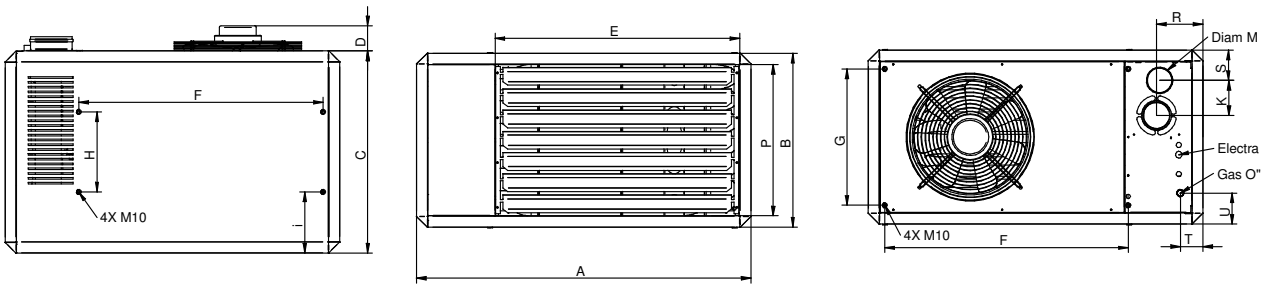
The heater has been tested in detail on safety and correct operating settings before leaving the factory. It has been adjusted for the type of gas that is stated on the data badge. Should there be any doubt, please contact your supplier.

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.

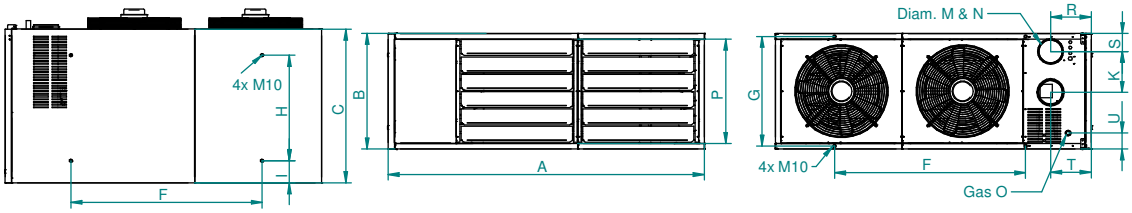
4 Technical details:

Typ TR-3.5 (ERP2018)		**TR10**	**TR15**	**TR20**	**TR24**	**TR28**	**TR40**	**TR50**
Maximum nominal heat input (Nett)	kW	10,8	15,7	19,5	23,5	29,0	41,5	51,0
Minimum nominal heat input (Nett)	kW	9,0	14,0	14,5	20,0	24,0	35,0	40,0
Maximum heat output	kW	**10,1**	**14,6**	**18,2**	**21,7**	**26,7**	**38,8**	**47,2**
Minimum heat output	kW	8,3	11,6	13,5	18,4	22,0	32,5	36,6
Efficiency max. power	%	93.3	93,0	93,4	92,3	92,1	93,4	92,6
Efficiency min. power	%	92,2	92,8	92,8	92,2	91,8	92,9	91,5
Max. air output (+temp. increase)	m3/h	2000	2000	1850	3150	3200	4250	5800
Throw horizontal (max.)	m	12	12	12	16	16	22	26
Throw vertical (max. warm)	m	4	4	4	5	5	6	6
Gas connection	G"	1/2"	1/2"	1/2"	1/2"	1/2"	3/4"	3/4"
Electrical connection (50Hz)	V	230	230	230	230	230	230	230
Electrical power consumption max.	kW	0,200	0,200	0,200	0,190	0,200	0,300	0,425
Electrical power consumption min.	kW	0,200	0,200	0,200	0,190	0,200	0,300	0,425
Electrical power consumption standby	kW	0,004	0,004	0,004	0,004	0,004	0,004	0,004
Electrical consumption Amps max.	A	0,9	0,9	0,9	0,8	0,9	1,3	1,8
Emission efficiency, (ηs, flow)	%	95.9	93,7	92,5	94,3	93,1	92,4	93,6
Seas. Space heating efficiency	%	74,2	72.7	72.9	73,4	72,4	72,5	72.9
NOx emissie (GCV)	mg/kWh	93	99	93	97	94	95	96
NOx klasse		4	4	4	4	4	4	4
Flue gas amount max.	kg/h	20	30	40	50	55	80	100
Thermostat communication bussystem (low voltage)		Argus link						
Pressure switch point	Pa	120	135	160	135	120	150	135
Sound level	dBA	42	42	42	45	45	48	50
Min. suspension height horz. throw	M (min.)	1,7	1,7	1,7	1,7	1,7	1,7	1,7
Min. suspension height vertical. throw	M (min.)	4,0	4,0	4,0	4,0	4,0	4,0	4,0
Maximum flue / air length	m	9	9	9	9	9	9	9
weight	kg	50	50	55	67	70	85	100
Natural gas G20 (I2H) ,								
Nominal supply pressure G20 (H)	mbar.	20						
Supply pressure (min-max) G20 (H)	mbar.	17-25						
Gas category		II2H3P B/P						
Class		B23, C13, C33						
Max gas consumption G20 (H)	m3/h	1,1	1,7	2,1	2,5	3,1	4,4	5,4
d injectors	n x Ømm	2x 1,9	3x 1,9	4x 1,9	5x 1,9	6x 1,9	8x 1,9	10x 1,9
Burner pressure high G20 (H)	mbar	14,5	13,5	11,5	11,0	12,3	13,4	12,9
Burner pressure low G20 (H)	mbar	10,0	10,6	6,5	8,0	8,5	9,5	8,0
CO2 High (indication) G20 (H)	%	8,0	8,2	8,0	8,0	8,0	9,0	8,5
Propane, G31,								
Nominal supply pressure G31 (P)	mbar.	30-50						
Supply pressure (min-max) G31 (P)	mbar.	25-50						
Gas category		II2H3P B/P						
Class		B23, C13, C33						
Max gas consumption G31 (P)	kg/h	0,9	1,2	1,6	1,9	2,4	3,3	4,1
d injectors	n x Ømm	2x 1,4	3x 1,4	4x 1,4	5x 1,4	6x 1,3	8x 1,4	10x 1,4
Burner pressure high G31(P)	mbar	23,0	21,3	18,5	16,5	22,5	20,5	20,3
Burner pressure low G31(P)	mbar	16,0	17,0	10,0	12,3	15,5	14,5	12,4
CO2 High (indication G30 (B/P)	%	9,0	9,3	9	8,8	9,5	9,5	9,7
Butane, G30,								
Nominal supply pressure G30 (B/P)	mbar.	30-50						
Supply pressure (min-max) G30 (B/P)	mbar.	25-50						
Gas category		II2H3P B/P						
Class		B23, C13, C33						
Max gas consumption G30 (B/P)	kg/h	0,7	0,9	1,2	1,4	1,7	2,5	3,1
d injectors	n x Ømm	2x 1,4	3x 1,4	4x 1,4	5x 1,4	6x 1,3	8x 1,4	10x 1,4
Burner pressure high G30(B/P)	mbar	18,0	16,5	14,0	13,0	17,5	16,0	16,0
Burner pressure low G30 (B/P)	mbar	13,0	13.0	8,0	9,5	12,0	11,5	9,3
CO2 High (indication G30 (B/P)	%	9,2	9,2	9,2	9,2	9,2	9,2	9,2



Dimensions	**axial version**	**TR10**	**TR15**	**TR20**	**TR24**	**TR28**	**TR40**	**TR50**
A	mm	1110	1110	1110	1040	1040	1130	1130
B	mm	290	290	290	540	540	540	670
C	mm	630	630	630	630	630	700	700
D	mm	-	-	-	80	80	120	120
E	mm	760	760	760	760	760	760	760
F	mm	-	-	-	763	763	763	763
G	mm	-	-	-	426	426	426	550
H	mm	250	250	250	250	250	250	250
I	mm	190	190	190	190	190	225	225
K	mm	110	110	110	110	110	140	140
M	mm	Ø80	Ø80	Ø80	Ø80	Ø80	Ø100	Ø100
N	mm	Ø80	Ø80	Ø80	Ø80	Ø80	Ø100	Ø100
O	mm	1/2“	1/2“	1/2“	1/2“	1/2“	3/4“	3/4“
P	mm	250	250	250	470	470	470	600
R	mm	235	235	235	145	145	195	195
S	mm	80	80	80	95	95	95	95
T	mm	175	175	175	75	75	165	165
U	mm	50	50	50	80	80	70	80
For the purpose of suspension above / below & backside		4x M10	4x M10	4x M10	4x M10	4x M10	4x M10	4x M10
Weight	kg	50	50	55	67	70	85	100

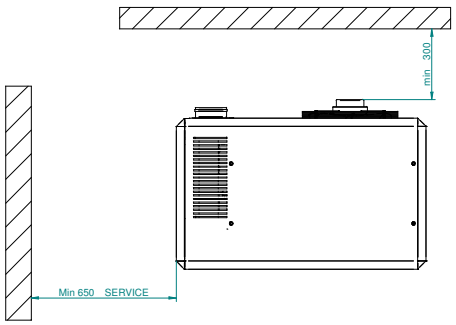
Type TR-3.5 (ERP2018)		**TR60**	**TR80**	**TR100**	**TR125**	**TR150**
Maximum nominal heat input (Nett)	kW	65,5	81,0	105,0	132,0	152,0
Minimum nominal heat input (Nett)	kW	46,0	56,0	73,5	95,0	110,0
Maximum heat output	kW	**60,8**	**74,8**	**98,3**	**121,8**	**140,6**
Minimum heat output	kW	41,8	50,6	67,0	86,2	100,1
Efficiency max. power	%	92,9	92,3	93,2	92,3	92,5
Efficiency min. power	%	90,9	90,4	91,2	90,7	91,0
Max. air output (+temp. increase)	m3/h	6600	8750	10.400	14.250	16.000
Throw horizontal (max.)	m	28	30	30	33	35
Throw vertical (max. warm)	m	6,0	6,0	6,0	6,0	6,0
Gas connection	G"	3/4"	3/4"	3/4"	3/4"	3/4"
Electrical connection (50Hz)	V	230	230	230	230	230
Electrical power consumption max.	kW	0,350	0,600	0,750	1,100	1,500
Electrical power consumption min.	kW	0,350	0,600	0,750	1,100	1,500
Electrical power consumption standby.	kW	0,004	0,004	0,004	0,004	0.004
Electrical consumption Amps max.	A	1,5	2,6	3,3	4,8	6,5
Emission efficiency, (ηs, flow)	%	93,4	94,0	93,4	93,7	93,5
Seas. Space heating efficiency	%	72,6	73,0	73,1	72.8	72,8
NOx emissie (GCV)	mg/kWh	82	94	90	93	97
NOx klasse		4	4	4	4	4
Flue gas amount max.	kg/h	120	150	200	250	310
Thermostat communication bussystem (low voltage)		Argus Link				
Pressure switch point	Pa	180	180	220	215	200
Sound level	dBA	50	52	54	60	63
Min. suspension height horz. throw	M (min.)	1,7	1,7	1,7	1,7	1,7
Min. suspension height vertical. throw	M (min.)	4,0	4,0	4,0	4,0	4,0
Maximum flue / air length	m	9	9	9	9	9
weight	kg	135	150	200	230	260
Natural gas G20 (I2H) , heater version 3.3						
Nominal supply pressure G20 (H)	mbar.	20				
Supply pressure (min-max) G20 (H)	mbar.	17-25				
Gas category		II2H3P B/P				
Class		B23, C13, C33				
Max gas consumption G20 (H)	m3/h	6,9	8,6	11,2	14,0	16,1
d injectors	n x Ømm	5x 3,2	6x 3,7	8x 3,7	9x 3,7	11x 3,7
d injectors	n x Ømm				1x 3,5	1x 3,5
Burner pressure high G20 (H)	mbar	11,8	7,0	7,3	6,3	6,0
Burner pressure low G20 (H)	mbar	5,8	3,3	3,4	3,1	3,1
CO2 High (indication) G20 (H)	%	8,5	8,7	8,6	8,5	8,2
Propane, G31, heater version 3.4						
Nominal supply pressure G31 (P)	mbar.	30-50				
Supply pressure (min-max) G31 (P)	mbar.	25-50				
Gas category		II2H3P B/P				
Class		B23, C13, C33				
Max gas consumption G31 (P)	kg/h	5,2	6,4	8,4	10,5	12,1
d injectors	n x Ømm	5x 2,3	6x 2,3	8x 2,3	10x 2,3	12x 2,3
Burner pressure high G31(P)	mbar	19,0	19,0	17,7	19,3	17,4
Burner pressure low G31(P)	mbar	9,4	9,0	8,5	9,5	8,9
CO2 High (indication G31 (P)	%	10,0	9,5	9,5	9,5	9,5
Butane, G30, heater version 3.4						
Nominal supply pressure G30 (B)	mbar.	30-50				
Supply pressure (min-max) G30 (B)	mbar.	25-50				
Gas category		II2H3P B/P				
Class		B23, C13, C33				
Max gas consumption G30 (B)	kg/h	3,9	4,9	6,4	7,9	9,1
d injectors	n x Ømm	5x 2,3	6x 2,3	8x 2,3	10x 2,3	12x 2,3
Burner pressure high G30 (B)	mbar	14,5	14,3	13,8	14,9	13,3
Burner pressure low G30 (B)	mbar	7,4	6,0	6,5	7,5	7,1
CO2 High (indication G30 (B)	%	9,2	9,2	9,2	9,5	9,5



Dimensions	axial version	TR60	TR80	TR100	TR125	TR150
A	mm	1735	1735	1735	1735	1735
B	mm	630	630	800	970	1130
C	mm	845	845	845	845	845
D	mm	120	120	120	140	140
E	mm	1335	1335	1335	1335	1335
F	mm	1050	1050	1050	1050	1050
G	mm	603	603	768	938	1103
H	mm	580	580	580	580	580
I	mm	123	123	123	123	123
K	mm	225	225	225	225	225
M	mm	Ø130	Ø130	Ø130	Ø130	Ø130
N	mm	Ø130	Ø130	Ø130	Ø130	Ø130
O	mm	3/4“	3/4“	3/4“	3/4“	3/4“
P	mm	570	570	740	910	1070
R	mm	220	220	220	220	220
S	mm	143	143	143	143	143
T	mm	127	127	127	127	127
U	mm	88	88	88	88	88
For the purpose of suspension above / below & backside		4x M10	4x M10	4x M10	4x M10	4x M10
Weight	kg	135	150	200	230	260

5 Installation

5.1 Positioning

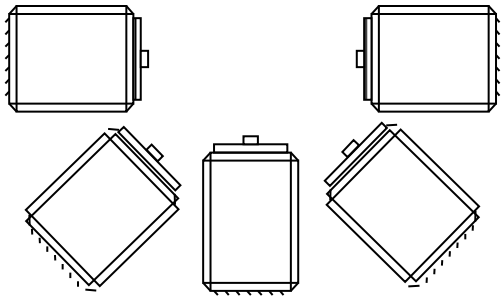


- Check and make sure that the support is solid enough.
- Keep sufficient distance between the heater and any obstruction, in connection with safety and access for service and maintenance. Pay particularly attention to any flammable materials. Please take into account the possibility to open the door 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 4x M10 (TR10 up to150) 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



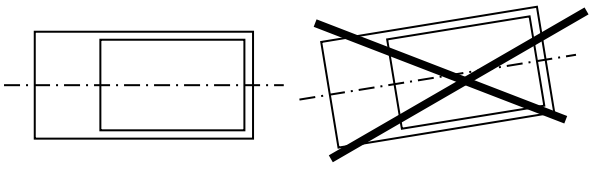
Horizontally upside down
TR10 - 50

At an angle down
0 - 90°

At an angle down
0 - 90°
TR10-50

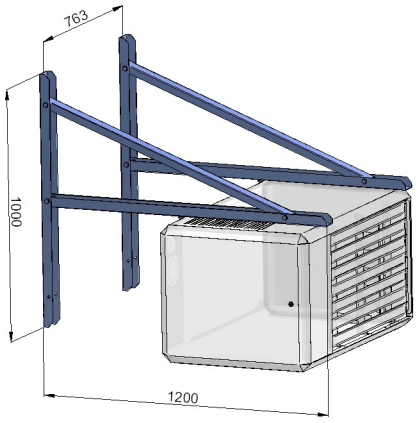
Vertically

horizontal but not with an inclination.



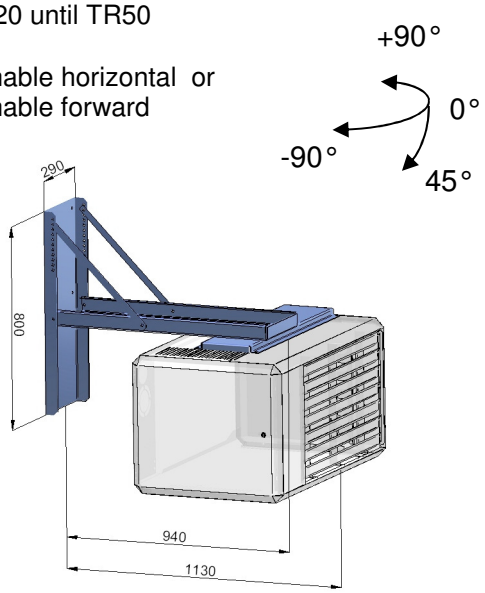
Wall console (standard) art.nr. GA.8580
TR10 until TR100 and TR60 until 125

Wall console (standard) art.nr. GA.8675
TR150



Wall console (turnable) art.nr. GA.8670
TR20 until 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 Multi Therm Comfort; 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 – 250 m (max.) ➔ min. 0,80 mm2
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.
Only the described flue material may be used. This goes for the roof or wall terminal and also for the piping between the heater and the terminal. Only so the installation is approved.
Never connect a roof terminal for condensing appliances, rain can damage the heater trough the discharge pipes.
In some cases the roof terminal has to be at least 0,5m above roof level (local regulations).

5.5.1 Flue material

It is only allowed to use CE marked flue material from the manufacturer Muelink & Grol (M&G) and Burgerhout, type Alu-fix temperature class T200. This system has a gasket that can withstand high temperatures. These Flue systems can be bought at your supplier.

Only use one flue pipes from the same diameter as the flue spigots on the heater.

Different manufacturers have different connections systems from the flue pipes. It is not allowed to combine systems from different manufacturers.

5.5.2 Mounting

Follow the mounting instructions for the flue and air intake materials enclosed in the packaging of those systems.
Not following those instructions, for example not the correct fixation, can lead to dangerous situations. Flue leaks can lead to physical injuries. Always check the flue ways on tightness.

5.5.3 Maximum flue length

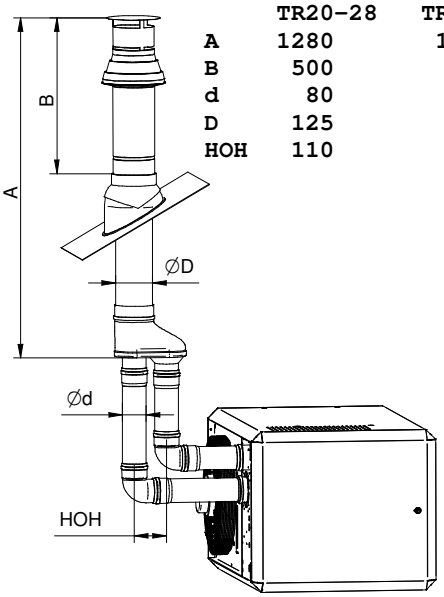
Vertical: 9 meters is the maximum length between the heater and its flue outlet.
Horizontal: 6 meters is the maximum length between the heater and the flue outlet.

When bends are used, the pressure drop will increase and therefore a 90° bend will count as 2 meters and a 45° bend as 1 meter. For further information regarding the flue system, please contact your supplier.

5.5.4 Flue terminals

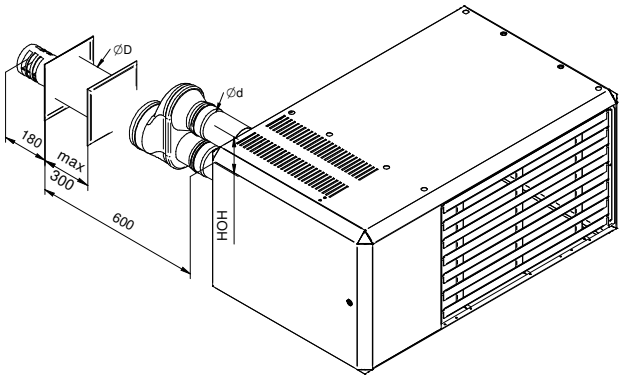
The following flue terminals are allowed:

Vertical discharge			**Horizontal discharge**	
TR10-28:	DDV 80/125	art.nr. IA8202	CT 80/125	art.nr. IA8113
	For h>0,5m above roof	IA8218		
TR40-50:	DDV100/150	art.nr. IA8101	CT100/150	art.nr. IA8112
	for h>0,5m above roof	IA8107		
TR60 -150	DDV130/200	art.nr. IA8305	CT130/200	art.nr. IA8312



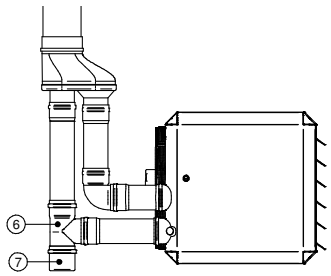
	TR20-28	TR40-50	TR60-150
A	1280	1360	1850
B	500	550	955
d	80	100	130
D	125	150	200
HOH	110	140	225

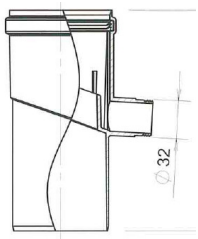
	TR20-28	TR40-50	TR60-150
d	80	100	130
D	125	150	200
HOH	110	140	225



5.5.1 Condensate into the flue system

In some cases condensate can be formed into the flue system. When this happens this condensate may not flow back to the heater. If the condensate flows back to the heater there will be problems with water into the hoses to the pressure switch and the pressure switch itself. For heaters installed with a wall terminal, make sure the condensate flows away from the heater to outside.
For heaters with a roof terminal a condensate drain needs to be placed, or a T-piece with a condensate trap can be placed when there is not always a condensate problem.





	T-piece (6)	condensate trap (7)	condensate drain
Ø80 art.:	IA8223	IA8225	IA8286
Ø100 art.:	IA8176	IA8188	IA8288

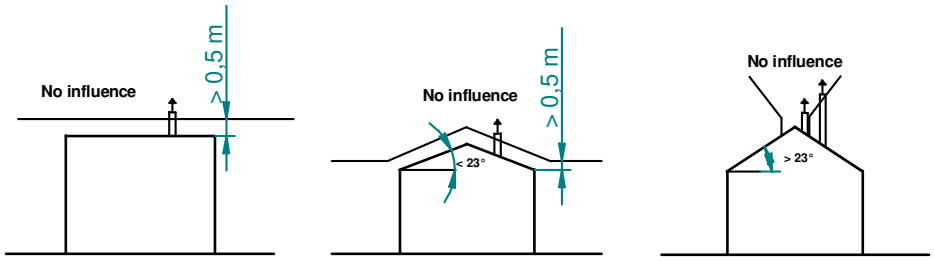
This condensate will most likely not be formed on heaters more than 20kW.
On the smaller heaters like the TR10 and TR15 the forming of condensate is a risk.
When a heater often burns, and is placed in a normal heated room (temperature above 15 degrees) the condensate risk is low.

When a heater is placed in a room that only needs to be just above 5 degrees, it will only burn for a very short time. In this short time the condensate that is formed will not evaporate. And the condensate accumulates and will eventually result in pressure switch errors.
In general, when the flue pipe is long and is running through a cold space condensate can be formed.

5.5.2 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.

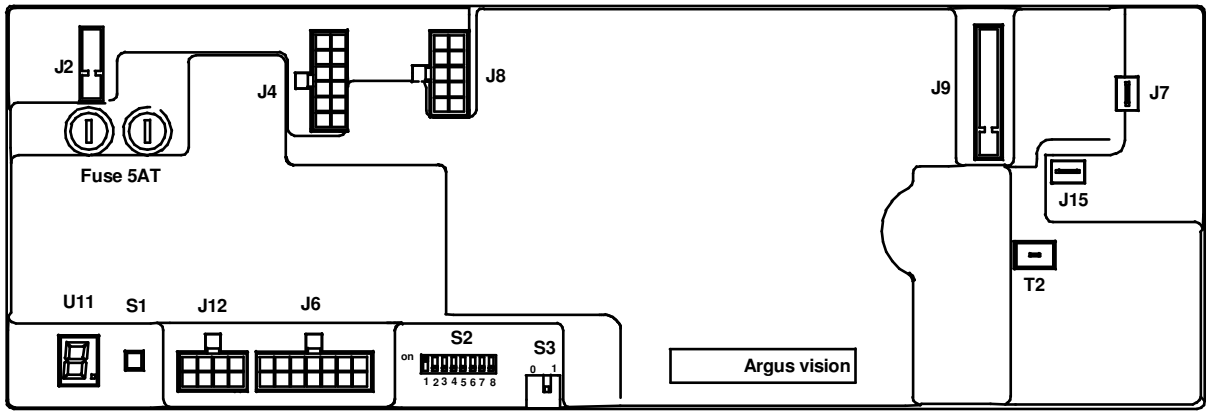
7.5 High limit protection

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 [**A 1**]. 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.

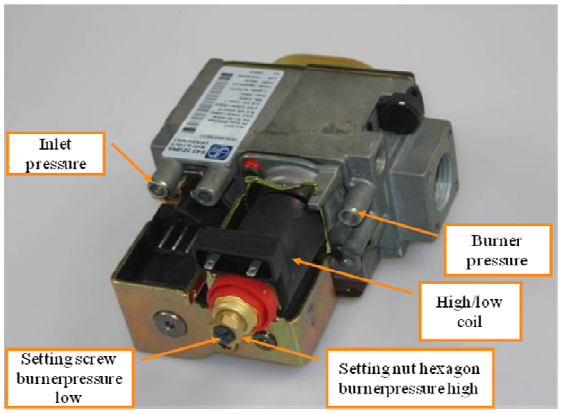
Display on the print board

0	stand-by	Stand-by
1	Pre-purge	System checks and 30 sec. pre purge of the fluebooster
2	Ignition	The ignitionelectrode 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.

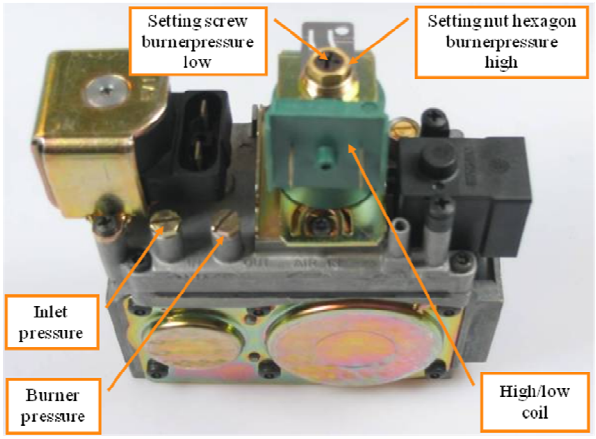
9 Adjusting the gas-control

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 (external 10mm). The High / low coil must be energised !
- De-energise coil (disconnect wire) and set low burner pressure by turning screw (slot for screwdriver) Do not set lower than 3 mbar in order to avoid problems with inter-lightning of burnerstrips.



TR10 up to 50



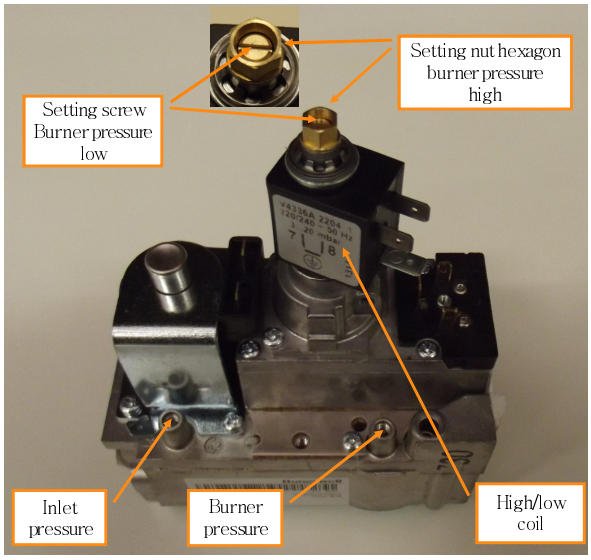
TR60 up to 125

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)

The TR125 and TR150 are provided with two gas control valves. The adjustment of the high and low burner pressure setting is in principle equal like the above described adjustment of the burner pressures. The burner pressures for high and low should be measured and set at each gas control valve itself. After the adjustment of the burner pressure the burner pressure should be checked on each gas control valve.

The TR150 heater is provided with two Honeywell Gas control valves.



TR150

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

A/0 Blinking	Internal failure	Defective print board
A/1 Blinking	No flame	Within 5 sec flame, then flame failure: Cause 1 No flame: Cause 2
A/2 Blinking	Exchanger too hot	Heater stops because the temperature of the heat exchanger is too high: Cause 3
A/3 Blinking	Sensor error	Temperature sensor on heat exchanger error: Cause 4
A/4 Blinking	Too many flame failures	Too many flame failures on ionization: Cause 1, 5
A/5 Blinking	Internal error	Defective print board
A/6 Blinking	Safety relays	2nd temperature limiter (optional) switched: Cause 3, 10
A/7 Blinking	Flame	Flame detection when there should not be a flame
A/8 Blinking	Fluebooster	Fluebooster does not run: Cause 6 Fluebooster runs: Cause 7

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

E/0 Blinking	Internal defect	Defective print board
E/1 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
E/2 Blinking	Selection resistance	Heater recognition does not work: Cause 8
E/3 Blinking	Selection resistance	Heater recognition does not work: Cause 8
E/9 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

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

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 CO2 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.

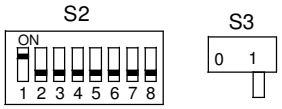
- Take out the burner, by unscrewing the 4 socket screws.
- Check the heat exchanger from the inside for dirt and/or damage.
- Check the burner on damage and clean the ignition electrode if necessary. CAUTION: do not twist the electrode out of shape!
- Check the air supply and the flue discharge.
- Clean 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.

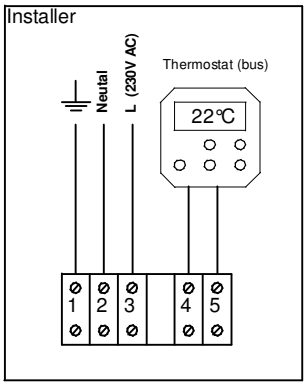
12 Examples electrical installation

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.

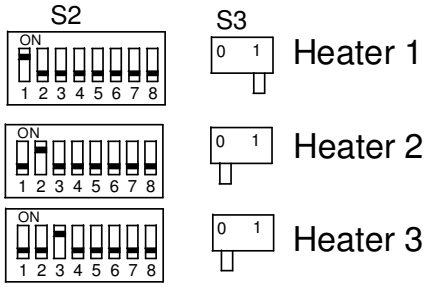


In all cases: make sure you use a screened cable.
Cable length:
0 – 250 m (max.) ➔ min. 0,80 mm2
The given length is the maximum length between the units and the thermostats.

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.

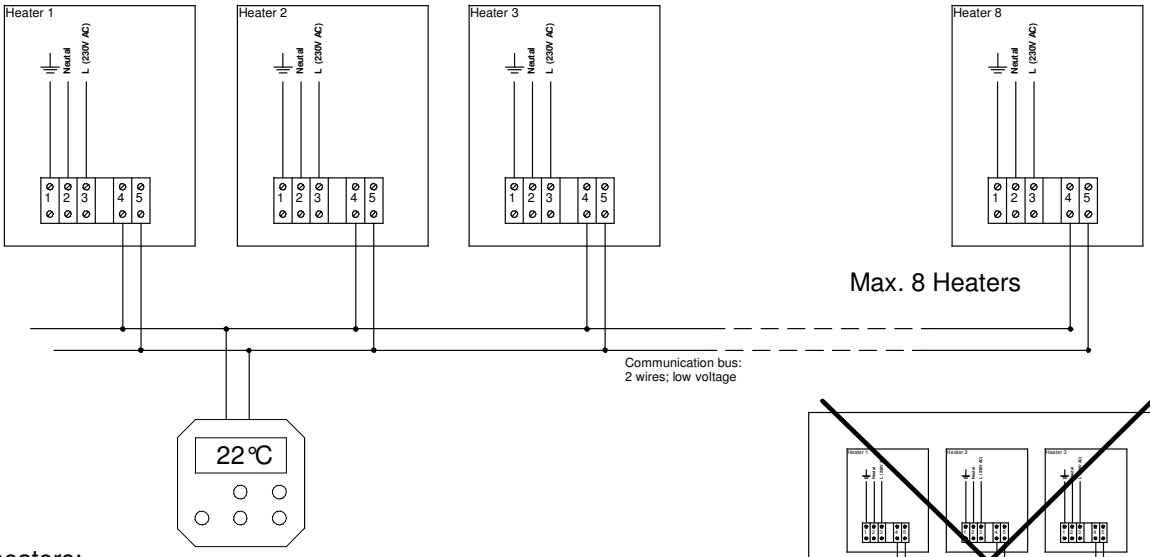
Standard factory setting: switch 1 “on”
Each heater needs its own unique number to have the heater recognised by the room thermostat. The number of the heater can be set by the micro switch on the heater control HC in the heater. The number at the upper position of the switch is the given number for that heater. Make sure that each heater has is own unique number. If more than one heater have the same number, the system does not work.



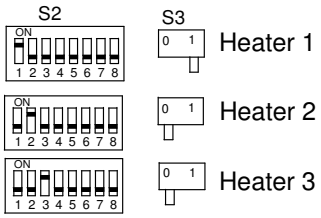
The changement of these switches need to be performed without power on the Heater, otherwise these settings take no effect.

In all cases: make sure you use a screened cable.
Cable length:
0 – 250 m (max.) ➔ min. 0,80 mm2
The given length is the maximum length between the units and the thermostats.

More heaters on one room thermostat

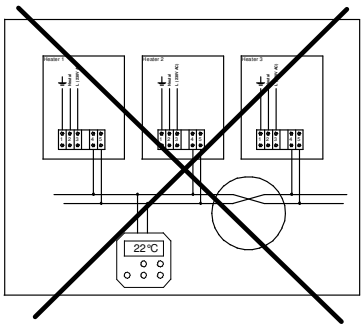


in heaters:
micro switch on printboard.



Important:

Whem more heaters on one thermostat, each next heater must have its own number (2 til 8).
Only in heater nr 1 S3 to ON, other heaters S3 to 0.
Do not change clamb 4 with 5 between the heaters.



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.

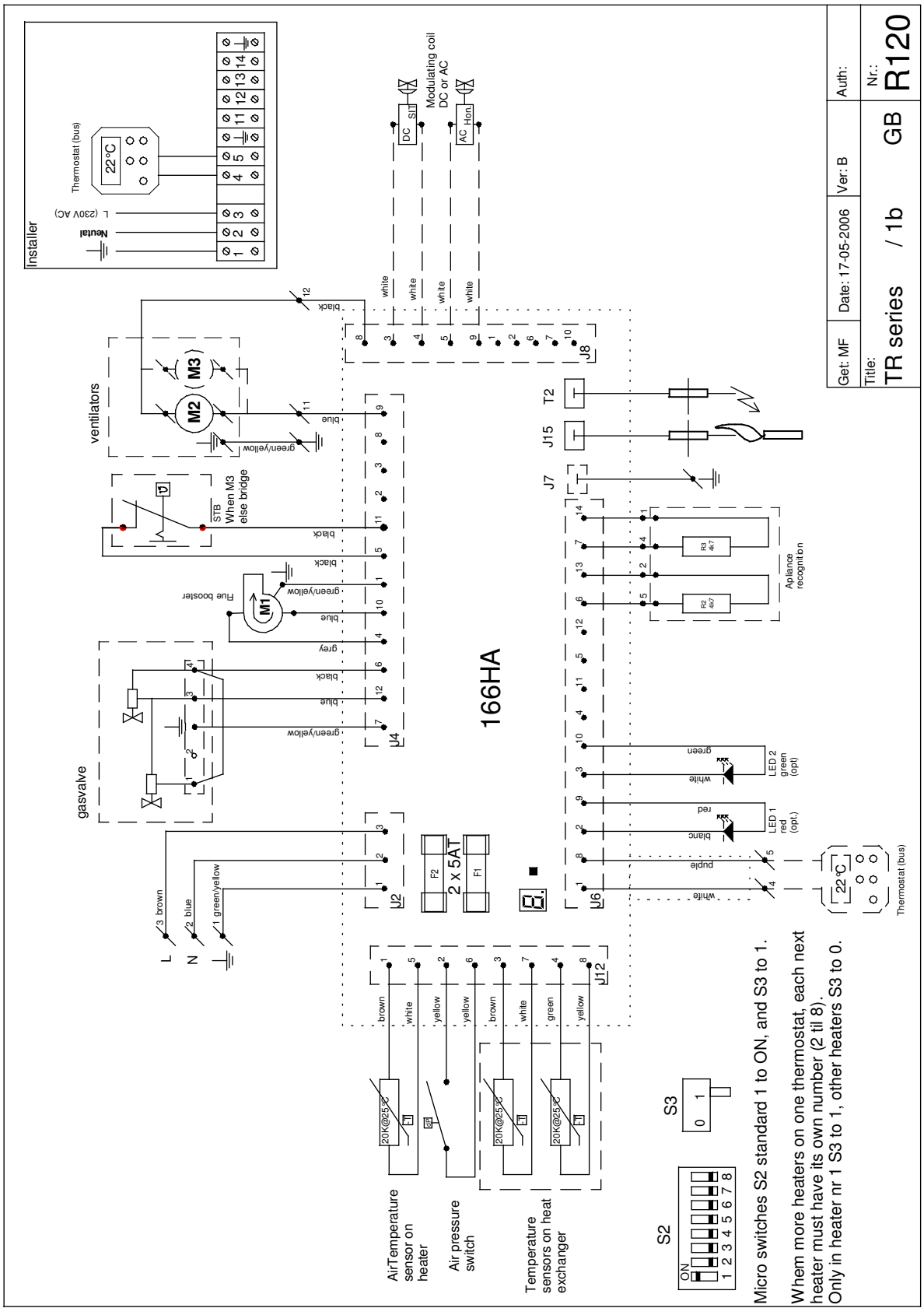


The following settings have to be made on the main board in the heater:

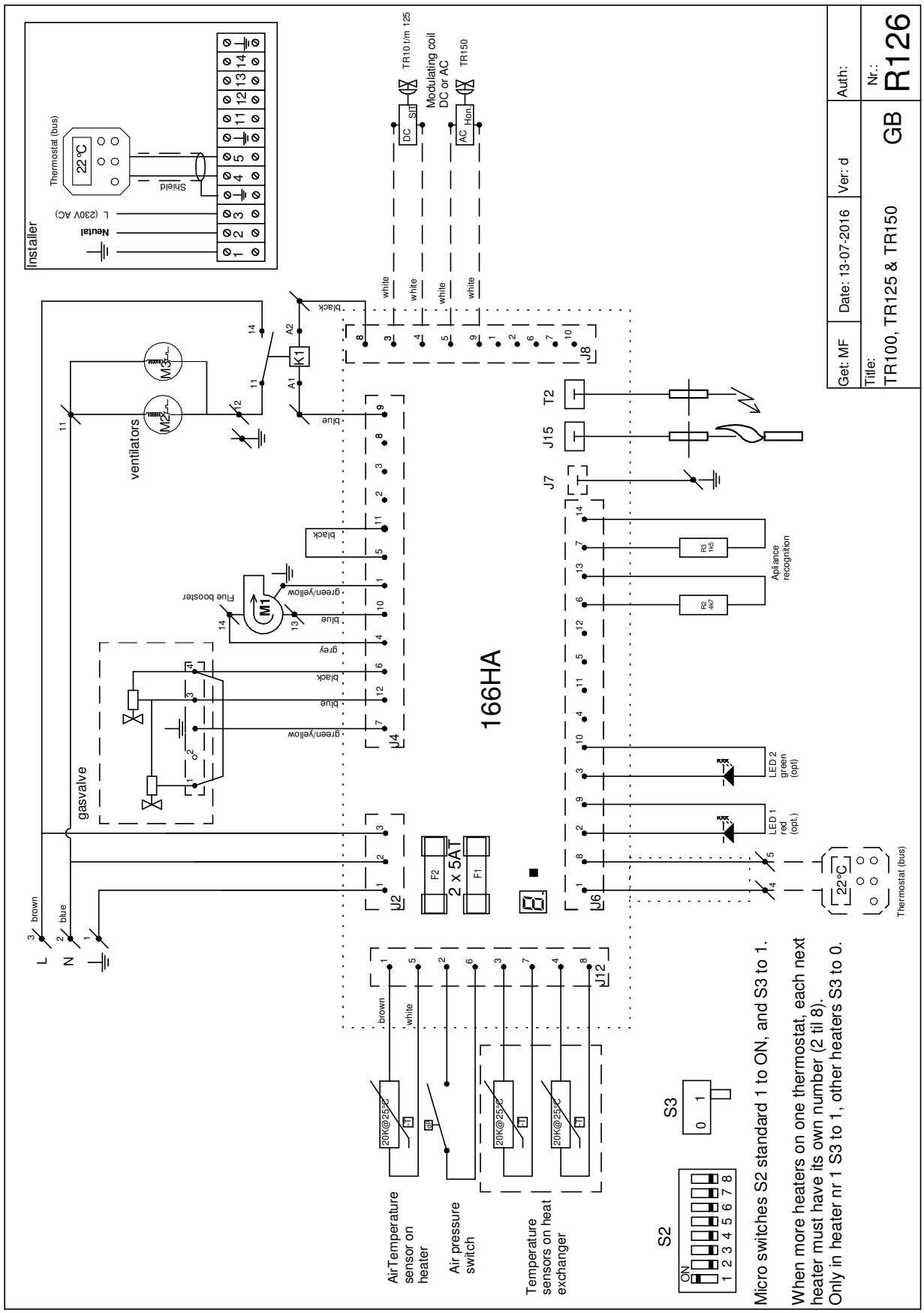
- The micro switches on the main board have to be set to OFF, see example.
- The switch S3 has to be set to 1.
- The thermostat has to be connected to the clamps 4 and 5 in the heater.
- In the case that more than 1 heater is connected to 1 thermostat, do not exchange clamp 4 with clamp 5 between the 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

13.1 Electrical diagram TR10 - TR80



13.2 Electrical diagram TR100 - TR150



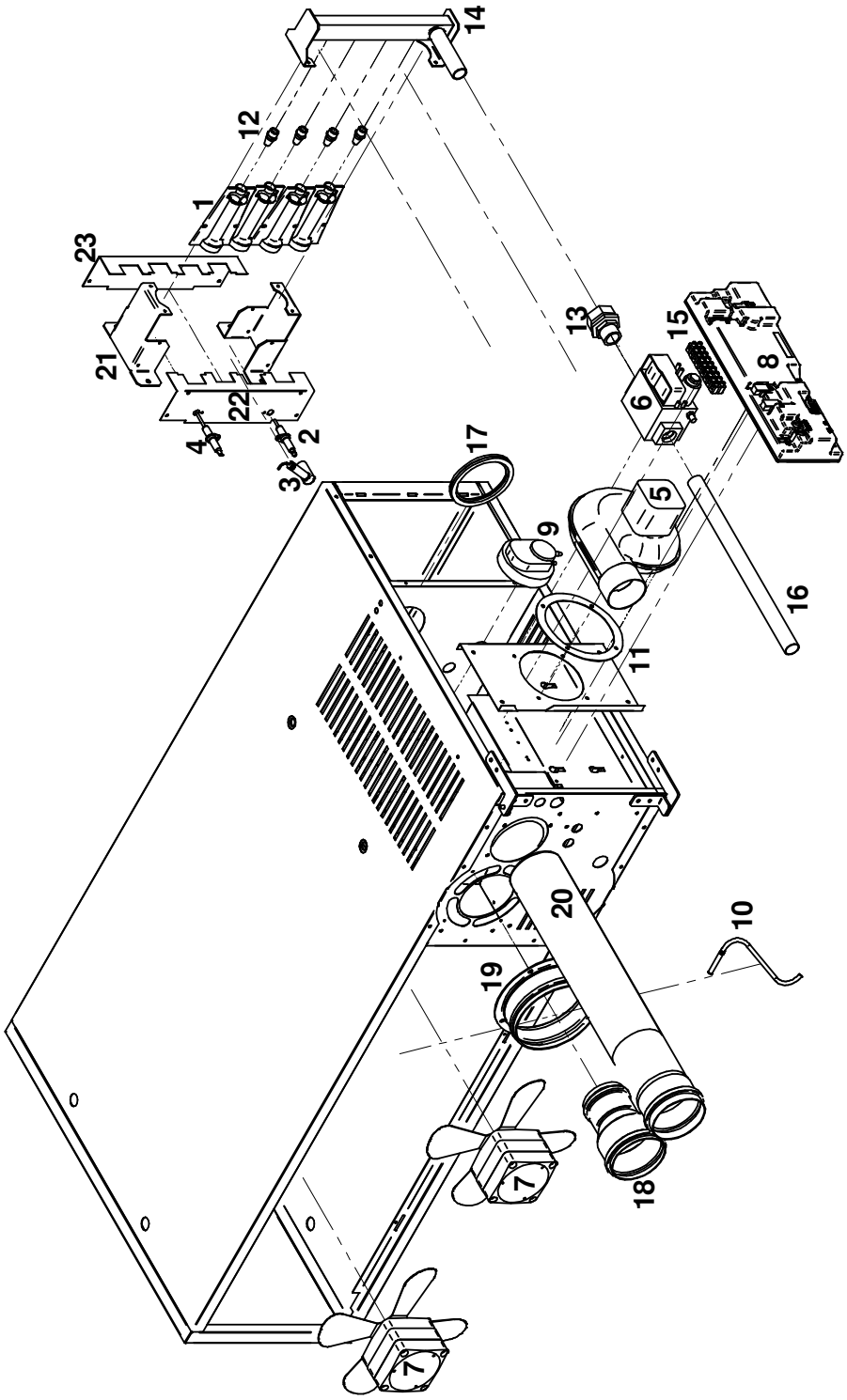
14 Spare parts / Exploded view drawing

14.1 Spare Parts

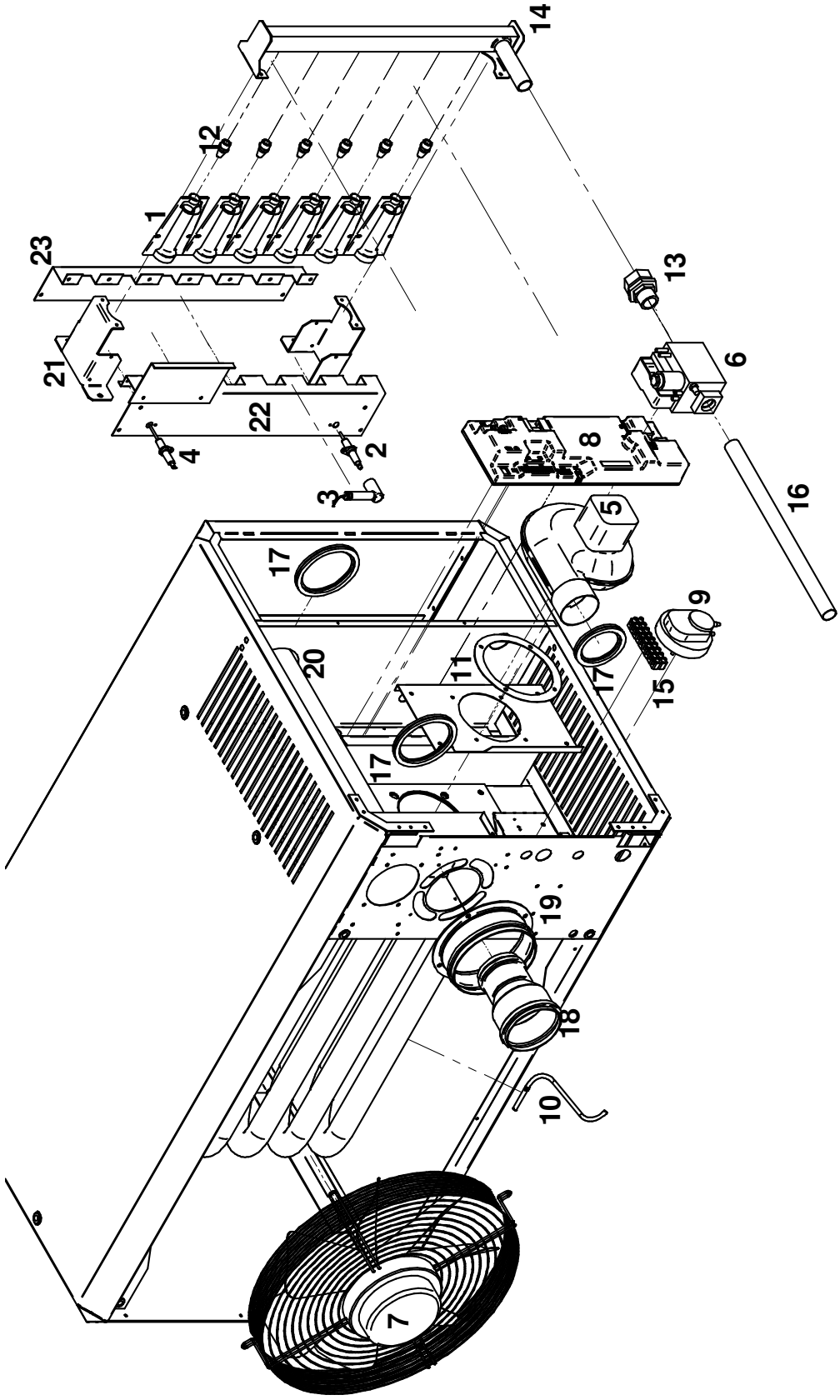
No.	Description	TR10	TR15	TR20	TR24	TR28	TR40	TR50
1	Burner	IB3200	IB3200	IB3200	IB3200	IB3200	IB3200	IB3200
2	Ignition electrode	GA3400	GA3400	GA3400	GA3400	GA3400	GA3400	GA3400
3	Ignitioncable	GA3460	GA3460	GA3460	GA3460	GA3460	GA3460	GA3460
4	Ionisation electrode	GA3402	GA3402	GA3402	GA3402	GA3402	GA3402	GA3402
5	Flue fan	GA4500	GA4500	GA4500	GA4500	GA4500	GA4514	GA4514
6	Gas controle valve	GA3394	GA3394	GA3394	GA3394	GA3394	GA3394	GA3394
7	System Fan	IB4816	IB4816	IB4816	IX4201	IX4201	IX4203	IH4206
8	Controle board 166HA	GA5908	GA5908	GA5908	GA5908	GA5908	GA5908	GA5908
9	pressureswitch	IB3901	IB3900	IB3911	IB3900	IB3901	IB3902	IB3900
10	NTC cable set	GA3902	GA3902	GA3902	GA.3902	GA3902	GA3902	GA3902
11	Gasket set TR	GA6712	GA6712	GA6712	GA.6712	GA.6712	GA6714	GA6714

No.	Description	TR60	TR80	TR100	TR125	TR150
1	Burner	IB3204	IB3204	IB3204	IB3204	IB3204
2	Ignition electrode	GA3400	GA3400	GA3400	GA3400	GA3400
3	Ignitioncable	GA3460	GA3460	GA3460	GA3460	GA3460
4	Ionisation electrode	GA3402	GA3402	GA3402	GA3402	GA3402
5	Flue fan	GA4516	GA4516	GA4517	GA4517	GA4517
6	Gas controle valve	GA3314	GA3314	GA3314	GA3314	GA3319
7	System Fan	IX4201	IX4203	IH4206	IX4207	IX4207
8	Controle board 166HA	GA5908	GA5908	GA5908	GA5908	GA5908
9	pressureswitch	IB3904	IB3904	GA3968	GA3966	GA3964
10	NTC cable set	GA3902	GA3902	GA3902	GA3902	GA3902
11	Gasket set TR	GA6716	GA6716	GA6716	GA6716	GA6716

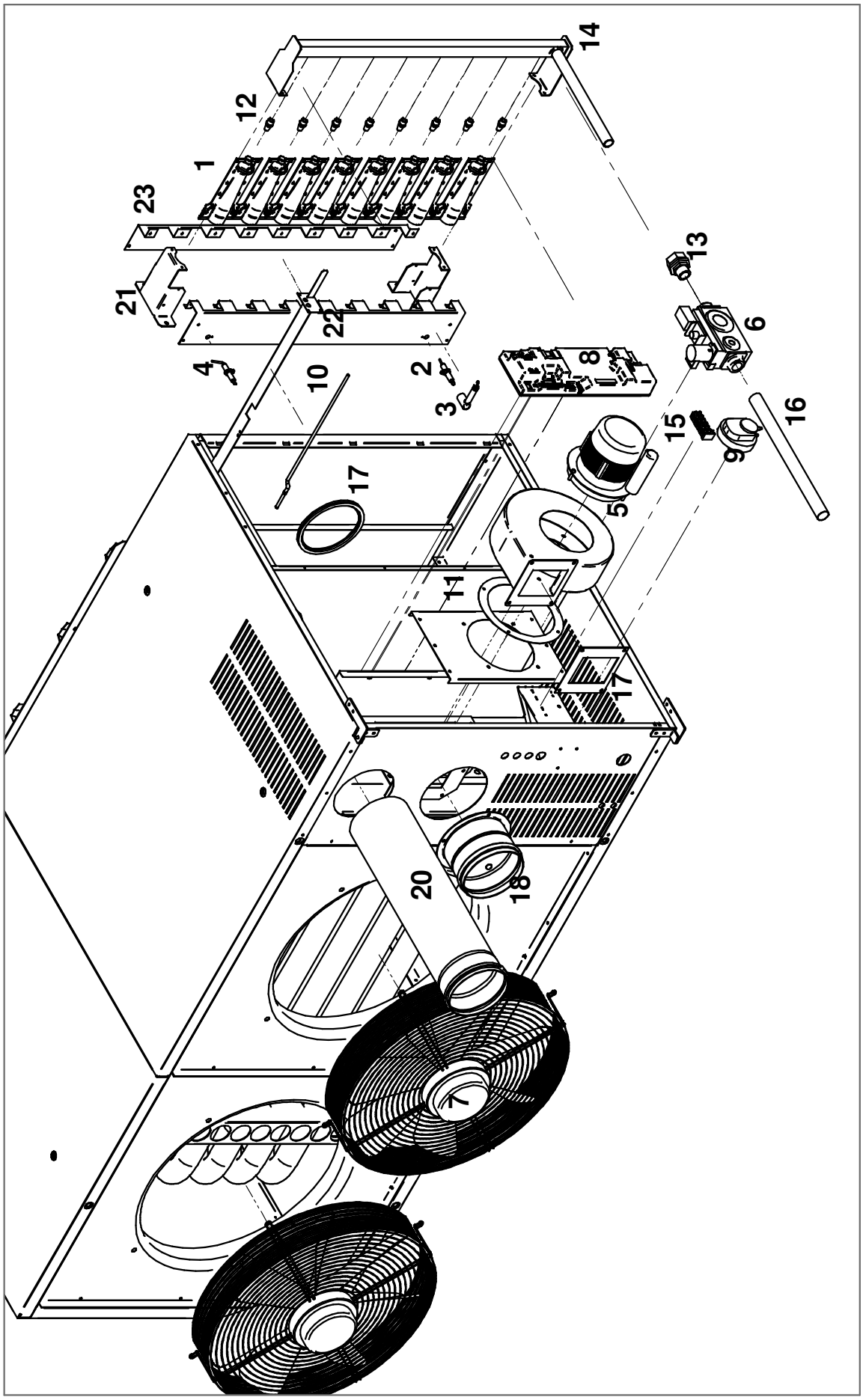
14.2 Exploded view TR10 - TR20



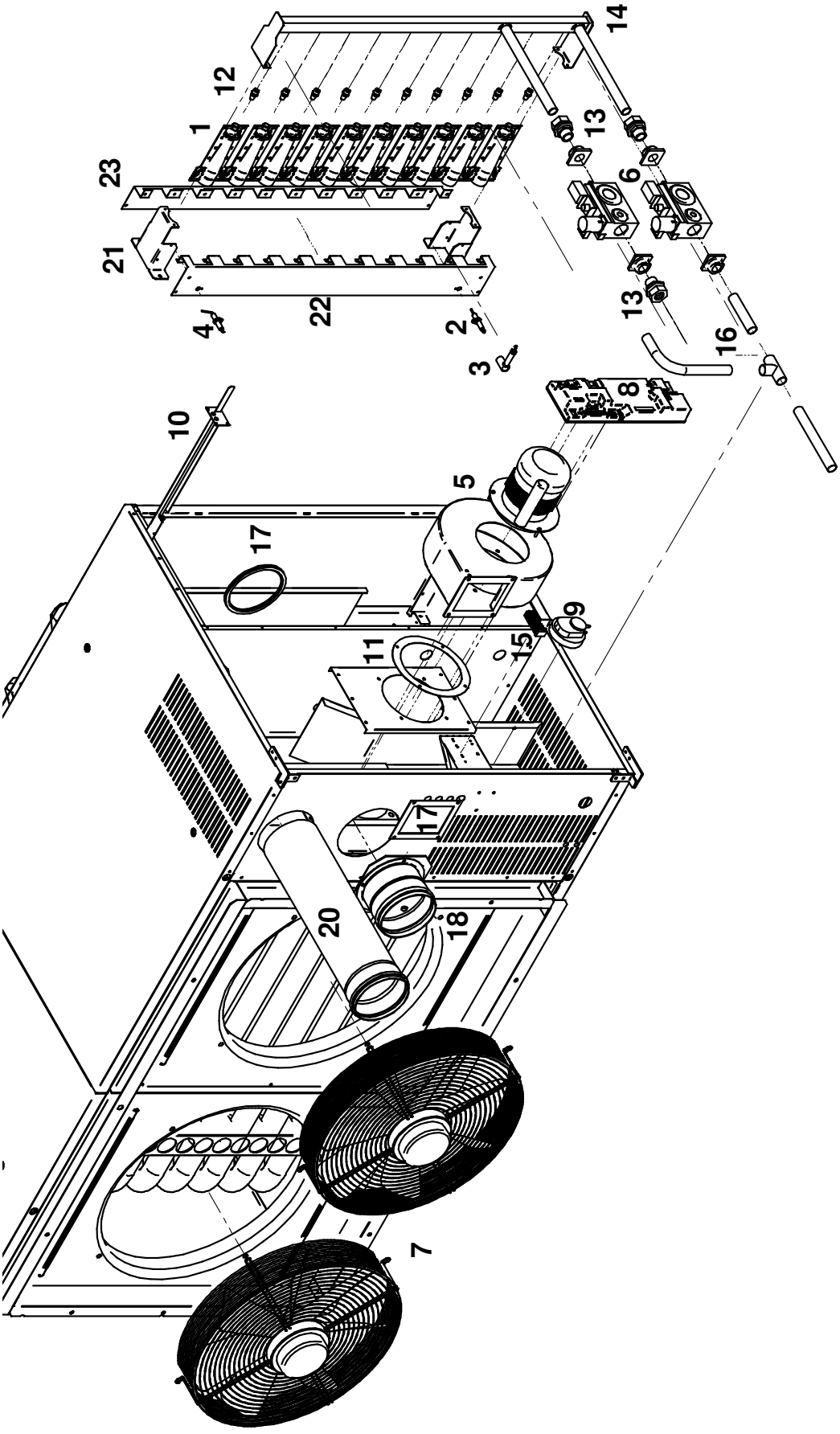
14.3 Exploded view TR24 – TR50



14.4 Exploded view TR60 - TR100



14.5 Exploded view TR125 & TR150



Certificate

kiwa
Partner for progress

Number	59641/02	Replaces	59641
Issued	27-02-2013	Scope	2009/142/EC
Report number	177344-3	Contract number	E 0450
PIN	0063BR3344		

EC TYPE EXAMINATION CERTIFICATE

Kiwa hereby declares that the **gas fired air heaters**, types

Winterwarm
TR10, TR15, TR20 A/C/D;
TR24, TR26, TR28, TR31, TR35, TR40 A/C/D/R;
TR50, TR55, TR60, TR60-2, TR61, TR75, TR80, TR80-2 A/C/D/R;
TR100, TR100-2, TR105, TR125-2, TR150-2 A/C/D/R;
TR20, TR28, TR31, TR40 ACR,
DXC80

manufactured by **Winterwarm**
Winterswijk, The Netherlands

meet the essential requirements as described in the
Directive on appliances burning gaseous fuels 2009/142/EC (ex- 90/396/EEC).

Appliance types : B22, C12, C32
Appliance categories : II2EL3P, II2L3P, II2H3P, II2E3P,II2Er3P, II2E(S), II2ELwLs3P, I2E(R), I3P

Countries:

Austria	Estonia	Liechtenstein	Romania
Albania	Finland	Lithuania	Slovakia
Belgium	France	Luxembourg	Slovenia
Belarus	Germany	Macedonia	Spain
Bosnia-Herzegovina	Greece	Malta	Sweden
Bulgaria	Hungary	Moldavia	Switzerland
Croatia	Iceland	Netherlands, the	Turkey
Cyprus	Ireland	Norway	Ukraine
Czech Republic	Italy	Poland	United Kingdom
Denmark	Latvia	Portugal	Yugoslavia

Kiwa Nederland B.V.

B. Meekma

Bouke Meekma
Director

kiwa
Approved
EC Directive
EC TYPE EXAMINATION
2009/142/EC
GASTEC

CE 0063

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7300 AC APELDOORN
The Netherlands
www.1kiwa.com
GASTEC
PRODUCTS
RvA C 002

CE

Winterwarm
heating solutions

Winterwarm Heating Solutions BV
Industrieweg 8
P.O.Box 36
NL-7100 AA Winterswijk
The Netherlands

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Fax +31 (0)543 546 310
info@winterwarm.nl
www.winterwarm.nl

DECLARATION OF COMPLIANCE

Winterwarm Heating Solutions B.V.
Industrieweg 8
7102 DZ Winterswijk
The Netherlands

Declares that air heaters types:

TR 10, 15, 20, 28, 31, 35, 40, 50, 60, 70, 80, 100, 125, 150
A/C/D/R/ACR
CE PIN: 0063BR3344

Are in accordance with the essential requirements of the relevant EU directives being:

- Gas Appliances Directive	2009/142/EC
- Low Voltage Directive	2006/95/EC
- Electromagnetic Compatibility Directive	2004/108/EC
- Machinery Directive	2006/42/EC

Goods should be installed and used in accordance with our instructions and with the local and international rules in force. Installation should be done by a skilled and registered person for the relevant work.

Winterswijk, 15 April 2014

ir. M. Fiselier
Manager Research and Development

Page. 1/1

VAT registration nr. NL853363316B01 commercial register 59198516