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## 1. INTRODUCTION

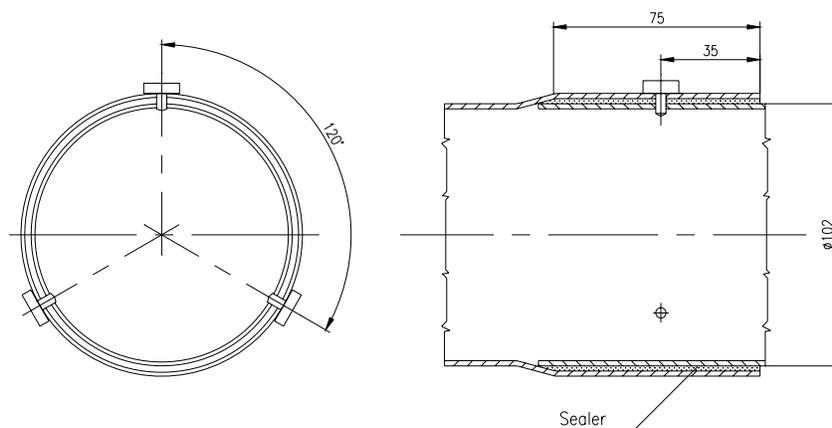
Assembly must comply with local regulations currently in force and during positioning of appliance, installation must be finished according to these circumstances undertaken by a competent person. Considering these, the gas fitter must keep all the standards referring to assembly of gas appliances by all means.

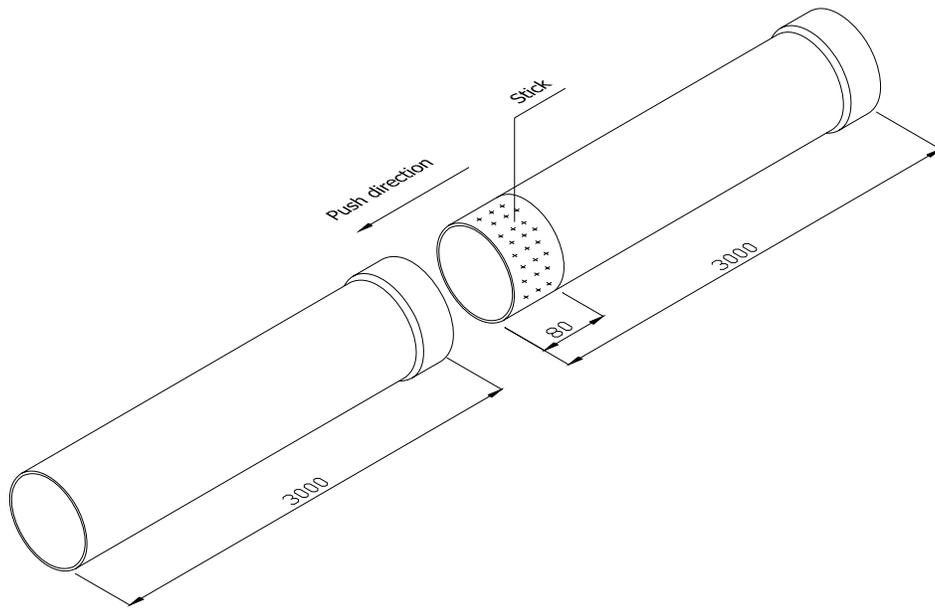
The installer or competent person has to carry on a gas safety test that is compulsory at gas connection, prior to commissioning.

Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

## 2. ASSEMBLY INSTRUCTIONS

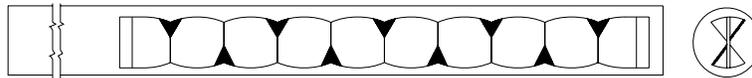
- 1.) The piping system is completed by slipping the burner tube and radiant heat tubes into each other. The burner tube (the tube which is provided with clamp) is fixed to the burner. To this one connect all the radiant heat tubes.
- 2.) Smoothly cover the external surface of non-enlarged end of tube with the sealant, at a distance of 80 mm measured from the end of tube.
- 3.) Join it to the enlarged end of next radiant heat tube, and so on. Then to secure use 3 self-drilling and tapping screws, 120° apart each other.





tubes join

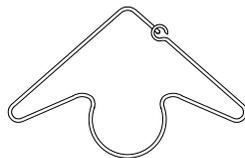
- 4.) Turbulator (bent plate) must be always placed in the last radiant heat tube, before flue gas outlet.



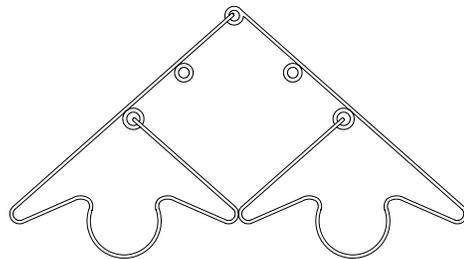
- 5.) After the assembly of tubes, place combination hangers and reflector hangers at their position. Do not deviate from recommended positions by more than  $\pm 100$  mm the mounting of the hangers.



Reflector hanger

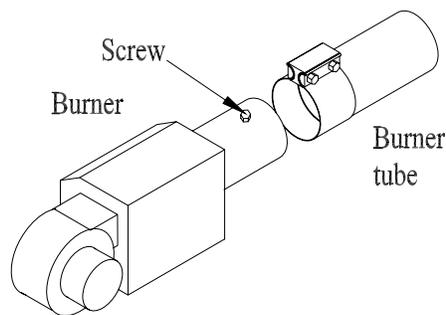
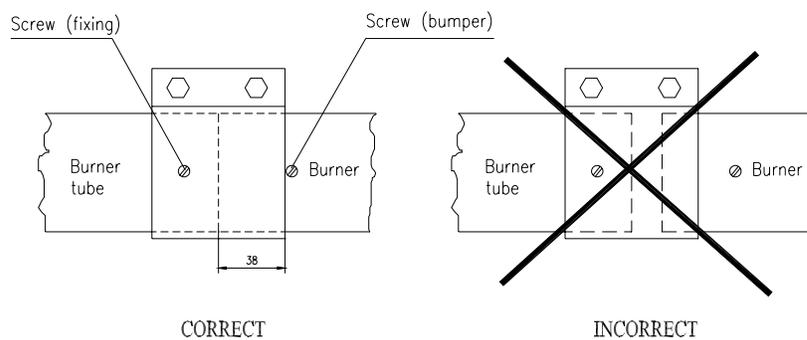


E combination hanger



U combination hanger

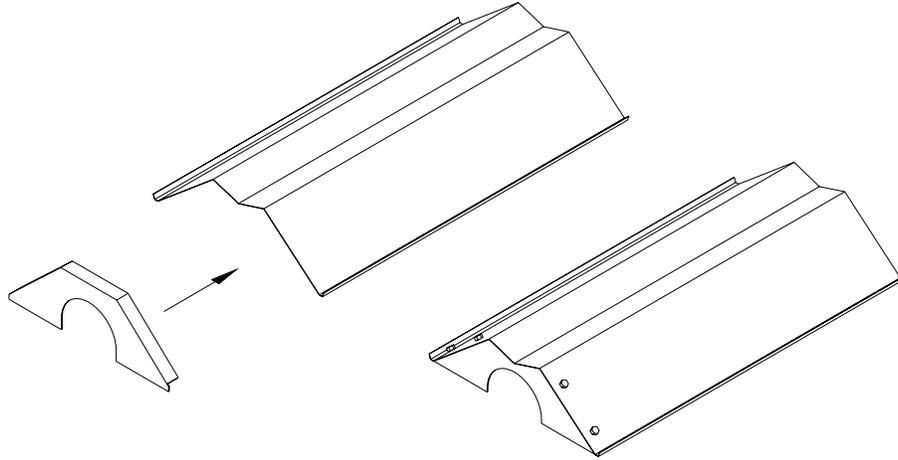
- 6.) Place all, reflectors at their positions and join them with a minimum 50 mm overlap. You are fixing max. 2 pieces reflector because of the changing shape of the reflector from the thermal expansion! Even more reflector fixing not allowed!
- 7.) Then connect burner into the burner tube, depending on execution.
- a.) Enlarged tube joint: push burner to the enlarged part of burner tube until the shoulder. Use 3 self-drilling and tapping screws to secure. Do not apply sealant.
- b.) Draw band coupler at non-enlarged burner tube: The clamp is fixing to the burner tube a particular position by the manufacturer. Push the burner to the other side of clamp until the screw (bumper) which is fixing on the burner. Fasten the screw of clamp.



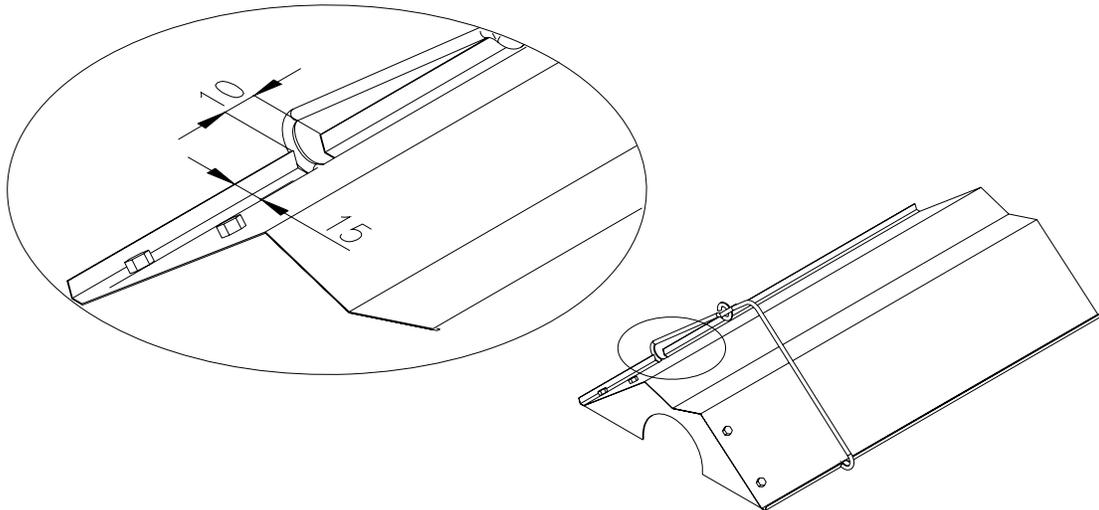
- 8.) Connect the hanging chains and “S” hooks to the combination hangers. Use tightening screws for precision of adjustment.

**NOTE:** To avoid accidental errors, it is practical to make assembly on the ground, then install appliance to its final position. In case it is not possible because of the weight of appliance and the local conditions, then it is worth mounting it in several parts and making the last connections in mounted position.

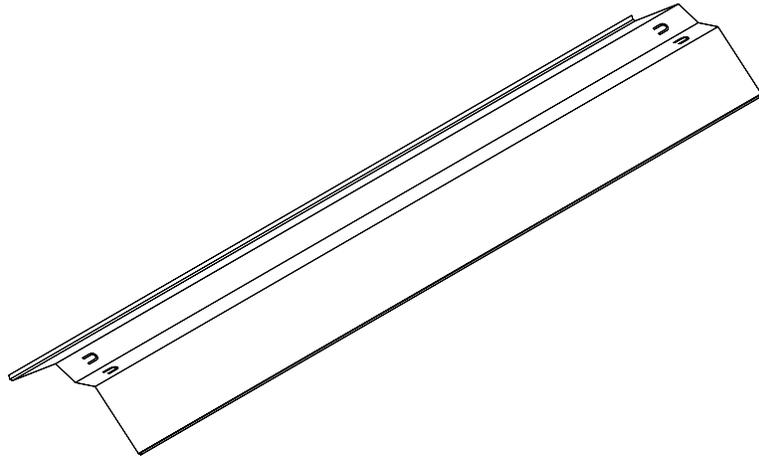
**Installation of the end plate of the reflector:** Always mount on beginning of the first reflector. Fixing: above or under the reflector with two pieces screw on each side.



On the first reflector both side you need to make a small hole (approximately: wide:10mm length: 15mm) at the place of first combination hanger, to stop the move of the reflector.

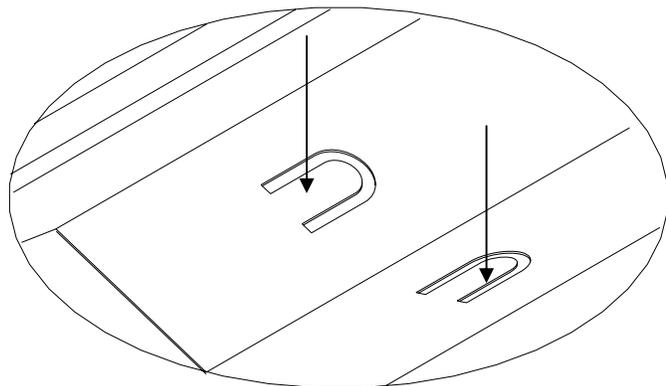
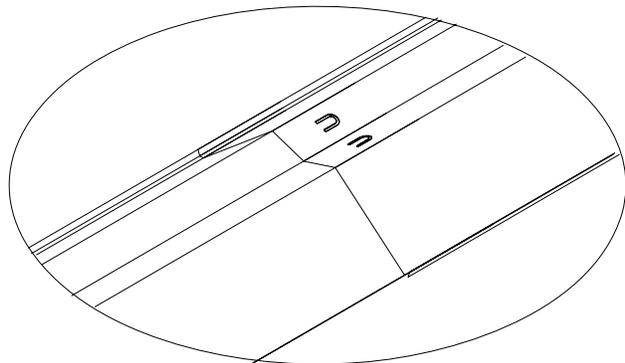


Every reflector includes two-two „U” type fixer handles on the end of part. The length of handle is 25mm and these parts of reflector help to fixing the reflectors together and impede those slips away.

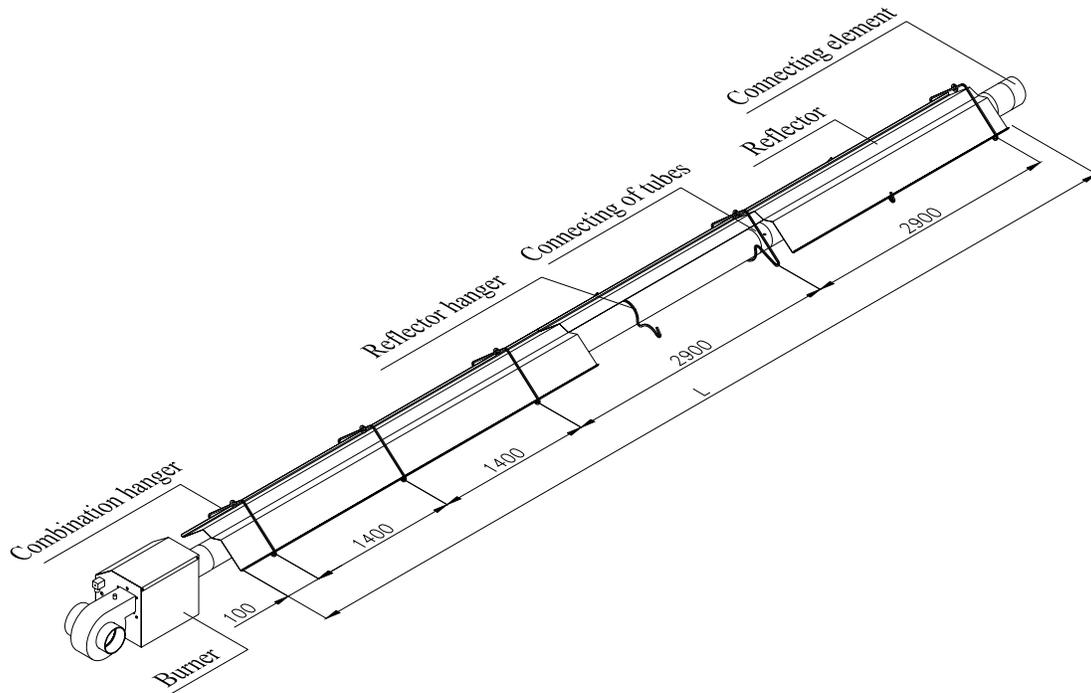


The fixing procedure at two reflectors:

1. Put one on top of the other the reflectors in such a way that the fixer handles are cover together. See on the picture.
2. After bending the fixer handle into the direction what the arrow shows so that new position will be approximately 90 degrees to the original position.
3. At every join point you can do that similarly.



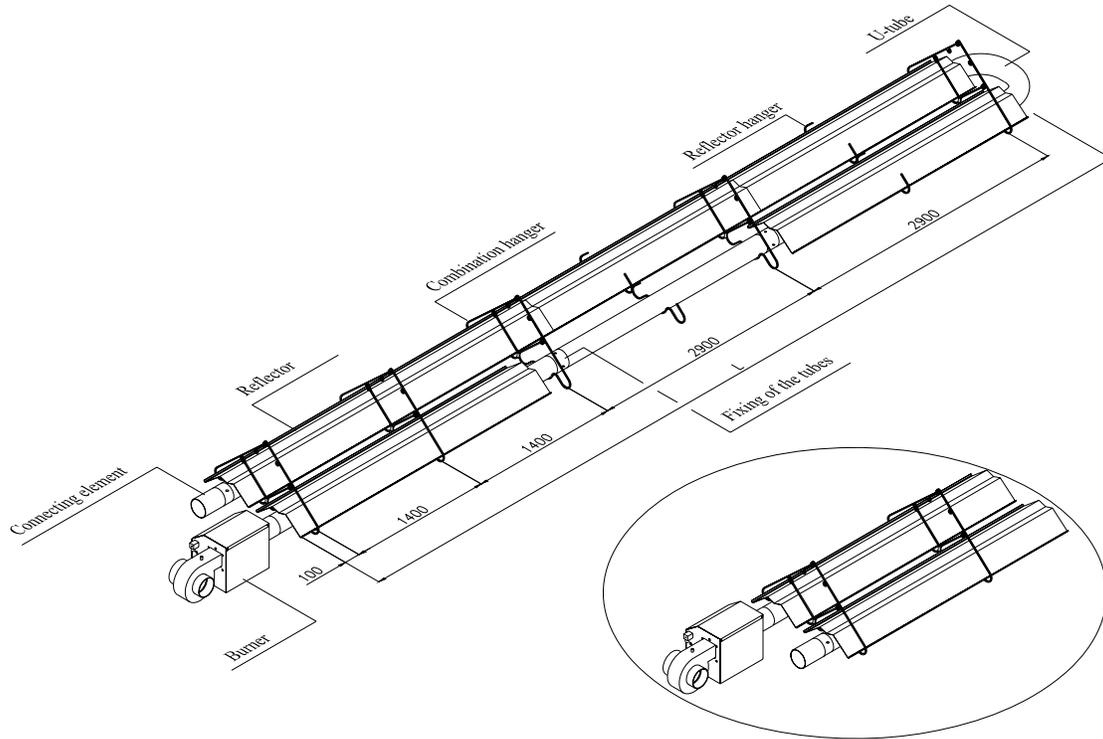
## 2.1 ELEMENTS OF TUBE RADIANT HEATER OF STRAIGHT EXECUTION, ASSEMBLY DISTANCES



For 3m (total length) long appliances only 2 hangers should be placed 1800 mm apart, 700 mm far from the beginning of burner tube.

During assembling of straight system 1 90° elbow is allowed, but it must be placed minimum 6 m far from burner.

## 2.2 ELEMENTS OF TUBE RADIANT HEATER OF “U”-TUBE EXECUTION, ASSEMBLY DISTANCES

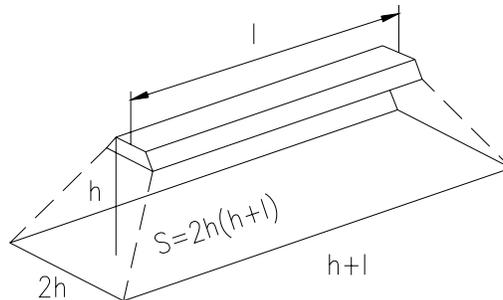


The burner mounting any end of tube, but always check the turbulator element must be before the exhaust system.

### 3. INSTALLATION LAYOUT

Installation must comply with the existing local regulations standards

**Heated area:**



**Protective distance: distance considering flammable materials:** depend on the performance

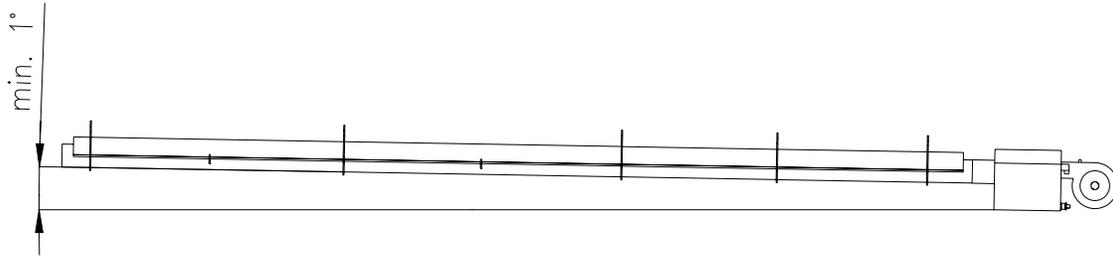
Input (kW)	Protective distance (m)				
	A	B	C	C1	E
12 – 14	0,12	1,1	0,3	0,8	0,8
16 – 20	0,12	1,3	0,6	0,9	0,8
22 – 28	0,15	1,5	0,8	1,2	1
30 – 36	0,15	1,6	0,8	1	1
38 – 44	0,18	1,6	1	1	1
46 – 52	0,18	1,8	1	1	1,2
54 – 58	0,18	2	1,2	1,5	1,2

Four diagrams illustrating different installation configurations for a heater. Each diagram shows a heater with a circular burner and a wavy heat exchanger. Distances A, B, C, C1, and E are indicated with arrows and labels. The diagrams show various orientations and clearances relative to the burner and heat exchanger.

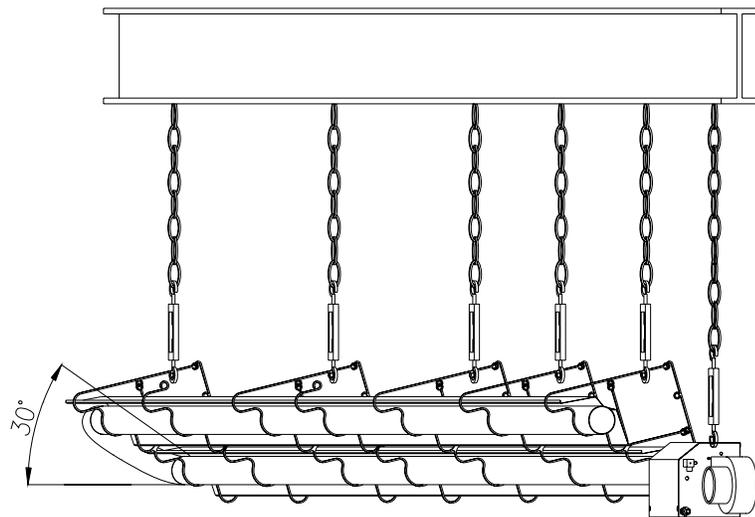
**The minimal mounting height:**

Type	Execution	Mounting	Input (kW), mounting height (m)										
			10	15	20	25	30	35	40	45	50	55	60
OMEGA	„U” tube	horizontal	3,4	3,7	4	4,2	4,4	4,6	4,9	5,2	5,4	5,7	5,9
		30°	3	3,2	3,4	3,7	3,9	4,1	4,3	4,6	4,8	5	5,3
	Straight „S”	horizontal	3,2	3,5	3,7	4	4,2	4,5	4,7	5	5,2	5,4	5,6
		30°	2,7	3	3,2	3,4	3,6	3,9	4,1	4,3	4,5	4,7	4,9

**Minimal ascent at the burner and radiant tube:**



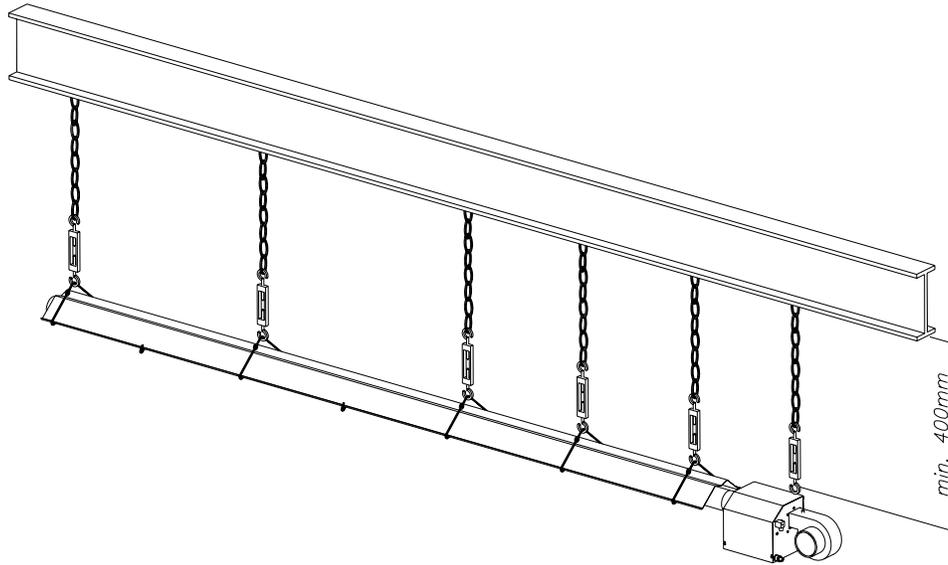
**Maximal angle at a total appliance: (max. 30°)**



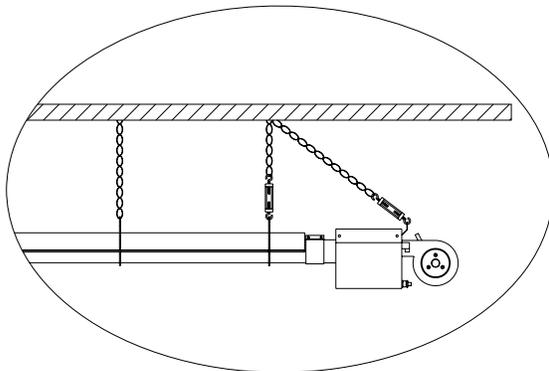
**3.1 MOUNTING**

After determining the number and exact position of appliances and hangers, you have to provide for hanging them at a minimum of 400 mm (hanging chains for example). This is necessary, so it does not hinder the length change, which increases during thermal expansion; hereby appliance does not deform. Install hangers under the roof structure, under buttresses or scaffolding, among columns or nearby wall. Appliances are hung by hanging brackets and combination hangers that are secured to the blower side of burner.

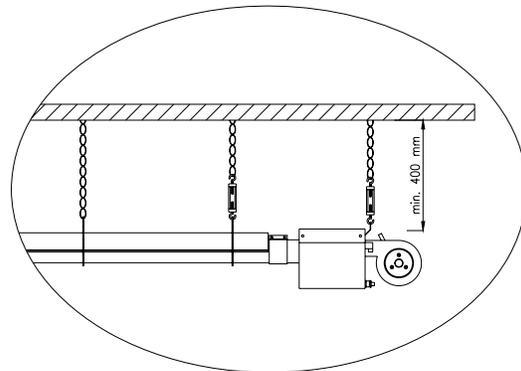
*EXAMPLE OF POSITIONING HANGERS*



At a mounting take the correct hanging up of the burner head into consideration, because the wrong hanging up make fault at working of the appliance.



Incorrect



Correct

## 4. GAS CONNECTION

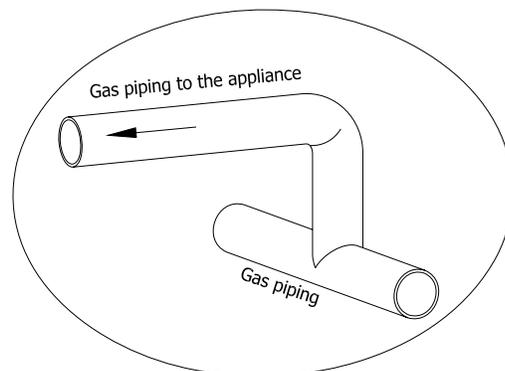
Only gas types given in data chart could operate OMEGA tube radiant heater.

In case the pressure of gas supply is higher than 60 mbar, then usage of pressure regulator is mandatory. The pressure regulator could be fitted to each appliance or 1 fitted centrally.

**Absolutely necessary to build in a gas-filter** front of the pressure regulator if you use pressure regulator front of at each appliance, but at centrally regulator usage you must built in a gas-filter front of the central regulator and directly front of each appliance, to avoid blockage in the regulator and in the gas solenoid valve of appliance that could be caused by possible deposits in the gas-pipe (even if the gas piping had been blown trough).

### Gas filter usage is obligatory!

The connecting to the main of gas must from above or from the side, because if you connecting from below that will be collector place of pollutants.



The execution of the branch off from main gas piping!

Thermal expansion of appliance must be considered during connection, this is why a flexible hose should make connection.

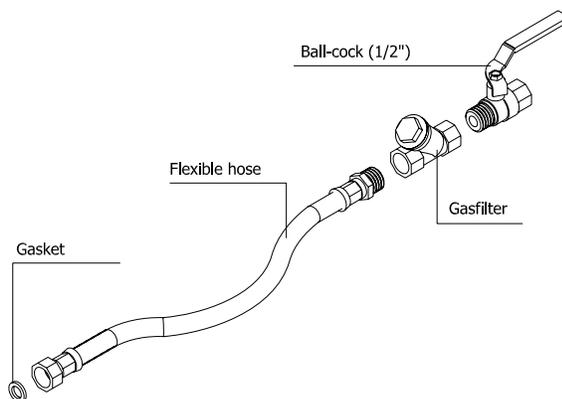
At connection, use the flexible hose belonging to burner so that it should render a 100 mm free enlargement possible. Assemble hose without turning.

Its connection should be directly to the 1/2" external threaded burner inlet pipe. If use gas pressure regulator before the burner you can install between the gas filter and the flexible hose.

It is necessary to an isolating valve to the flexible hose.

Usage of the gas connecting set recommended! (flexible hose, gas filter, 1/2" ball-cock)

Distributor: **PAKOLE** Kft.



#### 4.1 OPERATIONS TO BE MADE

##### - CLEANING OF GAS PIPING

Before connecting appliance to gas piping, it is important to clean gas piping totally and thoroughly.

##### - CHECKING THE GAS LEAKAGE

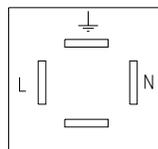
After connecting appliance, make sure of the soundness of several gas connections. This should be done on the assembled system, by 1,5 times of the maximal pressure value (60 mbar) prescribed to appliance, that is 90 mbar. This operation must be made after all assembly and disassembly.

### 5. ELECTRICAL CONNECTION

The combustion fan is fixed to the burner, must be supplied by mains voltage. Both the fan and controls need 230V/50Hz mains voltage.

#### **IMPORTANT:**

- Burner should be connected to electrical supply by a safety connector, which is placed on the panel beside the fan.
- Connection to electrical wiring:  
With ground plug and socket or fixed connection
- Electrical wiring: 3x0,75 MT cable
- Appliance is phase-sensitive, so always follow the instructions:



L - phase  
N - neutral  
Earth

- Safety: dissolving fuse (2A)
- Before you change the dissolving fuse, you must interrupt the electric supply.



## 6. CONTROL OF HEATER

OMEGA tube radiant heater could be controlled manually or automatically.

At **manual control**, electrical supply of appliance is interrupted manually, based on sense of temperature:

- As a central manner, at each heating zones by a common operation box
- Or individually, at each appliances separately

### **Automatic control**

Automatic control of temperature happens with switching appliance on and off, through the electrical input of appliances, inserting a programmable control box, or thermostat. It is recommended to apply a regulator for sense of temperature.

Type:

- General (2-point) regulation
- 3-point regulation (100%, 60% and 0)
- Modulation (between 100%-60%, or 0)

### **6.1 3-point regulation**

Works: during the appliance works has 3 possibilities. It works with 100%, 60% or off mode.

The regulation made by thermostat, which sense the temperature changing and turn on the 100%, 60% performance or turn off the appliance. The start is always 100% performance, after when the temperature achieve the adjusted temperature on the thermostat, then automatic reduce the performance the adjusted power, which has a minimal value in this case 60%. The heating goes on with this power, and if this input is enough for the heating then stay in this position. If this input is big for the heating, then the thermostat turn off the appliance. If the temperature goes down under (example: door is open) then the thermostat is take the appliance the right position. That than the reduced input it be 50 or 60%, that depend from the used length of tubes and the temperature of combustion product.

*Temperature controller type: 3-point control thermostat*

*The technical complementary parts of the burner:*

- V4336 A type solenoid coil
- OMRON MK 3P5-S type solenoid switcher

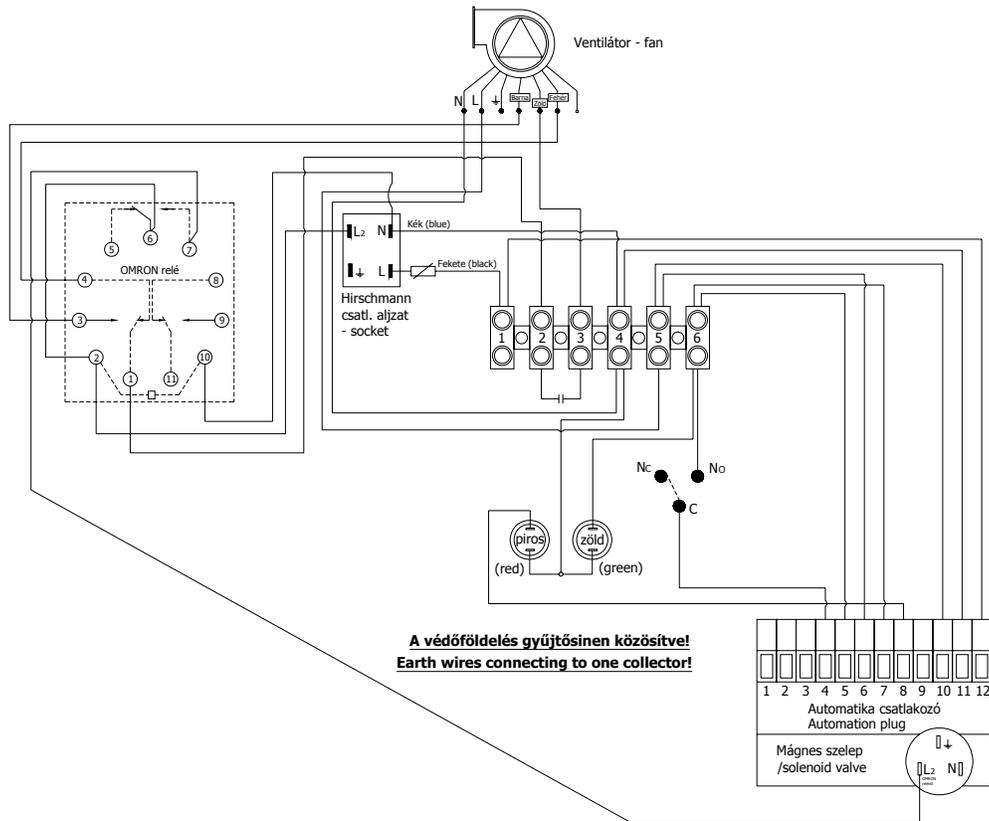
### **Operation:**

The start is always happens by maximal input, when the appliance get the two phase and null on across the thermostat. The L<sub>2</sub> phase switch on the OMRON relay, which get a phase to the solenoid coil of V4336A, so that give the adjusted maximal pressure. The EMC fans revolutions per minute it could be changing, and this revolutions per minute is depend from the electrical connection or place of the condenser. (has 3 revolutions per minute of EMC fan) The open or closed state of the OMRON relay is changing the place of the condenser.

When the thermostat turn off the L<sub>2</sub> phase, the relay is on rest position. In this case not goes phase to the V4336A coil, so the gas pressure will be the adjusted minimal, and the condenser position will be the low rotation of fan place.

*The electrical wire: 4x0,75 MT cable*

The electrical wire scheme:



## 6.2 Modulation:

Solenoid valve: **VK4105 R**

### Works:

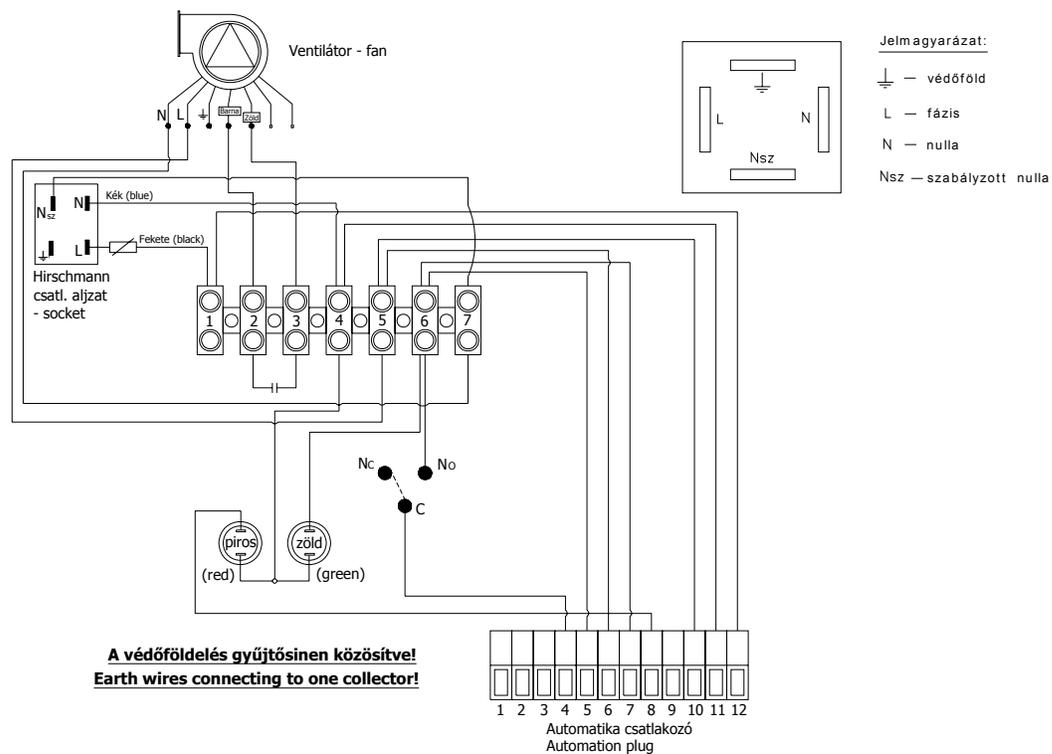
The different from the 3-point regulation is the appliance the on sign of the control box is works with maximal power, and when the temperature is close near the adjusted temperature (this approximately 1°C less than the adjusted temperature, but it could be changing) then the appliance start to reduce his power continuously until the max. 60% of the input. The heating is less continuously until the adjusted temperature, where that is turn off. If during the regulation time the temperature drop quickly, then the regulator increase the power of appliance if necessary until 100%. This controlling system it can be to give the optimal power.

## Working procedure:

The appliance starts with 100% power. When the temperature is close to the adjusted temperature, then the modulation control panel is reduce the voltage, which goes to the fan. So the revolutions per minute of fan is reduce and reduce the pressure too. The solenoid valve is register the changing of pressure and it can be reduce the outlet gas pressure.

*Temperature controller type: modulation control thermostat*

*The electrical wire scheme:*



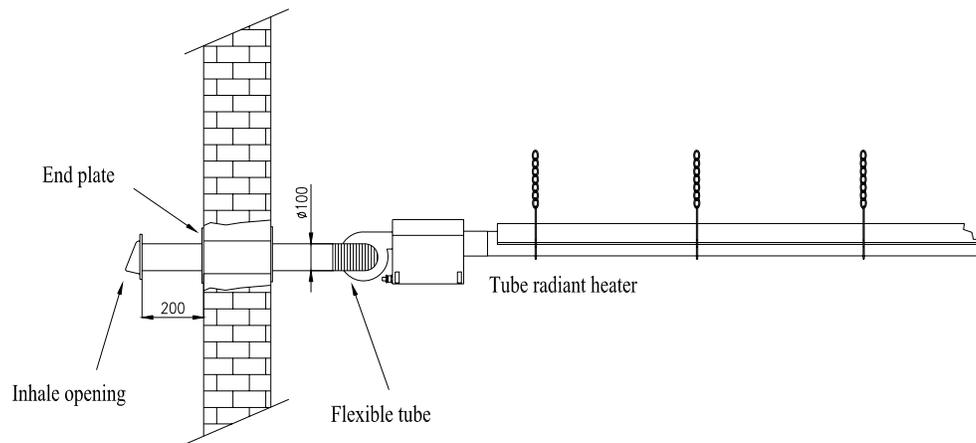
## 7. COMBUSTION AIR SUPPLY

Combustion air may be drawn from more spaces.

- a.) From space that is being heated.
- b.) Outside air supply- fresh air intake equipment is connected to the inlet side of blower.

You must not draw combustion air from the internal space, when the building is a negative pressure and the atmosphere is contaminated with acid fumes, fluorocarbons, corrosive substances, dirt, oil, etc., which would have adverse effect on the blower and tubing process.

Outside air supply (Recommended)



When two appliances are controlled by one thermostat a common combustion air supply can be used. The common duct must be to the 2 appliances a  $\text{Ø}150$  mm diameter and should not exceed 15 m in length.

A maximum of two  $90^\circ$  elbows may be used.

## 8. EXHAUST METHODS

Venting arrangements of combustibles to the environment:

- Flue-gas channel to the outside of building at each appliance.
- Flue-gas channels of two pieces appliance connected to a common duct.

Flue pipe is not allowed to have a low point, it must be made of Ø100 mm stainless steel or aluminium. The vent piping shall rise not less than 2 cm/m.

Type of the exhaust system:

- Combustion product lead across the wall
- Vertical combustion product lead

The length of the exhaust system:

The length of the exhaust system, depend from the allowed maximal length and the used length of the appliance.

The total length of the exhaust system:

**L:** Total length of exhaust system

**L<sub>MAX</sub>:** The allowed maximal length of appliance

**L<sub>USED</sub>:** The used length of appliance

$$L = L_{MAX} - L_{USED} + 6 \quad (\text{m})$$

*The exhaust system get 1pc 90° elbow without modification. If you want to use more 90° elbow than one, then you can use some modification.*

The modification is the following:

**Modification: 1piece 90° = 2 m Exhaust (Combustion product) lead tube**

You can reduce the length of the exhaust system if you use more than 1 piece 90° elbow.

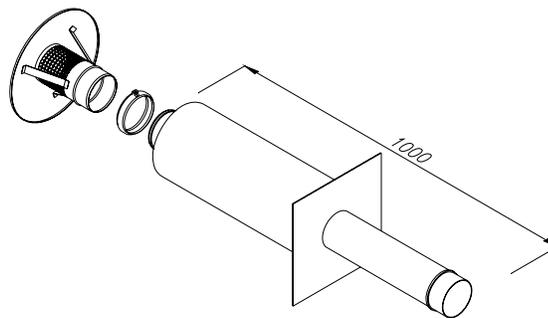
## The allowed maximal and minimal length of appliance

ZENIT overhead tube radiant heater																
Type	minimal and maximal length (m)															
	S	U	S	U	S	U	S	U	S	U	S	U	S	U	S	U
	3	1,5	6	3	9	4,5	12	6	15	7,5	18	9	21	10,5	24	12
ZENIT-12	x	x	x	x	-	-	-	-	-	-	-	-	-	-	-	-
ZENIT-14	-	-	x	x	-	-	-	-	-	-	-	-	-	-	-	-
ZENIT-16	-	-	x	x	x	x	-	-	-	-	-	-	-	-	-	-
ZENIT-18	-	-	x	x	x	x	-	-	-	-	-	-	-	-	-	-
ZENIT-20	-	-	x	x	x	x	-	-	-	-	-	-	-	-	-	-
ZENIT-22	-	-	x	x	x	x	x	x	-	-	-	-	-	-	-	-
ZENIT-24	-	-	-	-	x	x	x	x	-	-	-	-	-	-	-	-
ZENIT-26	-	-	-	-	x	x	x	x	-	-	-	-	-	-	-	-
ZENIT-28	-	-	-	-	x	x	x	x	x	x	-	-	-	-	-	-
ZENIT-30	-	-	-	-	x	x	x	x	x	x	-	-	-	-	-	-
ZENIT-32	-	-	-	-	-	-	x	x	x	x	-	-	-	-	-	-
ZENIT-34	-	-	-	-	-	-	x	x	x	x	x	x	-	-	-	-
ZENIT-36	-	-	-	-	-	-	x	x	x	x	x	x	-	-	-	-
ZENIT-38	-	-	-	-	-	-	x	x	x	x	x	x	-	-	-	-
ZENIT-40	-	-	-	-	-	-	-	-	x	x	x	x	-	-	-	-
ZENIT-42	-	-	-	-	-	-	-	-	x	x	x	x	x	x	-	-
ZENIT-44	-	-	-	-	-	-	-	-	x	x	x	x	x	x	-	-
ZENIT-46	-	-	-	-	-	-	-	-	x	x	x	x	x	x	-	-
ZENIT-48	-	-	-	-	-	-	-	-	x	x	x	x	x	x	-	-
ZENIT-50	-	-	-	-	-	-	-	-	x	x	x	x	x	x	x	x
ZENIT-52	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
ZENIT-54	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
ZENIT-56	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x
ZENIT-58	-	-	-	-	-	-	-	-	-	-	x	x	x	x	x	x

Tube length	Input (kW)
1,5mU / 3mS	12 kW
3mU / 6mS	12...22 kW
4,5mU / 9mS	16...30 kW
6mU / 12mS	22...38 kW
7,5mU / 15mS	28...50 kW
9mU / 18mS	34...58 kW
10,5mU / 21mS	42...58 kW
12mU / 24mS	50...58 kW

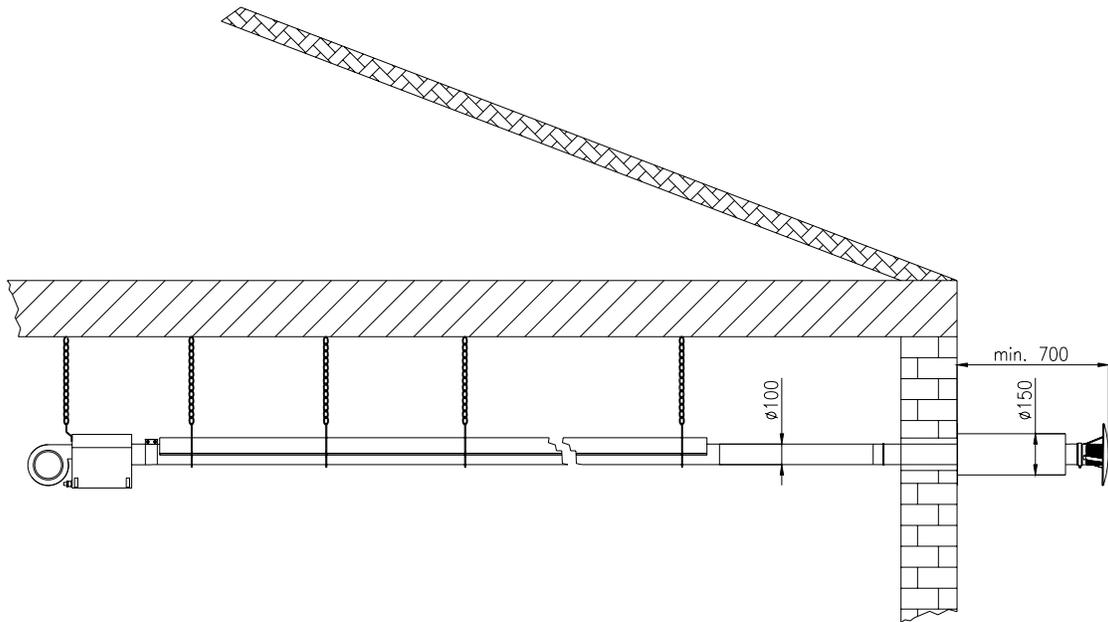
The exhaust system needed 1m more higher then any opening.

Exhaust system across the wall:

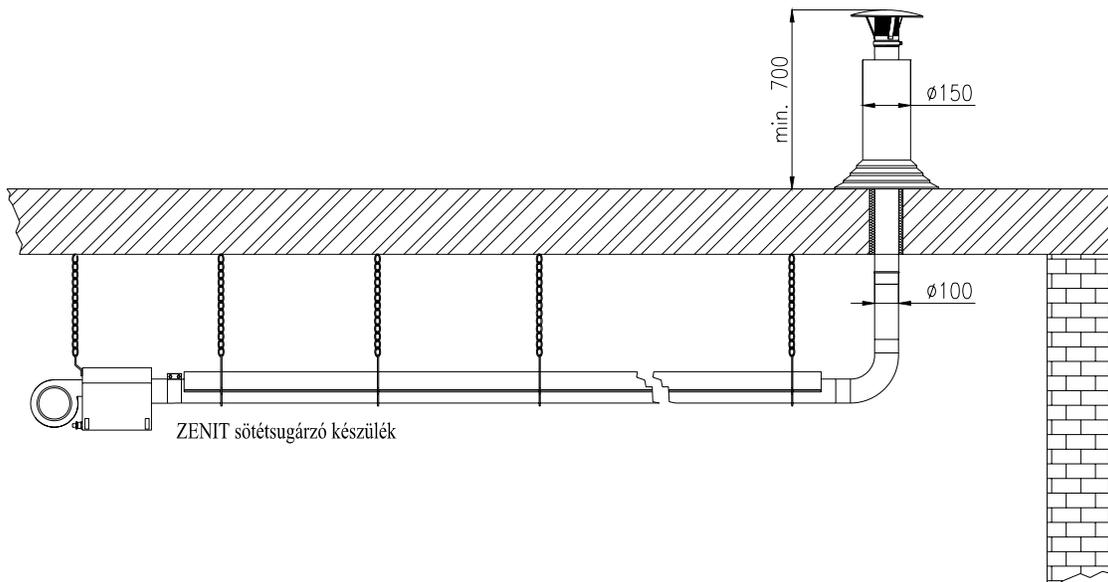


Exhaust system across the wall

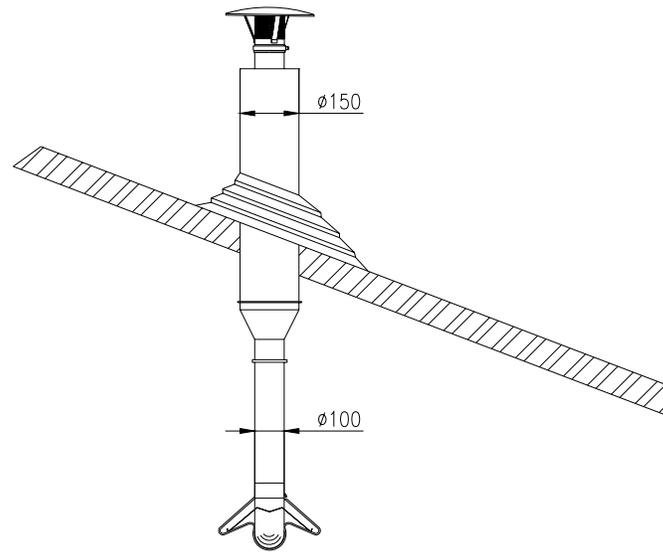
a.) Single wall vent pipe



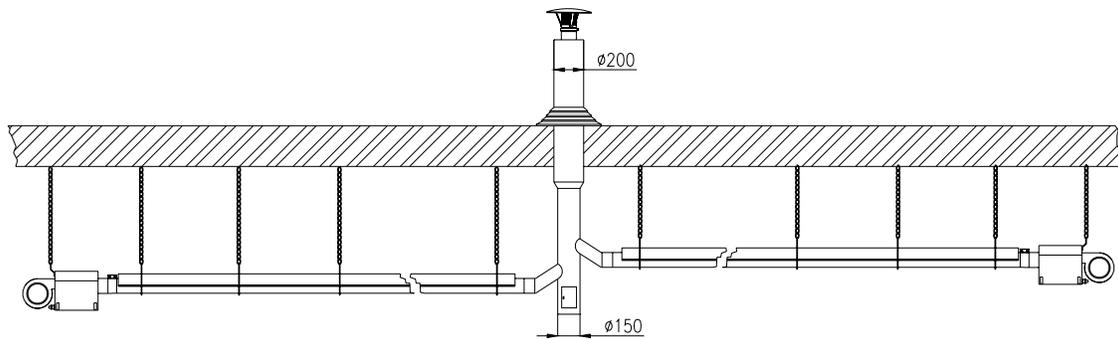
b.) Flat roof vent pipe



c.) Slanting roof vent pipe



d.) Appliances with common vent pipe



## 9. SYSTEM START-UP

A competent person determined by the authorised representative should make adjustment of heating appliance. Guarantee possesses its 2 years validity only in this case.

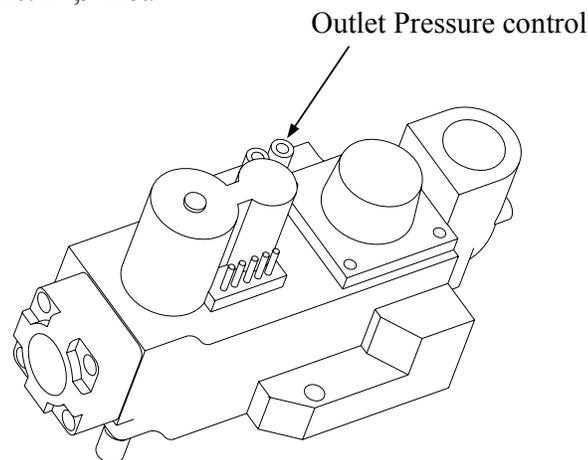
Before testing operation, pressure and soundness of gas piping should be tested first of all.

- Clean duct system of gas piping from any dust
- Check has a gas filter before the appliance, if needed clean it
- Check, has a gas pressure regulator before the appliance (max. allowed pressure is 60 mbar)
- Ensure, appliance to be earth
- Check, whether thermostat or programme-clock hinders electrical supply of appliance or not
- Open gas valve
- Check the gas pressure on the inlet side of solenoid valve. (Not allowed above 60mbar)
- Place appliance under voltage by the central sectionalising (connector) or programmer-regulator
- Check, at the secondary outlet of solenoid valve, whether the pressure value belonging to gas type is suitable or not

At Natural Gas - depending on output: 8,6 ; 9,5 or 10 mbar

At S-gas - depending on output: 8,6 ; 10; 11; 11,8 or 12,5 mbar

At Propane and butane: 24,9 mbar



Once appliance is placed under voltage, fan with operate continuously.

When purging to complete — after approx. 30 s, ignition spark commences and dual solenoid valve (combined gas plumbing) opens, burner ignites.

When flame control senses flame, the appliance begins to operate (the green control LED placed at the bottom of appliance is lighting).

### ***Appliance with DVI 980 type Burner control automation***

Meanwhile, it is producing a 5 seconds long spark-series on electrode/sensor assembly and processing electrical signals coming back from electrode. In case the continuous flame takes shape before 5 seconds, the appliance is operating, the green control LED is lighting. During its operation, appliance pays attention to the condition of differential pressure switch and signals coming from the flame control continuously, and the position of differential pressure switch is changing during the work that immediately intervenes in process then it stops the gas supply of burner and the appliance stands into error position and red control lamp is lighting placed at the bottom of burner.

If the Burner control automation of flame detector not register flame during the safety time than repeat the all ignition cycle at max 2 times. If in this time not register flame then it stops the gas supply of burner and the appliance stands into error position and red control lamp is lighting placed at the bottom of burner.

In case during burning process the pressure decreases under the permissible minimal value on the positive side of air pressure switch (from the fan side), then automation prohibits:

- Gas supply and the fan stops

The appliance stands into error position and red control lamp is lighting placed at the bottom of burner. Restart will be possible after the switching off and on of mains voltage.

In case during burning process the pressure increase above the permissible maximal value on the negative side of air pressure switch (from the burner tube side), and that is switch back to the original position then automation prohibits:

- Gas supply and the fan stops

The appliance stands into error position and red control lamp is lighting placed at the bottom of burner. Restart will be possible after the switching off and on of electric supply.

## Information system of the DVI 980 automation

The information system controlled by the microprocessor is suitable for the control of the burning. Continuously give information about the program, so you can check the all process and you can find easily the possible fault of the appliance. This system helps your process and fee of servicing. If the evaluation of the fault not possible immediately, it is not a big problem, because the automation possess with storage unit, so you can check the data later. The conversation between the automation and the person is happening trough a LED lamp. You can see this signs upper side of the automation and you can decode with an electronic decode set.

### The signs of the process

The actual phase of the process shows a flashing code

Signs	Flashing code
Waiting for the on position of the differential air switch	▬ ▬ .
Prepurge time (tv1)	▬ ▬ ▬ .
Waiting time (tv2)	▬ ▬ ▬ ▬ .
Safety time (ts)	▬ ▬ .
Waiting time 2. stage (tv2)	▬ ▬ ▬ .
Works	▬ —
Low mains voltage	▬ ▬ ▬ —
Wrong fuse	▬ ▬ —

Signs and abbreviations:

▬ = short impulse

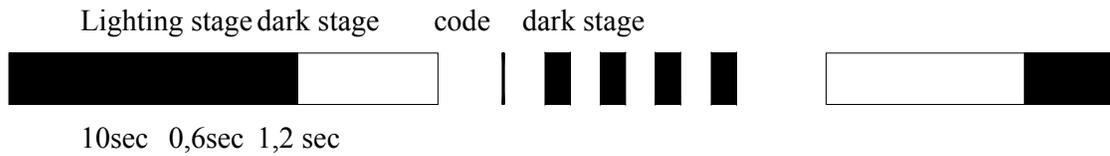
▬ = long impulse

▪ = short brake

— = long brake

## Breakdown diagnosis

The LED is lighting continuously at breakdown. This continuous light brakes every 10 seconds, and shows a flashing code with the fault. This repeats itself until you check the fault, or not switch off the electric current.



Signal	Code	Reason of the error
Error Safety time	■ ■ ■ ■ ■	Missing the flame during the safety time
External light breakdown	■ ■ ■ ■ ■	External light in the self-control stage Wrong sensor
Differential air switch Fan switch on	■ ■ ■ ■ ■	Differential air switch stick in
Differential air switch Time over	■ ■ ■ ■ ■	Differential air switch not switch during the needed time
Differential air switch open	■ ■ ■ ■ ■	Differential air switch open during the work stage
Flame error	■ ■ ■ ■ ■	Missing the flame signal during the work stage

### Codes with manual switch off

Signal	Code
Manual switch off	■ ■ ■ ■ ■   ■ ■ ■ ■ ■
RV error, or open the temp. limiter	■ ■ ■ ■ ■   ■ ■ ■ ■ ■
Open the temperature limiter. Switch off the electric current to erase of the error.	

## 10. CHECKS AT THE BEGINNING OF SEASON

Test system start-up and check the regular operation of appliance.

Checking the regular operation

Two kinds of supervision should be made:

- a.) Switch on appliance, let it operate some minutes, then push gas control knob to OFF position. Burner stops operating. Wait for 6-8 seconds, then turn gas control knob to the ON position, appliance starts to operate again.
- b.) Let it operate some minutes. Then disassemble from the exhaust end of radiant heat tubes the flue pipe and close vent opening.

The air pressure switch stage step in OFF position from ON. The automation is close the solenoid valve and the appliance is STOPS. The red LED is lighting bottom self of burner

Opening the exhaust system again, and stop everything on the original position. Start the appliance!

## 11. MAINTENANCE

Besides supervision and clearing of radiant tubes (see: Maintenance supervisions by the customer), OMEGA tube radiant heater does not need a separate maintenance, but to keep its SAFETY OPERATION and LONG LIFETIME, it is recommended to check appliance once a year by a competent person.

Maintenance supervisions must include the followings:

### Maintenance supervisions by the customer

#### **a.) Supervision and cleaning of radiant heat tubes**

Clean the external surface of tubes from any dust by a brush and make sure that there is not any burnout or warping.

#### **b.) Check connection and sealing of burner tube and radiant heat tubes by a survey.**

In case there is lack of sealing, fading shows it.

#### **c.) Check reflectors and clean them if it is necessary.**

Clean them by a soft cloth or a diluted detergent.

**d.) Check hangers, make sure that load is distributed smoothly at all mountings.**

You can check it moving each hanger a little.

**e.) Cleaning the vent of combustibles (flue pipe)**

**In case operational circumstances of appliance (atmosphere is contaminated with corrosive substances, dirt) need it, then supervision and cleaning may have done more often! The main reason of this that dirt placed on radiant body may damage efficiency of appliance and increase its weight significantly, which is an important factor because of mounting safety.**

Maintenance supervisions by a qualified service department (all kinds of interventions for which disassembly of appliance is necessary)

**a.) Supervision of nozzle pressure (at the secondary outlet of solenoid valve)**

**b.) Checking the condition of pressure regulator**

**c.) Clean the gas filter**

**d.) Checking the condition of differential pressure switch**

**e.) Checking the presence of protective ground**

**f.) Supervision of electrical connection**

**g.) Supervision of combustion air blower**

Check, whether wheel is revolving free or not and clean possible pollution from revolving blades.

## **12. GAS EXCHANGE**

In case you would like to operate your appliance by another type of gas (for example by Natural Gas instead of LP-gas), then contact the local authorised representative or a qualified service department.

### 13. TROUBLE SHOOTING: DIAGNOSIS & TESTING

SYMPTOM		POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Ignition checkout and flame sensing control	Gas burner and combustion air blower		
There is no spark between electrodes of ignition module		<ul style="list-style-type: none"> <li>- Ignition module is polluted</li> <li>- Electrical connection between ignition module and automation was interrupted</li> <li>- Spark interval is too large</li> <li>- Automation went wrong</li> </ul>	<ul style="list-style-type: none"> <li>- Clean electrodes of ignition module</li> <li>- Check electrical connection between ignition module and automation</li> <li>- Check spark interval between electrodes of ignition module</li> <li>- Replace automation</li> </ul>
	Combustion air blower is not revolving	<ul style="list-style-type: none"> <li>- There are not mains voltage enough at engine</li> <li>- Fuse has blown</li> <li>- Differential switch is not at rest</li> <li>- Automation went wrong</li> <li>- Engine of blower went wrong</li> </ul>	<ul style="list-style-type: none"> <li>- Check power supply</li> <li>- After surveying, replace fuse if it went wrong and try to find the reason of the high power consumption</li> <li>- Replace differential switch</li> <li>- Replace automation</li> <li>- Replace the blower or repair its engine</li> </ul>
Ignition cycle finishes normally	Appliance does not operate after the first ignition cycle	<ul style="list-style-type: none"> <li>- Gas control knob is closed</li> <li>- Air was not removed enough from gas piping</li> <li>- Pressure of nozzle is not suitable</li> <li>- Necessary air flow for burning is not suitable</li> </ul>	<ul style="list-style-type: none"> <li>- Open gas control knob</li> <li>- Remove air</li> <li>- Check in- and output pressure at solenoid valve</li> <li>- Check cleanness of inlet hood and wheel of blower</li> </ul>
Ignition cycle finishes normally	Appliance does not operate after more ignition cycles	<ul style="list-style-type: none"> <li>- Solenoid valve went wrong</li> <li>- Differential switch went wrong</li> <li>- Unstable electrical connection between ignition module and automation</li> <li>- Pressure of nozzle is not suitable</li> <li>- Necessary air flow for burning is not suitable</li> </ul>	<ul style="list-style-type: none"> <li>- Replace solenoid valve</li> <li>- Replace differential switch</li> <li>- Check electrical connection</li> <li>- Check in- and output pressure at solenoid valve</li> <li>- Check cleanness of inlet hood and wheel of blower</li> </ul>
	Gas burner ignites but shuts down soon	<ul style="list-style-type: none"> <li>- Phase and null are inverted</li> <li>- Pressure of nozzle is not suitable</li> <li>- Necessary air flow for burning is not suitable</li> <li>- Differential switch switches back to rest</li> </ul>	<ul style="list-style-type: none"> <li>- Check phase fitting</li> <li>- Check in- and output pressure at solenoid valve</li> <li>- Check cleanness of inlet hood and wheel of blower</li> <li>- Check cleanness of burner tube, radiant heat tubes and flue pipe system and clean it if it is necessary</li> </ul>
	Appliance operates, but burning is uneven and noisier than it should be	<ul style="list-style-type: none"> <li>- Turbulator was not placed into radiant heat tube</li> </ul>	<ul style="list-style-type: none"> <li>- Check turbulator</li> </ul>

AT AN INTERVENTION THAT NEEDS BURNER TO BE DISASSEMBLED, TURN TO A QUALIFIED SERVICE DEPARTMENT DESIGNATED BY THE AUTHORISED REPRESENTATIVE!

#### **14. GUARANTEE**

**It is offered a specific and limited 2-year guarantee covering OMEGA tube radiant heater in case of proper use.**

GUARANTEE LOSES ITS VALIDITY IN THE FOLLOWING CASES:

- Inexpert use
- Running burner(s) with intake combustion air drawn from an atmosphere that is contaminated with (even to a lesser degree) aggressive, force or other corrosive substances, which would have adverse effect on the material of radiant heater (for example chloric, sulphurous vapours, etc.)
- Product is installed not by a competent person who is charged by the authorised representative