

GAS RADIANT TUBES
INFRA 3BU - 6BU - 9BU - 12BU - 15BU
9BM - 12BM - 15BM - 18BM

INFRA BU/BM



SYMBOLS USED IN THIS USER MANUAL

**Note:**

This section provides useful information on the proper and safe operation of the device.

**Important**

Indicates important information and practical tips.

**THREAT**

In this manual, the word **DANGER**, when used in conjunction with the symbol shown here, indicates a high-risk hazard that, if not avoided, will result in death or serious injury.

**WARNING**

In this manual, the word **WARNING**, when accompanied by the symbol shown here, indicates a hazard involving a moderate level of risk which, if not avoided, could result in death or serious injury.

**NOTE**

In this manual, the word **CAUTION**, when used in conjunction with the symbol shown here, indicates a low-risk hazard that, if not avoided, could result in minor or moderate injury.

**READ CAREFULLY BEFORE USE. KEEP FOR FUTURE REFERENCE.**

Before installation, verify that local distribution conditions, gas type, and pressure are compatible with the device's specifications. In order to improve the product, Systema reserves the right to modify the content without prior notice.



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TABLE OF CONTENTS

1. GENERAL INFORMATION	5
2. PACKAGING	6
2.1. PACKAGING - LIST	6
3.1 DESCRIPTION AND CHARACTERISTICS OF THE WORK	7
3. KEY TECHNICAL SPECIFICATIONS	7
3.2 TECHNICAL SPECIFICATIONS	8
3.2.1. MAIN COMPONENTS OF THE DEVICE	9
3.3 DIMENSIONS	10
3.4 VIEW OF THE 3-BU INFRARED RADIATOR	11
3.5 VIEW OF THE INFRA 6 BU 28 KW/35 KW RADIANT HEATER	12
3.6 VIEW OF THE 9 BU 45 KW INFRARED HEATER	13
3.7 VIEW OF THE INFRA 9 BU 53 KW RADIANT HEATER	14
3.7.1. LEGEND FOR THE INFRA 9 BU 45 KW RADIANT HEATER VIEW	15
3.7.2. LEGEND FOR THE INFRA 9 BU 53 KW RADIANT HEATER VIEW	15
3.8 VIEW OF THE INFRA 12 BU 45/60 KW RADIANT HEATER	16
3.8.1. LEGEND FOR THE INFRA 12 BU 45/60 KW RADIANT HEATER VIEW	17
3.9 VIEW OF THE INFRA 15 BU 60 KW RADIANT HEATER	18
3.9.1. LEGEND FOR THE INFRA 15 BU 60 KW RADIANT HEATER VIEW	19
3.10 VIEW OF THE INFRA 9 BM 18 KW RADIANT HEATER	20
3.10.1. LEGEND FOR THE INFRA 9 BM RADIATOR VIEW	20
3.11 VIEW OF THE INFRA 12 BM 28 KW RADIANT HEATER	21
3.11.1. LEGEND FOR THE INFRA 12 BM RADIATOR VIEW	21
3.12 VIEW OF THE INFRA 15 BM 35 KW RADIANT HEATER	22
3.12.1. LEGEND FOR THE INFRA 15 BM RADIATOR VIEW	22
3.13 WIDOK PROMIENNIKA INFRA 18 BM 45 kW	23
3.13.1. LEGENDA WIDOKU PROMIENNIKA INFRA 18 BM	23
3.14 BRACKETS	24
3.15 VIEW OF THE BURNER WITH A LIST OF COMPONENTS	25
3.15A VIEW OF THE FAN ASSEMBLY	26
3.16 SPARK-IONIZATION ELECTRODE	27
3.17 BURNER NOZZLE	27
4. INSTALLATION	28
4.1 INSTALLATION LOCATIONS AND SAFETY DISTANCES	28
4.2 INSTALLATION OF EQUIPMENT	30
4.3 INSTALLATION OF THE RBT SCREEN	32
5. INSTALLATION OF THE DEVICE	34
5.1 CEILING MOUNT	34
5.2 WALL MOUNTING	35
6 EXHAUST OUTLETS AND AIR INTAKES	36
6.1 EXHAUST VENTING AND AIR INTAKE THROUGH THE CEILING	36
6.2 MAXIMUM LENGTHS OF AIR AND EXHAUST DUCTS	37
6.3 COMPONENTS OF THE EXHAUST-AIR SYSTEM	38
6.3.1 ROOF SYSTEM WITH SEPARATE EXHAUST AND INTAKE DUCTS (TYPE C32)	38
6.3.2 WALL SYSTEM WITH SEPARATE TUBES FOR SMOKE AND AIR INTAKE (TYPE C12)	39
6.3.3 COAXIAL CEILING SYSTEM (TYPE C32)	40
6.3.4 COAXIAL FLUE GAS VENTING SYSTEM THROUGH THE WALL (TYPE C12)	41
6.3.5 FLUE GAS EVACUATION THROUGH THE ROOF (TYPE B22)	42
6.3.6 FLUE GAS EVACUATION THROUGH THE WALL (TYPE B22)	43
7 GAS CONNECTIONS	44
7.1 CONNECTING THE DEVICE	44
8.1 CONNECTION DIAGRAM FOR CE/A CONTROL PANELS	45
8. ELECTRICAL SYSTEM	45
8.2 CONNECTING THE DEVICE TO AN SCD/EURO-SCAN ANALOG CONTROL PANEL	46
8.2.1 SCD/EP D10 CONTROL PANEL, 10 PCS., INFRARED	47
8.2.2 DIGITAL CONTROL PANEL (INET) FOR UP TO 16 INFRARED DEVICES	48
8.3 ELECTRICAL SCHEMATIC FOR M82/E82 PCB CONNECTIONS	49
8.4 CABLING	50

9.1 PRE-IGNITION PROCEDURES	53
9. TESTING AND COMMISSIONING	53
EXHAUST GAS ANALYZER	55
EXHAUST GAS SAMPLING POINT	55
FLEXIBLE EXHAUST PIPE	55
9.2 MEASUREMENT OF COMBUSTION QUALITY	55
10. MAINTENANCE	56
10.1 FUEL CHANGE	56
10.1.1 SWITCHING FROM NATURAL GAS TO LIQUEFIED GAS	56
10.1.2 SWITCHING FROM LPG TO NATURAL GAS	56
10.2 DESCRIPTION OF DEVICE MALFUNCTION	57
10.1.3 ADAPTING THE BURNER TO CATEGORY 2E+/3+	57
11. GUARANTEE	58
11.1 SCOPE AND DURATION OF THE WARRANTY	58
11.2 WARRANTY EXCLUSIONS	58
12. TURNING OFF THE DEVICE	58
13. RISK ANALYSIS AND ASSESSMENT	59

1. GENERAL INFORMATION

This manual is an integral part of the device and should be kept nearby for easy reference. Please read the instructions and warnings in this manual carefully, as they provide important information regarding the safety, installation, use, and maintenance of the device.

ATTENTION!!

If you lose this manual, please contact the manufacturer or supplier of the unit to request a replacement copy. The unit is designed to heat large work areas such as industrial and commercial production halls, warehouses, high-airflow halls, outdoor loading docks, and sports facilities.

Thanks to the principles of radiant heat, it allows for the heating of individual zones or, when multiple units are used, for the heating of entire facilities.

Infra heaters can be used to heat animal housing facilities, in agricultural applications (greenhouses, livestock farms), and in all industrial production cycles (furnaces and dryers) wherever heating is required and contact between products and exhaust gases is not permitted.

It is prohibited to use these devices to heat rooms where the processing operations or materials pose a risk of explosive formations, flammable gases, or dust.

The equipment must be installed exclusively by professionally qualified technicians in full compliance with applicable safety regulations. The manufacturer disclaims liability for damages caused by improper installation or misuse of the device.

The initial startup of the device should be performed by qualified personnel. All packaging materials (nylon, Styrofoam, wood, staples, etc.) should be kept out of the reach of children, as they may pose a potential hazard. If the device stops working or malfunctions, it must be turned off immediately. All repairs or replacement of parts must be performed by qualified personnel using only original replacement parts. Failure to follow these guidelines may adversely affect the safe operation of the device. To ensure the device operates correctly, it is essential to strictly follow the manufacturer's instructions and to perform regular inspections and maintenance of the device (at least once a year).

2. PACKAGING

2.1. PACKAGING - LIST

1. The exhaust fan and burner are packed in a cardboard box along with the user manual.
2. Additional accessories and parts are packed in cardboard boxes.
3. Different sizes of radiant tubes for various Infra heaters are packaged separately, along with all the additional components needed to assemble the complete heater.
4. The screens are stacked on top of each other to minimize their volume. As an alternative to standard screens, you can order RBT screens (see Fig. 3.11) with mineral wool insulation, or maxi screens with brackets (see Fig. 3.10).
5. Air and exhaust outlets are delivered wrapped in stretch film or in cardboard boxes.



ATTENTION!!!

Please remove the protective film from the screens (if present) before mounting them on the brackets.

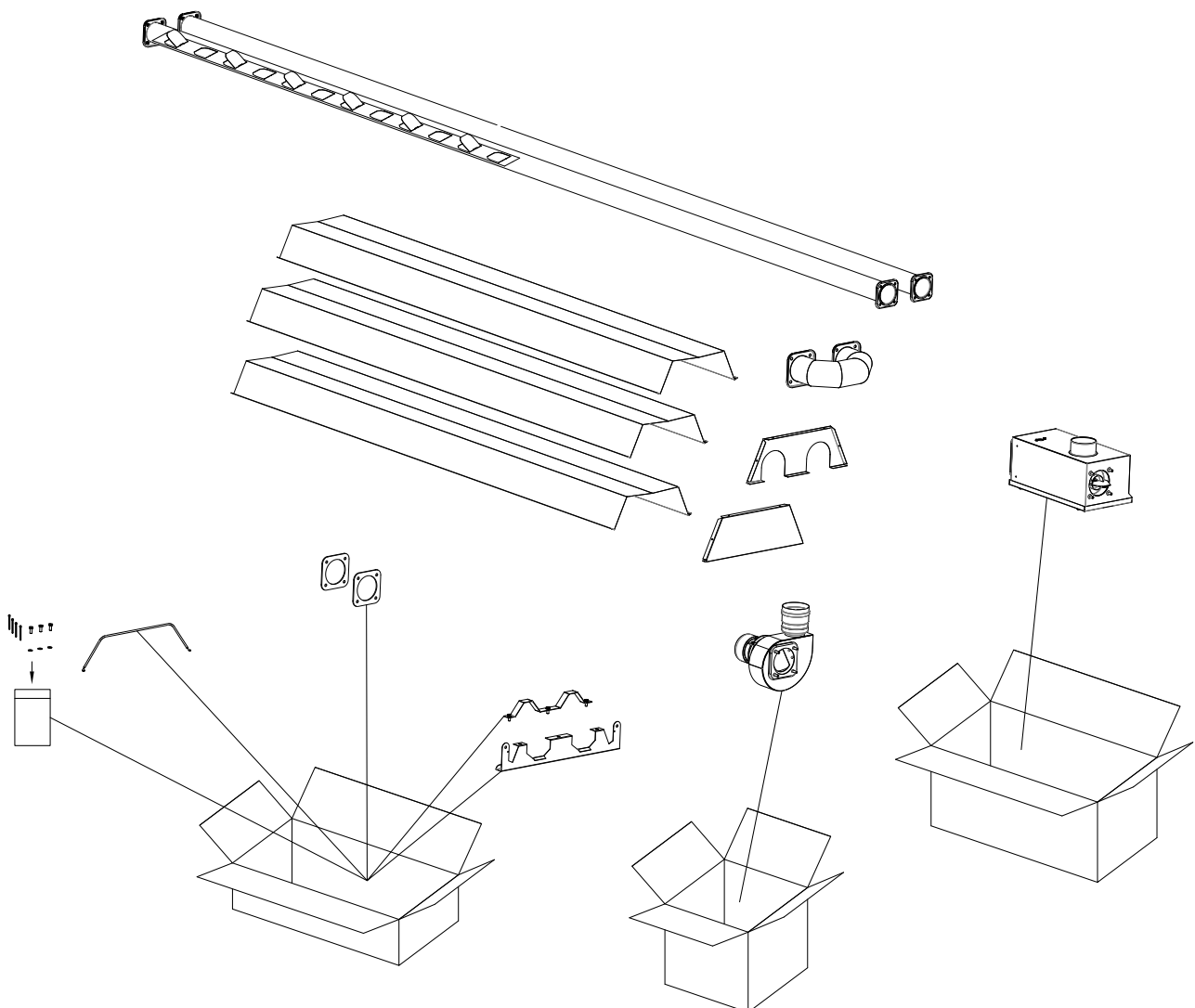


Fig. 2.1 Packaging

3. KEY TECHNICAL SPECIFICATIONS

3.1 DESCRIPTION AND CHARACTERISTICS OF THE WORK

The „INFRA“ gas radiant tubes are made of U-shaped calorized steel pipes and partly stainless steel, in which the combustion of the gas (natural gas or LPG) takes place, which causes the external surface to heat up to a temperature of about 350°C. A stable operating temperature can be achieved in a matter of minutes. Control, circulation, combustion and ignition take place in a sealed device operating in negative pressure. Due to the fact that the air inlet and the flue gas outlet are continuously connected from the burner to the smoke outlet outside the system, there is no connection between the combustion chamber and the heated room. This ensures maximum safety. Along the entire radiant tube (6, 9, 12 m) passes the reflector whose role is to reflect the heat downwards. In the RBT radiant tube version, the reflectors can be equipped with mineral wool that acts as an additional insulator. The thermostats, located around the work area, arranged on the panels, which can activate / deactivate one or more modules simultaneously, control the thermal conditions inside the room to be heated. This makes it possible to heat the entire building as well as selected areas (including the supply of different temperatures)

Fig. 3.1 Packaging of RBT screens

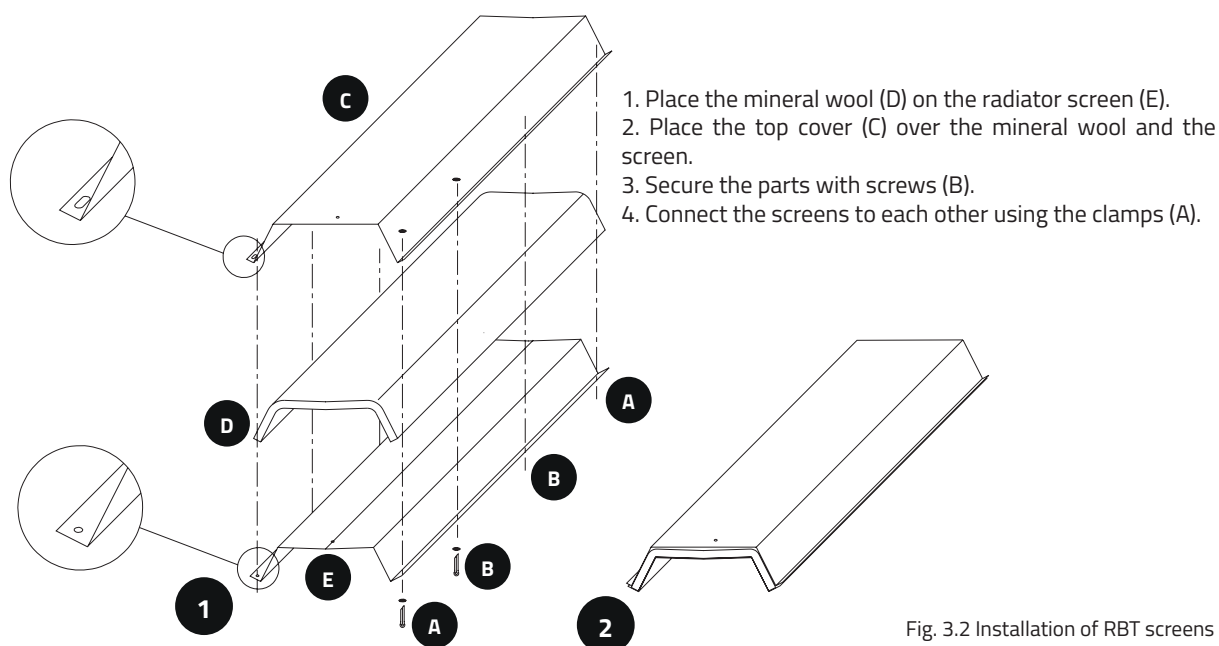
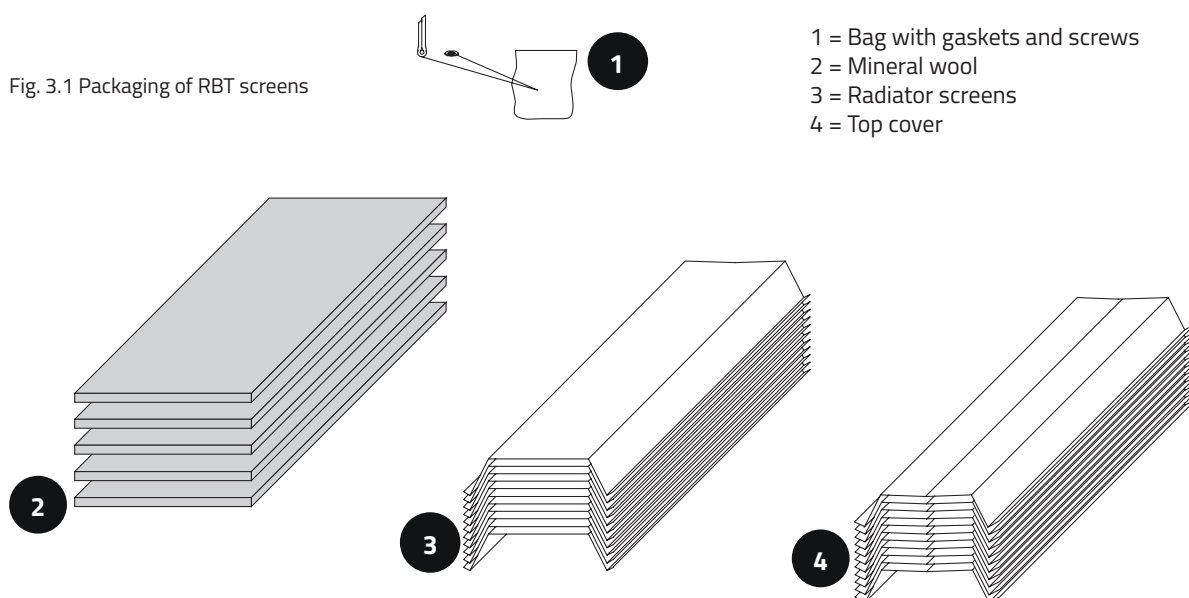


Fig. 3.2 Installation of RBT screens

3.2 TECHNICAL SPECIFICATIONS

INFRA Models		INFRA 3 BU 16	INFRA 6 BU 28	INFRA 6 BU 35	INFRA 9 BU 45	INFRA 9 BU 53	INFRA 12 BU 45	INFRA 12 BU 60	INFRA 15 BU 60
Rated thermal load Hi	kW	18.0	28.0	35.0	45.0	53.0	45.0	60.0	60.0
Heat output	kW	16.4	25.7	32.0	40.95	48.39	40.95	54.6	54.9
Combustion efficiency	%	91.0	91.8	91.3	91.0	91.3	91.0	91.0	91.5
Power supply	V/Hz	230 V - 50/60 Hz							
Total electrical power	W	120	120	120	120	200	120	200	200
Pressure switch calibration	Pa	60							
Fan power	W	100	100	100	100	180	100	180	180
Fan turbine diameter	Ø mm	102	102	133	133	145	145	170	170
Diameter of the burner's gas connection	cal	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Diameter of the flexible gas connection	cal	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	3/4"	3/4"
Air intake (men's)	Ø mm	100	100	100	100	100	100	100	100
Exhaust connector (female)	Ø mm	100	100	100	100	100	100	100	100
Exhaust gas flow	m³/h	55	86	107	138	163	138	184	184
Exhaust gas temperature	°C	190	190	195	195	210	185	205	190
Weight of the standard version	kg	65	86.5	86.5	139	140.5	176	177.5	209.5
Weight of the RBT version	kg	76	105.5	105.5	167.5	169	214	215.5	247.5
Gas consumption at 15°C and 1013.25 mbar									
Natural Gas G20	m³/h	1.90	2.96	3.70	4.76	5.61	4.76	6.35	6.35
Natural Gas G27	m³/h	2.32	3.61	4.52	5.81	6.84	5.81	7.74	7.74
Natural Gas G2.350	m³/h	2.64	4.12	5.14	6.61	nd	6.61	nd	nd
LPG Butane G30	kg/h	1.42	2.21	2.76	3.55	4.18	3.55	4.73	4.73
LPG Propane G31	kg/h	1.40	2.18	2.72	3.50	4.12	3.50	4.66	4.66

INFRA Models		INFRA 9 BM	INFRA 12 BM	INFRA 15 BM	INFRA 18 BM
Rated thermal load Hi	kW	18.0	28.0	35.0	45.0
Heat output	kW	16.4	25.7	32.0	40.95
Combustion efficiency	%	91.0	91.3	91.4	91.0
Power supply	V/Hz	230 V - 50/60 Hz			
Total electrical power	W	120	120	120	120
Pressure switch calibration	Pa	60			
Fan power	W	100	100	100	100
Fan turbine diameter	Ø mm	133	133	133	146
Gas connection (female thread)	cal	1/2"	1/2"	1/2"	1/2"
Diameter of the flexible gas connection	cal	1/2"	1/2"	1/2"	3/4"
Air intake (men's)	Ø mm	100	100	100	100
Exhaust connector (female)	Ø mm	100	100	100	100
Weight of the standard version	kg	98	124	148	176
Weight of the RBT version	kg	122	156	188	224
Gas consumption at 15°C and 1013.25 mbar					
Natural Gas G20	m³/h	1.90	2.96	3.70	4.76
Natural Gas G27	m³/h	2.32	3.61	4.52	5.81
Natural Gas G2.350	m³/h	2.64	4.12	5.14	6.61
LPG Butane G30	kg/h	1.42	2.21	2.76	3.55
LPG Propane G31	kg/h	1.40	2.18	2.72	3.50

3.2.1. MAIN COMPONENTS OF THE DEVICE

PRESSURE SWITCH SPECIFICATIONS	
Manufacturer	HUBA CONTROL
Manufacturer code	605
Installation instructions	vertically
Maximum operating pressure	500 PA
Closing price	-
Opening price	60 PA (+ 12 PA)
Pneumatic connection	Ø 6.2 mm
Operating temperature	-30C, +85C

ELECTRIC MOTOR - SINGLE-PHASE INDUCTION MOTOR		
Model	INFRA 3-6 BU, 9 BM, 12 BM, 9 BU45, 15 BM, 18 BM	INFRA 9 BU53, 12 BU60, 15 BU
Manufacturer	AACO	AACO
Type	02/20-3	12/19-3
Power supply	230 V ~ 50 Hz	
Electrical power	100 W	180 W
Current	0.72 A	1.36 A
Capacitor	3.15 µF 450 V	5 µF 450 V
Insulation	H	H

SPECIFICATIONS OF A GAS SOLENOID VALVE			
Producent	SIT CONTROLS	SIT CONTROLS	RESIDEO
Model	830 TANDEM	SIGMA 840	VK4105
Power supply	230 V 50 Hz	230 V 50 Hz	220/240 V 50 Hz
Protection rating	IP 54		
Closing time	< 1s	< 1s	< 1s
Operating temperature	0 °C - +60 °C -20 ° - +60 °C (upon request)	0 °C - +60 °C -20 ° - +60 °C (upon request)	- 15 °C - + 60 °C
Output pressure range	3 - 50 mbar [0.3-5] kPa	3 - 50 mbar [0.3-5] kPa	3 - 50 mbar [0.3-5] kPa
Gas flow (at 5 mbar overpressure)	4.8 m³/h	4,6 m³/h	4.8 m³/h
Maximum inlet pressure	60 mBar [6 kPa]	60 mBar [6 kPa]	60 mBar [6 kPa]

SPECIFICATIONS OF THE BURNER CONTROL UNIT		
Marka	GENIUS	BRAHMA
Model	IDEA E82	SRM DFC E32C
Power supply	220/240V 50/60 Hz	220/240V 50 Hz
Operating temperature	-20 ° - +60 °C	-20 ° - +60 °C
Ventilation time	20 s	20 s
Safety margin	Max 10 s	Max 10 s
Emergency shutdown time	< 1s	< 1s
Type of reset	Electric	Electric

Fig. 3.3 Dimensions of INFRA heaters—models 3 BU 18 kW, 6 BU 28/35 kW, 9 BU 45 kW, 12 BU 45 kW

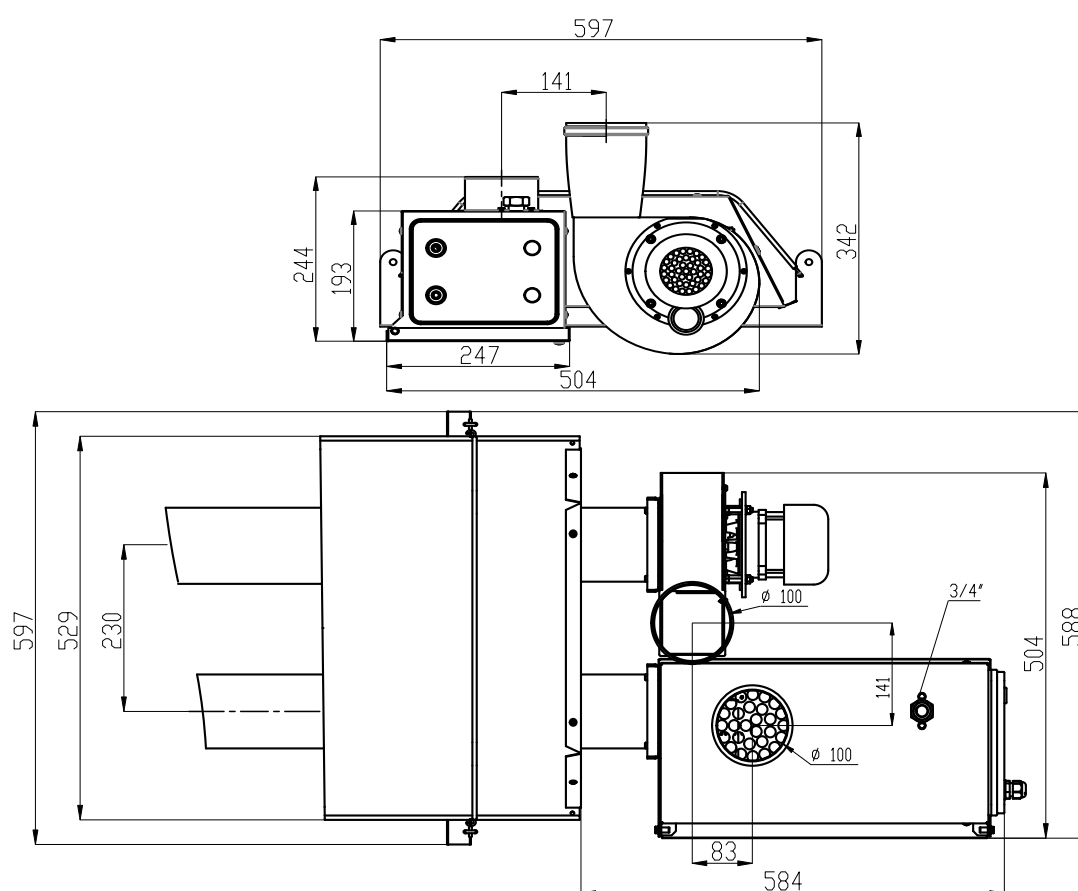
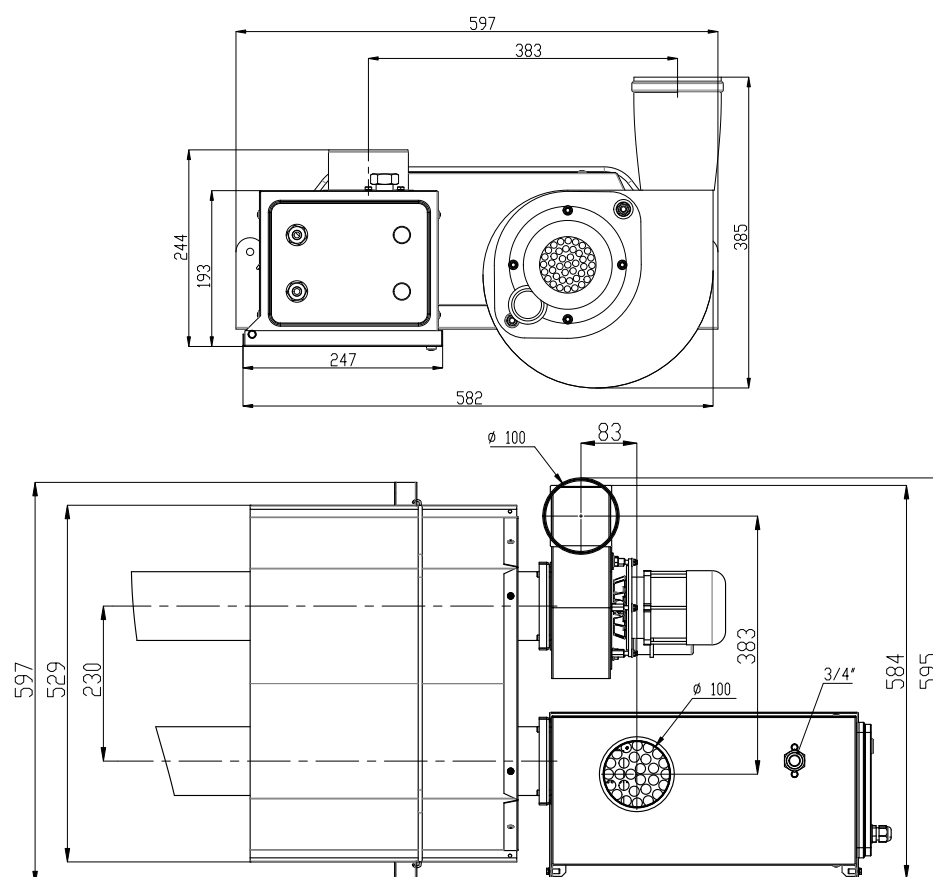
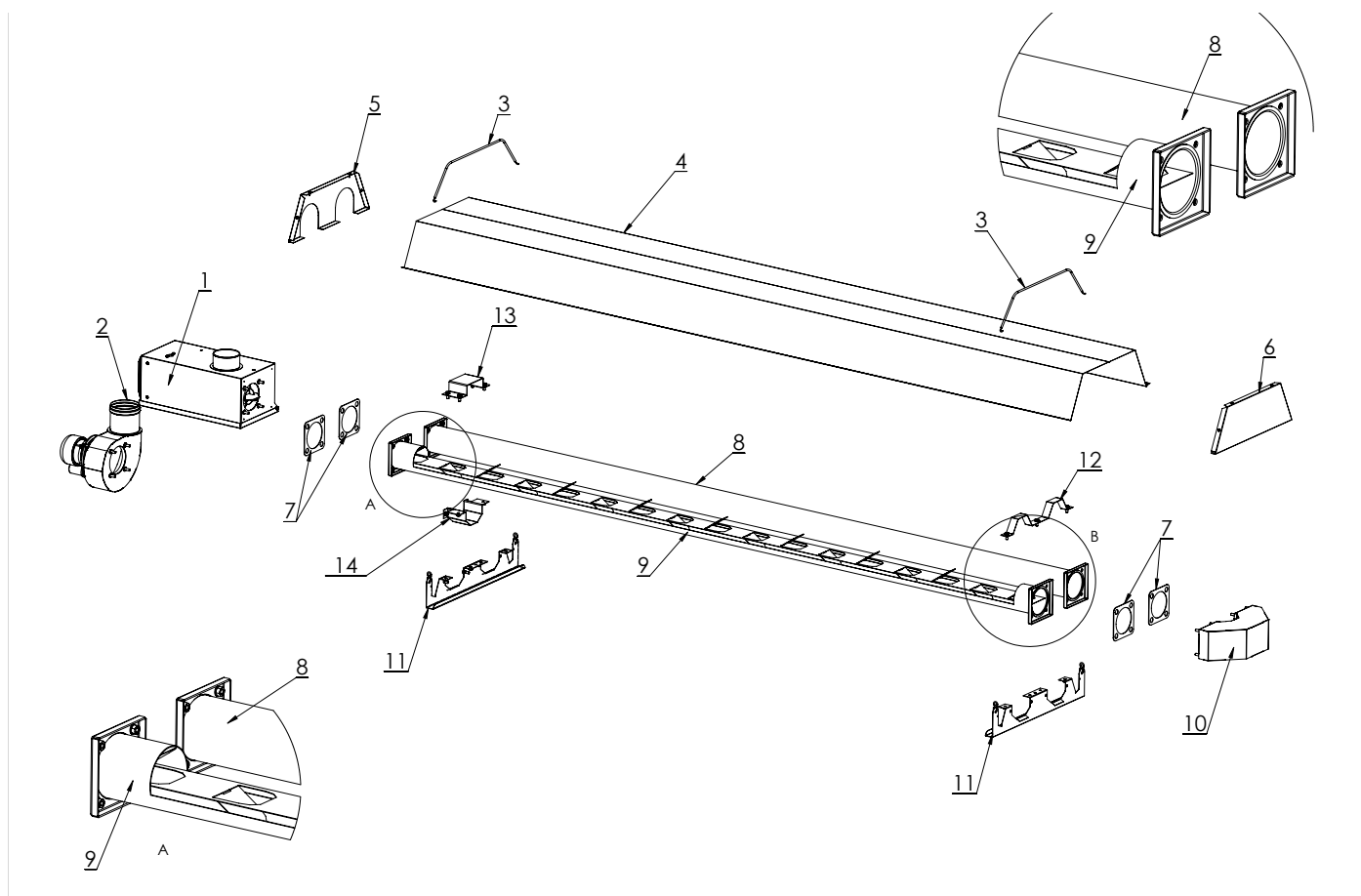


Fig. 3.3a Dimensions of INFRA heaters—models 9 BU 53 kW, 12 BU 60 kW, 15 BU 60 kW

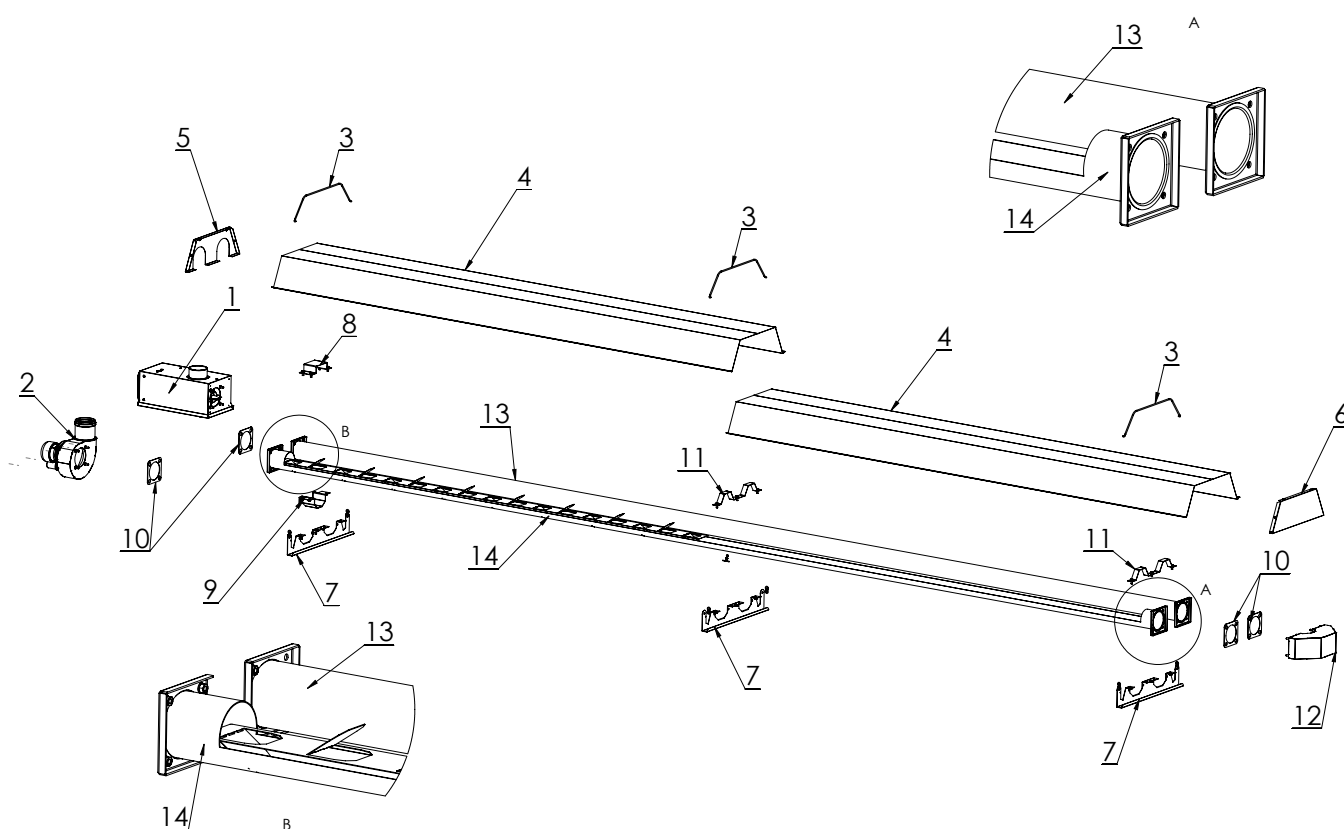


3.4 VIEW OF THE 3-BU INFRARED RADIATOR



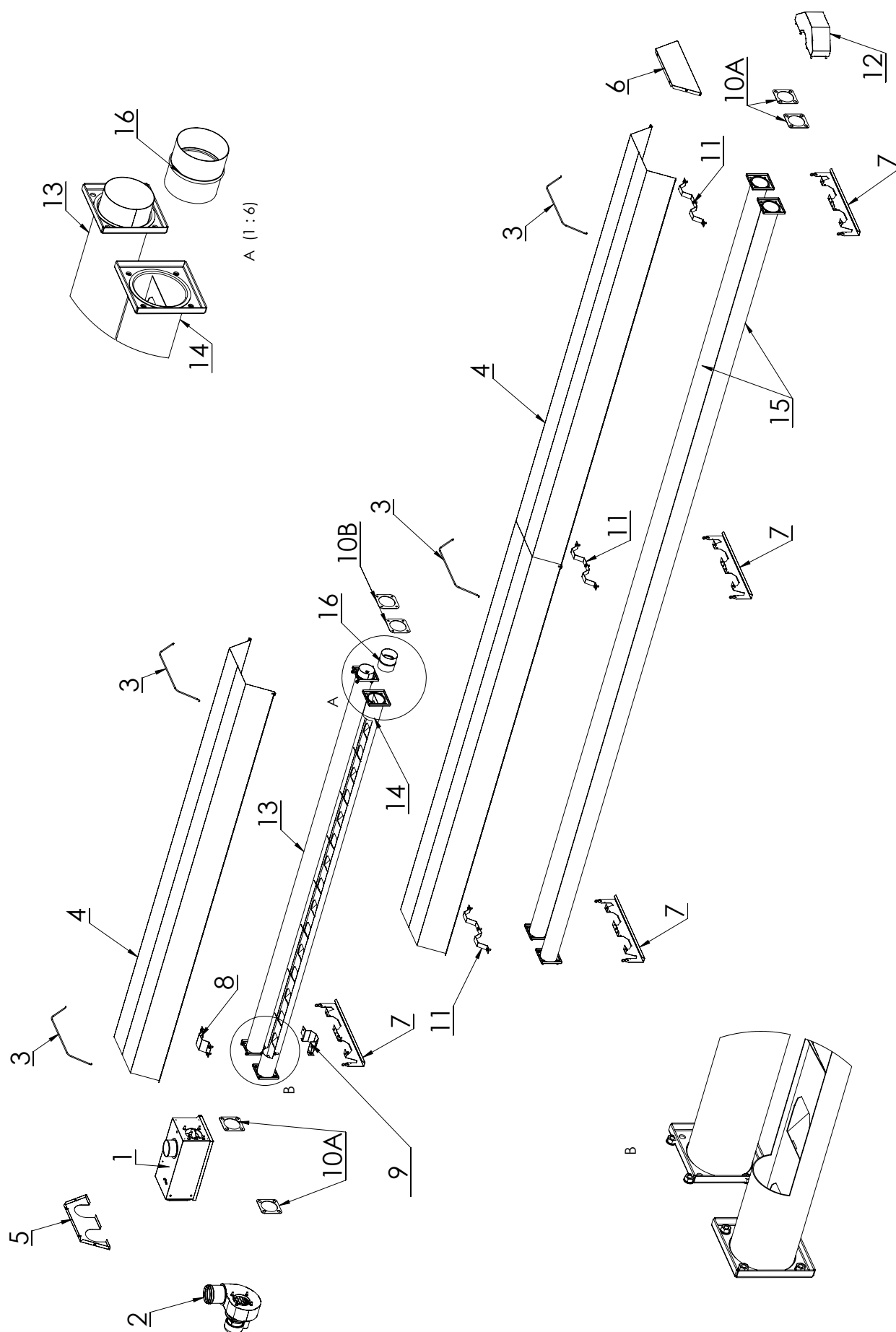
Lp.	Code	Description	Quantity
1	30INPAL1113	Gas burner INFRA 18 kW BU/BM	1
2	30INWE0030	Exhaust fan INFRA BU/BM 18-28 kW	1
3	01CNMO0300/WG	Spring INFRA BU	2
4	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	1
5	30INPR0116/30INPR0116	Burner reflector cap INFRA BU / BUAL	1
6	30INPR0115/30INPR0105	End reflector cap INFRA BU / BUAL	1
7	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	4
8	30INRU5003	Calorized tube D.101 INFRA BU/BM L-2900	1
9	30INRU5022	Calorized tube D.101 INFRA BU/BM L-2900 with turbulator	1
10	30INRU4124	Elbow INFRA BU	1
11	30INZA6941	Bottom bracket INFRA BU	2
12	30INZA6942	Upper bracket INFRA BU	1
13	30INZA6966	Upper burner support INFRA BU/BM	1
14	30INZA6967	Bottom burner support INFRA BU/BM	1

3.5 VIEW OF THE INFRA 6 BU 28 KW/35 KW RADIANT HEATER

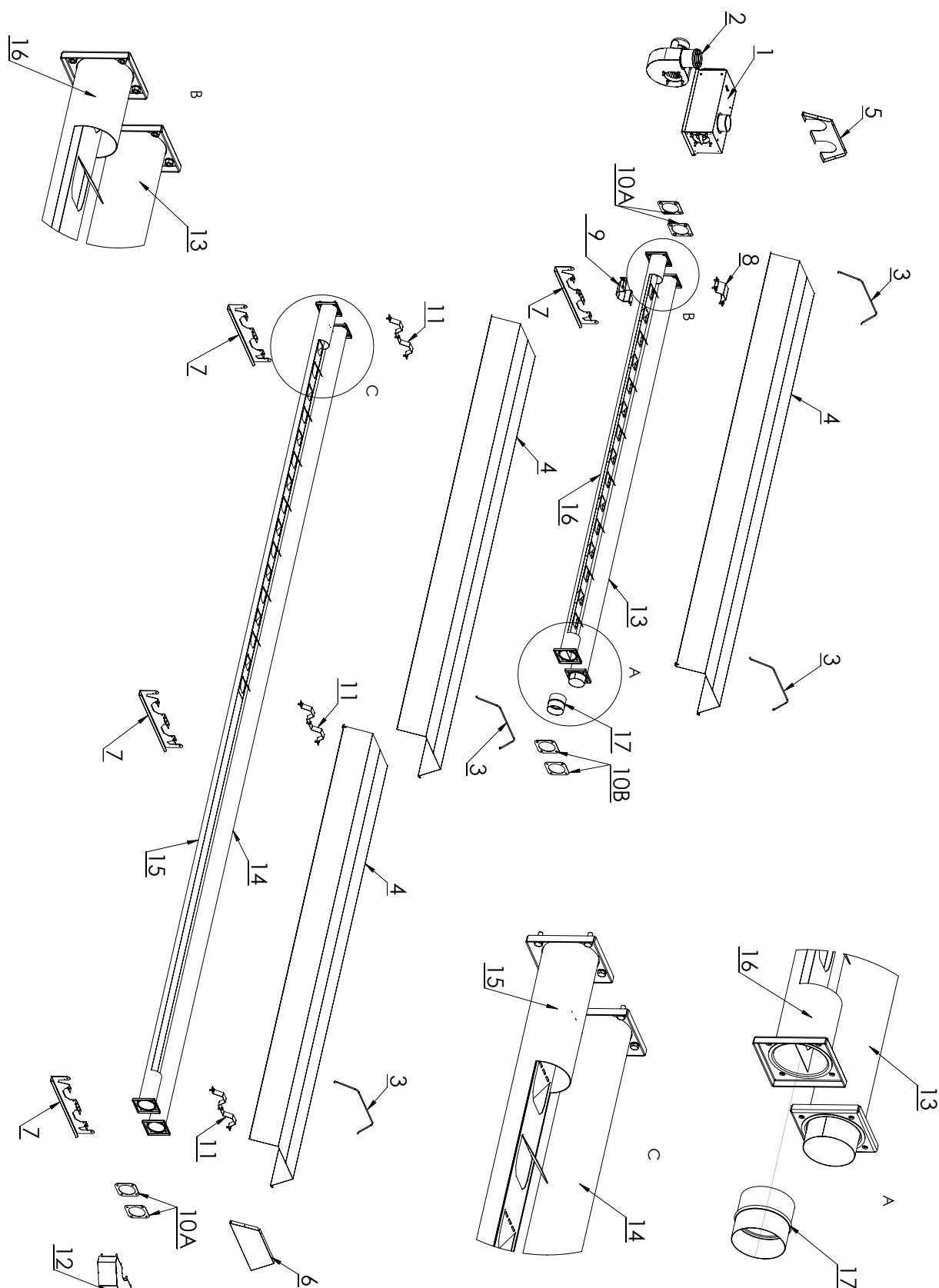


Lp.	Code	Description	Quantity
1	30INPAL1111	Gas burner INFRA 28 kW BU/BM	1
1	30INPAL1118	Gas burner INFRA 35 kW BU/BM	1
2	30INWE0030	Exhaust fan INFRA BU/BM 18-28 kW	1
3	30INWE0028	Exhaust fan INFRA BU/BM 35-45 kW	3
4	01CNM00300/WG	Spring INFRA BU	2
5	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	1
6	30INPRO116/30INPRO116	Burner reflector cap INFRA BU / BUAL	1
7	30INPRO115/30INPRO105	End reflector cap INFRA BU / BUAL	2
8	30INZA6941	Bottom bracket INFRA BU	1
9	30INZA6966	Upper burner support INFRA BU/BM	1
10	30INZA6967	Bottom burner support INFRA BU/BM	4
11	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	2
12	30INZA6942	Upper bracket INFRA BU	1
13	30INRU4124	Elbow INFRA BU	1
14	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator - 1pcs. for INFRA 6BU 28 kW	1
14	30INRU5023	Calorized tube D.101 INFRA BU/BM L-5800 with 2 turbulators - 1pcs. for INFRA 6BU 35 kW	1

3.6 VIEW OF THE 9 BU 45 KW INFRARED HEATER



3.7 VIEW OF THE INFRA 9 BU 53 KW RADIANT HEATER



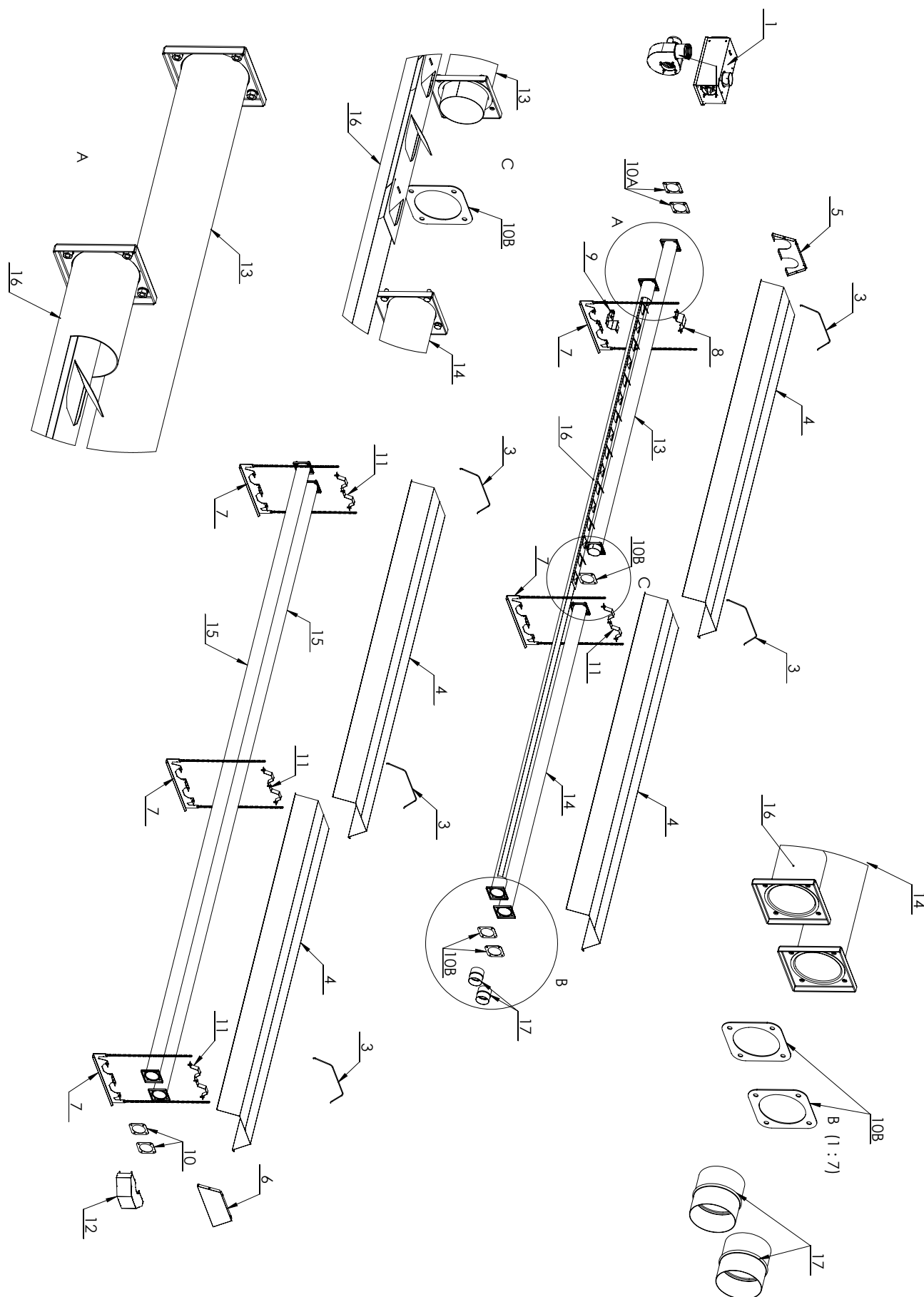
3.7.1. LEGEND FOR THE INFRA 9 BU 45 KW RADIANT HEATER VIEW

Lp.	Code	Description	Quantity
1	30INPAL1110	Gas burner INFRA 45 kW BU/BM	1
2	30INWE0028	Exhaust fan INFRA BU/BM 35-45 kW	1
3	01CNMO0300/WG	Spring INFRA BU	4
4	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	3
5	30INPR0116/30INPR0116	Burner reflector cap INFRA BU / BUAL	1
6	30INPR0115/30INPR0105	End reflector cap INFRA BU / BUAL	1
7	30INZA6941	Bottom bracket INFRA BU	4
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	6
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	6
11	30INZA6942	Upper bracket INFRA BU	3
12	30INRU4124	Elbow INFRA BU	1
13	30INRU5002	Burner tube D.101 INFRA BU L-2900	1
14	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	2
15	30INRU5022	Calorized tube D.101 INFRA BU/BM L-2900 with turbulator	1
16	30INRU5059	Connecting tube INFRA BU/BM	1

3.7.2. LEGEND FOR THE INFRA 9 BU 53 KW RADIANT HEATER VIEW

Lp.	Code	Description	Quantity
1	30INPAL1119	Gas burner INFRA 53 kW BU/BM	1
2	30INWE0029	Exhaust fan INFRA BU/BM 53-60 kW	1
3	01CNMO0300/WG	Spring INFRA BU	4
4	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	3
5	30INPR0116/30INPR0116	Burner reflector cap INFRA BU / BUAL	1
6	30INPR0115/30INPR0105	End reflector cap INFRA BU / BUAL	1
7	30INZA6941	Bottom bracket INFRA BU	4
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	6
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	6
11	30INZA6942	Upper bracket INFRA BU	3
12	30INRU4124	Elbow INFRA BU	1
13	30INRU5002	Burner tube D.101 INFRA BU L-2900	1
14	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	1
15	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator	1
16	30INRU5022	Calorized tube D.101 INFRA BU/BM L-2900 with turbulator	1
17	30INRU5059	Connecting tube INFRA BU/BM	1

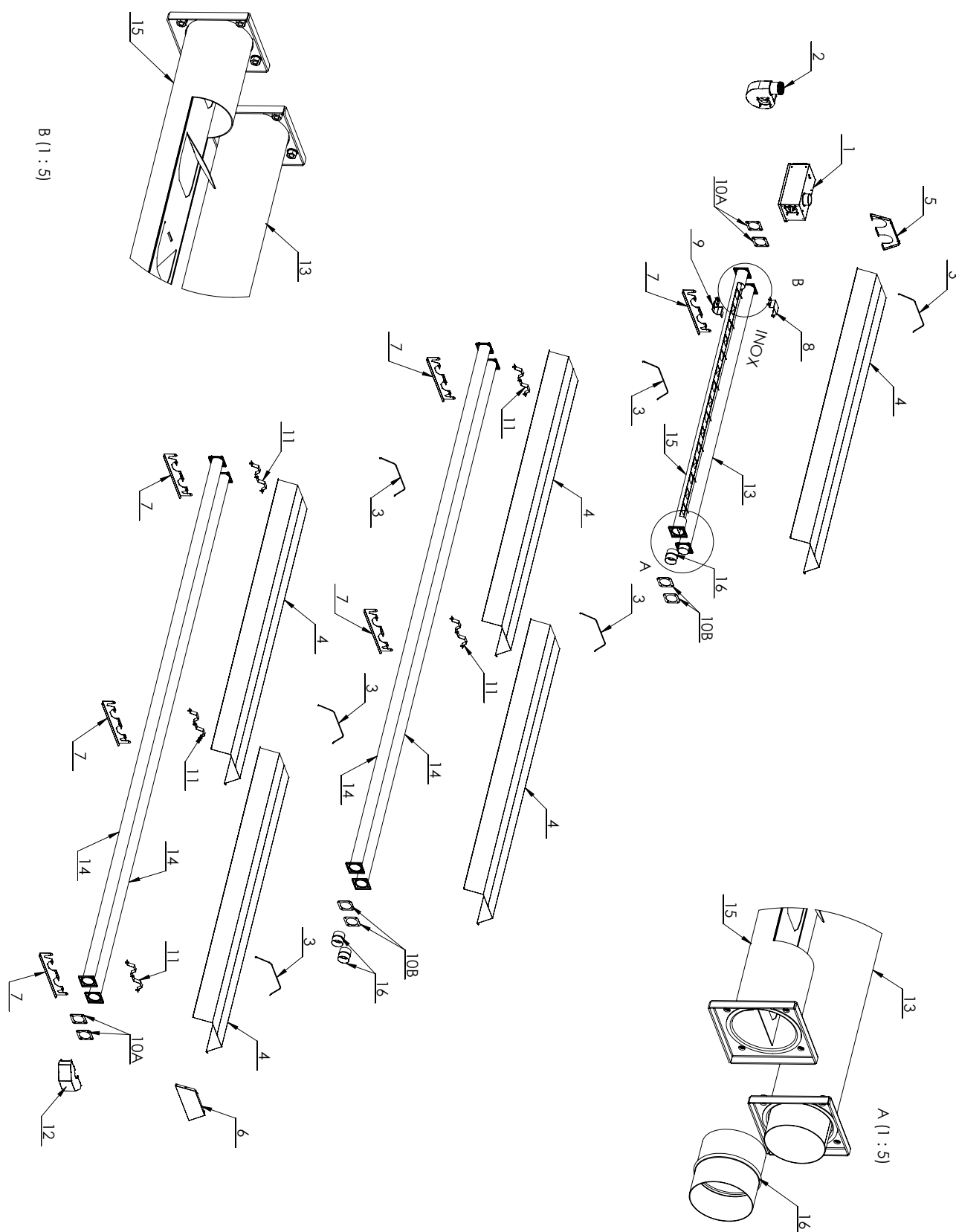
3.8 VIEW OF THE INFRA 12 BU 45/60 KW RADIANT HEATER



3.8.1. LEGEND FOR THE INFRA 12 BU 45/60 KW RADIANT HEATER VIEW

Lp.	Code	Description	Quantity
1	30INPAL1110	Gas burner INFRA 45 kW BU/BM	1
1	30INPAL1120	Gas burner INFRA 60 kW BU	1
2	30INWE0028	Exhaust fan INFRA BU/BM 35-45 kW	1
	30INWE0029	Exhaust fan INFRA BU/BM 53-60 kW	1
3	01CNM00300/WG	Spring INFRA BU	5
4	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	4
5	30INPR0116/30INPR0116	Burner reflector cap INFRA BU / BUAL	1
6	30INPR0115/30INPR0105	End reflector cap INFRA BU / BUAL	1
7	30INZA6941	Bottom bracket INFRA BU	5
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	7
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	7
11	30INZA6942	Upper bracket INFRA BU	4
12	30INRU4124	Elbow INFRA BU	1
13	30INRU5002	Burner tube D.101 INFRA BU L-2900	1
14	30INRU5003	Calorized tube D.101 INFRA BU/BM L-2900	1
15	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	2
16	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator - 1pcs. for INFRA 9BU 45 kW	1
16	30INRU5023	Calorized tube D.101 INFRA BU/BM L-5800 with 2 turbulators - 2pcs. for INFRA 9BU 60 kW	1
17	30INRU5059	Connecting tube INFRA BU/BM	2

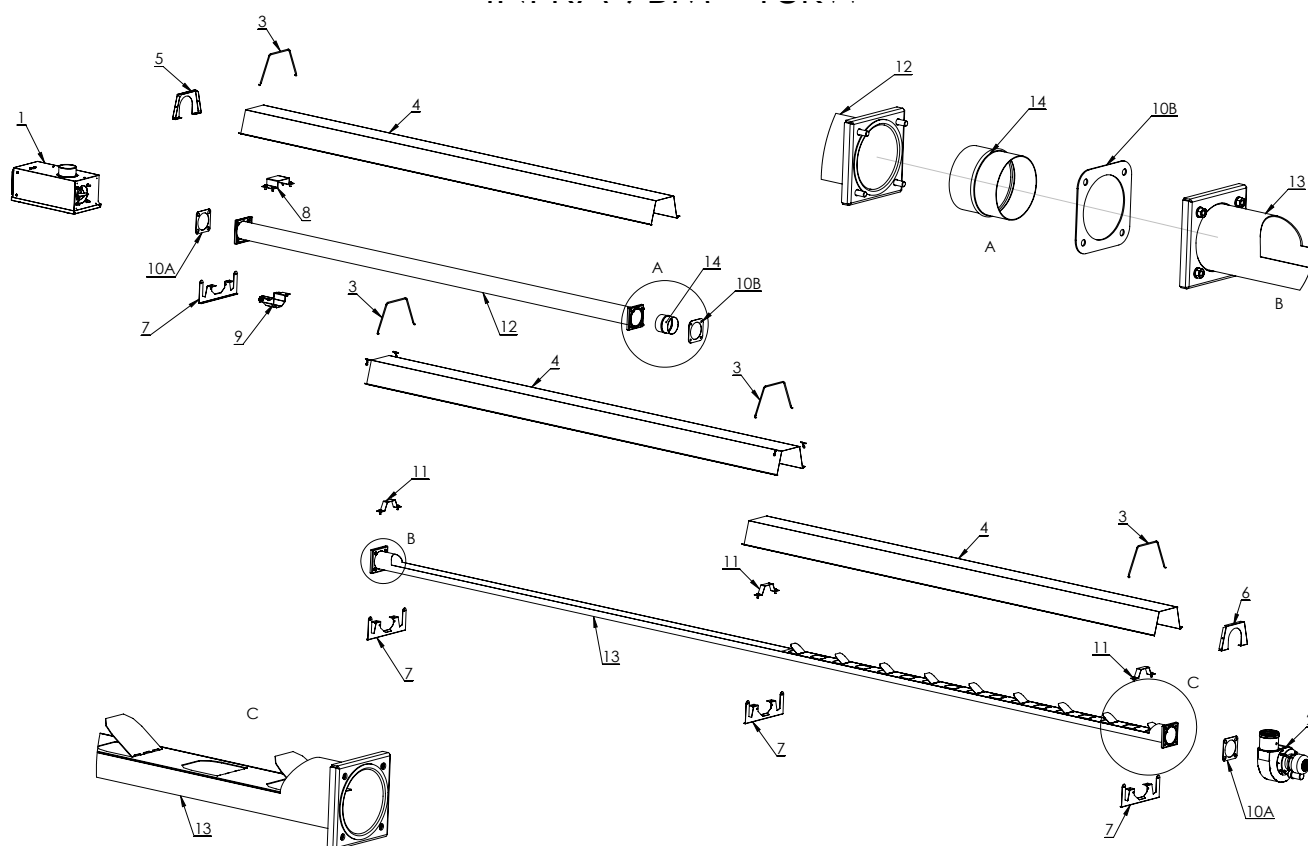
3.9 VIEW OF THE INFRA 15 BU 60 KW RADIANT HEATER



3.9.1. LEGEND FOR THE INFRA 15 BU 60 KW RADIANT HEATER VIEW

Lp.	Code	Description	Quantity
1	30INPAL1120	Gas burner INFRA 60 kW BU	1
2	30INWE0029	Exhaust fan INFRA BU/BM 53-60 kW	1
3	01CNM00300/WG	Spring INFRA BU	6
4	30INOS0051/30INOS0055	Reflector INFRA BU / BUAL	5
5	30INPR0116/30INPR0116	Burner reflector cap INFRA BU / BUAL	1
6	30INPR0115/30INPR0105	End reflector cap INFRA BU / BUAL	1
7	30INZA6941	Bottom bracket INFRA BU	6
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	8
10	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	8
11	30INZA6942	Upper bracket INFRA BU	5
12	30INRU4124	Elbow INFRA BU	1
13	30INRU5002	Burner tube D.101 INFRA BU L-2900	1
14	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	4
15	30INRU5022	Calorized tube D.101 INFRA BU/BM L-2900 with turbulator	1
16	30INRU5059	Connecting tube INFRA BU/BM	3

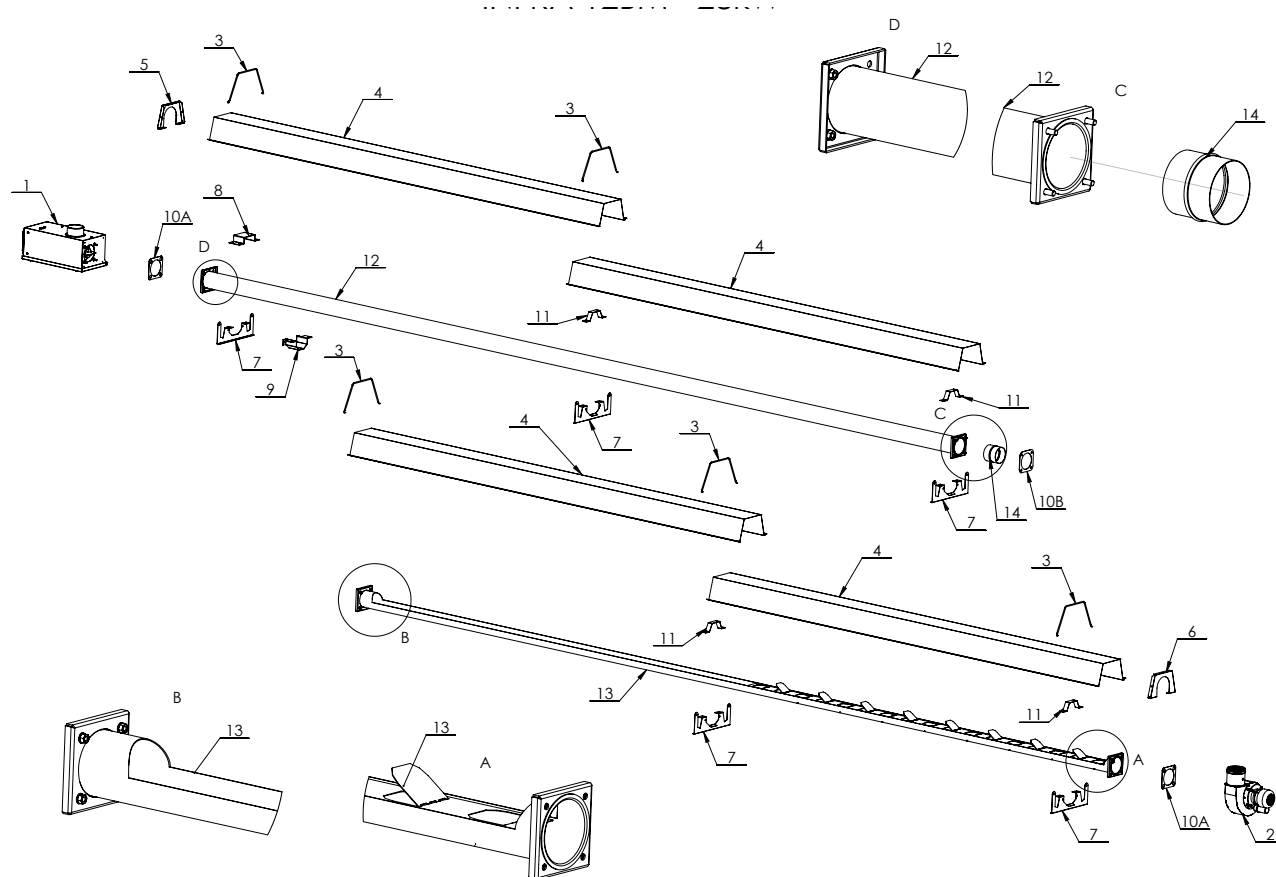
3.10 VIEW OF THE INFRA 9 BM 18 KW RADIANT HEATER



3.10.1. LEGEND FOR THE INFRA 9 BM RADIATOR VIEW

Lp.	Code	Description	Quantity
1	30INPAL1113	Gas burner INFRA 18 kW BU/BM	1
2	30INWE0030	Exhaust fan INFRA BU/BM 18-28 kW	1
3	01CNM00287/WG	Spring INFRA BM	4
4	30INOS0054/30INOS0056	Reflector INFRA BM / BMAL	3
5,6	30INPR0119/30INPR0120	Reflector cap INFRA BM / BMAL	3
7	30INZA6969	Bottom bracket INFRA BM	2
8	30INZA6966	Upper burner support INFRA BU/BM	2
9	30INZA6967	Bottom burner support INFRA BU/BM	4
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	1
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	1
11	30INZA6970	Upper bracket INFRA BM	3
12	30INRU5026	Calorized tube D.101 INFRA BM L-2900	3
13	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator	3
14	30INRU5059	Connecting tube INFRA BU/BM	1

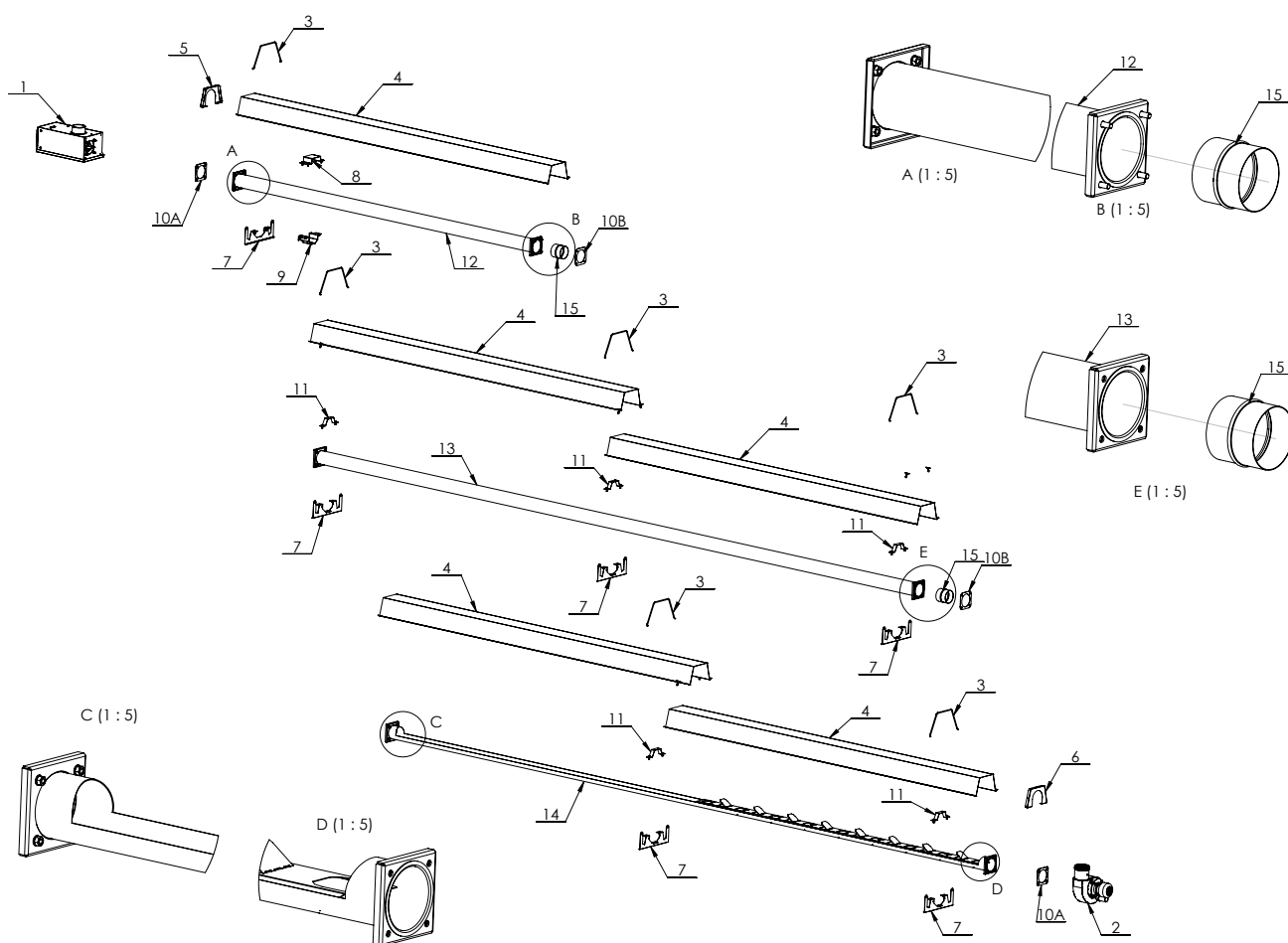
3.11 VIEW OF THE INFRA 12 BM 28 KW RADIANT HEATER



3.11.1. LEGEND FOR THE INFRA 12 BM RADIATOR VIEW

Lp.	Code	Description	Quantity
1	30INPAL1111	Gas burner INFRA 28 kW BU/BM	1
2	30INWE0030	Exhaust fan INFRA BU/BM 18-28 kW	1
3	01CNMO0287/WG	Spring INFRA BM	5
4	30INOS0054/30INOS0056	Reflector INFRA BM / BMAL	4
5,6	30INPR0119/30INPR0120	Reflector cap INFRA BM / BMAL	2
7	30INZA6969	Bottom bracket INFRA BM	5
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	3
10	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	3
11	30INZA6970	Upper bracket INFRA BM	4
12	30INRU5025	Calorized tube D.101 INFRA BM L-5900	1
13	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator	1
14	30INRU5059	Connecting tube INFRA BU/BM	1

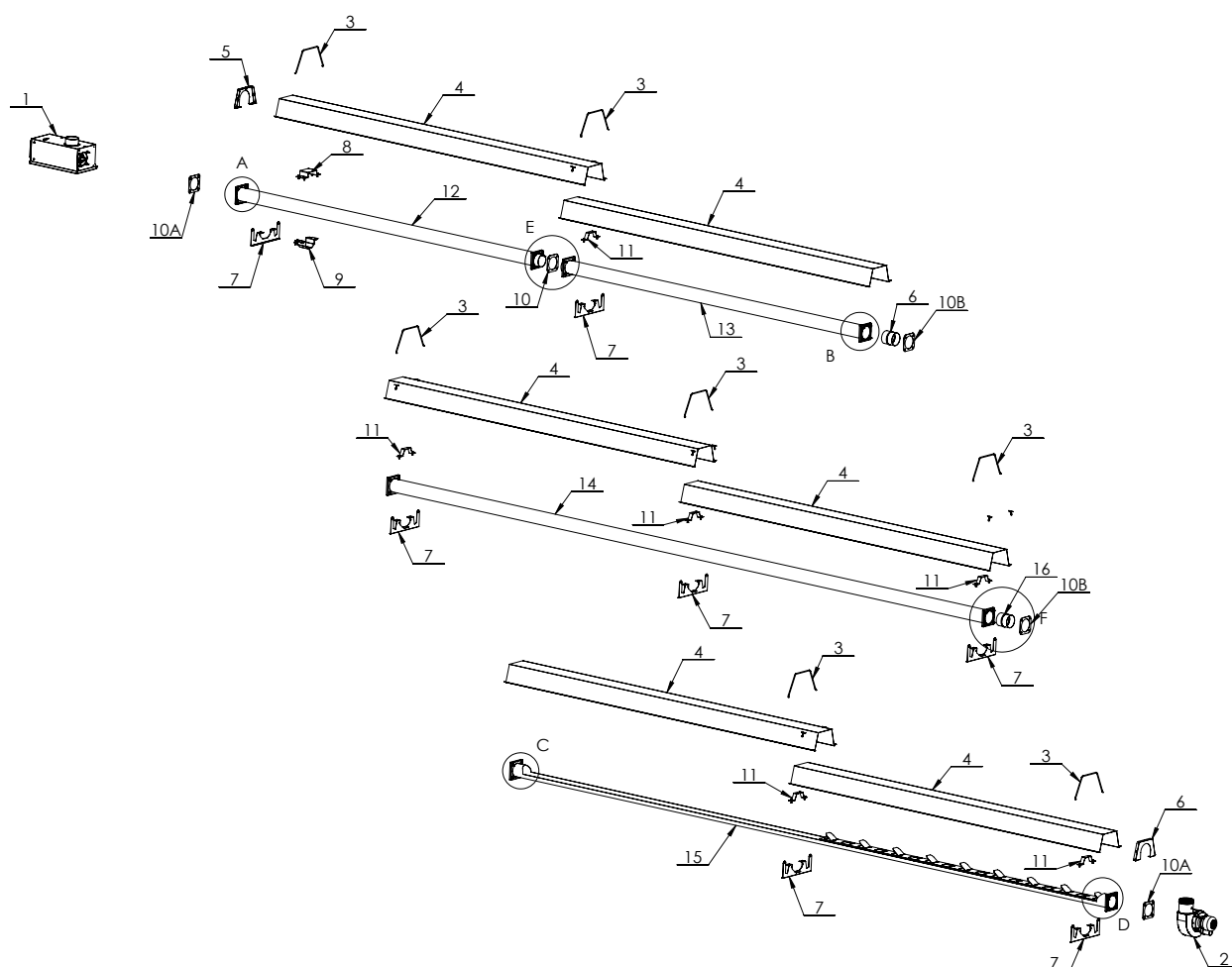
3.12 VIEW OF THE INFRA 15 BM 35 KW RADIANT HEATER



3.12.1. LEGEND FOR THE INFRA 15 BM RADIATOR VIEW

Lp.	Code	Description	Quantity
1	30INPAL1118	Gas burner INFRA 35 kW BU/BM	1
2	30INWE0028	Exhaust fan INFRA BU/BM 35-45 kW	1
3	01CNM00287/WG	Spring INFRA BM	6
4	30INOS0054/30INOS0056	Reflector INFRA BM / BMAL	5
5,6	30INPR0119/30INPR0120	Reflector cap INFRA BM / BMAL	2
7	30INZA6969	Bottom bracket INFRA BM	6
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	2
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	2
11	30INZA6970	Upper bracket INFRA BM	5
12	30INRU5026	Calorized tube D.101 INFRA BM L-2900	1
13	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	1
14	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator	1
15	30INRU5059	Connecting tube INFRA BU/BM	1

3.13 WIDOK PROMIENNIKA INFRA 18 BM 45 kW



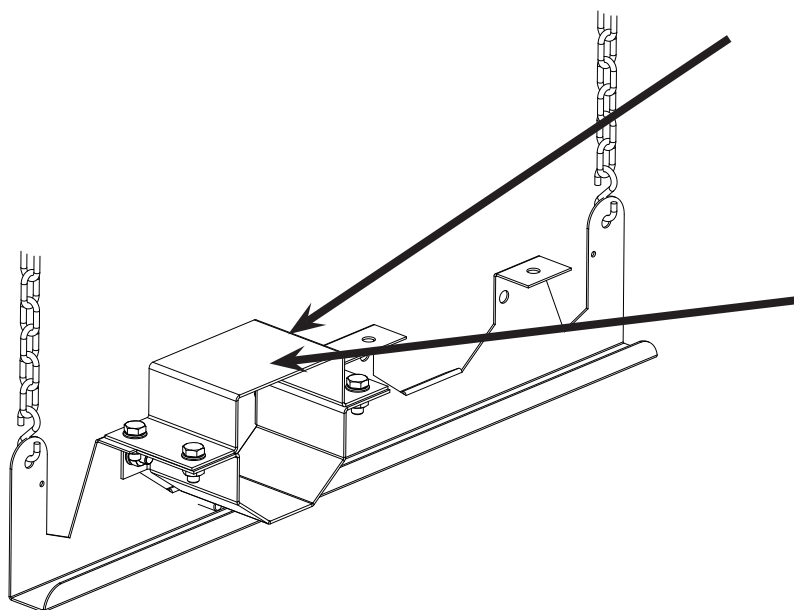
3.13.1. LEGENDA WIDOKU PROMIENNIKA INFRA 18 BM

Lp.	Code	Description	Quantity
1	30INPAL1110	Gas burner INFRA 45 kW BU/BM	1
2	30INWE0028	Exhaust fan INFRA BU/BM 35-45 kW	1
3	01CNMO0287/WG	Spring INFRA BM	7
4	30INOS0054/30INOS0056	Reflector INFRA BM / BMAL	6
5,6	30INPR0119/30INPR0120	Reflector cap INFRA BM / BMAL	2
7	30INZA6969	Bottom bracket INFRA BM	7
8	30INZA6966	Upper burner support INFRA BU/BM	1
9	30INZA6967	Bottom burner support INFRA BU/BM	1
10A	01CNGU3126/WG	Gasket INFRA BU/BM [FAN/BURNER/ELBOW]	5
10B	01CNGU3125/WG	Gasket INFRA BU/BM [TUBES]	5
11	30INZA6970	Upper bracket INFRA BM	6
12	30INRU5024	Burner tube D.101 INFRA BM L-2900	1
13	30INRU5003	Calorized tube D.101 INFRA BU/BM L-2900	1
14	30INRU5000	Calorized tube D.101 INFRA BU/BM L-5800	1
15	30INRU5021	Calorized tube D.101 INFRA BU/BM L-5800 with turbulator	1
16	30INRU5059	Connecting tube INFRA BU/BM	2

3.14 BRACKETS

Fig. 3.4 Burner bracket

The pipe clamp in the burner bracket is different from the others. It clamps the radiant pipe leading to the exhaust fan in such a way as to secure it in place.



PAY CLOSE ATTENTION TO THE CORRECT INSTALLATION OF THIS COMPONENT!

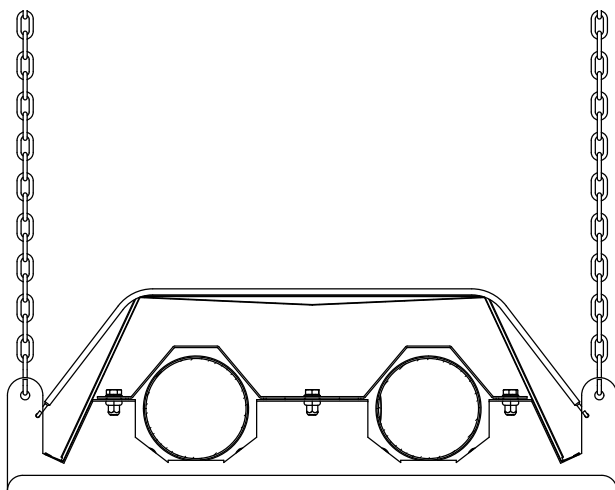


Fig. 3.5 Standard bracket

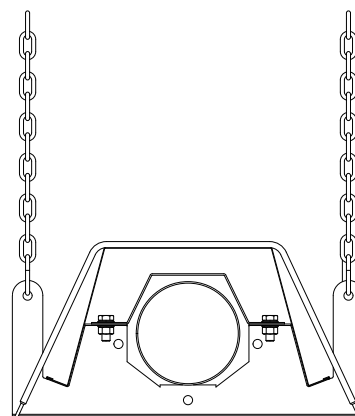
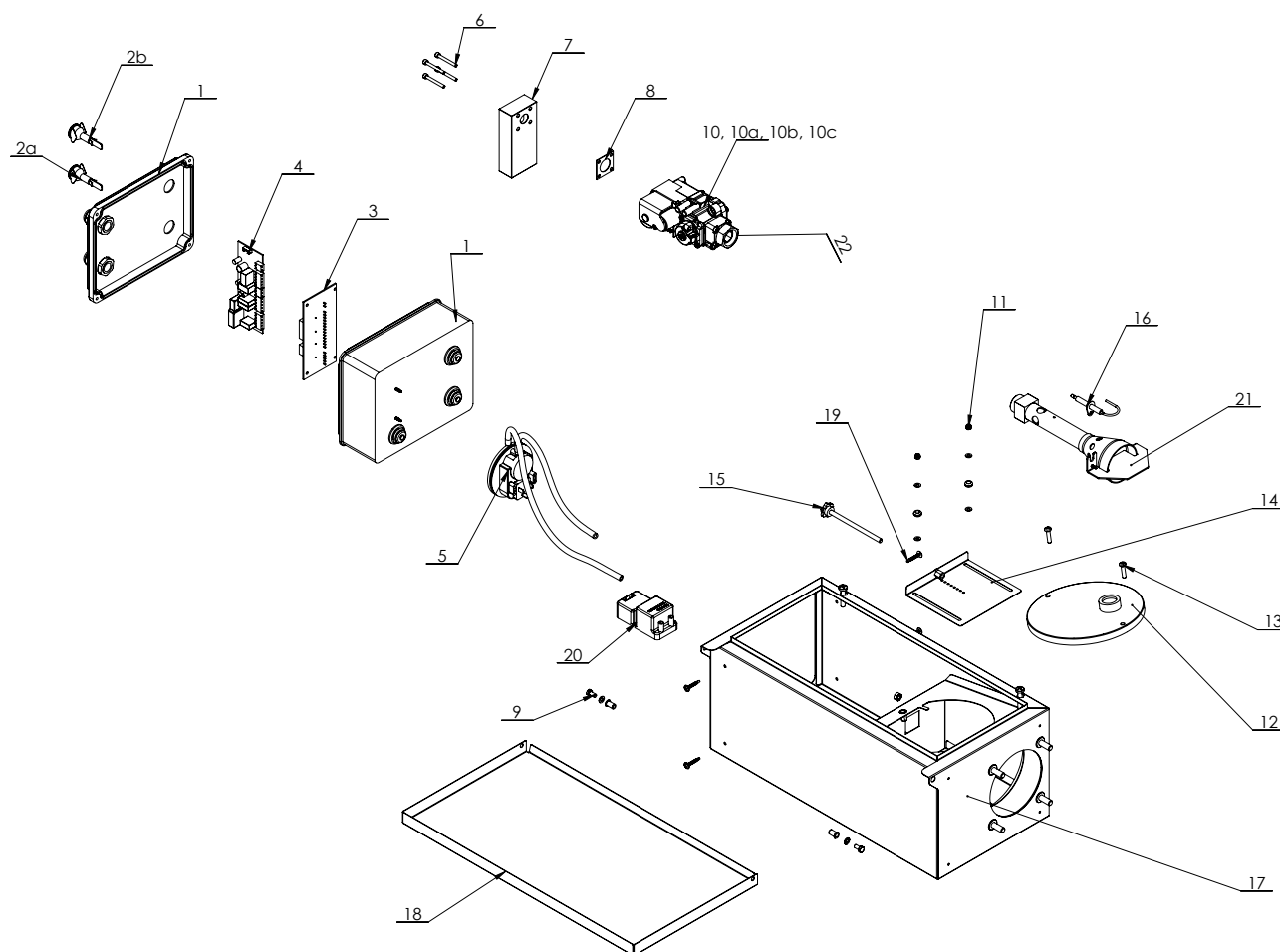


Fig. 3.6 MONO - INFRA BM Radiator Bracket

3.15 VIEW OF THE BURNER WITH A LIST OF COMPONENTS



Lp.	Description	Code	Lp.	Description	Code
1	Cable PVC box	30ELPU0222	11	Nuts	10WSNA2064
2a	Red indicator lamp	94CEPU0024/WG	12	Combustion chamber lid	01CNDI2910/WG
2b	Green indicator lamp	94CEPU0025/WG	13	Screw	10WSSR2080
3	Printed circuit board INFRA	01CECU0092/WG	14	Air lock	30INSK0130
4	Burner controller	00CEAP0778/WG	15	Knurled knob	10WSSR2088/WG
5	Pressure switch	00CEPR1105/WG	16	Electrode INFRA	80ELEK0000
6	Socket head screw	10WSSR2030	17	Burner box INFRA	30INSK1118
7	Gas valve aluminium block body	01CNRA0343/WG	18	Burner box door	30INSK1110
8	Gasket for gas block	01CNGU0216/WG	19	Screw	10WSWK2004
9	Hinge stud nut	10WSSR2080	20	Igniter TSM Igniter TR2	80ELZA0004 00CNAC2008/WG
10	Gas valve VK4125	00CEEV0958/WG	21	Gas injector torch	01CNT01050/WG
10a	Gas valve VK4105	00CEEV0956/WG	22	Burner union	00CNDA0148
10b	Gas valve SIT 830	00CEEV0537/WG			
10c	Gas valve SIT 840	94CEVA0014/WG			

3.15A VIEW OF THE FAN ASSEMBLY

Fig. A Fan

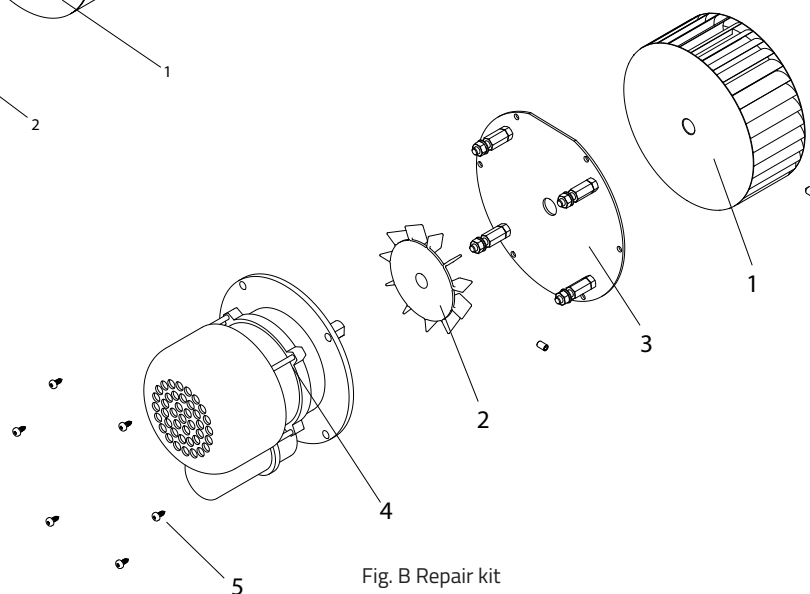
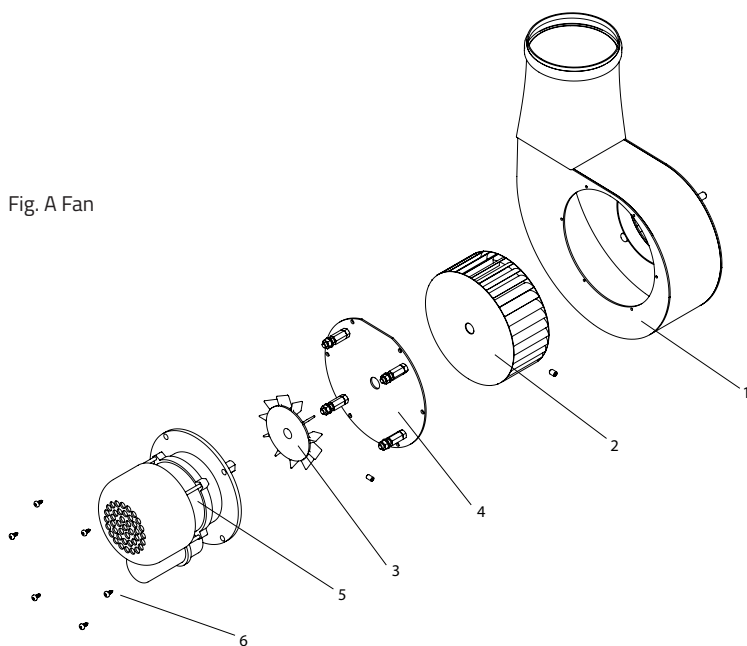


Fig. B Repair kit

Fig. No.	Part number	Description	Code	Notes	Quantity
A	1	Exhaust fan housing	01INWE4013	INFRA 18-45 kW	1
		Exhaust fan housing	01INWE4012	INFRA 53-60 kW	1
	2	Impeller fan	00CNVE0596/WG	INFRA 18-35 kW	1
		Impeller fan	00CNVE0595/WG	INFRA 45 kW	1
		Impeller fan	01CNVE0977/WG	INFRA 53-60 kW	1
	3	Cooling impeller	00CNVE0776/WG	INFRA 18-60 kW	1
	4	Steel screw closing plate	01INB04006	INFRA 18-45 kW	1
		Steel screw closing plate	01INB04026	INFRA 53-60 kW	1
B		Motor	00CEMT0287/WG	INFRA 18-45 kW	1
		Motor	04CEMO2601/WG	INFRA 53-60 kW	1
		Repair kit for exhaust fan	30INZE4002	INFRA 18-28 kW	1
		Repair kit for exhaust fan	30INZE4001	INFRA 35-45 kW	1
		Repair kit for exhaust fan	30INZE4008	INFRA 53-60 kW	1

3.16 SPARK-IONIZATION ELECTRODE

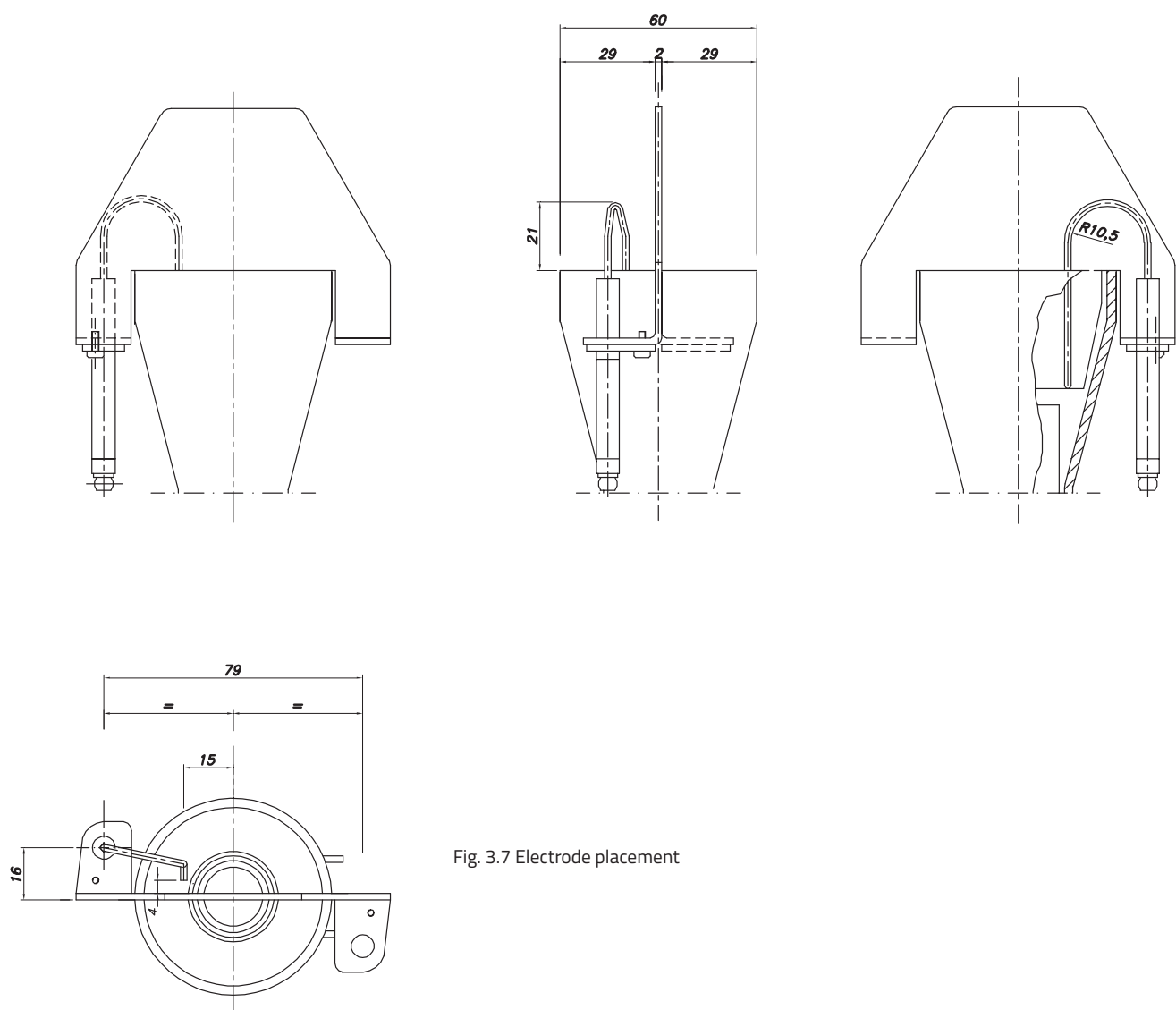


Fig. 3.7 Electrode placement

3.17 BURNER NOZZLE

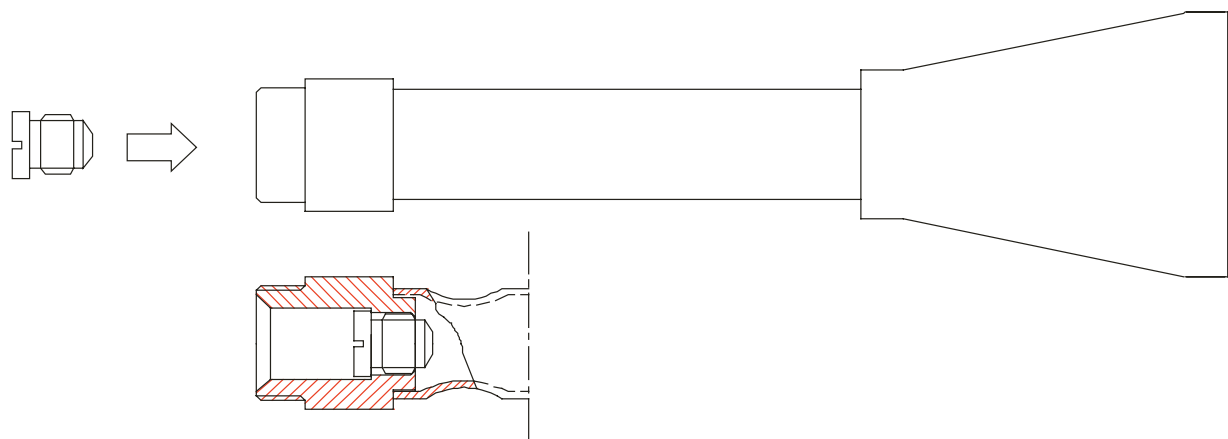


Fig. 3.8 Nozzle location

4. INSTALLATION

4.1 INSTALLATION LOCATIONS AND SAFETY DISTANCES

Flammable materials must be placed at a safe distance from the radiator pipe to prevent dangerous temperatures from being reached. Laboratory tests have shown that flammable materials (with a surface area of 0.5 m^2) placed 1.5 m away from the module and parallel to it will never reach dangerous temperatures.

MINIMUM DISTANCES BETWEEN FLAMMABLE MATERIALS AND RADIANT PIPES: (wood, cardboard, plastic, pallets, etc.) In accordance with DIN 3372 Part 6, Section 3.12 – DVGW, G63/11, Part 12/3.1.2. Under no circumstances may the surface temperature of heated materials exceed 85°C . Load-bearing elements (cranes) must not be heated over large areas to a temperature higher than 50°C .

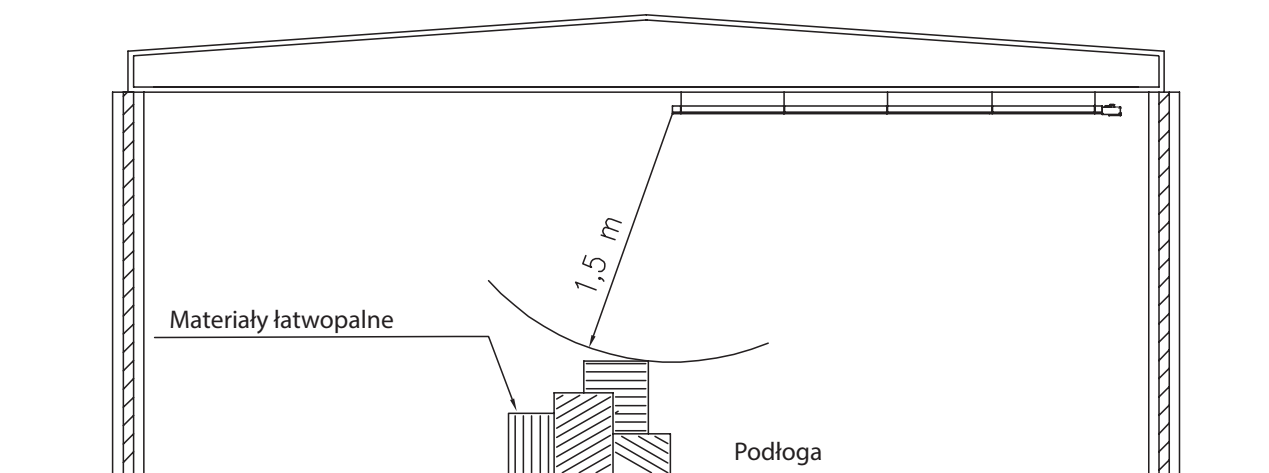


Fig. 4.1 Distance from flammable materials

In special cases, if it is not possible to maintain the required clearances (e.g., for overhead crane motors, electrical cables, lamps, etc.), steps must be taken to ensure adequate shielding/isolation of materials susceptible to damage caused by overheating from the radiator (see Fig. 4.2).

In addition, INFRA heaters should be installed on horizontal or vertical surfaces in such a way that the temperature of these surfaces does not exceed 50°C . Therefore, adequate thermal insulation must be provided in these areas.

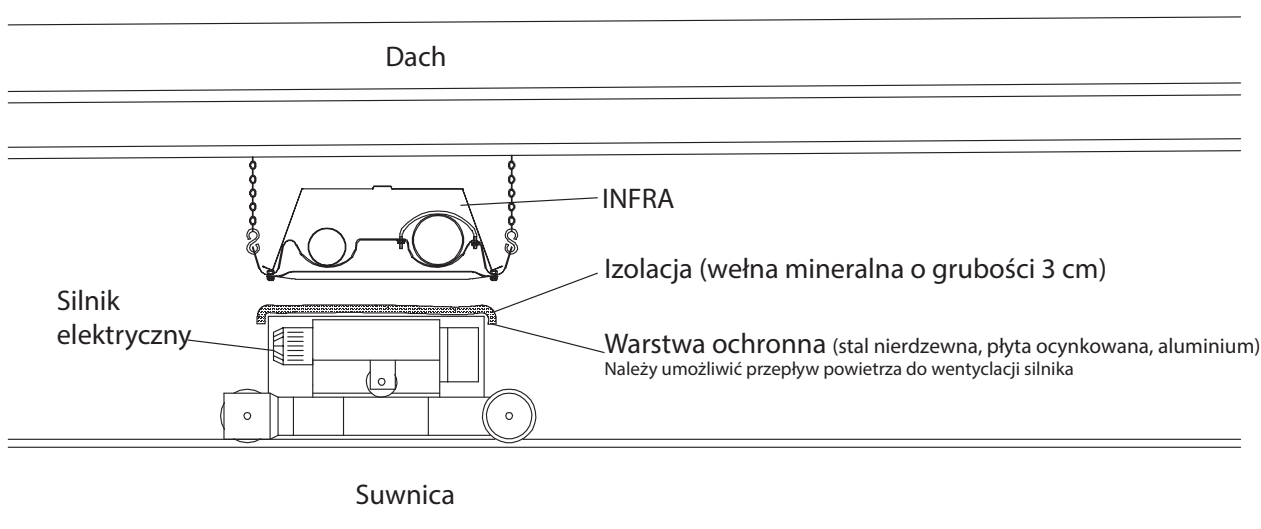


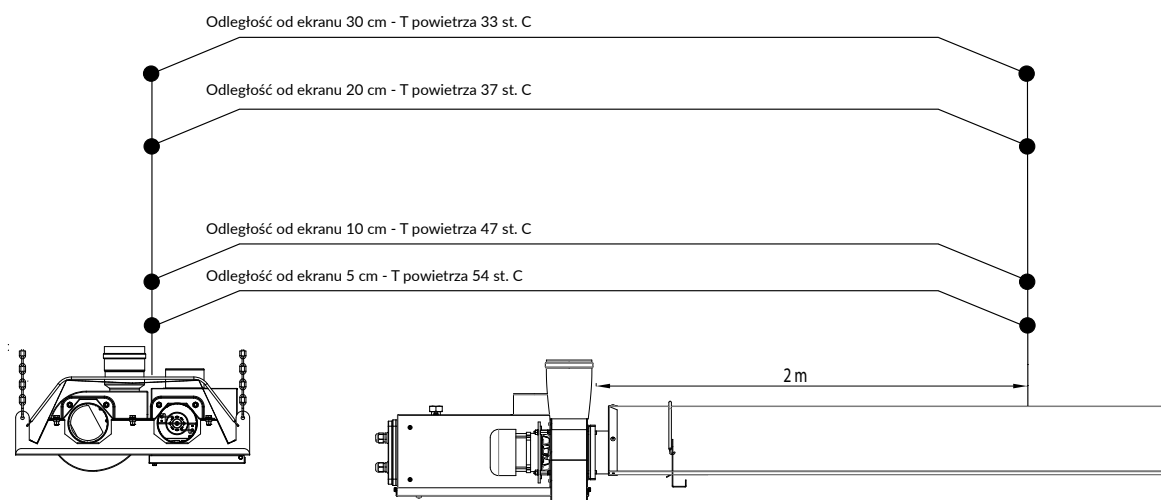
Fig. 4.2 Example of an electric motor protection system on a crane

The table below shows the results of an experiment conducted using INFRA heaters. The experiment involved measuring the temperatures of various objects depending on their distance from the heating element.

Measurements of surface temperature taken on various materials placed at different distances from the radiator pipes			
	Material type		
Absorption coefficient	0.9	0.8	0.1
	wood, cardboard, steel	electrical cables / PVC	polished aluminum, stainless steel
Distance	Temperature		
0.25 m	85°C	72°C	41°C
0.5 m	63°C	58°C	35°C
1.0 m	48°C	35°C	27°C
1.5 m	40°C	31°C	22°C
2.0 m	28°C	22°C	20°C

Test conditions:

- Unit: INFRA 9 BU, rated power = 45/53 kW,
- Maximum surface temperature of the radiator tube = 420°C,
- Material installed – 0.5 m² of surface area installed parallel to the module at a distance of 1.5 m from the burner on the vertical axis (where the highest temperature occurs),
- The temperature is measured after 60 minutes of irradiation
- Room temperature = 19°C.



Test conditions:

- Radiator model - INFRA 9 U 45/53 kW without screen insulation,
- Ambient temperature: 24.1°C,
- Measurement taken after 60 minutes of heater operation,
- Distance between the measuring point and the burner: 2 m – the highest surface temperature of the screen.
- The air temperature was measured using an electronic thermometer with an accuracy of +/- 0.5°C.

4.2 INSTALLATION OF EQUIPMENT

To install the radiator pipe, follow the instructions below:
Start by connecting the elbow to the pipes:

1. **For all models**, fasten the pipe flanges to the elbow flanges using the set of bolts, washers, and nuts. Be sure to place a gasket between the flanges, as shown in FIG. 4.3.
2. **For INFRA 9BU / 12BU / 15BU only:** Connect the corresponding radiant tubes by bolting the flanges together using the set of bolts, washers, and nuts. 8 x M8.25. Be sure to place a gasket between the flanges, as shown in FIG. 4.4.
3. **For all models:** Place the twisted pipes on the brackets and secure the lower brackets to the upper clamps using the included screws, FIG. 4.5
4. **MAKE SURE THAT THE BURNER BRACKET CLAMP IS INSTALLED SO THAT IT SECURES THE PIPE ON THE FAN SIDE SPALINOWEGO.**

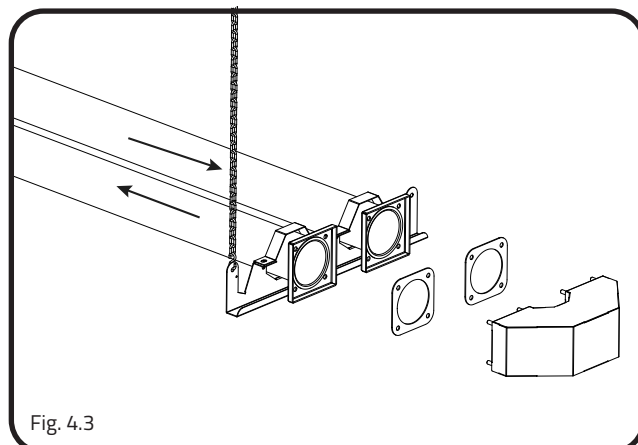


Fig. 4.3

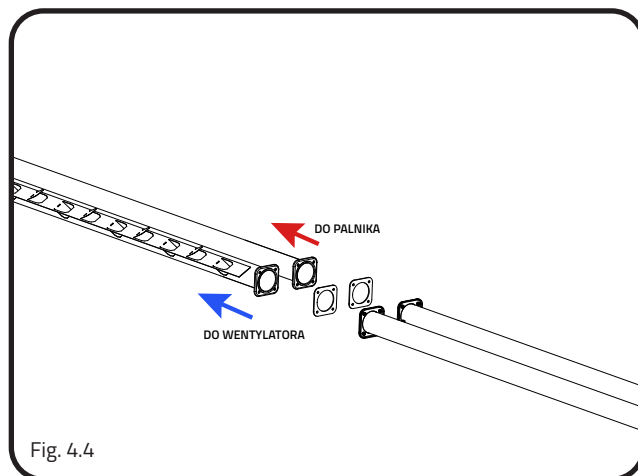


Fig. 4.4

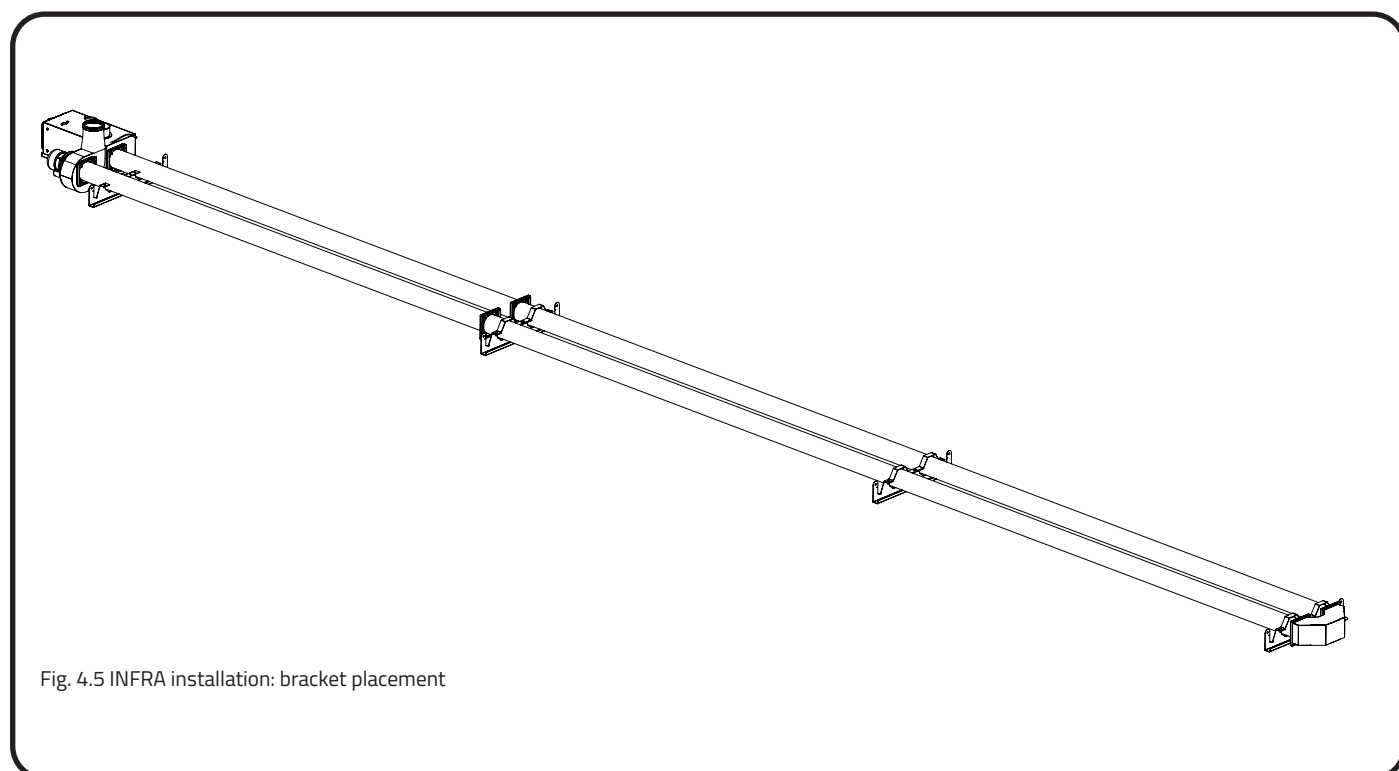
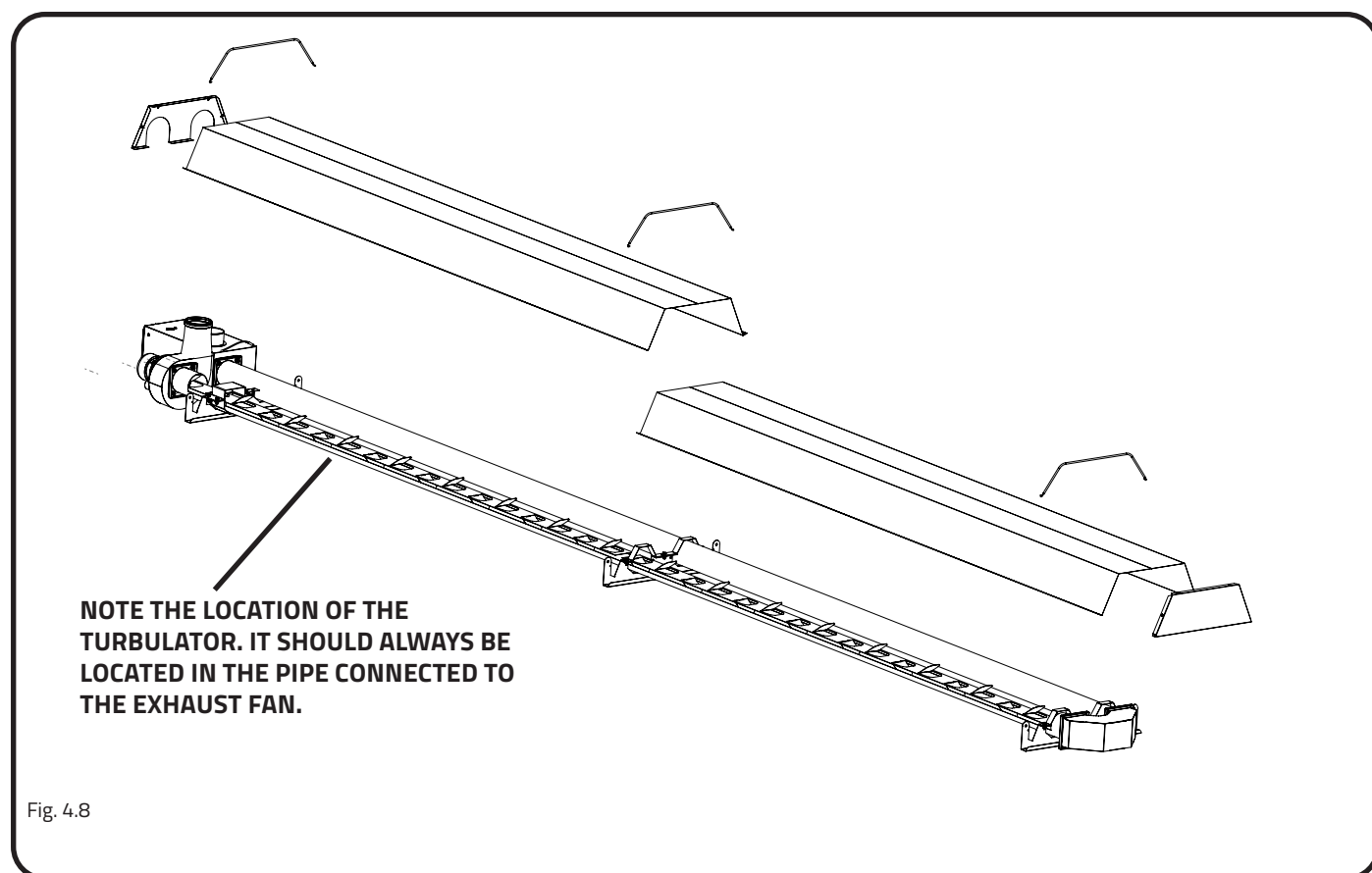
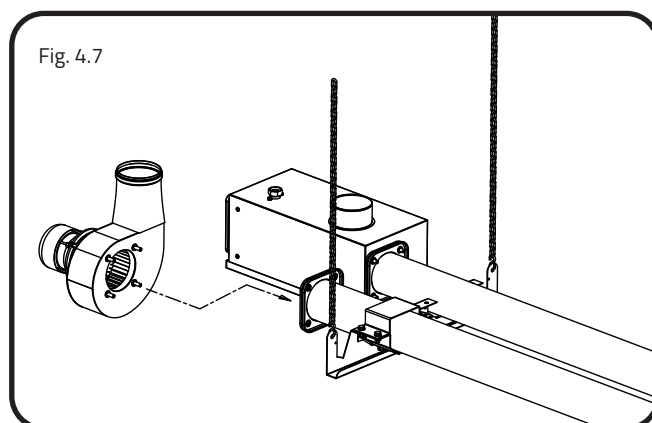
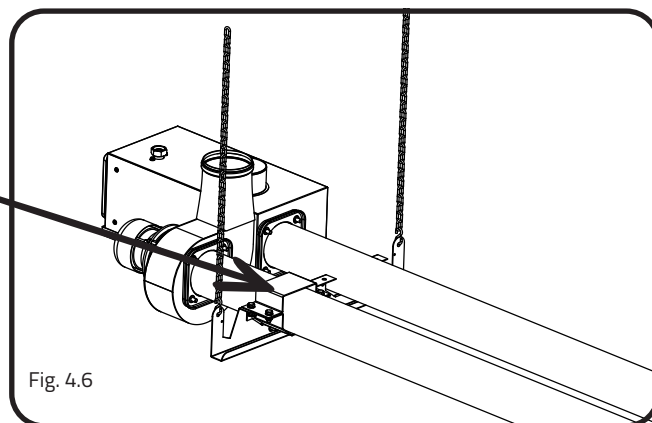


Fig. 4.5 INFRA installation: bracket placement

5. THE RADIANT TUBE ON THE BURNER SIDE SHOULD HAVE SUFFICIENT CLEARANCE TO ALLOW IT TO MOVE FREELY DURING WARM-UP AND THERMAL EXPANSION. FIG. 4.6.
6. Use the provided screws to secure the fan and burner. FIG. 4.7. **PLEASE NOTE THE LOCATION OF THE BURNER AND THE FAN.**
7. Place the screens on the brackets and connect them using the pre-drilled holes and cotter pins (FIG. 4.8).
8. After installing the screens, install the burner end cap and the end cap on the elbow side (FIG. 4.8).



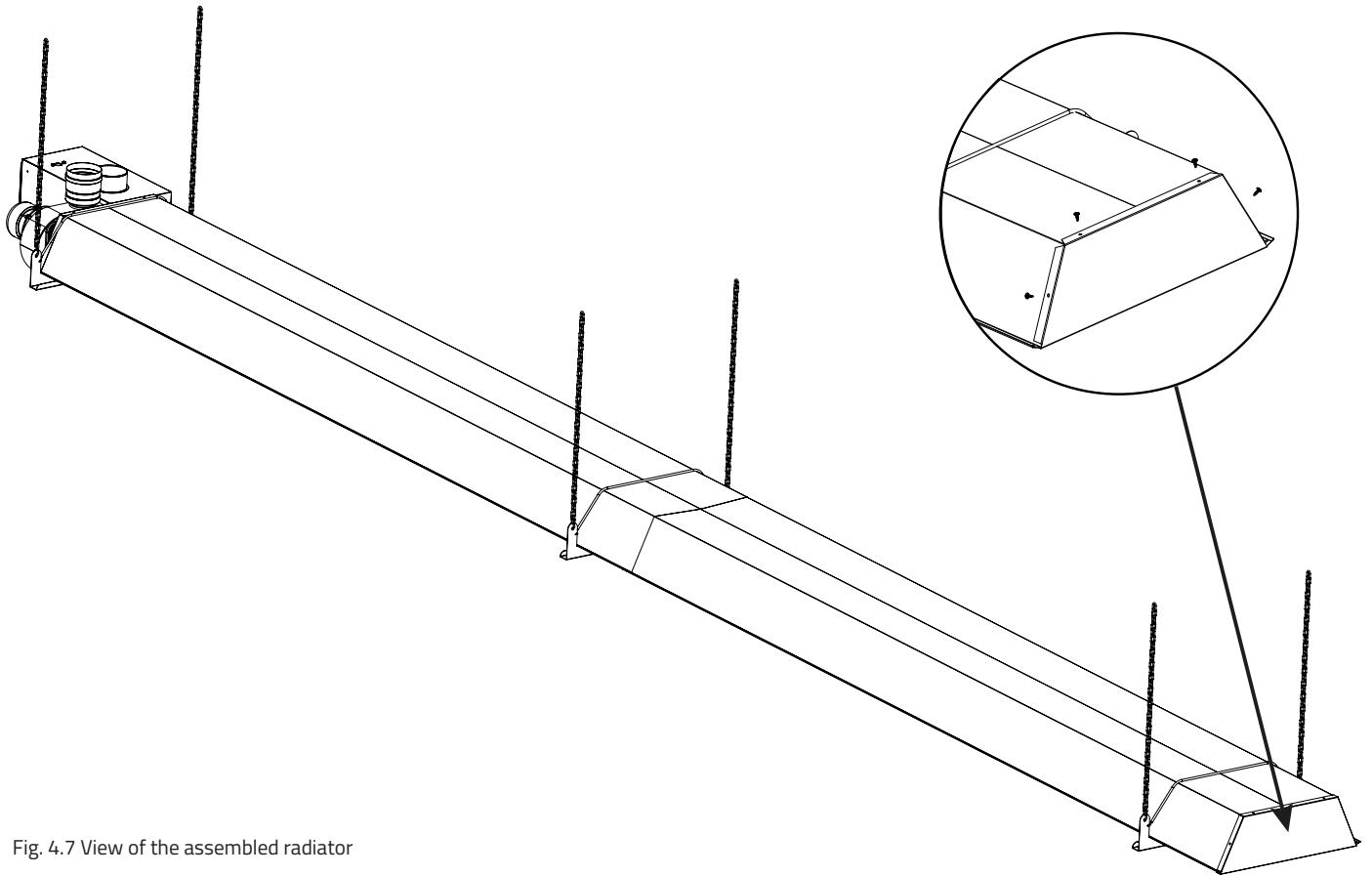


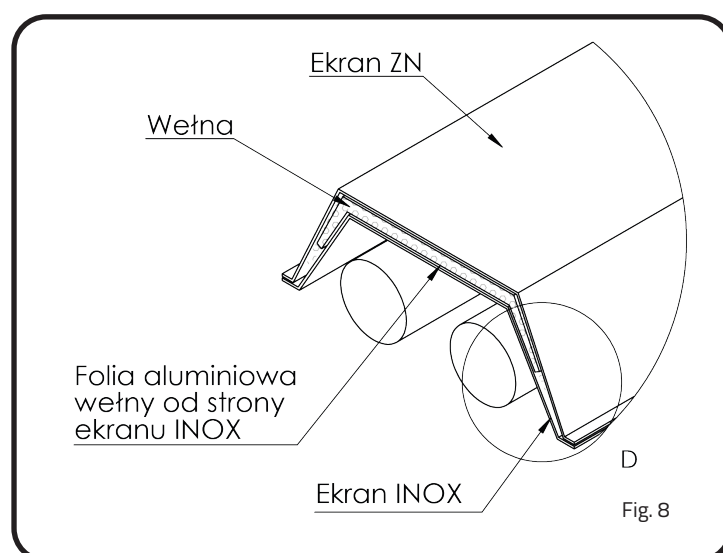
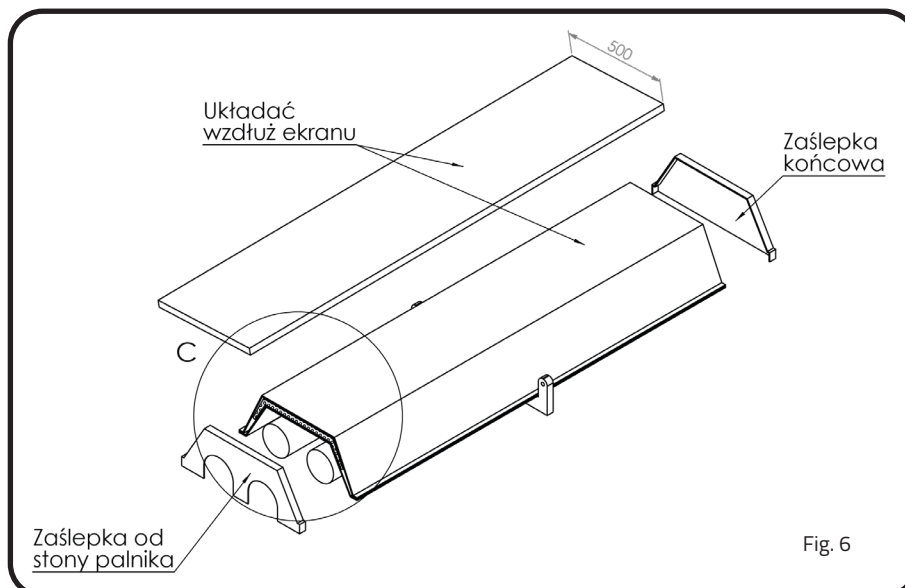
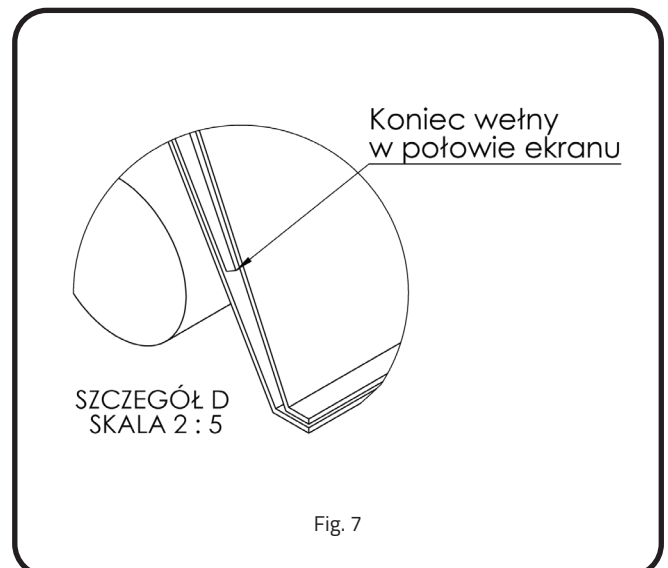
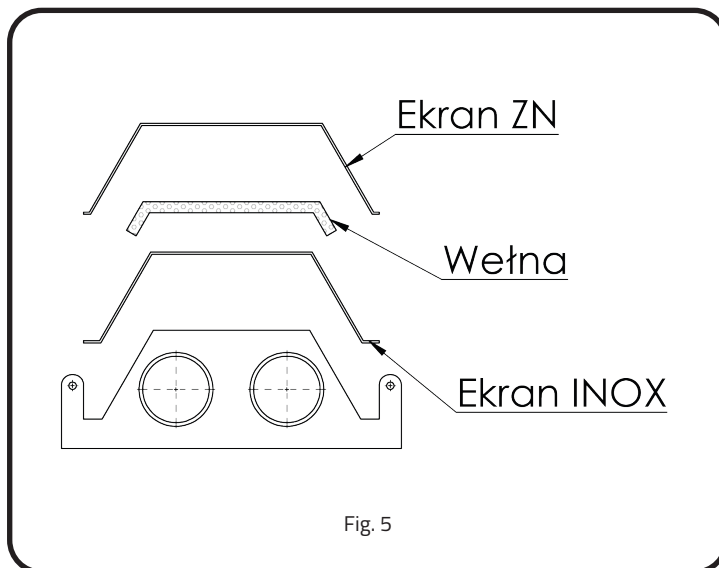
Fig. 4.7 View of the assembled radiator

4.3 INSTALLATION OF THE RBT SCREEN

The RBT screen installation kit includes 10 meters of foil-coated mineral wool, a screen made of stainless steel, and a screen made of galvanized steel. The installation sequence is shown in Fig. 5.

Place a layer of mineral wool on the stainless steel screen. The mineral wool, supplied in 10-meter lengths, should be cut to the length of the radiator. Then place it on the stainless steel screen. The foil should be in direct contact with the stainless steel screen. The ends of the mineral wool should be positioned in the middle of the screen. Place the galvanized steel screen over the mineral wool—see Figs. 6 and 7.

After installing the insulation and the screen, apply the end caps. Then proceed according to the instructions, treating the screen as a single unit—Fig. 8.



5. INSTALLATION OF THE DEVICE

5.1 CEILING MOUNT

Equipment tends to vibrate due to thermal expansion. It must therefore be equipped with chains or cables long enough to allow for free oscillation.

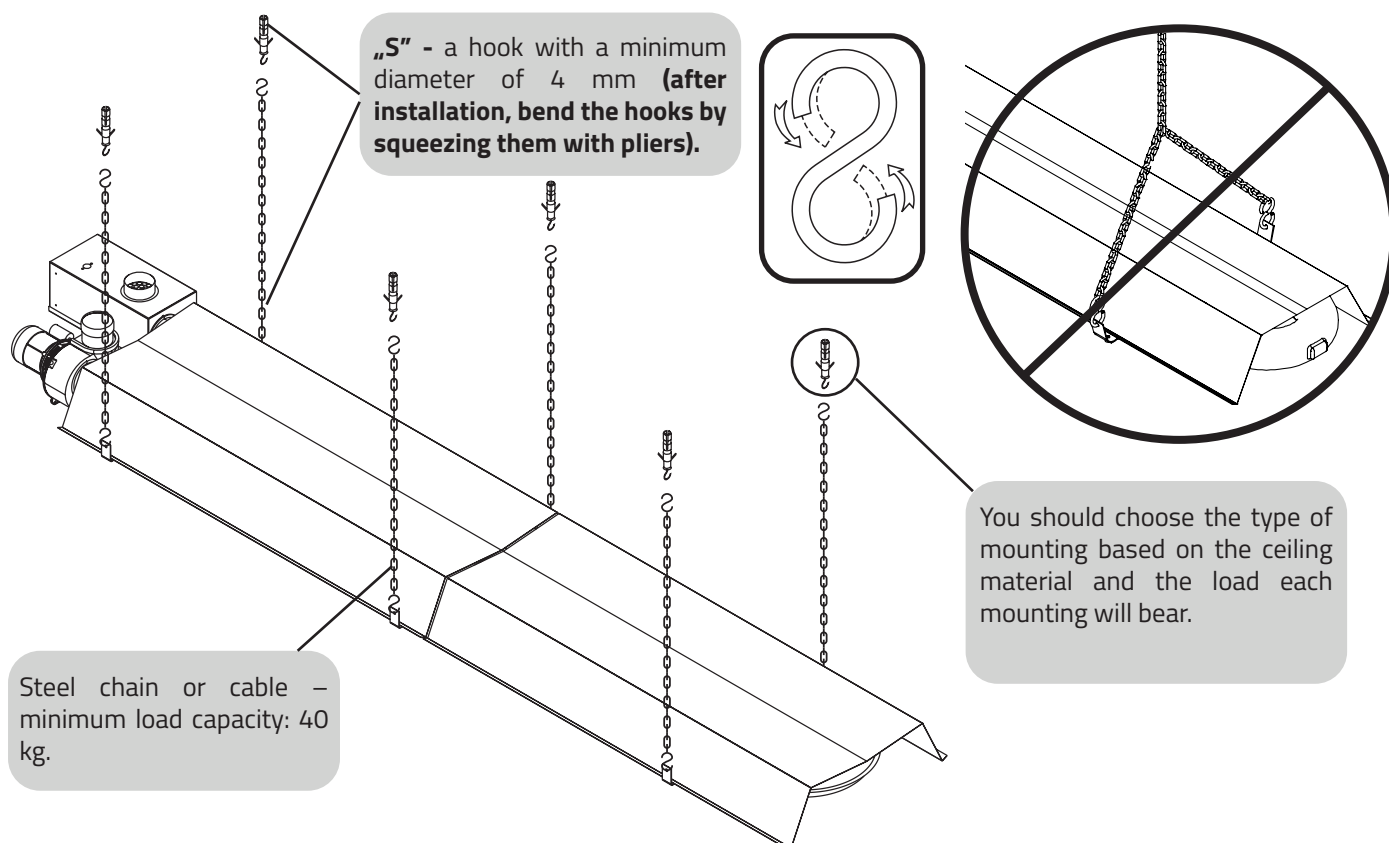


Fig. 5.1 Ceiling mount

It should also be noted that, due to thermal expansion, the tube may slightly deform into an upward curve while the device is in operation. At this point, the weight of the device will rest solely on the initial and final fastening chains. The radiant tube may also deform sideways; in this case, the unit load on the bracket will remain unchanged, and this phenomenon may only have a negative aesthetic effect. This is a natural phenomenon and does not constitute a defect in the device nor does it affect its service life. In cases where the deformation is accompanied by a "glow" effect, this may indicate that the burner's heat output is too high. In this situation, the device should be inspected to verify the correctness of the burner parameters.

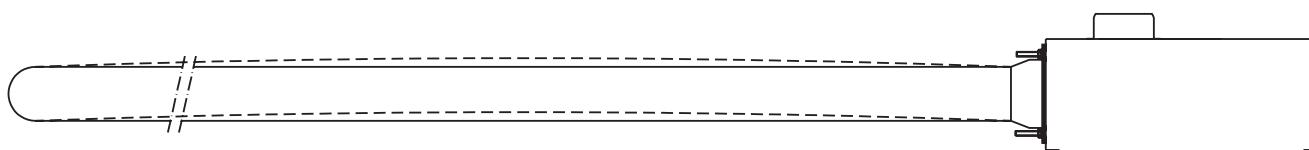


Fig. 5.2 Deformation of the device tube during startup

5.2 WALL MOUNTING

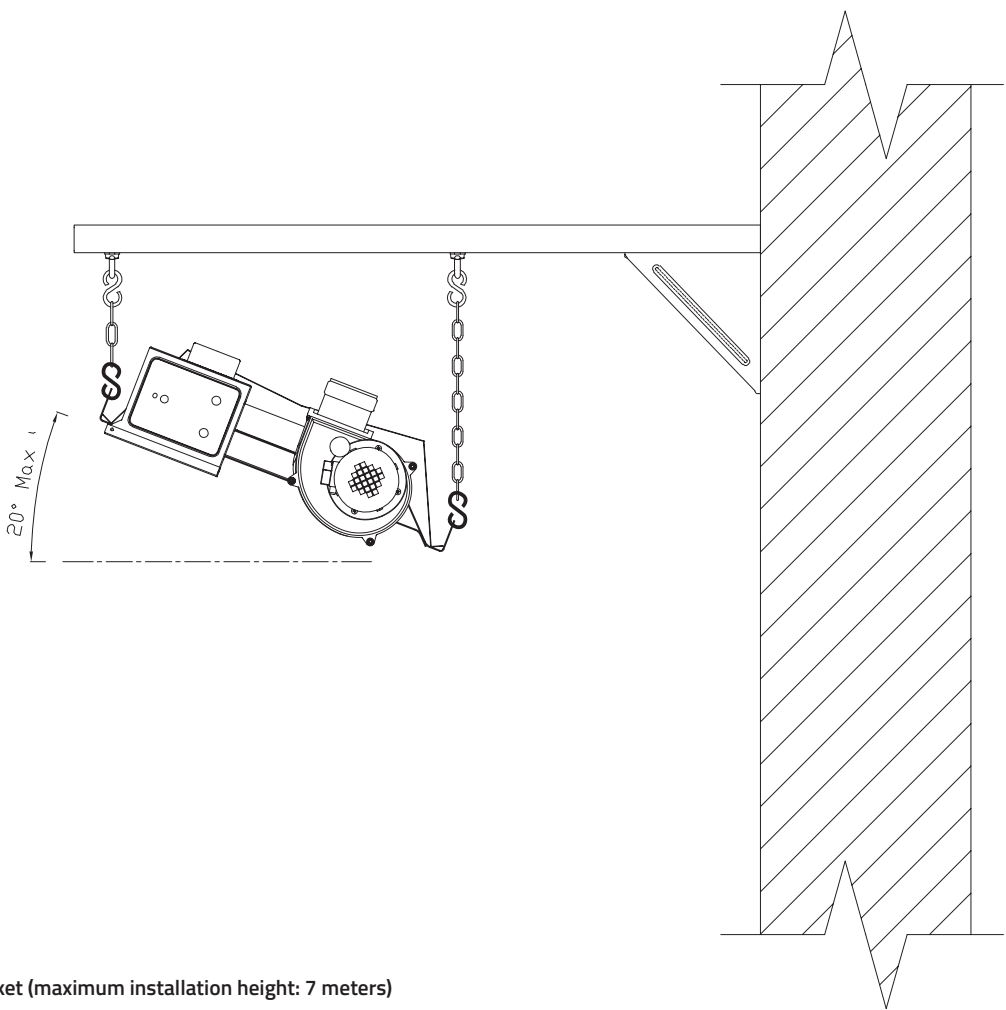
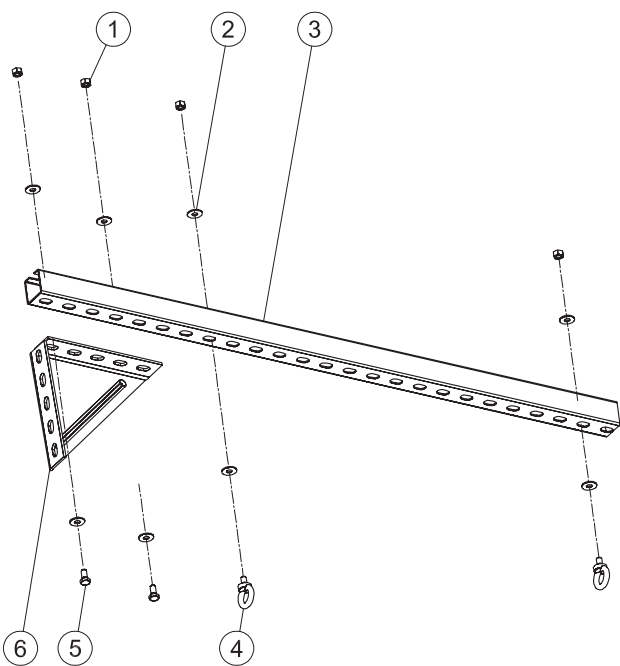


Fig. 5.3 Wall mounting using the maxi bracket (maximum installation height: 7 meters)



Lp.	Description
1	Nut
2	Washer
3	Profile
4	Eye screws
5	Hex screw ISO 4017
6	Support

Fig. 5.4 Wall bracket

6 EXHAUST OUTLETS AND AIR INTAKES

Exhaust ducts can be installed using various systems: roof-mounted (Fig. 6.2 and Fig. 6.6), wall-mounted (Fig. 6.3 and Fig. 6.7), single, coaxial (Fig. 6.4 and Fig. 6.5) or collective (Fig. 6.6) with an appropriate electric fan.

When planning a connection, there are two issues to consider:

1. Radiant tubes expand when heated.
2. Condensation occurs during startup.

6.1 EXHAUST VENTING AND AIR INTAKE THROUGH THE CEILING

Exhaust pipes for Type C must meet the following requirements:

...must be made of metal, ...from a material capable of withstanding prolonged mechanical stress, heat, and the adverse effects of combustion products and condensate that may form during the operation of the device.

Stainless steel pipes may be used for the flue gas and air ductwork. Aluminum pipes are permitted for the combustion air intake system.

Exhaust and air intake pipes should be rigid, with smooth inner surfaces, made of metal, and have a minimum nominal diameter of 100 mm. The use of flexible stainless steel ducts is permitted.

The maximum lengths of the exhaust and air hoses are listed in the table on page 41.

The pipes and fittings used must ensure that the system is airtight with respect to the surrounding environment.

1. A steel chain or cable (minimum breaking strength: 40 kg),
2. S-shaped hook, 4 mm diameter,
3. 100 mm diameter stainless steel flexible pipe for exhaust gas discharge, minimum length 1 m,
4. INOX flexible/rigid connector for a single Ø100 mm pipe,
5. Gas fireplace,
6. 3/4-inch or 1/2-inch flexible gas line, minimum 50 cm,
7. 3/4" shut-off valve,
8. Gas network,
9. Power cord: 6 x 1.5 mm (depending on the control type),
10. Flex connector, 100 mm diameter.

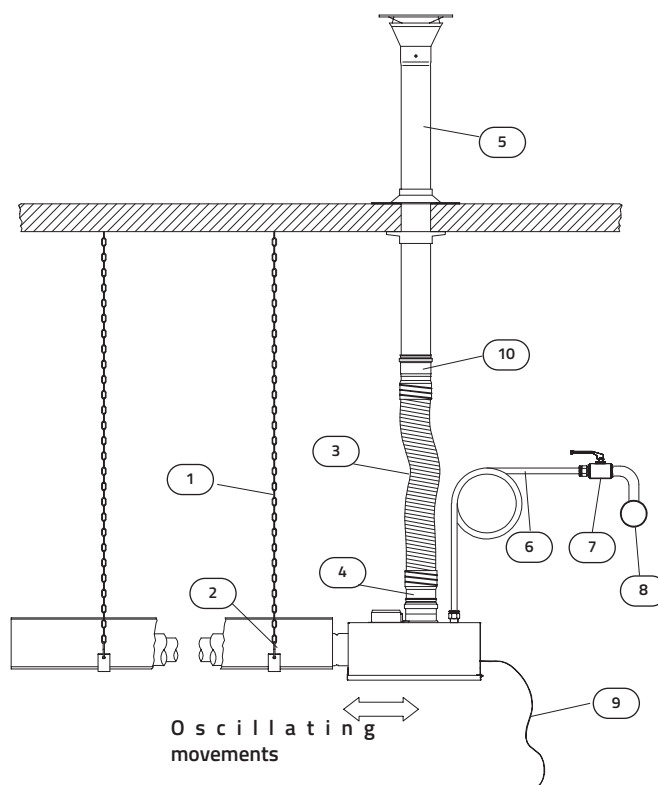
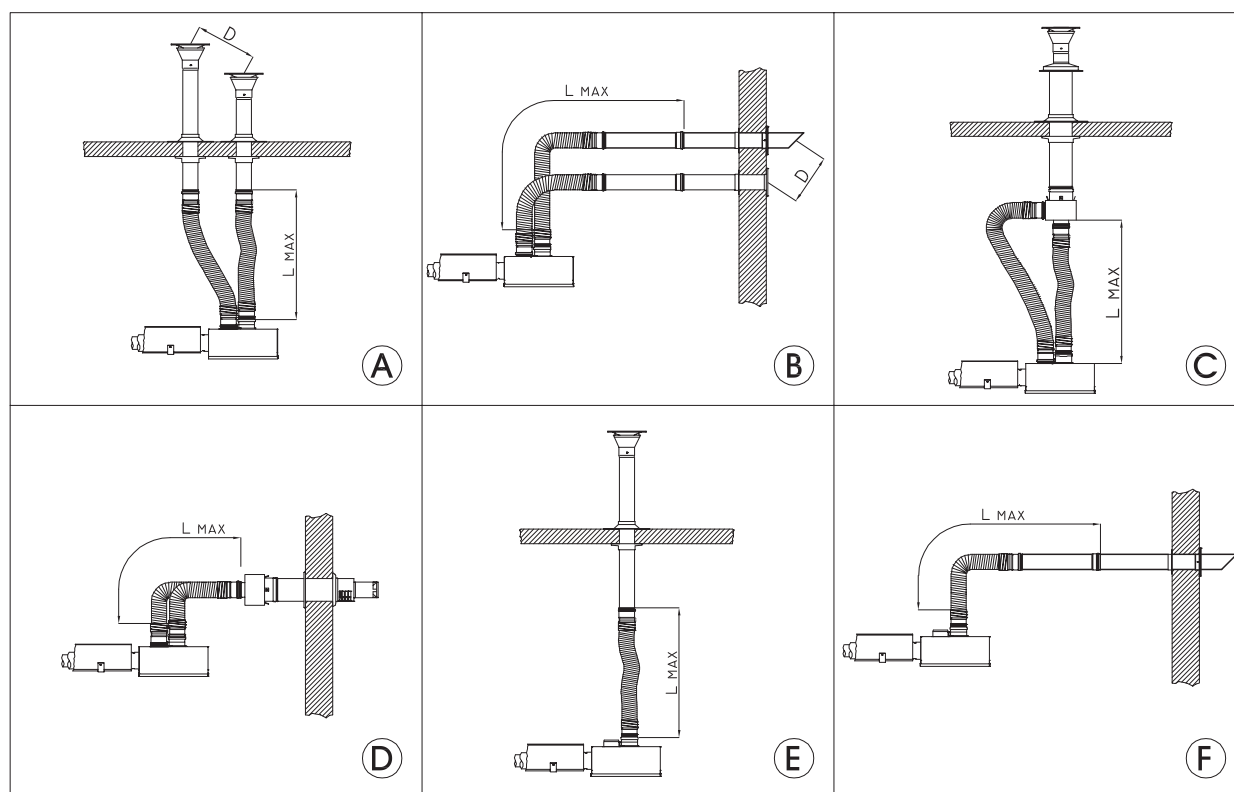
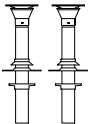
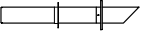
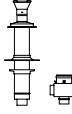
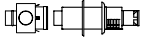


Fig. 6.1 Details of the INFRA radiant heater installation

6.2 MAXIMUM LENGTHS OF AIR AND EXHAUST DUCTS



Models	Maximum lengths [m]									
	INFRA 3BU	INFRA 6BU	INFRA 9BU	INFRA 12BU	INFRA 15BU	INFRA 9BM	INFRA 12BM	INFRA 15BM	INFRA 18BM	TYP
	9+9	8+8	7+7	6+6	6+6	6+6	5+5	5+5	5+5	C32 fig. A
	15	13	13	13	11	10	10	10	10	B22 fig. E
	9+9	8+8	7+7	6+6	5+5	6+6	5+5	5+5	5+5	C12 fig. B
	12	10	10	10	10	10	10	10	10	B22 fig. F
	5	5	3	3	3	nd	nd	nd	nd	C32 fig. C
	5	5	3	3	3	nd	nd	nd	nd	C12 fig. D

6.3 COMPONENTS OF THE EXHAUST-AIR SYSTEM

6.3.1 ROOF SYSTEM WITH SEPARATE EXHAUST AND INTAKE DUCTS (TYPE C32)

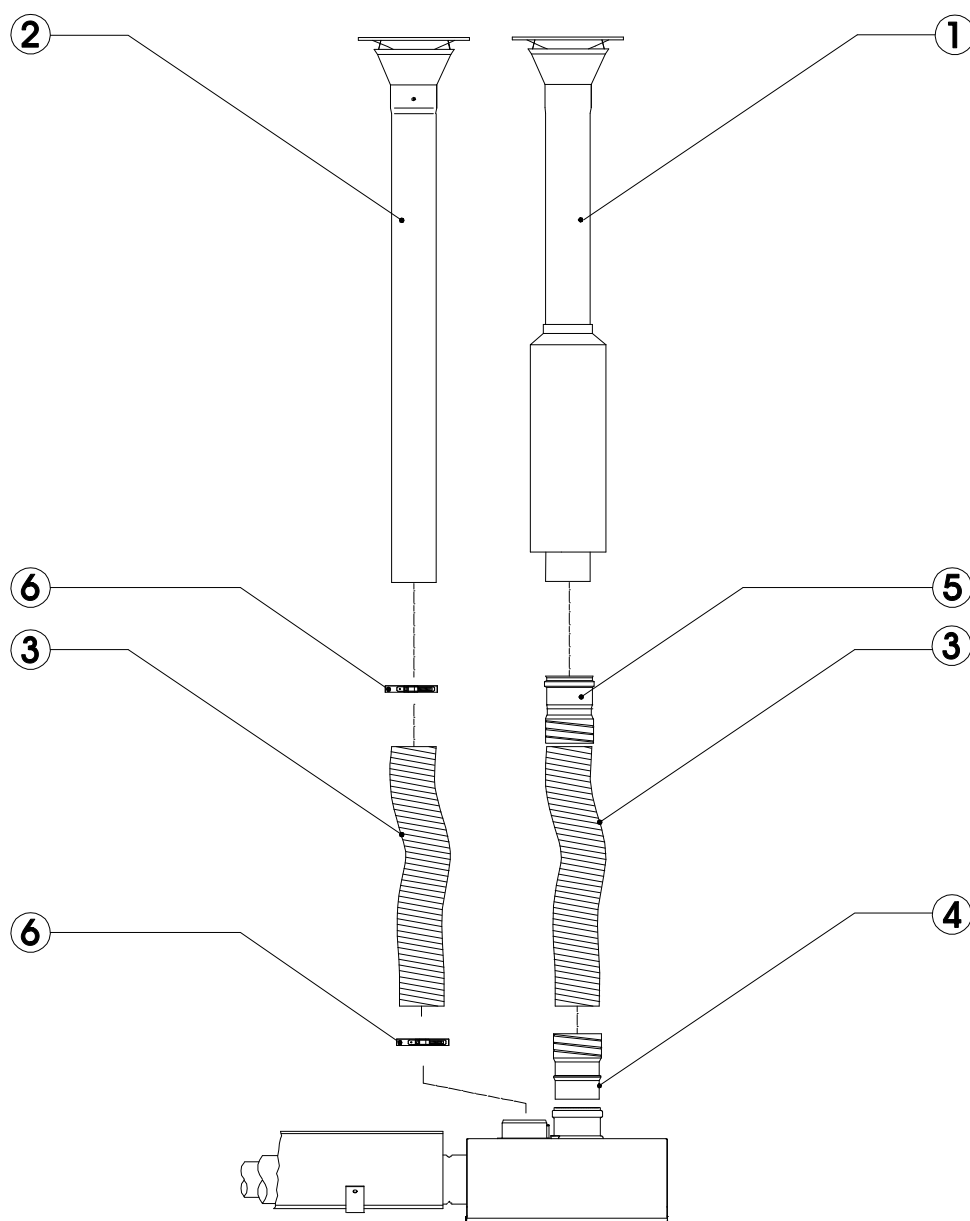


Fig. 6.2 Separate roof system (Type C32)

Lp.	Description	Code	Quant.
1	Chimney, roof with protective pipes Ø 150 – Inox	80AKK03010/WG	1
2	Air tube, roofing 100 mm	80AKK05121	1
3	Ø 100 mm aluflex tube for the air intake	00AKRU7002/WG	mb
4	Male flexible fitting Ø 100 mm	80AKZL3000/WG	1
5	Raccord flexible femelle avec joint Ø 100 mm	80AKZL3001/WG	1
6	Female flexible fitting with gasket 100-120 mm	80AKOP3052/WG	2

6.3.2 WALL SYSTEM WITH SEPARATE TUBES FOR SMOKE AND AIR INTAKE (TYPE C12)

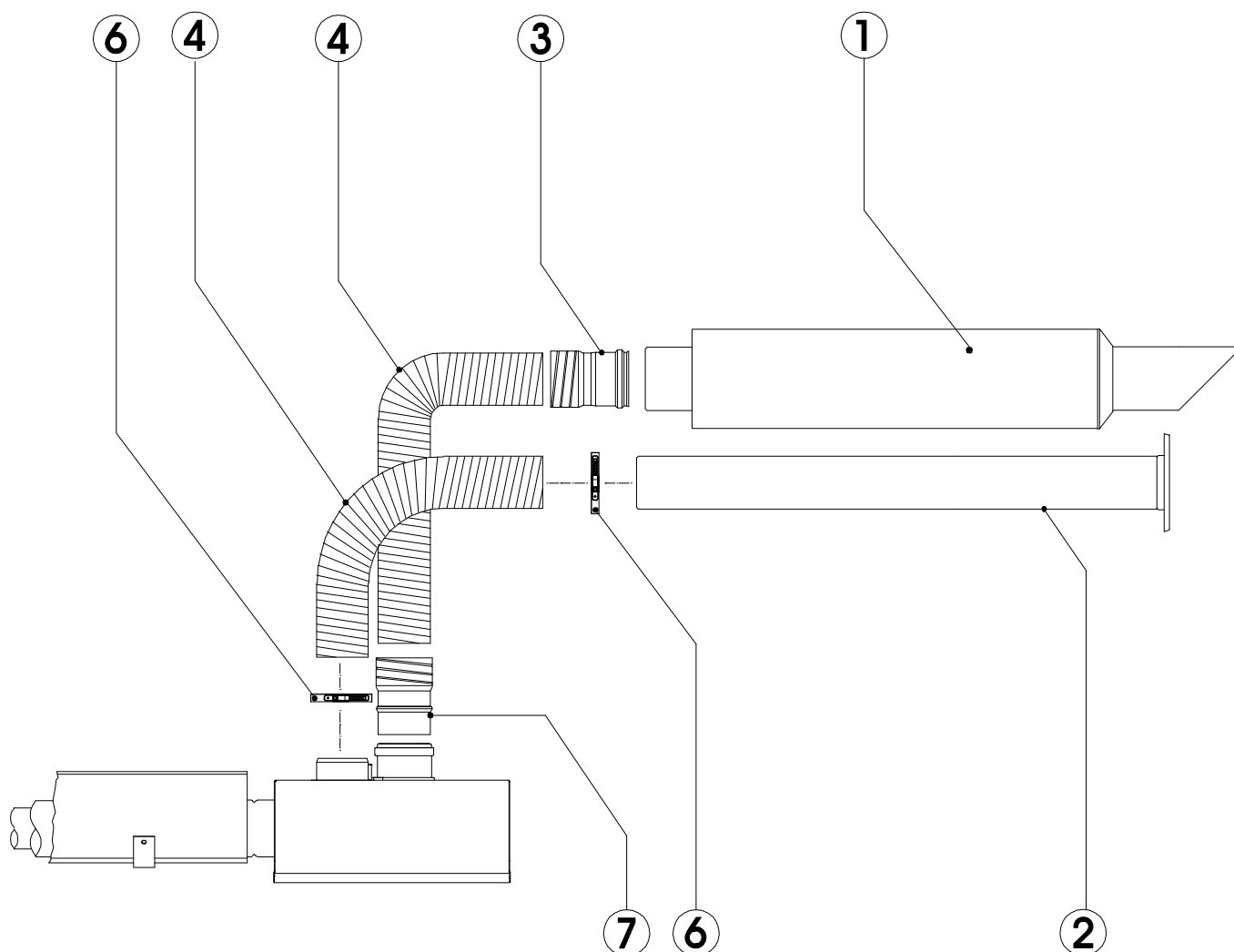


Fig. 6.3 Wall-mounted system with separate flue and air intake pipes (Type C12)

Lp.	Description	Code	Quant.
1	Chimney, wall-mounted with protective pipes Ø 150 – Inox	80AKKO3012/WG	1
2	tube d'air mural Ø 100 mm	80AKKO5123	1
3	Female flexible fitting with gasket Ø 100 mm	80AKZL3001/WG	1
4	Flexible stainless steel tube Ø 100 mm for smoke evacuation	00AKRU7002/WG	mb
6	Connection Flange 100-120 mm	80AKOP3052/WG	2
7	Male flexible fitting Ø 100 mm	80AKZL3011/WG	1

6.3.3 COAXIAL CEILING SYSTEM (TYPE C32)

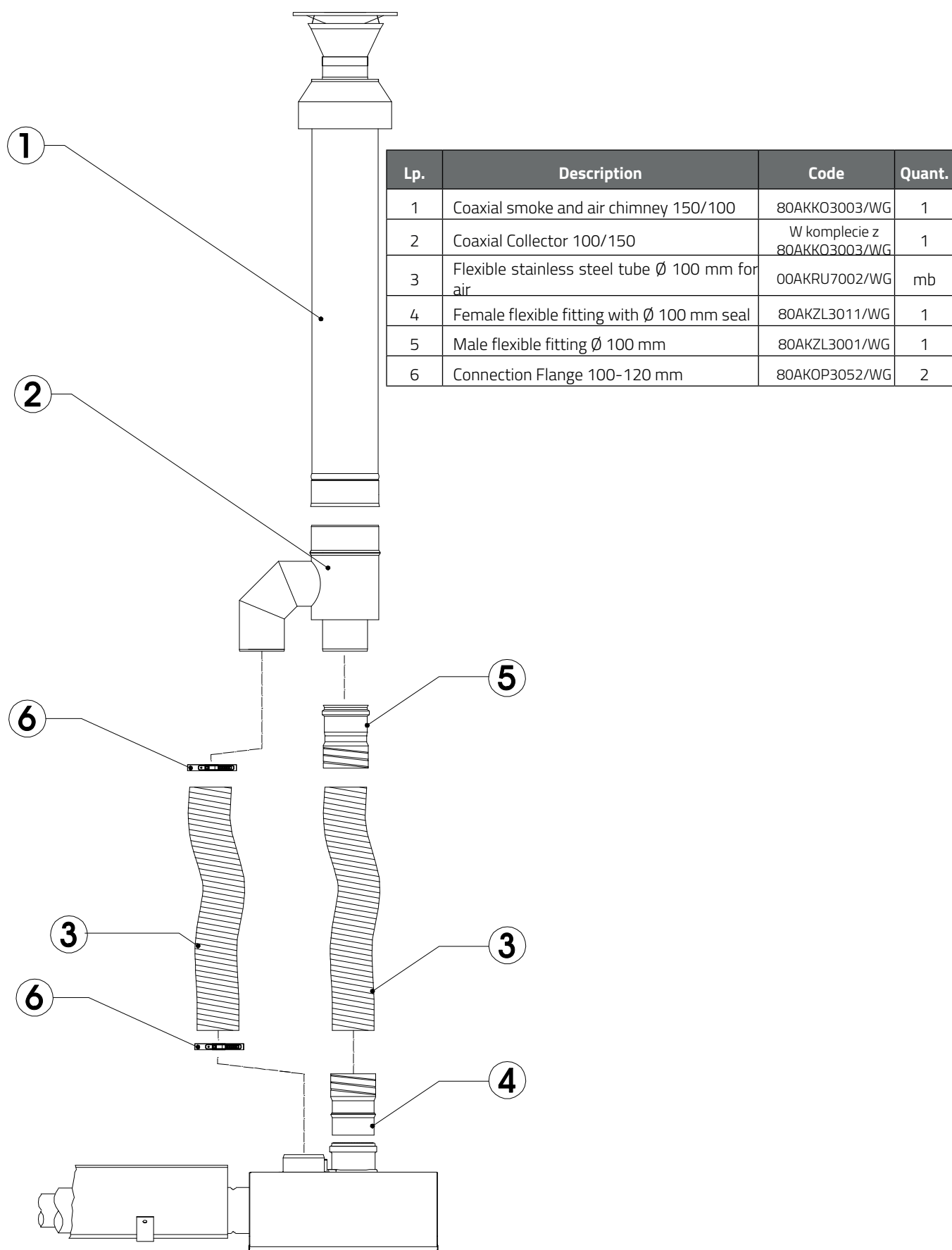


Fig. 6.4 Coaxial flue-air system (Type C32)

6.3.4 COAXIAL FLUE GAS VENTING SYSTEM THROUGH THE WALL (TYPE C12)

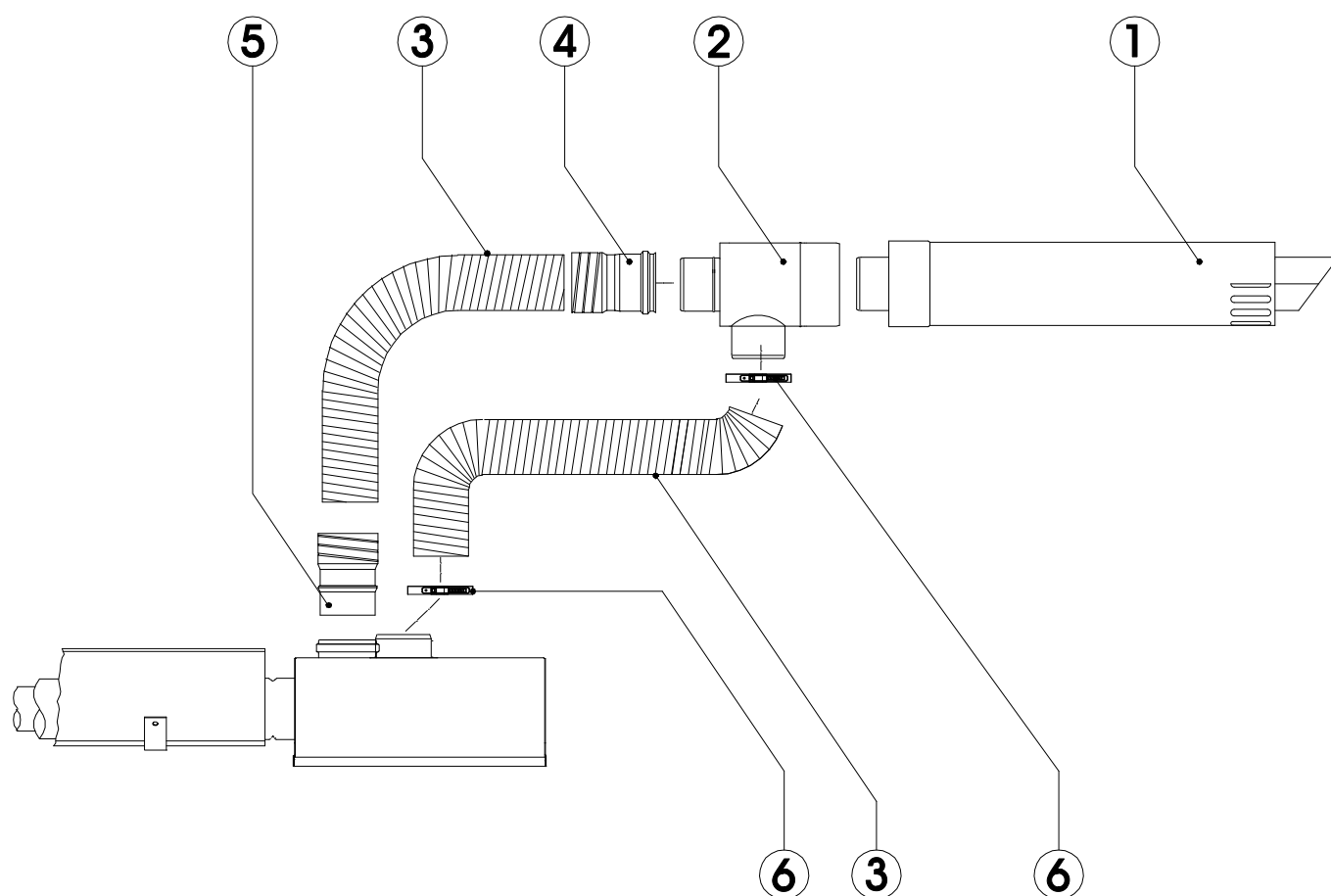


Fig. 6.5 C32 coaxial wall system

Lp.	Description	Code	Quant.
1	Coaxial smoke and air chimney 150/100 – wall-mounted	80AKKO3005/WG	1
2	Coaxial Collector 100/150	Includes the 80AKKO3005/WG	1
3	Flexible stainless steel tube Ø 100 mm for the air intake	00AKRU7002/WG	mb
4	Female flexible fitting with Ø 100 mm seal	80AKZL3001/WG	1
5	Male flexible fitting Ø 100 mm	80AKZL3011/WG	1
6	Connection flange 100-120 mm	80AKOP3052/WG	2

6.3.5 FLUE GAS EVACUATION THROUGH THE ROOF (TYPE B22)

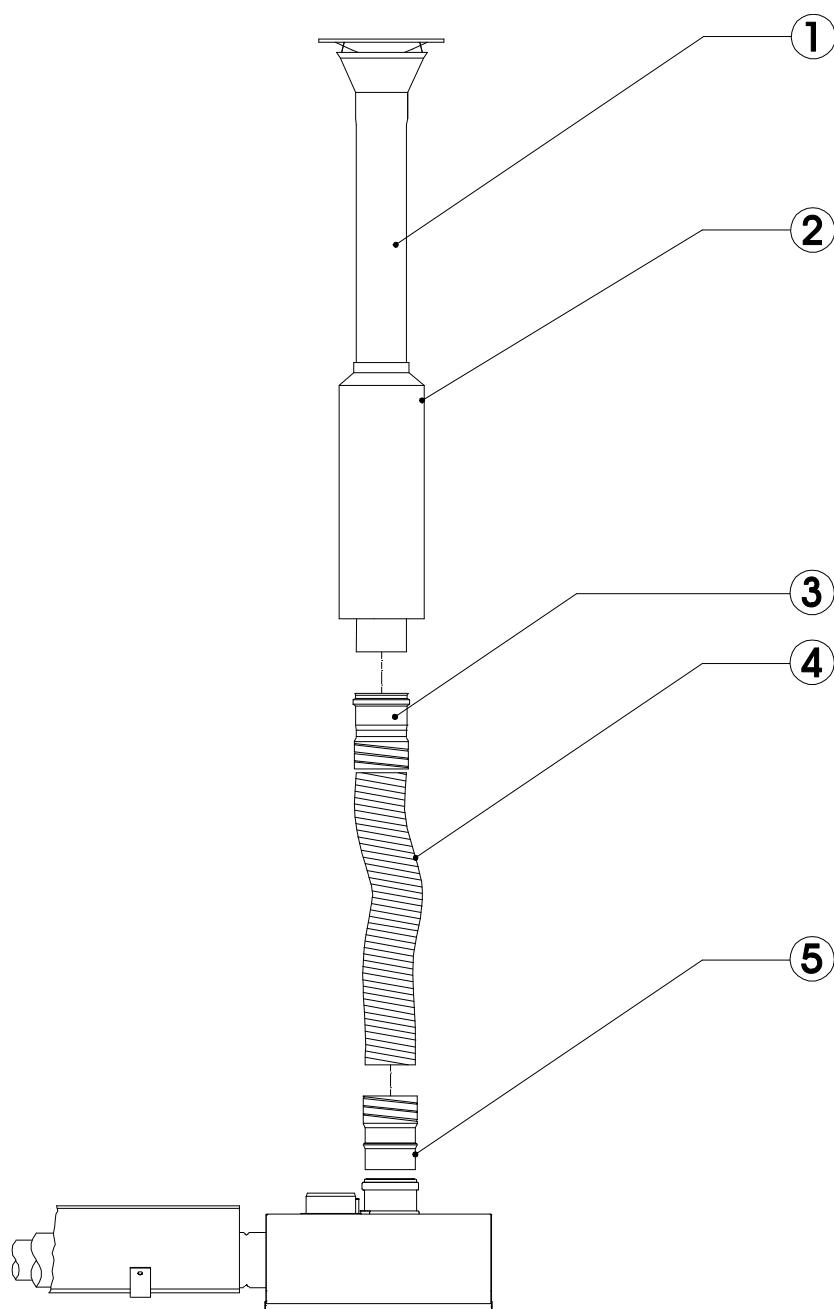


Fig. 6.6 Roof exhaust system (Type B22)

Lp.	Description	Code	Quant.
1	Chimney, roof with protective pipes Ø 150 – Inox	80AKKO3010/WG	1
2	Protective Tube Ø 150	Includes the 80AKKO3010/WG	1
3	Female flexible fitting with gasket Ø 100 mm	80AKZL3001/WG	1
4	Flexible stainless steel tube Ø 100 mm for smoke evacuation	00AKRU7002/WG	mb
5	Male flexible fitting Ø 100 mm	80AKZL3011/WG	1

6.3.6 FLUE GAS EVACUATION THROUGH THE WALL
(TYPE B22)

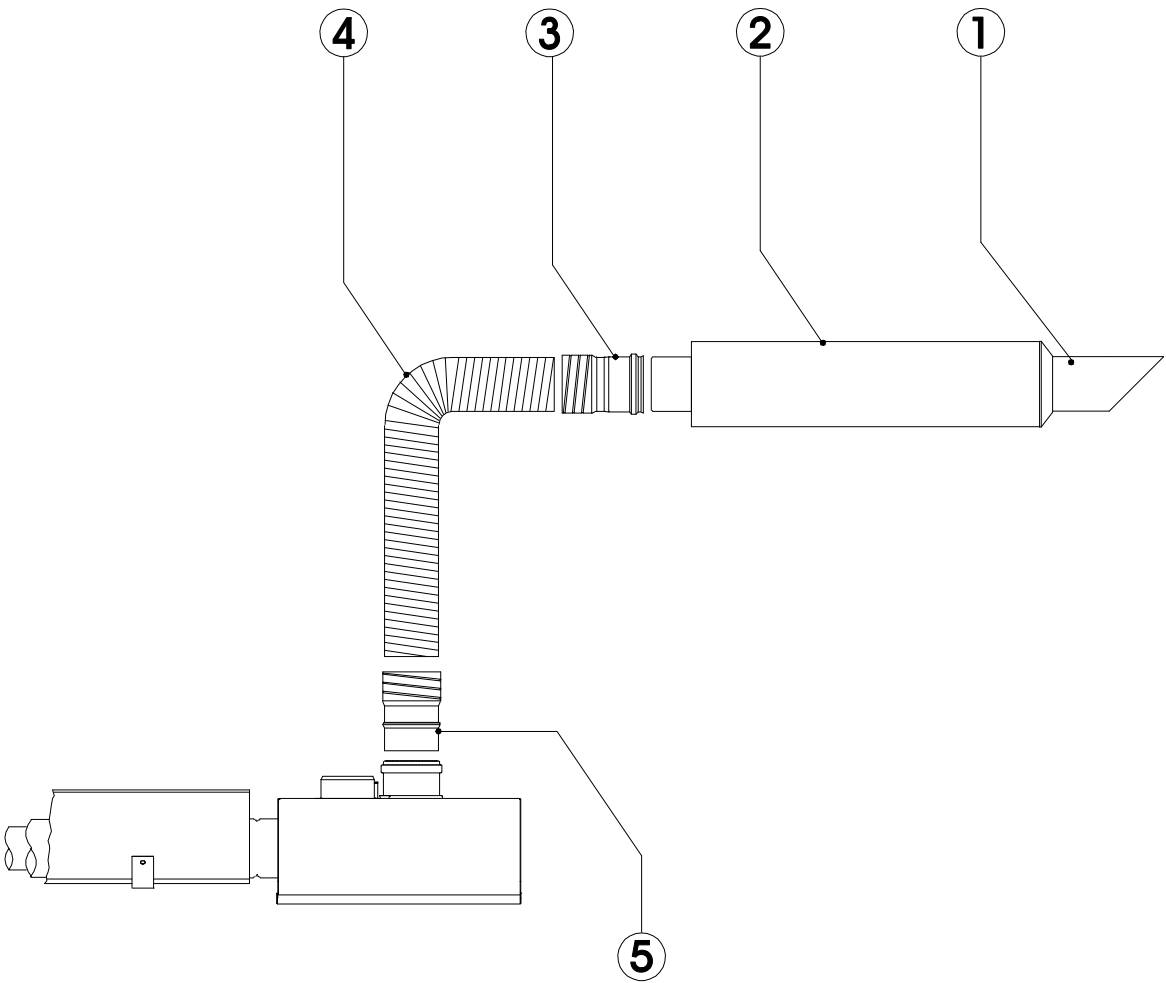


Fig. 6.7 Wall-mounted exhaust system (type B22)

Lp.	Description	Code	Quant.
1	Chimney, wall-mounted with protective pipes Ø 150 – Inox	80AKKO3012/WG	1
2	Protective Tube Ø 150	Includes the 80AKKO3012/WG	1
3	Female flexible fitting with gasket Ø 100 mm	80AKZL3001/WG	1
4	Flexible stainless steel tube Ø 100 mm for smoke evacuation	00AKRU7002/WG	mb
5	Male flexible fitting Ø 100 mm	80AKZL3011/WG	1

7 GAS CONNECTIONS

The gas installation must be routed in accordance with the construction plans and installed in compliance with the standards in effect in the country where the equipment is installed. The pipe diameters and the flow capacity of the gas installation's regulators must ensure adequate pressure and the proper operation of gas appliances. The materials used must comply with the standards in effect in the country in question.

C 7.1 CONNECTING THE DEVICE

The connection to the device must be made using a flexible connector due to thermal expansion. Connection using a reducing nipple (A).

A mesh gas filter must be installed downstream of the gas shut-off valve.

The required diameter of the flexible gas connection for burners with a capacity of up to 35 kW is 1/2". For 45, 53, and 60 kW burners, a 3/4" diameter connection is required.

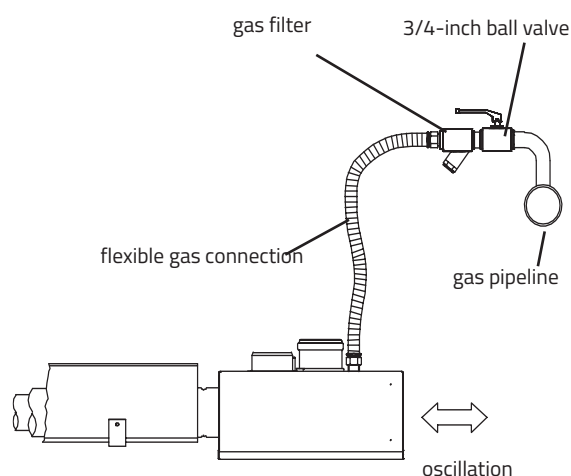
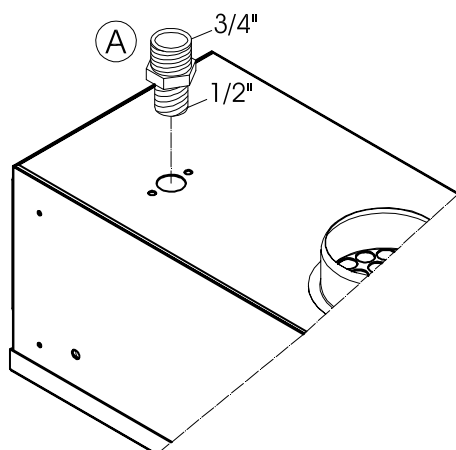


Fig. 7.1 Connection to the gas line using a 1/2" or 3/4" flexible connector (minimum length 50 cm)

A) G20 Natural Gas: The main gas supply to the system should maintain a stable gas pressure within the indoor installation. The pressure should be set to 20 mbar (2 kPa); higher pressure may cause improper combustion, ignition difficulties, and perforation of the radiant pipes due to excessive heat.

B) LPG (G31): A first-stage pressure regulator must be installed on the gas tank to reduce the pressure to 1.5 bar. The second-stage regulator should be installed outside the building and should ensure the pressure in the internal system in accordance with Table 9.2 on page 58: 29 mbar or 37 mbar. Higher pressure may cause improper combustion, difficulty starting the system, and perforation of the radiant pipes due to excessive temperature.

C) Gas supply pressure: Always check which type of gas the appliance is factory-set for. To do this, check the nameplate on the appliance's burner.

NOTE: Always check gas connections for leaks after adjusting the burner settings!



IMPORTANT!

For connections involving any type of gas at a pressure other than the nominal pressure, a pressure regulator must always be provided for each appliance and set to the appropriate value, or the burner must be adjusted to verify that the pressure settings at the gas block outlet—the burner nozzle—are correct.

8. ELECTRICAL SYSTEM

8.1 CONNECTION DIAGRAM FOR CE/A CONTROL PANELS

To connect CE-type control panels, follow the diagram shown in Figs. 8.2, 8.3, 8.5, and 8.6. In particular:

- Use a 6-wire cable, which includes wires for the phase, neutral, ground, reset, operation indicator, and lock indicator.
- Make sure the device is properly grounded and that the live wire and neutral wire are connected; otherwise, the controller will be damaged.
- Mount the thermostat at a height of approximately 1.50–1.80 m above the floor in a location where it is within the radiant heater's heat zone; only in this way will the sensor be able to monitor the temperature generated by the radiant heater (see Fig. 8.1).

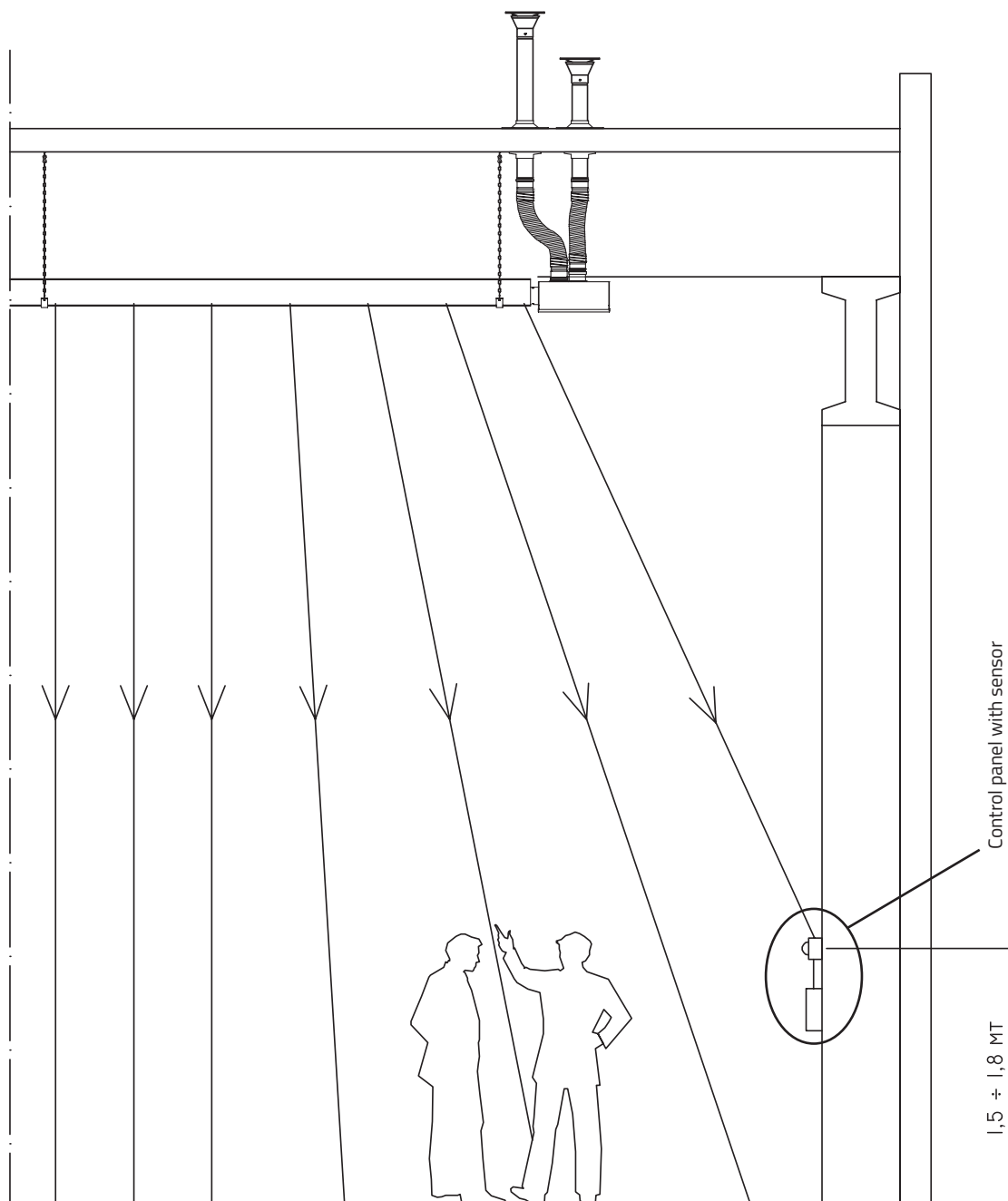


Fig. 8.1 Location of the temperature sensor

8.2 CONNECTING THE DEVICE TO AN SCD/EURO-SCAN ANALOG CONTROL PANEL

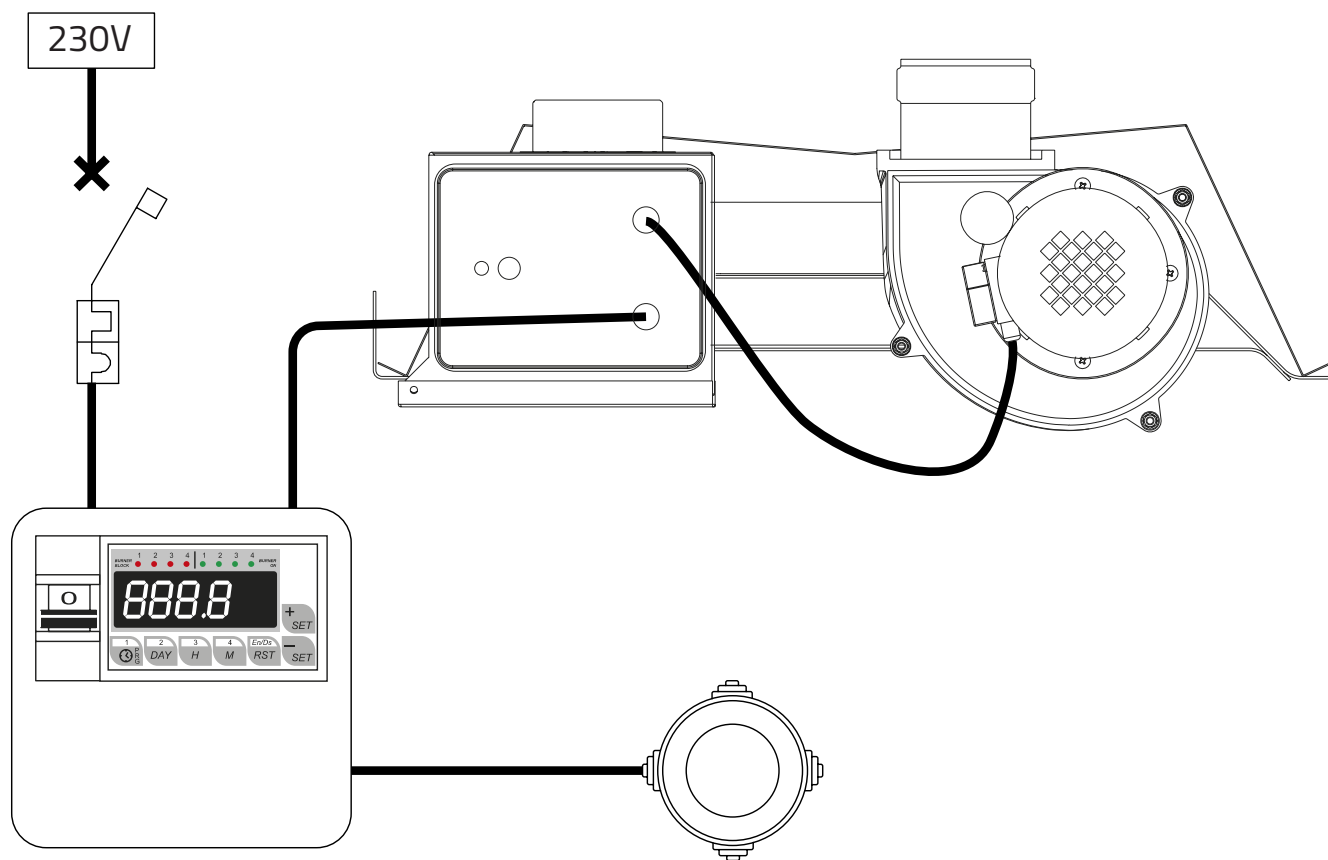


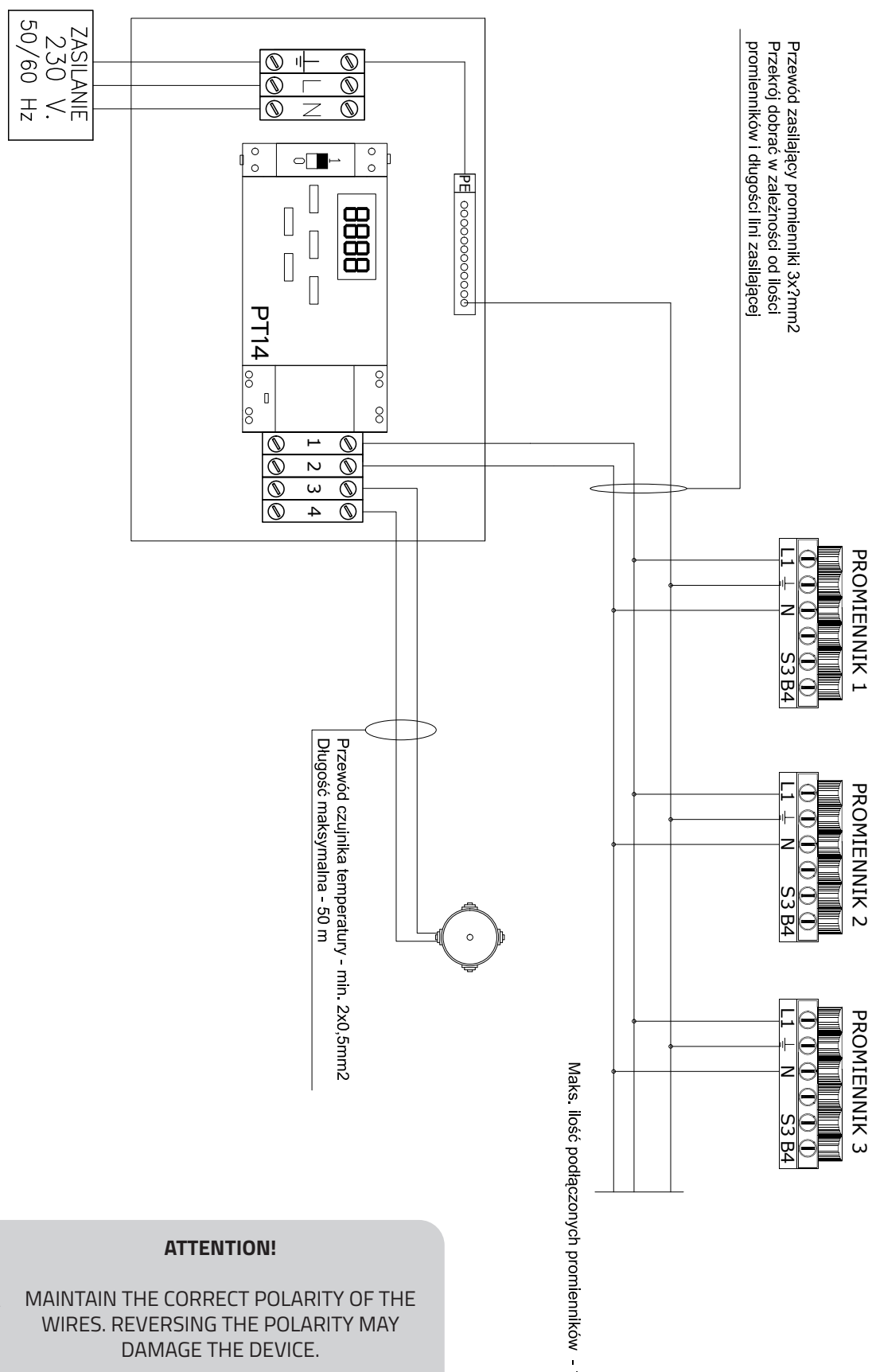
Fig. 8.2 Electrical connection between the Euro-scan analog control unit and the INFRA radiator

1. INFRA radiant tube burner with automatic device E82
2. Somek fan,
3. Fan power cable 3 x 1.5 mm²,
4. Controller connection – LGY burner 3 x 1.5 mm² (max. LGY 3*2.5 mm)
5. Globosonda,
6. Controller connection with temperature sensor 2 x 0.75 mm²

For cable lengths exceeding 10 m, use a shielded cable, such as LiYCY 2 * 0.75. Route the cables in separate cable trays.

7. Analog Control System / SCD / EURO-SCAN
8. The circuit breaker on the supply line – select according to the load.

8.2.1 SCD/EP D10 CONTROL PANEL, 10 PCS., INFRARED

**ATTENTION!**

MAINTAIN THE CORRECT POLARITY OF THE WIRES. REVERSING THE POLARITY MAY DAMAGE THE DEVICE.

Fig. 8.3 Electrical diagram for INFRA heaters with INET series controllers

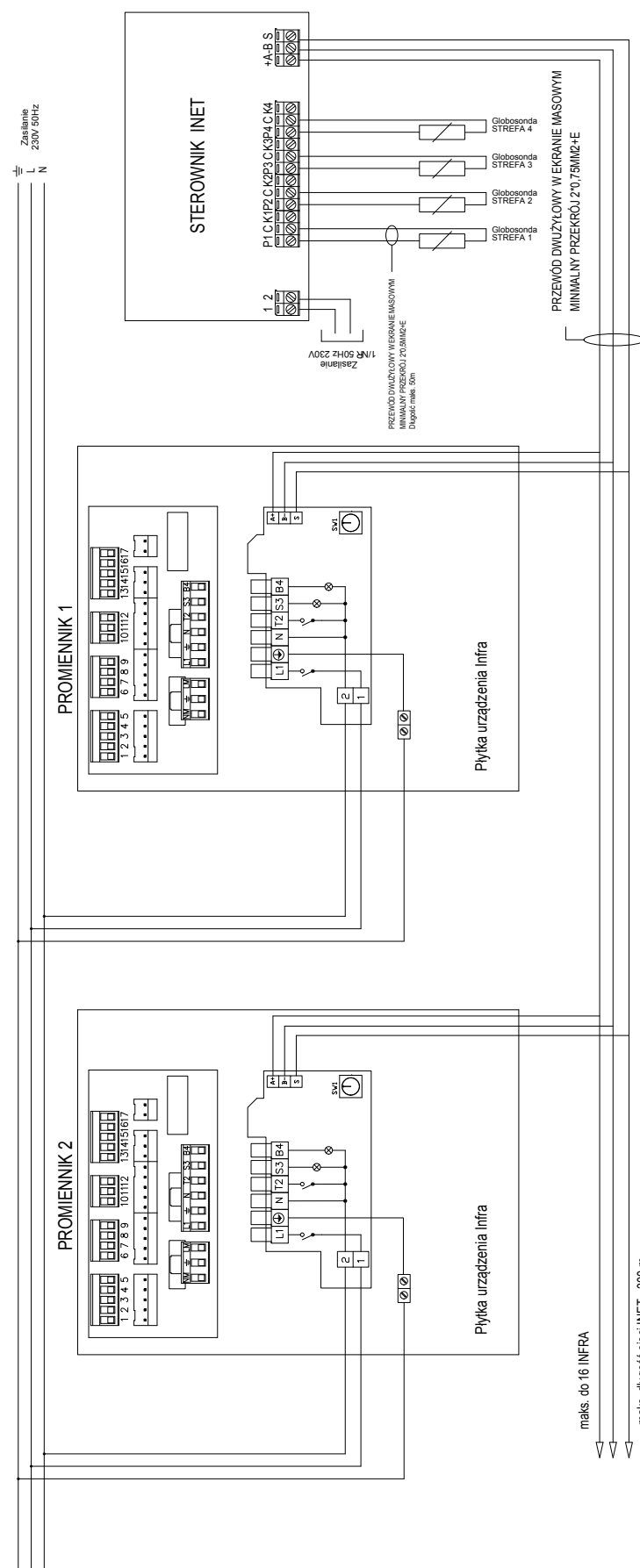


Fig. 8.3 Electrical diagram for INFRA heaters with INET series controllers

8.3 ELECTRICAL SCHEMATIC FOR M82/E82 PCB CONNECTIONS

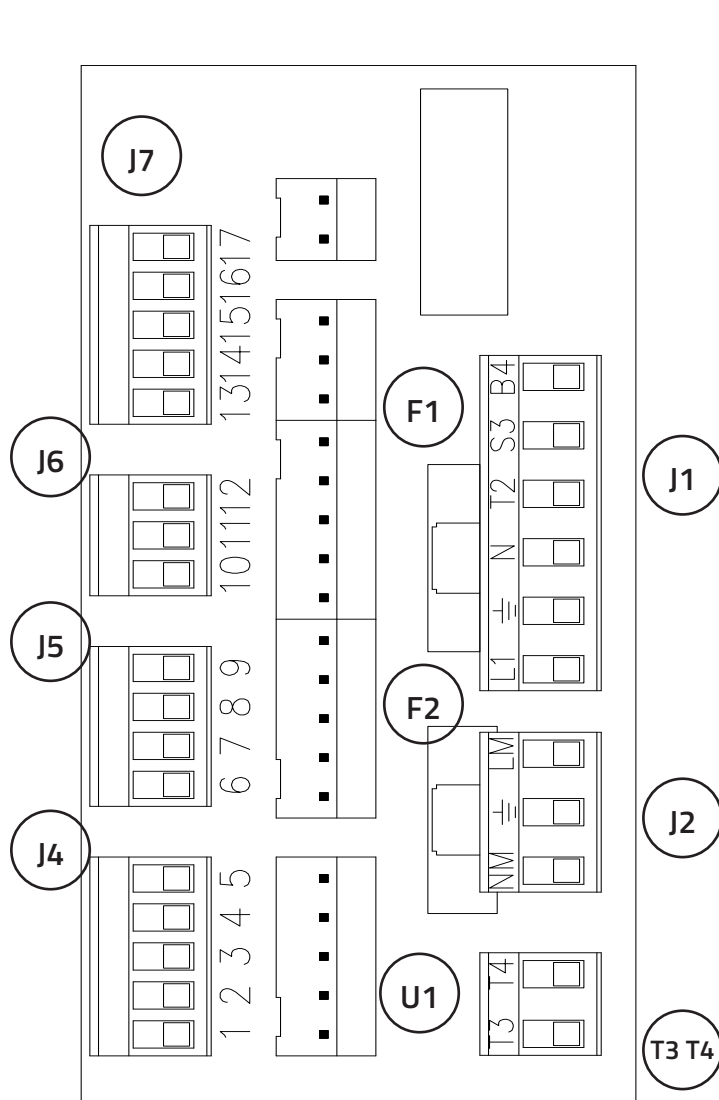
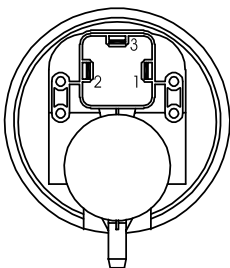


Fig. 8.4 Hi/Lo Infra 2-stage switch contact



Rys. 8.5 Air pressure switch

J1**Power supply**

L1 = Phase line
 $\perp$ = Grounding
 N = Neutral Line
 T2 = Reset
 S3 = Operating indicator
 B4 = Error indicator

J2**Exhaust fan**

NM = Neutral wire
 $\perp$ = Ground wire
 LM = Phase wire

J4**Ignition electrode**

1 = yellow-green
 2 = brown
 3 = blue
 4 = yellow-green
 5 = -

J5**Gas valve**

6 = yellow-green
 7 = -
 8 = blue
 9 = brown

T3 T4**Hi/Lo Infra 2-stage switch**

T3 - Input L1
 T4 - Input L1

**ATTENTION!**

In the case of the E82, the
 RESET BUTTON DOES NOT
 WORK

J6**Pressure switch**

10 = black (2)
 11 = white (1)
 12 = pink (3)

J7**Reset button**

16 = operation indicator light
 17 = operation indicator light

F1 F2**Fuses**

4 x 20 mm 3.15 A

8.4 CABLING

The electrical wires for the BAF burner are housed in a PVC enclosure. The wires are connected to the M82/E82 controller board via a system of electrical connectors.

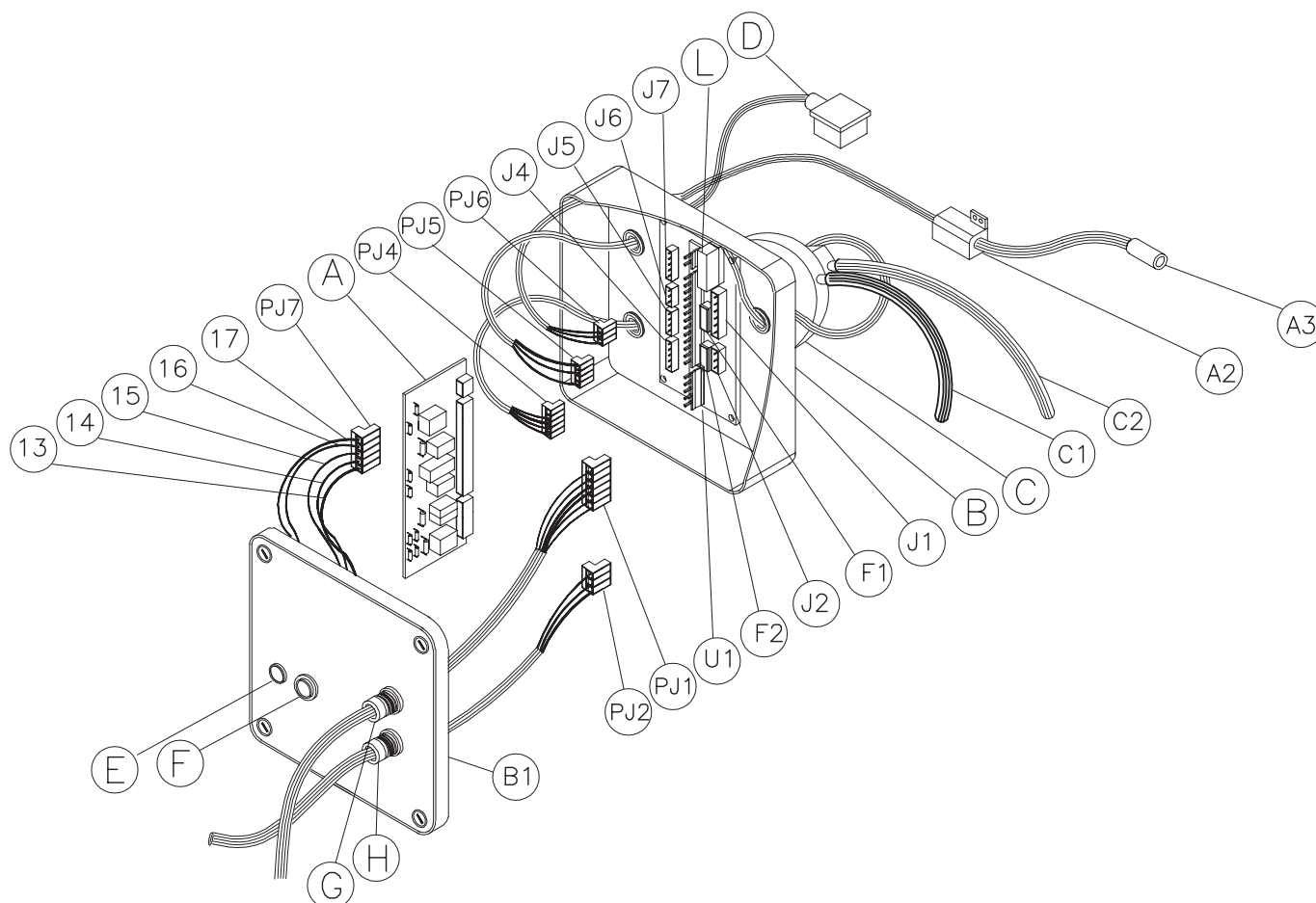


Fig. 8.7 Internal connection diagram for a burner with an M82/E82 controller

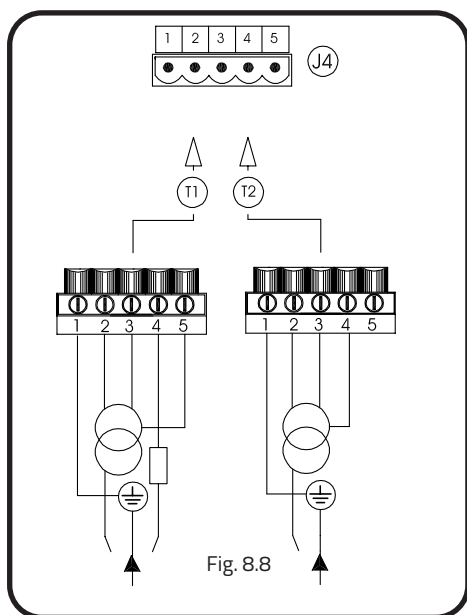


Fig. 8.8

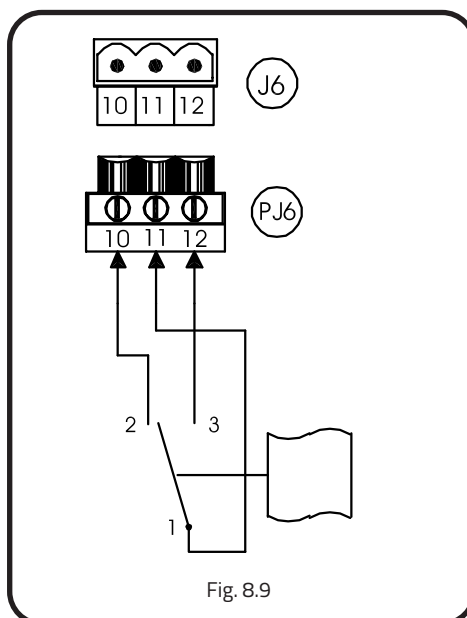


Fig. 8.9

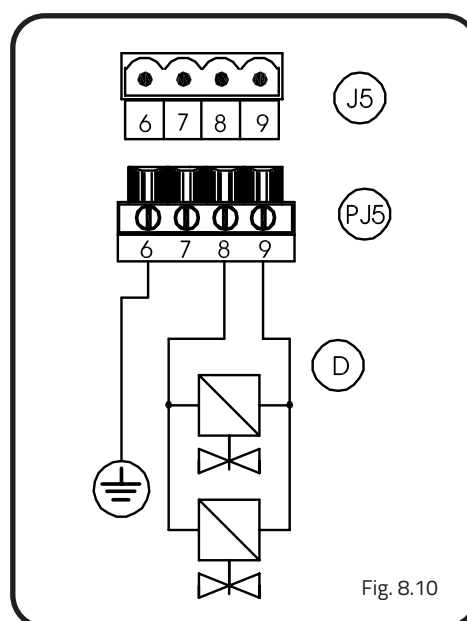


Fig. 8.10

"SCP928/A" Wiring - Description:

A - A1 - A2 - A3 - A4 - M82/E82 electronic control unit.

The M82/E82 control unit manages burner operation by sending a control signal to the **A2** igniter (Fig. 8.7), receives pressure switch readings, and allows the burner to be reset in the event of a fault.

The M82/E82 control unit works with a single ignition-ionization electrode A3 (Fig. 8.7) connected according to **T2** (Fig. 8.8), and with two separate ignition and ionization electrodes connected according to **T1** (Fig. 8.8) in the non-standard version. The M82/E82 control unit is supplied with soldered components and a MOLEX connector mounted on a printed circuit board with sockets for connecting wires.

Connecting the spark plug and electrode:

The spark plug (and, if applicable, the ionization electrode) is connected to the printed circuit board with the **PJ4 sockets** (Fig. 8.7), which is connected to **J4** (Fig. 8.7).

Connection **T1** (Fig. 8.8) is designed for burner operation with two electrodes: one ignition electrode and one ionization electrode. Connection **T2** (Fig. 8.8) is designed for burner operation with a single ignition-ionization electrode.

The diagram shown illustrates the electrical connection between the electrodes and the printed circuit board; the lines are numbered according to the figure provided:

- 1) Burner grounding cable
- 2) Magneto Phase Cable
- 3) Neutral cable of the magneto
- 4) Yellow-green detection cable **T2** cable = single electrode
- 5) Grounding for the magneto for the **T1 connection**

B - B1) Protective case:

The electrical wiring and all electrical components are enclosed in a sealed PVC housing **B** (fig. 8.10) which is attached to the burner housing. On the cover of the protective box **B1** (fig. 8.10) are placed two control coils to introduce electrical cables from the smoke fan and the controller. In addition, there are two LEDs, a GREEN operating indicator and a RED error indicator. The reset button is on the red indicator.

C - C1 - C2 - J6 - PJ6) Pressostat:

Pressure switch **C** (Fig. 8.7) is located on the rear panel of the PVC housing, with silicone tubing **C1** for vacuum and C2 for atmospheric pressure. The connection is made via the **PJ6** plug (Fig. 8.7). The wires are terminated with a plug inserted into the J6 socket (Fig. 8.10), as shown in the attached figure. Plug description (Fig. 8.9):

- 10) N.C. (Normally Closed)
- 11) shared
- 12) N.O. (Normally Open)

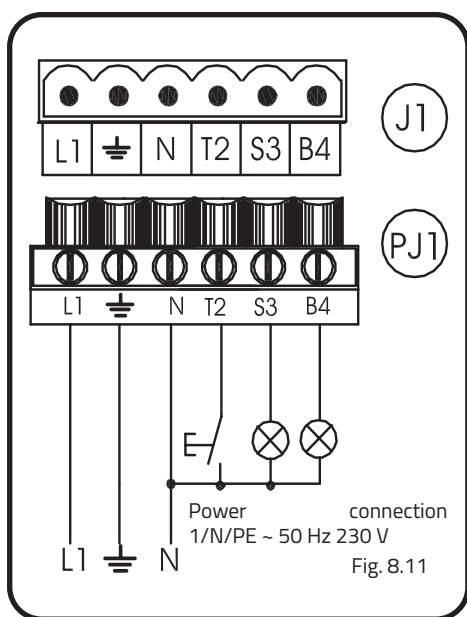
D - J5 - PJ5) Gas valve:

The gas valve's power supply is connected to **J5** (Fig. 8.7) on the printed circuit board via the **PJ5** connector (Fig. 8.7) integrated into the valve. Line labeling (Fig. 8.10):

- 6) grounding line
- 7) terminal not connected
- 8) phase line
- 9) neutral line

E - J7 - PJ7) Operating indicator:

On the cover of the cable housing, there is a GREEN indicator light connected to the circuit board via the **PJ7** connector using wires labeled **16-17** (Fig. 8.7), which is plugged into the J7 socket (Fig. 8.7) soldered onto the circuit board.



F - PJ7) Error indicator light:

The wiring enclosure features a RED error indicator connected to an N.O. (Normally Open) button used to reset the burner.

The indicator light with a pushbutton is connected via a **PJ7 plug** (Fig. 8.7):

13 (Fig. 8.7) - Phase wire;

14 (Fig. 8.7) - burner reset;

15 (Fig. 8.7) - neutral, common.

G - J1 - PJ1) Power supply:

The lid of the protective enclosure contains **G-type** cable glands (Fig. 8.7) for connecting the power cord. The electrical connection to the circuit board is made via socket **J1** (Fig. 8.7) and plug **PJ1** (Fig. 8.7). The voltage should be 230 V, 50/60 Hz.

Plug description (Figs. 8.11, 8.12):

L1) 3-phase power supply line, 230 V, 50/60 Hz,

PE) protective conductor clamp,

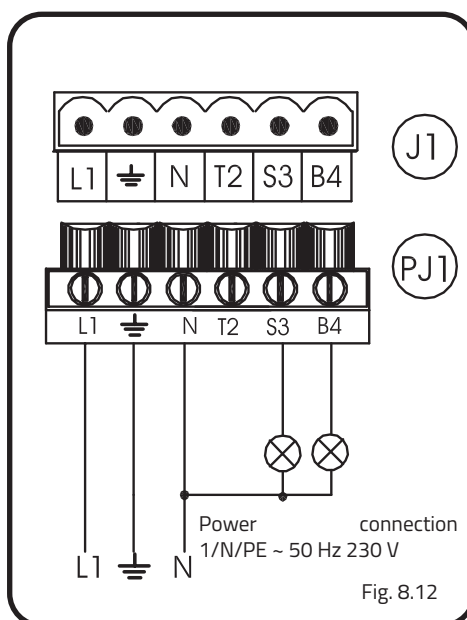
N) 230 V 50/60 Hz neutral line,

T2) reset neutral terminal, *

S3) the device's signal phase wire,

B4) the phase wire of the device's lock signal.

*** IMPORTANT!!** If you connect the burner with the E82 unit to a control board other than the CE/A type, the connection must be made without resetting (T2). With the E82 unit (Fig. 8.15), the E82 controller is reset by turning the power off and then back on.



H - PJ2 - J2) Connecting the fan (230V 50/60 Hz):

The electrical connection cover contains an H-type cable gland (Fig. 8.7) for the exhaust fan power cable. The cable should be connected to the motherboard via the **PJ2** plug (Fig. 8.7) and plugged into the **J2** socket on the motherboard (Fig. 8.7).

The supply voltage for the exhaust fan should be 230 V, 50 Hz.

The fan connector is shown in Fig. 8.13.

LM) Phase 230V 50Hz.,

PE) Protective conductor,

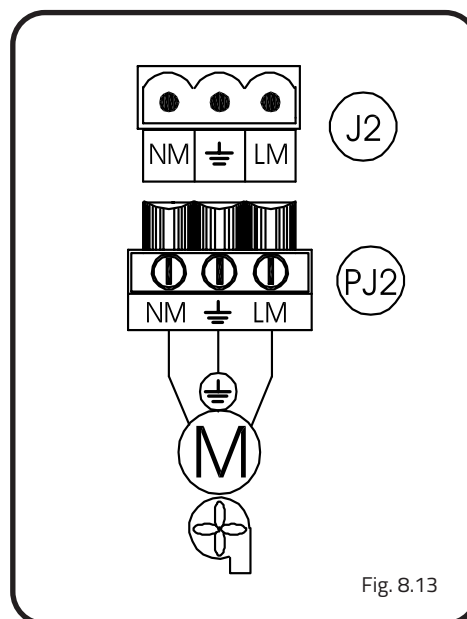
NM) Neutral 230V 50Hz.,

F1-F2) Fuses.

The printed circuit board is equipped with 4x20 mm 4 A fuse sockets (F1-F2) (Fig. 8.7).

L) RESET relay (For M82 controllers only):

The printed circuit board circuit includes a reset relay with a normally open (N.O.) contact. Closing the reset circuit causes the relay to switch and resets the M82 controller. The RESET signal comes from button F located on the housing of burner control unit B1 (Fig. 8.7) or from the remote control panel.



9. TESTING AND COMMISSIONING

9.1 PRE-IGNITION PROCEDURES

1. Check that the appliances are set to the correct gas type (if necessary, refer to section 10.1 to change the fuel type), check the supply pressure (see Table 9.2), and then turn on the gas supply.
2. Check the electrical connection between the burner and the controller.
3. Turn on the room thermostat and set it to the desired temperature (refer to the manual included with the controller);
4. The burner will start.

Red light	Burner Lock
Red light off	Burner reset
The green light on	Proper burner operation



ATTENTION!

On the E82 unit, the red warning light is illuminated during the purge phase

1. Calibration of a smooth pressure rise
2. Measurement of outlet pressure
3. Pressure calibration
4. Inlet pressure measurement

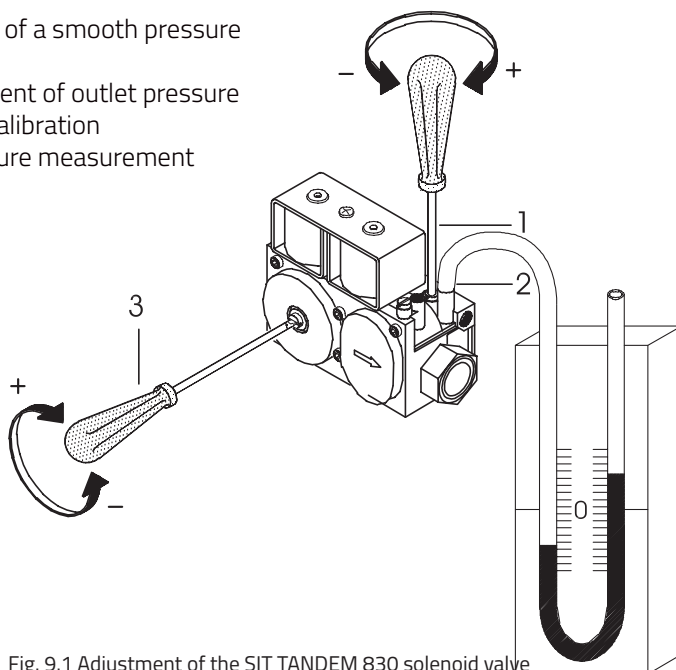
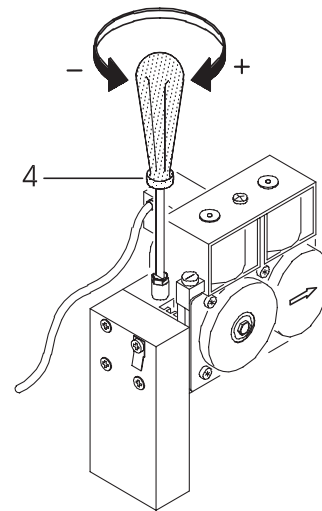


Fig. 9.1 Adjustment of the SIT TANDEM 830 solenoid valve



IMPORTANT!

CLOSE THE CHECKPOINTS
AFTER COMPLETING THE
DEVICE ADJUSTMENT

1. Measurement of outlet pressure
2. Inlet pressure measurement
3. Pressure calibration
4. Calibration of a smooth pressure rise

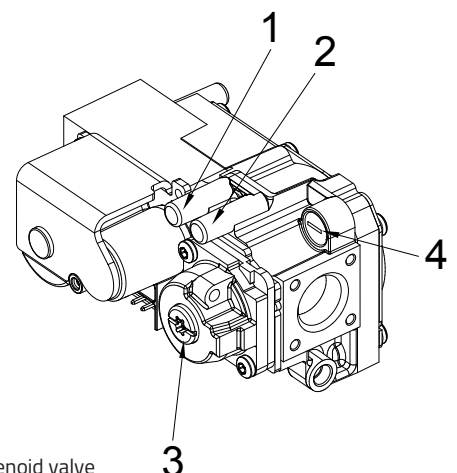
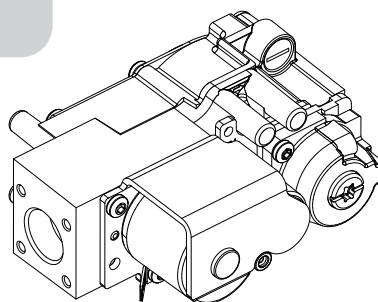
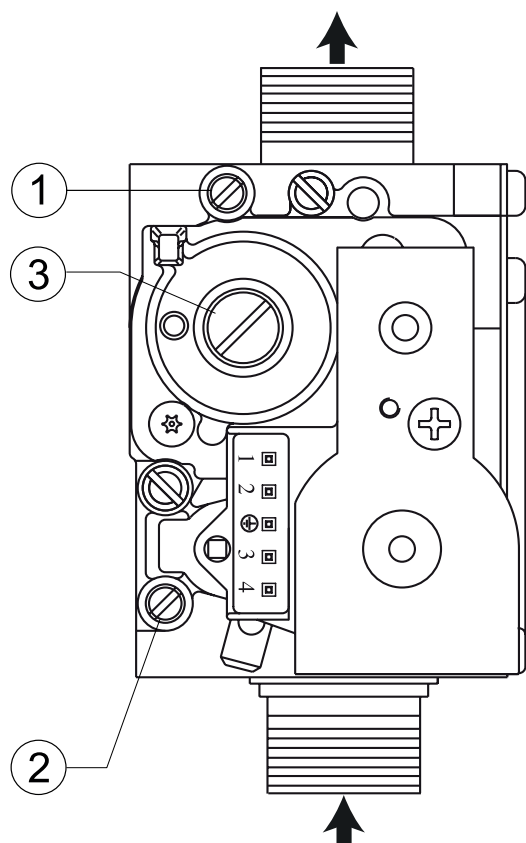


Fig. 9.1a Adjustment of the HONEYWALL VK4105 solenoid valve



IMPORTANT!
CLOSE THE CHECKPOINTS
AFTER COMPLETING THE
DEVICE ADJUSTMENT

1. Measurement of outlet pressure
2. Measurement of inlet pressure
3. Pressure calibration

Fig. 9.1b Adjustment of the SIT SIGMA 840 solenoid valve

Models		INFRA 3BU INFRA 9BM	INFRA 6BU INFRA 12BM	INFRA 6BU INFRA 15BM	INFRA 9BU INFRA 18BM INFRA 12BU	INFRA 9BU	INFRA 12BU INFRA 15BU
Rated power		18 kW	28 kW	35 kW	45 kW	53 kW	60 kW
NOZZLE DIAMETER							
G20 natural gas	mm	3.8	5	5	6	6.5	7
G25 natural gas	mm	4,0	5,3	5,6	6.5	7.0	7.5
G27 natural gas	mm	4.2	5.5	5.8	6.5	7.0	8
Natural gas G2.350	mm	5.0	5.8	6.5	7.0	nd	nd
LPG Propane-Butane G30	mm	2.1	2.6	3	3.3	3.5	3.8
LPG Propane G31	mm	2.1	2.6	3	3.3	3.7	3.8
NOZZLE PRESSURE							
G20 natural gas [20 mbar]	mbar	6.5	6.5	11.5	8.5	8.5	7.5
G25 natural gas [25 mbar]	mbar	7.0	9.0	10	8.0	8.0	8.0
Natural gas G27 [20 mbar]	mbar	7.0	9.0	10	9.0	8.5	7.5
Natural gas G2.350 [20 mbar]	mbar	7.5	8.0	8	6.5	nd	nd
LPG Propane-Butane G30	mbar	28	29	29	28	29	28
LPG Propane G31	mbar	34	35	36	34	34	34
GAS CONSUMPTION AT 15°C AND 1013.25 mbar							
G20 natural gas	m³/h	1.90	2.96	3.70	4.76	5.61	6.35
G25 natural gas	m³/h	2.21	3.45	4.31	5.54	6.52	7.38
G27 natural gas	m³/h	2.32	3.61	4.52	5.81	6.84	7.94
Natural gas G2.350	m³/h	2.64	4.12	5.14	6.61	nd	nd
LPG Propane-Butane G30	kg/h	1.42	2.21	2.76	3.55	4.18	4.73
LPG Propane G31	kg/h	1.40	2.18	2.72	3.50	4.12	4.66

9.2 MEASUREMENT OF COMBUSTION QUALITY

During routine inspections and any adjustment procedures, check the exhaust gas composition. Position the probe as shown in the figure below (see Fig. 9.2). After completing the measurement, seal the test port to ensure that the exhaust duct remains airtight during normal operation of the unit.

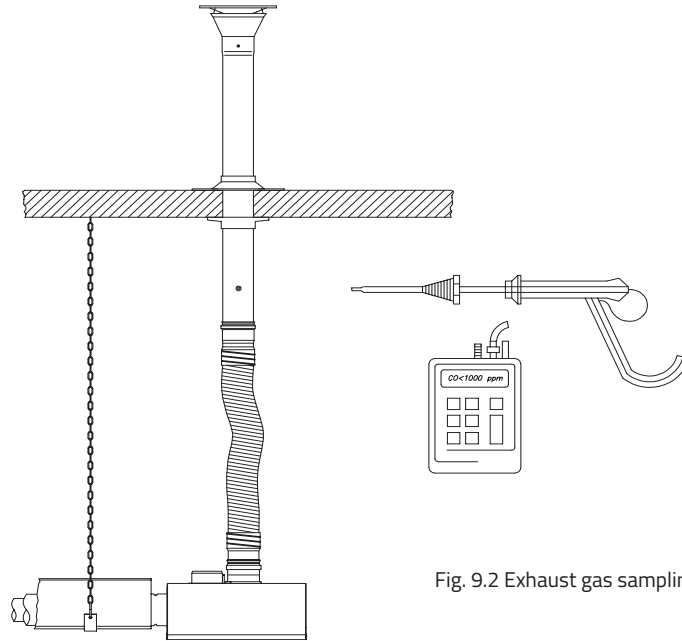


Fig. 9.2 Exhaust gas sampling point for analysis

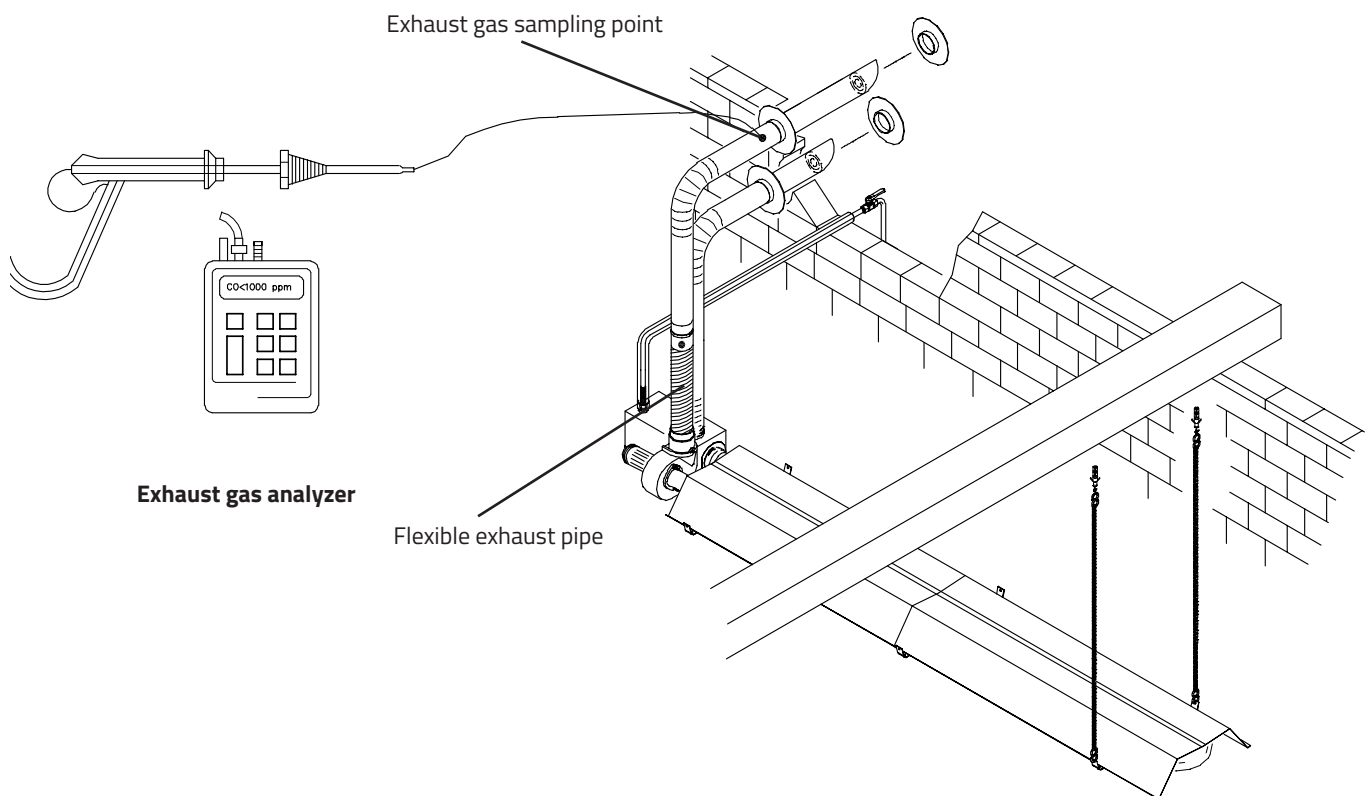


Fig. 9.3 Sampling for analysis (point B)

The measurement must be taken at the appropriate point on the appliance's flue. After taking the measurement, the person performing the measurement must seal the measurement opening.

10. MAINTENANCE

Equipment should be inspected at least once a year. Such inspections should be performed by qualified personnel.

10.1 FUEL CHANGE

Fuel changes must be performed by professionally qualified personnel responsible for complying with safety regulations; the manufacturer shall not be liable for any damage resulting from improper adjustment of the device's settings or from improper use.

10.1.1 SWITCHING FROM NATURAL GAS TO LIQUEFIED GAS

1. Turn off the gas supply and disconnect the power supply,
2. Disconnect the burner from the solenoid valve (using a 30 mm wrench),
3. Unscrew the nozzle (using a flathead screwdriver) from the inside of the burner, taking care not to damage the electrodes (ignition and ionization) located on the burner head (see figure below),
4. Replace the nozzle. Check that the nozzle diameter matches the specification on the unit's nameplate,
5. Connect the burner to the solenoid valve and tighten it securely,
6. Set the correct pressure at the burner using the solenoid valve pressure regulator by turning the adjustment screw clockwise (+) (item 3, Fig. 9.1, p. 57),
7. Start the measurement and check whether the gas pressure at the burner (item 2 in Fig. 9.1, p. 57) matches the value listed on the device's nameplate,
8. Check the gas connections for leaks,
9. Indicate the change in gas type on the nameplate.

IMPORTANT: Be sure to reseal the gas valve regulator after completing the adjustment process!

10.1.2 SWITCHING FROM LPG TO NATURAL GAS

1. Follow steps 1, 2, 3, and 4 in Section 10.1.1
2. Set the correct pressure at the burner using the solenoid valve pressure regulator (item 3 in Fig. 9.1),
3. Start the measurement and check whether the pressure at the burner (item 2 in Fig. 9.1) matches the value indicated on the unit's nameplate,
4. Indicate the change in gas type on the nameplate.

IMPORTANT: Be sure to reseal the gas valve regulator after completing the adjustment process!

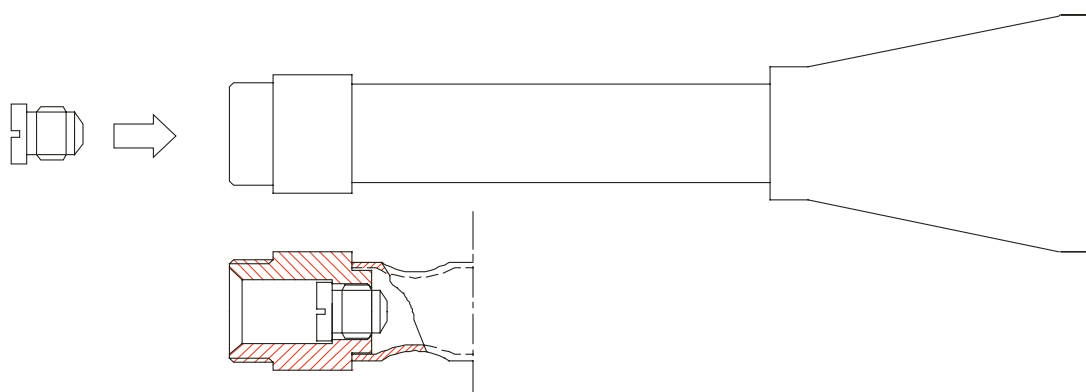


Fig. 9.4 Nozzle position

10.1.3 ADAPTING THE BURNER TO CATEGORY 2E+/3+

Devices designed for categories 2E+ and 3+, i.e., for operation within a pressure range, feature different burner nozzle diameters. These categories do not require changing the burner nozzle when switching fuels within the same gas family. Only the gas supply pressure changes, and the solenoid valve regulator is turned off (inactive). Below are the nozzle diameters for categories 2E+ and 3+

Category	Models		INFRA 3BU INFRA 9BM	INFRA 6BU INFRA 12BM	INFRA 6BU INFRA 15BM	INFRA 9BU INFRA 18BM INFRA 12BU	INFRA 9BU	INFRA 12BU INFRA 15BU
	Rated power		18 kW	28 kW	35 kW	45 kW	53 kW	60 kW
	ŚREDNICA DYSZY							
2E+	Gaz ziemny G20 / G25 - ciśnienie 20 / 25 mbar	mm	3,2	4,1	4,5	5,1	5,5	5,9
3+	LPG G30 / G31 - ciśnienie 30 / 37 mbar	mm	2.1	2.6	3	3.3	3.7	3.8

10.2 DESCRIPTION OF DEVICE MALFUNCTION

DEFECT	REASON	SOLUTION
The burner turns on and then shuts off after a few seconds	A) Reversed connection of the phase and neutral wires	A) Reverse the wire connections
	B) Inadequate grounding	B) Check the ground connection
	C) The electrode or test probe is not properly connected	C) Electrode position = 4 mm from the plate
	D) Faulty controller	D) Replace the equipment with genuine replacement parts
	E) Air-locked gas lines	E) Bleed the gas lines
	F) Incorrect gas pressure	F) Check that the pressure matches the value listed on the nameplate. IMPORTANT: Be sure to reseal the gas valve regulator after completing the adjustment!
The fan motor starts up briefly, and a moment later the controller attempts to start the unit, but the combustion process does not begin	A) No gas in the burner	A) Check the gas supply line
	B) The solenoid valve coil is inactive because the air pressure switch is off	B) Check the silicone tube connection and the operation of the air pressure switch
	C) Malfunction of the solenoid valve coil	C) Check the coil using, for example, a screwdriver. When the coil is energized, the metal part of the screwdriver will be attracted to it.
	D) Natural gas pressure at the nozzle is too high	D) Reduce the pressure to the value indicated on the nameplate
The exhaust fan does not start	A) No power	A) Check the switch settings on the electrical control panel and on the main panel
	B) Fan motor malfunction	B) Check that the fan itself is working; if it is damaged, replace it with a new genuine part
	C) Faulty capacitor	C) Replace the capacitor with a new one with the same specifications
The fan motor starts up, the controller attempts to initiate the startup process, the solenoid valve opens, but there is no ignition	A) Check if gas is flowing to the burner	A) Bleed the gas supply (if the system is new)
	B) Incorrectly positioned spark plug	B) Position the electrode 4 mm from the plate
	C) Gas pressure too high	C) Set the pressure according to the rating plate
The fan motor turns on, but the controller does not send a signal to the burner or the solenoid valve	A) During the initial purge of the unit, the pressure switch contacts became stuck in the closed position	A) Replace the pressure switch with a new genuine one of the same calibration
	B) Faulty controller	B) Replace the controller with a new genuine one

11. GUARANTEE

11.1 SCOPE AND DURATION OF THE WARRANTY

The manufacturer provides a 24-month warranty for the proper functioning of the delivered equipment, in accordance with the general provisions of the Civil Code, subject to the following conditions:

1. The warranty covers defects in materials and components manufactured by SYSTEMA. In the event of material defects or malfunction of the device, SYSTEMA guarantees free repair, replacement of parts, or, if necessary, replacement of the equipment with a new unit. Hidden defects that may only become apparent under normal conditions during use must be reported within 7 days of their discovery. The defects will be repaired as soon as possible at the manufacturer's expense.
2. The replacement of any defective parts does not extend the warranty period. The warranty expires on the date specified in the warranty card.

The detailed warranty terms and conditions are set forth in the warranty card.

11.2 WARRANTY EXCLUSIONS

The warranty does not apply in the following cases:

- In the event of damage resulting from actions or work performed without the proper authorization, using unsuitable materials, or in violation of the user manual,
- Damage caused during transport or storage,
- As a result of failure to comply with applicable standards and proper installation guidelines,
- If the device is used in facilities not intended for this purpose,
- In the event of damage caused by fire, ignition, excessive moisture, chemical reactions, exposure to corrosive substances, or other causes not authorized by SYSTEMA,
- If the required startup or inspection of the equipment is not performed,
- In the event of unauthorized access,
- In the case of defects resulting from unforeseen events or malfunctions in the electrical or gas systems,
- If non-original replacement parts are used.

12. TURNING OFF THE DEVICE

If it becomes necessary to shut down the unit for an extended period, we recommend taking the following steps: Set the main power switch to the "0" position and disconnect the unit from the electrical supply. Turn off the gas supply at the valve, and then disconnect the unit from the gas supply. If there is a change in the owner of the device, all documentation for the heating device must be transferred.



IMPORTANT!

Make sure that all maintenance and service operations are performed by qualified personnel!

13. RISK ANALYSIS AND ASSESSMENT

The following section outlines the hazards to be aware of during normal or foreseeable operation of the INFRA heater

Source of danger :	Risk-Producing Action :	Risk
ELECTRICAL SYSTEM:		
Cable connections Power Cable Smoke fan cable	Removal of protections Stretching out your hands under the protections Work with bollards	Potentially fatal electric shock
Terminal blocks/connectors	Attention, voltage of 230 V When working with terminals, it is possible to find the voltage on them despite the main switch being deactivated	Potentially fatal electric shock
	Incorrect wiring sequence	Undefined connection passages, resulting in significant damage (motor / motherboard / automatic burner device) Risk of short circuit and possible electric shock.
ENGINE:		
Engine	Contact with the hot device	Risk of burns
Rotating engine parts	Removal of protections/contact	Risk of injury
FAN:		
Rotating fan rotor	Opening of the protections Reaching out to the fan rotor	Risk of injury
GAS INSTALLATION:		
Gas connectors Control Fittings	Improper connection/sealing Opening of various screw connections Opening the control fittings	Gas leak Risk of explosion
TUBE RADIANT:		
Hot Radiant Tube Surface	Contact with the hot device	Risk of burns
CHIMNEYS:		
Chimneys Measuring sleeves	Opening various exhaust connections Opening the measuring sleeves Contact with bare flues Contact with bare measuring sleeves	Smoke outlet Risk of poisoning Risk of burns
BURNER IGNITION:		
Ignition coils ignition cables Tips for ignition electrodes	Loosening the ignition cables Removing the electrode tip	Life-threatening electric shock (high voltage)

Residual hazards associated with the operation of a room heater - INFRA Infrared Radiator

What hazards does the INFRA unit pose to operating personnel?

Regardless of the heater's application, the relevant safety regulations regarding the transport and installation of utilities (electricity, gas, ventilation, heating) must be observed.

Below are the potential residual hazards resulting from the operation of the heater that may occur despite the safety measures taken.

Thermal hazards:

Under normal operating conditions of the INFRA radiant heater, the radiant tube heats up to temperatures ranging from 200 to 500 degrees Celsius in exposed areas. These components are not protected against accidental contact!!

The exhaust system is heated to high temperatures—reaching 200–250 degrees Celsius in exposed areas. These components are not protected against accidental contact!!

Hazards posed by materials and substances:

If the exhaust system is leaking, exhaust gases—which are normally vented into the atmosphere by the burner fan—may escape uncontrollably (risk of carbon monoxide poisoning). Therefore, when performing maintenance on gas heaters, be sure to check the system for leaks.

Hazards resulting from breakage or burnout during operation:

If the radiant tube cracks or burns through due to wear and tear, exhaust gases may escape outside the heater system, which could result in the release of toxic carbon monoxide. Immediately disconnect the heater from the gas and electrical supply.

Hazards associated with working in areas at risk of explosion:

The heater must not be installed in areas where there is a risk of explosion (ATEX) or anywhere where there is a risk of explosive mixtures forming.

Explosion hazards:

The INFRA radiant heater may pose a risk of gas explosion. In the event of leaks in gas connections, control valves, or the external connection to the gas supply, uncontrolled gas leakage may occur. In rooms where a gas heater is installed, it is recommended to use a gas detection system (for a total installed capacity of over 60 kW, a gas detection system is mandatory).

Hazards associated with the installation and maintenance of the equipment:

Special care must be taken when lifting the heater or its components for installation.

Due to the installation and maintenance work performed on the unit at a height, the operator is at risk of falling from a height. Always use appropriate safety equipment for working at heights.

When working at heights, health and safety regulations must be strictly observed.

Personal protective equipment:

Protective gloves.

When performing maintenance work at heights, appropriate safety harnesses and a hard hat must be worn.

CERTYFIKAT BADANIA TYPU UE

EU TYPE EXAMINATION CERTIFICATE

Nr GAR1450CU0004

Instytut Nafty i Gazu – Państwowy Instytut Badawczy
niniejszym stwierdza, że urządzenia:

Instytut Nafty i Gazu – Państwowy Instytut Badawczy (INiG-PIB) hereby states that the appliances:

Gazowe jednopalnikowe promienniki niskotemperaturowe do stosowania w pomieszczeniach niemieszkalnych.

Ogrzewacz pomieszczeń typu rura promieniująca
Single burner gas fired overhead radiant heaters for non-domestic use.
Gas heater type radiant tube.

typu:
type

INFRA

typ instalacji spalinowej B₂₂, C₁₂, C₃₂
combustion products circuit type B₂₂, C₁₂, C₃₂

produkowane przez:
being manufactured by:

Systema Polska Sp. z o.o.
ul. Długa 5, 98-220 Zduńska Wola

w:
in:

Systema Polska Sp. z o.o.
ul. Długa 5, 98-220 Zduńska Wola

spełnia zasadnicze wymagania zawarte w Rozporządzeniu Parlamentu Europejskiego i Rady (UE) 2016/426 z dnia 9 marca 2016 r. w sprawie urządzeń spalających paliwa gazowe oraz uchylenia dyrektywy 2009/142/WE (Dz. U. UE L 81 z dnia 31.3.2016) na podstawie przeprowadzonego badania typu UE (typ produkcji) – moduł B zgodnie z zał. III pkt 1 ww. Rozporządzenia

meets the essential requirements covered by Regulation (EU) 2016/426 of the European Parliament and of the Council of 9th March 2016 on appliances burning gaseous fuels and repealing directive 2009/142/EC (OJ EU L 81 of 31.3.2016) on the basis of EU type examination (production type) – module B according to Annex III, clause 1 of a/m Regulation

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Biura Certyfikacji
Certification Office Manager



Magdalena Swat



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Instytutu Nafty i Gazu
- Państwowego Instytutu Badawczego
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Ewa Kukulska-Zajac

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