

INDUSTRIAL HEATING CATALOGUE

Content

COMPANY PROFILE	3
HELIOS Dark Gas-Fired Infra-Red Heater	4
MONZUN Gas Fired Hot-Air Heater	7
MONZUN-RTI Gas fired hot-air heater with mixing chamber	8
MONZUN-TE Hot water air heater	12
AIRSTREAM Air curtain	16
STRATIFIER Ceiling fan	17
OTHER MANUFACTURING PROGRAMME	18

Company headquarters



MANDÍK, a.s. (Inc.) Company Profile

Established in 1990, MANDÍK, a.s. (Inc.) is one of the most significant manufacturers of air-conditioning components and industrial heating systems in the Czech Republic. The MANDÍK, a.s. (Inc.) company is a genuinely Czech, family owned company.

The company primarily promotes itself on the market by laying emphasis on high-quality technical crafting of products and maximum flexibility in relation to customers. The company structure ensures very rapid reaction of the entire company to any kind of request from its business partners. This method of managing the company was evaluated as a clear competitive advantage, particularly in the difficult time of the financial crisis of 2009.

The current level of the company's technical ability is documented by prestigious jobs such as supplying HVAC for the most demanding projects – the Prague metro, Swiss tunnels, The Olkiluoto nuclear power plant in Finland, The Doel nuclear power plant in Belgium and others.

All of these jobs are contingent upon adherence to very strict quality standards, not limited only to the ISO 9001:2008 standard, but by also conforming to the higher standards of KTA1401 and 10 CFR50 App. B. As a matter of course, the company holds all relevant know-how and certificates.

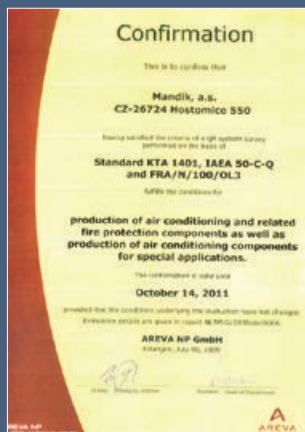
With regard to territorial activities, in addition to the domestic market and the developed nations of western Europe, MANDÍK, a.s. (Inc.), it also covers the former Soviet Block countries.

The strategic vision of MANDÍK, a.s. (Inc.) is to develop a Czech company of European significance in Hostomice producing HVAC equipment.

Company certificates



ISO 900110



KTA 1401



CRF50

Industrial heating product certificates



Helios



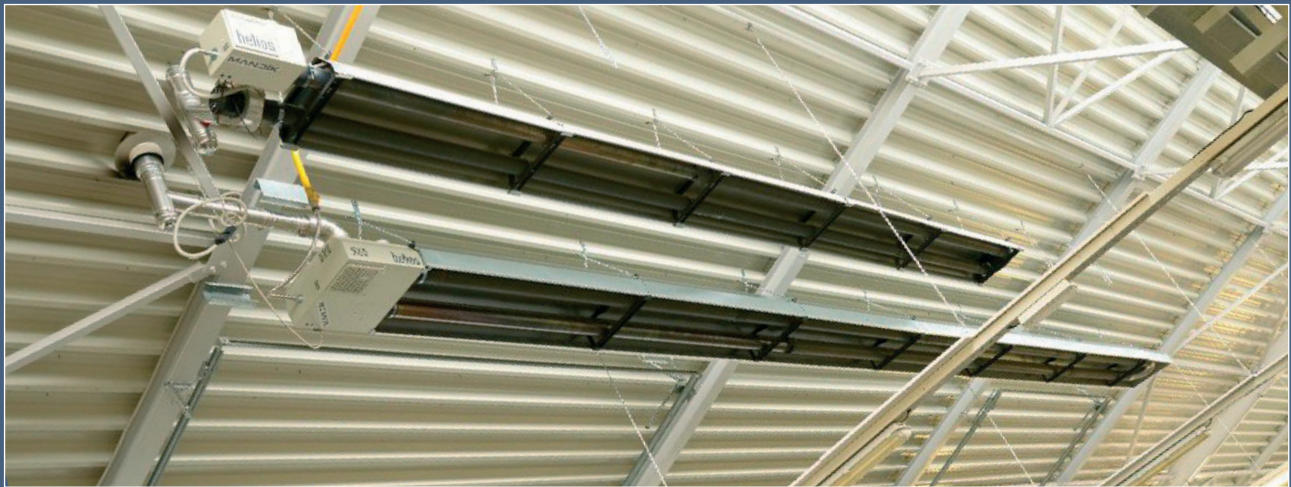
Monzun



Monzun TE

HELIOS

Dark Gas-Fired Infra-Red Heater



The principle of heating with Helios dark infra-red heaters

Infra-red radiation is, on impact on a body, partly reflected and partly absorbed. Absorbed radiation is converted into heat that penetrates the body. This is the analogy of sunlight, where, even at low temperatures, a thermal effect is felt.

This knowledge is used in the design of the HELIOS infra-red heating systems. Unlike warm air heating, where the warmest air is collected near the ceiling, in our case the effect is

opposite. A stable natural thermal effect is created without noise, drafts and dust swirling in an environmentally friendly manner. Deliberately lower the air temperature in the hall of 3-5 °C and achieve the desired thermal comfort by radiant heat of infra-red heaters. Reduction of the air temperature by 1 °C saves about 7% of energy, in this case, 20-35%.

Software HEFAISTOS

Hefaistos software was developed for computing the radiant intensity and temperature in rooms heated with dark infra-red heaters Helios. It is a tool for optimizing of the design, performance, and deployment of radiant heaters, so as to achieve an optimal match between thermal effect and investment and operating costs.

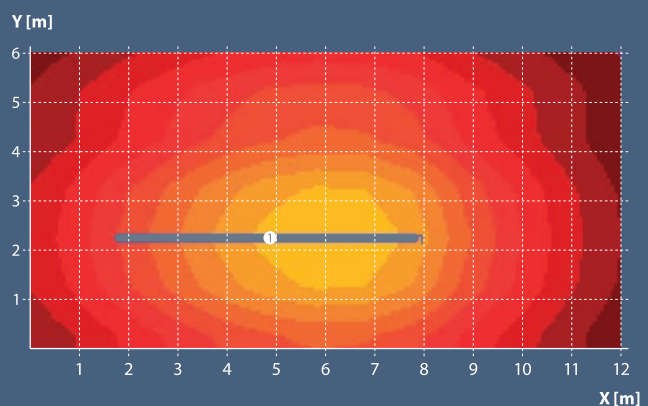
Input data:

- desired final temperature
- climatic conditions
- room geometry
- thermal and technical characteristics of cladding
- other heat sources

The output is:

- graphical representation of the radiation intensity
- graphical representation of the resulting temperature in the hall
- overall evaluation of the proposed heating

Hefaistos software is available for download at www.mandik.cz



Values valid at air temperature of 16,7°C

Thermal spectrum

Radiation intensity [E+1 W/m ²]	1.25	1.65	2.04	2.44	2.83	3.22	3.62	4.01	4.40	4.80	5.19	more
Final temperature* [°C]	16.8	17.0	17.1	17.3	17.5	17.7	17.8	18.0	18.2	18.3	18.5	more

*The required final temperature is 18 °C

Advantages of the HELIOS Infra-Red Heater

- up to 60% investment savings as compared to traditional heating installations – no need to set up boiler rooms, pipe lines, water systems etc.
- operating cost savings of up to 40%
- operational readiness, no need of frost protection
- no thermal losses in pipelines
- enables heating of exact working area (workplace)
- does not cause drafts and dust disturbance
- control allowing fully automatic operation
- two-stage burner regulation enables further reductions of operating costs

Technical data of infra-red heaters Helios 10-50 line

Infra-red heater type	Output power nominal [kW]	Output power minimal NG [kW]	El. power input [W]	Natural gas max. consumption [m ³ .h ⁻¹]	Weight [kg]	Length [m]
10-I	11,1	6,1	100	1,26	100	7,0
20-I	21,5	10,3	100	2,51	144	10,0
30-I	32,8	15,8	100	3,84	186	13,0
40-I	37,8	19,3	100	4,33	229	16,0
10-U	11,1	6,1	100	1,26	88	3,8
20-U	19,2	10,3	100	2,26	123	5,3
30-U	29,5	15,8	100	3,46	155	6,8
40-U	36,7	19,3	100	4,27	188	8,3
50-U	45,0	23,3	100	5,47	221	9,8

Technical data of infra-red heaters Helios 33S/50S line

Infra-red heater type	Output power nominal [kW]	Output power minimal NG [kW]	El. power input [W]	Natural gas max. consumption [m ³ .h ⁻¹]	Weight [kg]	Length [m]
33-UD	32,3	16,4	100	3,75	240	9,3
50-UD	44,5	23,4	100	5,47	331	13,2

U,I – refers to radiant tube shape

All radiant heater types can be equipped with or without reflector insulation and with one-stage or two-stage burner control

- With tilted reflector (15°) or horizontal
- Natural gas or propane or propane/butane fired

Infra-red heaters HELIOS 10 – 50 line

Gas-fired infra-red heaters HELIOS belong to the category of „dark“ radiators, which operate with surface temperatures up to 550 °C. The radiators are made in several designs variants, differing in shape of the tube, the reflector design, and burner power control.

Combustion chamber of infra-red heater is made of heat-resistant stainless steel, which significantly extends its life-time

Infra-red heaters Helios 33S/50S line

The design is based on experience with the tried and tested Helios 10-50 line, with larger radiant tube diameter and insulated reflector the radiant efficiency was increased. The Helios 33S/50S line is state-of-the art among dark infra-red heaters.

Advantages of Helios 33S/50S line heaters

- suitable for very high rooms
- higher radiant efficiency
- Standard two-stage burner control and insulated reflector



Wall mounted Helios infra-red heater

Control of Helios Infra-red Heater

Control box OI – enables manual control of one (OI1) to six (OI6) single stage or two stage infra-red heaters. The power control of two stage infra-red heaters is manual. A thermostat can be added to OI control box. If a programmable room thermostat (e.g. EURO 91_F) is added, the heating can be controlled automatically according to a chosen programme.

The Helreg Control box – provides fully automatic operation and control of one (Helreg 1) to six (Helreg 6) infra-red heaters. The power control of two stage infra-red heaters is automatic and based on the radiant temperature sensor. The temperature sensor is part of the control box. Optional Helreg monitoring software allows for the connection of the control box to PC.

Control Panel Siemens Climatix – provides fully automatic operation and control of infra-red heaters, auto switching of performance at two stage infra-red heaters, including monitoring the radiant temperature in thermal zones by temperature sensors. The panel can control the radiant heaters according to a year-time programme, where vacations, holidays etc. can be set and up to 10 various desired temperature changes for each day of the year. All parameters of the regulation can be set and monitored from a PC using any web browser via TCP/IP communication without additional costs. The control panel enables connection and control of external equipment like doors or windows, fire-protection equipment, dampers, ventilators, gas meters, gas armatures etc.



Control box OI



The Helreg Control box



Control Panel Siemens Climatix

Accessories

Exhaust systems and combustion air supply – combustion products are discharged outside the heated object using the flue (chimney), which can be made of stainless steel or other suitable material. Air can be supplied from outside through a system of supply pipes made of materials such as aluminium, stainless steel, etc. All details and offered components are in the TPM 047/05 Exhaust and Air Supply Systems technical brochure.

Infra-red heater suspension and gas hose – Infra-red heater can be hung on the designated location using chains and snap hooks. For connection of infra-red heater to the gas pipeline $\frac{1}{2}$ " or $\frac{3}{4}$ " flexible gas hose is used.



Stainless steel components of exhaust/air supply system



Suspension components and gas hose

MONZUN

Gas Fired Hot-Air Heater



7

MONZUN

Gas fired hot-air heaters are designed for hot air heating of large rooms like workshops, industrial and sporting halls, warehouses etc. As gas appliance they are equipped with forced flue gas exhaust categories B (open appliance) or C (closed appliance with external combustion air supply)

The heaters are equipped with complete regulation providing their safe operation. The Monzun range of air heaters has 11 various types with nominal power from 15kW to 92,8 kW.

According to the fan type, the heaters are marked as

- VH (axial fan)
- CV (radial fan, enables connection of the unit to air-ducting)

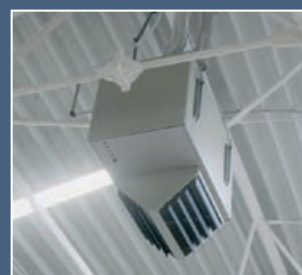
According to the burner power control the heaters are supplied as

- VH / CV-E (one stage power control, "on-off")
- VH / CV-ED (two stage burner control, "Max-min-off")
- VH / CV-EM (the burner power is modulated from "min to max or off")

Hot-air heaters with two stage or modulating burner control are equipped with fan speed regulator in order to supply heated air of constant temperature



Horizontal installation of hot-air heater on the wall



Vertical installation of hot-air heater from the ceiling

Technical data of gas fired hot-air heaters Monzun VH (axial fan)

Heater type	Output power max. [kW]	Output power min. [kW]	Nominal air flow rate [m³/h]	air flow range* [m]	Air temperature rise ΔT [°C]	Weight [kg]
VH 130	15,0	6,5	1 300	12	33,0	74
VH 180	22,0	10,4	1 900	15	33,0	78
VH 250	29,6	12,0	2 750	17	30,0	92
VH 300	35,5	12,2	3 000	18	34,0	93
VH 350	40,6	15,8	4 000	23	30,5	93
VH 400	46,4	19,3	4 600	25	30,0	130
VH 450	52,2	21,3	4 600	25	34,0	130
VH 520	60,9	26,2	4 600	25	40,0	130
VH 600	69,6	28,1	7 500	26	28,0	182
VH 700	81,2	35,6	7 500	26	32,4	182

* in open space, residual velocity 0,25 m/s



Technical data of gas fired hot-air heaters Monzun CV (radial fan)

Heater type	Output power max. [kW]	Output power min. [kW]	Nominal air flow rate [m³/h]	Air temperature rise ΔT [°C]	Weight [kg]
CV 130	15,0	6,5	1 370	31,1	81
CV 180	22,0	10,4	1 750	36,0	84
CV 250	29,6	12,0	3 200	26,5	104
CV 300	35,5	12,2	3 200	32,0	105
CV 350	40,6	15,8	4 000	30,5	113
CV 400	46,4	19,3	4 600	30,0	150
CV 450	52,2	21,3	4 600	34,0	150
CV 520	60,9	26,2	4 600	39,5	150
CV 600	69,6	28,1	8 000	26,0	230
CV 700	81,2	35,6	8 000	30,5	230
CV 800	92,8	40,8	9 000	30,5	240



MONZUN-RTI

Gas Fired Hot-Air Heater with Mixing Chamber



Monzun RTI Gas fired hot-air heaters are designed for ventilation (eventually heating) of large rooms and halls. The heater air inlet has a mixing chamber with regulation dampers for setting the fresh air/circulating air rate in a range of 0 to 100%.

According to the fan type, the heaters are marked as

- VH-RTI (axial fan)
- CV-RTI (radial fan)

According to the burner power control the heaters are supplied as

- VH / CV-RTI-E (one stage power control)
- VH / CV-RTI-ED (two stage burner control)
- VH / CV-RTI-EM (the burner power is modulated)

The VH-RTI version (with axial fan) is designed for local ventilation (eventually heating). It is produced in 10 types with nominal power from 15 kW to 81,2 kW with nominal air flow from 1 050 to 5 200 m³/h. The mixing chamber of VH-RTI version can be equipped with air filter.

The CV-RTI version (with radial fan) is designed for central ventilation (eventually heating). 11 types with nominal power from 15 kW to 95,8 kW are produced with nominal air flow from 1 300 to 8 000 m³/h. This version can be connected to air ducting, eventually a bag filter can be installed at the air input.



Horizontal installation of Monzun-RTI on the wall



Vertical installation of Monzun RTI from the ceiling

All Monzun RTI heaters are equipped with fan speed regulation, which keeps the supplied air temperature constant.

Technical data of gas fired hot-air heaters Monzun VH-RTI (axial fan)

Heater type	Output power max. [kW]	Output power min. [kW]	Nominal air flow rate [m ³ /h]	Air temperature rise ΔT [°C]	Weight [kg]
VH-RTI 130	15,0	6,5	1 050	42	110
VH-RTI 180	22,0	10,4	1 500	44	114
VH-RTI 250	29,6	12,0	2 350	37	135
VH-RTI 300	35,5	12,2	2 400	44	135
VH-RTI 350	40,6	15,8	2 750	44	135
VH-RTI 400	46,4	19,3	3 800	36	178
VH-RTI 450	52,2	21,3	3 800	41	178
VH-RTI 520	60,9	26,2	3 800	47	178
VH-RTI 600	69,6	28,1	5 200	40	255
VH-RTI 700	81,2	35,6	5 200	46	255



Technical data of gas fired hot-air heaters Monzun CV-RTI (radial fan)

Heater type	Output power max. [kW]	Output power min. [kW]	Nominal air flow rate [m ³ /h]	Air temperature rise ΔT [°C]	Weight [kg]
CV-RTI 130	15,0	6,5	1 300	34	142
CV-RTI 180	22,0	10,4	1 750	37	142
CV-RTI 250	29,6	12,0	2 750	31	173
CV-RTI 300	35,5	12,2	3 000	34	174
CV-RTI 350	40,6	15,8	3 500	35	180
CV-RTI 400	46,4	19,3	4 000	35	225
CV-RTI 450	52,2	21,3	4 300	36	225
CV-RTI 520	60,9	26,2	4 500	40	225
CV-RTI 600	69,6	28,1	6 000	35	335
CV-RTI 700	81,2	35,6	7 000	35	335
CV-RTI 800	92,8	40,8	8 000	35	335



Control of Monzun Heater

Thermostat Euro 91-F (programmable thermostat) enables manual and automatic control of Monzun E heater (one stage power control) according to temperature and week-long programme.

Control box OM enables manual control of Monzun E (one stage power control) and Monzun ED (two stage power control) in "winter" (heating) or "summer" (ventilation) mode. For "winter" mode, the control box can be connected to a thermostat – e.g. programmable thermostat Euro 91-F. Power control of Monzun ED (two stage) is manual. The OM control box can be optionally delivered for control of 2 to 6 Monzun heaters (control box OM 2 to OM 6)

Control box REMON enables fully automatic operation and control of Monzun E (single stage power), Monzun ED (two stage power) and Monzun EM (modulated power) in "winter" or "summer" mode according to programmed desired temperatures in week-long cycle. The programme enables up to 10 temperature changes a day. The room temperature sensor is a part of the control box. The Monzun ED/EM heater power control is fully automatic, based on temperature evaluation. The REMON monitoring software allows the control box to be connected to a PC.

Control Panel Siemens Climatix - provides fully automatic operation and control of Monzun heaters. Power control of Monzun ED/EM heaters is fully automatic based on temperature evaluation. The panel can control the heaters according to a year-time programme, where vacations, holidays etc. can be set and up to 10 various desired temperature changes for each day of the year. All parameters of the regulation can be set and monitored from a PC using any web browser via TCP/IP communication without additional costs. The control panel enables connection and control of external equipment like doors or windows, fire-protection equipment, dampers, ventilators, gas meters, gas armatures etc.

Control box SGF 24 M provides control of mixing chamber of Monzun RTI dampers equipped with electric actuator Belimo. The control box enables setting of fresh air/circulating air rate in 0 to 100% rate.



thermostat Euro 91-F



control box OM



control box REMON



control box Siemens Climatix



control box SGF 24M

Accessories for Monzun Hot-Air Heaters

Exhaust systems and combustion air supply – combustion products are discharged outside the heated object using the flue (chimney), which can be made of stainless steel or aluminium. Air supply can be done from outside through

the system of supply pipe. All details and offered components are in technical brochure TPM 047/05 Exhaust and Air Supply Systems.



Stainless steel components of exhaust/air supply system



Aluminium components of exhaust/air supply system

Installation and Connection of Monzun Heater

The Monzun hot-air heater can be installed horizontally on the wall using a pair of cantilevers or suspended vertically from the ceiling using hangers. Connection to the gas piping is usually done using a $\frac{1}{2}$ " or $\frac{3}{4}$ " flexible gas hose.



pair of cantilevers



pivoting head for pair of cantilevers



hangers for Monzun heater – set



flexible gas hose (stainless steel)

Vents for Monzun Air Heaters

The basic louver grille is, as standard, installed on the air outflow of the Monzun hot-air heater for horizontal installation. Its horizontal blades are made of galvanized, coated steel and direct the air flow elevation.

The front angle grille is designed to direct the hot air outflow sideways. It can be installed on the air outflow of the Monzun heater for horizontal installation. Each blade of the grille can be adjusted individually. The grille is made of galvanized steel and powder coated.



Monzun heater with basic louver grille



Facing angle grille



Vertical angle grille



Monzun heater with flange for air duct connection

Fresh Air Intake Fittings for Monzun RTI

Mixing chamber – Monzun-RTI heaters are equipped with mixing chamber for mixing fresh and circulating air. The mixing chamber is made of galvanized steel with louver dampers at both fresh and circulating air intake. The dampers are coupled to set the fresh air/circulating air rate from 0 to 100%. The fresh air damper is tight, the circulating air damper is not tight. The dampers can be adjusted manually (version .01) or with electric actuator (version.057). The mixing chamber can be supplied with or without an integrated filter (for Monzun VH-RTI).

The horizontal duct is designed for installation into wall openings for horizontal installation of Monzun RTI. The duct is rectangular, dimensions as fresh air flange of the mixing chamber, with one loose flange. The supplied length is 1 m and is made of galvanized steel. The precise length is adjusted on site by the installer.

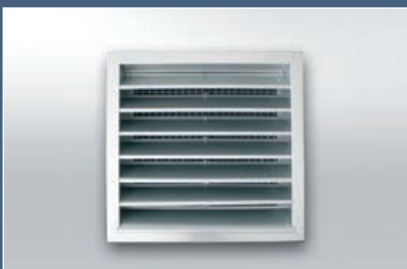
The rain protection louver is installed at the end of the horizontal duct into the wall. Standard version is made of galvanized steel, for other possible variants refer to technical brochure TPM 079/01

The damping pad is used to avoid transmission of dynamic loads and vibrations to connected air ducts.

The vertical duct is installed into the roof opening. It is a rectangular fresh air intake duct, 600 mm long with 4 moulding bars, which are fixed to the duct and roof by the installer according to the roof angle. The entire set up is made of galvanized steel. Usually, the roof air intake head is installed on the top of a vertical duct.

The roof air intake head is designed for fresh air intake above the roof. It consists of head body and hinged roof. The entire is made of galvanized steel. In the head body a bag filter is installed. Filter pollution is signalled by differential pressure switch.

The chamber with bag filter – can be connected to the fresh and/or circulating air intake of the Monzun CV-RTI mixing chamber.



Rain protection louver



Roof air intake head



Mixing chamber

MONZUN – TE

Hot Water Air Heater



Air heaters with a Monzun TE water heating coil are designed for hot-air heating (eventually ventilation) of rooms, workshops, industrial and sporting halls etc. The heating medium is hot water. Three sizes of heaters are produced, each size with one row to four row heating coil. The air is driven through the heating coil by an axial fan. The heaters can be installed horizontally on walls or vertically bellow the ceiling. As part of ventilation set with mixing chamber they can be used for ventilation. Maximum heating water temperature is 100°C, maximum heating water pressure is 1,4 MPa. The degree of electric protection of the Monzun TE heater is IP54.

Monzun-TE heaters can be supplied with following variants of internal electric wiring

- **variant B** – basic wiring (thermostat control is not supported)
- **variant BT** – enables control of the heater by thermostat, each heater has to have its own thermostat
- **variant BTM** – enables control of several heaters by single thermostat
- **variant BTP** – variant BT plus fan motor thermal protection
- **variant BTMTP** – variant BTM plus fan motor thermal protection



Technical data of hot water air heaters Monzun TE						
Heater type	rated air flow [m³/hod.]	Thermal output * [kW]	Weight [kg]	Electric input [W]	Air flow range ** [m]	Air temperature rise ΔT [°C]
Monzun TE 1.1.150	1 500	8,6	20	100	10,0	17,0
Monzun TE 1.1.180	1 800	9,5	21	110	11,4	15,6
Monzun TE 1.1.220	2 200	10,5	20	190	14,5	14,1
Monzun TE 1.2.150	1 500	15,7	23	110	10,0	30,9
Monzun TE 1.2.200	1 900	18,0	22	190	12,1	28,0
Monzun TE 1.2.250	2 400	20,6	23	280	16,0	25,3
Monzun TE 1.3.180	1 700	22,4	25	190	10,8	38,9
Monzun TE 1.3.220	2 100	25,6	26	280	13,8	35,9
Monzun TE 1.4.150	1 500	24,4	27	190	10,0	47,9
Monzun TE 1.4.180	1 800	28,2	28	280	11,4	44,9
Monzun TE 2.1.200	2 000	12,5	30	110	12,0	18,5
Monzun TE 2.1.250	2 600	14,3	32	170	16,0	16,3
Monzun TE 2.1.400	3 800	17,4	34	240	22,5	13,5
Monzun TE 2.2.250	2 400	24,7	34	170	15,0	30,3
Monzun TE 2.2.320	3 200	29,2	36	240	20,5	26,9
Monzun TE 2.2.420	4 250	34,2	36	540	24,0	23,7
Monzun TE 2.3.220	2 100	30,1	37	170	13,0	42,3
Monzun TE 2.3.280	2 800	36,2	37	240	18,0	38,2
Monzun TE 2.3.400	3 800	43,8	39	540	22,5	34,0
Monzun TE 2.4.200	1 900	33,0	39	170	11,5	51,2
Monzun TE 2.4.250	2 500	40,1	39	240	15,5	47,3
Monzun TE 2.4.350	3 500	50,4	41	540	21,5	42,5
Monzun TE 3.1.450	4 600	25,9	52	240	18,0	16,6
Monzun TE 3.1.600	6 000	29,7	53	360	22,5	14,6
Monzun TE 3.1.800	7 800	33,9	55	740	27,0	12,8
Monzun TE 3.2.420	4 250	44,0	55	240	16,5	30,5
Monzun TE 3.2.560	5 500	51,2	56	360	21,6	27,4
Monzun TE 3.2.700	6 750	57,4	58	740	24,0	25,1
Monzun TE 3.3.400	4 000	56,1	59	240	15,0	41,3
Monzun TE 3.3.500	5 000	64,7	60	360	19,0	38,2
Monzun TE 3.3.600	5 900	71,8	62	740	22,5	35,9
Monzun TE 3.4.350	3 700	62,6	62	240	14,5	49,9
Monzun TE 3.4.450	4 500	71,9	63	360	17,5	47,1
Monzun TE 3.4.520	5 200	79,4	65	740	20,5	45,0

* rated thermal power for heating water temperature 90/70°C and ambient air temperature 15°C; ** residual velocity 0,25m/s

Control of Monzun TE Hot Water Air Heater

MONZUN TE – Accessories

Thermostat Euro 91-F (programmable thermostat) – enables manual and automatic fan control of one Monzun TE heater BT (or several Monzun TE BTM heaters) according to temperature and week-long programme. Thermostat can be used to control circulation pump of the hot water circuit too.

The freeze protection thermostat – stops the fan if the output water temperature is lower than 6°C, eventually its signal is used to shut off the fresh air supply to the input damper to the mixing chamber of ventilation set that is equipped with an electric actuator (variation.057)

Control box SGF 24 M – provides control of dampers of mixing chamber of Monzun TE ventilation set equipped with electric actuator (variation57). The control box enables connection of freeze protection thermostat and ensures the heating coil freeze protection. The Power supply of the Belimo actuator is from this control box.

Fan speed controller P-E enables manual control of fan speed by circular switch



Thermostat Euro 91-F



Control box SGF 24 M



Freeze protection thermostat



Fan speed controller P-E-2,5



Fan speed controller P-E-6

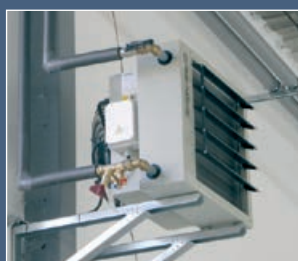
Vents for Monzun TE Heaters

Basic louver grille – is standard installed on the air outflow of the Monzun TE hot-air heater for horizontal installation. Its horizontal blades direct the air flow elevation. The grille is made of galvanized steel and powder coated.

Two-sided vent is designed to direct the air flow from horizontally installed Monzun TE heater sideways. It can be installed on the air outflow side of the Monzun-TE heater behind the Basic louver grille. Two-sided vent is made of galvanized steel and powder coated.

Vertical angle grille is designed for vertical installation of the Monzun TE heater. It can direct the hot air outflow vertically or sideways. Each blade of the grille can be adjusted individually. The grille is made of galvanized steel and powder coated.

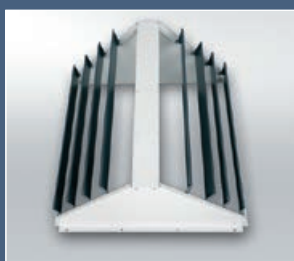
Vertical four-sided vent is designed for vertical installation of Monzun TE heater. It directs the air outflow to four sides. Vertical four-sided vent is made of galvanized steel and powder coated.



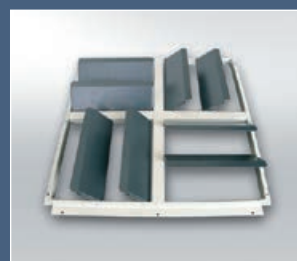
Monzun-TE heater with basic louver grille



Two-sided vent



Vertical angle grille



Vertical four-sided vent

Installation of Monzun TE Heater

The Monzun TE hot water air heater can be installed horizontally on a wall using pair of cantilevers or suspended vertically bellow the ceiling using set of hangers.



Pair of cantilevers for Monzun-TE heater



Set of hangers for Monzun-TE heater



Pair of cantilevers for Monzun-TE ventilation set



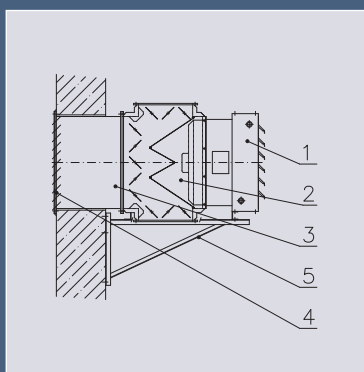
Set of hangers for Monzun-TE ventilation set

Fresh Air Intake Fittings for Monzun TE Ventilation Set

MONZUN TE – Accessories

Monzun-TE ventilation set

- horizontal installation on the wall



- 1) Hot water air heater Monzun-TE
- 2) Mixing chamber with filter
- 3) Horizontal duct
- 4) Rain protection louver
- 5) Pair of cantilevers for Monzun-TE ventilation set

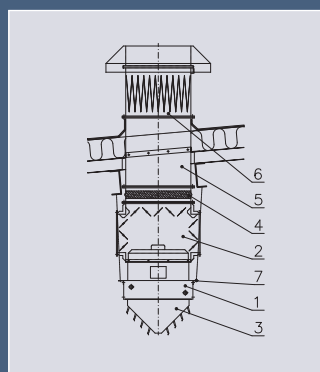
Rain protection louver is installed at the end of horizontal duct into the wall. Standard version is made of galvanized steel, for other possible variants refer to technical brochure TPM 079/01

Mixing chamber – for mixing fresh and circulating air. The mixing chamber is made of galvanized steel with louver dampers at both the fresh and the circulating air intake. The dampers are coupled to set the fresh air/circulating air rate from 0 to 100%. The fresh air damper is tight, the circulating air damper is not tight. The dampers can be adjusted manually (version .01) or with electric actuator (version.057). The mixing chamber can be supplied with or without integrated filter.

Damping pad is used to avoid transmission of dynamic loads and vibrations to connected air ducts.

Monzun-TE ventilation set

- vertical installation bellow the ceiling



- 1) Hot water air heater Monzun-TE
- 2) Mixing chamber without filter
- 3) Vertical angle grille
- 4) Damping pad
- 5) Vertical duct
- 6) Roof air intake head with bag filter
- 7) Set of hangers for Monzun-TE ventilation set

Horizontal duct is designed for installation into the wall opening for horizontal installation of Monzun TE ventilation set. The duct is rectangular, dimensions as fresh air flange of the mixing chamber, with one free flange, the supplied length is 1 m, made of galvanized steel. The precise length is adjusted on site by the installer.

Vertical duct is installed into the roof opening. It is a rectangular fresh air intake duct, 600 mm long with 4 moulding bars which are fixed to the duct and roof by the installer according to roof angle. The whole is made of galvanized steel. Usually, the roof air intake head is installed on the top of vertical duct.

Roof air intake head is designed for fresh air intake above the roof. It consists of head body and hinged roof. The entire is made of galvanized steel. In the head body a bag filter is installed. Filter pollution is signalled by differential pressure switch.



Rain protection louver



Roof air intake head



Mixing chamber

AIRSTREAM

Air curtain

Air curtains are air handling system devices intended for separation of internal and external environments in industrial buildings. During the opening of an industrial gate the internal temperature in the building decreases, which affects thermal comfort and increases costs of heating.

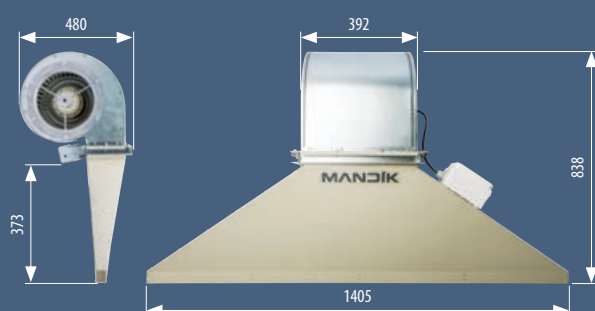
The air stream from the air curtain serves for limitation of undesirable penetration of outdoor air into heated space while the gate is opening. The air curtain uses a powerful radial fan which draws warmer air from upper layers of the heated area and exhausts the same into the gate area with the help of a long and narrow outlet.

The air curtain operation is controlled either manually or more advantageously with the help of an end switch installed in the gate. The connection box makes it possible to switch on multiple air curtains by using a single end switch. The air curtain is installed directly above the gate for vertical air stream, or in case of a wide gate the installation of the necessary number of air curtains is to be made. The installation is made by using an air curtain holder which makes it possible to turn the air curtain and thus also the air stream in an angle range from -30° to $+15^{\circ}$ from the vertical plane.

Technical characteristics:

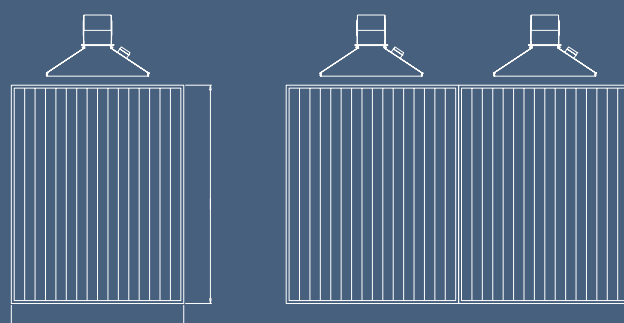
Type		AS 43	AS 47
Air stream capacity	m ³ /h	4300	4700
Noise level at 1 m	dBA	74	79
Max. installation height	m	4.5	5.5
(Gate) hole width	m	2 to 3	2.5 to 3.5
Fan speed	rpm	1150	1200
Maximum static pressure	Pa	450	480
Maximum flow rate	m ³ /h	4300	5500
Motor power input	W	1500	1950
Number of fans		1	1
Power supply	V/Hz	230/50	400/50
Current	A	6.7	3.4
Fuses	A	16	3x10A
Ingress protection		IP40	IP40
Air curtain weight	kg	34.8	34.8

Dimensions :



Air curtain installation above the gate and maximum gate dimensions:

Air curtain	Maximum gate dimensions	
	W (mm)	H (mm)
AS 43	3000	4500
AS 47	3500	5500



Multiple air curtains installed side by side are used for a wider gate.



STRATIFIER

Ceiling fan



17

STRATIFIER

The Stratification-ceiling fan pushes the air downwards (towards the floor) and thus lowers the air temperature difference between the upper part of the hall and the floor. More uniform temperature distribution in the hall saves heating costs, particularly with hot air heating.

Stratifier-ceiling fan is controlled by a built in thermostat. Three sizes of stratifiers are produced with air flow from 4 500m³/h to 9 000 m³/h.



Technical data of stratifier

Type	Air flow at 20°C [m³/h]	Fan speed [rpm]	Noise level 1,5 m above floor [dB(A)]	Electric supply	Degree of motor protection	Weight [kg]	Minimum suspension height [m]	Maximum suspension height [m]
D1	4 500	870	48	230 V / 50 Hz	IP 40	19,5	4	10
D2	6 500	1 240	53	230 V / 50 Hz	IP 40	20,0	8	12
D3	9 000	860	56	230 V / 50 Hz	IP 40	25,5	10	16

Accessories for Stratifier

Suspending material – The stratification fan is suspended from the ceiling using chains and snap hooks.

Speed controller P-E enables manual fan speed control by circular switch.



Chain + snap hooks for stratifier



Fan speed controller P-E-2,5



Ceiling fan installation



Fan speed controller P-E-6

OTHER MANUFACTURING PROGRAMME



Fire damper – PKTM



Fire damper – PKTM III



Fire damper – FDMC



Fire damper – FDMD



Single compartment smoke extraction damper – SEDS



Multi compartment smoke extraction damper – SEDM



Fire shutter – PSUM



Fire valve – PVM



Silencer – SMR, SMRF



Square regulation damper – RKM



Square tight regulation damper – RKTM



Round regulation damper – RKKM



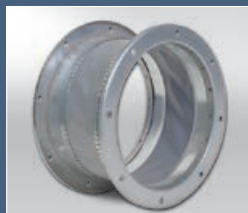
Round tight regulation damper – RKKTM



Constant airflow regulator – RPM-K



Variable airflow regulator – RPM-V



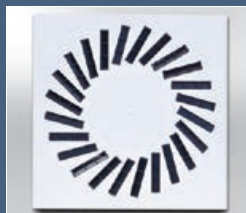
Damping pad – TVM



Overpressure damper – NKTm



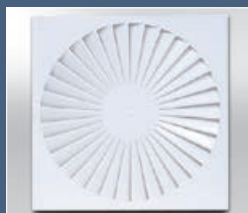
Evacuation (decompression) damper – DM-E



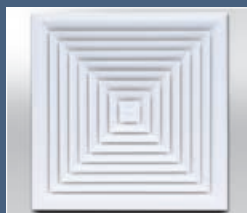
Whirling air outflow outlet – VVM



Whirling air outflow outlet – VVDM



Whirling air outflow vent with fixed blades – VVPM



Anemostat diffuser – ALCM



Anemostat diffuser – ALKM



Architectural anemostat – CHICAGO



Whirling anemostat with adjustable blades – VASM



Whirling anemostat with fixed blades – VAPM



Whirling anemostat with fixed blades - linear – VAPM-L



Connection box to front panels – EKOBX



Perforated panel – DPM



Disk valve – TVOM, TVPM



Slot air outflow outlet – VSV



Large-area vent – VPVM



Covering grille – KMM



Wall mounted grille – SMM, SMPM



Adjustable vent – VNM



Wall vent – SVM



Vent for round duct – VNKM



Long-reach nozzle – DDM II



Rain protective louver – PDZM



Overpressure damper for special applications – NKT MJ



Dark gas-fired infra-red tube heater – HELIOS



Gas hot-air unit – MONZUN



Gas fired hot-air unit with mixing section – MONZUN – RTI



Hot-water air heater – MONZUN – TE



Components of exhaust/air supply system



Ceiling fan – STRATIFIER



Hot air gas heater for HVAC ducts and air conditioning units – MONZUN – EUROKLIM



Fire damper resistant to seismic events, action of high pressure and higher air flow velocity – PKTMB – 120



Fire damper resistant to seismic events, action of high pressure and higher air flow velocity – PKTMF – 120



Fire damper resistant to seismic events, action of high pressure and higher air flow velocity – PKTMJ – 90/120



Regulation damper resistant to seismic events, action of high pressure and higher air flow velocity. Usable as tight damper, overpressure damper, regulation and insulating damper – RKT MJ

MANDÍK, a. s.

Dobříšská 550

267 24 HOSTOMICE

Czech Republic

Tel.: +420 311 706 706

Fax: +420 311 584 810

E-mail: mandik@mandik.cz

www.mandik.cz

Issue date: March 2014

