

INDUSTRIAL HEATING CATALOGUE



MANDIK®

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Company headquarters



MANDÍK, a. s. Company profile

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

The market is primarily promoted on the market by laying emphasis on high-quality technical crafting of products and maximum flexibility in relation to customers. The organizational structure of the company ensures a rapid reaction of the entire company to any kind of requirements from its business partners.

The current level of the company's technical excellence is documented by prestigious supplies of HVAC technology for the most demanding projects – the Prague Metro, Swiss tunnels, the Olkiluoto nuclear power plant in Finland, the Doel nuclear power plant in Belgium, the Angra nuclear power plant in Brazil and others.

All these deliveries are contingent upon the adherence to very strict quality management rules, not limited only to the ISO9001 standard but also to the higher KTA1401 and 10CFR APP10 standards. As a matter of course, the company holds all relevant know-how and certificates.

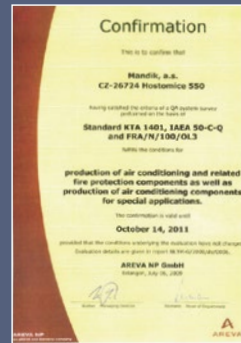
With regard to territorial aspects of business, MANDÍK, a. s. covers, in addition to the domestic market, most of the European countries and many others, such as the UAE, Tunisia, Egypt, Brazil, etc.

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

Certificates



ISO 9001



KTA 1401



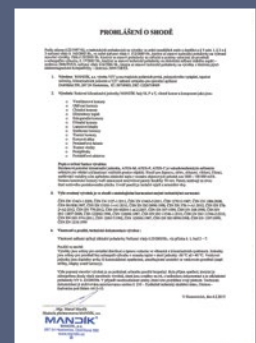
Product certificates



Eurovent certificate



Hygienic assessment



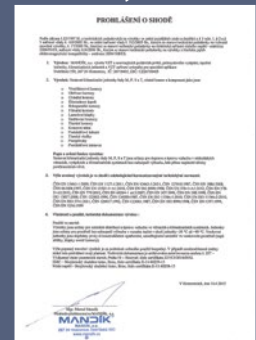
ATEX declaration of conformity



Energy efficiency certificate RT-TUV-01



Testing protocol TUVSUD



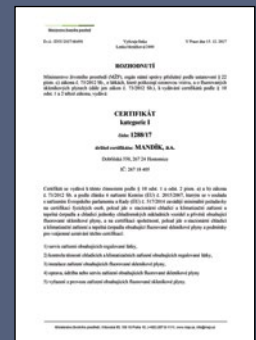
Declaration of conformity



Certificate of electrical safety of Mandík air-conditioning units, including control system



Certificate of electromagnetic compatibility in residential and industrial buildings of Mandík air-conditioning units, including control system



Certificate of the Ministry of the Environment pursuant to Commission Regulation (EU) No. 2015/2067

HELIOS

Dark gas-fired infrared tube heater



The principle of heating with dark infrared heaters HELIOS

Infrared radiation is partially reflected and partially absorbed when it impacts an object. Absorbed radiation is converted into heat that penetrates the body. This is the analogy of sunlight when, even at low temperatures, thermal comfort is felt. This knowledge is used to design the HELIOS infrared heaters. Unlike hot-air heating, in which the hottest air is concentrated near the ceiling, the effect is the opposite in this case. A stable natural thermal effect is created without noise, drafts

and dust swirling in an environmentally friendly manner. We deliberately lower the air temperature in the hall by 3–5 °C and achieve the desired thermal comfort by radiant heat of infrared heaters. This is a sort of “replenishment” to the desired temperature. Lowering of air temperature by 1 °C alone saves about 7 % of energy, i.e. 20–35 % in this case.

Design software HEFAISTOST

The Hefaistos programme serves to calculate the spatial distribution of the resulting temperature and radiant intensity in rooms heated by the Helios dark infrared heaters. With its help, it is possible to optimize the design, number, performance and location of infrared heaters in order to achieve optimal harmony between thermal comfort and investment and operating costs.

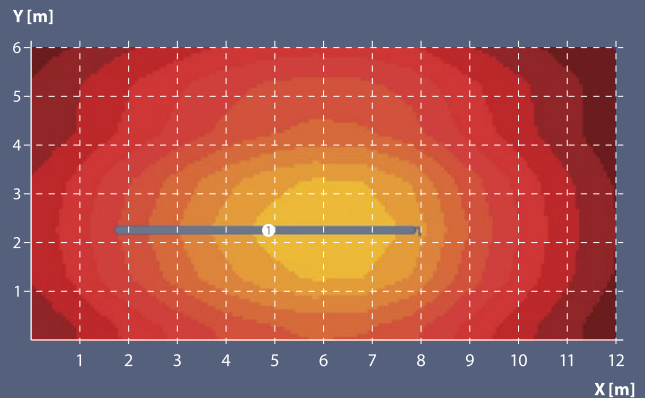
Input data:

- required resulting room temperature
- building location area - calculated outdoor temperature of the location
- hall geometry
- thermal and technical characteristics of cladding
- other potential heat sources

Output includes:

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

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



Values valid at air temperature of 16.7 °C















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

* the entered required resulting temperature is 18 °C

Benefits of heating with HELIOS infrared heaters

- savings of investment as compared to traditional heating installation – 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 losses during medium transport
- enables “zone” heating
- does not cause drafts and dust swirling
- control allowing full automatic operation
- two-stage performance control allows further reduction of operating costs

Technical parameters of the Helios infrared heaters, 10 – 100 series

Infrared heater type	Nominal output power [kW]	Minimal output power of NG [kW]	Electric power input [W]	Max. gas consumption of NG [m ³ .h ⁻¹]	Weight [kg]		Length [m]
10-UD +	11.1	6.1	100	1.26	88		3.8
20-UD +	19.2	10.3	100	2.26	123		5.3
30-UD +	29.5	15.8	100	3.46	155		6.8
40-UD +	37.6	19.3	100	4.27	188		8.3
50-UD +	45.0	23.3	100	5.50	254		11.3
10-ID +	11.1	6.1	100	1.26	100		7,0
20-ID +	22,5	10,3	100	2,51	144		10,0
30-ID +	32,8	15,8	100	3,84	186		13,0
40-ID +	37,8	19,3	100	4,33	229		16,0
ŘADA S							
33-SUD +	32.3	16.4	100	3.75	240		8,4
50-SUD +	57.0	23.3	100	5.47	331		12,4
70-SUD+	61.7	31.9	250	7.16	392.5		14,8
70-SID+	61.7	31.9	250	7.16	304.7		20,2
100-SD+	2× 44,5	2× 23	200	10,36	547,5		21,5

U, I - refers to the tube shape

The types of infrared heaters listed in the table can be in the following versions:

- insulated – two-stage ones
- with a horizontal reflector (0 °) – with a tilted reflector (15 °)
- natural gas (G20) – propane/butane (G31/G30) – propane (G31)

Helios infrared heaters, 10 – 50 series

The Helios gas-fired infrared heaters belong to the category of “dark” infrared radiators, which operate at a surface temperature of up to 550 °C; they are manufactured in several design variants, differing in tube shape, reflector design and burner performance. The combustion chamber of the infrared heater is made of heat-resistant stainless steel, which significantly extends its service life.

Helios infrared heaters, S series

The Helios gas-fired infrared heaters, S series, have been developed on the basis of knowledge and experience with the well-proven standard Helios series. We have achieved a higher radiant efficiency by using a heating tube of a larger diameter of and a standard-insulated reflector. The Helios S infrared heaters are at the top in the category of dark infrared heaters.

Advantages of the Helios S infrared heaters

- suitable for installations in very high-ceiling spaces
- higher radiant efficiency
- two-stage performance and a reflector with insulation in the standard version
- high heating outputs of up to 90 kW



installation of the Helios infrared heater



detail of the pipe connection of the heating tubes

Control

OI control box – it enables manual control of one (OI 1) to six (OI 6) single-stage or two-stage Helios infrared heaters. Power control switching in two-stage infrared heaters is manual. The OI control box can be supplemented with a thermostat – e.g. the TP 08 programmable thermostat, which enables the operation and control of the Helios infrared heaters according to a preset programme.



OI control box

OID control box – it enables fully automatic operation and control of one (OI 1) to six (OI 6) single-stage or two-stage Helios infrared heaters. Power control switching in two-stage infrared heaters is fully automatic based on the evaluation of temperature sensor data. The control box includes a temperature sensor for sensing temperature in the heated space. An external sensor for sensing the radiant component can be supplied.



OID control box

Siemens Climatix Control Box – it enables fully automatic operation and control of Helios infrared heaters, automatic power control switching in two-stage infrared heaters, including sensing of the temperature radiant component within thermal zones with temperature sensors. All the Siemens control box parameters can be entered and monitored via a PC using any web browser without additional costs via TCP/IP communication. Control box enables connection/control of external devices – e.g. windows, doors, fire-protection equipment, dampers, fans, gas meters, gas pipeline armatures, etc.



Siemens Climatix control box

Accessories

AWTM economizer – a counter-current exchanger utilizing the residual heat of flue gases for heating the air.

After starting up an infrared heater, flue gases flow through the economizer internal heat-exchange surface and heat it gradually. As soon as the economizer temperature reaches 42 °C, an air fan starts to blow air between the outer shell and the heat-exchange surface, the heated air exits through an outlet socket and the connected vent or pipeline. When the economiser temperature drops below 30 °C, the air fan stops. Condensate drainage must be provided.



AWTM economizer – a counter-current heat exchanger

Exhaust systems and combustion air supply – flue gases are discharged outside the heated building through a flue gas duct (smoke-flue), which can be made of stainless steel or other suitable material. Air can be supplied from the outside through a system of inlet pipes made of, for example, aluminum, stainless steel, etc. All the components of the exhaust and air supply pipelines can be found in the technical documentation – flue-gas systems and air suction systems.



stainless steel exhaust and air supply pipelines

Suspension of the infrared heater and connecting hoses – the infrared heater can be suspended at a designated location using suspension chains and carabines. The infrared heater is connected to a gas pipeline by means of a 1/2" or 3/4" flexible gas hose.



suspension components and gas hose

MONZUN

Gas-fired hot-air heater



The Monzun gas-fired hot-air heaters are designed for hot air heating of large interior rooms such as workshops, industrial halls, gyms, etc. As a gas appliance they are equipped with forced flue-gas exhaust of type "B" (open appliance) or "C" (closed appliance). The units are equipped with complete power control and an automatic safety device. The Monzun units are manufactured in six power ranges from 11.6 kW to 58.3 kW.

The Monzun gas-fired hot-air heaters can be installed on the building wall or suspended, in a ceiling-mounted version, under the building ceiling. There are appropriate accessories available for all suspension variants, both in the form of suspension components and as accessories that provide fresh air supply.

- combustion efficiency of up to 95.8 %
- heat exchanger all made of stainless steel
- continuous power modulation
- overpressure burner
- low nitrogen oxide emissions



Parameters of the Monzun gas-fired hot-air heaters						
Type units	Maximum heating output [kW]	Minimum heating output [kW]	Max. air flow [m ³ /h]	Range* [m]	Air temperature increase ΔT [°C]	Weight [kg]
15	15.6	11.6	2,200	12	21.1	66
20	20.4	11.6	2,200	12	25.4	66
30	32.1	23.5	2,900	14	32.5	91
40	38	23.5	2,900	14	38.9	91
50	49.9	36.8	5,000	24	29.7	118
60	58.3	36.8	5,000	24	33.9	118



* in open space, residual velocity of 0.25 m.s⁻¹
 ** the specified heating output applies to the G20 fuel (natural gas)

Control

TP 08 thermostat (a programmable thermostat) – it enables automatic control of the Monzun heater depending on temperature, or temperature and adjustable week-long programme.



TP 08 thermostat

MC control box – it enables manual control of the Monzun heater in “winter” (heating) and “summer” (ventilation) modes. For the “winter” mode, the control box can be equipped by a thermostat, e.g. the TP 08 programmable thermostat. The Monzun hot-air heaters are power-controlled manually, by “rotating a wheel”, where the user may choose the heater power output within the range of 60–100 %.

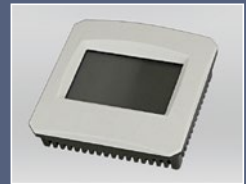


MC control box

MCM Control Box – a digital, full touch-screen, backlit controller that enables the Monzun heater to operate and be controlled automatically.

Power modulation in the Monzun units is fully automatic based on the evaluation of temperature sensor data. The control box enables the user to control the heater in a scheduled programme that enables setting weekdays with six changes for each day.

The control box also offers the option of switching on the fan without the need to operate the gas burner, which in the summer enables the air to circulate in the space where the heater is installed, thus providing a more user-friendly environment.



MCM control box

Siemens Climatix control box – it enables a fully automatic operation and control of the Monzun heaters; power switching/modulation in the Monzun units is fully automatic based on the evaluation of temperature sensor data. All the Siemens control box parameters can be entered and monitored via a PC using any web browser without additional costs via TCP/IP communication. Control box enables connection/control of external devices – e.g. windows, doors, fire-protection equipment, dampers, fans, gas meters, gas pipeline armatures, etc.



Siemens Climatix control box

SGF 24M control box – it provides control of the mixing chamber dampers equipped with servo drives in the Monzun heaters with a mixing chamber. The control box enables proportional adjustment of the mixing chamber dampers in the fresh/internal air supply within the range of 0–100 %. The control box provides power supply to the Belimo servo drive.



SGF 24M control box

Accessories

Exhaust systems and combustion air supply – flue gases are discharged outside the heated building through a flue gas duct (smoke-flue), which can be made of stainless steel or aluminium. Air can be supplied from the outside through an inlet pipeline. All the components of the exhaust and air supply pipelines can be found in the technical documentation – flue-gas systems and air suction systems.



stainless steel exhaust and air supply pipelines

Cantilevers – the Monzun heaters can be installed on a wall using fixed or pivoting cantilevers.



support cantilevers (a set)

Heater hanger – the heaters in the ceiling-mounted version can be suspended under the building ceiling.



heater hanger
– assemblies (a set)

Gas hose – the Monzun heaters are connected to a gas pipeline using flexible gas hoses.



gas hose (stainless steel,
flexible)

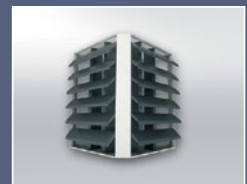
Vents

Basic louver grille – as a standard horizontal louver, it is installed at the air outlet of the Monzun heater; it is intended to direct the exhaust air stream. It is mounted on the front of the heater for horizontal (wall) installation. It is made of galvanized sheet metal and it is powder coated.



Monzun heater with
louver grille

Front angled vent – it is intended to direct the exhaust air stream to the sides. It is mounted on the front of the Monzun heater for horizontal (wall) installation. Each blade of the vent can be adjusted individually. It is made of galvanized sheet metal and it is powder coated.



front angled vent

Vertical angled vent – it is designed for vertical (ceiling) installation at the air outlet of the Monzun heater; it is intended for vertical exhaust of air stream, or for dispersion to the sides. Each blade of the vent can be adjusted individually. It is made of galvanized sheet metal and it is powder coated.



vertical angled vent

Flange – it enables connection to HVAC ducts or to other applications. The flange is made of galvanized sheet metal.



Monzun heater with flange for connection to HVAC duct

Other accessories

Mixing chamber – the Monzun heaters can be equipped with a mixing chamber to mix outdoor and circulating air. It consists of a body made of galvanized sheet metal and of louver dampers designed to adjust a selected air proportion within the range of 0–100 %. The damper is closed for outside air; the dampers are open for circulating air. The control dampers are mechanically coupled to the manual control (version .01) or servo drive (version .57). The mixing chamber can be supplied with or without a filter



mixing chamber

Roof head – it is designed to draw outdoor air from above the roof. It consists of a head body and a head roof. The entire head is made of galvanized sheet metal. There is a bag filter in the body of the roof head. Filter pollution is monitored by a differential pressure switch.



roof head

Rain protection louver – it is designed to terminate the passage piece on the outer wall. The standard version is made of galvanized sheet metal. Other possible versions according to technical data.



rain protection louver

MONZUN TE

Hot-water air heater



The Monzun TE hot-air heater with a water heat-exchanger are designed for hot-air heating (or ventilation) of rooms, workshops, industrial halls, gyms, etc. The heating medium is hot water. They are made in three sizes, with one- to four-row heat-exchangers. The heaters are fitted with axial fans. They are designed for wall or ceiling mounting. An assembly with a mixing chamber can be used for ventilation. The maximum water temperature at the heater input is 100 °C and the maximum pressure is 1.4 MPa. The degree of electric protection of the heater is IP54.

From the point of view of wiring, the heaters can be delivered in the following versions

- **version B** – no extended wiring (does not enable connecting a thermostat and other similar devices)
- **version BT** – enables connecting a thermostat (1 thermostat enables controlling 1 heater)
- **version BTM** – enables multiple heaters to be connected to one thermostat
- **version BTP** – version BT + fan motor thermal protection
- **version BTPM** – version BTM + fan motor thermal protection
- **version 1** – single-phase connection
- **version 3** – three-phase connection



The parameters of the Monzun TE hot-water hot-air heaters

Heater type Monzun TE hot-air heater	Air flow [m ³ /hour]	Output* [kW]	Weight [kg]	Power input [W]	Air flow range ** [m]	Air temperature increase ΔT [°C]
Monzun TE 1.1.150	1,500	9.6	22	90	9	34
Monzun TE 1.1.180	1,650	10	23	85	11	33
Monzun TE 1.1.220	1,950	11	22	120	14	31.8
Monzun TE 1.2.150	1,450	17.1	25	85	10	50
Monzun TE 1.2.200	1,750	19.5	24	120	12	48.1
Monzun TE 1.2.250	2,050	21.5	25	150	15	46.2
Monzun TE 1.3.180	1,650	22	26	120	11	54.6
Monzun TE 1.3.220	1,900	24.2	27	150	13	52.8
Monzun TE 1.4.150	1,600	26	29	120	10	63.3
Monzun TE 1.4.180	1,750	27.7	29	150	12	62
Monzun TE 2.1.200	2,100	13.1	32	120	12	33.5
Monzun TE 2.1.250	2,600	14.8	34	150	16	31.9
Monzun TE 2.1.400	3,500	17.2	36	260	21	29.6
Monzun TE 2.2.250	2,300	25.5	36	150	14	47.9
Monzun TE 2.2.320	3,100	30.4	38	260	20	44.1
Monzun TE 2.2.420	3,900	35	38	480	23	41.7
Monzun TE 2.3.220	2,250	31.8	39	150	13	57
Monzun TE 2.3.280	2,800	36.5	39	260	18	53.7
Monzun TE 2.3.400	3,700	44.3	41	480	22	50.6
Monzun TE 2.4.200	2,150	36.4	41	150	12	65.2
Monzun TE 2.4.250	2,650	42.2	41	260	15	62.3
Monzun TE 2.4.350	3,200	48.1	43	480	20	59.6
Monzun TE 3.1.450	3,900	25.8	55	260	16	34.7
Monzun TE 3.1.600	5,100	29.7	56	480	20	32.3
Monzun TE 3.1.800	6,000	32.2	58	570	23	30.9
Monzun TE 3.2.420	3,600	45	58	260	15	52.1
Monzun TE 3.2.560	4,800	54.5	59	480	19	48.7
Monzun TE 3.2.700	5,600	60	61	570	22	46.8
Monzun TE 3.3.400	3,550	51.5	62	260	15	58.1
Monzun TE 3.3.500	4,600	61.5	63	480	18	54.7
Monzun TE 3.3.600	5,400	68	65	570	21	52.4
Monzun TE 3.4.350	3,500	61.1	65	260	14	66.8
Monzun TE 3.4.450	4,500	73.5	66	480	17	63.8
Monzun TE 3.4.520	5,100	80.3	68	570	20	61.8

* the above performance data apply at heating water temperature of 90/70 °C and air inlet temperature of 15 °C; ** residual velocity 0.25 m/s

TP 08 thermostat (a programmable thermostat) – enables manual control of the Monzun TE heater air fan (or more heaters in case of the BTM version) depending on temperature and adjustable week-long programme. The thermostat can also be used to control the pump of a respective heating circuit.



TP 08 thermostat

Freeze-protection thermostat – it is designed to stop the fan running when the output water temperature drops below 6 °C, or to send a signal to shut off the fresh air control damper at the mixing chamber operated with a servo drive (version .57).



freeze-protection thermostat

SGF 24VM control box – it is designed for control the mixing chamber dampers operated with a servo drive (version .57). It also enables connection of a freeze-protection thermostat to ensure protection of the heat-exchanger from water freezing. The control box provides power supply to the Belimo servo drive.



SGF 24VM control box

P-E fan speed controller – it enables manual control of fan speed with a circular switch.



P-E-2,5 – 10 fan speed controller

Accessories

Support cantilever – the heaters can be installed on a wall using a fixed support cantilever.



heater support cantilever (a set)

Heater hanger – the heaters in the ceiling-mounted version can be suspended under the building ceiling.



heater hanger (a set)

Vents

Basic louver grille – as a standard horizontal louver, it is installed on the air outlet of the Monzun TE heater; it is intended to direct the exhaust air stream. It is mounted on the front of the heater for horizontal (wall) installation unit in a standard version or a two-sided-vent version. It is made of galvanized sheet metal and it is powder coated.



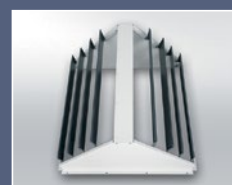
Monzun TE heater with a basic louver grille

Two-sided vent – it is designed to direct the exhaust air flow to the sides. It is mounted on the front of the Monzun TE heater for horizontal (wall) installation in combination with a standard basic louver grille. It is made of galvanized sheet metal and it is powder coated.



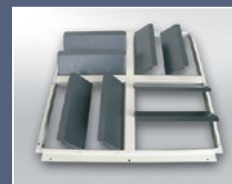
two-sided vent

Vertical angled – it is designed for vertical (ceiling) installation at the air outlet of the Monzun TE heater; it is intended for vertical exhaust of air stream, or for dispersion to the sides. Each blade of the vent can be adjusted individually. It is made of galvanized sheet metal and it is powder coated.



vertical angled vent

Vertical four-sided vent – it is designed for vertical (ceiling) installation at the air outlet of the Monzun TE heater; it is intended to direct exhaust of air stream to four sides. It is made of galvanized sheet metal and it is powder coated.



vertical four-sided vent

Other accessories

Mixing chamber – it is designed to mix outdoor and circulating air. It consists of a body made of galvanized sheet metal and of three louver dampers designed to adjust a selected air proportion within the range of 0–100 %. The damper is closed for outside air; two dampers are open for circulating air. The control dampers are mechanically coupled to the manual control (version .01) or servo drive with continuous control (version .57). The mixing chamber is supplied with or without a filter.



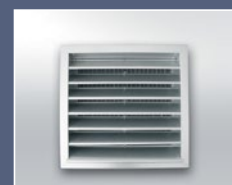
mixing chamber

Roof head – it is designed to draw outdoor air from above the roof. It consists of a head body and a head roof. The entire head is made of galvanized sheet metal. There is a bag filter in the body of the roof head. Filter pollution is monitored by a differential pressure switch.



roof head

Rain protection louver – it is designed to terminate the passage piece on the outer wall. The standard version is made of galvanized sheet metal. Other possible versions according to technical data – TPM 079/01.



rain protection louver

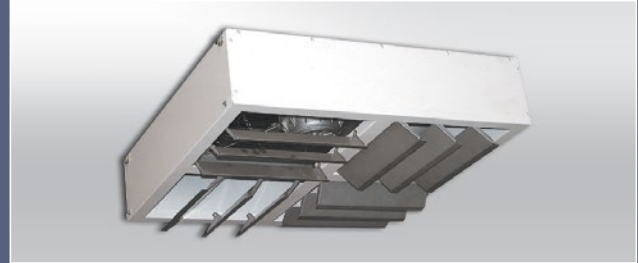
DESTRATIFIER

Ceiling-mounted fan



Destratifier – a ceiling-mounted fan ensures forced downward air flow (to the working zone), thus reducing the temperature gradient between the upper and lower parts of the hall. This contributes to the efficiency of industrial hall heating, especially in combination with hot-air heating.

Destratifier – a ceiling-mounted fan is equipped with a thermostat that controls the fan operation. The destratifier is manufactured in three power ranges with an air flow of 4,300 m³/hour up to 9,100 m³/hour.



Ceiling-mounted fan type	D1	D2	D3
Air flow rate at 20 °C [m³/hour]	4,300	5,700	9,100
Fan power input [A]	260	480	520
Current B [A]	1.15	2.10	2.40
Fan speed [revolutions /min.]	1,380	1,390	950
Acoustic pressure level* [dB (A)]	46	48	44
Electrical connection	230 V / 50 Hz		
Recommended circuit breaker	6 A		
Protection	IP 20		

* value for free-field noise propagation at a distance of 7 m for D1, 10 m for D2, 13 m for D3

Accessories

Suspension material – the ceiling-mounted fans can be suspended under the ceiling using a suspension chain and carabines

The P-E fan speed controller enables continuous changes of fan speed with a circular switch.



chain + carabines for suspending the ceiling-mounted fan



P-E-2,5 speed controller



installation of a ceiling-mounted fan



P-E-6 speed controller

Popis zařízení

Room air-conditioning units MANDÍK KFR are designed for heating and cooling of homes as well as office spaces. Thanks to inverter technology, they are cheap to operate and environmentally friendly.

The continuous change of the compressor speed by the inverter ensures the highest energy efficiency in all air-conditioning operating modes.

The KFR air-conditioning units ensure that the environment in your home or office is stable in both winter and summer months. Thanks to the dehumidification function and an ionisation filter, the air-conditioning units are able to create a cleaner, healthier environment in your home or office.

Benefits

- Low operating costs thanks to using inverter technology
- Energy class A++ for cooling, A+ to A+++ for heating
- The heating system is able to operate at an outdoor temperature of up to -15 °C
- Environment-friendly – the operation of the units does not produce any harmful substances discharged into the environment (zero emissions) and negative environmental impacts



Technical parameters				
Model			KFR-09GW/BP	KFR-12GW/BP
Power supply		V-Hz	220–240 V~ 50Hz, 1f	220–240 V~ 50Hz, 1f
Cooling	Rated power output (range)	W	2,638 (1,026–3,224)	3,517 (1,084–4,103)
Cooling	Power input	W	100–1,240	100–1,580
Heating	Rated power output (range)	W	2,931(821–3,370)	3,810 (879–4,220)
Heating	Power input	W	120–1,200	130–1,510
Seasonal cooling	Energy efficiency class		A++	A++
Heating (average)	Pdesignh	kW	2,2	2,3
	Energy efficiency class		A+	A+
Heating (warmer)	Pdesignh	kW	2,8	2,9
	Energy efficiency class		A+++	A+++
Heating operating temperature limit Tol		°C	-15	-15
Max. power input		W	2075	2200
Airflow volume of indoor unit (Hi/Mi/Lo)		m ³ /h	420/320/270	570/470/370
Acoustic pressure level of indoor unit (Hi/Mi/Lo/Si)		dB(A)	40/34/29.5/25	41/36/28/23
Acoustic output level of indoor unit (Hi)		dB(A)	52	53
Indoor unit	Dimensions (W × D × H)	mm	715 × 194 × 285	805 × 194 × 285
	Weight net/gross	Kg	6.8/8.9	7.2/9.6
Airflow volume of outdoor unit		m ³ /h	1,800	1,800
Acoustic pressure level of outdoor unit		dB(A)	55.5	56
Acoustic output level of outdoor unit		dB(A)	60	59
Outdoor unit	Dimensions (W × D × H)	mm	770 × 300 × 555	770 × 300 × 555
	Weight net/gross	Kg	25.2 / 27.4	25.5 / 27.7
Coolant	Type		R410A	R410A
	GWP		2,088	2,088
Coolant piping	Pressure side / Return side	mm (inch)	1/4" / 3/8"	1/4" / 3/8"
	Max. length of coolant piping	m	25	25
	Max. height difference	m	10	10
Thermostat – type			Remote control	Remote control

AIRSTREAM

Gate curtain



Gate curtains are HVAC system devices intended to separate indoor and outdoor environments in industrial buildings. When opening an industrial gate, the indoor temperature in the building decreases, thus reducing the thermal comfort and increasing the heating costs.

The air stream from the gate curtain serves to reduce undesirable ingress of outdoor air into the heated space while the gate is opened. The curtain is based on a powerful radial fan that draws in the warmer air from the upper layers of the heated room and blows it into the gate space through a long and narrow vent.

The operation of the curtain is controlled either manually or, more preferably, by means of a limit switch installed on the gate. The connection box enables switching on multiple gate curtains with one limit switch. Gate curtains are installed directly above a gate for vertical air stream or, in case of wider gates, a necessary number of gates curtains is installed. The installation is made by using a gate-curtain holder which makes it possible to turn the gate curtain and thus also the air stream in at an angle ranging from -30° to $+15^{\circ}$ from the vertical plane.

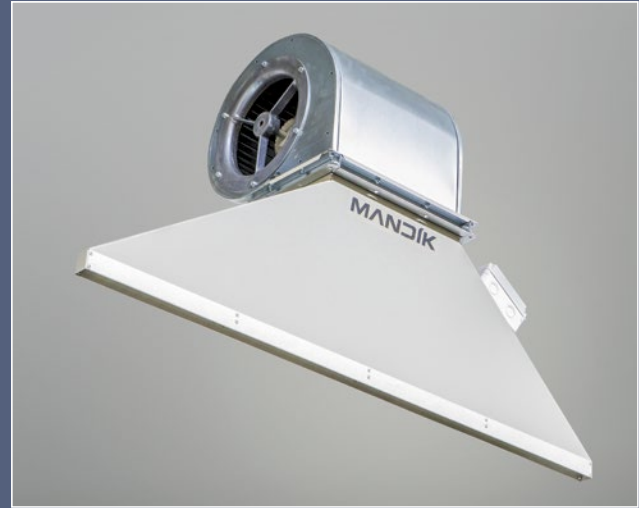
Technical parameters:

Type		AS 47
Airflow volume	m ³ /h	4,700
Noise level at distance 1 m	dBA	79
Max. installation height	m	5.5
Opening (gate) width	m	2.5 to 3.5
Fan speed	rpm	1,200
Maximum static pressure	Pa	480
Motor power input	W	1,950
Number of fans		1
Power supply	V/Hz	400/50
Current	A	3.4
Circuit breaker	A	3x 10 A
Degree of protection		IP40
Curtain weight	Kg	34.8

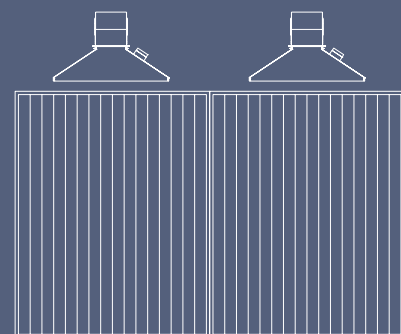
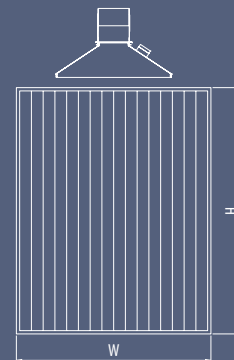
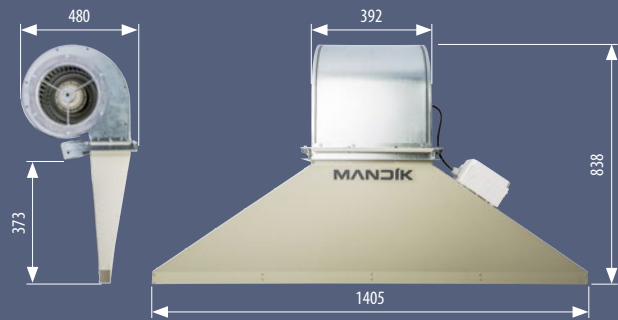
Installation of the gate curtain above a gate and maximum dimensions of gate:

Gate curtain	Maximum gate dimensions	
	width W (mm)	height H (mm)
AS 47	3,500	5,500

For wider gates, multiple gate curtains side by side are used



Dimensions:



OTHER MANUFACTURING PROGRAMM

Fire-fighting technology



Fire damper – PKTM 90-C(K)



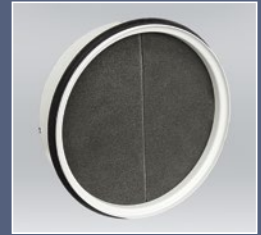
Fire damper – PKTM III



Fire damper – FDMC



Fire damper – FDMD



Fire damper – CFDM



Fire dampers without thermal insulation – DM-S



Multi-leaf fire damper – FDML



Fire dampers – FDMS



Duct silencer – SMR, SMRF

Smoke and heat extraction technologies



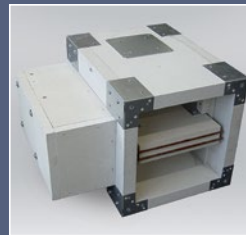
Single-compartment smoke extraction damper – SEDS



Single-compartment smoke extraction damper – SEDS-R



Single-compartment smoke extraction damper – SEDS-L



Multi-compartment smoke extraction damper – SEDSM



Multi-compartment smoke extraction damper – MSD



Multi-blade smoke damper – BRK-J

Other HVAC components



Damping pad – TVM



Non-return damper, overpressure damper – NKTM



Evacuation (decompression) flap – DM-E



Duct silencer – SMR

Air regulation technologies



Square regulation/adjustment damper – RKM



Square tight regulation/adjustment damper – RKTm



Square aluminium regulation/adjustment damper – RKALM



Round regulation/adjustment damper – RKKM



Round tight regulation/adjustment damper – RKKTM



Round variable airflow regulator – RPM-V



Round constant airflow regulator – RPM-K



Square variable airflow regulator – RPMC-V



Square constant airflow regulator – RPMC-K

Air-handling units



Compact air-handling unit MANDIK



Air-handling unit MANDIK



Air-handling unit MANDIK with heat pump

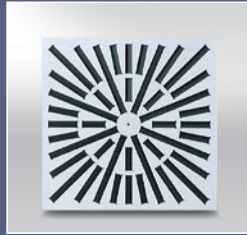


Control system

Distribution elements



Whirling air outflow outlet – VVM



Whirling air outflow outlet – VVDM



Whirling air outflow outlet with fixed blades – VVPM



Anemostat diffuser – ALCM



Anemostat diffuser – ALKM



Whirling anemostat with adjustable blades – VASM



Whirling anemostat with fixed blades – VAPM



Whirling anemostat with fixed blades – linear – VAPM-L



Plenum box for front panels – EKOBX



Dish valve – T VOM, T VPM



Slot airflow vent – VSV



Slot airflow vent – SDL



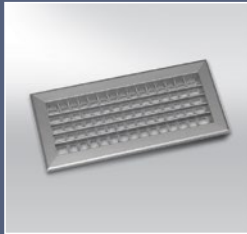
Large-area vent – VPVM



Covering/protection grille – KMM



Wall-mounted grilles – SMM, SMPM



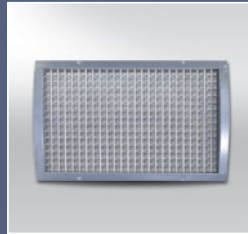
Adjustable vent – VNM



Wall-mounted vent – SVM



Vent with fixed blades at 45° angle – RAG45



Vent for round – VNKM



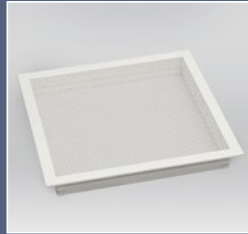
Stainless-steel adjustable vent – VNMI



Long-range nozzle – DDM II



Rain-protection louver – PDZM



Perforated air diffuser – DVCM

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