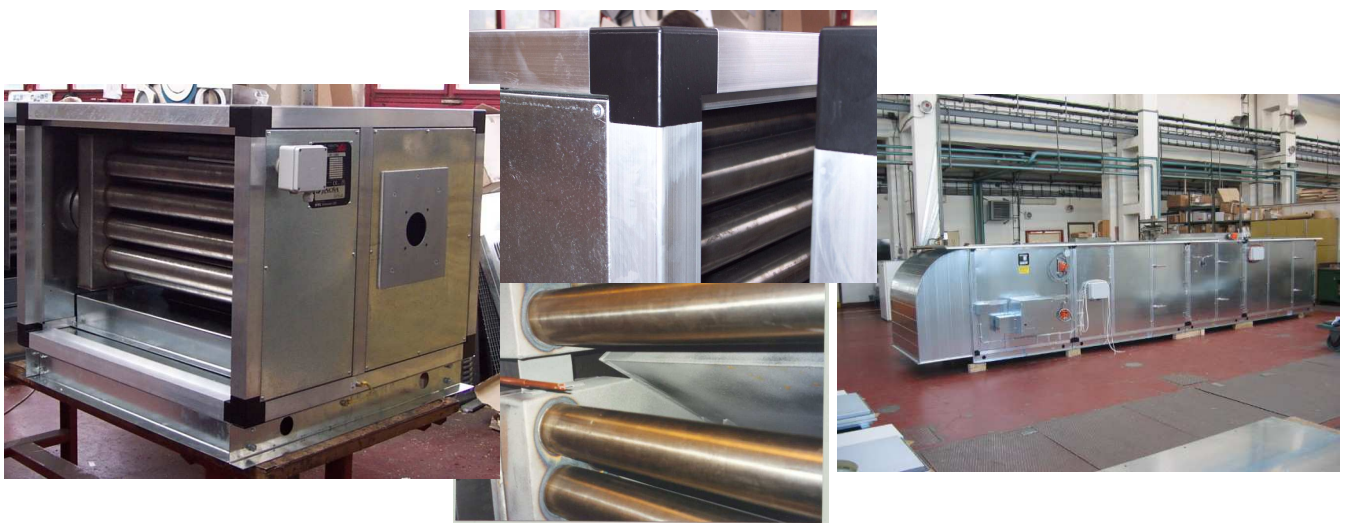


# ICS - Praha



## MTPAL MODULAR GAS-FIRED AIR HANDLING UNITS



MTPAL modular air handling units with gas heating are designed for air transport, air heating and air treatment in ventilation, heating and technical systems in all industry branches and civic amenities. Traditional utilization includes mainly:

- heating and ventilation of shop floors, factory buildings, and warehouses
- heating and ventilation of shops and supermarkets
- replacement of exhausted air during production processes
- air supply and air treatment for spray booths
- air supply for specific production lines

### **Advantages of MTPAL units**

- **Quick and easy heating and ventilation**
- **High efficiency**
- **Low investment and operational costs**
- **High flexibility of manufactured units**
- **Practical block design**



### **Basic characteristics of MTPAL units**

**Heat load: 20-5000 kW**  
**Air volume: up to 120 000 m<sup>3</sup>/h**

The air volume provided by the standard series of MTPAL units lies within the range of 1 500 – 60 000 m<sup>3</sup>/h. Special units provide up to 120 000 m<sup>3</sup>/h.

Heat load of standard MTPAL units lies within the range of 10 - 900 kW, upon request we can also provide heaters with outputs up to 3000 kW.

The units are produced in block or chamber designs. The frame of the units is made of aluminium sections; panels have the thickness of 45 mm and are filled with mineral wool. They are produced only in horizontal design on a support frame.



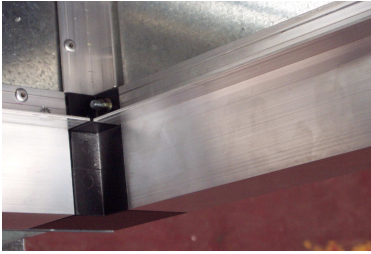
Gas heating components are always equipped with a ventilating valve bypass. Centrifugal fans are placed on a joint frame and fitted on a vibration insulator.

The units are complemented with standard series of pocket filters, valves, mixing chambers and other standard accessories.

The whole construction of the unit fully complies with the modern construction trends and meets the most demanding requirements for ventilation and heating device operations.

### **Construction:**

The units are divided into blocks and chambers according to transport standards, layout and unit equipment in order to reduce production costs. Upon customer request, individual blocks can be further divided, or the unit can be delivered in a more compact design. All components of the unit are supplemented with a support frame – upon customer request, it can be a joint frame for several blocks.



Unit frames are made of modular aluminium sections with square cross section of an edge length of 50 mm. The jacketing ensures maximum thermal insulation of the unit. It is made of sandwich panels filled with mineral wool, the thickness is 45 mm. For increased durability and longer lifetime, the panels are supported with glued and riveted sections.

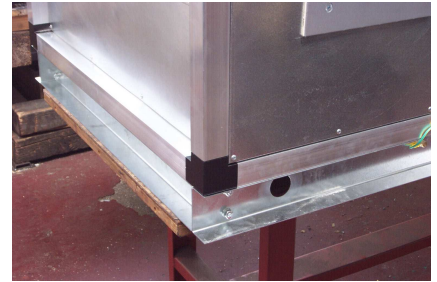
Depending upon their position, the panels are attached to the aluminium frames with rivets, bolts and nuts, plastic fasteners, or hinges and catches.

Apart from standard high-quality gasket, the panels for outdoor use to which no access is necessary are sealed. Upon customer request, for an additional charge the panels can be delivered sprayed with any colour of powder paints.

The support frame is mounted from corrugated zinc-coated sections linked and supported with connections. By all transport units, the support frame is equipped with transport lugs and holes for assembling the unit to the floor.

For joining of the units, we commonly deliver bolts with distance tubes, which ensure a tight and strong joining without any harm to the unit.

All components of the unit are standardly produced in a non-silicone version.



### **Application of the unit with regard to its placement:**

MTPAL units are delivered in designs for both indoor and outdoor use.

The indoor design can be used only in basic environment in compliance with the Czech ČSN EN 330300 standard. Unlike basic design, units for outdoor use are equipped with sealed panels and an all-covering zinc-coated sheet metal roof that fully covers the unit, the roof is sealed with capping strips. The outdoor design is further equipped with covering for the burner, thermostats and for all delivered components that require protection.



### **Fan component**

The fan component of MTPAL units is usually combined with a diffusion chamber of an appropriate length. The fans of the MTPAL units are always centrifugal fans with a volute casing, low- or middle-pressure fans, upon customer request. According to their parameters, the fans are either in a basic design or fitted in a bracing frame. The exhaust of the fan can be also directed upwards or downwards, or the air can be sucked into the fan component from vertical directions.



Motors, together with the fans, are situated on an integral frame which is fitted in the unit frame and is removable if needed. The frame is attached to the construction and unit volute panels, bigger fans are anchored to a support frame with the help of a specially supported floor panel. Transmission is provided by euro pulleys and V-belts.

Non standard units are equipped with double fans with a shared shaft, or two parallel fans.

The fan component has a door for access to the motor and the fan. Upon request it is possible to deliver fan components with eye-slits and transmission coverings.

## **Filtration component**

Standard filtration components can be equipped with a whole range of standard cartridge filters – EU-3 to EU-9 class pocket filters, frame pre-filters, filters from synthetic materials, from fibreglass etc. Upon request, we can also deliver carbon filters.

Pocket filters in standard-size cartridges are placed in lateral side rails. Filter replacement is then carried out by simply drawing the filters out one after another into the service side of the unit.



## **Mixing and valve components, valves**

As a standard, the units are equipped with aluminium valves with plastic boxes that fully cover the control hand wheels. It reduces significantly deposition of soil particles in the cogs and reduces demands on valve maintenance.

Mixing chambers are fitted with all-covering valves from outside, or with valves with a small hole inside the mixing chamber, upon customer request or according to the mixing ratio. In units for indoor use, the valves for suction of air from the ambient medium are covered with grids, in units for outdoor use they can be complemented by weather-proof louvers.

Valves with a small hole designed for articulation at the ductwork are standardly delivered together with an electric sleeve.

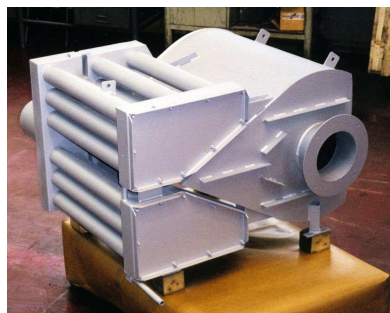
Delivered valves are ready to be fitted with actuating mechanisms (actuating mechanisms can be included in the delivery), or they are delivered in a design with manual operation. Large valves are usually divided so that they can be controlled by several actuating mechanisms. Mixing valves can be joined with a rod for master control.

## **Gas heating components**

Gas heating MTPAL components are fitted with a high-quality exchanger with a combustion chamber and a bypass. Depending on its output, the heater is 3 ducted or 4 ducted and it is made from selected materials to guarantee the longest lifetime and highest efficiency with the given specifications. The combustion chamber is constructed to maximise flue gas recirculation and minimise combustion emissions. The tubular exchanger is constructed for maximum efficiency and operation with the lowest air resistance.

The combustion chamber and the edges of the tubular exchanger are supplemented with build-up plates and ribs to regulate air flow in the exchanger components and maximise the heat transfer surface. All pipes are fitted with a flue gas whirler.

The high quality workmanship and refined construction of the MTP exchanger guarantees a lifetime that exceeds the one of standard exchangers that work on the same principle.



Depending on the given specifications or on customer request, the chimney exhaust can be situated on the rear side of the heater, the burner side or the upper side. Conventional standards for chimneys of gas facilities with a pressure burner apply to this chimney.

The gas heating component is equipped with valve bypass to enable precise regulation of the outlet temperature and to enhance the lifetime and efficiency of the exchanger. The bypass is situated in the upper part of the heating component – when directly attached to the ductwork unstable temperature just behind the exhaust must be taken into account. The bypass valve is all-metal, heat-resistant, and cannot be damaged even by sudden failures of a unit with hot exchanger. With correct regulation and control of the burner and the bypass, the exhaust temperature of the unit can be regulated with an accuracy of approximately  $\pm 1^{\circ}\text{C}$  (against a standard accuracy of a pressure burner without bypass regulation approximately  $\pm 5^{\circ}\text{C}$ ). Regulation systems can be delivered together with the unit.



### Burners

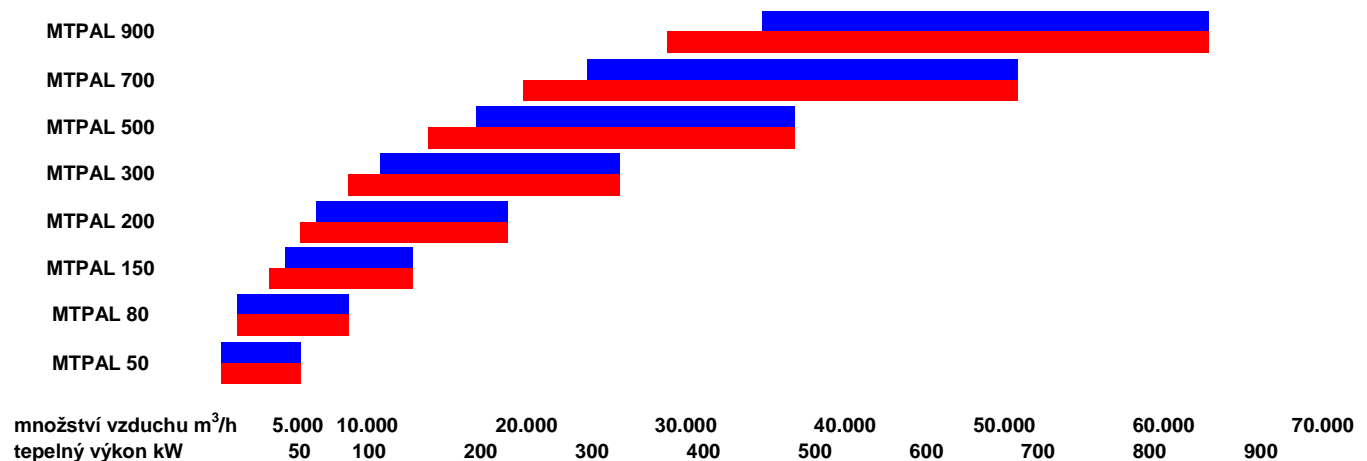
With the unit, we standardly deliver Weishaupt pressure burners that burn natural gas, propane, butane, extra light heating oil and other kinds of fuels. Burners are standardly delivered with a two-stage or modulating regulation. Burners comprise entire gas fittings, electric control and all safety functions.

### Electric accessories of the heaters and Metering and Regulation systems

The units delivered can include controls and safety elements, and upon customer request can be also delivered in any output range. For example, the units can be delivered only with fitted actuating mechanisms, or with basic control electric starter box only for protection and start up of the main motors.

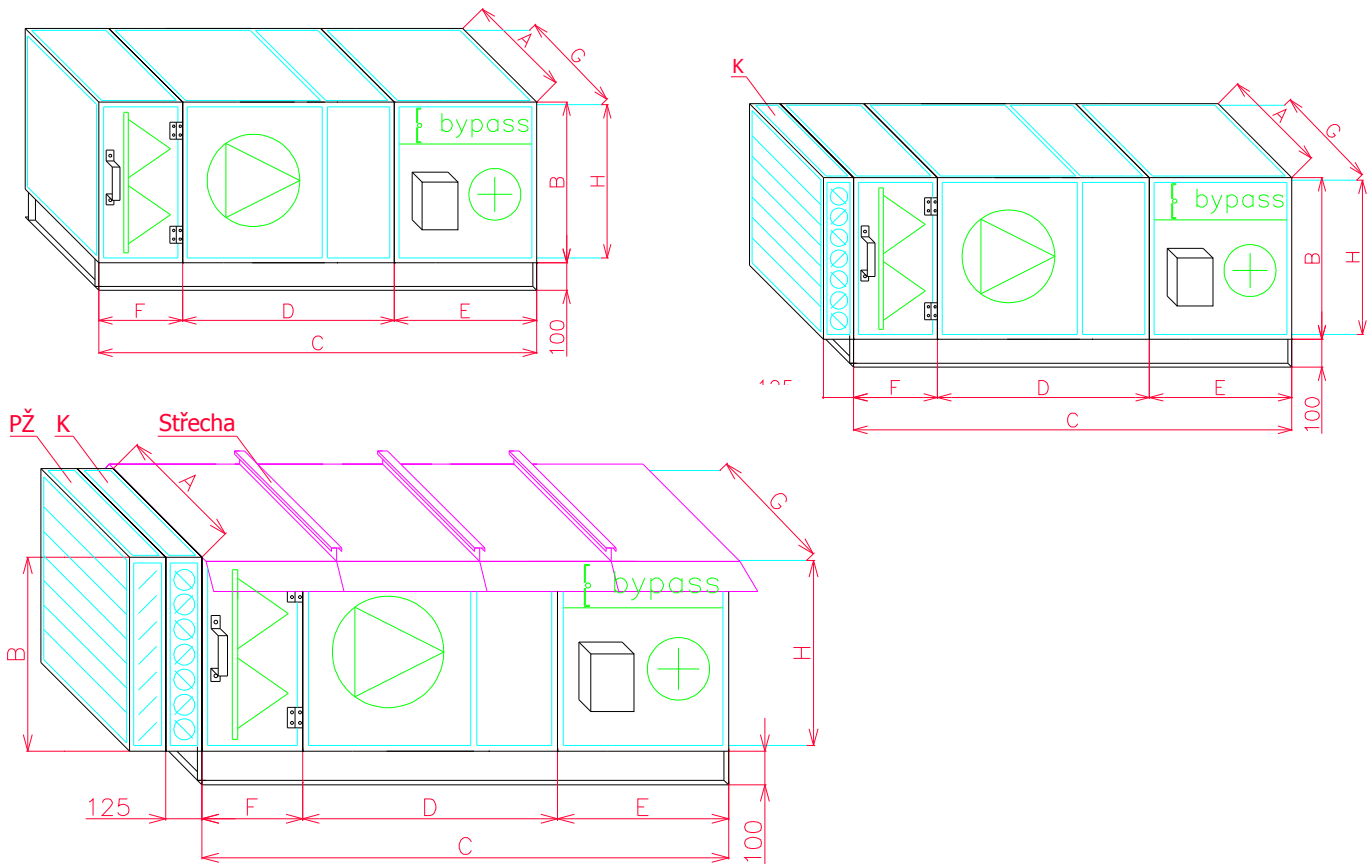
Regulation delivered together with the unit is usually designed for a particular event, for example with regard to the requirement to adjust ambient temperature (shops) or supply temperature (e.g. spraying booths).

The control of the unit can be manual - combination of basic electric control and manual valves control, manual and electronic - with a protective electric starter box, or can be supported by advanced regulators connected with further control systems. The metering and regulation system can be also delivered including a full installation work and start-up of the units.



## SUPPLY ASSEMBLY MTPAL FILTER-FAN-HEATER

- The most common air handling unit with gas heating. The standard production unit has two designs with two exchanger sizes for two output levels. Pocket filter is delivered in all standard levels of filtration. The following basic designs can be complemented e.g. with a cooling chamber.

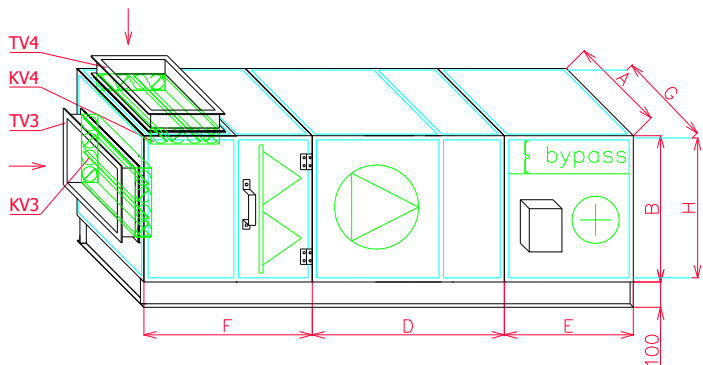


Outdoor design is complemented with a roof and, if needed, with a weather-proof louver for suction of fresh air.

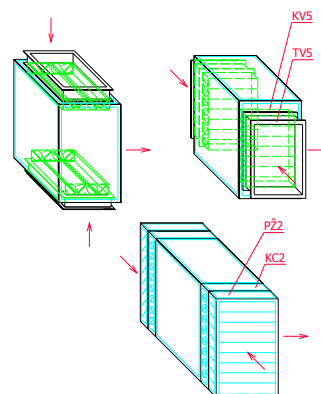
parameters / type	50	80	150	200	300	500	700	900
max. output [KW]	50	80	140	200	275	460	700	900
max. flow at 300 Pa	5200	8800	12500	18000	25000	36000	48000	60000
standard. motor [KW]	1,1 - 3	2,2 - 4	3 - 5,5	4 - 7,5	5,5 - 11	11 - 18,5	15 - 30	22 - 30
BK	P/37	37/65	65/100	100/150	150/225	225/400	400/525	400/650
weight [kg]	600	800	1200	1350	1750	2450	3450	4450
valve K [mm]	830x650	1030x850	1280x950	1380x1200	1530x1450	1930x1600	2330x2050	2730x2150
WPL [mm]	830x630	1030x830	1280x930	1380x1180	1530x1430	1930x1580	2330x2030	2730x2130
A [mm]	900	1100	1350	1450	1600	2000	2400	2800
B [mm]	700	900	1000	1250	1500	1650	2100	2200
C [mm]	3050	3350	3650	4120	4450	4900	6000	6500
D [mm]	1550	1700	1800	2020	2250	2450	3100	3450
E [mm]	1000	1150	1350	1600	1700	1950	2400	2550
F [mm]	500	500	500	500	500	500	500	500
G [mm]	800	1000	1250	1350	1500	1900	2300	2700
H [mm]	600	800	900	1150	1400	1550	2000	2100

## SUPPLY ASSEMBLY MTPAL MIXING CHAMBER-FILTER-FAN-HEATER

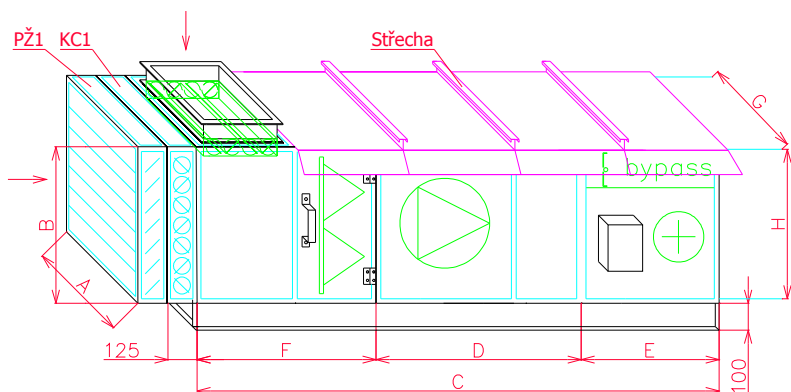
- The most common air handling unit with gas heating. The standard production unit has two designs with two exchanger sizes for two output levels. Pocket filter is delivered in all standard levels of filtration. The following basic designs can be complemented e.g. with silencing blocks on suction and exhaust. The mixing chamber can be fitted with louver valves on all sides. For air supply through pipes, the valves are usually inside the mixing chamber with an elastic sleeve outside, for suction of fresh air outside valves are used, complemented with a weather-proof louver.



Further examples of placement and labelling of suction valves



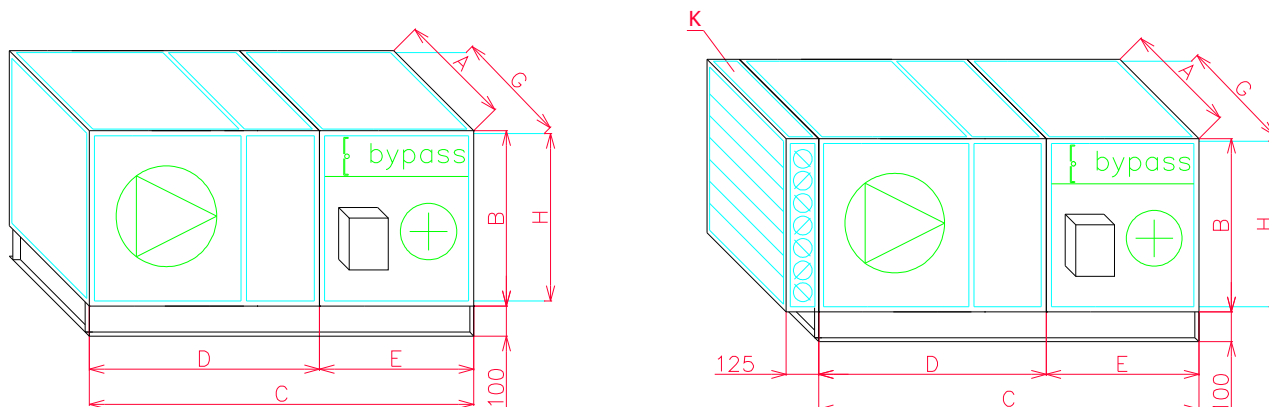
Outdoor design including an all-covering louver valve for suction



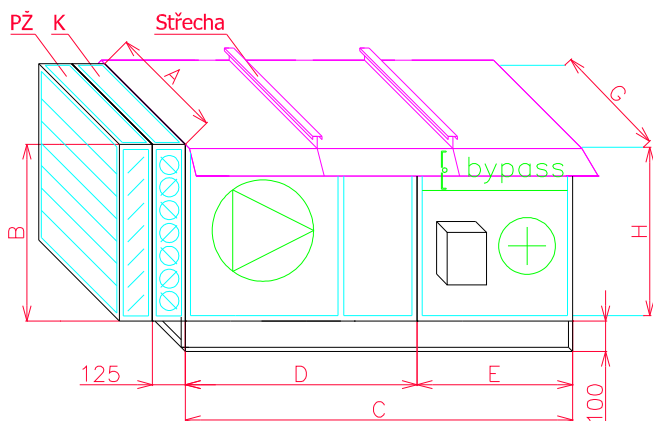
parameters \ type	50	80	150	200	300	500	700	900
max. output [KW]	50	80	140	200	275	460	700	900
max. flow at 300 Pa	5200	8800	12500	18000	25000	36000	48000	60000
standard motor [KW]	1,1 - 3	2,2 - 4	3 - 5,5	4 - 7,5	5,5 - 11	11 - 18,5	15 - 30	22 - 30
BK	P/37	37/65	65/100	100/150	150/225	225/400	400/525	400/650
weight [kg]	700	900	1300	1500	1900	2650	3700	4750
K1 [mm]	830/650	1030/850	1280/950	1380/1200	1530/1450	1930/1600	2330/2050	2730/2150
K2 [mm]	730/650	880/850	980/950	1080/1200	1180/1450	1380/1600	1480/2050	1480/2150
K3 [mm]	500x355	700x500	950x630	1050x700	1100x800	2x(600x1300)	2x(700x1500)	2x(900x1600)
K4 [mm]	500x355	700x500	950x630	1050x700	1100x800	1500x900	2x(800x1000)	2x(900x1000)
K5 [mm]	380x400	500x500	600x630	700x900	800x1100	900x1300	1000x1700	1060x1800
TV3 [mm]	500x355	700x500	950x630	1050x700	1100x800	2x(600x1300)	2x(700x1500)	2x(900x1600)
TV4 [mm]	500x355	700x500	950x630	1050x700	1100x800	1500x900	2x(800x1000)	2x(900x1000)
TV5 [mm]	380x400	500x500	600x630	700x900	800x1100	900x1300	1000x1700	1060x1800
WPL1 [mm]	830x630	1030x830	1280x930	1380x1180	1530x1430	1930x1580	2330x2030	2730x2130
WPL 2 [mm]	730x630	880x830	980x930	1080x1180	1180x1430	1380x1580	1480x2030	1480x2130
A [mm]	900	1100	1350	1450	1600	2000	2400	2800
B [mm]	700	900	1000	1250	1500	1650	2100	2200
C [mm]	3800	4250	4650	5220	5650	6300	7500	8000
D [mm]	1550	1700	1800	2020	2250	2450	3100	3450
E [mm]	1000	1150	1350	1600	1700	1950	2400	2550
F [mm]	1250	1400	1500	1600	1700	1900	2000	2000
G [mm]	800	1000	1250	1350	1500	1900	2300	2700
H [mm]	600	800	900	1150	1400	1550	2000	2100

## SUPPLY ASSEMBLY MTPAL FAN-HEATER

- The simplest air handling unit with gas heating. The standard production unit has two designs with two exchanger sizes for two output levels. The following basic designs can be complemented for example with silencing blocks on suction and exhaust.



Outdoor design is complemented with a roof and, if needed, a weather-proof louver for suction of fresh air



parameters \ type	50	80	150	200	300	500	700	900
max. output [KW]	50	80	140	200	275	460	700	900
max. flow at 300 Pa	5200	8800	12500	18000	25000	36000	48000	60000
standard motor [KW]	1,1 - 3	2,2 - 4	3 - 5,5	4 - 7,5	5,5 - 11	11 - 18,5	15 - 30	22 - 30
BK	P/37	37/65	65/100	100/150	150/225	225/400	400/525	400/650
Weight [kg]	500	700	950	1200	1550	2200	3200	4150
valve K [mm]	830x650	1030x850	1280x950	1380x1200	1530x1450	1930x1600	2330x2050	2730x2150
WPL [mm]	830x630	1030x830	1280x930	1380x1180	1530x1430	1930x1580	2330x2030	2730x2130
A [mm]	900	1100	1350	1450	1600	2000	2400	2800
B [mm]	700	900	1000	1250	1500	1650	2100	2200
C [mm]	2550	2850	3150	3620	3950	4400	5500	6000
D [mm]	1550	1700	1800	2020	2250	2450	3100	3450
E [mm]	1000	1150	1350	1600	1700	1950	2400	2550
G [mm]	800	1000	1250	1350	1500	1900	2300	2700
H [mm]	600	800	900	1150	1400	1550	2000	2100