

STEAM HUMIDIFIERS

RANGE OF APPLICATION

Humidification of air in various technological processes, in lounges and industrial premises, such as:

- hospitals
- offices
- laboratories
- museums
- libraries
- graphic premises
- fitness centres
- steam saunas
- store-houses
- air-conditioners
- etc.



DESCRIPTION

The electrode steam humidifier generates steam, within a disassembling vessel, out of potable water. Steam is developed as a consequence of heat originating from passage of electric steam through the water. The developed steam is aseptic, denuded of calcite and other mineral substances. The mineral substances thicken the water within the humidifier. After the required concentration is reached, they are transported into waste by means of a pump. The steam output of the humidifier is regulated by the altitude of water in the humidifier vessel. The electronic regulator of the humidifier secures the control of the intake valve, of the pump and of the fan, as well as all the other activities necessary for achievement of the necessary steam output, required humidity of the space being humidified, as well as reliable, safe and economical performance.

ELNP

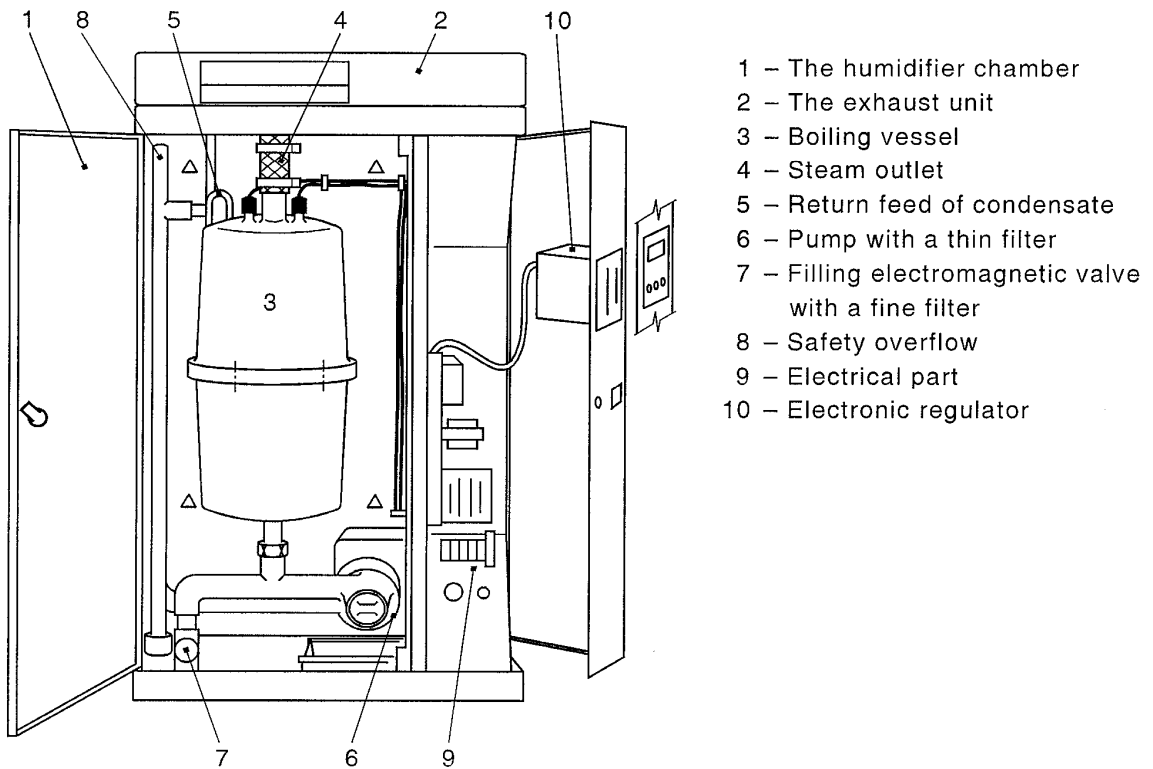


Fig. 1 Components overview

The humidifier vessel with accessories

The vessel of the humidifier has a cylindrical shape and is constructed of health unexceptionable, high-quality plastic material. The water circuit of the humidifier is constructed so that the humidifier vessel is contaminated by the minerals in the minimum possible extent. For this reason, the vessel has a large volume and the water thickened by the minerals is being drained by a powerful pump. There is no screen inside the humidifier vessel; the pump drains also the sediment particles. The thin filter which forms a common block with the pump, is opened easily, without the necessity of using tools. After a time when other humidifiers require exchange of the complete vessel, the vessel of the ELAP humidifier can be disassembled, cleaned and used further. This provides savings concerning not only the costs but also the environment.

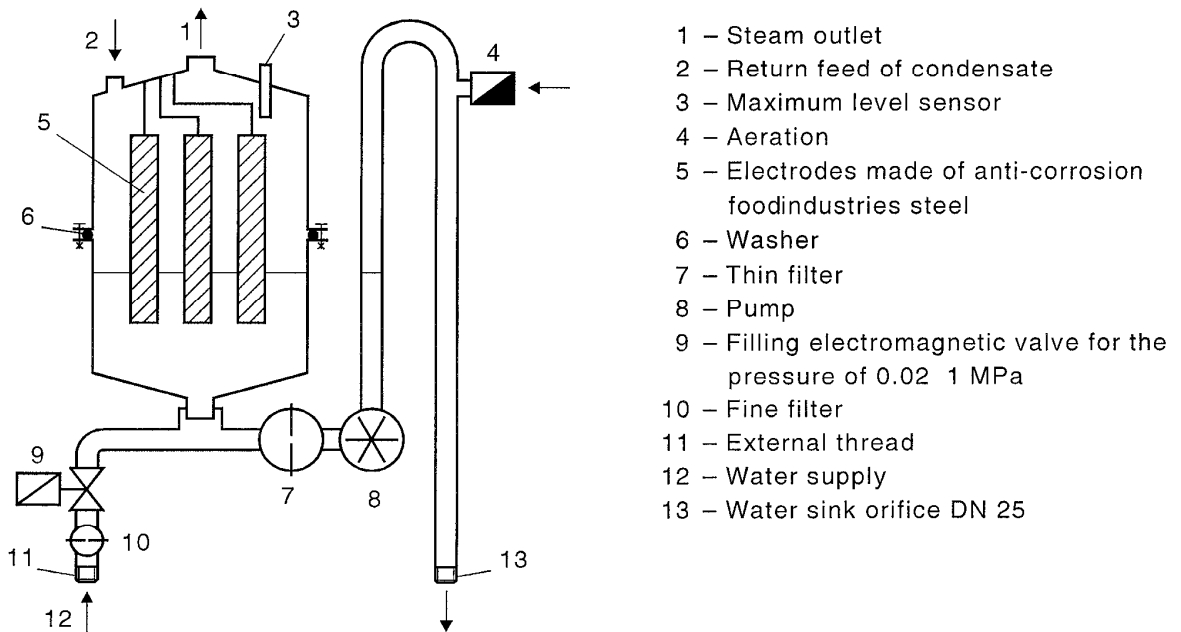


Fig. 2

Regulator

The electronic regulator is constructed on basis of the state-of-art technology Surface Mount Technology (SMT). Its function is to maintain the prescribed steam output by regulating the altitude in the vessel and, according to the water hardness, to drain economically the water thickened by minerals. The steam output of the humidifier, e.g. the amount of steam for a given period of time, can be set in an extent of 10% to 100% of nominal output. Clogging of the water sink orifice or eventual choking of the humidifier vessel is being signalled, whereby water intake and further functioning of the humidifier is blocked.

According to the requirements, the regulator is capable to maintain relative humidity in the specified area, in the air-conditioning piping, or, based on external signal, to modify the steam output.

The required relative humidity may be set directly at the humidifier, or from the site of the sensor, e.g. from the sensor EAS 229, whereby regulation of the steam output can be two-position or, at higher requirements on precision of regulation, continuous or with modulation control, as the case may be. Continuous regulation is also used in case of indirect humidification of areas in cases when, at certain conditions, the state of insufficient absorption of steam from the humidifier in the air-conditioning piping occurs. The following illustrations show the connection of external signals and supply for the individual humidifier models.

The control of operation of the external fan is used only in special cases during indirect humidification, or in steam saunas.

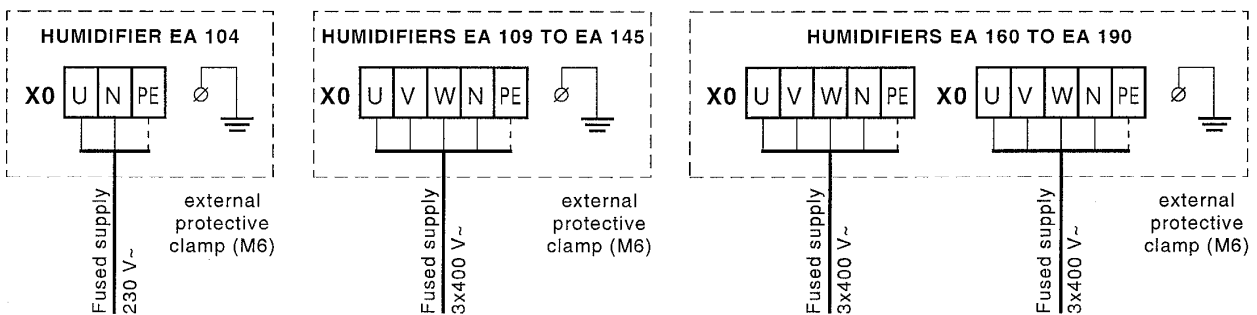


Fig. 3a

Supply for
a one-phase version

Fig. 3b

Supply for
a three-phase version

Fig. 3c

Supply for
a three-phase version

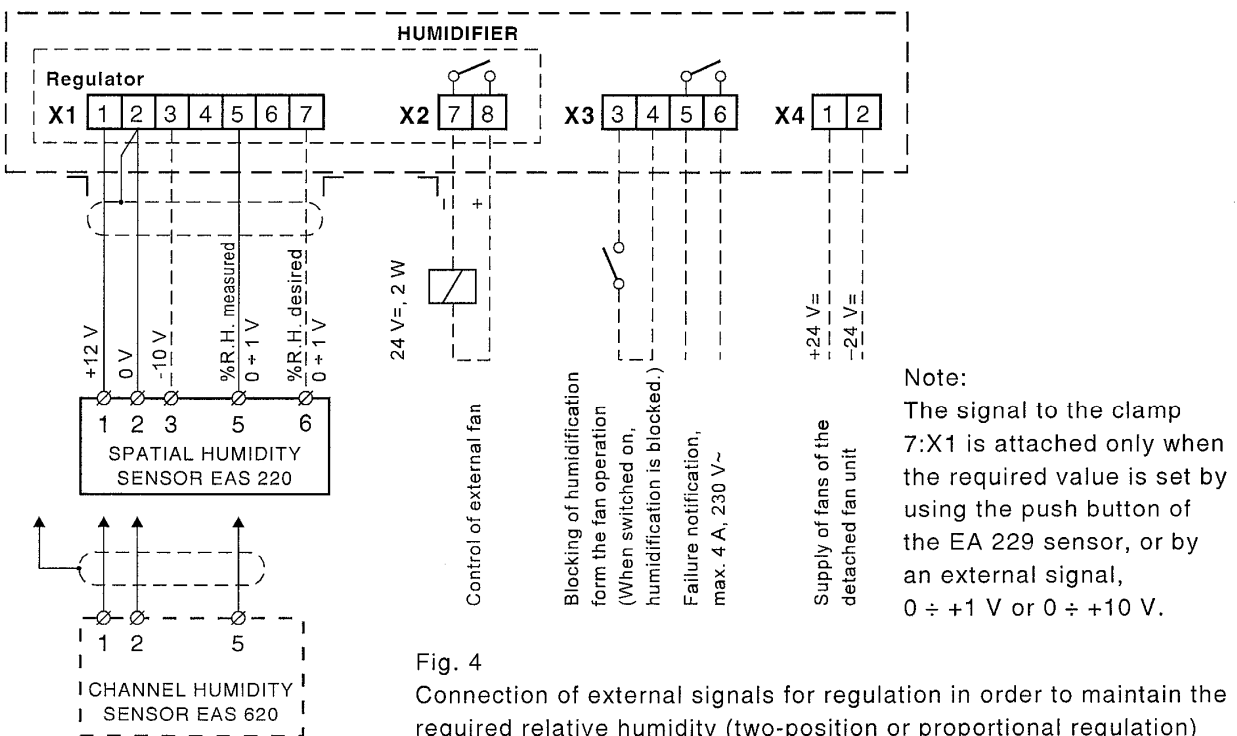


Fig. 4

Connection of external signals for regulation in order to maintain the required relative humidity (two-position or proportional regulation)

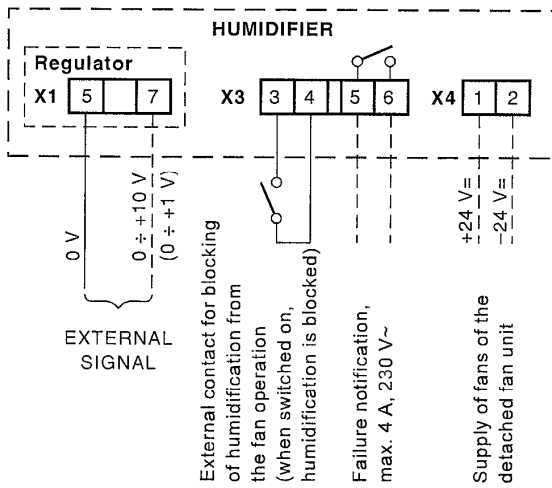


Fig. 5a

Control of the humidifier steam output using external signal, continuously, in an extent of 0-100% of the pre-set output

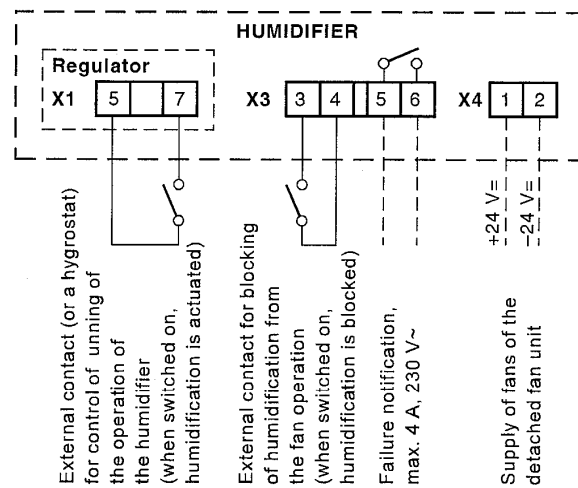


Fig. 5b

Control of the humidifier by means of an external contact

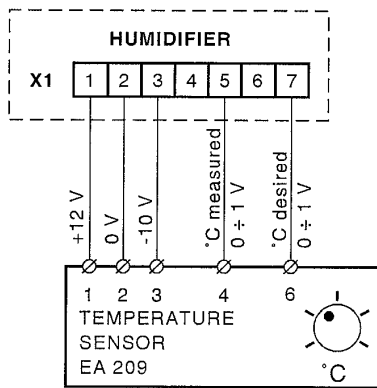


Fig. 5c

Connection of external signals for regulation of temperature in steam sauna

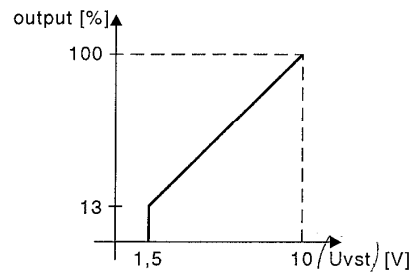
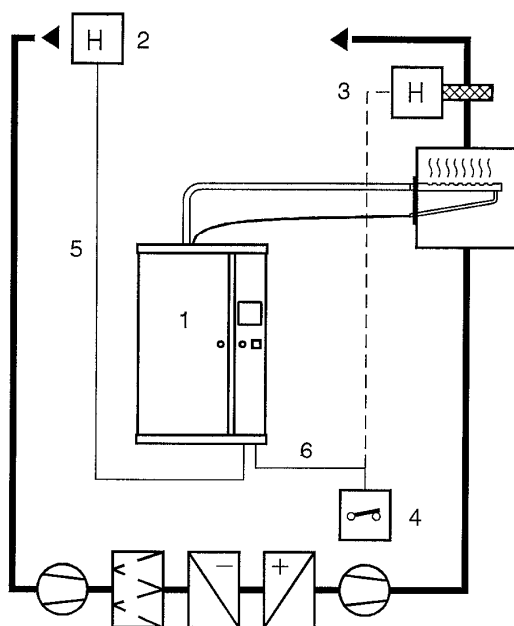


Fig. 5d

Continuous regulation of steam output by external signal

INDIRECT HUMIDIFICATION OF THE AREA



Connection of external signals in case of indirect humidification

Fig. 6

- 1 - Humidifier
- 2 - Humidity sensor in the area or a computer of an air-conditioning device
- 3 - Safety hygrostat (when switched on, humidification is blocked)
- 4 - Contact of the fan remote-control switch or a switch of air flow
- 5 - Shaded string cable, e.g. Mk 4x0.35
- 6 - String cable, e.g. 2x0.35

Steam from the humidifier is being transported to a distributor, which may be situated in the air-conditioning device or in the piping. The steam distributor may be situated above or under the humidifier. The distance of the steam distributor from the curves, turnings, fans etc. has to be as much as possible. The minimum distances are within an interval of 0.5 to 8 m, whereby the difference of air relative humidity in front and next to the distributor is in an extent between 5 and 90%.

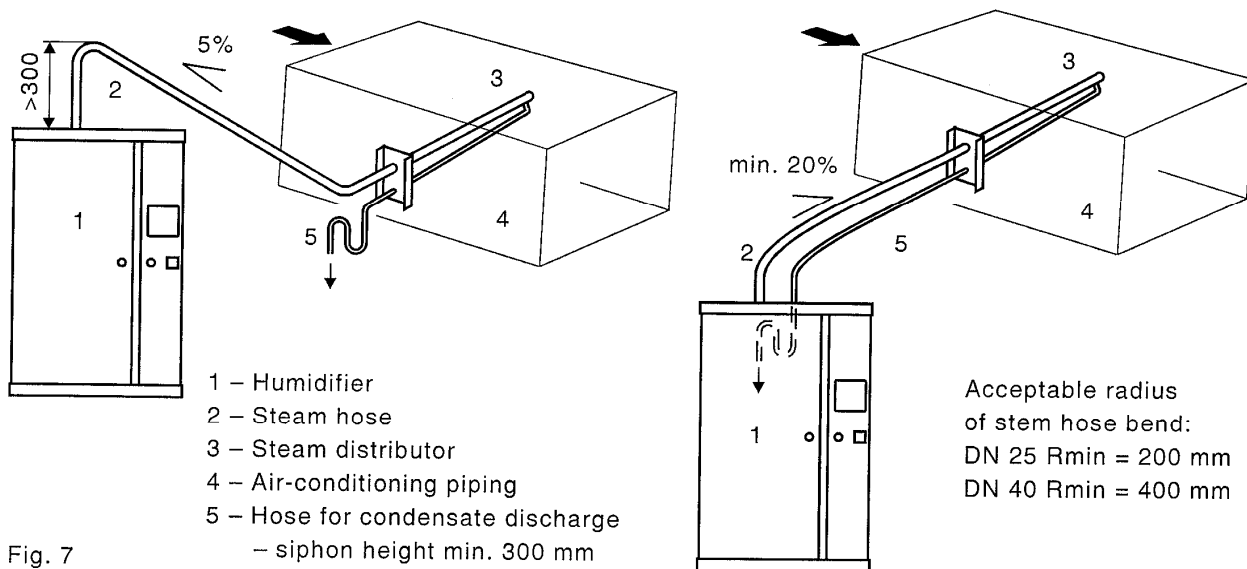


Fig. 7

DIRECT HUMIDIFICATION OF THE AREA

Trouble-free function of the humidifier depends on correct distribution of steam, which has to be homogenous, free of drops. With the EA 104 and EA 109 humidifiers, the fan unit is mounted directly onto the humidifier case and is shipped also in a modification for separated mounting. The fan unit has to be mounted in such a way so that the flow of the mixture of steam and air does not hit the surrounding objects. As a general principle, there should be free space of at least 1 m from both sides of the fan unit, the distance from the ceiling at least 1 m, 3 m to 6 m in front of the humidifier for the output of 4 to 18 kg of steam per hour (higher output is delivered upon request). In cases of high relative humidity, or low relative ambient air temperatures, it is necessary to increase the distances specified above.

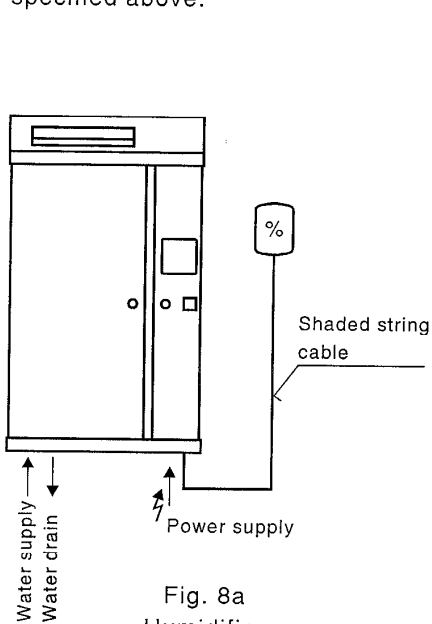


Fig. 8a
 Humidifier with a fan unit

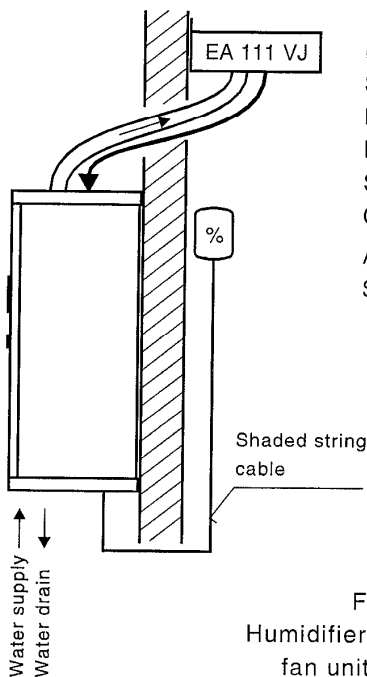


Fig. 8b
 Humidifier with detached fan unit EA 111 VJ

EA 111 UNIT - TECHNICAL SPECIFICATION:
 Dimensions: 450x90x300 mm
 Maximum output: 11 kg/hour
 Steam supply: DN 25
 Condensate drain: DN 9
 Air volume: 170 m³/hr.
 Supply: 24V = / 7.2W
 (directly from the humidifier)

ACCESORIES

Steam distributors

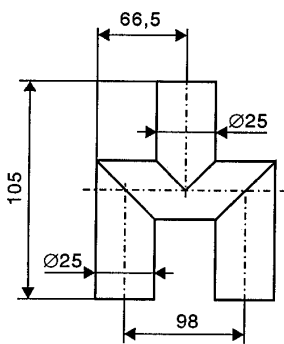
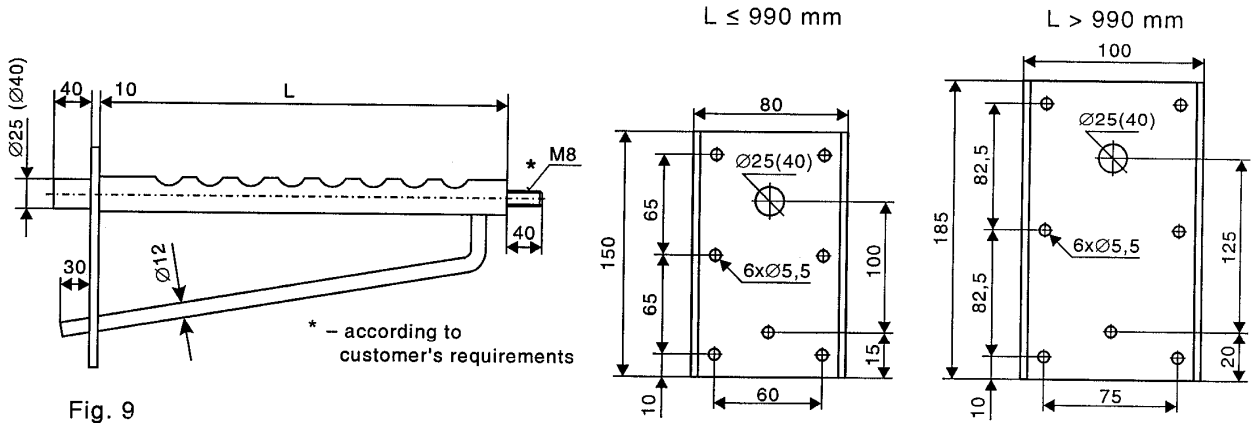
– are made of food industry anti-corrosion steel.

Lengths supplied as follows:

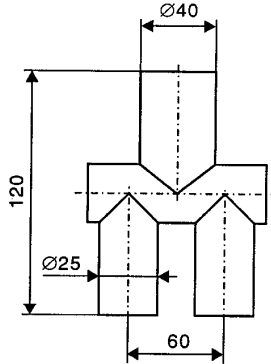
DN 25 L = 200, 250, 300, 350, 400, 450, 500, 550, 600, 800, 900 mm

DN 40 L = 300, 350, 400, 450, 500, 550, 600, 650, 700, 800, 900, 1000, 1200 mm

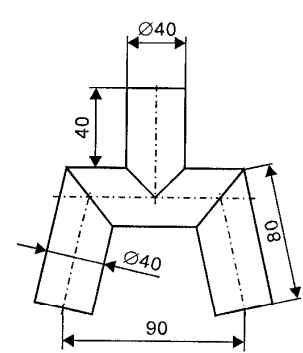
Other lengths upon producer agreement.



T piece 2xDN 25 / 1xDN 40



T piece 2xDN 25 / 1xDN 40



T piece 2xDN 40 / 1xDN 40

Hoses

Steam hose internal DN 25mm and DN 40 mm.

Condensate hose internal DN 9 mm.

Water drain hose DN 25/40.

Water supply hose with drag-through nuts with an 1" thread, for interconnection of the humidifier with a fixed water supply.

Sensors

Spatial sensors of relative humidity are supplied without a pushbutton, type EAS 220.x, and with a pushbutton for entering the desired humidity value from the area, type EAS 229.x. For sensing of air humidity in the air-conditioning piping, channel sensors of type EAS 620.x are used.

Other accessories

Cables for connecting of sensors and other external signals, clamps for attachment of hoses for steam and condensate are supplied upon request.

TECHNICAL DATA

TYPE	EA 104.xx	EA 109.xx	EA 118.xx	EA 130.0x	EA 145.0x	EA 160.0x	EA 190.0x
Max. output [kg/hour]	4	9	18	30	45	60	90
Output range [kg/hour]	0,4 ÷ 4	1 ÷ 9	2 ÷ 18	3 ÷ 30	4,5 ÷ 45	6 ÷ 60	9 ÷ 90
Max. electrical wattage [kW]	3,0	6,9	13,7	22,5	33,8	2x22,5	2x33,8
Supply voltage [V]	230 / 400	400	400	400	400	400	400
Current 50 Hz [A]	13 / 4,3	10	19,8	32,5	48,8	2x32,5	2x48,8
Number of phase	1 / 3	3	3	3	3	3	3
Operating weight [kg] 0x / 1x	18 / 21,5	19	34	60	86	102	160
Width [mm]	450	450	694	600	600	1090	1090
Height [mm]	700	700	700	766	766	766	766
Depth [mm]	300	300	300	380	380	380	380
Steam hose DN 25	1	1	2	–	–	–	–
Steam hose DN 40	–	–	–	1	2	2	4
Condensation hose	1	1	2	1	2	2	4

The EA 104 and EA 109 humidifiers with a fan unit have a height of 760 mm.

Covering: IP20. Protection against dangerous contact voltage provided by connecting to zero potential and by interconnection.

MARKING

E A - - - . x x	0 – control by means of an external switch
0 – steam exhaust into the piping	1 – 2-position regulation, entering the desired value at the humidifier
1 – steam exhaust into the area	2 – 2-position regulation, entering the desired value at the sensor
	3 – continuous regulation, entering the desired value at the humidifier
	4 – continuous regulation of output from external signal [0 ÷ +10 V]
	5 – continuous regulation, entering the desired value at the sensor
	6 – modulation control (for very fine humidity control of small areas) for EA 104, 109

INSTALLATION

Steam humidifiers are installed in compliance with the "Recommendation for projection and installation", which is an integral part of the documentation accompanying the humidifiers.

The steam humidifier may be installed in an area without danger of explosion, with the ambient temperature of +1÷+40°C up to 80% rel. air humidity.

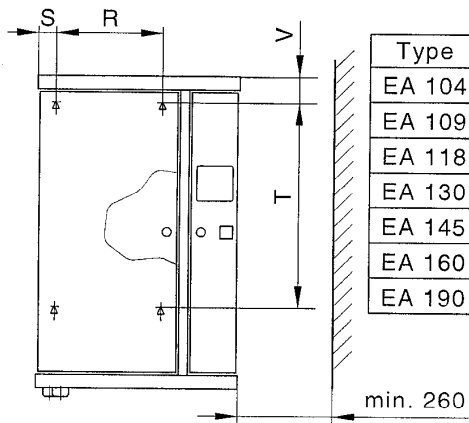


Fig. 11
Attachment dimensions

The connection for water supply at the humidifier has, for screwing attachment of its flexible water supply hose, an external 1" thread. Water supply pressure: 0.02 ÷ 1 MPa
Water conductivity:
min. 125 µS/cm
max. 1250 µS/cm
A closing valve has to be mounted at the water inlet. Water drain has a closing for fitting a DN 25 hose.

ADVANTAGES OF ELAP STEAM HUMIDIFIERS

- Long lifetime
- Low maintenance costs
- The supplied steam is aseptic and deprived of minerals
- Simple operation (consists of mere switching on the mains switch and setting the desired area humidity)
- Rapid steam production
- Robust pump with a thick and easily dismountable filter

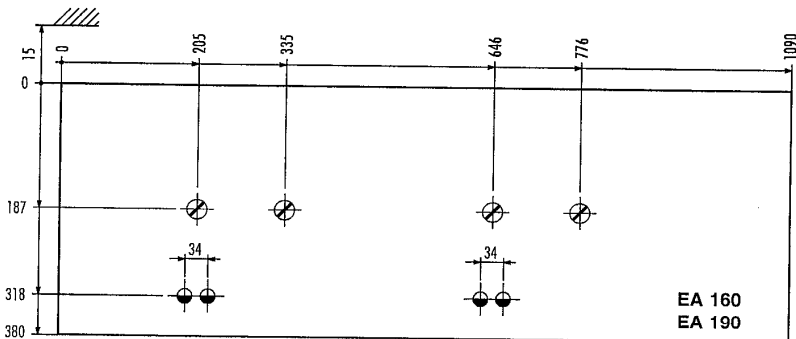
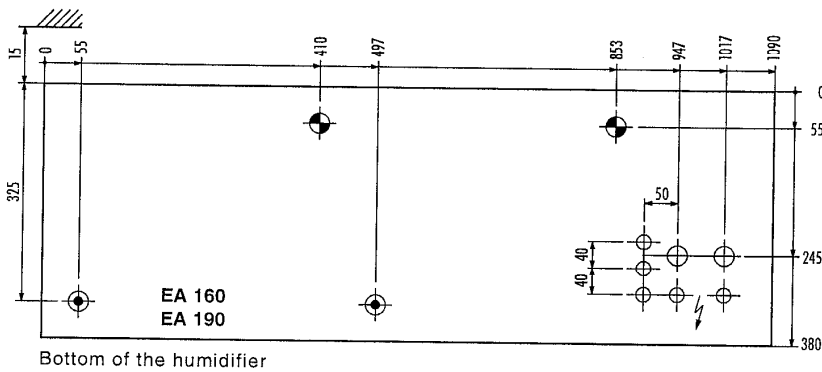
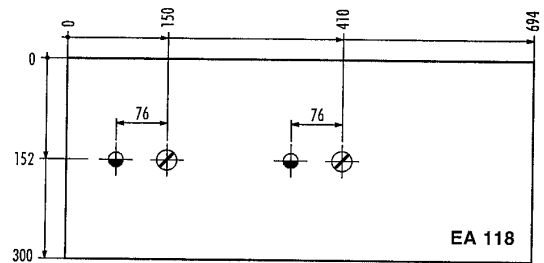
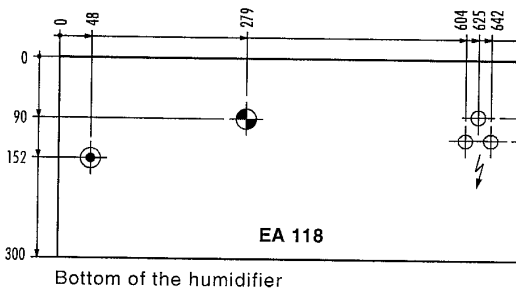
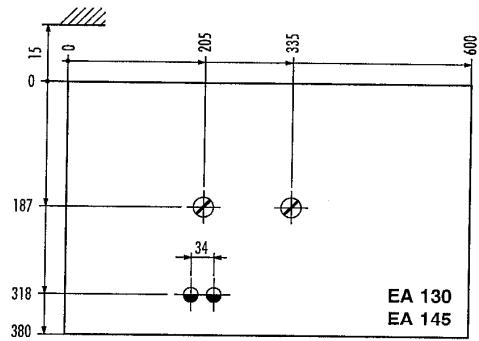
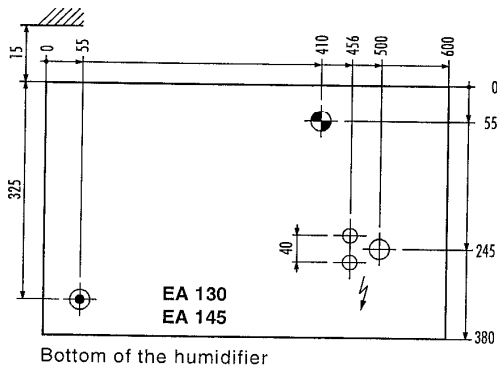
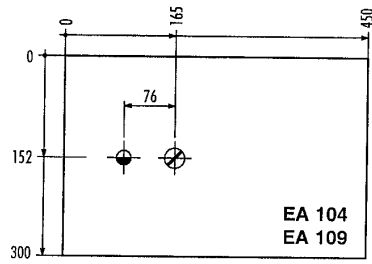
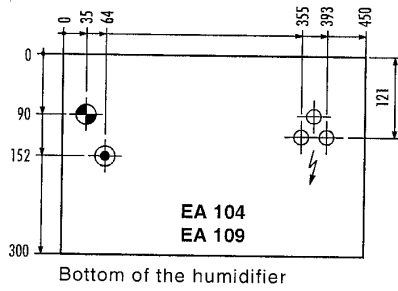


Fig. 12
Connection dimensions for:

- water supply
- water drain
- steam distribution
- condensate discharge
- electric connections

A view from above.