

Electrically Heated Evaporator for Capacity to 10000PPD(200kg/hr) · Series EV7000



- Fully Automatic Control by Microprocessor-based Controller
- 1 Month Working Data Memory backing by Black-box
- Easy Check of Working Condition by Newly-improved Controller
- Vaporizer Chamber Fabrication exceeding ASME Code
- Standard Design of No Circulation Pump by a way of Convection
- New Design of Cathode Protection System
- Simple Set of Control Values

The Series EV7000 electrically heated evaporators are automatically vaporized and superheated liquid chlorine, sulfur dioxide or ammonia at rates controlled by the using system.

The evaporators are designed and fabricated in accordance with Section VIII, Div. 1 of the ASME Boiler and Pressure Vessel Code. The digital LCD controller has a multi-function for the control and display the status of operation for the vaporizing process.

Four buttons of controller are soft-touch style and easily connected with program and operators. The evaporators are housed in corrosion resistant and attractive fiberglass reinforced polyester cabinets identical in size and color to the cabinets of AQUS floor mounted gas dispensers.

AQUS considers chlorine a lethal gas and recommends the evaporator be purchased with the testing and inspection requirements necessary to meet Part UW-2 of the code which covers vessels built to contain lethal substances

- Welding meets lethal gas requirements.
- Fabricated using seamless pipe for lethal gas.
- Whole vessel has been post weld heat treated.
- Complete vessel satisfies the full radiography requirements (100%) of all welded joints for lethal substances or design pressures exceeding 50 psi (345 kPa).

Design Features

- **Heavy Construction** : 1/2 inch wall thickness of the vaporizing chamber exceeds the ASME Code.
- **Efficient** : Standard design affords good water circulation by convection with no circulating pump. Optional design affords good water circulation by pump to assure heat distribution and improves heat transfer.
- **Automatic** : Water chamber temperature is automatically controlled by an adjustable electronic controller.
- **Convenient** : Minimum attention is required by operating personnel.

Engineering Specifications

Capacity and expenditure

The capacity of electrically heated evaporator depends on the maximum capacity of the injected gas and capacity of heater.

Model	Chlorine		Sulfur Dioxide		Ammonia		Heater capacity
	lb/day	kg/hr	lb/day	kg/hr	lb/day	kg/hr	
EV7201C	6000	120	4500	85	1250	25	12 kW
EV7301C	8000	160	6000	115	1680	35	15 kW
EV7401C	10000	200	7500	140	2100	40	18 kW

Power supply condition

220/380/440 V ac: three phases are standard for the heater elements. 120/240 V ac is required for the control circuits. Other voltages are optionally available.

Pressure Ratings :

Hydrostatic Test Pressure: 5.7 MPa

Design Pressure: 3.8 MPa at 100

STANDARD UNIT FEATURES

- Electric immersion heater
- Fiberglass cabinet
- PVC form insulation
- Galvanized water chamber
- Gas pressure gauge (psig and MPa)
- Gas temperature gauge (°F and °C)
- Super-heat baffle
- Vaporizing chamber
- Water level sight gauge
- Water level control switch
- Water low level alarm switch
- Electronic cathodic protection system
- Digital electronic temperature controller(Microprocessor based)
 - Water temperature controller
 - Water low temperature alarm switch
 - Water high temperature alarm switch
 - Water temperature display

REQUIRED ACCESSORIES

Pressure Reducing and Shut-off valve: If the evaporator is being used with a gas dispenser, a pressure reducing and shut-off valve is required to eliminate the possibility of liquefaction and liquid carryover to the gas dispenser.

Pressure Relief: A pressure relief device is required in the gas discharge line in order for the evaporator installation to meet the requirements of the ASME Code.

Magnetic Contactor: Energizes and de-energizes the immersion heater in response to the water temperature digital electronic controller. While required for operation, it is not supplied as standard with the evaporator. The standard optional contactor is housed in a NEMA type 1 (IEC IP20) enclosure with a 120/240 V ac control circuit. Other voltages and NEMA enclosures are available.

OPTIONAL ACCESSORIES

The basic evaporator unit has adequate controls and safeguards for operation under normal conditions. However, additional accessories are available and recommended for

operation where there is a possibility of liquid carryover, or the absence of continuous supervision.

Liquid expansion tanks

Gas pressure relief valve

Pressure reducing valve

External heater available

Circulating pump available

Installation

Location

Installation location should be determined so that no other personnel is permitted to access, except the authorized right persons only and must be indoors that the temperature does not fall down to a freezing temperature value point.

Safety devices should be prepared and furnished at the installation places to make operators ensured of absolute personal safety against any of life accidents.

Connection

Both the liquid inlet and the gas outlet should be firstly line-connected and next, the water inlet, line-connected. The other extended piping lines should be supplied and correctly connected by client or end-user

Pressure reducing and shut-off valve should be sized over 3/4" minimum acceptable but nevertheless, should match a bigger size to maker's recommendation as per total gas feeding rate of the system.

Operation

The evaporator is essentially a vaporizing chamber surrounded by a water jacket. The water is heated by an electric immersion heater, digitally electronic controlled to maintain constant temperature. Liquid chlorine, ammonia or sulfur dioxide enters the vaporizing chamber through the inlet tube and is piped to the bottom of the vaporizing chamber. After it emerges from the pipe, the liquid absorbs heat from the hot water and vaporizes. The vaporizes to pass out of the evaporator through the gas outlet. Prior to discharge from the evaporator the vapor is superheated by being forced against the hot chamber wall by the superheat baffle.

The demands of the using system for vapor automatically regulate the level of liquid inside the vaporizing chamber.

As vapor pressure inside the chamber increases, the rate at which the liquid enters the vaporizing chamber decreases. If the demand for vapor increases, permitting liquid to enter the chamber at a higher rate.

An equilibrium condition is soon achieved where the rate at which the liquid is being converted to gas exactly equals the rate at which liquid enters the vaporizing chamber.

A low water level switch is wired to shut off the heater should the water level drop to a preset level in the water jacket.

Optionally, a circulating pump can be available to assure heat distribution and improves heat transfer.

An automatic pressure reducing and shut-off valve, controlled by the water low temperature switch, is installed in the gas line to the dispensing system. This valve will automatically shut off when the water chamber temperature falls below a preset limit, preventing liquid from entering and flooding the gas dispensing system.

A pressure relief valve installed in the gas discharge line operates when the pressure within the gas chamber exceeds safe limits.

An optional diaphragm protected pressure switch will give a contact closure when the system pressure exceeds the design pressure of the rupture disc.

Ordering information

Specify

Series EV7000 Evaporator

Chemical Service

Max. Capacity

Heater characteristics, size, electrical voltage and phase

Optional accessories

Pressure reducing valve and shut-off valve model no.

Pressure relief valve

Magnetic contactor

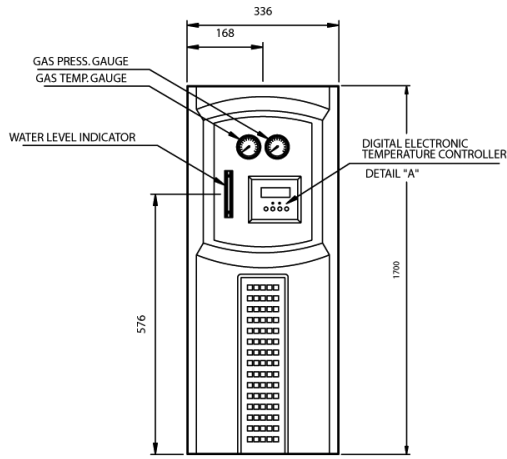
Heat transfer circulation pump

Shipping Weight and Cubage

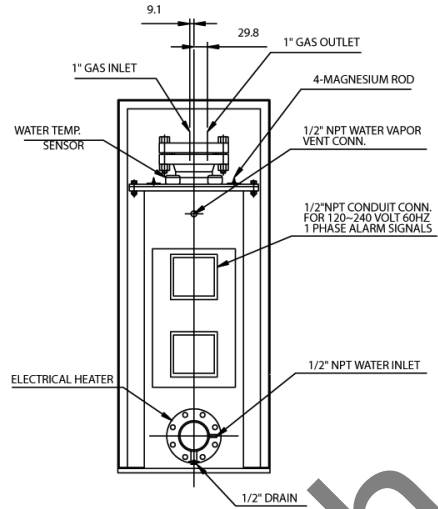
900 lb (408 kg), 86 ft³(2.4 m³)

Dimensions

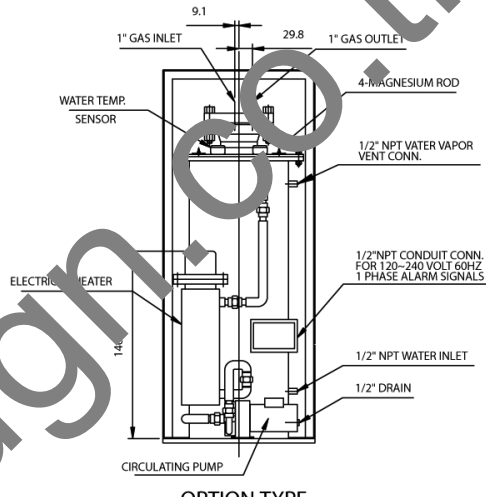
See Next Page



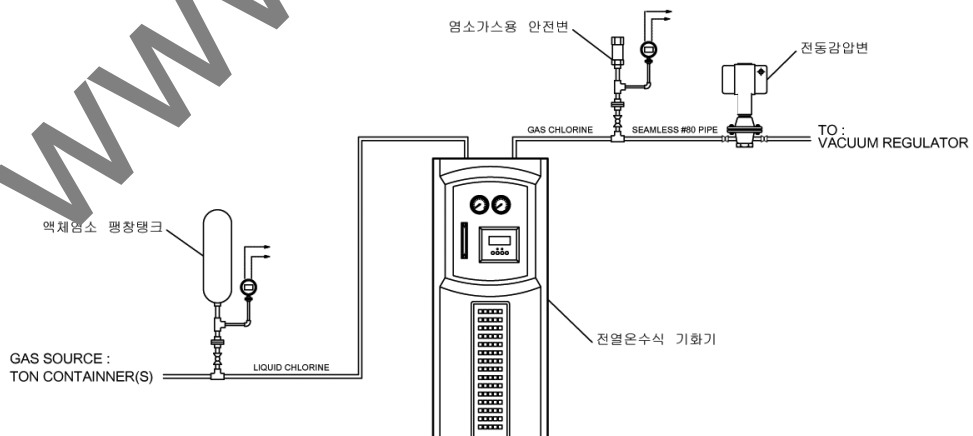
FRONT VIEW



STANDARD TYPE



OPTION TYPE



AQUS Inc.

46, Dongtansandan 2-gil, Dongtan-myeon, Hwaseong-si, Gyeonggi-do, 445-811, Korea
Tel_ +82-31-451-1820 Fax_ +82-31-629-6277 Http://www.aqus.biz