

ICOS is present on the international markets with a wide range of Autoclaves using the air + steam or the superheated water for the terminal sterilization of injectable solutions.

The wide experience acquired at ICOS in about 30 years of activity enables us to offer an extremely diversified products capable of meeting the requirements of the most varied applications and to satisfy the strictly standards of pharmaceutical industry (FDA, cGMP, GAMP 5, etc.).

These machines are identified as follows:

- AIR + STEAM MIXTURE AUTOCLAVE, AMS SERIES
- SUPERHEATED WATER AUTOCLAVE, ASS SERIES



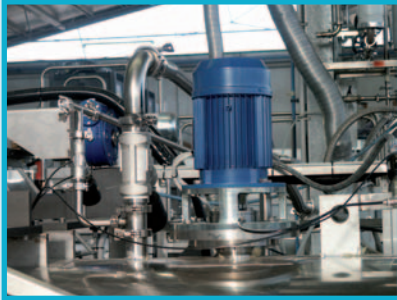
#### FIELD OF APPLICATION

The autoclaves in this series are used to sterilize liquids in sealed containers such as: bottles, bags, prefilled syringes, pockets, etc.

LOADING SIDE - TYPE AMS 24/1920



DETAIL OF DOORS MOVEMENT



DETAIL OF AIR RECYCLING FAN



LOADING AND UNLOADING SIDE - TYPE AMS 30/1920

## MAIN FEATURES

- Sterilization chamber of round cross section, containing all the accessories for its use with an air+steam mixture or superheated water
- Machine body insulated with an high density ceramic material and covered by AISI 304 stainless steel sheet
- Machine body supported by a frame designed for a suitable load distribution on the floor
- Chamber bottom fitted with guides for moving the product loading carts
- Doors driven by an electromechanical system
- Provision of connections required for the validation tests
- Possibility of applying an automatic loading and unloading device for the product loading carts

## CONSTRUCTION FEATURES

The machine body and associated safety devices are manufactured and tested in compliance with the standards required in the country of destination. Unless there is a specific request, the machines and systems are manufactured in compliance with the european (PED) or american (ASME) standards.

- Machine body of AISI 316L stainless-steel construction
- Support frame of AISI 304 stainless steel
- External panelling made of AISI 304 stainless steel
- All the machine components are of sanitary type
- In the standard version, the door tightness is guaranteed by a pneumatically pressurized silicone gasket
- On request, the door gasket can be made of an automatic pressure-sealing type. This system guarantees the tightness of the door in any condition of operation
- The chamber inside surface, the tubing and all parts in contact with the product are polished to a degree of roughness  $^2$  0,5  $\mu$ m

## AUTOMATIC LOADING AND UNLOADING

If particular reasons require that loading and unloading be carried out automatically, ICOS can propose a range of solutions compatible with the requirements of the customer.

### PROCESS DATA

The sterilization program using an air+steam mixture is applied for different types of loads.

It is also used in microbiological laboratories, particularly in the sterilization of sealed plastic containers.

The process foresees the application of counterpressure to avoid permanent deformations.

The sterilization program using superheated water is used mainly for sterilizing large containers, although it can also be used for other types of loads.

The product is treated in counterpressure, in order to avoid deforming or breaking the containers.

### CONTROL SYSTEM

Le machins of "AMS" ed "ASS" series are provided with a control system made up of a programmable controller (PLC), operating panel (OP) or industrial computer (PC) and printer.

The control system manages the machine and its basic parameters, such as temperature, F0, and pressure; it allows an easy interfacing with the operator and makes it possible to customize the working cycles and maintenance operations.

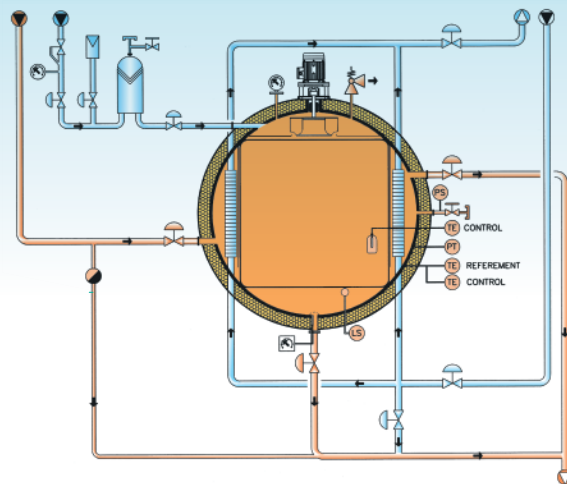
The system provides a complete hard-copy process documentation and assists in the convalidation procedures.

Note: A full description of the control system is contained in the relative booklet.

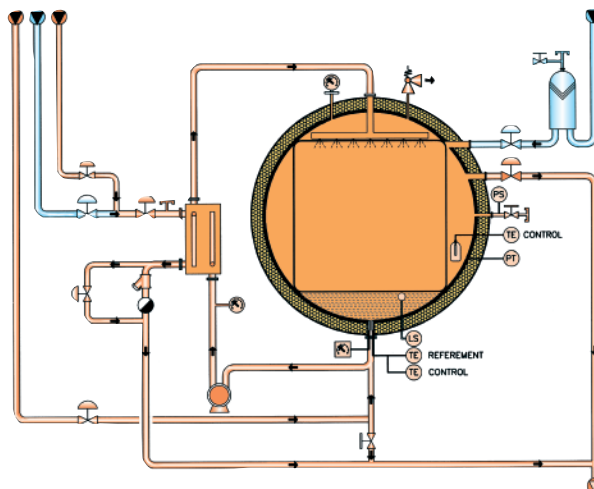
In the quality of the materials used, and in their accurate finish, construction and process characteristics, all the icos machines are in compliance with the most up-to-date standards.



CONTROL BOARD



FUNCTIONAL DIAGRAM  
AIR + STEAM MIXTURE AUTOCLAVE



FUNCTIONAL DIAGRAM  
SUPERHEATED WATER AUTOCLAVE

## NORMS AND STANDARDS

The new ICOS autoclaves are in compliance with the following Norms and Directives:

Governing directive/standard for pressure vessels:

- CE NE 97/23/EEC (PED)
- ASME code Sec. VIII Div. 1, 2001 Ed. + Add. 2003

Technical norms/standards:

- CE EN 285:2009 + A2:2009
- 2004/108/EC
- 2006/42/EC
- cGMP
- CE EN 61010-1
- CE EN 61010-2-040
- HTM 2010
- UL, NEMA 4X, OSHA



ICOS RESERVES THE RIGHT TO MAKE PRODUCT CHANGES WITHOUT PRIOR NOTIFICATION



## AMS SERIES - AIR + STEAM MIXTURE AUTOCLAVES

Type	Useful Capacity (litres / cu. ft.)	Chamber dimensions (mm / inches)				Overall dimensions (mm / inches)		
		Diameter	Width	Height	Lenght	Width	Height	Lenght
AMS 13/1100	830 / 29	1100 / 43	800 / 31.5	800 / 31.5	1300 / 51	2200 / 86.5	2380 / 93.5	1780 / 70
AMS 26/1100	1660 / 58.5	1100 / 43	800 / 31.5	800 / 31.5	2600 / 102	2200 / 86.5	2380 / 93.5	3080 / 121
AMS 39/1100	2490 / 88	1100 / 43	800 / 31.5	800 / 31.5	3900 / 154.5	2200 / 86.5	2380 / 93.5	4380 / 172.5
AMS 13/1500	1300 / 46	1500 / 59	1000 / 39	1000 / 39	1300 / 51	2800 / 110	2480 / 97.5	1780 / 70
AMS 26/1500	2600 / 92	1500 / 59	1000 / 39	1000 / 39	2600 / 102	2800 / 110	2480 / 97.5	3080 / 121
AMS 39/1500	3900 / 137.5	1500 / 59	1000 / 39	1000 / 39	3900 / 154.5	2800 / 110	2480 / 97.5	4380 / 172.5
AMS 52/1500	5200 / 183.5	1500 / 59	1000 / 39	1000 / 39	5200 / 204.5	2800 / 110	2480 / 97.5	5680 / 223.5
AMS 26/1920	4900 / 173	1920 / 75.5	1220 / 48	1550 / 61	2600 / 102	3500 / 137.5	2580 / 101.5	3080 / 121
AMS 39/1920	7370 / 260	1920 / 75.5	1220 / 48	1550 / 61	3900 / 154.5	3500 / 137.5	2580 / 101.5	4380 / 172.5
AMS 52/1920	9830 / 347	1920 / 75.5	1220 / 48	1550 / 61	5200 / 204.5	3500 / 137.5	2580 / 101.5	5680 / 223.5
AMS 62/1920	11720 / 414	1920 / 75.5	1220 / 48	1550 / 61	6200 / 244	3500 / 137.5	2580 / 101.5	6480 / 255
AMS 74/1920	13990 / 494	1920 / 75.5	1220 / 48	1550 / 61	7400 / 191	3500 / 137.5	2580 / 101.5	7880 / 310
AMS 84/1920	15880 / 560.5	1920 / 75.5	1220 / 48	1550 / 61	8400 / 330.5	3500 / 137.5	2580 / 101.5	8880 / 349.5
AMS 96/1920	18150 / 641	1920 / 75.5	1220 / 48	1550 / 61	9600 / 378	3500 / 137.5	2580 / 101.5	10080 / 397
AMS 108/1920	20420 / 721	1920 / 75.5	1220 / 48	1550 / 61	10800 / 425	3500 / 137.5	2580 / 101.5	11280 / 444
AMS 120/1920	22690 / 801	1920 / 75.5	1220 / 48	1550 / 61	12000 / 472.5	3500 / 137.5	2580 / 101.5	12480 / 491

## ASS SERIES - SUPERHEATED WATER AUTOCLAVES

Type	Useful Capacity (litres / cu. ft.)	Chamber dimensions (mm / inches)				Overall dimensions (mm / inches)		
		Diameter	Width	Height	Lenght	Width	Height	Lenght
ASS 13/1100	830 / 29	1100 / 43	800 / 31.5	800 / 31.5	1300 / 51	2200 / 86.5	2380 / 93.5	1780 / 70
ASS 26/1100	1660 / 58.5	1100 / 43	800 / 31.5	800 / 31.5	2600 / 102	2200 / 86.5	2380 / 93.5	3080 / 121
ASS 39/1100	2490 / 88	1100 / 43	800 / 31.5	800 / 31.5	3900 / 154.5	2200 / 86.5	2380 / 93.5	4380 / 172.5
ASS 13/1500	1300 / 46	1500 / 59	1000 / 39	1000 / 39	1300 / 51	2800 / 110	2480 / 97.5	1780 / 70
ASS 26/1500	2600 / 92	1500 / 59	1000 / 39	1000 / 39	2600 / 102	2800 / 110	2480 / 97.5	3080 / 121
ASS 39/1500	3900 / 137.5	1500 / 59	1000 / 39	1000 / 39	3900 / 154.5	2800 / 110	2480 / 97.5	4380 / 172.5
ASS 52/1500	5200 / 183.5	1500 / 59	1000 / 39	1000 / 39	5200 / 204.5	2800 / 110	2480 / 97.5	5680 / 223.5
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ASS 120/1920	22690 / 801	1920 / 75.5	1220 / 48	1550 / 61	12000 / 472.5	3500 / 137.5	2580 / 101.5	12480 / 491