



Curated by

amicus

Autoclave Information Pack 2026



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Technical Support



products@amicusappliances.com

We'll answer your questions and put you in touch with your local Amicus distributor

What is an autoclave?

An autoclave is a glorified pressure cooker. Just as in cooking, a pressure cooker is quicker and more efficient than a pot of boiling water, an autoclave is better than trying to sterilise by simple boiling.

Why are they called “autoclaves”?

The word comes from the Greek “autos” meaning “self” and the Latin “clavis” meaning “key”, the combined meaning being “self-closing”. As an autoclave heats up and the pressure increases (see later), the lid or door becomes difficult if not impossible to open, essentially self-locking during use.

Why is an autoclave better than boiling?

The boiling point of water at sea level is 100°C, so that’s the hottest you can heat anything up to in boiling water. But if you build up the pressure, the water, or to be more precise the steam can get much hotter. In theory something put in boiling water will be sterile in 30 minutes, but this does not apply to all pathogens and is not considered a reliable method.

Steam under pressure is much hotter and more effective. So, for example, you can reliably sterilise something at 121°C in 15 minutes, or at 134°C in 3 minutes (this is not necessarily the case for porous items like lab coats or wrapped instrument, but more about that later).

Can you sterilise in an oven?

Yes, but you need to use 200°C for around 2 hours. Quite apart from the fact that this takes a lot longer, the higher temperature is more likely to damage or melt certain items. The reason that ovens take longer is that you’re using air as the medium to pass destructive heat energy into a microbe; saturated steam (this is not tautology!) is a much better medium.

So, what is “saturated steam”?

Steam is described as saturated when there is no or very little air mixed in with it. It’s crucial to use saturated steam when autoclaving.

Does an autoclave “clean” things?

Not really. An autoclave sterilises. So, if something is put into an autoclave dirty, it will come out dirty, it’s just that the dirt is now sterile!

What makes up an autoclave?

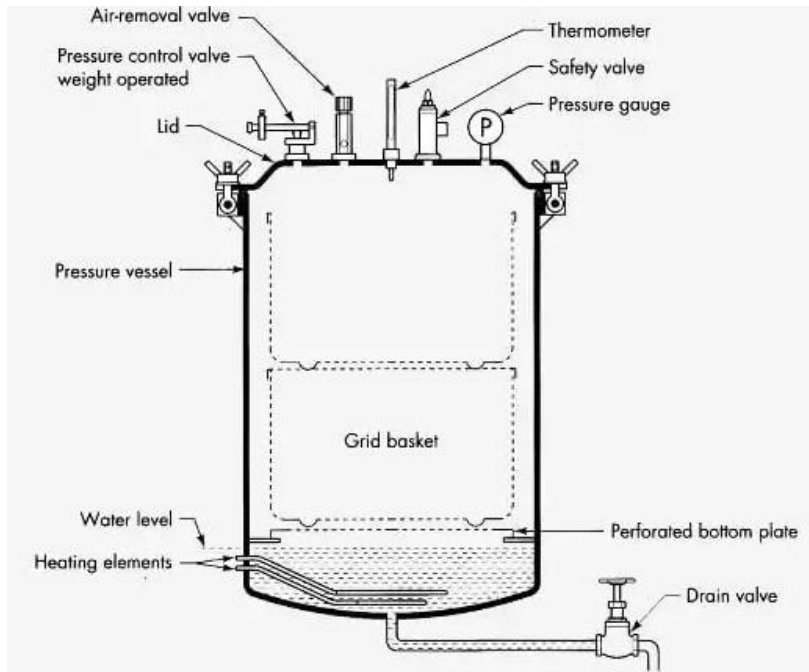
The main parts of the autoclave are the **pressure vessel** and **lid**. This is where all the action is. The lid is secured using some sort of closing or clamping device for safety at high pressure and temperature.

In the base of the autoclave are the **heating elements** doing precisely the same job as a kettle element.

Introduction to autoclaves

Above the elements there's a **perforated bottom plate** to keep the load above the water in the bottom of the pressure vessel (also referred to as a chamber).

Baskets are often used as a convenient way of loading glassware.



The **pressure control valve** does what is says on the tin. It's there to control the pressure and subsequently the temperature of the autoclave. As the temperature increases, the pressure increases.

The **air removal valve** is there to obtain the saturated steam needed for sterilisation. When the autoclave heats up the water, as it boils and steams, the steam displaces the air upwards. At this point the air removal valve is open. When the all the air is pushed out, the valve is shut.

The **thermometer** does what you'd imagine it does, as does the **pressure gauge**. As mentioned above, as the temperature increases, so does the temperature. The thing is that there is a precise correlation between these two values if the steam is saturated, i.e. contains no air. If the temperature and pressure don't correlate, there's still air in the chamber and sterilisation may be compromised.

The **safety valve** is there in case of malfunction of the pressure control valve. This is routinely tested.

The **drain valve** doesn't have to be used every time, unless the load needs to be dry at the end of the cycle (a drying option of some sort would be required then) or if the water has become contaminated (usually when media from media bottles boils over into it. But more about this later).

Temperature		Pressure (BarG)
(°C)	(°F)	
100	212	0.00
105	221	0.20
110	230	0.43
115	239	0.69
120	248	0.99
121	250	1.06
122	252	1.13
124	255	1.25
126	259	1.35
128	262	1.55
130	266	1.70
132	270	1.86
134	273	2.04
136	277	2.21
138	281	2.40
140	284	2.60

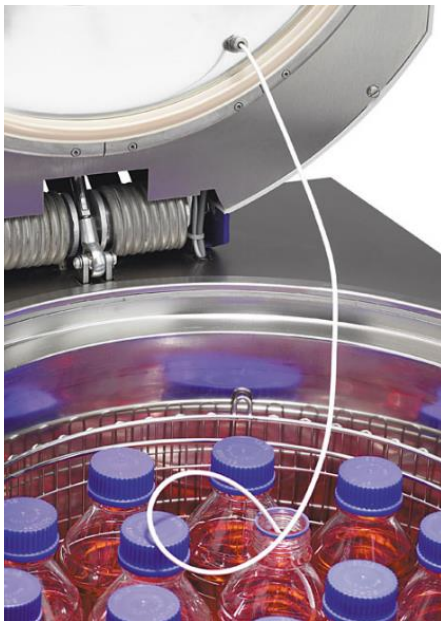
What can be autoclaved?

The answer is virtually anything!

A simple autoclave as described so far is used for glassware, autoclavable plasticware (for example, polypropylene) and (unwrapped) metal instruments. Why unwrapped? More about this later. It can also be used for waste discard and liquids in bottles, though for the latter, it's better if you have a **load temperature probe** (you've guessed it – more later).

Discard loads

This would typically be a bag (nearly) full of waste such as used polystyrene Petri dishes, containers, pipettes and so on. The bag is designed for autoclaving and is typically made of polypropylene. The bag is only loosely tied so the steam can get inside and displace the air.



Liquids in bottles

In theory one can just use a basic autoclave for this but there's a couple of things to bear in mind. Firstly, the bottle cap must not be too tight, to avoid bottles exploding or liquid spillage.

Secondly, the autoclave needs to have a **cooling lock**. This is a safety feature where the autoclave cannot be opened until the chamber temperature has dropped below a set value, usually 80°C. If the autoclave is opened too soon, the rush of cool air into the chamber will either cause thermal shock, breaking the bottles, or bottles exploding due to the pressure imbalance between the inside of the bottle and the surrounding atmosphere.

The other feature is to have a wandering **temperature probe**, sometimes known as a **load sensing probe**. This is placed in a reference bottle as seen above. The reference bottle is the same size as the other bottles and contains the same amount of fluid (usually just water) as the other bottles. This gives an indication of the temperature *inside* the bottles instead of just the chamber temperature. As with cooking, it's the inside of the food that needs to get to the right temperature to avoid poisoning people (think meat thermometer). As mentioned above, to sterilise effectively you need to process at the right temperature for the right amount of time.

If you go by the chamber temperature only, there's no guarantee that the load has been sterilised. The load sensing probe can also be inserted in a bag of discard, though this can result in a very mucky probe, so best avoided!

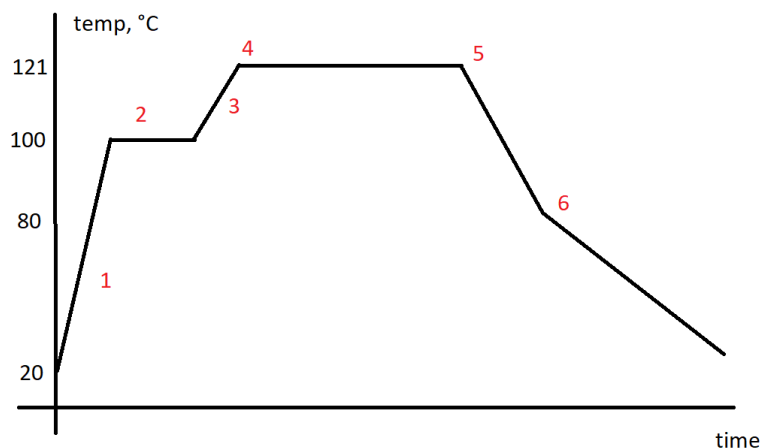
Unwrapped metal instruments

Autoclaving unwrapped instruments is very straight forward, and if you set the cooling lock temperature a little higher, you can open the lid a little sooner so the steam escapes and the hot instruments dry themselves. Rather like opening a dishwasher straight after the cycle ends. I keep mentioning *wrapped* instruments because any porous wrapping will just keep them soggy.

There is a way of sterilising wrapped instruments and porous items using an autoclave with heating elements or heating tape wrapped round the walls of the sterilisation chamber. This reduces the amount of condensation forming on the autoclave chamber walls and lid, and wetting the load, and then allows the chamber to be used as a drying oven. This is the method our drying autoclaves employ. A better method of sterilising porous loads is using a *vacuum autoclave*. This involves a much more complex and expensive system.

What does a typical autoclave sterilising cycle consist of?

1. Heat the water to boiling point.
2. Keep boiling with the air removal valve (also known as the vent valve or purge valve) open to displace all the air.
3. Close the vent valve and continue heating until the required temperature and pressure are reached.
4. Start timing the sterilising period.
5. At the end of the sterilisation stage, heating goes off and the vent valve opens.
6. The load cools to a safe temperature and the lid can be opened



Stephen Pághány
October 2023

What makes our autoclaves so special?

Portability

Larger autoclaves need electricity, connection to a water supply and connection to a drain. This means that they tend to be put where these services are sited, rather than where the user wants them. Our 60 and 85 litre capacity autoclaves are on castors so they can be moved around easily, they have their own water supply tank inside, and the condensate and waste water are collected in another internal tank. This means they are self-contained and can be wheeled to wherever they're needed. The 60-litre version is the most versatile as it can be plugged into an ordinary 13-amp socket.

Easy to drain

If you remove the condensate (waste water collecting) tank from the front, you can easily get to the drain valves to drain off the water from the sterilising chamber or internal water tank. This is useful if you need to move the autoclave around to make it a little lighter, or to drain off any muck that can accumulate in the sterilising chamber. The drain valve on many autoclaves is awkward to get to; some don't even have one and you need to use a wet vacuum cleaner to empty it! Also, the pipework between the tanks and drain valves are short, making them much less prone to blocking.

Extra large internal water supply tank

The internal tank is a generous 28 litres, so more cycles can be run between top-ups. This is larger than most of our competitors'.

Pump-assisted filling

Instead of a connection to a tap or water supply for refilling, the autoclave is filled from any convenient water container placed alongside using the built-in feed pipe which is connected to an efficient internal pump. There's also a strainer at the end of the feed pipe to remove any debris which could clog the pipework.

USB port as standard

This is usually an optional extra but standard on the range we offer. With this the user can download all the data collected during the autoclave cycle to ensure the cycle was successful and sterilisation complete. The data is in a simple csv format which can be saved as is or imported into Excel, for example.

Data printer as standard

Again, this is usually an optional extra but standard on our range. This gives the user a live printout and hard copy of the cycle data which can be kept for the user's records. If the printout is lost, it can be reprinted.

What makes our autoclaves so special?

Load temperature probe as standard

This is strongly recommended for use when sterilising liquids so the user can ensure the liquid itself is up to temperature, not just the autoclave chamber. This is normally an optional extra with most autoclaves.

BSL-3 filtration as standard

This is important if class 3 biohazards are being sterilised. Without the filter there's a risk of these nasties getting into the atmosphere during the autoclaving process.

Fan assisted cooling as standard

Another common optional extra, a powerful cooling fan blows ambient air over the sterilising chamber during the cooling phase of the autoclaving cycle. This typically reduces the cooling time of liquid loads by 5%.

The Zealway autoclaves as curated by amicus are sold as a “standard” package with the most commonly required options all included. This makes selection and purchasing much simpler.

Easy to use controller

The controller is intuitive with a bright, clear screen and large buttons making it easy to control even when wearing protective gloves. There are prompts on the screen throughout to help the user. The graphic design of the screen mimics the pressure or temperature curve of a typical autoclave cycle so it only takes a quick glance to clearly see what stage the autoclaving cycle is at.

Easy opening lid

Traditionally autoclaves were closed and locked using hand-nuts which needed to be laboriously tightened individually. Nowadays many modern autoclaves have some sort of “single action” closure system (i.e. a single handle) but these can be notoriously stiff. The Zealway autoclave's door opening slider is very easy to open.

Autoclave lids need to be solidly made to withstand the internal pressures involved. This makes them quite heavy. Many autoclaves use a hydraulic strut to make it easier to open. The Zealway autoclave has the lid cantilevered, making it light to open and close, but without the hydraulic struts which tend to wear out with time.

8 – point lid locking

Most autoclaves of this size have 4 locking points or bolts. The Zealway autoclave has 8. As well as offering greater security, with the pressure load being evenly spread across 8 points reduces strain and wear on the lid.

What makes our autoclaves so special?

Load temperature probe storage in lid

When the load temperature probe is not in use, it tends to get in the way which is annoying and it can get damaged (usually by the user forgetting that they've left it dangling over the side of the autoclave whilst loading and slamming the lid down on the cable). The Zealway autoclave has a handy storage loop in the lid to stow the probe out of harm's way. Incidentally, should the probe still find itself in harm's way, the cable is heavily armoured to keep it safe.

Exhaust speed control

Most autoclaves simply vent to the atmosphere at the end of the cycle, the vent simply opening or closing. When liquid loads are sterilised, there's a risk of boiling over if the venting and resulting pressure drop is too fast. Zealway autoclaves have 6 levels of exhaust speed to choose from.

Lower loading height

The diameter of the sterilisation chamber is larger than most in this category at 400mm. This means that the chamber is shorter without sacrificing overall capacity, leading to a lower loading height. A basket full of bottles containing liquids can be heavy, making it awkward and potentially hazardous if lifted too high during loading.

316L stainless steel chamber

Although this is not a unique feature, many autoclave chambers (or pressure vessels) are made in lower grade 304L stainless steel. 316L stainless steel ensures a longer service life.

Recessed safety valve

The safety valve at the back of the autoclave is in its own recessed alcove which helps divert any steam safely away from lab personnel.

Ideal for microbiology labs and media preparation

This range of autoclaves has many features required in microbiology labs where culture media such as agar are used. As well as sterilisation as offered by other autoclaves, the Zealway autoclave has a gentle melting feature and warming feature to ensure the media are kept at the perfect pouring temperature. Without these features there runs a risk of over-cooking expensive and more thermally sensitive media.

60 and 85 litre Autoclaves

A range of high-quality, high-performance autoclaves, combining excellent performance and versatility with competitive pricing. The 60-litre versions are fully self-contained, needing no connection to a drain or a mains water supply, simply a standard 13-Amp power supply. All models are fully portable, mounted on heavy-duty castors. Perfect for the microbiology lab with programmes and features specially for media preparation.

Typical Applications:

Research and Development Laboratories:

- Biological and Biochemical Research
- Chemical and Physical Research
- Medical and Clinical Laboratories

Industrial and Quality Control Settings:

- Pharmaceutical Industry
- Food Science and Processing
- Other Industries

Education:

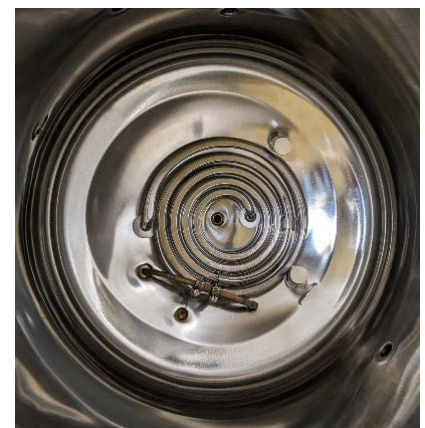
- Schools
- Colleges
- Universities

Features:

- 0.2µm Sartorius PTFE filter
- Filter self-sterilisation
- Cooling fan
- Suitable for BSL-3 labs as supplied
- 316L stainless steel chamber
- Complies with ASME, CE, DOHS, MOM and TS
- Panel mounted printer for temperature, time and F0 value.
- USB output port
- Digital pressure sensor
- Load sensed process timing with wandering PT100 probe
- Saturated steam monitoring
- Locking castors
- Delayed start facility
- Media warming and hold-warm feature
- Auto drying (SRU model only)



AMC-GR60-SFU

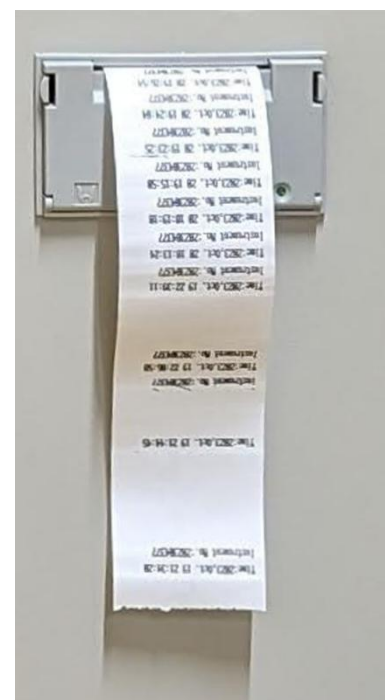


316L stainless steel chamber

60 and 120 litre Autoclaves

Specifications at a glance

Model	AMC-GR60-SFU	AMC-GR60-SRU	AMC-GR85-SFU
Capacity	60 litres		85 litres
Chamber dimensions	390mm dia x 505mm deep		390mm dia x 700mm deep
Basket dimensions	370mm dia x 190mm deep		370mm dia x 280mm deep
Basket capacity	2		
Overall dimensions	600x831x980mm (LxWxH)		644x831x980mm (LxWxH)
Weight, dry, empty	111kg		120kg
Rated power	2.3kW		4.6kW
Power requirement	220V±10%, 10A, 50/60Hz		220V±10%, 32A, 50/60Hz
Temperature display accuracy	0.1°C		
Working environment	5-40°C, RH ≤85%		
Chamber material	316L		
Sterilisation temperature range	105-138°C		
Sterilisation time range	1-6,000min (100 hrs)		
Melting temperature range	60-115°C		
Melting time range	1-6,000min (100 hrs)		
Warming temperature range	45-79°C		
Warming time range	1-9,999min (approx. 167 hrs)		
Drying time		1-300min (5 hrs)	
Drying temperature		80-160°C	
Cooling lock range	40-99°C for solids, discard, agar 40-80°C for liquids		
Condensate tank capacity	3 litres	6 litres	3 litres
Water storage capacity	27 litres		
Sterilisation programmes	Liquids, Liquids with warming, Rubber, Fast, Discard, Agar +User defined	Liquids, Liquids with warming, Rubber, Fast, Discard, Agar, Wrapped instruments, Fabrics +User defined	Liquids, Liquids with warming, Rubber, Fast, Discard, Agar +User defined
Programme storage	60 programmes		
Exhaust speed control	Fully automatic internal discharge, choice of 6 levels		
Time delay for auto startup	0-15 days		
Pressure gauge range	-0.1 – 0.5MPa		
Safety valve set pressure	0.29MPa		
Controller	“Inspiration” controller with LCD display		
Available display units	°F, °C, bar, psi, kPa		
Lid opening	Easy single-hand operation		
Locking method	Patented 8-point locking		



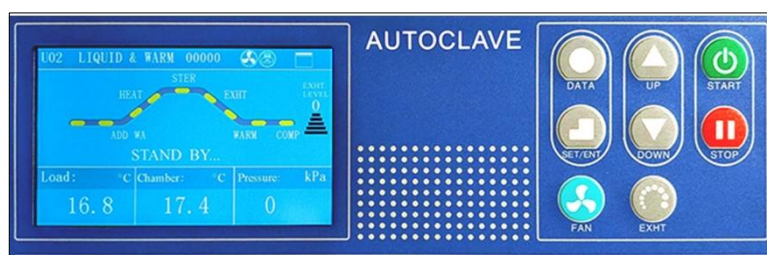
Integral printer as standard



Self-contained condensate tank



Self-filling from any convenient container



Advanced but user-friendly controller

60 and 120 litre Autoclaves

Specifications at a glance

Reagent bottle capacities:

Model	AMC-GR60-SFU-SRU		AMC-GR85-SFU	
Bottle capacity	No. of baskets	Total No. of bottles	No. of baskets	Total No. of bottles
250ml	2	36	2	38
500ml	2	24	2	24
1000ml	1	8	2	16
2000ml	1	4	2	8
5000ml	1	1	1	1
10000ml			1	1

Erlenmeyer flask capacities:

Model	AMC-GR60-SFU-SRU		AMC-GR85-SFU	
Flask capacity	No. of baskets	Total No. of flasks	No. of baskets	Total No. of flasks
250ml	2	26	2	26
500ml	1	7	2	14
1000ml	1	5	2	10
2000ml	1	2	1	2
5000ml			1	1

Accessories:

AMC-GR60-BASKET	Basket, 190mm deep (for 60 litre models)*
AMC-GR85-BASKET	Basket, 280mm deep (for 85 litre models)*
AMC-GR60-PAIL	Solid container, 320mm deep (for 60 litre models)
AMC-GR85-PAIL	Solid container, 450mm deep (for 85 litre models)
AMC-GR60-TRAY	Spillage tray, 40mm deep (for 60 litre models)
AMC-GR85-TRAY	Spillage tray, 40mm deep (for 85 litre models)

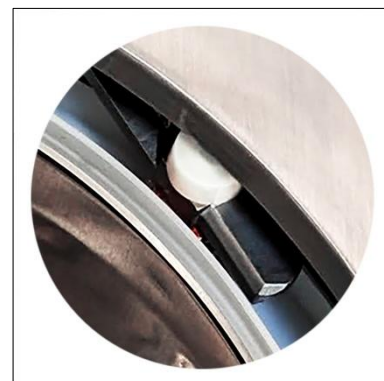
*2 baskets included as standard with all models



Stainless steel basket

Stainless steel container

Stainless steel spillage tray



Unique easy locking system



Load sensing probe stows away in lid when not used



Heavy duty castors – total mobility

120 litre Autoclaves

New for 2026



GF Series Autoclaves

Large capacity – small footprint

Standard Features:

- Load temperature probe
- Cooling fan
- Automatic chamber water fill
- Automatic reservoir fill
- Printer
- USB port
- 316L stainless steel chamber
- Integral condensate bottle
- Media warming and hold-warm
- Delayed start
- F₀ calculation
- 2 stainless steel baskets
- 10-point secure locking mechanism

Offering:

High Efficiency

Automatic Water Feed, Rapid-Cooling Fan System, 6-Level Exhaust Control
Built-in condensate recirculation – less steam and less water wastage

Advanced High-Temperature Performance

Up to 138°C Sterilisation

Outstanding Data Management and Programming

60 customisable programs
USB data export
5-level authority management
Advance program scheduling



The “Inspiration II” Advanced touch-screen controller system offering a user-friendly, intuitive interface.

120 litre Autoclaves

Specifications at a glance

Model	AMC-GF120-DFU
Chamber Capacity	120 Litres
Chamber Dimensions (Dia x Depth)	508x668mm
External Dimensions (LxWxH)	659x776x1041mm
Sterilization Temperature	105-138°C
Temperature Accuracy	0.1°C
Pressure Range	Max working pressure: 0.27Mpa, design pressure: 0.35Mpa
Sterilization Time Range	1-6000 minutes
Melting Temperature	60-100°C
Melting Time Range	1-6000 minutes
Warming Temperature	45-60°C
Warming Time Range	1-9999 minutes
Programme Delay	Can be preset for auto start upto 6 days in advance
Cooling Lock Setting	40-80°C for liquid cycle, 40-99°C for other cycles
Sterilization Programmes	1.Solid, 2. Liquid, 3. Liquid with warming, 4. Agar, 5. Medical waste, 6. Custom
Sterilization Data	Can save up to 60 programmes, record 1000 cycles, USB port
Exhaust Mode	Automatic discharge to internal condensate bottle. 6 exhaust rates selectable.
Power Requirements	220V, 50/60Hz, 4,600W (25A)
Exhaust Levels	6 selectable exhaust speeds
Control System	"Inspiration II" microcomputer controller with LCD screen & USB logging
Security	5-level access permission
Pressure Display Range	-0.1-0.5Mpa
Chamber Material	316L Stainless Steel
Standard Baskets Included	2 Stainless Steel wire baskets
Basket Dimensions (Dia x H)	478x280mm each
Working Environment	5-45°C, relatively humidity 10%-85%
Safety Features	Electric double inner locks, lid closed check, dry scorch protection, overpressure protection, safety valve, water level sensor, over temperature protection, temperature monitor, over current and short circuit protection, leakage protection, cooling lock, anti-scald chamber cover and bench, automatic troubleshooting.
Water Requirements	Distilled (conductivity >3µS/cm)
Reagent Bottle Loading Capacity:	
500ml	38-40 bottles (2 baskets)
1000ml	28-30 bottles (2 baskets)
2000ml	14 bottles (2 baskets)



AMC-GWA Series 180 and 280 litre Autoclaves

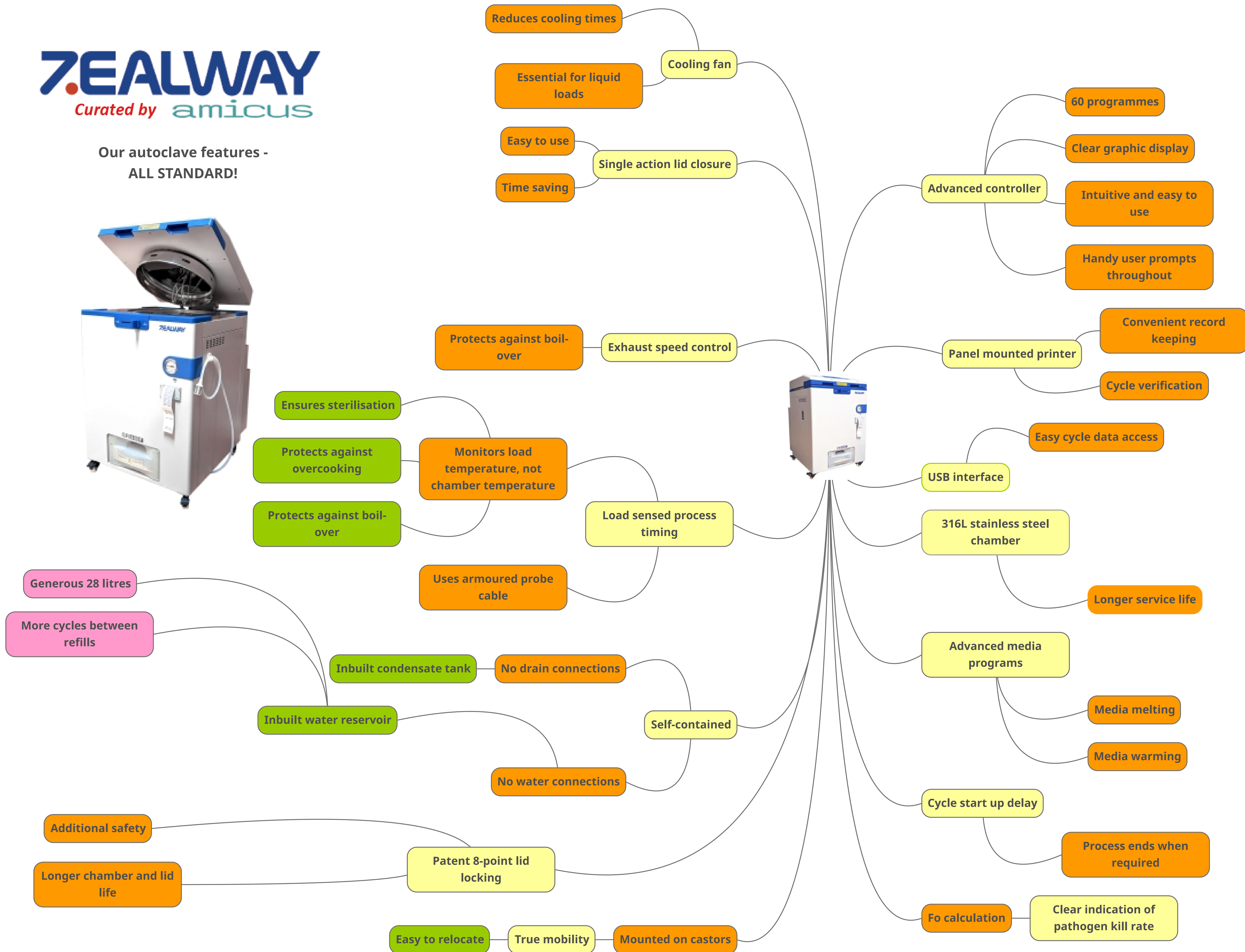
The AMC-GWA Vacuum + Water Cooling Autoclaves offer cutting-edge sterilisation for demanding environments. Available in 180L and 280L capacities, these autoclaves combine vacuum technology with efficient water cooling to ensure rapid and thorough sterilisation. Ideal for hospitals, laboratories, and pharmaceutical facilities, they guarantee optimal performance and reliability. The advanced control system and robust construction makes them user-friendly and durable. Compliant with international safety and quality standards, they're the perfect solution for users seeking top-tier sterilization technology.

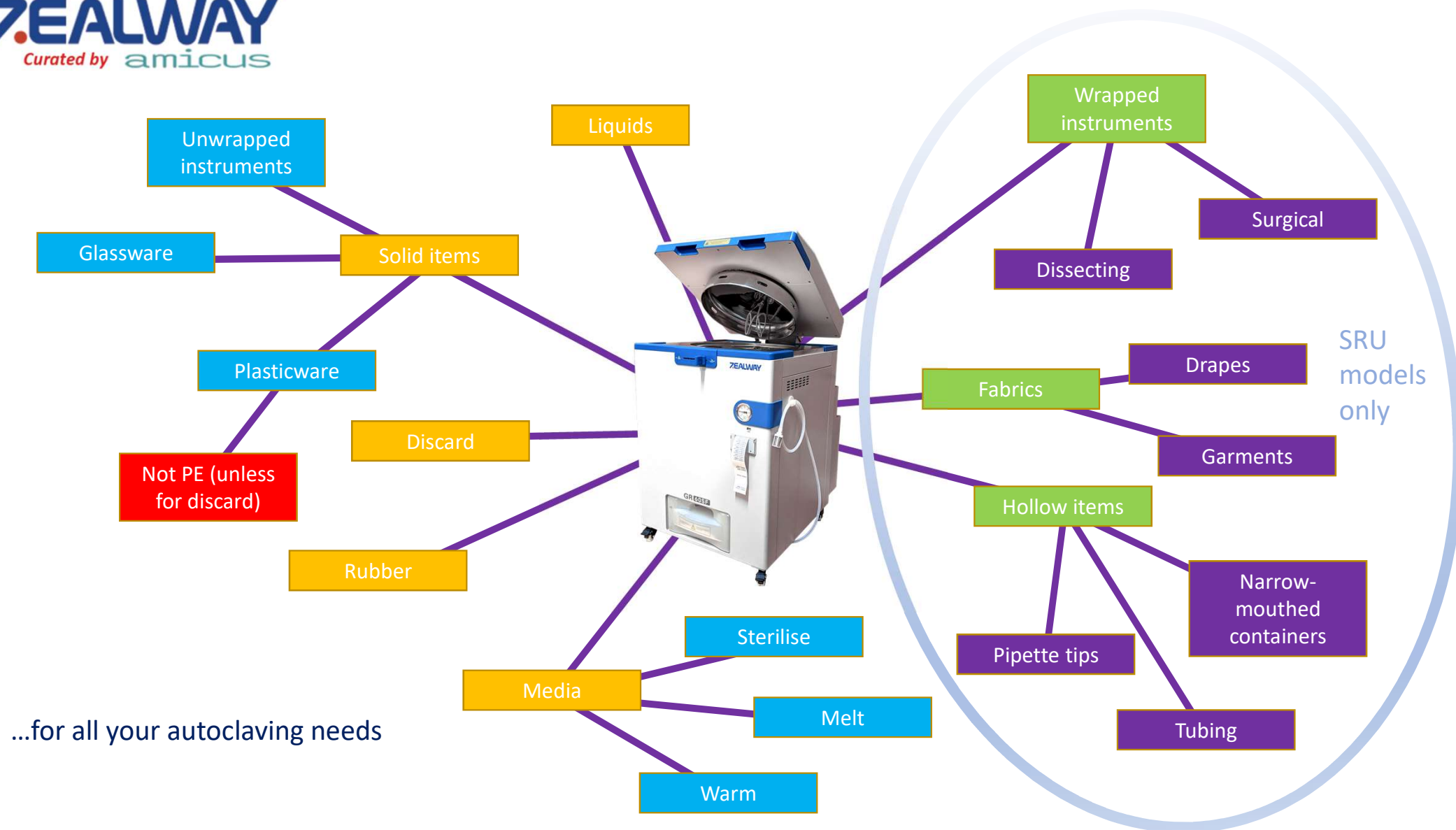
Specifications	AMC-GWA180-SQ	AMC-GWA280-SQ
Capacity	180 litres	280 litres
Dimensions (LxWxH)	796x1485x1612mm	796x1485x1612mm
Chamber dimensions (ØxD)	500x1150mm	600x1175mm
Power	16kW	
Chamber material	S30408	
Sterilisation temperature	115-135°C	
Rated working pressure	0.25MPa	
Pressure gauge range	-0.1 to 0.5MPa	
Safety valve set pressure	0.28MPa	
Sterilisation timer range	1-6,000min	
Drying time	0-300min	
Pulse number	1-99	
Vacuum	<-93kPa	
Controller	Industrial PLC	
Power supply	Three-phase, five-wire system (380V, 50/60Hz)	
Water Source Requirements	Tap Water: 0.15 - 0.3MPa Softened Water: 0 - 0.3MPa (no lower limit for conductivity)	
Drainage	Direct sewage outlet required	
Compliance	EN285; GB8599; 2014/68/EU	

Advanced features:

- 7-inch touchscreen display
- Automatic door system
- Pre-vacuum and vacuum drying
- Separate steam generator
- Water cooled chamber
- Adjustable exhaust speed
- Drainage temperature control
- Automatic and dynamic process control

Our autoclave features -
ALL STANDARD!







Curated by
amicus

Quality Autoclaves Require Quality Components

ZEALWAY sources certified engineering-grade stainless steel, as well as parts and accessories, only from reliable suppliers. Some of the brands are listed below.



Schneider Electric

World-leading energy technologies
provider.



Philips

Leading health technology
company.



ABB

Superior supplier of digital
technologies.



Siemens

Leading power generation system
supplier.

1. We warrant that on delivery and for a period of 2 years from the date of purchase, the autoclave shall:
 - a. be of satisfactory quality;
 - b. be free from material defects in design, materials and workmanship;
 - c. comply with all applicable statutory and regulatory requirements for selling the equipment in the United Kingdom.
2. This warranty does not apply to any defect in the equipment arising from fair wear and tear, wilful damage, accident, negligence by the purchaser or any third party, if the equipment is used in a way not recommended in the Instruction Manual, **the user's failure to follow the instructions for regular cleaning and simple maintenance**, or any alteration carried out by the user or any third party without our prior written approval.
3. The warranty shall cover parts and labour for the first year, and parts only for the second year.
4. Consumable parts shall not be covered by this warranty. This includes door gaskets and seals, in-line air filters and seals, printer paper and ribbons. Semi-consumable parts (maintenance parts) are covered for the first year only. These include heating elements, valves and fuses.
5. It is strongly recommended that your autoclave is covered by a service contract. Failure to do so may invalidate the warranty.
6. *Any callouts, labour, or materials provided in response to an issue falling outside warranty coverage will be subject to service charges.*

