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# Product Specification

**Model Ref.**

**AMA440BT**



## Astell AMA440BT – 60 litre Top Loading Compact Autoclave – Classic Version

### Full Colour Touch Screen Controller

Ideal for Liquids & Most laboratory applications, including Discard, Glassware, Laboratory Instruments etc

Self contained – Water Fill is Manual directly into the chamber, adding water when necessary

### Standard Features

All the following are Value - Added Features  
Included AS STANDARD

- Full Colour Touch Screen Controller
- 5 Programs
- Swiftlock rapid access safety closure
- Over temperature water cut out
- Thermocouple entry port
- No plumbing required
- Cool Lock Protection (fluid Cycles)
- Low Water Indicator
- Base Shelf
- Automatic timed air purge system
- Pressure gauge
- Vent valve
- Electro Polished Stainless Steel Pressure Vessel
- Safety Valve Testing



### Bottle Capacity

	AMB420BT AMB220BT	AMB430BT AMB230BT	AMB440BT AMB240BT	AMA440BT AMA240BT
500ml (Duran)	10	14	21	24
1000ml (Duran)	8	11	15	14
2000ml (Duran)	2	3	4	6*

*\*AMA240BT / AMA440BT will hold 8 x 2000ml bottle if baskets are not used*

### Options

Integral Data printer  
10 Program Controller  
Datalogger  
Load Sensed Process Timing

RS232  
Ethernet  
Assisted Air Cooling

### Accessories

½ Depth Stainless Steel Basket  
½ Depth Morrison Discard Container  
Load Support Plate  
Spare Condensate Bottle

See options & Accessory pages for full details

Overall Capacity	Chamber Diameter	Working Depth	Overall Dimensions	Operating Range
60 Litres	350mm	640mm	530x700x1040mm (wxdxh)	100 -138°C (0.2-2.4 bar)

**Power Requirements** Single phase + Neutral & Earth 230 volts, 13 Amps, 50/60Hz.

Approx. Nett Weight:	Shipping Weight	Shipping Dimensions
130kg	147kg	87x65x138cm (wxdxh)

## Options & Accessories

The basic model quoted above is manufactured to the highest standards. It will be fully calibrated and tested prior to dispatch, and will be suitable for a wide range of sterilization procedures.

Please note however, that the following factory-fitted options are available for the above model. For certain applications, these options can provide increased flexibility and improved performance. If purchased with the autoclave, there would be no additional freight/FOB costs incurred.

### Data Monitoring & Recording Options

- AAR130**     **Integral Data Printer:** This printer provides a permanent and traceable record of: "Time "Temperature "Pressure "Batch No. "Cycle Name. There is also provision for operator signature; the printer also provides reports of cycle settings and servicing information.
- AAR120**     **RS232 Interface:** This allows cycle progress to be monitored on an external computer equipped with suitable software.
- AAR122**     **Ethernet Interface :** Via VNC Viewer. Allows visual display of autoclave touch screen

### Important option to be considered if fluids are being processed

- AAR014**     **Load Sensed Process Timing:** Load Sensed Process Timing allows the sterilization cycle to be controlled via the temperature achieved in the centre of the load. The operation of load sensed process timing is controlled via the 'Secure' programmer. A 'wandering' probe, situated within the chamber is inserted into the load, or load simulator, and initiates the sterilization period once the probe reaches the programmed threshold temperature. A selectable 'Profiled Overshoot Boost' speeds up the cycle and minimises over-processing of media loads.

### Cooling Option

- AAP007**     **Assisted Air Cooling:** A powerful fan-assisted cooling system which greatly reduces cool-down time. The operation of the Assisted Air Cooling system is controlled via the 'Secure' programmer and is available on all models.

### Additional Option

- AAP800**     **Multi Program Controller:** A multi-program controller which allows storage of up to eight programs for added speed and versatility in sterilization procedures. Additional features on this option include a digital pressure display and a "menu" allowing the user to display and cross check all programs at the press of a button. If the optional data printer (AAR100) is fitted, this may be printed out.

#### **IQ/OQ Documentation Pack**

##### **IQ Documentation**

Details of calibration equipment \* Order Acknowledgement \* PED (Pressure Equipment Directive) Compliance \* Declaration of Conformity \* FAT (Factory Acceptance Test) \* Drawing Schedule \* ISO 9001:2000 Certification \* Pressure vessel specification \* Door safety checks

##### **OQ Documentation**

Chamber temperature distribution (per cycle) \* Automatic control test (per cycle)

***Please note: This is our standard IQ/OQ Documentation package. If other documents are required, please contact us with details of your specific requirements.***

### Chart Recorders

**Astell are able to offer a comprehensive range of Chart Recorders.** Please either contact us or visit our website ([www.astell.com](http://www.astell.com)) for further information

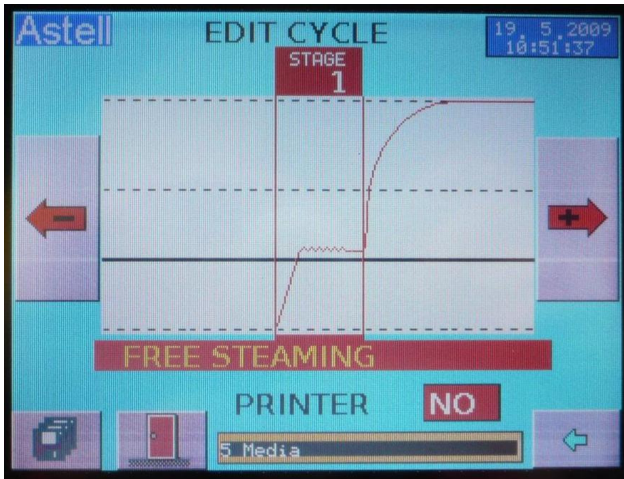
## Accessories

<b>AAN340</b>	½ depth stainless steel basket AMA4/240
<b>AAN342</b>	½ depth Morrison discard container AMA4/240
<b>AAN308</b>	Spare condensate bottle

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***NEXT PAGE – Controller Information & Technical Specification . . . . . ➤***

## Full Colour Touch Screen Controller



- Full Colour Touch Screen
- Data Archiving
- 5 Selectable security operating levels with Password Protected Security
- Easy Fingertip Operation even when wearing Lab Gloves
- Easy selection of program by Name and Settings
- Audible confirmation of key presses
- Simple Cycle Selection
- RS232 Interface / Port - Allowing connection to other peripheral devices such as a printer
- Operator Interface
- Built-in provision for mandatory Safety valve tests etc
- Enables continual monitoring

- Warnings of Faults
- Onscreen Display of Program Info, Times, Temperatures, Pressure, Cycle stage, Cycle Counter etc
- Internal Fault Detection with automatic fault diagnosis and complete fault history for easy servicing
- Simple to use Controls set out on the large illuminated Touch Screen display with menus for all operations
- Optional Communications including Ethernet and RS232

This control system is an advance in sterilization control technology, bringing together years of unrivalled experience, to produce a user friendly, fully automatic control system, to meet and exceed the expectations of even the most demanding laboratories and centres of sterilization.

The controller consists of a wipe clean touch screen based on an industrial PLC controller, combined with a number of analogue and digital input/output modules.

The controller software has been developed by Astell for the precision control of autoclaves.

The code is split into well-defined blocks, each of which performs a specific function and has been written in high level language to allow maximum clarity.

**NB – This unit does not have a vacuum feature and is therefore unsuitable for wrapped instruments etc**

### Safety Features:

#### Design to PD97/23/EC

#### Overheat protection

#### Insulated safety door

#### Cooling locks

(in accordance with H.S.E. PM73) preventing opening of autoclave above 80°C. (for fluid & discard cycles)

#### Alarms

for Cycle Fault - Cycle Interruption - Sterilize Failure - Water Low - Door Unlocked

#### Door Seal

Self Energising / Service independent

#### Door

The door release is interlocked by both temperature and pressure to ensure all residual pressure has completely and effectively vented to atmosphere before the doors can be opened. The door will retain its positions in the event of failure of any service. The door is thermally insulated to prevent the surface temperature presenting a hazard to operators. The surface temperature will not exceed IEC 61010 requirements. A cycle cannot start until the door is closed and locked. Steam cannot be applied to the chamber unless the door is closed and locked.

## Interlocks

Safety interlocks are provided, and are achieved by hardware, separate from and additional to the control system. All interlocks are configured to fail-safe and to provide a signal to the control system to indicate that normal operation has been prevented, and to terminate the current cycle. The interlock system is designed so that its function can be tested during routine maintenance. Safety related interlocks are either hard wired or piped. The following safety interlocks are provided: ♦If the door is not closed, the steam supply to the chamber will be isolated ♦If the pressure in the chamber exceeds 0.15 bar the door will remain locked.

## Performance Tests

All electrical equipment is Safety Tested in accordance with the Low Voltage Directive.

Astell shall perform the following standard Factory Acceptance Tests. The tests are included in the machine costs as per the quotation prior to despatch:

**All Astell autoclaves are fully tested and calibrated before despatch in line with our ISO9001-2000 procedures.**

Connect and check all supplies	Produce printout for each cycle tested (When printer option fitted)
Check software version	Check door interlocks
Power up controller and check door open/close operation	Carry out sterilize monitor timer test on each cycle
Install relevant cycle data as required by client	Run cycle and check for any leaks
Calibrate all temperatures and pressures	Check all safety valves
Check rotation of all pumps and motors (if applicable)	Run each cycle and check conforms with applicable standards
Check and document safety devices	Document in Astell procedures

## Applicable Standards

PED EN/97/23/EC /

ISO9001-2000 / UKAS / IEC 61010

Medical Devices Directive 93/42/EEC

Medical Devices Quality Management System - BS EN ISO 13485:2003

### Autoclave Safety

N.B. Please note that all Astell autoclaves are manufactured to the highest standards and in full compliance with the Pressure Equipment Directive – i.e. PD5500/PED/97/23EC. Whilst all units have the necessary safety features to minimise user risk, and help ensure long term reliability, it is recommended that:

- a) Routine safety checks are carried out in accordance with Astell manuals and in compliance with current pressure regulations and/or insurance requirements.
- b) Autoclaves are serviced regularly by Astell or Astell trained/recommended engineers. *(UK only: Please contact us for further information and costs on our range of Preventative Maintenance contracts).*