



artis

Dialysis System

SW 8.09.13

Training module 5 – Troubleshooting

*Ref: Operator's Manual SW 8.09.13
- Chapter 16 – Alarms, Information Signals, Troubleshooting*

Troubleshooting



- Alarm Management
- Air in Venous Line Alarm
- Arterial/Venous Pressure Alarms
- Malfunction Alarms
- SmartScan

Important Notice:

This presentation does not relieve any user of the Artis Dialysis System from his or her duty to carefully read the full text of the Operator's Manual before using the system.

Important:

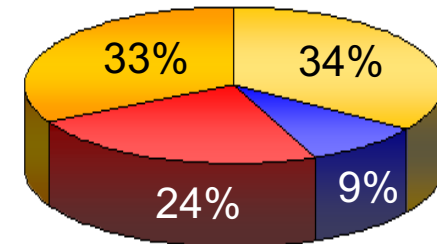
Please note that the SW change to 8.09.13 of this presentation does not change the training of the Artis Dialysis System for users.

Alarm Classes and Distribution

Classes	Alarm Priority	Display Color	Sound*	Light appearance
High	HIGH	RED	High sound 10 pulses/7sec	RED Flashing
Medium	MEDIUM	YELLOW	Med Sound 3 pulses/7sec	YELLOW Flashing
Low	LOW	YELLOW	Low sound 2 pulses/17sec	YELLOW Constant
Notification	n/a	BLUE	Tune every 90 sec	n/a
Smartscan	n/a	BLUE	Tune every 90 sec	n/a

*Ref: Operator's Manual SW 8.09 chap. 16 p. 16-2

GUI text, sound and light in compliance with the IEC 60601-1-8 standard:



Alarms are now categorized as per above mentioned standard compared to SW 6.04 when Artis was launched.

Smart Alarm Management

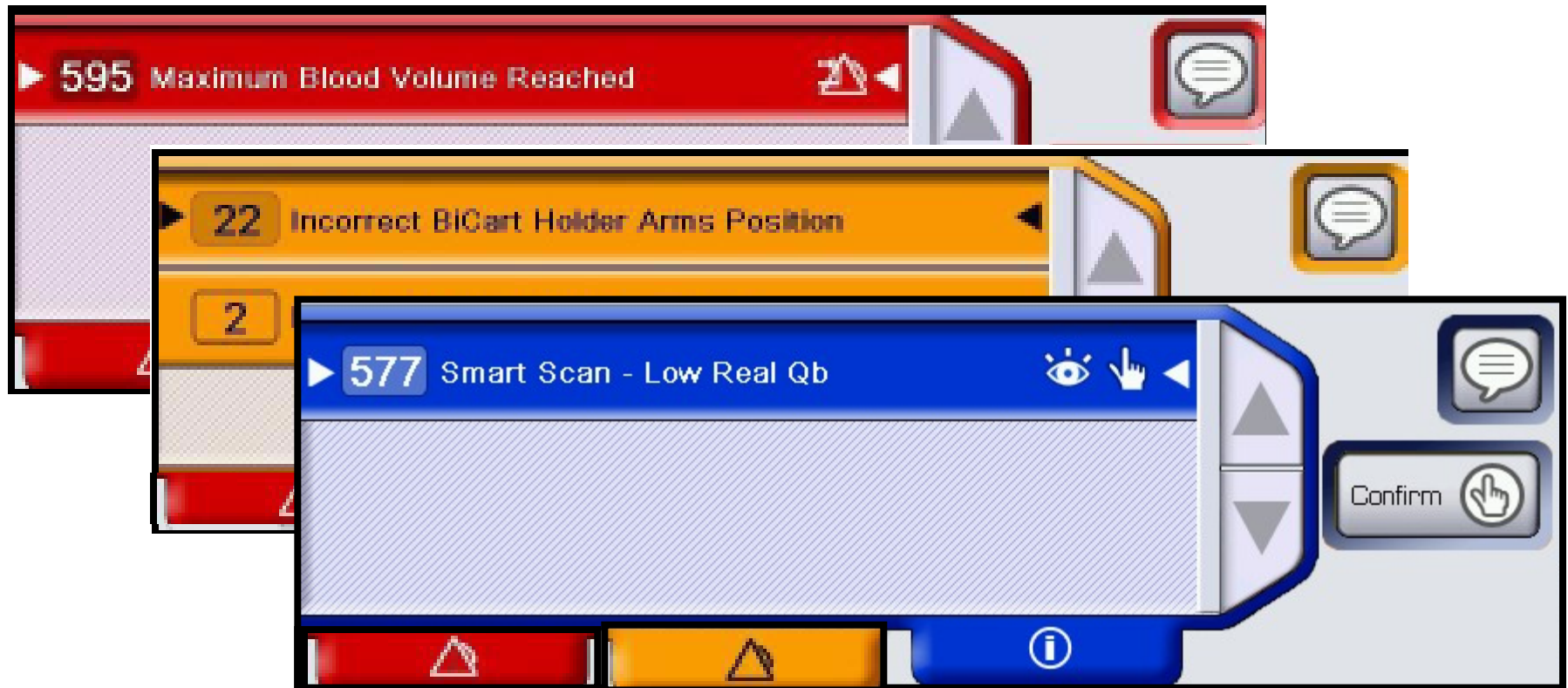
The alarm code and message displayed may include several related alarm codes.

Examples to the right:

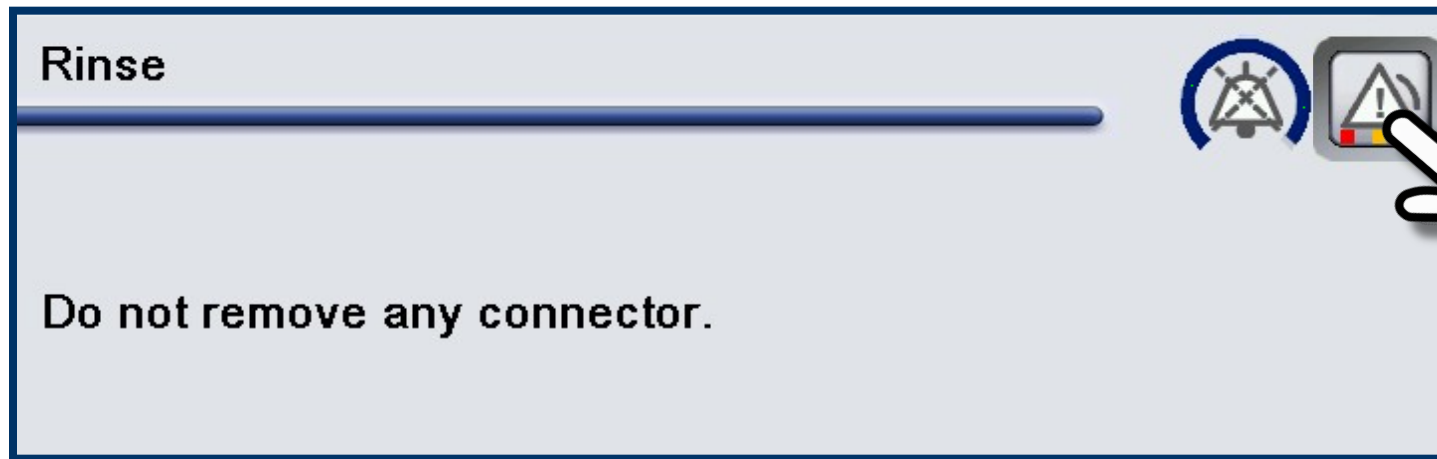
- BiCart cartridge empty (#21)
- Acid/Acetate Concentrate Container Empty (#1)

Root Alarm	Related Alarms
BiCart cartridge empty (#21)	<ul style="list-style-type: none"> • Incorrect conductivity measured (#375) • Incorrect bicart/blue concentrate tube concentration (#366) • Dialysis fluid temp low (#377) • Dialysis fluid flow low (#373) • Conductivity too low (#462) • Acid/Safebag Concentrate Error (#369) • Bicarbonate/Safebag Concentrate Error (#370) • Dialysis fluid temp too low (#461) • Dialysate pH low (#368) • Dialysate pH high (#40) • Bicarbonate/K Conductivity too Low (#464) • Incorrect fluid conductivity detected (#496) • Select Concentrate Error (#590)
Acid/Acetate Concentrate Container Empty (#1)	<ul style="list-style-type: none"> • Incorrect conductivity measured (#375) • Incorrect bicart/blue concentrate tube concentration (#366) • Dialysis fluid temp low (#377) • Dialysis fluid flow low (#373) • Conductivity too low (#462) • Acid/Safebag Concentrate Error (#369) • Bicarbonate/Safebag Concentrate Error (#370) • Dialysis fluid temp too low (#461) • Dialysate pH low (#368) • Dialysate pH high (#40) • Bicarbonate/K Conductivity too Low (#464) • Incorrect fluid conductivity detected (#496)

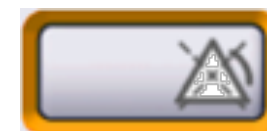
Alarm Appearance



Alarm Management



Mute icon with 2 minute progress bar



Only a blood leak alarm can be paused (overridden) per Operator's manual chap 16.

Alarm Help-on-screen

Air in Venous Line

1. Clamp the Venous Patient Line.
Do not clamp above the automatic Venous Line Clamp.
2. Clamp the Venous Dialyzer Line.
3. Attach Syringe.
Create a negative venous pressure.
Clamp the Venous Infusion Line.
4. Open the Venous Patient Line Clamp.
5. Start Arterial Pump.
6. Open the Venous Dialyzer Line Clamp.
If needed, adjust the chamber levels.

Next Close

4 Air in Venous Line

VEN 126 mmHg

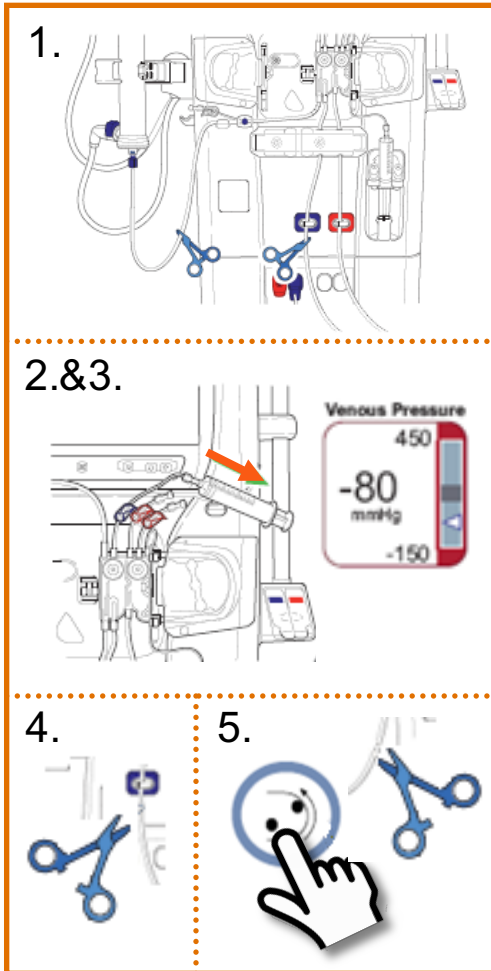
ART -74 mmHg

UF Rate 0.00 L/h

UF Volume 0.01 L

Help-on-screen is automatically closed if an alarm with higher priority occurs

Air in Venous Line



1. Manually clamp:
 - The venous patient line below the venous automatic line clamp and any visible air
 - The dialyzer venous line
 - **This will isolate the venous chamber**
2. Attach a sterile luer-lock syringe to the venous infusion line and create a negative pressure of -80 mmHg in the venous chamber (vacuum effect)
3. The venous patient line clamp will open automatically (listen)
4. Remove the manual clamp from venous patient line and pull air into syringe to raise level in chamber – check that no air is present in the line
5. Restart blood pump and remove the manual clamp from dialyzer line
6. *Check/adjust chamber fluid levels as needed*

As long as another red alarm is active it is not possible to restart the blood pump

When resolving the Air in Venous alarm, the venous clamp closes again if the venous pressure reaches + 40 mmHg

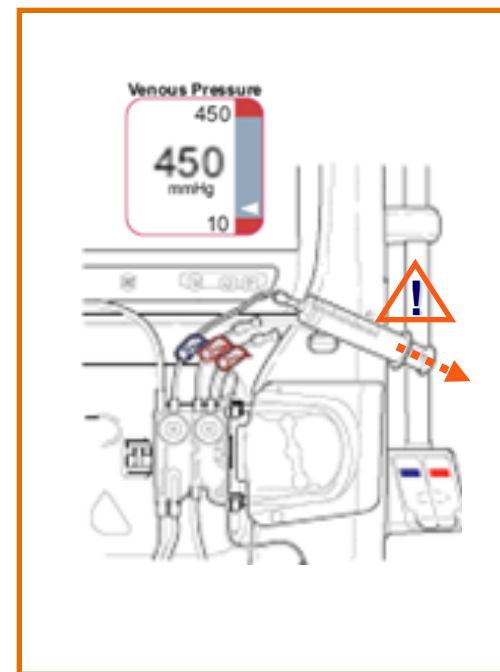
A/V Pressure Alarms

Arterial pressure alarm:

- ▶ occurs when a surge or a drop in the arterial pressure goes over or below the window limits
- ▶ Once the arterial pressure stabilizes, press the Reset button to reset the alarm.
- ▶ The blood pump will restart automatically

Venous pressure alarm

- ▶ Occurs when a surge or a drop in the venous pressure goes over or below the window limits
- ▶ Once the venous pressure stabilizes, press the Reset button to reset the alarm
- ▶ The blood pump will restart and the venous clamp will open automatically



A Venous pressure above 450 mmHg requires the use of a sterile luer lock syringe to decrease the pressure

Malfunction alarm – Call for service

- Note the alarm code (check the malfunction list in the Operator’s Manual)
- Perform a “Fast Recovery” procedure (if applicable, see below)
- If the malfunction alarm is not resolved / recurs - turn the machine OFF and perform a Manual Rinseback
- Call your biomedical technician for Service

Pay special attention to malfunction alarm code 59 and 64

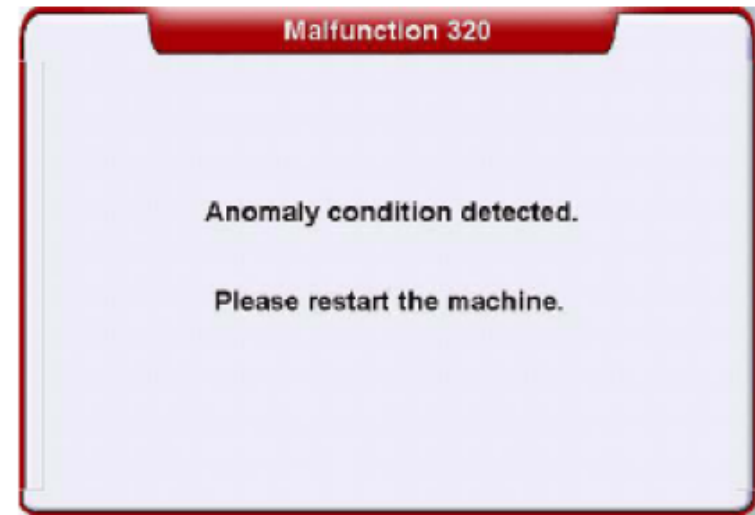


- ▶ Code 59: Heater protection error
 - **Switch the machine OFF**
 - Perform a Manual Rinse-back
- ▶ Code 64: Safe state activated “Excessive Rinseback Volume”
If this alarm code occurs during Rinseback
 - Switch the machine OFF
 - **Disconnect the patient**

Malfunction 320

Malfunction 320 is presented with this specific alarm windows:

- The touch screen is blocked
- A “Fast Recovery“ procedure is required
- Turn Artis machine off then restart and follow instructions on screen

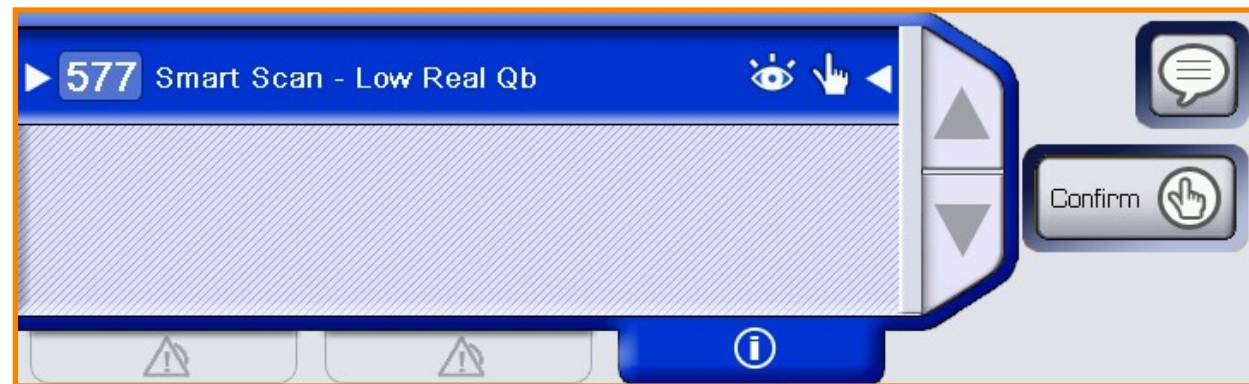


It is not necessary to disconnect the patient

SmartScan



Treatment supervisor, alerting the Operator when the ongoing treatment may be improved by the adjustment of a parameter settings



Some of the SmartScan notifications are presetable

Examples of SmartScan notifications



- Smartscan - High QD, code 514
- Smartscan - Low QD, code 513
- Smartscan - Low QB, code 512
- Smartscan - Low Real QB, code 577
- Smartscan - High Sodium setting, code 606
- Smartscan - Hemocontrol: Late on Prescription, code 229
- Smartscan - Hemocontrol: Early on Prescription, code 230
- Smartscan - Hemocontrol: High Na Concentration, code 231
- Smartscan - Hemocontrol: Low Na Concentration, code 232
- Smartscan - Not performing UF, code 443
- Smartscan - Diascan: Low Clearance, code 530
- Smartscan - Diascan: Low Kt/V, code 531

Hands on Module 5

- *Change A/V pressure window*
- *Change A/V pressure limits*
- *Handle A and V pressure alarms*
- *Handle air in venous line*

References

- IEC 60601-1-8 standard

For the safe and proper use of the Artis dialysis System, refer to Warnings, Precautions and the complete Instructions For Use in the Operator's Manual available by contacting customer support

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