

# Preface

This manual provides the information needed to operate the WRO 300 H water purification unit.

Valid program version	4.x
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## Other manuals for WRO 300 H

The list below shows all manuals related to this Operator's Manual.

Service Manual	WRO 300 / WRO 300 H, HCEN12073
Installation Guide	WRO 300 / WRO 300 H, HCEN12115

## Definitions of expressions in the manual



### **WARNING**

Is used to alert the user/operator **not to take** a certain action, which if taken can cause a potential hazard and result in a serious adverse reaction, injury or death. A warning may also be used to alert the user/operator **to take** a certain action to avoid the potential hazard as above.



### **CAUTION**

Is used to alert the user/operator **to take** a certain action to protect against a potential hazard which, if ignored, could have an adverse effect on the patient or the device. A caution may also be used to alert the user/operator **not to take** a certain action to avoid the potential hazard as above.

### **NOTE**

A reminder to the user/operator on normal treatment activity and on what is a suitable action in a particular situation.

## Safety considerations



### **WARNING**

Unauthorized installation, modifications, alterations or repair of the WRO 300 H may result in malfunctioning or have other serious consequences for the safe operation of the equipment.



### **WARNING**

Dialysis machines that are supplied with water from the WRO 300 H water purification unit must comply with IEC 60601-2-16.



### **CAUTION**

- WRO 300 H may be operated only by persons who have studied the instructions in this manual and the manual for the dialysis monitor. If the system does not perform as described in this manuals, it should not be used until the condition is rectified.
- The operator should pay attention to alarms and follow the instructions, warnings, cautions and notes given in the manual.
- The WRO 300 H will perform as designed only if it is used and maintained in accordance with Gambro's written instructions. Any warranties made by Gambro with respect to the WRO 300 H are voided if the equipment is not used in accordance with the written instructions provided. Gambro will not accept responsibility for any damage or injury resulting from improper use or maintenance or unauthorized repair.
- The use of mobile telephones or communication equipment in the vicinity of the WRO 300 H could adversely influence the performance of the machine. See specification.
- The WRO 300 H is not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
- WRO 300 H needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the Operator's and Service manual.
- For USA: US Federal law restricts this device to sale by or on the order of a physician.

**NOTE**

- During transportation and storage the equipment must be kept in its original packing. If transportation or storage time is more than 15 weeks the environmental data relating to the operation must be followed.
- For the qualified technician the WRO 300 / WRO 300 H Service Manual is available. The Service Manual provides all of the necessary information for the safe and required maintenance of the machine.
- The WRO 300 H is intended for continuous operation

## List of symbols



Alternating current



Protective earth (ground)



Warning, consult accompanying documents



Off (power, disconnection from the mains)



On (power, connection to the mains)



Type B, applied part



Handle with care



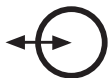
This way up



Keep dry



Separate collection for electrical and electronic equipment



Input /Output



Year of manufacturing

**IPX1**

The WRO 300 H is protected against dripping water



This symbol indicates that the water purification unit WRO 300 H contains toxic or hazardous substances or elements.

The figure 25 indicates the corresponding environmental protection use period of the water purification unit WRO 300 H.

(Valid for Main land China only)



Recycling symbol -General



Reject water connection



Feed water inlet connection



Loop connections (Product water outlet and return)

## Certification marks



The CE-conformity mark indicates that the WRO 300 H water purification unit conforms to the requirements in the EC Council Directive 93/42/EEC of 14 June, 1993 concerning medical devices. It also indicates that the notified body British Standards Institution (BSI, No. 0086) has approved the Quality Management System. The CE conformity mark is only valid for the WRO 300 H water purification unit. Disposables and any accessories specified for use with the WRO 300 H water purification unit are marked with CE conformity marks in their own right.



The CSA(C-US) mark indicates that the WRO 300 H water purification unit conforms to the requirements related to safety of medical devices for the US and Canada. The "C" and the "US" adjacent to the CSA mark indicates that the WRO 300 H water purification unit has been evaluated to the applicable ANSI/UL and CSA standards for use in the US and Canada.

## IPR - Intellectual Property Rights

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# 1 Introduction

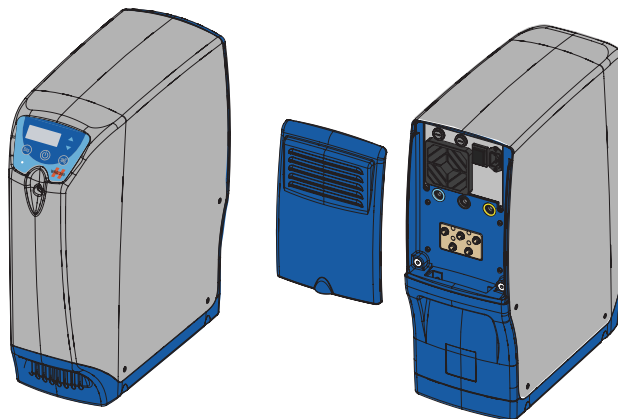
## 1.1 Intended use

The Gambro WRO 300 H Water Purification Unit is intended to be used as a dialysis accessory to produce water through reverse osmosis for one hemodialysis equipment.

The WRO 300 H can be connected to hemodialysis equipment used both in hospitals and in home environments, in conjunction with appropriate pre and post treatment units, as a part of a water treatment system designed to meet applicable regulations or standards for water for dialysis, e.g. current AAMI and Federal (U.S.) standards.

### **!** CAUTION

The water produced by WRO 300 H should be analysed at installation and on a regular basis to verify that it conforms to applicable regulations or standards for water for dialysis.



## 1.2 General

The WRO 300 H has been designed to fulfil the special requirements of dialysis setting. For this purpose this device has the following features:

- Simple user interface
- Automated Heat disinfection
- Chemical disinfection and cleaning modes
- Auto flush function during Standby periods to minimize stagnant water.

This manual for WRO 300 H includes instructions for operating, monitoring, cleaning, disinfecting and troubleshooting this device from an operator's perspective. For installation instructions refer to separate *Installation Guide*.

## 1.2.1 Alarm types

### Notification


Next time the WRO goes to Standby the buzzer sounds, , flashes and the message text will be displayed.

<i>Buzzer Sound</i>	<i>Description</i>
Notification	— — — — —

### Info


The WRO continues in the current mode. The message text will be displayed.

### Alarm

The WRO continues in the current mode. The buzzer sounds, , flashes and the message text will be displayed.

<i>Buzzer Sound</i>	<i>Description</i>
Alarm	— — — — —

### Stop

The WRO stops. The buzzer sounds, , flashes and the message text will be displayed.

<i>Buzzer Sound</i>	<i>Description</i>
Stop	— — — — —

### 1.2.2 Conductivity monitoring

The conductivity monitoring system in the WRO 300 H has three limits, allowing for individual adaptation of alarm settings to local preferences and regulations. The three limits are described in the sections below.

All three limits are set to 60  $\mu\text{S}/\text{cm}$  from factory. With this setting the WRO 300 H will stop without any previous warning if the product water conductivity exceeds this value.

#### **NOTE**

If the notification, alarm and stop limits are set to the same value the priority of the action are in the order of stop, alarm and notification.




#### Conductivity notification

Indicates that the product water conductivity is above normal reading. It will be issued when the WRO 300 H enters Standby mode if the notification limit has been exceeded for more than 30 consecutive seconds during the previous run period. It may be caused by several reasons such as incipient fouling, degradation of the RO membrane or change in the feed water quality.




#### **NOTE**

If the feed water conductivity is known to vary significantly, the conductivity notification limit should be inactivated by setting it at the same value as the conductivity alarm, see below.

#### Conductivity alarm

The clinic's predefined maximum product water conductivity for water for dialysis has been exceeded for more than 30 consecutive seconds. An audible and visual alarm will be issued. The WRO 300 H will, however, continue in operation to allow for finishing the dialysis treatment. The buzzer can be muted indefinitely by pressing ,  or , however the button remains lit to indicate that the alarm persists.

### Conductivity stop

The clinic's predefined maximum permissible product water conductivity has been exceeded for more than 30 consecutive seconds. An audible and visual alarm will be issued and WRO 300 H will stop. The alarm can be acknowledged by pressing ,  or . The WRO 300 H can be restarted, but the alarm will reappear and the WRO 300 H will stop after 30 seconds if the conductivity remains over the limit.

### Setting of conductivity limits

- If the intention is to have an early warning of a change in the product water conductivity, set the notification limit at a value between the normal product water reading and the set alarm limit.
- If the intention is to stop operation in case of a conductivity alarm, set alarm and stop limits to the same value.
- If, in case of a conductivity alarm, the intention is to allow for continued dialysis in order to finish the ongoing dialysis treatment, set the alarm limit at the desired limit. The stop limit at which the WRO 300 H will stop then has to be set at a higher value.

To adjust the limits, refer to the *Service Manual*.

### Low rejection rate notification

The rejection rate is the reduction (in %) of the conductivity of the water in a reverse osmosis system. It depends on a number of factors such as conductivity, pH and temperature of the feed water and may vary significantly from one location to the other. It should therefore not be considered as an absolute measure of the quality of the water but rather as an indicator that can help to detect changes in performance of the WRO 300 H which may be caused by incipient fouling or degradation of the RO-membrane.

The Low rejection rate notification default setting of 90 % is relevant for most inlet water supplies. It may, however, need to be adjusted at installation to a lower value by a qualified technician to fit local conditions, especially in cases of low feed water conductivity ( $<100 \mu\text{S}/\text{cm}$ ). The limit should be set at least 5 % lower than the initial value recorded at installation.

The Low rejection rate notification will be displayed when the WRO 300 H enters Standby if the set limit has been exceeded for more than 5 consecutive minutes during the previous run period.

### 1.2.3 Mains power switch

The mains power switch is only used in service situations to turn off the power. The mains power switch is located on the rear side behind a detachable cover.













## 1.3 Operator's panel



### 1.3.1 Description of buttons

<i>Buttons</i>	<i>Description</i>
	Press to start operation (RUN).
	Press to stop operation (STANDBY).
	Press to stop Heat disinfection procedure and Low Flow Heat
	Press to enter <b>SELECT</b> (only in Standby mode)
	Press to start the selected procedure ( <b>SELECT</b> or <b>CHEM SELECT</b> ).
	Press during the chemical intake procedure to pause.
	Press during dwell period to initiate rinse.
	Press to silence audible alarms.
	Press to unlock the display and enter the alarm list.
	Used to scroll and view data in the display.
	Press any of the arrow buttons to unlock the display and enter the alarm list.
	Pressing both arrow buttons simultaneously will lock current information in the display. Press any arrow buttons to release the locking function.

### 1.3.2 Description of indications

Indications			Description
	Green	General	Indicates that the WRO 300 H is energized.
	Green	Steady light	RUN mode, Auto flush or Manual Flush in progress.
		Slow flash	The Auto flush function is activated. (only in Standby mode)
		Fast flash	Insufficient feed water supply. (only in RUN mode)
	Yellow	Steady light	Chemical disinfection, Heat disinfection, Low Flow Heat or Cleaning is in progress.
		Slow flash	The automated Heat disinfection by time channels is activated. (only in Standby mode)
		Medium flash	The disinfection wand connector is inserted into the chemical intake.
			During selection of procedure in <b>SELECT</b> or <b>CHEM SELECT</b>
The chemical intake phase is paused.			
		Forced rinse is required ( <b>404 RINSE REQUIRED</b> ).	
	Red	Medium flash	Unconfirmed notification, info, alarm or stop conditions are present.
		Steady light	Notification, info, alarm or stop condition has been confirmed.

#### Definition of flash indications

Flash indication	Time	
	On	Off
Slow flash	0.4 sec	2.0 sec
Medium flash	0.4 sec	0.4 sec
Fast flash	0.2 sec	0.2 sec



### 1.3.3 Reminders



Reoccurring notifications can be preset to remind the user to take certain actions, for example exchange cartridge in the pre-filter. When the reminder time expires the notification message will be displayed. Further information of setting the Reminders, refer to *Service Manual*.

**NOTE**

After the reminder time has expired the notification message will only appear once!



### 1.3.4 Operational data

If any alarm (stop, alarm, info or notification) has been issued, the alarm list will appear first and can be scrolled and viewed by using the  or . Refer to “*Troubleshooting*” on page 53.

By using  or  the operational data can be scrolled and viewed in the display.

<i>Operational data</i>		<i>Unit</i>
PRODUCT WATER		X µS/cm
FEED WATER		X µS/cm
REJECTION RATE		X %
PRODUCT WATER FLOW		X ml/min
PRODUCT WATER TEMP		X °C
HEAT,	<i>DAYS SINCE LAST<sup>a</sup></i>	X
CHEM,		X
ACID CLEAN,		X
ALKALINE CLEAN,		X
PROGRAM VERSION		X.y
TOTAL RUN TIME		X hr
DATE		yyyy-mm-dd
TIME		hh:mm:ss
INTERNAL SERVICE		Not applicable

a. *Visible depending on settings*

Main view will reappear automatically after 15 seconds. It is also possible to return to the Main view, by using either  or  to scroll through the alarm list and the operational data until Main view is displayed.

## 2 Operation

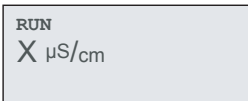


### WARNING

This device does not remove chlorine and chloramines. If these substances are present in the feed water, carbon filtration is required to remove these substances. Severe patient injury may otherwise occur. A test for total chlorine of the pretreated water must be performed prior to initiating dialysis treatment. The level of total chlorine must be below 0.1 mg/l (ppm).



### 2.1 Start

Press  until light goes on.




If Remote start/stop is provided (not available in the USA), WRO 300 H will start automatically when requested from the dialysis machine.

### NOTE

 will light up and the WRO 300 H will go into Active Cooldown if the internal water temperature exceeds 45 °C ( will still be lit). The procedure will continue until the temperature is below 45 °C.

## 2.2 Stop

Press  until light goes out and the WRO 300 H goes to Standby mode.



### **NOTE**

If power failure occurs during operation mode the procedure continues in the same phase as when the power failure occurred when the WRO 300 H starts up again.

## 3 Regular maintenance

**NOTE**

The procedure below assume factory settings of the protocol.

**NOTE**

If the internal water temperature exceeds 45 °C when initiating the preferred procedure the display reverts to the **SELECT** menu or the **CHEM SELECT** menu.

This situation is resolved by initiating RUN and letting the WRO 300 H operate and perform an Active cooldown until the temperature is below 45 °C.

### 3.1 Heat disinfection and Low Flow Heat

The required Heat disinfection frequency to fulfil the desired microbiological requirements for the product water depends on several factors, such as:

- the quality of the feed water
- local regulations regarding the microbiological quality of dialysis water etc.

Therefore, no general rules can be given that cover all situations. The disinfection schedule should instead be based upon microbiological testing performed by the clinic. A maximum period between disinfections should then be established to ensure acceptable bacteriological quality of the product water according to the clinic's standards.

As a guideline, Gambro recommends a minimum frequency of weekly Heat disinfection to ensure consistent microbiological quality of the product water.

If the WRO 300 H will not be used for an extended period of time, regular automated Heat disinfection preset by the time channels will maintain the microbiological quality of the product water.

### 3.1.1 Heat disinfection

Heat disinfection of the WRO 300 H, including product water loop.

**NOTE**


The dialysis machine shall be turned off when the Heat disinfection procedure is performed.







**NOTE**

The Heat disinfection procedure can also be initiated by the time channels. Further information of time channel settings refer to *Service Manual*.


#### Procedure

**NOTE**

If power failure occurs during Heat disinfection procedure 301 **INSUFFICIENT HEAT** is displayed when the WRO 300 H restarts. Press  until the WRO 300 H either goes to Standby or an Active Cooldown is initiated if it is preset.

- 1 Press  until **SELECT** is shown in the display and  starts to flash.
- 2 From **SELECT**, press  to enter the list of available procedures.
- 3 Select **HEAT** by using the  .
- 4 Initiate the Heat disinfection by pressing  until the light goes on.

#### Stop of Heat disinfection procedure

- Press  until light goes on, to stop Heat disinfection procedure. An Active Cooldown is initiated. Then the WRO 300 H goes to Standby. More information of the settings of Active Cooldown refer to *Service Manual*.



### 3.1.2 Low Flow Heat

Low Flow Heat starts to heat the water in the outlet product water line and supplies hot water to the dialysis machine's inlet parts.

For more detailed information on how to perform Low Flow Heat together with Gambro Dialysis machines, please refer to *separate instructions for Low Flow Heat*.

#### Procedure



**NOTE**

If power failure occurs during Low Flow Heat procedure the Low Flow Heat restarts when the power is restored.

Follow the procedure "*Heat disinfection*" on page 24.

In *step 3* select **LOW FLOW HEAT** in the **SELECT** menu.

#### Stop of Low Flow Heat

- Press  for at least two seconds, to stop Low Flow Heat. The WRO 300 H goes to Standby when  light goes out (after approximately 30 seconds).

## 3.2 Chemical disinfection

For certain peracetic acid disinfectants the manufacturer recommends that the WRO 300 H should be cleaned with an acid cleaning agent per the cleaning instructions prior to Chemical disinfection to preserve the RO membrane. Refer to “*Cleaning*” on page 33.

Contact Gambro for suitable chemical disinfectant for the procedures.

### 3.2.1 Approved chemical disinfectants

- DIALOX<sup>®</sup> disinfectant, undiluted. (Not available for sale in the USA)  
Required amount: 115 ml per disinfection cycle (will be diluted to 3 % solution of DIALOX<sup>®</sup> disinfectant by the WRO 300 H).

- MINNCARE<sup>®</sup> Cold Sterilant

Required amount: 50 ml of concentrated disinfectant



**CAUTION**

Disinfectants may be toxic. Refer to *manufacturer's instructions*.



**CAUTION**

A test for residual disinfectant after rinse must be performed before the initiation of the next dialysis session. The residual concentration of the disinfectant in the fluid must be below levels specified by the clinic or by national standards. It is essential to use an appropriate test method, either with proven sensitivity for the disinfectant or recommended by the manufacturer of the disinfectant.

### Example of test kit

STERICHEK<sup>®</sup> Residual Peroxide, Gambro order no. 103428.

### 3.2.2 Chemical disinfection procedure

Chemical disinfection of the WRO, including product water loop.

#### NOTE

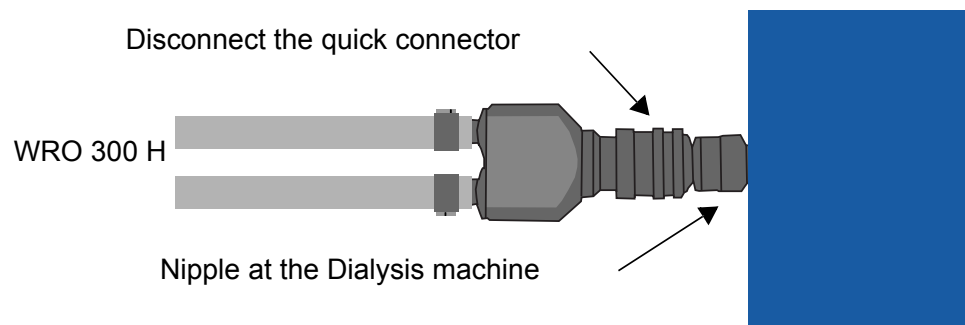
If power failure occurs during Chemical disinfection **404 RINSE REQUIRED** is displayed when the WRO 300 H restarts (also **401 REMOVE WAND** is displayed during the intake phase). Press **Dis** until light goes on, to initiate rinse.

- 1 The WRO shall be in Standby mode.
- 2 Disconnect the WRO 300 H from the dialysis machine with the quick connector on the product water loop. Alternatively the connector can be left in place. However note the caution below.



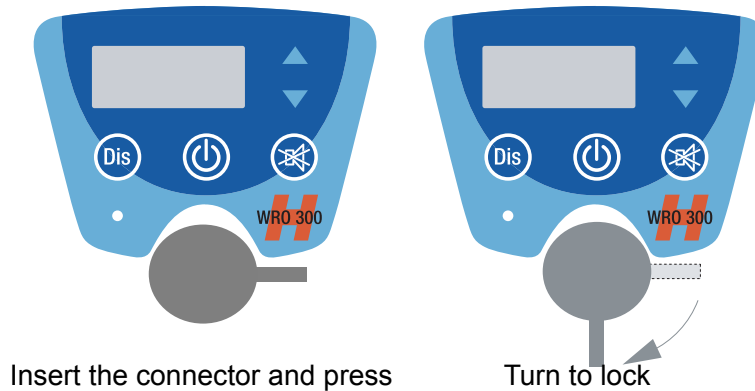
#### CAUTION

If the WRO 300 H is not disconnected from the dialysis machine during the Chemical disinfection procedure, the test for residuals after the Chemical disinfection procedure must be performed on the dialysis machine according to the *operator's manual* of this device.

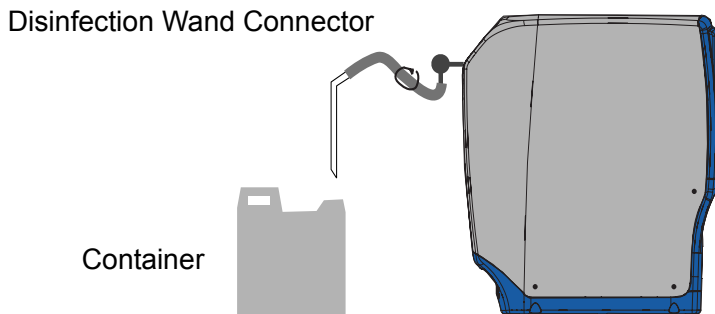



- 3 Place a tag on the WRO 300 H, stating that Chemical disinfection is in progress and what type of disinfectant is being used.

- 4 Insert the wand connector into the chemical intake port of the WRO 300 H (see figure below), press firmly and turn the connector downwards to lock. Check that the connector is securely in place.




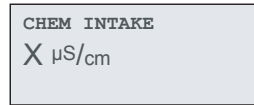
- 5 **CHEM SELECT** is shown in the display and **Dis** starts to flash.
- 6 Insert the open end of the disinfection wand into a container with sufficient amount of disinfectant (refer to *“Approved chemical disinfectants”* on page 26). Check that the open end of the intake wand is below the solution level and that the clamp is open.



- 7 From **CHEM SELECT**, press  to enter the list of available Cleaning and Chemical disinfection programs.
- 8 Select preferred Chemical disinfection program by using the arrow buttons.



- 9 Initiate the disinfectant intake by pressing  until light goes on.



**NOTE**

The display shows present phase of the Chemical disinfection procedure.

**NOTE**






The container can be empty before the intake phase is finished.



**CAUTION**

The Chemical disinfection has to be restarted if alarm **406 INSUFFICIENT INTAKE** has appeared.

Pause, interrupt or restart procedure



	<i>Action</i>
<i>Pause of chemical intake phase</i>	Press  until light flashes. To continue the intake press  again until light goes on.
<i>Interrupt Chemical disinfection procedure</i>	Disconnect the wand connector and press  until light goes on, to initiate rinse.
<i>Restart of intake phase</i>	Remove the wand connector and insert it again <b>CHEM INTAKE RESTART</b> appears on the display and  flashes. Then press  until light goes on .

- 10 **401 REMOVE WAND** is displayed and the buzzer sounds and  is flashing, press .

- 11 Keep the wand in the container and disconnect the wand by turning the connector a quarter of a turn and gently pull it out. Let the disinfectant liquid from the line and wand flow back into the container. Then clamp the line. Also check that correct amount of disinfectant has been consumed.
- 12 Remove the disinfection wand from the container and flush with water.
- 13 The Chemical disinfection procedure will now continue automatically with **DWELL PERIOD** followed by **RINSE**. The remaining time to complete the Chemical disinfection procedure is also displayed.

**NOTE**

The conductivity value is checked during the final five minutes of the rinse phase. If the value is above the Conductivity notification limit (refer to "[Conductivity monitoring](#)" on page 14) when the preset rinse time is finished it is prolonged 30 minutes. If the value decreases below the Conductivity notification limit the prolonged rinse finishes. If the level still is above the Conductivity notification limit when the prolonged rinse is finished the alarm **403 HIGH CONDUCTIVITY RINSE** appears.






- 14 When the Chemical disinfection program is completed the display will show **PERFORM RESIDUAL TEST**. The indication  will remain steady lit and the  will flash.

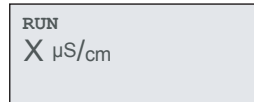
### 3.2.3 Residual test after Chemical disinfection



#### CAUTION


If the WRO 300 H has been connected to the dialysis machine during the Chemical disinfection procedure, the test for residuals after the Chemical disinfection procedure must be performed on the dialysis machine according to the *operator's manual of the dialysis machine*.

- 1 Press  until light goes on, to start WRO 300 H.  
Indication  will be steady lit and  will flash.
- 2 Collect a water sample either from the product water line or from the dialysis machine according to the caution above.
- 3 Test for disinfectant residuals with STERICHEK<sup>®</sup> Residual Peroxide test strips or other approved test strips or methods.
- 4 Confirm by pressing  until light goes out. Indication  remains steady lit



- 5 Remove any tag indicating storage with disinfectant.

#### If detecting residuals

If residuals are detected after starting the WRO 300 H by pressing  until light goes on, repeat the residual test every five minutes until no residuals can be detected.

### 3.2.4 Central Chem

The Central Chem disinfects the WRO and also sends disinfectant into the dialysis machine.

For more detailed information on how to perform Central Chem together with Gambro dialysis machines, please refer to *separate instructions for Central Chem*.



#### CAUTION

If the produced disinfection solution is fed into a device other than Gambro dialysis machines, it is the user's responsibility to ensure that the connected device is compatible with Peracetic acid disinfectants and to establish the procedure for the WRO in combination with the connected device.



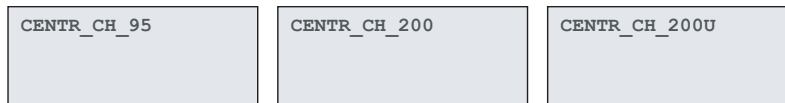
#### CAUTION

As the disinfection solution produced by the WRO will enter any device connected to the quick connector on the product water loop, residual test after disinfection must be performed on the connected device in accordance with the Operator's manual for the connected device.

#### Procedure

Follow the *“Chemical disinfection procedure” on page 27*, but start at *step 3* to and follow the instruction until *step 13*.

In *step 8* select the preferred Central Chem protocol in the **CHEM SELECT** menu.



#### NOTE

During the intake phase of the Central Chem program, the product water loop will not be pressurized until the correct conductivity has been obtained, which will take a few minutes.



## 3.3 Cleaning

### 3.3.1 Warm Acid cleaning

Warm Acid cleaning should be performed when

- Rejection rate has decreased by more than 5 % from initial value.
- Sufficient output flow is not obtained.
- As preventive measure when a softener is not used.
- As a method to remove transitional metals from the RO membrane prior to Chemical disinfection.

Dissolve 100 ml of citric acid in 200 ml of product water from the WRO 300 H. This will result in a 2 % solution in the WRO 300 H.

For procedure refer to *“Cleaning procedure” on page 34.*

**NOTE**

Other acid membrane cleaner may be used as an alternative cleaner for the WRO 300 H. Follow *manufacturer’s guidelines* to prepare the cleaning solution.

### 3.3.2 Alkaline cleaning



Alkaline cleaning should be performed when

- Product performance is affected and cleaning with citric acid does not improve performance.
- Organic fouling is suspected.

Use MINNCLEAN<sup>®</sup> TF or P3 - ULTRASIL<sup>®</sup> 10 according to manufacture’s instruction.

For procedure refer to *“Cleaning procedure” on page 34.*

### 3.3.3 Cleaning procedure

- 1 Press  until the display shows **RUN**. Wait until the product water conductivity stabilizes and record the value. Press  until light goes out to stop the WRO.
- 2 Follow the Chemical disinfection procedure, but instead select **WARM CITRIC**, or **ALKALINE CLEAN** in the **CHEM SELECT** menu. Refer to *“Chemical disinfection procedure” on page 27*.








#### CAUTION

If the temperature is not achieved during Warm Acid cleaning, alarm **407 INSUFFICIENT TEMPERATURE** will appear and the Cleaning procedure has to be restarted.

#### NOTE

The container can be empty before the intake phase is finished.

### Test for residuals

- 1 Press  until light goes on, to start the WRO 300 H. Indication  will be steady lit and  will flash.
- 2 Collect a water sample from the product water line.
- 3 The absence of cleaning chemical in the product water is confirmed if the pH is within 1.0 pH unit of the feed water value, checked with a suitable method, and if the conductivity of the product water corresponds to the previously recorded value.
- 4 Confirm by pressing  until light goes out. Indication  remains steady lit.

## 3.4 Long time Storage

If the WRO 300 H will not be used for an extended period of time, regular automated Heat disinfection preset by the time channels, will maintain the microbiological quality in the WRO.

### 3.4.1 Preservation

If automated Heat disinfection "*Long time Storage*" on [page 35](#) is not possible to perform when the WRO 300 H is taken out of operation for an extended period of time a chemical preservation has to be done. For example if electrical and water connections are disconnected.

#### Preservation agents

Use MEMSTOR and dissolve 100 ml in two liters of potable tap water. Warm water (35-40°C) speeds up dissolution.






#### Procedure

- 1 Follow the Chemical disinfection procedure (refer to "*Chemical disinfection procedure*" on [page 27](#)) *step 2-step 12*, but instead select **PRESERVATION** in the **CHEM SELECT** menu.




!

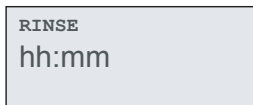
#### CAUTION



If the conductivity limit is not achieved, alarm **406 INSUFFICIENT INTAKE** will appear and the Preservation procedure has to be restarted.

- 2 After *step 12*: the display will show **404 RINSE REQUIRED** and the buzzer will now sound and the indications  and  will flash. Press ,  or  acknowledge the alarm and the alarm list will be unlocked.
- 3 Switch off the WRO 300 H on the mains power switch behind the detachable cover.

### 3.4.2 Rinse after preservation








- 1 Turn on the WRO 300 H on the mains power switch behind the detachable cover.
- 2 The indication  and  flashes and the display shows **404 RINSE REQUIRED**.
- 3 Press  until light goes on to initiate rinse.



- 4 When the rinse program is completed the display will show **PERFORM RESIDUAL TEST**. The indication  will remain steady lit and the  will flash.

### 3.4.3 Check for complete rinse-out

The required rinse program in the WRO has been designed and validated to ensure complete rinse-out of the preservation.





- 1 Press  until light goes on, to start the WRO.  
Indication  will be steady lit and  will flash.
- 2 Let the WRO run in normal operation for at least 5 minutes. Then press  or  to show the conductivity value in the display (Within 15 seconds the display will return to **PERFORM RESIDUAL TEST**). Check and verify that the product water conductivity remains stable and constant.
- 3 Confirm by pressing  until light goes out. Indication  remains steady lit.
- 4 The WRO is now ready to use.

## 3.5 Flush

### 3.5.1 Manual Flush

This mode provides a short flush of the WRO at elevated flow rate (5 minutes preset).

#### Procedure

- 1 Press  until **SELECT** appears
- 2 Scroll with  to select **MANUAL FLUSH**.
- 3 Press  to initiate Manual Flush (**MANUAL FLUSH** will be displayed and  will be lit).

### 3.5.2 Auto flush

During Standby Auto flush is regularly performed to exchange water in the WRO, if enabled in preset. Within specified intervals the water circulates in the WRO and some water goes to drain.

## 3.6 Exterior cleaning

Wipe the outside of the WRO 300 H with a cloth moistened with ethanol (70 %) or isopropanol (60 %).

**NOTE**

Do not use iodine-based or tenside-containing disinfectants as these may crack or discolour the plastic materials.



## 4 Technical data

### 4.1 Performance and specification

		Values
<i>Product water</i>	Output flow	Min. 1.1 l/min - at + 10 °C feed water temperature - at 0.15 MPa pressure in the product water loop
	Product water loop	Maximum 2 metres (2 x 1 m) uninsulated Maximum 20 metres (2 x 10 m) insulated*
	*under the following conditions; - by Gambro recommended insulation shall be used - the minimum feed water temperature is + 10 °C - the minimum ambient temperature is + 18 °C	
	Product water pressure	0.12 to 0.6 MPa (15 to 85 PSI) during RUN mode (depending of the consumption from product water loop)
	Quality	Depends on feed water quality. If potable water is used, the following rejection rates will be obtained: Total dissolved salts: > 96% (based on conductivity); - at + 10 °C feed water temperature Bacteria and endotoxins: > 99%

		Values
<i>Water supply</i>	Input	Min. 3.0 l/min required
	Feed Water Pressure	During operation <sup>1</sup> : 0.15 to 0.3 MPa (20 to 45 PSI) <sup>1</sup> There is an inlet flow of water into the WRO unit.
		Maximum design pressure: 0.8 MPa (115 PSI)
		If the feed water pressure exceeds 0.3 MPa (45 PSI), a flow regulator, order no W522001001, should be installed.
	Feed Water Temperature	+ 5 to + 30 °C
	Feed Water Quality	Potable water should be used.
		Particle filtration shall be used (< 5µm)
		Carbon filtration shall be used if water is chlorinated, see limits below.
		Membrane life expectancy might be reduced if the monitor is operated outside the following limits.
	Hardness	< 0.3 °dH (6 ppm as CaCO <sub>3</sub> )
	Iron	< 0.1 mg/l
	Manganese	< 0.1 mg/l
	Turbidity	< 1 JTU
	Total dissolved salts (TDS)	< 1500 mg/l
Fouling index (silt density index)	< 5	
Chlorine (total)	< 0.1 mg/l	



		<i>Values</i>	
<i>Drain</i>	Drain output flow during RUN mode	1.2 ± 0.1 l/min	
	Height difference between the drain hose outlet and the WRO 300 H drain outlet.	Max. 1.0 m	
	Drain (length of hose)	Max. 5 m	
	Drain flow capacity	Min. 3.0 l/min required	
	Max temperature	85 °C	
<i>Tank air vent</i>	This outlet connects the tank to the atmosphere. This outlet must be connected with an air gap. If a hose is connected to the Tank air vent the hose shall have a constant slope.		
	<p><b>NOTE</b></p> Air will move back and forth in this line because of the variation of the level in the tank.		
<i>Chemical intake</i>	The machine is designed to bring in disinfectant/cleaning agent through the chemical intake. The maximum suction height from chemical intake is 600 mm.		
<i>Fluid Connections</i>	Designed for flexible, reinforced tubing 8 mm x 2.5 mm (5/16" I.D.) The product water loop is designed for flexible, reinforced tubing 5 mm x 3 mm.		
<i>Conductivity measurement (Temperature compensated)</i>	Product water conductivity	Operating range	1 - 500 µS/cm
		Accuracy	± 10% or ± 10 µS/cm Which ever is greatest
	Feed water conductivity	Operating range	10 - 2000 µS/cm
		Accuracy	± 10% or ± 10 µS/cm Which ever is greatest

		<i>Values</i>
<i>Temperature measurement</i>	Operating range	0 to 105 °C
	Accuracy	± 4 °C
<i>Reverse osmosis module</i>	Membrane material	Polyamide, thin film composite
	Membrane configuration	Spiral wound
	Membrane pH tolerance	2 to 11

		<i>Values</i>
<i>Power supply</i>	Mains Voltage	100 to 240 V AC (line voltage range 85 to 264 V AC)
	Frequency	50 or 60 Hz (line frequency range 45 to 65 Hz)
	Power Consumption Max	1500 W (100 V AC) 1380 W (115 V AC) 1850 W (220-240 V AC)
	Appliance inlet	According to IEC 60320; C14
	Cable	Cable with protective earth Conductor length max. 3.5 m minimum 1 mm <sup>2</sup> (220-240 V AC) AWG 16 at 100 and 115 V AC
	Mains plug	<ul style="list-style-type: none"> <li>• Continental Europe - 230 V AC, mains plug CEE-7 / VII</li> <li>• United Kingdom - 230 V AC, mains plug BS 1363/A</li> <li>• Australia - 240 V AC, mains plug AS/NZS 3112</li> <li>• North America type - 100 and 115 V AC, Hospital grade, earthed plug, type IEC 60 083; A5-15</li> <li>• China - 220 V AC mains plug PRC/3</li> <li>• Brazil - 220 V AC, mains plug BR/3</li> <li>• Denmark - 230 V AC, mains plug DK3/HGAS</li> </ul>
	Fuses	10 A slow blow (220-240 V AC) 15 A slow blow (115 V AC) 15 A slow blow (100 V AC)
	Earth Leakage Current	Max. 250 µA (220-240 V AC) Max. 145 µA (115 V AC) Max. 140 µA (100 V AC)

		<i>Values</i>	
<i>Connection of external equipment</i>	<i>External connector 8 pins REDEL, yellow.</i>		
	Remote start (Not available in the USA)	Max voltage	5 V DC
		Max current	100 mA DC
	External alarm	Max voltage	24 V AC or DC
		Max current	100 mA AC or DC
	<i>External connector 8 pins REDEL, black. USB</i>		
	Logging interface	Max input voltage	±15 V DC
		High level min output voltage	5.0 V DC
		Low level max output voltage	5.0 V DC
		Max Current	±5 mA DC
	<i>External connector 8 pins REDEL, green.</i>		
External equipment	Accessory equipment connected to the WRO 300 H should comply with relevant standards (e.g. IEC 60950 for data processing equipment). Furthermore, medical systems should comply with IEC 60601-1-1. One important issue to consider, when configuring a system, is that the resulting leakage current for the system does not exceed acceptable limits.		
<i>Sound</i>	Sound power level	Less than 65 dB(A) during normal operation	

## 4.2 Chemical disinfection and Cleaning

<i>Disinfection</i>	The following disinfectants may be administered via the chemical intake
	<ul style="list-style-type: none"> <li>- DIALOX<sup>®</sup> , undiluted (Not available for sale in the USA)</li> <li>- MINNCARE<sup>®</sup> Cold Sterilant</li> <li>- Other peracetic acid disinfectants, provided that they are approved by the manufacturer for disinfection of thin film composite reverse osmosis membranes made of modified polyamide. Follow the manufacturer's instructions for Use for the specific disinfectant.</li> </ul>
<i>Cleaning agents</i>	<p>The following cleaning agents may be administered via the chemical intake:</p> <ul style="list-style-type: none"> <li>- Citric acid</li> <li>- P3 - Ultrasil 10</li> <li>- Minnclean<sup>®</sup> AC</li> <li>- Minnclean<sup>®</sup> TF</li> <li>- Acetic Acid (5 %)</li> <li>- Other cleaning agents may also be used, provided that they are approved by the manufacturer for cleaning of thin film composite reverse osmosis membranes made of modified polyamide. Follow the manufacturer's instructions for use for the specific cleaning agent</li> </ul>
<i>Preservation</i>	<p>The following preservation's may be administered via the chemical intake and feed water inlet:</p> <ul style="list-style-type: none"> <li>- MEMSTOR<sup>®</sup></li> <li>- MEMSTOR<sup>®</sup> in combination with 9 % glycerol</li> <li>- Formalin</li> </ul>
<i>Exterior cleaning</i>	<ul style="list-style-type: none"> <li>- Ethanol (70%)</li> <li>- Isopropanol (60%).</li> </ul>

### 4.3 Physical data

<i>Measurements</i>	<i>Values</i>
<i>Weight</i>	33 kg
<i>Height</i>	563 mm
<i>Depth</i>	Max 520 mm
	Footprint 380 mm
<i>Width</i>	Max 205 mm
	Footprint 185 mm
<i>Internal fluid volume</i>	Approximately 3.5 litres excluding the product water loop

#### 4.3.1 Materials in contact with product water

<i>Type</i>	<i>Material</i>
<i>Polymers</i>	PA (Polyamide) PEEK (Polyetheretherketone) PEI (Polyetherimide) PE (Polyethylene) PFA (Flourcarbon) POM (Polyoxymethylene) PP (Polypropylene) PPS (Polyphenylsulphite) PVC (Polyvinylchloride) PVDF (Polyvinylidenflurid)
<i>Rubber</i>	Q (Silicone)
<i>Metals</i>	Titanium Stainless steel
<i>Others</i>	Ceramic

## 4.4 Environmental data

		<i>Value</i>
<i>Operation</i>	Ambient Temperature range	+ 10 to + 40 °C
	Relative Humidity range	30 to 85 % RH
	Air Pressure range	700 to 1060 hPa
<i>Transportation and storage</i>	Ambient Temperature range	- 10 to + 40 °C
	Relative Humidity range	10 to 95% RH
	Air Pressure range	500 to 1060 hPa
	For transportation and storage below the freezing point, the WRO 300 H must be filled with a preservation solution of 2 % MEMSTOR, at least 9% glycerol and the remaining parts RO-water.	
	During transportation and storage the equipment must be kept in its original packing. If transportation or storage time is more than 15 weeks, the environmental data relating to the operation must be followed.	
If condensation occurs when moving the equipment between locations with different temperatures and high relative humidity (e.g. outdoor and indoor locations), the inside of the equipment must be allowed to dry before switching on the equipment.		


### 4.4.1 Electromagnetic environment

	<i>Value</i>
The WRO 300 H is intended for use in the electromagnetic environment specified below. The customer or the user of the WRO 300 H should assure that it is used in such an environment.	
<i>Emissions test</i>	<i>Compliance</i> <i>Electromagnetic environment - guidance</i>
RF emissions CISPR 11	Group1      The WRO 300 H uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment

		<i>Value</i>	
RF emissions CISPR 11	Class B	The WRO 300 H is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes	
Harmonic emissions IEC 61000-3-2	Class A (Not applicable for 115 V version)		
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies (Not applicable for 115 V version)		
<i>Immunity test</i>	<i>IEC 60601 test level</i>	<i>Compliance level</i>	<i>Electromagnetic environment-guidance</i>
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV Air	±6 kV contact ±8 kV Air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Surge IEC 61000-4-5	±1 kV for differential mode ±2 kV for common mode	1 kV for differential mode ± 2kV for common mode	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines. IEC 61000-4-11	<5% $U_T$ <sup>a</sup> (>95% dip in $U_T$ ) for 0.5 cycle	<5% $U_T$ (>95% dip in $U_T$ ) for 0.5 cycle	Mains power quality should be that of a typical commercial or hospital environment.
	40% $U_T$ (60% dip in $U_T$ ) for 5 cycles	40% $U_T$ (60% dip in $U_T$ ) for 5 cycles	
	70% $U_T$ (30% dip in $U_T$ ) for 25 cycles	70% $U_T$ (30% dip in $U_T$ ) for 25 cycles	
	<5% $U_T$ (>95% dip in $U_T$ ) for 5 sec	<5% $U_T$ (>95% dip in $U_T$ ) for 5 sec	



		Value	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
<i>Immunity test</i>	<i>IEC 60601 test level</i>	<i>Compliance level</i>	<i>Electromagnetic environment-guidance<sup>b</sup></i>
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Portable and mobile RF communications equipment should be used no closer to any part of the WRO 300 H, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2 \sqrt{P}$ where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 3.0 GHz	3 V/m	$d = 1.2 \sqrt{P}$ 80 to 800 MHz <sup>c</sup> $d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz

		<i>Value</i>	
Radiated RF mobile phones	-	30 V/m	<p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey <sup>d</sup>, should be less than the compliance level in each frequency range<sup>e</sup>.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 

	Value		
<i>Recommended separation distances between portable and mobile RF communications equipment and the WRO 300 H</i>			
The WRO 300 H is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the WRO 300 H can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the WRO 300 H as recommended below, according to the maximum output power of the communications equipment.			
<i>Rated maximum output power of transmitter W</i>	<i>Separation distance according to frequency of transmitter (m)</i>		
	150 kHz to 80 MHz $d = \left[ \frac{3.5}{3} \right] \sqrt{P}$	80 MHz to 800 MHz <sup>f</sup> $d = \left[ \frac{3.5}{3} \right] \sqrt{P}$	800 MHz to 3 GHz $d = \left[ \frac{7}{3} \right] \sqrt{P}$
0,01	0.11	0.11	0.23
0,1	0.37	0.37	0.74
1	1.2	1.2	2.3
10	3.7	3.7	7.4
100	12	12	23
Rated maximum output power of mobile phone	-	-	$d = \left[ \frac{7}{30} \right] \sqrt{P}$
2W GSM/3G	-	-	0.33
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			




- a. NOTE: UT is the AC mains voltage prior to application of the test level.
- b. NOTE: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
- c. NOTE: At 80 MHz and 800 MHz, the higher frequency range applies.

- d. *Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the WRO 300 H is used exceeds the applicable RF compliance level above, the WRO 300 H should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the WRO 300 H.*
- e. *Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.*
- f. *NOTE: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.*

## 4.5 Safety









<i>The machine complies with the following standards:</i>
IEC 60601-1 General requirements for safety, Class I, type B, and IPX1.
IEC 60601-1-2 Electromagnetic compatibility.










## 5 Troubleshooting

In alarm situations the message text will appear in the display. Only the latest message will be visible in the display. By using the ,  or  the display will be unlocked and the alarm list can be scrolled. Main view will reappear after a time period.

### 5.1 Alarms and notifications









#### 5.1.1 General











No.	Alarm and notifications	Definition	
101	CONDUCTIVITY SENSOR FAILURE	WRO 300 H	Buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	The initial conductivity system check failed.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Check that the product water conductivity is within normal range. If so, continue as normal but notify technical personnel.</li> </ol>
102	HIGH LEVEL SENSOR FAILURE	WRO 300 H	WRO 300 H stops, buzzer sounds with Stop sound,  flashes, message text is displayed.
		Reason	Failure of High level sensor in tank.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Notify technical personnel.</li> </ol>

No.	Alarm and notifications	Definition	
103	: N INTERNAL ERROR <sup>a</sup>	WRO 300 H	WRO 300 H stops, buzzer sounds with Stop sound,  flashes, message text is displayed.
		Reason	Control unit failure.
		Action	<ol style="list-style-type: none"> <li>1 Press  ,  or  to silence buzzer</li> <li>2 Restart unit, or notify technical personnel.</li> </ol>
104	INVALID WATER LEVEL	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	Failure of level sensors in tank
		Action	<ol style="list-style-type: none"> <li>1 Press  ,  or  to silence buzzer</li> <li>2 Check that no water has flooded from Tank air vent</li> <li>3 The WRO 300 H can be restarted by pressing  .</li> <li>4 Otherwise notify technical personnel.</li> </ol>





a. The number (N) shown before the alarm text identifies which specific kind of alarm that has occurred. Reference list for those number refer to Service Manual.

## 5.1.2 Operation











No.	Alarm and notifications	Definition	
201	CONDUCTIVITY NOTIFICATION	WRO 300 H	When entering Standby mode, buzzer sounds with Notification sound,  flashes, message text is displayed.
		Reason	The conductivity value has exceeded the notification limit for more than 30 consecutive seconds during previous run period.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Perform cleaning according to local procedures.</li> <li>3 If problem persists notify technical personnel.</li> </ol>
202	CONDUCTIVITY ALARM	WRO 300 H	Buzzer sounds with Alarm sound,  flashes, message text is displayed
		Reason	The conductivity value has exceeded the alarm limit for more than 30 consecutive seconds.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Note down the conductivity value</li> <li>3 Continue treatment</li> </ol> <p>After treatment</p> <ol style="list-style-type: none"> <li>4 Inform responsible medical staff according to local procedures</li> <li>5 Notify technical personnel for further actions</li> </ol>











No.	Alarm and notifications	Definition	
203	CONDUCTIVITY STOP	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	The conductivity value has exceeded the stop limit for more than 30 consecutive seconds.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Inform responsible medical staff according to local procedures</li> <li>3 The WRO 300 H can be restarted by pressing . It will stop again if the problem persists.</li> <li>4 If problem persists discontinue dialysis</li> <li>5 Notify technical personnel.</li> </ol>
204	INSUFFICIENT WATER SUPPLY	WRO 300 H	WRO 300 H stops,  flashes fast, message text is displayed.
		Reason	Lack of feed water
		Action	<ol style="list-style-type: none"> <li>1 Check the feed water supply.</li> <li>2 Notify technical personnel.</li> </ol>
205	LOW REJECTION RATE	WRO 300 H	When entering Standby mode, buzzer sounds with Notification sound,  flashes, message text is displayed.
		Reason	Decreased membrane performance.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Perform cleaning according to local procedures.</li> <li>3 If problem persists notify technical personnel.</li> </ol>

















<i>No.</i>	<i>Alarm and notifications</i>	<i>Definition</i>	
206	LOW PRODUCT FLOW	WRO 300 H	When entering Standby mode, buzzer sounds with Notification sound,  flashes, message text is displayed.
		Reason	The product water flow is below the preset notification limit which indicates that the performance of the membrane is reduced.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Perform cleaning according to local procedures.</li> <li>3 Notify technical personnel.</li> </ol>













### 5.1.3 Heat and Low Flow Heat
















No.	Alarm and notifications	Definition	
301	INSUFFICIENT HEAT	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed
		Reason	Power failure.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Press  until light goes on. The WRO 300 H either goes to Standby or an Active Cooldown.</li> </ol>
302	INSUFFICIENT WATER SUPPLY	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed
		Reason	Lack of feed water
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Check the feed water supply.</li> <li>3 Check for leakage</li> <li>4 Restart by pressing </li> <li>5 Notify technical personnel if problem persists.</li> </ol>

No.	Alarm and notifications	Definition	
303	OVERDUE HEAT	WRO 300 H	When entering Standby mode, buzzer sounds with Notification sound,  flashes, message text is displayed.
		Reason	Heat disinfection procedure is activated automatically by time channel settings but cannot be started because the WRO 300 H is not in Standby mode.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Activate Heat disinfection procedure manually. Refer to <i>“Heat disinfection and Low Flow Heat”</i> on page 23.</li> </ol>
304	INCORRECT WATER LEVEL	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  and  flashes, message text is displayed
		Reason	Water level in tank is lower than expected.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Check that the dialysis machine is turned off</li> <li>3 Press  until the WRO 300 H either goes to Standby or an Active Cooldown.</li> <li>4 If the problem still persists notify technical personnel.</li> </ol>

### 5.1.4 Chemical, Cleaning, Rinse and Preservation

No.	Alarm and notifications	Definition	
401	REMOVE WAND	WRO 300 H	Buzzer sounds with Alarm sound,  flashes, message text is displayed
		Reason	Wand connector not removed after completion of Chemical intake.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Remove wand from disinfectant intake port.</li> </ol>
402	INSUFFICIENT WATER SUPPLY	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	Lack of feed water
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Check the feed water supply.</li> <li>3 Check for leakage</li> <li>4 Restart by pressing </li> <li>5 Notify technical personnel if problem persists.</li> </ol>
403	HIGH CONDUCTIVITY RINSE	WRO 300 H	Buzzer sounds with Alarm sound,  flashes, message text is displayed
		Reason	Conductivity value is above Conductivity Notification limit after a prolonged rinse.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Perform an extra rinse by pressing  until rinse starts.</li> <li>3 If problem persists notify technical personnel.</li> </ol>

No.	Alarm and notifications	Definition	
404	RINSE REQUIRED	WRO 300 H	Buzzer sounds with Alarm sound,  and  flashes, message text is displayed
		Reason	The WRO is filled with chemicals .
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Perform rinse by pressing  until rinse starts.</li> </ol>
405	INCORRECT WATER LEVEL	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  and  flashes, message text is displayed
		Reason	Water level in tank is lower than expected.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Check that the dialysis machine is turned off</li> <li>3 Press  to restart</li> <li>4 If the problem persists notify technical personnel.</li> </ol>

No.	Alarm and notifications	Definition	
406	INSUFFICIENT INTAKE	WRO 300 H	Buzzer sounds with Alarm sound,  and  flashes, message text is displayed.
		Reason	The product water conductivity is below the minimum intake conductivity limit.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 If the Disinfection Wand is inserted and  is pressed a second intake phase is started.</li> <li>3 If the Disinfection Wand is not inserted and  is pressed the WRO continues to Dwell period</li> </ol>
407	INSUFFICIENT TEMPERATURE	WRO 300 H	Buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	The temperature during Warm acid cleaning has not reached above the preset limit.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Notify technical personnel.</li> </ol>
408	INSERT WAND	WRO 300 H	WRO 300 H stops, buzzer sounds with Alarm sound,  flashes, message text is displayed.
		Reason	A Central Chemical disinfection has been initiated via the remote control and the Disinfection Wand is not inserted.
		Action	<ol style="list-style-type: none"> <li>1 Press ,  or  to silence buzzer</li> <li>2 Insert the Disinfection Wand to continue the Central Chemical disinfection procedure.</li> </ol>

## 5.2 Boot loader

This alarm indicate that the software is corrupt.

<i>No.</i>	<i>Alarm and notifications</i>	<i>Definition</i>	
	LOAD APPLICATION FAILED	WRO 300 H	LOAD APPLICATION FAILED is shown on the display
		Reason	Software malfunction
		Action	Notify technical personnel.









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