Reference to Figure 79 Potable Water System Schematic (A318/A319/A321)

ATA 38 WATER AND WASTE

38–10 POTABLE

SYSTEM DESCRIPTION (A318/A319/A321)

Water Tank

The potable water is stored in one tank installed in the pressurized underfloor aerea of the right hand fuselage, aft of the rear cargo compartment.

The potable water tank is made of CFRP (**C**arbon **F**iber **R**einforced **P**lastic). It is strengthened to accept the rated pressure for the potable water system. The capacity of the tank is 200 l (53 USgal). The tank is attached to the aircraft structure with clamps.

The tank has:

- an overflow port,
- an installation port for the fill/overflow drain valve and for draining,
- an installation port for the water-contents quantity transmitter 3MH,
- a connection for air pressurization system with an air-no-water valve.

Fill/Overflow Drain Valve

The fill/overflow drain valve is installed between the water service panel and the potable water tank. Tube assemblies connect the valve to the tank and to the ports on the potable water service panel. The 'fill' function of the valve also operates as a system 'drain' facility. You can manually select the fill and drain facilities on the service panel. The overflow function operates as an overflow outlet and a vent for the tank. The operation of the fill/overflow drain handle opens the overflow port when it is selected to the 'FILL' or 'DRAIN' position and the handle pulled out.

Pressure Switch

The pressure switch 10MD senses the pressure in the potable water tank and switches the electric motor (of the compressor) on and off. At 28 psi (1.9305 bar) the pressure switch disconnects the 28V DC line from the relay. This stops the electric motor. When the pressure in the potable water tank is 25 psi (1.7236 bar) the pressure switch connects the 28V DC line. This causes the relay to start the electric motor of the compressor to pressurize the system.

Compressor

The air compressor 8MD is a double-bellows reciprocating pump that is electrically driven.

Door Microswitch

The limit switch 5MA (DOOR MICROSWITCH) at the service panel 171AL is connected between the 28V DC GND/FLIGHT BUS and the pressure switch 10MD. When the service panel 171AL is open, the relay 9MD is de-energized and stops the electric motor of the compressor 8MD.

SERVICING

Filling

Filling is achieved through a fill/overflow and drain valve operated by the fill/drain control handle on the potable water service panel.

The quantity transmitter sends a tank full–signal directly, or optional via a preselector control unit, to close the fill/overflow and drain valve automatically (the tank full signal will be provided when the full or preselected quantity is reached).

A manual operation is also possible. Maximum permissible pressure to fill the potable water tank is 50 psi (3.4 bars).

Draining

The draining operation is achieved through the fill/overflow and drain valve and a motorized drain valve, using the same control handle as the filling operation.

Manual operation is possible via control handles dedicated to each valve.

CLASSIC

VACUUM SYSTEM CONTROLLER (VSC)

ENHANCED

2

CIDS 1

FLIGHT ATTENDANT PANEL (FAP)

PRESSURE REDUCING VALVE

CHECK VALVES

PRESSURE SWITCH

FWD GALLEY

FWD LAVATORY

MANUAL SHUT OFF VALVES

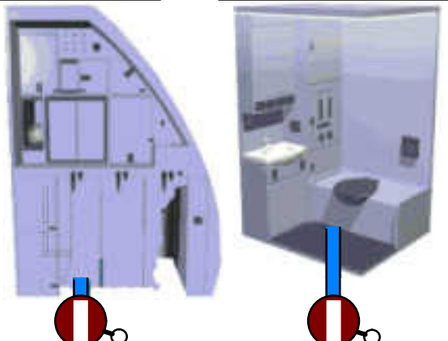
WATER QUANTITY TRANSMITTER

POTABLE WATER TANK

AIR COMPRESSOR (OPTIONAL)

AFT GALLEY

AFT LAVATORY



MANUAL SHUT OFF VALVES

A318
A319
A321

DRAIN VALVE

FILL/OVERFLOW DRAIN VALVE

LIMIT SWITCHES

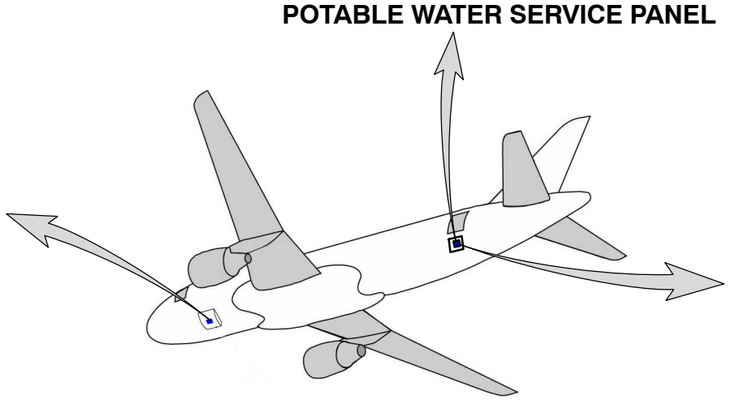
OVERFLOW

FILLING AND DRAINING

DOOR MICROSWITCH

POTABLE WATER SERVICE PANEL

DRAIN SERVICE PANEL



FWD DRAIN VALVE OPEN LIGHT

TANK FULL LIGHT

WATER OVERFLOW

FILL & DRAIN CONTROL HANDLE

QTY IND

GRD PRESS

FILL & DRAIN PORT

POTABLE WATER SERVICE PANEL

Note: Water tank is located aft of Aft Cargo Compartment

Reference to Figure 80 Potable Water System Schematic (A320)

SYSTEM DESCRIPTION (A320 DIFFERENCES)

Water Tank

The potable water tank 3000MM is installed in the pressurized underfloor area RH behind the forward cargo compartment.

Water Drain Panels

The forward drain panel and a drain/overflow panel are located in the lower part of the forward fuselage. The drain control handles are used to manually operate the drain valves.

Pressure Switch

The pressure switch 10MD senses the pressure in the potable water tank and switches the electric motor of the compressor on and off.

At 25 psi (1.7236 bar) the pressure switch disconnects the 28V DC line from the relay.

This stops the electric motor. When the pressure in the potable water tank is 22 psi (1.5168 bar) the pressure switch connects the 28V DC line. This causes the relay to start the electric motor of the compressor to pressurize the system.

Filling

When the fill/drain control handle is turned from NORMAL to FILL position and pulled out to its stop, it mechanically opens the fill / drain valve.The fill limit switch sends an open signal to the overflow valve. The overflow valve control light (green) comes on when the valve is open.

The quantity transmitter sends the quantity signal to the optional preselector control unit (which provides then a full signal at the preselected quantity) or sends a full signal directly to the fill/drain valve.

This signal causes the fill/drain valve to close electrically. The control handle is automatically pulled in and returns to the NORMAL position.

When the fill/drain valve is closed, the tank full control light (green) comes on.

The fill/drain control handle NORMAL position causes the electrical closure of the overflow valve.

Filling (without Electrical Power)

You can also fill the water tank when there is no electrical power.

To do so you must open the fill/drain valve and the overflow valve manually.

To open the fill/drain valve you turn the control handle on the potable water service panel from NORMAL to FILL.

Then pull the control handle out to its stop.

To open the overflow valve you turn the control handle at the overflow and drain panel from SHUT to OPEN.

There are no indications that the valves are open. When the tank is full, you must close the valves manually again.

Draining

When the fill/drain control handle is turned to DRAIN and pulled out, it mechanically opens the fill/drain valve. The drain limit switch sends open signals to the overflow valve and the drain valves.

The control lights (green) on the service panel come on when the associated valves are opened (fwd drain valve, tank drain valve and overflow valve).

When the system has been drained, the fill/drain control handle must be manually set back to NORMAL. This closes the fill/drain valve.

The fill/drain control handle NORMAL position causes the electrical closure of the overflow, tank and forward drain valve.

If electrical power is not available, you can open the valves manually with handles installed on the potable water service and the drain panels. The handles are marked SHUT/OPEN.

ENHANCED

2

CIDS 1

FLIGHT ATTENDANT PANEL (FAP)

CLASSIC

VACUUM SYSTEM CONTROLLER (VSC)

FWD GALLEY

FWD LAVATORY

MANUAL SHUT OFF VALVES

DRAIN

WATER QUANTITY TRANSMITTER

POTABLE WATER TANK

PRESSURE REDUCING VALVE

CHECK VALVE

PRESSURE SWITCH

CHECK VALVE

CHECK VALVE

AIR COMPRESSOR (OPTIONAL)

AFT GALLEY

AFT LAVATORY

MANUAL SHUT OFF VALVES

FILL/DRAIN LIMIT SWITCHES

DRAIN VALVE

OVERFLOW VALVE

DRAIN VALVE

FILL DRAIN VALVE

FILLING AND DRAINING

A320

A

DRAIN SERVICE PANEL

B

OVERFLOW/DRAIN PANEL

DOOR MICROSWITCH

FWD DRAIN VALVE OPEN LIGHT

TANK FULL LIGHT

TANK DRAIN VALVE LIGHT

OVERFLOW VALVE LIGHT

FILL & DRAIN CONTROL HANDLE

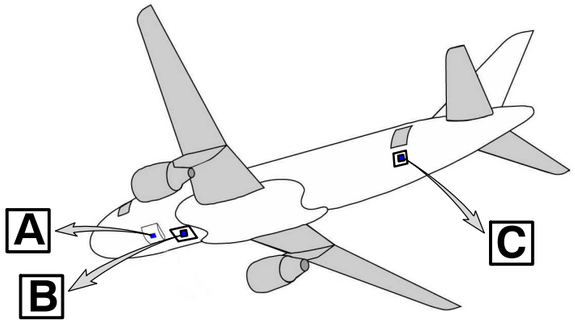
QTY IND

GRD PRESS

FILL & DRAIN PORT

C

POTABLE WATER SERVICE PANEL



Note: Water tank is located aft of Aft Cargo Compartment

Figure 80 Potable Water System Schematic (A320)

Reference to Figure 81 Toilet System Schematic

38–31 TOILET SYSTEM

WASTE SYSTEM DESCRIPTION

Vacuum System Controller

The VSC (**V**acuum **S**ystem **C**ontroller) is connected to the aircraft power circuit and electrical interfaces of the:

- flush control unit(s),
- liquid level transmitter,
- liquid level sensor,
- altitude pressure switch
  (for the shut off function of the Vacuum Generator),
- differential pressure transducer (if installed)
- CFDS (**C**entralized **F**ault **D**isplay **S**ystem) via ARINC 429 data bus.

The VSC functions are system control, monitoring and fault reporting.

The VSC calculates and transmits signals to the FAP (**F**orward / **F**light **A**ttendant **P**anel) to indicate the waste tank levels and reports system defects. The VSC memorizes and sends system defects to the ARINC 429 data bus which is connected to the CFDS.

On Enhanced A/C, the VSC function is integrated into the CIDS Director (**C**abin **I**ntercommunication **D**ata **S**ystem). Door switch information is send to the CIDS Director via DEU (**D**ecoder/**E**ncoder **U**nit) B.

A new FAP displays information.

The altitude data come from CPC (**C**abin **P**ressure **C**ontroller) via the SDAC (**S**ystem **D**ata **A**cquisition **C**oncentrator).

Flush Control Unit

The flush control unit is an electronic assembly is part of the toilet assembly.

It is connected electrically to the:

- flush switch,
- water (rinse) valve,
- flush valve,
- vacuum system controller.

The unit controls the time and sequence of the toilet operation during the flush cycle. A BITE monitors the operation of the water valve, flush valve and its internal control board circuitry. Faults are transmitted to the VSC.

Quantity Indication System

An LED indicator on the FAP shows the water and waste content in percentage of volume. To get an indication the ”IND ON” push button must be pressed.

For the toilet system different fault LEDs are provided such as for System INOP and LAV INOP. They provide the operater with informations about a Fault of the complete Toilet system or a single toilet.

Toilet Service Panel

AThe service panel is for all toilets and has:

- a waste holding tank rinse connection
- a waste holding tank drain connection
- the door micro switch
- an actuation unit for the waste drain valve

Waste Holding Tank

The waste holding tank is installed on the right of the aircraft under the floor and is equipped with:

- a water separator,
- a liquid level transmitter,
- a liquid level sensor,
- the waste inlets,
- a waste outlet,
- two rinse connections.

Water (Rinse) Valve

The water (rinse) valve is solenoid controlled and is connected electrically to the flush control unit. It has a fitting for the aircraft system interface and a strainer. The outlet of the valve is connected to the anti-syphon valve.

Flush Valve

A motor-actuated pinch-knife closes and seals the tube between the flush cycles. The flush control unit controls the flush valve operation. A manual waste shutoff valve is installed on the downstream side of the flush valve.

Liquid Level Transmitter

The LLT (**L**iquid **L**evel **T**ransmitter**)** is connected electrically to the VSC. It gives the VSC an analog signal for the waste content of the tank. The VSC calculates and transmits the signal to the FAP for waste quantity indication.

Liquid Level Sensor

The LLS **(L**iquid **L**evel **S**ensor) is connected electrically to the VSC. When the waste holding tank content level is at full, the LLS sends a signal to the VSC. When the VSC receives a tank full signal, (from the LLS) it shuts down the toilet systems and the SYS INOP legend on FAP comes on.

NOTE: The liquid level sensor operates normally independent of the liquid level transmitter. Depending on a/c modification (SB status) a full signal from LLS and LLT(>90%) is needed to shut down the toilet system.

ENHANCED SYSTEM

DEU "B"

DEU "B"

WATER / WASTE

CIDS 1

2

FLIGHT ATTENDANT PANEL (FAP)

CLASSIC SYSTEM

VACUUM SYSTEM CONTROLLER

AFT LAVATORY UNITS

FLUSH SWITCH

FLUSH CONTROL UNIT

FROM POTABLE WATER SYSTEM

WATER RINSE VALVE

FLUSH VALVE

FWD LAVATORY UNITS

WATER SEPARATOR

WASTE HOLDING TANK

LIQUID LEVEL SENSOR

VACUUM GENERATOR

WASTE DRAIN VALVE

LIQUID LEVEL TRANSMITTER

TOILET SERVICE PANEL

NIPPLE ASSEMBLY DRAIN VALVE

AIRCRAFT SKIN

CONTROL HANDLE

WASTE LINE DRAIN VALVE

DOOR LIMIT SWITCH

CLASSIC SYSTEM

ALTITUDE PRESSURE SWITCH

(INSTALLED IN STABILIZER COMPARTMENT)

FWD LAVATORY UNITS

FLUSH SWITCH

FLUSH CONTROL UNIT

M

FROM POTABLE WATER SYSTEM

RINSE VALVE

FLUSH VALVE

FROM AFT LAVATORY UNITS

WATER SEPARATOR

LIQUID LEVEL SENSOR

WASTE HOLDING TANK

LIQUID LEVEL XMTR

WASTE DRAIN VALVE

RINSE CONN.

DRAIN CONNECTION

LIMIT SWITCH

CONTROL HANDLE

QTY INDICATOR (optional)

TOILET SERVICE PANEL

FORWARD ATTENDANT PANEL (FAP)

% 0 25 50 75 100

WASTE QTY

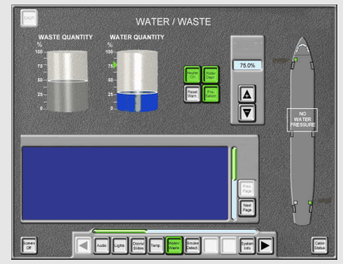
SYSTEM INOP

LAV A INOP

LAV B INOP

CLASSIC SYSTEM

ENHANCED SYSTEM



FLIGHT ATTENDANT PANEL (FAP)

CABIN FLOOR

(optional)

WASTE LEVEL INDICATION

FAN FAULT

MOTOR STARTING RELAY

115V AC CONTROL

SERVICE DOOR OPEN

LGCIU

L/G DOWN

TOILET SYSTEM SERVICING

VACUUM SYSTEM CONTROLLER

RS-232–C INTERFACE

CIDS DIRECTOR

CFDS

FAULT OTHER TOILETS

NO WATER
WATER VLV FAULT
FLUSH VLV FAULT
CTL UNIT FAULT

FLUSH CONTROL UNITS OTHER TOILETS

FAULT TOILET A

NO WATER
WATER VLV FAULT
FLUSH VLV FAULT
CTL UNIT FAULT
ENABLE

FLUSH CONTROL UNIT TOILET A

ALTITUDE PRESSURE SWITCH

P

CLASSIC SYSTEM

AIRCRAFT SKIN

Figure 82 VSC&Waste System Operation Schematic