



Pall Corporation

Pall WS08 Series Water Sensor



instruction booklet

WS08

Pall WS08 Series

Water Sensor

instruction booklet

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Because of developments in technology these data or procedures may be subject to change. Consequently we advise users to review their continuing validity annually. Part numbers appearing in this manual are protected by the Copyright of Pall Europe Limited.

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USA

FCC notice:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the installation manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this device.

CANADIAN

ICES-003 notification:

This Device B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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1. GENERAL

The manual is a part of the scope of supply and serves to ensure proper handling and optimum functioning of the instrument. For this reason, the manual must be read before start-up.

In addition, the manual is for all personnel who require knowledge concerning transport, setup, operation, maintenance and repair.

The manual must not be used for the purpose of competition without a written consent from Pall and must also not be forwarded to third parties.

Copies for personal use are permitted.

All information, technical data and illustrations contained in these instructions are based on information available at the time of publication.

1.1 Symbol assertion



This symbol indicates a safety instruction.

These safety instructions should always be followed carefully.

By not following these instructions injuries of persons or material damage could happen.

Pall does not accept liability in the event of these safety instructions being ignored.



This symbol indicates a note.

These notes should be observed to achieve optimum functioning of the equipment.

1.2 Safety instructions



General Safety Instructions

- Excessive mechanical loads and incorrect usage should always be avoided.
- In general, work on live components should be avoided and when absolutely necessary should be performed by qualified personnel only.
- Installation, electrical connection, maintenance and commissioning should be performed by qualified personnel only.



Safety instructions for use of the alarm module with voltages >50V

- To insulate the optional relay connections from the low-voltage side of the water sensor, the partition provided for this purpose must be fitted in the lower section.
- During operation of the instrument the modular housing must be completely closed.
- The protection class of an opened housing corresponds to IP00 and direct contact with components carrying dangerous voltages is therefore possible. In general, work on live components should be avoided and when absolutely necessary, should be performed by qualified personnel only.



1.3 Disposal of Equipment

At the end of its life, the Water Sensor should be dismantled and disposed of in accordance with all applicable local waste disposal laws and bylaws. Where facilities exist, component parts of the unit may be recycled. Details of the materials of construction are given on the product installation drawing and if required, more detailed information regarding specific items may be obtained from Pall or an approved agent.

If component parts of the equipment were previously contaminated with the service fluid, an appropriate Manufacturer's Safety Data Sheet (MSDS) for the fluid should be obtained and read to ensure that contaminated component parts are disposed of safely. Pall Europe Ltd., will meet its obligations under the EU Directive on Waste Electrical and Electronic Equipment (WEEE).

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Any product marked with the WEEE logo should be separated from other waste streams to ensure that it can be recycled in an environmentally sound manner.

Pall Europe Ltd., accepts liability for New WEEE at the end of life and will dispose of safely or recycle goods wherever possible. As defined in the **Terms and Conditions of Sale**, Pall Europe does not accept any liability whatsoever for the remote collection, shipping costs or packaging of returned goods. All costs associated with the return of WEEE will be born by the customer.

Customers are responsible for the costs of shipping goods to the Central Collection Point and Pall Europe Ltd accepts no liability whatsoever for any such costs.

Instructions to both customers and recyclers/treatment facilities regarding WEEE can be found at www.Pall.com/weee.

2. PRODUCT DESCRIPTION

Pall Water Sensor series WS08 are specially designed for the measurement of water content in oil.

The measured and the calculated values are available on two freely scaleable and configurable analogue outputs. In addition, the relay output can be used for alarms and process control (no relay available with RS485 options).

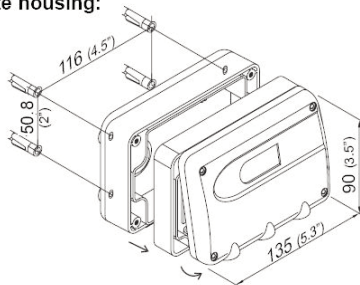
The modular housing enables a user-friendly operation and a quick replacement of the sensor unit for service purposes.

3. INSTALLATION

3.1 Installation of the housing

The necessary dimensions for the mounting holes can be found in the drawing to the left.

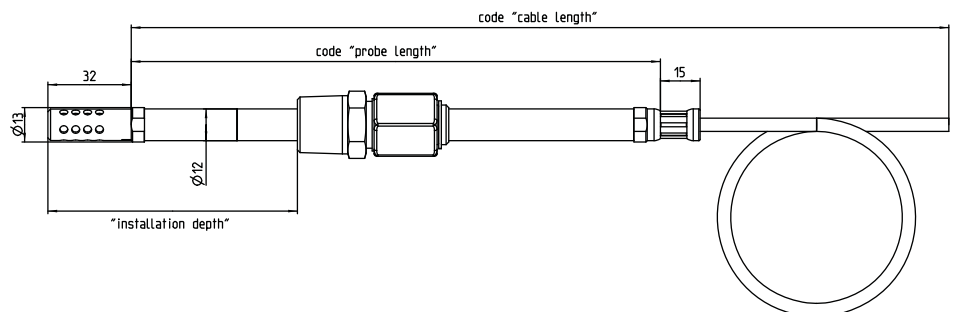
polycarbonate housing:



3.2 Installation of the probe

The probe should be located somewhere in the system where fluid will steadily flow past the probe tip. A return line, or the wall of a reservoir are usually suitable. Avoid locations where the fluid is frequently stagnant; also avoid places where water or dirt/sludge could collect around the probe.

Installation depth:	100 mm probe	23 - 65 mm
	200 mm probe	23 - 165 mm



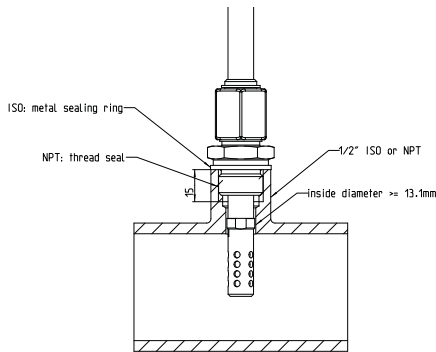
3.2.1 General safety instructions for installation

The Water Sensor probe is designed for use with pressures up to 20 bar (290 psi). Precautions therefore need to be taken when installing or removing the probe to ensure that it is not ejected from the system at high velocities. The design of the probe is such that only when the gland is fully unscrewed can the probe be removed from the system.

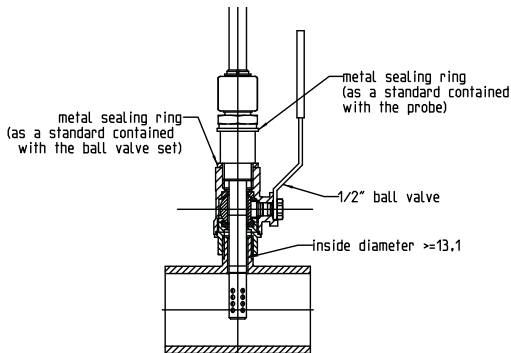
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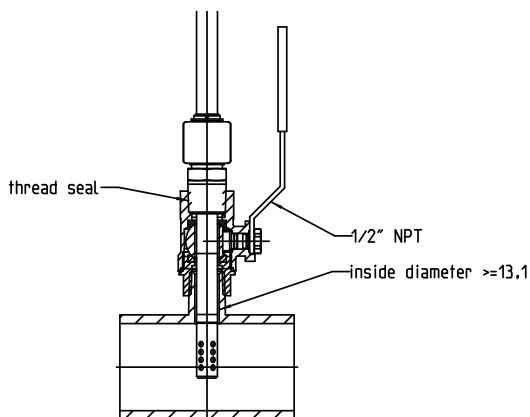
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C08 option with ball valve



B08 option with ball valve



3.2.2 Installing a bushing/stub

The standard probe without ball valve requires either a 1/2" BSPP/ISO or a 1/2" NPT female bushing to be welded to the pipe or reservoir where the probe is to be located. The NPT bush is required for the – B08 option probe. The long probe, when supplied with a ball valve, requires a male threaded stub at the installation location. The BSPP/ISO stub must be suitable for use with a bonded seal or metal sealing washer.

Unless a suitable threaded port is already available, a 1/2" bush/stub will need to be welded to the pipe or reservoir, the fluid having been drained. Suitable cleaning/flushing procedures will be necessary once the bushing/stub is fitted.

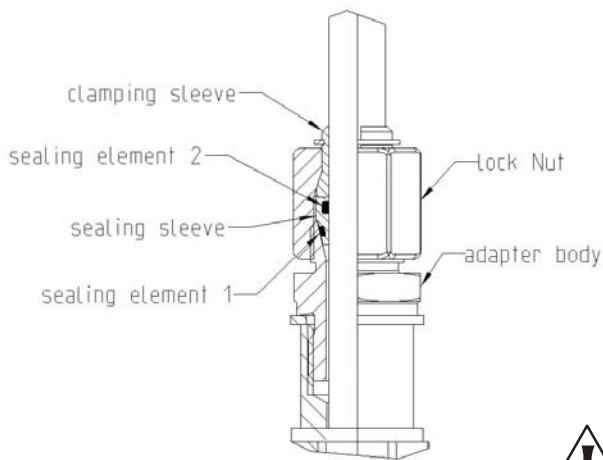
3.2.3 Installing the probe, without ball valve

Unscrew the gland-nut completely and check that the o-ring on the cone of the gland is in good condition. If it is cut or damaged, replace the o-ring.

Apply thread tape (-B08 option) to the thread of the nipple, or fit a suitable seal (C08 option, bonded seal or metal sealing washer). Fit the nipple into the bush. Tighten sufficiently to ensure a fluid seal. Slide the probe through the gland to locate the probe tip in the fluid flow, and tighten the gland lock-nut onto the nipple to a torque of 30Nm (22 lbf ft). If a torque spanner is not available, firmly hand-tighten the nut, then spanner-tighten a further 50° (approximately 1 flat). Check that the probe is not free to slide in the gland – tighten further if it can be moved by hand. Fill the system, pressurise to normal working pressure, and check for leaks. For safety reasons, keep away from the probe while the system is being pressurised, until it is established that the probe will not be forced through the gland by the pressure.

3.2.4 Installing the probe, with ball valve.

- With the valve open, fit a suitable seal, or apply thread tape if appropriate, and screw the valve onto the stub so that the handle of the valve points away from the stub. Tighten sufficiently to seal the joint. Close the valve, and fill/pressurise the system.
- Unscrew the gland-nut completely and check that the o-ring on the cone of the gland is in good condition. If it is cut or damaged, replace the o-ring. Fit a suitable seal, or apply thread tape if appropriate, and fit the nipple into the bush. Tighten the nipple sufficiently to achieve a fluid seal. Screw the gland-nut onto the nipple, sliding the probe back until the stop-ring contacts the gland.



- c) Hand-tighten the gland nut until the probe is just free to slide/turn within the gland, and slowly open the ball valve – there may be a very slight leak of fluid around the gland-nut. Firmly and steadily press the probe through the gland until the tip is in the flow of fluid. Keeping the probe in position, tighten the gland-nut to 30Nm (22 lbf ft). If a torque spanner is not available, firmly hand-tighten the nut, then spanner-tighten a further 50° (approximately 1 flat). Check that the probe is not free to slide in the gland – tighten further if it can be moved by hand. Tightening the gland-nut should eliminate the small leak which may occur during installation. For safety reasons, keep away from the probe while the system is being pressurised, until it is established that the probe will not be forced through the gland by the pressure.



Note that a force of at least 1 kgf per bar of pressure (1.7 lbf per 10 psi) is necessary to press the probe through the gland with the system under pressure. Although the probe is designed for operation at up to 20 bar (290 psi) system pressure, it will be difficult to push the probe through the gland and valve at pressures above about 4 bar (58 psi), and there will be risk of damage to the probe. Ideally the system should be depressurised to install the probe; the valve allows installation/removal of the probe without draining the system.

3.3 Removal of the probe.

3.3.1 Removal of the probe, without ball valve.

- a) Either completely isolate and depressurise the system where the probe is located, or depressurise the whole system and drain it until the fluid level is below the probe location.
- b) Carefully loosen the gland nut, and having checked that there is no residual pressure in the system, unscrew the gland-nut completely and withdraw the probe.

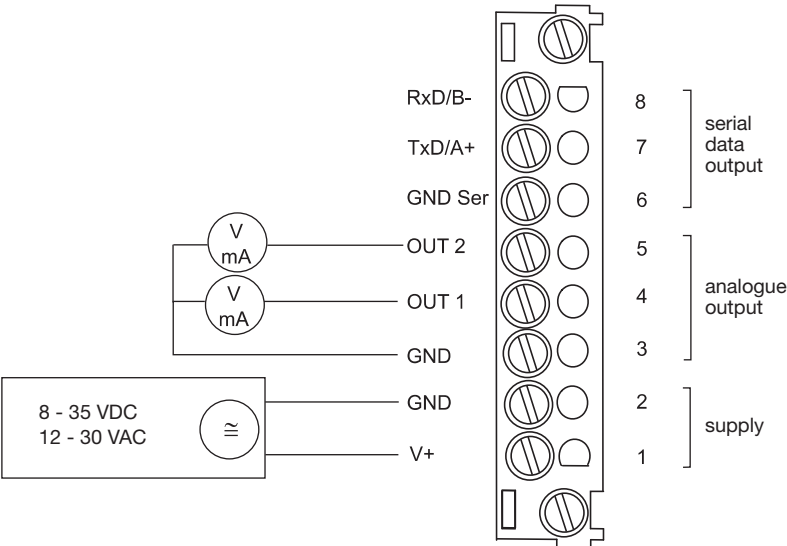
3.3.2 Removal of the probe, with ball valve.

- a) Depressurise the system. This is essential if the operating pressure is above about 4 bar (58 psi), and recommended for lower pressures.
- b) Carefully loosen the gland-nut – if the system is still pressurised, apply a force along the probe to ensure that it is not forcibly pushed back through the gland. Once the probe is free to move, withdraw it through the gland until the stop-ring on the probe makes contact with the gland. Close the valve. Do not force the valve closed if there is a resistance, but investigate why the probe has not been fully withdrawn.
- c) Fully unscrew the gland-nut and withdraw the probe from the valve assembly.

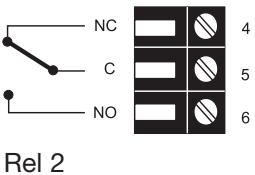
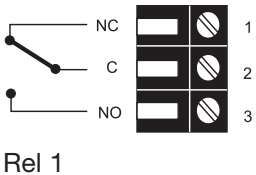
For reinstallation follow the instructions 3.2.2 or 3.2.3, omitting the installation of the nipple, which should already be in place.

4. ELECTRICAL CONNECTIONS

4.1 Connection diagram

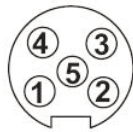


4.2 Relay connection diagram / Option



4.3 Connection configuration with plug connections

Plug for RS485
connection
(front view)



Description:	Connection assignment:
GND-Ser	5
GND	4
Rxd/B-	3
V+	2
Txd/A+	1



The cable should be connected according to the number stamped in the plug as shown in the above drawings.

4.4 Connection configuration of bottom part of the housing with integrated power supply / 100...240V AC (option V01)

Plug for RS232
analogue output
(front view)



Description:	Connection assignment:
GND-Ser	5
GND	4
Rxd/B-	3
V+	2
Txd/A+	1

Plug for 100-240V
metal housing
(front view)



Description:	Connection assignment:
GND-Ser	5
GND	4
Rxd/B-	3

Plug for 100-240V
polycarbonate
housing
(front view)



Description:	Connection assignment:
GND-Ser	5
GND	4



External diameter of supply cable: 10-12mm (0.39-0.47")

Maximum wire cross section: 1.5mm² (AWG 16)

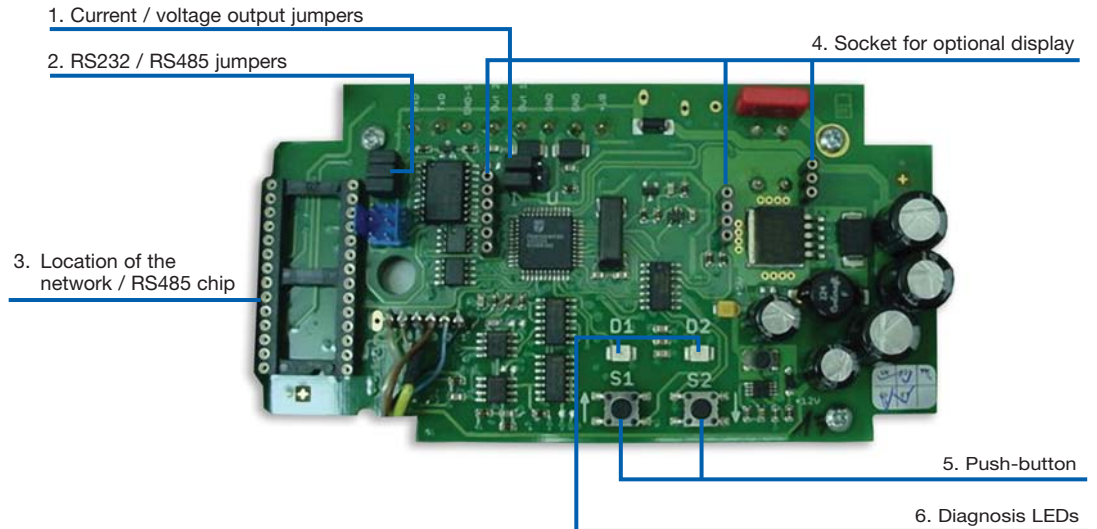
The protection of the supply cable against excess current and short-circuit shall be in accordance with national and local codes.

Bottom and centerpiece of the housing shall be grounded!

5. OPERATING COMPONENTS


5.1 Circuit board

After removal of the housing cover, the following operating components on the circuit board may be accessed for adaptation of the transmitter to the desired configuration. Each component is discussed in more detail below.



1. Current / voltage output:

The default factory output setting is for current. The device can be switched from current to voltage output using the configuration software the two jumpers must be located as follows:

for current signals:  OUT2
 OUT1

for voltage signals:  OUT2
 OUT1

2. RS232 / RS485:

For the transition from RS232 to RS485 (network operation) these jumpers must be removed.



3. Location of the network chip:

For refitting to RS485, an IC must be used (available as an option). The notch on the chip must match the receiver slot!

4. Socket for optional display:

Pin connector for optional display.

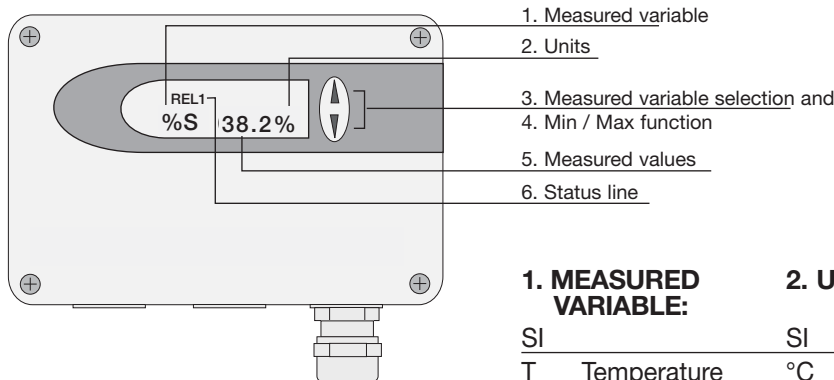
5. Push-Buttons for calibration purposes:

See Hardware, chapter 7 "Maintenance"

6. Diagnosis LEDs:

See Hardware, chapter 7 "Maintenance"

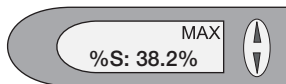
5.2 Display module / Option



1. MEASURED VARIABLE:		2. UNITS:		3. MEASURED VARIABLE SELECTION
SI		SI	US	
T	Temperature	°C	°F	Press the ▲ or ▼ button to select the desired Measured Valve
%S	% saturation	%	%	
x	Water content	ppm	ppm	

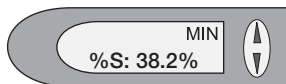
4. MIN / MAX FUNCTION:

The WS08 Water Sensor can display the highest and lowest measured value recorded since the last reset.



Highest measured value:

1. Select the desired measured variable.
2. To display the maximum value of the selected measured variable, press the ▲ button for at least five seconds.
- 3.1. To reset the instrument to its normal operating status, press the ▲ button once again for five seconds.
- 3.2. If both buttons are pressed for at least five seconds while the maximum value is displayed → the "MAX" symbol disappears → the maximum value will be deleted (Reset).



Lowest measured value:

1. Select the desired measured variable.
2. To display the minimum value of the selected quantity, press the ▼ button for at least five seconds.
- 3.1. To reset the instrument to its normal operating status, press the ▼ button once again for five seconds.
- 3.2. If both buttons are pressed for at least five seconds while the minimum value is displayed → the "MIN" symbol disappears → the minimum value will be deleted (Reset).

5. DISPLAY RANGE:

The full range of each measured variable which can be displayed is as follows:

	Legend	Minimum	Maximum	Unit
% saturation	%S	0	100	%
Temperature	T	-40 (-40)	180 (356)	°C (°F)
Water content	x	0	99999	ppm

Note that the water content in ppm will not be displayed unless 4 constants, specific to the fluid, have been entered via the Configuration software (see section 5.4 of the software description in this manual).

6. STATUS LINE:

- MIN; MAX: see point "MIN/MAX Function"
- CALIB LOW; CALIB HIGH: indicates the low or high humidity / temperature calibration point.
- REL1 / REL2: Status Relay
- "ERROR 01....04": see Hardware, chapter 7 "Self-diagnosis and error messages"

6. RELAY CONNECTION

The relay connection can be used for alarm and basic control functions. Two relays are provided which can be configured using the configuration software supplied (Note: Relays are not available with RS485 option).

The user thus has the option of setting the **measured variable to be monitored** (%S, x, T) and the **threshold hysteresis** for each relay. (For the procedure, see the Configuration Software, page 20 chapter 5.2 "Relay")

max. switched voltage / max. switched current:	250 VAC / 6A 28 VDC / 6A
Minimum load:	>100mA / 12V

The range over which the switching point of each relay can be adjusted is given below:

	Legend	Minimum	Maximum	Unit
% saturation	%S	0	100	%
Temperature	T	-40 (-40)	180 (356)	°C (°F)
Water content	x	0	99999	ppm

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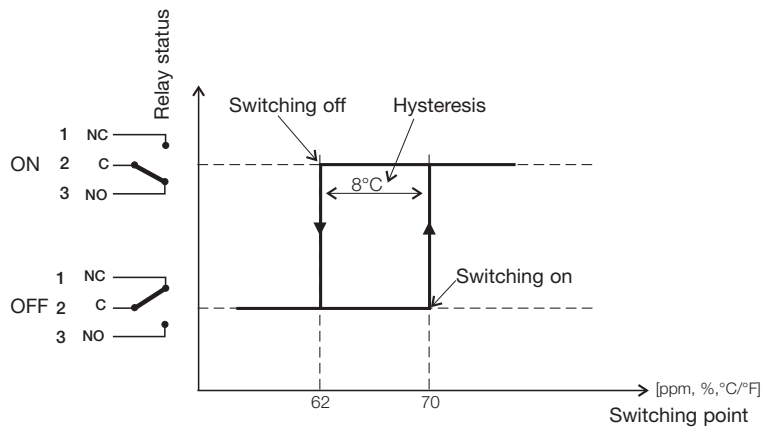
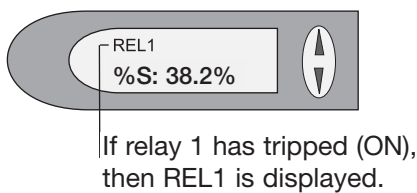
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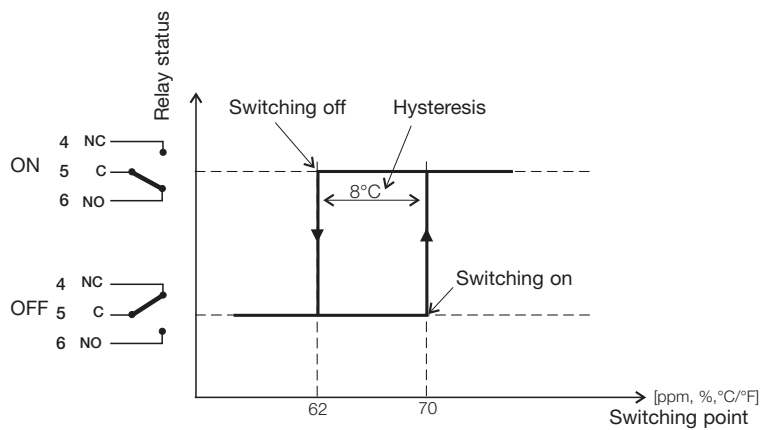
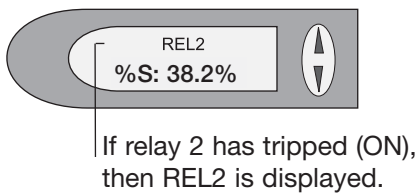
i Note, however, that the ppm output is not disabled if no ppm conversion constants have been entered via the Configuration software (page 23, section 5.5). If the Physical Quantity (see software, page 20, section 5.1) is set to ppm, but no constants have been entered, the relay operation and appearance of REL legends in the display will be unpredictable and meaningless.

! Caution: The measured variable ppm (x) should only be used if C1 to C4 constants have been loaded.

Switching relay 1:



Switching relay 2:



7. MAINTENANCE

- Sensor cleaning



Note: A reduction of the stabilisation time can be achieved by cleaning the probe with n-Hexane resp. n-Heptane. Swirl the probe carefully in the solvent then drip off and after that exhaust the air around the probe >0.5h. Attention: Other solvents than above mentioned can corrode the humidity sensor!!

- Fuse replacement (only with option V01)

7.1 Diagnostics

Self-diagnostics via the LEDs on the circuit board (see section 5.1)

- Both LEDs off – no power to circuit board.
Check wiring and low voltage power supply
- Green LED flashing – circuit operating, microprocessor active.
- Green LED continuously on – electronic fault.
Contact Pall or your local supplier
- Red LED flashing – probe sensing element gaining moisture.
- Red LED continuously on – liquid water droplets on sensing element.
Allow the probe to dry out.



Note that during calibration operations using the buttons on the circuit board, the significance of the LEDs being on, or flashing, is different from the above. Humidity / Temperature Calibration using push buttons.

Self-diagnostics via messages on the display (when fitted)

- Error 1 – sensing element damaged. Contact Pall or your local supplier.
- Error 2 – liquid water on the sensing element. Allow the probe to dry out.
- Error 3 – temperature sensor open circuit or damaged. Contact Pall or your local supplier.
- Error 4 – temperature sensor shorted. Contact Pall or your local supplier.

Definitions:

• Error

possible cause

⇒ Measures / Help

• Display shows incorrect values

Error during re-adjustment of the transmitter

⇒ Reset to factory calibration and repeat the calibration routine

Sensor defective

⇒ Replace sensor

Output configured incorrectly

⇒ PC - Software

• Transmitter failure

no supply voltage

⇒ Check wiring and supply voltage

⇒ only green LED is illuminated continuously

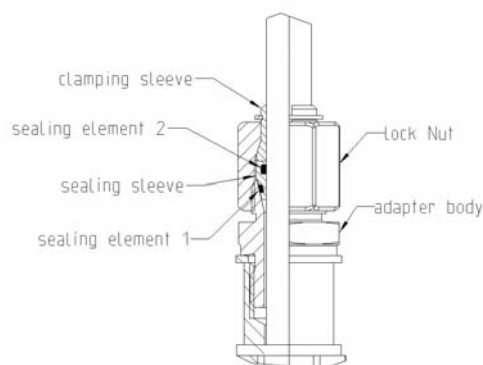
⇒ Electronics defect

⇒ contact the manufacturer

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7.2 Replacement of sealing element1

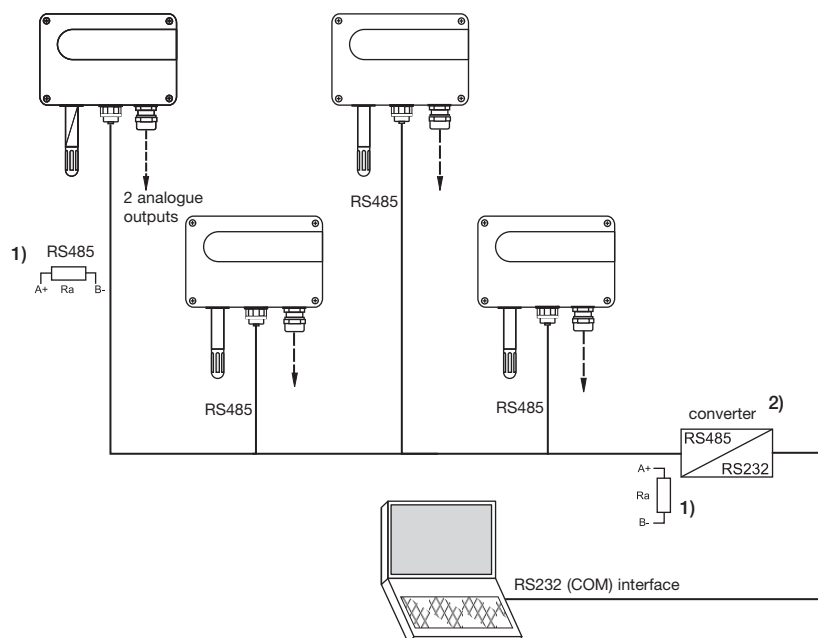
In the event of sealing element wear or failure, replace with a fluorocarbon sealing element 1 having 1.5 diameter and 13mm ID.

8. NETWORK

Provided each of the WS08 Water Sensors has the RS485 communications option fitted, up to 32 instruments can be connected to a single RS485 network. Full details of networking WS08 Water Sensors, together with information on the communications protocols, are given in a separate manual which will normally be provided only when instruments fitted with RS485 communications are supplied. The Pall manual corresponding to RS485 communications is titled:

“Pall WS08 Series Water Sensor RS485 communications”

Network configuration:



1) Note: to enable optimum expansion, both ends of the network must be terminated with a 100 Ohm resistor.

2) Note: to adapt the RS232 interface on the PC to the RS485 network protocol, a signal converter is required.

Technical Data:

- Max. network size: 32 transmitters / COM-PORT of PC
- Max. network expansion: 1200m (3937ft) total length
- Transmission rate: 9600 Baud

Mounting notes:

Data cables:

- minimum diameter of 4mm (0.16")
- 2-core twisted pair
- Typ. 50 pF/m, impedance 100 Ohm, non-shielded
- In accordance with the RS485 standard, cables in category 5 (UTP), specified according to EIA/TIA/ANSI 568, meet these requirements.



For high noise emissions, especially for large cable lengths, the use of shielded cables is recommended. (Shield laid at GND)

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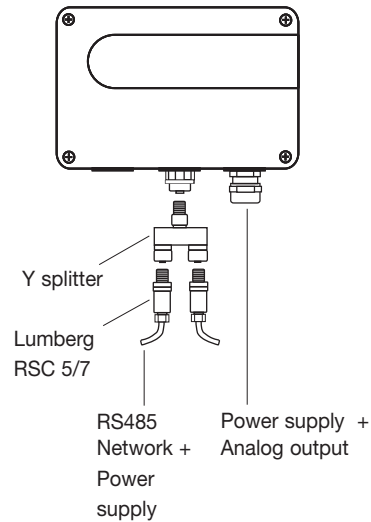
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Plug connectors:

For the network configuration, the following plug connectors are also necessary:

- Y splitter: Siemens 6ES7 194-1KA01-0XA0
- Plug: Lumberg RSC 5/7



RS232/485 Converter:

To adapt the RS232 interface on the PC to the RS485 network protocol, a signal converter.

9. REPLACEMENT PARTS / ACCESSORIES

Description	Order Code
- LCD display and housing cover	WS08D05-KIT
- RS232 interface cable, 3m	WS08CA
- Ball valve set ISO (CO8 option)	WSPV-KIT
- Sealing Element 1	HA050308
- Ball valve set NPT (BO8 option)	WSPV-KIT-NPT

10. TECHNICAL DATA

Saturation

Measuring range¹

0...100%

Accuracy incl. hysteresis and nonlinearity in air

± 2% (0...90%RH)

± 3% (90...100%RH)

Response time at 20 °C (68 °F) / t₉₀

typ. 10min in still oil

Temperature

Temperature sensor element

Pt1000 (Tolerance class A, DIN EN 60751)

Working range sensing probe

-40 °C to 180 °C (-40 °F to 356 °F)

Housing with display

-20 °C to 50 °C (-4 °F to 122 °F)

Housing without display

-40 °C to 60 °C (-40 °F to 140 °F)

Accuracy (typ.)

+/- 0.5 °C

Outputs²

Two freely selectable and scaleable analogue outputs

0 - 5V

Load Current < 1mA

0 - 10V

Load Current < 1mA

4 - 20mA

RL < 500 Ohm

0 - 20mA

RL < 500 Ohm

General

Supply voltage

Safety Extra Low Voltage 8 to 35 VDC

Safety Extra Low Voltage 12 to 30 VAC

Current consumption - 2x voltage output
- 2x current output

for 24V DC/AC: typ. 40mA
typ. 80mA

Pressure range sensing probe

0...20bar

System requirements for software

WINDOWS 98 or later; serial interface

Serial interface for configuration⁴

RS232C

Housing / Protection class

polycarbonate / IP65; Nema 4

Cable gland

M16 x 1.5 cable Ø 4.5 - 10mm (0.18 - 0.39")

Electrical connection

screw terminals up to max. 1.5mm² (AWG 16)

Electromagnetic compatibility according to

EN61000-6-2 EN61000-6-3 ICES-003 ClassB
EN61326-1+A1+A2 FCC Part15 ClassB



Options

Display

graphical LC display (128x32 pixels), with integrated pushbuttons
for selecting parameters and MIN/MAX function

Relay outputs

2 x 1 switch contact: 250V AC / 6A and 28V DC / 6A

threshold + hysteresis can be adjusted with configuration software

¹ refer to the working range of the humidity sensor!

² can be easily changed by software

⁴ no data output

CONFIGURATION SOFTWARE

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1. GENERAL INFORMATION

The configuration software was developed by Pall to allow fast and easy configuration of individual transmitters.

This software tool is included in the scope of supply.

System requirements: MS WINDOWS 98® or higher; RS232 serial interface



2. INSTALLATION

Insert the CD-ROM supplied with the transmitter into the PC and open the set-up application. Follow the instructions of the dialogue menus to set the desired language and all other parameters for installation. At the end of the routine, the software is installed and the Readme file or the program will be automatically opened.

Note: Before any reinstallment or upgrade the older version must first be uninstalled (the User will be notified during the installation routine and the process will be interrupted automatically).

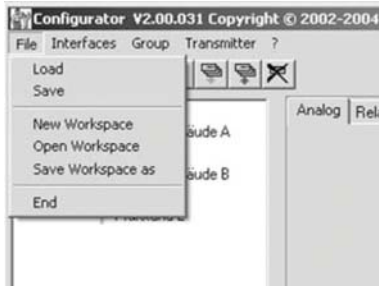
To remove the previous version, open the software folder in the system control panel. All of the programs installed on your system are located here. Uninstall the WS08 Configurator by clicking on the appropriate button and then reinstall or upgrade.

3. ICONS ON THE TOOL BAR



Note:

Within the Water Sensor **Configurator** software the word “transmitter” is used to refer to the WS08 Water Sensor. Users of this software should realize that “transmitter” and “water sensor” can be used interchangeably.



3.1 File

Load: Loads a file with a saved transmitter configuration.

Save: Saves the current transmitter configuration in a file.

New Workspace: Opens a file for a new tree.

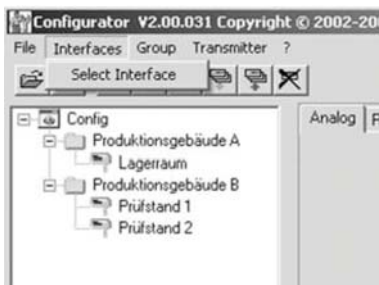
Open Workspace: Opens existing trees.

Save Workspace: Saves the current trees in an archive file.



Note:

The functions “Save Workspace” and “Open Workspace” apply to the tree structure only, not to the configurations of individual transmitters!



3.2 Interfaces

Select: Selects the serial interface (COM port) for communication with the transmitters. Following functions are available:

use / do not use: Marked COM ports are greyed out and deactivated for the configuration software (e.g. COM for integrated Notebook Modem).



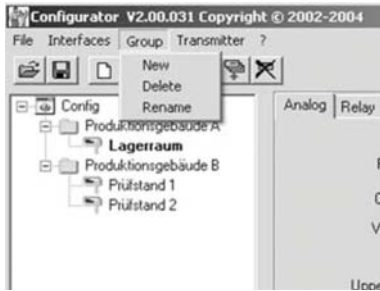
Note:

A disabled interface (shaded = do not use), can be enabled by clicking on the “use” button.

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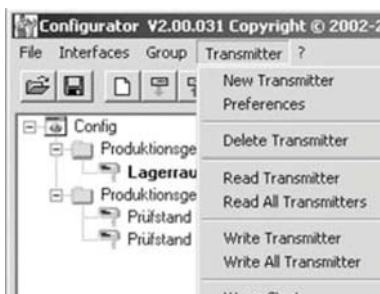
3.3 Group

The icon “Group” provides the option of combining transmitters in groups. A group may consist of transmitters used in the same application, for instance assigned to a building.

New: Creates a group or adds another group into an existing structure.

Delete: Deletes groups within a tree.

Rename: Changes the name of a transmitter group.



3.4 Transmitter

New transmitter:

A new transmitter is created in the tree.

This procedure requires the input of a number of parameters:

Group: Assigns a transmitter to a group.

Network: The check box network must be selected when several WS08's are operated in a network.

Network address: Input of the network address for the WS08 transmitter for unique assignment within the network (see label on the transmitter housing). For use only with RS485 equipped systems.

Interface: Selects the interface for connecting the transmitter to the network. (For information on how to set up a COM port, see Configuration Software, chapter 3.2 “Interfaces”).

Name: Assigns a meaningful name related to the transmitter. This name is displayed in the tree under the relevant group (e.g.: Clean Room).



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Preferences: Displays the preferences for all transmitters that have been set-up. The preferences may also be changed here.

Delete transmitter: Deletes from the tree structure the selected transmitters, or the selected groups.

Read: Reads and displays the configuration parameters of the selected transmitter.

Read All: Reads the configuration for all transmitters.



Note:

Only those parameters that have the same value for all transmitters of the network will be displayed. Other values are shaded and can not be selected or changed.

Write: Writes the current configuration to the selected transmitter.

Write All: Writes the current configuration to all selected transmitters.



Set the configuration for a transmitter, then select the appropriate network in the tree and write the configuration all transmitters of the target group using the command "Write All".

Warm Start: Resets and restarts the microprocessor of the selected transmitter.

3.5 Information

Version: Displays the version number of the WS08 software currently installed and the contact information for Pall.



4. ICON LIST



"Load File" (see Configuration Software, chapter 3.1 File)



"Save File" (see Configuration Software, chapter 3.1 File)



"New Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Read Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Save Transmitter" (see Configuration Software, chapter 3.4 Transmitter)



"Read All Transmitters" (see Configuration Software, chapter 3.4 Transmitter)

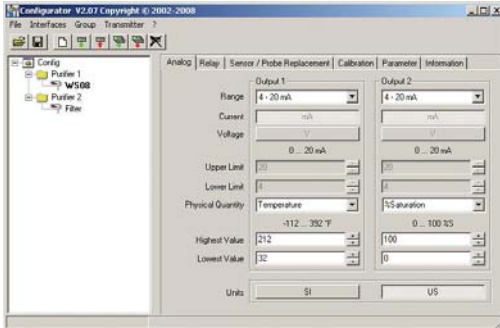


"Write All Transmitters" (see Configuration Software, chapter 3.4 Transmitter)



"Delete Transmitter" (see Configuration Software, chapter 3.4 Transmitter)

5. TABS



5.1 Analog

For the configuration of both analogue outputs.

Range:

Using the drop-down input field, select either a standardized output signal (0-5V, 0-10V, 0-20mA, 4-20mA) or a user-defined current/voltage output range (upper and lower limits may be selected as required between the limits indicated).

Physical Quantity: Selects the output physical quantities.

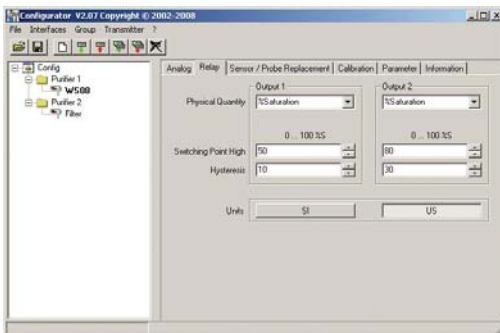
Highest /

Lowest Limit:

Sets the desired scaling of the output. The limits must fall within the operating range indicated above.

Units:

Selects between SI or US units.



5.2 Relay

Used to set both alarm outputs.

Physical Quantity: Selects the physical quantity for each alarm output.

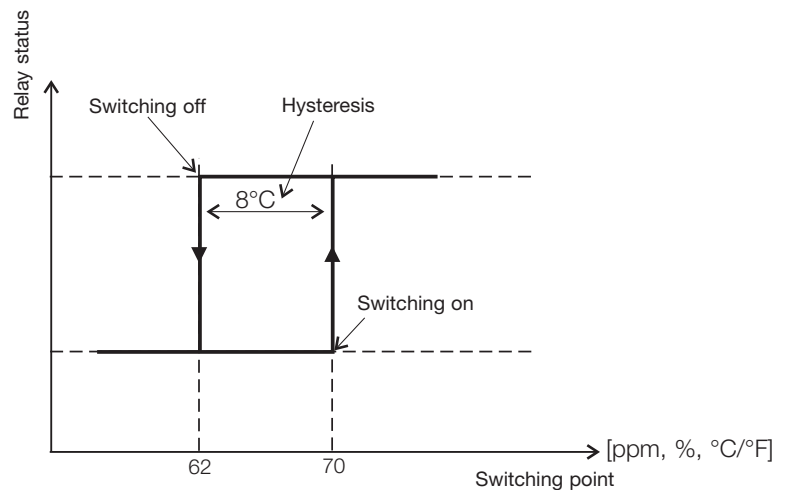
Switching

Point High:

Sets the high switching point.

Hysteresis:

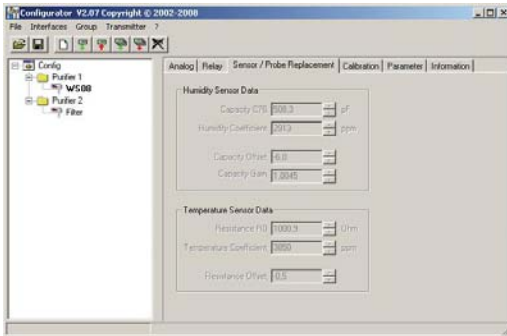
Sets the switching hysteresis that should be maintained each time the signal falls below the upper switching limit.



Note:

The word "TABS" refers to the selectable pages titled Analog, Relay, Calibration and Information. These Tabs can be accessed by clicking on the desired one.

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5.3 Sensor / Probe Replacement

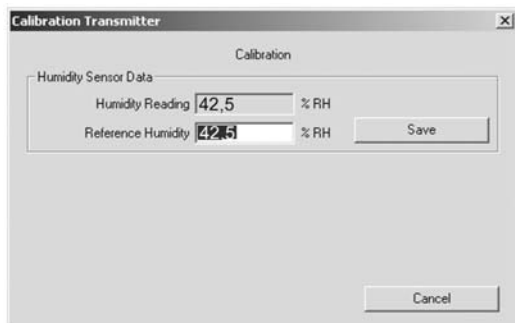
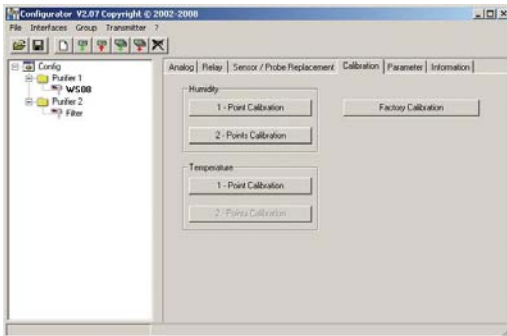


Note: For sensing elements and probe replacement, please contact your local Pall representative.

5.4 Calibration



Note: A reduction of the stabilisation time can be achieved by cleaning the probe with n-Hexane resp. n-Heptane. Swirl the probe carefully in the solvent then drip off and after that exhaust the air around the probe >0.5h. Attention: Other solvents than above mentioned can corrode the humidity sensor!!



1-point calibration Humidity:

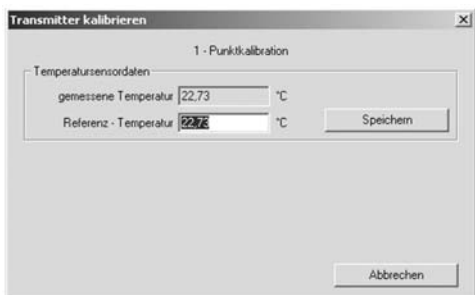
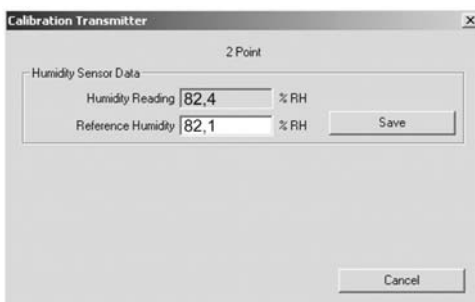
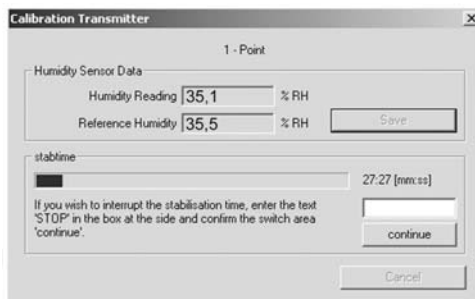
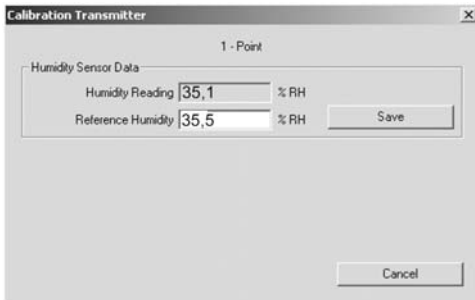
Fast and easy calibration for accurate measurement results at a defined working point (humidity point).

- 1) Stabilise the probe of the desired humidity for min. 30 minutes.
- 2) Click on the Humidity "1-point calibration" button. The measured values will now appear in both input fields.
- 3) Replace the value in the input field "Humidity Reading" with the reference humidity (value of the saline solution or display of HUMOR 20).
- 4) By clicking on "Save", the humidity reading for the transmitter will be adjusted to the reference humidity.

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2-point calibration Humidity:

Calibration for accurate results over the entire measurement range.

- 1) Place the probe at the reference humidity (lower point).
- 2) Click on the Humidity 2-Point Calibration button.
(In a separate window, the measured values will appear in both input fields)
- 3) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
- 4) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity. Now the 30-minute stabilisation period starts.
- 5) Place the probe at the reference humidity (high point).
- 6) Before continuing wait till the 30-minute stabilisation period is over.
- 7) Replace the value in the input field "Humidity Reading" with the reference humidity. (Value of the saline solution or display of HUMOR 20)
- 8) By clicking on "Save", the humidity reading of the transmitter will be adjusted to the reference humidity.
- 9) The process is complete when the message "Two-point calibration successful" appears.

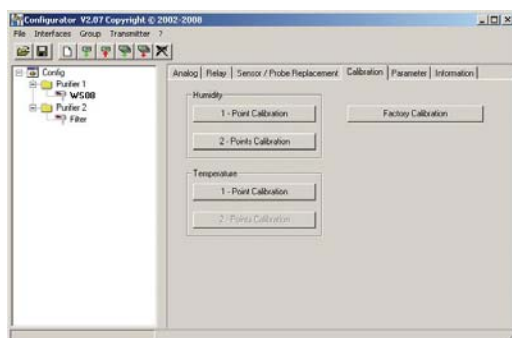
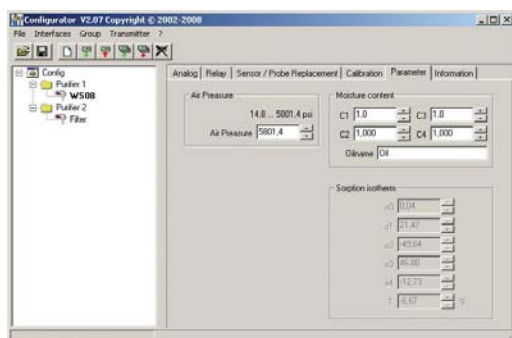
1-point calibration Temperature:

If the working range is limited to a narrow temperature range, one-point calibration will be sufficient within this working range.

- 1) Place the probe at the reference temperature and allow stabilisation for approx. 30 minutes.
- 2) Click on the Temperature 1-Point Calibration button.
The measured value will appear in both input fields.
(see additional window)
- 3) Replace the value in the input field "Temperature Reading" with the reference temperature.
- 4) By clicking on "Save", the temperature reading of the transmitter will be adjusted to the reference temperature.
- 5) The process is complete when the message "Calibration Successful" appears.

Factory Calibration:

Using the "Factory Calibration" button the user can reset all calibration values back to their original factory setting. The "Factory Calibration" button is located on the Calibration Tab (see photo at the start of section 5.4 Calibration).



5.5 Parameter

Moisture content:

Enter the parameter C1, C2, C3 and C4 for calculation of the water content x [ppm].



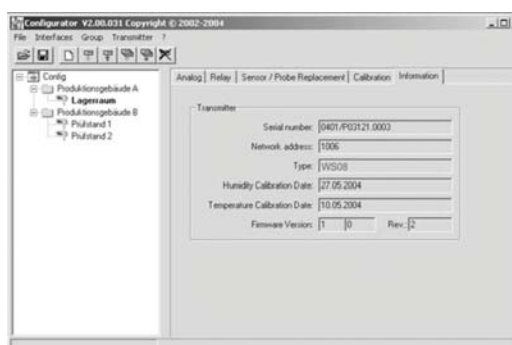
Note: The saturation content is PPM (parts per million) can be displayed if the proper C1, C2, C3, & C4 constants have been loaded. It is important to point out the constants vary for each oil manufacturer and oil type.

The user is cautioned not to experiment by entering arbitrary constants since this will result in an inaccurate displayed PPM valve.

Contact your local Pall Corporation representative for more details.

Air pressure:

If a transmitter of the WS08 series is operated far above sea level or a measurement is required at high process pressure, the prevailing ambient pressure can be entered to increase the accuracy of the derived values / computing functions.



5.6 Information

Here you will find information on the selected transmitter.

Serial number: Used to track the manufacturing data of the transmitter.

Network address: Each transmitter is assigned a unique network address at the factory for precise identification.

Type: Name of the transmitter series.

Humidity

Calibration Date: Provides information on the date of the last humidity calibration, but only if the configuration software was used.



Note: Calibrations performed directly on the circuit board are not recorded!

Temperature

Calibration Date:	Provides information on the date of the last temperature calibration, but only if the configuration software was used.
--------------------------	--



Note: Calibrations performed directly on the circuit board are not recorded!

Firmware /

Version: Provides information on the software version implemented in the transmitter (internal).

6. OVERVIEW

6.1 How to set-up a new transmitter/Water Sensor?



Note: Within the Water Sensor Configurator software the word “transmitter” is used to refer to the WS08 Water Sensor. Users of this software should realize that “transmitter” and “water sensor” can be used interchangeably.



Menu “File” --> “New Workspace”

Assign a name to the file and select the location to save the file

Menu “Group” --> “New Group”

Assign and add a name, then click on “Finish”

Menu “Transmitter” --> “New Transmitter” or Button “New Transmitter”

Select the group for the transmitter using the pull-down menu “Group”.

Specify the COM port (serial interface) of the PC / Notebook in the pull-down menu “Interface”.

Enter the name for the transmitter in the “Name” field.

Complete the “New Transmitter” process by clicking on the button “Add”.



6.2 How to read the configuration of a transmitter/Water Sensor?

The current configuration of the selected transmitter can be read by clicking on the button “Read Transmitter” or by selecting “Transmitter” --> “Read Transmitter”.

If the configuration is already loaded, the configuration data in the TABS can be modified.



6.3 How to save the configuration in a transmitter/Water Sensor?

A modified configuration in the TABS can be saved to the selected transmitter by clicking on the button “Save Transmitter” or by selecting “Transmitter” --> “Save Transmitter”.

DECLARATION OF CONFORMITY



PALL MACHINERY AND EQUIPMENT
- A DIVISION OF PALL CORPORATION.

DECLARATION OF CONFORMITY

PRODUCT DESCRIPTION: WS08 WATER SENSOR

PRODUCT PART NUMBER: SEE NAMEPLATE

SERIAL NUMBER: SEE NAMEPLATE

On behalf of Pall Machinery and Equipment division of Pall Corporation, I, J. Collard hereby declare that the above product complies with the following transposed harmonised standards:-

EN61000-6-3	Generic emissions standard residential, commercial and light industry.
EN61000-6-2	Generic immunity standard industrial environment
EN61326-1+A1+A2	Electrical equipment for measurement, control and laboratory use - EMC requirements

This compliance is sufficient to meet the requirements of the EMC Directive 89/336/EEC.

J Collard
Engineering Manager

Date: 23/05/2005

For and on behalf of: **Pall Machinery and Equipment**
Europa House
Havant Street
Portsmouth
Hampshire
England PO1 3PD

instruction booklet

NOTES

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal blue lines across its entire width, set against a plain white background. There are no margins, text, or other markings present.

instruction booklet

NOTES

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal blue lines across its entire width. The paper is otherwise completely empty, with no margins, text, or other markings.



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