ChloroStar™ Sensor
Panel system



ChloroStar Sensor panel system

Measurement made easy

Introduction

Drinking water, cooling water, and industrial wastewater are usually disinfected with chlorine, chlorine dioxide, or ozone. The level of disinfectant in these waters must be carefully controlled, because insufficient disinfection must be avoided and chlorine concentrations that are too high can cause undesirable tastes and corrosion of pipes.

This Commissioning Instruction provides the installation and setup procedures of the ChloroStar Sensor panel system.

For more information

Further publications for the ChloroStar Sensor are available for free download from:
abb.com/measurement
or by scanning this code:

Links and reference numbers for related sensor documents:

	Search for/click:
ACL420 ChloroStar sensor – Data sheet	DS/ACL420
ACL421 panel system – Operating instruction	OI/ACL421
AWT420 transmitter – Operating instruction	OI/AWT420

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1 Health and safety

Document symbols

Symbols that appear in this document are explained below:

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

'Note' indicates operator tips, particularly useful information or important information about the product or its further uses. **'Note'** does not indicate a dangerous or harmful situation.

Safety precautions

Be sure to read, understand and follow the instructions contained within this manual before and during use of the equipment. Failure to do so could result in bodily harm or damage to the equipment.

⚠ WARNING

Installation, operation, maintenance and servicing must be performed:

- by suitably trained personnel only
- in accordance with the information provided in this manual
- in accordance with relevant local regulations

Potential safety hazards

Electrical hazards

The ACL420 probe operates on 3.3 V DC supplied from the transmitter.
The Steady-Flow module operates from 24 V DC.
Up to 240 V AC may be present in the AWT420 transmitter. Be sure to isolate the supply before removing the terminal cover.
Safety advice concerning the use of the equipment described in this manual or any relevant Material Safety Data Sheets (where applicable) can be obtained from the Company, together with servicing and spares information.

Safety standards

This product has been designed to satisfy the requirements of IEC61010-1:2010 3rd edition 'Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use' and complies with US NEC 500, NIST and OSHA.

Product symbols

Symbols that may appear on this product are shown below:

⎓ Direct current supply only.


This symbol identifies a risk of chemical harm and indicates that only individuals qualified and trained to work with chemicals should handle chemicals or perform maintenance on chemical delivery systems associated with the equipment.


This symbol indicates the need for protective eye wear.


This symbol indicates the need for protective hand wear.


Recycle separately from general waste under the WEEE directive.

Product recycling and disposal (Europe only)


ABB is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible. The European Waste Electrical and Electronic Equipment (WEEE) Directive that initially came into force on August 13 2005 aims to reduce the waste arising from electrical and electronic equipment; and improve the environmental performance of all those involved in the life cycle of electrical and electronic equipment. In conformity with European local and national regulations, electrical equipment marked with the above symbol may not be disposed of in European public disposal systems after 12 August 2005.

NOTICE

For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.

Information on RoHS Directive 2011/65/EU (RoHS II)



ABB, Process Automation, Measurement & Analytics, UK, fully supports the objectives of the RoHS II directive. All in-scope products placed on the market by PAMA UK on and following the 22nd of July 2017, will be compliant to the RoHS directive, 2011/65/EU.

2 Cyber security

This product and the EZLink Connect™ app is designed to be connected to and to communicate information and data via a digital communication interface.

It is your sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be). You shall establish and maintain any appropriate measures (such as but not limited to the application of authentication measures etc.) to protect the product, the EZLink Connect app, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB Ltd and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Although ABB provides functionality testing on the products and updates that we release, you should institute your own testing program for any product updates or other major system updates (to include but not limited to code changes, configuration file changes, third-party software updates or patches, hardware change out, etc.) to ensure that the security measures that you have implemented have not been compromised and system functionality in your environment is as expected.

Communication protocol-specific security

The HART® protocol is an unsecured protocol, as such the intended application should be assessed to ensure that these protocols are suitable before implementation.

The Modbus® protocol is an unsecured protocol, as such the intended application should be assessed to ensure that these protocols are suitable before implementation.

The PROFIBUS® PA protocol is an unsecured protocol, as such the intended application should be assessed to ensure that these protocols are suitable before implementation.

The PROFIBUS DP protocol is an unsecured protocol, as such the intended application should be assessed to ensure that these protocols are suitable before implementation.

3 System overview

Figure 1 and Table 1 show the components of the ChloroStar Sensor panel system:

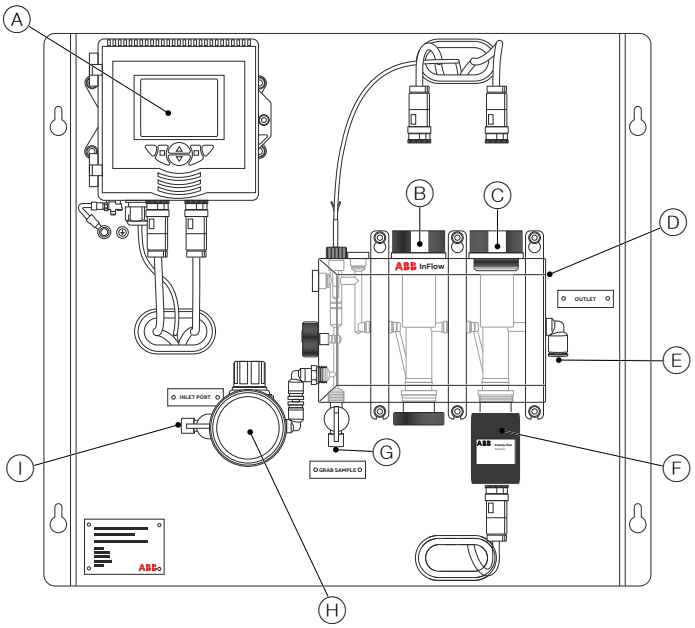


Figure 1 ChloroStar Sensor panel system components

Table 1 ChloroStar Sensor panel system component descriptions

Part	Description
A	AWT420 transmitter
B	Sensor 1 position
C	Sensor 2 position (optional)
D	InFlow Multi-Cell modular flow cell
E	Sample outlet (10 mm push-fit tubing)
F	Steady-Flow module (optional)
G	Grab sample outlet
H	Pressure regulator module (optional)
I	Sample inlet (6 mm push-fit tubing)

4 Installation

Location

Install the panel system in a clean, dry, well-ventilated location that gives easy and safe access for operators to maintain and calibrate the analyzer.

The location must also comply with these conditions:
- It must have no vibrations.
- The cell must not be exposed to direct sunlight.
- It should be as far as possible from rotating devices and electrical communication devices.
- The transmitter should be near to the cell and above it for periodic calibration.

Preparation before installation

The ACL421 panel system is designed to be wall-mounted. Attach the ACL421 panel system to the wall with the supplied mounting screws through the designated mounting holes.

Sample line connection

Sufficient water sample pressure must be available to keep water transfer time as short as possible and decrease system time lag.
For pressure over 4 bar, the pressure regulator option should be chosen.
When the sample enters the cell for gravity, allow a minimum hydraulic head of 500 mm.
Use polyethylene tubing or PVC piping for water sample transfer.

Sample connection

1. To connect the sample line, use a 6 mm OD polyethylene or flexible PVC tubing.
2. Make sure that the hose is tightly in position.
3. Push the inlet hose into the ball valve.
4. Insert the drain hose (customer-supplied) approximately 10 to 15 cm (3.9 to 5.9 in) in a nonmetal pipe. This makes it easier to remove the hose when you collect a sample, which is necessary for periodic calibration.

Outlet connection

To reduce the risk of siphoning, make sure that the height difference between the outlet port on the flow cell and the exit of the 10 mm (⅜ in) OD tube is no greater than 150 mm (5.9 in).

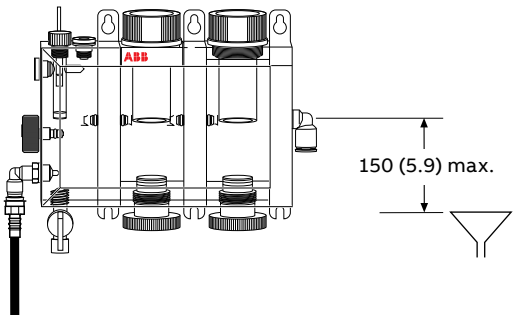


Figure 2 Outlet connection

Sampling requirements

The selection of a good, representative sampling point is important to make sure that you obtain optimum performance from the analyzer.

To decrease the sample dead time, install the analyzer as near to the sampling point as possible.

The sample must also conform to the conditions that follow:
- The sample flow must be continuous:
  - Min. sample flow rate: 1 L/h (0.26 galUS/h) (with optional Steady-Flow module).
  - Min. sample flow rate: 10 L/h (2.64 galUS/h) (without optional Steady-Flow module).
- The sample temperature must be between 2 and 50 °C (36 and 122 °F).
- Install a sample filter on the sample inlet line. A filter size of 50 µm is recommended.
- The sample pressure must not exceed 4.5 bar (65 psi) without the optional pressure regulator, or 8 bar (116 psi) with the pressure regulator.
- The sample must not have bubbles.
- The sample must be fully mixed and representative of the process.

For aggressive and fouling-prone applications, the AWT420 transmitter can be configured to activate a cleaning relay.

Refer to OI/AWT420 for configuration options. ABB also offers the automatic cleaning system (liquid) (IN/ANAINST/042).

…4 Installation

…Sampling requirements

For chlorine measurement, it is important to eliminate gas bubbles that may disturb the diffusion of chlorine across the membrane. An optional de-bubbler (7997 500) is available to eliminate gas bubbles. Mount the de-bubbler vertically with the flow upwards.

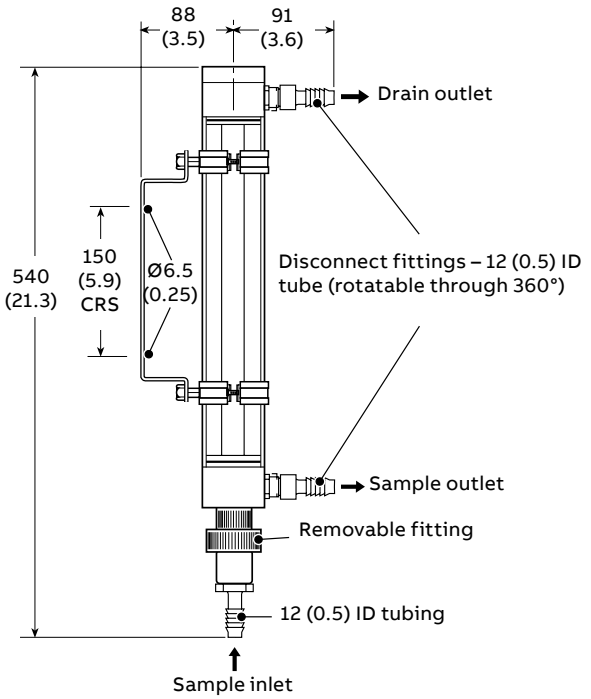


Figure 3 De-bubbler mounting information (de-bubbler part number 7997 500)

For systems that include a de-bubbler:

5 Open the sample-in isolating valve to keep the overflow from the de-bubbler at a minimum.

6 Adjust the sample flow through the flow cell with the flow regulating valve.

Dimensions in mm (in).

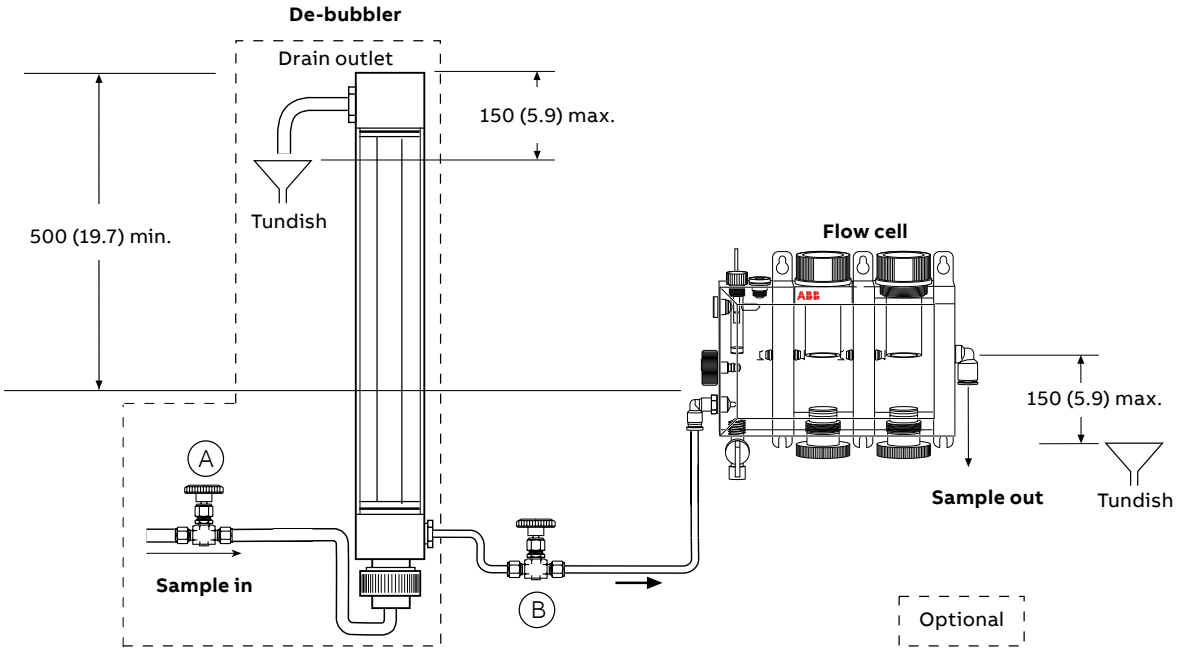


Figure 4 Typical system installation

Note:
It is recommended to use the sample regulating valve together with a flow indicator to ensure easy maintenance and consistent performance. These devices are not supplied with the modular flow cell.

5 Electrical connections

Refer to CI/AWT420 and OI/AZA100 for electrical connections.

6 Start the panel system

Start the panel system (Pressure-regulated)

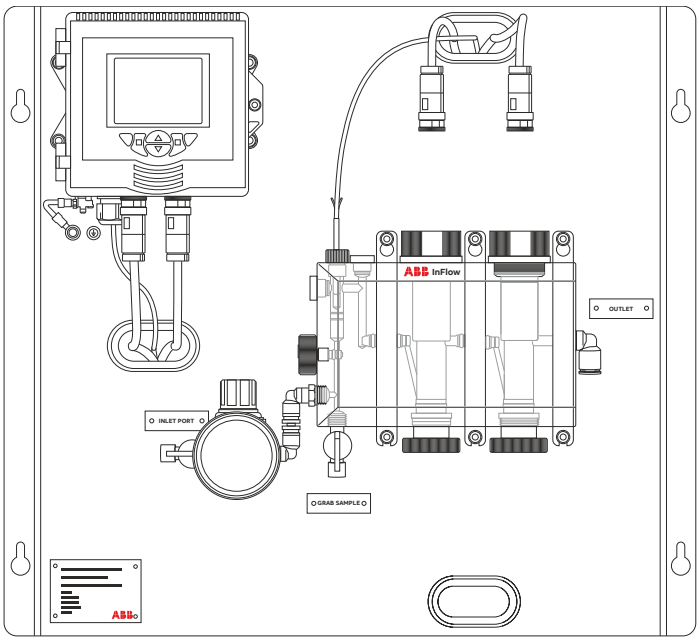


Figure 5 Pressure-regulated panel

1. Make sure that the inlet and outlet are connected correctly. Refer to Figure 5.
2. Open all of the valves in the sample water line.
3. Operate the pressure regulator to be within 1 to 8 bar.
4. Using the flow rate regulator fitted to the sample conditioning module, turn counterclockwise until desired flow rate is obtained (or until low flow alarm disappears from the AWT420 alarms).

Start the panel system (Non pressure-regulated)

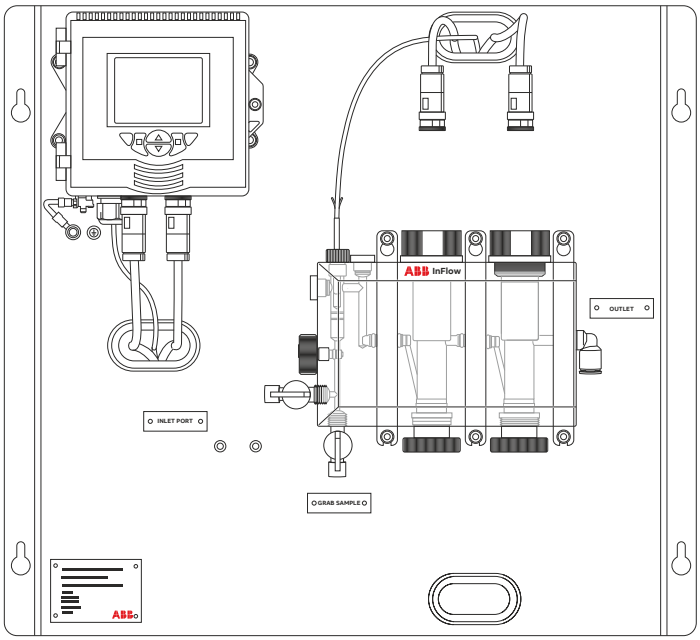


Figure 6 Non pressure-regulated panel

1. Make sure that the inlet and outlet are connected correctly. Refer to Figure 6.
2. Open all of the valves in the sample water line.
3. Make sure that the sample pressure does not exceed 4.5 bar (65 psi).
4. Using the flow rate regulator fitted to the sample conditioning module, turn counterclockwise until desired flow rate is obtained (or until low flow alarm disappears from the AWT420 alarms).

Trademarks

- ChloroStar is a trademark of ABB Limited.
- EZLink is a trademark of ABB Limited.
- HART is a registered trademark of FieldComm Group.
- Modbus is a registered trademark of Schneider Electric USA, Inc.
- PROFIBUS is a registered trademark of PROFIBUS Nutzerorganisation, e.V.

Notes

ABB Measurement & Analytics

For your local ABB contact, visit:
abb.com/contacts

For more product information, visit:
abb.com/measurement

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