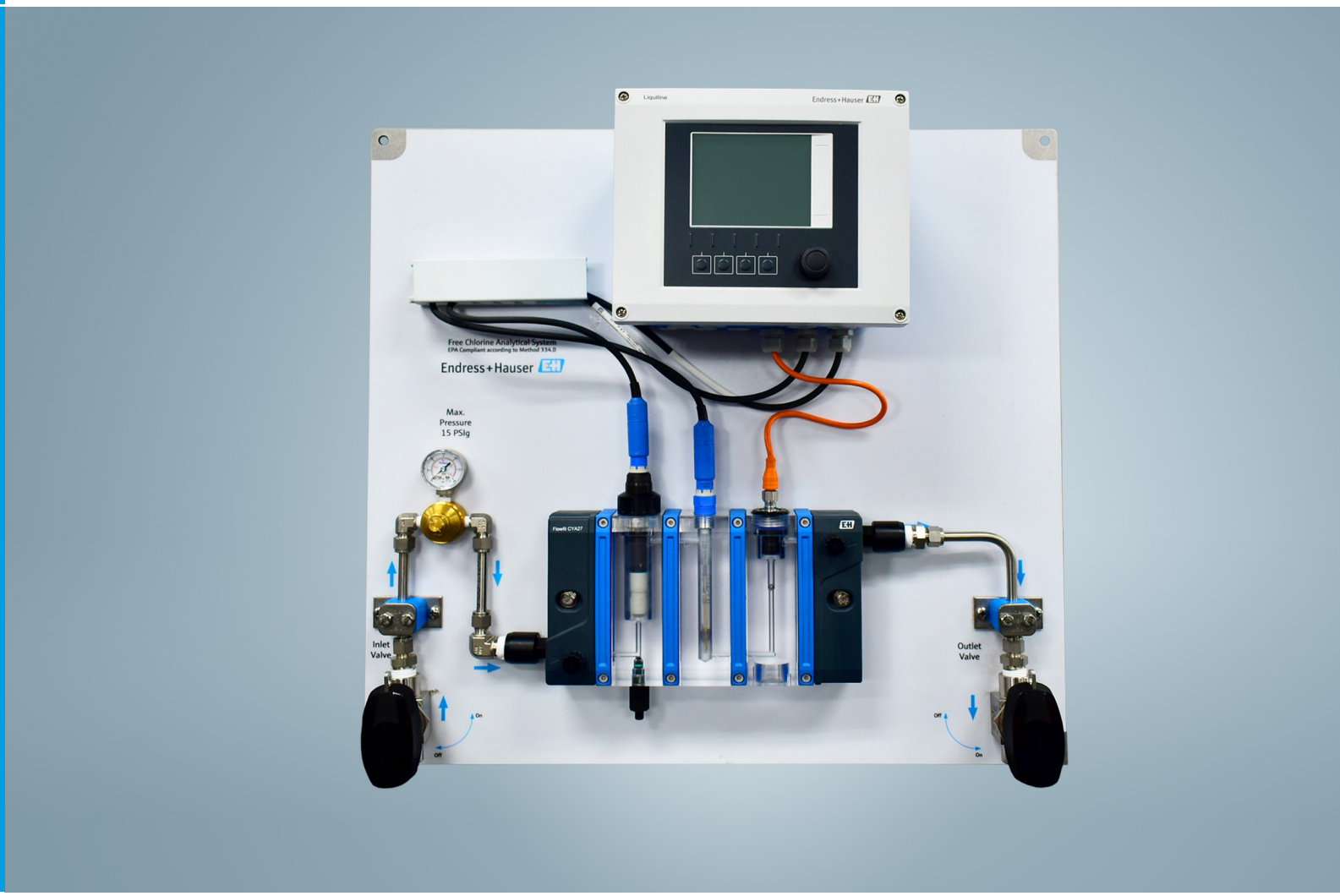
Turnkey solutions for disinfection measurement

Reagent-less systems for free or total chlorine measurement



Endress+Hauser

People for Process Automation

Disinfection Measurement Systems

Free or Total Chlorine measurement systems eliminate reagents by using EPA recognized amperometric sensor technology.

Complete panel solutions for Free or Total Chlorine

- A selection of systems for free chlorine or total chlorine measurement
- Reagent-less systems using amperometric sensor technology
- Accurate measurement with a choice of sensor measurement ranges
- EPA compliant free chlorine systems according to Method 334.0
- Free chlorine systems include pH compensation to ensure proper hypochlorous acid measurement and accurate DPD verification
- Easy DPD verification with built-in test valve
- Inlet and outlet valves allow for easy installation and isolation for routine sensor maintenance
- Expansion panels facilitate the installation of additional disinfection sensors, while leveraging the transmitter from an existing system

Integrated flow assembly and pressure regulation

- Integrated flow cell is designed to properly hold both the chlorine and pH probes
- Built-in flow valve for control between 30 and 120 L/hr
- An integral inductive switch activates an alarm when flow is too low for proper measurement
- Constant pressure is maintained in the flow assembly thanks to an integral pressure regulator

Liquiline and Memosens® technology

- Plug-and-play Memosens digital sensors eliminate problems associated with analog sensor technology
- Liquiline transmitter in two or four channel versions with a flexible range of I/O simplifies control system integration
- Optional Memobase Plus hardware and software enables remote calibration and intelligent lifecycle sensor management

Each disinfection analysis system is designed to provide a turnkey panel-mounted solution for free or total chlorine measurement. Each complete panel system incorporates a Memosens amperometric chlorine sensor. Free chlorine systems include a Memosens pH probe for accurate and reliable hypochlorous acid disinfection measurement. Each panel is equipped with a Liquiline transmitter, either a model CM442 with two sensor input channels and two analog outputs or a model CM444 transmitter with two sensor inputs and two analog outputs. Systems are also available with EtherNet/IP digital communications with the model CM444 transmitter.

Disinfection expansion panels are also available to add additional sensor measurements to an existing system, without the need for an additional transmitter. Sensors installed in a disinfection expansion panel are simply connected to a CM444 transmitter on an existing system with the addition of additional sensor input channels, thereby leveraging the transmitter across multiple disinfection measurement points.

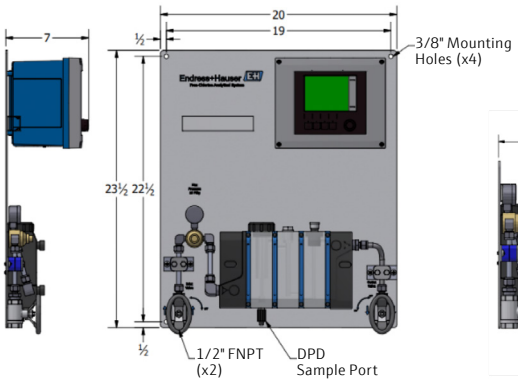
All free chlorine panels are EPA compliant according to Method 334.0, which recognizes both reagent-based systems or amperometric measurement systems for online free chlorine analysis. The disinfection systems accomplish chlorine analysis using amperometric sensor technology, eliminating the need for costly reagents or the maintenance reagent-based systems require. These systems are ideally suited for applications in drinking water, industrial water or power.

System Design

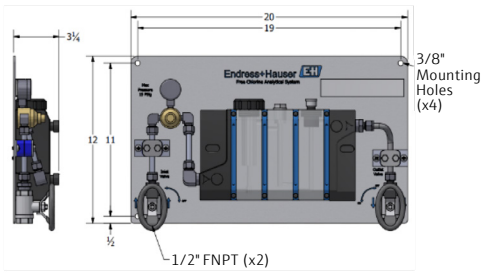
A disinfection panel is comprised of a Liquiline transmitter, either the CM442 or CM444 and an amperometric chlorine sensor, either free or total. A free chlorine system uses a CYA27 flow assembly with free chlorine and pH sensors. The total chlorine sensor is mounted in a Flowfit CCA250 assembly without the need for pH measurement. All panels include an integral flow switch to monitor for proper sample flow that provides an alarm through the transmitter if flow is interrupted. All systems include sensor cables, ⅜-inch stainless steel tubing and an integral lead-free pressure regulator to maintain system pressure at 15 psi. Free chlorine components are mounted on a 20 x 23.5 inch stainless steel panel. Total chlorine system components are mounted on a 20 x 20 inch panel. The free and total chlorine extension panels measure 20 x 12 inches. All panels are ready to be mounted to a secure vertical surface with ⅜-inch mount holes. Stainless steel inlet and outlet shut off valves, with ½-inch female NPT fittings, allow for system isolation during routine sensor maintenance. A separate sample valve in each system allows for ease of performing a DPD verification test without interrupting system operation.

The transmitter has a NEMA 4X (IP66) rating and all other components are water-proof, for installation indoors, outdoors or in an enclosure.

Free chlorine disinfection measurement system

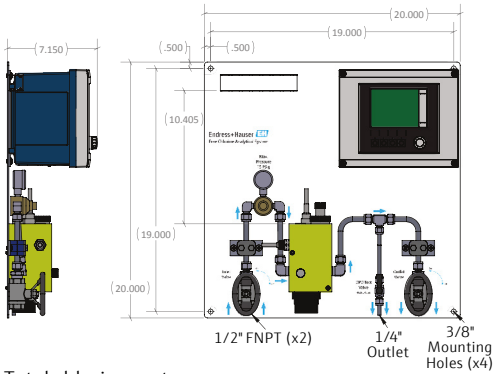


Free chlorine system

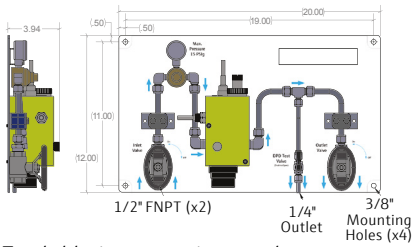


Free chlorine expansion panel

Total chlorine disinfection measurement system



Total chlorine system



Total chlorine expansion panel

System Components

Liquiline CM442 or CM444* transmitter:

- CM442-CAM2A2FD11A: CSA C/US General purpose, two sensor inputs, two analog outputs with HART, two discrete inputs and outputs, 100 to 230 VAC, or,
- CM444-CAM21A1FG11BAA: CSA C/US General purpose, two sensor inputs, two analog outputs with HART, two discrete inputs and outputs, 100 to 230 VAC, or,
- CM444-CAM2DA1FG11BAA: CSA C/US General purpose, two sensor inputs, Ethernet IP with two analog outputs, two discrete inputs and outputs, 100 to 230 VAC

Memosens free chlorine sensor – CCS51D (range dependent):

- CCS51D-AA11AD-NA: 0 to 5 mg/L, non-hazardous
- CCS51D-AA11BF-NA: 0 to 20 mg/L, non-hazardous
- CCS51D-AA11CJ-NA: 0 to 200 mg/L, non-hazardous

Memosens total chlorine sensor – CCS120D:

- CCS120D-AA21AE: 0.1 to 10 mg/L, non-hazardous

Memosens pH sensor – CPS31E:

- CPS31E-AA7ASC2: Non-hazardous, basic version, 1-12 pH, 3 ceramic junctions, salt store, 120 mm

Memosens measurement cable:

- CYK10-A881: Non-hazardous, 1 m, wire terminals

Flowfit CYA27 flow assembly for free chlorine:

- CYA27-AA1A12A10AAAAAAAAAAA AA1 +NCNDQGRA
- NPT process adaption
- Integral flow switch
- Integral DPT test sample valve

Flowfit CCA250 flow assembly for total chlorine:

- CCA250-M1
- NPT process adaption
- Integral flow switch

Panel features:

- Pressure regulator with gauge: Lead-free, 0-30 PSIG,15 PSIG nominal operating pressure
- Inlet and outlet valves: 316 SS ball valve, ½-inch NPT fitting
- Free Chlorine DPD test valve: integral to the CYA27 flow assembly
- Total Chlorine DPD test valve: 316 SS toggle valve, ¼-inch

* Accommodates up to eight sensor inputs and other optional outputs that are ordered separately.

Material Numbers

Material Number	Transmitter	Description
71573435	Liquiline CM442	Free Chlorine Analysis System complete with Liquiline CM442 transmitter, 0 to 5 mg/L chlorine range, compliant to EPA Method 334.0
71573437	Liquiline CM444	Free Chlorine Analysis System complete with Liquiline CM444 transmitter, 0 to 5 mg/L chlorine range, compliant to EPA Method 334.0
71573438	Liquiline CM444	Free Chlorine Analysis System complete with Liquiline CM444 transmitter with EtherNet/IP communications, 0 to 5 mg/L chlorine range, compliant to EPA Method 334.0
71573439	Liquiline CM442	Free Chlorine Analysis System complete with Liquiline CM442 transmitter, 0 to 20 mg/L chlorine range, compliant to EPA Method 334.0
71573440	Liquiline CM444	Free Chlorine Analysis System complete with Liquiline CM444 transmitter, 0 to 20 mg/L chlorine range, compliant to EPA Method 334.0
71573441	Liquiline CM444	Free Chlorine Analysis System complete with Liquiline CM444 transmitter with EtherNet/IP communications, 0 to 20 mg/L chlorine range, compliant to EPA Method 334.0
71573442	Liquiline CM442	Free Chlorine Analysis System complete with Liquiline CM442 transmitter, 0 to 200 mg/L chlorine range, compliant to EPA Method 334.0
71573443	Liquiline CM444	Free Chlorine Analysis System complete with Liquiline CM444 transmitter, 0 to 200 mg/L chlorine range, compliant to EPA Method 334.0
71573454	Liquiline CM442	Total Chlorine Analysis System complete with Liquiline CM442 transmitter, 0.1 to 10 mg/L chlorine range
71573455	Liquiline CM444	Total Chlorine Analysis System complete with Liquiline CM444 transmitter, 0.1 to 10 mg/L chlorine range
71573456	Liquiline CM444	Total Chlorine Analysis System complete with Liquiline CM444 transmitter with EtherNet/IP communications, 0.1 to 10 mg/L chlorine range
71573445		Expansion panel for installing additional free chlorine measurement using an existing system with CM444 transmitter. (Sensor(s) and sensor cable(s) are ordered separately.)
71575115		Expansion panel for installing additional total chlorine measurement using an existing system with CM444 transmitter. (Sensor(s) and sensor cable(s) are ordered separately.)

Note: Variations from these standard panels are available upon request. Disinfection systems with the Liquiline CM444 transmitter allow for integration of up to eight sensor inputs. The CM444 configurations also allow for the integration of additional I/O in the transmitter, such as digital communications or additional analog outputs. A system with a CM444 transmitter is required to integrate the additional sensor(s) used with an expansion panel.

Consult your local Endress+Hauser sales representative to define a version tailored to a specific need.

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