ABB MEASUREMENT & ANALYTICS | DATA SHEET

AC200 Series

Industrial 2-electrode conductivity cells with rapid temperature response

Measurement made easy
Rugged sensors, rapid response

Safe operation and high process resistance
- 316L stainless steel body and PEEK insulator operates to 20 bar (290 psi) and 200 °C (392 °F)
- Epoxy body and carbon electrodes to 6.6 bar (100 psi) and 100 °C (212 °F)

Easy installation and operation
- insertion, flow-through, immersion and submersible types

Problem-free cable connection
- plug-in connector eliminates incorrect connection and tangled cables
- terminal head version for on-site adjustment of cable length

Excellent for rapid changing processes
- fast integral temperature sensor
- T_{90} under 30 seconds

Reduced maintenance
- easy to clean, removable electrode sheath

Wide range of applications
- power plants
- water treatment
- de-mineralization
- semiconductors
- pulp & paper

Safe operation and high process resistance

The AC200 series of cells provide highly accurate and reliable inline conductivity measurements up to 20 bar (290 psi) and 200 °C (392 °F). Typical applications are power plants, ion-exchangers, reverse osmosis and chip cleaning.

AC210 cells are available as screw-in, flow-through, immersion and submersible types to permit installation in the majority of industrial applications.

The series comprises two essential variants: AC210 with electrodes of high-density graphite (for 0.1 and 1.0 cell constants); and AC220 stainless steel (for 0.01 and 0.1 cell constants).

A range of cell constants (k values) is provided to measure a wide range of process media from 10,000 µS cm^{-1} down to 0.055 µS cm^{-1} (or 18.2 MΩ.cm).

All AC200 cells are manufactured to highly exacting standards. Traceable certificates of cell constant accuracy can be supplied on request.

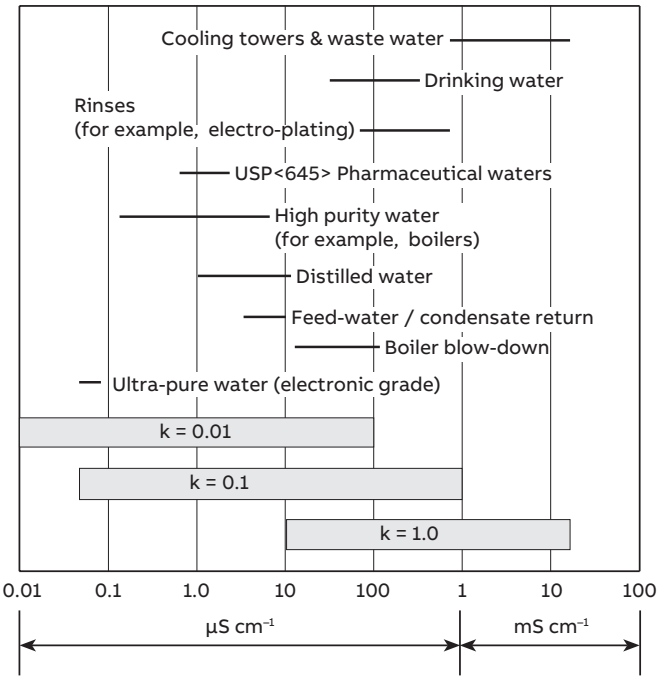


Figure 1 Process solutions and cell constants

Simple maintenance easy-to-clean cells

Some ultra-pure water processes can contain contaminants that periodically could coat electrodes and reduce measurement accuracy. This can occur during commissioning of new plant or with on-demand power plant where the process does not run continually.

To make maintenance easier all AC220 cells have a removable outer sheath making access for cleaning very simple.

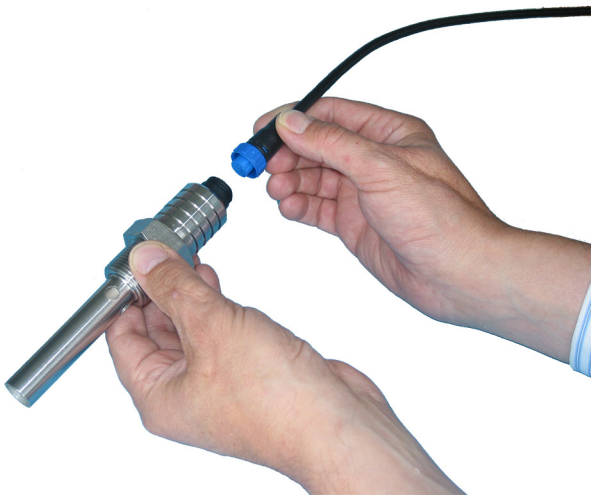


Figure 2 Detachable connector for easy installation

Flexibility of cable connection

A choice of sensor cable interconnection methods is provided in order to suit a wide variety of needs. The detachable cable connector ensures easy installation and eliminates the possibility of making a wrong connection or tangling cables

.For user flexibility, a terminal head version enables on-site adjustment of cable length and cell stocking, while direct fixed integral cable mounting is provided for the simplest, problemfree connection.

Rapid integral temperature sensor

Temperature compensation is critical for conductivity measurement, particularly where a wide variation of temperatures is expected.

In addition, detection of cooling water failure can be critical on high temperature sampled systems in the modern power plant.

All AC220 stainless steel cells are equipped with a very fast temperature compensator with T_{90} of under 30s. This enables accurate temperature compensation and use as a separate temperature measurement for output from the analyzer.

Easy installation and operation insertion, flow, immersion and submersion

The AC200 is designed to make installation easy and operation simple. These sensors have been designed for mounting in-line, immersed in tanks or directly submerged. The comprehensive range easily meets actual process needs.

AC210 graphite / epoxy cells

AC210 sensors are constructed of high-density graphite electrodes mounted in loaded epoxy resin. This provides excellent polarisation resistance at higher conductivities and exceptional chemical resistance.

AC211 screw-in insertion cells

The AC211 sensor is designed to be screwed directly in-line and is rated to 100 °C (212 °F) and 7 bar (100 psi). The process connection is a G 1 in. (BSP) or NPT male thread.

IP68 cable connection options include fixed cable, terminal head and a detachable connector.

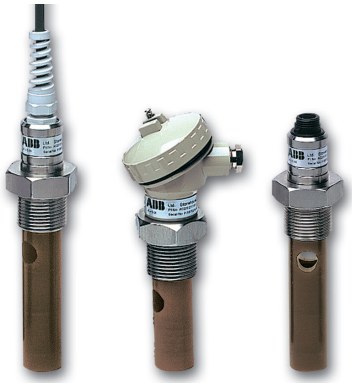


Figure 3 AC211 screw-in cells

AC212 flow-through cell

The AC212 cell is an integral, flow-through design reducing outlay and easing installation in small-bore lines. The sensor is suitable for operation to 100 °C (212 °F) and 7 bar (100 psi).

Process connections are Rp ½ in. (BSP parallel) and NPT female threads.

Connection of cable is achieved via the integrated IP67 terminal head.

Figure 4 AC212 Flow-through cell for small bore lines

AC213 immersion and submersible cells

Installation in open channels and tanks is easily achieved with the AC213 polypropylene immersion (dip) system in either 1m (3.3 ft) or 2m (6.6 ft) length. Actual dip length is adjustable on site enabling the system to match actual process needs.

Longer dip lengths are accommodated with the submersible version mounted in a dip tube provided by the user. IP68 protection of the integral, potted-in cable makes it perfectly suited for direct submersion in open channels and bore holes.

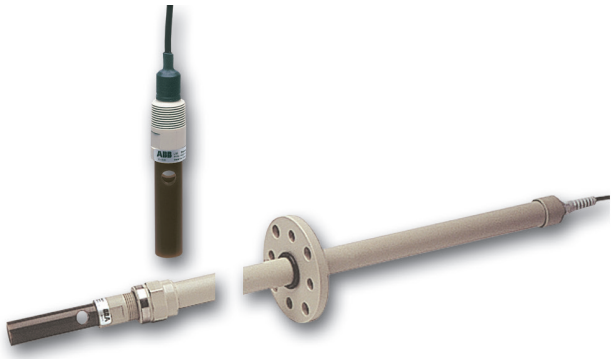


Figure 5 AC213/0 Submersible and AC213/1 Immersion Cells

AC220 stainless steel cells

The AC220 series comprises dedicated screw-in cells that can be inserted directly in-line or screwed into a flow-chamber.

AC220 steel cells are rated to 20 bar (290 psi) and 200 °C (392 °F) when using the terminal head version with ABB high temperature cable. All other types are suitable for operation to 110 °C (230 °F).

Figure 6 AC221 stainless steel cells

Specification – AC210 carbon cells

Wetted parts

Electrodes
Carbon
Cell body
Loaded epoxy resin
Mounting boss (AC211)
316L stainless steel
Immersion tube (AC213/1 and /2)
Glass reinforced polypropylene
Submersible shroud and cable (AC213/0)
PVC and cross-linked polyolefin

Temperature and pressure limits

Insertion and flow-through variants
Max. operating temperature
100 °C (212 °F)
Max. operating pressure (absolute)
7 bar (700 kPa, 100 psi)

Immersion (dip) variant
Max. operating temperature
90 °C (194 °F)
Max. operating pressure (absolute)
2 m water head (0.2 bar)

Submersible variant
Max. operating temperature
80 °C (176 °F)
Max. operating pressure (absolute)
10 m water head (1 bar)

Ingress protection

IP68 (all variants except flow-through)
IP67 (flow-through)

Available cell constants

0.10 and 1.00

Temperature element

Integral Pt100 (3-wire) in sensor body

Sensor cable terminations

Integral, potted-in cable
On insertion, immersion and submersible models
Terminal head
On insertion and flowthrough models
Detachable cable
On insertion models

Available cable lengths

1, 2, 5, 10, 15 and 20 m (3.3, 6.6, 16, 33, 49 and 66 ft.)

Process connections

Screw-in insertion
- G1 in. (BSP parallel) thread
- 1 in. NPT thread

Flow-through
- Rp ½ in. (BSP parallel) thread
- ½ in. NPT thread

Immersion (dip) mount
- 1 and 2 m (3.3 and 6.6 ft) immersion lengths, site adjustable
- Non pressure-bearing flange with DN10 / ANSI 1½ in. 150lb mounting holes
- Mounting bracket (optional)

Replacement immersion cell
1 in. NPT rear thread to fit ABB or user-own dip tube
Submersible
Suspended in process by the sensor cable

Specification – AC220 stainless steel cells

Wetted parts

Electrodes and cell body

316L stainless steel

Insulator

PEEK

Max. operating temperature

Terminal head version

200 °C (392 °F) when used with ABB high temperature cable Pt. no. 4TB3004-0008

Fixed and detachable cable and terminal head versions

110°C (230°F)

Max. operating pressure (absolute)

20 bar (2000kpa, 290 psi)

Ingress protection

IP68

Cell constants

0.01 and 0.10

Temperature element

Integral Pt100 (3-wire) in sensor body

Temperature response, T_{90}

<30s

Sensor cable terminations

- Integral, potted-in cable
- Terminal head
- Detachable cable

Available cable lengths

1, 2, 5, 10, 15 and 20 m (3.3, 6.6, 16, 33, 49 and 66 ft.)

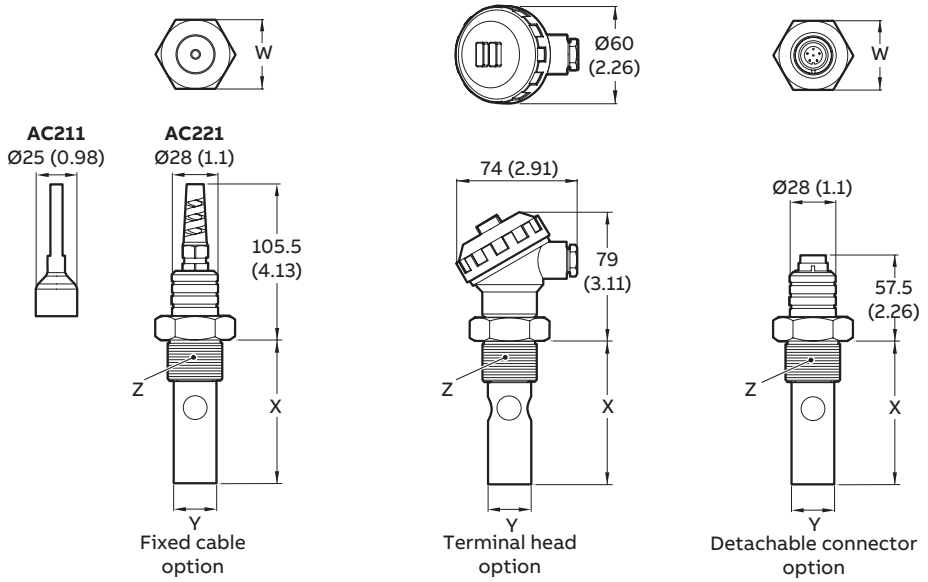
Process connections

Screw-in insertion

- G¾ in. (BSP parallel) thread
- ¾ in. NPT thread

Dimensions

Dimensions in mm (in.)



	AC211 carbon cells	
	K = 1.0	K = 0.1
W	42.5 (1.67)	
X	123 (4.84)	88 (3.46)
Y	Ø26.4 (1.04)	Ø26.4 (1.04)
Z	1in. BSP or NPT thread	

AC221 stainless steel cells	
K = 0.1	K = 0.01
33 (1.3)	
47 (1.85)	91 (3.58)
Ø20 (0.79)	Ø16 (0.63)
¾ in. BSP or NPT thread	

Figure 7 AC211 and AC221 cells

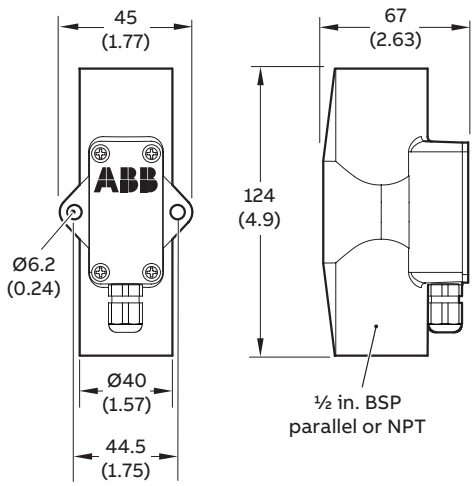


Figure 8 AC212 flow-through cell

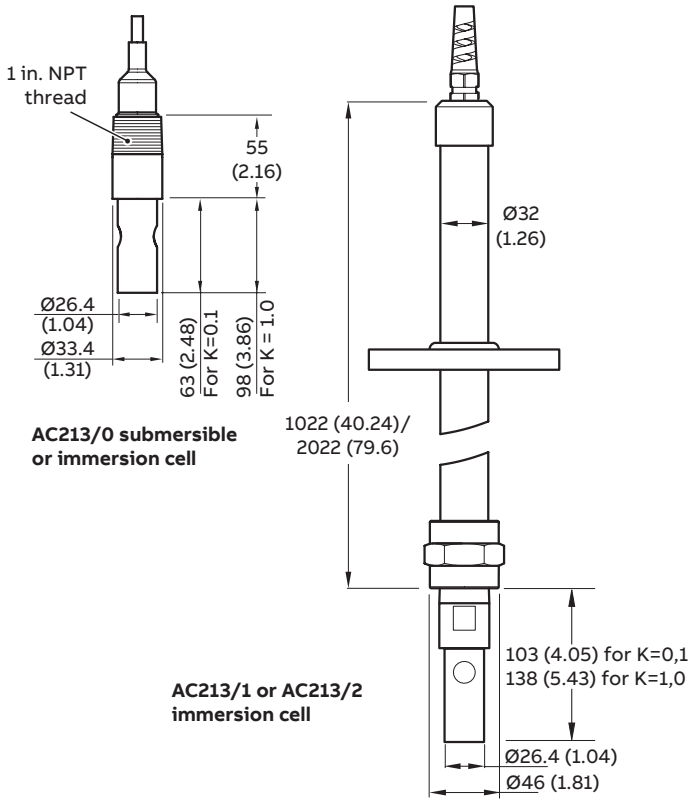


Figure 9 AC213 submersible and immersion cells

Ordering information

AC210 series 2-electrode carbon cells	**AC21**	**X**	**/X**		**X**	**X**	**X**	**X**
Insertion cells								
G 1 in. (BSP parallel) thread		1	/3					
1 in. NPT thread		1	/4					
Flow-through cells								
Rp ½ in. (BSP parallel) thread		2	/1					
½ in. NPT thread		2	/2					
Dip (immersion) and submersible cells								
Submersible Cell – requires dip holder for immersion		3	/0					
Polypropylene dip, length 1m (3.3 ft) with fitted AC213 cell		3	/1					
Polypropylene dip, length 2m (6.6 ft) with fitted AC213 cell		3	/2					
Cell constant								
0.10				3				
1.00				4				
Temperature compensator								
Pt100					1			
Cable connection method								
Fixed cable (not for AC212)						1		
Terminal head (not for AC213)						2		
Detachable connector (not for AC212 or AC213)						3		
Cable length								
None							0	
1m (3.3 ft)							1	
2m (6.6 ft)							2	
5m (16 ft)							3	
10m (33 ft)							4	
15m (49 ft)							5	
20m (66 ft)							6	
Other lengths (terminal head version only) – consult factory							9	
Language (manual)								
English								1
French								2
Italian								3
German								4
Spanish								5

AC220 series 2-electrode stainless steel cells	**AC22**	**X**	**/X**		**X**	**X**	**X**	**X**
Insertion cells								
G ¾ in. (BSP parallel) thread		1	/1					
¾ in. NPT thread		1	/2					
Cell constant								
0.01				1				
0.10				3				
Temperature compensator								
Pt100					1			
Cable connection method								
Fixed cable						1		
Terminal head						2		
Detachable connector						3		
Cable length								
None							0	
1m (3.3 ft)							1	
2m (6.6 ft)							2	
5m (16 ft)							3	
10m (33 ft)							4	
15m (49 ft)							5	
20m (66 ft)							6	
Other lengths (terminal head version only) – consult factory							9	
Language (manual)								
English								1
French								2
Italian								3
German								4
Spanish								5

Accessories

AC200 replacement / extension cables	AC200	XXX	X
Cell extension cable			
For terminal head versions AC2xx/xxx2		018	
For detachable connector versions AC2xx/xxx3		008	
Cable length			
None			0
1m (3.3 ft)			1
2m (6.6 ft)			2
5m (16 ft)			3
10m (33 ft)			4
15m (49 ft)			5
20m (66 ft)			6
Other length – consult factory			9

2998 series flow chambers for AC221 stainless steel cells

	Cell connection	Inlet / Outlet connection
2998/350	¾ in. BSP	⅜ in. NPT
2998/360	¾ in. BSP	⅜ in. BSP

Notes

Sales

Service

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DS/AC2CO-EN Rev. F 11.2017