Data Sheet
SS/4630_12

pH/Redox (ORP) Analyzers

Models 4630 & 4635
(incorporating Water Wash Versions 4631 & 4636)

- **Comprehensive range of field-proven electrode systems and electrodes**
  – satisfies broad range of applications
- **Comprehensive diagnostics facility with in-built software protection**
  – ensures security and confidence in operation
- **Fully automatic buffer recognition**
  – allows buffering in either order
- **Solution temperature compensation as standard**
  – essential for ammonia-dosed high purity boiler water applications
- **Second current output or Modbus™ option**
  – enables temperature to be retransmitted
- **IP66/NEMA4X**
  – reliable operation in demanding environments.
- **Water Wash facility**
  – enhances performance in difficult applications
- **English, French, German, Italian and Spanish software**
  – simple, user-selection of display language

A high specification pH/Redox (ORP) analyzer offering advanced functionality, simple operation and reliability in harsh environments

4630 Series pH/Redox (ORP) Analyzer

The ABB 4630 Series pH/Redox (ORP) Analyzer comprises a transmitter and a sensing system to accurately, and reliably, measure and transmit the pH/Redox (ORP) value in a range of water monitoring applications such as water treatment plants, boiler water and effluent.

The Analyzer offers high performance and advanced functionality in a compact, cost-effective package. It is rugged and reliable for safe operation in harsh environments, simple to install and use; and requires minimum maintenance.

Sensor System

The sensing system can be selected from an extensive choice of dip, flow, in-line and withdrawable versions to suit the application.

The design and method of construction has resulted in a world-class product with an enviable reputation for longevity, quality and reliability.

The 4630 Series Universal Transmitter

The 4630 Series Universal Transmitter provides the operator interface and communications to other devices. The signal from the sensing system is converted by the transmitter and the information is presented on a large, custom-designed, easy-to-read, back-lit liquid crystal display (LCD) as a pH or Redox (ORP) value.

A process retransmission signal and two alarm relay outputs are provided as standard, while an optional RS485 serial interface allows the transmitter to be easily incorporated into the ABB PC30 supervisory system. A second current output option enables temperature as well as pH to be retransmitted.

Available in wall-mounting or ¼ DIN panel-mounting versions the transmitter is protected to IP66/NEMA 4X, ensuring reliable operation in the most demanding situations. The same level of protection is maintained during programming and calibration.

User Friendly Operation

An easy to read display is used in conjunction with the four tactile membrane key pads to prompt the user through the programming procedures. Included as standard is a five-language, software package, to display information in English, French, German, Italian or Spanish.

Easy Installation, Commissioning and Maintenance

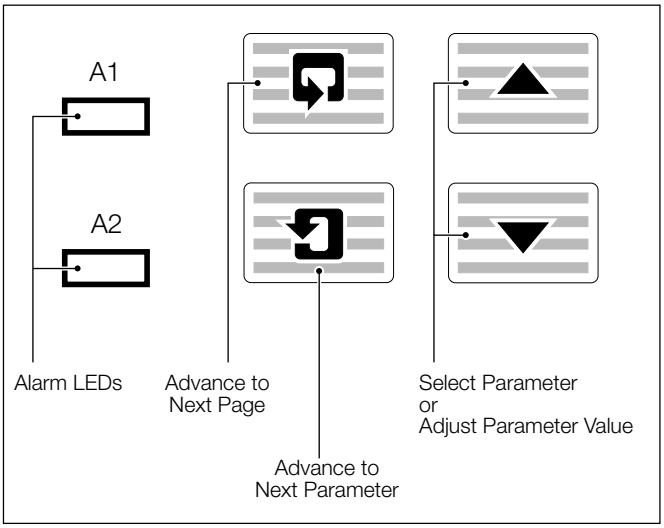
The compact panel- or wall-mounting transmitter allows flexible and easy installation. The unique LCD is easy to read in all light conditions. Used in conjunction with the membrane key pad it prompts the user through the setup procedure. Range, alarm levels, set point adjustments and system calibration are easily set.

Water Wash Models 4631 and 4636

The instrument can be supplied with the capability to automatically wash the pH electrode using normal mains water when used with the Series 7670 cartridge pH/Redox system. This facility can significantly improve the performance and reduce the maintenance on difficult applications.

Confidence in Service

To complement the well-proven design and unrivalled accuracy and reliability in service of the sensors, the entire sensing loop is regularly self-monitored for short circuits and temperature element faults. The instrument includes non-volatile memory, eliminating the need for battery back-up, and line voltage supply filtering to minimize the effects of mains borne interference. The instruments carry the CE mark, having undergone extensive testing.



Instrument Key Pad

Wash in Process

Specification – Transmitter

Display

Measured value

5-digit x 7-segment back-lit LCD

Information

16-character, single line, dot matrix, back-lit LCD

Ranges

pH	0 to14
Redox (ORP)	–1000 to +1000mV

Resolution

0.1pH, 1mV

Accuracy

±0.01pH, ±1mV

Glass pH slope range

Max. 105%

Min. configurable between 60 and 90%

Temperature compensation

–10 to 110°C (14 to 230°F) manual or automatic via Pt100 resistance thermometer

Environmental Data

Operating temperature limits

–20 to 55°C (–4 to 130°F).

Storage temperature limits

–25 to 70°C (–13 to 158°)

Operating humidity limits

Up to 95%RH non-condensing

Power Supply

Voltage requirements

100 to 130V or

200 to 260V 50/60Hz

Power Consumption

<6VA

Error due to power supply variations

Less than 2% for +6% –20% variation from nominal supply voltage

Insulation

Mains to earth (line to ground) 2kV RMS

Outputs and Set Points

No. of Relays

Two

Set point adjustment

Programmable

Water Wash

No. of relays	one for control
	one for water wash

Frequency of wash

15 minutes, 30 minutes, 45 minutes, 1 hour, 2 hours up to 24 hours in 1 hour increments

Duration of wash

15 seconds, 30 seconds, 45 seconds, 1 minute, 2 minutes, 3 minutes, 4 minutes or 5 minutes

Set point differential

±1% of span

Relay contacts

Single pole changeover

Rating	250V AC 3A AC	250V DC max. 3A DC max.
Loading (non-inductive) (inductive)	750VA 75VA	30W max. 3W max.

Insulation

2kV RMS contacts to earth (ground)

No. of set points

Two

Set point adjustment

Programmable

Set point hysteresis

±1% fixed

Local set point annunciation

Red LED

...Specification – Transmitter

Retransmission

No. of retransmission signals

One fully isolated – standard

Two fully isolated – optional

Output current

0 to 10mA, 0 to 20mA or 4 to 20mA programmable

Output ranges

Retransmission 1

User programmable

pH	0 to 14pH, min. span 2pH
Redox (ORP)	–1000 to +1000mV, min. span 150mV

Retransmission 2 (optional)

User programmable

pH	0 to 14pH, min. span 2pH
Redox (ORP)	–1000 to +1000mV, min. span 150mV
Temperature	–10 to 150°C (32 to 302°F), min. span 20°C (36°F)

Accuracy

±0.25% FSD or ±0.5% reading

Resolution

0.1% at 10mA, 0.05% at 20mA

Maximum load resistance

750Ω (20mA max.)

Modbus serial communication

RS485 (optional extra)

Mechanical Data

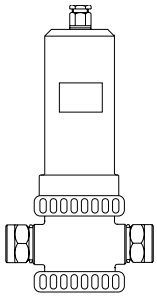
Models 4630 & 4631

Mounting	Wall
Protection	IP66/NEMA4X
Dimensions	160mm wide x 214mm high x 68mm deep (6.30 in. x 8.43 in. x 2.68 in.)
Weight	2kg (4 1/2 lb)

Models 4635 & 4636

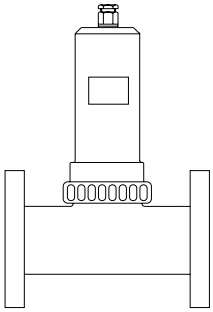
Mounting	Panel (1/4 DIN)
Protection	IP66/NEMA4X front
Dimensions	96mm wide x 96mm high x 191mm deep (3.78 in. x 3.78 in. x 7.52 in.)
Weight	1.5kg (3 1/4 lb)

Specification – Sensing System



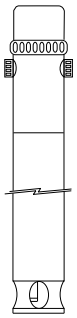
Body material	Glass coupled polypropylene
Operating temperature range	–5 to 100°C (23 to 212°F)
Max. temperature	100°C at 2 bar (212°F at 29psi)
Max. operating pressure	10 bar at 20°C (145psi at 68°F)
Process connection (standard)	1 in. BSP female 1½ in. BSPT adapter
Process connection (optional)	½ in. NPT female adapter Other flanges to order

Model 7651



Body material	Glass coupled polypropylene and polypropylene
Operating temperature	–5 to 80°C (23 to 176°F)
Max. temperature	80°C (176°F) at atmospheric pressure
Max. operating pressure	2.75 bar at 20°C (40psi at 68°F)
Process connections (standard)	2 in. BSP flange
Process connections (optional)	51mm (2 in.) DIN flange
Mounting	In pipeline

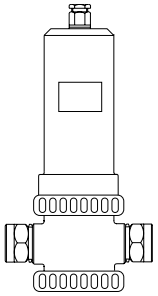
Model 7652



Body material	Glass coupled polypropylene and polypropylene
Operating temperature	–5 to 80°C (23 to 176°F)
Max. temperature	80°C (176°F) at atmospheric pressure
Max. operating pressure	2.75 bar at 20°C (40psi at 68°F)
Process connection (standard)	Open tank
Process connection (optional)	Sealed, adjustable flange
Mounting	7654 – 1 clamp system 7655/6 – 2 clamp system
Stem length	1m, 2m or 3m

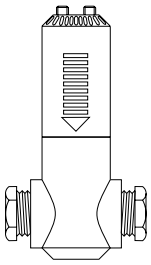
Model 7654/5/6

...Specification – Sensing System



Body material	316 stainless steel (wet section)
Operating temperature	0 to 100°C (32 to 140°F) with high temp. electrodes
Max. temperature	100°C at 6.6 bar (212°F at 100psi)
Max operating pressure	6.6 bar at 20°C (100psi at 68°F)
Process connections (standard)	1/2 in. or 1 in. BSP
Process connections (optional)	3/8 in. NPT
Mounting	Surface mounting brackets

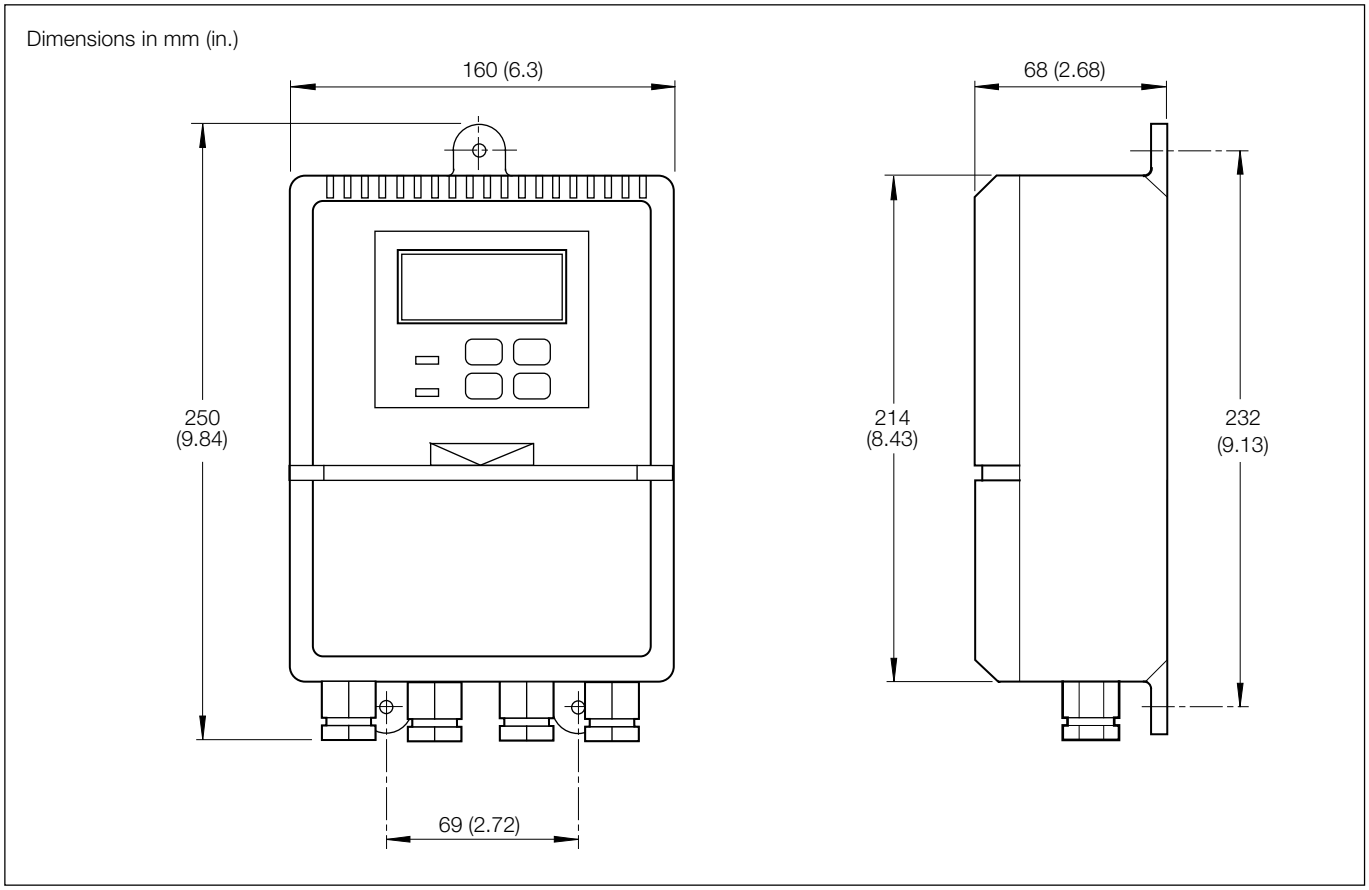
Model 7660



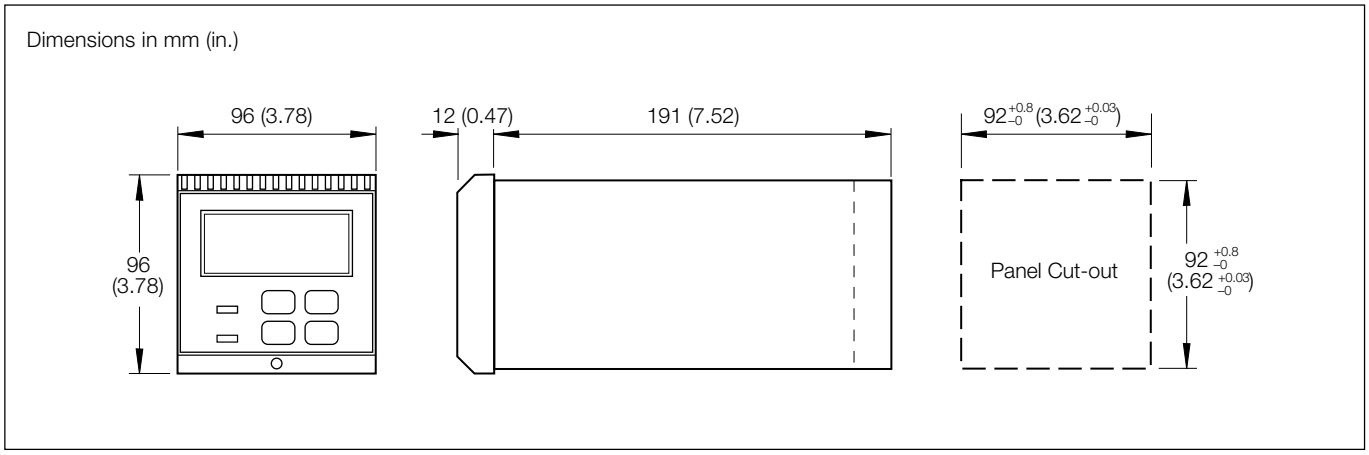
Body material	Glass coupled polypropylene
Operating temperature	0 to 100°C (32 to 212°F)
Max. temperature	100°C (212°F) at atmospheric pressure
Max. operating pressure	6.6 bar at 20°C (100psi at 68°F)
Process connection (standard)	1/2 in. or 1 in. BSP
Dip Systems	1m, 2m and 3m (39 in., 78 in., 118 in.)
Screw-in Systems	1 in. NPT

Model AP100

Overall Dimensions

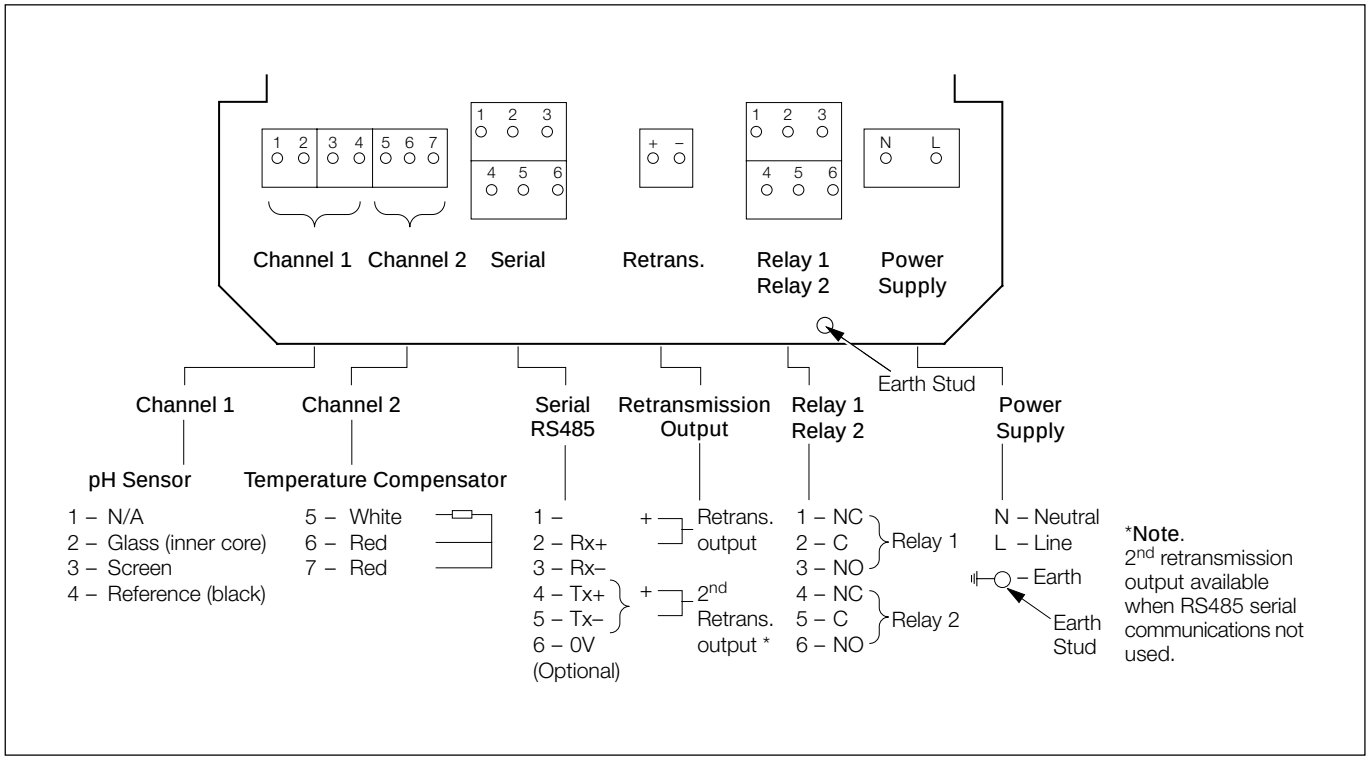


Models 4630 and 4631 Wall-mount Versions

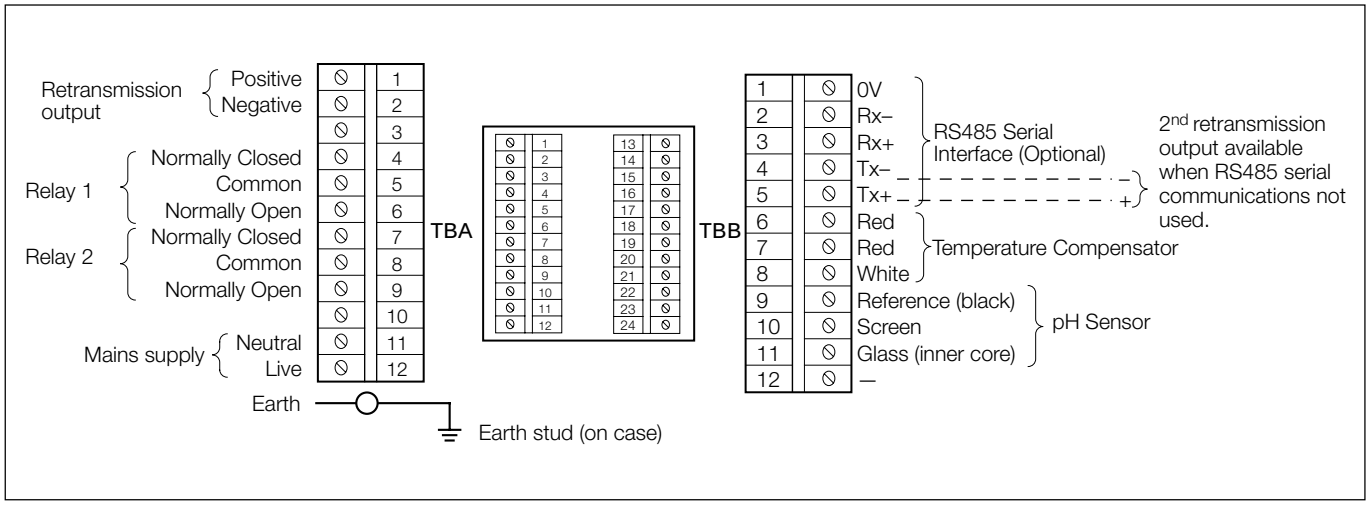


Models 4635 and 4636 Panel-mount Versions

Electrical Connections



Models 4630 & 4631 Wall-mount Versions



Models 4635 & 4636 Panel-mount Versions

Ordering Information

4630 Series Analyzer

Model 4630, 4631, 4635 or 4636 pH/Redox (ORP) Analyzer	463	X	–	X	0	0
Range 0 to 14pH, power supply 110V/240V 50/60Hz, high and low alarms						
Case						
Wall-mount IP66		0				
Wall-mount IP66 with water wash control		1				
Panel-mount IP66		5				
Panel-mount IP66 with water wash control		6				
Output						
Single isolated current output				5		
Modbus™ serial data interface				7		
Two isolated current outputs				8		

...Ordering Information

7650/7660 Electrode System

7650/7660 Series pH/Redox Electrode System	76	XX	/	0	X	X
System Type and Material						
Polypropylene Systems						
Flow system with 1/2 in. and 1 in. process connections		51				
Flow system with 2 in. process connections		52				
Dip system – 1m (39 in.)		54				
Dip system – 2m (78 in.)		55				
Dip system – 3m (118 in.)		56				
Stainless Steel System						
Flow system with 3/8 in. process connections (Reservoir-fed reference version)		60				
Connection Cable Length and Type						
With Automatic Temperature Compensation						
No cable					0	
3m (10 ft)length					1	
5m (16 ft) length					2	
10m (33 ft) length					3	
20m (65 ft) length					4	
Special length					S	
For Redox						
No cable					0	
3m (10 ft) length					5	
5m (16 ft) length					6	
10m (33 ft) length					7	
20m (65 ft) length					8	
Special length					M	
Sensor Types						
No sensor						0
1720-000 all purpose glass pH electrode 1730-000 standard reference electrode 1750-000 Pt100 temperature compensator Recommended for industrial process/waste water						1
1722-000 low resistance glass electrode 1730-000 standard reference electrode 1750-000 Pt100 temperature compensator Recommended for potable waters						2
1740-000 Platinum Redox (ORP) electrode 1730-000 standard reference electrode For Redox (ORP) applications.						5
1741-000 Antimony electrode (pH) 1730-000 standard reference electrode Recommended for pH applications where Hf is present in the sample						6
High temperature glass pH electrode 1730-000 standard reference electrode 1750-000 Pt100 temperature compensator For high temperature applications.						7

AP100 Electrode System

AP100 Series pH/Redox (ORP) Cartridge Sensor	AP10	X/	X	XX	X	XX	X	X
Cartridge Type								
Bayonet…cable detached (**NOT** Dip type)		1						
Bayonet…cable attached (**NOT** Dip type)		2						
Screw-in…cable detached		3						
Submersible *		4						
Sensor Type								
Standard glass (0 to 100°C, [32 to 212°F] 0 to 14pH)			1					
Standard glass + water wash (0 to 100°C, [32 to 212°F] 0 to 14pH)			2					
Low resistance glass (0 to 70°C, [32 to 158°F] 0 to 11pH)			3					
Low resistance glass + water wash (0 to 70°C, [32 to 158°F] 0 to 11pH)			4					
Redox (ORP)			5					
Redox (ORP) + water wash			6					
Cable Length								
No cable				00				
1m (39 in.) cable				01				
2m (78 in.) cable				02				
3m (117 in.) cable				03				
5m (16.25 ft) cable				05				
10m (32.5 ft) cable (minimum length for Submersible Cartridge type)				10				
15m (48.75 ft) cable				15				
20m (65 ft) cable				20				
25m (81.25 ft) cable				25				
30m (97.5 ft) cable (available only for use with Submersible Cartridge type)				30				
For Cartridge sensor only no further coding options are required **For full system continue selecting options**								
Dip Type (operating temperature 0 to 80°C [32 to 176°F])								
No dip tube					0			
1m (39 in.) dip					1			
2m (78 in.) dip					2			
3m (117 in.) dip					3			
1m (39 in.) dip + water wash					4			
2m (78 in.) dip + water wash					5			
3m (117 in.) dip + water wash					6			
Flow Sensor Type (operating temperature 0 to 100°C [32 to 212°F])								
No flow cell						00		
Bayonet ½ in. BSP process connection glass-coupled polypropylene						01		
Bayonet 1 in. BSP process connection glass-coupled polypropylene						02		
Bayonet ½ in. NPT process connection glass-coupled polypropylene						03		
Bayonet 1 in. NPT process connection glass-coupled polypropylene						04		
Screw-in ½ in. BSP process connection glass-coupled polypropylene						05		
Screw-in 1 in. BSP process connection glass-coupled polypropylene						06		
Screw-in ½ in. NPT process connection glass-coupled polypropylene						07		
Screw-in 1 in. NPT process connection glass-coupled polypropylene						08		
Bayonet ⅜ in. NPT process connection stainless steel low volume						11		
Bayonet ⅜ in. NPT process connection Delrin low volume						12		
Pipe-line adapter process connection 1½ in. BSP (bayonet fitting)						13		
Reserved							0	
Manual								
English								1
German								2
French								3
Spanish								4
Other								9

* Submersible Cartridge Type available only with either Sensor Type option 1 (Standard Glass) or 5 (Redox [ORP]).
Submersible Cartridge Type available only with cable length of 10m (32.5ft) or over.

The 4600 Series transmitters are so user-friendly and easy to program they are normally supplied with standard factory settings If specific programming requirements are stated at the time of ordering, units can be despatched suitably customized. Please apply to the nearest ABB office for details.

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