Conductivity Analyzer
Models 4620 & 4625

- Comprehensive range of field-proven conductivity cells
  - satisfies broad range of applications.

- Comprehensive diagnostics facility with in-built software protection
  - ensures security and confidence in operation.

- Universal transmitter
  - covers applications from ultra-pure water to liquids with conductivity up to 10,000 µS/cm.

- Ultra-pure water temperature compensation
  - ensures accuracy at conductivities below 1 µS/cm.

- Second current or Modbus option
  - enables temperature to be retransmitted

- IP66/NEMA4X
  - reliable operation in demanding environments.

- Guaranteed cell constant
  - ensures high accuracy and total interchangeability.

- English, French, German and Spanish software
  - simple, user-selection of display language.

A high specification conductivity analyzer offering advanced functionality, simple operation and reliability in harsh environments.
4620 Series Conductivity Analyzer

The ABB 4620 Series conductivity analyzer comprises a transmitter and a sensing system to accurately, and reliably, measure and transmit the conductivity value in a range of water monitoring applications.

The 4620 Series 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 sensor system can be selected to suit a specific application from an extensive range of well proven conductivity cells. All cells have guaranteed ±1% cell constant and Pt100 temperature compensation elements. A variety of mounting configurations are offered to meet most industrial applications.

The cells are constructed in either epoxy resin with annular carbon electrodes, or stainless steel and are resistant to polarization, requiring virtually no maintenance.

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

The 4600 Series Universal Transmitter

The 4600 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 conductivity value in one of seven programmable units of measure.

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.

Available in a wall mounted or ¼ DIN panel mounted version the transmitter is protected to IP66, 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 one of English, French, German, Italian or Spanish languages.

Easy Installation, Commissioning and Maintenance

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 simply prompts the user through the set up procedure. Range, alarm levels, set point adjustments and system calibration are easily set.

Confidence in Service

To complement the well proven design and unrivalled accuracy and reliability in service of the conductivity cells 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.

Two Current Outputs

All 4620/25 Conductivity Analyzers can be supplied with an additional current output to enable both the conductivity and temperature to be retransmitted.

Alternatively a Modbus serial communication can be supplied.

Analog outputs configured for conductivity can be set by the user as linear, bi-linear or logarithmic. Selecting linear provides an output in direct proportion to the measuring range. Selecting bi-linear or logarithmic enables excellent discrimination at low conductivity levels, yet permits a readable output during high level excursions.
Conductivity Analyzer
Models 4620 & 4625 SS/4620_8

Specification – Transmitter

Display

Measured value
5-digit x 7-segment back-lit LCD

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

Ranges
Programmable 0 to 0.5µS/cm up to 10,000µS/cm
(with various cell constants)

Scaling
µS/cm, µS/m, mS/cm, mS/m, Mohm-cm, TDS and PPM
Conductivity ranges configurable as linear, bi-linear,
2- or 3-decade logarithmic

Accuracy
±1.0% f.s.d., ±1 digit

Linearity
±0.1% f.s.d.

Temperature measuring range
–10°C to 150°C (14° to 302°F).

Temperature compensation
–10°C to 130°C (14° to 266°F) automatic

Temperature coefficient
Programmable 0 to 3.0%/°C (0 to 1.5%/°F)

Temperature sensor
Pt100 resistance thermometer

Reference temperature
20°C (68°F) or 25°C (77°F) programmable

Power Supply

Voltage requirements
100 to 130V, 200 to 260V, 50/60Hz

Power consumption
< 6VA AC

Error due to power supply variation
Less than 0.1% 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

No. of set points
Two

Set point adjustment
Programmable

Set point hysteresis
±1% fixed

Local set point annunciation
Red l.e.d.

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

Insulation
2kV RMS contacts to earth (ground)

Environmental Data

Operating temperature limits
–20° to 55°C (~4° to 131°F)

Storage temperature limits
–25° to 55°C (~13° to 131°F)

Operating humidity limits
Up to 95% RH non-condensing
...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**

<table>
<thead>
<tr>
<th>Retransmission 1</th>
<th>Retransmission 2 (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero 0 fixed</td>
<td>Programmable conductivity or temperature</td>
</tr>
<tr>
<td>Span 10 to 100% of the display range</td>
<td>Conductivity as Retransmission 1</td>
</tr>
<tr>
<td>Temperature –10°C to 150°C (14° to 302°F) min. span 20°C (36°F)</td>
<td>Temperature –10°C to 150°C (14° to 302°F)</td>
</tr>
</tbody>
</table>

**Accuracy**
- ±0.25% FSD ±0.5% reading

**Resolution**
- 0.1% at 10mA, 0.05% at 20mA

**Max. load resistance**
- 750Ω (20mA max.)

**Serial communication**
- RS485 (optional extra)

---

**Mechanical Data**

**Model 4620**
- Wall-mounting
- Protection: IP66
- Dimensions: 160mm (6.30 in.) wide x 214mm (8.43 in.) high x 68mm (2.68 in.) deep
- Weight: 2kg (4 1/2 lb)

**Model 4625**
- Panel-mounting
- Protection: IP66 front
- Dimensions: 96mm (3.78 in.) wide x 96mm (3.78 in.) high x 191mm (7.52 in.) deep
- Weight: 1.5kg (3 1/4 lb)
- Panel cut-out: 92 \(\pm 0.8\) mm x 92 \(\pm 0.8\) mm (3.62 \(\pm 0.03\) in. x 3.62 \(\pm 0.03\) in.)
### Dip Cell Model 2025

<table>
<thead>
<tr>
<th>Specification</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell constant available</strong></td>
<td>0.1 or 1.0</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Dip type</td>
</tr>
<tr>
<td><strong>Cell body</strong></td>
<td>Loaded epoxy resin</td>
</tr>
<tr>
<td><strong>Electrode matl.</strong></td>
<td>Carbon</td>
</tr>
<tr>
<td><strong>Fixing detail</strong></td>
<td>Adjustable with bracket provided</td>
</tr>
<tr>
<td><strong>Maximum press. bar (psi)</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Maximum temp.</strong></td>
<td>90°C (194°F)</td>
</tr>
<tr>
<td><strong>Ordering Information</strong></td>
<td>Order under part number 2025–000</td>
</tr>
<tr>
<td></td>
<td>Cell constant K = 0.1 4</td>
</tr>
<tr>
<td></td>
<td>Cell constant K = 1.0 6</td>
</tr>
<tr>
<td></td>
<td>Non-temperature compensated 0</td>
</tr>
<tr>
<td></td>
<td>Temperature compensated Pt100 5</td>
</tr>
</tbody>
</table>

### Flow Cell Model 2045

<table>
<thead>
<tr>
<th>Specification</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell constant available</strong></td>
<td>0.1 or 1.0</td>
</tr>
<tr>
<td><strong>Type</strong></td>
<td>Flow-line</td>
</tr>
<tr>
<td><strong>Cell body</strong></td>
<td>Loaded epoxy resin</td>
</tr>
<tr>
<td><strong>Electrode matl.</strong></td>
<td>Carbon</td>
</tr>
<tr>
<td><strong>Fixing detail</strong></td>
<td>Threaded ½ in. BSP parallel or NPT</td>
</tr>
<tr>
<td><strong>Maximum press. bar (psi)</strong></td>
<td>6.6 (100)</td>
</tr>
<tr>
<td><strong>Maximum temp.</strong></td>
<td>100°C (212°F)</td>
</tr>
</tbody>
</table>

### Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>2025–000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell constant K = 0.1</td>
<td>4</td>
</tr>
<tr>
<td>Cell constant K = 1.0</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>2045–000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell constant K = 0.1</td>
<td>4</td>
</tr>
<tr>
<td>Cell constant K = 1.0</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>2025–400 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-temperature compensated</td>
<td>0</td>
</tr>
<tr>
<td>Temperature compensated Pt100</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>2045–400 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-temperature compensated</td>
<td>0</td>
</tr>
<tr>
<td>Temperature compensated Pt100</td>
<td>5</td>
</tr>
</tbody>
</table>
## Screw-in Model 2077

**Dimensions (in mm):**
- Dia. 68 (2.67)
- 70 (2.75)
- 22 (0.86)

**Specifications:**
- **Cell constant:** available 0.1 or 1.0
- **Type:** Screw type
- **Cell body:** Loaded epoxy resin
- **Electrode matl.:** Carbon
- **Fixing detail:** Threaded 1 in. BSP parallel or NPT
- **Maximum press. bar (psi):** 6.6 (100)
- **Maximum temp. °C:** 100 (212°F)

**Ordering Information:**
- **Order under part number:** 2077–000
- **Cell constant K = 0.1:** 4
- **Cell constant K = 1.0:** 6
- **Threaded 1 in. BSP:** 0
- **Threaded 1 in. NPT:** 8
- **Non-temperature compensated:** 0
- **Temperature compensated Pt100:** 5

**Model Dimensions:**
- **Model:** 2078–4
  - **A (in.):** 184 (7.24)
  - **B (in.):** 102 (4.0)
- **Model:** 2078–3
  - **A (in.):** 184 (7.24)
  - **B (in.):** 102 (4.0)

## Screw-in Model 2078

**Dimensions (in mm):**
- Dia. 22 (0.86) dia.
- 915mm (36 in.) length of connecting cable fitted with watertight plug and socket

**Specifications:**
- **Cell constant:** available 0.05 or 0.1
- **Type:** Screw-in
- **Cell body:** 316 St. Steel
- **Electrode matl.:** 316 St. Steel
- **Fixing detail:** Threaded ¾ in. BSP parallel or NPT
- **Maximum press. bar (psi):** 10.5 (150)
- **Maximum temp. °C:** 110 (230°F)

**Ordering Information:**
- **Order under part number:** 2078–000
- **Cell constant K = 0.05:** 3
- **Cell constant K = 0.1:** 4
- **Threaded ¾ in. BSP:** 0
- **Threaded ¾ in. BSP fitted with plug & socket:** 1
- **Threaded ¾ in. NPT:** 7
- **Threaded ¾ in. NPT fitted with plug & socket:** 8
- **Non-temperature compensated:** 0
- **Temperature compensated Pt100:** 5

**Model Dimensions:**
- **Model:** 2078–4
  - **A (in.):** 102 (4.0)
  - **B (in.):** 70 (2.75)
- **Model:** 2078–3
  - **A (in.):** 102 (4.0)
  - **B (in.):** 70 (2.75)

---

**Screw-in Model 2077**

**Screw-in Model 2078**
## Conductivity Analyzer

### Models 4620 & 4625

#### Withdrawable Cell Model 2085

<table>
<thead>
<tr>
<th>Dims. in mm (in.)</th>
<th>0.9m (36 in.)</th>
<th>Cable length with watertight plug and socket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearance for Removal</td>
<td>130 (5.1)</td>
<td></td>
</tr>
<tr>
<td>25 (1)</td>
<td>89 (3.5)</td>
<td></td>
</tr>
<tr>
<td>1 1/2 in. BSPP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Specification

<table>
<thead>
<tr>
<th>Cell constant available</th>
<th>0.05 or 0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Withdrawable</td>
</tr>
<tr>
<td>Cell body</td>
<td>Naval brass and 316 St. Steel</td>
</tr>
<tr>
<td>Electrode matl.</td>
<td>316 St. Steel</td>
</tr>
<tr>
<td>Fixing detail</td>
<td>Used with Model 2089 valve assembly 1 1/2 in. BSP parallel or NPT</td>
</tr>
<tr>
<td>Maximum press. bar (PSI)</td>
<td>10.5 (150)</td>
</tr>
<tr>
<td>Maximum temp.</td>
<td>110°C (230°F)</td>
</tr>
</tbody>
</table>

#### Ordering Information

<table>
<thead>
<tr>
<th>Order under part number</th>
<th>2085–000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell constant K = 0.05</td>
<td>3</td>
</tr>
<tr>
<td>Cell constant K = 0.1</td>
<td>4</td>
</tr>
<tr>
<td>Non-temperature compensated</td>
<td>0</td>
</tr>
<tr>
<td>Temperature compensated Pt100</td>
<td>5</td>
</tr>
</tbody>
</table>

Order withdrawable valve for this cell under part number 2089–800.

### Model 2999

A range of stainless steel flow chambers is available for flow applications which require the use of a screw-in type cell (e.g. ultrapure water applications). These are available as the 2999 Series, the most common versions of which are detailed below. Special requirements can be catered for under certain circumstances.

#### Ordering Information

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Process Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>2999-015</td>
<td>Flow jacket to fit Model 2078 cell</td>
<td>10mm tube connections</td>
</tr>
<tr>
<td>2999-020</td>
<td>Flow jacket to fit Model 2078 cell</td>
<td>1/2 in. BSP parallel</td>
</tr>
<tr>
<td>2999-025</td>
<td>Flow jacket to fit Model 2073/76 cell</td>
<td>3/4 in. BSP parallel</td>
</tr>
<tr>
<td>2999-100</td>
<td>Flow jacket to fit Model 2271 cell</td>
<td>10mm tube connections</td>
</tr>
<tr>
<td>2999-115</td>
<td>Flow jacket to fit Model 2072 cell</td>
<td>10mm tube connections</td>
</tr>
<tr>
<td>2999-190</td>
<td>Flow jacket to fit Model 2078 cell</td>
<td>3/4 in. NPT</td>
</tr>
</tbody>
</table>

#### Note

This is only a selection of flow chambers available. If your requirements are not listed above, please contact our Sales Department stating your needs as fully as possible.
Electrical Connections

Model 4620 Wall-mounting Version using Cells Fitted with Bulkhead Plug and Socket*

Model 4625 Panel-mounting Version using Cells Fitted with Bulkhead Plug and Socket*

* Note. When using cells supplied without bulkhead plug and socket connect as follows:

Model 4620
Yellow = terminal 5
Red = terminal 3
Green = terminal 6
Blue = terminal 7
  – In addition connect screen to the earth stud and link terminals 6 and 7

Model 4625
Yellow = terminal 8
Red = terminal 22
Green = terminal 19
Blue = terminal 18
  – In addition connect screen to the earth stud and link terminals 18 and 19

Note.
To select the most suitable cell constant for the desired working range use the following criteria:

Minimum range 10 x cell constant
Maximum range 10,000 x cell constant

e.g. cell constant k = 0.1
  Minimum range = 10 x 0.1 = 1.00µS/cm
  Maximum range = 10,000 x 0.1 = 1000µS/cm

For ultrapure water applications (less than 1.00µS/cm) a cell constant of 0.05 or 0.1 must be used.
Overall Dimensions

Dimensions in mm (in.)

Model 4620 Wall-mounting Version
...Overall Dimensions

Dimensions in mm (in.)

Model 4625 Panel-mounting Version
Ordering Information
To order a 4600 Conductivity Analyzer select the Transmitter, Sensing System and Connecting Cables from the following information.

<table>
<thead>
<tr>
<th>Models 4620 &amp; 4625 Conductivity Analyzers</th>
<th>462</th>
<th>X</th>
<th>0</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wall-mounting IP66</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel-mounting IP66 front</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single isolated current output</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modbus serial data interface</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two isolated current outputs</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conductivity Cell
Select the appropriate Conductivity Cell – see pages 4 and 5.

Connection Cables
Cell connection cable part no. 0233-811
Temperature compensation connection cable part no. 0233-819

(Maximum length 100m (325ft) when using cell constants $K = 0.1$ and $K = 1.0$ and 50m when using cell constant $K = 0.05$.)

The 4600 Series transmitters are so 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.