

## pH/ORP Preamplifier PHA

- ◆ Low cost
- ◆ High input impedance – over  $10^{13} \Omega$
- ◆ Low output impedance
- ◆ Temperature compensation available
- ◆ Unipolar or bipolar supply voltage
- ◆ High IP protection class available
- ◆ May be connected to low-cost measurement devices

COMECO's PHA preamplifier amplifies the voltage from pH or REDOX potential (ORP) probes through a special amplifier that serves as input buffer and provides the high input impedance necessary for normal operation of pH/ORP probes. The low impedance output of the preamplifier may be connected to a standard indicator, data logger, or controller. Two PHA variants are available: - variant '100' with low IP protection class that needs bipolar supply voltage; - variant '150' with high IP protection class and single polarity supply voltage. PHA100 serves only as a high input impedance buffer; no change of voltage signal is performed. PHA150 shifts input signal so that the output voltage has single polarity (its polarity does not change), and allows temperature compensation measurement via an additional Pt100 input. Variant '150' is designed for wall mounting, while PHA100 is to be either left to hang freely on its wires or mounted by the means of a bracket. Both variants are applicable in cases in which there is a need to connect pH/ORP probes to measurement devices without posing special requirements to devices' input circuits and connection cables. The fields of application include biotechnological, chemical, food, and other industries, and research.



### Technical specifications

| Input   |                            |                 |
|---|----------------------------|-----------------|
| <b>Input range:</b>                           |                            |                 |
| - pH  | 0...14 pH                  |                 |
| - ORP   | -2000...+2000 mV           |                 |
| Temperature compensation input <sup>(1)</sup> | external Pt100, 0...100 °C |                 |
| Input impedance                               | > $10^{13} \Omega$         |                 |
| Input capacitance                             | 0.5 pF                     |                 |
| <b>Output</b>                                 | '100'                      | '150'           |
| <b>Output signal (at 25 °C):</b>              |                            |                 |
| - pH  | +410...-410 mV             | +2910...1090 mV |
| - ORP   | -2000...+2000 mV           | 500...+4500 mV  |
| Output asymmetry                              | ± 1 mV                     | -               |
| Output impedance                              | 1 kΩ                       | 1 kΩ            |
| <b>Power supply</b>                           |                            |                 |
| Supply voltage                                | ± 5...± 8 VDC              | 5...9 VDC       |
| Admissible variations                         | ± 1%                       | ± 5%            |
| Consumption                                   | max. 0.1 mA                | max. 2 mA       |

| Accuracy                    | '100'               | '150'                     |
|-----------------------------|---------------------|---------------------------|
| <b>Error</b>                | < ± 0.01% from span | < ± 0.05% from span       |
| <b>Temperature drift</b>    | 2 μV / °C           | 3 μV / °C                 |
| <b>Operating conditions</b> |                     |                           |
| Operating temperature       | 0...60 °C           | 0...70 °C                 |
| Operating humidity          | 10...85 %RH         | 0...95 %RH <sup>(2)</sup> |
| Storage temperature         | -10...70 °C         | -10...70 °C               |
| Storage humidity            | 0...95 %RH          | 0...95 %RH                |
| <b>Design and materials</b> |                     |                           |
| Case material               | aluminum            | aluminum                  |
| Mounting                    | free                | on wall                   |
| Wiring                      | exposed terminals   | hidden terminals          |
| Dimensions                  | ø25x60 mm           | 46x80x32 mm               |
| Weight                      | 30 g                | 120 g                     |
| Protection class            | IP20                | IP20                      |
| Increased IP (option)       | -                   | IP65                      |

<sup>(1)</sup> Not available for variant '100'!

<sup>(2)</sup> With increased protection

### Ordering code PHA\* - G6 - #1

| Code | Feature or option                   | Code values                                 |
|------|-------------------------------------|---|
| *    | Variant                             | <b>100</b> - bipolar, <b>150</b> - unipolar |
| G6   | Input                               | <b>DN</b> - pH, <b>DO</b> - ORP             |
| #1   | Increased protection <sup>(3)</sup> | <b>X</b> - none, <b>P</b> - IP65 protection |

<sup>(3)</sup> ONLY for variant '150'