

## Digox 602 *dac*

### Degassed Acid Conductivity

The conductivity in water-steam cycle in power plants is an important measurement.

This conductivity monitoring system is based on ASTM D4519-16.



It must be distinguished between:

#### - Specific conductivity

which records the sum of all charge carriers and is mainly caused by enriched alkalis agents.

#### - Acid conductivity

In cation filter, the H<sup>+</sup> from the exchanged cations combine with OH<sup>-</sup> from alkalis agents to water. The remaining conductivity is determined by the autoprotolysis of the pure water plus the impurities in the form of anions, i.e. also CO<sub>3</sub><sup>2-</sup>.

To operate a steam turbine, the acid conductivity must not exceed a threshold of typically 0.2 µS/cm.

The following causes for increased conductivity are possible:

- unclean piping system, high corrosion conditions
- cooling water leakage in the condenser
- atmospheric air-in leakage with CO<sub>2</sub>-impact
- organic substances in the boiler feed water - CO<sub>2</sub>-impact after heating

#### - Degassed Cation conductivity

For the shortest possible start-up phase, the acid conductivity must be measured without the influence of the conductivity caused by dissolved CO<sub>2</sub>. Thus the threshold for operation of the turbine is reached faster. The dissolved CO<sub>2</sub> rises up the conductivity, but does not harm the turbine.

Therefore, it is necessary to remove the carbonic acid from the sample and to measure the conductivity again (**degassed acid conductivity**). Thus, on one hand, the startup phase can be significantly reduced. On the other hand, the system can be monitored for organic substances and atmospheric air ingress.

With the **Digox 602 dac** you have a universal measuring instrument at your disposal for this kind of tasks. In the compact design, you have first a double conductivity measuring including a cation filter, automatic venting and pH calculation according to VGB-S006, then a separating operable degassing unit with conductivity measurements before and after degassing. Depending on the efficiency, the degassing can be calculated to 100 %.

## ADVANTAGES

- Degassing and measurement of all conductivities at the same, not elevated sample temperature
- No heating up, therefore no gas emissions of other volatile acids
- No inert gas required, air-conditioning by means of air treatment
- High gain of degassed carbonic acid
- Very short response times  $t_{90} < 90$  s for degassing unit
- Regenerative operating chemicals for cation exchanger
- Very low power consumption < 60VA
- Available as retrofit option for existing measurement of the cation conductivity: Digox dac basic
- Simple flow adjustment and stabilization with built-in flow stabilizer
- Improved efficiency of the degassing >90%, with switchable calculation to 100 %
- Highly accurate measurements of temperature and conductivity
- Profibus DP Interface

The analyser **Digox 602 dac** ensures very short start-up times of the power plant and a simple, safe operation.

## TECHNICAL DATA

# Digox 602 dac

<b>Device</b>	<b>Digox 602 dac</b>
<b>Measuring range</b>	Conductivity 0 – 1000 $\mu$ S/cm, pH-calculation from 7.5 - 10.5
<b>Display</b>	Graphic display, backlit, colour changes in messages
<b>Accuracy</b>	< [1 % of measuring value + 0,015 $\mu$ S/cm]
<b>Alarm outputs</b>	one relais per unit: 3A/250 VAC, 3A/30 VDC, no inductive loads
<b>Error report</b>	Flow- /device error, over temperature on relay / error current 22 mA
<b>Operation</b>	password protection for the menu-led entry with 7 operating keys
<b>Analogue outputs</b>	4 outputs, 0(4)...20 mA, linear/bilinear, max. load 500 Ohm
<b>Digital interface</b>	Profibus DP
<b>Ambient temperature</b>	+5 – 45°C, storage and transport 0 – 50 °C, relative humidity 30 – 95 %
<b>Sample quantity</b>	10–20 l/h CatControl-Unit, 3–5 l/h degassing unit, display in l/h with digital flow rate sensor
<b>Power supply</b>	90–264 VAC 50/60Hz, 60 VA or 120–264 VDC, 60 VA
<b>Protective system</b>	IP 65 (electrical parts)
<b>Weight</b>	27.5 kg
<b>Main dimensions</b>	850 x 570 x 210 mm (HxWxD)

### Necessary preconditions for the validity of the pH-value calculation:

- Use of just one alkalisng medium
- Main contamination of NaCl
- pH-range 7.5 < pH-value < 10.5