

Made in Germany

## 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 alkalising agents.

### - Acid conductivity

In cation filter, the  $H^+$  from the exchanged cations combine with  $OH^-$  from alkalizing 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  $CO_3^{2-}$ .

To operate a steam turbine, the acid conductivity must not exceed a threshold of typically  $0.2 \mu S/cm$ .

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  $CO_2$ -impact
- organic substances in the boiler feed water -  $CO_2$ -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  $CO_2$ . Thus the threshold for operation of the turbine is reached faster. The dissolved  $CO_2$  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 %.

## Technical features

- 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

|                     |                                                                                                 |
|---------------------|-------------------------------------------------------------------------------------------------|
| Device              | Digox 602 dac                                                                                   |
| Measuring range     | Conductivity 0 – 1000 $\mu\text{S/cm}$ , pH-calculation from 7.5 – 10.5                         |
| Display             | Graphic display, backlit, colour changes in messages                                            |
| Accuracy            | < [1 % of measuring value + 0,015 $\mu\text{S/cm}$ ], temperature-compensated at 5 – 45 °C      |
| Alarm outputs       | One relais per unit: 3A/250 VAC, 3A/30 VDC, no inductive loads                                  |
| Error report        | Flow- /device error, over temperature on relay / error current 22 mA                            |
| Operation           | Password protection for the menu-led entry with 7 operating keys                                |
| Analogue outputs    | 4 outputs, 0(4)...20 mA, linear/bilinear, max. load 500 Ohm                                     |
| Digital interface   | Profibus DP                                                                                     |
| Ambient temperature | 5 – 45 °C, storage and transport 0 – 50 °C, relative humidity up to 95 %                        |
| Sample quantity     | 10–20 l/h CatControl-Unit, 3–5 l/h degassing unit, display in l/h with digital flow rate sensor |
| Sample conditioning | Temperature 5 – 52 °C, pressure 1 – 5 bar (DAC complete) or 0.8 – 1.2 bar (basic)               |
| Power supply        | 90 – 264 VAC 50/60Hz, < 35 VA or 120 – 370 VDC, < 15 W                                          |
| Protective system   | IP 65                                                                                           |
| Weight              | 27.5 kg                                                                                         |
| Main dimensions     | 850 x 568 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

# Dr. Thiedig

Subject to technical alterations.

## Sampling & Analysing Systems

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