Dr. Thiedig

Sampling & Analysing Systems

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 exchanger, 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 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_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 (***d***egassed ***a***cid ***c***onductivity). 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 exchanger, automatic venting and pH calculation according to VGB-S006, then a separating operable degassing unit with conductivity measurings 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 treatment by means of air treatment cartridge**
- **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 < 35 VA**
- **Retrofit option for existing measurement of the cation conductivity: Digox 602 *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**
- **A version with a Profibus DP Interface is available**

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 µS/cm, pH-calculation from 7.5 – 10.5
Display	Graphic display, backlit, colour changes in messages
Accuracy	< [1% of measuring value + 0.015 µS/cm], temperature-compensated at 5 – 45°C
Alarm outputs	One relais per unit: 3 A/250 VAC, 3 A/30 VDC, no induktive loads
Error report	Flow error, device error, overtemperature 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 (optional)
Ambient temperature	5 – 45°C, storage and transport 0 – 50°C, relative humidity up to 95%, non-condensing
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	100 – 240 VAC 50/60Hz, < 35 VA or version with 24 VDC, < 15 W
Protective system	IP 65
Weight	17 kg (basic) | 30 kg (DAC complete)
Dimensions	850 x 290 x 210 mm (HxWxD) (basic) | 850 x 568 x 210 mm (HxWxD) (DAC complete)

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

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

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Subject to technical alterations.

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