



APPLICATION REPORT

Power Generation

Zonal differential pressure measurement to control thermal waste treatment in a waste incinerator

- Control of bottom air for a grate-firing system
- Measurement of the total primary air quantity
- Long-term stable measurement for control of the combustion process and low-maintenance operation

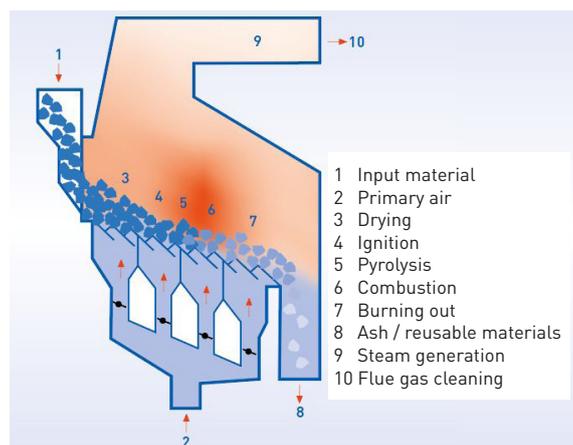


1. Background

MVA Bielefeld-Herford GmbH runs a thermal waste treatment plant with a capacity of approx. 400,000 t/ year at the Bielefeld site. Thanks to the energy recovery using combined heat and power (CHP), approx. 55,000 households are supplied with electricity and approx. 23,000 households with heat in an eco-friendly way. The plant is continuously being modernised and expanded.

2. Measurement requirements

In the grate-fired system, combustion of the raw material takes place in five successive zones. Each zone is supplied with individual primary air flow to regulate the combustion process. There are two air supply lines per zone, left and right. The accurate and continuous regulation of the entire staged process from pyrolysis to combustion has a huge impact on the flue gas amount, the expense incurred during treatment as well as energy efficiency and residual materials. The air quantity is regulated via the differential pressure flow measurement of the total bottom air quantity as well as the small differential pressures of the individual zones above and below the grate (approx. 5 mbar / 0.072 psi). According to the differential pressures the individual dampers for each zone are controlled.



Process of waste incineration



The existing differential pressure transmitters were to be replaced as part of the ongoing modernisation of the plant. The new measuring devices had to fit the existing valve connections and feature a correspondingly small measuring range. They also had to be long-term stable as well as easy and quick to configure.

3. KROHNE solution

In parallel to the existing pressure transmitters, the OPTIBAR DP 7060 differential pressure transmitter was initially installed as a test. The KROHNE device proved itself during a prolonged test phase in this application. After verification with a pressure calibrator, no more adjustment was necessary for the first time. Following the filed test, all measuring points were fitted with OPTIBAR DP 7060 pressure transmitters for the overall measurement of the primary air quantity and the bottom air quantity supplied to each individual zone. Thanks to compatible connections and simple operation via the modular, illuminated display, the differential pressure transmitters were put into set-up in a short period of time.



OPTIBAR DP 7060 C Differential pressure transmitter for the zone regulation of the bottom air

To maintain a robust and accurate differential pressure measurement in the field, even under changing process conditions, each OPTIBAR DP 7060 differential pressure transmitter was linearised in all 3 dimensions during factory-calibration: differential pressure, ambient temperature and static pressure were taken into account in all combinations during this "3D linearisation". Since all of the specified operating ranges are covered, stable and accurate measurement can be guaranteed under all process conditions.

4. Customer benefits

The OPTIBAR DP 7060 plays a key role in the zonal regulation of the incineration plant – and thus for the thermal processing and efficiency of the plant in general. Thanks to differential pressure measurement, the operator can always precisely control the bottom air flow to ensure an optimum combustion process according to the waste on the grate.

The OPTIBAR DP 7060 units used are extremely reliable, work without interruption and are "unobtrusive" in the best possible way for the customer. The unit has proven itself when it comes to zonal control and to such an extent that the operator is already planning to retrofit more measuring points with the pressure transmitter. The modular design of the differential pressure transmitter facilitates the transmitter exchange. The OPTIBAR DP 7060 offers a flexibly configurable selection of housing variants, process connections and electronics for every application. As one-stop supplier, KROHNE can also provide a comprehensive range of pressure measurement equipment – including primary elements, diaphragm seals, manifolds and other accessories.

5. Product used

OPTIBAR DP 7060

- Differential pressure converter with integrated absolute pressure measurement
- Outstanding temperature and static pressure stability even under harsh conditions
- Unique 3D linearisation of transmitter: compensation for influencing factors in practically all combinations
- Ex ia, Ex d approvals



Contact

Would you like further information about these or other applications?
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