

## KBT 916 – Fire Testing System for Cables

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| Measurement method     | Fire Testing System for measuring the heat release and smoke production during flame spread tests on vertically mounted bunched cables and insulated wires, in accordance with EN 50399 and IEC 60332-3-10 (testing device)                                                                                                                                                                                                                                                                                                                                                                                                    |
| Test chamber           | <ul style="list-style-type: none"> <li>▪ Robust steel profile frame</li> <li>▪ Double wall design with stainless steel cladding and mineral wool insulation (65 mm)</li> <li>▪ High-temperature resistant steels for inner walls (1.4571/1.4828)</li> <li>▪ Extinguishing water drain (option)</li> <li>▪ Rails for insertion of the sample holder to the rear wall with ramp for easy entry</li> <li>▪ Cable winch with electric drive</li> <li>▪ Total dimensions (W x D x H): 1350 mm x 2350 mm x 4300 mm</li> <li>▪ Door dimensions (H x W): 2160 mm x 1340 mm</li> <li>▪ Weight chamber/total: 1900 kg/2800 kg</li> </ul> |
| Incoming air           | <ul style="list-style-type: none"> <li>▪ Direct driven radial fan, controlled by software</li> <li>▪ Debimo probe for differential pressure measurement, thermocouple type K</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Burner                 | <ul style="list-style-type: none"> <li>▪ Ribbon propane burner with Venturi mixer, igniter and flame detector, rotatable</li> <li>▪ Protective cover, stainless steel</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Sensors                | 3 sheathed thermocouples type K for test chamber                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Extraction hood        | With collector, stainless steel (W x D x H): 1000 mm x 1500 mm x 1000 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Measuring tube         | <ul style="list-style-type: none"> <li>▪ High-temperature resistant stainless steel (1.4571)</li> <li>▪ Ø 400 mm, internal guiding wings for defined gas flow</li> <li>▪ Gas sampling probe, optical section with adapter for compressed air</li> <li>▪ 3 thermocouples and bidirectional probe for air speed measurements</li> </ul>                                                                                                                                                                                                                                                                                          |
| Sample holder          | Welded tube construction, stainless steel (H x W): 3600 mm x 500 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Gas installation       | <ul style="list-style-type: none"> <li>▪ Mass flow controllers and magnetic valves for propane and compressed air, shut-off valve for propane</li> <li>▪ Steel cabinet with wall mount (W x D x H): 210 mm x 300 mm x 600 mm, weight: 22 kg</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| Process fan            | Direct driven radial fan (3 kW) for 0.5 – 1.5 m <sup>3</sup> /s, controlled by software                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Control Unit           | <ul style="list-style-type: none"> <li>▪ Colour touch screen 10.1", 1280 x 800, single board computer (Windows 10)</li> <li>▪ Temperature acquisition (-100 °C to 1300 °C) with 24 bit sigma delta ADC</li> <li>▪ Digital communication with MFC, outputs for solenoid valves for propane, calibration, zero gases and pump for measuring gas</li> <li>▪ 19"- industrial cabinet (W x D x H): 650 mm x 650 mm x 1750 mm</li> <li>▪ Weight: 168 kg, power supply: 230 V, 50 Hz</li> </ul>                                                                                                                                       |
| Cold trap for test gas | <ul style="list-style-type: none"> <li>▪ Effective Peltier cooler for gas cooling (no chiller necessary)</li> <li>▪ Cooling to -10°C for effective drying</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Light measuring system | <ul style="list-style-type: none"> <li>▪ Halogen point light source 10 W, color temperature 2900 K</li> <li>▪ Silicon photo receiver and spectral filter with CIE distribution</li> <li>▪ Tempered heat-proof optics</li> <li>▪ Data acquisition system with two separate and synchronized ADC channels for fast operational readiness and high stability</li> </ul>                                                                                                                                                                                                                                                           |
| Gas conditioning       | <ul style="list-style-type: none"> <li>▪ 2 particle filters, main filter for 2 µm and secondary filter for 0.1 µm particle size</li> <li>▪ Condensate pump</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

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| Analyzer                                                                 | <ul style="list-style-type: none"> <li>■ SIEMENS ULTRAMAT/OXYMAT 6E</li> <li>■ Measuring components O<sub>2</sub>, CO<sub>2</sub>, optional CO</li> <li>■ Automatic calibration of the gas analyzer by software</li> <li>■ Full integration into the SBC system and operation via KBT touch panel</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Operating unit KBT                                                       | <ul style="list-style-type: none"> <li>■ Windows Desktop PC, 23" LCD monitor, HP LaserJet</li> <li>■ 19" PC - industrial cabinet with safety glass (W x D x H): 800 mm x 800 mm x 1800 mm, weight: 110 kg; power supply: 230 V, 50 Hz</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Software                                                                 | <ul style="list-style-type: none"> <li>■ Graphical and numerical display of all test results</li> <li>■ User guidance for test procedure</li> <li>■ Easy operation and full gas analyzer control by digital interfaces</li> <li>■ Calibration of test device according to standard (stability, step calibration test, heptane calibration, light measurement)</li> <li>■ Report generator</li> <li>■ Via 10" touch screen of embedded SBC: Control of all hardware components such as fans, valves, gas analyzer, light measurement system, sensors for differential pressure and mass flow controller</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Calibration gases*<br>(gases for calibration of<br>SIEMENS gas analysis) | <ul style="list-style-type: none"> <li>■ Synthetic air                             <ul style="list-style-type: none"> <li>■ Composition: 20.0 % O<sub>2</sub>, 80% N<sub>2</sub></li> <li>■ Content: 1 bottle (10 l) or more</li> <li>■ Bottle connection: R 3/4" (DIN 477 Nr.9)</li> <li>■ Pressure reducer: display 0-200 bar, control range 0.2-4bar</li> </ul> </li> <li>■ Zerogas                             <ul style="list-style-type: none"> <li>■ Composition: 100% N<sub>2</sub></li> <li>■ Content: 1 bottle (10 l)</li> <li>■ Bottle connection: W 24,32 x 1/14 (DIN 477 Nr.10)</li> <li>■ Pressure reducer: display 0-200 bar, control range 0.05-1 bar</li> </ul> </li> <li>■ Calibration gas                             <ul style="list-style-type: none"> <li>■ Composition: 20% O<sub>2</sub>, 5% CO<sub>2</sub>, and N<sub>2</sub></li> <li>■ Content: 1 bottle (10 l)</li> <li>■ Bottle connection: M19 x 1.5 (DIN 477 Nr.14)</li> <li>■ Pressure reducer: display 0-200 bar, control range 0.05-1bar</li> </ul> </li> </ul> |
| Burning gas*                                                             | <ul style="list-style-type: none"> <li>■ Bottle size: 50l</li> <li>■ Pressure: ca. 7-10 bar</li> <li>■ Content Propane, commercially available</li> <li>■ Purity at least 95%</li> <li>■ Pressure reducer: 2-4 bar</li> <li>■ Operating pressure: 2-2.7 bar overpressure</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Compressed air*                                                          | <ul style="list-style-type: none"> <li>■ Application: cleaning the optical components of the light measuring section</li> <li>■ Requirements: oil-free</li> <li>■ Line pressure: 5-8 bar</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

\* Gas to be provided by the user