

Product Information

Electromechanical Creep Testing Machine Kappa SS



Kappa 50 SS

Application

The Electromechanical Creep Testing Machine KAPPA SS offers a wide range of applications.

- Creep tests
- Creep rupture tests
- Stress rupture tests
- Relaxation tests
- Creep crack tests
- Definition of individual stepless sequences of load and temperature
- 'Advanced creep' - Tests
 - Creep fatigue tests
 - Creep strain modelling (e.g. to give creep strength at various levels of strain)
 - Creep ductility
 - Creep property deterioration due to service exposure
 - Creep data from component tests
- Additional load-, stress- and strain-controlled tests such as tensile, compression, flexure, LCF or fracture toughness
- Ambient or elevated temperature
- For long term tests (reaching up to 10,000h)

Load Frame and drive system

- Stand-alone floor machine
- High stiffness, precision and durability by 4-columns-design and central single screw
- Precise axial alignment according to ASTM E 292 by precision crosshead guiding and special seating load train
- Requires no special base or foundation
- Includes vibration isolation with Sylomer-dampers under the load frame
- High resolution crosshead resolver and high resolution load channel permit excellent control characteristics
- Precise speed of $\pm 0.1\%$ of set speed in range of $1\mu\text{m/h}$ to 100 mm/min (no load or constant load) measurement (average over 5 sec or 10 mm)
- High durability by use of brushless AC-motors
- Drive control sampling and adjustment frequency 6 ms
- Optional integration of high temperature controller in Kappa SS base

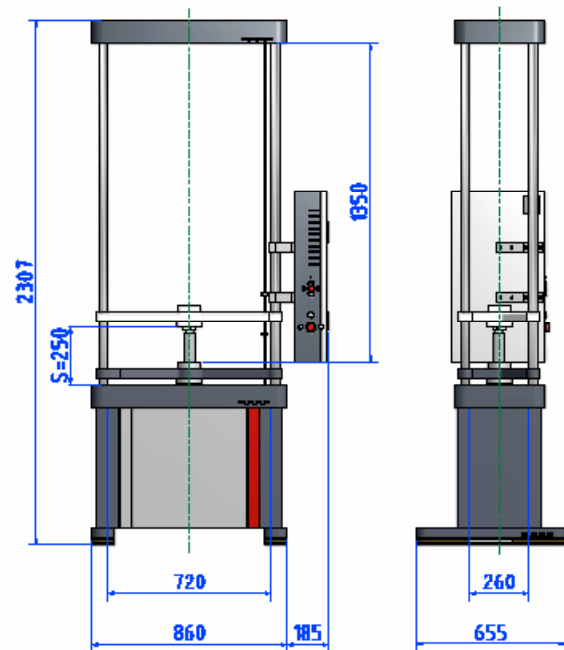
Product Information

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Specification 50 SS / 100 SS

Technical data:

	Kappa 50 SS	Kappa 100 SS
load capacity	50 kN	100 kN
test area-depth	unlimited	unlimited
test area-width between drive screws	720 mm	720 mm
test area-height ¹	max. 1350 mm	max. 1350 mm
crosshead stroke s	250 mm	250 mm
Lateral support of moving crosshead	precision sliding bearing on four hard chromium-plated columns (40 mm diameter)	
Test speed range	0.001 mm/h to 100 mm/min	0.001 mm/h to 100 mm/min
Return speed	100 mm/min	100 mm/min
Crosshead speed accuracy	+/- 0.1 % of setting (no load or constant load averaged over 10 mm or 5 s)	+/- 0.1 % of setting (no load or constant load averaged over 10 mm or 5 s)
Resolution of stroke-encoder	0,003 µm	0,003 µm
Frame Dimensions (WxDxH)	1045 x 655 x 2307 mm	1045 x 655 x 2307 mm
Weight	700 kg	700 kg
Power requirements	230 VAC, 1 kVA	230 VAC, 1 kVA



¹ vertical clearance (including mounted standard load cell but without jigs- and fixtures/grips)

Product Information

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Accessories

Load cells

- Rotational symmetrical Design
- Precise axial alignment
- Electronic „Plug and Play“-Type (Calibration and technical data are saved in sensor plug)
- High accuracy (Linearity, Repeatability, Hysteresis, Resolution) acc. to ASTM E 4 and ISO 7500-1
- High measurement range in class 1 acc. to ISO 7500-1 from 0.2 % 100% of nominal load
- Extreme low temperature sensitivity



Pull rods

- Pull rods made of nickel-based superalloy
- Durability > 3 years at full load
- Upper pull rod with spherical bearing, lower pull rod with clamping lever
- Axial alignment acc. to ASTM E 292 and NADCAP-requirements
- No additional alignment cardan joints necessary



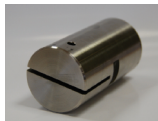
Specimen adapters

- Specimen adapters made of nickel-based superalloy

- Screw head
- Round specimen



- Clevis couplings
- Flat specimen

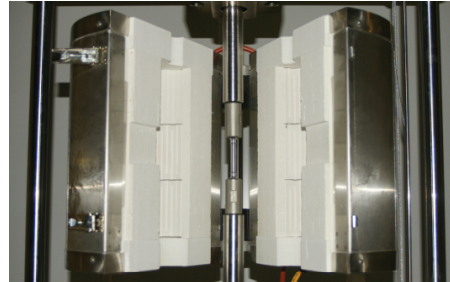


- Clevis couplings
- Pipe segment specimen



Accessories

High temperature furnace and controller



HT-furnace

- 3-zone furnace standard from 100/200°C to 1.200 °C
- Internal diameter: 100 mm
- Heated length: 300 mm
- Vertical positioning of furnace: furnace stays in the centre of the specimen during test
- Openings for load train, Thermocouples and Extensometers
- Optional side windows for optical strain measurement
- 3 Thermocouples for furnace controller, up to 3 additional Thermocouples for temperature control at the specimen



HT-controller

- Integrated, sophisticated Control-Algorithm for a precise Temperature along specimen and to prevent Temperature overshooting
- Empirically determined control parameters for different temperatures are no longer required
- Automatic Controller settings from 100/200°C to 1.200°C
- Temperature-tolerances acc. ASTM E 139
- Interface for 6 Thermocouples (3 for furnace, 3 for specimen special configurations possible)
- Digital display of temperatures
- Stand Alone or PC-operation possible

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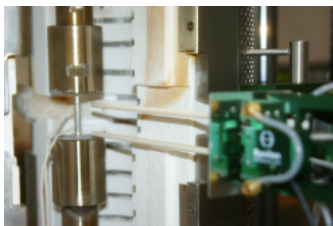
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Accessories

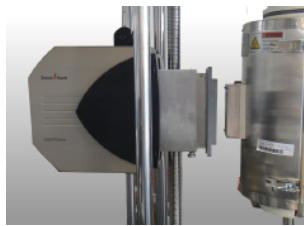
Extensometers

Measurement of axial strain

Side Entry:



Contacting Extensometer

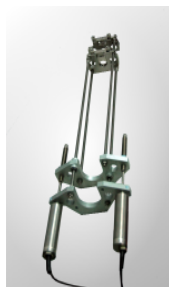


Optical Extensometer

Axial Entry:

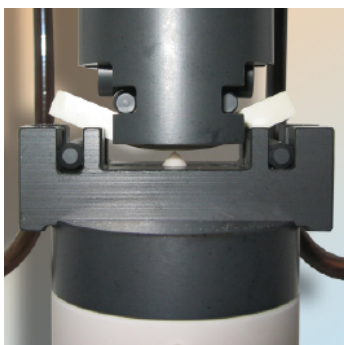


ME 31-400.1200°
(up to 1200°C - Ceramics)



ME 31-400.850°
(up to 850°C - metal)

Measurement of flexure and compression

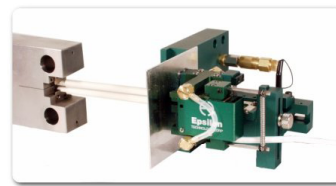


Highlights

- Simple attachment of feeler arms by use of adjustment wheel
- Quick set up for testing
- Measurement by reference feeler arms (2 x parallel to test axis to compensate temperature-caused extension of centric feelerarm (1x in test axis))
- Flexure: measurement of deflection of loaded specimen
- Compression: measurement of axial deformation of loaded specimen

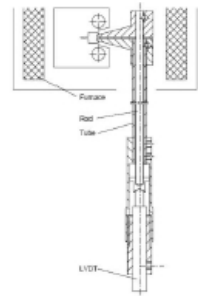
Measurement of Load line Deflection

Side entry



- up to 1.200 °C
- high purity alumina rods
- mounted on the HT-furnace
- Option: water cooling

Axial entry

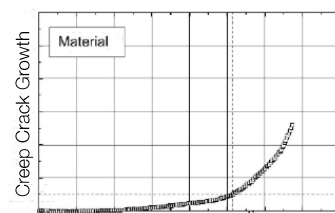


- up to 1.200 °C
- rod-in-tube-Design

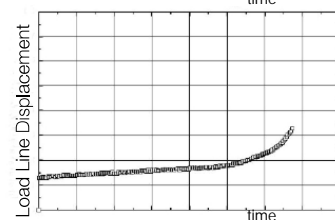
Creep Crack Growth measurement

Typical presentation of Creep Crack Growth Test

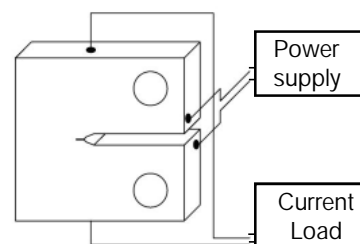
- Load Line Deflection measured by rod-in-tube Extensometer
- Crack length measured by DCPD-System



Creep growth



Load Line
deflection



DCPD Connection

