Zwick / Roell

Product Information

High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

CTA: 209588 75295

Open high-temperature furnace

Switching and control system for high-temperature round furnaces

Applications for the high-temperature furnaces

The high-temperature furnace is intended for the determination of the thermo-elastic behavior, high-temperature stability and thermal yield point of high-temperature materials when heated in air.

The high-temperature furnaces of the 900°C Fix, 1,000°C Fix, 1,100°C Fix and 1,250°C Fix series feature fixed distance specimen temperature measurement.

With the 1,250°C Variable furnace the distance and position settings of the optional thermocouples for specimen temperature measurement can be varied. The 1,250°C Variable furnace is mounted on two crescent shape mountings. This allows for better furnace adjustment and ease of use.

Advantages and features

- Good temperature distribution via three independently controllable heating zones with prepared openings for mounting of the thermocouples, the high-temperature extensometer and the high-temperature tool
- Three thermocouples for furnace temperature monitoring, 1-3 thermocouples for control of the specimen temperature
- Specimen temperature measurement at a fixed distance from the center of the furnace of ± 25 mm or at a variable distance from the center of the furnace from ± 6 mm to 50 mm (only for 1,250°C Variable).
- Lightweight thermal insulation material (asbestos-free)
- Rustproof furnace housing; reduction of the outer wall temperature through convection cooling

Applications for the switching and control system

The switching and control unit is tailored for the control of high-temperature furnaces with separate heating zones, according to ISO 6892-2 and ASTM E21. The three channel Eurotherm controller has connections for 6 thermocouples (3 x furnace temperature, 3 x specimen temperature) and a power converter for low voltage furnaces.

Advantages and features

- Intelligent control algorithms ensure that the specimen temperature is reached and maintained in compliance with the standards without overshooting, as well as temperature stability along the sample
- Empirically determined control parameters for different specimen temperatures are no longer necessary
- Automatic controller setting in a temperature range of 200 °C to 1200 °C
- Temperature tolerance on specimen, max. parallel length 100 mm:
  - 200°C to 350°C: ± 2K
  - 350°C to 1200°C: ± 1K
- Digital display of temperatures
- Suitable for stand-alone operation and PC operation with testXpert II / testXpert III testing software

PI_ZRF_88_832_08.2021

Zwick / Roell

Product Information

High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

Technical data for high-temperature furnaces (1x required)

Series	900°C Fix	1,000°C Fix	1,100°C Fix	1,250°C Fix	1,250°C Variable	1,250°C Variable	1,250°C Variable	
Item Number	606521	1029792	1029794	1029795	1029796	1029797	1064153	
Specimen temperature, min.[1)]	200	200	200	200	200	200	200	°C
Specimen temperature, max.	900	1,000	1,100	1,250	1,250	1,250	1,250	°C
Heating zones	3	3	3	3	3	3	3	
Heating rates, max.[2)]	Ca. 20	Ca. 20	Ca. 20	Ca. 20	Ca. 20	Ca. 20	Ca. 20	K/min
Furnace, outer Ø	Ca. 275	Ca. 275	Ca. 275	Ca. 295	Ca. 295	Ca. 295	Ca. 295	mm
Furnace, height	Ca. 405	Ca. 405	Ca. 405	Ca. 405	Ca. 465	Ca. 465	Ca. 465	mm
Heating area, inner Ø	Ca. 100	Ca. 100	Ca. 100	Ca. 100	Ca. 100	Ca. 100	Ca. 100	mm
Heating area, height	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	mm
Heated length	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	Ca. 300	mm
Power rating	3 x 0.6	3 x 0.6	3 x 0.6	3 x 0.6	3 x 0.6	3 x 0.6	3 x 0.6	kVA
Nominal voltage	3 x 34	3 x 34	3 x 34	3 x 34	3 x 34	3 x 34	3 x 34	V
Weight	Ca. 30	Ca. 30	Ca. 30	Ca. 45	Ca. 45	Ca. 45	Ca. 45	kg
Thermocouple (furnace temperature)	3x type K	3x type K	3x type K	3x type N	3x type N	3x type N	3x type S	
Heating element	Fibrothal module with horizontally aligned free-radiating AF1 coil resistors							
Housing	Stainless steel,double-wall version, 2 half shells with quick-release fasteners, hinged, convection cooling (air)							
Heat insulation	Insulation based on polycrystalline aluminum oxide wool							
Extensometer slot standard, H x W								
Front vertical	60 x 10	60 x 10	60 x 10	60 x 10	105 x 10	60 x 10	60 x 10	mm
Front horizontal	-	-	-	-	-	-	-	mm
Rear vertical	-	-	-	-	60 x 10	60 x 10	60 x 10	mm
Rear horizontal	-	-	-	-	-	-	-	mm
Extensometer slot max. H x W								
Front vertical	60 x 10	60 x 10	60 x 10	60 x 10	200 x 42	102 x 22	102 x 22	mm
Front horizontal	-	-	-	-	-	27 x 67	27 x 67	mm
Rear vertical	-	-	-	-	102 x 22	102 x 22	102 x 22	mm
Rear horizontal	-	-	-	-	27 x 67	27 x 67	27 x 67	mm
Position of the 3-piece thermocouple feedthrough for specimen temperature measurement, fixed	In the center of the furnace and ± 25 mm (vertikal)				-	-	-	
Position of the 3-piece thermocouple feedthrough for specimen temperature measurement, variable	-	-	-	-	Variable in the center of the furnace and ± 6 mm ... ± 50 mm (vertical)			
	1 set HT tool reduction sleeves for feedthroughs (top + bottom) included							

1) Operation at low temperature is possible with higher temperature tolerance

2) Max. heating rate is dependent on the target temperature

All data at ambient temperature.

Subject to change in the course of further development.

Zwick / Roell

Product Information

High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

Optional accessories

Description	ArticleNumber
Monitoring sensor for furnace OFF when opening the furnace. The sensor triggers heating deactivation when the furnace is open. Retrofit sensor for high-temperature furnaces series 900°C to 1,250 °C, Fix.[1)]	**084980**
High-temperature furnace insulation kit suitable for repair of the furnace's TC	**1036264**
A pair of insulation plugs for high-temperature furnace, without holes[2)]	**1040241**

1) As standard, the Fix series does not include a monitoring sensor. If needed, it must be ordered separately. The Variable series already includes this sensor as standard.

2) When ordering, the diameter of the feedthrough must be indicated.

Technical data for the switching and control system for high-temperature furnaces with three heating zones (1x required)

Description	ArticleNumber
Switching and control unit type K/K for high-temperature furnace 900 °C, 1,000 °C, 1,100 °C, Fix	**041858**
Switching and control unit type K/N for high-temperature furnace 900 °C, 1,000 °C, 1,100 °C, Fix	**1009796**
Switching and control unit type K/S for high-temperature furnace 900 °C, 1,000 °C, 1,100 °C, Fix	**042096**
Switching and control unit type N/N for high-temperature furnace 1,250 °C, Fix	**030231**
Switching and control unit type N/S for high-temperature furnace 1,250 °C, Fix + Variable[1)]	**042095**
Switching and control unit type S/S for high-temperature furnace 1,250°C, Variable	**042875**

1) The designation switching and control system type N/S means that the thermocouples are used for measurement of the furnace temperature type N (contained in the furnace) and for measurement of the specimen temperature type S (contained in the specimen temperature measuring device).

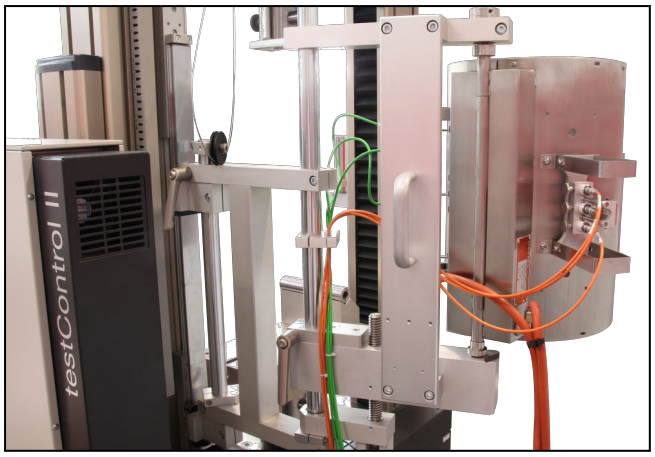
Zwick / Roell

Product Information

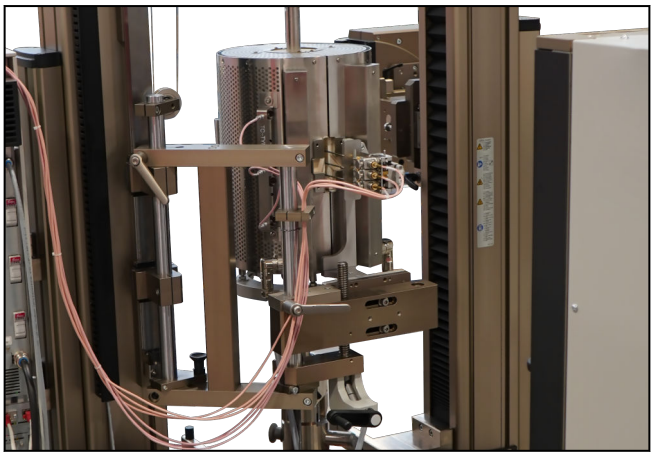
High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

Mounting and swivel unit

CTA: 75305 75306



Mounting and swivel unit for high-temperature round furnace, Fix series



Mounting and swivel unit for high-temperature round furnace, Variable series

Applications

The mounting and swivel unit is used to hold and swivel the high-temperature furnace in and out of the test axis of the materials testing machine.

The high-temperature furnace is attached on the rear left or right to a column or to the load frame of the materials testing machine using a swivel unit.

The high temperature furnaces of the Fix series are coupled to the mounting unit by means of a hinge on the two half shells. The high-temperature furnaces of the Variable series are mounted and stored on crescent-shaped mounts. The height of the mounting unit can be adjusted using a crank handle to centrally align the furnace quickly and easily for different specimen sizes.

Advantages and features

- The furnace can be opened to allow for fast and convenient insertion and removal of the specimens.
- The high temperature furnace can be completely swiveled out of the test area to perform tests at room temperature.
- Automatic vertical positioning of the furnace during a test.

Description	ArticleNumber
Mounting and swivel unit, for series 900°C Fix, 1,000°C Fix, 1,100°C Fix and 1,250°C Fix, attachment to the rear left or rear right, height adjustable	**1064155**
Mounting and swivel unit, variable designs for series 1,250°C Variable, attachment to the rear right, height adjustable, e.g. for different test arrangements	**1064154**

Zwick / Roell

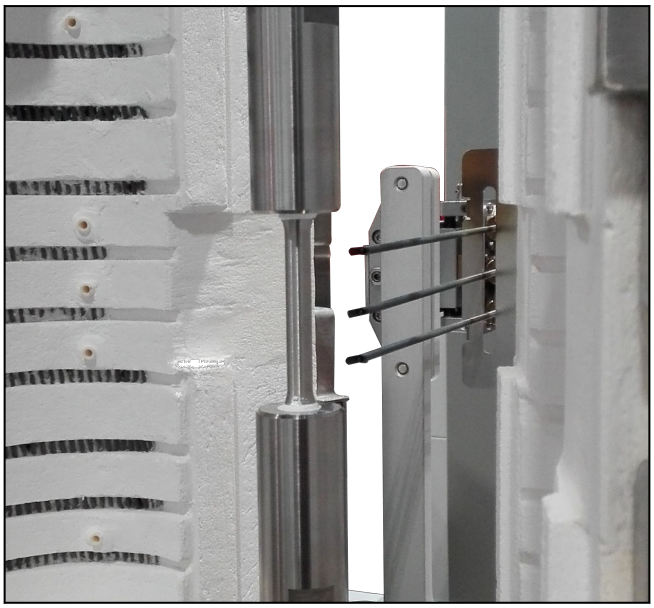
Product Information

High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

CTA: 75301 199004

Specimen temperature measuring device

Specimen temperature measuring device, Fix series



Specimen temperature measuring device, Variable series

For specimen temperature measurement directly on the specimen, a specimen temperature measuring device is used.

The mechanics for driving this measuring device in and out are mounted on the furnace. For specimen shapes with L_0 < 50 mm only the center thermocouple is attached to the specimen.

The main advantage of the specimen temperature measuring device is that the actual specimen temperature value is recorded and used for specimen temperature control.

Advantages and features

- Secure and repeatable attachment through
  - Movable and double-spring-loaded thermocouples
  - Precision adjustment of each thermocouple
  - No deformation of the thermocouples caused by the use of protective tubes made of CMC material
- Good thermal contact with the specimen due to adjustable contact force
- Wide range of specimens possible due to large thermocouple sensing distance
- Easy specimen change due to high retraction distance of the thermocouples

Fixed vertical position (not in the furnace dividing plane)

Generally three thermocouples are attached to the specimen surface. The thermocouples for the high-temperature furnaces of the series 900 °C Fix, 1,000 °C Fix, 1,100 °C Fix and 1,250 °C Fix are arranged at a fixed distance at the center of the specimen and ± 25 mm.

Variable vertical position (in the furnace dividing plane)

The thermocouples for the 1,250 °C Variable high-temperature furnace offer the possibility of variable vertical positioning in the furnace dividing plane: center of specimen and ± 6 mm to ± 50 mm.

All data at ambient temperature.

Subject to change in the course of further development.

Zwick / Roell

Product Information

High-temperature round furnace up to 900-1,250°C, with switching and control system and specimen temperature measuring device

Technical data

Description	ArticleNumber
Specimen temperature measuring device 3 x specimen, slidable, Fix series Slide unit and extension of the 3 specimen temperature thermocouples directly on the surface of the tensile specimen (top, center, bottom) - Thermocouples sheath length 190 mm - Sheath material Inconel 600 (Typ K, N, S) or platinum alloy (Typ S) - Thermocouples spring loaded - Thermocouple connection via standard TC plug - Thermocouple tip spacing, fixed: specimen center and ± 25 mm	
Specimen temperature measuring device with thermocouple type K (NiCr-Ni) up to 1100°C (operating temperature) with Inconel 600 sheath material	**1065097**
Specimen temperature measuring device with thermocouple type N (NiCrSi-NiSi) up to 1200°C (operating temperature) with Inconel 600 sheath material	**1065098**
Specimen temperature measuring device with thermocouple type S (Pt10Rh-Pt) up to 900°C (operating temperature) with Inconel 600 sheath material	**1065102**
Specimen temperature measuring device with thermocouple type S (Pt10Rh-Pt) up to 1200°C (operating temperature) with platinum sheath material	**1065104**
Specimen temperature measuring device 3 x specimen, slidable, Variable series Slide unit and extension of the 3 specimen temperature thermocouples directly on the surface of the tensile specimen (top, center, bottom) - Thermocouple connection via standard TC plug - Thermocouple distance between tips = adjustable, variable center of furnace ± 6 mm to ± 50 mm - Free thermocouple length: 200 mm - Retraction distance: 70 mm - Sheath material: Inconel 600 (type N, S), platinum alloy (type S) - Protection pipe material: CMC - Thermocouples movable and double-spring mounted - Precision adjustment for each thermocouple possible	
Specimen temperature measuring device with thermocouple type N (NiCrSi-NiSi) up to 1,100°C (max. permanent operating temperature) or 1,280°C (max. operating temperature for one hour) with Inconel 600 sheath material	**1095134**
Specimen temperature measuring device with thermocouple type S (Pt10Rh-Pt) up to 1,200°C (max. permanent operating temperature) or 1,300°C (max. operating temperature for one hour) with platinum sheath material	**1095142**
Specimen temperature measuring device with thermocouple type S (Pt10Rh-Pt) up to 900°C (max. permanent operating temperature) or 1,280°C (max. operating temperature for one hour) with Inconel 600 sheath material	**1095151**