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Test equipment for temperature and its reduction



- **Pt100 precision RTD temperature probe**
- **Calibrated temperature measuring chain with precision display device**
- **Calibrations as service (DAkkS approved)**
- **Calibration measuring range -80 to +1100 °C**

Increased quality consciousness, improved measuring techniques and quality assurance systems, such as, for instance, DIN ISO 9000, strengthen the requirements regarding process documentation and measuring means monitoring.

The use of platinum precision RTD temperature probes is preferred as standard. They are intended to monitor all temperature probes used in industry, building services engineering and quality assurance.

In connection with a precision display unit (temperature measuring chain) the measured temperatures can be directly read and transmitted online via the USB interface. For documentation purposes, the "DE-Graph" software available as an option, allows the establishment of tables and graphics as well as editing in other Windows applications.

The main criterion of all devices is the traceability of the measurement results to the national standards. DAkkS (DKD)-calibrated test equipment is recognized without further information as feedback instruments, both in Europe and in many countries outside of Europe. The calibration service is available at any time for existing test equipment.

Technical data

Precision RTD temperature probe:

Measuring insert:
Pt100 ceramic temperature probe as per DIN EN 60751, cl. A

Temperatures:
-50 to +250 °C, -200 to +450 °C

Sheath:
Stainless steel 1.4541, Ø 3 mm, Ø 4.5 mm

Protection class:
IP65

Connection:
4-pin Lemosa coupling, size 1, 4-wire circuit, included in the scope of delivery is a 1.5 m long silicone insulated connection line with connector, ambient temperature
-30 to +150 °C

Response times: (in water with 0.4 m/s and air 3 m/s)

Ø 3 mm:	Water	$t_{0.5}$ = 1.3 s,	$t_{0.9}$ = 4 s
	Air	$t_{0.5}$ = 14 s,	$t_{0.9}$ = 41 s
Ø 4.5 mm:	Water	$t_{0.5}$ = 3.5 s,	$t_{0.9}$ = 9 s
	Air	$t_{0.5}$ = 31.5 s,	$t_{0.9}$ = 89 s

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Precision display unit:

Description:
These universally applicable, process-controlled indicating devices convince with highest accuracy and are perfectly suitable for measuring tasks that require highest precision. Application areas are in the fields of quality assurance, production, maintenance/repair and service as well as in the air conditioning and environmental technology. All devices of the P700 series are equipped with a USB interface allowing an online documentation of the measured values. This interface can also be used for supplying the devices with power. The measured data can be processed further using the optionally available Windows software "DE-Graph".

Product features:
- integrated calibration function for simple compensation of probe tolerances
- 1-stage, 2-stage or 3-stage calibration optionally possible
- USB interface
- Windows evaluation software optionally available (see accessories "DE-Graph")
- Large LCD display
- Storage of MAX, MIN, HOLD and average values
- Differential temperature display for 2-channel units, simultaneous display of both values
- Mains operation possible
- Pt100 input in 4-wire circuit, thermocouple inputs as per DIN EN 60584
- Measuring channels can be freely assigned
- °C/°F change-over

Versions:

902722/20 (P700)	Pt100, thermocouple type J, K, L, N, R, S, T 1-channel; resolution 0.1 °C
902722/25 (P705)	Pt100, thermocouple type J, K, L, N, R, S, T 2-channel; resolution 0.1 °C
902722/30 (P750)	Pt100, thermocouple type J, K, L, N, R, S, T, 1-channel; resolution 0.01 °C from -200 to +200 °C, otherwise 0.1 °C
902722/35 (P755)	Pt100, thermocouple type J, K, L, N, R, S, T 2-channel; resolution 0.01 °C from -200 to +200 °C, otherwise 0.1 °C

Measuring ranges:
-200 to +850 °C (Pt100), thermocouples as per DIN EN 60584

Accuracy:

Version 902722/20 ... 25:	
for Pt100	± 0.1 °C from -100 to +200 °C, residual range 0.1 % of the measured value
for thermocouple type: R, S	± 1.0 °C + 0.1 % of the measured value
for thermocouple type: K, J, L, N, T	± 0.2 °C from 0 to 200 °C, ± 0.5 °C up to 1000 °C, residual range ± 1.0 °C of the measured value
Version 902722/30 ... 35:	
for Pt100	± 0.03 °C from -50 to +199.99 °C, ± 0.05 °C from -200 to -50.01 °C, residual range 0.05 % of the measured value
for thermocouple type: R, S	± 1.0 °C + 0.1 % of the measured value
for thermocouple type: K, J, L, N, T	± 0.2 °C from 0 to 200 °C, ± 1.0 °C residual range

Display:
2-line LCD display

Case:
ABS plastics, dimensions 200 mm x 93 mm x 44 mm (L x W x H)

Admissible operating temperature:
0 to 40°C

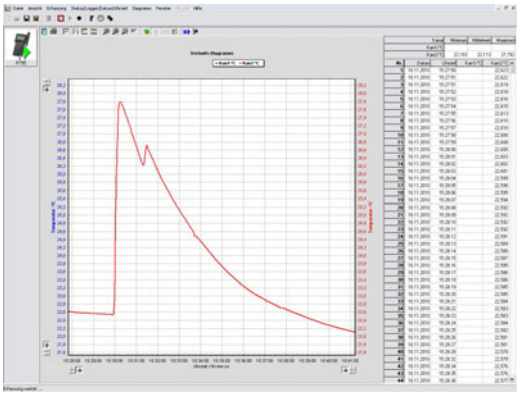
Weight:
approx. 350 g

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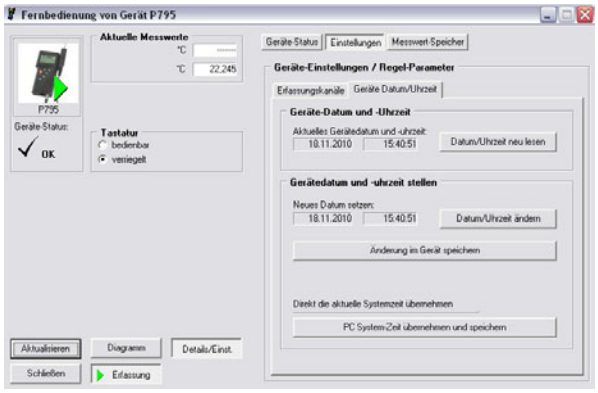
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DE-Graph:

Protocol and evaluation software:
The software offers versatile possibilities for online documentation and processing of the measured values under Windows. This application is recommended for all those applications, where measured data must often be documented or compared. In addition, precision RTD temperature probes and their calibration numbers can be efficiently managed. The physical connection of display unit and PC is automatically carried out via the USB port. The measured data can be comfortably displayed and analysed in graphics and tables. Any number of measuring channels and graphic windows can be selected. Printing is possible on any installed Windows printer.
The program allows comfortable data download in the DBF format and an easy export to Excel. The languages German, English and French can be selected.



Visualization in graphics and tables



Device setting management

Calibration services:

The **calibration laboratory for the temperature measuring variable (D-K-15129-01-00) at JUMO** has been approved by the Physikalisch-Technische Bundesanstalt (PTB) (German physical-technical federal agency) since 1992. With its latest DAkkS approval, the calibration laboratory is allowed to hand over calibration certificates for the calibration objects and measuring ranges specified as follows. In respect to the smallest measuring uncertainty, take into account that greater measuring uncertainties as specified in the table can be passed on depending on the respective test parts.
The values result from the stability inspection on the respective calibration objects.

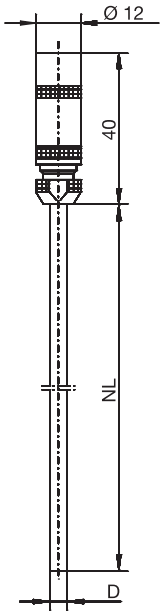
Calibration object	Measuring range	Measuring uncertainty
- RTD temperature probe, - directly indicating electronic temperature probe (temperature measuring chains), - Data logger	0.01 °C -80 to 0 °C > 0 to 90 °C > 90 to 300 °C	5 mK 15 mK 10 mK 15 mK
- Thermocouples	-80 to +200 °C > 200 to 300 °C	0.2 K 0.3 K
- Noble metal thermocouples	> 300 to 1100°C	1.0 K
- Non-noble metal thermocouples, - directly indicating electronic temperature probe	> 300 to 1100°C	1.5 K
- RTD temperature probe with transmitter, - directly indicating electronic temperature probe, with transmitter	-80 to 0 °C > 0 to 90 °C > 90 to 300 °C	45 mK 40 mK 45 mK
- Temperature block calibrators	30 to 133 °C > 133 to 660 °C > 660 to 1100 °C	0.2 K 1.5 mK x (T) 2.5 K

Extended possibilities due to factory calibration on request !

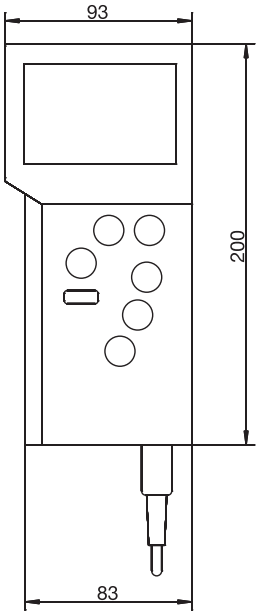
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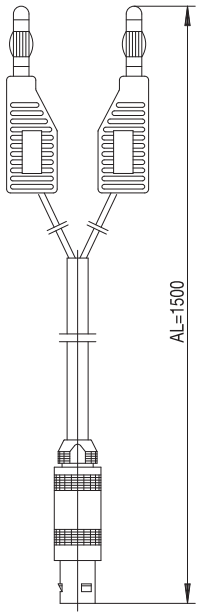
Dimensions



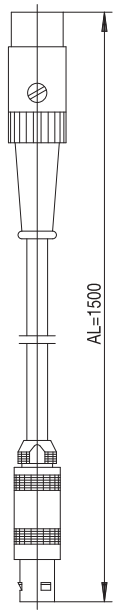
Precision RTD temperature probe
Basic type 902721/10
Basic type 902721/15



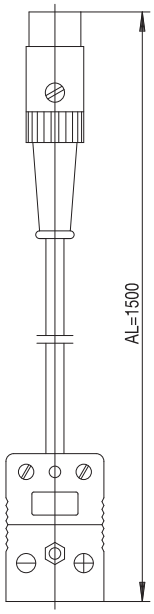
Precision indication device (P700)
Basic type 902722/20
Basic type 902722/25
Basic type 902722/30
Basic type 902722/35



Connection cable,
precision RTD temperature probe



Connection cable,
temperature measuring chain
for Pt100



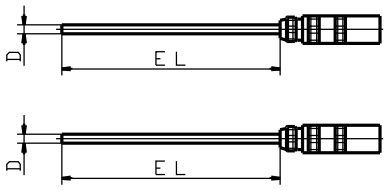
Compensation line,
temperature measuring chain for
thermocouples (NiCr-Ni, type K)

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Order details: Precision RTD temperature probe

			(1) Basic type
		902721/10	Precision RTD temperature probe as per DIN EN 60751 Pt100 4-wire/Lemosa connector/ connection cable/-50 to +250 °C
		902721/15	Precision RTD temperature probe as per DIN EN 60751 Pt100 4-wire/Lemosa connector/ connection cable/-200 to +450 °C
			(2) Sheath diameter D in mm
x	x	3	Ø 3 mm
x	x	4.5	Ø 4.5 mm
			(3) Fitting length EL in mm
x		200	200 mm
x	x	300	300 mm
	x	400	400 mm
			(4) Packaging
x	x	10	In twist pack
			(5) Extra codes
x	x	000	no extra code
x	x	774	DAkkS (DKD) calibration (standard, with RTD temperature value table)**
x	x	775	DAkkS (DKD) calibration (service, specify inspection points in plain text)



	(1)		(2)		(3)		(4)		(5)	
Order code	☐	-	☐	-	☐	-	☐	/	☐	,...
Order example	902721/10	-	3	-	200	-	10	/	775, -10, 0, +25°C[1]	

1. State extra codes one after the other, separated by commas.

Note:

** For extra code standard calibration, the temperatures 0, 100 and 200 °C are used as inspection points. Different and further inspection points are optionally selectable under extra code 775.

Temperature probe connection

An 1.5 m long silicone insulated connection line is contained in the scope of delivery.

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Order details: Temperature measuring chain

					(1) Display unit basic type
				902722/20	Precision display unit P700 1-channel/resolution 0.1 °C/-200 to +850 °C Pt100, thermocouples: type K, J, L, N, R, S, T
				902722/25	Precision display unit P705 2-channel/resolution 0.1 °C/-200 to +850 °C Pt100, thermocouples: type K, J, L, N, R, S, T
				902722/30	Precision display unit P750 1-channel/resolution 0.01 °C/0.1 °C/-200 to +850 °C Pt100, thermocouples: type K, J, L, N, R, S, T
				902722/35	Precision display unit P755 2-channel/resolution 0.01 °C/0.1 °C/-200 to +850 °C Pt100, thermocouples: type K, J, L, N, R, S, T
					(2) Operating temperature, temperature probe, in °C
x	x	x	x	135	-200 to +450 °C (Precision RTD temperature probe including adapter cable)
x	x	x	x	150	-200 to +600 °C (RTD temperature probe), basic type 902240/20...*
x	x	x	x	185	-200 to +1200 °C (Thermocouples), basic type 901240/20-1043... including adapter cable*
x	x	x	x	385	-50 to +250 °C (Precision RTD temperature probe including adapter cable)
x	x	x	x	415	-50 to +600 °C (RTD temperature probe), basic type 902240/20...*
					(3) Temperature probe sheath diameter D in mm
x	x	x	x	3	Ø 3 mm
x	x	x	x	4.5	Ø 4.5 mm
x	x	x	x	...	Specification in plain text (only for (2) selection 150, 185 and 415)*
					(4) Temperature probe fitting length in mm
x	x	x	x	200	200 mm (not for (2) selection 135)
x	x	x	x	300	300 mm
x	x	x	x	400	400 mm (not for (2) selection 385)
x	x	x	x	...	Specification in plain text (50 mm steps, only for (2) selection 150, 185 and 415)*
					(5) Number of temperature probes
x	x	x	x	...	Specifications in plain text
					(6) Extra codes
x	x	x	x	000	no extra code
x	x	x	x	773	DAkkS (DKD) calibration (standard, display values only)**
x	x	x	x	774	DAkkS (DKD) calibration (standard, with RTD temperature value table)**
x	x	x	x	775	DAkkS (DKD) calibration (service, specify inspection points in plain text)
x	x	x	x	781	Connector power pack AC 230 V for P700 series
x	x	x	x	782	Service box (plastic) with foam padding
x	x	x	x	923	"DE-Graph“ evaluation software
x	x	x	x	926	With storage module for 6.000 measured values

	(1)		(2)		(3)		(4)		(5)		(6)	
Order code		-		-		-		-		/		, ...
Order example	902722/35	-	135	-	3	-	200	-	2	/	775, -40, 0, 100°C[1]	

1. State extra codes one after the other, separated by commas.

Note:

* Please select the precise version from the respective data sheets 90.1210 and 90.2210 and specify the fitting length and the sheath diameter in the order details.

** For extra code standard calibration, the temperatures 0, 100 and 200 °C are used as inspection points. Different and further inspection points are optionally selectable under extra code 775.