on-site tester calibrator
CALYS 5

CE
ISO 9001

The digital tester calibrator CALYS 5 is designed for maintenance and calibration of physical quantities either on-site or in labs.
It can:
- Measure
  - temperatures,
  - resistances,
  - DC voltages and currents.
- Simulate thermocouples and RTDs.
- Simulate resistances.
- Output DC voltage and current signals.

- Two instruments in one
  - tester, calibrator
  - stand alone logger
- Memory reading on the display or via analog output
- Interchangeable battery, quick charge: 3 hours
- 10 hours lifetime
- 200 000 points in simulation
- Multilanguage

functions

The CALYS 5 is designed for checking equipment in telemetry loops, such as sensors, transmitters, positioners, converters, controllers.
Delivered with elastomeric enclosure, the CALYS 5 is self-contained thanks to rechargeable battery pack. It can operate on mains without battery discharge.
It includes an alphanumeric display and a very comprehensive 24-key keypad allowing easy programming and processing thanks to help messages available in several languages.
It can store up to 1000 measurements in one or more bursts.

DC voltage, DC current, resistance

Measurement .....
Measurement range up to 120% of range.
- Voltage, input resistance:
> 1000 MΩ over 50 mV and 500 mV ranges,
10 MΩ over 5 V and 50 V ranges.
Normal mode rejection level > 70 dB at 50/60 Hz.
Common mode rejection level > 120 dB in DC and AC 50 Hz.
Max. permissible common mode voltage: 250 V rms.
- Current, voltage drop < 1.6 V
- Current, 24 V DC may power a loop including a passive transmitter.
- Resistance, measuring current:
1 mA over 500 Ω range,
0.1 mA over 5000 Ω range.
3-wire balanced circuit.

Emission / simulation .....
• Voltage, nominal load resistance ≥ 100 kΩ.

Source resistance < 0.2 Ω.
• Resistance, nominal current In for the announced accuracy: 1 mA (500 Ω range) or 0.1 mA (5 000 Ω range). Permissible measuring current: 0.5 In to 3 In.

Range	Measurement			Emission / Simulation			
	Resolution	Accuracy (1) 90 days	Accuracy (1) 1 year	Emission range	Resolution	Accuracy (1) 90 days	Accuracy (1) 1 year
50 mV	10 µV	0.05 % + 10 µV	0.1 % + 10 µV				
500 mV	100 µV	0.05 % + 100 µV	0.1 % + 100 µV	- 30 to + 220 mV	1 µV	0.03 % + 4 µV	0.05 % + 18 µV
5 V	1 mV	0.05 % + 1 mV	0.1 % + 1 mV	- 300 to + 2 200 mV	10 µV	0.02 % + 20 µV	0.05 % + 40 µV
50 V	10 mV	0.05 % + 10 mV	0.1 % + 10 mV	- 2 to + 22 V	100 µV	0.02 % + 0.2 mV	0.04 % + 0.4 mV
50 mA	10 µA	0.05 % + 10 µA	0.1 % + 10 µA	0.1 to + 24 mA	0.1 µA	0.02 % + 0.3 µA	0.04 % + 0.5 µA
500 Ω	100 mΩ	0.05 % + 100 mΩ	0.1 % + 0.1 Ω	26 to 501 Ω	1 mΩ	0.02 % + 10 mΩ	0.04 % + 20 mΩ
5 000 Ω	1 Ω	0.05 % + 1 Ω	0.1 % + 1 Ω	260 to 5 010 Ω	10 mΩ	0.02 % + 150 mΩ	0.04 % +250 mΩ

(1) In ± (% rdg + n digits) at 23 ± 1°C.

Temperature by thermocouples

Sensor	Measurement				Simulation		
	Measurement range	Resolution	Accuracy (1) 90 days	Accuracy (1) 1 year	Simulation range (2)	Accuracy (1) 90 days	Accuracy (1) 1 year
K (NiCr / NiAl)	- 250 to - 200°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C	- 240 to - 200°C	1°C	2°C
	- 200 to - 100°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.15 % + 0.1°C	0.3 % + 0.2°C
	- 100 to + 1 372°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 1372°C	0.03 % + 0.1°C	0.05 %+ 0.2°C
T (Cu / CuNi)	- 250 to + 200°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C	- 240 to - 200°C	1°C	2°C
	- 200 to - 100°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.15 % + 0.1°C	0.3 % + 0.2°C
	- 100 to + 400°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 400°C	0.03 % + 0.1°C	0.05 %+ 0.2°C
J (Fe / CuNi)	- 209 to - 120°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 210 to 0°C	0.15 % + 0.1°C	0.3 % + 0.2°C
	- 120 to + 1 020°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 1200°C	0.04 % + 0.1°C	0.08 % + 0.2°C
E (NiCr / CuNi)	- 250 to - 200°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C	- 240 to - 200°C	1°C	2°C
	- 200 to - 100°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.1 % + 0.1°C	0.2 % + 0.2°C
	- 100 to + 755°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 1000°C	0.03 % + 0.1°C	0.05 %+ 0.2°C
N (NiCrSi / NiSi)	- 240 to - 200°C	1°C	0.05 % + 1°C	0.1 % + 1.5°C	- 240 to - 200°C	1.5°C	3°C
	- 200 to + 400°C	0.5°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.15 % + 0.2°C	0.3 % + 0.4°C
	+ 400 to + 1 300°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 1300°C	0.03 % + 0.2°C	0.05 %+ 0.4°C
U (Cu / CuNi DIN)	- 200 to - 100°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.1 % + 0.1°C	0.2 % + 0.2°C
	- 100 to + 600°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 600°C	0.02 % + 0.1°C	0.04 % + 0.2°C
L (Fe / CuNi DIN)	- 200 to - 40°C	0.2°C	0.05 % + 0.4°C	0.1 % + 0.6°C	- 200 to 0°C	0.1 % + 0.1°C	0.2 % + 0.2°C
	- 40 to + 900°C	0.1°C	0.05 % + 0.2°C	0.1 % + 0.3°C	0 to + 900°C	0.03 % + 0.1°C	0.05 %+ 0.2°C
S (Pt10%Rh / Pt)	- 50 to + 450°C	1°C	0.05 % + 2°C	0.1 %+ 3 °C	- 50 to + 1 768°C	1°C	2°C
	+ 450 to + 1 767°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C			
R (Pt13%Rh / Pt)	- 50 to + 450°C	1°C	0.05 % + 2°C	0.1 %+ 3 °C	- 50 to + 1 768°C	0.8°C	1.5°C
	+ 450 to + 1 767°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C			
B (Pt13%Rh / Pt16%Rh)	- 400 to + 900°C	1°C	0.05 % + 2°C	0.1 %+ 3 °C	0 to + 1 820°C	1°C	2°C
	+ 900 to + 1 820°C	0.5°C	0.05 % + 1°C	0.1 % + 1.5°C			
C (W5%Rh / W26%Rh)	- 20 to + 300°C	0.5°C	0.05 % + 1°C	0.1 % + 1 °C	- 20 to 0°C	0.3°C	0.5°C
	+ 300 to + 1 830°C	0.2°C	0.05 % + 0.5°C	0.1 % + 0.8°C	0 to + 400°C	0.3 % + 0.3°C	0.05 %+ 0.5°C
	+ 1 830 to + 2 320°C	0.5°C	0.05 % + 1°C	0.1 % + 1 °C	+ 400 to + 2 300°C	0.06 % + 0.3°C	0.1 %+ 0.5°C

(1) In ± (% rdg + n°C) at 23 ± 1°C.
(2) For a 0.1°C resolution.
The listed accuracies are guaranteed for a 0°C reference junction. Using the internal reference junction, except thermocouple B, add an uncertainty of 0.2°C. When measuring, the inherent temperature error of the sensor used must also be taken into account.

Temperature by RTDs

Temperature			Measurement			Simulation	
Probe	Measurement range	Accuracy (1) 90 days	Accuracy (1) 1 year	Covered range	Accuracy (1) 90 days	Accuracy (1) 1 year
Pt 100 Ω	- 220 to + 1 200°C	0.05 % + 0.3°C	0.1 % + 0.4°C	- 180 to + 1 200°C	0.02 % + 0.1 °C	0.04 % + 0.2°C
Pt 200 Ω	- 220 to + 550°C	0.05 % + 0.2°C	0.1 % + 0.3°C	- 210 to + 405°C	0.02 % + 0.05°C	0.04 % + 0.1°C
Pt 500 Ω	- 220 to + 1 200°C	0.05 % + 0.5°C	0.1 % + 0.7°C	- 120 to + 1 200°C	0.02 % + 0.2 °C	0.04 % + 0.3°C
Pt 1000 Ω	- 220 to + 1 200°C	0.05 % + 0.3°C	0.1 % + 0.4°C	- 180 to + 1 200°C	0.02 % + 0.1 °C	0.04 % + 0.2°C
Ni 100 Ω	- 59 to + 180°C	0.05 % + 0.3°C	0.1 % + 0.4°C	- 60 to + 180°C	0.02 % + 0.1 °C	0.04 % + 0.2°C
Ni 200 Ω	- 59 to + 180°C	0.05 % + 0.2°C	0.1 % + 0.3°C	- 60 to + 180°C	0.02 % + 0.05°C	0.04 % + 0.1°C
Ni 500 Ω	- 59 to + 180°C	0.05 % + 0.5°C	0.1 % + 0.7°C	- 60 to + 180°C	0.02 % + 0.2 °C	0.04 % + 0.3°C
Ni 1 000 Ω	- 59 to + 180°C	0.05 % + 0.3°C	0.1 % + 0.4°C	- 60 to + 180°C	0.02 % + 0.1 °C	0.04 % + 0.2°C

(1) In ± (% rdg + n°C) at 23 ± 1°C. The accuracy is given for a temperature sensor connected in 3-wire balanced circuit. The inherent temperature error of the sensor used must also be taken into account.

Measurement
Resolution: 0.1°C.
Measuring current:
• Pt 100, 200 and Ni 100, 200: 1 mA.
• Pt 500, 1000 and Ni 500, 1000: 0.1 mA.

Simulation
Resolution: 0.01°C.
Usable nominal current In:
• Pt 100, 200 and Ni 100, 200: 1 mA.
• Pt 500, 1000 and Ni 500, 1000: 0.1 mA.

Permissible measuring current: from 0.5 In to 3 In.
Response time < 90 ms.

additional functions

Temperatures in measurement and simulation functions can be expressed either in °C or °F.

Measurement trigger
Automatic or keypad key; burst triggering can be programmed from 1 to 1000 successive measurements with a time interval from 0.5 to 3 400 s.

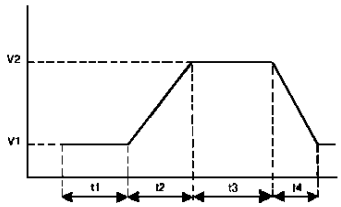
Autoranging with voltage and resistance functions

Relative measurements
The unit reads the deviation regarding a value measured and stored as a reference. L = M-R with L value read, M value measured with the chosen function and range and R reference value.

Display according to a conversion law
The unit reads the function L = aM + b with L value read, M value measured with the chosen function and range; a and b are defined by the unit on the basis of the desired L1 and L2 values for the corresponding values of M1 and M2, the data having previously been entered on the keypad.

Step generator
The emission signal can vary per step, those amplitude and positive or negative directions are defined using the keypad.

Ramp generator
The emission signal can vary continuously between two predetermined values, after programming values of level v1 and v2, times t1 to t4 and number of n successive cycles.



Storage of emission values
100 simulation values can be programmed and stored in non-volatile memory. They can be recalled using the keypad.

Measurement memory
It can store the number, function, range and value of the last 1000 measurements or n bursts of p measurements (E.g.: 250 bursts of one measurement).
The unit computes the average and determines the maximum and minimum of the values for each burst.

Recalling measurements
The values can be:
• either recalled using the keypad and read on the display,
• or converted into 4-20 mA or 0-1 V analog signals available on the unit terminals; the time interval between outputs of 2 consecutive measurements is selected by program.

general specifications

Display
One line of 16-backlit characters.

Operating conditions
Reference range: 23 ± 1°C, relative humidity 45 to 75%.
Operating normal range: 0 to 50°C, RH: 20 to 75%.
Operating limit range: - 10 to + 55°C, RH: 10 to 80%.

Standards
Platinum probe according to DIN-IEC Publication 475 (NFC 42-330 and DIN 43760).
Thermocouple according to IEC Publication 584-1 (NFC 42-321) or DIN 43710.

Power requirements
Removable NiMH battery pack, 5 accumulators, quick charge in 3 h.
Life: > 10 h.
Mains block: 12 V/400 mA.
External charger: 220 V, 50/60 Hz.
Output: 12 V DC.

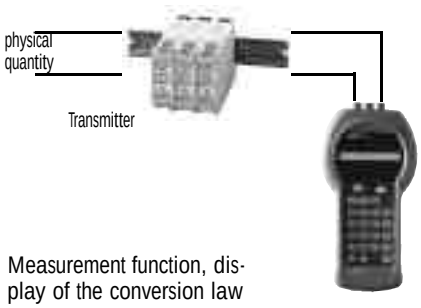
Feature
ABS casing with elastomer enclosure.
Dimensions: 260 mm x 144 mm x 60 mm.
24-key keypad control.
Weight < 1.5 kg.

Languages
French, English, German, Swedish, Italian, Spanish, and Dutch.

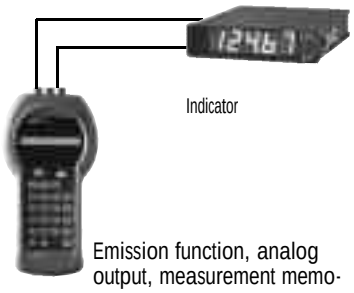
CALYS 5 solutions

Industrial process .....
• For adjusting parameters of an industrial process.

Well-adapted to the measurement of transmitters and/or industrial process conditioners, the CALYS 5, connected to the 0-10 V or 4-20 mA transmitter output in 2- or 4-wire circuit, displays the physical measurement according to the conversion law previously entered on the keypad.
These measurements can be stored and converted into analog signals for testing the DPM associated to the transmitter.



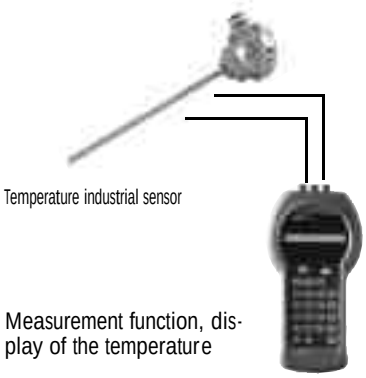
Measurement function, display of the conversion law



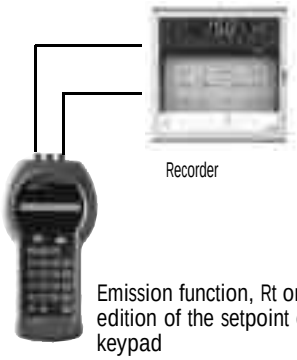
Emission function, analog output, measurement memory, 4-20 mA

Maintenance.....
• For removing all doubts on operation of a component from a measurement chain.

The CALYS 5 tests the industrial sensor from the measurement chain and displays the process measurement.
In the same way, the CALYS 5 simulates a resistance or a thermocouple to test the correct deviation of a recorder.



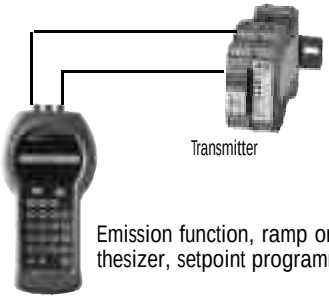
Measurement function, display of the temperature



Emission function, Rt or Tc, edition of the setpoint on the keypad

• For simulation of valve opening to characterize the alarm thresholds.

The CALYS 5 outputs a ramp in the transmitter function in step by step mode. The alarms are displayed on the monitoring system.



Emission function, ramp or synthesizer, setpoint programming

For transmitter tests with calibration reports, measurement storage and processing software, ask for the CALYS 10 which is the additional solution.

ordering instructions

All-purpose tester calibrator	CALYS 5

Accessories.....

Battery pack	AN 6010
Set of 5 leads	ACL 9310
Cigar lighter lead	ATL 306

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