



## CALYS 120 IS

ATEX documenting multifunction calibrator with high accuracy 0.006%

CALYS 120 IS is the top instrument of our range of ATEX documenting multifunction calibrators.

## Description

CALYS 120 IS is the top instrument of our range of ATEX documenting multifunction calibrators. It is the perfect tool for advanced process maintenance and use on test bench in hazardous and non-hazardous areas. Suitable for all field and lab measurements, it can simultaneously measure and generate over two isolated channels various signals of temperature, resistance, process, pressure and frequency in one single instrument.

CALYS 120 IS does not only work as a simulator (IN / OUT) but also as a dual channel thermometer (IN / IN) to perform comparison calibration.

Providing extended functionalities (temperature simulation, scaling, steps, synthesizer, statistical functions...) and audit trails, CALYS IS series complies with both 21 CFR Part 11 and NADCAP Heat Treatment standards and makes advanced data exploitation and full data traceability easier. CALYS IS can store and recall up to 10 complete instrument configurations and values with manual or automatic recall for easy and quick work in the field.

The dual channel display allows a simultaneous indication of the measured and the simulated values. The graphic mode allows the trend to be displayed.

### Pressure calibration:

Single or dual range internal pressure modules can be configured in CALYS 80 IS and 120 IS to provide gauge, absolute and differential pressure measurements. External interchangeable pressure module can be connected to any model in order to extend the pressure range up to 700 bar.



Using this user-friendly instrument, calibration tasks can be quickly carried out over the whole process chain. Take the 1.4 kg documenting process calibrator to the field with you during the whole week with 10 calibration procedures stored in the device. Run the procedure after connecting the probes to the instrument and save the results for onsite easy and quick calibration. Back to the office, you can then upload the data on a computer in order to issue customized calibration certificates with dedicated calibration software DATA CAL.

## Key features:

- ATEX compliance: ATEX Ex II 1G EEx ia IIC T4 -20°C Tamb +50°C) X
- Switch test, leak test
- IN / IN: CALYS 120 IS has a dual channel input for comparison calibration

## Specifications

### Specifications and performances in temperature @23°C ±5°C

Uncertainty is given in % of reading (CALYS 120 IS display) + fixed value.

#### Resistive probes: Measurement and simulation

Sensor	Range (Input and Output)	Resolution	Accuracy / 1 year
Pt100 ( $\alpha = 3850$ )	-200°C to +850°C	0.01°C	0.01% RDG + 0.05°C
Pt100 ( $\alpha = 3926$ )	-200°C to +850°C	0.01°C	0.01% RDG + 0.05°C
Pt100 ( $\alpha = 3902$ )	-200°C to +650°C	0.01°C	0.01% RDG + 0.05°C
Pt100 ( $\alpha =$ JIS SAMA)	-200°C to +600°C	0.01°C	0.01% RDG + 0.05°C
Pt200 ( $\alpha = 3851$ )	-200°C to +850°C	0.1°C	0.01% RDG + 0.15°C
Pt500 ( $\alpha = 3851$ )	-200°C to +850°C	0.1°C	0.01% RDG + 0.1°C
Pt1000 ( $\alpha = 3851$ )	-200°C to +850°C	0.01°C	0.01% RDG + 0.1°C
Cu10 ( $\alpha = 427$ )	-70°C to +150°C	0.1°C	0.01% RDG + 0.4°C
Cu100 ( $\alpha = 428$ )	-180°C to +150°C	0.1°C	0.01% RDG + 0.05°C
Ni100 ( $\alpha = 618$ )	-60°C to +180°C	0.1°C	0.01% RDG + 0.05°C
Ni120 ( $\alpha = 672$ )	0°C to +150°C	0.1°C	0.01% RDG + 0.05°C

Connections: 2, 3 and 4 wires

Rtd simulation excitation current: from 0.1 to 4 mA without incremental error

Rtd measurement excitation current: 0.2 mA

Rtd cable compensation: up to 100 m (for each wire)

Rtd cable compensation error (Pt100):  $\pm 0.005^\circ\text{C}$ / of total wire

Maximum load resistance: 600  $\Omega$  @ 20 mA

#### Thermocouples: Measurement and simulation

Type	Range	Résolution	Accuracy / 1 an
J	-210 to +1200°C	0.01°C	0.01% RDG + 0.1°C
K	-270 to +1370°C	0.01°C	0.01% RDG + 0.1°C
T	-270 to +400°C	0.01°C	0.01% RDG + 0.1°C
R	-50 to 1760°C	0.1°C	0.01% RDG + 0.2°C
S	-50 to 1760°C	0.1°C	0.01% RDG + 0.2°C
B	+50 à +1820°C	0.1°C	0.01% RDG + 0.3°C
C	0 to 2300°C	0.1°C	0.01% RDG + 0.2°C
G	0 to 2300°C	0.1°C	0.01% RDG + 0.3°C

D	0 to 2300°C	0.1°C	0.01% RDG + 0.3°C
U	-200 to +400°C	0.01°C	0.01% RDG + 0.1°C
L	-200 to +760°C	0.01°C	0.01% RDG + 0.1°C
N	-270 to +1300°C	0.01°C	0.01% RDG + 0.1°C
E	-270 to +1300°C	0.1°C	0.01% RDG + 0.1°C
F	0 to +1400°C	0.1°C	0.01% RDG + 0.1°C

Display units: °C, °F et K

Resolution: 0.01°C / 0.01°F

Temperature scale: ITS90 and IPTS68

Reference junction compensation: internal automatic from -10°C to +55°C or external

Rj compensation drift: ± 0.002°C/°C (from -10 °C to +45 °C) - Class A Pt100

Input impedance: > 10 MΩ

## Specifications and performances in pressure @23°C ±5°C

### Pressure

Pressure media: AISI 316 SS compatible fluids (water, gas, and oil)

Temperature compensation: Automatic with built-in calibration matrix

Engineering units: mbar, bar, hPa, kPa, Mpa, kg/cm<sup>2</sup>, kg/m<sup>2</sup>, psi, mmH<sub>2</sub>O, cmH<sub>2</sub>O, mH<sub>2</sub>O, Torr, atm, lb/ft<sup>2</sup>, inH<sub>2</sub>O, FTH<sub>2</sub>O, mmHg, cmHg, mHg, inHg

Accuracy: accuracies given for 1 year, include non linearity, hysteresis, and repeatability.

Temperature coefficient inside the temperature compensated range: ± 0.002% RDG /°C

Compensation range: 0°C to 45°C

### Measurement by internal pressure module

Reference	Range	Resolution
IPM000100G	-100 / 100 mbar Gauge	0.001 mbar
IPM000500G	-500 / 500 mbar Gauge	0.01 mbar
IPM002000G	-0.95 / 2 bar Gauge	0.01 mbar
IPM007000G	-0.95 / 7 bar Gauge	0.1 mbar
IPM020000G	-0.95 / 20 bar Gauge	0.1 mbar
IPM002000A	2 bar Absolute	0.01 mbar
IPM020000A	20 bar Absolute	0.1 mbar

Accuracy: ± 0.025% F.S.

Overpressure: 125% F.S.

Port: female, 1/8" BSP

### Measurement by external pressure module

Reference	Range	Resolution
EPM000100G	-100 / 100 mbar Gauge	0.001 mbar

EPM000500G	-500 / 500 mbar Gauge	0.01 mbar
EPM001000G	-0.95 / 1 bar Gauge	0.01 mbar
EPM002000G	-0.95 / 2 bar Gauge	0.01 mbar
EPM007000G	-0.95 / 7 bar Gauge	0.1 mbar
EPM200000G	-0.95 / 20 bar Gauge	0.1 mbar
EPM035000G	0.95 / 35 bar Gauge	1 mbar
EPM070000G	0 / 70 bar Gauge	1 mbar
EPM150000G	0 / 150 bar Gauge	1 mbar
EPM350000G	0 / 350 bar Gauge	10 mbar
EPM700000G	0 / 700 bar Gauge	1 mbar
EPM002000A	2 bar Absolute	0.01 mbar
EPM020000A	20 bar Absolute	0.1 mbar

Accuracy:  $\pm 0.025\%$  F.S.

Overpressure: 125% F.S.

Port: male, 1/4" BSP

Connection wire length: 2 m

## Specifications and performances in process @23°C $\pm 5^\circ\text{C}$

### DC voltage: Measurement and simulation

Range	Resolution	Accuracy / 1 an
-20 mV to +200 mV	1 $\mu\text{V}$	0.006% RDG + 3 $\mu\text{V}$
-0,2 V to +2 V	10 $\mu\text{V}$	0.006% RDG + 10 $\mu\text{V}$
-2 V to +12 V	100 $\mu\text{V}$	0.006% RDG + 100 $\mu\text{V}$

Input impedance:

< 10 M $\Omega$  for ranges up to 2 V

> 500 k $\Omega$  for ranges up to 20 V

Output impedance (emf output): < 0.5  $\Omega$  with a maximum current of 0.5 mA

Output noise (at 300 Hz):

< 2  $\mu\text{V}$  pp for ranges up to 200 mV

< 10  $\mu\text{V}$  pp for ranges up to 2 V

< 80  $\mu\text{V}$  pp for ranges up to 20 V

### DC current: Measurement and simulation

With or without loop supply

Range	Resolution	Accuracy / 1 an
0 mA to 21 mA	0.1 $\mu\text{A}$	0.01% RDG + 0.4 $\mu\text{A}$
-5 mA to 50 mA	0.1 $\mu\text{A}$	0.01% RDG + 0.4 $\mu\text{A}$

Input impedance: < 20  $\Omega$  at 1 mA  
 Maximum load resistance: 600  $\Omega$  at 21 mA  
 Loop supply: 12 V  $\pm$  5%

### Resistance: Measurement and simulation

Type	Range	Resolution	Accuracy / 1 an
Measurement	0 to 500 $\Omega$	10 m $\Omega$	0.008% RDG + 12 m $\Omega$
	0 to 5000 $\Omega$	100 m $\Omega$	0.008% RDG + 120 m $\Omega$
Simulation	0 to 500 $\Omega$	10 m $\Omega$	0.008% RDG + 40 m $\Omega$
	0 to 5000 $\Omega$	100 m $\Omega$	0.008% RDG + 320 m $\Omega$

Connections: 2, 3 and 4 wires  
 Source resistance effects:  $\pm$  1  $\mu$ V error for 1000  $\Omega$  source resistance  
 Simulation excitation current: from 0.1 to 4 mA without incremental error  
 Measurement excitation current: 0.2 mA  
 Maximum load resistance: 600  $\Omega$  @ 20 mA

### Frequency, pulse: Measurement and simulation

Type	Range	Resolution	Accuracy / 1an
Frequency	1 to 200 Hz	0.001 Hz	0.005% RDG + 0.001 Hz
	1 to 2 kHz	0.01 Hz	0.005% RDG + 0.01 Hz
	1 to 20 kHz	0.1 Hz	0.005% RDG + 0.1 Hz
Pulse	0 to 106	1 pulse	0.01% RDG

Input impedance: > 500 k $\Omega$

### Further features

Scaling in measurement and simulation modes	Setup of zero and span programmable within -399999 and +999999 Scaling allows process signals to be displayed in % of FS or in all other units. This function also allows sensors to be corrected after a calibration.
Square root	In combination with scaling function
Statistical functions	hold, max, min, offset, zero, average
Transmitters tests	The feature enables any pressure or temperature transmitter to be controlled and calibrated with simultaneous display of input and output values in % F.S. or in actual unit. The measuring circuit is also able to power the loop for a direct connection to the transmitter under test.
Ramps generation	Autoramp and Autostep capability with Start, End, and Step programmable parameters Single and continuous cycle with Start, End, Rises,

	Soaks, and Falls programmable parameters The signal value setting uses a unique in-line single-digit setting mode or a direct numeric entry Direct keypad access to n.10 programmable memory stored values
Transmitter function	CALYS IS can be used as a transmitter. Any input signal (electric or pressure) can be converted into a 4-20 mA output. The galvanic insulation between the input and output channels allows this function to be used on the process directly.
Switch test	Temperature, signal and pressure switches can be tested using this advanced procedure. The calibrator will hold the display reading when the contact changes status.

### General specifications

Size	290 x 98 x 57 mm
Weight	1.4 kg
Display	240 x 320 pixel liquid crystal graphical display with backlite and contrast control Display of result as table of values or trend curve
Power supply	230 V $\pm$ 10 %, 50/60 Hz
Battery	Type: NiMh Charging time: 8 h, 6 h if instrument switched off Life time: 8 h (Tc and V), 3 h at 20 mA
Communication ports	RS 232
Storage capacity	10 data with manual or automatic recall

### Environmental specifications

Reference range	23°C $\pm$ 5°C (RH: 45 to 75 % condensing)
Operating reference range	-10 to 55°C (RH: 95 % non condensing)
Storage temperature limits	0°C to +60°C (without battery)
Maximum height	0 to 2000 m
IP protection	IP54 according to EN60529

### Safety specifications

Protections	<ul style="list-style-type: none"> <li>• Thermal fuse</li> <li>• High voltage suppressor</li> <li>• Resistor-diode voltage limiter</li> </ul>
Class	class II 1G Ex ia IIC T4 (-20°C from T Ambient to +50°C)



## Models and accessories

### Instrument:

CALYS120 IS      On-site ATEX documenting multifunction calibrator with high accuracy  
0.006%

Delivered in standard with:

- User manual
- Battery charger
- Protection rubber holster
- Factory test report

### Internal pressure sensors - AISI316SS - $\pm 0.025\%$ FS: (2 *maximum*)

IPM000100G	-100 / 100 mbar (gauge) - Res. 0.001 mbar
IPM000500G	-500 / 500 mbar (gauge) - Res. 0.01 mbar
IPM002000G	-0.95 / 2 bar (gauge) - Res. 0.01 mbar
IPM007000G	-0.95 / 7 bar (gauge) - Res. 0.1 mbar
IPM020000G	-0.95 / 20 bar (gauge) - Res. 0.1 mbar
IPM002000A	2 bar (absolute) - Res. 0.01 mbar
IPM020000A	20 bar (absolute) - Res. 0.1 mbar

### External pressure sensors - AISI316SS - $\pm 0.025\%$ FS:

EPM000100G	-100 / 100 mbar (gauge) - Res. 0.001 mbar
EPM000500G	-500 / 500 mbar (gauge) - Res. 0.01 mbar
EPM001000G	-0.95 / 1 bar (gauge) - Res. 0.01 mbar
EPM002000G	-0,95 / 2 bar (gauge) - Res. 0,01 mbar
EPM007000G	-0.95 / 7 bar (gauge) - Res. 0.1 mbar
EPM020000G	-0.95 / 20 bar (gauge) - Res. 0.1 mbar
EPM035000G	-0.95 / 35 bar (gauge) - Res. 0.1 mbar
EPM070000G	-0.95 / 70 bar (gauge) - Res. 0.1 mbar
EPM150000G	-0.95 / 150 bar (gauge) - Res. 1 mbar
EPM700000G	-0.95 / 700 bar (gauge) - Res. 1 mbar
EPM002000A	2 bar (absolute) - Res. 0.01 mbar

EPM020000A 20 bar (absolute) - Res. 0.1 mbar

### External hand pump:

F3280013 From -0.8 to 2 bar pressure pump  
F3280019 From -0.95 to 40 bar pressure pump  
F3280018 From 0 to 350 bar oil / water pump  
F3280015 External 700 bar oil / water pump  
F3280015 External 700 bar oil / water pump with high pressure hose  
+ EE372008  
F3280016 External 1000 bar oil/water pump with high pressure hose  
+ EE372008  
F3280022 700 bar oil/water compact bench  
EE480053 1/4" BSPM / NPT F kit (1/8"; 1/4"; 3/8"; 1/2")  
EE480054 1/4" BSPM / BSP kit (1/2" M; 1/2" F, 3/8" F, 1/8" F)

### Further accessories:

EE300040 Electrical signal test leads  
BB880043 Vinyl carrying case with accessories folder  
BB530212 USB Cable  
BB530203 RS232 PC Cable  
EE300122 Compensated TC cables J; K; T; R, S  
EE300204 MiniDin Connectors Kit Tc J, K, T, S Female connector  
EE300205 MiniDin Connectors Kit Tc J, K, T, S Male connector

### Software:

DATA CAL Calibration software for CALYS 75 / 100 / 150  
Supplied with USB cable

### Certification:

QMA11EN COFRAC certificate of calibration  
With all relevant data points where the device has been tested

### Packing information:

Size 290 mm x 98 mm x 57 mm



Weight without packing 1.4 g

**DENVER**  
*metrología electrónica, S.L.*

**Tel: +34 91 569 8006**

**info@denver.es - www.denver.es**