Baluntech

BL986 / BL987 Series

Multi-function Process Calibrator



- High Accuracy Calibration
- Signal Source & Measure
- HART Communication

%FF Accuracy | 12 TC Types | 24V Loop Power | Data Logger · Calibration Tasks

Explove Products

Overview

The BL986/BL987 series multifunction process calibrators combine all milliamp loop functions and sources, and read DC volts, millivolts, 12 thermocouple types, 13 RTD curves, ohms, and process frequency signals. Advanced features include automatic detection of 2-wire, 3-wire, and 4-wire RTDs, plus configurable automatic stepping and ramping. The BL987 adds documenting capabilities - data logging, calibration task automation, and HART communicator - all in one rugged, handheld device.

Key Features

- 0.01%FS, 0.02%FS accuracy
- Source voltage, current, resistance, frequency, pulse, TC, RTD, pH
- Measure voltage, current, resistance, frequency, pulse, switch, TC, RTD, pH
- Simultaneous source and measure on two channels
- One-button 24V independent loop power
- Dual-channel SPRT measurements with probe management list
- Cold junction compensation: internal, external, or fixed value
- Frequency source: square wave & sine wave with adjustable duty cycle and amplitude
- Resistance/RTD support 2/3/4-wire wiring
- Unit conversion: linear, square root, cube root functions
- Step and ramp functions with configurable outputs
- Data statistics: min, max, average, rate of change
- Measurement filter for stable readings
- Wizard-type accuracy self-correction
- Snapshot function for one-click data recording
- Bluetooth wireless (optional) + USB wired communication
- Low thermoelectric potential test leads with 24K gold-plated jacks
- Anti-falling hook design for easy carrying and hands-free use

BL987-Exclusive Features

- **Data Logger:** Record, view, and manage measurement data on-device; delayed/timed, manual/auto recording; digital/graphical display
- **Calibration Tasks:** Create, execute, and delete calibration tasks; auto-complete UUT calibration with pass/fail judgment; export data to PC
- **HART Communicator (BL987-H only):** Supports HART v5/6/7; internal 24V loop power with built-in 250Ω resistor; Fisher DVC6200 auto-tuning
- **PC Software:** Separate database for generating, uploading, downloading, reporting, and certificates

Model Comparison — BL987 Series vs. BL986 Series

The table below compares all six models across the BL987 and BL986 product families. BL987 models offer higher resolution (6.5-digit vs 5.5-digit), wider frequency range (100 kHz vs 50 kHz), and documenting capabilities.

Mode	Function	BL987-H	BL987	BL987 S	BL987 XS	BL986-H	BL986
Source	Voltage	●	●	●	●	●	●
	Current	●	●	●	_	●	●
	Ohm	●	●	●	●	●	●
	TC (12 types)	●	●	●	●	●	●
	RTD (13 types)	●	●	●	●	●	●
	Frequency	●	●	●	_	●	●
	Pulse	●	●	●	_	●	●
	24V Loop	●	●	●	●	●	●
Measure	Voltage	●	●	●	●	●	●
	Current	●	●	●	_	●	●
	Ohm	●	●	●	●	●	●
	Frequency	●	●	●	_	●	●
	TC (12 types)	●	●	●	●	●	●
	RTD (13 types)	●	●	●	●	●	●
	Pulse	●	●	●	_	●	●
	Switch	●	●	●	_	●	●
	Stats (ρ)	●	●	●	_	●	●
Other	HART Communicator	●	_	_	_	●	_
	Dual Temperature (SPRT)	●	●	_	●	_	_
	pH Meter	●	●	_	_	_	_
	Calibration Tasks	●	●	_	_	_	_
	Data Logger	●	●	_	_	_	_
	PC Software	●	●	_	_	_	_
	Wireless (Bluetooth)	●	●	_	_	_	_
	Pressure Module	●	●	_	_	_	_

Key differences BL987 vs BL986: Resolution improved by 1 bit across all ranges; Frequency range doubled (50 kHz → 100 kHz); Pulse range expanded; BL987 adds Data Logger, Calibration Tasks, pH meter, PC Software, Bluetooth, and Pressure module support.

Source Specifications

Function	Range	BL986 /BL987 Resolution	BL986 MPE 0.01 / 0.02 class	BL987 MPE 0.01 / 0.02 class
Voltage	-12 ~ 30 V	1 mV / 0.1 mV	±(0.008rd+1.5mV) ±(0.015rd+1.5mV)	±(0.006rd+0.8mV) ±(0.01rd+0.8mV)
	±10 V	0.1 mV / 10 μV	±(0.008rd+0.5mV) ±(0.015rd+0.5mV)	±(0.006rd+0.2mV) ±(0.01rd+0.2mV)
	±120 mV	10 μV / 1 μV	±(0.008rd+50μV) ±(0.015rd+50μV)	±(0.006rd+20μV) ±(0.01rd+20μV)
	±100 mV	1 μV / 0.1 μV	±(0.008rd+5μV) ±(0.015rd+5μV)	±(0.006rd+5μV) ±(0.01rd+5μV)
Current	0 ~ 30 mA	1 μA / 0.1 μA	±(0.01rd+2μA) ±(0.015rd+2μA)	±(0.01rd+1μA) ±(0.015rd+1μA)
Resistance	0 ~ 4000 Ω	10 mΩ	±(0.008rd+80mΩ) ±(0.015rd+80mΩ)	±(0.008rd+80mΩ) ±(0.015rd+80mΩ)
	0 ~ 400 Ω	1 mΩ	±(0.008rd+15mΩ) ±(0.015rd+15mΩ)	±(0.008rd+15mΩ) ±(0.015rd+15mΩ)
TC	12 types: S, R,B,K,N,E,J,T,L,WRe3-2 5,WRe5-26,EA-2	0.1°C / 0.01°C	See TC table	See TC table
RTD	13 types: Pt10,Pt50,Pt100,Pt200,Pt400,Pt500,Pt1000,Cu50,Cu100,BA1,BA2,BA3,G	0.01°C	See RTD table	See RTD table
Frequency	BL986: 0.5~50 kHz BL987: 0.5~100 kHz	0.1 Hz	±1.5 Hz	±1 Hz
	≤10 kHz	0.01 Hz	±0.15 Hz	±0.1 Hz
	≤1 kHz	0.001 Hz	±0.015 Hz	±0.01 Hz
Pulse	1 ~ 9999999 pieces	1 piece	±1 piece	±1 piece
pH	-3 ~ 17 pH	0.0001 pH	±(0.003rd+0.0002pH) ±(0.006rd+0.0002pH)	±(0.003rd+0.0002pH) ±(0.006rd+0.0002pH)

Notes: Max output current of voltage range: 10mA; Loading effect ≤ 50μV /mA; 20mA output load capacity ≤ 1kΩ. Square wave amplitude: 0.1~12.0Vpp; Sine wave amplitude: 0.1~12.0Vpp; Duty cycle: 2%～98%. Ambient temperature 20±5°C, accuracy within one year.

Measurement Specifications

Function	Range	Resolution	BL986 MPE 0.01 / 0.02 class	BL987 MPE 0.01 / 0.02 class
Voltage	-120 ~ 120 V	1 mV / 0.1 mV	±(0.008rd+1.5mV) ±(0.015rd+1.5mV)	±(0.006rd+1.0mV) ±(0.01rd+1.0mV)
	±10 V	0.1 mV / 10 μV	±(0.008rd+0.5mV) ±(0.015rd+0.5mV)	±(0.006rd+0.2mV) ±(0.01rd+0.2mV)
	±120 mV	10 μV / 1 μV	±(0.008rd+50μV) ±(0.015rd+50μV)	±(0.006rd+20μV) ±(0.01rd+20μV)
	±100 mV	1 μV / 0.1 μV	±(0.008rd+5μV) ±(0.015rd+5μV)	±(0.006rd+5μV) ±(0.01rd+5μV)
Current	-120 ~ 120 mA	10 μA / 1 μA	±(0.01rd+10μA) ±(0.015rd+10μA)	±(0.01rd+10μA) ±(0.015rd+10μA)
	±30 mA	1 μA / 0.1 μA	±(0.01rd+2μA) ±(0.015rd+2μA)	±(0.01rd+1.2μA) ±(0.015rd+1.2μA)
Resistance	0 ~ 7500 Ω	10 mΩ	±(0.008rd+80mΩ) ±(0.015rd+80mΩ)	±(0.008rd+80mΩ) ±(0.015rd+80mΩ)
	0 ~ 500 Ω	1 mΩ	±(0.008rd+15mΩ) ±(0.015rd+15mΩ)	±(0.008rd+15mΩ) ±(0.015rd+15mΩ)
	0 ~ 50 Ω	0.1 mΩ	-	±(0.008rd+15mΩ) ±(0.015rd+15mΩ)
TC	12 types: S, R,B,K,N,E,J,T,L,WRe3-25,WRe5-26,EA-2	0.1°C / 0.01°C	See TC table	See TC table
RTD	13 types: Pt10,Pt50,Pt100,Pt200,Pt400,Pt500,Pt1000,Cu50,Cu100,BA1,BA2,BA3,G	0.1°C / 0.01°C	See RTD table	See RTD table
SPRT Test	SPRT25, SPRT100 -189.8 ~ 961.8°C	0.001°C	-	±0.05°C
Frequency	BL986: 0.5~50 kHz BL987: 0.5~100 kHz	0.1 Hz	±1.5 Hz	±1 Hz
	≤10 kHz	0.01 Hz	±0.15 Hz	±0.1 Hz
	⩽ 1 kHz	0.001 Hz	±0.015 Hz	±0.01 Hz
Pulse	1 ~ 9999999 pieces	1 piece	±1 piece	±1 piece
pH	-3 ~ 17 pH	0.0001 pH	±(0.003rd+0.0002pH) ±(0.006rd+0.0002pH)	±(0.003rd+0.0002pH) ±(0.006rd+0.0002pH)
Stats (ρ)	0.00001 ~ 0.99999	0.00001	±0.00005	±0.00005

Notes: Input impedance ≥ 3MΩ (>=10 V range), ≥ 500MΩ (=<1 V range). Current measurement input impedance ≤ 10Ω. Frequency input impedance ≥10MΩ; input amplitude 0.1~60 V(rms). Resistance/RTD measurement current: 1mA /50 Ω; 1mA /500 Ω; 0.25mA /5000 Ω. Ambient temperature 20±5°C, accuracy within one year.

Thermocouple Accuracy (Source & Measure)

Type	Temperature Range	BL986 MPE 0.01 0.02	BL987 MPE 0.01 0.02
S	-35 ~ 0°C	±1.2 / ±1.2	±1.15 / ±1.15
	0 ~ 100°C	±1.0 / ±1.0	±0.94 / ±0.94
	100 ~ 1768°C	±0.8 / ±0.8	±0.73 / ±0.73
R	-35 ~ 0°C	±1.4 / ±1.4	±1.40 / ±1.40
	0 ~ 200°C	±1.1 / ±1.1	±1.02 / ±1.02
	200 ~ 1768°C	±0.7 / ±0.7	±0.61 / ±0.66
B	600 ~ 800°C	±1.0 / ±1.0	±0.96 / ±0.97
	800 ~ 1820°C	±0.8 / ±0.8	±0.71 / ±0.73
K	-260 ~ -200°C	±1.2 / ±1.3	±1.14 / ±1.22
	-200 ~ -100°C	±0.5 / ±0.5	±0.43 / ±0.50
	-100 ~ 600°C	±0.3 / ±0.3	±0.28 / ±0.30
	600 ~ 1372°C	±0.4 / ±0.4	±0.38 / ±0.39
N	-205 ~ -100°C	±0.6 / ±0.6	±0.51 / ±0.52
	-100 ~ 1300°C	±0.4 / ±0.4	±0.34 / ±0.36
E	-255 ~ -200°C	±0.7 / ±0.7	±0.63 / ±0.69
	-200 ~ -100°C	±0.3 / ±0.3	±0.24 / ±0.25
	-100 ~ 700°C	±0.2 / ±0.2	±0.16 / ±0.18
	700 ~ 1000°C	±0.2 / ±0.2	±0.15 / ±0.20
J	-210 ~ -100°C	±0.4 / ±0.4	±0.31 / ±0.32
	-100 ~ 700°C	±0.2 / ±0.2	±0.14 / ±0.17
	700 ~ 1200°C	±0.3 / ±0.3	±0.22 / ±0.26
T	-250 ~ -100°C	±0.9 / ±1.0	±0.86 / ±0.91
	-100 ~ 0°C	±0.3 / ±0.3	±0.28 / ±0.28
	0 ~ 400°C	±0.2 / ±0.2	±0.15 / ±0.17
WRe3-25	0 ~ 2000°C	±0.6 / ±0.7	±0.56 / ±0.66
	2000 ~ 2315°C	±0.9 / ±1.1	±0.84 / ±1.02
WRe5-26	0 ~ 1000°C	±0.5 / ±0.5	±0.41 / ±0.43
	1000 ~ 2000°C	±0.6 / ±0.7	±0.58 / ±0.70
	2000 ~ 2315°C	±0.9 / ±1.1	±0.90 / ±1.07
L	-200 ~ -100°C	±0.4 / ±0.4	±0.34 / ±0.40
	-100 ~ 400°C	±0.2 / ±0.3	±0.20 / ±0.24
	400 ~ 900°C	±0.2 / ±0.2	±0.13 / ±0.18
EA-2	-50 ~ 0°C	±0.4 / ±0.4	±0.34 / ±0.39
	0 ~ 100°C	±0.3 / ±0.4	±0.28 / ±0.34
	100 ~ 800°C	±0.3 / ±0.3	±0.25 / ±0.30

Complies with ITS-90. Based on mV MPE. Excludes sensor and compensating wire errors. Reference junction at 0°C. Add 0.2°C error for cold-junction compensation. Ambient 20±5°C, one-year accuracy.

RTD Accuracy (Source & Measure)

Type	Range	BL986 Source MPE 0.01 / 0.02	BL986 Measure MPE 0.01 / 0.02	BL987 Source MPE 0.01 / 0.02	BL987 Measure MPE 0.01 / 0.02
Pt10 (385)	-200 ~ 200°C	±0.50 / ±0.58	±0.50 / ±0.58	±0.50 / ±0.58	±0.50 / ±0.58
	200 ~ 600°C	±0.65 / ±0.72	±0.65 / ±0.72	±0.65 / ±0.72	±0.65 / ±0.72
	600 ~ 850°C	±0.73 / ±0.84	±0.73 / ±0.84	±0.73 / ±0.84	±0.73 / ±0.84
Pt50 (385)	-200 ~ 200°C	±0.15 / ±0.18	±0.15 / ±0.18	±0.15 / ±0.18	±0.15 / ±0.18
	200 ~ 600°C	±0.19 / ±0.26	±0.19 / ±0.26	±0.19 / ±0.26	±0.19 / ±0.26
	600 ~ 850°C	±0.25 / ±0.33	±0.25 / ±0.33	±0.25 / ±0.33	±0.25 / ±0.33
Pt100 (385)	-200 ~ 200°C	±0.11 / ±0.13	±0.11 / ±0.13	±0.11 / ±0.13	±0.11 / ±0.13
	200 ~ 600°C	±0.15 / ±0.19	±0.15 / ±0.19	±0.15 / ±0.19	±0.15 / ±0.19
	600 ~ 850°C	±0.18 / ±0.25	±0.18 / ±0.25	±0.18 / ±0.25	±0.18 / ±0.25
Pt200 (385)	-200 ~ 200°C	±0.16 / ±0.19	±0.16 / ±0.19	±0.16 / ±0.19	±0.16 / ±0.19
	200 ~ 300°C	±0.17 / ±0.22	±0.17 / ±0.22	±0.17 / ±0.22	±0.17 / ±0.22
	300 ~ 600°C	±0.20 / ±0.27	±0.20 / ±0.27	±0.20 / ±0.27	±0.20 / ±0.27
	600 ~ 850°C	±0.30 / ±0.39	±0.31 / ±0.41	±0.30 / ±0.39	±0.31 / ±0.41
Pt400 (385)	-200 ~ 0°C	±0.09 / ±0.11	±0.09 / ±0.11	±0.09 / ±0.11	±0.09 / ±0.11
	0 ~ 200°C	±0.13 / ±0.15	±0.13 / ±0.16	±0.13 / ±0.15	±0.13 / ±0.16
	200 ~ 600°C	±0.16 / ±0.23	±0.17 / ±0.24	±0.16 / ±0.23	±0.17 / ±0.24
	600 ~ 850°C	±0.18 / ±0.28	±0.18 / ±0.28	±0.18 / ±0.28	±0.18 / ±0.28
Pt500 (385)	-200 ~ 200°C	±0.10 / ±0.12	±0.11 / ±0.13	±0.10 / ±0.12	±0.11 / ±0.13
	200 ~ 600°C	±0.16 / ±0.22	±0.16 / ±0.23	±0.16 / ±0.22	±0.16 / ±0.23
	600 ~ 850°C	±0.21 / ±0.29	±0.21 / ±0.29	±0.21 / ±0.29	±0.21 / ±0.29
Pt1000 (385)	-200 ~ 200°C	±0.06 / ±0.09	±0.06 / ±0.10	±0.06 / ±0.09	±0.06 / ±0.10
	200 ~ 600°C	±0.10 / ±0.17	±0.10 / ±0.17	±0.10 / ±0.17	±0.10 / ±0.17
	600 ~ 850°C	±0.13 / ±0.23	±0.13 / ±0.23	±0.13 / ±0.23	±0.13 / ±0.23
Cu50	-50 ~ 150°C	±0.13 / ±0.15	±0.13 / ±0.15	±0.13 / ±0.15	±0.13 / ±0.15
Cu100	-50 ~ 150°C	±0.09 / ±0.13	±0.09 / ±0.13	±0.09 / ±0.13	±0.09 / ±0.13
BA1	-200 ~ 0°C	±0.13 / ±0.15	±0.18 / ±0.24	±0.13 / ±0.15	±0.18 / ±0.24
	0 ~ 400°C	±0.18 / ±0.24	±0.18 / ±0.24	±0.18 / ±0.24	±0.18 / ±0.24
	400 ~ 650°C	±0.21 / ±0.29	±0.21 / ±0.29	±0.21 / ±0.29	±0.21 / ±0.29
BA2	-200 ~ 200°C	±0.10 / ±0.12	±0.10 / ±0.12	±0.10 / ±0.12	±0.10 / ±0.12
	200 ~ 650°C	±0.15 / ±0.19	±0.15 / ±0.19	±0.15 / ±0.19	±0.15 / ±0.19
BA3	200 ~ 650°C	±0.10 / ±0.13	±0.07 / ±0.10	±0.10 / ±0.13	±0.07 / ±0.10
G	-50 ~ 100°C	±0.15 / ±0.18	±0.13 / ±0.17	±0.15 / ±0.18	±0.13 / ±0.17

Complies with ITS-90. Based on resistance MPE. Ambient 20±5°C, one-year accuracy. RTD types: Pt10, Pt50, Pt100, Pt200, Pt400, Pt500, Pt1000, Cu50, Cu100, BA1, BA2, BA3, G.

General Specifications

Parameter	Specification
Operating Temperature	-10 ~ 50°C
Storage Temperature	-20 ~ 60°C
Relative Humidity	< 90% RH (non-condensing)
Atmospheric Pressure	86 ~ 106 kPa
Display	3.5" high-resolution TFT color screen
Dimensions (L×W×H)	197 × 103 × 55 mm
Weight	Approx. 0.8 kg
Power Supply	Rechargeable Li-ion battery pack / 12 VDC adapter
Battery Life	Typical 16 hours (24V loop consumes more)
Charging Time	< 5 hours via 12 VDC adapter
Power Consumption	Typical 2 W, max 3 W
Measurement Ports	Standard φ4 mm electrical jacks
TC Connection	Miniature TC connector
Power Jack	DC 5.5 × 2.1 mm
Pressure Module Port	7-pin circular LEMO connector
Communication	Optional Bluetooth (≥10 m) + USB wired
Real-time Clock	2000 ~ 2099, 24-hour format
Temp. Coefficient	1×10^{-6} FS / °C (typical)
Time Drift	3×10^{-5} FS / year (typical)

Scope of Delivery

- BL986 / BL987 Multi-function Process Calibrator
- 100- 240V external power adapter (1pc)
- Test leads with crocodile clips — 3 sets (6pcs)
- 24V loop power connection cable (1pc)
- PT100 probe with 1.5 m cable, -50°C ~ 200°C (1pc)
- USB 2.0 to 5-pin connection cable (1pc)
- K-type thermocouple cold suction (BL987 only)
- HART communications cable (HART version only)
- Factory test report
- Carrying case

Ordering Information

Model	Description
BL986-01	Standard, 0.01 accuracy class
BL986-02	Standard, 0.02 accuracy class
BL986-H-01	HART version, 0.01 accuracy class
BL986-H-02	HART version, 0.02 accuracy class
BL987-XS-01	Economy (no current/freq/pulse), 0.01 class
BL987-XS-02	Economy (no current/freq/pulse), 0.02 class
BL987-S-01	Standard multi-function, 0.01 accuracy class
BL987-S-02	Standard multi-function, 0.02 accuracy class
BL987-01	Documenting, 0.01 accuracy class
BL987-02	Documenting, 0.02 accuracy class
BL987-H-01	HART + Documenting, 0.01 accuracy class
BL987-H-02	HART + Documenting, 0.02 accuracy class

Optional Accessories & Services

- ISO/IEC 17025 calibration certificate
- Cold junction compensation kit (8pcs/set)
- Intelligent pressure module with connection cable
- ISO/IEC 17025 calibration certificate for pressure module