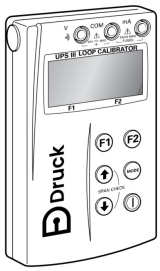
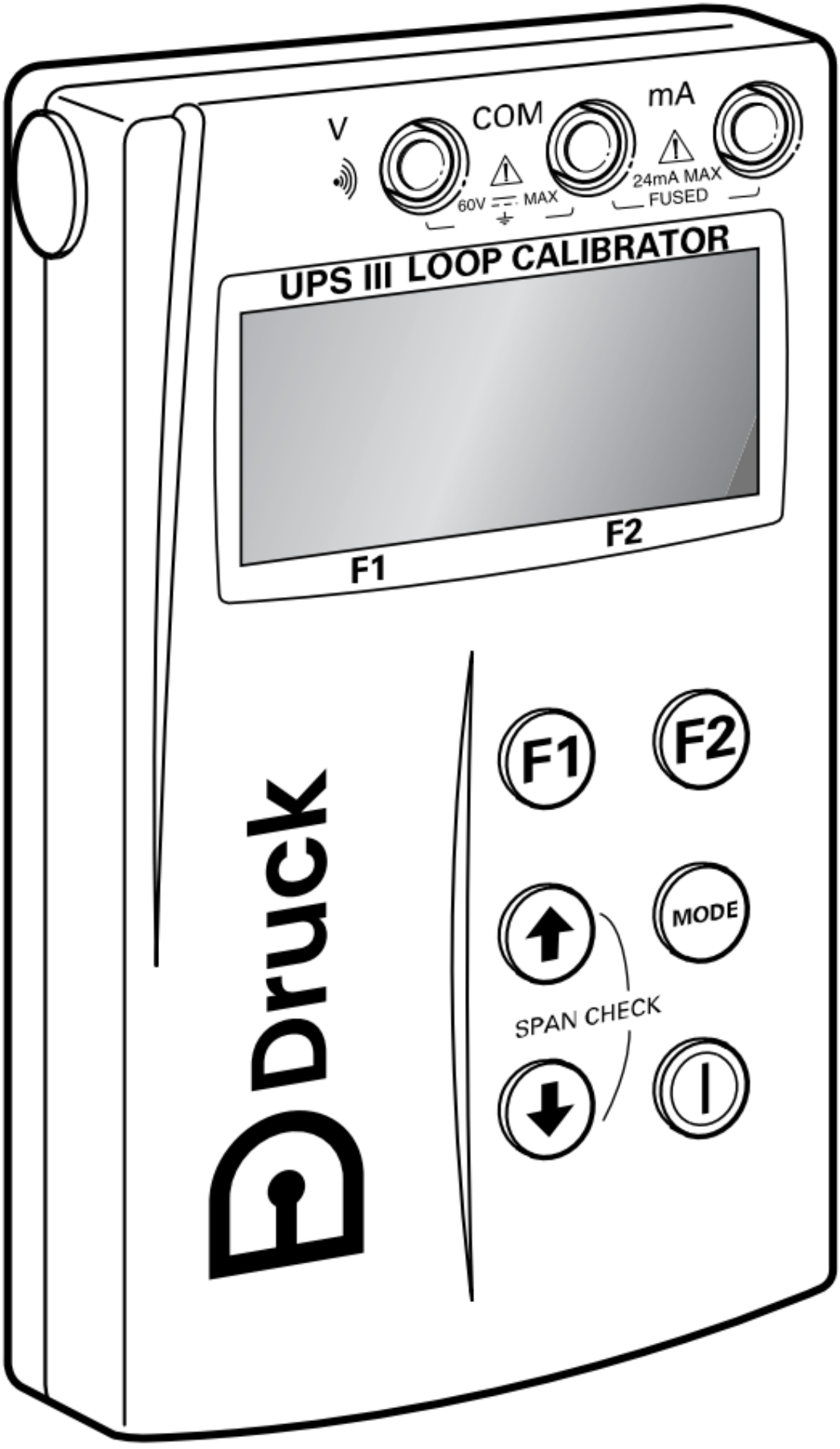


Druck UPS-III Loop Calibrator Instruction Manual

Druck UPS-III Loop Calibrator


V
COM
mA
60V MAX
24mA MAX
FUSED
UPS III LOOP CALIBRATOR
F1
F2
Druck
F1
F2
MODE
SPAN CHECK

Contents

Introduction

The Druck UPS-III Intrinsically Safe Loop Calibrator can supply power (source mode) and produce readings (measure mode) to perform field calibrations on 2-wire devices. The set-up menu enables the user to “source” or “measure” in either voltage or current and to perform continuity tests. These instructions detail the requirements and operation of the UPS-III Intrinsically Safe Loop Calibrator in a hazardous area. Read the whole publication before starting.

Safety

The UPS-III has been designed to be safe when operated using the procedures detailed in this manual. Do not use this equipment for any other purpose than that stated, the protection provided by the equipment may be impaired.
Before installing and using the UPS-III, read and understand all the related data. This includes: all local safety procedures and installation standards, and this document.
Before starting an operation or procedure, use only approved engineers who have the necessary skills (if necessary, with qualifications from an approved training establishment). Follow good engineering practice at all times.

Repair

Do not do repairs to this equipment. Return the equipment to the manufacturer or an approved service agent.

Symbols

Symbol	Description
	This equipment meets the requirements of all relevant European safety directives. The equipment ca rries the CE mark.
	This symbol, on the equipment, indicates a warning and that the user should refer to the user manual. Ce symbole, sur l'instrument, indique que l'utilisateur doit consulter le manuel d'utilisation. Ce symbol e, dans le manuel, indique une situation dangereuse.
	Do not dispose of this product as household waste. Use an approved organization that collects and/o r recycles waste electrical and electronic equipment. For more information, contact one of these: – Our customer service department: Druck.com/essential – Your local government office.

Power Supply

The power supply for this loop calibrator can be the internal nonrechargeable batteries or an external universal power supply unit, Druck accessory **IOPSU-1.**

Batteries

 **CAUTION Do not mix cell types. Do not mix old and new cells.**
Remove cells from the unit when placed in storage for an extended period of time. If a cell has leaked return the unit to an approved Druck Service Centre.

Use only 4 x AA LR6 manganese alkaline primary cells

Guide to Supply and Input/Output

Table 1: Key to Entity Parameter Table Conditions

Condition	Description
❶&❷	Current measurement between mA and COM with external 24V. This mode of operation inserts the apparatus in the current loop by breaking into the circuit and connecting mA (positive) and COM (negative) into the circuit.
❸	Current measurement between mA (24V) and mA with internal 24V. Terminal mA (24V) provides the source of power to supply remote sensor. Special condition for safe use – remote sensor MUST be isolated from all other sources of power.
❹	Voltage measurement between V and COM.
❺	Continuity measurement between V and COM. Special condition for safe use – remote sensor MUST be isolated from all other sources of power.
❻	Current generation between mA and COM with external 24V. This mode of operation inserts the apparatus in the current loop by breaking into the circuit and connecting mA (positive) and COM (negative) into the circuit.
❼	Current generation between mA (24V) and mA with internal 24V. Terminal mA (24V) provides the source of power to supply the remote sensor. Special condition for safe use – remote sensor MUST be isolated from all other sources of power.

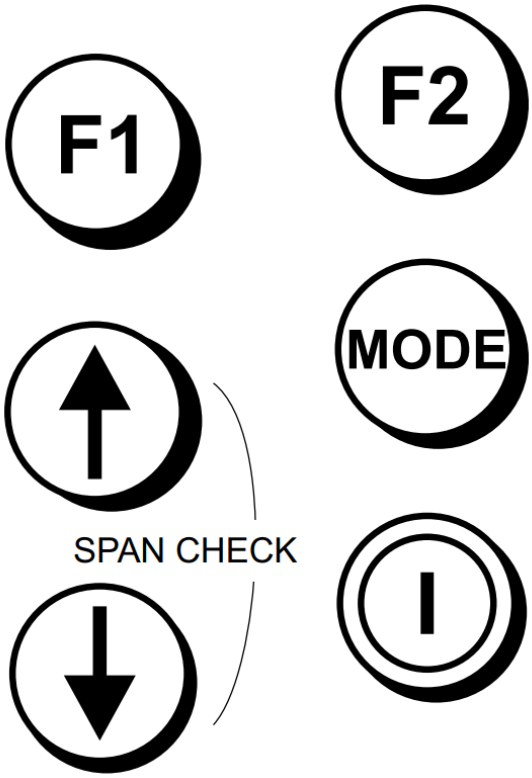
Operation

Keys

The  key switches the loop calibrator on and off. Press and hold for 2 seconds.

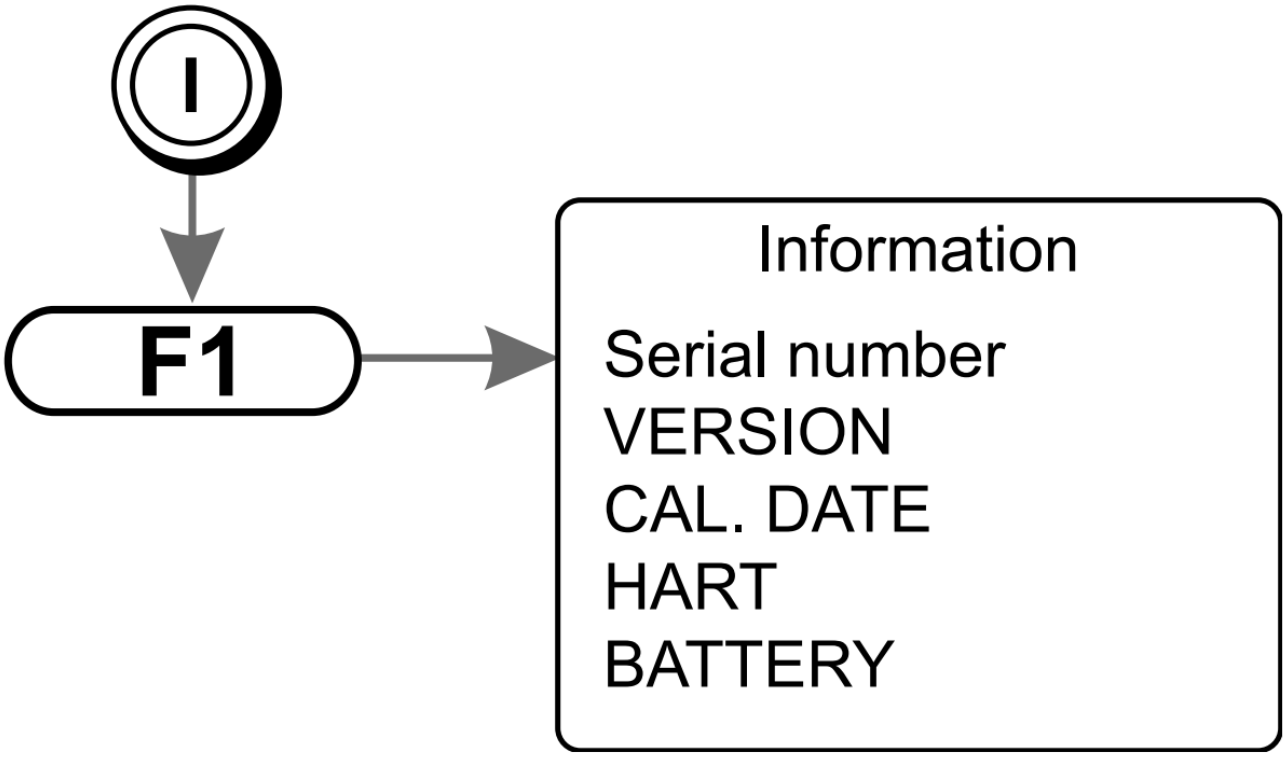
The  key changes the measure or source operating mode. Pressing the  keys makes menu selections, sets numerical values and controls step and ramp functions (up/down).

The  select advanced functions shown on the bottom of the display. When no key is pressed for 10 minutes, the loop calibrator times out and switches off. Todisable this automatic time out, select Aut power down in the set-up menu.

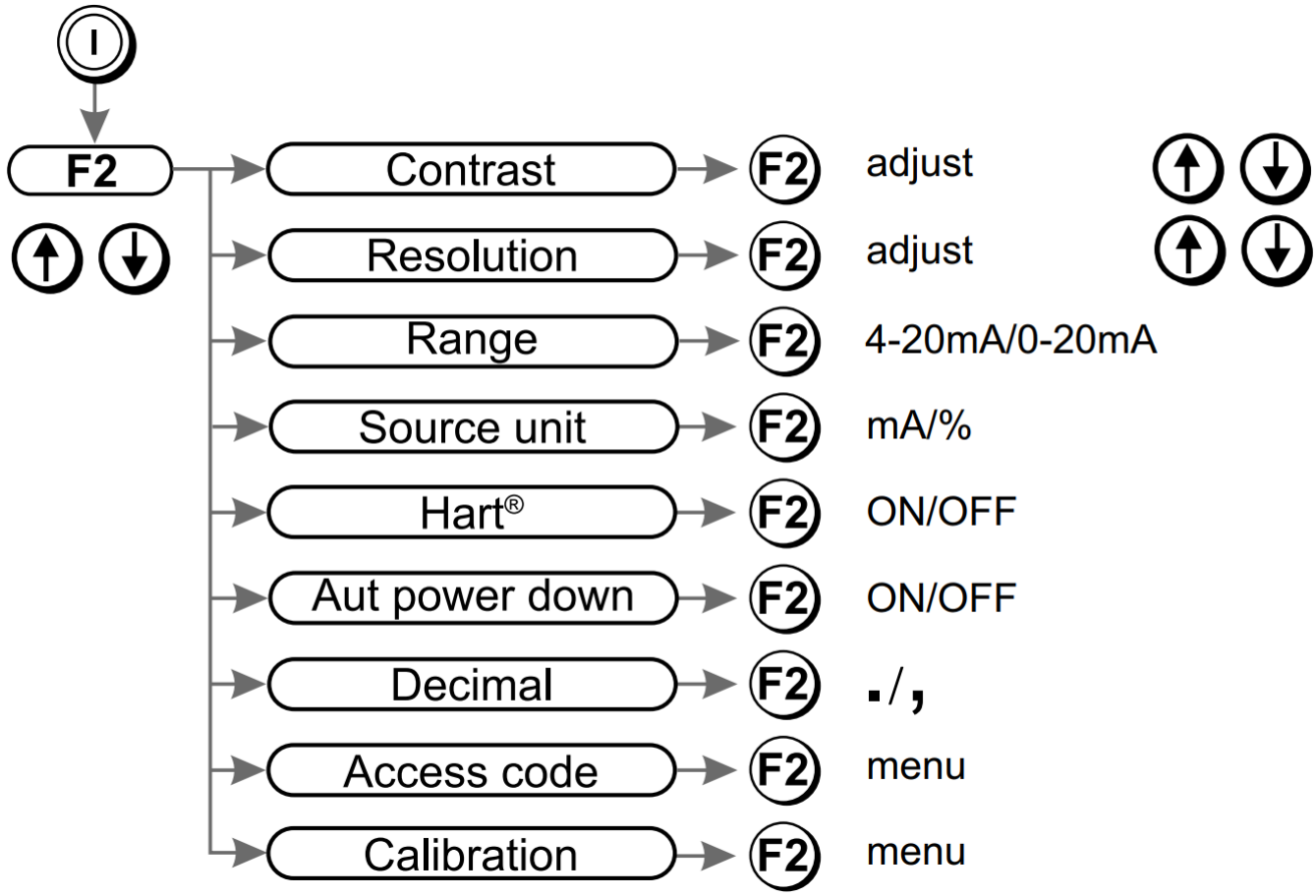


Operating Modes

Pressing I switches the instrument on and the display shows the start-up sequence. Pressing F1, at this time, the display shows the information screen:



Pressing F2, at this time, the display shows the set-up screen:



The calibrator can be used in two modes measure or source.

Measure Mode

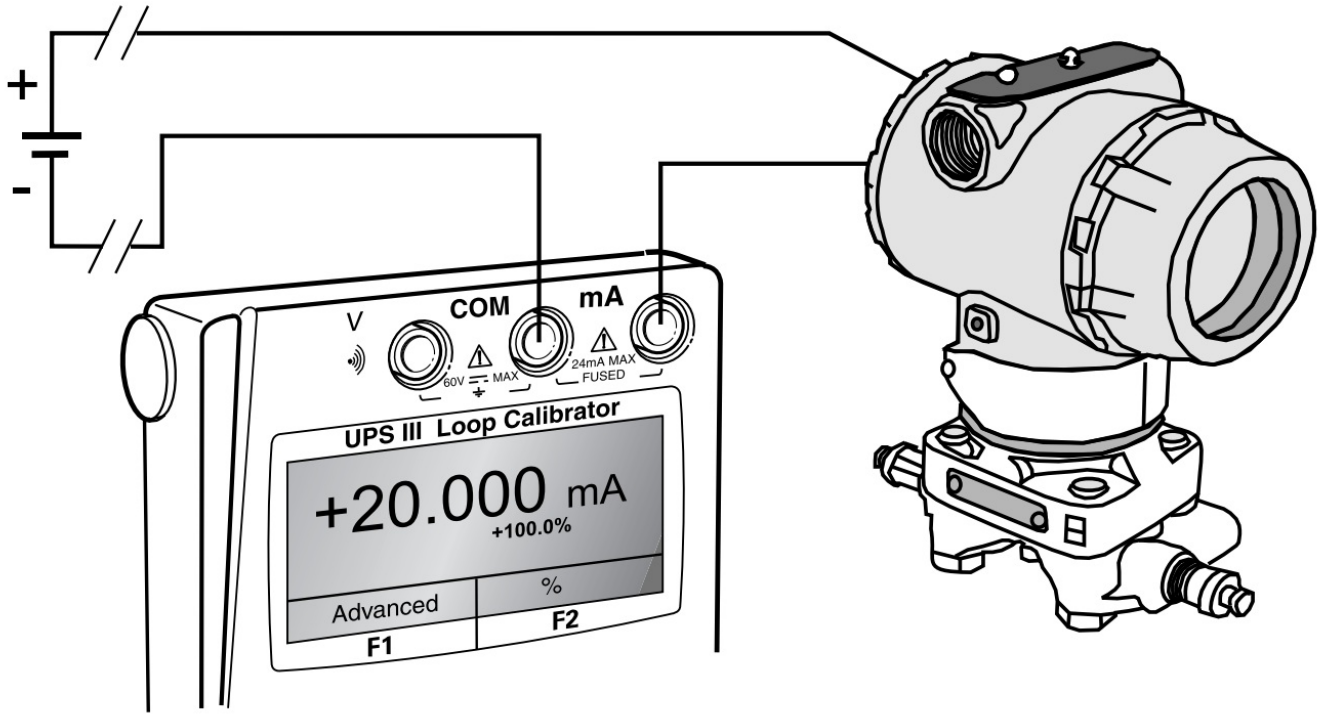
The display shows the measured value; depending on the settings made in set-up and advanced settings:

When measuring current pressing F1 enables linear or flow, pressing F2 enables mA or % (value of 4 to 20 mA or 0 to 20 mA).

When measuring voltage pressing F2 changes the resolution between 0.00 V and 0.000 V.

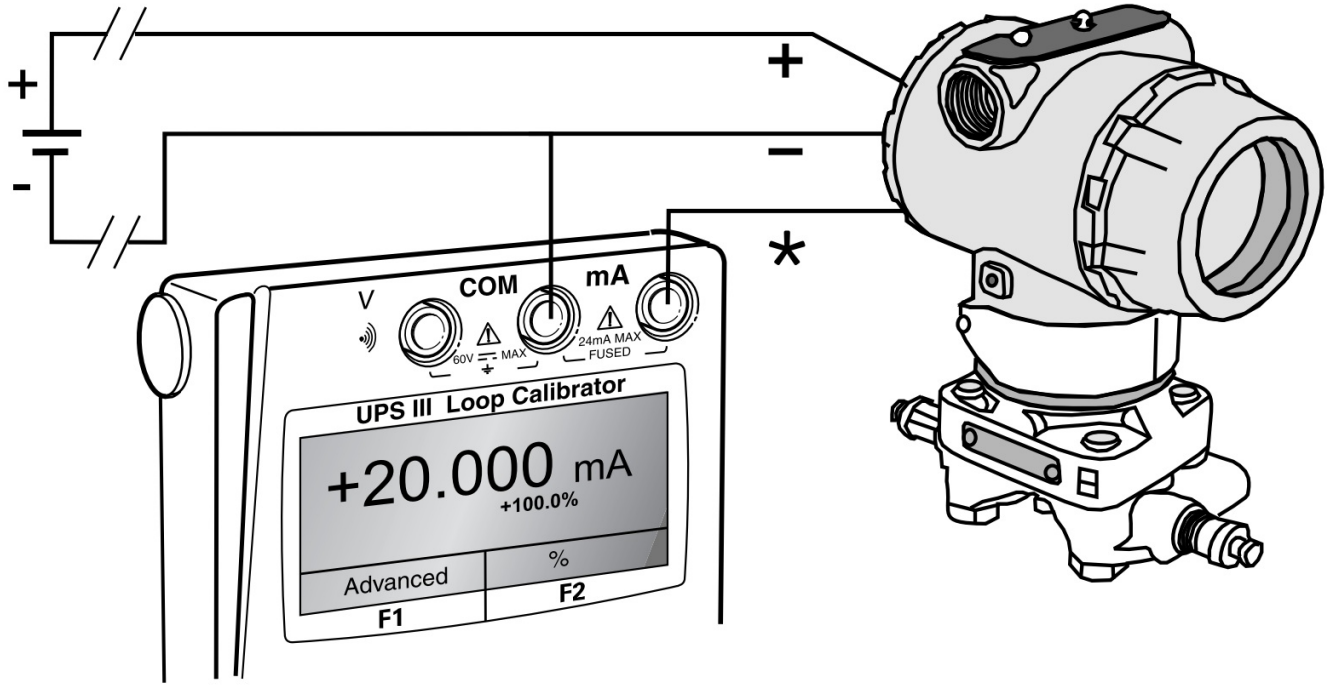
To measure continuity the displays shows an open or closed switch symbol with an audible signal on switch closure. Connect the calibrator to the device to be tested:

Measure mA ❶
Press the **mode** key and select [Measure mA]. An external power supply supplies a maximum of 60 V for the loop. The calibrator measures the current of the loop.



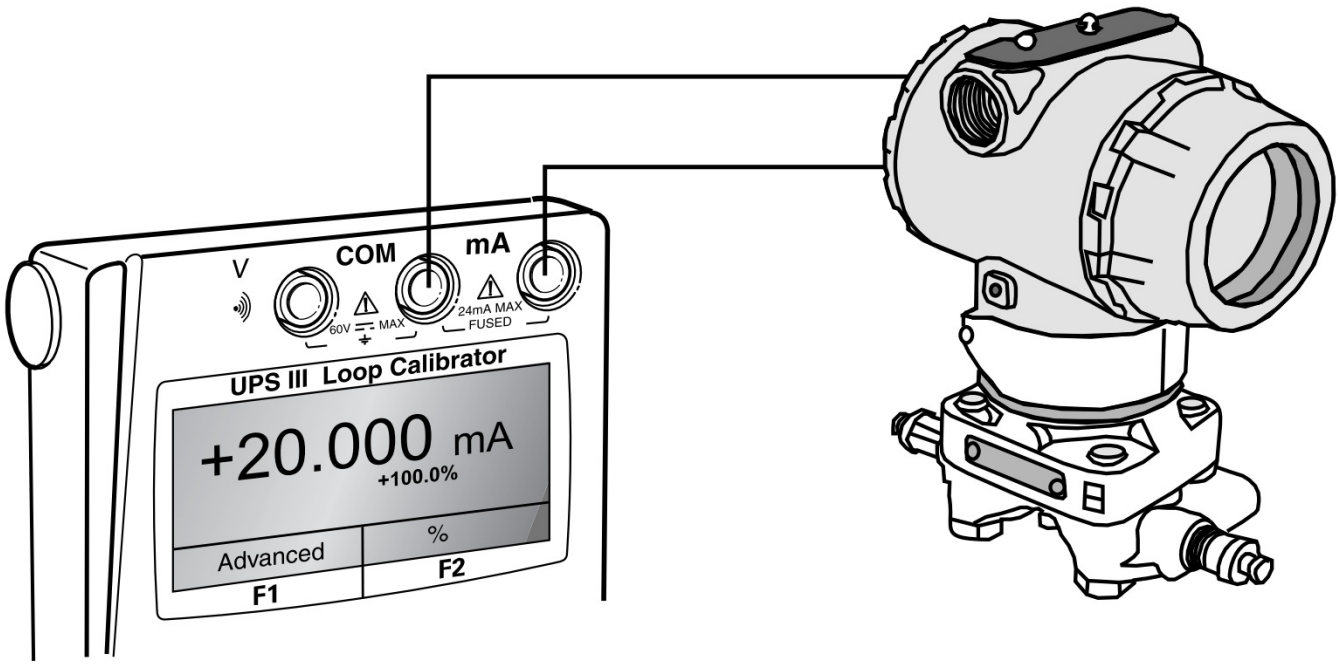
Measure mA ❷

Closed loop current measurement from transmitter test terminal.



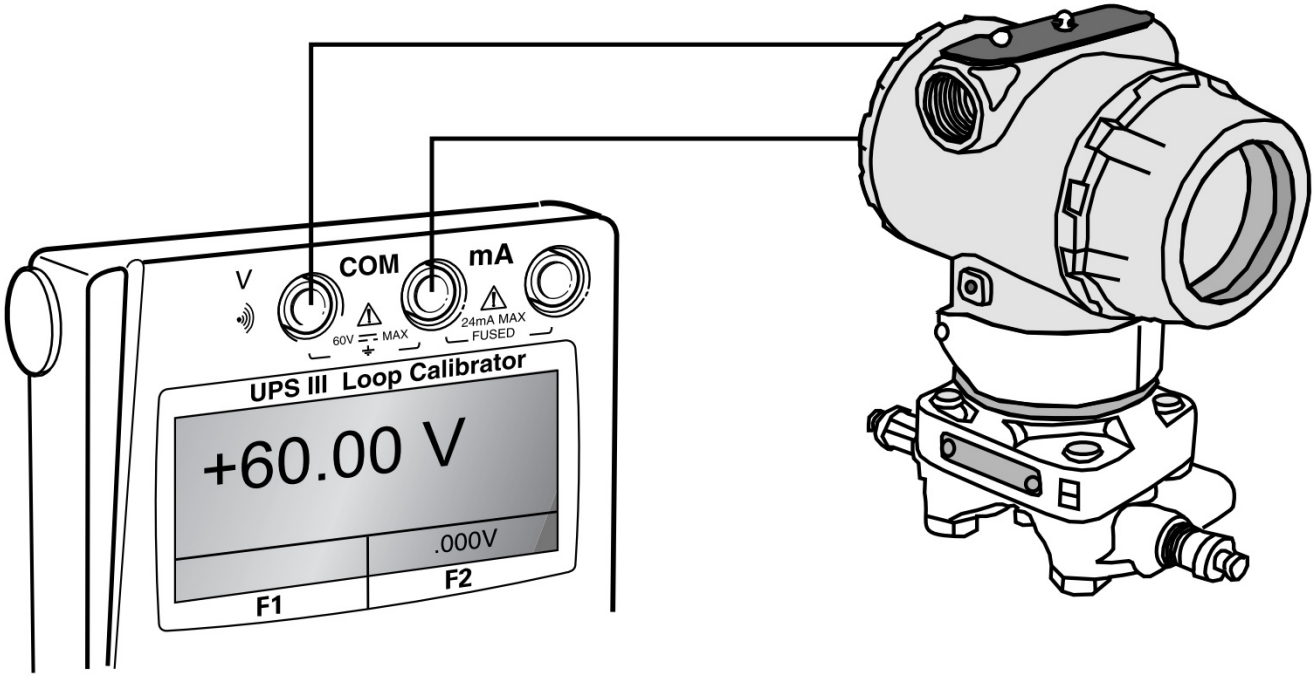
Measure mA with 24V ❸

Press mode key and select [Measure mA and 24V]. The calibrator supplies 24 V (maximum) for the loop, maximum 24 mA.



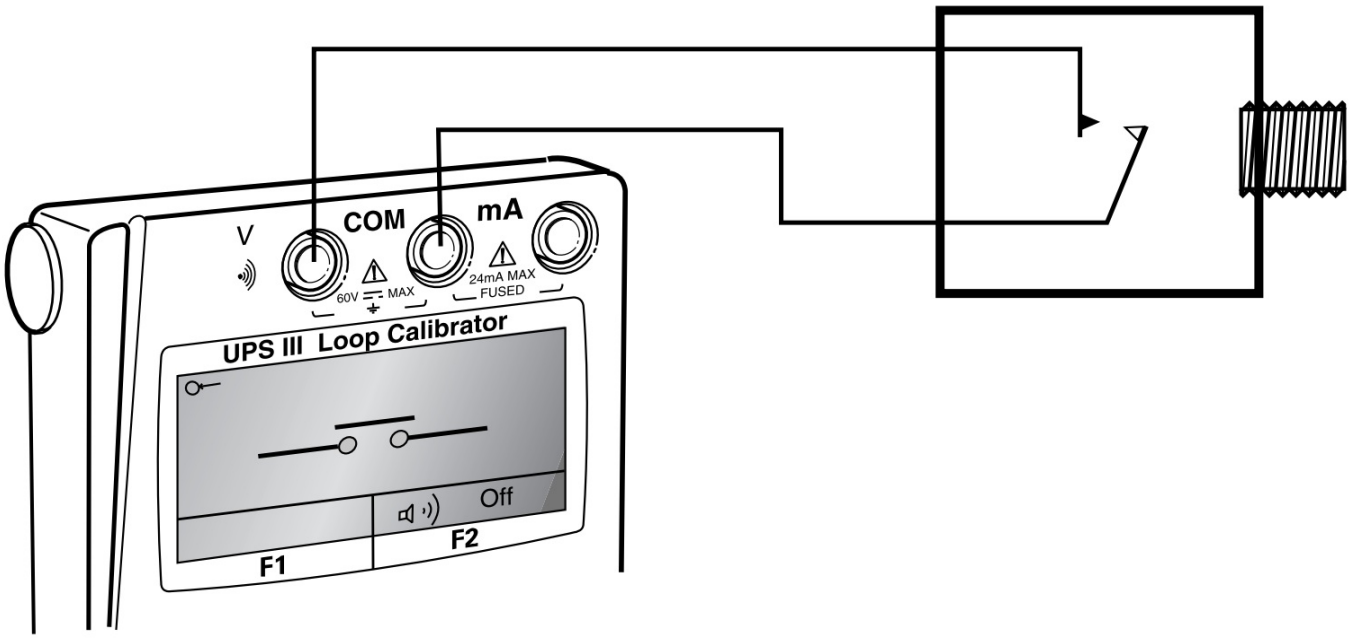
Measure Volts ❹

Press mode key and select [Measure Volts], measure range 60 V, maximum impedance 1 Mohm.



Continuity Test ❺

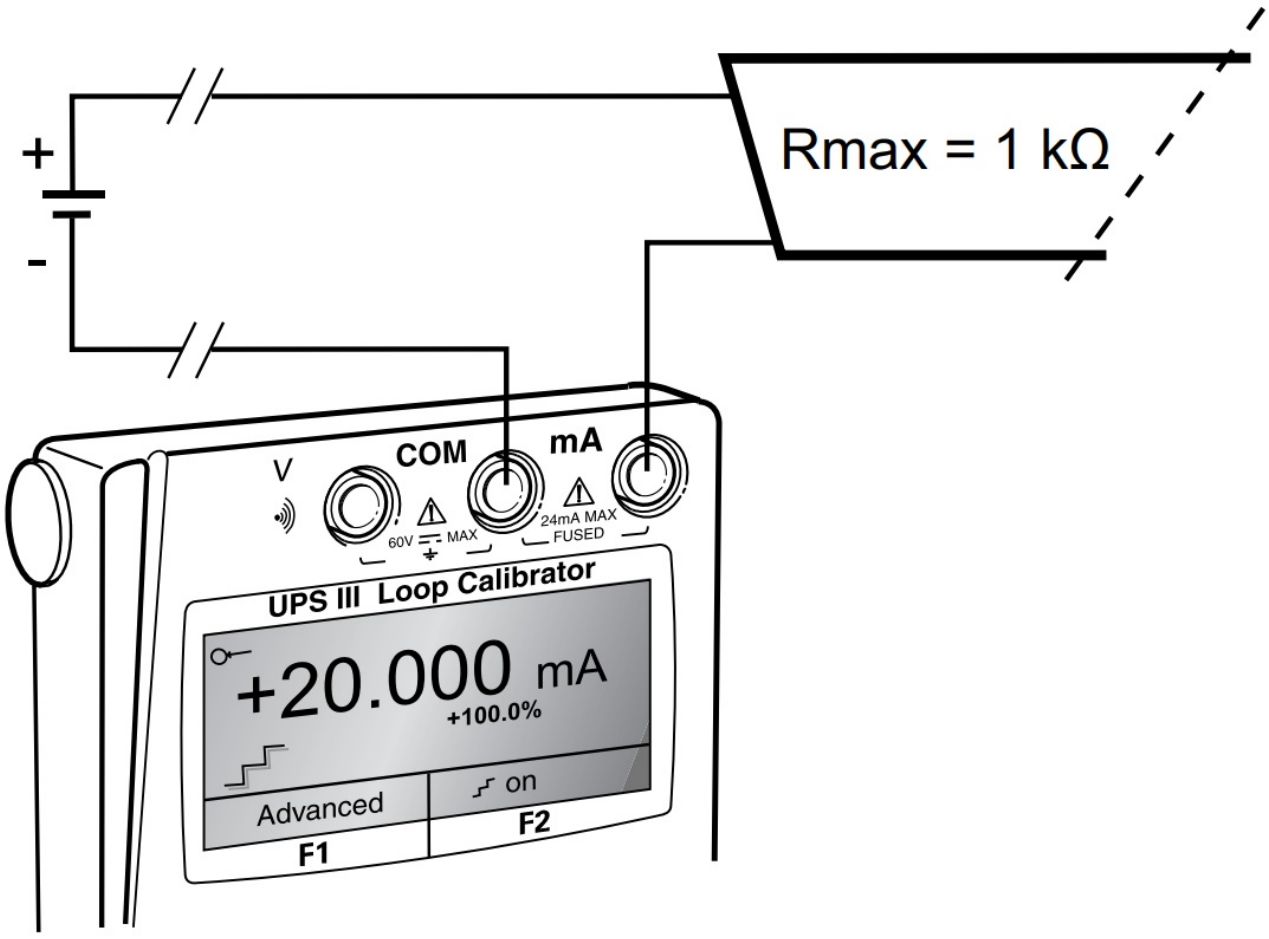
Press **mode** key and select [Continuity Test]. Pressing switches the audible signal on/off.



Source Mode

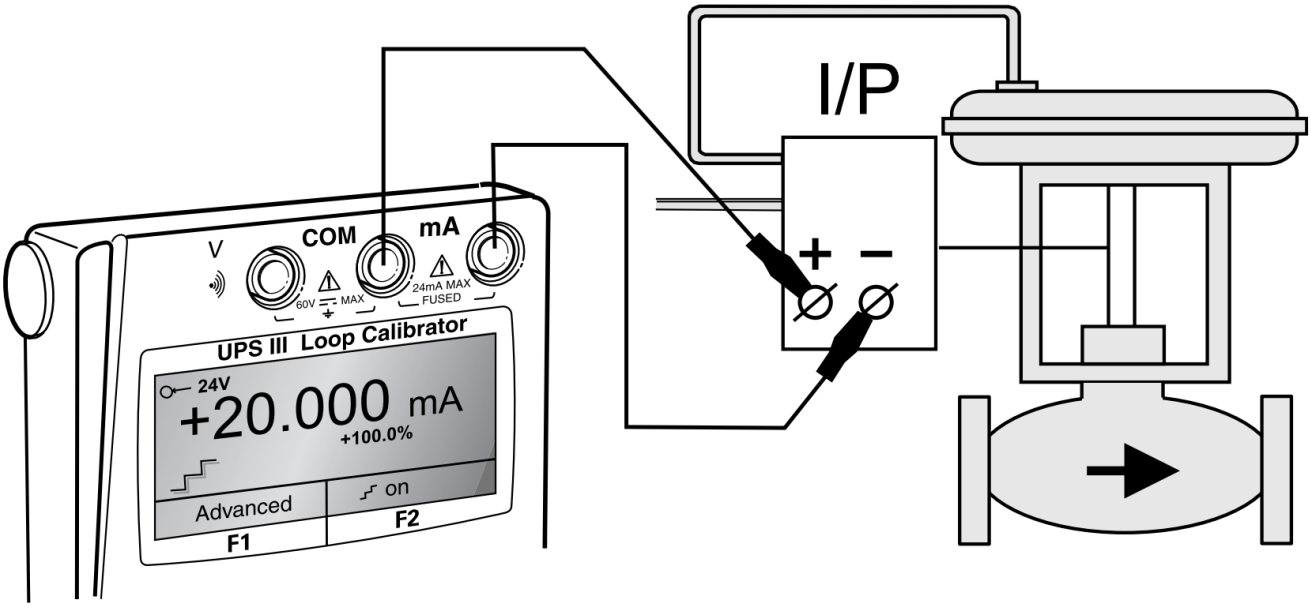
The display shows the source value in mA or % value of 4 to 20 mA or 0 to 20 mA, linear or flow depending on the settings made in set-up and advanced settings.

Source mA ❻
Press mode key and select [Source mA]. The calibrator supplies maximum output of: 24 mA; Vmax = 60 V; receiver inputRmax = 1 kΩ.



Source mA with 24V ❼

Press **mode** key and select [Source mA and 24V]. The calibrator supplies loop power of: 24 V and 24 mA.



Advanced Options in a Source Mode

Press MODE the key and select mA Source or mA Source & 24V.

Use ↑ ↓ and F2 (Enter) to select the function.

Press F1 the key (Advanced) and the display shows:

- ‘Linear’ simulates linear transmitters.
- ‘Flow’ simulates flow transmitters.
- ‘Valve’ simulates valve control signals.

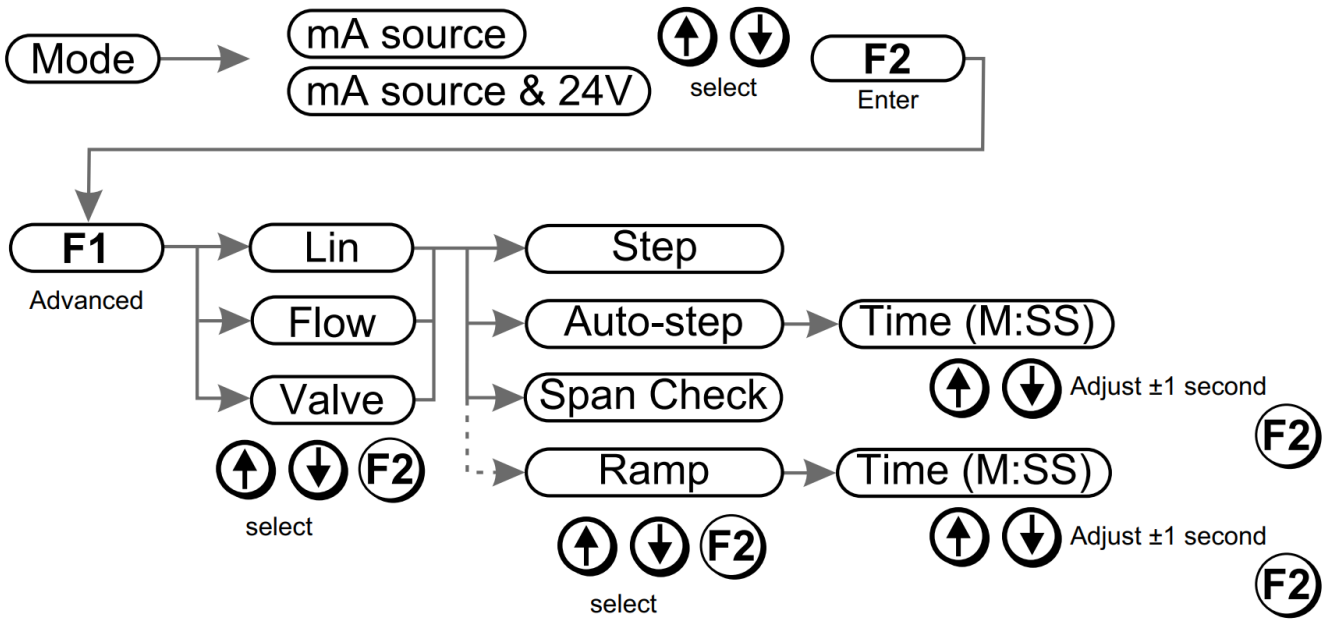
Use ↑ ↓ and F2 (Enter) to select the Advanced option:

Table 2: Advanced Options

Option	Description
Step	25% steps for linear and flow – fixed values for valve.
Auto-step	The same as step with a timed step interval.
Span Check	Step between 4 (or 0) mA and 20 mA.
Ramp	Automatic ramp between 4 (or 0) mA and 20 mA.

Note: Ramp function not available for valve selection.

Use F1 to quit. The display returns to the selected source mode with the advanced setting available.



Example Operation

Press the F2 key to switch the advanced setting on and off:

e.g.  on or off

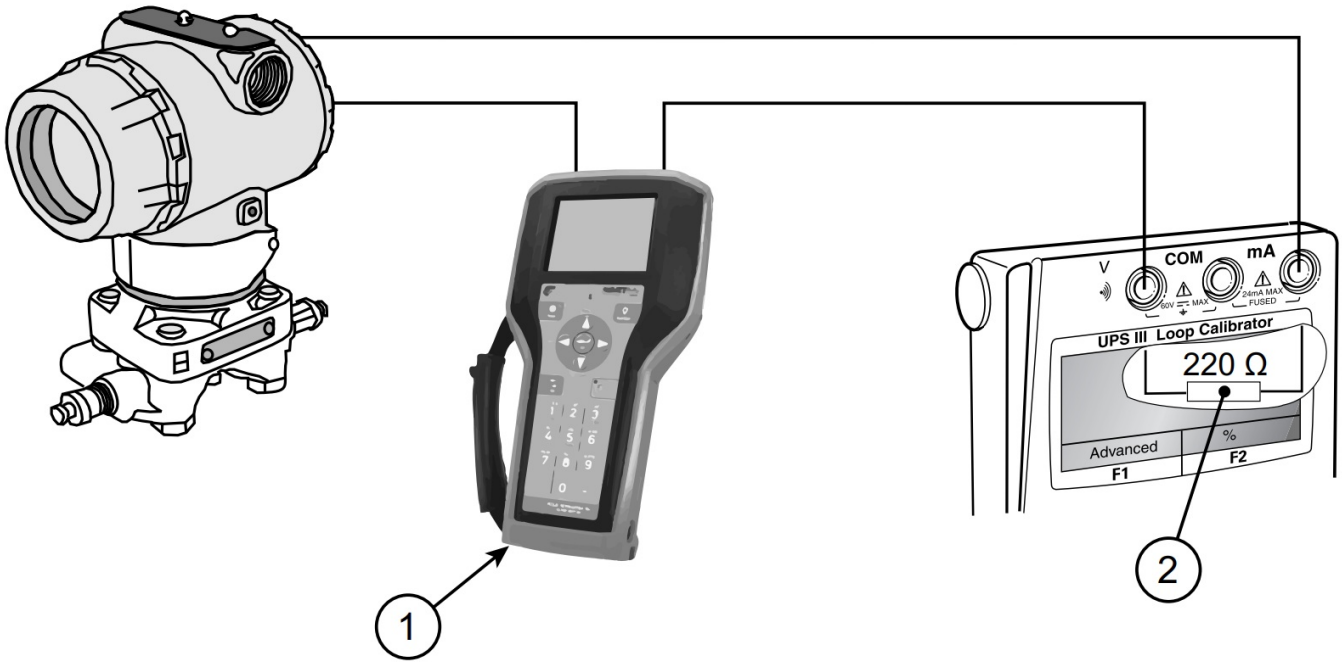
Press  or  to:

a. step the output up or down.
b. step the span check maximum or minimum.
c. start the “ramp”.

Press  then  to start:
a. continuous auto-step.
or
b. continuous ramp cycle.

Hart® Application

This application allows mA measure and source modes to be used through the Hart® communicator.



1. Hart® communicator.
2. UPS-III menu selectable 220 Ω loop resistor

Maintenance

- Return the loop calibrator to an authorized repair center for any repairs, it cannot be repaired on-site.
- To keep the loop calibrator accurate a calibration check should be carried out once per year.

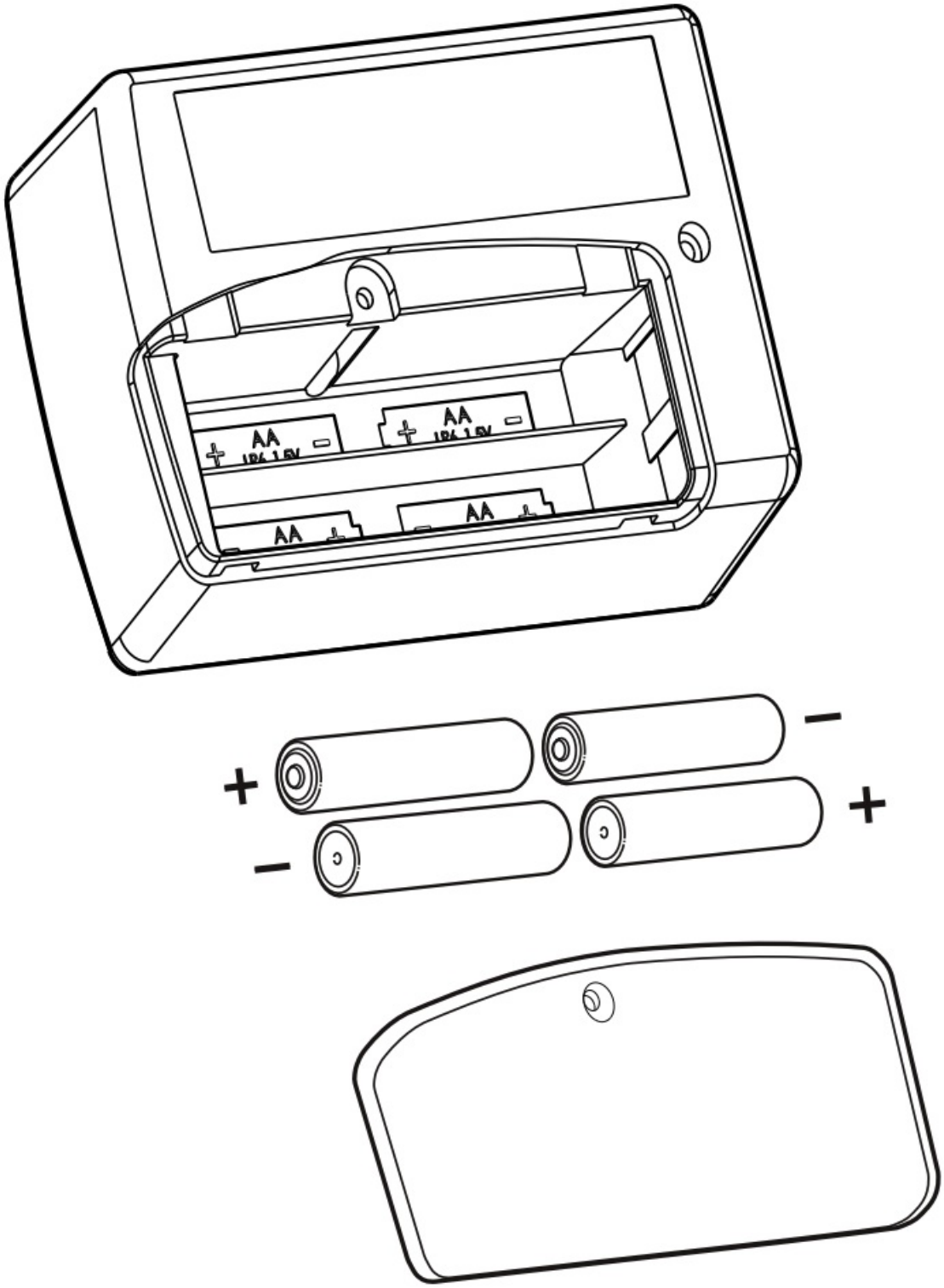
Cleaning

- Clean the loop calibrator case with a moist, lint-free cloth and weak detergent.

Battery Replacement


This symbol indicates that the batteries are low, replace observing polarity shown below.

Unscrew and remove the securing screw from the battery panel. Replace the batteries, check the polarity of the batteries. Refit and secure the battery panel.



Remove batteries from the loop calibrator immediately when discharged and before storage.
Dispose of batteries in accordance with local regulations and battery manufacturers' instructions.
When storing and transporting batteries make sure they cannot be short circuited.

Calibration

The instrument is supplied by the manufacturer, complete with calibration certificate(s).
A calibration period of 12 months is recommended. The actual calibration interval depends on instrument usage and the total measurement uncertainty acceptable for the specified application.

The UPS-III is a very precise measuring instrument and the test equipment and conditions of test must be suitable for the type of work. The calibration check and calibration adjustment should be carried out in a controlled environment by a calibration technician*

The manufacturer offers a comprehensive and, if required, UKAS accredited calibration service.

Calibration Equipment

The following tables give the accuracy requirements for the calibration equipment and the UPS-III.
Calibration requires a stable temperature of 21° ± 1°C (70° ± 2°F).

UPS-III Measure Mode

Table 3: mA Measure

Applied mA	Permitted UPS-III Error (mA)	Calibrator Error (mA)
0	0.002	0
4	0.002	0.00014
12	0.002	0.00030
20	0.002	0.00046

Table 4: V Measure

Applied V	Permitted UPS-III Error (mV)	Calibrator Error (mV)
0	0.004	0.00040
20	0.004	0.00014
40	0.005	0.00064
50	0.005	0.00070

A calibration technician must have the necessary technical knowledge, documentation, special test equipment and tools to carry out the calibration work on this equipment.

UPS-III Source Mode

Table 5: mA Source

Applied mA	Permitted UPS-III Error (mA)	Calibrator Error (mA)
0	0.002	0
4	0.002	0.00012
12	0.002	0.00011
20	0.002	0.00015

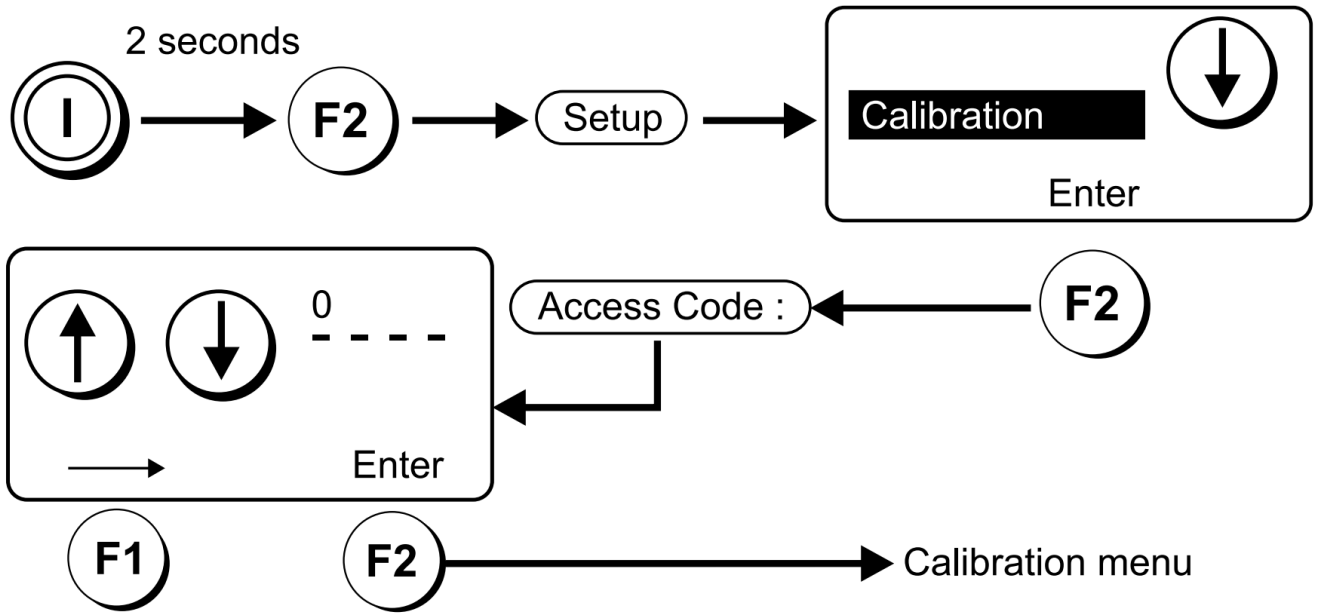
Calibration Check

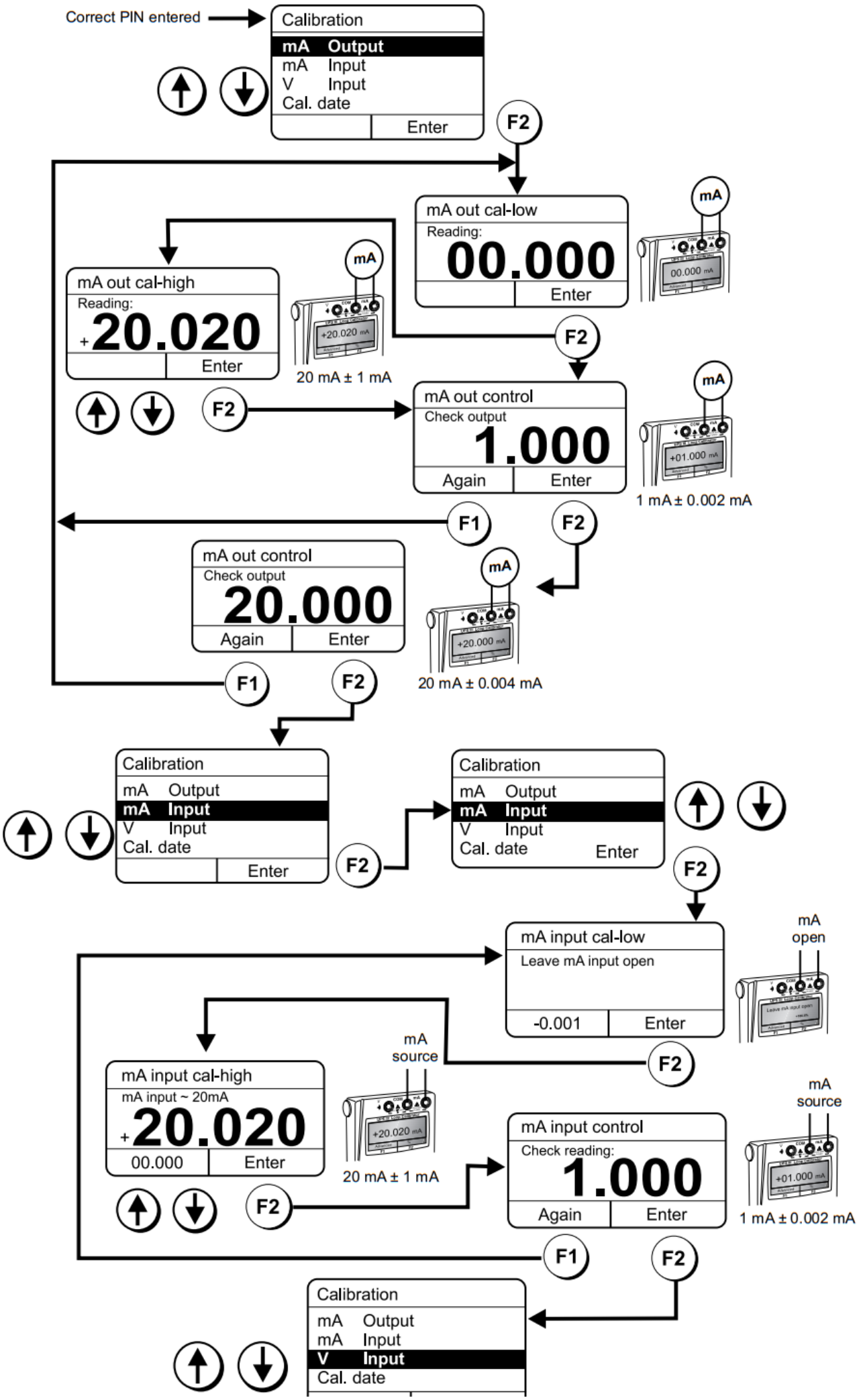
1. Connect the UPS-III to the electrical calibrator. Switch on the electrical calibrator and allow it to thermally stabilize.
2. Switch on the UPS-III and allow the instrument to thermally stabilize.
3. Set the UPS-III to mA measure, adjust the electrical calibrator to apply the first value in the Table 3. Record the reading of the UPS-III.
4. Repeat step 3 for all the values in the Table 3.
5. Compare the recorded values and the applied values if the difference is greater than the permitted error, the instrument requires a calibration adjustment.
6. Repeat this procedure for V measure (Table 4) and mA source (Table 5).

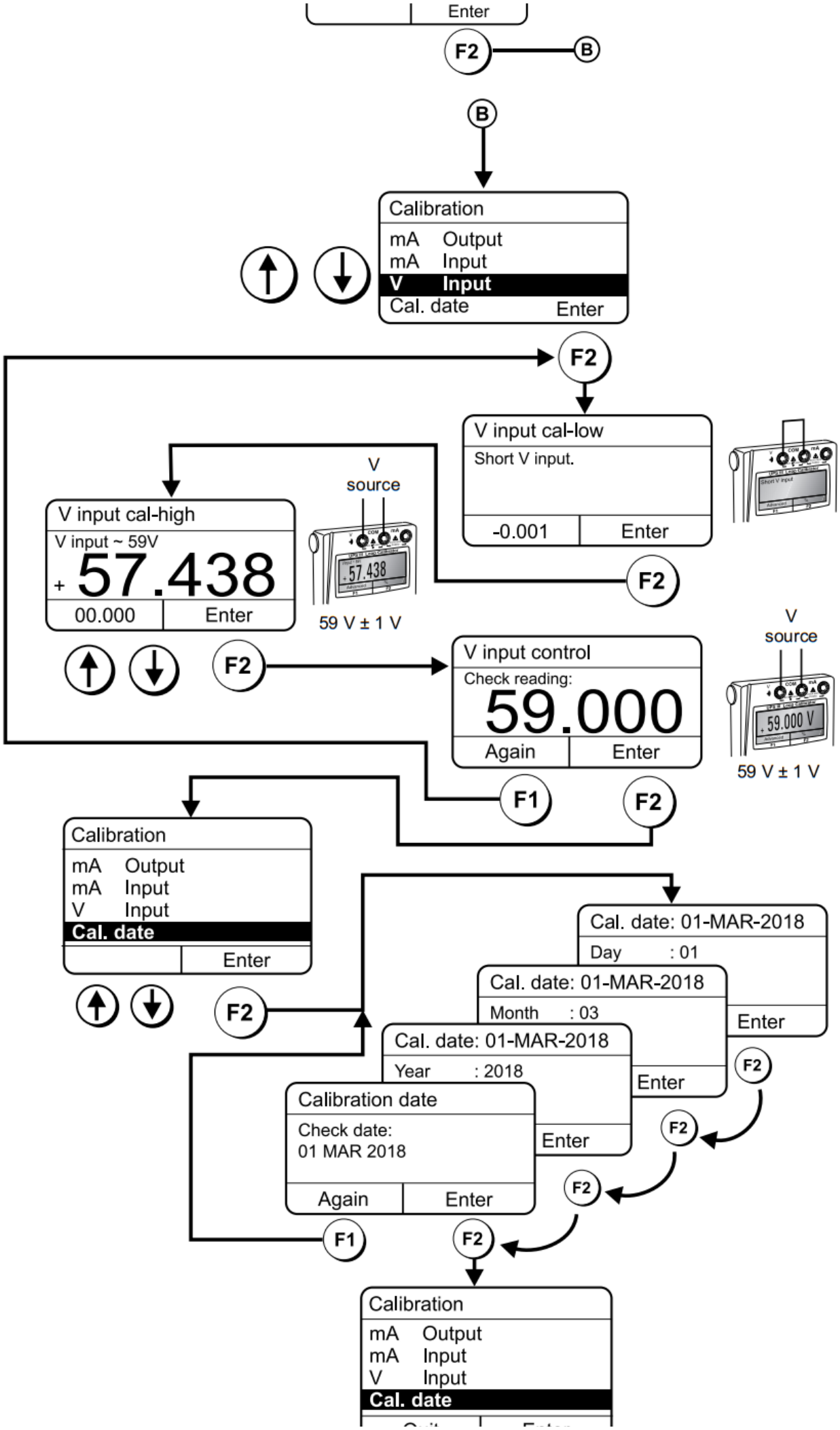
Calibration Adjustment

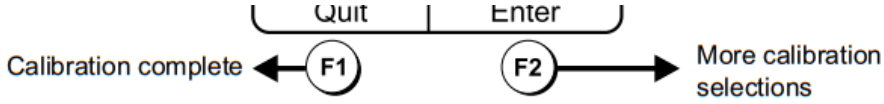
INFORMATION The UPS-III requires a two-point calibration on the V and mA range.

1. Connect the UPS-III to the electrical calibrator. Switch on the electrical calibrator and allow it to thermally stabilize.
2. Switch on the UPS-III and press F2, within two seconds to select Calibration. Enter the access code [9410 factory setting] and allow the instrument to thermally stabilize.
3. Select the parameter required for calibration. Use the display menu to select the calibration values. After a successful calibration enter the new calibration date




Correct PIN entered
Calibration
mA Output
mA Input
V Input
Cal. date
Enter
F2
mA out cal-low
Reading:
00.000
Enter
mA out cal-high
Reading:
+20.020
Enter
20 mA ± 1 mA
mA out control
Check output
1.000
Again
Enter
1 mA ± 0.002 mA
F1
mA out control
Check output
20.000
Again
Enter
20 mA ± 0.004 mA
Calibration
mA Output
mA Input
V Input
Cal. date
Enter
mA input cal-low
Leave mA input open
-0.001
Enter
mA open
mA input cal-high
mA input ~ 20mA
+20.020
00.000
Enter
mA source
20 mA ± 1 mA
mA input control
Check reading:
1.000
Again
Enter
mA source
1 mA ± 0.002 mA
Calibration
mA Output
mA Input
V Input
Cal. date


Enter
F2
B
B
Calibration
mA Output
mA Input
V Input
Cal. date
Enter
F2
V input cal-low
Short V input.
-0.001
Enter
V
source
V input cal-high
V input ~ 59V
+ 57.438
00.000
Enter
59 V ± 1 V
F2
F2
V input control
Check reading:
59.000
Again
Enter
V
source
59 V ± 1 V
F1
F2
Calibration
mA Output
mA Input
V Input
Cal. date
Enter
F2
Cal. date: 01-MAR-2018
Day : 01
Enter
Cal. date: 01-MAR-2018
Month : 03
Enter
Cal. date: 01-MAR-2018
Year : 2018
Enter
Calibration date
Check date:
01 MAR 2018
Again
Enter
F2
F2
F2
F1
F2
Calibration
mA Output
mA Input
V Input
Cal. date



Specification

Table 6: Physical Specification

Item	Specification
Dimensions	77 x 129 x 24 mm (3” x 5” x 1”)
Weight (nominal)	275 g (9.7 oz.)
Terminals	4 mm sockets
Case	High impact ABS
Environmental	IP40
Relative Humidity	0 to 90%

Table 7: General Specification

Item	Specification
Accuracy for one year	17°C to 27°C (63°F to 81°F)
Outside these limits	0.003%/°C (0.0015%/°F)
Reference	22°C ± 1°C; Relative humidity 45% ± 15%
Battery Life	≥ 75 hours in measure mode ≥ 18 hours at 12 mA in source mode
Hart® Communications	Menu selectable 220 Ω loop resistor
Operating Temperature	-10°C to 50°C (14°F to 122°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)

Table 8: Accuracy Specification

Mode	Range	Resolution	Accuracya
Source mA	0 to 24 mAb	0.001	0.01% rdg + 2 lsd
Source mA + 24V	0 to 24 mAc	0.001	0.01% rdg + 2 lsd
Measure mA	0 to 24 mAb	0.001	0.01% rdg + 2 lsd
Measure mA + 24V	0 to 24 mAd	0.001	0.01% rdg + 2 lsd
Measure V	0 to 60 Ve	0.001	0.02% rdg + 4 lsd
Continuity	<100 Ωf	–	–

a. rdg = reading, lsd = least significant digits.
b. V maximum = 75V.
c. R maximum 1 kΩ at 20 mA.
d. R measure = 15 Ω.
e. R measure > 1 MΩ.
f. Audio and visual indication, 1 mA test current

Return Goods/Material Procedure

If the unit requires calibration or is unserviceable, return it to the nearest Druck Service Centre listed at: Druck.com/essential.

Contact the Service Department to obtain a Return Goods/Material Authorization (RGA or RMA). Provide the following information for a RGA or RMA:

- Product (i.e. UPS-III)
- Serial number.
- Details of defect/work to be undertaken.
- Calibration traceability requirements.
- Operating conditions.

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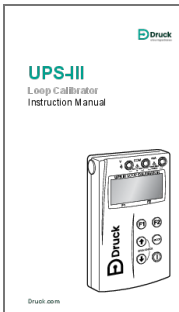
Documents / Resources



Druck UPS-III Loop Calibrator [pdf] Instruction Manual
UPS-III, Loop Calibrator, UPS-III Loop Calibrator, Calibrator