Druck UPS-II
Loop Calibrator
User manual - K0434
Approved Service Agents
For the list of service centres visit our web site:

www.gesensinginspection.com

Symbols

This equipment meets the requirements of all relevant European safety directives. The equipment carries the CE mark.

Do not dispose of this product as household waste. Use an approved organisation that collects and/or recycles waste electrical and electronic equipment. For more information:

Contact us at www.gesensinginspection.com

Battery Safety
This instrument is fitted with four size AA batteries either rechargeable (nickel cadmium) or non-rechargeable (alkaline).

Before storing this instrument remove the batteries.

When fitting batteries make sure the electrical contacts are clean and observe the correct polarity.

The battery compartment should be inspected for corrosion caused by leaking batteries. Corrosion must be removed using approved methods*.

When storing and transporting batteries make sure that they cannot be short circuited. A short-circuited battery can become very hot and can, in certain circumstances, explode. It is recommended that a suitable container is used for storing and transporting batteries.

Dispose of old batteries using a safe, approved method.*

*Refer to the manufacturer for this information:

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Introduction
The Druck UPS-II Loop Calibrator can supply power (source mode) and produce readings (measure mode) to perform field calibrations on 2-wire devices.

Operation
For different applications place switches in position as indicated below:

<table>
<thead>
<tr>
<th>MODE</th>
<th>OUT</th>
<th>READ</th>
<th>EXT.</th>
<th>INT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milliamp. source</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitter sim.</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milliamp measure</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmitter cal.</td>
<td>•</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(transmitters are 4-20mA 2 wire)

The UPS-II has special functions for fixed steps and readings in %. To open menu press * for 2 seconds. Scroll menu contents with ↓ key and make your choice. Press * again to confirm your choice.

<table>
<thead>
<tr>
<th>MENU CHOICE</th>
<th>SWITCH</th>
<th>DISPLAY READING IN:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20mA lin #</td>
<td>out</td>
<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>0-20mA lin</td>
<td>out</td>
<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>4-20mA flow</td>
<td>out</td>
<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>0-20mA flow</td>
<td>out</td>
<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>4-20mA valve</td>
<td>out</td>
<td>0 to 22mA</td>
</tr>
<tr>
<td>4-20mA lin #</td>
<td>read</td>
<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>0-20mA lin</td>
<td>read</td>
<td>0 to 22mA or % span</td>
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<td>0 to 22mA or % span</td>
</tr>
<tr>
<td>0-20mA flow</td>
<td>read</td>
<td>0 to 22mA or % span</td>
</tr>
</tbody>
</table>

Note: Functions marked with # are directly available after out or read selection. Flow = SQ.RT in %.

Press mA/% key to read in mA or %. Press * to select "continuous" or "fixed steps" in output mode.

Fixed Steps
To output fixed calibration currents in series as indicated below: choose range from the menu and select "fixed steps".

Press ↑ or ↓ to advance one step

4-20mA lin#        0-20mA lin        4-20mA valve
4 - 8 - 12 - 16 - 20mA 0 - 5 - 10 - 15 - 20mA 3,8-4-4,2 - 12 - 19 - 20 - 21mA
4-20mA flow        0-20mA flow
4 - 5 - 8 - 13 - 20mA 0 - 1,25 - 5 - 11,25 - 20mA
To output these currents automatically select "fixed steps" and press ↑ ↓ keys simultaneously. Time between steps is 10 seconds. Stepping starts at the low end of span. To return to manual press ↑ or ↓.

**Valve mode**
In the valve mode, stepping will be 3,8 - 4 - 4,2 or 19 - 20 - 21 mA. Select appropriate current to start auto-stepping.

**Ramp mode**
To output a continuous up/down ramp cycle press ↑ ↓ keys simultaneously. Ramp travel time between range limits is 60 seconds cycle starts at displayed value. Press ↑ or ↓ first to select start direction. To return to manual press ↑ or ↓.

**Batteries**
Use alkaline or rechargeable NiCad batteries only. The display shows **LOBAT** when battery capacity goes low. **CAUTION**
**DO NOT LEAVE DISCHARGED BATTERIES IN THE INSTRUMENT. OLD BATTERIES CAN LEAK AND CAUSE CORROSION.**

**WHEN FITTING THE BATTERIES MAKE SURE THE ELECTRICAL CONTACTS ARE CLEAN AND OBSERVE THE CORRECT POLARITY**

1. Centre screw.
2. Battery compartment cover.

**Replacement**
Unscrew the centre screw (1).

Remove the cover (2).

Make sure the polarity of the new batteries (3) is correct.
Current reading

<table>
<thead>
<tr>
<th>Switch positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
</tr>
<tr>
<td>Read</td>
</tr>
</tbody>
</table>

Transmitter Calibration

<table>
<thead>
<tr>
<th>Switch positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
</tr>
<tr>
<td>Read</td>
</tr>
</tbody>
</table>
### Transmitter Simulation

<table>
<thead>
<tr>
<th>Switch positions</th>
<th>Loop power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out</td>
<td>Ext.</td>
</tr>
</tbody>
</table>

![Transmitter Simulation Diagram](image)

### Valve Stroking

<table>
<thead>
<tr>
<th>Switch positions</th>
<th>Loop power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Out</td>
<td>Int.</td>
</tr>
</tbody>
</table>

![Valve Stroking Diagram](image)
Calibration Instructions

General
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-II is a 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.

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

Calibration Equipment
The following tables give the accuracy requirements for the calibration equipment and the UPS-II.

Calibration requires a stable temperature of 21° ±1°C (70° ±2°F).

UPS-II measure mode

<table>
<thead>
<tr>
<th>Applied mA</th>
<th>Permitted UPS-II error (mA)</th>
<th>Calibrator error (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.007</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0.007</td>
<td>0.00014</td>
</tr>
<tr>
<td>12</td>
<td>0.007</td>
<td>0.00030</td>
</tr>
<tr>
<td>20</td>
<td>0.007</td>
<td>0.00046</td>
</tr>
</tbody>
</table>

UPS-II source mode

<table>
<thead>
<tr>
<th>Applied mA</th>
<th>Permitted UPS-II error (mA)</th>
<th>Calibrator error (mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.01</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0.01</td>
<td>0.00012</td>
</tr>
<tr>
<td>12</td>
<td>0.01</td>
<td>0.00011</td>
</tr>
<tr>
<td>20</td>
<td>0.01</td>
<td>0.00015</td>
</tr>
</tbody>
</table>
Calibration Check

1. Check the instrument for accuracy in measure and source modes, if there is an error greater than the permitted error, the instrument requires a calibration adjustment.

Calibration Adjustment

*Note: For complete accuracy, the measure mode and source mode adjustment must be carried together and in the following order.*

Measure mode

1. Connect the UPS-II to the electrical calibrator. Switch on the electrical calibrator and allow it to thermally stabilise.
2. Switch on the UPS-II and allow the instrument to thermally stabilise.
3. Select EXT on the LOOP PWR slide switch. Use the display menu to select the calibration values:

```
Calibration Procedure mA Input

2 seconds

and  +  → READ

serial number

* Enter

Apply zero - open circuit test leads

− 0.000 adjust each digit * Enter

Connect test leads to mA source apply full-scale

− 20.000 adjust each digit * Enter

Adjust mA source to any value within range - check reading example

− 10.000 * Enter

Input calibration complete new offset values stored continue with output calibration.
```
### Source mode

1. Connect the UPS-II to the electrical calibrator. Switch on the electrical calibrator and allow it to thermally stabilise.
2. Switch on the UPS-II and allow the instrument to thermally stabilise.
3. Select INT on the LOOP PWR slide switch. Use the display menu to select the calibration values:

#### Calibration Procedure mA Output

- **2 seconds**
- **serial number**

<table>
<thead>
<tr>
<th>Value</th>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000</td>
<td>Connect test leads to mA-meter, compare values.</td>
</tr>
<tr>
<td>20.000</td>
<td>Adjust each digit, enter</td>
</tr>
<tr>
<td></td>
<td>Check reading.</td>
</tr>
<tr>
<td></td>
<td>Check reading.</td>
</tr>
<tr>
<td>done</td>
<td>Calibration complete, new output values stored</td>
</tr>
</tbody>
</table>

### Completion

1. Switch off and disconnect the calibration equipment.
2. Update the calibration records for the instrument.
Specifications

Range........................................................................................ 0 to 22.2 mA
Accuracy........................................................................ 0,05% of range
Resolution......................................................................... 10 microamps
Temperature effect........................................................... 0,003%/°C - 0,0015%/°F
Internal loop power.......................................................... 24 VDC stabilized
External loop power.......................................................... 48 VDC max.
Measurement input......................................................... 12 ohms fused
Drive capability............................................................... 900 ohms
Operating temperature.................................................. -10°C to 50°C - 14°F to 122°F
Storage temperature......................................................... -20°C to 60°C - -4°F to 140°F
Battery............................................................ 4 x 1.5V alkaline or rechargeable size AA
Battery life (alkaline)....................................................... source 12mA; 18 hours
................................................................................. measure 900 hours
Loop mismatch................................................................. flashes "LOOP"
Low battery................................................................. flashes "LOBAT"
Over-range................................................................. flashes "EEEE"
Reversed polarity.......................................................... flashes "POL"
Adaptor line/6VDC
230V/50Hz........................................ part numbers - UNO-13600-1 (UK)
............................................................... - UNO-13600-2 (Europe)
110V/60Hz........................................ part number - UNO-13600-3 (USA)
Housing................................................................. high impact ABS
Size................................................................. 3" x 5" x 0,83"
................................................................................. 77 x 124 x 21 mm
Weight................................................................. 212 grams - 7.5 oz
................................................................................. (including batteries)
This notification serves to certify that the unit described above has been inspected and tested in accordance with the specifications.

The unit calibration is traceable to international standards.