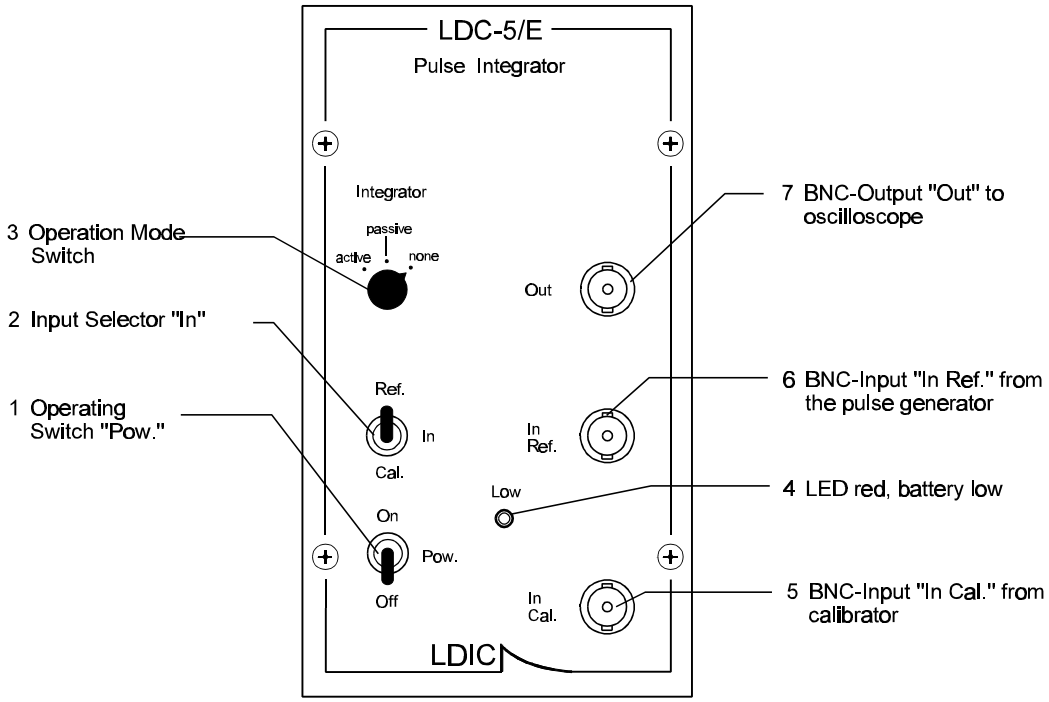
PULSE INTEGRATOR

LDC-5/E



The Pulse Integrator LDC-5/E is designed for the precise measurement of pulse charges generated from partial discharge calibrators. On the one hand the LDC-5/E consists of an active integrator, which is suitable for measurements of pulses up to a charge of 1,000 pC. On the other hand it contains a passive integrator, which is suitable for the evaluation of extremely high pulse charges up to about 100,000 pC.

The pulse charge feeded into the LDC-5/E will be formed by the active or the passive integration to a proportional voltage step. For checking of the time parameter the input pulse can be matched by a measuring resistor of 50 Ω.

After making of the connections to both a suitable digital oscilloscope, as the Tektronix TDS 744, and the PD calibrator to be tested, the device can be switched on. The Input Selector "In" (2) will be switched to the position "Cal." and the desired integrator mode (active or passive) can be selected by the Operation Mode Switch (3). The oscilloscope will be triggered to the corresponding edge according to the chosen charge polarity. Pay attention, that the active integrator inverts the output signal, i.e. the feeding of a charge with positive polarity causes a negative voltage step on the output of the active integrator, but a positive voltage step on the output of the passive integrator.

The voltage difference between 0.2 µs before and 0.8 µs after the triggering of the integration of the feeded charge pulse is used for the evaluation of the pulse charge.

Using the active integrator

The active integrator works only if the operating voltage is switched on. For that the Operating Switch "Pow." must be switched on. The maximum transient output voltage is ± 10 V, higher output voltages are a sign of an overloading of the integrator. The polarity of the output voltage of the active integrator is inverted compared to the polarity of the feeded pulse charge.

Using the passive integrator

The passive integrator evaluates the charges by means of an integrating capacitor of 10 nF. Due to this a measuring error may arise, dependent on the value of the capacitor for the charge feeding of the calibrator. The error can be eliminated using an appropriate correction according to the following equation (1), if the series capacitance of the calibrator C_{Cal} is known.

$$Q = \Delta u \cdot k_{PP} \cdot (0{,}99 + \frac{C_{Cal}}{10\text{nF}}) \qquad (1)$$

The integrator is adjusted for a calibration capacitance of C_{Cal} = 100 pF. In order to eliminate the influence of cables, the delivered measuring cables must be used.

Using the matching resistor

In this operation mode the calibrator is matched by the measuring resistor of 50 Ω. The appearing pulse allows the determination of the duration of the charge feeding.

In order to avoid mis-interpretations through partly discharged batteries a cyclic check of the operating voltage is necessary. While switching on or switching off of the device the LED red (4) must flash up shortly. A permanently flash or missing of the shortly flash up are a sign for discharged batteries, all batteries must be replaced.

Technical data

maximum pulse charge using the active integration mode	1000 pC
scale factor of the active integrator	k_{PA} = 10 mV / pC
maximum pulse charge using the passive integration mode	100 nC
scale factor of the passive integrator	k_{PP} = 100 mV / pC
maximum input voltage	100 V
measuring uncertainty	< 1 %
power supply	± 18 V / 7 mA
	4 pieces (typ 6LR21)
operation temperature range	22 °C ± 5 °C