

Data Sheet 6.33/3

## PD Calibrator, Type CAL

The appropriate choice of a calibrator depends on the range of typical charge values of the PDs being measured. The requirements for calibrators as well as the calibration procedures are given in IEC 60270:2000. Calibrators of type CAL (figure 1) are used for the calibration of a PD measuring system in the complete test circuit. The repetitive calibration charges  $q_0$  are generated by a step voltage pulse  $U_0$  injected into a capacitor  $C_0$ :

$$q_0 = U_0 C_0.$$

Type CAL calibrators use a variable voltage step  $U_0$  up to 120 V (IEC 60270: rise time < 60 ns) and a fixed capacitor  $C_0$ . This injection capacitor is relatively small, as the step voltage amounts up to 120 V for full range output. Therefore, the calibrators offer excellent impulse properties. The injection capacitor can also be a HV capacitor in the measuring circuit. This enables the calibration of completely metal-enclosed HV test circuits (e.g. for GIS testing in factory or on site) by using the type CAL1H or permanent calibration during PD measurement by using the type CAL1C.

For special application in GIS testing including UHF PD measurement the calibrators supply a very steep voltage step of < 0.3 ns rise time.

Type CAL calibrators are calibrated according to IEC 60270:2000 traceable to the German National Institute of Standards, PTB Braunschweig.

### Simple to use

The calibrator is switched on with the pushbutton On/Off. Both amplitude (Range) and polarity (Pos/Neg) of the *single* charge pulse per cycle are displayed and can be adjusted by pressing the two buttons.

The calibrator automatically synchronizes to line frequency by a photo diode. In case of insufficient pick-up of power frequency light, the calibrator automatically selects the internal quartz oscillator (50 Hz and 60 Hz versions available).



Figure 1: Calibrators type CAL

Table 1: Main parameters

Type	Range	Typical injection capacitor (C <sub>0</sub> )	Light synchronization	IEC 60270 compliant	2 pulses per cycle option	Connector	Usage
CAL1A	1, 2, 5, 10, 20, 50, 100 pC	1 pF	✓	✓	✓	BNC	standard, lab use
CAL1B	0.1, 0.2, 0.5, 1, 2, 5, 10 nC	100 pF	✓	✓	✓	BNC	high-level application, e.g. rotating machines, cable field tests
CAL1C	1, 2, 5, 10, 20, 50, 100 pC	external <sup>1)2)</sup>	✓	✓	✓	BNC	c/w ext. capacitor
CAL1D	10, 20, 50, 100, 200, 500, 1000 pC	10 pF	✓	✓	✓	BNC	standard, lab use
CAL1E	0.5, 1, 2, 5, 10, 20, 50 nC	500 pF	✓	✓	✓	BNC	high-level application, e.g. rotating machines, cable field tests
CAL1F	0.2, 0.5, 1, 2, 5, 10, 20 nC	200 pF	✓	✓	✓	BNC	high-level application, e.g. rotating machines, cable field tests
CAL1G	20, 50, 100, 200, 500, 1000, 2000 pC	20 pF	✓	✓	✓	BNC	transformer test
CAL1H	0.5, 1, 2, 5, 10, 20, 50 pC	external <sup>1)3)</sup>	✓	✓	✓	BNC	GIS, live injection via stray capacitance
CAL2A	0.5, 1, 2, 5, 10, 20, 50 pC	1 pF	✓	✓	-	N	GIS & UHF
CAL2B	2, 5, 10, 20, 30, 40, 50 V	external <sup>1)</sup>	✓	-	-	N	GIS & UHF

<sup>1)</sup> into R<sub>L</sub>=50 Ω

<sup>2)</sup> with external high-voltage capacitor of 100 pF

<sup>3)</sup> with stray capacitance or with external low voltage injection capacitor of 1 ... 2 pF (adjustment necessary)

### Type designation

CAL a

a = type code