



Option external power adaptor



Option BNC to banana plug

The **LFR** is a dual range ac current probe with a flexible, clip-around coil. It can be powered either by a single 9V battery or an external dc supply.

The **LFR** has market leading low frequency performance, optimised to give minimal phase measurement error from 45Hz up to 20kHz and the lowest possible noise floor. It also has a good high frequency performance e.g. 1.0MHz bandwidth for a 300mm coil.

The LFR has a 10:1 switch selectable current rating to give a wide measurement range in a single probe.

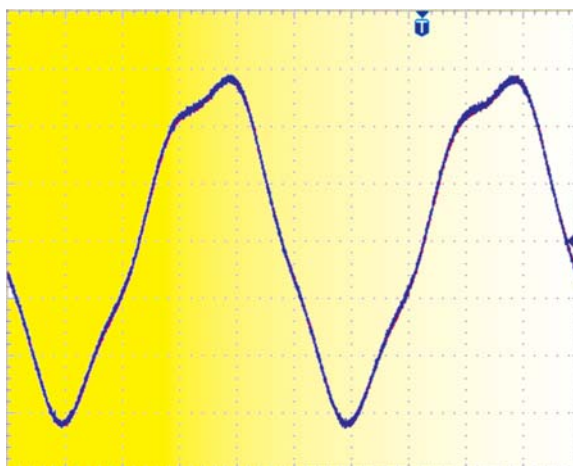
It is available in ratings from 60A up to 60.0kA and with coil lengths from 300 to 1000mm. Longer coils can be supplied on request.

**The LFR is ideal for current monitoring in power measuring applications, of leakage currents, and for power quality measurements.**

The LFR is a Rogowski current probe with all the benefits: easy to insert in confined spaces (8.5mm max coil thickness), not affected by dc current, is undamaged by current overloads and is non-intrusive.

The LFR can be used with oscilloscopes, power analysers and meters, acquisition cards and dataloggers.

The LFR is CE marked and complies with safety standard EN61010.



90A peak current / 50Hz with 3rd harmonic distortion  
Timebase: 4.0ms per division  
Channel 1: Class 0.2 current transformer  
Channel 2: LFR03/3, 100mV/A, Phase error <0.85° at 50Hz



## PERFORMANCE CHARACTERISTICS

Type	Sensitivity (mV/A)		Peak current (A)		Noise typ. <sup>*1</sup> (mV rms)		Phase error at 50Hz max. (deg.)	LF (-3dB) bandwidth typ. (Hz) $f_L$	Phase error at 20kHz <sup>*2</sup> typ. (deg)		Peak di/dt <sup>*3</sup> (kA/μs)	
	x10	x1	x10	x1	x10	x1			Coil Length		x10	x1
LFR 03/3	100.0	10.0	60.0	600.0	3.0	1.0	<0.85°	0.45	1.8°	3.0°	0.015	0.25
LFR 06/6	50.0	5.0	120.0	1.2k	3.0	1.0	<0.50°	0.23	1.8°	3.0°	0.03	0.5
LFR 1/15	20.0	2.0	300.0	3.0k	2.0	1.0	<0.35°	0.15	1.8°	3.0°	0.1	1.2
LFR 3/30	10.0	1.0	600.0	6.0k	2.0	1.0	<0.25°	0.10	1.8°	3.0°	0.2	2.5
LFR 6/60	5.0	0.5	1.2k	12.0k	2.0	1.0	<0.20°	0.08	1.8°	3.0°	0.4	5.0
LFR 15/150	2.0	0.2	3.0k	30.0k	1.0	0.5	<0.18°	0.07	1.8°	3.0°	0.9	6.0
LFR 30/300	1.0	0.1	6.0k	60.0k	1.0	0.5	<0.18°	0.07	1.8°	3.0°	1.8	6.0

<sup>\*1</sup> Distributed around the  $f_L$  (-3dB) bandwidth. The peak to peak magnitude of the noise = 6.1 \*Noise typ. (rms)

<sup>\*2</sup> The high frequency bandwidth is in part dependent on coil length. Contact PEM for values of  $f_L$  for other coil lengths.

<sup>\*3</sup> Slew rate limitation

**HIGH FREQ. (-3dB) bandwidth**  
typ  $f_H$  <sup>\*2</sup> 1.0 MHz (for coil length 300mm)  
600.0 kHz (for coil length 700mm)

**TYPICAL ACCURACY** Calibrated to  $\pm 0.3\%$  with conductor central in the Rogowski loop. Calibration certificate supplied.  
Variation with conductor position in the coil loop typically  $\pm 1\%$

**TYPICAL LINEARITY**  $\pm 0.05\%$  (full scale)

**DC OFFSET** max @ 65°C  $\pm 2.5$ mV

**ABSOLUTE MAXIMUM VALUES of di / dt (kA / μs)**  
(values must not be exceeded) **PEAK** 6.0  
**RMS** 0.3 @ 70°C (further information available on request)

## COIL AND CABLE

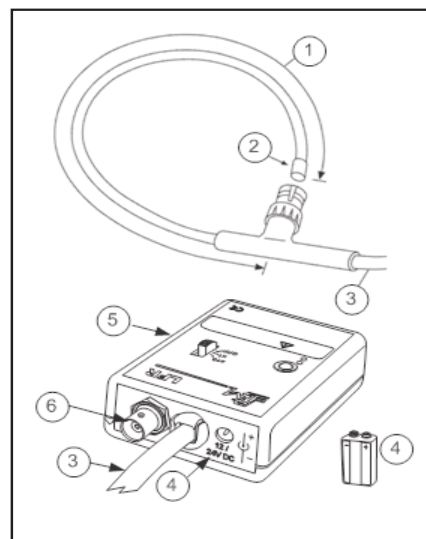
① **COIL CIRCUMFERENCE** 300, 500, 700 or 1000mm

② **COIL CROSS SECTION (max)** 8.5mm (14mm with sleeve)

**PEAK COIL VOLTAGE ISOLATION** 2kV  
Safe peak working voltage to earth. The coils are flash tested at 4kVrms for 60 seconds. The coil is supplied with a removable silicone sleeve for additional mechanical protection. Information about continuous use of the coils at high voltage can be obtained from PEM.

**TEMPERATURE RANGE** -20°C to 70°C  
For de-rating due to temperature cycling please consult PEM

③ **CABLE LENGTH (from box to coil)** 2.5m



## INTEGRATOR

④ **POWER SUPPLY** Single 9V PP3 battery - battery life typically 50 hours  
**-plus-** 2.1/2.5mm socket for 12V to 24Vdc ( $\pm 10\%$ ) DC supply - (Quiescent current 10mA)  
**Optional power supply available from PEM.**  
Battery inoperative with DC supply present

⑤ **INTEGRATOR BOX DIMENSIONS** H = 28mm, W = 65mm, D = 90mm

⑥ **OUTPUT SOCKET** BNC (output impedance 50Ω - unit supplied with 0.5m BNC - BNC coaxial cable)  
**Optional 0.5m BNC to banana plug cable available from PEM**

**MIN. OUTPUT LOADING** 100kΩ (for rated accuracy)

**TEMPERATURE RANGE** -10°C to 55°C

## ORDERING

Type	/	Coil Circumference (mm)
e.g. order code	/	
LFR 06/6	/	700

If you have any queries regarding the LFR or require specifications outside our standard ranges please do not hesitate to contact us.

