

LEM~flex AC Current Probe

MODEL RR 7500-SK/SP1

MODEL RR 7500-SK/SP2

Three Phase, Current Probe

Manual Item No. 041078

Rev. F

**Installation, Operation
and Service Instructions**

WARRANTY

This product is warranted to be free from defects in material and workmanship for a period of eighteen (18) months from the date of shipment.

Correction shall be in the form of repair or replacement of the defective items or components, freight paid by the customer both ways. Such correction shall constitute a fulfillment of all LEM DynAmp, Inc. liabilities in respect to said items and components. In no event shall LEM DynAmp, Inc. be liable for consequential damage.

REVISION HISTORY

<u>Page</u>	<u>Rev.</u>	<u>Revision Summary</u>	<u>Date</u>
all	New	First Issue	05/96
all	A	Revise and convert to Word format	10/96
2	B	Revise Figure 1-1	01/97
all	C	Added RR 7500-SK/SP2	01/97
3	D	Revised Figure 1-2	02/97
8	E	Specification Change	08/97
Front	E	Warranty Statement	08/97
2,3	E	Revised Figures 1-1 and 1-2	10/97

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Model RR 7500-SK/SP1
Model RR 7500-SK/SP2
Installation, Operation and Service Instructions

1-1. SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific *WARNINGS* given elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument.

The LEM DynAmp, Inc. assumes no liability for the customer's failure to comply with these requirements.

!! WARNING !!
(Do not use until you have read this!)

Hazardous potentials may exist in the vicinity of the desired current measurements. Use locally approved safety procedures when working near these potentials. It is recommended not to install the LEM~flex around a live bus that is at a hazardous voltage potential. If installation is not possible when the bus is inactive or power is turned off, always use appropriate gloves and/or equipment that are approved when working around hazardous potentials when installing the LEM~flex in the vicinity of these hazardous potentials.

The LEM~flex AC transducer and interconnection cable uses double insulation to protect the operator from possible hazardous potentials of the bus. The electronics package is not double insulated. Make sure the electronics package is well away from the bus. The current probe is rated for Installation Category III, Pollution Degree 2. The maximum voltage to earth rating for the transducer and cable is $600V_{AC}$.

1-2. SAFETY SYMBOLS

General definitions of safety symbols used on equipment or in manual.



Direct current (power line).



Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION.



Caution (refer to accompanying documents).

1-3. OVERVIEW and DESCRIPTION

The LEM ~flex AC Current Probe Model RR 7500-SK is a device similar in purpose to CTs or current transformers used to measure single phase ac currents. It measures AC currents as low as several amps to a maximum of 7.5kA rms when using a +6V_{DC} power supply. The device output is an analog voltage proportional to the AC current in the conductor. The output signal is isolated from the hazardous conductor potential and is an exact replica of the AC current waveform in the conductor. The output signals are available via an output cable that is easily connected to a readout device.

The power for RR 7500-SK/SP1 is provided by an external power supply while the power for the RR 7500-SK/SP2 may be provided by an external power supply (not supplied) or from the readout device via the output cable. All of the output commons are tied together within the RR 7500-SK. The power supplied through the output cable must be referenced to these commons.

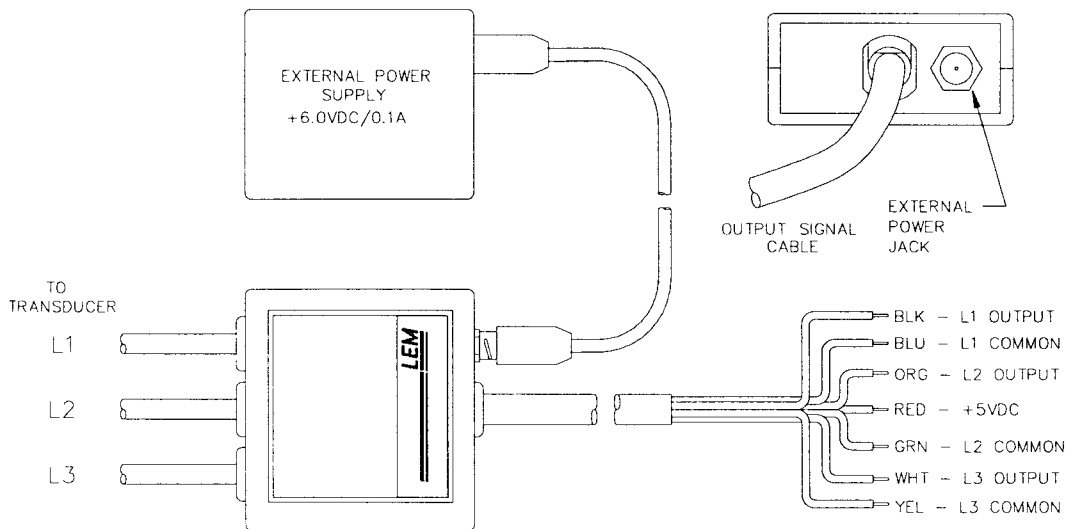


Figure 1-1.
RR 7500-SK/SP1 Current Probe

Electronics Package

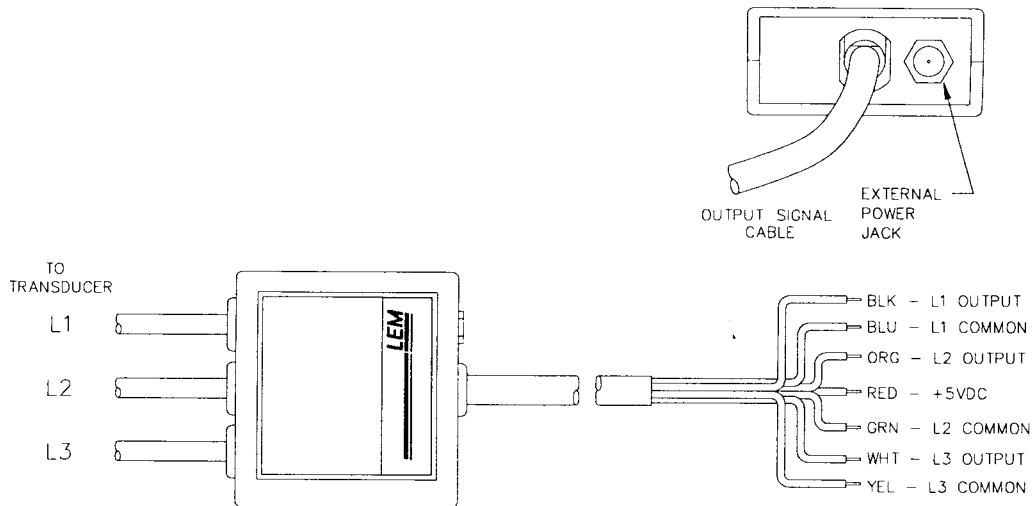


Figure 1-2.
RR 7500-SK/SP2 Current Probe
Electronics Package

1-4. LEM ~ flex AC CURRENT TRANSDUCER

The RR 7500-SK design utilizes the light weight and flexibility of the LEM ~ flex AC Current Transducer. This transducer is a versatile current probe that may be wrapped around most conductors. (Various lengths are available). It's application versatility and high-voltage isolation rating clearly distinguish the RR 7500-SK from other current measuring methods. The measuring transducer head is constructed from non-ferrous materials, minimizing any circuit loading.

The frequency response of the RR 7500-SK is rather wide compared to conventional CTs. This allows the user to monitor a much wider range of line harmonic components than conventional CTs allow. The RR 7500-SK was designed to be very flexible, larger in aperture and smaller in cross section than many conventional CTs. This allows measurements in tight places as never before possible.

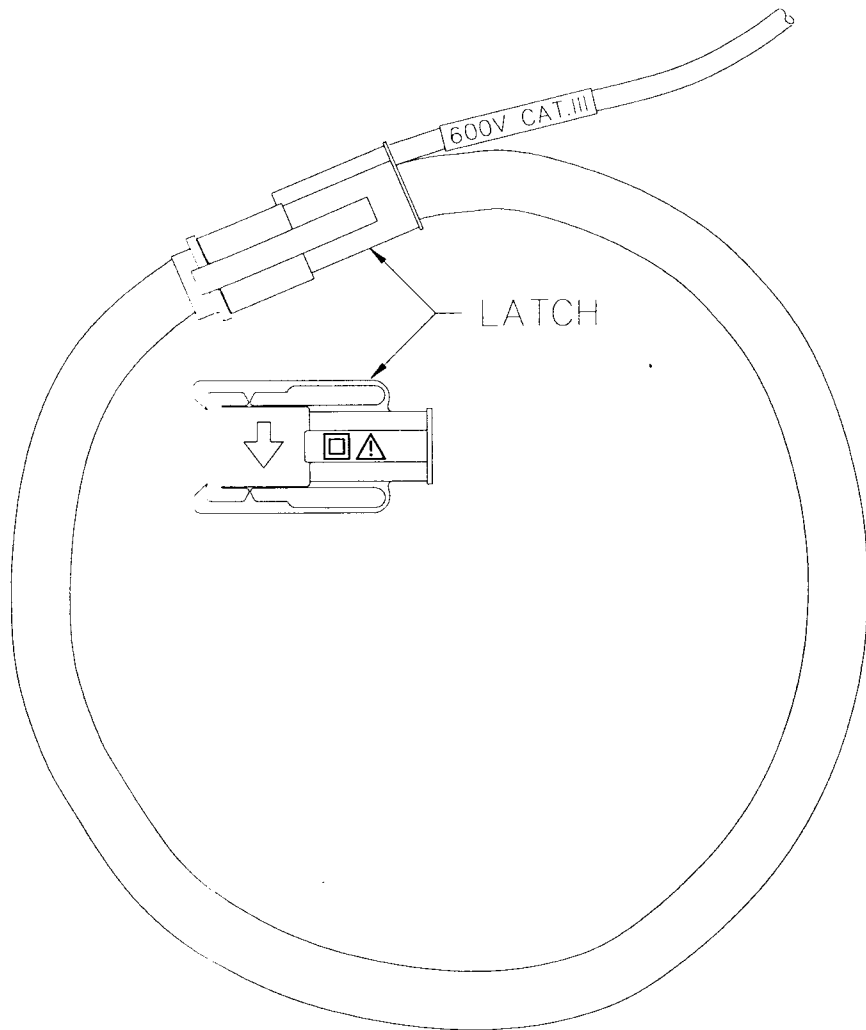


Figure 1-2.
LEM~flex Current Transducer

1-5. INSTALLATION

The RR 7500-SK was made to allow the operator to connect this measurement device around conductors without disconnecting the conductors as many CTs presently demand. The LEM~flex AC Current Transducers are installed around the conductors with the molded-in arrow on the latches (see Figure 1-3) pointing in the direction of conventional current flow. Conventional current flow is defined as current flowing from the positive to the negative potential.

The LEM~flex Transducer must be installed with the interconnection cable on the outside of the loop when the latch is engaged. The polarity arrow, the double insulation, and the warning symbols will all be on the outside of the loop. It should be noted that the current probe will produce twice the output if you wrap the transducer around the conductor twice.

There is minimal shock hazard using the RR 7500-SK, as the transducer head does not generate high voltages at low frequencies. Each transducer has been Hi-Pot tested to several thousand volts with no voltage breakdown. This particular characteristic allows high-current measurement (with a wide frequency bandwidth) of conductors at less than $600V_{AC}$ potential to earth.

!! WARNING !!
(Do not use until you have read this!)

Hazardous potentials may exist in the vicinity of the desired current measurements. Use locally approved safety procedures when working near hazardous potentials. It is recommended not to install the LEM~flex around a live bus that is at a hazardous voltage potential. If installation is not possible when the bus is inactive or power is turned off, always use appropriate gloves and/or equipment that are approved when working around hazardous potentials when installing the LEM~flex in the vicinity of these hazardous potentials.

Do not exceed the minimum bending radius of the LEM~flex AC Current Transducer when installing the transducers around the conductors. Exceeding the bending radius will degrade the measurement accuracy.

Make sure the LEM~flex AC Current Transducer and its output cable are clean before installing them around the conductor. If the transducer and cable are not clean, the contaminants on them may provide a conductive path for a high-voltage breakdown. Also, check the transducer and output cables for cuts and abrasions. The transducer should not be used if damaged.

1-6. MAINTENANCE

Preventive maintenance primarily consists of cleaning the transducer and cables to prevent surface contamination. Use a mild detergent and water to clean the transducer and cables. Remove the detergent with clear water, then wipe dry with a clean cloth.

NOTE

The use of solvents as cleaners is not recommended unless thoroughly tested and found harmless to all surfaces and parts. Do not submerge current probe into water or other fluids.

2-1. SPECIFICATIONS

The specifications for the RR 7500-SK are given in table 2-1.

Table 2-1
Model RR 7500-SK Specifications

SIGNAL CONDITIONER:

Input:	Three LEM ~ flex Transducers
Output:	2.5VAC or ± 3.5 VPK full scale @ 6VDC in Load > 1000 ohm
Output Connection:	7 Conductor Cable Length = 108 in. (2.8m)
Scaling:	0.333mV per amp
Accuracy:	$\pm 1.0\%$ of full scale
Linearity:	$\pm 0.2\%$ of reading 10%...100% of full scale
Repeatability:	$\pm 0.1\%$ of reading 10%...100% of full scale
Frequency Response:	8Hz to 7kHz
Phase error:	$< \pm 0.5^\circ$ maximum 50-60 Hz
Noise:	< 2.0 mV ac maximum
DC offset:	< 5.0 mV dc maximum
Temperature range:	Operational 0°C to 70°C (32°F to 158°F) Gain Change $\pm 0.08\%/^\circ\text{C}$ maximum DC offset ± 0.3 mV/ $^\circ\text{C}$ maximum
Power:	+6.0VDC via External Power Supply
Material:	ABS Plastic
Dimensions:	2.4H x 2.3W x 1.0D inches (61.0H x 58.4W x 25.4D) mm
Weight:	0.1 lbs. (0.045 kg)

Table 2-1
LEM~flex AC Current Probe Specifications (continued)

TRANSDUCER:

Material:	TPE rubber, Polypropylene
Minimum bending radius:	1.5 in. (38.1 mm)
Cable O.D.	0.625 in. (15.87 mm)
Coupling O.D.	0.875 in. (22.20 mm)
Connecting Cable:	Length 78.7 in. (2.0m) shielded
Temperature:	Operational -20°C to 90°C (-4°F to 194°F)
Position Sensitivity:	< ±2.0% with measured bus > 1" from head
External Magnetic Field:	< ±1.0% with external bus > 8" from head
Standard Size:	Length 24 in. (610 mm)
	I.D. 7.0 in. (178mm)
	O.D. 8.3 in. (210mm)
Weight:	0.4 lbs. (0.18 kg)
Safety Rating:	Double Insulated Installation Category III, Pollution Degree 2, 600VAC to Earth
Working Voltage:	600VAC to Earth
Head/Cable Test:	5550VAC for 1 minute surface to output

ACCESSORIES:

Standard:	RR 7500-SK/SP1: +6.0VDC/100mA External Power Supply
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LEM INSTRUMENTS SUBSIDIARIES

AUSTRIA
LEM INSTRUMENTS
Tel 02236 6910
Fax 02236 62474

FRANCE
LEM FRANCE
Tel 1 6918 1750
Fax 1 6928 2429

JAPAN
NIPPON LEM
Tel 06395 4073
Fax 03695 4079

SWITZERLAND
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Fax 055 46 75 55

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Tel 57 62606
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GERMANY
LEM INSTRUMENTS
Tel 0911 955 7512
Fax 0911 955 7531

NORTH AMERICA
LEM INSTRUMENTS
Tel 847 437 6444
Fax 847 437 6466

RUSSIA
TVELEM
Tel 082 224 40 53
Fax 095 973 01 44

UK
LEM UK
Tel 01695 720777
Fax 01695 50704

MANUFACTURED BY: LEM DynAmp, Inc., Grove City, Ohio

