

Digital Panel Meters DC/AC Current and Voltage Indicator/Controller Type LDM35H



- Multi-input instrument 3 1/2 dgt LED
- 0.1% RDG basic accuracy
- TRMS AC current and voltage measurements
- AC/DC current measurements: selectable full scales (200µA to 5A)
- AC/DC voltage measurements: selectable full scales (200mV to 500V)
- Up to 2 independent alarm set-points (optional)
- Universal power supply: 18-60VAC/DC and 90-260VAC/DC
- Front protection degree: IP65

Product Description

µP-based digital panel meter, 3 1/2 dgt LED indicator and controller, for current, voltage measurements. Measuring ranges and functions easily programmable from the key-pad. LDM35H includes storage min-max functions and double level protection password. Housing for panel mounting with front protection degree: IP65.

How to order

LDM35H LSE H 0 XX XX



Type Selection

Measuring inputs	Power supply	Alarms	Retransmission
LSE: signal inputs + AUX: 0.2-2-20mA DC/AC; 0.2-2-20V DC/AC HSX: signal inputs: 0.2-2-5A DC/AC; 20-200-500V DC/AC	H: 90 to 260V AC/DC L: 18 to 60V AC/DC	0: None 1: single relay output, (AC1-5AAC, 250VAC) 2: Dual relay output, (AC1-5AAC, 250VAC)	XX: None Options XX: None TX: Tropicalization

Input Specifications

Analogue inputs LSE type HSX type	Channels and variables 1, mA and V DC/AC + AUX 1, A and V DC/AC	Temperature drift	See table "Measurement accuracy, temperature drifts, min and max indications"
Accuracy	See table "Measurement accuracy", temperature drifts, minimum and maximum indications"	Sampling rate	500 samples/s @ 50Hz
Additional errors Humidity Input frequency Magnetic field	0.3% RDG, 60% to 90% R.H. 0.4% RDG, 62 to 440 Hz 0.5% RDG @ 400 A/m	Display refresh time	200 msec @ 50Hz
		Display	3 1/2 DGT, 7 segments height 14.2 mm Colour: red
		Max and min indication	See table "Measurement accuracy, temperature drifts min and max indications"

Input specifications (cont.)

Measurements	Current, voltage. For the current and voltage measurements: TRMS measurement of distorted sine waves. Direct ≤ 3 ; $A_{Pmax}=1.7I_n$; $V_{Pmax}=1.7U_n$	Input impedance	See table "input impedances and overloads"
Coupling type		Frequency	40 to 440 Hz
Crest factor		Overload	See table "input impedances and overloads"

Measurement accuracy, temperature drifts, min and max indications

All accuracies and min/max indications are referred to an ambient temperature range of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$, relevant humidity $\leq 60\%$ and scale ratio (electrical/displayed scale) equal to 1.

Module	Inputs	Type	Accuracy	Temp. drift	Min. indicat. (■)	Max. indicat. (■)
LSE	-200 μA to +200 μA -2mA to +2mA -20mA to +20mA -200mV to +200mV -2V to +2V -20V to +20V	DC/AC	DC: $\pm(0.1\%RDG+3DGT)$ 0% to 25% FS; $\pm(0.1\%RDG+2DGT)$ 25% to 110% FS. TRMS (45 to 65Hz)*: $\pm(0.3\%RDG+3DGT)$ 0% to 25% FS; $\pm(0.3\%RDG+2DGT)$ 25% to 110% FS.	± 150 ppm/ $^{\circ}\text{C}$	- 199.9 - 1.999 - 19.99 - 199.9 - 1.999 - 19.99	+ 199.9 + 1.999 + 19.99 + 199.9 + 1.999 + 19.99
HSX	-200mA to +200mA -2A to +2A -5A to +5A -20V to +20V -200V to +200V -500V to +500V	DC/AC	DC: $\pm(0.1\%RDG+3DGT)$ 0% to 25% FS; $\pm(0.1\%RDG+2DGT)$ 25% to 110% FS. TRMS (45 to 65Hz)*: $\pm(0.3\%RDG+3DGT)$ 0% to 25% FS; $\pm(0.3\%RDG+2DGT)$ 25% to 110% FS.	± 150 ppm/ $^{\circ}\text{C}$	- 199.9 - 1.999 - 5.00 - 19.99 - 199.9 - 500	+ 199.9 + 1.999 + 5.00 + 19.99 + 199.9 + 500

Input impedances and overloads

Module	Inputs	Type	Impedance	Overload (continuous)	Overload (1s)
LSE	-200 μA to +200 μA -2mA to +2mA -20mA to +20mA -200mV to +200mV -2V to +2V -20V to +20V	DC/AC DC/AC DC/AC DC/AC DC/AC DC/AC	$\leq 2.2\text{k}\Omega$ $\leq 22\Omega$ $\leq 22\Omega$ $\geq 2.2\text{k}\Omega$ $\geq 200\text{k}\Omega$ $\geq 200\text{k}\Omega$	5mA 50mA 50mA 10V 50V 50V	10mA 150mA 150mA 20V 100V 100V
HSX	-200mA to +200mA -2A to +2A -5A to +5A -20V to +20V -200V to +200V -500V to +500V	DC/AC DC/AC DC/AC DC/AC DC/AC DC/AC	$\leq 1\Omega$ $\leq 0.012\Omega$ $\leq 0.012\Omega$ $\geq 2\text{M}\Omega$ $\geq 2\text{M}\Omega$ $\geq 2\text{M}\Omega$	0.8A 7.5A 7.5A 750V 750V 750V	1A 100A 100A 1000V 1000V 1000V

* $<45\text{Hz} > 65\text{Hz} = \pm(0.5\%RDG+3DGT)$ 0% to 25% FS; $\pm(0.5\%RDG+2DGT)$ 25% to 110% FS.

(■) The min. indication for TRMS measurement (AC or DC) is 0; it is possible to modify the decimal point position.

Output specifications

Alarm outputs	(on request) Active alarm for out-of-range, up alarm, down alarm, down alarm with start-up deactivation, up alarm with latch, down alarm with latch	Insulation	AC 1: 5A, 250VAC DC 12: 5A, 24VDC AC 15: 2,5A, 250VAC DC 13: 2,5A, 24VDC 4000 V _{RMS} output to measuring input, 4000 V _{RMS} output to power supply input.
Alarm type			
Alarm set-point	Adjustable from 0 to 100% of displayed range	Excitation output	LSE input
Hysteresis	0 to 100% of displayed range	Voltage	13 VDC ±10% max. 50 mA
On-time delay	0 to 255 s	Insulation	25V _{rms} output to measuring input, 4000 V _{rms} output to power supply input
Off-time delay	0 to 255 s		
Output status	Selectable: normally energized/de-energized		
Min response time	500 ms, with filter excluded, without alarm on-time delay		
Output channels	Up to 2 Type SPDT		

Software functions

Min / Max storage	Automatic storage (in the EEPROM) of the minimum and maximum measured value from the previous memory reset	Decimal point position	Programmable within the displayed range
Password	Numeric code max 4 dgt 2 levels of data protection. 0 to 4999 completely protected. 5000 to 9999 access to programming is protected . Alarm set-points are directly programmable from the measuring mode.	Displayed range	Programmable within the displayed range.
		Diagnostics	The display flashes when the limits of the displayed range are exceeded, the data are updated up to 20% of the rated displayed range.
1st level		Digital filter	
2nd level		Filter operating range	0 to 1999
Measurement selection	Depending on the input: - measuring range - measuring type (TRMS or DC).	Filtering coefficient	1 to 32
Integration time selection	Automatic or from 100.0 to 999.9 ms only in the current and voltage measurement.	Display selection	3 1/2 DGT or 3 DGT plus dummy zero.
Scaling factor		Scaling	
Operating mode	Electrical scale compression, displayed scale compression/expansion (max. 2 without filter, up to 10 with filter)		Selection of min value of the input range. Selection of max value of the input range. Selection of decimal point position. Selection of min displayable value. Selection of max displayable value.
Electrical range	Programmable within the whole measuring range		

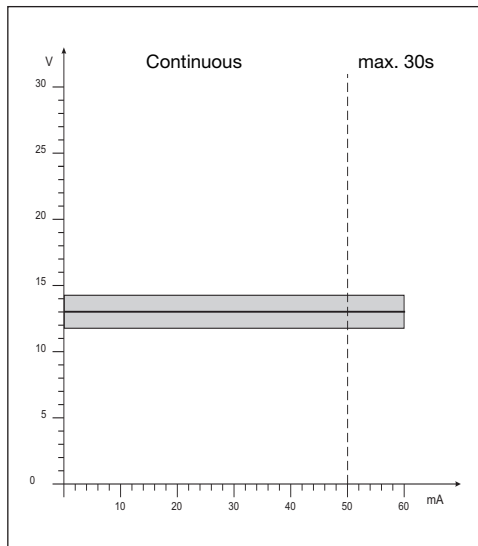
General Specifications

Operating temperature	0° to 50°C (32° to 122°F) (R. H. < 90% non-condensing)	Safety Standards	
Storage temperature	-10° to 60°C (14° to 140°F) (R.H. < 90% non-condensing)	Safety	EN 61010-1, IEC 61010-1
Insulation reference voltage	300 V _{RMS} to ground (500V input)	Connections	Screw type Max 2.5mm ²
Insulation	See table "Insulation between inputs and outputs"	Wire section	
Dielectric strength	4000 V _{RMS} for 1 minute	Housing	
Rejection		Dimensions	1/8 DIN, 48 x 96 x 83 mm
NMRR	40 dB, 40 to 60 Hz	Material	PC-ABS, self-extinguishing: UL 94 V-0
CMRR	100 dB, 40 to 60 Hz	Protection degree	Front: IP65 Connections: IP20
EMC		Weight	340 g approx (packing included)
	EN61000-6-2, IEC61000-6-2 EN61000-6-3, IEC61000-6-3	Approvals	CE, UL e CSA in progress

Supply Specifications

AC/DC voltage	90 to 260V (standard) 18 to 60V (on request)	Energy consumption	≤ 8VA/4W (90 to 260V) ≤ 8VA/4W (18 to 60V)
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Excitation output



The excitation output is constant and independent of power supply's voltage.

Insulation between inputs and outputs

	Meas. inputs	Relay output	AUX p. supply	90-260VAC/ DC p.supply	18-60VAC/ DC p.supply
Meas. inputs	-	4kV	25V	4kV	4kV
Relay output	4kV	-	4kV	4kV	4kV
AUX p. supply	25V	4kV	-	4kV	4kV
90-260VAC/ DC p.supply	4kV	4kV	4kV	-	-
18-60VAC/ DC p.supply	4kV	4kV	4kV	-	-

Used calculation formulas

Only for TRMS Measurements

Instantaneous effective voltage (TRMS)

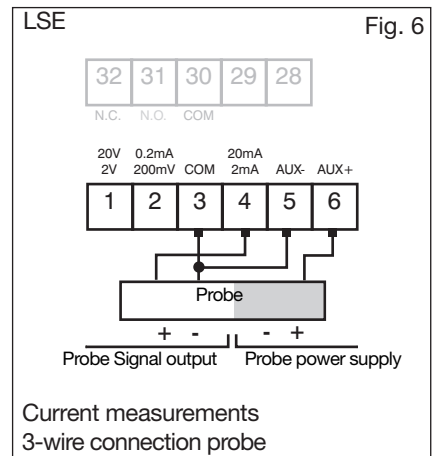
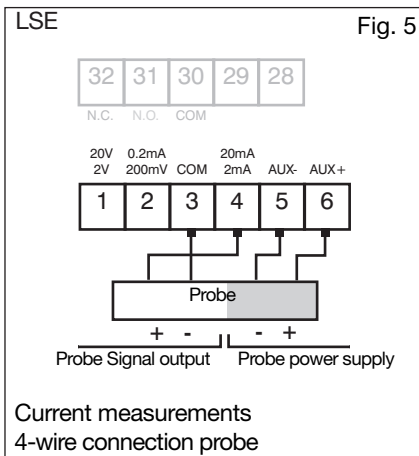
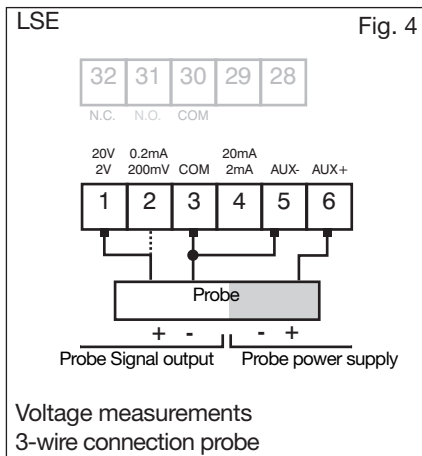
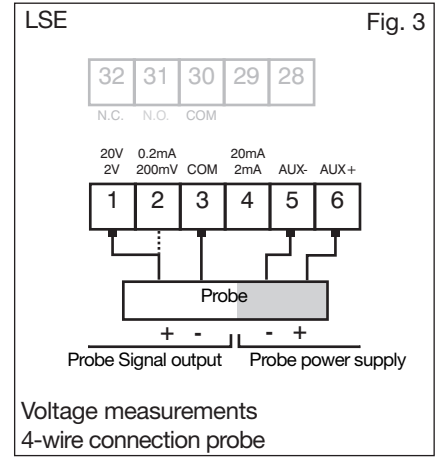
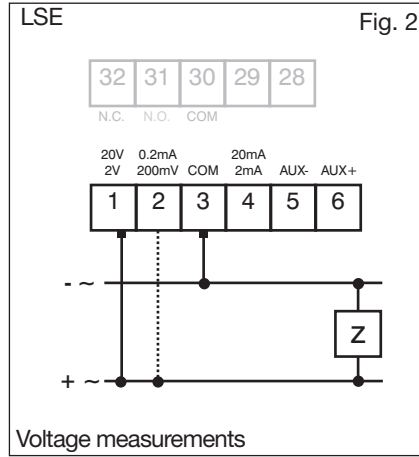
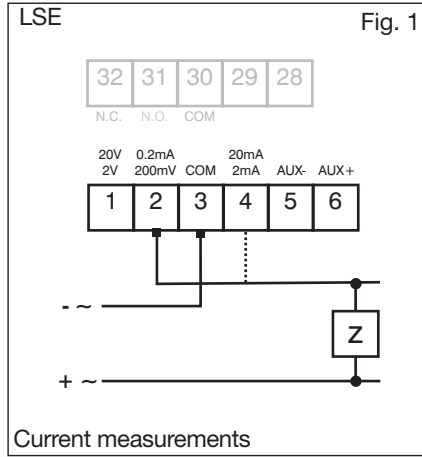
$$V_1 = \sqrt{\frac{1}{n} \cdot \sum_1^n (V_1)_i^2}$$

Instantaneous effective current (TRMS)

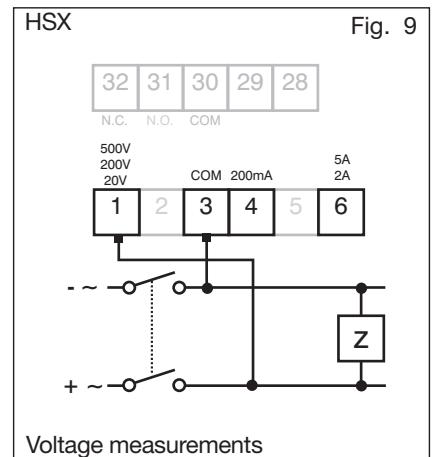
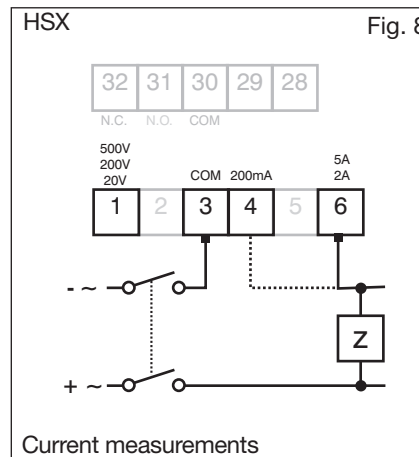
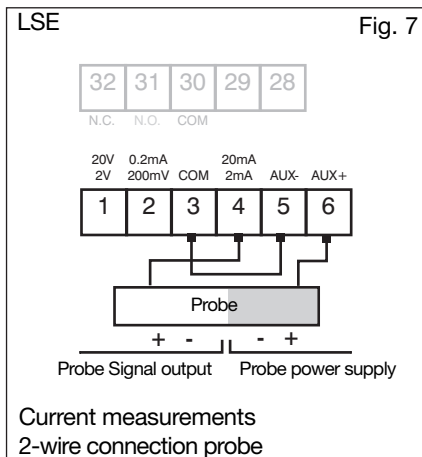
$$A_1 = \sqrt{\frac{1}{n} \cdot \sum_1^n (A_1)_i^2}$$

Wiring diagrams

Process signal wiring diagrams



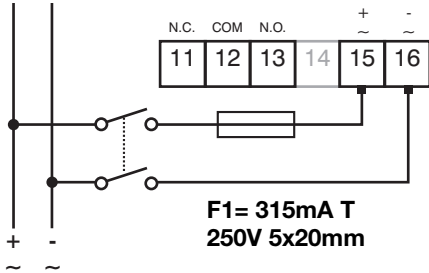
High-level signals wiring diagrams



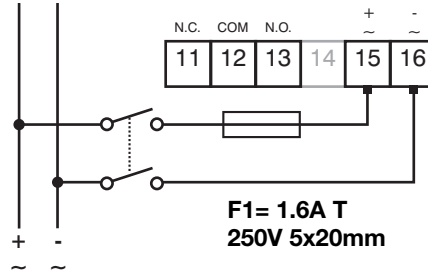
Wiring diagrams (cont.)

Power supply wiring diagrams

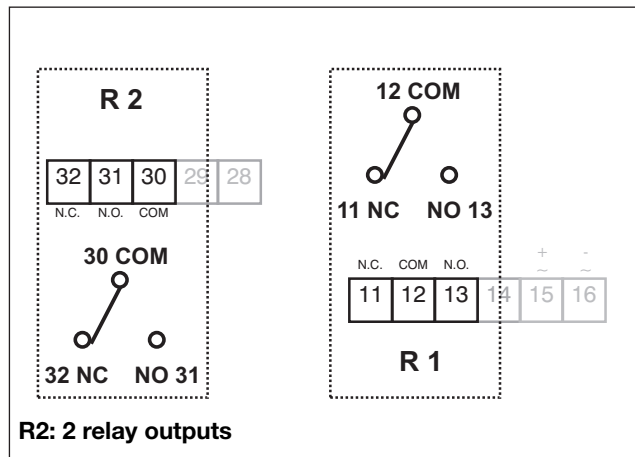
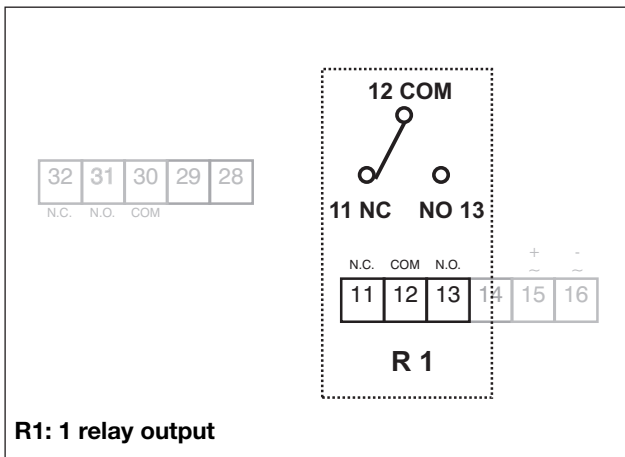
H: power supply 90-260VAC/DC



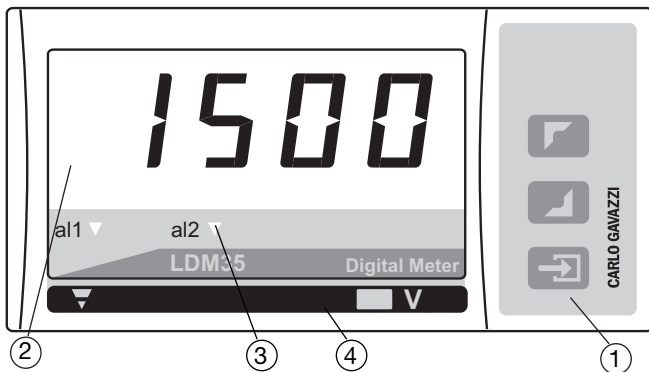
L: power supply 18-60VAC/DC



Wiring diagrams of outputs



Front panel description



1. Key-pad

The programming of the configuration parameters and the display are easily controlled by means of the 3 function keys.

: to enter the programming procedure and to confirm the password.

- :
- to program values;
- to select functions;
- to scroll display pages.

2. Display

- Instantaneous measurements:
- 3 1/2 digit (max display 1999).
- Alphanumeric indications by means of LED display for:
- Display of configuration parameters;
- The measured variable.

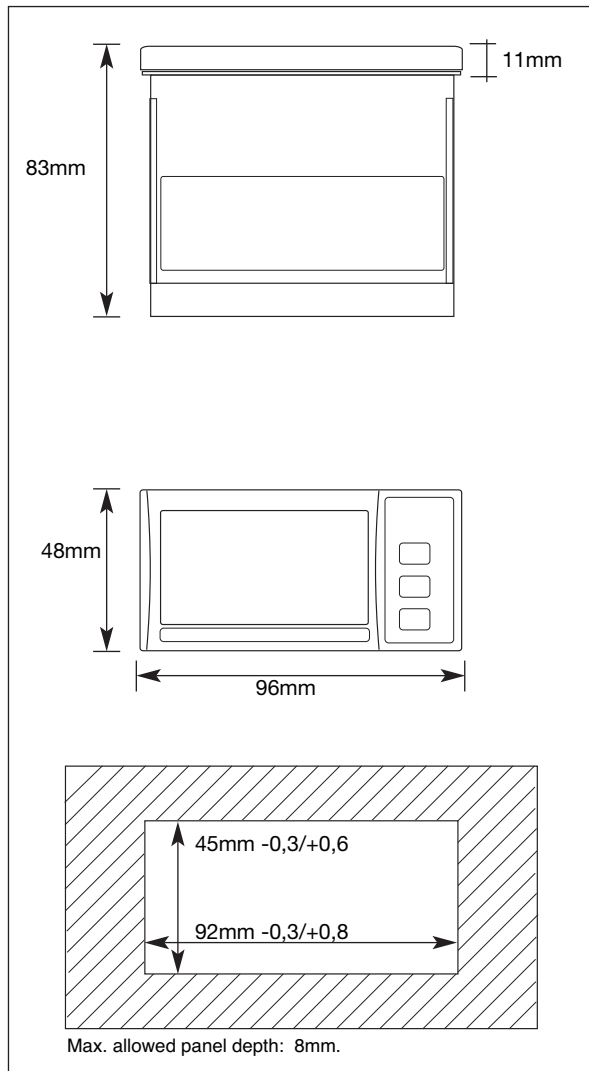
3. Alarm status LED

Display any alarm condition

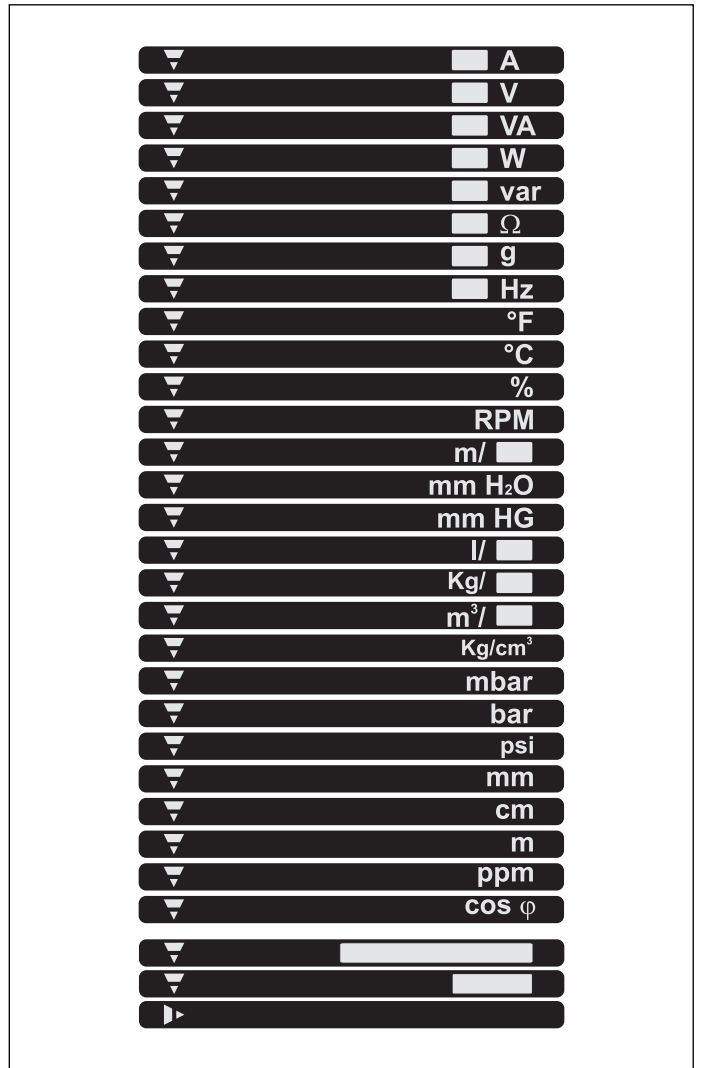
4. Engineering unit

The instrument is supplied with a complete set of self-sticking labels with the main engineering units.

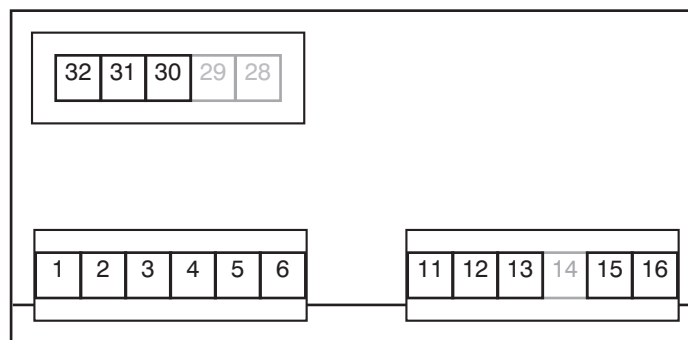
Dimensions



Engineering Units



Terminal blocks



Instrument back view