

Panel Meters and Controllers

Panel Meter Modular

Series EDM 35

CARLO GAVAZZI



- Modular digital panel meter, 3 1/2-digit
- Indicating or controlling current, voltage, resistance, temperature, tacho or frequency.
- Easy programming
- Programmable hysteresis and time delay (up to 2 setpoints)
- Data hold
- Peak/valley function
- Password protection of programming parameters
- Stock-saving - several ranges on each input module
- IP 65 (front)
- Optional hardware lock of programming
- Optional high-efficiency red or green display

Product Description

The EDM 35 is a 3 1/2-digit, modular digital panel meter where input and output modules can be combined to suit many applications. Scaling and setpoints are fully programmable and the program-

ming itself is very user-friendly. Furthermore, the EDM 35 includes peak/valley function and password protection. The housing is easy to mount and ensures a protection degree of IP 65.

Ordering Key

EDM35V1D41XXX



Type Selection

Range DC Voltmeters:

V1D: -199.9 to +199.9 mV
V2D: -1.999 to +1.999 V
V3D: -19.99 to +19.99 V
V4D: -199.9 to +199.9 V
V5D: -600 to +600 V *

Range AC Voltmeters:

V1A: 0 to 199.9 mV
V2A: 0 to 1.999 V
V3A: 0 to 19.99 V
V4A: 0 to 199.9 V
V5A: 0 to 600 V *

Range Ohmmeters:

R1D: 0 to 199.9 Ω
R2D: 0 to 1.999 kΩ
R3D: 0 to 19.99 kΩ
R4D: 0 to 199.9 kΩ

Range DC Ammeters:

A1D: -199.9 to +199.9 μA
A2D: -1.999 to +1.999 mA
A3D: -19.99 to +19.99 mA
A4D: -199.9 to +199.9 mA
A5D: -1999 to +1999 mA
A6D: -5.00 to +5.00 A
A7D: -10.00 to +10.00 A

* Nominal voltage according to IEC 60664-1.
 The measuring range includes 15% tolerance equal to 690 V.

Range AC Ammeters:

A1A: 0 to 199.9 μA
A2A: 0 to 1.999 mA
A3A: 0 to 19.99 mA
A4A: 0 to 199.9 mA
A5A: 0 to 1999 mA
A6A: 0 to 5.00 A
A7A: 0 to 10.00 A

Range Thermometers:

Pt 100:
P1C: -100.0 to 199.9°C
P2C: -100 to 850°C
P1F: -148.0 to 199.9°F
P2F: -148 to 392°F
P3F: -148 to 1562°F

Thermocouple Type J:

-JC: -100 to 760°C
-JF: -148 to 1400°F

Thermocouple Type K:

-KC: -100 to 1250°C
-KF: -148 to 1999°F

Signal Output:

X: None
1: 4 to 20 mA
2: 0 to 20 mA
4: 0 to 10 V
5: Transducer power supply 12 VDC
6: Transducer power supply 24 VDC
 Contact factory for other output signals

Options:

XX: None
CX: High eff. red display
DX: Green display
XP: Program lock
01-99: Special options (assigned by factory)

Relay Output:

0: None
1: 1 Relay
2: 2 Relays

Power Supply:

3: 12 to 48 VDC
4: 230 VAC
5: 115 VAC
6: 48 VAC
7: 24 VAC

Range Frequency Meters:

F1X*: 5.0 to 199.9 Hz
F2X*: 10.0 to 1999 Hz

* **Replace X with:**
A for Namur input
B for NPN, PNP & Contact input
C 600 VAC input



Type Selection (cont.)

Range Tachometers:

T1X* :	8.0 to 199.9 rpm @30 ppr**
T2X* :	5.0 to 199.9 rpm @60 ppr**
T3X* :	2.0 to 199.9 rpm @100 ppr**
T4X* :	20 to 1999 rpm @30 ppr**
T5X* :	10 to 1999 rpm @60 ppr**
T6X* :	10 to 1999 rpm @100 ppr**

- * Replace X with:
 A for Namur input
 B for NPN, PNP & Contact input
- ** pulses per revolution

Input Specifications - General

Power supply	Input modules supplied by main unit
EMC	Electromagnetic compatibility
Immunity	Acc. to IEC 60801-4 Acc. to IEC 60801-5

Supply Specifications

Power supply AC	Overvoltage cat. III (IEC 60664)
Rated operational voltage	230 VAC ± 10% 115 VAC ± 10% 48 VAC ± 10% 24 VAC ± 10%
Frequency	50/60 Hz ± 5Hz
Voltage interruption	≤ 20 ms
Rated insulation voltage	250 VAC basic rms
Rated impulse withstand voltage	6 kV (1.2/50 μs) IEC 60664-1
Power supply DC	
Rated operational voltage	12 to 48 VDC ±15%
Voltage interruption	≤ 10 ms (voltage = 10 VDC)
Rated insulation voltage	150 VDC basic
Rated impulse withstand voltage	4.0 kV (1.2/50 μs) IEC 60664-1
Rated operational power	< 7 VA
EMC	Electromagnetic compatibility
Immunity	Acc. to IEC 60801-4 Acc. to IEC 60801-5

Separate Ordering Numbers

Main unit (mechanical parts included)	Ordering number	
Red display (standard red)	5100511	
Red display (high-bright red)	5100512	
Green display	5100510	
		With Program Lock
Input modules		
VDC	5100530	5100630
VAC	5100531	5100631
ADC	5100532	5100632
AAC	5100533	5100633
AAC/ADC 10 A	5100534	5100634
Ohm	5100535	5100635
Pt 100	5100536	5100636
Pt 100 850°C	5100539	5100639
Thermocouple Type J	5100537	5100637
Thermocouple Type K	5100538	5100638
Tachometer	5100540	5100640
Frequency meter	5100541	5100641
Output modules		
1 Relay	5100561	
2 Relays	5100562	
Analog output	5100560	
12/24 VDC excitation output	5100526	
Power supply modules		
12 to 48 VDC	5100524	
24 VAC	5100523	
48 VAC	5100522	
115 VAC	5100521	
230 VAC	5100520	

General Specifications

Display	7-segment LED, height 14.2 mm 2 LEDs for indication of relay ON -1999/1999 EE (underrange: -EE) See module specifications See module specifications
Min./Max. indication	-1999/1999
Overrange indication	EE (underrange: -EE)
Accuracy	See module specifications
Temperature drift	See module specifications
Scaling	
Electrical input range	Progr. within whole range
Display range	Progr. within whole range
Decimal point position	Programmable
Module connection	Screw terminals
Environment	
Degree of protection	IP 65 (front) IP 20 (behind panel)
Operating temperature	0° to +50°C. R.H. < 90% non-condensing
Storage temperature	-10° to +60°C. R.H. < 90% non-condensing
Weight	Approx. 350 g depends on modules used
Housing	
Dimensions	48 x 96 x 89 mm
Housing material	ABS/Polycarbonate blend
Front material	Polycarbonate
Colour	Black housing Red front with red display Grey front with green display
Approvals	UL, CSA, SEV

Input Specifications - Modules

Voltmeters - AC/DC (5100531/5100530, 5100631/5100630)

Measuring ranges	Jumper position	Range code		Resolution	Input imped.
		AC	DC		
199.9 mV	1 - 4	7	1	0.1 mV	100 kΩ
1.999 V	2 - 5	8	2	1 mV	100 kΩ
19.99 V	2 - 5	9	3	10 mV	1 MΩ
199.9 V	3 - 6	10	4	0.1 V	1 MΩ
600 V *	5 - 6	12	6	1 V	1 MΩ

* Nominal voltage according to IEC 664-1. The measuring range includes 15% tolerance equal to 690 V.

Accuracy

AC voltmeter	0.3% of reading ± 3 dgt
DC voltmeter	0.2 % of reading ± 2 dgt

Temperature drift

AC voltmeter	± 150 ppm/ $^{\circ}$ C ± 0.2 dgt/ $^{\circ}$ C
DC voltmeter	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C

Ammeters - AC/DC(5100533/5100532/ 5100534, 5100633/5100632/5100634)

Measuring ranges	Jumper position	Range code		Resolution
		AC	DC	
199.9 μ A	1 - 2	7	1	0.1 μ A
1.999 mA	2 - 3	8	2	1 μ A
19.99 mA	4 - 5	9	3	10 μ A
199.9 mA	5 - 6	10	4	0.1 mA
1999 mA	2 - 5	11	5	1 mA
5.00 A	2 - 5	12	6	10 mA
10 AAC	2 - 3	12	-	10 mA
10 ADC	1 - 2	-	6	10 mA

Accuracy

AC ammeter	0.3% of reading ± 3 dgt
AC ammeter (10 A)	0.5% of reading ± 5 dgt
DC ammeter	0.2 % of reading ± 2 dgt
DC ammeter (10 A)	0.5% of reading ± 5 dgt

Temperature drift

AC ammeter	± 150 ppm/ $^{\circ}$ C ± 0.5 dgt/ $^{\circ}$ C
AC ammeter (2 A, 5 A)	± 200 ppm/ $^{\circ}$ C ± 0.1 dgt/ $^{\circ}$ C
AC ammeter (10 A)	± 200 ppm/ $^{\circ}$ C ± 0.5 dgt/ $^{\circ}$ C
DC ammeter	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
DC ammeter (2 A, 5 A)	± 200 ppm/ $^{\circ}$ C ± 0.5 dgt/ $^{\circ}$ C
DC ammeter (10 A)	± 200 ppm/ $^{\circ}$ C ± 0.5 dgt/ $^{\circ}$ C

Voltage drop

< 200 mV (all ranges)

Thermometers (5100536/5100537/5100538, 5100539/5100636/5100637/5100638/5100639)

Range	Reso- lution	Accuracy	Temperature drift
Pt 100:			
-100.0 to 199.9 $^{\circ}$ C	0.1 $^{\circ}$ C	$\pm 0.2\%$ of reading ± 2 dgt	± 150 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-148.0 to 199.9 $^{\circ}$ F	0.2 $^{\circ}$ F	$\pm 0.2\%$ of reading ± 4 dgt ± 0.10 dgt/ $^{\circ}$ F	± 180 ppm/ $^{\circ}$ F -148 to 392 $^{\circ}$ F
1 $^{\circ}$ F		$\pm 0.2\%$ of reading ± 4 dgt ± 0.10 dgt/ $^{\circ}$ F	± 180 ppm/ $^{\circ}$ F
Pt100, 850$^{\circ}$C:			
-100 to 850 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 0.2\%$ of reading ± 3 dgt	± 150 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-148 to 1562 $^{\circ}$ F	2 $^{\circ}$ F	$\pm 0.4\%$ of reading ± 6 dgt	± 180 ppm/ $^{\circ}$ F ± 0.1 dgt/ $^{\circ}$ F
Thermocouple type J:			
-100 to 760 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 0.1\%$ of reading ± 4 dgt	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-148 to 1400 $^{\circ}$ F	1 $^{\circ}$ F	$\pm 0.1\%$ of reading ± 8 dgt ± 0.1 dgt/ $^{\circ}$ F	± 180 ppm/ $^{\circ}$ F
Thermocouple type K:			
-100 to 1250 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 3\%$ of reading ± 3 dgt	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-100 to -50 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 1\%$ of reading $\pm 5/-1$ dgt	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-50 to 780 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 0.1\%$ of reading ± 3 dgt	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
780 to 1250 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 0.25\%$ of reading $\pm 1/-3$ dgt	± 100 ppm/ $^{\circ}$ C ± 0.05 dgt/ $^{\circ}$ C
-148 to 1999 $^{\circ}$ F	2 $^{\circ}$ F	$\pm 3\%$ of reading ± 6 dgt ± 0.1 dgt/ $^{\circ}$ F	± 180 ppm/ $^{\circ}$ F -148 to -58 $^{\circ}$ F
2 $^{\circ}$ F		$\pm 1\%$ of reading $\pm 10/-2$ dgt	± 180 ppm/ $^{\circ}$ F ± 0.1 dgt/ $^{\circ}$ F
-58 to 1436 $^{\circ}$ F	2 $^{\circ}$ F	$\pm 0.1\%$ of reading ± 6 dgt ± 0.1 dgt/ $^{\circ}$ F	± 180 ppm/ $^{\circ}$ F 1436 to
1999 $^{\circ}$ F	2 $^{\circ}$ F	$\pm 0.25\%$ of reading $\pm 2/-6$ dgt	± 180 ppm/ $^{\circ}$ F ± 0.1 dgt/ $^{\circ}$ F

Ohmmeters (5100535, 5100635)

Measuring ranges	Jumper position	Range- code	Resolution
199.9 Ω	1 - 4	7	0.1 Ω
1.999 k Ω	2 - 5	8	1 Ω
19.99 k Ω	3 - 6	9	0.01 k Ω
199.9 k Ω	1 - 2	10	0.1 k Ω

Accuracy

0.2% of reading ± 2 dgt

Temperature drift

± 150 ppm/ $^{\circ}$ C ± 0.1 dgt/ $^{\circ}$ C

Input Specifications - Modules (cont.)

Tachometers (5100540, 5100640)

Measuring ranges	Jumper position	Range code	Resolution
199.9 rpm @30 ppr*	J4, 1-2	7	0.1 RPM
199.9 rpm @60 ppr*	J5, 1-2	8	0.1 RPM
199.9 rpm @100 ppr*	J6, 1-2	9	0.1 RPM
1999 rpm @30 ppr*	J4, 2-3	10	1 RPM
1999 rpm @60 ppr*	J5, 2-3	11	1 RPM
1999 rpm @100 ppr*	J6, 2-3	12	1 RPM

* pulses per revolution

Input selection Namur NPN, PNP, Contact	J1 J2
Accuracy	1% of reading ± 5 dgt
Temperature drift	± 200 ppm/ $^{\circ}$ C
Input impedance Namur NPN, PNP and Contact	1 k Ω 5 k Ω
Time constant (tc)	1 sec.

Frequency Meters (5100541, 5100641)

Measuring ranges	Jumper position	Range code	Resolution
199.9 Hz	J7	7	0.1 Hz
1999 Hz	J8	8	1 Hz

Input selection Namur NPN, PNP, Contact 600 VAC	J1, J4 and J6 J2 and J5 J3
Accuracy	1% of reading ± 5 dgt
Temperature drift	± 200 ppm/ $^{\circ}$ C
Input impedance Namur NPN, PNP and Contact 600 VAC	1 k Ω 5 k Ω 600 k Ω
Time constant (tc)	1 sec.

Output Specifications

Excitation output (5100526)

Power supply	Supplied by main unit
Output voltage 12 VDC: jumper position 24 VDC: jumper position	3 - 6, tolerance $\pm 20\%$ 1 - 4, tolerance $\pm 20\%$
Output current 12 VDC 24 VDC	≤ 35 mA DC ≤ 20 mA DC
EMC Immunity	Electromagnetic compatibility Acc. to IEC 60801-4 Acc. to IEC 60801-5

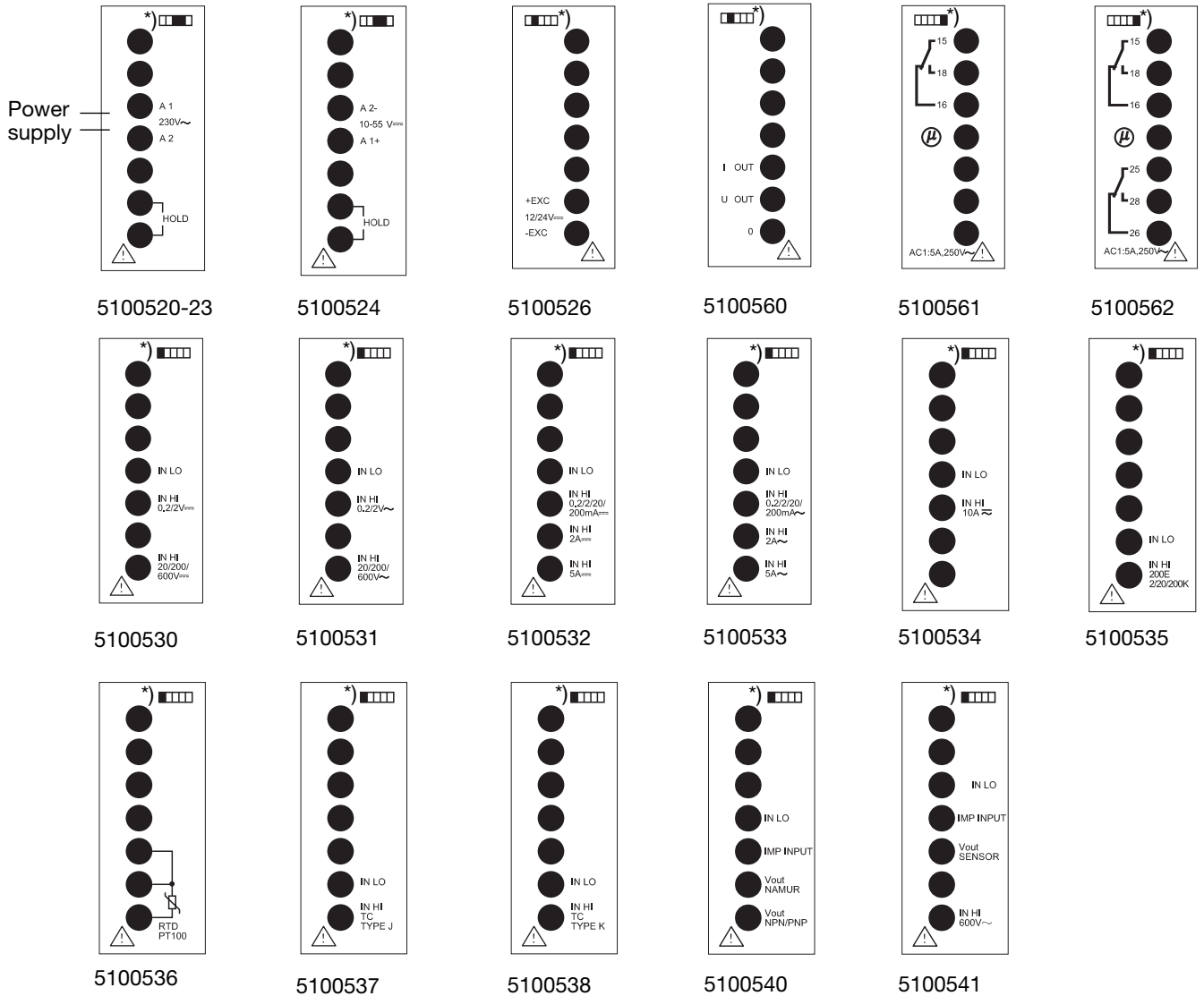
Analogue output (5100560)

Measuring ranges	Load resistance
0 to 20 mA	$\leq 500 \Omega$
4 to 20 mA	$\leq 500 \Omega$
0 to 10 V	$\geq 1,000 \Omega$
Accuracy 0 to 20 mA 4 to 20 mA 0 to 10 V	$\pm 1\%$ of reading ± 0.1 mA $\pm 1\%$ of reading ± 0.1 mA $\pm 1\%$ of reading ± 0.05 V
Temperature drift	± 200 ppm/ $^{\circ}$ C
Short-circuit protection	yes

Relay output 1 or 2 relays (5100561/5100562)

Power supply	Supplied by main unit
Output	1 or 2 SPDT relays
Rated insulation voltage	250 V basic rms
Contact ratings (AgCdO) Resistive Small inductive loads	AC 1 DC 1 AC 15 DC 13
	5 A, 250 VAC 5 A, 24 VDC 2 A, 250 VAC 3 A, 24 VDC
Mechanical life	$\geq 40 \times 10^6$ operations
Electrical life	$\geq 10^5$ operations (at max. load)
Operating frequency	max. 10 Hz (50% duty cycle)
Dielectric strength Dielectric voltage Rated impulse withstand volt.	2 kVAC (rms) 4 kV (1.2/50 μ s)

Wiring Diagrams



Modules with type nos. xxxx63x are equipped with Program Lock function.

*) Module position (slot) in the base unit is indicated by a drawing on the plastic cover.

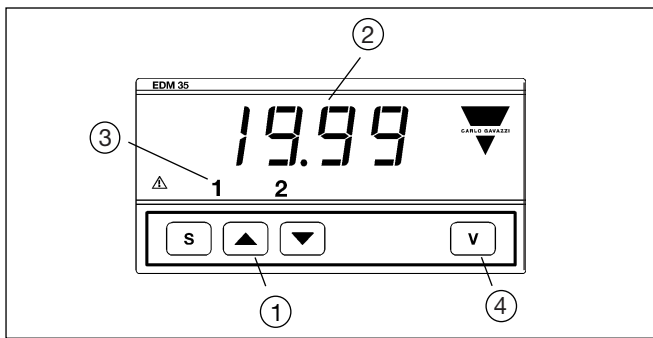
Caution!

Since the input circuitry is not galvanically isolated, the potential of the measured variable will be present on all connections to the unit (i.e. "Hold" input). This is of special importance when measuring line voltage and current.

Note.

By short-circuiting terminals marked "HOLD" (supply module), it is possible to hold the displayed value indefinitely (hold function). The comparison of the input variable with the alarm setpoint remains active. To reactivate the display, remove the short-circuit.

Front Panel Description



1. Keyboard

- « S » Set/enter
- « ▲ » Up
- « ▼ » Down

Set-up and programming procedures are easily controlled by the three pushbuttons.

Set/Enter key:

- Entry of variables.
- Selecting programming functions.

Up and Down key for:

- Display control.
- Increasing or decreasing programming value.
- Selecting programming functions and instrument configuration together with the « S » key.

2. Display

3 1/2-digit (maximum read-out 1999).

Alphanumeric indication by means of 7-segment display for:

- Displaying of the measured value.
- Indication of programming parameters.

3. LED

- "1" and "2" LED indicators for alarm conditions.

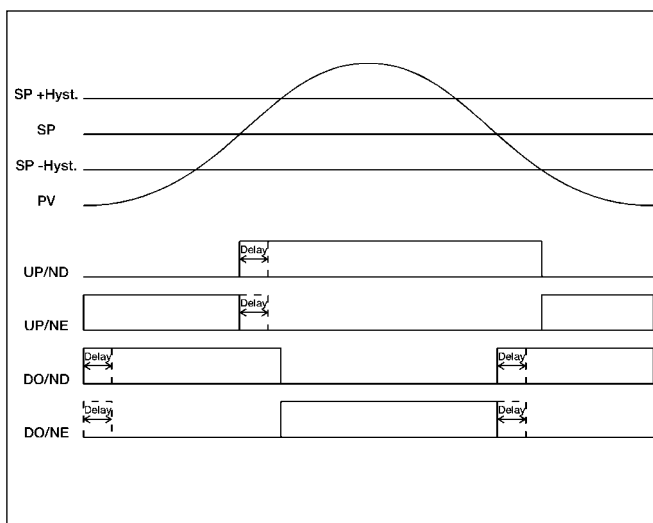
4. Engineering unit

Screen for interchangeable unit label. The symbols in the greyish areas are those available on the set of engineering unit labels supplied with the EDM. (Engineering unit label to be inserted by customer.)

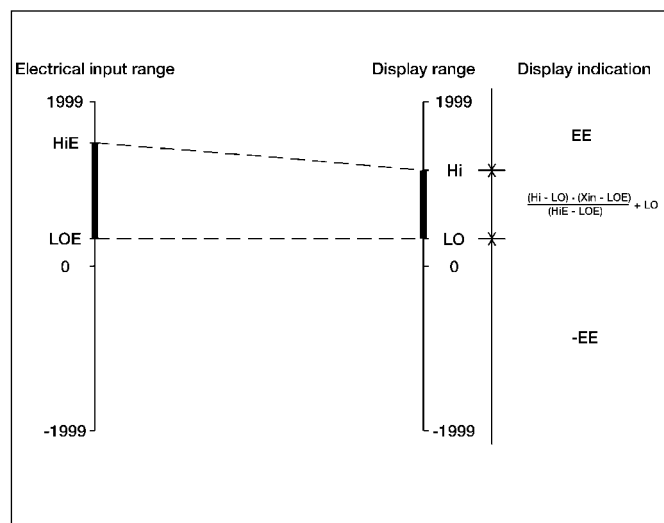
	W = 08	MΩ = 16	% = 24	mm HG = 32	cm = 40
mV = 01	kW = 09	Hz = 17	mbar = 25	l/min = 33	m = 41
V = 02	MW = 10	kHz = 18	bar = 26	l/h = 34	kg = 42
kV = 03	var = 11	RPM = 19	psi = 27	kg/min = 35	ppm = 43
μA = 04	kvar = 12	m/s = 20	ata = 28	ton/h = 36	kA = 44
mA = 05	Mvar = 13	m/min = 21	ate = 29	m ² /min = 37	cos φ = 45
A = 06	Ω = 14	°C = 22	kg/cm ² = 30	m ² /h = 38	m ³ = 46
mW = 07	kΩ = 15	°F = 23	mm H ₂ O = 31	mm = 39	μs = 47

Operation Diagrams

Setpoint Operation



Scaling Operation



Mode of Operation

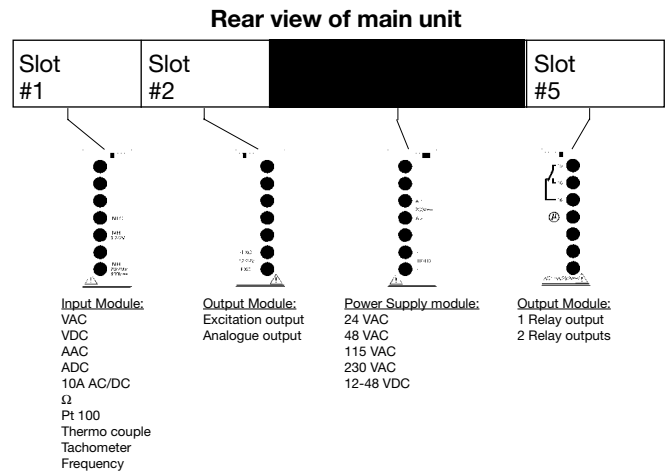
Depending upon the input modules used, it is possible to measure AC/DC (current or voltage), resistance (the range is selected with a jumper on the input module) or temperature (Pt 100 or Thermocouple J/K). Without an output module, the EDM is an indicator - by inserting an output module the EDM is a controller.

The input range and the display range are fully programmable, and so are the set-point(s) if a relay output module is inserted. A hold function is available for freezing a measured value. Passwords 0 to 99 are for overall programming while passwords 100 to 199 allow direct set-point programming outside the password protection. See user manual for further details.

Settings

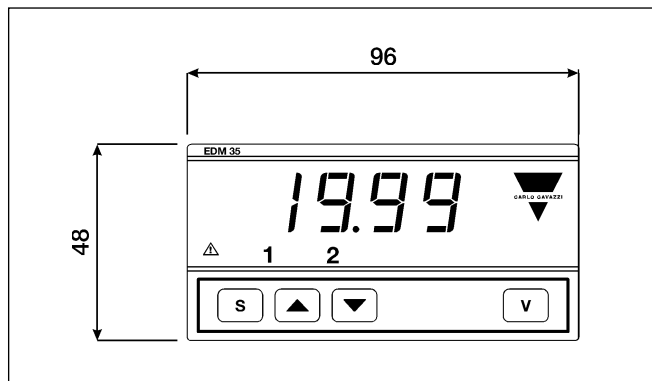
Programmable setting: See user manual.
 Jumper setting: See user manual.

Modules and Slot Position

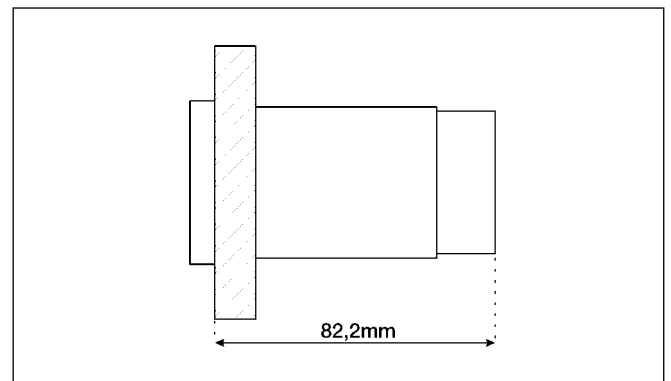


Overall Dimensions and Panel Cutout

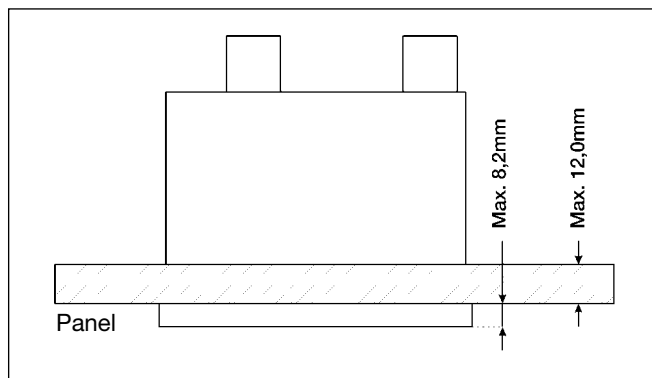
Front view



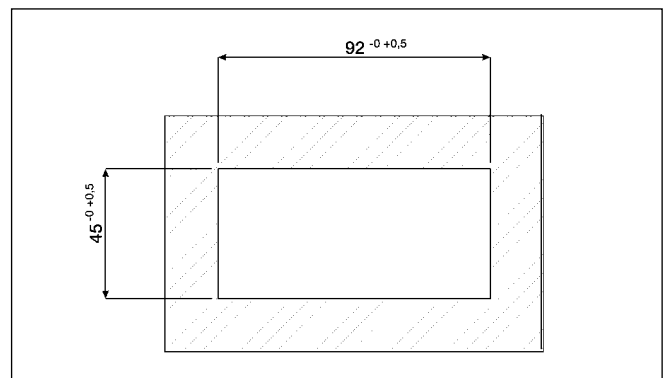
Side view



Top view



Panel cutout



All dimensions in mm.