

PROGRAMMABLE DIGITAL PANEL METERS

DIP400/401/402 - DGN75U/T/M DIP500/502 - DGN85U/M

ARDETEM

SFERE

Introduction

The series DIP et DGN offers a complete **range of high accuracy digital panel meters**, with IP 65 front face protection.

Each instrument is equipped with a 14mm high 5 red digit display, whose brightness fits applications in industrial control rooms perfectly. It enables display, control and transmission of data of all measurable magnitudes.

This range is declined in 3 input versions:

- **DIP400/500, DGN75U/85U** (for process inputs)
Bidirectionnal input for DC current or voltage: $\pm 100\text{mV}$, $\pm 1\text{V}$, $\pm 10\text{V}$, $\pm 300\text{V}$, $\pm 20\text{mA}$.
- **DIP401/DGN75T** (for Temperature inputs)
-Either thermocouple:
(J, K, N, S, B, W5, T, R, E, W, W3, L)
-Or sensor:
Pt 100 Ω 3 wire, Δ Pt 100 Ω 2 wire, Ni 100 Ω 3 wire
- **DIP402/502, DGN75M/85M** (Process, temperature, potentiometer + resistance inputs)
Potentiometer: from 100 Ω to 10 K Ω
Resistance: caliber 0-400 Ω , 0-2 K Ω (0-8 K Ω , as option)



Easy programming from the front face via a 4-key keyboard.

- **Display** : Electroluminescent red, 4 alarm messages
DIP400/402 DGN75U/M : $\pm 10\,000$ points (14 mm)
DIP500/502 DGN85U/M : -10 000 / +100 000 points (14 mm)
- **Housing** : Self-extinguishing case of black UL 94 V0 ABS.
- **Connectings** : plug-off connectors on the rear for screwed connections (2.5mm², flexible or rigid)
- **Protection** : Front face: IP 65 Case/terminals: IP20
- **Standards** : Complies with standards EN 50081-2 on emission and EN 50082-2; immunity (in industrial environment)
EN 61000-4-2 level 3, EN 61000-4-3 level 3,
EN 61000-4-4 level 4, EN 61000-4-6 level 3
CE Marking

Combinable with various option types:
(to be specified on the order)

Isolated analog output:

Output active or passive current, or voltage.
Programmable scale ratios, with enlarging effect.
Return value in case of sensor break and/or self-diagnosis

Relay output: 2 or 4 relays: mode setpoint or window.
Memorising of the alarms.
Time delay and hysteresis adjustable on each setpoint.
Alarm messages

Isolated digital output:

RS 485 2 wire, protocole MODBUS-JBUS.

LOGIC input: 2 isolated LOGIC inputs, with programmable functions:

Display hold, moving of the decimal point, tare function, min. and max. zero reset.

Bargraph display: (16 leds display)

Enables fast evaluation of the measured value variations.
Programmable scale factor.

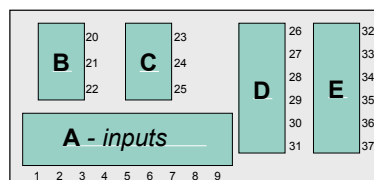


Technical features

Input types		Types of options																																									
DIP400/DGN75U	DIP400/DGN75U <u>DC current or voltage</u> Bidirectional ±100mV, ±1V, ±10V, ±300V, ±20mA. • Accuracy 0,05% of the full scale at +25°C • Thermal drift < 200 ppm/°C • Measurable scale overlapping from -5% to +5% • Scale factor programmable • Enlarging effect - Square root extraction • Special linearisation on 20 points • Supply for 2 or 3-wire sensor 26 Vdc (±15%) -25 mA protected from short circuits	option A1, A2, A3	<u>Analog output</u> : choice among 3 types A1: Active current output 0/4-20mA A2: Passive current output 0/4-20mA (Vmax.=30Vdc) A3: Voltage output 0-10V • Accuracy 0.1 % in relation to display (at +25°C) • Residual drift ≤ 0,2% • Admissible load 0Ω < Rc < 500 Ω (current) Rc > 2 kΩ (voltage) • Programmable scale ratio with enlarging effect • Response time: 40 ms																																								
	DIP401/DGN75T <u>Temperature</u> <u>Thermocouples:</u> <table><tr><td>Type J</td><td>min. -160 °C</td><td>max. +1200 °C</td></tr><tr><td>Type K</td><td>min. -270 °C</td><td>max. +1370 °C</td></tr><tr><td>Type N</td><td>min. +0 °C</td><td>max. +1300 °C</td></tr><tr><td>Type S</td><td>min. -50 °C</td><td>max. +1770 °C</td></tr><tr><td>Type B</td><td>min. +200 °C</td><td>max. +1820 °C</td></tr><tr><td>Type W5</td><td>min. +0 °C</td><td>max. +2300 °C</td></tr><tr><td>Type T</td><td>min. -270 °C</td><td>max. +410 °C</td></tr><tr><td>Type R</td><td>min. -50 °C</td><td>max. +1770 °C</td></tr><tr><td>Type E</td><td>min. -120 °C</td><td>max. +1000 °C</td></tr><tr><td>Type W</td><td>min. 1000 °C</td><td>max. +2300 °C</td></tr><tr><td>Type W3</td><td>min. 0 °C</td><td>max. +2480 °C</td></tr><tr><td>Type L</td><td>min. -150 °C</td><td>max. +910 °C</td></tr></table> • Accuracy: 0.1% of full scale at +25°C, or 25µV typical (50µV max.) • Thermal drift < 150ppm/°C (except CJC) CJC efficiency: < 0,03°C/°C ± 0.5°C from -5°C to +55°C <u>Sensors:</u> <table><tr><td>Pt 100 Ω</td><td>min -200 °C</td><td>max. +850 °C</td></tr><tr><td>Ni 100 Ω</td><td>min -60 °C</td><td>max. +260 °C</td></tr></table> • Line resistance influence in 3-wire measure included in the class for 0<Rt<25Ω • 2-wire Δ Pt100 measurement from -200°C to +270°C (0<Rt<10Ω) (Resistance max. 400Ω) • Max. measure current: 250 µA • Accuracy: 0.1% of full scale at +25°C		Type J	min. -160 °C	max. +1200 °C	Type K	min. -270 °C	max. +1370 °C	Type N	min. +0 °C	max. +1300 °C	Type S	min. -50 °C	max. +1770 °C	Type B	min. +200 °C	max. +1820 °C	Type W5	min. +0 °C	max. +2300 °C	Type T	min. -270 °C	max. +410 °C	Type R	min. -50 °C	max. +1770 °C	Type E	min. -120 °C	max. +1000 °C	Type W	min. 1000 °C	max. +2300 °C	Type W3	min. 0 °C	max. +2480 °C	Type L	min. -150 °C	max. +910 °C	Pt 100 Ω	min -200 °C	max. +850 °C	Ni 100 Ω	min -60 °C
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Ni 100 Ω	min -60 °C	max. +260 °C																																									
DIP 401/DGN75T		option N	<u>Digital output</u> N: RS485 data link (2 wire) • Protocoles MODBUS-JBUS , data formats: integer / double integer • Slave number programmable from 1 to 255 with a 1200 to 19200 Baud rate																																								
			option LOGIC <u>LOGIC inputs</u> LOGIC : 2 insulated LOGIC inputs • Display hold, • Moving of the decimal point, • Function tare, • Min. max. zero reset																																								
DIP402/502-DGN75M/85M	DIP402/502 - DGN75M/DGN85M <u>DC current or voltage, temperature, potentiometer, resistance</u> (See DIP 400 and DIP 401 features above) Resistive sensor : calibers 0-400 Ω and 0-2 kΩ (option 0-8 kΩ) • Accuracy : 0.1% for calibers 0-400 Ω and 0-8 kΩ and 0.5% for caliber 0-2 kΩ (of full scale at +25°C) • Thermal drift < 150ppm/°C Potentiometers : from 100 Ω to 10 kΩ • Accuracy: 0.1% of full scale at +25°C • Thermal drift < 150ppm/°C	option B <u>Bargraph display</u> B: display 16 leds • Enables fast evaluation of the measured value variations																																									

◆ Locations and combinations of options

All options can be combined, except in one case:
options: logic input, 4 relays, with the analog output.



Location of the terminals
(view of case rear side)

Locations

- B** : option N (digital output)
- C** : option A1, A2, A3 (analog output) or logic option
- D** : option R (2 relays only)
- E** : option logic input or **E+D**: option R4 (2+2 relays)

Note: the location E is used in priority for the option logic input

◆ Power supply

For the DIP400/401/402, DGN75 U/T/M:

20 to 270VAC 50/60/400Hz, and 20 to 300Vdc

Power draw: 3 W max. 5.5 VA max.

For the DIP500/502, DGN85U/M:

2 Versions: High or Low Voltage
(to be specified on order)

High Voltage: 90...270 VAC 50/60/400 Hz
and 88 ...350 Vdc

Low Voltage: 20...53 VAC 50/60/400 Hz
and 20...75 Vdc

Power draw: 5 W max. 8 VA max.

◆ Features

- Sampling time: 100ms
- Input impedance $\geq 1\text{ M}\Omega$ for voltage inputs
0.9 V max. drop for current input
- Rejection rate:
Common mode: 130 dB Serial mode: 70 dB 50/60 Hz
- Zero drift compensation and self-calibration
- Isolation: Input/Power supply: 2.5 kV eff. 50Hz-1min
Input/Output: 2.5 kV eff. 50Hz-1min

◆ Programmable integration indice

Allows stabilizing the display in case of unsteady input.

◆ Sensor or line break detection

- Can be detected on inputs mV, TC, Pt 100, Ni 100 ,
 Δ Pt100, resistance (0-400 Ω) and current (4-20 mA).
- Return value programmable on the analog output in case of sensor break.
- Sensor break detection programmable on the 4 relays.
- Possibility to disconnect the sensor rupture.

◆ Self diagnosis:

- Permanently watches any component drift that may surge.
Serves to warn the user before they provoke false measures.
- Self-diagnosis error detection programmable on the 4 relays.
- Return value programmable on the analog output in case of error self-diagnosis

◆ Input scale overstepping

Visualised on the display by a flashing measure.

◆ Linearisations

- Linear input
- Square root extraction (current or voltage inputs)
- Special linearisation on 20 points (in X and in Y)
(voltage, current, potentiometer or resistance inputs)

◆ Process calibration (slope or offset)

Programmable on all inputs.

◆ Brightness setting

Sets the brightness of digits and bargraph leds independently
Programmable: 4 levels
According to the instrument location (outdoor, control room...)

◆ Quick reading on the display

- Of the setpoint values.
- Of the input signal electrical value.
- Of the min. and max. values.

◆ Simulation function

- Simulation of the analogue output possible (mode generator).
- Simulation of the measure possible: enables validating the configuration of the analog output and the relay outputs in the system.

◆ Access code

An access code adjustable from 0000 to 9999 serves to prevent unauthorized programming of the meter, of the set-points and to lock the access to some functions.
The code is 0000 on factory exit.

x	x	x	x
...	...	...	...
...	...	0 to 5	Access to the process calibration
...	...	6 to 9	No access
...	...	...	...
...	...	0 to 5	Access to measure and output simulations
...	...	6 to 9	No access
...	...	...	...
...	...	0 to 5	Access to the function "tare" (except t° inputs)
...	...	6 to 9	No access
...	...	...	...
...	...	0 to 5	Access to the quick entering of alarm setpoints
...	...	6 to 9	No access

◆ Environment

- Front face protection IP 65.
- Operating temperature: -5 to 55°C.
- Storage temperature: -30°C to +80°C.
- Relative dampness: 80% annual average
- Connection by plug-off screwed connectors
(for 2.5 mm² cable, flexible or rigid).
- Black ABS self-extinguishing case UL 94 VO.
- Weight with/without output board: 250g/150g.

Coding

◆ Types:

ARDETEM: DIP400/401/402/500/502

SFERE: DGN75U/T/M, DGN85U/M

◆ Output options :

A : Analo (A1, A2 or A3: specify)
R : 2 relays
R4 : 4 relays
N : Digital link (RS 485 2 wire)
tor : 2 logic inputs
B : Bargraph display

Simultaneously combinable options:

A / R / N / B / tor
A / R4 / N / B
R4 / N / B / tor

Order example: For a 10000 point meter with temperature input to display temperature from an engine rotor with an analogue output and 2 relays with a 230 VAC power supply, request the reference: **DIP 401/DGN75T A2R 2** (passive current output).

This appliance is dedicated to industrial applications. It has to be installed in an electrical cabinet, or equivalent.

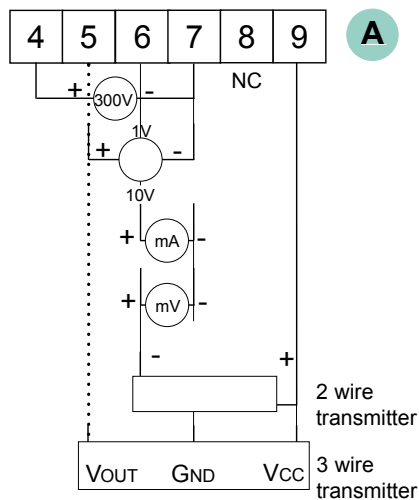
Connections

INPUTS

DIP402/502-DGN75M/85M

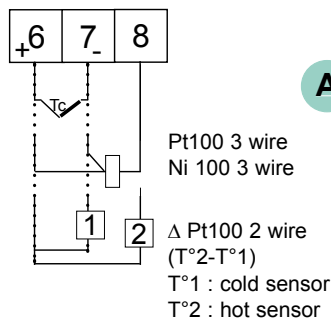
DIP400/500-DGN75U/85U

PROCESS

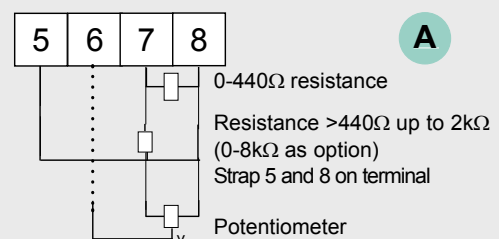


DIP401/DGN75T

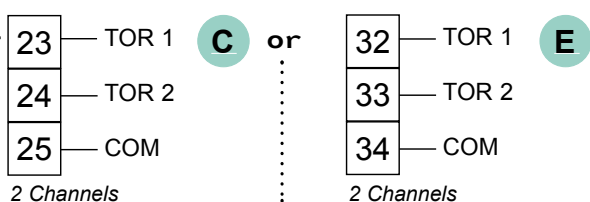
TEMPERATURE



RESISTANCE and POTENTIOMETER



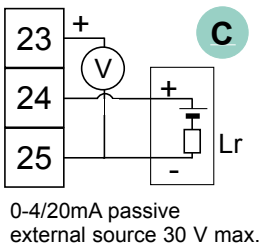
LOGIC INPUTS (options)



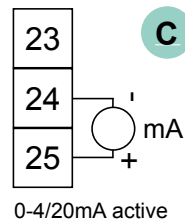
OUTPUTS (options)

VOLTAGE

PASSIVE CURRENT

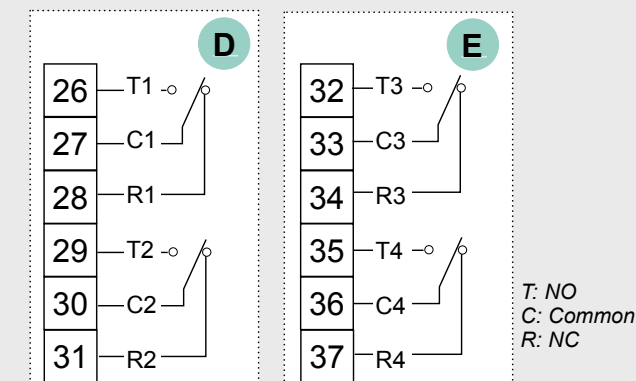


ACTIVE CURRENT

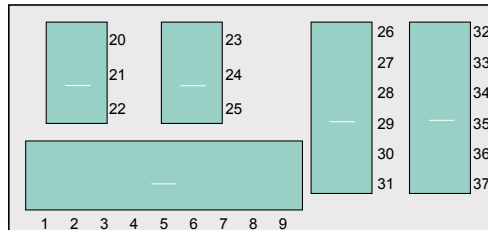
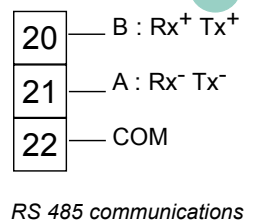


2 RELAYS: D OR E

4 RELAYS: D AND E

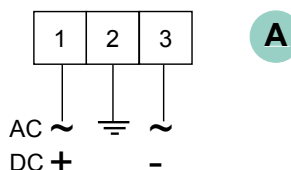


DIGITAL



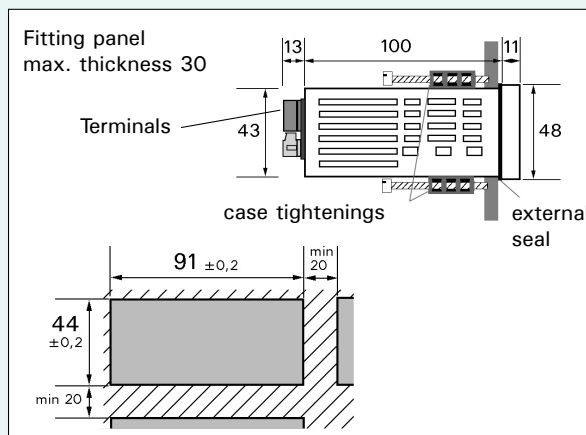
Location of the terminals
(view of case rear side)

SUPPLY



Dimensions

Housing: 96 x 48 x 124 mm (with terminals)



Mounting: on panel, cut out 44 x 91 mm



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