GEFRAN

40T 96

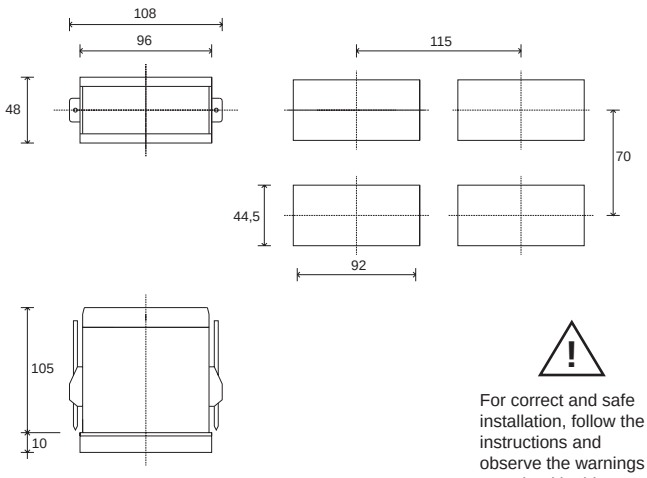
UNIVERSAL TEMPERATURE and PRESSURE INDICATOR - ALARM UNIT

INSTALLATION and OPERATION MANUAL

SOFTWARE VERSION **3.2x** (includes R77 version)
code **81641F** / edition **12** - **01/07**

1 • INSTALLATION

• Dimensions and cut-out; panel mounting



For correct and safe installation, follow the instructions and observe the warnings contained in this manual.

Panel mounting:

Fix the device with the bracket provided before making any electrical connections.
To mount two or more devices side by side, use the cut-out dimensions shown above.

***CE MARKING*:** EMC (electromagnetic compatibility) conformity to EEC Directive 89/336/EEC and following modification with reference to the generic Standard EN61000-6-2 (immunity in industrial environments) and EN61000-6-4 (emission in industrial environments).

BT (low voltage) conformity to Directive 2006/95/CE.

***MAINTENANCE*:** Repairs must be done out only by trained and specialized personnel. Cut power to the device before accessing internal parts.

Do not clean the case with hydrocarbon-based solvents (Petrol, Trichlorethylene, etc.). Use of these solvents can reduce the mechanical reliability of the device. Use a cloth dampened in ethyl alcohol or water to clean the external plastic case.

***SERVICE*:** GEFRAN has a service department. The warranty excludes defects caused by any use not conforming to these instructions.

EMC conformity has been tested with the following connections

FUNCTION	CABLE	LENGTH. USED
TC input probe	0,8 mm² compensated	5 mt
"PT100" input probe	1 mm²	3 mt
Power supply cable	1 mm²	1 mt
Relay output cables	1 mm²	3,5 mt

2 • TECHNICAL SPECIFICATIONS

Display	3, 4 digit red LED's digit height 20mm (3 digits), digit height 14mm (4 digits)
Keys	3 mechanical keys (Raise, Lower, F)
Accuracy	0.2% f.s. at 25°C, amb. temperature ts =120msec
Thermal drift	0.005% f.s./°C
Resolution (unction of settable sample time)	120msec, >14bit 60msec, >14bit (only for linear inputs) 30msec, >13bit (only for linear inputs) 15msec, >12bit (only for linear inputs)
Main input	TC, RTD, PTC, NTC 60mV, 1V Ri ≥ 1MΩ; 5V, 10V Ri ≥ 10KΩ 20mA, Ri = 50Ω. adjustable digital filter
Thermocouples	J, K, R, S, T, B, E, N (IEC 584-1, CEI EN 60584-1, 60584-2) L GOST, U, G, D, C. Custom linearization available on request
Cold junction error	0,1° / °C
RTD type (scale configurable within indicated range, with or without decimal point)	DIN 43760 (PT100), JPT100
Max. RTD line resistance	20Ω
PTC type / NTC type	990Ω, 25°C / 1KΩ, 25°C
Max non-linearity error	See **tP** parameter
°C / °F selection	Faceplate configurable
Linear scale range	-1999...9999 (with 4 digit display) -999...999 (with 3 digit display); punto Configurable decimal point position, possible 3 segment linearization
Logic input	24V, 5mA or no-voltage contact
Function of logic input	configurable to reset memory latch, hold, flash, zero, select max./ min. peak, peak-peak value
Alarms (Trip points)	Maximum of three configurable alarms: absolute, deviation, symmetrical deviation. Adjustable hysteresis
Alarm masking	- exclude on power-up - latch reset from key and/or external contact - insert delay filter (DON, DBI, DOF, DPO) - set minimum intervention time
Relat contact	NO (NC) 5A 250Vac, 30Vdc
Logic output	24Vdc, 10V at 20mA, limitation to 30mA
Triac output	20...240Vac ±10%, 3A max. Snubberless, inductive and resistive load I^2t = 128A^2S
Fault settings	Alarm states can be configured in probe fault condition
Transmitter / Sensor power Supply (option)	24V ±10%, 50mA 15V for transmitter, max. 50mA 1,2V for potentiometer > 100Ω
Analog retransmission (option)	10V Rmin 50K - 0/4...20mA Rmax. 500Ω resolution 12bit
Power supply (switching)	(std) 100...240Vac/dc ±10%, 50/60Hz, 8VA (opt) 11...27Vac/dc ±10%, 50/60Hz,8VA
Fuse (inside device, not operator serviceable)	100 to 240VAC/DC -type T-500mA-250V 11 to 27VAC/DC - type T - 1,25A - 250V
Faceplate protection	IP65
Working / Storage temperat.	0 to 50°C / -20 to 70°C
Relative humidity	20 to 85% Ur non condensing
Environmental conditions of use	for internal use only, altitude up to 2000m
Installation	Panel mounting, extractable from front
Weight	320 g for the complete version

3 • DESCRIPTION OF FRONT PANEL

"Raise" and "Lower" keys:
These keys are used for any operation that requires a numerical parameter to be raised or lowered. •• The speed of change is proportional to the time the key is pressed. •• The operation is not cyclic: once the maximum (minimum) limit is reached, there will be no further increase (decrease) of the value, even if the key remains pressed.
The keys can be configured to perform reset, hold, display of the peak value, etc. as determined by the 't.U.' and 't.d.' parameters on the 'In' menu.

Function key:
Gives access to different configuration stages ••
Confirms any parameter changes

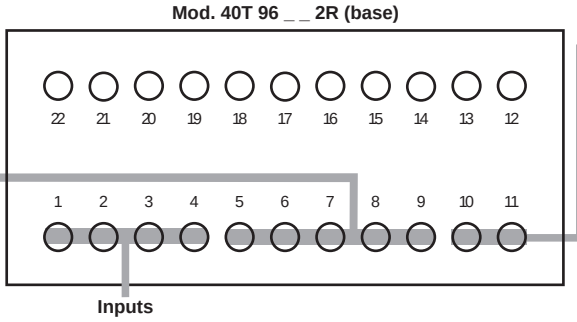
PV display: Indication of process variable ••
Indication of 'HI' or 'Lo' out of range •• Indication of open circuit (br) or short circuit (Er)
•• Display of configuration and calibration messages

Label with engineering units

Indication of output states:
OUT 1 (Alarm 1); OUT 2 (Alarm 2);
OUT 3 (Alarm 3); OUT 4 (Alarm 4)

4 • CONNECTIONS

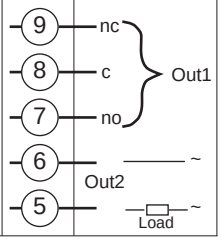
Mod. 40T 96 _ _ 2R (base)



• Outputs

Generic user configurable outputs

Out1
- relay 5A/250Vac
Out2
- relay 5A/250Vac

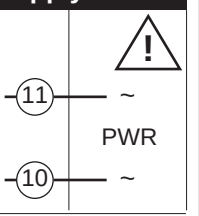


• Power supply

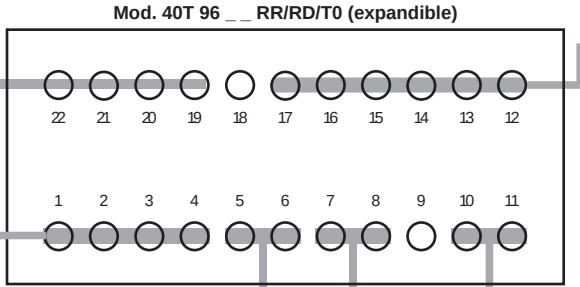
Standard:
100 to 240VAC/DC ±10%

Optional: 11 to 27VAC/DC ±10%

50/60Hz, 8VA max.

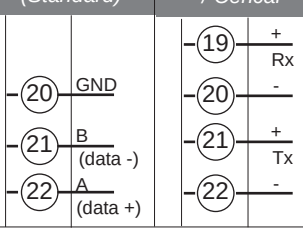


Mod. 40T 96 _ _ RR/RD/T0 (expandible)



• Serial line

Modbus 2 wires (Standard)	*Modbus 4 wires / Cencal*



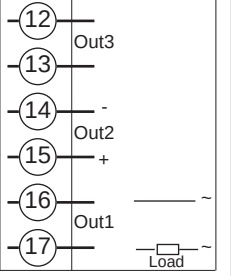
RS485 isolated serial line

For configuration Modbus 4 wires/Cencal sees sheet technical

• Outputs

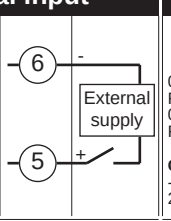
Generic user configurable outputs

Out1
- relay 5A/250Vac
- Triac
  20...240Vac ±10%
  1A max
Out2
- relay 5A/250Vac
- logic 24V/20mA,
Out3
- relay 5A/250Vac



• Digital input

Digital input
24V, 5mA
or no-voltage
contact

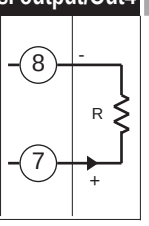


• Retransmiss. output/Out4

Analog retrans. output

0...20mA,
Rmax. 500Ω
0...10V
Rmin. 10KΩ

Out4
- relay 5A
250Vac

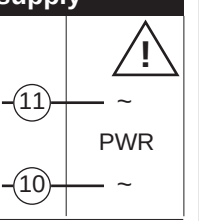


• Power supply

Standard:
100 to 240VAC/DC ±10%

Optional: 11 to 27VAC/DC ±10%

50/60Hz, 8VA max.

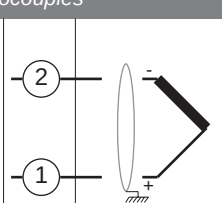


• Inputs

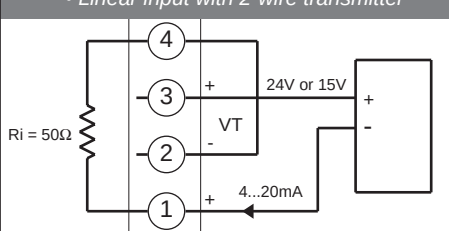
• Thermocouples

Available thermocouples:
J, K, R, S, T, B, E, N, L, U, G, D, C

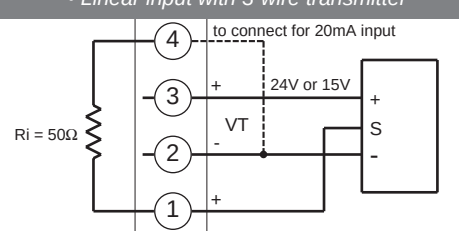
- Respect polarities
- For extensions, use compensated cable appropriate for thermocouple.



• Linear input with 2-wire transmitter

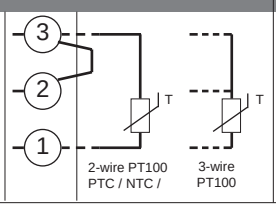


• Linear input with 3-wire transmitter

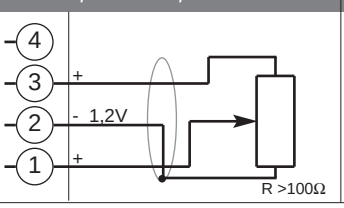


• Pt100 / PTC / NTC

Use wires of adequate thickness (min. 1mm²)
PT100, JPT100, PTC, NTC



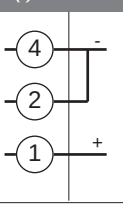
• Linear input 1V for potentiometer



• Linear (I)

dc current linear input

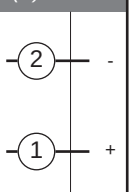
20mA, Ri = 50Ω



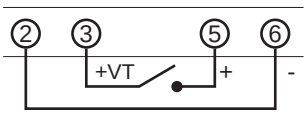
• Linear (V)

dc voltage linear input

60mV, 1V
Ri > 1MΩ
5V, 10V
Ri > 10kΩ



Connections for keylock function through digital input (require selection +VT for the signal on contact 3)



OFF (open): keyboard enable
ON (closed): keyboard disable

User configurable generic outputs / inputs

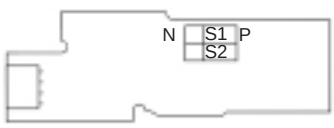
ANALOGUE Output

- Analogue 0...10V, 0/4...20mA
- 0/2...10V (S1-ON),
  0/4...20mA (S1-OFF)
  S1 is a jumper on the board for continuous or analogic output

DIGITAL Input

- Digital input 24V 5mA (Jumpers S1, S2 in position P) or from non-powered terminal (Jumpers S1, S2 in position N)

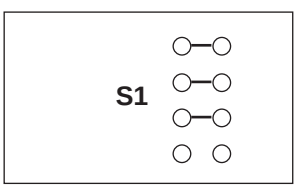
Hrd Menù configuration
Parameter diG or di2 = +16



Serial line

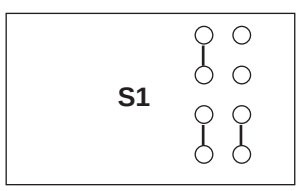
Modbus 2 wires (Standard)

Jumper position on board

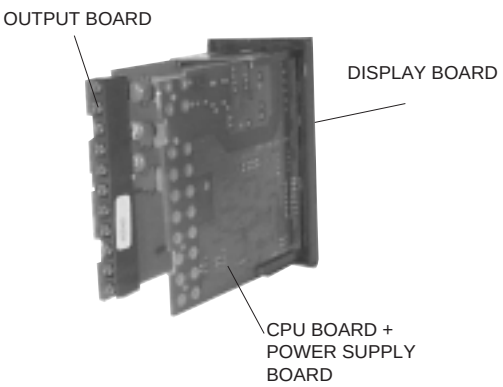


Modbus 4 wires / Cencal

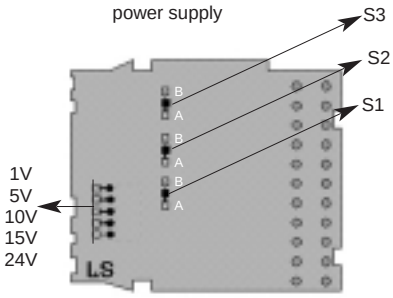
Jumper position on board



Device structure: identification of boards



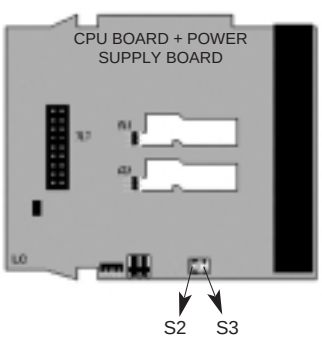
OUTPUT BOARD
Selection for the sensor or transmitter power supply



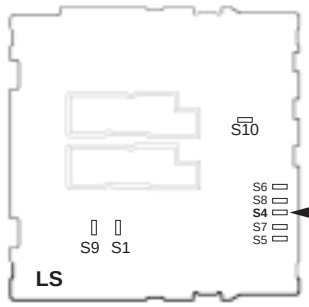
	Jumper	Directed		Inverse	
		A	**B**	**A**	**B**
OUT1	S1	ON	OFF	OFF	ON
OUT2	S2	ON	OFF	OFF	ON
OUT3	S3	ON	OFF	OFF	ON

You can select output state to have direct or reverse mode.
Jumper S1, S2 and S3 are normally closed in position A.
To change their state, the connection has to be removed.
This operation must be done by trained technical personnel.

Example in case of relay output:
- Direct mode: energized relay and related closed contact correspond to active trip point.
- Reverse mode: de-energized relay and related open contact correspond to active trip point.

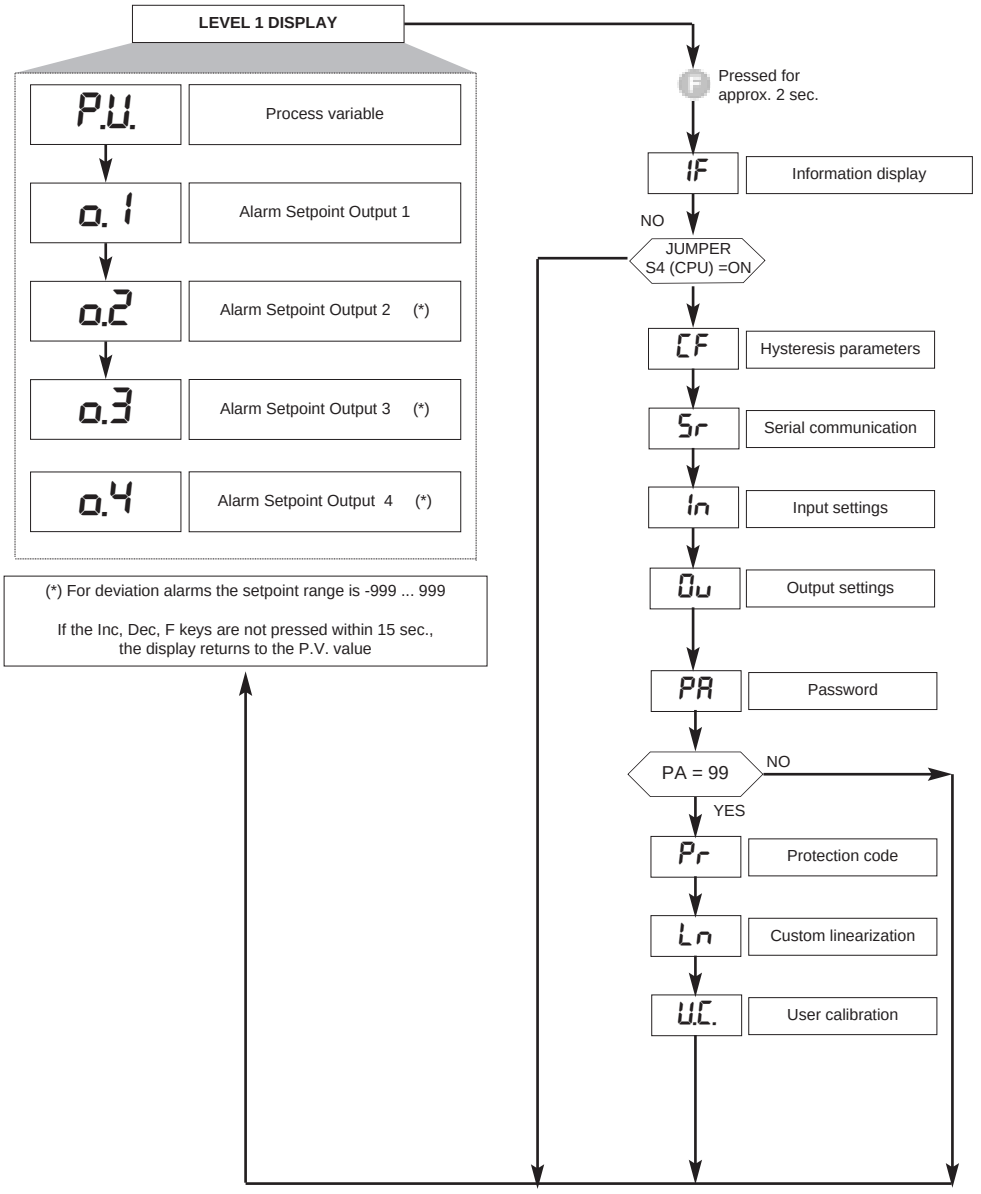


	RTD, PTC, NTC Input	Transmitter and Potent. Supply
S2	ON	OFF
S3	OFF	ON



Jumper S4 is normally closed.
To change its state, the connection has to be removed.
This operation must be done by trained technical personnel.

ACCESS TO THE MENU (S4)



Keep the F key pressed to browse the menus.

Release the F key to enter the displayed menu.

Press the F key to access the parameters.

Keep the F key pressed to exit any menu at any time.

• Hysteresis parameters

CF — Hysteresis parameters

H.1 — Hysteresis for trip point 1 — -999 ... +999 scale points

H.2 — Hysteresis for trip point 2 — -999 ... +999 scale points

H.3 — Hysteresis for trip point 3 — -999 ... +999 scale points

H.4 — Hysteresis for trip point 4 — -999 ... +999 scale points

• Information display

IF — Information display

Ud — Software version

Co — Instrument code

Hd — Hardware Configuration 1

H2 — Hardware Configuration 2

OUT 1
0 = None
1 = Present

OUT 2
0 = None
1 = Present

OUT 3
0 = None
1 = Present

OUT 4
0 = None
1 = Present

For model 3 digits sign: central segment

Central segment
Sign Extinguished = None

Central segment
Sign Ignited = Present

ANALOG OUTPUT
0 = None
5 = Present

DIGITAL INPUT
0 = None
7 = Present

SERIAL COMM.
0 = None
1 = RS485

• Serial communication

Sr — Serial setting

Co — Unit identification code — 0...247

SP — Serial interface protocol

SP	Serial protocol
0	CENCAL Gefran
1	MODBUS RTU

bA — Select Baudrate

bA	Baudrate
0	1200
1	2400
2	4800
3	9600
4	19200

Pt — Parity selection

Pt	Parity
0	No parity
1	Ddd
2	Even

S.I — Virtual instrument inputs — 0...63

Inputs	IN	PV	AL4	AL3	AL2	AL1
Bit	5	4	3	2	1	0
Ex.	1	1	0	0	0	0

Set code 48 in S.I to manage serial line PV and IN

S.o — Virtual instrument outputs — 0...31

Outputs	OUTW	OUT4	OUT3	OUT2	OUT1
Bit	4	3	2	1	0
Ex.	1	0	0	1	1

Set code 19 in S.o to manage serial line OUT1, OUT2 and OUTW

S.U — Virtual instrument user interface — 0...127

Interf		KEYB		DISF	LED OUT4	LED OUT3	LED OUT2	LED OUT1
Bit	7	6	5	4	3	2	1	0
Ex	0	1	0	0	0	0	0	1

Set code 65 in S.U to manage serial line KEYB and OUT1

• TC/LIN input parameters

In — Input settings

t.P — Type of probe, signal and scale of main input

TYPE	Type PROBE	4 DIGIT		3 DIGIT + sign	
		without dec. point	with dec. point	without dec. point	with dec. point
	Probe: TC				
0	TC J °C	0/1000	0.0/999.9	0/999	0.0/99.9
1	TC J °F	32/1832	32.0/999.9	32/999	32.0/99.9
2	TC K °C	0/1300	0.0/999.9	0/999	0.0/99.9
3	TC K °F	32/2372	32.0/999.9	32/999	32.0/99.9
4	TC R °C	0/1750	0.0/999.9	0/999	0.0/99.9
5	TC R °F	32/3182	32.0/999.9	32/999	32.0/99.9
6	TC S °C	0/1750	0.0/999.9	0/999	0.0/99.9
7	TC S °F	32/3182	32.0/999.9	32/999	32.0/99.9
8	TC T °C	-200/400	-199.9/400.0	-200/400	-99.9/99.9
9	TC T °F	-328/752	-199.9/752.0	-328/752	-99.9/99.9
10	TC B °C	44/1800	44.0/999.9	not available	not available
11	TC B °F	111/3272	111.0/999.9	not available	not available
12	TC E °C	-100/750	-100.0/750.0	-100/750	not available
13	TC E °F	-148/1382	-148.0/999.9	-148/999	not available
14	TC N °C	0/1300	0.0/999.9	0/999	not available
15	TC N °F	32/2372	32.0/999.9	32/999	not available
16	TC L-GOST°C	0/600	0.0/600.0	0/600	0.0/99.9
17	TC L-GOST°F	32/1112	32.0/999.9	32/999	32.0/99.9
18	TC U °C	-200/400	-199.9/400.0	-200/400	-99.9/99.9
19	TC U °F	-328/752	-199.9/752.0	-328/752	-99.9/99.9
20	TC G °C	0/2300	0.0/999.9	0/999	not available
21	TC G °F	32/4172	32.0/999.9	32/999	not available
22	TC D °C	0/2300	0.0/999.9	0/999	not available
23	TC D °F	32/4172	32.0/999.9	32/999	not available
24	TC C °C	0/2300	0.0/999.9	0/999	not available
25	TC C °F	32/4172	32.0/999.9	32/999	not available
26	TC °C	Custom	Custom	Custom	Custom
27	TC °F	Custom	Custom	Custom	Custom
	Probe: RTD				
28	PT100 °C	-200/850	-199.9/850.0	-200/850	-99.9/99.9
29	PT100 °F	-328/1562	-199.9/999.9	-328/999	-99.9/99.9
30	JPT100 °C	-200/600	-199.9/600.0	-200/600	-99.9/99.9
31	JPT100 °F	-328/1112	-199.9/999.9	-328/999	-99.9/99.9
	Probe: PTC - NTC				
32	PTC °C	-55/120	-55.0/120.0	-55/120	-55.0/99.9
33	PTC °F	-67/248	-67.0/248.0	-67/248	-67.0/99.9
34	NTC °C	-10/70	-10.0/70.0	-10/70	-10.0/70.0
35	NTC °F	14/158	14.0/158.0	14/158	14.0/99.9
	Probe: Voltage + Current				
36	0...60mV	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
37	0...60mV	linear custom	linear custom	linear custom	linear custom
38	12...60mV	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
39	12...60mV	linear custom	linear custom	linear custom	linear custom
40	0...20mA	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
41	0...20mA	linear custom	linear custom	linear custom	linear custom
42	4...20mA	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
43	4...20mA	linear custom	linear custom	linear custom	linear custom
44	0...10V	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
45	0...10V	linear custom	linear custom	linear custom	linear custom
46	2...10V	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
47	2...10V	linear custom	linear custom	linear custom	linear custom
48	0...5V	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
49	0...5V	linear custom	linear custom	linear custom	linear custom
50	1...5V	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
51	1...5V	linear custom	linear custom	linear custom	linear custom
52	0...1V/POT	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
53	0...1V/POT	linear custom	linear custom	linear custom	linear custom
54	200mV...1V	-1999/9999	-199.9/999.9	-999/999	-99.9/99.9
55	200mV...1V	linear custom	linear custom	linear custom	linear custom
	Probe: Custom PT100 - PTC - NTC				
56	PT100 JPT	custom	custom	custom	custom
57	PTC	custom	custom	custom	custom
58	NTC	custom	custom	custom	custom

N.B.: for the version R77 are not available the probe codes 0...39, 48...51, 54...58

In case of non-availability, maximum and minimum limits are set to 0.
In case of custom linearization, test limits for setting LO and HI errors are given by the calibration values.
If these limits are not exceeded, they are taken into consideration as limits LO_S and HI_S.

C.1. — Select sampling time (resolution). For linear input only.

0	120ms	> 14bit
1	60ms	> 14bit
2	30ms	> 13bit
3	15ms	> 12bit

+4 to disable filter (average of the last eight values sampled)

F.t — Digital filter on main input — 0.0 ... 20.0 sec

F.d — Digital filter on process variable display — 0.0 ... 9.9 scale points

dP — Decimal point position for main input scale

dP	Format
0	XXXX
1	XXX.X
2 *	XX.XX
3 *	X.XXX

(*) not available for TC, RTD, PTC and NTC scales

+4 in order to visualize under the Ls value - (Hs - Ls) / 256 (only linear inputs not custom)

L.S — Minimum limit of main input scale and analogue output — min…max scale of input selected in t.P

H.S — Maximum limit of main input scale and analogue output — min…max scale of input selected in t.P

o.F — Offset correction of main input — -999 ...999 scale points

d.i. — Select function of digital input

d. i. - t. u. - t. d.	
0	None
1	Zero
2	Hold
3	Flash
4	Max. peak display
5	Min. peak display
6	Delta peak display
7	Peak memory reset
8	Zero + peak memory reset
9	Alarms reset
10	Peak + alarms reset
11	Zero + alarms reset
12	Peak + zero + alarms reset
13	Output status OUT1
14	Output status OUT2
15	Output status OUT3
16	Output status OUT4
17	Keylock (d.I only)
18	Potentiometer Calibration (t.U and t.d. only)
19	OFFSET (t.U. and t.d. only)

t.U. — Raise key function (active only in P.V.selection)

t.d. — Lower key function (active only in P.V.selection)

L.L — Low limit for the alarms set point — L.S ... H.S

H.L — High limit for the alarms set point — L.S ... H.S

Max. non-linearity error for thermocouples (TC), resistors (PT100) and thermistors (PTC, NTC).

The error is calculated as deviation from theoretical value and is expressed as percentage of full scale (in °C).

S, R range 0...1750°C; error < 0.2% f.s. (t > 300°C) / for other range; error < 0.5% f.s.
T error < 0.2% f.s. (t > -150°C)
B range 44...1800°C; error < 0.5% f.s. (t > 300°C) / range 44,0...999,9; error < 1% f.s. (t > 300°C)
U range -99,9...99,9 and -99...99°C; error < 0.5% f.s. / for other range; error < 0.2% f.s. (t > -150°C)
G error < 0.2% f.s. (t > 300°C)
D error < 0.2% f.s. (t > 200°C)
C range 0...2300; error < 0.2% f.s. / for other range; error < 0.5% f.s.

NTC error < 0.5% f.s.

Tc: **J, K, E, N, L** error < 0.2% f.s.

PT100, JPT100 and **PTC** error < 0.2% f.s.

• Output parameters

Ou — Output settings

On — Number of outputs — 0 to 4

1.t — Alarm type 1 (absolute only)

2.t — Alarm type 2

3.t — Alarm type 3

4.t — Alarm type 4

1. t - 2. t - 3. t - 4.t

Value	Direct (high limit) Inverse (low limit)	Absolute or Relative to previous absolute	Normal or Symmetric (window)
0	Direct	Absolute	Normal
1	Inverse	Absolute	Normal
2	Direct	Relative	Normal
3	Inverse	Relative	Normal
4	Direct	Absolute	Symmetrical
5	Inverse	Absolute	Symmetrical
6	Direct	Relative	Symmetrical
7	Inverse	Relative	Symmetrical

+8 to disable on power-up until first alarm
+16 to memorize
+32 to filter with F.O. mode (output filter mode)

F.O — Output filter mode

0	not active: calculated status is sent directly to relay
1	On delay (DON)
2	On delay after it has been turned off (DBI)
3	Off delay (DOF)
4	Delay for activation only at power-up (DPO)

+ 8 time base max. 99 min (default = 99 sec)

r.A — delay for F.O. — 0 to 99 min or sec

t.M — Minimum output pulse — 0 to 99 sec

Disabled by setting value 0
Displayed if associated with at least one output

rE — Fault action (in case of damaged sensor) Er, br

Value	Out 1	Out 2	Out 3	Out 4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

• Protection

Pr — Protection code

Value	Displayed parameters	Modifiable parameters
0	o.1, o.2, o.3, o.4	o.1, o.2, o.3, o.4
1	o.1, o.2	o.1, o.2
2	o.1	o.1
3	o.1	none

+4 to disable In and Ou pages
+8 to disable Cf; Sr page
+16 to enable maintenance of reset latch at power-off (for linear inputs only)
+32 base configuration (the following parameters will not be displayed:
In: Ft, Fd, Of, L_L, H_L
Ou: On [forced to no. outputs present], rE)
Ft, Fd, Of remain at set value
L.L, H.L are forced to L.S, H.S
+64 Virtual instrument
+128 Disable of all the pages except P.A (Password)

• Custom linearization

Ln — Custom linearization of main input

0.0. — Step 0 (beginning of scale value) — Display limits (-1999 to 9999 for 4 digit display)

.....

the **n** step value corresponds to input:
mV beginning scale + n * ΔmV
ΔmV = (mV full scale - mV beginning scale) / 32

3.2. — Step 32 (end of scale value) — Display limits (-1999 to 9999 for 4 digit display)

3.3. — Step 33 — mV beginning of scale (*)

3.4. — Step 34 — mV end of scale (*)

3.5. — Step 35 — mV at 50°C (*)

(*) only for tP = TC CUSTOM

• User calibration

U.C.

U.C.	Function
1	analog retransmission output
2	Custom RTD sensor
3	Custom PTC sensor
4	Custom NTC sensor
5	Potentiometer (0 to 1V)

C.L. — Calibration of minimum (*)

C.H. — Calibration of maximum (*)

(*) when U.C. = 1 press keys Δ ∇ to calibrate analog output

• HOLD function

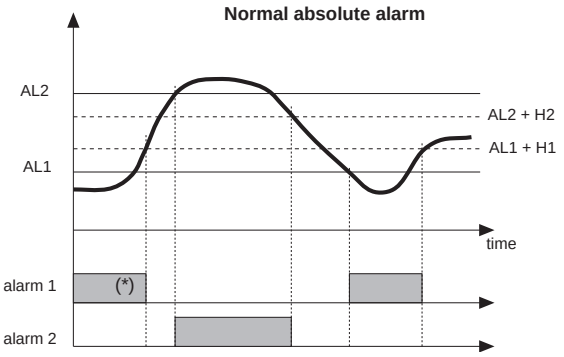
The input value and alarms are frozen while the logic input is closed.
With logic input closed, a reset turns OFF both the relay outputs and the alarms latch.

• FLASH function

Input value is sampled; state of alarms is not transferred to outputs; outputs are “frozen”.
When the logic input is active the input value is “frozen” and the outputs are updated according to the calculated alarms state, including the ones latched.

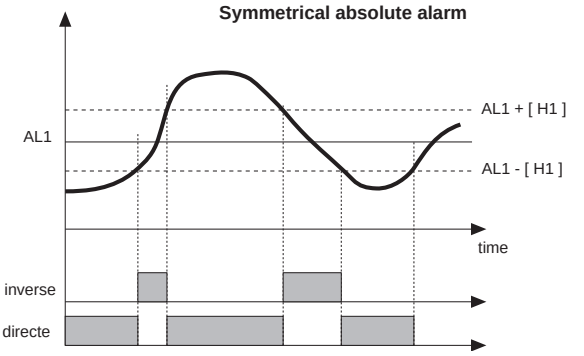
6 • ALARMS

Normal absolute alarm



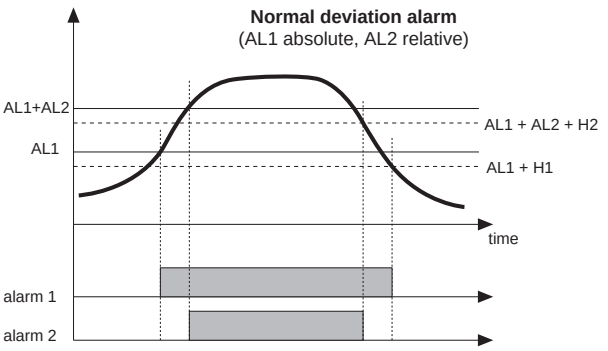
For AL1 inverse absolute alarm (min.) with positive H1, 1 t = 1
(*) = OFF if disabling on power-on exists
For AL2 direct absolute alarm (max) with negative H2, 2 t = 0

Symmetrical absolute alarm



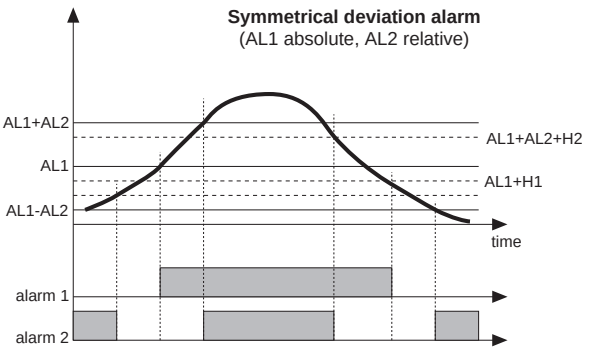
For AL1 inverse absolute, symmetrical alarm with hysteresis H1, 1 t = 5
For AL1 direct absolute, symmetrical alarm with hysteresis H1, 1 t = 4

Normal deviation alarm
(AL1 absolute, AL2 relative)



For AL1 direct absolute alarm (max) with negative H 1, 1 t = 0
For AL2 direct relative alarm (max) with negative H2, 2 t = 2

Symmetrical deviation alarm
(AL1 absolute, AL2 relative)

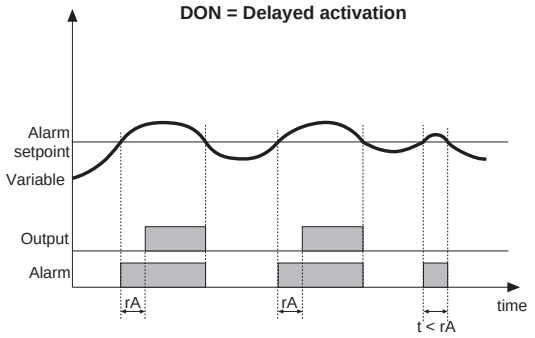


For AL1 direct absolute alarm (max) with negative H1, 1 t = 0
For AL2 symmetrical deviation alarm H2, 2 t = 6

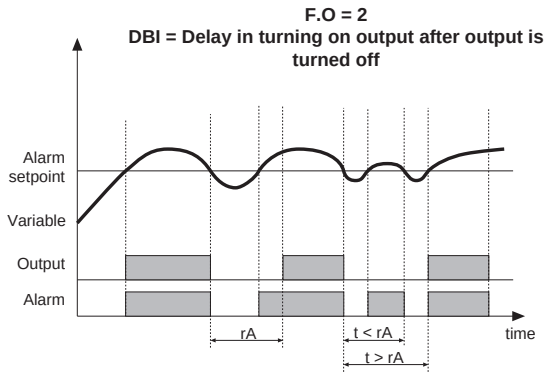
• Filter - outputs with reference to parameters F.0 and r.A

The diagrams refer to a normal absolute alarm with hysteresis H = 0

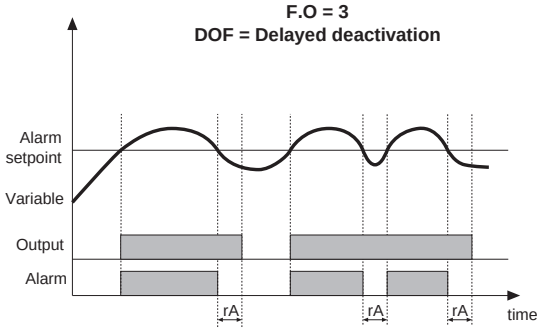
F.O = 1
DON = Delayed activation



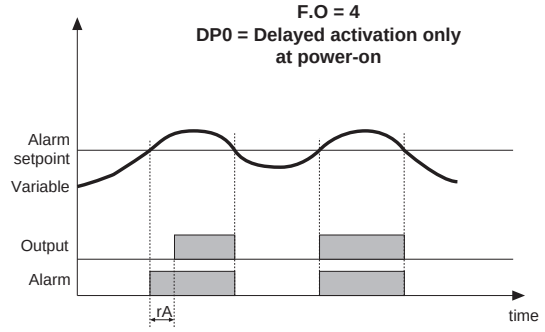
F.O = 2
DBI = Delay in turning on output after output is turned off



F.O = 3
DOF = Delayed deactivation



F.O = 4
DP0 = Delayed activation only at power-on



• RS323 interface cable for configuration

N.B.: the PC configuration cable is supplied with the programming software.
WARNING: make the connection with the device powered and with inputs and outputs disconnected.

• ORDER CODE

COD. **1108200**	Cable + Floppy

ORDER CODE

40T 96 □ □□ □□ □□ □ □ □

NR. DIGITS	
3 + sign	3
4	4

TRANSMITTER POWER SUPPLY	
None	0 0
For T input (alternative to RTD, PTC, NTC)	
1,2Vdc for potentiometer (**) (*)	0 1
15Vdc for transmitter (**)	1 5
24Vdc, 50mA	2 4
All (****)	9 9

OUT 1, OUT 2	
Relay, Relay	2 R
Relay, Relay	R R
Relay, logic	R D
Triac, Absent	T 0

OUT 3, OUT 4 (**)	
None	0 0
Relay, absent	R 0
Relay, Relay (***)	RR

POWER SUPPLY	
0	11...27Vac/dc
1	100...240Vac/dc

DIGITAL COMMUNICATION (**)	
0	None
2	RS485

DIGITAL INPUT / RETRANSMISSION OUTPUT (**)	
0	None
1	Digital input
2	Analogue output 0...20mA (0...10V) (***)
3	Both (***)

(*) R77 for potentiometer input (Rinput >10Mohm
(**) Not available in the case of escape 1, exited 2 equal to 2R
(***) Output 4 relay alternative to the retransmission output
(****) Selectable (standard = 24Vdc)

Please, contact GEFRAN sales people for the codes availability.

• WARNINGS

WARNING: this symbol indicates danger.
It is seen near the power supply circuit and near high-voltage relay contacts.

Read the following warnings before installing, connecting or using the device:
• follow instructions precisely when connecting the device.
• always use cables that are suitable for the voltage and current levels indicated in the technical specifications.
• the device has no ON/OFF switch: it switches on immediately when power is turned on. For safety reasons, devices permanently connected to the power supply require a two-phase disconnecting switch with proper marking. Such switch must be located near the device and must be easily reachable by the user. A single switch can control several units.
• if the device is connected to electrically NON-ISOLATED equipment (e.g. thermocouples), a grounding wire must be applied to assure that this connection is not made directly through the machine structure.
• if the device is used in applications where there is risk of injury to persons and/or damage to machines or materials, it MUST be used with auxiliary alarm units. You should be able to check the correct operation of such units during normal operation of the device.
• before using the device, the user must check that all device parameters are correctly set in order to avoid injury to persons and/or damage to property.
• the device must NOT be used in inflammable or explosive environments. It may be connected to units operating in such environments only by means of suitable interfaces in conformity to local safety regulations.
• the device contains components that are sensitive to static electrical discharges. Therefore, take appropriate precautions when handling electronic circuit boards in order to prevent permanent damage to these components.
***Installation*:** installation category II, pollution level 2, double isolation
• only for low power supply: supply from Class 2 or low voltage limited energy source
• power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.
• install the instrumentation separately from the relays and power switching devices
• do not install high-power remote switches, contactors, relays, thyristor power units (particularly if “phase angle” type), motors, etc... in the same cabinet.
• avoid dust, humidity, corrosive gases and heat sources.
• do not close the ventilation holes; working temperature must be in the range of 0...50°C.
• surrounding air: 50°C
• use 60/75°C copper (Cu) conductor only, wire size range 2 x No 22 - 14 AWG, Solid/Stranded
• use terminal tightening torque 0.5Nm
If the device has faston terminals, they must be protected and isolated; if the device has screw terminals, wires should be attached at least in pairs.
• *Power*: supplied from a disconnecting switch with fuse for the device section; path of wires from switch to devices should be as straight as possible; the same supply should not be used to power relays, contactors, solenoid valves, etc.; if the voltage waveform is strongly distorted by thyristor switching units or by electric motors, it is recommended that an isolation transformer be used only for the devices, connecting the screen to ground; it is important for the electrical system to have a good ground connection; voltage between neutral and ground must not exceed 1V and resistance must be less than 6Ohm; if the supply voltage is highly variable, use a voltage stabilizer for the device; use line filters in the vicinity of high frequency generators or arc welders; power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.
• *Input and output connections*: external connected circuits must have double insulation; to connect analog inputs (TC, RTD) you have to: physically separate input wiring from power supply wiring, from output wiring, and from power connections; use twisted and screened cables, with screen connected to ground at only one point; to connect adjustment and alarm outputs (contactors, solenoid valves, motors, fans, etc.), install RC groups (resistor and capacitor in series) in parallel with inductive loads that work in AC *(Note: all capacitors must conform to VDE standards (class x2) and support at least 220 VAC. Resistors must be at least 2W)*; fit a 1N4007 diode in parallel with the coil of inductive loads that operate in DC.
GEFRAN spa will not be held liable for any injury to persons and/or damage to property deriving from tampering, from any incorrect or erroneous use, or from any use not conforming to the device specifications.