# GEFRAN

## 1650

*PID 1/8 DIN Double temperature controller*



*Dimensions 48 × 96 × 80 mm (1/8 DIN)*

**Main features**

- Operator interface with large LCD Display and three configurable bargraphs
- Scrolling diagnostics messages, configurable, in the selected language
- Easy, guided configuration, copy/paste parameters even withe power off
- Preventive maintenance with energy counters (kWh) and load switching
- 32 function block applications
- 8 Math application blocks
- Timer, setpoint and algorithm programmer for controlling motorized valves
- Advanced tuning of control parameters
- Different password levels
- 2 setpoint programmers (192 steps in 16 programs, or 12 programs with 16 fixed steps each)
- 1 ingresso analogico lineare configurabile per funzioni ausiliarie
- 2 PID control loops
- 2 Programmatori di setpoint (192 passi in 16 programmi oppure 12 programmi da 16 passi fissi ciascuno)
- Relay, logic, isolated analog outputs
- Up to two TA inputs for interrupted load diagnostics
- RS485 serial communication in Modbus RTU slave
- RS485 serial communication in Modbus RTU master for reading/writing information to Modbus slave devices
- Ethernet Modbus TCP communication in Slave mode
- Web server for browser access to web pages residing in the devvice, for monitoring and setting parameters
- Bridge function for creation of Modbus RTU 485 sub-network
- Weekly clock\calendar with RTC
- Removable faceplate for immediate replacement
- Accuracy 0,1%, sampling time 60 ms

### Operator Interface

Large backlit LCD screen with high visibility and high contrast. Two to three rows on the screen display variables, setpoints and alphanumerical information, scrolling up to 75 configurable messages of 32 characters each in three different languages. The selection of languages and easily comprehensible scrolling texts regarding diagnostics, alarms, and process statuses ensure that the controllers speak the users' language.

### Control

One or two PID control loops with two universal inputs configurable for thermocouples, thermoresistances and linear inputs. They may be used independently to manage two different forms of control or they may interact with cascade or ratio control. An optional third linear analogue input may be used to acquire signals such as remote setpoints or retroactive valve feedback, while also supplying the necessary potentiometer power supply.

If the appropriate four-point calibration is performed in the field, the controller meets the requirements of standard AMS2750E and may be used in applications requiring the NADCAP directive.

### Easy Configuration

Set-up wizard for manual-free programming with only a few indispensable parameters, commented by online help messages. Opportunity to create your own password-protected "User menu" containing only the parameters required for the application.

Advanced set-up and work recipe creation can be achieved via PC and GF_eXpress software, even without powering the controllers. GF_eXpress may be used to define, for each menu and parameter, which values will be shown to the controller to ensure easy use in the field.

Controllers can still be configured directly in the field using only four keys, associated with led lights that provide feedback when a button is pressed and guide the user by indicating the appropriate operations. Factory settings can be restored if necessary, either on the keyboard or using the GF_eXpress software tool. Diagnostics, preventive maintenance and consumption monitoring.

Exhaustive diagnostics for breakage or incorrect connection of probes, total or partial load breakdown, off-scale variables and anomalies in the control ring. Counters for the number of relay and compara-

tor switches, with alarm thresholds, permit scheduling of preventive maintenance to replace worn actuators. Two internal energy counters with alarms for anomalous variations count total energy consumption in kWh and its cost, permitting ongoing energy monitoring.

### Diagnostics, preventive maintenance and consumption monitoring.

Exhaustive diagnostics in the event of breakage or incorrect connection of probes, total or partial breakage of the load, off-scale variables and anomalies in the adjustment ring. Relay switch counters and comparators with alarm signals permit planning of preventive maintenance work for replacement of worn actuators. Two internal energy counters with alarms for signalling anomalous variations totalise energy consumption in kWh and its cost, permitting uninterrupted energy monitoring.

### Functional application blocks

Thirty-two logical AND, OR, Flip-Flop, Comparator, Counter and Timer Function Blocks permit creation of customised logical sequences for complete, flexible machine control. Eight mathematical Function Blocks permit processing of analogue vari-

ables and calculation of differences, sums, multiplication and division, averages, top and bottom values, square root calculation and logarithms. Function Blocks also permit management of 8+8 additional inputs/ outputs available for models 1850 ¼ DIN.

### Tuning
Advanced tuning algorithms refined over time guarantee stable, accurate control even with critical or very rapid thermal systems, automatically activated when necessary.

### Timers
Three different types of timer permitting waiting times to be set before activating control, maintenance times on setpoint values, and scheduled set changes over time.

### Setpoint programmers
Up to 192 steps are available for applications with setpoint profiles, each with a ramp and maintenance time, which can freely be grouped into up to 16 programmes. Each segment may be associated with enabling inputs, event outputs, and configurable messages to be displayed. In models 1850, the display also permanently shows the step number and programme number underway. Double programmer

mode, with a synchronous or asynchronise timing base, permits activation of two different setpoint profiles which may be independent of one another and may be associated with two control loops. The clock/ weekly calendar function with a real-time clock and buffer battery facilitate starting and stopping of various programmes in default automatic mode.
Simplified keyboard configuration permits creation and editing of simple programmes with only three parameters per step, with no need for a PC, cables, or configuration software, while the extended configuration with Gf_ eXpress also offers graphic functions for displaying the profiles created.

### Valve positioner
Models are available for motorised valve control, with or without position feedback. The position of floating valves is calculated; for valves with potentiometers, auxiliary inputs can be used to control valve position and display it in numerical form or in one of 3 configurable bar graphs (for models 1650/1850)

### Connectivity
850/1650/1850 "Performance" controllers have three different levels of communication with automation and supervision devices:

-RS485 Modbus RTU slave serial communication for interface with Master Modbus
-RS485 Modbus RTU master serial communication for reading/writing information toward Modbus slave devices such as power controllers or other controllers
-RJ45 Ethernet Modbus TCP port, which can also be used as a bridge toward Modbus RTU slave devices.
An Ethernet connection may be used to access the Web Server service offering a number of monitoring, diagnostics and configuration pages, accessible via local or remote networks with an ordinary browser and two password levels.
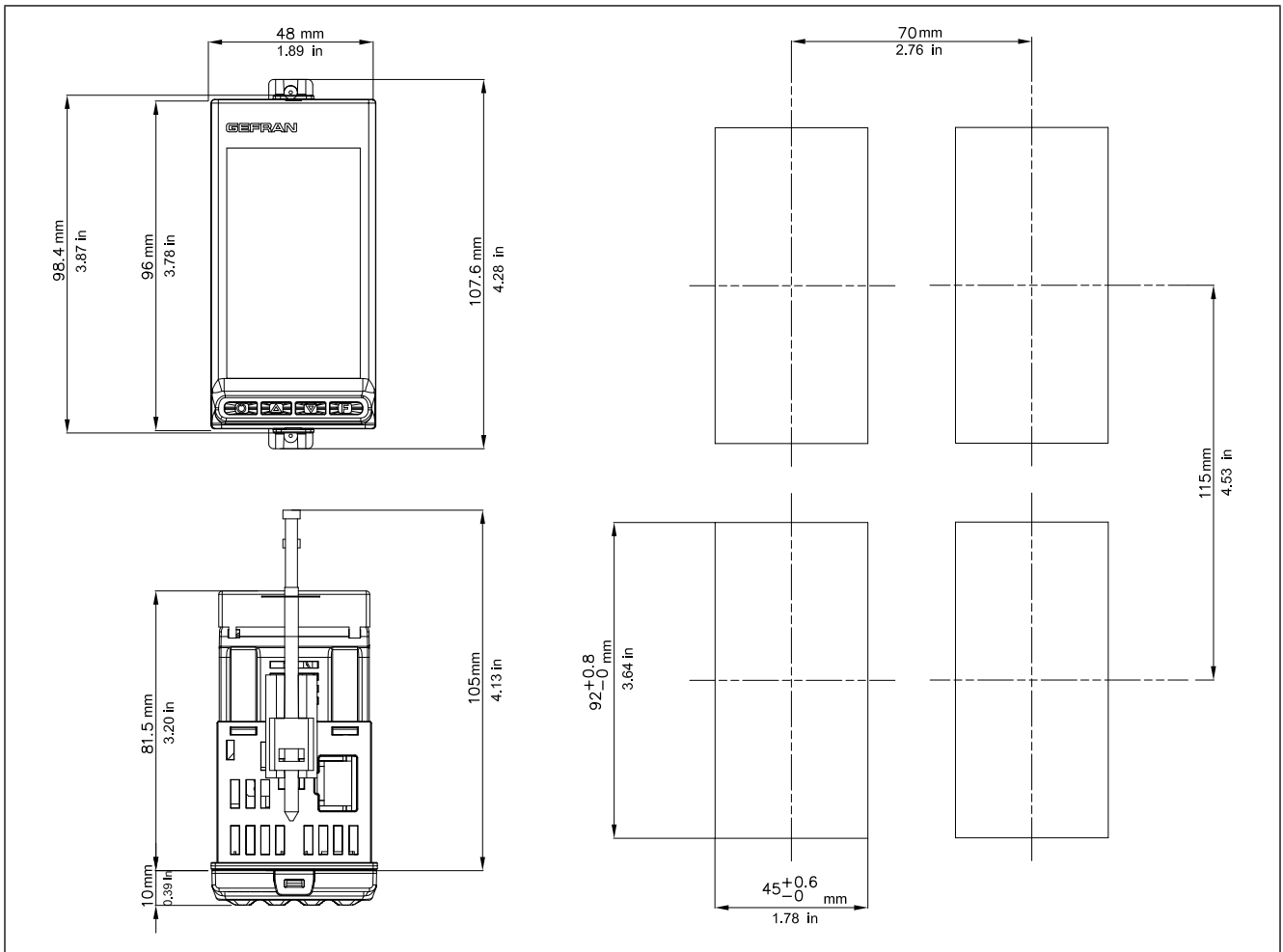
### General features
Performance controllers are entirely configurable using the software and keyboard, without accessing their internal electronics, but the controller can be replaced at any time by simply pulling it out from the front, with no further operations, maintaining IP65 protection for the front.

## DISPLAY AND KEYS



1   Unit of measurement or number of program running or number of loop displayed.

2   State of outputs  OUT1, OU2, OUT3, OUT4

3   Controller function states:
   • RUN = functioning (flashing = normal functioning, steady on = program running);
   •   _/- = setpoint ramp active;
   • TUN = PID parameters tuning active;
   • MAN = manual/automatic (off = automatic control, on = manual control);
   • REM = remote setpoint enabled;
   • SP1/2 = setpoint active (off = setpoint 1, on = setpoint 2).

4   Work mode key (manual/automatic) in standard mode.
   A function can be assigned via parameter but1.
   The key is active only when the display shows the process variable (HOME).

5   Up/down keys: raise/lower the value of the parameter displayed on the SV or PV display.

6   F key:  lets you navigate among controller menus and parameters. Confirms the parameter value and selects the next parameter.

7   Key pressed signals.

8   Displays percentage of power or current, configurable with parameter bAr.3.

9   Display of percentage of process variable and of setpoint.

10  F display: parameters, diagnostics and alarm messages. Configurable with parameter dS.F (default = % control power).

11  SVdisplay: parameter values. Configurable with parameter dS.SP (default = setpoint).

12  PV display: process variable.

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48 mm
1.89 in

98.4 mm 3.87 in
96 mm 3.78 in
107.6 mm 4.28 in

81.5 mm 3.20 in
105mm 4.13 in
10mm 0.39 in

70 mm
2.76 in

115mm 4.53 in

$92^{+0.8}_{-0}$ mm 3.64 in

$45^{+0.6}_{-0}$ mm
1.78 in

**Note** : the electronic components of a 1650 instrument made after January 2020 cannot be inserted in the casing of an instrument made prior to this date. If it should be necessary to replace an 1650 controller manufactured before January 2020 with a similar controller manufactured after this date, the casing anchored to the panel must also be replaced.

## DATI TECNICI

### OPERATOR INTERFACE

| | | |
|---|---|---|
| **DISPLAY** | Type | LCD black background |
| | Screen area (L x H) | 37 × 68 mm |
| | Lighting | Backlit with LEDs, life > 40.000 hours @ 25 °C (with brightness level backl = 8) |
| | PV display | Number of digits: 4 to 7 segments, with decimal point<br>Digit height: 17 mm<br>Color: white |
| | SV display | Number of digits: 4 to 7 segments, with decimal point<br>Digit height: 14 mm<br>Color: green |
| | F display | Number of digits: 5 to 14 segments, with decimal point<br>Digit height: 9 mm<br>Color: amber |
| | Unit of measurement | Selectable, °C, °F or custom [1]<br>Color: same as PV display |
| | Controller state signals | Number: 6 (RUN, MAN, _/-, REM, SP1/2)<br>Color: amber |
| | Output state signals | Number: 4 (1, 2, 3, 4)<br>Color: red |
| | Bargraph indicator, configurable | Type: graphic bargraph,11 segments<br>Power indication: 0 ... 100% o -100 ... 100%<br>Current indication: 0 ... 100% f.s.<br>Valve position indication: 0 ... 100% |
| | Bargraph indicator | Type: double bar, 11 segments<br>Indication of process variable and setpoint:  0...100% f.s. |
| **KEYPAD** | | Keys number: 4, silicone ( Man/Auto, INC,DEC,F)<br>Type: mechanical |

| INPUTS | | |
|---|---|---|
| **MAIN AND AUXILIARY INPUT** **(Main, Aux1, Aux2)** | Sensor type | • Thermocouples, RTD (PT100, JPT100), IR pyrometers with type K output, 4…20mA, 0…20mA, 10V, 5V, 1V, 60mV, potenziometro<br>• Reading accuracy : ±0,1% of value read<br>This Gefran controller, when subjected to the necessary calibration operations in the field, is suitable for use in Nadcap applications for any class of oven, from 1 to 6, according to specification AMS2750E, paragraph 3.3.1. |
| | Thermocouple | • Types : J, K, R, S, T, C, D, B, E, L, L-GOST, U, G, N,Pt20Rh-Pt40Rh Custom linearisation available<br>• Linearisation accuracy: according to standard ITS90 polynomes; refer to user manual for details<br>• Cool junction accuracy:  < ±  1°C a 25°C room temperature<br>• Cool junction compensation : greater than 40:1 rejection at changes in room temperature exceeding 25°C<br>Diagnostics: Indication of faulty probe and out of scale |
| | RTD input (Pt100 and JPt100) | • Types: Pt100, JPt100. Custom linearisation available<br>• Calibration accuracy: < ±0,1% del valore letto in °C ± 0,4°C<br>• Linearisation accuracy: <±0,062°C<br>• Thermal shift:  < (±0.002% of read value/°C, starting from 25°C room temperature) ± 0.1°C<br>• Diagnostics: Indication of faulty probe and out of scale |
| | Linear DC input | • Types : 0...60 mV, 0…20mA, 4…20mA, 0…1V, 0…5V, 0…10V, 0…2.4V high impedance, 0…1.2V high impedance<br>•Input impedance :<br>    0…60mV, 0…1V, 0…1.2V, 0…2.4V : > 100 MΩ<br>    0…5V, 0…10V : > 400 kΩ<br>    0…20mA, 4…20mA : 50 Ω<br>• Linearisation:  linear or custom<br>• Calibration accuracy: < 0.1% full scale<br>• Thermal shift: <±0.003% full scale/°C, starting from 25°C room temperature |
| | Sampling time | 60 ms or 120 ms, selectable |
| | Digital filter | 0,0...20,0 s configurable |
| | Rejection at network disturbance (48-62Hz) | Rejection at differential mode: >80 dB<br>Rejection at common mode: >150 dB |
| | Temperature unit of measure | Grado C / F, selectable on the keypad |
| | Reading interval | Tipe: linear<br>Scale: -1999...9999, settable decimal point |
| | Insulation | Functional insulation between main and auxiliary inputs |
| **TA (ammeter) INPUT** | Type | Isolated via external transformer |
| | | Number: 2 max<br>Max. capacity: x / 50 mA AC<br>Line frequency: 50/60 Hz<br>Input impedance (Ri): 10 Ω |
| | Accuracy | ±2% f.s. ±1 digit @25 °C |
| **DIGITAL INPUTS** | Number | 5 max |
| | Type | Voltage-free contact, or<br>NPN 24 V - 4,5 mA, o<br>PNP 12/24 V - max 3,6 mA<br>*For detail see electrical connections* |
| | Isolation | 250 V |

| | | |
|---|---|---|
| **OUTPUTS** | | |
| | Relay (R) | Nuumber: 4 max<br>Type of relay contact: NO<br>Max. current: 5A (2A at ambient temperature up to 45 ° C for certification UL), 250VAC / 30 VDC, cosφ = 1<br>Minimum load: 5 V, 10 mA<br>Number of operations: > 600,000 @ 2A load current<br>Double isolationInstallation of an external R-C suppressor ("snubber") is recommended |
| | Logic (D) | Number: 2 max<br>Type: for solid-state relays<br>Voltage: 24 V ±10% (min 10 V @20 mA)<br>Isolated from main input |
| | Isolated logic (M) | Number: 2 max<br>Type: MOS optoisolated for PLC inputs and AC/DC load<br>Voltage: 30 V AC/DC max<br>Current: 100 mA max<br>Resistance ON: 0,8 Ω max<br>Isolation: 1500 V |
| | Triac ( long life relè) (T) | Number: 1 max<br>Load: resistive<br>Voltage: 75...240 VAC<br>Current max: 1 A<br>Isolation 3 kV<br>snubber circuit integrated zero crossing switching |
| | Continuous (C) | Number: 1 max<br>Current: 4...20mA<br>$R_{out}$ < 500 Ω<br>Resolution: 12 bit<br>Isolated from main input |
| | Analog retransmission (A1) (A2) | Number: 2 max<br>0...10 V, max 20 mA, $R_{out}$: > 500 Ω<br>0...20 mA, 4...20 mA, $R_{out}$: < 500 Ω<br>Resolution: 12 bit<br>Isolated from main input |
| **ALARMS** | Number of alarm functions | 4 max, assignable to an output |
| | Possible configurations | Maximum, minimum, symmetric, absolute/relative, exclusion at firing, memory, reset from keypad and/or contact, LBA, HB, HBB Hold Back Band if enabled with Programmer function, alarm after power variation at full power |
| **POWER SUPPLY** | For sensor VT1, VT2 | Voltage: 24 VDC ±10%<br>Current max: 30 mA<br>VT1 option of Out3 |
| | For potentiometer VP | Voltage: 1 VDC ±1%<br>Current max: 30 mA |
| **CONTROL FUNCTIONS** | | |
| **CONTROL** | Type | Single loop, double loop |
| | Control | PID, ON/OFF, single action heat or cool, double action heat/cool |
| | Control output | Continuous or ON/OFF<br>Cycle time: constant or optimized (BF) |
| | Control output for motorized valves | OPEN/CLOSE for floating motorized valve or with feedback with position control by potentiometer on Relay, Solid-state, Triac outputs. |
| **SETPOINT PROGRAMMER (Double programmer if double loop)** | Number of programs | Max 16 (if double loop 8 + 8) (*)<br>Start / Stop / Reset / Skip via digital inputs and/or outputs from logic operations<br>Output state: Run /Hold / Ready / End |
| | Number of steps | Max 192, each with own setpoint, ramp time and hold time (**)<br>Times settable in HH:MM or MM:SS<br>Max 4 consents, configurable for ramp and for hold<br>Max 4 events, configurable in ramp and in hold |
| **MULTIPLE SETPOINTS** | Number of setpoints | Max 4, selectable from digital input<br>Each setpoint change is subject to set ramp, different for up and down ramp |
| **LOGIC OPERATIONS [1]** | Digital function blocks | Max 32, with 4 input variables per block.<br>The result can act on the state of the controller, of the programmer on alarms and outputs.<br>Each function contains a block type AND, OR with TIMER |
| **OPERATIONS MATHEMATICAL [1]** | Analog function blocks | Max 8, with 2 input variables per block, with operators such as + , - , × , : , average, square root, ...<br>The result may act on analog variables in input to PID loops (controlled variable, setpoint) or analog outputs . |
| **TIMER FUNCTION** | Modes | START / STOP (2 timer if double loop)<br>STABILIZATION (timer is on when PV enters a band set around setpoint; at end of count you can activate an output, shut down SW or change SP1/SP2)<br>FIRING (timed activation of control after power on) |
| **ENERGY COUNTER** | | Calculation done on nominal line voltage and nominal load power or on rms current measured on load via CT |

| DIAGNOSTIC | | Short circuit or open circuit (LBA alarm)<br>Interrupted or partially interrupted load (HB alarm)<br>Short circuit of control output (SSR alarm) |
|---|---|---|
| RETENTIVE MEMORY | Type | FRAM |
| | Max. number of writes | Number max: > $10^{10}$ cycles<br>Retention: > 10 anni |

(*) if in standard mode; if in "Simplified programmer" mode, Max 12 programs

(**) freely selectable in any program, if in standard mode; if in "Simplified programmer" mode, MAX 16 steps per program, in a set order:
Program 1 Step 1-16, Program 2 Step 17 – 32, and so on

### *GENERAL DATA*

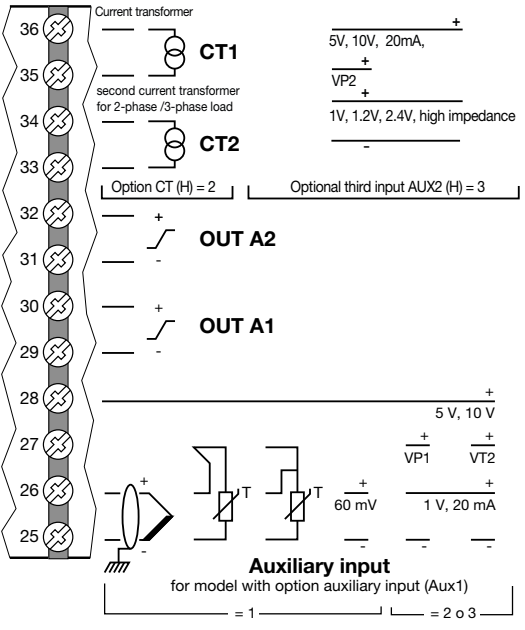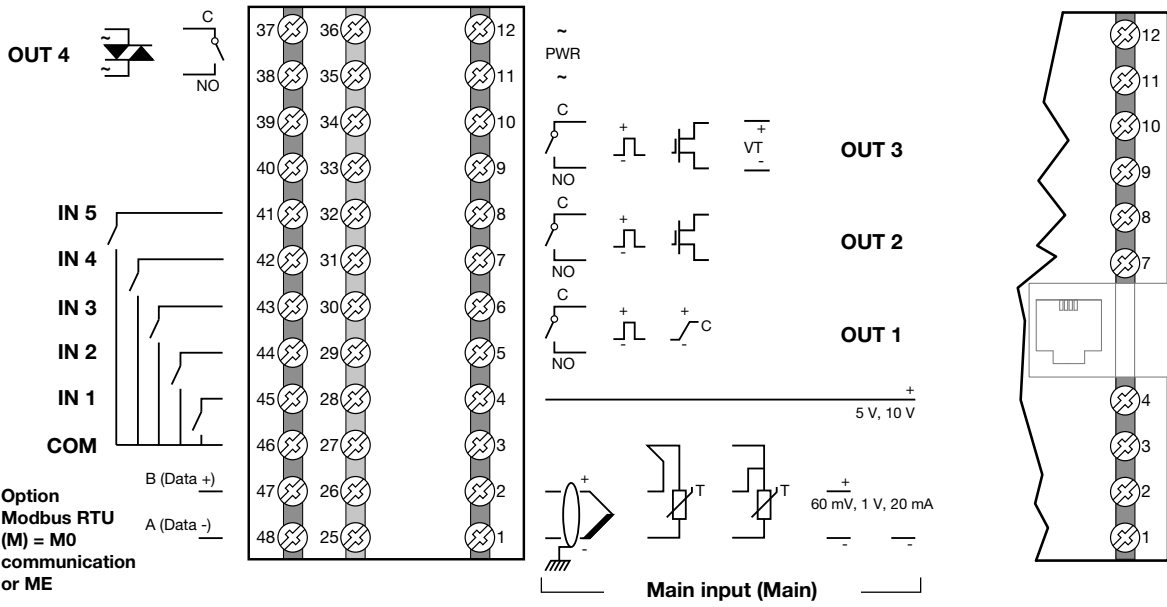| | | |
|---|---|---|
| POWER SUPPLY | Operating voltage | 100...240 VAC/VDC ±10%, 50/60 Hz<br>(20...27 VAC/VDC ±10%, 50/60 Hz) |
| | Power dissipation | 10 W max |
| | Protections | Overvoltage 300 V / 35 V |
| | Connection | Screw terminals and crimp connector, max. wire section 1 mm$^2$ |
| CONNECTIONS | Serial configuration port | Connector: microUSB |
| | RS485<br>(option) | Baudrate: 1200, 2400, 4800, 9600, 19.200, 38.400, 57.600, 115.200 bit/s<br>Protocol: Modbus RTU<br>Insulation compared to main entrance<br>Screw terminals and crimp connector, max. wire section 2.5mm$^2$ |
| | Master Modbus | Baudrate: 1200, 2400, 4800, 9600, 19.200, 38.400, 57.600, 115.200 bit/s<br>Protocol: Modbus RTU Master<br>Connector: RJ10 |
| | RTU Bridge | Baudrate: 1200, 2400, 4800, 9600, 19.200, 38.400, 57.600, 115.200 bit/s<br>Protocol: Modbus RTU Master<br>Screw terminals and crimp connector, max. wire section 2.5mm$^2$ |
| | Ethernet Modbus TCP e Webserver<br>(opzione) | Baudrate : 10/100BaseTX,  10/100Mbit/s<br>Protocol : Modbus TCP slave, integrated Webserver<br>Isolamento compared to other peripherals<br>RJ45 Standard connector |
| | Inputs and outputs | Screw terminals and crimp connector, max. wire section 2.5mm$^2$ |
| AMBIENT CONDITIONS | Use | Indoor |
| | Altitude | 2000 m max |
| | Operating temperature | -10 ... +55 °C (as per IEC 68-2-14) |
| | Storage temperature | -20 ... +70 °C (as per IEC 68-2-14) |
| | Relative humidity | 20...85% RH non-condensing (as per IEC 68-2-3) |
| PROTECTION LEVEL | | IP 65 on front panel (as per IEC 68-2-3) |
| ASSEMBLY | Positioning | On panel, removable faceplate |
| | Installation regulations | Installation category: II<br>Pollution degree: 2<br>Isolation: double |
| DIMENSIONS | | 48 X 96 mm (1/8 DIN)<br>Depth: 80 mm |
| WEIGHT | | 0,24 kg |
| CE STANDARDS | EMC conformity<br>(electromagnetic compatibility) | Conforms to Directive 2014/30/EU norme EN 61326-1<br>Emissions in industrial environment classe A |
| | LVD safety | Conforms to Directive 2014/35/EU norme EN 61010-1 |
| CERTIFICATIONS | Generals | This Gefran controller, when subjected to the necessary calibration operations in the field, is suitable for use in Nadcap applications for any class of oven, from 1 to 6, according to specification AMS2750E, paragraph 3.3.1. |
| | Europe | CE, RoHS, REACH |
| | USA, Canada | UL, cUL |
| | Russia | EAC |

1) Programming is done with the GF_eXpress configuration program.

## ACCESSORIES

| Code | Description | Compatibile | | |
|------|-------------|:---:|:---:|:---:|
| | | 850 | 1650 | 1850 |
| **F060800** | Cable for programming with PC, USB-TTL 3 V with USB – microUSB connectors, length 1.8 m | • | • | • |
| **F043958** | "GF_eXpress" software CD | • | • | • |
| **F060909** | Configuration kit for new instruments GF_eXK-3-0-0 | • | • | • |
| **51968** | Rubber gasket 48×48 front-box | • | | |
| **51969** | Rubber gasket 48×96 front-box | | • | |
| **51970** | Rubber gasket 96×96 front-box | | | • |
| **51292** | Rubber gasket  48×48  box-panel | • | | |
| **51068** | Rubber gasket  48×96 box-panel | | • | |
| **51069** | Rubber gasket  99×96 box-panel | | | • |
| **51250** | Fastening box to panel | • | | |
| **49030** | Fastening box to panel | | • | • |
| **51294** | Protection of contacts at box bottom | • | | |
| **51328** | Protection of contacts at box bottom | | • | • |
| **51454** | 18 contacts at box bottom | • | | |
| **51453** | 24 contacts at box bottom | • | | |
| **51738** | 36 contacts at box bottom | | • | • |
| **330200** | Current transformer (CT) 50/0.05 A | • | • | • |
| **330201** | Current transformer (CT) 25/0.05 A | • | • | • |

**with option OUT1**
**Master Modbus (B) = G**

OUT 4

C
NO

IN 5
IN 4
IN 3
IN 2
IN 1
COM

**Option Modbus RTU (M) = M0 communication or ME**

B (Data +)
A (Data -)

~
PWR
~

C
NO OUT 3
C
NO OUT 2
C
NO OUT 1

+
5 V, 10 V

+
60 mV, 1 V, 20 mA
-

VT
+
-

**Main input (Main)**

G

Current transformer
36 — CT1
35
second current transformer for 2-phase /3-phase load
34 — CT2
33

Option CT (H) = 2

5V, 10V, 20mA,
+
VP2
+
1V, 1.2V, 2.4V, high impedance
-

Optional third input AUX2 (H) = 3

32
31 OUT A2 +  -
30
29 OUT A1 +  -
28
+
5 V, 10 V
27
+
VP1
+
VT2
26
+
60 mV
+
1 V, 20 mA
25
-
-

**Auxiliary input**
for model with option auxiliary input (Aux1)
= 1     = 2 o 3

**With Ethernet communication option(M) = E0 or ME**

GEFRAN
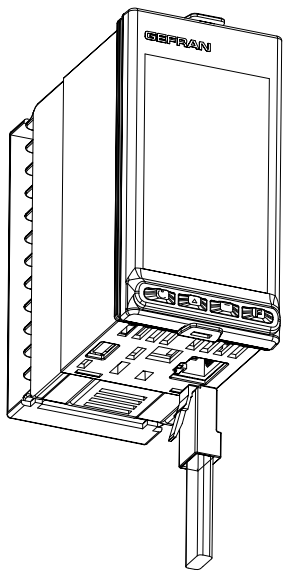
## LEGEND

| | | | | | |
|---|---|---|---|---|---|
| ~ PWR ~ | *Power supply* | | *Isolated digital inputs* | NO C | *Relay output* |
| + - | *Linear input in voltage / current* | + | *Thermocouple input* | | *Long-life solid state relay output* |
| | *Input for current transformer* | T T | *Input PT100 JPT100 2 / 3wires* | + | *Logic output* |
| | | | | | *Isolated logic output* |
| | | | | + | *Isolated analog output* |

B (Data +)
A (Data -) *RS485 serial line*

+
VT
- *Supply transmitter*

+
VP
- *Supply potentiometer*

⚠ **ATTENTION**: For correct installation, read the warnings contained in the user manual.

| | A | B | C | D | E | F | G | H | I | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ordering code: | 1650 X | - X | - X X X | | | - 0 | - X | - X X | - X | - X X | - 0 0 | | - X | - X X |

### Model (A)

| | |
|---|---|
| Controller | |
| Programmer | P |
| Valve (1) | V |
| Programmer+valve (1) | PV |

### Output 1 (B)

| | |
|---|---|
| Relay | R |
| Logic | D |
| Analog | C |
| Master Modbus RTU communication | G |

### Output 2 (C) Output 3 (D)

| | |
|---|---|
| Relay - Relay | R R |
| Logic - Logic | D D |
| Isolated logic - Isolated logic | M M |
| Relay - VT1 24 V | R V |
| Logic - VT1 24 V | D V |
| Isolated logic - VT1 24 V | M V |

### Output 4 (E)

| | |
|---|---|
| Absent | 0 |
| Relay | R |
| Long Life relay | T |

### Retransmission (G)

| | |
|---|---|
| Absent | 0 |
| Analogue A1 | 1 |
| Analogue A1 + A2 | 2 |

### Function (P)

| | |
|---|---|
| 00 | Absent |
| FB | Logical + mathematical operations |
| CK | RTC + Logical operations + mathematical |

### Supply (O)

| | |
|---|---|
| 0 | 20...27 VAC / VDC |
| 1 | 100...240 VAC / VDC |

### Communication (M)

| | |
|---|---|
| 00 | Absent |
| M0 | RS485 Modbus RTU (slave) |
| E0 | Ethernet Modbus TCP |
| ME | Ethernet Modbus TCP / RTU bridge |

### Digital inputs (L)

| | |
|---|---|
| 0 | Absent (3) |
| 5 | 5 DI |

### Auxiliary input (I)

| | |
|---|---|
| 0 | Absent |
| 1 | Input Aux : TC, RTD, 60mV |
| 2 | Input Aux: 1V/5V/10V/20mA + VP 1 V |
| 3 | Input Aux : 1V/5V/10V/20mA + VT2 24 V |

### Input CT / 3° Analog input (H)

| | |
|---|---|
| 0 | Absent |
| 2 | CT1 + CT2 |
| 3 | 3° Input Aux + VP 2 1 V (4) |

**Notes**
1) Only with option (C) = R and (D) = R
3) Only with option E-M = 0
4) Only with option (I) = 1,2,3

**GEFRAN spa** reserves the right to make any kind of design or functional modification at any moment without prior notice.

| | |
|---|---|
| UL | Conformity C/UL/US File no. E216851 |
| CE | EMC: Compliance with Directive 2014/30 / EU, with reference to EN 61326-1 emission in industrial environment class A<br>Security LVD: Compliance with Directive 2014/35 / EU, with reference to EN 61010-1 |
| EAC | |
| RoHS✓ | |