DISPLAY AND KEYS

1. Unit of measurement or number of program running or loop display.
3. Controller function states:
   - RUN = functioning (flashing or normal functioning, usually on = program running).
   - J = setpoint ramp active.
   - TUN = PID parameters tuning active.
   - MANT = Manual back-up mode active (off = manual control). 
   - REM = remote input enabled (off = setpoint = 1).
4. Work mode key (manual/automatic) in standard mode. A function can be assigned via parameter configuration only when the display shows the process variable (PV).
5. Up/down keys: raise/lower the value of the parameter displayed on the 5V or PV display.
6. If yes, let you navigate among controller's other menus and parameters. Confirm the parameter value and select the next parameter.
7. Fast access to diagnostic parameters, diagnostics and alarm messages. Configurable with parameter d3.35 (default = setpoint).
8. PV display: process variable, parameter value.

CONNECTIONS

1. Insert the die-cut rubber gasket between the controller and the panel. The gasket (supplied) is indispensable for ensuring tighth.
2. - the hole on the support scrupulously respects the specified drilling dimensions;
   - the housing in which the device is inserted is dust-tight and watertight;
3. The front of the controller has an IP65 protection index, so the device can be installed without problems in rooms that are exposed to rain, generate electromagnetic fields, such as power contactors, relays, thyristor power units (especially phase angle), motors, transformers, television, high-frequency units, etc.
4. The controller is designed for permanent indoor installation. It must be mounted on electrical panels or on panels control-boards with a specific conductor to prevent grounding through the machine structure.

PACKAGE CONTENTS

1. 1/16 Din Temperature Controller 116D model 850
2. Wiring bracket with screws
3. Fastener gauge kit 44-401 box
4. Instruction sheet

MAINTENANCE

- Use a soft, dampened in alcohol or water to clean the front panel and the housing. Do not use abrasive detergents like hydrocarbons, gasoline, etc.

WARRANTS AND SAFETY

- Although all the information in the user's manual has been carefully checked, GEFRAN S.p.A. assumes no liability expre-
  sly for any errors or regarding damage to property and/or to persons caused by any incorrect use of the device.
- GEFRAN S.p.A. also reserves the right to make changes in the contents and form of this manual and to the characteristics of the device described here and at any time and without prior notice.
- The instruction of the device indicated in this manual must be carried out by qualified technicians in compliance with the laws and standards in force and in accordance with the indications contained in the manual.
- The controller embraces compliance to EN 61010-1 and EN 61010-2-030 and is used in application with the risk management process, machine or equipment, in line with appropriate and essential content and in line with all of the foreseen and assumed activities.
- Before interacting with the PID temperature controllers 116D model, the operator must read and bring into the proced-ure of permit/permit, emergency, escape, maintenance and maintenance of the system.
- More information on the device and procedures of the installation, maintenance and servicing can be found in the installation and service instructions 850-1930-1030, which is available for free download from the GEFRAN website www.gefran.com.

TECHNICAL SPECIFICATIONS

- Main input
- Output circuits must have double isolation.
- Connected external circuits must have double isolation.
- Use copper cables with 0,75 mm² insulation.
- Use heat-sealed isolated cables for low power connections.

- The controller can work in Pollution Degree 2 environments (presence of non-conductive dust, only temporarily conductive data plate).

- REM = remote setpoint enabled;
- OUT4 = output 4.

CONNECTIONS

1. Loop 0...20 mA, 24 VDC (AL1)
2. Loop 0...20 mA, 24 VDC (AL2)
3. Loop 0...20 mA, 24 VDC (AL3 / HB)
4. Loop 0...20 mA, 24 VDC (AL4 / HB)

NOTE:
- To enable the valve position control, connect the valve positioner to terminals 7 and 11, 7 and 17 or 7 and 22.
- In order to control the valve position, select the correct direction for applying the valve.
- Always use appropriate cables for the voltage and current links specified in the list of values and technical data.

- The controller can be powered by a line separated from the one used for electrical equipment or power and control devices.
- It is advisable to install a short-circuit wire on the power line, as close as possible to the device, to limit the controller's susceptibil-
ity to electrical noise.
- If the controller's power line is heavily disturbed by the switching of thyristor power units or by motors, it is advisable to use an isolation transformer only for the controller, grounding the shield.
- Use appropriate filters in the wiring of high-frequency generators or arc welders. Use a voltage stabilizer if there are pulsos shifts or low voltage.

- To power remote, the controller's input and output cables must be kept away from the power cables (high voltages or high currents).

- The input and output cables and the power cables must not be placed parallel to one another, or insulated cables or separate cable trays.

Attention! Make sure the ground connection is efficient.
Always or sufficient grounding can make the device available for use according to the specific end in which it is intended to be used.

- If not correctly disposed of, some of the components used in the devices may harm the 
  environment.
- Indicates a particularly delicate situation that could affect the safety or correct operation of the controller, or an 
  action that should be taken in order to prevent hazards.

- This is a class A product intended for use in an industrial environment. There may be potential difficulties in
  using the device in a domestic environment.
**DRILLING DIMENSIONS AND TEMPLATES**

**GENERAL DATA**
- **Operating voltage**: 100–240 VAC/DC ±10%, 50/60 Hz
- **Power dissipation**: 10 W max
- **Input**: Screw terminals and crimp connector, max. wire size 2 mm²

**CONNECTIONS**
- **Input type**: Screw terminals and crimp connector, max. wire size 2 mm²
- **Power supply**: 20...27 VAC/VDC ±10%, 50/60Hz

**TECHNICAL DATA**

**OUTPUTS**
- **Display**: 1 1/2 digit (max. 1 line with 3 digits with contact in contrast)
- **Type of relay contact**: NO
- **Max. current**: 0.5 A (life for contact: 50000)
- **Life cycle**: > 100000 operations
- **Double relay selection**

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**AUXILIARY INPUT**
- **Type**: NO, N.C., P.M.T. (P.P.M.T.)
- **Resolution**: 12 bit
- **Insulation**: compared to main input

**MAIN INPUT**
- **Input type**: 0...10 V, max 20 mA, R<sub>in</sub> ≥ 500 Ω
- **Power supply**: 75...240 VAC
- **Current**: max. 1 A
- **Isolation**: 3 kV

**PARAMETERS**
- **Ranges**: ± 1% from reading in °C ±0.5°C
- **Resolution**: 0.005% from reading in °C ±0.015°C
- **Temperature drift**: > 30:1 rejection to the change of the ambient temperature
- **Cold junction compensation**: (0.25% of reading in °C ±0.1°C)
- **Cold junction accuracy**: (0.15% of reading in °C ±0.4°C)

**DIGITAL INPUTS**
- **Type**: NO, N.C., P.M.T. (P.P.M.T.)
- **Resolution**: 12 bit
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**ALARMS**
- **Number of unusual configurations**: Maximum, minimum, absolute, relative, spike, rejection, exclusion, at a specific memory, reset from keypad and/or contact, position
- **HBA Hold Back Band if enabled with Programmer function**

**POWER SUPPLY**
- **Input**: 1 V DC. Max input: 50 mA
- **Output**: 12 V DC. Max output: 30 mA

**CONTROL FUNCTIONS**
- **Control**: Single loop, double loop
- **Output**: Max. 16 output channels, single loop or double loop conventional

**PROGRAMMER**
- **Number of modes**: 16 (double loop)
- **Number of programs**: Max 16 (double loop)
- **Start/Stop**: Start/Stop or Step/Stop
- **Outputs**: Digital and/or analog

**SETPOINT PROGRAMMER**
- **Number of sets**: Max 16 (double loop)
- **Start/Stop**: Start/Stop or Step/Stop
- **Output types**: Digital and/or analog

**LOGIC OUTPUTS**
- **Number of outputs**: Max 16
- **Function**: Logical AND, OR, NOT, EXCLUSIVE OR

**OPERATIONS MATH**
- **Number of blocks**: Max 8, with 2 input variables per block, with operations such as: +, -, *, /, square, square root, etc.
- **Function**: Each output can act on the state of the controller, of the programmer on alarms and outputs.

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