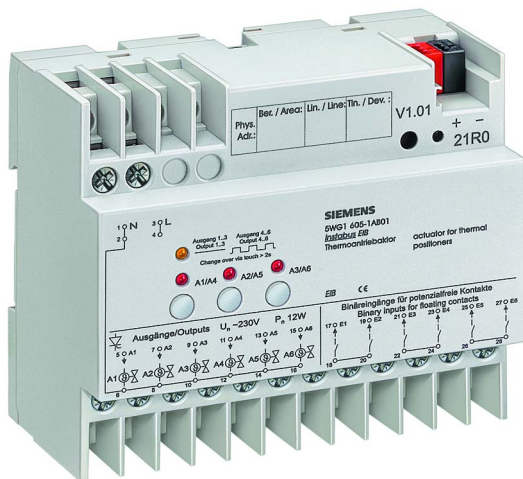


**Thermal drive actuator N 605
(6 x AC 230 V / 0,05 A)**
5WG1 605-1AB01

Product and functional description



The thermal drive actuator N 605 has been specially developed to control miniature valves with electrothermal valve drives for AC 230 V operating voltage. It is a DIN rail mounted component for the *instabus EIB*. All the cable connections are carried out via screw terminals except for the bus cable which is plugged in.

6 channels with semiconductor outputs are available to control the valve drives. The outputs each have 2 output terminals available (for N and switched L). A maximum of 4 thermal drives may be connected in parallel to one channel (actuator output). The outputs are monitored for short circuits and overload. If a short circuit or overload is detected, all the outputs are temporarily de-energized and the red LEDs are triggered with a circulating light. After a cooling down period of 6 minutes, the individual outputs are switched on in sequence to determine where the short circuit or overload has occurred. It is reported via a special communication object which outputs are affected. These outputs are disabled for further operation and the associated red LEDs flash rapidly. All the other outputs are then operated as normal. It is only possible to reset a disabled channel by isolating the actuator from the mains voltage.

The power supply of the actuator electronics is carried out via an integrated power supply unit which is independent of the EIB bus voltage. Each output in a group of three outputs (outputs 1-3 or outputs 4-6) can be manually switched on or off or to the 50% open position via three push buttons which are integrated in the actuator and each have 1 red LED. The manual switching

also functions if the bus cable is not connected or if the bus communication fails. After a long push button action (> 2 s), the other valve group is selected. The yellow LED indicates which of the two output groups can be operated (continuous light = outputs 1-3, flashing light = outputs 4-6).

Application Program

21 A6 Actuator Heat/Cool Binary 906101

The application program enables the actuator outputs to be controlled via ON/OFF switching commands or via positioning commands expressed as a percentage. The latter are converted into switching commands with pulse width modulation under consideration of the heating up and cooling down periods of a thermal drive. A changed status or the current state of an output can be queried via a separate status object or sent automatically. The type of the output status object is always the same as the trigger object. The behaviour of the actuator on bus voltage failure can also be preselected (no action, switch on, switch off, forced position).

If the program function "Calcification protection" is activated, each actuator output is switched on and off once within a period of 6 days to prevent the valves from being fixed in position outside the heating respectively cooling period.

If you do not want that, in a room with several windows, the opening of only one window will switch the room thermostat to the building protection mode, hereby closing all heating and cooling valves, then the program function "Constrained Position" has to be activated. In this case, only the valve of the respective radiator or cooling ceiling element that is located in the immediate vicinity of the opened window is closed, except for a set residual opening (the "constrained position"). If a logical connection of the "Constrained Position" object with the "Frost alarm" or "Outside temperature" object is selected and a frost alarm is not present or the outside temperature is $\geq 1^{\circ}\text{C}$, the valve will be fully closed (and not set to the constrained position) if the "Constrained Position" object is set to logical 1 by the opening of a window.

There are 6 additional binary inputs available for floating signal contacts in order to record and transmit the switching state e.g. of the window contacts or dew point detectors.

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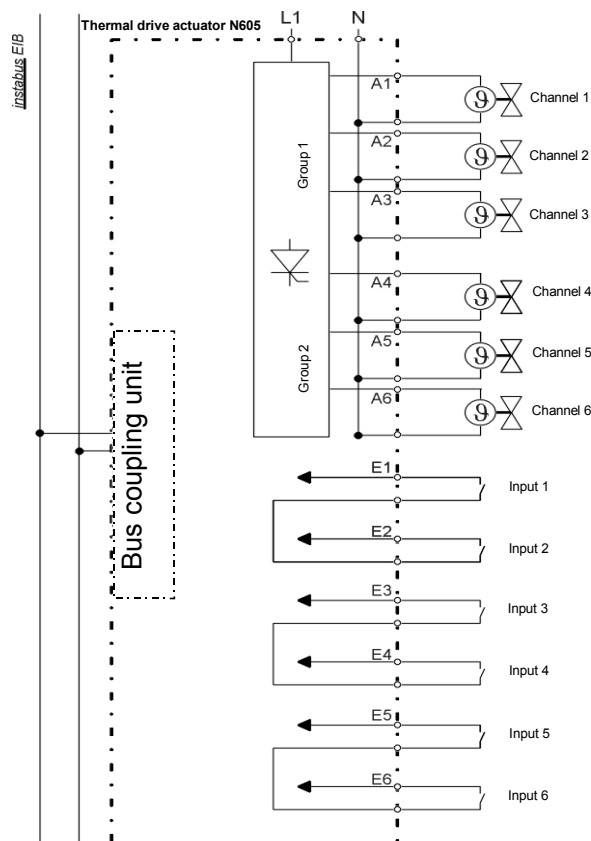
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Prerequisites

The user of the program must ensure that the following requirements are met for the error-free operation of the application program for the N 605:

1. The user must specify via a parameter whether the room thermostat only sends switching command telegrams of type EIS 1 to activate a valve whereby a logical 0 corresponds to the command for closing the valve and a logical 1 corresponds to the command for opening the valve. Otherwise, it must be defined whether the valve is triggered via positioning commands of type EIS 6 expressed as percentage values whereby 0% corresponds to a closed valve and 100% to an opened valve.
2. The room thermostat must ensure that it never sends switching or positioning commands which lead to the simultaneous opening of the heating and cooling valves (i.e. a switching/positioning command to open a valve may only be sent by the thermostat if it has previously sent a switching/positioning command to close the other valve).
3. Thermal drives of the same type from the same manufacturer must be connected to all the outputs of the N 605. The user must indicate for each valve whether it is closed or opened in the de-energized state.
4. If dew point detectors have been installed and are connected to the EIB, the room thermostat must send a "CLOSE" command (0% command) to the cooling supply valve if a dew point alarm is present followed by an "OPEN" command (100% command) when the dew point alarm is no longer present and further cooling is required.
5. If the opening of a window is reported to the room thermostat via the EIB and the program function "Constrained Position" has not been activated, the thermostat must switch to "Building protection mode" and immediately send a "CLOSE" command (0% command) to the currently opened supply valve. In the "Building protection mode", the room thermostat must ensure by controlling the valves that the room temperature does not fall below the setpoint value for frost protection respectively does not exceed the setpoint value for heat protection.

Connection example



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Installation instructions

- The device can be used for permanent installations in dry rooms and for insertion in distribution boards.
- To ensure that the inputs for the window contacts function without any errors, the terminal pairs 18/20, 22/24 and 26/28 may not be connected together.

DANGER

- The device may only be installed and commissioned by an authorised electrician.
- The prevailing safety and accident regulations must be observed.
- Limited by the permitted printed conductor load, the total of the switched currents may not exceed 10 A.
- The device must be protected against short circuits with a circuit-breaker of characteristic A or B with a maximum nominal current of 10 A.
- A faulty connection of AC 230 V on the screw terminals for connection of floating signal contacts can lead to the electronics module being damaged.
- The device may not be opened. Any faulty devices should be returned to the local Siemens office.

Technical data

Power supply

Via an integrated power supply unit (230 V AC +10% -15%), independent of the EIB bus voltage

Operating elements

- 1 programming button: for toggling between normal mode/addressing mode
- 3 push buttons for toggling a group of three outputs locally, independent of the EIB

Outputs

- Number: 6 (semiconductor switch)
- Rated voltage: AC 230 V, 50 ... 60 Hz
- Rated current: 0.05 A (short-time 1.5 A, resistive load)
- Continuous load per output: 12 W (resistive load)

Inputs

- Number: 6 (for floating signal contacts)
- Length of connection cable: max. 50 m

Display elements

- 1 red LED: for controlling the bus voltage and for displaying normal mode/addressing mode
- 1 yellow LED for displaying the operating voltage and the outputs that can currently be operated (continuous light = outputs 1-3 can be operated, flashing light = outputs 4-6 can be operated)
- 3 red LED's: for displaying the switching state of a group of 3 outputs (LED lights up if 230 V is present at the output)

Connections

- Mains connection: 2-pole (N, L)
Insulation strip length 9... 10 mm
0.5 ... 2.5 mm² single-core or
0.5 ... 1.5 mm² finely stranded with connector sleeve
- 6 load outputs: 2-pole (N, switched L)
Insulation strip length 9 ... 10 mm
0.5 ... 2.5 mm² single-core or
0.5 ... 1.5 mm² finely stranded with connector sleeve
- Bus line: screwless bus terminal
0.6 ... 0.8 mm Ø single-core

Mechanical data

- Housing: plastic
- Colour of housing: light grey
- Dimensions: DIN rail mounted device in N-system dimensions, width = 6 modules (1 module = 18 mm)
- Weight: approx. 380 g
- Fire load: approx. 5300 kJ ± 10 %
- Installation: Snap-on fixing onto DIN rail TH35-7.5 according to DIN EN 60715

Electrical safety

- Degree of pollution (according to IEC 60664-1): 2
- Type of protection (according to EN 60529): IP 20
- Overvoltage category (according to IEC 60664-1): III
- Bus: safety extra-low voltage SELV DC 24 V
- Complies with: EN 50090-2-2 and EN 60669-2-1

Reliability:

Failure rate: 976 fit at 40 °C

EMC requirements

Complies with: EN 50081-1, EN 61000-6-2 and EN 50090-2-2

Environmental conditions

- Climatic withstand capability: EN 50090-2-2
- Ambient operating temperature: -5 ... +45 °C
- Storage temperature: -25 ... +70 °C
- Relative humidity (not condensing): 5% ... 93%

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Approval

EIB certified

CE mark

In accordance with EMC guideline (residential and functional buildings) and low voltage guideline

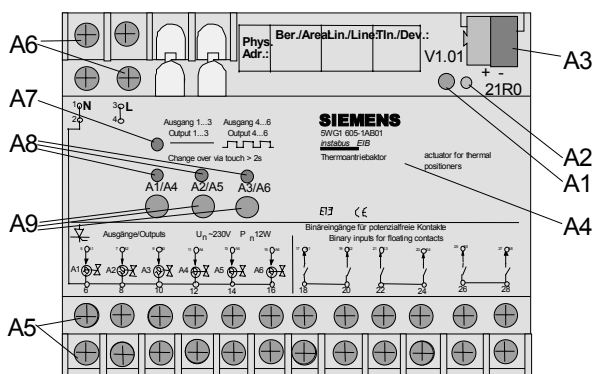
Location and function of the operating and display elements


Diagram 1: Location of the operating and display elements

- A1 Learning button for toggling between normal mode and addressing mode for transferring the physical address
- A2 LED for displaying normal mode (LED off) or addressing mode (LED on); it is extinguished automatically once the physical address has been transferred
- A3 Plug for bus connecting terminal
- A4 Label
- A5 Screw terminals for connecting the valve drives and signal contacts
- A6 Screw terminals for connecting the mains voltage
- A7 LED for displaying the operating voltage and the outputs that can currently be operated
- A8 3 LED's to display whether 230 V is present at the output
- A9 3 push buttons for local operation

Mounting and wiringGeneral description

The N-system DIN rail mounted device (6 modules) can be inserted in the N-system distribution board, either surface- or flush-mounted and wherever DIN rails TH35-7.5 according to DIN EN 60715 are available.

The connection with the bus line is carried out via a bus terminal.

Installation of the DIN rail mounted device (Diagram 2)

- Slide the device (B) onto the DIN rail (B1) and
- rotate the device downwards until the slide switch audibly clicks into position.

Dismantling the DIN rail mounted device (Diagram 2)

- Remove all the connected cables,
- press the slide switch (C2) downwards with a screwdriver and
- remove the device (C) from the DIN rail (C1) with a swivel action.

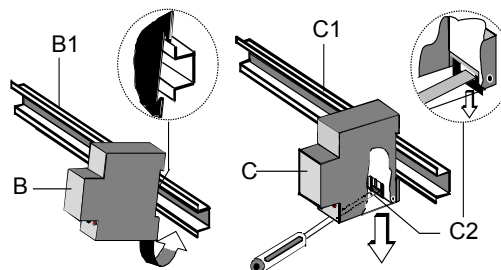


Diagram 2: Installing and dismantling the DIN rail mounted device

Removing the bus terminal (Diagram 3)

- The bus terminal is located on the top of the actuator N 605
- The bus terminal (D1) consists of two sections (D2.1, D2.2), each with four terminal contacts. Care should be taken not to damage the two test sockets (D2.3) either by accidentally connecting them to the bus conductor or with the screwdriver (when trying to remove the bus terminal).
- Carefully insert the screwdriver in the wire entry slot underneath the bus terminal (D2) and pull the bus terminal forwards out of the actuator N 605 (D1).

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Notice: Care should be taken as there is a risk of shorting the bus voltage when removing the bus terminal.

Plugging in the bus terminal (Diagram 3)

- Place the bus terminal (D2) in the guide slot and push the device backwards until it reaches the stop.

Connecting the bus cable (Diagram 3)

- The bus terminal (D2) is suitable for solid conductors with 0.6 ... 0.8 mm Ø.
- Strip approx. 5 mm of the insulation from the conductor (D2.4) and plug in the terminal (D2) (red = +, black = -).

Disconnecting the bus cable (Diagram 3)

- Remove the bus cable (D2) and the conductor (D2.4) of the bus cable by rotating them simultaneously backwards and forwards.

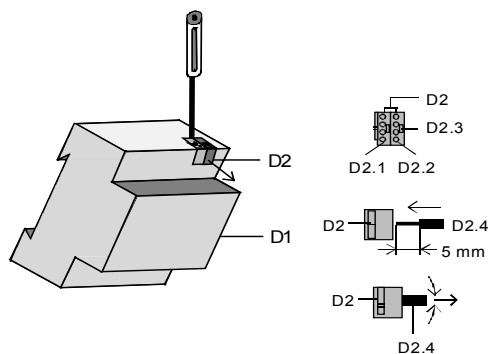


Diagram 3: Connecting and disconnecting the cable

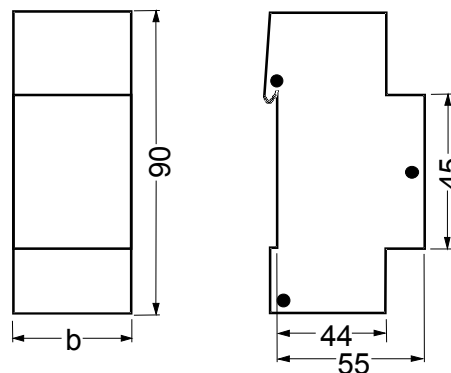
Connecting the mains voltage and valve drives

- The connections are carried out with screw terminals.
- Strip approx. 9-10 mm of insulation from the conductor, slide under the wire clamps of the respective terminal and screw into position.

Cross-sections: see *Technical data*.

Dimension drawing

Dimensions in mm



b = 6 modules

1 module = 18 mm

instabus EIB

Technical product information

April 2003

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Notes