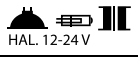
DA3-22M

EN Universal dimming actuator, 2-channel

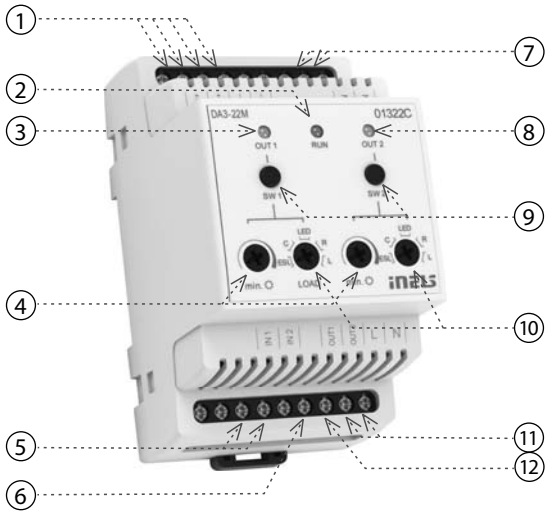
Characteristics

- DA3-22M is a universal dimming 2-fold actuator enabling control of brightness intensity of dimmable light sources of the type ESL, LED and RLC with power supply 230V.
- DA3-22M has two MOSFET controlled outputs 230V AC, maximum load is 2x 400 VA.
- Option of connecting an external temperature sensor.
- Each output channel is independently controllable and addressable.
- Type of light source is set by a switch on the front panel.
- By setting the min. brightness potentiometer on the front panel, flashing of different types of light sources is eliminated.
- DA3-22M is equipped with two inputs 230 V AC, which can be controlled by mechanical switches (buttons, relays). Inputs are galvanically connected to potential L, which is permanently at the terminals IN1 and IN2.
- Buttons on the front panel, you can manually switch on or off the corresponding output.
- Electronic overcurrent and thermal protection - switch off output in case of overload short circuit and overheating.
- During installation, it is necessary to leave on each side of the actuator at least half the module space for better cooling.
- DA3-22M in 3-MODULE version is designed for mounting into a switchboard on DIN raill EN60715.

Types of connectable loads

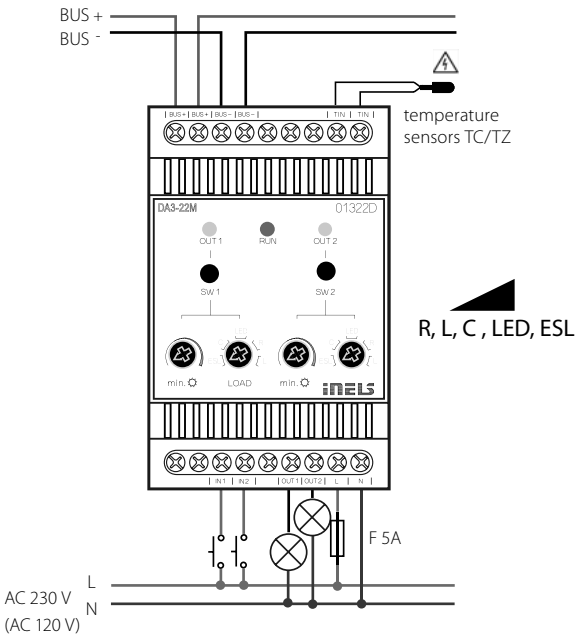
type of source	symbol	description
R resistive		ordinary light bulb, halogen lamp
L inductive		coiled transformer for low-voltage halogen lamps
C capacitive		electronic transformer for low-voltage halogen lamps
LED		LED lamps and LED light sources, 230 V
ESL		dimmable energy-saving fluorescent tubes

Description of device



1. Data BUS
2. LED indication of unit´s state
3. LED indication channel 1 active
4. Setting minimum brightness
5. Input switching by potential L
6. Output channel 1
7. Input for thermo sensor
8. LED indication channel 2 active
9. Control buttons
10. Selection of light source type
11. Terminals of supply voltage 230 V AC
12. Output channel 2

Connection



Technical parameters

DA3-22M

Inputs	
Input: ⚠	2x inputs, switching potential L*
Temperature measuring: ⚠	YES, input for external thermo sensor TC/TZ
Scope and accuracy of temp. measurement:	-20 .. +120°C; 0.5°C from the range
Number of control buttons:	2x buttons, 4x potenciometers on front panel
Outputs	
Output:	2 contactless outputs, 2x MOSFET
Load type:	resistive, inductive, capacitive**, LED, ESL
Isolation BUS separated from all internal circuits:	reinforced Insulation (Cat. II surges by EN 60664-1)
Isolation voltage between particular power:	max. 500 V AC
Minimal controlled load:	10 VA
Maximal controlled load:	DA3-22M/230V: 400 VA for each channel DA3-22M/120V: 200 VA for each channel
Output indication ON/OFF:	2x yellow LED
Device protection:	thermal / short-term overload / long-term overload
Communication	
Installation BUS:	BUS
Power supply	
Supply voltage by BUS /tolerance:	27 V DC, -20 / +10 %
Rated current:	5 mA (at 27 V DC), from BUS
Status indication unit:	green LED RUN
Supply voltage for power section / tolerance:	DA3-22M/230V: AC 230 V (50 Hz), -15 / +10 % DA3-22M/120V: AC 120 V (60 Hz), -15 / +10 %
Connection	
Terminal:	max. 2.5 mm² / 1.5 mm² with sleeve
Operating conditions	
Air humidity:	max. 80 %
Operating temperature:	-20 .. +35 °C
Storing temperature:	-30 .. +70 °C
Protection degree:	IP20 device, IP40 mounting in the switchboard
Overvoltage category:	II.
Pollution degree:	2
Operating position:	vertical
Installation:	switchboard on DIN rail EN 60715
Design:	3-MODULE
Dimensions and weight	
Dimensions:	90 x 52 x 65 mm
Weight:	166 g

⚠ Input is connected to the mains voltage potential.
* The inputs are not galvanically isolated from the supply voltage.
** Attention: It is not allowed to connect loads of inductive and capacitive character, at the same time.

Warning

Before the device is installed and operated, read this instruction manual carefully and with full understanding and Installation Guide System iNELS3. The instruction manual is designated for mounting the device and for the user of such device. It has to be attached to electro-installation documentation. The instruction manual can be also found on a web site www.inels.com. Attention, danger of injury by electrical current! Mounting and connection can be done only by a professional with an adequate electrical qualification, and all has to be done while observing valid regulations. Do not touch parts of the device that are energized. Danger of life-threat! Temperature sensor input on the potential of the mains voltage - beware the possibility of electric shock. It is therefore necessary to use a sensor possessing double or reinforced insulation for the overvoltage category according to EN 60664-1 (eg sensor TC, TZ). While mounting, servicing, executing any changes, and repairing it is essential to observe safety regulations, norms, directives and special regulations for working with electrical equipment. Before you start working with the device, it is essential to have all wires, connected parts, and terminals de-energized. This instruction manual contains only general directions which need to be applied in a particular installation. To ensure correct function of the dimmer, its cooling is important. The dimmer creates temperature loss approx 1.5% from installed output. For instance when output is 1000 W the temperature loss is 15 W. Dimmer is cooled by a natural air flow and therefore it is necessary to ensure such air flow in the switchboard. In case the air access is restricted, cooling must be ensured by a fan. Rated operating ambient temperature is 35 °C. In case of installation of more dimmers in one line, there has to be a space in-between them – minimally 2 cm. In the course of inspections and maintenance, always check (while de-energized) if terminals are tightened and air flow is sufficient.

General instrucions

CONNECTION INTO THE SYSTEM

Connect the product to the system according to the connection diagram listed with each product. The wires of data BUS of iNELS system are connected to the terminals BUS+ (standard red wire for single-pair wiring, red and yellow for two-pair wiring) and BUS- (standard black wire for single-pair wiring, black and white for two-pair wiring), and it is not possible to change the terminals. A twisted pair of wires must be used for the data BUS with a wire diameter at least 0.8 mm. Data communications and power supply to the units are led in a single pair of wires, and you must observe the power cable size with regard to voltage loss on the wire and the maximum power draw.

INSTALLATION RECOMMENDATIONS

Assure sufficient device cooling. Due to the large number of light sources, the maximum load depends on the internal design of dimmable LEDs and ESLs and their effect cos φ.

The effect of dimmable LEDs and ESLs fluctuates within a range of: cos φ = 0.95 to 0.4. The approximate value of the maximum load is attained by multiplying the dimmer load carrying capacity with the power factor of the connected light source.

DEVICE SETTING

Setting the minimum brightness: the minimum brightness is set when the load is switched on by turning the minimum brightness potentiometer to the required value. The minimum brightness is saved around 3 seconds after performing the last change in the potentiometer position.

Setting the load type: the load type is set when the load is switched off by turning the light source selection potentiometer to the required value.

CAPACITY AND CENTRAL UNIT

It is possible to connect to the central unit CU3-01M or CU3-02M two independent BUSes by means of terminals BUS1+, BUS1- and BUS2+, BUS2-. It is possible to connect to each BUS up to 32 units, so it is possible to connect directly to the central unit a total of 64 units. It is necessary to comply with the requirement of a maximum load of one BUS line – maximum up to 1000 mA current. It is the sum of the rated currents of the units connected to the BUS line, other units can be connected using the units MI3-02M, which generate further BUSes. These are connected to the CU3 unit via the system BUS EBM and you can connect a total of 8 units via EBM BUS to the central unit MI3-02M.

COMMUNICATION BUS OF THE SYSTEM

The BUS must have a cable created by a twisted pair of wires for data BUS of the system with a minimum wire diameter of 0.8 mm. A shielded cable must be used in case of installation of cables of the BUS in an environment with the possibility of electromagnetic interference (e.g. when running along power lines, near electric machines and devices, during LV passage through a distributor, etc.). We highly recommend using the cable JYSTY 2x2x0.8 for BUS. The BUS cable is installed in accordance with its mechanical properties given by the producer (into a pipe / bar, under plaster, underground, suspended, etc.) To increase the mechanical resistance of cables, we always recommend installing the cable into an electrical insulation pipe of the appropriate diameter. The total length of wires of the BUS for CU3-01M (CU3-02M), or MI3-02M, can be 1.100 m (550 m for each BUS). The topology of the communications BUS is open with the exception of topology of the circuit. It is necessary to use the cable FTP CAT5e or higher for the system BUS EBM – one pair of wires is connected to the terminals EBM+ and EBM- and the second pair of wires can be curled and connected to GND terminal (just on the one side of EBM BUS). The typology of EBM system BUS is strictly linear and must be terminated at both ends with a nominal resistance value of 120 Ω. It is the installer's responsibility to follow all instructions in the manual and all installation requirements for the RS485 BUS.

SUPPLYING THE SYSTEM

For supplying power to system units, it is possible to use the power sources of ELKO EP titled PS3-100/iNELS. We recommend backing up the system with backup batteries connected to the source of PS3-100/iNELS (see sample diagram of connecting the control system).

DESCRIPTION OF DEVICE PROTECTION STATUS

The DA3-22M device features protection from overheating, short-term and long-term overloads:

- Thermal protection: activates upon constant output load, or insufficient device cooling. The protection switches off the output until the dimmer cools down to its operating temperature. The dimmer can then be switched back on. Remove faults by providing better dimmer cooling, by decreasing the power consumption of the connected load, or by switching to the correct light source position.
- Short-term overload: activates by short-term high overload, ex. by temporary short circuit. Protection appears by short flashing of the connected load. Remove faults by decreasing the power consumption of the connected load, or by switching to the correct light source position.
- Long-term overload: activates by constant short circuit, or output overload caused by excessive amount of connected load. The protection switches off the device, and it is possible after 5 minutes to switch the dimmer back on. Remove faults by decreasing the power consumption and by specialized inspection of the wiring distribution.

GENERAL INFORMATION

The unit is capable of working as an independent element without a central unit only in very limited scope of its functions. For full utility of the unit, it is necessary for the unit to be connected to the central unit of the system CU3-01M, or to a system that already contains this unit as its expansion to include further system.

All unit parameters are set through the central unit CU3-01M in the software iDM3.

There are LED diodes on the unit front panel, for indication of supply voltage and communication with the central unit series CU3. In case that the RUN diode flashes at regular intervals, so there is standard communication between the unit and BUS. If the RUN diode lights permanently, so the unit is supplied from BUS, but there is no communication between BUS and unit. In case that RUN diode is OFF, so there is no supply voltage on the terminals BUS+ and BUS-.

Attention: The temperature sensor input is at the potential of the network supply voltage - beware the possibility of electric shock.

ADDITIONAL INFORMATION

Energy-saving lamps not explicitly marked as dimmable cannot be dimmed. Incorrect setting of the light source type only influences the range and course of dimming (meaning no damage occurs to either the dimmer or load). Incorrect setting of the load type may cause the dimmer to overheat. The maximum number of dimmable light sources depends on their internal design.