DA3-22M

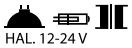
EN Universal dimming actuator, 2-channel

02-78/2017 Rev.2

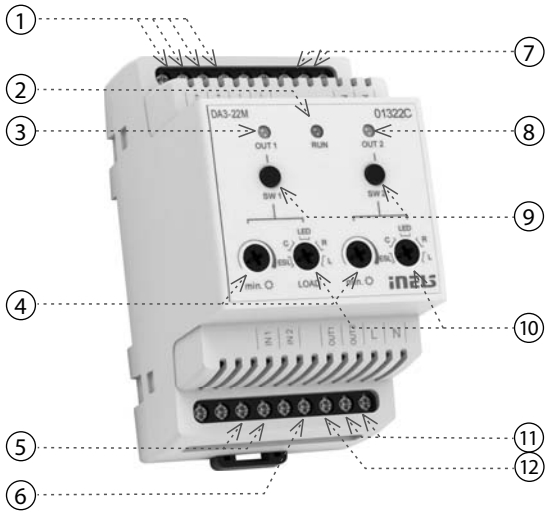
Characteristics

- 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.
- The power supply (potential L) must be protected by a protective element corresponding to the power input of the connected load, e.g. a safety fuse.
- 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

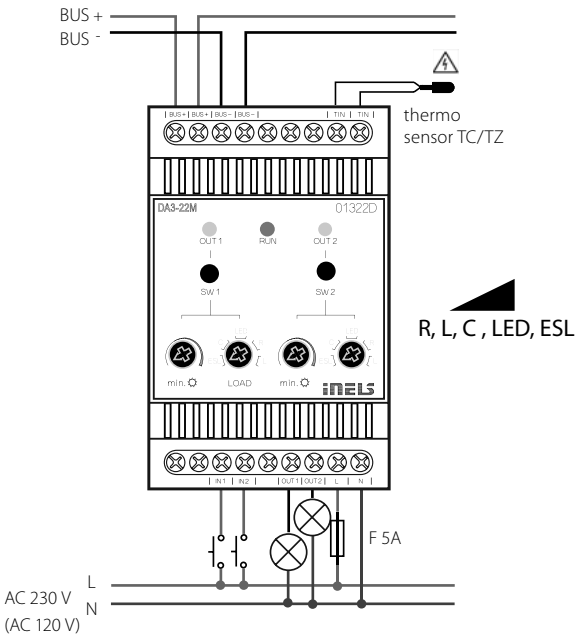
type of source	symbol	description
R resistive		ordinary light bulb, halogen lamp
L inductive		coiled transformer for low-voltage halogen lamps
C capacitive		electronic transformer for low-voltage halogen lamps
LED		LED lamps and LED light sources, 230 V
ESL		dimmable energy-saving fluorescent tubes

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	DA3-22M/120V
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:	400 VA for each channel	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:	AC 230 V (50 Hz), -15 / +10 %	AC 120 V (60 Hz), -15 / +10 %
Dissipated power:	max. 13 W	max. 7.5 W
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 TO THE SYSTEM, INSTALLATION BUS

iNELS3 peripheral units are connected to the system through the BUS installation. Installation BUS conductors are connected to the terminal units to BUS+ and BUS- terminals, wires cannot be interchanged. For installation of BUS it is necessary to use a cable with a twisted pair of wires with a diameter of at least 0.8 mm, the recommended cable is iNELS BUS Cable, whose features best meet the requirements of the BUS installation. Bearing in mind that in terms of all the properties is it is possible in most cases also use the cable JYSTY 1x2x0.8 or JYSTY 2x2x0.8, however it is not recommended as the best option. In the case of a cable with two pairs of twisted wires it is not possible to use the second pair of the other for modulated signal due to the speed of communications; it is not possible within one cable to use one pair for one segment BUS and the second pair for the second segment BUS. For installation of BUS it is vital to ensure that it is kept at a distance from the power lines of at least 30 cm and must be installed in accordance with its mechanical properties. To increase mechanical resistance of cables we recommend installation into a conduit of suitable diameter. BUS topology installation is free except for the ring, wherein each end of the bus must terminate at the terminals BUS + and BUS- peripheral unit. While maintaining all the above requirements, the maximum length of one segment of the installation BUS can reach up to 500 m. Due to the data communication and supply of units in one pair of wires, it is necessary to keep in mind the diameter of wires with regards to voltage loss on the lead and the maximum current drawn. The maximum length of the BUS applies provided that they comply with the tolerance of the supply voltage.

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. When connecting units which draw greater than 1A, BPS3-01M with 3A sampling can be used. 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.

SUPPLYING THE SYSTEM

For supplying power to system units, it is recommended to use the power source 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.