ABB i-bus® KNX
Energy Actuator, 3F, 16/20 A, MDRC
SE/S 3.16.1, 2CDG 110 136 R0011

2CDC 071 021 S0010

The Energy Actuator is a modular installation device in Pro *M* design for installation in the distribution board. The device is especially suitable for switching loads with high peak inrush currents such as lighting equipment with compensation capacitors or fluorescent lamp loads (AX) to EN 60 669.

Manual operation is possible using a keypad on the device. This simultaneously indicates the switching state.

The Energy Actuator can switch up to 3 independent electrical loads via floating contacts. The maximum load current per output is 20 A.

The connection of the outputs is implemented using universal head screw terminals. Each output is controlled separately via the KNX.

Individual outputs can be copied or exchanged to reduce the programming effort.

The parameterization is undertaken via the ETS. The connection to the KNX is implemented using the bus connection terminal on the front.

Technical data

Supply	Bus voltage	21…30 V DC
	Current consumption via bus	< 12 mA
	Power consumption via bus	Maximum 250 mW
	Power consumption on mains	≤ 0.7 W
Rated output value	Number of switch outputs (floating)	3
	U_n rated voltage	250/440 V AC (50/60 Hz)
	I_n rated current	16/20 AX, C-Load
	Leakage loss per device at max. load 3 x 16 A	3.0 W
	Leakage loss per device at max. load 3 x 20 A	4.2 W
Switching current	AC3[2] operation (cos φ = 0.45) to EN 60 947-4-1	16 A/230 V AC
	AC1[2] operation (cos φ = 0.8) to EN 60 947-4-1	16/20 A/230 V AC
	C-Load switching capacity	20 A
	Fluorescent lighting load to EN 60 669-1	16/20 AX/250 V AC (200 µF)[2]
	Minimum switching power	100 mA/12 V AC 100 mA/24 V AC
	DC current switching capacity (resistive load)	20 A/24 V DC
Relay service life	Mechanical service life	> 10^6 switching operations
	Electrical endurance to IEC 60 947-4-1	
	AC1[1] (240 V/cos φ = 0.8)	> 10^5 switching operations
	AC3[1] (240 V/cos φ = 0.45)	> 3 x 10^4 switching operations
	AC5a[1] (240 V/cos φ = 0.45)	> 3 x 10^4 switching operations
Measuring range	Active consumption/active power	5.7 W…4,600 W (U_n = 230 V) 2.8 W…2,300 W (U_n = 115 V)
	Current (AC)	0.025…20 A
	Voltage (AC)	95…265 V
	Frequency	45…65 Hz

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Accuracy[4]	Active consumption/active power (250…500 mA)	± 6 % measuring value
	Active consumption/active power (500 mA… 5 A)	± 3 % measuring value
	Active consumption/active power (5…20 A)	± 2 % measuring value
	Current (0.025…20 A)	± 1 % of actual value and ± 10 mA
	Voltage (95…265 V)	± 1 % of actual value
	Frequency (45…65 Hz)	± 1 % of actual value
Starting current	25 mA	
Relay switching times[3]	Maximum relay position changes per output per minute if all relays are switched simultaneously. The position changes should be distributed evenly over the minute.	15
	Maximum relay position changes per output per minute if only one relay is switched.	60
Connections	KNX	Via bus connection terminals 0.8 mm Ø, single core
	Load current circuits (1 terminal per contact)	Universal head screw terminal (PZ 1) 0.2… 4 mm^2 stranded, 2 x 0.2…2.5 mm^2 0.2… 6 mm^2 solid, 2 x 0.2…4 mm^2
	Ferrules without/with plastic sleeves	0.25…2.5/4 mm^2
	TWIN ferrules	0.5…2.5 mm^2 Contact pin length min. 10 mm
	Tightening torque	Maximum 0.8 Nm
Operating and display elements	Button/LED	For assignment of the physical address
	Switch position display	Relay operating element
Enclosure	IP 20	To EN DIN EN 60 529
Safety class	II, in the installed state	To EN DIN EN 61 140
Insulation category	Overvoltage category	III to EN DIN EN 60 664-1
	Pollution degree	2 to DIN EN 60 664-1
KNX safety extra low voltage	SELV 24 V DC	
Temperature range	Operation	-5 °C…+45 °C
	Storage	-25 °C…+55 °C
	Transport	-25 °C…+70 °C
Ambient conditions	Maximum air humidity	93 %, no condensation allowed
Design	Modular installation device (MDRC)	Pro *M* modular installation device
	Dimensions	90 x 72 x 64.5 mm (H x B x T)
	Mounting width in space units (modules at 18 mm)	4
	Mounting depth in mm	64.5
Weight	in kg	0.26
Installation	On 35 mm mounting rail	To EN 60 715
Mounting position	As required	
Housing/colour	Plastic housing, grey	
Approvals	KNX to EN 50 090-1, -2	Certificate
CE mark	In accordance with the EMC and Low Voltage Directive	

[1] Further information concerning electronic endurance to IEC 60 947-4-1 can be found at: AC1, AC3, AX, C-Load specifications, page 15.

[2] The maximum peak inrush current may not be exceeded, see Lamp load output, page 9.

[3] The specifications apply only after the bus voltage has been applied to the device for at least 30 seconds. Typical delay of the relay is approx. 20 ms.

[4] The stated values apply only if no DC components are present. A DC component causes additional distortion of the measurement result.

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Lamp load output

Lamps	Incandescent lamp load	3680 W
Leuchtstofflampen T5/T8	Uncorrected	3680 W
	Parallel compensated	2500 W
	DUO circuit	3680 W
Low-voltage halogen lamps	Inductive transformer	2000 W
	Electronic transformer	2500 W
Halogen lamps 230 V		3680 W
Dulux lamps	Uncorrected	3680 W
	Parallel compensated	3000 W
Marcury-vapour lamps	Uncorrected	3680 W
	Parallel compensated	3680 W
Switching performance (switching contact)	Maximum peak inrush-current I_p (150 µs)	600 A
	Maximum peak inrush-current I_p (250 µs)	480 A
	Maximum peak inrush-current I_p (600 µs)	300 A
Number of electronic ballasts (T5/T8, single element)[1]	18 W (ABB EVG 1 x 18 SF)	26[2]
	24 W (ABB EVG-T5 1 x 24 CY)	26[2]
	36 W (ABB EVG 1 x 36 CF)	22
	58 W (ABB EVG 1 x 58 CF)	12[2]
	80 W (Helvar EL 1 x 80 SC)	10[2]

[1] For multiple element lamps or other types, the number of electronic ballasts must be determined using the peak inrush current of the electronic ballasts, see Ballast calculation, page 14.

[2] The number of ballasts is limited by the protection with B16 circuit-breakers

Device type	Application program	Maximum number of communication objects	Maximum number of group addresses	Maximum number of associations
SE/S 3.16.1	Switch Measure 3f/…*	183	254	254

* … = current version number of the application program. **Please observe the software information on our homepage for this purpose.**

Note

For a detailed description of the application program see "*Energy Actuator SE/S 3.16.1*" product manual. It is available free-of-charge at *www.abb.com/knx*.

The ETS and the current version of the device application program are required for programming.

The current version of the application program is available for download on the internet at *www.abb.com/knx*. After import in the ETS it is available in the ETS under *ABB/Output/Energy actuator*.

The device does not support the locking function of a KNX device in the ETS. If you inhibit access to all devices of the project with a *BCU code*, this has no effect on this device. It can still be read and programmed.

Note

Current values less than 25 mA are indicated as a 0 mA value on the KNX (starting current). For small load currents that are just above the minimum detection threshold of 25 mA, it is possible that a value of 0 mA is displayed due to the inaccuracies, even though a current is flowing.

The Energy Actuator is only suitable for recording measured values of *Loads*, i.e., the meters only record positive energy. Negative power values are discarded with load control, and negative instrument and power values (feedback) cannot be monitored with thresholds.

Important

Threshold value monitoring should not be used for safety-relevant applications. The Energy Actuator cannot assume the function of a circuit-breaker or RCD (earth-leakage circuit breaker).

With communication objects that can be written via the bus (e.g. threshold value limits), the range of values is not limited, i.e. even if the values that can be entered in the ETS for a threshold value or load limit can only be entered within defined limits, any value can be written to the communication object over the bus. It is therefore necessary to ensure that only permitted and useful values can be written to the communication object.

If the threshold value monitoring is to be used for equipment fault detection that only causes a slight change of less than 30 mA (7 W), mains voltage and current fluctuations due to ambient influences (e.g. temperature) and natural ageing of the load play a significant role. Even when the current changes are detected by the Energy Actuator, the detected current changes do not necessarily mean that a device has failed.

The outputs are electrically isolated from each other, i.e. they can be connected to different phase conductors within the voltage ranges permitted in the technical data. There may not be potential differences between the neutral conductor connection of the load and the neutral conductor connection on the Energy Actuator to ensure that useful measured values are delivered.

Danger

In order to avoid dangerous touch voltages, which originate through feedback from different phase conductors, all-pole disconnection must be observed when extending or modifying the electrical connections.

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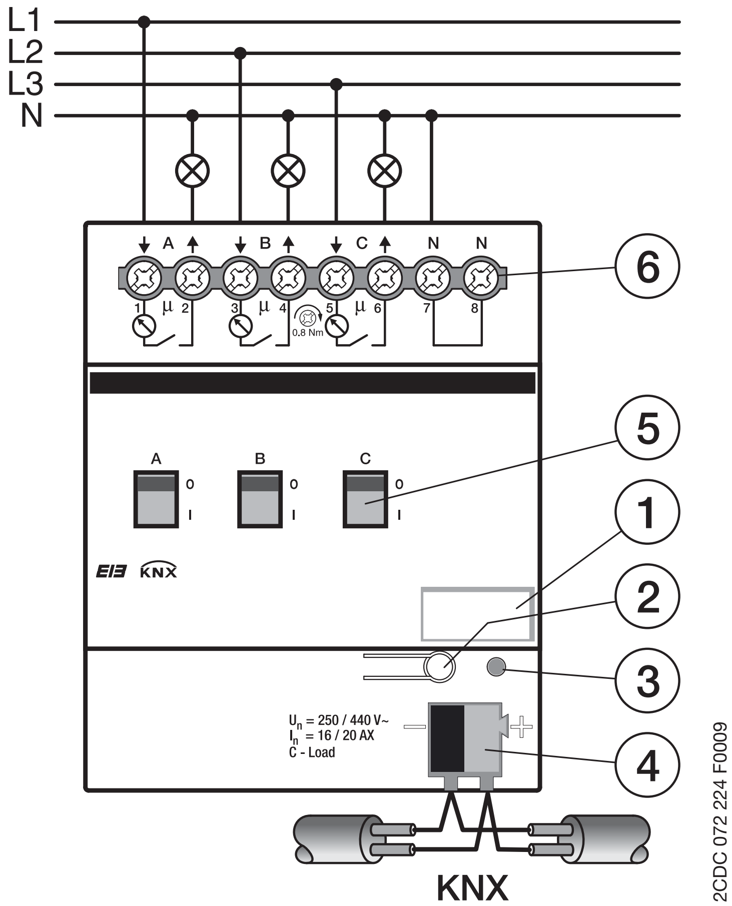
Circuit diagram



1 Label carrier
2 Button *Programming*
3 LED *Programming* (red)
4 Bus terminal connection
5 Switch position display and ON/OFF actuation
6 Load circuits (A…C) each with 2 screw terminals, neutral conductor (N)

Important
Mains voltage must be present on at least one output, and the neutral conductor must be connected for supplying power to the measurement section. No load currents may be conducted via the N terminal on the device. The switched load must be connected directly to the N rail. Terminals 7 or 8 should be connected directly to the N busbar. The second N terminal can be used to loop to further Energy Actuators.

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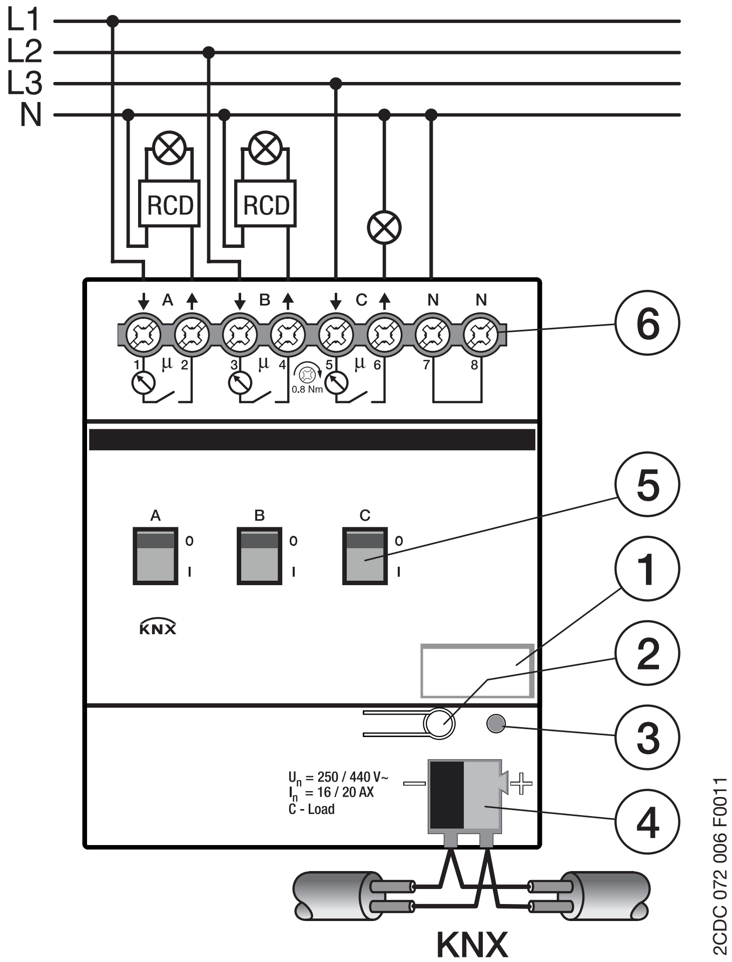
Connection example

If the outputs of the Energy Actuator are to be individually protected against residual currents, the RCD (earth-leakage circuit breaker) must be connected as follows.



Dimension drawing