E290/E297 Range

Mechanical Latching and Installation Relays

- Save space and energy
- High number of lamps switched
- Easy to assemble
- Noiseless switching and low consumption coils for maximum comfort
- Long lifetime endurance

ABB is the world's leading provider of products for electrical installation in buildings.
A comprehensive domain knowledge, global experience and continous innovation enable us to provide optimal solutions for residential, commercial as well as industrial environments.
Our solutions help to make your buildings safer, more energy efficient and equipped for the future.

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E290/E297 Range
Save space and energy

Both Latching and Installation Relays are able to switch a high number of lamps. Additional accessories help to control a higher number of light lines with the same Latching Relay.

Noiseless switching and low consumption coils for a maximum of comfort in household applications.

Thanks to their ability to control more lamps than contactors of the same nominal current, they save energy, space and costs.

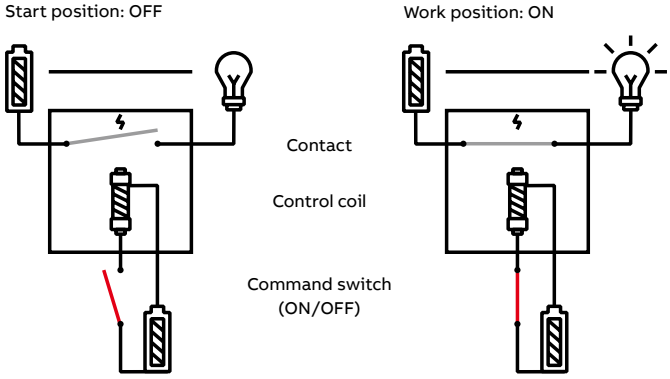
E290 and E297 are harmonized to IEC standards IEC/EN 60669 and VDE certified.

The E290/E297 range of Latching and Installation Relays is specifically designed to give maximum performances in lighting control in residential, commercial and industrial applications. In order to avoid expensive wiring our range enables to control and to switch the lights from more than two points.

Moreover, the E290/297 range is very easy to assemble: A visual indication of the contacts' position is located over the handle position and with the front handle you can give a manual command locally. Thanks to the flexibility of combining the devices directly on the field, there are less order codes to manage.

How relays work
A relay is an electrical switch that opens and closes under command control of another electrical circuit.

Latching relays are bistable which means they have two relaxed states and work with impulse voltage on the coil. When current is switched off, they remain in the present position while Installation Relays go back to the initial position. Mono-stable Installation Relays have only one relaxed state and work with continuous voltage on the coil.



E290/E297 Range
Benefits

Reduced installation time
Products are delivered with open terminals

Simple solution
Connection diagrams coherent with the number written on the terminal and printing is always in the same place of the modular components

Easy operation
The handle indicates the status of the contact and it's possible to manually manage contacts and test of functionality

Completeness
Complete offer of relays with a wide range of accessories for switching, control and manage in many ways the applications, Latching Relays up to 32 A and Installation Relays up to 16 A

Reliability
Long lifetime ensures 250.000 operations on mechanical endurance

Flexibility
Universal accessories that can be attached to the main module by hand

E290 Mechanical Latching Relay
Simplicity, energy saving and efficiency

Latching relays control more lamps than contractors of the same nominal current. Also we can save space and energy in the distribution board since the coil of the Latching Relay is supplied with a short impulse.

Latching Relays are electromagnetically operated devices. They can be used to realize a simple, energy saving and efficient lighting control system. These devices are mainly used in private houses, factory premises and commercial and public buildings as well as in industrial plants. As a rule, Latching Relays controlled by means of impulse buttons are installed where it is necessary for lighting to be operated from at least three different places.

Each time a command is initiated (by means of an impulse button), an electrical pulse is applied to the coil of the Latching Relay. The coil in the device is briefly energized and activated. That short pulse to the coil leads to the mechanical latch of the internal main contacts. The internal switching mechanism enables us to achieve a safe and reliable interlock (in the same way as a ballpoint pen). Each pulse that is sent to the magnetic coil system switches the device back to its previous position where it is held mechanically until the next control pulse is received. Therefore the result of a command initiated by means of an external button (e.g. in the corridor) always depends on the current state of the controlled Latching Relay. If it is switched on, then the next pulse will result in it being switched off (switching sequence: 0-1-0-1-0 -...).

Mechanical Latching Relays are also referred to as "bistable relays". That is because they have two mechanically stable contact positions (on or off). In case of a power failure, the last switch position is guaranteed to be held mechanically. This technology enables to reduce the electrical power loss and current consumption of devices considerably. The extremely low level of switching noise means that Latching Relays are also suitable for use in public buildings and hotels as well as in private households.

The on/off position can be identified by means of the easily visible and clearly labelled switch lever. Activation can be tested manually by operating the switch lever. The switch position is held mechanically and is clearly indicated.

—

- Saves energy, space and money
- Reduces electrical power loss and current consumption
- E290 goes up to 32A rated current; for higher amount of lamps switchable per phase
- Noiseless switching
- Auxiliary contact available
- Reliable switching with clear position indicator

E290 Mechanical Latching Relay Applications

In an office building or large building complex, Latching Relays can be used to achieve a flexible, modern and reliable lighting control system for the whole site.

APPLICATION FOR AN E290 LATCHING RELAY

— 01 Example of use within a residential building
— 02 Example of use within an industrial warehouse

Each time the impulse button is operated, an electrical pulse is applied to the Latching Relay that results in a change to the switching state. This state is held mechanically until the next pulse is received.

Switching sequence:
OFF – ON – OFF – ON

The main application for a Latching Relay is to simply switch various independent lighting areas on and off. Switching from „on“ to „off“ is carried out by means of a short impulse.

As the device coil of the Latching Relay is only excited by a pulse for a short time during switching, no additional holding energy is required. The contact position (on/off) is held by means of a mechanical interlock until the next pulse command is sent. In the event of a power failure, the current switch position will always be held. This technology considerably helps to reduce the temperature rise and current consumption of devices operated by magnetic coils, thus saving on unnecessary energy costs.

APPLICATION FOR AN E290 LATCHING RELAY IN CONJUCTION WITH AN E294 CENTRAL ON-OFF CONTROL MODULE

The interior lighting controlled by means of various impulse buttons can also be operated from a central control point by snapping on a central on-off control module onto the left side of the E290 Latching Relay.

Switching sequence:
Local → OFF – ON
Central → OFF – ON
(the central command is the superordinate command)

The combination of a main device plus central on-off control module can be used to switch multiple lights on and off at the same time without any dependence on the current switch position of the devices. The actual switch position of the various devices (on/off) can be indicated by snapping an auxiliary contact (attachable on the right side) to the control center.

Another possibility would be the combination of an E290 with an E294 central on-off control module for various control voltages. This combination enables for example the cooperation with a PLC (programmable logic controller). Any number of different logical activations in respect of Latching Relays can be recorded and visualised.

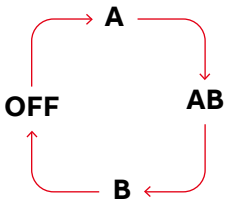
01

02

APPLICATION USING AN E291S SEQUENTIAL LATCHING RELAY

This independent special sequential Latching Relay switches the contact position in a preset fixed switching sequence.

Switching sequence:
OFF – A – AB – B – OFF



This preset internal switching sequence enables for example the following lighting sequence to be used. As two separate switching circuits are available, lights A, AB and B can be operated individually or together as required. If the button is pressed once or several times (pulse control), the sequential Latching Relay changes the contact position in the preset switching sequence. An amazingly refined interior or exterior lighting system can be realised with this user-friendly and reliable lighting control option, without any additional installation costs.

—
01 Example of use within a car park

E290 Mechanical Latching Relay
Product details and accessories

E290 LATCHING RELAY

This 18 mm wide DIN rail mounted device is designed for direct installation in main distribution or sub-distribution systems (mounted on 35 mm DIN mounting rails). The devices are activated by means of control pulses and guarantee energy-optimized lighting control. As a rule, installations with Latching Relays are used where the lighting control system can be operated from at least three points in different locations. Those Latching Relays are designed for a rated current of 16 A or 32 A.

Standard number of contacts:
1 NO contact, 2 NO contacts or 1 NO contact + 1 NC contact

The number of switching contacts can be increased by a maximum of two main contacts using a snap-on main module (E292-…-…). As a result, up to four lighting sets can be switched by a single device. A signalling and/or indicating facility can be created using the additional snap-on auxiliary contact module (E299-11).
The various standard AC/DC coil voltages complete the comprehensive and interesting product range. The additional devices can be snapped onto the Latching Relay on the left or right side.

Control elements	→	**Attachable on the left side**
Switching elements	→	**Attachable on the right side**

Switching sequence:
OFF – ON – OFF – ON

Safety information
If more than one Latching Relay installed next to each other, it is recommended to use a intermediate piece (distance). This guarantees optimal heat dissipation by the main modules. The intermediate pieces (9 or 18 mm wide) can be found in the order information as types ZLS725 or ZLS726 (the use depends on the application).

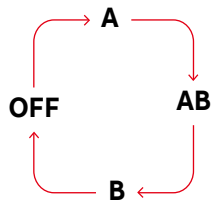
E291S SEQUENCIAL LATCHING RELAY

The sequential Latching Relay is an 18 mm wide device which has two NO contacts. The preset switching sequence for the main contacts enables the switching on and off, of different lighting sets to be "programmed". The E291S has an easily visible switch position display on the front. A prallel switching of several E291S is not allowed! No manual intervention possible!

Standard number of contacts:
2 NO contacts

Cannot be combined or attached.
"Stand-alone" product.

Switching sequence:
OFF – A – AB – B – OFF



E294 CENTRAL ON-OFF CONTROL MODULE (FOR DIFFERENT CONTROL VOLTAGES)

This 18 mm wide additional control module can be snapped onto a Latching Relay and has a galvanically separated contact to the standard Latching Relay.
The devices are mechanically connected. Two different control voltage potentials (e.g. AC local; DC central) can be used between the local and the central control point. The E294 central on-off control module is suitable for professional use in control circuits with various configurations. With this snap-on device a priority central command (all off/all on) can be realized.
For this type of solution, a central control module needs to be attached for each Latching Relay integrated in the central on-off control system. Central commands always take priority and reliably switch the mechanically connected coil of the standard Latching Relay on or off without any dependence on the previous switch position of the individual Latching Relays. By using a E294/... central on-off control module at the main module E290, it‘s not possible to snap on a E292 contact module.

Control element → Attachable on the left side

Switching sequence:
Central OFF – Central ON – Central OFF – Central ON

E292 MAIN CONTACT MODULE FOR E290 LATCHING RELAYS

The E292 is a 9 mm wide snap-on main contact module. If required, the number of existing main contacts in the standard Latching Relay can be increased by a maximum of two contacts. The main contact module is available in a 16 A design (e.g. for 3-phase lighting sets).
In the case of 32 A Latching Relays, it is not possible to increase the number of main contacts!

Standard number of contacts:
1 NO contact + 1 NC contact, 2 NO contacts or 1 change-over contact

Switching element → Attachable on the right side

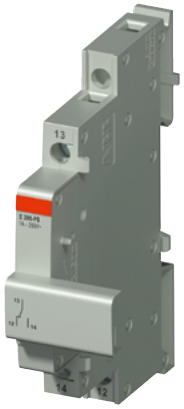
E299 AUXILIARY CONTACT

The E299 auxiliary contact can be used with Latching Relays and Installation Relays. The E299-11 auxiliary contact is a snap-on device that enables the individual indication or signalling of the current operating state of the main module (two integrated contacts).

Standard number of contacts:
1 NO contact + 1 NC contact
2 NO contacts

Switching elements → Attachable on the right side

A maximum of two additional snap-on modules can be mounted on the right side of the main device. The additional modules (contact module and/or auxiliary contact) simply snap onto the right side of the main device. Neither additional fixing screws nor additional wiring are required in order to build the various combinations. All additional modules are also easy to remove.



E295-PS PERMANENT SIGNAL MODULE

The E295-PS permanent signal module is an add-on module that enables the Latching Relay to be controlled by means of a permanent signal. After receiving the permanent signal, the Latching Relay changes its contact position and the coil of the main module is released by the attached permanent signal module at the same time. Without this permanent signal module, the Latching Relay coil would be permanently energised and valuable energy would be wasted.
When using a permanent signal module, it is not possible to operate manually over the lever on Latching Relay as the switch lever is covered.
This refined solution is particularly useful if the Latching Relay is controlled by means of a timer, a twilight switch, a motion detector or another switch with a changeover contact (e.g. a reversing switch, relay, time relay etc.)

Control element → Attachable on the left side

E295-GM GROUP MODULE

The E295-GM group module is an additional module that is also suitable for use in centrally controlled installations. It enables fixed groups of Latching Relays to be created and controlled which can be combined with the central on-off control system.
For example, various control circuits in an office building can be interconnected. As a result, groups of offices can be controlled by floor or even throughout the whole building using a central on-off control system. The group module is not subject to any restrictions on the number of control circuits. One group module is required per control circuit.
Suitable for use with standard Latching Relays as well as in combinations with central contact modules.

Control element → Cannot be attached!

E296-CP COMPENSATOR MODULE

The E296-CP compensator module is used when illuminated buttons (control points) are used in conjunction with Latching Relays. The additional module (compensator) enables a higher number of illuminated buttons (inductance) to be connected to a Latching Relay.
If no compensator module is installed and the glow lamp reverse current is higher than 5 mA, the Latching Relay may be activated unintentionally. In order to prevent this, an additional compensator must be implemented.

Control element → Cannot be attached!

—

Maximum Number of Illuminated buttons per main device (with 0.6 mA glxow lamp)

		Latching relay		Central ON/OFF, different potential
	contacts	**1 & 2**	**3 & 4**	**1 & 2**
	without compensator	8	9	12
+	with 1 compensator	18	22	21
+	with 2 compensators	45	38	58

E290 Mechanical Latching Relay
Possible mounting variations

E294/...
Central On-Off Control Module (different potential)

By snapping on an E294/... Central On-Off Control Module at the Main Module E290, it's not possible to use a E292-... Contact Module!

E292-16-20
Main Contact Module (attachable: max. 1 unit)

1) If using a Contact Module, always attach it as the first component.

1

Always attach on the left side!
Only one type of Control Module can be attached.

Always attach on the right side!
One unit can be snapped on per E290 Main Module in each case.

2

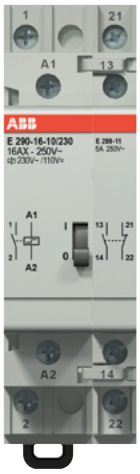
E290-16-11/230
Latching Relay
Main Module

E295-PS
Permanent Signal Module (use: In the case of control via a time switch or light sensor permanent energising

E299
Auxiliary Contact (attachable: max. 1 unit)

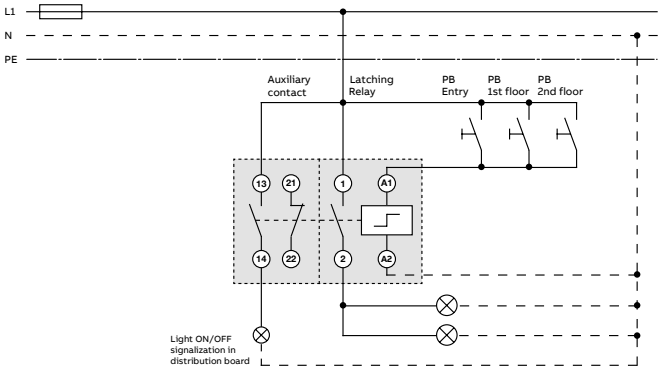
2) If using an attachable Auxiliary Contact, it is to be attached directly to the Latching Relay or to the Contact Module installed first.

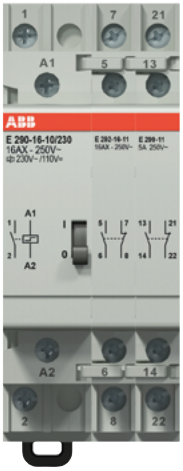
Safety information
If more than one Latching Relay installed next to each other, it is recommended to use a intermediate piece (distance). This guarantees optimal heat dissipation by the main modules. The intermediate pieces (9 or 18mm wide) can be found in the order information as types ZLS725 or ZLS726 (the use depends on the application).



E290-16-10 + E299-11 – LATCHING RELAY WITH AUXILIARY CONTACT

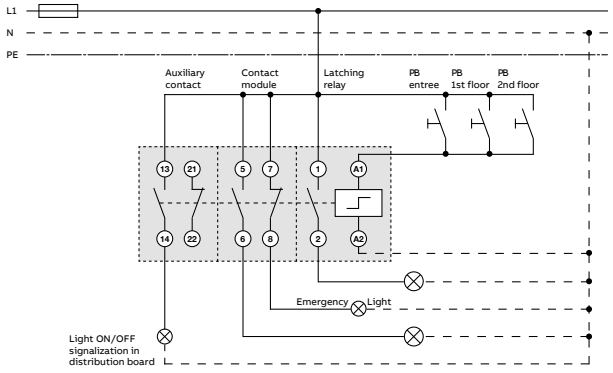
Application at a normal light control via different push buttons (PB): The snapped-on auxiliary contact (E299-11) displays the current switching state of the light control (ON/OFF).





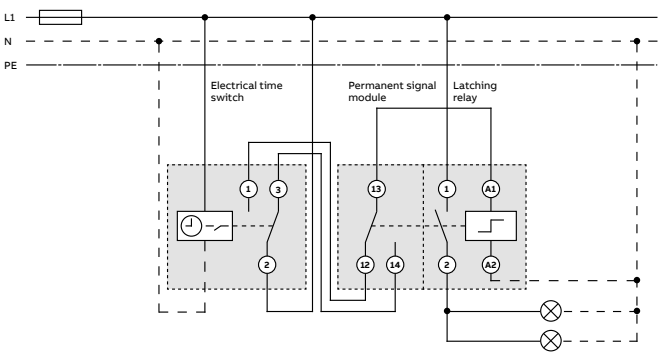
E290-16-10 + E292-16-11 + E299-11 – LATCHING RELAY WITH AUXILIARY CONTACT

Latching Relay E290 with attached contact module E292-16-11 (additional main contact tracks) plus an auxiliary contact to externally display the switching state of the main contacts (ON/OFF).



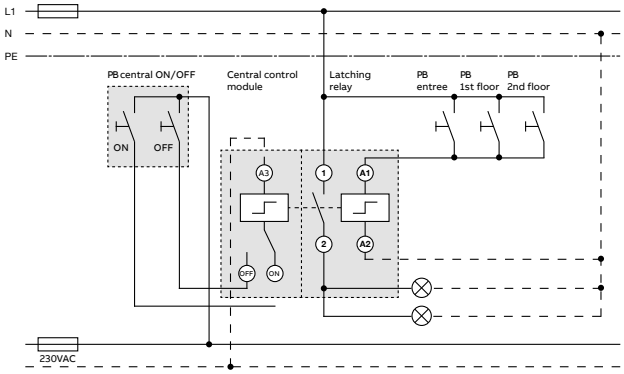
E290-16-10 + 295-PS – LATCHING RELAY WITH PERMANENT SIGNAL MODULE

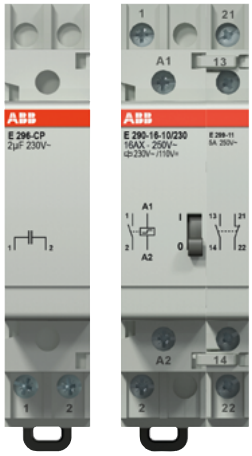
This combination permits control of the E290 coil via a permanent signal (e.g. directly controlled by a timer or a twilight switch).
When using this accessory, manual switching at the main unit is not possible.



E290-16-10 + E294/230 – LATCHING RELAY WITH CENTRAL CONTROL MODULE

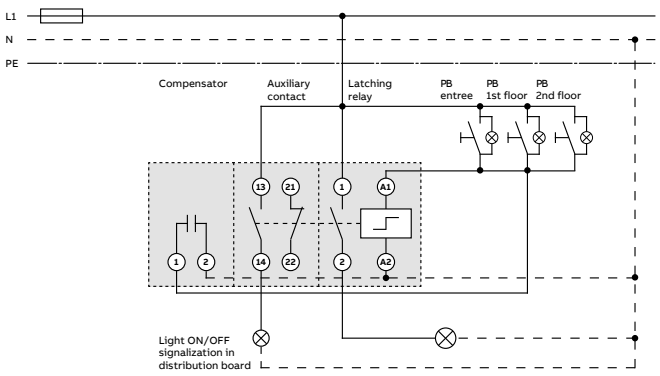
This is a second possibility to implement a Central ON/OFF control. When a E294/... accessory is snapped on, this Central ON/OFF device uses a different voltage source for coil control. The light control can be performed locally on site via the regular button. The Central ON/OFF button permits a general switching state change from a central location.





E296CP + E290-16-10 + E299-11 – LATCHING RELAY WITH AUXILIARY CONTACT PLUS COMPENSATOR

The compensator E296-CP is used every time a certain number of lit local buttons is exceeded.
See table in the catalogue,



E290 Mechanical Latching Relay

Ordering data

Standard devices – E290 Latching Relay

Cont. config.	Rated Voltage VAC	Power loss W	Width mm	Coil coltrol voltage VAC/VDC	Ordering data Type code	Order code	Bbn 7612270 EAN	Weight per unit kg	Pack. unit units
Rated current = 16 A									
1NO	250	0.32	18	8VAC	E290-16-10/8	2TAZ312000R2061	939558	0.114	10
1NO	250	0.32	18	12VAC	E290-16-10/12	2TAZ312000R2051	939565	0.114	10
1NO	250	0.32	18	24VAC/12VDC	E290-16-10/24	2TAZ312000R2041	939572	0.114	10
1NO	250	0.32	18	48VAC/24VDC	E290-16-10/48	2TAZ312000R2031	939589	0.114	10
1NO	250	0.32	18	115VAC/60VDC	E290-16-10/115	2TAZ312000R2021	939596	0.114	10
1NO	250	0.32	18	230VAC/110VDC	E290-16-10/230	2TAZ312000R2011	939602	0.114	10
Rated current = 32 A									
1NO	250	1.20	18	8VAC	E290-32-10/8	2TAZ322000R2061	939619	0.114	10
1NO	250	1.20	18	12VAC	E290-32-10/12	2TAZ322000R2051	939626	0.114	10
1NO	250	1.20	18	24VAC/12VDC	E290-32-10/24	2TAZ322000R2041	939633	0.114	10
1NO	250	1.20	18	48VAC/24VDC	E290-32-10/48	2TAZ322000R2031	939640	0.114	10
1NO	250	1.20	18	115VAC/60VDC	E290-32-10/115	2TAZ322000R2021	939657	0.114	10
1NO	250	1.20	18	230VAC/110VDC	E290-32-10/230	2TAZ322000R2011	939664	0.114	10
Rated current = 16 A									
2NO	250	0.64	18	8VAC	E290-16-20/8	2TAZ312000R2062	939671	0.122	10
2NO	250	0.64	18	12VAC	E290-16-20/12	2TAZ312000R2052	939688	0.122	10
2NO	250	0.64	18	24VAC/12VDC	E290-16-20/24	2TAZ312000R2042	939695	0.122	10
2NO	250	0.64	18	48VAC/24VDC	E290-16-20/48	2TAZ312000R2032	939701	0.122	10
2NO	250	0.64	18	115VAC/60VDC	E290-16-20/115	2TAZ312000R2022	939718	0.122	10
2NO	250	0.64	18	230VAC/110VDC	E290-16-20/230	2TAZ312000R2012	939725	0.122	10
Rated current = 32 A									
2NO	250	2.40	18	8VAC	E290-32-20/8	2TAZ322000R2062	939732	0.122	10
2NO	250	2.40	18	12VAC	E290-32-20/12	2TAZ322000R2052	939749	0.122	10
2NO	250	2.40	18	24VAC/12VDC	E290-32-20/24	2TAZ322000R2042	939756	0.122	10
2NO	250	2.40	18	48VAC/24VDC	E290-32-20/48	2TAZ322000R2032	939763	0.122	10
2NO	250	2.40	18	115VAC/60VDC	E290-32-20/115	2TAZ322000R2022	939770	0.122	10
2NO	250	2.40	18	230VAC/110VDC	E290-32-20/230	2TAZ322000R2012	939787	0.122	10
Rated current = 16 A									
1NO+1NC	250	0.50	18	8VAC	E290-16-11/8	2TAZ312000R2063	939794	0.122	10
1NO+1NC	250	0.50	18	12VAC	E290-16-11/12	2TAZ312000R2053	939800	0.122	10
1NO+1NC	250	0.50	18	24VAC/12VDC	E290-16-11/24	2TAZ312000R2043	9393817	0.122	10
1NO+1NC	250	0.50	18	48VAC/24VDC	E290-16-11/48	2TAZ312000R2033	939824	0.122	10
1NO+1NC	250	0.50	18	115VAC/60VDC	E290-16-11/115	2TAZ312000R2023	939831	0.122	10
1NO+1NC	250	0.50	18	230VAC/110VDC	E290-16-11/230	2TAZ312000R2013	939848	0.122	10
Rated current = 32 A									
1NO+1NC	250	1.20	18	8VAC	E290-32-11/8	2TAZ322000R2063	939855	0.122	10
1NO+1NC	250	1.20	18	12VAC	E290-32-11/12	2TAZ322000R2053	939862	0.122	10
1NO+1NC	250	1.20	18	24VAC/12VDC	E290-32-11/24	2TAZ322000R2043	939879	0.122	10
1NO+1NC	250	1.20	18	48VAC/24VDC	E290-32-11/48	2TAZ322000R2033	939886	0.122	10
1NO+1NC	250	1.20	18	115VAC/60VDC	E290-32-11/115	2TAZ322000R2023	939893	0.122	10
1NO+1NC	250	1.20	18	230VAC/110VDC	E290-32-11/230	2TAZ322000R2013	939909	0.122	10

Standard devices – Sequencial Latching Relay

Cont. config.	Rated Voltage	Power loss	Width	Coil coltrol voltage	Ordering data		Bbn 7612270	Weight per unit	Pack. unit
	VAC	W	mm	VAC/VDC	Type code	Order code	EAN	kg	units
Rated current = 16 A									
2NO	250	0.64	18	8VAC	E291S-16-20/8	2TAZ313000R2062	939919	0.110	10
2NO	250	0.64	18	12VAC	E291S-16-20/12	2TAZ313000R2052	939923	0.110	10
2NO	250	0.64	18	24VAC/12VDC	E291S-16-20/24	2TAZ313000R2042	939930	0.110	10
2NO	250	0.64	18	48VAC/24VDC	E291S-16-20/230	2TAZ313000R2012	939947	0.110	10

NO = normally-open contact; NC = normally-closed contact; CO = changeover contact

E290 Mechanical Latching Relay

Ordering data of accessories

Accessories and additional devices for combinations with Latching relays

Cont. config.	Rated Voltage	Power loss	Width	Coil coltrol voltage	Ordering data		Bbn 7612270	Weight per unit	Pack. unit
	VAC	W	mm	VAC/VDC	Type code	Order code	EAN	kg	units
Main Contact Module (Rated current = 16 A)									
2NO	250	0.64	9		E292-16-20	2CCA704300R0001	939480	0.45	10
1NO+1NC	250	0.32	9		E292-16-11	2CCA704301R0001	939503	0.45	10
1CO	250	0.32	9		E292-16-001	2CCA704302R0001	939527	0.45	10
Central ON-OFF Control Module (with different control voltages)									
			18	24VAC	E294/24	2TAZ312001R2043	939411	0.110	5
			18	230VAC	E294/230	2TAZ312001R2013	939442	0.110	5
Permanent Signal Module									
			9		E295-PS	2TAZ312005R1003	939459	0.041	10
Group Module									
			18		E295-GM	2TAZ310002R1000	939466	0.059	10
Compensator									
			18		E296-CP	2TAZ310003R1000	939473	0.055	10
Auxiliary Contact for Latching and Installation Relays (Rated current = 5 A)									
1NO+1NC	250	0.10	9		E299-11	2CCA704340R0001	939985	0.045	10
2NO	250	0.10	9		E299-20	2CCA704341R0001	465346*	0.045	10
Intermediate piece (for heating dissipation – bag contains 5 items)									
			18		ZLS725	2CCS500900R0181	100989	0.100	1 bag
			9		ZLS726	2CCS400900R0091	104703	0.070	1 bag

* with Bbn 7612271
NO = normally-open contact; NC = normally-closed contact; CO = changeover contact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E297 Installation Relay
Lighting up every application

Installation Relays save energy since they control more lamps than contactors of the same nominal current. The IR coil is consumption optimized which allows for using a smaller transformer so we can reduce the size of the distribution board.

Installation Relays are electromagnetically operated miniature contactors in the standard DIN width of 18 mm. A reliable control system can be designed using these Installation Relays. They are mainly used in industrial plants but also in commercial and public buildings.
As a rule, Installation Relays operated by means of a control switch (maintained contact) are installed where it is necessary to operate lighting, an air-conditioning system, a fan or suchlike.
Installation Relays are also referred to as monostable switching relays or 2-pole miniature contactors. The term "monostable" means that an on command has to be sent to the coil by means of a control switch (maintained operation) in order to excite the magnetic coil. The coil armature attracts and closes or opens the main contacts. The device remains in the on position for as long as the control voltage is applied to the coil.
If the voltage flow to the coil is interrupted, the Installation Relay always returns to the neutral position (off position). Installation Relays and the accessories are available in different versions in order to easily satisfy the various market requirements.

Their optimal switching capacity also makes them suitable for use in industrial environments and in situations where it is necessary to ensure control over more powerful consumers (such as e.g. multiple lighting systems).
Using an optimized coil (low power loss = lower operating temperature) ensures a clean and safe operation in the electrical distribution board.
The low level of switching noise and the practically hum-free magnetic system mean that they are also suitable for use in public buildings and in private houses.
The current switch position is clearly indicated by the switch lever. The Installation Relay can be proofed manually for test purposes by operating this switch lever (i.e. without activating the magnetic coil). As soon as the switch lever is released, the relay returns to the neutral position.

- Clean and safe operation thanks to using an optimized coil
- Low level of switching noise
- Flexible thanks to different versions of Installation Relays and accessories
- Optimal switching capacity: Control over more powerful consumers
- Clearly indicated current switching position

E297 Installation Relay
Applications

Because of the individual options for using Installation Relays in building management systems, these devices can be used to realise a modern and reliable consumer control system.

APPLICATION FOR AN E297 INSTALLATION RELAY

When current is applied to an Installation Relay, the relay coil attracts one of the main contacts and changes the contact position. The coil of an Installation Relay has to remain energised in order to hold the contact position. If the voltage is removed from the coil, the Installation Relay always returns to the off position.

Switching sequence:
OFF – ON

Main areas of application include exterior lighting for office buildings or supermarket car parks as well as other big installations. An extremely flexible and modern lighting control system can be created, using E297 Installation Relays. Activation can be carried out by means of a twilight switch or a timer but also by means of a simple on-off switch or another electrical control unit.

Reliable switching of an exterior lighting system, for example, is realised by sending clear on and off control commands from an external control point. The magnetic coil has to be permanently energised in order for the Installation Relay to be held in the on position. The energy consumption of the Installation Relay is reduced to a minimum by the performance-optimised magnetic coil. The low switching noise also makes it suitable for professional use in closed inhabited areas.

— 01 Example of use within a technical building

E297 Installation Relay
Product details and accessories

E297 INSTALLATION RELAY

The E297 Installation Relay is an electromechanical switching device controlled by means of a continuous pulse. The coils have a low level of switching noise, are optimized for low power loss and therefore ensure safe and fault-free use in various applications. Either AC or DC control voltage can be applied. The Installation Relay is designed for a rated current of 16 A.

Standard number of contacts:
1 NO contact, 2 NO contacts or 1 NO contact + 1 NC contact

In addition, the number of main contacts can be increased to four contact lines using the snap-on E298 main contact module so that three different groups of loads can be switched and controlled safely.
The various AC/DC coil voltages complete the comprehensive and interesting product range. The additional devices can be snapped onto the Installation Relay on the right side.

Switching element → Attachable on the right side

Switching sequence:
OFF – ON – OFF – ON

Safety information
If more than one Installation Relay installed next to each other, it is recommended to use a intermediate piece (distance). This guarantees optimal heat dissipation by the main modules. The intermediate pieces (9 or 18mm wide) can be found in the order information as types ZLS725 or ZLS726 (the use depends on the application).

E298 MAIN CONTACT MODULE FOR E297 INSTALLATION RELAYS

The E298 is a (9 mm) snap-on module with integrated main contacts. As the E297 main module has a maximum of two main contacts, the number of main contacts can be increased to four contact lines using the main contact module (e.g. for 3-phase lighting sets).

Standard number of contacts:
1 NO contact + 1 NC contact, 2 NO contacts or 1 change-over contact

Switching element → Attachable on the right side

E299 AUXILIARY CONTACT

The E299 auxiliary contact can be used with Installation Relays and Latching Relays. The E299 auxiliary contact is an additional snap-on device that enables the individual indication or signalling of the current operating state of the main module.

Standard number of contacts:
1 NO contact + 1 NC contact
2 NO contacts

Switching element → Attachable on the right side

A maximum of two additional snap-on modules can be mounted on the right side of the main device. The additional modules (contact module and/or auxiliary contact) simply snap onto the right side of the main device. Neither additional fixing screws nor additional wiring are required in order to complete the combination. All additional modules are also easy to remove.

E297 Installation Relay
Possible mounting variations

E298-16-20
Main Contact Module
(attachable: max. 1 unit)

1) If using a Contact Module, always attach it as the first component.

1

Always attach on the right side!
One unit can be snapped on per E297 Main Module in each case.

2

E297-16-11/230
Installation Relay
Main Module

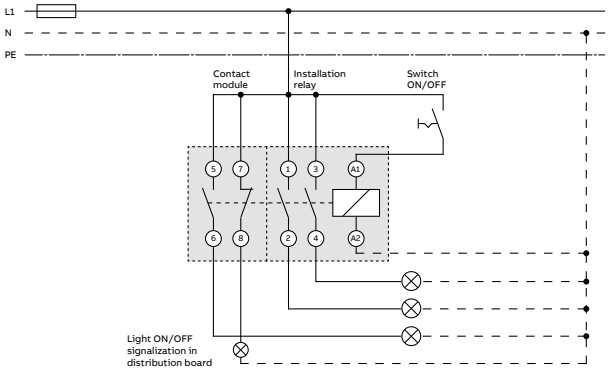
E299
Auxiliary Contact
(attachable: max. 1 unit)

2) If using an attachable Auxiliary Contact, it is to be attached directly to the Installation Relay or to the Contact Module installed first.

Safety information
If more than one Installtion Relay installed next to each other, it is recommended to use a intermediate piece (distance). This guarantees optimal heat dissipation by the main modules. The intermediate pieces (9 or 18mm wide) can be found in the order information as types ZLS725 or ZLS726 (the use depends on the application).

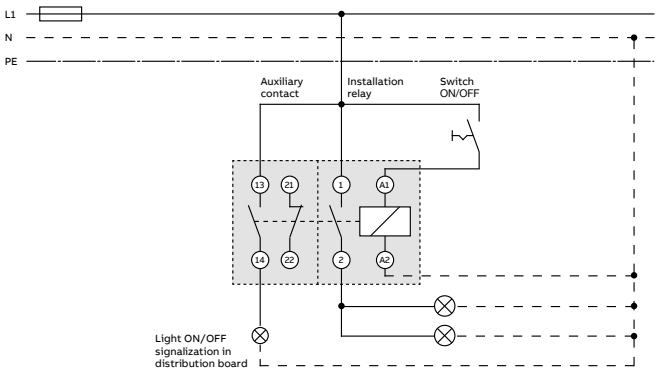
E297-16-20 + E298-16-11 – INSTALLATION RELAY WITH CONTACT MODULE

Light control via an Installation Relay E297 with connected Contact Module E298-16-11 (additional main contacts) to externally signal the switching state of the main contacts (ON/OFF).



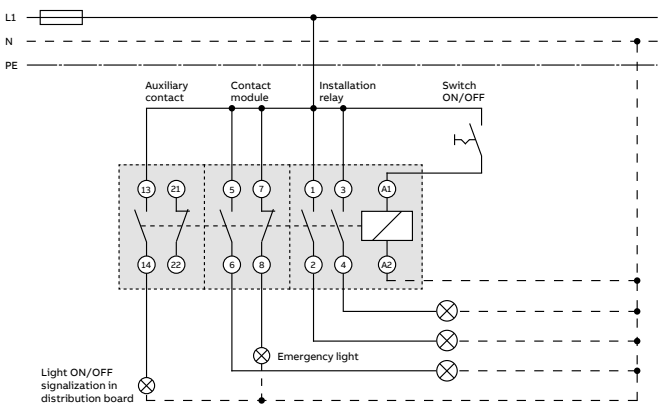
E297-16-10 + E299-11 – INSTALLATION RELAY WITH AUXILIARY CONTACT

Application with a normal light control via an ON/OFF switch. The current condition indication of the light control (ON/OFF) is implemented, e.g., in the distribution board, with the help of the auxiliary contact (E299-11).



E297-16-20 + E298-16-11 + E299-11 – INSTALLATION RELAY WITH CONTACT MODULE AND AUXILIARY CONTACT

Combination of an Installation Relay E297 with an attached Contact Module E298-16-11 (additional main contacts) plus an Auxiliary Contact to clearly indicate the switching state of the main contacts (ON/OFF).



E297 Installation Relay

Ordering data and accessories

Standard devices – E297 Installation Relay

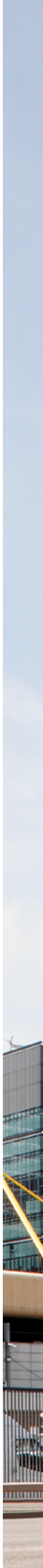
Cont. config.	Rated Voltage	Power loss	Width	Coil coltrol voltage	Ordering data		Bbn 7612270	Weight per unit	Pack. unit
	VAC	W	mm	VAC/VDC	Type code	Order code	EAN	kg	units
Rated current = 16 A									
1NO	250	0.50	18	8VAC	E297-16-10/8	2TAZ311000R2061	940004	0.113	10
1NO	250	0.50	18	12VAC	E297-16-10/12	2TAZ311000R2051	940011	0.113	10
1NO	250	0.50	18	24VAC/24VDC	E297-16-10/24	2TAZ311000R2041	940028	0.113	10
1NO	250	0.50	18	48VAC/48VDC	E297-16-10/48	2TAZ311000R2031	940035	0.113	10
1NO	250	0.50	18	115VAC/110VDC	E297-16-10/115	2TAZ311000R2021	940042	0.113	10
1NO	250	0.50	18	230VAC	E297-16-10/230	2TAZ311000R2011	940059	0.113	10
Rated current = 16 A									
1NO+1NC	250	0.50	18	8VAC	E297-16-11/8	2TAZ311000R2063	940066	0.121	10
1NO+1NC	250	0.50	18	12VAC	E297-16-11/12	2TAZ311000R2053	940073	0.121	10
1NO+1NC	250	0.50	18	24VAC/24VDC	E297-16-11/24	2TAZ311000R2043	960080	0.121	10
1NO+1NC	250	0.50	18	48VAC/48VDC	E297-16-11/48	2TAZ311000R2033	940097	0.121	10
1NO+1NC	250	0.50	18	115VAC/110VDC	E297-16-11/115	2TAZ311000R2023	940103	0.121	10
1NO+1NC	250	0.50	18	230VAC	E297-16-11/230	2TAZ311000R2011	940110	0.121	10
Rated current = 16 A									
2NO	250	1.00	18	8VAC	E297-16-20/8	2TAZ311000R2062	940127	0.121	10
2NO	250	1.00	18	12VAC	E297-16-20/12	2TAZ311000R2052	940134	0.121	10
2NO	250	1.00	18	24VAC/24VDC	E297-16-20/24	2TAZ311000R2042	940141	0.121	10
2NO	250	1.00	18	48VAC/48VDC	E297-16-20/48	2TAZ311000R2032	940158	0.121	10
2NO	250	1.00	18	115VAC/110VDC	E297-16-20/115	2TAZ311000R2022	940165	0.121	10
2NO	250	1.00	18	230VAC	E297-16-20/230	2TAZ311000R2012	940172	0.121	10

Accessories and additional devices for combinations with Installation Relays

Cont. config.	Rated Voltage	Power loss	Width	Coil coltrol voltage	Ordering data		Bbn 7612270	Weight per unit	Pack. unit
	VAC	W	mm	VAC/VDC	Type code	Order code	EAN	kg	units
Main Contact Module (Rated current = 16 A)									
2NO	250	0.64	9		E298-16-20	2CCA704320R0001	939961	0.45	10
1NO+1NC	250	0.32	9		E298-16-11	2CCA704321R0001	939954	0.45	10
1CO	250	0.32	9		E298-16-001	2CCA704322R0001	939978	0.45	10
Auxiliary Contact for Latching and Installation Relays (Rated current = 5 A)									
1NO+1NC	250	0.10	9		E299-11	2CCA704340R0001	939985	0.045	10
2NO	250	0.10	9		E299-20	2CCA704341R0001	465346*	0.045	10
Intermediate piece (for heating dissipation – bag contains 5 items)									
			18		ZLS725	2CCS500900R0181	100989	0.100	1 bag
			9		ZLS726	2CCS400900R0091	104703	0.070	1 bag

* with Bbn 7612271
NO = normally-open contact; NC = normally-closed contact; CO = changeover contact

Overall information
E290 & E297
Latching and Installation Relays



- Technical data
- Dimension drawings
- Approvals & Standards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Technical data

Latching Relays and accessories

E290 Latching Relay

General				
Overall depth		68 mm		
Overall width		1 module (18 mm)		
Color		grey, RAL 7035		
Climate resistance in accordance with		IEC 60068-2-2 (dry heat)		
		IEC 60068-2-30 (humid heat)		
		IEC 60068-2-1 (low temperature)		
Ambient temperature		-25°C to +55°C		
Storage temperature		-40°C to +70°C		
Contact system		Double interruption		
Tightening torque		1.2 - 1.5 Nm		
Weight		0.122 kg		
Standards		EN 60669-1; EN 60669-2-2		
Approval		VDE; EAC		
Power Circuit				
Rated Current I_n				
	E290-16-.../...	16 A		–
	E290-32-.../...	–		32 A
Rated voltage U_n		250 VAC		250 VAC
Frequency		50 Hz		50 Hz
Short circuit withstand capacity I_{nc}		3 kA		3 kA
Back-up fuses (gL)		max. 16 A		max. 32 A
Latching Relay contact configurations for 16 A and 32 A Additional power contacts for 16 A (attachable) (not for 32 A version)			1NO; 2NO; 1NO + 1NC 1CO; 2NO; 1NO + 1NC	
Max. DC current per contact with 24 VDC		5 A		8 A
Min. switching load			24 V; 10 mA*	
Bounce time			< 3 ms	
Power loss in W per contact		0.32 W		1.2 W
Rated impulse withstand voltage U_{imp}			4 kV	
Max. lamp load				
Glow lamps (20 W - 200 W)		3000 W		4000 W
Flourescent lamps, uncorrected power factor (cos. 0.5)		1800 W		2200 W
Flourescent lamps, corrected power factor (cos. 0.9)				
	serial	3000 W		4000 W
	parallel	2500 W		3200 W
	single	1800 W		2200 W
	double	2500 W		3200 W
(see also lamp load table)				

* E291S (Sequential Latching Relays min. switching load 24V, 200mA)

Lifetime (switching cycles)		
Electrical (AC1 rated current load)		150000
Mechanical		250000
Connector cross-sections		
Connecting terminals		solid from 1x1 mm² to 1x10 mm² or 2x2.5 mm² flexible from 1x0.75 mm² to 1x16 mm² (Cu) with end ferrule or pin cable lug
Control Circuit		
Rated control voltages U_n		
	AC:	8 V; 12 V; 24 V; 48 V; 115 V; 230 V;
	DC:	– ; – ; 12 V; 24 V; 60 V; 110 V;
AC/DC ratio [1]		1: 0.5 (not available for 8 VAC and 12 VAC coils)
Operation limits		+/- 10% = 0.9 - 1.1 x U_n
Minimum command duration		50 ms
Max. switching operations		15 x per min. at I_n 16 A; 8 x per min. at I_n 32 A
switching noise		60 dB (A) (distance 1 m)
Max. number of illuminated buttons (0.6 mA)		(see table on page 16)
Max. glow lamp current parallel to the 230 V control buttons		5 mA

Coil Consumption – E290 Latching Relay

Product type	Control voltage V AC	Coil consumption average pull-in current A	Control voltage V DC	Coil consumption average pull-in current A
E290				
	230	0.062	110	0.057
	115	0.070	60	0.105
	48	0.212	24	0.207
	24	0.434	12	0.558
	12	1.263	–	–
	8	2.048	–	–
E291S				
	230	0.051	110	0.047
	24	0.378	12	0.355
	12	0.803	–	–
	8	1.088	–	–
E294				
	230	0.120	–	–
	24	0.684	–	–

1) Coil supply voltage: All E290 devices can be supplied with AC or DC control voltage.
The ratio of 1 : 0.5 applies, i.e. a 230 VAC coil can also be used for 110 VDC. (See Ordering data.)

NO = normally-open contact; NC = normally-closed contact; CO = changeover contact

—

Switching components for E290

E292-16-... Contact Module (attachable only to 16 A I_n version)	
Rated current I_n per E292 contact	16 A
Rated voltage U_n	250 VAC
Frequency	50 Hz
Max. no. attachable [1)] (additional main contacts)	1 unit (attachable on the right side of the main module)
Contact configurations	1CO; 2NO; 1NO+1NC
Max. DC current per contact with 24 VDC	8 A
Min. switching load	24 V; 10 mA
E299-... Auxiliary Contacts	
Max. no. attachable (signalling or control contacts)	1 unit (attachable on the right side of the main module)
Number of contacts	1 NO + 1 NC; 2 NO
Max. current per contact with AC	5.0 A
Max. current per contact with 24 VDC	5.0 A

—

Control components for E290

E294 Central On-Off Control Module (different control voltage potential)	
Max. no. attachable [1)]	1 unit (attachable on the left side of the main module)
Rated current I_n max.	1 A
Rated voltage U_n	250 VAC
E295-PS Permanent Signal Module	
Max. no. attachable [1)]	1 unit (attachable on the left side of the main module)
Rated current I_n max.	1 A
Rated voltage U_n	250 VAC
E295-GM Group Module	
Use of group switching modules	1 unit per defined group
Rated current I_n max.	1 A
Rated voltage U_n	250 VAC
E296-CP Compensator	
Compensation when using illuminated buttons	Wiring parallel to the main module
Compensation	12.2 □F
Rated voltage U_n	250 VAC

1) See overview page 18.

NO = normally-open contact; NC = normally-closed contact; CO = changeover contact

Technical data
Installation Relay

E297 Installation Relay

General		
Overall depth		68 mm
Overall width		1 module (18 mm)
Color		grey, RAL 7035
Climate resistance in accordance with		IEC 60068-2-2 (dry heat)
		IEC 60068-2-30 (humid heat)
		IEC 60068-2-1 (low temperature)
Ambient temperature		-25°C to +55°C
Storage temperature		-40°C to +70°C
Tightening torque		1.2 - 1.5 Nm
Weight		0.122 kg
Standards		EN 60669-1; EN 60669-2-2
Approval		VDE; EAC
Power Circuit		
Rated Current I_n		16 A
Rated voltage U_n		250 VAC
Frequency		50- 60 Hz
Short circuit withstand capacity I_{nc}		3 kA
Back-up fuses (gL)		max. 16 A
Installation contact configurations Additional power contacts for 16 A (attachable)		1NO; 2NO; 1NO + 1NC 1CO; 2NO; 1NO + 1NC
Max. DC current per contact with 24 VDC		8 A
Min. switching load		24 V; 10 mA
Bounce time		< 3 m
Power loss in W per contact		0.50 W
Rated impulse withstand voltage U_{imp}		4 kV
Max. lamp load		
Glow lamps (20 W - 200 W)		3000 W
Flourescent lamps, uncorrected power factor (cos. 0.5)		1800 W
Flourescent lamps, corrected power factor (cos. 0.9)		
	serial	3000 W
	parallel	2500 W
	single	1800 W
	double	2500 W
(see also lamp load table)		
Lifetime (switching cycles)		
Electrical (AC1 rated current load)		150000
Mechanical		250000
Application categories		
Switching capacity in accordance with		
	AC-1 (based on EN 60947)	16 A
	AC-5b (based on EN 60947)	5 A
	AC-7a (based on EN 61095)	16 A
	AC-7c (based on EN 61095)	5 A

Connector cross-sections			
Main connecting terminals		solid from 1 x 1 mm² to 1 x 10 mm² or 2 x 2.5 mm², flexible from 1 x 0.75 mm² up to 1 x 6 mm² (Cu) with end ferrule or pin cable lug	
Control Circuit			
Coil rated voltages U_n AC/DC		8 VAC; 12 VAC; 24 VAC/24 VDC; 48 VAC/48 VDC; 115 VAC/110 VDC; 230 VAC	
AC/DC ratio [1]		1 : 1	
Operation limits		+/- 10 % = 0.9 - 1.1 x U_n	
Switching noise		60 dB (A) (distance 1 m)	
Max. switching operations		15 x per min. at I_n 16 A	
Coil power loss			
		AC	DC
	Pick up	< 2.8 VA	< 2.0 VA
	Holding	< 2.6 VA	< 1.8 VA

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Coil Consumption – E297 Installation Relay

Product type	Control voltage		Coil consumption average pull-in current (Peak < 10 ms)	Coil consumption average holding power	Coil consumption average holding current
	V AC	V DC	A	W	A
E297					
	230	–	0.36	1.970	0.009
	115	110	0.90	1.676	0.019
	48	48	2.10	1.416	0.033
	24	24	2.80	1.701	0.090
	12	–	5.80	1.503	0.170
	8	–	7.00	0.924	0.183

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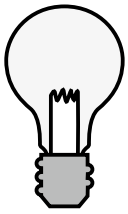
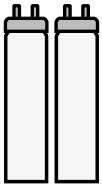
Switching components for E297

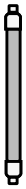
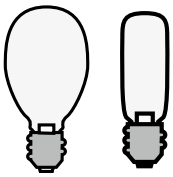
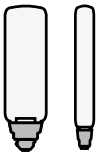
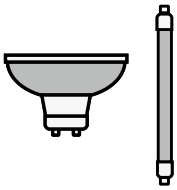
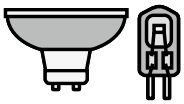
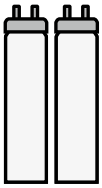
E298-16-... Contact Module	
Max. no. attachable (additional main contacts)	1 unit (attachable on the right side of the main module)
Rated current I_n per E298 contact	16 A
Rated voltage U_n	250 VAC
Frequency	50-60 Hz
Number of contacts	1CO; 2NO; 1NO+1NC
Max. DC current per contact with 24 VDC	5 A
Min. switching load	24 V; 10 mA
E299-... Auxiliary Contacts	
Max. no. attachable (signalling or control contacts)	1 unit (attachable on the right side of the main module)
Number of contacts	1 NO + 1 NC; 2NO
Max. current per contact with AC	5.0 A
Max. current per contact with 24 VDC	5.0 A

1) Coil supply voltage: All E297 devices can be supplied with AC or DC control voltage. The ratio of 1 : 1 is to be heeded, i.e. a 48 VAC coil can also be used for 48 VDC. (See Ordering data.)

Technical data

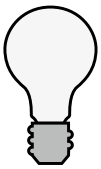
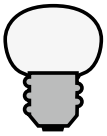
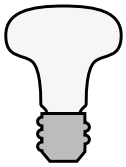
Lamp load table for Latching and Installation Relays

		Latching Relays max. number for E290		Installation Relays max. number for E297
	Power in W	**16 A**	**32 A**	**16 A**
Glow lamps				
	15	200	266	120
	25	120	160	72
	40	75	102	45
	60	50	65	30
	75	40	52	24
	100	30	40	18
	150	20	26	12
	200	15	20	9
	300	9	12	6
	500	5	7	3
Fluorescent lamps with starter				
	18	81	100	50
	36	44	58	25
	40	38	53	23
	58	29	35	16
	65	26	34	13
Fluorescent lamps with ballast				
	18	103	132	17
	36	63	81	13
	40	40	77	12
	58	29	35	10
	65	17	28	7
Fluorescent lamps with duo circuit				
	2x18	82	110	50
	2x36	41	55	25
	2x40	35	50	23
	2x58	23	34	16
	2x65	12	23	13
Energy saving lamps				
	1x18	83	112	38
	1x36	46	61	30
	1x58	31	38	17
	2x18	40	56	19
	2x36	23	30	15
	2x58	14	19	8

		Latching Relays max. number for E290		Installation Relays max. number for E297
	Power in W	**16 A**	**32 A**	**16 A**
Halogen lamps 230 V				
	55	27	36	6
	90	17	22	4
	135	11	14	3
	185	8	10	2
High-pressure sodium-vapour lamps				
	70	15	18	10
	150	8	10	5
	250	4	6	3
	400	3	3	2
	1000	1	1	–
Low-pressure sodium-vapour lamps				
	55	25	29	6
	90	16	20	4
	135	11	12	3
	185	4	5	2
High-pressure mercury-vapour lamps				
	150	20	27	12
	250	12	16	7
	300	10	13	6
	400	7	10	4
	500	6	8	3
	1000	3	4	2
Low-pressure mercury-vapour lamps				
	20	116	160	72
	50	46	64	29
	75	31	42	20
	100	24	32	15
	150	15	21	10
	200	12	16	7
	300	7	10	5
Fluorescent lamps with electronic ballast				
	1x18	83	112	38
	1x36	46	61	30
	1x58	31	38	17
	2x18	40	56	19
	2x36	23	30	15
	2x58	14	19	8

Technical data

LED lamp load table for Latching and Installation Relays

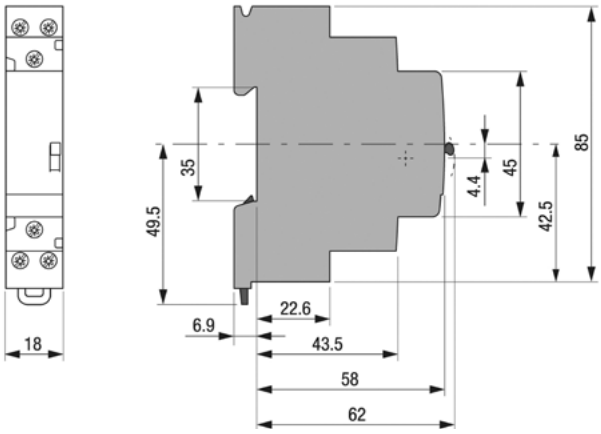
	Application for (in W)	P [W] of the LED component	Number of LED components		
			Latching Relays (E290)		Installation Relays (E297)
			16 A	32 A	16 A
Switchable total power P (W) per contact path			**200**	**250**	**200**
LED E27 glow lamp shape					
	40	5.5	36	45	25
	40	6.0	33	42	23
	40	7.0	29	36	20
	60	9.0	22	28	16
	60	9.5	21	26	15
	60	10.0	20	25	14
	75	11.5	17	22	12
	75	13.0	15	19	11
	100	15.0	13	17	9
	100	18.0	11	14	8
LED E14 Candle-shaped bulb					
	25	3.0	67	83	40
	25	4.0	50	63	30
	40	6.0	33	42	20
	40	6.0	33	42	20
27/E14 Drop-shaped bulb					
	25	3.0	67	83	40
	25	4.0	50	63	30
	40	6.0	33	42	20
LED E27/E14 Reflectors					
	40	4.5	44	56	27
	50	5.5	36	45	22
	40	8.5	24	29	14
	40	9.5	21	26	13
	40	13.0	15	19	9
LED Low-voltage reflectors					
	20	3.4	59	74	35
	35	5.5	36	45	22
	35	6.5	31	38	18
	35	7.0	29	36	17
	50	8.0	25	31	15
LED High-voltage reflectors					
	35	3.5	57	71	34
	35	4.0	50	63	30
	50	4.5	44	56	27
	50	5.0	40	50	24
	50	5.4	37	46	22

	Application for (in W)	P [W] of the LED component	Number of LED components		
			Latching Relays (E290)		Installation Relays (E297)
			16 A	32 A	16 A
Switchable total power P (W) per contact path			**200**	**250**	**200**
LEDTube 0.6 m fluorescent lamp with electronic ballast					
	18	10.5	19	24	11
LEDTube 1.2 m fluorescent lamp with electronic ballast					
	36	16.5	12	15	7
	36	18.0	11	14	7
	36	21.0	10	12	6
LEDTube 1.52 m fluorescent lamp with electronic ballast					
	18	10.5	19	24	11
	36	16.5	12	15	7
	36	18.0	11	14	7
	36	21.0	10	12	6
	58	22.0	9	11	5
	58	26.0	8	10	5
LEDTube 1.5 m with concentional/low-loss ballast					
	58	20.0	10	13	6
	58	23.0	9	11	5
	58	25.0	8	10	5
LEDTube 1.2m with concentional/low-loss ballast					
	36	16.0	13	16	8
	36	18.0	11	14	7
LEDTube 0.6m with concentional/low-loss ballast					
	18	8.0	25	31	15
	18	9.0	22	28	13

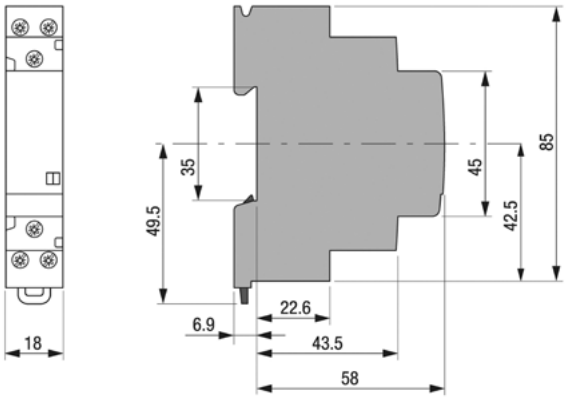
E27 Mostly used bulb fitting for standard lamps
E14 Up to 40 (rarely 60) W with candle-shaped bulb

Dimension Drawings
Latching Relays

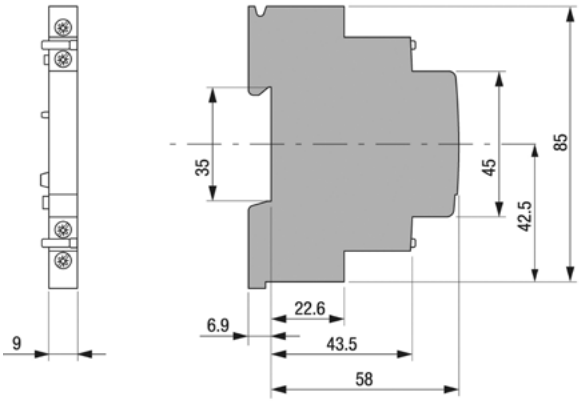
E290 LATCHING RELAY



E291S SEQUENCIAL LATCHING RELAY

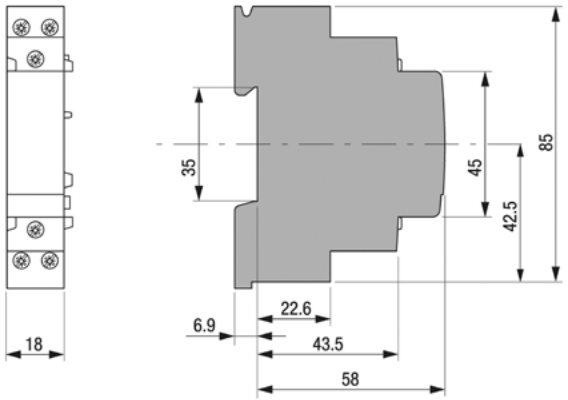


E292 MAIN CONTACT MODULE

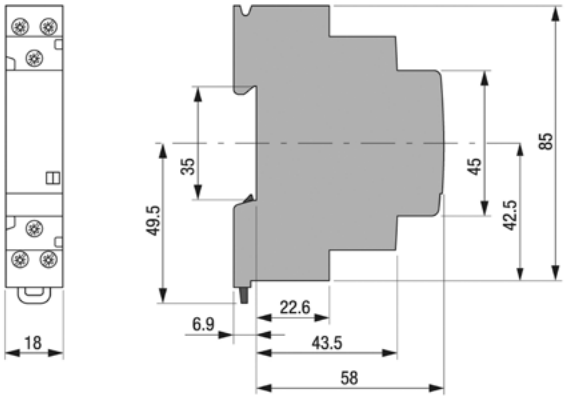


Dimension Drawings
Accessories for Latching Relays

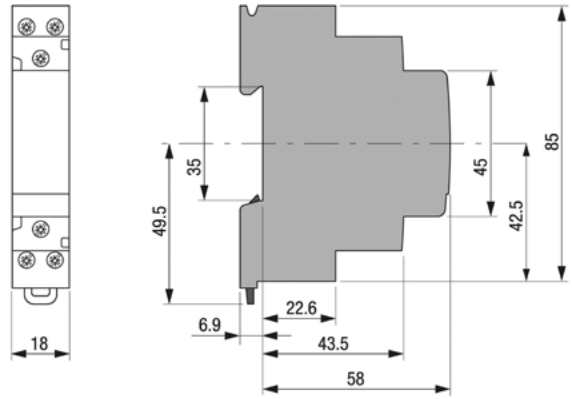
E294 CENTRAL ON-OFF CONTROL MODULE (FOR DIFFERENT CONTROL VOLTAGE POTENTIAL)



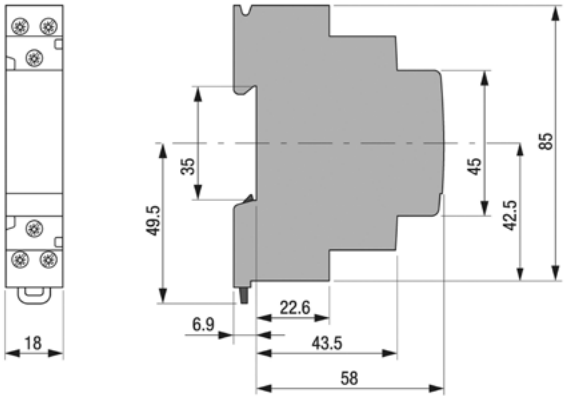
E295-PS PERMANENT SIGNAL MODULE



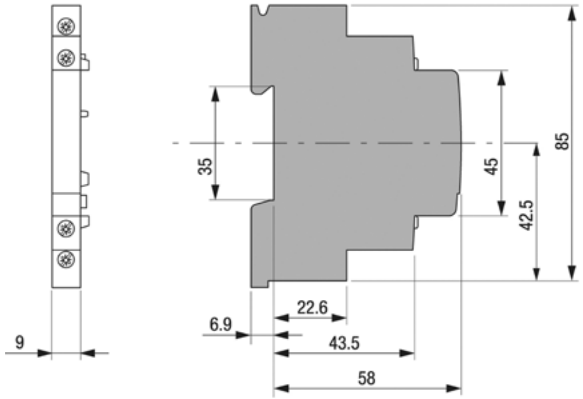
E295-GM GROUP MODULE



E296-CP COMPENSATOR

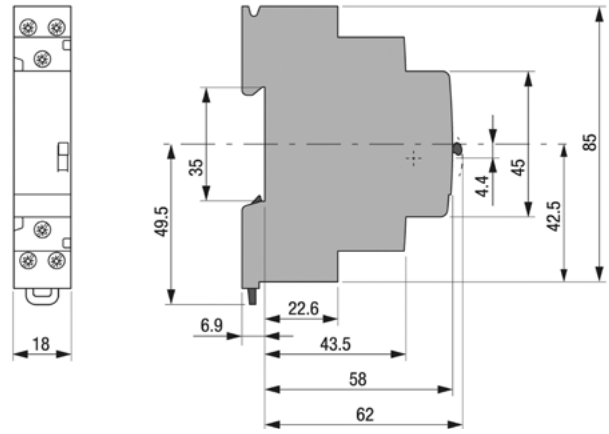


E299-11 AUXILIARY CONTACT

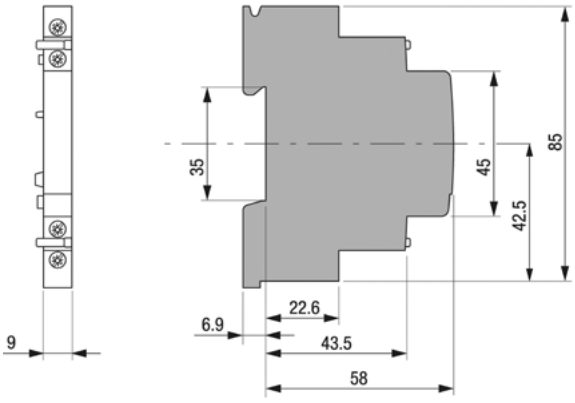


Dimension Drawings
Installation Relays

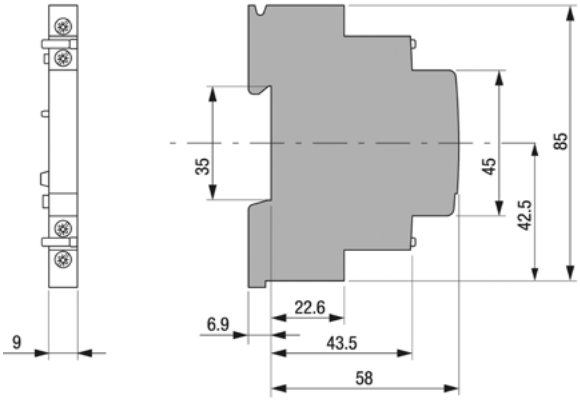
E297 INSTALLATION RELAY



E298 MAIN CONTACT MODULE



E299 AUXILIARY CONTACT



Approvals & Standards
Latching and Installation Relays

	Germany	Denmark	Norway	Russia	Switzer-land	USA/CA	Poland	China	Marine classification societies		
	VDE	DEMKO	NEMKO	EAC	ESTI	cURus	BBJ	CCC	RINA	DNV- GL	LR
E290 Latching Relay	•			•							
E291S Sequential Latching Relay	•			•							
E292 Main Contact Module	•			•							
E294 Central On-Off Control Module	•			•							
E295-GM Group Module	•			•							
E295-PS Permanent Signal Module	•			•							
E296-CP Compensator	•			•							
E297 Installation Relay	•			•							
E298 Main Contact Module	•			•							
E299 Auxiliary Contact	•			•							

• Devices are approved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