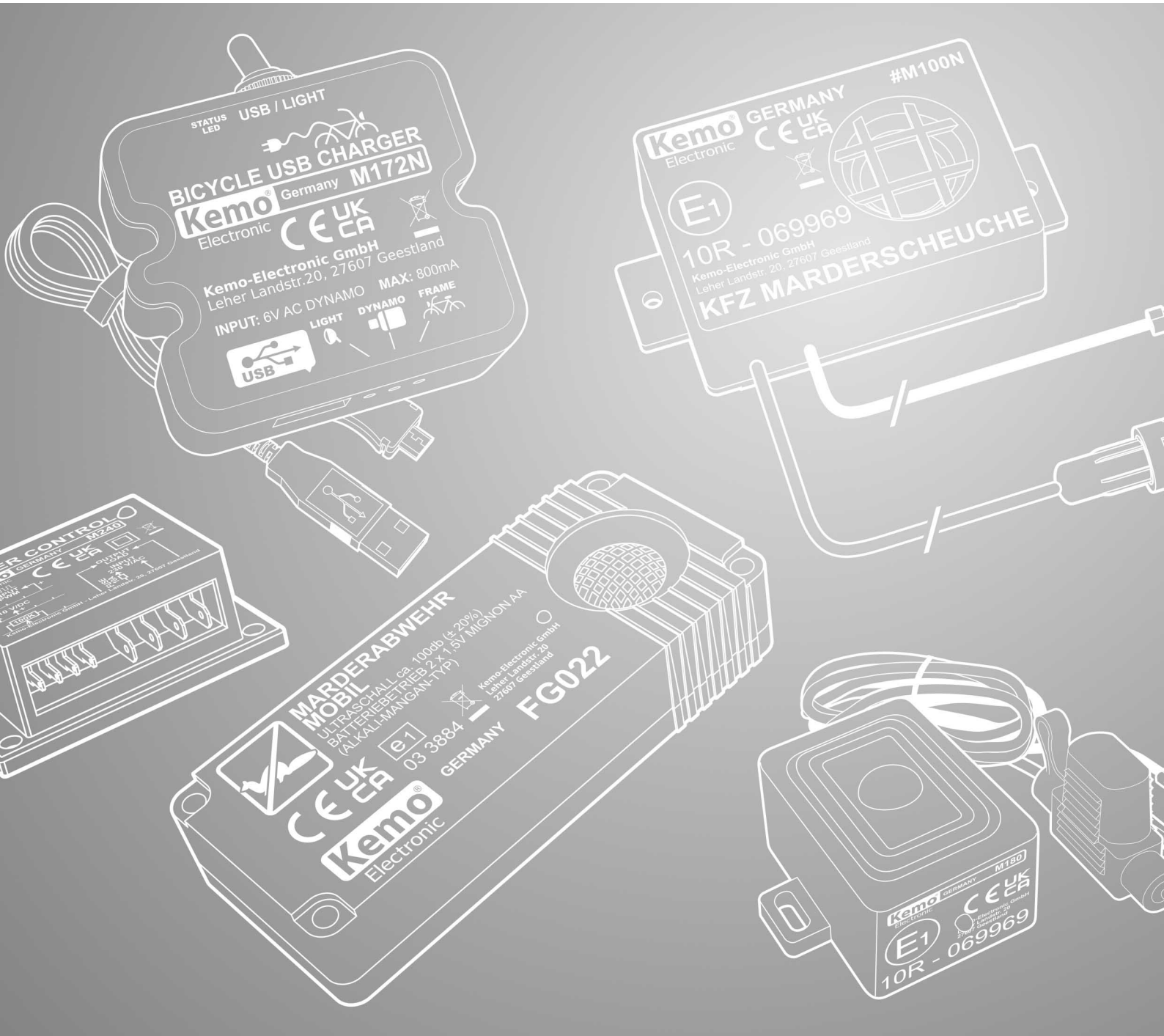
Kemo®
Electronic

CATALOG 2024

MODULES · DEVICES · KITS · ASSORTMENTS · CASES · SPEAKER



Electronics for industry, automobile and hobby

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3 May 2024

M012 | Power Control 110 / 240 V/AC, 1200 VA

...regulates ohmic or inductive loads like heaters, hand drills, etc. via a potentiometer. Auxiliary module M150 | DC + Pulse Converter. When superposing this module, it also possible to control the dimmer module M012 with control voltages (1 - 5 V/DC or 3 - 12 V/DC or 6 - 24 V/DC) or with TTL pulses (optionally in each case).
Available accessory: M150 - DC + pulse converter

Technical Data:
Admissible operating voltage: 110 / 240 V/AC, 50 - 60 Hz
Operating temperature range: approx. 0ºC to +50ºC
Max. admissible current: 6 A (constant duty: 3 A)
: At 110 V/AC this corresponds to maximally 600 watt or constant duty 300 watt, respectively, or to maximally 1200 watt or constant duty 600 watt, respectively, at 240 V/AC.
Duty cycle: 100% at 3 A or 20% (max. 3 min.) at 6 A, respectively Control: via a firmly connected rotary potentiometer
Loads: for ohmic or inductive loads
Dimensions: approx. 70 x 36 x 23 mm

4024028030128

M013N | Twilight switch 240 V/AC

This electronic twilight switch connects automatically by means of an installed relay lamps (e.g. energy saving lamps) or other consumers at nightfall and off again at daybreak. The module may also work the other way round: on at daybreak (for advertising displays, fountains etc.) and off at nightfall. Floating loads up to 3 A may be switched.

Technical Data:
Operating voltage: 210 - 240 V/AC
Current consumption: < 40 mA
Switching contact (floating): 1 x switchover max. load 3 A (resistive load) max. 1 A (inductive load)
Turn-on brightness: approx. 10 Lux ± 50%
Turn-off brightness: approx. 60 Lux ± 50%
Delay in reaction: approx. 30 sec. ± 50%
Temperature range: approx. -15°C - +40°C
Dimensions: approx. 70 x 60 x 23 mm (without fastening straps)

4024028030135

M015N | DC/DC Converter, adjustable

Max. 1.5 A, Input: 6 - 28 V/DC, Output: 3 - 15 V/DC
The input voltage must be at least 3 V higher than the adjusted output voltage. The adjusted output voltage is stabilized and short circuit-proof. For operation of appliances with lower voltages at a 12 V or 24 V car battery or power supplies.

Technical Data:
Input voltage: 6 - 28 V/DC
Output voltage adjustable: 3 - 15 V/DC (electronically stabilized)
Note: The input voltage must be at least 3 V higher than the adjusted output voltage
Max. output current: 1,5 A
Max. dissipation: approx. 3 W without heat sink, approx. 10 W with heat sink (not enclosed)
Dimensions: approx. 60 x 45 x 20 mm (without fastening straps)

4024028030159

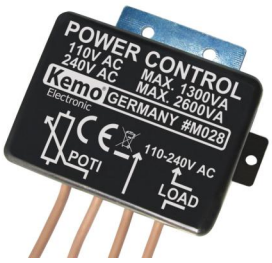
M028 | Power control 110 - 240 V/AC, 2600 VA

Control of resistive + inductive loads (e.g. motors, heatings, incandescent lamps, etc., if they are phasecontrollable). It is not possible to control: e.g. fluorescent lamps, motors with starting capacitor.
Available attachments: M150 - DC + pulse converter. When superposing this module, it also possible to control the power control M028 with control voltages (1 - 5 V/DC or 3 - 12 V/DC or 6 - 24 V/DC) or with TTL pulses (optionally in each case).

Please notice the article "Dosierte Leistung" from the german magazine "Electronic Actuell Magazin" no. 4/99.

Available accessory: M150 - DC + pulse converter

Technical Data:
Operating voltage: 110 - 240 V/AC
Current: max. 12 A. At 110 V/AC this corresponds to max. 1320 VA and to max. 2880 VA at 240 V/AC.
Load: max. 2600 VA
Required potentiometer: 470 k lin. (not enclosed)
Dimensions: approx. 60 x 56 x 20 mm (without fastening straps)



4024028030289

M028N | Power control 110 - 240 V/AC, 4000 VA

Control of resistive + inductive loads (e.g. motors, heatings etc., if they are phase-controllable).
Auxiliary module: M150 - DC + pulse converter
When superposing this module, it also possible to control M028N with control voltages (1 - 5 V/DC or 3 - 12 V/DC or 6 - 24 V/DC) or with TTL pulses (optionally in each case).

Important installation instructions, please note!

Technical Data:
Operating voltage: 110 - 240 V/AC
Loading capacity: 110 V/AC this corresponds to max. 2000 VA and to max. 4000 VA at 240 V/AC
Max. load: 18 A when mounting on a heat sink
Without additional heat sink: max. 6 A (peak max. 25 A / 10 sec.)
Regulation: phase control
Connectable loads: ohmic + inductive loads (see circuit description)
Dimensions: 87 x 60 x 33 mm (with mounting bottom)

4024028032924

M029 | DC/DC Converter

DC/DC converter input: 6 - 14 V/DC, output: 11 - 26 V/DC
This electronically controllable DC voltage converter transforms a low input voltage in to a nearly twice as high output voltage. Output voltage decreases whenever there is a higher load. With the help of an additional potentiometer of 4,7 k lin. output voltage can be limited towards higher rates at input voltages of over 10 V.

Technical Data:
Input voltage: 6 - 14 V/DC
Output voltage: 11 - 26 V/DC direct current (depending on load)
Output current: max. 2 A
Dimensions: approx. 70 x 60 x 23 mm (without fastening straps)

4024028030296

M031N | Amplifier 3,5 W, universal

Robust amplifier module for universal use. The module is cast humidity-proof and shake-proof. The casting compound and the module case consist of a special, highly heat-conductive plastic. So no additional heat sinks are needed. The module is protected electronically against overheating and overload.
Available accessory: M040N - Universal preamplifier

Technical Data:
Operating voltage: 4.5 - 12 V/DC
Output: max. 3.5 W music power
Loudspeaker connection: 4 - 16 ohm
Input sensitivity: < 80 mV
Frequency response: approx. 40 - 20.000 Hz
Dimensions: approx. 40 x 40 x 12 mm (without fastening straps)

4024028030319

M032N | Amplifier 12 W, universal

Robust amplifier module for universal use. The module is cast humidity-proof and shake-proof. The casting compound and the module case consist of a special, highly heat-conductive plastic. So no additional heat sinks are needed. The module is protected electronically against overheating and overload.
Available accessory: M040N - Universal preamplifier

Technical Data:
Operating voltage: 8 - 16 V/DC
Current consumption: max. 800 mA
Input sensitivity: < 80 mV
Loudspeaker connection: 4 - 16 ohm
Music power: max. 12 W with 16 V at a 4-ohm loudspeaker
Frequency response: approx. 40 - 20.000 Hz
Dimensions: approx. 70 x 36 x 23 mm (without fixing straps)

4024028030326

M032S | Universal Amplifier 12 W "Plug & Play"

Amplifying module with jacks used for the signal input and for the power supply. Inserted loudspeaker regulator and loudspeaker connection are over the cables.
Available accessory: M040N - Universal preamplifier

Technical Data:
Operating voltage: 8 - 16 V/DC
Current consumption: max. 800 mA
Input sensitivity:

4024028030302

M033N | Amplifier 18 W, universal

Robust amplifier module for universal use. The module is cast humidity-proof and shake-proof. The casting compound and the module case consist of a special, highly heat-conductive plastic. So no additional heat sinks are needed. The module is protected electronically against overheating and overload.
Available accessory: M040N - Universal preamplifier

Technical Data:
Operating voltage: 8 - 20 V/DC
Current consumption: max. 800 mA
Input sensitivity: < 80 mV
Loudspeaker connection: 4 - 16ohm
Music power: max. 18 W with 20 V at a 4-ohm loudspeaker
Frequency response: approx. 40 - 20.000 Hz
Dimensions: approx. 70 x 36 x 23 mm

4024028030333

M034 | Amplifier 40 W, universal

Robust amplifier module for universal use. The module is cast humidity-proof and shake-proof. The casting compound and the module case consist of a special, highly heat-conductive plastic.
Available accessory: M040N - Universal preamplifier

Technical Data:
Musical power: max. 40 W at 4 Ohm loudspeaker load in case of an operating voltage of 16 V
Operating voltage: 6 - 16 V
Connectable loudspeakers: 4 - 8 Ohm
Sensitivity: < 500 mV
Frequency range: approx. 20 - 25.000 Hz
Dimensions: approx. 70 x 45 x 29 mm (with cooling angle)

4024028030340

M034N | Power Amplifier 40 W

Loudspeaker output transformer amplifier for general use: e.g. increase of output of small radio- CD- tape- microphone amplifiers etc.
Available accessory: M040N - Universal preamplifier

Technical Data:
Musical power: max. 40 W at 4 Ohm loudspeaker load in case of an operating voltage of 16 V
Operating voltage: 8 - 16 V
Connectable loudspeakers: 4 - 8 Ohm
Sensitivity:

4024028030357

M038N | DC-Converter

von 24 V/DC auf 12 V/DC (13,8 V/DC), max. 3 A
For operation of 12 V/DC devices at a 24 V/DC lorry or boat battery. Short circuit-proof, shock-proof module.
Important installation instructions, please note!

Technical Data:
Input voltage: 24 - 28 V/DC
Output voltage: approx. 13,8 V/DC (equivalent to a full loaded 12 V/DC battery)
Maximum current: 3 A
Dimensions: approx. 87 x 60 x 33 mm (with mounting bottom)

4024028030388

M040N | Universal preamplifier

For microphones and diverse usages. This mini module is simply connected between a power amplifier (e.g. M032N | Amplifier 12 W, universal) and a weak signal source (e.g. microphones).
Available accessory:
M031N - Amplifier 3,5 W, universal
M032N - Amplifier 12 W, universal
M032S - Universal Amplifier 12 W "Plug & Play"
M033N - Amplifier 18 W, universal
M034 - Amplifier 40 W, universal
M034N - Power Amplifier 40 W
M055 - Stereo amplifier 3 W

Technical Data:
Operating voltage: approx. 9 - 24 V/DC
Frequency range: approx. 20 - 20.000 Hz ±3 dB
Input voltage: approx. 2 - 50 mV
Output voltage: approx. 0,2 - 5 V
Input impedance: approx. 50 kΩ
Output impedance: approx.

4024028030401

M048N | Ultrasonic Generator

Through ultrasonic sounds it is possible to scare away animals and insects: e.g. rats, mice, martens, wild rabbits, mosquitoes. If mounted at the car, roe will be put to rout (decreased danger of accidents). For connection of a piezo-treble loudspeaker. The module is an ideal aid to scare away destructive animals out of your pantry, kitchen, storehouses, garden, etc. Also to be used as dog whistle. There are some birds species which will be scared away out of your fruit trees.

Recommended piezo-tweeter:
L001 - Piezo spherical dome tweeter with flare
L002 - Ultrasonic wall loudspeaker
L003 - Piezo-tweeter approx. 8 Ohm 50 mm
P5123 - Mini piezoelectric tweeter for M094N

Technical Data:
Operating voltage: 12 - 15 V/DC
Current consumption: < 50 mA
Loudspeaker output: only for up to 5 piezo loudspeakers!
Audio frequency: adjustable approx. 8 - 40 kHz (± 20%)
Dimensions: approx. 60 x 45 x 29 mm (without fastening straps)

4024028030487

M055 | Stereo amplifier 3 W

This universal stereo amplifier is shakeproof and waterproof encapsulated. The operating voltage should normally be 9 V (max 10 V). It is suitable for many applications, i.a. also to amplify the signal from headphone outputs for external speakers.
Available accessory:
M040N - Universal preamplifier (two pieces are needed for stereo)
M237 - Stereo Preamplifier

Technical Data:
Output power: max. 3 W musical power (2 x 1.5 W)
Operating voltage: 3 - 10 V/DC
Loudspeaker socket: 8 - 32 ohms
Input sensitivity: < 100 mV
Frequency response: ca. 20 - 20.000 Hz
Dimensions: ca. 60 x 45 x 20 mm (without fastening straps)

4024028030555

M062 | Mini-Fence-High-Voltage Generator

Produces from a battery voltage of 9 - 12 V/DC a pulsating, weak high-tension of approx. 1000 Volt. For electrically operated fences for small animals, as thief-protection etc.
The two high voltage wires must be simultaneously connected to the bare feet, tongue, snout or other part of the small animal to induce electric shock.

Technical Data:
Operating voltage: 9 - 12 V/DC
Power consumption: ca. 40 mA
Output voltage: pulsating max. 1000 V / 0.5 joule
Pulse frequency: ca. 1 Hz (1 puls per second)
High-voltage display: LED
High-voltage cable length: max. 100 m (use paired wiring, wires not included)
Dimensions: ca. 72 x 50 x 42 mm (without fastening straps)

4024028030623

M063N | Dimmer 12 - 48 V/AC, max. 10 A

Controls continuously 12 V/AC motors (also direct current motors with added rectifier), incandescent lamps, heatings, etc. Only to be operated at a 12 V/AC transformer (50 - 60 Hz), not suitable for DC voltage (battery). It is also possible to control voltages such as 24 V/AC or 48 V/AC by exchanging the potentiometer.
Important installation instructions, please note!

Technical Data:
Operating voltage: 12 V/AC, 50 - 60 Hz (for normal iron-core transformers only, not for electronic transformers).
If the enclosed potentiometer is exchanged for a potentiometer 100 k lin., it is also possible to control 24 V/AC or a potentiometer 220 k lin. is required for 48 V/AC (not enclosed).
Mode of operation: phase control
Control range: approx. 0 - 90%
Loading capacity: for ohmic or inductive loads up to max. 10 A (with cooling) or max. 4 A without additional cooling, e.g. AC motors, incandescent lamps, heatings, transformers, etc.
Dimensions: Ca. 87 x 60 x 33 mm (with mounting bottom)

4024028030661

M069N | Underground mole & vole repeller

This waterproof module emits in rapid intervals aggressive seismic oscillations, which are widely radiated underground and are mostly avoided by root voles, moles and similar rodents. The module has to be digged near the animal tunnels and is operated through a cable with operating voltage of 9 V/DC. One module will be enough for approx. 1.000 m² of garden.

Technical Data:
Operating voltage: 9 V/DC
Current consumption: max. 100 mA
Range of Action: max. 1000 m²
Dimensions: approx. 72 x 50 x 35 mm

4024028030692

M071N | Ultrasonic vermin repeller

This ultrasonic generator produces pulsating and aggressive ultrasonic sounds like a siren which many animals perceive as extremely unpleasant and, therefore, try to avoid as far as possible. The generator should be used to keep away rodents, insects, crawling parasites, game and birds, etc.
The frequency of the generator is adjustable between approx. 8 - 40 KHz. A special loudspeaker with vaulted aluminium dome membrane has been built in to achieve a better sound distribution. A stabilised power supply 12 V/DC (< 60 mA) is necessary for setting into operation. Up to 4 additional loudspeakers Kemo L001 (built-in loudspeaker) or L002 (on-wall loudspeaker) may be connected, if larger rooms (> 30 m²) shall be exposed to ultrasonic waves. Available accessories:
L001 - Piezo spherical dome tweeter with flare
L002 - Ultrasonic wall loudspeaker
P5123 - Mini piezoelectric tweeter for M094N

4024028030715

Technical Data:
Operating voltage: 12 V/DC (10-13.8 V/DC)
Current consumption: ca. < 60 mA
Adjustable frequency: ca. 8 - 40 KHz (± 15%)
Frequency deviation, ca. 2 x per second: app. 2-3 KHz (automatic change of frequency, siren-like)
Sound pressure: max. 100 dB (± 15%) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr))
Range: >40m with free field of vision
Loudspeaker's beam angle: max. 140°
Connection of additional piezoelectric loudspeakers: max. 4 additional loudspeakers may be connected
Functional display: blinking LED
Connection: via free cables
Dimensions: ca. 72 x 50 x 33 mm (without fastening straps, with potentiometer)

M073N | Motorbike Alarm

Switches automatically a horn or a siren on, if the motorbike should be moved from a parking position to any other one. A waterproof and shakeproof sealed module. Also to be use to protect any other objects, which are not to be moved.

4024028030739

Technical Data:
Switching tilt angle: approx. 12 to 20° in all directions
Switching capacity: max. 25 V/DC max. 1 A
Dimensions: approx. 30 x 25 x 15 mm (without fastening straps)

M079E | Flasher / Alternating Flasher 7 - 24 V/DC

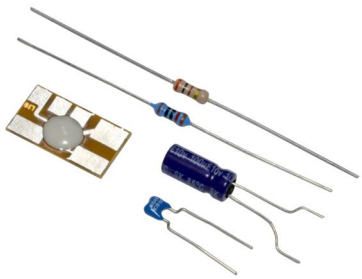
Very small electronic flasher unit consisting of 2 small electric components only during operation with an incandescent lamp. Circuit diagrams for many variations are enclosed. It is also possible to connect LEDs. However, these must be then operated with additional protective resistors (not included). 3 additional resistors (not included), which are tailored to the respective configuration are required for the operation as alternating flasher. The components have to be connected by using a soldering iron.

4024028030760

Technical Data:
Operating voltage range: approx. 7 - 24 V
Power rating range (connectable lamp load): approx. 10 mA - 1 A
Flash frequency: Ø approx. 1.2 Hz (approx. 1 flash pulse every 0.8 sec.)
Duty cycle per flash pulse: approx. 50% (approx. 0.4 sec)
Operating temperature: approx. -20 - + 80°C
On-resistance in the flasher unit: approx. 0.08 ohm
Dimensions of the electronic flasher unit: approx. Ø 3.4 x 8 mm
Dimensions of the corresponding capacitor: approx. Ø 6.5 x 12.4 mm
Protected against reverse battery and short-circuit proof

M079N | Flasher/Alternating Flasher/Running Light

Very small, highly integrated flasher unit, which may optionally be used as flasher, alternating flasher or running light for 1 to max. 6 LEDs.

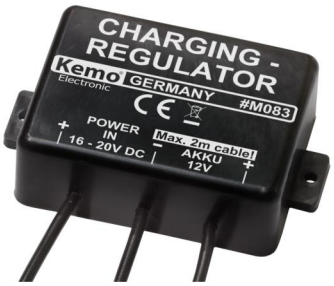


Technical Data:
Operating voltage: 3 - 6 V battery
Clock frequency: approx. 3 x per second (3 Hz)
Duty cycle per channel: approx. 76 ms
Flasher: for 1 - 2 LEDs
Alternating flasher: for 1 - 2 LEDs per channel
Running light (3 - channel): for 1 - 2 LEDs per channel
Dimensions flashing electronic: approx. 18 x 10 mm

4024028030784

M083 | Battery charging regulator 12 V/DC

This module supervises the charging state of a 12 V car battery and starts charging automatically, whenever there is a drop of voltage. With full batteries the module will switch off and supervise the battery. Suitable for batteries placed in alarm systems, weekend-houses, caravans etc. in order to keep batteries constantly charged without the risk of overcharging. Also suitable as charging regulator for solar panels. Short circuit and reverse current proof.
Automatic charging interruption with battery voltage of approx. 13.8 - 14.2 V/DC.



Technical Data:
Input voltage: 16 - 20 V/DC (solar panel or power supply)
Output: regulated for charging a 12V battery to max. 13.8 - 14.2 V/DC
Output current: 0 - 1,5 A, depending on the charging state of the battery
Dimensions: ca. 60 x 45 x 20 mm (without fastening straps)

4024028030838

M087N | LED Tester

With the aid of this test module it is made possible to carry out tests of wired light emitting diodes in order to check function, brightness, colour and polarity. In order to facilitate selection of LED's of equal brightness, there have been placed two test sockets with the same currents (5 mA/10 mA) side by side. Necessary: battery 9 V (alkali).

Technical Data:
Operating voltage: 9 V battery (alkali)
LED-connection: socket strip
LED-testing currents: optional approx. 0.5, 1, 2.5, 5, 10, 20, 35, 50 mA
Dimensions: approx. 60 x 82 x 24 mm

4024028030876

M091A | Phase Coupler for Power Line Products

For DIN rail mounting. Connects capacitively all 3 inhouse mains phases with each other so that transfer rates of up to 650 Mbps via the mains supply can be reached for the internet and computer networking (depending on the nature of the mains supply). If the signal is fed into 1 phase only, the phase coupler connects all 3 phases with each other so that these become permeable to the power line signal and the internet or computer signal will also be available at all other sockets of the in-house network. Also suitable for wireless intercoms! A considerable increase of the range and transmission quality may be achieved!

Technical Data:
For electric circuits: 110 V - 440 V/AC
3-phase version: 0,5 - 1000 MHz
For power line products: 10 - 650 Mbps
Dimensions: approx. 86 x 36 x 61 mm (without clamps)

4024028030968

M091N | Phase Coupler for Power Line Products

Connects capacitively all 3 in-house mains phases with each other so that transfer rates of up to 650 Mbit via the mains supply can be reached for the internet and computer networking (depending on the nature of the mains supply). If the signal is fed into 1 phase only, the phase coupler connects all 3 phases with each other so that these become permeable to the power line signal and the internet or computer signal will also be available at all other sockets of the in-house network. Also suitable for wireless intercoms! A considerable increase of the range and transmission quality may be achieved!

4024028030951

Technical Data:
For electric circuits: 110 - 440 V/AC
3-phase version: 0,5 - 1000 MHz
For power line products: 10 - 650 Mbit
Measures: ca. 72 x 50 x 28 mm (without fastening straps)
Installation only by an authorized qualified electrician!

M094N | Marten repeller

Produces intensively pulsating ultrasonic sounds which are found by martens and similar rodents especially unbearable, and therefore is capable to scare away these animals. This „Marten repeller“ includes 4 small ultrasonic loudspeakers to achieve a profitable radiation of the ultrasonic sound. Usage: This module is able to scare away martens from the engine compartment of cars and lorries, place where these animals use to gnaw at cables and other plastic parts! Or to be used in pantries, in the cellar or attic!
Please notice the article "Marderscheuche" from the german magazine "Electronic Actuell Magazin" no. 2/99.

4024028030944

Fitting additional loudspeaker:
L001 - Piezo spherical dome tweeter with flare
L002 - Ultrasonic wall loudspeaker
P5123 - Mini piezoelectric tweeter for M094N

Technical Data:
Operating voltage: 12 - 15 V/DC
Current consumption: at 12 V/DC < 0.05 A
Indication of operation: through light emitting diode
Loudspeaker output: only for piezo loudspeakers!
Audio frequency: adjustable approx. 8 - 40 kHz (± 20%)
Volume : 120 db (± 20%) with 1 speaker
Dimensions piezo loudspeaker: approx. Ø 30 mm x 13 mm
Dimensions module: approx. 60 x 45 x 25 mm (without fastening straps)

M100N | Ultrasonic Anti marten device for motor vehicles

Produces aggressive ultrasonic sounds not audible to human which martens find extremely annoying and so try to avoid them, if possible. To be mounted in the engine compartment of motor vehicles.
Ultrasonic marten repellent for use in cars, houses and lofts. Produces enormously loud and pulsating ultrasonic sounds with a special dome speaker.
Available accessory: M038N - DC-Converter

4024028031002

Technical Data:
Features: Powerful hemispherical dome speaker, 2-fold effectiveness ultrasound + pulsating light.
Operating voltage: 11 - 15 V/DC (car battery)
Switch-on function: soft start so that the vehicle computer will not be disturbed.
Average power consumption: < 2 mA
Ultrasonic frequency: approx. 23 kHz.
Angle of radiation: approx. 140°
Acoustic pressure: max. ca. 110 dB (± 20%) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Sound: loud pulsating
Loudspeaker: ceramic piezoelectric ultrasonic loudspeaker with spherical membrane of aluminium.
Optical determent: pulsating LED
Temperature range: approx. –25 to +80°C
Electronics: watertight encapsulated
Fuse in the fuse holder: F500mA
Dimensions: approx. 72 x 50 x 28 mm (without fastening straps)
Voltage peaks: secured against voltage peaks in the vehicle power supply up to 40 V (< 20 ms)
CAN data bus: suitable for vehicles with CAN data bus.
Why does the device have no frequency change? Answer: Martens and other small predators emit short and intense warning cries, no siren sounds! Our anti-marten device imitates these sine-like tones very naturally and is, therefore, optimal to scare away martens!

M101A | Magnet Field Generator

Magnetic field generator for sanitary conduits
Produces magnetic alternating fields, which charge the trace elements such as lime, metal oxides, etc. contained in water positively molecular. So it can be prevented that these cannot dock to molecules that are also charged positively (e.g. pipes). Thus the deposit of lime, minerals, etc. in pipes, valves, etc. is made difficult or prevented, respectively.
Required plug power supply: 6 - 15 V/DC with jack plug 3,5 mm, < 130 mA (not enclosed).

For indoor use only

example of use and details
Magnet Field Generator against calcification M101A - Application test

Technical Data:
Operating voltage: 6 - 16 V/DC
Current consumption: ca. < 130 mA
Operating frequency: < 2000 Hz
For water pipes made of copper, plastic, steel, approx. Ø 8 - 80 mm
Capacity: max. approx. 5000 l/h
The coil on the water pipe must be wound in opposite directions!!
Dimensions: approx. 76 x 56 x 28 mm (without fastening straps)

4024028031118

M102A | Second battery charger 6 - 24 V/DC

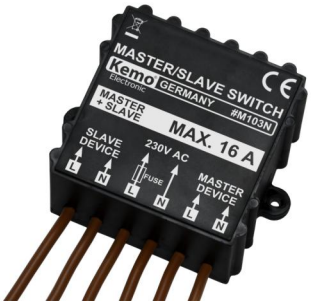
For lead accumulators 6 to 24 V. With this accumulator separating filter 2 accumulators are charged separately at one source of charging current (vehicle generator, solar systems, windmills, chargers etc). For charging currents up to 10 A at maximum (with cooling 20 A). The charging current distributes in such a manner that an empty battery will be charged more than an battery that is almost charged. It is perfect for motor caravans if one battery operates the television, radio etc. and the second battery must remain charged in order to start the motor. Or for weekend cottages if one battery used for the alarm system must not be emptied. A compensating current of approx. 0.005 A may flow between both accumulators (during normal operation at 12 V). This serves the purpose to enable a solar regulator, which is possibly connected in series the possibly necessary voltage control.

Technical Data:
Batteries to be connected: 2 each of the same voltage 6 - 24 V/DC
Max. charging current: 10 A, with cooling 20 A at maximum (total current)
Dimensions: approx. 87 x 60 x 33 mm (without fixingstraps)

4024028031323

M103N | Master/Slave switch 230 V/ AC (400 V/AC)

Automatically switches another load on when a machine, lamp etc., is turned on. It can monitor 1-phase or 3-phase (where a single phase is sampled) machines. On the output side, 1-phase devices (e.g. vacuum cleaner) are switched on automatically (or three-phase loads with an auxiliary relay, not included). Maximum of 15 A each. Total output: 3600 W.



Technical Data:
Operating Voltage: 230 V/AC
Maximum Currents: 15 A for the master, 15 A for the slave, but the total current must not exceed 16 A!
Example: if the master port needs 10 A, only one slave load of max. 6 A can be connected
Tripping Power: The module connects at currents of approx. Ø 40 mA or less
Operating temperature range: -15 ºC to + 70 ºC
Switch Function: Relay 1 x ON max. 16 A
Own Power Module:

4024028031033

M113A | Time switch 12 - 15 V/DC

Time switch approx. 2 sec. up to 23 min. (± 30%)
Switches other devices on after pressing the key and switches them off again automatically by means of the installed relay point 1 x ON (max. 3 A) when the adjusted time has expired. The lapse of time may be interrupted any time with the second key. 2 push-buttons are required for operation.

Technical Data:
Operating voltage: 12 - 15 V/DC
Current consumption: approx. 20 mA / 80 mA (relay off / on)
Adjustable time: approx. 2 sec. to 23 min., (± 30 %)
Connection: via flat-pin plug at the module
Displays: 2 (1 x LED operating voltage, 1 x LED relay “ON”)
Relay point: 1 x ON, max. 3 A, max 25 V (The installed relay point may also switch up to 230 V/AC, but in this case the safety regulations of VDE like protection against accidental contact, etc. have to be observed)
Dimensions: approx. 87 x 60 x 33 mm (with mounting bottom)

4024028031309

M113D | Digital Timer 12 V/DC

Timer with adjustable times between 1 second and 2047 seconds or 1 minute and 2047 minutes. The timer switches on after pressing the key and switches off again when the adjusted time has elapsed. The time lapse may be stopped at any time by using a second key. External push-buttons may be connected (not included). The timer can also be started by external control pulses (3 - 24 V / DC) or automatically after switching on with the connection of an Elko (22 µF 50 V).

4024028031347

Technical Data:
Operating voltage: 12 V/DC ± 5%
Current consumption: off-condition: < 6 mA, on-condition:< 50 mA
Switching contact: 1 x ON, max. 24 V max. 10 A AC or DC
Connection: strip terminal for additional on-key button, off-key button, switching contact, 12V operating voltage connection
Display: 1 LED each for “operation” and “switching on”
Adjustable turn-on times: 1 second up to 2047 seconds in 1-second steps or 1 minute up to 2047 minutes in 1-minute steps
Accuracy of the adjusted times: approx. ± 10%
After starting the time, the switching on may be stopped at any time by pressing the “Off” key
Auto boot: When connecting a capacitor 22 µF >50 V to the terminals for the start push-button, the timer starts automatically when switching on the operating voltage
Dimensions: approx. 120 x 70 x 30 mm (without fastening feet)

M114N | Flasher, slow 240 V/AC, 110 V/AC

Flasher with adjustable flash period: ca. 0,6 - 9 seconds turn-on time. Turn-off time ca. 50% of the turn-on time, respectively. Built-in fuse: T 1,6 A. For incandescent lamps or LED-lamps, 10 - 300 watts, 240 V/AC (10 - 150 W at 110 V/AC).
Use: billboards, model lighthouse etc.

4024028031149

Technical Data:
Operating voltage: 110 - 240 V/AC
Rupturing capacity: For incandescent lamps or LED-lamps with 210 - 240 V/AC up to max. 300 W or for incandescent lamps or LED-lamps with 110 V/AC up to max. 150 W
Minimum load: 10 W
Safety fuse: installed 1.6 A delay-action
Flash period: approx. 0.6 - 9 seconds on-transition time (adjustable), disconnecting time approx. 50% of the on-transition time.
Dimensions: approx. 72 x 50 x 41 mm (without fixing straps)

M120 | Infrared spotlight for CCD cameras

With the infrared spotlight CCD-cameras may recognize objects also in complete darkness. The infrared light is invisible for men, CCD-cameras can see well with an infrared spotlight.
Perfect for inconspicuous observation of entrances, drives etc.

Technical Data:
Operating voltage: 12 - 15 V/DC
Current consumption: < 300 mA
Range: max. 5 m
Wavelength: approx. 875 nm
Dimensions: approx. 72 x 50 x 18 mm (with LED´s)

4024028031200

M122 | Twilight switch 12 V/DC

The twilight switch switches on e.g. lamps at nightfall and off again at daybreak. (for weekend cottages, sailing yachts, caravans etc.) Distribution output: relay 1 x SWITCH OVER, max. 3 ampere.

The sensitivity of the luminous intensity may be changed by partially covering the sensor mechanically.

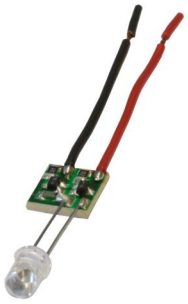
Connection plan for 12 V load, without external power source

Technical Data:
Operating voltage: 12 V/DC (11 - 14 V/DC)
Power consumption: ca. 2 mA / 35 mA (relay off / on)
Relay contact: 1 x switch-over, loading capacity max. 25 V / 3 A
Operating temperature range: ca. -15 - +50°C
Luminous intensity switching-on: ca. 25 lux ±20%
Luminous intensity switching-off: ca. 45 lux ±20%
Switching delay: ca. 3 - 4 seconds
Dimensions: ca. 72 x 50 x 32 mm (without fastening straps)

4024028031224

M142 | LED Constant current 4 - 30 V/DC

This LED with soldered constant current electronics may be connected at any voltage between 4 - 30 V/DC. The LED always shines with almost constant brightness and has a current consumption of ca. 15 mA. An additional protective resistor is not required. The supplied LED can be exchanged for any other LED. It is also possible to connect several LED's in series.



Technical Data:
Operating voltage: 4 - 30 V/DC
Current consumption: approx. 15 mA
Dimensions of the board: approx. 10 x 13 mm

4024028031422

M148-24 | Battery Guard for 12 or 24 V/DC

Protects car batteries against total discharge by switching off consumers such as refrigerator boxes, heatings, etc. in time. It switches on again automatically when the normal voltage returns. Automatic detection of the battery (12 or 24 V).

Technical Data:
Operating voltage: accumulator 12 V or 24 V (the module switches over automatically)
Max. switching capacity: 40 A for max. 10 sec. or 20 A continuous power, only with good ventilation!
Interrupting voltage: adjustable approx. 9.8 - 11.3 V with 12 V / approx. 20 - 23.2 V with 24 V (acoustic signal before switching off, may be deactivated).
Resetting voltage: approx. 1.2 – 1.6 V higher than the adjusted interrupting voltage.
Cutoff element: power MOS transistor in the positive cable.
Own current consumption: approx.

4024028031477

M148A | Battery guard 12 V/DC

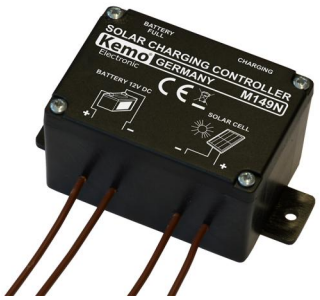
This battery saver protects your car battery from total discharge by switching off consumers such as ice boxes, heaters, radios + television sets, etc. in time. It switches on again automatically after return of the normal voltage. The interrupting voltage is adjustable: approx. 10.4 - 13.3 V.
Important installation instructions, please note!

Technical Data:
Operating voltage: 12 V battery
Max. switching capacity: 20 A (10 A without cooling, 20 A with additional cooling)
Interrupting voltage: adjustable approx. 10.4 - 13.3 V
Resetting voltage: approx. 0.8 V (± 0.3 V) higher than the adjusted interrupting voltage
Cutoff element: power MOS transistor in the negative line
Own current consumption: < 0.7 mA in OFF condition, < 1.6 mA in ON condition (LED lights)
Dimensions: approx. 87 x 60 x 33 mm (with mounting bottom)

4024028031484

M149N | Solar Charging Controller 12 V/DC, 10 A / 20 A

This solar charging controller is connected between a solar cell 12 V/DC (open circuit voltage 14 - 30 V/DC) and a battery 12 V/DC to prevent an overcharge of the battery. LED displays for “battery full” (approx. 14.4 V/ DC) and “charging”.

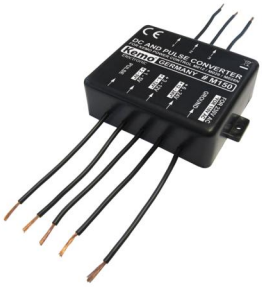


Technical Data:
Input voltage solar cell panels: 14 - 30 V/DC open circuit voltage
Nominal voltage: 12 V/DC
Max. input current: 10 A, short-time till 5 min: 20 A
Inrush voltage: battery voltage approx. 14.4 V
Displays: 1 LED for “CHARGING”, 1 LED for “BATTERY FULL”
Own power consumption:

4024028031491

M150 | DC + pulse converter

By connecting this module in series, it is possible to control our power control modules (230 V/AC or 110 V/AC) M012 + M028 + M028N (from microcomputers or PCs) with a DC voltage or a pulse width modulation. This module is connected at the spot of the potentiometer. Galvanic separation of the control circuit via optocouplers. Control may be done optionally (at 230 V/AC) 1 - 5 V/DC, 3 - 12 V/DC, 6 - 24 V/DC. Or TTL rectangular pulses 5 V/DC, 1 - 10 kHz pulse width 10 - 90% PWM (Puls width modulation). Regulation is done by changing the pulse width.
The DC and pulse converter module M150 is an ideal controlling module for:
M012 - Power Control 110 / 240 V/AC, 1200 VA
M028 - Power control 110 - 240 V/AC, 2600 VA
M028N - Power control 110 - 240 V/AC, 4000 VA



4024028031507

Technical Data:
Operating voltage: 110 V/AC or 230 V/AC (is led to the dimmer module via the connections)
Output: The module delivers a control voltage for the potentiometer input of the dimmer modules M012, M028 or M028N (Page 46)
Input: The module M150 may either be controlled with control DC voltages of 1 - 5 V/DC or 3 - 12 V/DC or 6 - 24 V/DC. Or with TTL pulses with a pulse width modulation
Frequency: between 1 - 10 kHz
Impulse voltage: approx. 5 V/DC, pulse width 10 - 90% PWM. The power is adjusted with the pulse width 10 - 90%
Input resistances: control input 1 - 5 V/DC >1,4 k, control input 3 - 12 V/DC >4,1 k, control input 6 - 24 V/DC >9,1 k
TTL pulse input: >1,1 k
Galvanic separation: via an optocoupler between the control inputs and the signal output towards the power control module
Dimensions: approx. 70 x 60 x 23 mm (without fastening straps)

M152 | Rain Sensor 12 V/DC

If the sensor plate gets into contact with rain or slushy snow / hail, it switches on a relay. Sun blinds may be retracted with that, skylights may be closed or a simple rain alarm can be given. The automatically heated surface of the sensor prevents any freezing or wetting of the sensor surface. 2 installed LEDs indicate the function. Waterproof-encapsulated electronics. Note: The electronics of the rain sensor reacts to the electrical conductivity of the water. We have now ascertained that there are areas where rainwater falls, which is absolutely clean (distilled water). The sensor does not react to this. The water must be at least slightly contaminated (fractions of dust, smoke, etc.) so that the water is electroconductive and triggers the sensor. In Germany the rainwater is conductive in 99% of the areas. If the sensor does not trigger in your case, you should install it in such a manner that the rainwater runs at first over a small porch roof or the like before the water touches the sensor. If the water falls directly from the cloud on the sensor in its purest form and does not trigger it, it will be sufficient if it runs over a small board or from a porch roof on the sensor. Then the water will have absorbed enough impurifications that it will be electroconductive and triggers the sensor. Of course, the sensor has to be built it slantwise so that the water runs down again.

4024028031521

Technical Data:
Operating voltage: 12 V/DC
Current consumption without / with heating: ca. 8 / 160 mA
Relay contact: 1 x ON, maximum load 25 V, 2.5 A
Sensor heating: automatically in case of contact with rain
Light-emitting diode 1: indication that the rain sensor works
Light-emitting diode 2: indication that rain is reported and the relay has switched on
Duty cycle of the relay: as long as the sensor is wet
The module is encapsulated waterproof.
Active sensor surface, gold-plated: ca. 29 x 30 mm
Dimensions: ca. 65 x 45 x 36 mm

M152K | Rain Sensor, Capacitive

A relay connects if the completely insulated sensor plate gets wet (e.g. raindrops). In contrast to rain detectors with a metallic sensor, this sensor functions capacitively. That means it also switches when getting into contact with distilled water (completely clean rain). Skylights may then be closed with it, canvas blinds may be pulled in or rain is just indicated. 2 installed LEDs indicate the function. The sensitivity is adjustable.

4024028031538

Technical Data:
Operating voltage: 12 V/DC
Current consumption max.: approx. 130 mA
Relay contact: 1 x ON, maximum load 25 V 2.5 A
Sensor heating: automatically in case of contact with rain
Light-emitting diode 1: indication that the rain sensor works
Light-emitting diode 2: indication that rain is reported and the relay has switched on
Duty cycle of the relay: as long as the sensor is wet
Sensitivity: adjustable
Active sensor surface: approx. 26 x 32 mm
Overall dimensions: approx. 65 x 45 x 36 mm

M157 | Marten defence

Chases away martens from cars, garages, etc. with sharp, high tone bursts (approx. 12 kHz). Extremely low current consumption: < 0.0012 A (0.015 W). Automatic activation in parking cars.

4024028031576

Technical Data:
Operating voltage: 11 - 15 V/DC
Operation display: LED on the upper side of the device
Current consumption: average ca. 1,2 mA (± 20 %)
Frequency: approx. 12 kHz (± 10 %)
Acoustic pressure: max. 85 dB (± 25 %)
Pulse frequency: ca. 10 sec. on, then an interval of 10 sec. (± 20 %)
Fuse in the fuse holder: F 0,5 A
Operating temperature range: ca. -25 - +70 °C
Type approval by the Federal Motor Transport Authority: e1*72/245*2006/28*3884*03
Dimensions: ca. 91 x 50 x 28 mm (L x W x H with mounting straps)

M158 | Water Switch 9 - 12 V/DC

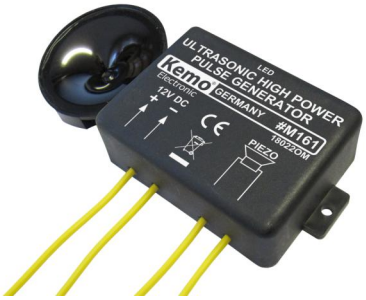
If the 2 sensor connections of the module come into contact with water, the built-in relay switches on. Sirens, other cutoff relays, etc. may be triggered with that.

4024028031583

Technical Data:
Operating voltage: 9 V/DC voltage are ideal (max. 12 V/DC), (please do only employ a stabilised power supply)
Current consumption: "Ready" < 10 mA. In case of contact with water when the relay picks up < 90 mA each with 9 V/DC
Contact capacity: max. 3 A / 25 V/DC
LED displays: 1 LED for the indication of readiness “POWER”, 1 LED for the indication “ON”, if the relay switches on
Connections: via free cables
Approved cable length towards the water sensors: max. 5 m with normal cable, max. 100 m with shielded cable, if the shielding braid is connected with the negative pole of the distribution voltage
Dimensions: sealing case approx. 60 x 45 x 20 mm (without fastening straps)

M161 | Ultrasonic Power Cannon

High-Power Ultrasonic Pulse Generator with Loudspeaker
...to chase away wild animals such as martens, wild boars, deers etc from gardens, farmlands etc. The loudspeaker emits pulsed ultrasonic sounds, which have an acoustic range of up to 300 m with a tube placed upon (not included).
Available accessory: L010 - Piezo Loudspeaker



4024028031613

Technical Data:
Operating voltage: 12 - 14,4 V/DC
Power consumption: max. 150 mA
Frequency: ca. 22 kHz (not audible to men)
Frequency curve: sine
Pulse width: ca. 0,5 sec.
Pulse sequence: ca. 5 sec.
Indication: flashing LED when the loudspeaker is connected
Loudspeaker output: for piezo-loudspeakers
Max. 2 each of the enclosed type L010 may be operated in parallel (1 loudspeaker is attached).
Dimensions: ca. 60 x 46 x 20 mm (without fixing straps)

M167N | Level Indicator for Water Tanks

Remote Sensing up to 100 m
Battery-powered level indicator for measuring the liquid level of water tanks such as rainwater, sewage chambers or slurry tanks from a distance of up to 100 m. After touching the button, indication occurs via 10 LEDs in steps of 10% each (indication 10 - 100%). The device is earmarked for wall assembly (approx. 131 x 78 x 36 mm) and requires 2 batteries „AA“. Connection is made via terminals inside the device. A normal signal cable (telephone cable, control wire or the like) with at least 11 cores is necessary to connect your water tank with the level indicator (cable is not included). You may also employ cables with less cores, but then it will not be possible to use all indication steps (e.g. with 8 cores only 7 LED indication steps may be used, which is, however, often sufficient).
Extension in case of bigger measurements
This module is normally to be used for measuring water levels in rain containers, water containers, etc. Our clients have asked us if the module can be used to measure bigger containers like for example a dwell, where the separation of the measurement electrodes is of approx. 5 m. Due to the big separation between the higher and the lower electrode in this kind of measurements (approx. 40 m), the intensity of the measurement display (LED´s) can become weak. In order to avoid this, we recommend installing the electrodes with a parallel long tube for all of the electrodes (See picture).

4024028031675

Technical Data:
Operating voltage: 3 V (2 AA batteries, not attached)
Display: max. 10 LEDs and 1 LED for the battery control
Measuring points in the water tank: 1 - 10, switchable
Current consumption during the measurement (button is pushed): max. 120 mA if all LEDs light up
Max. cable length between the level indicator and water tank: 100 m
Required cable to the water tank: telephone cable or similar cable with at least 11 cores
Measuring current at the water tank probe: approx. 50 µA per channel
Dimensions: approx. 131 x 78 x 36 mm

M168 | Overvoltage Protection 12 V/DC

Voltage spike suppressor for motor vehicles — suppresses constantly all voltage spikes in the supply system of motor vehicles! Prevents damage to the sensitive supply system electronics through voltage spikes in the supply system.

Technical Data:
Field of application: 12 V/DC (supply system of motor vehicles)
Max. energy rating: i max 8/20 µs 2000 A
Dimensions: ca. 30 x 25 x 15 mm (without fastening straps)

4024028031682

M169A | Temperature switch-thermostat 12 V/DC

Adjustable electronic temperature switch. The sensor (Ø 5 mm) may be connected with the control electronics via a cable with a length of up to 1 m.

Technical Data:
Operating voltage: 12 - 15 V/DC stabilized (min. 0.1 A)
Temperature range: approx. 0 - 100°C
Switching output: relay contact 1 x switc h over max. 5 A / 25 V
The sensor (Ø 5 mm) may be connected with the control electronics via a cable with a length of up to 1 m
Dimensions: approx. 60 x 45 x 25 mm (without fixing straps) with trimming potentiometer.

4024028031699

M171 | PWM Power control 9 - 28 V/DC, max. 10 A

Power control to control direct current loads (motors, lamps, heatings, LEDs with protective resistors, etc.). Electric motors start well also at low revolution speeds because of the employed PWM (pulse width) modulation.
Important installation instructions, please note!
Modules from serial no. 06022DI (available > 11/2011) can also be connected to a control voltage of 0 - 5 V/DC.

Technical Data:
Operating voltage: 9 - 28 V/DC
Max. current carrying capacity: 5 A or 10 A (if the module is screwed on a cooling plate)
Control range: approx. < 5% to > 95%
Control mode: PWM pulse width modulation with a frequency between 10 kHz - 20 kHz
Potentiometer: 4,7 k lin (enclosed)
Permissible loads: direct current motors, incandescent lamps, heatings, LEDs with protective resistors. Current consumption up to max. 10 A in each case.
Dimensions: approx. 87 x 60 x 33 mm (with mounting bottom)

4024028031712

M172 | Bicycle charge controller USB (Mini B)

Allows the operation of navigators, PDAs, MP3 players, etc. if these have a current supply jack „Mini USB B“ with generally usual wiring. The current for the operation and/or for charging the battery is then taken from the bicycle dynamo.
M172 installation hints

Supported Devices

Technical Data:
Input voltage: 6 V/AC commercial bicycle dynamo (also wheel hub dynamos) alternating voltage
Output voltage: 5.2 V/DC stabilized (approx. 5.1 - 5.3 V/DC)
Output current: max. 300 mA (is fully sufficient for most of the devices that are supplied with USB jack)
LED display: the installed LED lights up when the switch is set to „USB operation“ and the bicycle is moved
Switch: installed change-over switch in order to switch to „USB operation“ or „Bicycle lighting on“. The bicycle dynamo cannot charge USB and operate the lights at the same time
Connections: 1 USB cable approx. 60 cm long, 1 cable „earth“ to the bicycle chassis, 1 cable to the dynamo, 1 cable to the bicycle lighting
Dimensions: approx. 40 x 40 x 12 mm (without switch and fastening straps)

4024028031729

M172N | Bicycle Power Charge Controller USB

Allows the connection of mobile phones, navigators, PDAs, MP3-players, etc. to a bicycle dynamo. The charge controller has an USB-A jack. It is thus possible to use many charging cables of various devices. A charging cable with micro USB plug is enclosed. In addition this charge controller is especially powerful: input voltage up to max. 70 V (may occur with hub dynamos at very high speeds). Output: 5 V max. 800 mA (if your dynamo can produce this output, otherwise the current is lower: max. approx. 500 mA).
M172N installation hints

How can this device provide power even while standing still?

Supported Devices

4024028031774

Technical Data:
Input: 6 V bicycle dynamo (also suitable for 6 V hub dynamos, which may supply up to 70 V at high speeds)
Output: via USB-A jack approx. 5 V stabilized (±5 %) max. 500 mA with a normal dynamo or 800 mA with a more powerful dynamo
Switch: installed change-over switch for charging operation USB jack or bicycle light (both at the same time is not allowed)
LED display: lights up during the USB charging operation.
Fastening: with cable straps at the handlebar
Connecting cable USB-A to micro USB is enclosed
The regulator may also be operated at accumulators of electric bicycles 24 – 36 V
Dimensions: approx. 70 x 62 x 42 mm (without switch)

M173 | Soil Humidity sensor 12 V/DC

This sensor switches your garden irrigation pump or the magnetic valve on when the soil is dry and switches off when there is enough humidity in the soil. The measuring head has to be buried into the ground at the depth where it shall measure and has to be connected with the basic device via a cable. Approx. 2 m of cable are included, the sensor cable may, however, be prolonged up to 20 m with normal 2-pole cable. The device is operated by means of a commercial plug power supply (12 V/DC stabilized, > 130 mA, jack plug 3.5 mm). If the garden shall be irrigated at certain times of the day or weekdays only, then please put a commercial timer before the plug power supply and program it accordingly. The soil humidity sensor starts to operate when it receives current from the power supply.
Operation sequence:
The soil humidity is measured after switching on the operating voltage. The connected pump is switched on for 18...30 minutes if the soil is too dry. If the soil is humid enough the device switches to „Pause“ for about 18 - 30 minutes and makes a new measurement after that. This continues as infinite loop until the operating voltage is switched off.

4024028031736

Technical Data:
Operating voltage: 12 V/DC stabilized > 130 mA, jack bush 3.5 mm
Display: 3 LEDs: "On" ... "Off"..."Pause"
Switching contact: potential-free relay contact 1 x On max. 3 A (up to 25 V or also 230 V/AC, see description)
Connections: screw terminals
Time delays: ca. 18 - 30 minutes in each case
Switching threshold: continuously adjustable
The basic device must be mounted in a dry place.
Dimensions soil humidity sensor: diameter ca. 30 x 64 mm plus 2 galvanized metal pins ca. 4 x 40 mm
Dimensions basic device: ca. 72 x 50 x 28 mm (without fastening straps)

M174 | Solar charging regulator Dual 16 A

To be connected between a solar panel 12 V/DC and 1 or 2 batteries in order to avoid an overload of the batteries. If 2 batteries are connected, they are charged separately from each other. The battery with lowest charging voltage always receives more charging current. With LED displays and high charging capacity: max. 2 x 8 A or 1 x 16 A.
Important installation instructions, please note!

4024028031743

Technical Data:
Input voltage: solar panels 15 - 30 V/DC open circuit voltage, 12 V/DC rated voltage
Max. charging current: total 16 A (2 batteries of max. 8 A each or 1 battery connected in parallel at both outputs up to 16 A)
Connections: 1 or 2 batteries 12 V. If only one battery is connected then both outputs (1 + 2) in parallel (simultaneously) applied to the battery
Displays: one display per battery "battery is charging", 1 display: "all batteries charged".
Cooling: In case of currents > 4 A the module has to be screwed with the metal bottom on a heat sink with a surface of > 300 sq. cm.
Fuse: A pre-fuse F16 A is necessary (not included)
Switch-on voltage: battery approx. < 12,9 V/DC (± 7%)
Switch-off voltage: "battery charged" ca. 14,2 V/DC (± 7%)
Own current consumption (is taken from the battery): < 2 mA
Reverse current-proof (no additional diode required)
Dimensions: ca. 87 x 60 x 33 mm (with mounting bottom)

M175 | Animal Repeller Ultrasonic High Performance

This ultrasonic generator produces very loud and aggressive ultrasonic sounds pulsating like a siren, which many animals perceive as extremely unpleasant and, therefore, try to avoid them as far as possible (very often, but not always!). The generator should be used to keep away rodents, insects, crawling parasites, game and birds. If larger areas shall be exposed to ultrasound up to 2 additional loudspeakers L020 may be connected (not enclosed). The audio frequency may be adjusted between ultrasound (not audible to men) and loud + high sounds that are audible to men.

4024028031750

M175 as wolf repeller

Available accessory: L020 - Additional Ultrasonic Loudspeaker for M175
From series 14034DI modules have two connection options for power supply. DC Barrel Power Jack (5,5 x 2,1 mm DC connector) or screw terminal.

Technical Data:
Operating voltage: 12 - 14 V/DC (stabilized power supply or 12 V battery > 12 Ah)
Current consumption: max. 150 mA
Adjustable frequency range: approx. 8 kHz - 41 kHz. Pulsating like a siren
LED displays: one LED each for „Power On“ and „Sound Emission“
Connections: for up to 2 additional loudspeakers L020 (not enclosed)
Acoustic range: max. 100 m, may be extended with additional loudspeakers L020
Acoustic pressure: max. 135 dB ± 30% (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Loudspeakers: High-power ultrasonic loudspeakers with plastic membrane
Dimensions: approx. 140 x 65 x 37 mm

Frequencies after adjustment of the controller (1 kHz = 1000 Hz): 1 - 2: approx. 8 - 9 kHz | 3: approx. 9 - 10 kHz | 4: approx. 10 - 12 kHz | 5: approx. 12 - 14 kHz | 6: approx. 14 - 16 kHz | 7: approx. 17 - 19 kHz | 8: approx. 26 - 30 kHz | 9 - 10: approx. 38 - 41 kHz
Practical values: Birds: approx. 10 - 12 kHz | rodents, predators: approx. 20 - 30 kHz | insects: approx. 27 - 38 kHz

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M176 | Marten Defence for Motor Vehicles 12 V/DC, splash-proof with IP 65*

Chases away the marten through high-voltage plates (movable) charged electrically to approx. 200 - 300 V/DC through electric shock in the motor compartment of the vehicle (only weak current pulses that merely chase the marten away but do not kill it) and through strong, aggressively pulsating ultrasonic sounds. Extremely low current consumption (< 0.005 A), switches off automatically at a battery voltage of < 11.5 V/DC (does not discharge the battery if vehicles are being parked for quite some time). The basic device with the ultrasound radiation is splash-proof according to IP 65* and may be mounted directly at the vestibule opening of the marten in the car. Built-in brightly blinking LED.

4024028031767

Available accessories:
M038N - DC-Converter
Z115 - "Ground"-Mat for electroshock devices
Z176 - Extension-set 2 highvoltage plates for M176

This clip only shows that the module is waterproof, it is not suitable for permanent use under water.

Technical Data:
Features: splash-proof | 3-fold effectiveness: ultrasound, electric shock, pulsating light

Operating voltage: 12 - 15 V/DC (car battery)
Sealing: The control unit including the loudspeaker is splash-proof according to IP 65* (it can be mounted at the entrance holes of the motor vehicle.)
Average power consumption: < 5 mA
Switch-on function: soft start so that the vehicle computer will not be disturbed
Automatic switch-off: if the battery voltage decreases to < 11,5 V (± 5%)
Output voltage: approx. 200 - 300 V/DC
Ultrasonic frequency: approx. 22 kHz ± 10%
Acoustic pressure: max. approx. 100 dB ± 20% (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Angle of radiation ultrasound: approx. 160°
Loudspeaker: impact sound generator, which makes the upper side of the case oscillate (splash-proof)
Sound: sine, aggressively pulsating
Temperature range: approx. -25°C to +80°C
Functional display: flashing LED (approx. every 5 - 12 sec.)
Cable length high-voltage cable: approx. 4 m (± 10%)
Fuse in the fuse holder: 1 A
High-voltage contact plates: 6 pieces, movable, approx. 62 x 42 mm each, stainless steel
Dimensions basic device: approx. 40 x 50 x 70 mm (without cable entry + fastening feet)
Cable for terminal 15: If this cable is connected with „Positive“, the marten

defence disconnects. The marten defence switches on if it is connected with “Negative” or does not receive any signal.
CAN data bus: suitable for vehicles with CAN data bus.
Voltage peaks: The device is protected against voltage peaks in the vehicle power supply up to 40 V (< 20 ms).
Optical determent: The built-in pulsating LED unsettles the nocturnal martens in addition.
Why does the device have no frequency change? Answer: Martens and other small predators emit short and intense warning cries, no siren sounds! Our anti-marten device imitates these tones very naturally and is, therefore, optimal to scare away martens.
*IP65: No penetration of dust at a low pressure of 20mbar in the case. Protected against hose water from any direction against the case (corresponds to 12.5 ltr./minute – garden hose) (test period: 5 minutes)

M180 | Anti marten device splash proof IP 65*

4024028031804

To repel martens in cars, houses, etc. Produces aggressive ultrasonic sounds inaudible to men, which martens find very annoying and try to avoid if possible. May be mounted at the entrance holes of the cars.
Through the water and dirt resistance, this Marten Device can be mounted on the cars initial openings directly.

Available accessory: M038N - DC-Converter
This clip only shows that the module is waterproof, it is not suitable for permanent use under water.

Technical Data:
Features: splash-proof | 2-fold effectiveness ultrasound + pulsating light

Operating voltage: 11 - 15 V/DC (car battery)
Sealing: splash-proof case, according to IP 65* (can be mounted at the entrance holes of the motor vehicle)
Switch-on function: soft start so that the vehicle computer will not be disturbed
Average power consumption: < 2 mA
Ultrasonic frequency: approx. 23 kHz ± 15%
Angle of radiation ultrasound: approx. 160°
Acoustic pressure: approx. 105 dB (± 20%) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Sound: Sine, aggressively pulsating
Loudspeaker: impact sound generator, which makes the upper side oscillate (splash-proof)
Optical determent: pulsating LED (serves as functional display at the same time)
Temperature range: approx. -25°C to +80°C
Voltage peaks: secured against voltage peaks in the vehicle power supply up to 40 V (< 20 ms)
Fuse in the fuse holder: 1 A
Dimensions: approx. 58 x 38 x 31 mm (without fastening straps)
CAN data bus: suitable for vehicles with CAN data bus.

Why does the device have no frequency change? Martens and other small predators emit short and intense warning cries, no siren sounds! Our anti-marten device imitates these tones very naturally and is, therefore, optimal to scare away martens.
*IP 65: No penetration of dust at a low pressure of 20 mbar in the case, protected against hose-water from every direction against the case (corresponds to 12.5 ltr./minute e.g. garden hose, test period: approx. 5 minutes, information without engagement).

M186 | Marten Defence for Motor Vehicles 12 V/DC

4024028031866

Chases away martens by means of small high-voltage plates charged electrically to approx. 200 - 300 V/DC through electric shock in the engine compartment of the vehicle (only weak current pulses that chase the marten away, but do not kill it) and through strong, aggressively pulsating ultrasonic sounds. Extremely low power consumption (< 0.005 A), switches the battery voltage of < 11.5 V automatically off (does not discharge the battery completely if vehicles are being parked for quite some time).

Available accessories:
Z115 - "Ground"-Mat for electroshock devices

Technical Data:
Operating voltage: 12 - 15 V/DC (car battery)
Average power consumption: < 5 mA
Automatic shutoff: if the battery voltage decreases to < 11,5 V (± 5%)
Output voltage: approx. 200 - 300 V/DC
Ultrasonic frequency: approx. 22 kHz ± 10%
Acoustic pressure: max. approx. 100 dB ± 15%
Angle of radiation ultrasonics: approx. 150 degree
Loudspeaker: special ceramic piezoelectric loudspeaker with spherical membrane of aluminium
Temperature range: approx. -25 - +80°C
Functional display: flashing LED (approx. every 5 - 12 sec.)
Cable length high-voltage cable: 1 x approx. 4 m (± 10%)
Fuse in the fuse holder: 500 mA

High-voltage contact plates: 6 pieces, approx. 40 x 40 x 1,5 mm each
Dimensions basic instrument: approx. 125 x 70 x 31 mm (without cable entry point + LED).
Suitable for vehicles with Can Bus.
Cable for terminal 15: If this cable is connected with “positive“, the marten defence disconnects. The marten defence switches on if it is connected with “negative” or does not receive any signal.

M188 | Battery Guard 12 V

Indicates in 5 steps via 3 LEDs the actual charging condition during operation of an 12 V accumulators. Thus it is easier to control the accumulator and a total discharge can be prevented. In addition it is checked whether the accumulator is in order and it receives the full charging voltage from the battery charger. (If the Battery guard is connected during charging of the battery.) The Battery guard is designed to monitor a battery in a closed, active circuit. Very low consumption of less than 4.9 mA!

4024028031880

Technical Data:
Operating voltage: 10.4 – 15.5 V/DC
Current consumption: Ø < 4.9 mA
Display: 3 LEDs for: Full (green), Low (yellow), Empty (red)
Measuring range: (Tolerance: max. 5%)
- red: < 10.4 V
- yellow/red: 10.5 – 10.8 V
- yellow: 10.9 – 12.2 V
- yellow/green: 12.3 – 12.6 V
- green: > 12.7 V

Dimensions: approx. 40 x 40 x 13 mm (without fixing straps)

M195 | PWM Power control 9 - 28 V/DC, max. 20 A

Power controller for controlling DC loads (DC motors, light bulbs, heaters, LEDs with current limiting resistors, etc.) The use of PWM (pulse width) control works well even with electric motors running at low RPM. Switching frequency: approx. 300 - 600 Hz (for motors, a humming noise may be heard). The control is via the supplied potentiometer or optional with an external control voltage 0 to 5 V/DC.

4024028031958

Technical Data:
Operating voltage: 9 - 28 V/DC
Max. current carrying capacity: 20 A (if the module is screwed on a cooling plate)
Control range: approx. 0% to 100%
Control mode: PWM pulse width modulation with a frequency between 300 - 600 Hz
Potentiometer: 4,7 k lin (enclosed)
Permissible loads: direct current motors, incandescent lamps, heatings, LEDs with protective resistors. Current consumption up to max. 20 A in each case.
Dimensions: approx. 87 x 60 x 33 mm (with mounting bottom)

M197 | Twilight Switch 12 - 28 V/DC

Switches on any electrical load (e.g. incandescent lamp, motor, LED lamp or the like) at nightfall and switches it off again at daybreak.

4024028031972

Technical Data:
Operating voltage: 12 - 28 V/DC
Current carrying capacity: max. 5 A
Current consumption: < 0.5 mA
Switching-on: at approx. 25 Lux (± 50%)
Switching-off: at approx. 45 Lux (± 50%)
Delay time: approx. 4 sec. (± 3 sec). Short-circuit proof.
Dimensions: approx. 40 x 40 x 12 mm (without fastening straps)
Ideal application area: caravans, trucks, boats, weekend cottages (with power supply by an accumulator)

M202 | Lead-Acid Battery Activator / Refresher 12 V

Acts against the sedimentation of lead sulfate and thus increases the service life of the car battery. Lead sulfate is actively removed and the sedimentation is prevented, respectively, through strong and very short current pulses. With LED display.

Technical Data:
Operating voltage: approx. >11 - 16 V
Automatic deactivation: approx.

4024028032023

M203 | Master/Slave Switch 230 V/AC - adjustable

Automatically switches on another load (slave) when a machine, lamp, etc. (master) is switched on. The total power master + slave is max. 3680 W (16 A), with the maximum „slave“ power being 2300 W (10 A). The sensitivity of the master load is adjustable.

Technical Data:
Operating voltage: 230 V/AC / 50 Hz
Max. currents: 16 A, 3680 W (total power master + slave), where the maximum „Slave“ power is 2300 W (10 A). Example: if the „master“ connection needs 9 A, only a „slave“ load of max. 7 A may be connected.
Adjustable tripping power: approx. 5-60 W
Operating temperature range: 0°C up to +50°C
„Slave“ Switching function: triac max. 2300 W (10 A)
„Slave“ minimum load: approx. 10 W (0,05 A)
Own power consumption:

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M204 | Power Control 230 V, max. 16 A for heaters

Regulates ohmic loads like heatings, etc. without additional need for interference suppression with pulses in zero crossing. Regulation takes place by switching on and off in pulses. It is, therefore, only suitable for heatings (heating plates, welding wires, thermal welding machines, ovens, etc.). Not suitable for motors and lamps (they would sputter and blink, respectively).

Technical Data:
Operating voltage: 220 - 240 V/AC, 50 - 60 Hz
Output voltage: pulsating, approx. 0.8 Hz with adjustable pulse length, switching on and off in phase zero crossing, respectively. Thus, almost no radio-interferences occur.
Max. current carrying capacity: approx. 16 A
Connection: via flat plug 6.3 mm
Current consumption without load: approx. 0.3 W
Aluminium metal case with cooling rib, potted
Regulation via a connected and included potentiometer: approx. 0 - 100%. The potentiometer is fully insulated on the operator side.
Operation display: with installed LED
Dimensions: approx. 55 x 50 x 36 mm (without mounting straps)

4024028032047

M206 | Flasher for LED or Incandescent Lamps 9 - 48 V/DC max. 10 A

You may connect either incandescent lamps or LED lamps with operating voltages ranging from 9 to 48 V/ DC to the flasher. The flasher is then operated at the operating voltage of the connected lamps. The device is short-circuit proof. Adjustable flash period: approx. 0.15 - 7 sec.

Technical Data:
Operating voltage: 9 - 48 V direct-current voltage (depending on the connected lamps)
Current-carrying capacity: max. 10 amperes (at 12 V these are e.g. lamps up to max. 120 W)
Adjustable flash period: approx. 0.15 - 7 sec.
Light-pause ratio: approx. 50/50%
Own current consumption: Ø < 2.5 mA
Dimensions of the module: approx. 87 x 60 x 33 mm
Display at the module: flashing LED
Connections: mounting tabs 6.3 mm
Short-circuit proof

4024028032061

M227 | Capacitive Level Indicator

Level indicator for liquid tanks with capacitive measurement recording (insensitive to dirt and deposits in the water). It can also be used to check liquid levels of liquids that chemically attack metal sensors. Only for liquids such as clean or dirty water, liquid manure or similar, not for oils or flammable liquids. The measurement recording is carried out by 2 insulated cables running in parallel, which are immersed in the liquid and indicate the liquid level by changing the capacitance. Tanks with max. filling heights of 0.5 - 2 m can be measured (cables are not included).

4024028032276

Technical Data:
Operating voltage: 9 V block battery
Display duration: As long as the test button is pressed
Current consumption: Only as long as the test button is pressed: approx. 10 - 20 mA (depending on how many LEDs light up)
Measuring principle: capacitive (the capacitance between the two measuring cables changes when the liquid level varies)
Display: 10 LEDs in steps of 10: 10 - 100%
Accuracy: approx. 10%
Measurable filling height: approx. 0.5 - 2 m
Max. cable length between the sensor module and the display unit: 100 m
Dimensions Display: approx. 131 x 78 x 36 mm
Dimensions Sensor Module: approx. 83 x 51 x 32 mm (without fastening straps)

M229 | Marten Defence for Motor Vehicles, battery-operated with Dual Pol contact plates

Marten defence with electric shock, high-frequency sounds and flashing LEDs and 6 double high-voltage contact plates with two-pole connection. With built-in batteries (4 x AA), independent of the electrical system. No electrical connection to the electrical system of the motor vehicle required. Modern microprocessor control: The high-frequency scaring signals are emitted irregularly and at random intervals in order to avoid a habituation. The device switches on automatically by means of a vibration sensor only when the car is parked. The two-pole double contact plates ensure that the marten gets an electric shock in any case, even if it does not stand on a metallic base in the car (it must only touch both contact surfaces at the contact plates at the same time).

4024028032290

Technical Data:
Batteries: required 4 x AA (UM 3 mignon, alkaline-manganese or a similar high-grade quality)
Current consumption: Ø approx. 0.25 mA
Battery durability: approx. 1 year depending on the quality of the batteries.
Circuit breaker: There is a circuit breaker on the side of the device.
Loudspeaker: high-power piezoelectric loudspeaker with vaulted aluminium membrane for broad sound radiation.
Sound pressure: max. approx. 105 dB ± 20%
Ultrasound: sinusoidal, randomly interrupting and varying frequency against habituation (one pulse approx. every 9 - 30 sec., approx. 21 – 24.5 kHz).
High-voltage: approx. 220 - 260 V/DC 3 LED displays: flashing to control the ultrasound, high-voltage + battery.
Vibration switch: built-in vibration switch, which switches the marten scarer off when the motor is running and activates it again in parking position (the motor does not run).
Temperature range: approx. -20 to +80°C (also dependant on the inserted batteries, which often have a limited temperature range).
Approval mark: yes, the e1 mark granted by the Federal Motor Transport Authority
Dimensions: approx. 140 x 100 x 43 mm (without switch)
Dimensions two-pole high-voltage shock plates: approx. 60 x 60 x 12 mm. 2 pole contacts on 2 levels.

M234 | Marten - Rat - Mouse Repeller

For indoor and outdoor use with aggressive ultrasound. Produces enormously loud, sinusoidal ultrasound, which martens, etc. find very annoying and the animals try to avoid if possible. These sounds are not audible to humans. The basic device is waterproof according to *IP65 and may also be mounted outside. The connected plug power supply has to be inserted into a socket in a dry place.

4024028032344

Technical Data:
Operating voltage: 230 V AC, 50 Hz,

M237 | Stereo Preamplifier

Universal stereo preamplifier for microphones and universal application. The module is simply connected between a stereo power amplifier and a too weak signal source (e.g. microphone).

Technical Data:
Operating voltage: 9 - 24 V/DC stabilized (or battery)
Current consumption: approx. 3.4 mA ± 20% at 12 V (without load)
Frequency range: approx. 8 Hz - 60 kHz, 3 dB at U out 1.5V RMS
Input impedance: 100k Ω
Output load: > 2k Ω
Amplification: approx. 30 dB ± 20%
Distortion: ≤ 0.02% ± 20%
Dimensions: approx. 40 x 40 x 12 mm (without fixing straps)

4024028032375

M240 | Power Control 230 V/AC, 10 A, Multifunction

Power controller for 230 V/AC consumers such as motors, lamps, many dimmable LEDs etc. The controller is overload- proof and can be controlled via a potentiometer (100 K lin.), a control voltage (0 - 10 V) or with PWM signals (0 - 100%, 100 - 10,000 Hz).

Technical Data:
Operating voltage: 220 - 230 V/AC 50 - 60 Hz
Max. connectable load: 10 Ampere (2,300 W)
Control mode: phase angle control
Switching-on: soft start
Operating display, overload display: 2-coloured LED
Control options: with potentiometer 100 K lin or control voltage 0 - 10 V/DC or PWM signal 3 - 24 V 100 - 10,000 Hz
The control signal input is completely isolated from the load control circuit.
Connections: Plug contacts flat plugs 6.3 mm and 2.8 mm
Dimensions: approx. 87 x 60 x 33 mm

4024028032405

M241 | Vibration Switch 12V DC

Vibration switch, switches 12 V devices off when vibrations occur (e.g. motor running noises) and on with a time delay at standstill. Operating voltage: 11 - 15 V. For devices up to a current consumption of approx. 1000 mA. Indication by a flashing LED. The vibration switch switches on e.g. signal horns when a machine (e.g. pump) switches off and no longer vibrates. Or a marten repellent, if the vehicle has no more engine vibrations or driver vibrations and is parked.

Technical Data:
Operation voltage: 11 - 15 V direct current voltage
Own current consumption: in case of vibrations, motor runs (LED off): < approx. 0.000005A (< 5µA)
At rest, no vibrations (LED flashes): < approx. 0.000008A (< 8µA)
Max. switching current (max. current consumption of the connected device): 1 A
At rest (no vibrations), the input voltage (11 - 15 V/DC) is switched through to the output and the connected device is in operation.
Switch-off delay during movement: approx. 3 seconds (depending on the intensity of the vibrations)
Switch-on delay at end of movement: approx. 22 seconds
Switching sensitivity: roughly adapted to the vibrations of an combustion engine in a motor vehicle
Operating temperature range: approx. -20°C to +70°C
Dimensions (without fixing straps): approx. 60 x 45 x 20 mm

4024028032412

FG002N | Power control 230 V/AC

The output of ohmic or inductive loads 230 V/AC, which are controllable by phase control is infinitely variable with it. The regulator has a CE approval up to a load of 400 W. It may also control loads up to 800 W, but then an additional interference filter has to be connected in series. It is also possible to control temporarily (max. 3 seconds) loads up to 1600 W (e.g. in case of high starting currents for electric motors, only with additional interference filter connected in series).
Ohmic loads are e.g. electric heatings, soldering irons, etc.. Inductive loads are e.g. motors with carbon brushes (e.g. kitchen machines), electromagnets, vibrating tables, etc.. It is not possible to connect devices, which already have built-in control electronics!
Only for indoor use!

Technical Data:
Operating voltage: 180 - 240 V/AC
Load: max. 400 W
Load with an additional interference filter: max. 800 W
Short load capacity: (max. 3 sec) 1600 W
Dimensions: approx. 112 x 67 x 63 mm (without connector)

4024028020020

FG015 | Animal repeller / High power ultrasonic generator

Animal repeller To drive away wild animals such as martens, rodents (e.g. out of carports, lofts, camper vans), wild boars, deer, etc. (from gardens, farmland, etc.). The device produces an enormously loud, pulsating and aggressive ultrasonic sound of about 21 kHz which is not audible to most people, but represents a considerable annoyance for wild animals which, therefore, try to avoid it. In some cases (not always!) it is also possible to drive away dogs and cats that are used to human community. The device is operated with 4 batteries R14 (UM2) which last up to 8 months depending on the quality.

Technical Data:
Fastening: at walls or ceilings with 4 screws Ø 3 mm (not attached)
Batteries: operation with 4 batteries UM2 (R14, round cell), not included
Equipment-on indication: via a built-in LED which lights up during radiation of ultrasonic sounds.
Assembly: suitable for outside assembly but only at spots that are protected against splash water (under the canopy, installed into aviaries in the garden, under a parking caravan, etc.)
Ultrasonic frequency: approx. 21 kHz (± 10 %)
Mark space ratio: approx. 0,6 sec. ON, app. 6 sec. rest
Sound pressure: > 100 dB (± 15 %) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr))
Angle of radiation: > 120°
Loudspeaker: special piezoelectric ultrasonic high-power loudspeaker with lacquered (humidity-proof) membrane
Acoustic range: > 200 m
Operating voltage: 6 V/DC (4x batteries UM2)
Current consumption idle: app. 0,005 mA
Current consumption active: app. 5 mA
Tested temperature range: -15 °C - +60 °C
Dimensions: approx. 190 x 70 x 33 mm L x W x D (dimensions without fixing straps)

4024028020150

FG015F | Fox Repeller

To drive away wild animals such as martens, rodents (e.g. out of carports, lofts, camper vans), wild boars, deer, etc. (from gardens, farmland, etc.). The device produces an enormously loud, pulsating and aggressive ultrasonic sound of about 21 kHz which is not audible to most people, but represents a considerable annoyance for wild animals which, therefore, try to avoid it. In some cases (not always!) it is also possible to drive away dogs and cats that are used to human community. The device is operated with 4 batteries R14 (UM2) which last up to 8 months depending on the quality.

Technical Data:
Acoustic coverage: > 200 m (656 feet). In unobstructed space up to 600 square meter (6458,35 ft²)
Sound pressure: > 120 dB (± 15%) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Output: Highly e□ffective ultrasonic sinus sound of approx. 21 kHz sound can not be heard by human beings
Fastening: at walls or ceilings with 4 screws Ø 3 mm (not attached)
Batteries: operation with 4 batteries UM2 (R14, round cell), not included
Assembly: suitable for outside assembly but only at spots that are protected against splash water (under the canopy, installed into aviaries in the garden, under a parking caravan, etc.)
Equipment-on indication: via a built-in LED which lights up during radiation of ultrasonic sounds.
Ultrasonic frequency: approx. 21 kHz (± 10%)
Angle of radiation: > 120°
Mark space ratio: approx. 0.6 sec. ON, approx. 6 sec. rest

4024028020150

Loudspeaker: special piezoelectric ultrasonic high-power loudspeaker with lacquered (humidity-proof) membrane
Tested temperature range: -15°C to +60°C
Acoustic range: > 200 m
Operating voltage: 6 V (4 x batteries UM2)
Current consumption: idle approx. 0.005 mA, active approx. 5 mA
Dimensions: approx. 190 x 70 x 33 mm L x W x D (dimensions without fastening straps)

FG022 | Marten Repeller mobile

This mobile marten repellent operates with latest high-frequency technology (ultrasound) and without assembly work. This marten repellent may be employed everywhere (e.g. in cars, carports, garages and houses), ideal as protection for e.g. cars that are parked for longer periods. The optimum maintenance-free time of performance of 12 months can only be reached with high-quality alkaline manganese batteries (2 x 1.5 V Mignon AA, not enclosed). Of course, the device has to be mounted in such a way that no water or dirt may penetrate into the case. May also be used against mice and other rodents.

Technical Data:
Range of Action: > 55 m²
Frequency: approx. 24 kHz (± 15%)
Acoustic pressure: approx. 100 dB (± 20%) (Ultrasonic devices should have a sound pressure level exceeding 100 dB (C) to avoid habituation (ADAC test results). (Source de.wikipedia.org/wiki/Marderabwehr)
Operating voltage: 3 V/DC
Acoustic range: > 6 m

4024028020228

FG025 | Pasture Fence Device - High-Voltage Device for Electric Fences

Electric fence device to repel small animals (martens, dogs, etc.). For fence lengths up to approx. 1 km (without vegetation). High-voltage pulses: max. 2400 V in cycles of >1.2 sec. Extremely low current consumption: Ø 0.008 A. A plug power supply 12 V/DC, output at least 100 mA or a 12 V car battery > 12 Ah is still required for operation (both is not included). In both cases the electric cable requires a barrel connector of 5.5 x 2.1 mm.
General Information for Kemo Modules

Technical Data:
Operating voltage: 12 V/DC battery or power supply (not included)
Current input: barrel connector-socket 2.1 mm (5.5 x 2.1 mm)
Current consumption: approx. Ø 0.008A (pulsed, temporarily 100 mA)
Clock pulse interval: >1.2 sec. (according to VDE regulation)
Power: approx. 0.12 joule (against small animals)
Max. fence length: 1 km (without vegetation)
Dimensions: approx. 122 x 72 x 66 mm (without mounting feet and connecting terminals)

4024028020259

FG025SET | Marten and Raccoon Repeller Electric Fence

High voltage electric fence for mounting at gutters and downpipes against martens and raccoons in houses. The animals often climb up the downpipes and via gutters into the loft to nest there. An electric shock at this two pole electric fence should expel the animals effectively. A plug power supply 12 V/DC, output at least 100 mA or a 12 V car battery > 12 Ah is still required for operation (both is not included). In both cases the electric cable requires a barrel connector of 5,5 x 2,1 mm.
FG025SET warning sign electric fence (pdf)

General Information for Kemo Modules

Technical Data:
Operating voltage: 12 V/DC battery or power supply (not included)
Current input: barrel connector-socket 2.1 mm
Current consumption: approx. Ø 0.008 A (pulsed, temporary 100 mA)
Output voltage: max. 2400 V pulses
Clock pulse interval: > 1.2 sec.
Power: approx. 0.12 joule (against small animals)
Stainless steel strand: Ø approx. 0.7 mm, 7 stranded single wires
Max. wire lengths: permitted up to approx. 100 m
Pipe clamp: for downpipes Ø approx. 70 - 110 mm
Size high-voltage generator: approx. 122 x 72 x 66 mm (without mounting feet and connecting terminals)

4024028020051

FG028 | Pasture Fence Device approx. 8000 V

Pulse approx. 310 mJ, 12 V operating voltage (battery) For pastures with larger animals (e.g. horses) with fence lengths up to approx. 5 km (without vegetation). All connections are inside and thus well protected (the cables are led into the interior of the casing through channels). Built-in total discharge protection for the 12 V battery. Very low current consumption (Ø approx. 45 mA). Connection cable for a car battery (battery is not included in the delivery) with a cable length of approx. 1.8 m with 2 terminal alligators is included. Connection cable with terminal for the pasture fence is included as well.

Technical Data:
Operating voltage: 12 V/DC (car battery or plug power supply)
Current consumption: Ø approx. 45 mA | Battery total discharge protection: automatic disconnection at

4024028020068

K001 | Plugin axle with button

Plug-in axle with injection-moulded button

Technical Data:
axle : Ø approx. 15 x 8 mm.
Total length together with button: approx. 46 mm.

4024028050812

K062-4 | Turning knob with grub screw for Ø 4mm axle

Knob body, black, with grey cap. Knob Stable fastening with set screw M3 and nut.

Packing unit 10 pieces.

Technical Data:
Dimension knob: ca. Ø 22 mm x 14,5 mm
Grub screw: M3
Axis diameter: 4mm

4024028050904

KL001 | Enamelled Copper Wire Ø approx. 0.1 mm

Technical Data:
Diameter: approx. 0.1 mm
Length: approx. 140 m

4024028050010

KL006 | Enamelled Copper Wire Ø approx. 0.6 mm

Technical Data:
Diameter: approx. 0.6 mm
Length: approx. 16 m

4024028050065

KL007 | Enamelled Copper Wire Ø approx. 0.7 mm

Technical Data:
Diameter: approx. 0.7 mm
Length: approx. 12 m

4024028050072

KL010 | Enamelled Copper Wire Ø approx. 1.0 mm

Technical Data:
Diameter: approx. 1.0 mm
Length: approx. 6 m

4024028050102

KL015 | Enamelled Copper Wire Ø approx. 1.5 mm

Technical Data:
Diameter: approx. 1.5 mm
Length: approx. 4 m

4024028050157

KS006 | Silver Plated Copper Wire Ø approx. 0,6 mm

Technical Data:
Diameter: approx. 0.6 mm
Length: approx. 10 m

4024028050201

KS008 | Silver Plated Copper Wire Ø approx. 0,8 mm

Technical Data:
Diameter: approx. 0.8 mm
Length: approx. 7 m

4024028050218

KS010 | Silver Plated Copper Wire Ø approx. 1 mm, 5 m

Technical Data:
Diameter: approx. 1 mm
Length: approx. 5 m

4024028050225

KS012 | Silver Plated Copper Wire Ø approx. 1,2 mm

Technical Data:
Diameter: approx. 1.2 mm
Length: approx. 3 m

4024028050232

L001 | Piezo spherical dome tweeter with flare

This high-quality piezo-spherical cap-tweeter can be connected directly at the amplifier or at a diplexer. This tweeter has a vaulted aluminium spherical cap and no conical membrane (as usual with flare loudspeakers). Due to the aluminium spherical cap the acoustic pressure is not so strong as with comparable other piezo-tweeters. In return the loudspeaker has a very broad angle of radiation and a very good brilliant sound. Due to the aluminium spherical cap with its special radius of gyration and very low mobile mass the frequency response is very clean up to 45000 Hz. Therefore this tweeter is especially suitable as ultrasonic loudspeaker for the control of parasites (against rodents, vermins etc.).

Technical Data:
Frequency Range: approx. 2500 - 45000 Hz
Dimensions: approx. 65 x 145 mm, height: approx. 40 mm

4024028050607

L002 | Ultrasonic wall loudspeaker

Additional loudspeaker (Piezo) for our ultrasonic vermin scare M071N - Ultrasonic vermin repeller. An installed light emitting diode serves as operation indication. Aluminium spherical cap membrane with a very broad angle of radiation. Suitable for mounting outside provided the loudspeaker will be installed protected from rain (e.g. under the roof ledge). The LED is loaded by the supplied ultrasonic wave frequency and thus does not require any additional operating voltage.
Available accessory: M071N - Ultrasonic vermin repeller

Technical Data:
Range of transmission: approx. 6000-45000 Hz
Dimensions: approx. 72 x 50 x 29 mm (without fastening straps)

4024028050614

L010 | Piezo Loudspeaker

Ultrasonic piezo loudspeaker for M161 - Ultrasonic Power Cannon.

Technical Data:
Rated voltage: 16 Vp-p
Max. rated long power: 30 Vp-p
Frequency range: approx. 2 - 60 kHz
Sound pressure level: max. 120 dB (± 15%)
Operating Temperature: approx. -25°C to +80°C
Weight: approx. 6 g
Dimensions: diameter: Ø approx. 41 mm, height: approx. 12 mm
Angle of radiation: approx. 160°

4024028050577

L020 | Additional Ultrasonic Loudspeaker for M175

Loudspeaker (supplement) for M175 - Animal Repeller Ultrasonic High Performance in order to extend the acoustic sphere of action considerably. The required 2-pole connection cable (max. 50 m, > 2 x 0.5 mm²) is not enclosed. The loudspeaker must be mounted in such a manner that it will be protected against water (e.g. under a roof overhang). A light-emitting diode indicates the function. The cable connection is made via a 2-pole terminal under the slide cover of the additional loudspeaker. The additional loudspeaker must be mounted in such a manner that it may radiate freely and without obstacles onto the surface to be protected.

Technical Data:
Acoustic pressure: max. 135 dB ± 30%
Acoustic range: max. 100 m
Loudspeaker: High-power ultrasonic loudspeaker with plastic membrane
Dimensions: 140 x 65 x 37 mm

4024028050584

G004 | Modul case approx. 60 x 45 x 20 mm

Sealing case black, without bottom. With fixings straps.

Technical Data:
Dimensions (L x W x D): approx. 60 x 45 x 20 mm (tolerance ~1%)

4024028060040

G006 | Ribbed module case approx. 70 x 36 x 23 mm

Sealing case, black, without bottom, with fixing straps.

Technical Data:
Dimensions (L x W x D): approx. 70 x 36 x 23 mm (tolerance ~1%)

4024028060064

G007 | Ribbed module case approx. 67 x 65 x 37 mm

Sealing case, black, without bottom, with fixing straps.

Technical Data:
Dimensions (L x W x D): ca. 67 x 65 x 37 mm (tolerance ~1%)

4024028060071

G010 | Plastic Half Shell Enclosure approx. 95 x 135 x 45 mm

With ventilating slots and removable front panels.

Technical Data:
Color: black
Dimensions (L x W x D): ca. 95 x 135 x 45 mm (tolerance ~1%)

4024028060101

G01B | 9 V/DC Plastic case, small approx. 102 x 61 x 26 mm

Double wall black plastic case with battery box for incorporation of a 9 V/DC compound battery or two 1,5 V/DC minicells.

Technical Data:
Dimensions (L x W x D): approx. 102 x 61 x 26 mm (tolerance ~1%).

4024028060026

G020 | Case For Signals approx. 72 x 50 x 28 mm

Case to build in piezo-loudspeaker. Screws are enclosed!

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 28 mm (tolerance ~1%)

4024028060200

G021 | Transparent Case approx. 72 x 50 x 40 mm

Black bottom part with fixing straps and internal possibilities to fasten boards. Transparent upper part

Technical Data:
Dimensions without fixing straps (L x W x D): approx. 72 x 50 x 40 mm (tolerance ~1%)

4024028060217

G022 | Case With Fasting Straps approx. 72 x 50 x 63 mm

Inside there are 4 screw nipples to fasten one board. The case will be screwed down by using the 4 attached screws.

Technical Data:
Dimensions without fixing straps (L x W x D): approx. 72 x 50 x 63 mm (tolerance ~1%)

4024028060224

G023N | Case With Fastening Straps approx. 74 x 51 x 28 mm

Inside there are 4 screw nipples to fasten one board. The case will be screwed down by using the 4 attached screws.

Technical Data:
Dimensions without fixing straps (L x W x D): approx. 74 x 51 x 28 mm (tolerance ~1%)

4024028060231

G024N | Case With Fastening Straps approx. 72 x 50 x 41 mm

Inside there are 4 screw nipples to fasten one board. The case will be screwed down by using tEhe 4 attached screws.

Technical Data:
Dimensions without fixing straps (L x W x D): approx. 72 x 50 x 41 mm (tolerance ~1%)

4024028060248

G025N | Plastic Case approx. 72 x 50 x 22 mm

With a wall thickness of 1,8 mm. Delivery with four fastening screws for the case cover.

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 22 mm (tolerance ~1%)

4024028060255

G026N | Plastic Case approx. 72 x 50 x 28 mm

With a wall thickness of 1,8 mm. Delivery with four fastening screws for the case cover.

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 28 mm (tolerance ~1%)

4024028060262

G027N | Plastic Case approx. 72 x 50 x 35 mm

With a wall thickness of 1,8 mm. Delivery with four fastening screws for the case cover.

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 35 mm (tolerance ~1%)

4024028060279

G028N | Plastic Case approx. 72 x 50 x 42 mm

With a wall thickness of 1,8 mm. Delivery with four fastening screws for the case cover.

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 42 mm (tolerance ~1%)

4024028060286

G029 | Plastic Case approx. 72 x 50 x 63 mm

With a wall thickness of 1,8 mm. Delivery with four fastening screws for the case cover.

Technical Data:
Dimensions (L x W x D): approx. 72 x 50 x 63 mm (tolerance ~1%)

4024028060293

G02B | 6 V Plastic Case, Large approx. 123 x 72 x 39 mm

Double wall black plastic case with a large battery box for incorporation of a battery support for 4 round cells.

Technical Data:
Dimensions (L x W x D): approx. 123 x 72 x 39 mm (tolerance ~1%)

4024028060033

G030 | Case feet, black, small 12 x 7 mm

Case feet, black. For screwing down, made of soft-plastic.
Packing unit 50 pieces.

Technical Data:
Dim.: 12 x 7 mm

4024028060309

G03B | Plastic Case With Battery Box 9 V approx. 104 x 62 x 30 mm

Double wall black plastic case with battery box for incorporation of a 9V-compound battery or a battery holder for two AAA-battery cells with sliding for the battery box.

Technical Data:
Dimensions (L x W x D): approx. 104 x 62 x 30 mm (tolerance ~1%).

4024028060927

G050 | Case feet, black, large 22 x 13 mm

Case feet, black. For screwing down, made of soft-plastic.
Packing unit 50 pieces.

Technical Data:
Dim.: 22 x 13 mm

4024028060507

G059 | Module Case approx. 40 x 40 x 12 mm

Case to build in small wirings. Black case, with fixing straps, without bottom.

Technical Data:
Dimensions (L x W x D): approx. 40 x 40 x 12 mm (tolerance ~1%)

4024028060590

G059W | Module Case approx. 40 x 40 x 12 mm (white)

Case to build in small wirings. Black case, with fixing straps, without bottom.

Technical Data:
Dimensions (L x W x D): approx. 40 x 40 x 12 mm (tolerance ~1%)

4024028060583

G060 | Modul case approx. 70 x 60 x 23 mm

Sealing case black, without bottom. With fastening straps.

Technical Data:
Dimensions (L x W x D): approx. 70 x 60 x 23 mm (without fastening straps) (tolerance ~1%)

4024028060606

G061 | Mini module case approx. 30 x 25 x 15 mm

With fixing straps and cover. With fastening pivot for a board.

Technical Data:
Color: black
Dimensions without fixing staps (L x W x D): approx. 30 x 25 x 15 mm (tolerance ~1%)

4024028060613

G062 | Working bowl, ca. 205 x 130 x 35 mm

Working bowl

Technical Data:
Dim.: approx. 205 x 130 x 35 mm

4024028060620

G070 | Module case long approx. 120 x 50 x 24 mm

Black sealing case with possibility to fasten one board. The bottom is open. With fixing straps.

Technical Data:
Dimensions (L x W x D): approx. 120 x 50 x 24 mm (incl. fixing straps) (tolerance ~1%).

4024028060705

G080 | Standard Flat Case approx. 120 x 70 x 20 mm

Case for the installation of board material in half euro format.

Technical Data:
Dimensions (L x W x D) ca. 120 x 70 x 20 mm (tolerance ~1%)

4024028060804

G081N | Standard Case approx. 120 x 70 x 35 mm

Case for the installation of board material in half euro-format.

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 35 mm (tolerance ~1%)

4024028060811

G082N | Standard case "middle" approx. 120 x 70 x 50 mm

Case for the installation of board material in half euro format.

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 50 mm (tolerance ~1%)

4024028060828

G083N | Standard Case "High" approx. 120 x 70 x 65 mm

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 65 mm (tolerance ~1%)

4024028060835

G084 | Standard Wall Case "Flat" approx. 120 x 70 x 20 mm

Wall case for the installation of board material.

Technical Data:
Dimensions (L x W x D): approx. 120 x 70 x 20 mm (tolerance ~1%)

4024028060842

G085N | Standard Wall Case approx. 120 x 70 x 35 mm

Wall case for the installation of board material.

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 35 mm (tolerance ~1%)

4024028060859

G086 | Standard Wall Case "medium" approx. 120 x 70 x 50 mm

Wall case for the installation of board material in half euro format.

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 50 mm (tolerance ~1%)

4024028060866

G087N | Standard Wall Case, high approx. 122 x 72 x 66 mm

Wall case for the installation of board material in half euro format.

Technical Data:
Dimensions (L x W x D): ca. 122 x 72 x 66 mm (tolerance ~1%)

4024028060873

G088 | Transparent wall case, flat approx. 120 x 70 x 15 mm

Wall cases for the installation of board material in half euro-format. By the clear view lid the wiring remains visible. Ideal to installation of wirings with many visual signaling transmitters (LED's).

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 15 mm (tolerance ~1%)

4024028060880

G089N | Transparent Wall Case, Standard approx. 121 x 71 x 31 mm

Wall cases for the installation of board material in half euro-format. By the clear view lid the wiring remains visible. Ideal to installation of wirings with many visual signaling transmitters (LED's).

Technical Data:
Dimensions (L x W x D): approx. 121 x 71 x 31 mm (tolerance ~1%)

4024028060897

G090 | Transparent cover case, flat approx. 120 x 70 x 15 mm

Cases for the installation of board material in half euro-format. By the clear view lid the wiring remains visible. Ideal to installation of wirings with many visual signaling transmitters (LED's).

Technical Data:
Dimensions (L x W x D): ca. 120 x 70 x 15 mm (tolerance ~1%).

4024028060903

G100 | Display Case approx. 130 x 130 x 17 mm

With holes for wall fastening and wraparound edge for optional assembly of pictures. With transparent front panel. For installation of presentation electronics with illuminants (LEDs, neon lamps, etc.)

Technical Data:
Dimensions (L x W x D): ca. 130 x 130 x 17 mm (tolerance ~1%)

4024028060941

STG15 | Connector case with socket

Case with injection-moulded shock-proof plug and injection-moulded shock-proof socket (each with grounding bow).

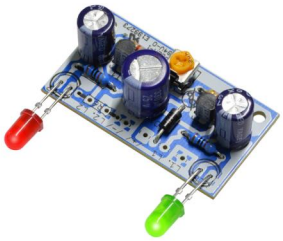
Technical Data:
Color: black
Dimensions (L x W x D): approx. 112 x 67 x 63 mm (measured without connector) (tolerance ~1%)

4024028050997

B003 | Flasher / Alternating Flasher

Flasher / alternating flasher (kit) for 6 - 12 V/DC for connection of small incandescent lamps (max. 300mA) or LEDs (not enclosed). Adjustable clock frequency: approx. 1 - 3 times per second.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 6 - 16 V/DC
Max. load: 0,3 A per output (2 outputs available)
For small lamps: 6 - 16 V/DC
Flashing speed: adjustable, approx. 1 - 3 times per second
Board dimensions: approx. 45 x 25 mm



4024028010038

B042 | Time switch (short), 2 sec - 5 min.

After pressing the key the installed relay switches on for approx. 2 seconds up to approx. 5 minutes (adjustable) and then switches off again.
Fitting case: G024N - Case With Fastening Straps approx. 72 x 50 x 41 mm

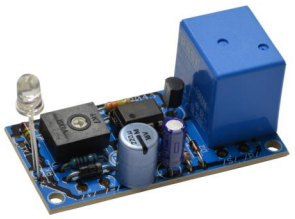
Technical Data:
Operating voltage: approx. 12 V/DC
Power consumption: approx. 40 mA
Switching times: approx. 2 sec. - 5 min. adjustable
Relay-breaking capacity: max. 3 A, max. 25 V
Board dimensions: approx. 54 x 44 mm

4024028010427

B045 | Light barrier 12 V/DC

The kit switches on/off a relay at light and darkness (shadow).
Usage: Whenever the light beam of a lamp on doors, windows, etc. is interrupted by a person, the relay connects. Also suitable as twilight switch.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 12 V/DC
Current consumption: < 100 mA
Relay contact: 1 x ON, max. 3 A max., 25 V
Sensitivity: adjustable
Designed for visible light
Size of board: approx. 56 x 27 mm

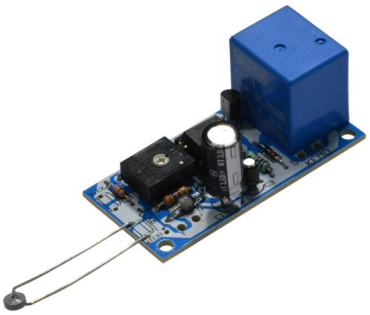


4024028010458

B048 | Temperature switch 12 V/DC

Switches according to a preset temperature a relay on or off. Ideal as thermostat, ice alarm, fire detector, etc.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 12 - 14 V/DC
Current consumption: approx. 100 mA at maximum
Temperature switching range: approx. -30°C - +150°C
Relay contact: 1 x ON
Contact capacity relay: max. 25 V, 3 A
Board dimensions: approx. 56 x 27 mm



4024028010489

B051N | Gas Sensor | Spirits tester

This instrument indicates gases such as alcohol, acetone, benzole, propane, carbon monoxide (contained in the smoke of fire). Perfect as alarm for gases and fire.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 12 V/DC
Current consumption: approx. 180 mA
Indication: LED and relay (1 x ON, 3 A)
Board dimensions: approx. 58 x 45 mm

4024028010519

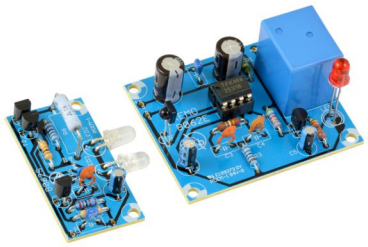
B062 | Infrared light barrier - max. approx. 18 m

This light barrier uses the IC U2531B and works with invisible infrared light beams. Transmitter and receiver included!
Ideal for alarm systems, automatical animal picturing, remote control for garage doors, etc. With incorporated infrared filter for day operation!

Fitting cases:
• G026N - Plastic Case approx. 72 x 50 x 28 mm
• G027N - Plastic Case approx. 72 x 50 x 35 mm

Datasheet U2531B

Technical Data:
Operating voltage transmitter: 9 V/DC
Operating voltage receiver: 12 V/DC
Relay contacts: 1x ON, max. 25 V / 3 A
Board dimensions transmitter: approx. 24 x 45 mm
Board dimensions receiver: ca. 55 x 45 mm



4024028010625

B073 | Pre-amplifier, universal super broadband: aprox. 10 Hz - 150 kHz!

Super broadband: aprox. 10 Hz - 150 kHz!
Application: 2-step preamplifier for high-power amplifier, headphones-amplifier, etc.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

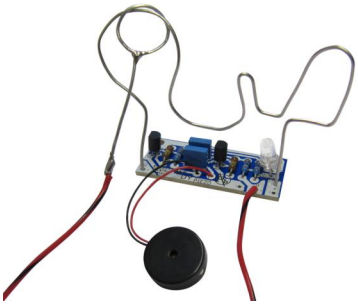
Technical Data:
Operating voltage: 12 - 30 V/DC
Super Broadband: approx. 10 Hz - 150 KHz
Input sensitivity: approx. 2 - 20 mV
Output: app. 200 mV - 2 V
Structure: 2 - stage
Board dimensions: approx. 54 x 29 mm

4024028010731

B081 | Deftness game

The matter is to pass a small wire loop through a thread wire with a lot of bends and obstacles. The person who touches the thread wire with the wire loop, will release an acoustic and optic signal. An interesting game for parties and for never-ending evenings.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 9 - 12 V/DC
Error indication: optical + acoustical
Board dimensions: approx. 45 x 20 mm



4024028010816

B085 | Parabolic-Microphone

When installing into a hemispherical reflector (e.g. a plastic ball divided in halves) this highly sensitive microphone is able to record noises and speech from a distance of several hundred meters. Ideal for observing animals, for detectives, etc.
Fitting case: G085N - Standard Wall Case approx. 120 x 70 x 35 mm

Technical Data:
Acoustic sensor: high-sensitive FET capacitor microphone
Sensitivity: adjustable
For headphone connection: 8 - 32 ohm
Operating voltage: 9 V/DC
Power consumption: max. approx. 230 mA
Size of board: approx. 55 x 55 mm

4024028010854

B092 | LED-alternating flasher

2 differently coloured light emitting diodes will flash alternately. Adjustable flashing velocity.
Usage: flashing adornments, name-plates, for miniature constructions etc.
Fitting case: G01B - 9 V/DC Plastic case, small approx. 102 x 61 x 26 mm

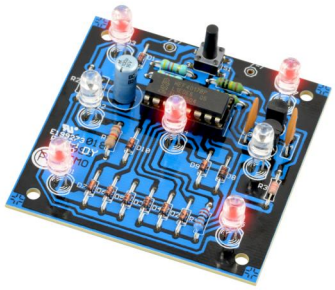
Technical Data:
Operating voltage: 6 - 12 V/DC (9 V/DC battery)
Power consumption: approx. 20 mA
Flashing frequency: adjustable
Board dimensions: approx. 26 x 25 mm

4024028010922

B093 | Electronic dice

After pressing a key this digital die indicates depending on chance a number between 1 - 6. Indication takes place via LED's.
Fitting case: G100 - Display Case approx. 130 x 130 x 17 mm

Technical Data:
Operating voltage: 9 - 15 V/DC battery or stabilized power supply
Current consumption: < 20 mA
Indication: numbers Die numbers 1 - 6 via LEDs
Clock frequency: approx. 30 Hz
Dimensions of the board: approx. 60 x 60 mm



4024028010939

B133 | Precision timer

Adjustable time switch for switching operations from approx. 1 sec. to approx. 40 minutes. The device switches on after pressing the key and switches off again when the adjusted time has expired. The lapse of time may be interrupted any time with the reset key.
Fitting case: G024 - Case With Fastening Straps approx. 72 x 50 x 41 mm

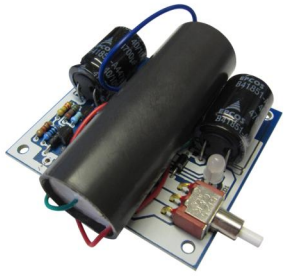
Technical Data:
Adjustable time: approx. 1 sec. to 10 min. or approx. 3 sec. to 40 min.
Adjustment of time: with an adjustable regulator
Operating voltage: 12 V/DC
Current consumption: < 50 mA
Rupturing capacity: max. 25 V, max. 3 A
Switching contact: 1 x ON
Board dimensions: approx. 56 x 45 mm

4024028011332

B181N | Paralyser 15.000 V

Produces high-voltage sparks of more than 15,000 V from a 9 V battery, which may even penetrate through cloth. Ideal as self-defence against wild animals, etc. or for physical experiments. The possession as a weapon is prohibited in many countries (e.g. in the EU). A deterrent effect is already achieved through the sparks flashing over and the sparking crackle!
Fitting case: G02B - 6 V Plastic Case, Large approx. 123 x 72 x 39 mm

Technical Data:
Operating voltage: 9 V alkaline block battery
Current consumption: temporary (keystroke) 100 - 200 mA
Output voltage (spark): > 15.000 V
Frequency of sparks: 1 spark per keystroke, spark sequence: may be released every 2 seconds at maximum
Board size: approx. 64 x 68 mm

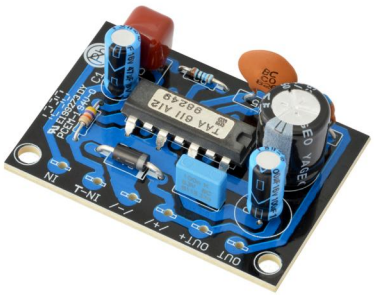


4024028011813

B182 | Amplifier 1 W

Small universal amplifier with a peak sound capacity of 2 W. A modern, low cost amplifier for many purposes. It works with an 8-pin DIP IC, the design is very small, so that this amplifier can be integrated into many devices.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Power: max. 2 W music power
Operating voltage: 6 - 9 V/DC
Current consumption: max. 380 mA
Loudspeaker connection: 8 ohm
Frequency range: approx. 20 - 20.000 Hz
Sensitivity: approx. 80 mV
Dimension of the board: approx. 45 x 32 mm



4024028011820

B185 | Flasher 6 - 12 V/DC, max. 100 mA

Electronic flasher unit for glow lamps. Also suitable as alternating flasher. Flashing frequency: approx. 1 - 3 x per second. Ideal for usage within miniature constructing!
Together with the additional kit "B197 - Relay card 12 V/DC" (not included in this kit) it is feasible to operate flashers with loads up to 3 A current consumption!
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Additional kit: B197 - Relay card 12 V/DC

Technical Data:
Operating voltage: 6 - 12 V/DC
Switch current: max. 100 mA
Flashing frequency: approx. 1 - 3 x per second
For small lamps: 6 - 12 V/DC
Board dimensions: approx. 45 x 26 mm

4024028011851

B186 | Jumbo LED flasher

Electronic flasher unit with a great Ø 8 mm light emitting diode.
For decoration, models etc.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: approx. 6 - 12 V/DC
Flashing frequency: approx. 60 - 120 x per minute
Board dimensions: approx. 21 x 55 mm

4024028011868

B192 | Water Level Sensor 9 V/DC

Whenever two bare wires have contact with water, the light emitting diode will light up. The device is suitable to release alarm in case of overflowing rain barrels and gutters. Operating voltage: 9 V/DC.
As accessories is available the kit B197 - Relay card 12 V/DC, which could be connected with this kit and could switch through the relay contact other devices (e.g. pumps) up to current consumption of 3 A.
Recommended case: G025 - Plastic Case approx. 72 x 50 x 21 mm

Technical Data:
Operating voltage: 9 V/DC
Power consumption: rest (without water contact) < 10 µA, LED shines approx. 15 mA
Indication of water: via LED
Size of board: approx. 45 x 16 mm

4024028011929

B195 | Infrared detector

With the aid of this circuitry it is made possible to carry out functional tests of infrared remote controls used in TV-sets and video devices, etc. Whenever there is radiation of infrared beams on the Special-Sensor, the LED will light up and indicate that the infrared remote control is operated.
As accessories is available our kit "B197 | Relay card 12 V/DC". This could be connected with the Infrared Detector and it is then possible to switch through the relay contact loads up to 3 A.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Additional kit: B197 - Relay card 12 V/DC

Technical Data:
Operating voltage: 9 V/DC (8 - 12 V/DC)
Current consumption without signal: < 200 µA
Current consumption with a signal of a IR remote control: approx. 2 - 15 mA
Range between remote control and infrared detector: approx. 2 - 10 cm, depending on the remote control
Function display: via a light-emitting diode
Size of board: approx. 17 x 58 mm

4024028011950

B197 | Relay card 12 V/DC

This relay card could be released with weak signals from approx. 5 mA upwards and will then switch a relay with a heavy current contact of 3 A. Ideal as switching amplifier for other kits, which have solely a light emitting diode as output and should switch other devices and machines through the relay contact.
Fitting case: G027N - Plastic Case approx. 72 x 50 x 35 mm

Technical Data:
Operating voltage: 12 V/DC
Current consumption: < 80 mA
Contact capacity: 3 A / 30 V
Contact 1 x ON
Sensitivity: < 5 mA
Board dimensions: approx. 44 x 18 mm

4024028011974

B214 | Ultrasonic proximity sensor

An LED lights up if a body approaches the ultrasonic sensors at a distance of 10 - 80 cm (depending on the size of the body). Use: parking-in assistance for cars in garages, alarm signal for persons or animals staying in a certain area. Operating voltage: 9 - 12 V/DC. The device works according to the same principle as the ultrasonic echo ranging of bats!
This kit may be extended to relay operation with our relay board "B197" (not enclosed).
Please notice the article "Peilen wie die Fledermaus" from the german magazine "Electronic Actuell Magazin" no.7/99.

Fitting case: G023 - Case With Fastening Straps

Additional kit: B197 - Relay card 12 V/DC

Technical Data:
Operating voltage: 9 - 12 V/DC
Operating frequency: approx. 40 kHz
Range: approx. 10 - 80 cm, depending on the size of the body (approx. 0,01 - 0,5 m²)
Display: LED
Current consumption: < 10 mA
Board dimensions: approx. 55 x 45 mm

4024028012148

B223 | Infrared spotlight

With the infrared spotlight CCD- and video cameras may recognize objects also in complete darkness. The infrared light is invisible for men, CCD-cameras can see well with an infrared spotlight. Perfect for inconspicuous observation of entrances, drives etc.
Fitting case: G089N - Transparent Wall Case, Standard approx. 121 x 71 x 31 mm

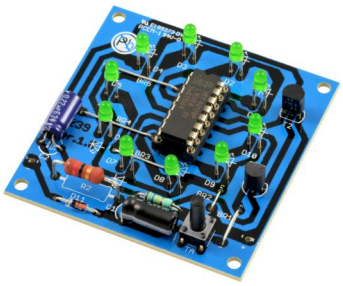
Technical Data:
Operating voltage: 12 - 14 V/DC
Current consumption: approx. 300 mA
Light wave length: approx. 870 - 950 nm
Board dimensions: approx. 74 x 56 mm

4024028012230

B239 | Electronic wheel of fortune

After releasing the push-button, the light signal rotates quickly at the 10 LEDs, slows down and then stops at random at one of the LEDs. During operation all LEDs shine except that LED that just receives the signal. That's why the luminous board looks very decorative.
Fitting case: G100 - Display Case approx. 130 x 130 x 17 mm

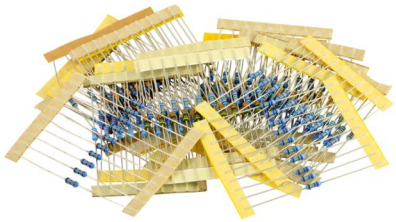
Technical Data:
Operating voltage: 9 - 12 V/DC
Number of LEDs: 10
Board dimensions: approx. 56 x 56 mm



4024028012391

S001 | Resistors approx. 200 pieces

Resistors approx. 200 pieces. Different values.



4024028040011

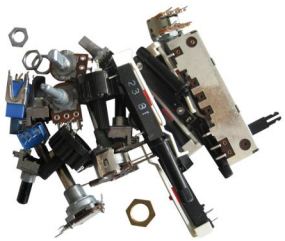
S003 | Trimming poteniometers approx. 50 pieces

Trimming poteniometers approx. 50 pieces

4024028040035

S004 | Potentiometers approx. 20 pieces

Potentiometers approx. 20 pieces



4024028040042

S005 | Elektrolytic capacitors approx. 50 pieces

Elektrolytic capacitors approx. 50 pieces

4024028040059

S007 | Ceramic capacitores approx. 100 pieces

Ceramic capacitors approx. 100 pieces

4024028040073

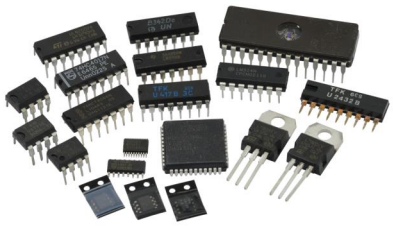
S009 | Switches + key buttons approx. 20 pieces

Switches + key buttons approx. 20 pieces

4024028040097

S012 | Intergrated Circuits

Intergrated circuits, approx. 20 pieces. Partly with datasheet Random Assortment.
Different types.



4024028040127

S023 | Coils + chokes + filters, approx. 50 pieces

Coils, chokes, filters, approx. 50 pieces

4024028040233

S035 | Trimming capacitors, ceramic, approx. 20 pieces

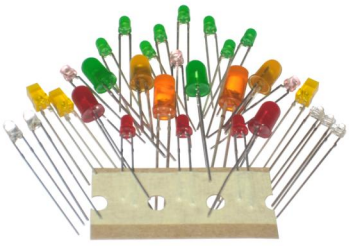
Trimming capacitors, ceramic, approx. 20 pieces

4024028040356

S036 | Light emitting diodes approx. 30 pieces

Lucky bag with different LED types This bag contains standard-LEDs of different colours and form. All LEDs run with a current of 10 mA or less. Each LED has to be set into operation by using a series resistor, which limits-according to the operating voltage- the current to 10 mA or less. The LEDs can only be used with direct voltage.
The LEDs have different operating voltages, according to their colour.

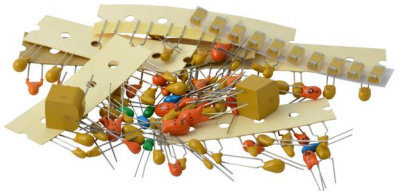
Equipment
• Red approx. 1.6 V
• Green approx. 2.1 V
• Yellow approx. 1.8 V
• Infrared approx. 1 V (invisible light for humans, for infrared remote control)



4024028040363

S040 | Tantalum elcas, approx. 100 pieces

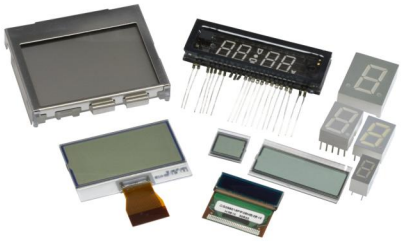
Tantalum elcas, approx. 100 pieces



4024028040400

S043 | LED+LCD Displays

LED+LCD Displays, approx. 10 pieces, random assortment



4024028040431

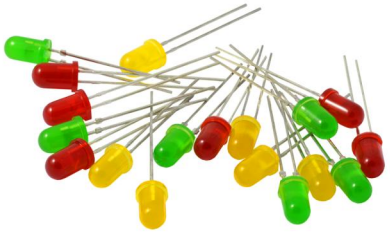
S049 | Soldering terminals assorted, approx. 50 pieces

Soldering terminals assorted, approx. 50 pieces

4024028040493

S050 | LEDs red-green-yellow Ø 5mm, approx. 18 pieces

LEDs red-green-yellow Ø 5mm, approx. 18 pieces



4024028040509

S051 | Fuses, approx. 30 pieces

Fine Fuses, approx. 30 pieces

4024028040516

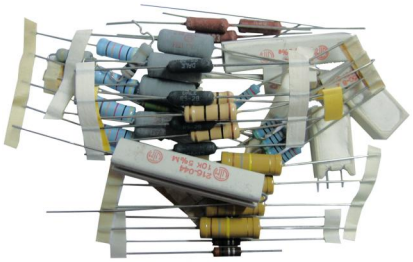
S052 | Film capacitors approx. 100 pieces

Film capacitors approx. 100 pieces

4024028040523

S053 | Power resistors app. 50 pcs

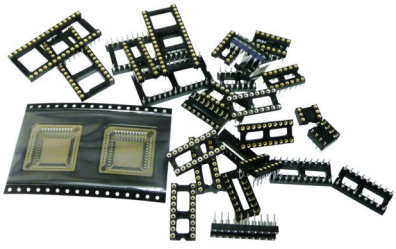
Power resistors, different types



4024028040530

S057 | IC-socket, approx. 30 pieces

IC-socket, approx. 30 pieces



4024028040578

S058 | Heat shrink tubes, approx. 15 pcs

Heat shrink tubes, approx. 15 pcs

4024028040585

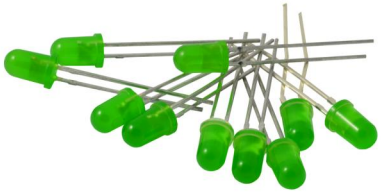
S062 | LED Ø 5mm red, approx. 10 pieces

LED Ø 5mm red, approx. 10 pieces

4024028050621

S063 | LED Ø 5mm green, approx. 10 pieces

LED Ø 5mm green, approx. 10 pieces



4024028050638

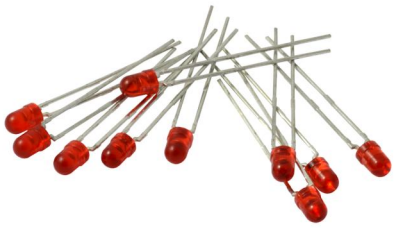
S064 | LED Ø 5mm yellow approx. 10 pieces

LED Ø 5mm yellow approx. 10 pieces

4024028050645

S065 | LED Ø 3mm red approx. 10 pieces

LED Ø 3mm red approx. 10 pieces



4024028050652

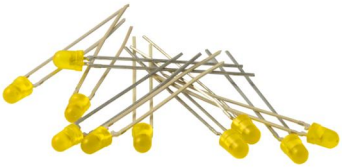
S066 | LED Ø 3mm green, approx. 10 pieces

LED Ø 3mm green, approx. 10 pieces

4024028050669

S067 | LED Ø 3 mm yellow, approx. 10 pieces

LED Ø 3 mm yellow, approx. 10 pieces



4024028050676

S071 | LED Ø 3 mm red approx. 50 pieces

LED Ø 3mm red approx. 50 pieces

4024028050713

S072 | LED Ø 3 mm green approx. 50 pieces

LED Ø 3mm green approx. 50 pieces

4024028050720

S076 | Duo-LED Ø 5 mm red/green, approx. 10 pieces

Duo-LED Ø 5 mm red/green, approx. 10 pieces

4024028050768

S078 | Line up LED Ø 5 mm green approx. 10 pieces

Line-up LED Ø 5 mm green approx. 10 pieces

4024028050782

S079 | Line up LED Ø 5mm red approx. 10 pieces

Line-up LED red approx. 10 pieces Ø 5mm

4024028050799

S080 | Line up LED Ø 5mm yellow approx. 10 pieces

Line-up yellow approx. 10 pieces Ø 5mm

4024028050805

S081 | Infrared LED Ø 5mm approx. 10 pieces

Infrared LED Ø 5mm approx. 10 pieces

4024028050836

S093 | LED-creative-set

Approx. 50 light-emitting diodes and 20 resistors, for operation of the light-emitting diodes at 6 V/DC or 12 V/DC. With detailed description and connecting diagrams.
Different Types.
Equipment:
Approx. 50 Led’s
Approx. 20 resistors:
• 6 x R1 = 165 ohm
• 6 x R2 = 680 ohm
• 8 x R3 = 820 ohm

4024028041025

S097 | LED Ø 3 mm orange approx. 10 pieces

LED Ø 3mm orange approx. 10 pieces

4024028041063

S102 | LED white Ø 3 mm 5 pieces

LED white Ø 3 mm 5 pieces

4024028041186

S104 | Micro switches and buttons, approx. 30 pcs.

30 pieces random micro switches and buttons. Pictures are just examples, pieces may vary

4024028041209

S105 | Piezo speakers and microphones, approx. 20 pcs.

Approx. 20 pcs. Random assortment. Different types. Partly with datasheet. Not all listed types are inevitably included.

4024028041230

S106 | Power MOSFET & IGBT Transistors

Approx. 20 pcs. Mixed assortment. Various types.

4024028041223

S108 | SMD Transistors Approx. 100 pieces

SMD Transistors Approx. 100 pieces

4024028041247

S109 | Optical fiber cable, approx. 2 m

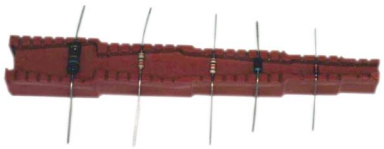
Conducts light and other optical signals to another place. For use in model making, decoration applications, audio applications. With black outer sheath so that the light can only exit at the end. It may be put before LED light sources in models, can be shortened as desired and is flexible.

Technical Data:
Outside: Ø approx. 2.2 mm
Inner conductor: Ø approx. 1 mm
Cable profile: fiber optic
Bending radius: at least 25 mm
Attenuation: approx. 0.23 dB/m

4024028041254

A001 | Bending device

For resistors, diodes, chokes, capacitors and electrolytic capacitors.
Earmarked for five grid sizes: 7,5 / 10 / 12,5 / 15 / 17,5 mm.
Bending device is a usefull accessory for all of our kits and many assortments.



4024028060019

Ä100 | Etchant

White etchant: approx. 100g (sodium persulphate) for engraving of boards.
Sufficient for 0,5l water.
Inclusive instruction manual.

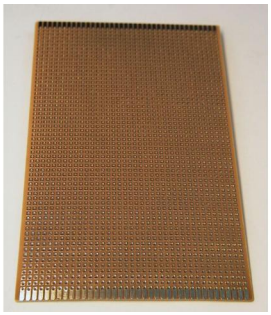
Attention:
Commercial resellers must follow the Banned Chemicals Ordinance.

4024028070308

E002 | Experimental board - dot grid

Experimental board in euro measurement, flash-gold plated (better for soldering "lead-free"). FR2 Phenolic paper

Technical Data:
One-side copper layer: approx. 35 µm
Material: FR2 (Phenolic paper)
Hole distance: 2.54 mm
Hole: Ø approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm



4024028070025

E003 | Experimental board - strip grid

Experimental board in euro measurement, flash-gold plated (better for soldering "lead-free"). FR2 Phenolic paper

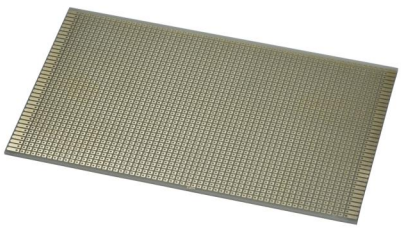
Technical Data:
One-side copper layer: approx. 35 µm
Material: FR2 (Phenolic paper)
Hole distance: 2.54 mm
Hole: Ø approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm

4024028070032

E004 | Experimental board - dot grid

Experimental board in euro measurement, flash-gold plated (better for soldering "lead-free"). FR4 fiberglass laminate

Technical Data:
One-side copper layer: approx. 35 µm
Material: FR4 fiberglass laminate
Hole distance: 2.54 mm
Hole: Ø approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm

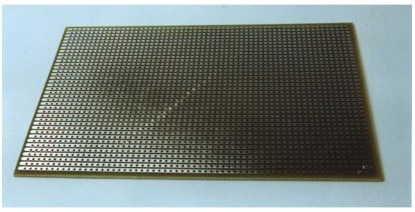


4024028070049

E005 | Experimental board strip grid

Experimental board in euro measurement, flash-gold plated (better for soldering "lead-free"). FR4 fiberglass laminate

Technical Data:
One-side copper layer: approx. 35 µm
Material: FR4 fiberglass laminate
Hole distance: 2.54 mm
Hole: Ø approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm

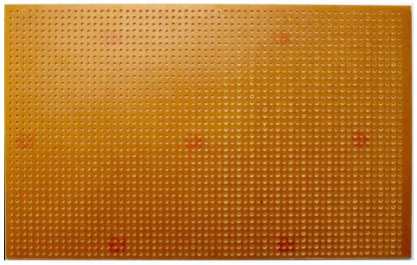


4024028070056

E010 | Experimental board, punched

Experimental board in euro measurement. FR2 Phenolic paper

Technical Data:
Without copper layer
Hole distance: 2.54 mm
Material: FR2 (Phenolic paper)
Diameter of holes: approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm

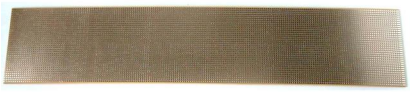


4024028070223

E011 | Experimental board, strip grid

Flash-gold-plated (better for soldering "lead-free"). FR2 Phenolic paper

Technical Data:
One-side copper layer: approx. 35 µm
Hole distance: 2.54 mm
Diameter of holes: approx. 1 mm
Material: FR2 (Pertinax) gold plated
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 500 mm

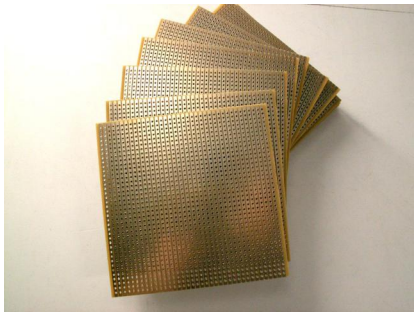


4024028070230

E012 | Experimental board, strip grid

Flash-gold-plated (better for soldering "lead-free"). FR2 Phenolic paper

Technical Data:
One-side copper layer: approx. 35 µm
Material: FR2 (Phenolic paper)
Hole distance: 2.54 mm
Diameter of holes: approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 100 mm

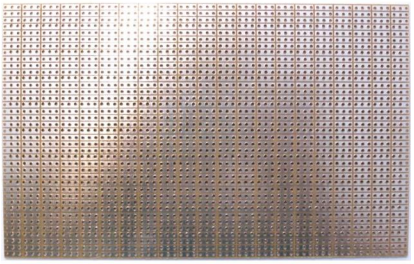


4024028070247

E013 | Experimental board, with 3 strip grid

The strip raster is interrupted every 3rd hole. One-side copper layer, flash-gold plated (better for soldering "lead-free"). FR2 Phenolic paper

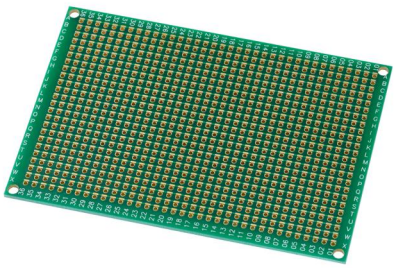
Technical Data:
One-side copper layer: approx. 35 µm
Material: FR2 (Phenolic paper)
Hole distance: 2.54 mm
Diameter of holes: approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 160 mm



4024028070254

E014 | Experimental board dot/matrix grid

Experimental board in half euro measurement, double sided, flash-gold plated (better for soldering "lead-free").
Each contact point (hole) can optionally be connected to the adjacent strip trace with a solder bridge. On the board, these strip conductors run horizontally on one side and vertically on the other side. This allows simple connections between the individual holes.
FR4 fiberglass laminate

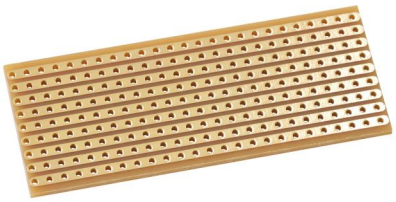


Technical Data:
Double sided copper layer: approx. 35 µm
Material: FR4 fiberglass laminate
Hole distance: 2.54 mm
Hole: Ø approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 100 x 70 mm

4024028070292

E015 | Experimental board, strip grid, small

Flash-gold-plated (better for soldering "lead-free"). FR2 Phenolic paper



Technical Data:
One-side copper layer: approx. 35 µm
Material: FR2 (Phenolic paper)
Hole distance: 2.54 mm
Diameter of holes: approx. 1 mm
Thickness: approx. 1.5 mm
Dimensions: approx. 25 x 64 mm

4024028070889

E100 | Developer 10g (sodium hydroxide)

For development of photopositive coated boards.

Attention:
Commercial resellers must follow the Banned Chemicals Ordinance.

4024028071008

E250 | Developer for photopositive boards 250g

For development of photopositive coated boards. Natriumhydroxid NaOH. 10g dissolve in 1L water.

Attention:
Commercial resellers must follow the Banned Chemicals Ordinance.

4024028070001

P5123 | Mini piezoelectric tweeter for M094N

With aluminium spherical cap for especially low distortion and constant high pitch radiation. Very suitable for ultrasonic vermin scares because these robust loudspeakers are small and can be installed in narrow angles

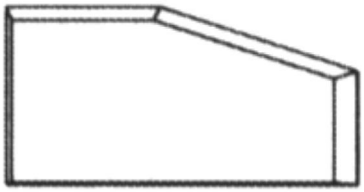
Technical Data:
Frequency range: approx: 2.500 - 45.000 Hz
Dimension: Ø approx. 30 x 13 mm

4024028040875

TK55XX | Transponder key plastic

Substitute transponder key for M126N - Electronic key
Please hold the black tip of the plastic part in the centre of the switching surface of the switching module M126N to trigger switching.

Technical Data:
Frequency: approx. 125...128 kHz
Switching distance: approx. 2...5 mm
Dimensions: approx. 12 x 6 x 3 mm



4024028071565

W001 | Plastic forceps

Internal geared point with an especially broad and flexible clamping surface. Ideal for works at alive parts or for handling caustic baths.

Technical Data:
Lenght: approx. 125 mm

4024028060002

Z001 | 8 Roof Brackets for anti-marten electric fence

Roof brackets for attaching bare wires to a rain gutter to set up an electric fence against martens. Extension for FG025 electronic fence generator. Contains 8 roof brackets and 8 screws.

Attachable to:
FG025 - Pasture Fence Device - High-Voltage Device for Electric Fences
FG025SET - Marten and Raccoon Repeller Electric Fence

See also:
Z002 - 1 Damp and 6 Roof Brackets
Z003 - Bare Stainless Steel Wire, approx. 100m

4024028042756

Z002 | 1 Damp and 6 Roof Brackets

Damp and Roof brackets for attaching bare wires to a downpipe to set up an electric fence against martens. Extension for FG025 electronic fence generator. Contains 1 damp (2-parts) and 6 roof brackets, 6 screws M5 x 25 mm for roof brackets for fasting at the pipe clamp and 2 screws M6 x 60 mm with nut for joining the pipe clamps.

Attachable to:
FG025 - Pasture Fence Device - High-Voltage Device for Electric Fences
FG025SET - Marten and Raccoon Repeller Electric Fence

See also:
Z001 - 8 Roof Brackets for anti-marten electric fence
Z003 - Bare Stainless Steel Wire, approx. 100m

4024028042763

Z003 | Bare Stainless Steel Wire, approx. 100m

Bare Stainless Steel Wire, approx. 100m

Attachable to:
FG025 - Pasture Fence Device - High-Voltage Device for Electric Fences
FG025SET - Marten and Raccoon Repeller Electric Fence

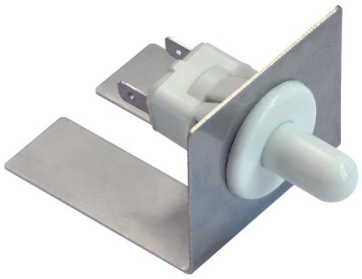
See also:
Z001 - 8 Roof Brackets for anti-marten electric fence
Z002 - 1 Damp and 6 Roof Brackets

4024028042770

Z004 | Bonnet switch for anti marten devices in cars

Please place the switch in a way, that the pin is 60 - 80% pressed when the hood is closed. Then the connected anti marten device turns on. The pin must not be pressed to the limit, because the switch can then be broken when the hood is slammed vigorously (the pin then strikes against the stopper and pushes the switch bottom out).

Package Contents:
1 bonnet switch (1 x ON)
1 stainless steel mounting bracket
2 female terminal 4,8 mm



4024028042794

Z100 | Marten Repellent Spray

Highly effective (heat-resistant!) concentrate in a pump bottle (no pressurized spray cans). This agent has been proven effective thousands of times over!

The active ingredient geraniol spray almost always drives away the marten from the engine compartment of your car, from the attic, etc.

Tip:
Before the first application remove existing marten scent with our Z101 - Scent marks remover or a thorough engine wash.

Content: 500 ml concentrate corresponds to approximately 1.3 liters of non-concentrated liquid.

Technical Data:
• Use the Spray safely. Before use always read label and product information.
• Keep locked up and out of the reach of children.
• Avoid contact with eyes and skin.
• Active ingredient: 1.5 g / l geraniol.
May cause allergic reactions.
BAuA No.: 47927
Use biocides safely. Always read the label and product information before use.

4024028040684

Z101 | Scent marks remover

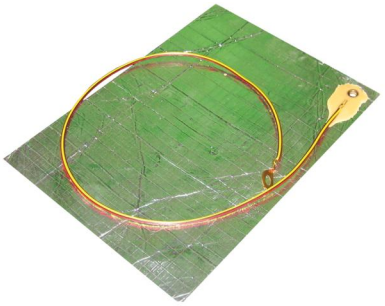
4024028040691

FOR THE RELIABLE REMOVAL OF MARTEN SCENT MARKS IN THE ENGINE COMPARTMENT APPLY BEFORE THE USE OF MARTEN REPELLENT PRODUCTS WITHOUT THE INITIAL REMOVAL OF SCENT MARKS, THE MARTEN FEELS PROVOKED AND DEFENDS HIS TERRITORY. NOT AN ENGINE CLEANER. ESPECIALLY FOR SCENT MARKS.

Application: Apply only when engine / engine compartment is cool!
• Spray the Scent Marks Remover inside the engine compartment including the hood and fenders.
• Wait approx. 2-3 minutes, and then rinse with water. Do not rinse with high pressure washer.
• Please be especially careful around sensitive electronic parts!
Scent marks remover alone does not protect against marten damage. For protection against marten damage please use a marten repellent device or our Z100 - Marten Repellent Spray.

Technical Data:
Safety Precautions: Liquid and vapor flammable. Causes severe eye irritation.If medical advice is required, provide packaging or identification label.Keep out of reach of children. Read identification label before use. Keep away from heat, hot surfaces, sparks, open flames and other sources of ignition. Do not smoke. IF IN CONTACT WITH THE SKIN (or the hair): Remove all contaminated clothing immediately. Wash skin with water / shower. IF IN CONTACT WITH THE EYES: Rinse cautiously with water for several minutes. In case you have contact lenses, remove if possible, before rinsing. Continue rinsing. Keep in a well-ventilated place. Keep it cool.
Disposal Instructions: Small amounts can be diluted with plenty of water and washed away. Contaminated packaging is to be emptied optimally, they can be recycled after appropriate cleaning.
Ingredients:

Z115 | "Ground"-Mat for electroshock devices



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Against martens and rodents in vehicles and buildings In vehicles:
This is an accessory for contact plate-electroshock devices, which are used against martens in vehicles. The martens that enter into the engine department do only get an electric shock upon touching the high-voltage contact plates if they touch the vehicle mass (chassis) with the paws at the same time. But nowadays there are cars that are largely laid out with plastic linings. In such cases the marten's contact with the high-voltage contact plates is without effect as the simultaneous contact with the vehicle mass (chassis) is missing. In this case it is necessary that this self-adhesive "ground" mat is affixed close to the high-voltage contact plates so that the marten will touch this with the paws at the same when it bites into the high-voltage contact plates. A cable is affixed to the "ground" mat, which has to be electrically connected to the nearest ground point of the vehicle.
The "ground" mat must not be exposed to temperatures above 60°C.
On lofts:
This "ground" mat may also be mounted inside at the entrance holes, e.g. on lofts, in order to chase away the martens out of the house. In this case the mat has to be affixed at the bottom of the entrance hole on the floor, the high-voltage contact plates have to be mounted at the marten's eye level directly vis-a-vis and the cable of the "ground" mat is to be connected with the ground connection (negative pole of the battery) of the high-voltage marten defence. If the marten now wants to slip through its entrance hole into the loft, it will then unevitably touch the "ground" mat with the paws and one high-voltage contact plate with the snout or forepaws. If the marten then gets an electric shock, it will escape.
It is recommendable to chase away the marten with strong ultrasonic devices in addition (> 20 kHz, > 100 dB).

Accessory for:
M186 - Marten Defence for Motor Vehicles 12 V/DC
M176 - Marten Defence for Motor Vehicles 12 V/DC, splash-proof with IP 65*

Technical Data:
Dimensions: approx. 210 x 150 x 2 mm

Z176 | Extension-set 2 highvoltage plates for M176

The Expansion set contains 2 adjustable plastic sockets, 2 stainless steel high voltage plates and 4 stainless steel screws 2,9 x 9,5 mm.
Accessory for:
M176 - Marten Defence for Motor Vehicles 12 V/DC, splash-proof with IP 65*

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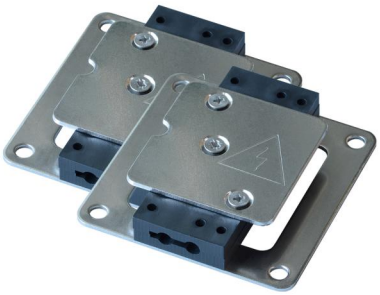
Z229 | Expansion set of 2 positive-negative contact plates for M229

Expansion set of 2 positive-negative contact plates for M229 The expansion set contains 3,2 plastic sockets, 4 stainless steel high voltage plates and stainless steel screws: 4x 2,9 x 9,5 mm and 2x 2,9 x 7,5 mm.



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index by product number

35	G02B	6 V Plastic Case, Large approx. 123 x 72 x 39 mm
35	G030	Case feet, black, small 12 x 7 mm
35	G03B	Plastic Case With Battery Box 9 V approx. 104 x 62 x 30 mm
36	G050	Case feet, black, large 22 x 13 mm
36	G059	Module Case approx. 40 x 40 x 12 mm
36	G059W	Module Case approx. 40 x 40 x 12 mm (white)
36	G060	Modul case approx. 70 x 60 x 23 mm
37	G061	Mini module case approx. 30 x 25 x 15 mm
37	G062	Working bowl, ca. 205 x 130 x 35 mm
37	G070	Module case long approx. 120 x 50 x 24 mm
37	G080	Standard Flat Case approx. 120 x 70 x 20 mm
38	G081N	Standard Case approx. 120 x 70 x 35 mm
38	G082N	Standard case "middle" approx. 120 x 70 x 50 mm
38	G083N	Standard Case "High" approx. 120 x 70 x 65 mm
39	G084	Standard Wall Case "Flat" approx. 120 x 70 x 20 mm
39	G085N	Standard Wall Case approx. 120 x 70 x 35 mm
39	G086	Standard Wall Case "medium" approx. 120 x 70 x 50 mm
40	G087N	Standard Wall Case, high approx. 122 x 72 x 66 mm
40	G088	Transparent wall case, flat approx. 120 x 70 x 15 mm
40	G089N	Transparent Wall Case, Standard approx. 121 x 71 x 31 mm
41	G090	Transparent cover case, flat approx. 120 x 70 x 15 mm
41	G100	Display Case approx. 130 x 130 x 17 mm
27	K001	Plugin axle with button
27	K062-4	Turning knob with grub screw for Ø 4mm axle
27	KL001	Enamelled Copper Wire Ø approx. 0.1 mm
28	KL006	Enamelled Copper Wire Ø approx. 0.6 mm
28	KL007	Enamelled Copper Wire Ø approx. 0.7 mm
28	KL010	Enamelled Copper Wire Ø approx. 1.0 mm
28	KL015	Enamelled Copper Wire Ø approx. 1.5 mm
29	KS006	Silver Plated Copper Wire Ø approx. 0,6 mm
29	KS008	Silver Plated Copper Wire Ø approx. 0,8 mm
29	KS010	Silver Plated Copper Wire Ø approx. 1 mm, 5 m
29	KS012	Silver Plated Copper Wire Ø approx. 1,2 mm
30	L001	Piezo spherical dome tweeter with flare
30	L002	Ultrasonic wall loudspeaker
30	L010	Piezo Loudspeaker
30	L020	Additional Ultrasonic Loudspeaker for M175
3	M012	Power Control 110 / 240 V/AC, 1200 VA
3	M013N	Twilight switch 240 V/AC
3	M015N	DC/DC Converter, adjustable
3	M028	Power control 110 - 240 V/AC, 2600 VA
4	M028N	Power control 110 - 240 V/AC, 4000 VA
4	M029	DC/DC Converter
4	M031N	Amplifier 3,5 W, universal
4	M032N	Amplifier 12 W, universal
5	M032S	Universal Amplifier 12 W "Plug & Play"
5	M033N	Amplifier 18 W, universal
5	M034	Amplifier 40 W, universal
5	M034N	Power Amplifier 40 W
6	M038N	DC-Converter
6	M040N	Universal preamplifier
6	M048N	Ultrasonic Generator
7	M055	Stereo amplifier 3 W
7	M062	Mini-Fence-High-Voltage Generator
7	M063N	Dimmer 12 - 48 V/AC, max. 10 A
7	M069N	Underground mole & vole repeller
8	M071N	Ultrasonic vermin repeller
8	M073N	Motorbike Alarm
8	M079E	Flasher / Alternating Flasher 7 - 24 V/DC
9	M079N	Flasher/Alternating Flasher/Running Light
9	M083	Battery charging regulator 12 V/DC
9	M087N	LED Tester
9	M091A	Phase Coupler for Power Line Products
10	M091N	Phase Coupler for Power Line Products
10	M094N	Marten repeller
10	M100N	Ultrasonic Anti marten device for motor vehicles
11	M101A	Magnet Field Generator
11	M102A	Second battery charger 6 - 24 V/DC
11	M103N	Master/Slave switch 230 V/ AC (400 V/AC)
12	M113A	Time switch 12 - 15 V/DC
12	M113D	Digital Timer 12 V/DC
12	M114N	Flasher, slow 240 V/AC, 110 V/AC
13	M120	Infrared spotlight for CCD cameras
13	M122	Twilight switch 12 V/DC
13	M142	LED Constant current 4 - 30 V/DC
13	M148-24	Battery Guard for 12 or 24 V/DC
14	M148A	Battery guard 12 V/DC
14	M149N	Solar Charging Controller 12 V/DC, 10 A / 20 A
14	M150	DC + pulse converter
15	M152	Rain Sensor 12 V/DC
15	M152K	Rain Sensor, Capacitive
15	M157	Marten defence
16	M158	Water Switch 9 - 12 V/DC
16	M161	Ultrasonic Power Cannon
16	M167N	Level Indicator for Water Tanks
17	M168	Overvoltage Protection 12 V/DC
17	M169A	Temperature switch-thermostat 12 V/DC
17	M171	PWM Power control 9 - 28 V/DC, max. 10 A
17	M172	Bicycle charge controller USB (Mini B)
18	M172N	Bicycle Power Charge Controller USB
18	M173	Soil Humidity sensor 12 V/DC
18	M174	Solar charging regulator Dual 16 A
19	M175	Animal Repeller Ultrasonic High Performance
19	M176	Marten Defence for Motor Vehicles 12 V/DC, splash-proof with IP 65*
20	M180	Anti marten device splash proof IP 65*
20	M186	Marten Defence for Motor Vehicles 12 V/DC
21	M188	Battery Guard 12 V
21	M195	PWM Power control 9 - 28 V/DC, max. 20 A
21	M197	Twilight Switch 12 - 28 V/DC
22	M202	Lead-Acid Battery Activator / Refresher 12 V
22	M203	Master/Slave Switch 230 V/AC - adjustable
22	M204	Power Control 230 V, max. 16 A for heaters
22	M206	Flasher for LED or Incandescent Lamps 9 - 48 V/DC max. 10 A
23	M227	Capacitive Level Indicator
23	M229	Marten Defence for Motor Vehicles, battery-operated with Dual Pol contact plates
23	M234	Marten - Rat - Mouse Repeller
24	M237	Stereo Preamplifier
24	M240	Power Control 230 V/AC, 10 A, Multifunction
24	M241	Vibration Switch 12V DC
61	P5123	Mini piezoelectric tweeter for M094N
47	S001	Resistors approx. 200 pieces
47	S003	Trimming poteniometers approx. 50 pieces
48	S004	Potentiometers approx. 20 pieces
48	S005	Elektrolytic capacitors approx. 50 pieces
48	S007	Ceramic capacitores approx. 100 pieces
48	S009	Switches + key buttons approx. 20 pieces
49	S012	Intergrated Circuits
49	S023	Coils + chokes + filters, approx. 50 pieces
49	S035	Trimming capacitors, ceramic, approx. 20 pieces
49	S036	Light emitting diodes approx. 30 pieces
50	S040	Tantalum elcas, approx. 100 pieces
50	S043	LED+LCD Displays
50	S049	Soldering terminals assorted, approx. 50 pieces
50	S050	LEDs red-green-yellow Ø 5mm, approx. 18 pieces
51	S051	Fuses, approx. 30 pieces
51	S052	Film capacitors approx. 100 pieces
51	S053	Power resistors app. 50 pcs
51	S057	IC-socket, approx. 30 pieces
52	S058	Heat shrink tubes, approx. 15 pcs
52	S062	LED Ø 5mm red, approx. 10 pieces
52	S063	LED Ø 5mm green, approx. 10 pieces
52	S064	LED Ø 5mm yellow approx. 10 pieces

index by name

50	S050	LEDs red-green-yellow Ø 5mm, approx. 18 pieces
16	M167N	Level Indicator for Water Tanks
42	B045	Light barrier 12 V/DC
49	S036	Light emitting diodes approx. 30 pieces
54	S078	Line up LED Ø 5 mm green approx. 10 pieces
54	S079	Line up LED Ø 5mm red approx. 10 pieces
55	S080	Line up LED Ø 5mm yellow approx. 10 pieces
11	M101A	Magnet Field Generator
23	M234	Marten - Rat - Mouse Repeller
26	FG025SET	Marten and Raccoon Repeller Electric Fence
15	M157	Marten defence
20	M186	Marten Defence for Motor Vehicles 12 V/DC
19	M176	Marten Defence for Motor Vehicles 12 V/DC, splash-proof with IP 65*
23	M229	Marten Defence for Motor Vehicles, battery-operated with Dual Pol contact plates
62	Z100	Marten Repellent Spray
10	M094N	Marten repeller
26	FG022	Marten Repeller mobile
11	M103N	Master/Slave switch 230 V/ AC (400 V/AC)
22	M203	Master/Slave Switch 230 V/AC - adjustable
56	S104	Micro switches and buttons, approx. 30 pcs.
37	G061	Mini module case approx. 30 x 25 x 15 mm
61	P5123	Mini piezoelectric tweeter for M094N
7	M062	Mini-Fence-High-Voltage Generator
31	G004	Modul case approx. 60 x 45 x 20 mm
36	G060	Modul case approx. 70 x 60 x 23 mm
36	G059	Module Case approx. 40 x 40 x 12 mm
36	G059W	Module Case approx. 40 x 40 x 12 mm (white)
37	G070	Module case long approx. 120 x 50 x 24 mm
8	M073N	Motorbike Alarm
57	S109	Optical fiber cable, approx. 2 m
17	M168	Overvoltage Protection 12 V/DC
43	B085	Parabolic-Microphone
44	B181N	Paralyser 15.000 V
26	FG025	Pasture Fence Device - High-Voltage Device for Electric Fences
27	FG028	Pasture Fence Device approx. 8000 V
9	M091A	Phase Coupler for Power Line Products
10	M091N	Phase Coupler for Power Line Products
30	L010	Piezo Loudspeaker
56	S105	Piezo speakers and microphones, approx. 20 pcs.
30	L001	Piezo spherical dome tweeter with flare
33	G025N	Plastic Case approx. 72 x 50 x 22 mm
34	G026N	Plastic Case approx. 72 x 50 x 28 mm
34	G027N	Plastic Case approx. 72 x 50 x 35 mm
34	G028N	Plastic Case approx. 72 x 50 x 42 mm
34	G029	Plastic Case approx. 72 x 50 x 63 mm
35	G03B	Plastic Case With Battery Box 9 V approx. 104 x 62 x 30 mm
61	W001	Plastic forceps
31	G010	Plastic Half Shell Enclosure approx. 95 x 135 x 45 mm
27	K001	Plugin axle with button
48	S004	Potentiometers approx. 20 pieces
5	M034N	Power Amplifier 40 W
3	M028	Power control 110 - 240 V/AC, 2600 VA
4	M028N	Power control 110 - 240 V/AC, 4000 VA
3	M012	Power Control 110 / 240 V/AC, 1200 VA
22	M204	Power Control 230 V, max. 16 A for heaters
25	FG002N	Power control 230 V/AC
24	M240	Power Control 230 V/AC, 10 A, Multifunction
56	S106	Power MOSFET & IGBT Transistors
51	S053	Power resistors app. 50 pcs
43	B073	Pre-amplifier, universal super broadband: aprox. 10 Hz - 150 kHz!
44	B133	Precision timer
17	M171	PWM Power control 9 - 28 V/DC, max. 10 A
21	M195	PWM Power control 9 - 28 V/DC, max. 20 A
15	M152	Rain Sensor 12 V/DC
15	M152K	Rain Sensor, Capacitive
46	B197	Relay card 12 V/DC
47	S001	Resistors approx. 200 pieces
31	G007	Ribbed module case approx. 67 x 65 x 37 mm
31	G006	Ribbed module case approx. 70 x 36 x 23 mm
63	Z101	Scent marks remover
11	M102A	Second battery charger 6 - 24 V/DC
29	KS006	Silver Plated Copper Wire Ø approx. 0,6 mm
29	KS008	Silver Plated Copper Wire Ø approx. 0,8 mm
29	KS010	Silver Plated Copper Wire Ø approx. 1 mm, 5 m
29	KS012	Silver Plated Copper Wire Ø approx. 1,2 mm
57	S108	SMD Transistors Approx. 100 pieces
18	M173	Soil Humidity sensor 12 V/DC
14	M149N	Solar Charging Controller 12 V/DC, 10 A / 20 A
18	M174	Solar charging regulator Dual 16 A
50	S049	Soldering terminals assorted, approx. 50 pieces
38	G083N	Standard Case "High" approx. 120 x 70 x 65 mm
38	G082N	Standard case "middle" approx. 120 x 70 x 50 mm
38	G081N	Standard Case approx. 120 x 70 x 35 mm
37	G080	Standard Flat Case approx. 120 x 70 x 20 mm
39	G084	Standard Wall Case "Flat" approx. 120 x 70 x 20 mm
39	G086	Standard Wall Case "medium" approx. 120 x 70 x 50 mm
39	G085N	Standard Wall Case approx. 120 x 70 x 35 mm
40	G087N	Standard Wall Case, high approx. 122 x 72 x 66 mm
7	M055	Stereo amplifier 3 W
24	M237	Stereo Preamplifier
48	S009	Switches + key buttons approx. 20 pieces
50	S040	Tantalum elcas, approx. 100 pieces
42	B048	Temperature switch 12 V/DC
17	M169A	Temperature switch-thermostat 12 V/DC
42	B042	Time switch (short), 2 sec - 5 min.
12	M113A	Time switch 12 - 15 V/DC
32	G021	Transparent Case approx. 72 x 50 x 40 mm
41	G090	Transparent cover case, flat approx. 120 x 70 x 15 mm
40	G088	Transparent wall case, flat approx. 120 x 70 x 15 mm
40	G089N	Transparent Wall Case, Standard approx. 121 x 71 x 31 mm
61	TK55XX	Transponder key plastic
49	S035	Trimming capacitors, ceramic, approx. 20 pieces
47	S003	Trimming poteniometers approx. 50 pieces
27	K062-4	Turning knob with grub screw for Ø 4mm axle
21	M197	Twilight Switch 12 - 28 V/DC
13	M122	Twilight switch 12 V/DC
3	M013N	Twilight switch 240 V/AC
10	M100N	Ultrasonic Anti marten device for motor vehicles
6	M048N	Ultrasonic Generator
16	M161	Ultrasonic Power Cannon
46	B214	Ultrasonic proximity sensor
8	M071N	Ultrasonic vermin repeller
30	L002	Ultrasonic wall loudspeaker
7	M069N	Underground mole & vole repeller
5	M032S	Universal Amplifier 12 W "Plug & Play"
6	M040N	Universal preamplifier
24	M241	Vibration Switch 12V DC
45	B192	Water Level Sensor 9 V/DC
16	M158	Water Switch 9 - 12 V/DC
37	G062	Working bowl, ca. 205 x 130 x 35 mm