

PRODUCT CATALOG 2016

Flasher and Wiper Relays		Autolight Relays		Electromagnetic and Solid State Relays
	Control Relays of Voltage, Temperature, Frequency, Level		Timer Relays, Pulse Relays	
Voltage Converters		Signallers		Voltage Indicators
	Indicators of Pulse Number, Operation Time		Indicators of Temperature, Frequency, Speed	
Fuse/Relay Blocks		Dual Battery System URA		



WASCH



Energomash CJSC specializes in the field of developing, producing and marketing of low-voltage electronics. Adaptable manufacture equipped with robots together with usage of modern components make it possible to produce the goods of high quality.

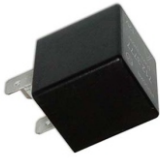
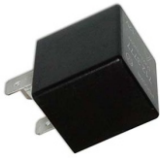
Electronics produced by our company is widely used at transport, industry and private life. In most products adjustment and visual control are possible. This allows to adjust the products individually and combine the electrical circuit according to the requirements of the customer. Fuse/relay blocks usage provides waterproof assembling and visual control. Most products of this line are unique and do not have analogues in the world. It is possible to adjust the products according to the customer requirements before the shipment.

Our company also produces specialized electronics. Usage of standard components and approved circuit technique decisions together with adjustable equipment allows to start mass production within two days since the moment the datasheet is confirmed.

Energomash CJSC is certified according to ISO 9001:2008.




Flasher Relays

Part №	Picture	Analog	Application	U _{nom.} , V	P, W	Dimensions, mm	Weight, gr	Packing, pcs.
712.3777-01		4DB 003 750-651 DZ 07227 495.3747-01	Universal for cars	12	2(4)x21W+0...5W	40x28x25	20	65
712.3777-07		4AZ 001 879-021	Universal for trucks	24	(2x21)x2	40x28x25	20	65

Flasher Relay Control Unit

The unit makes flasher signal longer at short pressure (for the cars without this option). It is also used to produce a "thanks" signal by short pressure of alarm button.


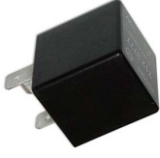
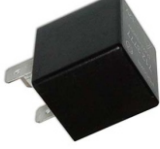
Part №	Picture	U _{nom.} , V	I _{max.} , A	Number of flasher blinks	Number of "thanks" blinks	Dimensions, mm	Weight, gr	Packing, pcs.
374.3787		12	14	3	2	of the unit itself 40x28x6 of the cables 200	17	1

Flasher Relays for LED

712.3777-002 relay is used at cars with LED bulbs over 1W with nominal values. The relay is equipped with integrated multiturn resistor (25 turnovers). It helps to check the bulb accuracy at the maneuvering mode.




712.3777-003 relay is used at cars with combination of LED bulbs and incandescent lamps. Accuracy at maneuvering mode can be checked only for the 21W incandescent lamps.

712.3777-004 relay is used at cars both with LED bulbs and incandescent lamps. Accuracy at maneuvering mode can not be checked.


Part №	Picture	Application	U _{nom.} , V	P, W	Dimensions, mm	Weight, gr	Packing, pcs.
712.3777-002		Universal for cars	12	(2x(1...10)+0,5)x2	40x28x25	20	40
712.3777-003			12	((1...4)+21+5)x2	40x28x25	40	39
712.3777-004			12	((1...4)+(1...4))x2	40x28x25	20	39

Rain Sensors

The units are intended for turning the wipers ON automatically as soon as rain drops appear on the wind screen. Wiper operation mode depends on the rain activity. Rain sensor installed on the wind screen has four sensitivity levels. It can also operate at "winter", "summer" or interval control modes. Indication of operation mode is carried out through semi-transparent relay case. Switching between the modes is done by the key on the sensor case.

Part №	Picture	U _{nom.} , V	I, A	Dimensions, mm	Weight, gr	Packing, pcs.
723.3777-05		12	6	40x28x25	80	40
BUMOS1		12	-	55x51x20	50	40
BUMOS2		12	-	55x51x20	50	40

Wiper Relay


Part №	Picture	U _{nom.} , V	I, A	Dimensions, mm	Weight, gr	Packing, pcs.
723.3777		12	6	40x28x25	20	65

Wiper Relay with Interval Control


Wiper relay with interval control is intended for control over interrupted operation of wiper relay and joined operation of screen washer and screen wiper. Usage of such relay makes driving in difficult conditions more comfortable. This prolongs life cycle of the wind screen, brushes and wiper.

Both manual and automatic operation modes are possible. Programming is fulfilled through standard under-wheel switch. Interval range lays between 0.5 and 45 seconds.

The relay is installed into the regular block.

Part №	Picture	U _{nom.} , V	I, A	Dimensions, mm	Weight, gr	Packing, pcs.
723.3777-01		12	6	40x28x25	20	64 blister

Rear Wiper Washer Relay

Part №	Picture	U _{nom.} , V	t, sec	Dimensions, mm	Weight, gr	Packing, pcs.
726.3777		12	5±1,5	40x28x25	20	65

Autolight Relays

The relays are intended for automatic ON/OFF switching of outside lights. The relays exclude driving without outside lights and provide their automatic switching OFF.

719.3777 relay is completed with photosensor placed inside of the car. The photosensor checks illumination level and switches side lights and dim lights ON automatically. Threshold level is carried out by rotation of a regulator located inside the relay. In order to lower the battery load while the engine is starting up and the sensor is darkened, the relay starts operating within 5-10 seconds after the ignition is switched ON.

In 719.3777-01, -02, -11 relays switching ON of the lights is made effective after starting of engine operation and holding of "pull-in" voltage within 5 seconds. The relays provide switching ON of lights with a delay after the engine starts operation. This makes start of engine operation easier, reduces battery load (especially in cold periods) and makes life cycle of lamps longer. The lights are switched OFF together with the ignition.

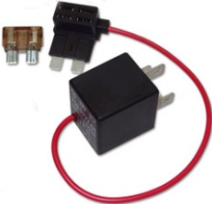

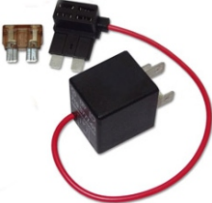


719.3777-01 and 719.3777-11 relays are installed into relays and fuses block instead of the regular dim lights relay. Fuse coupler is included in the set.

719.3777-06 relay is intended for Daytime Running Lights (DRL) automatic switching ON/OFF. DRLs are switched ON/OFF together with the ignition. Automatic DRLs switching OFF while the starter is operating prolongs their life cycle. DRLs switching OFF with the help of the regular switch is also possible.

719.3777-07, -08, -10, -12 relays are installed on the place of regular distance light relay. They can operate both in the mode of distance light and Daytime Running Lights. In the second mode the relays provide usage 30% of power. Relay smooth ON option is possible. All the relays may operate both in automatic and manual mode.

Part №	Picture	Application	U _{nom.} , V	U _{ON/OFF} , V	I _{com.} , A	Weight, gr	Packing, pcs.
719.3777		Universal for cars	12	-	10	100	23 blister
719.3777-01		Cars with dim lights winding constantly connected to "ground"	12	13,3±0,1	25	60	23 blister
719.3777-02		Cars with dim lights winding constantly connected to "ground"	12	13,3±0,1	25	160	20
719.3777-06		Universal for cars	12	11,2±0,1/ 10,5±0,1	25	160	20


Autolight Relays

Part №	Picture	Application	U _{nom.} , V	U _{ON/OFF} , V	I _{com.} , A	Weight, gr	Packing, pcs.
719.3777-07		Cars with distance lights winding constantly connected to "ground" and contacts polarity "30" - plus, "87"- minus	12	13,3±0,1 (13,8±0,1)/ 12,9±0,1	15	30	23 blister
719.3777-08		Cars with regular distance light relay and contacts polarity "30" - plus, "87"- minus and mini- fuses	12	13,3±0,1 (13,8±0,1)/ 12,9±0,1	15	30	23 blister
719.3777-10		Cars with distance lights winding constantly connected to "ground" and contacts polarity "30" - plus, "87"- minus	12	13,3±0,1 (13,8±0,1)/ 12,9±0,1	15	30	23 blister
719.3777-11		Cars with regular dim light relay and mini-fuses	12	13,3±0,1	25	55	23 blister
719.3777-12		Cars with regular distance light relay and contacts polarity "30" - plus, "87"- minus and mini- fuses	12	13,3±0,1 (13,8±0,1)/ 12,9±0,1	15	30	23 blister

Fog Headlights Sets

Fog headlights sets are intended for fog headlights connection at the cars without regular wiring (the headlights are not included).

Pf12 consists of microprocessor control unit and wiring necessary for fog headlights connection. Usage of PF12 allows to control fog headlights ON/OFF through the regular side and dim lights switch. This makes installation of Pf12 easier and lets to avoid additional cables laying.

Part №	Picture	Composition	Application	Weight, gr	Packing, pcs.
Pf12		Control unit, socket with cables and fuse, "ground" cables (black), connector for the cable, clamps, screw	Cars of any brand	160	20

Timer Relay REGTIME

The relays are used for switching for a certain time (REGTIME1), after the certain time (REGTIME2) or with OFF delay (REGTIME3). REGTIME5 is a pulse generator. Duration and frequency of the pulses may be adjusted by multi-turn resistors.

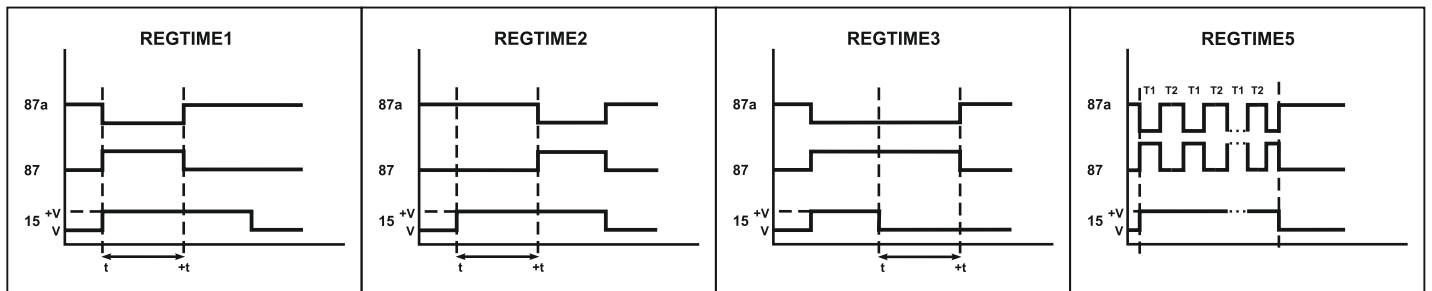
Switching power relay is controlled by the timer.

The relays operate on single-cable scheme and only when voltage is supplied. Negative outlet of the battery is connected with the frame of the car.

Manual adjustment of operation time is possible. The adjustment is carried out by the resistor through the opening in the relay case. There is a LED under the semi-transparent case for visual control. Three time intervals are available: from 0 to 60 seconds, from 60 to 600 seconds and from 600 to 6000 seconds.

Different time intervals and fixed time are also possible on the request of the customer.

Relay Operation Diagram





Part №	Picture	Contacts	t, sec	U _{nom.} , V	I _{switch.} , A	I _{input.} , mA	Dimensions, mm	Weight, gr
REGTIME1-12-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	12	25	60	40x28x25	20
REGTIME1-24-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	24	25	35	40x28x25	20
REGTIME2-12-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	12	25	60	40x28x25	20
REGTIME2-24-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	24	25	35	40x28x25	20
REGTIME3-12-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	12	25	60	40x28x25	20
REGTIME3-24-(0-60) (60-600) (600-6000)			0-60, 60-600, 600-6000	24	25	35	40x28x25	20
REGTIME5-12-(0-600)			0-6 0-600	12	25	60	40x28x25	20
REGTIME5-24-(0-600)			0-6 0-600	24	25	35	40x28x25	20

Window Heating Timer Relays

The relays are intended for window heating turning ON for a fixed time: 361.3787 relay - for 15 minutes; 361.3787-02 relay - for the time being regulated (1...30 minutes). The time is settled by the multi-turn resistor.

The relays are installed on the place of regular heating relays (of 90.3747-10 type) or micro-relays (of 98.3747-10 type) with the help of adaptor. Regular button helps to control the relay.

361.3787 relay operates only when the engine is ON so it controls on-board voltage level. 361.3787-02 relay operates only when the ignition is ON. It can be possible due to fuse coupler connection with the appropriate fuse socket in the block.


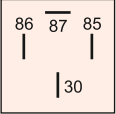
Part №	Picture	Application	U _{nom.} , V	U _{ON/OFF} , V	I _{com.max} , A	I _{input} , mA	t, sec	Dimensions, mm	Weight, gr	Packing, pcs.
361.3787		Cars with regular window heating relay	12	(13,3/12,8)±0,1	25	4	900	40x28x25	20	39
361.3787-02		Cars with regular rear window heating relay and flat fuses	12	-	25	-	60-1800	40x28x25	30	39

Solid State Relay

Solid state relay is a semi-conductor electronic device realized on the bases of MOSFET transistor, controlled by PWM. It is intended for 12V DC. The relay provides noiseless operation and has longer life cycle compared with electromagnetic relays.

Smooth ON/OFF function allows to use the relay for the purpose of protection of different devices from the current drops. Polarity of the hard body relay is "30" - plus, "87" - minus.


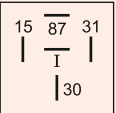

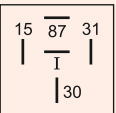
Different ON/OFF time is possible.

Part №	Picture	Contacts	U _{nom.} , V	I _{switch} , A	I _{input} , mA	ON/OFF time, sec	Dimensions, mm	Weight, gr
405.3787-02			12	25	6	1/1	40x28x25	20

Pulse Relays

Pulse relays are intended for control over different devices through pulses. The relays open/close their contacts at appearing a pulse of any polarity and duration less than 0,5 seconds. The relays can be used for turning different devices ON/OFF by using regular control units and wiring.

There is an installed LED for visual control.







Part №	Picture	Contacts	U _{nom.} , V	I _{switch} , A	T _{pulse} , msec	Dimensions, mm	Weight, gr
375.3787			12	25	25+500	40x28x25	20
375.3787-01			24	25	25+500	40x28x25	20

Voltage Control Relays

Voltage control relays are intended for automatic ON/OFF switching of different devices (car coolers, seat heaters, cigarette lighters, music, anti radars and others). ON switching is made effective after the engine start and holding of ON voltage level within 5 seconds. OFF switching is made effective after the engine is stopped and OFF voltage level is held within 3 seconds.

362.3787 relay allows the devices to be switched ON automatically only after the engine start. This prevents them from loads while engine is starting. The devices are switched OFF after the engine is stopped. This prevents the battery from discharging.




In 362.3787 and 362.3787-05 relays manual adjustment of ON/OFF voltage is possible. The adjustment can be done by the resistor through the opening in the case of the relay. There is a possibility of manufacturing of relays with different ON/OFF voltage according to the requirements of the clients.

Part №	Picture	Contacts	U _{nom.} , V	U _{ON/OFF} , V	I _{switch} , A	I _{input} , mA	Dimensions, mm	Weight, gr
362.3787			12	(13,3/12,8)±0,15	25	4	40x28x25	20
362.3787-04			12	(10-16)/(10-16)	25	4	40x28x25	20
362.3787-05			24	(20-32)/(20-32)	20	4	40x28x25	20

Temperature Control Relays

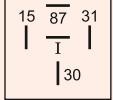
The relays are intended for circuits commutation as soon as ON/OFF temperature is reached. For 363.3787-01 relay ON/OFF temperature can be adjusted according to the requirements of the customer.

363.3787-04 relay has ON/OFF temperature buttons. It is also equipped with LED matrix to display the current temperature and the temperature being adjusted.

Part №	Picture	T, °C	Cables length, mm	U _{nom} , V	I _{switch} , A	Dimensions, mm	Weight, gr
363.3787-01		(-45...+125) ±0,5°C	200 + 2500 (with sensor)	10-30	25	40x28x25	20
363.3787-04		(-55...+125) ±0,5°C	200 + 3000 (with sensor)	10-30	4	61x40x15	55
Case for the relay 363.3787-04		-	-	-	-	70x51x21	24


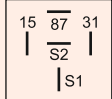
Frequency Control Relay

The relay is intended for different devices turning ON/OFF depending on the frequency of the input signal. Manual adjustment of ON/OFF thresholds is possible. Adjustment is done by integrated multi-turn resistors through the openings in the case of the relay. There is an installed LED for visual control.






Part №	Picture	Contacts	U _{nom.} , V	I _{switch} , A	Number of thresholds	Range, Hertz	Dimensions, mm	Weight, gr
364.3787			12	25	2	10÷1000	40x28x25	20

Level Control Relay

The relay is intended for different devices turning ON/OFF by the signal from one or two sensors. The relay may be used to make devices operation automatic. There is an installed LED for visual control.

Part №	Picture	Contacts	U _{nom.} , V	Input, A	Number of thresholds	Dimensions, mm	Weight, gr
366.3787			12	25	2	40x28x25	20

Signallers

Part №	Picture	Type	U _{nom.} , V	Contacts	Sound, dB/sm	Dimensions, mm	Weight, gr
REZVUN 1-01		interrupted with steady operation time and frequency 80±5 cycle/min	12		90/10	65x41x18	35
REZVUN 2-01		interrupted with steady operation time and frequency 80±5 cycle/min	24		90/10	65x41x18	35
REZVUN 3		interrupted with 25 sec duration, 35 cycles, and frequency 80±5 sec/min	12		85/10	65x41x16	30
REZVUN 6		steady sound	12/24	2x terminal 6,3	85/10	40x28x25	12
REZVUN 8-K		1st mode - steady light (red), 2nd mode combined steady sound and light	12	three cables	85/10	Ø18,5x35	11
REZVUN 9-K		16 modes: light (red), sound, combined; steady, variable (85 cycle/min) with time limit (30 seconds)	12	six cables	85/10	Ø29x50	22
LIS1		steady light (white, 1,8W)	12	2x terminal 6,3	-	40x28x25	10

Voltage Converters 24/12V

Voltage converters are intended for connection of 12V accessories (communication facilities, wireless, etc.) with 24V car electrical system.

Line converters 21.3759-01...-07 are fulfilled on the basis of compensatory voltage stabilizer. These converters have protection against higher voltage.

Part №	Picture	U _{input/output} , V	P _{output} , W	I _{nom/pulse} , A	Dimensions, mm	Weight, gr	Packing, pcs.
21.3759		24/12	40	3/5	60x145x50	350	70
21.3759-01		24/12	80	6/10	100x145x50	500	45
21.3759-02		24/12	120	9/15	140x145x50	730	30 (32)
21.3759-03		24/12	160	12/20	180x145x50	900	22 (26)
21.3759-04		24/12	200	15/25	220x145x50	1100	
21.3759-05		24/12	240	18/30	260x145x50	1300	17 (18)
21.3759-07		24/12	320	24/40	340x145x50	1630	15

Pulse Voltage Converters 24/12V

Voltage Converters 24/12V are intended for connection of 12V accessories (communication facilities, wireless, etc.) with 24V car's electrical system.


Pulse converters 21.3759-08, -09 have one-cable electronic pulse lowering stabilizer scheme and are equipped with smoothing outlet filter. The converters provide gradual increase of output voltage while switching ON. They also limit loads at start. This prolongs life cycle of the converters. Operating efficiency of pulse converters is more than 80%. The converters have overloads and short-circuit protection.

Part №	Picture	U _{input/output} , V	P _{output} , W	I _{nominal/pulse} , A	Dimensions, mm	Weight, gr	Package, pcs.
21.3759-08		24/12	200	15/20	110x106x58	500	6
21.3759-09		24/12	270	20/25	110x106x58	600	6

Voltage Converter 12/24V


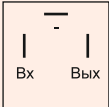
211.3759 converter is intended for connection of different 24V devices with 12V car's electrical system.

Aluminium radiator provides effective heat conducting. The converters have protection against overloads and short-circuit. The converter has a switch and output voltage LED indicator. Assembly and commutation set is included.

Part №	Picture	U _{input/output} , V	P _{output} , W	I _{nominal/pulse} , A	Dimensions, mm	Weight, gr	Packing, pcs.
211.3759		12/24	200	8/12	110x106x58	500	6

Adjustable Voltage Converter

The converter is intended for connection of different devices which require stable supply voltage. They have protection against short circuit and OFF function preventing from overheating. Necessary output voltage may be adjusted with the help of multi-turn resistor through the opening in the case of the relay.

Part №	Picture	Contacts	U _{input/output} , V	I _{nominal/pulse} , A	Dimensions, mm	Weight, gr
211.3759-01			(10...16)/(1,5...12)	2,5/3	40x28x25	20



Voltage Indicators

Voltage indicators are intended for digital reflection of voltage values. They have red and green LED matrix.

Part №	Picture	Range	U, V	I _{supp.} , mA	Discrete-ness	Error, not more	Toperat. °C	Cable, mm	Dimensions, mm
Voltage Indicator IN2-K		8-30V	8-30	100	0,1V	0,1V	-40...+85	1500	38x16x11
Voltage Indicator IN2-Z		8-16V	8-16	100	0,1V	0,1V	-40...+85	1500	38x16x11
Voltage Indicator IN3-K		8-30V	8-30	100	0,1V	0,1V	-40...+85	-	Ø34x46
Voltage Indicator IN3-Z		8-16V	8-16	100	0,1V	0,1V	-40...+85	-	Ø34x46
Voltage Indicator IN4-K		8-30V	8-30	100	0,1V	0,1V	-40...+85	-	40x28x25

Frequency Indicators

These indicators are intended for digital reflection of engine rotation frequency. They have four-digital LED matrix of red color. The indicators are used in petrol engine cars with number of cylinders from 1 to 8.

Part №	Picture	Range	U, V	I _{supp.} , mA	Discrete-ness	Error, not more	Toperat. °C	Cable, mm	Dimensions, mm
Frequency Indicator ICHVU2-K-01		200-9990 RPM	8-30	30	10 RPM	30rot./min	-40...+85	1500	38x16x14
Frequency Indicator ICHVZ-K-01		200-9990 RPM	8-30	100	10 RPM	30rot./min	-40...+85	-	Ø34x46
Frequency Indicator ICHV4		200-9990 RPM	8-30	100	10 RPM	30rot./min	-40...+85	-	40x28x25

Temperature Indicators

Temperature indicators are intended for temperature digital reflection by red and green LED matrix.

Part №	Picture	Temperature Range	U _{sup.} , V	I _{input} , mA	Discrete-ness	Error, not more	T _{operat.} , °C	Cable, mm	Case dims., mm
Temperature Indicator IT2-K		-55...+125°C	8-30	100	0,1°C (-9,9÷99,9°C) 1°C (rest values)	0,5°C	-40...+85	1500 + 2500 (with sensor)	38x16x11
Temperature Indicator IT2-3		-55...+125°C	8-16	100	0,1°C (-9,9÷99,9°C) 1°C (rest values)	0,5°C	-40...+85	1500 + 2500 (with sensor)	38x16x11
Temperature Indicator IT2-K-01		-40...+300°C	8-30	30	0,1°C (-9,9÷99,9°C) 1°C (rest values)	1°C	-40...+85	1500 + 2500 (with sensor)	38x16x11
Temperature Indicator IT3-K		-55...+125°C	8-30	100	0,1°C (-9,9÷99,9°C) 1°C (rest values)	0,5°C	-40...+85	3000 (with sensor)	Ø34x46
Temperature Indicator IT3-3		-55...+125°C	8-16	100	0,1°C (-9,9÷99,9°C) 1°C (rest values)	0,5°C	-40...+85	3000 (with sensor)	Ø34x46
Temperature Indicator IT4-K		-55...+125°C	8-30	100	0,1°C (-9,9÷99,9°C) 1°C (rest values)	0,5°C	-40...+85	1500 + 2500 (with sensor)	40x28x25




Speed Indicators

Speed indicators are intended for digital reflection of speed and acceleration up to 100 km/h by the LED matrix of red color. It is used in the cars with pulse speed sensor.

Part №	Picture	Temperature range	U _{supp.} , V	I _{inpt} , mA	Discrete-ness	Error, not more	T _{operat.} , °C	Cable, mm	Case dims., mm
Speed Indicator IS2-K		0-999 km/h	8-30	100	1 km/h	1 km/h	-40...+85	2000	38x16x11
Speed Indicator IS3-K		0-999 km/h	8-30	100	1 km/h	1 km/h	-40...+85	-	Ø34x46




Pulse Number Indicators

These indicators are intended for calculation and reflection of the incoming pulses. They have four-digit LED matrix of red color. The indicators can be used like counters of periodic operations when different equipment is used.


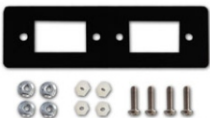
Part №	Picture	Range	U, V	I _{supp.} , mA	Discreteness	U input, V		T _{pulse, min} , msec	Weight, gr	Case dims., mm
						low	high			
Pulse Number Indicator IKI2		0-9999	10÷30	30	1	-0,6÷1	3÷30	30	60	38x16x14
Pulse Number Indicator IKI3		0-9999	10÷30	30	1	-0,6÷1	3÷30	30	30	Ø34x46
Pulse Number Indicator IKI4		0-9999	10÷30	30	1	-0,6÷1	3÷30	30	25	40x28x25

Operation Time Indicators

These indicators are intended for operation time reflection. They have four-digit matrix of red color. The indicators can be used like counters of motor hours of different electrical installations, tractors and other equipment.

Part №	Picture	Range	U, V	I _{supp.} , mA	Discreteness of counting (with saving), sec.	Discreteness of indication, h	Operat., °C	Weight, gr	Case dims., mm
Operation Time Indicator IVN2		0-9999 h	10-30	30	1	1	-40...+85	60	38x16x14
Operation Time Indicator IVN3		0-9999 h	10-30	30	1	1	-40...+85	30	Ø34x46
Operation Time Indicator IVN4		0-9999 h	10-30	30	1	1	-40...+85	25	40x28x25

Panels for Indicators

Part №	Picture	Application	Stuff	Dimensions, mm	Weight, gr
Panel for Indicator PI1		In2; IT2; ICHV2; IS2; IKI2; IVN2	Aluminium	50x28x1	6
Panel for Indicator PI2				94x28x1	11

Dual Battery System URA

Dual Battery Systems (URA) are intended for automatic ON/OFF of the reserve battery and decoupling of the main and reserve batteries. They provide autonomous operation of the batteries. This allows to use one of the batteries when the engine is not operating for additional devices feeding (music, chiller, etc.) This prevents the main battery from discharging. Dual Battery Systems can be used on the cars and 12V ships and boats.

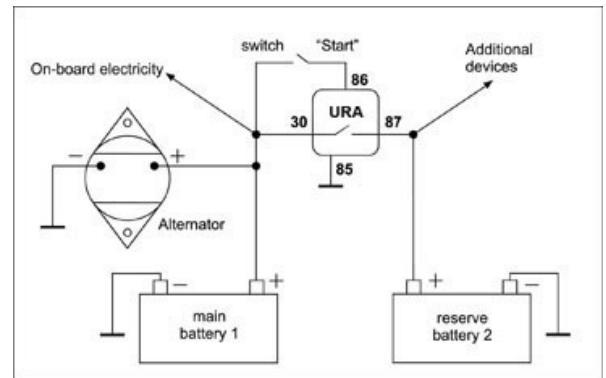
URA 200 and URA 300-01 are power relays with integrated microcontroller. The reserve battery is switched ON/OFF automatically as soon as the main battery voltage reaches $\geq 13,2B$ and $\leq 12,8B$ correspondently and holds it within 6 seconds. Forced ON switching of the reserve battery is possible by usage of "start" clamp.

URA300-01 has hermetic slot (of "Super Seal" type) for connection to the control circuit.

In higher humidity conditions it is recommended to use URA 200 and URA 300-01. One should make outline cover waterproof protection first. URA 300-01 includes counterpart slot with 1 meter length cable.


URA 400 is a high capacity bistable relay connected to the control unit. Control unit indicates batteries voltage level and controls relay operation.

Manual installation of switching levels and indication mode of the reserve battery operation are possible in URA400.



Part №	Picture	Power contacts	U _{nom} , V	U _{ON/OFF} , V	I _{max} , A	I _{nom} , A	I _{switch} , mA	Dimensions, mm	Weight, gr	Packing, pcs.
URA 200		M6	12	13,2/ 12,8	200	120	1,5	77x45x45	100	1
URA 300-01		M8	12	13,2/ 12,8	300	200	1,5	101x50x44	306	1
URA 400		M8	12	(8-16/ (8-16)	400	300		relay 95x75x60 control unit 70x51x21 cables 3000	280	1

DIN Holder

Part №	Picture	Application	I _{max} , A	Contacts	Dimensions, mm	Weight, gr
KP DIN		Relays, indicators, signallers	30	terminal 6,3 mm x 5	50x42x23	20

Fuse/Relay Blocks

Fuse/Relay blocks are intended for low voltage circuits assembling.

The block is a PCB base with contacts (sockets and terminals of 6,3 mm) and hermetic transparent housing. Sockets are combined into groups for flat fuses and mini-relays installation (relays, indicators (IN4-K, ICHV4-K, IT4-K, IKI4, IVN4), signalers (LIS1, Rezvun6), voltage converters (211.3759-01)). The sockets are connected with correspondent PCB terminals.

Commutation is done by connective cables with 6,3 mm sockets (for fixation on the PCB terminals).

Cables with sockets are not included in the set.

For convenience it is recommended to use cables of different colors.

Cable should be laid inside the block through hermetic lead-in of the appropriate size.


It is possible to produce fuse/relay blocks with different number of places for the fuses and relays.

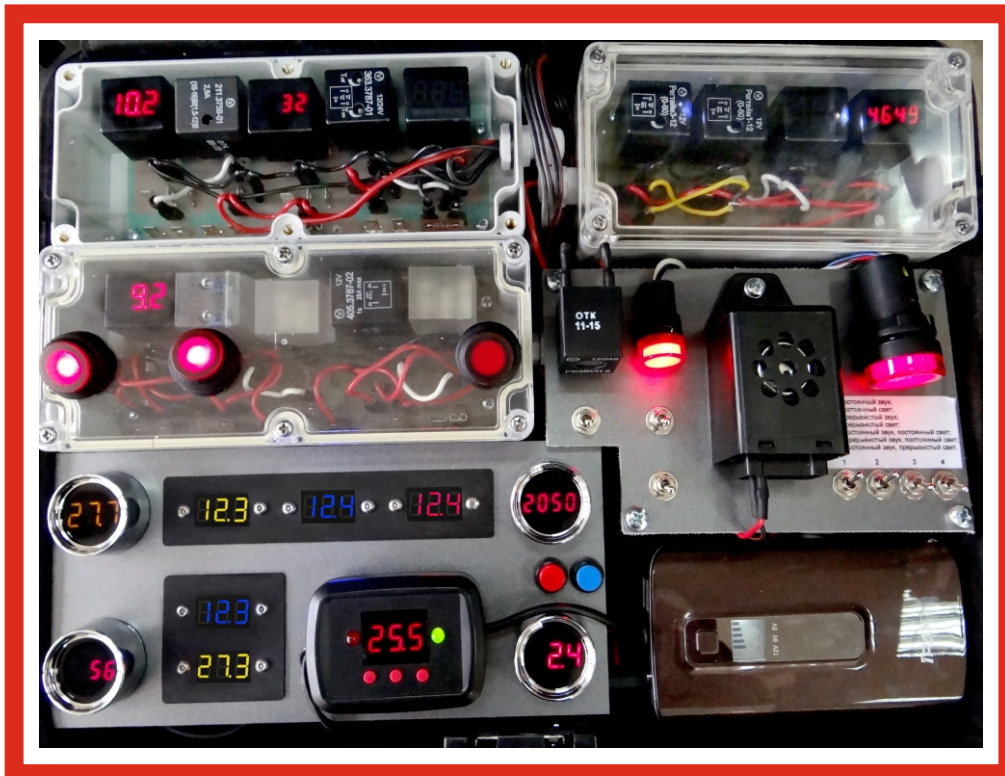


Part №	Picture	Number of places for		Waterproof range	Dimensions, mm	Packing, pcs.
		relays	fuses			
BRP2		2	2	IP67	82x80x55	1
BRP3		3	3	IP67	120x80x55	1
BRP4		4	4	IP67	160x80x55	1
BRP5		5	5	IP67	190x80x55	1

Circuit Board

Circuit board for diodes, resistors and other soldering components. It is intended for circuits commutation in fuse/relay blocks. Circuit board has contact spaces for components.

Part №	Picture	Components	Dimensions, mm	Weight, gr
Circuit board		SMA, SMB, SMC, 1206, 1210, 1812, 1225, LED 4008 (side light) and others	20x20x1,0	2



PRODUCTION

Energomash CJSC
Grabtsevskoe shosse, 43 build. 20
Kaluga, Russia, 248009
Phone: +7 4842 580731, 580732
info@12v.ru

www.12v.ru

ON-LINE SHOP

12V LTD
Teatralnaya str., 37/2
Kaluga, Russia, 248000
Phone: +7 910 7080980
info@12vi.ru

www.12vi.ru