CHECKOUT CONTROLLER

MV4k/1
MV4k/2

Version 1.21

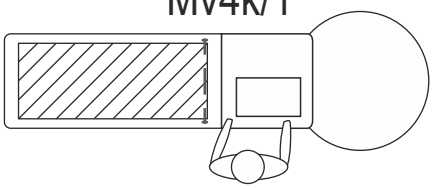
Dimensions	5, 6
Terms of use	7
Electriacla parameters	8
Controller connections	9, 10
Description of the panel	11
Controller oparation at work	12, 13
Additional security features	14
Programming functions	15
Lamps settings	16
Settings for motor 1	17
Settings for motor 2	18
Solving problems	19
Guarantee card and terms	20

This controler is integrated microprocessor device which control chceckout motors.
The controller is eqiupped with photocell and it is able to connect with various types of peripheries which make the cashier's work easier and increase safety of usage chceckout box. Device has built-in main switch, safety switch and motor's capacitor. Additional sensors are optional and the possibility of their connection depends on the version you order.
The controller is installed in a minimum of time because all connections are terminated with detachable connectors.
Mainly feature of our controller is photocell which is included in the controller set and the control system has a digital coding and signal verification system to prevent daylight interference.
The controller is fed in set: controller, photocell and a set of connectors to connect the cabling.

Basic parameters
- automatic control of main belt
- automatic control of additional belt(version for two motors)
- automatic belt stopping with a photocell
- automatic belt starting with a photocell
- automatic stop when the belt is empty
- work with use a footswitch
- work with the additional buttons
- output for lighting of a checkout
- output for signal light (constant or pulse)
- front panel with keyboard
- safety switch
- main switch
- input of the motor thermal sensor
- input of the motor cover lift sensor (optional)
- Soft start of the conveyors (the bottles do not fall down as the belt starts moving).

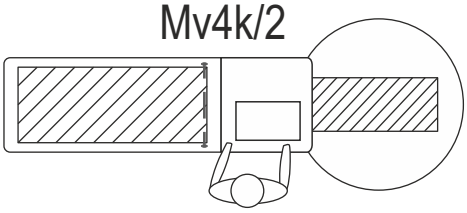
Possibility of working in configuration:

Mv4k/1



Single with one belt

Mv4k/2

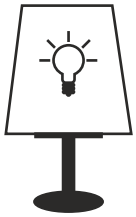


Single with two belts

Possibility of connecting accessories:

Accessories are additional elements and they are not included in basic set.
If you have any questions please contact our sales department.

signal lamp

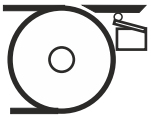


lightening

signal lamp

foot switch

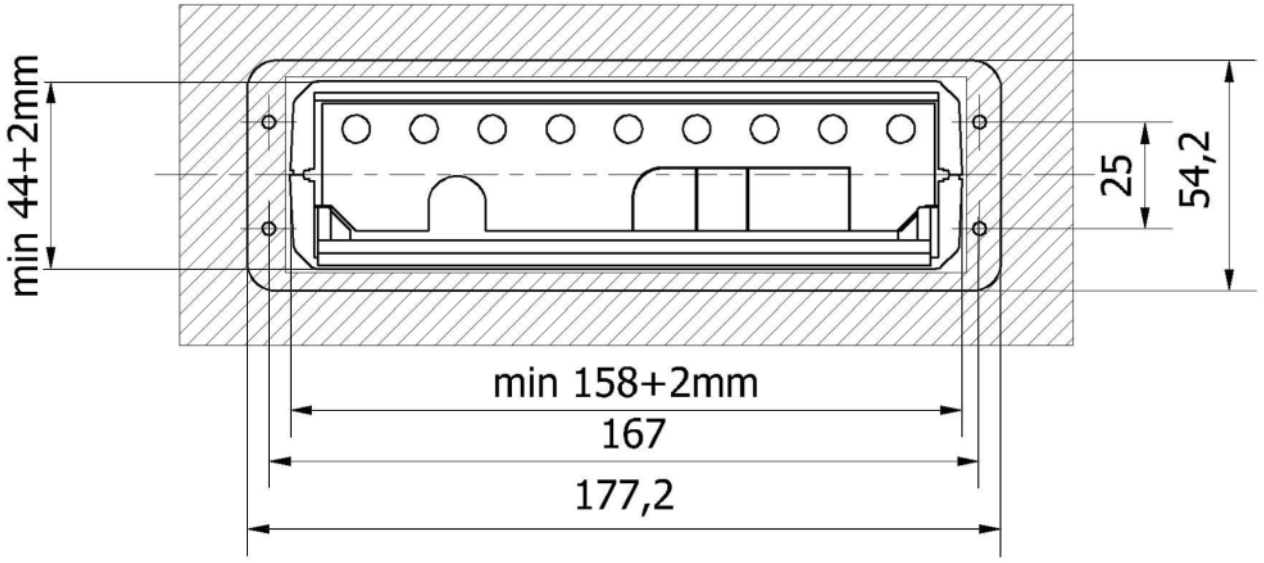
inductive cover sensor



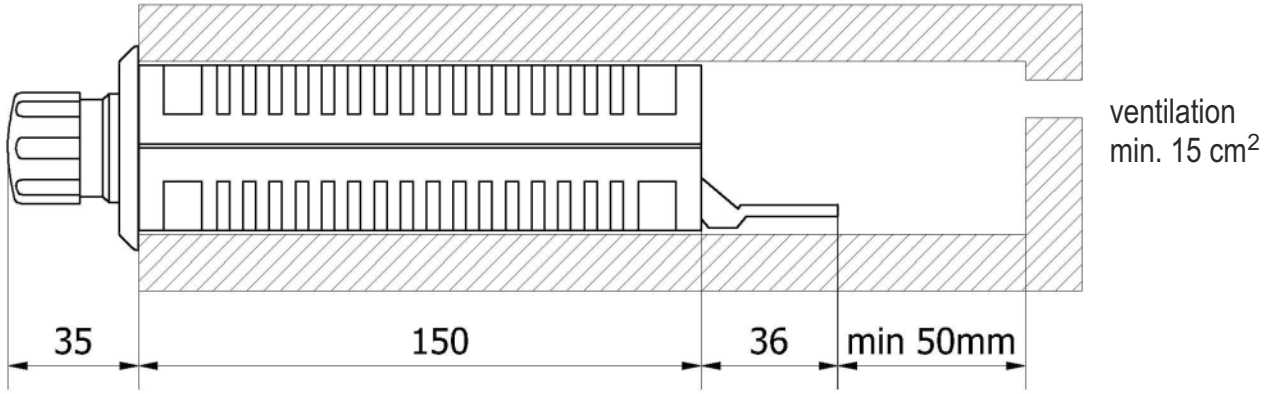
mechanical cover sensor

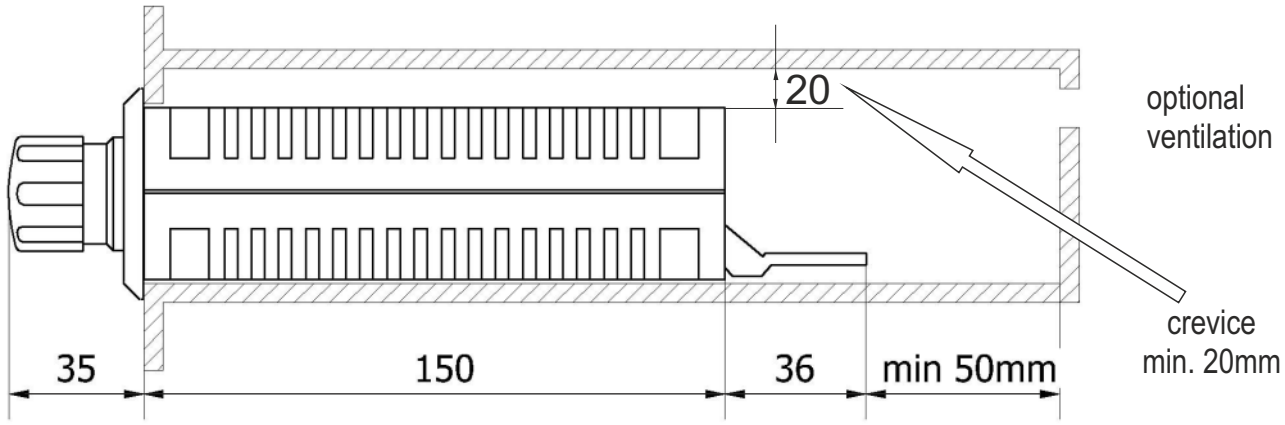
thermal motor sensor

Mounting dimensions of controller:



Mounting configuration:





The following must be strictly observed !

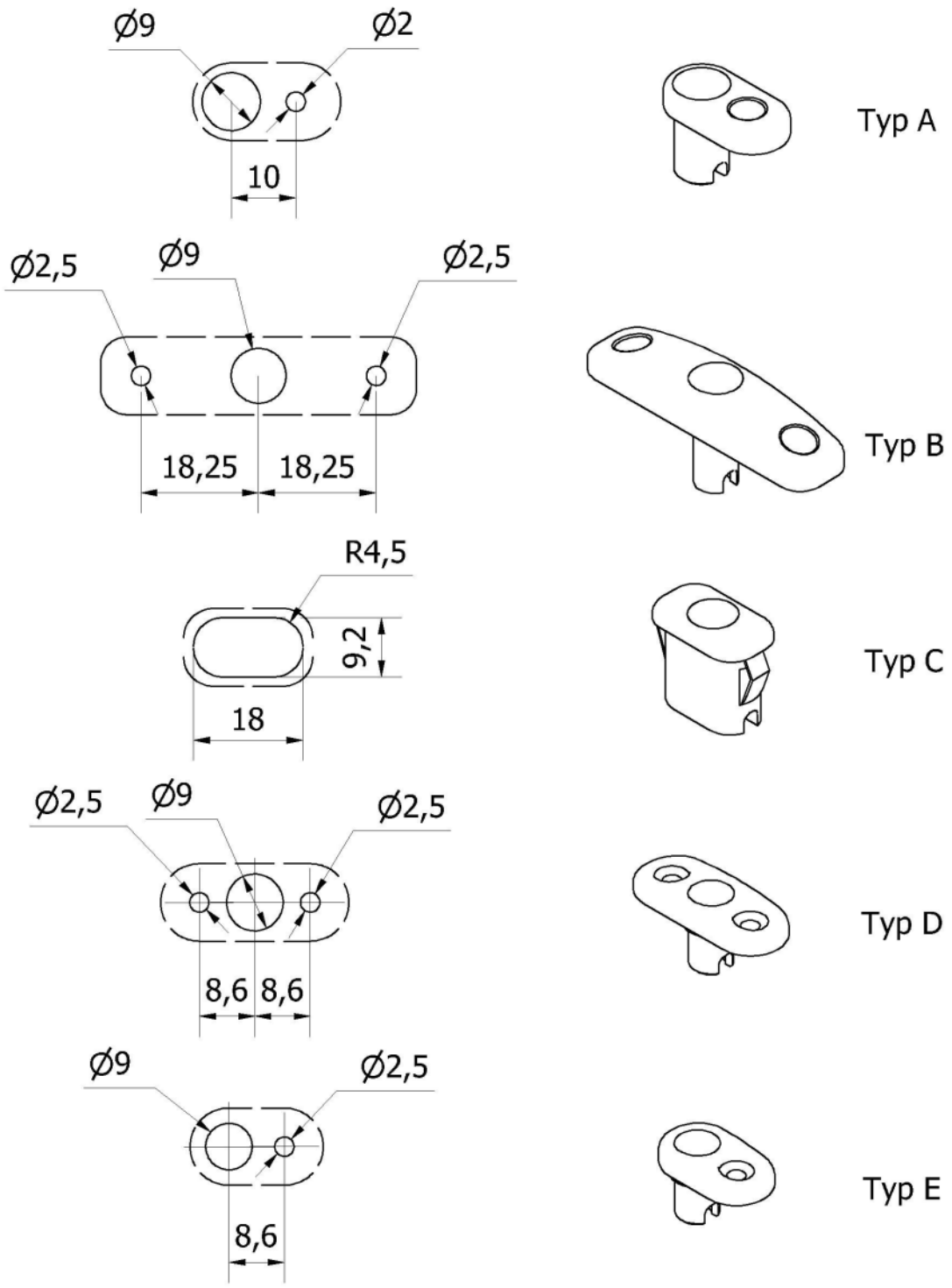
It is built-in device and does not work independently. It is the responsibility of the manufacturer - constructor of the final product to provide adequate protection against shock, in accordance with the standards applicable to the final product. The controller is designer for checkouts, which are subject to the requirements of EN 60204-1.

Therefore, it should be remembered that the checkout box is subject to this standard and the controller is one of the electrical components of the whole machine. The design of the checkout box should be made in accordance with the requirements of safety standards and not cause a risk to the user. The user of the controller may only access the front part used to operate the controller. Access to the rest, especially the electrical parts and cabling, can be possible with tools. The controller should be permanently attached to the surface of the device in which it is mounted, and its disassembly is possible only with tools. Controller wires and moving parts of the device such as the motor, belt and others shall be secured in such a way that they cannot be damaged and come into direct contact with the operator. The cabling shall be fixed in such a way that the plugs cannot be pulled out of the connectors on the control board, in accordance with safety rules (it must not be tangled or strained). The individual conductors of the cable should be insulated, tinned or clamped in the sleeve end as shown. Outputs of lamp circuits on the controller board are used to connect signaling lamps. Wires for signal lamps, led from the controller, should be in the second insulation class and installed in such a way that they cannot be damaged during the use of the device. The lighting lamps of the station should be out of reach of the operator.

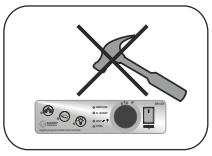
The controller as a machine component and the supply terminals of the controller are not adapted and are not used to connect the main connection cable. The protective ground clamp in the controller is one of the elements of the protective circuit connections and cannot be used as the main protective ground clamp.
The controller protect the motor circuit against short circuit by means of the main fuse. If there is a short circuit in the motor circuit, the main fuse will be burn out and the controller will switch off. The controller's fuse is used to prevent the device from escaping an internal emergency situation such as a short circuit or overload.
It is allowed to apply additional protections on the output circuits of the controller. A properly selected overcurrent protection, indicated by the motor manufacturer, can be used as motor overload protection.
It is recommended to use motors equipped with thermal sensors. Some versions of the controller are equipped with thermal motor sensor inputs and can provide additional protection for motors against long term overload and overheating. These sensors can be connected to the appropriate inputs on the controller board described in the manual. The insulation of the wires of any sensor shall at least match the basic insulation.
During the design phase of the device body into which the controller will be mounted, it must be taken into account that liquids and solid objects that would get on the controller from above must not have an effect on the controller. It is recommended to use appropriate housing to eliminate such occurrences.

On the next page we have included basic ways of mounting the controller. We allow for a 90 degree angle of installation. It is important to remember about proper ventilation of the unit and to consider the heat dissipation from the controller during the design phase. A minimum ventilation gap of 15 cm2 must be provided in a closed enclosure. We also recommend a minimum of space for the cabling coming out of the controller.

Mounting photocells:

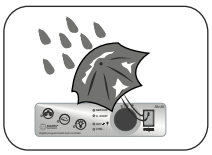


All dimensions are in milimeters

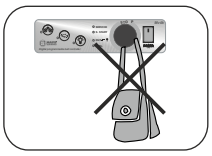


The controller should be used as intended.

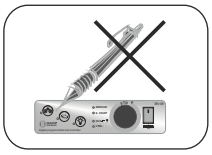
Be careful with the water!
The machine lives! In case of fire use dry powder extinguisher.



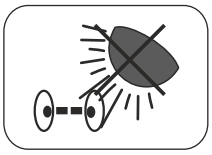
Protect against flooding.



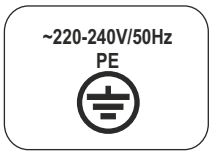
Do not hang bags and other items.



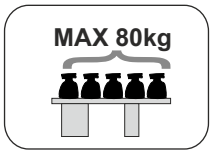
Do not push the buttons with sharp tools.



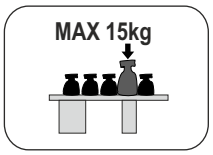
Do not expose the photocell directly to the sun or other strong light.



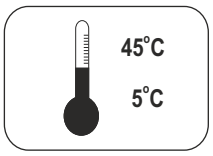
Power supply current ~ 220-240V 50/60Hz with the protective ground.
Connecting only with the PE guard wire.



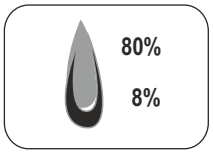
The total conveyor belt surface load must not exceed 80kg.



Weight of a single weight belt can not exceed 15kg



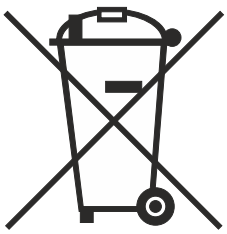
Ambient temperature required for proper operation of the controller ranges from 5 ° to 45 °.



Humidity required for proper operation of the controller ranges from 8% to 80%.

The cashier counter can be connected only by an authorized person

WARNING!!! Information concerning the designation and collection of waste electrical and electronic equipment



The symbol placed on the product or its packaging indicates selective collection of electrical and electronic waste equipment. This means that the product should not be disposed with other household waste. Proper disposal of old and waste electrical and electronic equipment will help to prevent potential negative effects on the environment and human health. The obligation for selective collection of used equipment is the user's duty, who should give it to the collector of used equipment.

Electrical parameters of version 230V/50Hz

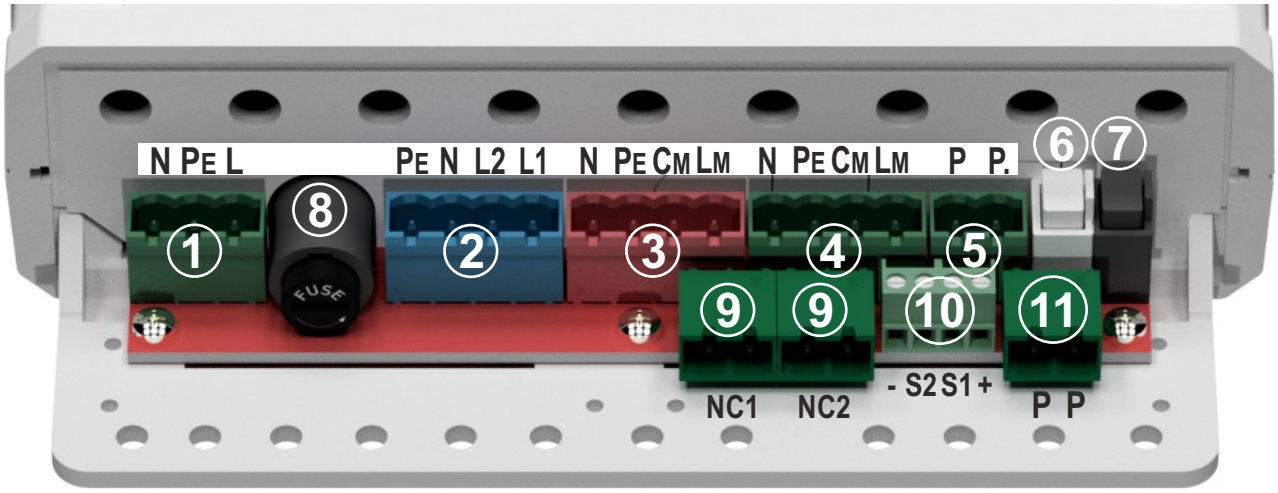
Power supply:	230V/50Hz
Max. total power consumption:	700W
Output current of the main belt:	max 1 A
Output current of the additional belt:	max 1 A
Max. Power consumption of an additional circuit L1:	100W
Max. Power consumption of an additional circuit L2:	100W
Power consumption of the control system:	2,5W
Max. Motor power 1:	200W
Max. Motor power 2:	200W
Fuses:	
Glass fuse type F (fast):	4A/250V
Short circuit limit current:	40A
Dimensions:	5x20 mm

Working conditions:	
Operating temperature:	0şC~+40şC
Operating humidity (non-condensing):	10% ~80%
Max. Work altitude:	1000m AMSL
Storage Conditions	
Storage temperature:	-25st.C~+55st.C
Short storage temperature (to 24h):	
Relative humidity (non-condensing):	10% ~80%
Dimensions:	
Width:	160mm
Hight:	50mm
Lenght:	190mm
Weight:	0,9kg
Photocell:	
Type:	IR
Wavelenght:	940nm
Optimum range:	700mm
The tollerance of parallel movement of photocells axis:	50mm
The tollerance of perpendicular deviation from photocells axis:	3ş
Standard cable lenght:	2200mm
Connector:	N2 blok

Electrical parameters of version 115V/60Hz

Power supply	115V/60Hz
Max. Total power consumption:	820W
Output current of the main belt:	max 2 A
Output current of the additional belt:	max 2 A
Max. Power consumption of an additional circuit L1:	60W
Max. Power consumption of an additional circuit L2:	60W
Power consumption of the control system:	2,5W
Max. Motor power 1:	345W
Max. Motor power 2:	345W
Fuses:	
Glass fuse type F (fast):	6,3A/150V
Short circuit limit current:	80A
Dimensions:	5x20 mm

Controller MV4K - Connections



Description of connectors:

1. Power supply of the controller (X1).
   - L – AC power cable.
   - PE – AC protective cable.
   - N – AC neutralcable.
2. Power supply of the lamps circuits (X2).
   - L1 – phase cable of the first lamp.
   - L2 – phase cable of the second lamp.
   - PE – protective cable of the both lamps.
   - N – neutral cable of the both lamps.
3. Power supply of the motor I (X3).
   - LM – phase cable of the motor power supply.
   - CM– condenser phase cable of the motor power supply.
   - PE – protective cable of the motor.
   - N – neutral cable of the motor power supply.
4. Power supply of the motor II (X4).
   - LM – phase cable of the motor power supply.
   - CM– condenser phase cable of the motor power supply.
   - PE – protective cable of the motor.
   - N – neutral cable of the motor power supply.
5. I motor footswitch connector, contact NO type.
6. Photocell - sender (grey cable).
7. Photocell - receiver (black cable).
8. Fuse – main short circuit protection.
9. Motors thermal sensor connectors:
   - NC1 - thermal sensor for motor I.
   - NC2 - thermal sensor for motor II.
10. Motors inductive sensor connectors
    - (-) – Output GND.
    - S2 – Inductive sensor input 2.
    - S1 – Inductive sensor input 1.
    - (+) – Output +12V.
11. II motor footswitch connector, contact NO type

Controller MV4K - connections

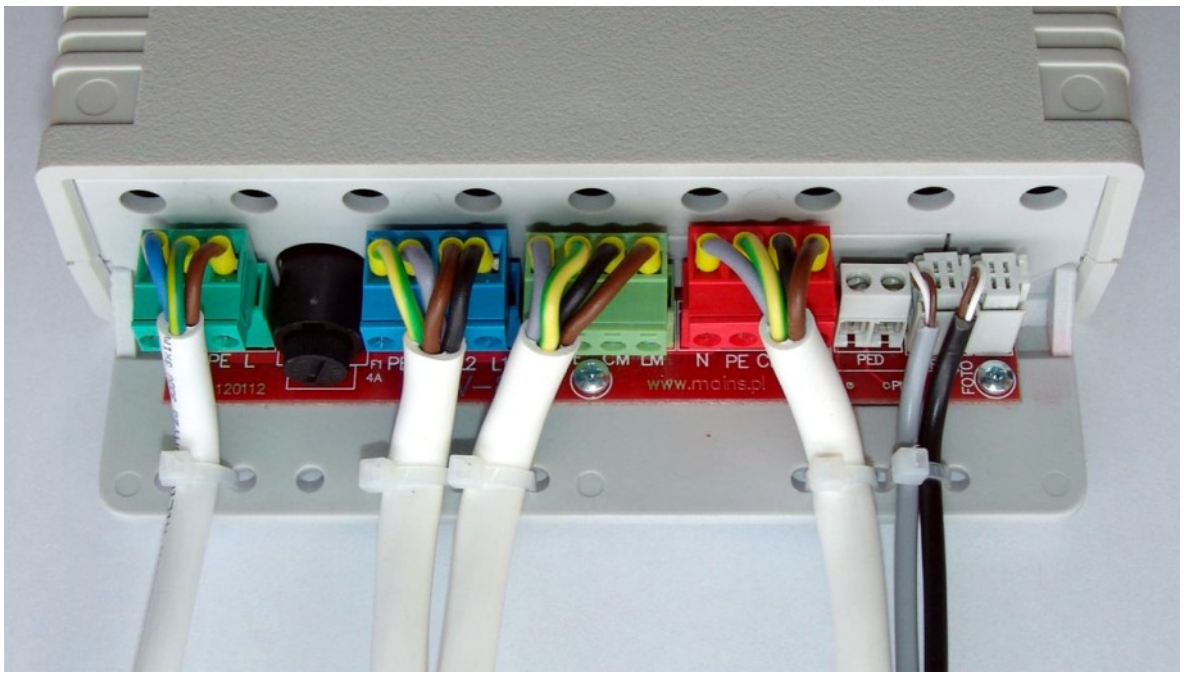
Attention!

In the Figure the correct connection and attachment of wires to the controller were presented.

It is mandatory to attach the cables to the holes in the housing. Such a solution protects form pulling the plug from the sockets.

The individual cable cores should be insulated, tinned or crimped with the use of the end sleeve (as shown).

It is a protection against accidental short circuit of the cores and possible damage of the controller.



Accesories

To the controller one can connect additional accessories such as footswitch and elevation motor cover sensor.
Input of the elevation cover sensors is optional and it not included in the standard equipment of the device.
More avaliable accesories you can find on our website www.mains.pl

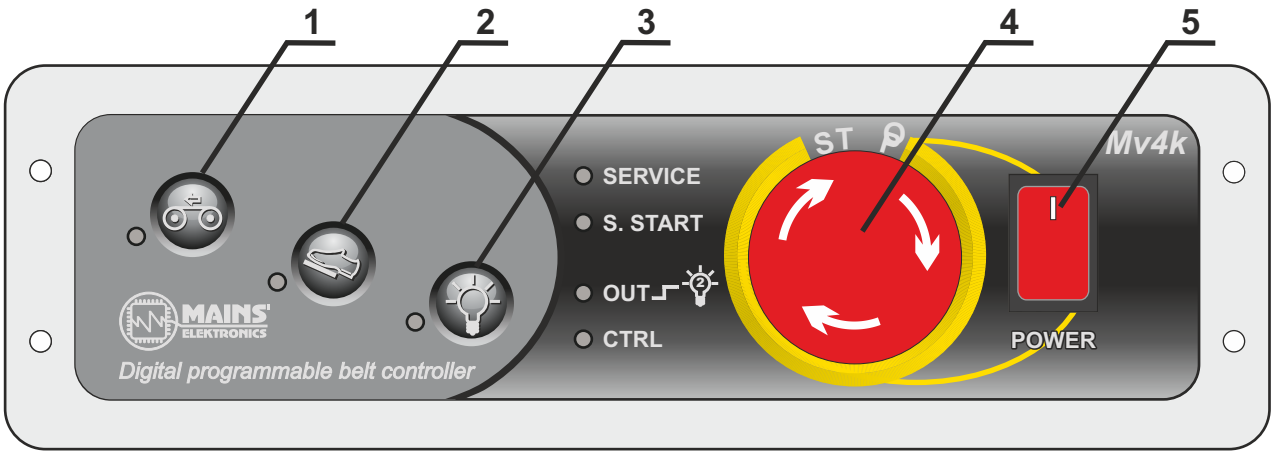
Mechanical sensors

Inductive sensors

Signal lamps

Footswitches

Controller MV4K - description of the panel



Front panel of the MV4K

Buttons:
1. Turning on or off the conveyor belt in automatic mode with the use of photocells.
2. Turning on the operation belt mode, controlled with the use of the footswitch.
3. Switching L1 circuit (first pressing - continuous signal, second pressing - intermittent signal).
4. Safety switch - disconnects the power supply terminal phase.

STOP – in case of any emergency, you must press the button!
This will immediately disconnect the power supply and stop the motor.
This function is to be used only in emergency situations!

5. Main power switch – turns on the power of the controller and the circuit of the lamp 2

LEDs:

SERVICE – signals the need to service review of the unit.
- indicates the activation of the elevation motor cover sensor.

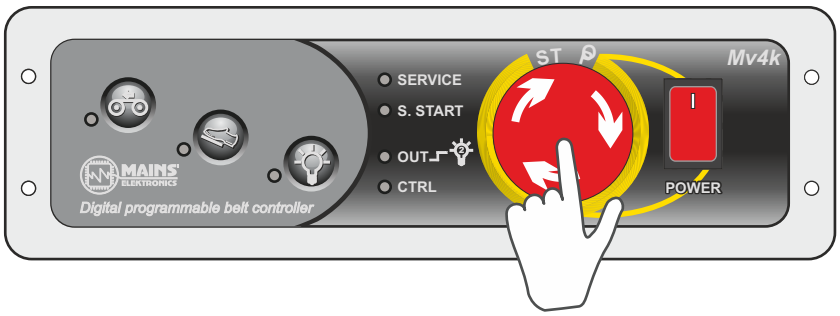
S.START – indicates that the motor soft start function is turned on.

OUT – indicates the type of applied voltage for additional output - either continuous or intermittent.

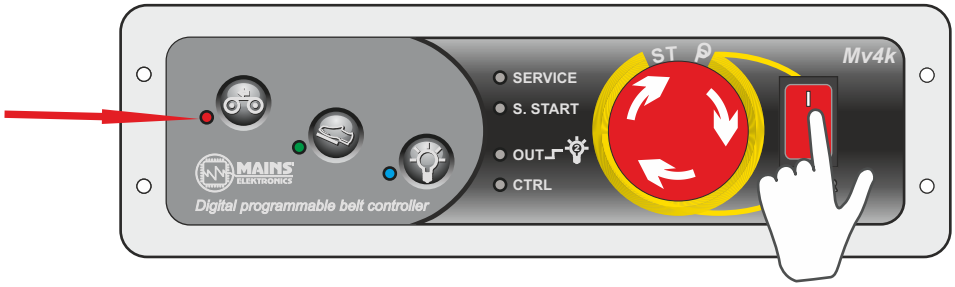
CTRL – indicates motor operation.

Controller MV4K - Handling

Turn on the controller:

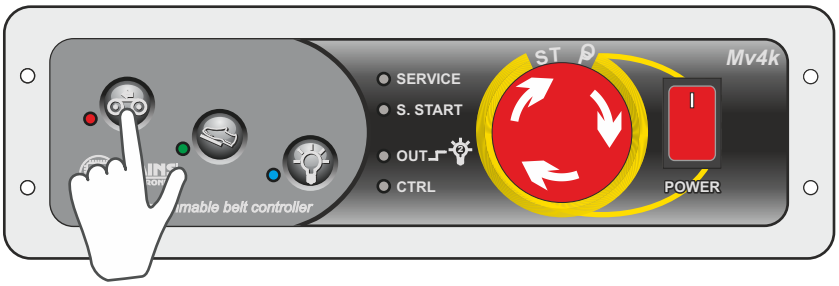


1. Realese the safety button [4], by turning it to the right.



2. Switch the main switch [5] in the upper position, the permit button LED blinks.

Turn on a conveyor belt in automatic mode:



Press the button nr [1], the LED lights up. In this mode, the first belt works automatically with the use of photocells.
To start the conveyor belt for the first time overshadow the photocell with any object or press the foot pedal.

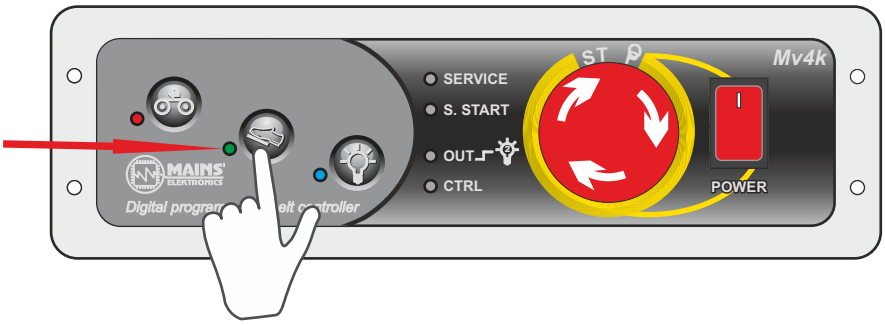
If duringthe work the photocell is obscured by any object, the conveyor stops automatically and it will start again after removing the object from the photocell line-of-sight contact.
In case of shaded photocell (or in case of lack of signal from it), it is possible to move the conveyor using the footswitch.

If the conveyor belt is running empty for 12 seconds* and nothing will overshadow the photocell, the controller will stop it automatically.
(*standard setting - time amount is to define in service menu)

The second belt works automatically and moves according to the first belt, (two motors version)
but its operating time is extended for about 2 seconds*
(*standard setting - time amount is to define in service menu)

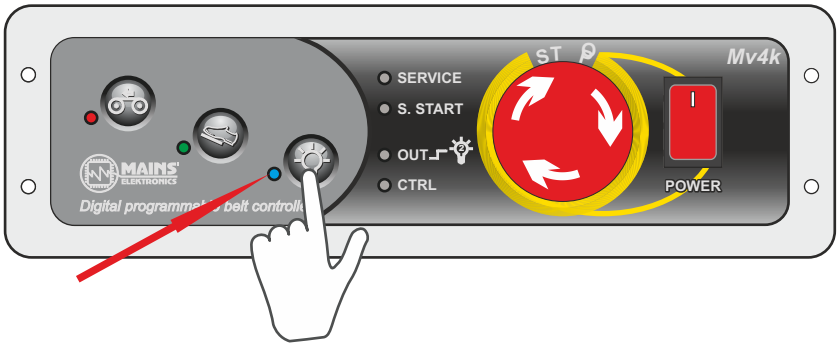
Controller MV4K - Handling

Turn on a conveyor belt in automatic mode:



Please press the button[2], a LED lights up.
In this mode, the conveyor belt operates according to the footswitch signals.
Pressing starts belt operatio
releasing - stops the belt.

Turn on the light circuit 1:



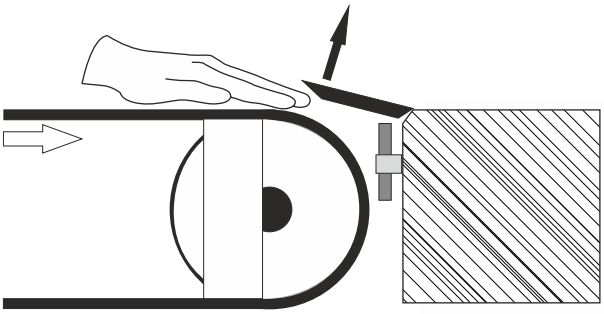
Pressing the button [3]turns on or off the circuit, this is indicated by LED next to the button.
- The first pressing causes the lamp to light continuously.
- The second pressing causes the lamp to glow intermittently.
- The third press turns off the lamp circuit.

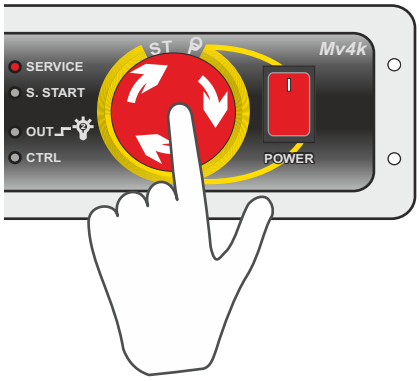
Turning on second lamp circuit:
(konfigurowana w menu serwisowym)

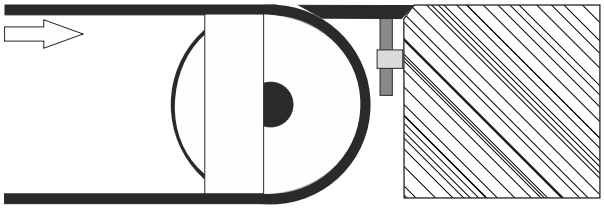
Actuall state of lamp is signalized by LED OUT

Additional security features for user:

The operations of the motor elevation cover sensor (optional)
In situations where the controller is switched on, (the motors are working or not), and from any cause the motor elevation cover sensor will be switched on, the motor will be stopped immediately and the work permit function will be turn off too.
This is indicated by an intermittent tone and flashing of the SERVICE LED on the front cover.
One should then use the safety switch STOP [4] or turn the controller off the power with the use of switch POWER [5], and remove the cause of switching on the sensor.







WARNING!
The condition of re-enabling the work permit function is to switch off the controller from the grid and to make sure that the cause of its activation was removed and switching on the power is safe for the cashier counter users and the surrounding.

Alarm identification:

During alarm LED controls shows actual state of sensors

If during alarm LED is lighted it means:

SERVICE	- motor 1 elevation cover
S. START	- motor 2 elevation cover (two motors version)
OUT	- motor 1 thermal sensor
CTRL	- motor 2 thermal sensor (two motors version)

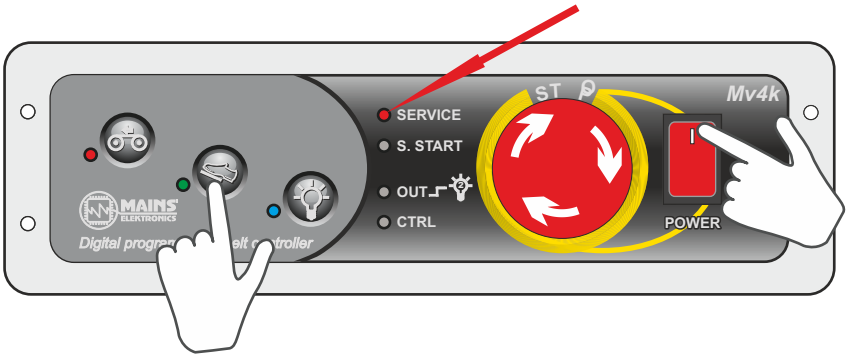
Controller MV4K - programming functions

● LED ON

○ LED OFF

Programing the operating modes MV4

Entering into service mode:



1 service option (diagnostic)

To enter into service mode:

- Turn off controller
- Press and keep pressed button number [1]
- Turn on the controller by pressing POWER button simultaneously holding manual work button by 4 seconds

Service option nr 1 in menu is diagnostic mode.
In this mode, controller send sound signals to help diagnose work of periphery like photocells, footswitches and sensors.
Controller makes intermittent sounds, which means work of it.
The SERVICE LED will flashing in service mode

● SERVICE
○ S. START
○ OUT
○ CTRL

Button functions in service menu:

[1]

Changing the type of work

[2]

Next service option
(to move forward keep pressed by 1 second)

[3]

Turning on/off motors soft start
(active in service option 4 and 5)

2 service option (lamp 1 settings)

Service option 2 is switching by holding next service option button[2] by 1 second in service option 1.
Entering into service option 2 is signalized by double signal sound and turning on LED OUT2

● SERVICE
○ S. START
● OUT
○ CTRL

Lamp 1 settings

Another pressing of button[1] changes the type of work lamp 1.
LED diodes shows binary number, which means number of work type.

1. ● ○ ○	pulsating/turn off
2. ○ ● ○	turn on/pulsating/turn off
3. ● ● ○	bell
4. ○ ○ ●	turn on after power the controller
5. ● ○ ●	turn on after permission
6. ○ ● ●	turn off after permission
7. ● ● ●	lamp turned off
8. ○ ○ ○	turn on/turn off

3 service option (lamp 2 settings)

Service option 3 is switching by holding next service option button[2] by 1 second in service option 2.
Entering into service option 3 is signalized by triple signal sound and pulsating LED OUT2

● SERVICE
○ S. START
pulsating ● OUT
○ CTRL

Lamp 2 settings

Another pressing of button[1] changes the type of work lamp 2.
LED diodes shows binary number, which means number of work type.

4. ○ ○ ●	turn on after power the controller
5. ● ○ ●	turn on after permission
6. ○ ● ●	turn off after permission
7. ● ● ●	lamp turned off

4 service option (motor 1 work settings)

Service option 4 is switching by holding button [2]
by 1 second in service option 3.
Entering into service option 4 is signalized by quadruple(4) signal sound and turning on LED CTRL

● SERVICE
○ S. START
○ OUT
● CTRL

Setting the time to off for empty belt for belt 1 (motor 1) - TIMEOUT

Another pressing button [1] causes change of settings for time of work belt 2.
LED diodes shows binary number, which means number of work type.

1.	● ○ ○	12 seconds
2.	○ ● ○	15 seconds
3.	● ● ○	18 seconds
4.	○ ○ ●	21 seconds
5.	● ○ ●	24 seconds
6.	○ ● ●	27 seconds
7.	● ● ●	30 seconds
8.	○ ○ ○	No TIMEOUT of belt 1

Turning on/off soft start for motor 1

Soft start for motor 1 is turning on by button [3].
Turning on soft start is signalized by LED S.Start

● SERVICE
● S. START
○ OUT
● CTRL

5 service option (motor 2 work settings)*

***active in 2 motors version**

Service option 5 is switching by holding button[2]
by 1 second in service option 4.
Entering into service option 5 is signalized by quintuple(5) signal sound and pulsating LED CTRL

● SERVICE
○ S. START
○ OUT
pulsating CTRL

Setting the time of work motor 2

Another pressing button [1] causes change of settings for time of work belt 2.
LED diodes shows binary number, which means number of work type.

Values showed below are added to time of work belt 1
Time of work belt 2 = Time of work belt 1 + value from table

1.	● ○ ○	1 second
2.	○ ● ○	2 seconds
3.	● ● ○	3 seconds
4.	○ ○ ●	4 seconds
5.	● ○ ●	5 seconds
6.	○ ● ●	6 seconds
7.	● ● ●	7 seconds
8.	○ ○ ○	no extension

Turning on/off soft start for motor 2

Soft start for motor 1 is turning on by button [3].
Turning on soft start is signalized by pulsating LED S.START
Turning on soft start for motor 2 is possible only with turned on soft start for motor 1.
If soft start for motor 1 is turned off, than soft start for motr 2 will be also turned off.

● SERVICE
● S. START
○ OUT
pulsating CTRL

Exit from service menu

In service point 4 (1 motor version) or 5 (2 motor version) keep pressed button [1] by 1 second.
Exit from service menu is signalized by six sound, than settings will be saved and controller will restart itself.

Solving problems

Prior to diagnostic measures one should ensure that:
1. The controller is properly connected and powered on.
2. The safety button is not pressed.
3. The main switch of the controller is turned on (on / off LED lights).

Problem: The conveyor belt 1 is not working.
a) The conveyor is not working in photocell mode
- check whether the photocells are not contaminated.
- check whether the work button with the use of the foot switch is not turned on (LED lights), if it lights - turn off the button.
- check that the photocells are not illuminated by daylight or strong artificial light, ensure proper lighting conditions.
- check whether the "CTRL" LED switches on after the unveiling the photocell - if not, call the customer service.

b) The conveyor belt is not in a controlled footswitch mode.
- check whether the work button, using the foot switch is not turned on (LED lights continuously).
- check if the foot switch is connected to the controller.

c) The conveyor belt is not running, the SERVICE LED flashes.
- make sure that the motor cover is not lifted, if the cover is in the correct position, wait 30 seconds, when you hear an audio signal press the STOP button on the keyboard and enable the controller to work.

Problem: service diode is blinking, all the controllers functions work properly.
Please call the service, as the controller requires the maintenance and replacement, also starting capacitor of the motors is to be replaced.

GUARANTEE CARD

Chceckout controller type: MV4K

serial number:_____

Dealer stamp

Date of purchase _____

Warranty terms:

1. The Mains Company issue a warranty only on a properly operated unit for a period of 2 years (24 months).
2. The date from which the warranty is in force is the date of issuing the warranty card. The warranty period is specified in the description of each product.
3. Defects discovered during the warranty period will be removed free of charge within 14 working days from the date of delivery of the unit to the address of Mains company, a warranty period is extended by the time of the repair.
3. The warranty card is valid, if it has entered the date of purchase and the stamp of the point sale.
4. In order to guarantee service one ought to deliver the product at its own expense, to the point of sale. After repairing the product will be send to the advertiser at the expense of the guarantor.
5. Advertisers should deliver the device adequately protected against damage during the transport.
6. The advertiser is responsible for the loss of the machine during the transport, the guarantor obligates himself to deliver fixed unit to the advertiser and is responsible for its loss during the transport.
7. During the warranty period defective unit will be repaired or replaced for the same free of defects.
8. This following warranty covers unit faults occurred during normal operation or due to manufacturing defects and does not apply to consumables or other additional accessories.
9. The warranty does not cover defects caused due to:
- Arbitrary repairs, made by the user or other unauthorized persons, modifications or design changes.
- Mechanical, thermal, chemical or intentional equipment damages.
- Damage caused by other device parameters other than specified in the instruction in the principles of safety equipment use.
- Incorrect storage and maintenance of the equipment and other damages caused by the user.
- Reducing the quality of the product due to the natural process of wear such as abrasion of the outer covering of the product, scratches, etc.
- Damages resulting from noncompliance the proper operation rules and the usage of the equipment in the purpose other than its intended one.