ENGLISH

AUTOMATION SYSTEMS

Document version 2.5

MOVATIC

DRIVE FOR SLIDING GATES

Installation, commissioning and use instructions
for the installer and user.

www.dtm.pl

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SAFETY OF THE AUTOMATION SYSTEM

Before starting the installation, please read the entire product installation and operation manual carefully. Failure to observe and comply with the notes in this manual may result in an accident resulting in injury to people or property damage. The drive only ensures correct and safe operation when installed and used in accordance with the following safety instructions. DTM System is not responsible for accidents resulting from improper use or unprofessional installation of devices.

- Packaging materials should not be left within the reach of children as they pose a potential hazard;
- This product has been designed and manufactured solely for the intended use described in this documentation. Using it for another purpose may adversely affect the technical condition and operation of the device and constitutes a potential source of danger;
- DTM System is not responsible for the consequences of incorrect use, inconsistent with the intended use;
- Do not install the device in an environment with an increased risk of explosion or exposed to aggressive air;
- Automatic gates should comply with the standards as well as with any applicable local regulations, they must comply with the requirements of the EN 12604 standards;
- DTM System is not responsible for any consequences resulting from design defects of the driven elements or their deformations that may occur during use;
- Before starting any work on the system, disconnect all power sources;
- The electrical installation to which the automation is connected must comply with applicable standards and be properly constructed;
- The installer should provide the device with a 30mA residual current circuit breaker ensuring that the devices are isolated from the main power supply. It is recommended to use a 6A thermal fuse with an all-circuit breaker;
- Safety mechanisms (EN12978 standard) provide protection against hazards associated with the movement of moving mechanical components, such as crushing, snagging or detachment;
- DTM System is not responsible for the safety and proper operation of the device if components that are not products offered by DTM System are used;
- Only original parts should be used for servicing;
- Do not modify the components of the device in any way;
- The end user must be informed about how to operate it, how to deal with failures and about the dangers arising from the use of the device;
- The device can only be operated by properly trained adults;
- Control devices should be out of the reach of children to protect the automation system against accidental activation;
- Service is permitted only by qualified personnel;
- During assembly or repair work, be careful and do not wear jewelry, watches or loose clothing;
- After installation, it is necessary to check whether the device is correctly positioned and whether the controlled devices and safety system operate properly;
- Protection systems against crushing or injury (e.g. photocell systems) must work properly after mounting and connecting the drive to the network;
- Radio remote control may only be used if the gate movement can be observed and there

are no persons or objects in the movement area.

- While the automation system is operating, both children and adults must keep a safe distance from the operating automation.
- Movement between the gate leaves is only allowed when it is fully open.
- The movement of automation elements should not be obstructed, any obstacles impeding movement should be removed.
- The operation and good visibility of signal lamps and information boards must be ensured.
- Manual operation of the system is only possible when the power is disconnected.
- In the event of a failure, disconnect the power supply and then call the service center who will make the necessary repairs.
- Do not perform any repairs or maintenance on the device yourself. The device may only be serviced by qualified personnel.
- Make sure that people who install, maintain or operate the device follow these instructions. Keep these instructions where you can quickly refer to them when needed.
-

1. Introduction

1.1. Basic information

The electromechanical drive is designed to control sliding gates. The assembled and launched system can be conveniently operated using radio transmitters. Please check whether you have all the elements from Figure 1 and then read the entire manual.

1.2. Drive technical data

- power supply	230 VAC / 50Hz
- emergency power supply	space for a 12V battery, min. 3.6Ah
- power consumption	200 W
- power consumption in stand-by mode:	<0.5W
- overcurrent protection	fuse 5x20mm slow-blow 5A
- protection class	IP-44
- maximum gate weight	500 kg
- leaf movement speed:	22 m/min
- traction force:	350 N
- work intensity	40% / h (24 cycles / h)
- temperature range	-20 ^{O}C to +55 ^{O}C
- winter/summer operating mode	automatic temperature sensor
- drive weight	11.5 kg
- remote control	built-in DTM868MHz radio / 433MHz extension card
- remote control memory	35
- limit switches	magnetic
- signal lamp output	24V / 5W
- peripheral power output (photocells, etc.)	24VDC, max. 1A
- gate status information outputs	OC/3 type
- photocell inputs / number	NC type / 2
- parameterized input 8.2kohm	NC type
- input for manual control of the OPEN mode	NO type
- input for manual control of the CLOSE mode	NO type
- input for manual control of the STEP BY STEP mode	NO type

- input for manual control of the GATE mode	NO type
- input for manual control of the STOP mode	NC type
- opening, closing and slowdown time adjustments	programmable
- auto closing time / auto photo closing time adjustment	max. 10 minutes

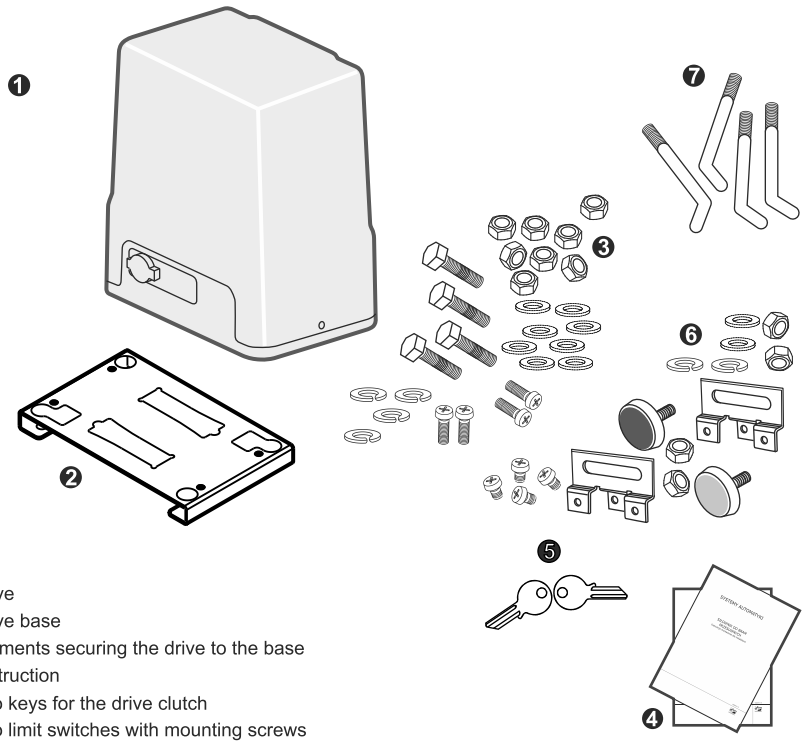
2. Mechanical assembly

2.1. Preparation of the workplace before mounting the drive

In order to properly install the drive, the workplace must be properly prepared. Before installing the drive, it is necessary to examine the gate system. It should be taken into account whether the drive mechanism will be mounted in a place where it will not be exposed to flooding. If not, change its installation location. You should also check whether the gate opens and closes freely.

Gate parameters affecting the operation of the system:

- ***Gate dimensions:*** The size of the gate is a very important factor. High rolling (moving) resistance may cause the gate to brake, significantly increasing the force required to move it.
- ***Gate weight:*** The gate weight given in the technical data of the drive is an approximate parameter. The quality of the gate drive system has a significant impact on the proper operation of the automation. However, the maximum permitted weight of the gate should not be exceeded.
- ***Temperature influence:*** Low external temperatures may make starting difficult or impossible (changes in the ground, snow, ice, etc.).
- ***Service frequency / switch-on time:*** Exceeding the value may damage the drive. Such damage is not subject to warranty repair.



1. drive
2. drive base
3. elements securing the drive to the base
4. instruction
5. two keys for the drive clutch
6. two limit switches with mounting screws
7. additional anchors for fixing in the concrete foundationęd

Fig.1. Components supplied with the drive.

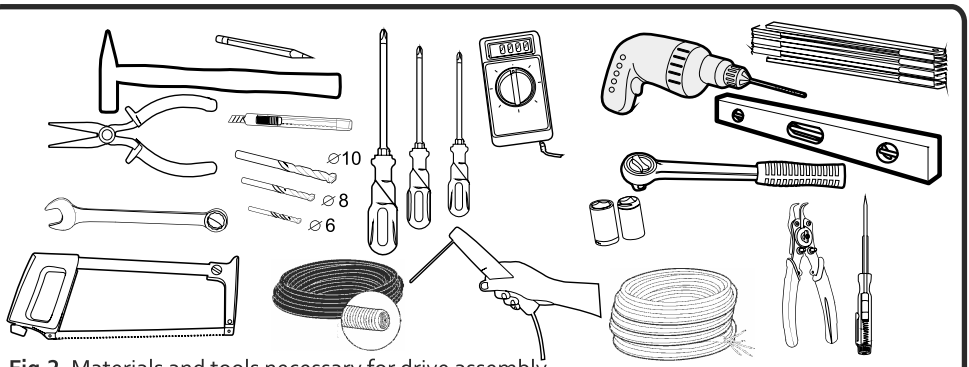


Fig.2. Materials and tools necessary for drive assembly.

CAUTION!
The drive must not cause the gate to pinch on fixed structural elements. Correctly set actuator limit switches stop the gate before it encounters resistance at the extreme positions (there remains play between the gear wheel and the toothed rack when the gate is closed or open). Failure to follow this recommendation may damage the actuator and void the warranty!
The drives are not designed to operate continuously to their maximum ON time (continuous operation). The outside temperature and gate parameters are important factors that influence the actual switch-on time.
The gate movement must be even, impact-free and unobstructed.Please remember that the soil tends to collapse in winter and may lift the gate foundation if it is too shallow. The gate should be stable and as free from play as possible to prevent unwanted and oscillating movements. Determine what materials are needed to install the kit and provide them before installation begins. This applies to screws, stops, cables, distribution boxes, tools.

2.2. Gate preparation

Only parts of the frame should be used as a base for mounting the racks. In the case of a steel gate, the slats are attached to the main frame. When the gate is not stable enough, it must be strengthened. In the case of a wooden gate, screw the screws through. Thin wooden or plastic gates must be additionally strengthened to withstand the stresses that occur.

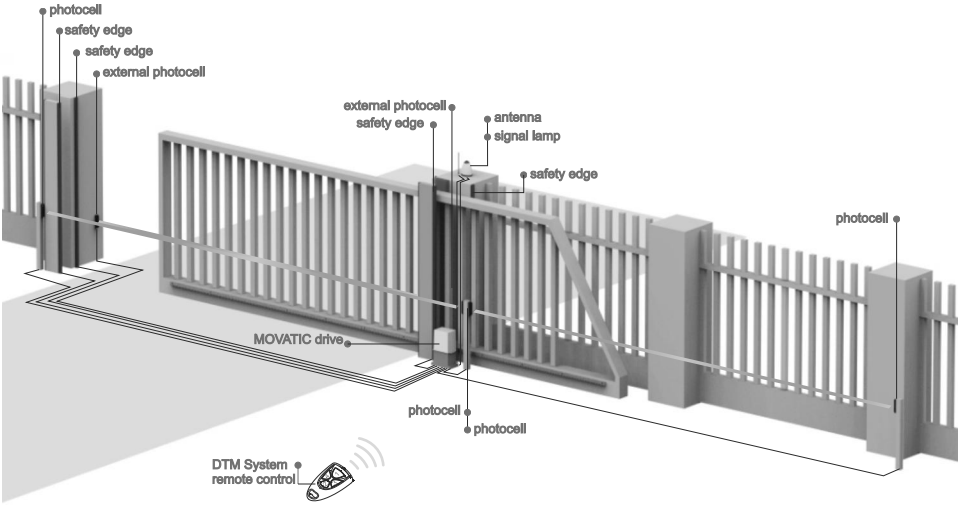


Fig.3. Illustrative view of the gate automation installation.

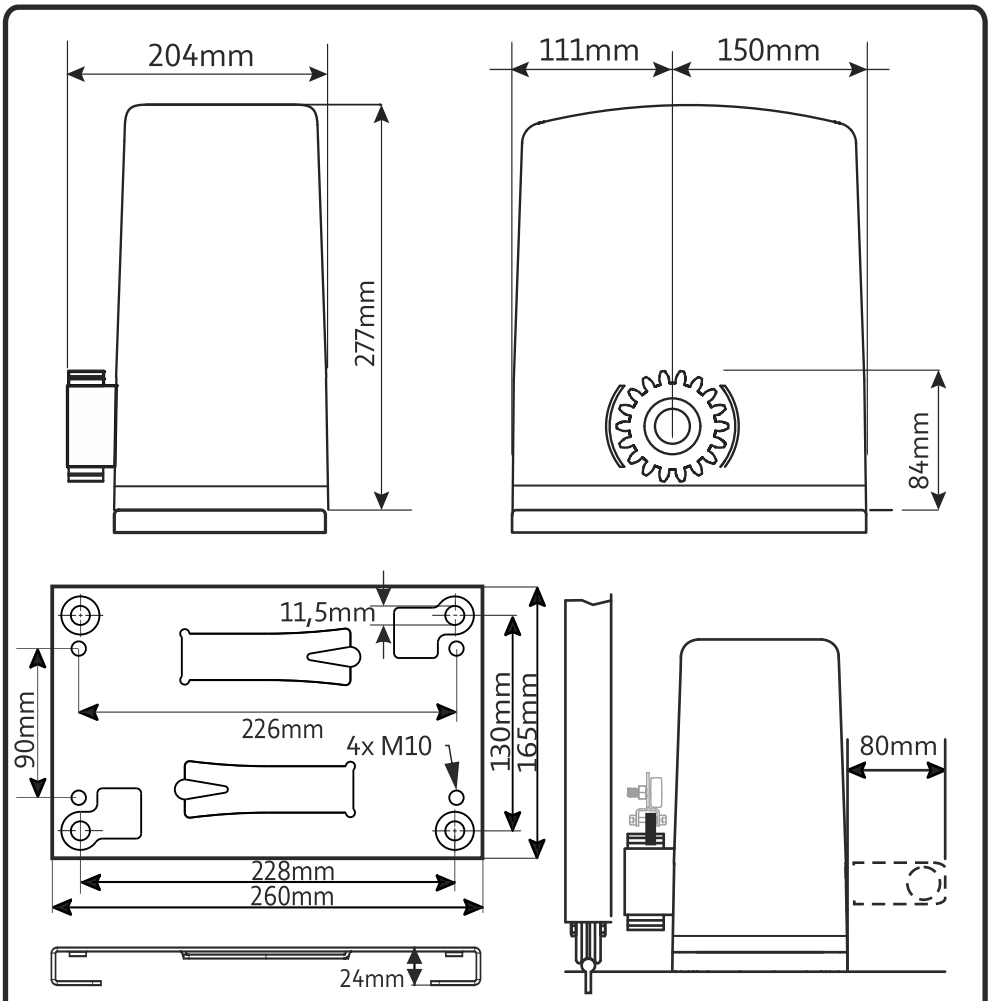


Fig.4. Drive dimensions and recommended installation dimensions.

2.3. Drive base

The appropriate position of the base is decisive for the subsequent installation of the drive itself and the operation of the gate. The first step is to determine the distance between the rotation point of the rack and the mounting plane of the racks, and then the height of the base plane to the edge of the racks. These dimensions may vary depending on the type of rack. Before determining the final assembly dimensions, it is necessary to check whether it will be possible to assemble the drive (there is enough space for assembly tools).

Drives in gate installations exert very high forces on the base. Therefore, after determining the best dimensions, it is best to weld the base directly to the gate structure. In the case of stone or

concrete foundations, attach the base so that the locating pins do not loosen during operation.

2.4. Drive installation

For convenient installation, the drive should be unlocked (information on unlocking the drive can be found later in the manual). Place the unlocked drive on the base and secure it using the screws and nuts provided. If the central hole is used for electrical installation, the electrical components must be inserted into the drive before installation.

2.5. Installation of racks

Depending on the racks you have and the design of the gate itself, you should screw them or, if necessary, weld threaded spacer sleeves and then screw the racks to them. Installation can be made easier by using a third strip as a support, see drawing.

Fig.5. Types of racks.

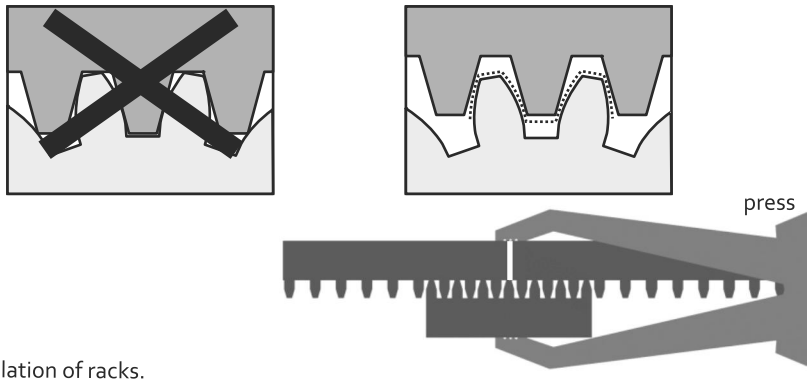


Fig.6. Installation of racks.

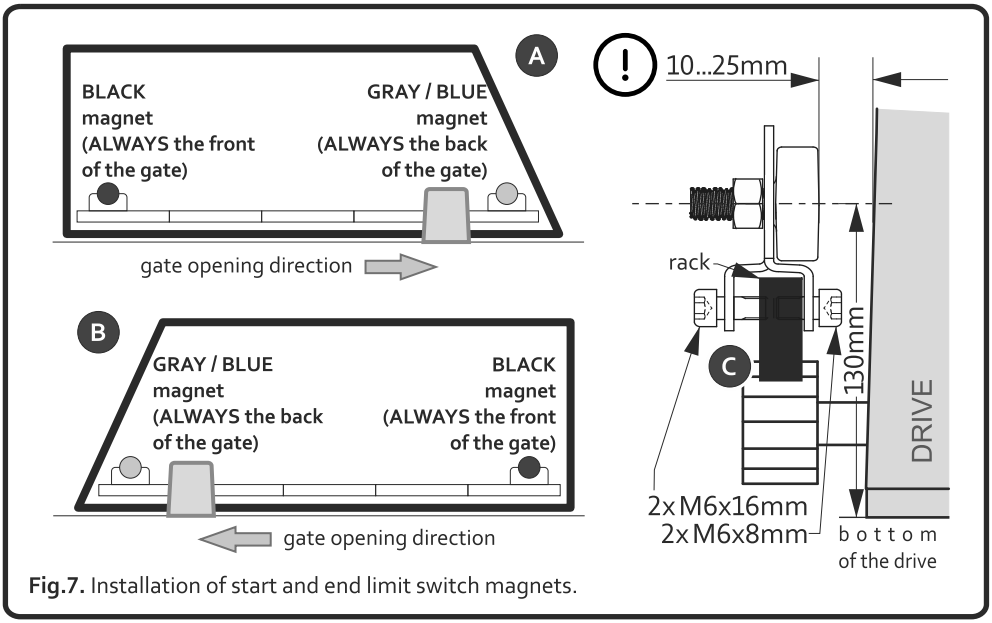


Fig.7. Installation of start and end limit switch magnets.

2.6. Installation of limit switches

The initial assembly is carried out before the first start-up of the drive, in such a way that the appropriate limit switch is switched on before the gate reaches its extreme positions. The black magnet is always mounted at the front of the gate, while the gray (blue) magnet should be attached to the back of the gate leaf. The distance between the front surface of the magnets and the surface of the drive cover should be within the range of 10...25mm. To obtain the required distance between the magnets, try to place the magnet holders as shown in Figure 7[C]. Activating the gate without the presence of magnets may result in damage to the drive and/or the gate when one of the permitted extreme positions is exceeded.

A magnet distance of less than 10mm may result in an E7 error occurring during drive calibration and subsequent gate operation.

2.7. Locking/unlocking the drive

The drive mechanism can be unlocked in the event of a failure or power failure. The gate can then be operated manually. To unlock the drive, turn the key in the ignition and tilt the clutch lever. After locking/unlocking the drive, cover the key area with a cover. To lock the drive, proceed in the reverse order: insert the key into the ignition, turn the clutch lever so that it is completely hidden in the recess intended for it, and lock the mechanism with the key.

After blocking the drive, before starting it for the first time, move the gate manually until you hear the characteristic "click" of the drive mechanism. This activity significantly increases the life of the clutch components.

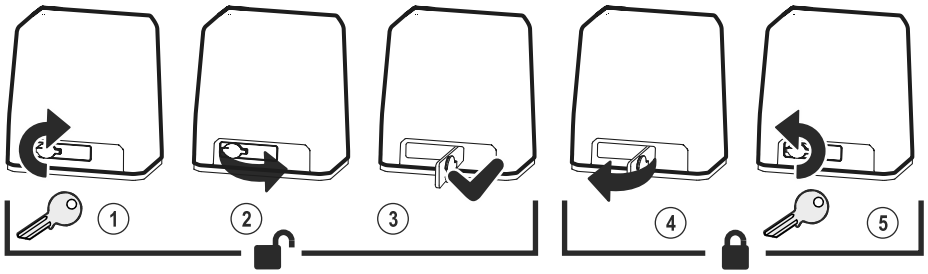


Fig. 8. Locking / unlocking the gate drive.

IMPORTANT REMINDER

Electrical and drive automation installations must be performed by experienced and qualified personnel in accordance with applicable law. The devices contain dangerous voltages of 230V 50Hz, all connections should be made with the voltage turned off. The installer's task is to install the system in a safe enough way to minimize the risks associated with its use. The person who installs the device without complying with all applicable regulations is responsible for any damage that the device may cause.

2.8. Preparation of electrical installation components

Before purchasing the cabling, check whether you have a photocell with a built-in optical indicator, then you must provide two additional wires in the photocell cables. The length of the wiring depends on the length of the gate, the width and height of the posts, and the space provided for the distribution boxes, so we should estimate the cable lengths ourselves. Protective corrugated pipes should also be used for the cables.

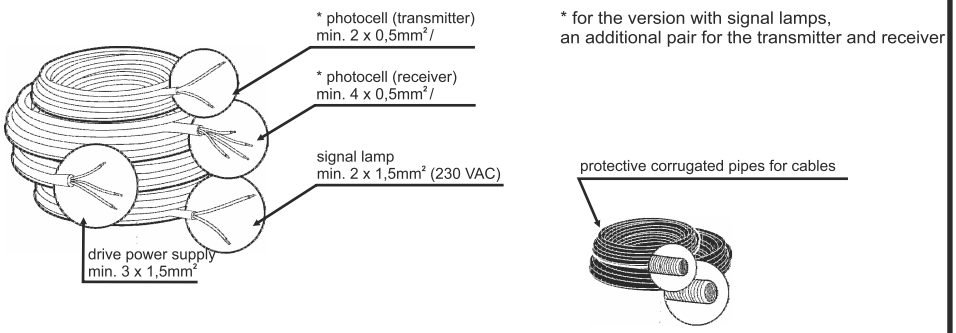


Fig.9. Materials necessary for proper electrical installation.

2.9. Drive assembly - components of the controller motherboard

All necessary connections and settings must be made in the drive controller. For ease of installation, all screw connections are detachable. The elements marked in the figure are:

1. User interface - LED display;
2. User interface - buttons for menu operation and quick adding of remote controls;
3. MEMO programmer connector;
4. Mini series fuse (10.9mm) 10A protecting the battery circuit;
5. Mini series fuse (10.9mm) 10A protecting the 24VAC circuit of the controller and the motor;
6. Connector for the 433MHz radio module;
7. Main fuse 230V/5A;
8. Power connector 230VAC.

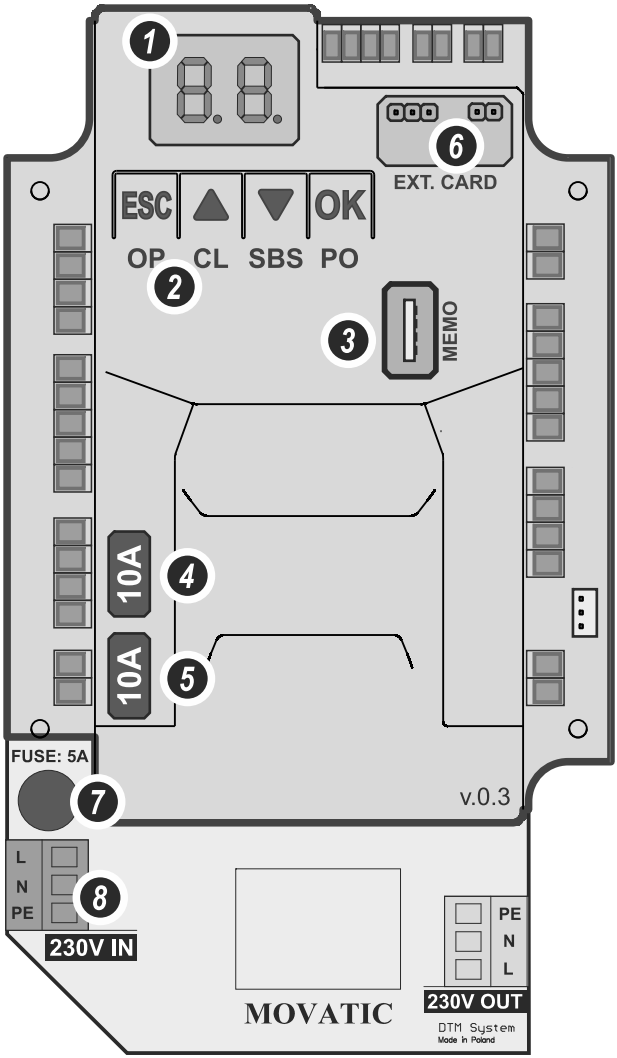


Fig.10. View of the controller's main board.

3. Description of the controller's electrical connections

This section contains information regarding the electrical connections of devices associated with the controller. The way the controller responds to the actions of connected devices is determined by the installer via the controller menu.

3.1. Mains power terminals 230VAC, 50Hz L, N, PE

Connect the phase (L), neutral wire (N), and protective wire (PE) to the appropriate terminals.

3.2. Signaling output terminals for connecting a signal lamp LAMP

The terminals are used to connect optical signaling of the operating gate (+, GND). Use 24V lamps, max. 5W. The signaling output is also an output informing about the gate status and possible errors. Details of the output behavior are presented in the table.

3.3. Accessories power terminals 24VDC

The controller has 24VDC accessory power outputs with a maximum load capacity. 1A. The output on the left side of the controller is intended for photocell transmitters, photocell receivers and the STOP button. Other control and safety devices should be connected to the terminals on the right side of the controller. Please remember that the load capacity of the 24VDC power outputs and the signal lamp is 1A in total.

v.0.2

Lamp	Times	Description
	1s - 1s	gate / wicket during opening
	0,5s - 0,5s	gate / wicket during closing
	czas AF	countdown of the time until the gate / wicket closes
	0,1s - 1,9s	gate/wicket opening on emergency power supply, no 230VAC power supply
	0,1s - 0,9s	gate/wicket closing on emergency power supply, no 230VAC power supply
	+3s 0,25s - 0,25s	service inspection required
	3x 0,4s - 1s	check the operation of the photocells/phototest
	6x 0,4s - 1s	internal damage of the controller – service
	7x 0,4s - 1s	limit switch magnets installation error
	8x 0,4s - 1s	motor encoder failure – service

Tab.1. Output operation method for signal lamps.

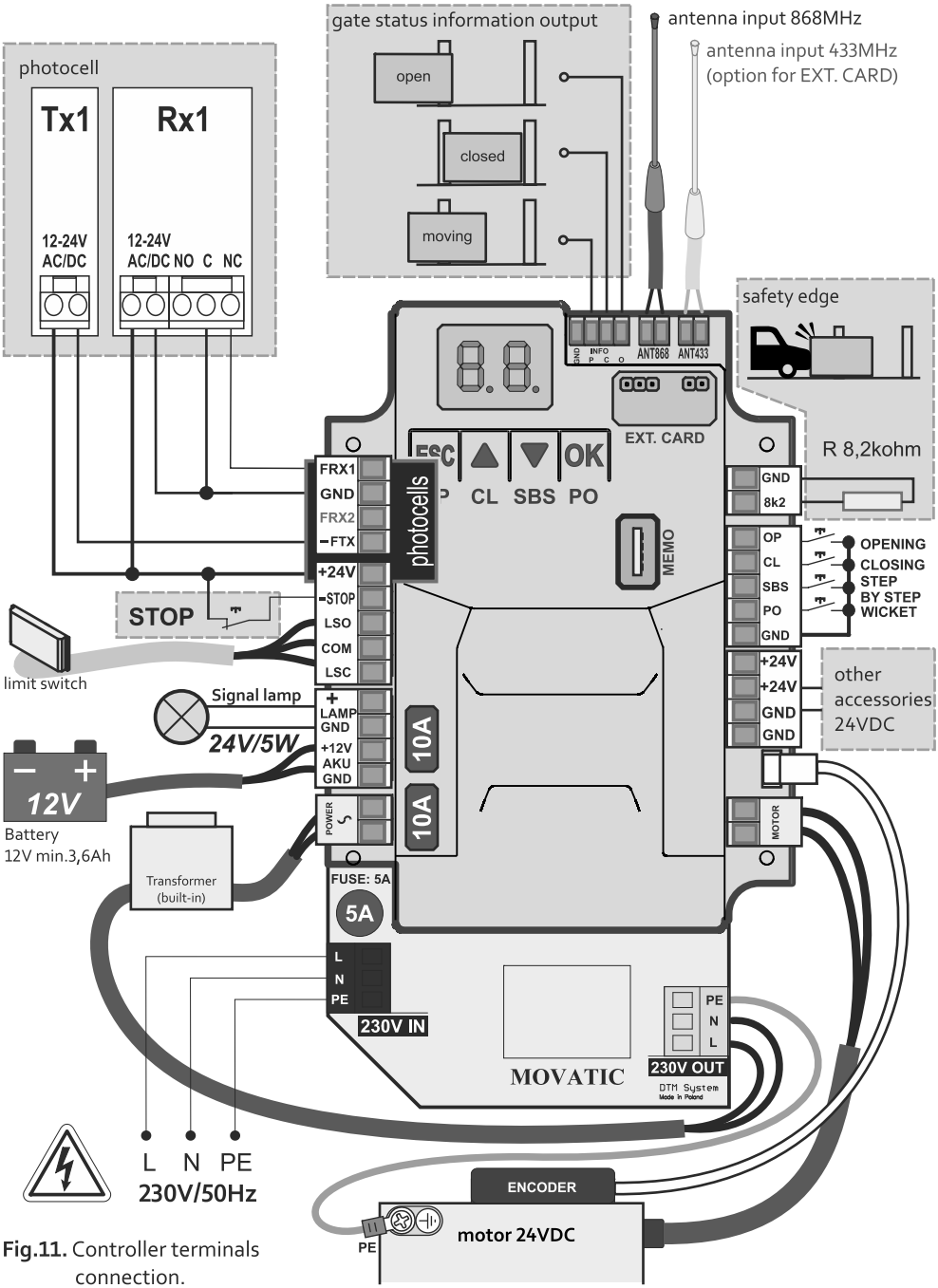


Fig.11. Controller terminals connection.

3.4. Information output terminals INFO C, O, P

These are OC type outputs for connecting input modules of facility automation systems. The method of using information about the gate being closed [c], open [o] and in an intermediate position [p] depends on the user's needs. It may as well function as a control for road semaphores. The output load is 50mA, which is sufficient to control electromagnetic signaling relays. The output has a common GND terminal.

3.5. Photocell transmitters power output terminal -FTX (photo-test)

The transmitter power supply should be connected between the +24V and -FTX terminals, regardless of the use of the photo-test function.

If the number of wires is limited, the connection to the -FTX terminal can be replaced with a connection to GND - however, in this case it is not possible to use the photo-test function.

The power supply connection for the second pair of photocells should be done in the same way.

When the photo-test function is turned on, the controller checks the correct operation of the photocells. This is done by controlling the reaction of the photocell receiver to the disappearance of the light beam from the transmitter. If everything is OK, the engine starts. If the procedure fails, the controller will report a failure, which is indicated by a signal lamp and LED display. The photo test must be set separately for each pair of photocells in the controller menu. **The photo-test function significantly increases the level of safety. The photo-test function is turned on in the controller's service menu.**

3.6. Terminals for connecting photocell receivers FRX1 and FRX2

FRX1 and FRX2 inputs are dedicated to photocell receivers that perform the safety function during gate movement. Connect appropriately: FRX1 - output of the receiver of the first pair of photocells, FRX2 - output of the receiver of the second pair of photocells. In normal operation, the FRX1 and FRX2 input must be shorted to GND via the NC contact. An unused input should be disabled in the controller menu or connected to GND.

3.7. Manual control terminals OP, CL, SBS, PO

A momentary NO type button can be connected to the OP terminal, which will activate OPENING. A momentary NO type button can be connected to the CL terminal, which will activate CLOSING. A momentary NO type button can be connected to the SBS terminal, which will control the automation SEQUENTIALLY in accordance with the settings in the controller menu. In this case, the gate can be opened, stopped and closed using the same button. The gate PARTIAL OPEN button (wicket function) can be connected to the PO terminal. All unused inputs should be left unconnected. The common terminal of the inputs is the GND terminal. Activation of the manual control button consists in pressing it momentarily (min. 0.1s).

3.8. Manual control terminal STOP

A momentary (monostable) NC type button should be connected to this terminal. The unused input should be shorted to the +24V terminal or disabled in the controller menu. Violation of this input will cause an emergency stop of the gate.

3.9. Safety edge input terminal 8k2 - emergency stop function

NC type input (8k2, GND) when violated, the controller stops the gate in an emergency. Input intended mainly for edge strips with a parameter of 8.2kohm. The unused input should be

disabled in the controller menu or connected to GND through an 8.2kohm resistor.

3.10. Remote control antenna terminals

The controller has two terminal sections for connecting an 868MHz antenna and an optional 433MHz antenna. An 868MHz wire antenna is installed as standard.

3.11. Radio card connector EXT. CARD

The controller has a connector for a radio remote control module operating at 433MHz. When installing the module, remember to connect the 433MHz antenna to the appropriate antenna socket of the controller.

3.12. Emergency power battery connector AKU

Connect a 12V battery with a minimum capacity of 3.6Ah to the +12V and GND terminals. In emergency mode, the speed at which the gate moves changes and the operation of the signaling output changes.

For mounting the battery, there is a compartment inside the drive with dimensions: 150x100x65mm (with a cover secured from the top with four screws).

3.13. MEMO programmer connector

Connecting the MEMO service programmer allows you to update the controller software.

In case of problems with updating the software, you can force the bootloader mode. To do this, press the "CL" button with the power off and, while still pressing the button, turn on the controller's power supply.

Manually forced bootloader mode is active for 10s. After this time, the controller returns to normal operation unless the program memory has been previously modified.

3.14. Energy saving – stand-by limited power consumption mode.

To increase energy efficiency under Directive 2009/125/EC, the controller automatically switches to limited power consumption mode 15 minutes after the end of the last work cycle. All 24V power outputs are switched off in this mode, reducing energy consumption. The limited power consumption mode can be deactivated in situations requiring constant power supply to external devices. To do this, enter the controller menu and change the "LP" function settings.

4. Description of the controller's operation

After turning on the controller's power supply, it automatically switches to OPERATING MODE. In the operating mode, the current status of the controller and any errors are indicated by the LED display. The list of possible messages for an uncalibrated gate and a calibrated gate is presented in the table below.

v.0.5

No.	Gate calibrated	gate NOT CALIBRATED	Description of the drive / gate status
1		**cr**	Gate in extreme position - calibration can be started after setting the gate in an intermediate position
2		**LP** - *blink*	The end position of the gate is being determined during calibration
3	**CL**	**cL**	The gate is closed
4	**CL** - *blink*	**cL** - *blink*	Gate closing in progress
5	**CL** - *blink* **L**	**cL** - *blink* **L**	The gate is closing - slowdown
6	**CH**	**cH**	Gate stopped while closing
7	**OP**	**oP**	The gate is open
8	**OP** - *blink*	**oP** - *blink*	Gate opening in progress
9	**OP** - *blink* **P**	**oP** - *blink* **P**	The gate is opening - slowdown
10	**OH**	**oH**	Gate stopped while opening
11	**Fr**		The gate is partially open - a wicket
12	**E1**		Drive inactive, short circuit in the motor circuit
13	**E1** - *blink*		Gate stopped due to a short circuit in the motor
14	**E2**		Drive inactive, STOP switch circuit interrupted
15	**E2** - *blink*		Gate stopped due to violation of the STOP switch circuit
16	**E3**		Drive inactive, check the operation of photocells/phototest
17	**E3** - *blink*		Gate stopped after photocell activation
18	**E4**		Drive inactive, protection circuit 8k2 violated
19	**E4** - *blink*		Gate stopped due to violation of security input 8k2
20	**E5** - *blink*		Overload on the gate leaf when closing / opening
21	**E6** - *blink*		Fuse failure
22	**E6**		Internal damage to the controller - service
23	**E7**		Error in the installation of the limit switch magnets
24	**E8**		Motor encoder failure – service
25	**Er**		During calibration, the engine operation time exceeded 5 minutes or the gate resistance was too high
26	*. - right dot*		Ambient temperature above 0˚C
27	*. - left dot*		Ambient temperature below 0˚C - automatic correction of force settings
28	*. - dot blink*		Active STAND-BY mode or battery power supply

Tab.2. Possible indications on the controller display.

5. Controller programming

The drive is programmed using the "ESC", "v", "^", "OK" buttons located on the drive controller and the digital LED display.

5.1. Access to the controller menu and navigate through it

Access to the controller menu is obtained after entering the four-digit service code. The code must be entered from "left to right". Input begins by pressing any button. Then, change the digit values using the "^" or "v" button. To move to the next position to the right using the 'OK' button, and to the left (to the previous digit) using the 'ESC' button. After entering the code, confirm it with the 'OK' button, the first item in the controller menu should appear on the display. The factory service code is 1234.

Access to the controller menu is possible for another 5 minutes after the last exit from the menu. After this time, you will need to enter the service code again.

When in the controller menu, switching between functions is done using the "^"/"v" buttons. To enter the next menu level or to edit a parameter, press the "OK" button and confirm the changes with the same button. You can go back in the menu or exit without changes by pressing the "ESC" button.

5.2. First start-up - analysis of needs and efficient adjustment of drive settings

In order to efficiently carry out the controller programming process, the following sequence should be followed:

Step 1: Analyze the tables with individual controller settings and select the appropriate functions.
Step 2: Calibrate the gateway.
Step 3: Check correct operation and repeat programming if necessary.

No.	Controller function			Parameter	Factory settings	Definition	v.2 Description
	Grade 1	Grade 2	Grade 3				
1	**cr/Cr**				cr	***Calibration***	Gate uncalibrated - cr, gate calibrated - Cr, calibration reset 5x "OK"
2	**Fr**			oF, 1..40	40	***Wicket***	Gate tilting - wicket function: **oF** - disabled, **1...40%** of full gate opening
3	**bA**				-	***Photocells***	Infrared barrier settings
4		**F1/F2**		F1, F2	-		Select photocell settings F1 or F2
5			***oP***	br/st/re	br	***opening***	Reaction when opening F1/F2: br - no reaction, st - stop, re - reverse
6			***cL***	br/st/re	br	***closing***	Reaction when closing F1/F2: br - no reaction, st - stop, re - reverse
7			***Ft***	on/oF	oF	***photo-test***	F1/F2 photocell phototest: **on** - turned on, **of** - turned off
8			***AF***	oF, 0,1..9,9	oF	***auto-photo***	Auto closing after photo F1/F2: **oF** - disabled, **0.1...9.9** minutes from releasing the barrier to starting closing

Tab.3. View of the functions available in the controller menu 1/2.

No.	Controller function			Parameter	Factory settings	Definition	Description v.2
	Grade 1	Grade 2	Grade 3				
9	PP			1..35	-	Remote controls	Programming the remote control (programming: function – button). At the end, the position number in which the remote control is saved is displayed.
10		op			-	open	Programming for the open function
11		cl			-	close	Programming for the close function
12		Sb			Sb	in sequence	Programming for the function step by step, open - stop - close - stop
13		Fr			-	wicket	Programming for the function: open the wicket, partial opening of the gate
14		St			-	stop	Programming for the stop function - stopping the gate
15	UP			1..35	-	Delete remote	Deleting a remote control from the indicated record in the controller memory
16	PF				-	Remotes' memory	Displays free positions in the remote controls' memory. After confirming 5x "OK", the remote control memory is deleted.
17	Au			oF, 0,1..9,9	oF	Auto - closing	Automatic gate / wicket closing time in minutes
18	SE				-	Inputs	Control sequence for controller inputs
19		St		on/oF/rE	oF	stop	Behavior of the STOP input in the controller: **on** - enabled, **oF** - disabled, **rE** - reverse and stop
20		SP		0/1/2	0	8k2	Behavior of input 8k2: **0** - disabled, **1** - reverse and stop, **2** - reverses and stops when closing, stop when opening
21		Sb		oS/oc/or	oS	sbs	SBS control operation diagram: **oS** - open-stop-close-stop, **oc** - open-close, **or** - open-stop-close-revers
22	bL				-	Blockages	Blockages settings
23		Pd		on/oF	oF	simple	Blocking the function of simple adding remote controls
24		Zd		on/oF	oF	remote	Blocking the function of remote adding of remote controls
25	Sr			of, 1...10	oF	Signaling	Signaling before gate movement: **of** - disabled, **1..10** signaling time in seconds
26	LC			0..9999	0	Cycles	Cycle counter. After exceeding the max. displayed, a dot also lights up. Clearing the counter - 5x "OK"
27	EP			0..9999	0	Overloads	Number of overloads When the max. number is exceeded. displayed, a dot also lights up. Clearing the counter - 5x "OK"
28	EZ			0..9999	0	Short circuits	Number of motor short circuits When the max. number is exceeded. displayed, a dot also lights up. Clearing the counter - 5x "OK"
29	CP			of, 1...10	oF	Service	Service signaling threshold in thousands of cycles. Clearing the counter - 5x "OK"
30	Lo				-	Slowdowns	Correction of slowdown areas
31		tc		-5..0..5	0	closing	Correction when closing: value x10cm
32		to		-5..0..5	0	opening	Correction when opening: value x10cm
33		rc		0...2	0	closing	Soft start on closing (0-none, 1-short, 2-long, no recalibration required. It does not have to be a start from the end position.
34		ro		0...2	0	opening	Soft start on opening (0-none, 1-short, 2-long), no recalibration required. Does not have to start from the end position.
35		rt		on/oF	oF	„kick"	At low temperatures, it starts each movement with a jerk (movement for 1 second at the maximum possible speed)
36	Pn	0000	Pn (blink)	0000..9999	1234	PIN	Changing the installer code - entering the code twice to prevent mistakes
37	FA				-	Settings reset	Restoring factory settings without deleting the remote control memory - 5x "OK"
38	LP			on/oF	on	Power	Turn on/off Stand-by mode
39	rP			1..9	4	Emergency stop	Overload adjustment
40	rS				-	speed	Speed adjustment. This parameter affects the gate speed in both the fast and slow phases.
41		cl		1...5	5	closing	Gate closing speed (1-min, 5-max). Changing this parameter cancels calibration and requires re-calibration.
42		op		1...5	5	opening	Gate opening speed (1-min, 5-max). Changing this parameter cancels calibration and requires re-calibration.

Tab.3. View of the functions available in the controller menu 2/2.

5.3. Adding remote controls to the controller

Remote control programming can be done in three ways.

1. Simple adding of remote controls using the controller buttons:

- press and hold the appropriate button on the controller: OP - open, CL - close, SBS - step by step, PO - gate;
- after 3 seconds, the appropriate message will start flashing on the display: "oP" / "CL" / "Sb" / "Fr";
- during this time (with the controller button still pressed), press the button of the added remote control;
- the selected function will be assigned to the selected remote control button
- the remote control number in the controller memory will be displayed.

The procedure for simply adding remote controls will end after the remote control has been successfully added or after releasing the controller button. A given remote control button can be programmed multiple times, changing its function.

2. Remotely adding remote controls within the controller's radio range without viewing the controller:

- press and hold any button of the previously added remote control for 15 seconds
- then, within 3 seconds, press any button on the remote control to be added for 15 seconds
- if everything went correctly, the new remote control will have the settings of the remote control previously used in the remote adding procedure.

The procedure only works within the radio range of the controller to which we want to add the remote control!

3. Procedure for adding a remote control via the controller menu:

- enter the menu using the service code;
- go to the "PP" function;
- then select the function that the remote control button is to perform (OP - open, CL - close, SBS - step by step, PO - gate);
- press the selected remote control button;
- correct addition of the remote control is indicated by displaying the position in which it was saved and then by blinking the dot three times on the display;
- then the controller will return to the previously selected function, allowing you to add another remote control.

5.4. Changing or deleting remote control button settings

To change the button settings on the remote control, add the buttons to the newly selected functions again. If you do not want to use a previously added button, you should delete the remote control from the controller memory and, if necessary, re-add selected buttons of such a remote control in an appropriate way.

5.5. Deleting a remote control, erasing the remote control memory

Deleting a remote control can be done in two ways:

1. Deleting a single, selected remote control from the controller menu:

- enter the menu using the service code;
- go to the "UP" function
- select the memory location where the remote control to be deleted is saved;
- press the "OK" button 5 times to confirm the remote control removal function.

2.Deleting all remote controls from the controller menu, deleting the remote control memory:

- enter the menu using the service code;
- go to the "PF" function

- press the "OK" button 5 times to confirm the removal of the remote control.

5.6. Method of reaction of photocell inputs

Photocell operating mode settings:

- after entering the service code, go to the "bA" function in the controller menu;
- then select the input for which you want to make changes: F1 or F2;
- select the operating mode for opening: br - no reaction, st - stop, re - reverse, closing;
- select the operating mode for closing: br - no reaction, st - stop, re - reverse, opening;

Additionally, in the photocell settings you can: enable/disable the photo test function and activate auto photo closing (automatic closing of the gate if there are no barrier violations for a set period of time). Default photocell settings: F1 - disabled, F2 - disabled.

5.7. Programming the "width" of the wicket

Wicket function - after entering the service code, go to the "Fr" function in the controller menu. Select the percentage value of the opening width, assuming full gate opening as 100%. The adjustment range for opening in wicket mode is from 1% to 40%.

5.8. Programming the automatic gate closing function

Automatic closing - after entering the service code, go to the "Au" function in the controller menu. Select the time, in minutes, after which the gate will automatically close.

5.9. Gate calibration when the drive is first started

Before starting calibration, make sure that there are no obstacles in the gate's path. During calibration, the drive automatically selects the overload setting. Be especially careful during calibration - all controller protections are inactive. A properly performed calibration procedure guarantees reliable and safe operation of the gate.

To calibrate the gate after complete drive installation:

Step 1: Turn on the power.

Step 2: Add a transmitter to the drive or connect an accessory to one of the control inputs, necessary to control the gate during the calibration process.

Step 3: Unlock the drive with the key. Set the gate leaf in an intermediate position. Then lock the drive.

Step 4: Use the transmitter or connected accessory to cause the gate to move. The gate will start moving slowly towards one of the end positions, the LED display will show a flashing "LP".

Step 5: Each time the gate reaches the end position, press the button on the remote control or the selected accessory to move the gate.

Step 6: Calibration will be complete when the display changes from "cL" to "CL" with the gate closed.

Step 7: Check the selection of slowdown areas. The gate should move slowly for at least 0.5 m before reaching its end positions. Correct slow areas if necessary.

Step 8: Check the proper operation of the photocells and, if present, also the resistive strips. Measure the force on the closing edge. Check whether the force limitation is consistent with the specifications given in Annex A of the PN-EN 12453 standard. The dynamic force of the main closing edge cannot exceed 400N in the area 50 cm from the post, 1400N in the remaining area, the dynamic time cannot exceed 750 [ms] according to the PN standard -EN12453. A significant

improvement in the parameters in terms of dynamic forces can be achieved by using a special shock-absorbing rubber profile on the edge of the gate leaf.

5.10. Clearing automatic calibration. Recalibration of the drive.

Before performing this step, place the gate in an intermediate position or make sure you have the key.

If it is necessary to recalibrate the drive, first delete the previous calibration settings. After entering the service code, go to the "Cr" function in the controller menu. To delete the calibration, press "OK" 5 times. After deleting the calibration, the next start of the gate will start the calibration process, which should be carried out as in the case of the first start of the drive.

5.11. Movement at reduced speed (slowdown), high force function at low temperatures - "kick"

Correction of slowdown areas - after entering the service code, go to the "Lo" function in the controller menu. Then, choose between:

- correction of the slowdown area during opening/closing - "to" / "tc." Both areas can be adjusted from -5 (shortening) to 5 (lengthening). A single change in the "tc" or "to" parameters changes the slowdown area by approximately 10 cm. After each change in the slowdown area, the controller clears the calibration settings. Automatic calibration must be repeated, starting with the gate in an intermediate position;
- slowdown at the beginning of movement each time it opens/closes - "ro" / "rc";
- switching the increased force at start-up at low temperatures to "on" and "oF" to „off."

5.12. Emergency stop - overload adjustment in the controller

The overload adjustment in the gate controller allows you to adjust the sensitivity of obstacle detection, which affects the safety of use. The "rP" parameter allows you to set values from 1 to 9, where a lower value means greater sensitivity to overload. By default, the parameter is set to 4. If an overload is detected, the drive will stop the gate.

5.13. Factory settings of the controller

Restoring factory settings - after entering the service code, go to the "FA" function in the controller menu. To restore factory settings, press "OK" 5x. The factory setting values are shown in the function table. The function does **not erase** the remote control memory.

5.14. Menu protection code

Changing the service code: go to the "Pn" function in the controller menu. Then enter the new service code twice. Loss of the code will require sending the controller to the manufacturer's service center.

5.15. Drive diagnostics - irregularities during drive use

The drive controller is equipped with a number of diagnostic mechanisms that allow you to determine whether the drive requires technical inspection or repair. After properly configuring the controller, the need for service or repair will be automatically signaled.

The maximum value of the counters indicated on the display is 9999. After exceeding this

value, if the indication is not cleared, a dot will be displayed next to the indication. To delete counters, enter the menu and select the appropriate counter and then press "OK." 5x.

The following diagnostic functions are available:

- work cycle counter - the work cycle includes the complete movement of the gate from closing to opening and back to closing;

- overload counter - a very important parameter, most often signaling the need to repair the gate, which begins to pose too much resistance to the drive, which will lead to damage to the drive itself. This type of damage is not subject to warranty repairs.

- service counter - after how many cycles in thousands the drive should report the need to perform automation maintenance work at the signal lamp output.

- signaling of drive errors via signaling output and LED display- the meaning of individual messages is described in the table showing how the lamp works and the controller's message table. ***In such a case, the intervention of a qualified person is required to determine and remove the automation failure.***

5.16. Automatic winter/summer mode

The drive is equipped with a temperature sensor. Detection of a drop in the controller's ambient temperature below 0°C will automatically correct the drive force settings. ***If startup work (calibration) of the drive is performed at a temperature below 0°C, turn on the drive power and wait at least 1 hour.***

6. Checking the correct operation of the automation

After installing the controller and all associated devices, especially safety ones, final tests should be performed to check the entire automation. These tests should be performed by competent personnel who are aware of the existing hazards! Final tests are the most important phase in the implementation of automation. Individual components such as the motor, photocells, etc. may require specific inspections and it is therefore recommended to follow the inspection procedures contained in the instructions for the components concerned.

CAUTION!

The gate, both when opening and closing, should provide the same resistance to the actuator. The plane of the gate should be positioned relative to the ground in such a way that there is no variation in resistance due to gravity forces when opening and closing the gate.

7. Automation unit maintenance

Activities that can be performed by a trained user after carefully reading the instructions provided with the product. For gates with electric drive, at least once every 3 months:

- check the correct adjustment of the limit switches,
- check the correct operation of electrical safety devices by simulating working conditions,
- check photocells - by simulating the conditions,
- check the overload switch - the gate should stop and reverse when the leaf encounters an obstacle,
- check the manual unlocking mechanism of the drive,
- check if the electrical cables show any signs of wear,
- regularly clean the photocell housing and the signal lamp cover,
- the batteries powering the transmitters should be checked/replaced at least once every 12 months.

DISPOSAL

Electrical or electronic devices cannot be disposed of with household waste. Proper disposal of the device allows you to preserve the Earth's natural resources for longer and prevents environmental degradation.

WARRANTY CONDITIONS

DTM System delivers devices that are operational and ready for use. The introducer grants a warranty on the basis of a correctly completed warranty card and sales document. The introducer undertakes to repair the device free of charge if any defects occur during the warranty period due to the fault of the introducer. The defective device should be delivered to the place of purchase, including a copy of the proof of purchase, a correctly completed warranty card and a short, clear description of the damage. The cost of dismantling and assembling the device is borne by the user. The warranty does not cover batteries in remote controls, any damage resulting from improper use, unauthorized adjustments, modifications and repairs, or damage resulting from lightning, overvoltage or short circuit in the power supply network. Detailed conditions for granting guarantees are regulated by relevant legal acts.

DTM System hereby declares that the device complies with Directives 2014/53/EU, 2006/42/EC, 2014/30/EU, 2014/35/EU, 2009/125/EC. The full text of the EU declaration of conformity is available at the following internet address: **www.dtm.pl**

DESIGN AND PRODUCTION OF ELECTRONIC DEVICES

DTM System

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