



PALLET BUDDY

- Instruction manual



Serial Number:

Model:

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General information

These operating instructions apply to the Palomat Greenline model and are the original operating instructions for Palomat Greenline.

The purpose of these instructions is to ensure that the Palomat is correctly handled, installed, operated and maintained throughout its service life.

These operating instructions must be kept in a location known to the staff and be easily accessible to operators and maintenance personnel, see (**section 4.9**).

All operators and maintenance personnel who are to operate, service, or otherwise come into contact with the machine throughout its service life, must have read and understood this manual before unpacking and commissioning. In case of doubt, contact the machine supplier. The documentation must always accompany the machine.

The following documents are delivered together with this manual:

- Manual front page
- Declaration of Conformity
- Electrical documentation



***The manual must be read and understood before installation and use.
Use as a reference in case of doubt.***

1.1 Version

These operating instructions were drawn up/edited by:

Revision:	Date:	Initials:	Description of change:
12.0	04-04-2004	DAH Y	First edition
Not released	01-09-2024	THBP/SICH	Updated version and structure pursuant to EN ISO 20607 – Not released
13.0	01-02-2026	MSH/KIML	Document edited and approved for release

1.2 Expected level of education, training and competence

The machine may only be operated and maintained by persons who have the necessary qualifications and have been instructed in its use:

1. Operator: (Operating staff)	Persons instructed in the daily operation, functions and safety devices of the machine. The operator must have read and understood these operating instructions for use before starting work.
2. Technical staff: (Maintenance)	Persons with relevant professional training (e.g. mechanic, electrician) and specific knowledge of the machine structure, safety circuits and troubleshooting. Only technical personnel may carry out repairs and interventions in the machine that cannot be considered part of the daily operation.
3. Persons in training: (as well as people under the age of 18)	May only operate the machine under constant supervision of an experienced and instructed operator, and only to the extent that it complies with legislation regarding the employment of young persons. Operation by persons under the age of 16 is prohibited.

When working on the machine, any requirements regulated by national legislation, or work otherwise requiring special permits or training, must always be complied with this.

1.3 Other persons

People who have not been instructed as operators or technical personnel e.g., (visitors, administrative staff, cleaning staff, or children) are considered unauthorized to operate or move around the machine.

- These persons must **not** operate the machine or remain within or around the machine's working area.
- It is the operator's responsibility to ensure that no bystanders or unauthorized people are present within, or in the immediate vicinity of the machine, before and during operation.

2 Safety information



2.1 Purpose and intended use of the machine

This machine must be placed and fixed directly to the floor. The machine is only intended for raising and lowering pallets. Only handling empty and undamaged pallets in accordance with section 3.2.1 The machine must be used as described in this manual, otherwise BILA A/S disclaims any liability and the CE is void. When working on the machine, national legislation must always be observed.

2.2 Warning about foreseeable misuse

According to the Machinery Directive's requirement to address "any reasonably foreseeable misuse" (Appendix I, item 1.1.2.c), the following acts are **strictly prohibited**:

- **Restricted areas:**
It is strictly forbidden for persons to be inside the Palomat or its working area as well as under lifted pallets. The machine is only for pallet handling.
- **Operation restricted to one person:**
The Palomat may only be operated by one person at a time.
- **Lifting of persons forbidden:**
Under no circumstances should the Palomat be used for lifting persons.
The lifting mechanism does not meet the safety requirements for such use.
- **Incorrect operation in manual mode:**
The pallet stack must not be lifted in manual mode, the grippers **MUST NEVER** be pulled out of the pallet.
- **Manipulation of safety equipment:**
It is forbidden to bypass, block or disassemble safety switches, light curtains, emergency stop or other safety-related parts of the machine. Attempts at manipulation are considered a significant safety violation that makes the machine dangerous to persons.
- **Operation without cover:**
The machine must not be operated if fixed covers are removed, defective or damaged so that internal moving parts are accessible.
- **Emergency stop**
Never block or make emergency stops inaccessible. They must always be visible and free for immediate activation.
- **Overload:**
Do not load more pallets or exceed the load capacity of the Palomat (see specifications in **section 3**) or the pallet stack exceeds the top of the machine. Overfilling may result in structural failure.
- **Maintenance under voltage:**
Do not perform adjustments, maintenance or service while the machine is in normal operation or connected to the power supply. The power must be disconnected as described in section 2.3



2.3 Safety precautions

In order to ensure correct and safe use of the machine, the following security measures and organisational procedures must be complied with anyone who operates, maintains or otherwise is in contact with the machine:

- **Safety devices:**
The safety devices of the machine must be intact and properly installed before starting operation.
- **Visual check:**
At each start-up, the operator must ensure that there are no persons or unauthorised equipment within the working area of the machine.
- **Periodic inspection:**
Periodic inspections must be performed to ensure that the machine is intact and that safety functions function properly.
- **Qualifications:**
The machine may only be operated and maintained by persons described in **section 1.2**.
- **Use:**
The Palomat may only be used for commercial purposes. Only one operator may operate the machine and the area must be secured during service, maintenance and manual operation.
- **Manual operation:**
Staff must take particular care during manual operations. During manual operation, it is the operator's full responsibility to operate the Palomat so that dangerous situations do not occur.

Special conditions for: Installation and handling of the machine, Service maintenance, Troubleshooting, Spare parts, Optional accessories



- **Only be performed by instructed technical staff! See section 1.2!**
All directions and instructions must be followed. Necessary equipment must be used such as work platforms, lifts and lifting equipment in accordance with local regulations.
- **Disconnecting power:**
All work that does not require the machine to be connected to the power supply, the power plug must be removed from the socket and secured against accidental connection by using a suitable locking device (lockout). If the machine has been delivered with a switch disconnecter, it must be switched to the OFF / "0" position and secured against re-engaging with a suitable locking device (lockout). (See figure 1)
Take special care when during work that demands the machine is connected to the power supply!
- **Before any work starts:**
The machine must be emptied for pallets. The area around the machine must be cordoned off so that unauthorized people do not have access to the area.
- **No repair of safety components:**
Do not repair safety components (emergency stop, door switches, light curtains). If they are defective, they must be replaced with new, original components by an authorised service technician.



2.3.1 Protective equipment

The following protective equipment must always be used when operating the Palomat.

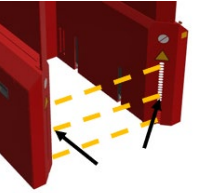
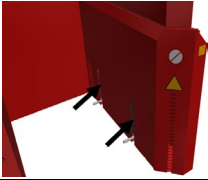
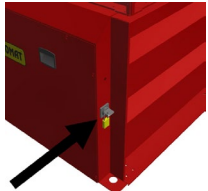
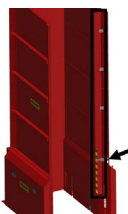


Always wear gloves when servicing and maintaining the Palomat.



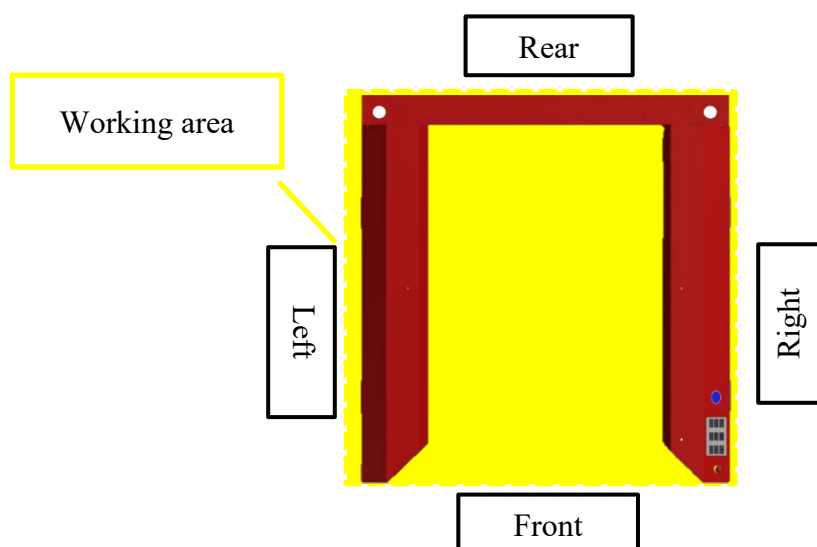
Always wear safety shoes.

2.3.2 Location of critical security measures

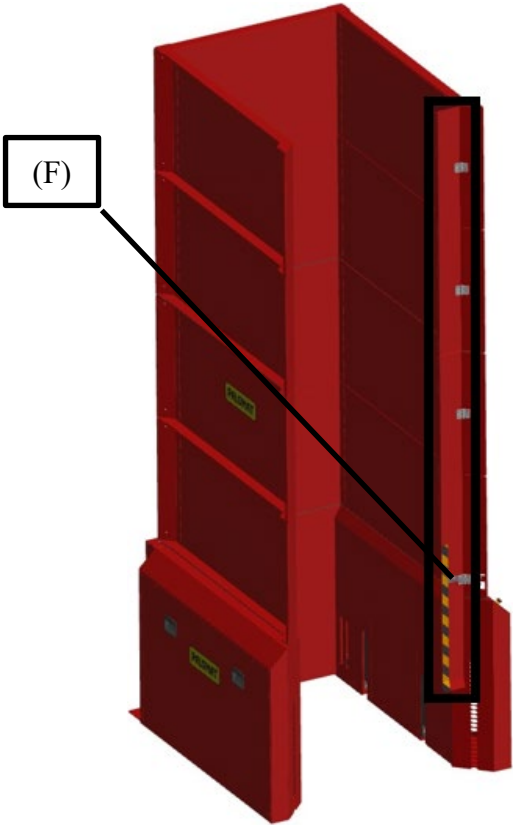
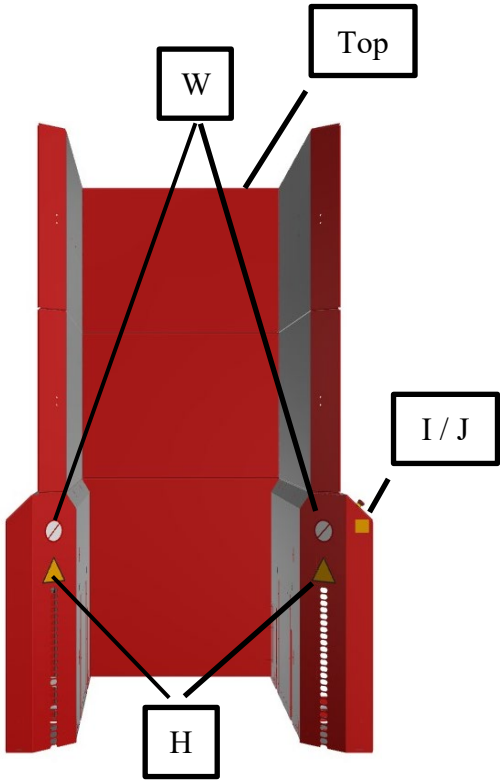
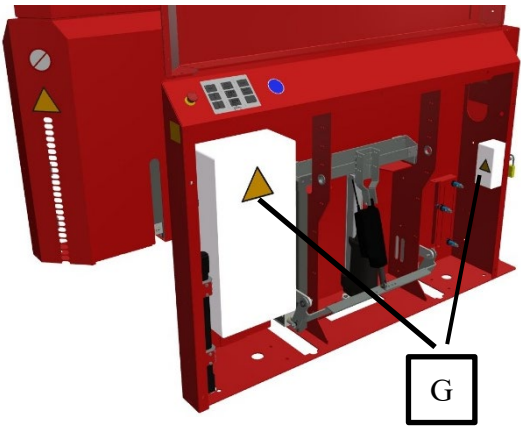
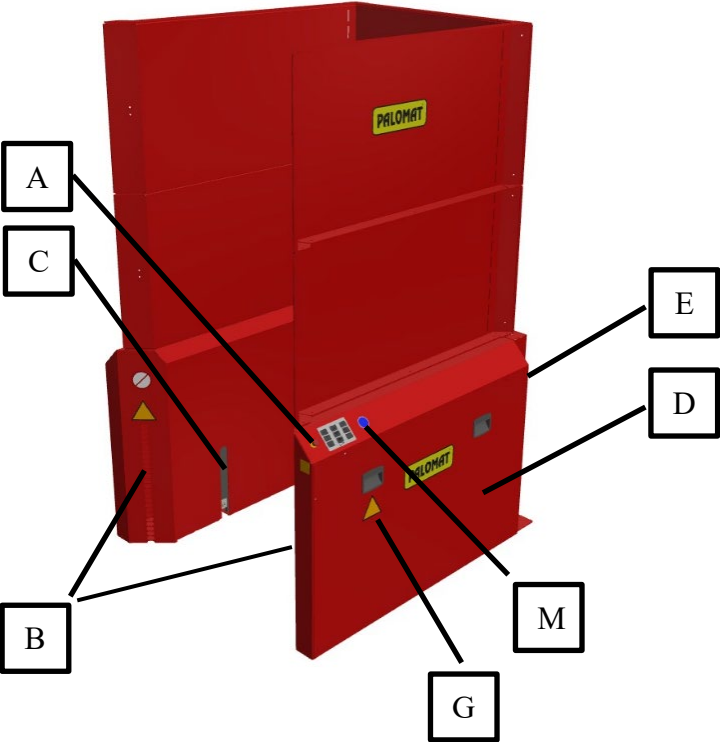
Location	Component	Description
A		The control panel features an emergency stop. The emergency stop is intended for use in emergencies only. The emergency stop is designed as Performance Level C and implemented according to Category 1 in accordance with EN ISO 13849-1. The emergency stop is designed for 20 years of operation.
B		The safety light curtain is a safety function that stops the machine's movements in the event of accidental activation. The light curtain is designed as Performance Level C and implemented according to Category 1 in accordance with EN ISO 13849-1. The light curtain is dimensioned for 20 years of operation.
C		Covers over pallet grippers are mounted above all four grippers.
D		Side covers are mounted on the right and left side of the machine.
E		Switch disconnecter, located right rear corner. If the power plug is connected so that it cannot be disconnected quickly and safely, the machine MUST feature a switch disconnecter.
F		Safety gate with switch, (only on machines over 15 pallets) (option on machines up to and including 15 pallets). The safety gate switch is a safety function that performs a safety-related stop if the safety gate is not closed. The safety gate switch is designed as Performance Level C and implemented according to Category 1 in accordance with EN ISO 13849-1. The safety gate switch is dimensioned for 20 years of operation.

2.4 Definitions, pictograms and symbols

Location	Symbol	Description
G		Dangerous voltage. Located at the end of the cover as well as on the control box behind the cover, and on the switch disconnecter behind the cover.
H		Caution, hand crushing hazard. Located on the front of the machine, near the hazardous area.
I		Maximum Palomat load. Placed at the front of the Palomat with a capacity of 500 kg (see section 3.3 Product data for the Palomat).
J		Maximum Palomat load. Placed at the front of the Palomat with a capacity of 700 kg (see section 3.3 Product data for the Palomat).
K		This is only used in the manual to draw attention to important points.
L		Warning, no unauthorised access (placed on the front).
M		The manual must be read and understood before installation and use. Use as a reference in case of doubt. (placed on the push button panel).



2.4.1 Location and references on machine



2.5 Residual risks

The significant residual risks include:

Risk of manual operation: During manual operation, where persons may be closer to moving parts, or can do faulty operation, there is an increased risk of pinching hands and feet.

Precautions:

- Always keep hands and feet out of the hazardous area. Pay attention to the movements of the machine.
- Secure the area around the machine from access by other people.
- Operated by only one person.

Risk of staying in the operational area: If, despite warnings, persons are wholly or partly in the machine's working area during start-up or operation, there is a risk of serious injury.

Precautions:

- Comply with the restricted work area access. The machine must only be operated by one person at a time.

Risk of Special conditions for: Installation and handling of the machine, Service maintenance, Troubleshooting, installation of Spare parts and Optional accessories:

If instructions are not followed as described despite warnings, there is a risk of serious personal injury, such as lacerations to arms and hands, crushing hazards, and risk of electric shock.

Precautions:

- Comply with the safety measures described in the manual.
- It must only be performed by instructed technical personnel.

The machine is designed according to the three-step risk reduction method required by DS/EN ISO 12100 and the Machinery Directive:

Self-contained design (step 1):

The machine is designed with fixed covers, proper dimensioning and mechanical stability to minimise hazardous situations.

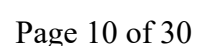
Technical protection measures (step 2):

Access to the machine's main sources of danger is limited by a safety light curtain, which stop the machine when activated. The machine is equipped with an emergency stop. Electrical safety is ensured via the machine's internal potential equalisation, as well as requirements for RCD and SPD in the power supply (DS/EN 60204-1:2018).

Information for the user (step 3):

The manual contains clear instructions on the significant residual risks and precautions to be taken by the user, cf. Annex I, Section 1.7.4.2 of the Machinery Directive. The manual must be read and understood before it is set up and commissioned. This applies to anyone who, during the service life of the machine, must operate, maintain, handle or otherwise bypass the machine.

The Palomat pallet magazine is used for pallet handling by stacking and destacking pallets. The Palomat comes in various models and sizes. Check the type plate on the machine for type number, serial number and electrical data, and serial number. The type of Palomat can be found by reading the type number, after which you can see which type of pallet fits in the machine in question in **section 3.3** Product data for the Palomat. The Palomat has an estimated service life of 10 years under normal operating conditions: 37 hours per week, with regular lubrication and maintenance. See section 6.



3.3 Product data for the Palomat

Variant chart.

The type number can be found on the machine plate. See the location of the machine plate in section 3.

Palomat type	Palomat length A (mm)	Palomat width B (mm)	Palomat height C (mm)	Palomat weight kg (mm)	Max. no. of pallets	Max capacity kg	Pallet size A – B – C
152001	1485	1350	2372	375	15	500	1200-800-144
152002	1485	1550	2372	375	15	500	1200-1000-144
152003	1485	1750	2372	395	15	500	1200-1200-144
152101	1485	1350	3770	505	25	700	1200-800-144
152102	1485	1550	3770	520	25	700	1200-1000-144
152103	1485	1750	2370	535	15	700	1200-1200-144
152007	1285	1750	2370	355	15	500	800-1200-144
152008	1285	1750	2370	360	15	500	1000-1200-144
152050	1285	1350	2370	340	15	500	600-800-144

A - B - C dimensions are given in Figure 1 for Palomat and Figure 2 for pallet type.

If the type number ends with “-SP”, e.g.: “152001-SP”, see separate appendix.

The Palomat can handle pallet types made of different materials. The pallets must comply with the dimensions for which the Palomat is designed and must not exceed the maximum capacity in terms of quantity or weight, (see section 3.3).

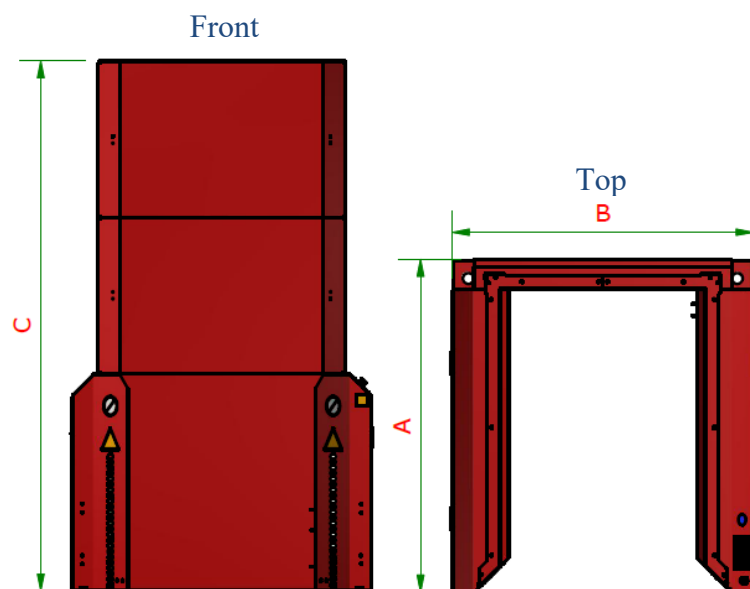


Figure 1

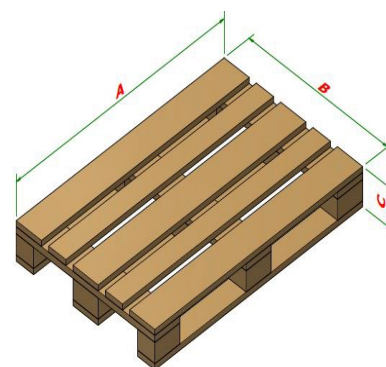


Figure 2

4 Installation and handling of the machine

NOTE! The operations below may only be performed by instructed technical staff!
See section 1.2 and 2.3!



4.1 Receipt and storage

When the machine is received the buyer is responsible for checking the machine for any transport damage and that all parts of the delivery have been received. Inform the dealer of any deficiencies. If the machine is not to be installed directly, it should be packed as received and stored in an environment as described in **section 3.1**.

4.2 Transport

If using a forklift truck or hand pallet truck to transport the machine, this must only be done from its front or rear and using the dedicated transport pallet. (See Figure 1)



Figure 1

4.3 Unpacking

Unpacking and installing the Palomat may only be carried out by qualified personnel. Before unpacking, place the Palomat as close as possible to its final location. The Palomat is placed on a transport pallet and is wrapped in film. The pallet and film must be removed prior to use. Carefully remove the film using scissors or a knife. Avoid cutting into the Palomat.

4.4 Handling: dismantling from the transport pallet

- A. Remove the 4 bolts that secure the Palomat to the transport pallet. Figure 2. Use a 10 mm spanner to loosen the bolts and remove them.

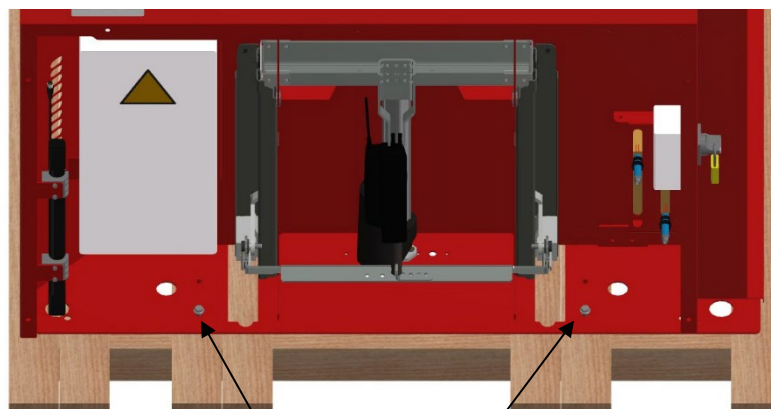


Figure 2

Transport bolts

- B. Then place a pallet in the magazine using a forklift truck so that it rests on the 4 grippers
Figure 3. Lift the Palomat off the transport pallet.



Figure 3

- C. Now remove the transport pallet and place the Palomat on the floor in the desired location.
Figure 4.



Figure 4

4.5 Setup

Once the Palomat has been placed on the floor, check the internal distance between the sides both front and rear. (Figure 5) The measured distance must be identical within a tolerance of ± 5 mm. If the measured distance is not within ± 5 mm, make sure the floor is level (**see section 4.6**).

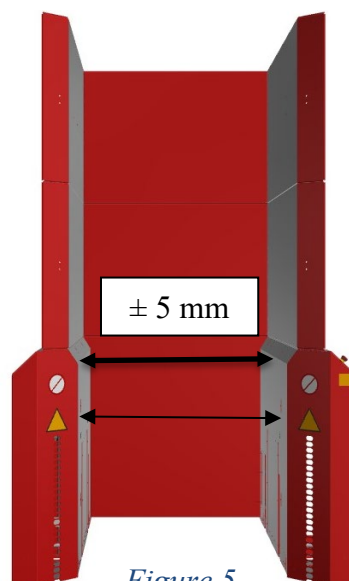


Figure 5

4.6 Installation and connection

The surface to which the Palomat is attached must be flat, stable and with sufficient load-bearing capacity. Remove the side cover (see section 6.3 step 2) and mark the mounting holes on the right and left sides (Figure 6 'A'). Remove the machine and drill the holes in the floor.

Reposition and secure the machine with expansion bolts or glue anchor bolts (M10).

Each of the four mounting points must be able to withstand at least 4kN of traction.

After fastening the Palomat, check inside that it is level (0.05° - 0.07°) on the three inside sides. If necessary, loosen the screws and straighten the machine under the mounting holes and the points on (Figure 6 'B') and then retighten.

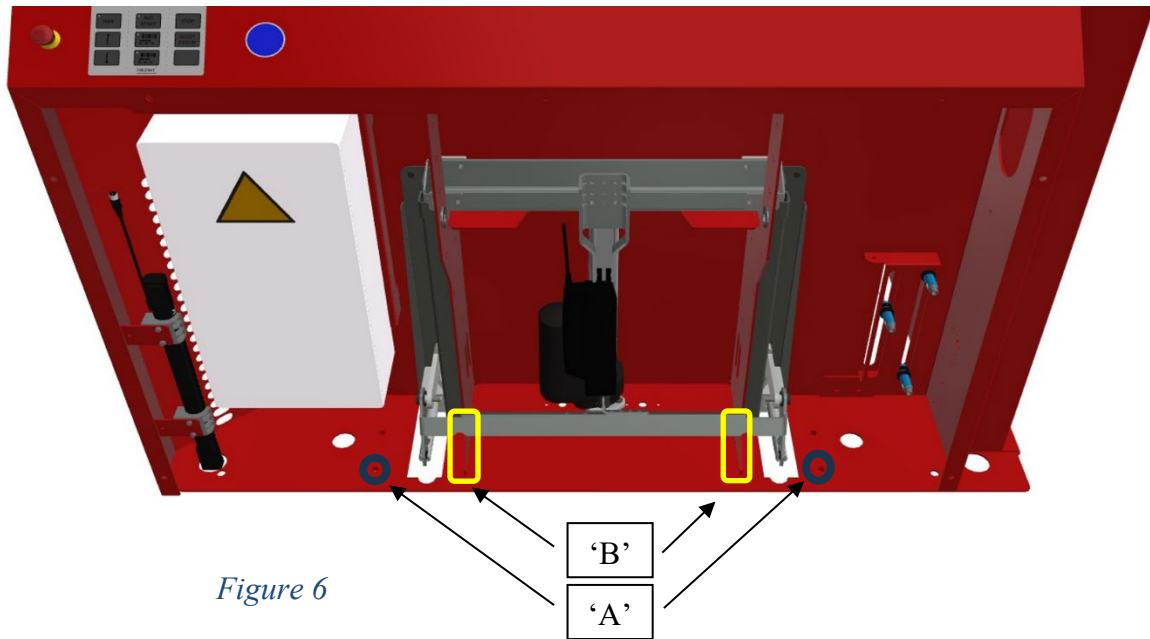


Figure 6

Connect the machine to an electrical supply in accordance with the electrical specifications described in section 3.1. The machine is supplied with plugs on the power supply line, which must be easily accessible so that the power supply can be quickly and safely interrupted.

If the supply plug is connected so that the power supply cannot be disconnected in a fast and safe manner, the machine **MUST** be delivered with a switch disconnecter.

The supply cable to the machine must be mechanically protected or placed so that there is no risk of overload or damage. The machine must only be connected to an installation with active earthing (PoE) to ensure correct function of fault current protection and surge protection.

4.7 Pre-commissioning checks

All functions **must** be tested before commissioning the machine. All covers must be attached before commissioning the Palomat. Before using pallets, check the safety functions and the functions of the machine as described in Section 6.1

When checking before use, use at least 2 test pallets of the same type that are to be used in the machine must. Carry out a pallet stacking test and a destacking test. Do this by starting the machine in automatic mode and carrying out a stacking and a destacking operation, respectively.

The packaging must always be disposed of in accordance with local regulations.

4.8 Protecting the Palomat during periods without normal use

If the machine is taken out of service for an extended period of time, clean it and then lubricate it with a thin layer of acid-free oil to protect against unnecessary rust and corrosion. For cleaning and lubrication instructions, see **section 6.3**.

4.9 Placement of the operating instructions

These operating instructions must be available near the Palomat. If this is not possible, then the location of the manual must be clearly marked near the machine. This must be easily accessible to all users of the machine.

4.10 Repackaging

If the machine is to be moved, it must be wrapped securely with foil and attached to the transport pallet. It must be possible to move the machine without risk of damage, neither to the machine nor to persons.

5 Function description

The Palomat is operated via the panel.

1. Manual

Manual operation. The Palomat can be raised or lowered, and the grippers can be extended or retracted.

2. Auto/Start

Starts the automatic stacking or destacking controls. Activate the button for 2 seconds.

3. Up arrow

MAN operation: Lifting actuator moves up.

4. Down arrow

MAN operation: Lifting actuator moves down.

AUTO operation: Activate the emptying function for 5 seconds, and the Palomat will lower the stack of pallets to the floor.

5. Stacking/gripper retracted

MAN operation: Pulls the grippers out of the pallet. (DO NOT perform with pallet lifted)

AUTO operation: Automatic control for stacking pallets.

6. Destacking/gripper extended

MAN operation: Insert the grippers into the pallet.

AUTO operation: Automatic control for destacking pallets.

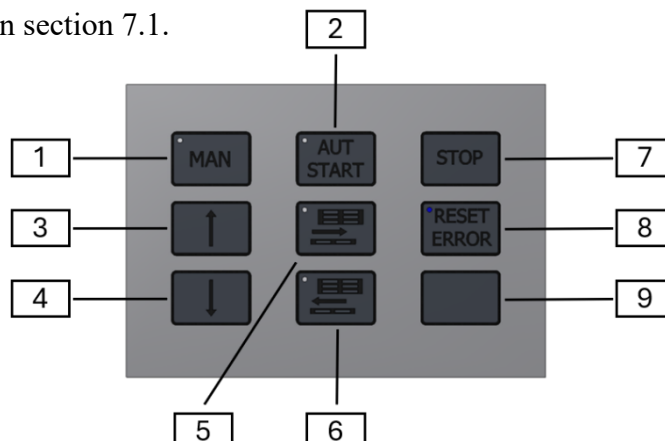
7. Stop

Stops all movement and changes over to manual mode.

8. Reset/Error

Reset: Cancels alarm. Pressing and holding the button for 2 seconds switches the Palomat to manual mode.

Error: The RESET/ERROR button flashes a certain number of times for errors. Please check the number of flashes in section 7.1.



5.1 Description of the stacking function

1. Press and hold the “AUTO/START” button for 2 seconds.
2. Make sure the “STACKING” button is lit.
3. The Palomat is now ready for use.
4. Drive a pallet into the magazine and remove the hand-pallet/forklift truck on which the pallet will be stacked.

5.2 Description of the de-stacking function

1. Press and hold the “AUTO/START” button for 2 seconds.
2. Make sure the “DE-STACKING” button is lit.
3. Drive a stack of pallets into the Palomat.
4. The Palomat will now lift the stack, leaving the bottommost pallet.
5. The bottom pallet can now be removed from the Palomat. About 10 seconds after the bottom pallet has been removed, the Palomat will lower the next pallet to the floor.
6. Once the last pallet has been removed, repeat from point 3.

You can always switch between stacking and destacking in “AUTO” mode.

5.3 Description of the pallet-stack removal function

To remove all pallets from the Palomat, press and hold the “Down arrow  button for 5 seconds, after which the Palomat will lower the stack to the floor. The pallet stack can now be removed.

(If the safety gate option is installed, open it first)

NB. The button for stacking  or de-stacking  will flash. This function will remain active until no pallets remain in the Palomat or it is set to manual mode.

5.4 Technical protection measures

Safety light curtain:

Sequence description of safety light curtain in "STACK" mode

1. The machine is in “Auto” with the pallet stack raised and not in motion
2. The pallet is fed into the machine with pallet truck, and the light curtain is broken
3. The pallet is delivered to the bottom of the magazine, and the bottom sensor is activated
4. The pallet lifter is pulled out, the bottom sensor remains activated, and the light curtain will no longer be blocked
5. The machine reconnects and picks up the pallet

Sequence description of safety light curtain in "DE-STACKING" mode

1. The machine is in “Auto” with a lifted pallet stack, a single pallet on the floor, ready for pick-up and not in motion
2. The empty pallet truck is inserted into the machine, and the light curtain is broken
3. The pallet is lifted off the floor, the pallet is extended and the bottom sensor is deactivated
4. The pallet lifter with pallet is pulled fully out and the light curtain is no longer blocked (within 10 seconds)
5. The machine reconnects and picks up the pallet

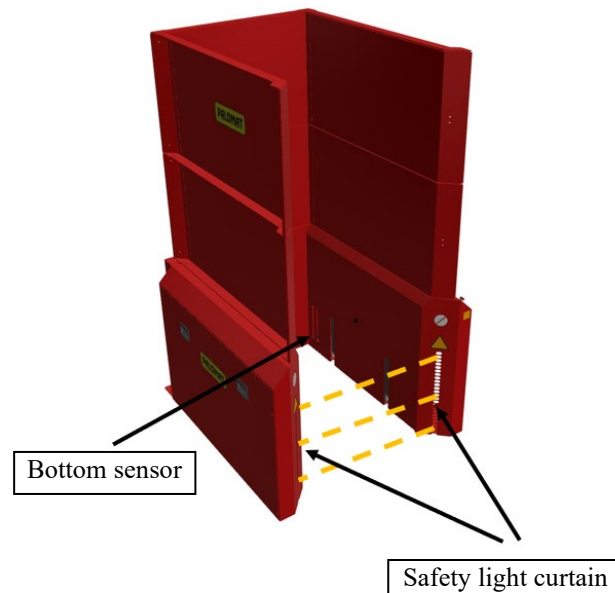
If the light curtain is interrupted while the Palomat is in standby mode (Not operating)

The Palomat will enter alarm mode and the RESET/ERROR button will flash but can be reset by pushing the RESET/ERROR button on the control panel or by resume sequence from description above.

If the light curtain is interrupted while the machine is moving or for more than 10 seconds when the machine is stopped, the machine will stop and enter alarm mode.

The “RESET/ERROR” button will then flash 3 times. To reset the alarm, check that nothing is blocking the light curtain and it is safe to start the machine.

After checking the area, press and hold the “RESET/ERROR” button for 2 seconds and the machine will switch to manual mode. Then press and hold AUTO/START for 2 seconds, and the machine will continue operating, move up and start over.



Emergency stop:

The emergency stop is intended for use in emergencies only.

Activating the emergency stop will stop all movement of the Palomat.

The "RESET/ERROR" button will flash twice.

To reset:

Reset the alarm by releasing the emergency stop (turn to the right to release the button) and then press and hold the "RESET/ERROR" button for 2 seconds. The Palomat will switch to manual mode. Then press and hold AUTO/START for 2 seconds, and the Palomat will continue its automatic operation.

Safety gate switch: (option)

The safety gate switch is for monitoring that the safety gate is in the closed position.

If the safety gate switch is activated, the Palomat will cease all movement.

The “RESET/ERROR” button will flash twice.

To reset:

Reset the alarm by closing the safety gate (closed in front of the pallet stack) and then press and hold the “RESET/ERROR” button for 2 seconds. The Palomat will switch to manual mode. Then press and hold AUTO/START for 2 seconds, and the Palomat will continue its automatic operation.

6 Service and maintenance



6.1 Safety precautions before service, maintenance and troubleshooting

NOTE! The operations below may only be performed by instructed technical staff! See section 1.2 and 2.3!

6.2 Service and maintenance table

Maintenance and service must be done according to the table in this section.

Lack of maintenance or outright neglect will render the warranty void.

Service and maintenance must be carried out to ensure fault-free and safe operation.

The following are required to clean and lubricate the Palomat:

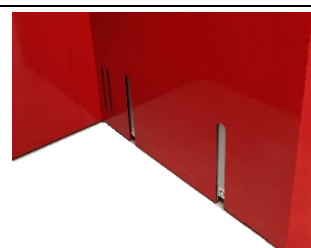
- A dry, lint-free cloth
- Mildly alkaline cleaning agent
- A wrung-out cloth in water
- Universal lubricant (e.g. Blackbolt NSF H1)

Service and maintenance table	Monthly	Every six months	Once a year
¹ Tighten after the first month of operation, then once a year.			
All sensors and reflectors must be cleaned with a dry, lint-free cloth.	X		
Cleaning of the entire Palomat.			X
Lubricate C-profiles with a universal lubricant (e.g. Blackbolt NSF H1).		X	
Check the emergency stop, the light curtain and the safety gate switch (option).			X
Tighten bolts and nuts.			X

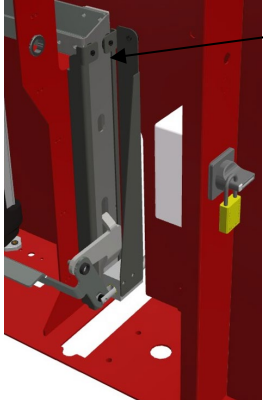
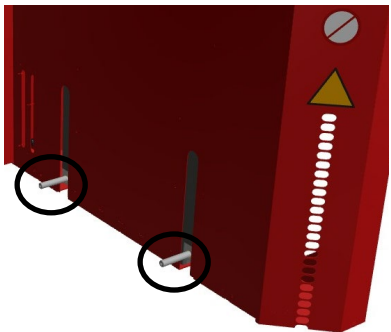
The service schedule is calculated based on a 10-year service life, operating 37 hours per week. Service intervals may vary depending on the environment, load, and use, so the recommended service frequency must be considered a minimum guideline.

6.3 Cleaning, maintenance and control instructions



Step	Action	Illustration
1	Switch to manual operation, lower the remaining pallets, and remove them from the machine. Extend pallet gripper, see section 5.3.	

2	Disconnecting power. Ensure that the machine is disconnected from the power supply and secured against reconnection as described in section 2.3.	
3	Tighten the guard bolts. and remove the cover. Do not remove the bolts, just loosen them so the cover can be removed. Do this on both sides of the machine.	
4	Cleaning the rear sensors. Wipe off the sensors with a dry, lint-free cloth. It is best done using the tracks inside the pallet magazine. It is the red glass that needs to be wiped down. Sensors are only fitted on the right side. Remove any pallet residues.	
5	Cleaning the light curtain on both sides Wipe off the glass with a dry, lint-free cloth. Wipe from the outside of the machine (behind the side cover).	

6	Pay attention to sharp edges when the cover is removed. Lubricate the C-profiles with a universal lubricant. The C-profile can be raised to the top to ease lubrication. A professional assessment must be made of the remaining service life of the sliding blocks.	
7	The pallet grippers are maintenance-free and do not require lubrication. They can be cleaned with a dry cloth, and stubborn dirt can be removed with ethyl alcohol. Remove any traces of lubricant from the pallet grippers.	
8	Replace the covers on both sides. Tighten the cover bolts. Clean inside and around the Palomat.	
9	Make sure that there are no persons, tools or other foreign objects inside or around the Palomat. Make sure that the cover is correctly attached. Once this has been checked, the power supply can be connected.	

10	Check emergency stop and light curtain. NB. Test must be performed with an empty magazine. Press the emergency stop button and make sure that the Palomat has stopped, that the Reset/Error button on the control panel is flashing, and that the machine cannot be started before the emergency stop has been reset, using the Reset/Error button on the control panel. Block the light curtain and check that the Palomat has stopped and the Reset/Error button on the control panel flashes and the machine cannot be started until the light curtain is not blocked. Check all pictograms are intact and visible (see section 2.4.1.).	
11	Safety gate switch (option). NB. Test must be performed with an empty magazine. If a safety gate is installed, open the safety gate and check that the Palomat enters a safety-related stop. Close the gate and check if the safety can be re-engaged. Check the locking tab locks and secures the gate when it is in the closed position.	
12	The Palomat is ready for automatic operation.	

6.4 Adjustment of gripping height



1. Destack the entire stack by holding down the down-arrow  for 2 seconds. Remove the entire pallet stack from the Palomat and the grippers will now be retracted to the bottom position.
2. Press and hold “Reset Error” and the up-arrow  until “MAN” starts flashing.
3. When “MAN” flashes, move the grippers to the bottom position by pressing the down-arrow button .
4. Measure the new gripping position on the desired pallet.
Measure from floor to centre of gripping hole on pallet 2. REMEMBER, it is always in pallet no. 2 from the floor that is adjusted (see Figure 1).

5. The grippers are operated manually with the up-arrow-up  button to the measured height in item 4, measured from the floor.
(See Figure 2)
6. Feed the new pallet stack that the adjustment is made for into the machine and remove the pallet lifter again. Start with max 5 pallets.
7. To extend the grippers (into the pallet stack), press the destack button  (The machine will then flash in “manual” and “reset error”) (see Figure 3).
8. When the grippers have been moved out of position, press and hold the Reset Error button until it no longer flashes. The machine has now saved the new gripping height and is put back into Auto.



Figure 1

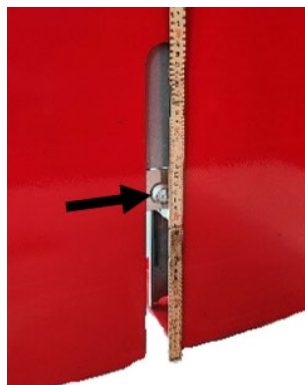


Figure 2

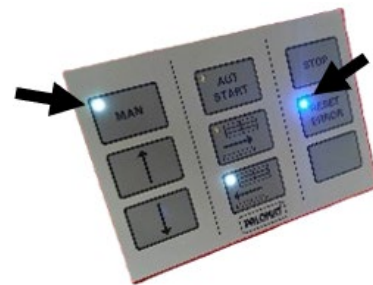


Figure 3

6.5 Homing procedure

If the actuators/grippers are in a position that does not allow the Palomat to be manually operated, it is possible to run a ‘homing procedure’.

1. Put the Palomat in “MAN” and in “STACK” mode,  so that the grippers are inside and clear of the pallet. Check that the “MAN” and “STACK” lights are on. 
2. Press and hold the “RESET/ERROR” button for 5-6 seconds, after which the actuators will run to the top.

NB: Please note that this is not possible if the grippers are out (visible) in the Palomat.

7 Troubleshooting



NOTE! Below may only be performed by instructed technical staff! See section 1.2 and 2.3!

In case of errors, first remove all pallets using caution. The lowest and/or second-lowest pallet may be stuck due to the error on the machine, or may be pinched. These must be left in place. DO NOT attempt to remove them with force. During troubleshooting, it may be necessary to check various electrical and mechanical components by manually operating.

7.1 Possible faults

To decode the error message, flash codes can be read on the “RESET/ERROR” button on the control panel. The button has a diode that displays the error code by flashing a specified number of times, followed by a short pause, and repeating the number of flashes. See Table 1.

If the following does not resolve the problem, contact your dealer.

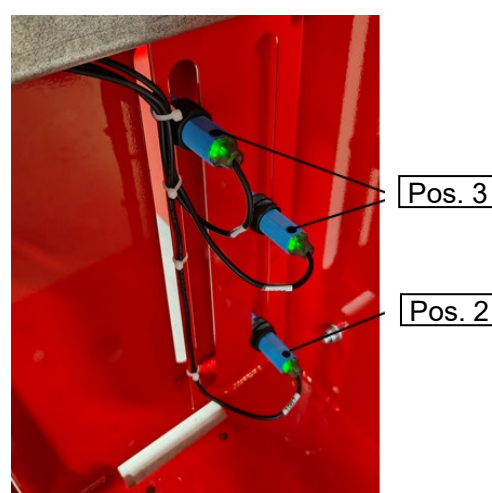
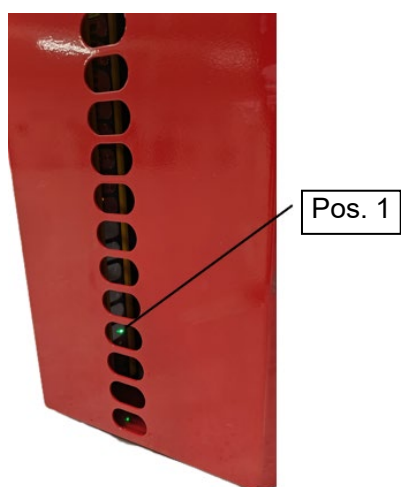
Table 1: (All errors are reset by pressing and holding Reset/Error for 2 seconds.)

Error code (Number of flashes)	Fault	Possible cause	Solution
2	Emergency stop circuit enabled	Emergency stop or safety gate (option) has been activated.	- Release the emergency stop. - Close safety gate, if fitted. (Option) - If safety gate is fitted, check gate safety switch (option) - Press Reset/Error to acknowledge errors
3	Front sensor has been activated during operation or is misaligned	Front sensor cannot see reflector. Front sensor is dirty or defective.	- Clean the sensor and reflector with a dry, lint-free cloth, or adjust them. - Check that the sensor diodes are lit – when adjusted correctly, 1 turns green and 1 turns yellow. - Press Reset/Error to acknowledge errors
4	Gripping error in out-direction right side	The gripper actuator has not reached its end position in the outward direction.	- Reset the error using the Reset/Error button. - Make sure that the gripper moves smoothly in and out in manual mode when the magazine is empty. - Reset the error using the Reset/Error button. Make sure that the machine can now operate in automatic mode. If not, contact a technician for further troubleshooting.
4 + flashes in Man.	Gripping error in out-direction left side	The gripper actuator has not reached its end position in the outward direction.	- Reset the error using the Reset/Error button. - Check that the gripper is running effortlessly in and out, in manual mode when the magazine is empty. - Reset the error using the Reset/Error button. Check if the machine can now operate automatically. If not, contact a technician for further troubleshooting
5	Gripping error in in-direction right side	The gripper actuator has not reached its end position in the inward direction.	- Reset the error using the Reset/Error button. - Make sure that the gripper moves smoothly in and out in manual mode when the magazine is empty. - Reset the error using the Reset/Error button. Check if the machine can now operate in automatic mode. If not, contact a technician for further troubleshooting
5 + flashes in Man.	Gripping error in in-direction left side	The gripper actuator has not reached its end position in the inward direction.	- Reset the error using the Reset/Error button. - Make sure that the gripper moves smoothly in and out in manual mode when the magazine is empty. - Reset the error using the Reset/Error button. Check if the machine can now

			operate in automatic mode. If not, contact a technician for further troubleshooting
6	Lifting error, top	The lift actuator has not reached its final position at the top.	- Reset the error using the Reset/Error button. - Check that the lift actuators are not blocked and can run smoothly in manual mode with an empty magazine. - Perform a homing procedure (Section 6.5) - See section 7.3 for troubleshooting the lifting actuator. - Contact technician for further troubleshooting
7	Lifting error, bottom	The lift actuator has not reached its final position at the bottom.	- Reset the error using the Reset/Error button. - Make sure that the lift actuators are not blocked and can run smoothly in manual operation, with empty magazine. - Perform a homing procedure (Section 6.5) - See section 7.3 for troubleshooting the lifting actuator. - Contact technician for further troubleshooting
8	Lifting errors "from bottom to middle"	The lifting actuators have not reached their gripper position when they rise.	- This may be due to an internal error in the control system (-7M1) or power supply. - Reset the error using the Reset/Error button. - Contact technician for further troubleshooting
9	Lifting errors "from top to middle"	The lifting actuators have not reached their gripper position when they descend.	- This may be due to an internal error in the control system (-7M1) or power supply. - Reset the error using the Reset/Error button. - Contact technician for further troubleshooting

7.2 Troubleshooting the sensors

1. Remove all pallets from the PALOMAT.
2. Set the Palomat in manual mode.
3. Enter the Palomat and activate the sensors by holding a piece of cardboard or similar in front of them.



Pos. no.	Error/fault	no.
1	The front light curtain turns green when light curtain is unbroken and OK.	9B6
2	Rear sensor “lights up when activated”: pallet is destacked down in the magazine.	9B7
3	Rear sensor “lights up when activated”: pallet is raised in the magazine.	9B5

7.3 Troubleshooting the lifting actuator



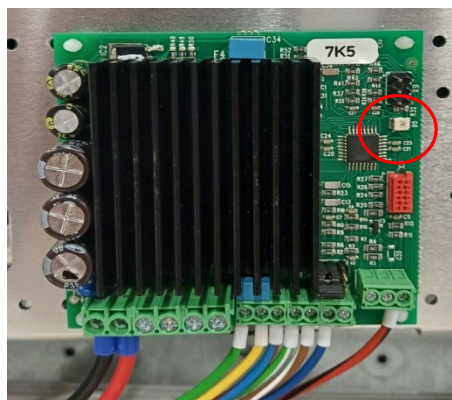
If an actuator cannot run in manual mode and does not move, this may be due to a defect in the DC motor or the power supply.

If there is no movement, check the supply fuse.

If one of the actuators runs intermittently while the other actuator remains stationary, the fault is in the one that runs intermittently. The actuator that remains stationary will move one step each time the direction is changed, but otherwise does not. The actuator that stands still is OK!

If the actuators are in a position that does not allow them to be operated manually, try running a “homing procedure” (see section 6.5). If an actuator is replaced, it is important to perform a “homing procedure”. If a homing procedure cannot be run at the first attempt, repeat the “homing procedure” until both actuators are at the top.

7.4 Control unit PCB TR-EM-239



The control unit's PCB for lifting actuators is mounted in the electrical box.

A Palomat fault can also be caused by a fault in the control unit's PCB. This can be checked by having qualified personnel remove the cover and open the electrical box in which the control unit is located.

This has a red LED on the PCB, which can show the error status of the control unit. The red LED will flash a specific number of times depending on the error. (See Table 2)

Table 2 - Troubleshooting the control unit TR-EM-339			
Error code (Flashes)	Fault	Possible cause	Solution
2	Interrupted due to overcurrent.	Overload.	- Make sure the pallet stack can move reely. - Make sure that the lifting actuators can move freely without a load.
3	No pulses.	No signal is coming from the actuator.	- Check cables and connections. - Replace actuator or cable.

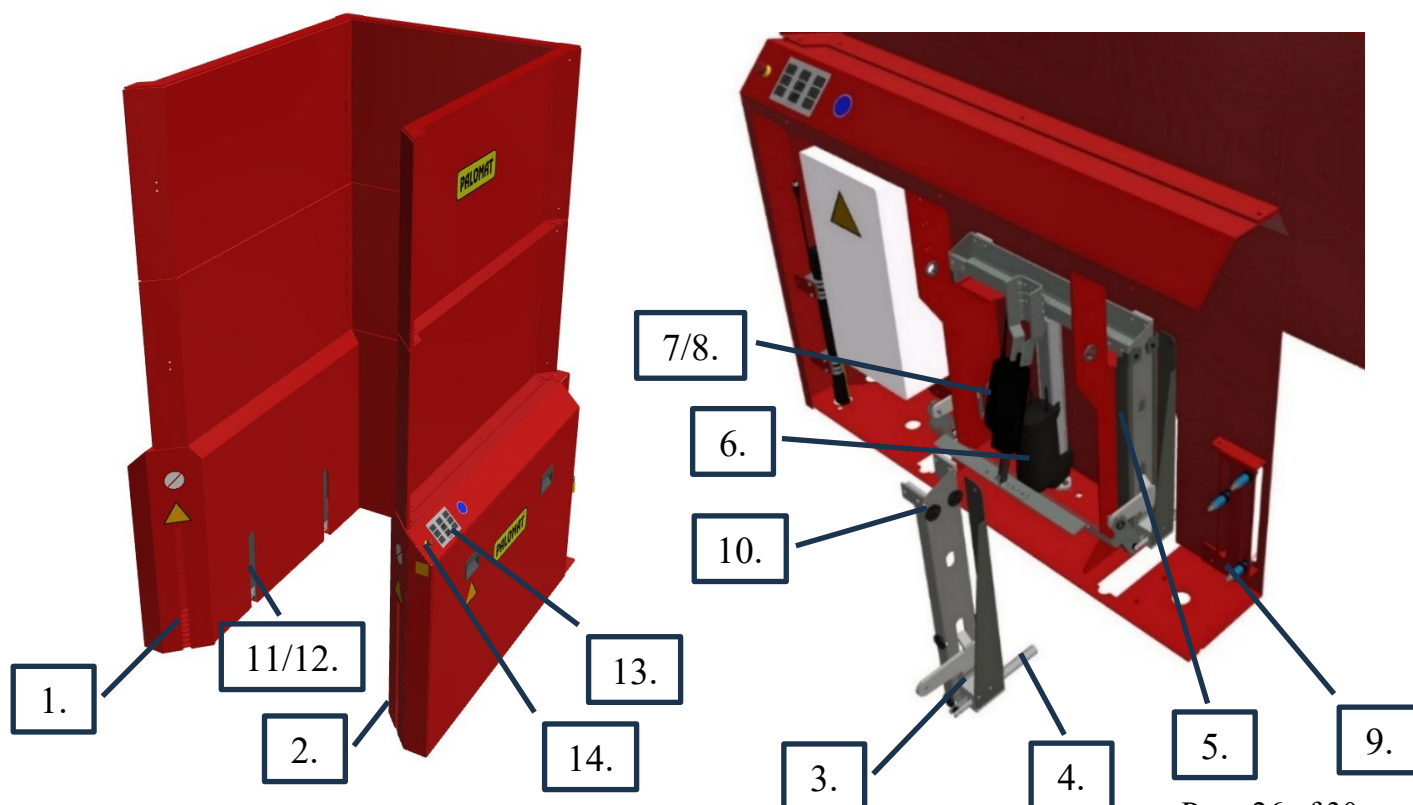
4	Pulse deviations.	The actuators are not synchronised.	- Initialise the system: Run the homing procedure by pressing and holding the Reset/Error button for 5 or 6 seconds.
5	Overheating.	The actuators have been overloaded.	- Stop the system and wait until it has cooled down, approximately 16 minutes. Investigate the cause of the overload.

8 Recommended spare parts

If parts need to be replaced, parts identical to those on the spare parts list must be used.
If any parts are used that are not identical to those specified in the part list the manufacturer's liability ceases to apply.

8.1 Parts list

Pos.	Error/fault	Item number:
1	Light curtain C2C-SA04530A10000 SENDER 450MM	EL/1213202
2	Light curtain C2C-EA04530A10000 RECIEVER 450MM	EL/1213203
3	Guide housing for gripper	180006_V2
4	Gripper shaft	183025-M_V2
5	C-profile guide (complete per side)	187077
6	Lifting actuator: LINAK - 362569-00 (365B03+2H250B20)	57920260-M
7	Gripper actuator: LINAK - 122X00 – 30451228 - Right	57920246-01
8	Gripper actuator: LINAK - 122X00 – X045242X - Left	57920247-01
9	Diffuse photocell: SICK GRTE18-P1237	EL/1121486
10	Sliding brick	183033_V1
11	Safety protection	187160
12	Safety protection	187160_MIR
13	Control panel	EL/2474S002
14	Emergency stop button: SCHLEGEL Ø22,3 M12P	EL/FRVKOO_C001



9 Removal from operation

If the machine is to be disposed of, the machine should be disassembled so that different materials can be sorted. The parts from the machine must always be disposed of in accordance with the local regulations governing the destruction and disposal of hazardous waste.



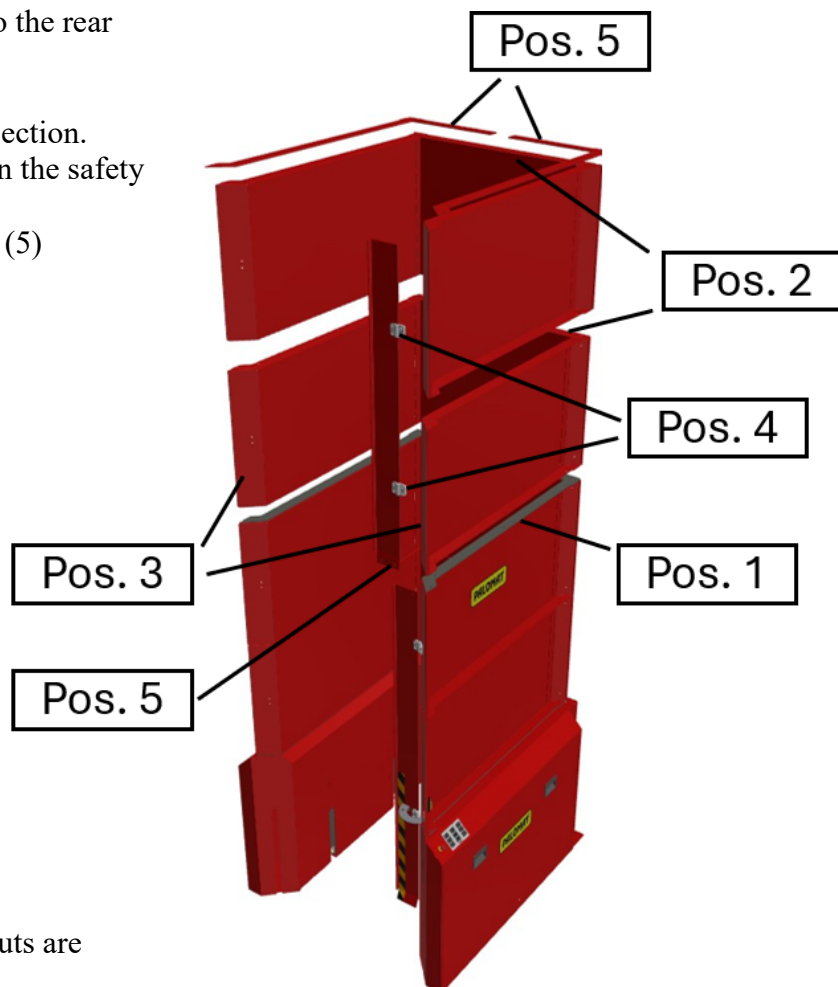
10 Optional accessories

NOTE! The options below may only be performed by instructed technical staff! See section 1.2 and 2.3!

10.1 Installation of safety frame and safety gate

In order to mount a safety frame on the Palomat, the instructions below must be followed.

1. Remove the top bolts (1) on the top of the existing safety frame.
2. Place the inner side of the rear cover (2) level with the inner side of the Palomat. (2)
3. Place the sides (3), with the tracks turned towards the rear screening (2) and fasten them to the rear screening.
4. Fasten the covers
5. Repeat from point 2 to mount the next section.
6. Then install the safety gate hinges (4) on the safety frame.
7. Attach the new gate to the existing gate (5)
8. Finish with a fishplate (6) at the top of the safety frame and retighten the bolts.



Use the bolts and nuts provided.

If, contrary to expectations, screws or nuts are missing, contact your dealer.

All bolt holes must be fitted with tightened bolts and nuts!

10.2 Signal tower incl. max indicator

The signal tower together with (maximum indicator) detects when the pallet stack is full or empty. This allows the operator to know the status of the Palomat by switching between three different colours.

If the Palomat is to stop, e.g. at 10 pallets, the signal tower and the maximum indicator can be mounted in the safety frame. When the maximum indicator is activated, e.g. at 10 pallets, the lamp turns blue and the stack is automatically put down on the floor.

- The green light indicates that the Palomat is ready to receive pallets, that the Palomat is emptied of pallets which means that the Palomat is ready for use.
- The yellow light indicates that the Palomat is either stacking or destacking pallets, which is why the machine is running in one of its sequences.
- The blue light is installed and connected to a maximum/minimum indicator and will turn on when the machine is full or empty.
- A flashing blue light will indicate the same number of flashes corresponding to the error code.

10.3 Installing the signal tower

1. Install the signal tower bracket on the right front side of the safety frame.
2. Mount the signal tower on the bracket and connect the cable see Figure 1.
3. Attach the cable to the safety frame with cable ties.
4. Pass the cable through the hole on the side cover, see Figure 2, and further in for installation in the electrical box.
5. Route the cable to the electrical distribution box and install according to the wiring diagram.

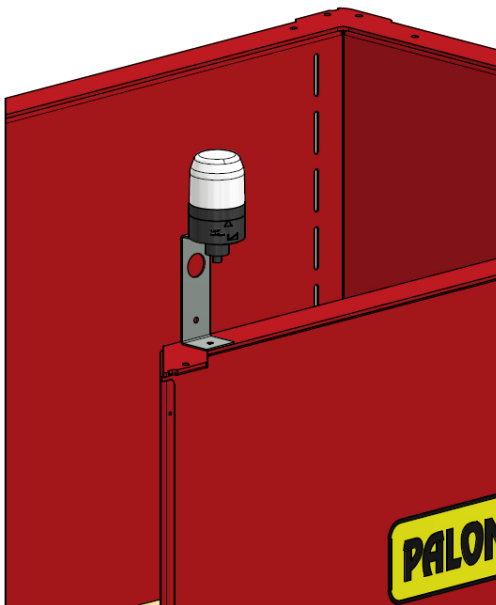


Figure 1

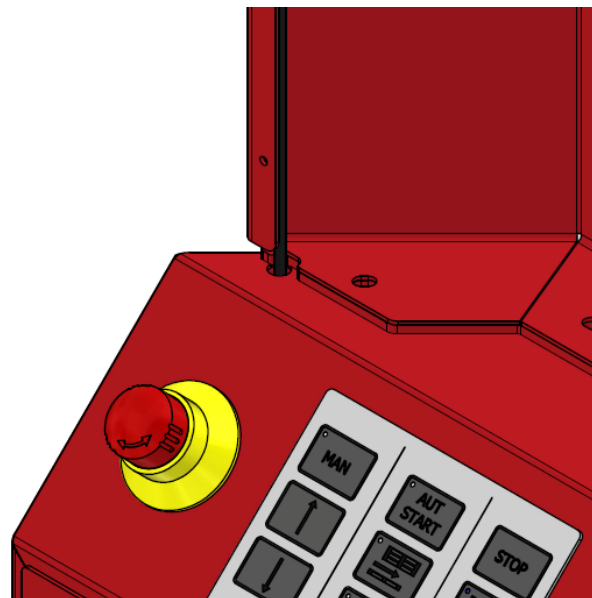


Figure 2

10.4 Maximum indicator

If the Palomat is to stop at, for example, 10 pallets, a maximum indicator can be installed on the safety frame. When the maximum indicator indicates the specified number of pallets, the stack is automatically placed on the floor. The stack is now ready for pick-up with, e.g., a hand pallet truck. Never adjust the maximum indicator to more pallets than the machine is intended for, or the pallet stack will exceed the top of the machine.

10.5 Retrofit of sensor for maximum indicator for full magazine

For installation, follow the instructions below.

1. Install the max indicator bracket on the right-hand side safety frame at the rear of the machine.
2. Attach the sensor to the bracket approx. 20 mm above the height of the stack of max pallets minus 1 lifted up in the magazine.
3. Place the cable at the edge of the safety frame as shown in Figure 1 and pass it through the hole in the back plate Figure 2 and further into the side cover for installation in the electrical box.
4. Install the cable in the electrical box. Refer to the supplied electrical diagram.

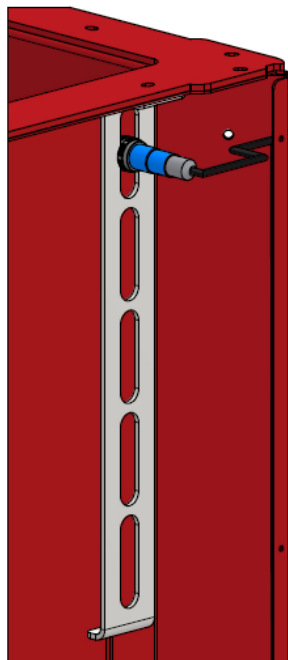


Figure 1

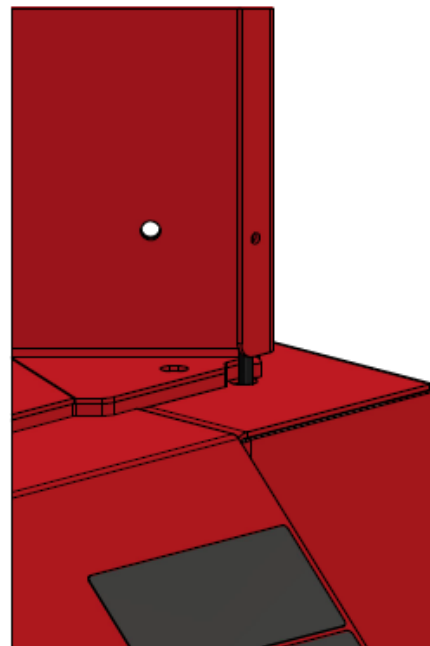


Figure 2

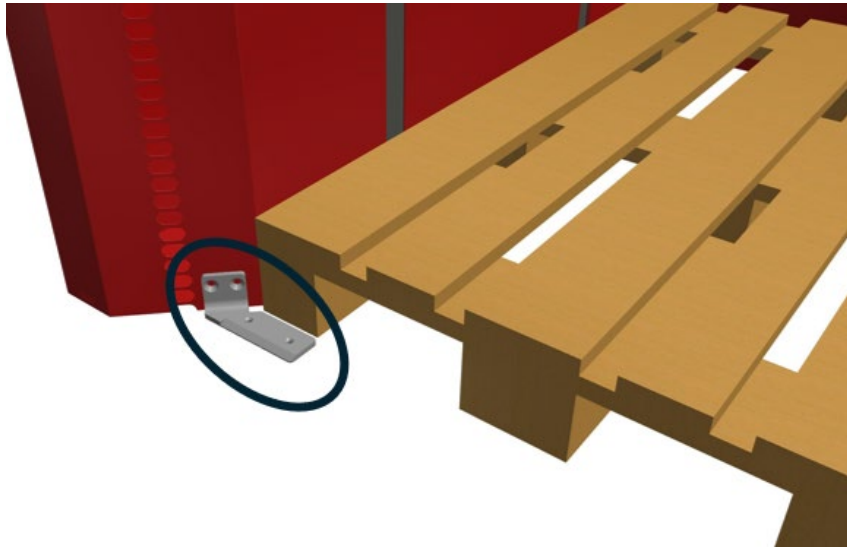
10.6 Adjustment of maximum indicator sensor

When adjusting the sensor to, for example, 25 pallets, 24 pallets are placed in the magazine in a stacked condition. Place the sensor approx. 20 mm above pallet no. 24. When stacking pallet no. 25, the Palomat will receive a signal from the maximum indicator, and will then place the stack of 25 pallets on the floor.

The grippers retract automatically so that the pallet stack can be removed.

10.7 Stop block

Stop blocks are the ideal solution when the Palomat has to handle pallets, where the skids at the bottom go across the lifting trolley. When the hand pallet truck is pulled out of the Palomat, the two stop blocks hold the pallet in place so that the pallet stays in the magazine. Stop blocks are mounted in the front of the Palomat - one on each side next to the light curtain. They are mounted so that there is 20 mm between the pallet and the stop blocks.



10.8 Truck protection

The truck protection is made of 10 mm steel and can be used as extra protection for the front of the machine. The truck protection is two separate parts that are mounted in the floor in front of the Palomat. The solution is used especially by companies that handle pallets using forklift trucks.

These can be purchased in 3 standard sizes: (Height x width)

- 300 x 310
- 300 x 250
- 1000 x 250

Truck guards are mounted on the floor with expansion bolts M12 or similar suitable bolts in the 3 Ø14 mm holes

