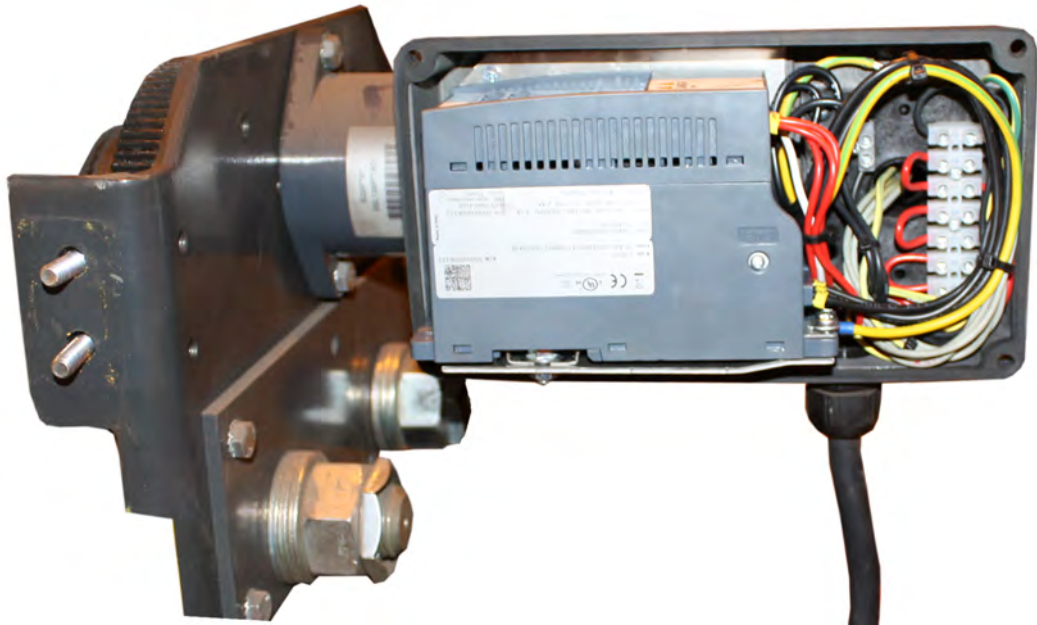


English

Original Instruction



INSTALLATION INSTRUCTION

TMU Upgrade Kit
020131en / Revision C

2013-03-20



R&M
MATERIALS HANDLING



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1 INTRODUCTION

1.1 About this manual

This manual offers installation and commissioning instructions of CMX 007 frequency converter replacement to ControlMaster@NXT 003 .

As a maintenance technician, taking the time to read this manual will help you easily adopt the replacement procedures. Note that this manual is not intended as a substitute for proper training.

1.2 About the upgrade kit usage



This upgrade kit is designed only for CMX 007 frequency converter which is mounted in a TROLLEY MOTOR UNIT (TMU) in chain hoist crane. It is not designed for wire rope hoist application. There is a different replacement kit available for the Wire Rope Hoist application.



There is no replacement kit available for chain hoist hoisting application. In case of brake down, the complete chain hoist must be replaced with a new one.



Parameters for the new ControlMaster@NXT 003 frequency converter have NOT BEEN SET UP at the factory. Please make sure that you SET UP the DIP switches according the following instructions before start-up.

1.3 Waste treatment and recycling of removed material

The removed parts and packaging material shall be recycled according to local regulations. We recommend recycling the frequency converter's aluminum heat sink separately.



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2 SAFETY

2.1 Before starting to work at the site

Before starting any work on the crane:

- Familiarize yourself with the equipment and its user instructions.
- Find out the location of the main switch and the emergency stop buttons.
- Evaluate the risks of the site and try to minimize them.
- Inform the site responsible that you will be working on the crane.
- Restrict access to the working area, if possible.
- Prevent unintentional use of the crane.
- Ensure that you have all the appropriate personal protection equipment. Use them as required.

2.2 Main switch and emergency stop buttons

Lock and tag the main switch when you need to switch it off during your work.



**Be aware of the main isolation switch functionality.
Even though one switch is turned off, there may still be voltage in some parts of the product.**

2.3 After working at the site

Ensure that you leave the site in a safe condition:

- Ensure that the work area is clean.
- Remove any locks/tags from switches.
- Ensure that the crane functions normally.
- Inform the site responsible that you have finished the work.



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3 DESCRIPTION OF THE UPGRADE KIT

3.1 Parts included in the kit

Part	Name	Qty.	Image
Part 1	Frequency converter	1 pcs	
Part 2	Mounting rack	1 pcs	
Part 3	Installation accessory	1 pcs	

INSTALLATION ACCESSORY

Part	Name	Qty.	Image
Part 4	Cable tie	3 pcs	
Part 5	Wire marker set	1 pcs	
Part 6	Allen key	1 pcs	
Part 7	Cleaning pad	1 pcs	
Part 8	Wire end ferrule 1.5 mm ²	5 pcs	
Part 9	Wire end ferrule 2.5 mm ²	5 pcs	
Part 10	Counter sunk flathead screw M5 x 8	3 pcs	



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3.2 Required tools

Item No	Name	Image
1	Screwdriver, slot-head 3.5 x 0.6 mm	
2	Screwdriver, Phillips No. 2 (PH2)	
3	Wire cutters	
4	Socket wrench, 8 mm	
5	Crimping tool for wire end ferrules	
6	Wire strippers	

3.3 Terminal connections

The following table describes the differences between the terminals of CMX 007 and ControlMaster®NXT 003 .

Description of terminal	CMX 007 Terminal X1	ControlMaster®NXT 003 Power terminals
Protective earth	1	PE
Power supply, phase 1	2	L1
Power supply, phase 2	3	L2
Power supply, phase 3	4	L3
Motor supply, phase 1	5	U
Motor supply, phase 2	6	V
Motor supply, phase 3	7	W
		Control board terminals
Drive command, direction 1	8	1
Drive command, direction 2	9	2
Speed 2 / Acceleration command	10	3
Control voltage, common	11	7



Terminals 4, 5 and 6 in ControlMaster®NXT 003 control board are not used.



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3.4 DIP switches

CMX 007 has 4 groups of DIP switches (S1-S4), whereas ControlMaster®NXT has 10 groups of DIP switches (S1-S10).

The correct DIP switch settings for ControlMaster®NXT 003 can be found in Chapter 5: “Commissioning”.

CMX 007		ControlMaster®NXT 003	
Switch	Description	Description	Switch
S1	Maximum driving frequency	Maximum driving frequency	S1
S2	Minimum driving frequency	Minimum driving frequency	S2
S3	Acceleration and deceleration ramp times	Acceleration and deceleration ramp times	S3
S4	Control mode and motor type	Control method and slowdown mode	S4
		Limit operations	S5
		Voltage at low frequencies (U/f curve)	S6
		Current limit	S7
		Start and stop current	S8
		Motor nominal frequency	S9
		Terminal DI6 operation	S10



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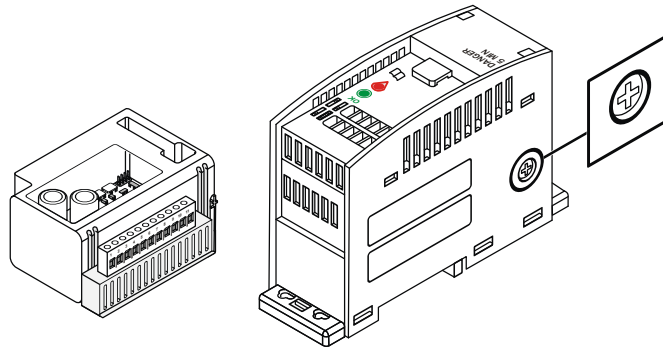
3.5 EMC filter

CMX 007 has an external EMC filter package (KC310 / KC330), whereas ControlMaster®NXT 003 has an internal EMC filter in the power supply. By default, the EMC level of the frequency converter is set to N by the manufacturer.

If the mains network is non-grounded (IT-network), the ControlMaster®NXT 003 frequency converter's EMC level must be changed to 0 by removing the filter capacitor disconnection screw.



Verify the type of electrical supply network from original electrical drawings.





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4 INSTALLATION

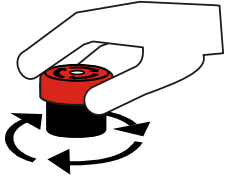
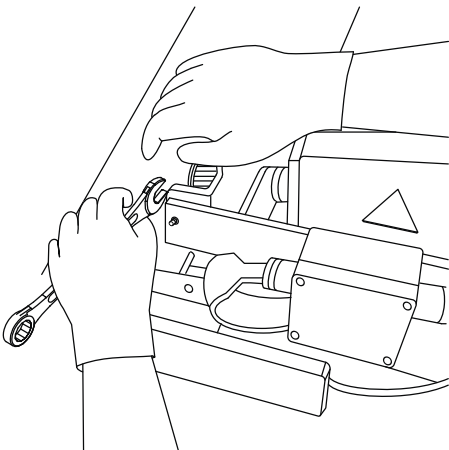


Before installation.



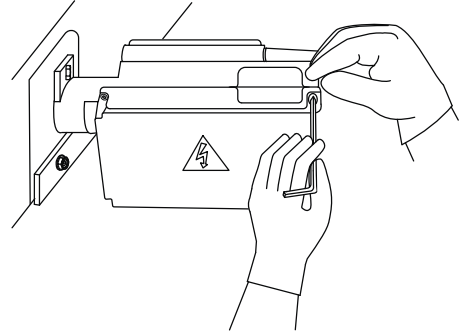
After installation.

4.1 Old frequency converter removal

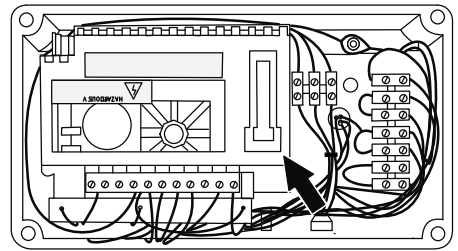
1	<p>If the trolley is operable (not broken), record the trolley driving directions.</p> <div style="text-align: right;">  </div>
2	<p>Push the main power off from the pendant or radio controller.</p> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 5px;"> ⚠ WARNING </div> <p>High voltage inside the Frequency converter. Wait for at least five minutes after the voltage supply has been switched off before taking any service actions.</p>
3	<p>Remove the festoon electric connection box (if installed)</p> <div style="text-align: right;">  </div>



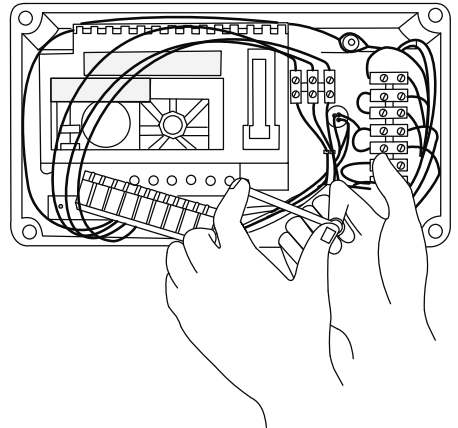
4 Remove the motor connection box lid.



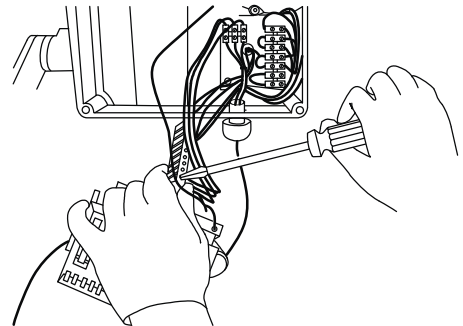
5 Record the dip-switch settings from the CMX 007 frequency converter.
On [page Old inverter parameter settings \(page 17\)](#) you can find an empty table where to write the settings.



6 Remove the wire terminal by pulling. Remove the CMX 007 .



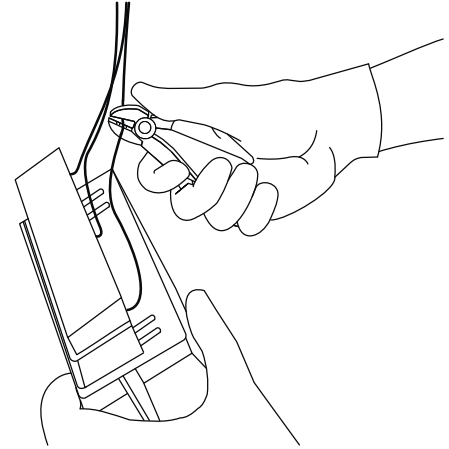
7 Remove wires from the terminal one at the time.



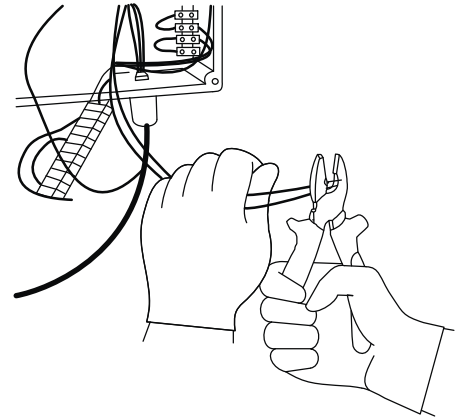


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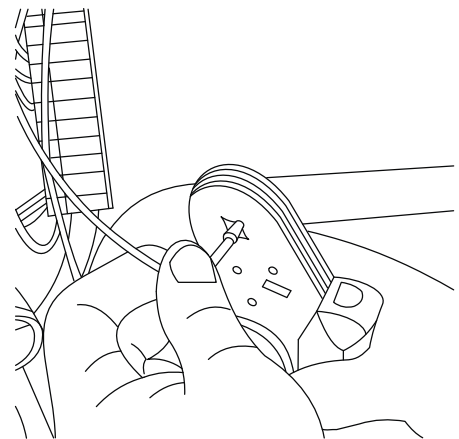
8 Cut the wire. Make sure you leave as much length for the wire as you can.



9 Strip the wire end from the length of 10 mm.



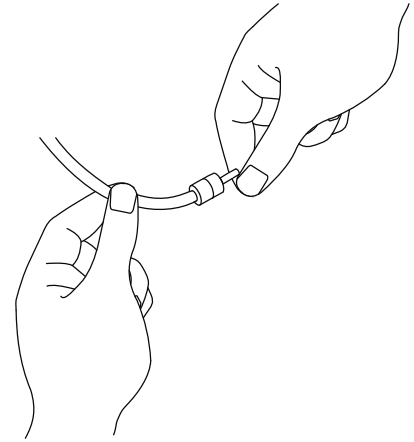
10 Connect the end ferrule to the wire end.





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11 Mark the wire with markers. Use installation mandrel for easy installation.



12 Do steps 5-9 to the rest of the wires.

4.2 Control voltage front resistors

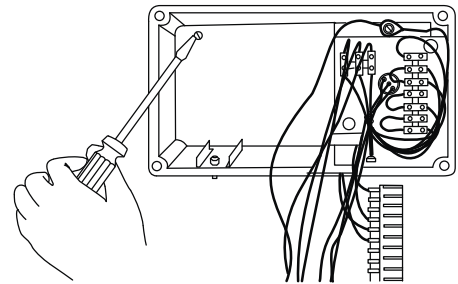
The TMU should not have front resistors. However, if they are present, they must be removed. Do not mix the order of the wires.



If the front resistors are not removed or by-passed, the control inputs on the ControlMaster®NXT 003 frequency converter will not be activated, even though voltage can be measured with a multimeter.

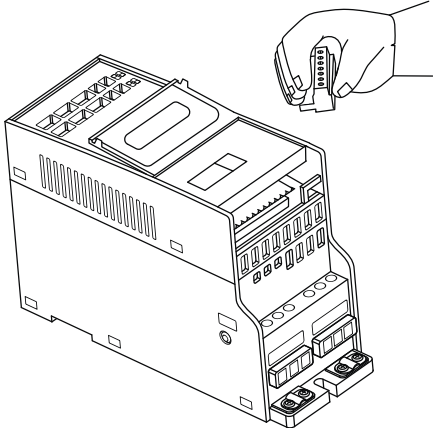
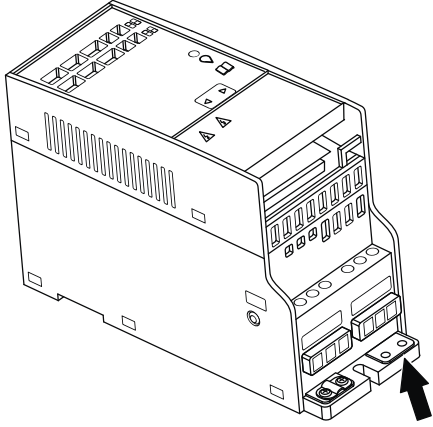
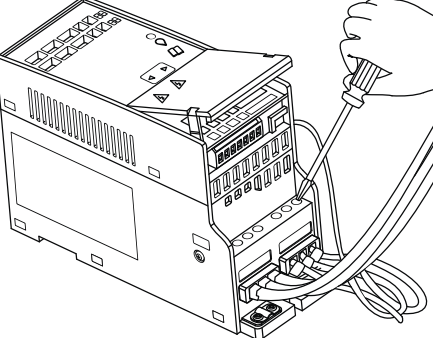
4.3 New frequency converter installation

1 Install the bottom plate. Use the 2 flat head screws delivered with the package.





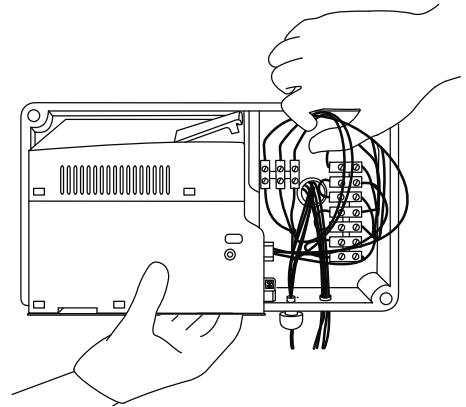
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2	Remove the input wire terminal from the ControlMaster®NXT 003 frequency converter.	
3	Remove the grounding wire connector. See image. Leave the other in place. The inverter doesn't fit into the motor connection box otherwise.	
4	Connect the frequency converter power supply wires; L1, L2, L3 and motor power supply wires; U,V,W.	
5	Set the correct dip switch settings according to commissioning tables.	

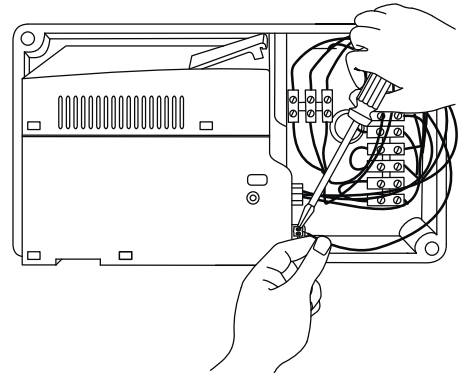


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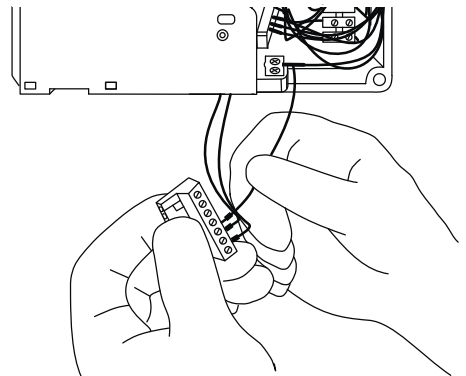
6 Push the new frequency converter into the c-rail. Leave the input lid open.



7 Install the ground wire.



8 Install the control wires (1,2,3 and 7) into the input terminal.

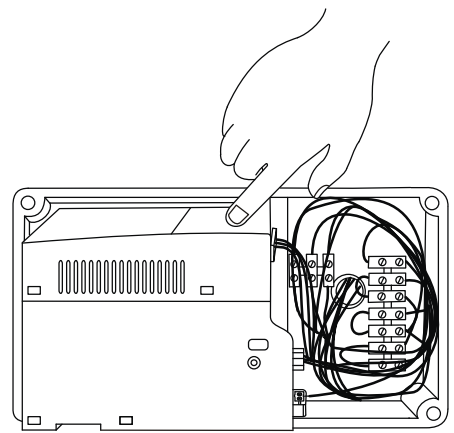
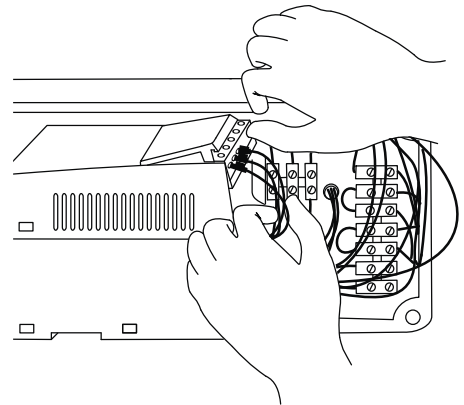




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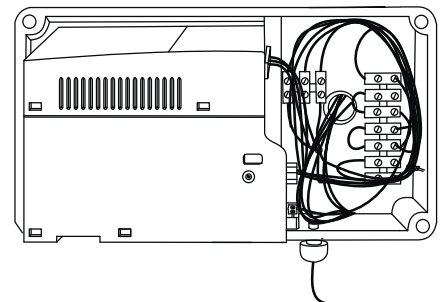
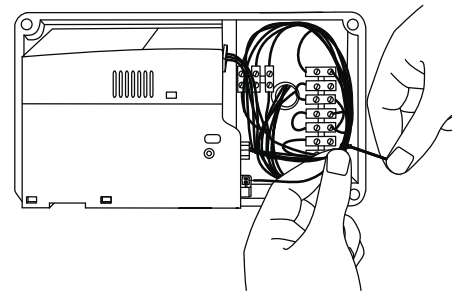
9

Push the input terminal into ControlMaster®NXT 003 . And close the lid.

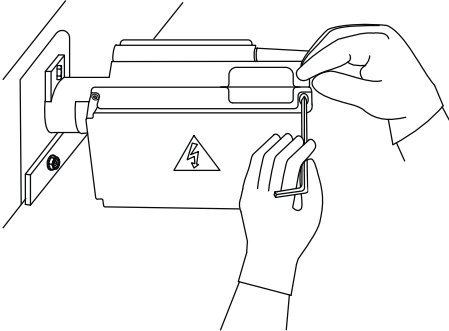
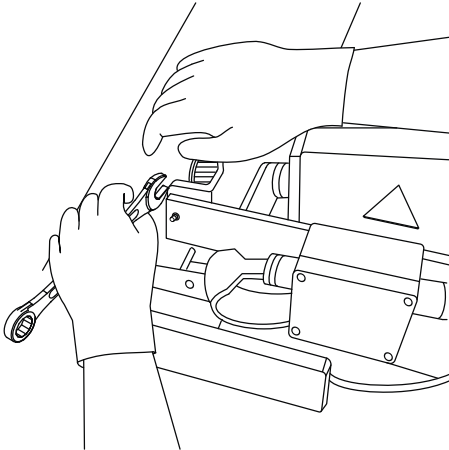
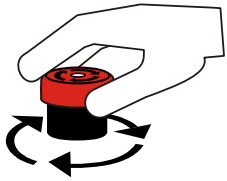


10

Fold the wires inside the box. Secure the wires with cable ties. The image on the right shows how the final assembly should look alike.





11	Install the motor connection box lid.	
12	Install the festoon electric connection box (if installed).	
13	Release the main power button up from the pendant or radio controller.	
14	Make sure that the trolley move's into correct directions by operating the trolley.	
15	Make sure that the traveling speeds are suitable for customer needs by operating the trolley.	
16	Make sure that the trolley slow-down ramps are suitable for customer needs by operating the trolley.	



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5 COMMISSIONING

Compare the DIP switch settings of the CMX 007 with the following tables and find the correct settings for the ControlMaster@NXT 003 DIP switches.

5.1 Old inverter parameter settings

Write in the table below the old frequency converter DIP switch settings.

Table 1. CMX 007 parameter settings.

Switch S1				Switch S2				Switch S3				Switch S4			
-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4

5.2 Driving frequency table selection

The maximum and minimum driving frequencies depend on the nominal frequency of the motor. Use the following table to determine which table should be used to set

Table 2. Driving Frequency table selection

CMX 007 Switch S4			Maximum Driving Frequency Table	Minimum Driving Frequency Table
-2	-3	-4		
0	0	0	3	5
0	1	0		
0	0	1		
1	0	0	4	6
1	1	0		



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5.3 S1 Maximum driving frequency

Set the maximum driving frequency according to the following tables

Table 3. Motor nominal frequency = 100/120 Hz

CMX 007 Switch 1				ControlMaster®NXT 003 Switch 1		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	0	0	0
0	0	0	1	1	1	1
0	0	1	0	1	1	0
0	0	1	1	1	1	1
0	1	0	0	1	0	0
0	1	0	1	1	1	0
0	1	1	0	1	0	1
0	1	1	1			
1	0	0	0	0	0	1
1	0	0	1	1	0	1
1	0	1	0	1	0	0
1	0	1	1	0	1	0
1	1	0	0			
1	1	0	1	0	1	1
1	1	1	0			
1	1	1	1	0	0	1

Table 4. Motor nominal frequency = 80 Hz

CMX 007 Switch 1				ControlMaster®NXT 003 Switch 1		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	0	1	0
0	0	0	1	0	1	1
0	0	1	0	0	0	1
0	0	1	1	0	1	1
0	1	0	0	1	1	0



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CMX 007 Switch 1				ControlMaster®NXT 003 Switch 1		
-1	-2	-3	-4	-1	-2	-3
0	1	0	1	0	1	1
0	1	1	0			
0	1	1	1	0	0	1
1	0	0	0	0	0	0
1	0	0	1	1	1	1
1	0	1	0			
1	0	1	1	1	1	0
1	1	0	0	1	0	1
1	1	0	1	1	0	0
1	1	1	0	1	0	0
1	1	1	1	0	1	0

Table 5. Motor nominal frequency = 35 Hz

CMX 007 Switch 1				ControlMaster®NXT 003 Switch 1		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	0	1	0
0	0	0	1	0	0	0
0	0	1	0	0	1	1
0	0	1	1			
0	1	0	0	1	1	0
0	1	0	1	0	1	1
0	1	1	0	0	0	1
0	1	1	1	1	1	1
1	0	0	0	0	1	0
1	0	0	1	1	1	1
1	0	1	0	1	0	1
1	0	1	1	1	0	0
1	1	0	0			



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CMX 007 Switch 1				ControlMaster®NXT 003 Switch 1		
-1	-2	-3	-4	-1	-2	-3
1	1	0	1	0	1	0
1	1	1	0			
1	1	1	1			

5.4 S2 Minimum driving frequency

Set the minimum driving frequency according to the following tables:

Table 6. Motor nominal frequency = 100/120 Hz

CMX 007 Switch S2				ControlMaster®NXT 003 Switch S2		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	1	1	0
0	0	0	1	0	0	0
0	0	1	0	1	0	0
0	0	1	1	0	0	0
0	1	0	0	1	1	1
0	1	0	1	0	0	0
0	1	1	0	0	0	1
0	1	1	1	1	0	1
1	0	0	0	1	1	1
1	0	0	1	1	0	1
1	0	1	0	0	1	0
1	0	1	1	1	1	1
1	1	0	0			
1	1	0	1			
1	1	1	0			
1	1	1	1			
1	1	1	1			



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Table 7. Motor nominal frequency = 80 Hz

CMX 007 Switch S2				ControlMaster®NXT 003 Switch S2		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	1	1	1
0	0	0	1	1	0	1
0	0	1	0	0	1	0
0	0	1	1	0	0	0
0	1	0	0	0	1	1
0	1	0	1	0	0	1
0	1	1	0	1	1	0
0	1	1	1	1	0	0
1	0	0	0	0	1	1
1	0	0	1			
1	0	1	0			
1	0	1	1			
1	1	0	0			
1	1	0	1			
1	1	1	0			
1	1	1	1			

Table 8. Motor nominal frequency = 35 Hz

CMX 007 Switch S2				ControlMaster®NXT 003 Switch S2		
-1	-2	-3	-4	-1	-2	-3
0	0	0	0	1	0	0
0	0	0	1	0	1	0
0	0	1	0	1	1	0
0	0	1	1	0	0	0
0	1	0	0	1	1	0
0	1	0	1	0	0	0
0	1	1	0	0	0	1
0	1	1	1	1	0	1



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CMX 007 Switch S2				ControlMaster®NXT 003 Switch S2		
-1	-2	-3	-4	-1	-2	-3
1	0	0	0	1	1	0
1	0	0	1			
1	0	1	0			
1	0	1	1			
1	1	0	0			
1	1	0	1			
1	1	1	0			
1	1	1	1			



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5.5 S3 Acceleration and deceleration ramp time

Set the acceleration and deceleration ramp time according to the table below.



It is not possible to separately set the acceleration and deceleration time.



For ControlMaster®NXT 003 , 1.5 s is the shortest possible ramp time.



Do not set the ramp time to be shorter than the original; this would shorten the lifetime of the frequency converter. Increasing of the ramp time is allowed if the customer accepts it.

Table 9. Acceleration and deceleration ramp time

Ramp time (s)	CMX 007 Switch S3				ControlMaster®NXT 003 Switch S3			Ramp time (s)
	-1	-2	-3	-4	-1	-2	-3	
0,5	1	1	1	1	1	1	0	1,5
1	0	1	1	0				
1,5	1	0	0	0				
2	0	1	0	0	0	1	1	2
2,5	0	0	0	0	0	1	0	2,5
3	0	0	1	0	1	0	1	3
3,5	0	0	0	1	0	0	0	3,5
4	1	0	0	1	1	0	0	4
4,5	1	1	0	0	0	0	1	4,5
5	0	0	1	1	1	1	1	5,5
5,5	1	1	1	0				
6	1	1	0	1				
6,5	1	0	1	1				
7	1	0	1	0				
7,5	0	1	1	1				
8	0	1	0	1				



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5.6 S4 Control mode and slowdown mode

Set the control mode (EP or MS control) and slowdown mode according to the following table:

Table 10. Control mode

CMX 007 Switch S4	ControlMaster®NXT 003 Switch S4	
-1	-1	-2
0	1	1
1	0	1



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5.7 S5–S10 Motor parameters

Set the motor parameters according to the following table:

Motor type	Nominal frequency	ControlMaster®NXT 003															
		CMX 007 CMX Switch S4			Switch S5		Switch S6		Switch S7		Switch S8		Switch S9		Switch S10		
		-2	-3	-4	-1	-2	-1	-2	-1	-2	-1	-2	-1	-2	-1	-2	
MF06MK200	35	1	0	1	1	1	0	0	1	0	0	0	0	1	0	1	0
MF06MK200	100	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0
MT06MK100	80	1	0	0	1	0	1	0	1	0	0	0	0	0	1	1	0

Table 11. Motor parameters



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5.8 Testing the trolley functions

If any problems or malfunctions occur during the commissioning, refer to Chapter “Troubleshooting” to find out the reason. The source of any problems with the product must be solved before continuing with the commissioning procedure.




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6 TROUBLESHOOTING

6.1 Purpose of troubleshooting

The purpose of troubleshooting is primarily to determine whether problems are caused by the frequency converter or external devices. It is also possible that a faulty external device has caused damage to the frequency converter. In that case it is very important to repair or change any faulty devices to prevent recurring problems.

6.2 Problems and solutions

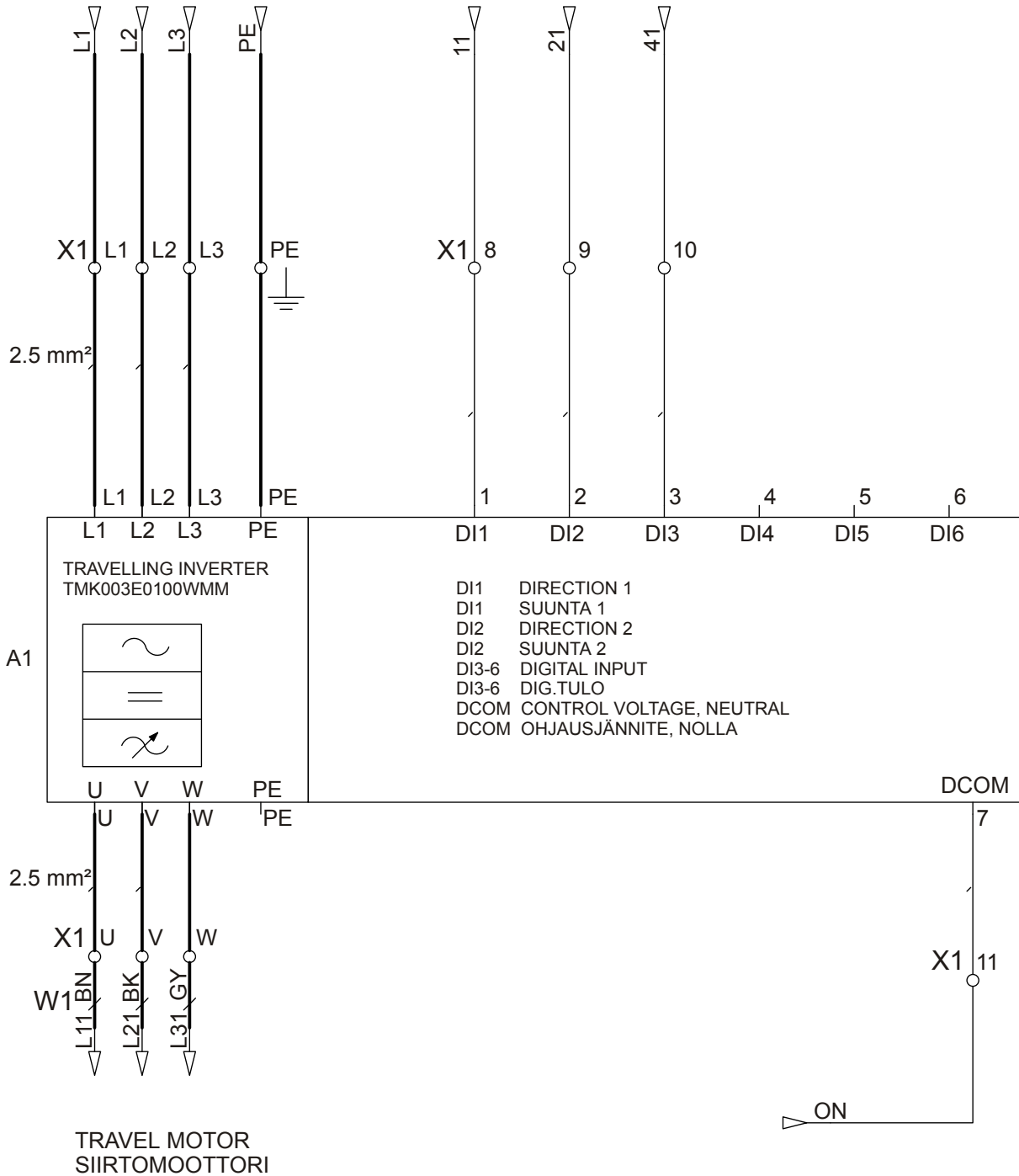
Sr. no.	Product	Suggested solution
1	The green LED is continuously ON but motor does not run or just jerks but control voltage can be measured from the terminals.	Make sure that the front resistors on the control voltage circuit have been removed or by-passed according to the instructions in Control voltage front resistors (page 12) .
2	The frequency converter does not start (green LED stays off) when it is started.	<ul style="list-style-type: none"> • Check the main voltage between terminals L1, L2 and L3. • Check that there are no devices causing disturbance connected to the same voltage supply as the crane. These are for example devices that require high currents, such as big motors or welding devices.  <p>When the EMC screw is connected, the frequency converter has RC filters connected to the power supply side to reduce disturbance to the network. The capacitors of these filters may cause the RCD (Residual Current Device) to trip. Therefore, using RCD with frequency converter controlled cranes is not recommended.</p>
3	The green LED is continuously on or flashing (after previous fault) and the red LED is off, but motor does not run.	<ul style="list-style-type: none"> • Check the motor cable connection. • Check the limit switches. • Check the voltage in direction command terminal 1 (DI1) and terminal 2 (DI2) against the common (terminal 7).
4	The motor runs poorly: trolley/bridge does not move as it supposed to move.	<ul style="list-style-type: none"> • Check that the load is not over nominal. • Check that all cables are correctly connected and not loose. • Check that all motor parameters are correctly set. • Check that the U/f-curve parameters (switch group S6) are correctly set. • Check that the switch group S4 switch -2 is set to 1 and group S5 switches are set to 11. • Check that the switch group S7 switches are set to 010. • Check that the motor's brake opens completely.



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7 ELECTRICAL DRAWING

Frequency controller ControlMaster@NXT





English

Original instructions



OWNER'S MANUAL FOR TRAVEL FREQUENCY CONTROL SYSTEM

CMNXT

PS11648

29.2.2012



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1 GENERAL INTRODUCTION

1.1 Foreword: About This Manual




This manual offers guidance to enable safe and efficient operation of the crane.

As a **crane operator**, taking the time to read this manual will help you to prevent damage to the crane and load, and, most importantly, personnel situated close to the crane. The crane is designed to be safe when used correctly. However, there are many potential hazards associated with incorrect operation and these can be avoided when you know how to recognize and anticipate them.

This manual is not intended as a substitute for proper training but provides recommendations and methods for safe and efficient operation. The crane owner must ensure that operators are properly trained prior to crane operation and, at all times, comply with all of the applicable and prevailing safety and other standards, rules and regulations.





1.2 Symbols Used In This Manual

Readers should familiarize themselves with the following symbols which are used in this manual.

	<p>Indicates that the crane is slowing down or is moving at its slowest speed.</p>
	<p>Indicates that the crane is accelerating or moving at its highest speed.</p>
	<p>NOTE: Indicates items which require special attention by the reader. There is no obvious risk of injury associated with notes.</p>

1.3 Safety Alert Symbols and Signal Words

The following symbols are used in this manual to indicate potential safety hazards.

	<p>Obey all safety messages that follow this symbol to avoid possible injury for death.</p>
	<p>Indicates a potentially hazardous situation, which if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.</p>
	<p>Indicates a potentially hazardous situation, which if not avoided, COULD result in death or serious injury.</p>
	<p>INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.</p>



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NOTICE	Addresses situations not related to personal injury, such as likely or possible damage to equipment.
---------------	--

Shall	Indicates that a rule is mandatory and must be followed.
--------------	--

Should	Indicates that a rule is a recommendation, the advisability of which depends on the facts in each situation.
---------------	--

1.4 Questions And Comments

Any questions or comments relating to the content of this manual and/or the operation, maintenance and/or service of manufacturer products should be directed to: www.rmhoist.com

1.5 Exclusion Of Warranty

THE MANUFACTURER MAKES ABSOLUTELY NO WARRANTY WHATSOEVER WITH REGARD TO THE CONTENTS OF THIS MANUAL, EXPRESS OR IMPLIED, WHETHER ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

1.6 Manual Use

Every person exposed to the manufacturer's products must, prior to OPERATING, SERVICING AND/OR MAINTAINING SUCH PRODUCTS, read and understand the contents of this manual and strictly adhere AND CONFORM THEIR CONDUCT WITH AND TO THE INFORMATION, RECOMMENDATIONS AND warnings provided herein.



Note: Keep these instructions in a safe, accessible location for future reference by personnel operating the crane or exposed to crane operation.

	Read and understand the contents of this manual prior to operating, servicing, and or/maintaining the crane. Failure to do so can result in serious injury or death.
--	---

Manufacturer shall not be liable for and owner and READER shall release, and hold manufacturer, harmless from any and all claims, demands, AND damages, regardless of their nature or type losses and expenses , whether known or unknown, present or future, any and all liability, of and from any and all manner of actions, cause[s] of actions, all suits in law, in equity, or under statute, State or Federal, of whatever kind or nature, third party actions, including suits for contribution and/or indemnity on account of or in any way arising out of acts or omissions of the Owner or READER and relating in any way to this MANUAL or THE PRODUCTS referenced herein, including, but not limited to the Owner's or READER'S use thereof or any other cause identified herein or that may be reasonably inferred HEREFROM.



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1.7 Terminology

The following terms and definitions may have been used in this manual:

ANSI	American National Standards Institute
Authorized personnel	Persons who are authorized by the owner and who have the necessary training to carry out operation or service actions.
CE marking	The product's CE-marking indicates that the product complies with the appropriate CE regulations.
Check	A visual and functional assessment (not a test) of the product without dismantling.
Current rating	The maximum flow of current through a frequency converter.
Bridge	The bridge (main girder) moves along the runway.
Main girder	The main girder (bridge) is connected to the bridge end carriages.
Main isolation switch	The main isolation switch is the power switch which the operator should normally use to turn off the power.
Hoist	Drive mechanism for lifting and lowering the load.
Power supply	Power is supplied to the components via the power supply.
Controller	The pendant or other type of controller is used by the operator to give commands to the crane.
Qualified personnel	One with necessary qualification based on theoretical and practical knowledge of hoists or/and cranes. The person must be in a position to assess the safety of the installation in conjunction with the application. Persons with the authority to undertake certain maintenance work on products of manufacturers include manufacturers' service engineers and trained fitters with corresponding certification.
QR Code™	A two dimensional bar code that can include, for example, a product's serial number in an optically readable form. Note: The term "QR Code" is a registered trademark of Denso Wave Incorporated in Japan and other countries.



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1.8 Directives and standards

1.8.1 CE/CSA/UL/CCC

This product complies with one or more of the following requirements and directives described in this section. For more detailed information about which requirements the product meets, see the main sticker attached to the device.

- CE** The CE marking certifies that a product has met EU health, safety, and environmental requirements, which ensure consumer safety.
- CSA** The CSA marking means that a product has been tested and meets applicable standards for safety and/or performance, including the applicable standards written or administered by the American National Standards Institute (ANSI), Underwriters Laboratories (UL), Canadian Standards Association (CSA), National Sanitation Foundation (NSF), and others.
- UL** The UL marking means that Underwriters Laboratories (UL) has tested representative samples of the product and determined that they meet UL's requirements. These requirements are based primarily on UL's published and nationally recognized Standards for Safety.
- CCC** The China Compulsory Certificate mark, commonly known as the CCC Mark, is a compulsory safety mark for a variety of products sold on the Chinese market. The CCC mark is required for both domestically manufactured products and products imported into China.
- RoHS** The RoHS marking means that a product complies with the directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- WEEE** The WEEE indicates that the product should be disposed of according to the WEEE directive regulations.

The frequency converters carry the CE label as a proof of compliance with the Low Voltage Directive (LVD) and the Electro Magnetic Compatibility (EMC). The company SGS Fimko has acted as the Competent Body.



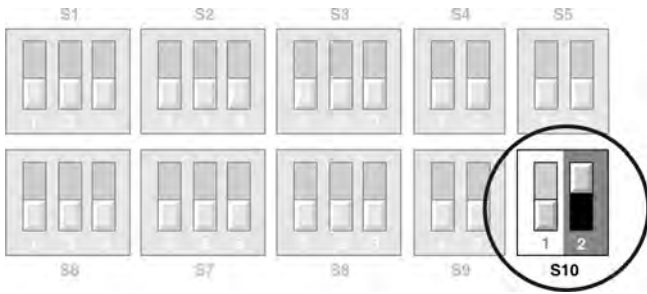
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2 IDENTIFICATION

2.1 Product identification data

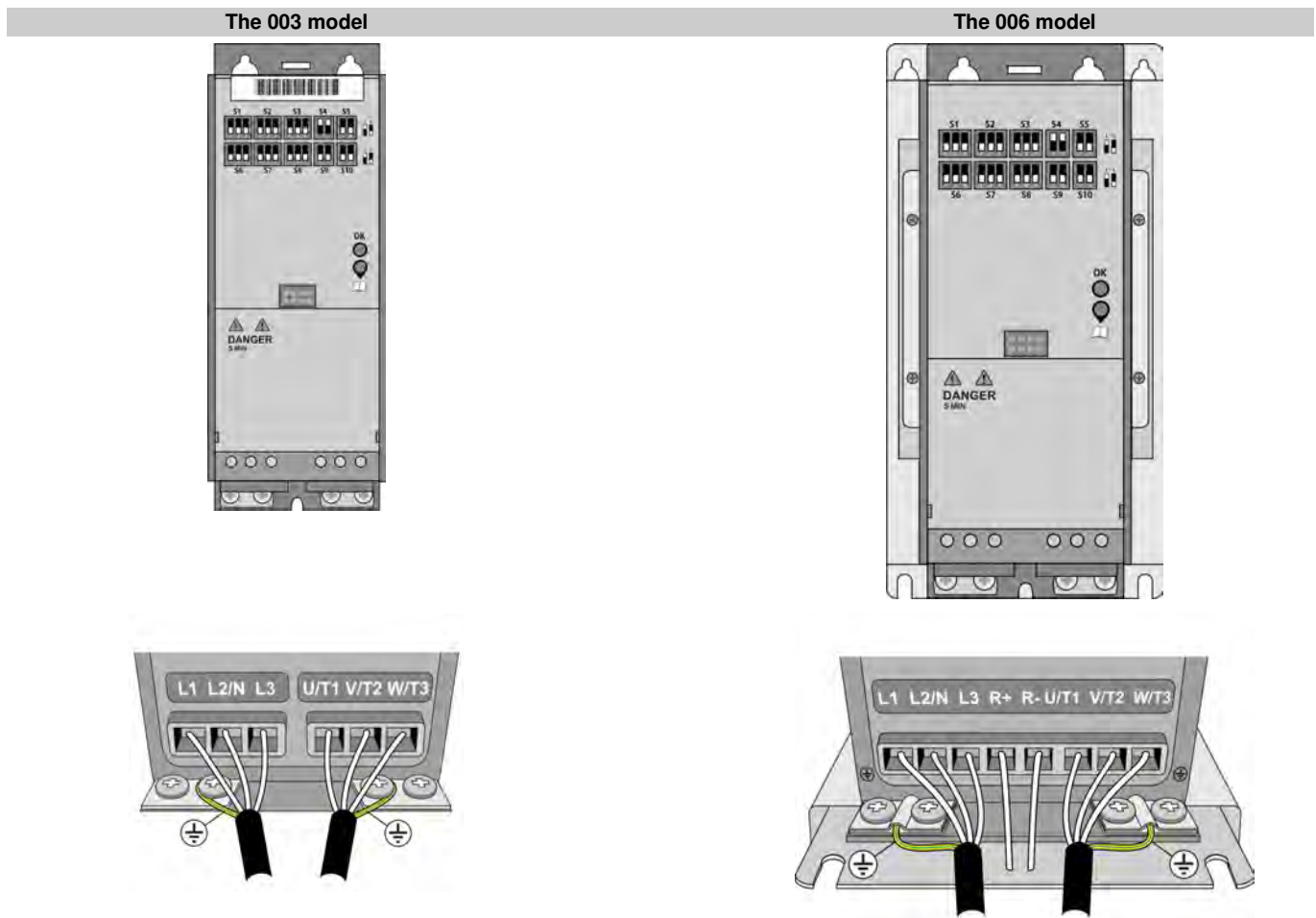
This manual covers the installation and use of the switch based frequency converter model.

Converter can be used on traveling movement application and chain hoist lifting application. Application type is selected with switch S10-2. Switch settings are explained on section Parameters.



 CAUTION	<p>Application type selection done with switch S10-2 changes the basic functionality of converter. Pay special attention that application is selected correctly with switch S10-2. Wrong switching will cause potentially hazardous situation.</p>
--	---

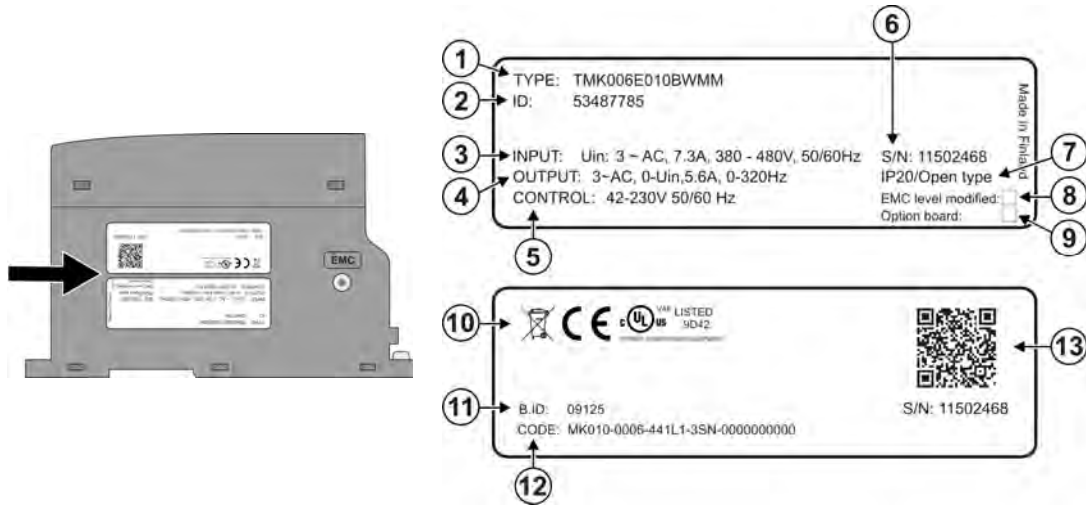
Front panels of frequency converter models:





2.1.1 Main sticker

The main sticker shows, for example, the model and serial number of the frequency converter, as well as the rated voltage.



1	Product model number	Indicates the exact model of the product.
2	Identification number	A unique string that identifies the unit.
3	Input	Indicates the acceptable mains voltage range, current and frequency that the product can be connected to.
4	Output	Indicates the voltage range, current and frequency range the product is able to provide at a specified output capacity.
5	Control	Indicates the acceptable voltage range and frequency of control signals that the product can be connected to.
6	Serial number	The serial number of the unit in an alphanumeric format.
7	IP classification	Indicates the ingress protection classification of the product.
8	EMC level modified	Indicates whether the EMC level has been changed from the default level. By default, the EMC level is set as N.
9	Option board	Indicates whether the product is fitted with an optional board providing additional features. Option boards can be used only with a frequency converter featuring a display.
10	Approvals and standards	Indicates the directives and approvals the product complies to. See the section "Directives and standards for more information.
11	Batch identification number	Indicates the batch from which the unit originates. The first four digits indicate the year and week of manufacture, respectively. The last digit (1 through 5) indicate the weekday, 1 being Monday, 2 Tuesday, number 5 indicating Friday.
12	Code	Identification and feature information provided by the manufacturer.
13	QR Code™	A two dimensional bar code in an optically readable form. Note: The term "QR Code" is a registered trademark of Denso Wave Incorporated in Japan and other countries.



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3 SAFETY RELATED INSTRUCTIONS

3.1 Intended use of the frequency converter

Travelling movements

These frequency converters are designed for industrial crane usage for controlling the speed of travelling motors.

Hoisting movements

These frequency converters are designed for industrial crane usage for controlling lifting speed in chain hoist applications.

3.2 Limitations of use



Note: The frequency converter shall be used only in fixed installations.



Note: Only the product's manufacturer shall perform any voltage withstand tests.



Any alterations and/or modifications to the product not authorized by the manufacturer are strictly prohibited. Opening the product's cover voids its warranty.



WARNING

The parameters and settings of the frequency converter shall not be changed. Changing the parameters or settings could lead to dangerous situations, serious injury or death.

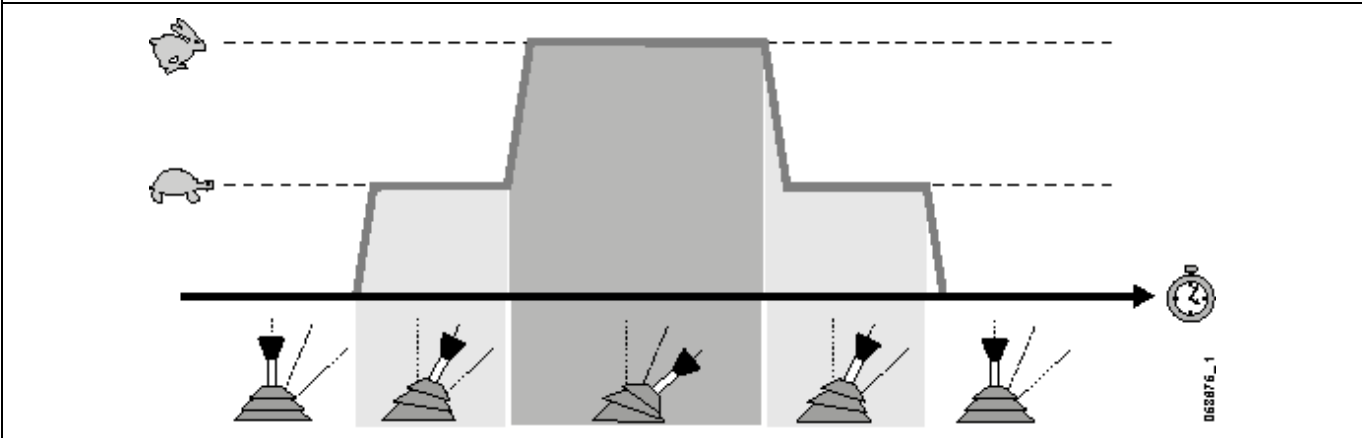


4 OPERATING INSTRUCTIONS

4.1 Normal function

4.1.1 Control methods

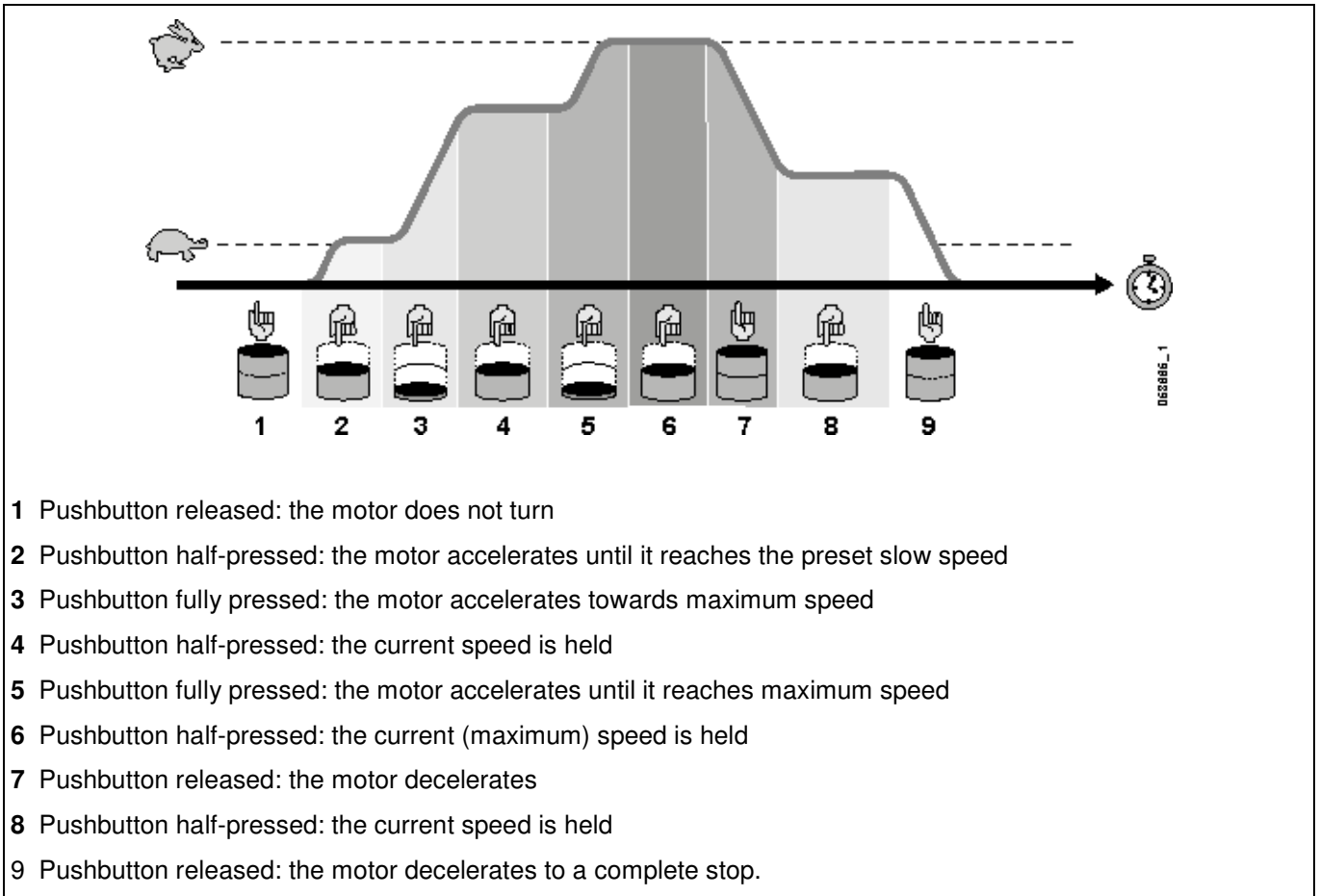
Two speed joystick control




The motor moves at one of two preset speeds corresponding to the force applied to the direction control. The motor moves at its slowest speed when the control is partially pushed and at its maximum speed when the control is fully pushed. The motor stops moving when the joystick is released.

EP (Electronic Potentiometer) stepless pushbutton control

	<p>Released (stop): The device doesn't move or, if it is already moving, it will decelerate to a complete stop.</p>
	<p>Fully pressed (accelerate): The device accelerates continuously until the pushbutton is released or the maximum speed is reached.</p>
	<p>Half-pressed (slow/hold): If half-pressed the device will accelerate until it reaches the preset slow speed. If half-pressed when the device is moving above the preset slow speed, the current speed will be held without accelerating or decelerating.</p>



 CAUTION	When a pushbutton is pressed or released, the movement will accelerate or decelerate smoothly. The operator SHALL account for the starting and stopping distances before making crane movements.
---	---

4.1.2 Slowdown-limit

The slowdown limit reduces the speed of the crane or trolley at both ends of the runway. The slowdown signal input is connected to terminal DI4. In a normal state the limit switch contact is closed and control voltage connected to the input. When the limit switch contact is opened, the slowdown function is activated.

The slowdown function limits the output frequency. If the driving frequency is higher than the set slowdown frequency, the frequency converter decelerates to the slowdown frequency. Movement is possible between the slowdown frequency and minimum frequency. The movement speed is reduced in the running direction or both directions, depending on the setting of switch S4-2.

4.1.3 Stop-limit

The stop limit stops the crane or trolley before the free runway ends. The stop limits are connected in series to direction input S1 and S2. In a normal state the limit switch contact is closed. When the limit switch contact is opened the motion stops with ramp. Movement is possible only in the opposite direction when the stop limit function is active.




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5 TAKING PRODUCT OUT OF OPERATION

5.1 Disposal of waste materials

Waste material from installation, maintenance or dismantling shall be disposed of according to local regulations.

	If the product is taken out of use, the metal and electrical parts should be recycled.	
	In addition to local regulations, liquids like oil, grease and other chemicals shall never be spilled onto the ground or soil. Used oil and grease shall be stored in containers indicated for the purpose.	