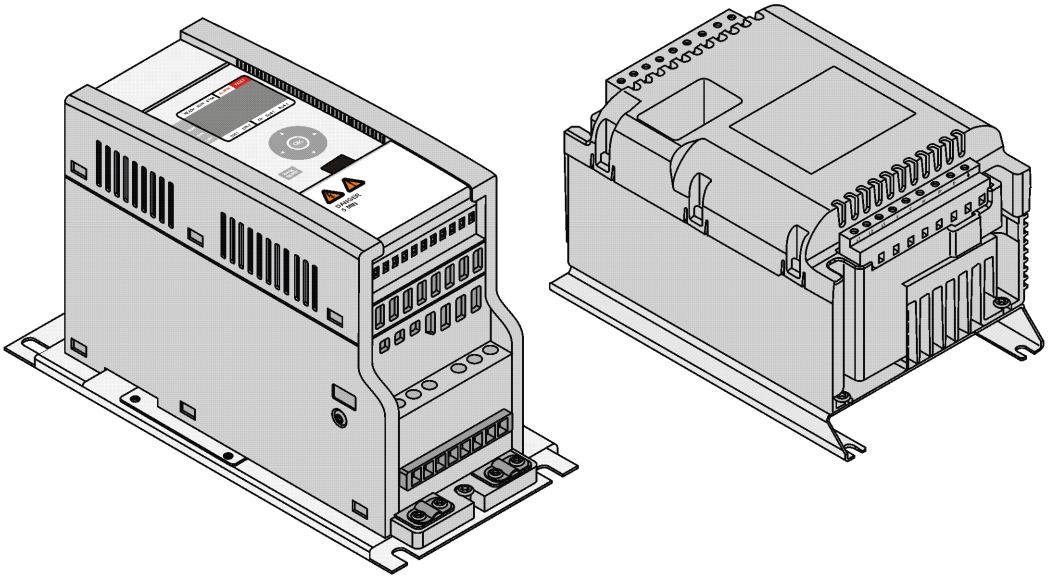
KONECRANES®
Lifting Businesses™

DMCS022 Upgrade Kit

Installation Instruction

020145en / Revision D / 2015-04-29



Original Instruction

TABLE OF CONTENTS

1 INTRODUCTION

1.1 About this manual

This manual offers guidance to the installation and start-up tasks of DynADrive 022 frequency converter replacement.

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

Please read through these instructions and make yourself familiar with all the steps before proceeding.

More information can be found in the original Service Manuals of the specific device.

1.2 About the upgrade kit usage

This upgrade kit is designed only for DynADrive 022 frequency converter.

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.

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.

Electrical shock hazard
Touching live electrical circuit can cause serious injury.
Even though main switch is turned off, there may still be voltage inside electrical devices such as inverters. Wait at least 5 minutes before opening covers.

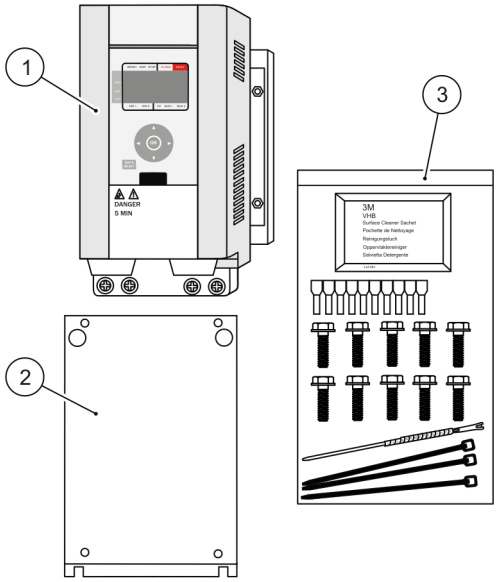
2.3 After working at the site

Ensure that you leave the site in a safe condition:

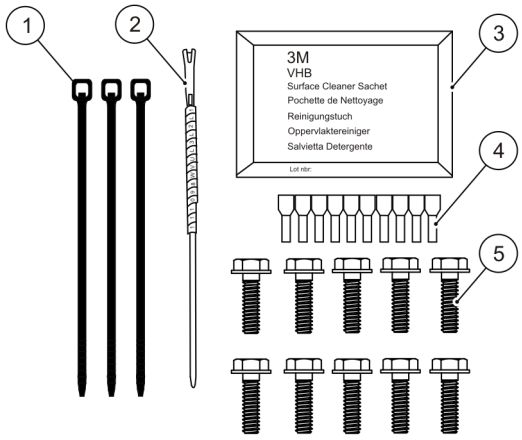
- Ensure that the work area is clean.
- Remove any locks/tags from switches.
- Ensure that the crane functions normally.
- Inform the site responsible that you have finished the work.

3 DESCRIPTION OF THE UPGRADE KIT

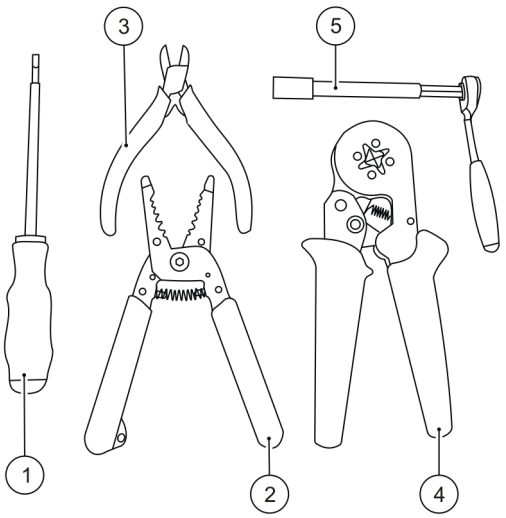
3.1 Parts included in the kit

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 1	Cable tie	3 pcs	
Part 2	Wire marker set	1 pcs	
Part 3	Cleaning pad	1 pcs	
Part 4	Wire end ferrule 2,5mm²	10 pcs	
Part 5	M5 x 10 Flanged screw	10 pcs	

3.2 Required tools

Item No	Name	Image
1	Screwdriver, slot -head, 3,5 x 0,6mm	
2	Wire strippers	
3	Wire cutters	
4	Crimping tool for wire end ferrules	
5	Socket wrench, 8mm	

3.3 Terminal connections

Table 1. Power terminals

Description of Terminal	DynADrive 022 Terminal X2	DynA45 006 Power terminals
Power supply, phase 1	L1	L1
Power supply, phase 2	L2	L2/N
Power supply, phase 3	L3	L3
Motor supply, phase 1	U	U/T1
Motor supply, phase 2	V	V/T2
Motor supply, phase 3	W	W/T3
Braking resistor, positive	R+	R+
Braking resistor, negative	R-	R-
Protective earth	PE	PE

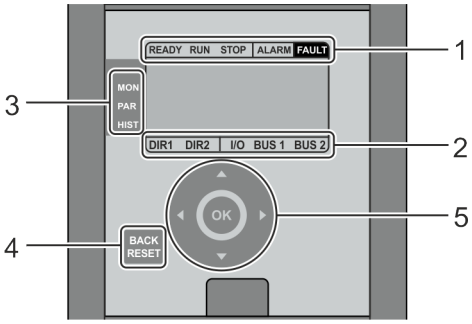
Table 2. Control terminals

DynADrive 022		DynA45 006	
Description of Terminal	**Terminal X1**	**Description**	**Control board terminals**
Drive command, direction 1	1	Drive command, direction 1	1
Drive command, direction 2	2	Drive command, direction 2	2
Speed 2 / Acceleration command	3	Speed 2 / Acceleration command	3
Slowdown/Stop limit, direction 1	4	Common slowdown, Slowdown/Stop limit, direction 1	4
Slowdown/Stop limit, direction 2	5	Common stop, Slowdown/ Stop limit, direction 2	5
Common DI1-5	6	Motor temperature protection / External stop	6
Normally open relay contact	7	Common DI1-6	7
Normally open relay contact	8	Normally open relay contact	8
Empty	9	Normally open relay contact	9
Motor thermistor, T1	10		
Motor Thermistor, T2	11		

Terminal X1 and control board terminal pins may have different functions!

3.4 User interface

DynADrive 022 has 6 groups of DIP switches (S1-S6), whereas DynA45 006 has operating digital panel and large menu structure. The correct parameter settings for DynA45 006 can be found in chapter: "Commissioning".

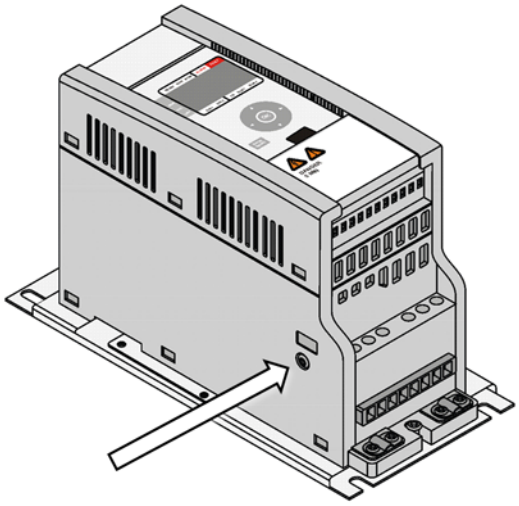
DynADrive 022		DynA45 006	
Switch	**Description**	**No:**	**Description**
			
S1	Maximum driving frequency	1.	Drive status
S2	Minimum driving frequency	2.	Control selection
S3	Acceleration and deceleration ramp times	3.	Main menu
S4	Control mode and motor type	4.	Back/reset button
S5	Motor current limit	5.	Navigation and confirmation (OK) buttons.
S6	Limit operation settings		

3.5 EMC filter

DynADrive 022 has an external EMC filter package (KC310 / KC330), whereas DynA45 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 DynA45 006 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.



4 INSTALLATION

4.1 Preparations

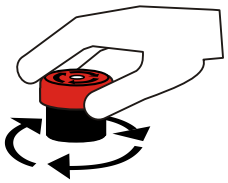
Before you start, be sure to take into account the following matters:

- If the crane is drivable, check the trolley/bridge driving directions before switching the main power off.
- Check that the main power switch is off (lock and tag procedure).
- Always follow all local safety regulations and instructions.

⚠ WARNING

High voltage inside the device.
Wait for at least five minutes after the voltage supply has been switched of before taking any service actions.

4.2 Old frequency converter removal

1	If the trolley is operable (not broken), record the trolley driving directions. 
2	Push the main power off from the pendant or radio controller. **⚠ WARNING** **High voltage inside the Frequency converter.** **Wait for at least five minutes after the voltage supply has been switched of before taking any service actions.**
3	DynA45 006 has an internal EMC filter. The old EMC filter can be removed. Cut the ground wire and the power supply wires (L1, L2, L3) right next to the connector and mark them with the yellow wire marks (Part 17). The old EMC filter can remain on the DynADrive 022 body.

4 Disconnect and mark the motor supply wires (U, V and W) with cable markers. If the DynADrive 022 has an external braking resistor, disconnect the braking resistor wires and remove the braking resistor. Disconnect the control wires and mark them according to the next table.

Pin in DynADrive 022	Connect to pin number in DynA45 006	Function
1	1	Drive command, direction 1
2	2	Drive command, direction 2
3	3	Speed 2 / Acceleration command
4	4	Slowdown/stop limit, direction 1
5	5	Slowdown/stop limit, direction 2
6	7	Common for Digital Inputs
7*	8	Normally open relay contact
8*	9	Normally open relay contact
10**	Connect to OL10 signal	Supply voltage for motor bi-metal thermal protection
11**	6	Motor thermal protection
*) If there are no wires connected in pins 7 and 8 in DynADrive 022 , the relay is not in use and thus must not be marked.		
**)If the pins 10 and 11 are connected together, the motor thermal protection is not in use and thus pin number 6 must be connected to OL10 signal. If there are two motors, there are two thermal protection circuits which must be connected in series.		
If there is a thermistor installed in the motor, a thermistor relay ,e.g. MSL, must be installed to thermal protection circuit of the motor. Pin number 6 must be connected to OL10 via MSL.		

5 Loosen and remove the screws (4 pcs) holding the DynADrive 022 . Remove the DynADrive 022 and the EMC-filter from the enclosure. Note: The old screws are self-tapping so they must not be re-used. Use the delivered screws (part 8) instead.

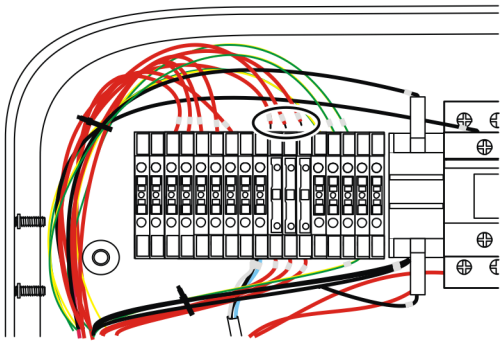
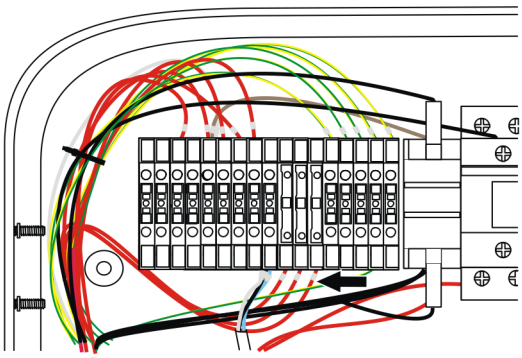
6 Strip all the wires up to 10 mm. If the wires have thin strands, use wire end ferrules (Part 21) as shown in the picture.

4.3 Control voltage front resistors

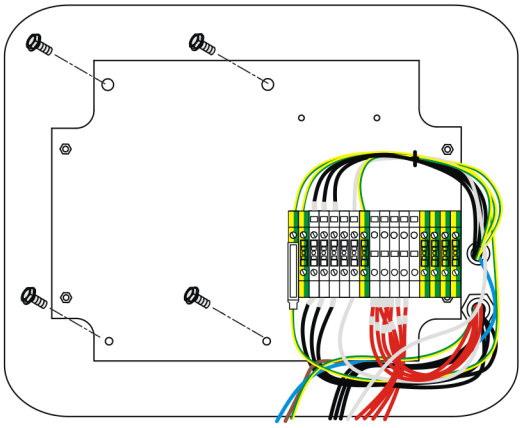
The control voltage range in the DynADrive 022 was 48V - 115V. If the control voltage was 230V, the front resistors were used to decrease the control voltage to 115V or 48V. In the DynA45 006 the control voltage range is 42V - 230V. Therefore you must remove or by-pass the possible front resistors when upgrading the DynADrive 022 to DynA45 006 .

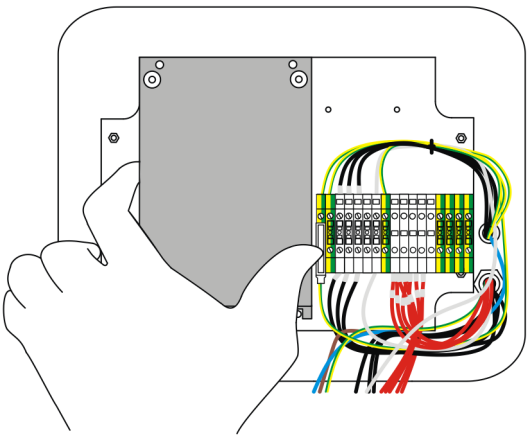
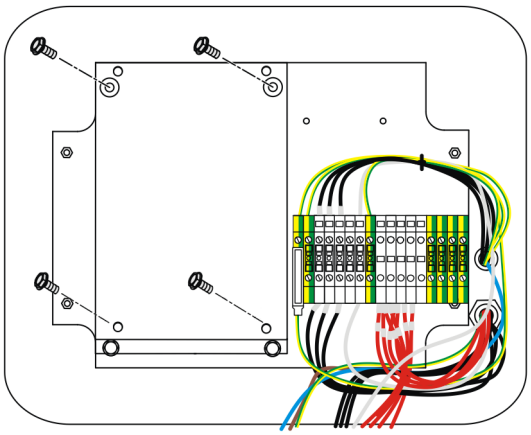
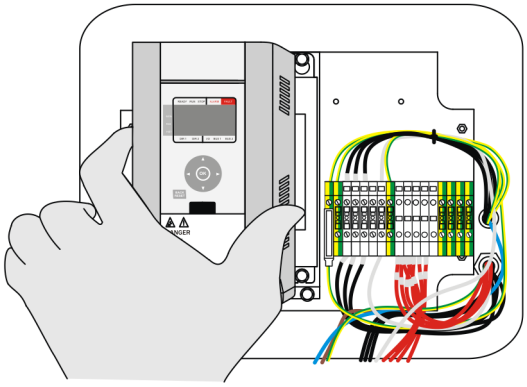
If the front resistors are not removed or by-passed, the control inputs on the DynA45 006 frequency converter are not activated, even though voltage can be measured with a multimeter.

4.4 By-passing the control voltage front resistor

1	Remove the control signal wires from the top side of the front resistor.	
2	Connect the control signal wires to the bottom side of the front resistor. See the picture below. **Do not mix the order of the wires.**	

4.5 New frequency controller installation

1	If the DynADrive 022 has an external braking resistor: install the braking resistor to suitable place close to DynA45 006 in the crane. Install the braking resistor wire from the braking resistor to the cubicle.	
2	Put 4 pcs , size M5 x 10 Flanged installation screws into back plate. Leave screws loose. The installation rack has slotted screw holes.	

3	Put the installation rack (part 2) into place . Tighten the screws.	
4	Put 4 pcs, size M5 x 10 Flanged installation screws into assembly rack. Leave screws loose. The inverter has slotted screw holes.	
5	Put the DynA45 006 into place. Tighten the screws.	
6	Connect the power supply and motor wires in DynA45 according to electrical drawings.	
7	Connect extra grounding wire from new inverter PE(protective earth) terminal to ground. Wire length should not exceed 10 cm. The wire size should be minimum of 2.5 mm². This extra grounding wire is not delivered with the package.	
8	If the DynADrive 022 has an external braking resistor: Remove the internal braking resistor wires and connect the braking resistor cable to DynA45 006 according to the electrical drawings.	

9

Connect the control wires according to the next instructions. Look at the original electrical drawings to see how the original application is built. There are five different variations how control wires can be connected.

Variation 1 - MS2+stop . EP2 or MS2 control with stop limit.

Figure 1. Old inverter + MS2 + stop

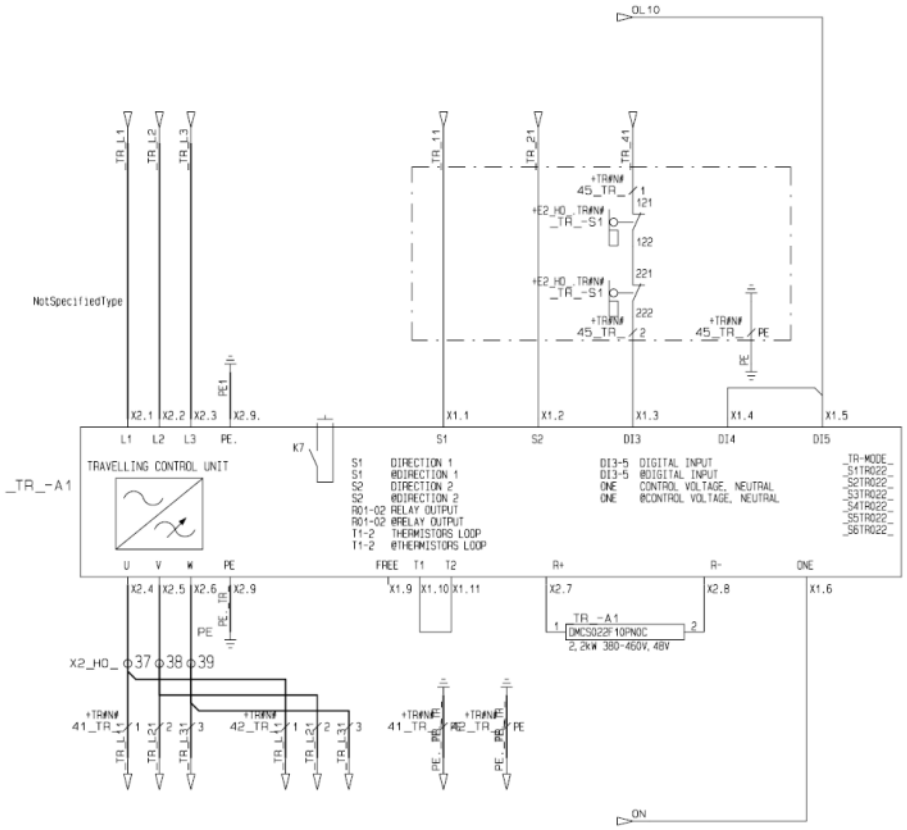
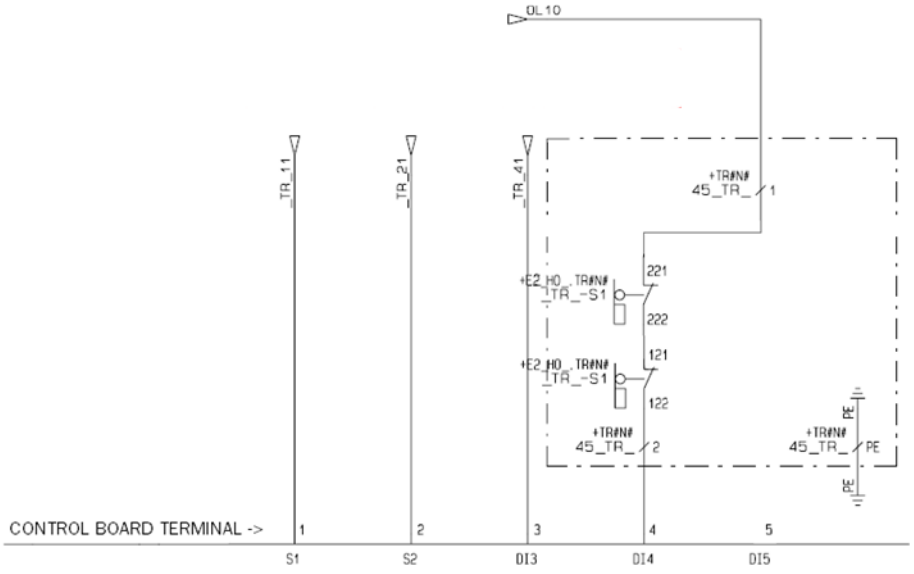


Figure 2. New inverter + MS2 + stop



Digital input 5 in DynA45 will be deactivated. No connection is needed.

Variation 2 - EP2+slow down. MS2 control method with slowdown limit switch. With DynA45 both direction signals from limit switch must be connected in series as shown in below figures.

Figure 3. Old inverter + EP2 + slow down

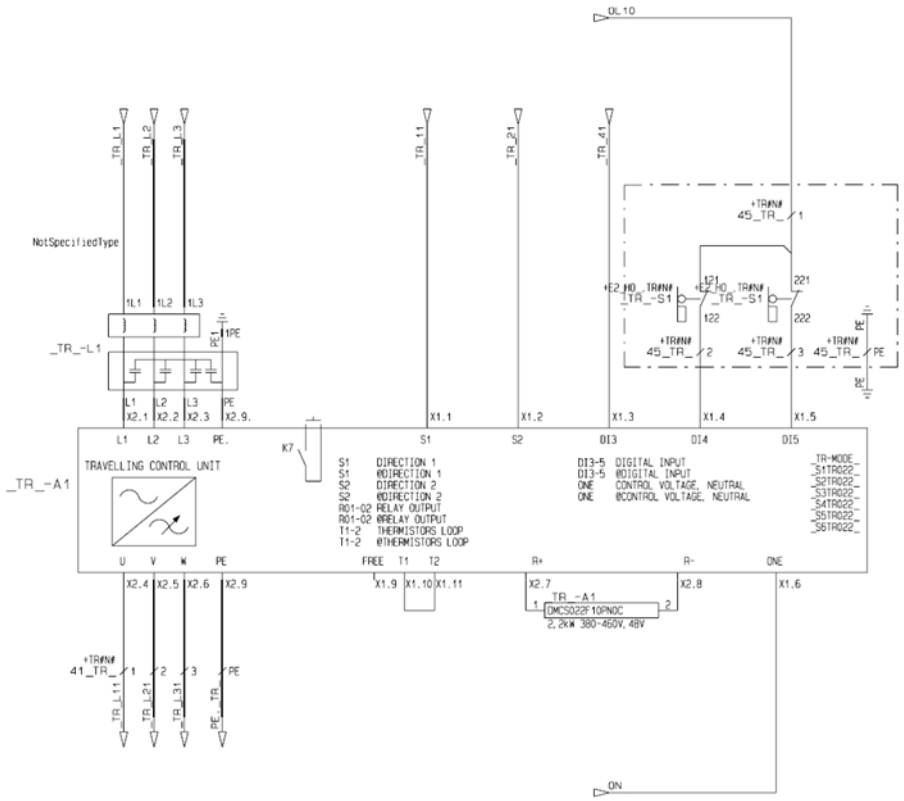
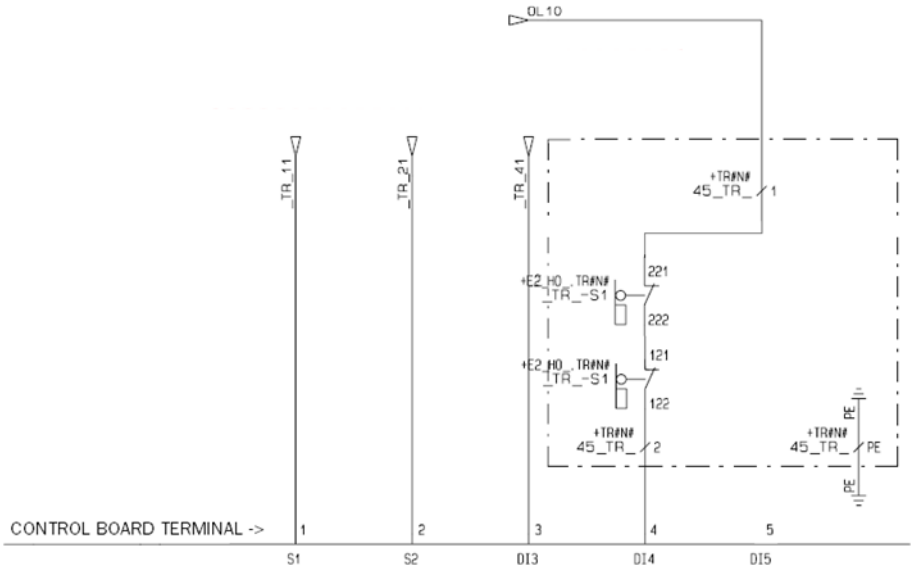


Figure 4. New inverter + EP2 + slow down



Digital input 5 in DynA45 will be deactivated. No connection is needed.

Variation 3 - EP2 / MS2 + stop.

Figure 5. Old inverter + EP2 / MS2 + stop

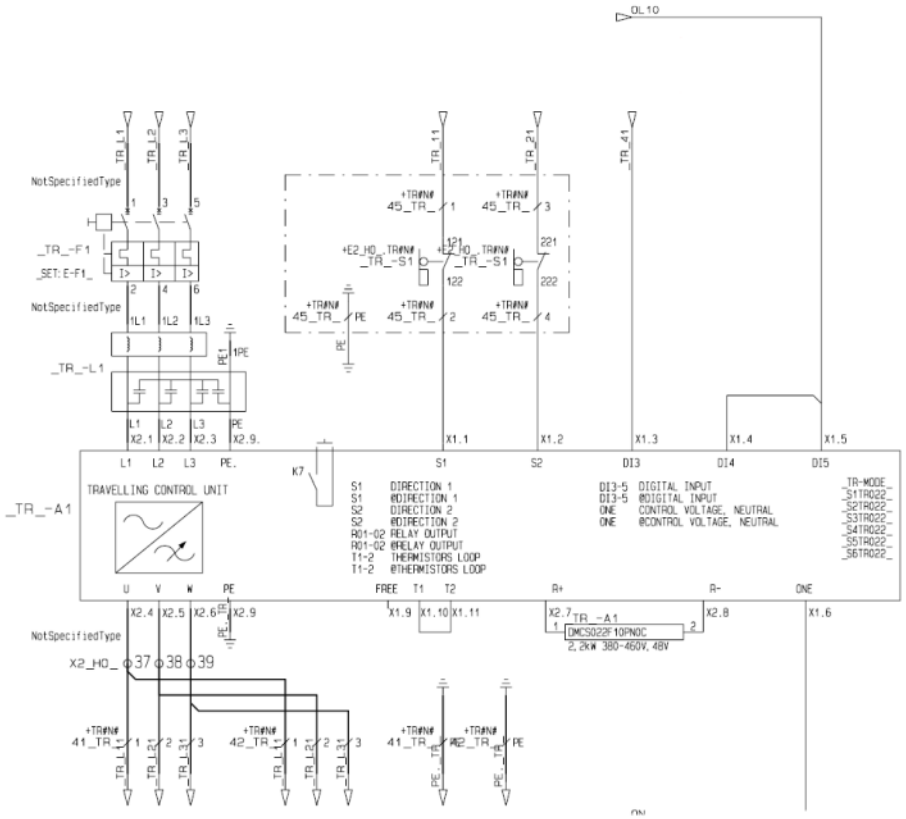
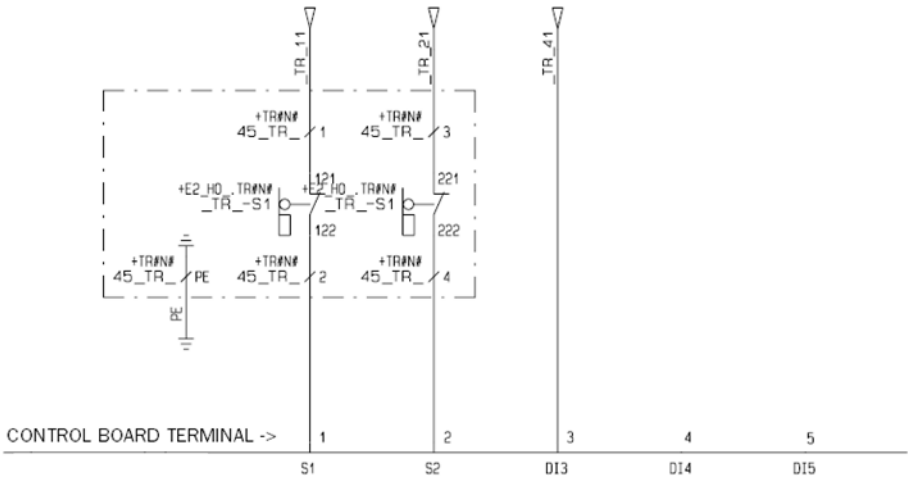


Figure 6. New inverter + EP2 / MS2 + stop



Digital inputs 4 and 5 in DynA45 will be deactivated. No connection is needed.

Variation 4 - MS2 + 2-step limit switch.

Figure 7. Old inverter + MS2 + 2-step limit switch

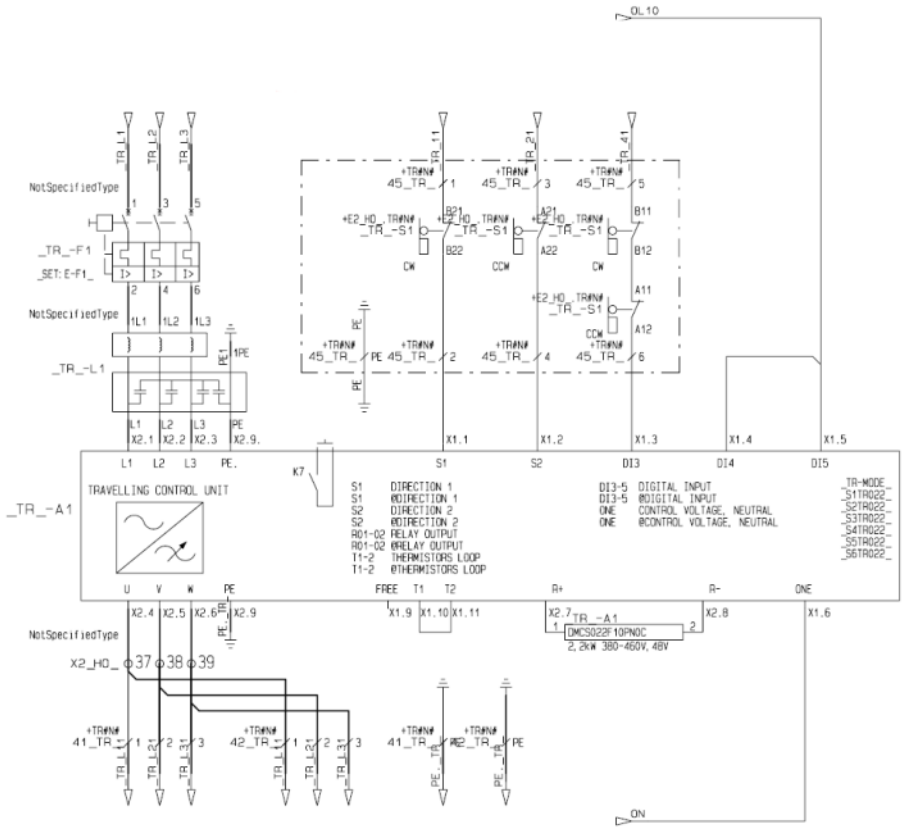
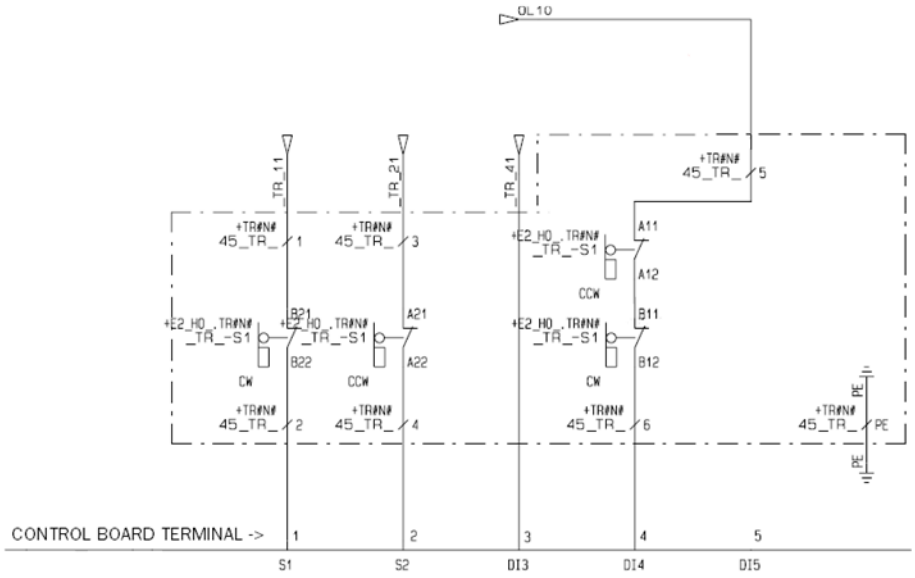


Figure 8. New inverter + MS2 + 2-step limit switch



Variation 5 - EP2 + 2-step limit switch. With DynA45 the both slowdown direction signals from limit switch must be connected in series.

Figure 9. Old inverter + EP2 + 2-step limit switch

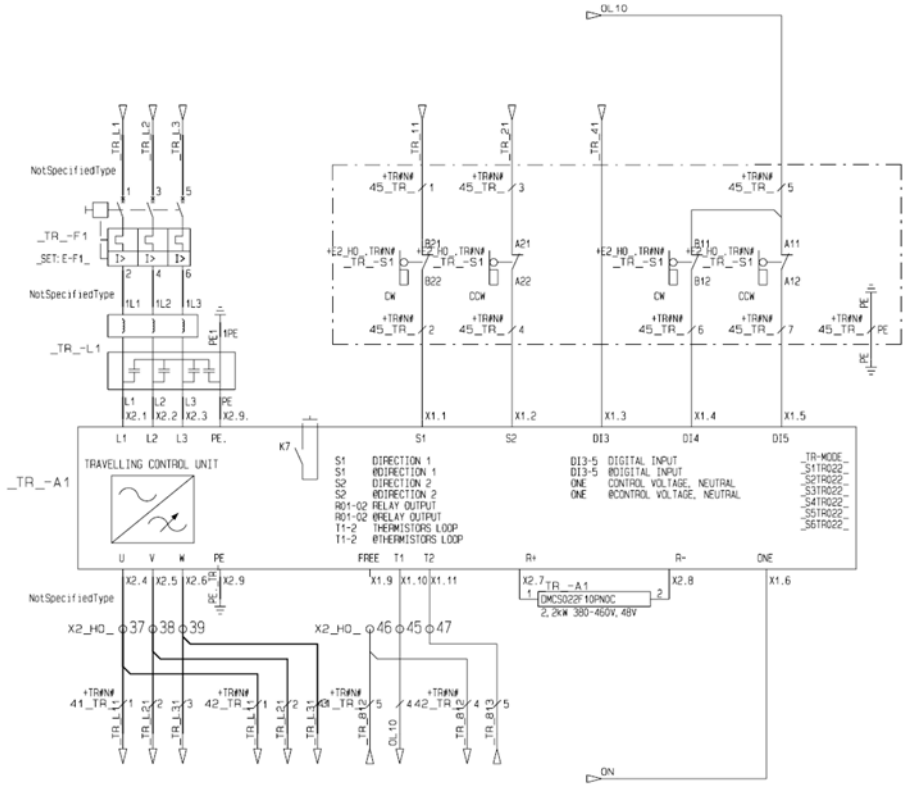
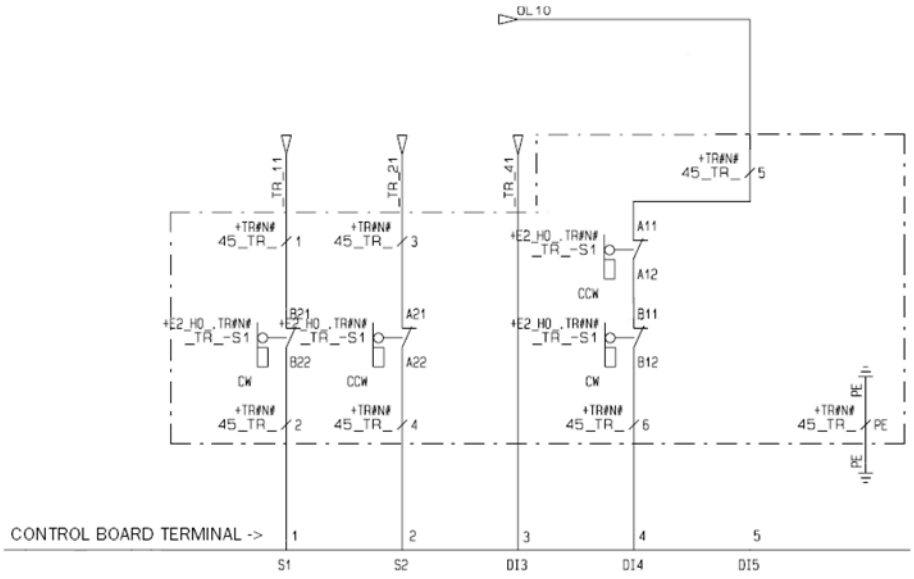


Figure 10. New inverter + MS2 + 2-step limit switch



5 COMMISSIONING

5.1 Old inverter parameter settings

Write down the old parameter settings from the DynADrive 022 frequency converter in the table below.

Table 1: DynADrive 022 parameter settings																								
Dip switch position	Switch 1				Switch 2				Switch 3				Switch 4				Switch 5				Switch 6			
	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4	-1	-2	-3	-4
ON																								
OFF																								

5.2 Motor type

Record the motor type. You need to verify if you're motor is equipped with compact brake. This information is later used on the commissioning steps. The commissioning steps are different with compact brake motors.

Motor type

Compact brake motor types
MF06MA200
MF06MA100
MF06LA200
MF06LA100

5.3 Traveling motor rating plate values

Record the traveling brake rating plate values for further use on commissioning.

Name	Motor rating plate value
Motor Nom Volt [V]	
Motor Nom Freq [Hz]	
Motor Nom Speed [rpm]	
Motor Nom Curr [A]	
Nom Magnetizing Curr [A]	
Motor Cos Phi	

5.4 Setting up the new inverter parameters

Compare the DIP switch settings of the DynADrive 022 with the following tables and find correct settings for the DynA45 006 parameter settings.

1	At the DynA45 006 frequency converter; set parameter **P1.1** to value 129. This sets the engineering password level which is needed for parameter settings.

2

Set the nominal driving frequency. Driving frequency depends on the chosen nominal frequency of the motor. Use table 1 to determine which table must be used to set the maximum and minimum driving frequencies. Note that switch S4-3 and S4-4 are not shown, because these were used for the IR-compensation purpose in the DynADrive 022 inverter.

Table 3. ***Selecting Maximum and Minimum frequency table***

DynADrive 022		Table	Nominal Frequency (Hz)
Switch S4			
-1	-2		
0	0	4	100/120
1	0	5	80
0	1	6	50/60

Table 4. ***Maximum and minimum frequency 100/120 Hz***

DynADrive 022				Minimum frequency (Hz) To P1.2	Maximum Frequency (Hz) To P1.3
Switch S1					
-1	-2	-3	-4		
0	0	0	0	29	100
0	0	0	1	14	50
0	0	1	0	23	62
0	0	1	1	10	54
0	1	0	0	32	80
0	1	0	1	12	58
0	1	1	0	16	66
0	1	1	1	18	70
1	0	0	0	50	115
1	0	0	1	20	75
1	0	1	0	26	85
1	0	1	1	35	90
1	1	0	0	38	95
1	1	0	1	41	105
1	1	1	0	44	110
1	1	1	1	47	120

Table 5. ***Maximum and minimum frequency 80 Hz***

DynADrive 022 Switch S1				Minimum frequency (Hz) To P1.2	Maximum Frequency (Hz) To P1.3
-1	-2	-3	-4		
0	0	0	0	22	77
0	0	0	1	14	42
0	0	1	0	18	50
0	0	1	1	10	40
0	1	0	0	30	62
0	1	0	1	12	44
0	1	1	0	16	46
0	1	1	1	20	48
1	0	0	0	40	80
1	0	0	1	24	53
1	0	1	0	26	56
1	0	1	1	28	59
1	1	0	0	32	65
1	1	0	1	34	68
1	1	1	0	36	71
1	1	1	1	38	74

Table 6. ***Maximum and minimum frequency 50/60 Hz***

DynADrive 022 Switch S1				Minimum frequency (Hz) To P1.2	Maximum Frequency (Hz) To P1.3
-1	-2	-3	-4		
0	0	0	0	15	50
0	0	0	1	7	25
0	0	1	0	12	31
0	0	1	1	5	27
0	1	0	0	16	40
0	1	0	1	6	29
0	1	1	0	8	33
0	1	1	1	9	35
1	0	0	0	25	58
1	0	0	1	10	38

DynADrive 022				Minimum frequency (Hz) To P1.2	Maximum Frequency (Hz) To P1.3
Switch S1					
-1	-2	-3	-4		
1	0	1	0	13	43
1	0	1	1	18	45
1	1	0	0	19	48
1	1	0	1	21	53
1	1	1	0	22	55
1	1	1	1	24	60

3

Set acceleration and deceleration ramp time values. Acceleration and deceleration ramp time values for DynADrive 022 can be found in table 7. The corresponding value for DynA45 006 must be set to parameters **P1.7** and **P1.8**. The original value for the Acceleration and deceleration ramp time can be found from the original electrical drawings. Default value for trolley acceleration time is 3,5s and bridge acceleration time 4,5s.

Reducing of the acceleration or deceleration ramp time from the value of the original delivery is not allowed.

Table 7. ***Acceleration and deceleration ramp times***

DynADrive 022				Acceleration and deceleration Ramp Time (s)
Switch S3				
-1	-2	-3	-4	
0	0	0	0	2,5
0	0	0	1	3,5
0	0	1	0	3
0	0	1	1	5
0	1	0	0	2
0	1	0	1	8
0	1	1	0	1
0	1	1	1	7,5
1	0	0	0	1,5
1	0	0	1	4
1	0	1	0	7
1	0	1	1	6,5
1	1	0	0	4,5
1	1	0	1	6
1	1	1	0	5,5
1	1	1	1	0,5

4

At the DynA45 006 frequency converter; Set **P1.9**=drive selection, to value 1=travel or 2=travel compact brake motor.

5

If you set **P1.9**=drive selection to value 1=travel on the step 4, autotune the inverter. After autotuning, go to step 8. Steps 6 and 7 are done only with compact brake motors.

AUTOTUNING

5.1 Ensure that parameters **P3.1** (Motor Nominal Voltage), **P3.2** (Motor Nominal Frequency), **P3.4** (Motor Nominal Current), **P3.5** (Motor Nominal Flux Current), **P3.6** (Motor Cos Phi) are equal to the motor rating plate values If motor no-load current is not known, set **P3.5** (Motor Nominal Flux Current) equal to zero. Auto-tuning then uses motor cos phi for calculations instead of no-load current.

5.2 Set parameter **P3.7** (Autotuning) = 1. Auto-tuning will start right after the parameter change. RUN indicator on the display turns on (and STOP indicator turns off). Autotuning will take about 5 seconds.

5.3 After auto-tuning, parameter **P3.7** (Autotuning) = 3, successfully done.

6

(only with compact brake motors) Set motor control parameters.

- **P3.2**=Motor nominal frequency in percent of motor nominal voltage.
- **P4.1**=zero frequency voltage in percent of motor nominal voltage.
- **P4.2**=U/f mid voltage in percent of motor nominal voltage.
- **P4.3**=U/f mid frequency in Hz.
- **P4.4**=Rs voltage drop in percent of motor nominal voltage.

Table 8. ***Motor control parameters***

Compact brake motors	DynADrive 022				DynA45 006				
	Switch S4				Parameter				
	-1	-2	-3	-4	P3.2	P4.1	P4.2	P4.3	P4.4
MF06MA200	0	0	0	0	100/120 Hz	10%	14%	10%	0%
MF06MA100	1	0	1	0	80 Hz	9%	16%	8%	0%
MF06LA200	0	0	1	0	100/120 Hz	8%	12%	10%	0%
MF06LA100	1	0	0	1	80 Hz	6%	12%	8%	0%

7

(only with compact brake motors) Set motor nominal current. You can set the parameter according to this table or look the real value from the motor rating plate.

Table 9. ***Motor nominal current***

DynADrive 022		Motor nominal current limit	DynA45 006
Switch S5			Parameter
-1	-2		P3.4
0	0	0…1,8A	1,8A
0	1	1,9…2,7A	2,7A
1	0	2,8…3,5A	3,5A
1	1	>3,5A	5,6A

8

At the DynA45 006 frequency converter; Set **P3.8**=Start DC-Current. If you have multiple motors, motor current values must be must be multiplied by the number of motors.

9 At the DynA45 006 frequency converter; Set **P3.9**=current limit to 8.4A. This is the maximum allowed temporary over current for one minute of time.

10 Set the control mode. The control mode settings in DynADrive 022 and the corresponding parameter value for DynA45 006 are given in table 6.

Table 10. ***Control mode***

DynADrive 022		Control Method	DynA45 006
Switch S6			Parameter
-1	-2		P6.1
0	0	MS2	2
1	0	EP2	1

11 Set travel limit operation settings. See chapter New frequency controller installation (page 12) , step 9, how the control wiring was in the old inverter and how the new inverter wiring was done. In the new inverter you need to set correct parameters in order to set travel limits to work. After setting the parameters, test the limit functions.

Old DynADrive 022 inverter control board connections		Original limit settings	DynA45 006 parameter		
			P6.2	P6.3	P6.4
X1:4 / DIA4	X1:5 / DIA 5	S11 , S21	3	0	1
X1:4 / DIA4	X1:5 / DIA 5	OL10	0		
X1:3 / DIA3		S11, S21	3		

12 At the DynA45 006 frequency converter; set parameter **P1.1** to value 0. This sets the default password level which doesn't allow any changes to the parameters .

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 frequency converter is on READY status 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 11).
2	The frequency converter does not start (not in READY status) when it is started.	• Measure the main voltage between terminals L1, L2 and L3. See electrical drawings for the correct value. • Make sure that there are no devices causing disturbance connected to the same voltage supply as the crane, such as big motors or welding devices. • Make sure all motor cables have proper connection. • Make sure that no limit switch or operation is not active. • Measure the control voltage in direction command terminal 1 (DI1) and terminal 2 (DI2) against the common (terminal 7). Voltage should increase when button is pushed on the controller.  **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.**
3	The motor runs poorly: trolley/bridge does not move as it supposed to move.	• 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 (P4.2, P4.3 and P4.4) are correctly set. • Check that the motor's brake opens completely.

6.3 Fault codes and alarms

When the frequency converter detects an unacceptable situation it stops the current movement and indicates a warning or fault code. First digits of the fault code indicates the order f the code, e.g. F1 means the latest fault. Next two digits are indicating the fault code. At active fault situation FAULT arrow and fault code are blinking. If there are several active faults, they all are blinking in history browsing.

Some of the faults are reset automatically by the software, while others may require the frequency converter to be powered down. The causes of the fault(s) must be resolved and both drive commands have to be on the OFF position for 0.5s before the motor can be started again. In a case of over current fault the supply voltage must be switched off and back on before it is possible to resume operation.

The warning and fault code numbers and corresponding warnings and faults, possible causes and suggested solutions are listed in the following table.

Table 11. FAULT CODES

Code	Fault	Possible cause	Suggested solution	Resetting
1	Overcurrent	• Motor failed • Short circuit in motor wiring	• Check/replace motor • Check/repair motor wiring.	A
2	Overvoltage	• Too high supply voltage • Braking resistor failed • Break in braking resistor wiring	• Measure supply voltage and check hoist supply voltage from hoist type plate • Measure braking resistor resistance • Check braking resistor and wiring visually	C
3	Earth Fault	• Short circuit in wiring • Motor failed	• Check/repair wiring • Check/replace motor	A
8	System Fault	• Internal fault	• Switch off supply voltage • If problem recurs, replace inverter	B
13	Under temperature	• Internal temperature too low	• Minimum operating temperature is -30ºC	C
14	Overtemperature	• Internal heat sink temperature too high	• Wait for unit cooling down	C
22	API EEPROM Checksum	• Internal parameter save error	• Switch off supply voltage • If problem recurs, replace inverter	B
23	POW EEPROM Checksum	• Internal parameter save error	• Switch off supply voltage • If problem recurs, replace inverter	B
24	Counter fault	• Internal counter error	• Switch off supply voltage • If problem recurs, replace inverter	B
25	API Microprocessor Watchdog	• Internal watchdog error	• Switch off supply voltage • If problem recurs, replace inverter	B
26	POW Microprocessor Watchdog	• Internal watchdog error	• Switch off supply voltage • If problem recurs, replace inverter	B
34	Internal Bus Communication	• Internal bus error	• Switch off supply voltage • If problem recurs, replace inverter	B
35	Application Fault	• Internal application error	• Switch off supply voltage • If problem recurs, replace inverter	B
41	IGBT Overtemperature	• Internal IGBT temperature too high	• Wait for unit cooling down	C
52	Parameter Fault	• Wrong parameter setting. P1,9 Drive Selection = 0	• Check parameter P1.9 Drive Selection	C

Code	Fault	Possible cause	Suggested solution	Resetting
53	CAN Communication Fault	• CAN Communication is not working	• Switch off supply voltage from all devices that are connected to CAN bus • Check CAN-bus wiring and termination resistor settings • Check CAN-communication parameters	C
55	Board Fault	• API3 is not installed or not working properly	• Switch off supply voltage • Check API3 supply voltage • Check API3 wiring connections • If problem recurs, replace inverter	B
56	Generator Current Limit/Deceleration Ramp Supervision	• Inverter cannot stop with the set ramp stretching	• Increase P1.8 Deceleration Time or P11.1 Ramp Stretching value	C
57	Motor Overtemperature	• Motor temperature too high • Digital input DIA4 deactivated when used for motor overtemperature protection	• Wait for motor cooling down • Avoid running long periods at low speed • Check motor temperature protection wiring	C
58	Overvoltage Regulator Timeout	• Overvoltage regulator has been active for 5 sec		C
59	Overvoltage at Start	• Too high supply voltage	• Measure supply voltage and check hoist supply voltage from hoist type plate	C
60	Power unit fault	• Power unit has stopped running • E-stop during running	• Switch off supply voltage • Check power unit wiring • If problem recurs, replace inverter	B
61	Overspeed	• Overspeed situation detected • Interference in speed signal connected to ENC1A	• Check supply voltage • Check load measurement operation and calibration • Check sensor cable grounding and inverter PE-connections • Check/replace speed sensor connected to ENC1A	A

Code	Fault	Possible cause	Suggested solution	Resetting
62	Speed difference	• Speed difference situation detected • Load measured too low in ESR use • Mechanical failure e.g. in gear • Interference or missing signal in ENC1A • Sensor channels ENC2A-B connected wrong way • Interference or missing signal in ENC2A-B	• Check supply voltage • Check load measurement operation and calibration • Check hoist operation without load • Check sensor cable grounding and inverter PE-connections • Check/replace speed sensor connected to ENC1A • Swap connections between ENC2A and ENC2B • Check/replace speed sensor connected to ENC2A-B	A
63	Stall	• Motor does not run. Mechanical failure e.g. in gear • Missing signal in ENC1A	• Check/replace motor • Check/repair motor wiring • Check hoist operation without load • Check/replace speed sensor connected to ENC1A	A
64	Relay	• Error detected in ROB1 relay, test circuit or the main contactor	• Check main contactor circuit wiring • If problem recurs replace inverter	A
71	Brake control	• Error detected in brake control circuit	• Check/repair brake control circuit wiring • Check brake coil resistance • Replace brake if not ok • If problem recurs replace inverter	A
73	Both Direction Commands Active	• S1 and S2 controls active at the same time • Fault in control circuit/ controller	• Check/repair control circuit wiring • Check/replace pendant controller	C
77	CRC	• Internal safety parameter fault	• Switch off supply voltage • If problem recurs, replace inverter	B

Code	Fault	Possible cause	Suggested solution	Resetting
82	Overload	• Overload situation detected • Worn chain or chain drive (chain hoist) • Load sensor out of calibration • Load sensor failed • Mechanical failure in gear (chain hoist)	• Make sure that the load on hook is not more than rated load • Check/replace chain and chain drive • Recalibrate load sensor by performing load calibration function • If problem recurs after re-calibration, replace load sensor and perform offset correction and calibration • Check hoist gear operation by observing noise, vibration and so on	C
84	Clutch supervision	• Clutch slipping detected (chain hoist) • Worn chain or chain drive (chain hoist) • Missing pulses in signal connected to ENC2A-B • Parameter P8,7 ENC2 Stall Pulse Limit value too high	• Check/adjust clutch adjustment • Check/replace chain and chain drive • Check/replace speed sensor connected to ENC2A-B • Lower the parameter P8,7 ENC2 Stall Pulse Limit value	A
85	Load Sensor Fault	• Load sensor signal out of range	• Check/repair load sensor wiring • Check/replace load sensor	C

Resetting column explanation
- A = E-stop activation / deactivation
- B = Hoist supply voltage switch OFF / ON
- C = Automatic when fault situation is over

Table 12. ALARMS

Code	Alarm	Possible cause	Suggested solution
6	External Stop	ES-signal not active.	Lift E-stop button.
51	Stop Limit	Stop limit activated. Break in limit switch wiring. Limit switch failed.	• Run to the other direction • Check/repair limit switch wiring • Check/replace limit switch
54	Limit fault	Wrong limit switch active. Frequency too low to detect direction.	Check limit switch operation and wiring.
83	Slack wire	Slack wire function active.	
86	Load not calibrated	Load calibration has not been done.	Perform load calibration function.

Code	Alarm	Possible cause	Suggested solution
87	Programmable limit active	Programmable limit is disabling driving in either direction	• Run other direction • Set the programmable limit to other position • Limit can be also by-passed temporarily by activating the movement control more than 5 seconds
88	CCU fault	Controlled common use fault.	Another device that is connected in CAN bus has an active fault.
93	CCU activation	Controlled common use activation.	Another device that is connected in CAN bus has caused the stopping.