MOBICHAIN

S.W.L   kg

S.W.L   kg

movomech®

Contents

1. Safety

Movomech's equipment is manufactured in accordance with the latest technological advances, and according to the latest applicable European standards and directions. The aim of this documentation is to provide the user with practical instructions for safe operation and simple maintenance of the equipment.

Anyone who deals with the installation of the equipment (including related equipment), operational procedure, use, maintenance, and/or repair functions must have read and understood:

•   the instruction manual,

•   the safety regulations, and

•   the safety instructions for each individual section.

In order to avoid misuse and to ensure the reliable operation of the products, we recommend that the instruction manual is always available to the user/operator.

Intended usage

The equipment is intended exclusively for transportation, lifting and lowering of load. Any other use, including the towing of a load and the transportation of passengers, is prohibited (see below for more examples). Movomech does not accept responsibility for damage caused by such use. All risks are the sole responsibility of the user.

The equipment may only be used in perfect technical condition by trained staff, and in accordance with current safety and work protection regulations. Furthermore, the user must observe operational and maintenance conditions contained in the instruction manual. Severe personal injury and damage to equipment can be caused by:

•   removal of covers and casings,

•   non-professional installation of equipment,

•   incorrect usage, or

•   insufficient maintenance.

Prohibited usage

Certain types of activities and operations are prohibited, as in specific circumstances they can cause personal injury as well as permanent damage to the construction. For example:

•   It is prohibited to convey passengers using the equipment.

•   Never transport suspended loads above anyone's head.

•   Never drop a suspended load, and make sure it is lifted in a straight line.

•   Never loosen secured or fastened loads by using the equipment.

•   Do not overload.

•   Do not leave a suspended load unattended.

General safety aspects

The instruction manual should always be kept within easy reach of the equipment. It contains important safety information and sections that relate to guidelines, norms, and regulations. Failure to follow the safety regulations in this instruction manual may result in personal injury or death.

In addition to the instruction manual, generally applicable regulations and rules must be followed and adhered to in order to avoid accidents and protect the environment. This also applies to regulations relating to the handling of products dangerous to the environment and the use of personal safety equipment.

As regards all work associated directly or indirectly with the equipment, the user must follow and adhere to all the above regulations as well as current work protection and safety regulations. In spite of this, a life-threatening risk still prevails in cases where the equipment is used and operated by non-trained or non-instructed staff in a non-professional or non-intended way.

The user should supplement the instruction manual with instructions that consider the nature of the operation, e.g. company organisation, work procedures, and number of staff.

The members of staff who are assigned to work with the equipment must have read the instruction manual prior to undertaking any work, and he/she should pay particular attention to the chapters containing safety instructions. It is too late once work has commenced. This applies in particular to members of staff who are working with the equipment on a temporary basis, e.g. for maintenance purposes.

When convenient, the staff should be tested on their knowledge of the manual's contents that relate to safety and accident awareness.

The user is responsible for ensuring that the equipment is used only when it is in perfect condition and that all applicable and relevant safety regulations and requirements are followed.

The equipment should be taken out of operation immediately if functional damage or defects are discovered.

Personal safety equipment should be used as and when necessary, or when required by regulations.

Safety and warning devices, such as signs, stickers and labels must not be removed or made illegible.

All safety and warning devices on or adjacent to the equipment should be complete and maintained in a legible/functional condition.

All changes, extensions or reconstruction that may affect safety are forbidden without written permission from Movomech. This also applies to assembly and adjustment of safety equipment and welding of structural parts.

Spare parts must comply with Movomech's stated technical requirements. This compliance is guaranteed when original spare parts are used. The intervals prescribed or stated in the instruction manual for regular testing/inspection must be adhered to!

Staff selection and qualifications

Reliable staff must carry out work with/on the equipment. Regulations that apply to under-age persons must be followed.

The user is responsible for supplying necessary training and instructions to those that he/she employs, including professionals and/or apprentices.

It is recommended that the user draws up instructions and guidelines relating to the causes of errors, communicates these to the relevant staff, and posts directions on appropriate and clearly visible places.

It is recommended that the user makes sure that the knowledge of the staff is adequate as regards the following points, prior to the operation of the construction:

•   knowledge of the contents of the instruction manual,

•   knowledge of the safety and user regulations contained therein,

•   and knowledge of applicable work protection regulations.

Only trained and instructed staff should be permitted to work with the equipment. Parameters relating to use, maintenance, and installation should be clarified.

Safety instructions for usage

The only persons allowed to work on the electrical equipment are competent staff members who work in accordance with regulations and standards for high-voltage equipment.

No persons under the influence of drugs, alcohol or medication which affects their ability to react, are allowed to use, maintain, or repair the construction.

All stated actions and instructions relating to work protection and issues relating to general safety and protection of workers that should be carried out or studied prior to, during or following operation must be followed to the letter. Failure to do so may result in fatal accidents.

The equipment should be stopped or taken out of operation at the time of detection of faults relating to work protection and operational accessibility.

Safety equipment must not be deactivated, altered or used in a way that conflicts with applicable regulations.

Appropriate actions must be taken to ensure safe operation and functional conditions for the user.

The equipment should only be used when all protective and safety equipment, such as detachable guards and emergency stop devices, are in place and in working order.

Any type of modification and alteration of the equipment is prohibited. However, this does not apply to lesser changes that do not affect the strength, operational safety or work protection, or to actions which promote an increased level of safety.

The fundamental responsibility for these changes lies with the user. If in doubt, contact Movomech for written approval of the actions prior to implementation.

The equipment should be stopped and locked immediately when functional faults occur. Faults should be corrected immediately!

Following an "emergency stop" the user has to wait for the cause of the disruption to be repaired and for an assurance that there is no further danger before he/she reconnects the equipment and resumes operation.

The equipment should be disconnected immediately in the following cases:

- in case of damage to the pneumatic / electrical / mechanical equipment, and

- in case of malfunctioning personal protective equipment.

Specific local circumstances or applications may lead to situations that were unknown at the time of writing this document. In such cases, the user must ensure safe operation and disconnect the equipment until measures to maintain safe operation have been carried out in conjunction with Movomech or other authorised party.

Ensure that no one can become injured when they use the equipment prior to connecting/activating the equipment.

If the user notices the presence of persons who may become injured during operation, the operation should be discontinued immediately and must not be resumed until these persons have left the dangerous area.

The user must make sure that the equipment is in a perfect and operationally safe condition prior to all operations using the equipment.

The user should carry out all prescribed safety measures and make sure that automated procedures are completed when the equipment is disconnected (e.g. when there are deficiencies as regards operational and personal safety, an emergency situation exists, repair or maintenance is being carried out, damage is noticed or at the completion of work).

Work with the equipment is only allowed when the operator has been instructed to do so by his superior, and if the operator has knowledge of the equipment and its function.

Warning
Suspended load

Warning
Do not go under a raised load
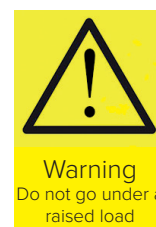
2. Description

MobiChain is an articulated jib crane with integrated chain hoist with a hook for a maximum load of 100 kg. The crane unit consists of the tower and the inner and outer arms.

The crane can be attached to the floor with expander bolts or mounted on a mobile foot plate. The crane can also be mounted on a wall or tower and thus consists of a wall mount, inner arm and outer arm. The inner arm is available in lengths of 1, 1.5 and 2 metres. The outer arm is available in lengths 1.5 and 2 metres. The shaft in the inner arm is attached to the tower with a bearing mount. This shaft has an internal brake which holds the shaft in place when set either in parked or in any other extended position. MobiChain connects electrically with a 230 V AC, 10 A plug.
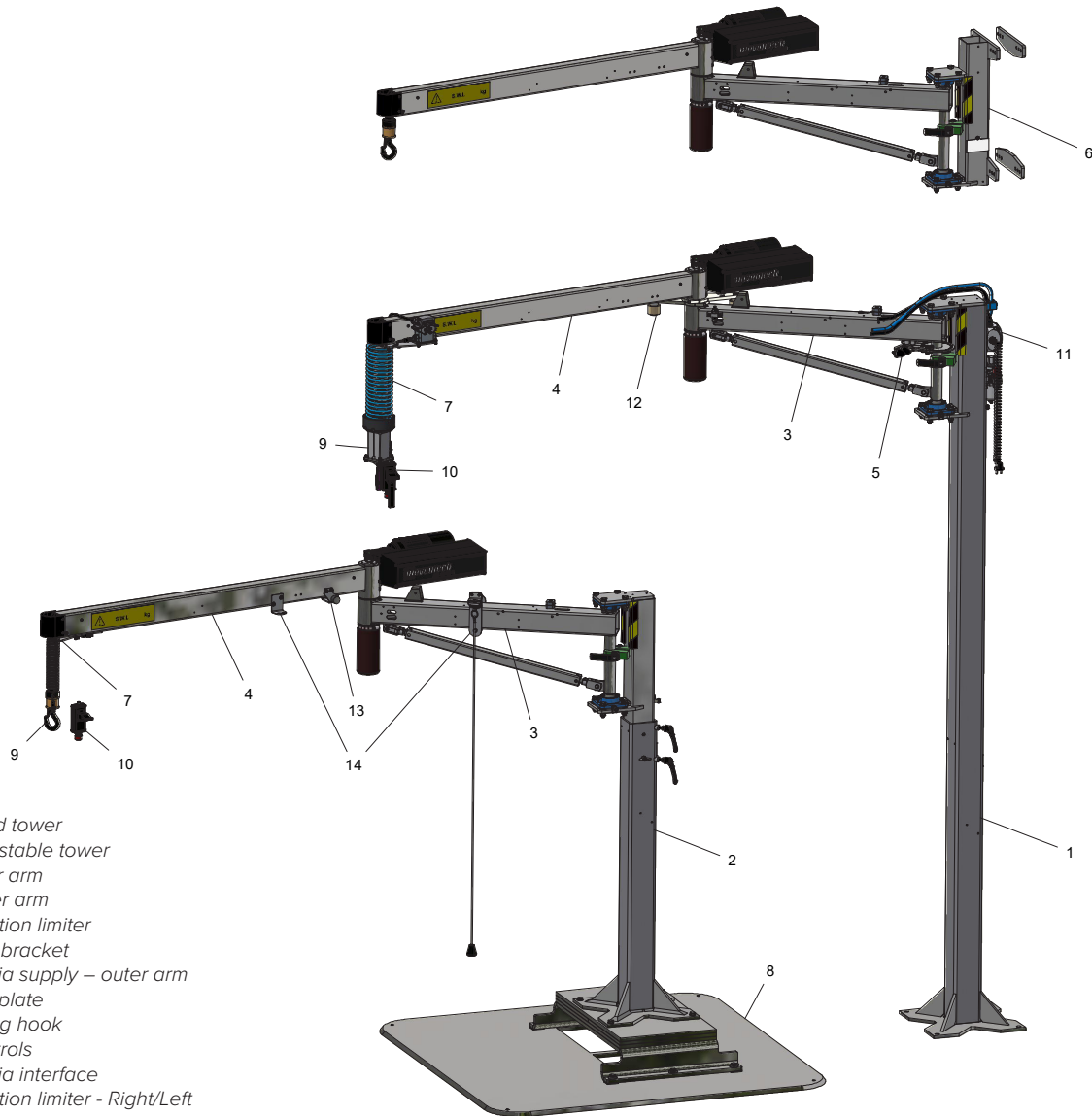
1. Fixed tower
2. Adjustable tower
3. Inner arm
4. Outer arm
5. Rotation limiter
6. Wall bracket
7. Media supply – outer arm
8. Footplate
9. Lifting hook
10. Controls
11. Media interface
12. Rotation limiter - Right/Left
13. Rotation limiter - Full rotation
14. Arm lock

3. Technical Data
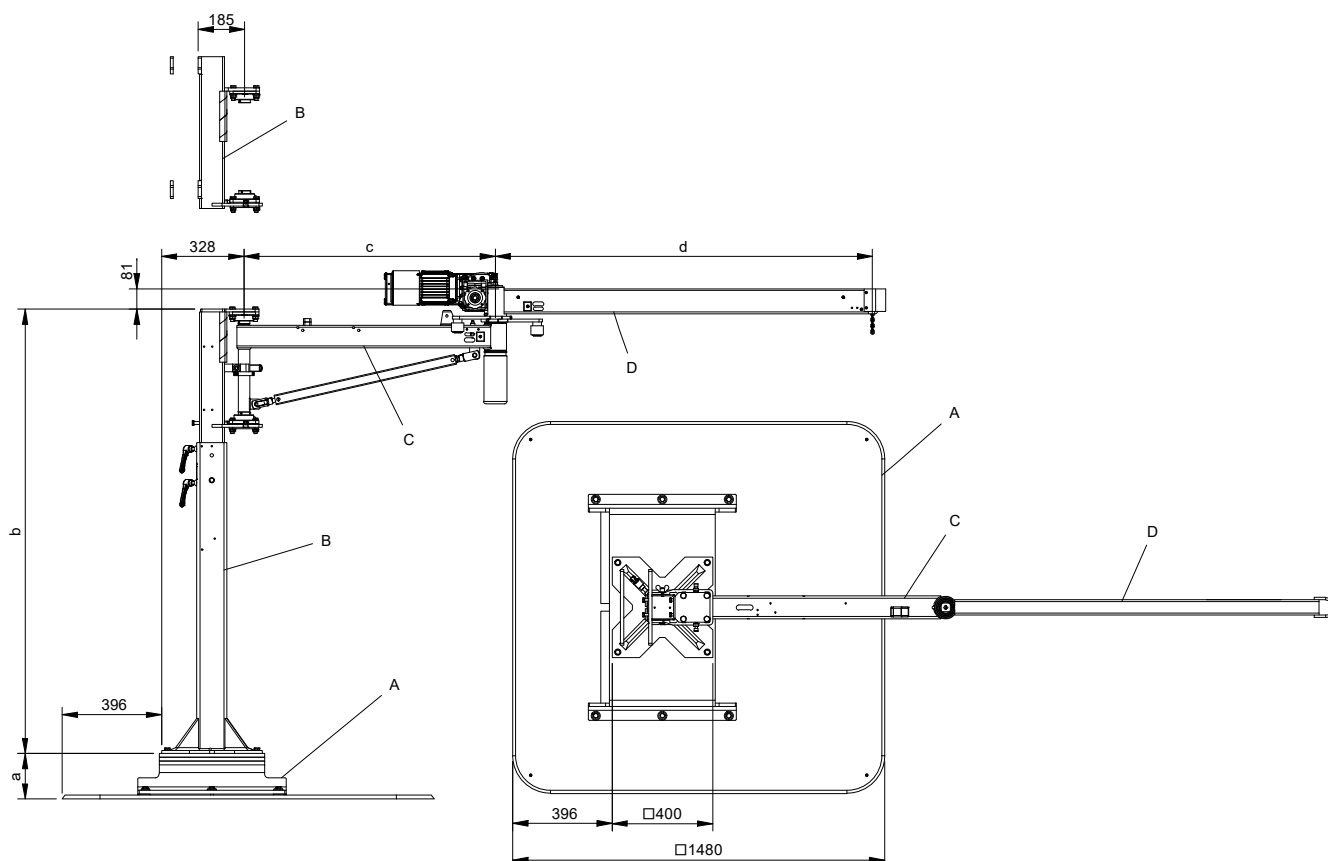
Dimensions & Weights	a [mm]	b [mm]	c [mm]	d [mm]	mass [kg]
A - Mobile footplate 0	136				271
A - Mobile footplate 1	151				309
A - Mobile footplate 2	166				345
A - Mobile footplate 3	181				381
A - Mobile footplate 4	196				418
A - Mobile footplate 5	211				455
A - Mobile footplate 6	226				491
A - Mobile footplate 7	241				528
A - Mobile footplate 8	256				565
A - Mobile footplate 9	271				601
A - Mobile footplate 10	286				637
A - Mobile footplate 11	301				674
A - Mobile footplate 12	316				708
B - Fixed tower		Clearance Height			20+b×0.028
B - Adjustable tower		1768-2728[1]			83
B - Adjustable tower +500		2268-3228[1]			90
B - Wall bracket					24
C - Inner arm 1			1000		24
C - Inner arm 1.5			1500		32
C - Inner arm 2			2000		38
D - Outer arm 1.5				1470	41
D - Outer arm 2				1970	46

General		
Max. crane load (depending on configuration)	[kg]	100
Operating temperature	[° C]	5 - 40
Electrical connection	[V AC]	230
	[A]	10
Pneumatic connection	["]	G 3/8 inside thread

[1] The height of the tower may be adjusted within the stated intervals in increments of 100 mm

4.   Installation

4.1   Preparations

NB! Carefully read chapter "1. Safety" before starting installation of the crane.

Before you install the crane, you must check whether:

•   it will intrude into truck paths or into the working area of any other equipment,

•   there is a risk of physical interference with fixtures and such,

•   there is a risk of getting caught in any item in the surrounding area.

In any such case, measures must be taken to avoid that personnel are hurt or equipment is damaged. The manufacturer is not responsible for where and how the crane is placed at the user's premises.

4.2   Permanently mounted crane

This version is supplied as two parts:

•   tower

•   inner and outer arms

Installing to floor

The crane is mounted in the floor using four expander bolts (part no. 743573 HST3 M16x135). The floor must be of concrete and be of **C20/25** quality, with a minimum thickness of **140 mm**.

Place the tower in position on the floor.

Use the floor plate of the tower as a template to drill four holes, **Ø16 mm** to a depth of **108 mm** (see image).
NB! The minimum distance to the nearest concrete edge must be **125 mm**.

Blow out any dust from the drilled holes with compressed air or such.

Insert an expander bolt through the foot plate into each hole. Tap the bolt in place with a hammer.
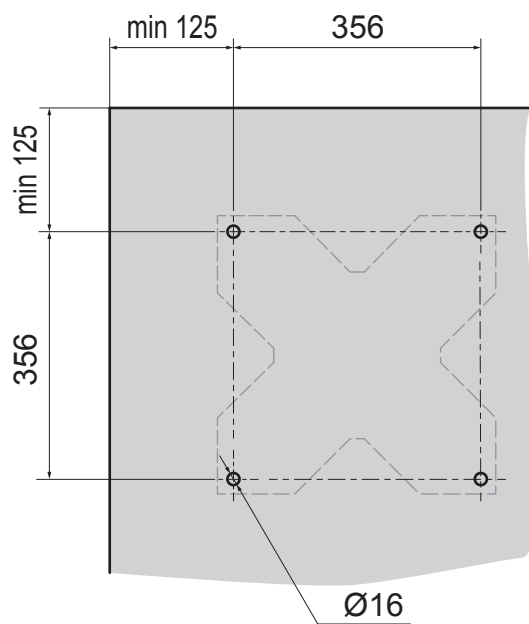**NB**! Tap the rod of the expander bolt, not on the nut!

Tap the expander bolt so far down that the washer and the nut of the expander bolt are touching the foot plate of the tower.
The expander bolt must not touch the bottom of the drilled hole.

Use the included shims to plumb the tower.

Tighten the expander bolts to **110 Nm**.

Fitting the inner arm to the tower

Remove the flange bearings (1) already fitted to the tower. Place these on the inner arm shaft.
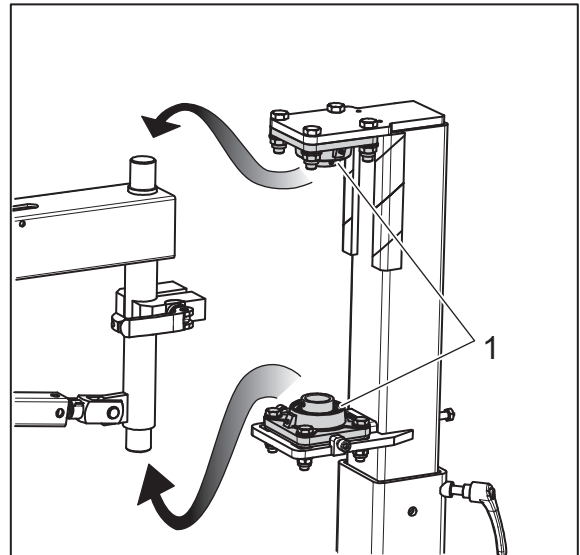
1.   *Flange bearing*

Push the arm and bearings in between the bearing plates (A) on the tower. Insert a spacer (B) between the lower flange bearing and the bearing plate.

Refit screws, washers and nuts (upper bearing M14, lower bearing M12). Fit a spacer under the lower bearing plate before fitting washers and nuts (M12).

From this point on, adjust the crane, go to (insert link to Adjusting the arm).
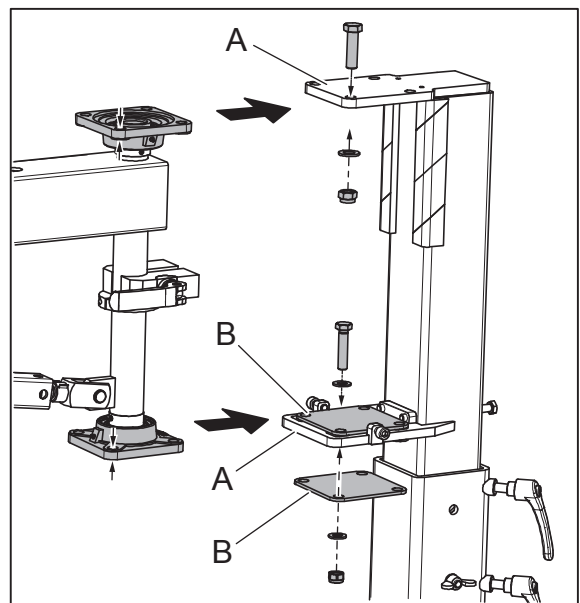
A.   *Bearing plate*
B.   *Spacer*

4.3   Crane with mobile foot plate and adjustable tower

The crane is delivered assembled.

Place the crane in position on the floor.

Adjust the levelling screws at the corners of the mobile foot plate so that these touch the floor and the crane is standing securely.

R: spare part S: wear part
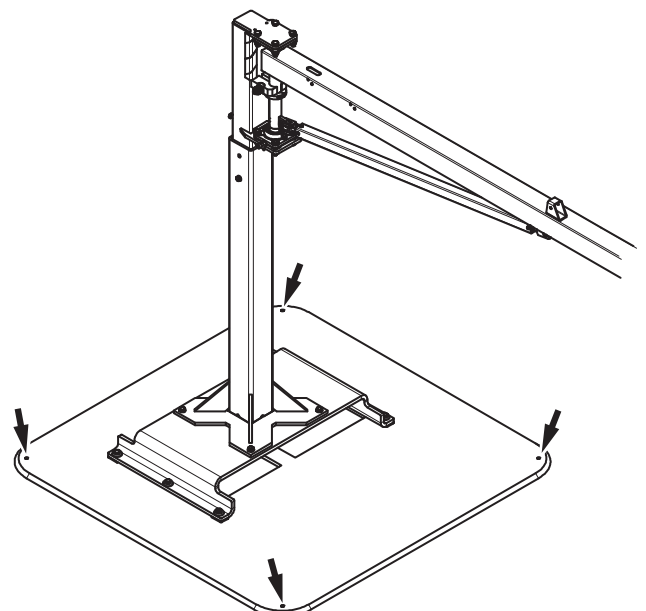
4.4   Crane with mobile foot plate and fixed tower

This version is delivered in 3 parts:

•   mobile foot plate

•   fixed tower

•   inner and outer arms

Assembling the tower to the mobile foot plate

Place the foot plate on the floor and remove the screws (A).

Place the tower on the foot plate, and make sure that the tower and the foot plate are facing as per the illustration. Refit the screws. Tightening torque: **81 Nm.**

Refit the inner arm as shown in "Fitting the inner arm to the tower" on page 9,
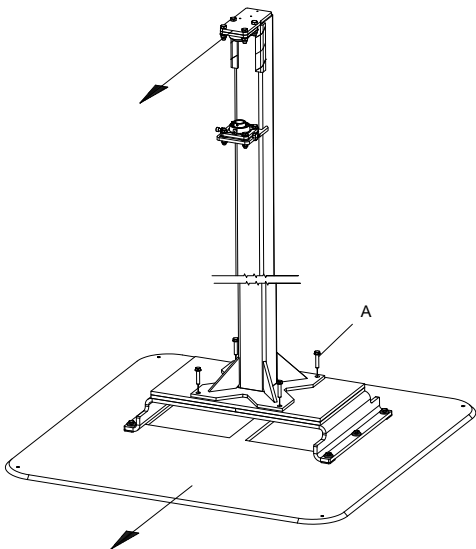
4.5   Wall-mounted crane

The crane is delivered assembled:

For the installation, you will need:

•   16 x Nut M12, grade 8.8

•   4 x 8.8 threaded rod M12
      Length = thickness of wall/pillar + 90mm

Mounting the crane to a wall

Remove the wall bracket (A) from the inner arm (B) by undoing screws (C) holding the flanged bearings.

Mount the wall bracket at a suitable height and use a spirit level to adjust the position.

Tighten the nuts to the wall bracket to **81 Nm**
Secure each nut with an additional nut (K)

Refit the inner arm as shown in "Fitting the inner arm to the tower" on page 9.
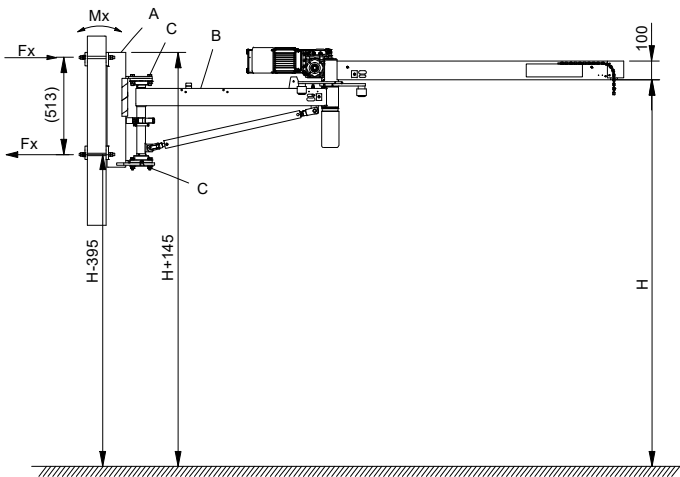
The crane loading on the pillar/wall

Inner and outer arms combined	Max. load (kg)	Tare weight (kg)	M_x (Nm)	F_x (N)
1 + 1.5	100	88	3771	7351
1.5 + 1.5	85	95	4146	8081
1.5 + 2	70	100	4185	8159
2 + 2	55	105	4212	8210

R: spare part S: wear part
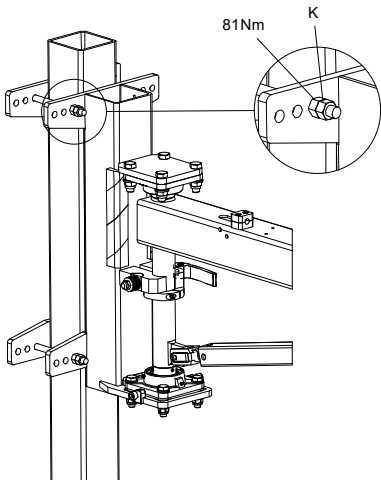
4.6   Adjusting the arm

When the arm is adjusted, the lifting equipment must be attached but no load is to be carried (empty).

Commence by setting the crane height:

Undo the tension screws (1), remove the wing nut (3), and remove the screw.

Lift the upper half of the tower to the desired height.

NB! The upper part of the tower must not be lifted so high that the red marks are visible.

Refit the screw and the wing nut.

Tighten the tension screws.
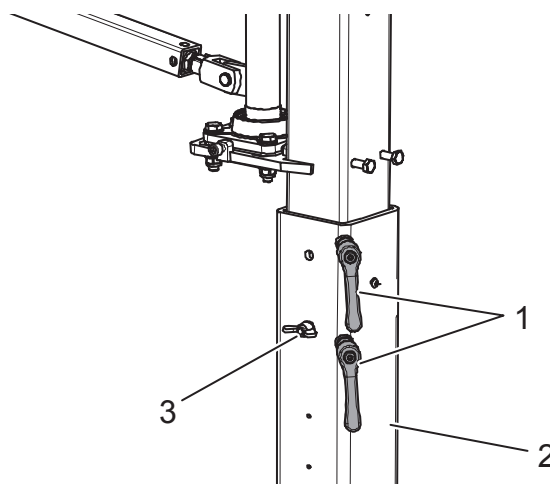
1.   *Tensioning screws*
2.   *Tower*
3.   *Wing nut and screw*

Move the arm (inner and outer sections) to 90° compared to the normal position (B), as per the image.

Place a spirit-level on top of the inner arm. Observe the spirit-level.

Undo the screws holding the lower flange bearing somewhat and adjust sideways using the adjusting screws (see image) until the spirit level shows the same for both positions (B and C).

Turn the arm to position C. Adjust the lower support to the inner arm so that the arm is perfectly level.

Turn the arm to position B. Check that the arm is still perfectly level.

Turn the arm to position A (normal position). Adjust the lower bearing using the adjusting screw for lateral adjustment (see image) to level the inner arm.

Tighten the screws that hold the inner bearing of the inner arm when the arm is correctly adjusted as per above.
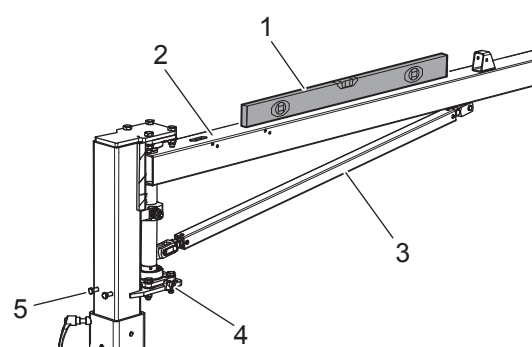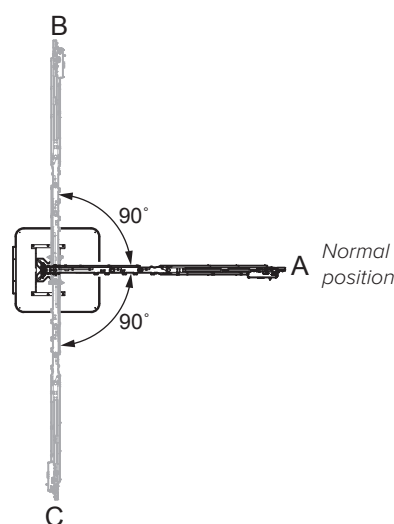
1.   *Spirit level*
2.   *Inner arm*
3.   *Lower support to inner arm*
4.   *Lateral adjusting screw*
5.   *Longitudinal adjusting screw*

R: spare part S: wear part

4.7   Adjusting the inner brake

The inner brake (see image) is adjusted so that the crane jib does not turn.

Set the lock handle of the inner brake in the open position.

Adjust the brake by tightening or releasing the lock nut (see image).

(The parked position of the inner brake (locked position) is described at "Parking position, crane arms" on page 13)
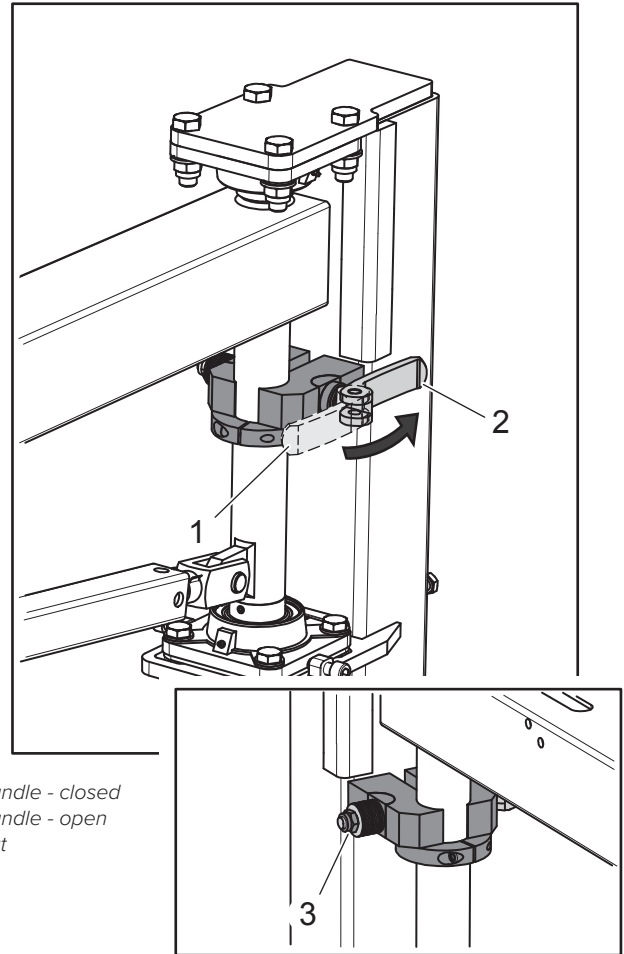
1.   *Lock handle - closed*
2.   *Lock handle - open*
3.   *Lock nut*

4.8   Adjusting the rotation limiter

Both parts of the rotation limiter are fitted to the shaft in the joint between the inner and the outer jib.

Set the rotation limiter by undoing the screws.

Set the rotation limiter in the desired position, and tighten the screws.

(The outer jib may be locked in the parked position (locked), see "Parking position, crane arms" on page 13)
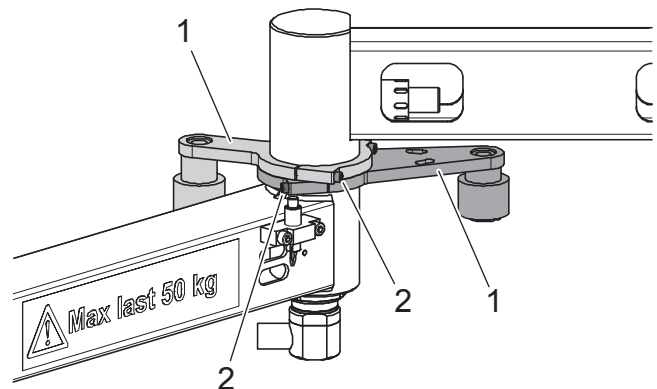
1.   *Rotation limiter*
2.   *Screw*

R: spare part S: wear part

5. Operating the crane

NB! Before any kind of work is performed on or with the MobiChain, the chapter "Safety" must have been carefully read.

A complete work station that includes a MobiChain, must have a specific description of the work to be performed which considers all the points indicated below:

• the configuration
• the design and the function of the attached lifting equipment
• the characteristics and any variation in the lifted objects
• the work environment
• the selected working pace and work frequency.

5.1 The crane

Moving a crane mounted on the footplate

When moving a crane mounted on the mobile footplate, the crane arm must be placed in the parked position (see below) before performing the move. This will prevent the arm from moving about uncontrollably during the move.

The crane is moved by using a hand pallet truck. The forks of the truck are inserted between the foot plate and the raised section where the tower is mounted.
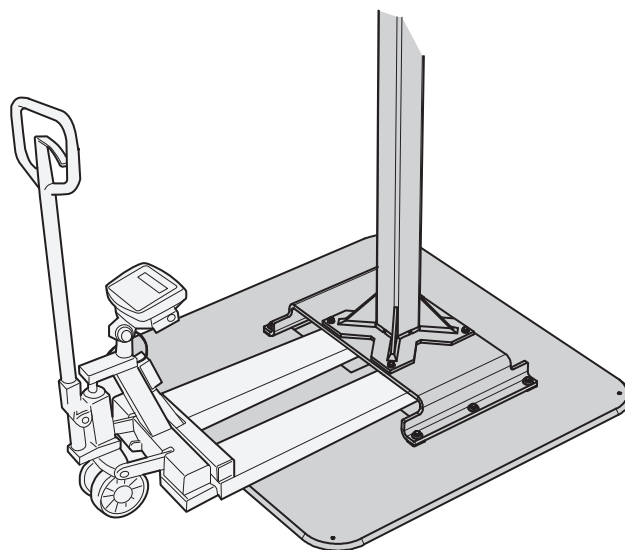
Parking position, crane arms

Locking the inner arm

The inner arm is locked in position by moving the eccentric tensioner of the inner brake into the locked position.

Unlocked
(Normal position during operations)
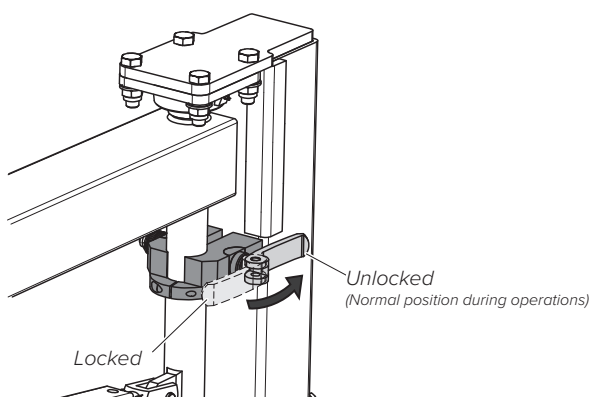
Locked

Locking the outer arm - Right/Left

The outer jib is locket against the inner jib by turning the outer jib so that the rotation limiter with its two oblong holes are in such a position that the spring-loaded lock pin on the inner jib can be pushed in to the outer hole of the rotation limiter.

Rotation limiter

Lock pin

R: spare part S: wear part

Arm lock
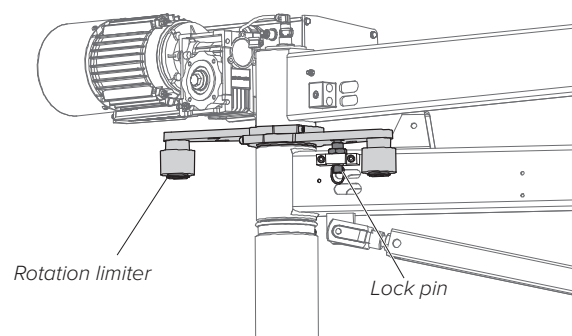
Knob

Locking the outer arm - Full rotation

The outer arm may be locked up against the inner arm.
Pull down on the knob to release the catch, and fold the outer arm against the inner arm.
Release the spring loaded knob to lock the outer arm in position.
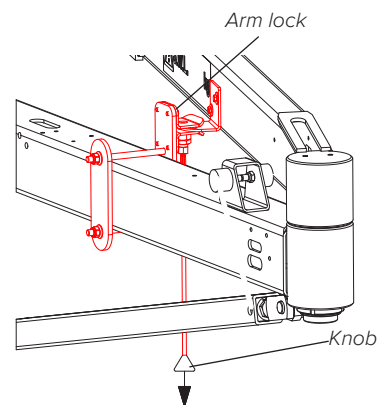
Operating the hook and emergency stop

S.W.L   kg

Lifting movement

Jib

Up

Up   Down

Down

Emergency stop

P

Programming (option)

Start (2 buttons)

Emergency stop

R: spare part S: wear part
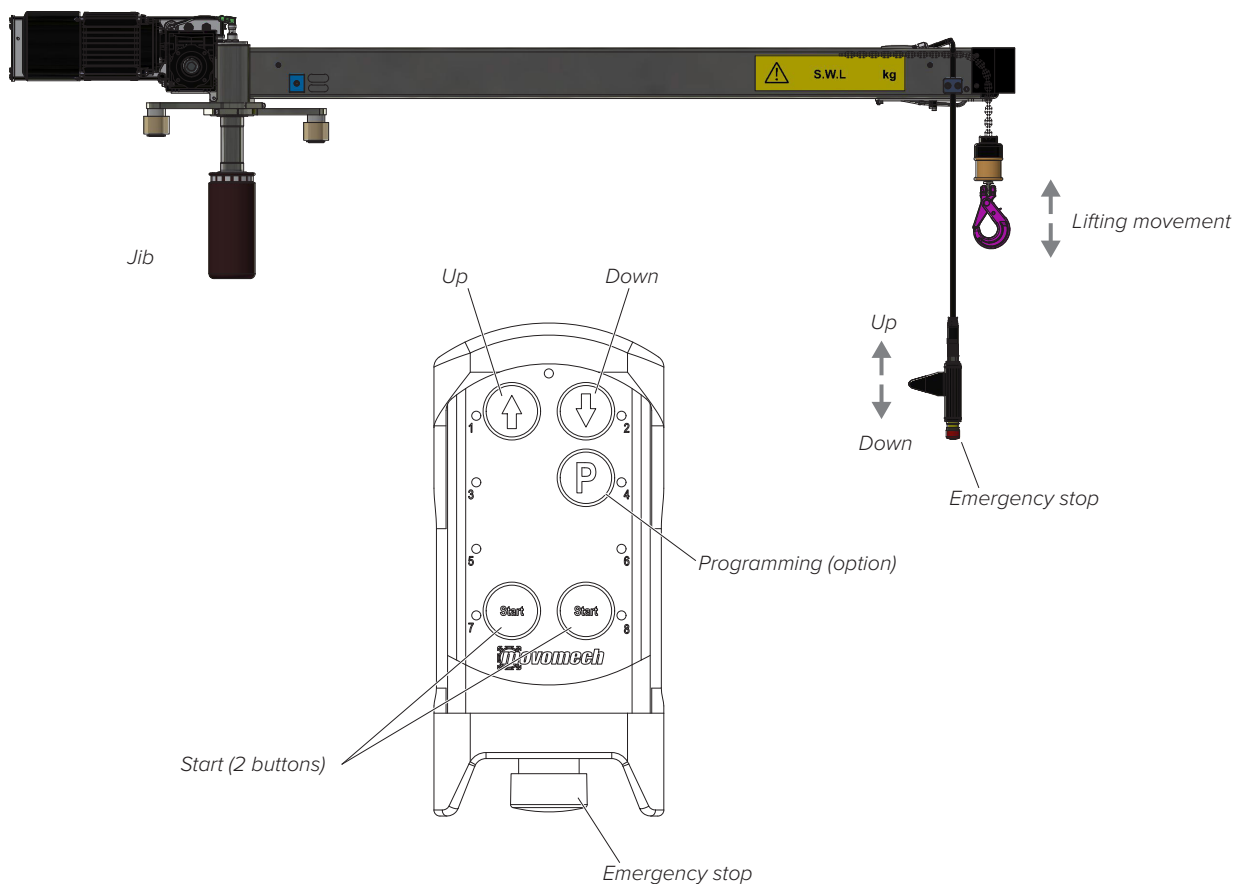
6. Service, maintenance & care

General checks and function tests are performed regularly when commissioned.

A record must be kept of all service and maintenance. The user must ensure that all the required items for the jobs are available.

NB! In order to avoid any injury to personnel or damage to equipment, make sure to immediately replace any component that is damaged.

Keep the equipment and the area surrounding it and the work area properly cleaned. This will promote well-being and promotes all service and maintenance.
Uncleanliness is a clear indication that the equipment is not handled in the required manner, which in turn may affect any remaining warranty on the equipment.

Safety instructions when performing maintenance

The instructions concerning adjustment, maintenance and inspection measures and their intervals, including instructions for replacing parts / components must be observed! These activities may be performed by skilled personnel only.

Mechanical, electrical and pneumatic repair and maintenance work as well as renovation work may only be carried out by personnel with the necessary skills and competences.

Unauthorized persons must be prohibited from working with machinery and equipment in the facility.

For all repairs and maintenance work, disconnect, switch off and secure against accidental or unauthorized use.

Ensure that:
*   moving parts have come to a stand-still, and
*   moving parts cannot accidentally start moving during the performance of the work.

Use safe and environmentally friendly operating and maintenance products as well as replacement parts!

Instructions for work with the equipment in operation

The user or the "authorized person" employed by him must, for each particular case, check that the specified work, because of special local conditions, can be carried out without risk of personal injury.

To avoid accidents during maintenance, adjustment and repair work, only permitted and appropriate lifting tools and aids may be used.

Do not touch any rotating parts, and maintain sufficient safety distances to these so that clothing, body parts or hair can not get caught.

Avoid open flames, extreme heat (e.g. welding), and do not create any sparks when handling detergents or near combustible or heat sensitive parts (e.g. wood, plastic components, lubricants and electrical equipment)
- negligence may lead to a risk of fire, harmful gases or damage to insulation materials.

Instructions for working with electrical equipment

Only use original fuses with the prescribed current! In the event of a fault in the electrical supply, switch off the system immediately!

Defective fuses must not be repaired or bypassed and must only be replaced with fuses of the same type.

Work on electrical equipment and electrical components or parts must only be carried out by electricians or trained personnel in accordance with applicable electrical safety regulations.

The parts of the equipment on which inspection, maintenance and repair work is to be carried out must, when so directed, be disconnected from the power supply. The disconnected parts must first be checked for voltage supply.

The electrical equipment of the plant must be inspected/checked on a regular basis. Defects, such as loose connections, must be rectified immediately.

In cases where it is necessary to work on live parts, a second operator must be called in to operate the emergency stop or switch off the main switch in an emergency. Cordon off the work area with a red/white chain or belt and warning signs. Use only voltage-insulated tools!

Before separating or connecting electrical connectors, disconnect them from the power supply (excluding wall outlets, provided that they are not hazardous to touch according to the safety regulations).

Keep the equipment and the area surrounding it and the work area properly cleaned.

6.1   Components

C-C

A

B
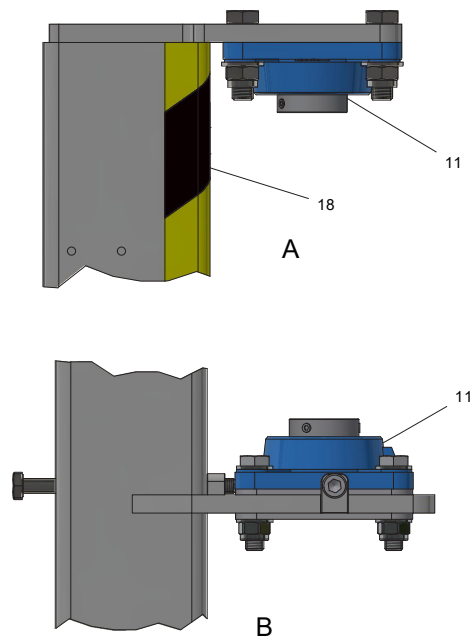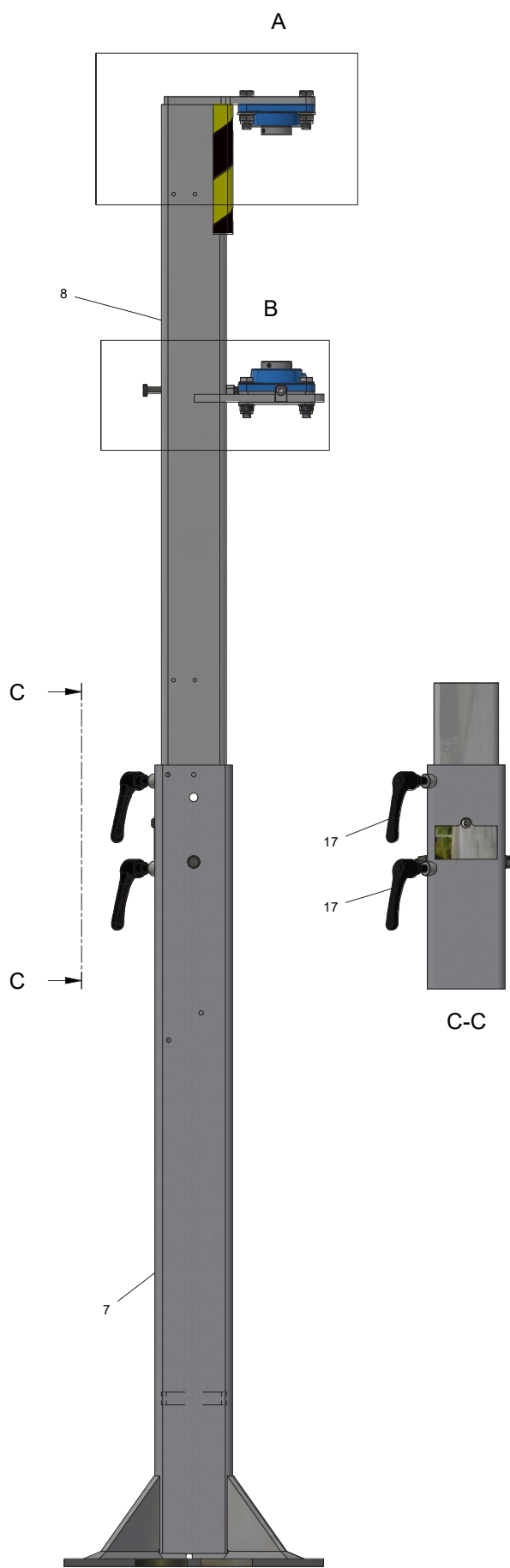
	743254	Adjustable tower +500		
#	Article nr.	Designation		Quantity
7	743200	Lower tower-weld		1
8	743202	Upper tower +500 -weld		1
11	743263	Bearing unit Ø35	S	2
17	743269	Adjustable hand lever M12x40	R	2
18	743417	Edge protection 30x30x10	S	2

R: spare part S: wear part

A

8

B

C

C

17

17

C-C

A

18

11

11

B
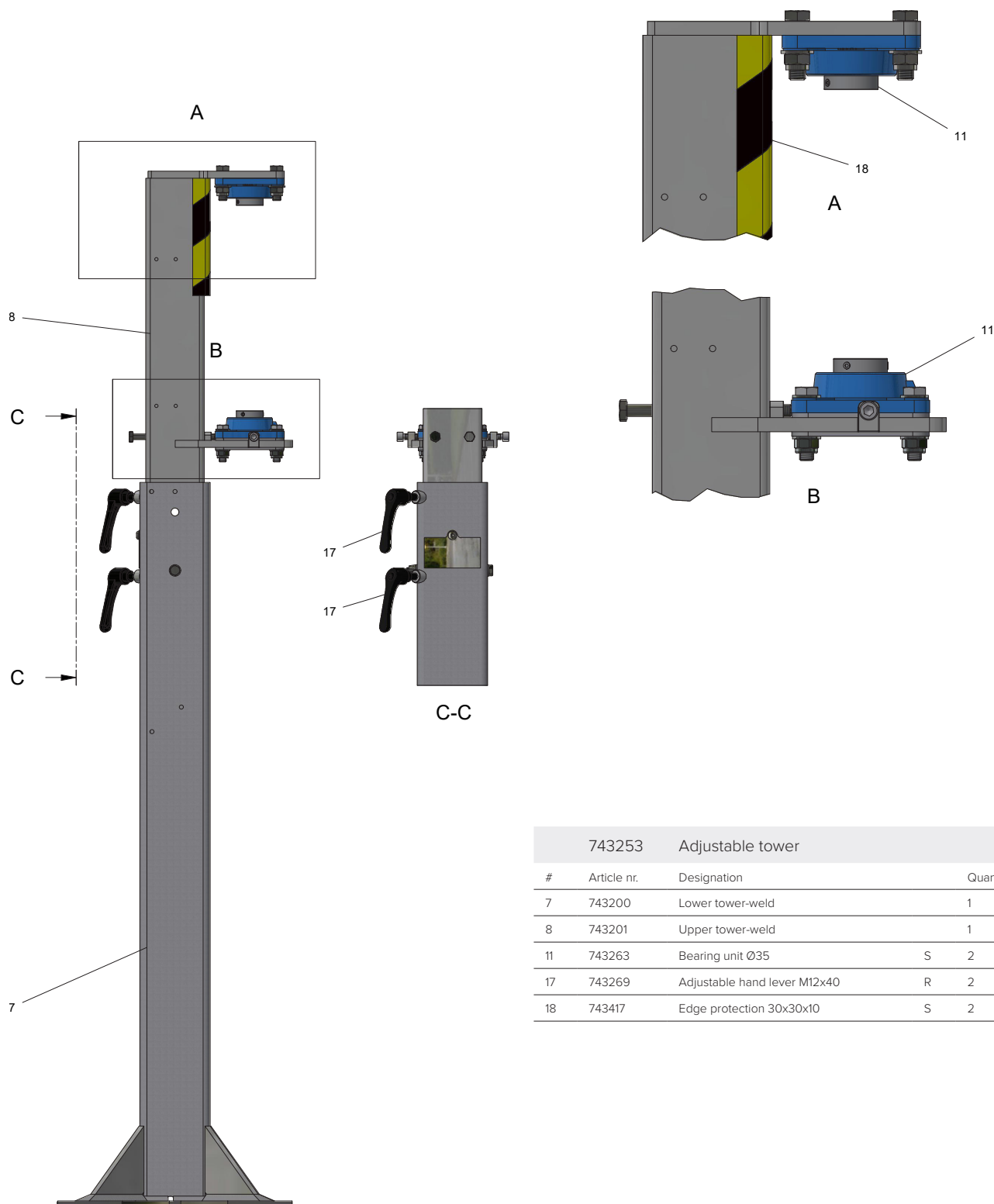
	743253	Adjustable tower		
#	Article nr.	Designation		Quantity
7	743200	Lower tower-weld		1
8	743201	Upper tower-weld		1
11	743263	Bearing unit Ø35	S	2
17	743269	Adjustable hand lever M12x40	R	2
18	743417	Edge protection 30x30x10	S	2

R: spare part S: wear part

A

B

C-C

C

C

14

A

9

13

A

9

B
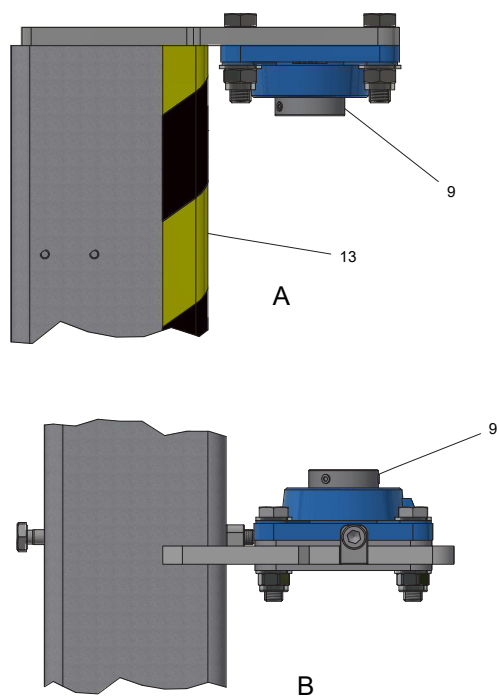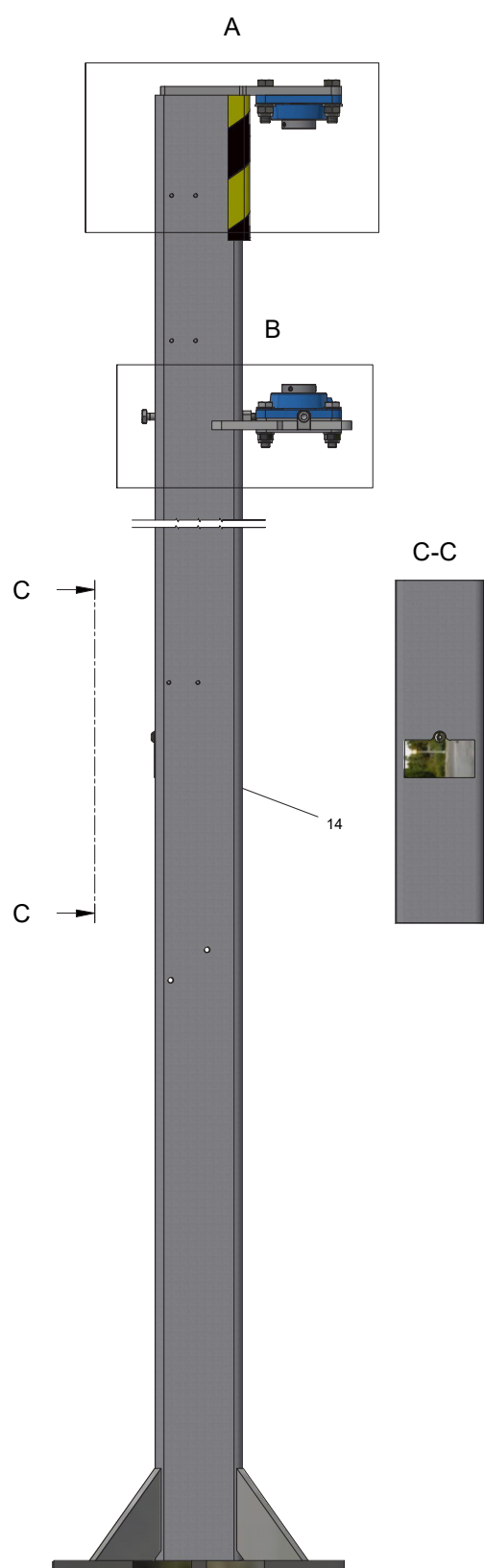
	743953	Tower, fixed height		
#	Article nr.	Designation		Quantity
9	743263	Bearing unit Ø35	S	2
13	743417	Edge protection 30x30x10	S	2
14	743954	Tower, fixed height-weld		1

R: spare part S: wear part
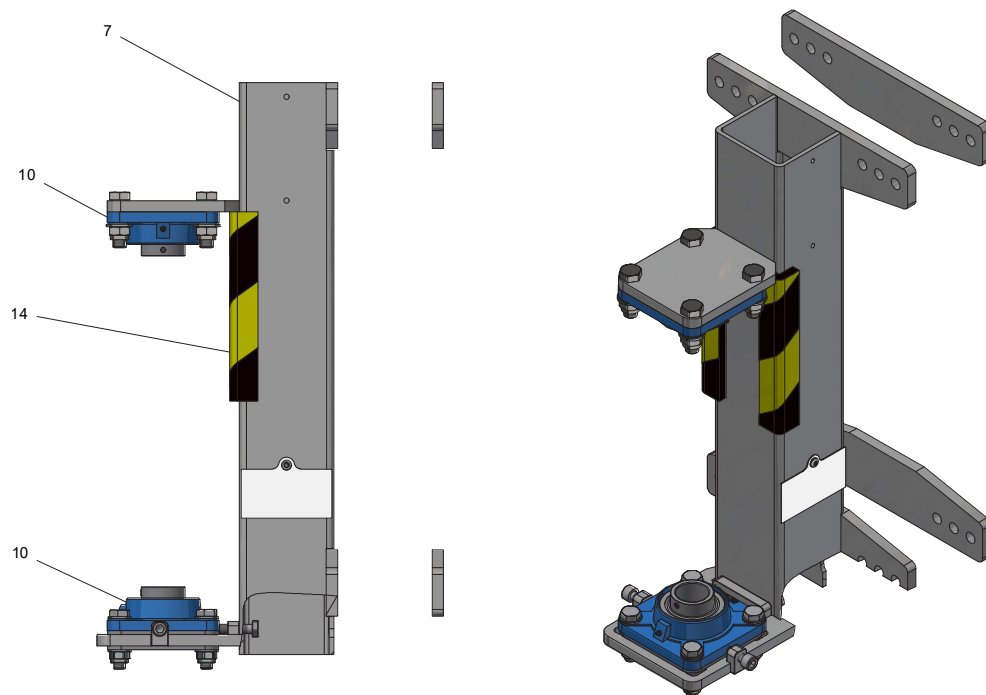
743255		Wall mounting		
#	Article nr.	Designation		Quantity
7	743203	Wall mounting-weld		1
10	743263	Bearing unit Ø35	S	2
14	743417	Edge protection 30x30x10	S	2

R: spare part S: wear part
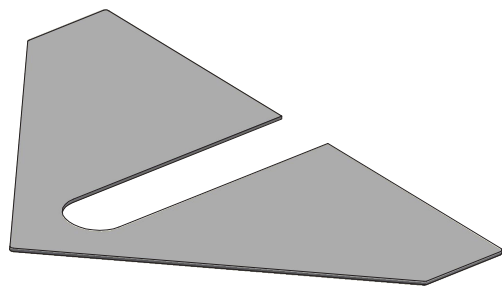
Shim washer

#	Article nr.	Designation	Quantity
1	743506	Shim washer	1
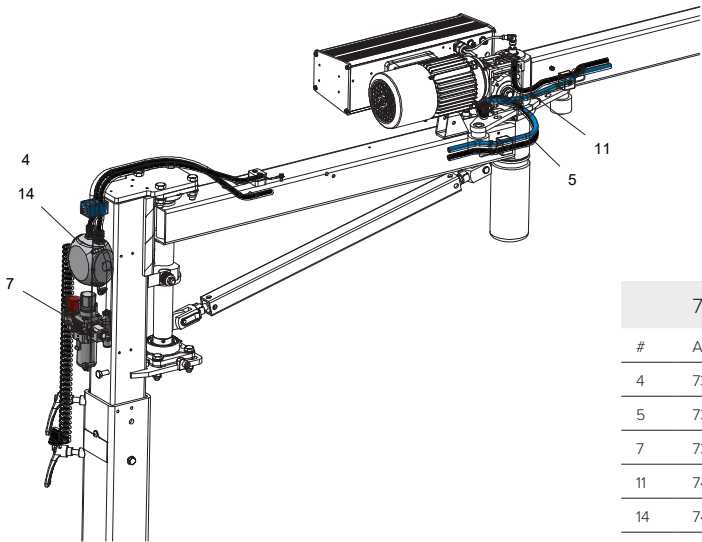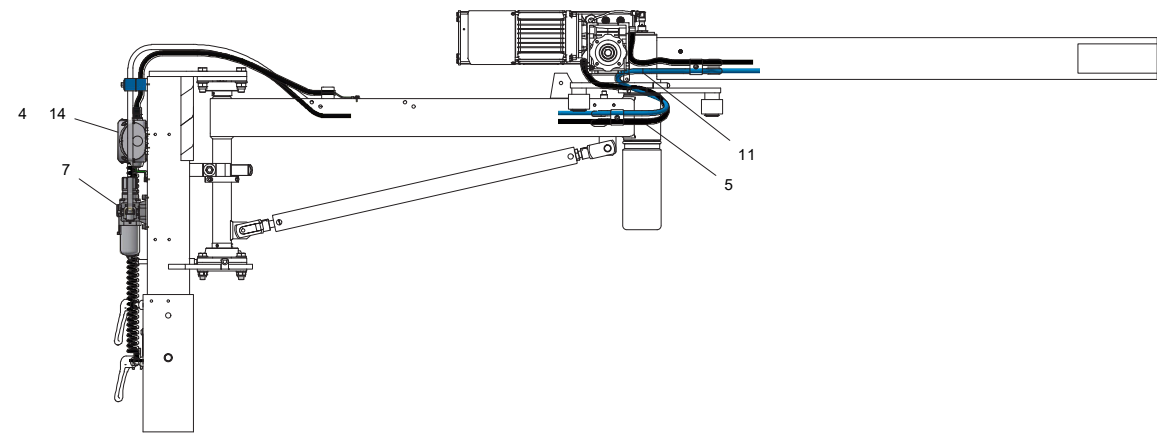
	744924	Electric-pneumatic connection		
#	Article nr.	Designation		Quantity
4	730958	Cable protection hose		2
5	730958_	Cable protection hose	R	1
7	735349	FRL unit (A)		1
11	743104	Hose Ø12x8	R	1
14	743934	Connection box, Mobiarm		1

R: spare part S: wear part
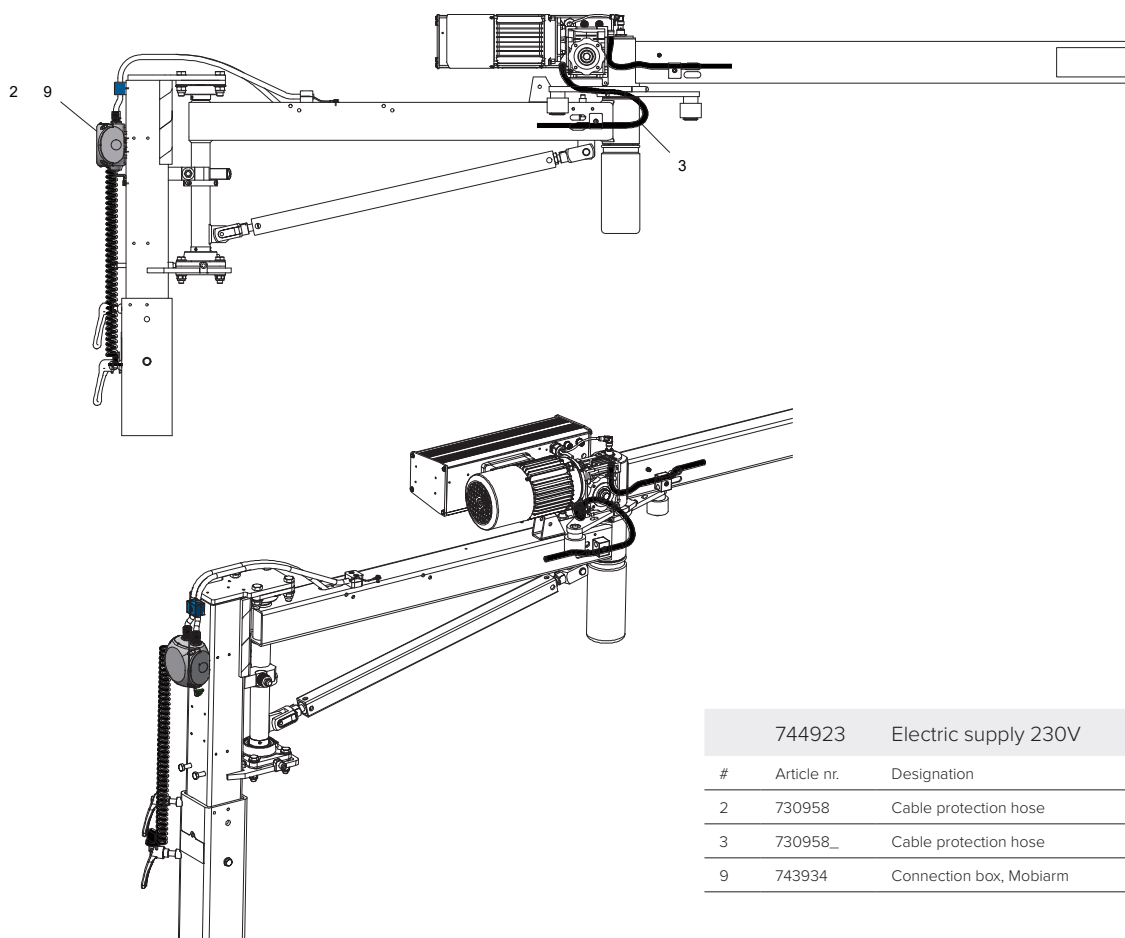
	744923	Electric supply 230V	
#	Article nr.	Designation	Quantity
2	730958	Cable protection hose	2
3	730958_	Cable protection hose	1
9	743934	Connection box, Mobiarm	1
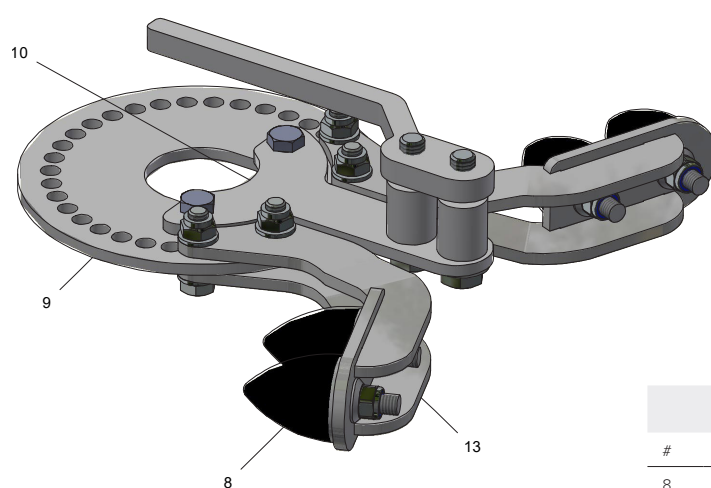
	743974	Rotation limiter	
#	Article nr.	Designation	Quantity
8	743150	Rubber bumper	4
9	743979	Indexing plate	1
10	743980	Bracket	1
13	743985	Limiter arm	2
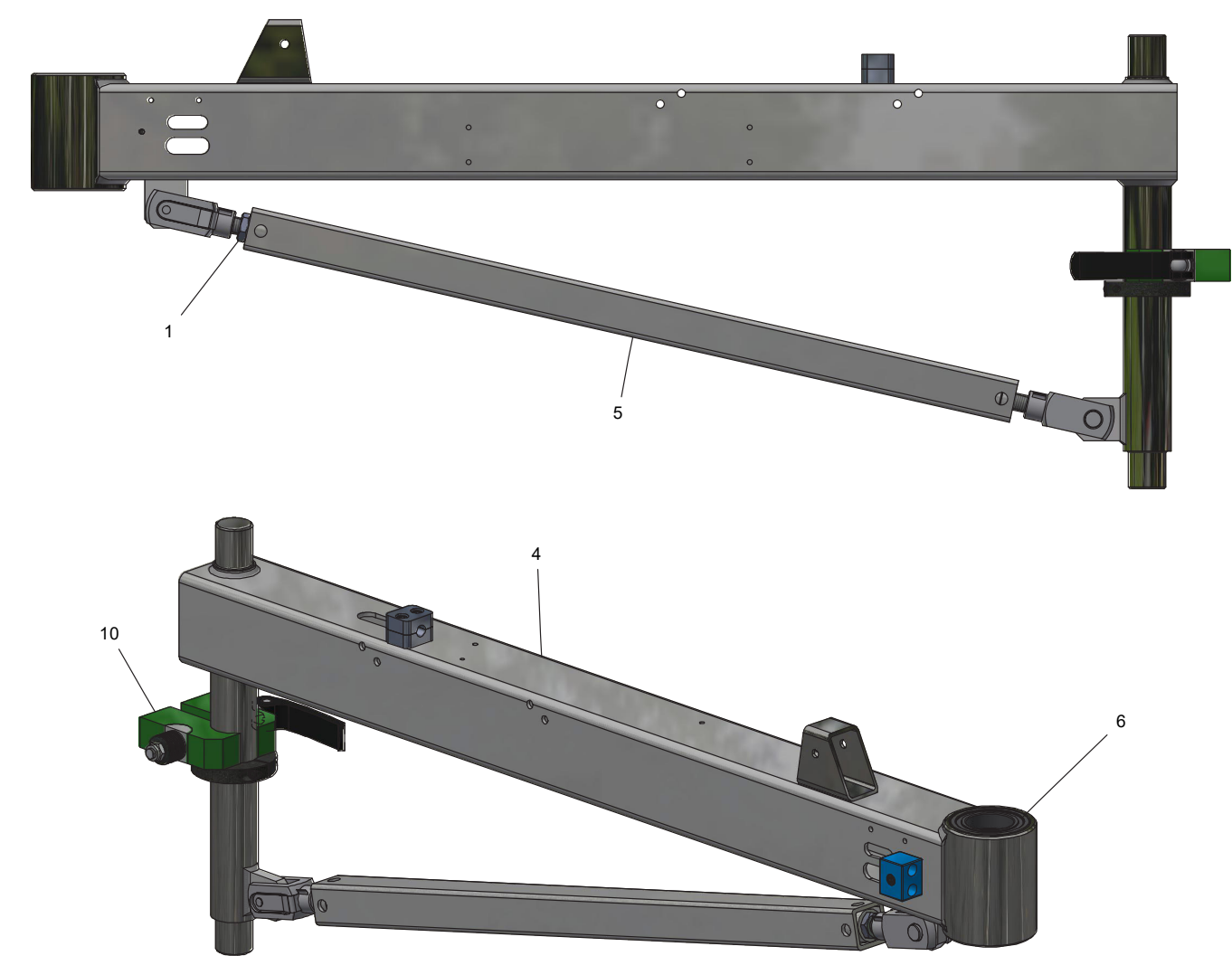
	744926	Inner arm, 1m		
#	Article nr.	Designation		Quantity
1	730237	Nut ML6M M16		1
4	743204	Inner arm 1m,-weld		1
5	743207	Support rod 1m		1
6	743270	Ball bearing	S	2
10	743460	Inner brake	->	1

	744927	Inner arm, 1,5m		
#	Article nr.	Designation		Quantity
1	730237	Nut ML6M M16		1
4	743205	Inner arm 1,5m-weld		1
5	743208	Support rod 1,5-2m		1
6	743270	Ball bearing	S	2
10	743460	Inner brake	->	1

	744928	Inner arm, 2m		
#	Article nr.	Designation		Quantity
1	730237	Nut ML6M M16		1
4	743206	Inner arm 2m-weld		1
5	743208	Support rod 1,5-2m		1
6	743270	Ball bearing	S	2
10	743460	Inner brake	->	1

R: spare part S: wear part
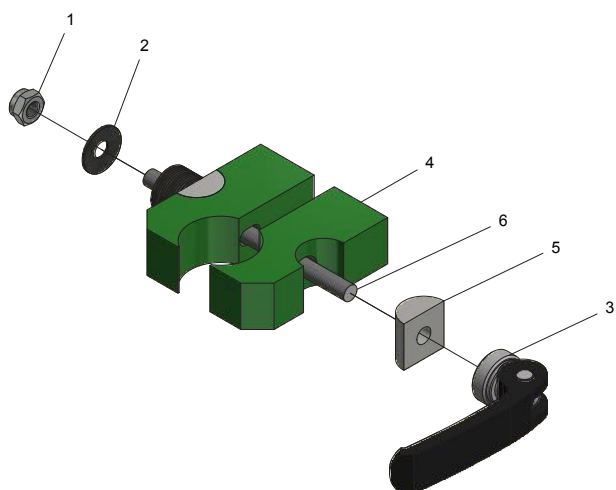
	743460	Inner brake		
#	Article nr.	Designation		Quantity
1	730904	Locking nut M10		1
2	743279	Disc spring Ø28x10,2x1,5		12
3	743416	Cam clamping lever M10	R	1
4	743461	Brake pad	S	2
5	743462	Pressure washer		2
6	731793	Threaded bar M10		1

R: spare part S: wear part

A-A
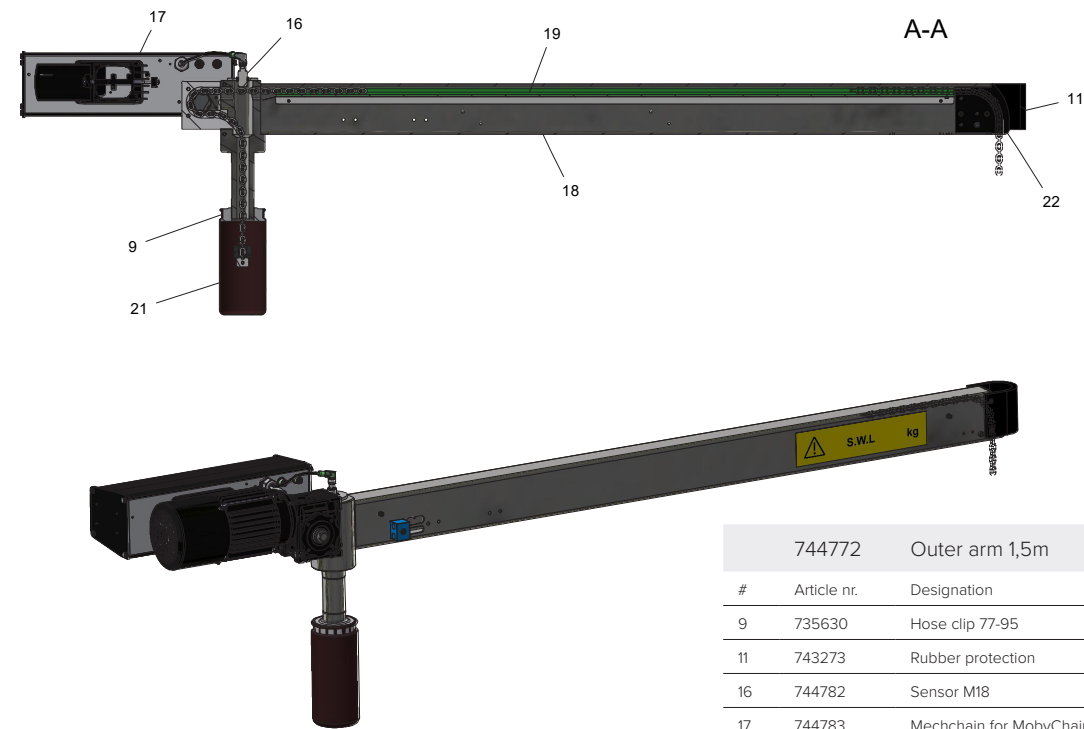
	744772	Outer arm 1,5m		
#	Article nr.	Designation		Quantity
9	735630	Hose clip 77-95		1
11	743273	Rubber protection	R	1
16	744782	Sensor M18	R	1
17	744783	Mechchain for MobyChain		1
18	744784	Outer arm 1,5m,-weld		1
19	744786	Glidstrip	S	1
21	744790	Chain bag		1
22	744791	Chain guide, front	S	1

A-A
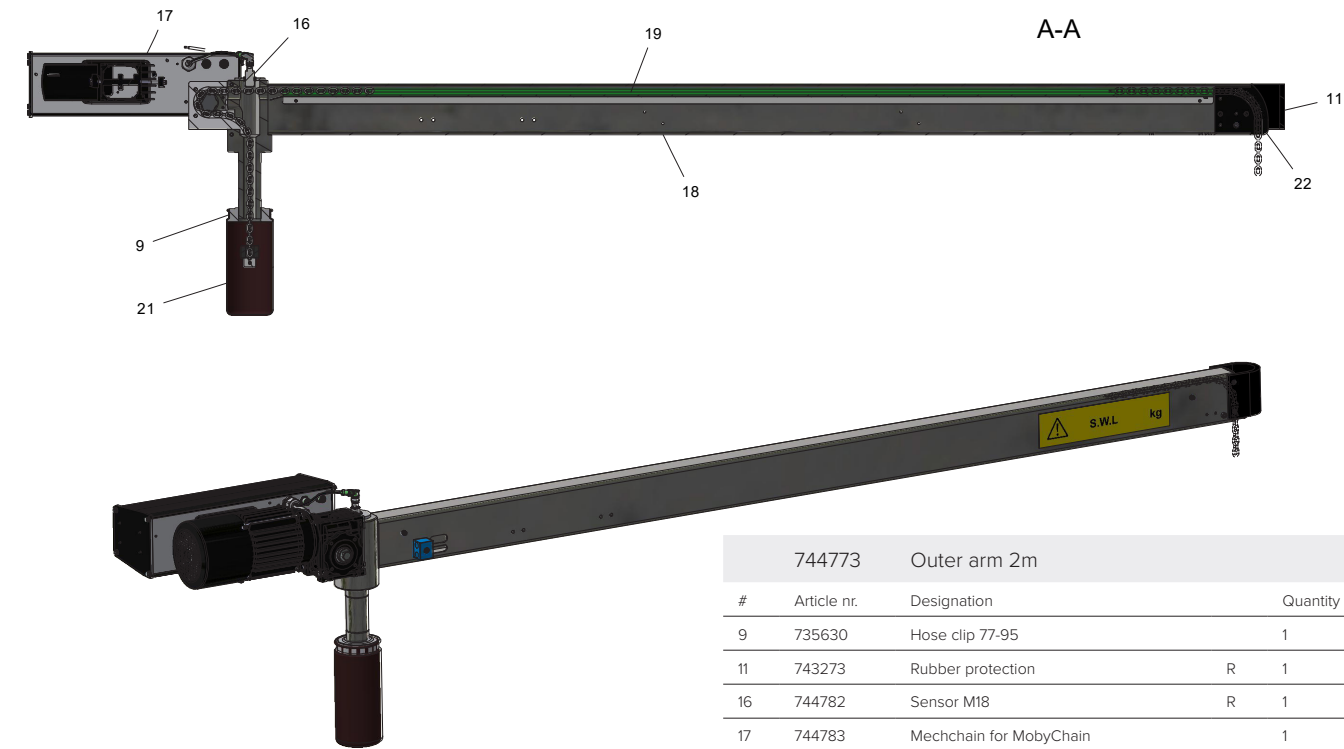
	744773	Outer arm 2m		
#	Article nr.	Designation		Quantity
9	735630	Hose clip 77-95		1
11	743273	Rubber protection	R	1
16	744782	Sensor M18	R	1
17	744783	Mechchain for MobyChain		1
18	744785	Outer arm 1,5m,-weld		1
19	744787	Glide strip	S	1
21	744790	Chain bag		1
22	744791	Chain guide, front	S	1

R: spare part S: wear part
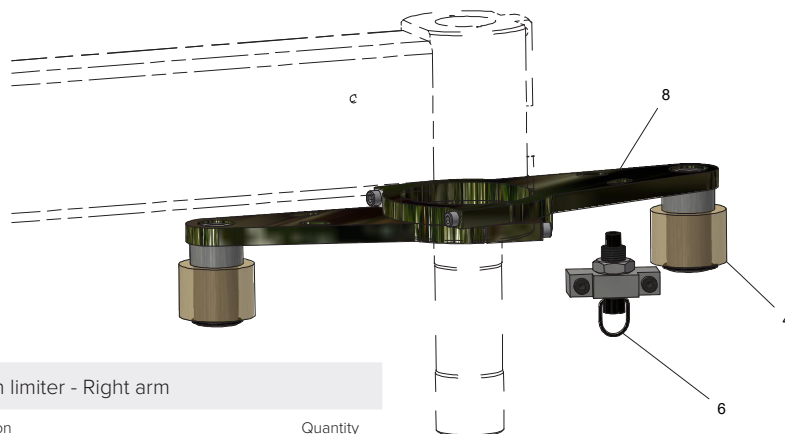
744959		Rotation limiter - Right arm		
#	Article nr.	Designation		Quantity
4	738975	Rubber damper 50/30x36	R	2
6	743278	Indexing plunger	R	1
8	743473	Rotation limiter 2		2
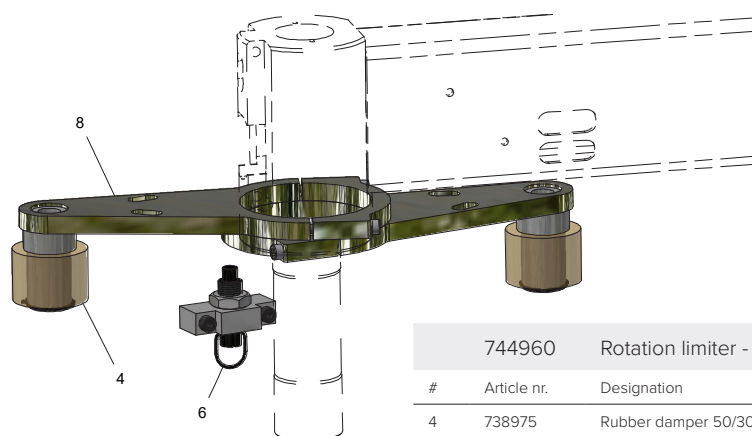
744960		Rotation limiter - Left arm		
#	Article nr.	Designation		Quantity
4	738975	Rubber damper 50/30x36	R	2
6	743278	Indexing plunger	R	1
8	743473	Rotation limiter 2		2
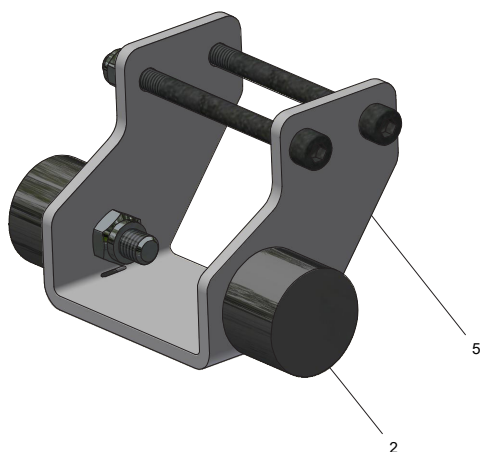
744961		Rotation limiter - Full rotation		
#	Article nr.	Designation		Quantity
2	730449	Rubber damper	R	2
5	744962	Damper bracket		1
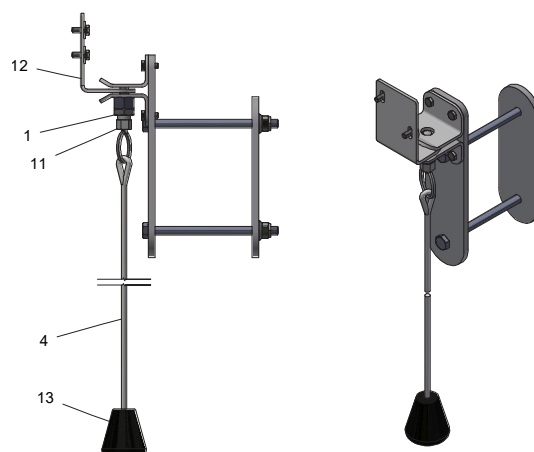
744963		Arm lock		
#	Article nr.	Designation		Quantity
1	730222	Thin nut M12		1
4	731609	Strain strap D=5		1
11	743958	Index bolt		1
12	744981	Arm bracket		1
13	6070049	Conical knob		1

R: spare part S: wear part
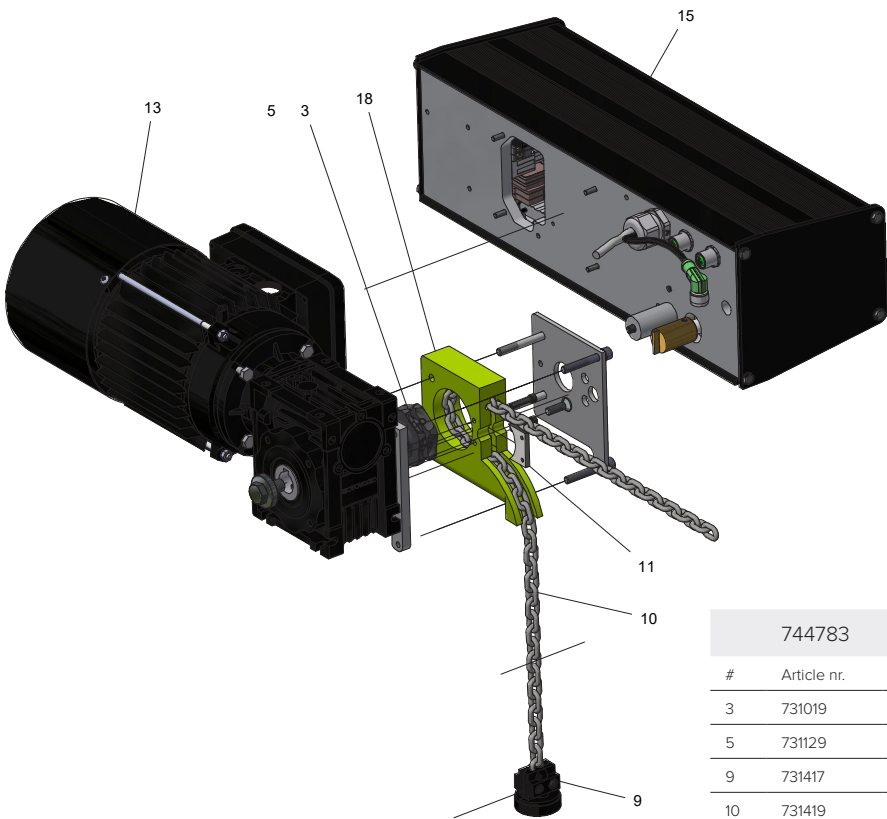
	744783	Mechchain for MobiChain		
#	Article nr.	Designation		Quantity
3	731019	Chain sprocket	S	1
5	731129	Flat key 6x6-70		1
9	731417	End stop with damper		1
10	731419	Lifting chain Ø4x12	S	1
11	731428	Guiding for chain sprocket		1
13	742909	Worm gear motor 0.37 kW		1
15	744795	Electrical cabinet	-> 6.5	1
18	744798	Chain guide, rear	S	1
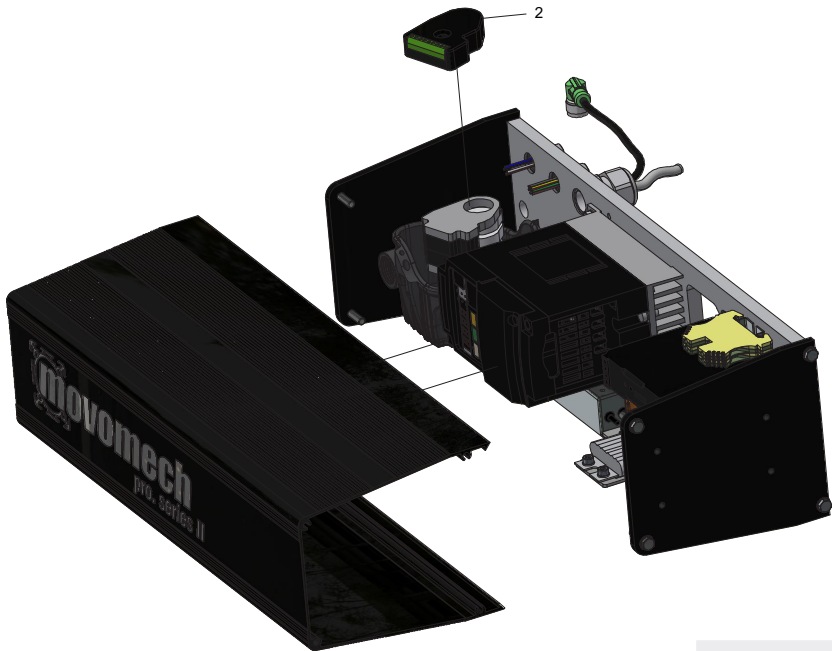
	Encoder kit		
#	Article nr.	Designation	Quantity
2	744920	Encoder kit for positioning	1

R: spare part S: wear part
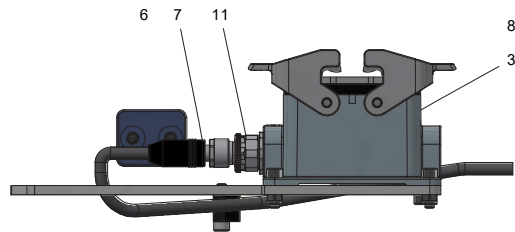
	744774	Interface - Hanging manouver		
#	Article nr.	Designation		Quantity
3	731968	Housing		1
6	740937	Cable, M12, 8 conductors, 2.0 m	R	1
7	741678	Cable, M12, 8 conductors, 0.6 m	R	1
8	742932	Insert female 10 POL + PE	R	1
11	743546	Male panel mount connector		1
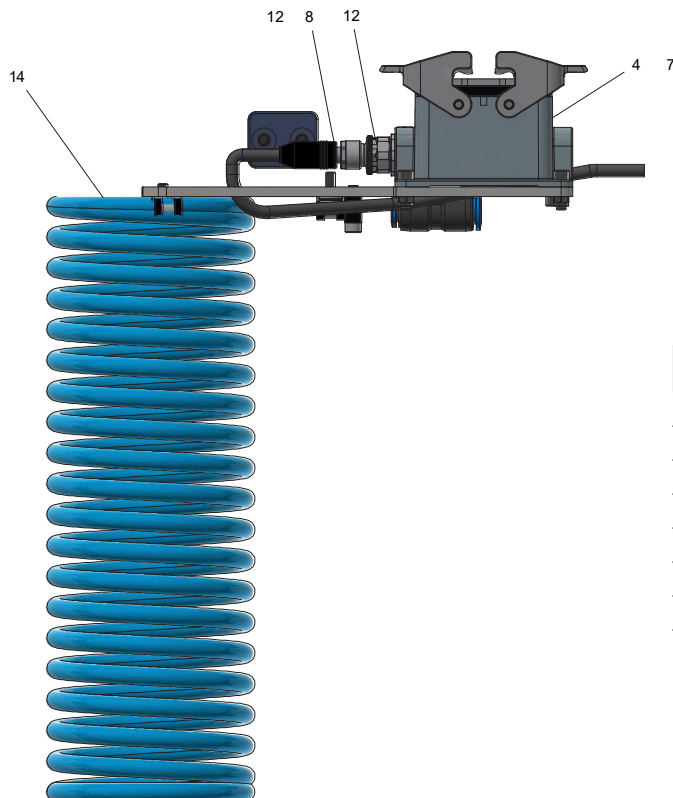
	744775	Interface -Hanging manouver + Ø12 Pneu		
#	Article nr.	Designation		Quantity
4	731968	Housing		1
7	740937	Cable, M12, 8 conductors, 2.0 m	R	1
8	741678	Cable, M12, 8 conductors, 0.6 m	R	1
9	742932	Insert female 10 POL + PE		1
12	743546	Male panel mount connector	R	1
14	744491	Spiral hose	R	1
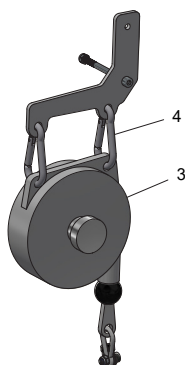
	745095	Balancer for cable		
#	Article nr.	Designation		Quantity
3	731723	Balance hoist 0.4-1 kg	R	1
4	732845	Spring hook, Dt=5, L=50	S	2
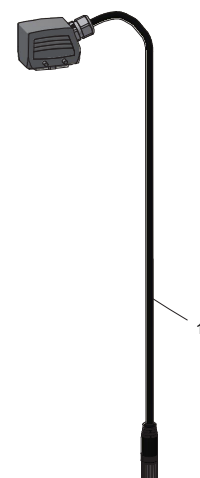
		Cable for hanging manouver		
#	Article nr.	Designation		Quantity
1	742955	Control unit cable 2,5m	R	1

R: spare part S: wear part
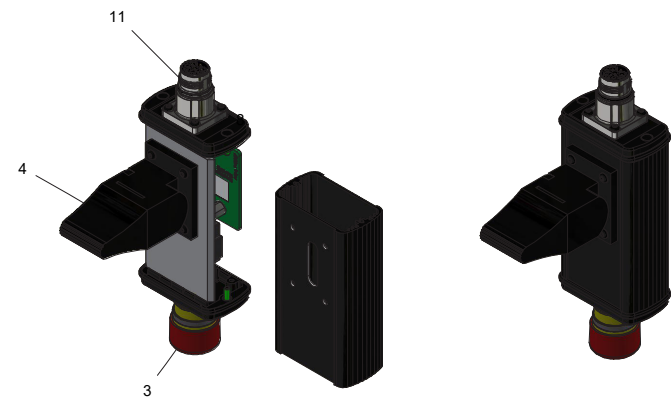
742195		Control unit with emergency stop		
#	Article nr.	Designation		Quantity
3	731740	Emergency stop assembly	R	1
4	732307	Joystick JC100	R	1
11	742945	Flange plug M17 8 pol male		1
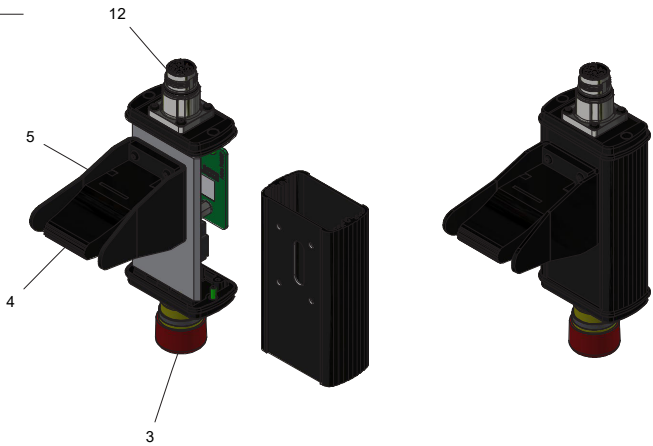
742196		Control unit with protection + emergency stop		
#	Article nr.	Designation		Quantity
3	731740	Emergency stop assembly	R	1
4	732307	Joystick JC100	R	1
5	742182	Protection plate		1
12	742945	Flange plug M17 8 pol male		1
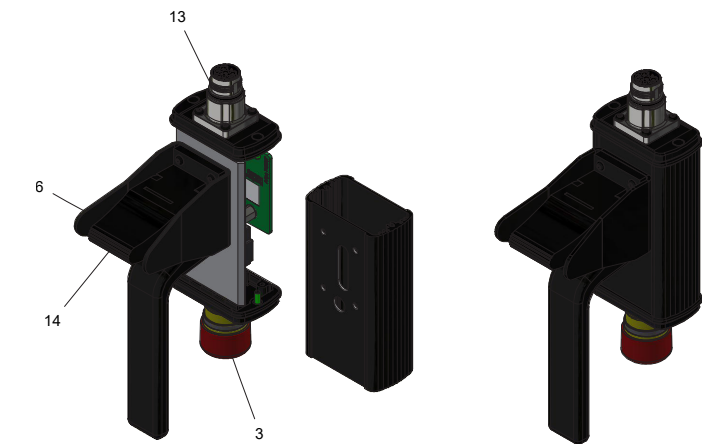
742197		Control unit with protection + em. stop + handle		
#	Article nr.	Designation		Quantity
3	731740	Emergency stop assembly	R	1
6	742182	Protection plate		1
13	742945	Flange plug M17 8 pol male		1
14	742946	Joystick JC100, worked	R	1

R: spare part S: wear part
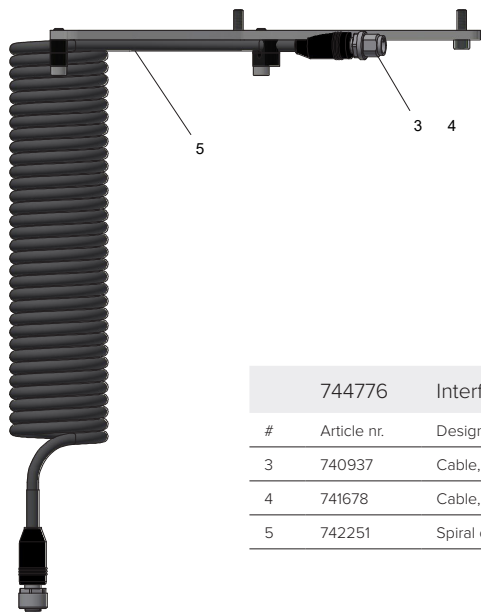
744776		Interface -Spiral cabel		
#	Article nr.	Designation		Quantity
3	740937	Cable, M12, 8 conductors, 0.6 m	R	1
4	741678	Cable, M12, 8 conductors, 2.0 m	R	1
5	742251	Spiral cable	R	1
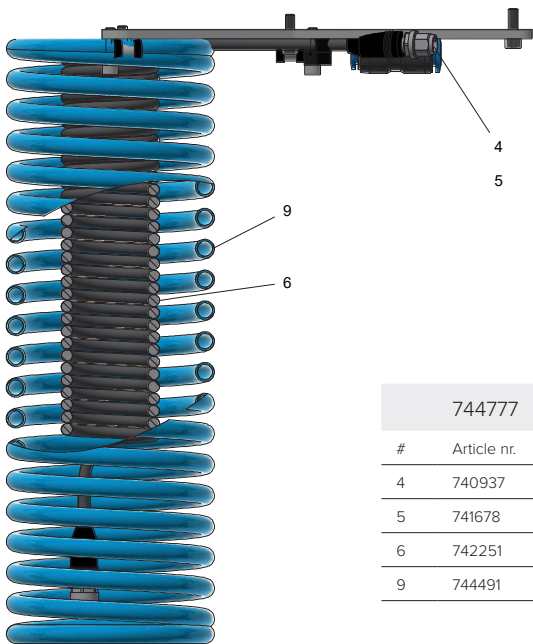
744777	Interface -Spiral cabel + Ø12 Pneu	
#	Article nr.	Designation	Quantity
4	740937	Cable, M12, 8 conductors, 2.0 m	1
5	741678	Cable, M12, 8 conductors, 0.6 m	1
6	742251	Spiral cable	1
9	744491	Spiral hose	1

R: spare part S: wear part
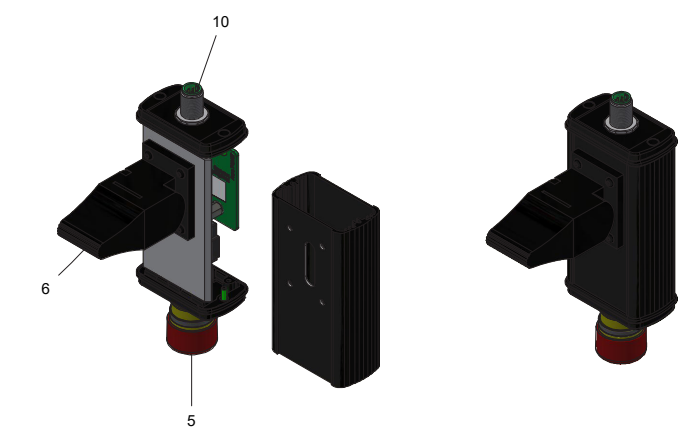
742192		Control unit with emergency stop		
#	Article nr.	Designation		Quantity
5	731740	Emergency stop assembly	R	1
6	732307	Joystick JC100	R	1
10	740827	Flange plug M12 4 pol male		1

742194		Control unit 2w protection + emergency stop		
#	Article nr.	Designation		Quantity
5	731740	Emergency stop assembly	R	1
6	732307	Joystick JC100	R	1
9	742182	Protection plate		1
11	740827	Flange plug M12 4 pol male		1
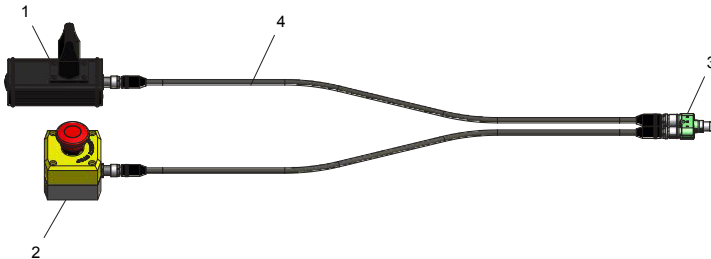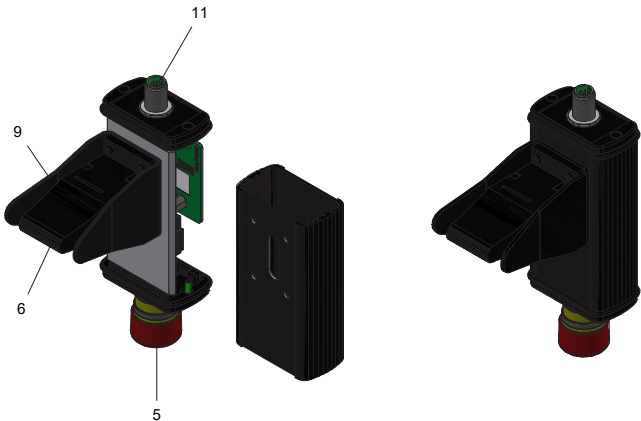
742240		Control unit external emergency stop		
#	Article nr.	Designation		Quantity
1	742191	Control unit		1
2	740457	Emergency stop, complete	R	1
3	740509	Y split 8 pol		1
4	740937	Cable, M12, 8 conductors, 0.6 m		2
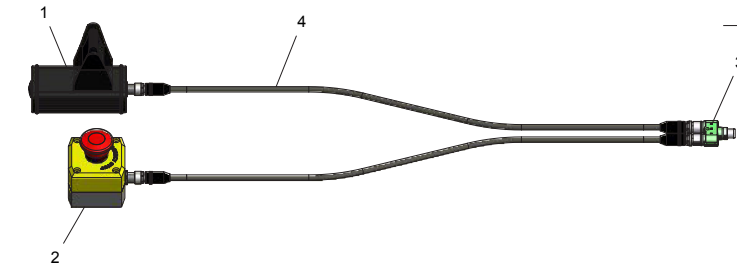
742241		Control unit with protection + ext. emergency stop		
#	Article nr.	Designation		Quantity
1	742193	Control unit with protection		1
2	740457	Emergency stop, complete	R	1
3	740509	Y split 8 pol		1
4	740937	Cable, M12, 8 conductors, 0.6 m		2

R: spare part S: wear part
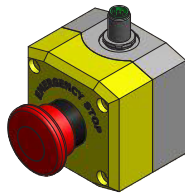
740457	Emergency stop, complete
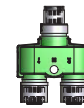
740509	Y split 8 pol
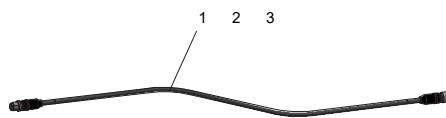
	Spiral-manöver-dok	Cables for spiralcable		
#	Article nr.	Designation		Quantity
1	740937	Cable, M12, 8 conductors, 0.6 m	R	1
2	741586	Cable, M12, 8 conductors, 1,0 m	R	1
3	741678	Cable, M12, 8 conductors, 2,0 m	R	1

	742191	Control unit 2d		
#	Article nr.	Designation		Quantity
5	732307	Joystick JC100	R	1
9	740827	Flange plug M12 4 pol male		1
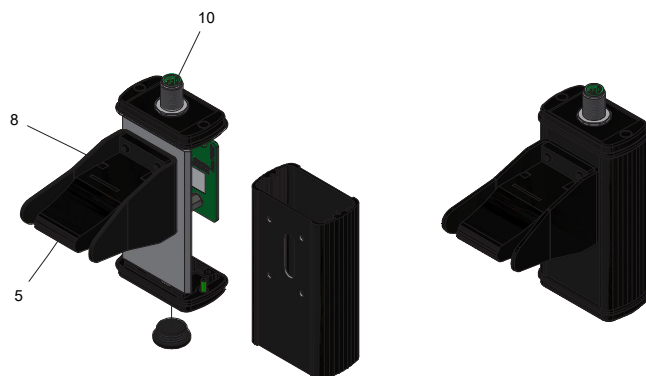
	742193	Control unit with protection		
#	Article nr.	Designation		Quantity
1	742185	Joystick box		1
2	742184	Counterplate		1
3	742248	Gable M16x1.5		2
4	732307	Joystick JC100	R	1
5	742238	Blind plug M16		1
6	731522	Screw K6S M3x12 black		3
7	742265	Screw K6S M3x16 black		1
8	742182	Protection plate		1
9	742257	PCB		1
10	740827	Flange plug M12 4 pol male		1

R: spare part S: wear part

4
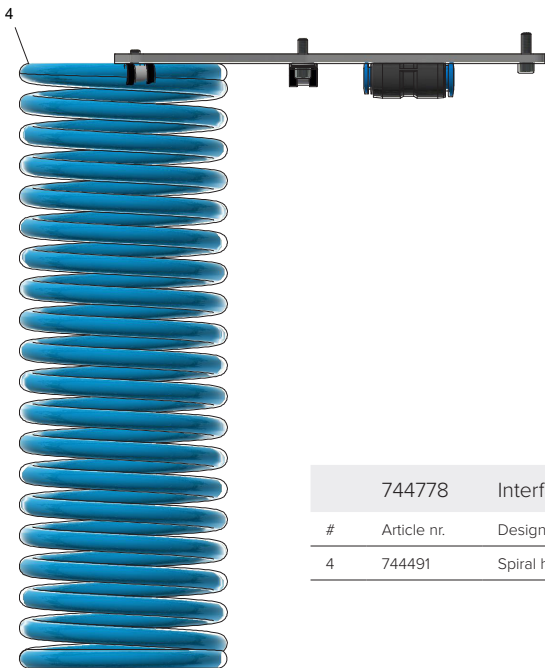
744778	Interface -Ø12 Pneu		
#	Article nr.	Designation	Quantity
4	744491	Spiral hose	R 1

1
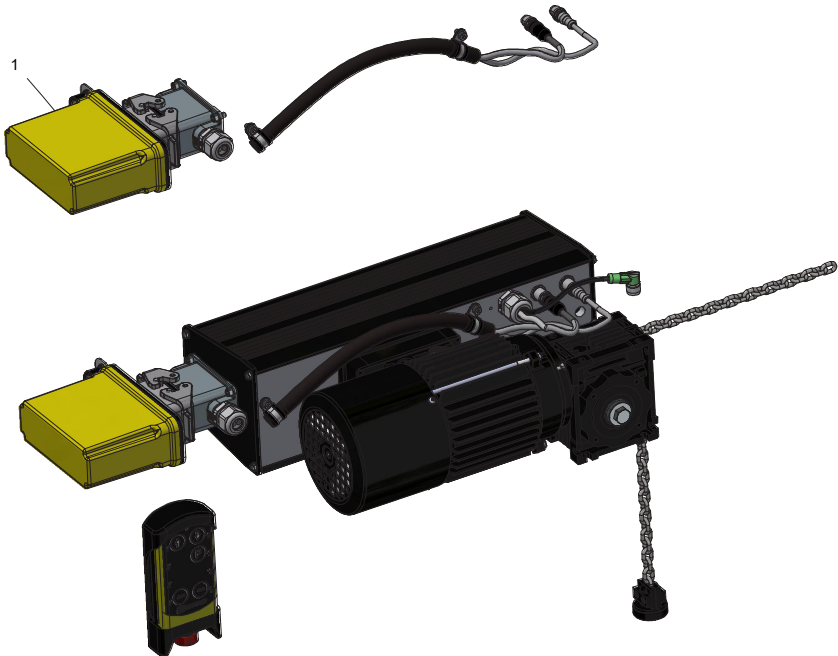
Radio control			
#	Article nr.	Designation	Quantity
1	744781	Radio control, Mobichain	1
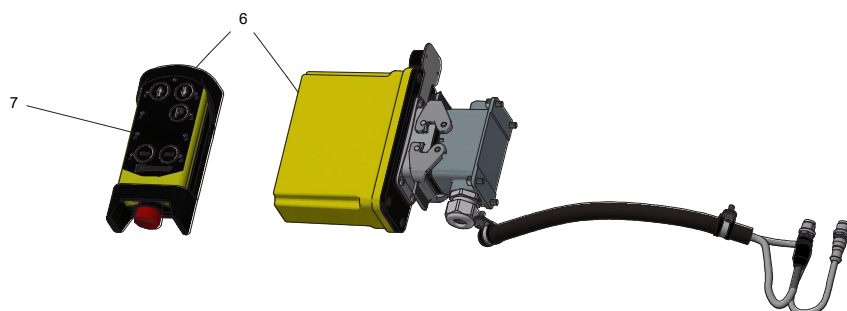
744781		Radio control, Mobichain	
#	Article nr.	Designation	Quantity
6	743023	Radio control system	1
7	743026	Decal for transmitter "Movomech"	1
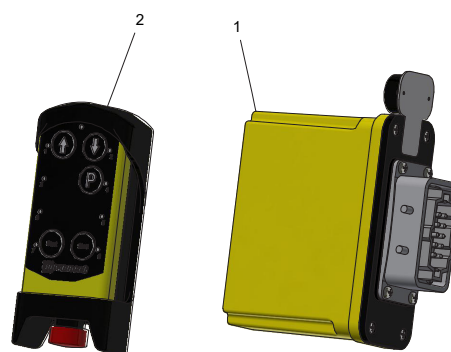
743023		Radio control system	
#	Article nr.	Designation	Quantity
1	743021	Receiver, radio control	1
2	743022	Transmitter unit	1
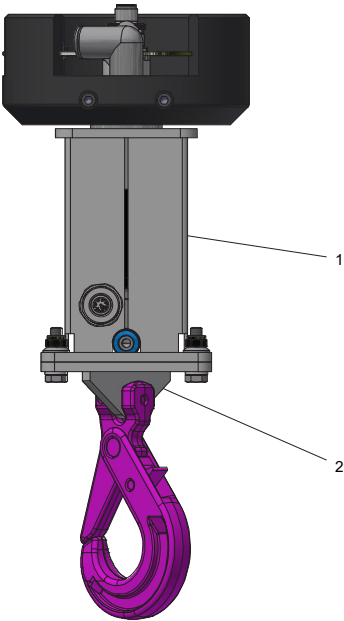
744779	Swivel El 8P + Pneu Ø8		
#	Article nr.	Designation	Quantity
1	744461	Svivel Mechchain 8P+ Ø8	1
2	744486	Swivel hook	1
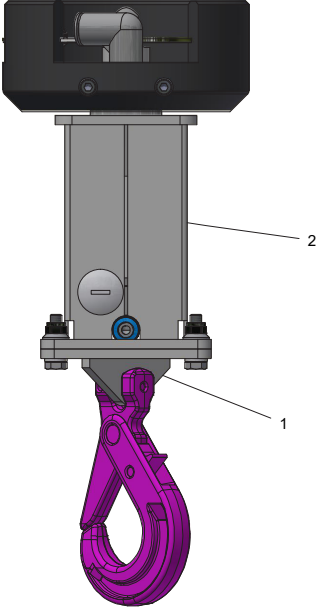
744780	Swivel - Pneu Ø8			
#	Article nr.	Designation		Quantity
2	744490	Svivel Mechchain Ø8	R	1
1	744486	Swivel hook		1
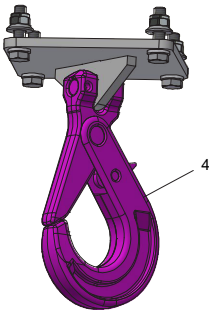
744486	Swivel hook			
#	Article nr.	Designation		Quantity
4	742961	Safety hook	R	1

	Hooks			
#	Article nr.	Designation		Quantity
1	731418	Standard hook	R	1
2	731637	Safety hook	R	1

R: spare part S: wear part

6.2   Servicing instructions

6.2.1   Chain and load sheave

Chain transmission

Chain life is dependent on lubrication. Environmental and operating conditions affect the inspection and maintenance intervals.

Maintenance of the chain involves checking regularly for wear and lubricating the chain **every 100 hours of operation**. During the daily chain check, the quality of the lubrication can be determined.

*   Re-lubricate or change lubricant if necessary.

*   Before lubricating, clean dirty chain.

*   Lubrication must be carried out under no load so that the lubricant lubricates the bearing faces of the chain.

*   Use dry lubricant (slip lacquer) in an environment with increased wear impact (sanding dust, sand, etc.).

Checking the chain

For scrapping the chain, the following must be considered:

*   chain wear

*   surface defects

*   corrosion

Assessing chain wear

A direct assessment of chain wear is the extension of the nominal length of the chain, and wear can therefore be determined by measuring length according to the instructions below.
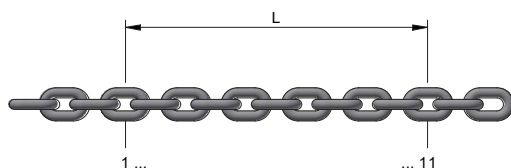
Measurement length "L" in mm.

Nominal chain length over 11 links is 140 mm.

The result from measuring the chain length over 11 links according to the illustration must not exceed 143 mm.

As a general rule, the chain is worn out and should be replaced when the percentage extension reaches 2%.

Surface defects and corrosion

If surface defects or corrosion are ascertained, the chain must be replaced.

NB! Corrosion significantly reduces the lifting capacity of the chain and can lead to chain breakage.

Changing the chain and load sheave

The entire chain should be replaced for the following reasons:

*   The cost of a standstill can often be higher than the cost of a chain change.

If the chain is to be replaced as a result of wear or for any other reason, make sure that the new chain is lubricated after assembly.

*   The load sheave(s) should normally be changed at the same time as the chain.

Health precautions

The following precautions must be taken before disconnecting and removing a chain from a transmission during chain replacement or repair:

*   Always disconnect the drive source from the lifter and relieve the lifter of all other forces from the equipment.

*   Always wear protective eyewear.

*   Always wear suitable protective clothing, gloves and work shoes.

*   Make sure the tools are in good condition.

*   Always release tensioning devices.

*   Support the chain to avoid sudden fallout of chain or other details.

*   Never attempt to disassemble or connect a chain transmission without fully understanding the design and operation of the drive.

*   Never reuse a worn chain or load sheave.

731419

731019

*   The chain must be checked regularly and lubricated every 100 hours of operation.

*   Recommended lubricant:
    Mobile Pyrolube 830 (brush application)

*   The load sheave(s) should normally be changed at the same time as the chain.

6.2.2   Replacing the chain

1. Read section "6.2.1 Chain and load sheave" on page 35.

2. Move MobiChain to its top position.

3. Detach the hook.

Hook
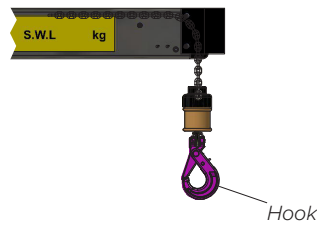
4. Measure how much of the chain hangs out.

?

5. Loosen the spindle limit position and pull it outwards 6-10 mm.
    Be careful not to change the position of the axle.

Spindle limit switch

6-10 mm
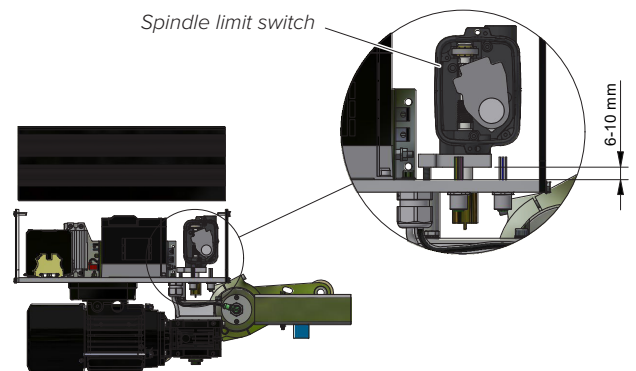
6. Dismantle the chain tensioner and end stop (mechanical end
    stop on the chain).

Chain tensioner

End stop
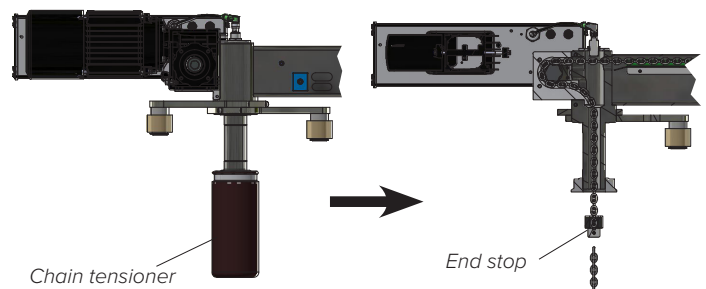
7. Take an open link (like a C) and hang it on the outermost link.

8. Hang a new chain in the open link.

9. Carefully run the new chain through until the open link and the
    old chain have come out.
    If a rattling noise is heard while the chain is running through,
    it may indicate that the load sheave or chain guide is worn.
    Contact the service department to replace the load sheave.

10. Install end stop and chain tensioner.

11. Run the chain through to the same distance as before. Lubricate
    the chain at the same time.

12. Refit the spindle limit switch and the hook.

13. Test-run MobiChain and check that both upper and lower limit
    positions are working.

6.2.3   Checking the hook for wear

Checking the hook

Inspect the hook for cracks, distortion and wear. If the following values for the hook opening E and wall thickness F are not met, the hook must be replaced.

Checking the hook latch

Check hook latch G for function, distortion and wear.

Hook		731418	731637
Max. opening E	mm	43,6	30,8
Min. wall thickness F	mm	17,1	18,0
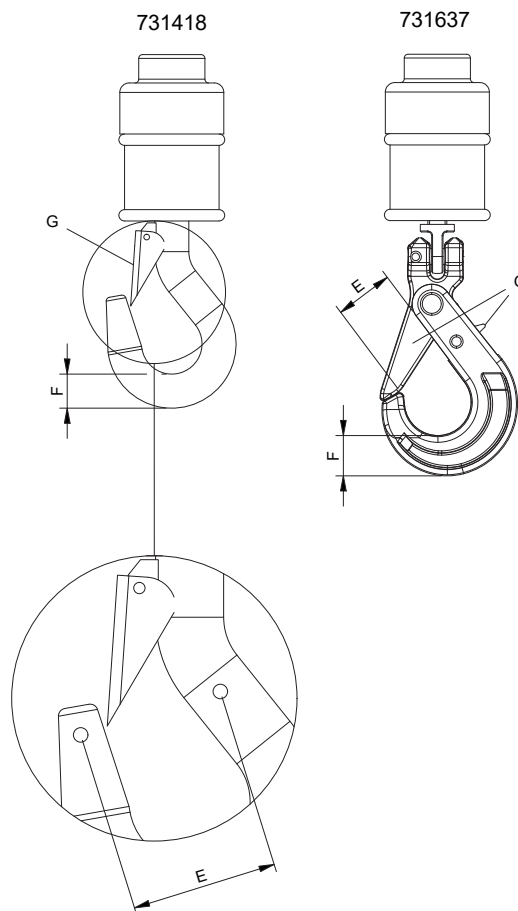
6.2.4   Adjusting the spindle limit switch

When replacing the chain, for example, the setting of the spindle limit position may be affected, which not only changes the upper and lower limit position and the useful length of stroke, but also runs the risk of the MobiChain striking a mechanical end limit.
NB! The spindle limit position must be adjusted without a load.

Adjusting the spindle limit position - upward hook movement

1.   Move the hook upwards to **Z10** = 50 mm.

2.   Lower the hook approximately 300 mm to position **Z20**.

3.   Turn screw 2 anti-clockwise until the upper lug strikes the switch (a clicking sound is heard).
      NB! The lug must strike the switch from the left side.

4.   Move the hook down 300 mm and then run it up at full speed until the spindle limit position stops the movement.

5.   Measure at **Z10**!

6.   If the measurement is greater than 50 mm, adjust by turning screw 2 further anti-clockwise.

7.   Repeat steps 4–6 until **Z10** = 50 mm.
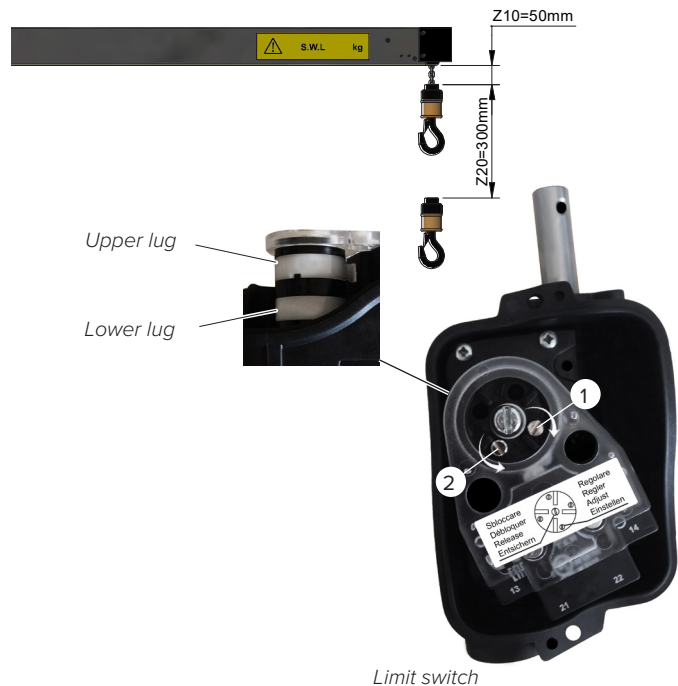
Adjusting the spindle limit position - upward hook movement

1.   Move the hook upwards to an upper position where the spiral hose is very easily compressed.
      Lower the hook 50 mm.
      This position is **Z11**. Note the measurement!

2.   Lower the hook approximately 300 mm to position **Z21**.

3.   Turn screw 2 anti-clockwise until the upper lug strikes the switch (a clicking sound is heard).
      NB! The lug must strike the switch from the left side.

4.   Move the hook down 300 mm and then run it up at full speed until the spindle limit position stops the movement.

5.   Measure **Z11** and compare it to the measurement recorded previously (see step 1).

6.   If the measurement is greater than the recorded measurement, adjust by turning screw 2 further anti-clockwise.

7.   Repeat steps 4–6 until measurement **Z11** corresponds to the recorded measurement (see step 1).

Adjusting the spindle limit position – downwards hook movement

1.   Dismantle the chain bag.

2.   Lower the hook until **Z30** = 50 mm.

3.   Raise the hook approximately 300 mm to position **Z40**.

4.   Turn screw 1 clockwise until the upper lug strikes the switch (a clicking sound is heard).
      NB! The lug must strike the switch from the right side.

5.   Move the hook up 300 mm and then run it down at full speed until the spindle limit position stops the movement.

6.   Measure **Z30**!

7.   If the measurement **Z30** is greater than 50 mm, adjust screw 1 further anti-clockwise.

8.   Repeat steps 5–7 until **Z30** = 50 mm.

Upper lug

Lower lug

Limit switch

Chain bag
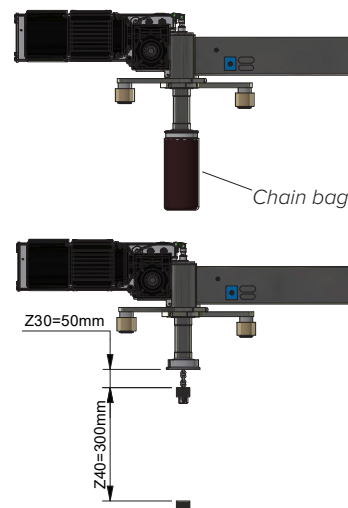
6.2.5   Frequency converter – using the front panel keypad

Please take a moment to familiarize yourself with the keypad layout shown in the figure below. The display is used in programming the inverter's parameters, as well as monitoring specific parameter values during operation.

Items	Contents
(1) POWER LED	Turns ON (Green) while the inverter is powered up.
(2) ALARM LED	Turns ON (Red) when the inverter trips.
(3) Program LED	· Turns ON (Green) when the display shows changeable parameter. · Blinks when there is a mismatch in setting.
(4) RUN LED	Turns ON (Green) when the inverter is driving the motor.
(5) Monitor LED [Hz]	Turns ON (Green) when the displayed data is frequency related.
(6) Monitor LED [A]	Turns ON (Green) when the displayed data is current related.
(7) Run command LED	Turns ON (Green) when a Run command is set to the operator. (Run key is effective.)
(8) 7-seg LED	Shows each parameter, monitors etc.
(9) Run key	Makes inverter run.
(10) Stop/reset key	· Makes inverter decelerates to a stop. · Reset the inverter when it is in trip situation
(11) CYCLE key	· Go to the top of next function group, when a function mode is shown · Cancel the setting and return to the function code, when a data is shown · Moves the cursor to a digit left, when it is in digit-to-digit setting mode · Pressing for 1 second leads to display data of *d001*, regardless of current display.
(12) Up key (13) Down key	· Increase or decrease the data. · Pressing the both keys at the same time gives you the digit-to-digit edit.
(14) SET key	· Go to the data display mode when a function code is shown · Stores the data and go back to show the function code, when data is shown. · Moves the cursor to a digit right, when it is in digit-to-digit display mode
(15) USB connector	Connect USB connector (mini-B) for using PC communication
(16) RJ45 connector	Connect RJ45 jack for remote operator

Keys, modes, and parameters

The purpose of the keypad is to provide a way to change modes and parameters. The term *function* applies to both monitoring modes and parameters. These are all accessible through *function codes* that are primary 4-character codes. The various functions are separated into related groups identifiable by the left-most character, as the table shows.
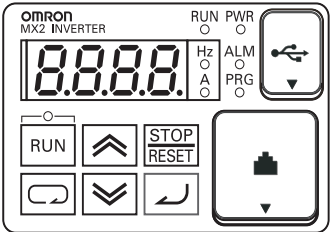
Function Group	Type (Category) of Function	Mode to Access	PRG LED Indicator
"d"	Monitoring functions	Monitor	○
"F"	Main profile parameters	Program	●
"A"	Standard functions	Program	●
"b"	Fine tuning functions	Program	●
"C"	Intelligent terminal functions	Program	●
"H"	Motor constant related functions	Program	●
"P"	Pulse train input, torque, Drive Programming, and communication related functions	Program	●
"U"	User selected parameters	Program	●
"E"	Error codes	–	–

Keypad navigation map

The inverter drives have many programmable functions and parameters. You need to access just a few items to perform the powerup test. The menu structure makes use of function codes and parameter codes to allow programming and monitoring with only a 4-digit display and keys and LEDs. So, it is important to become familiar with the basic navigation map of parameters and functions in the diagram below. You may later use this map as a reference.
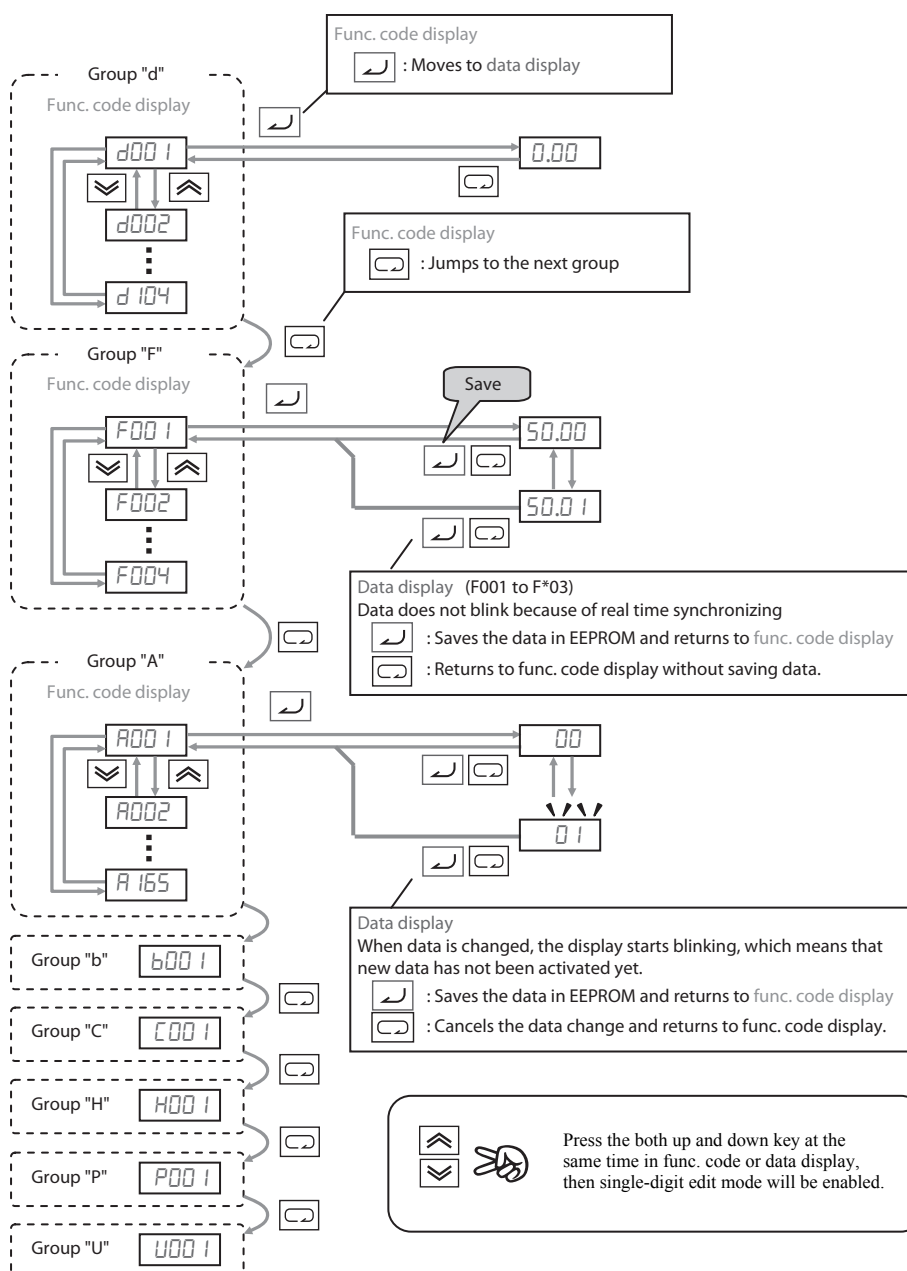
Note Pressing the ⟲ key will make the display go to the top of next function group, regardless the display contents. (e.g. *A021* –> ⟲ –> *b001*)

[Setting example]

After power ON, changing from `0.00` display to change the `b083` (carrier frequency) data.

② Press `⊂⊃` key to show the function code

① Data of `d001` will be shown on the display after the first power ON

`d001` ⟵ - - - - - - - - - - ⟶ `0.00`

③ Press `⊂⊃` key to move on to the function group `F001`

`F001`

④ Press `⊂⊃` key twice to move on to the function group `b001`.

`b001` ⑤ Press Up key to change increase function code (`b001` → `b083`).

⑥ Press `↵` key to display the data of `b083`

`b083` ⟶ `5.0` Display is solid lighting.

⑦ Press up key to increase the data (`5.0` → `12.0`)

`12.0` When data is changed, the display starts blinking, which means that new data has not been activated yet.

⑦ Press `↵` key to set and save the data

`↵` : Fix and stores the data and moves back to the function code

`⊂⊃` : Cancels the change and moves back to the function code

Note Function code `bxxx` are for monitor and not possible to change.

Function codes `Fxxx` other than `FHHH` are reflected on the performance just after changing the data (before pressing `↵` key), and there will be no blinking.

	When a function code is shown…	When a data is shown…
`⊂⊃` key	Move on to the next function group	Cancels the change and moves back to the function code
`↵` key	Move on to the data display	Fix and stores the data and moves back to the function code
`≪` key	Increase function code	Increase data value
`≫` key	Decrease function code	Decrease data value

Note Keep pressing for more than 1 second leads to d001 display, regardless the display situation. But note that the display will circulate while pressing the `⊂⊃` key because of the original function of the key.

(e.g. `100F` → `100A` → `100C` >– `100b` → … → displays `00.05` after 1 second)

6.2.6   Setting the encoder (option)

Electric MobiChain may optionally be equipped with an encoder that reads the axle in the spindle limit switch. This makes it possible to set a lower stop position, as well as a further two stop/start positions along the stroke.

The positions are stored in a built in memory in the frequency converter and are not erased in case of power cuts. It is possible to adjust the height several times by following the same procedure. The stop/start position when moving upwards may be at the same height as for the downwards movement.

Please note: The encoder never replaces the end limit switches! It is only to be used as a complementary tool to facilitate for the operator to stop the lifting movement at pre-set positions.

Resetting the encoder (when changing/at first installation)

1. Use the joystick to raise the chain/hook to the top position (the upper spindle limit switch stops the lifting movement).

2. Go to parameter P128 on the frequency converter, and set the value =1.

3. Wait 10 seconds.

4. The encoder is now reset.

Setting the lower stop position

1. Use the joystick to set the chain/hook in the desired lower stop position.

2. Go to parameter D25 on the frequency converter and read the value (0–9999).

3. Go to parameter P129 and set the value = the value from D25.

Please note: Parameter P129 must be more than 0000 if the other positions are to be used. The function is deactivated by setting the value to = 0000.

Setting the stop/start position for an upward movement

Manual setting (alternative 1):

1. Use the joystick to drive the chain/hook to the desired stop position.

2. Activate the emergency stop.

3. Press the joystick upwards for 20 seconds.

4. Release the joystick and reset the emergency stop.

Via the frequency converter (alternative 2):

1. Use the joystick to drive the chain/hook to the desired stop position.

2. Go to parameter D25 on the frequency converter and read the value (0-9999).

3. Go to parameter P131 and set the value = the value from D25.

Setting the stop/start position for a downward movement

Manual setting (alternative 1):

1. Use the joystick to drive the chain/hook to the desired stop position.

2. Activate the emergency stop.

3. Press the joystick downwards for 20 seconds.

4. Release the joystick and reset the emergency stop.

Via the frequency converter (alternative 2):

1. Use the joystick to drive the chain/hook to the desired stop position.

2. Go to parameter D25 on the frequency converter and read the value (0-9999).

3. Go to parameter P130 and set the value = the value from D25.

Upper stop position
(always limit switch)

P131
stop/start
upward movement

P130
stop/start
downward movement

P129
lower stop position

P

Radio control with encoder

Setting positions is carried out in the same way as with the joystick, but the positions are programmed with **P** + button *Up* or *Down* instead of with the emergency stop.
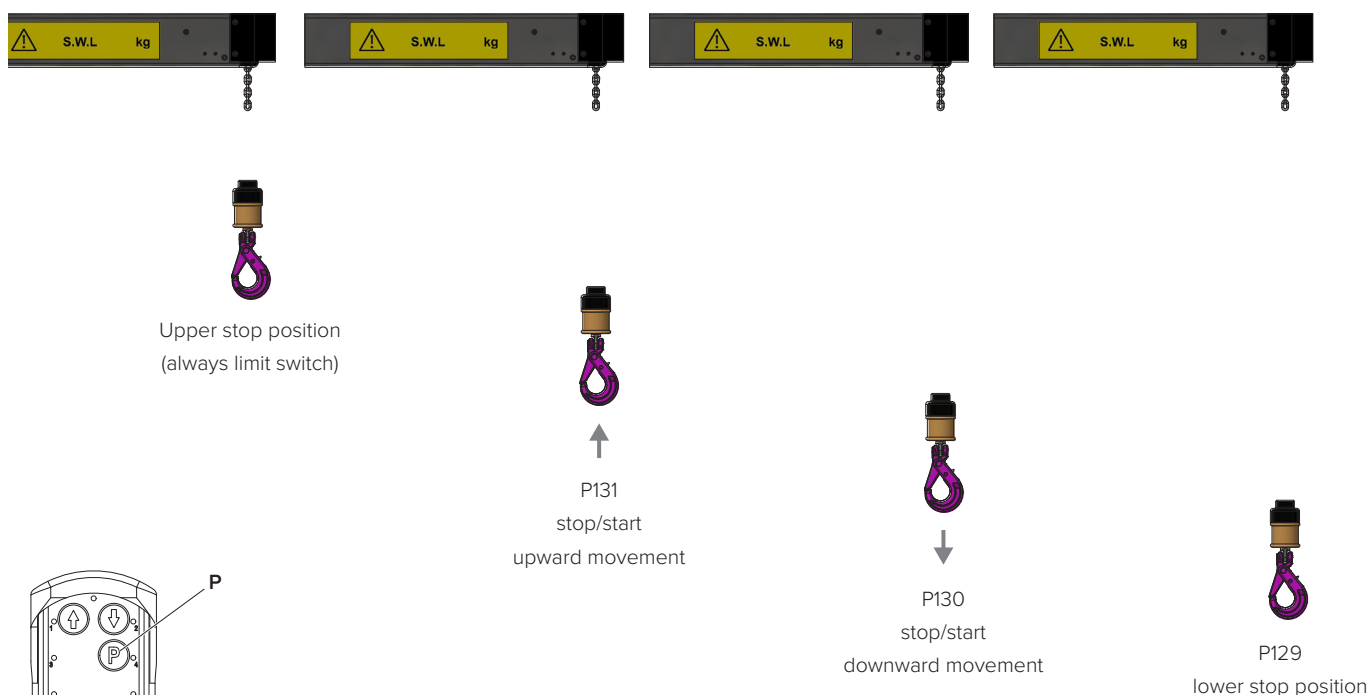
6.2.7 Setting the encoder (option) – low speed zones

A more advanced setting of low speed zones to the stop positions can be used as shown below.

A021 (U00)
Upper stop position

A022 (U03)
Offset value for
low speed zone

P131 (U31)
Stop/start
up

A025 (U06)
Offset value for
low speed zone

A024 (U05)
Offset value for
low speed zone

P130 (U30)
Stop/start
down

A023 (U04)
Offset value for
low speed zone

P129 (U29)
Lower stop position
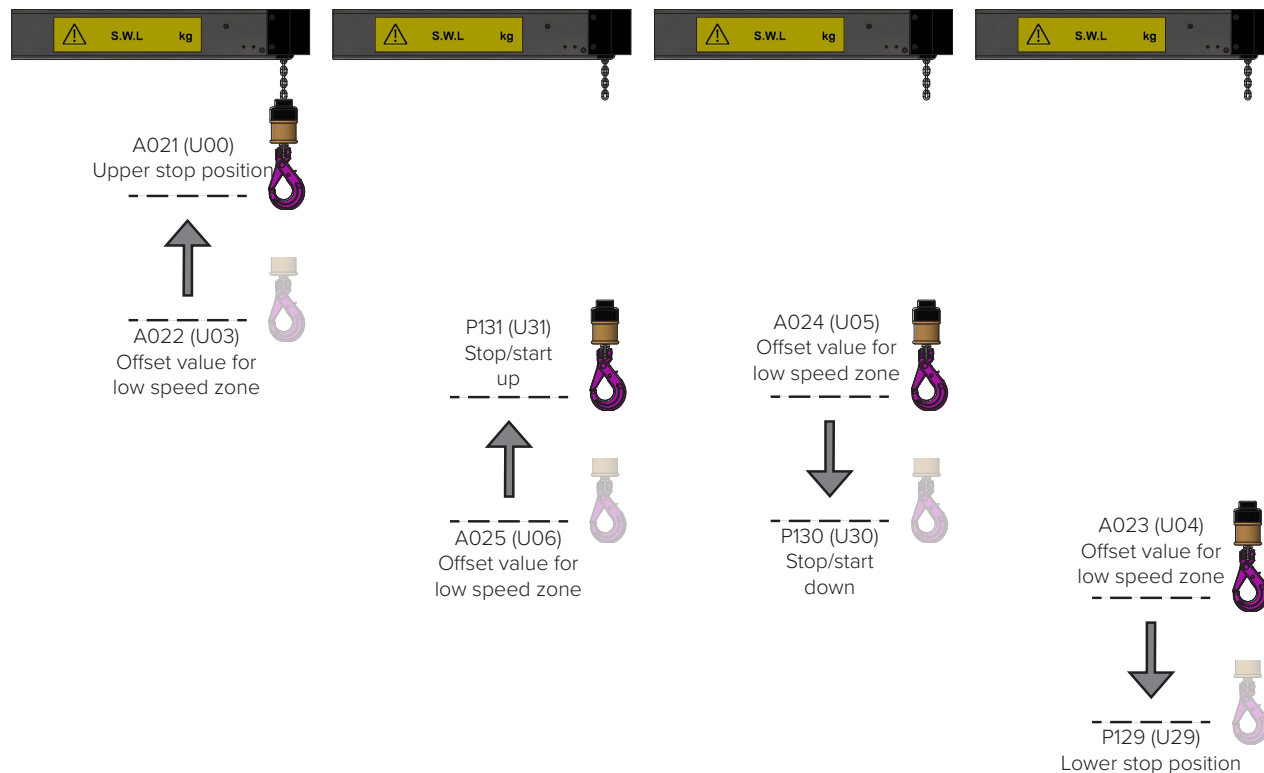
When changing the encoder parameters, the values below can be filled (see "6.2.5 Frequency converter – using the front panel keypad" on page 39).

Index	Description	Default value	Custom value	Comment
P129	Lower stop position	0		Must be greater than 0 to activate positioning mode.
P130	Stop/start downward movement	0		Set by parameter or teach-in.
P131	Stop/start upward movement	0		Set by parameter or teach-in.
A021	Upper stop position	12,00 (1200 units)		
A022	Offset value for slow speed zone, upper stop position	8,00 (800 units)		
A023	Offset value for slow speed zone, lower stop position	10,00 (1000 units)		
A024	Offset value for slow speed zone, stop/start downward movement	10,00 (1000 units)		
A025	Offset value for slow speed zone, stop/start upward movement	8,00 (800 units)		
A030	Acceleration ramp	1,00 (1 sec)		
A031	Deceleration ramp without positioning	0,50 (0,5 sec)		
A032	Deceleration ramp with positioning	0,30 (0,3 sec)		
A034	Constant speed slow speed zone	10,00 (10 Hz)		
A035	Time for setting position with teach-in	0,20 (20 sec)		

- All parameters above can be reset to their default value by setting parameter P126 to 1 and waiting 10 seconds.

6.3 Service record sheet – MobiChain

ID:	Customer / place:				The service record sheet must be archived by the customer.	1/1
Serviced by:	Date:					

👁 Visual inspection, check if the equipment is damaged				* if fitted	
👂 Aural inspection, check if the equipment makes noise					
✋ Physical inspection, check if the equipment is damaged				Operational checks are performed with no load on the tool.	
🛠 Mechanical inspection, check if the equipment is damaged, tools are required				Service must be performed while observing safety instructions for maintenance work.	

No.	Product	Checked	Interval in months at 1–3 shifts	Interval in months at >3 shifts	Checker Dept. / Sign.	Note
1	Motor unit	👁 👂 ✋ 🛠 General checks.	3	2		
1.1	Fasteners	👁 ✋ 🛠	3	2		
1.2	Motor	👁 👂 ✋ 🛠 Check the motor gearbox for oil leaks. Check the cables and connectors. Operational check: Move the hoist up and down; the motor should be in direct contact with the relevant joystick. Test full speed and slow speed.	3	2		
1.3	Load sheave	👁 👂	⇨	⇨		See section: 6.2.1 on page 35
2	Electrical cabinet	👁 👂 ✋ 🛠 General checks.	3	2		
2.1	Fasteners	👁 👂 🛠	3	2		
2.2	Cable routing	👁 ✋ 🛠 Check the cables and connectors.	3	2		
2.3	Spindle limit position	👁 👂 ✋ 🛠 Operational check: Move the hoist up and down; the motor should stop the hoist's lifting motion in its upper and lower position respectively. NB! The movement of the hoist must not be obstructed by mechanical stops! Perform the check on the tool unladen.	Daily	Daily		See section: 6.2.4 on page 38
3	Chains	👁 👂 ✋ 🛠 General checks.	⇨	⇨		See section: 6.2.1 on page 35 6.2.2 on page 36
4	Chain hook	👁 👂 ✋ 🛠 General checks.	2	1		See section: 6.2.3 on page 37
5	Control unit and emergency stop	👁 ✋ General checks.	3	2		
5.1	Joystick/transmitter	👁 ✋ Operational check: Move the hoist up and down; the motor should be in direct contact with the relevant joystick/transmitter. Test full speed and slow speed.	Daily	Daily		
5.2	Emergency stop	👁 👂 ✋ 🛠 Operational check: Move the hoist up or down; press the emergency stop button and the hoist must stop immediately. The button should remain depressed after the action (rotary reset).	Daily	Daily		

6.4   Troubleshooting

Type of fault	Probable cause	Corrective action
No lifting/lowering movement	The emergency stop is affected	Check if the emergency stop switch has been affected, or if there is any risk from resetting the emergency stop.
		Reset the emergency stop.
	There is something blocking the crane mechanically	Check if any part of the hoist or tool including any load that is stuck in other equipment/ fittings.
		Remove any obstructions.
	No power supply to hoist	Check if the power supply to the hoist is unavailable; some checks may need to be carried out by qualified maintenance personnel.
		Reset the power supply.
	Defective control device	Check the hoist for power; inspect the control unit; some checks may need to be carried out by qualified maintenance personnel.
		Repair the control unit.
	The hoist is in the top position	Lower the load.
	The hoist is in the lowest position	Lift the load.
	Tripped slack chain switch	Pull the hook to reset.
Uneven or jerky lifting / lowering movements	There is something blocking the crane mechanically	Check if any part of the hoist or tool including any load that is stuck in other equipment/ fittings.
		Remove any obstructions.
	Load sheave and chain worn	Replace the load sheave and chain (see 6.2.1 on page 35).

6.4.1   Trip history and frequency converter status

It is recommended that you first determine the cause of the fault before clearing trip history and the frequency converter status. When a fault occurs, the frequency converter stores important performance at the time of failure.

To access this data, use the monitor function (dxxx) and select d081: Details of the current error. The previous 5 faults are stored in d082 to d086. Each fault cycles through d081–d086 and the new fault is written to d081.

The following monitor menu map shows how to access the fault codes. When a fault is present, the details of the fault can be viewed by first selecting the correct function: d081 is the most recent and d086 is the oldest.

Trip history 1 (latest)   Trip history 6

d081	...	d086

ESC   SET

E07.2	Hz / A	Fault code
60.00	Hz / A	Output frequency
4.00	Hz / A	Output current
284.0	Hz / A	DC bus voltage
18	Hz / A	Elapsed runtime
15	Hz / A	Elapsed time in power-on mode

E07.2

Trip history   Frequency converter status at trip point

.0	Startup or initial processing
.1	Stop
.2	Retardation
.3	Constant speed
.4	Acceleration
.5	0 Hz command and RUN
.6	Start
.7	DC braking
.8	Overload restriction

- Note: The indicated frequency converter status may differ from the actual behaviour of the frequency converter.

  Example: During PID operation or if frequency is given by analogue signal, even though it appears that the speed is constant, acceleration and retardation can be repeated over a very short cycle.

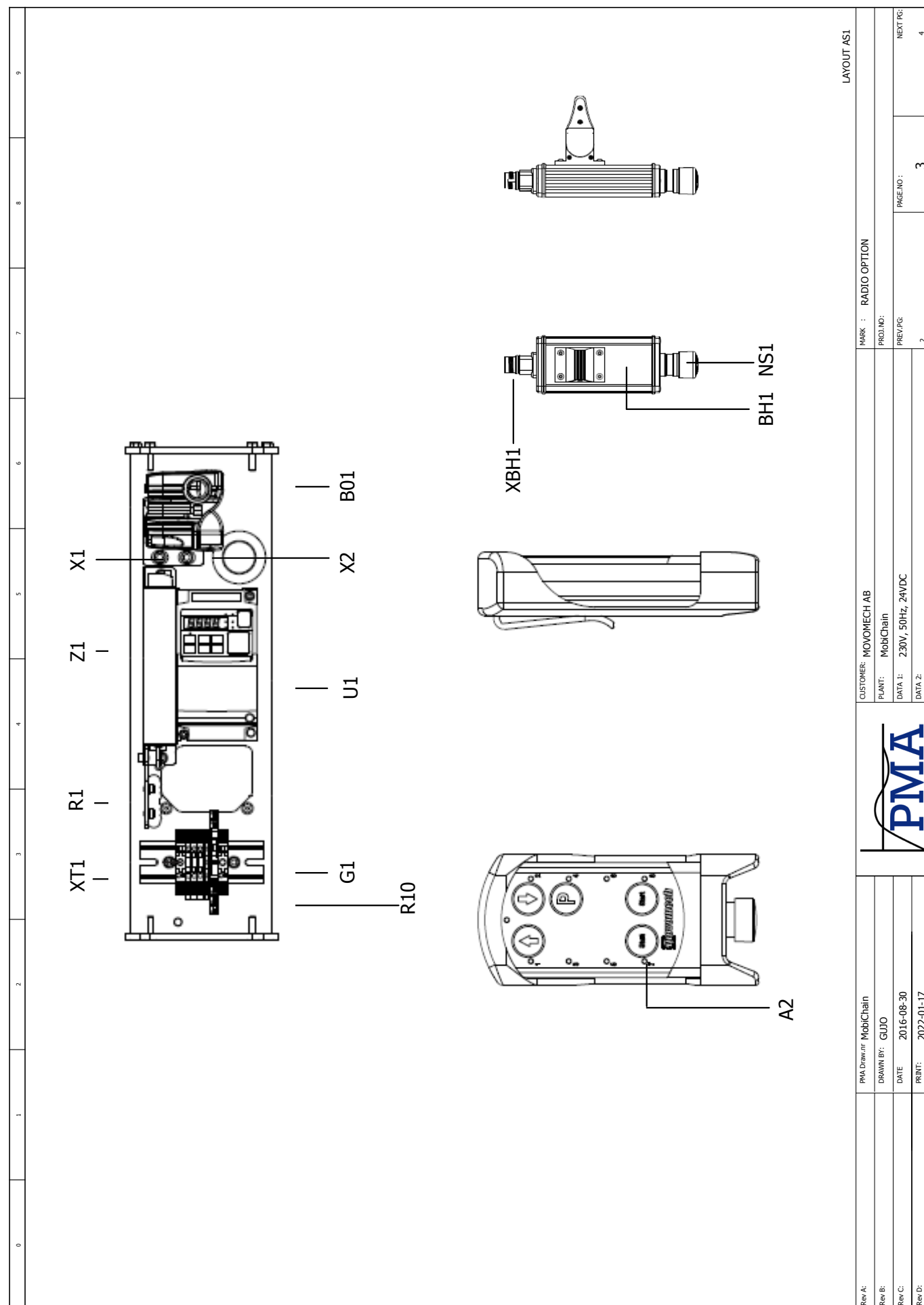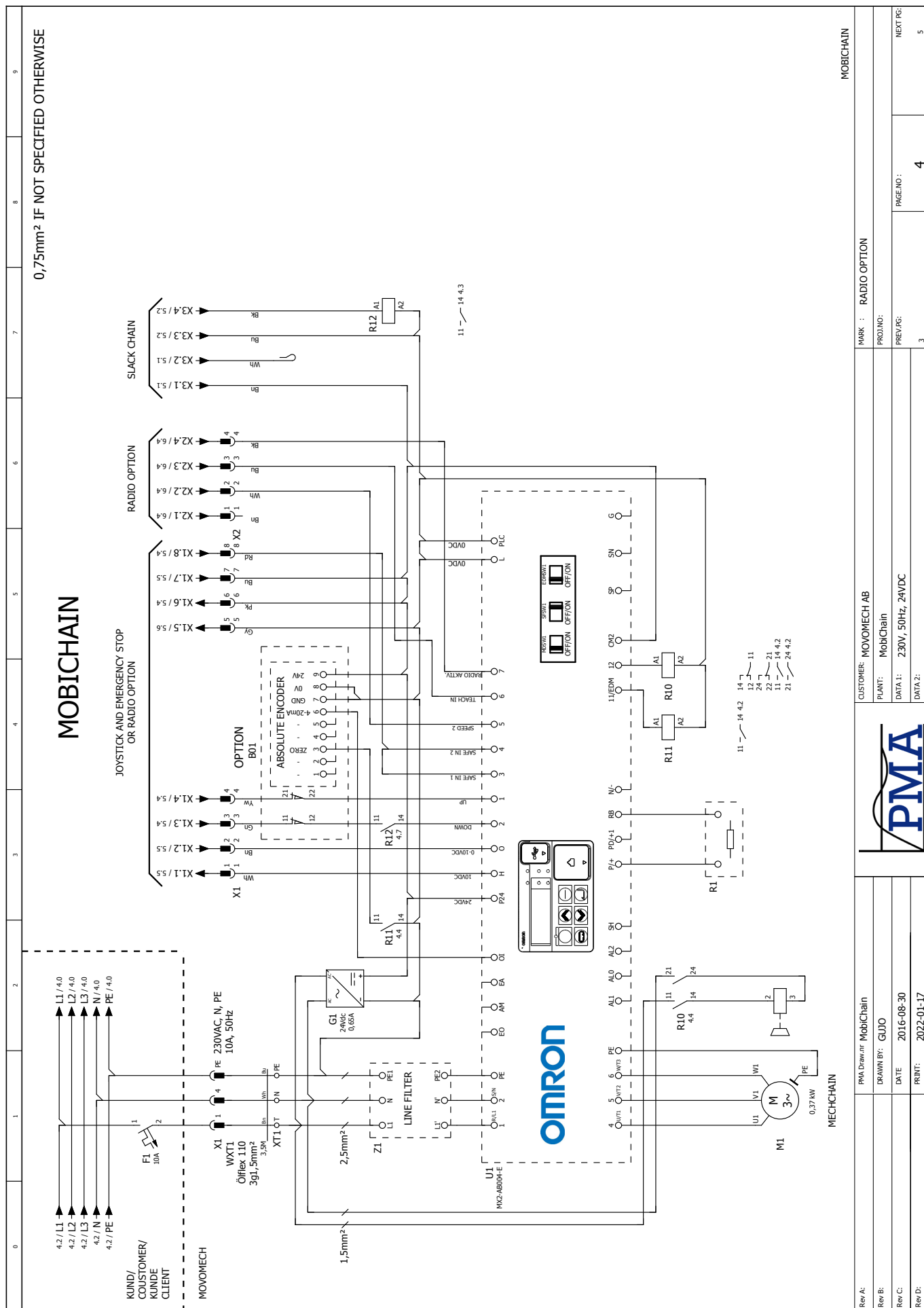| Error code	Name	Cause(s)
E01	Over-current event while at constant speed	The inverter output was short-circuited, or the motor shaft is locked or has a heavy load. These conditions cause excessive current for the inverter, so the inverter output is turned OFF.
E02	Over-current event during deceleration	The dual-voltage motor is wired incorrectly.
E03	Over-current event during acceleration	
E04	Over-current event during other conditions	
E05	Motor overload protection	When a motor overload is detected by the electronic thermal function, the inverter trips and turns OFF its output. Check that the thermal model is properly set in parameter b0 12, b0 13, b9 10, b9 11 and b9 12. Check if the application can accept softer acceleration rates to minimize peak currents F002/F202/A092/A292). Check if motor parameters are not correctly set (H020 to H034 or H005), depending in motor control method (A044/A244).
E06	Braking resistor overload protection	When the BRD operation rate exceeds the setting of "b090", this protective function shuts off the inverter output and displays the error code.
E07	Over-voltage protection	When the DC bus voltage exceeds a threshold, due to regenerative energy from the motor.
E08	EEPROM error	When the built-in EEPROM memory has problems due to noise or excessive temperature, the inverter trips and turns OFF its output to the motor.
E09	Under-voltage error	A decrease of internal DC bus voltage below a threshold results in a control circuit fault. This condition can also generate excessive motor heat or cause low torque. The inverter trips and turns OFF its output.
E10	Current detection error	If an error occurs in the internal current detection system, the inverter will shut off its output and display the error code.
E11	CPU error	A malfunction in the built-in CPU has occurred, so the inverter trips and turns OFF its output to the motor.
E12	External trip	A signal on an intelligent input terminal configured as EXT has occurred. The inverter trips and turns OFF the output to the motor.
E13	USP	When the "Unattended start protection" (USP) is enabled, an error occurred when power is applied while a run signal is present. The inverter trips and does not go into "Run mode" until the error is cleared.
E14	Ground fault	The inverter is protected by the detection of ground faults between the inverter output and the motor upon during powerup tests. This feature protects the inverter, and does not protect humans.
E15	Input over-voltage	The inverter tests for input over-voltage after the inverter has been in "Stop mode" for 100 seconds. If an over-voltage condition exists, the inverter enters a fault state. After the fault is cleared, the inverter can enter "Run mode" again.
E21	Inverter thermal trip	When the inverter internal temperature is above the threshold, the thermal sensor in the inverter module detects the excessive temperature of the power devices and trips, turning the inverter output OFF.
E22	CPU communication error	When communication between two CPU fails, inverter trips and displays the error code.
E25	Main circuit error (*3)	The inverter will trip if the power supply establishment is not recognized because of a mal-function due to noise or damage to the main circuit element.
E30	Driver error	If instantaneous overcurrent occurs the Inverter will shut off IGBT's output to protect the main circuit element. After tripping due this protective function the inverter cannot retry the operation.
E35	Thermistor	When a thermistor is connected to terminals [5] and [L] and the inverter has sensed the temperature is too high, the inverter trips and turns OFF the output.
E36	Braking error	When "D 1" has been specified for the "Brake control selection" (b 120), the inverter will trip if it cannot receive the braking confirmation signal within the "Brake wait time for confirmation" (b 124) after the output of the brake release signal. Or when the output current doesn't reach the brake release current (b 126) during the brake wait time for release (b 121).
E37	Safe stop	Safe stop signal is given.*
E38	Low-speed overload protection	If overload occurs during the motor operation at a very low speed, the inverter will detect the overload and shut off the inverter output.
E40	Operator connection	When the connection between inverter and operator keypad failed, inverter trips and displays the error code.
E41	Modbus communication error	When "trip" is selected (C076=00) as a behavior in case of communication error, inverter trips when timeout happens.
E43	Drive programming invalid instruction	The program stored in inverter memory has been destroyed, or the PRG terminal was turned on without a program downloaded to the inverter.
E44	Drive programming nesting count error	Subroutines, if-statement, or for-next loop are nested in more than eight layers
E45	Drive programming instruction error	Inverter found the command which cannot be executed.
E50-E59	Drive programming user trip (0 to 9)	When user-defined trip happens, inverter trips and displays the error code.
E51	Top limit switch (only 400/650 kg)	Check that the rotary limit switch is working and that it is correctly adjusted. Reset by activating and then resetting the emergency stop. It is now only possible to drive the manipulator downwards until the top limit switch is unaffected.
E60-E69	Option errors (error in connected option board, the meanings change upon the connected option).	These errors are reserved for the option board. Each option board can show the errors for a different meaning. To check the specific meaning, please refer to the corresponding option board user manual and documentation.
E80	Encoder disconnection	If the encoder wiring is disconnected, an encoder connection error is detected, the encoder fails, or an encoder that does not support line driver output is used, the inverter will shut off its output and display the error code shown on the right.
E81	Excessive speed	If the motor speed rises to "maximum frequency (A004) x overspeed error detection level (P026)" or more, the inverter will shut off its output and display the error code shown on the right.
E83	Positioning range error	If current position exceeds the position range specification (P072-P073), the inverter will shut off its output and display the error code.

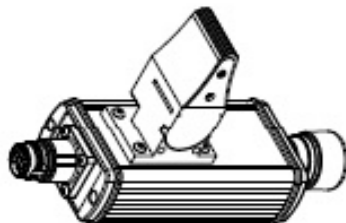* E37.X only can be reset by digital input (18: RS).

6.4.2   Parameter list 63 - 80 125 - 160 - 225 kg

Index	Description	Value	Default	Range	Units
A001	Frequency Reference Selection 1	7: Drive Programming	1	0 to 10	
A003	Base Frequency 1	50	120	30,0 to 100,0	Hz
A004	Maximum Frequency 1	100	120	50,0 to 400,0	Hz
A012	O End Frequency	95	0	0,00 to 400,00	Hz
A013	O Start Ratio	6	0	0 to 94	%
A014	O End Ratio	94	100	6 to 100	%
A017	Drive Programming Selection	2: Always	0	0 to 2	
A044	Control Method 1	3: SLV (sensorless vector control)	0	0 to 3	
B012	Electronic Thermal Level 1	1,9	5	1,00 to 5,00	A
B038	Initial Screen Selection	2: d002 - Output current monitor	1	0 to 202	
B041	Torque Limit 1 (Four-quadrant Mode Forward Power Running)	30 (63 kg), 45 (80 kg), 65 (125 kg), 75 (225 kg)	200	0 to 255	%
B083	Carrier Frequency	15	10	2,0 to 15,0	kHz
B090	Usage Rate of Regenerative Braking	25	0	0,0 to 19,6	%
B095	Regenerative Braking Selection	1: Enabling [disabling while the motor is stopped]	0	0 to 2	
B097	BRD Resistor Value	200	50	50,0 to 600,0	Ohm
B164	Initial Screen Automatic Switching Function	1: Enabled	0	0 to 1	
C001	Multi-function Input [1] Selection	56: X(00) Drive Programming (MI1)	0	0 to 255	
C002	Multi-function Input [2] Selection	57: X(01) Drive Programming (MI2)	1	0 to 255	
C003	Multi-function Input [3] Selection	77: GS1 (GS1 input)	12	0 to 255	
C004	Multi-function Input [4] Selection	78: GS2 (GS2 input)	18	0 to 255	
C005	Multi-function Input [5] Selection	255: no (not used)	2	0 to 255	
C006	Multi-function Input [6] Selection	255: no (not used)	3	0 to 255	
C007	Multi-function Input [7] Selection	255: no (not used)	6	0 to 255	
C013	Multi-function Input Terminal [3] Operation Selection	1: NC	0	0 to 1	
C014	Multi-function Input Terminal [4] Operation Selection	1: NC	0	0 to 1	
C021	Multi-function Output Terminal [11]/EDM-Selection	44: Y(00) Programmation pilote (MO1)	0	0 to 255	
C022	Selection of multi-function Output Terminal [12]	2: FA2 (Frequency Arrival Type 2 - surfréquence)	1	0 to 255	
C026	Multi-function Relay Output (AL2, AL1) Function Selection	45: Y(01) Programmation pilote (MO2)	5	0 to 255	
C036	Multi-function Relay Output (AL2, AL1) Contact Selection	0: NO	1	0 to 1	
C042	Arrival Frequency During Acceleration	1	0	0,00 to 400,00	Hz
C043	Arrival Frequency During Deceleration	1	0	0,00 to 400,00	Hz
C081	O Adjustment	125	100	0,0 to 200,0	
C091	Debug Mode Selection	1: Enabled	0	0 to 1	
F002	Acceleration Time Setting 1	1	10	0,00 to 3600,00	sec
F003	Deceleration Time Setting 1	0,3	10	0,00 to 3600,00	sec
F202	Acceleration Time Setting 2	2	10	0,00 to 3600,00	sec
F203	Deceleration Time Setting 2	0,5	10	0,00 to 3600,00	sec
H002	Motor Parameter 1	2: Auto-tuned data	0	0 to 2	
H030	Motor 1 Parameter R1 (Auto-tuning Data)	8,034	2,984	0,001 to 65,535	Ohm
H031	Motor 1 Parameter R2 (Auto-tuning Data)	3,983	1,448	0,001 to 65,535	Ohm
H032	Motor 1 Parameter L (Auto-tuning Data)	58,07	12,97	0,01 to 655,35	mH
H033	Motor 1 Parameter Io (Auto-tuning Data)	1	1,96	0,01 to 655,35	A
H034	Motor 1 Parameter J (Auto-tuning Data)	0,01	0,009	0,001 to 9999,000	kgm^2
P031	Acceleration/Deceleration Time Input Type	3: Drive Programming	0	0 to 3	

6.5 Electrical diagram, MobiChain

LAYOUT AS1

MARK : RADIO OPTION

XBH1

BH1 NS1

XT1 R1 Z1 X1

B01

X2

U1

G1

R10

A2

CUSTOMER:	MOVOMECH AB	
PLANT:	MobiChain	
DATA 1:	230V, 50Hz, 24VDC	
DATA 2:		

			PAGE.NO:	NEXT PG:
PROJ.NO:				
PREV.PG:			PAGE.NO:	3
2				4

PMA Draw.nr MobiChain	
DRAWN BY:	GUJO
DATE	2016-08-30
PRINT:	2022-01-17

Rev A:
Rev B:
Rev C:
Rev D:

MOBICHAIN

0,75mm² IF NOT SPECIFIED OTHERWISE

CUSTOMER:	MOVOMECH AB	
PLANT:	MobiChain	
DATA 1:	230V, 50Hz, 24VDC	
DATA 2:		

MARK :	RADIO OPTION	
PROJ.NO:		
PREV.PG:		PAGE.NO :
3		**4**

MOBICHAIN

PMA Draw.nr	MobiChain	
DRAWN BY:	GUJO	
DATE	2016-08-30	
PRINT:	2022-01-17	

Rev A:
Rev B:
Rev C:
Rev D:

NEXT PG:
5

0,75mm² IF NOT SPECIFIED OTHERWISE

MOBICHAIN
JOYSTICK

JOYSTICK OCH NÖDSTOPP/
JOYSTICK AND EMERGENCY STOP/
JOYSTICK UND NOT AUS/
JOYSTICK ET ARRÊT D'URGENCE

JOYSTICK

MovoMech Artno 742257

NÖDSTOPP/
EMERGENCY STOP/
NOT AUS/
ARRÊT D'URGENCE

WX1
6.1
MURR 8x0.34
8x0,34mm²
XU1

WBH1
PHOENIX
3X1.0+5X0,34x

BH1 XBH1

SLACK CHAIN

WX3
MURR 4x0.34
4x0,34mm²
150mm 90°

SLACK CHAIN

CUSTOMER:	MOVOMECH AB	MARK :	JOYSTICK & SENSOR
PLANT:	MobiChain	PROJ.NO:	
DATA 1:	230V, 50Hz, 24VDC	PREV.PG:	PAGE.NO:
DATA 2:			5

Rev A:		PMA Draw.nr MobiChain	MARK :	RADIO OPTION
Rev B:		DRAWN BY: GUJO		
Rev C:		DATE 2016-08-30	PREV.PG: 4	NEXT PG:
Rev D:		PRINT: 2022-01-17	PAGE.NO: 5	6

0,75mm² IF NOT SPECIFIED OTHERWISE

MOBICHAIN
RADIO

A1

A2

RADIO OCH NÖDSTOPP/
RADIO AND EMERGENCY STOP/
RADIO UND NOT AUS/
RADIO ET ARRÊT D'URGENCE

RADIOCONTROL

		RADIO CONTROLLER
CUSTOMER: MOVOMECH AB	MARK : RADIO OPTION	
PLANT: MobiChain	PROJ.NO:	
DATA 1: 230V, 50Hz, 24VDC	PREV.PG: 5	PAGE.NO : 6	NEXT PG: 7
DATA 2:		

PMA Draw.nr MobiChain
DRAWN BY: GUJO
DATE 2016-08-30
PRINT: 2022-01-17

Rev A:
Rev B:
Rev C:
Rev D:

WX1
5,4
MURR 8x0,34
8x0,34mm²

XU1

WX2
MURR 4x0,34
4x0,34mm²

SR1 HUVUD-KONTAKTOR
SR2 HUVUD-KONTAKTOR
RELÄ 1 UPP
RELÄ 2 NER
RELÄ 3 2A HASTIGHET
RELÄ 4
RELÄ 5 TEACH IN UPP

SUPPLY 24VDC
0 VDC

7.   EU declaration of conformity

EC declaration of conformity of the machinery

TRANSLATION
(according to 2006/42/EG, annex 2A)

Manufacturer
Movomech AB
Box 9083
291 09 Kristianstad
Sweden

Tel: +46 (0)44 28 29 00
Fax: +46 (0)44 28 29 28
E-mail: info@movomech.se
Web: www.movomech.com

Representative for documentation
Krister Johnsson
Movomech AB

hereby declares that the machinery

Designation	**Machine type**	**Version**
MobiChain	Knucle boom crane	55-100 kg

and that standards and/or technical specifications as described below are applied

☒ **Machinery Directive 2006/42/EC**

☒ **EMC Directive 2014/30/EU**

☒ **Low Voltage Directive 2014/35/EU**

and that standards and/or technical specifications as described below are applied.

☒ **Machinery Directive**	☒ **EMC Directive**	☒ **Low Voltage Directive**
SS-EN-ISO 12100:2010		IEC 60204-32
		IEC 60204-1

Place: Kristianstad   **Date:** 2022-03-15

Krister Johnsson, Managing Director
Movomech AB

movomech®