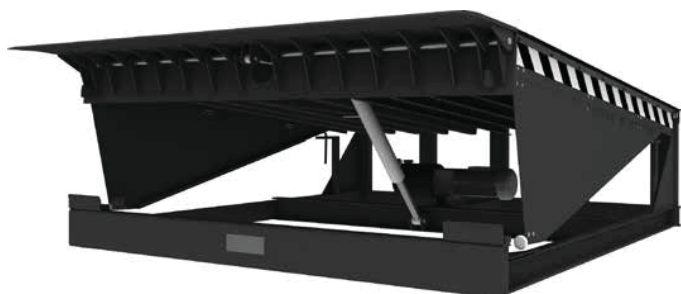


DOCK LEVELLER

WITH HINGED LIP/MODEL: DLHHI



Installation and operation manual

CONTENTS

1. MANUFACTURER'S DECLARATION OF CONFORMITY	2
2. GENERAL INFORMATION	2
3. SAFETY RULES	3
4. SAFETY FEATURES	4
5. GENERAL VIEW	5
6. PACKAGE	6
7. INSTALLATION	6
8. OPERATION	10
9. MAINTENANCE	11
10. TROUBLESHOOTING	12
11. APPENDIXES	13
Appendix 1. Spare parts	13
Appendix 2. Hydraulic components for dock leveller series	17
Appendix 3. Pits for dock levellers	23

1. MANUFACTURER’S DECLARATION OF CONFORMITY

Directive: Machinery Directive 2006/42/EC
Manufacturer: DoorHan
Address:
DoorHan-Europe: Czech Republic, Kadan 43201, Kralovsky VRCH 2018, phone: +420-474-319-111, www.doorhan.cz
DoorHan-China: China, Gucun Road 188, Xukou Road, Suzhou, 215164, phone: +86-0512-663-16-108, www.doorhan.cn
DoorHan-Russia: 143002, Russia, Moscovskaya obl., Odintsovskiy r-n, s. Akulovo, ul. Novaya, d. 120, phone: +7 (495) 933-24-00, 981-11-33, www.doorhan.com

Declares that the Product(s): Dock Leveller with Hinged Lip

Model DLHH, DLHHI: is in conformity with the essential health and safety requirements of the relevant EC directives and the applicable harmonized standards and is CE-marked

Relevant EC directive: EC Machinery Directive 2006/42/EC
Applied harmonized standards: DIN EN 1398 Dock levellers — Safety requirements
EN 349 Safety of machinery — Minimum gaps to avoid crushing of parts of the human body
EN 60204-1 Safety of Machinery — Electrical Equipment of Machines. General Requirements
EN ISO 12100-2010 Safety of machinery- General principles for design- Risk assessment and risk reduction

This declaration of conformance is not applied if:

- the Product is operated in the extreme climatic conditions, in the magnetic action environment etc, and in case of special requirements, e.g. explosion hazard;
- the Product is operated for loading/unloading of hazardous substances e.g. acids, radiation-emitting materials, molten metal, fragile freights;
- the risk arises caused through transport facilities (e.g. forklift etc).

2. GENERAL INFORMATION

The purpose of this manual is to give information to the operating personnel on correct procedures for installation, operation and maintenance of hinged lip dock leveler. The manual contains rules to observe for safe operation and maintenance of the dock leveller. The manufacturer does not handle the operation, maintenance and placement of the equipment. The operator is responsible for safe operation and maintenance of the equipment. It is the operator’s responsibility to study this manual prior to installation. The manufacturer assumes no liability for interpretation of the contents of this manual.
Dock levellers with hinged lip is designed to act as bridge between warehouse and truck body and to enable quick and unimpeded movement of forklift during loading/unloading.

Only qualified personnel can make installation, operation and maintainace for dock leveller.
We reserve the right to make design modifications without preliminary notice.

LIFTING EQUIPMENT

Fork lift: minimum carrying capacity 35 kN, fork length 2000 mm.
Crane: minimum carrying capacity 20 kN at the given radius.

EQUIPMENT FOR INSTALLATION

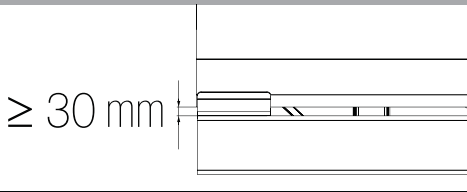
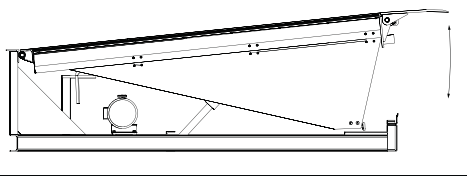
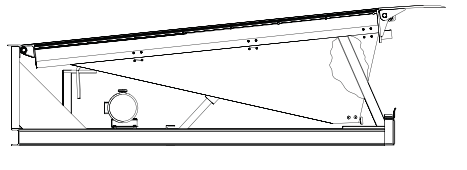
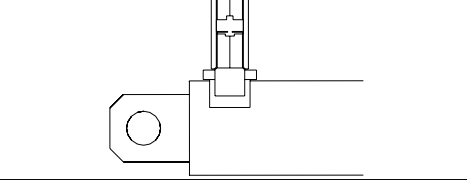
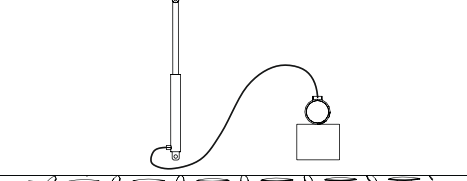
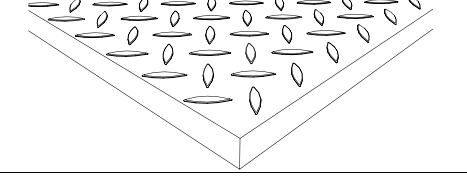
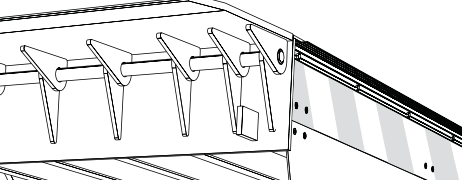

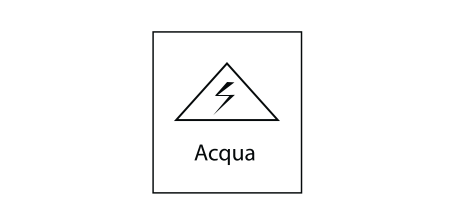
Before installation you should have following equipment:
welding machine (5-200 A) or similar;
welding electrodes 3,0 mm.

3. SAFETY RULES

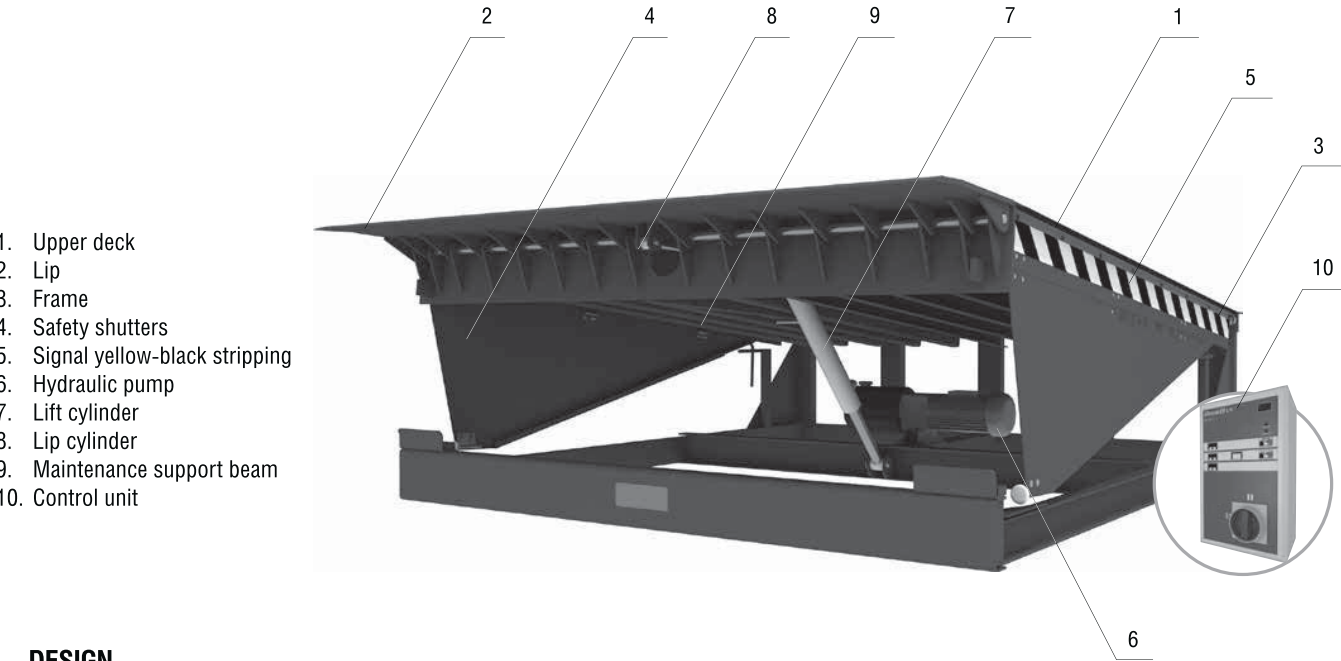


- The improper use is not allowed.
- Provide good lighting and visibility when operating the dock leveler.
- When operating the dock leveler, keep the operating zone free from people and obstacles.
- Watch closely when handling outsized, unstable or dangerous loads, and when the operating zone is not free from obstacles.
- When operating the dock leveler, be sure that the door is fully opened.
- Make sure that the truck has stopped in the required position. If there is a risk of truck departure fix it using a wheel block.
- Before loading/unloading, make sure that the dock leveller lip lies in the truck body correctly. The lip must overlap the truck bed by at least 85 mm.
- The dock leveller control unit must be placed so that the operator has full view of the operating zone and is able always to keep under control the whole process of loading/unloading.
- To prevent injury during installation, keep a safe distance from the dock leveller.
- Before connecting any wire be sure that the power supply is switched off.
- When not in use, the dock leveller should be in the rest position.
- Do not put the lip of dock leveller on the truck’s tail lift.
- Do not exceed the maximum allowable working angle 12.5% or 7°.

4. SAFETY FEATURES

	Minimum distance between lip and front (cross) beam set to 30 mm for finger protection.
	Rising/lowering speed less than 0.15 m/s.
	Maintenace support beam ensures safe maintenance and connection of wiring.
	Burst valve immediately stops upper deck in case of hose rupture.
	All hydraulic components designed to resist to a pressure at least double than declared one.
	The upper sheet of the dock leveller is made of diamond steel sheet to ensure the best bite of the forklift wheels and dock leveler's deck.
	Black/yellow safety marking allows to see that the platform is above the the ramp
	Noise level during operation of the dock leveller does not exceed 85 Db within a radius of 1 m.
	Protection rating is IP54.

5. GENERAL VIEW



DESIGN

Upper plate of the dock leveller is a 6–8 mm thick steel sheet with lentiform (diamond) riffling with height 0.5–2.4 mm. If loading/unloading is performed using a standard 4-wheel forklift with inflatable tyres, the dock leveller is manufactured with 6 mm thick sheet and riffling height 0.6–1.8 mm. If loading/unloading is performed using equipment with high point load (for example, electric pilers), the dock leveller is manufactured with 8 mm thick steel sheet with riffling height 0.8–2.4 mm. Small deformation of the dock leveller upper sheet is admissible, as it does not effect operation of the product. The lip is made of steel 12 mm thick sheet with diamond riffling height 1.2–3.6 mm. The reinforcement profiles can be made of flanged beams 100/120 mm or L-shaped profile 140×40×4 mm, the frame is made of channel bar 100/120 mm. If the profile length exceeds 3500 mm, the reinforcement profiles and the frame are made of flanged beams 120 mm.

PERFOMANCE

Load capacity	6000 kg (60 kN)/10 000 kg (10k N)
Maximal point load (upper sheet 6 mm)	1.3 N/mm ²
Maximal point load (upper sheet 8 mm)	6.5 N/mm ²
Motor hydraulic unit	1.1 kW
Power supply	380 V, 3 phase
Control voltage	24 V
Control unit protection class	IP54
Working fluid	Mobile VG46
Class of surface cleaning before painting	Sa 2
Thickness of painted layer	60–90 micron
Operation temperature range	From –30 to +50°C

WEIGHT OF DOCK LEVELLERS

Length, mm	2000	2500	3000	3500	4000	4500
Weight, kg	713	891	1029	1167	1361	1465

6. PACKAGE

1. Dock leveller	1	3. Operating manual	1
2. Control unit, connection cables*	1	4. Guarantee card	1

* Control unit is to be ordered separately depending on the required functions. For dock levellers with length up to 3 m, a 7 m long connection cable is required (art. DKHL02), for dock levellers with length exceeding 3 m, a 10.5 m long connection cable is required (art. DKHL02-1).

7. INSTALLATION

UNLOADING

GENERAL: Make the installation in accordance to all local safety regulations! The installation of the dock leveller must be carried out by the service department of DoorHan or by a service department/dealer recognized by DoorHan.

When installing the dock leveler in the pit, fix the lifting belts only in certain points.

Before installation some important point to be checked:

- Is protective pipe for cables made according to drawings?
 - Is the pit made according to drawing?
- See detailed drawing of the manufacturer.

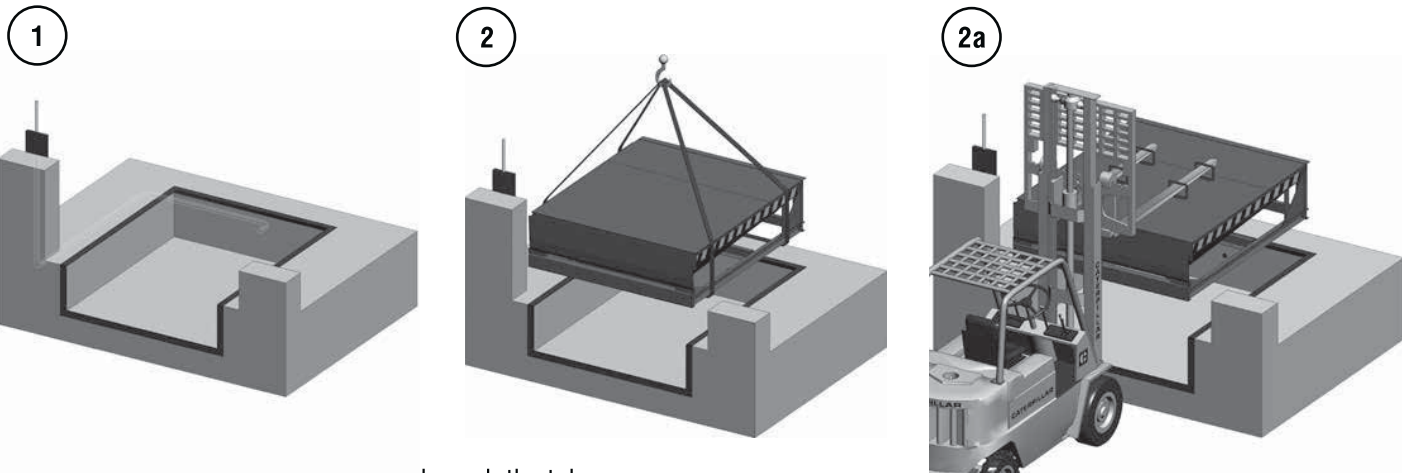
Unloading

Check the possible damages during transportation of dock leveler. Always transport and store the dock leveller in a horizontal position and in any case do not let it fall! At the same time allowed to pick up and unload only one dock leveller!

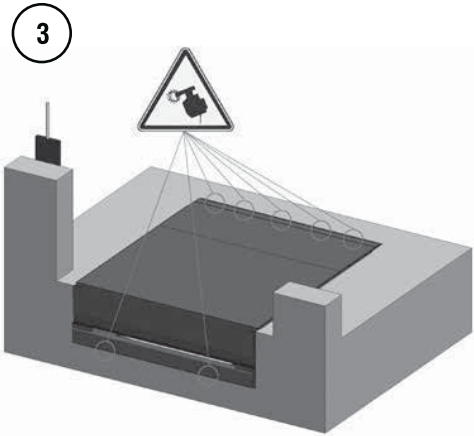
PIT PREPARATION

Before Installation the dock leveller, prepare the pit in strict accordance with the drawings that have been supplied by the manufacturer. Detailed information on dimensions, types of dock levellers and pits as well as recommendations on pit preparation is given in our engineering solution catalogue.

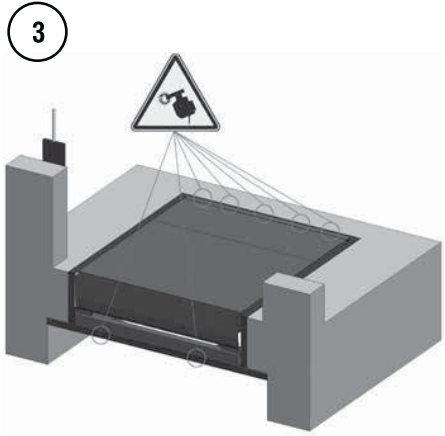
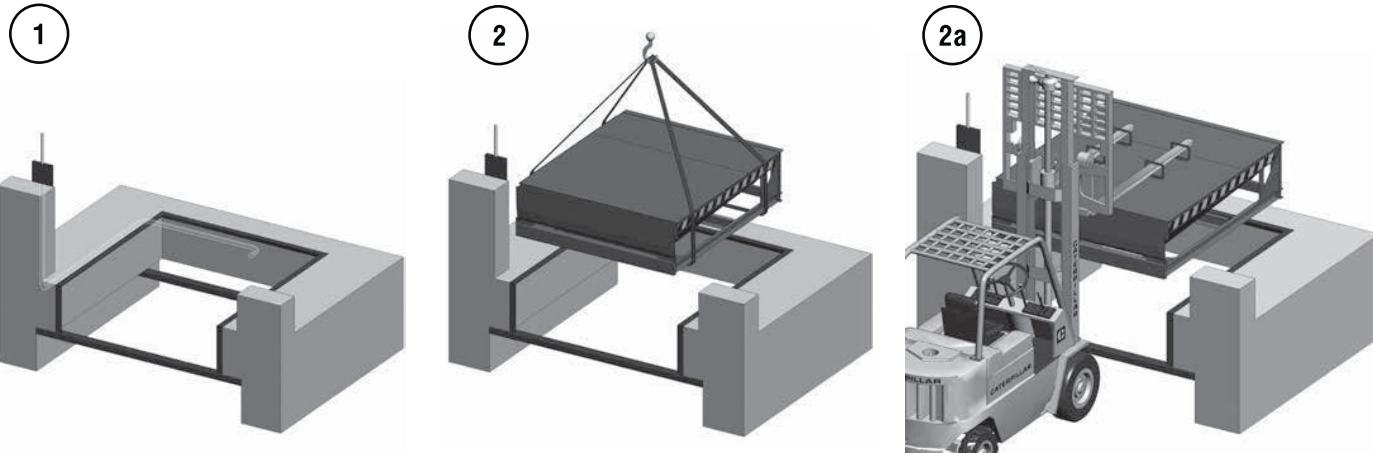
EMBEDDED MOUNTING WITHOUT TAIL LIFT RECESS



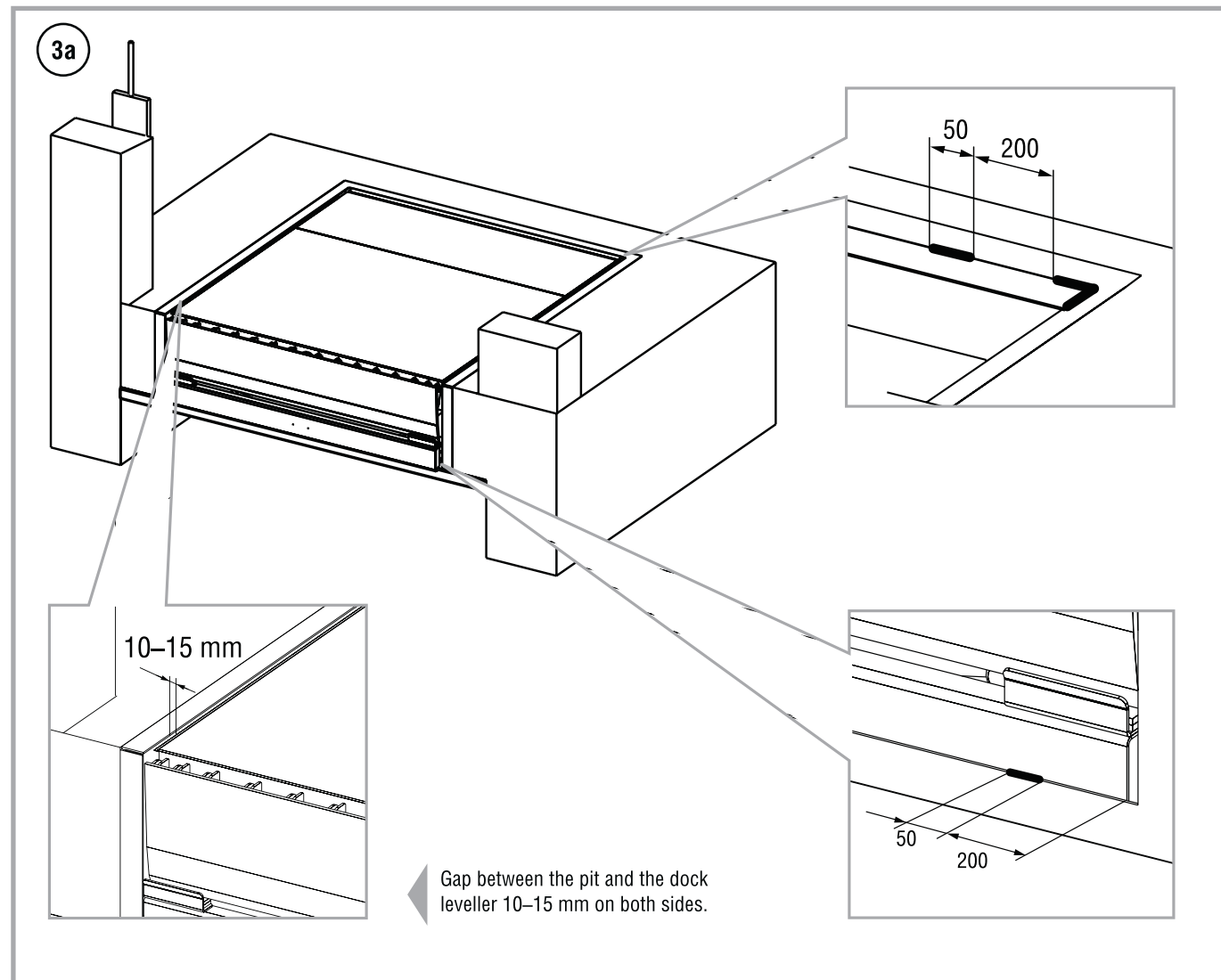
1. Stretch the connection wiring through the tube.
2. Install the dock leveler so that the rear corner of the dock leveller tightly adjoined to the rear upper fitting on the pit.
3. Longitudinal gaps between the pit and leveler should be 10–15 mm width.
4. Weld joints on the platform with the rear and front fittings on the pit as shown in Figure 3, 3a.



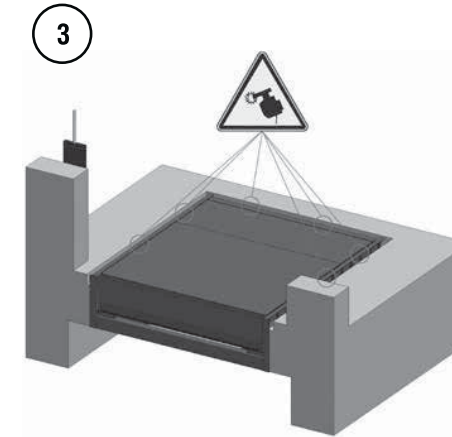
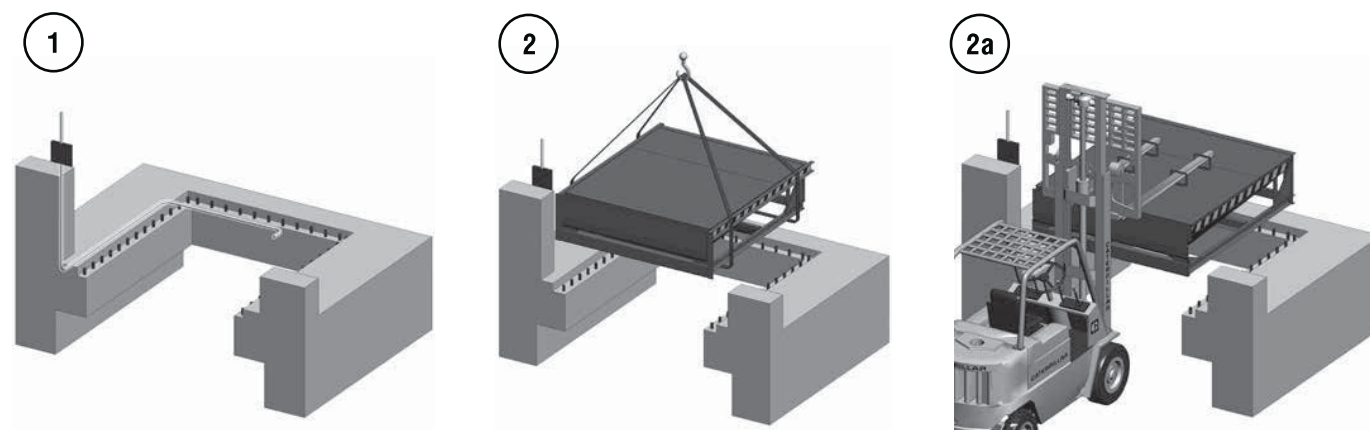
EMBEDDED MOUNTING WITH TAIL LIFT RECESS



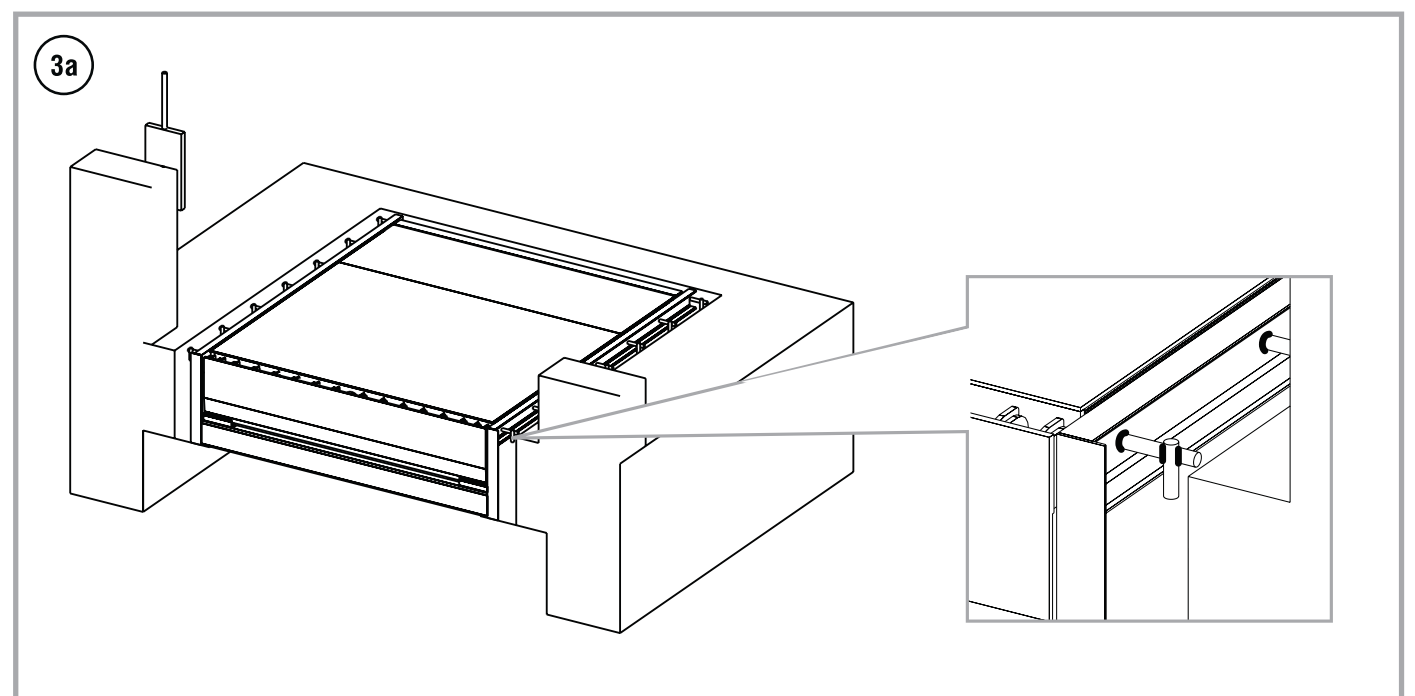
1. Stretch the connection wiring through the tube.
2. Install the dock leveler so that the rear corner of the dock leveller tightly adjoined to the rear upper fitting on the pit.
3. Longitudinal gaps between the pit and leveler should be 10–15 mm width.
4. Weld joints on the platform with the rear and front fittings on the pit as shown in Figure 3, 3a.



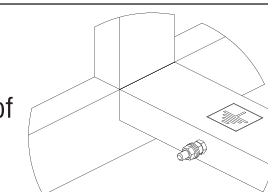
SUSPENDED MOUNTING



1. Stretch the connection wiring through the tube.
2. Install the dock leveller in the required position.
3. Connect the dock leveller external frame with fittings of concrete floor by welding. See Fig 3a.
4. Longitudinal gaps between the pit and leveller should be 10-15 mm width.
5. Underpour concrete.



Connect dock leveller steel structure to the grounding of the building!



CONTROL UNIT INSTALLATION



Control unit shall be installed so, that the dock leveller operator is always able to keep under control the operation of the dock leveller.

8. OPERATION

Connect the control unit to the dock leveller following the instructions given in the control unit manual. Complete 4–5 full opening/closing cycles, make sure that the dock works properly.

When operating the dock leveller, do observe the following rules:



Never operate the dock leveller when persons, goods are on it or in front of it.

The lip of the dock leveller must be placed in the truck body in full width and has sufficient support at least 85 mm.

Do not exceed declared load capacity. Load capacity agrees with total weight of the forklift with load and the driver.

It is strictly forbidden to operate the dock leveller with the load.

When not operated (after loading/unloading has been completed), the dock leveller should be back in rest position.

When loading/unloading, do not switch off control unit.

Emergency stop function integrated into the main switch. Use this function ONLY in case of emergency. It may not be used during loading/unloading, as the dock leveller is unable to follow the vertical movements of truck which could lead to damage of hydraulic system.

- Place the truck with door open correctly in front of dock leveller. Fix the track to avoid it's unwanted departure.
- Set the main switch in position «I». Press button «Up» and keep it pressed until the upper deck has reached the highest position and the lip is completely open. Release the button, upper deck with open lip lowers under gravity until the lip rests on the truck bed.
- Once loading or unloading is completed, return the dock leveller to the parked position at platform level. Keep the «Up» button pressed until the lip has cleared the loading track and the deck is at least 100 mm higher than floor level, then release the button. If the truck drives away without first parking the leveller, there should be no persons, fork lifts e.t.c. on the dock leveller. The deck descends to the lowest position and the lip turns in the vertical position. Press the «Up» button until the deck is approx. 100 mm above the floor level and then release the button. The dock leveller will descend to the rest position.

9. MAINTENANCE

WARNING NOTICE!



Do not enter under this platform unless it is mechanically locked.

ATTENTION!

Before maintenance, the dock leveller must be fixed in raised position using a maintenance support beam.

Maintenance frequency depends on the particular conditions of the operation.

When servicing the dock leveller, always check:

1. Signal yellow-black stripping on right/left side: the possibility of perception.
2. Supporting structure: a state of welds, reinforcement profiles, joints, rollers, hinges and corrosion.
3. Electrical Equipment:
Control unit: the state, work, smooth running, protection from unauthorized and erroneous command input.
Emergency switch: designation, the state, work, smooth running.
Wires: damage, mounting, protection from the tension.
Limit switches: the state, work (if presented).
4. Hydraulic system and hydraulic equipment: tightness, hydraulic fluid, hose connections, mounting, injury, deformity, corrosion.
Hoses and hose couplings: fixing, the damage, brittleness.
Cylinders: mounting, crack, the state of connections of hoses, the state of the surface of the piston rod.
5. Safety devices
Safety shatters work. Door limit switch work (if presented).

Hydraulic fluid changing :

1. Remove the main cylinder from upper deck and truss.
2. Push lifting cylinder manually, hydraulic fluid back into the tank.
3. Remove the hose from lifting cylinder and put it into a suitable vessel.
4. Press the «Up» button, so that fluid can flow from the tank to capture vessel.
5. Once the fluid begins to splash, release the button and fill fresh fluid into the tank. When filling another type fluid, first rinse tank is a new hydraulic fluid (as described above).
6. Mount the hose on the cylinder back.

Venting:

1. Put lifting cylinder vertically (hose nipple from above) and push «Up» button, the fluid will flow into the cylinder.
2. Push lifting cylinder manually, hydraulic fluid back into the tank.
3. Repeat the last 2 operation 2 or more times so that the fluid completely out of air.
4. Adjust the throttle valve to have lowering speed not more than 150 mm/s.
5. Provide the same operation with lip cylinder.
6. Check the dock leveller works properly.

REGULAR INSPECTION/SERVICE

General	— Inspection for visible damage	Daily
General	— State of the welds — State of reinforcement profiles — Rust — Safety shatters working	1 time in 6 months More often if necessary
Joints	— State of joints and lubrication (Lithol-24)	1 time in 6 months More often if necessary
Hydraulic system	— State of hydraulic system — Leaking — Checking hoses and cylinders damage (cracks, corrosion)	Once a year More often if necessary
Electrical Connections	— Inspection of all electrical connections	1 time in 6 months More often if necessary
Working fluid	— Level of working fluid — Changing of working fluid 1 time in two years	Monthly More often if necessary

10. TROUBLESHOOTING

Problem	Possible cause	Remedy
Dock leveller is not raised (the motor is not running)	No mains supply	Check the electrical cables
	Blown main power fuse	Change fuse in control unit
	Incorrect phasing of the power pack electric motor	Change any two incoming main power phase in the control unit
	Safety (limit) switch with door	Check safety (limit) switch
Dock leveller is not raised (the motor is running)	There is no working fluid in the hydraulic system, or it is not enough	Check working fluid level with the dip-stick, fill it in if necessary
	There is a load on the dock leveller	Remove the load from dock leveller
	Cylinder or hose damaged-	Replace damaged components of the hydraulic system
	Misaligned flow control valve	Check the settings of flow control valve
	Misaligned relief valve	Check the settings of relief valve
Rising speed is too slow	Low phase voltage	Check electrical connections and voltage phase
<div>Front hinges contaminated</div>	Leaking fluid	Find and fix the leak
	Misaligned relief valve	Check the settings of relief valve
Dock leveller does not rise to the required height	Low fluid level in power pack tank	Fill the fluid to normal level
	Unauthorized object or rear hinges without lubrication	Remove unauthorized object, lubricate joints
	Misaligned relief valve	Check the settings of relief valve
Lip opens before deck rises	Misaligned sequence valve	Check the operation and settings the sequence valve
Lip doesn't open	Front hinges contaminated	Clean the hinges, lubricate with LITOL-24
	Misaligned sequence valve	Check the operation and settings the sequence valve
	Lip cylinder damaged	Replace cylinder
Lip drops when deck is in highest position	Burst valve in the main cylinder is blocked	Press the "Up" button briefly Check and ajust burst valve on the lifting cylinder
	Working fluid viscosity is too high	Change working fluid
Lip drops when loading/unloading is completed.	There is air into lip cylinder	Vent lip cylinder. See section 8 «Venting»
The dock leveler does not lower	The oil backflow valve is damaged	Replace the valve (2).
	The solenoid coil is damaged	Replace the solenoid coil (5).
	The flow control valve is misadjusted	Check the flow control valve adjustmen (1).
	The hose break safety valve is blocked	Check and adjust the valve in the main cylinder
	Burst valve blocked	Check and ajust burst valve on the lifting cylinder
Lip does not move to rest (vertical) position	Front hinges contaminated	Clean the hinges, lubricate with LITOL-24
	Lip cylinder damaged	Replace cylinder

APPENDIX 1

SPARE PARTS

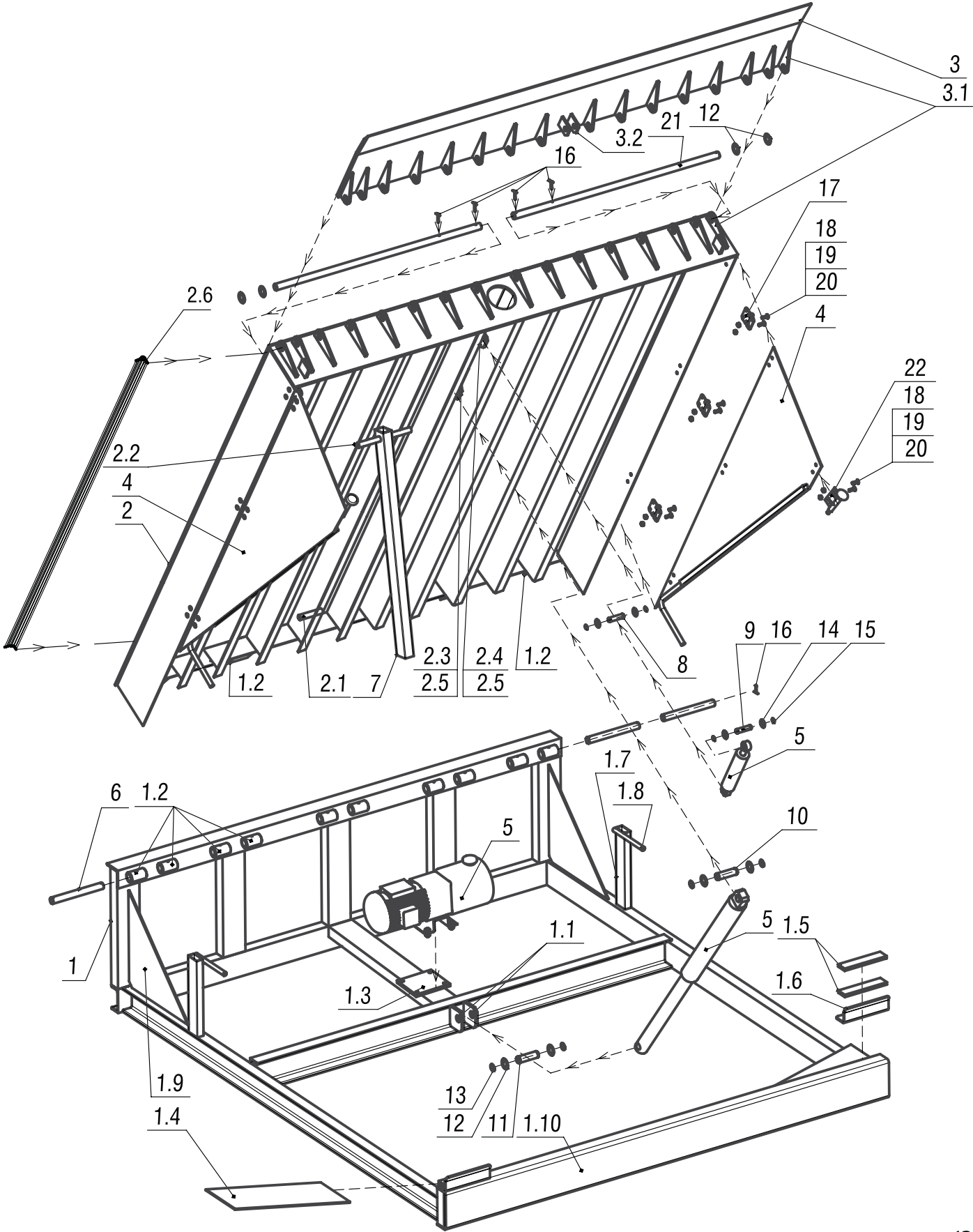


Table 1

TRUSS

Pos.			Dock leveller length, mm					
			2000	2500	3000	3500	4000	4500
1	Dock leveller width, mm	1800	DLHHIE2181	DLHHIE25184	DLHHIE3181	DLHHIE35181	DLHHIE4181	DLHHIE45181
		2000	DLHHIE221	DLHHIE2521	DLHHIE3021	DLHHIE3521	DLHHIE4021	DLHHIE4521
		2200	DLHHIE2221	DLHHIE25221	DLHHIE3221	DLHHIE35221	DLHHIE4221	DLHHIE45221

Table 1.1

BEVEL, STEEL TUBE

Pos		Dock leveller length, mm					
		2000	2500	3000	3500	4000	4500
1.4	Bevel	HDLHL02.406-06			HDLHL02.406-02	HDLHL02.406-04	
1.7	Steel tube 50×25×2,5 mm	L = 350 mm				L = 365 mm	

Table 1.2

CROSS BEAM

Pos.		LIP 400 mm		
1.10	Cross beam for dock leveller lengths, mm: 2000, 2500, 3000, 3500	HDLHM020110-1	HDLHM020110-2	HDLHM020110-3
	Cross beam for dock leveller lengths, mm: 4000, 4500	HDLHL09.101-3	HDLHL09.101-4	HDLHL09.101-5
3	Aeticle of Lip	HDLHL0103	HDLHL0203	HDLHL1103
		LIP 500 mm		
1.10	Cross beam for dock leveller lengths, mm: 2000, 2500, 3000, 3500	METT169 L = 1800	METT169 L = 2000	METT169 L = 2200
	Cross beam for dock leveller lengths, mm : 4000, 4500	HDLHM020110-1	HDLHM020110-2	HDLHM020110-3

Table 2

UPPER DECK

Pos.			Dock leveller length, mm					
			2000	2500	3000	3500	4000	4500
2	Dock leveller width, mm	1800	DLHHIE2183	DLHHIE25183	DLHHIE3183	DLHHIE35183	DLHHIE4183	DLHHIE45183
		2000	DLHHIE223	DLHHIE2523	DLHHIE3023	DLHHIE3523	DLHHIE4023	DLHHIE4523
		2200	DLHHIE2223	DLHHIE25223	DLHHIE3223	DLHHIE35223	DLHHIE4223	DLHHIE45223

Table 3

LIP

Pos.		LIP 400 mm		
		1800	2000	2200
3	Lip	HDLHL0103	HDLHL0203	HDLHL1103
		LIP 500 mm		
		HDLHL0205	HDLHL0206	HDLHL0207

Pos.	Name	Article
1	Truss	See table 1
1.1	Loop	HDLHM01.112
1.2	Bushing 27×40×69 mm	HDLH02.102
1.3	Mount	HDLHL02.104
1.4	Bevel	See table 1.1
1.5	Lip installation mount	HDLHL02.112
1.6	Catcher	HDLHM 02.105
1.7	Steel tube 50×25×2,5 mm	See table 1.1
1.8	Shutter stop	HDLHL02.404
1.9	Gusset	HDLHL02.103
1.10	Cross beam	See table 1.2
2	Upper deck	See table 2
2.1	Hook	HDLHL02.210
2.2	Bar	HDLHL02.209
2.3	Loop	HDLHLM02.210
2.4	Loop	HDLHLM02.209
2.5	Loop base	HDLHLM25.22211
2.6	Side seal	See table 6
3	Lip	See table 3
3.1	Hinge	HDLHL02.205-1
3.2	Loop	HDLHLM01.302
4	Right/left shutter in assembly with roller	See table 4
5	Hydraulic drive in assembly	See «Hydraulic components DLHHI serie»
6	Clevation axis	HDLHLD01
7	Maintenance support beam	HDLHLM107
8	Axis 16×55 mm	HDLHLM02.03
9	Axis 16×68 mm	HDLHLM02.04
10	Axis 25×68 mm	HDLHLM02.02
11	Axis 25×91 mm	HDLHLM02.01
12	Washer 26×47 mm	HDLHLD05
13	Closing ring Φ25 external	DHM0320
14	Washer 16×30 mm	DHM0310
15	Closing ring Φ16 external	DHM0337
16	Cotter pin 4×40 mm	DHM0401
17	Internal hinge	25233
18	Screw M6×20 DIN965	DHM0624
19	«Stainless Nylon Insert Lock Nut M6 DIN985»	DHM0230
20	Lip axis	See table 5
21	Roller in assembly right/left	HDLHL-2.820/HDLHL-2.920

Table 4

RIGHT/LEFT SHUTTER IN ASSEMBLY WITH ROLLER

Pos.		Dock leveller length in mm					
		2000	2500	3000	3500	4000	4500
4	Right/left shutter in assembly with roller	DLHHIE222-1/ DLHHIE222-2	DLHHIE2522-1/ DLHHIE2522-2	DLHHIE322-1/ DLHHIE322-2	DLHHIE3522-1/ DLHHIE3522-2	DLHHIE422-1/ DLHHIE422-2	DLHHIE4522-1/ DLHHIE4522-2

Table 5

LIP AXIS

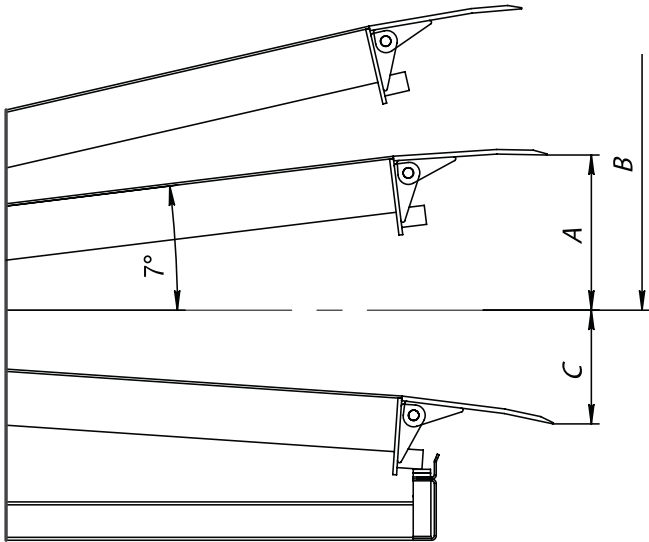
Pos.		1800	2000	2200
21	Lip axis	HDLHL_B18D02-R	HDLHL_B20D02-R	HDLHL_B22D02-R

Table 6

SIDE SEAL

Dock leveller length, mm	2000	2500	3000	3500	4000	4500
Code	OE.DL03-1	OE.DL03-2	OE.DL03-3	OE.DL03-4	OE.DL03-5	OE.DL03-6

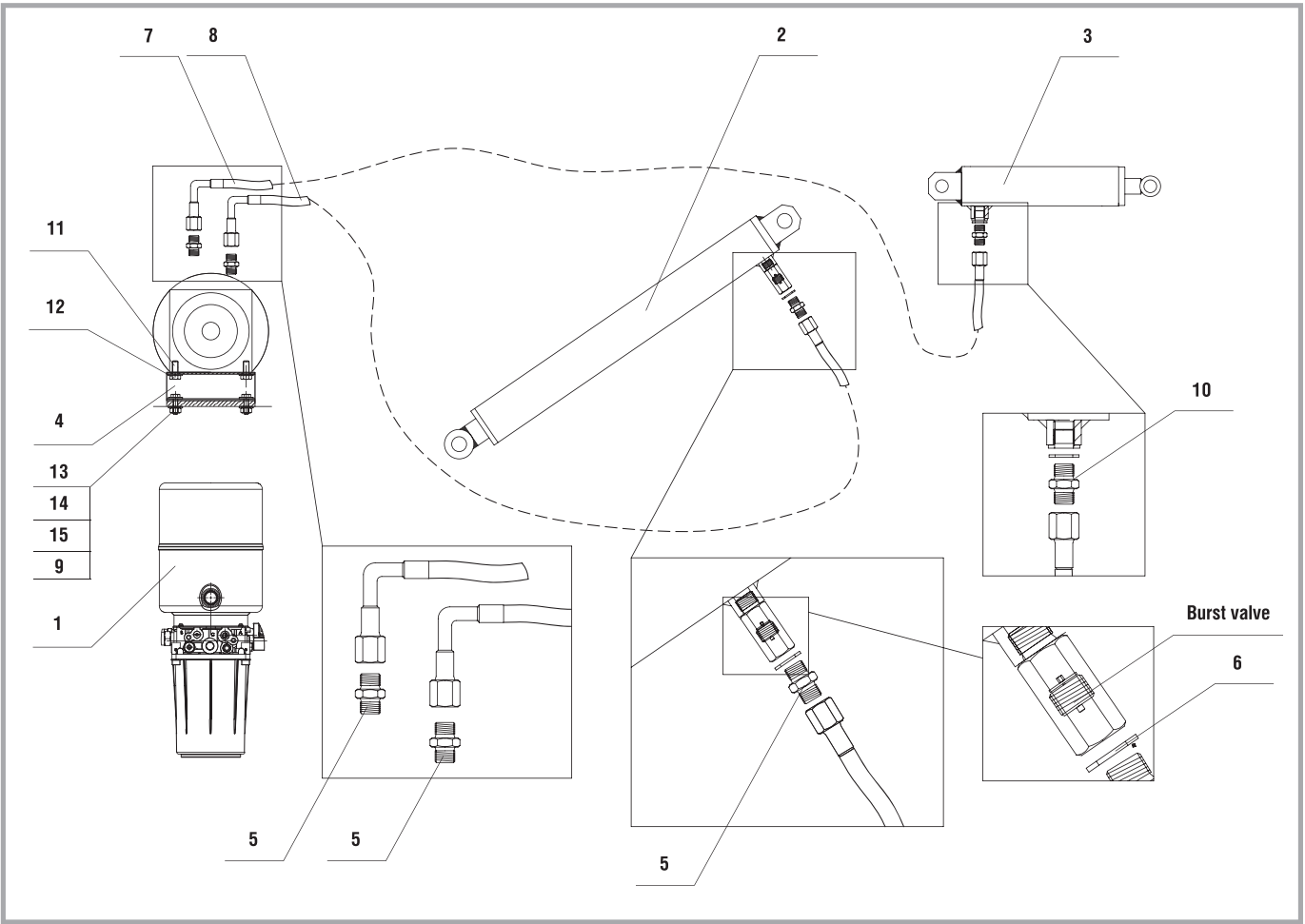
OPERATING RANGE



DLHHI		L, mm					
		2000	2500	3000	3500	4000	4500
7	A,mm	225	285	345	405	465	525
Above	B,mm	625	675	730	785	855	915
Below	C,mm	315	305	300	295	380	380

APPENDIX 2

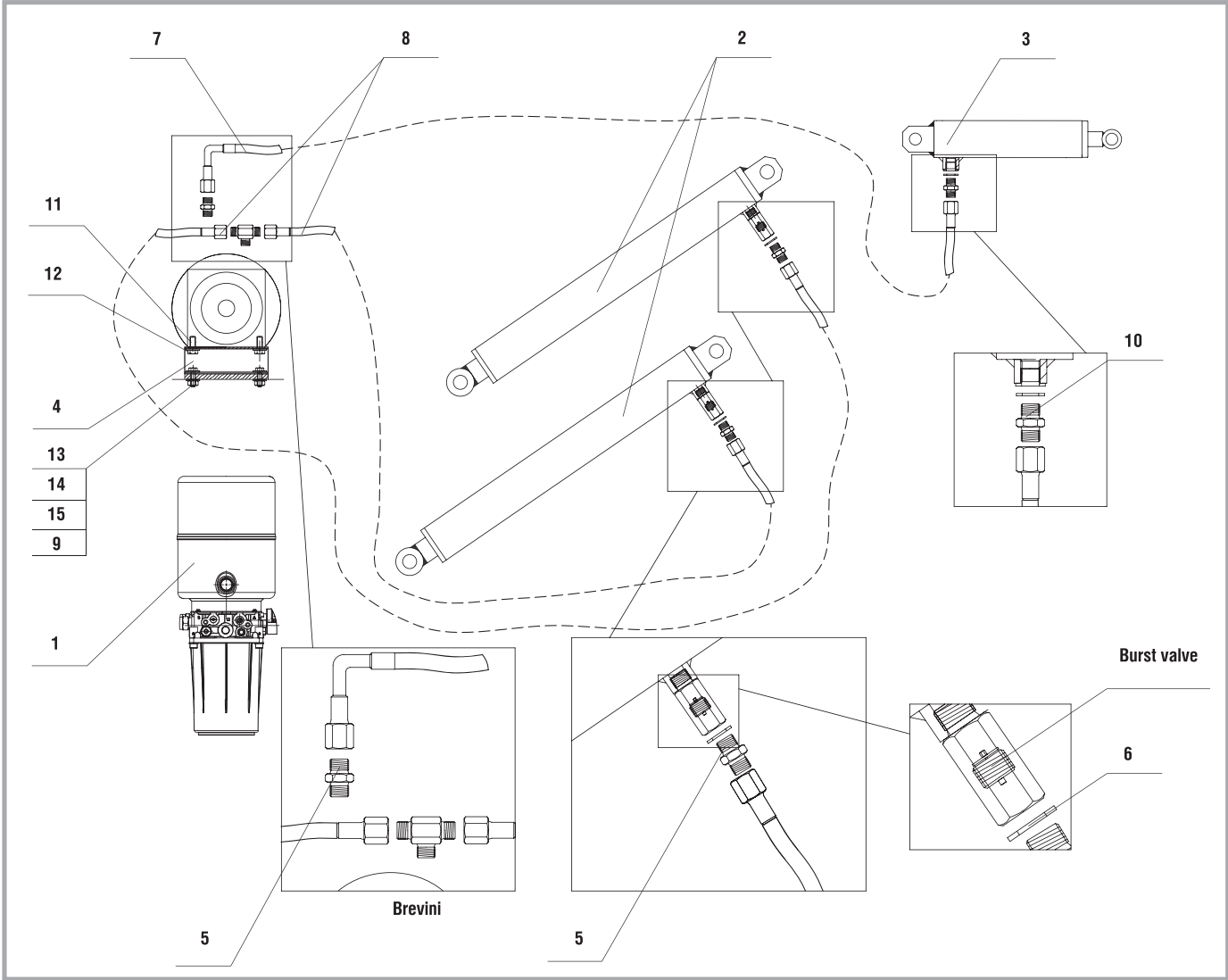
HYDRAULIC DRIVE FOR DOCK LEVELER WITH ONE LIFTING CYLINDER



Complete set article:
DKHL010102-2

№	Description	Article
1	Hydraulic pump	MK1-PF/7
2	Lift cylinder	XE52380HM
3	Lip cylinder	XE52370HM
4	Hydraulic station bracket	HDLHLD06
5	Fitting	RV301.0604
6	Copper washer 19×13×1.5 1/4»	GAR1300000
7	Hydraulic hose L = 1500 mm	V0014-1500
8	Hydraulic hose L = 2000 mm	V0014-2000
9	Washer 8×16	DHM0301
10	Fitting	RV301.0604
11	Bolt M10×25	DHM0104
12	Spring washer 10	DHM0308
13	Spring washer 8	DHM0305
14	Nut M8	DHM0210
15	Bolt M8×25	DHM0131
	Hydraulic drive assembly	DKHL010102-2

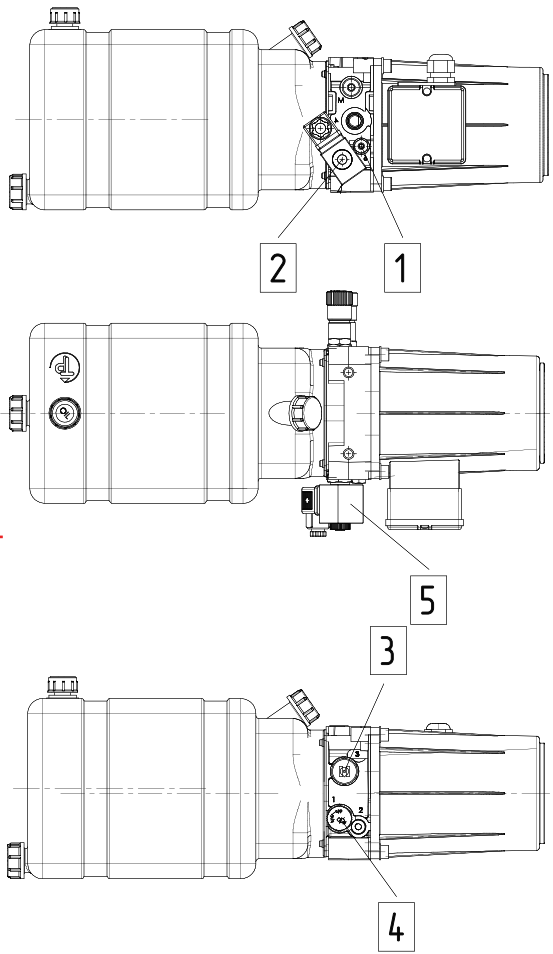
DOCK LEVELER WITH TWO LIFTING CYLINDERS



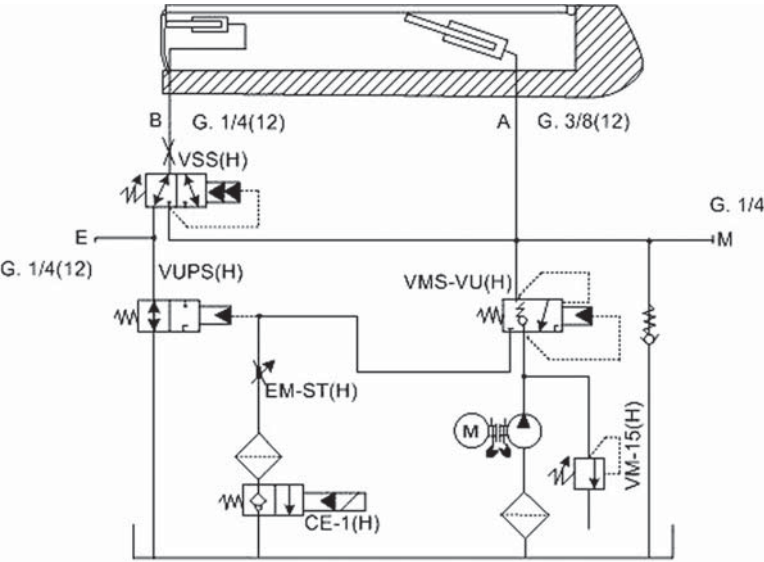
Complete set article:
DKHL010102-8

Nº	Description	Article
1	Hydraulic pump	MK1-PF/7
2	Lift cylinder	XE523000090HFR1
3	Lip cylinder	XE52370HM
4	Hydraulic station bracket	HDLHLD06
5	Fitting	RV301.0604
6	Copper washer 19×13×1.5 1/4»	GAR1300000
7	Hydraulic hose L = 1500 mm	V0014-1500
8	Hydraulic hose L = 2000 mm	V0014-2000
9	Washer 8×16	DHM0301
10	Fitting	RV301.0604
11	Bolt M10×25	DHM0104
12	Spring washer 10	DHM0308
13	Spring washer 8	DHM0305
14	Nut M8	DHM0210
15	Bolt M8×25	DHM0131
	Hydraulic drive assembly	DKHL010102-8

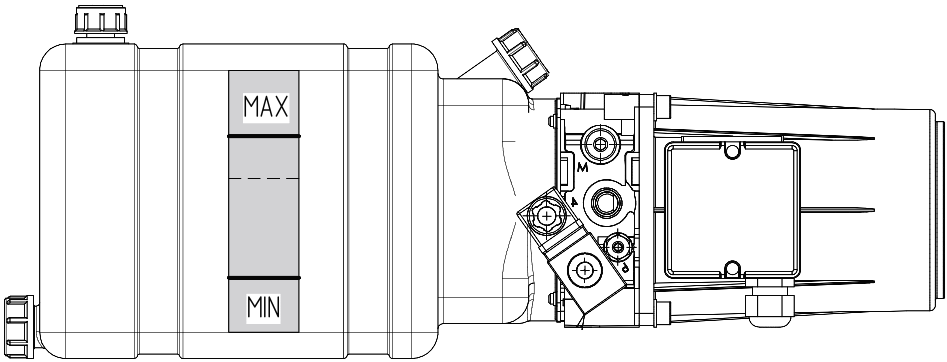
HYDRAULIC POWER PACK



Pos	Article	Item
1	27000032.000	Flow control valve
2	20024800	Catrige solenoid valve
3	27000019.000	Catrige solenoid valve 3/2
4	27000020.000	Relief valve
5	M14000009	Coil 21,6 VDC.



HYDRAULIC FLUID LEVEL



~~Working fluid: Mobil Unavis HVI 26 or analogue
V = 4.0 Lt~~

[illegible][illegible]

[illegible][illegible]

DoorHAN[®]

Suzhou Doorhan Modern Metals & Materials Co., Ltd.

Add: No.5188,Baodai West Road,XuKou Town,Suzhou,215164,P.R.China

Tel: +86(512)66316108 66316111

Fax:+86(512)66316107

E-mail: sales.suzhou@doorhan.com

www.doorhan.cn