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Operating instructions

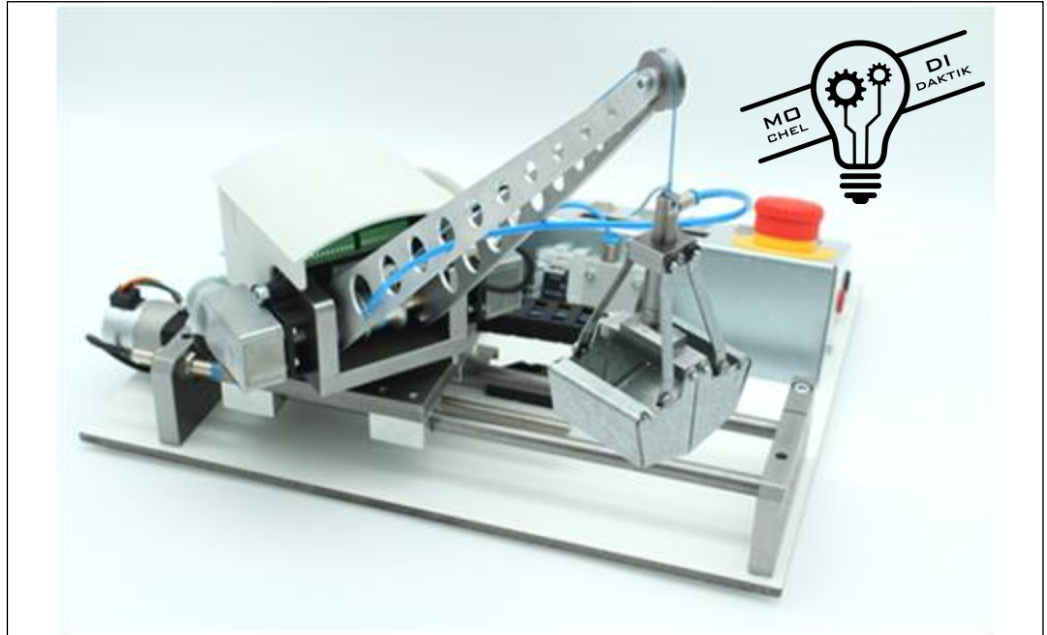


Fig. 1: Mounted slewing jib crane (14010-99)

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1 SAFETY PRECAUTIONS



Caution!

- Read the operating and assembly instructions carefully and completely before assembling the slewing jib crane. This will protect you and prevent damage to your kit.
- Do not put the kit into operation if any damage is visible.
- Watch out for sharp-edged objects, especially raw materials!
- Ensure that the components are complete according to the parts list.
- After completion, only connect the slewing jib crane to a properly installed 24 VDC power source that is protected by a 5 amp fuse.
- If you use an extension cable to connect the device, make absolutely sure that the extension cable is properly earthed and fitted with the standard national plugs. Incorrect extension cables can lead to injuries and damage to the appliance.
- Always switch off the slewing jib crane using the emergency stop switch and disconnect the power supply before carrying out maintenance or repairs. Observe the corresponding operating instructions in the electrical and mechanical installation instructions.

2 PURPOSE AND CHARACTERISTICS

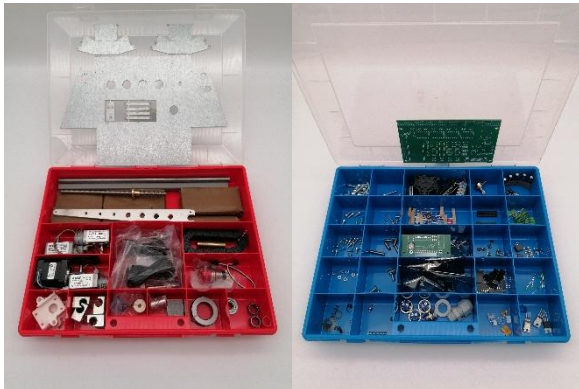
Purpose: The project teaches vocationally relevant basics of metalworking, electrical engineering and automation technology through the construction of a jib crane. It prepares trainees specifically for the examination by teaching practical knowledge and skills that correspond to the examination.

Features:

- Modular design: The construction of the slewing jib crane is divided into individual modules that can be worked on step by step.
- Microcontroller control: The slewing jib crane is equipped with a powerful microcontroller that enables control without a PLC and offers interfaces such as WLAN and Bluetooth.
- Flexibility: A connection to PLCs or other control systems is possible in order to realise further projects.
- Complete package: Contains all the necessary materials such as standard parts, semi-finished products, circuit boards and electric drives for construction.
- Digital media library: Includes drawings, assembly instructions, videos, web interface, as well as control and evaluation sheets to support the learning process.
- Practice-orientation: The linear axis corresponds to that in the final mechatronics technician examination to enable targeted learning.

This project provides trainees with a structured and practice-orientated learning environment that conveys technical challenges and optimally prepares them for their professional future.

3 SCOPE OF DELIVERY



1. Raw material (unprocessed semi-finished product) and material set in red assortment box
2. Electronics and standard parts material set in blue assortment box
3. Base plate HPL white (not on the picture)

Exact contents See parts list in the appendix

4 NOTES ON OPERATION

The kit fulfils the technical requirements summarised in the current directives of the European Community. The product characteristics authorise CE marking.

The operation and construction of this kit is only permitted under expert supervision in a controlled electromagnetic environment in research, teaching and training centres (schools, universities, institutes and laboratories).

The exact sequence and settings of the installation instructions must be observed.

The following measures reduce or eliminate the disturbing influence:

Avoid carpeted floors; ensure potential equalisation; install on a conductive, earthed surface, use insulated cables.

5 HANDLING

This section describes the handling of the kit. Please read this section carefully and observe the safety and operating instructions.

5.1 Handling the kit

- 1) Remove the black conveyor belt with suitable scissors.
- 2) Open the assortment boxes and check the components against the parts list.
- 3) Check all raw materials (semi-finished products) for the correct length
- 4) Start manufacturing the components according to the drawing and assembly instructions.
- 5) Once all components have been manufactured, start producing the circuit boards and wiring.
- 6) Always follow the assembly instructions for the electrical system.
- 7) Once all components have been completed, start adjusting the motor drivers.
- 8) Now start commissioning.



Make sure that you never leave the slewing jib crane running unattended and in continuous operation. This can otherwise lead to the motors overheating.

5.2 Transport

When transporting the parts of the kit, always ensure that the lid is closed so that the parts cannot fall over. Be careful not to damage the sheet metal parts and the HPL base plate with sharp edges.

5.3 Care and maintenance



Make sure that the slewing jib crane is switched off and the mains plug is disconnected before you start cleaning.

Clean the guides, steel parts and sheet metal parts with a dry cloth and, if necessary, with a little oil. Do not touch the electronic components. Clean them with low pressure compressed air. Do not use cleaning agents that contain organic solvents such as alcohol or acetone. Lubricate the bearings and guides regularly with plain bearing grease.

6 TECHNICAL DATA

Operating temperature range: 5 - 40°C

Relative humidity < 80%.

Dimensions and weight (kit):

Height:	1255 mm
Width:	298 mm
Length:	370 mm
Weight:	8,8 kg

Power requirements (Finished slewing jib crane):

Maximum power consumption: 72 VA
Input voltage: 12-24VDC
Input current: max. 3A
Fuse: 3A Slow

7 WARRANTY INFORMATION

We guarantee the kit supplied by us for 24 months within the EU and for 12 months outside the EU. Excluded from the guarantee are Machined and processed components, damage caused by non-compliance with the operating instructions, improper handling or natural wear and tear.

8 DISPOSAL

The packaging mainly consists of environmentally-friendly materials that should be returned to the local recycling stations.



Do not dispose of this product with normal household waste. If this unit needs to be disposed of, please return it to the address that is stated below for proper disposal





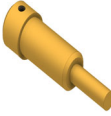






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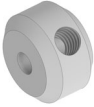




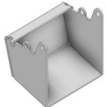


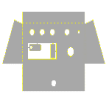




Stückliste Schwenkkran




Part List Swing Crane

25.03.2025

Bild	Stück	Bauteilnummer	Beschreibung	Din Bez./ Rohmass	X
	1	10001-02	A1 Grundplatte Turm	S235JRC+C 80x10x82	
	2	10002-01	A1 Stehlager	S235JRC+C 40x10x82	
	1	10003-01	A1 Antriebsflansch links	11SMn30 D25x19	
	1	10004-01	A1 Antriebsflansch rechts	11SMn30 D25x27	
	1	10005-01	A1 Antriebswelle	CuZn40 D14x37	
	1	10010-01	A2 Distanzstück	11SMn30+C D5x11	
	1	10011-01	A2 Antriebsrolle	11SMn30+C D20x30	
	1	10012-01	A2 Umlenkrolle	11SMn30+C D20x11	
	1	10017-01	Grundplatte	S235JRC+C 80x10x112	
	1	10018-01	Lagerbock links	S235JRC+C 50x12x102	
	1	10019-01	Lagerbock rechts	S235JRC+C 50x12x102	

	1	10020-01	Spindelmutterflansch	S235JRC+C 25x10x23	
	2	10021-01	Führungsstange	11SMn30 D10x320	
	1	10022-01	Lagerbolzen Turm	11SMn30 D25x45	
	1	10023-01	Zentrierring	11SMn30 D25x12	
	4	10024-01	Platinendistanzstück	11SMn30+C D6x27	
	1	10025-01	Berührungsschutz	Polycarbonat	
	1	10026-01	Positionierplatte	HPL	
	4	10027-01	Greifer Sicherungsbolzen	11SMn30+C D5x7	
	1	10028-01	Greiferhalter	S235JRC+C	
	1	10029-01	Greiferumlenkung	S235JRC+C	
	1	10030-01	Greifer Zylinder	11SMn30+C D10x47	
	1	10031-01	Greifer Zylinderdeckel	11SMn30+C D10x8	
	1	10032-01	Greifer Kolben	11SMn30+C D6x46	

	1	10033-01	Seilstopper	11SMn30+C D10x6	
	1	10045-01	Maschinenleuchte	AlCuMgPb D25x142	
	1	10046-01	Maschinenleuchte Glas	Polycarbonat 110x20x2	
	2	20001-01	A2 Ausleger	AlMg3	
	1	20002-01	Schleppkettenhalter	DC01 / vorgelasert	
	2	20003-01	Greiferschale	Laserteil DC01	
	4	20004-01	Greiferarm	Laserteil DC01	
	1	20005-01	Seilführung	AlMg3	
	1	20006-01	Bedienteil Blech	DC01 / vorgelasert	
	13	30001-01	Innensechskantschraube	DIN 912 - M5 x 20	
	8	30002-01	Innensechskantschraube	DIN 912 - M4 x 10	
	21	30003-01	Innensechskantschraube	DIN 912 - M3 x 6	
	5	30004-01	Gewindestift	DIN 913 - M3 x 4	

	3	30005-01	Zylinderstift	DIN 7979 - 5 x 16	
	3	30006-01	Innensechskantschraube	DIN 912 - M5 x 30	
	2	30007-01	Gewindestift	DIN 913 - M5 x 10	
	4	30008-01	Senkkopfschraube	ISO 10642 - M5x12	
	2	30009-01	Senkkopfschraube	ISO 10642 - M3x10	
	11	30010-01	Sechskantmutter	ISO 4032 - M3	
	1	30011-01	Sicherungsring für Wellen	DIN 471 - 10x1	
	1	30012-01	Tellerfeder	DIN 2093 10 x 1,55	
	6	30013-01	Senkkopfschraube	DIN 7991 - M3x12	
	2	30014-01	Sechskantschraube	DIN 933 - M3 x 20	
	4	30015-01	Spannstift	ISO 8752 - 3 x 10	
	6	30016-01	Sicherungsscheibe	DIN 6799 - 2,3	
	1	30017-01	O-Ring	NBR 1,5 x 3	

	1	30018-01	Zylinderstift	ISO 2338 - 5 x 24	
	2	40001-01	Nadellager	HK1210	
	1	40002-01	A2 Seil	Schnur D1	
	1	40003-01	Flanschlager	F-6900 ZZ	
	1	40004-01	Axialkugellager	51105 - 25x42x11	
	4	40005-01	drylin Linearlager	WJ200UM-01-10	
	1	40006-01	Pneumatikanschluss	133001_QSM-M3-3-I-R	
	1	40007-01	Druckfeder	5,7 x 25 x 0,8	
	1	40008-01	Trapezgewindemutter	Tr8x8 P2,66	
	1	40009-01	Trapezgewindespindel	Tr8x8 P2,66	
	1	40010-01	Wellenkupplung	5x8	
	1	50002-01	Kabine	3D Druck PLA	
	3	50003-01	Motoradapter	3D Druck PLA	

	1	60001-01	Steuerungsplatine V2.0	unbestückt	
	9	60002-01	Kohleschicht Widerstand	0207 10kOhm	
	3	60003-01	Kohleschicht Widerstand	0207 1,5 kOhm	
	3	60004-01	Kohleschicht Widerstand	0207 220 Ohm	
	5	60005-01	Kohleschicht Widerstand	0207 680 Ohm	
	8	60006-01	Buchsenleiste	8 Pin	
	2	60007-01	Buchsenleiste	6 Pin	
	2	60008-01	Buchsenleiste	15 Pin	
	1	60009-01	Socket	28 Pin	
	3	60010-01	MOSFET TO220	IRLZ34N	
	6	60011-01	LED 3mm 2mA	KBT_L-7104LGD	
	1	60012-01	MCP23017	MCP23017	
	2	60013-01	DC/DC Wandler	TSR1 2450E	

	1	60014-01	PTC-Sicherung	FRU250-30F	
	2	60015-01	PTC-Sicherung	FRX030-60F	
	1	60016-01	D-Sug Buchse	15-polig gewinkelt	
	7	60017-01	Schraubklemme	2,54-10P	
	1	60018-01	Stiftleiste	10Pol	
	5	60019-01	Jumper	2 Pol	
	8	60020-01	Elektrolythkondensator	100 μ F 35V	
	4	60021-01	Kurzhubtaster	6x6x6	
	1	60022-01	Schottky Diode	SBX2540	
	4	60023-01	Diode DO35	1N4148	
	4	60024-01	Treiber	DRV8825	
	1	60025-01	H-Brücke	DRV8833	
	1	60026-01	Microcontroller	ESP32	

	1	60027-01	Anschlussplatine	unbestückt	
	3	60028-01	JST Stecker	JST S48 PH K S	
	1	60029-01	D-Sub Buchse	25-polig gewinkelt	
	1	60030-01	D-Sub Stecker	25-polig Lötkelch	
	2	70001-01	Schrittmotor 6RPM	CHS-GW4632-25BY	
	1	70002-01	Schrittmotor 150RPM	CHS-GW4632-25BY	
	1	70003-01	Schrittmotor	NEMA 17	
	2	70004-01	Induktiver Sensor	M8x1	
	4	70005-01	Mutter zu Sensor	M8x1	
	1	70006-01	Schleppkette IGUS	E045_16_018_0	
	1	70007-01	Verdrahtungskanal	15x15	
	4	70008-01	Drucktaster	IB16A-G10J/N	
	1	70009-01	Not-Aus- Schalter	D22	

	1	70010-01	D-Sub Stecker	15-polig	
	1	70011-01	LCD Display	20x4 I2C	
	1	70012-01	Kabeldurchführung	M16 mit Mutter	
	1	70013-01	Kabel Lapp Unitronic	14x0,34 0,5m	
	1	70014-01	Potentiometer	B10K	
	1	70015-01	Markierung Gelb	Aufkleber	
	1	70017-01	Elektromagnet	24V DC	
	1	70020-01	LED Streifen	14xLED	
	1		Jumperkabel		
	1		Aufkleber Achtung Quetsch		