Leak Testing Device for Centric Butterfly Valves

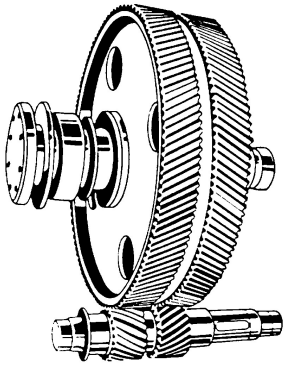
Type Ebro Z011A and Z014A

Manual

October, 2011

Contents

Manufacturer and Supplier:



Becker Maschinenbau

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Germany

Web: www.becker-maschinenbau.com

Mail: becker@becker-maschinenbau.com

1. Description of Device

The leak testing devices are built to easily detect a pass-through of gas (air) from one side of the valve to the other.

Therefore the valve is clamped hydraulically between two plates, forming two separate compartments.

One compartment will be inflated with the testing pressure. An increase of pressure inside the other compartment will indicate a leak then.

The compartment connected to the pressure switch will remain opened for a certain time to allow the valve disc to settle under testing pressure.

As soon as the settling time is elapsed, the compartment will be closed by the according valve and the pressure switch is activated to detect a possible leak.

The actual testing time depends on the valve size and is adjusted accordingly.

When the first test cycle is finished, the device automatically switches over to the same procedure, testing the contrary pass-through.

If no pressure increase occurs during the testing time, the according green indicator will light up.

If a leak is detected, the red indicator will flash and the test in this flow direction will be aborted.

If this happens during the first flow direction test, the equipment will proceed testing the second flow direction unless the reset button is pressed.

2. Installation and Installation Requirements

For proper operation the equipment needs a pressurized air supply, 2 bars above the maximum testing pressure, filtered, dehydrated but not oiled.

Do not use oiled air! It will destroy some sorts of liners and cause irreparable damages of the testing equipment!

For electrical supply, a connecting cable of 5m length is fitted and equipped with a power plug acc. to IEC 60309-2 CEE 5x16A 400V 6h, including a phase changer.

3. Taking in Use

For reasons of transportation, the equipment is delivered with empty hydraulic set. First fill in approx. 5 litres of suitable hydraulic fluid such as HLP mineral oil. Check oil level at the gauge of the fill-plug.
For further information look at separate documentation “Hydropa Hydraulic Device KL-1-B-ZP1,2-BH06-EDJ(0,75)/1-ZT7-DB1/300(200)-H1” on attached CD.

Connect the device to the mains and switch on mains switch. (Refer to chapter 4.)

Check correct direction of rotation of hydraulic pump by pressing both chuck keys. After a few seconds, the cylinder should move forward. If not, disconnect the plug and Change two mains phases, using the phase changer of the plug:

CEE plug with phase changer:

Depress the changer with a suitable screwdriver and turn 180°

Now the cylinder moves forward while depressing the chuck keys.

Insert a suitable distance and an according butterfly valve and depress the chuck keys to chuck the valve. Release and chuck again for several times to get rid of the air remaining in the hydraulic system.

Connect to compressed air supply. Incoming pressure must be 2bars above testing pressure.

The device is ready for use now!

4. Testing of Valves

First make sure, compressed air supply is connected. Check the testing pressure at the gauge and adjust it to the required value.

After switching on the mains switch a self-test routine will start, indicated by all indicator lights flashing four times.

When this routine is finished, both the white test indicators will light up permanently.

Chose a spacer according to the valve size, insert it into the centring device and place the valve to be tested on top of the spacer between the pressure plates.

Make sure, the valve is safely seated on top of the spacer! The pivot of the spacer must properly fit into the end plug of the valve! The valve must not be tilt or inclined!

Press both of the chuck buttons for approx. 5 seconds until the valve is safely clamped. The actual hydraulic pressure is displayed on the middle gauge. It has to be around 200bar.

Start the testing procedure by depressing the start button once. The first chamber will be tested as described above. The according white indicator will flash, showing the test is running. The actual testing pressure can be taken from the according gauge, right respectivly left.

After the first chamber test is finished, the result indicator will light up. After 5 seconds the device will automatically switch over to the reverse test, flashing the other white indicator.

The test run can be terminated at every stage by actuating the reset button.

As soon as the complete test is finished and the valve passed the test, both the green indicators will be lit.

If a red indicator is flashing, the according flow direction of the valve failed the test.

Press reset to terminate the test. The system will be depressurized for 15 seconds, but the valve can already be released by pressing the release button.

Take off the valve. When the white indicators are lit again, the system is ready for the next test cycle.

The hydraulic pump only works, if both the chuck buttons are depressed simultaneously within half a second. If a loss of compressed air can be heard during the test, the pump can be actuated to increase the clamp force, but the release button is blocked while testing.

5. Maintenance

Keep the installation tidy.

Pay attention the air preparation unit the testing device is connected to. Dewater and change filter frequently.

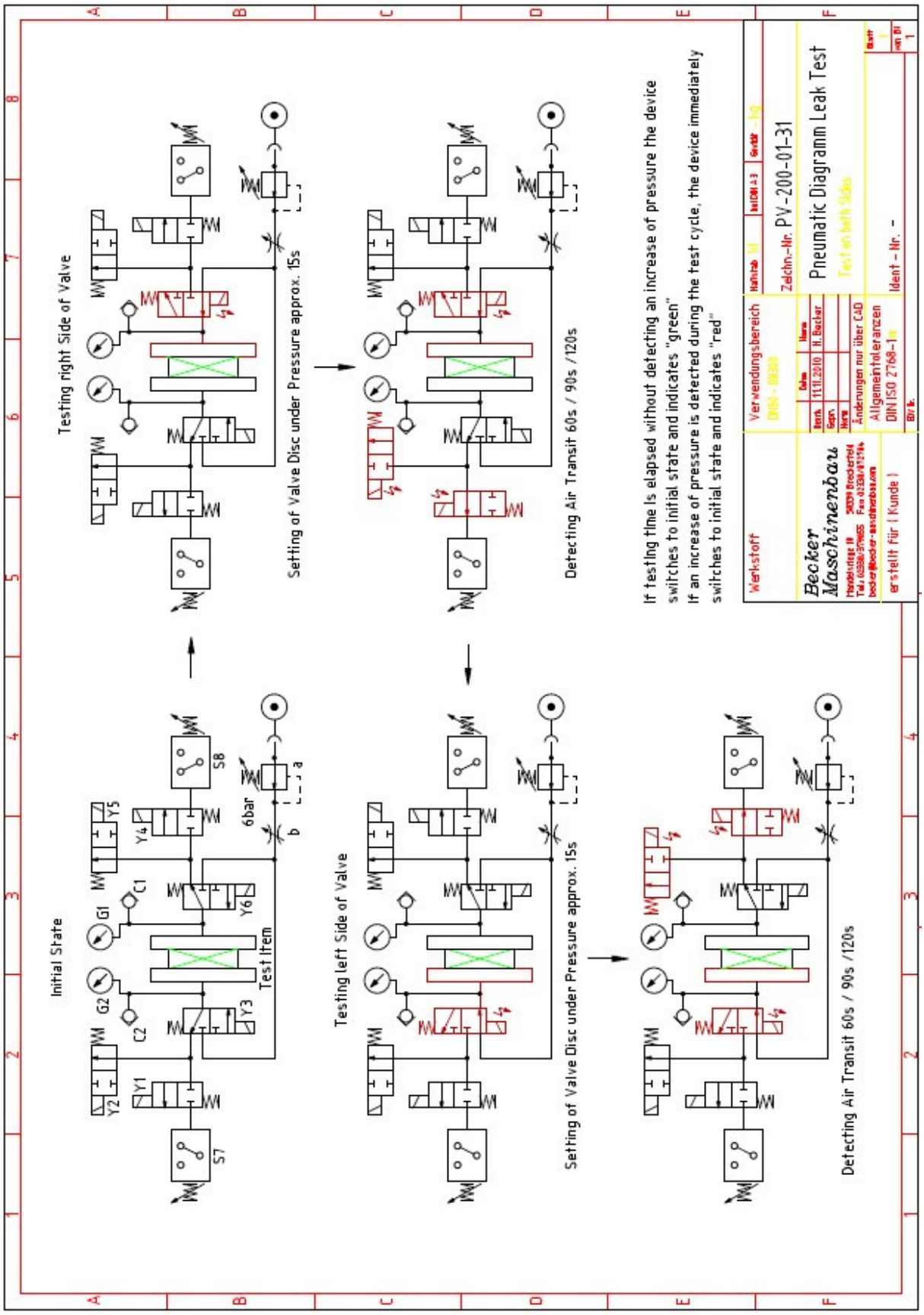
Change hydraulic fluid at least once a year. Place a suitable bin containing 10 litres underneath the drain plug and remove the plug. Remove the fill plug and drain oil completely.

Refit the drain plug and proceed as described above (Chapter 3. Taking in Use).

If the red service indicator is lit, open the switch cabinet and reset the motor overload switch.

If the overload switch triggers too often, i.e. more than once a week, the electric motor may be defective and should be checked by an electrician!

6. Pneumatic Diagram and Part List

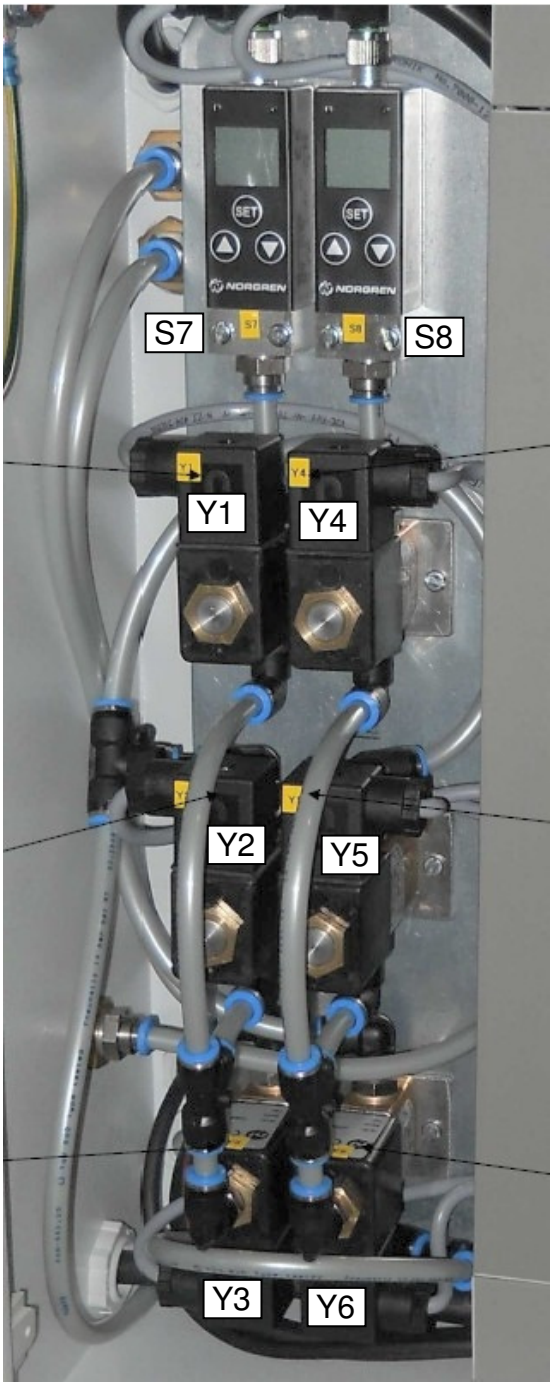


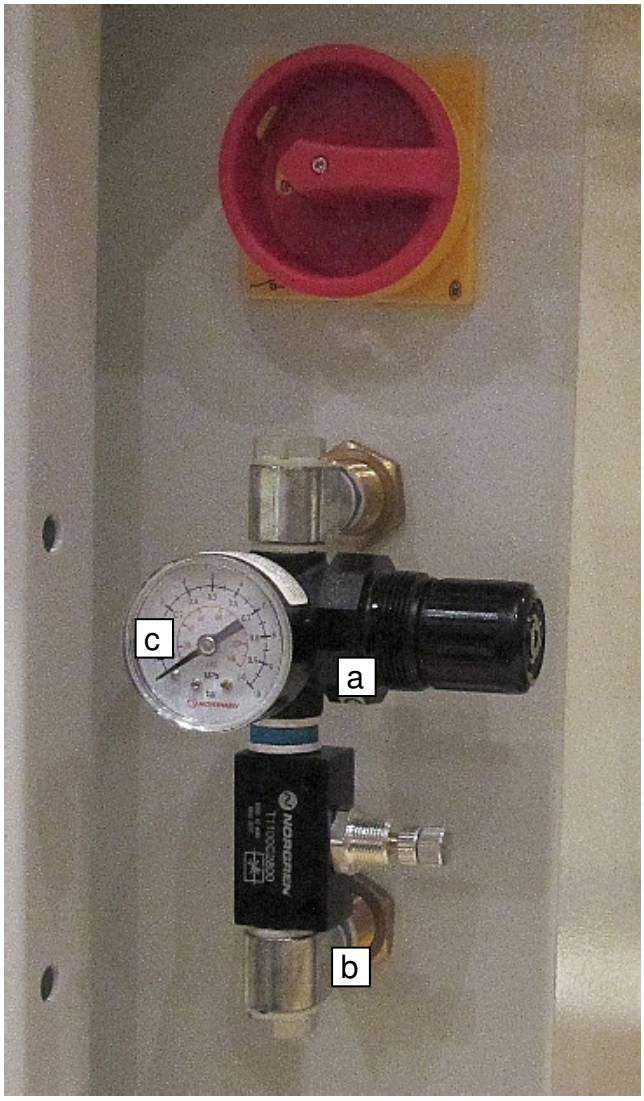
Pneumatic Equipment Supplier: Norgren Pneumatics

120/34 Soi 21/2 Kingkaew Road, Moo 12, Thambol Rachatheva,
Amphur Bangplee, Samutprakarn 10540, Thailand
Tel: +66 2750 3598/3599
Fax: +66 2750 3855
Email: sales@norgren.co.th

S7, S8	Pressure switch	0863012000000000
Y3, Y6	Solenoid valve 3/2-WV-NC G1/4 24VDC	9600210024602400
Y2, Y5	Solenoid valve 2/2-WV-NO G1/4 24VDC	9502310024602400
Y1, Y4	Solenoid valve 2/2-WV-NC G1/4 24VDC	9500200024602400

Location of Valves and Pressure Switches:



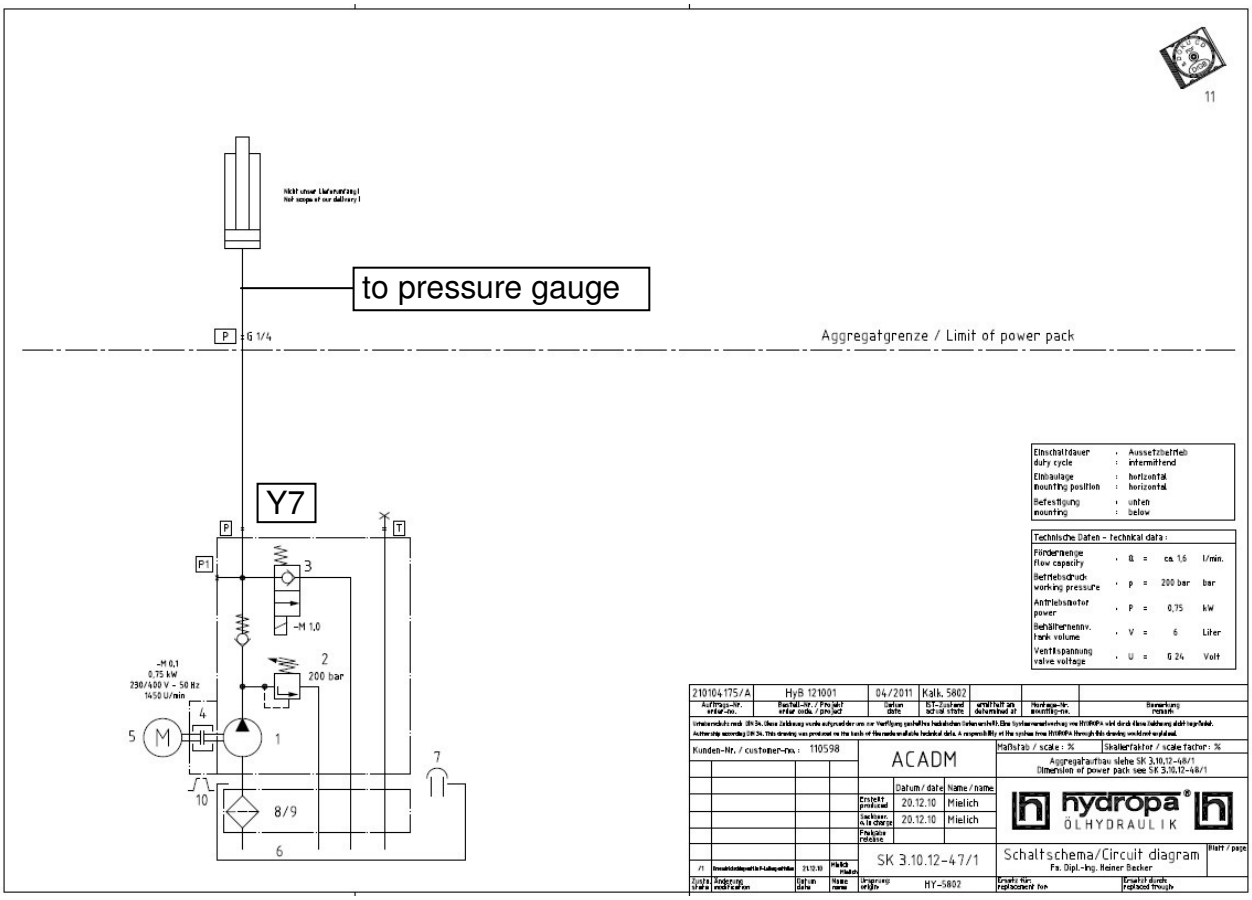


a) Pressure regulating valve
R07-205-RNMG

b) Throttle
T1100C2800

c) Pressure gauge
18-013-989

7. Hydraulic Diagram and Part List



Hydraulic Set

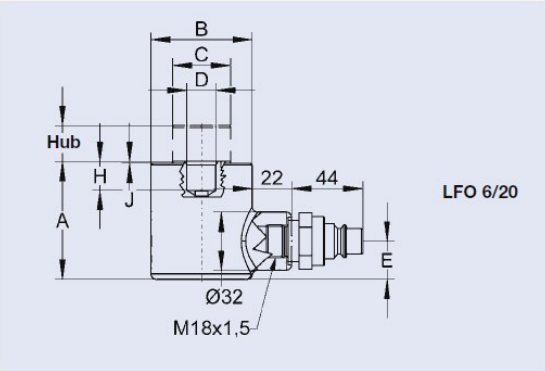
Manufacturer: Hydropa Hydraulische Erzeugnisse GmbH & Cie KG

Hydropa GmbH & Cie. KG
Därmannsbusch 4
58456 Witten
Telefon: +49 23 02 / 70 12-0
Telefax: +49 23 02 / 70 12-47
E-Mail: info@hydropa.de

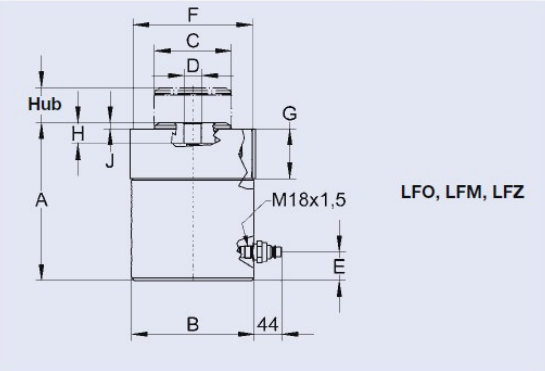
Hydraulic Cylinders

Manufacturer: LUKAS Hydraulik GmbH

A Unit of IDEX Corporation
Weinstrasse 39
91058 Erlangen
Germany
Telefon: +49 (0)9131 698-0
Fax: +49 (0)9131 698-394
Email: lukas.info@idexcorp.com
Website:

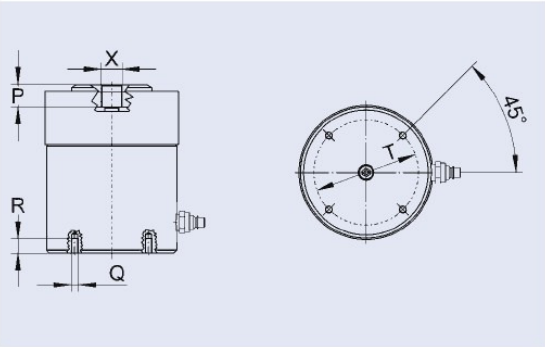


LFO 6/20



LFO, LFM, LFZ

Auf Wunsch mit Befestigungsbohrungen in der Kolbenstange und im Zylinderboden.



	X	P	Q	R	T
LFO 6/20	M 18 x 1,5	10 mm	--	--	--
LF. 6/..	M 18 x 1,5	13,5 mm	M 6	10 mm	35 mm
LF. 10/..	M 18 x 1,5	22,5 mm	M 6	10 mm	50 mm
LF. 16/..	M 27 x 2	22,5 mm	M 8	13 mm	66 mm
LF. 25/..	M 27 x 2	24 mm	M 8	13 mm	88 mm
LF. 40/..	M 27 x 2	30 mm	M 10	19 mm	110 mm
LF. 63/..	M 27 x 2	30 mm	M 10	19 mm	140 mm
LF. 100/..	--	--	M 12	24 mm	185 mm

LFM mit metrischem Außengewinde und Kupplungsanschluss M 18 x 1,5

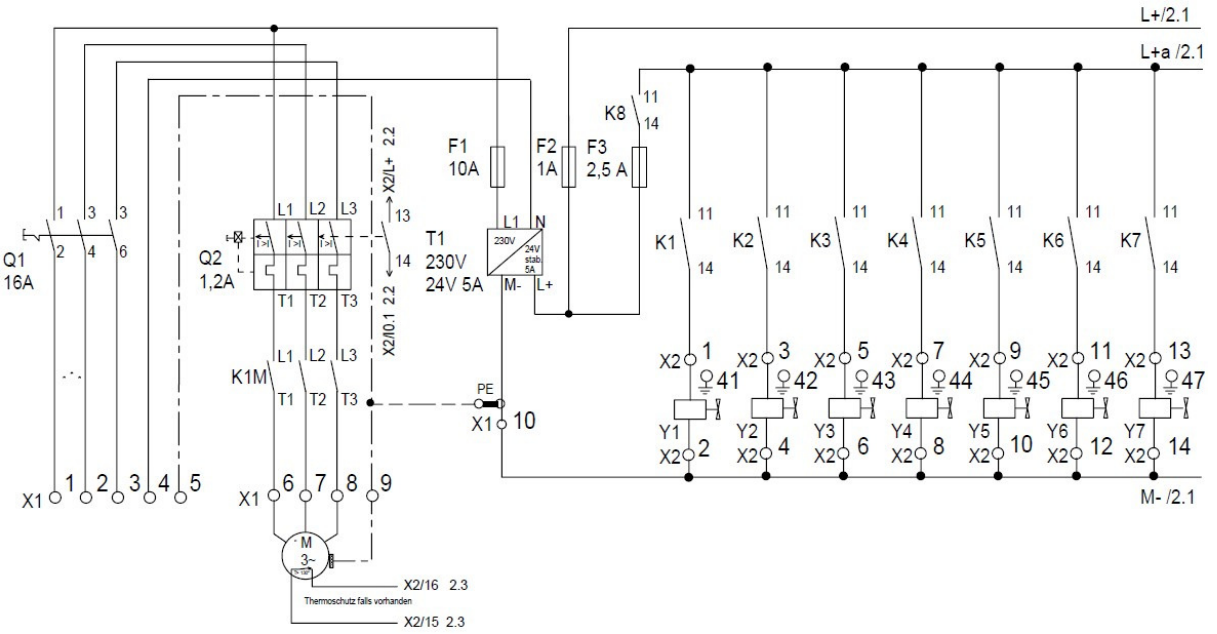
Typ	Bestell-Nr.	Hubkraft kN	Hub mm	Kolbenfläche cm²	Ölbedarf l	A mm	B Ø mm	C Ø mm	D Ø mm	E mm	F Ø mm	G mm	H mm	J mm	Masse kg
LFM 6/50	85145/1808	63	50	12,6	0,06	160	58	32	16	23	M55x2	42	16	5	1,4
LFM 6/160	85145/1813	63	160	12,6	0,20	270	58	32	16	23	M55x2	42	20	5	2,5
LFM 10/50	85145/2208	98	50	19,6	0,10	186	70	40	16	23	M68x2	50	29	6	2,7
LFM 10/160	85145/2213	98	160	19,6	0,31	296	70	40	16	23	M68x2	50	29	6	4,2
LFM 16/50	85145/2608	156	50	31,2	0,16	205	85	50	25	40	M85x2	60	30	7	5,2
LFM 16/160	85145/2613	156	160	31,2	0,50	315	85	50	25	40	M85x2	60	30	7	6,4
LFM 25/25*	85145/3005	251	25	50,3	0,15	101	110	63	25	21	M110x3	55	25	1	6,7
LFM 25/50	85145/3008	251	50	50,3	0,25	215	127	63	25	40	M120x3	70,5	30	7	9
LFM 25/100	85145/3011	251	100	50,3	0,50	265	127	63	25	40	M120x3	70,5	30	7	11
LFM 25/200	85145/3014	251	200	50,3	1,01	365	127	63	25	40	M120x3	70,5	30	7	15
LFM 40/50	85145/3408	393	50	78,5	0,39	224	146	90	25	30	M140x3	70,5	30	9	11
LFM 40/200	85145/3414	393	200	78,5	1,57	374	146	90	25	30	M140x3	70,5	30	9	17
LFM 63/50	85145/3808	614	50	122,7	0,61	225	175	110	25	41	M170x3	70,5	30	9	15,5
LFM 63/160	85145/3813	614	160	122,7	1,96	341	175	110	25	41	M170x3	70,5	30	9	22,5
LFM 63/200	85145/3814	614	200	122,7	2,45	384	175	110	25	41	M170x3	70,5	30	9	25
LFM 100/50	85145/4208	1005	50	201	1,01	265	220	140	40	55	M220x4	70	30	9	29,5
LFM 100/200	85145/4214	1005	200	201	4,02	415	220	140	40	55	M220x4	70	30	9	44

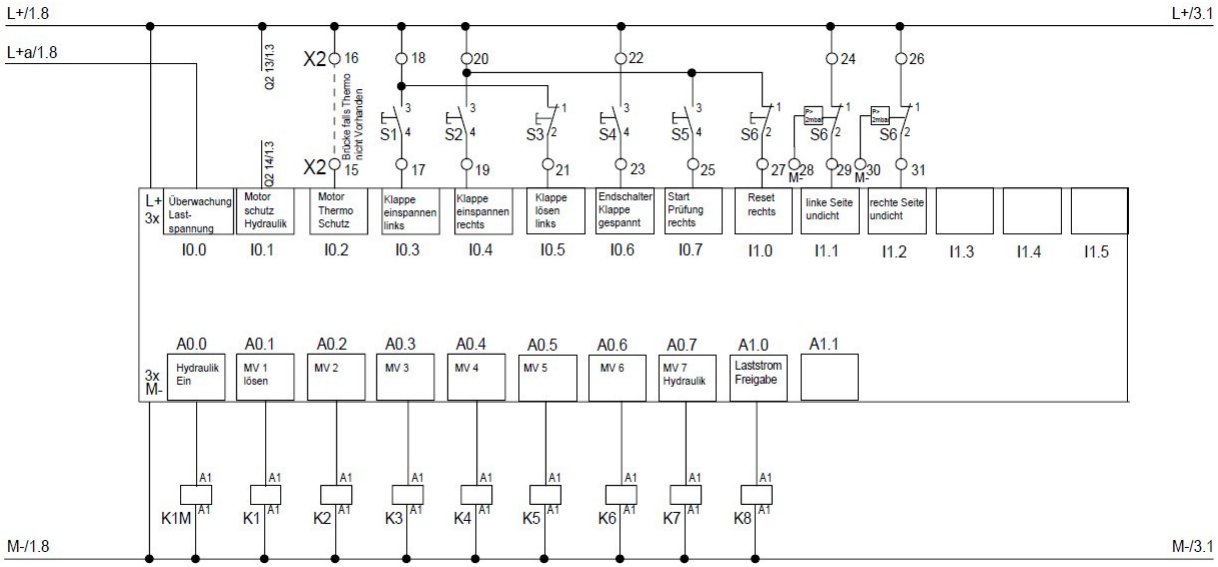
Press frame size 125 LFM 6/50

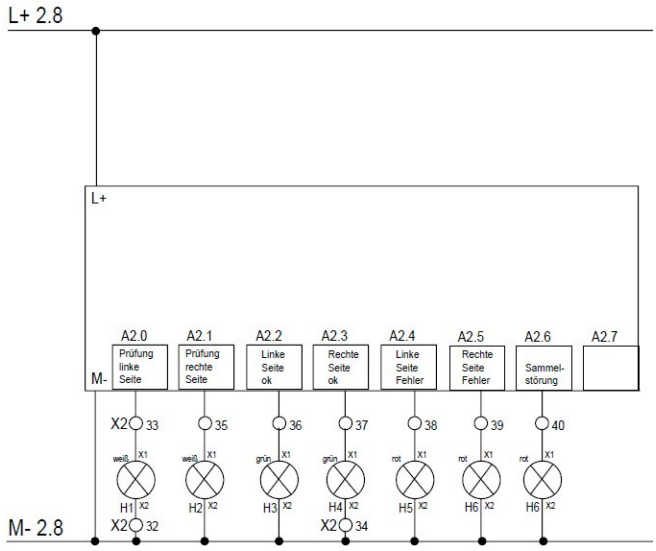
Press frame size 200 LFM 16/50

Press frame size 300 LFM 40/50

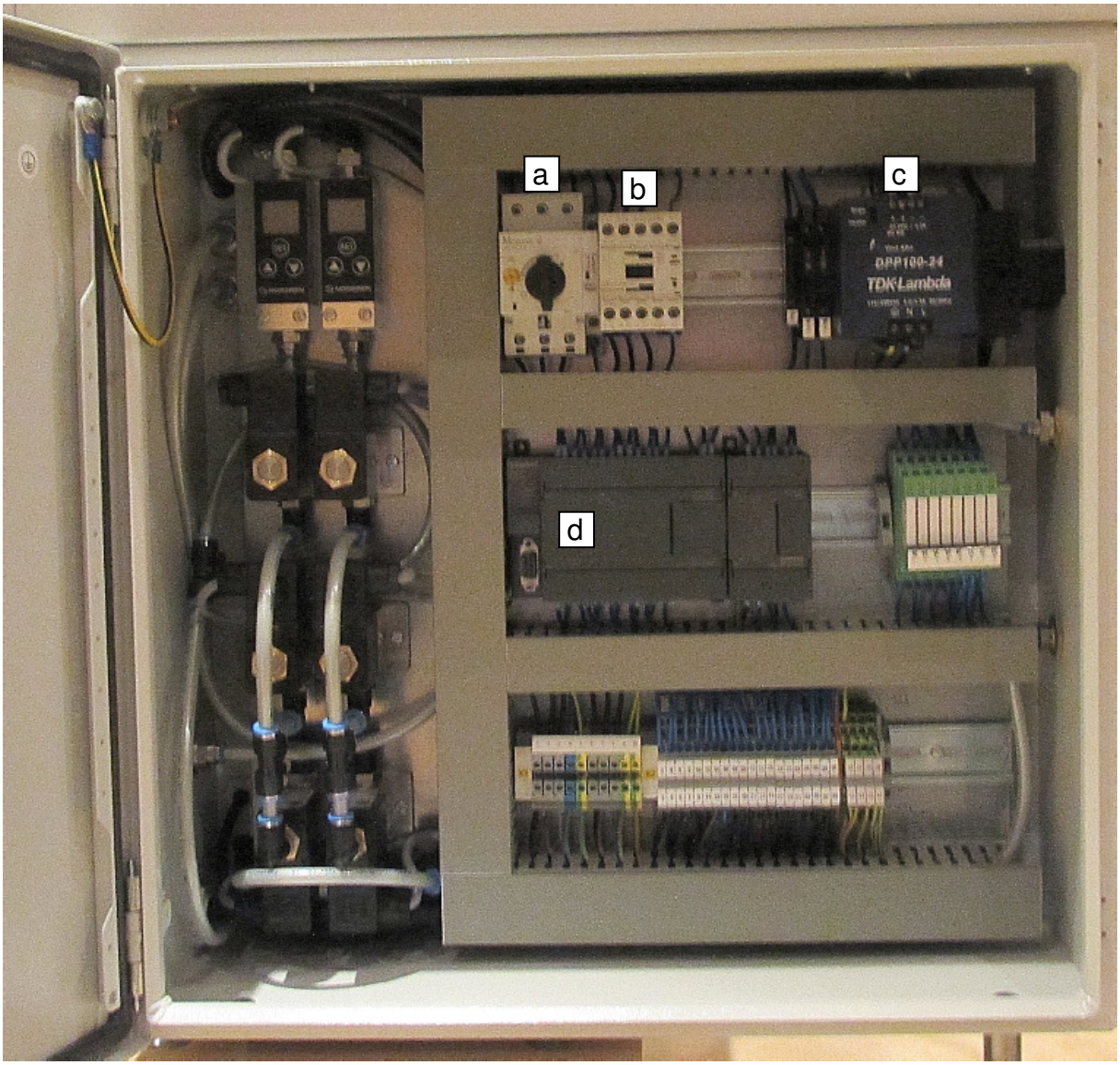
8. Electrical Diagram and Part List







Location of Electrical Components



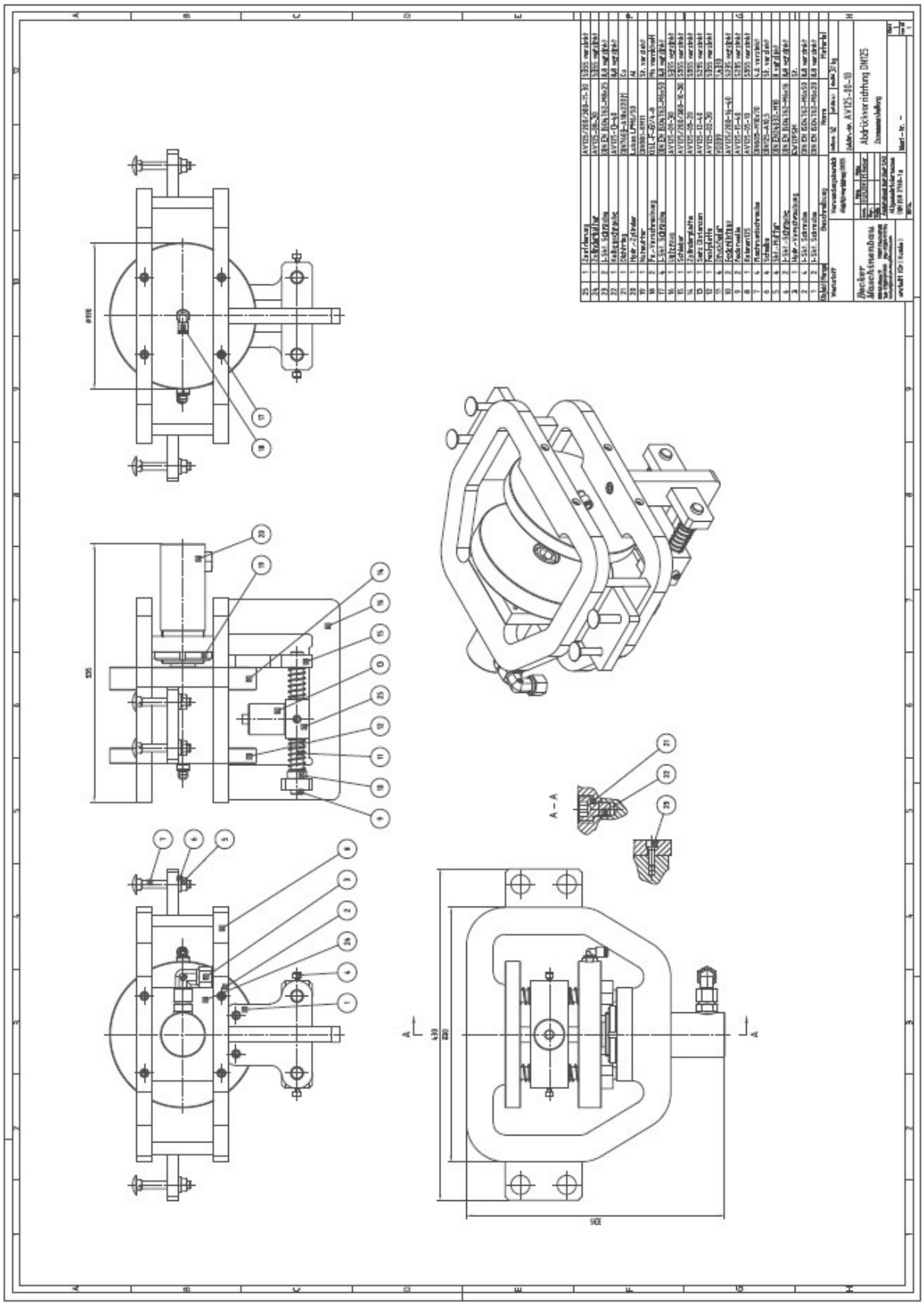
a) Motor Overload Switch
b) Motor Contactor
c) Power Supply
d) Programmable Logic Controller

Type of PLC: Siemens S7-200 / 224

Supplier of PLC: Siemens Thailand

Charn Issara Tower II
2922/333 New Petchburi Road,
Bangkapi, Huaykwang,
Bangkok 10310 , THAILAND
Phone : +66 (0) 2 715-4000
Fax : +66 (0) 2 715-4100

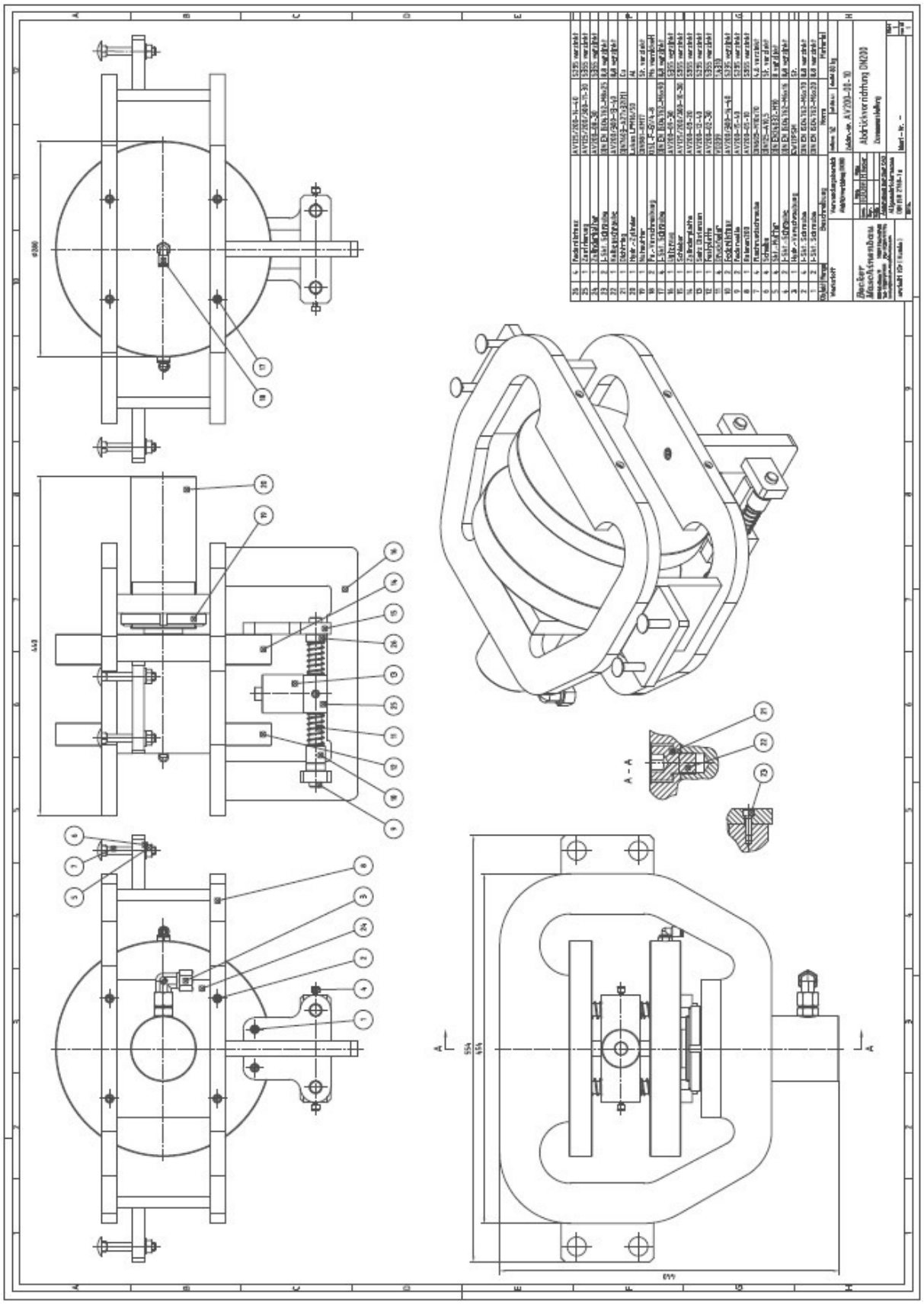
9. Press Frame 125 Assembly and Part List



Part List Press Frame Size 125

Pos.	Am.	Description	Standard / Drawing No.	Material
0	1	Assembly	AV125-00-10	
1	2	Allen Screw	DIN EN ISO4762-M6x20	8.8 zinc plated
2	4	Allen Screw	DIN EN ISO4762-M6x50	8.8 zinc plated
3	1	Hydraulic Joint	EW12PSM	St.
4	2	Allen Screw	DIN EN ISO4762-M6x16	8.8 zinc plated
5	4	Nut	DIN EN24032-M10	8 zinc plated
6	4	Washer	DIN125-A10,5	St. zinc plated
7	4	Cup Square Bolt	DIN603-M10x70	4.6 zinc plated
8	1	Frame	AV125-05-20	S355 zinc plated
8.1	2	Frame arch	AV125-04-30	S355 zinc plated
9	2	Spring Shaft	AV125-15-40	S235 zinc plated
10	2	Spring Spacer	AV125/200-14-40	S235 zinc plated
11	4	Spring	VD209	1.4310
12	1	Fixed Plate	AV125-02-30	S355 zinc plated
13	1	Set of Spacers	AV125-12-40	S235 zinc plated
13.1	1	Spacer 50	in AV125-12-40	S235 zinc plated
13.2	1	Spacer 65	in AV125-12-40	S235 zinc plated
13.3	1	Spacer 80	in AV125-12-40	S235 zinc plated
13.4	1	Spacer 100	in AV125-12-40	S235 zinc plated
13.5	1	Spacer 125	in AV125-12-40	S235 zinc plated
14	1	Moving Plate	AV125-03-30	S355 zinc plated
15	1	Slide Plate	AV125/200/300-10-30	S355 zinc plated
16	1	Support machined Part	AV125-09-30	S355 zinc plated
16.1	1	Support cutted Part	AV125-06-30	S355
17	4	Allen Screw	DIN EN ISO4762-M6x50	8.8 zinc plated
18	2	Pneumatic Joint	QSL-F-G1/4-8	Ms nickel plated
19	1	Grooved Nut	DIN981-KM11	St. zinc plated
20	1	Hydraulic Cylinder	Lukas LFM5/50	Al
20.1	1	Piston Rod Thread	acc. to Specification M18x1,5 t=	St.
21	1	Sealing Ring	DIN7603-A18x22(lt)	Cu
22	1	Piston Rod Screw	AV125-13-40	8.8 zinc plated
22.1	1	Allen Screw	DIN EN ISO4762-M20x90	8.8 zinc plated
23	2	Allen Screw	DIN EN ISO4762-M8x25	8.8 zinc plated
24	1	Cylinder Support	AV125-08-30	S355 zinc plated
25	1	Centring Device	AV125/200/300-11-30	S355 zinc plated

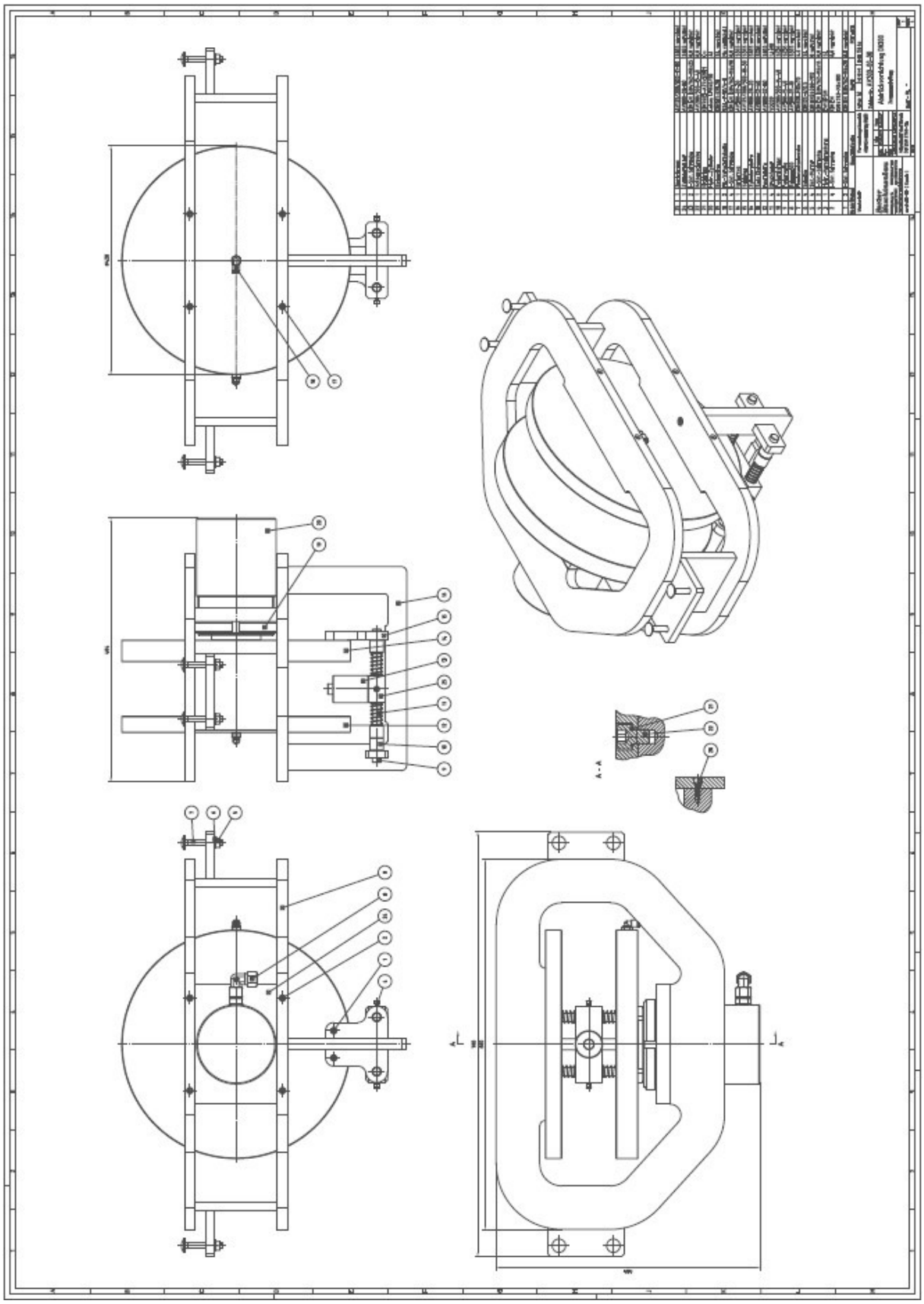
10. Press Frame 200 Assembly and Part List



Part List Press Frame Size 200

Pos.	Am.	Description	Standard / Drawing No.	Material
0	1	Assembly	AV200-00-10	
1	2	Allen Screw	DIN EN ISO4762-M6x20	8.8 zinc plated
2	4	Allen Screw	DIN EN ISO4762-M6x70	8.8 zinc plated
3	1	Hydraulic Joint	EW12PSM	St.
4	2	Allen Screw	DIN EN ISO4762-M6x16	8.8 zinc plated
5	4	Nut	DIN EN24032-M10	8 zinc plated
6	4	Washer	DIN125-A10,5	St. zinc plated
7	4	Cup Square Bolt	DIN603-M10x70	4.6 zinc plated
8	1	Frame	AV200-05-10	S355 zinc plated
8.1	2	Frame arch	AV200-04-30	S355 zinc plated
9	2	Spring Shaft	AV200-15-40	S235 zinc plated
10	2	Spring Spacer	AV200/300-14-40	S235 zinc plated
11	4	Spring	VD209	1.4310
12	1	Fixed Plate	AV200-02-30	S355 zinc plated
13	1	Set of Spacers	AV200-12-40	S235 zinc plated
13.1	1	Spacer 125	in AV200-12-40	S235 zinc plated
13.2	1	Spacer 150	in AV200-12-40	S235 zinc plated
13.3	1	Spacer 200	in AV200-12-40	S235 zinc plated
14	1	Moving Plate	AV200-03-30	S355 zinc plated
15	1	Slide Plate	AV125/200/300-10-30	S355 zinc plated
16	1	Support machined Part	AV200-09-30	S355 zinc plated
16.1	1	Support cutted Part	AV200-06-30	S355
17	4	Allen Screw	DIN EN ISO4762-M6x90	8.8 zinc plated
18	2	Pneumatic Joint	QSL-F-G1/4-8	Ms nickel plated
19	1	Grooved Nut	DIN981-KM17	St. zinc plated
20	1	Hydraulic Cylinder	Lukas LFM16/50	Al
20.1	1	Piston Rod Thread	lt. Katalogblatt M27x2 t=20	St.
21	1	Sealing Ring	DIN7603-A27x32(lt)	Cu
22	1	Piston Rod Screw	AV200/300-13-40	8.8 zinc plated
22.1	1	Allen Screw	DIN EN ISO4762-M30x120	8.8 zinc plated
23	2	Allen Screw	DIN EN ISO4762-M8x25	8.8 zinc plated
24	1	Cylinder Support	AV200-08-30	S355 zinc plated
25	1	Centring Device	AV125/200/300-11-30	S355 zinc plated
26	4	Spring Spacer	AV125/200-14-40	S235 zinc plated

11. Press Frame 300 Assembly and Part List

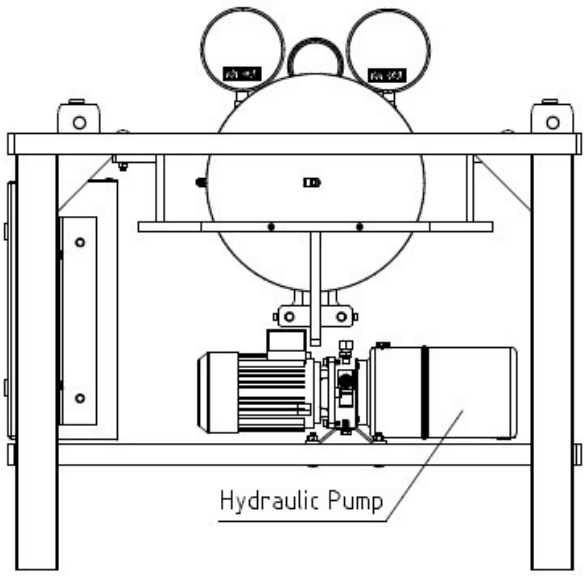


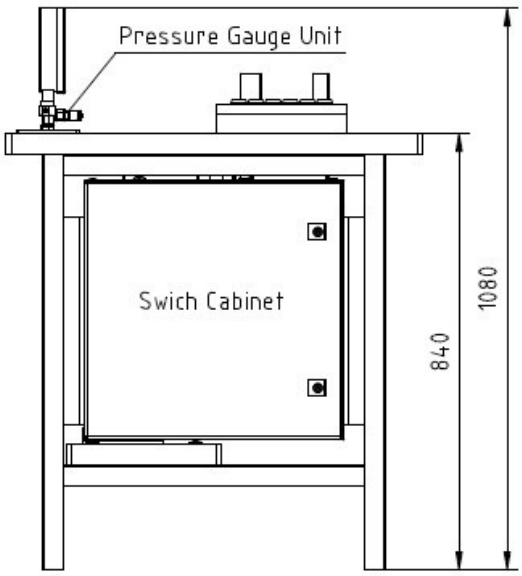
Part List Press Frame Size 300

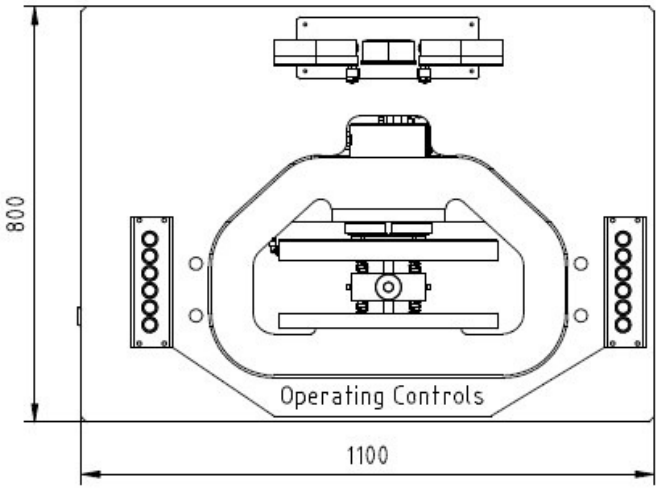
Pos.	Am.	Description	Standard / Drawing No.	Material
0	1	Assembly	AV300-00-00	
1	2	Allen Screw	DIN EN ISO4762-M6x20	8.8 zinc plated
2	4	Allen Screw	DIN EN ISO4762-M6x100	8.8 zinc plated
3	1	Hydraulic Joint	EW12PSM	St.
4	2	Allen Screw	DIN EN ISO4762-M6x16	8.8 zinc plated
5	4	Nut	DIN EN24032-M10	8 zinc plated
6	4	Washer	DIN125-A10,5	St. zinc plated
7	4	Cup Square Bolt	DIN603-M10x70	4.6 zinc plated
8	1	Frame	AV300-05-10	S355 zinc plated
8.1	2	Frame arch	AV300-04-20	S355 zinc plated
9	2	Spring Shaft	AV300-15-40	S235 zinc plated
10	6	Spring Spacer	AV200/300-14-40	S235 zinc plated
11	4	Spring	VD209	1.4310
12	1	Fixed Plate	AV300-02-30	S355 zinc plated
13	1	Set of Spacers	AV300-12-40	S235 zinc plated
13.1	1	Spacer 200	in AV300-12-40	S235 zinc plated
13.2	1	Spacer 250	in AV300-12-40	S235 zinc plated
13.3	1	Spacer 300	in AV300-12-40	S235 zinc plated
14	1	Moving Plate	AV300-03-20	S355 zinc plated
15	1	Slide Plate	AV125/200/300-10-30	S355 zinc plated
16	1	Support machined Part	AV300-09-30	S355 zinc plated
16.1	1	Support cutted Part	AV300-06-20	
17	4	Allen Screw	DIN EN ISO4762-M6x90	8.8 zinc plated
18	2	Pneumatic Joint	QSL-F-G1/4-8	Ms nickel plated
19	1	Grooved Nut	DIN981-KML28-M140x3	St. zinc plated
20	1	Hydraulic Cylinder	Lukas LFM40/50	Al
20.1	1	Piston Rod Thread	lt. Katalogblatt M27x2 t=20	St.
21	1	Sealing Ring	DIN7603-A27x32(lt)	Cu
22	1	Piston Rod Screw	AV200/300-13-40	8.8 zinc plated
22.1	1	Allen Screw	DIN EN ISO4762-M30x120	8.8 zinc plated
23	2	Allen Screw	DIN EN ISO4762-M8x25	8.8 zinc plated
24	1	Cylinder Support	AV300-08-30	S355 zinc plated
25	1	Centring Device	AV125/200/300-11-30	S355 zinc plated

12. Dimensions

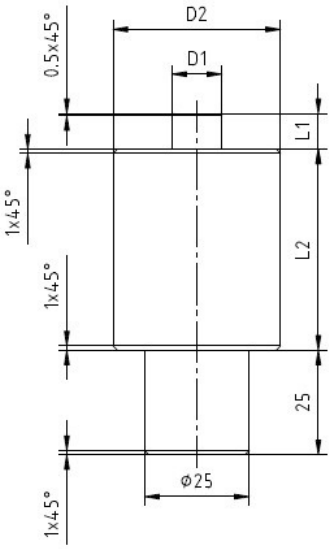
Dimensions of Testing Benches







Dimensions of Spacers



Size 125

	D1	L1	D2	L2
DN50	12	8.5	40	48
DN65	12	8.5	40	39.5
DN80	17	9.5	40	28.5
DN100	17	9.5	40	17.5
DN125	17	9.5	40	5

Size 200

	D1	L1	D2	L2
DN125	17	9.5	50	54.5
DN150	19	9.5	50	30.5
DN200	19	9.5	50	5

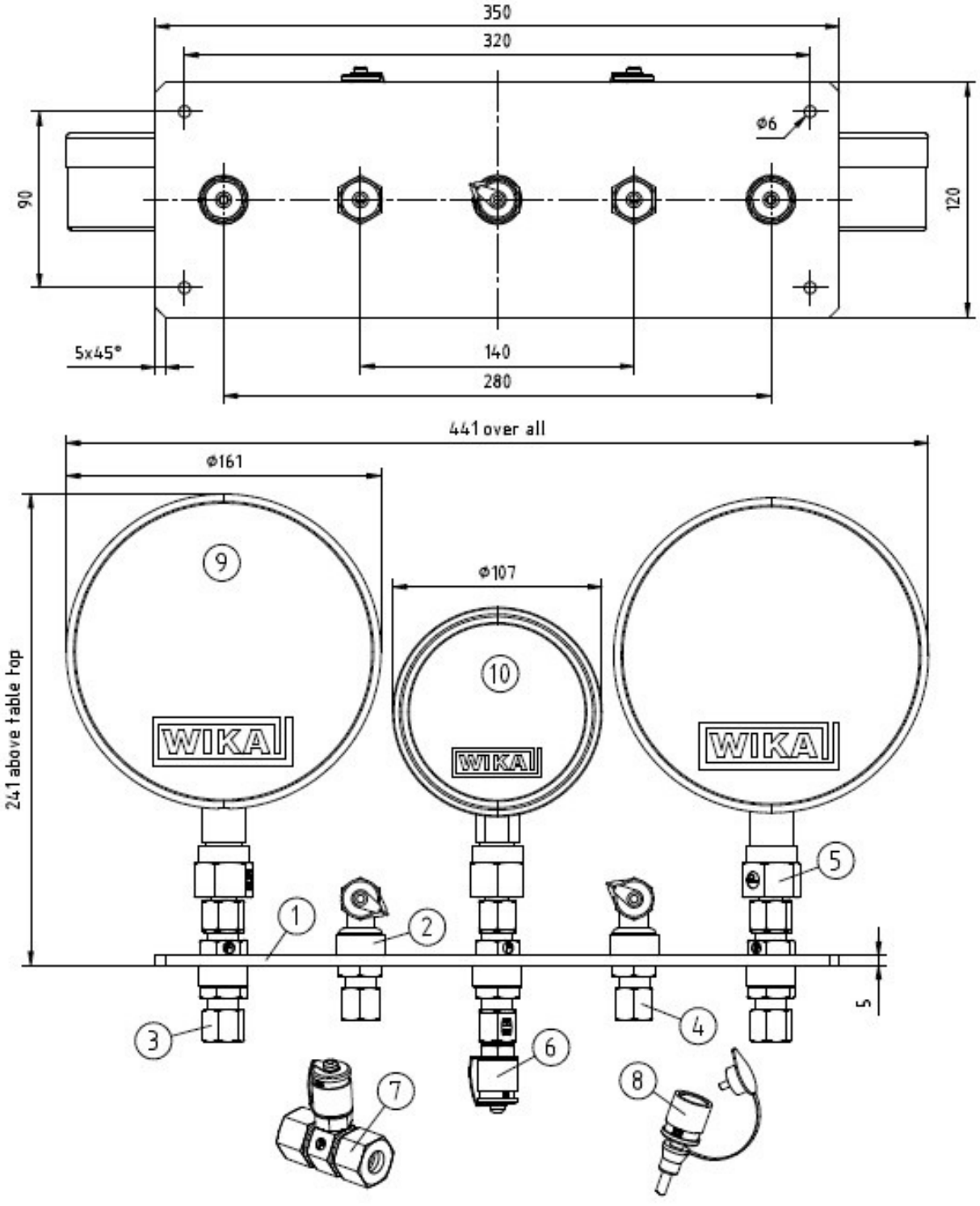
Size 300

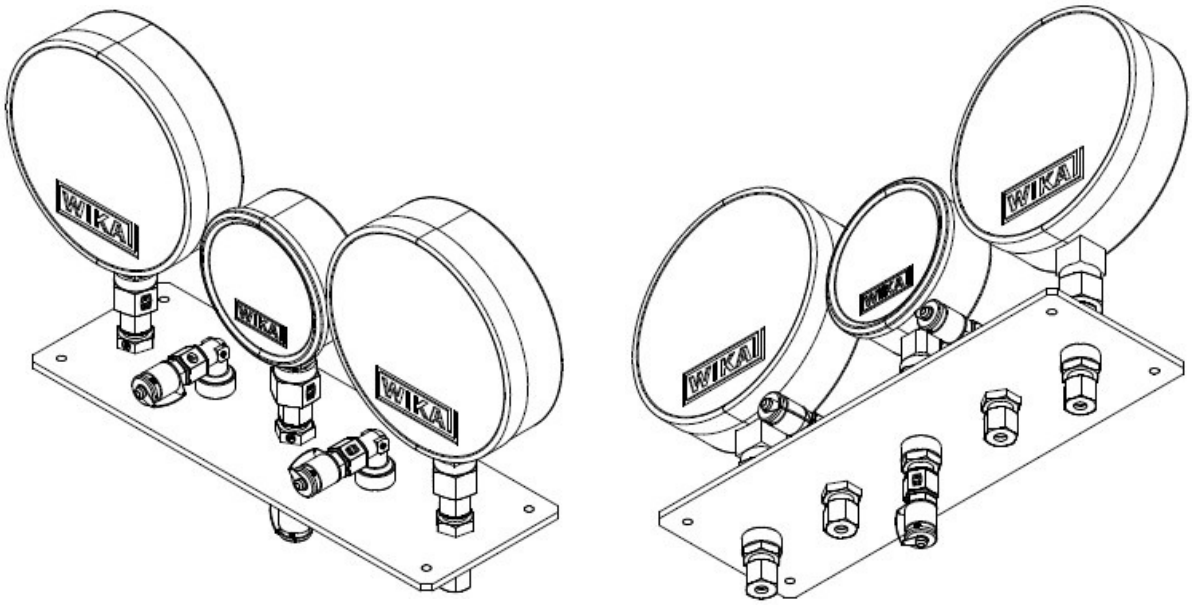
	D1	L1	D2	L2
DN200	19	9.5	50	65.5
DN250	19	9.5	50	30
DN300	19	9.5	50	5

13. Pressure Gauge Unit

The pressure gauge unit consists of 2 high precision pneumatic gauges to supervice the actual testing pressure and a fluid cushioned hydraulic gauge to monitor the clamping pressure.
Apart from that it is provided with couplings for connection to calibrating devices.

Dimensions and Part List





Part List

0	1	Gauge Unit	MP101-00-20	
1	1	Mounting Plate	MP101-01-30	Stainless Steel
2	5	Spacer	MP101-02-40	Stainless Steel
3	3	Hydraulic Joint	SV08S	St. zinc plated
4	2	Hydraulic Joint	WSV08S	St. zinc plated
5	3	Hydraulic Joint	MAVE08SR	St. zinc plated
6	3	Hydraulic Joint	VKA3/08S	St. zinc plated
7	1	Hydraulic Joint	GMA3/12S	St. zinc plated
8	1	Gauge Hose	SMA3-630	PU
9	2	Pressure Gauge	WIKA 312.20-16bar	Stainless Steel
10	1	Pressure Gauge	WIKA 213.53-400bar	Stainless Steel

Supplier of Gauges:

Wika Instrumentation Corporation (Thailand) Co., Ltd.

850/7 Ladkrabang Road, Ladkrabang
Bangkok 10520

Phone: +66 2 326 6876-80
Fax: +66 2 326 6874
E-mail: N.pimkaew@wika.com.sg

http://www.wika.co.th

14. Calibration

The units are precalibrated and ready for use. If nessecary, verification can be done by using a calibrated leak. If there is need for that, please contact the quality management of EBRO – Valves Germany and ask for further instructions.

15. Technical Data

All Devices:

Mains:	Tree-Phase Current 400V 0.5kW
Pressurized Air Supply:	2bar above Testing Pressure, max. 12bar, not oiled
Maximum Testing Pressure:	10bar

Size 125:

Clamping Force:	24kN
Valve Size:	DN50 – DN125
Test Duration:	approx. 140 Sec.
Weight:	150kg

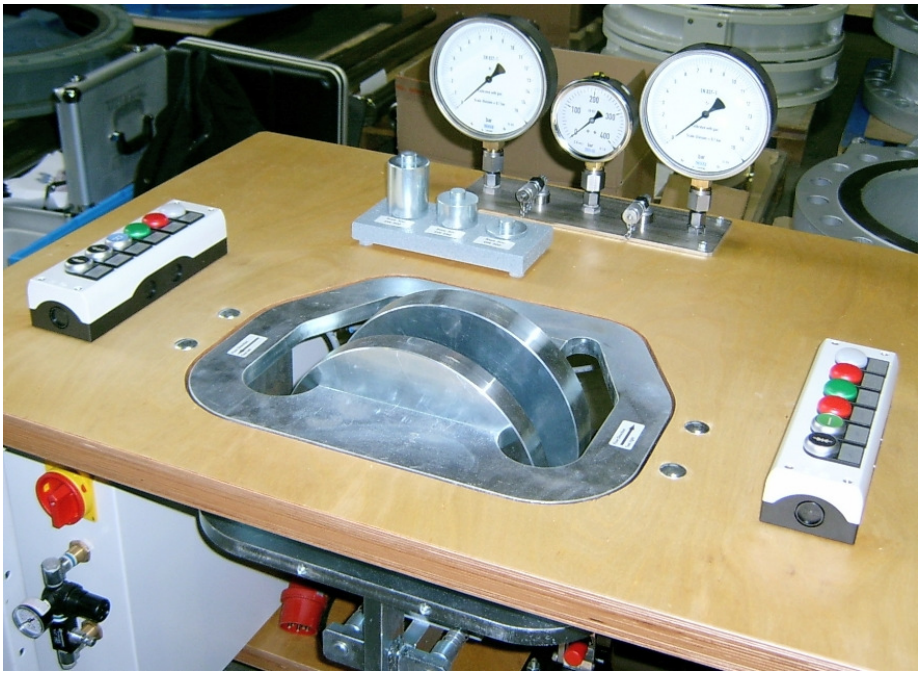
Size 200:

Clamping Force:	64kN
Valve Size:	DN125 – DN200
Test Duration:	approx. 200 Sec.
Weight:	200kg

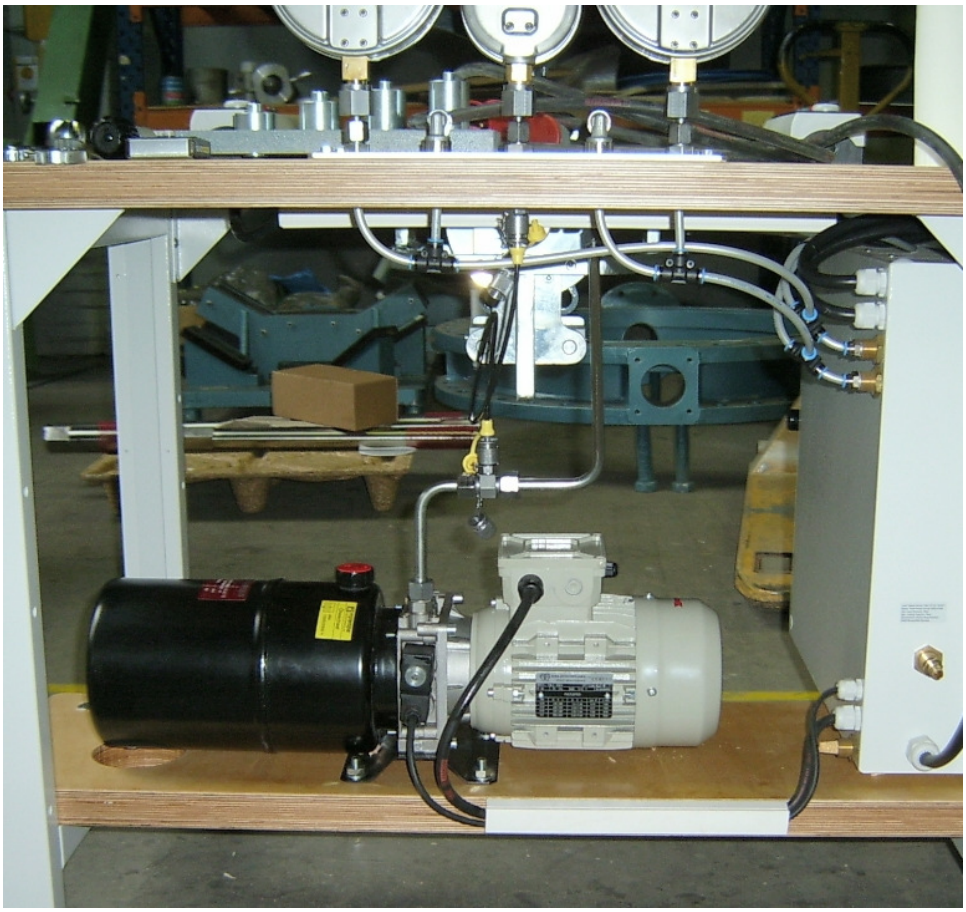
Size 300:

Clamping Force:	160kN
Valve Size:	DN200 – DN300
Test Duration:	approx. 260 Sec.
Weight:	300kg

16. Auxiliary Views



Picture 1 Table Top



Picture 2 Hydro Set and Fluid connectors

Picture 3 Keys left Side

Picture 4 Keys right Side

Picture 4 Complete View

Declaration of Conformity (CE Declaration)

Declaration acc. to suffix II B of MaschRL 98/37/EG

Manufacturer:

Becker Maschinenbau
Handelsriege 18
58339 Breckerfeld
Germany
Tel.: +49-2338-379855

Type of Device and Description:

Leak testing Device

Test bench to detect pass-through of air via valve seat

Device - No. 07/2011 Size 300

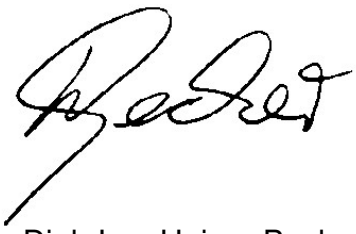
The design is done by the following standards, completely or in parts of it:

DIN EN ISO 12100-1, Ausgabe:2004-04
DIN EN ISO 12100-2, Ausgabe:2004-04
DIN EN ISO 14121-1, Ausgabe 2005-12
DIN EN 418, Ausgabe:1993-01
DIN EN 983; Ausgabe 1996-09
DIN EN 1127-1; Ausgabe 1997
DIN EN 1037, Ausgabe:1996-04
DIN EN 60204-1, Ausgabe:1998-11
DIN EN 13463-1; Ausgabe 2002-04
DIN EN 13463-5; Ausgabe 2004-03

The device must not be taken in use until it is made sure that the complete line of production meets the requirements of rule 97/38/EG.

Legally binding signature

Breckerfeld October, 10th 2011



Dipl.-Ing. Heiner Becker

Becker Maschinenbau, Handelsriege 18, 58339 Breckerfeld Germany