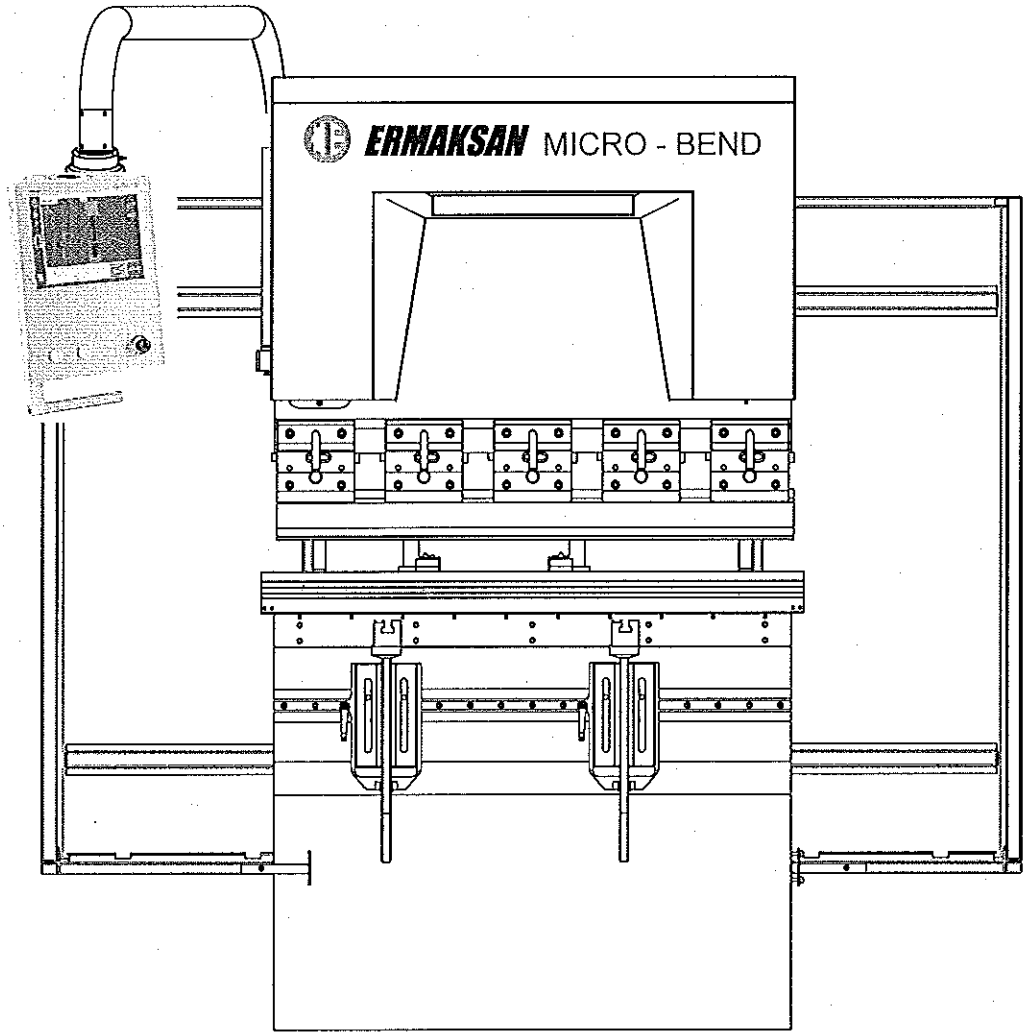
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ERMAKSAN



MICRO - BEND 1040
HYDRAULIC PRESS BRAKE
MANUAL INSTRUCTION

TÜV AUSTRIA

CERTIFICATE OF CONFORMITY

Certificate - No.: 15-PS-0175-TAT-18-MAD-0305

Applicant	:	ERMAKSAN MAKİNA SANAYİ TİCARET A.Ş. Organize Sanayi Bölgesi Lacivert Cad. No: 6 Nilüfer BURSA- TURKEY
Product	:	SYNCHRONIZED HYDRAULIC PRESS BRAKES
Type/Model(s)	:	See the attachment - 1
Standard(s) / Certification Basis	:	2006/42/EC Machinery Directive 2014/30/EU Electromagnetic Compatibility Directive EN ISO 12100:2010 EN 12622:2009/A1:2013 EN ISO 13855:2010 EN ISO 13849-1:2015 EN 60204-1:2006/A1:2009/AC:2010 EN 61000-6-2:2005/AC:2005 EN 61000-6-4:2007/A1:2011

This Conformity Assessment is issued on customer request according to Machinery Directive *2006/42/EC article 12 3.a*. The listed equipment in Annex IV complies with the harmonized standard and principal protection requirements of the directive. It refers only to the particular sample and its technical documentation submitted for inspection.

Test Report No	:	**15-PS-0175-IR-001**
Issue Date	:	**07.02.2018**
Expiry Date	:	**06.02.2019**

For and on behalf of
TÜV Austria Türk Belgelendirme
Eğitim ve Gözetim Hizmetleri Ltd. Sti.
Ali Osman Özveren
Industrial Auditor

CE

After preparation of the necessary technical documentation as well as the declaration of conformity the required CE marking can be affixed on the product. Other relevant directives have to be observed.

This Certificate of Conformity has been granted to the applicant based on the results of testing performed by the applicant/manufacturer or an accepted laboratory and the consequent review of the test report by TÜV Austria Turk. Revisions to the referenced certification basis or any change of the design, materials, components or processing may require the repetition of all or some of the qualification tests in order for the test report and therefore this associated certificate to remain valid.

TÜV Austria Turk
Koşuyolu Mahallesi Katip Salih Sok.
No : 69 Kadıköy ,Istanbul-TURKEY,
www.tuvaustriaturk.com/

Tel : +90 216 537 08 11
Fax : +90 216 537 08 13
E-mail : infoturkey@tuv.at

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Attachment-1
Certificate of Conformity

Certificate - No.: 15-PS-0175-TAT-18-MAD-0305

Type/Model(s):

AP SERIES
CNC AP SERIES
CNC HAP SERIES
CNC SAP SERIES
CNC TAP SERIES
CNC THAP SERIES
CNC TSAP SERIES
MICRO BEND SERIES
PRO BEND SERIES
SPEED BEND SERIES
ECO BEND EXPERT SERIES
REVOLUTION SERIES
EVOLUTION SERIES
EVO I SERIES
EVO II SERIES
EVO I T SERIES
EVO II T SERIES
GREEN PRES Fx SERVO SERIES
SPEED BEND SMART SERIES
SPEED BEND SMART T SERIES
SERVO BEND SERIES
SERVO BEND T SERIES
POWER BEND SERIES#
SPEED BEND PRO SERIES
POWER BEND PRO Series.
POWER BEND FALCON SERIES#
POWER BEND T SERIES#
POWER BEND PRO T Series.
POWER BEND FALCON T SERIES#
SPEED BEND PRO T SERIES
ECO BEND EXPERT T SERIES
SPEED BEND T SERIES

For and on behalf of
TÜV Austria Turk Belgelendirme
Eğitim ve Gözetim Hizmetleri Ltd.Şti
Ali Osman Özyeren
Industrial Auditor

TÜV Austria Turk
Koşuyolu Mahallesi Katip Salih Sok.
No : 69 Kadıköy ,Istanbul-TURKEY,
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Tel : +90 216 537 08 11
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ERMAKSAN
METAL FABRICATING MACHINERY
innovative technologies.

CE

EC DECLARATION OF CONFORMITY

THIS IS HEREBY DECLARED THAT FOLLOWING DESIGNATED PRODUCT COMPLIED WITH THE ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF MACHINERY DIRECTIVE 2006/42/EC, ELECTROMAGNETIC COMPATIBILITY DIRECTIVE 2014/30/EU ON THE APPROXIMATION OF THE LAWS OF THE MEMBER STATES RELATING TO IT.

THE ITEM OF PRODUCTS WHICH IDENTIFIED BELOW HAS BEEN SUBJECT TO INTERNAL MANUFACTURING CHECKS WITH MONITORING OF THE FINAL ASSESMENT BY **ERMAKSAN MAKİNE SANAYİ TİCARET A.Ş.**

Manufacturer Information
Name : ERMAKSAN MAKİNE SANAYİ TİCARET A.Ş.
Address : Organize sanayi Bölgesi Lacivert Cad. No: 6 Nilüfer / BURSA - TÜRKİYE
Tel : +90 224 294 75 00 Fax: +90 224 294 75 46
Web : www.ermaksan.com.tr

Name and Address of the Person Authorised to Compile the Technical File
Name : Fatih PITIR
Address : Organize sanayi Bölgesi Lacivert Cad. No: 6 Nilüfer / BURSA - TÜRKİYE
Tel : +90 224 294 75 00 Fax: +90 224 294 75 46
Web : www.ermaksan.com.tr
E-Mail : fatih.pitir@ermaksan.com.tr

Product Information
Description of Product : SYNCHRONIZED HYDRAULIC PRESS BRAKES
Brand : ERMAKSAN
Model(s)/Type(s) :#AP SERIES# CNC AP SERIES# CNC HAP SERIES# CNC SAP SERIES #CNC TAP SERIES #CNC THAP SERIES#CNC TSAP SERIES#MİCRO BEND SERIES#PRO BEND SERIES #SPEED BEND SERIES#ECO BEND EXPERT SERIES#REVOLUTION SERIES #EVOLUTION SERIES#EVO I SERIES# EVO II SERIES #EVO I T SERIES #EVO II T SERIES #GREEN PRESS Fx SERVO SERIES #SPEED BEND SMART SERIES #SPEED BEND SMART T SERIES#SERVO BEND SERIES#SERVO BEND T SERIES#POWER BEND SERİES #SPEED BEND PRO SERIES#POWER BEND PRO SERIES#POWER BEND FALCON SERIES #POWER BEND T SERIES#POWER BEND PRO T SERIES#POWER BEND FALCON T SERIES#SPEED BEND PRO T SERIES#ECO BEND EXPERT T SERIES#SPEED BEND T SERIES#

Applicable Directives
2006/42/EC Machinery Directive
2014/30/EU Electromagnetic Compatibility Directive

Applicable Harmonised Standards
EN ISO 12100:2010, EN 12622:2009+A1:2013, EN ISO 13855:2010, EN ISO 13849-1:2015, EN 60204-1:2006+A1:2009+AC:2010, EN 61000-6-2:2005+AC:2005, EN 61000-6-4:2007+A1:2011

THIS DECLARATION APPLIES TO ALL SPECIMENS MANUFACTURED IDENTICAL TO THE MODEL SUBMITTED FOR TESTING /EVALUATION. ASSESSMENT OF COMPLIANCE OF THE PRODUCT WITH THE REQUIREMENTS RELATING TO SAFETY STANDARDS LISTED ABOVE WAS PERFORMED BY MANUFACTURER.

SIGNED ON BE HALF OF THE MANUFACTURER
Name / Surname: Fatih PITIR
Title : AR-GE COORDINATION RESPONSIBLE
Place / Date : Bursa / 2018
Signature :

ERMAKSAN
MAKİNE SANAYİ ve TİC. A.Ş.

GUARANTEE CONDITIONS

1- All the pats of the machine are under guarantee regarding to workmanship and material defaults. (Exclusion of electricity materials).

2- Guarantee period is 1 year after delivery time.

3- If any part changed during guarantee period, that part has also 1 year guarantee from changing time.

EXCEPTIONS

1- Operating the machine before making the installation adjustments.

2- Not fixing the machine to the ground with anchorage bolts.

3- Feeding the machine with electricity voltage other than electricity voltage mentioned in Instruction Manual.

4- Not changing the parts that must be changed periodically such as oil and air filter.

5- Not lubricating the parts that are shown in Instruction Manual.

6- Operating the machine over max. pressure mentioned in Instruction Manual.

7- Damages occured from wrong cutting.

8- Damages occured from Compulsions.

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TECHNICAL DATAS

1.1- Technical features

Model	: MICRO-BEND 1000 - 40
Bending length	: 1000 mm.
Maximum power	: 40 TN.
Maximum bending capacity (St 42)	: 5 mm.
Maximum stroke	: 100 mm.
Distance between housing	: 800 mm.
Table height	: 800 mm.
Throat depth	: 250 mm.
Height	: 308 mm.
Back gauge distance (X Axis)	: 500 mm.
Free down speed	: 110 mm/s.
Bending speed	: 11 mm/s.
Return back speed	: 105 mm/s.
Hydraulic pumping motor	: 4 kW.
IP	: 54
Plant temperature	: 0 - 50 C°
Maximum noise	: 70 dBA
Machine length	: 2600 mm.
Machine width	: 1950 mm.
Machine height	: 1860 mm.
Weight	: 1860 kg.
Oil volume	: 60 lt.
Maximum pressure	: 255 bar

ELECTRICITY INFORMATION TABLE

Type	MICRO-BEND
Current type	3 AC
Frequency	50 Hz
Operation voltage	415V
Command voltage	24 V
Nominal current	10A
Power entrance cable	4x2,5 mm²
Minimum resistance isolation	1MΩ
Test voltage	415V

1.3 - Standard material

- Electricity Motors
- Bottom and top tool
- Command panel
- Foot pedal
- Front support
- Oil indicator
- Side and back guards
- Bottom tool fixing buffer
- Chains to turn the bottom tool (Only Special bottom tools)

1.4 - Abrasion parts

- Bottom tool
- Top tool
- Cylinder seals

1.5 - Special parts

- Digital controller

2- UNLOADING AND TRANSPORTING THE MACHINE

I Machine has to be unloaded and transported with an approriate lifting capacity crane. For the weight of the machine, see section Technical Features.

To transport the machine , use lifting hooks that are located both sides of the machine. As you see. (Figure:1)

I Lifting rope' s length and diameter have to be appropriate. Be careful about the transportation of the machine. (Not to turn over the machine)

When you received the machine please check if themachine has any damage. If you realize a damage, register it to transporter receipt and inform us.

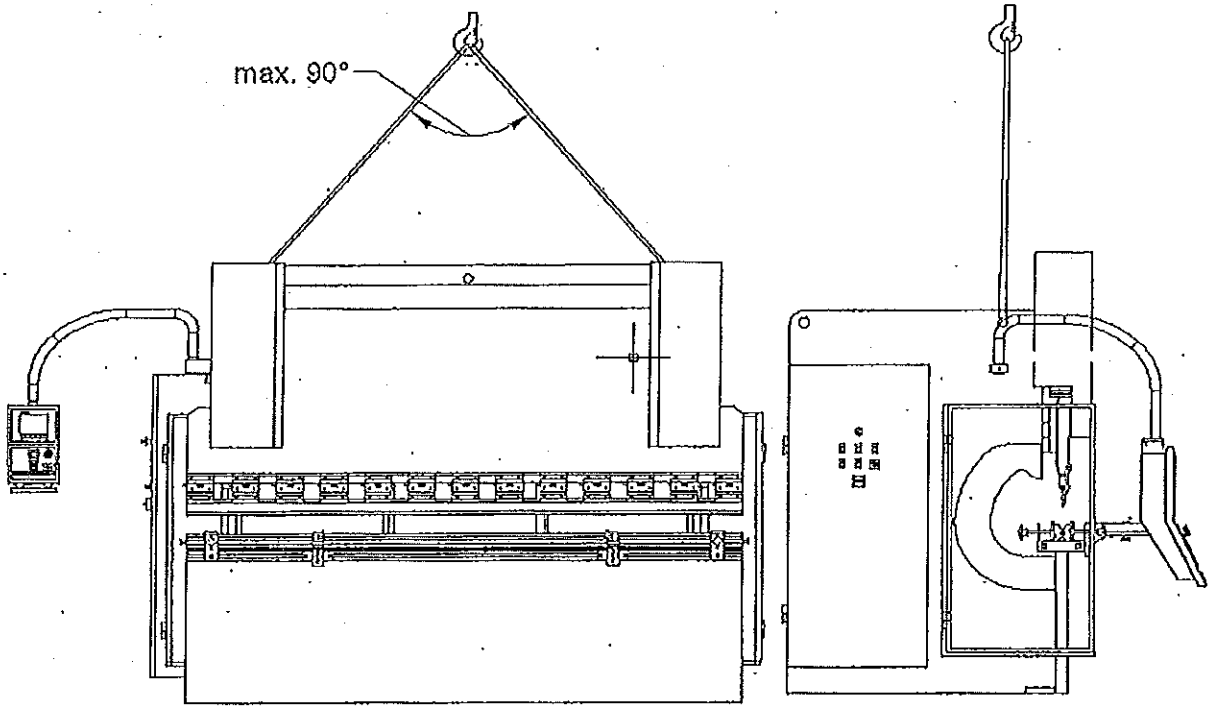


Figure : 1 - Unloading and Transporting Machine

3 - ASSEMBLY

3.1 - Locating the machine

Before choosing the place of machine, be careful about the machine dimensions mentioned in instruction manual. Prepare the anchroge holes and foundation. (Figure : 2) When the foundation is ready, locate the machine on to the foundation. Put on the adjustment plates, foundation bolts and nuts to their places. Fill the anchorage holes with concrete. After drying of concrete, locate a precise water scale on to the bottom to the bottom tool table. Adjust the machine precisely with water scale and 4 numbered bolts. Tighten the 2 numbered foundation bolts.

! The machine has to be fixed to the ground perfectly.

3.2 - Electricity connection

! The electricity connection of the machine to the network has to be made by a specialised person. Firstly check the current's appropriateness. (For electricity value see page 1/1)

! Electricity entrance cable cross section; has to be chosen appropriate to the machine power. (see page 1/2)

As you see in Figure: 3, pass the energy cable from the hole under the electricity panel. Connect the electricity cables to L1,L2,L3,N, clemenses. Connect the foot pedal command jack to the jack box on the electricity panel. (Figure:3)

! Electrical plant has to be earthed.

3.3 - First operation

! Before operating machine read and understand the instruction manual.

! Check the oil level in the oil tank.Check the fixedness of guards and switches.

Take 1Q1 main switch on the electricity panel from position 0 to position 1. The lamp (Energy is on) 3H1 numbered on the main switch must be on. If not, change the phases of energy entrance cable. For the transportation, not to fall down the top beam, in the factory wood buffers are located between the top and bottom tools. Take the position switch on the electricity panel to position 2. By pressing the left pedal on the foot pedal command continually, take the beam up. Take off the wooden buffers between the top and bottom beam .

Open the main switch then push the TEST button and START button to run the pump. And on CNC Controller push big hand button for manual operation. After that push CNC start button to make backgauge to go to reference position. On the same time push left pedal on the foot foot control to raise the top beam and it will take its reference position. Meanwhile backgauge will also take its reference position. And the wooden blocks between the beams. Push big hand button on CNC controller for manual operation and push right foot pedal to lower the top beam and stop it near the bottom tool. Then push CNC stop, pump stop buttons and finally turn off the main switch.

3-4 - Knowledge about CNC press brake

3.4.1 - CNC Press brake mechanism and components

3.4.1.1 - CNC Press brake operation system : When the bottom beam is upeer position, it goes down by it's heaviness. During that time a vacuum arise in the cylinder. Oil fill to the cylinder from the oil tank. The pump with electrical motor drive, send pressure oil to cylinders. By the power appear, the sheet between the tools bent. After the bending operation is finished, the direction valve in hydraulic system changes it's direction and pressured oil sent to bottom of the cylinder. By pistons the beam goes up.

3.4.1.2 - The assistants components

3.4.1.2.1 - Top & Bottom tools : The components that the sheet bended. Depending on requirements, they can be in different shape and position.

3.4.1.2.2 - The assistants components

3S2 Emergency stop	At the electrical panel
3S3 Emergency stop	At the foot pedal
Photocell	At the rear guards
Light curtain	At the right door
Light curtain	At the left door

If you press the emergency stops or if the protections are open, the top beam stops and goes up. When it reaches the top limit switch machine stops.

- 3.4.1.2.3 - **Backgauge system** : Backgauge provides the sheet to bent in required measurement. It is controlled by the digital display which is t the command panel. It has two backgauge finger and two limit switches.

3.4.1.2.4 - **Foot control panel :** It has 3 components.

Emergency stop	(3S4)	: Usage for emergency condition
Right pedal	(6B1)	: It provides top beam to go down
Left pedal	(6B2)	: It provides top beam to go up

3.4.2 - **Protection components :** For safety of operator, some protective component are fitted on necessary places of the machine.

- Side protection covers
- Rear protection covers
- Cylinder protection sheets
- Backgauge drive belt sheets
- Cable protection sheets
- Safety barriers

3.4.3 - **Accident and precaution**

3.4.3.1 - **Hand press between tools :** To prevent this safety guard has been fitted on the machine.

3.4.3.2 - **Bending sheet has strike to body of operator :** Warning label on the front of machine.

3.4.3.3 - **Hand press between moving drive systems :** Safety guard sheets have been fitted on the around of moving parts.

3.4.3.4 - **Electric shock :** Grounded has been made on the machine and all cables have been taken in the cable canal, outside cables coated by spiral protection against crush.

3.4.4 - **Bottom tool clamping :** Fixing the bottom tool by centringV canal as to top tool.

3.4.5 - **Designing tool :** All tools production is in standard size, special product is possible for if the operator requires in different sizes. Sheet thickness and canal size can be choose from bending capacity table. This table available on the machine and manual instruction book.

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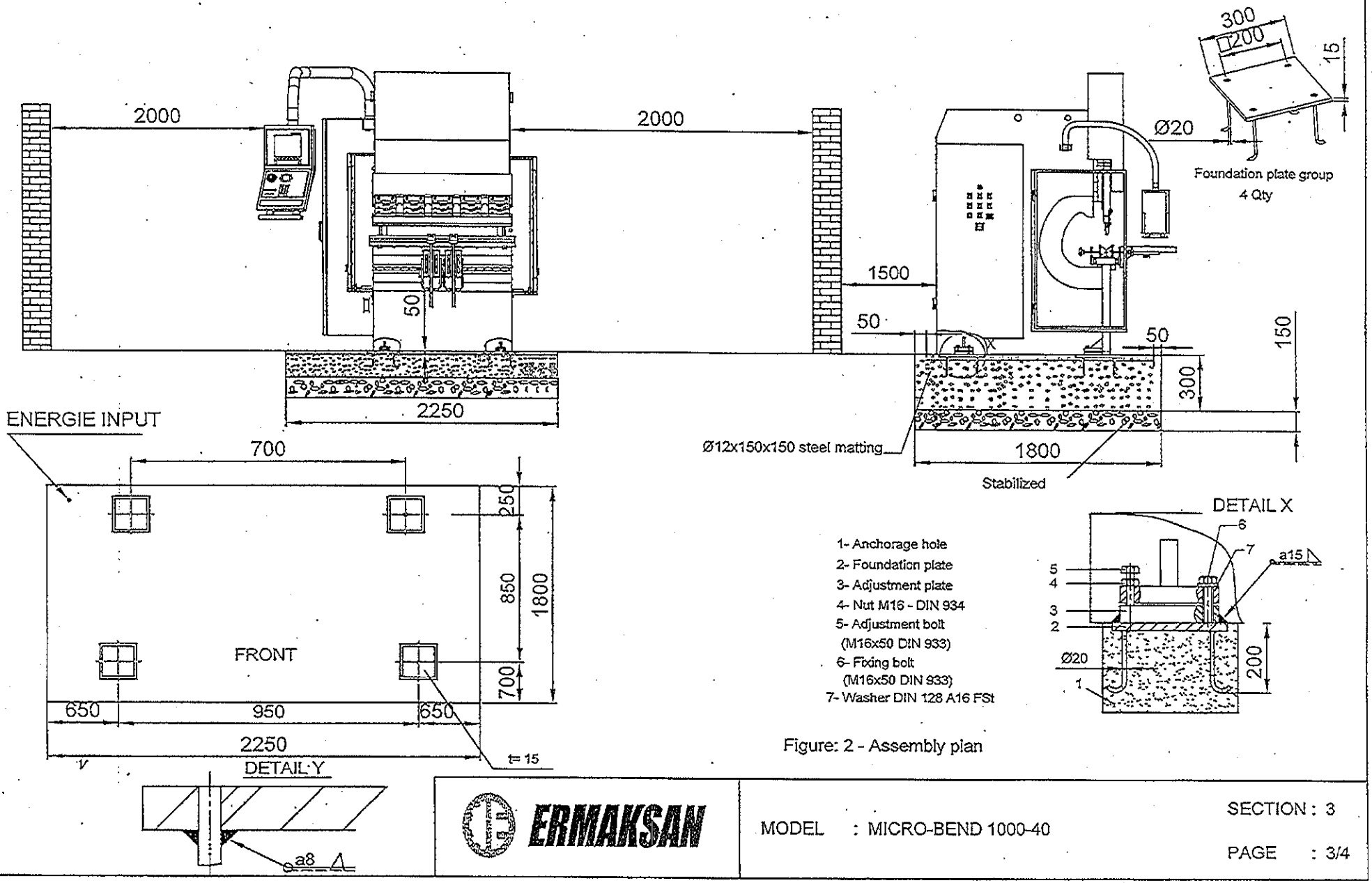


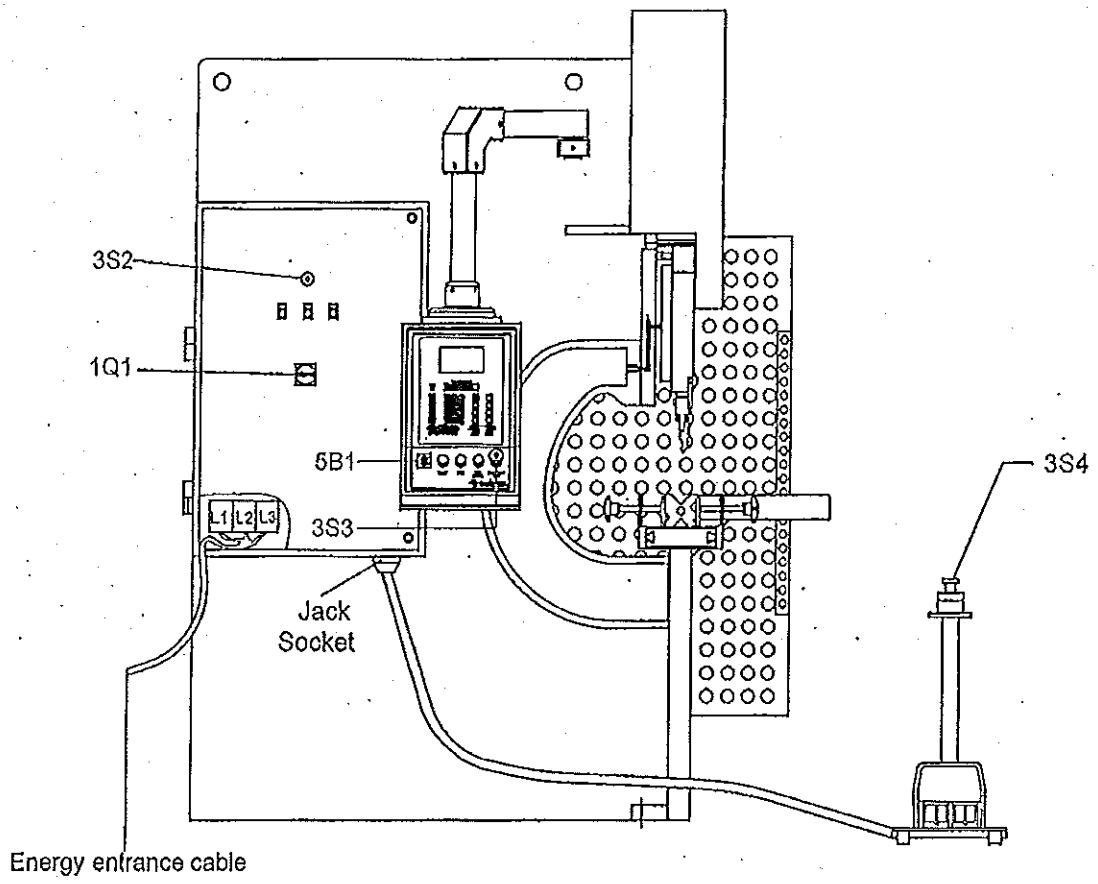
Figure: 2 - Assembly plan

ERMAKSAN

MODEL : MICRO-BEND 1000-40

SECTION : 3

PAGE : 3/4



If the light is on, on the phase control relay it means electrical connections are made correctly. If not phase change the place of two phase cables.

Figure: 3 - Electricity Connection

4 - OPERATION

4.1 - Forbidden operation

CNC Hydraulic Press Brake; has not be used in the following conditions.

- Between the top and bottom tool , if there is a foreign matter other than the material which wil be bended.
- The application which is not simetric during the bending (Figure: 4)
- Bending material which is not horizontal.
- If the guards and switches are out of order.
- Cutting , crushing , pressing , cracking , breaking and drilling applications.

4.2 - Incorrect operation

1- If the top tool is not parallel to the bottom tool;
   - Requested bending angle can not be achieved.
   - Damage or breakage on the tool.
   - Brakage of the screw shaft that connects the piston to the top beam.

2- If the adjustment between the tools is not made according to bending sheet's thickness
   a) If the gap between the tools is more than the thickness of the sheet.
      - Requested bending angle can not be achieved.
   b) If the gap between the tools is less than the thickness of the sheet.
      - Tools can be damaged during bending.
      - Bending angle can be lower than the requested angle value.

3- Bending a sheet which has been cut by a gas cutter ;
      - Tools can be damaged.
      - Spreading parts may cause an accident.

4- During the adjustment of the machine or in operation, if any foreign material exists between the two tools. Bolt,pin, key, etc.)
      - Tools can be damaged.
      - Spreading parts may cause an accident.

Figure - 6 : Electricity Panel

4.3 - Command Elements

4.3.1 - Electricity Panel

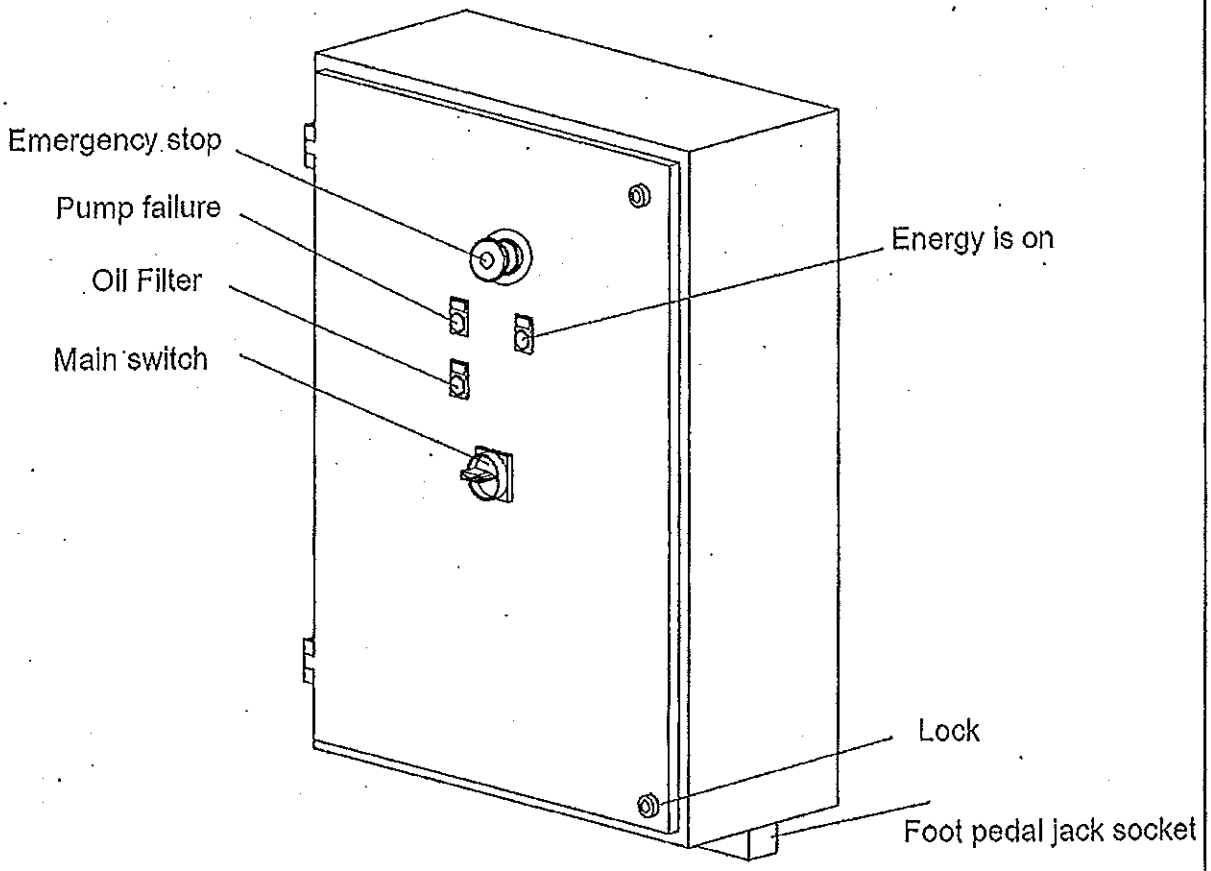


Figure : 6 - Electricity Panel

4.3.2 - Command Panel
Type : CYBTOUCH PS 12

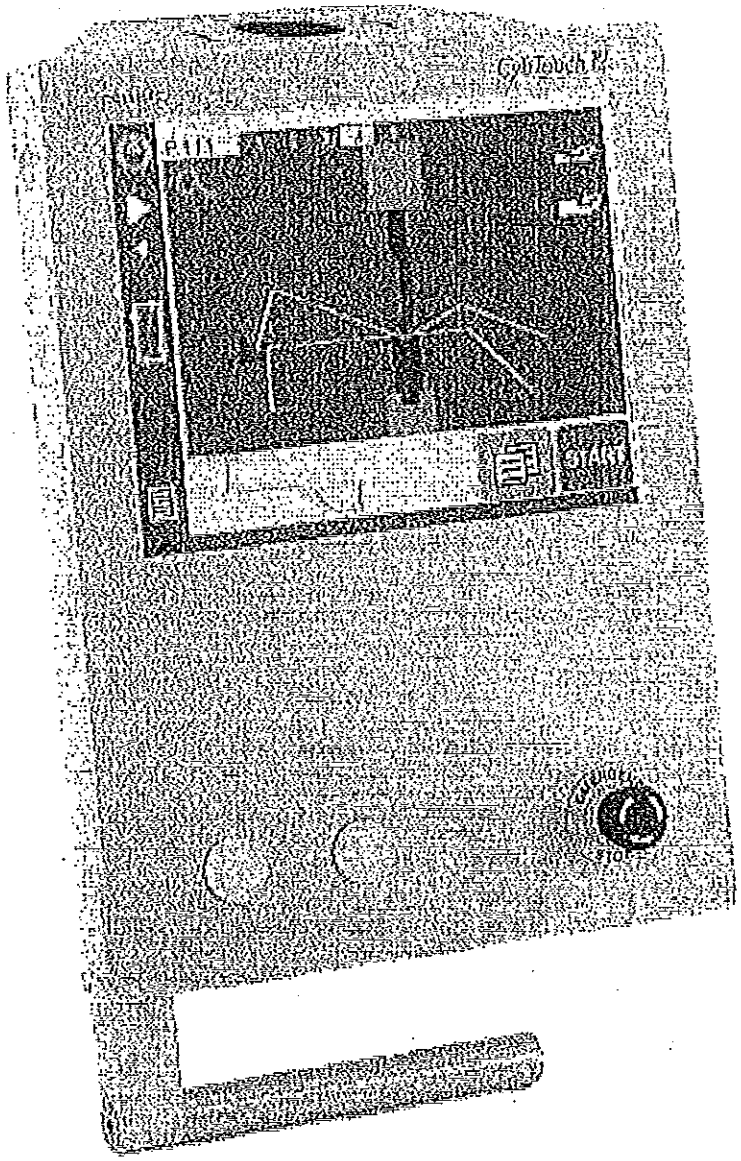


Figure : 7 - Command Panel

4.4 - Operation

The machine has to be used by a specialist person. Machine has delivered after all the adjustment made in factory. Before starting the bending operation, lubricate the tools. Choose the appropriate position and after making all the required adjustments, start bending operation.

4.4.1 - Positions

Position selection; made from Position Switch (P 123) on the command panel.

Position 0 - No function

Position 1 - When you press the right pedal (6B1) continually, top beam goes down and complete the bending process. When you press the left pedal (6B2) continually, top beam goes up.

Position 2 - When you press the right pedal (6B1) continually, top beam goes down, complete the bending process and goes up.

Position 3 - When you press the right pedal (6B1) continually, top beam goes down slowly and complete the bending process. If you press the left pedal (6B2), top beam goes up.

3S4 - Emergency Stop
6B1 - Down Stroke
6B2 - Up Stroke

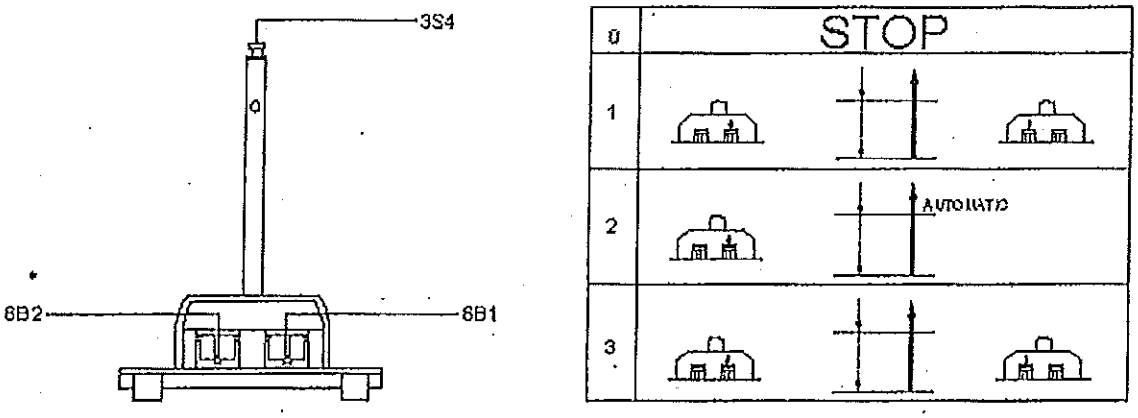
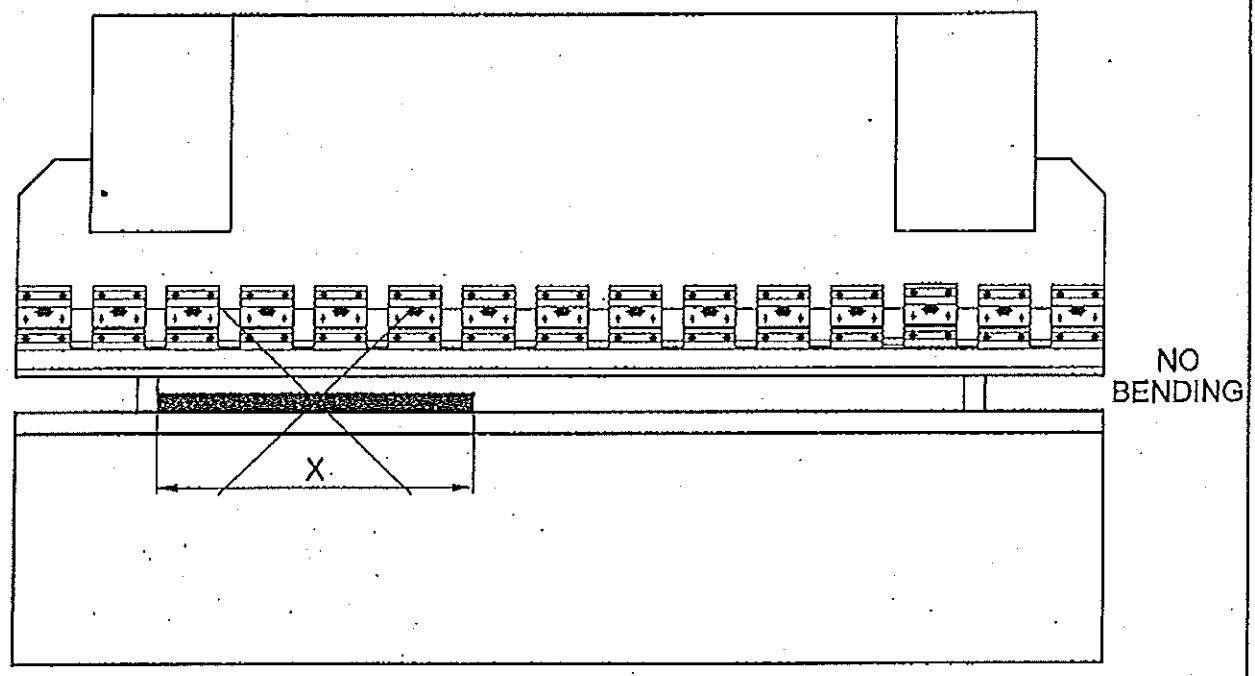
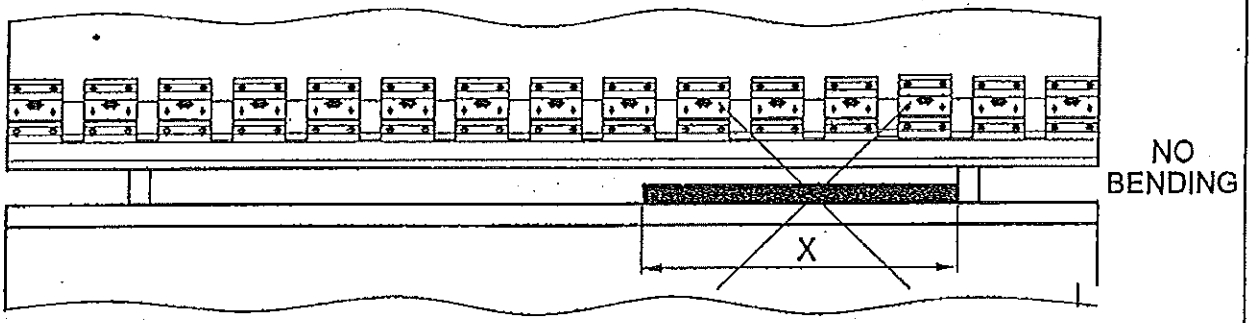
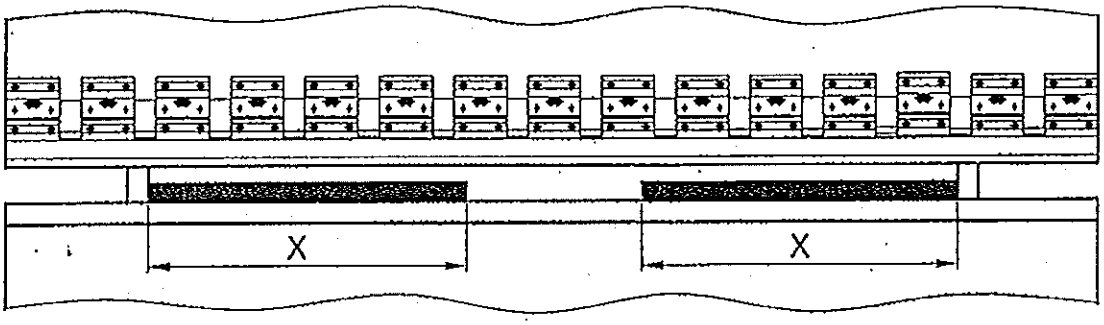


Figure - 8 : Foot Pedal Command and Position Table

WHEN CONTROLLER AND FOOT PEDAL USED TOGETHER, YOU CAN MOVE THE TOP BEAM AND MAKE THE BEND.
IN AN EMERGENCY; YOU CAN STOP THE MACHİNE BY PUSHİNG ON THE (MUSHROOM SHAPED) EMRGENCY STOP BUTTON ON THE FOOT PEDAL OR WHEN FOOT PEDAL İS AT 2ND STAGE (BY PRESSİNG STRONGLY ON THE FOOT PEDAL).







If you want to bend short sheets, you have to bend in both sides of the machine at the same time.

Figure : 4 - Symmetrical bending.

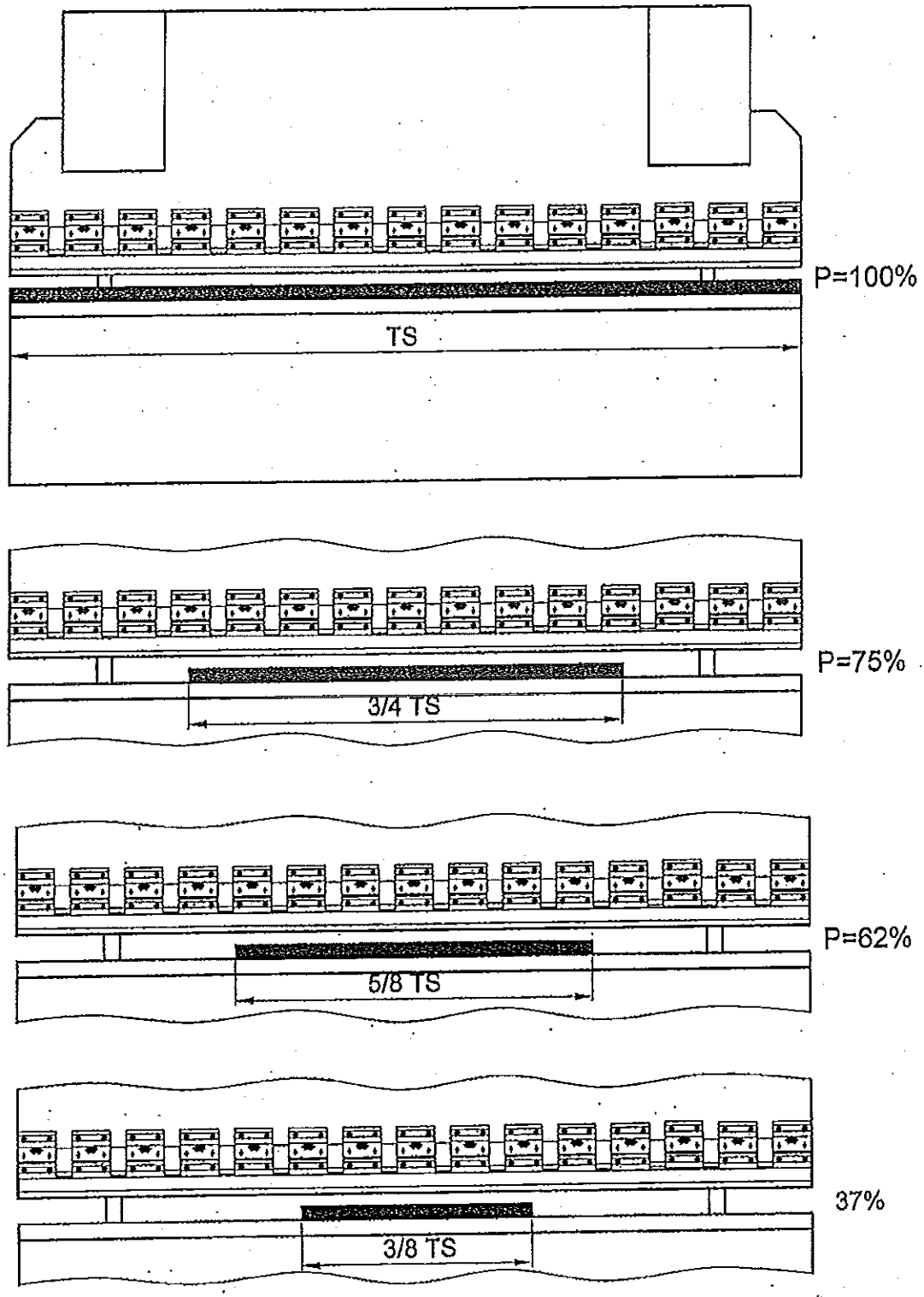


Figure : 5 - Maximum loading according to sheet length

4.4.2 - Pressure Adjustment

The default value of valves limiting the pressure is adjusted to be 110% of the working pressure. The operator should not make any pressure adjustment on the distributor block in any case. The tonnage to be applied on the sheet is automatically calculated by the CNC controller as the thickness and the length of the sheet is entered to the CNC controller. **The operator should not make any pressure adjustments.**

4.4.3 - Stroke Adjustment

The stroke is automatically adjusted by the machine according to the bending program.

4.4.4 - Bending Angle Adjustment

The " V " canal is chosen according to the thickness of the sheet. (Ref 4.4.9.2.1). The width of the "V" canal should be 10 times bigger than the thickness of the sheet to be bended. If the bending angle is smaller than 90°, a special apparatus is needed for bending.

The bending angle is entered to the controller as 90°,then by pressing the foot pedal, the Y Axis approaches to the bottom tool and centers the V canal. The Y axis is raised by pressing the foot pedal again. After entering the bending angle, the thickness, the length and the V Canal to the CNC controller, the sheet is placed on the bottom tool and the Y Axis is lowered by pressing the foot pedal and the sheet is bended, then the Y axis raises to it's initial position. The angle of the bended sheet is measured, if the angle is smaller, the difference is entered as plus degree as plus degree to the correction line and make another bending.

4.4.5 - Adjustment of the top tool (Anti-Deflection)

During long term operations, the angle of the top tool can be changed, and it may be hard to get the same angle during bending.

To correct this, Switch the "P123" position arm to "2" . Enter The thickness as 2mm and the bending length as 2000mm. Loosen the no1 bolts. Take the no 2 wedges to right side in order to take away the pressure on the top tool. (figure 15). Press the right pedal on the foot pedal (6B1) continuously and lower the top beam. Release the foot pedal as the top touches the bottom tool.

So you can see the defective parts or places on the top tool.

Take the wedges to left and let the top tool press on the bottom tool. (along the bottom tool) Tighteen the no 1 bolts and and finalize the adjustment operation. Press the left pedal on the foot pedal (6B2) and raise the top beam (Figure : 8)

ERMAKSAN

MODEL : MICRO-BEND

ERMAKSAN

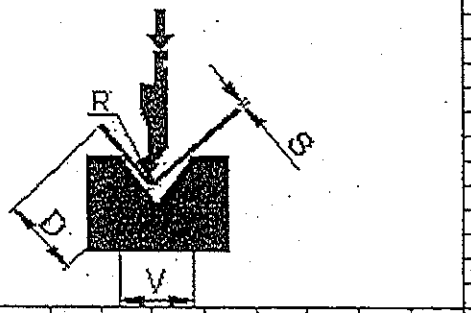
ERMAKSAN MAKİNA SANAYİ VE TİC. A.S.

Organize Sanayi Bölgesi Ladivert Cad. No:6 BURSA / TÜRKİYE

Tel : (00 90 224) 294 75 00 Fax: (00 90 224) 294 75 44

web : www.ermaksan.com.tr e - mail : ermaksan@ermaksan.com.tr

S mm.	0.7	0.8	1	1.3	1.6	2	2.7	3	3.3	4	5	5.5	6.5	7	8	10	11	13	16	19	21	23	24.5	26	28	32	41	48	R
	2.3	3.5	4	6	7	9	11	13	14	17	22	24	28	31	35	42	49	56	70	80	90	100	105	110	130	148	170	200	D
	4	5	6	8	10	12	15	18	20	25	30	35	40	45	50	60	70	80	100	120	130	140	150	160	180	200	250	300	V
0.5	4	3	2	2																									F
0.6	5	4	3.5	3	2																								F
0.8		5	7	5	4	2																							F
1.0			10	8	6	5	4																						F
1.2				10	8	7	6	5																					F
1.5					13	12	9	7	7																				F
1.8						16	13	11	10	8																			F
2.0							16	14	12	10	8																		F
2.5								21	20	15	12	11																	F
3.0									27	22	18	15	13																F
3.5										29	24	21	18	16															F
4.0											32	27	24	21	19														F
4.5												35	30	27	24	20													F
5.0													37	33	30	25	21												F
6.0														48	43	36	31	27											F
7.0															58	49	42	37	29										F
8.0																64	55	48	42	32									F
10																	85	75	60	50	46								F
12																		107	86	72	66	61							F
13																			101	84	76	72	67						F
14																				98	90	84	78	73					F
15																					103	96	90	85	75				F
16																						109	102	95	85	76			F
18																							129	120	107	97	77		F
20																								140	132	119	95	80	F
25																									207	186	149	124	F
30																										268	215	179	F



$$F = \frac{1{,}42 . \sigma . s^2 . L}{1000 . V}$$

σ: 42 Kg/mm²

BENDING CAPACITIES

S- Thickness of Sheet (mm)
R- Inside Radius (mm)
D- Smallest Setting Side (mm)
V- Width of Bottom Die Opening to Fit (mm)
F- Pressure in Metric Tons Per Meter
- Tensile Strength (kg / mm²)
L- Sheet Length (mm)

CAPACIDADES DE DOBLADA

Espesor de la chapa (mm)
Radio del borde interior (mm)
Anchura mínima de borde de doblada (mm)
Canal conforme al espesor la chapa (mm)
Fuerza de doblar la chapa de 2 metro

CAPACIDADES DE QUINAGEM

Espessura da placa (mm)
Raio interior (mm)
Lado definiçao + Pequeno cote (mm)
Largura da matriz inferior (mm)
Pressao em ton. metricas p/mt.

MACHINE TYPE	0,4	0,5	0,6	0,8	1,0	1,2	1,5	1,8	2,0	2,5	3,0	3,5	4,0	4,5	5,0	6,0	7,0	8,0	10,0	12,0	13,0	14,0	15,0	16,0	18,0	20,0	25,0	30,0	S
	4	5	6	8	10	12	15	18	20	25	30	35	40	45	50	60	70	80	100	120	130	140	150	160	180	200	250	300	V
CNC AP 1270 - 35	19	24	29	39	48	58	72	87	96	121	145	169	193	217	MAX. PRESSURE 240 BAR														bar
CNC AP 2100 - 35	32	40	48	64	80	96	120	144	159	199	239	MAX. PRESSURE 240 BAR																	bar
CNC AP 2100 - 80	12	16	19	25	31	37	47	56	62	78	93	109	125	140	156	187	MAX. PRESSURE 200 BAR							S = SHEET THICKNESS (mm)					bar
CNC AP 2600 - 50	27	34	41	55	69	82	103	123	137	171	206	240	MAX. PRESSURE 270 BAR											V = CANAL WIDTH (mm)					bar
CNC AP 2600 - 80	15	19	23	31	39	46	58	69	77	96	116	135	154	174	193	MAX. PRESSURE 200 BAR													bar
CNC AP 2600 - 120	12	15	18	24	30	37	46	55	61	76	91	107	122	137	152	183	213	244	MAX. PRESSURE 240 BAR										bar
CNC AP 3100 - 80	18	23	28	37	46	55	69	83	92	115	138	161	184	MAX. PRESSURE 200 BAR															bar
CNC AP 3100 - 120	15	18	22	29	36	44	54	65	73	91	109	127	145	163	182	218	MAX. PRESSURE 240 BAR												bar
CNC AP 3100 - 160	12	15	18	24	29	35	44	53	59	74	88	103	118	132	147	177	206	235	MAX. PRESSURE 260 BAR										bar
CNC AP 3100 - 200	10	12	15	19	24	29	36	44	49	61	73	85	97	109	122	146	170	195	243	MAX. PRESSURE 265 BAR									bar
CNC AP 3100 - 250	8	9	11	15	19	23	28	34	38	47	56	65	75	85	94	113	132	151	188	226	246	MAX. PRESSURE 260 BAR							bar
CNC AP 3100 - 300	6	8	9	12	15	18	23	27	30	38	45	53	60	68	75	90	105	120	150	180	196	210	225	240	MAX. PRESSURE 250 BA				bar
CNC AP 3600 - 120	17	21	25	34	42	51	63	76	84	105	127	148	169	190	211	MAX. PRESSURE 240 BAR													bar
CNC AP 3600 - 160	14	17	21	27	34	41	51	62	68	85	103	120	137	154	171	205	239	MAX. PRESSURE 260 BAR											bar
CNC AP 3600 - 200	11	14	17	23	28	34	42	51	56	71	85	99	113	127	141	169	198	226	MAX. PRESSURE 265 BAR										bar
CNC AP 3600 - 250	9	11	13	17	22	26	33	39	44	55	66	77	87	98	109	131	153	175	219	262	MAX. PRESSURE 260 BAR								bar
CNC AP 3600 - 300	7	9	10	14	17	21	26	31	35	44	52	61	70	78	87	105	122	139	174	209	227	244	MAX. PRESSURE 250 BAR						bar
CNC AP 3760 - 120	18	22	26	35	44	53	66	79	88	110	132	154	176	198	220	MAX. PRESSURE 240 BAR													bar
CNC AP 3760 - 160	14	18	21	29	36	43	54	64	71	89	107	125	143	161	178	214	250	MAX. PRESSURE 260 BAR											bar
CNC AP 3760 - 200	12	15	18	24	29	35	44	53	59	74	88	103	118	133	147	177	206	236	MAX. PRESSURE 265 BAR										bar
CNC AP 3760 - 250	9	11	14	19	23	27	34	41	46	57	69	80	91	103	114	137	160	183	228	MAX. PRESSURE 260 BAR									bar
CNC AP 3760 - 300	7	9	11	15	18	22	27	33	36	46	55	64	73	82	91	109	127	146	182	219	237	MAX. PRESSURE 250 BAR							bar
CNC AP 4100 - 120	19	24	29	38	48	58	72	86	96	120	144	168	192	216	240	MAX. PRESSURE 240 BAR													bar
CNC AP 4100 - 160	16	19	23	31	39	47	58	70	78	97	117	136	156	175	195	234	MAX. PRESSURE 260 BAR												bar
CNC AP 4100 - 200	13	16	19	26	32	39	48	58	64	80	96	113	129	145	161	193	225	257	MAX. PRESSURE 265 BAR										bar
CNC AP 4100 - 250	10	12	15	20	25	30	37	45	50	62	75	87	100	112	125	149	174	199	249	MAX. PRESSURE 260 BAR									bar
CNC AP 4100 - 300	8	10	12	16	20	24	30	36	40	50	60	69	79	89	99	119	139	159	199	238	MAX. PRESSURE 250 BAR								bar
CNC AP 4100 - 400	6	8	9	12	15	18	23	27	30	38	46	53	61	68	76	91	106	122	152	182	198	213	228	243	MAX. PRESSURE 250 BA				bar
CNC AP 5100 - 200	16	20	24	32	40	48	60	72	80	100	120	140	160	180	200	240	MAX. PRESSURE 265 BAR												bar
CNC AP 5100 - 300	10	12	15	20	25	30	37	44	49	62	74	86	99	111	123	148	173	198	247	MAX. PRESSURE 250 BAR									bar
CNC AP 5100 - 200	13	24	29	38	48	57	72	86	96	120	144	167	191	215	239	MAX. PRESSURE 265 BAR													bar
CNC AP 5100 - 250	15	19	22	30	37	44	56	67	74	93	111	130	148	167	185	222	259	MAX. PRESSURE 260 BAR											bar
CNC AP 5100 - 300	12	15	18	24	30	35	44	53	59	74	89	103	118	133	148	177	207	236	MAX. PRESSURE 250 BAR										bar
CNC AP 5100 - 400	9	11	14	18	23	27	34	41	45	57	68	79	90	102	113	136	158	181	226	MAX. PRESSURE 250 BAR									bar

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Figure : 10 Pressure table

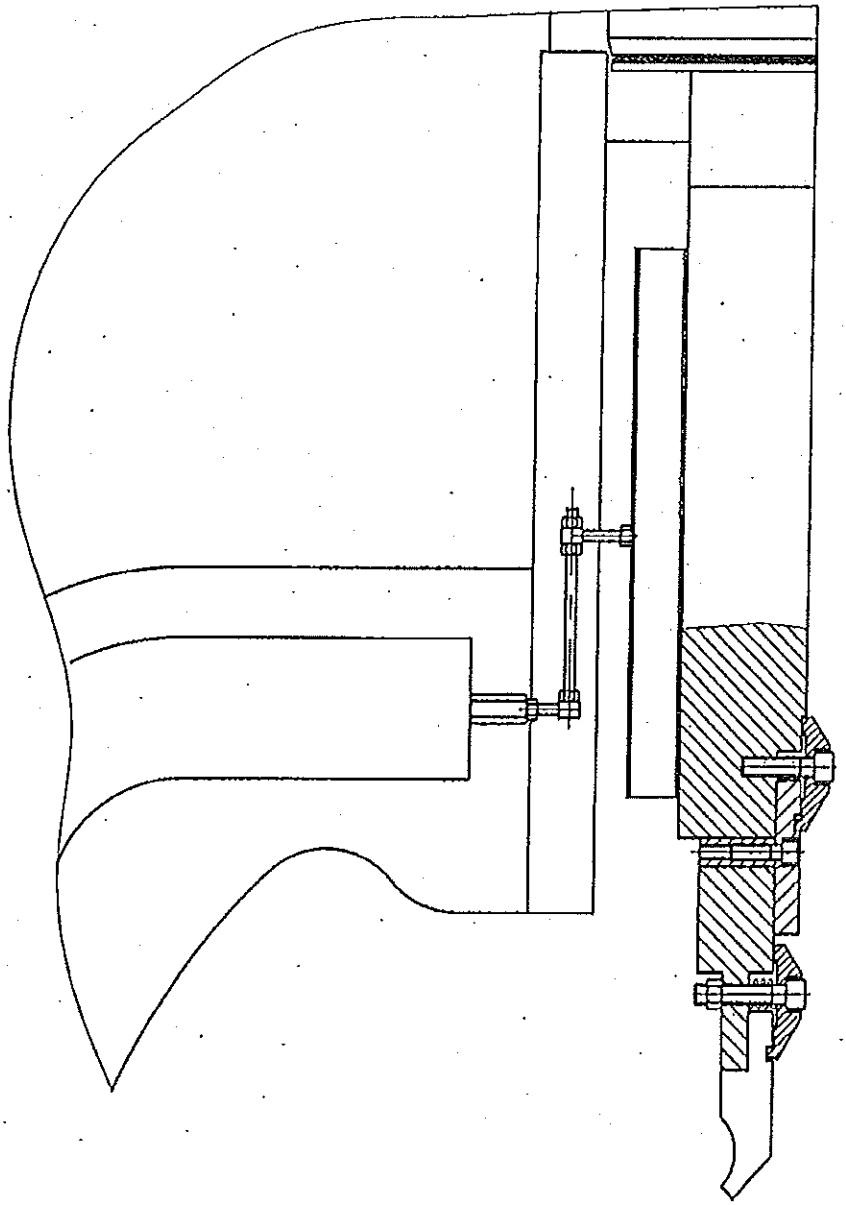
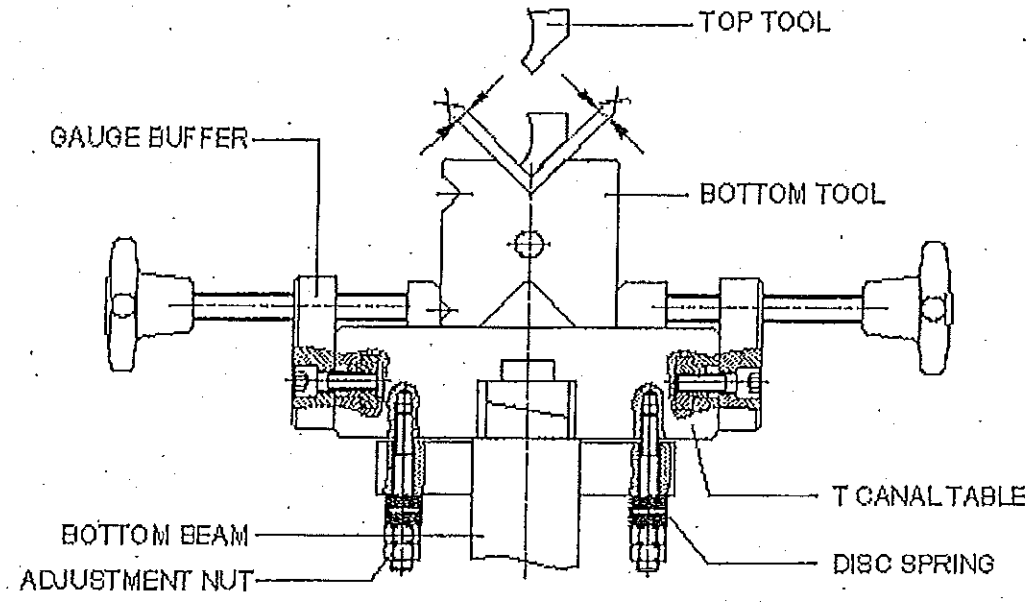
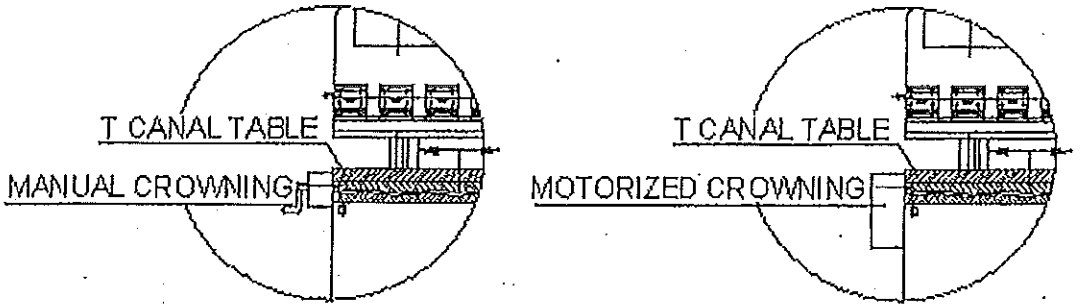


Figure : 12 - Linear Scale System





ANTI DEFLECTION SYSTEM

Crowning is done by turning a manual arm on manual system. But in motorized system unit is driven by CNC control unit.

Figure - 12 : Adjustment between tools

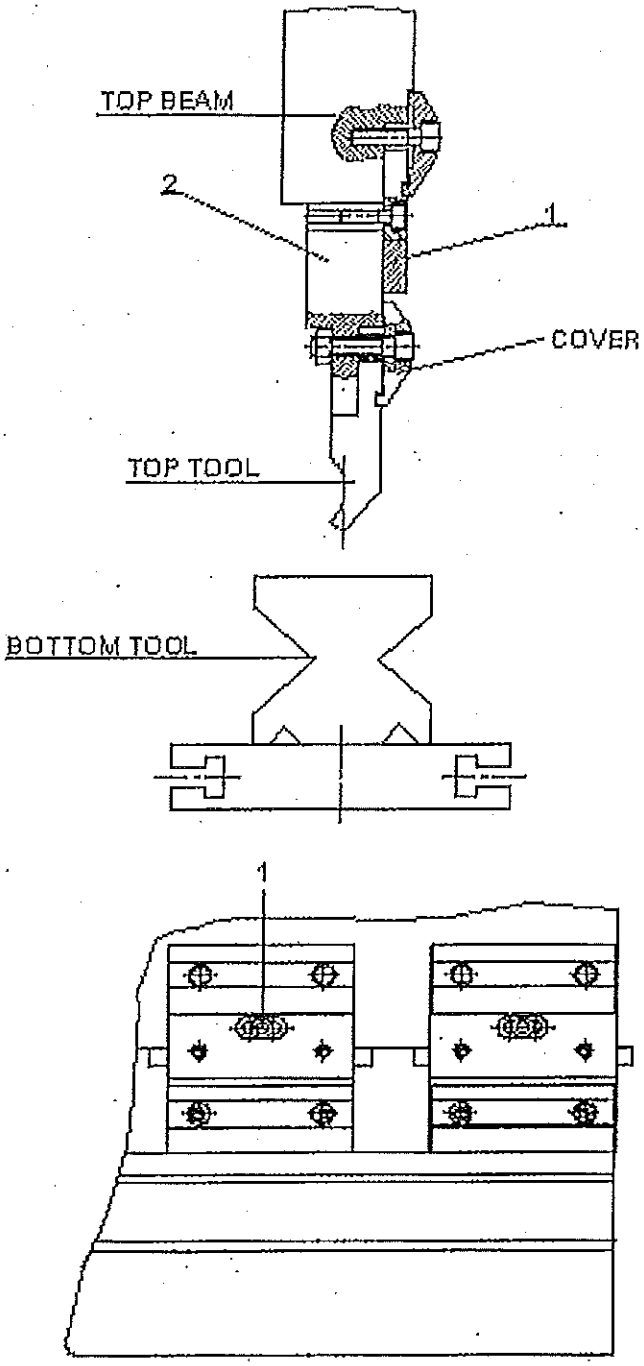


Figure - 14 : Top Tool System

4.4.7 - BENDING TECHNIQUE

Generally there are two ways to bend a sheet.

1 - Free Bending

When compared with the other one, it is done with less power. But you find the real angle after the sheet's flexibility.

2 - Pressure

It needs 3 or 5 times more power than other applications. But the angle's rightness is more precise because it applicates more pressure to inside angle.

4.4.7.1 - Free Bending

Generally there are two ways.

4.4.7.1.1 - Free bending until top tool touches to bottom tool.

Main principals:

-RXS (Flexibility of the sheet after bending)

-R≅ V / 10 ; (R=S If V= 10 x S)

-R, S If R equals to S , natural bending in R is half diameter.

Application:

For 90° bendings (see pressure bending table)

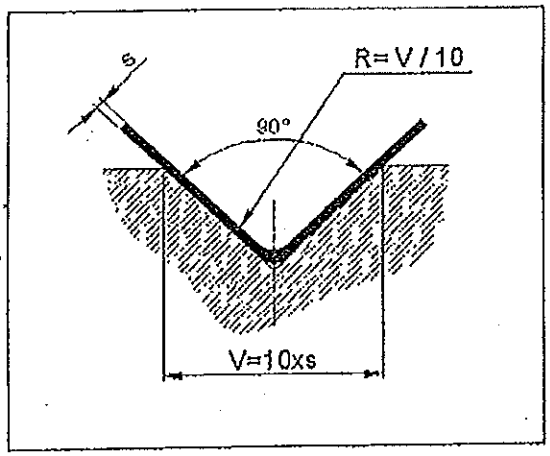
Bottom tool wideness (In 4 mm Sheets) 7-8 times S (more than 4 mm sheet) 9-10 times S

Bottom tool angle= 88° to compensate the flexibility.

V > 30 mm = 86°

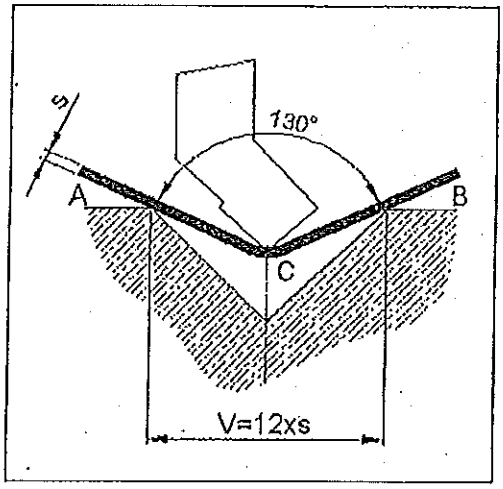
V < 30 mm = 88°

This method can be applied after 2 mm. thickness.



4.4.7.1.2 - Free bending without leaning the top tool to bottom tool

In this bending method, stop the process before top tool leans to bottom tool completely.



Sheet touches bottom tool in A-B-C points.

This method requires bigger V canal (from 12 to 15 S) to have a better bending quality.

- In this condition, shape of the bottom and top tool is not so important.

4.4.7.2 - Free bending

Main principals:

R < S Top tool point enters to bottom tool's half diameter and by this way it breaks the elasticity of the material.

Aplication:

To bend 90°

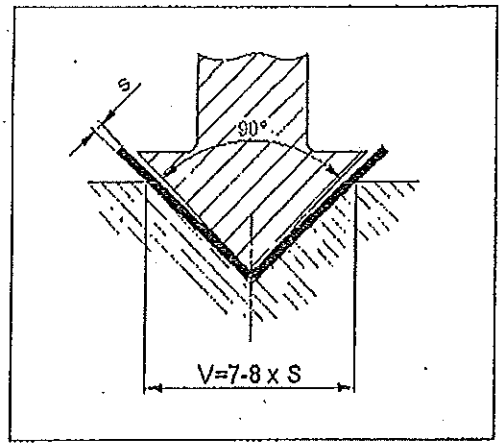
Wideness of bottom tool = from 7 to 8 S

Bottom tool angle = 90°

Top tool angle = 90° only in this condition, Top tool angle is important.

This method is valid for 2 mm. thickness, in emergency conditions,

It is valid up to 3 mm.



4.4.8 - Replacing the tools

4.4.8.1 - Top Tool

Switch the "5B1" position arm to "3". Press the right pedal on the foot pedal (6B1) continuously and lower the top beam until the distance between the edge of the top tool and the bottom of V canal is 2 mm. Take out the side covers. Loosen the no 1 bolts. Take out the top tool pieces by sliding from the side of the the machine and take to a proper place. Put on the other top tool pieces on the machine. Tighten the no 1 bolts. (Figure : 17) If the top tool is one piece, carry with a crane.

4.4.8.2 - Bottom Tool

4.4.8.2.1 - Choosing the V channel according to the thickness

Switch the "5B1" position arm to "3". Press the right pedal on the foot pedal (6B1) continuously and lower the top beam.Loosen the bottom tool holders,put on the no 4 chain on thw no 2 and no 6 bolts.(from the each side of the tool). Press the left pedal (6B2) on the foot pedal and lift the bottom tool with the top tool (only used for 1 piece tools) Turn the bottom tool with no 6 bolt with the proper wrench.) (by leaving the desired V at the top) If the tools on the machine are segmented, turn off the main switch, loosen the setscrews and leave the desired V at the top. After adjusting the axis, you may start operation.

4.4.8.2.2 - Replacing the bottom tool with another one.

Loosen the bottom tool holders. Slide the bottom tool at one side of the machine and carry to a proper place with a crane. Replace the bottom tool with the recent one. Make the axis adjustments and tighten the bottom tool holders. If the tools on the machine are segmented, turn off the main switch, loosen the setscrews and leave the desired V at the top. After adjusting the axis, you may start operation.

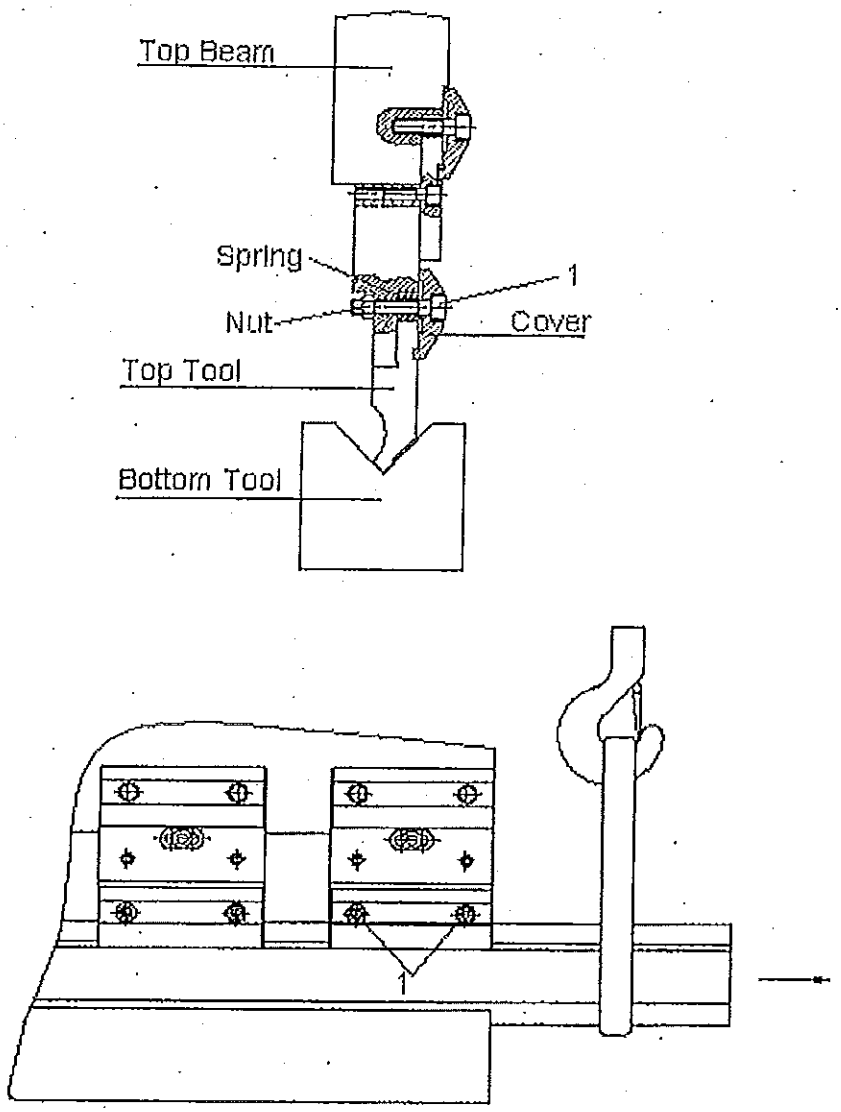
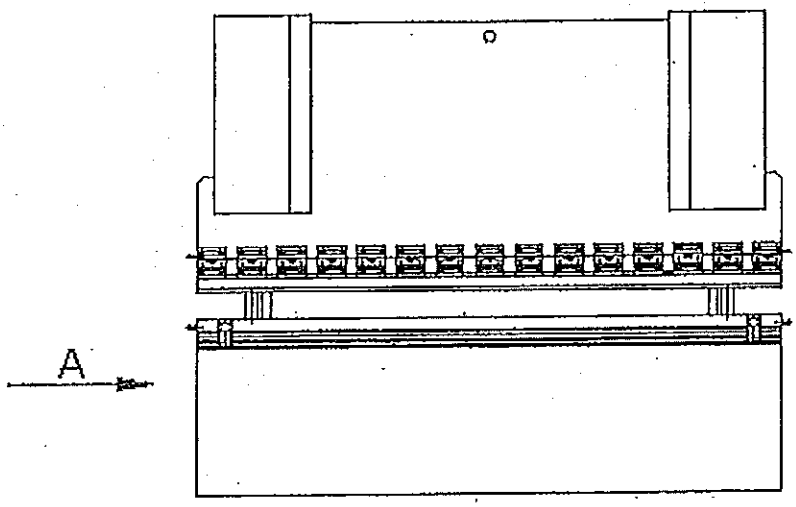
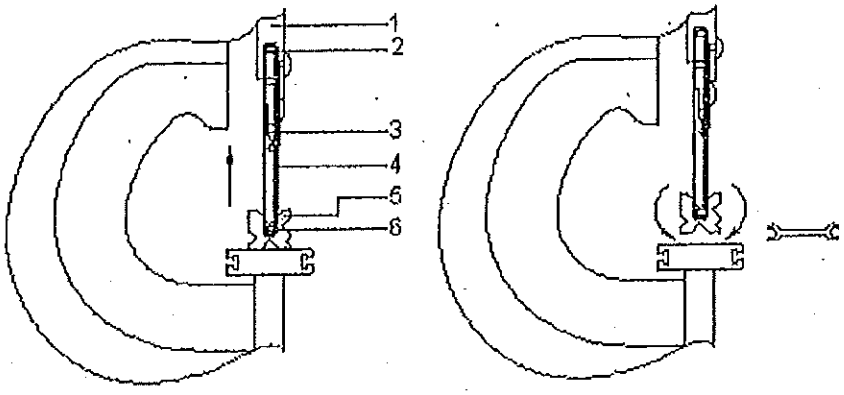


Figure - 16 : Changing of top tool



A VIEW



1.POSITION

2.POSITION

1 - Top Beam
2 - Lifting Bolt
3 - Top Tool
4 - Lifting Chain
5 - Bottom Tool
6 - Lifting Bolt

Figure - 16 : Turning the bottom tool

4.4.9 - SECURITY PRECAUTIONS

I Foot pedal command has to be 1.5 meter away from the machine's operation table.

I Do not take off the guards if it is not so necessary.

I Be careful about the warning plates on the machine. Do not take them off.

I In emergency conditions press emergency switch.

I Do not put your hands between the tools when the machine is in operation.

I During bending, not to cause any accident, wear gloves and protecting shoes. Do not wear loose cloths.

I During bending, the sheet may go up. Be carefull about this situation.

I In operation defaults, stop the machine immediately and secure it.

I Before maintenance, stop the machine fully.

I Do not leave any material on the front support arms.

I Check the connection parts, if needed tighten them.

I Operate the machine with appropriate tools.

I Do not use parts which are not fitted to the machine.

5-MAINTENANCE

5.1 - General maintenance

Control	Frequency	Responsible
Greasing	See section 5.5	Operator
Lubrication of the tools	Daily	Operator
Damage on guards	Daily	Operator
Oil leakage on cylinders	Daily	Operator
Hydraulic oil level	Weekly	Operator
Looseness of cylinder-foot connection bolts	Weekly	Operator
Oil leakage on hydraulic materials and connections	Weekly	Operator
Top tool adjustment bolts	Weekly	Operator
Electricity connections	Annually	Electrician

5.2 -Hydraulic System

Check the hydraulic oil level regularly.Clean the hydraulic circuit materials. During the control period, dust and dirt musn't to go through the hydraulic system. Change fuse seals, damaged and abrasion parts.

!Hydraulic system adjustment are made in the factory.Do not change the hydraulic system adjustment.

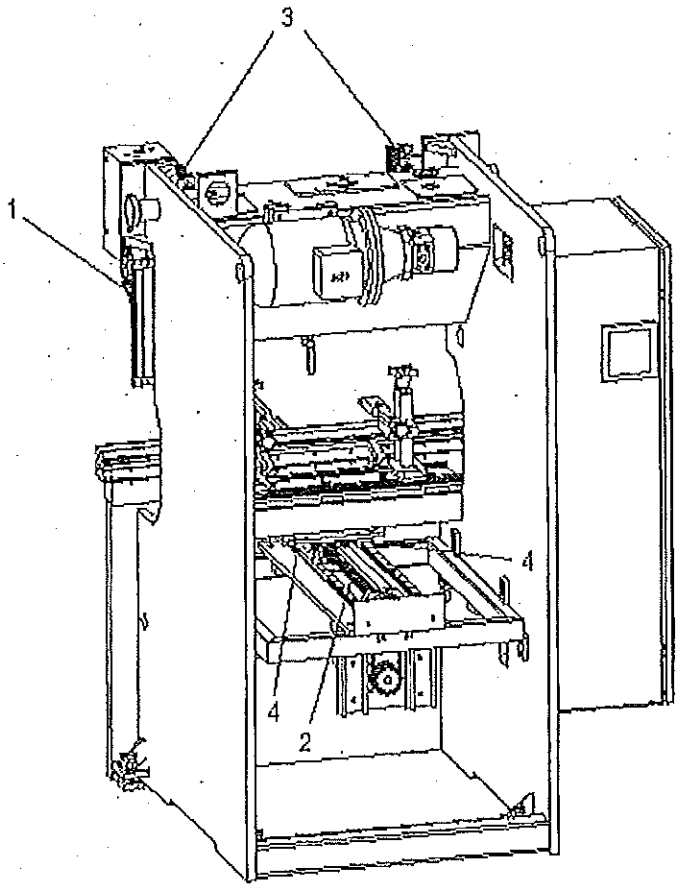
5.3 - Oil changing

First changing of the oil in the tank has to be done after 1000 hours operation. Further changings have to be done after 2500 hours operation. In time hydraulic oil may be dirty and worn out. In this condition, it has to be changed. Sedimentary, blurred oil has to be changed. Get the position switch to position 3. Go down the top beam. Place the top tool to bottom tool. Than cut the electricity current of the machine.
To release the oil from the tank, locate a pot under the tank. Than by the help of a hose release the oil to the pot.To fasten the releasing, open one of the covers of the tank. Prevent the entrance of dust and dirt. After the releasing of the oil, clean the tank. Close the releasing cover. Fill oil to the tank.

5.4- EQUIVALENCE HYDRAULIC OILS

AMBIENT TEMPERATURE		
0° C / + 20° C		+ 20° C / + 40° C
CASTROL	HYSPIN AWS 32	HYSPIN AWS 46
MOBIL	DTE 24	DTE 25
PETROL OFİSİ	SUPER HYDRO OIL HD 32	SUPER HYDRO OIL HD 46
	SUPER HYDRO OIL HD 37	
SHELL	TELLUS 32	TELLUS 46
	TELLUS 37	

5.5 - Greasing



No	Pieces	Place on the Machine	Frequency	Oil Type
1	2	Guideway buffer	once in a 3 days	BELGİN GRESON LİTHIUM EP 2
				MOBİL MOBİLUX EP2 NLGI 2
2	1	Back gauge ball screw	once in a week	MUSCLE PL-10
3	4	Guideway buffer (2nd)	once in a 3 days	BELGİN GRESON LİTHIUM EP 2
				MOBİL MOBİLUX EP2 NLGI 2
4	2	Linear guideways	once in a 3 days	BELGİN GRESON LİTHIUM EP 2
				MOBİL MOBİLUX EP2 NLGI 2

Figure : 20 - Greasing shema

6- ELIMINATING THE DEFECTS

PROBLEM	CAUSES	SOLUTIONS
Top tool could not go down and could not make the bending	- Electricity current is low	- Inform the electrician
	- Pump is defective	- Change the pump
	- Piston seals has abrasion	- Change the seals
	- Oil leakage in filling valve	- Clean the valve
	- Congession on pressure adjustment valve	- Clean the valve
	- Pressure adjustment valve is defective	- Change the valve
	- Direction valve bobbin burn out	- Change the winding
Top tool does not go up and down	- Oil leakage in hydraulic circuit	- Check the connections tighten them
	- Cylinder seals have damages	- Change the seals
	- Congession on pressure adjustment valve	- Clean the valve
	- Pressure adjustment valve is defective	- Change the valve
	- Direction valve is defective	- Change the valve
	- Direction valve winding burned out	- Change the winding
Oil leakage from cylinders	- Abrasion of cylinder seals	- Change the seals
	- Abrasion of cylinder cover O-rings	- Change the o-rings
Oil leakage from connection places	- Nuts are loosen	- Tighten the nuts
Trembling of the machine when the beam goes up	- Guides have no oil or adjustment	- Adjust and lubricate the guides
		- Unload the pump
Top beam goes down slowly		- Check the guides

7 - SAFETY

7.1 - Safety measures emergency distance : 1500 mm.

7.2 - Preventable risks

a) Mounting protection pipe to the foot pedal to prevent damages that will come from.
b) Mounting guarding doors the back of the machine to prevent enter the machine from the back while operating.
c) Mounting side guardswith switches to prevent get jammed to the machine tools.
d) In emergency conditions using emergency stops. The emergency stops are located in :

1 - Foot pedal
2 - Control panel
3 - Electricity panel

7.3 - The methods used in emergency condition on the machine

1- Safety systems on the hydraulic block with UVV.
2- Control protection pipe with base.
3- Mounting back protection guard doors with switch system.
4- Mounting side protection guard doors with switch system.
5- In emergency conditions the of emergency stop.
a) - Foot pedal
b) - Control panel
c) - Electrical panel
6- Optional front light guard. (the inner side of side guards)
7- The limit switches on the right foot.

7.4 - Position of the machine user to be closely pressed

All safe guard system, available in the Hydraulic Press Brake. In spite of the machinery user to be closely pressed, immediately press the near emergency stop button and top beam go up to automaticly and then immediately pick up to the machine user.

7.5 - Details of any further protection of the operator which is necessary to deal with residual risks

1.Ear protection : While the machine is working, the generated noise level is 70dB(A) therefore it is not necessarily

2.Eye protection : As there in no crust spread, spark or light spread while operating the machine, there is no necessarily to wear safety glasses.

3.Feet protection :The operator should wear work shoes, in order to prevent any damage if a material fall down to his feet.

4.Hand protection : The operator should wear work gloves, in order to prevent damage to the hands by e.g sharp objects. Also, safety guard should be fitted on the machine, in order to prevent operator to press his hands between the tools.

7.6 - Security systems

1.Concerned with electrical security : The below electrical systems have been used for machine safe.

1.1-Security barricade :Mounted in front of the machines.
Down stroke is not possible without the light guard. If light guard is out of order, down stroke is not possible. Except for spesific maintenance,only available through KEY, Light Guard is not operating, The machine is operable only on safety speed in combination with hold to run.

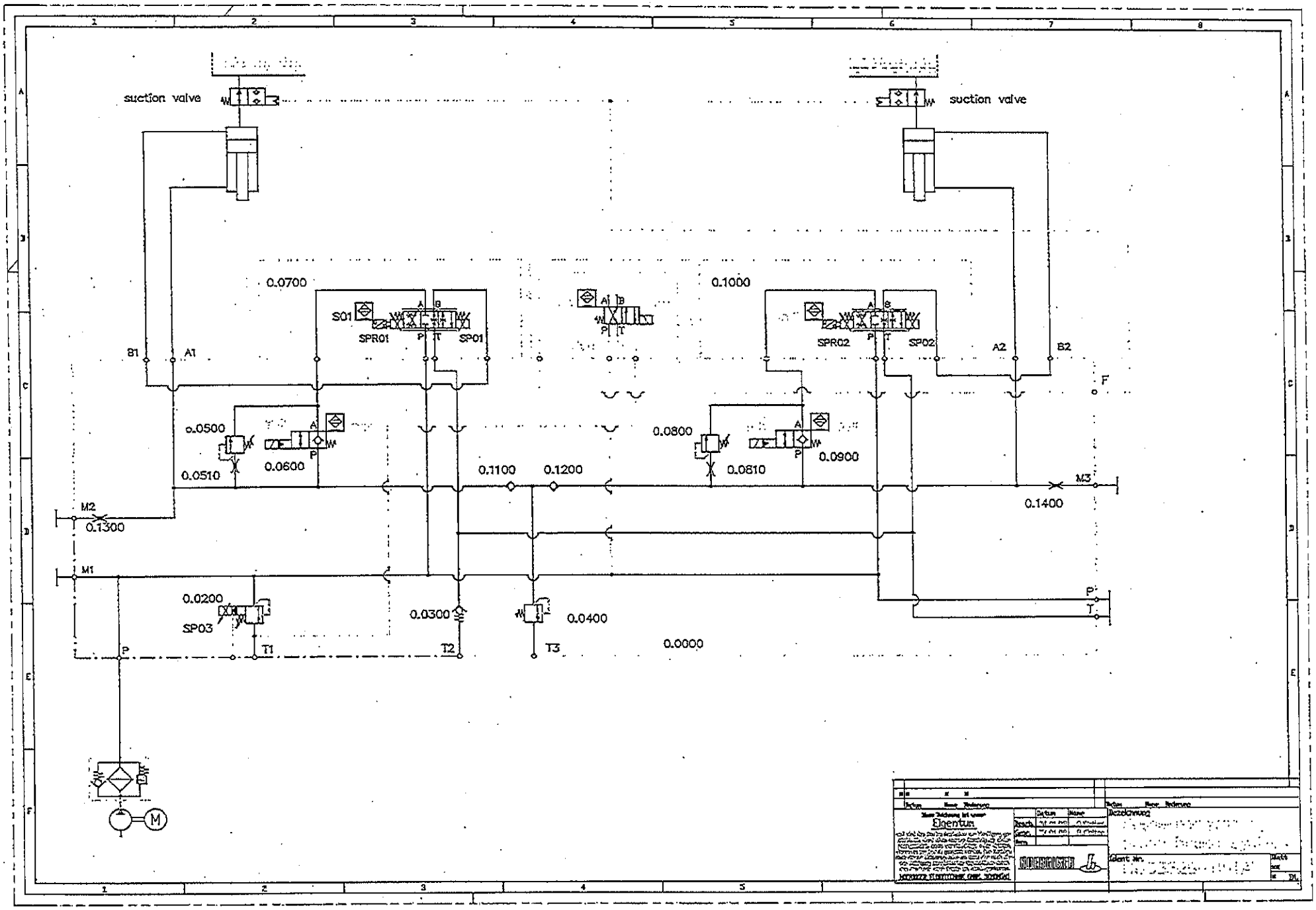
1.2-Emergency stops : -3S 2 : On the control panel

-1.3- Security switch :-3LS 1 : On the rear guards

2.The security systems concerning hydaulic:

2.1- UVV hydraulic black used

2.2-Security valve used in the hydraulic system.

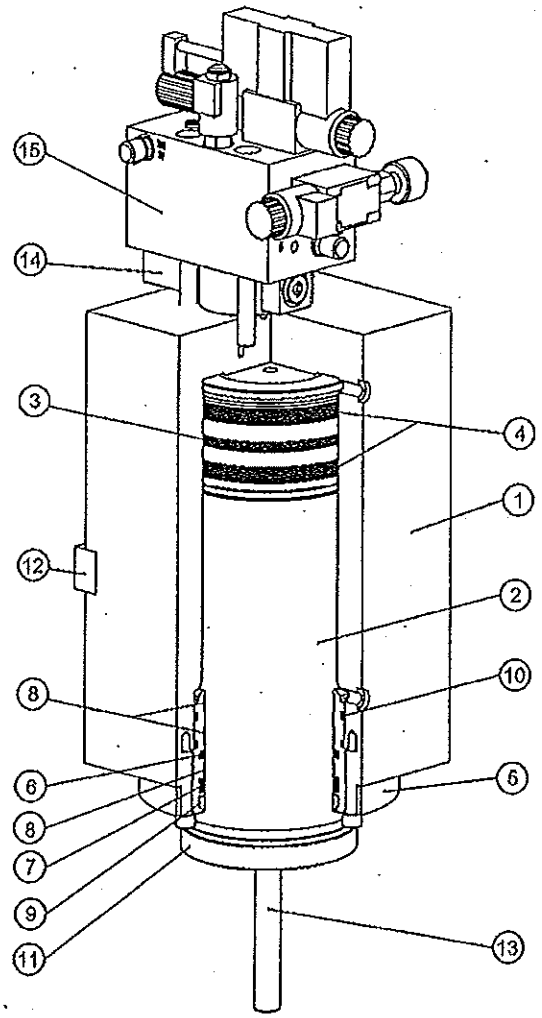

suction valve
suction valve
0.0700
0.1000
S01
SPR01
SP01
SPR02
SP02
B1
A1
A2
B2
F
0.0500
0.0510
0.0600
0.0800
0.0810
0.0900
0.1100
0.1200
M3
0.1400
M2
0.1300
M1
0.0200
SP03
0.0300
0.0400
0.0000
P
T1
T2
T3
P
T
M

HOERBIGER Automatisierungstechnik GmbH

POSNO	PT	QUANTITY	UN	COMPONENT	DESCRIPTION	
0001	T				DIMENSION DRAW. :HB53574-100A	1
0002	T				CIRCUIT DIAGRAM :HB53529-001A	1
0010	L	1,000	ST	HB53557-004A	MAIN CONTROL BLOCK \	1
0020	L	2,000	ST	KX6206	PIPE PLUG \G 3/8 NBR	1
0030	L	1,000	ST	KX6215	PIPE PLUG \G 1/4 NBR	1
0040	L	1,000	ST	HEX3067C	RATING PLATE \ 40 X 60	1
0050	L	2,000	ST	ZS0797	NOTCH NAIL DIN1476 \ 1,4X 4	1
0060	L	2,000	ST	KC5275	LOCKING SCREW \M 8X1 -5.8 -A3C	1
0200	L	1,000	ST	HV08796	PROP.-PRESS. RELIEF VALVE \ VPDBVE16E	1
0210	L	4,000	ST	ZP0524	MACH. SCREW DIN 912 \ M 8 X 55- 8.8	1
0300	L	1,000	ST	HEX0463A	CHECK VALVE \ RVE16	1
0400	L	1,000	ST	HV08610	PRES.RELIEF VAL. \ VDBE03E350 A1	1
0500	L	1,000	ST	HV08879	PRES.RELIEF VALVE\ VDBE03EB A1	1
0510	L	1,000	ST	KY9779	NOZZLE\ S-M 5 -1,2-MS	1
0600	L	1,000	ST	HV08723	2/2-WEGE-SITZVENT.\ IVN221BE08PD D2	1
0700	L	1,000	ST	HV06545	PROP.-CONTROL VALVE \ PIL500PC06P06	1
0800	L	1,000	ST	HV08879	PRES.RELIEF VALVE\ VDBE03EB A1	1
0810	L	1,000	ST	KY9779	NOZZLE\ S-M 5 -1,2-MS	1
0900	L	1,000	ST	HV08723	2/2-WEGE-SITZVENT.\ IVN221BE08PD D2	1
1000	L	1,000	ST	HV06545	PROP.-CONTROL VALVE \ PIL500PC06P06	1
1100	L	1,000	ST	HEX0461A	CHECK VALVE \ RVE06	1
1200	L	1,000	ST	HEX0461A	CHECK VALVE \ RVE06	1
1300	L	1,000	ST	KY9776	NOZZLE\ S-M 5 -0,6-MS	1
1400	L	1,000	ST	KY9776	NOZZLE\ S-M 5 -0,6-MS	1
1500	L	1,000	ST	HV06386	4/2-WAY SPOOL VALVE \ SBM220PC06PGSO802C	1
1510	L	4,000	ST	ZP0453	IHX SCREW DIN 912\ M 5 X 30- 8.8	1
1600	L	3,000	ST	KX5739A	SCREW-LOCK \G 1/4; M 16	1

HOERBIGER Automatisierungstechnik GmbH

POSNO	PT	QUANTITY	UN	COMPONENT	DESCRIPTION	
9800	Y	1,000	ST		MONTAGEANWEISUNG: TYPENSCHILDKENNZEICHNUNG: SIEHE TYPE DER STUELI. SIEHE IDENTNUMMER DER STUELI. 280 BAR 12L/MIN 24=V DATUM DRUCKVENTIL POS.0500,0800 BEI 1L/MIN AUF 40 BAR EINSTELLEN.	1
9901	Y	1,000	ST		060503/JL	1



NO	PART NAME	QTY	EXPLANATION
1	Cylinder Body	1	Ç 1040
2	Piston	1	Ç 1050
3	Omegat (Piston Seal)	1	Ø100xØ84,5x6,3
4	Bearing Band	2	2,5x15x310
5	Cylinder Cover	2	Ç 1020
6	Omegat (Throat Seal)	1	Ø95xØ110,1x6,3
7	U CUP	1	Ø95x110x10
8	Bearing Band	2	2,5x9,7x310
9	Dust Seal	1	Ø95xØ103x6/8
10	O - Ring	1	Ø105xØ4
11	Piston Sphere	1	Ç 1020
12	Cylinder Wedge	1	Ç 1020
13	Piston Pin	2	Ç 1050
14	Filling Valve	1	Hoerbiger
15	Proportional Valve	1	Hoerbiger

ERMAKSAN

CE

TYPE		
MODEL		
MACHINE Nr.		
CAPACITY		TON
WEIGHT		Kg.
APPROACH SPEED		mm/s.
SAFETY DISTANCE		mm.
MOTOR POWER		kW.
VOLTAGE		V.
IP		
WIDTH		mm.
LENGTH		mm.
HEIGHT		mm.

ERMAKSAN MAKİNA SANAYİ TİC. A.S
Organize Sanayi Bölgesi Lacivert Cad. No:6 Nilüfer / BURSA / TÜRKİYE
Tel : (00 90 224) 294 75 00 Fax : (00 90 224) 294 75 44
web : www.ermaksan.com.tr e - mail : ermaksan@ermaksan.com.tr

Rev : 00

CURRENT SORT		
FREQUENCY		Hz
WORKING VOLTAGE		V
CONTROL VOLTAGE		V
NOMINAL CURRENT		A
MAIN FUSE NOMINAL CURRENT		A
E - SWITCH PLAN NR.		

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Tel : (00 90 224) 294 75 00 Fax : (00 90 224) 294 45 44
web : www.ermaksan.com.tr e - mail : ermaksan@ermaksan.com.tr

Rev : 00

DİKKAT !

MAKİNEYE YAĞ DOLDURMADAN ÇALIŞTIRMAYIN !

WAARSCHUWING !

GEBRUIK DE MACHINE NIET VOOR DAT OLIERESERVOIR IS GEVULD

ATENCION !

NO HACER FUNCIONAR LA MAQUINA ANTES DE PONER DEL ACEITE !

ATTENTION !

NE PAS FAIRE FONCTIONNER LA MACHINE AVANT DE METTRE DE L' HUILE !

CAUTION !

DO NOT OPERATE THE MACHINE BEFORE FILLING THE OIL TANK !

ACHTUNG !

DIE MASCHINE NICHT IN BETRIEB NEHMEN, OHNE DEN ÖLTANK DER MASCHINE MIT DEM ÖL EINZUFÜLLEN !

ERM - 489 Rev: 00

DİKKAT !

KULLANMA KILAVUZUNU OKUMADAN MAKİNEYİ ÇALIŞTIRMAYIN !

WAARSCHUWING !

GEBRUIK DE MACHINE NIET VOOR HANDLEIDING IS GELEZEN

ATENCION !

NO HACER FUNCIONAR LA MAQUINA SIN HABER LEIDO EL MANUAL DE USO !

ATTENTION !

NE PAS FAIRE FONCTIONNER LA MACHINE SANS AVOIR LU LE MODE D' EMPLOI !

CAUTION !

DO NOT OPERATE THE MACHINE BEFORE READING THE MANUAL INSTRUCTION !

ACHTUNG !

DIE MASCHINE NICHT IN BETRIEB NEHMEN, OHNE DEN BEDIENUNGSHINWEIS ZU LESEN !

ERM - 490 Rev: 00



DO NOT ADJUST
HYDRAULIC VALVE

ERM - 080 Rev: 00

DO NOT REMOVE PROTECTIVE COVERS
BEFORE THE MACHINE IS FULLY STOPPED.

ERM - 084 Rev: 00

ERMAKSAN

MODEL :MICRO-BEND

ATTENTION !

PLEASE CHECK THE OIL LEVEL BEFORE OPERATING THE MACHINE.
LUBRICATION : PLEASE CHECK THE MANUAL INSTRUCTION FOR OIL TYPE.
PLEASE CONTROL THE MAIN MOTOR ROTATION BEFORE OPERATING THE MACHINE.

ERM - 072 Rev : 00

CE

ERM - 121 Rev : 00

ATTENTION !

MAX. PRESSURE ____ bar.
____ psi.

ERM - 114 Rev : 00

·BENDING PRESSURE

ERM

ERM - 120 Rev : 00

FREE FALL PRESSURE

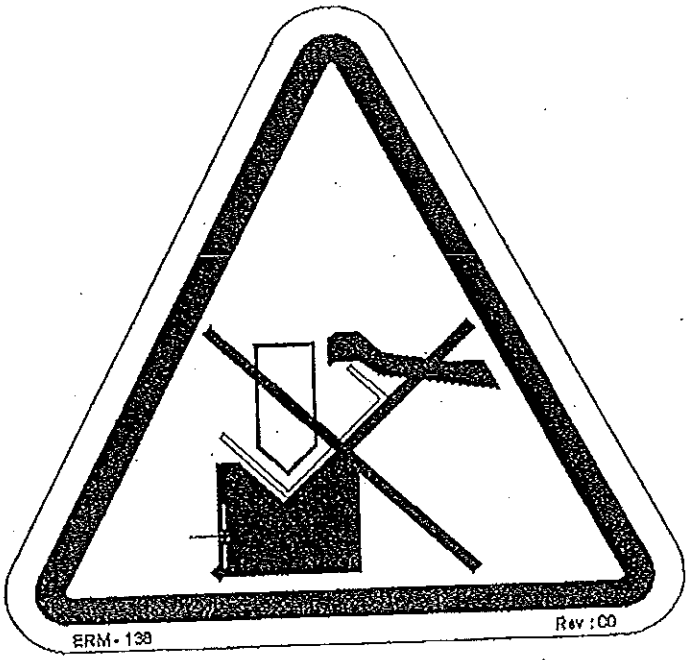
ERM

PUMP PRESSURE

ERM 102

EMERGENCY STOP

ERM - 141 Rev : 00



ERM - 138 Rev : 00

ERMAKSAN

MODEL :MICRO-BEND

WARNING

I NEVER USE MACHINE WITHOUT READING USER MANUAL.

I NEVER RUN MACHINE WITHOUT LEVELING AND FIXING TO THE GROUND.

I NEVER USE THE MACHINE WITHOUT CLEANING TOP AND BOTTOM TOOLS.

I PERIODICALLY APPLY GREASE AND OIL TO THE REQUIRED PLACES.

ERM - 143 Rev : 00

TO ALL CONCERNED : MAKE SURE THAT THE OPERATOR UNDERSTANDS THE FOLLOWING.

WARNING

TO PREVENT SERIOUS BODILY INJURY

NEVER PLACE ANY PART OF YOUR BODY AT THE POINT OF OPERATION

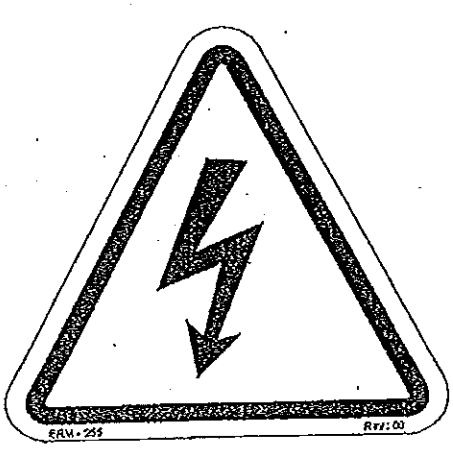
NEVER OPERATE, SERVICE, REPAIR OR ADJUST MACHINE WITHOUT PROPER INSTRUCTION FROM YOUR SUPERVISOR AND WITHOUT READING AND UNDERSTANDING THE INSTRUCTION MANUAL

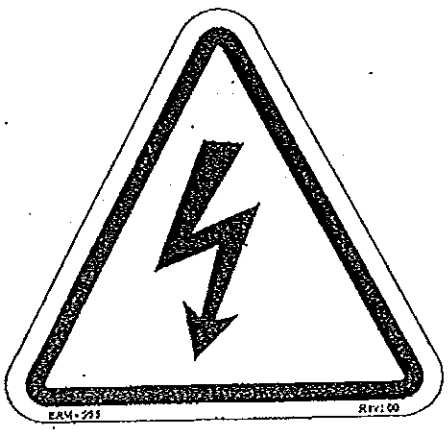
NEVER SERVICE MACHINE WITH MOTOR ON

IT IS THE EMPLOYER'S RESPONSIBILITY TO IMPLEMENT THE ABOVE INSTRUCTIONS AND TO PROVIDE PROPER SAFETY MEASURES NECESSARY FOR EACH PARTICULAR USE, OPERATION, SET - UP SERVICE OF THE MACHINE.

DO NOT REMOVE THIS SIGN FROM MACHINE FOR ANY REASON.

ERM - 090 Rev : 00





ERMAKSAN

MODEL :MICRO-BEND

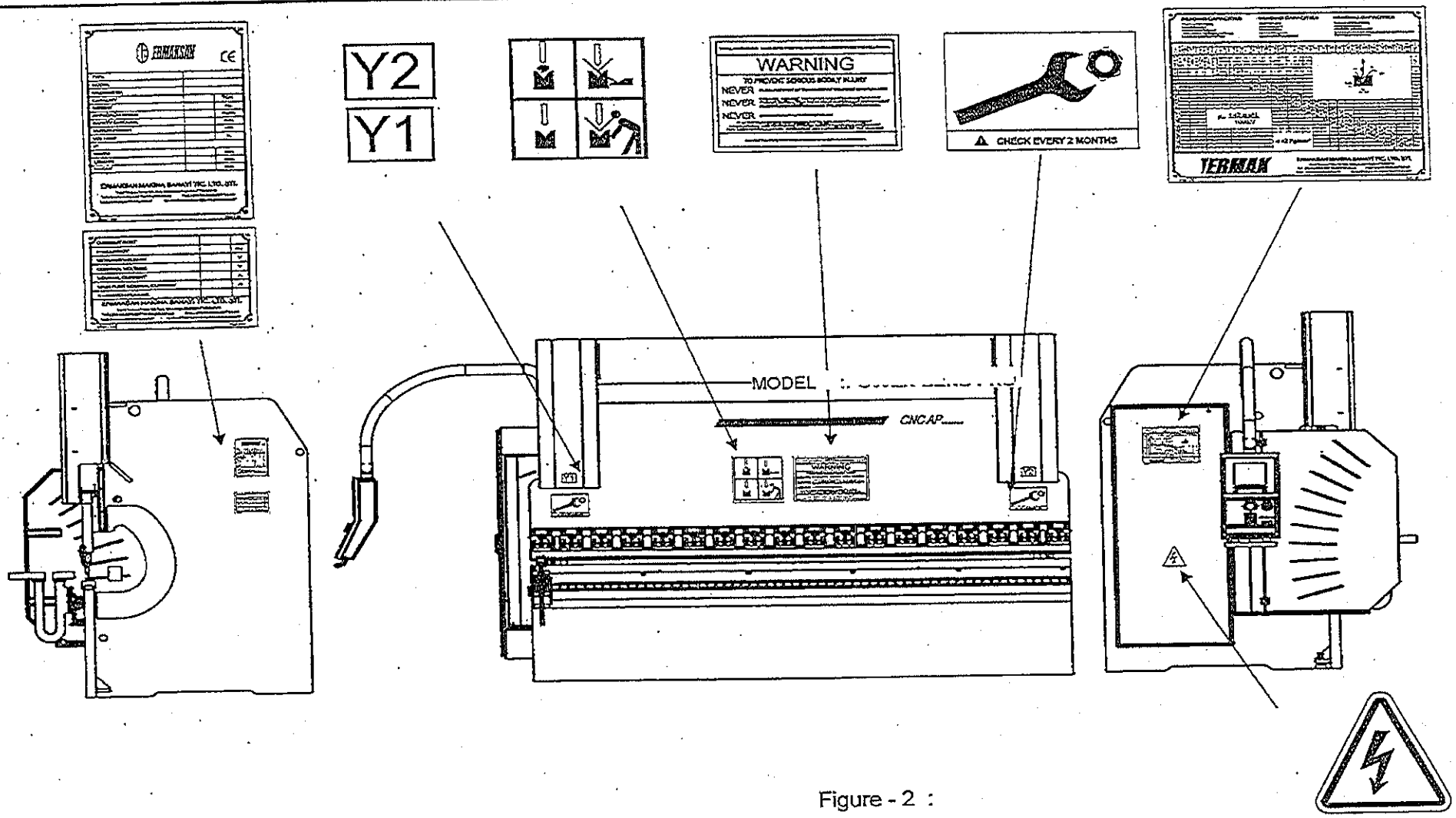
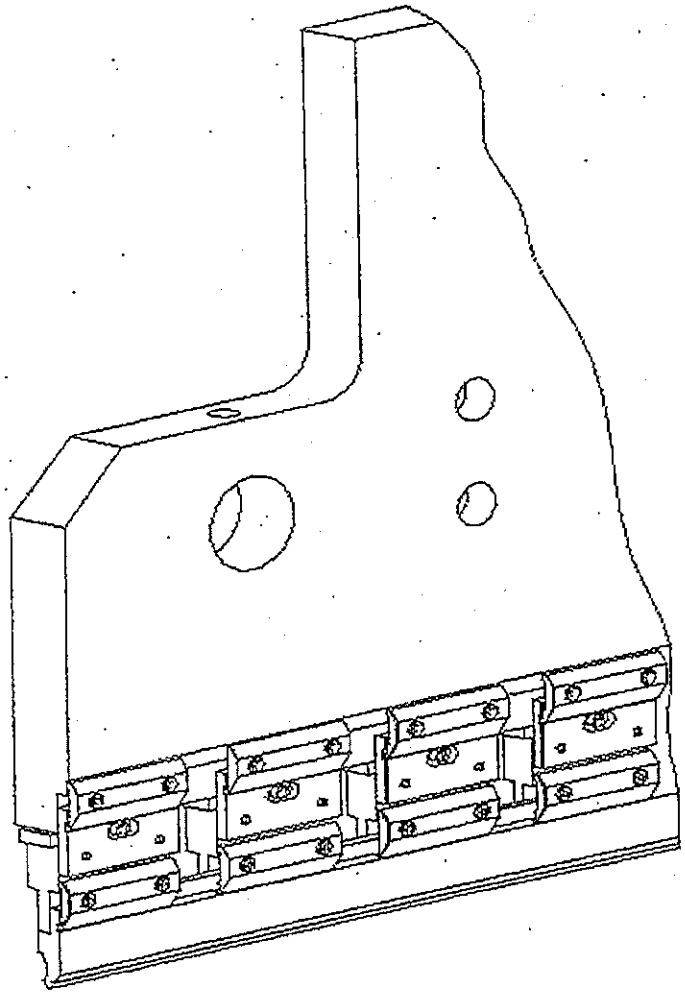
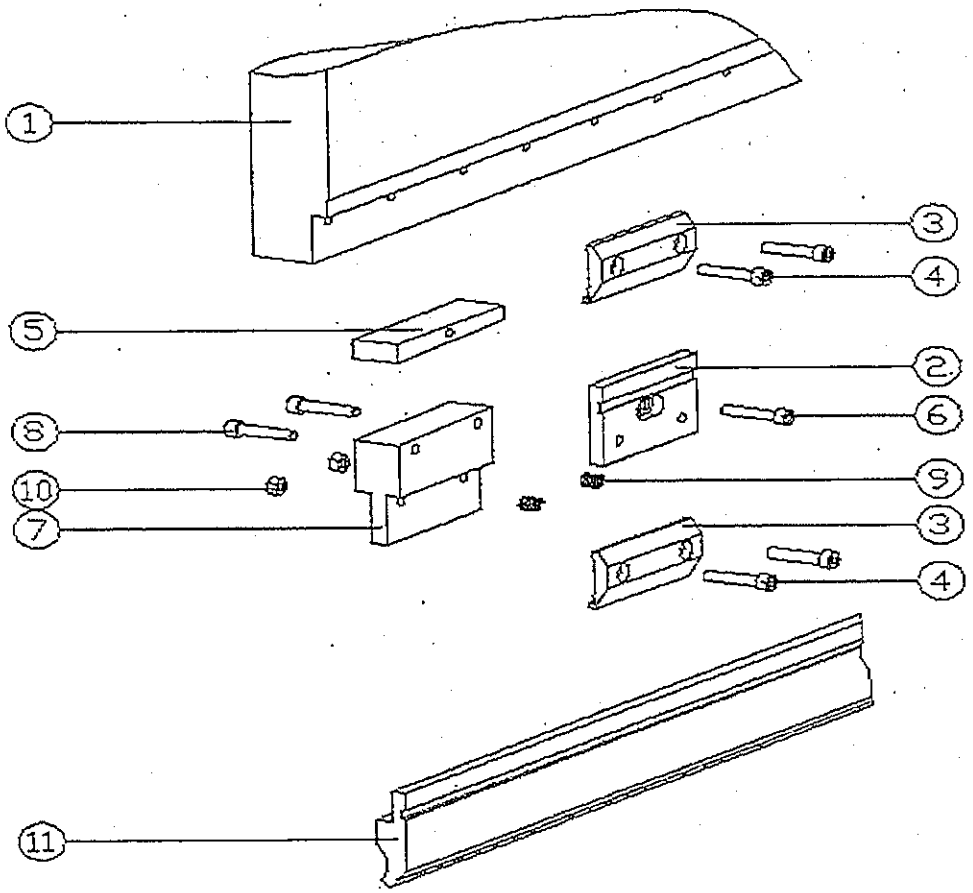


Figure - 2 :

ERMAKSAN	MODEL :MICRO-BEND





ERMAKSAN

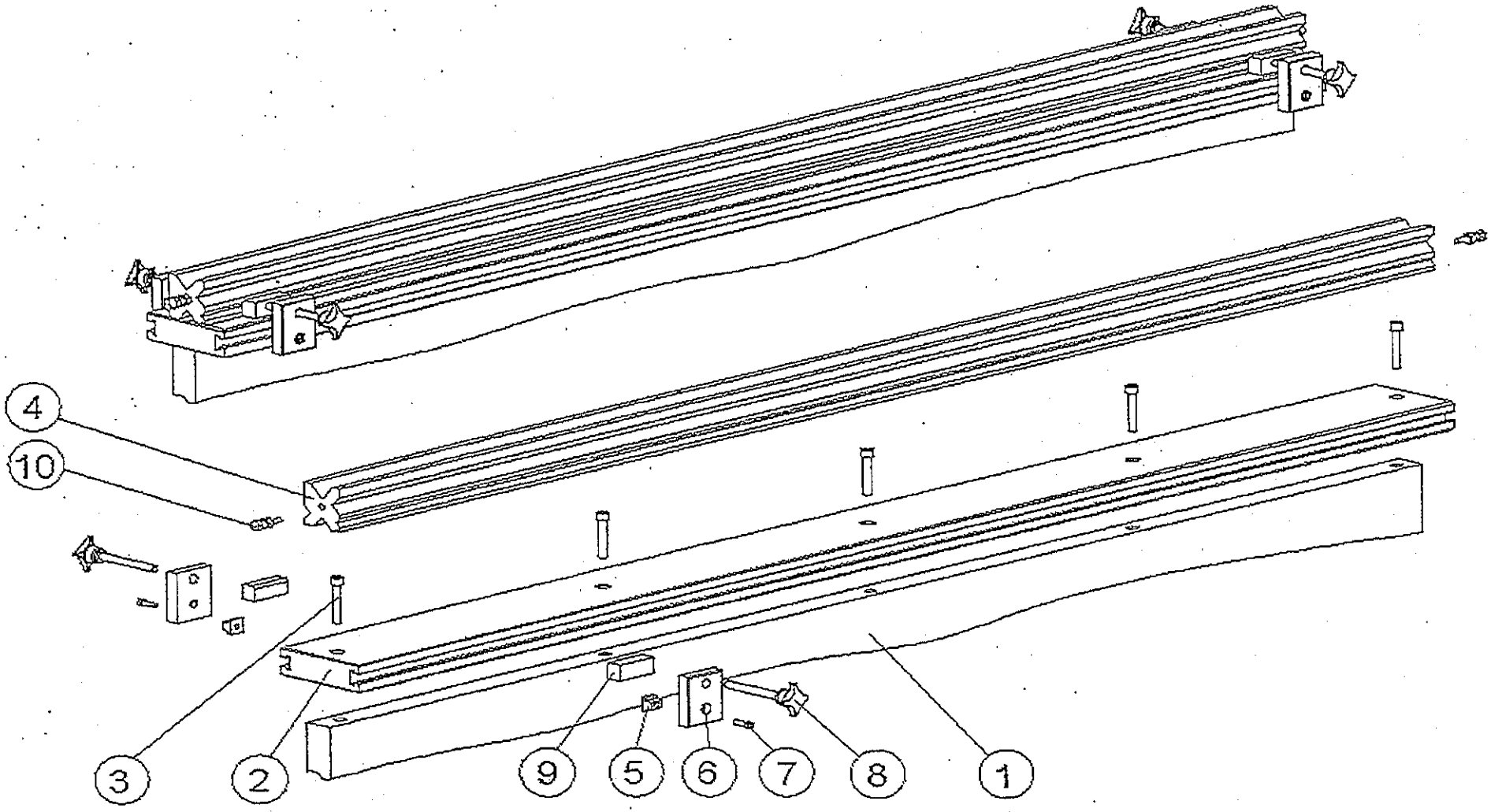
TOP TOOL GROUP

TOP TOOL GROUP ELEMENTS

NO	PART NAME	PIECES FOR MODELS							DESCRIPTION
		1270 mm.	2100 mm.	2600 mm.	3100 mm.	3600 mm.	4100 mm.	6100 mm.	
1	TOP BEAM	1	1	1	1	1	1	1	
2	PROMECAM FIXING PART	6	10	12	15	17	19	29	
3	PROMECAM COVER	12	20	24	30	34	38	58	
4	BOLT M10x40	24	40	48	60	68	76	116	DIN 912
5	PROMECAM WEDGE	6	10	12	15	17	19	29	
6	BOLT M8x20	6	10	12	15	17	19	29	DIN 912
7	PROMECAM BODY	6	10	12	15	17	19	29	
8	BOLT M10x40	12	20	24	30	34	38	58	DIN 912
9	SPRING	12	20	24	30	34	38	58	
10	NUT M10	12	20	24	30	34	38	58	
11	TOP TOOL	1	1	1	1	1	1	1	

ERMAKSAN

TOP TOOL GROUP ELEMENTS



ERMAKSAN

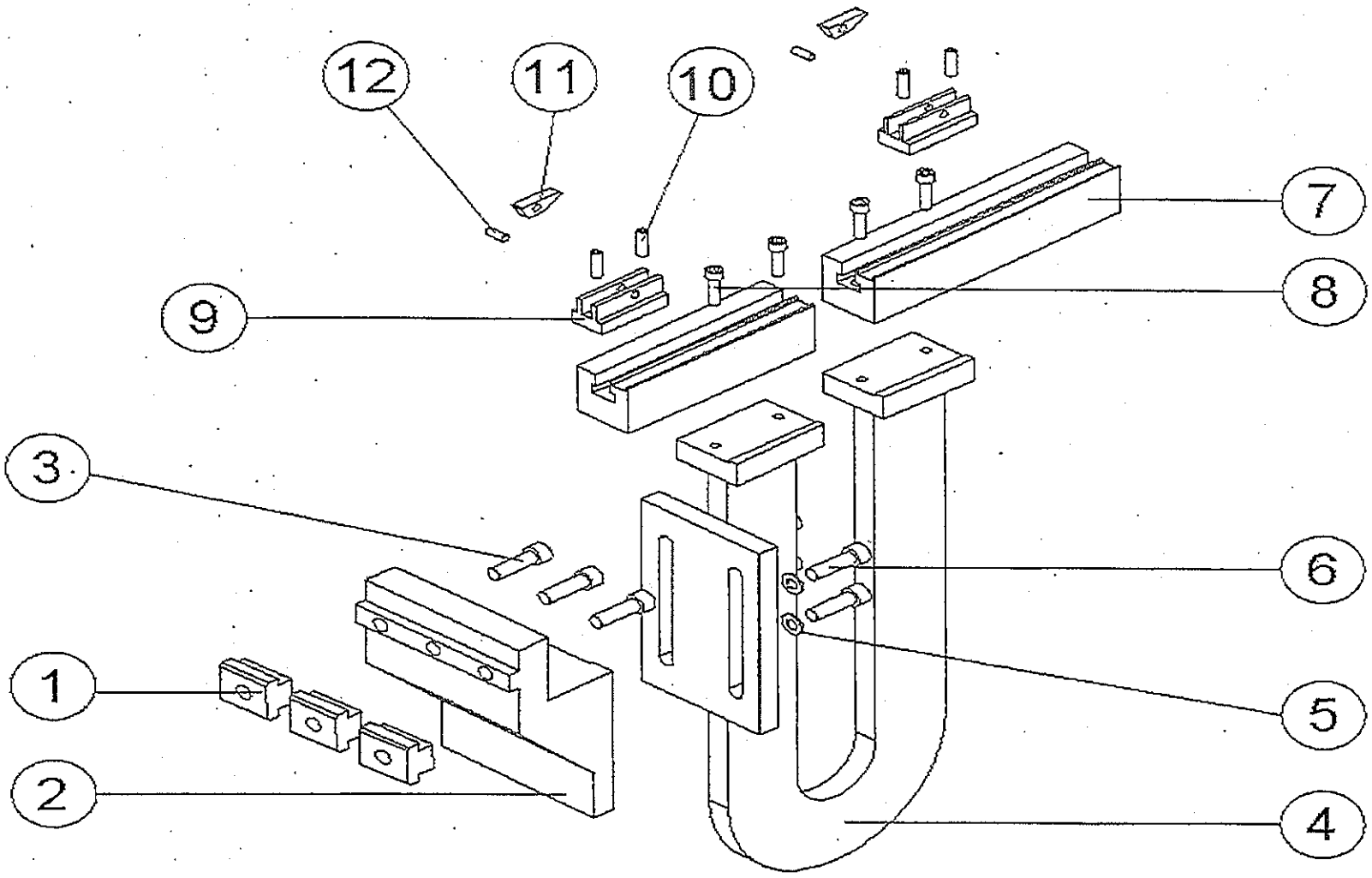
BOTTOM TOOL GROUP

BOTTOM TOOL GROUP ELEMENTS

NO	PART NAME	PIECES FOR MODELS							DESCRIPTION
		1270 mm.	2100 mm.	2600 mm.	3100 mm.	3600 mm.	4100 mm.	6100 mm.	
1	BOTTOM BEAM	1	1	1	1	1	1	1	
2	T - SLOT TABLE	1	1	1	1	1	1	1	
3	BOLT M16x80	4	5	5	5	6	6	9	DIN 912
4	BOTTOM TOOL	1	1	1	1	1	1	1	
5	T - SLOT NUT	4	4	4	4	4	6	8	
6	TOOL FIXING PART	4	4	4	4	4	6	8	
7	BOLT M12x35	4	4	4	4	4	6	8	DIN 912
8	GAUGE BOLT	4	4	4	4	4	6	8	
9	TOOL SQUEEZE SHOE	4	4	4	4	4	6	8	
10	BOLT M12x40	2	2	2	2	2	2	2	DIN 912

ERMAKSAN

BOTTOM TOOL GROUP ELEMENTS



ERMAKSAN

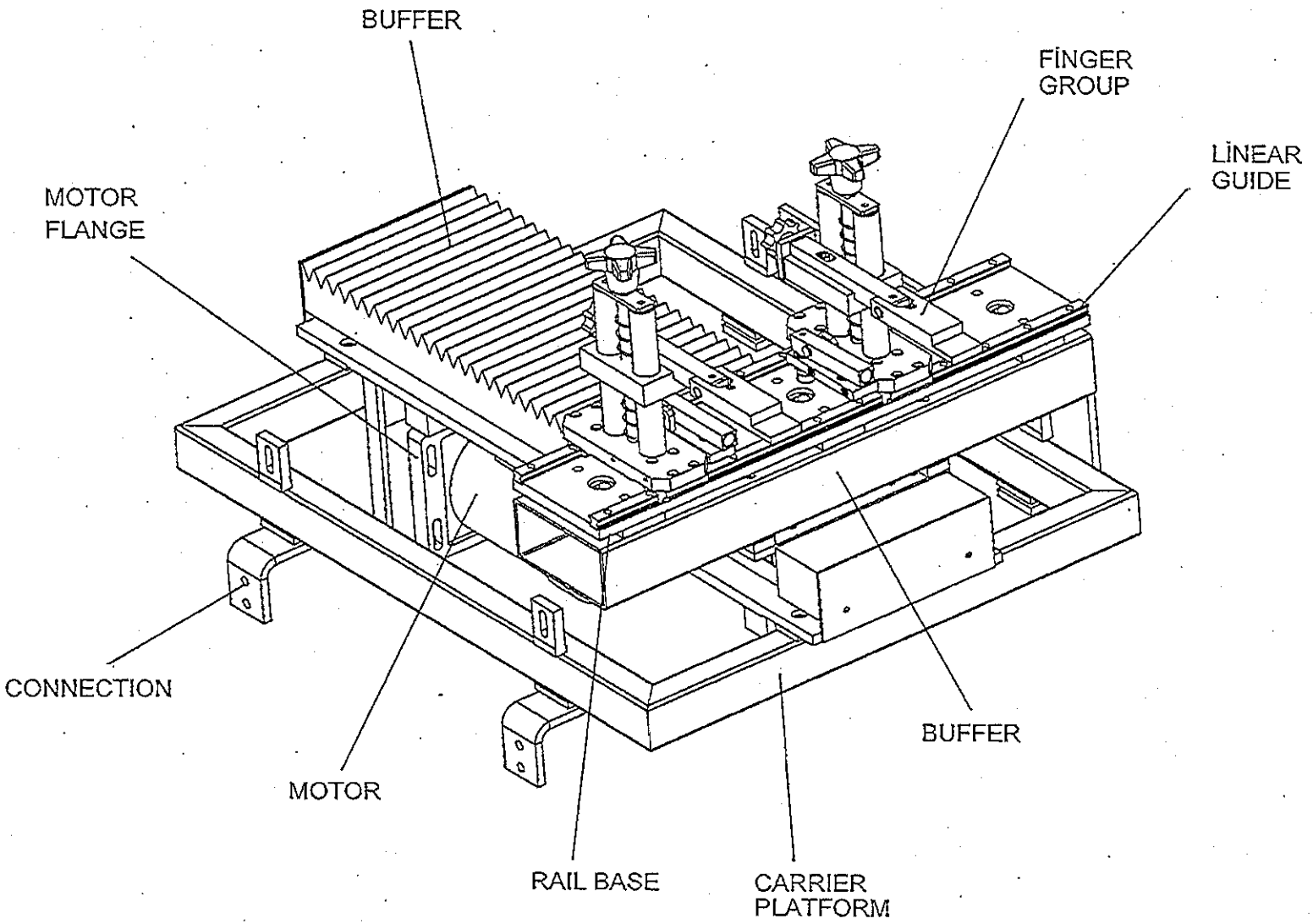
FRONT GAUGE GROUP

FRONT GAUGE GROUP ELEMENTS

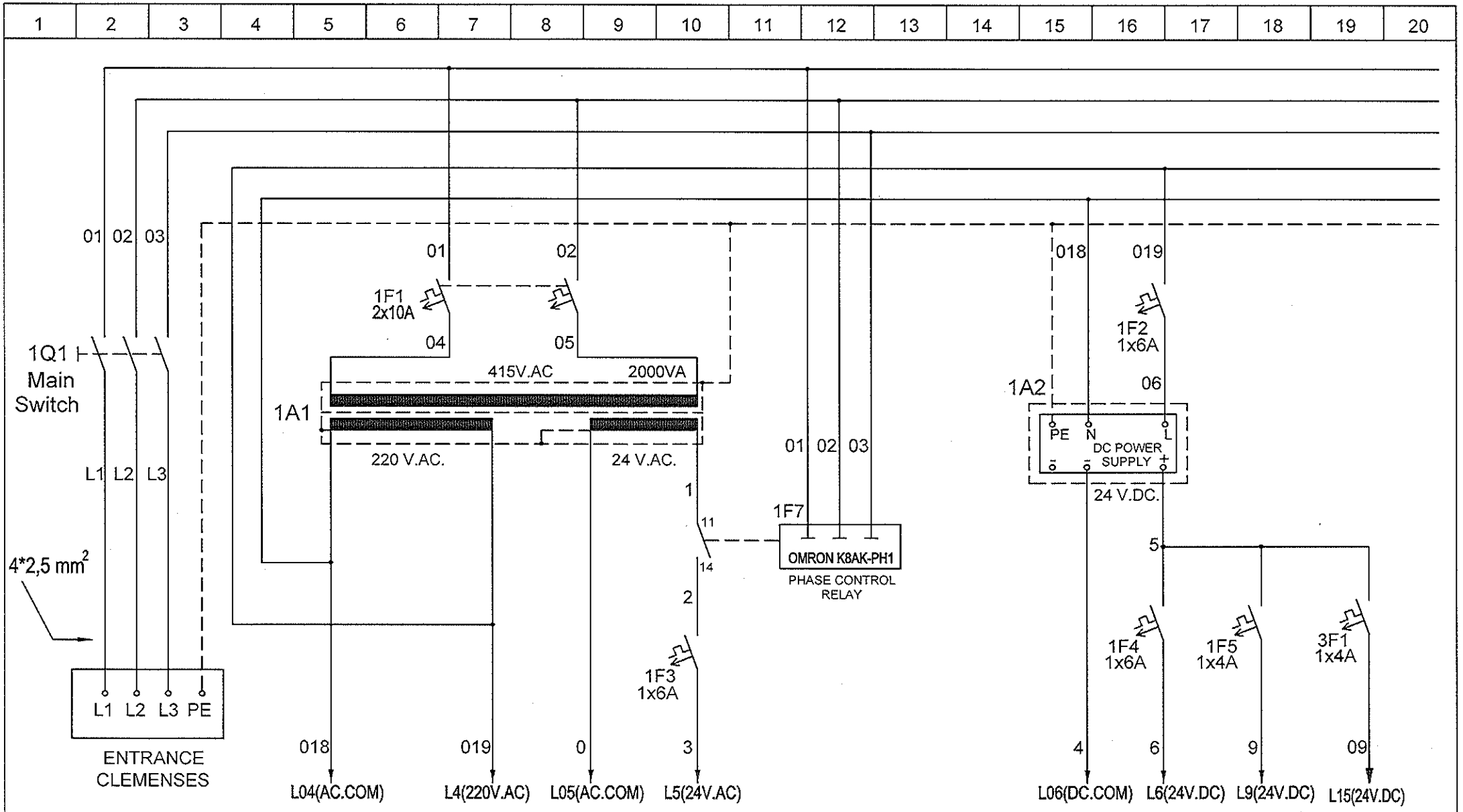
NO	PART NAME	PIECES FOR MODELS							DESCRIPTION
		1270 mm.	2100 mm.	2600 mm.	3100 mm.	3600 mm.	4100 mm.	6100 mm.	
1	T-SLOT NUT	3	3	3	3	3	3	3	
2	VERTICAL ARM HOLDER	1	1	1	1	1	1	1	
3	BOLT M12x45	3	3	3	3	3	3	3	DIN 912
4	CARRIER	1	1	1	1	1	1	1	
5	PLAKE A13-St	4	4	4	4	4	4	4	DIN 125
6	BOLT M12x35	4	4	4	4	4	4	4	DIN 912
7	T-SLOT CONSOLE	2	2	2	2	2	2	2	
8	BOLT M10x35	4	4	4	4	4	4	4	DIN 912
9	THUMB CARRIER	1	1	1	1	1	1	1	
10	SETSKUR M6X12	2	2	2	2	2	2	2	DIN 913
11	THUMB	1	1	1	1	1	1	1	
12	THUMB PIN	1	1	1	1	1	1	1	

ERMAKSAN

FRONT GAUGE GROUP ELEMENTS


BUFFER
FİNGER GROUP
LİNEAR GUIDE
MOTOR FLANGE
CONNECTION
MOTOR
RAIL BASE
CARRIER PLATFORM
BUFFER

ERMAKSAN



SUPPLY: 415V 50Hz 3Ph PE
NOMINAL CURRENT: 11A
ENTRANCE CABLE: 4*2,5 mm²

Black Cable : 415V
Black Cable : 220V

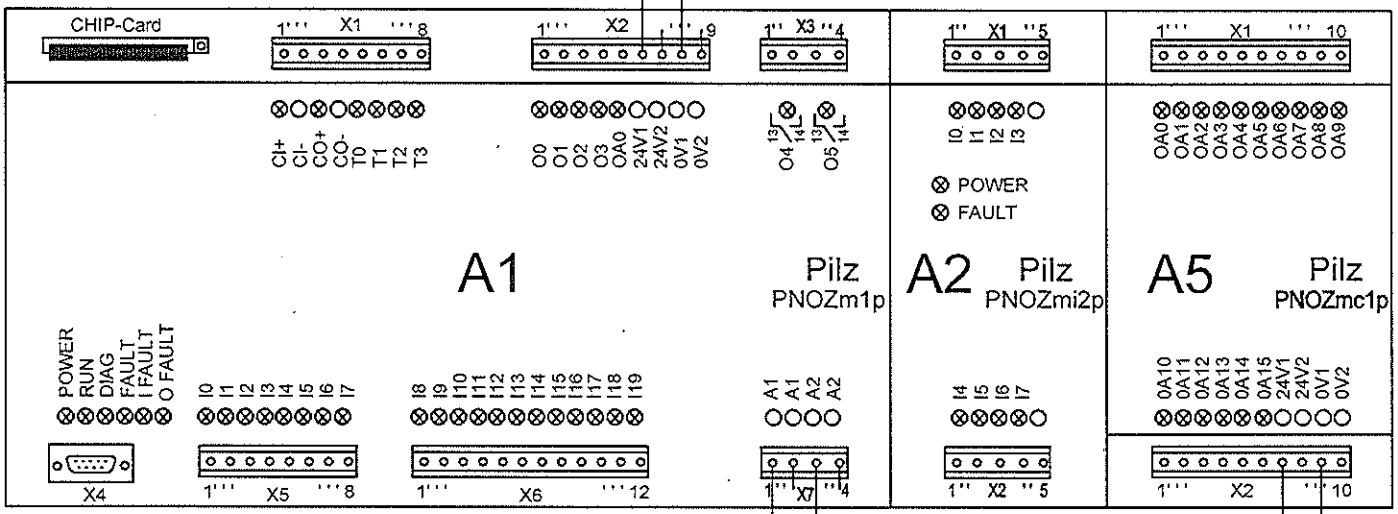
Red Cable : 24V.AC
Blue Cable : 24V.DC

PAGE	MACHINE TYPE	REV	DATE	27.04.2018	SIGNATURE
1	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
POWER CIRCUIT					

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

L6(24V.DC) 6

L06(DC.COM) 4



L6(24V.DC) 6

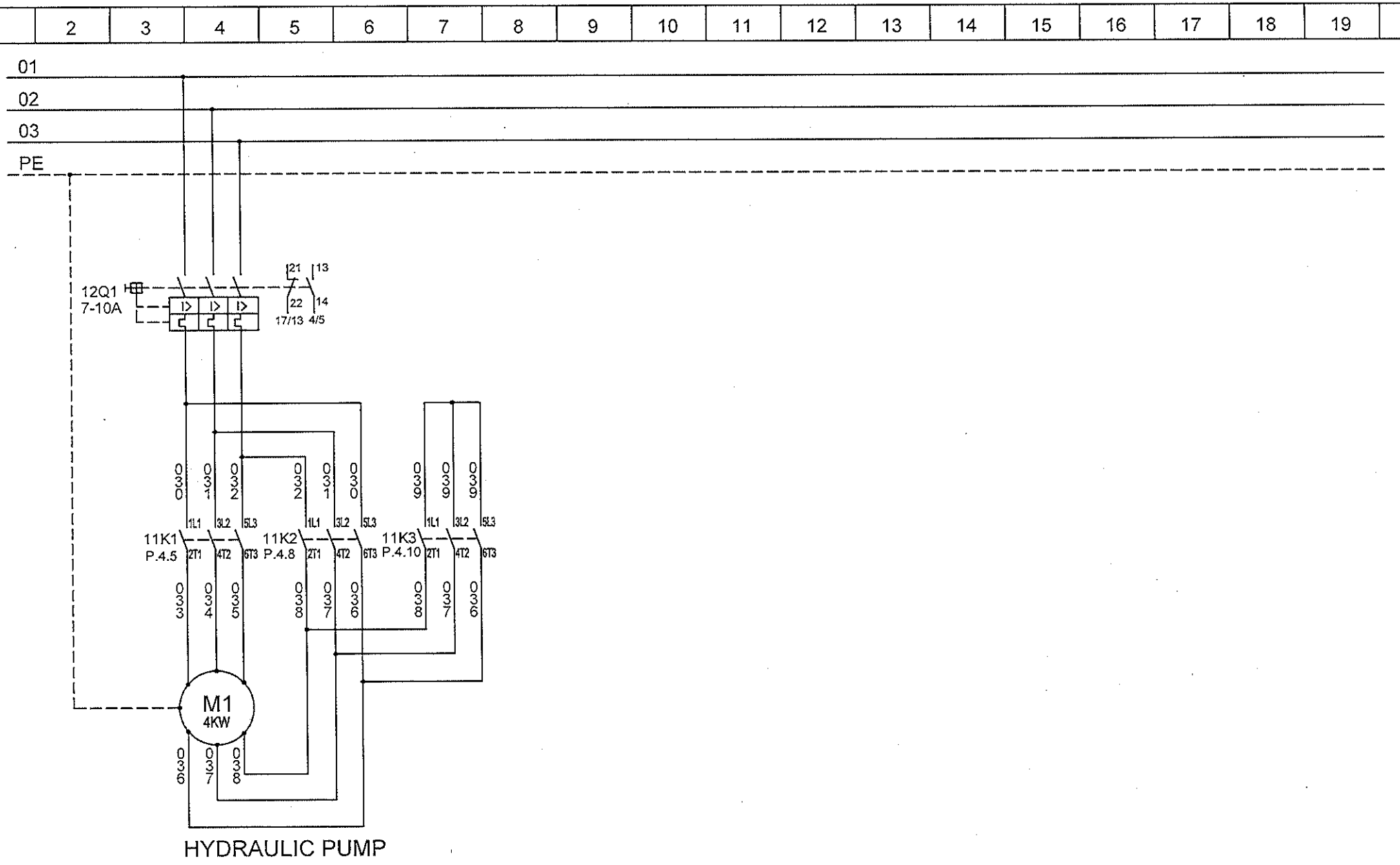
L06(DC.COM) 4

PAGE	MACHINE TYPE	REV	DATE	04.04.2016	SIGNATURE
2	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

PILZ FEEDING CIRCUIT

ERMAK METAL FABRICATING MACHINERY

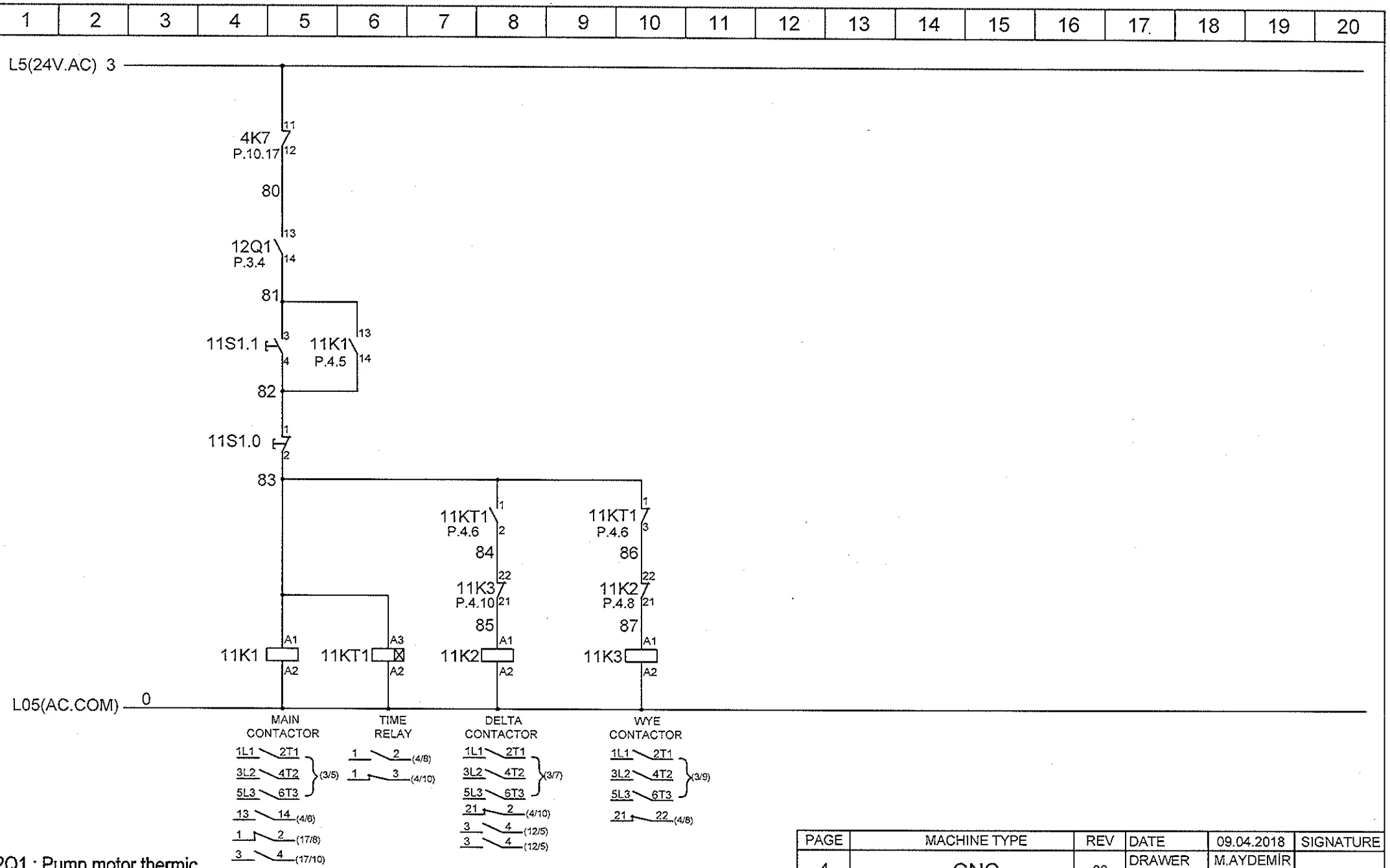


PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
3	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

MOTOR POWER CIRCUIT

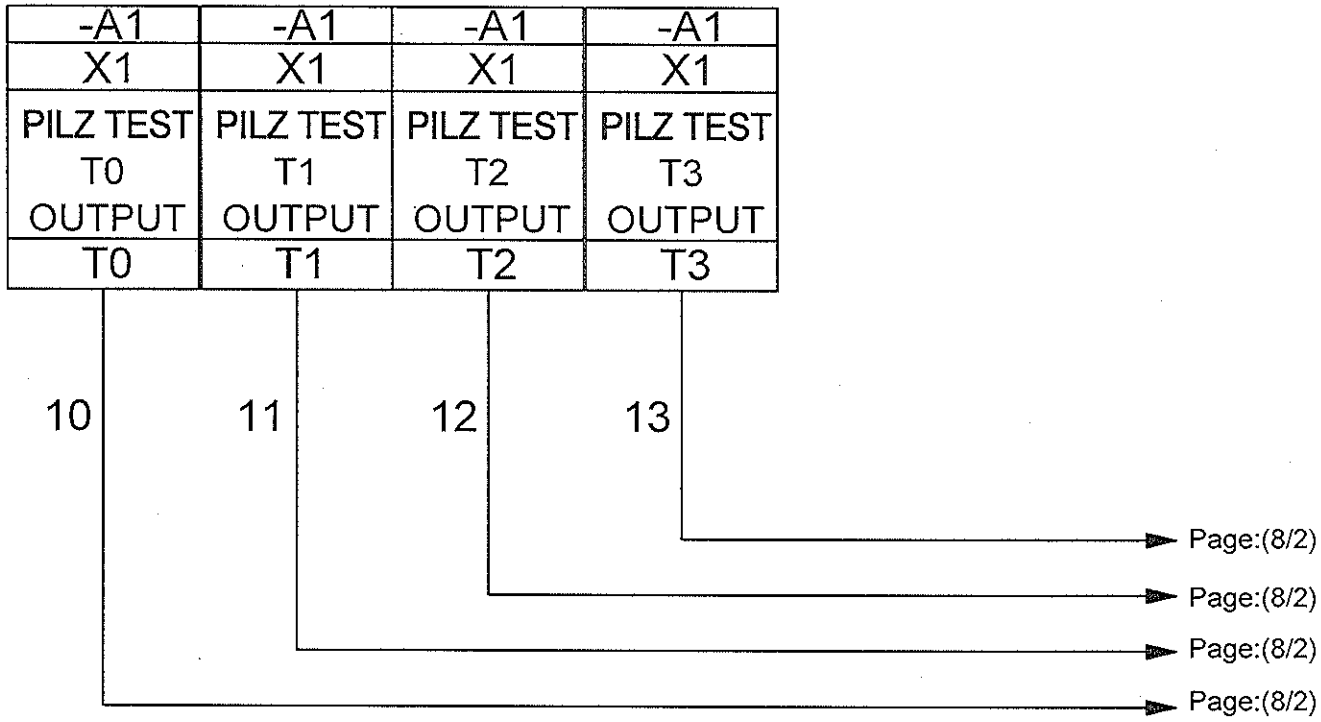
ERMAK
METAL FABRICATING MACHINERY



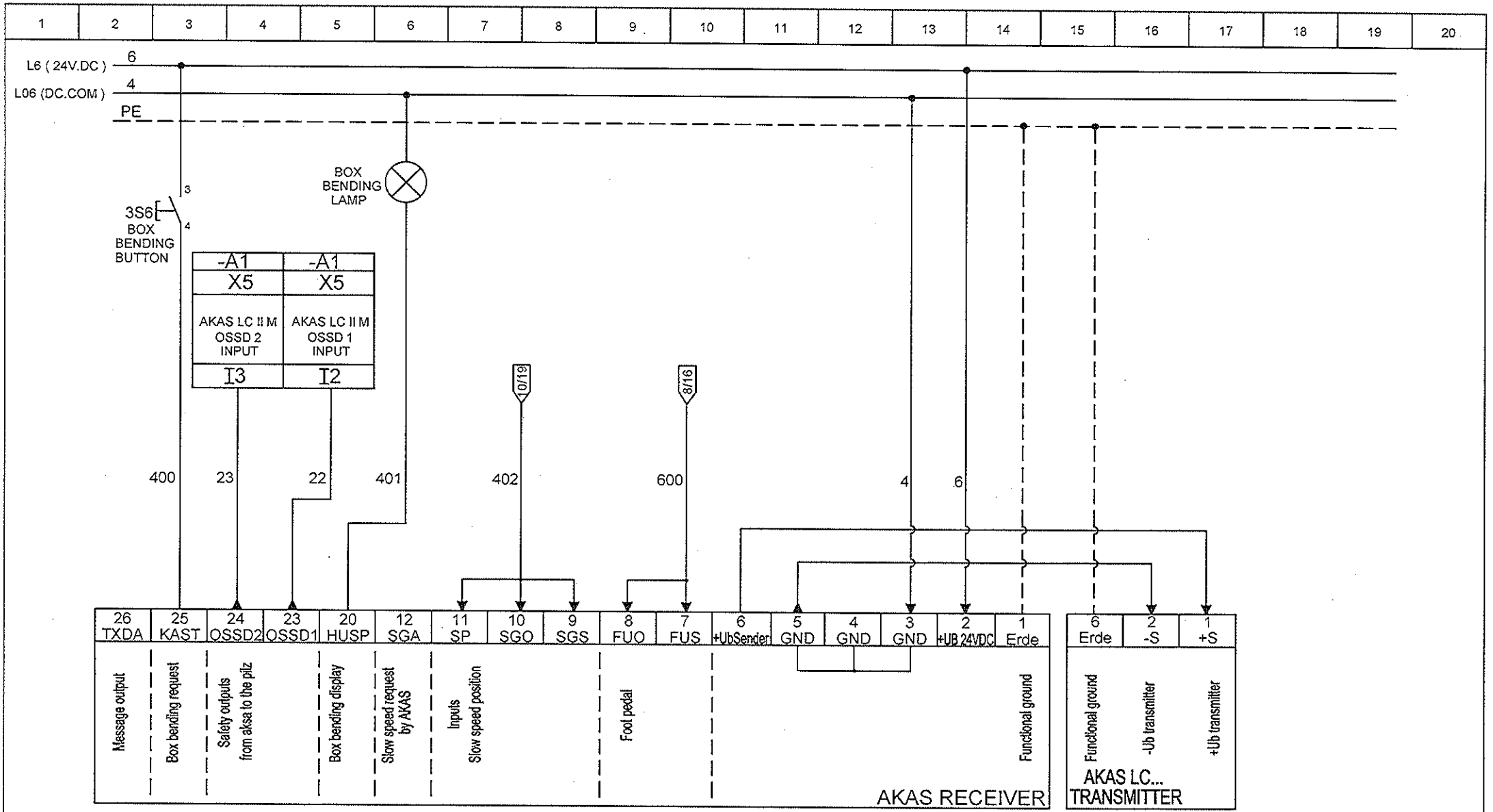
12Q1 : Pump motor thermic
11S1.1 : Pump start button
11S1.0 : Pump stop button

PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
4	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME					
WYE-DELTA COMMAND CIRCUIT			ERMAK METAL FABRICATING MACHINERY		

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

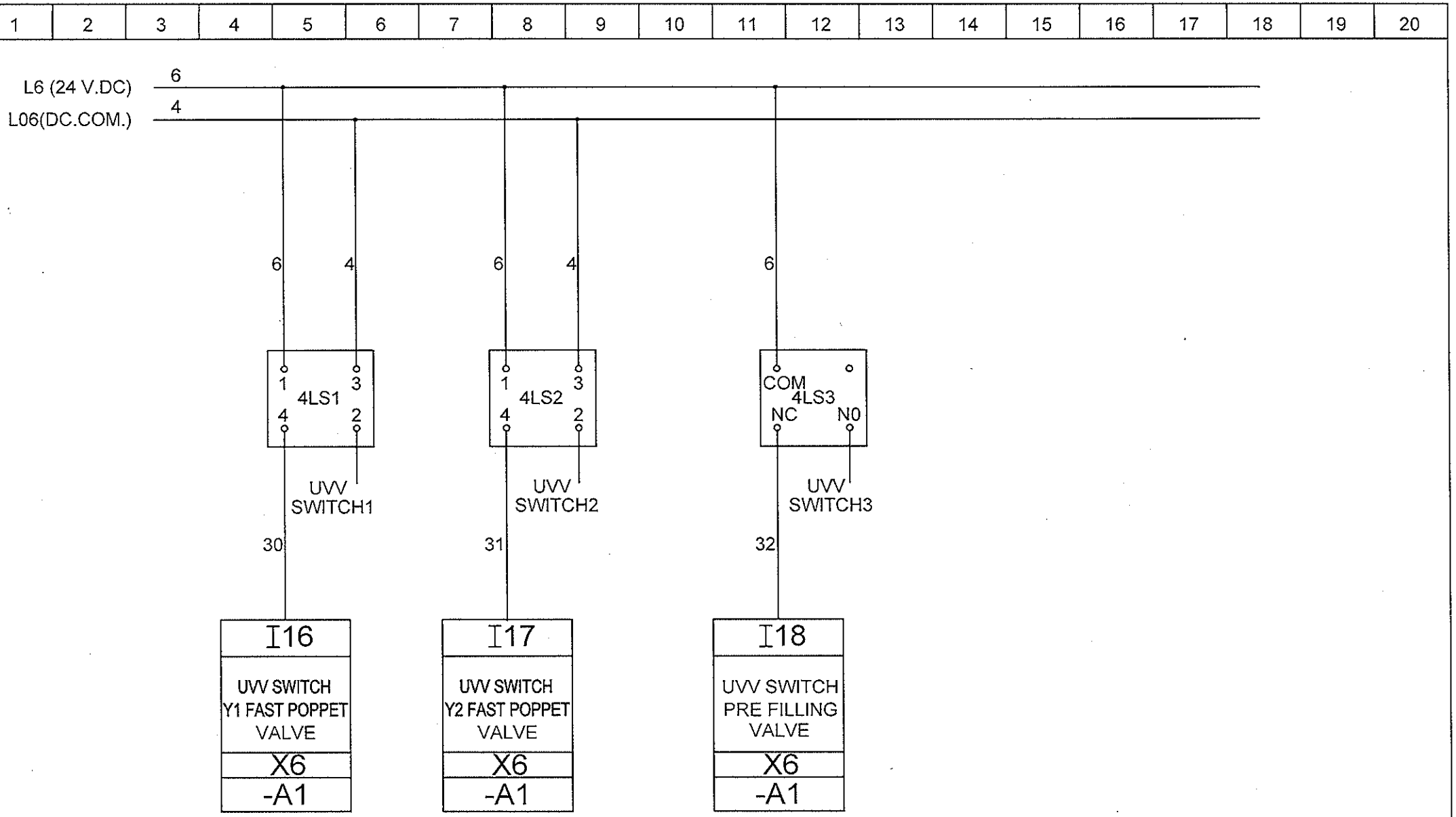


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5	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
PILZ TEST OUTPUT CIRCUIT					



PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
6	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME					
AKAS LCII M CONNECTION CIRCUIT					

ERMAK METAL FABRICATING MACHINERY

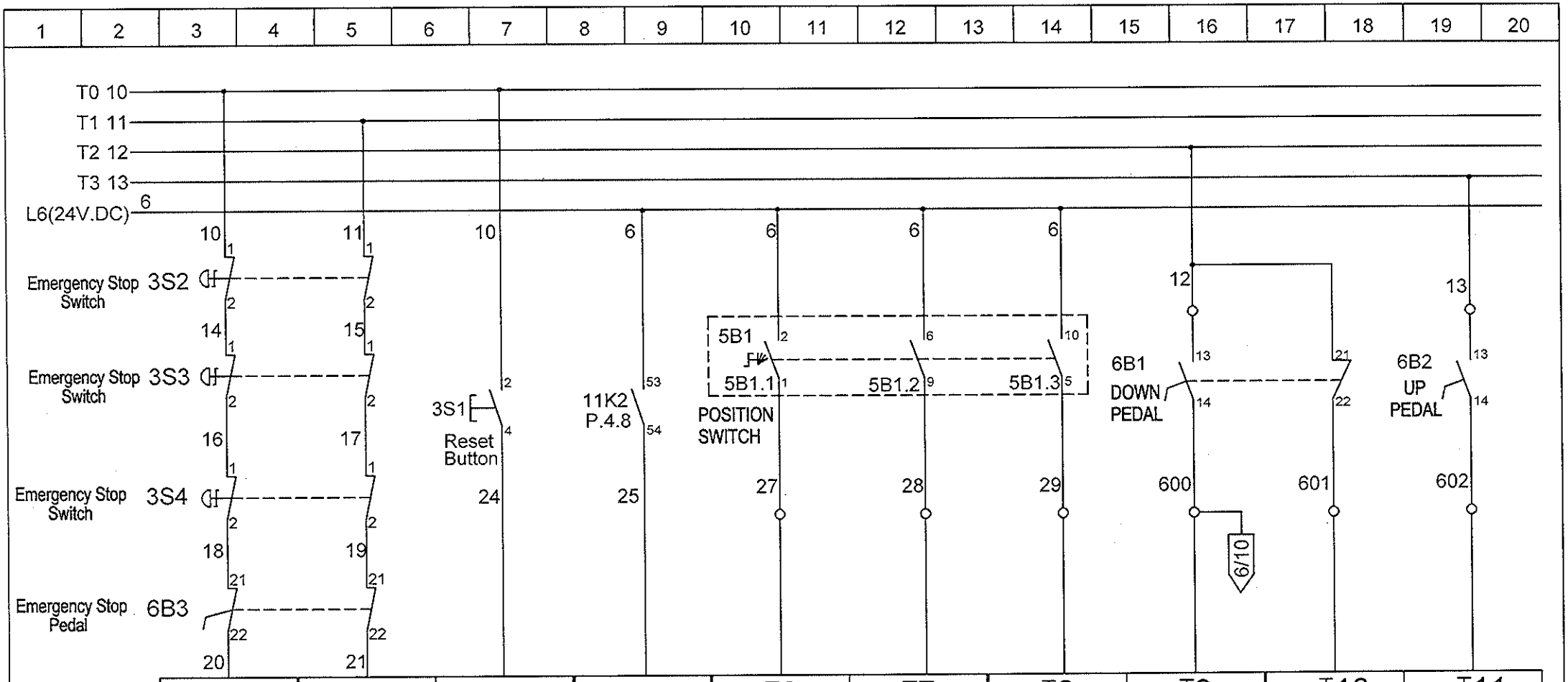


PAGE	MACHINE TYPE	REV	DATE	04.04.2016	SIGNATURE
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			APPROVAL	T.ER	

SCHEME NAME

UVV VALVES CIRCUIT

ERMAK
METAL FABRICATING MACHINERY



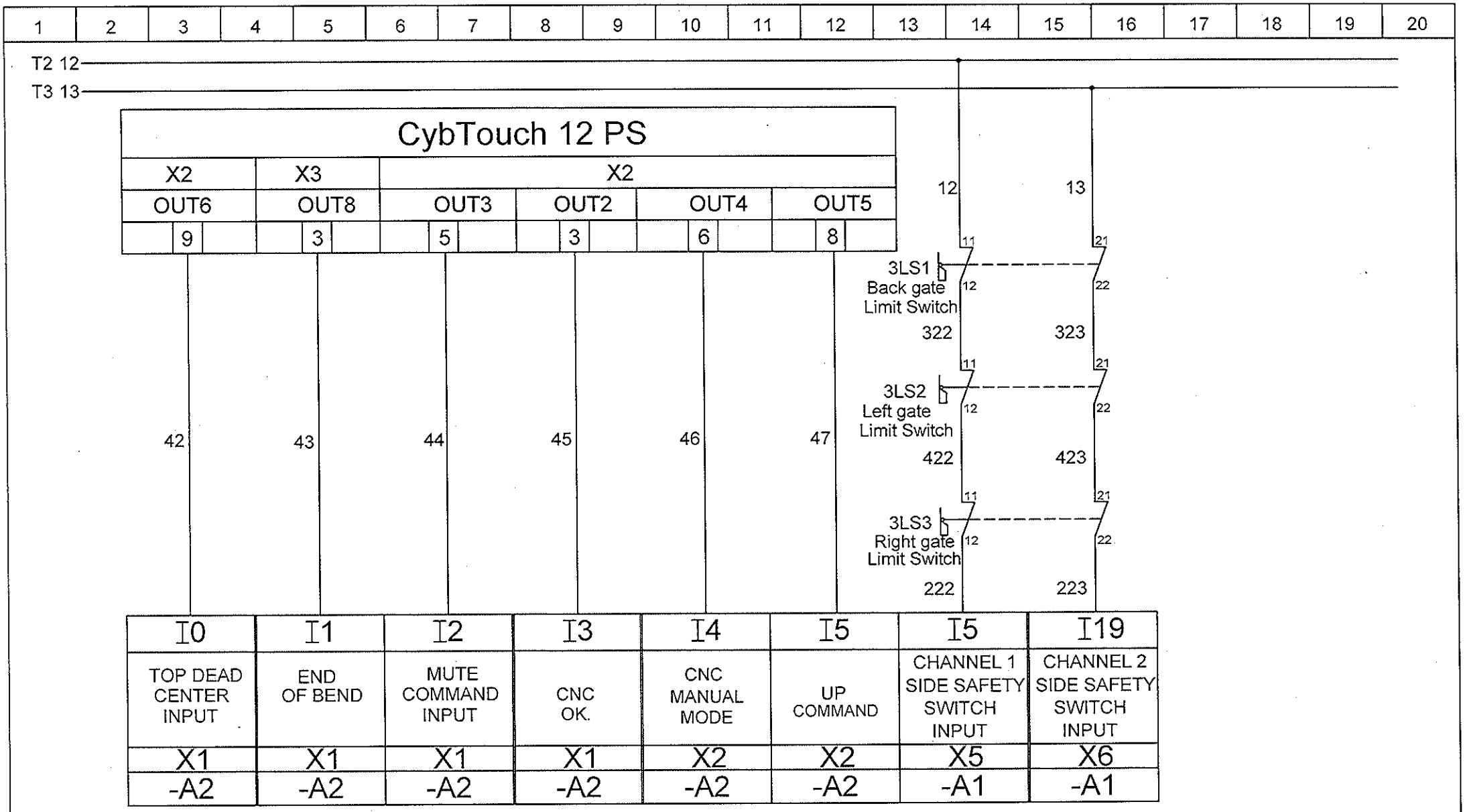
I0	I1	I4	I15	I6	I7	I8	I9	I10	I11
CHANNEL 1 EMERGENCY STOP INPUT	CHANNEL 2 EMERGENCY STOP INPUT	RESET BUTTON INPUT	MOTOR WORKING INPUT	FIRST POSITION INPUT	SECOND POSITION INPUT	THIRD POSITION INPUT	DOWN PEDAL INPUT	DOWN PEDAL CONTROL INPUT	UP PEDAL INPUT
X5	X5	X5	X6	X5	X5	X6	X6	X6	X6
-A1	-A1	-A1	-A1	-A1	-A1	-A1	-A1	-A1	-A1

PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
8	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

PILZ INPUT (EMERGENCY STOP) CIRCUIT

ERMAK
METAL FABRICATING MACHINERY



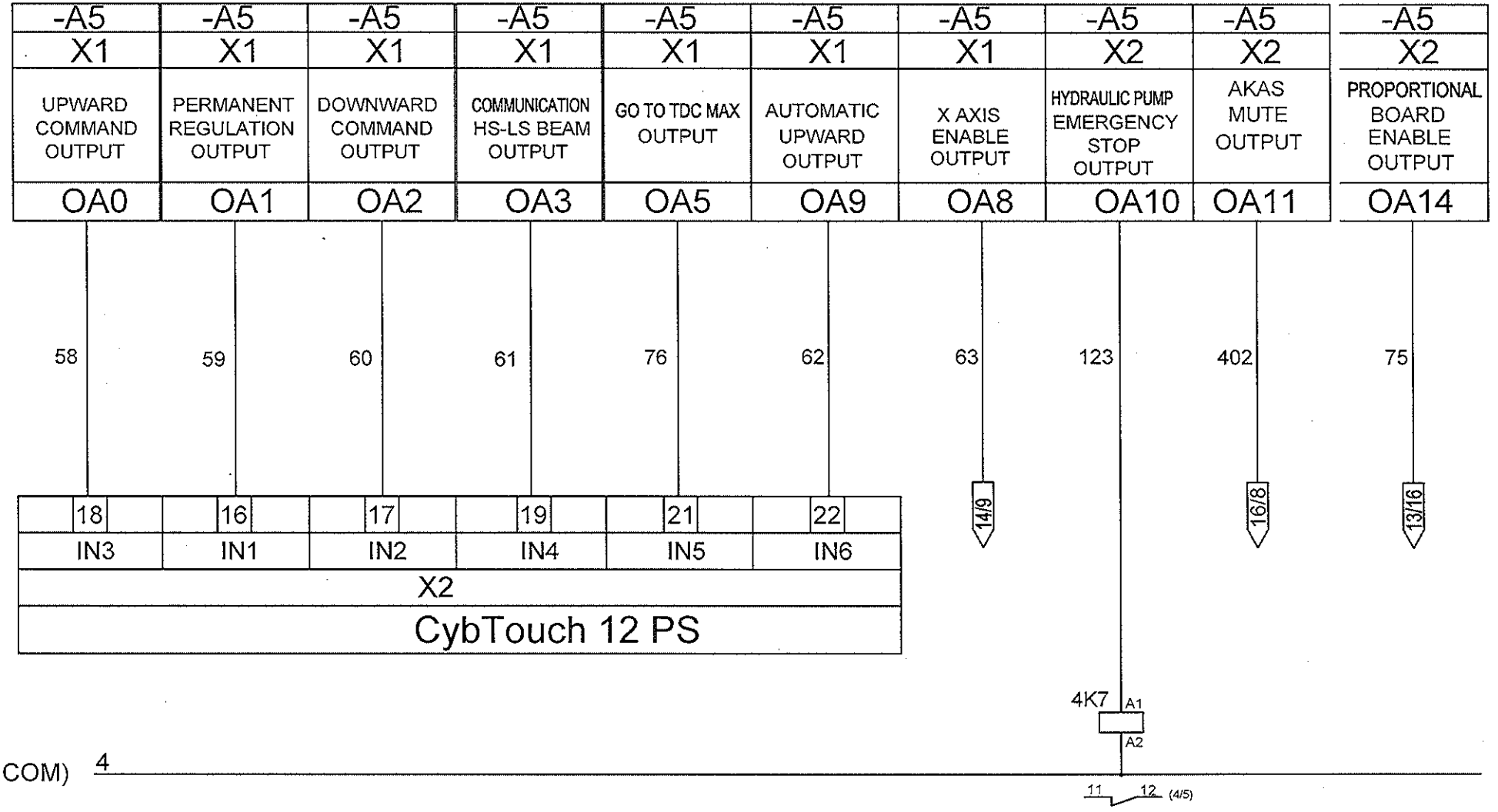
PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
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			APPROVAL	T.ER	

SCHEME NAME

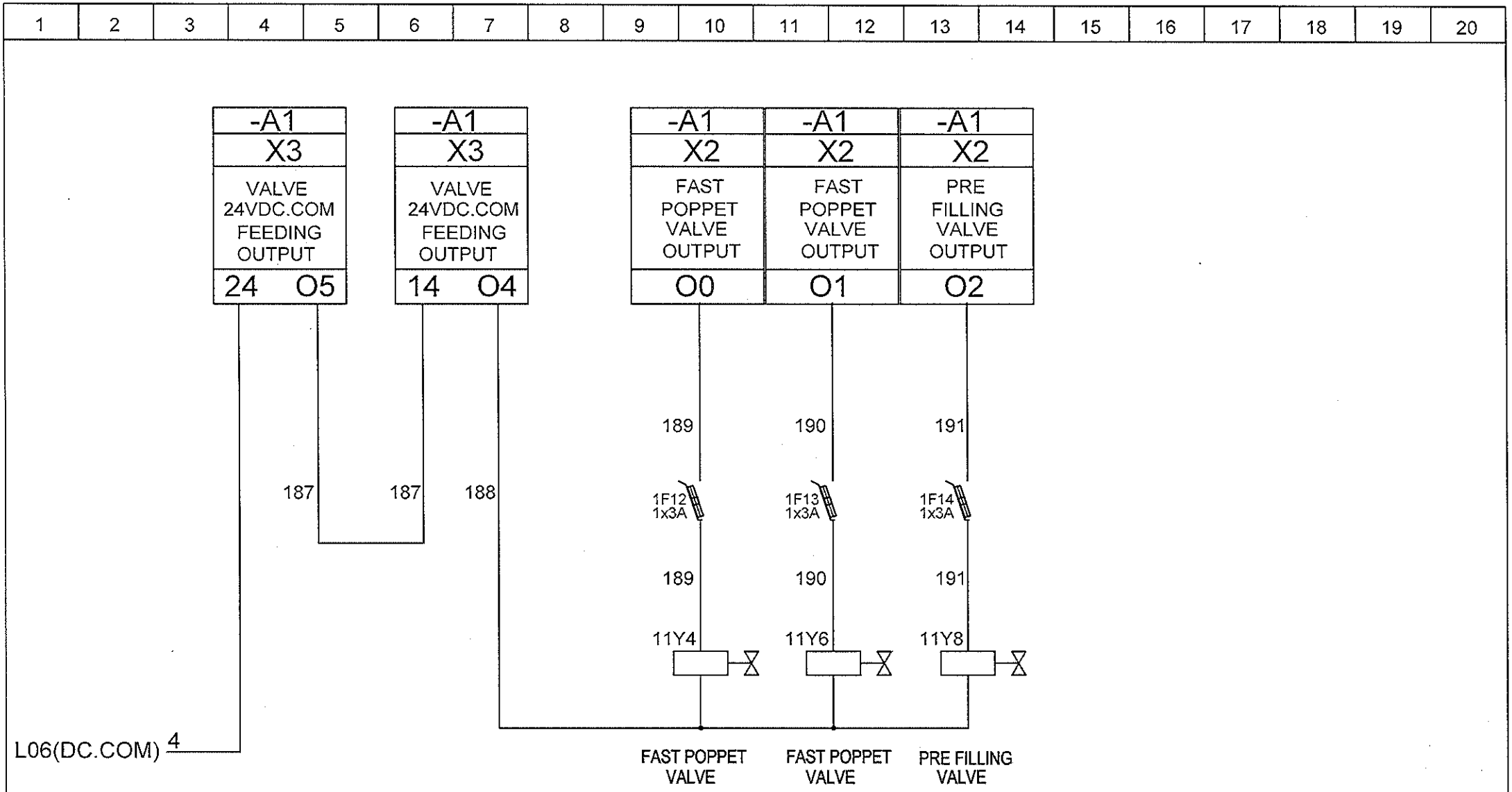
PILZ INPUT (COMMAND) CIRCUIT

ERMAK
METAL FABRICATING MACHINERY

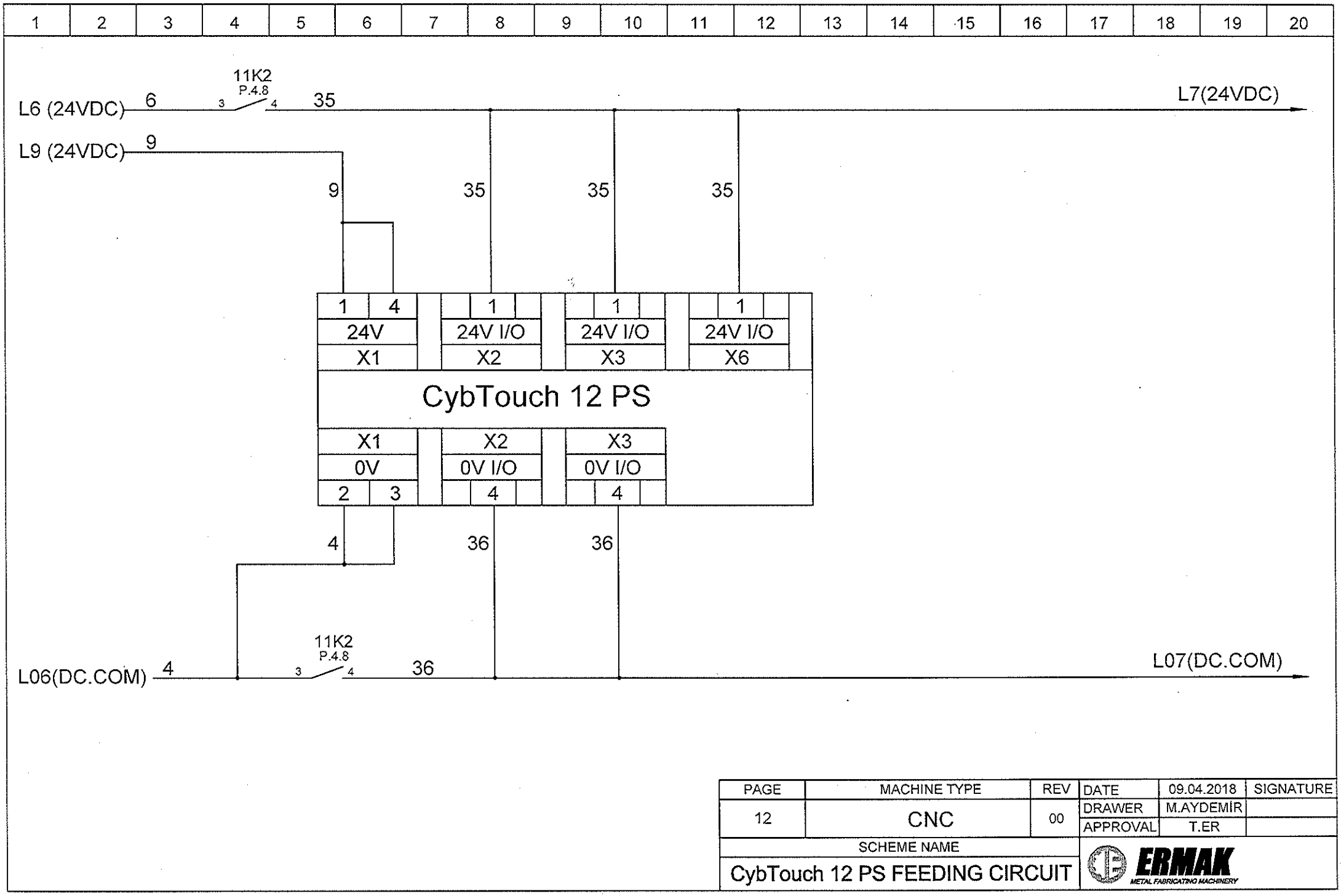
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PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
10	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
PILZ OUTPUT CIRCUIT					



PAGE	MACHINE TYPE	REV	DATE	04.04.2016	SIGNATURE
11	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME					
PILZ OUTPUT CIRCUIT			ERMAK METAL FABRICATING MACHINERY		

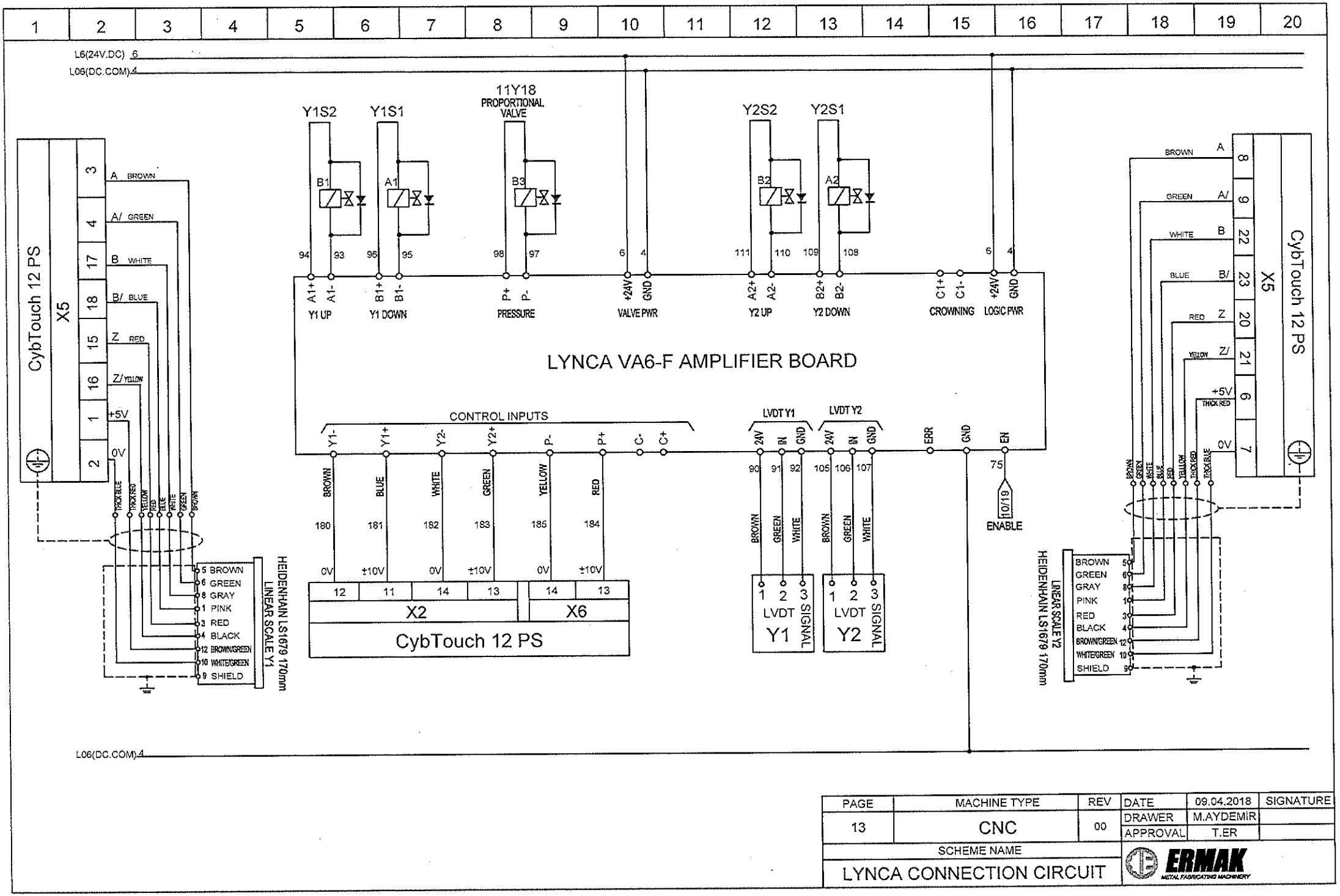


PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
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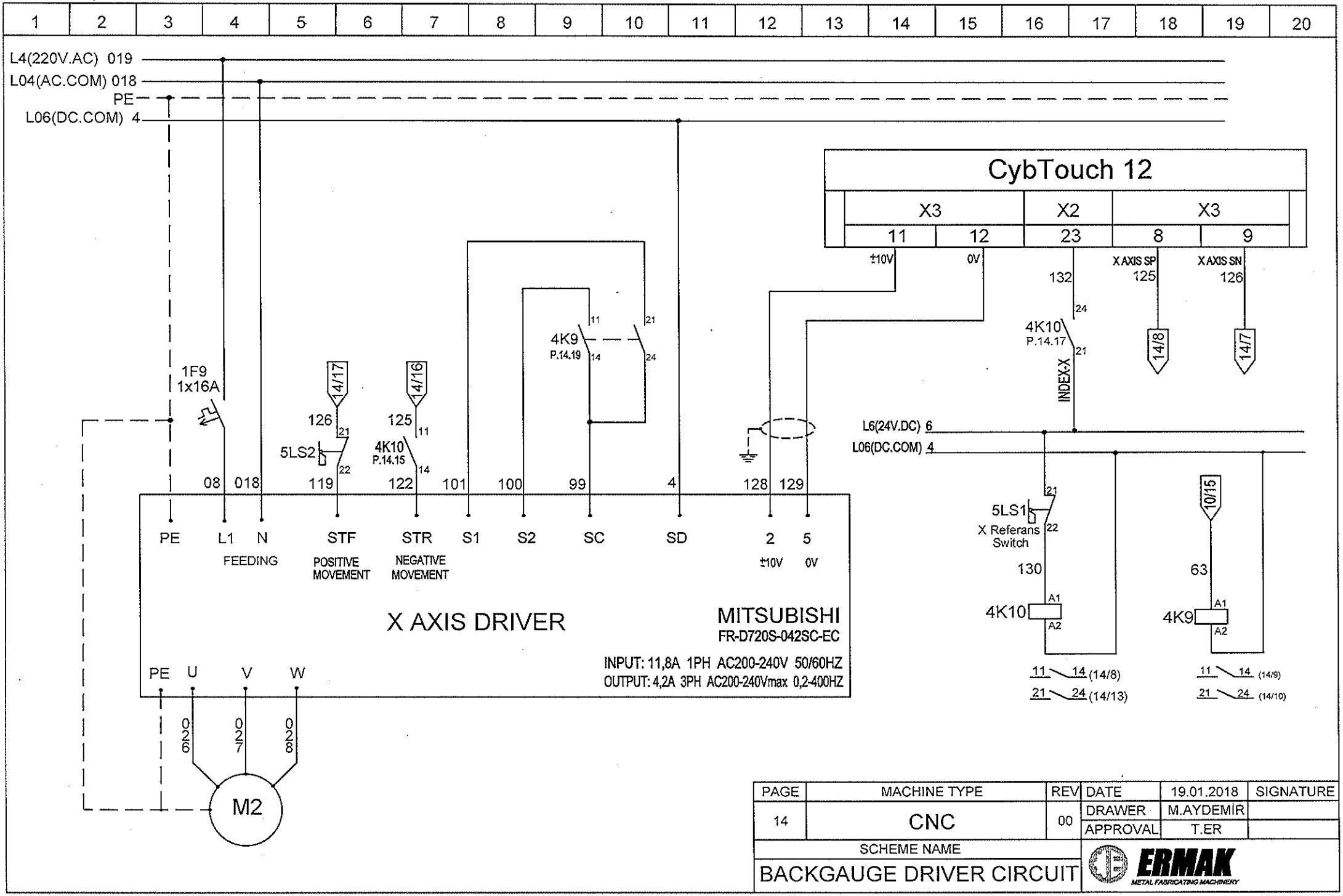
SCHEME NAME

CybTouch 12 PS FEEDING CIRCUIT

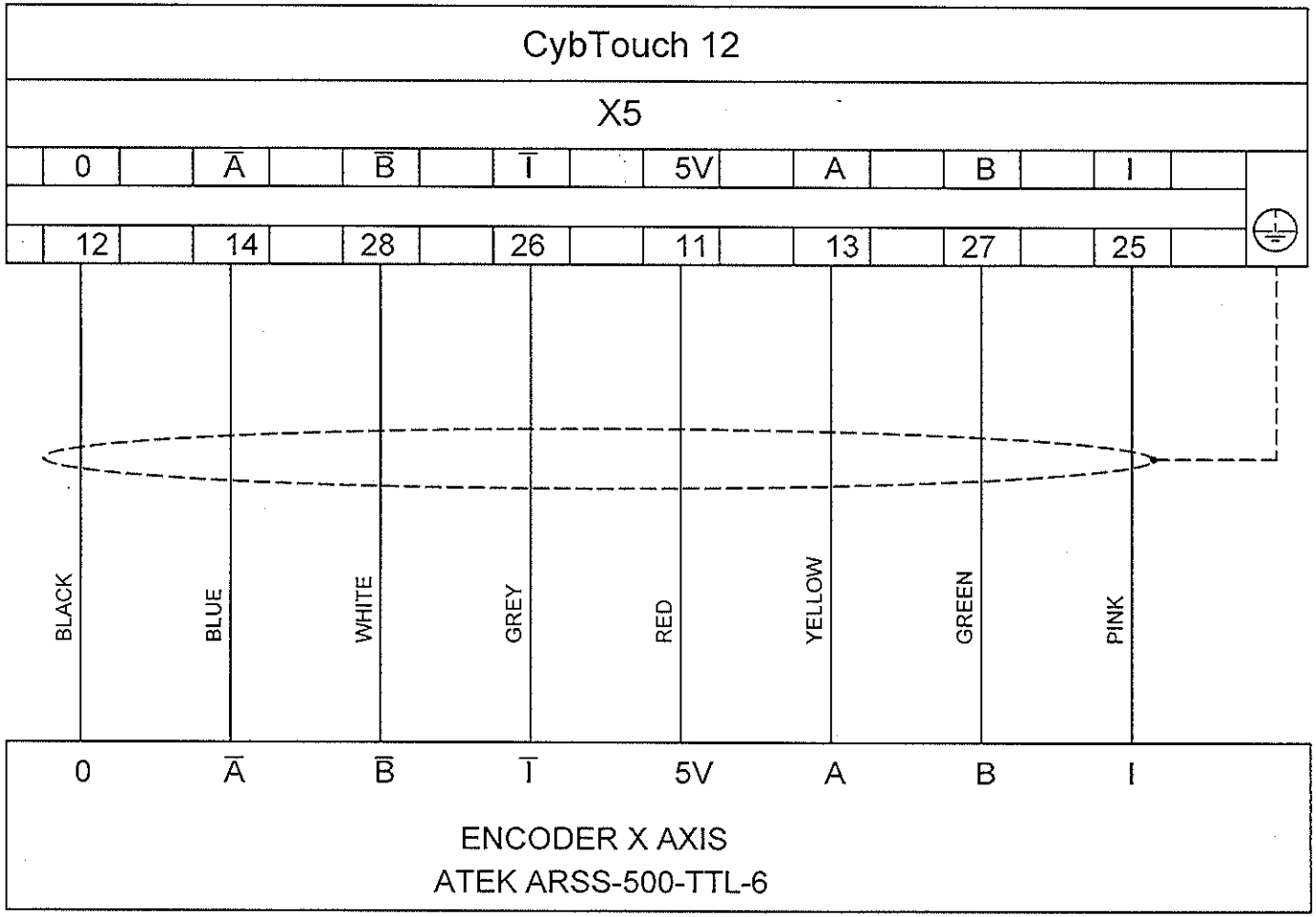
ERMAK
METAL FABRICATING MACHINERY



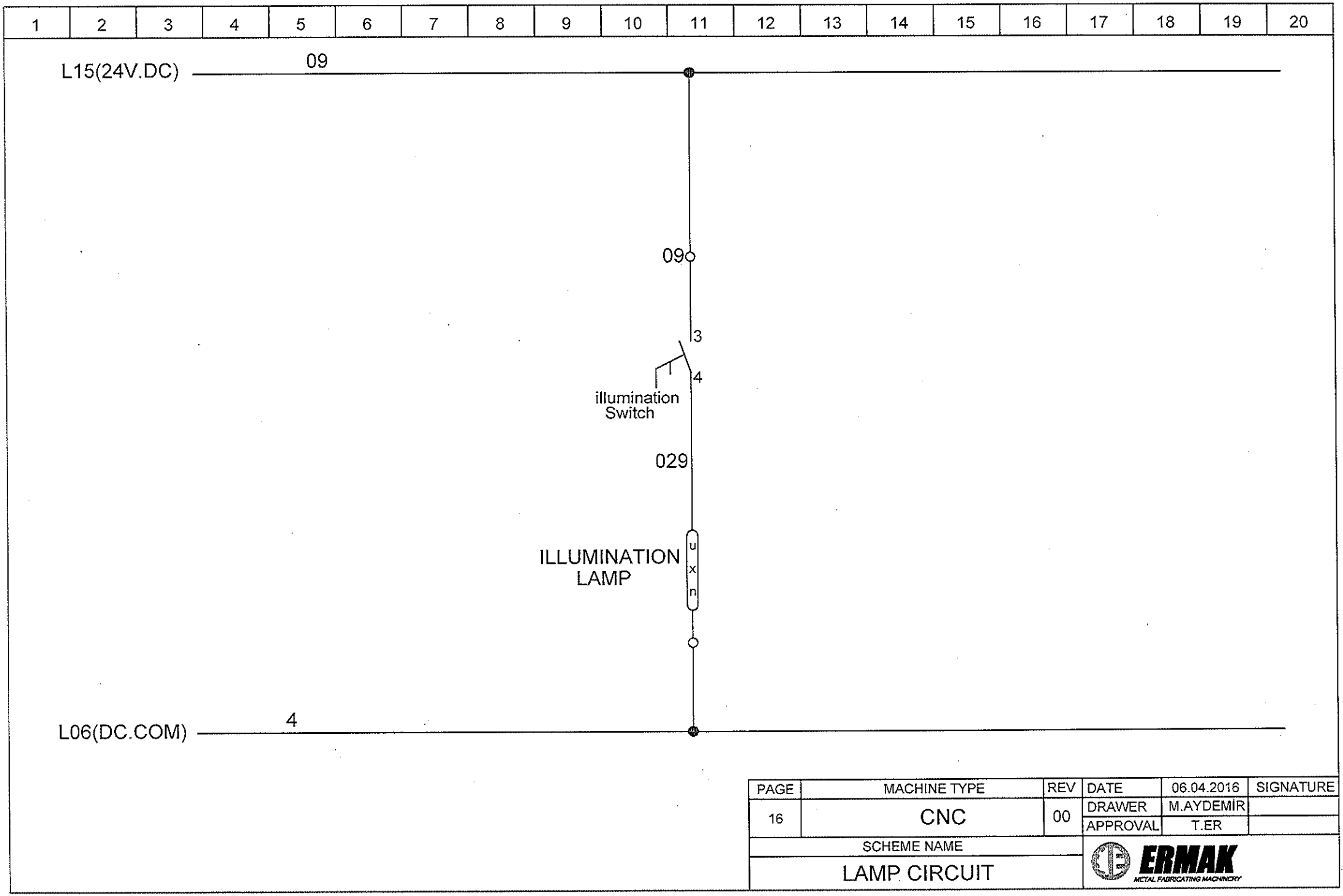
PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
13	CNC	00	DRAWER	M.AYDEMİR	
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SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
LYNCA CONNECTION CIRCUIT					



PAGE	MACHINE TYPE	REV	DATE	19.01.2018	SIGNATURE
14	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
BACKGAUGE DRIVER CIRCUIT					



PAGE	MACHINE TYPE	REV	DATE	06.04.2016	SIGNATURE
15	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	
SCHEME NAME			ERMAK METAL FABRICATING MACHINERY		
CYBTOUCH 12 ENCODER INPUT CIRCUIT					

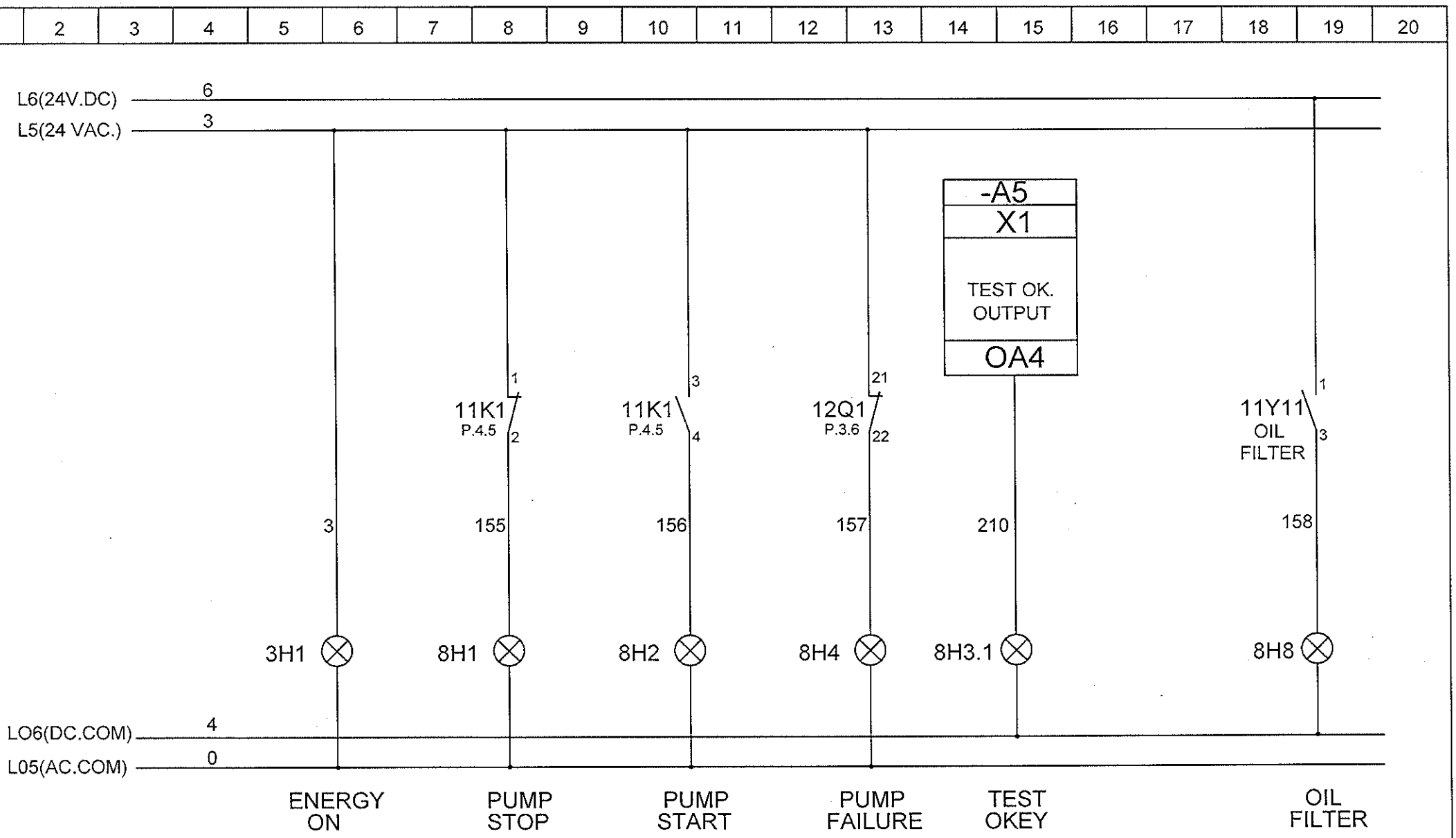


PAGE	MACHINE TYPE	REV	DATE	06.04.2016	SIGNATURE
16	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

LAMP CIRCUIT

ERMAK
METAL FABRICATING MACHINERY

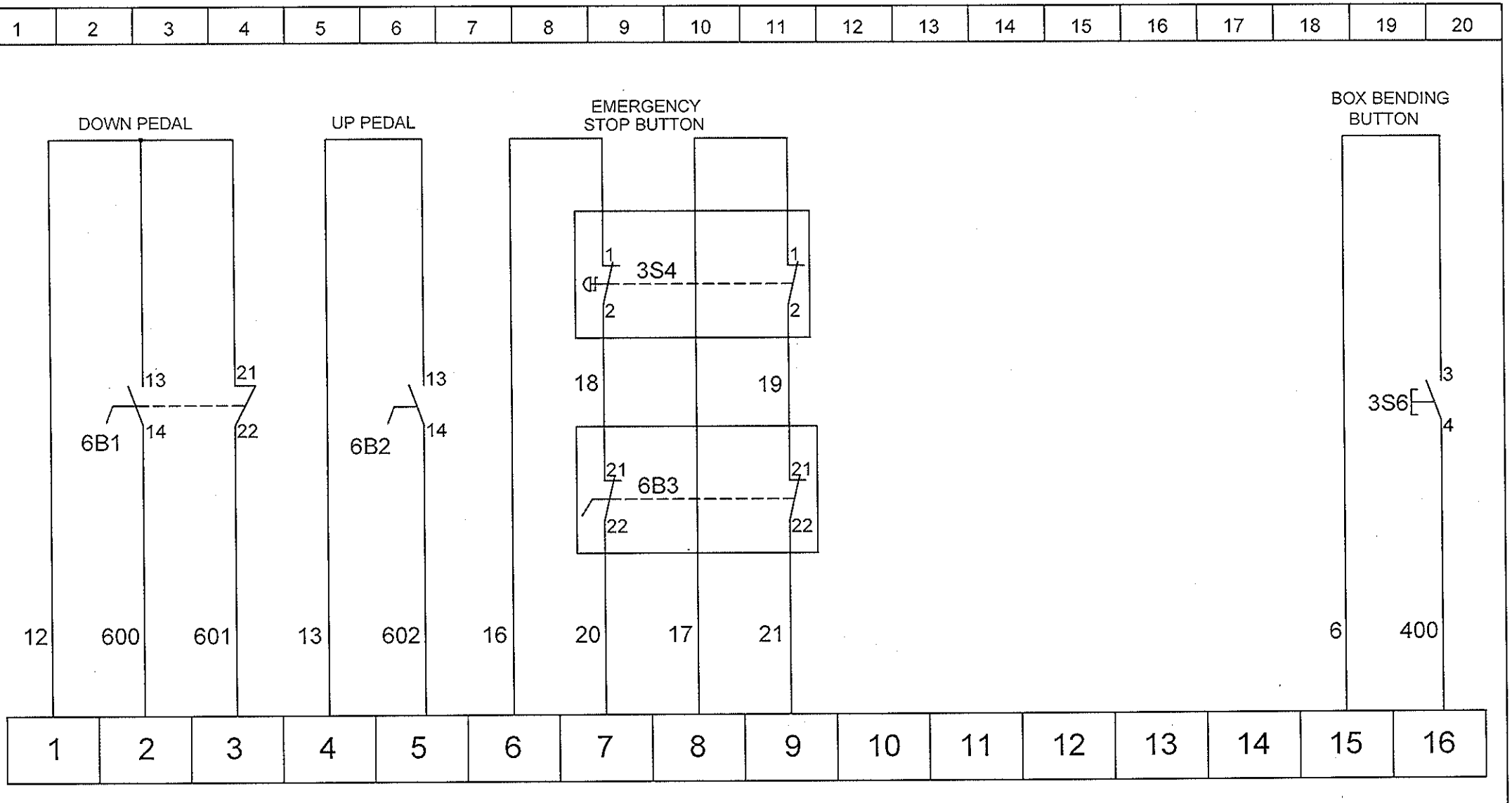


PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
17	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

SIGNAL LAMPS CIRCUIT

ERMAK
METAL FABRICATING MACHINERY



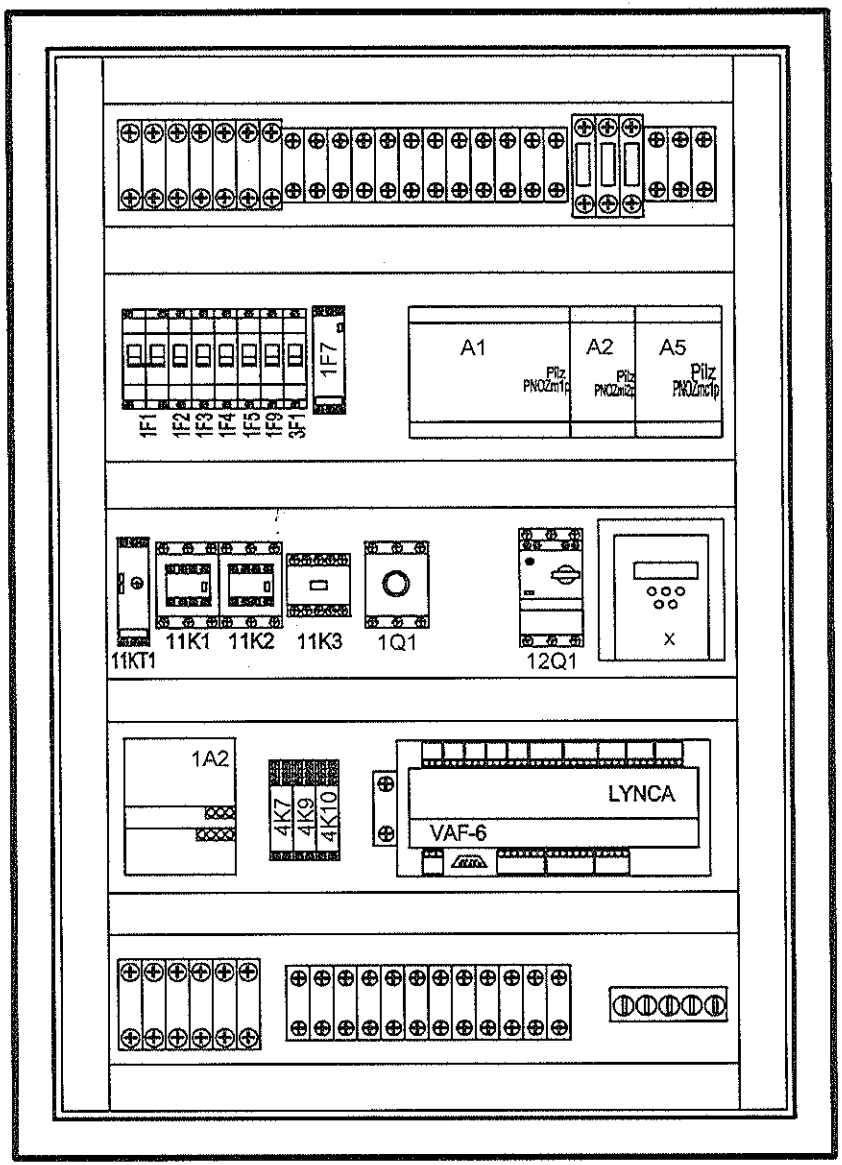
PAGE	MACHINE TYPE	REV	DATE	09.04.2018	SIGNATURE
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			APPROVAL	T.ER	

SCHEME NAME

PEDAL COMMAND CIRCUIT

ERMAK
METAL FABRICATING MACHINERY

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20



PAGE	MACHINE TYPE	REV	DATE	27.04.2018	SIGNATURE
19	CNC	00	DRAWER	M.AYDEMİR	
			APPROVAL	T.ER	

SCHEME NAME

PANEL DESIGN DIAGRAM

ERMAK
METAL FABRICATING MACHINERY