

OPERATION MANUAL

Vacuum Press Machine
WINTER RIBEXVAC ECO -B



WARNING!

*The operator must thoroughly read this manual before operation.
Keep this manual for future reference.*

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USER MANUAL | BECKER U.4.100 (VACUUM PUMP)

USER MANUAL | RAYTEK MI3 (DIGITAL HEATING SENSOR)

USER MANUAL | AUTONICS TZ4 L SERIES (TEMPERATURE CONTROLLER)

ELECTRIC CONTROL DIAGRAMS (AC 220 V 3 Phase 60 Hz.) & (AC 380 V 3 Phase 50 Hz.)

LIST OF COMPONENTS

A. FOREWORD

First of all thank you for choosing our product. For prolong using time of machine and if you would like to take maximum productivity please read and understand operation manual, safety notes and labels before the operation carefully.

Please don't forget that operators common sense and discretion as important as safety rules, labels, notes, devices and barriers.

8 DESCRIPTION OF PRODUCT/VACUUM PRESS MACHINE

This product is manufactured according to 2006/42 EC rules. This manual will provide operator to identify and to use the machine properly. Before operate, operator should read and understand this manual very carefully.

The manufacturer company keep the rights to change the technical details without any prior notice.

New generation RIBEX ECO-B Vacuum Press Machines are used for 3D thermoforming, lamination of PVC foils, veneer to MDF board and suitable for doors, panels in kitchens, various furniture applications, bathrooms and bedrooms. Operation principals of the machine respectively; quartz heaters heat the coating material progressively and vacuum pump extracts the air from material and (sanding/glueing process might be necessary before process) coat it perfectly onto it. Optional silicone membrane also allows to laminate veneers as well as the other laminating products to the MDF board. (Materials should be wood, chipwood, mdf e.t.c)

E. TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS	
Table Frame Dimensions	2435 x 1440 mm
Table Usage Area	2275 x 1230 mm
Maximum Working Thickness	400 mm
Pump Motor Power	2,2 Kw
Pump Motor Speed	1450 r.p.m
Pump Extraction Capacity	105 m3 /h
Noise Limit	68 Dba
Max. Temperature	200°C
Total Power	22,5 Kw
Total Operation Time	4 – 5 Min.
Average Net Weight	850 Kgs.
Dimensions (WxLxH)	3000 x 3000 x 1650 mm
<ul style="list-style-type: none">• We reserve the right to make technical modifications without prior notice.	
<p style="text-align: center;">STANDARD PROPERTIES</p> <ul style="list-style-type: none">• CE, ISO 9001 Certified• Automatic height adjustment controller• Automatic temperature control• Short processing cycle• Independent vacuum and heat operation• Operation window for direct monitoring• Manual adjustment and usage• Low cost maintenance• Low cost heaters• Minimum wastage and time saving	

1.GENERAL SAFETY RULES AND INSTRUCTIONS:

1. Operators would not like to meet any problem or risk, main safety rules should be apply.
2. ON-IS MAK is not responsible for any damages or loss due to incorrect use of the machine , deriving from failure to observe the instructions in this use and maintenance booklet and declines all responsibility for damages to persons or things.
3. Keep the machine and work area neat, clean and orderly.
4. Keep all guards and cover plates in place and all machine cabinet doors closed.
5. Never lay anything on the working surfaces of the machine, where it may foul with rotating or moving parts.
6. According to the machine lubrication instructions and the Operation Manual specified requirements, regularly pour or change the specified-designation lubricant or lub.grease.
7. Do not touch or reach over moving or rotating machine parts.
8. Operator should know all safety rules before operate the machine.
9. Ensure you know how to stop the machine before starting it.
10. Do not operate the machine in excess of its rated capacity.
11. Do not rush work.
12. Do not move guards while machine is under power.
13. Press emergency stop button immediately anything unexpected happens.
14. Be sure machine is not running when changing or installing any part on the machine.
15. Users are not allowed to modify the machine by themselves.
16. Stop machine and turn off the main switch if operator will leave near machine.
17. It is prohibited for unprofessional personel to open the electric cabinet. The electric cabinet should be opened by electricians who are familiar with electric system. The electric cabinet is equipped with power off device for opening the door. Only when you are sure that it is power,off after opening the door, can the maintaining and repairing be done.
18. Do not operate this machine unless long hair has been confined. Do not wear loose clothes, gloves, jewellery or other items which can become entangled in the tool
19. If any identification, warning or information mark on electrck equipment or machine body has been damaged or has fallen away, it should be supplied again.
- 20.Use equipment necessary for handling workpieces.

21. Always select the correct tool for the job.

22. Machine installing should keep away from pollution source (such as oil mist, water mist, strong vibration and shock etc.) If necessary, isolating measures should be taken to prevent the outside pollution source from influencing the operation and service.

23. Power – supply should be led in accordance with the electric requirements. The grounding requirements of the main grounding terminal of the machine should conform to the specifications of its Operation Manual.

24. Responsibilities of user enterprise – managers

- a) Any operators should be trained, and only when they are qualified for it, can they do the work.
- b) The machine surrounding should be provided with clean and safety working-area for operation and service
- c) According to this requirement of Safety Operation of the machine and the specifications described in the Operation Manual of the machine, explain the content of the Safety Warning to the operators, to let them pay attention to the safety operation rules and marks.
- d) According to the usage of the machine, regularly check if all motion- parts are under safety state when the machine working.
- e) To machine various parts, proper safety guarding units should be provided.

25. Responsibilities of operators

a) Should operate in term with this requirements of safety operation of the machine and the requirements of the Operation Manual, preventing the danger caused by mis-operation.

b) Once any danger happen, turn off the main power timely and report it to the relative managers. It is prohibited to operate without observing the rules and to receive the instructions violating the rules.

c) As specified in Operation Manual, install and adjust the safety guarding unit.

d) When not approved by relative departments, operators must not replace, dismount or damage any guard covers and guard devices at will.

e) Operators should keep clean and safe working environment, and pay attention to the tool parts which will probably displace, fall and roll, causing dangers.

26. Operator must be careful that there is no crushing risk before starting automatic height adjustment system by ↑ **Up** and ↓ **Down** arrow buttons on control panel.

Prepare an electric panel according 3x140 A fuse 220 AC 60 Hz. to operation area. The connection cables should be 4x25 mm² TTR for 10 mt. If the distance more than 10 mt. you should use 4x35 mm² TTR Don't forget the earthing cable connection on machine.

2. SAFETY NOTES AND LABELS



This label indicates handling place of machine/additional worktable by forklift.



This label indicate attention to electric circuit/high voltage in that place. Danger of fatal injuries may cause with death.



This label earthed device board, indicates the reliable earthed device should be connected with this machine.



This label indicates hot surface. Burn hazard! Do not touch!



These labels indicate the worktable as Left or Right position installed on machine.



This label indicates that there is a safety sensor/photocell on it. Standing in front is dangerous and forbidden! Do not leave anything in front of the photocell/sensors.



Safety Rules strictly to be read/understood by user/operator before operation.



This label indicates that this area is dangerous or must be carefully maintained.



Numbers indicates descriptions of the assembly part (metal profile, rails or plastics) number. R=Right Worktable side L=Left Worktable side of the machine.

2.1 WARRANTY

Our machines are guaranteed against any possible effect in manufacturing or in material under normal use and maintenance conditions.

This guarantee has a validity of 24 (twenty four) months starting from working date and consists in a free replacement of faulty pieces.

Warranty is not extended on electric parts and components.

The warranty's validity ceases if machines have been handled by not authorized persons or firms, or if they have been used to do work not foreseen in our operating instructions.

Upon receipt of the machine it is necessary to ascertain its state, by checking the followings

- Alignment of tables
- Good order of : electric controls and their functioning,
handwheels for lifting and adjustment,
locking and adjustment of tables
safety guards

These different controls will enable you to express, if necessary, all conventional reserves with the carrier on the delivery note, on one side, and by registered letter in accordance with the law, on the other side.

We recommend not to place any objects on the working tables of the machine.

NOTE :

Transport/accomodation charges of our technicians as well as expenses in case of requirement and technical support demand are at full charge of the buyer.

3. NOISE LEVELS

S.no	Place	Average (Leq)	Max.(Lmax)
1	Operator position during work	75,18 dB	76,20 dB
2	1 meter far from operator position during work	72,44 dB	72,70 dB
3	3 meter far from operator position during work	70,36 dB	70,80 dB

The value indicated in the table represent emission levels and are not necessarily the noise levels which guarantee safe conditions in the work position. Although there is a clear relation between the emission levels and the noise levels, it is not possible to establish in certain terms whether additional safety measures are required. The factors which influence the noise emission levels in the working position include the duration of exposure, the characteristic of environment in which the machine is installed, other noise sources, for example, the number of machines or other types of machining in the surrounding areas. Furthermore, the noise levels may vary from country to country.

4.STORAGE CONDITIONS

For pro longing the usage of machine tool, you should obey the following rules:

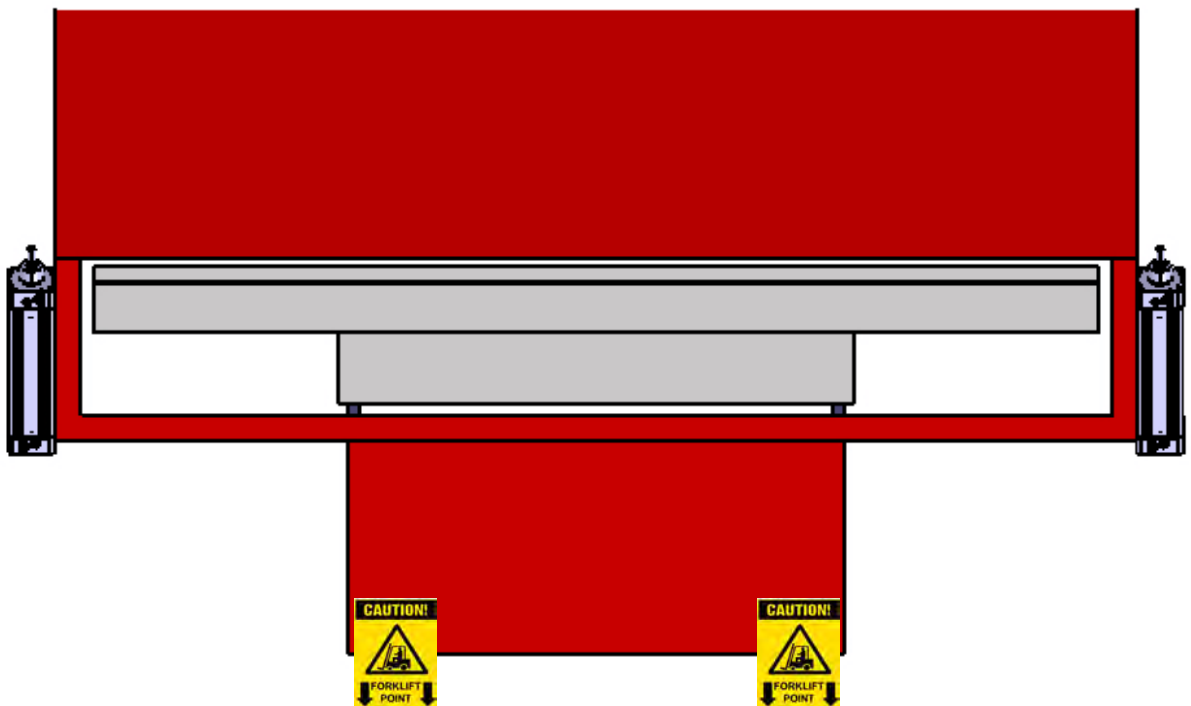
1. Do not expose to direct sunlight for a long time.
2. Do not place onto wet place.
3. Do not place on areas with strong vibration or shake.

IMPORTANT NOTICE : IN ORDER TO TAKE BEST AND SUITABLE VACUUM VALUES, VACUUM PRESS MACHINES SHOULD ONLY WORK AT WORKING AREA BETWEEN 20° - 30°. MANUFACTURER CAN NOT GIVE ANY WARRANTY FOR DIFFERENT WORKING TEMPERATURES.

5. HANDLING POSITION OF MACHINE

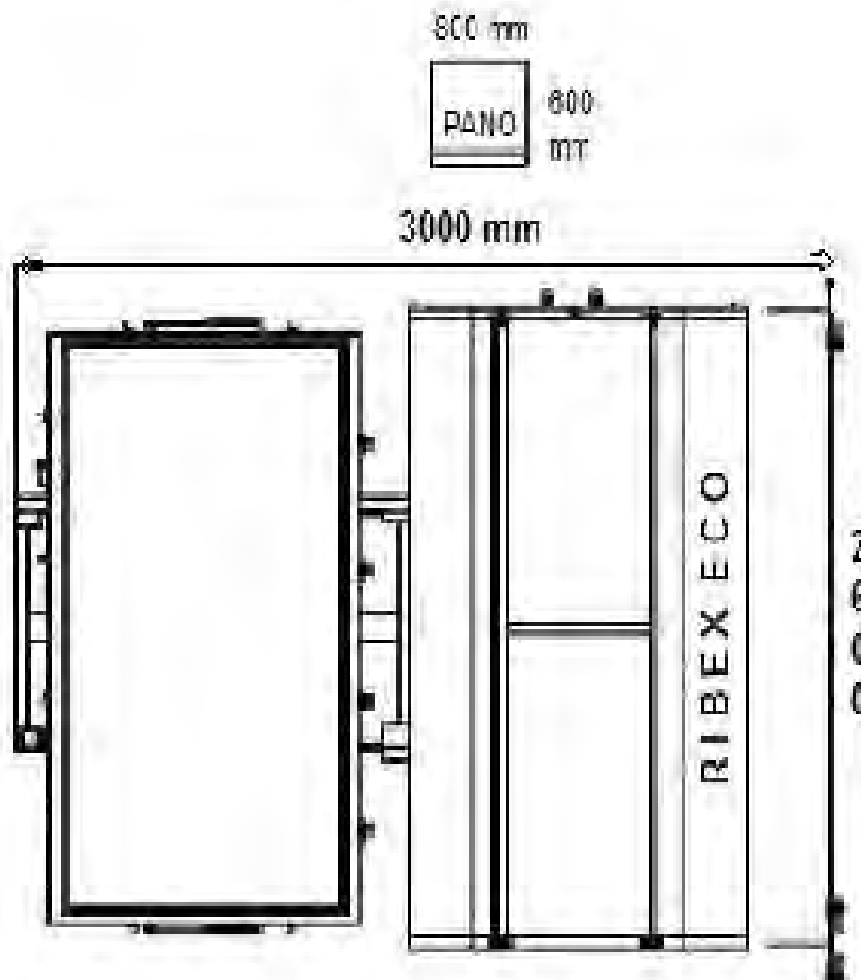
1. Never overload the lifting equipment.
2. Never use damaged slings
3. Position the sling correctly. The sling must not be placed around sharp edges, do not let it slide over corners or along edges.
4. Never let goods drop down.
5. Position sling correctly to ensure easy removal after use.
6. Use smooth-rounded hooks having an inside radius of not less than 50 mm.
7. Avoid placing more than one sling on the same hook.
6. Keep away from alkalis, acids and other dangerous goods.
7. Any greasy dirt on sling is not allowed.
8. Remember that vibration during transport can cause friction between sling and machine use protective sleeves on slings.

Slings are made from 100% polyester or of steel ropes with enough strength. For lifting rough or sharp edges loads, we recommend the use of protective sleeves to protect slings from damage. All slings are colour coded for increasing safety. Through check should be done to slings regularly.



Be aware whilst lifting the machine from correct forklift points of the machine's body!

6. LAYOUT PLAN



* Ribex Vacuum Press Machine should be located on flat ground for high sensitivity. If foundation area has small height difference. Please adjust the bases height of machine. Dimentions of machine Lenght 3000 mm. and width 2600 mm, but working area should be width 4600 mm and length 5000 mm. to operate safe and productive.

Please pay attention for avoid damage the control panel and connection cables of control panel.

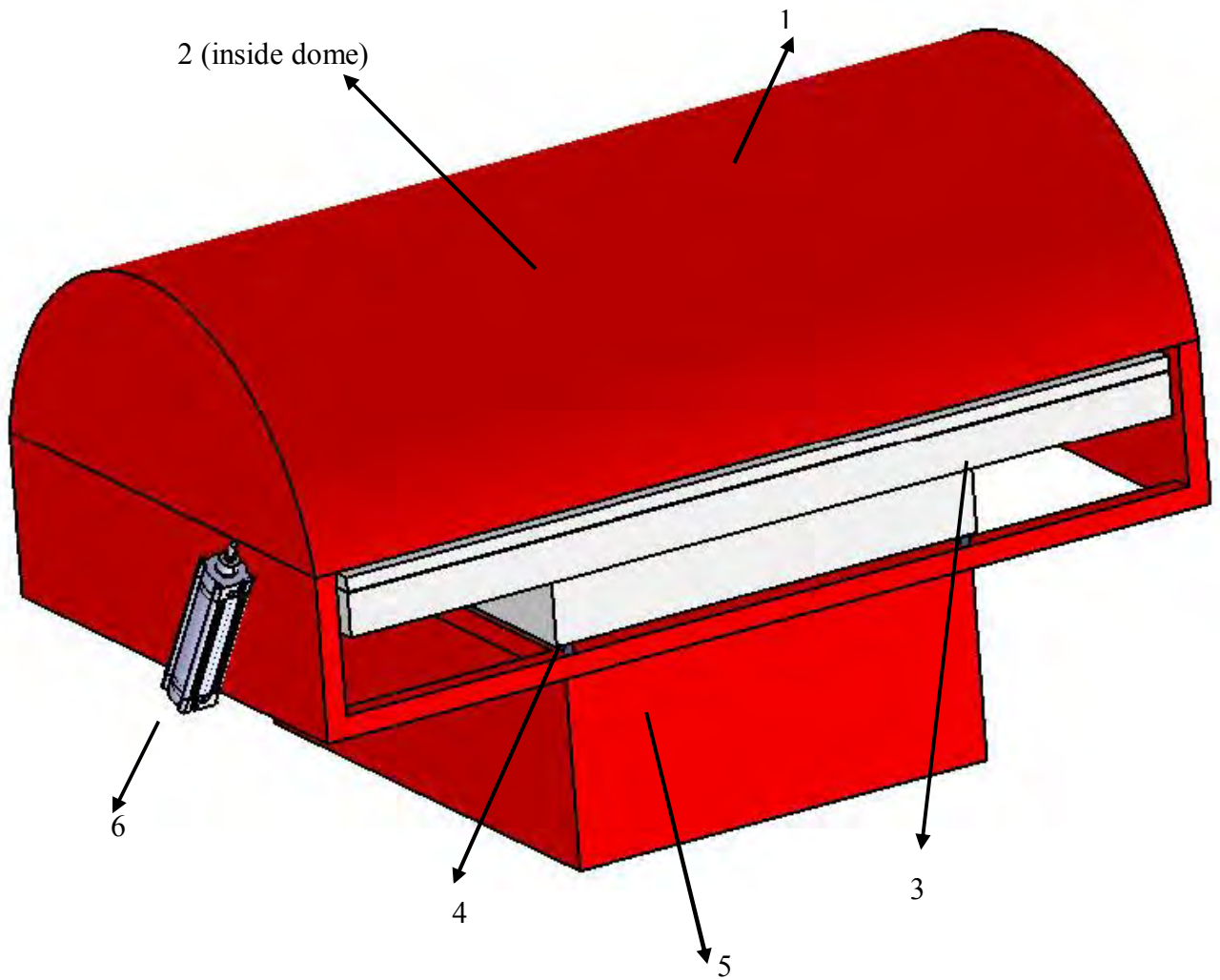
Prepare an electric panel acoording 3x80 A fuse 380/400 AC 50/60 Hz. to operation area. The connection cables should be 4x10 mm² TTR for 10 meters. If the distance more than 10 meters you should use 4x16mm² TTR Don't forget earthing cable connection on machine.

7. MAIN PARTS & INSTALLATION DRAWING OF MACHINE

Main parts of the machine has been defined as sown below.

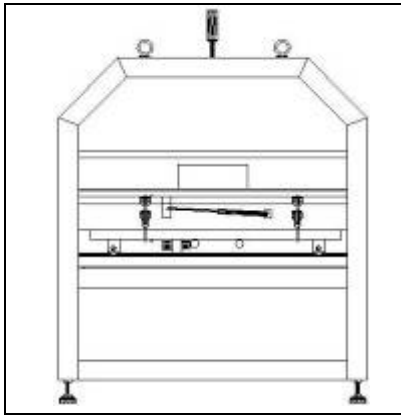
Machine consists mainly from 6 parts;

1. Main body
2. Heating unit
3. Worktable
4. Worktable rails
5. Worktable loader
6. Automatic lifting motors (Height Adjustment System)



Installation process are as follow drawings.

(1)



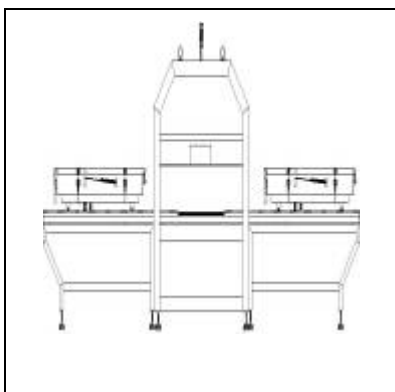
(2)



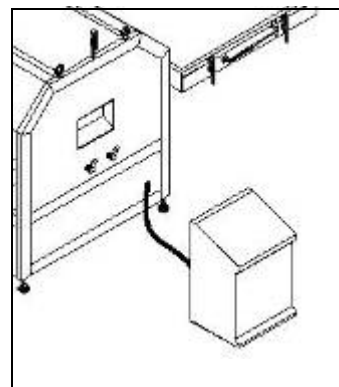
(3)



(4)



(5)





UNLOCKING OF SAFETY PARTS



ATTENTION! Do not move the worktable without removing metal safety parts.

RIBEX ECO MACHINE BODY
After installation of work table stand



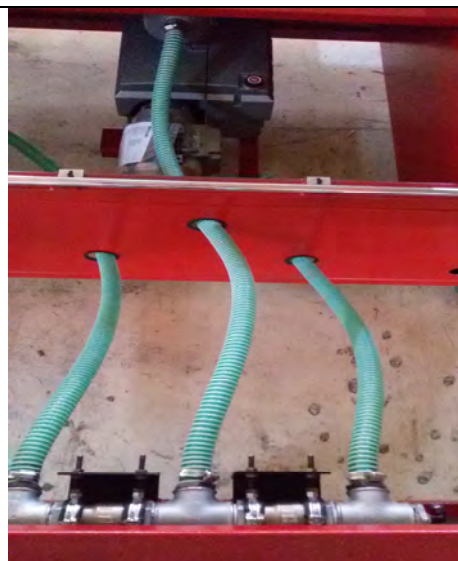
At the first installation of machine, worktable of machine must be connected as shown below from the screws to beds.



Under machine, there are 4 pieces of foundation leveling foot, machine must be leveling with the adjustment of these leveling bolts with the tool as shown below



8. HOSE CONNECTIONS



Hoses which are connected with vacuum pump, are being connected with 3 vanes from the middle side. Left working table is being connected with left side of vanes and right working table is being connected with right side of vanes. Then these vanes are connected with vacuum pump.

Note : Single table vacuum pumps have vanes with twin entrance.

9. ELECTRIC CONNECTIONS

After **energy/electricity** is connected, machine starts from main electricity **ON/OFF SWITCH** as shown below:

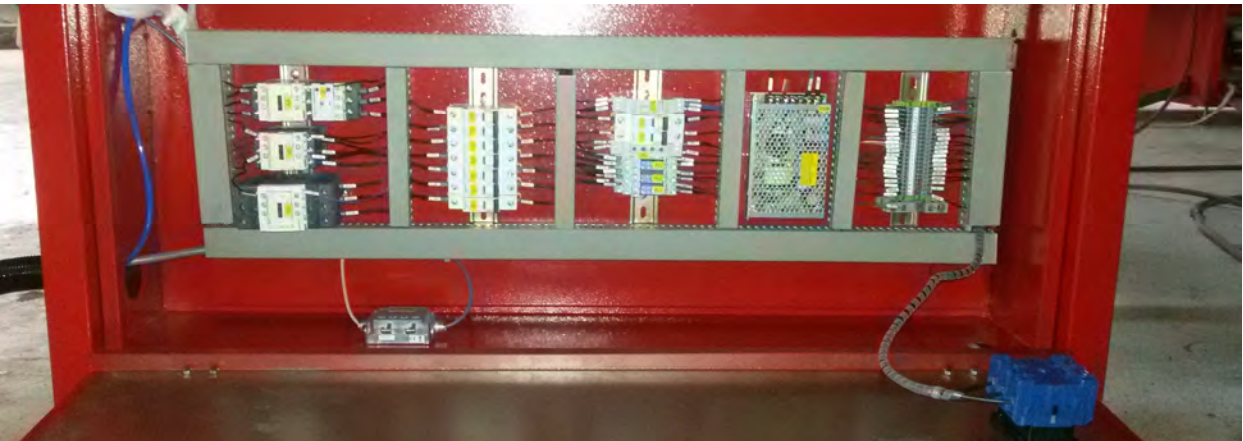


Before operating machine, please check once again and be sure that the earth connection is well connected, electrical line is properly and safe as the required power of the machine from power supply.



Main electrical board of the machine is located at the back side under the main body of machine. All electrical connections are being made from this section of machine. Open the electrical board door with the turning handle, for the connection of cables, at the right side, you will see L1,L2,L3 main electrical connections and connect 3 phase from here.

Inside main electrical board as shown below:



10. CONTROL PANEL



Only ECO-B has UP/DOWN feature.

RIBEX ECO/ECO-B CONTROL PANEL

- 1 VACUUM METER: During Vacuum process it indicates the vacuum power with Bar/Pressure unit.
- 2 VACUUM PUMP LAMP: If it's lighted up it indicates that vacuum process is active.
- 3 VACUUM PUMP START BUTTON: When it is pushed vacuum pump starts working and Vacuum Pump Light lights up.
- 4 VACUUM TIMER (ANALOG): Sets vacuum time analogue. It is deactivated automatically at the end of set time.
- 5 VACUUM PUMP STOP BUTTON: When it is pushed vacuum pump stops working and Vacuum Pump Light lights out.
- 6 POWER LAMP: Lights up when the machine is turned-on from main switch.
- 7 HEIGHT ADJUSTMENT: It allows the heating unit to lift up/down to adjust the height of working area. (Only ECO-B model has UP/DOWN feature!)
- 8 HEATERS LAMP (RESISTANCE): It lights up when heaters are active and lights out when heaters are deactivated.
- 9 HEATERS START BUTTON: When it is pushed heaters lamp lights up and heaters start the heating process. It continuously heats up until reaches out to maximum required/preset temperature value of temperature controller.
- 10 LAMP INDICATOR: It indicates if lamps inside of the machine are active/deactive.
- 11 HEATERS STOP BUTTON: When it is pushed it deactivate the heaters and Heaters Lamp lights out.
- 12 LAMP SWITCH (ILLUMINATION): It illuminates inside of the machine and it is activated/deactivated with this switch.
- 13 EMERGENCY STOP: Stops all functions of the machine in case of danger when pushed. By twist/pull back to it's position again after danger is eliminated.
- 14 VACUUM STEP BUTTON: When it is pushed manually vacuum pump starts working and Vacuum Pump Lamp starts lighting.

11. OPERATION OF MACHINE

- 1- Open the lid of the machine and lay on PVC on worktable, make sure to fit PVC regularly on both sides, before closing the lid, it must be well tighten and check the holes and tears on PVC carefully.



- 2- After PVC lays on worktable, as shown on picture above, PVC must be tighten between worktable and lid, then tightening clamps must be closed as shown on photo manually and should be prevent for the air flow.



- 3- PVC can be tighten with Step button and you can touch only 1 second in order to tighten PVC (it is advisable) Start the heating operation afterwards



Adjustment of temperature settings and vacuuming time is depend on PVC foil type, colour and thickness such as outside temperature and also even altitude. Working materials should be away from corners about 8 cm, and the distance between workpieces should not be lower than 7 cm from both sides.

Heating operation and vacuuming operation should be done step by step. From direct monitoring (operation window), entire operation can be easily seen.

Depends on the structure/technical specifications of glue and PVC material, vacuuming time and temperature adjustment can be adjusted easily.

Please find below some simple instructions, in order to understand about vacuum system ;

After pushing the manual worktable until completely inside of main working area:

1. We advise you to open illumination inside machine, in order to open the illumination, please turn the switch to right side.
2. Vacuuming operation should be done step by step, different material needs different vacuum pressure and temperature. Especially light colour PVC materials needs little high temperature and dark colour materials need low temperature, glue quality also effects the vacuuming operation. It should be asked before to PVC or glue manufacturer for exact activation/expansion levels/points.

11.1 ROBO MAGNETS



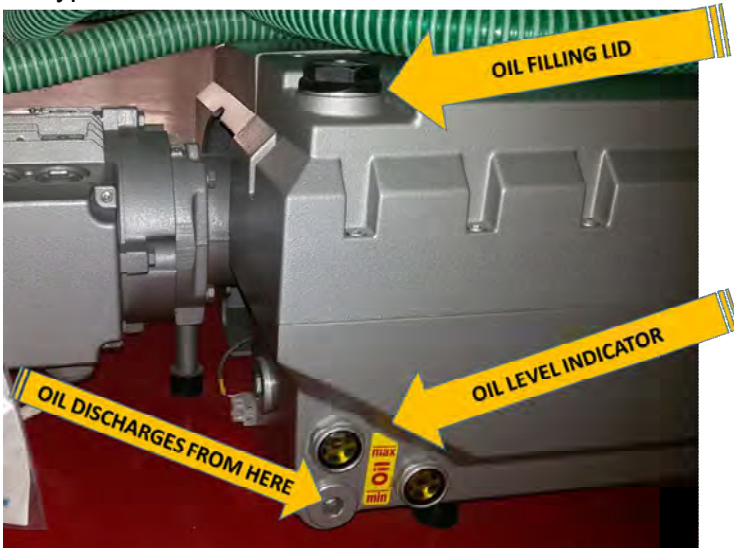
Robo magnets are designed for supporting workpieces during vacuuming operation for turning corners properly, depends on workpiece shape, it can be used one top of the other. Bottom supporter robo magnets have long life usage and easy working possibility. With bottom U shape channels, it supports vacuuming circulation during vacuuming operation.

12. GENERAL MAINTENANCE OF VACUUM PUMP

1. These vacuum pumps with its structure, does not need periodical maintenance. It is oil type vacuum pump with its 105 m³ vacuuming capacity.
2. Oil level should be always controlled by operator from oil indicator
3. Oil level from vacuum pumps should be maximum at the middle level of oil indicator.
4. Never use vacuum pumps without oil.
5. Vacuum pumps can decrease oil little less during working, It should be added with the suitable level.
6. If each day you work with machine between 8-10 hours, vacuum pump oil should be changed monthly.
7. For vacuum pumps, please put periodical maintenance and oil change card, for failure or any type of breakage, please contact with manufacturer.
8. Each 100 hours, clean vacuum air filter with air gun. Each 6 monts change it with the new one.
9. Oil discharging and oil afilling is being done as it shown undermentioned, Open the hexagon bolt for filling oil, after filling oil, it should be tigthening carefully.



Oil types are recommended as follows: Shell Corena H100 | Mobil Rarus 427 | BP Energol RC 100



13. TROUBLESHOOTING

If the pump malfunctions, try the following measures first to eliminate the trouble. If trouble persists, contact service department.

Fault	Cause / Remedy
A) Pump does not run	1) Thermal switch has tripped; identify reason and activate switch. 2) Room temperature is too low; Restore room temperature to allowed range 3) Motor winding damaged; Contact service department
B) Pump cannot reach stated vacuum	1) Low oil in tank; Top up oil. 2) Oil is contaminated; Change oil 3) Discharge clogged; Check couplings at outlet.
C) Pump is noisy	1) Air exhaust filter clogged; Change air exhasut filter. 2) Motor bearings damaged, Contact service department. 3) Motor coupling damaged, Contact service department. 4) Vanes worn out, Contact service department.
D) Pump runs hot	1) Oil is not suitable type; Change oil

	<ul style="list-style-type: none"> 2) Poor room ventilation; Install an auxiliary ventilation. 3) Motor fan broken, Contact service department 4) Wrong power supply to motor; Check power supply 5) Outlet clogged
E) High oil consumption	<ul style="list-style-type: none"> 1) High working pressure (close to atmospheric pressure) Check oil level frequently. 2) Pump temperature is too high 3) Air exhaust filter damaged; Replace air exhaust filter.
F) Pump does not maintain after power-off	<ul style="list-style-type: none"> 1) Check valve(if fitted) damaged; Contact service department
G) Pump leaks oil	<ul style="list-style-type: none"> 1) Tank screws or knobs loosened; Tighten screws or knobs. 2) Tank gaskets damaged; Contact service department 3) Oil sight glass not tightened; Tighten oil sight glass.
H) If vacuum pressure (suction) is not enough	<ul style="list-style-type: none"> 1) Hose connection or hose may be broken; You should change the hose. Ther reason aslo can be from clamping parts, You should change it.
I) If some resistances are not working	<ul style="list-style-type: none"> 1) Maybe electrical cables are loosen or resistance/resistances breakdown.Check the cable connection of resistance or change with a new one.
J) Heat rate reading error	<ul style="list-style-type: none"> 1) Heat sensor do not give any data or it give negative heat rate. May be loosen electric cables or sensor has suffered damage. First of all check the cables connection. Tigten the cables. If sensor is broken. Please contact with our company for new sensor.

13.1 REPLACING QUARTZ HEATERS

For replacing a burned quartz heater first be sure there is no energy connected to take out the screw on iron part(L) and cable connection bolt thus you can put out the quartz heater and you can replace with new one. While replacing new one; first of all connect the cable afterwards you should put into place iron part.





Betriebsanleitung
 Operating Instructions
 Kullanım kılavuzu
 Instructions de service
 Istruzioni d'uso
 Handleiding
 Instrucciones para el manejo
 Manual de instruções
 Naudojimosi instrukcija
 Kasutusjuhend
 Lietošanas instrukcija
 Οδηγίες χρήσης

Driftsinstruks
 Driftsinstruktioner
 Käyttöohje
 Driftsvejledning
 Instrukcja obsługi
 Kezelési útmutató
 Návod k obsluze
 Navodilo za uporabo
 Návod na obsluhu
 El Kitabı
 Инструкция по эксплуатации

U 4.100

2006/42/EG



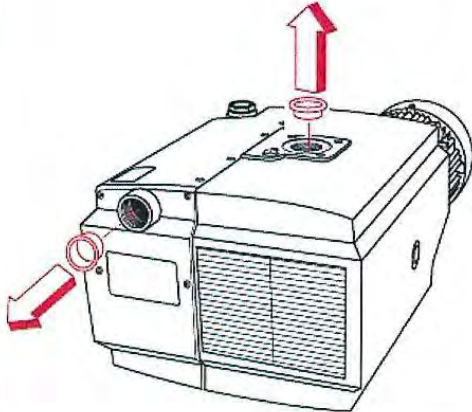
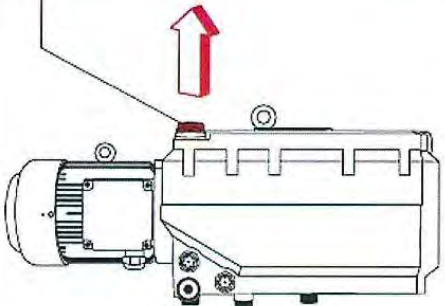
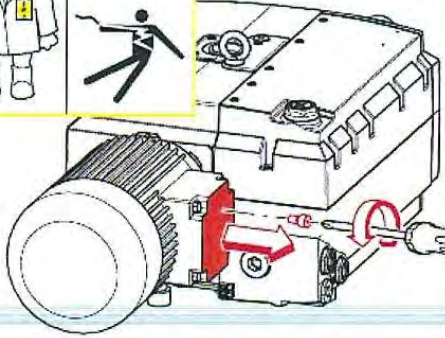
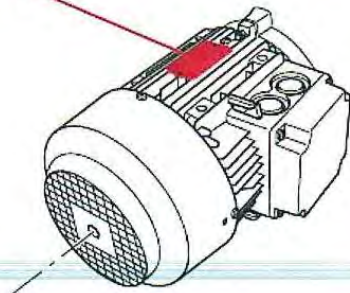
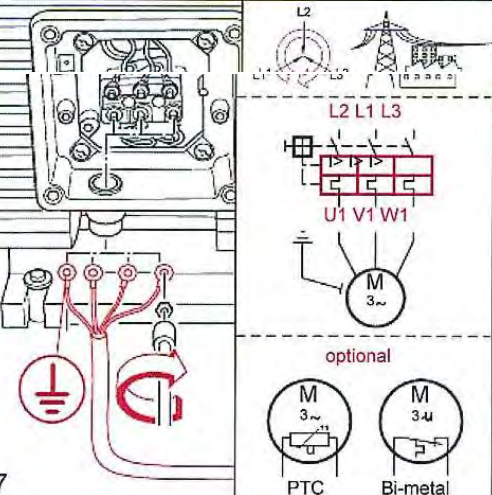
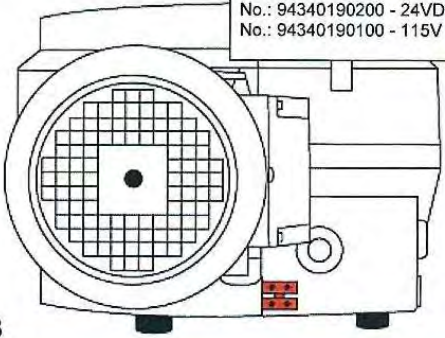
取扱説明書
 사용설명서



使用说明书




	Becker Lube M/S/SL 100 2,0 Liter		MAX. VACUUM	
				MAX.
AIR HAVA			DIN EN ISO 3744	$L_{pA} = 67,5 \text{ dB(A)} - 50\text{Hz}$ $L_{pA} = 69 \text{ dB(A)} - 60\text{Hz}$ $K_{pA} = 3 \text{ dB(A)}$

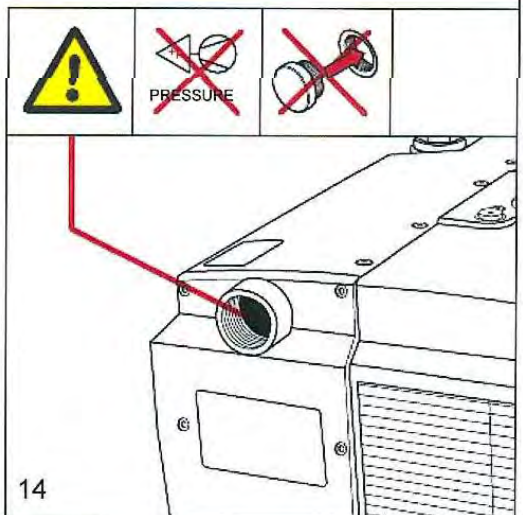
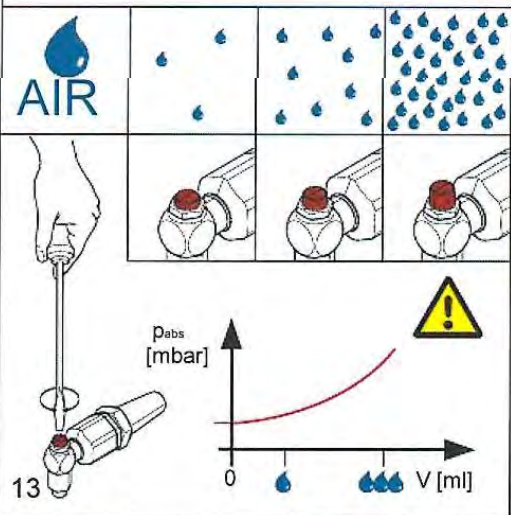
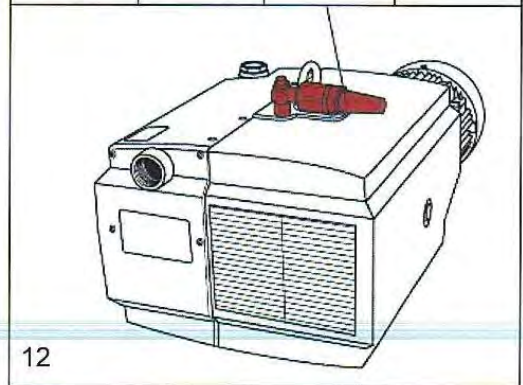
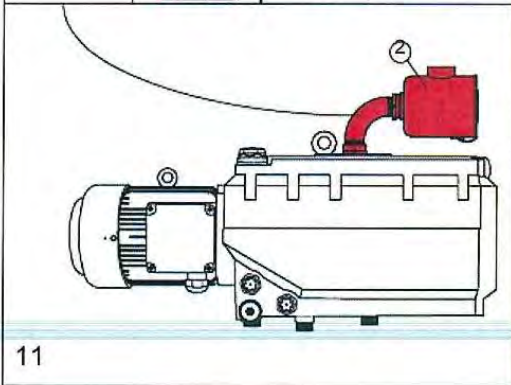
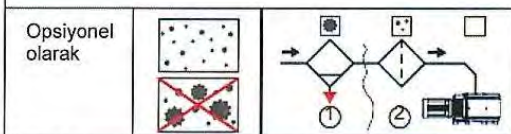
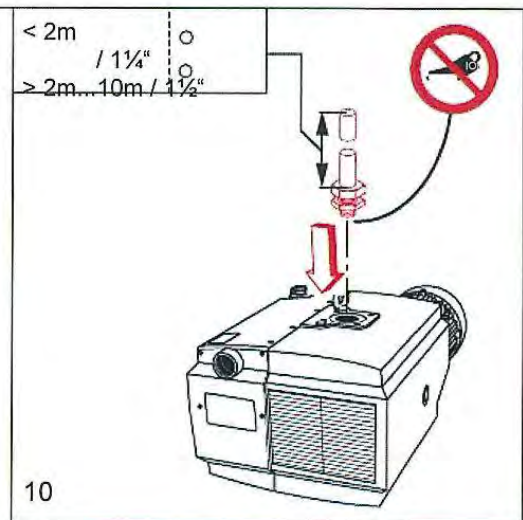
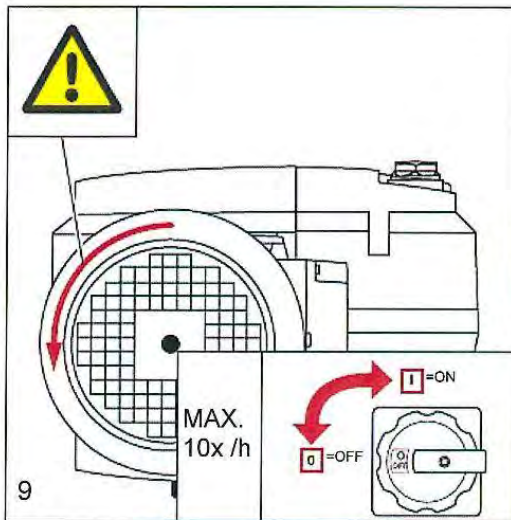
67,5 kg 148,8 lbs		$A > 100\text{mm}$ $A > 4'' - 5'' - 4,1''$	$< 40^\circ\text{C}/104^\circ\text{F}$	max. 90%	max. 800m

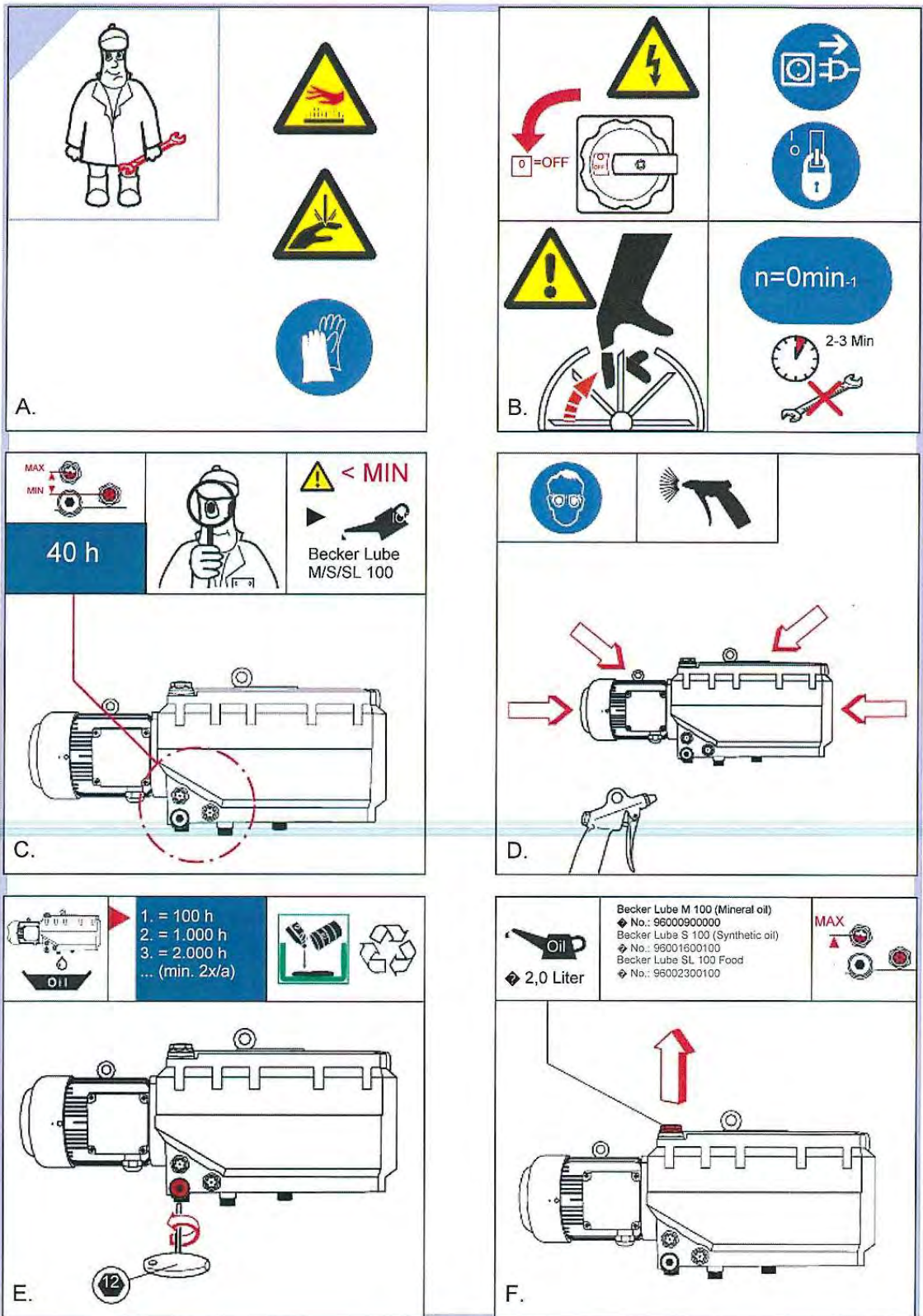
 <p>2,0 Liter</p>	<p>Becker Lube 100 lük veya muhteviyatı yağ kullanılmalıdır Yağ doldurma yeri üst tipada belirtildiği Şekildedir. Yağ tahliyesi alt tarafta yanda belirtildiği Şekilde yapılmaktadır.</p>	<p>MAX</p> 	 <p>4</p>
 <p>3</p>	 <p>5</p>	 <p>6</p>	
 <p>7</p>	 <p>8</p>		



BECKER		Mat. Nr. XXXXXX	ENXXXX	CE
NAUD XXXXXX		3 faz. XXXXXXXX	XX	
50 Hz	XXXV	XXXkW	60 Hz	XXXkW
XXX-XXXV / XXX-XXXV	V Δ / Y	XXX-XXX / XXX-XXX	XXX-XXXV / XXX-XXXV	V Δ / Y
XXX-XXX A		XXX-XXX A	XXX-XXX A	
cos φ XXX-XXX		cos φ XXX-XXX		
XXX-XXX mm		XXX-XXX mm		
				XX kg





40 - 200 h **AIR ?**

G.

1000 h

H.

2000 h

I.

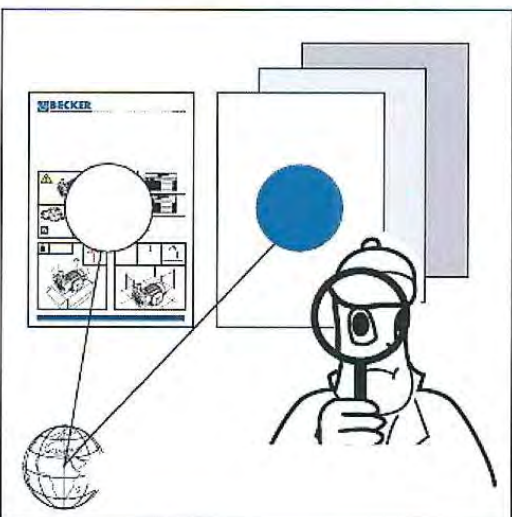
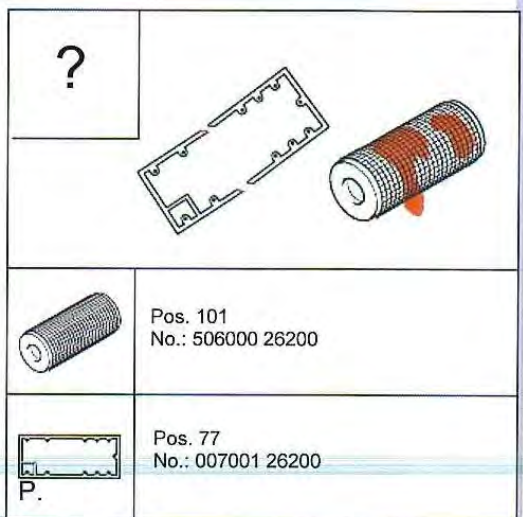
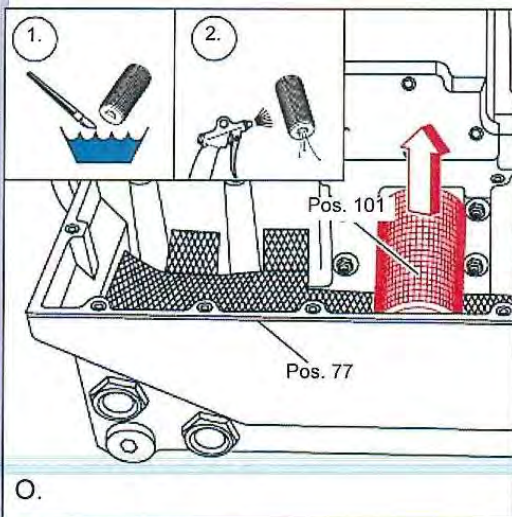
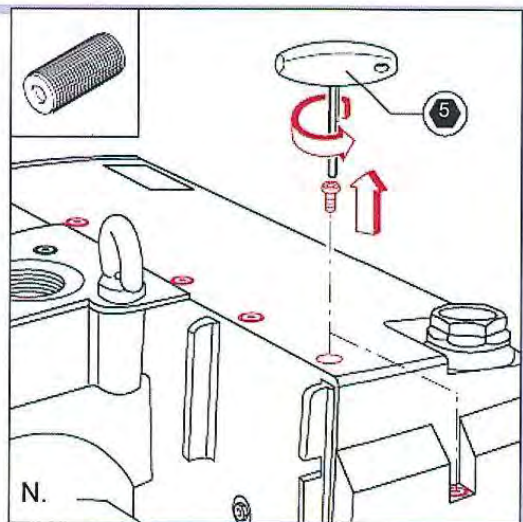
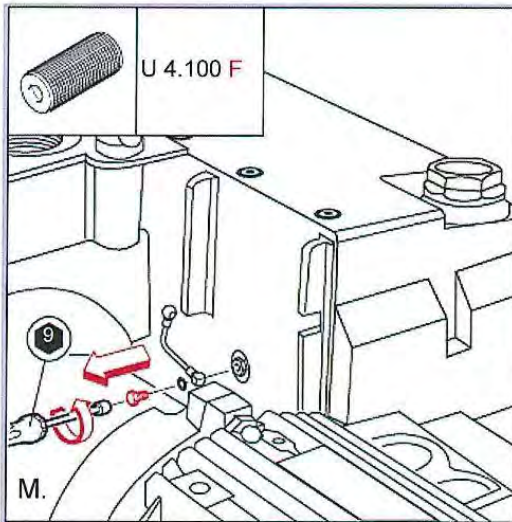
J.

Pos. 83
No.: 96541600000

K.

5000 h

L.



BECKER

Gebr. Becker GmbH
Hölker Feld 29-31
D-42279 Wuppertal

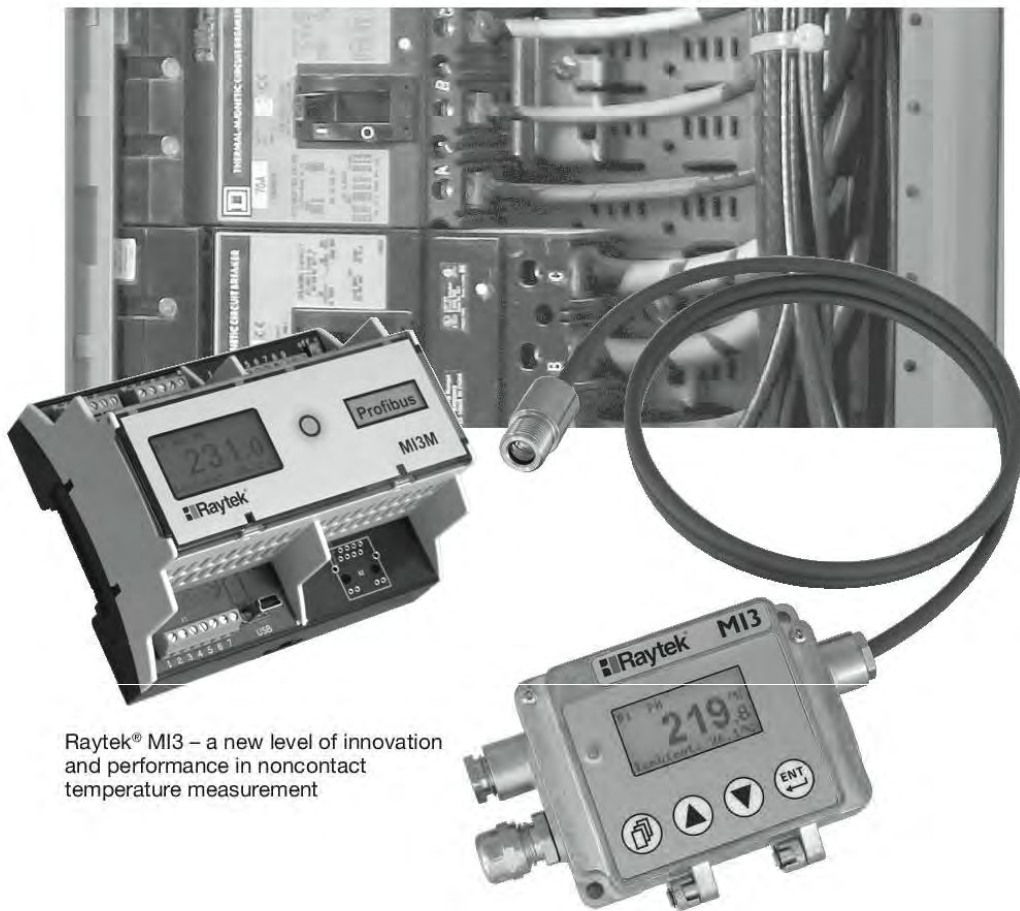
info@becker-international.com

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Tel: +49 (0)202 697-171
Fax: +49 (0)202 64 44 74

MI3



Noncontact Temperature Measurement for Industrial Applications and OEMs



Raytek® MI3 – a new level of innovation and performance in noncontact temperature measurement



Raytek®
A Fluke Company

MI3 Highlights

- Optional network communications interfaces RS485, Modbus®, Profibus, Ethernet and Profinet analog all outputs with galvanic isolation (Analog DIN 6TE variant only):
 - from power supply
 - from channel to channel
- Innovative multi-sensor design—up to 8 sensing heads/ system, each individually addressable
- Fast response times of < 20 mSec
- Rugged IP65 rated sensing heads survive ambient temperatures to 120°C (248°F) without cooling
- Intuitive user interface with high resolution LCD display for easy set-up
- Precision high resolution optics, up to 22:1
- User configurable analog outputs (0/4-20mA, 0-5/10V, type J, K, R or S t/c)
- Standard USB 2.0 digital interface for remote set-up
- Miniature sensing head fits where other sensors can't
- Isolated solid state alarm relay output
- Adjustable Emissivity, Peak Hold, Valley Hold and Averaging functions
- Datatemp® Multi-drop and field calibration software included
- Full range of accessories
- Automatic sensing head detection—plug and play
- Built in HTTP-Server and 64 MB data logger for communication boxes with Ethernet variant

The Raytek® MI3 is a powerful two-piece infrared temperature measurement system with miniature sensing head and separate communications electronics. The sensor is small enough to be installed just about anywhere, yet it outperforms much larger systems. Available in either a rugged cast metal electronics enclosure, an innovative multi-channel DIN mountable enclosure, or low cost OEM configurations, the MI3 offers a host of advanced signal processing features you won't normally find in sensors costing much more.

Designed for an endless range of applications, the MI3 features a variety of sensing head options. Low temperature sensors with a measurement range of -40°C to 1000°C (-40°F to 1832°F), fast response (<20 mSec) sensors, provide an impressive array of solutions for your process needs. The rugged stainless steel sensing head ensures reliable long term performance in the harshest industrial environments. Although the MI3 sensor is small in size, it has all the performance you need—with 1% accuracy, a choice of high resolution optics up to 22:1 and user configurable I/O.

Standard features include adjustable Emissivity, Peak Hold, Valley Hold, and Averaging functions. All sensor parameters are easily adjustable on the built-in user interface keypad, or remotely with the Windows® 7 compatible DataTemp software via the built-in USB interface.

Advanced features further extend the power of the MI3 and include user configurable alarm output, digital "recipe" table inputs that can be easily interfaced to an external control system, an external reset input for signal processing, and external inputs for analog emissivity adjustment or reflected energy compensation. Optional RS485, Modbus®, Profibus or Analog output network interfaces simplify intergration with a factory or machine control system.

The MI3's miniature size and low cost per measurement point make it ideal for installation at multiple points in your process. The MI3 is accurate, rugged, affordable, easy-to-install and operate. With the MI3, precision infrared temperature measurement is now an economical alternative.

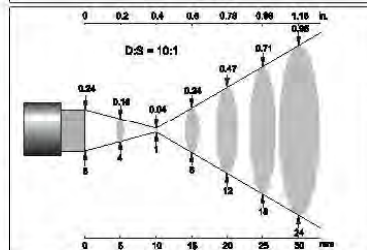
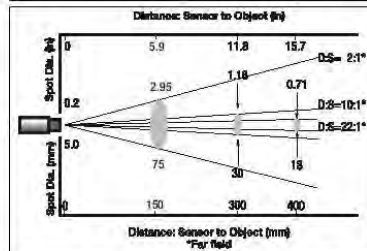
Raytek MI3 – a new level of innovation and performance in noncontact temperature measurement!

Specifications

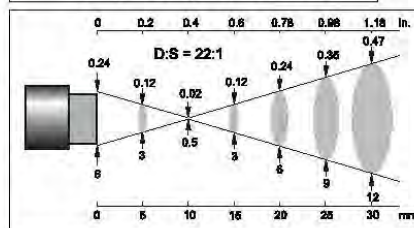
Spectral Response:	LT (Low Temp.) 8 to 14 microns		
Optical Resolution:	2:1, 10:1, 22:1	LTH	10:1, 22:1
	LTS	G5	10:1
	LTF		10:1
Temperature Range:	LTS (2:1, 10:1) -40°C to 600°C (-40°F to 1112°F)		
	LTF (LTS 22:1)	0°C to 1000°C (32°F to 1832°F)	
	LTH	-40°C to 600°C (-40°F to 1112°F)	
	G5	250°C to 1650°C (482°F to 3002°F)	
System Accuracy:	±1% of reading or ±1°C, whichever is greater Thermocouple output accuracy ±1% of reading or ±2.5°C, whichever is greater		
System Repeatability:	±0.5% of reading or ±0.5°C (1°F), whichever is greater		
Temperature Coefficient:	±0.05°K per °K, or ±0.05% per °K* Times, whichever is greater		
Temperature Resolution:	LT 0.1°C or 0.2°F*		
System Response Time:	LTS, LTH, G5 130ms (90%) LTF 20ms (90%)		
Emissivity:	0.100 to 1.100 digitally adjustable Increments of .001		
Transmission:	0.100 to 1.000 digitally adjustable Increments of .001		
Signal Processing:	Peak hold, valley hold, variable averaging filter, adjustable up to 998 seconds		

*Scaled temperature dynamic range < 500°C (< 932°F)

Nominal Optical Specifications



10:1 with Close Focus Accessory



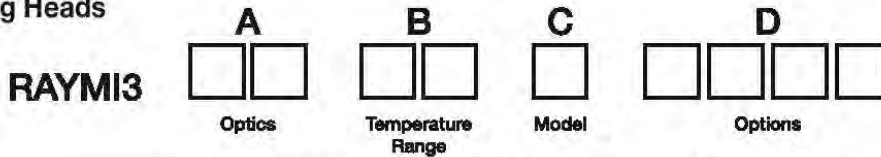
22:1 with Close Focus Accessory

D:S is the optical resolution expressed as a ratio of the distance to the measurement spot divided by the diameter of the spot.

Optical resolution for the MI3 is 2:1, 10:1, 22:1.

Nominal spot size based on 90% energy.

Sensing Heads



Each MI3 sensor system is comprised of (1) MI3 sensing head and (1) MI3COMM or MI3COMM communication module. The sensing head includes one mounting nut and 1m (3.3ft) cable. Longer cables up to 30 m (100ft) maximum are available and must be specified at time of order. The MI3 sensing head and MI3COMM box are ordered as separate items.

Model	Description
RAYMI3	Miniature Infrared sensing head with 1 meter (3.3ft) cable
Code A Optical Resolution	
02	2:1 20 22:1
10	10:1
Code B Temperature Range	
LT	-40°C to 600°C (-40°F to 1112°F) Note: 0°C to 1000°C (32°F to 1832°F) for LTF and LTS 22:1 models
G5	250°C to 1650°C (482°F to 3002°F)
Code C Model	
S	Standard sensing head, 120°C (248°F) maximum ambient
F	Fast response sensing head, 20 mSec response time, 120°C (248°F) maximum ambient (10:1 head only)
H	High ambient sensing head, up to 180°C (356°F)
Code D Options	
CB3	3m (10ft) cable CB15 15m (49ft) cable
CB8	8m (26ft) cable CB30 30m (98ft) cable

Communication Boxes

Model	Description
RAYMI3COMM	MI3 IR thermometer communication box with USB 2.0 communications, cast zinc housing and user-interface
RAYMI3COMM4	MI3 IR thermometer communication box with USB 2.0 communications and RS-485 communication option, cast zinc housing and user-interface
RAYMI3COMM4M	MI3 IR thermometer communication box with USB 2.0 communications and Modbus communication option, cast zinc housing and user-interface
RAYMI3COMM4P	MI3 IR thermometer communication box with USB 2.0 communications and Profibus communication option, cast zinc housing and user-interface
RAYMI3COMM	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and RS485 communications
RAYMI3COMM4M	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and Modbus communications
RAYMI3COMM4P	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and Profibus communications
RAYMI3COMM4N	Modular DIN mountable 4-channel IR communication box with no user interface, display or RS485 interface. Includes USB 2.0 and alarm relay, only
RAYMI3COMM4A	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and 4 galvanic isolated analog outputs
RAYMI3COMM4E	MI3 IR thermometer communication box with USB 2.0 communications and Ethernet communication and built in HTTP-Server option, cast zinc housing and user-interface
RAYMI3COMM4PN	MI3 IR thermometer communication box with USB 2.0 communications and Profinet communication, cast zinc housing and user-interface
RAYMI3COMM4ME	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and Ethernet interface with built-in HTTP-Server.
RAYMI3COMM4MPN	Modular DIN mountable 4-channel IR communication box with user interface, USB 2.0 and Profinet interface.

The Worldwide Leader in Noncontact Temperature Measurement

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Electrical Specifications MI3COMM

Digital Interface	USB 2.0 (RS485, Modbus, Profibus, Ethernet and Profinet optional)
Outputs:	Scaleable 4-20mA, 0-20mA, 0-10V, 0-5V, J, K, R or S thermocouple, 0-5V head ambient output
Inputs:	Digital inputs for emissivity control, ambient background temperature compensation, trigger/hold input
Alarm Relay:	48 VAC, 300 mA, optically isolated solid state relay
Cable Length*:	1m (3.3ft) standard, 3m (10ft), 8m (26ft), 15m (50ft) and 30m (100ft) lengths available
Output Impedance (I/C output):	20 ohms
Minimum Load Impedance (mV output):	10K ohms
Maximum Loop Impedance (mV output):	500 ohms
Power Draw:	4W max
Power Supply:	8-32VDC
Environmental Rating:	IP 65 (NEMA-4)
Electronics Housing:	-10°C to 65°C (14°F to 150°F)
Storage Temperature:	-20°C to 85°C (-4°F to 185°F)
Relative Humidity:	10 to 95%, non-condensing
Electronics Weight:	270g (9.5oz)
EMI/EMC/ESD	IEC EN61326-1 1:2006

*Maximum total cable length of 30 m (98 ft) when used with XXXMI3CONNBOX Multichannel interface box

Electrical Specifications MI3MCOMM

Sensor Head Inputs	Maximum of 4
Digital Interface	USB 2.0 and RS485 standard. (RS485, Modbus, Profibus, Ethernet and Profinet optional)
Outputs (Analog MI3MCOMM Box)	Scaleable 4-20mA, 0-20mA, 0-10V, 0-5V, J, K, R or S thermocouple, 0-5V head ambient output galvanic isolation
Inputs:	Trigger input
Alarm Relay:	48 VAC, 300 mA, optically isolated
Cable Length*:	1m (3.3ft) standard, 3m (10ft), 8m (26ft), 15m (50ft) and 30m (100ft) lengths available
Power Draw:	4W max
Power Supply:	8-32VDC
Electronics Housing:	-10°C to 65°C (14°F to 150°F)
Storage Temperature:	-20°C to 85°C (-4°F to 185°F)
Relative Humidity:	10 to 95%, non-condensing

*Maximum total cable length of 60m (197ft)

Sensing Head Specifications

Environmental Rating:	IP 65 (NEMA-4)
Head Ambient Temperature Range:	S and F models: -10°C to 120°C (14°F to 248°F)
Storage Temperature:	-20°C to 85°C (-4°F to 185°F)
Relative Humidity:	10 to 95%, non-condensing
Construction:	Sensing head: Stainless steel Comm box (MI3): Zinc, die-cast DIN Comm box (MI3M): Molded plastic Sensing head cable: PUR halogen free, flame retardant insulation, 125°C (257°F) max. temp

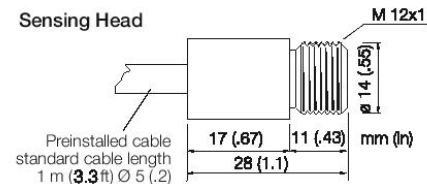
Weight:	Sensing head (w/1 m cable) 50g (1.75oz)
Shock (sensing head)	IEC 68-2-27 50g's, 11ms, 3 axis
Vibration (sensing head)	68-2-6 3g's, 10-150Hz, 3 axis
EMI/EMC/ESD	IEC EN61326-1 1:2006

Accessories

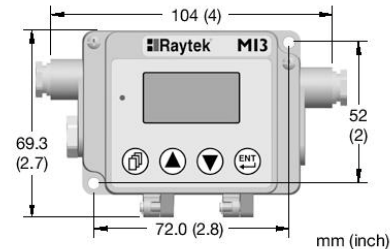
A full range of accessories for various applications and industrial environments are available. Accessories include items that may be ordered at any time and added on-site:

- (XXXSYSPS) 24 VDC, 1.2A Power supply
- (XXXMIACAB) Adjustable mounting bracket
- (XXXMIACFB) Fixed mounting bracket
- (XXXMIACMN) Sensor head mounting nut
- (XXXMIACAJ) Air purge jacket
- (XXXMIACCJ) Air cooling system with .8 m (2.6 ft) air hose or with (XXXMIACCJ1) 2.8 m (9.2 ft) air hose
- (XXXMIACRAJ, XXXMIACRAJ1) Right angle mirror
- (XXXMIACPW, XXXMI3ACPWP) Protective windows
- (XXXMI3ACCFL) Close focus lens
- (XXXMI3CONNBOX) Multi-channel sensor interface box for use with MI3COMM Box
- (XXXUSB485) USB/RS485 Adapter for boxes with RS485 interface

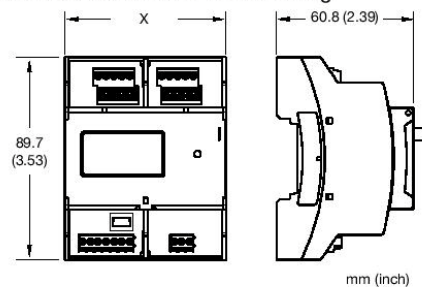
Sensor Dimensions



MI3 Electronics Housing



MI3M Multi-channel Electronics Housing



X Dimension	Models
54 mm (2.1 in)	RAYMI3MCOMM
72 mm (2.8 in)	RAYMI3COMM
108 mm (4.3 in)	All other models

Voltage pulse output(SSR)
Voltage pulse output is to control SSR unit installed in part of the unit. Generally, the capacity of relay contact is limited. If the capacity of relay is getting bigger, the life span will be shortened by value of spark.
●Set output: It is 120VAC, and it can use max. 30mA for load.
●Attention: speed of SSR is faster than relay, cause of using semiconductor.
It can proceed high speed control.
●Set "short" to "Open", it will be good condition to control the largest capacitor or semiconductor's very important. SSR is damaged, it may result in a fire.

Current output(4-20mADC)
This output, called analogue output is to control the transmitter(SSR unit). It can proceed stable control because there is no a sudden change.
●Output: 4-20mADC, manipulated value is 100% at 20mADC, 0% at 4mADC. It is used with transmitter and can not be used as the other application.
●This output operates through time, regulated as control in circuit. Therefore current output is not changed even if the resistive load is connected in outside, but if resistive load is too high(lower than 800Ω), the current can be changed. (Please use the resistive load less than 800Ω.)
●Do not use a current output in case of using ON/OFF control.
●When current output is used, it is changing as analogue form, the manipulated value can rarely be 100% or 0%.
●Therefore LBA function is not used.
●Front DUl lamp does not operate in case of using a current output.

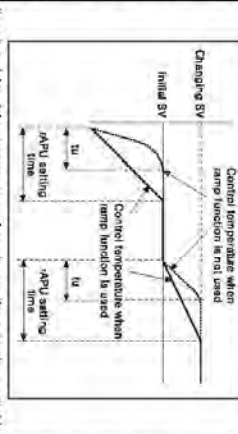
Retransmission output(4-20mADC)
Retransmission output is a direct, with current output of control output and to retentive current(4-20mADC) controlling the measuring temperature. But this current output can not use at over 800Ω resistive load.
●Mode of retransmission output is selected at FS-H, FS-L in the second loop chart.
●When PV reset at value of FS-L, it output 4mA.
●When PV reset at value of FS-H, it output 20mA.
●Set to 20mADC in design as resolution of min. 1/1,000 divisions.

RS485 communication function
It is used on the purpose that transmitting PV to an external equipment, setting SV at the external equipment.
●Set can be set at open, Addrs in second setting group, setup setting: 2500, 4800, 9600(Baud rate), Stop bit, Non parity) ●Address setting: 1 to 99 ●Compatible PLC: LG, Mitsubishi, OMRON etc.

Decimal point(Dot) setting function
Decimal point is displayed as "dot" in second setting group when the input is only analog(100V, 1-5VDC, 4-20mADC).

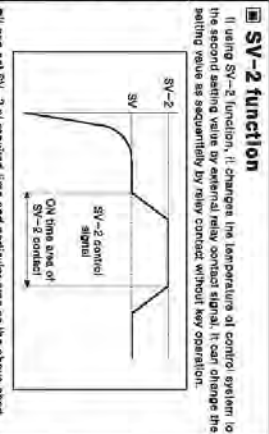
Cool/Heat function
Generally, there are two ways to control temperature, cool(heat) function is to heat when PV is getting down(heated), the other(Cool-Function) is to cool when PV is getting high(cool/heated). These functions are operating oppositely when it is ON/OFF control or proportional control.
●But in the case PID line constant will be different data to PID time constant will be decided according to control system when it is PID control.
●Cool-Function and heat-Function can be set at "P" mode in second setting group.
●Cool-Function and heat-Function must be set correctly according to the application. If set as opposite function, it may cause a fire. (If set cool-Function at heater, even if temperature is getting high, it will be maintained ON and it may cause a fire.)
●Avoid changing heat-Function to cool-Function or cool-Function to heat-Function on the unit is operating.
●It is impossible to operate both functions at once in the unit.
Therefore one function should be selected only.

Ramp function
Ramp function is to delay the rising time or falling time of temperature. If you change setting value at stable state of control, it forces rise or fall the temperature of control system during setting time at APU, AFD in first setting group. If Ramp is not ON in second setting group, APU, AFD will not be displayed in first setting group.
●Set Ramp is ON in second setting group for using Ramp function.
●Set the falling time and rising time in APU and AFD mode of first setting group.
●Ramp function will be operating when changing the set value at stable control status or supply the power again after the power was removed. ●APU function(delay of rising time)



It makes delay rising temperature when changing the set value at stable control status or supply the power again after the power was removed. When Ramp function is not used.

SV-2 function
It controls falling temperature as above. Note) AFD time cannot be shorter than falling time(td) of not being ramp function operated.
Changing SV
Initial SV
Control temperature when ramp function is used
Control temperature when ramp function is not used
AFD setting
TU
TD
TD
TD



●It can set SV-2 at required time and particular area like the above chart.
●SV-2 is in first setting group.
●Apply condition : The control system, which has to maintain constant temperature such as oven application. If you open the door, temperature will go down, in this case if you set the second setting value higher than setting value, temperature will rise fast. Therefore, after setting high-swing in order to cancel the door Open/Close and control it to SV-2, drive second setting value should be higher than SV. Then it controls temperature of oven stably.

Input correction(In-b) function
Input value is to correct deviation occurred from temperature sensor such as thermocouple, RTD, Analogue sensor etc. If you check the deviation of every from sensor precisely, it can measure temperature accurately.
●Set the mode after measuring deviation occurred from temperature sensor exactly. Because if measured deviation value is not corrected, designed temperature may be too high or too low.
●Setting range of input error is: -48 to +50(0.1 to 50.0°C)
●When you set, the input error value, you may need to record it, because it will be useful when performing maintenance.

Sub output(Event) function
Sub output can operate as main control output and sub function as well. There is one sub output in this unit.
●This sub output is relay A, contact output.
●If or 2 sub output can be selected among 7 kinds of alarm mode or LBA operated when the heater line is cut, SBA operated when the sensor ●The sub output can be latched or automatically reset depending on the alarm option menu selected.
●When the sensor line or the heater line is cut, SBA, or LBA output turns on. This output must be reset by turning the power off.
●When using Alarm output it is able to change interval between ON and OFF within range of 1 to 100(0.1 to 100.0).
●EJWHM alarm set temperature is 200°C. The output turns on at over 200°C, the output turns off at 199°C.
●(Above EJ) is that it set the interval between ON and OFF as 2(C). ●Special function of Sub output: In second setting group and set value of operation in that setting group.

Alarm output
The unit has output for control and sub(ALarm) output by option. (This alarm output is relay output and operates regardless to output for control.) ●Alarm output operates when the temperature of target is getting higher or lower than setting value.
●EJ alarm mode can be selected among 7 kinds of alarm mode at EV1. ●EJ2 in the second setting group.
●Please note below. ●Question chart for alarm output* 4. Option of Alarm output* regard to detailed operation and optional operation.

Operation chart for alarm output

RI-0	OFF	ON	ON
RI-1	OFF	ON	ON
RI-2	OFF	ON	ON
RI-3	OFF	ON	ON
RI-4	OFF	ON	ON
RI-5	OFF	ON	ON
RI-6	OFF	ON	ON

●RI-0: In alarm output
●RI-1: In operation when PV and SV is coinciding higher than deviation temperature. The deviation temperature is set in RI-1 or AL-2 of first setting group.
●RI-2: In operation when PV and SV is coinciding lower than deviation temperature. The deviation temperature is set in RI-1 or AL-2 of first setting group.
●RI-3: In operation when PV and SV is coinciding higher than deviation temperature. The output is set in RI-1 or AL-2 of first setting group.
●RI-4: In operation when PV and SV is coinciding lower than deviation temperature. The output is set in RI-1 or AL-2 of first setting group.
●RI-5: In operation when PV and SV is coinciding higher than deviation temperature. The output is set in RI-1 or AL-2 of first setting group.
●RI-6: In operation when PV and SV is coinciding lower than deviation temperature. The output is set in RI-1 or AL-2 of first setting group.

Alarm option setting

Symbol	Operation name	Function
RI-R	General alarm	No external alarm output.
RI-b	Learn function	When alarm output turns on once, the output will be ON continuously.
RI-C	Standby sequency function	It doesn't output at first operation. (When it resumes to first object value.)
RI-d	Latch & Standby sequency function	It operates latch & Standby sequency function together.

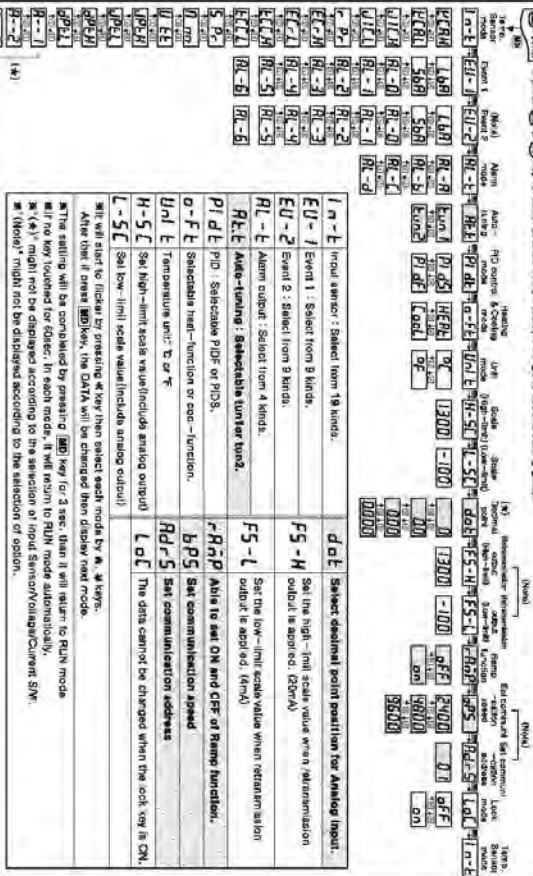
Loop break alarm(LBA)
LBA function is to diagnose an abnormal temperature of the control system. If the temperature of the control system is not changed within ±2°C during setting time of LBA, the LBA output will be ON.
●(When setting value(SV) is 30(0°C), processing value(PV) is 50°C, this unit can operate 100% in this time.)
●LBA output can be set at EV-1, EV-2 of the second setting group.
●LBA output is not selected at event output, it will not be displayed.
●Setting range of LBA output is 1 to 999sec.
●If internal response of the control system is slow, LBA value should be set to a high value.
●LBA output only operates when the manipulated value of the controller is 0% and 100% so, LBA cannot be used when it is current output.
●In case the LBA output is ON, please check the following :
①Sensor - circuit or cutting of the sensor, sensor.
②Abnormal condition of the equipment(Conductor, sub-relay, etc.)
③Abnormal wiring at cutting of the other cables.
④Wrong wiring at cutting of the other cables.
●When LBA is ON due to broken sensor, it will not output.
●Although connect sensor again.
●In this case, turn off the power then turn on again.
●The output of LBA function is EV-1 and EV-2 output.
●If you use LBA function, SBA and alarm operation function cannot be used.

Sensor break alarm(SBA)
This function causes the sub output to turn on when the sensor line is cut or open.
●It can easily check that the sensor line is cut or not by operating a buzzer using the relay control.
●SBA mode is EV-1 or EV-2 mode in second setting group.
●If you want to use SBA function, LBA and alarm operation function cannot be used.
●The output of SBA function is EV-1 and EV-2 output.

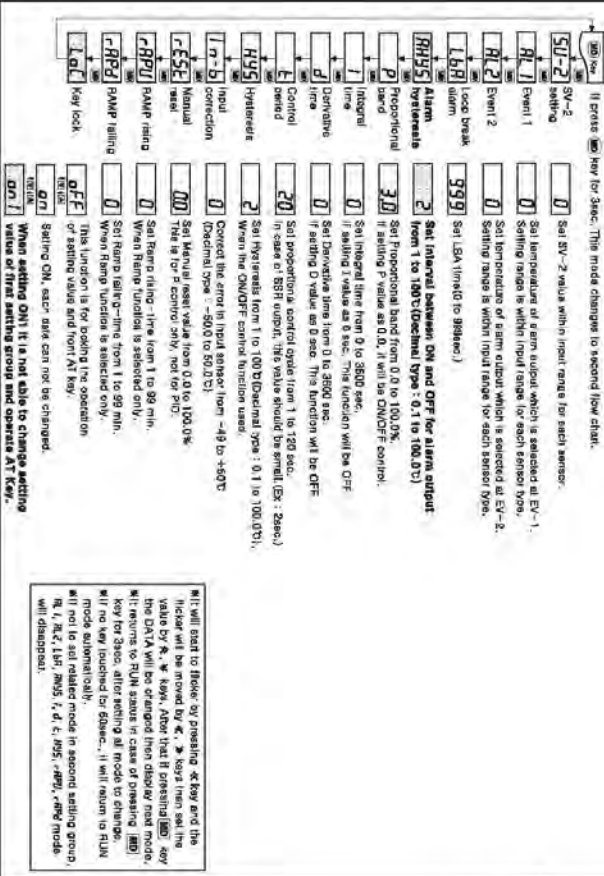
Error display
If error is occurred while the controller is operating, it will be displayed as follow.
●"LL" is flickering when measured final temperature is lower than input range of the sensor.
●"HHK" is flickering when measured input temperature is higher than input range of the sensor.
●"OE" is flickering when the input sensor is not connected or its wire is cut.

●"2" in interval between ON and OFF the setting menu is 1 to 100(0.1 to 100.0°C) and can be set at "msec" mode to first setting group.

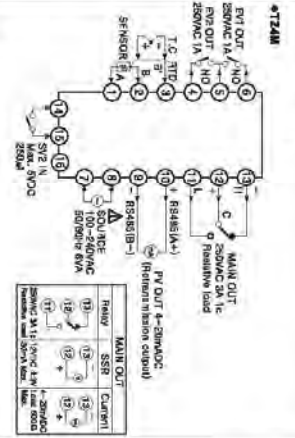
Flow chart for second setting group



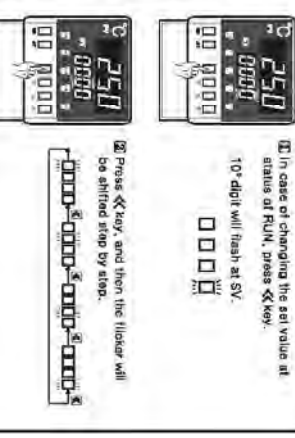
Flow chart for first setting group



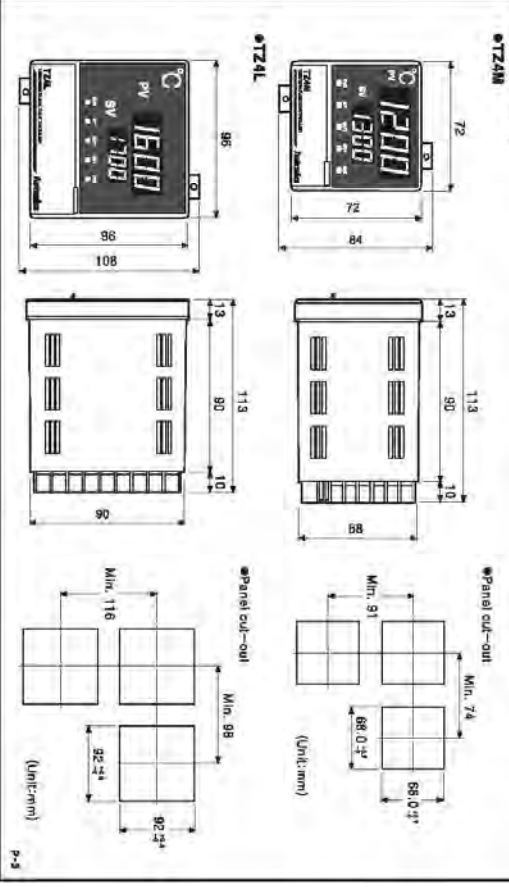
Connections



How to change the set value



Dimensions



Factory defaults

① Second setting group.

Mode	Set value	Mode	Set value
Ln-F	LcRH	PI de	PI dS
EU-1	RL-1	a-FL	HERF
EU-2	RL-2	UnLE	qC
RL-E	RL-R	H-5C	1300
RLt	Lun1	L-5C	-100
rRnP	off	LoC	off

② First setting group

Mode	Set value	Mode	Set value
SU-2	0	L	20
RL1	10	HY5	2
RL2	10	ln-b	0
LBR	600	r-ESC	00
RHS	2	r-RPU	10
P	3.0	r-RPD	10
I	0	LoC	off
d	0		

Applications

Food	Plastic	Incliny	Textiled
Packaging machinery, Branding machinery	Plastic machinery, Film making system, etc.	Electric furnace, Auto soldering machine, Drying machine, etc.	Body press, String machine

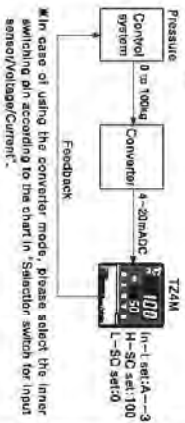
Analog Input

In case of measuring or controlling humidity & pressure, flux, etc. it uses the process control which is converting the measuring value to 4-20mADC or 1-5VDC or 0-10VDC.



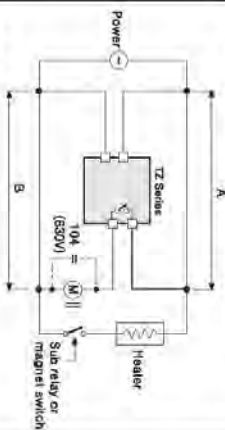
- ① The unit has the mode for the converter built-in. (4-20mADC) in selection mode of input in second setting group. Set the input value by H-SC and L-SC mode.
- ② The other operation function after doing that is same as controlling the temperature.

Applications



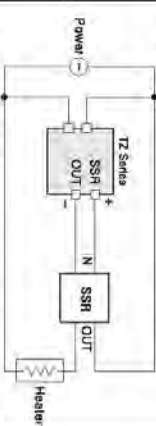
Min. case of using the converter mode, please select the inner switching pin according to the chart in "Selector switch for input sensor/Voltage/Current".

Application of relay output type



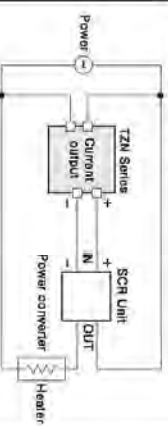
- ① Caution for wiring.
- Keep power relay as far away as possible from TZ series. If which part of A or B part is short, electromagnetic force flow in power line of the unit, it may cause malfunction.
 - If wires length of A or B part is short, please connect a condenser 10kΩ(E60V) across coil of the power relay to protect electromagnetic force.

Application of SSR output type



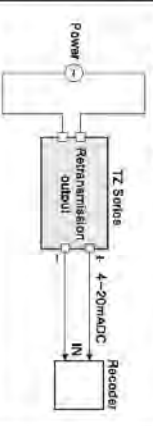
- ① Caution for using SSR
- SSR should be selected by the capacity of load, otherwise, it may short-circuit and result in a fire.
 - Indirect heated should be used with SSR for efficient working.

Application of current output (4 to 20mADC)

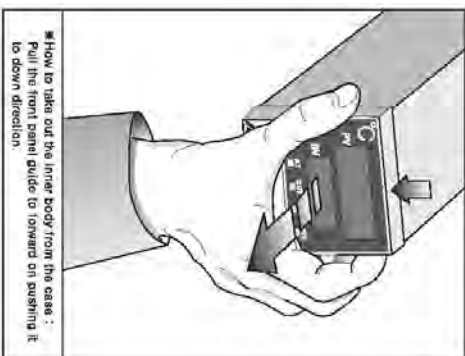


- ① It is important to select SCR unit after checking the capacity of the load.
② If the capacity is exceeded, it may cause a fire.

Application of Retransmission output (4 to 20mADC)



Case detachment



How to take out the inner body from the case: Pull the front panel guide to forward or pushing it to down direction.

Simple "error" diagnosis

- When it displays "Open" during operation. This is a warning that external sensor is cut off. Please turn off power and check the state of sensor. If sensor is not cut off, disconnected sensor line from terminal block and +, - together. When you turn on power it can check room temperature. If the unit cannot indicate room temperature, this unit itself is faulty. Please remove this unit from equipment and service or replace. (When input mode is sensor input mode(thermocouple) only, it can indicate room temperature.)
- In case of not operating the output(the heater). Please check operation of the Out lamp located in front panel of the unit. If lamp does not operate, please check the parameter of all programmed mode. If lamp is operating, please check the output(wire), operating voltage for SSR, current output after separating output line from the unit.
- In case of indicating "Er-D" in display. This Error message is indicated in case of damaging inner chip program data by outer strong noise. In this case, please send the unit to our after service center after removing the unit from system. Noise protection is designed in this unit, but it does not stand up strong noise continuously. If bigger noise than specified(Max. 2kV) flows in the unit, it can be damaged.

Caution for using

- Installation environment
 - It shall be used indoors.
 - Altitude Max. 2000m.
 - Pollution Degree 2
- Installation Category I.
 - Please use the terminal(M3.5, Max. 7.2mm) when connect the AC power source.



- Please use separated line from high voltage line or power line in order to avoid inductive noise.
- Please install power switch or circuit-breaker in order to cut power supply off.
- The switch or circuit-breaker should be installed near by users.
- Do not use this product as Volt-meter or Amper-meter, this is a temperature controller.
- Be sure to use compensating wire when extending wire from controller to thermocouple, otherwise a temperature deviation will occur at the point where wires are connected to each other.
- In case of using RTD sensor, 3-wires type must be used. If you need to extend the line, 3-wires must be used with the same resistance as the line. It might cause the deviation of temperature if the resistance of line is different.
- In case of making power line and input signal line close, line filter for noise protection should be installed at power line and input signal line should be shielded.
- Keep away from the high frequency instrument. (High frequency welding machine & sewing machine, big capacitive SCR controller)

- If you want to change the input sensor, reset switches (SW1, SW2) according to each input specification after power off. Turn on power and then set sensor mode by front keys at second flow chart.
- In case of changing input sensor, after change it according to SW1, SW2 inside of the unit, select changed sensor with key operation when power on.
- Do not connect power line to terminals of TZ4M No. 1, 2, 3, 4, 5, 6(Terminal No. 1, 2, 3: Sensor connection, Terminal No. 4, 5: EV-1, EV-2) and TZ4L No. 1, 2, 3, 6, 7, 8(Terminal No. 1, 2, 3: Sensor connection, Terminal No. 6, 7, 8: EY1, EY2)

It may cause malfunction if above instructions are not followed.

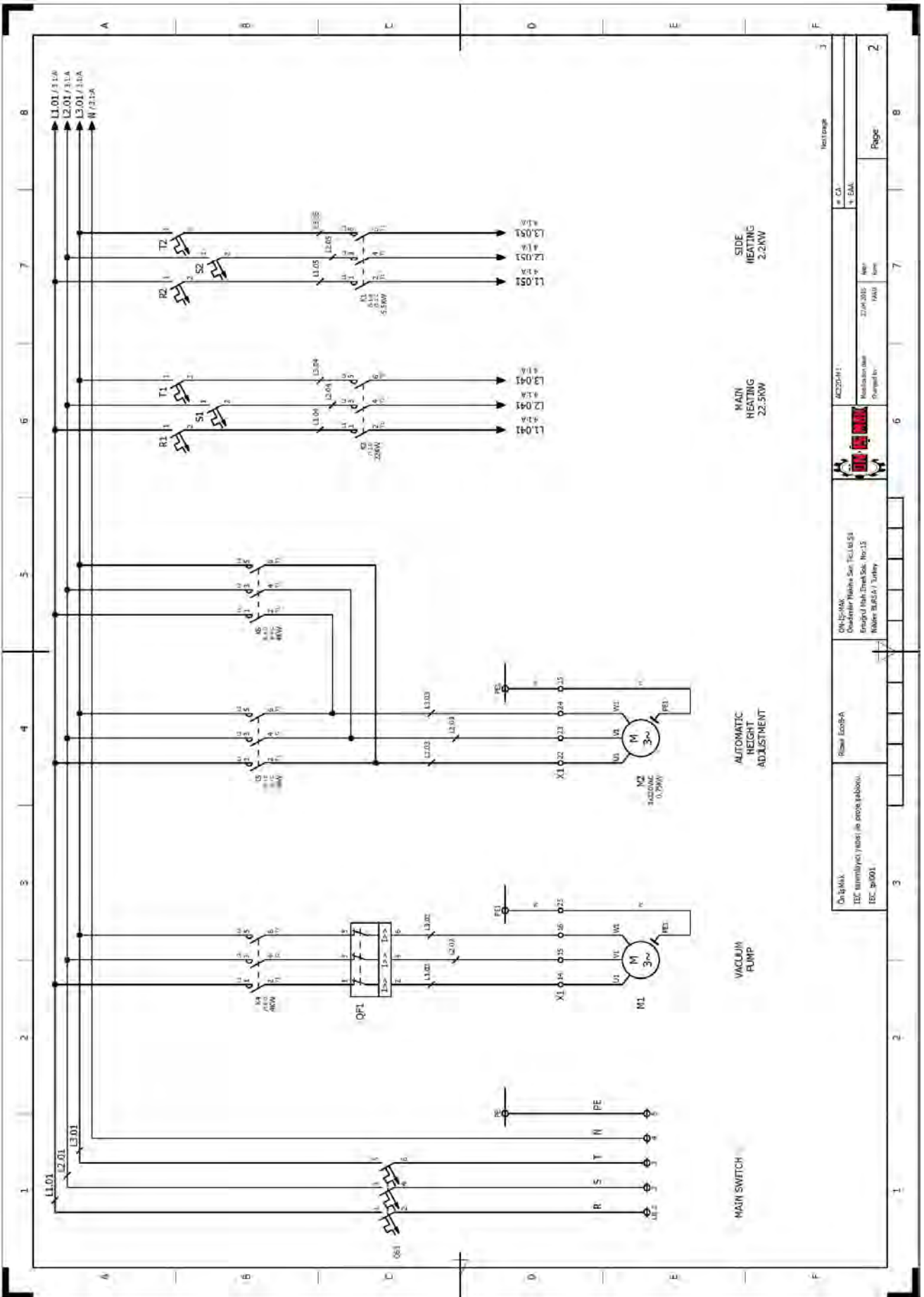
Main Products

- ① TZ4M, TZ4L, TZ4M/2, TZ4L/2
② TZ4M/3, TZ4L/3, TZ4M/4, TZ4L/4
③ TZ4M/5, TZ4L/5, TZ4M/6, TZ4L/6
④ TZ4M/7, TZ4L/7, TZ4M/8, TZ4L/8
⑤ TZ4M/9, TZ4L/9, TZ4M/10, TZ4L/10
⑥ TZ4M/11, TZ4L/11, TZ4M/12, TZ4L/12
⑦ TZ4M/13, TZ4L/13, TZ4M/14, TZ4L/14
⑧ TZ4M/15, TZ4L/15, TZ4M/16, TZ4L/16
⑨ TZ4M/17, TZ4L/17, TZ4M/18, TZ4L/18
⑩ TZ4M/19, TZ4L/19, TZ4M/20, TZ4L/20
⑪ TZ4M/21, TZ4L/21, TZ4M/22, TZ4L/22
⑫ TZ4M/23, TZ4L/23, TZ4M/24, TZ4L/24
⑬ TZ4M/25, TZ4L/25, TZ4M/26, TZ4L/26
⑭ TZ4M/27, TZ4L/27, TZ4M/28, TZ4L/28
⑮ TZ4M/29, TZ4L/29, TZ4M/30, TZ4L/30

Model Name: TZ4M/3, TZ4L/3, TZ4M/4, TZ4L/4, TZ4M/5, TZ4L/5, TZ4M/6, TZ4L/6, TZ4M/7, TZ4L/7, TZ4M/8, TZ4L/8, TZ4M/9, TZ4L/9, TZ4M/10, TZ4L/10, TZ4M/11, TZ4L/11, TZ4M/12, TZ4L/12, TZ4M/13, TZ4L/13, TZ4M/14, TZ4L/14, TZ4M/15, TZ4L/15, TZ4M/16, TZ4L/16, TZ4M/17, TZ4L/17, TZ4M/18, TZ4L/18, TZ4M/19, TZ4L/19, TZ4M/20, TZ4L/20, TZ4M/21, TZ4L/21, TZ4M/22, TZ4L/22, TZ4M/23, TZ4L/23, TZ4M/24, TZ4L/24, TZ4M/25, TZ4L/25, TZ4M/26, TZ4L/26, TZ4M/27, TZ4L/27, TZ4M/28, TZ4L/28, TZ4M/29, TZ4L/29, TZ4M/30, TZ4L/30

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ON-12-14K
Ondenerler Pnöline San. T.C.ULUSI
Emirgölü Halk. Dışk. Sk. No:15
Mikiler BURSA / Turkey

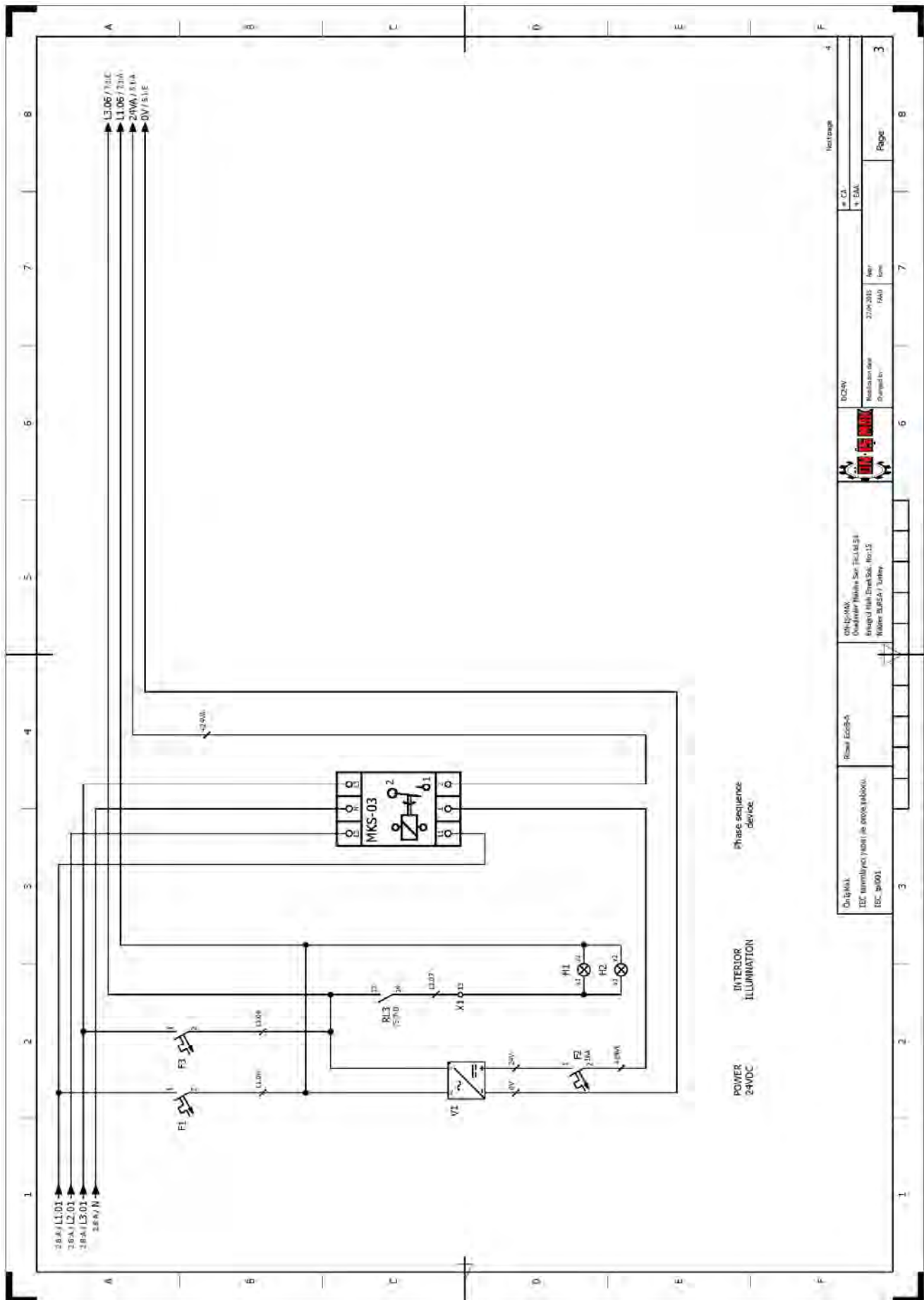
Reber Ecob-A

On 8/Max.
IEC 60336-1 (yeni) de göre tabanlı.
IEC 60001

VACUUM PUMP

AUTOMATIC HEIGHT ADJUSTMENT

MAIN HEATING 22.5kW
SIDE HEATING 2.2kW

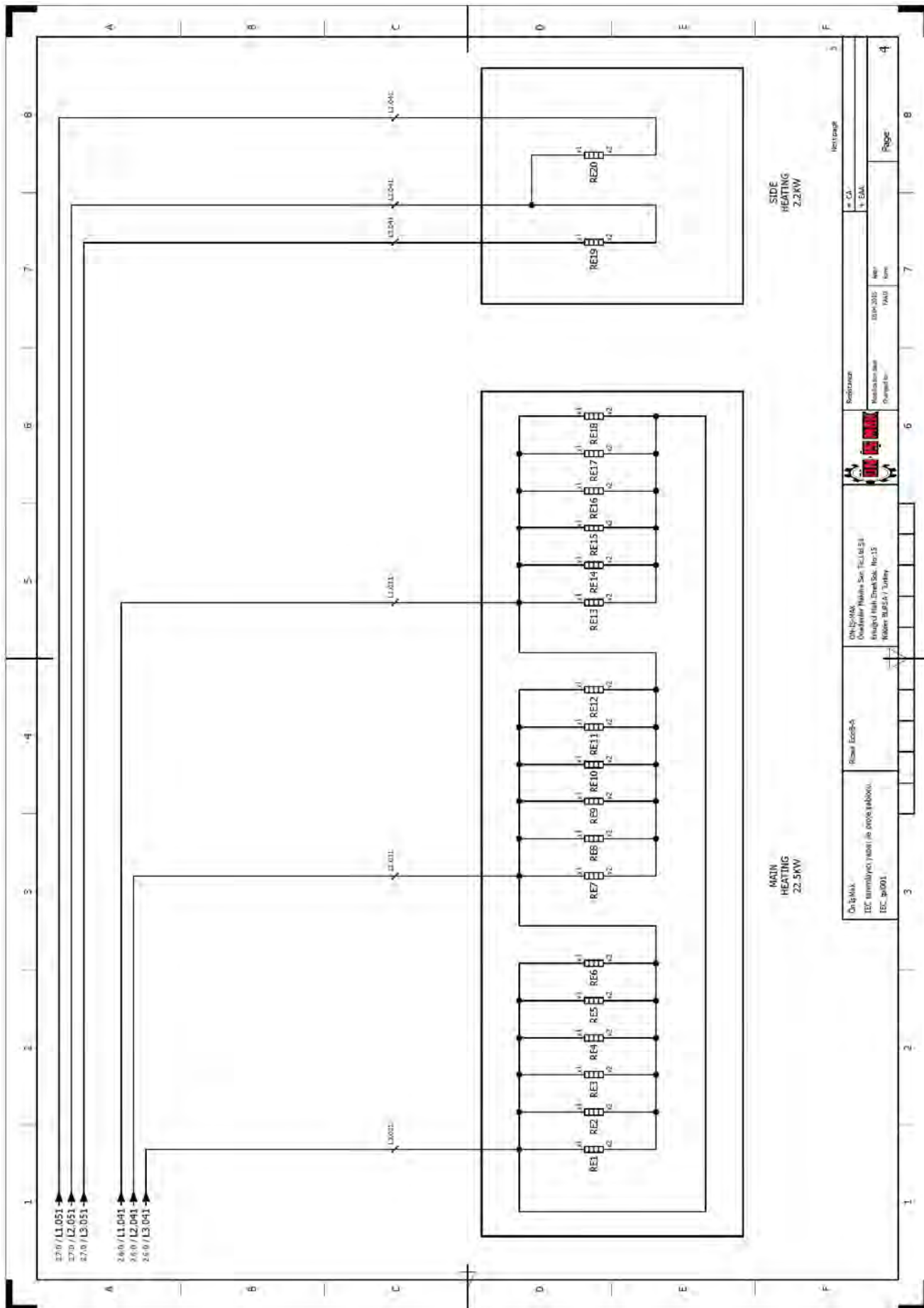


POWER 24VDC

INTERIOR ILLUMINATION

Phase sequence device

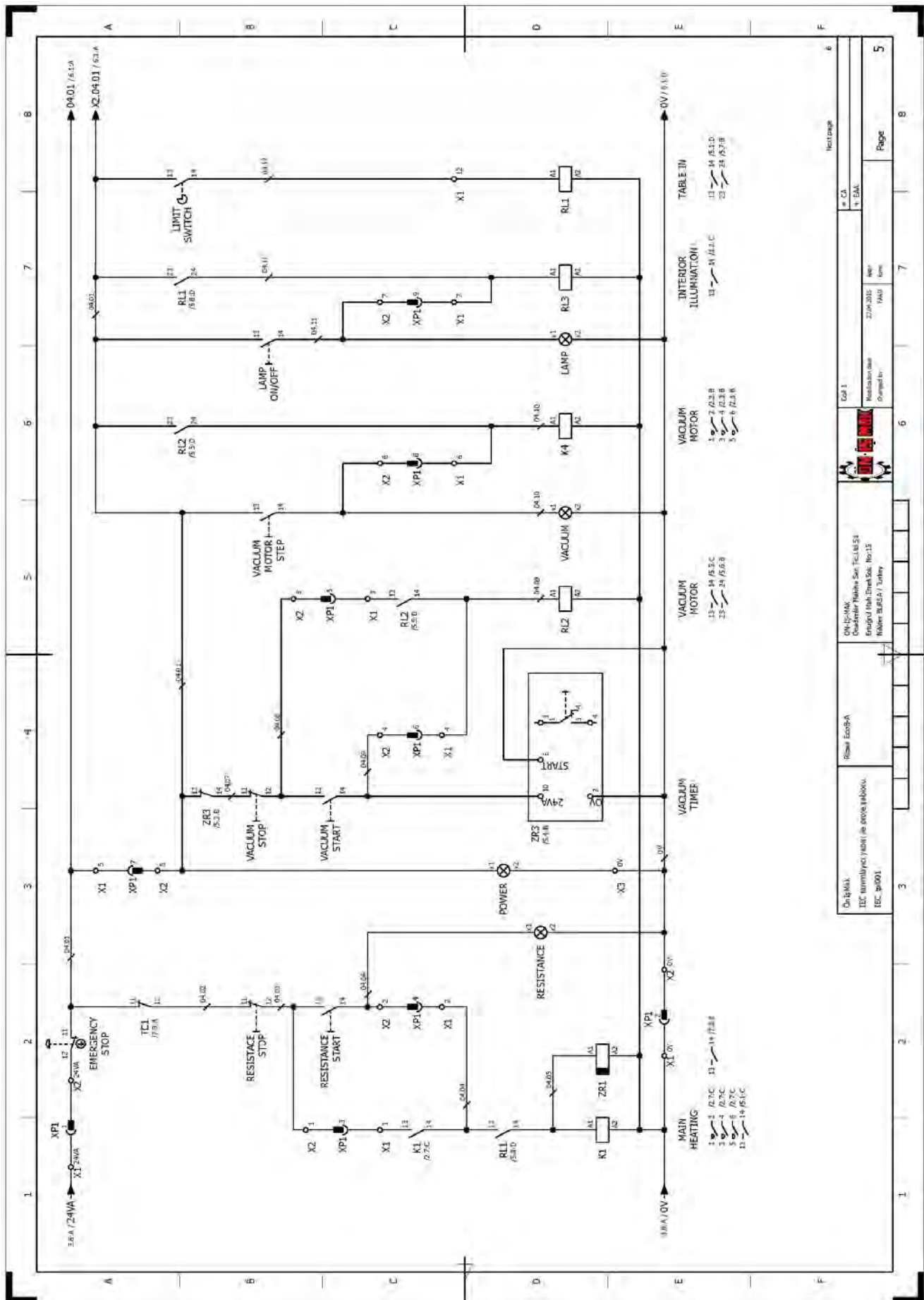
On 8/2013 IEC (interim) (part) in 2008 (partial) IEC 60001	Reviz Ecob-A	09/15/2013 Ozdemir Bilgin Sarı (ECLA) ESH Enayol Hakkı Dursun (Rev.15) Yıldırım BURGA / Turkey	DÜZEN Modülasyon tarihi Çizimci	27.09.2013 FAD Noy	# CA # EAM	Microcharge
3	8	7	6	5	4	3



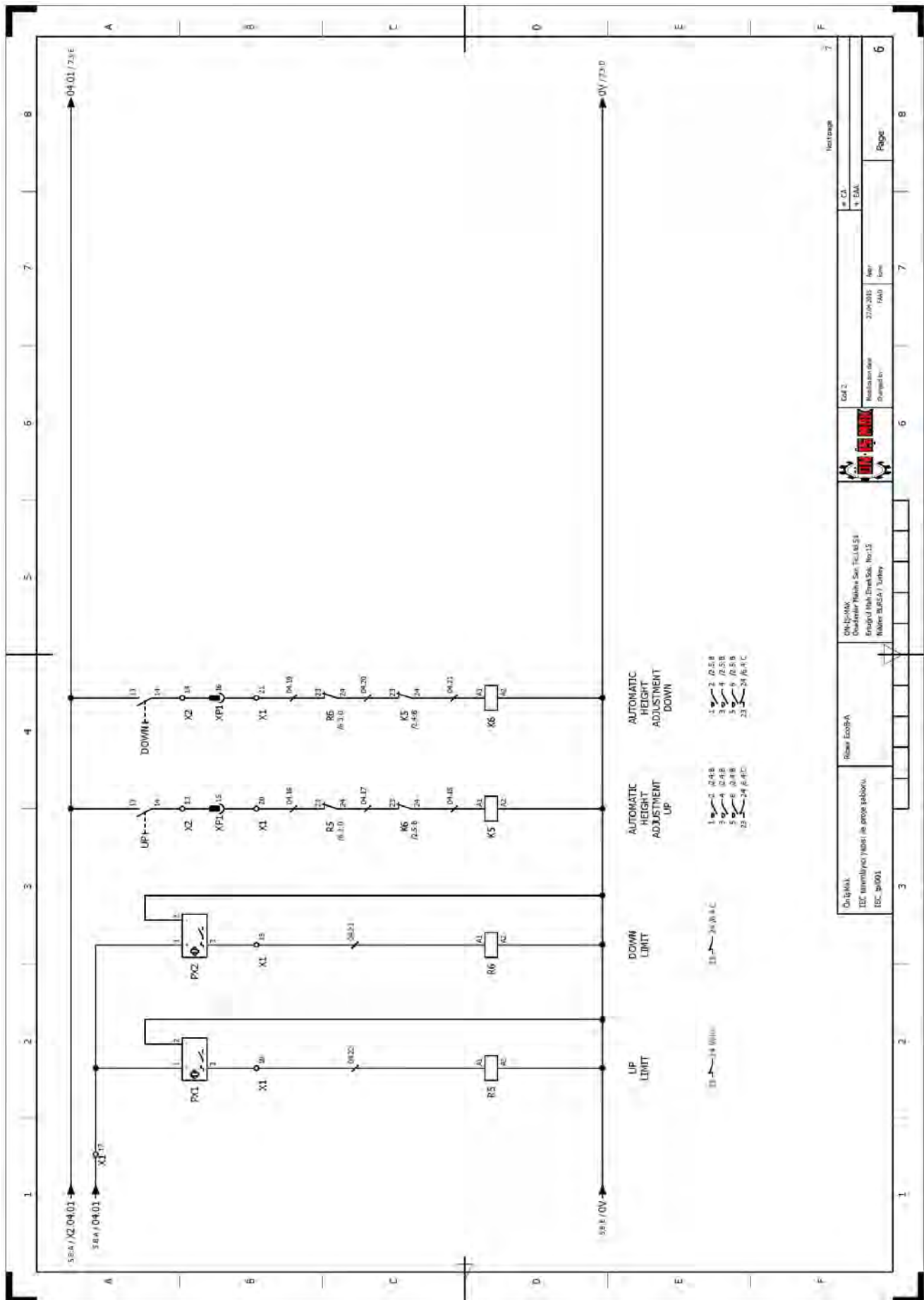
MAIN HEATING
22.5KW

SIDE HEATING
2.2KW

On 3xMax IEC (armalı) (max) 0.6/1.0kV REE 3x0.001	Reol Ecob-A	ON 12-MAX Overlander Plakası San. T.C.ULUŞI Erişimci Hızlı Dışık. No:15 MİLLER BURSA / TÜRKİYE	ResiDüzen Modülasyon Çıktıları	# CA # E.A.



On 8/Max. IEC 60364-4-41 (IEC 60364-41:2017) IEC 60364-4-41:2017	Röhm Ecoba	ON-12-MAX Düsenlötlampe Serie TCU-1251 Erzeuger Hilti Drähteknik, No.15 Wibler BURSA / Turkey	Logo 1	27.04.2015 PAAD Form	27.04.2015 PAAD Form	# CA # BAA	Page 5
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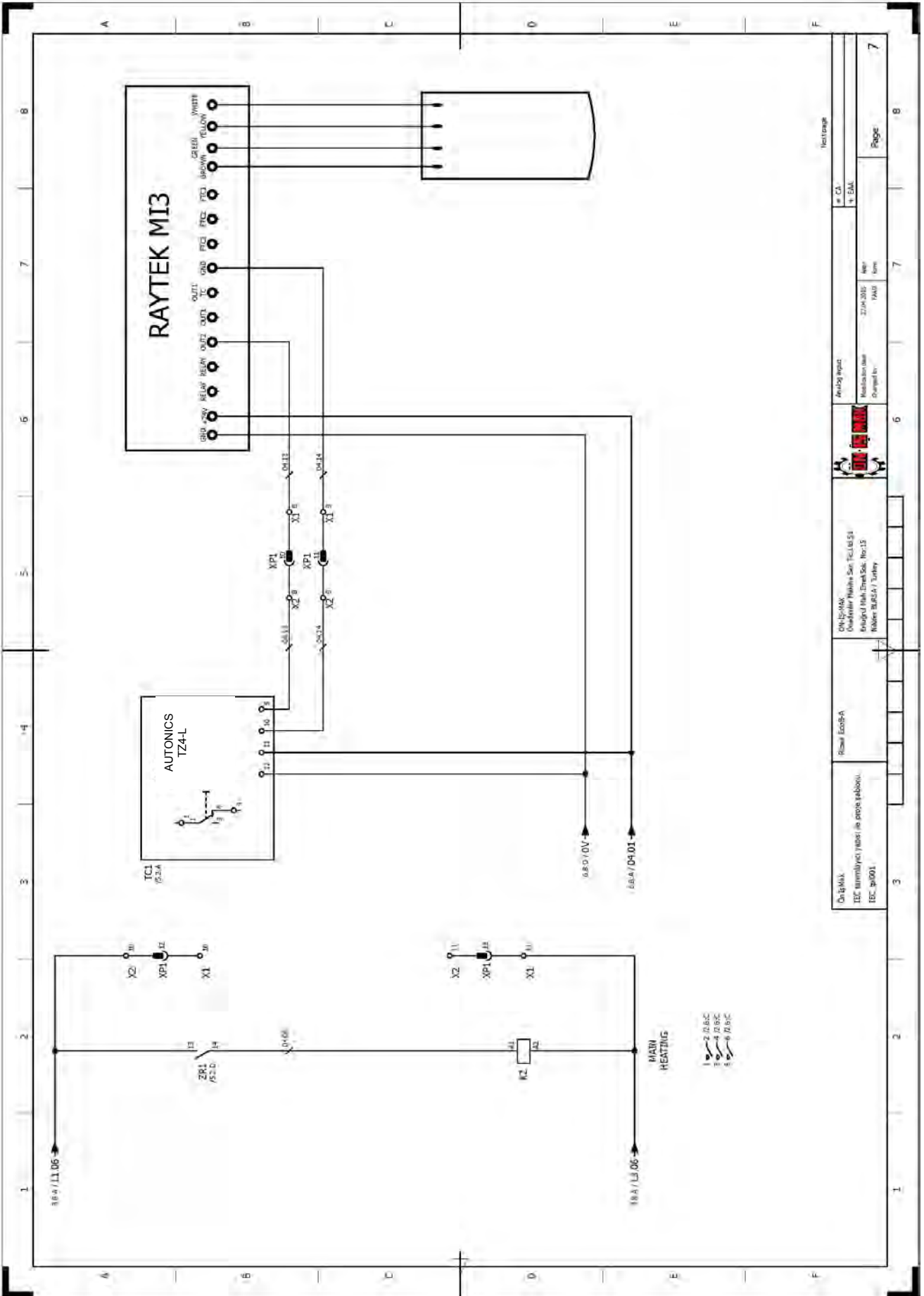
On 8/Max. IEC 1000V/1000V IEC 1000V	Row Ec08-A	ON-15-14K Ouederler Makine San. T.C.ULUSI Emuğul Hınlı Dış.Ş. No:15 MİLLER BURSA / Turkey		Kod 2 Modülasyon Çizim No: 27.04.2015 FİYAT Form	# CA # BMA	İnceleme Page: 6
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- AUTOMATIC HEIGHT ADJUSTMENT UP
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

- AUTOMATIC HEIGHT ADJUSTMENT DOWN
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

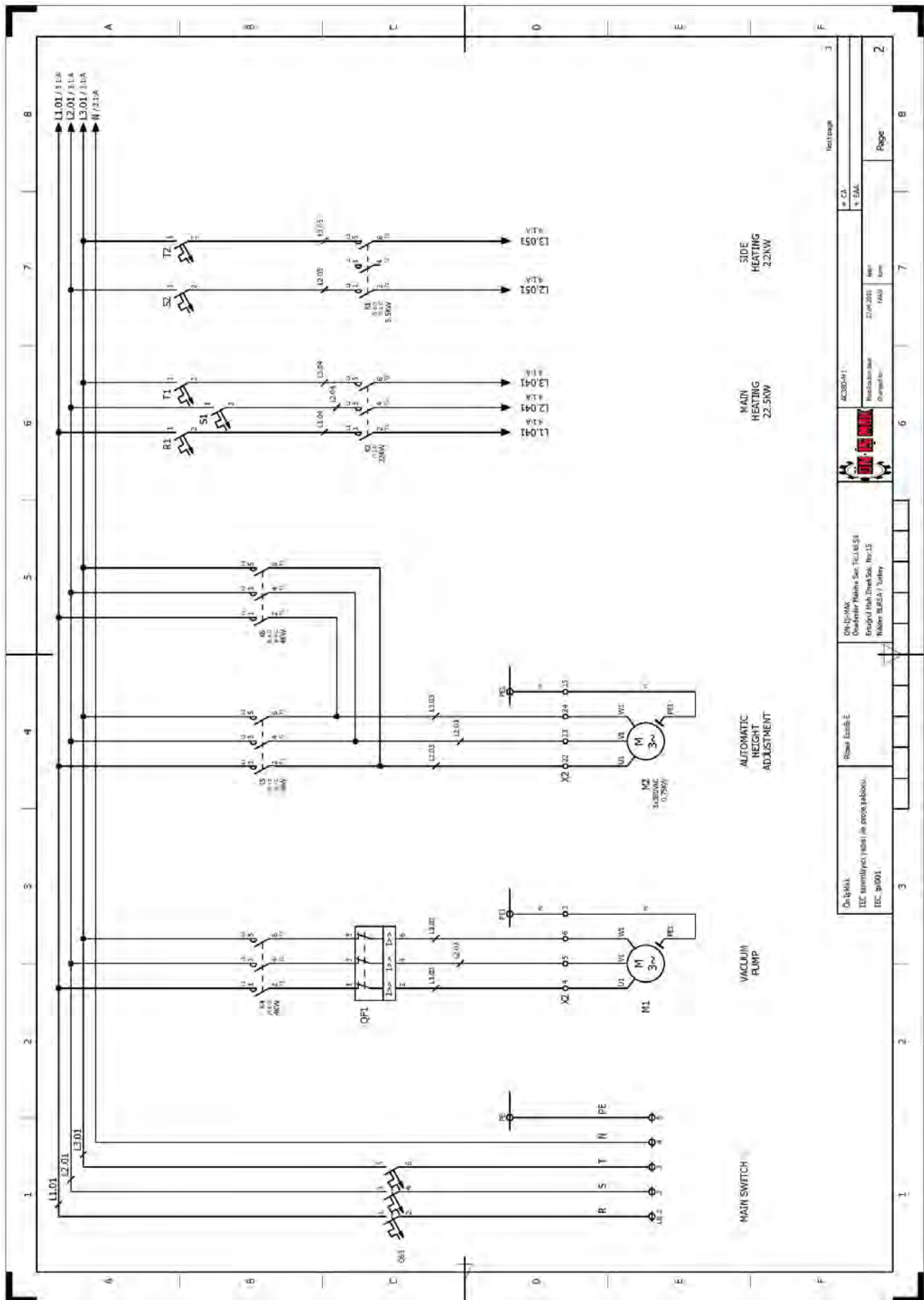
- UP LIMIT
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

- DOWN LIMIT
- 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



On 8.8.2015. IEC terminasyonu yapıldı ve prova yapıldı. IEC: 90001	Revizyon: 03.08.2015	ON 15-16K Ondokuz Mayıs San. T.C. ULUSI Enüyük Hıv. Dırek. Sk. No: 15 Nıkkıler BURSA / Turkey	Analıg ıngızt Mıshının ısmı Dıngımlı ıfı	27.04.2015 No: 7 FAAD	4. CA 4. EAA	7
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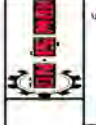
İnceleme



Scale	1:1
Project No.	27.04.2015
Client	FAAD
Page	2

CA
BAA

ACB0411
Modifications Made
Checked by
Drawn by



ON-12-14K
Onduliner Plakası San. T.C.ULUSİ
Enerji İnşaat Dış. No:15
Müh. BURELA / Turkey

Revizyonlar
Revizyonlar

On 15.04.2015
IEC (International) (Yeni) ve diğer standartlar
IEC 60001

Heating

SIDE HEATING
22.5KW

MAIN HEATING
22.5KW

AUTOMATIC HEIGHT ADJUSTMENT

VACUUM PUMP

MAIN SWITCH

8

7

6

5

4

3

2

1

A

B

C

D

E

F

R

S

T

N

PE

L1.01

L2.01

L3.01

N / 2:1-A

L1.05

L2.05

L3.05

L1.04

L2.04

L1.04

L2.03

L2.04

L1.04

L2.03

L2.04

L1.04

L2.03

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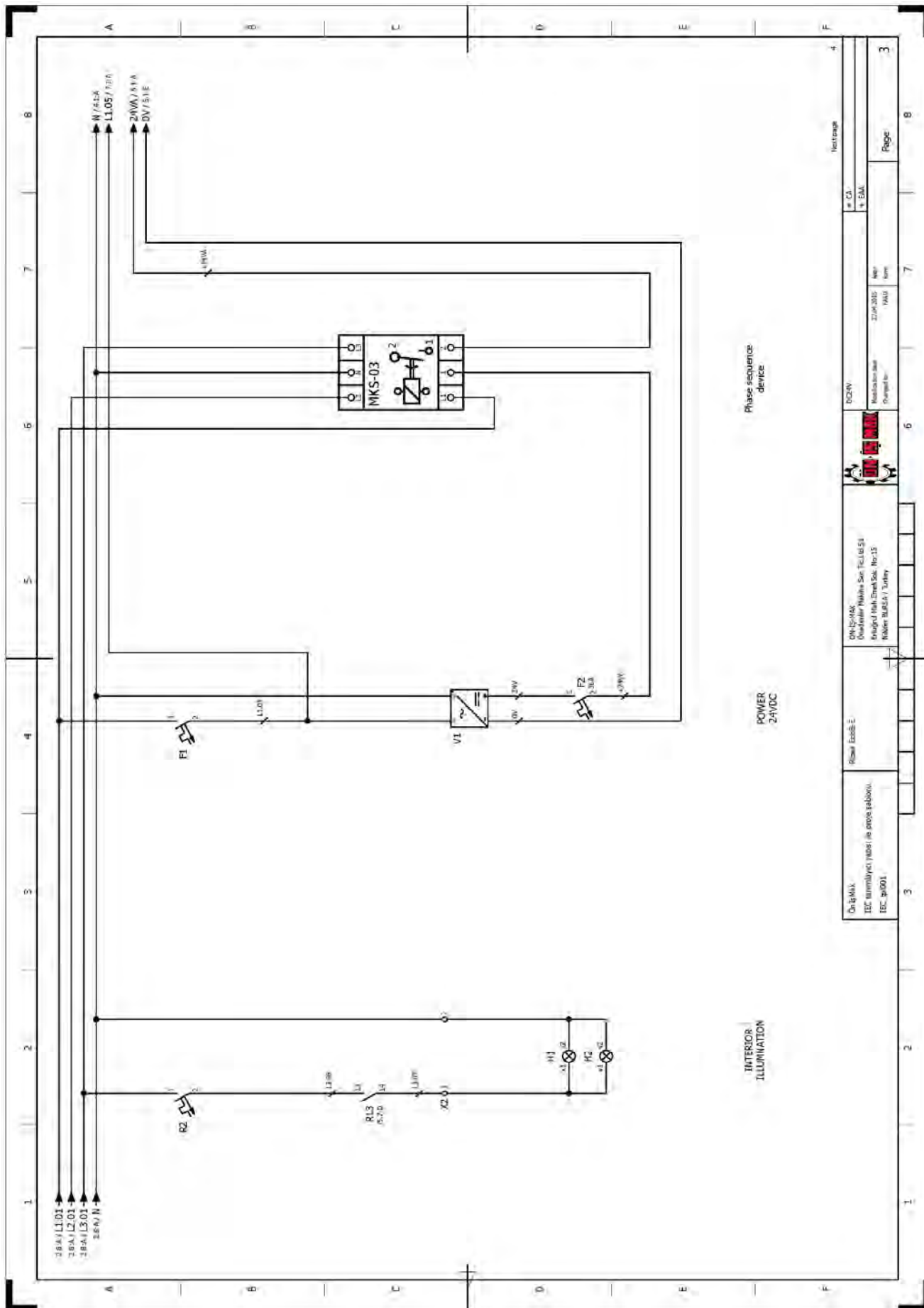
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L1.04

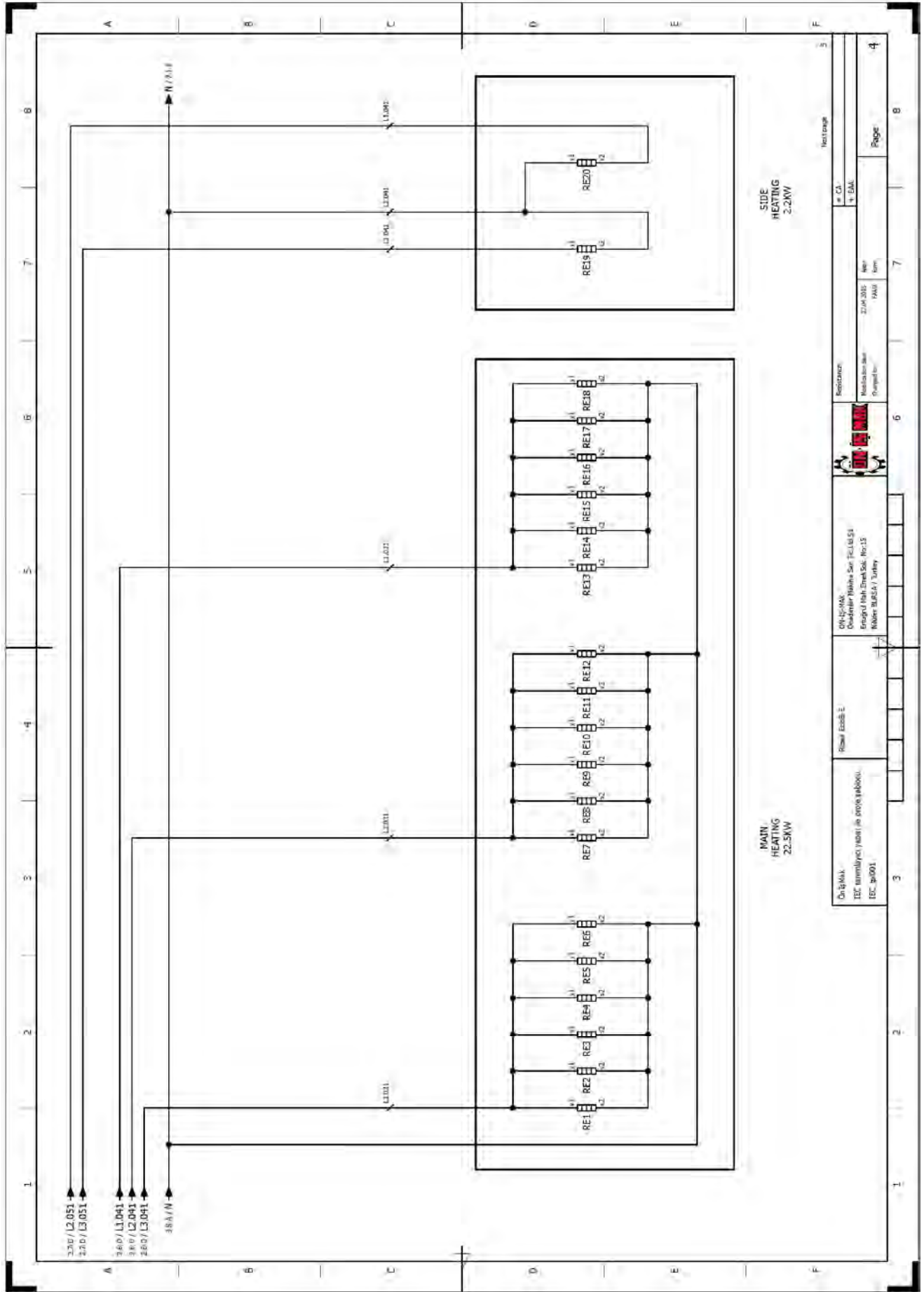
L2.03

L2.04

L1.04



On 18/06/2015 IEC 11mm (1/2") yataşlı şeritler için IEC 90001	Reklam Eki: B, E	ON-15-MAR Dönerlikler Fakültesi Elektrik Bölümü Elektrik Enerji Sistemleri Teknikliği Öğrencisi Rabia BURCU / Turkey		DÖZÜM No: 27/04/2015 Tarih: 27/04/2015 Durum: Tamamlandı Proje No: 27/04/2015	No: 3 Sayfa: 3
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MAIN HEATING
22.5KW

SIDE HEATING
2.2KW

On 5/15/2015
IEC (International Electrotechnical Commission) 60364-4-41
IEC 60364-4-41

Revizyonlar

ON-15-14K
Düzenleme Birimi SSK-14051
Emniyetli Hava Dışı SSK-14015
Mükemmel BURSA / Turkey



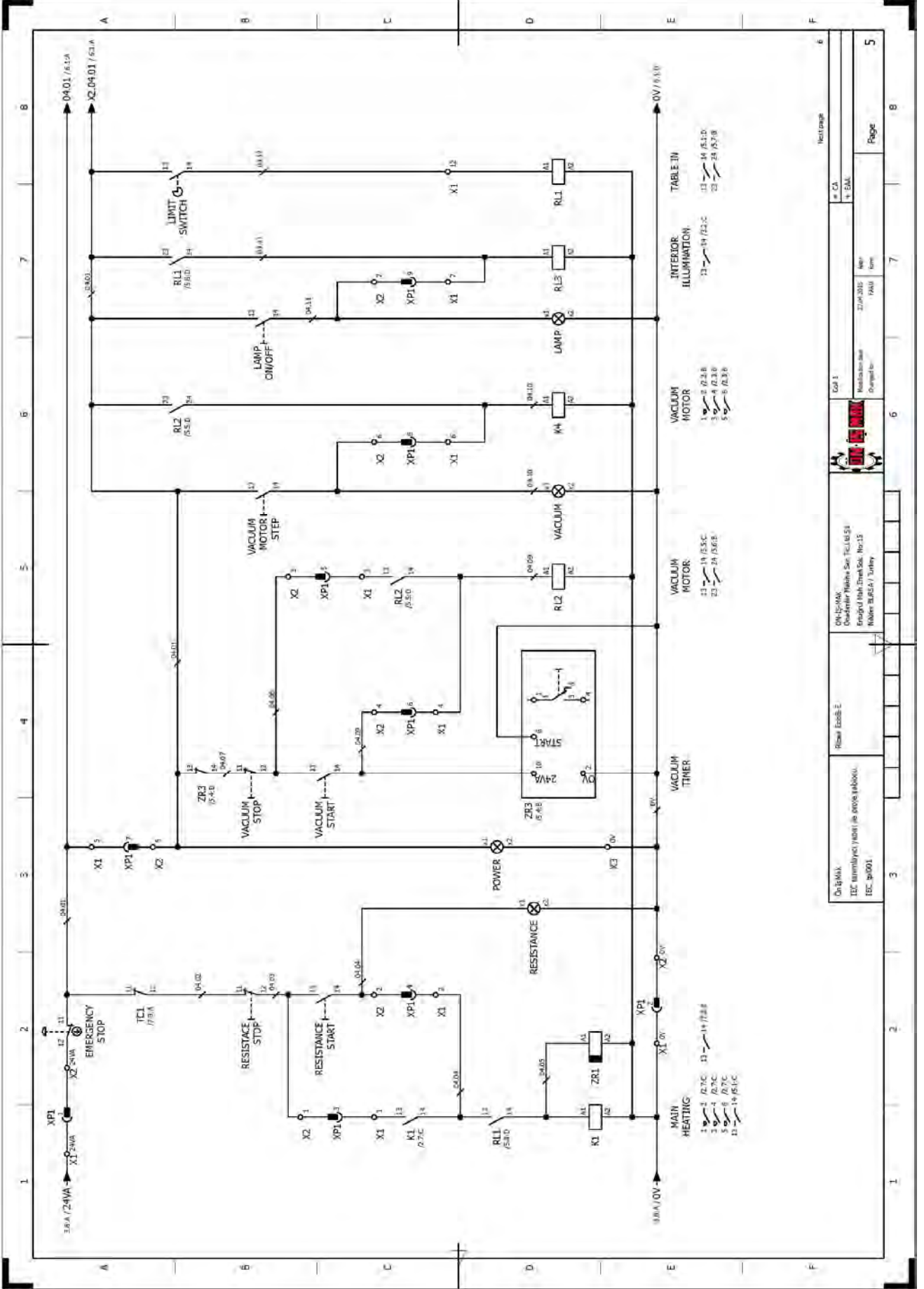
Revizyonlar
Mühürleme Tarihi
Çizimci İsmi

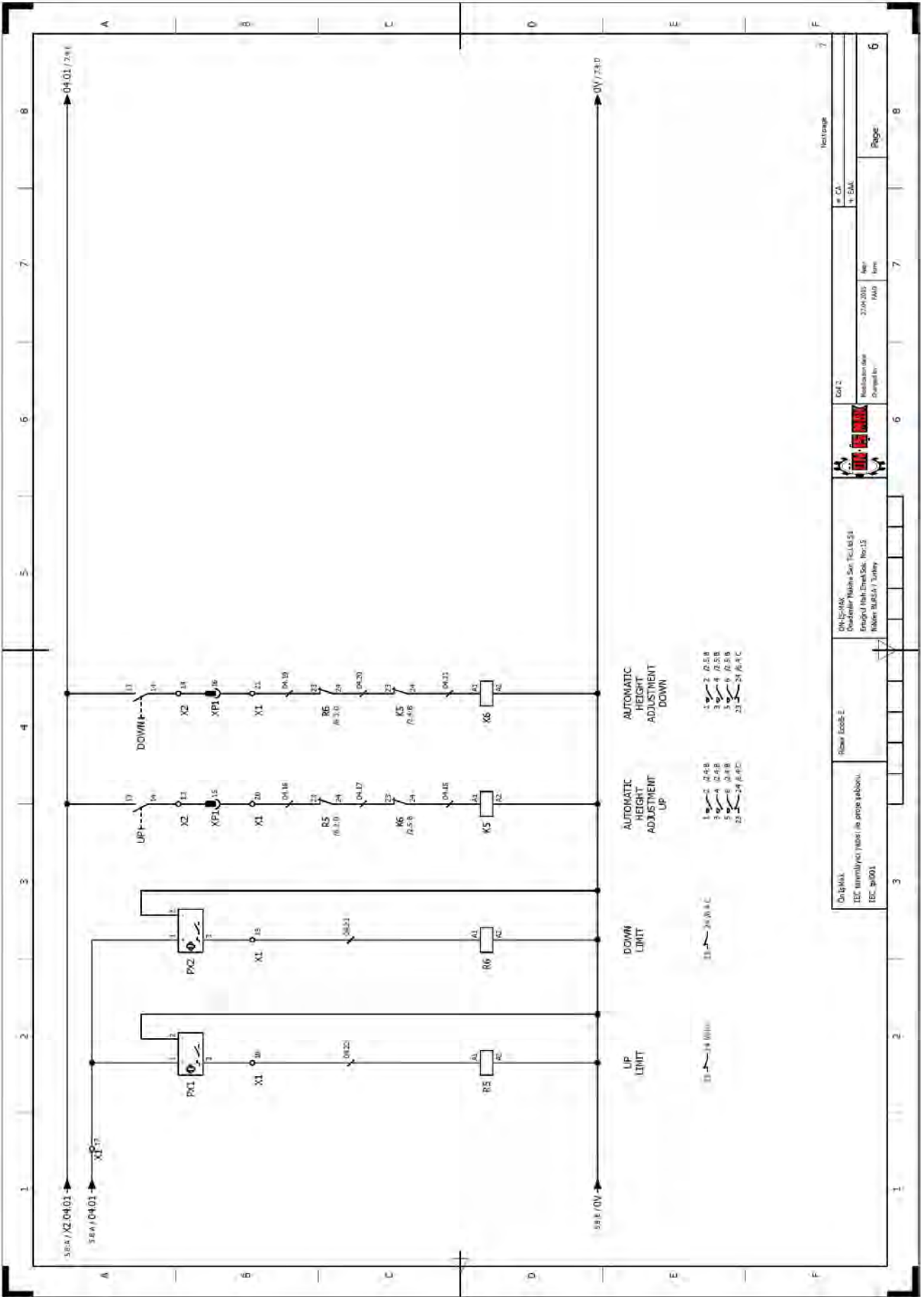
27.04.2015
FAAL
No:

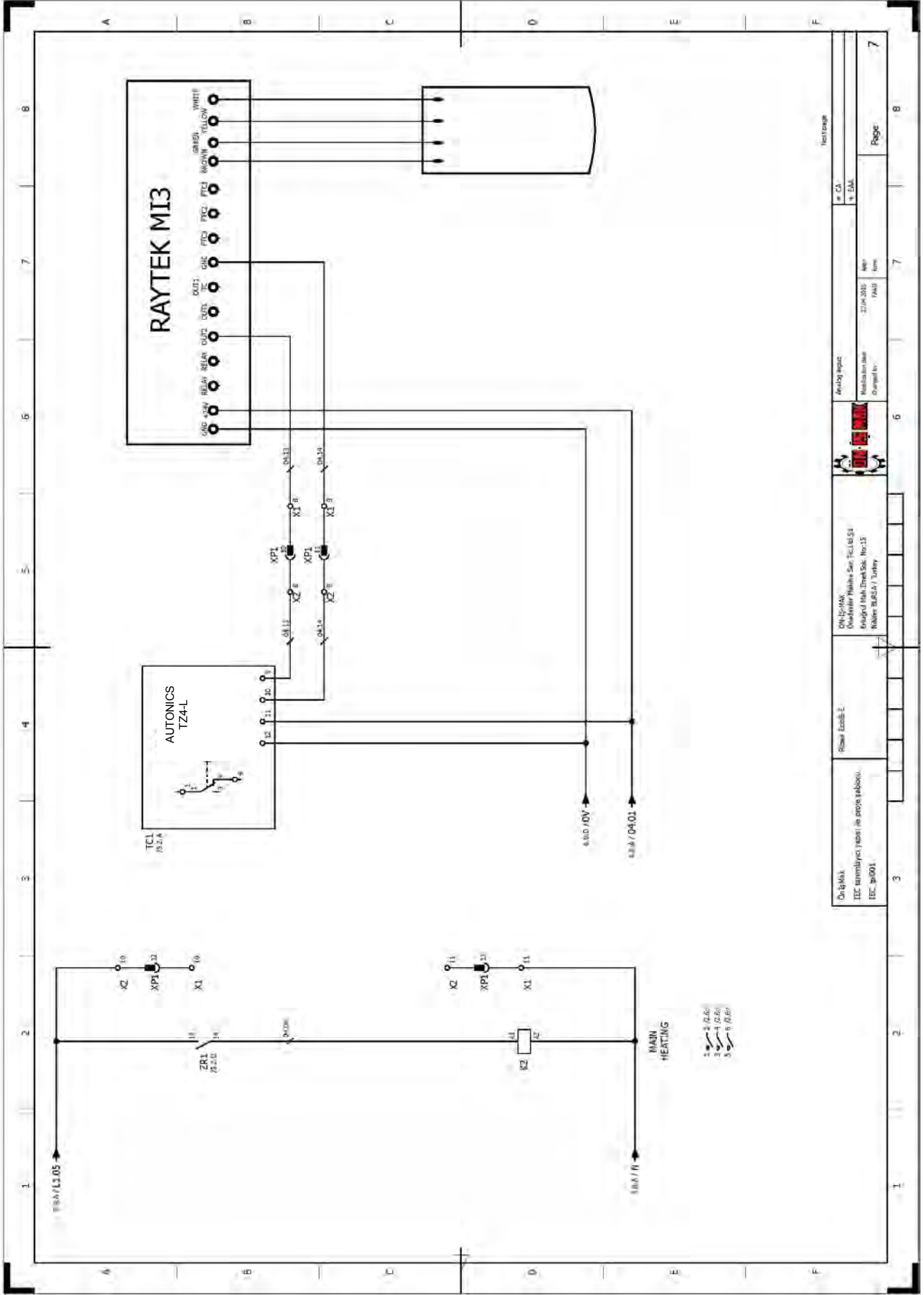
CA
BAA

Page

4







On 8/2014 IEC terminali vezi is pros tabolu. IEC 4001	Risat Esat E.	ON 12/2014 Düzenler Plakası San. T.C. LÜKSİ Enyük. Halk. Dış. İşk. No:15 Mük. BURSA / Turkey	Analog İşaret # CA # BMA	27.04.2015 FAAD No:1	7	8
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LIST OF COMPONENTS

Q.NO	PRODUCT DESCRIPTION	BRAND	CODE
1	INFRARED MODULE	RAYMIC	31DLTSCB3
2	INFRARED MODULE	RAYTEK	MI3
3	BUTTONLATCH 0-1 1 NC SELECTER	EMAS	B100S20
4	BUTTON START YELLOW	EMAS	B100-DS
5	BUTTON START GREEN	EMAS	B100-DY
6	BUTTON STOP RED 1NK	EMAS	B200DK
7	EMERGENCY STOP BUTTON RED 40MM	EMAS	B200E
8	EMERGENCY STOP STICKER	EMAS	BET60P PLASTICS
9	CONTACTOR	SCHNEIDER	LC1-D09BD 24VDC 4KW
10	CONTACTOR	SCHNEIDER	LC1-D12BD 24VDC 5,5KW
11	CONTACTOR	SCHNEIDER	LC1-D50BD DC24V 22KW
12	TIME RELAY	ENTES	MCB-8
13	RELAY SOCKET 11 PINS	ENTES	RS1P11
14	TIME RELAY	OMRON	H3CR-A
15	THERMIC MAGNETIC SWITCH (220 V 3 P 60 HZ.)	SCHNEIDER	LRD-21 (12-18 A)
16	THERMIC MAGNETIC SWITCH (380 V 3 P 50 HZ.)	SCHNEIDER	LRD-10 (4-6 A)
17	THERMIC MOTOR PROTECTION	ENTES	MKS-03
18	SAFETY SWITCH	KRAUS NAIMER	KG100 T203/01E 3x100A
19	FINAL SWITCH	SCHNEIDER	XCKN2145P20
20	SIGNAL LAMB GREEN LED	EMAS	B090XY
21	AUTOMATS PERFORATED RAIL	ONKA	
22	AUTOMATS	SCHNEIDER	C1x16A
23	AUTOMATS	SCHNEIDER	C1x25A
24	AUTOMATS	SCHNEIDER	C1x50A
25	CABLE NYAF	BİRTAŞ	1x0,75
26	CABLE NYAF	BİRTAŞ	1x1,5
27	CABLE NYAF	BİRTAŞ	1x2,5
28	CABLE NYAF	BİRTAŞ	1x4
29	CABLE NYAF BLACK	BİRTAŞ	1x10
30	CABLE SILICONE	BİRTAŞ	1x1,5
31	CABLE SILICONE	BİRTAŞ	1x2,5
32	CABLE SILICONE	BİRTAŞ	1x4
33	CABLE TTR	BİRTAŞ	2x0,75
34	CABLE TTR	BİRTAŞ	3x1,5
35	CABLE SHIELDED (BLENDAGED)	BİRTAŞ	4x0,22
36	ISOLATED CABLE FERRULE		1x10MM
37	CABLE TIE		150x3,5
38	CABLE TIE		100x2,5
39	ISOLATED CABLE FERRULE		1x4MM
40	ISOLATED CABLE FERRULE (DOUBLE ENTRY)		2x4MM
41	ISOLATED CABLE FERRULE		1x6MM
42	CY ISOLATED CABLE FERRULE		1x2,5MM
43	ISOLATED CABLE FERRULE (DOUBLE ENTRY)		2x2,5MM
44	CABLE LUG		BRTD-6(4)6,3 S

45	CABLE LUG		BRTD-2,5-6,3 M
46	ISOLATED CABLE FERRULE		IYF-1x0,75MM
47	CABLE FERRULE DOUBLE ENTRY		IYF-2x0,75MM
48	ISOLATED CABLE FERRULE		CY-1x1,0MM
49	CABLE FERRULE DOUBLE ENTRY		2x1,0MM
50	ISOLATED CABLE FERRULE		CY-1x1,5MM
51	CABLE FERRULE DOUBLE ENTRY		2x1,5MM
52	CONDUIT BOLTS		
53	CABLE CONDUIT	KLEMSAN	PKS GREY 25x40
54	CABLE CONDUIT	KLEMSAN	MET. FOR 5 50x40
55	CABLE CONDUIT ATTACHMENT		H5SAC
56	CABLE CONDUIT		PKS GREY 40x40
57	ADHESIVE HOLDER		19x19/28x28
58	TERMINAL ROW PLASTICS 12 sections	KLEMSAN	
59	TERMINAL ROW PORCELAIN 2 sections	ONKA	NO:3
60	TERMINAL ROW PORCELAIN Single section	ONKA	NO:3
61	CABLE STICKER	PHONEIX CONTACT	EMT 15X4R
62	TERMINAL STICKER	PHONEIX CONTACT	TMT 5R
63	RAIL TERMINAL ROW	PHONEIX CONTACT	ST 2,5MM
64	RAIL TERMINAL ROW	ONKA	ST 16 MM
65	TERMINAL NEUTR EARTH for 10	PHONEIX CONTACT	ST 10MM
66	BULB	OSRAM	300 E-14-40W
67	BULB CONNECTOR	OSRAM	E14-BRONZE
68	TEMPERATURE CONTROLLER DEVICE	AUTONICS	TZ4 L SERIES
69	QUARTZ HEATERS		113 CM 1100W
71	SILICONE MACARON CABLE PROTECTOR		8MM
72	MACARON GLASS FIBER		20MM
73	POWER SUPPLY	MEAN WELL	100 F-24 V ECO 4,5A
74	MINI RELAY	ALLEN BRADLEY	700-HP32Z24
75	MINI RELAY SOCKET	ALLEN BRADLEY	700HN1234
76	HOSE SPIRAL		Ø36 DFG GREY