

MKH-3

END LOAD CARTONING MACHINE



Model: MKH-3

Prog.: MKH-

SERIAL NUMBER

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CUSTOMER: _____

SAFETY INSTRUCTION

This machine is designed and manufactured in accordance to current safety legislation. However to ensure the correct and safe handling of this equipment, operators and technician must follow some safety instructions to avoid damages or injuries.

General information:



- The machine must be installed by qualified workers on a solid floor. A sufficient space must be allowed around the machine to ensure easy access to all equipment
- The operators and technician must wear clothing's that are close fitting to avoid them catching by mobile components. Workers must wear protective gloves when conducting maintenance operation.
- Ensure a daily cleaning of the machine and around it.
- The equipment must be use only for its original function. Modifications are not allowed without acceptance of the manufacturer of the equipment.

Electric hazard



- Connection to the electric power must be done by a qualified electrician.
- Follow the electric diagram to connect the electric power.
- Use suitable wires for the electrical power needs.
- Ensure that the machine is earthed.
- Install a Circuit breaker with earth leakage detection (300 or 500 mA) at the head of the electric supply cable.
- Modification of the electrical circuit is not allowed.
- Always disconnect the electric supply when conducting maintenance operation.
- Check periodically that wires or cables are not damaged and replace it by a qualified electrician if necessary.

Mechanic hazard



- Doors and protective panel must be in place when operating the machine.
- By-passing the door switches is strongly prohibited.
- When conducting maintenance operation or machine setup, switch off the electric power and disconnect the air supply.

Burn hazard



- The machine includes a Holt-melt device to close the boxes. The tank, the pump, the heated hoses and the guns are heated to a temperature above 150C during working time.
- The operator and technician must not touch these elements without adequate protective wearing. Take care that a long time is necessary to cool this elements after switched off.
- Read the manual book of the Holt-melt device before conducting any operation.

MACHINE DESCRIPTION

End load cartoning machine model MKH-3

- Simple and economic
- Mechanical driven cartoner control by speed control.
- Automatically open sleeve style carton for product, loading the product automatically from the conveyor, folding the flaps and seal by hot melt glue or by tuck in system as required.
- One operator.
- Control by P.L.C. controller.
- Safety doors around the machine.
- Safety function: No product - no feed
No carton in the feeding station - no feed - stop.
No carton in the magazine stop.
- Touch screen + Shooting trouble display.

Carton design

The carton design is very important in this machine for smooth run.
Consult with the machine manufacture
Before printing check on a blank carton.

- **SPECIAL APPLICATION UPON REQUEST**

In this case all extra modifications instruction will be add at the end of the book.

GLUE SYSTEM

The glue system will be supplied according to the requirements.

GLUE SET UP

There is an option to control of the gun glue by one line of glue or two short spot of glue. This option is controlled by changing the parameters of the GLUE 2

SPECIFICATION

Capacity: Up to 40 p/m depend on the product and size.

Carton size: Width 50 - 190 mm
Length 115 - 220 mm
High 25 - 50 mm

Carton style: 4 side flap glue system.
Other option as required

Carton design: See specification.

Air consumption: At Max. Speed 250 L/M at 6 Bar.

Electric power: 3 KW 200V 3PH 50HZ
Control box low voltage 24V DC

Machine motor: 0.5 HP

Vacuum unit: Venture units

Sealing type: glue jet system

Carton design: As required

Machine dimension: 3040 (L) 1200(W) 1600(H)

Weight: 850 KG

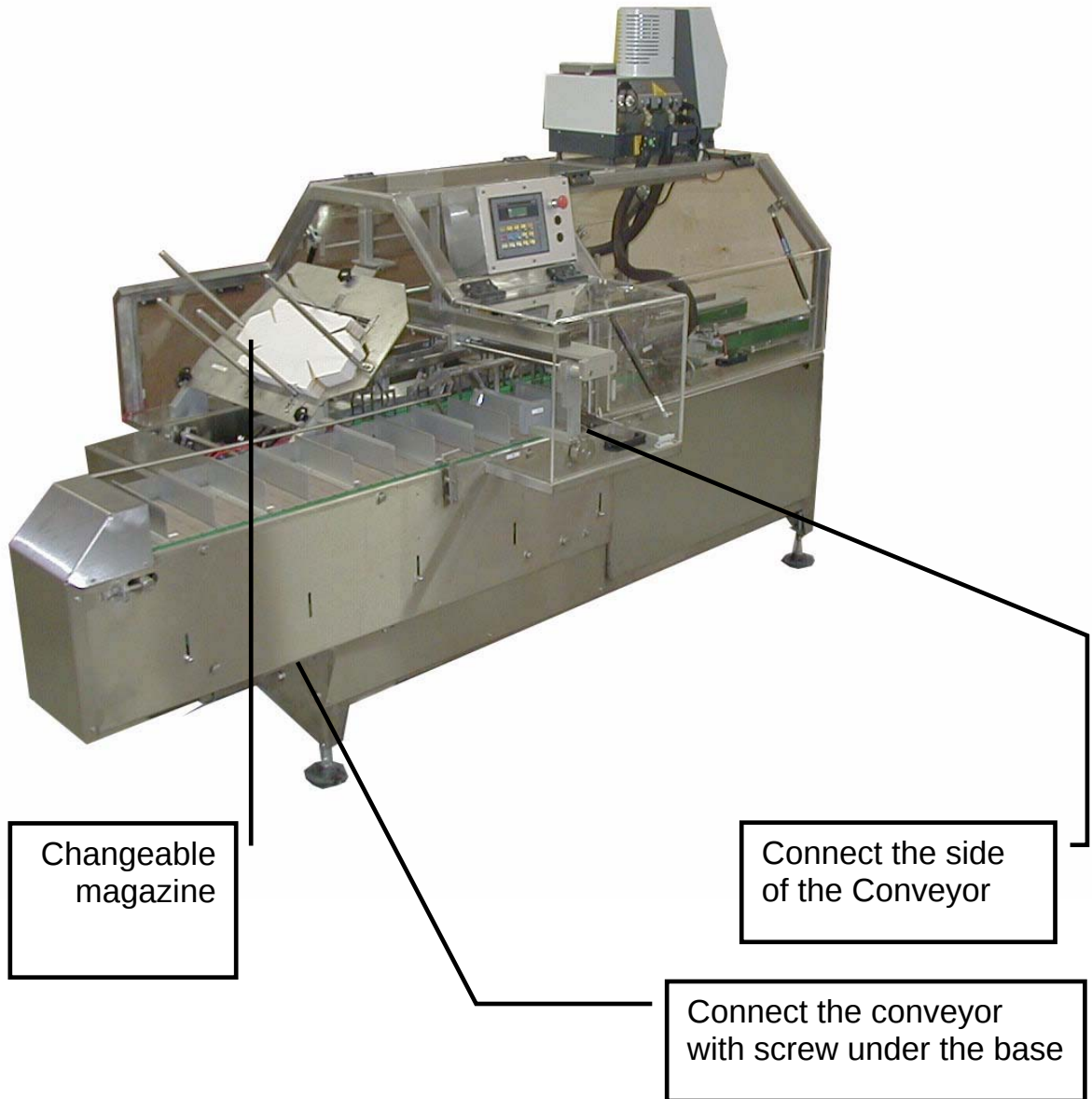
Recommend

Glue: hot melt granulate temp' 150°C-170°C cool time 1 sec,
Open time 1 Sec,

Air compressor unit: 250 L tank 5.5HP.

INSTALLATION

Before starting installation take out all machine cover



After connecting the conveyor, check that the level of the conveyor at the feeding station is on the same level of the tunnel.

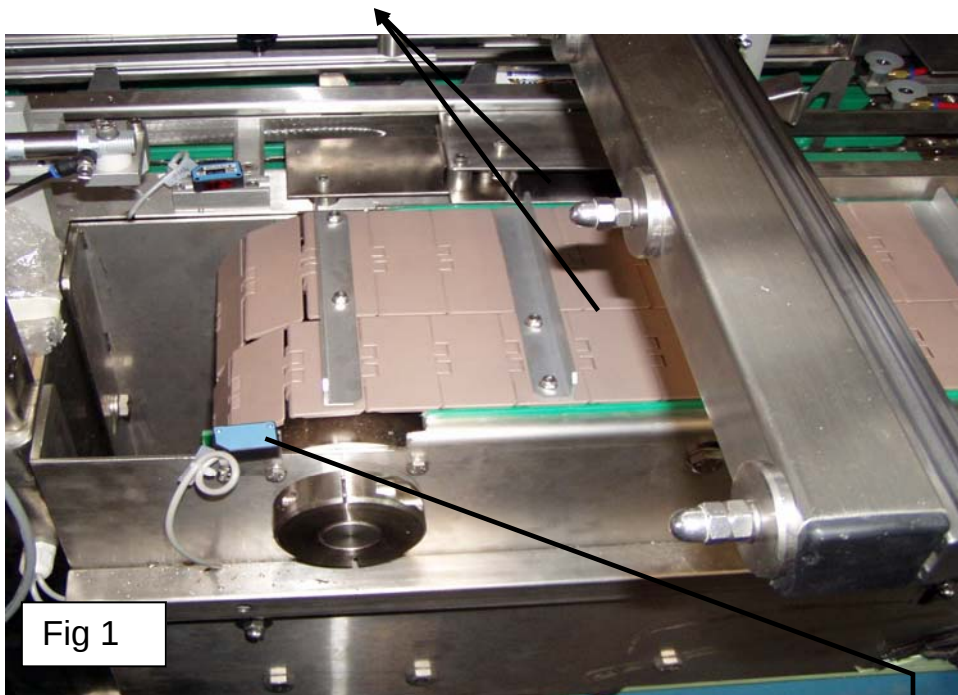


Fig 1

OPTION: Connect the (Ph4) photocell. This photocell will stop the machine if the product is too big and can't go between the conveyor and the side wall.

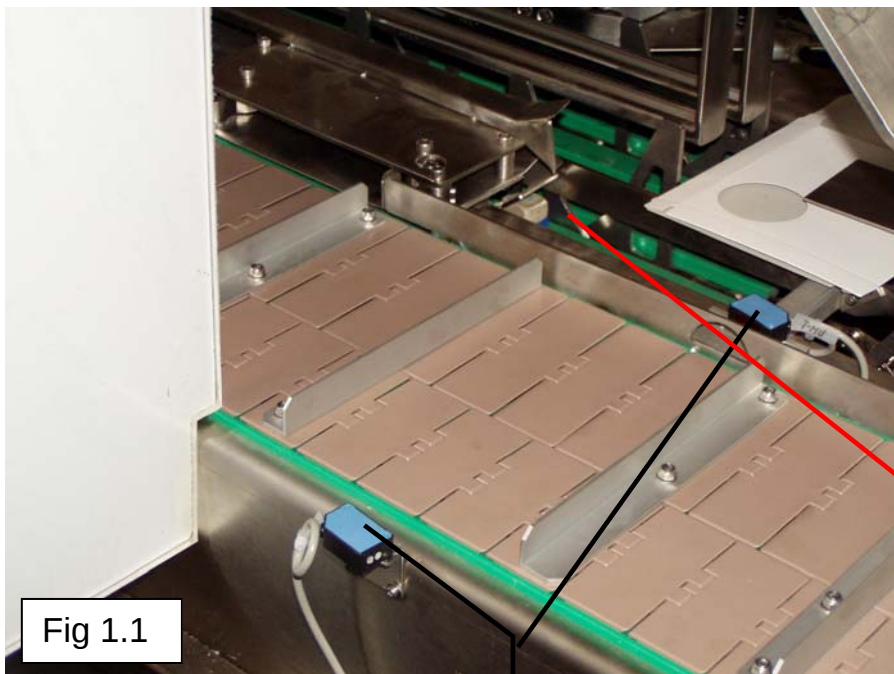
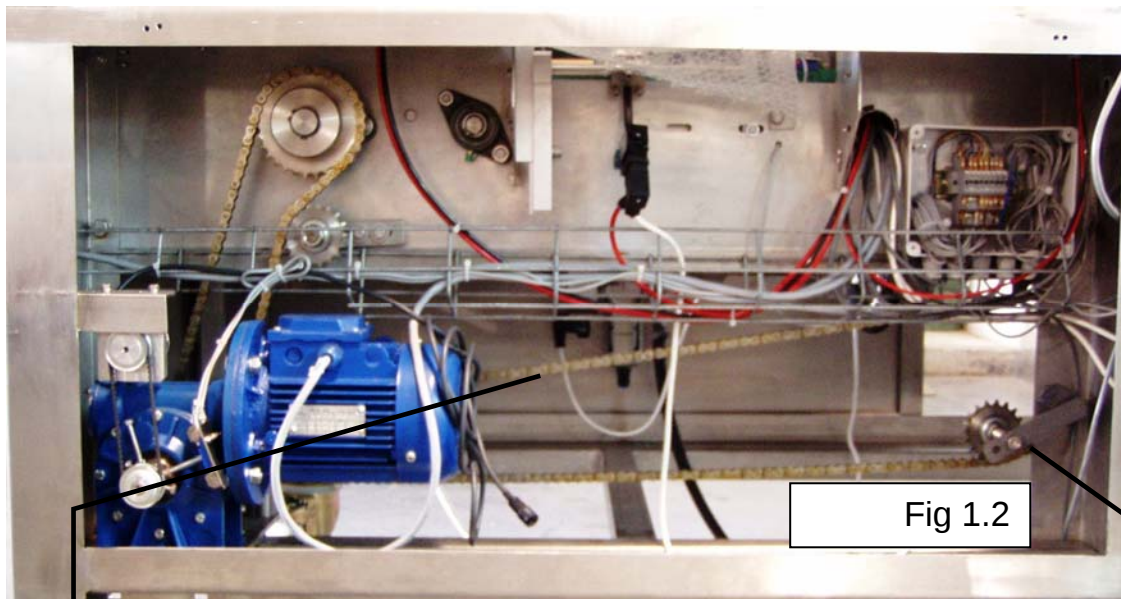


Fig 1.1

Product detector (Ph1)
Transmission and receiver

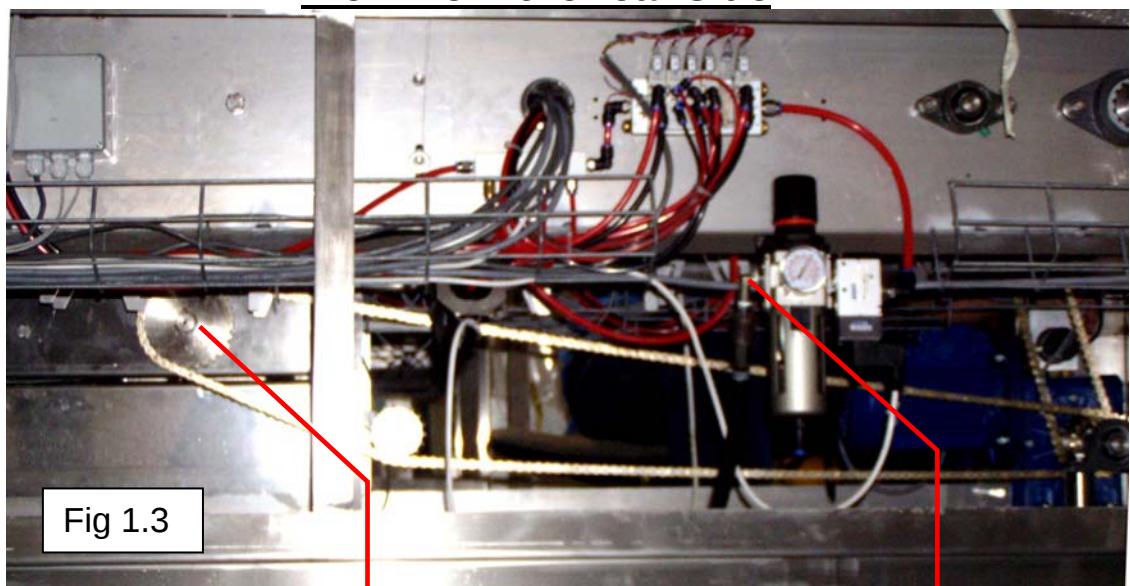
Carton detector in
feeding station (TL1)



Connect the main chain from the Motor to the conveyor

Fix the chain tension.

View from the rear side



Conveyor cog-wheel

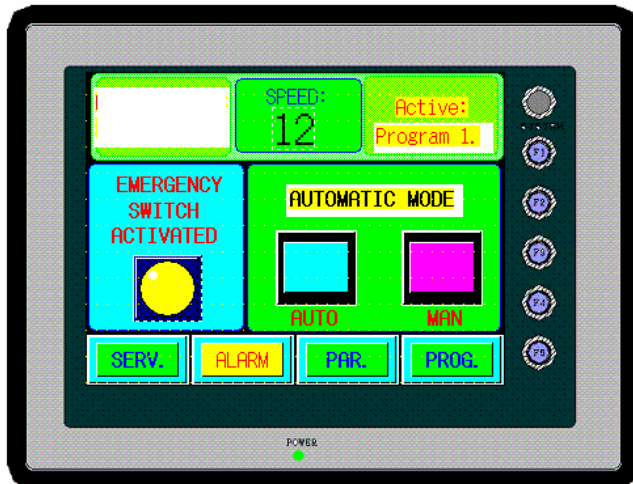
Connect the air supply.

OPERATION INSTRUCTION

- Turn on the main switch on the main electric box.
- On the main screen will show LEAD logo and program no

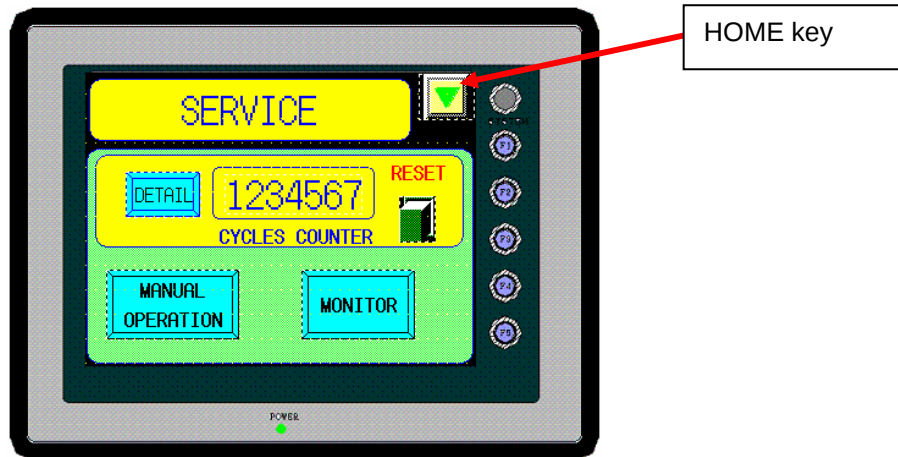


Touch the screen and the main screen will be showing



- **SPEED** – Show the current speed of the machine while running, calculate every 30 sec.
- **EMERGENCY SWITCH** – If the emergency switch is pressed the virtual knob will blink, operate also if any problem jump up and stop the machine.
- **ACTIVE** - Showing the program no. that is running.
- **AUTO** - For Automatic Mode
- **MANUAL** – For Manual mode.
- **SERV.** – Show all service need – counter- manual operation.
- **ALARM** – for any problem the ALARM switch will blink, pressing on it will show the problems
- **PAR.** – Change all kind of parameters of the machine function.
- **PROG.** – Can switch between programs for example – two sizes of glue length, each program will save those parameters for easy set up.

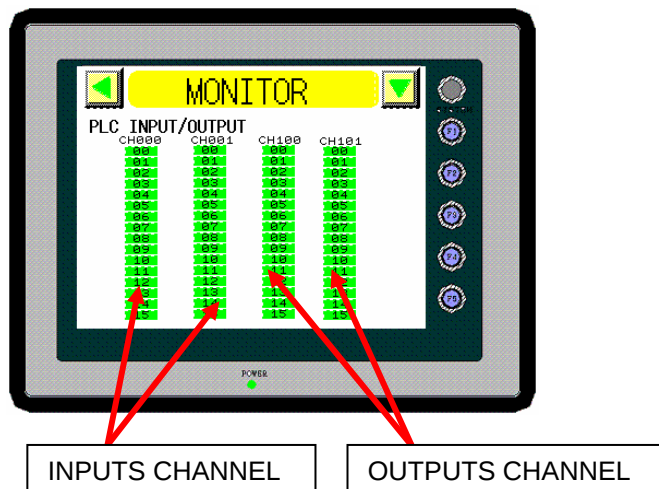
SERVICE



CYCLES COUNTER – Count the packed products. To reset it, press on the reset key. The **DETAIL** key allows to display more information (running hours, total cycles, speed).



MONITOR – Pressing this key, will display the following screen. This screen allows a technician to check the state of the PLC inputs/outputs.



At any time pressing on the "HOME" key in the upper right corner will back to the main screen.

MANUAL OPERATION

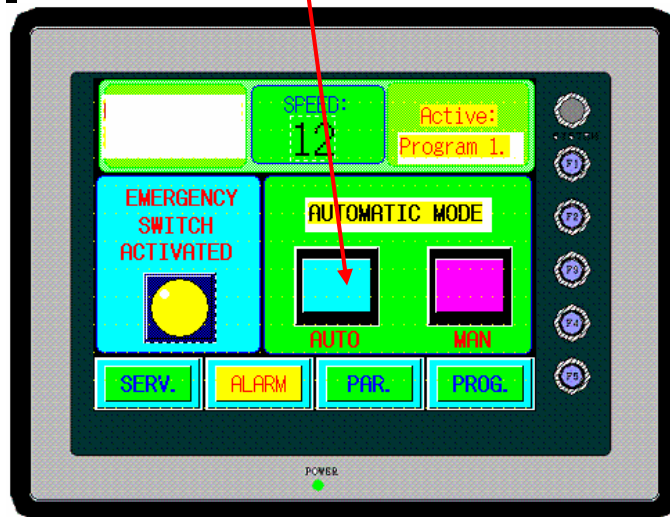
Pressing on the switch will show this screen



- PULLING** - Pull down the carton manually
- FEEDER** - Feed the product into the box manually (the machine must be in home position).
- VACUUM** - Operate the vacuum manually.
- JOG** - Run the machine at low speed while the jog key is pressed
- PRINTER** - (*Optional*) Each pressing will operate the printer once.
- LEAFLET** - (*Optional*) Each pressing will operate the leaflet or clips dispenser once (the machine must be in home position).

AUTOMATIC OPERATION

Press on the AUTO mode and then press on the START push-button (the green one, located on the right up corner).

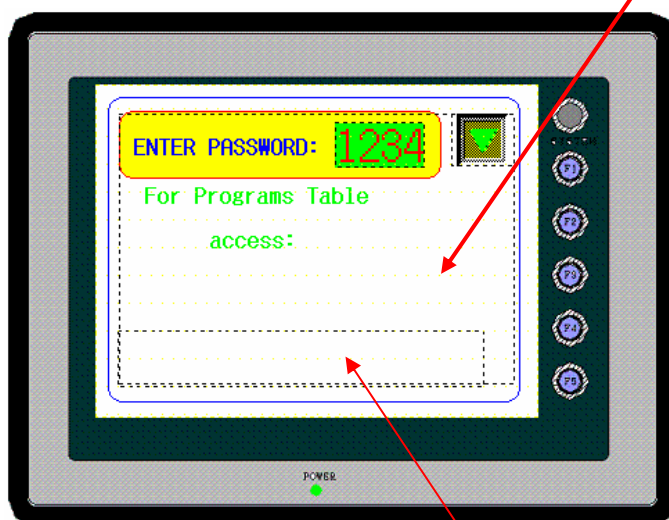


PROGRAM

A program is a set of related parameters that the operator can save or load to operate the machine for a related product.

To load a program from the memory, press the "PROG" key on the main screen.

The following screen is displayed. Press on this area to display the numeric keypad.



Enter the password (1234),
Then press ENTER

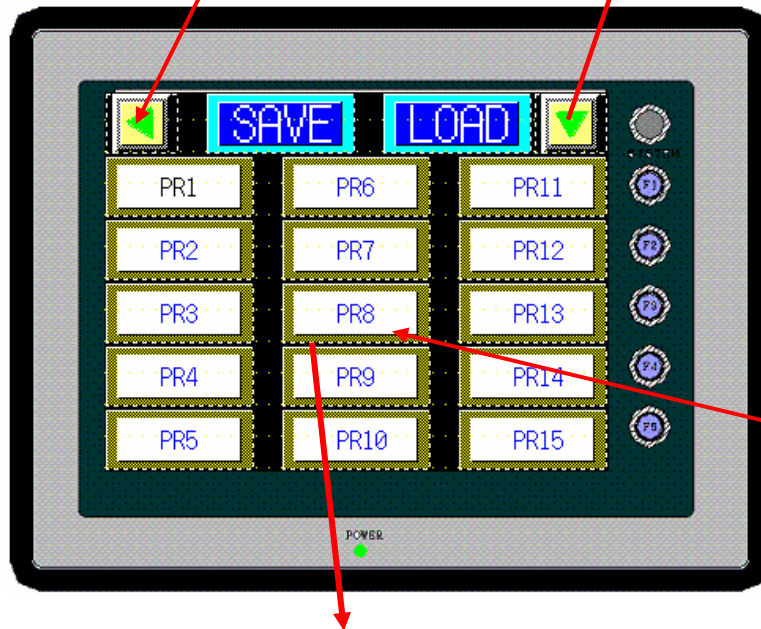
A message "INVALID
PASSWORD" is displayed
if the input number is
invalid.

Load the program you required.

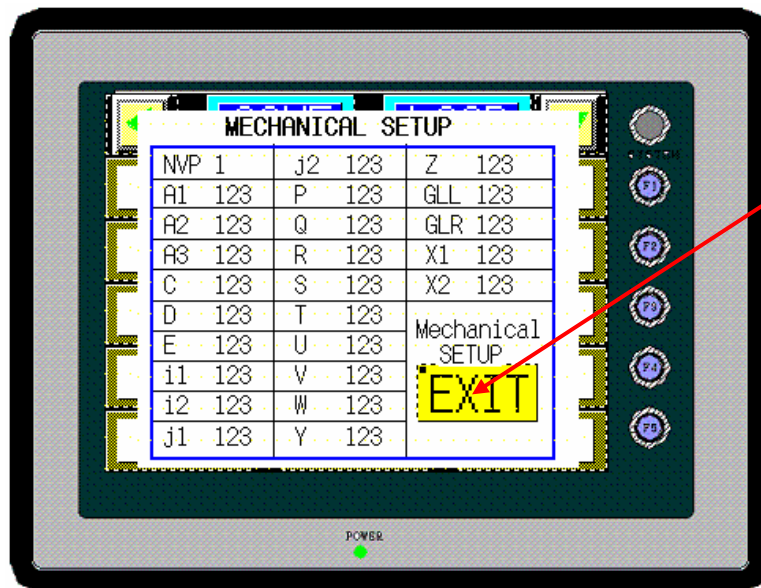
choose the program number you want to load

Access to program nr.16 to 30

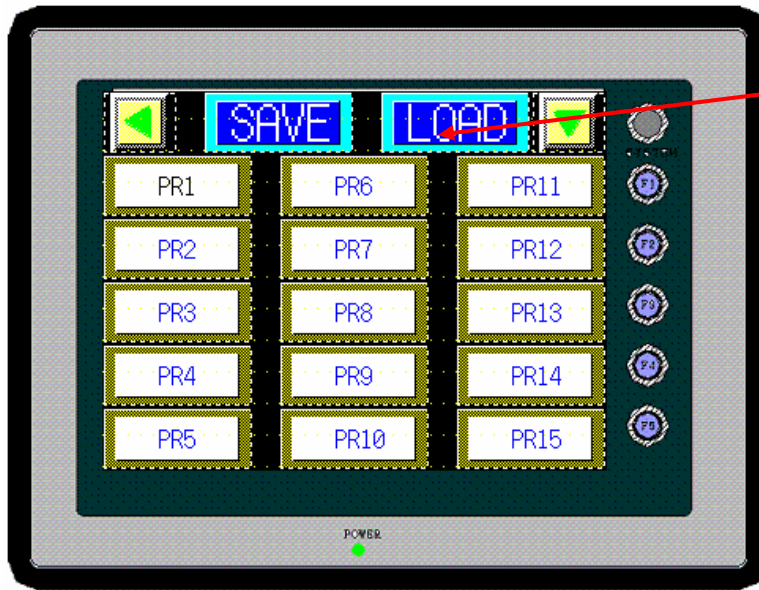
To the main screen



By pressing a key, the corresponding mechanical setup list will be displayed.



The mechanical setup parameter of the corresponding program is displayed. When the setup has been completed, press the EXIT key to press the LOAD key.



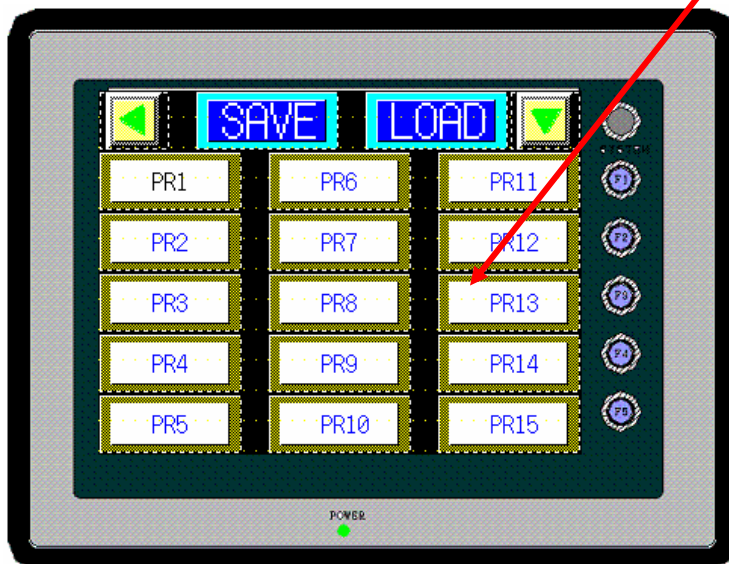
Press on the LOAD key to confirm your choice or the HOME key if you want to cancel your action. If the LOAD key is pressed the corresponding parameters are loaded in the PLC parameter area. The program number in use is displayed on the 1st screen and in the parameters screen

Copy an existing program to a new one

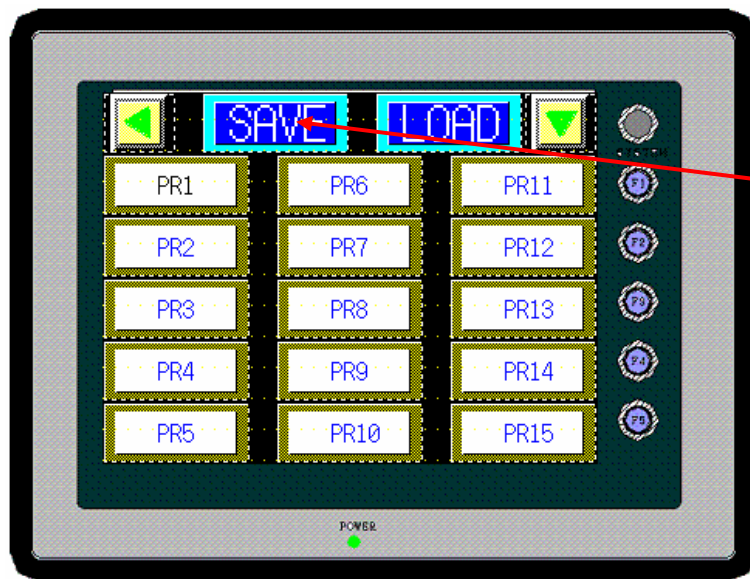
You can save a set of related parameters to a new program number.

Notice that the present program is continually updated when a parameter is changed and the program doesn't need to be saved.

The first operation is to load the program number (source) you want to copy. See the previous pages to perform this action. Check that the present program is the right one. Then select the target program number by pressing one of the screen



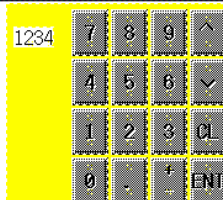
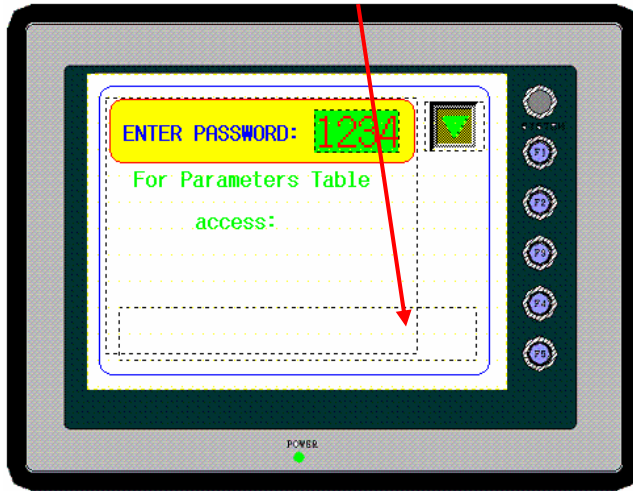
The selected program will be highlighted then press the SAVE key



Press the SAVE key to copy the present related parameters to the new program **.Notice** that if a target program exists, it will be erase by the new one.

PARAMETERS

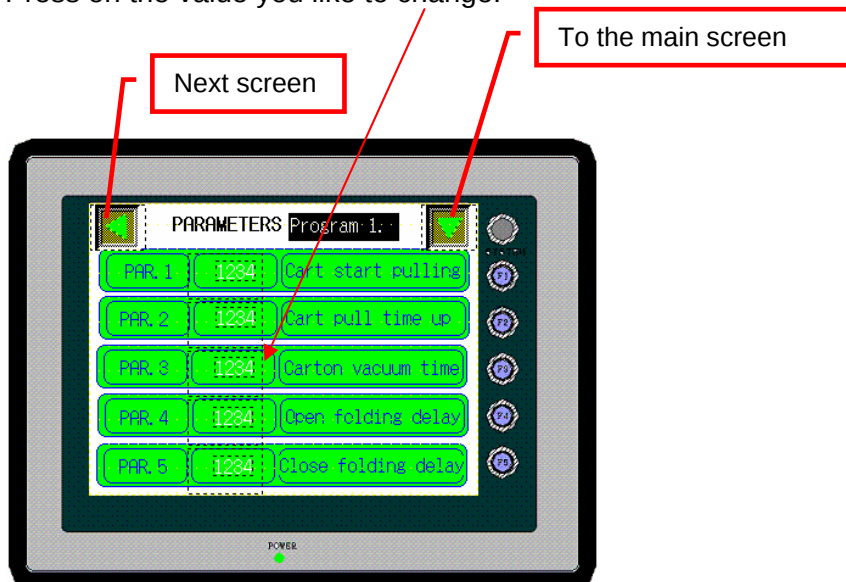
To change the parameters – press PAR. on the main screen.
The below screen is showing. Press on this area to display the numeric keypad.



Enter the password (1234)
Press ENTER

Change the parameters

Press on the value you like to change.



A numeric keypad will be displayed; change the value and press ENTER. *Notice that the new value is automatically saved in the program number displayed on the top of the screen.*



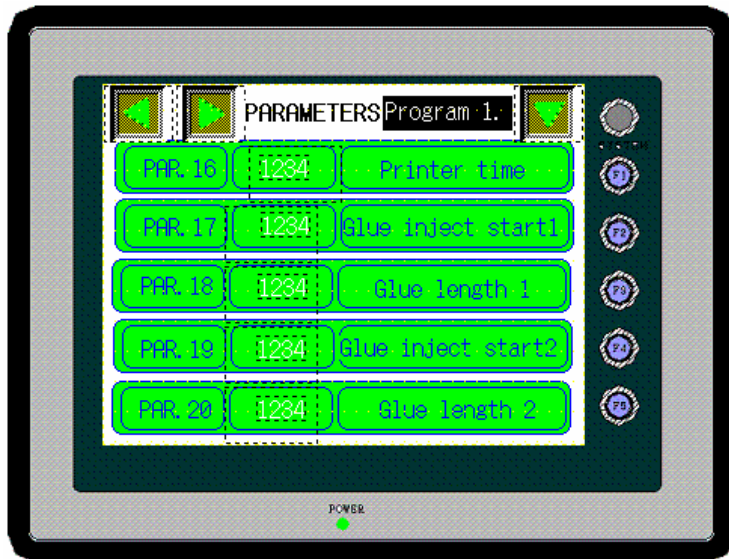
PARAMETER S	DESCRIPTION
<u>1</u>	WHEN THE PULLING UNIT STARTS TO GO UP AFTER MACHINE REACHES THE STOP POSITION. (HOME SENSOR ON THE MAIN MOTOR).
<u>2</u>	HOW LONG THE PULLING UNIT WILL STAY IN THE UPPER POSITION TO INSURE THE SUCKING. START FROM THE MAGNETIC SENSOR ON THE PISTON
<u>3</u>	THE VACUUM TIME START WHEN THE PULLING IS AT DOWN POSITION CONTROL FROM THE SENSOR ON THE PULLING PISTON.
<u>4</u>	WHEN TO OPEN THE SIDE FLAP PISTON- START WHEN THE MACHINE STARTS TO RUN. THIS TO INSURE THAT THE SIDE FLAP WILL NOT BE OPEN WHILE IT RUNS TO THE NEXT STATION.
<u>5</u>	CLOSING THE SIDE FOLDING. START FROM HOME SENSOR WHEN DETECTED AT STOP POSITION.



PARAMETER S	DESCRIPTION
<u>6</u>	THE TIME TO START TO RUN THE MACHIE AFTER THE CARTON WAS PULLED DOWN
<u>7</u>	<u>OPTION</u>
<u>8</u>	DELAY TO OPEN THE FINAL PRESSING UNIT BEFORE MACHINE START RUN (ALLWAYS 0)
<u>9</u>	DELAY TO CLOSE THE FINAL PRESSING UNIT AFTER THE MACHINE REACHES THE STOP POSITION.
<u>10</u>	DELAY TO PUSH THE PRODUCT INTO THE BOX AFTER THE MACHINE REACHES THE SLOW POSITION CAN'T BE [0]

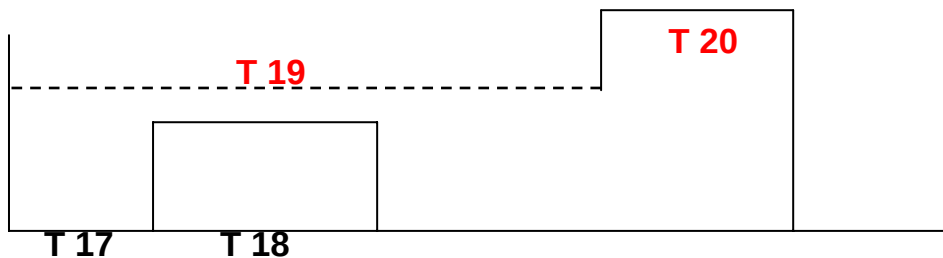


PARAMETER S	DESCRIPTION
<u>11</u>	HOW LONG THE FEEDER PISTON WILL STAY AT THE END OF ITS STROKE
<u>12</u>	HOW MANY CARTONS WILL BE PULLED BEFORE THE MACHINE STOP AUTOMATICALLY, AFTER THE PHOTOCELL LOCATED ON THE MAGAZINE DOESN'T DETECT CARTON. (OPTIONAL)
<u>13</u>	HOW LONG THE MACHINE IS WAITING BEFORE STARTING TO RUN AFTER THE FEEDER WAS BACK TO SAFE POSITION (ALLOWS TO REDUCE THE SPEED OF THE MACHINE FOR MANUAL FEEDING)
<u>14</u>	N/A
<u>15</u>	PRINTER DELAY AFTER THE MACHINE STOPS AT "HOME" POSITION.



PARAMETER S	DESCRIPTION
<u>16</u>	PRINTER PRESSING TIME.
<u>17</u>	DELAY TO ACTIVATE THE GLUE GUNS AFTER THE MACHINE STARTS TO RUN (Beginning of the glue line)
<u>18</u>	TIME FOR ACTIVATING THE GLUE GUNS (Length of the glue line)
<u>19</u>	SECOND START OF GLUE THIS OPTION ALLOWS TO PUT TWO SPOTS OF GLUE
<u>20</u>	SECOND GLUE SPOT LENGTH

GLUE DIAGRAM



**IF ONLY ONE CONTINUOUS LINE OF GLUE IS WANTED - SET
PARAMETER 19 AND 20 TO [0]**

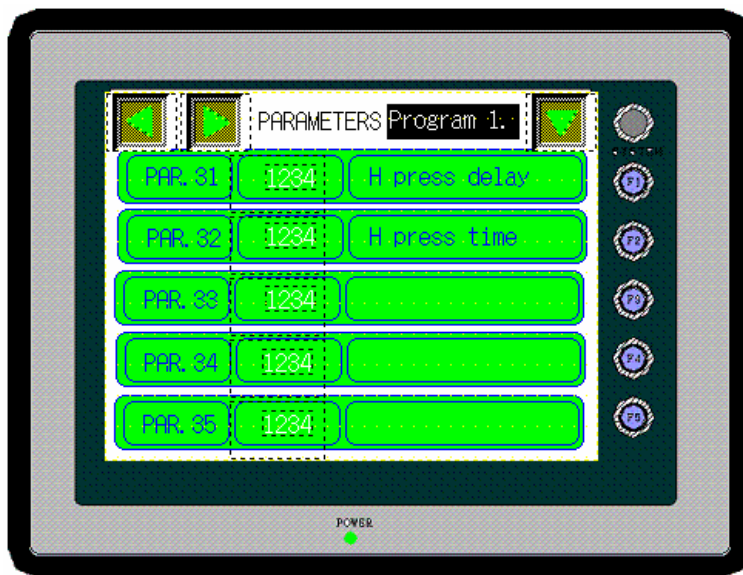


PARAMETER S	DESCRIPTION
<u>21</u>	DELAY FOR STOPPING THE OUT FEED CONVEYORS BELTS, AFTER MACHINE STOPS AT "HOME" POSITION.
<u>22</u>	N/A
<u>23</u>	N/A.
<u>24</u>	DELAY AFTER THE MACHINE REACHES THE "SLOW" POSITION TO GO DOWN THE PRESSING CYLINDER LOCATED ON THE FEEDING UNIT.
<u>25</u>	DELAY FOR RISING UP THE PRESSING CYLINDER AFTER THE FEEDER CYLINDER GOES BACK TO ITS STILL POSITION



This screen is displayed only in case that the machine is provided with a leaflet or clips ribbon dispenser.

PARAMETER S	DESCRIPTION
<u>26</u>	ENABLE / DISABLE THE LEAFLET/CLIPS DISPENSER EQUIPEMENT
<u>27</u>	DELAY TO PULL DOWN THE LEAFLET/CLIPS FROM THE MAGAZINE, AFTER THE MACHINE REACHES THE "HOME" POSITION
<u>28</u>	TIME THE LEAFLET/CLIPS PULLING CYLINDER IS ACTIVATED. (THE TIME NEEDED TO PUT THE LEAFLET/CLIPS ON THE PRODUCT)
<u>29</u>	DELAY TO START THE VACUUM FOR THE LEAFLET/CLIPS PULLING AFTER THE MACHINE REACHES THE "HOME" POSITION
<u>30</u>	THE MOMENT, THE VACUUM IS SWITCHED OFF AFTER THE PULLING OF THE LEAFLET/CLIPS BEGIN



This screen is displayed only in case that the machine is provided with a leaflet or clips ribbon dispenser.

PARAMETER S	DESCRIPTION
<u>31</u>	DELAY TO GO DOWN THE PRESS CYLINDER LOCATED AFTER THE LEAFLET/CLIPS DISPENSER
<u>32</u>	TIME THAT THE PRESS CYLINDER LOCATED AFTER THE LEAFLET/CLIPS DISPENSER IS ACTIVATED
<u>33</u>	N/A
<u>34</u>	N/A
<u>35</u>	N/A

The following screens are dedicated to the mechanical setup of the machine. The explanation of each parameter is given in the SETUP chapter. It is strongly recommended to fill the appropriate fields to help the operator in setting operations.

Mechanical SETUP Program 1.

N. pads	1	D	123
A1	123	E	123
A2	123	i1	123
A3	123	i2	123
C	123	j1	123

POWER

Mechanical SETUP Program 1.

J2	123	T	123
P	123	U	123
Q	123	V	123
R	123	W	123
S	123	Y	123

POWER

Mechanical SETUP Program 1.

Z	123
GL-R	123
GL-L	123
X1	123
X2	123

POWER

The fields X1 and X2 are not assigned in the machine and can be used freely by the operator.

SET UP

When start the set up of the machine press the emergency stop, so all the manual function can be use manually.

The set up of the machine will take 5-10 Min. if all the parameters are all ready checked before.

Please follow the parameters table to adjust the machine.

Set up for new carton

Make sure the machine is switched on and home position is done.
See operation instruction.

1. Pin width (setup name: U)

1.1. Release the screw on the two sprocket (20) so the inside chain will be free, use key 13mm fig 2.1.

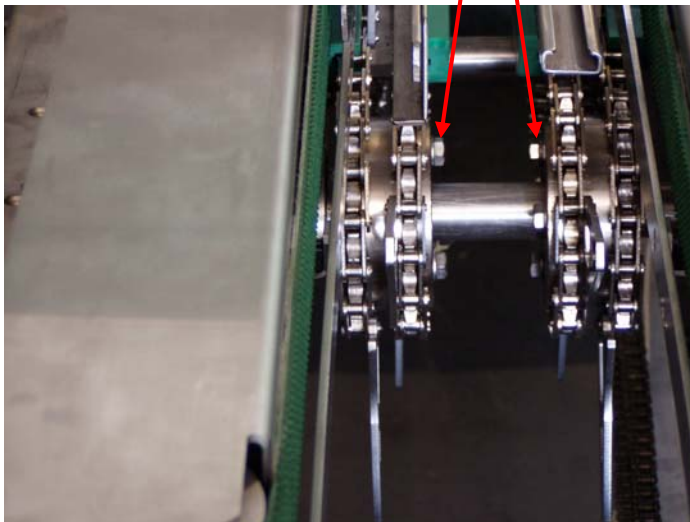


Fig 2.1

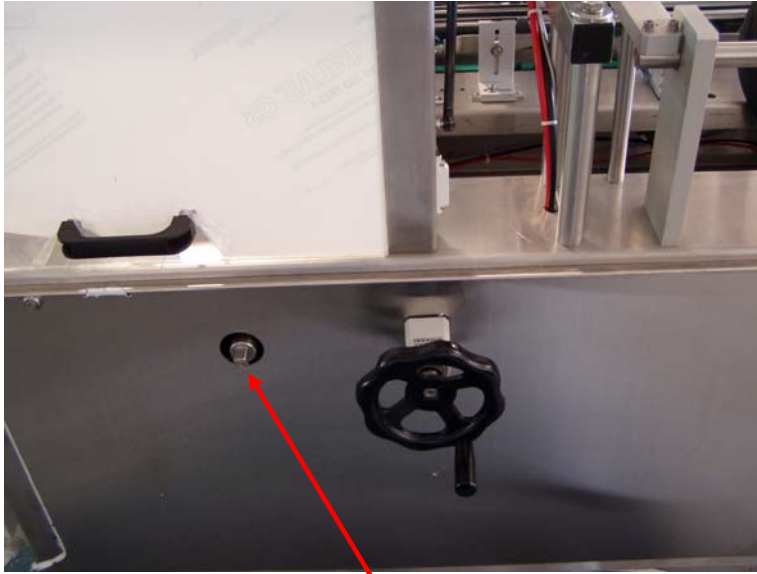
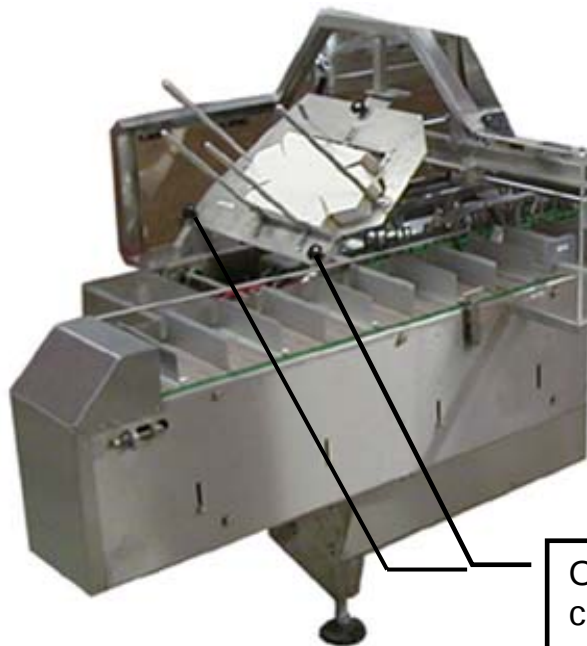


Fig 2.2

1.2. Change the width by turn wheel (U) and adjust the size according Use Fig 2.2

1.3. After set up, tight the two sprockets (fig2.1).

2. MAGAZINE CARTON



Open the two screws and change the magazine.

3. Pulling unit adjusting (setup name: NVP, A1, A2, A3)

3.1. There are 3 vacuum pads A1, A2, A3 that can be adjust, use the maximum number of pads you can.

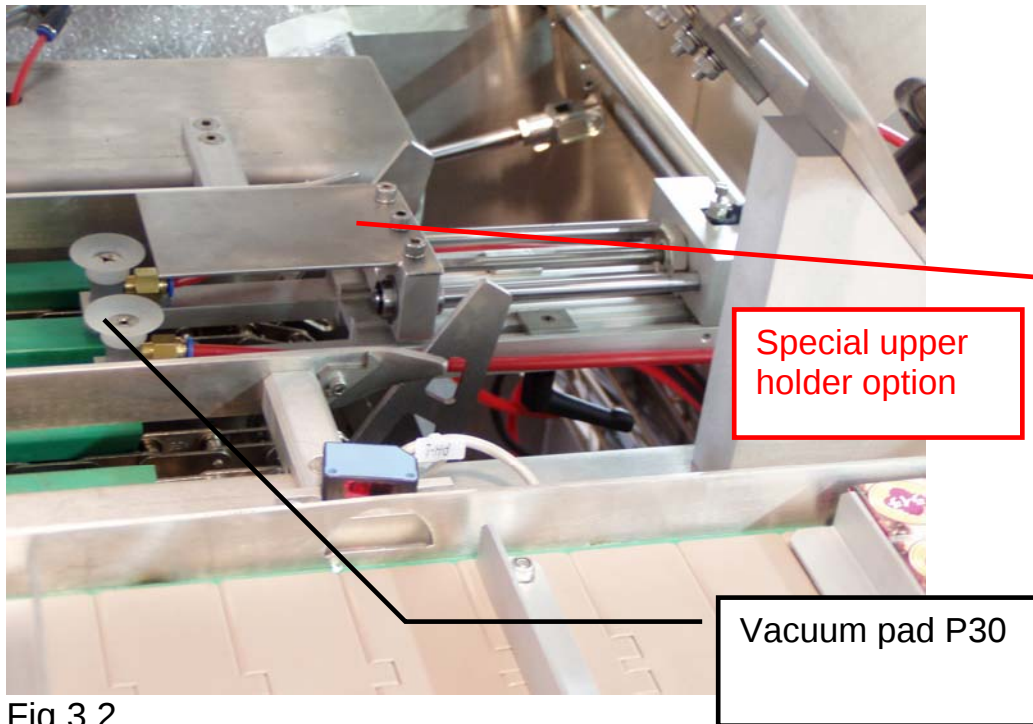


Fig 3.2

3.2 If one or two are not needed, open the handle screw and move it to the left side of the machine.

3.3. Select the manual operation screen, and press on the PULLING UNIT key. The pulling unit will pull up and the vacuum pad will touch the base of the carton

If need to erect carton manually, press on the vacuum key (8). The vacuum starts, press on the pulling unit key, the pad will suck one carton and it will be erected.

3.4. Adjust the vacuum pad (A1-A2) as Fig 3.2 the edges of the pad have to be 3-5 mm down from the folding line.

3.5. Recommendation

- A. for big carton more than 90mm width, the edge of the pad is 3-5 mm from the folding line
- B. Up to 90mm width the vacuum pad should be on the center of the folding line. For some problem with the erection the carton is bent use position [A].

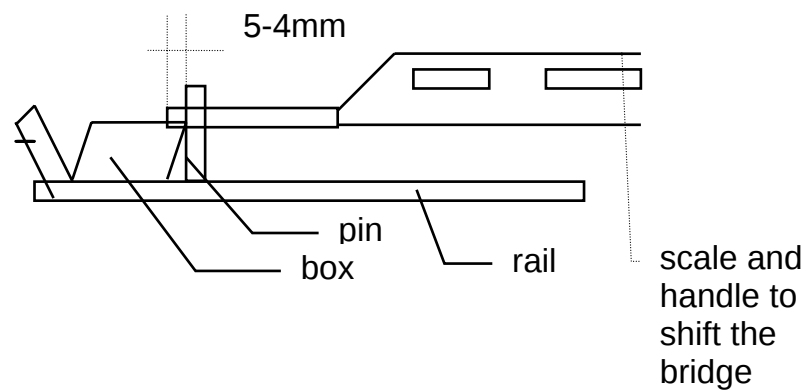
4. High carton adjusting (setup name: i1, i2, j1, j2, y, z)

The height of the carton is changed by the upper bridge.

4.1. Adjust the two bridges high to the height of the box

4.2. The high should not be too tied to the carton.

4.3. Shift the position of the two bridges both side 5 mm beyond the pin on the erection station by open the screw



5. Length carton adjusting (setup name: T)

5.1. Adjust the wheel [T] on the side of the machine.

5.2. The adjusting of the width should be as sketch.

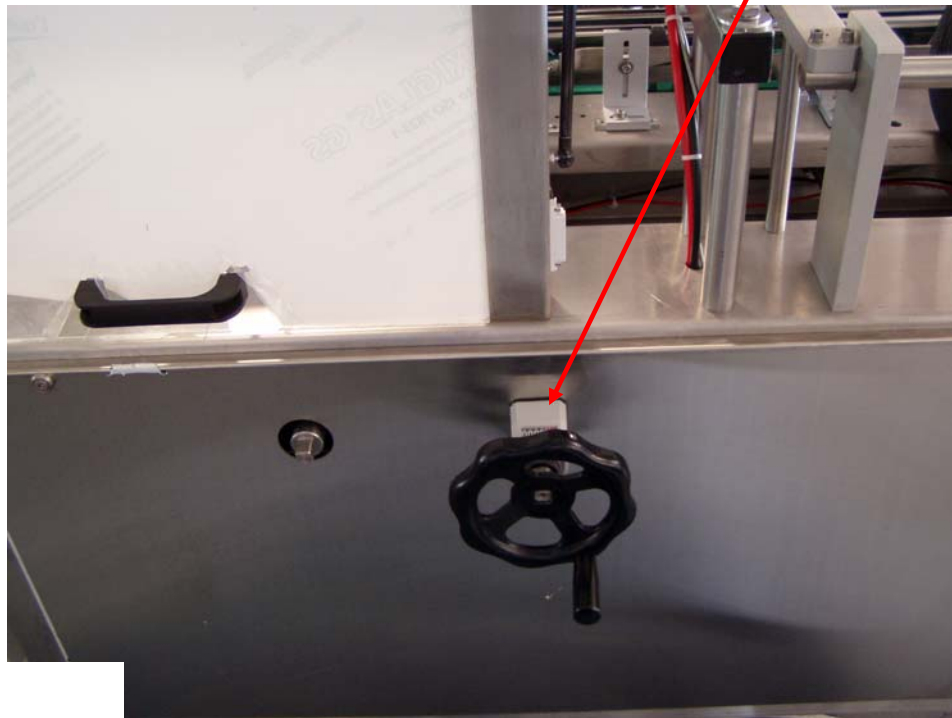
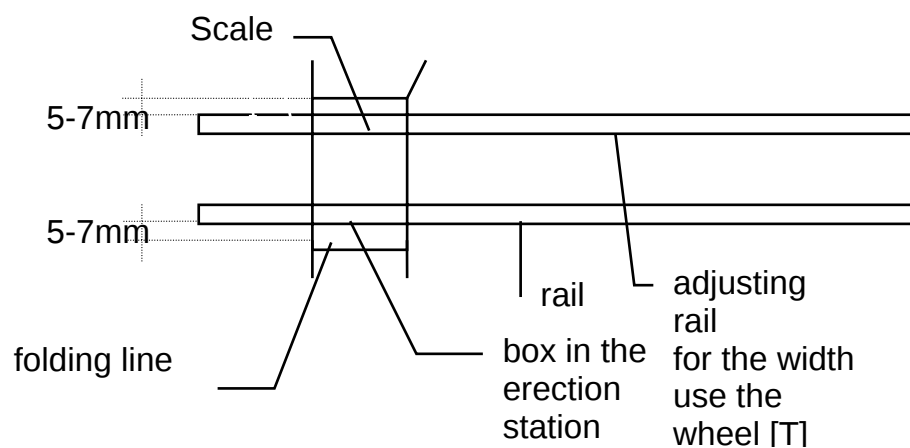
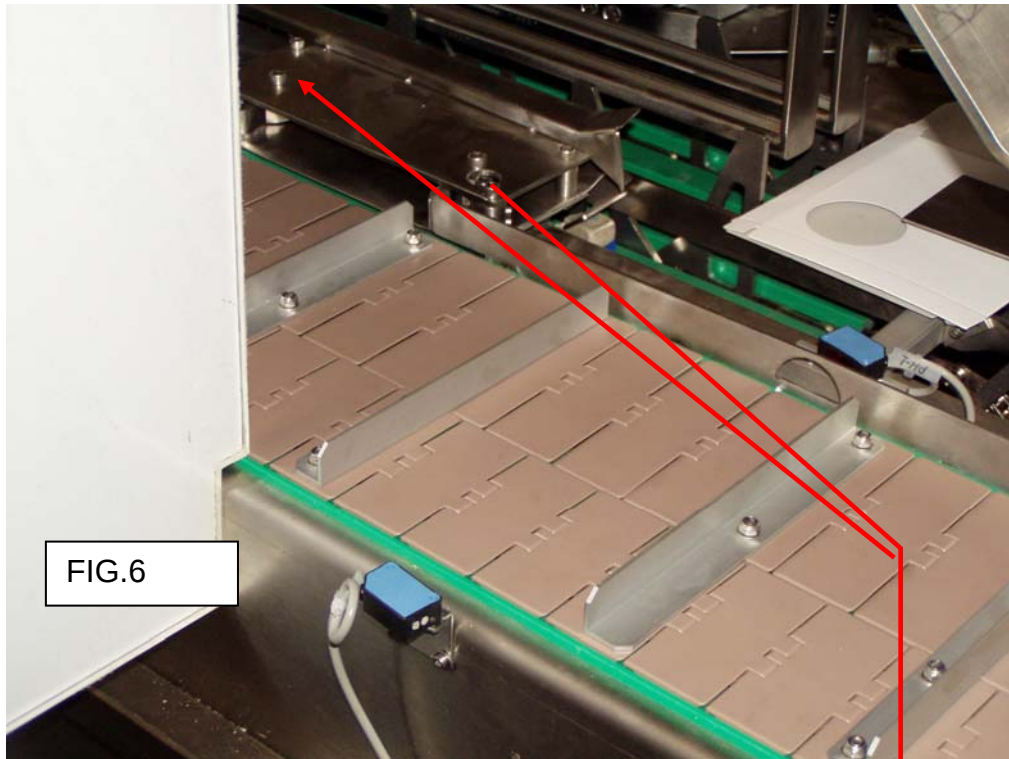


Fig 5.2



6. Tunnel change



Open the two screw of the tunnel to change it.

7. Width conveyor (setup name: C)

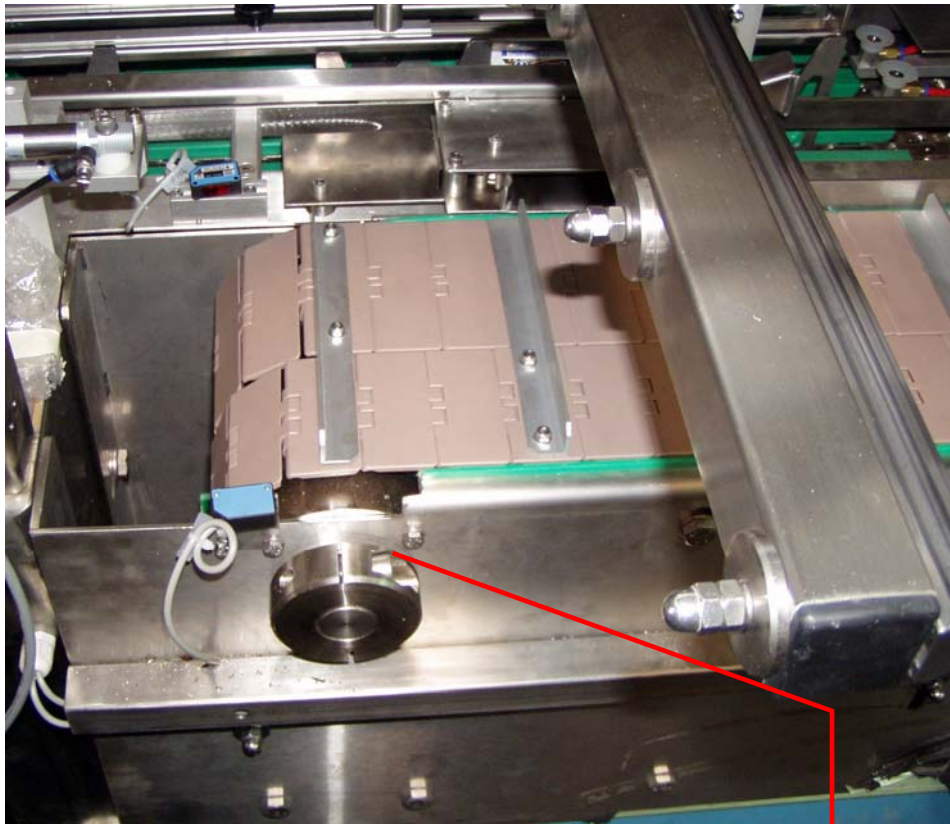
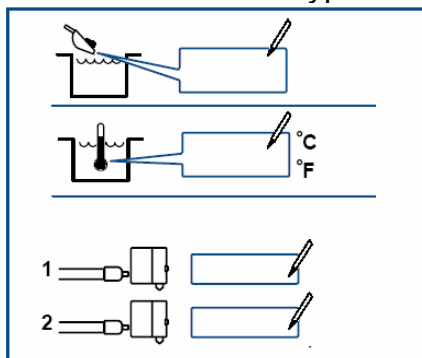


FIG 7

Open the screw and adjust the width of the cubbyhole
use Allen key 10mm

8. GLUE ADJUSTING (setup name: GL-L, GL-R)

We recommend to record the parameters of the holt-melt unit in accordance with the type of holt-melt used.



A standard carton doesn't need to adjust the position of the glue except the length and the start (parameters 17 & 18)

To change position of the glue line height



Fig.8

SAFETY

The machine is cover by safety glass

The machine cannot run if a door is open or the emergency switch is pressed. IN this case the main air valve is closed, the power supply to the motor inverters is switched off and the PLC outputs are not supplied.

The out feed of the cartoning machine have always to be free and have to be connected to any conveyor **but not to collect the product manually from the out feed.**

DON'T try to put hands into the machine while it running.

Always disconnect the air and electrical supply when maintenance is done.

SERVICE/MAINTENANCE

1. Check every 6 month the chains and insure the tension by adjust the tensions.
2. Grease the chains of the main motor, open the door on the motor side.
3. The grease should be every 4 month.
4. Add oil to the air service unit when need (oil 10W).
5. Venture vacuum should be clean every 3 month.
6. Clean the machine surface with air every day after finish working.
7. Air service unit: adjust the oil drop 1 drop every 15sec' if necessary.

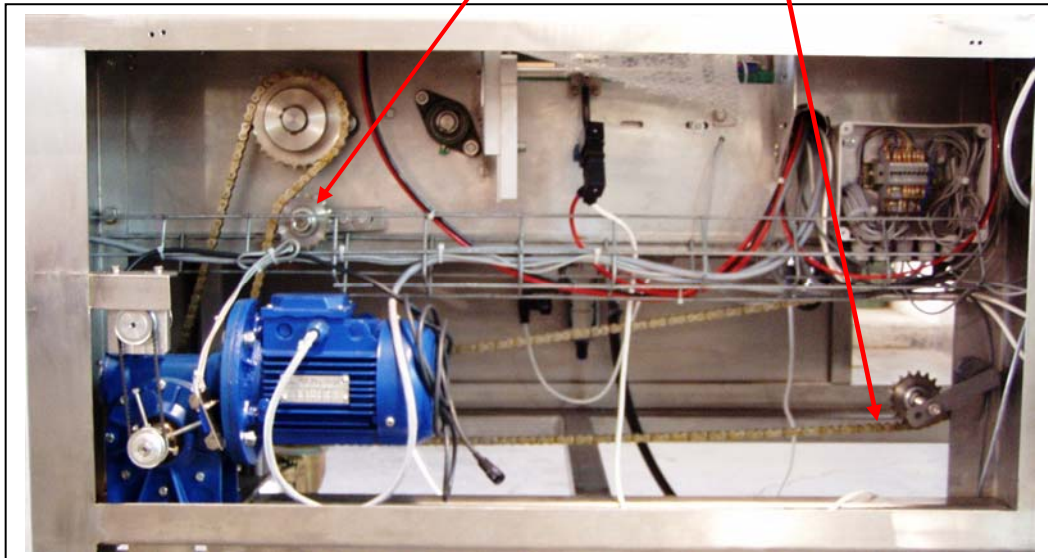
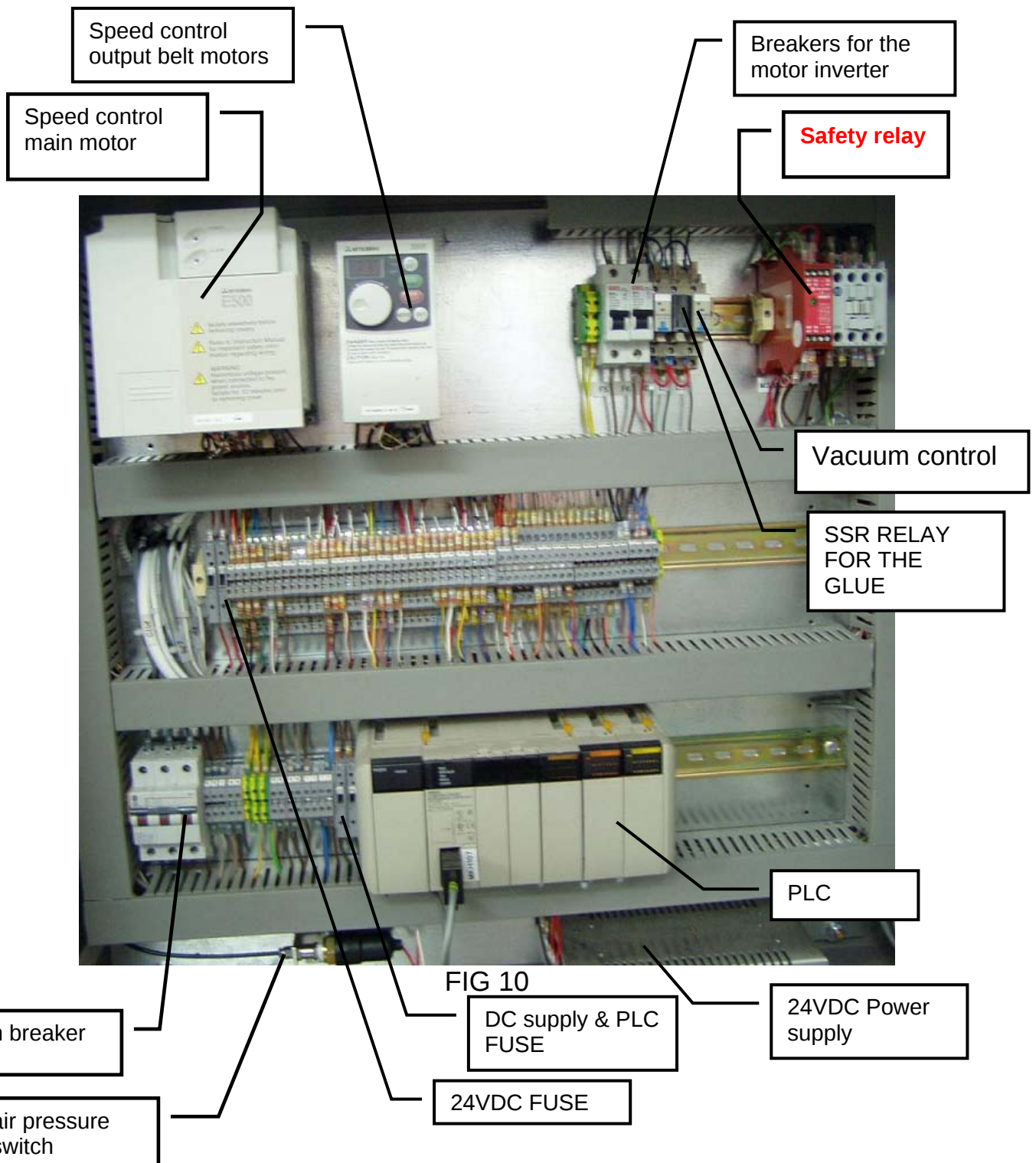


FIG 8



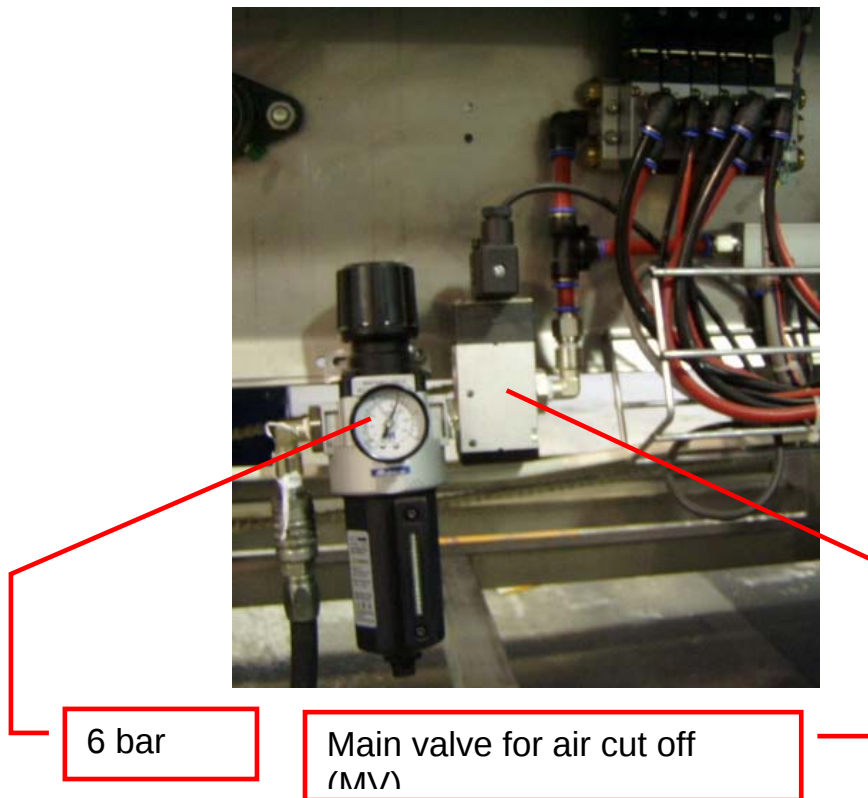
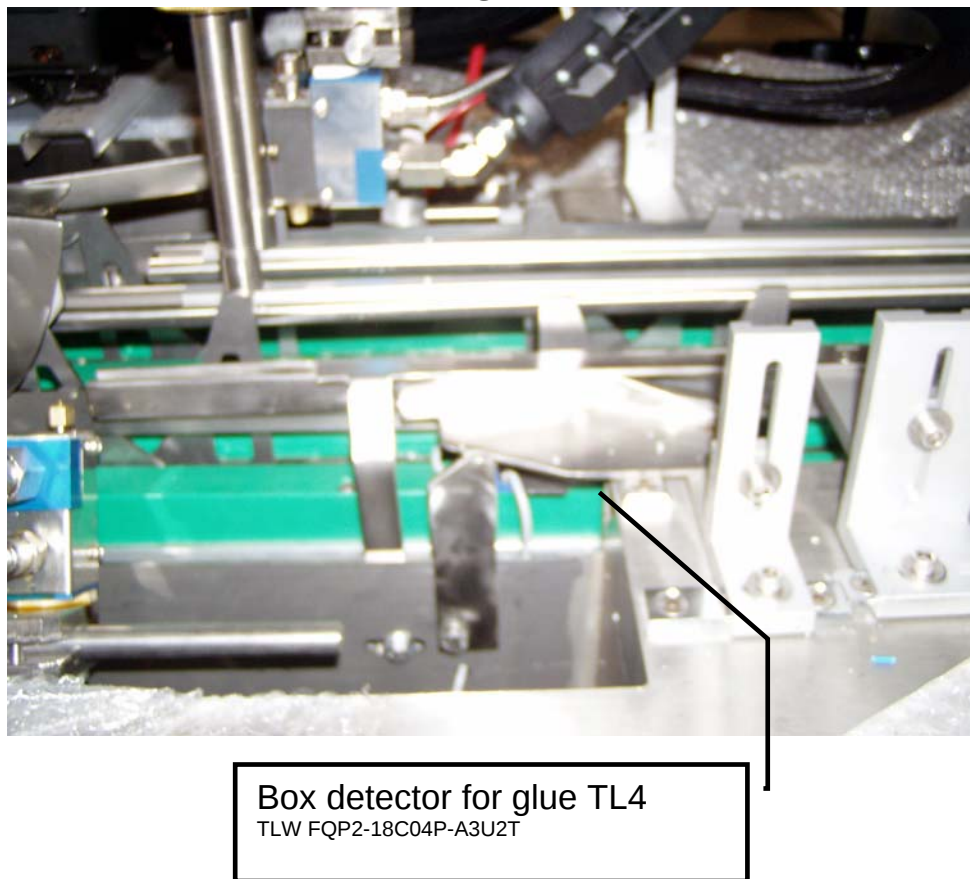


FIG 12



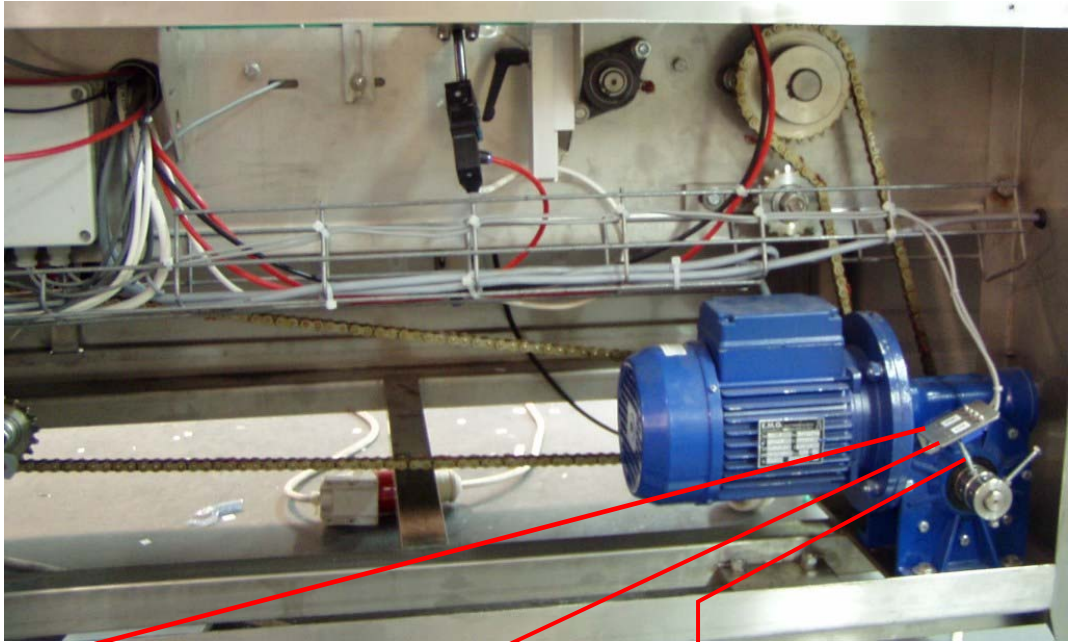


FIG 13

Slow speed sensor TL3
FQP2-18C04P-A3U2T

Home sensor TL2
FQP2-18C04P-A3U2T

Screw for home

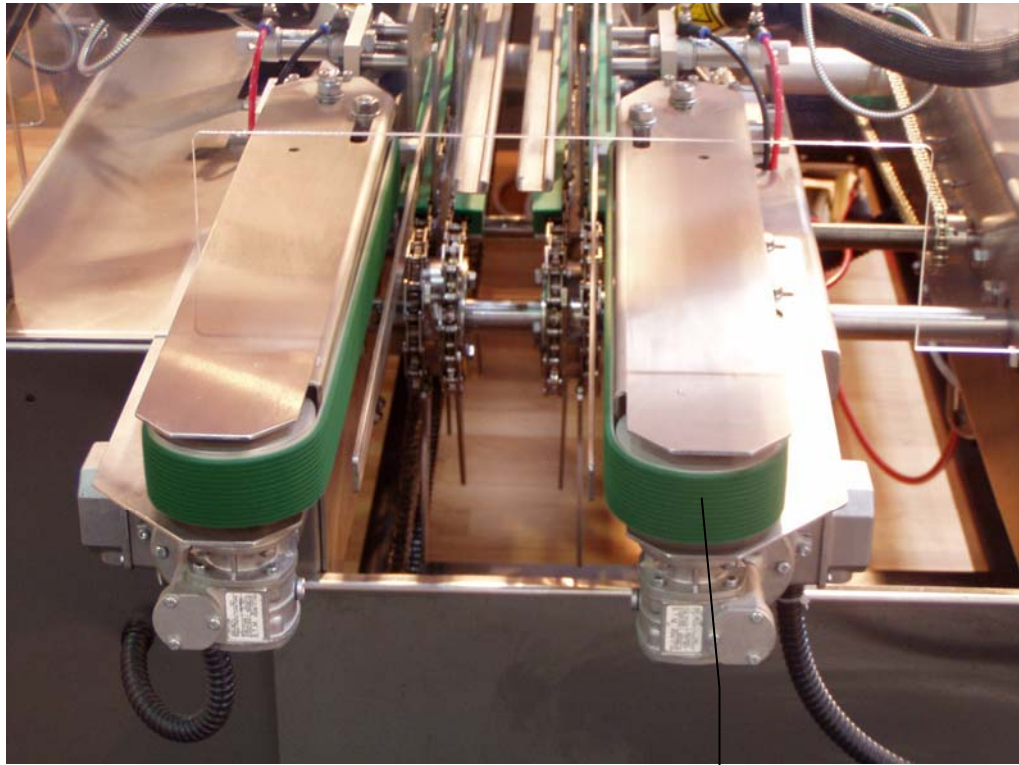


FIG 14

Side belt RMI028 1:7

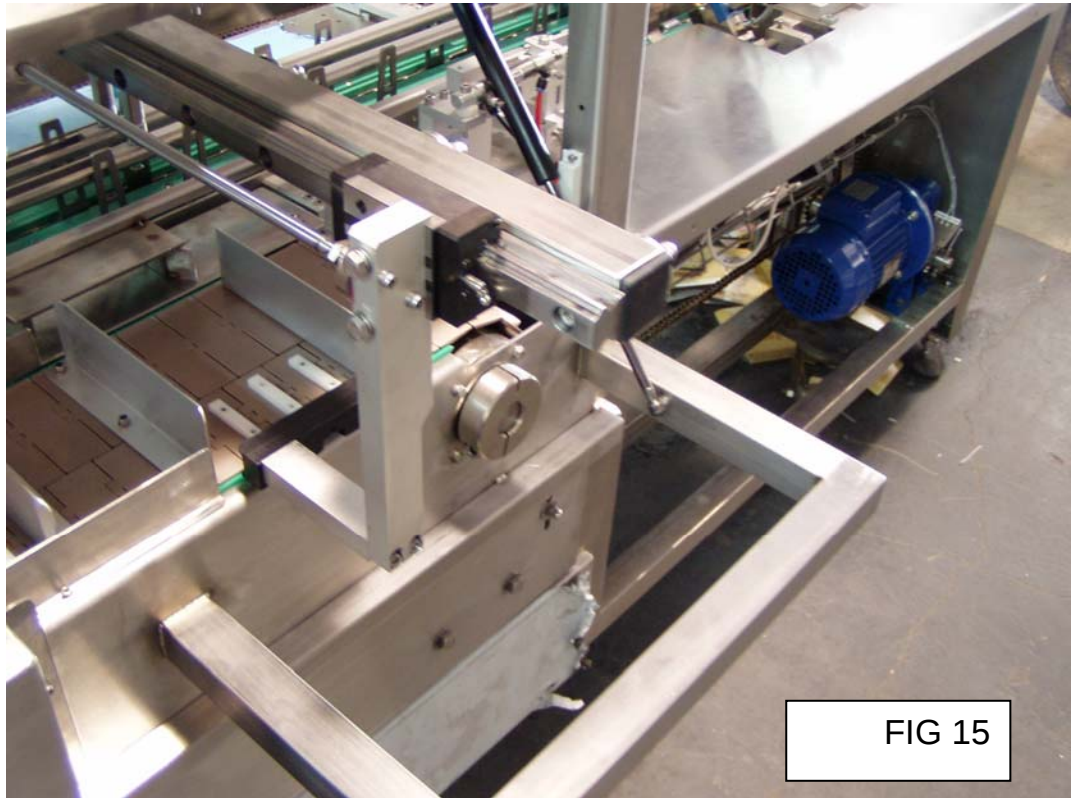


FIG 15

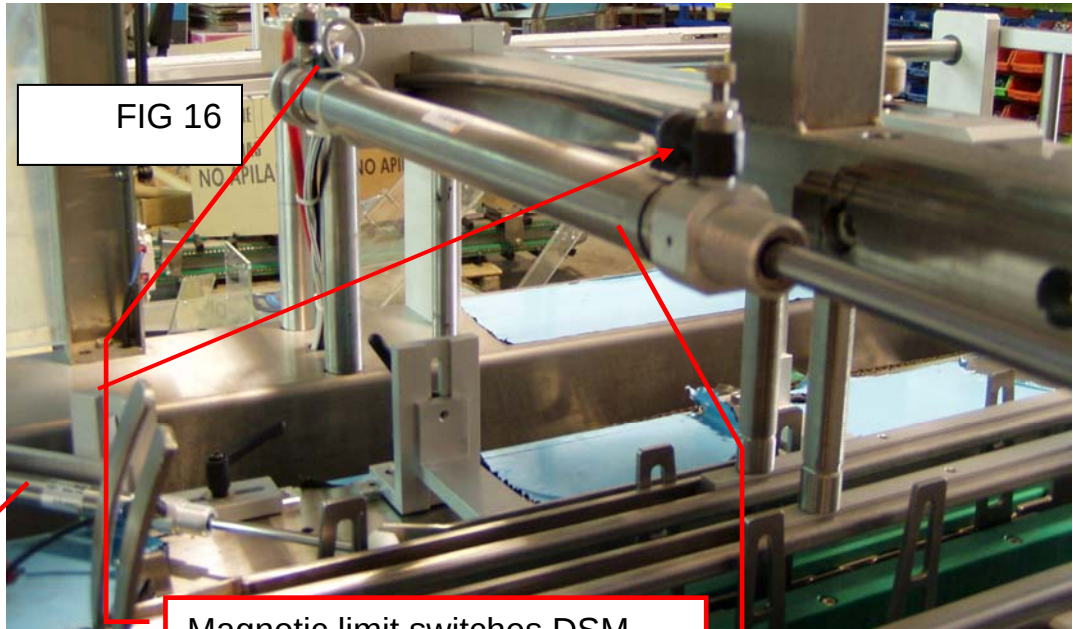


FIG 16

Magnetic limit switches DSM-

Air cylinder B Ø16x100

Air cylinder CH Ø25x420

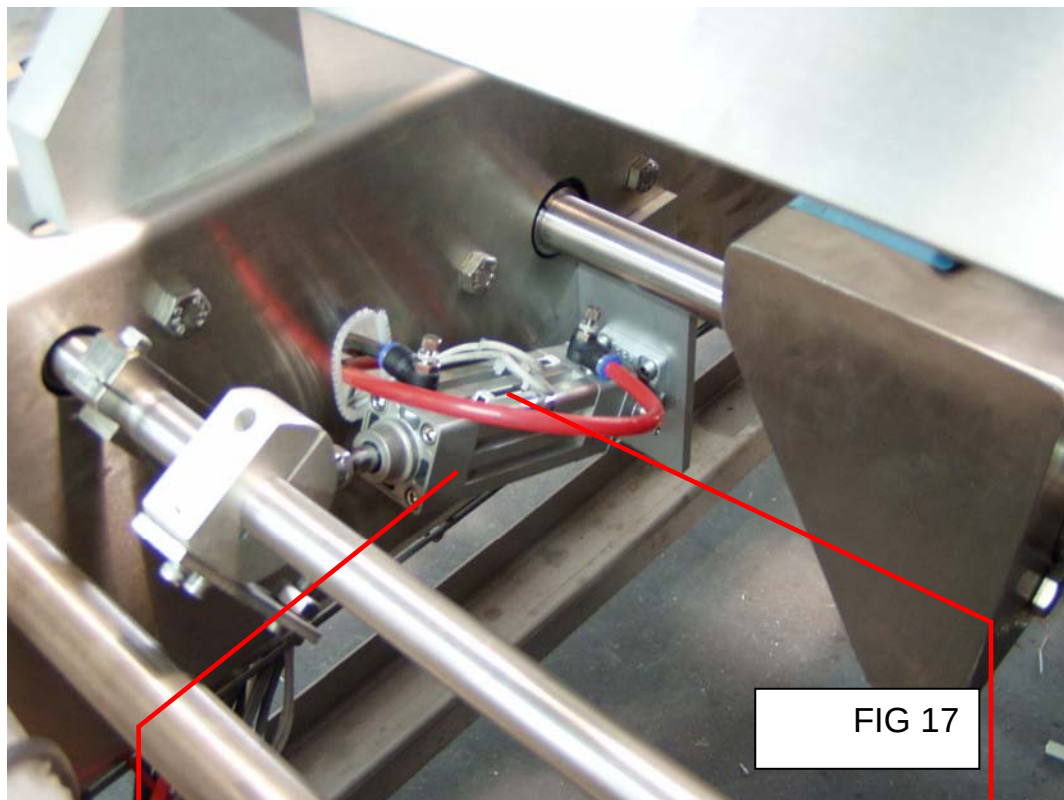


FIG 17

Magnetic limit switches SME8

Air cylinder A Ø32x50

FAULTS

TROUBLE SHOOTING INDICATOR

Each problem of the machine will affect the alarm light.
To see the problem, press on the ALARM key.



Fig.18

Once the problem has been solved, press on the RESET key to clear the alarm screen.

The "HOME" key will pass you to the main screen.

ALARM LIST

Alarm nr	Displayed Message	Description
1	FEEDER CH STUCK IN	The feeder cylinder doesn't reach its stroke end in less than 2.5s. or the Ch1 sensor is defective. Check the air flow limiter and that the pusher doesn't crash with other parts
2	FEEDER CH STUCK OUT	The feeder cylinder doesn't return in its still position when the electro-valve is not activated or the Ch0 sensor is defective
3	PULLING A STUCK	The pulling cylinder doesn't reach its work or still position in less than 2 s. or the a0 or a1 sensor is defective
4	NO CARDBOARD IN MAGAZINE	[OPTIONAL] There are not enough cardboard in the magazine or the sensor (Ph2) is defective.
5	MAIN MOTOR STUCK	The main motor runs continuously for more than 5s. or the TL2 sensor is defective or the frequency inverter is tripped
6	LOW AIR PRESSURE	The air pressure is below the required need (6 bars).
7	EMERGENCY STOP OR DOOR OPEN	A door is open or the emergency stop switch is pressed or the connection of the magnetic switches (Ls) is defective.
8	GLUE NOT READY	The temperature of the hot-melt equipment is below the value set to the glue level in the tank is too low.
9	NO CARTON IN FEEDING STATION	There is no box detected in the feeding station while the feeding cylinder is activated or the TL1 sensor is defective
10	PR10 FEEDER CH STUCK	The feeder cylinder is activated while the machine is not yet in its home position (increase parameter 10).
11	PRODUCT STUCK	[OPTIONAL] A product has been detected on the infeed conveyor after the feeding station or the Ph4 sensor is defective.
12	MACHINE NOT IN HOME	The machine is not stopped in the "home" position or the TL2 sensor is defective
13	PLC battery Low	The PLC battery must be replaced. If possible the machine must stay powered until the battery is replaced. See CQM1H manual operation for replacement
14	LEAFLET CYLINDER (G) STUCK	[OPTIONAL] The leaflet pulling cylinder doesn't return in its still position while the electro-valve is not activated or the g0 sensor is defective
15	PRESS cylinder (H) STUCK	[OPTIONAL] The pressing cylinder doesn't return in its still position while the electro-valve is not activated or the h0 sensor is defective
16	PRESS cylinder (J) STUCK	[OPTIONAL] The pressing cylinder doesn't return in its still position while the electro-valve is not activated or the j0 sensor is defective

Machine stop in automatic mode

- Feeder didn't feed the product into the box, check if the sensor
- Check carton stuck some place in the chain or in the out let of the machine.
- Check fuses 24 V DC in the electric box.
- Feeder move to slow, check the piston move smooth with out air by hand, high the flow control valve of the piston feeder front is to control on the out feed speed and rear control on the infeed speed.
- Chains are not moving smoothly. Turn off the main switch of the machine, try to move the chains with the wheels (U) and be sure that it moves smoothly. If it's look too hard to turn, check that no glue stuck to the chain and the chain is greased.
- One of the doors are open while the machine is operate, turn on the safety switch (2) on the electric box door.
- No glue in the tank see glue level indicator.
- No carton in the magazine see carton in magazine indicator.

No erection

- Check air pressure 6 bar see air pressure indicator.
- Check vacuum venture and clean if necessary.
- Check valve vacuum control.
- Check carton is put in the right position.
- Check vacuum pad no damage.
- Check erection sensor (12)

Carton in magazine indicator.

- Min. carton in the magazine fill cartons.
- Level indicator break, check the indicator lamp on the sensor.
- Clean the sensor if no sense.
- Adjust the sensor if possible.

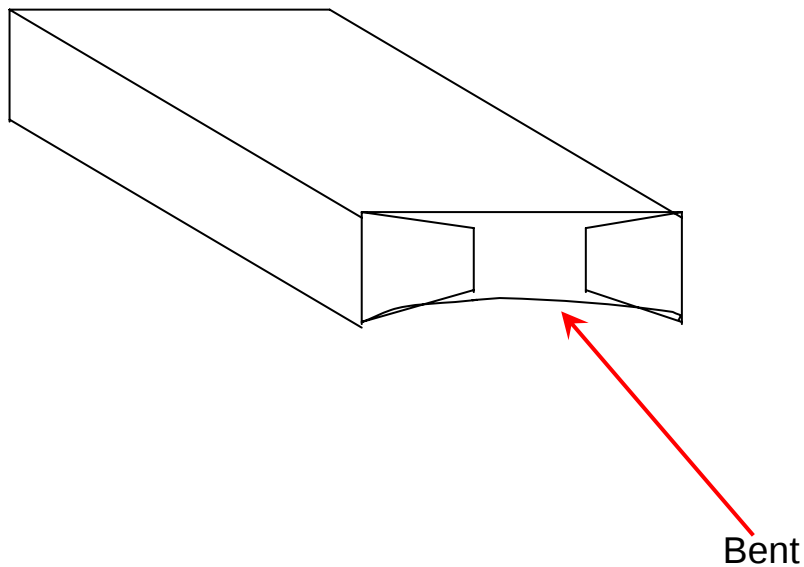
Stepping conveyor not move (use when stepping conveyor is connect)

- The sprocket is not tight see installation.
- Check the Connections between the main motor and the conveyor.

Carton isn't square

- The high adjusting is too tied and presses on the box.
- The sealing station is dirty with glue.
- The width between the pins is too wide.

Carton base is bent



This happened in the second station the opposite of the feeding product while the carton is empty and the criss line are not enough strong. – low down the side flap that will touch the base of the inner side of the box.

COUNTER SCREEN

When the [DETAIL] key is pressed in the SERVICE screen, the following is displayed:



The COUNTS numeric display shows the number of products packed since the last reset. The [RST] key allows to set this counter to 0, for example at the beginning of a new batch or a new worker team.

The RUNNING HOURS numeric display shows the cumulative time the machine is working. It helps to conduct maintenance operation. This display can't be reset.

The TOTAL CYCLES numeric display shows the cumulative number of cycles done on the machine. It helps to conduct maintenance operation. This display can't be reset.

The SPEED numeric display shows the number of cycles per minute. The refresh is made every 30s.

P A R T S L I S T

NAME	Qty	TYPE	BRAND
Pulling unit pneumatic cylinder (A)	1	DNCB-32-050PPV.PA	Festo
Right side flap folding cylinder (B1)	1	DSNU-16-40-PA	Festo
Left side flap folding cylinder (B2)	1	DSNU-16-80-PA	Festo
Final press pneumatic cylinder (D)	2	DSNU-25-10-PA	Festo
Feeding unit pneumatic cylinder (CH)	1	DSNU-25-320-PPV-A	Festo
Printer unit pneumatic cylinder (F)	1	MCJS-12-63-10	Mindman
Top-Holder cylinder (J)	1	DSNU-20-80-PA	Festo
Air service unit	1	LFR-D-MIDI-A	Festo
Vacuum control electrovalve	1	2/2 24N/C	GEM
Suction cups Ø30 for pulling carton	3	VP-30	PISCO
Venturi unit (vacuum generator)	3	VUH07-66A	PISCO
Electro-valves 5/2 24Vdc	6	MEH-5/2-1/8-PB	Festo
Main electro-valve 3/2 24Vdc	1	HEE-D-MIDI-24	Festo
P.L.C power supply unit	1	CQM1-PA203	Omron
P.L.C CPU unit with 16 inputs	1	CQM1H-CPU51	Omron
PLC battery	1	CPM2A-BAT01	Omron
P.L.C 16 inputs unit	1	CQM1-ID212	Omron
P.L.C 16 outputs unit	1	CQM1-OD212	Omron
HMI (Operator control screen)	1	V606-eM10	Hakko
Main motor inverter	1	FR-D720S-070-EC	Mitsubishi
24VDC 200W power supply unit	1	S201-24	Meanwell
Inductive proximity switch	4	FQP2-18C04P-A3U2T	SCAN
Magnetic limit switch for cylinders	3	DSM-1C	MPM
Magnetic limit switch for cylinders	2	SME-8K-LED24	Festo
Door safety switches	4	OPTOPUS-DEC	BTI
Safety relay	1	AWAX 26XXL	BTI
Product sensor before feeding (Ph1)	1	WS/WE100-P1439	Sick
Electromechanical relay 24VDC	2	G2R-1SN-24VDC	Omron
Solid-state relay 24VDC	1	G3R-ODX02SN	Omron
Power relay 3ph + 1xNC 24Vdc	1	100-C09-ZJ01	Allen-Bradley
Power relay 3ph + 1xNO 24Vdc	2	100-C09-ZJ10	Allen-Bradley
Main motor (M1)	1	MTT80A4 0.75kW	CMG
Main gearbox (M1)	1	NMRV063-R1/20	ZIK
Output motor (M2 & M3)	2	TN56B4 0.09kW	MT
Output gearbox (M2 & M3)	2	RMI28SL R1/7	STM
Chain 1/2"		ISO-08B	
Output belt	2	1350x50	
Pins driving chain		C2040H	

P.L.C. DATA
&
CONNECTION LIST

MKH-130
SCS (D)
SN 069608

P.L.C DATA OMRON (CPU) INPUT P.N.P

in	Cable/Color			DESCRIPTION	Main
0.00	W1	BROWN			[10U]
0.01	W1	ORANGE	A1	MAGNETIC LIMIT SWITCH FOR PULLING (down)	[11U]
0.02	W1	YELLOW	A0	MAGNETIC LIMIT SWITCH FOR PULLING (up)	[12U]
0.03	W1	GREEN			[13U]
0.04	W1	BLUE			[14U]
0.05	W1	PURPLE			[15U]
0.06	W1	GREY			[16U]
0.07	W1	WHITE			[17U]
0.08	W1	GREY-WHITE			[20U]
0.09	W1	YELLOW-WHITE			[21U]
0.10	W1	GREEN-WHITE	TL3	PROXIMITY SWITCH FOR SLOW POSITION	[22U]
0.11	W1	BLUE-WHITE	TL2	PROXIMITY SWITCH FOR HOME POSITION	[23U]
0.12	W1	PURPLE WHITE	GL	GLUE READY	[24U]
0.13	W1	RED WHITE			[25U]
0.14	W1	BROWN WHITE			[26U]
0.15	W1	BLACK WHITE	PR1	AIR PRESSURE SWITCH	[27U]

P.L.C DATA OMRON INPUT (CQM1-ID212) P.N.P

in	Cable/Color			DESCRIPTION	Main
1.00	W2	BROWN			[28U]
1.01	W2	ORANGE			[29U]
1.02	W2	YELLOW	J0	Top-Holder cylinder limit switch	[30U]
1.03	W2	GREEN	PH1	PHOTOELECTRIC SWITCH FOR PULLING UNIT	[31U]
1.04	W2	BLUE			[32U]
1.05	W2	PURPLE			[33U]
1.06	W2	GREY			[34U]
1.07	W2	WHITE			[35U]
1.08	W2	GREY-WHITE	TL1	PROXIMITY SWITCH FOR KARTON IN FEED STATION	[36U]
1.09	W2	YELLOW-WHITE	TL4	PROXIMITY SWITCH FOR BOX IN GLUE STATION	[37U]
1.10	W2	GREEN-WHITE	E.S	EMERGENCY STOP + DOORS (safety relay)	[38U]
1.11	W2	BLUE-WHITE	START	START PUSH-BUTTON	[39U]
1.12	W2	PURPLE WHITE	STOP	STOP PUSH-BUTTON	[40U]
1.13	W2	RED WHITE	CHO	MAGNETIC LIMIT SWITCH FOR FEEDER PISTON (in)	[41U]
1.14	W2	BROWN WHITE	CH1	MAGNETIC LIMIT SWITCH FOR FEEDER PISTON (out)	[42U]
1.15	W2	BLACK WHITE			[43U]

P.L.C OMRON OUTPUT (CQM1-OD212) N.P.N

out	Cable/Color			DESCRIPTION	Main
100.00	W3	BROWN	C3-KM3	OUTFEED CONVEYOR (M2 & M3)	[44D]
100.01	W3	ORANGE	M1-STF	MAIN MOTOR SLOW	[45D]
100.02	W3	YELLOW	M1-RL	MAIN MOTOR HIGH SPEED	[46D]
100.03	W3	GREEN	M1-RM	MAIN MOTOR 2ND DECELERATION	[47D]
100.04	W3	BLUE	J	PRESS CYLINDER (TOP-HOLDER)	[48D]
100.05	W3	PURPLE	A	PULLING UNIT VALVE	[49D]
100.06	W3	GREY	B	FLAP FOLDING VALVE	[50D]
100.07	W3	WHITE	CH	FEEDER VALVE	[51D]
100.08	W3	GREY-WHITE	F	PRINTER VALVE	[52D]
100.09	W3	YELLOW-WHITE	D	FINAL PRESS VALVE	[53D]
100.10	W3	GREEN-WHITE	MV	MAIN AIR SUPPLY VALVE	[54D]
100.11	W3	BLUE-WHITE			[55D]
100.12	W3	PURPLE WHITE			[56D]
100.13	W3	RED WHITE	C2 (SSR)	GLUE VALVE (GL-R)	[57D]
100.14	W3	BROWN WHITE	C1	VACUUM VALVE (VA)	[58D]
100.15	W3	BLACK WHITE			[59D]

CONNECTION LIST (Power)

Power Supply 3x380VAC +Neutral + Earth 3kW	R		
	S		
	T		
	N		
	G		
R	R		
	R		
	R		
S	S		
	S		
	S		
T	T		
	T		
	T		
	T		
N	N		
	N		
	N		
	N		
	G		
	G		
K1-(2)	R1		
	R1		
K1-(4)	S1		
	S1		
K1-(6)	T1		
	T1		
	G		
	F3		220VAC to 24VDC power supply
	F4		220VAC to PLC
	F1		24Vdc for PLC inputs
	F2		24Vdc for PLC outputs

CONNECTION LIST INPUT P.N.P TYPE

W1	BROWN	10U	In 0.00	
	(+)24V PLC	10M		
	(-)0V PLC	10D		
W1	ORANGE	11U	A1	MAGNETIC LIMIT SWITCH FOR PULLING (down)
	(+)24V PLC	11M		
	(-)0V PLC	11D		
W1	YELLOW	12U	A0	MAGNETIC LIMIT SWITCH FOR PULLING (up)
	(+)24V PLC	12M		
	(-)0V PLC	12D		
W1	GREEN	13U	Ph4	Product safety sensor (→ box A 6U) optional
	(+)24V PLC	13M		
	(-)0V PLC	13D		
W1	BLUE	14U	In 0.04	
	(+)24V PLC	14M		
	(-)0V PLC	14D		
W1	PURPLE	15U	In 0.05	
	(+)24V PLC	15M		
	(-)0V PLC	15D		
W1	GREY	16U	In 0.06	
	(+)24V PLC	16M		
	(-)0V PLC	16D		
W1	WHITE	17U	In 0.07	
	(+)24V PLC	17M		
	(-)0V PLC	17D		
		18U		
	(+)24V PLC	18M		
	(-)0V PLC	18D		
		19U		
	(+)24V PLC	19M		
	(-)0V PLC	19D		
W1	GREY-WHITE	20U	In 0.08	
	(+)24V PLC	20M		
	(-)0V PLC	20D		
W1	YELLOW-WHITE	21U	In 0.09	
	(+)24V PLC	21M		
	(-)0V PLC	21D		
W1	GREEN-WHITE	22U	TL3	PROXIMITY SWITCH FOR SLOW POSITION
	(+)24V PLC	22M		
	(-)0V PLC	22D		
W1	BLUE-WHITE	23U	TL2	PROXIMITY SWITCH FOR HOME POSITION
	(+)24V PLC	23M		
	(-)0V PLC	23D		
W1	PURPLE WHITE	24U	GL ready	Glue ready (white → TB2/1) (red → TB2/2)
	(+)24V PLC	24M		
	(-)0V PLC	24D		
W1	RED WHITE	25U	In 0.13	
	(+)24V PLC	25M		
	(-)0V PLC	25D		
W1	BROWN-WHITE	26U	In 0.14	
	(+)24V PLC	26M		
	(-)0V PLC	26D		
W1	BLACK WHITE	27U	PR1	AIR PRESSURE SWITCH
	(+)24V PLC	27M		
	(-)0V PLC	27D		
W2	BROWN	28U	In 1.00	(→ box A 02U)
	(+)24V PLC	28D		

	(-)0V PLC	28M		
W2	ORANGE	29U	In 1.01	(→ box A 03U)
	(+)24V PLC	29M		
	(-)0V PLC	29D		
W2	YELLOW	30U	J0	Top-holder cylinder limit switch
	(+)24V PLC	30M		
	(-)0V PLC	30D		
W2	GREEN	31U	PH1	PHOTOELECTRIC SWITCH FOR PULLING UNIT
	(+)24V PLC	31M		
	(-)0V PLC	31D		
W2	BLUE	32U	In 1.04	
	(+)24V PLC	32M		
	(-)0V PLC	32D		
W2	PURPLE	33U	In 1.05	
	(+)24V PLC	33M		
	(-)0V PLC	33D		
W2	GREY	34U	In 1.06	
	(+)24V PLC	34M		
	(-)0V PLC	34D		
W2	WHITE	35U	In 1.07	
	(+)24V PLC	35M		
	(-)0V PLC	35D		
W2	GREY-WHITE	36U	TL1	PROXIMITY SWITCH FOR KARTON IN FEED STATION
	(+)24V PLC	36M		
	(-)0V PLC	36D		
W2	YELLOW-WHITE	37U	TL4	PROXIMITY SWITCH FOR BOX IN GLUE STATION
	(+)24V PLC	37M		
	(-)0V PLC	37D		
W2	GREEN-WHITE	38U	SAF-24	Emergency-Stop (SAFETY RELAY)
	(+)24V PLC	38M		
	(-)0V PLC	38D		
W2	BLUE-WHITE	39U	Start	Start push-button (W7-GREEN)
	(+)24V PLC	39M	HMI +24Vdc	HMI DC SUPPLY (W7-RED)
	(-)0V PLC	39D	HMI -0Vdc	HMI DC SUPPLY (W7-BLACK)
W2	PURPLE WHITE	40U	Stop	Stop push-button (W7-YELLOW)
	(+)24V PLC	40M	Com+	(W7-BLUE)
	(-)0V PLC	40D		
W2	RED WHITE	41U	CH0	MAGNETIC LIMIT SWITCH FOR FEEDER PISTON (in)
	(+)24V PLC	41M		
	(-)0V PLC	41D		
W2	BROWN-WHITE	42U	CH1	MAGNETIC LIMIT SWITCH FOR FEEDER PISTON (out)
	(+)24V PLC	42M		
	(-)0V PLC	42D		
W2	BLACK WHITE	43U	In 1.15	
	(+)24V PLC	43M		
	(-)0V PLC	43D		

CONNECTION LIST OUTPUT N.P.N TYPE

	+24VDC	44U		
W3	BROWN	44D	VR2-STF	OUTFEED CONVEYOR (M2&M3)
	+24VDC	45U		
W3	ORANGE	45D	M1-STF	MAIN MOTOR SLOW
	+24VDC	46U		
W3	YELLOW	46D	M1-RL	MAIN MOTOR HIGH SPEED
	+24VDC	47U		
W3	GREEN	47D	M1-RM	MAIN MOTOR SECOND DECELERATE
	+24VDC	48U	+com	+24Vdc to electro-valves
W3	BLUE	48D	J	TOP-HOLDER CYLINDER (W5-GREY)
	+24VDC	49U		
W3	PURPLE	49D	A	PULLING UNIT VALVE (W5-BROWN)
	+24VDC	50U		
W3	GREY	50D	B	FLAP FOLDING VALVE (W5-BLUE)
	+24VDC	51U		
W3	WHITE	51D	CH	FEEDER VALVE (W5-WHITE)
		52U		
W3	GREY-WHITE	52D	F	PRINTER VALVE (W5-GREEN)
		53U		
W3	YELLOW-WHITE	53D	D	FINAL PRESS VALVE (W5-YELLOW)
		54U		
W3	GREEN-WHITE	54D	MV	MAIN AIR SUPPLIER VALVE
		55U		
W3	BLUE-WHITE	55D	Out 100.11	
		56U		
W3	PURPLE WHITE	56D	Out 100.12	
		57U		
W3	RED WHITE	57D	C2	GLUE APPLICATOR (GL-R + GL-L)
		58U		
W3	BROWN WHITE	58D	C1	VACUUM VALVE (VA)
		59U		
W3	BLACK WHITE	59D	Out 100.15	
		60U	C1-3	VA vacuum valve
		60D		
		61U	C2-3	GL-L + GL-R glue valves
		61D		
	AWAX – T11	62U	Ls1-red	Ls1 door safety switch
	Ls1-black	62D	Ls2-red	Ls2 door safety switch
	Ls2-black	63U	Ls3-red	Ls3 door safety switch
	Ls3-black	63D	Ls4-red	Ls4 door safety switch
	Ls4-black	64U	ES –c1	EMERGENCY STOP (W7-WHITE)
	AWAX – T12	64D	ES –c1	EMERGENCY STOP (W7-PURPLE)
	AWAX – T21	65U	Ls1-grey	Ls1 door safety switch
	Ls1-orange	65D	Ls2-grey	Ls2 door safety switch
	Ls2-orange	66U	Ls3-grey	Ls3 door safety switch
	Ls3-orange	66D	Ls4-grey	Ls4 door safety switch
	Ls4-orange	67U	ES –c2	EMERGENCY STOP (W7-GREY)
	AWAX – T22	67D	ES –c2	EMERGENCY STOP (W7-PINK)
	+24VDC	68U	Ls1-brown	Ls1 door safety switch
	-0Vdc	68D	Ls1-blue	
	+24VDC	69U	Ls2-brown	Ls2 door safety switch
	-0Vdc	69D	Ls2-blue	
	+24VDC	70U	Ls3-brown	Ls3 door safety switch
	-0Vdc	70D	Ls3-blue	
	+24VDC	71U	Ls4-brown	Ls4 door safety switch
	-0Vdc	71D	Ls4-blue	

VALVE

CABLE	COLOR	VALVE		MAIN
W5	RED	COM	+24Vdc	[48U]
W5	BROWN	A	PULLING UNIT	[49D]
W5	BLUE	B	FLAP FOLDING	[50D]
W5	YELLOW	D	FINAL PRESS VALVE	[53D]
W5	WHITE	CH	FEEDER VALVE	[51D]
W5	GREEN	F	PRINTER	[52D]
W5	GREY	J	PRESS CYLINDER (TOP-HOLDER)	[48D]
W5	ORANGE			
W5	PURPLE			
W5	BLACK			

A BROWN	B BLUE	D YELLOW	CH WHITE	F GREEN	J GREY
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CONTROL BOX

CABLE	COLOR	CONTROL BOX		MAIN
W7	BLACK	(-0VDC)	HMI [-]	[39D]
W7	RED	(+24VDC)	HMI [+]	[39M]
W7	ORANGE	Earth	HMI [E]	
W7	GREEN	START	START P.B	[39U]
W7	YELLOW	STOP	STOP P.B	[40U]
W7	BLUE	(+24Vdc)	+Com PLC	[40M]
W7	WHITE	E.S	EMERGENCY STOP P.B (cont.1)	[64U]
W7	PURPLE	E.S	EMERGENCY STOP P.B (cont.1)	[64D]
W7	GREY	E.S	EMERGENCY STOP P.B (cont.2)	[67U]
W7	PINK	E.S	EMERGENCY STOP P.B (cont.2)	[67D]

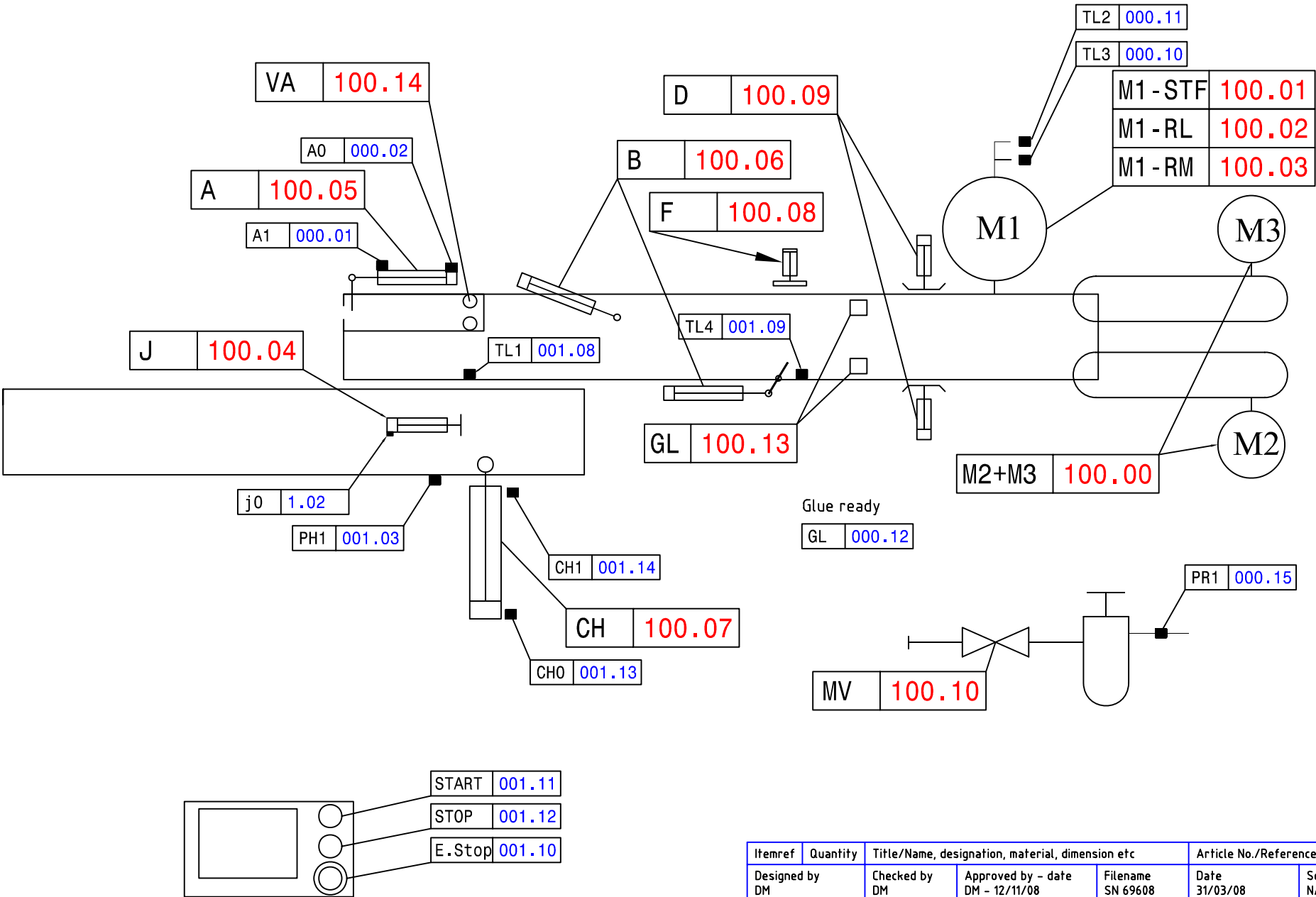
CONNEXION BOX A

CABLE	COLOR			DESCRIPTION	MAIN
W8	BLUE	01U	TL1	SENSOR FOR KARTON IN FEEDING STATION	[36U]
W8	RED	01M	+24Vdc		[36M]
W8	BLACK	01D	-0Vdc		[36D]
W8	BROWN	02U	In 1.00		[28U]
		02M			
		02D			
W8	ORANGE	03U	In 1.01		[29U]
		03M			
		03D			
W8	WHITE	04U	PH1	PHOTOELECTRIC SWITCH FOR PULLING UNIT	[31U]
		04M			
		04D			
W8	YELLOW	05U	TL4	SENSOR FOR BOX IN GLUE STATION	[37U]
		05M			
		05D			
W8	GREEN	06U	PH4	ph4 product safety **** (optional)	[13U]
		06M			
		06D			
W8	PURPLE	07U	TL2	PROXIMITY SWITCH FOR HOME POSITION	[23U]
		07M			
		07D			
W8	GREY	08U	TL3	PROXIMITY SWITCH FOR SLOW POSITION	[22U]
		08M			
		08D			
door	BLACK	09U	Ls1	Door safety switch (black)	[62U]
		09M			
door	RED	09D	Ls1	Door safety switch (red)	[62D]
door	BROWN	10U	Ls1	Door safety switch (brown)	[68U]
		10M			
door	BLUE	10D	Ls1	Door safety switch (blue)	[68D]
door	GREEN	11U	Ls1	Door safety switch (grey)	[65U]
		11M			
door	WHITE	11D	Ls1	Door safety switch (orange)	[65D]

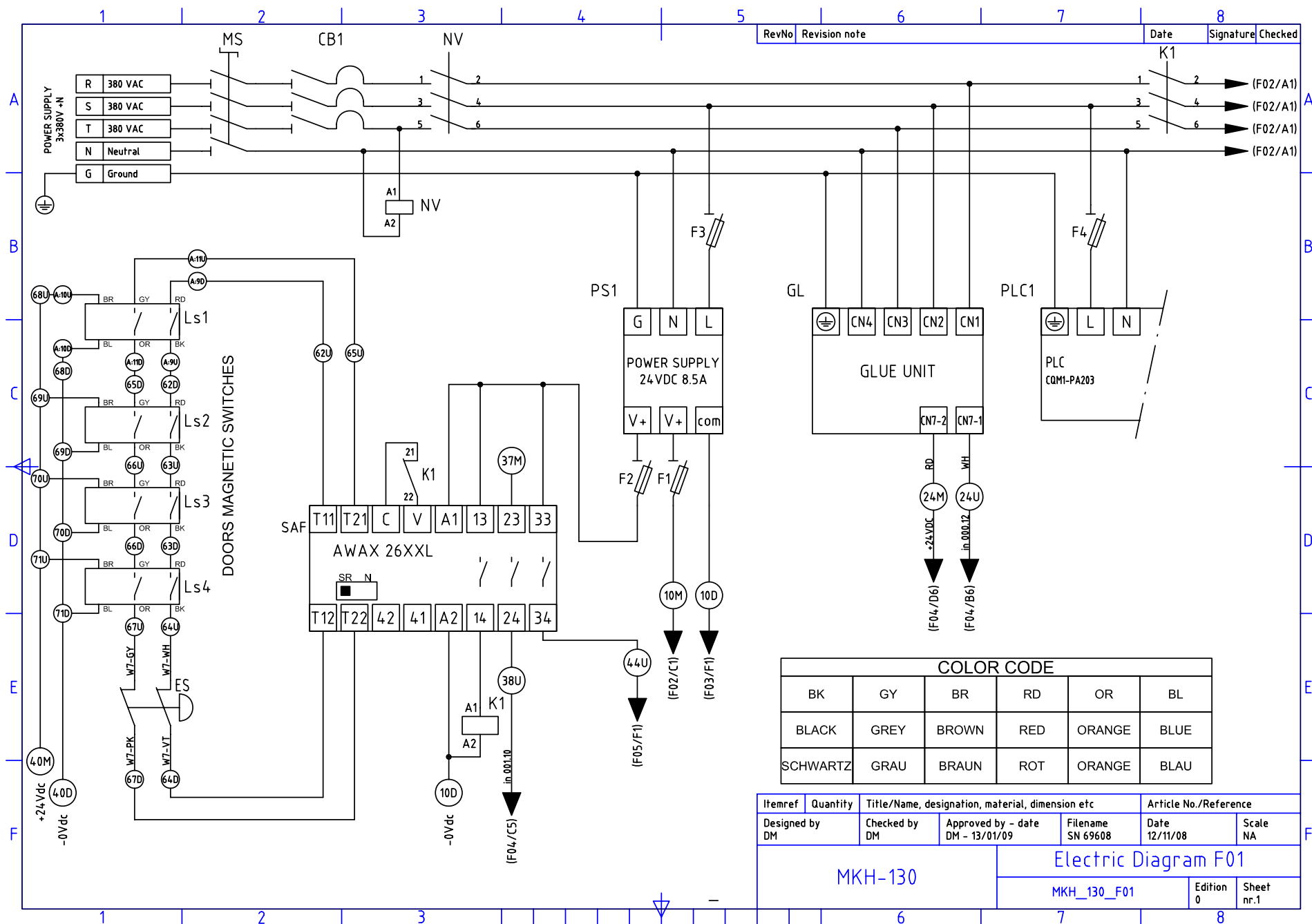
ELECTRIC SCHEME
&
PNEUMATIC SCHEME

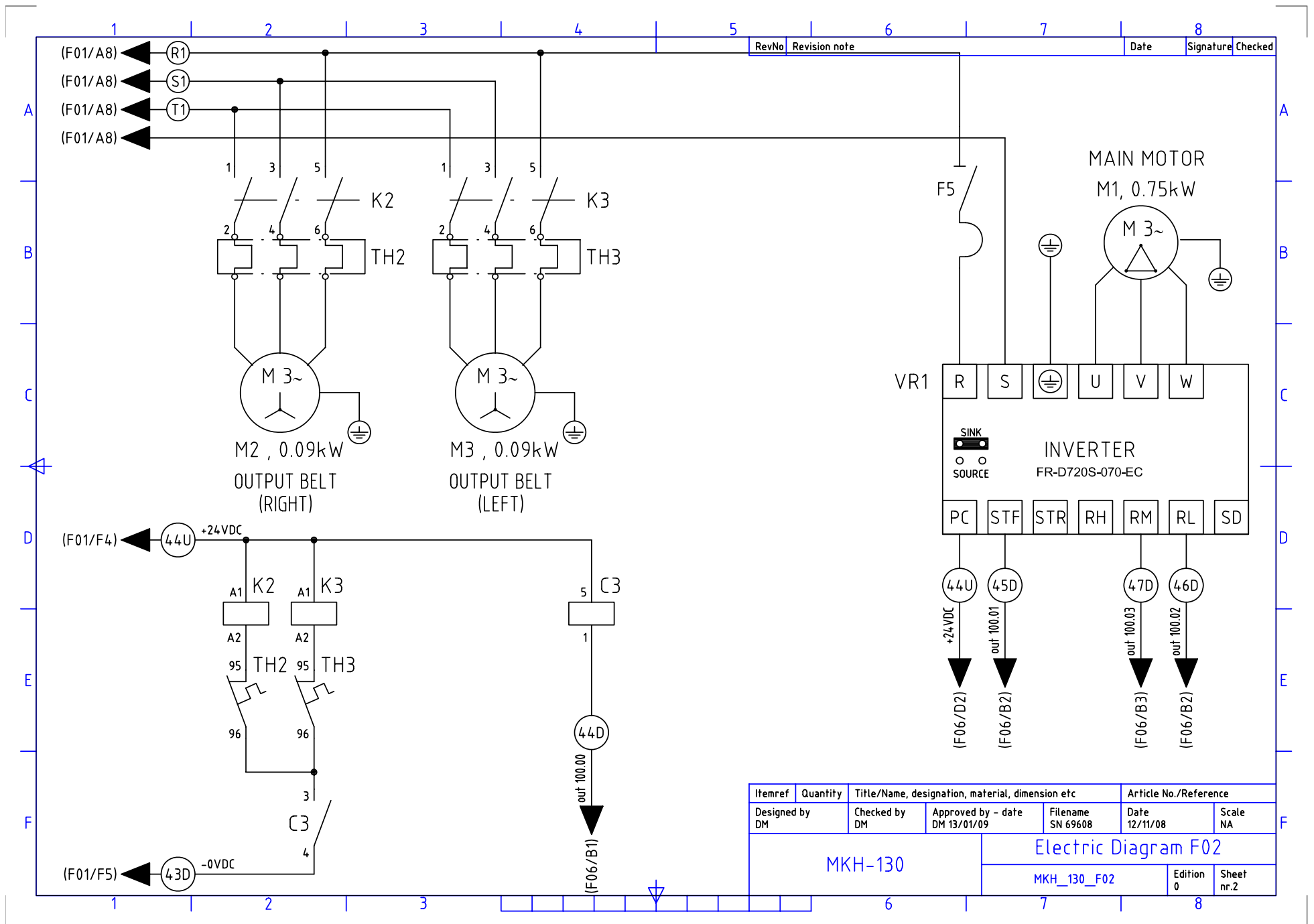
MKH-130-Layout

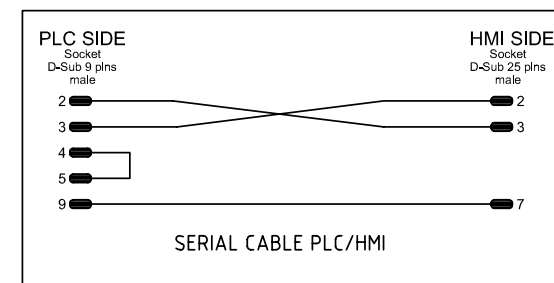
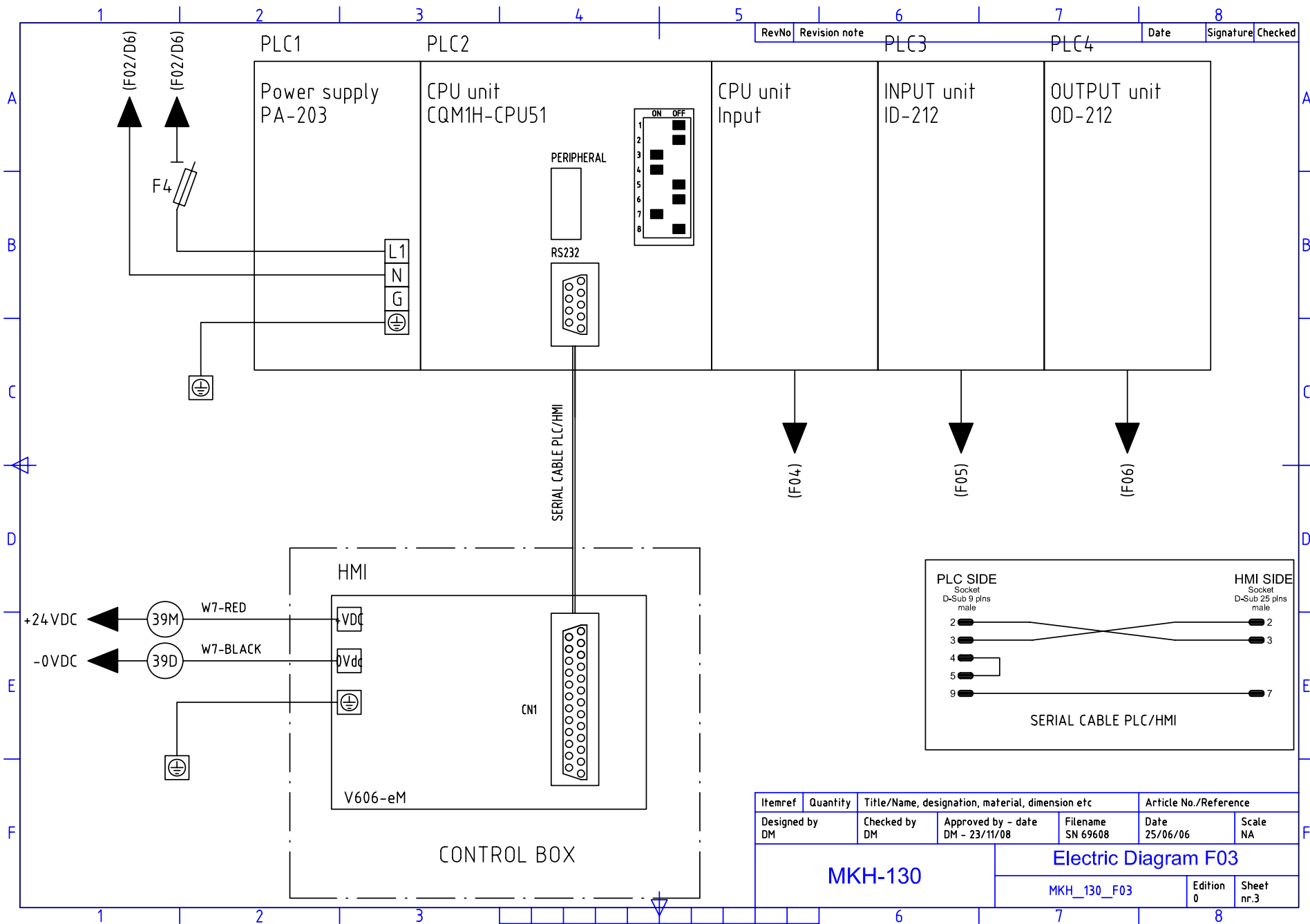
RevNo	Revision note	Date	Signature	Checked
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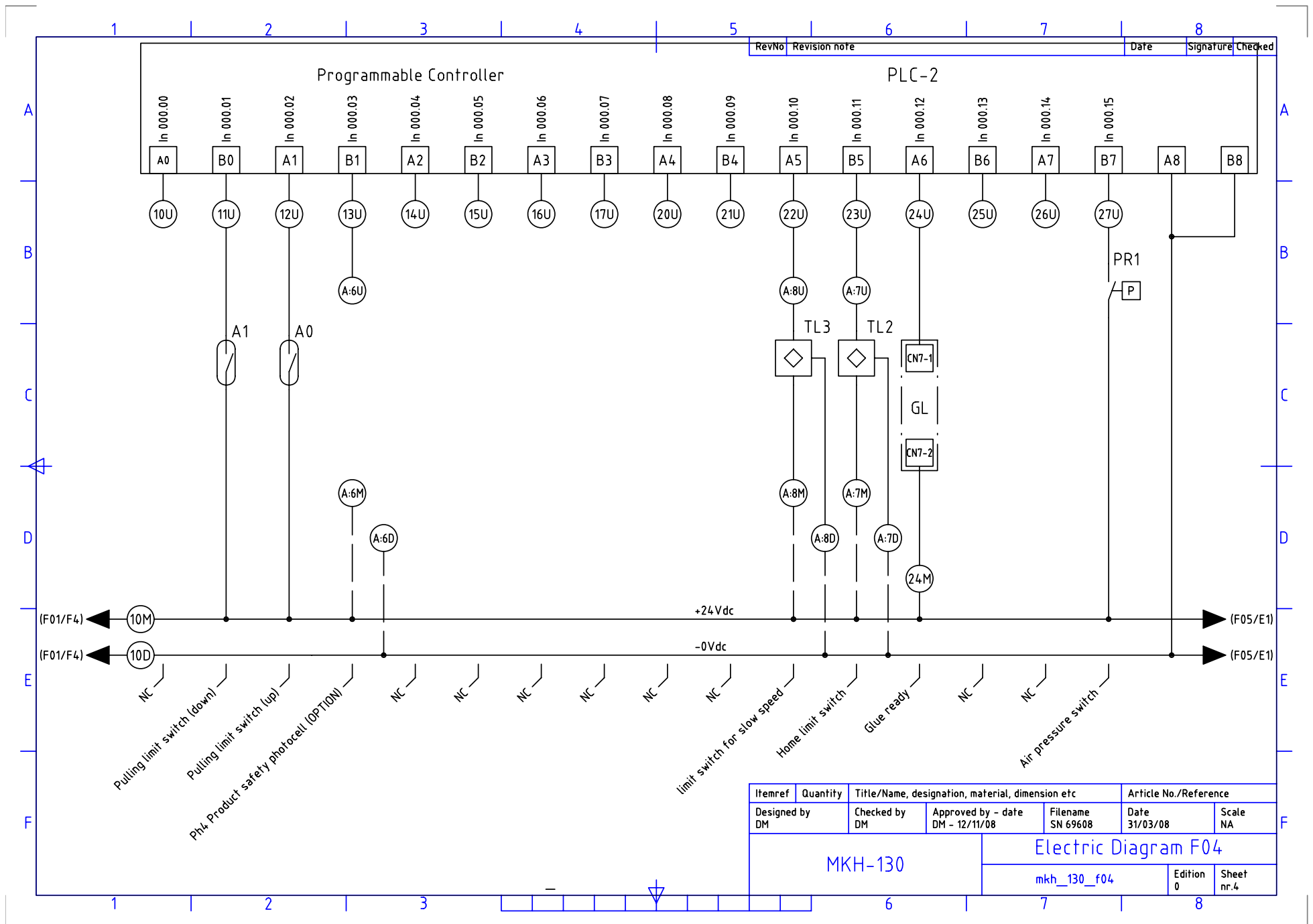
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Designed by DM	Checked by DM	Approved by - date DM - 12/11/08	Filename SN 69608	Date 31/03/08	Scale NA	
MKH-130			I/O LAYOUT			
			MKH_130_layout	Edition 0	Sheet nr.0	

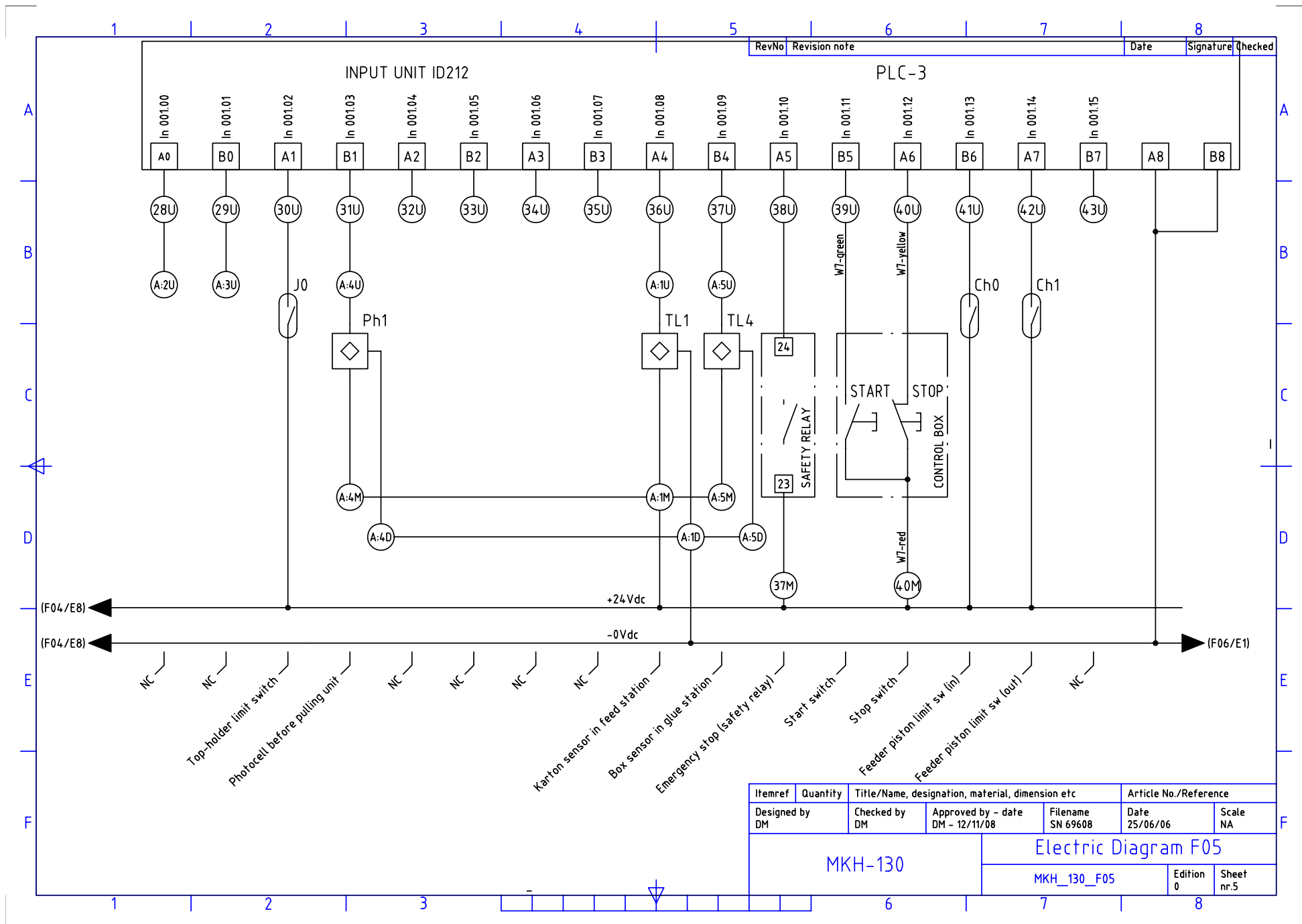


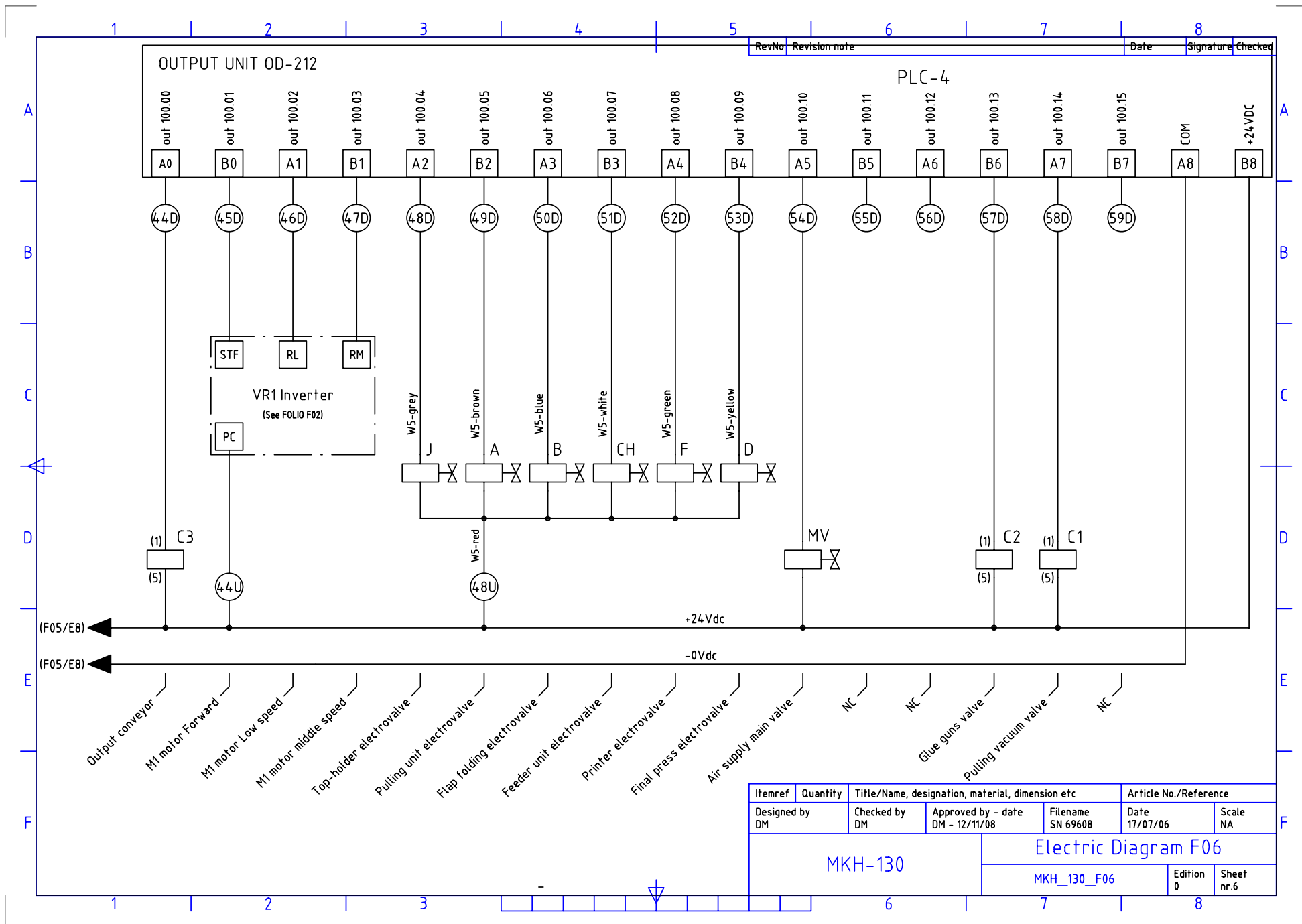




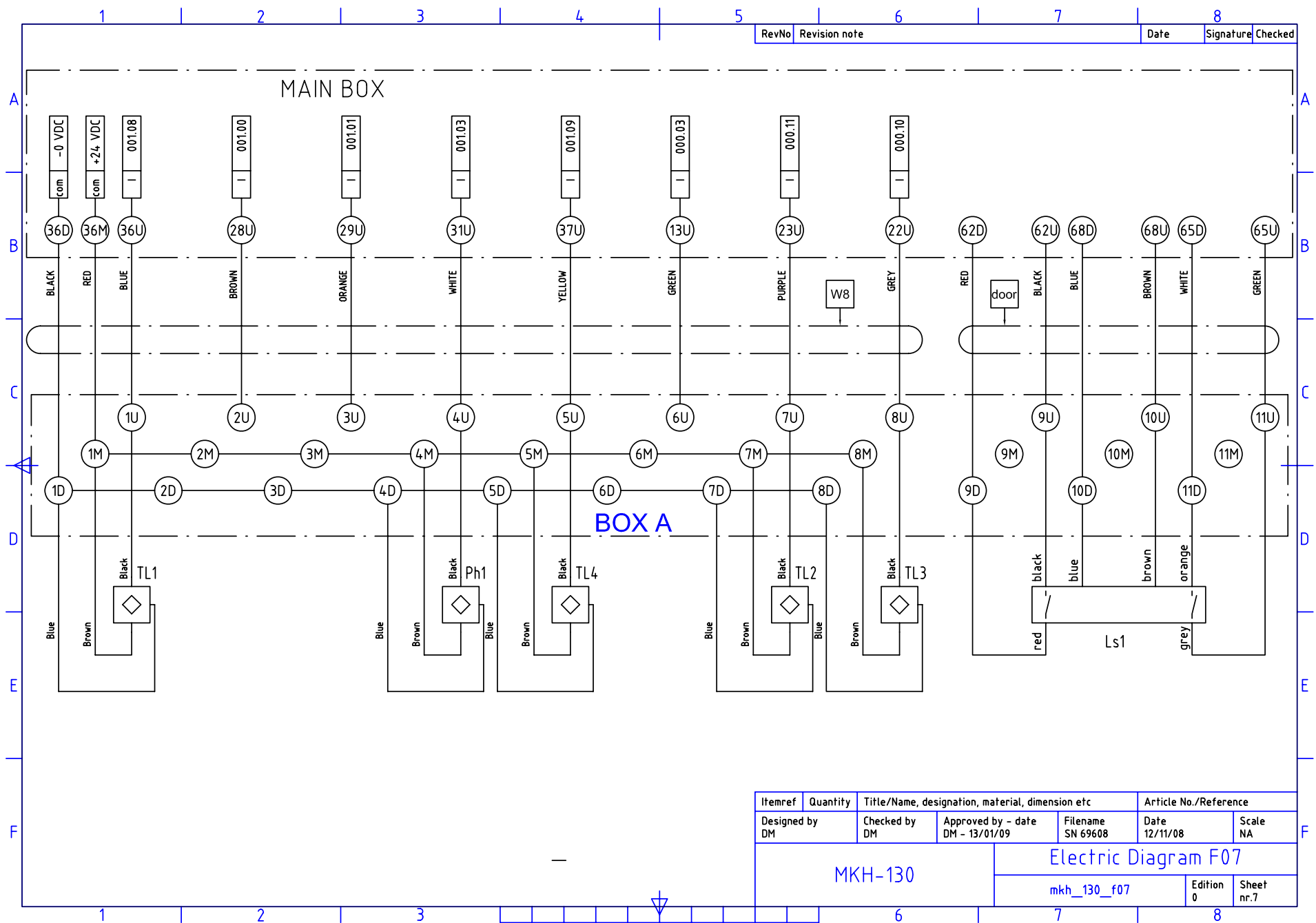
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MKH-130				Electric Diagram F03		
				MKH_130_F03	Edition 0	Sheet nr.3

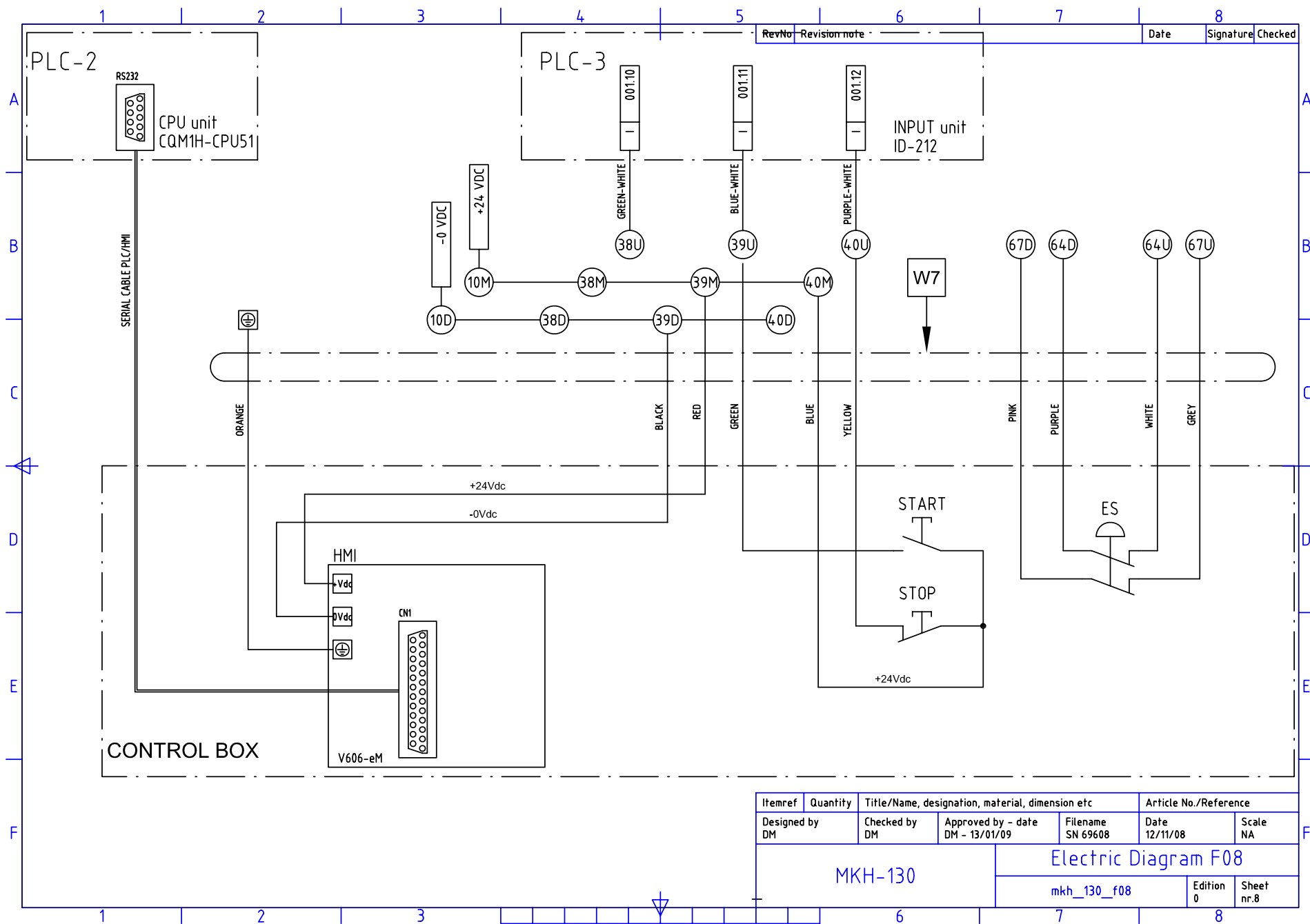


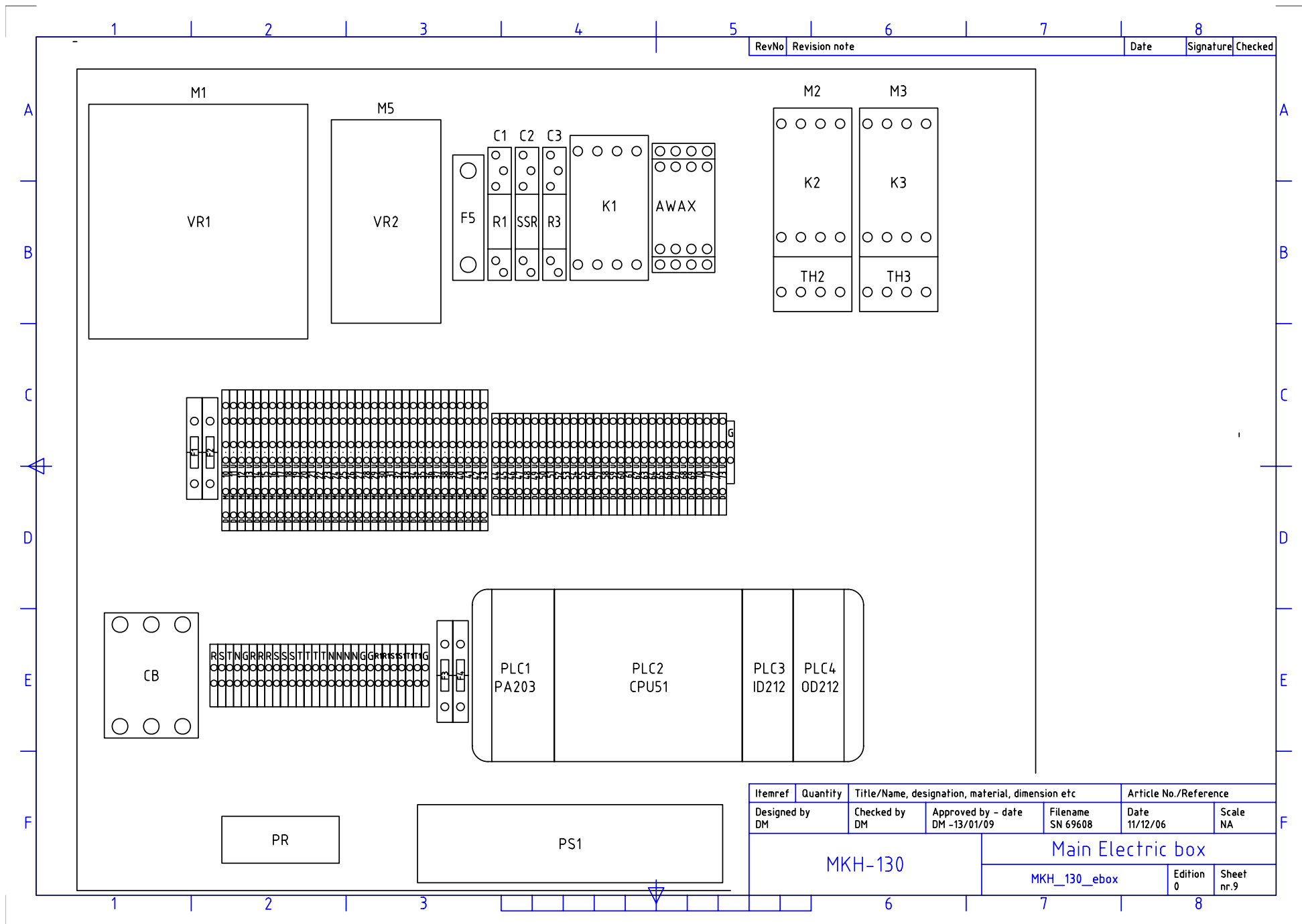




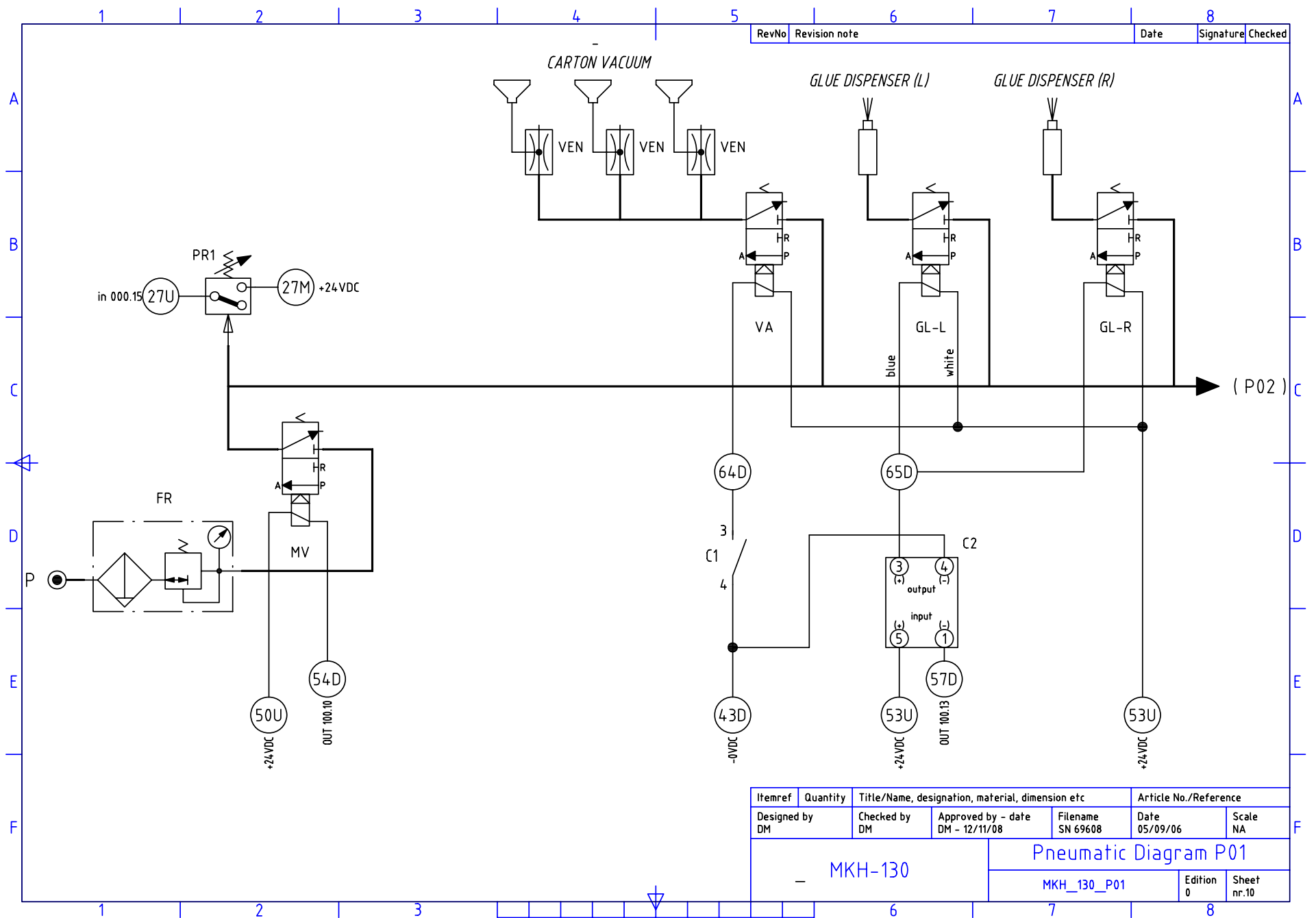
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Designed by DM	Checked by DM	Approved by - date DM - 12/11/08	Filename SN 69608	Date 17/07/06	Scale NA	
MKH-130			Electric Diagram F06			
			MKH_130_F06		Edition 0	Sheet nr.6

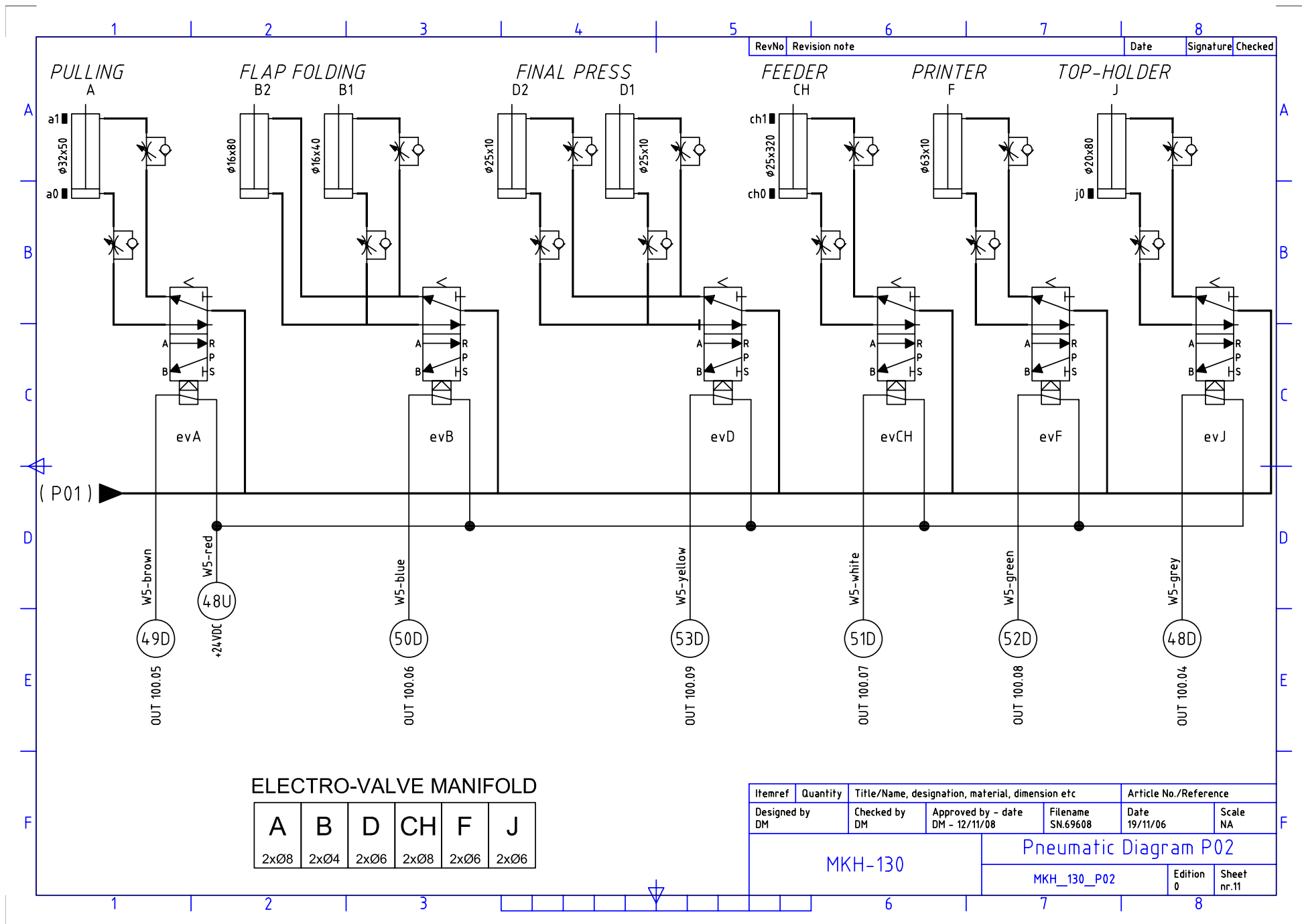


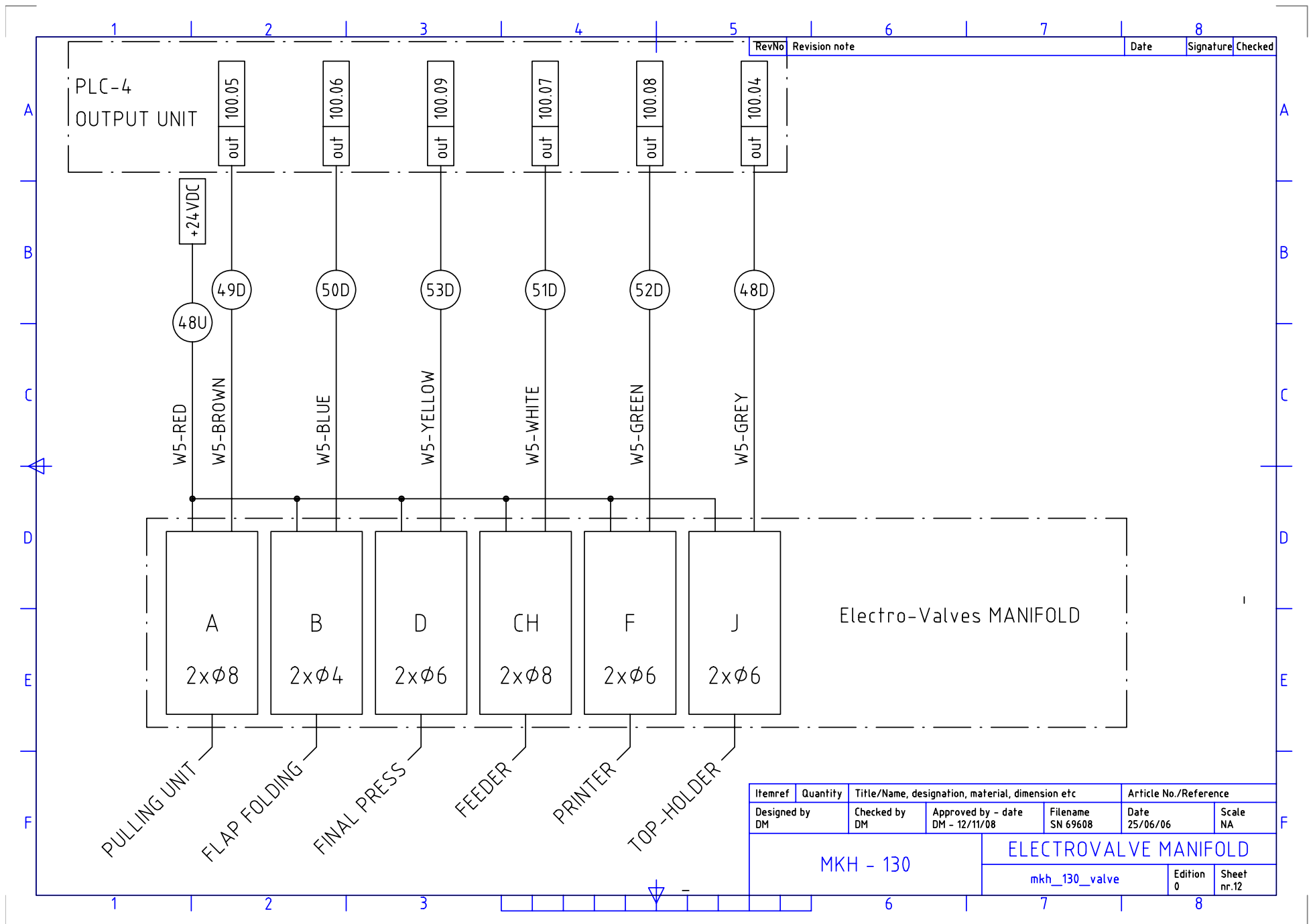




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MKH-130			Main Electric box			
			MKH_130_ebox		Edition 0	Sheet nr.9



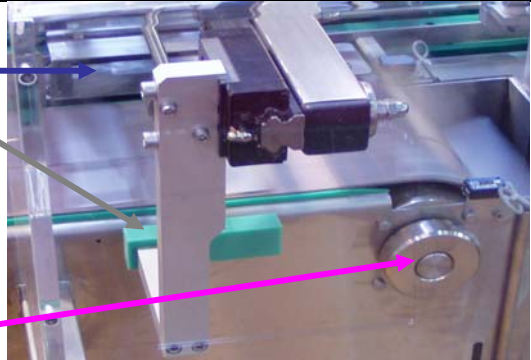
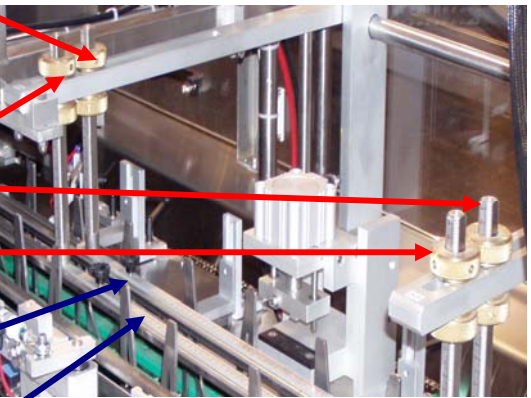
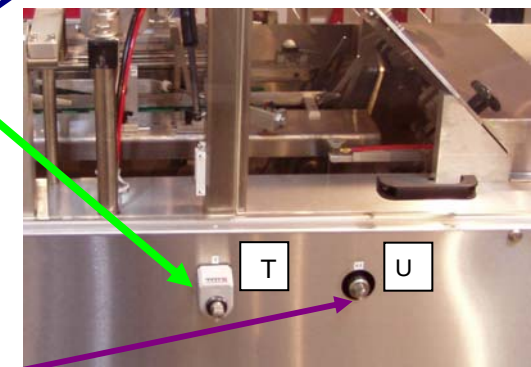
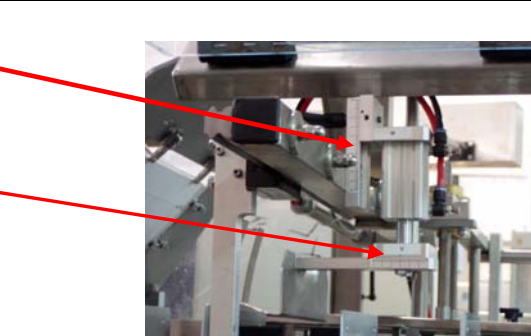
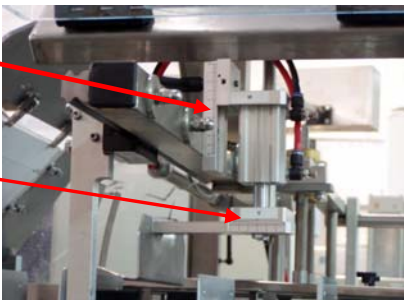


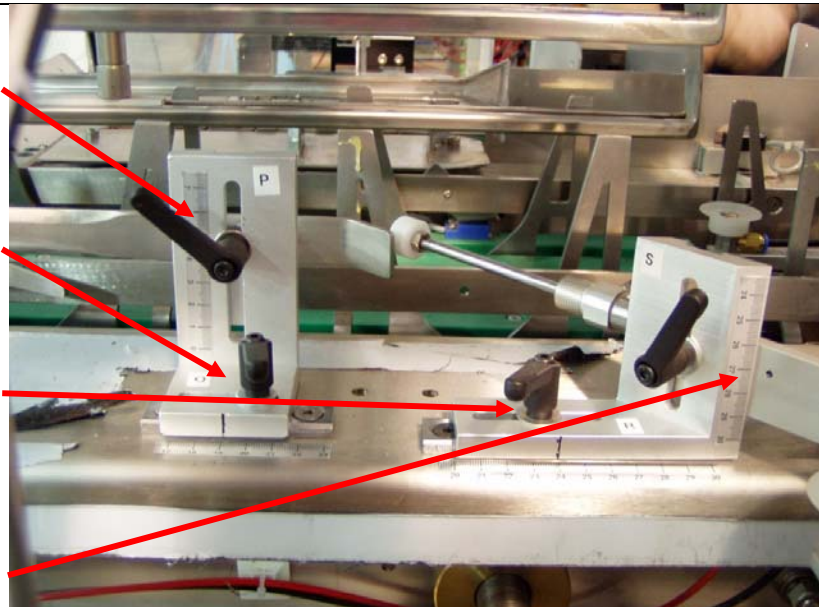
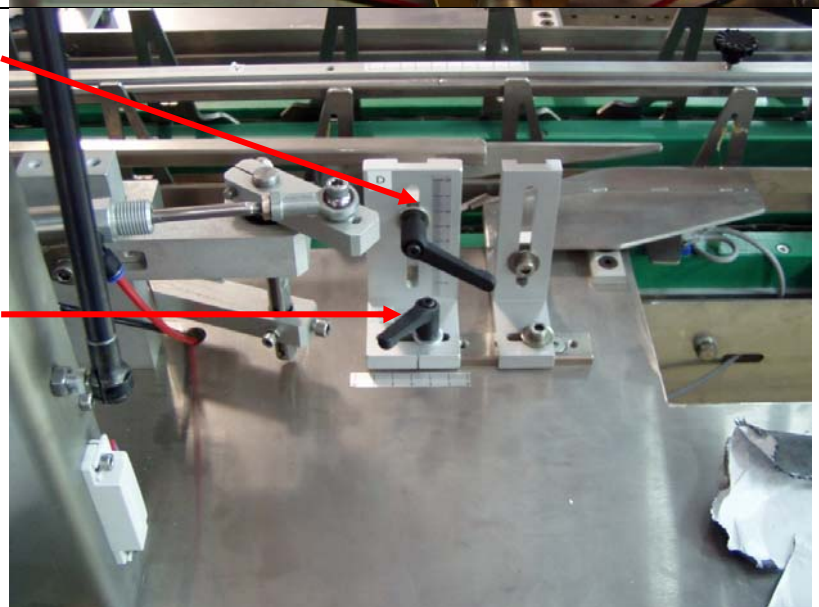
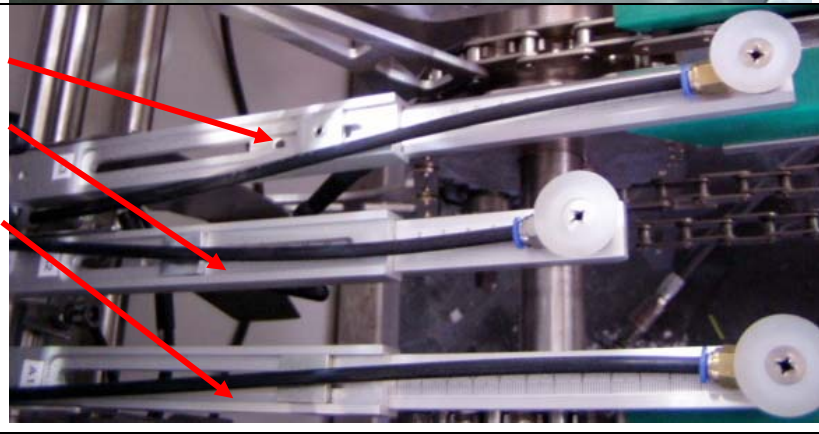


MACHINE SETUP

Machine adjustable Parameters

PRODUCT: _____

STEP	CHANGE	SIZE		
<u>1</u>	TUNNEL	PRODUCT		
<u>2</u>	PUSHER	PRODUCT		
<u>3</u>	MAGAZINE	PRODUCT		
<u>4</u>	WIDTH	BOX WITH (U)		
<u>5</u>	COBBYHOLE	PRODUCT AND PUSHER C		
<u>6</u>	HIGH	J1		
		I1		
		J2		
		I2		
<u>7</u>	BRIDGE HOLDER	Y		
		Z		
<u>8</u>	LENGTH BETWEEN FLAPS	T		
<u>9</u>	PROGRAM NO.			
<u>10</u>	Top holder	W		
<u>11</u>	Top holder position	V		
<u>12</u>				

<u>13</u>		P	
<u>14</u>		Q	
<u>15</u>		R	
<u>16</u>		S	
<u>17</u>		D	
<u>18</u>		E	
<u>19</u>		A3 A2 A1	

MACHINE SETUP LIST

	Prod.1	Prod.2	Prod.3	Prod.4	Prod.5
<u>Product name</u>					
Program nr					
Number of vacuum pad					
A1					
A2					
A3					
C					
D					
E					
I1					
I2					
J1					
J2					
P					
Q					
R					
S					
T					
V					
W					
Y					
Z					
GL-L					
GL-R					
X1					
X2					

PARAMETERS LIST

[illegible]

mitsubishi inverter parameters list

Motor nr : **M1 (MAIN MOTOR)**

PARAMETER LIST

Parameter nr	Name	Value
P0	Torque boost	6.0
P1	Maximum frequency	120.00
P2	Minimum frequency	12.00
P3	Base frequency	50.00
P4	Multi-speed setting High speed	50.00
P5	Multi-speed setting Middle speed	30.00
P6	Multi-speed setting low speed	75.00
P7	Acceleration time	0.1
P8	Deceleration time	0.0
P9	Thermal O/L relay	7.00
P10	DC injection brake operation F	8.00
P11	DC injection brake operation time	0.5
P12	DC injection brake voltage	20.0
P44	2nd Acc/Dec time	0.0
P45	2nd deceleration time	0.1
P71	Applied motor	3
P79	Operation mode	3
P160	Extended function display	0
P180	RL terminal function selection	0
P181	RM terminal function selection	3
P182	RH terminal function selection	2

Motor nr : **M2 & M3 (OPTIONAL output belts)**

PARAMETER LIST

Parameter nr	Name	Value
P0	Torque boost	6.0
P1	Maximum frequency	50.00
P2	Minimum frequency	0.00
P3	Base frequency	50.00
P4	Multi-speed setting High speed	50.00
P5	Multi-speed setting Middle speed	30.00
P6	Multi-speed setting low speed	10.00
P7	Acceleration time	0.0
P8	Deceleration time	0.0
P9	Thermal O/L relay	2.10
P30	Extended menu	0
P79	Operation mode	3
F	WORKING FREQUENCY	50