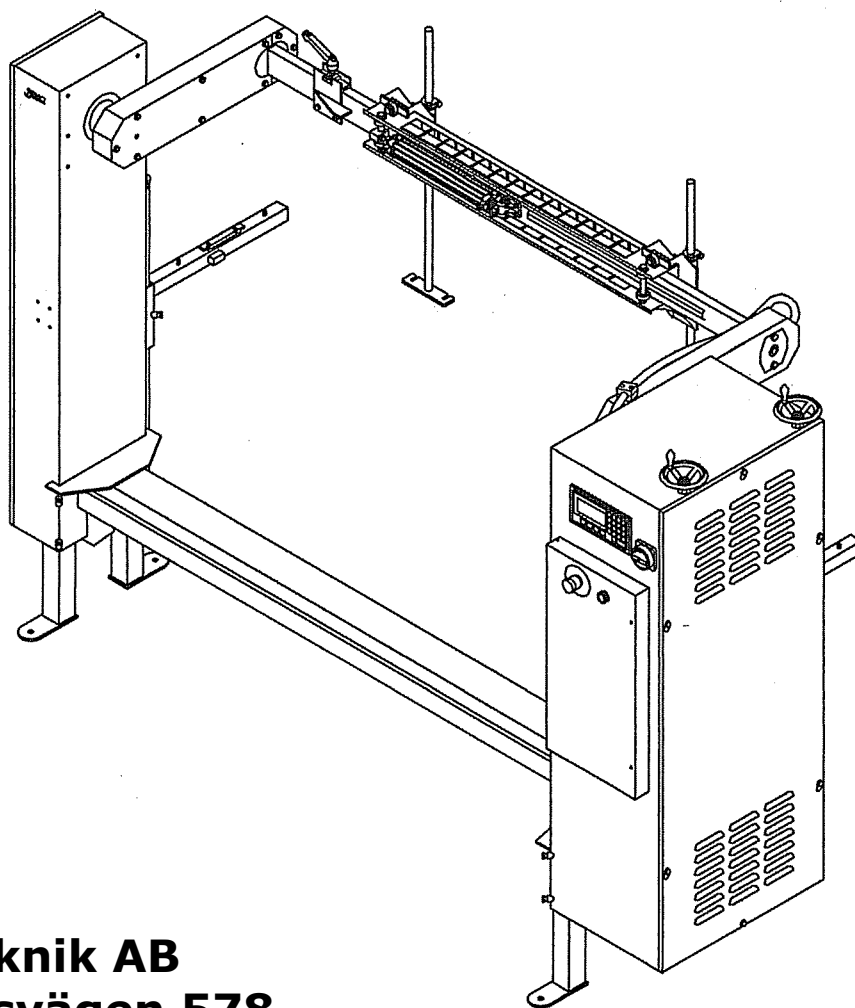




Placing and Pick-up Robot Omron CQM 1 & NT 11



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For the safety of everyone!!

Always disconnect the electricity
from the machine when:

not in use

cleaning

performing maintenance

changing pot size.

Keep hands, hair, loose clothing
and/or jewelry away from moving parts
of the machine.

**Read the manual first before
operating any equipment!!**

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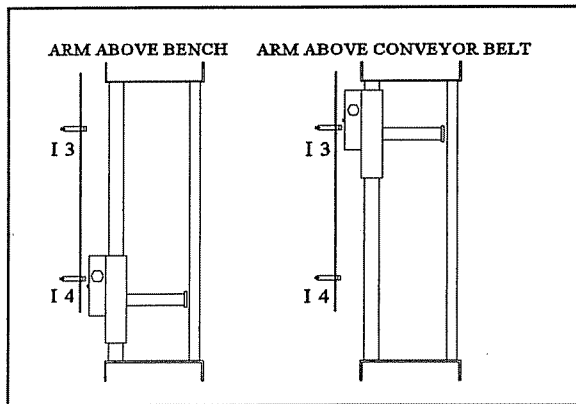
Operation of the Javo Robot.
25-05-1998

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General adjustments to the JAVO Placing/Spacing Robot .

ATTENTION:

BEFORE MAKING ANY MECHANICAL ADJUSTMENTS TO THE JAVO ROBOT, PUSH ONE OF THE "STOP" (RED) BUTTONS OR TURN OFF THE POWER!!



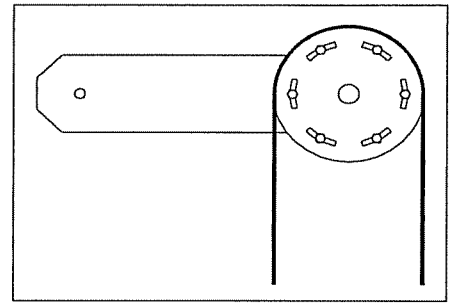
Adjustment arm motor

In order to achieve proper function of the arm motor, the adjustment of both proximity switches needs to be as precise as possible. (See drawing.) First, the desired speed needs to be set with the left hand wheel on top of the large column. This relates to the break-in distance of the arm motor. For high speed, the upper proximity switch is lower and for slow speed, this proximity switch is higher. When the grease cylinder is in its lowest position the lower proximity switch needs to be approximately $3/16$ " above the nodule on the grease cylinder. This switch services the arm motor stop and the fork movement in the container.

Adjustment arm stroke.

Required distance from bottom fork to top conveyor belt: approx. $1 \frac{3}{16}$ ".
Required distance from bottom fork to bottom container: approx. $7/16$ ". When the stroke of the arm is incorrect, e.g., the position of the fork is correct in the container but not over the conveyor belt, the stroke can be changed as follows:

- Measure the difference.
- Slightly release the bolts from the sprockets at the slotted holes in each column.
- Raise or lower the arm, whichever is required, half the distance as measured in A) and tighten the bolts.



Adjustment container transport motors.

The container transport motors are spring-loaded in order to allow for pressure of the wheels to the side of the container. The pivot of the motors can be limited by turning the vertical M10 bolts in or out. The container transport motors must be pushed in so far that the wheels are level when the container is between them. When the container is past the wheels, they should pivot to the inside, the wheel at the small column, approx. $1/2$ " and the wheel at the large column, approx. $3/8$ ". The proximity switch for counting the pulses concerning the distance of the container transport is mounted to the motor at the large column.

Adjustment collector.

Principally the collector needs to be adjusted as low to the conveyor belt as possible but not too low because of soil spillage on the belt, the top of the collector, approx. 1" above the conveyor belt. The width between the two sides of the collector must be pot-width (at 1" from the bottom) plus $1/8$ ". Then the stops at the bottom of the collector need to be pushed against the square blocks to secure this width. Mount the fork to the two rods on the arm and adjust the height right above the collector. Adjust the collector sideways till the fork picks up the pots in an orderly manner. Secure all bolts.

Placing the block cylinder

The block cylinder is mounted to the slotted holes in the collector and needs to be adjusted sideways so that the pots in the pre-collector are at equal distance. (Block cylinder needs to be "out").

Timing of the block cylinder.

Turn on the ROBOT and the Potting Machine and the pots will enter the collector. The photocell counts the pots and after the required amount of pots the block cylinder is activated. The duration that the block cylinder is activated has to be set so that when the fork with the pots is just above the collector the block cylinder is retracted and the new pots can enter the main part of the collector again. When the pots contain tall plants the timing needs to be longer.

Adjustment of the first row switch. *

The switch has to be inside the groove of the container and has to switch only at the beginning and at the end of the

container. The container stops when this switch, with the attached photocell, has switched once. This switch moment is the position for the first row of pots. Adjustments made in 29 allow for this switch to remain in position while working with larger pot sizes. This position is determined by the size of the pot. The attached photocell has a controlling function; the photocell "sees" if there actually is a container.

Adjustment of the last row switch. *

The switch has to be inside the groove of the container and has to switch only at the beginning and at the end of the container. After this switch has been activated at the end of the container the ROBOT places one more row of pots. This switch also controls the temporary reverse motion of the container in order to allow the fork to clear out of the container after placing the last row. This switch also controls the staggering motion of the first row of the next container according to the choice made for staggering. (See chapter "Staggering".)

* In case the containers have no groove all functions remain the same but in this situation the containers cannot be fed end-to-end and a gap of approx. 6" between containers is required.

Adjustment pot counter. (Photocell)

The photocell and reflector need to be mounted just after the block cylinder in order to activate the block cylinder right after the last pot has entered the main part of the collector.

The flexible blow hoses need to keep the area in front of the photocell and the reflector free of soil.

Adjustment pot counter delay.

The adjustment for this time-delay is made by placing one pot on the conveyor belt and letting it pass by the photocell. Start with the time-delay at a high setting so that the photocell does NOT count the pot. By lowering the setting of the count a point will be reached that the photocell counts the pot. This is the correct setting. This function is to prevent double counting because of overhanging leaves or soil. The setting depends on the diameter of the pot and the conveyor belt speed.

Adjustment fork movement. (Pick up delay)

In the event the fork wants to pick up a row of pots in the collector while the last pot is not in place yet, the in-going cylinder movement needs to be delayed. This can happen when using large pots in the STAGGERING-1 motion. In this case the last pot is allowed more time to reach its position. This adjustment can be made in 26. In case the fork wants to take back the row of pots from the container, the out-going cylinder movement needs to be increased. This can be done by turning out the knob of the reducer at the large column.

Adjustment highest position fork.

After the fork has placed the pots in the container and the value 02=YES (HIGH PLANTS FORK HIGH) is in effect, the fork goes to the highest position. This position is determined by the adjustment of the right wheel on top of the large column. In this case the fork returns to its rest position after the arm motor has come to a stop. In the case of the value 02=NO (HIGH PLANTS FORK HIGH), the fork also returns to its highest position but goes to rest position while in motion.

Adjustment rest position fork.

The adjustment for the rest position fork is done with the upper position detector (REED contact) on the cylinder in the large column. This detector can be raised or lowered on the cylinder. By using this adjustment, the fork can be controlled to stop just in front of the pots in the collector.

Adjustment lowest position fork

This adjustment is made with the lowest position detector (REED contact) on the cylinder inside the large column. When the cylinder is at the end of its in-going stroke, the LED (light) from the position detector has to come on. This is the start signal for the arm motor.

Adjustment staggering cylinder.

The speed for extending and/or retracting the cylinder can be made with the screws from the two valves on each side of the cylinder.

Adjustment conveyor belt stop.

After a container is filled with pots and while the container transport motors are moving the container away from the ROBOT, the collector is filled with pots. At the moment the block cylinder is activated, the time for the delayed conveyor belt stop begins. This timing can be made according to the time left until the pre-collector is also filled with pots. If within this time a new container is supplied to the ROBOT, all the equipment continues to function normally. But, if this time has expired and no container has been supplied, the Conveyor belt, Potting machine and the Robot stop. After a new container has been supplied, the Robot and the Conveyor belt will start automatically. The Potting machine has to be restarted manually.

Staggering

Staggering adjustment.

The staggering cylinder and the cylinder stop are located at the top of the arm mounted to the tubing. When staggering is required, the cylinder needs to be adjusted half of the heart to heart distance of the pots.

NO STAGGERING, MENU 04 = NO

The robot places the required number of pots in straight rows behind each other at the desired container transport distance. Container 1 and container 2 are equal. The container switches are mounted at the large or at the small column. The pots can be supplied from either side. (Fig.1)

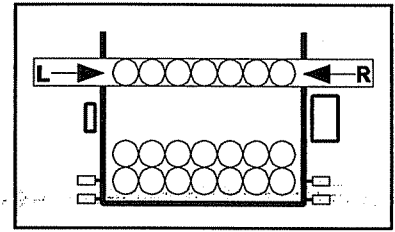


FIG.1

STAGGER WITH EQUAL NUMBER OF POTS.

MENU 04 = YES / MENU 12,13,14 = NO



The robot places the required number of pots with every other row in staggered formation at the desired container transport distance. (The staggering cylinder extends every other row.) Container 1 and container 2 are equal. The fork stays inside the container. The pots can be supplied from either side. The container switches are mounted at the large or at the small column.(Fig.2)

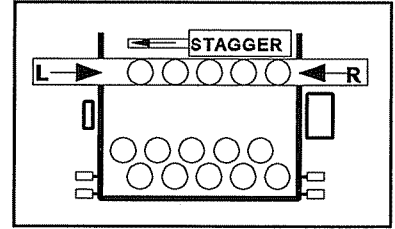
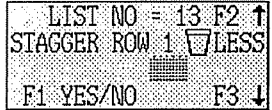


FIG.2

STAGGER WITH 1 POT LESS. POTS COMING FROM THE LEFT.

MENU 04 & 13 = YES / MENU 12 & 14 = NO



The robot places the required number of pots in first row. The second row is placed in staggered formation with one pot less at the desired container transport distance. This applies to the odd-numbered containers (1st, 3rd, 5th, 7th, etc.Fig.3a) The robot places the first row of pots in the even-numbered containers (2nd, 4th, 6th, etc.Fig.3b) with one pot less and in staggered formation. The second row is placed with a full count. The staggering cylinder extends every other row and at the beginning of the even-numbered containers. The container switches are mounted at the large column. The fork goes outside the container at the small column. The pot supply is from the small column.

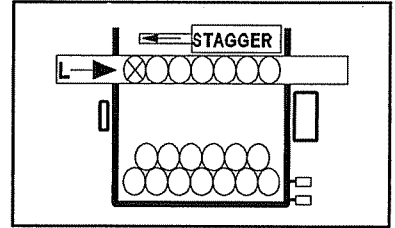


FIG.3a Container 1

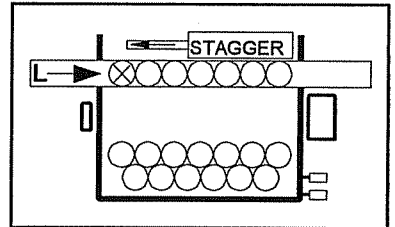
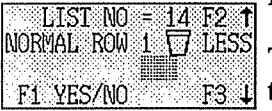


FIG.3b Container 2

STAGGER WITH 1 POT LESS. POTS COMING FROM THE RIGHT.

MENU 04 & 14 = YES / MENU 12 & 13 = NO



The robot places the required number of pots with one less in the first row. The second row is placed with a full count in staggered formation at the desired container transport distance. This applies to the odd-numbered containers (1st, 3rd, 5th, 7th, etc.Fig.4a) The robot places the first row of the even-numbered containers (2nd, 4th, 6th, etc. Fig.4b) with the full count in staggered formation and the second row with one less. The staggering cylinder extends every other row and at the beginning of the even-numbered containers. The container switches are mounted at the small column. The fork goes outside the container at the large column. The pot supply is from the large column.

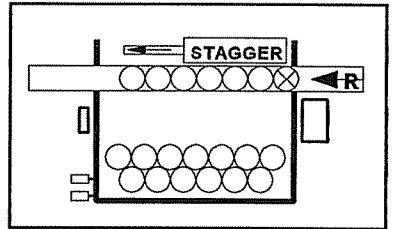


FIG.4a Container 1

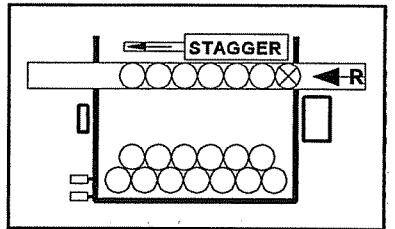
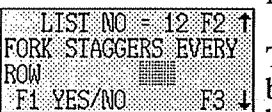


FIG.4b Container 2

EVERY ROW STAGGERED.

MENU 04 & 12 = YES / MENU 13 & 14 = NO



The robot places the required number of pots in straight rows behind each other at the desired container transport distance but in the staggering mode. The staggering cylinder shifts every row. This may be useful when a watering hose or such is present at one side of the container. The fork stays inside the container. The container switches are mounted at the large or at the small column. The pot supply is from either side. Fig.5 belongs to staggering adjustment of Fig 2 and Fig.6 belongs to staggering adjustment of Fig.4

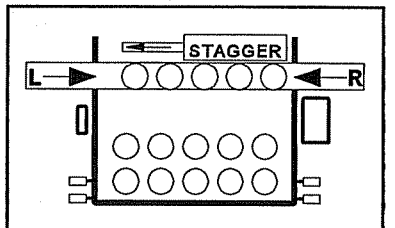


FIG.5

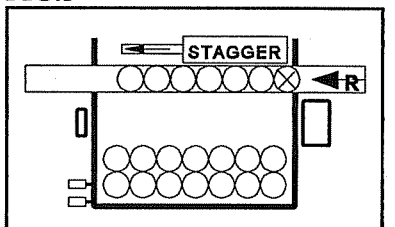
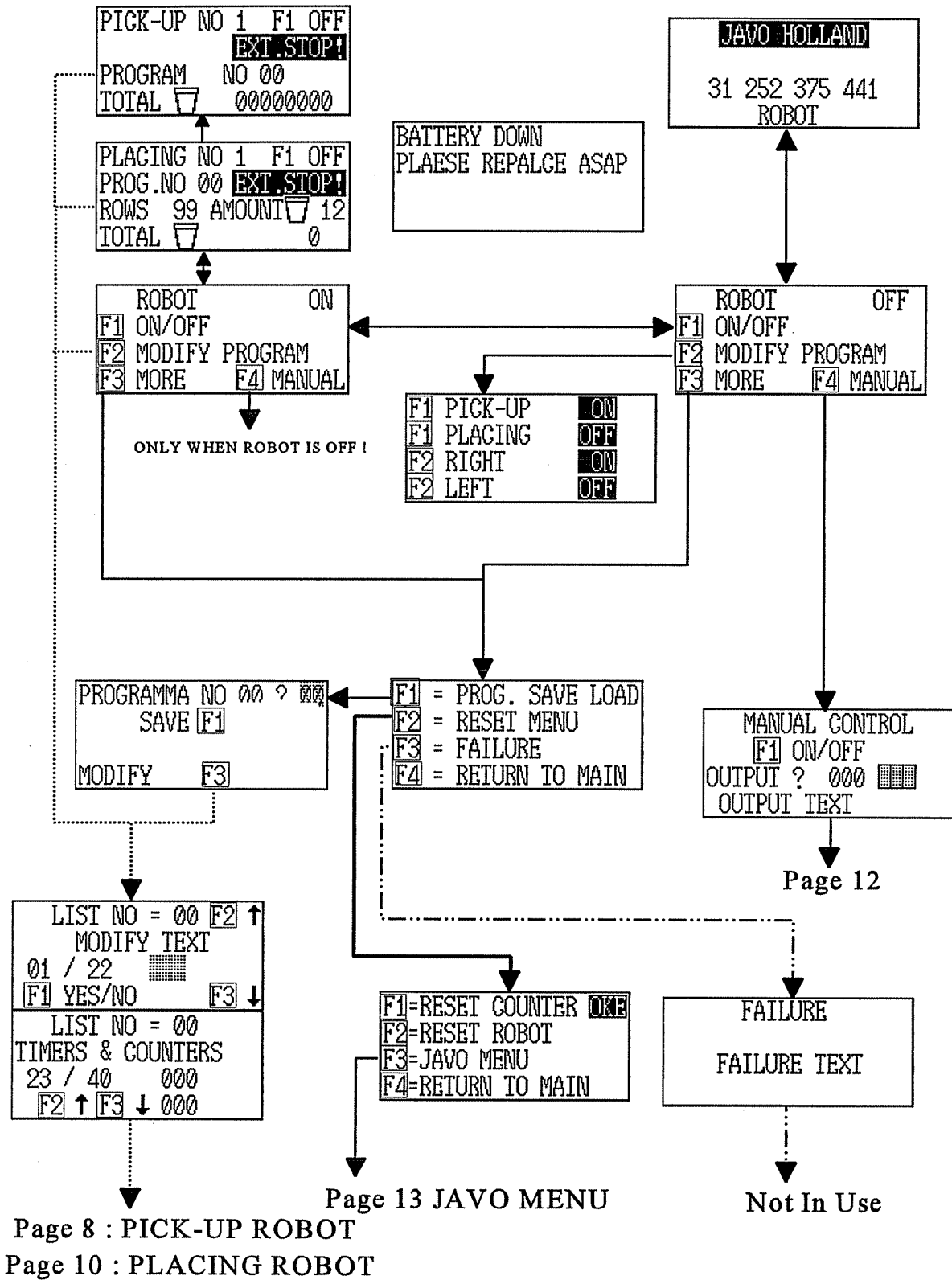


FIG.6

NT 11 TERMINAL OPERATION OVERVIEW



OMRON NT 11 BEDIENINGS HANDLEIDING.

DISPLAY MENU	Choice	Description	To MENU
JAVO HOLLAND 31-252-343121 ROBOT		This menu appears if the power is on or after 100 sec. when the robot is set off. If the robot is set on (F1 ON) then appears after 4 sec.	Pick-up: PICK-UP MANU Placing: PLACING MENU If you push the robot off with "F4" the display shows: MAIN MENU A
<hr/>			
ROBOT OFF F1 ON/OFF F2 MODIFY PROGRAM F3 MORE F4 MANUAL	F1 F2 F3 F4	Robot is off. Make a choice out off the next menu's: F1 Start robot. F2 Pick-up/Placing & Left/Right. F3 Load/Save , Reset , Failures. F4 Manual control off the outputs.	MAIN MENU B ROBOTMENU MORE MENU PAGE 12
<hr/>			
ROBOT ON F1 ON/OFF F2 MODIFY PROGRAM F3 MORE F4 MANUAL	F1 F2 F3 F4	Robot is on. After 4 sec. appears counter menu Make a choice out off the next menu's: F1 Stop robot F2 Adjustments F3 Load/Save , Reset , Failures. F4 Not in use.	----- Pick-up PICK-UP MENU \--Placing PLACING MENU Pick-up Placing MAIN MENU A PAGE 8 PAGE 10 MORE MENU FAILURE MENU
<hr/>			
PICK-UP NO 1 F1 OFF EXTERNAL STOP PROGRAM NO 00 TOTAL <input type="checkbox"/> 00000000	F1 F2 F3 F4	NO 1=Robotnumber. EXTERNAL STOP=Robot is stopt. PROGRAMM No 00=Present programm number. TOTAL=Number of counted pots after reset. F1 Stop robot F2 Adjustments F3 Load/Save , Reset , Failure. F4 Out of PICK-UP MENU	MAIN MENU A PAGE 8 MORE MENU MAIN MENU A
<hr/>			
PLACING NO 1 F1 OFF PROG.NO 00 EXTERNAL STOP ROWS 99 AMOUNT <input type="checkbox"/> 12 TOTAL <input type="checkbox"/> 00000000	F1 F2 F3 F4	NO 1=Robotnumber. PROGRAMMA No 00=Present programm number. EXTERNAL STOP=Robot is stopt. ROWS 99=Number of rows standing in the bench. AMOUNT 12=Number op pots to be collected for a full row. TOTAL=Number of counted pots after reset. F1 Stop robot F2 Adjustments F3 Load/Save , Reset , Failure. F4 Out of PLACING MENU	MAIN MENU A PAGE 10 MORE MENU MAIN MENU A

DISPLAY MENU	Choice	Description	To MENU
<div style="border: 1px solid black; padding: 2px;"> F1 PICK-UP <input type="checkbox"/> NO F1 PLACING <input type="checkbox"/> YES F2 RIGHT <input type="checkbox"/> NO F2 LEFT <input type="checkbox"/> YES </div>	F1 F2 F3 F4	Switch over between Pick-up en Placing Switch over between Left and Right. Not in use Out of ROBOT MENU	MAIN MENU A
ROBOTMENU			
<div style="border: 1px solid black; padding: 2px;"> F1 = PROG. SAVE LOAD F2 = RESET MENU F3 = FAILURE F4 = RETURN TO MAIN </div>	F1 F2 F3 F4	Programms load, save and change Reset Counters, Robot or goto JAVO MENU Read failures Out of MORE MENU	PROGRAM MENU RESET MENU N.I.U. MAIN MENU A/B
MORE MENU			
<div style="border: 1px solid black; padding: 2px;"> PROGRAMMA NO 00 ? 00 SAVE F1 MODIFY F3 </div>	00 F1 F3 F4	PROGRAMM No 00 =Present programm <u>Load programm:</u> Choose wanted programm number and press "ENTER" NO =Only when the robot is in off position. Save adjustments. Change adjustments.	Pick-up PAGE 8 Placing PAGE 10 MAIN MENU A/B
PROGRAMM MENU			
<div style="border: 1px solid black; padding: 2px;"> F1 = RESET COUNTER F2 = RESET ROBOT <input type="checkbox"/> OKE F3 = JAVO MENU F4 = RETURN TO MAIN </div>	F1 F2 F3 F4	OKE =Reset is done Total counter reset to zero Robot in set in start position JAVO MENU Out of RESET MENU	PAGE 13 MAIN MENU A/B
RESET MENU			
<div style="border: 1px solid black; padding: 2px;"> FAILURE </div>	F4	This function is out of order. Out of FAILURE MENU	MAIN MENU A/B
FAILURE MENU			
<div style="border: 1px solid black; padding: 2px;"> BATTERY DOWN PLAESE REPALCE ASAP </div>	F4	Call JAVO to replace the battery. Tell:31-252-343212 Out of FAILURE MENU	MAIN MENU A/B
BATTERY MENU			

PICK-UP ROBOT " MODIFICATIONS "

** F4 = OUT OF "MODIFICATIONS TO MAIN MENU **


DISPLAY MENU	Choice	Description	To MENU
LIST NO = 01 F2 ↑ ARM STOP ABOVE BELT YES F1 YES/NO F3 ↓	F1 YES : Arm stops while placing pots on the conveyor belt. NO : Arm does not stop while placing pots. F2 To following menu :		MENU 02
LIST NO = 02 F2 ↑ HIGH PLANTS FORK HIGH ? NO F1 YES/NO F3 ↓	F1 YES : Fork goes to rest position during arm movement. NO : Fork stays high until the arm has reached begin position. F2 To following menu : F3 To previous menu :		MENU 03 MENU 01
LIST NO = 03 F2 ↑ CONVEYOR STOP WHEN POTS ON BELT YES F1 YES/NO F3 ↓	F1 YES:When a row of pots is placed on the belt, the belt stops for a moment. NO : The belt does not stop when a row of pots is placed. F2 To following menu : F3 To previous menu :		MENU 04 MENU 02
LIST NO = 04 F2 ↑ FORK IN STAGGER NO F1 YES/NO F3 ↓	F1 YES : The pick-up-fork staggers every other row. NO : The pick-up fork picks up in straight rows. F2 To following menu : F3 To previous menu :		MENU 05 MENU 03
LIST NO = 05 F2 ↑ PUSH START AT NEW CONTAINER YES F1 YES/NO F3 ↓	F1 YES:When a new container is entered the robot needs to be restarted. NO :The robot starts automatically if a new container is entered . F2 To following menu : F3 To previous menu :		MENU 06 MENU 04
LIST NO = 06 F2 ↑ STOP PICK-UP IF THE BELT STOPS YES F1 YES/NO F3 ↓	F1 YES : When the pick-up robot is stopped the conveyor also stops. NO : The conveyor is only stopped by the placing robot. F2 To following menu : F3 To previous menu :		MENU 07 MENU 05
LIST NO = 07 F2 ↑ CONTAINER REVERS AT 1st ROW YES F1 YES/NO F3 ↓	F1 YES: While the fork picks up the first row the container is reversed. (menu 30 > 0) NO : The container is not reversed at the first row F2 To following menu : F3 To previous menu :		MENU 09 MENU 06
LIST NO = 08 F2 ↑ OUTPUT BLOCKCYL AS GRADINGBELT NO F1 YES/NO F3 ↓	F1 YES :Output 01 is used by gradingbeld relay. NO :Output 01 is not in use. F2 To following menu : F3 To previous menu :		MENU 15 MENU 07
LIST NO = 09 F2 ↑ VIBRATION OF THE PICK-UP FORK NO F1 YES/NO F3 ↓	F1 YES : The staggerring cylinder moves fast in and out while the pots enter the fork. (Vibration) NO :No vibration. F2 To following menu : F3 To previous menu :		MENU 15 MENU 07
LIST NO = 15 F2 ↑ STAGGER CYL. ABOVE BELT ALWAYS ON NO F1 YES/NO F3 ↓	F1 YES : Stagger cylinder is out and retracts in stagger motion. NO : Stagger cylinder is in and extends in stagger motion. F2 To following menu : F3 To previous menu :		MENU 16 MENU 09
LIST NO = 16 F2 ↑ FIRST ROW ALWAYS IN STAGGER NO F1 YES/NO F3 ↓	F1 YES : Pick up first row in Stagger. NO : Pick up first row Normal. F2 To following menu : F3 To previous menu :		MENU 17 MENU 15

DISPLAY MENU	Choice	Description	To MENU
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 17 F2 ↑ LIFT FORK NO F1 YES/NO F3 ↓ </div>	F1	YES :Lift the pots for moving backwards NO :No lift.	
	F2	To following menu :	MENU 18
	F3	To previous menu :	MENU 16
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 18 F2 ↑ CLAMBFORK NO F1 YES/NO F3 ↓ </div>	F1	YES :Clamb the pots for better hold on pots. NO :No clambfork	
	F2	To following menu :	MENU 24
	F3	To previous menu :	MENU 17
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 24 POT COUNTER DELAY 00.15sec F2 ↑ F3 ↓ 00.15 </div>	00.15	The beam of the photocell needs to be interrupted for the duration of the adjusted time to give a valid signal to the plc. (to avoid overhanging leaves to be counted as a pot).	
	F2	To following menu :	MENU 28
	F3	To previous menu :	MENU 15
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 28 ROW DISTANCE IN CONTAINER 120.0 mm F2 ↑ F3 ↓ 120.0 </div>	120.0	This is the distance of the container transport before the program reacts from the fork switches.	
	F2	To following menu :	MENU 29
	F3	To previous menu :	MENU 24
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 29 FIRST ROW CONTAINER 013.5 mm F2 ↑ F3 ↓ 013.5 </div>	013.5	This is the continuing transport distance after the first row switch is released so that the fork can lower itself in the container.	
	F2	To following menu :	MENU 30
	F3	To previous menu :	MENU 28
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 30 CONTAINER REVERS 005.0 mm F2 ↑ F3 ↓ 005.0 </div>	005.0	This is the distance with which the container reverses after the pots have engaged the fork switches.	
	F2	To following menu :	MENU 32
	F3	To previous menu :	MENU 29
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 32 WAIT PICK-UP UNTIL BELT IS EMPTY 0100 F2 ↑ F3 ↓ 0100 </div>	0050	After the fork has placed the pots on the conveyor belt the ROBOT waits the adjusted distance before it places a new row on the conveyor belt.	
	F2	To following menu :	MENU 33
	F3	To previous menu :	MENU 30
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 33 POT IN FORK DISTANCE 001.0 mm F2 ↑ F3 ↓ 001.0 </div>	001.0	This is the distance with which the container continues after the fork switches have been engaged.	
	F2	To following menu :	MENU 34
	F3	To previous menu	MENU 32
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 34 VIBRATION SPEED FORK 000.2 F2 ↑ F3 ↓ 000.2 </div>	000.2	By raising this value the vibration becomes slower.	
	F2	To following menu :	MENU 35
	F3	To previous menu :	MENU 33
<div style="border: 1px solid black; padding: 2px;"> LIST NO = 35 CONT. FORW. WHEN ARM MOVES 050.0 mm F2 ↑ F3 ↓ 050.0 </div>	050.0	The container moves forwards when the arm places the pots on the conveyorbelt.	
	F3	To previous menu :	MENU 34

PLACING ROBOT " MODIFICATIONS "

** F4 = OUT OF MODIFICATIONS TO MAIN MENU A OR B **

DISPLAY MENU	Choice	Description	To MENU
LIST NO = 02 F2 ↑ HIGH PLANTS FORK HIGH ? NO F1 YES/NO F3 ↓	F1 YES F2	F1 YES : Fork stays high until the arm has reached begin position. NO : Fork goes to rest position during arm movement.. To following menu :	MENU 04
LIST NO = 04 F2 ↑ FORK IN STAGGER NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : Fork staggers every other row . NO : Different or no stagger ! To following menu : To previous menu :	MENU 10 MENU 02
LIST NO = 10 F2 ↑ ARMSTOP IN CONTAINER YES F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : Arm stops while placing pots in the container. NO : Arm does not stop while placing pots. To following menu : To previous menu :	MENU 11 MENU 04
LIST NO = 11 F2 ↑ LAST ROW CONTAINER REVERSE YES F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES :When the last row is placed in the container the container reverses. NO :When the last row is placed the container does not reverse To following menu : To previous menu :	MENU 12 MENU 10
LIST NO = 12 F2 ↑ FORK STAGGERS EVERY ROW NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : The fork places every row in staggered formation. Adjustment 05 must show YES . NO : Different or no stagger ! To following menu : To previous menu :	MENU 13 MENU 11
LIST NO = 13 F2 ↑ STAGGER ROW 1 <input type="checkbox"/> LESS NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : Fork staggers every other row and every staggered row is -1 pot. Adjustment 05 must show YES and 12 & 14 must show NO . NO : Different or no stagger ! To following menu : To previous menu :	MENU 14 MENU 12
LIST NO = 14 F2 ↑ NORMAL ROW 1 <input type="checkbox"/> LESS NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : Fork staggers every other row and every normal row is -1 pot. Ad- justments 10,11,13 must show NO . NO : Different or no stagger ! To following menu : To previous menu :	MENU 15 MENU 13
LIST NO = 15 F2 ↑ STAGGER CYL. ABOVE BELT ALWAYS ON NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES : Stagger cylinder is normally out and retracts in staggering motion. NO : Stagger cylinder is normally in and extends in staggering motion. To following menu : To previous menu :	MENU 16 MENU 14
LIST NO = 16 F2 ↑ FIRST ROW ALWAYS IN STAGGER NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES :With every new container the first row will be in staggered formation NO : With every new container the first row is not necessarily in staggered formation To following menu : To previous menu :	MENU 17 MENU 15
LIST NO = 17 F2 ↑ LIFT FORK NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES :For moving the pots together on the bench NO :No lift. To following menu : To previous menu :	MENU 18 MENU 16
LIST NO = 18 F2 ↑ CLAMBFORK NO F1 YES/NO F3 ↓	F1 YES F2 F3	F1 YES :Clamb the pots for better hold on pots. NO :No clambfork To following menu : To previous menu :	MENU 23 MENU 17

DISPLAY MENU	Choice	Description	To MENU
LIST NO = 23 BLOCK CYLINDER DELAY 00.01sec F2 ↑ F3 ↓ 00.01	01.00 F2 F3	After the pots are picked up by the fork, the block cylinder remains extended during the adjusted time. To following menu : To previous menu :	 MENU 24 MENU 18
LIST NO = 24 POT COUNTER DELAY 00.15sec F2 ↑ F3 ↓ 00.15	00.15 F2 F3	The beam of the photocell needs to be interrupted for the duration of the adjusted time to give a valid signal to the plc. (to avoid overhanging leaves to be counted as a pot) To following menu : To previous menu :	 MENU 25 MENU 23
LIST NO = 25 ROW FULL STOP BELT 003.5sec F2 ↑ F3 ↓ 003.5	003.5 F2 F3	After the block cylinder is activated the conveyor belt keeps running for the adjusted time and then stops unless the block cylinder is retracted. To following menu : To previous menu :	 MENU 26 MENU 25
LIST NO = 26 DELAY START ARM 000.4sec F2 ↑ F3 ↓ 000.4	000.4 F2 F3	Timing for delay in fork motion. After the pots are counted the fork waits the adjusted time before starting the motions. Especially important in position N-1. In this case the last pot is allowed more time to reach its position and thus the arm motion can be faster. To following menu : To previous menu :	 MENU 27 MENU 25
LIST NO = 27 AMOUNT OF  PER ROW 14 F2 ↑ F3 ↓ 14	14 F2 F3	Setting for the number of pots required to fill the fork. When this number is reached the robot starts going through its steps. To following menu : To previous menu :	 MENU 28 MENU 26
LIST NO = 28 ROW DISTANCE IN CONTAINER 120.0 mm F2 ↑ F3 ↓ 120.0	0120 F2 F3	Setting of the travel distance for the container. To following menu : To previous menu :	 MENU 29 MENU 27
LIST NO = 29 FIRST ROW CONTAINER 013.5 mm F2 ↑ F3 ↓ 013.5	013.5 F2 F3	The position of the container where the fork needs to place the first row. To following menu : To previous menu :	 MENU 30 MENU 28
LIST NO = 30 CONTAINER REVERS 005.0 mm F2 ↑ F3 ↓ 005.0	005.0 F2 F3	This is the distance which the container reverses after the pots are placed in the container (squeezing) To following menu : To previous menu :	 MENU 31 MENU 29
LIST NO = 31 AMOUNT OF ROWS 000 F2 ↑ F3 ↓ 000	000 F3	Number of rows that will be placed in a container. When this number is reached a new container will be entered. When this value is 000 the last row switch determines the end of the container. To previous menu :	 MENU 30

MANUAL OPERATION WITH NT-11 DISPLAY TERMINAL

** TYPE OUTPUT NUMBER IN AND CONFIRM WITH "ENTER" **

** F2 SWITCHES OUTPUT ON AND OFF **

** F4 = OUT OF MANUAL OPERATION BACK TO MAIN MENU **

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 000 OFF
CONVEYOR BELT

Light 0
Conveyor belt.

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 008 OFF
CLAMP CYLINDER IN

Light 8
Clamp cylinder in

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 001 OFF
BLOCK CYLINDER

Light 1
Block cylinder

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 009 OFF
LIFT ARM CYLINDER UP

Light 9
Lift arm cylinder up

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 002 OFF
ARM MOTOR

Light 2
Arm motor.

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 010 OFF
LEFT TURN CONVEYOR

Light 10
Left turn conveyor

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 003 OFF
FORK HIGH

Light 3
Fork in high position..

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 011 OFF
RELAYS PICK-UP ROBOT

Light 11
Relays pick-up robot

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 004 OFF
FORK LOW

Light 4
Fork in low position

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 012 OFF
HIGH SPEED CONTAINER

Light 12
High speed container

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 005 OFF
STAGGER CYLINDER

Light 5
Staggering cylinder.

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 013 OFF
BLOCK CYLINDER -1

Light 13
Block cylinder -1

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 006 OFF
CONTAINER TRANSP →

Light 6
Bench transport motors
-->>

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 014 OFF
FORK PUSHES POTS OUT

Light A14
Fork pushes pots out

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 007 OFF
CONTAINER TRANSP ←

Light 7
Bench transport motors
<<--

MANUAL CONTROL
F1 ON/OFF
OUTPUT ? 015 OFF
SPARE

Light A15
Signal for enter a new bench

" JAVO MENU "

** "F4" is uit JAVO MENU naar HOOFDMENU A/B **

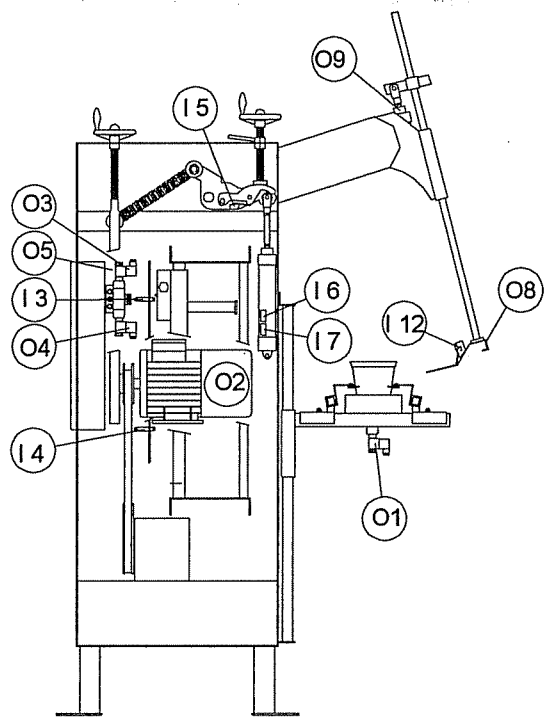
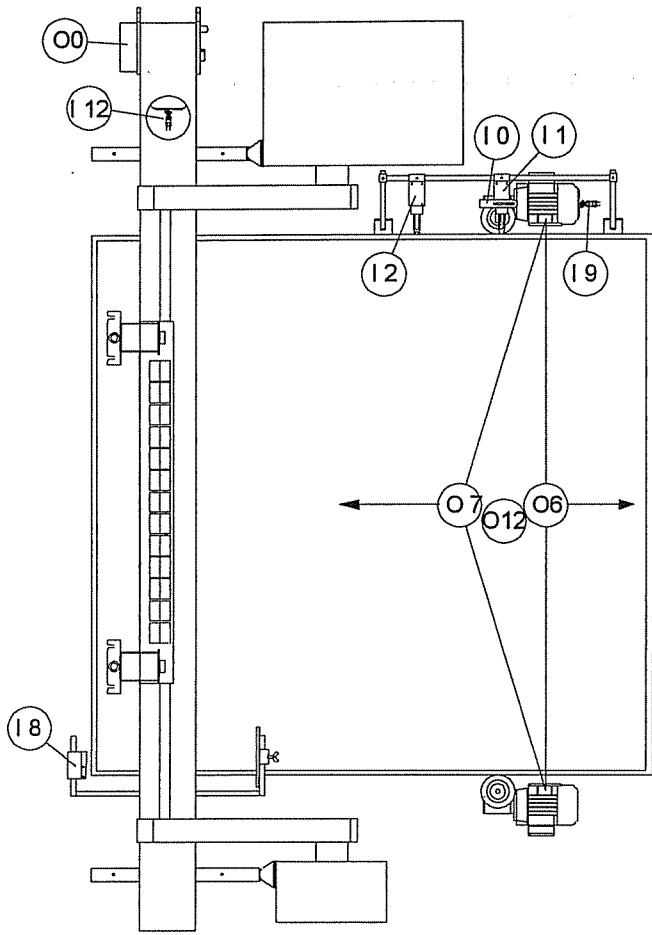
DISPLAY MENU	Choice	Description	To MENU
PUT IN PASWORD 0000		TYPE PASWORD TO ENTER THE JAVO MENU	
JAVO MENU PAG. 1 F1 ON A BELT OF F2 WITH PLATE OF F3 NO GROOVE OF	PAGE # ← Type the number of the belonging page. F1 OFF : Bench switches depend the positions of a bench. ON : Pots are set on belt. F2 OFF : Arm waits until the bench has been moved backwards. ON : Arm go's on when the pots standing on the bench F3 OFF : The bench swicth position is in the groove ON : The bench switches roling over the benchside.	1 t/m 6	
JAVO MENU PAG. 2 0 = NEDERLANDS 1 = ENGLISH 2 = DEUTSCH ? 1	PAG. # ← Type the number of the belonging page. 0 This menu has no function. 1 2	1 t/m 6	
JAVO MENU PAG. 3 ARM OUT CONT 02.0sec MOT. REVERS T 0.5sec ROBOT NO 1	PAG. # ← Type the number of the belonging page. ↓ Move the cursor with the green arrow up or down. ARM If the arm hit the end of the bench and the rest position is not made the arm moves then after this time. ↓ Move the cursor with the green arrow up or down. Mot.revers Delay between forward and backward switching of the benchmotors. ↓ Move the cursor with the green arrow up or down. ROBOT Type the belonging robot number in.	1 t/m 6 2.0 0.5 1 tm 9	
JAVO MENU PAG. 4 F1 PICK-UP OF F2 PLACING ON F1 PICK. F2 PLAC.	PAGE # ← Type the number of the belonging page. F1 ON : Change the robot also to pick-up robot. OFF : The robot is not a pick-up robot F2 ON : Change the robot also to placing robot. OFF : The robot is not a placing robot	1 t/m 6	
LIST NO PAG 5 NO # ? 06 = 1 0 = NO 1 = YES F1 1/0 F2 ↑ F3 ↓	PAGE # ← Type the number of the belonging page. ↓ Move the cursor with the green arrow up or down. NR. ** ← Type the belonging adjusment number who has to be changed. 0 Number is not in use 1 Number is used F2 1 number forwards F3 1 number backwards	1 t/m 6 00 t/m 40	
JAVO MENU PAG. 7 WHEELDIA. 100.0 DISPLAY PROG NO00.01 PLC PROG NO00.39	PAGE # ← Type the number of the belonging page. ↓ Move the cursor with the green arrow up or down. WheelDia. Put in the diameter off the transport wheel. DISPLAY Display programm number. PLC Plc programm number.	1 t/m 6 100.0	

PICK-UP ROBOT

PROGRAM NUMBER... FORK NUMMER.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
01=ARM STOP AT BELT	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
02=HIGH PLANTS FORK HIGH ?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
03=CONVEYOR STOP WHEN POTS ON BELT	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
04=FORK IN STAGGER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
05=PUSH START AT NEW CONTAINER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
06=STOP PICK-UP IF THE BELT STOPS	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
07=CONTAINER REVERS AT 1st ROW	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
08=OUTPUT BLOCKCYL AS GRADINGBELT	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
09=VIBRATION OF THE PICK-UP FORK	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
15=STAGGER CYL. ABOVE BELT ALWAYS ON	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
16=FIRST ROW ALWAYS IN STAGGER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
17= LIFT FORK	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
18=CLAMPFORK	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
24=COUNTER DELAY														
28=ROW DISTANCE IN CONTAINER														
29=FIRST ROW CONTAINER														
30=CONTAINER REVERS														
32=WAIT PICK-UP UNTIL BELT IS EMPTY														
33=POT IN FORK DISTANCE														
34=VIBRATION SPEED FORK														
35=CONT. FORW. WHEN ARM MOVES														

PLACING ROBOT

PROGRAM NUMBER. FORK NUMBER.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
02=HIGH PLANTS FORK HIGH ?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
04=FORK IN STAGGER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
10=ARMSTOP IN CONTAINER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
11=LAST ROW CONTAINER REVERSE	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
12=FORK STAGGERS EVERY ROW	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
13=STAGGER ROW 1 POT LESS	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
14=NORMAL ROW 1 POT LESS	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
15=STAGGERCYL. ABOVE BELT ALWAYS ON	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
16=FIRST ROW ALWAYS IN STAGGER	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
17=LIFT FORK	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
18=CLAMPFORK	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
23=BLOCK CYLINDER DELAY														
24=POT COUNTER DELAY														
25=ROW FULL STOP BELT														
26=DELAY START ARM														
27=AMOUNT OF POTS PER ROW														
28=ROW DISTANCE IN CONTAINER														
29=FIRST ROW CONTAINER														
30= CONTAINER REVERSE														
31=AMOUNT OF ROWS IN CONTAINER														



The Inputs and Outputs of Omron CQM1.

PICK-UP AND PLACING ROBOT

LED: 0CH INPUTS	DESCRIPTION
0	Container present photocell at container.
1	Position container first row. Begin container switch.
2	Position container last row. (Placing R.) End container switch. " A "
	Position container last row. (Pick-up R.) End container switch. " B "
3	Position fork in container. Lower proximity switch in large column.
4	Position fork over belt. Upper proximity switch in large column.
5	Fork position high. Micro switch above cylinder.
6	Fork position rest. Upper reed contact on cylinder.
7	Fork position start. Lower reed contact on cylinder.
8	Pot counter. (Small column) Photocell on conveyor belt.
	Pot counter. (Big column) Photocell on conveyor belt.
9	Container transport counter. Proximity switch at container transport motor.
10	Stagger switch (only Pick-up R.) Black collar push button
11	Start collecting (only Pick-up R.) Green collar push button
12	Pots are in fork (only Pick-up R.) Microswitches on fork
13	Program STOP Red Switch and Stop buttons.
14	Pot dispensing free (only Pick-up R.)
15	Conveyorbelt distance swich Proximity at conveyorbelt motor

LED: OCC222 OUTPUTS	DESCRIPTION
0	Conveyor belt Relay "1" (option. Variable Speed Drive.)
1	Block cylinder (Placing Robot) Air valve AA 184 (3/2) "1"
2	Arm motor Relay "2" (option. Variable Speed Drive.)
3	Arm cylinder "out" Air valve CM 680 (5/3) "2a"
4	Arm cylinder "in" Air valve CM 680 (5/3) "2b"
5	Staggering cylinder "out" Air valve CM 600 (5/2) "3"
6	Container transport <<---- Relay "3a" (option. Variable Speed Drive.)
7	Container transport ---->> Relay "3b" (option. Variable Speed Drive.)
8	Option. Fork clamb pots Air valve CM 600 (5/2)
9	Option. Fork lift pots Air valve CM 600 (5/2)
10	Option. Swiths to pick-up Relay
11	Option. Switch to left Relay
12	Option. High speed bench trp. (option. Variable Speed Drive.)
13	Option. Block cylinder -1 Air valve AA 184 (3/2)
14	Option. Fork moves pots out of row. Air valve CM 600 (5/2)
15	Option. New bench signal. Relay

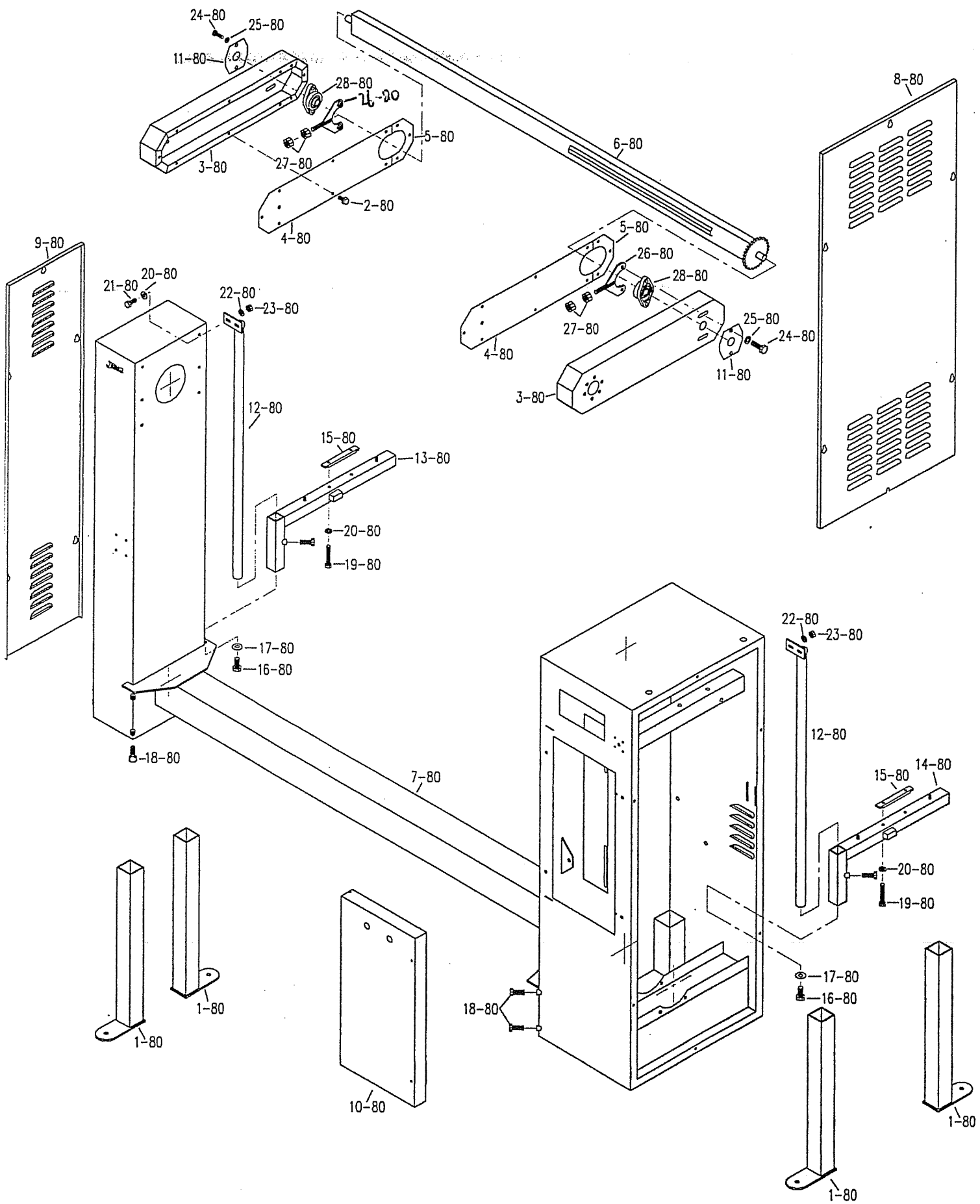


Fig.80

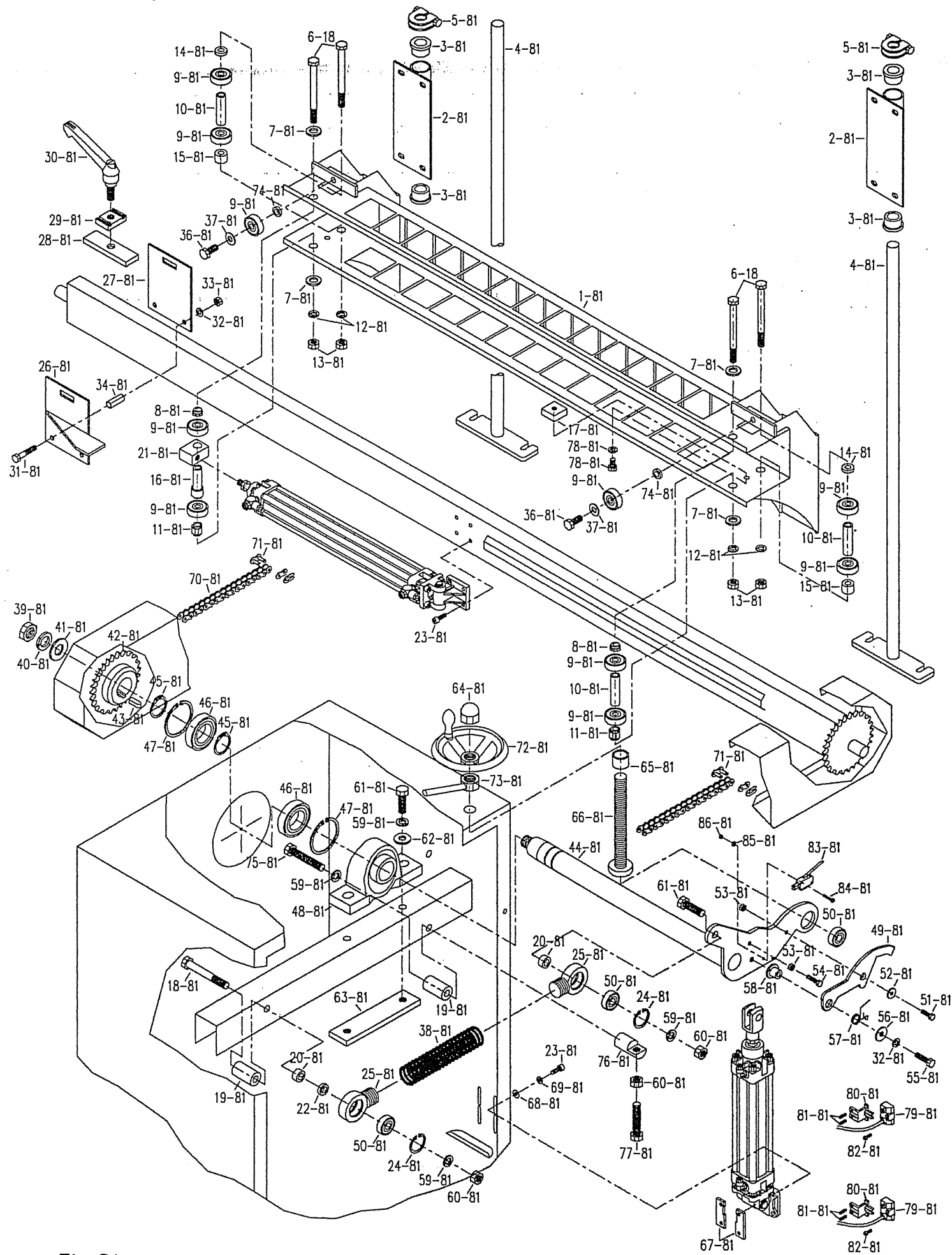


Fig.81

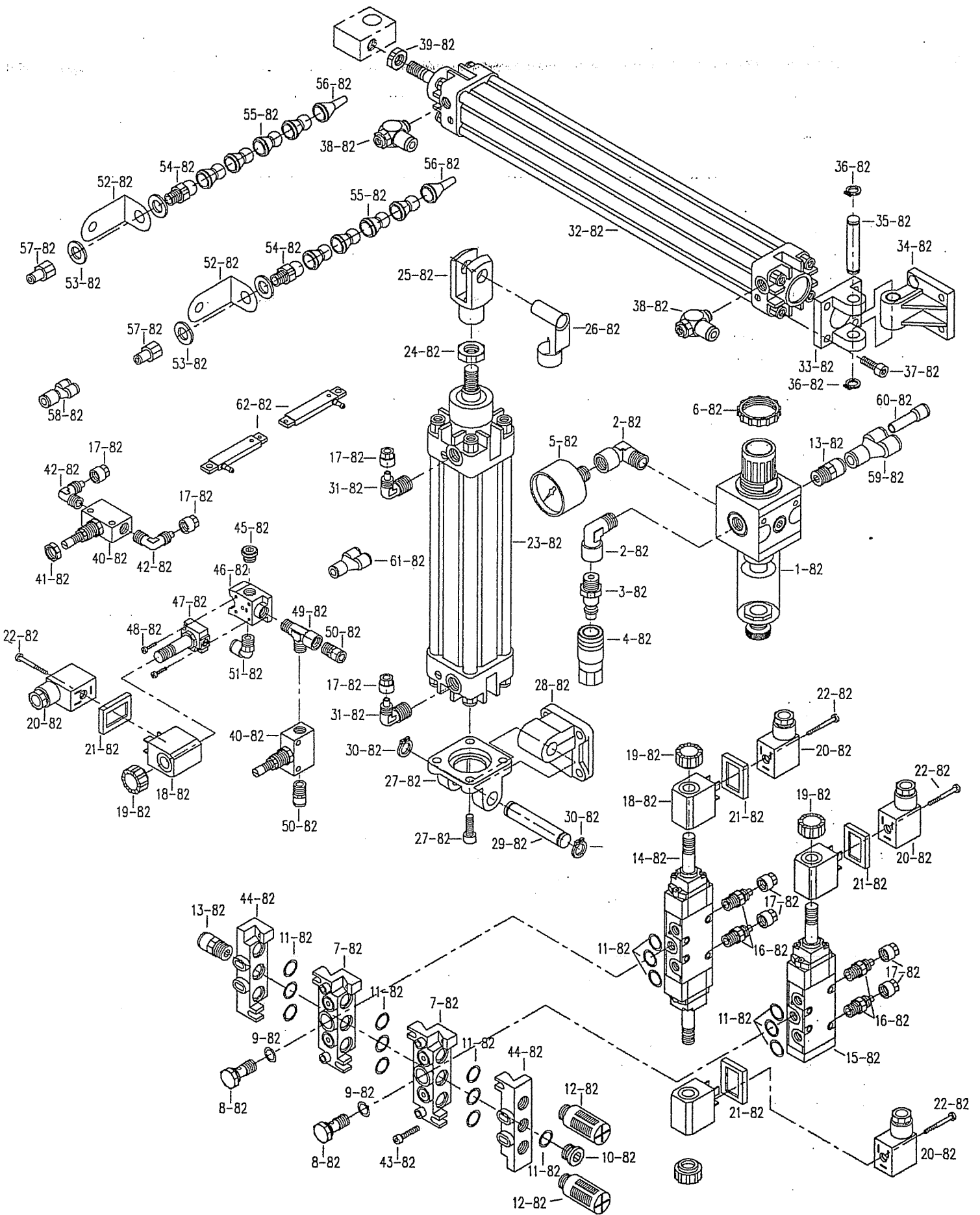


Fig.82

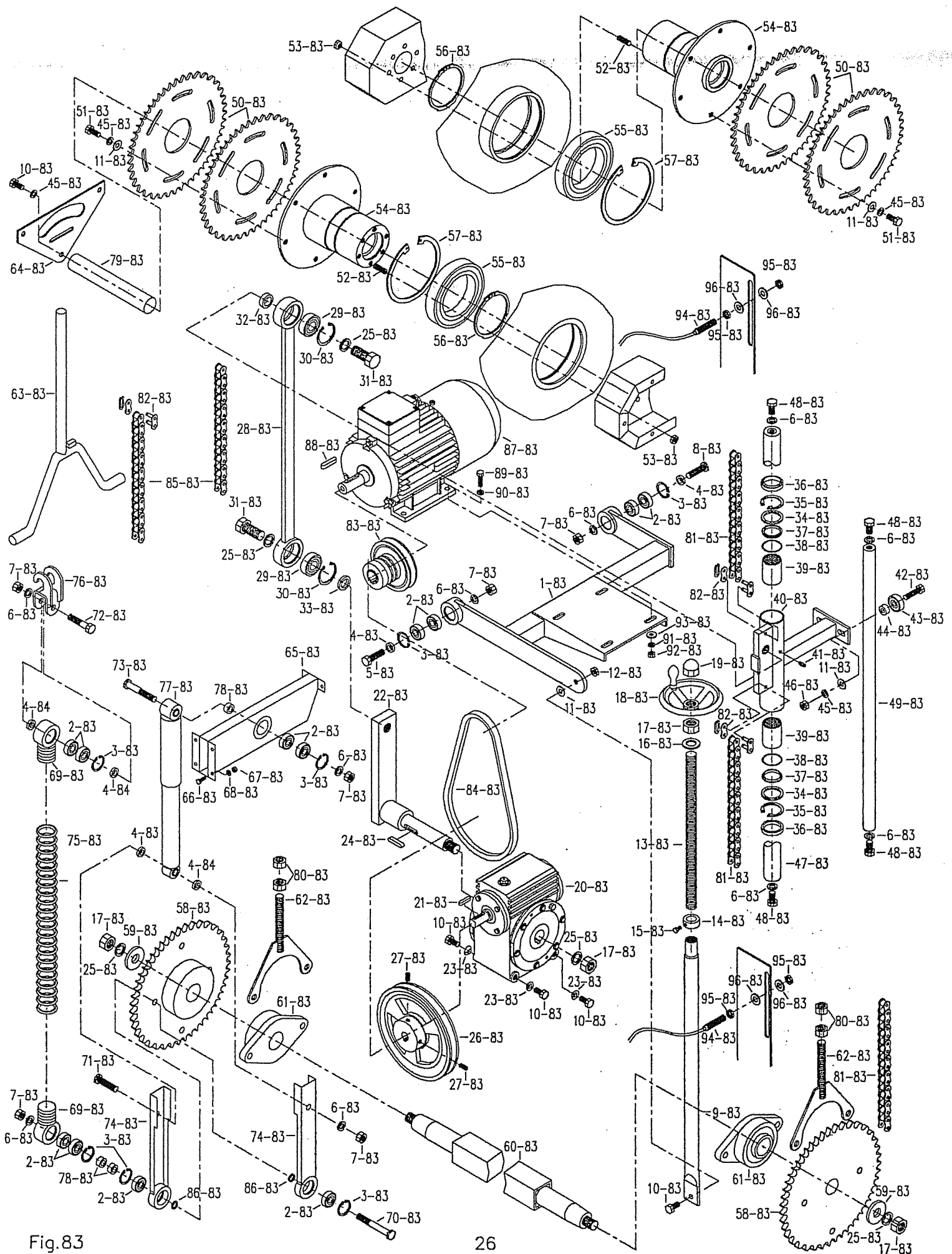


Fig.83

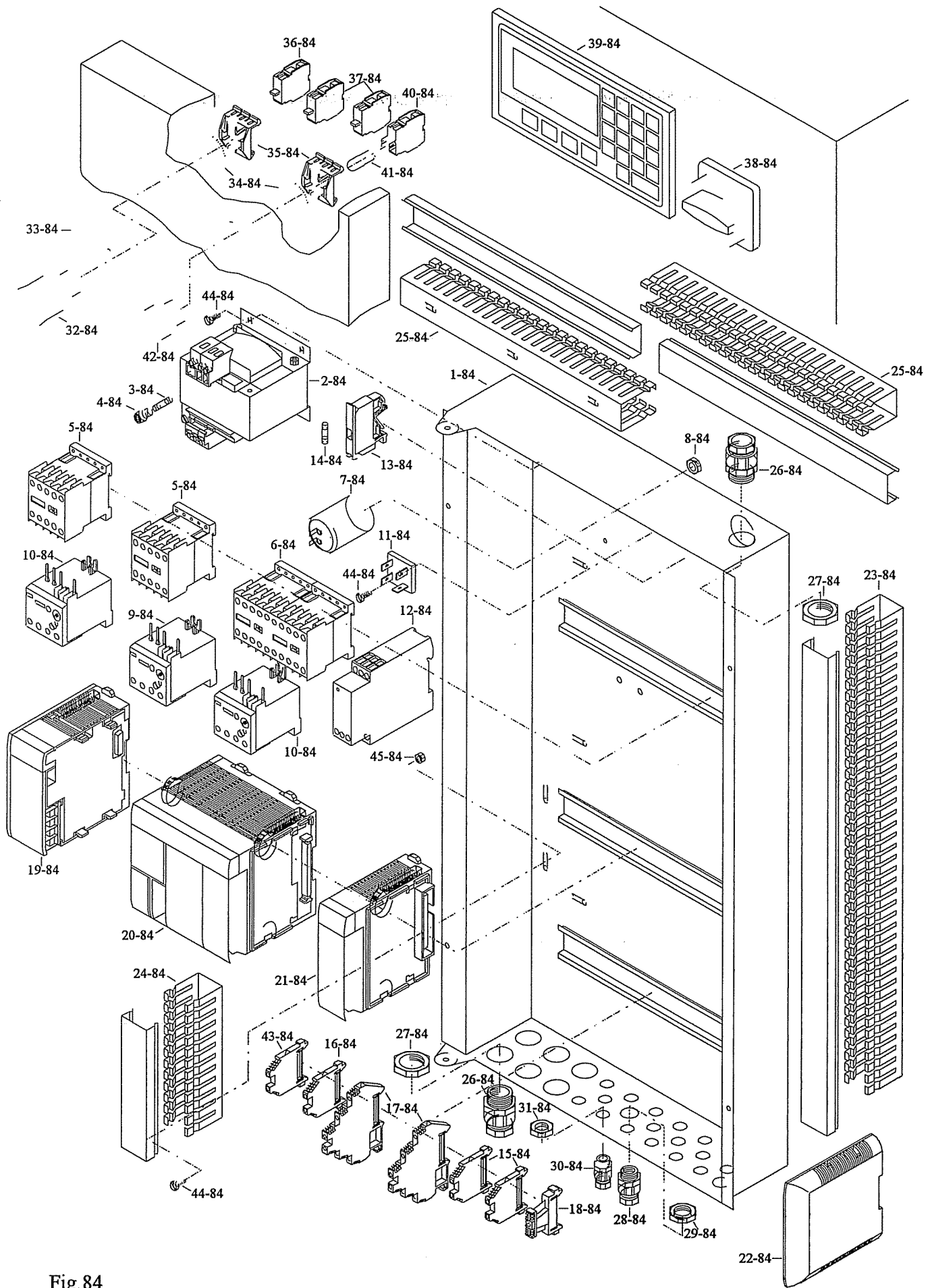


Fig. 84

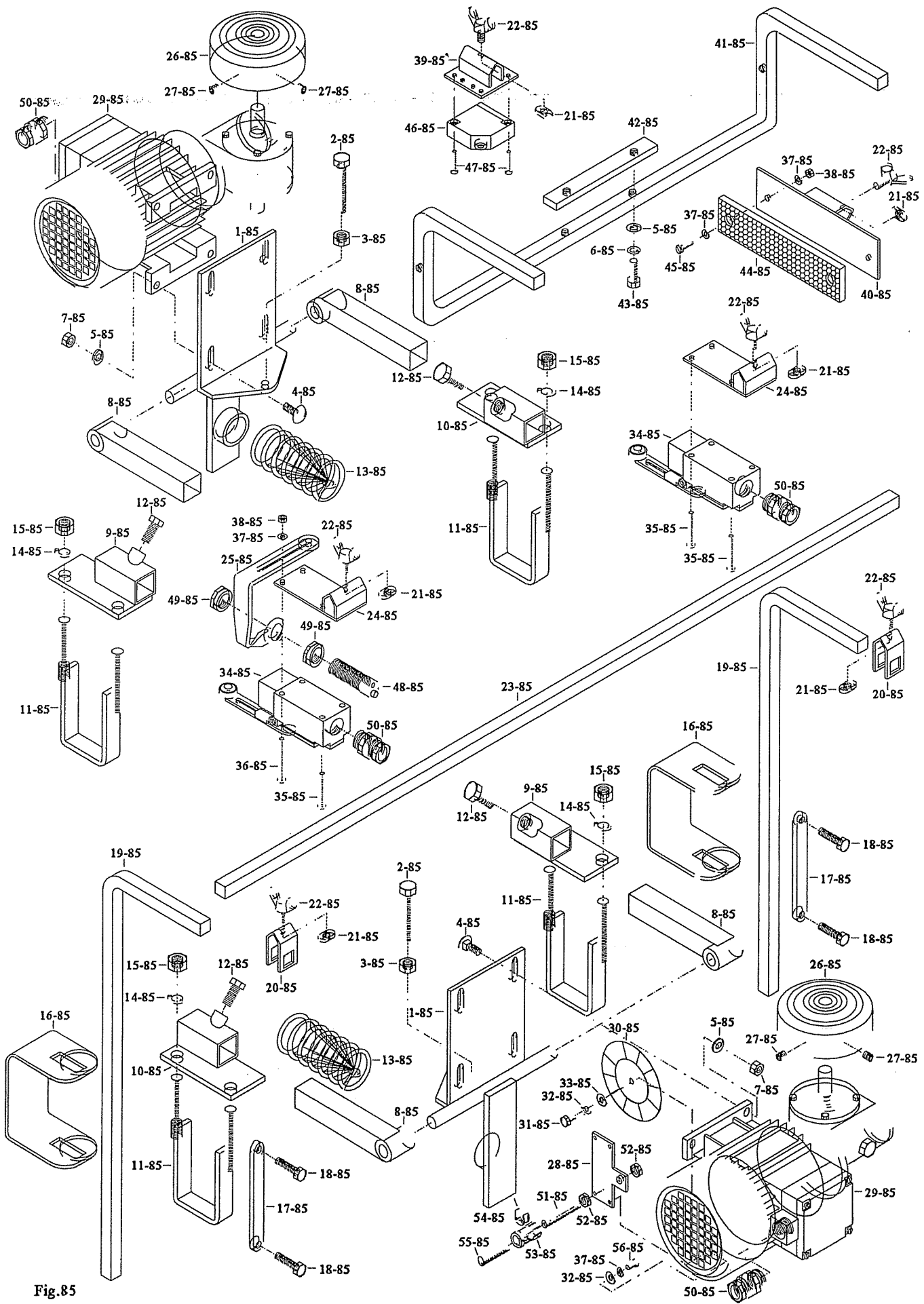


Fig. 85

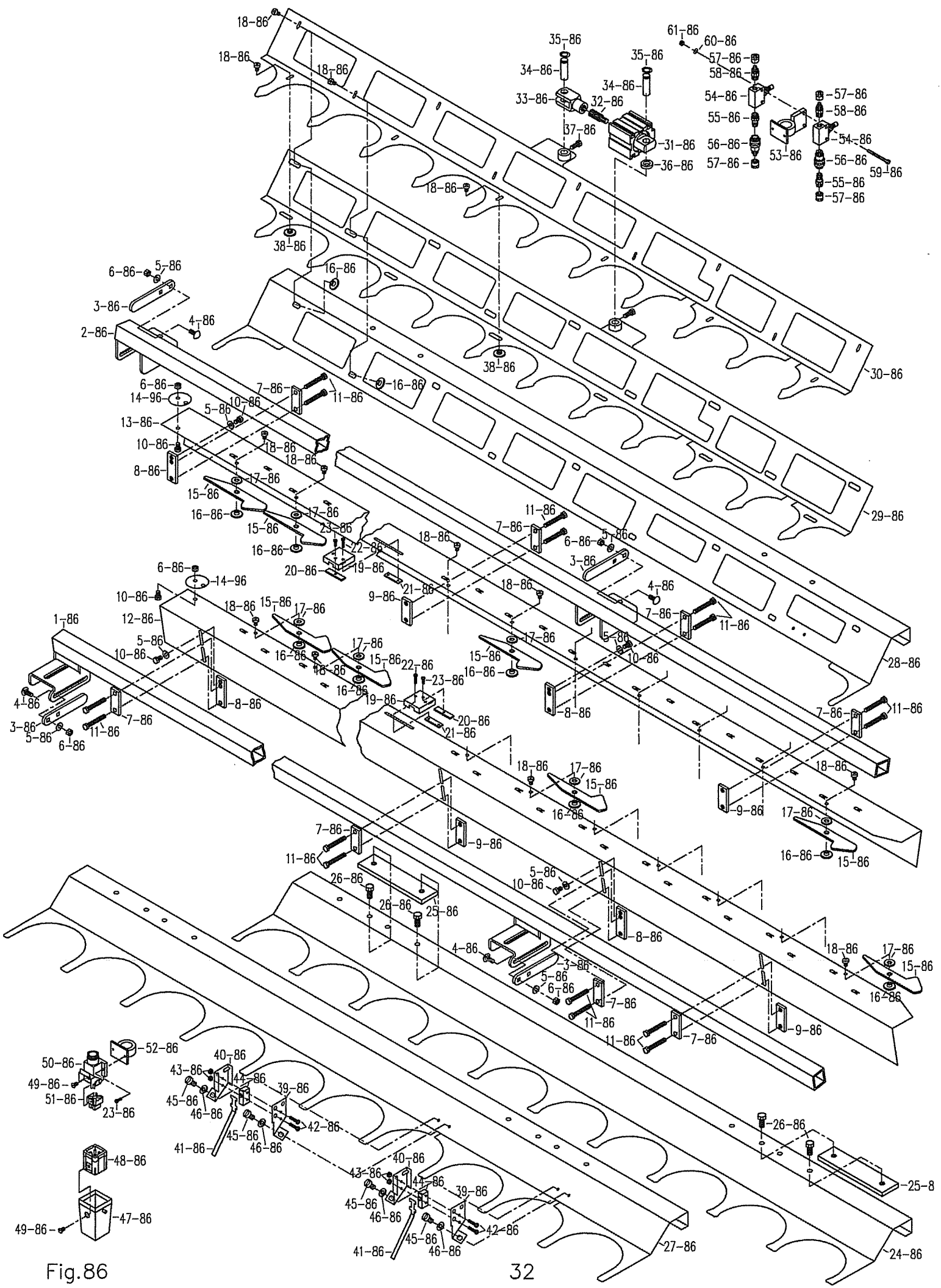
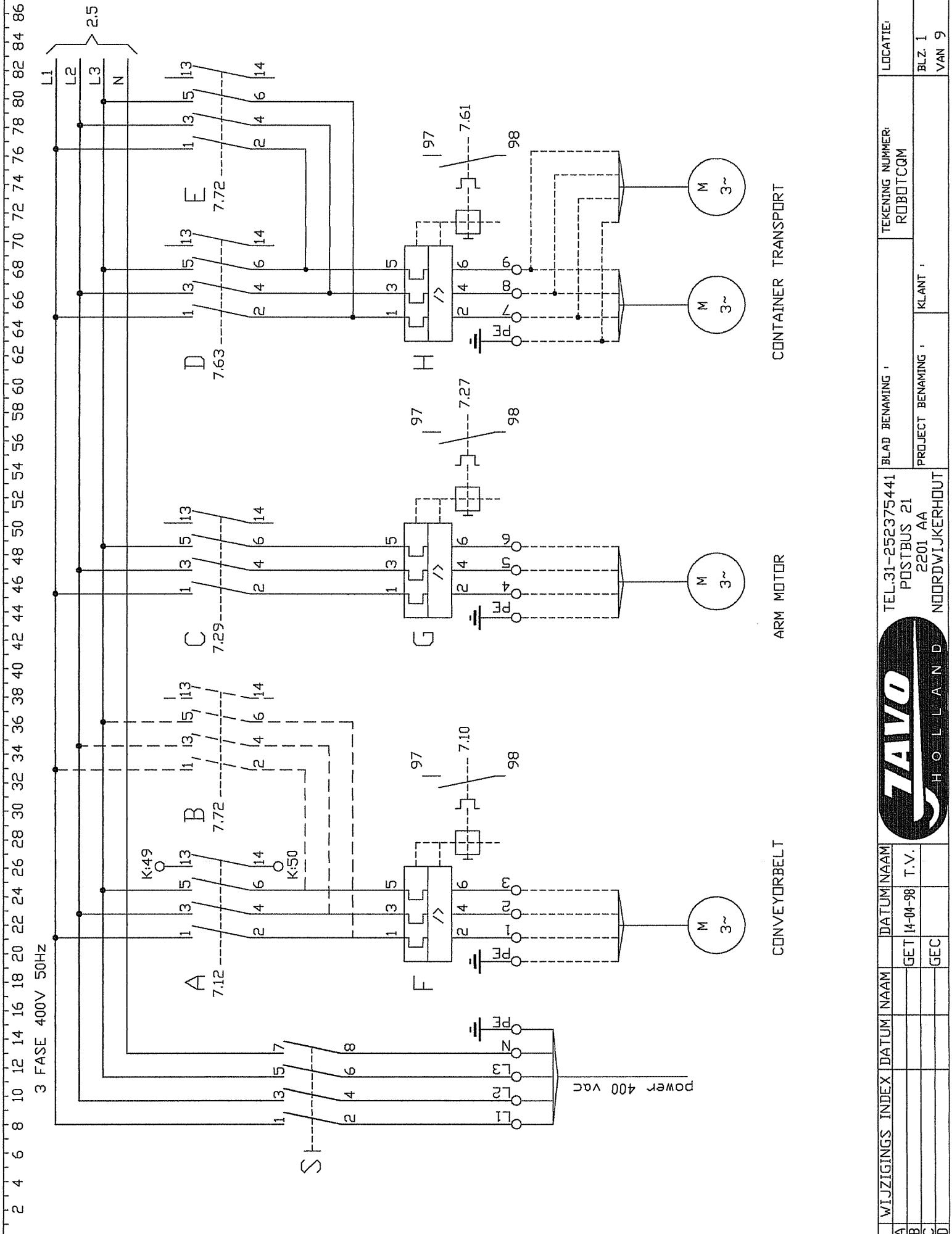
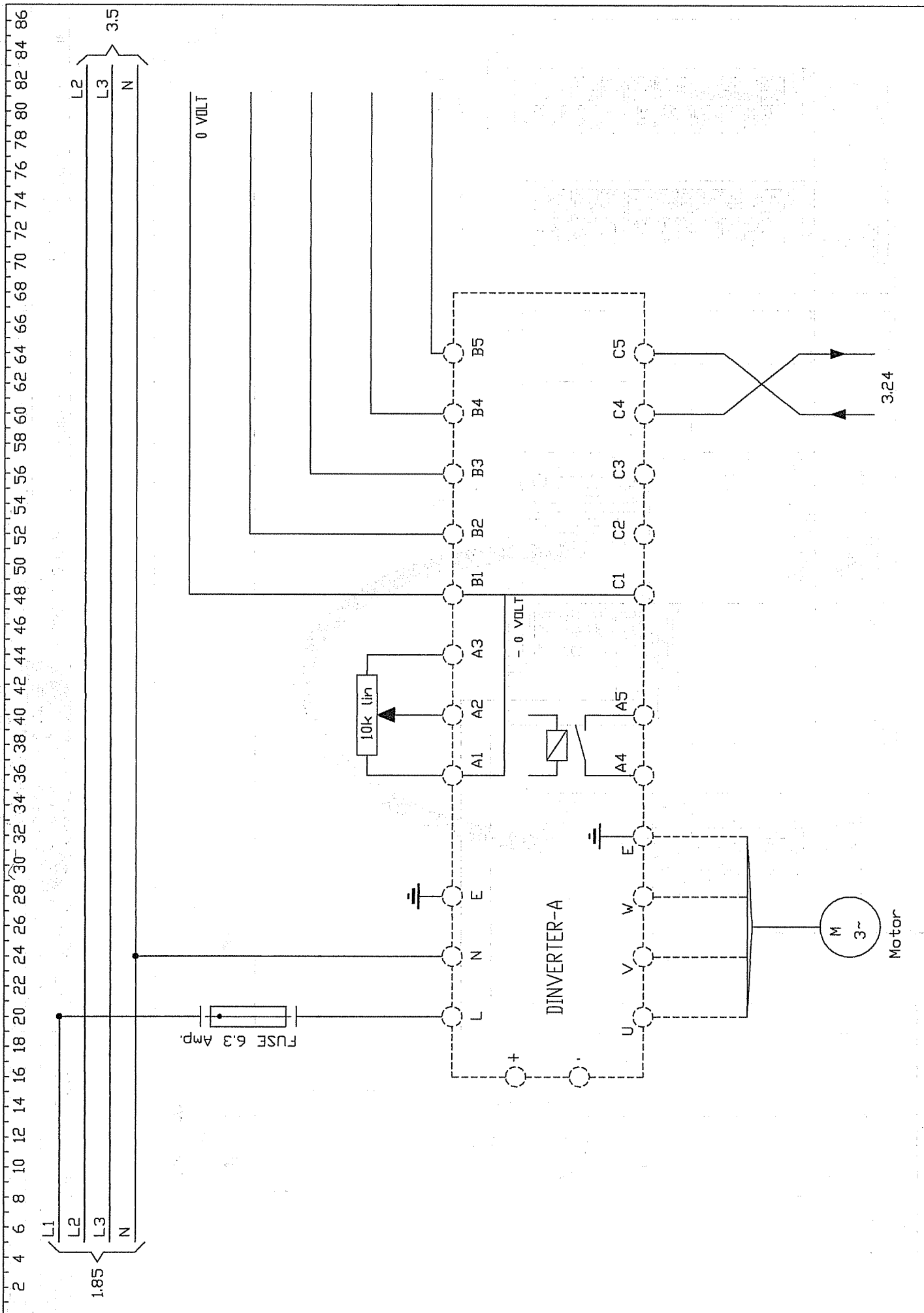


Fig.86



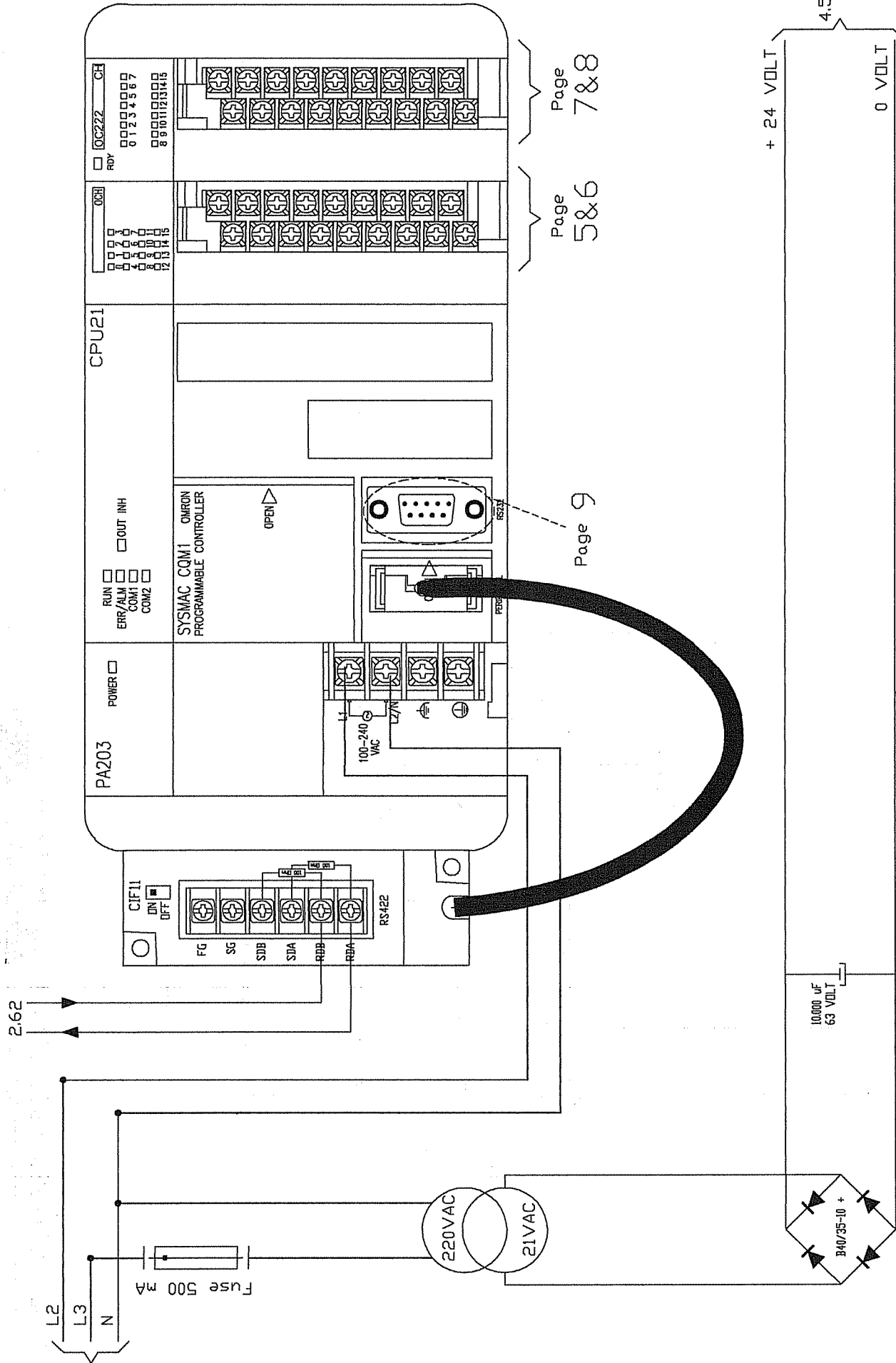
WIJZIGINGS INDEX	DATUM	NAAM	DATUM	NAAM	TEKENING NUMMER:	LOCATIE:
A	GET 14-04-98	T.V.			ROBOTCQM	BLZ. 1
B						VAN 9
C						
D						
BLAD BENAMING :				PROJECT BENAMING :		KLANT :
TEL.31-252375441				NOORDWIJKERHOUT		
POSTBUS 21						
2201 AA						





2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86
L1		L2		L3		N		1.85		L2		L3		N		3.5		0 VOLT		- 0 VOLT		10k Ohm		DINVERTER-A		M 3~		Motor		3.24		0 VOLT		0 VOLT		0 VOLT						
WIJZIGINGS INDEX		DATUM		NAAM		DATUM		NAAM		DATUM		NAAM		TEKENING NUMMER		ROBOTCQM		LOCATIE		BLAD BENAMING		PROJECT BENAMING		KLANT		BLZ. 2		VAN 9														
A		B		C		D		GET 14-04-1998		T.V.		GEC		TEL.31-252375441		POSTBUS 21		2201 AA		NOORDWIJKERHOUT		HOLLAND		ZAVO		JAVO		HOLLAND														

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86



PA203

POWER

RUN ERR/ALM COM1 COM2

OUT INH

CPU21

SYSMAC CQM1
OMRON
PROGRAMMABLE CONTROLLER

OPEN

RS422

100-240 VAC

Page 9

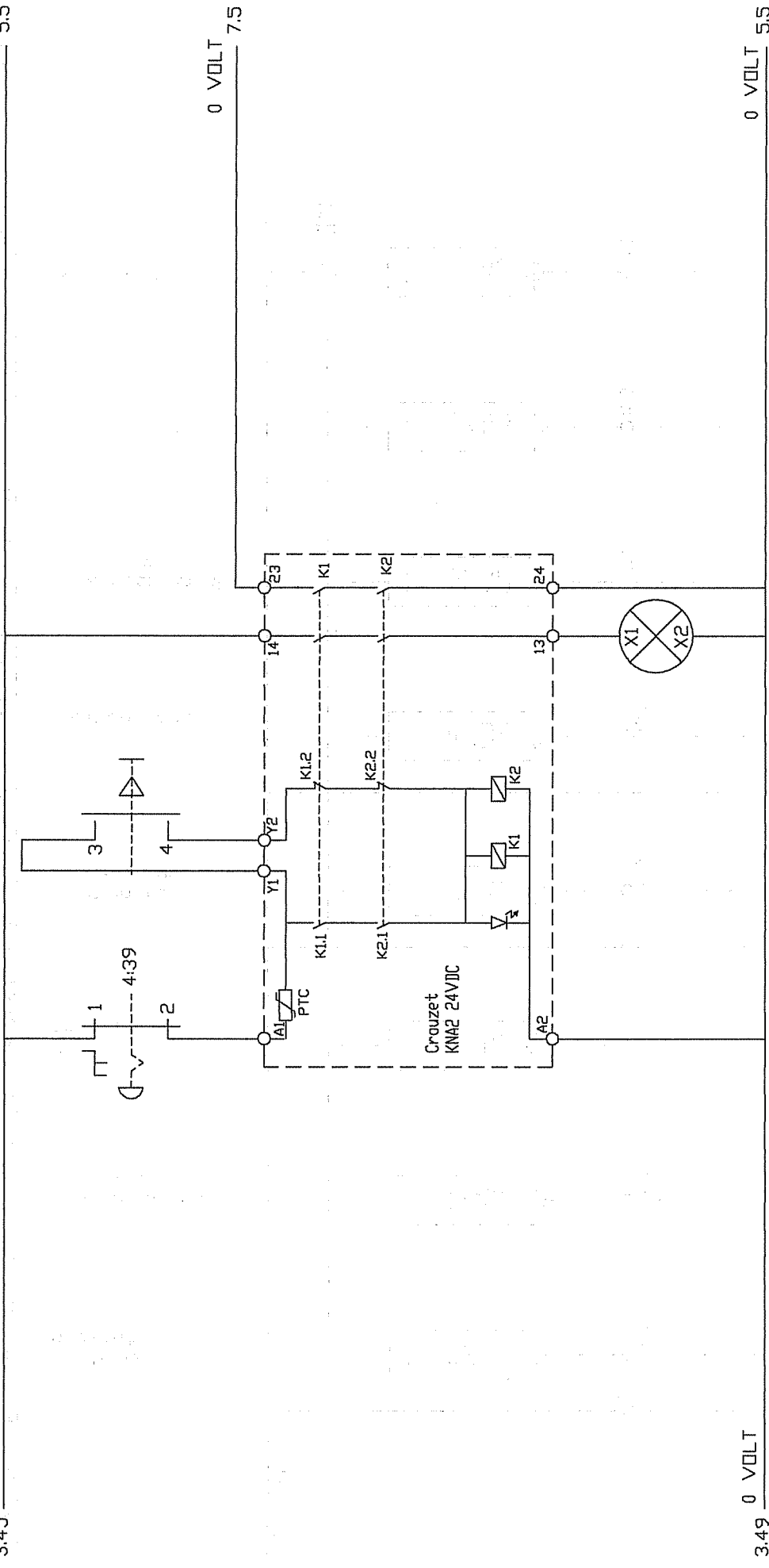
Page 5&6

Page 7&8

MIJZIGINGS INDEX	DATUM	NAAM	DATUM	NAAM	BLAD BENAMING	TEKENING NUMMER	LOCATIE
A					TEL.31-252375441	ROBOTCQM	
B	GET	14-04-98	T.V.		POSTBUS 21		BLZ. 3
C	GEC				2201 AA	KLANT	VAN 9
D					NOORDWIJKERHOUT		



2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86
 3.45 + 24 VOLT 5.5
 0 VOLT 7.5
 0 VOLT 5.5

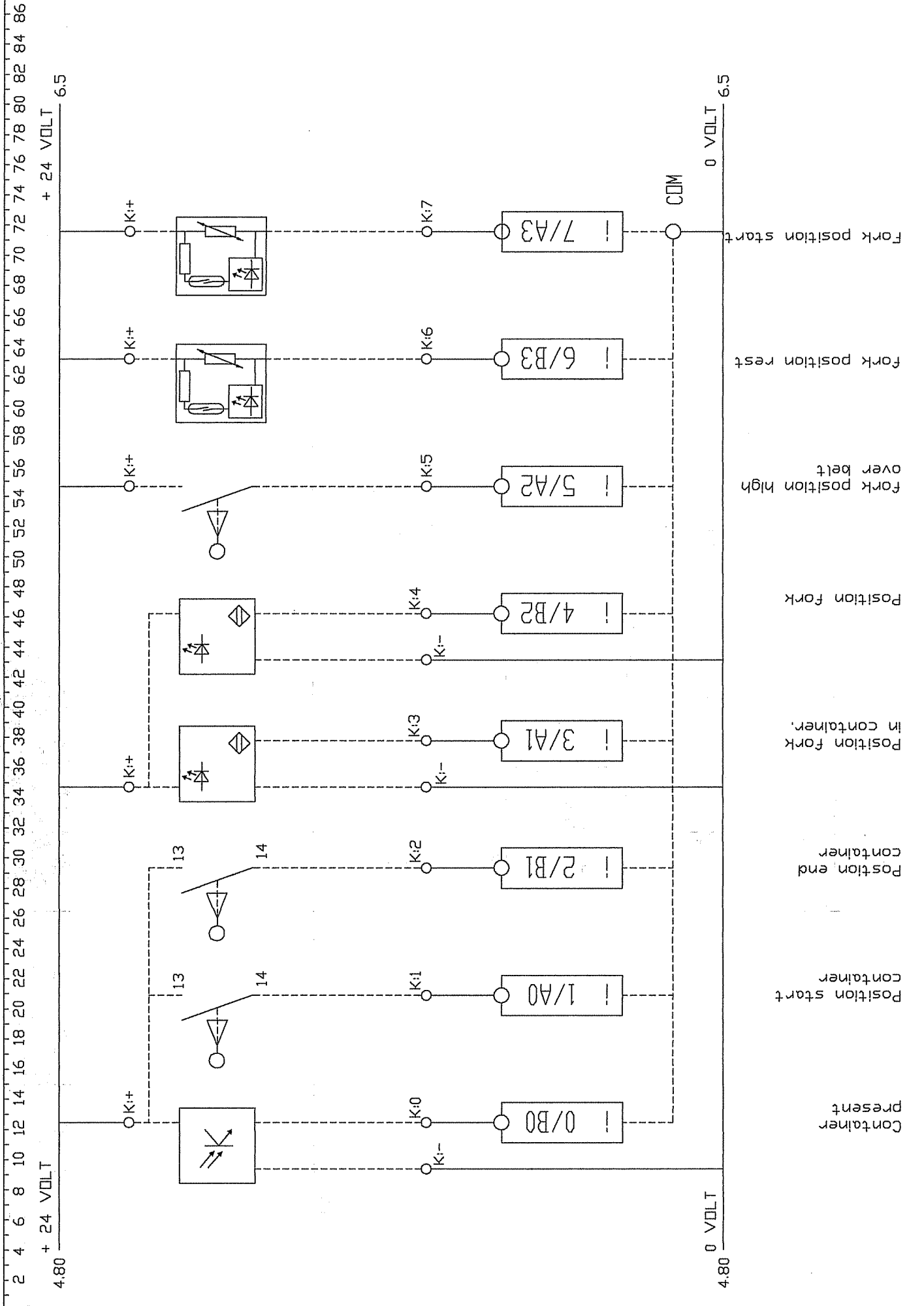


WIJZIGINGS INDEX	DATUM NAAM	DATUM NAAM	TEKENING-NUMMER:	LOCATIE:
A			ROBOTCQM	
B	GET 14-04-98	T.V.		BLZ. 4
C	GEC			VAN 9
D				

BLAD BENAMING :	TEKENING-NUMMER:	LOCATIE:
PROJECT BENAMING :	ROBOTCQM	
	KLANT :	

TEL.31-252375441	BLAD BENAMING :
POSTBUS 21	
2201 AA	
NOORDWIJKERHOUT	

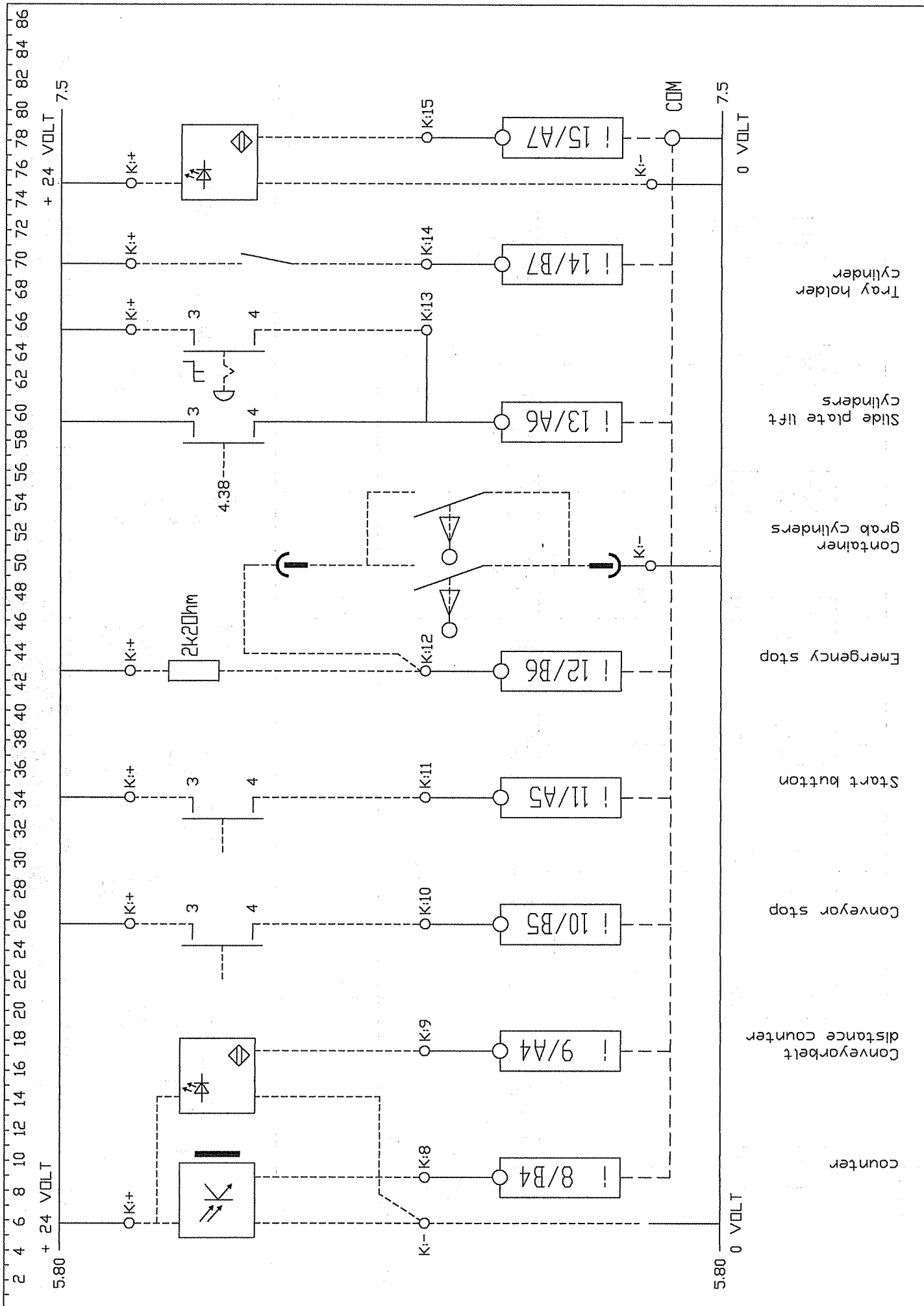




WIJZIGINGS INDEX	DATUM	NAAM	DATUM	NAAM	INDICATOR	TEKENING NUMMER	LOCATIE
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B							VAN 9
C							
D							

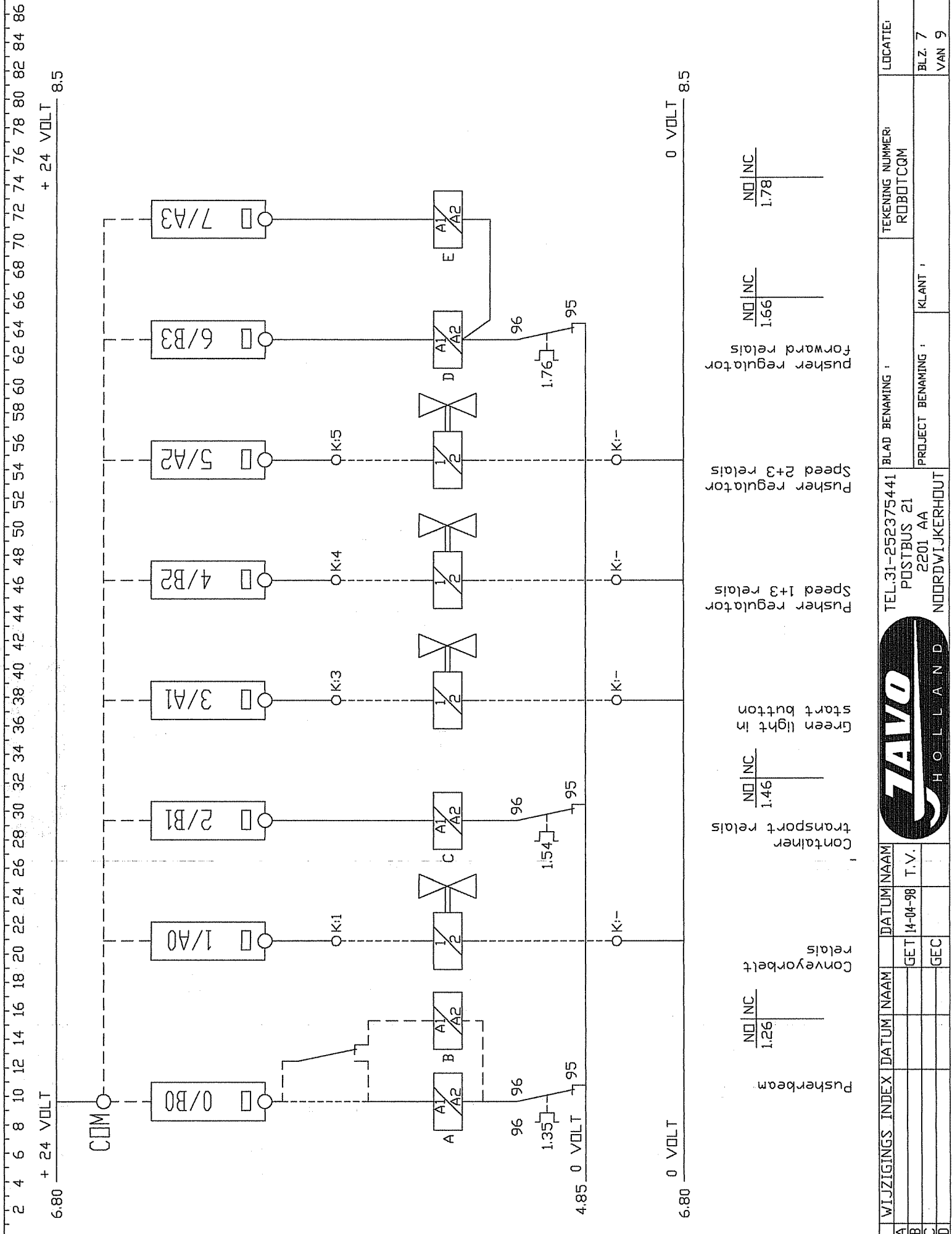
TEL.31-252375441	BLAD BENAMING :	TEKENING NUMMER:	LOCATIE:
POSTBUS 21		ROBOTCQM	BLZ. 5
2201 AA	PROJECT BENAMING :		VAN 9
NOORDWIJKERHOUT	KLANT :		





WIJZIGINGS INDEX	DATUM NAAM	DATUM NAAM	TEKENING NUMMER:	LOCATIE:
A	GET 14-04-98	T.V.	ROBOTCQM	
B				
C				
D				

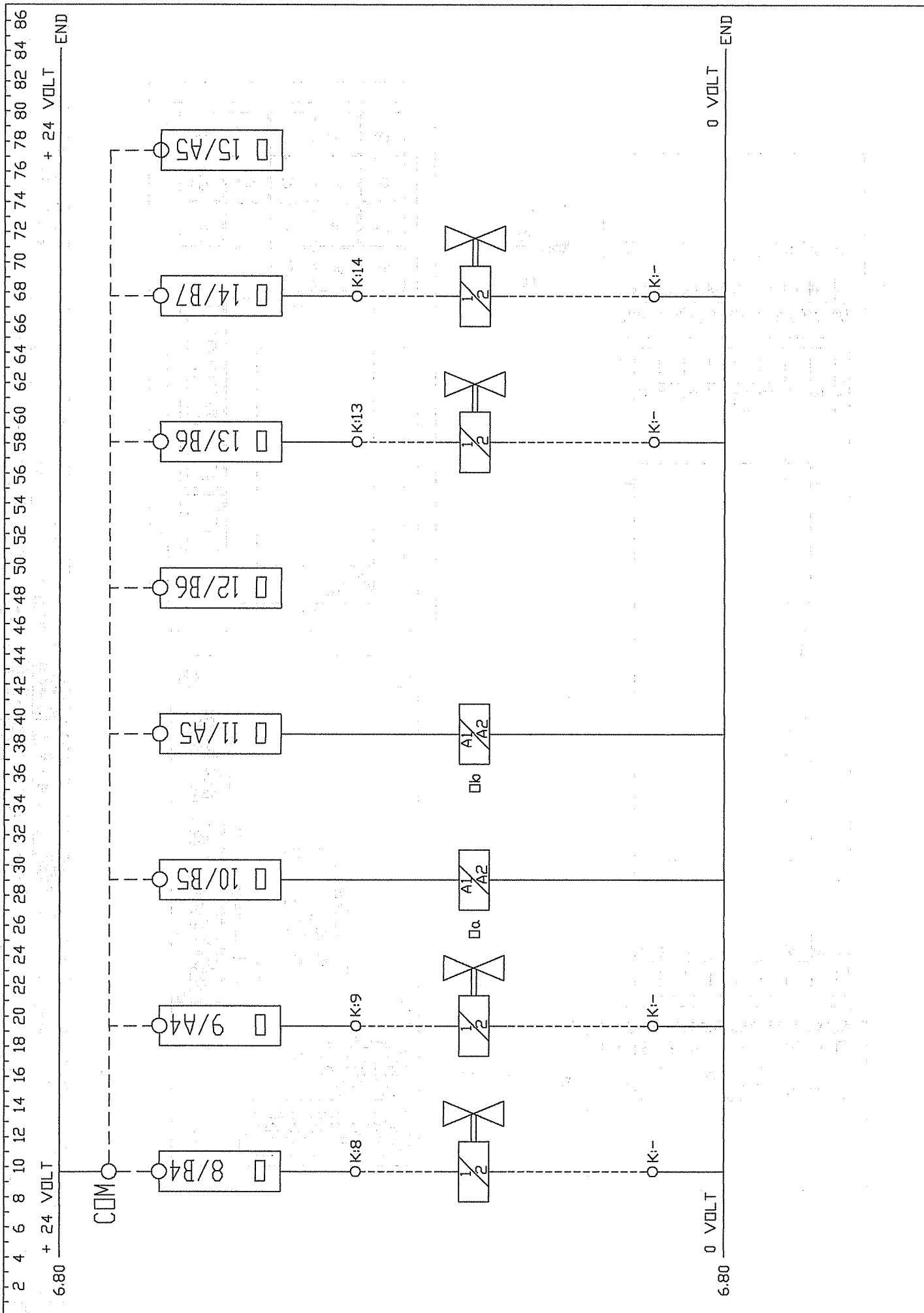
BLAD BENAMING :	KLANT :	BLZ. 6	VAN 9
TEL:31-252375441 POSTBUS 21 2201 AA	NOORDWIJKERHOUT		



MIJZIGINGS INDEX	DATUM	NAAM	DATUM	NAAM	DATUM	NAAM	TEKENING NUMMER	LOCATIE
A	GET	14-04-98	T.V.				ROBOTCQM	BLZ. 7
B								VAN 9
C	GEC							
D								

TEL.31-252375441	BLAD BENAMING :	TEKENING NUMMER:	LOCATIE:
POSTBUS 21		ROBOTCQM	BLZ. 7
2201 AA			VAN 9
NOORDWIJKERHOUT	PROJECT BENAMING :	KLANT :	





WIJZIGINGS INDEX	DATUM NAAM	DATUM NAAM	TEKENING NUMMER:	LOCATIE:
A	GET	14-04-98	ROBOTCQM	
B				
C				
D				

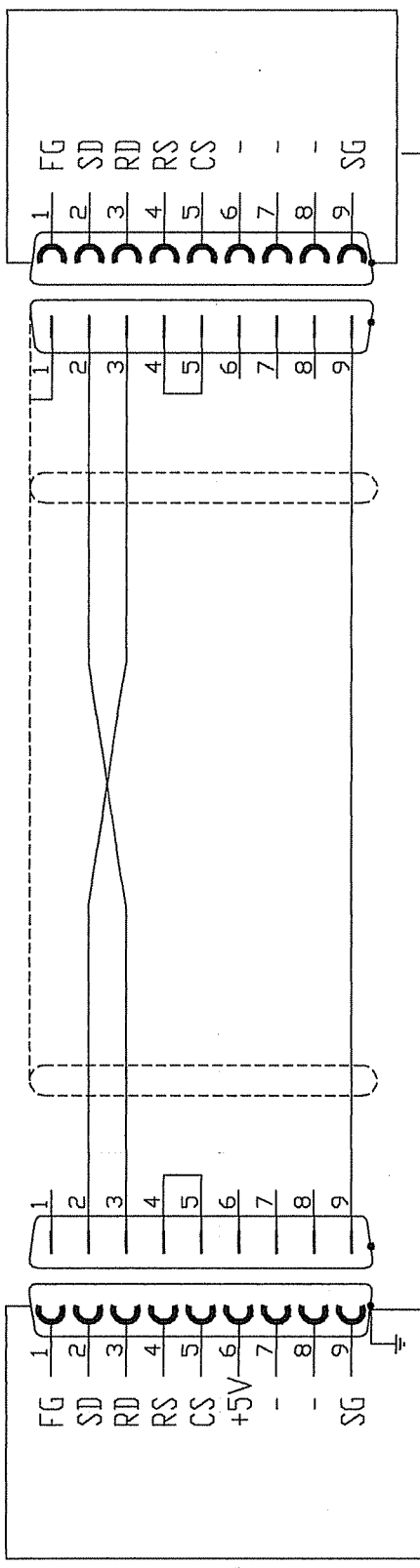
BLAD BENAMING :	TEKING NUMMER:	LOCATIE:
POSTBUS 21	ROBOTCQM	
2201 AA	KLANT :	BLZ. 8
NOORDWIJKERHOUT		VAN 9



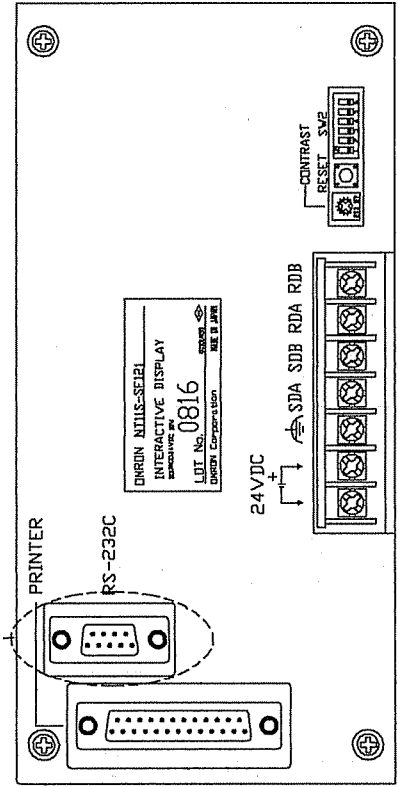
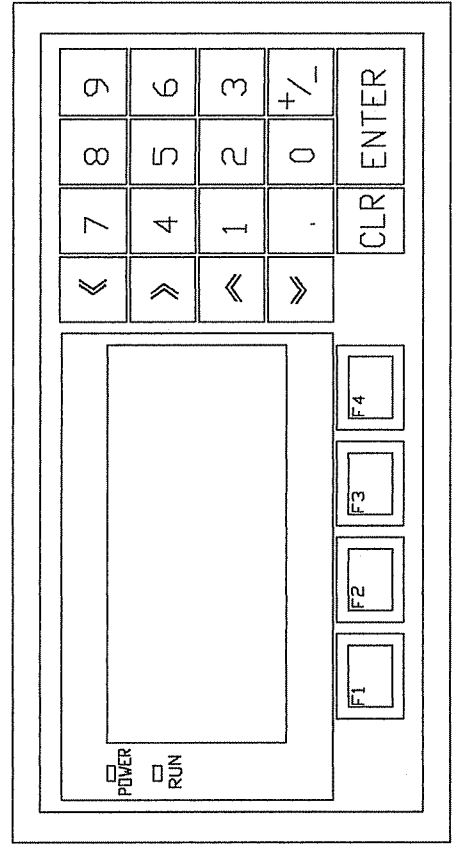
TEL.31-252375441
 POSTBUS 21
 2201 AA
 NOORDWIJKERHOUT

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86

CQM1



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WIJZIGINGS INDEX	DATUM NAAM	DATUM NAAM	TEKENING NUMMER	LOCATIE
A	GET	15-10-96	DIAPROBCEL	
B				BLZ. 9
C	GEC			VAN 9
D				

TEL.31-252375441	BLAD BENAMING :	TEKENING NUMMER:	LOCATIE:
POSTBUS 21	Kabel NT11 - CQM1	DIAPROBCEL	
2201 AA	PROJECT BENAMING :		
NOORDWIJKERHOUT	ROBOT	KLANT :	

