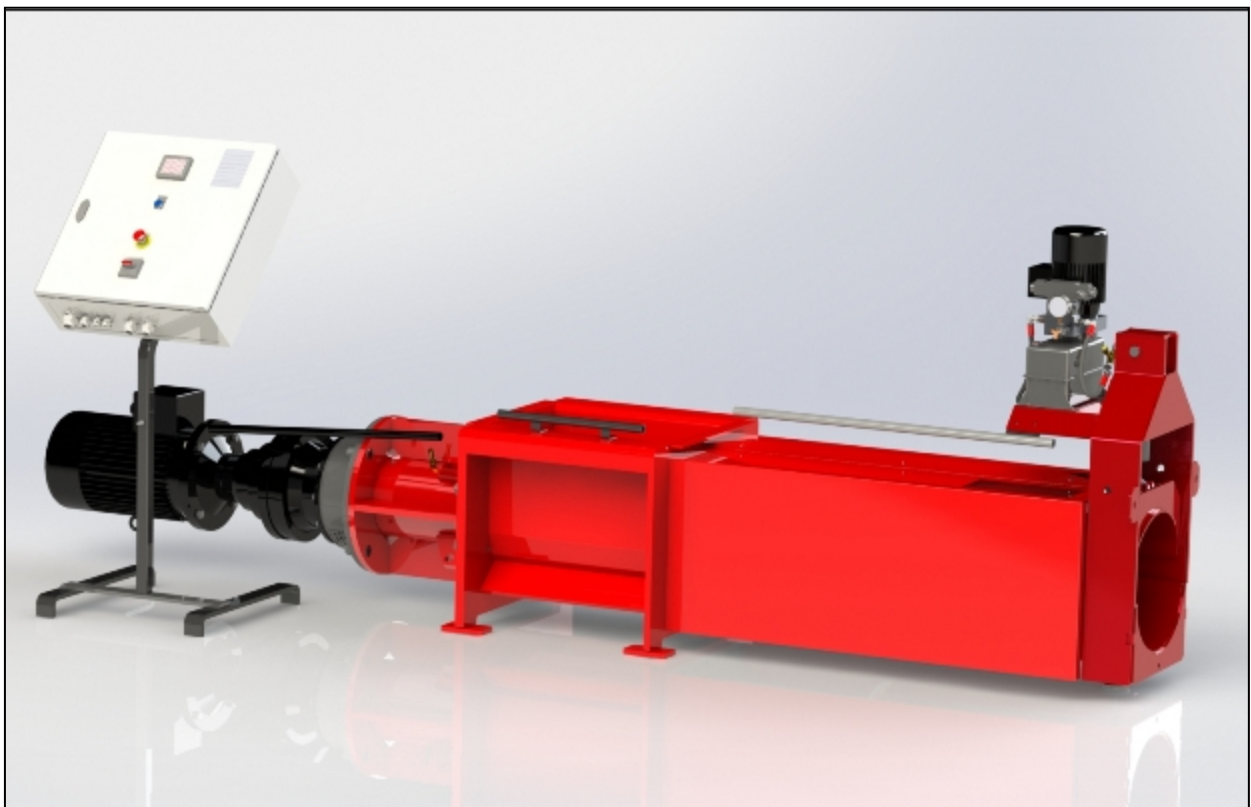




ORIGINAL INSTRUCTION MANUAL RUNI SCREW COMPACTOR



Model SK370 - Serial no.: 1811-2017

1. Table of contents

2. EU - Conformity declaration	5
3. Field of application	7
4. Warranty and liability	7
5. Safety around the machine	8
6. Owner's responsibility	10
6.1 Disposal.....	11
7. Technical specifications	11
8. Control box - buttons.....	12
9. Starting the compactor.....	12
10. Operation using PLC – automatic operation	13
10.1 Selecting the method for automatic operation.....	13
10.2 Machine halt when load outside the limit values	13
10.3 Reset*	14
10.4 Timers	14
11. Operating the PLC and display.....	14
11.1 Levels of operation	14
11.2 Login	15
11.3 Display	15
11.3.1 START SCREEN.....	16
11.3.2 CHOOSING MANUAL OR AUTOMATIC OPERATION.....	16
11.3.3 STATUS SCREEN	17
11.3.4 SETUP SCREEN	18
11.3.5 CHANGING PLC SETTINGS/PARAMETERS	18
11.4 Product 2 (option)	18
12. "QUICK MODIFY"	18
13. Other parameters	19
13.1 Screw settings.....	20
13.2 Hopper /pre-crusher settings (optional extra)	20
13.3 Jaw settings.....	21
13.4 Other settings	23
14. Factory settings	26
15. Alarms / error messages.....	28
16. Electrical components settings.....	31
16.1 Photocells (optional extra)	31
16.2 Power converter to monitor the main motor/screw	32
16.3 Rotating sensor / Ultrasonic sensor (optional extra)	32
17. Configuring the hydraulic jaws	32
18. The hydraulic system	33

19. Overpressure in bearing housing (optional extra)	34
20. Starting the compactor for the first time	34
21. Service and maintenance	35
21.1 Cleaning	35
21.2 Greasing.....	35
21.3 Re-tighten bolts	35
21.4 Planetary gearbox.....	36
21.5 Main bearings	36
21.6 Hydraulic system	37
21.7 Hopper with pre-crusher (optional extra)	37
21.8 Drain holes (extra equipment)	37
22. Transportation instructions	38
23. Installation.....	38
24. Assembly and disassembly	39
25. Glossary	40
26. Contact	40
27. Appendices	41
Appendix 1 Drawings, part lists and recommended spare parts	
Appendix 2 Assembly and disassembly instructions	
Appendix 3 Maintenance (blue and green schedule, greasing list)	
Appendix 4 Machine configuration	
Appendix 5 Qualification and Training Chart	
Appendix 6 Gearbox	
Appendix 7 Hydraulic chart and part list	
Appendix 8 El-documentation	
Appendix 9 Hopper possibly with pre-crusher/inspection door (optional extra)	
Appendix 10 Photocells (optional extra)	

2. EU - Conformity declaration

RUNI

EU CONFORMITY DECLARATION

Manufacturer: **RUNI A/S**

**Industriparken 8
DK-6880 Tarm
Denmark**

Tel.: +45 9737 1799

Authorized to compile the technical file

Søren Rossen Bech
Technical Director
Industriparken 8
DK-6880 Tarm

Hereby declares that:

Type:

SK370



Serial no.:

1811

Year:

2017

Has been manufactured in conformity with:

The requirements of the Council Directive 2006/42/EEC

Electrical power components in the machine complies with the requirements of the Council Directive 2014/35/EEC - Low Voltage Directive

Electronic components in the electrical equipment of the machine complies with the requirements of the Council Directive 2004/108/EEC - EMC Directive.

Has, where relevant, been manufactured in conformity with the following **national/international standards and technical specifications:**

EN ISO 12100:2010 Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 349 + A1:2010 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
EN ISO 13857:2008 Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
ISO 13856-3:2013 Safety of machinery - Pressure-sensitive protective devices
EN 60204-1:2006 Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 13849-1:2015 Safety of machinery - Safety-related parts of control systems -- Part 1: General principles for design

Søren Rossen Bech
Technical Director

Date:

This machine is incomplete and can, acc. to Directive 2006/42/EU article 2, not be put into service.

1. This machine is delivered without sufficient safety distances in these areas:
 - a. Material inlet
 - b. Material outlet

2. After installation, a risk assessment has to be performed, according to EN349 and ISO 13857.

This machine is, according to Directive 2006/42/EU article 2, only to be put into service after:

1. A interface risk assessment, according to ISO 12100, has been performed
2. Identified risks are handled, according to Directive 2006/42/EU. This could eg. require (including but not limited to) safety guards around infeed opening, E- stop of Trip wire type over belt conveyor.
3. A working safety evaluation, according to Directive 2009/104, has to be performed.

3. Field of application

The screw compactor has been developed to compact material in a continuous process. The screw compactor is able to keep a high and consistent pressure. The clamping jaws – and the extrusion die – are therefore the heart of the compactor. The screw compactor contains systems that are protected with utility model protection in the Danish Patent and Trademark Office.

(utility model registration no. DK 99500220 U3).

The screw compactor is designed to process waste such as EPS (polystyrene foam), plastic bottles and containers, aluminium and tin cans, textile scrap, etc.

To improve the processing of large EPS items, such as fish boxes, the machine is fitted with a special feed hopper with integrated pre-crusher. The aim of the pre-crusher is to pulverise the material to the extent that it can slip between the screw blades.

The compacted material can be discharged directly into a container, or into a continuous plastic bag which can be easily cut and tied at both ends. The latter will also prevent any dust problems. It is then easy to dispose of the material in an environmentally-friendly manner.

The screw compactor can also be built for emptying liquid content from various containers and draining many types of materials.

The screw compactor must not be used to compact hard, rigid components, as these can damage it. Dangerous materials, corrosive materials or explosive materials must not be compacted in the screw compactor - unless it has specifically been designed and built for this.

The manufacturer's warranty does not cover if the screw compactor is used without the field of application.

This machine is configured for compacting following material:

Paper labels and plastic labels

4. Warranty and liability

Warranty and liability in the event of human injury or machine damage are excluded if these are attributable to one or more of the following causes:

- Use of the machine for purposes other than those it is designed for.
- Installation, commissioning, operation or maintenance of the machine by unqualified personnel.
- Use of the machine by unqualified or unauthorised personnel.
- Use of the machine with defective safety devices, incorrectly fitted or non-functional safety and protection systems.
- Failure to comply with directions in the instruction manual relating to transport, set up, commissioning, operation and maintenance of the machine.
- Structural modifications to the machine.
- Inadequate monitoring of machine components subject to wear.
- Repairs carried out by unqualified personnel.
- Failure to adequately remove compacted material.

- Repair or disassembly has been carried out during the warranty period by anyone other than the supplier's technicians, except where agreed otherwise.
- Interference from foreign bodies, disaster or Force Majeure.

Interfaces:

- If the machine is integrated into an existing system, new hazard points may arise at the interfaces.
- RUNI A/S is not liable for any such new hazard points which arise due to integration of the machine into an existing system or production process!
- Our conformity declaration is nullified in such cases.

5. Safety around the machine



**No unauthor-
ised access**

The machine must not be started if any **exposed persons**** are within the **danger zone***.

If an **exposed person** is within the **danger zone** (e.g. during inspection, service or maintenance), the following precautions must be observed:

- 1) Power must be disconnected from the machine.
- 2) A padlock must be attached to the repair isolation switch.
- 3) There must be clear indication that the machine is not to be started.

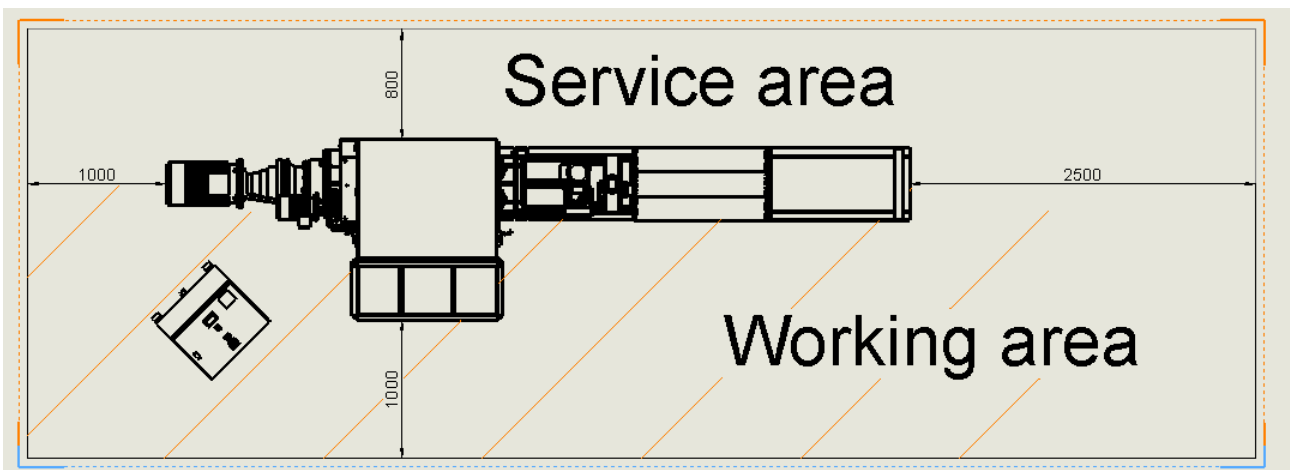
The operator must ensure that no **exposed persons** are within the **danger zone** while the machine is in use.

* **Danger zone:** all areas in and around the machine which represent a threat to the health and safety of an exposed person while the machine is being operated. Please pay attention to the following areas: hopper, pre-crusher, screw, pressure chamber and electrical components.

** **Exposed person:** any person located partially or fully within the danger zone.



Climbing into the hopper is expressly prohibited
Climbing into the pressure chamber when it is empty is expressly prohibited.
It is prohibited to climb on the machine.
It is prohibited to operate the machine with damaged safety devices, not properly placed or not functioning safety and protective devices.





To avoid noise and stress, operators must always wear approved hearing protection due to the loud noises which arise when material is pre-crushed and compacted. The compactor itself has a sound level of approx. 55 dB. The noise which arises as material is processed can vary greatly depending on the material.

The noise level in the area in which the operator needs to work can reach 91-113 dB(A, C). Other personnel in the vicinity should also be offered hearing protection if the noise exceeds 80 dB (A). Hearing protection is recommended in all circumstances. It is important that the working area is clearly marked with the compulsory (blue) hearing protection symbol where the use of hearing protection is required.

Please note: the ability to orient oneself may be effected when wearing hearing protection. The user must make sure that the area is designed in a way that does not cause any danger for the operator and others.



WARNING!

Please note that the machine starts up automatically when it has been configured to do so.

Compacting of the waste materials may result in spores, germs, gasses and chemical substances and the like may be released and contaminate the working area. Staying near the machine you must always wear personal protective equipment that protects against the relevant substances.

Manual feeding of the screw compactor may cause physical disabilities. The user must make sure that the work is planned with sufficient variety to prevent disability damages.

The screw compactor is developed and produced for industrial use and use in warehouse areas in connection with shops or similar. The screw compactor must not be used for private purposes, in schools or in sheltered workshops.

The screw compactor must only be used by trained personnel.

Read these safety instructions thoroughly before operating the machine. The safety instruction is placed on the control box.

Safety instruction

 Only trained personnel should operate and adjust the machine. Always follow the safety instructions.

 Before service/adjustment/repair you must read the manual. If there is no manual do not start adjustment, repair or separation of the machine.

 **NEVER PUT YOUR HANDS INTO THE MACHINE WHEN RUNNING!**

Keep loose clothes, jewellery and long hair away from the rotating parts.

 Use personal protective equipment to the extent that it is required for the job!

 All safety devices of the compactor must be whole and functional. Defects must be reported immediately to the person responsible.

 Any unauthorized separation should only happen with disconnected power plug or a locked main switch.

 Must be earthed in accordance with high voltage notification EN 60204-1.



6. Owner's responsibility

The owner is responsible for ensuring that the operator has the necessary skills.

The operator must ensure that no **exposed persons** are within the **danger zone** while the machine is being operated.

As the use of the RUNI Compactor is outside our control, we can only guarantee the quality of the machine and cannot accept compensation claims of any kind in relation to its performance.

Any form of personal injury resulting from the presence of **exposed persons** within the **danger zone** is solely the responsibility of the owner.

It is the owner's responsibility to ensure that the machine is installed in accordance with local regulations. Please give special attention to ensuring that:

- the control box is protected by an external circuit breaker,
- the control box is correctly connected to earth,
- no ladders, platforms or other objects for stepping on to around the screw compactor have been mounted, so safety distance to dangerous areas is reduced or risk of falling onto or into the screw compactor is possible.
- The machine is not integrated with other machinery, without consideration being given to safety, and the entire system being CE-labelled.
- The screw compactor must not be operated with damaged safety devices, not properly placed or not functioning safety and protective devices.

It is the user's responsibility that the screw compactor is undamaged and correctly maintained. Please pay attention in particular to:

- All protective devices are undamaged and in accordance with the documentation
- Bearings are greased in accordance with the instruction and with the correct grease
- Cable, pressure hoses and safety circuit checked and replaced in accordance with instruction.

It is the user's responsibility that only trained personnel can operate the screw compactor. In particular please pay attention to:

- Isolation switch is turned off and locked when trained personnel is not operating the machine.
- The instruction includes all safety devices in this instruction manual.
- Animals, children, mentally disabled people and private people do not have access to the danger zone, to operate the machine deliberately or unintended, neither to climb on or in the machine.
- Instruction includes correct protection and protective gear when standing close to the machine – this includes protection against noise and protection against relevant substances. Compacting of waste material may cause that spores, germs, gasses and chemical substances etc. are released and may contaminate the working area.
- The compactor must only be used for the approved purpose.

WARNING! The operator must not wear long, loose clothing, such as a long scarf, that can be caught and drawn into the machine.



All screws and bolts must be checked and tightened where necessary at regular intervals.

Emergency stop is used in dangerous situations and the machine must be brought to halt. **The safety switch** of the inspection door (OPTION) creates extra personal safety when opening the inspection door.

By ordinary operation the machine is stopped by pressing "STOP" on the touch display .

6.1 Disposal



Packaging should be disposed of in accordance with local regulations covering disposal of the packaging materials used.

The machine has been manufactured using materials which cannot be disposed of together with household waste.

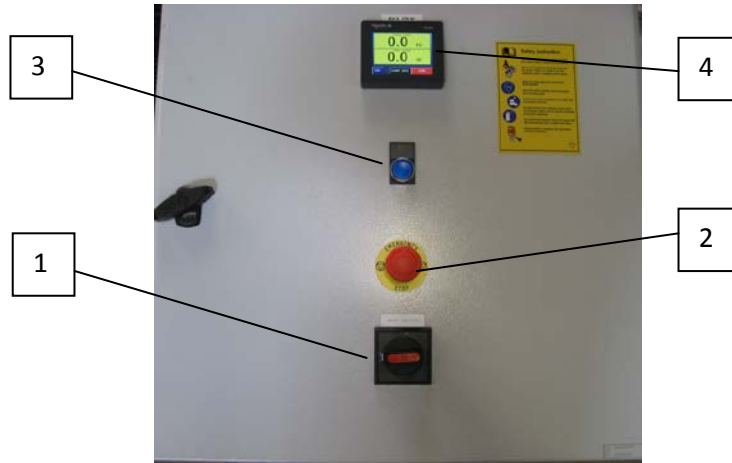
Empty the machine of oil and grease and close all connections. Uninstall and disassemble the machine for disposal in accordance with the applicable local regulations for disposal of the individual components.

7. Technical specifications

Type	:	SK370
Serial number	:	1811
Year of manufacture	:	2017
Dimensional drawing no.	:	5000012279
Drawing no.	:	5000007776, 5000008288, 5000007779, 5000008631
Main dimensions (HxWxD in mm)	:	1313 x 3700 x 730
Weight	:	Approx. 1.5 tonnes
Required power connection	:	3 x 400 V + earth, 50 Hz
Fuse	:	Min. 50 A / Max. 63 A gL/gG
Electrical diagram no.	:	3-356-146-ED-V01-01 (3-356-191 with AMP10)
Software version	:	3-356-191_lbnr 1725-2016_Ver1
Display	:	HMIS5T
Noise	:	Under no load: 55 dB Under load: 91-113 dB
Designed servicelife	:	10 years

8. Control box - buttons

The mode of operation can be set using the touch display on the front panel of the control box.



Item	Label	Name	Function and comments
1		Isolation switch - lockable	Disconnects all power to the compactor
2		Emergency stop	
3		Reset*, Fault – blue	Lights constant: the machine is stopped because of error (hard alarm) Flashing light: the control has detected an error but the machine continues operation (soft alarm) Error message will be shown on the display.
4		Display	Described in section 11.3

9. Starting the compactor

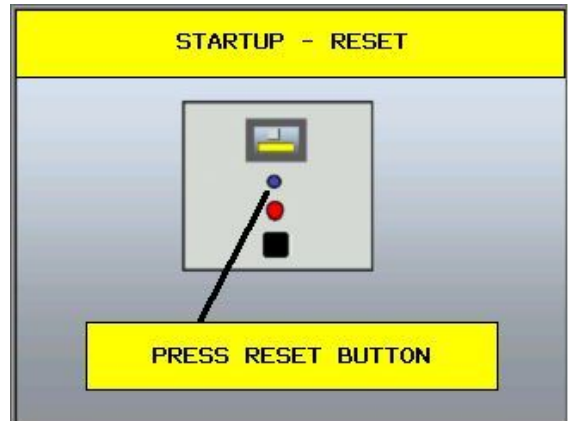
To start the machine/controller:

1. Turn the isolation switch (section 8, item 1) to the on position.
Following approx. 15 seconds of initialisation, a start-up image is shown on the display.
2. Check that the emergency stop button (section 8, item 2) is pulled out (power enabled).
3. Check that any external emergency stop switches, panel switches and safety wire switches are enabled.



Press “reset”* (section 8, item 3) and the blue light should go out.

If the compactor has stopped and the blue light is lit, you must press “reset”* before the machine can start again.



10. Operation using PLC – automatic operation

This section only applies to automatic operation of the machine.

During manual operation, the operator assumes full responsibility for the machine.

10.1 Selecting the method for automatic operation

When the machine runs in automatic mode (see section 11.3), there are two methods that can be used to control the hydraulic jaws.

1. Power control

Using this method, the PLC continually monitors the power consumption of the main motor. When the power consumption exceeds the defined upper limit (“LIMIT OPEN”), the jaws will open to reduce pressure on the compacted material and hence the power used by the motor. When the power consumption drops below the defined lower limit (JAWS SETUP 2 - “LIMIT OPEN” minus “DIFFERENCE”), the jaws will begin to be pressed downwards to increase load on the main motor. Thus the control system/PLC will continually seek to keep the power being consumed by the main motor between the two limit values, thereby ensuring the material are compacted uniformly.

Power control / continuous mode

In continuous mode, the above adjustment in relation to “LIMIT OPEN” and “LIMIT CLOSE” will take place as a continuous process. The PLC will continually seek to keep the power consumption within the desired range, which means that the hydraulic cylinder will be activated until this is achieved.

Power control / interval mode

In this mode the PLC will adjust the position of the hydraulic jaws following the same principle as above. However, the adjustment takes place at distinct intervals. The frequency of these adjustments and the duration of the interval during which the hydraulic cylinder/pump can operate are both adjustable.

In certain cases this method of operation can result in more uniform compaction, as only limited adjustment is made on each occasion, and then measurement is performed prior to the next adjustment.

2. Speed control (option)

10.2 Machine halt when load outside the limit values

If the PLC is unable to bring the power consumption / production speed within the defined limit values by adjusting the jaws, the controller will stop the compactor after a predefined time limit. The compactor is also stopped if the motor is under no load due to a lack of material for a predefined time interval. This helps prevent material meltdown from occurring in the machine. The end of the screw can get very hot if it keeps driving against the same material for a long time.

If the compacting screw of the machine is blocked by a big hard foreign object in the waste material, the blockage may be solved by changing to manual operation and activating the main motor to reverse. The screw will run reverse for 2 seconds.

Following the isolator switch is dis-connected and locked and the foreign object is removed.

If this does not solve the problem the isolator switch is dis-connected and locked and the machine must be dismantled to remove the blockage.

10.3 Reset*

If an error occurs the machine stops and the blue light is lit. The reason is shown on the display. In order to start the machine again, you must first press “reset” so the blue light goes out. Remember to address the problem first.

10.4 Timers

The PLC* has several built-in timers. For example, there is a brief delay during start and stop to avoid the machine starting/stopping at the exact time a photocell, etc., detects material or an absence of material. This is to avoid the machine starting and stopping very frequently.

There is also a timer to stop the hydraulic pump when the jaws are pressed together to their limit. This timer has been incorporated to reduce:


1. Operating time for the hydraulic pump, hence increasing its lifetime.
2. Heat generation, and hence the oil temperature, to increase the lifetime of the pump.

There are also timers which count the machine’s operating hours. After 100 hours of operation, the machine’s primary bearings must be greased. A message is shown on the display to this effect. It is also possible to view the machine’s total operating hours.

11. Operating the PLC and display

11.1 Levels of operation

- “LEVEL 1”: full access to change SETUP parameters
- “LEVEL 2”: limited access. This level only permits access to changing QUICK MODIFY parameters without an access code
- “LEVEL 3”: no permission to make any changes without an access code

ACCESS ADMINISTRATION	
LOGIN AS ADMIN TO CHANGE LEVEL	LOGIN LOGOUT
LEVEL 1	NO RESTRICTIONS
LEVEL 2	SETUP RESTRICTED! LOGIN TO GAIN ACCESS
LEVEL 3	SETUP + QUICK MODIFY RESTRICTED! LOGIN TO GAIN ACCESS.
	CURRENT LEVEL 1

If you wish to change the machine's access level you need to log in as user: ADMIN3 with a password.

Depending on your user status, you will have permission to change specific parameters.

11.2 Login

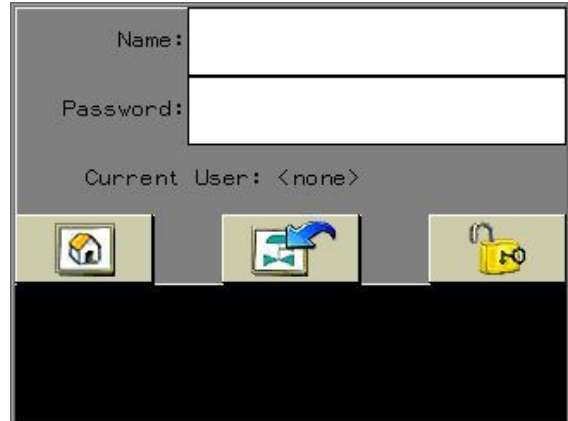
Name	Description
ADMIN1	User login
ADMIN2	Super user login
ADMIN3	Administrator login

Follow this procedure to log in:

Press the "LOGIN" button and this screen will be displayed.

Press the field next to "Name:" and enter the username

Press the field next to "Password:" and enter the password
(press the "123" button to bring up the numeric keypad)



: The PLC will be unlocked for a period of 5 minutes.



: Return to the "ACCESS ADMINISTRATION" menu.
The new access level can now be set /selected.



: Software version

11.3 Display

All settings/adjustments to the controller/PLC take place via the touchscreen.

Yellow fields: Display fields

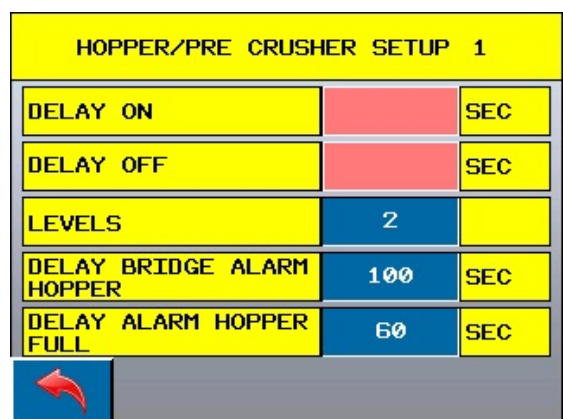
Blue fields: Touch-sensitive fields

Pink fields: You do not have permission to make changes in the given menu

Red arrow at the foot: Return to the previous screen

Shaded blue fields: You have only limited permission to make changes in the given menu.

Blue arrows in the top corners: Use these to page to the next/previous menu



11.3.1 START SCREEN

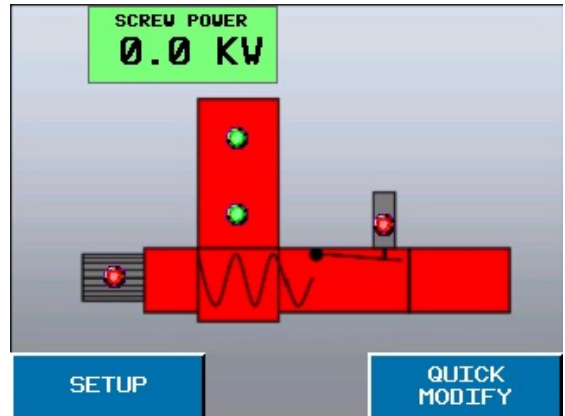
This screen is displayed whenever the machine is started or reset.

The top field displays the current power consumption for the main motor.

From this screen you can access "SETUP" or "QUICK MODIFY"

The glowing points with the 2 motors for respectively jaws and screw glow in the following colors:

- Yellow:** at "MAN" (manual) operation
- Red:** at "0" (function is stopped)
- Green:** at "AUTO" (automatic) operation



On the hopper the point/points for sensors turn green when the sensors spot material.

11.3.2 CHOOSING MANUAL OR AUTOMATIC OPERATION

To change the operation of the screw motor, jaws or pre-crusher (optional) press the current motor on the display and next to the current motor a grey menu bar will appear:

MAN – 0 – AUT (Manual – 0 – Automatic)

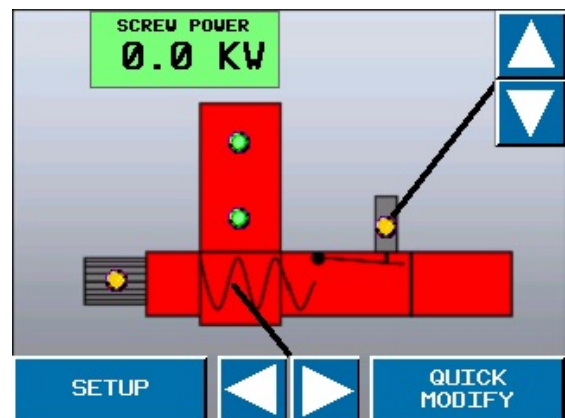
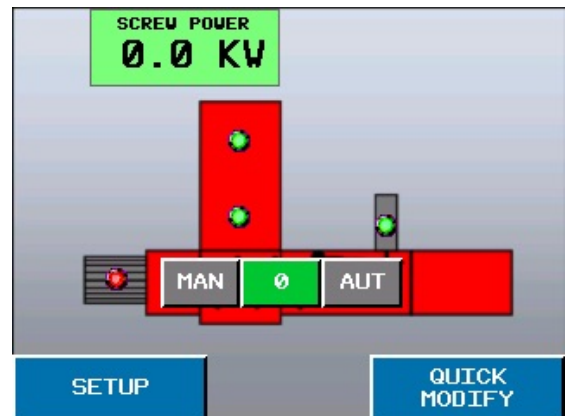
The chosen menu area shows green (here 0 and therefore the point for the motor is red). The point for the jaws glows green for automatic operation.

The menu bar can be hidden by touching the current motor again.

In certain situations (e.g. during servicing) it may be necessary to manually move the screw or jaws. Do this by choosing "MAN" operation and the point for the chosen motor will glow yellow. Arrow keys will then be displayed on the screen to activate these movements.

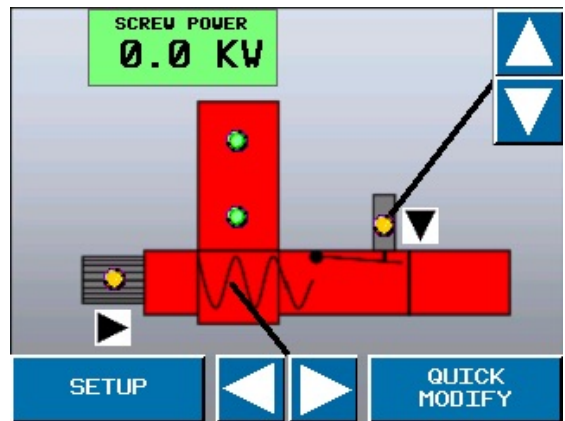
The relevant motors/functions are only activated for as long as the given button is pressed.

However, this does not apply to forward rotation of the screw. If the screw is activated by a simple press, it will continue even after the button is no longer being touched. Stop forward rotation of the screw by pressing the same arrow again or touch the "0" in the menu.



On the start screen black arrows will appear for the operation of screw and jaws.

These black arrows will be shown both in manual and automatic operation.



11.3.3 STATUS SCREEN

This is the **STATUS SCREEN** while operation in AUTO

If you do not touch the start screen, after approx. 10 seconds it will change to the status screen, displaying the current power consumption status. To get faster to the status screen - press the light green reading field on the start screen.

You have to touch the START AUTO area to operate the compactor automatic ref. to the settings in the PLC.



To stop the automatic operation touch STOP.

When you have started the automatic operation the START AUTO area will light green (and the STOP area will be dark red). When the machine is stopped the STOP area will light red (and the START AUTO area will be dark green).



WARNING:

- During normal operation this "STOP" function is used at normal stops in connection with breaks, switch, error correction or similar.
- Emergency stop and the safety switch of the inspection door is a part of the safety circuit and should not be used as normal "STOP" function.
- Emergency stop should be used when there is a dangerous situation and the machine must be put at halt.
- The safety switch of the inspection door ensures extra personnel safety when the inspection door is opened.

This is the status screen while operation in MANUAL

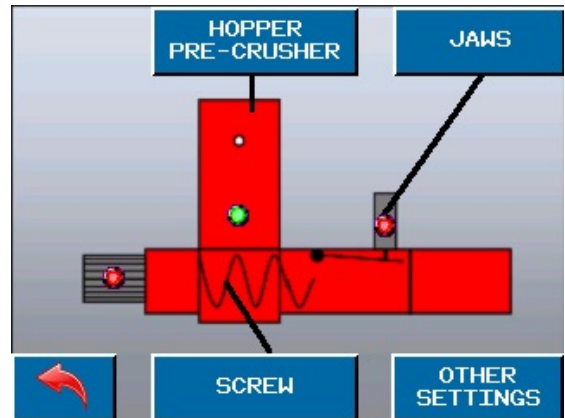
To return to the start screen press the red arrow at the foot.



11.3.4 SETUP SCREEN

This screen will be shown when you select "SETUP" on the start screen.

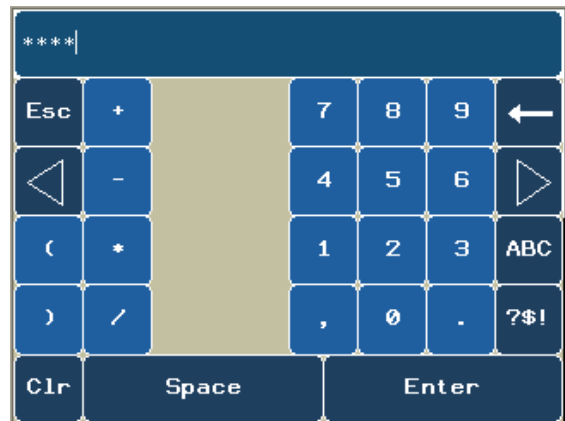
From this screen you can select all settings /parameters, see section 13.



11.3.5 CHANGING PLC SETTINGS/PARAMETERS

If you press on one of the blue fields containing a numeric value to change it, a screen will be displayed to allow you to enter the change (the value will be displayed in the top field).

Type the desired value and then press "ENTER" to return to the screen you have modified.



11.4 Product 2 (option)

12. "QUICK MODIFY"

Press "QUICK MODIFY" on the START SCREEN to display a menu where the parameters most commonly adjusted are easy to find.

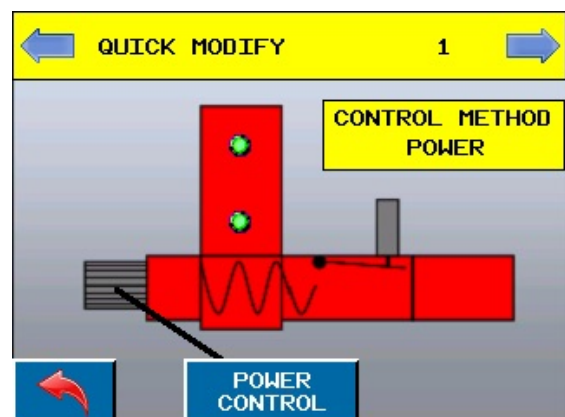
"QUICK MODIFY 1" ("JAWS SETUP 1")

If a speed control device is installed on the machine, you can select here whether to operate using "POWER CONTROL" or "SPEED CONTROL". Please refer to the description of these control methods in section 10.

To change the setting:

Press the desired blue field to select it.

The yellow "CONTROL METHOD" field will then display the selected setting.



“QUICK MODIFY 2”

(used with “POWER CONTROL”)

“LIMIT OPEN” is the limit value that controls when the jaws open.

“LIMIT OPEN” must never be set to a value higher than the maximum rating of the main motor.

“DIFFERENCE” is the difference between the value that controls when the jaws close up to “LIMIT OPEN”

Recommended value: 0.5-1 kW.

When compacting material such as EPS it is necessary to regularly adjust the limit values in response to changes in the weather (and hence temperature and air humidity), in order to achieve a satisfactory result.

“QUICK MODIFY 3” (“PROD. SPEED”)

(used only with “SPEED CONTROL”)



13. Other parameters

If you wish to change values/parameters other than those available under “QUICK MODIFY” (section 12) select “SETUP” from the start screen instead of “QUICK MODIFY”.

You will then have access to all the menus/parameters – including those shown under the “QUICK MODIFY” menu.

The following screen will be displayed.

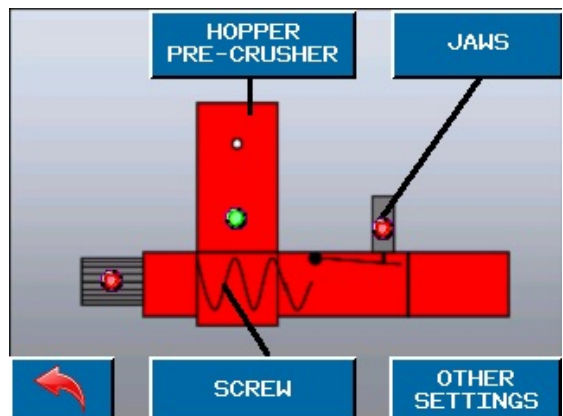
Use this to select the menu relevant to the individual machine components.

Hydraulic jaws: press “JAWS”

Screw/main motor: press “SCREW”

Hopper/pre-crusher: press “HOPPER/PRE-CRUSHER”

Other settings: press “OTHER SETTINGS”



13.1 Screw settings

“SCREW SETUP 1”

Sets the delay for automatic start and stop.

“DELAY ON”: The delay before the machine starts. This should be at least 1 second.

“DELAY OFF”: The delay before the machine stops. This should be at least 1 second.

SCREW SETUP 1		
DELAY ON	1	SEC
DELAY OFF	5	SEC

“SCREW SETUP 2” (INTERVAL MODE) OPTION

“SCREW SETUP 3” (AUTOMATIC REVERSE)

This function is only set to “YES” if the machine is built for dewatering and the drain holes have to be regularly cleaned. The function is only possible if the machine is configured for it.

“AUTOMATIC REVERSE” can be set to “YES” or “NO”.

If “YES” is chosen set the reverse interval (“FORWARD”: 30 sec. – 2.5 hours) and for how long the screw must reverse (“REVERSE”: 0.1 – 4 sec.)

Recommended values: Forward: 180 sec.
Reverse: 2.0 sec.

SCREW SETUP 3			
AUTOMATIC REVERSE	YES	NO	ON
FORWARD	180	SEC	
REVERSE	2.0	SEC	

“SCREW SETUP 4” (DECOMPACTOR) OPTION

13.2 Hopper /pre-crusher settings (optional extra)

“HOPPER/PRE CRUSHER SETUP 1”

“LEVELS” defines the number of sensor levels.

“DELAY ON” and “DELAY OFF” are options for pre-crusher.

OPTION: “DELAY BRIDGE ALARM HOPPER”

This function will stop the machine and enter alarm mode if the upper sensor detect material for x seconds without the lower sensor detects material.

OPTION: “DELAY ALARM HOPPER FULL”

The top sensor will function as an overfull alarm. When the

HOPPER/PRE CRUSHER SETUP 1		
DELAY ON		SEC
DELAY OFF		SEC
LEVELS	2	
DELAY BRIDGE ALARM HOPPER	100	SEC
DELAY ALARM HOPPER FULL	60	SEC

sensor has been activated for the defined number of seconds an alarm message will be shown on the display.

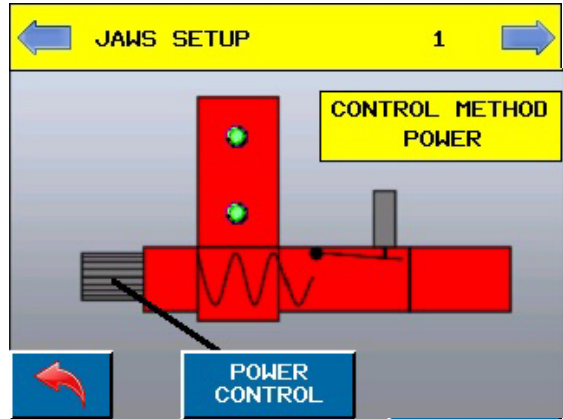
13.3 Jaw settings

“JAWS SETUP 1” (“QUICK MODIFY 1”)

If a speed control device is installed on the machine, you can select here whether to operate using “POWER CONTROL” or “SPEED CONTROL”. Please refer to the description of these control methods in section 10.

Press the desired blue button to select it.

The yellow (CONTROL METHOD) field will then display the selected setting.



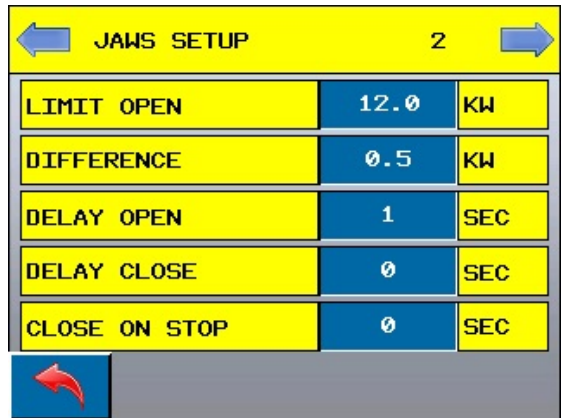
“JAWS SETUP 2”

(used with “POWER CONTROL”)

“LIMIT OPEN” is the limit value that controls when the jaws open.

“LIMIT OPEN” must never be set to a value higher than the maximum rating of the main motor.

“DIFFERENCE” is the difference between the value that controls when the jaws close (LIMIT CLOSE) up to “LIMIT OPEN”
Recommended value: 0.5-1 kW.



To avoid unnecessarily frequent activation of the jaws, a time delay has been included. The time delay is the continuous time period the load is above “LIMIT OPEN” or below LIMIT CLOSE (“LIMIT OPEN” minus “DIFFERENCE”).

*Recommended values: DELAY OPEN: 1-2 sec.
 DELAY CLOSE: 0-1 sec.*

“CLOSE ON STOP”

This allows the machine to close the jaws for a period of time when the machine stops. If the machine has to wait for material it may be necessary to close the jaws after a stop. This is because the speed controller is better at finding the right speed when the speed has to be increased rather than decreased. The machine should therefore start with a low speed every time it starts up.

Recommended value: 0-3 sec.

“JAWS SETUP 3”

IMPORTANT: JAWS SETUP 3 is dependent on the configuration selected under RUNI SETUP 2 “SPECIAL STOP” (See appendix 4)

STANDARD:

“TIMEOUT POWER LIMIT OPEN” will stop the machine if the load goes above the upper limit for X seconds.

“TIMEOUT POWER LIMIT CLOSE” will stop the machine if the load goes below the lower limit for Y seconds.

The machine thereby monitors itself to ensure it is working as configured.

This is partly to ensure that the machine does not become overloaded and that material does not melt down, especially when the screw is idling and a lot of heat is generated at the end of the screw against the compacted material.

If the machine is halted due to one of these causes, this will be indicated on the display.

“PUMP MAX RUNTIME JAWS DOWN”

This timer stops the hydraulic pump if it has closed downwards for X seconds. This timer has been incorporated to reduce:

1. Operating time for the hydraulic pump, hence increasing its lifetime.
2. Heat generation and hence oil temperature.

“TIMEOUT SPEED LIMIT LOW” and “DELAY TIMEOUT SPEED LIMIT LOW”

The machine will stop automatically if the production speed has been under a defined limit of X mm (“TIMEOUT SPEED LIMIT LOW”) for a period of Y seconds (“DELAY TIMEOUT SPEED LIMIT LOW”).

This helps ensure that the material does not melt down.

If the machine is halted because of one of these faults/detections, this will be indicated on the display.

← JAWS SETUP 3 →		
TIMEOUT POWER LIMIT OPEN	60	SEC
TIMEOUT POWER LIMIT CLOSE	60	SEC
PUMP MAX RUNTIME JAWS DOWN	10	SEC
TIMEOUT SPEED LIMIT LOW	40	MM
DELAY TIMEOUT SPEED LIMIT LOW	60	SEC

SPECIAL STOP

“TIMEOUT POWER LIMIT OPEN” functions as a stop/alarm as described above under STANDARD

“DELAY STOP” halts the machine (does not enter alarm mode).

This function causes the screw to run constantly until it has operated for X seconds under LIMIT CLOSE (JAWS SETUP 2 – “LIMIT OPEN” minus “DIFFERENCE”). It will typically stop due to a lack of material. The machine restarts automatically when there is enough material to be detected by the lower photocell.

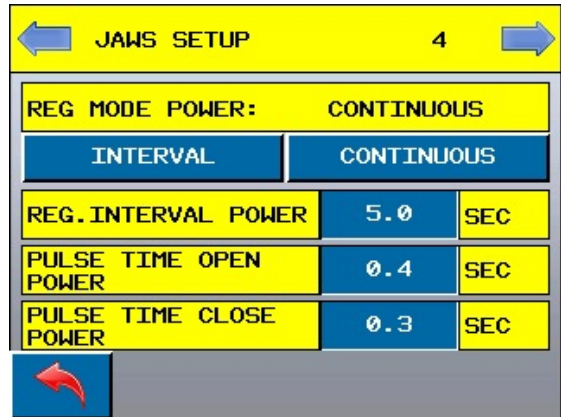
← JAWS SETUP 3 →		
TIMEOUT POWER LIMIT OPEN	60	SEC
DELAY STOP	60	SEC
PUMP MAX RUNTIME JAWS DOWN	10	SEC
TIMEOUT SPEED LIMIT LOW		MM
DELAY TIMEOUT SPEED LIMIT LOW		SEC

“PUMP MAX RUNTIME JAWS DOWN”, “TIMEOUT SPEED LIMIT LOW” and “DELAY TIMEOUT SPEED LIMIT LOW” function as described above under STANDARD.

“JAWS SETUP 4”

(used with “POWER CONTROL”)

This screen is used to define the frequency of adjustment when operating in interval mode. “REG. INTERVAL POWER” defines that the jaws will be adjusted every X seconds. “PULSE TIME OPEN POWER” and “PULSE TIME CLOSE POWER” define how much time the machine has available to adjust the jaws.



“JAWS SETUP 5” (used with “SPEED CONTROL”)

“JAWS SETUP 6” (used with “SPEED CONTROL”)

13.4 Other settings

Press “OTHER SETTINGS” on the setup screen brings up this screen, from which a number of sub-menus can be selected.



: login.



: logout.




: serial number of the machine.





: check on external links (OPTIONS)



EXTERNAL LINKS SCREEN:

 : Not available

 : No signal

 : Signal



“ALARMS”

Select this screen to view alarms which have occurred since the machine was last started (on some machines history will be stored even following power disconnection).

If/when an alarm occurs, this screen will be displayed. The factor which gave rise to the alarm will be highlighted with a red background.

See section 15 for a description of the various alarms/error messages.

Date	Time	State
15/12/08	13:28:00	RTN
15/12/08	13:28:01	RTN
		BLOCK DIVIDER NOT READY
		BLOCK DIVIDER NOT IN TOP
		READY BLOCK DIVIDER NOT IN TOP POS
		BLOCK DIVIDER NOT READY
15/12/08	13:29:53	ACK
		BLOCK DIVIDER NOT IN TOP

13:34:40 08/12/2015

“FEED SETUP”

This is a relay function (NO/NC) used to let the compactor's sensor control external feeder equipment (feeder auger, feeder conveyor belt, etc.)

When this function is used to control a feeder, delays can be added for starting and stopping the feeder, via the “FEED ON DELAY” and “FEED OFF DELAY” parameters.

FEED SETUP		
FEED ON DELAY	0	SEC
FEED OFF DELAY	0	SEC

“LANGUAGE”

Use this screen to select the language to be used on the display (not all languages are available).

LANGUAGE		
ENGLISH	DANISH	SPANISH
ITALIAN	GERMAN	FRENCH
POLISH	FINNISH	SWEDISH
PORTUGUESE	NORWEGIAN	LANGUAGE 12

ENGLISH

“HOUR METERS/COUNTERS”

“TOTAL” shows the total hours of operation – this counter cannot be changed or reset.

“GREASE C/D” means “Grease Count Down”. This timer starts at 100 hours and counts down to 0. When it reaches 0, an alarm is displayed indicating that the main bearings need to be greased. The machine can continue to operate in this alarm state, but the reset lamp will flash until the hour counter has been reset.

Resetting the hour counter: After greasing the bearings, the

HOURMETERS / COUNTERS		
TOTAL	0	H
GREASE C/D	0	H
OVERLOAD TOTAL	0	H
OVERLOAD MANUAL	0	H

counter can be reset by holding in the reset button continuously for 10 seconds. This counter can be reset at any time irrespective of its current value.

“OVERLOAD TOTAL” shows the total number of hours the machine has operated above the max. kW rating.

“OVERLOAD MANUAL” shows how many hours the machine has operated above the max. kW rating during manual operation.

“PARAMETER LIST”

This is a list displaying all parameters.

The list is several pages long – use the arrows in the top corners of the screen to page.

These fields are display only – the parameters cannot be changed via this menu.

The numbers in the list of factory settings (section 14) refer to the numbers in this parameter list.

PARAMETER LIST		1
#1	BLOCK DIVIDER SOFTWARE	OFF
#2	SCREW DELAY ON	1
#3	SCREW DELAY OFF	5
#4	SCREW AUTOMATIC RESTART	ON
#5	SCREW INTERVAL MODE	OFF
#6	SCREW INTERVAL ON	0
#7	SCREW INTERVAL OFF	2

“ACCESS ADMINISTRATION” This has been explained in section 11.

“EASY BREAK – BLOCK LENGTH /AMOUNT”

This function is only available if the speed control device is fitted to the machine, and is used almost exclusively when compacting EPS.

“FACTORY SET”

Press the “LOAD FACTORY SET” button continuously for 3 seconds to reset the PLC parameters to factory settings. (Requires login with the ADMIN 3 password).



14. Factory settings

The numbers in the first column refer to the parameter list which can be viewed under "OTHER SETTINGS".

No.	Description	Unit	Factory setting	Setting after commissioning	Current setting
	SCREW SETUP 1				
2	SCREW DELAY ON	sec	1		
3	SCREW DELAY OFF	sec	5.0		
4	SCREW AUTOMATIC RESTART		ON		
	SCREW SETUP 2				
6	SCREW INTERVAL ON	min	1		
7	SCREW INTERVAL OFF	min	1		
	PRE-CRUSHER SETUP 1				
8	CRUSHER DELAY ON	sec	1		
9	CRUSHER DELAY OFF	sec	1		
10	LEVELS		1		
11	DELAY BRIDGE IN HOPPER	sec	100		
12	DELAY ALARM HOPPER FULL		-		
	JAWS SETUP 1				
15	CONTROL METHOD		POWER		
	JAWS SETUP 2				
16	JAWS LIMIT OPEN POWER	kW	12.0		
17	DIFFERENCE	kW	0.5		
18	JAWS DELAY OPEN	sec	1		
19	JAWS DELAY CLOSE	sec	0		
20	JAWS CLOSE ON STOP	sec	0		
	JAWS SETUP 3				
21	TIMEOUT POWER LIMIT OPEN	sec	60		
22	TIMEOUT POW.LIM. CLOSE/SPECIAL STOP	sec	60		
23	PUMP MAX TIME JAWS DOWN	sec	10		
24	TIMEOUT SPEED LIMIT LOW	mm	40		
25	DELAY SPEED LIMIT LOW	sec	60		
	JAWS SETUP 4				
26	REG. MODE POWER		CONTINUOUS		
27	REG. INTERVAL POWER	sec	5.0		
28	PULSE TIME OPEN POWER	sec	0.4		
29	PULSE TIME CLOSE POWER	sec	0.3		
	JAWS SETUP 5				
30	PROD. SPEED	mm	80		
31	DB+	mm	3		
32	DB-	mm	3		
33	TIMEOUT SPEED ALARM DB+	sec	60		
34	TIMEOUT SPEED ALARM DB-	sec	60		
	JAWS SETUP 6				
35	REG. INTERVAL SPEED	sec	5.0		
36	PULSE TIME OPEN SPEED	sec	0.4		
37	PULSE TIME CLOSE SPEED	sec	0.3		
	FEED SETUP				
40	FEED ON DELAY	sec	0		

No.	Description	Unit	Factory setting	Setting after commissioning	Current setting
41	FEED OFF DELAY	sec	0		
	OTHER SETTINGS				
42	ACCESS LEVEL		1		
43	LANGUAGE		ENGLISH		
44	OPERATION CODE		DEACTIVATED		
45	OPERATION CODE PERIOD		0		
46	CURRENT OPER. CODE		0		
	BLOCK LENGTH / AMOUNT				
48	EASY BREAK A-BLOCK LENGTH	mm	1200		
49	EASY BREAK A-BLOCK AMOUNT		2		
50	EASY BREAK B-BLOCK LENGTH	mm	800		
51	EASY BREAK B-BLOCK AMOUNT		3		
52	EASY BREAK C-BLOCK LENGTH	mm	1200		
53	EASY BREAK C-BLOCK AMOUNT		2		
	EASY BREAK SETTINGS				
54	PRE-CRUSHER STOP	sec	30		
55	SCREW STOP & JAWS OPEN	sec	6.0		
56	EASY BREAK FORWARD TIME BEFORE JAWS AUTO	sec	4.0		
	RUNI SETUP				
1	BLOCK DIVIDER SOFTWARE		OFF		
	TURN SWITCHES		OFF		
	RUNI SETUP 1				
58	ROTATING SENSOR		OFF		
60	SPEED CONTROL		OFF		
57	PRE-CRUSHER		OFF		
13	DECOMPACTOR		OFF		
	MIXER		OFF		
	RUNI SETUP 2				
61	SPECIAL STOP		ON		
	RUNI SETUP 3 (SCREW)				
62	SCREW EFFECT VALUE	kW	27.7		
	RUNI SETUP 7				
59	PRODUCT NO 2		OFF		
47	AUTOMATIC REVERSE		ON		
	SCREW SETUP 3				
71/74	AUTOMATIC REVERSE (PROD. 1/2)		ON		
72/75	FORWARD (PROD. 1/2)	sec	180		
73/76	REVERSE (PROD. 1/2)	sec	2		
	RUNI SETUP 8				
85	LINE SIGNAL A START CONDITION		ON		
87	ALARM SIGNAL		ON		
88	HEALTHY SIGNAL		ON		

15. Alarms / error messages

When an alarm occurs a red banner is running over the screen.

You can always see this ALARM SCREEN by touching "SET-UP" -> "OTHER SETTINGS" -> "ALARMS".



Touch up and down  to see the full alarm log.

The alarms are marked with red, green and yellow:

Green: Historical alarms, which are not deleted

Delete alarms in the alarm log by touching  (one alarm) or  (all alarms).

Red: Active alarms

Yellow: Alarms you have marked that you are reacting on by touching  (one alarm) or  (all active alarms).

The following error messages can be displayed:

"EMERGENCY STOP ACTIVATED"

This message is displayed if the machine has been shut down, if an emergency stop button has been pressed (on the control panel or an external emergency stop) or a door switch has been opened.

Possible fault and rectification:

1. Check whether the emergency stop button (section 8, item 2) is pulled out.
2. Check that any external emergency stop buttons are deactivated and door switches are closed.

Press "reset"* to resume operation.

"THERMAL FAULT"

This message is displayed if the motor has been overloaded and the thermal relay has dropped out.

Possible fault and rectification:

1. A foreign body has entered the machine and blocked the pre-crusher or the screw. Inspect and remove if necessary.
2. The main motor is operating above its maximum rated power/amps. Lower the limit values slightly if necessary.
3. The pre-crusher is exceeding its power rating and cannot handle the amount of EPS being added or the hardness of the EPS. Add smaller amounts of EPS. Open the control box and reactivate the protective motor switch* which has dropped out.

Press "reset"* to resume operation.

"GREASE BEARINGS NOW"



Date	Time	State
16/03/21	11:17:29	RTN
BLOCK DIVIDER NOT IN TOP		
16/03/21	11:18:14	RTN
WAITING FOR LINE SIGNAL		
CODE EXPIRED		
BLOCK DIVIDER NOT READY		
16/03/21	11:19:30	RTN
BLOCK DIVIDER NOT IN TOP		
16/03/21	11:21:22	ACTIVE
CODE EXPIRED. PLEASE ENTER NEW		

11:21:39 21/03/2016

If the “GREASE BEARINGS NOW” message is displayed it is time to grease the main bearings. After greasing the main bearings (see section 21.5 – Main bearings) reset the hour counter and hence the alarm. To reset the counter, press and hold the reset button for 10 seconds.

“TIMEOUT JAWS POWER OPEN”

This message is displayed if the limit value for “JAWS SETUP 2 – LIMIT OPEN” has been exceeded for longer than permitted (the time limit is defined by “JAWS SETUP 3 – TIMEOUT POWER LIMIT OPEN”)

Possible fault and rectification:

1. The one-way restrictor valve* may be set too tight, such that the jaws open too slowly. If so, it should be loosened.
2. There may be an electrical or hydraulic problem with opening/closing the jaws. Change the jaws to manual operation and check whether they can open/close.

Press “reset”* to resume operation.

“TIMEOUT JAWS POWER CLOSE”

This message is displayed if the limit value for “JAWS SETUP 2 – LIMIT OPEN minus DIFFERENCE” is not reached within the permitted time (the time limit is defined in “JAWS SETUP 3– TIMEOUT POWER LIMIT CLOSE”)

Possible fault and rectification:

1. There is not enough material in the machine to reach the required power level. Investigate material feeding
2. Increase the time allowed in “JAWS SETUP 3 – TIMEOUT POWER LIMIT CLOSE”.
3. There may be an electrical or hydraulic problem with opening/closing the jaws. Change the jaws to manual operation and check whether they can open/close.

Press “reset”* to resume operation.

“TIMEOUT SPEED LIMIT LOW”

This message is displayed if the machine has operated at too low a production speed for longer than permitted (defined in “JAWS SETUP 3”).

Possible fault and rectification:

1. There is not enough material in the machine to reach the required speed. Investigate material feeding.
2. There may be an electrical or hydraulic problem with opening/closing the jaws. Change the jaws to manual operation and check whether they can open/close.

Press “reset”* to resume operation.

“TIMEOUT JAWS OPEN SPEED LIMIT”

This message is displayed if the machine has operated with lower than permitted production speed for longer than permitted in “JAWS SETUP 5”.

Possible fault and rectification:

1. The one-way restrictor valve* may be set too tight, such that the jaws open too slowly. If so, it should be loosened.
2. There may be an electrical or hydraulic problem with opening/closing the jaws. Change the jaws to manual operation and check whether they can open/close.
3. There is not enough material in the machine to reach the required speed. Investigate material feeding.

Press “reset”* to resume operation.

“TIMEOUT JAWS CLOSE SPEED LIMIT”

This message is displayed if the machine has operated with higher than permitted production speed for longer than permitted in “JAWS SETUP 5 – TIMEOUT SPEED ALARM DB+”.

Possible fault and rectification:

1. Increase the time allowed in “JAWS SETUP 5 – TIMEOUT SPEED ALARM DB+”.
2. There may be an electrical or hydraulic problem with opening/closing the jaws. Change the jaws to manual operation and check whether they can open/close.

Press “reset”* to resume operation.

“WAITING FOR LINE SIGNAL” OPTION

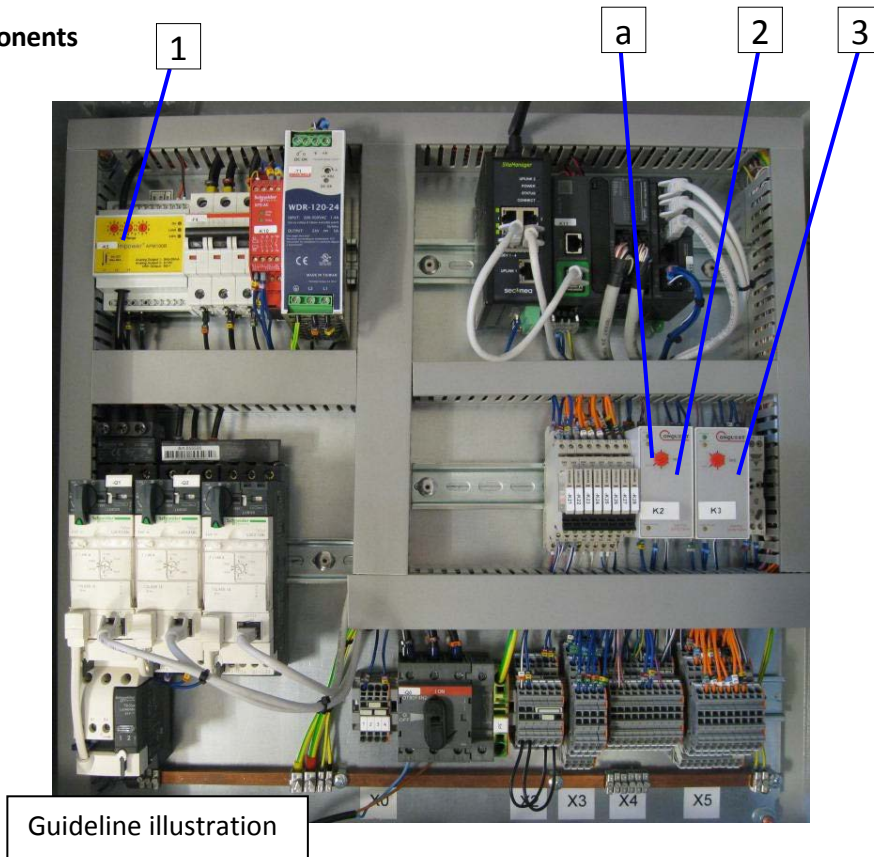
This message is displayed when the machine is configured for line signal. The machine needs a signal from the superior line control, to start in automatic operation mode.

Possible rectification:

1. Give the machine a start signal from the superior line control.

16. Electrical components settings

Control components



Guideline illustration

Item	Name	Comment
1	Power converter to monitor the main motor/screw	
2	Amplifier for photocell in hopper	
3	Amplifier for photocell in hopper	(optional extra)
a	Red adjustment dial	

16.1 Photocells (optional extra)

The photocells detect when there is material. The manufacturer's instructions must be carefully followed. See the photocell datasheet (appendix 10).

Configuring sensitivity

Sensitivity is set at the factory.

Adjustment is best done by trial and error.

The sensors can sometimes be triggered by dust and steam. If so, it is necessary to adjust the sensitivity using the adjustment dial (a).

The amplifier relay has 3 LEDs:

Green LED:	Supply	Indicates the relay has power.
Yellow LED:	Adjust	Indicates that the photocells can see each other
Yellow LED:	Operation	Indicates that the photocells cannot see each other

16.2 Power converter to monitor the main motor/screw

There is only one correct setting for the power converter, and this is the factory setting. The manufacturer's instructions must be carefully followed. See the power converter datasheet (appendix 8).

16.3 Rotating sensor / Ultrasonic sensor (optional extra)

17. Configuring the hydraulic jaws

Hydraulically activated pressure plate

The pressure plate presses down and is raised automatically using a hydraulic system. This consists of a hydraulic cylinder and pump, and electronic controls.

The hydraulic cylinder is bidirectional and is attached to the top of the compression chamber. The piston rod is attached to the moveable pressure plate.

The components of the hydraulic pump are described in the next section and in appendix 7. The electronic controls are built into the control box.

Setting and adjusting the oil pressure

The pressure relief valve (section 18, item 6) should be set between 80-200 bar, depending on the material (MAX 200 bar). Recommended value: 150 bar

Remove the cap from the pressure relief valve (item 6).

Loosen the nut on the pressure relief valve slightly, as it tightens against the adjustment screw.

Loosen or tighten the socket head screw until the desired pressure is achieved, then counter tighten the nut and replace the cap.

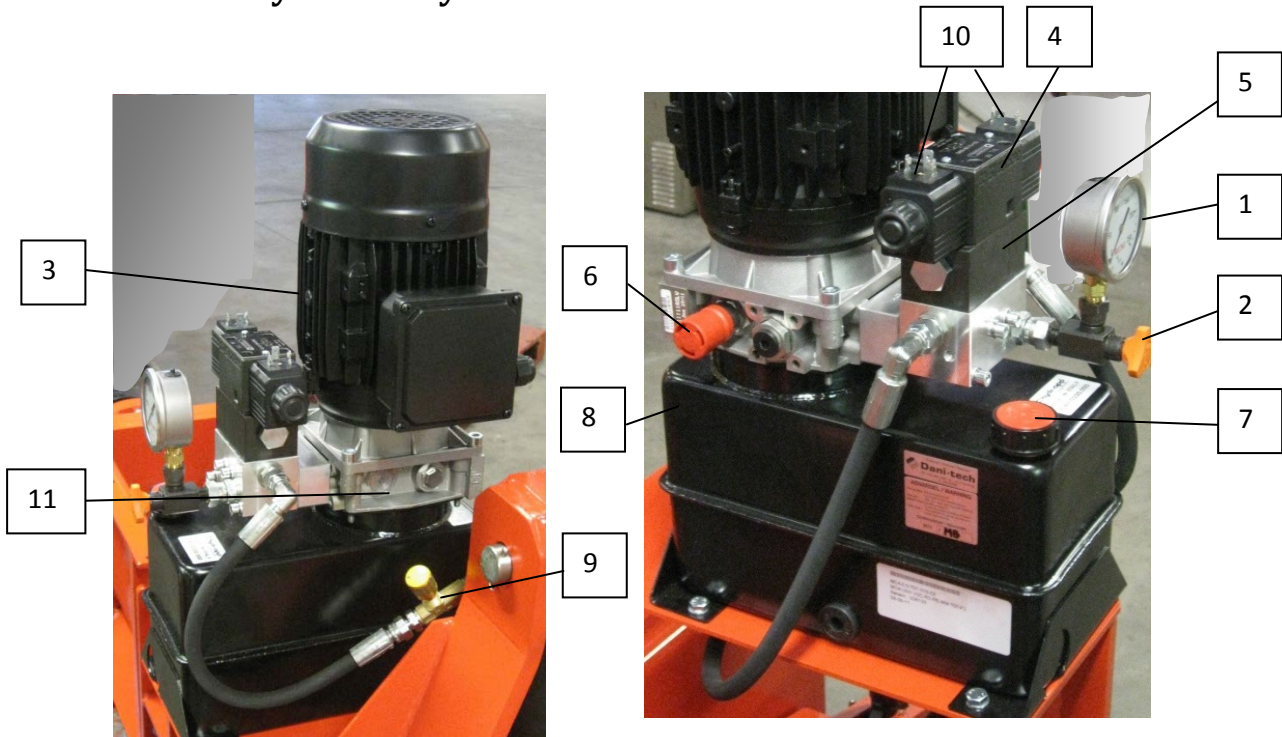
This is done while raising the jaws manually and keeping them continually activated such that the hydraulic cylinder is at the end of its travel and the maximum pressure is therefore built up and can be read.

Set the one-way restrictor valve (section 18, item 9) to configure the right opening speed.

It is very important that the one-way restrictor valve is set such that the opening speed of the hydraulic jaws is adequately low.

The speed is generally set to approx. 1 mm/second. The easiest way to do this is to manually close the jaw fully and then note its position. Open the jaw continuously for 10 seconds and then measure how many millimetres the jaw has opened – it should have opened approx. 10 mm.

18. The hydraulic system



Item	Name	Description
1	Manometer	0-250 bar 1/4 RG
2	Manometer tap	ES090
3	Electric motor	0.55 kW, 3×400 V 50 Hz
4	Double solenoid valve NG06	24 VDC
5	Pilot operated non-return valve NG06	
6	Pressure relief valve NG06	<i>ADJUSTABLE</i>
7	Filling cap	
8	Oil tank	7 L
9	One-way restrictor valve*	
10	Rectifier plug	24 VDC
11	Flange for pump station	2000000659

19. Overpressure in bearing housing (optional extra)

20. Starting the compactor for the first time

Starting up an empty compactor

When starting up an empty compactor, there is no compacted material in the pressure chamber and hence no initial counter pressure.

It is therefore necessary to generate counter pressure manually. This is done as follows:

1. Select “MAN” screw operation and “MAN” jaws operation (motor points on the display will light yellow, see section 11.3)
2. Check that the screw’s direction of rotation is correct (counter clockwise, viewed from the gearbox end).
3. Drive the movable jaw right up by pressing the up arrow on the touchscreen.

Stop the machine and lock the isolation switch. Feed new material “backwards” into the pressure chamber until it is completely full.

Unlock the isolation switch and continue “MAN” operation of screw and jaws. Drive the movable jaw right down by pressing the down arrow on the touchscreen.

4. Select “AUTOMATIC” screw operation but still “MAN” jaws operation. Start the machine and feed the raw material to be compacted into the hopper.
5. Monitor the machine to ensure that the kW consumption increases.

If the kW consumption does not increase and material is pushed out of the pressure chamber un-compacted, repeat step 3 using more solid material.

6. When the kW consumption reaches 11-12 kW select “AUTOMATIC” operation of the jaws. (All motor points on the display must now light green for automatic operation)

The machine will now automatically regulate the counter pressure in accordance with the “JAWS SETUP 2 – LIMIT OPEN/DIFFERENCE” settings or “SPEED CONTROL” if this is selected.

7. If the start-up plug/material need to be removed: stop the machine.

There is now a “plug” in the chamber, and the machine can be started and stopped without adjusting the counter pressure. In other words, this procedure is only necessary when starting an empty machine for the first time.

Situations can arise where the screw becomes stuck and the electric motor stops, e.g. if a hard foreign body becomes lodged.

To dislodge the screw again, it can be rotated in the opposite direction. Do this by selecting “Manual” operation of the screw and pressing the reverse arrow on the touchscreen. This must only be done briefly - **max 2 seconds at a time**. If the screw is reversed for a longer period, there is a major risk that material will be compacted at the front end of the screw housing and potentially force impurities into the bearing housing.

If the motor does not start when reversed, the cause is very likely to be thermal overload. If so, it will be necessary to open the control box and reset the protective motor switch.

21. Service and maintenance

Repair work must only be done by skilled persons (cf. appendix 5). Please pay particular attention:

- Service and repair must be done without any danger to anybody.
- The isolator switch must be dis-connected and locked before any repair.
- Necessary devices, protective gear, lifting equipment, scaffold and fall protection gear must be used.
- Heavy or slanting lifts must be avoided by correct use of devices.
- Crushing between machine parts must be avoided by correct service
- Technical and safety instructions in this instruction manual must be followed.
- A separated machine must not be put into operation.

In this section it is described how the machine should be maintained correctly. In appendix 3 you will find the maintain schedule describing maintain intervals and a maintain protocol. This must be used for registration of monthly or yearly service and 2500 hours and 5000 hours service.

21.1 Cleaning

To keep the nice appearance of the machine it must be cleaned in a normal way and as needed.

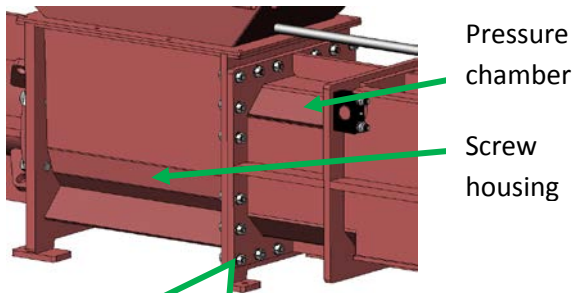
- The isolator switch must be switched off and locked before any cleaning.
- The machine is cleaned with clean water possibly with a cold water cleaner.
- Screens can be dismounted to ease the cleaning and afterwards mounted again.
- The machine must not be cleaned with corrosive cleaning detergent.
- The control panel cannot endure heavy cleaning with water.

21.2 Greasing

Greasing of the machine is important for the lifetime and function of the machine. In particular, greasing of the bearings and control of oil in planetary gearbox and in the pre-crusher gearbox as well as hydraulic oil on the pump station. In appendix 3 you will find the greasing instruction.

21.3 Re-tighten bolts

Each time the pressure chamber has been removed e.g. in connection with service, the bolts must be re-tightened **after 30 hours of operation**. All bolts have been oiled at the factory.



Pressure chamber
Screw housing

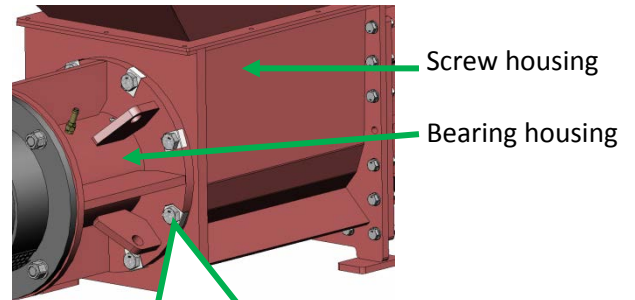
10.9 M16x60 bolts with 10.9 M16 nuts and two HB200 FZB M16 washers.

Torque:

- Dry: 293.62 Nm
- Oiled: 263.15 Nm



Re-tighten after 30 hours of operation



Screw housing
Bearing housing

10.9 M24x60 FZB bolts
10.9 M24x55 FZB bolts

Torque:

- Oiled: 631.75 Nm



Re-tighten after 30 hours of operation

21.4 Planetary gearbox

Planetary gearbox (drawing 5000007779, item 2). The instructions in the manufacturer's "Operation and maintenance guide" must be followed (see appendix 6).

The first oil change must be after 100 hours of operation. From then on, after every 2,500 hours of operation (see appendix 3).

Gearbox type: PSR 140 L3-P20-52-E16-VT
Oil type: STATOIL Loadway EP 150 or SHELL gearbox oil OMALA 150
Oil volume: 3.5 l

The temperature of the gearbox must not exceed 85° C.

21.5 Main bearings

The main bearings (drawing 5000008288, item 1,2,17) must be greased via three grease nipples on the side of the bearing housing (see appendix 3 for the correct order). Remember that the screw must be turning during greasing.

Grease after every **100** hours of operation. **IMPORTANT !** (see appendix 3)

Grease type: STATOIL GREASEWAY CAH 92 or AGIP AUTOL TOP 2000 or Shell Gadus S3 A1300 C 2
Grease quantity: approx. 50 cm³ (50 ml) per bearing.

After 5,000 hours of operation the bearings must be disassembled and both the bearings and bearing housing must be cleaned. They must then be greased with new bearing grease (after cleaning 280/280/480ml grease per bearing).

See instructions on disassembling and assembling the bearings (appendix 2).

21.6 Hydraulic system

The hydraulic system is described in section 17/18 and appendix 7.

Regularly check the oil level and fill when necessary. Regularly check that the hoses and connections are not leaking. Otherwise the normal rules for hydraulic systems apply.

The first oil change must be after 100 hours of operation. From then on, after every 2,500 hours of operation (see appendix 3).

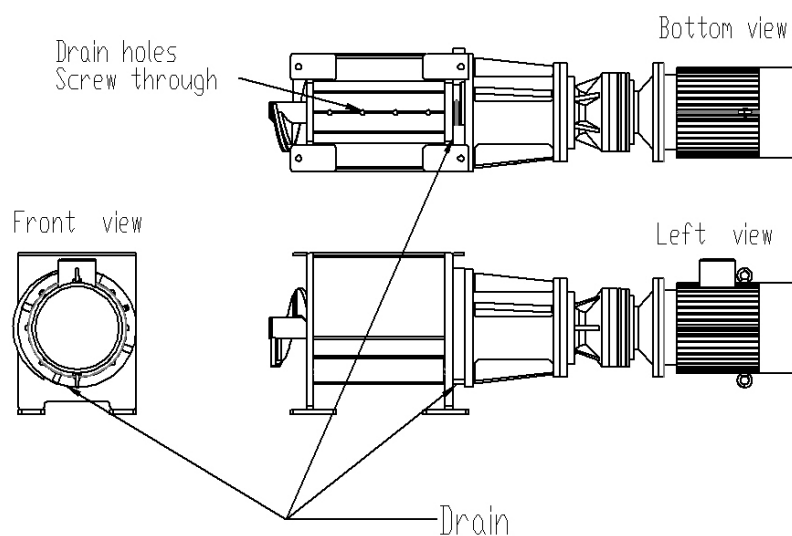
Oil type: Hydraulic oil, viscosity ISO 46

Oil volume: 5 litres

21.7 Hopper with pre-crusher (optional extra)

21.8 Drain holes (extra equipment)

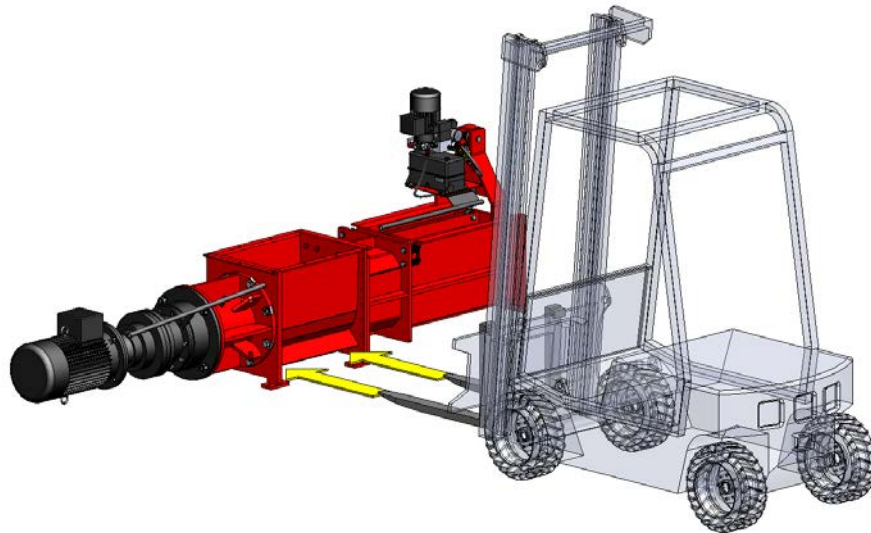
Drain holes in front of the bearing house must be kept clean and open.



22. Transportation instructions

Ensure that the machine is stable on a solid base, and that the accompanying parts have been carefully secured or packaged separately.

The machine should be transported using a forklift or lifting truck.



23. Installation

The following conditions must be met for correct use and commissioning of the machine:

- A level and solid base
- Correct transport (see section 22).
- Installation must be carried out by authorised personnel

If in doubt, please contact the importer or manufacturer.

Setting up

1. It is recommended that the machine be placed in a dry area (under cover) with plenty of space around it.
2. The compactor should be set up in such a way that there is easy access for maintaining and servicing all functions and primary components.
3. The compactor must be placed on a level floor. It is not normally necessary to bolt the machine to the floor. Do not install ladders, platforms or other objects, to step up on around the machine, as safety distances for hazardous area is reduced or the risk of falling into the machine becomes possible.
4. Manual feeding of the machine may cause physical disabilities. The user must ensure that the work is planned with sufficient variety to avoid disability damages.
5. If the machine is for manual feeding the user must secure a good working environment when it comes to light, temperature, ventilation, anti-slippery and necessary devices for e.g. heavy lifting.
6. Light must be placed without the reach of the operator from the machine. If the light is placed above the machine it must be minimum 2.7 meters above the walking foundation of the operator.

Power connection

All internal wiring is complete and ready when the machine leaves the factory.

The machine must be connected to power by an authorised electrician. In particular please pay attention to:

- Connection must be in accordance with el-documentation - appendix 8
- Residual Current Circuit Breaker must be installed before our control panel.
- Correct earth connection to our control panel must be installed.

24. Assembly and disassembly

See instructions in appendix 2

25. Glossary

Words marked with an asterisk (*) in the manual are explained below. Please note that screenshots are not labelled with asterisks.

EPS	Expanded polystyrene, also called Styropor or Styrofoam.
Hyst(eresis)	A property of a system whereby it does not immediately respond to inputs, but only after a time lag, and often does not (or only slowly) returns to the original state when the input ceases. i.e. the system has a kind of 'memory' of preceding events.
One-way restrictor valve	A hydraulic component designed to provide resistance in one direction and free flow in the other direction.
PLC	Programmable Logic Controller. A small computer used for automatic control of simple processes, e.g. controlling motors in a plant, etc. A PLC control system replaces numerous relays and timers compared to a traditional control system.
Protective motor switch	An electrical component that protects an electric motor, for example, from running overloaded for a prolonged period. If this happens, the motor's power drops out and the PLC detects this. The machine can only be restarted once the protective motor switch, i.e. the red button, is returned to its starting position.
Reset	Return something to its original state, often so work can carry on from a known state.

26. Contact

Please locate this instruction manual before initiating contact for spare parts or service, as it contains the model and serial numbers on the front page.

When ordering spare parts, please specify:

1. The model and serial number
2. The part numbers and names (can be found on the drawings in appendix 1)
3. The number of parts being ordered

If the machine has been purchased through a dealer, please contact the dealer.

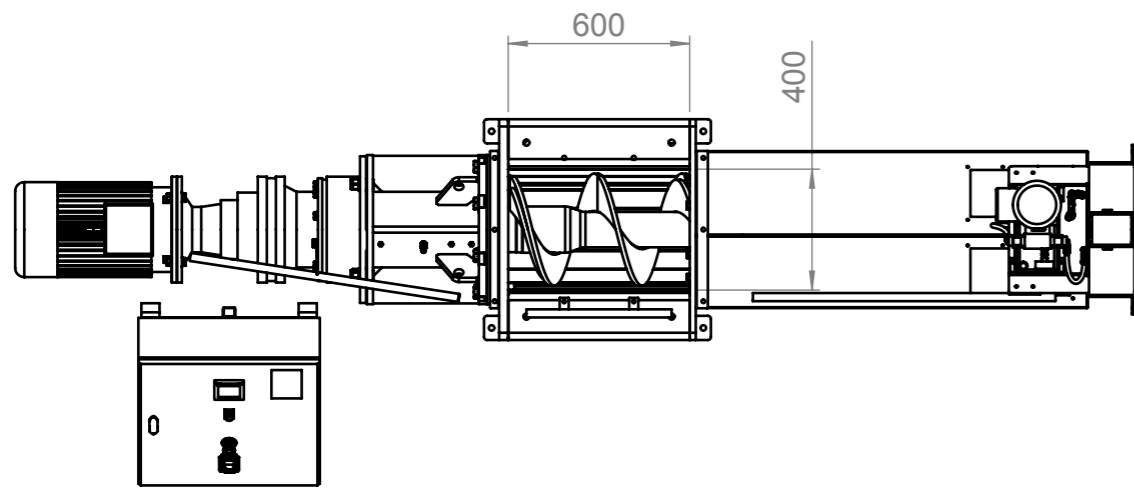
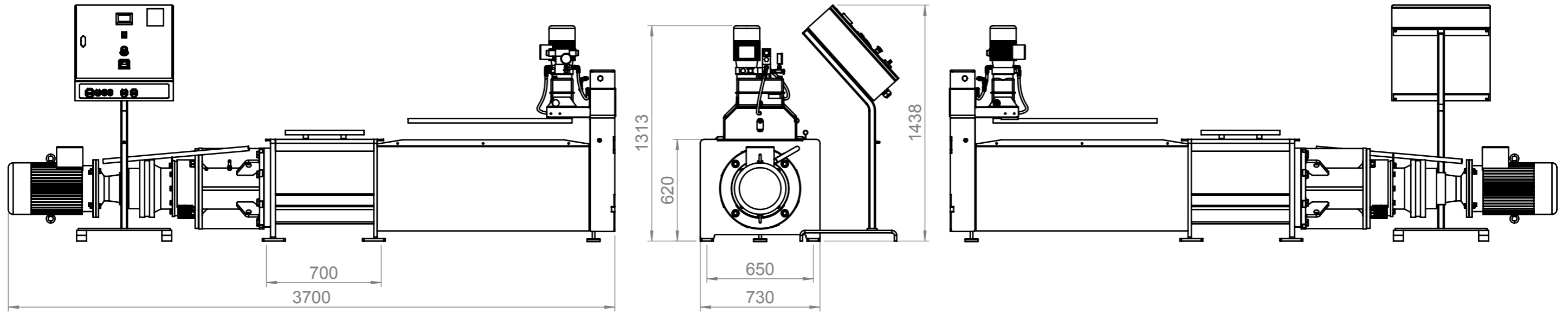
Otherwise contact:

RUNI A/S
Industriparken 8
DK-6880 Tarm
Denmark
Tel.: +45 9737 1799
Fax.: +45 9737 3800
Email: runi@runi.dk

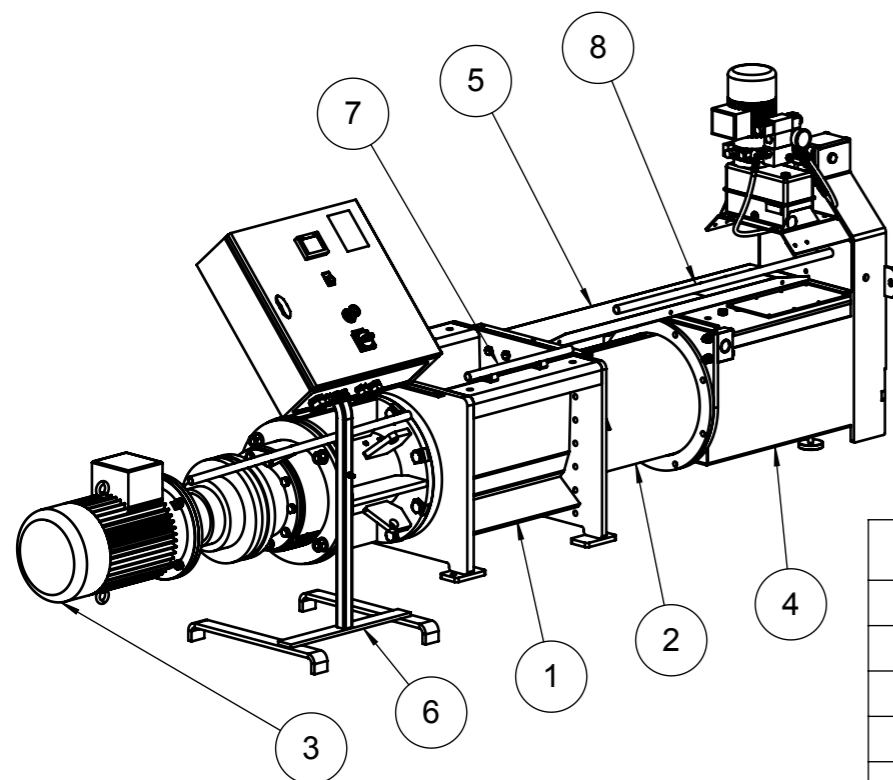
27. Appendices

Appendix 1	Drawings, part lists and recommended spare parts
Appendix 2	Assembly and disassembly instructions
Appendix 3	Maintenance (blue and green schedule, greasing list)
Appendix 4	Machine configuration
Appendix 5	Qualification and Training Chart
Appendix 6	Gearbox
Appendix 7	Hydraulic chart and part list
Appendix 8	El-documentation
Appendix 9	Hopper possibly with pre-crusher/inspection door (optional extra)
Appendix 10	Photocells (optional extra)

Appendix 1



ITEM NO.	PART NUMBER	DescriptionDK	DESCRIPTION	QTY.
1	5000007776	SK370 Basis HD trug med dræn (153/117)	SK370 Basic machine HD trough with drain (153/117)	1
2	5000000495	SK370 hulmatrice 600mm med Ø3/5 huller	SK370 perforated matrix 600mm with Ø 3/5 holes	1
3	5000007779	Motor: 15kW Gear: PSR 50Hz 29 omdr.	Motor: 15kW Gearbox: PSR 50Hz 29 rpm	1
4	5000008631	Pressekammer med hydraulisk pumpe og runde kæber	Pressure chamber including hydraulic pump and round jaws	1
5	5000008619	Skærm for pressekammer/600mm matrice - komplet	Screen for pressure chamber/600mm matrix - complete	1
6	5000007980	Kontrolskab for SK240 / SK370 (inkl. stativ)	Control box for SK240 / SK370 (incl. stand)	1
7	5000002060	Ledningsrør SK370 Basis	Cable tube SK370 Basic	1
8	5000008222	Ledningsrør for pressekammer (600 mm matrice) svejst	Cabel tube for chamber (600 mm matrix) welded	1



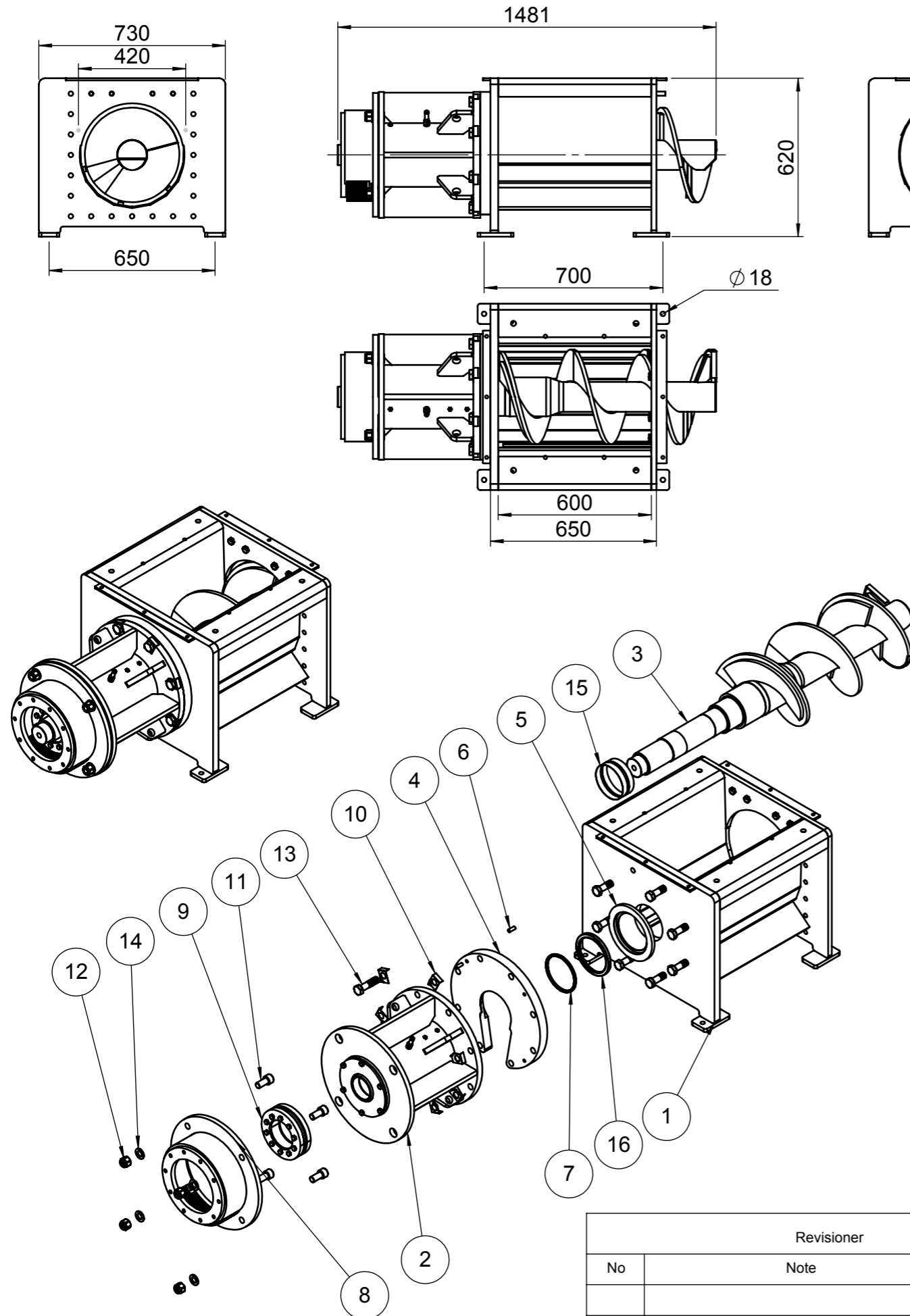
Revisioner			
No	Note	Init	Dato

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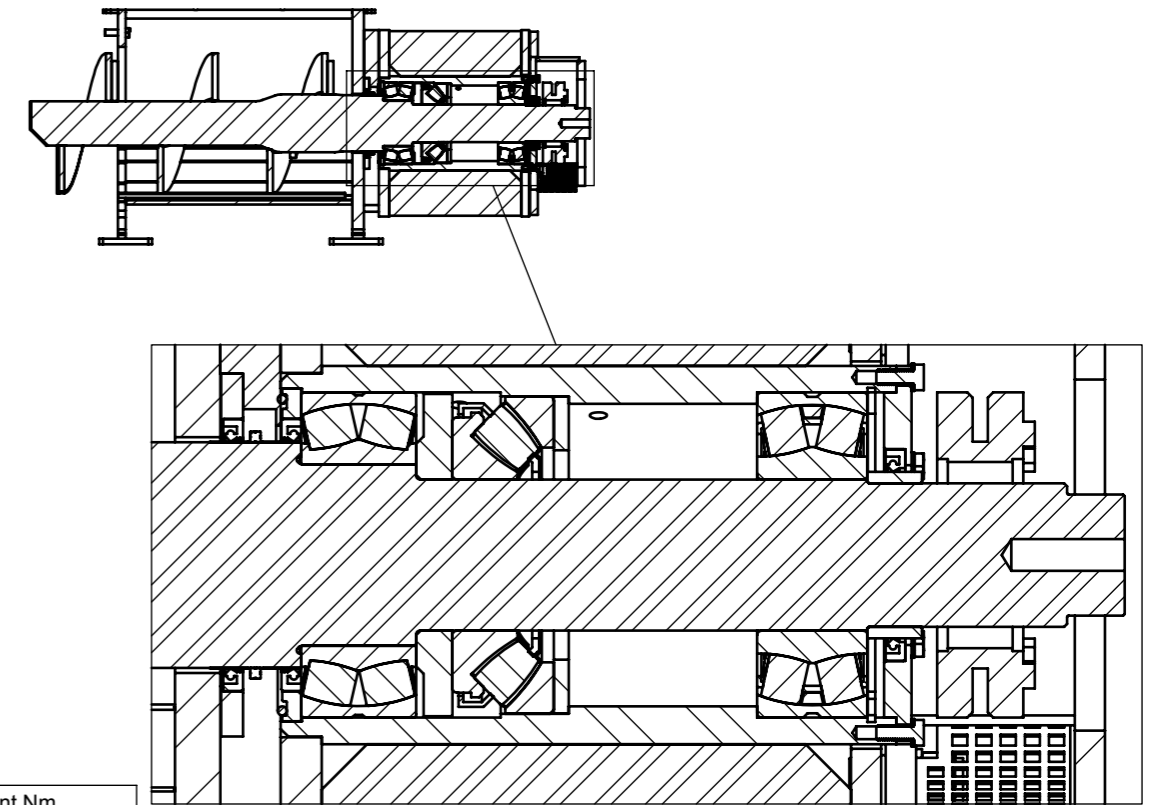
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General Tolerances (-DS/ISO 2768-1 m)			
Nominal value		Tolerance	
Above	Max.	Linear	Angle
0,5	3	±0,1	±1° 0'
3	6	±0,1	±1° 0'
6	30	±0,2	±0°30'
30	120	±0,3	±0°20'
120	400	±0,5	±0°10'
400	1000	±0,8	±0°05'
1000	2000	±1,2	±0°05'
2000	4000	±2,0	±0°05'

Replaces:	
Color:	Surface:
Description: SK370 for drainage no console 600m hole matrice 3/5	
Beskrivelse: SK370 til afvanding ingen konsol 600m hul matrice 3/5	
Scale: 1:25	Weight: kg
Drawing no.: 5000012279	Rev:



SECTION A-A



DETAIL B
SCALE 1 : 5

Tilspændingsmoment Nm	
M24 10.9	631 Nm
M24 12.9	1120 Nm
M16 8.8	197 Nm

ITEM	PART NO.	DESCRIPTION	DescriptionDK	Rev.	1/QTY.
1	5000007242	SK370 Screw trough reinforced (screw Ø 156 mm)	SK370 Snegletrug forstærket (snegl Ø 156 mm)	B.	1
2	5000008288	Bearing house HD120 SK370 Complete (axial bearing) Rev.2	Lejehus HD120 SK370 Komplet (aksial leje) Rev.2	A.	1
3	5000007764	Screw SK370 HD with 2xSpeedi-sleeves (Hard welded)	Snegl SK370 HD med 2xSpeedi-sleeves (Hårdbelagt)	A.	1
4	5000007677	SK370 distance plate HD trough	SK370 afstandsplade HD snegletrug	B.	1
5	5000007679	Ring for seal	Ring for pakdåse	B.	1
6	2000000300	Parallel Pin (Hard) 12x32mm	CYLIND. STIFT HÆRDET 6325 12X32MM	B.	2
7	2000001054	Q-ring 148,59 X 7,00	Q-ring 148,59 X 7,00		1
8	5000000571	Moment housing mounted - SK370	Momenthus monteret - SK370	D.	1
9	5000000894	Shrink disc KLPP 125x250mm	Spændeelement KLPP 125x215mm	B.	1
10	5000004126	Locking plate f. bearinghouse SK370 INOX vers.2	Låseblæk lejehus SK370 INOX vers.2	B.	8
11	3008041321	M24x50 12.9 Umbrako bolt cylinder	M24x50 12.9 Umbrako bolt cylinderhoved	B.	4
12	3097061310	DIN 985 M24 lock nut FZB	DIN 985 M24 låsemøtrik FZB	B.	4
13	3003081380	Bolt M24x95 10.9 FZB	Bolt M24x95 10.9 FZB	B.	8
14	3098062850	Washer DIN 125 FZB M24	Skive DIN 125 FZB M24	B.	4
15	2000001052	Speedi-Sleeve SKF gold Ø149,23	Speedi-Sleeve SKF gold Ø149,23		2
16	2000001055	Seal ring FP OAS 150 X 180 X 12 mm	Pakdåse FP OAS 150 X 180 X 12 mm (rustfri fjeder) (Aksel h11 Ra0,2-0,8) (Hus H8 Rz10-25)		1

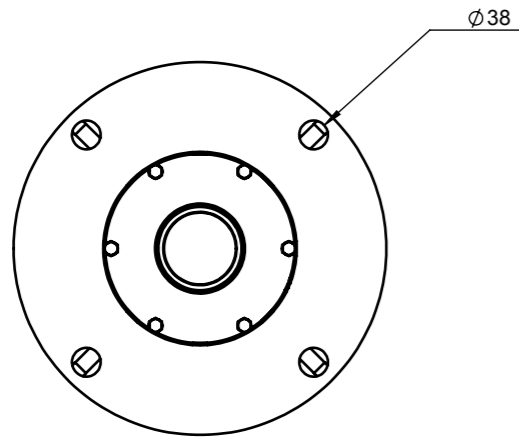
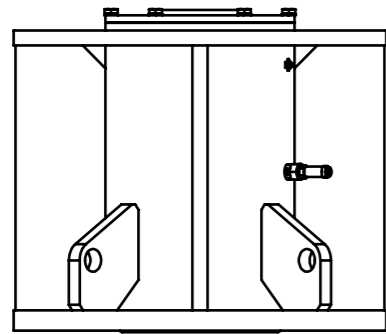
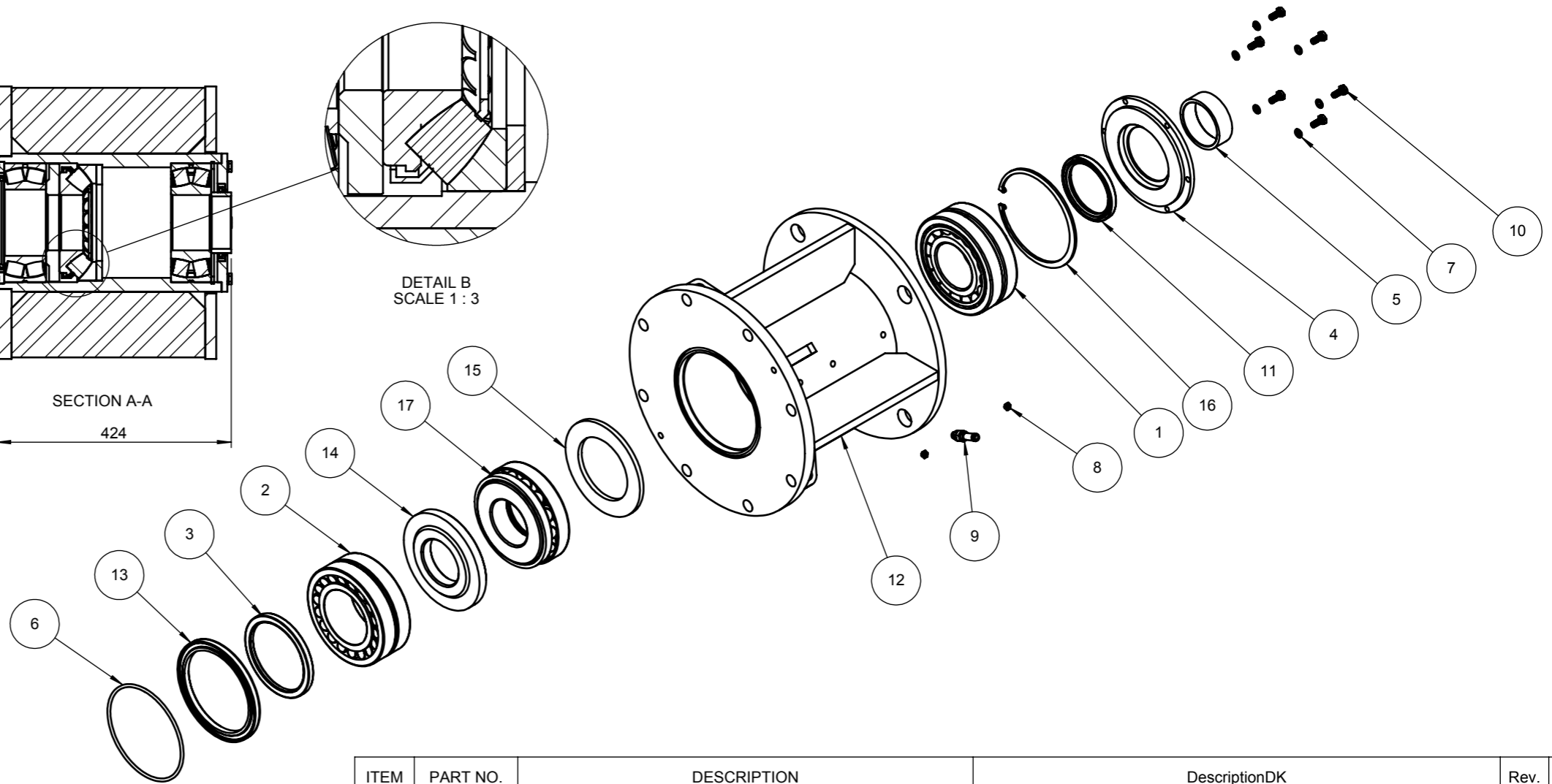
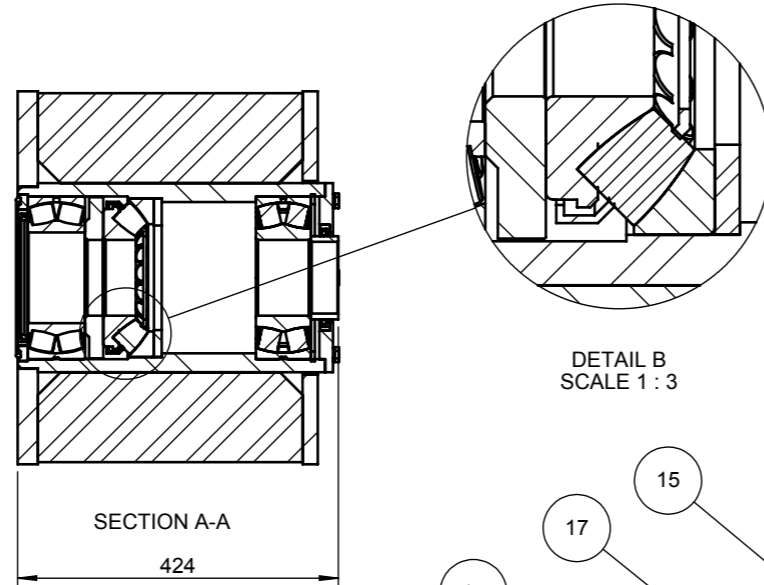
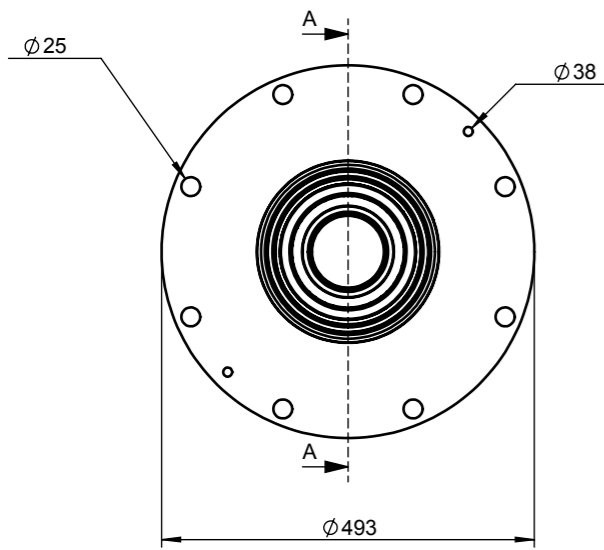
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B.	Nyt trykleje i lejehuset	AL	19-02-2015

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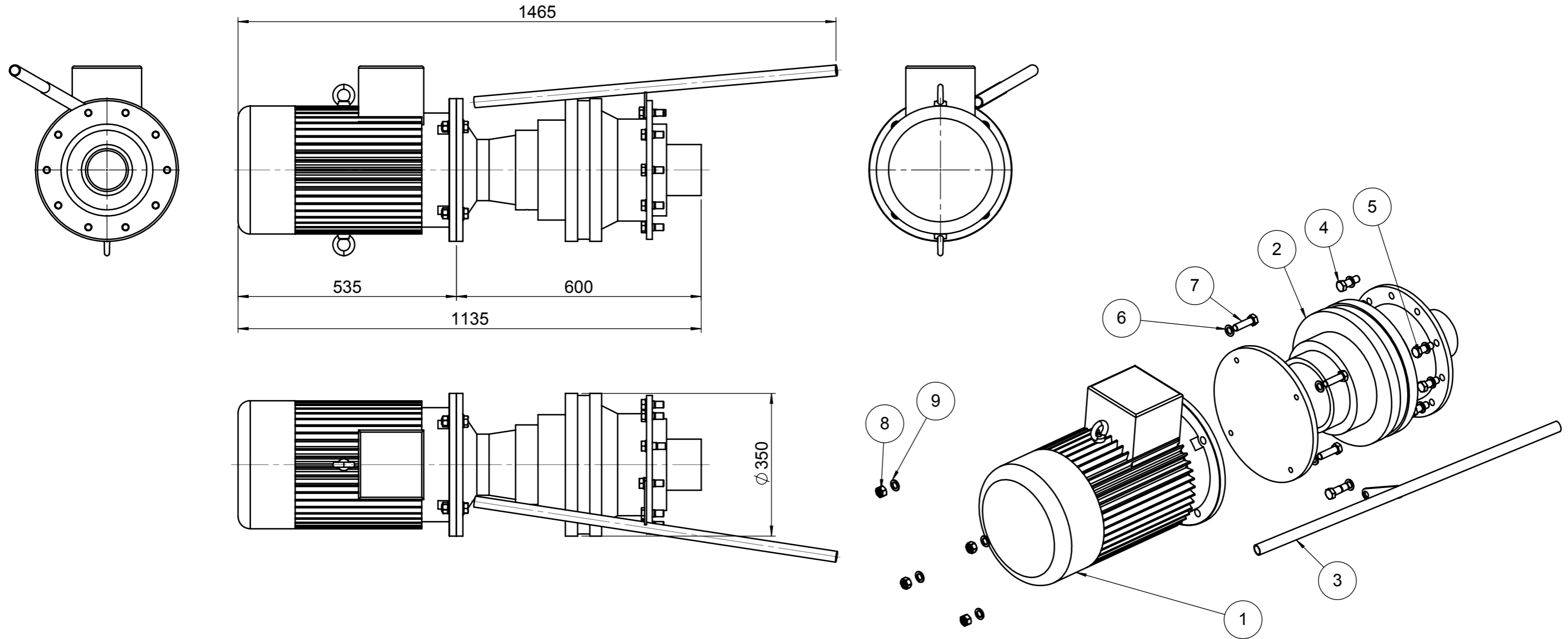
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Above	Max.	Linear	Angle
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3	6	±0,1	±1° 0'
6	30	±0,2	±0°30'
30	120	±0,3	±0°20'
120	400	±0,5	±0°10'
400	1000	±0,8	±0°05'
1000	2000	±1,2	±0°05'
2000	4000	±2,0	±0°05'

Replaces:		Projection:	
Color:	Surface:	Format:	A3
Description: SK370 Basic machine HD trough with drain (153/117)		Date:	13-05-2014
Beskrivelse: SK370 Basis HD trug med dræn (153/117)		Creator:	AL
		Projekt ID:	P010
Scale:	Weight:	Drawing no.:	Rev:
1:20	651.8 kg	5000007776	B.


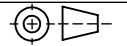


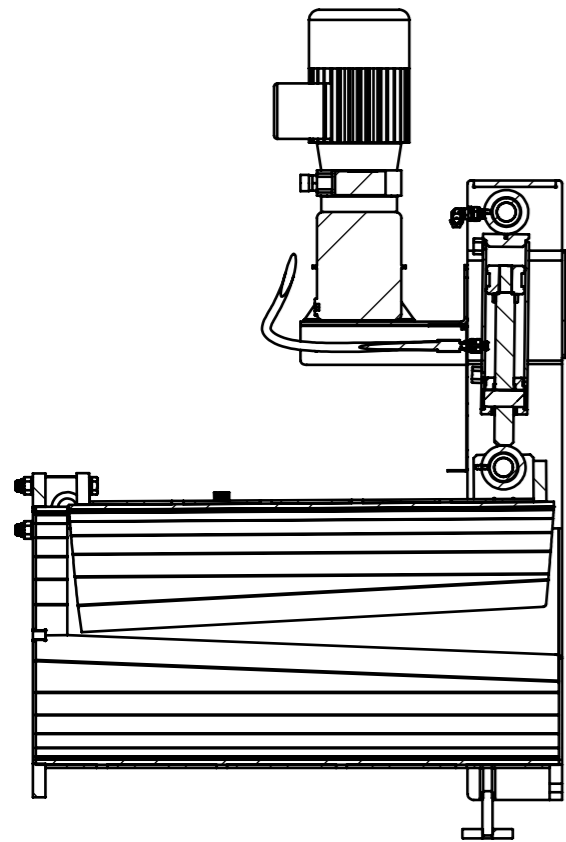
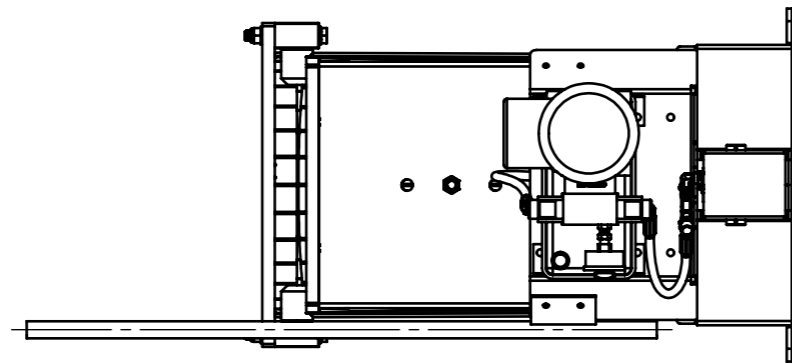
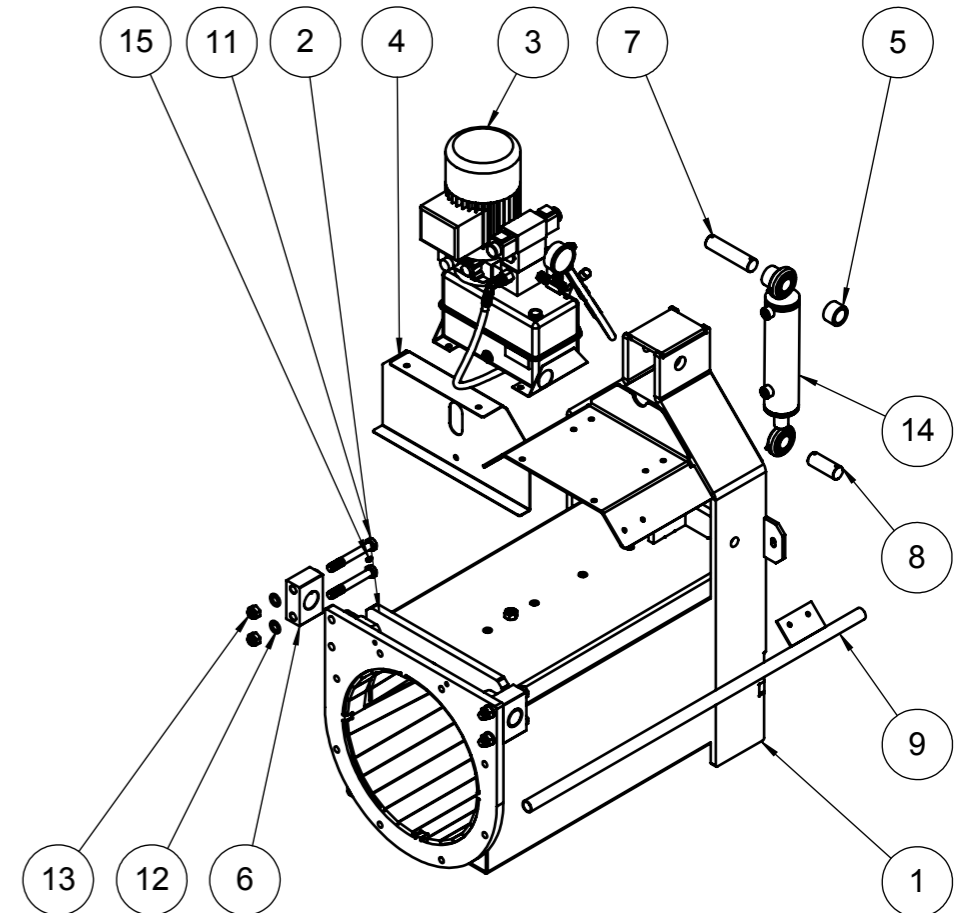
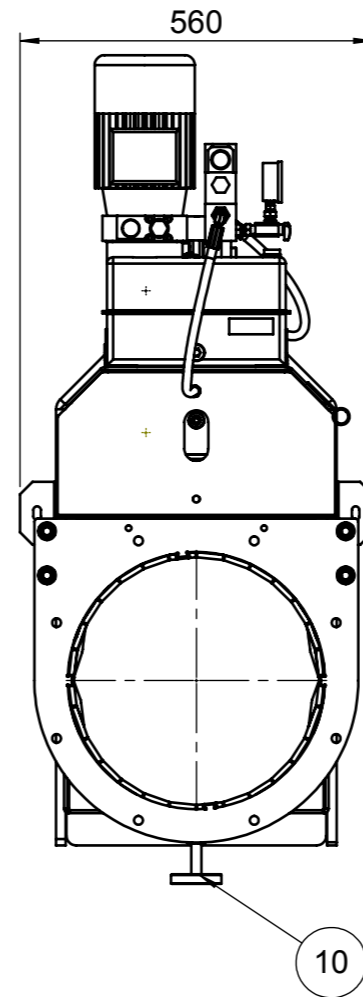
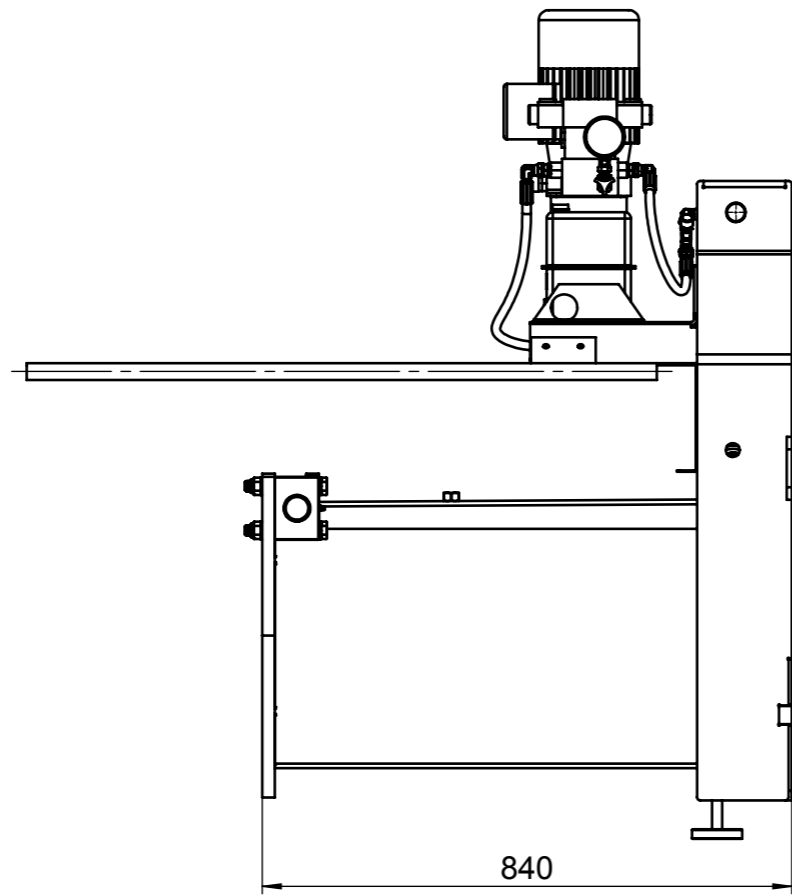
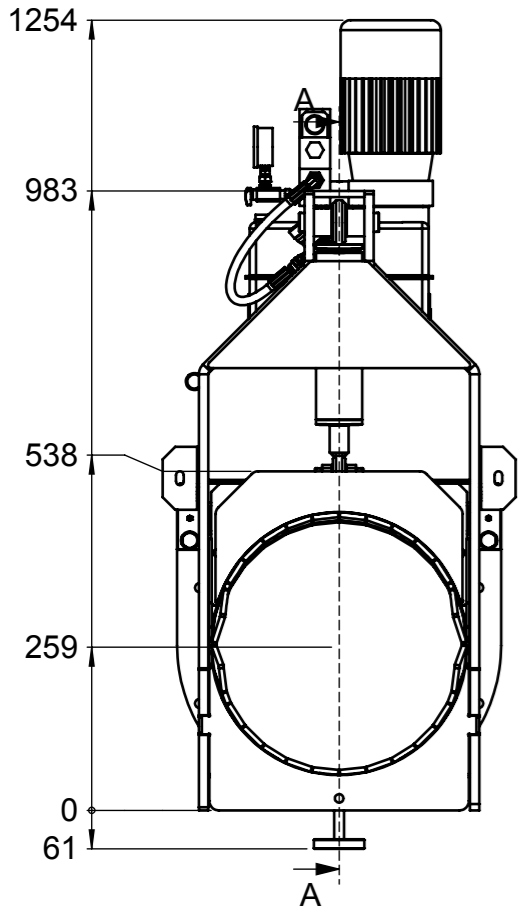
ITEM	PART NO.	DESCRIPTION	DescriptionDK	Rev.	1/QTY
1	200000262	Main bearing SK370, Ø215/ø100, 22320E	Hovedlejer SK370, Ø215/ø100, Sfærisk rulleleje 22320E (standard)	E.	1
2	2000001047	Front bearing Ø215/120 x76 HD bearing house	Forreste hovedleje Ø215/120 x76 HD lejehus		1
3	2000001055	Seal ring NBR OAS 150 X 180 X 12 mm	Pakdåse NBR OAS 150 X 180 X 12 mm		1
4	5000000105	SK370 End cover f. bearing house	SK370 Endedæksel f. lejehus	D.	1
5	5000000817	Distance bush short SK370	Afstandsbojsning kort SK370	E.	1
6	2000001053	O-ring 200 X 6 mm	O-ring 200 X 6 mm		1
7	3098060756	Spring washer M10 8.8 FZB DIN128	Fjederskive M10 8.8 FZB DIN128	B.	6
8	2000000167	Lubrication nipple 1/4"	Smørenippel lige 1/4"	F.	3
9	2000000250	Safety valvet 1/4" - 0,5 bar w. viton seal	Sikkerhedsventil 1/4" · 0,5 bar m. viton pakning	D.	1
10	3001060714	Bolt DIN912 M10x25 FZB	Bolt DIN912 M10x25 FZB	E.	6
11	5000000103	Seal ring w. stainless steel spring SK370	Pakdåse m. rustfri fjeder SK370	D.	1
12	5000008287	Bearing house HD120 - machined (conical bearing) Rev.2	Lejehus HD120 - bearbejdet (konisk leje) Rev.2	B.	1
13	5000008296	Ring f. seal Ø120 and O-ring - HD bearing house SK370	Ring f. pakdåse Ø120 og O-ring - HD lejehus SK370	A.	1
14	5000008295	Space ring Ø213/100 x 24mm	Afstandsring Ø213/100 x 24mm	A.	1
15	5000008297	Support ring for thrust bearing	Støttering til trykleje	A.	1
16	2000000207	Lock ring inner dia. ø215mm	Låsering indv. - ø215mm	C.	1
17	2000001138	Axial bearing Ø210/100 x 67 HD Bearinghouse	Aksial leje Ø210/100 x 67 HD lejehus		1

Revisioner				 RUNI A/S Industriparken 8 DK-6880 Tarm TLF. +45 97371799 FAX. +45 97373800 www.runi.dk	General Tolerances (-DS/ISO 2768-1 m)				Replaces:	
No	Note	Init	Dato		Nominal value		Tolerance		Color:	Surface:
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				3	6	±0,1	±1° 0'	Date: 28-01-2015		
				6	30	±0,2	±0°30'	Creator: CM		
				30	120	±0,3	±0°20'	Projekt ID: P010		
				120	400	±0,5	±0°10'	Description: Bearing house HD120 SK370 Complete (axial bearing) Rev.2		
				400	1000	±0,8	±0°05'	Beskrivelse: Lejehus HD120 SK370 Komplet (aksial leje) Rev.2		
				1000	2000	±1,2	±0°05'	Scale: 1:10	Weight: 145.1 kg	
				2000	4000	±2,0	±0°05'	Drawing no.: 5000008288	Rev: 2	



ITEM	PART NO.	DESCRIPTION	DescriptionDK	Rev.	1/QTY.
1	2000006007	Motor MOLL Y2HE-160L4 B5 IE1 S2 15kW/1470/400/690V-50Hz/CLF/IP55 RAL9005	Motor MOLL Y2HE-160L4 B5 IE1 S2 15kW/1470/400/690V-50Hz/CLF/IP55 RAL9005		1
2	2000005005	Planetary gearbox PSR 140 L3-P20-52-E16-VT 50Hz	Planetgear PSR 140 L3-P20-52-E16-VT 50Hz (SK370 15kW -50Hz)	B.	1
3	5000002054	Cable tube maine engine SK370	Ledningsrør hovedmotor SK370	B.	1
4	3003061021	Bolt 8.8 FZB 16X50	Bolt 8.8 FZB 16X50	B.	2
5	3003061020	Bolt 8.8 FZB 16X45	Bolt 8.8 FZB 16X45	B.	8
6	3098051059	Washer DIN433 Ø17/28	Facetskive DIN433 Ø17/28	B.	4
7	3003061022	Bolt 8.8 FZB 16X55	Bolt 8.8 FZB 16X55	B.	4
8	3097021002	DIN 934 8.8 M16	DIN 934 8.8 M16	B.	4
9	3098061056	Spring washer FZB M16	Fjedeskive FZB M16	B.	14

Revisioner				 RUNI A/S Industriparken 8 DK-6880 Tarm TLF. +45 97371799 FAX. +45 97373800 www.runi.dk	General Tolerances (-DS/ISO 2768-1 m)				Replaces:	
No	Note	Init	Dato		Nominal value		Tolerance		Color:	Surface:
				Above	Max.	Linear	Angle			
				0,5	3	±0,1	±1° 0'			
				3	6	±0,1	±1° 0'			
				6	30	±0,2	±0°30'			
				30	120	±0,3	±0°20'			
				120	400	±0,5	±0°10'			
				400	1000	±0,8	±0°05'			
				1000	2000	±1,2	±0°05'			
				2000	4000	±2,0	±0°05'			
								Scale:	Weight:	
								1:10	175.1 kg	
								Description: Motor: 15kW Gearbox: PSR 50Hz 29 rpm	Projection: 	
								Beskrivelse: Motor: 15kW Gear: PSR 50Hz 29 omdr.	Format: A3	
									Date: 26-08-2010	
									Creator: NN	
									Projekt ID: P010	
								Drawing no.: 5000007779	Rev:	



SECTION A-A

ITEM	PART NO.	DESCRIPTION	DescriptionDK	Rev.	QTY.
1	5000007622	Pressure chamber, fixed part - welded	Rund præssekammer, fast part - svejs		1
2	5000007897	Moveable jaw w. extra displacement - SK370	Bevægelig kæbe m. ekstra vandring - SK370		1
3	5000004152	Hydraulic station MC4 for jaws complete	Hydraulikstation MC4 for kæber komplet		1
4	5000007896	Cylinder screen	Afskærmning for cylinder	A.	1
5	5000000610	Distancebush for cylinder	Afstandsbusning til cylinder		2
6	5000000098	Hinge (female)	Hængsel (hun)	A	2
7	5000000600	Pin/axle f jaw cylinder (upper)	Nagle (øverste) på kæbe v. cylinder SK240/SK370		1
8	5000000601	pin/ axle f cylinder (lover)	Nagle (nedre) på kæbe v. cylinder/trykplade SK370		1
9	5000008222	Cabel tube for chamber (600 mm matrix) welded	Ledningsrør for pressekammer (600 mm matrice) svejst		1
10	5000002211	Runi foot M16	Støttefod M16		1
11	3001061038	Bolt M16X120 8.8 FZB	Bolt M16X120 8.8 FZB		4
12	3098051059	Washer DIN433 Ø17/28	Facetskive DIN433 Ø17/28	B.	8
13	3097061010	DIN 985 M16 lock nut FZB	DIN 985 M16 låsemøtrik FZB		4
14	2000000302	Hydraulic cylinder Ø63/30x150	Hydraulik cylinder Ø63/30x150		1
15	2000000110	Lubrication nipple M6	Smørenippel lige M6	B.	2

Revisioner			
No	Note	Init	Dato




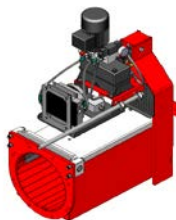
RUNI




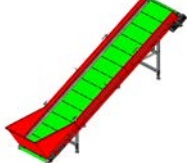
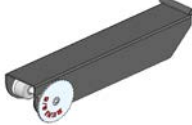
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General Tolerances (-DS/ISO 2768-1 m)			
Nominal value		Tolerance	
Above	Max.	Linear	Angle
0,5	3	±0,1	±1° 0'
3	6	±0,1	±1° 0'
6	30	±0,2	±0°30'
30	120	±0,3	±0°20'
120	400	±0,5	±0°10'
400	1000	±0,8	±0°05'
1000	2000	±1,2	±0°05'
2000	4000	±2,0	±0°05'

Replaces: 5000002865	
Projection:	
Color:	Surface:
Format: A3	
Date: 06-05-2015	
Description: Pressure chamber including hydraulic pump and round jaws	
Beskrivelse: Pressechamber med hydraulisk pumpe og runde kæber	
Creator: CM	
Projekt ID: P010	
Scale: 1:12	Weight: 221.0 kg
Drawing no.: 5000008631	Rev:

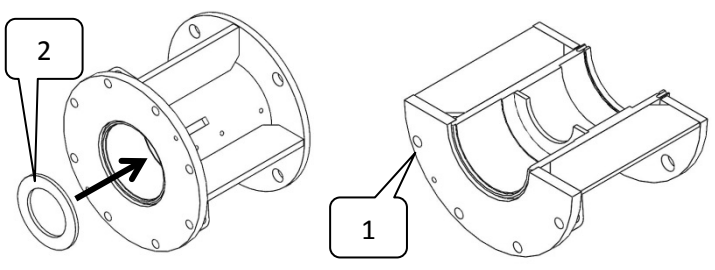
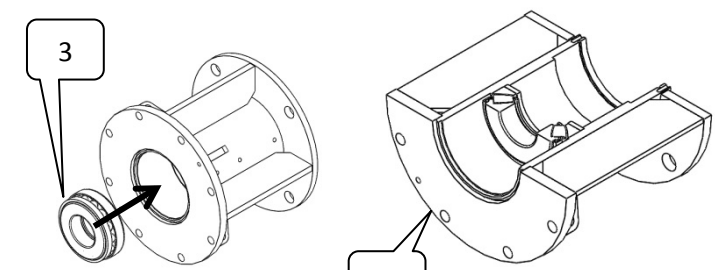
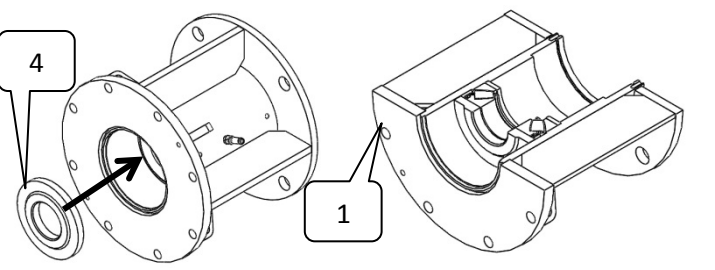
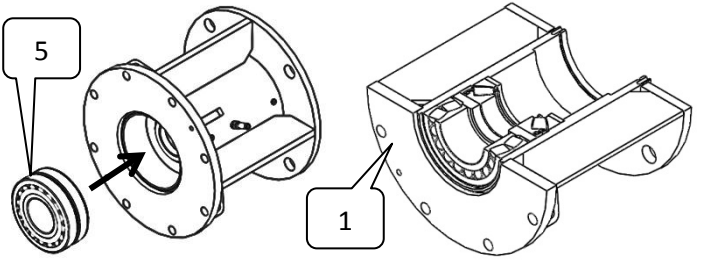
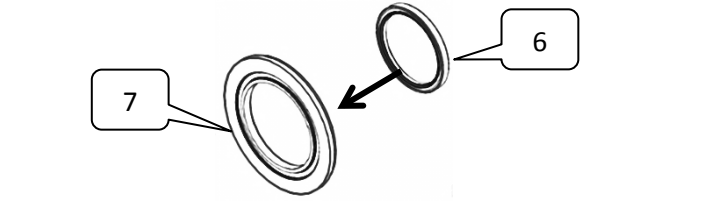
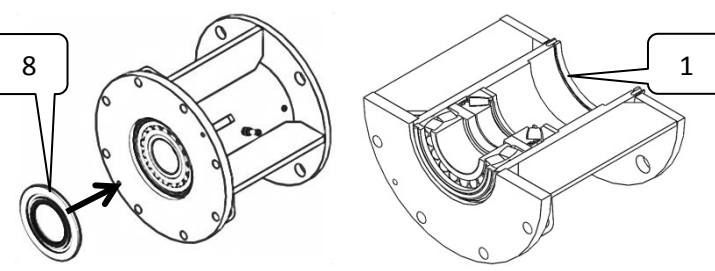
RECOMMENDED SPARE PARTS

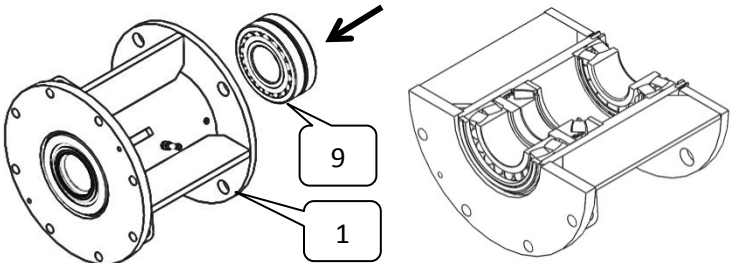
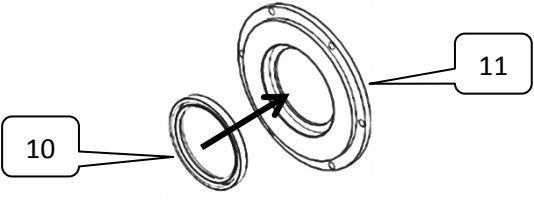
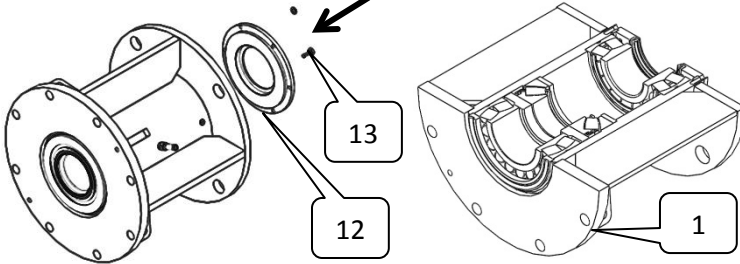
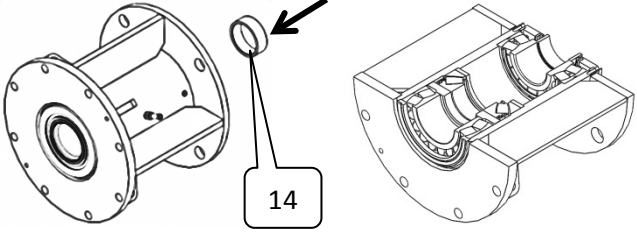
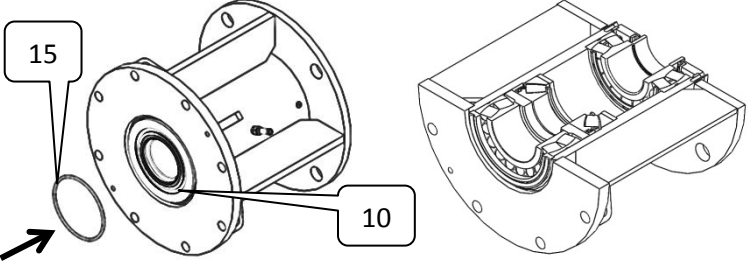
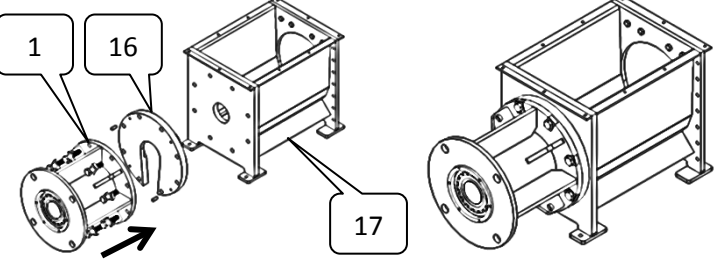
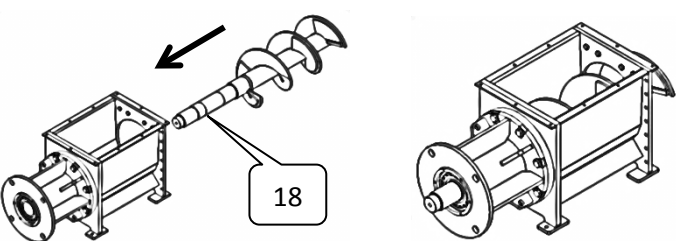
Machine:					RUNI				
SK 370									
Designed:	AL/SRB	Approved:	TD		Date:	11.10.2016	Revisions nr. 3.0		
Nr.	Description				Quantity	Notes			
Basic mashine									
1	Speedi-Sleeve Gold				2				
2	Shrink disc 125x250 mm				1				
3	Seal ring with dust lip				1				
4	Q-ring				1				
5	Bearing Ø215/100 mm				2				
6	Bearing Ø215/120x76 mm				1				
7	Bearing Ø170/100x42 mm with stop				1				
8	Screw				1				
9	Matrix				1				
10	Pressure regulator 1/4"				1				
Main gearbox and motor									
1	Electical motor				1				
2	Cooler for hydraulic oil				1				
3	Circulation pump				1				
4	Gear box				1				
Hopper									
1	Conquest photocelle - transmitter				2				
2	Conquest photocelle - receiver				2				
3	Coded magnetic switch with connector				1				
4	Coded magnetic switch				1				
5	Elmotor				1				
6	Gear box				1				
7	Rotating level-sensor				1				
8	Ultrasonic sensor				1				
9	Flange bearing Ø35 mm				4				
Press chamber									
1	Electical motor				1				
2	Hydraulic station (without motor)				1				
3	Hydraulic cylinder				1				
4	Hydraulic hose A				1				
5	Hydraulic hose B				1				
6	Hydraulic hose C				1				
7	Hydraulic hose D				1				
8	Pressure gauge 0-250 bar				1				
9	Manometer valve 90° R1/4"				1				

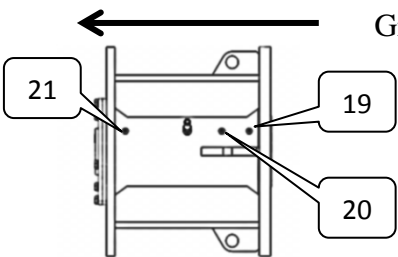
Block divider				
1	Inductive sensor	2		
2	Cable for inductive sensor, 10 m	2		
3	Hydraulic hose B	1		
4	Hydraulic hose H	1		
5	Pressure gauge 0-250 bar	1		
6	Manometer valve 90° R1/4"	1		
Outlet tray				
1	Limit Switch	1		
Crane				
1	Grip for SK370 block	1		
Conveyor				
1	Rope switch with reset	1		
Speed control				
1	Encoder	1		

Appendix 2

ASSEMBLING OF BEARING HOUSING AND SCREW

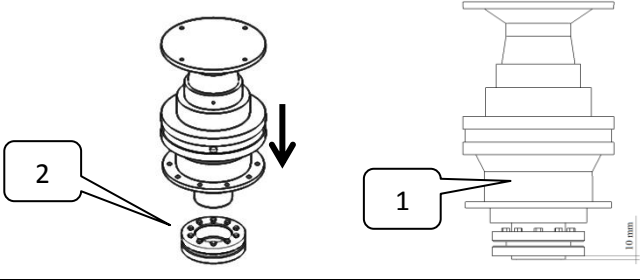
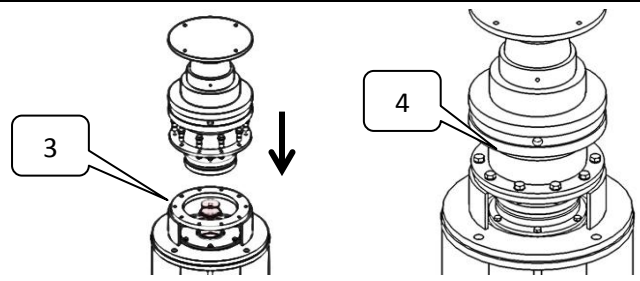
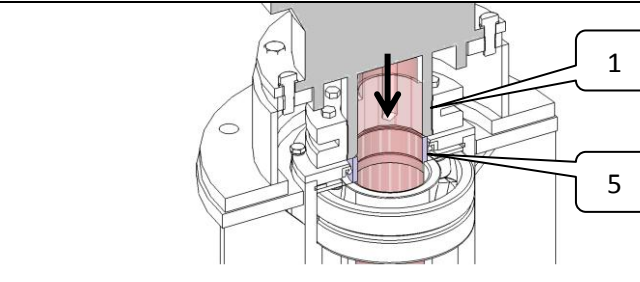
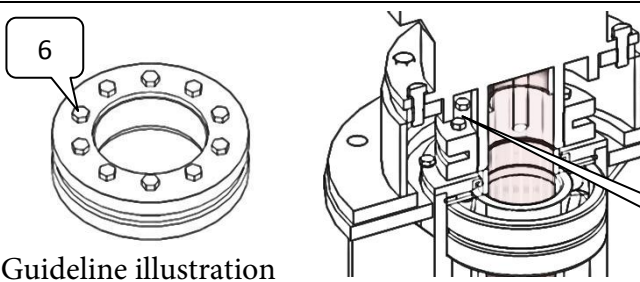
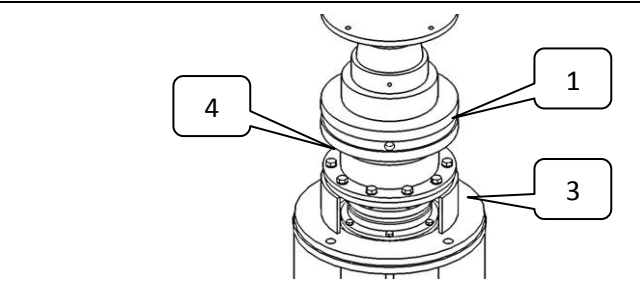
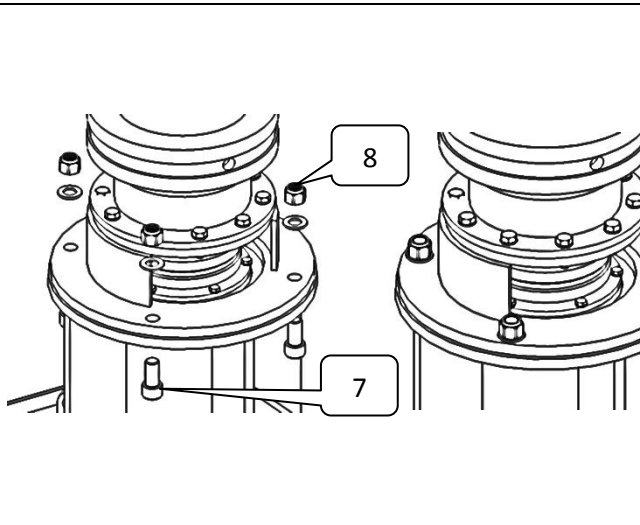
1		<p>Mount Support ring for thrust bearing (2) into bearing housing (1).</p>
2		<p>Fill the Axial bearing (2) with grease. Install it in the bearing housing (1). The total quantity of lubricant for the Axial bearing (3) is 480 ml. For this stage of lubricating use approx. 200 ml. The rest of the lubricant is added at stage 14 through the nipple (20). Check the lubrication manual.</p>
3		<p>Mount distance ring (4) into bearing housing (1).</p>
4		<p>Mount bearing (5) in the bearing housing (1).</p>
5		<p>Mount ring seal with dust lip (6) into ring for seal (7)</p>
6		<p>Mount ring for seal (8) in bearing house (1).</p>

7		<p>Mount bearing (9) in the bearing housing (1).</p>
8		<p>Mount ring for seal (10) in the end cover (11).</p>
9		<p>Mount the end cover (12) on the bearing housing (1) with the bolts (13).</p>
10		<p>Insert the short distance bush (14) into end cover (12).</p>
11		<p>Put the O-ring (15) into ring for seal (10).</p>
12		<p>Mount the bearing house (1) and distance plate (16) onto screw trough (17).</p>
13		<p>Mount screw (18) by pushing the shaft through the ring for seal and the bearing.</p>

14	 <p>← Greasing in this order</p> <p>21 19 20</p>	<p>Lubricate bearings by using of nipples (19, 20, and 21). Grease quantity: 280, 480 and 280 ml. Check the lubrication manual.</p>
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Disassembling of housing and screw is in opposite order

Before mounting the gear, shaft and hollow shaft has to be cleaned with cleaning fluid and wiped completely clean and 100% fat free.

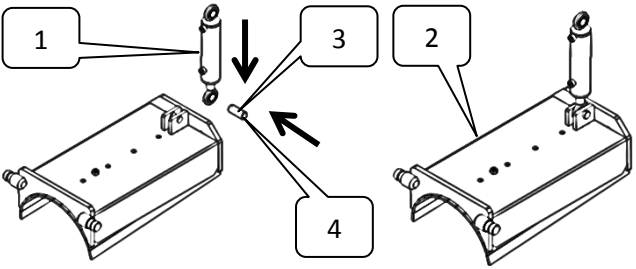
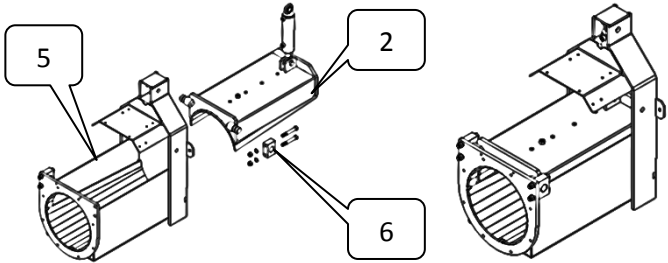
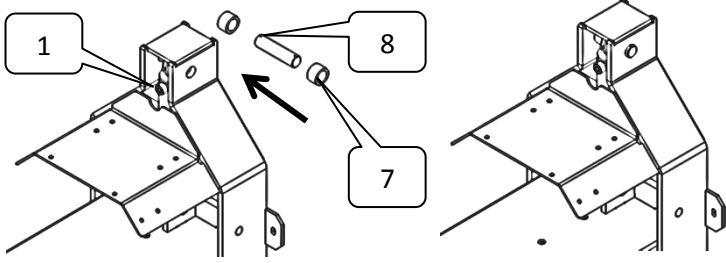
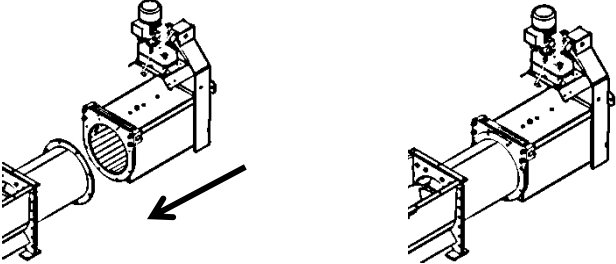
1		<p>Mount the shrink disc (2) loose around the hollow shaft of the gear (1), leaving 10 mm of this part free and making sure that the bolts are turned against the gear.</p>
2		<p>Moment housing (3) is loosely placed before the gear is mounted. Mount the flange of the gear with the bolts (4).</p>
3		<p>Guide the hollow shaft of the gear (1) in over the end of the shaft and press it towards the distance bush (5).</p>
4	 <p>Guideline illustration</p>	<p>The 14 bolts (6), (appendix 6 shrink disc type TLK602-125) should be tensioned gradually step by step until torque of 100 Nm is reached.</p>
5		<p>M16 bolts (4) in moment housing (3) and gear (1) are tightened with 187 Nm.</p>
6		<p>The 4 pcs. M24 bolts (7) are tightened in the mounting holes of the moment housing (3). The bolts must not be tightened to the bearing house. There must be clearance. Please check that this is observed during normal operation. The nuts (8) are tightened with 705 Nm. The gear is secured in the longitudinal direction by the shaft and must not be secured anywhere else. The purpose of the moment housing is only to stop gear and motor from rotating.</p>

Dismounting of the gear is in opposite order.

ASSEMBLING OF HYDRAULIC SYSTEM

1		<p>Pump station (1) is an autonomous unit, which is mounted on the bracket (2) on the press chamber (3).</p>
2		<p>Mount the hydraulic hose (4) on the pump's (1) A-port (with one way restrictor valve) and the cylinder's (5) "push inlet" (top).</p>
3		<p>Mount the hydraulic hose (6) on the pump's (1) B-port and the cylinder's (5) "pull inlet" (bottom).</p>

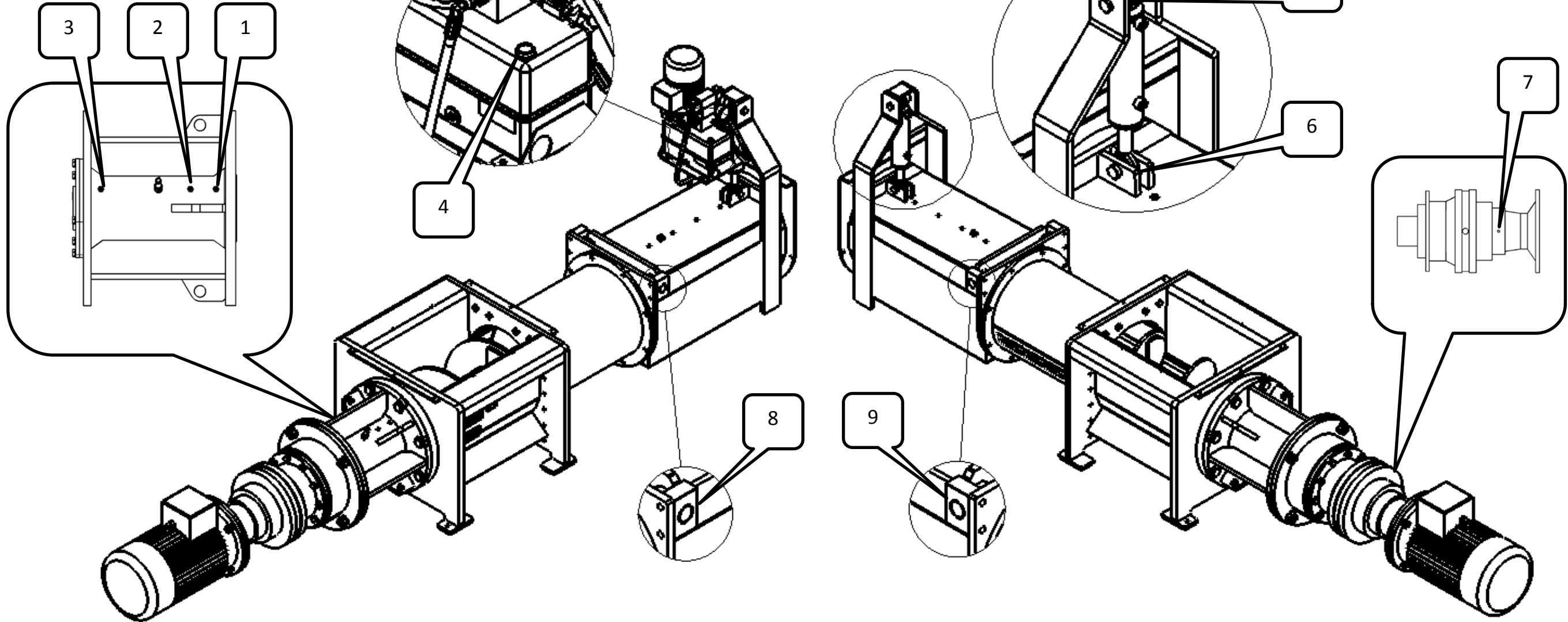
Disassembling is in opposite order.

ASSEMBLING OF PRESS CHAMBER		
1		<p>Mount hydraulic cylinder (1) on the moveable jaw (2) with the pin (3) and lock with the splits (4). Drawing 5000008631.</p>
2		<p>Mount the moveable jaw (2) on the fixed jaw (5) with the hinges (6), which are bolted on to the chamber. Drawing 5000008631.</p>
3		<p>Mount hydraulic cylinder (1) in the tension bracket with two distance bushes (7), the pin (8) and lock with the splits (4). Drawing 5000008631.</p>
4		<p>The assembled press chamber can now be mounted on the basic machine with the bolts.</p>

Disassembling of press chamber is in opposite order.

Appendix 3

Greasing in this order



Position	Description	Lubricant	Quantity	Service interval, operation hours
1	Nipple for lubrication of screw bearing no. 1	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	approx. 50 / 280 ml	100 / 5000
2	Nipple for lubrication of conical screw bearing no. 2	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	approx. 50 / 480 ml	100 / 5000
3	Nipple for lubrication of screw bearing no. 3	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	approx. 50 / 280 ml	100 / 5000
4	Hydraulic pump station	Hydraulic oil, viscosity ISO 46	5,0 l.	100 / 2500
5	Hydraulic cylinder	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	2 x per month (1push)	or every 100
6	Hydraulic cylinder	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	2 x per month (1push)	or every 100
7	Planetary gearbox	STATOIL Loadway EP 150	3,5 l.	100 / 2500
8	Nipple for lubrication of pressure chamber right side	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	2 x per month (1push)	or every 100
9	Nipple for lubrication of pressure chamber left side	GREASEWAY CAH 92 / AGIP AUTOL TOP 2000 / Shell Gadus S3 A1300 C 2	2 x per month (1push)	or every 100

Screw bearings should be cleaned after 5000 operation hours (please, check instruction manual)

Service & Maintenance Service Chart SK370



Service Tasks	Daily Service	Weekly Service	100 hour Service	Monthly Service	2500 hour Service	Yearly Service	5000 hour Service
Visual inspection of uncompromized Emergency Breaker Circuit	X						
Check Safety Switch function	X						
Clean machine in general		X					
Secure Clean photocells		X					
Clean motor ventilation ribs		X					
Clean oil cooler radiators ¹		X					
Clean the speed control reader ¹		X					
Grease main bearings			X				
Grease hydraulic cylinder fastenings			X				
Grease Presurechamber bearings			X				
Grease schredder shaft bearings ¹			X				
Grease shcredder gear wheels ¹			X				
Change main gear oil			X ²		X		
Change shredder gear oil ¹			X ²		X		
Change hydraulic oil			X ²		X		
Inspection of electrical cables						X	
Inspection of electrical enclosures						X	
Clean the drain at the bearing house ¹				X		X	
Inspection for gear leaks				X		X	
Inspection for hydraulic leaks				X		X	
Inspection of hydraulic hoses				X		X	
Check/adjust gear oil level				X		X	
Check/adjust hydraulic oil level				X		X	
Inspection safety enclosures						X	
Check that bolts are tightened ³						X	X
Inspection of bearing wear							X
Inspection of screw wear			(X ⁴)		X		X
Main bearing desassembly, cleaning regreasing							X

¹ if Equipped with schredder

² This applies only after the first 100 hours of operation.

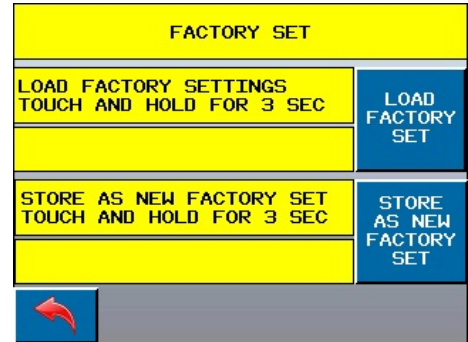
³ To be done after 30 hours after every assembly in connection with repair, service etc.

⁴ When processing abrasive or corrosive material a frequent inspection cycle is needed to determinine the right frequency of rebuilding the wear layer.

Appendix 4

The settings in this section can only be viewed and adjusted following log-in as a RUNI technician or distributor.

It is possible to save new factory settings.



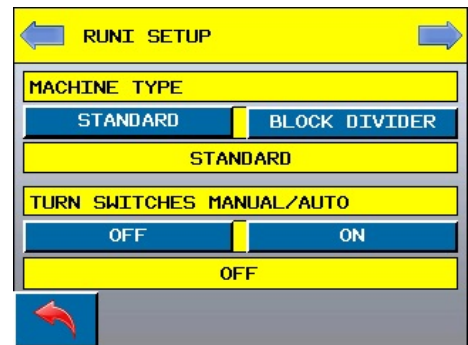
This menu allows you to configure the composition of the machine – which components are present, etc.

“MACHINE TYPE”:

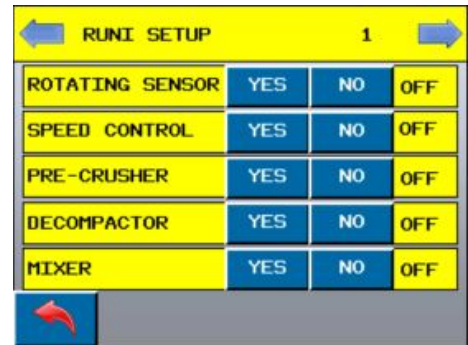
If the machine has a block divider select “BLOCK DIVIDER”.

“TURN SWITCHES MANUAL/AUTO”

If the control box has turn switches for manual/auto operation select “ON”.



This screen is used to define whether there is a rotating sensor in the hopper, whether a speed control device is installed, which type of hopper is installed (with or without a pre-crusher), whether there is a decompactor and whether a mixer is installed in the hopper.



“JAWS SETUP 3 – TIMEOUT POCER LIMIT CLOSE /DELAY STOP” has two different NAMES / functions depending on what is selected here under “RUNI SETUP 2”:

If “SPECIAL STOP” is not selected, the compactor will automatically stop and enter alarm mode if the kW consumption has been constantly above LIMIT OPEN or below LIMIT CLOSE (JAWS SETUP 2 – “LIMIT OPEN” minus “DIFFERENCE”) for the specified number of seconds.

If “SPECIAL STOPS” is selected:

“TIMEOUT POWER LIMIT OPEN” functions as a stop/alarm as described above.

“DELAY STOP” will function as a machine stop (but not as an alarm). Read more under “JAWS SETUP 3”



Appendix 5

Qualification and Training Chart SK120/240/370

Qualifications and Preconditions ¹	Transporting and moving around	Installing and Dismantling	Operating	Adjusting	Cleaning and Maintenance	Repairing, Disassembling and Assembling	Scrapping
Mentally stable and fully conscious	X	X	X	X	X	X	X
Physical capable to perform normal factory work	X	X	X	X	X	X	X
Normal eyesight	X	X	X	X	X	X	X
Skilled Electrician		X ²				X ²	X ²
Skilled Fitter		X				X	X
Training Required¹							
Trained in fastening of goods under transport	X						X
Trained in use of lifting equipment and devices	X	X				X	X
Trained in safe working behavior	X	X	X	X	X	X	X
Trained in relevant environmental legislations	X	X	X	X	X	X	X
Trained in basics of Machine Safety		X	X	X	X	X	
Trained in general machine operation		X	X	X	X	X	
Trained in general machine care and cleaning		X	X	X	X	X	
Trained in use of relevant personal protection gear	X	X	X	X	X	X	X
Trained in Operating and Cleaning of a RUNI Machine			X	X	X	X	
Trained in Inspection, Adjustment and Maintenance of a RUNI Machine		X	X	X	X	X	

¹ This is machine manufacturers requirements - if national legislations or company specific guidelines requires higher level it is mandatory to comply with those.

² For electrical cabling work a skilled electrician is required.

Appendix 6

PlanStar Planetary Gearbox MANUAL



Type

PSR 140 L3-P20-52-E16-VT



PlanStar

Technical Specification
 Technische Spezifikation
 Spécification technique

Type – Typ – Typ	<i>PSR 140 L3-P20-52-E16-VT</i>
Serial no.–Serien Nr.–No. de Série	??
Drawing – Zeichnung – Dessin	<i>0143132000</i>

Multi Disk Brake – Lamellenbremse – Frein de Lamelle			
Type – Typ – Type		- - - -	
Opening pressure Oeffnungsdruck Pression d'ouverture	- - - -	Braking Torque Bremsmoment Couple freinant	- - - -
Oil type–Oelsorte–Type d'huile	- - -	Oil Quantity–Oelmenge–Quantité d'huile	- - -

Ratio Uebersetzung Rapport	Stage Stufe Train	Input stage Antriebsstufe Train d'entrée			Output stage Abtriebsstufe Train de sortie	
		1	2	3	4	5
Size Grösse Taille		15	50	140		
2.2667						
3.0909						
3.3333						
3.4286						

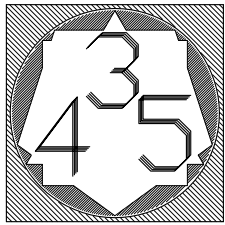
3.7500		×	×	×		

4.0909						
4.3478						
4.8571						

5.0526						
5.2500						
5.8125						

6.1333						
6.2308						
6.9231						

Total ratio – Gesamtübersetzung – Rapport total	<i>i = 52,73</i>
Torque – Drehmoment – Couple de Sortie	Max. <i>18000</i> Nm



PlanStar

Lubrication
Schmierung
Lubrification

Lubricants – Schmierstoffe – Lubrifiants

Air temperature Lufttemperatur Temperature ambient	C°	-20.....+10	-5.....+30	+10.....+40
Viscosity Viskosität Viscosité	ISO VG	100	150	220
AGIP		Blasia 100	Blasia 150	Blasia 220
Castrol		Alpha SP100	Alpha SP150	Alpha SP220
Esso		Spartan EP100	Spartan EP150	Spartan EP220
FINA		Giran 100	Giran 150	Giran 220
Mobil		Mobilgear 627	Mobilgear 629	Mobilgear 630
Q8		Goya 100	Goya 150	Goya 220
Shell		Omala EP100	Omala EP150	Omala EP220
Texaco		Meropa 100	Meropa 150	Meropa 220

Oil quantity – Oelmenge – Quantité d’huile			Liter Litre
Mounting position	In line gear box	H	3,5
	Koaxialgetriebe	V1	—
	Reducteur à arbres parallèles	V2	—
Einbaulage	Right angle gear box	H0	—
		V1H	—
Position de Montage	Winkelgetriebe	V2H	—
		HV1	—
	Reducteur à arbres perpendiculaires	HV2	—

Grease lubrication – Fettschmierung – Graissage

Lithium based grease, NLGI class 2 , base oil ISO VG 150–320

Lithium basiertes Fett, NLGI Klasse 2 , Basis-Oel ISO VG 150–320

Graisse sur la base de Lithium, NLGI Classe 2, Huile de base ISO VG 150–320

INSTALLATION:

In order to guarantee faultless operation it is important to follow some basic principles:

- The frame or structure accepting the gear box must be rigid and of sufficient thickness.
- The mating surfaces have to be machined making sure that the contact area is plane and smooth. Centering diameters must be machined to a H8 tolerance.
- Gearboxes in the sizes 300, 360, 420, 480, 560, 710, 900, 1100 and 1300 have 2 alignment diameters. The gearbox must be supported on both diameters if the shaft radial load exceeds 50% of the permissible value (see catalogue).
- Gearboxes with female output shaft, which normally cannot bear any shaft load, need high accuracy regarding the perpendicularity between bearing surface and driven shaft. This shaft must have separate bearings and has to be carefully aligned with the gearbox's center axis.
- Always use bolts of at least 8.8 quality. Tighten with torque wrench to 80% of the yield strength. If the gearbox has to transmit very high torque or if the direction of rotation is often inverted or if load shocks occur then use bolts of 10.9 or 12.9 quality and tighten to 80% of their yield strength.
- Always use all fixing holes on the mounting flange. In addition gearboxes of size 300, 360, 420, 480, 560, 710, 900, 1100 and 1300 have to be pinned. The required pins are already fitted to the flange of the gearbox.
- The mounting position should guarantee free access to the plugs in order to facilitate oil level checking and oil replacement.
- In case of vertical mounting extension tubes and compensation reservoirs may be needed. Pay attention to gearboxes with the output shaft pointing upwards, they often have a grease lubricated upper bearing at the output shaft.
- Shaft seals and breather plugs must not be painted.

SETTING IN MOTION:

- If possible the gearbox should be started without load at low speed. If there are no problems, as for example vibrations or noise, the gearbox can be run at normal conditions. Otherwise the correct installation must be verified.
- Check for oil leaks and check oil level after trial run.

LUBRICATION:

- The reducers are delivered **without** oil (unless directly specified with oil). Before starting up , the gearbox must be filled with an EP-oil. For standard applications use viscosity grade ISO VG 150 or 220. On page 2 you can choose the suitable lubricant for a wide range of ambient temperatures.
- Some planetary gearboxes with high loads should be lubricated with synthetic oil of the PAO type (Poly-Alpha-Olefin). For the first 100-250 hours in service mineral oil is sufficient. Then after a carefully performed drainage of the gearbox it can be filled with synthetic PAO-oil (for example Mobilgear SHC-XMP). In case of doubt ask EKC A/S (see below).
- The oil temperature should not exceed 80 °C. In the event that the transmitted power exceeds the thermal power limit of the gearbox an oil cooling system must be installed. The use of VITON[®] shaft seals (gear box designation **-VT**) and synthetic oil allows the oil temperature to rise up to 100 °C.
- The oil temperature depends on the mechanical losses in the gearbox. High input speeds normally cause higher oil temperatures than low speeds for a certain transmitted power. In case of a thermal problem please ask EKC A/S (see below).

MAINTENANCE:

- The only two necessary actions to be taken care of are to replace the lubricant and to check the oil level. In case of grease lubricated output shaft the bearings should be greased when the oil is changed.
- The first oil replacement is required after **100-250** operating hours and for every **2500** operating hours thereafter, or at least once every year. To avoid deposits we recommend to replace oil when the gearbox is still warm (40-50° C is a good temperature) . CAUTION ! Hot oil can cause severe burns ! Wear proper clothing and protect hands and face ! Fill up with the correct amount of suitable oil.
- If a gearbox is purposely overloaded it will wear out quickly. The life of the gearbox can however be extended by changing oil with short intervals (200, 400, 800 hours depending on the degree of contamination).

OIL COOLING:

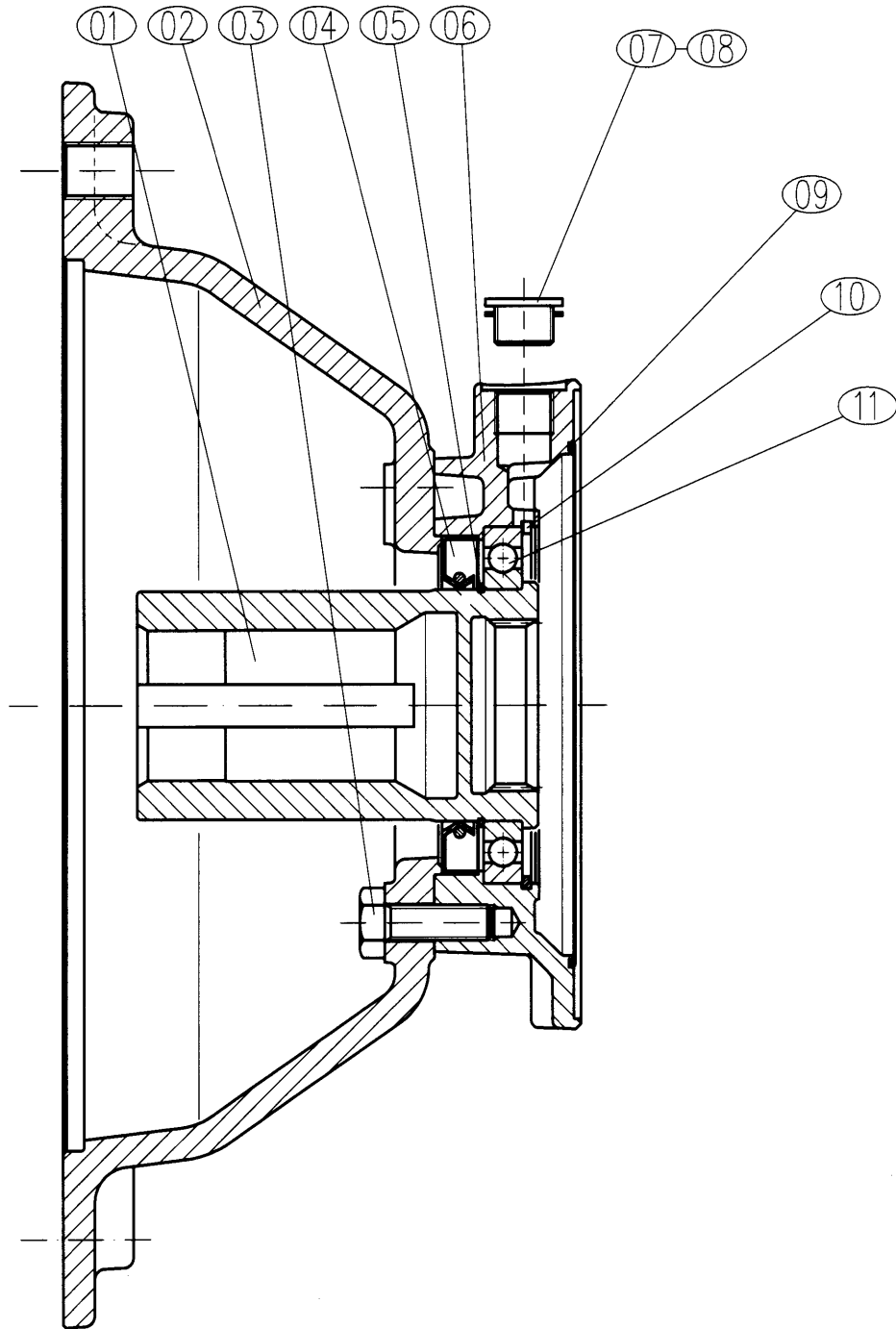
- Planetary gear boxes for very high power transmission can be cooled by an external oil cooling unit with pump, fan and filter. When filters of 10 micron are mounted the oil change interval can be extended to every **4000** operating hours.
- It is highly recommended to use synthetic oil of the PAO-type (Poly-Alpha-Olefin) in the gear box and circulation system (for example Mobil SHC-XMP 220). Oil of PAO type can be mixed with small amounts of mineral oil without problems.
- Check the filter pressure indicators every month (check when the oil is at working temperature). When the indicator is constantly in the red area change the filter (when the oil is still cold it is possible that the indicator goes into the red area until the oil is warmed up - this is not a critical condition).
- Some cooling systems employ a magnet on the suction side of the pump. By every oil change (or by change of filter element) the magnet should also be checked. The magnet holds back steel particles that could be harmful to the pump or the gear box. If big particles stick to the magnet something could be wrong inside the gearbox and you should call EKC A/S (see below). If only very fine black particles are caught by the magnet the gear box has no problems and the magnet can be cleaned and re-mounted.
- Check the oil level each time the oil is changed, or filter is changed, or the magnet has been cleaned. Start the pump for 1-2 minutes and stop it again. Now the oil level check can be done.
- Inspect the cooler unit every month and ensure that the air can pass freely through the lamellas. Clean by compressed air if necessary.



PS-IN-0022-160-00

Input Section PS 0022

Electric Motor IEC 160-B5



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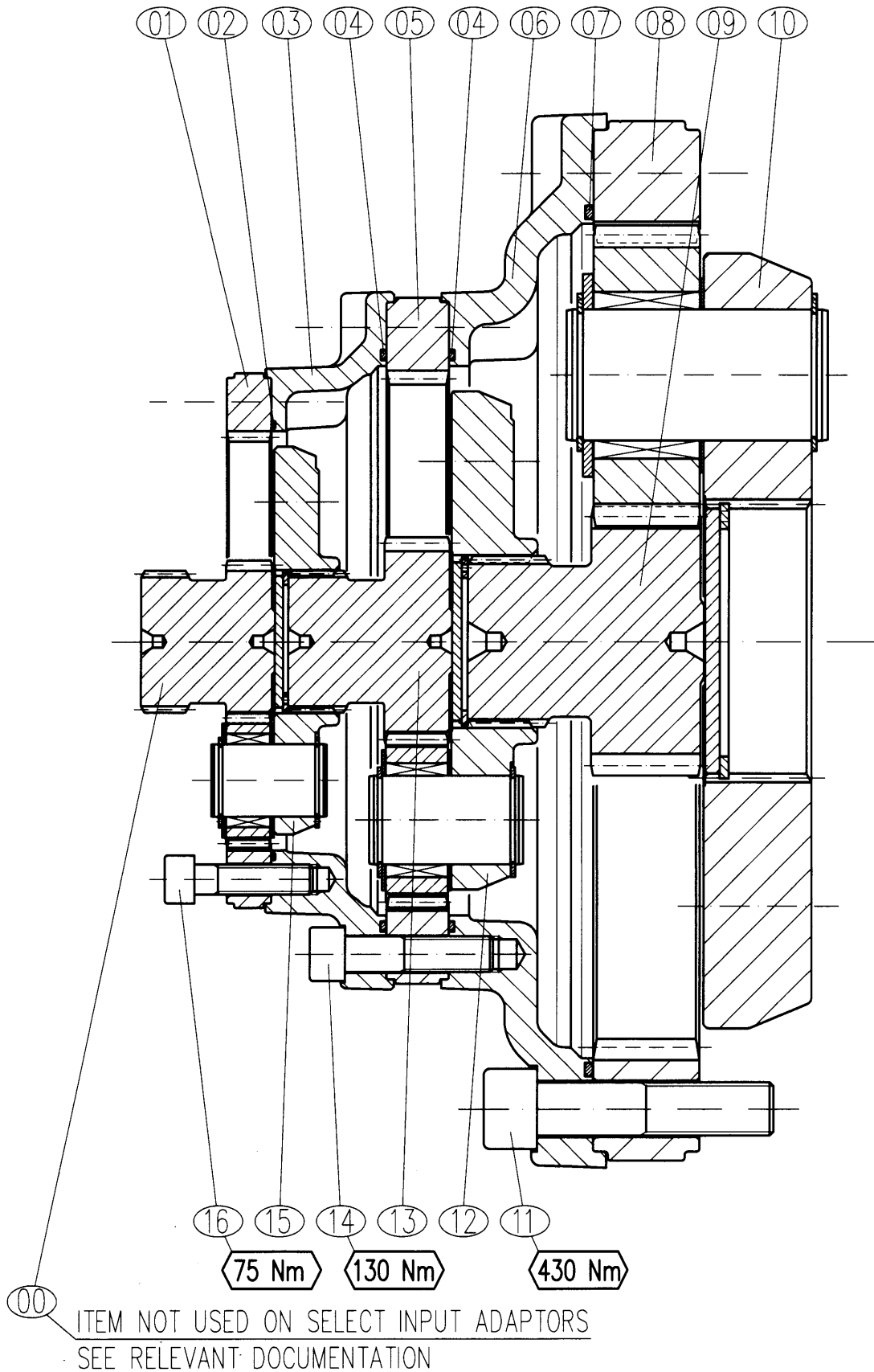
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PS-STG-0140-03a-00

Stages Section PS 0140

3 STAGES



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STG-0142-03a-00 ratio 53

Stages Section PS 0142

3 STAGES ratio 53

item	Description	Q'ty	code	size	kg	ext. kg
00	SUN GEAR	1	ratio	3.75	0.59	0.59
			91-01-00	15-04		
			kg	0.59		
1	RING GEAR	1	93-00-0015-00		1.1	1.1
2	O-RING	1	40-01-0051-00	AS 051 (2550) NBR		0
3	COVER, INTERMEDIATE	1	99-01-0050-00		2.66	2.66
4	O-RING	2	40-02-0169-00	AS 169 (3750) NBR		0
5	RING GEAR	1	93-00-0036-00		2.61	2.61
6	COVER, INTERMEDIATE	1	99-01-0140-00		7.95	7.95
7	O-RING	1	40-03-0276-00	AS 276 (41100) NBR		0
8	RING GEAR	1	93-00-0140-00		8.87	8.87
9	SUN GEAR	1	ratio	3.75	3.13	3.13
			91-01-0	140-04		
			kg	3.13		
10	PLANET CARRIER	1	ratio	3.75	18.47	18.47
			94-41-0	140-04		
			kg	18.47		
11	ALLEN BOLT	15	52-02-0080-18	DIN 912 - M18x80-12.9	0.2049	3.0735
12	PLANET CARRIER	1	ratio	3.75	5.43	5.43
			94-41-00	50-03		
			kg	5.43		
13	SUN GEAR	1	ratio	3.75	0.96	0.96
			91-01-00	36-04		
			kg	0.96		
14	ALLEN BOLT	10	52-02-0050-12	DIN 912 - M12x50-12.9	0.0578	0.578
15	PLANET CARRIER	1	ratio	3.75	2.01	2.01
			94-41-00	15-04		
			kg	2.01		
16	ALLEN BOLT	10	52-02-0040-10	DIN 912 - M10x40-12.9	0.0343	0.343
					kg	57.8

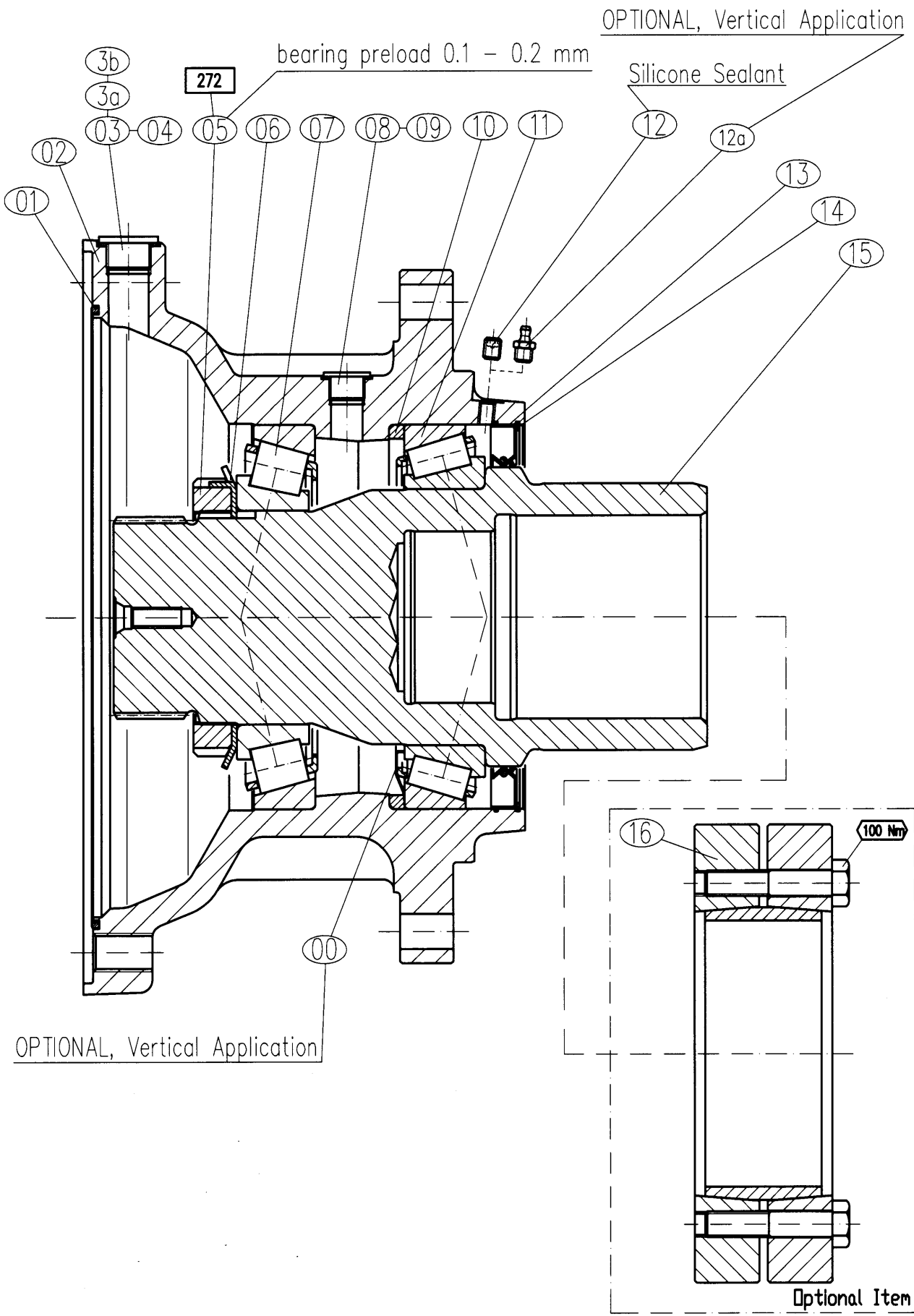
Revolution

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PS-OUT-0200-P20-00
Output Section PS 0200
HOLLOW, 95x125



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Plan - Star

OUT-0200-P20-00

Output Assembly

HOLLOW 95x125

item	Description	Q'ty	code	size	kg	ext. kg
0	Nilos Ring	1	35-91-0120-11	32024JV, option, vertical mount		0
1	O-Ring	1	40-03-0276-00	AS 276 (41100) - NBR		0
2	Housing	1	97-01-0200-01	STD	31.7	31.7
3	Plug	2	65-00-0012-00	DIN 908 - 1/2"G		0
3A	Drain Plug, magnetic	1	65-01-0012-00	DIN 908 - 1/2"G		0
3B	Breather	1	65-02-0012-00	1/2"G		0
4	Gasket	4	70-00-0012-00	1/2" - ALUMINUM		0
5	Locknut	1	75-01-0100-00	KM 20	0.64	0.64
6	Lockwasher	1	76-01-0100-00	MB 20A	0.11	0.11
7	Tapered Roller Bearing	1	20-03-0100-01	30220	3.65	3.65
8	Bush	1	81-02-0200-01		0.184	0.184
9	Tapered Roller Bearing	1	20-03-0120-02	32024 X	3.25	3.25
10	Set Screw	1	50-14-0010-08	M8x1.25x10 zn		0
10A	Grease Fitting	1	67-01-0125-08	M8x1.25, option, vertical mount		0
11	Shaft Seal	1	35-00-0140-02	140x180x12 AS - NBR		0
12	Retaining Ring	1	45-04-0180-01	SB 180x4x1.5	0.026	0.026
13	Output Shaft	1	98-02-0200-00	"0013" style 95x125	15.2	15.2
					tot. kg	54.8
14	Shrink Disc	1	98-22-0200-52	optional, D125 Hvy	11	11

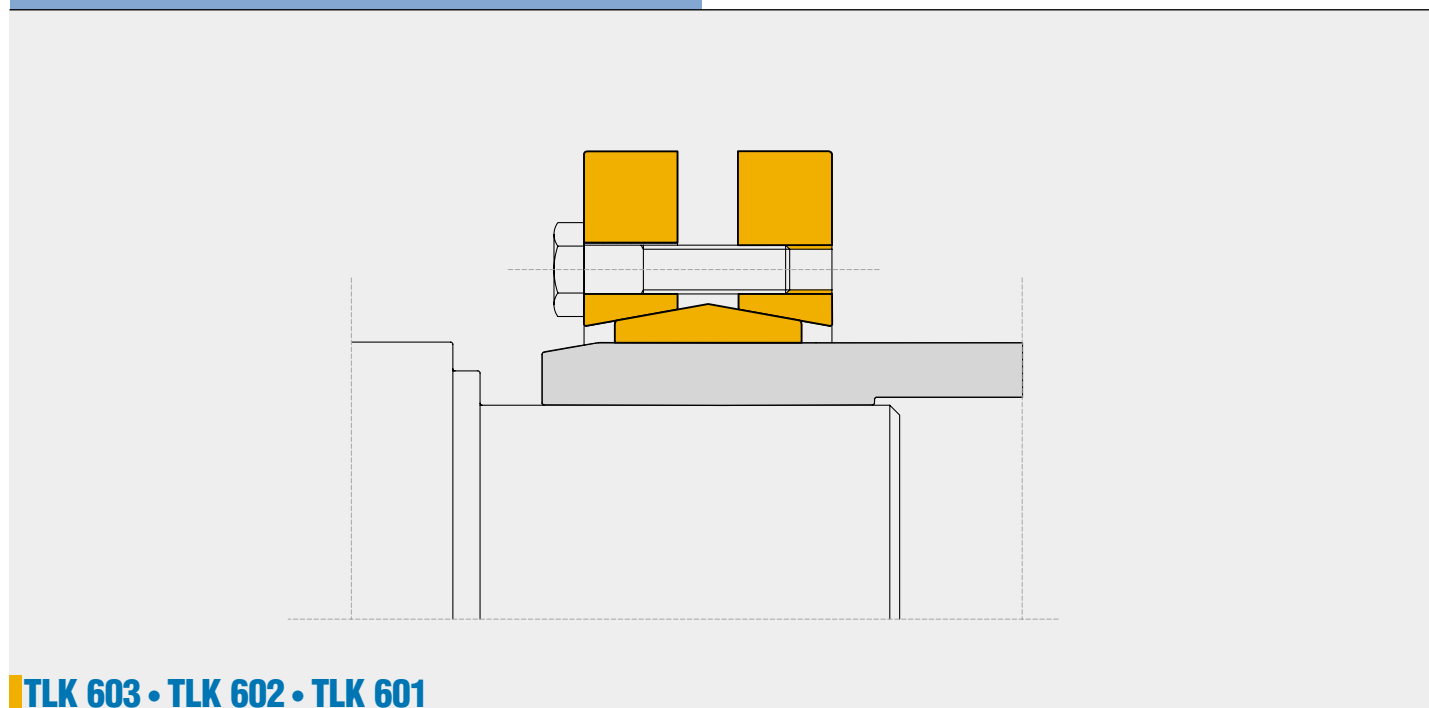
Revolution

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Shrink discs TLK 603 • TLK 602 • TLK 601



TLK 603 • TLK 602 • TLK 601

Characteristics

- Medium-high torque
- No shaft-hub axial movement
- Limited installation time
- Quick dismantling

Installation

Carefully clean the hub and shaft contact surfaces. Slide the shrink disc outside the hollow shaft. Tighten gradually and regularly in continuous sequence all screws to reach the tightening torque **Ms** indicated in the table. To reach the required tightening torque **Ms** it is necessary to repeat the procedure more than once. Do not use **molybdenum bisulphide** in the hub and shaft contact surfaces.

Dismantling

Loosen the clamping screws in a continuous and gradual sequence. Do not remove screws from threads. Normally with this operation the shrink disc is released. In case of reuse, apply a solid lubricant (that can guarantee a friction coefficient equal to 0,04) in the screws and in the tapered surfaces.

Tolerances, surface finish

A good surface finish by machine tool is sufficient. Maximum allowable surface finish:
Rt max 16 µm (Ra 3 µm - Rz 13 µm)

Maximum permissible tolerances:
d = h8 for shaft

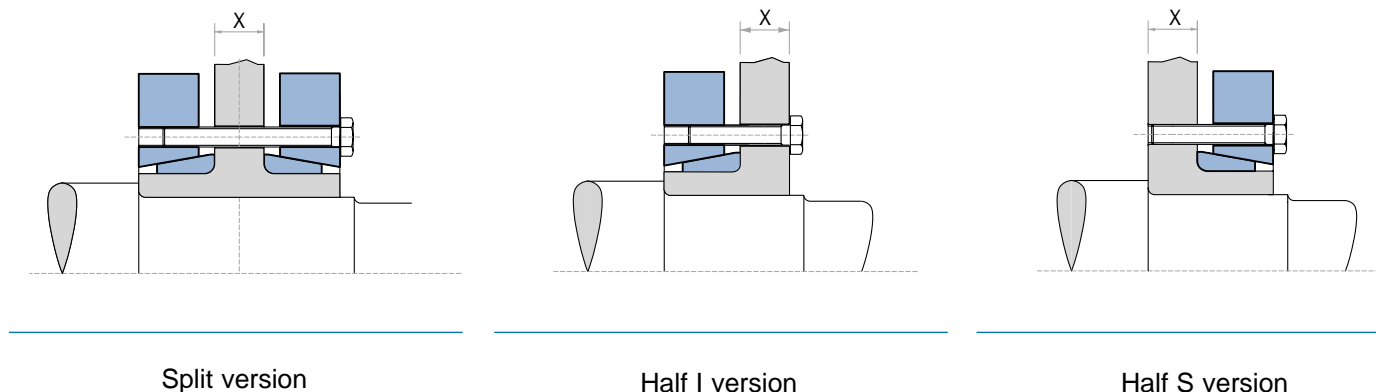
dw diameter tolerances

From 18 mm to 30 mm dw	H6/j6
From 30 mm to 50 mm dw	H6/h6
From 50 mm to 80 mm dw	H6/g6
From 80 mm to 500 mm dw	H7/g6

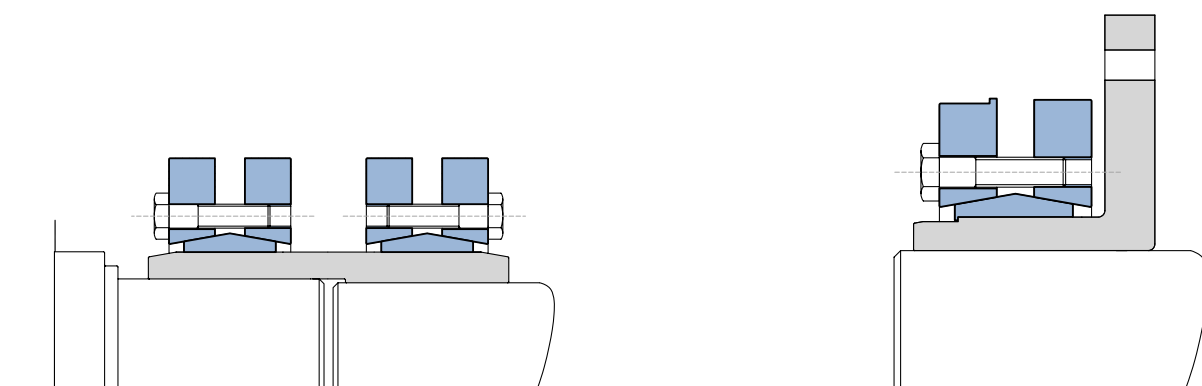
Axial movement

During screws tightening the hub has no axial movement with respect to the shaft.

Shrink discs Special applications

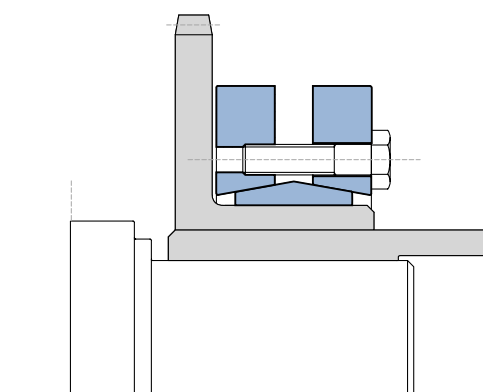


When ordering please specify X dimension



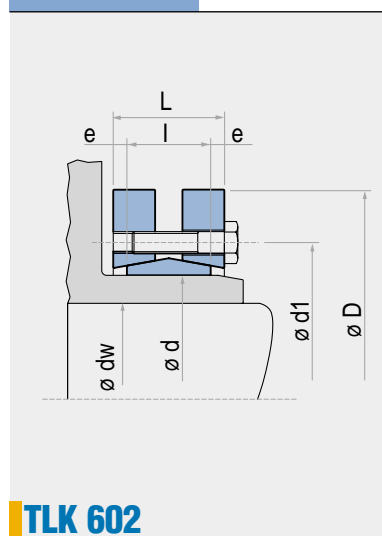
Use of model TLK 603 as coupling between different size shafts

Special version equipped with housing for brake



Contemporaneous locking of a sprocket and a hollow shaft.

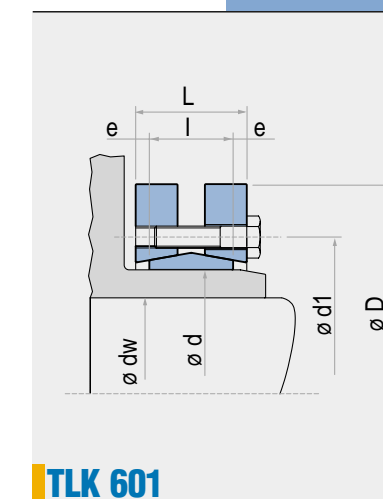
Shrink disc heavy version TLK 602



Type	Shaft diameter		Torque	Axial Thrust	Dimensions					Tightening screws DIN 931-10.9	Tightening torque	Weight
	d mm	dw mm			D mm	l mm	L mm	d1 mm	e mm			
125	85	90	15000	355	215	55	65	160	5	10 x M12	100	11
	90	17500	388									
	95	20000	422									
140	95	100	20600	433	230	60	74	175	7	12 x M12	100	13
	100	23500	469									
	105	26500	500									
155	105	110	28600	550	265	66	80	198	7	15 x M12	100	20
	110	32500	590									
	115	36400	630									
165	115	120	41000	740	290	72	88	210	8	10 x M16	250	26
	120	46000	785									
	125	50700	815									
175	125	130	47000	750	300	72	88	220	8	10 x M16	250	29
	130	52000	795									
	135	57000	840									
185	135	140	72000	1100	330	92	112	236	10	14 x M16	250	47
	140	78000	1150									
	145	86000	1200									
195	140	150	75000	1075	350	92	112	246	10	14 x M16	250	53
	150	88000	1180									
	155	96000	1235									
200	145	150	85000	1170	350	92	112	246	10	15 x M16	250	50
	150	92500	1230									
	155	100000	1290									
220	160	165	127000	1590	370	114	134	270	10	20 x M16	250	65
	165	136000	1650									
	170	146500	1720									
240	170	180	155000	1820	405	120	144	295	12	15 x M20	490	87
	180	176000	1960									
	190	198000	2080									
260	190	200	213000	2260	430	136	160	321	12	18 x M20	490	100
	200	240000	2420									
	210	268000	2580									
280	210	220	285000	2740	460	148	172	346	12	21 x M20	490	132
	220	320000	2910									
	230	355000	3090									
300	230	240	341000	2960	485	152	176	364	12	22 x M20	490	140
	240	376000	3130									
	245	394000	3215									
320	240	250	378000	3150	520	160	184	386	12	24 x M20	490	165
	250	415000	3325									
	260	451000	3470									
340	250	260	489500	3910	570	176	200	420	12	21 x M24	840	240
	260	530000	4075									
	270	578000	4275									
350	270	280	556000	4122	580	176	200	425	12	21 x M24	840	247
	280	604000	4320									
	285	629000	4415									
360	280	290	612000	4370	590	180	204	432	12	22 x M24	840	250
	290	663000	4570									
	295	689000	4670									
380	290	300	618000	4270	645	180	204	458	12	22 x M24	840	320
	300	668000	4455									
	310	719000	4645									
390	300	310	708000	4715	660	188	212	468	12	24 x M24	840	350
	310	762000	4910									
	320	814500	5090									
400	315	320	765000	4855	680	188	212	480	12	24 x M24	840	370
	320	788000	4927									
	330	845000	5125									
420	330	340	999000	6055	690	214	238	504	12	30 x M24	840	410
	340	1068000	6285									
	350	1140000	6515									
440	340	350	1058000	6230	750	224	252	527	14	24 x M27	1250	525
	350	1130000	6460									
	360	1204000	6690									
460	360	370	1320000	7440	770	224	252	547	14	28 x M27	1250	540
	370	1420000	7700									
	380	1500000	7950									

For larger diameter please contact us.

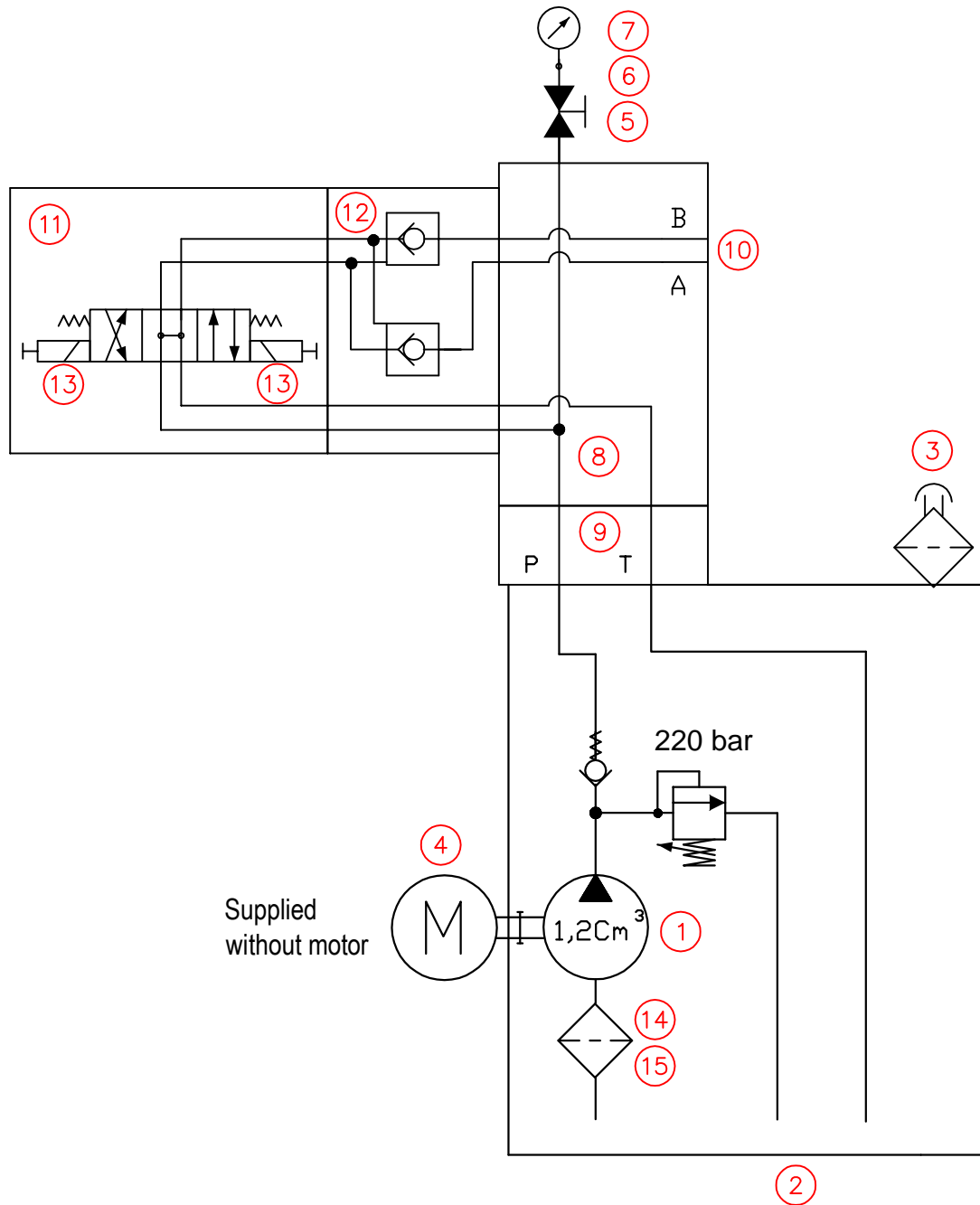
Shrink disc light version TLK 601



Type	Shaft diameter		Torque	Axial Thrust	Dimensions					Tightening screws DIN 931-10.9	Tightening torque	Weight
	d mm	dw mm			D mm	l mm	L mm	d1 mm	e mm			
125	95	100	10550	220	185	39	51	158	6	8 x M10	59	6
	100	12100	240									
	105	13800	260									
140	110	120	14800	265	220	39	51	175	6	9 x M10	59	8
	120	18640	310									
	125	20500	325									
155	130	135	24000	365	245	39	51	192	6	11 x M10	59	10
	135	26400	390									
	140	29000	410									
165	135	140	32000	475	260	46	62	210	8	10 x M12	100	14
	140	35200	500									
	145	38500	530									
175	145	150	39000	535	275	46	62	220	8	11 x M12	100	16
	150	42400	560									
	155	46000	590									
185	155	160	46600	600	295	46	62	225	8	12 x M12	100	20
	160	50300	625									
	165	54000	650									
195	165	170	63000	760	315	56	72	237	8	15 x M12	100	27
	170	67700	795									
	175	72500	825									
200	175	180	74000	850	330	56	72	242	8	16 x M12	100	30
	180	79500	890									
	185	84500	915									
220	180	190	82800	920	345	66	84	265	9	10 x M16	250	35
	190	93500	980									
	200	105000	1055									
240	200	210	113000	1135	370	66	84	290	9	12 x M16	250	44
	210	127500	1210									
	215	134500	1250									
260	220	230	149000	1350	395	72	92	310	10	14 x M16	250	48
	230	165000	1435									
	235	173000	1475									
280	230	240	171000	1485	425	84	104	333	10	16 x M16	250	60
	240	189000	1570									
	250	208000	1660									
300	250	260	215000	1720	460	84	104	358	10	18 x M16	250	75
	260	234000	1800									
	270	255000	1890									
320	270	280	260000	1940	495	84	106	378	11	20 x M16	250	84
	280	284000	2030									
	290	306000	2125									
340	290	300	300000	2070	535	84	106	402	11	21 x M16	250	100
	300	324400	2160									
	305	337000	2210									
350	300	310	372000	2485	545	100	122	413	11	16 x M20	490	120
	305	385000	2540									
	310	400000	2590									
360	300	320	360000	2400	555	100	122	423	11	16 x M20	490	125
	310	388000	2500									
	320	415000	2590									
380	320	325	435000	2720	585	112	136	442	12	18 x M20	490	150
	325	451000	2780									
	330	467000	2835									
390	330	340	505000	3060	595	112	136	452	12	20 x M20	490	156
	340	540000	3175									
	350	577000	3295									
400	340	350	550000	3235	615	112	136	462	12	21 x M20	490	170
	350	587000	3360									
	360	626000	3480									
420	350	360	578000	3300	630	120	144	485	12	22 x M20	490	185
	360	617000	3425									
	370	655000	3545									
440	370	380	677000	3660	660	120	144	505	12	24 x M20	490	205
	380	719000	3785									
	390	762000	3910									
460	390	400	840000	4320	685	132	158	527	13	28 x M20	490	235
	400	890000	4460									
	410	935000	4580									

For larger diameter please contact us.

Appendix 7



Application	Drawing JSA	Approved	Drawing no. 8220	Date 04-11-2011	Scale
Dani-tech			Description MC4-UD-V2C-PE-MM-T07-F2		
Denmark. ☎ +45-76342300 ☎ +45-76342301 Sweden. ☎ +46-46233060 ☎ +46-46233069 Nederland. ☎ +31-715417704 ☎ +31-715419106			Item no. MC4-0,00-T07-009-02		Sheet 1/1

MC4-0.0-T07-009-02 MC4-UD-V2C-PE-MM-T07-F2 - Part list

Unit with out cooler

Part number	Description	Amount	Unit	Position
C4000002.000	MC4-V2C-PE-TY07-F1 1,2ccm	1	Pcs.	1
90310014	Tank T07 rectangular with mounting food	1	Pcs.	2
TMDFA/12	Filler/breather with dipstick	1	Pcs.	3
KIT01008.002	Motor-mounting kit "M" 80	1	Pcs.	4
AMFDG0404	adapter 1/4"male-1/4"fem.	1	Pcs.	5
ES090	Manometer valve 90° R1/4"	1	Pcs.	6
BS-04	Bonded seals 1/4"	1	Pcs.	
2263R250-RUNI	Manometer Ø63 0-250 bar stand.	1	Pcs.	7
61112000	Manifold with manometer connection 1/4" "D"	1	Pcs.	8
61100500	Manifold parallel	1	Pcs.	9
RM10588	Plastic cap serie SR1002 1/4"BSP	2	Pcs.	10
0084-6X90	Bolt 8.8 forz. inside hexagon	4	Pcs.	
0441-6	Spring washer FZB M6	4	Pcs.	
Q25831022	O-ring for manifold block	4	Pcs.	
0084-5X70	Bolt 8.8 forz. Indside hexagon	4	Pcs.	
DL3-S2/10N-D24K1	NG06 solenoid valve 24vdc	1	Pcs.	11
MVPPD/50	NG06 double piloted check valve	1	Pcs.	12
088010060	Valve connector with full bridge rectifier	2	Pcs.	13
P171866	FIOA35/3 Suction strainer 1/2"	1	Pcs.	14
ARGG0806	Adapter 3/8"-1/2"	1	Pcs.	15

Appendix 8



UNI-EL A/S

Dybdalvej 4, 6920 Videbæk
 +45 97 16 63 11
 kontakt@uni-el.dk
 www.uni-el.dk

Runi A/S

SK240 / SK370 Screw Compactor / Skrue Komprimator

MOTOR CONFIGURATION / MOTOR BESTYKNING:

- 5,5KW SCREW / SNEGL
- 7,5KW SCREW / SNEGL
- 15KW SCREW / SNEGL
- 1,1KW CRUSHER / OPRIVER
- 5,5KW HD CRUSHER / OPRIVER

OPTIONS / OPTIONER:

- 20W HEATING UNIT/ VARMELEGEME 2000000473
- 40W HEATING UNIT/ VARMELEGEME 2000000474
- LIGHT TOWER / LYSTARN 2000000601
- OPTION 200001445 TURN-SWITCHES
- BLOCK DIVIDER+LILE READY / BLOKDELER+LINJE KLAR 2000000603
- CONTROL PANEL READY FOR ULTRA SONIC SENSOR / STYRING KLAR TIL ULTRALYDSFØLER 2000000602



Customer : Runi A/S - Industriparken 8 - 6880 Tarm - Denmark - Tel: +45 9737 1799 - Fax: +45 9737 3800 - Web: www.runi.dk - Mail: runi@runi.dk

End Customer :



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Project : SK240 / SK370 Screw Compactor / Skrue komprimator

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Created : 21-06-2017	Article No : 246.RUNI
Modified : 21-06-2017	Archive No : 3-356-246
Revision : V01-01	Constructor : KB

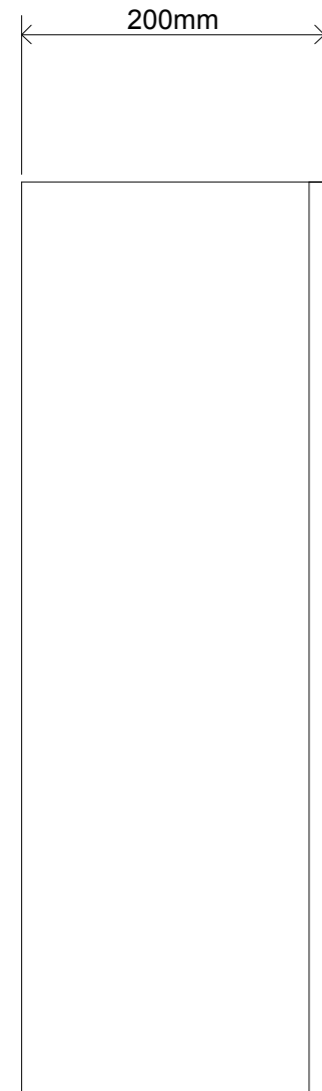
← Next : T.O.C

Electric Drawing

Table Of Contents

Page Number	Page Reference	Page Title
1		Lay Out - Outside / Udvendig
2		Lay Out - Internal / Intern
3		Main Circuit - Intake
4		Main Circuit - Screw & Pump
5		Main Circuit - Crusher, Motor 4 & Heating
6		Control Circuit - Emergency Stop Circuit
7		Control Circuit - Emergency Stop Circuit
8		Control Circuit - PLC Reference M221 Controller
9		Control Circuit - PLC Reference Expert Module & HMI
10		Control Circuit - Photocell Amplifier Relays
11		Control Circuit - Photocell Amplifier Relay
12		Control Circuit - Encoder & PLC Reset/Alarm
13		Control Circuit - PLC Start/Stop Auto Input
14		Control Circuit - Valves Jaws
15		Control Circuit - PLC Inputs Turnswitches Auto-0-Manual & Thermal Error
16		Control Circuit - PLC Outputs Reserved for Std starters
17		Control Circuit - Options Light Tower & Cooling
18		Control Circuit - PLC In-/Outputs Line Signals
19		Control Circuit - Line Signals
20		Control Circuit - Line Signals Auto Mode
21		Control Circuit - Block Divider
22		-Q1
23		-X2
24		-X3
25		-X4
26		-X4
27		-X4
28		-X5
29		Switchboard Data / Tavledata
30		EU Incorporation Declaration / Indkorporerings Erklæring
31		Lay Out - Ethernet
32		Terminals, Operator Interface and Aspects / Klemmerækker, Betjeningsorganer og Aspekter
33		Wires - Marking, Colour & Signalsymbols / Ledninger - Opmærkning, Farver og Signalsymb
34		Component List
37		PLC I/O List

LEFT SIDE:
VENSTRE SIDE:



FRONT:
FRONT:

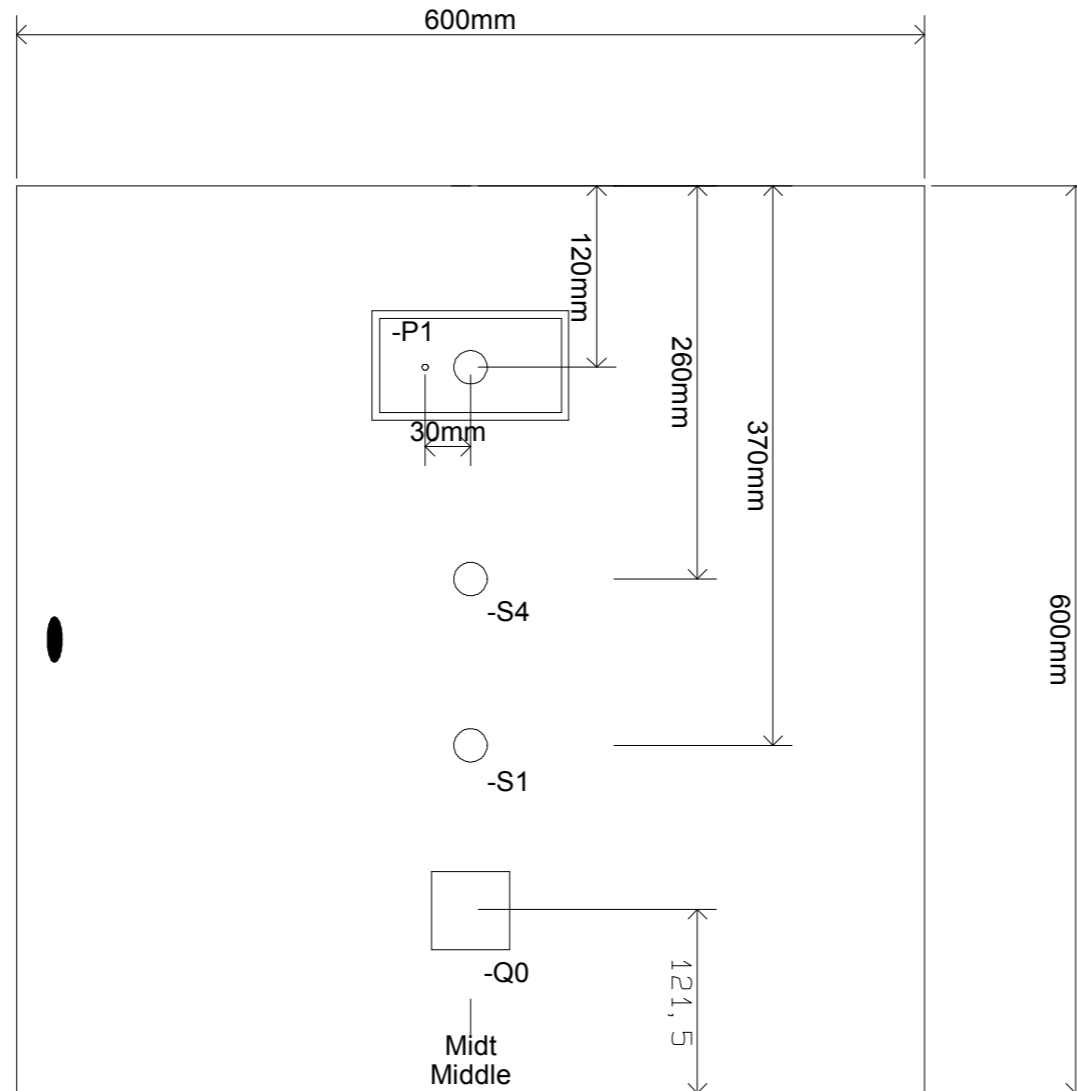
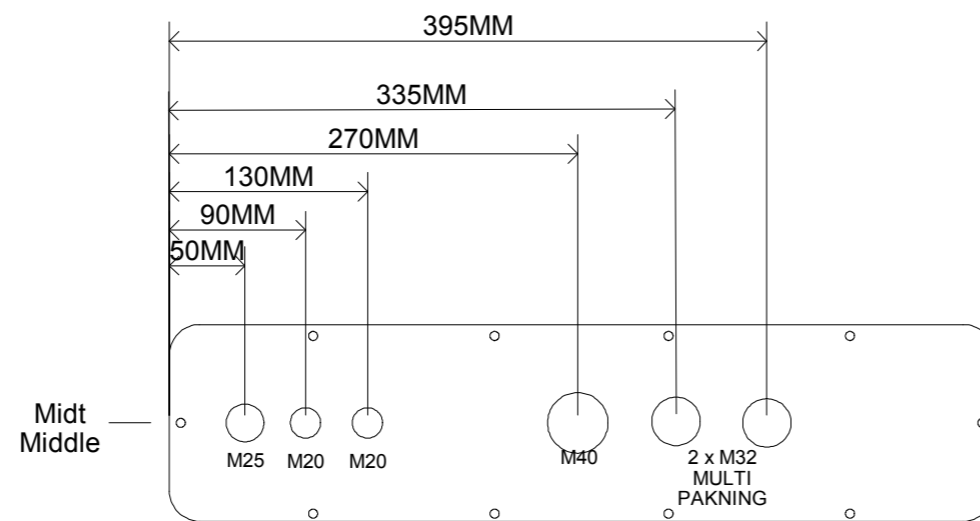
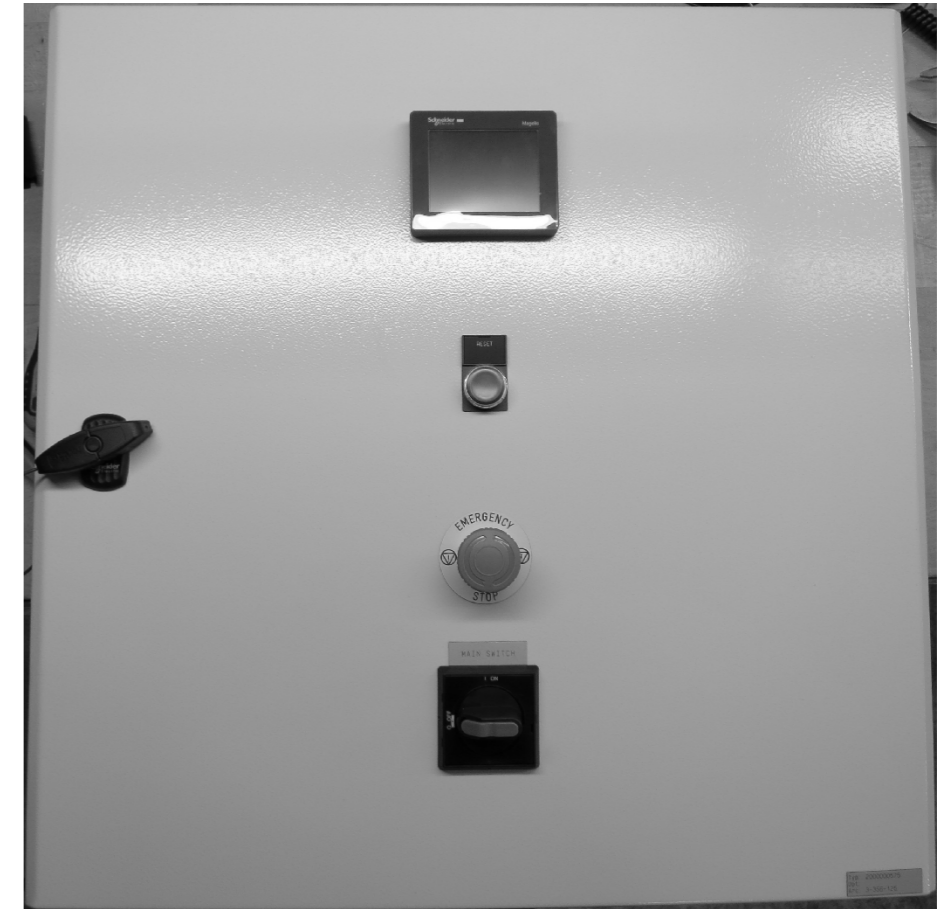


PHOTO:
FOTO:



Aspect :

A		A
B		B
C		C
D		D
E		E
F		F
G		G
H		H
I		I
J		J
K		K

Aspect :



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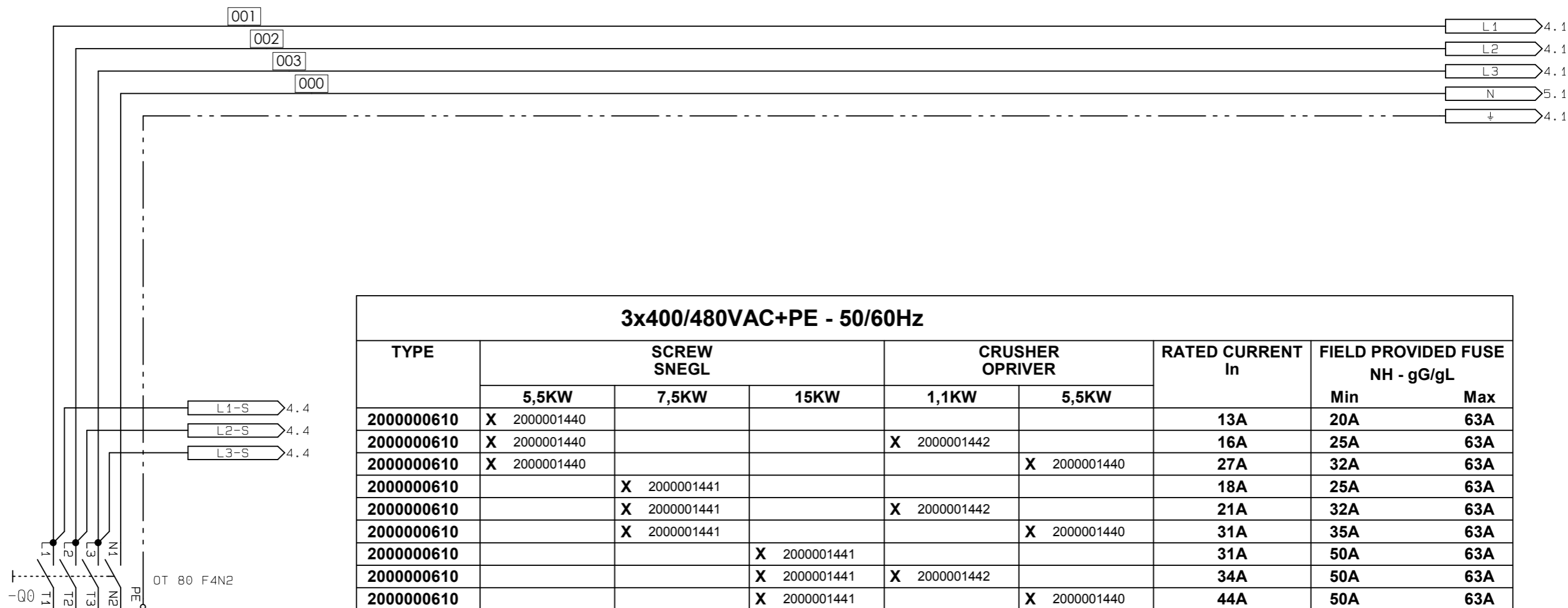
Project : SK240 / SK370 Screw Compacter / Skrue komprimator

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Modified : 21-06-2017	Archive No : 3-356-246
Revision : V01-01	Constructor : KB

← Prev. : 1
 → Next : 3
 Electric Drawing
 Page 2

3x400/480VAC+PE - 50/60Hz
MAX 63A



Aspect :

1 2 3 4 5 6 7 8



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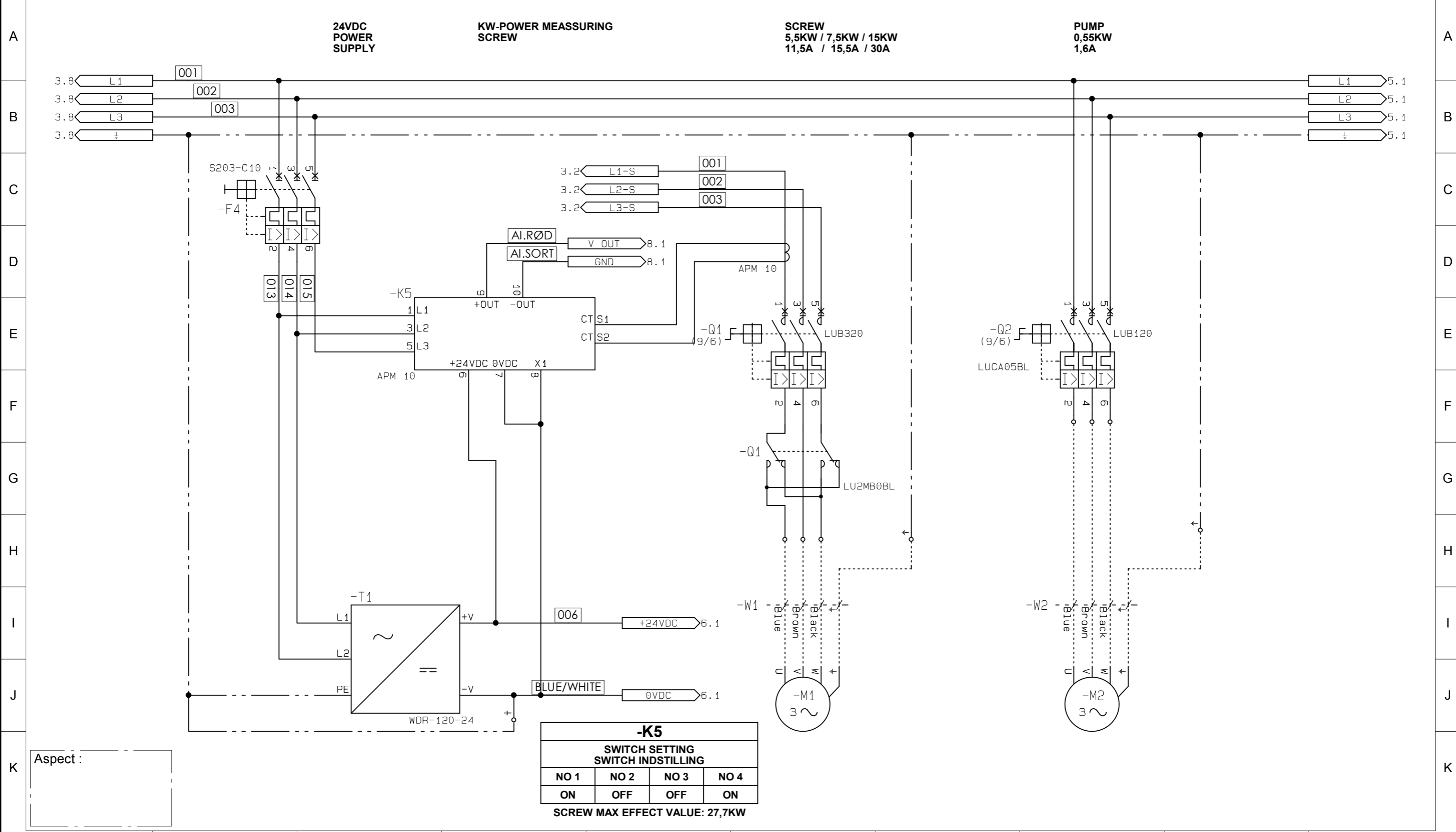
www.runi.dk - Mail: runi@runi.dk

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← Prev. : 2
 → Next : 4
 Electric Drawing
 Page 3



1 2 3 4 5 6 7 8

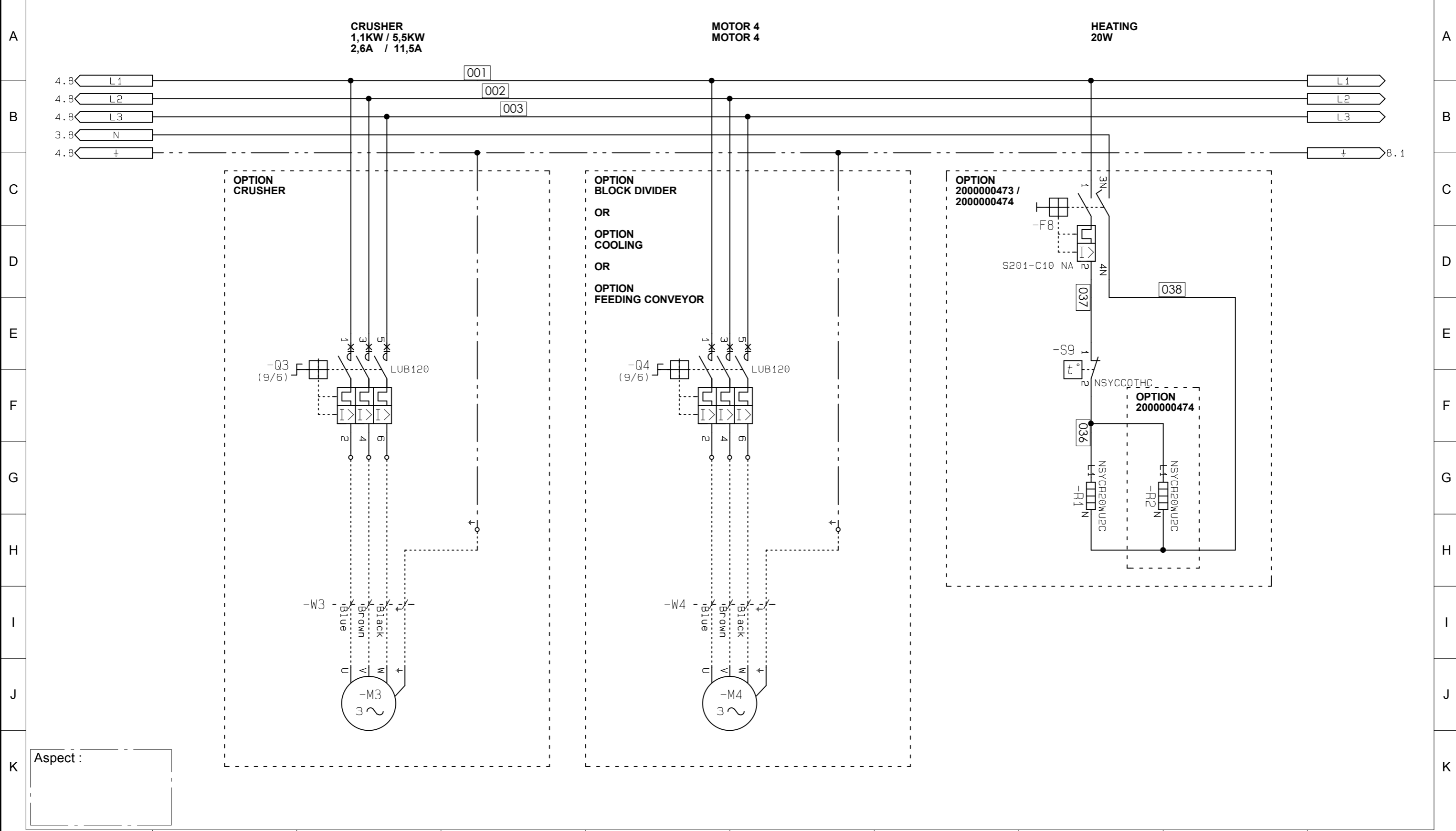


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Modified : 21-06-2017	Archive No : 3-356-246	
Revision : V01-01	Constructor : KB	



Aspect :

1 2 3 4 5 6 7 8



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Revision : V01-01

Article No : 246.RUNI

Archive No : 3-356-246

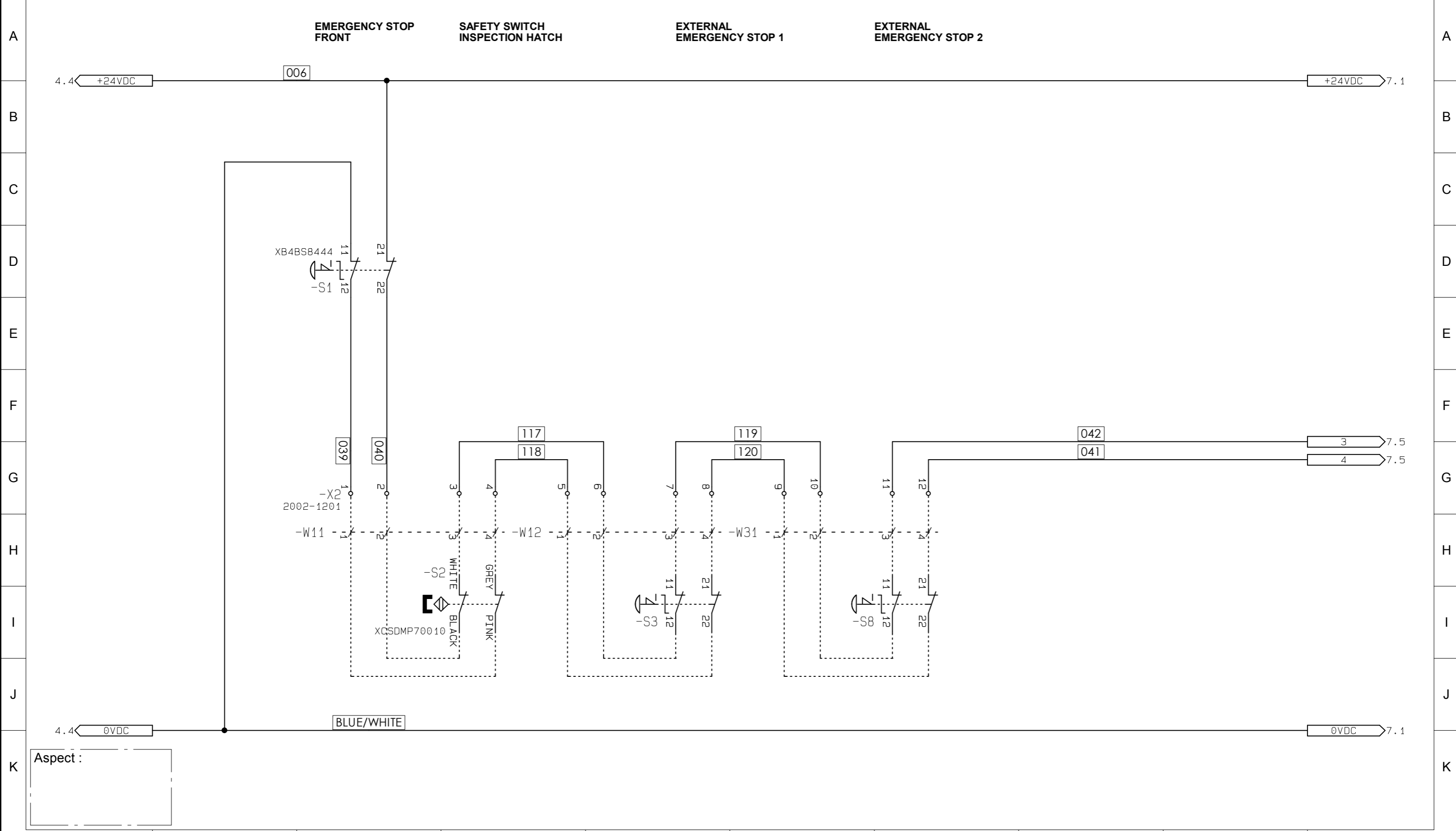
Constructor : KB

← Prev. : 4

→ Next : 6

Electric Drawing

Page 5



Aspect :

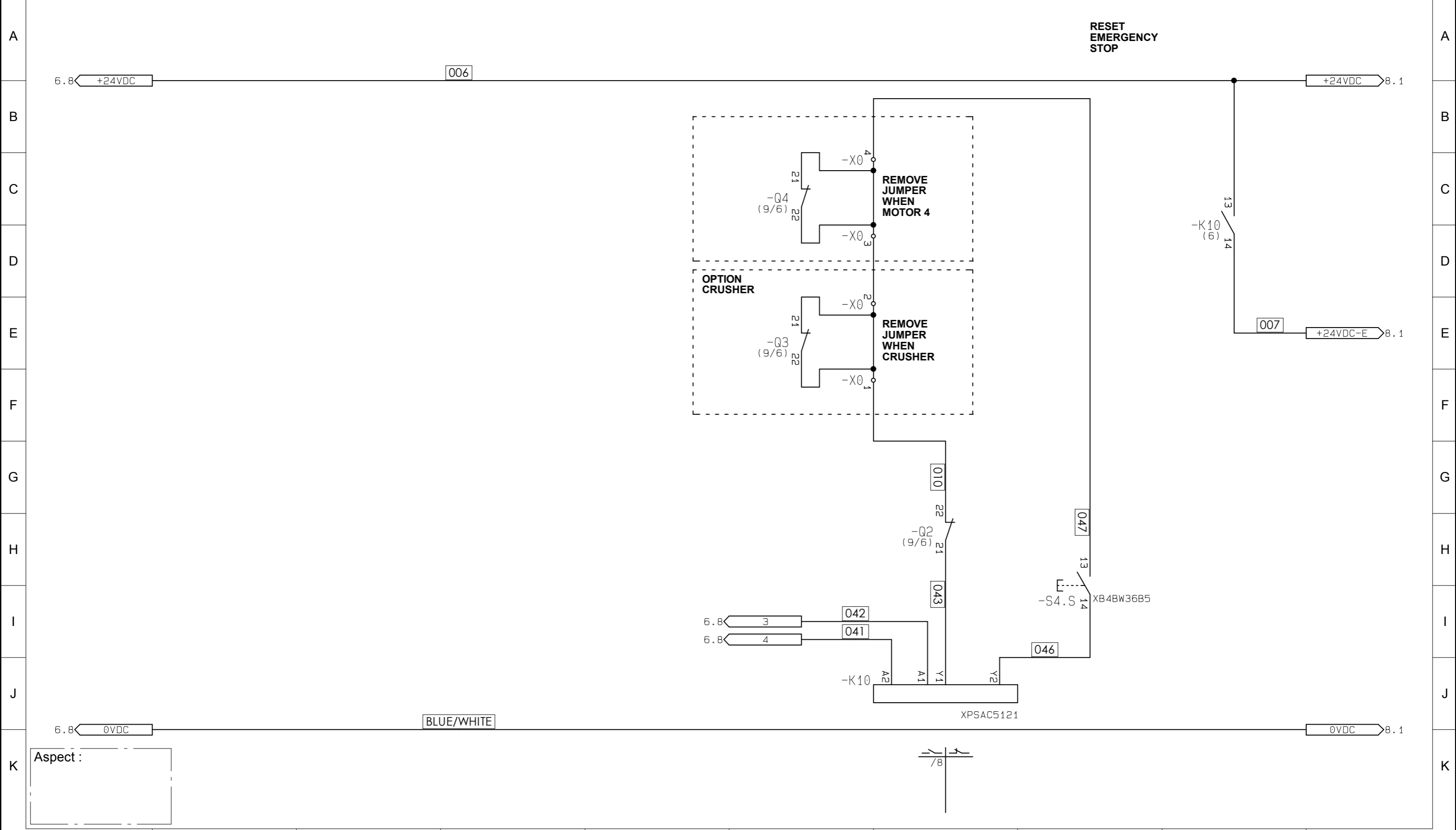
1 2 3 4 5 6 7 8



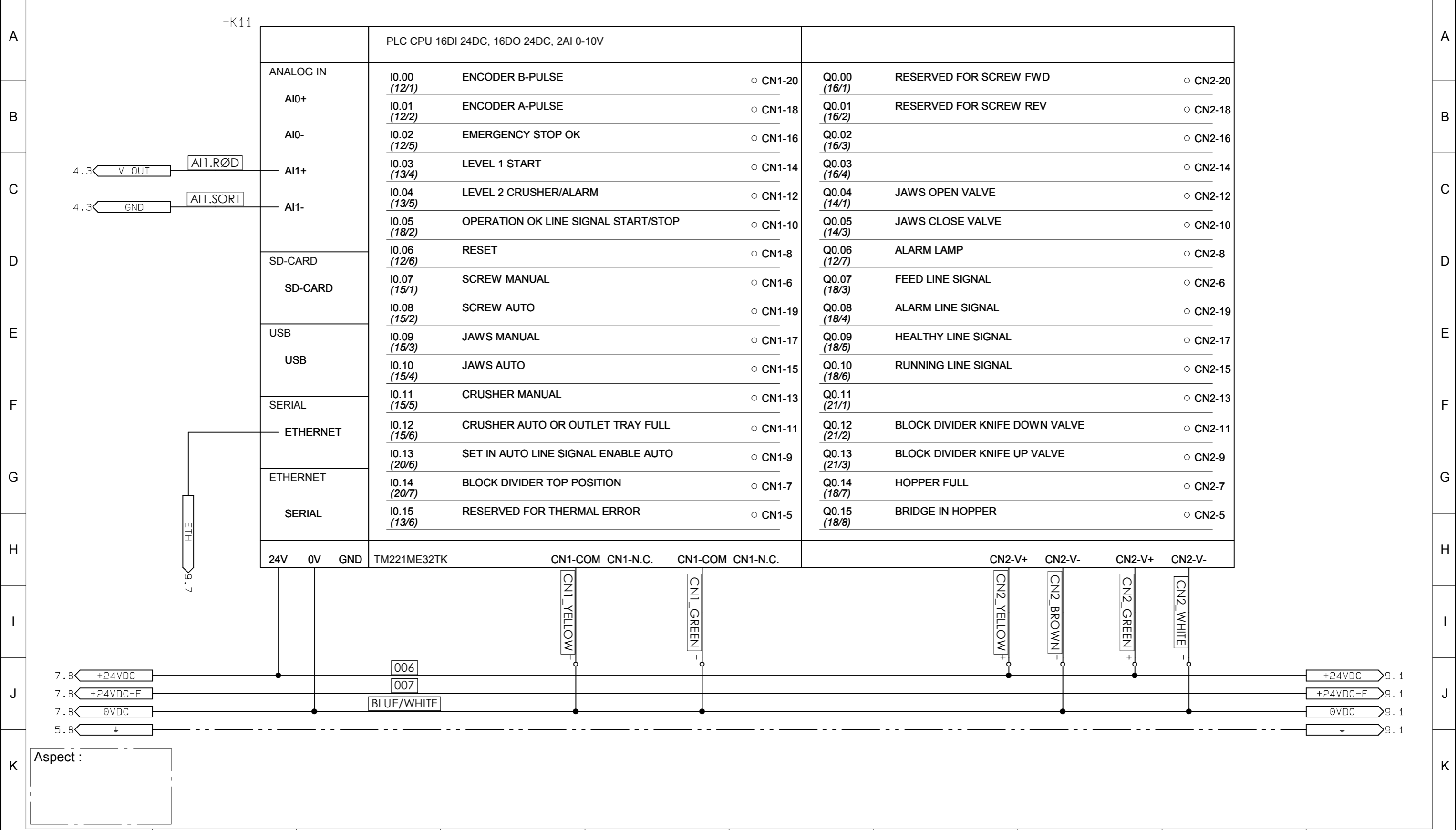
Runi A/S - Industriparken 8 - 6880 Tarm - Denmark - Tel: +45 9737 1799 - Fax: +45 9737 3800 - Web: www.runi.dk - Mail: runi@runi.dk
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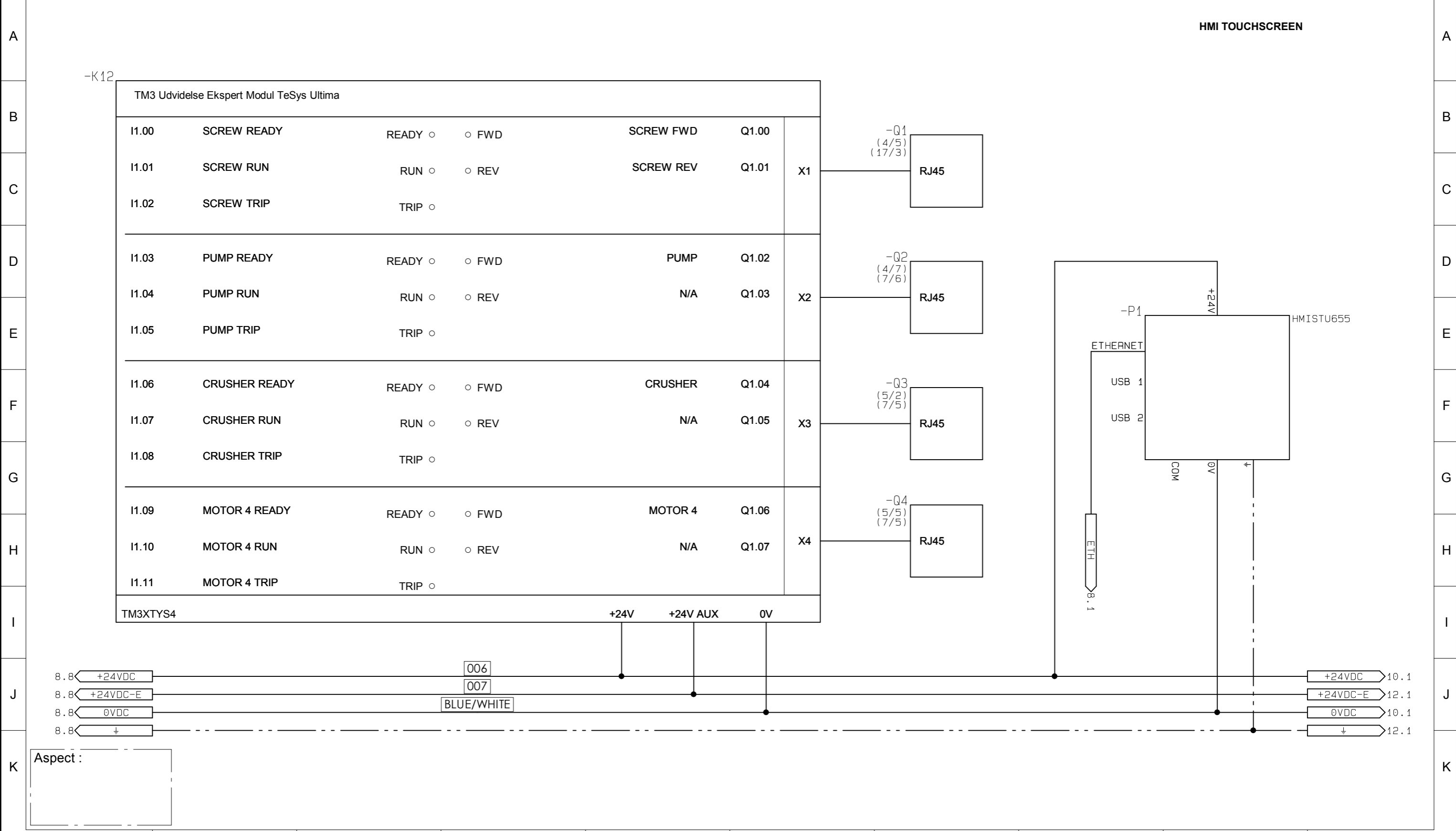
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Modified : 21-06-2017	Archive No : 3-356-246
Revision : V01-01	Constructor : KB

← Prev. : 5
 → Next : 7
 Electric Drawing
 Page 6



Aspect :





Aspect :

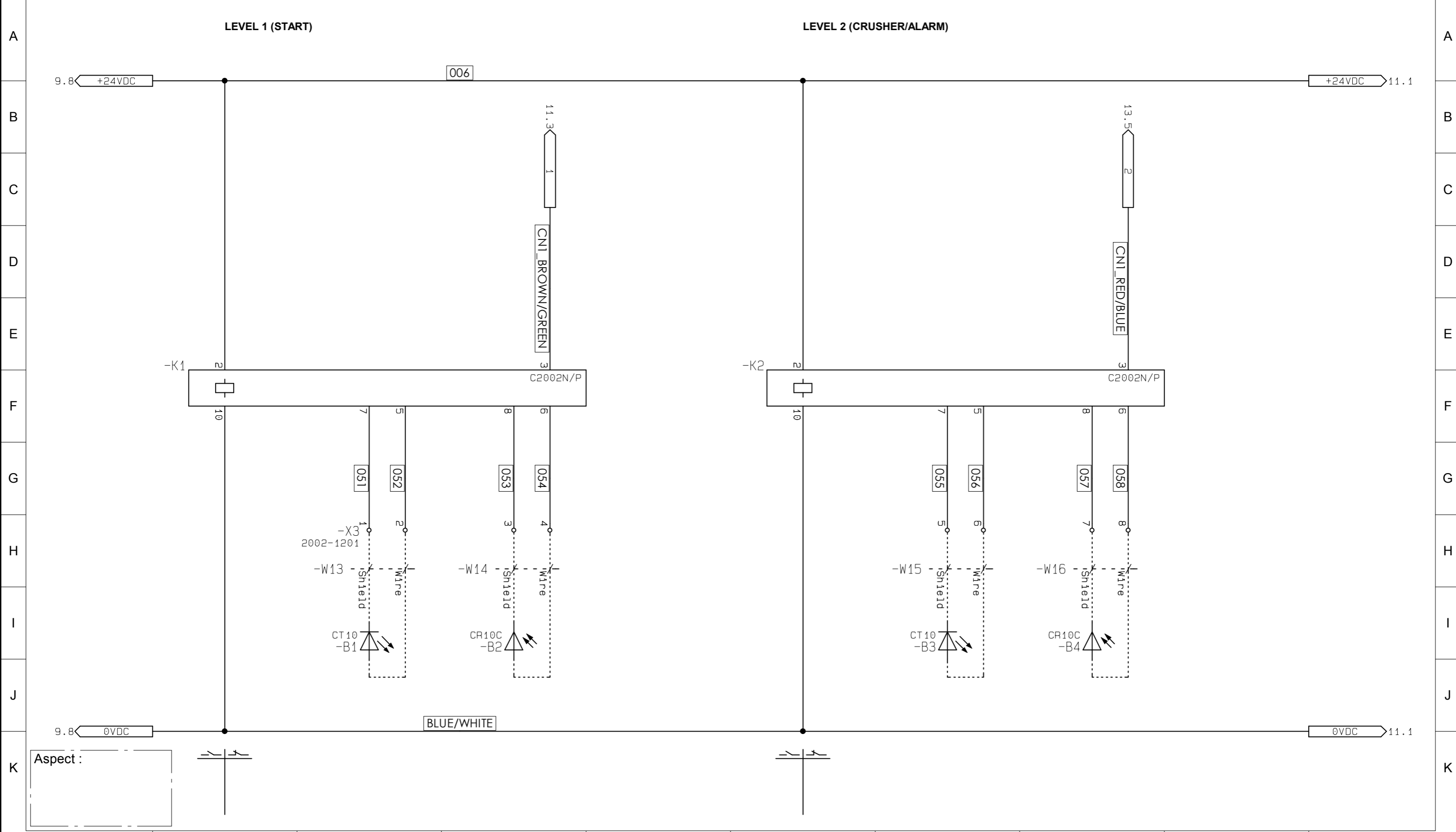
1 2 3 4 5 6 7 8



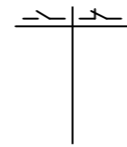
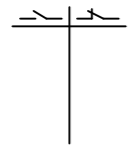
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 Modified : 21-06-2017 Archive No : 3-356-246
 Revision : V01-01 Constructor : KB

← Prev. : 8
 → Next : 10
 Electric Drawing
 Page 9



Aspect :



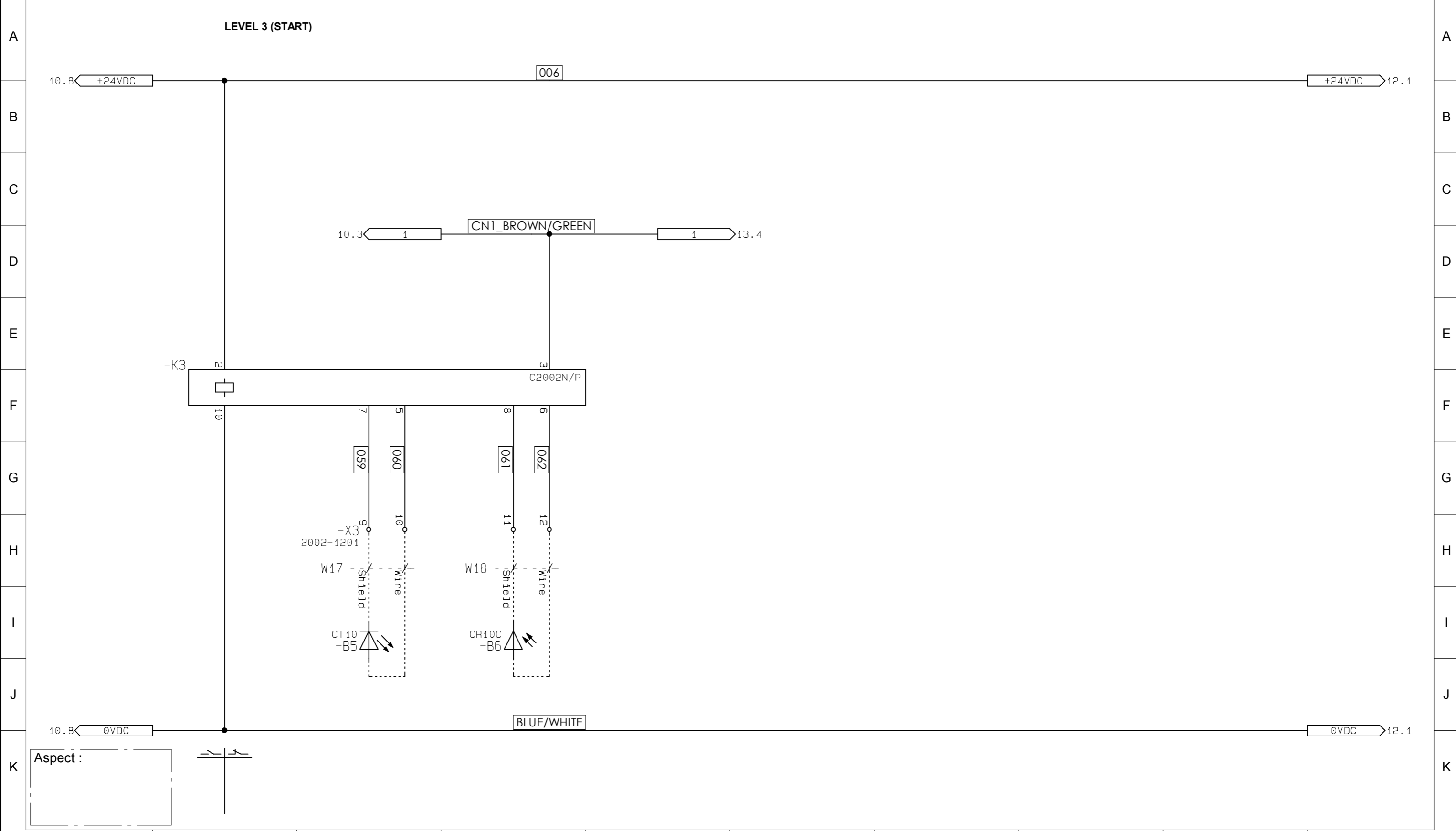
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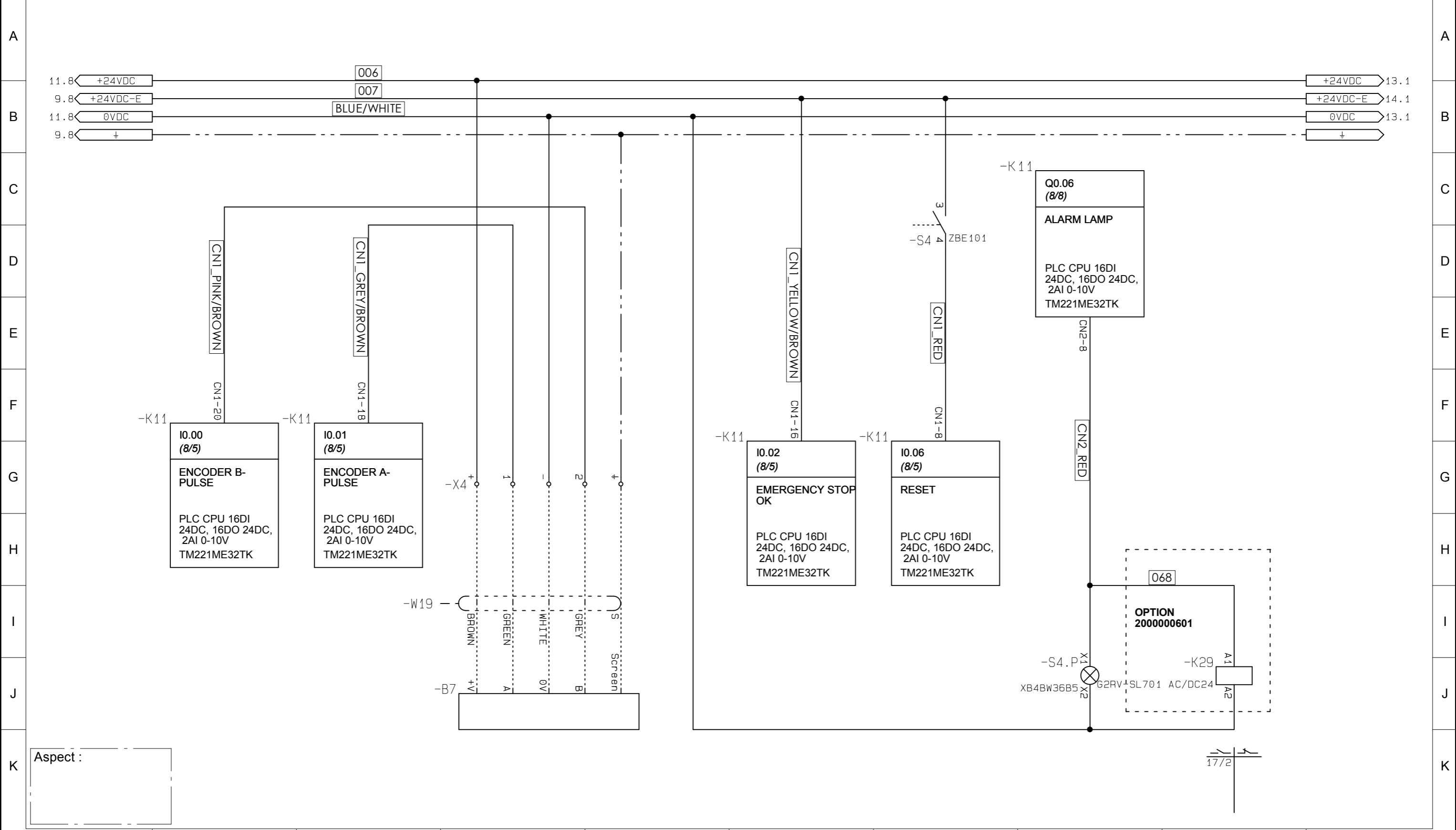


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 Modified : 21-06-2017 Archive No : 3-356-246
 Revision : V01-01 Constructor : KB

← Prev. : 9
 → Next : 11
 Electric Drawing
 Page 10





Aspect :

1 2 3 4 5 6 7 8



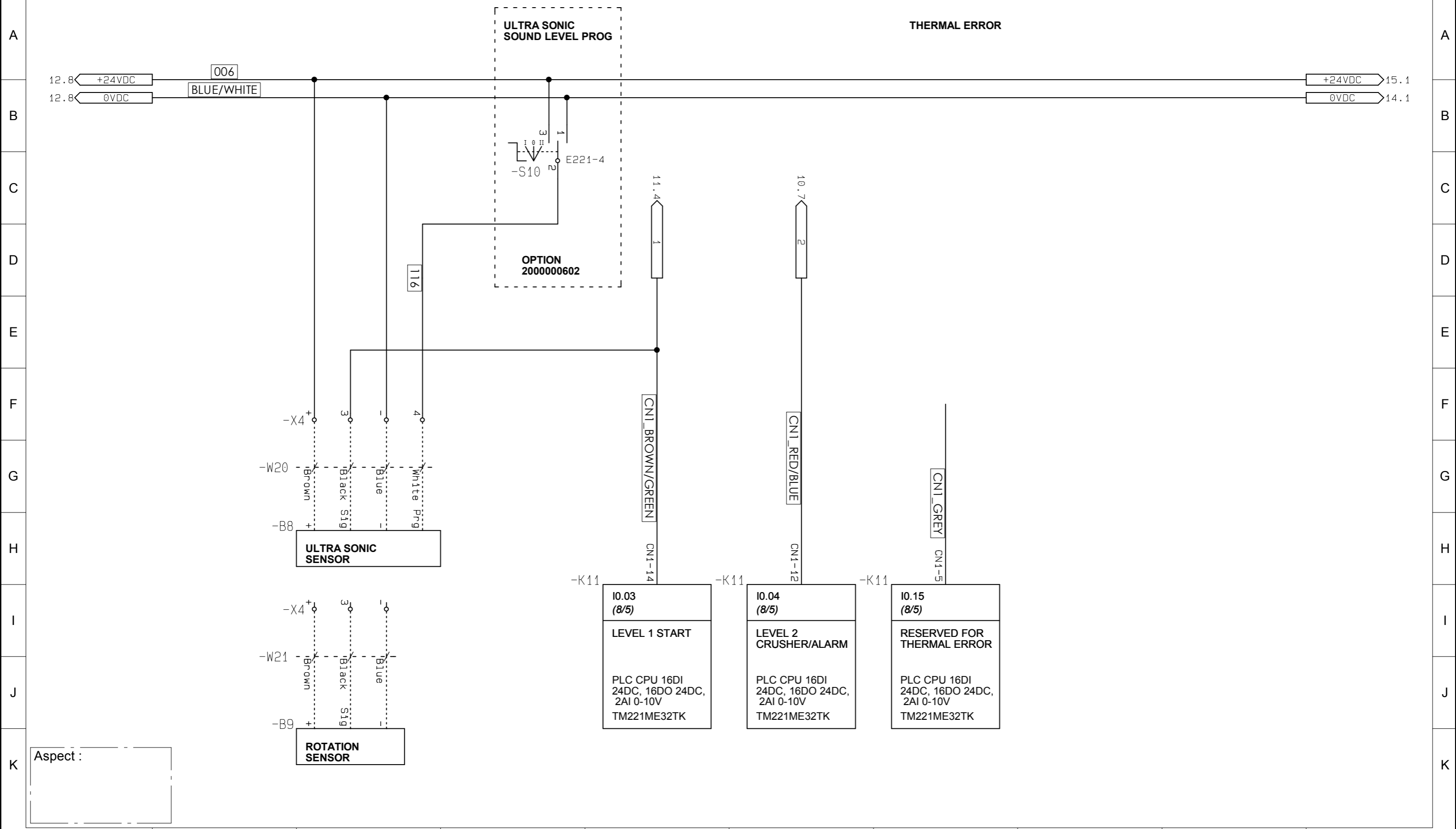
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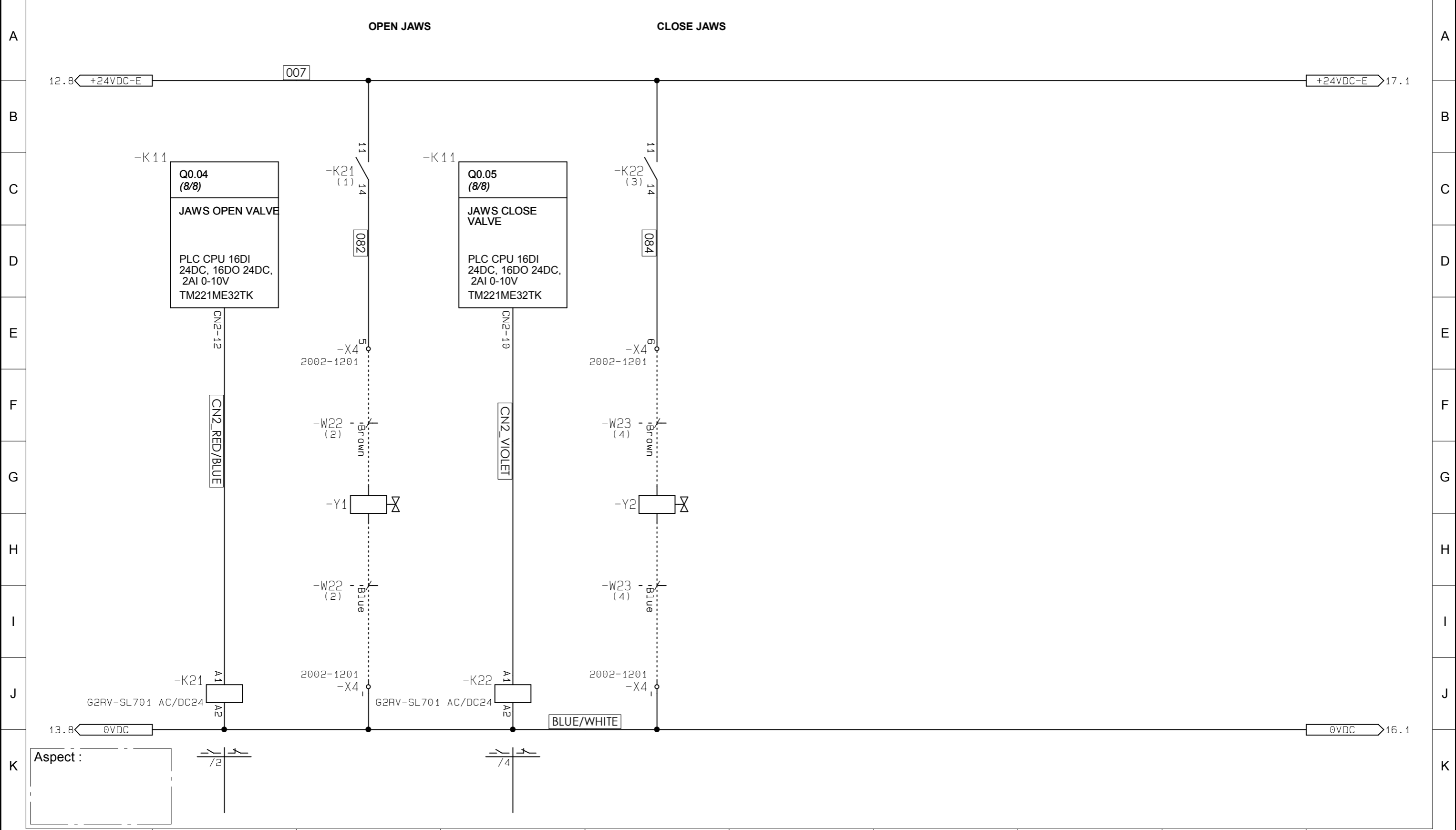
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 Revision : V01-01 Constructor : KB

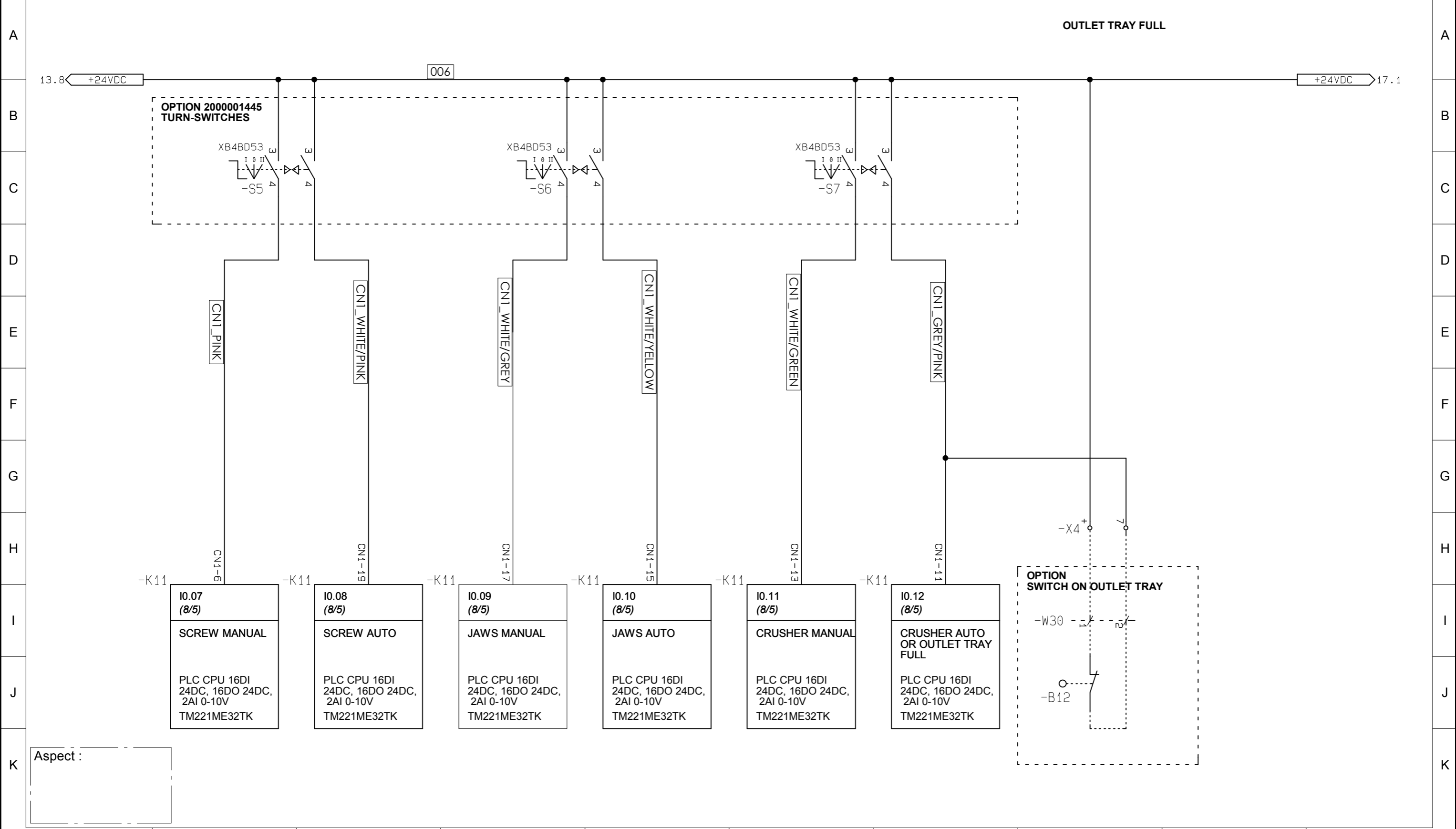
← Prev : 11
 → Next : 13
 Electric Drawing
 Page 12



Aspect :







Aspect :

1 2 3 4 5 6 7 8



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Revision : V01-01

Article No : 246.RUNI

Archive No : 3-356-246

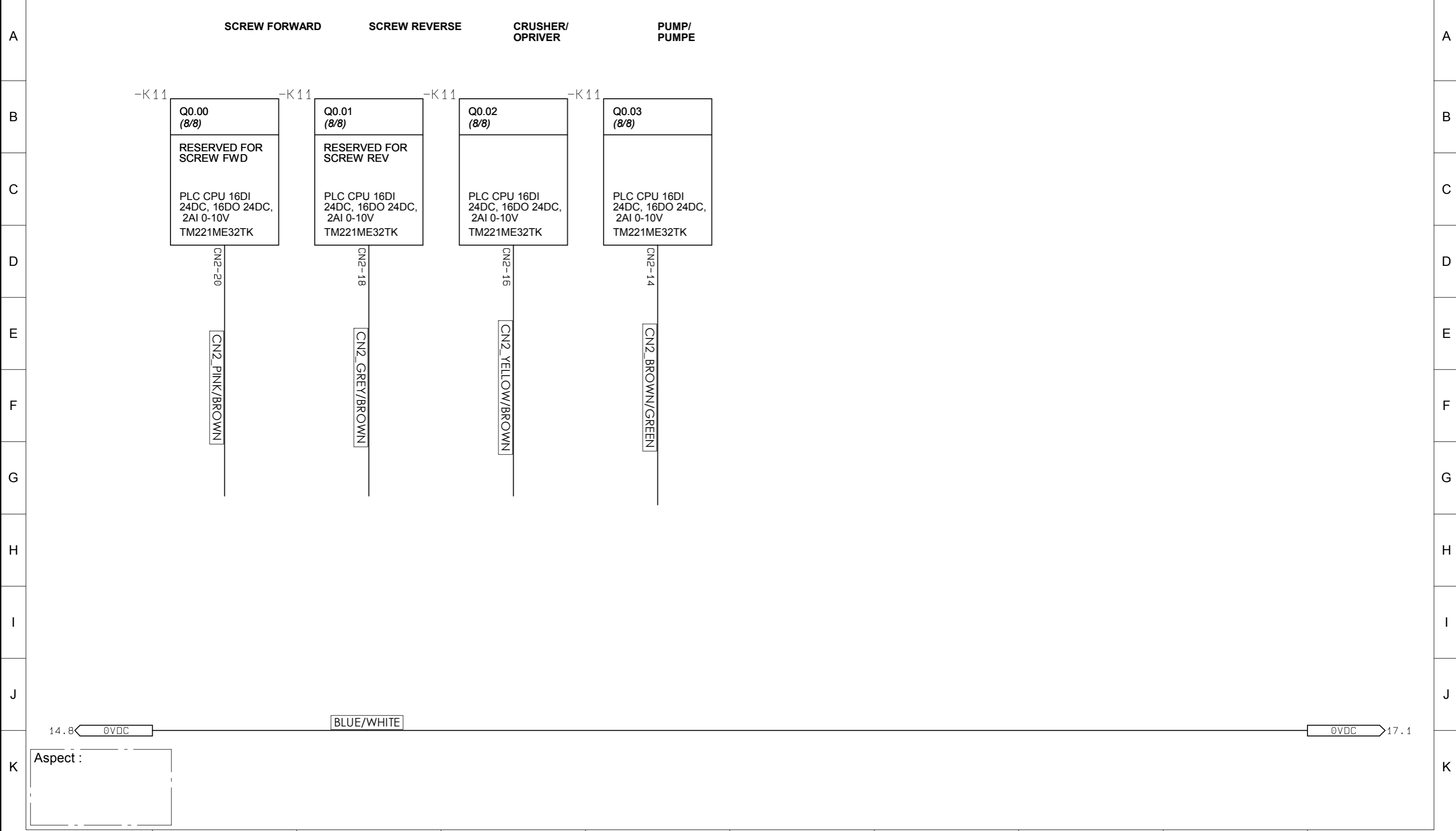
Constructor : KB

← Prev. : 14

→ Next : 16

Electric Drawing

Page 15



Aspect :

1 2 3 4 5 6 7 8



UNI-EL A/S
 Dybdalvej 4, 6920 Videbæk
 +45 97 16 63 11
 kontakt@uni-el.dk
 www.uni-el.dk

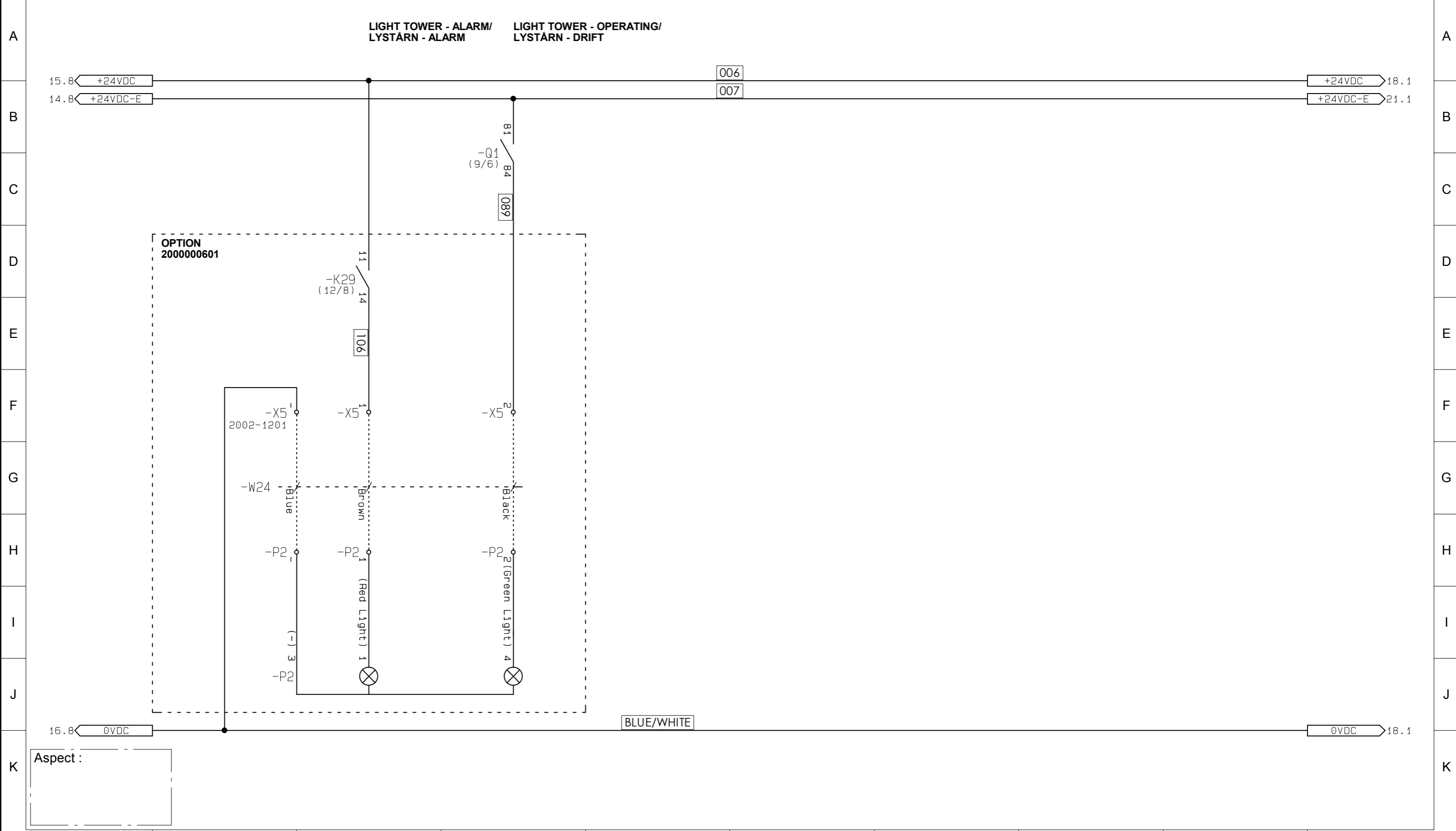
Runi A/S - Industriparken 8 - 6880 Tarm - Denmark - Tel: +45 9737 1799 - Fax: +45 9737 3800 - Web: www.runi.dk - Mail: runi@runi.dk

Project : SK240 / SK370 Screw Compacter / Skrue komprimator

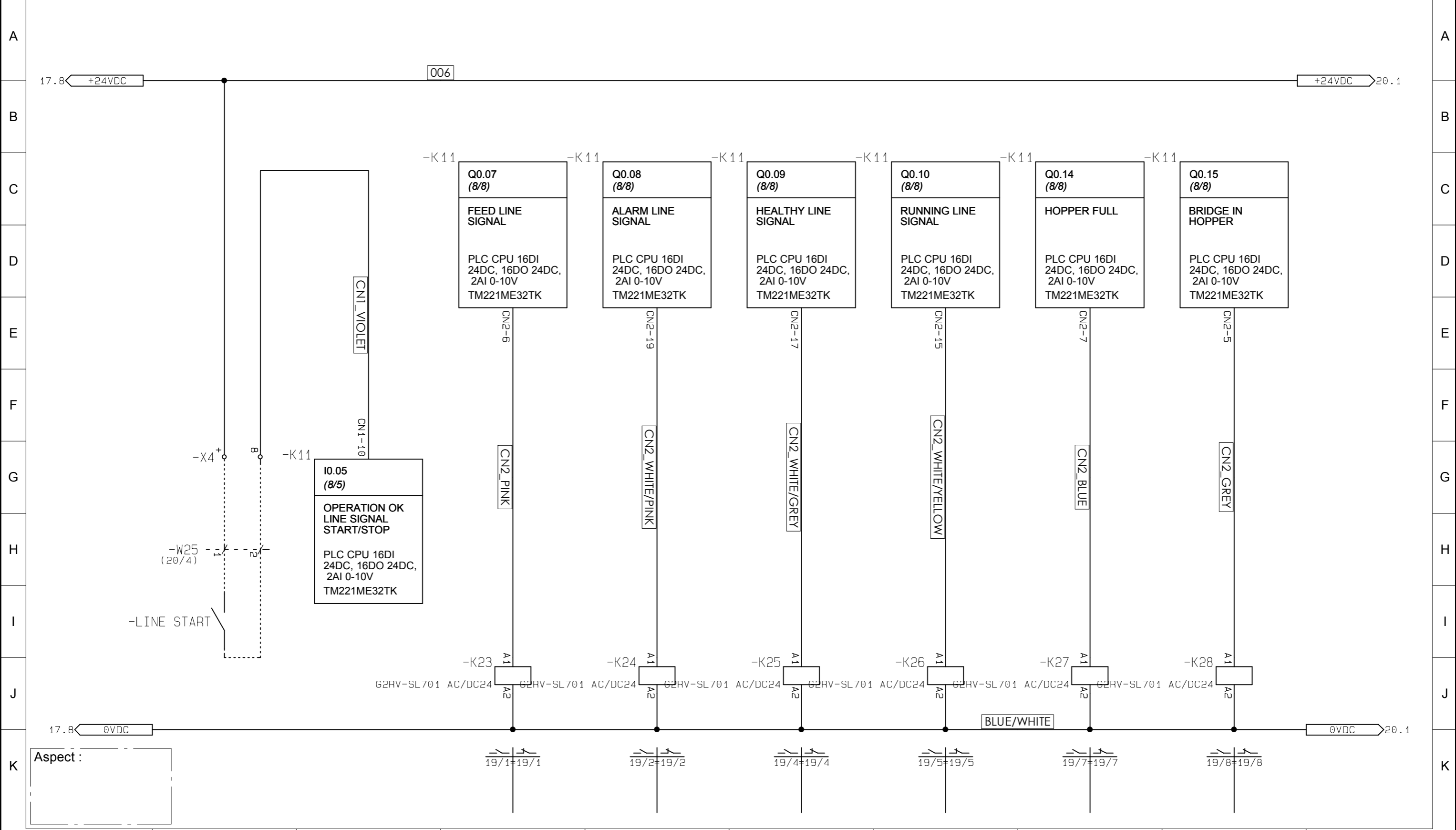
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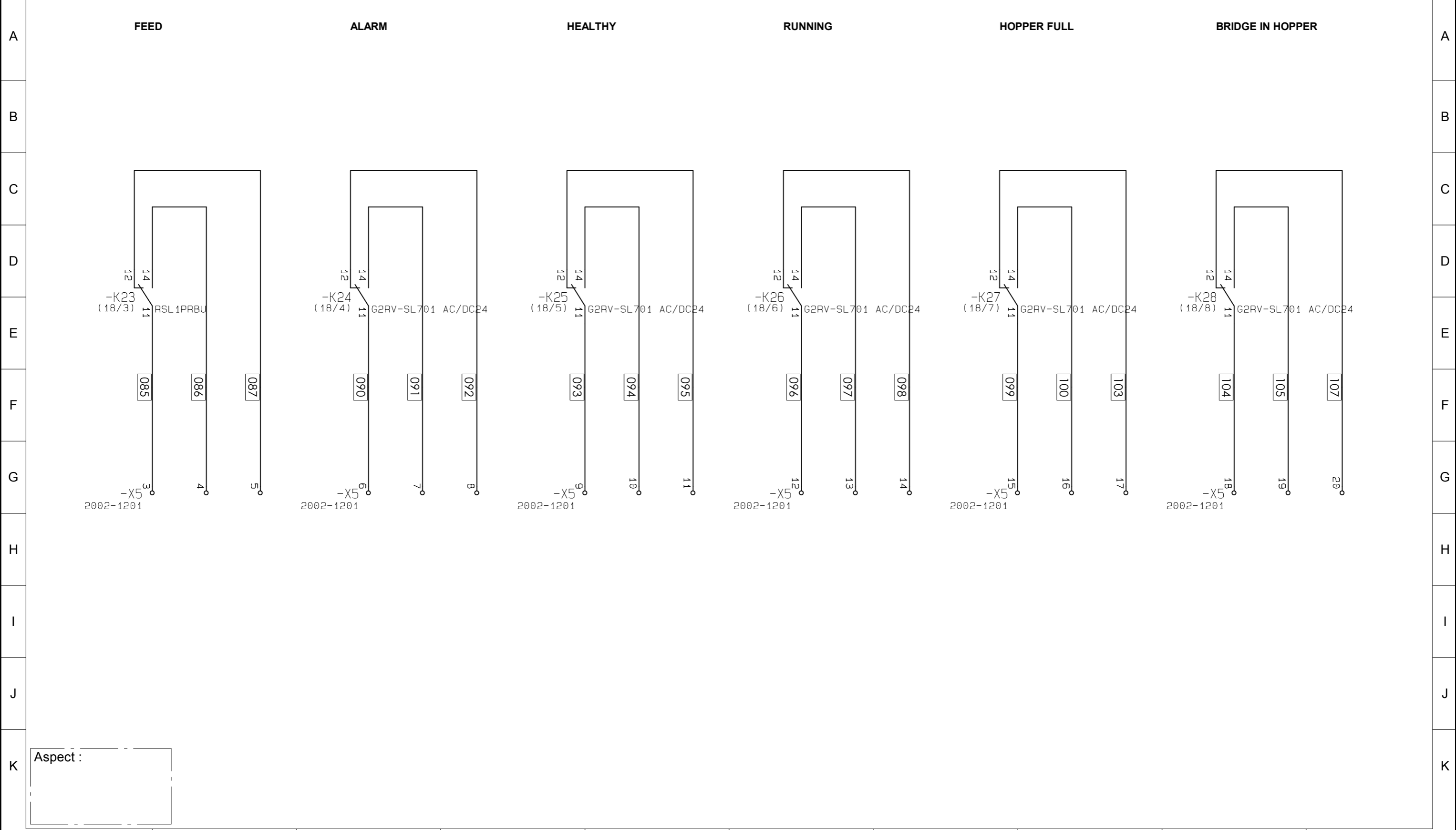
Created : 21-06-2017	Article No : 246.RUNI
Modified : 21-06-2017	Archive No : 3-356-246
Revision : V01-01	Constructor : KB

← Prev. : 15
 → Next : 17
 Electric Drawing
 Page 16



Aspect :





Aspect :

1 2 3 4 5 6 7 8



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Revision : V01-01

Article No : 246.RUNI

Archive No : 3-356-246

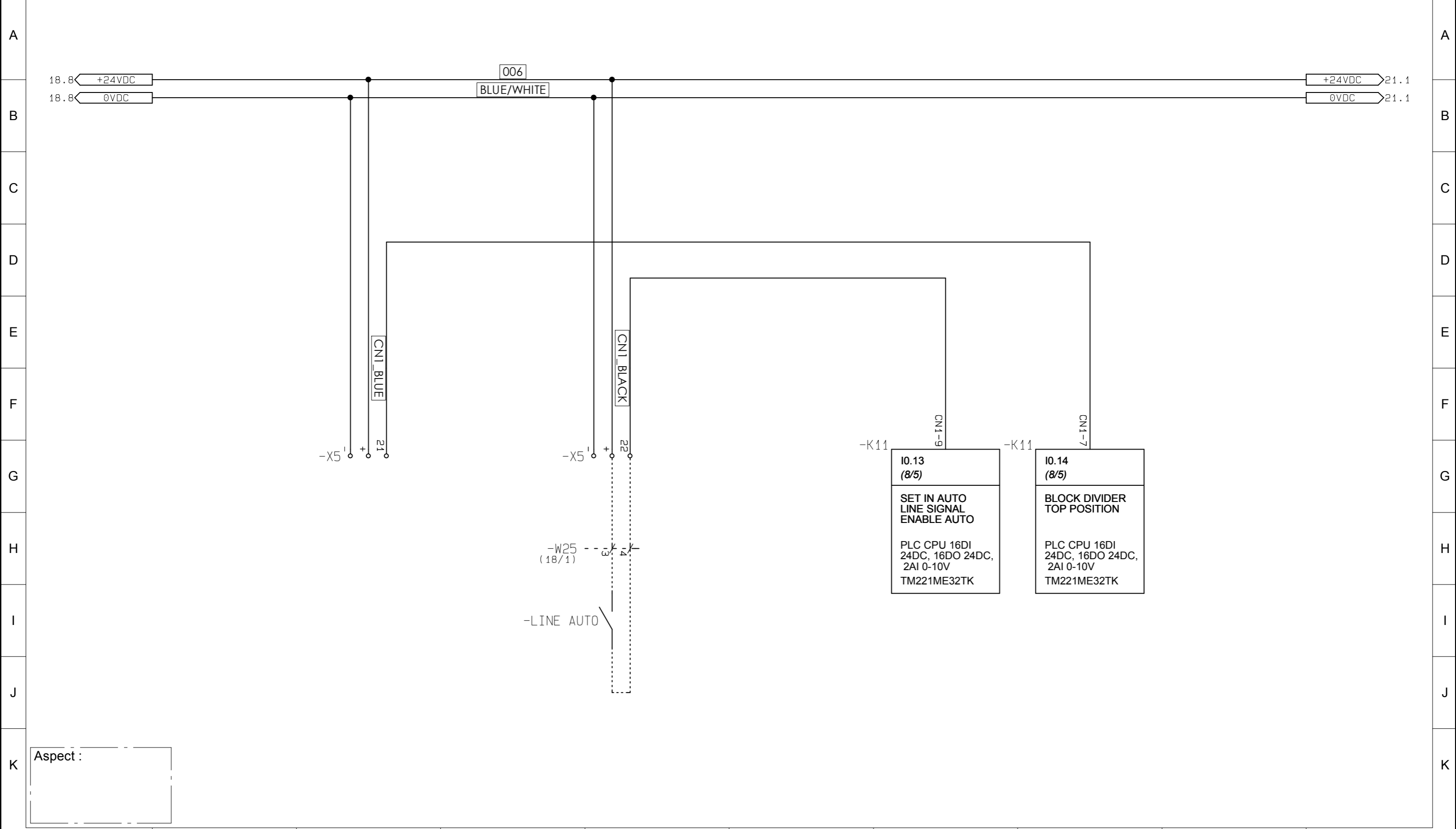
Constructor : KB

← Prev. : 18

→ Next : 20

Electric Drawing

Page 19



Aspect :

1 2 3 4 5 6 7 8



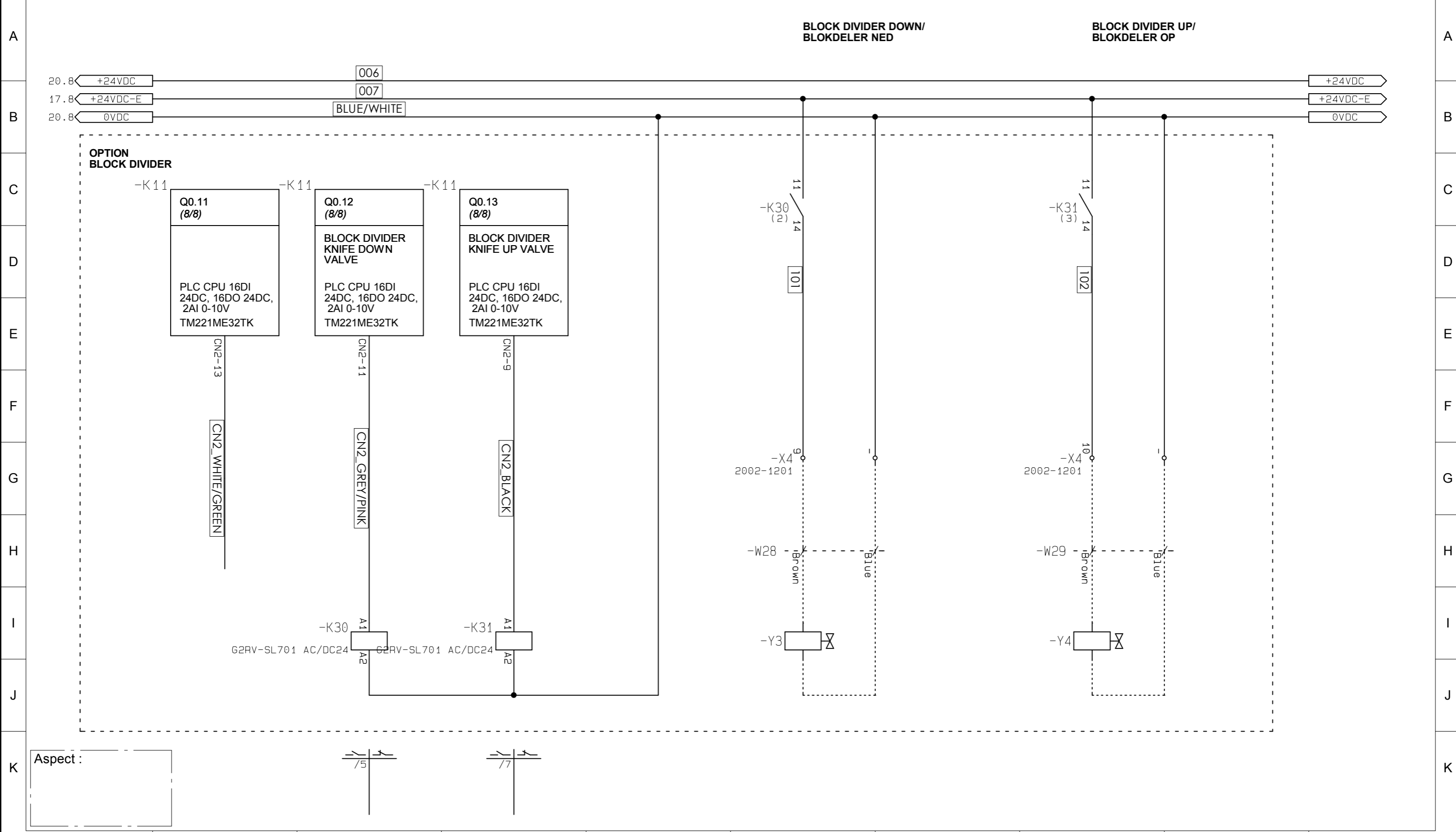
Runi A/S - Industriparken 8 - 6880 Tarm - Denmark - Tel: +45 9737 1799 - Fax: +45 9737 3800 - Web: www.runi.dk - Mail: runi@runi.dk

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Modified : 21-06-2017	Archive No : 3-356-246
Revision : V01-01	Constructor : KB

← Prev. : 19
 → Next : 21
 Electric Drawing
 Page 20



Aspect :

1 2 3 4 5 6 7 8



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 Modified : 21-06-2017 Archive No : 3-356-246
 Revision : V01-01 Constructor : KB

← Prev. : 20
 → Next : 22
 Electric Drawing
 Page 21

A

B

C

D

E

F

G

H

I

J

K

A

B

C

D

E

F

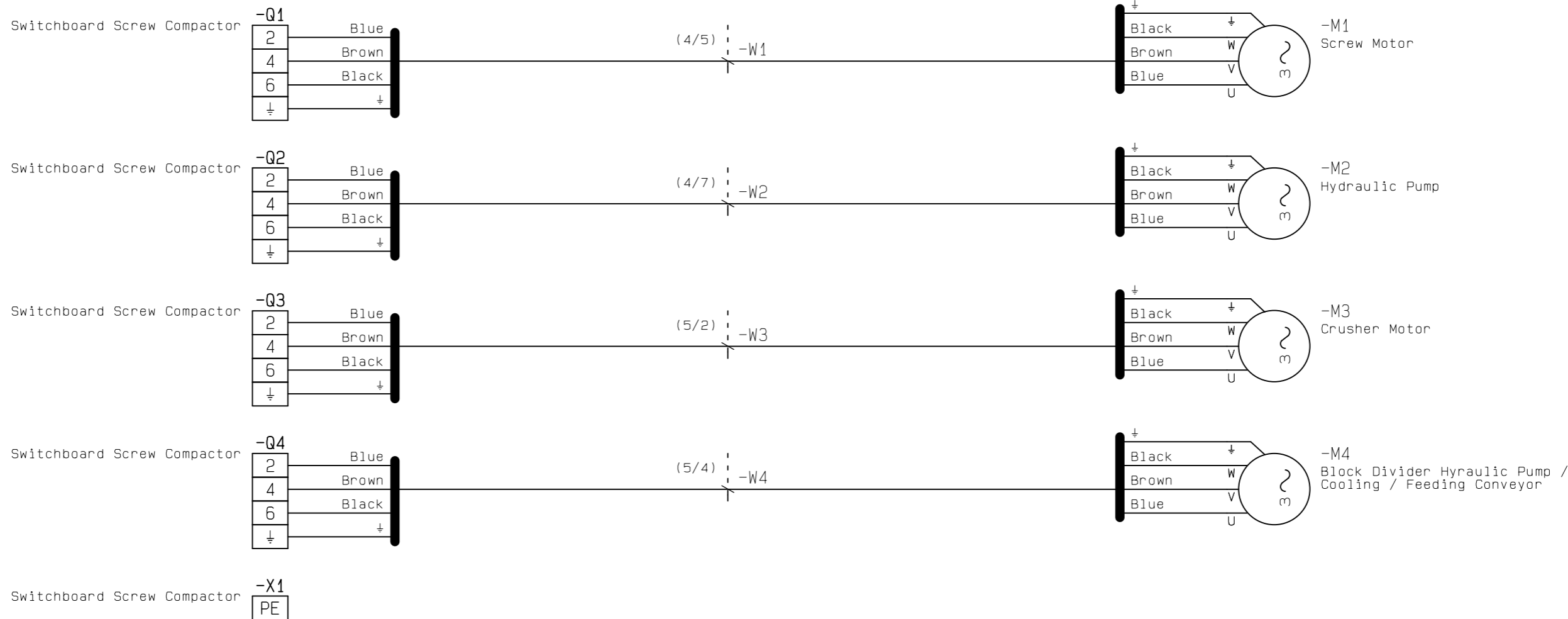
G

H

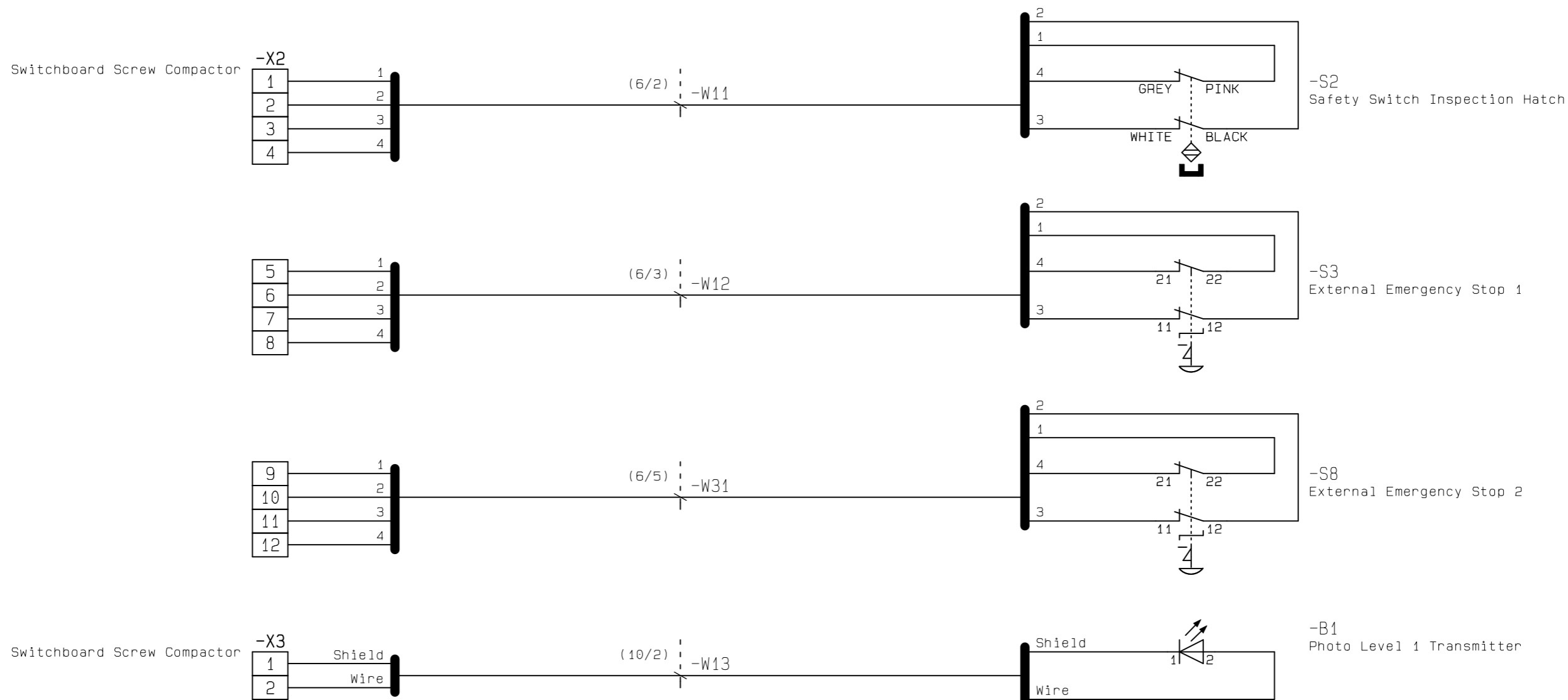
I

J

K



Aspect :



Aspect :

A

B

C

D

E

F

G

H

I

J

K

A

B

C

D

E

F

G

H

I

J

K

Switchboard Screw Compactor

-X3
3
4

Shield
Wire

(10/3) -W14

Shield
Wire

-B2
Photo Level 1 Reciever

5
6

Shield
Wire

(10/6) -W15

Shield
Wire

-B3
Photo Level 2 Transmitter

7
8

Shield
Wire

(10/7) -W16

Shield
Wire

-B4
Photo Level 2 Reciever

9
10

Shield
Wire

(11/2) -W17

Shield
Wire

-B5
Photo Level 3 Transmitter

11
12

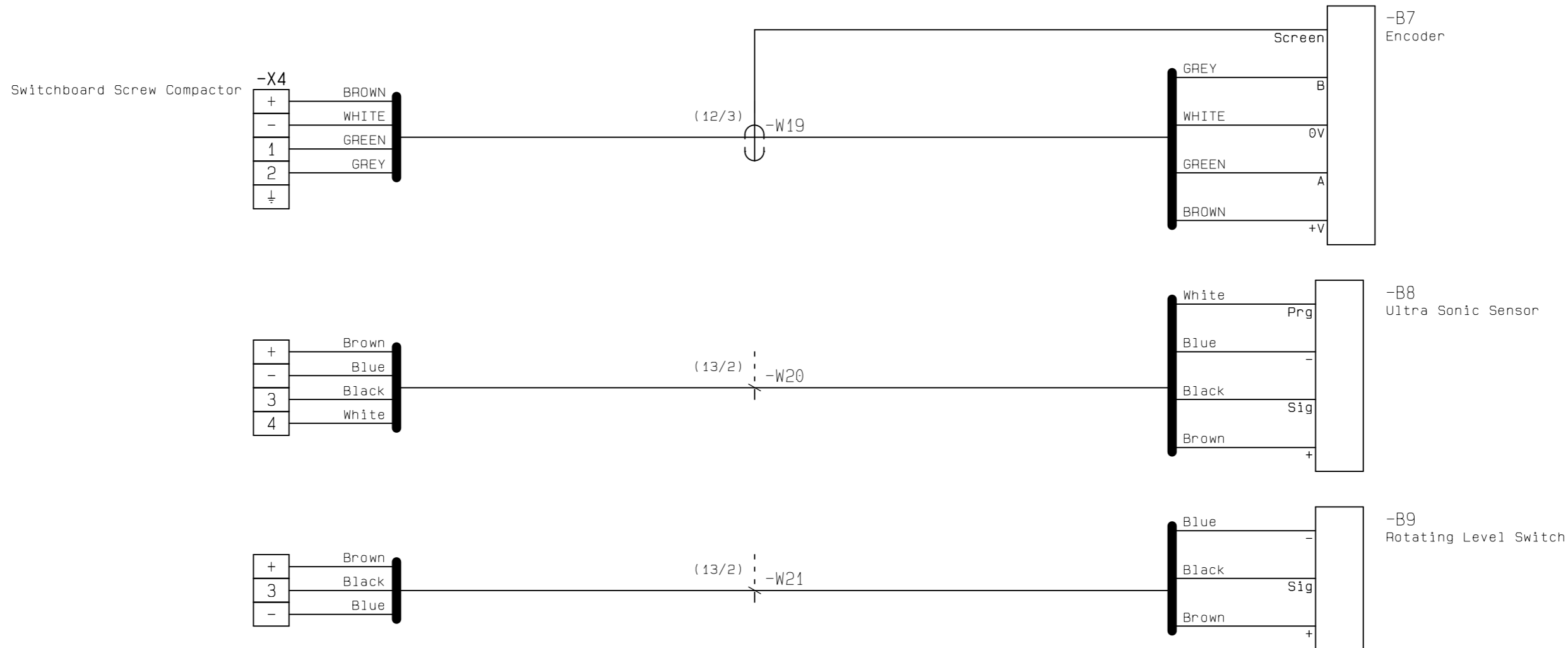
Shield
Wire

(11/3) -W18

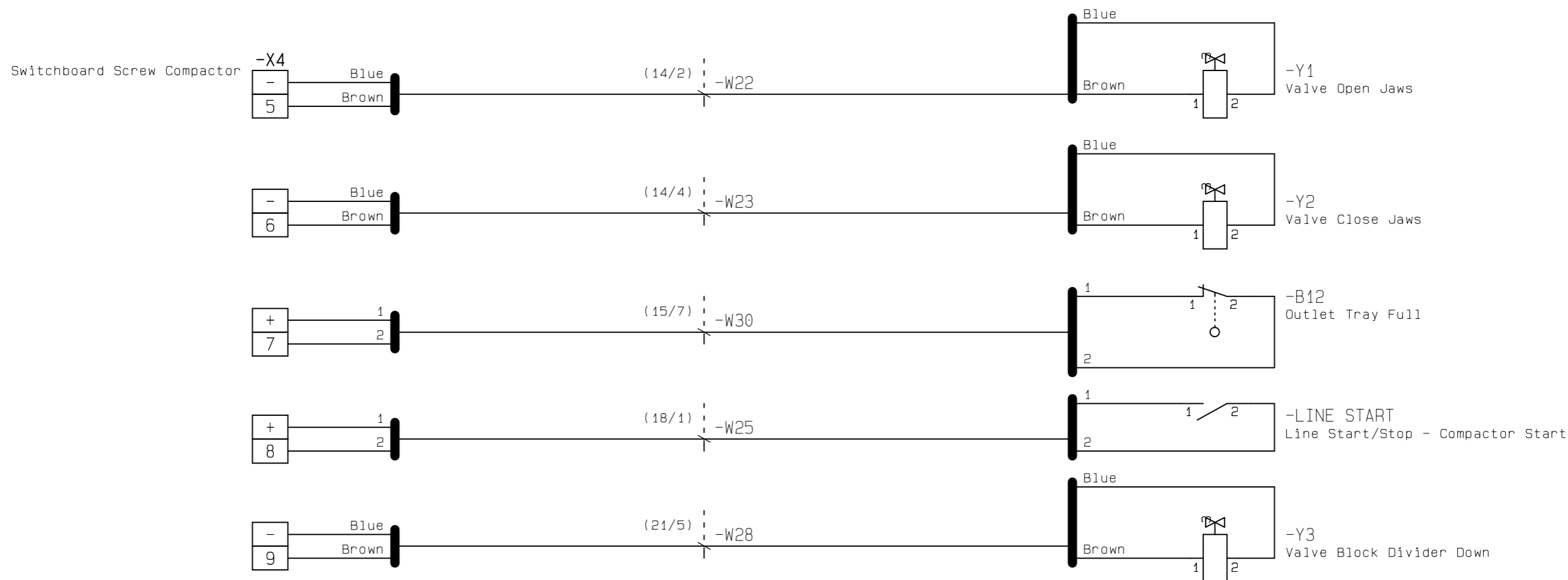
Shield
Wire

-B6
Photo Level 3 Reciever

Aspect :



Aspect :



Aspect :

A

B

C

D

E

F

G

H

I

J

K

A

B

C

D

E

F

G

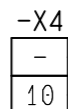
H

I

J

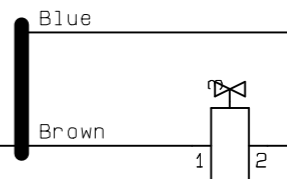
K

Switchboard Screw Compactor



Blue
Brown

(21/7) -W29



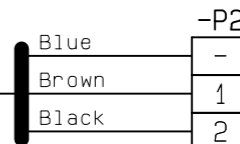
-Y4
Valve Block Divider Up

Switchboard Screw Compactor

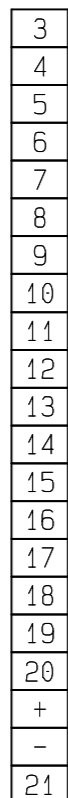


Blue
Brown
Black

(17/1) -W24



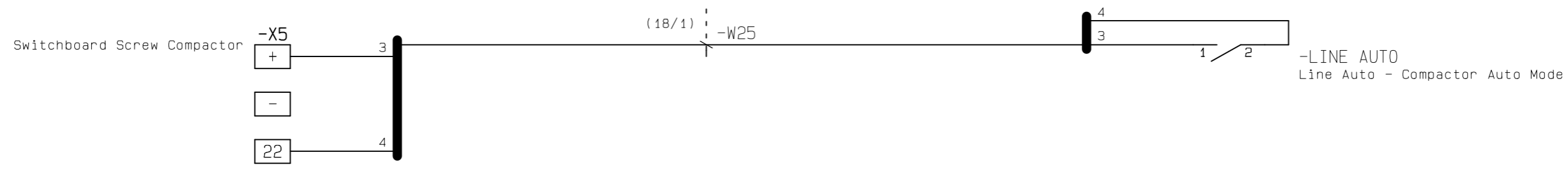
Light Tower



Aspect :

A
B
C
D
E
F
G
H
I
J
K

A
B
C
D
E
F
G
H
I
J
K



Aspect :



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Modified : 21-06-2017

Revision : V01-01

Article No : 246.RUNI

Archive No : 3-356-246

Constructor : KB

← Prev. : 27

→ Next : 29

Electric Drawing

Page 28



Switchboard Data

SK240 / SK370 Screw Compacter / Skrue komprimator

Case No:	246.RUNI
Construction date/year:	06/2016
Article / Constructor: UE Type UE Archive / Drawing Constructor	246.RUNI 3-356-246 KB
Standard:	EN 60204-1
Rated operating voltage: Main circuits Voltage Ue Control circuits Voltage Ue Frequency	3x400 / 3x480VAC 24VDC 50/60Hz
Rated current: Rated Current In Largest Inductive Consumer FLA Largest Non-Inductive Consumer FLA	xxA (Table page 3) <=15KW N/A
SCCR Short Circuit current Rating: Icf Min Icf Max	6kA
System grounding:	TN-S
Supply Fuse - Field Provided Fuse: Rated current Type Characteristics	Max 63Amp NH gL/gG
Switchboard dimensions: No 1: Height x Width x Depth No 2: Height x Width x Depth	600 x 600 x 200mm
Enclosure Type:	
IP-Class:	IP 55
Ambient Temperature: Max - Degrees Centigrade Min - Degrees Centigrade	40 0
EMC-Class:	
Polution Class:	
Working conditions:	Non-Corrosive Environment

**ERKLÆRING****MASKINDIREKTIVETS BILAG II B.**

Produkt: SK240 / SK370 Screw Compacter / Skrue komprimator

Fabrikeret af: Uni-El AS
 Dybdalvej 4 - Rimmerhus
 6920 Videbæk - Denmark

Model/Type: 246.RUNI / 3-356-246
 Konstruktions år: 06/2016

Undertegnede erklærer hermed at delmaskinen er fremstillet i overensstemmelse med de væsentlige sundheds- og sikkerhedskrav i maskindirektivet 2006/42/EF.

Delmaskinen skal inkorporeres og/eller samles med andre dele omfattet af maskindirektivet af 17. maj 2006 (2006/42/EF) med senere ændringer - svarende til Arbejdstilsynets bekendtgørelse 612/2008, Kapitel 2

– og alene opfylder delmaskinen derfor ikke bestemmelserne i Maskindirektivet i alle henseender.

Delmaskinen er i overensstemmelse EU-direktiverne 2006/95/EF (Lavspændingsdirektivet) og 2004/108/EF (EMC-direktivet) – sidste nævnte kun når der ikke er tale om en fast installation.

Delmaskinen er fremstillet i overensstemmelse med følgende harmoniserede standarder med relation mod Maskindirektivets bilag I:

- EN 60 204-1: Elektrisk materiel på maskiner.
- EN ISO 13850: Nødstop
- EN ISO 13849: Sikkerhedsrelaterede dele af styringssystemer

Disse standarder er kun anvendt i det omfang det er relevant i forbindelse med koblingsanlæggets individuelle udførelse.

Andre harmoniserede og internationale standarder er fulgt, når dette er krævet ifølge de ovenfor med nummer refererede standarder.

Der erklæres forbud mod ibrugtagning, indtil den færdige maskine/installation, hvori ovennævnte produkt inkorporeres, som en helhed er erklæret i overensstemmelse med alle relevante bestemmelser i Maskindirektivet (2006/42/EF med senere ændringer)

- og andre relevante direktiver og dette er bekræftet af maskinens overensstemmelseserklæring, samt ved CE-mærkning mindst relaterende mod Maskin- og Lavspændingsdirektivet.

Sted og dato Rimmerhus, den: 21-06-2017

Ansvarlig Underskriver Aksel Graversen

**DECLARATION****MACHINE DIRECTIVE ENCLOSURE II B.**

Product: SK240 / SK370 Screw Compacter / Skrue komprimator

Manufacturer: Uni-El AS
 Dybdalvej 4 - Rimmerhus
 6920 Videbæk - Denmark

Model/Type: 246.RUNI / 3-356-246
 Construction year: 06/2016

It is hereby declared that the Part-machine is made in accordance to the essential health- and safety demands in the Machine Directive 2006/42/EF.

The Part-machines is exclusively designed to have a coherent control function with the entire machine/ installation. It must therefore be incorporated with and/or be connected to other parts encompassed by the machine directive of 17. May 2006 (2006/42/EC) with later changes - In relation to the Danish Work Inspection Notice no: 612/2008, Chapter 2.

- Therefore the part-machine as a stand-alone entity does not fulfill every aspect of the Machine Directive.

The Part-machine is in accordance with the EU-directives 2006/95/EF (Low Voltage directive) and 2004/108/EF (EMC-directive) – the latter only when it is not a permanent installation.

The Part-machine is made in accordance to the following harmonized standards with relation to the Machine directive enclosure I

- EN 60 204-1: Electrical materiel on machinery
- EN ISO 13850: Emergency Shutdown
- EN ISO 13849: Safety related parts of the control systems

These standards are only used to the extent it is relevant in connection with the part-machines individual performance.

Other harmonized and international standards are complied with when this is required according to the above referenced standards.

Use of the above mentioned Part-machine is forbidden until the machine/installation in which it is incorporated is general declared in agreement with all relevant decisions in the Machine Directive (2006/42/EF with later changes)

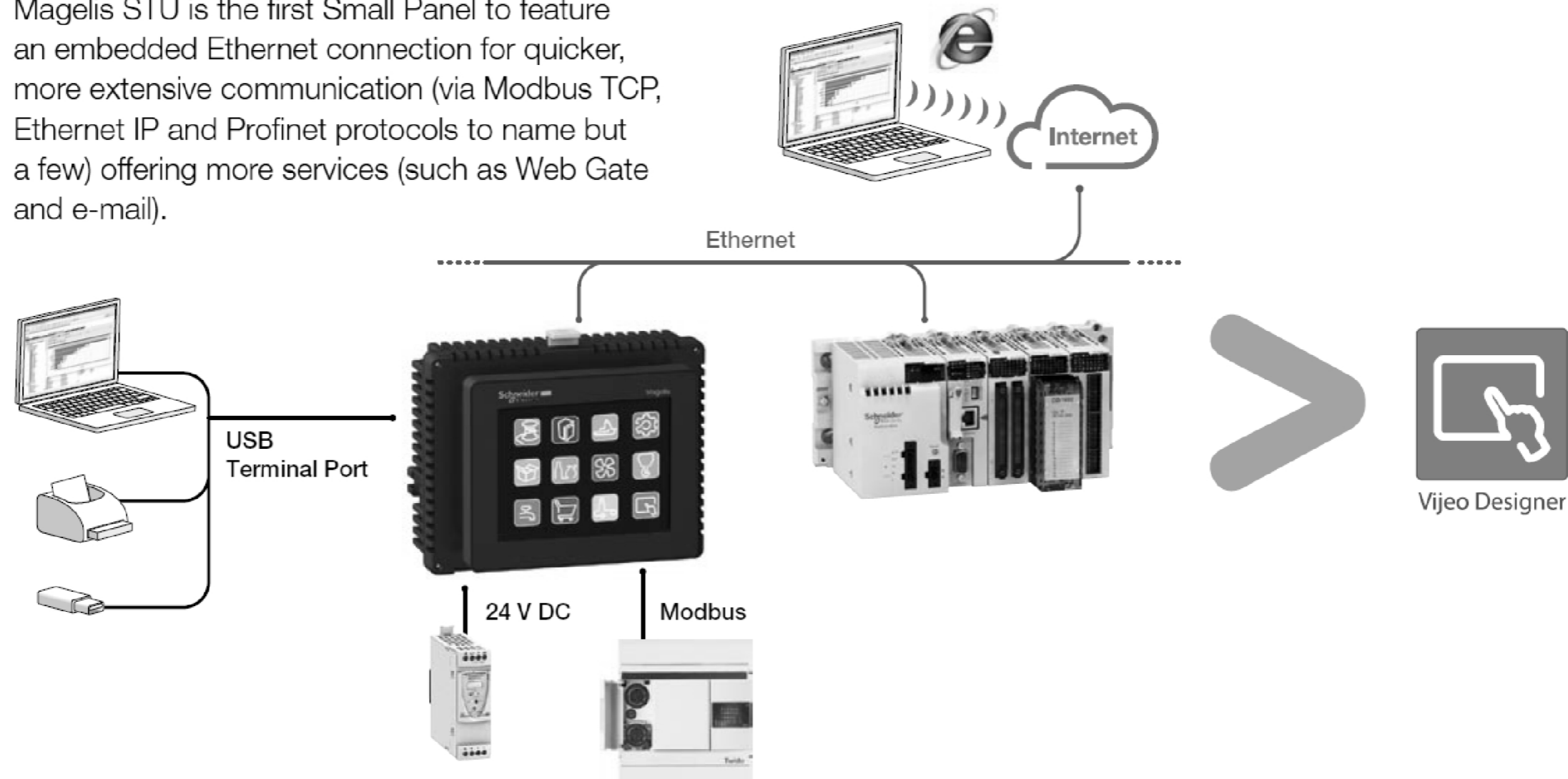
This must be confirmed by the Machine/installations declaration Of Conformity, as well as CE marking that minimum corresponds to the Machine and Low Voltage Directives.

Time and place Denmark - Rimmerhus, Date: 21-06-2017

Responsible signer Aksel Graversen

> More open communication

In addition to the standard RJ45 serial link, the Magelis STU is the first Small Panel to feature an embedded Ethernet connection for quicker, more extensive communication (via Modbus TCP, Ethernet IP and Profinet protocols to name but a few) offering more services (such as Web Gate and e-mail).



OPTION 1 - A SMALL ISOLATED NETWORK WITH HMI AND 1 PC:

SIMPLY CONNECT AN ETHERNET CABLE DIRECTLY FROM THE PORT ON THE HMI TO THE PORT ON A PC.
 USE THE INTERNET EXPLORER ON THE PC TO CONNECT TO THE INTEGRATED WEBGATE AND GAIN ACCESS TO THE PAGES ON THE PANEL.
 * STANDARD IP.ADR OF THE HMI PANEL IS: 192.168.150.60, ASSIGN A FIRM IP-ADR IN THE SAME RANGE TO THE PC'S PORT - EXAMPLE: 192.168.150.61

OPTION 2 - ADD THE HMI TO THE PLANT'S ETHERNET NETWORK WITH MULTIPLE PC's:

CONNECT AN ETHERNET CABLE FROM THE PORT ON THE HMI TO AN ETHERNET SWITCH. FROM ANY PC ON THE NETWORK:
 USE THE INTERNET EXPLORER ON THE PC TO CONNECT TO THE INTEGRATED WEBGATE AND GAIN ACCESS TO THE PAGES ON THE PANEL.
 * STANDARD IP.ADR OF THE HMI PANEL IS: 192.168.150.60, CHANGE THIS TO FIT THE PLANT IP-RANGE - GO TO THE TOUCH PANEL AND DO AS FOLLOWS:

- 1: TOUCH UPPER RIGHT CORNER FOLLOWED BY LOWER LEFT CORNER (QUICKLY)
- 2: TOUCH THE 'OFFLINE' FAN
- 3: TOUCH 'NETWORK' AND CONFIRM BY TOUCHING 'OK'. WAIT...
- 4: TAP IN NEW IP-ADR AND COFIRM WITH 'OK'
- 5: TOUCH 'RETURN TO RUN' AND CONFIRM WITH 'OK'

Aspect :

Terminalblocks

Name	Description
-X1	Main Circuit
-X2	Safety Circuit
-X3	Photo Sensors
-X4	Encoder
-X5	Ultra Sonic Or Rotating Sensor
-X6	Jaws Open/Close Valves
-X7	Line Signals
-X8	Light Tower
-X9	Block Divider
-X10	
-X11	

Control Components

Type	Colour	Description
Lamps	White	Normal State
	Green	Running / Operation
	Yellow	Abnormal state
	Red	Alarm / Emergency state
	Blue	
Buttons	Green	Start
	Red	Stop
	Black	Stop or activation of other functions than start
	White	Start
	Blue	Reset function
	Red on yellow surface	Emergency Stop


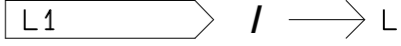
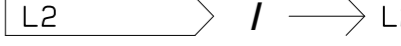
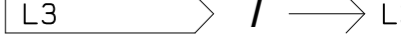

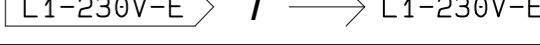

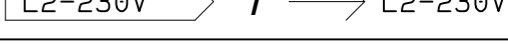
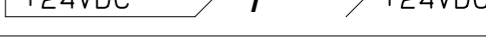
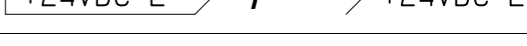

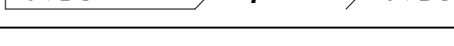

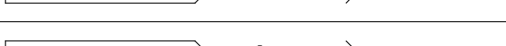
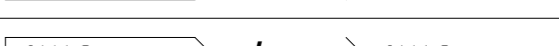
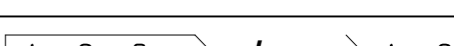
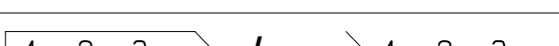
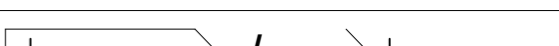
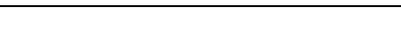
Function Aspects (=)

Aspects

Location Aspects (+)

	+A1	Switchboard Screw Compactor
--	-----	-----------------------------

Wires - Marking, Colours and Signal symbols

Number	Description	Colour	Signalsymbol
000	Neutral wire in main circuits (Before the first transformer)	Light Blue	
001	Phase no 1 in main circuits	Black	
002	Phase no 2 in main circuits	Black	
003	Phase no 3 in main circuits	Black	
004	AC Wire with voltage above 50V - Constant (example with 230VAC)	Red	
005	AC Wire with voltage above 50V - Cut off by Emergency stop (example with 230VAC)	Red	
010, 011, 012...*)	AC Circuits with voltage above 50V	Red	
**)	Neutral wire in AC circuit above 50V	Red w/stripe	
006	+24VDC Wire - Constant	Dark Blue	
007	+24VDC Wire - Cut off by Emergency stop	Dark Blue	
010, 011, 012...*)	+DC circuits	Dark Blue	
**)	-DC circuit	Dark Blue w/stripe	
008	AC Wire with voltage below 50V - Constant (example with 24VAC)	Red	
009	AC Wire with voltage below 50V - Cut off by Emergency stop (example with 24VAC)	Red	
010, 011, 012...*)	AC Circuits below 50V	Red	
**)	Neutral wire in AC circuit below 50V	Red w/stripe	
010, 011, 012...*)	Potential free or External circuits (Foreign Voltage)	Orange	
010, 011, 012...*)	Analog Circuits or circuits with alternating signaling	White	
**)	Protection wire (Earth)	Yellow/Green	

*) PART OF AN AUTOMATIC NUMBERING SYSTEM STARTING FROM NO. 010 (PRECEDING "0"'S ARE NOT MOUNTED ON WIRES)

**) NUMBERED BY ITS COLOUR - NUMBER ONLY ASSIGNED IF THERE'S MULTIPLE POTENTIALS WITH THIS COLOUR



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Constructor : KB

← Prev. : 32

→ Next : 34

Electric Drawing

Page 33

Component List

Name	Page	Description (English)	Type	Article	Product
-F4	4/2	MINIATURE CIRCUIT-BREAKER 3P C10	S203-C10	4016779467803	ABB A/S
-F8	5/7	MINIATURE CIRCUIT-BREAKER 1P+N C10	S201-C10 NA	4016779531757	ABB A/S
-K1	10/1	Socket, DIN rail/surface mounting, 11-pin, screw terminals (IEC/VDE)	PF113A-N	4536853879891	OMRON Electronics A/S
-K1	10/1	Amplifier Relay Photosensors Conquest C2002N/P 24VDC	C2002N/P	C2002N/P	Conquest
-K2	10/5	Socket, DIN rail/surface mounting, 11-pin, screw terminals (IEC/VDE)	PF113A-N	4536853879891	OMRON Electronics A/S
-K2	10/5	Amplifier Relay Photosensors Conquest C2002N/P 24VDC	C2002N/P	C2002N/P	Conquest
-K3	11/1	Socket, DIN rail/surface mounting, 11-pin, screw terminals (IEC/VDE)	PF113A-N	4536853879891	OMRON Electronics A/S
-K3	11/1	Amplifier Relay Photosensors Conquest C2002N/P 24VDC	C2002N/P	C2002N/P	Conquest
-K5	4/3	KW Measuring 3x380-500VAC , w/ Analog output 0-10V / 4-20mA	APM 10	APM 10	UNIPOWER
-K10	7/6	Safety modul cat.3, 3NO(s)+1sst, 24VAC/DC	XPSAC5121	7524682567	Schneider Electric
-K11	8/4	PLC CPU 16DI 24DC, 16DO 24DC, 2AI 0-10V	TM221ME32TK	TM221ME32TK_UE	Schneider Electric
-K12	9/3	TM3 Expansion Expert Module TeSys Ultima	TM3XTYS4	7586048275_UE	Schneider Electric
-K21	14/1	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K22	14/3	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K23	19/1	Relay 1pol, incl. 6mm socket with led, 24VDC	RSL1PRBU	7522602031_UE	Schneider Electric
-K23	18/3	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K24	18/4	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K25	18/5	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K26	18/6	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K27	18/7	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K28	18/8	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K29	12/8	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K30	21/2	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-K31	21/3	Relay 1pol, incl. 6mm socket with led, testbutton, 24VAC/DC	G2RV-SL701 AC/DC24	G2RV-SL701 AC/DC	OMRON Electronics A/S
-P1	9/8	Magelis HMI STU 655 Touch/Controllpanel 3,5", 320x240px, Color	HMISTU655	7586028606	Schneider
-Q0	3/1	Handle Black f/OT16-125 E3/4	OHBS2AJ	OHBS2AJ	ABB
-Q0	3/1	Circuit Breaker 75A(AC23) / 80A(AC21) 4P	OT 80 F4N2	OT 80 F4N2	ABB A/S
-Q0	3/1	Axel 6x250mm f/OT16-125 F3/4	OXS6x250	OXS6x250	ABB
-Q1	4/5	Power Base 32A 3P, without connections	LUB320	7522500023	Schneider Electric


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Constructor : KB

← Prev. : 33

→ Next : 35

Electric Drawing

Page 34

Component List

Name	Page	Description (English)	Type	Article	Product
-Q1	4/5	Control unit S3P10 3-12A Uc 24VDC	LUCA12BL	7522500764	Schneider Electric
-Q1	4/5	Control unit S3P10 8-32A Uc 24VDC	LUCA32BL	7522500887	Schneider Electric
-Q1	4/5	Revers. modul direct 3P+2CO Uc 24VDC	LU2MB0BL	7522501792	Schneider Electric
-Q2	4/7	Power Base 12A 3P, without connections	LUB120	7522500353	Schneider Electric
-Q2	4/7	Control unit S3P10 1,25-5A Uc 24VDC	LUCA05BL	7522500641	Schneider Electric
-Q3	5/2	Power Base 12A 3P, without connections	LUB120	7522500353	Schneider Electric
-Q3	5/2	Control unit S3P10 1,25-5A Uc 24VDC	LUCA05BL	7522500641	Schneider Electric
-Q3	5/2	Control unit S3P10 3-12A Uc 24VDC	LUCA12BL	7522500764	Schneider Electric
-Q4	5/5	Power Base 12A 3P, without connections	LUB120	7522500353	Schneider Electric
-Q4	5/5	Control unit S3P10 1,25-5A Uc 24VDC	LUCA05BL	7522500641	Schneider Electric
-Q4	5/5	Control unit S3P10 3-12A Uc 24VDC	LUCA12BL	7522500764	Schneider Electric
-R1	5/7	Heating Unit PTC 20W 110-250VAC	NSYCR20WU2C	NSYCR20WU2C	Schneider Electric
-R2	5/8	Heating Unit PTC 20W 110-250VAC	NSYCR20WU2C	NSYCR20WU2C	Schneider Electric
-S1	6/2	Emergency stop pushbutton Ø40 push-pull 2NC	XB4BS8444	7517808934	Schneider Electric
-S2	6/3	Safety Magnet Sensor 2NC + 1NO, Rect., Cat 4, 10m Cable	XCSDMP70010	7524682208	Schneider Electric A/S
-S3	6/4	Emergency stop pushbutton Ø40 push-pull 2NC	XB4BS8444	7517808934	Schneider Electric
-S4	12/6	Contact-element 1NO	ZBE101	7517807825	Schneider Electric
-S4	7/7	Push Button w/ Light, Blue, 24V AC/DC, incl LED	XB4BW36B5	7817801012	Schneider Electric
-S5	15/1	Turn Switch, Complete, 3 pos, short Handle, 2NO	XB4BD53	7517800071	Schneider Electric
-S6	15/3	Turn Switch, Complete, 3 pos, short Handle, 2NO	XB4BD53	7517800071	Schneider Electric
-S7	15/5	Turn Switch, Complete, 3 pos, short Handle, 2NO	XB4BD53	7517800071	Schneider Electric
-S8	6/6	Emergency stop pushbutton Ø40 push-pull 2NC	XB4BS8444	7517808934	Schneider Electric
-S9	5/7	Thermostat Heating NC-Contact 10	NSYCCO THC	NSYCCO THC	Schneider Electric
-S10	13/3	I-O-II Switch 1 P 16A/2, E 221-4	E221-4	2118259149	ABB A/S
-T1	4/2	Power Supply 120W 24VDC 5A, 200-500VAC	WDR-120-24	WDR-120-24	Mean Well
-W22	14/2	Plast Cable 3x1mm2 H05VV-F, Black, 50RG PKAJ	Plastkabel PKAJ	5432521259	
-W23	14/4	Plast Cable 3x1mm2 H05VV-F, Black, 50RG PKAJ	Plastkabel PKAJ	5432521259	
-W24	17/1	Cable for Sensor, PVC, w/ M12 Plug, L: 10meters	Y92E-M12PVC4A10M-L	Y92E-M12PVC4A10M	OMRON
-W28	21/5	Plast Cable 3x1mm2 H05VV-F, Black, 50RG PKAJ	Plastkabel PKAJ	5432521259	



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Constructor : KB

← Prev. : 34

→ Next : 36

Electric Drawing

Page 35

PLC I/O List

Name	I/O	Page	Description	Label
-K11:CN1-20	I0.00	12/1	ENCODER B-PULSE	
-K11:CN1-18	I0.01	12/2	ENCODER A-PULSE	
-K11:CN1-16	I0.02	12/5	EMERGENCY STOP OK	
-K11:CN1-14	I0.03	13/4	LEVEL 1 START	
-K11:CN1-12	I0.04	13/5	LEVEL 2 CRUSHER/ALARM	
-K11:CN1-10	I0.05	18/2	OPERATION OK LINE SIGNAL START/STOP	
-K11:CN1-8	I0.06	12/6	RESET	
-K11:CN1-6	I0.07	15/1	SCREW MANUAL	
-K11:CN1-19	I0.08	15/2	SCREW AUTO	
-K11:CN1-17	I0.09	15/3	JAWS MANUAL	
-K11:CN1-15	I0.10	15/4	JAWS AUTO	
-K11:CN1-13	I0.11	15/5	CRUSHER MANUAL	
-K11:CN1-11	I0.12	15/6	CRUSHER AUTO OR OUTLET TRAY FULL	
-K11:CN1-9	I0.13	20/6	SET IN AUTO LINE SIGNAL ENABLE AUTO	
-K11:CN1-7	I0.14	20/7	BLOCK DIVIDER TOP POSITION	
-K11:CN1-5	I0.15	13/6	RESERVED FOR THERMAL ERROR	
-K11:CN2-20	Q0.00	16/1	RESERVED FOR SCREW FWD	
-K11:CN2-18	Q0.01	16/2	RESERVED FOR SCREW REV	
-K11:CN2-16	Q0.02	16/3		
-K11:CN2-14	Q0.03	16/4		
-K11:CN2-12	Q0.04	14/1	JAWS OPEN VALVE	
-K11:CN2-10	Q0.05	14/3	JAWS CLOSE VALVE	
-K11:CN2-8	Q0.06	12/7	ALARM LAMP	
-K11:CN2-6	Q0.07	18/3	FEED LINE SIGNAL	
-K11:CN2-19	Q0.08	18/4	ALARM LINE SIGNAL	
-K11:CN2-17	Q0.09	18/5	HEALTHY LINE SIGNAL	
-K11:CN2-15	Q0.10	18/6	RUNNING LINE SIGNAL	
-K11:CN2-13	Q0.11	21/1		
-K11:CN2-11	Q0.12	21/2	BLOCK DIVIDER KNIFE DOWN VALVE	



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Constructor : KB

← Prev. : 36

→ Next : 38

Electric Drawing

Page 37

PLC I/O List

Name	I/O	Page	Description	Label
-K11:CN2-9	Q0.13	21/3	BLOCK DIVIDER KNIFE UP VALVE	
-K11:CN2-7	Q0.14	18/7	HOPPER FULL	
-K11:CN2-5	Q0.15	18/8	BRIDGE IN HOPPER	
-K12:1	I1.00	9/2	SCREW READY	
-K12:2	I1.01	9/2	SCREW RUN	
-K12:3	I1.02	9/2	SCREW TRIP	
-K12:4	I1.03	9/2	PUMP READY	
-K12:5	I1.04	9/2	PUMP RUN	
-K12:6	I1.05	9/2	PUMP TRIP	
-K12:7	I1.06	9/2	CRUSHER READY	
-K12:8	I1.07	9/2	CRUSHER RUN	
-K12:9	I1.08	9/2	CRUSHER TRIP	
-K12:10	I1.09	9/2	MOTOR 4 READY	
-K12:11	I1.10	9/2	MOTOR 4 RUN	
-K12:12	I1.11	9/2	MOTOR 4 TRIP	
-K12:21	Q1.00	9/3	SCREW FWD	
-K12:22	Q1.01	9/3	SCREW REV	
-K12:23	Q1.02	9/3	PUMP	
-K12:24	Q1.03	9/3	N/A	
-K12:25	Q1.04	9/3	CRUSHER	
-K12:26	Q1.05	9/3	N/A	
-K12:27	Q1.06	9/3	MOTOR 4	
-K12:28	Q1.07	9/3	N/A	


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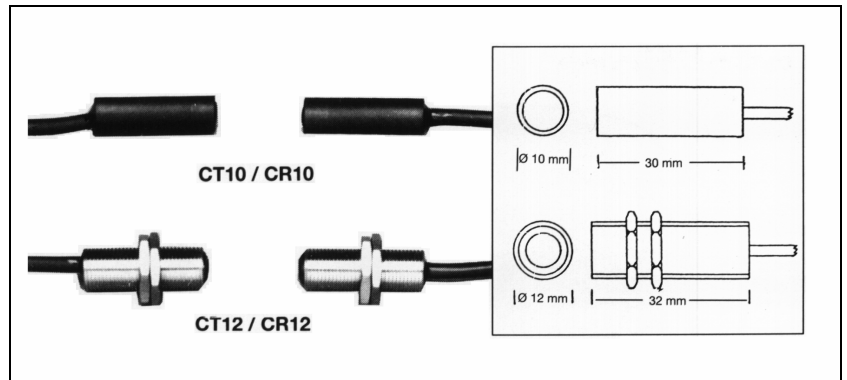
← Prev. : 37

→ Electric Drawing

Page 38

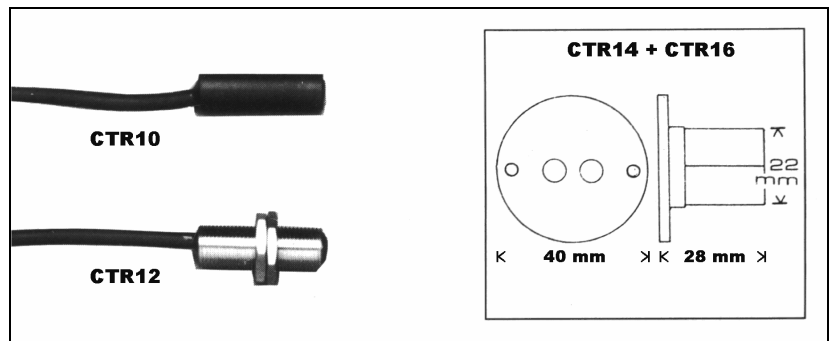
Appendix 10

Transmitter CT and receiver CR for amplifier



TYPES	CTIO	CR10	CR10B	CR10C	CT12	CR12	CR12B	CR12C
Sensing distance								
Through-beam:	-	20 M	10M	5M	-	20M	10M	5M
Diffuse reflection:	-	2M	1M	0,5M	-	2M	1M	0,5M
Retroreflective:	-	10M	5M	1M	-	10M	5M	1M
Housing	Noryl (black)				Acid-resistant stainless steel			
Ambient Temperature	- 20° C.....+ 70° C							
Protection	> IP 67							
Cable	5 m - 10 m - or 15 m standard shielded							

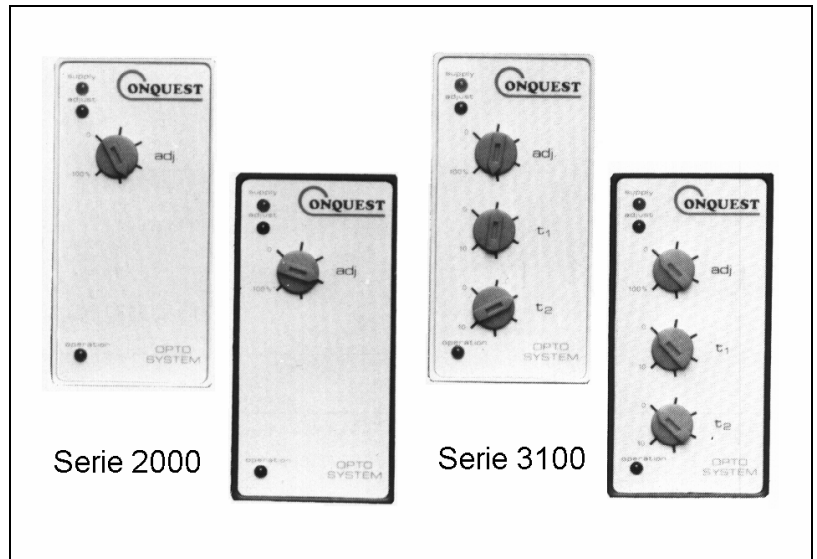
Proximity Sensors CTR for amplifier



TYPES	CTR10	CTR14	CTR16	CTR12
Sensing distance	50 mm	750 mm	2000 mm	50 mm
Housing	Noryl (black)		Stainless steel	
Ambient temperature	- 20° C.....+ 70° C			
Protection	> IP 67			
Cable	5 m - 10 m - or 15 m standard shielded			

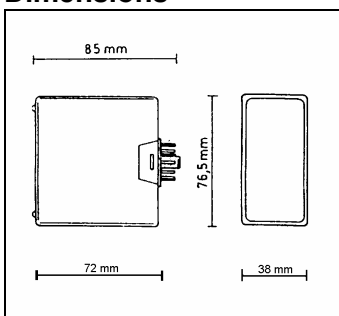
Other types and length of cable by request!

Amplifiers

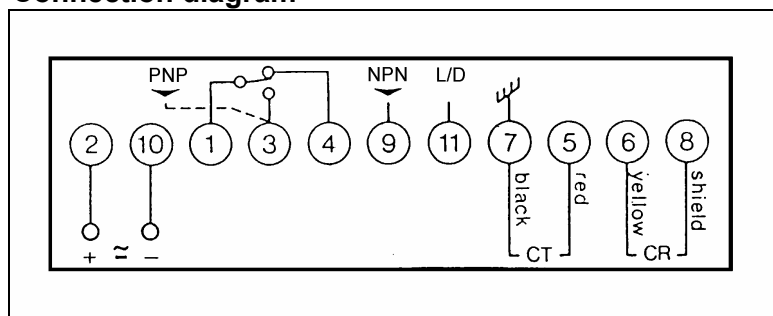


TYPES	C2000	C2001	C2002	C3100	C3102
Supply options	24 VAC/DC 230VAC	24 VAC/DC 230VAC	24 VDC	24 VAC/DC 230VAC	24 VDC
Output	Relay NPN	Relay	PNP NPN	Relay NPN	PNP NPN
Automatic self-adjustment and RELATIVE sensitivity (Add A to type number)	YES	NO	YES	YES	
Time delay	-----			on/off delay t1, t2, = 0-10 sek.	
Load	Relay max. 8 A, NPN/PNP max. 100 mA at 30 VDC				
Response time	Relay output = 25 mSek., NPN/PNP output = 10 mSek.				
Ambient temperature	- 20° C.....+ 60° C				
Housing	Noryl (grey and red)				

Dimensions



Connection diagram



Other types and time intervals by request!