Hexamatic

Struers

Manual No.: 15947001

Date of Release 27.10.2015

Instruction Manual

Hexamatic
Instruction Manual

Always state *Serial No* and *Voltage/frequency* if you have technical questions or when ordering spare parts. You will find the Serial No. and Voltage on the type plate of the machine itself. We may also need the *Date* and *Article No* of the manual. This information is found on the front cover.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:
Instruction Manuals: Struers Instruction Manual may only be used in connection with Struers equipment covered by the Instruction Manual.
Service Manuals: Struers Service Manual may only be used by a trained technician authorised by Struers. The Service Manual may only be used in connection with Struers equipment covered by the Service Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to change without notice. The manual may mention accessories or parts not included in the present version of the equipment.

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Hexamatic
Safety Precaution Sheet

To be read carefully before use

1. The operator should be fully aware of the use of the Hexamatic according to the Instruction Manual.

2. Hexamatic must be installed in compliance with local safety regulations.

3. The actual voltage must correspond to the voltage stated on the side of the machine. The machine must be earthed.

4. The water connections must be leak proof. Cut the water off if the machine stands idle for a long period.

5. Ensure that the emergency stop is in order.

6. When using specimen holders ensure that the specimens are securely clamped before starting the preparation process.

7. When preparing single/individual specimens, only use stainless steel retention rings. The steel rings must be securely fixed on the specimen.

8. If any malfunction or unusual noise is detected, the machine should be stopped immediately and technical service called.

The equipment should only be used for its intended purpose and as detailed in the Instruction Manual.

The equipment is designed for use with consumables supplied by Struers. If subjected to misuse, improper installation, alteration, neglect, accident or improper repair, Struers will accept no responsibility for damage(s) to the user or the equipment.

Dismantling of any part of the equipment, during service or repair, should always be performed by a qualified technician (electromechanical, electronic, mechanical, pneumatic, etc.)

Disposal

Equipment marked with a WEEE symbol contains electrical and electronic components and must not be disposed of as general waste.
Please contact your local authorities for information on the correct method of disposal in accordance with national legislation.

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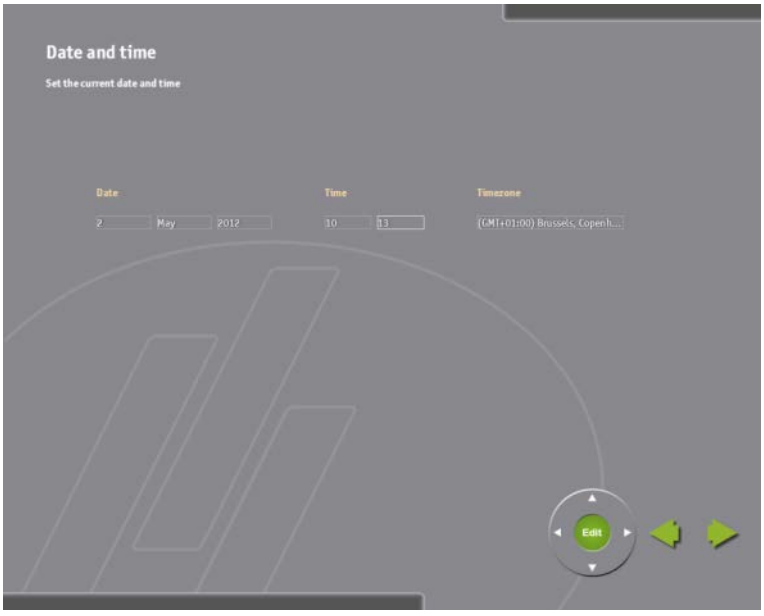
1. Initial Start-up

Running Hexamatic for the first time

- Switch on the Hexamatic.
- The built-in PC will boot automatically and after a short while the first wizard screen will appear to guide you through the Configuration process.

- Select the language you want to use.
  Press the green right arrow to continue.

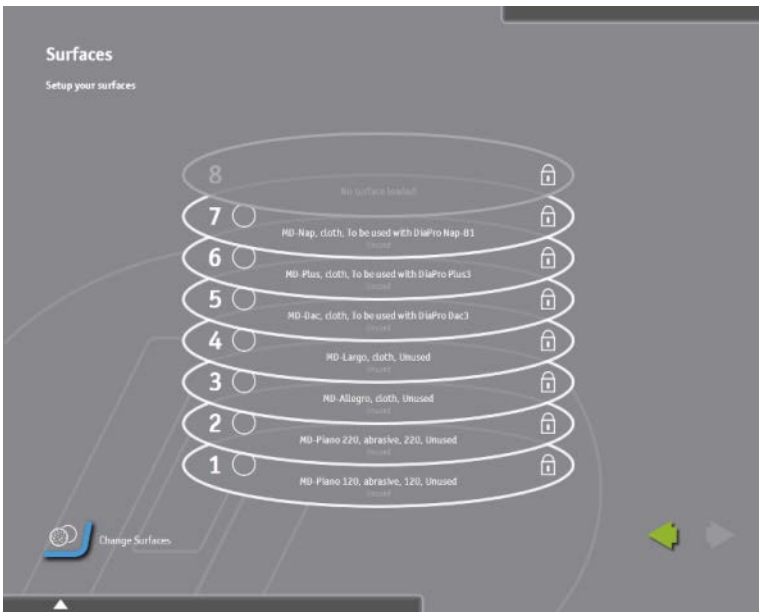
- Select the desired keyboard layout.
  Press the green right arrow to continue.



- Set the correct Date, Time and Time zone.
  Press the green right arrow to continue.

Placing Surfaces in the Elevator

- Make sure the main hood is closed.
- Touch the *Change Surfaces* key and the elevator will move into the loading position. The padlock symbols on the shelves will disappear.
- Open the main hood and place the correct MD-Consumable on each shelf. Touch each disc on the screen to change to the appropriate MD-Consumable.
- Close the main hood when all MD-Consumables have been inserted and programmed. As soon as the main hood is closed the elevator will start moving downwards and the shelves will be locked.



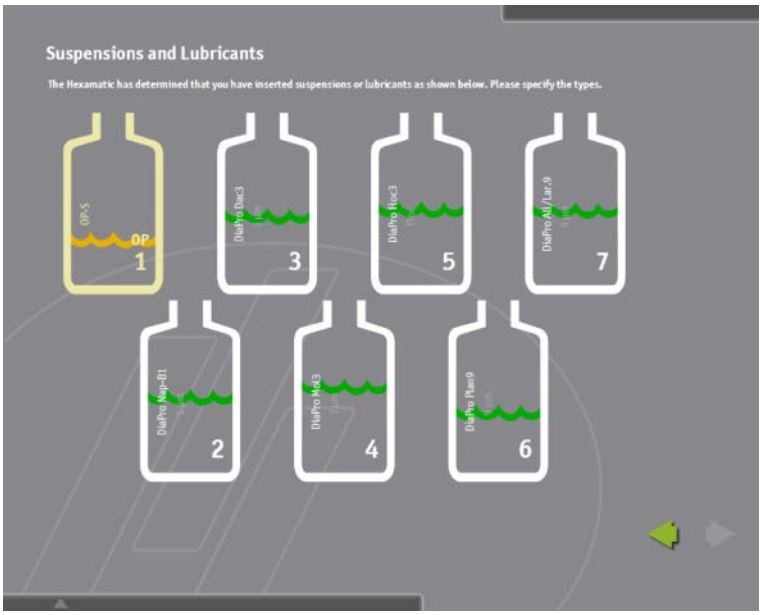
> ***Note:***
> For details, please see the section *Surfaces* in Chapter 3, *Configuration*.

Inserting Suspensions and Lubricants

- Touch the green right arrow to continue.

- Specify the contents of each bottle by touching the bottle and selecting the correct suspension or lubricant.

The yellow triangle symbols indicate that the bottles have not been inserted yet. As soon as the bottles are placed in the dosing unit, the weighing cells will indicate the filling level of the bottles.



Green wavy line	Sufficient filling level
Yellow wavy line	Refilling will soon be necessary
Red wavy line	Empty bottle, dosing is no longer possible.

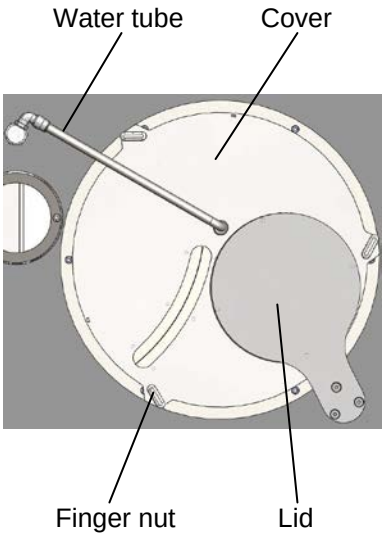
> ***Note:***
> For details, please see the section *Suspensions and Lubricants* in Chapter 3, *Configuration*.

- Touch the green right arrow to continue.

- Make sure the main hood is closed.

- Touch the grinding disc to select the appropriate grinding stone or diamond grinding disc and touch the *Yes* key to confirm that you want to change/insert a new disc.
  The dresser will move up and to the side and the lid over the stone opening will move away.

Mounting a Grinding Stone/ Diamond Grinding Disc



- Open the main hood.
- Move the water tube on the plane grinding station into an upright position.
- Unscrew the three finger nuts and remove the cover over the stone
- Remove the screw and the washer, place the grinding stone or diamond grinding disc on the driving plate - make sure that the two pins from the driving plate engage in the two holes at the bottom of the grinding stone or diamond grinding disc.
- Replace the washer and the screw and securely tighten the screw with the 8 mm Allen key.
- Replace the cover over the stone and secure with the three finger nuts.
- Move the water tube down into the correct position.
- Close the main hood of Hexamatic and the lid will move back to close the opening of the plane grinding station.
  When a grinding stone has been selected, the dresser will automatically move to find the top of the stone. After the top of the stone has been found the dresser moves into its park position.

Note:
For details, please see the section *Grinding Disc* in Chapter 3, *Configuration*.

Note:
A new stone should always be dressed a couple of times before it is used for grinding. That ensures that it is plane and ready for use.
Please see the section *Manual Dressing* in Chapter 3, *Configuration*.

Note:
When a diamond grinding disc is selected the dresser will stay at the side of grinding chamber as it is not used.

When all parameters have been set, a summary is displayed on the last wizard screen:

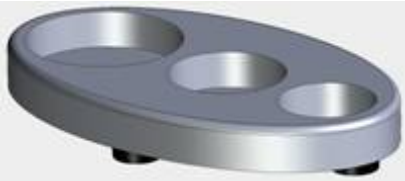
- Check that all settings are correct.
  If any changes have to be made, press the green left arrow to go back and make the changes, otherwise press the green right arrow to continue.

The *Main Menu* will then appear.

Clamping and levelling specimens

Individual specimens

Important!
The steel rings must be securely fixed on the specimen.



Levelling device

- Place the specimen in the appropriate hole in the levelling device.
- Slide the stainless steel retention ring over the specimen.
- Tighten the screw(s) with the Allen key.
- Transfer the specimen to the specimen mover plate.
- Arrange the specimens symmetrically around the centre of the specimen mover plate to ensure an even and balanced rotation.

In a Specimen Holder

If using a Uniforce Levelling device, please refer to the instructions in the Uniforce manual.

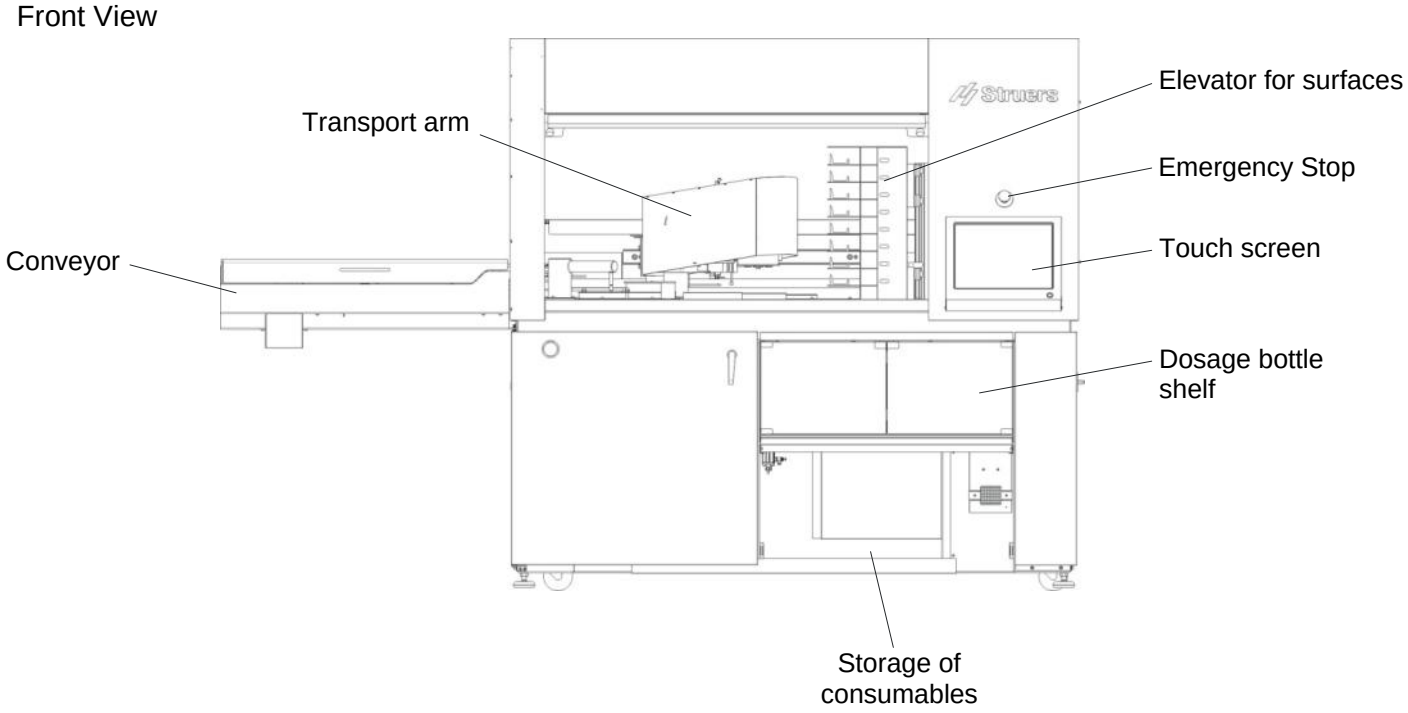
- Place the specimen holder on the Uniforce levelling device or on a levelling disc.
- Arrange at least three specimens symmetrically around the centre of the specimen holder to ensure an even and balanced rotation.
- Clamp the specimens by carefully tightening the screws. Always choose a length of screw which will leave a minimum part of the screw projecting from the specimen holder and which uses the whole length of the thread through the specimen holder.
- After clamping, make sure that the fixation of the specimens is absolutely firm.

2. Introduction

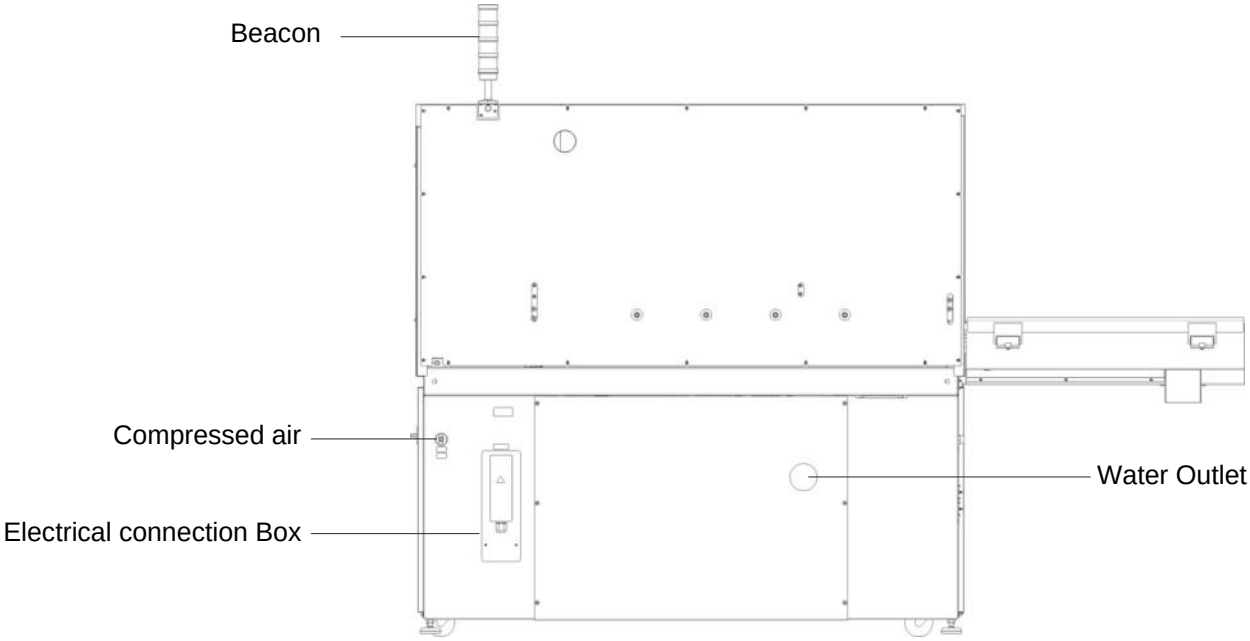
Your installation engineer will run through the basic components and functions of your Hexamatic upon installation.

Here is a brief overview of the main components:

Front View



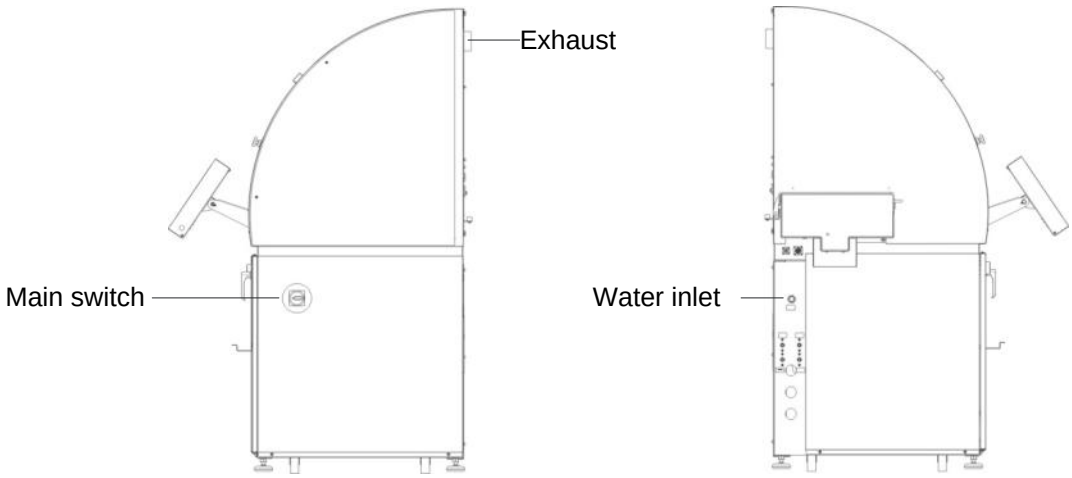
Rear View



Side View

Right side

Left side



The Software

On Hexamatic all programming and operation is carried out on the touch screen display mounted directly on the machine.
The touch screen display allows normal touch operations as well as drag and drop.
As soon as the Hexamatic is switched on, on the Main switch located at the right hand side of the machine, the PC will boot and load the operating software.
During start-up the following splash screen is displayed for a short while:

This screen displays the version number of the software.
Then the software automatically changes to the last screen displayed before the machine was switched off.

Navigating the Software

All operations are carried out on the touch screen display, by activating different areas of the screen.

Main Menu

From the *Main Menu* all functions can be reached.

To activate a different menu or function, simply press the key associated with this function and a new screen will open.
For example pressing the **Preparation** key will open the *Preparation Menu*.

From here new sub-menus can be activated or, the now active, green left arrow can be pressed to return to the previous screen.

Shortcuts

To quickly access different menus and screens a dash board is available:

- Press the dark grey area at the bottom of the screen and the dash board opens.

Dash Board

The dash board is divided into 3 different sections.
More Functions, Main and Recent

Main

The *Main* section in the center is always the same, allowing you to quickly go to the **Main Menu**, or to **Log off** the current user.

More Functions

The *More Functions* section at the left displays additional functions for the actual screen. They are placed there as they are used only occasionally, to avoid cluttering the screen.

Recent

The *Recent* section at the right displays the most recently used functions for fast activation.

Selecting Parameters

To select a parameter:

- Press the value directly or press the right or left arrow on the wheel to move from one parameter value to the next.
  The first touch selects a step or a value, the second touch opens the step or expands the value box.

Changing Parameters

There are several ways to edit and change parameters.

- Select the parameter to be changed, e.g. *Time*.

  The square box around the parameter value indicates the selection.
  Press the parameter again and a box appears with the values that can be selected. A scroll bar is shown if more values than displayed are available.
  Another way to activate the box is by pressing the green **Edit** button in the center of the wheel at the lower right corner of the screen.

Note:
All the values available may not appear in a scroll box (to avoid long scroll boxes). Select the closest value in the scroll box then use the up/down arrows to change the value with smaller steps.

- Select the desired value. This value will be inserted and the box closes.
  Or
  Press the up or down arrow on the wheel to select a different value and close the box by pressing **OK**.

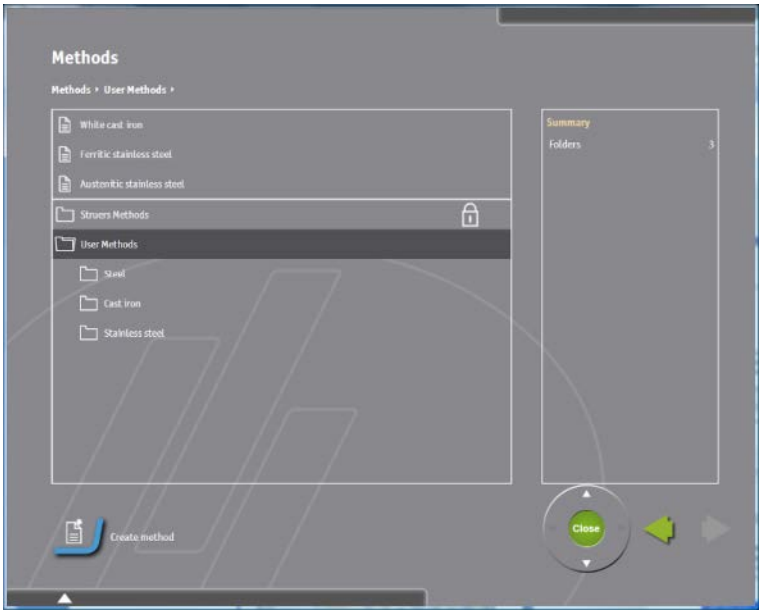
The arrows on the wheel can also be used to increase or decrease a selected value directly, but then the box with the possible values will not be displayed.

- Alternatively, touch the wheel and move your finger clockwise or counter-clockwise around the wheel.
  Moving clockwise increases the value and moving counter-clockwise decreases the value.

Note:
It is not necessary to save any changes to preparation methods.
All changes are automatically saved.

Methods

In the *Methods* Menu all preparation methods are saved.
Basically, all methods are saved in 2 Main folders, *Struers Methods* or *User Methods*.
The *Struers Methods* are pre-installed and as indicated by the lock to the right are protected against modification and deletion.
The folder *User Methods* is empty upon installation and is populated gradually as new methods are developed.

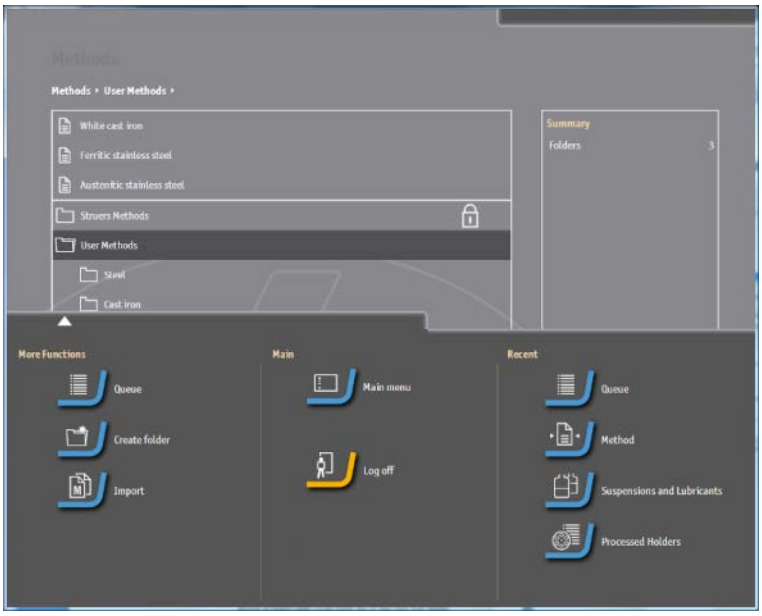


Methods can be placed directly in the *User Methods* folder, however, it is recommended to create sub folders to facilitate structuring the database.
The sub folders can either be named by material groups as shown above or every user could have an individual sub folder.

Creating Folders

To create a new folder:

- Select the top level folder where the new folder should be placed, then activate the dash board and select **Create folder**.



A ******new folder****** is created under *User Methods*.

- Touch the **Rename** key and the on-screen keyboard will pop-up.

- Type the name of the new folder and press **Enter**.

The new folder is now displayed with its correct name.
As the folder is still empty, the folder icon itself is displayed in a slightly darker colour.

Creating Methods

To create a new method:

- Select the folder where the method should be placed. Touch the **Create method** key and a new, empty method is created in that folder.

- Rename the method then touch the method name to open the method.

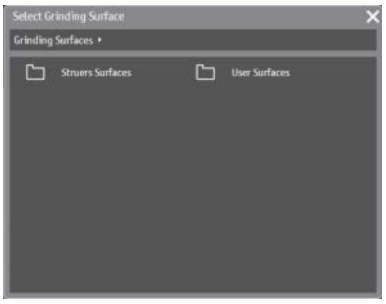
- Press the **Create** key

- Select the first step to be added, typically plane grinding.

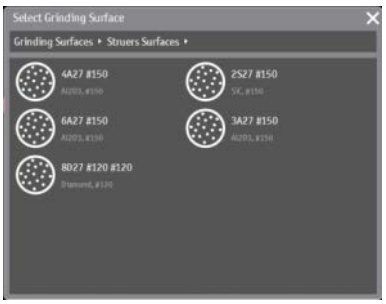
A plane grinding step is inserted and the red text at the left hand side indicates that this step has not been configured completely.

Note:
You will not be allowed to leave a method with incomplete steps, therefore there is no green left arrow.

- Touch the box next to the surface icon and a selection box will appear:



- Select either **Struers Surfaces** or **User Surfaces** and a sub-menu displaying the available plane grinding consumables shows.



- Touch the requested grinding disc. This disc will be selected and inserted into the preparation method.

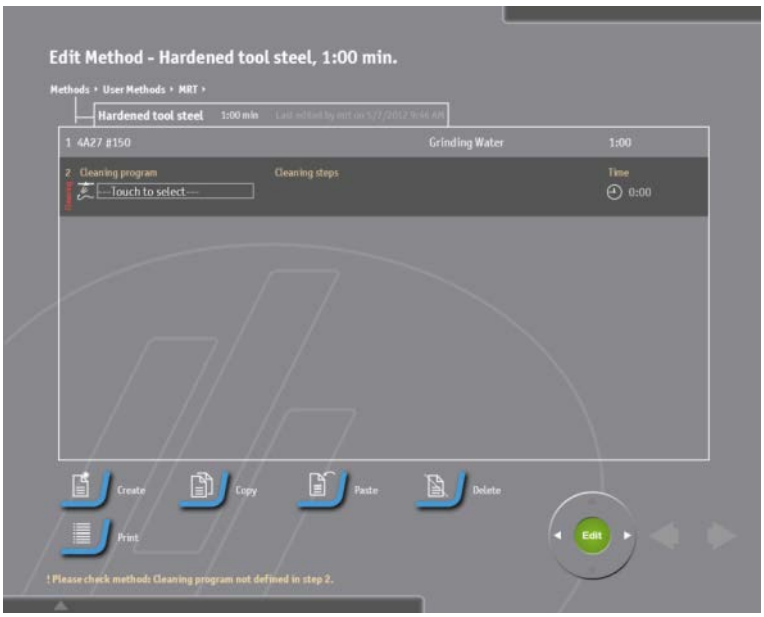
Now the force can be adjusted, time or removal can be selected, and depending on this selection either the grinding time can be set or a removal value can be specified.
The dresser removal value can also be set for this particular step.
Direction is greyed out as that cannot be changed on a plane grinding step.
All necessary parameters have been set, therefore the text Plane Grinding at the left hand side is no longer displayed in red and the green left arrow is active, indicating that you actually could leave the method now.

However, you still need to create several steps including cleaning to have a complete preparation method.

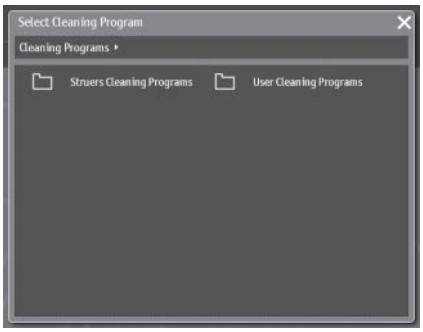
> ***Note:***
> Insert a cleaning step between different preparation steps to avoid contamination from a coarse preparation step to a finer one.

Inserting a Cleaning Step

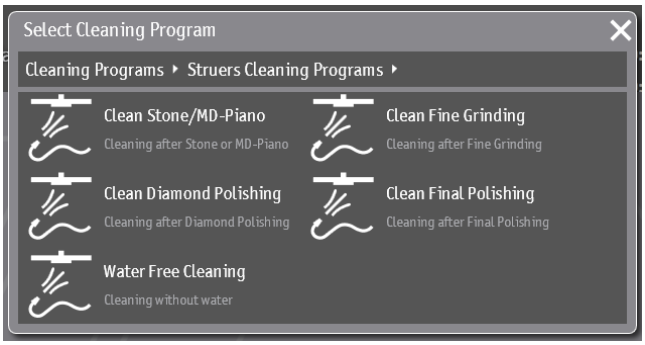
- Press the **Create** key to create the next step.
- Touch the *Cleaning Programs* box in the cleaning step and a selection box will appear.



- Select either *Struers Cleaning Programs* or *User Cleaning Programs.*



A sub-menu displaying the available cleaning programs will appear.



- Select a cleaning program and it will automatically be inserted into the preparation method and the individual sub-steps will be displayed.

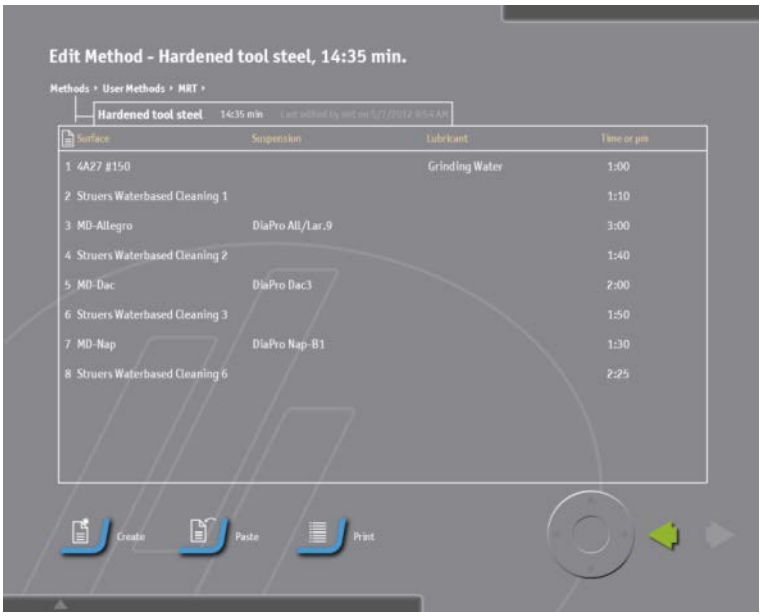
Creating a fine grinding or polishing step

To create a fine grinding or polishing step:

- Press the **Create** key and select either fine grinding or polishing. This selection will in the following display different consumables for easier selection.

- Select and set all the different parameters before continuing with the next step.

- Continue step by step until the entire preparation method has been programmed.



- Press the green left arrow to return to the *Methods* screen.

Signals: Beacon and Siren

Beacon

The beacon mounted on top of Hexamatic signals the current condition of the machine.

Green	Hexamatic is busy preparing specimens.
Yellow	Attention required All specimens are prepared and Hexamatic is idle or consumables have to be refilled or exchanged
Red	An unexpected stop has occurred and requires immediate attention

Siren

The siren is a configurable signal for directing attention to the some of the state changes to "Emergency" and "Stopped".

Emergency state:	signaled by a repeated series of a beep and a short pause
Stopped state:	signaled by a repeated series of a beep and a long pause

The siren can be stopped by acknowledging the pop-up message. The siren can also be stopped via the dedicated on-screen button.

Overview of Signals

State	"**Operating**" Green light Operation is in progress.	"**Stopped**" Yellow light Operation is stopped. A caution or marginal condition is detected, and attention is required.	"**Attention**" Yellow light Stopping is impending. A caution or marginal condition is detected, and attention is required.	"**Emergency**" Red light Operation is stopped. A protective device is engaged, or immediate action is required to deal with a hazardous condition.
Event				
Start or Continue is pressed	State change ⇨ **Operating**	State change ⇨ **Operating**		
Consumable missing/low on a holder in the queue				State change ⇨ **Attention**
Consumable low on the holder being processed				State change ⇨ **Attention**
Consumable missing on the holder being processed			State change ⇨ **Stopped** **Siren ON**	State change ⇨ **Stopped** **Siren ON**
Process is complete			State change ⇨ **Stopped**	State change ⇨ **Stopped**
Manual stop is pressed			State change ⇨ **Stopped**	State change ⇨ **Stopped**
Conveyor hood hazard			State change ⇨ **Emergency**	State change ⇨ **Emergency**
A door is opened			State change ⇨ **Emergency**	State change ⇨ **Emergency**
Emergency stop is pressed			State change ⇨ **Emergency**	State change ⇨ **Emergency**
Thermal overload	**Siren ON**	State change ⇨ **Emergency** **Siren ON**	State change ⇨ **Emergency** **Siren ON**	State change ⇨ **Emergency** **Siren ON**

3. Configuration

The *Configuration* screen is used to edit the configuration of consumables (disc / cloth, lubricants, suspensions), cleaning programs, dressing of the grinding stone and various options.

Editing Configuration Settings

- From the *Main Menu* press the **Configuration** key to open the *Configuration* screen.

Consumables

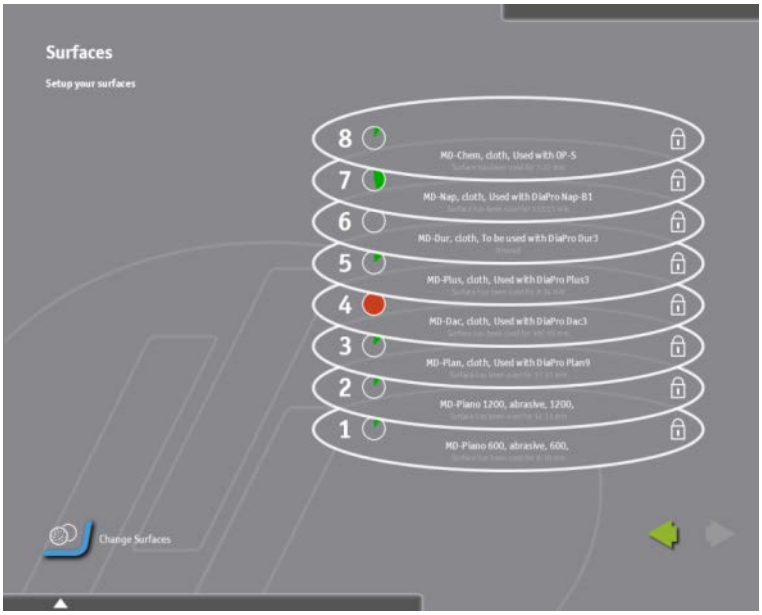
In the *Consumables* screen the preparation surfaces in the elevator, the suspensions and lubricants in the bottles and the grinding disc can be configured.

Surface lifetime allows you to specify the lifetime of the different MD-Consumables used for preparation.

It is also possible to define your own surfaces, suspensions and lubricants under **User Defined Consumables**.

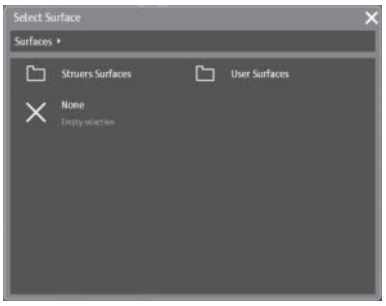
Surfaces

- To change the grinding surface or polishing cloth on one of the stations press the **Surfaces** key.

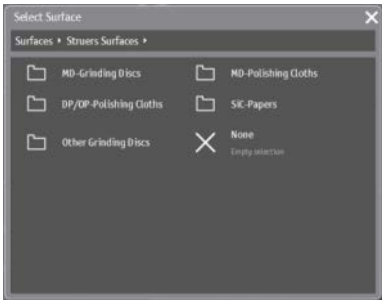


- To change the preparation surface on a certain position touch this position.

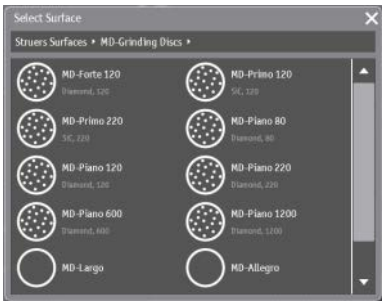
- Touch the consumable name on the surface and a selection box appears.



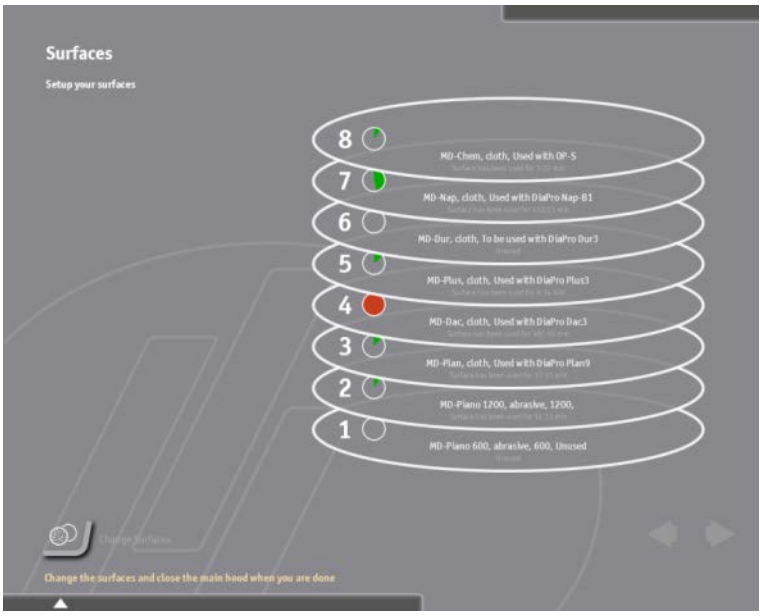
- Touch either **Struers Surfaces** or **User Surfaces** and a second selection box opens.



- Touch the appropriate sub-group of surfaces to open the next menu level.



- Touch the required preparation surface to return to the *Surfaces* screen. The correct preparation surface is now displayed.



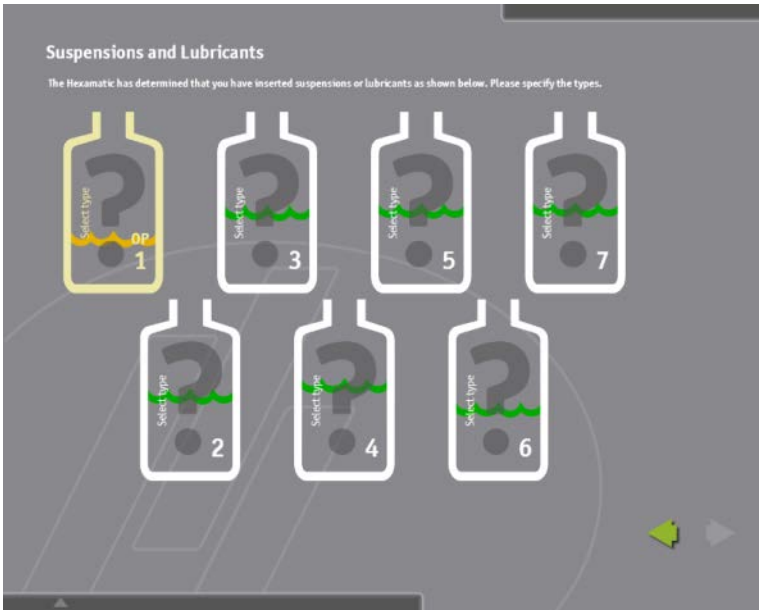
- When all the surfaces are correct touch the green left arrow to return to the *Consumables* screen or use the **Dash Board** to activate a different function.

Suspensions and Lubricants

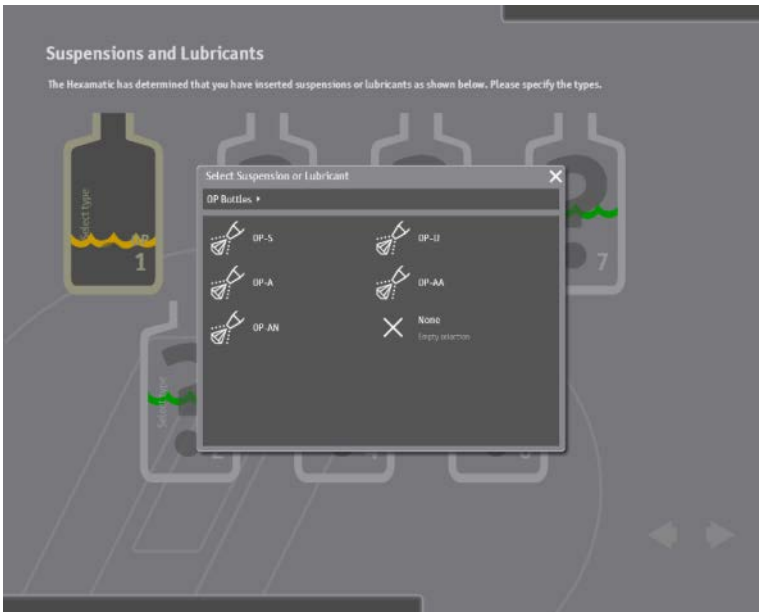
- To configure the contents in the different bottles for suspensions and lubricants touch the **Suspensions and Lubricants** key.

  Empty bottles with no suspension or lubricant configured are indicated with a yellow warning triangle and a red wavy line.

- Fill the bottles with the required suspensions and lubricants and the indications will change.

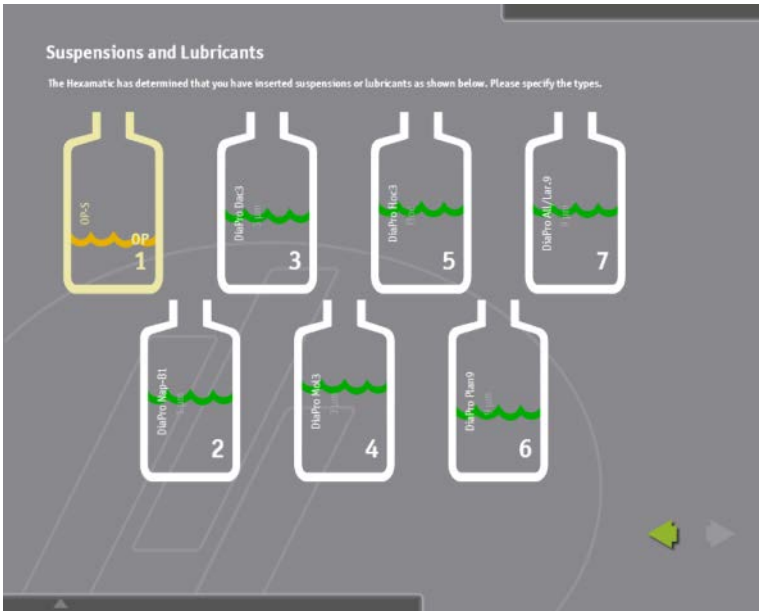


- Touch the bottle to be configured and a selection box appears.



- Select the correct suspension.
  This suspension will now be assigned to the selected bottle.

- Repeat to select suspensions and lubricants for the other bottles.



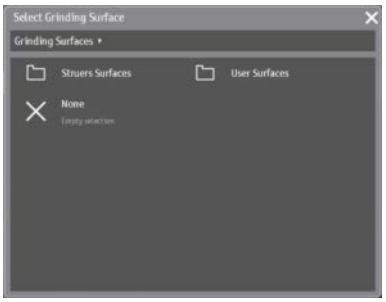
- Bottles from 1 to 7 are now defined with the correct suspensions or lubricants.

- When all the bottles are configured correctly touch the green left arrow to return to *the Consumables* screen or use **the Dash Board** to activate a different function.

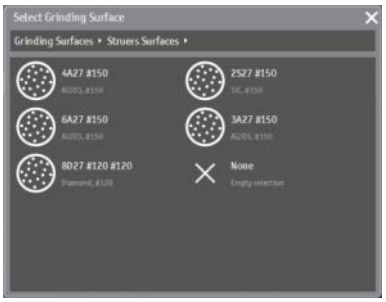
Grinding Disc

- To configure the grinding disc to be used touch the **Grinding disc** key.

- Touch the grinding disc to change to a different type.

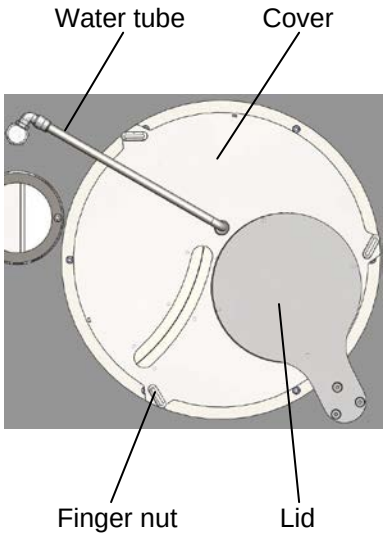


- Select **Struers** or **User Surfaces**.



- Select the correct grinding stone or diamond grinding disc.

- Press **OK** and the dresser will move up and to the side and the lid over the stone opening will move away.



- Open the main hood.
- Move the water tube on the plane grinding station into an upright position.
- Unscrew the three finger nuts and remove the cover.
- Remove the screw, the washer and the grinding disc.
- Clean the grinding station with clean water from the cleaning hose.

Note:
When using the cleaning hose to clean the grinding station, the water will run into the recirculation cooling unit.
Make sure that the recirculation cooling unit does not overflow!
Add some extra Struers additive, Corrozip to maintain the correct concentration.

Alternatively, pull out the recirculation tank and place a bucket underneath the drain tube of the grinding station to avoid filling the recirculation cooling unit.

- Place the new grinding stone or diamond grinding disc on the driving plate and make sure that the two pins from the driving plate engage in the two holes at the bottom of the grinding stone or diamond grinding disc.
- Replace the washer and the screw and tighten the screw securely with the 8 mm Allen key.
- Replace the cover and secure with the three finger nuts.
- Move the water tube down into its correct position.
- Close the main hood of Hexamatic.
  The lid will move back to close the opening of the plane grinding station.
  When a grinding stone has been selected, the dresser will automatically move to find the top of the stone. After the top of the stone has been found the dresser moves into its park position.

- When all the surfaces are correct, touch the green left arrow to return to the *Consumables* screen or use the **Dash Board** to activate a different function.

Note:
When a new grinding stone has been installed, it should be dressed a couple of times to make sure that it is in perfect working condition.
Please see the chapter on *Manual dressing* for information.

Surface Lifetime

- To adjust the lifetime used to signal when a specific polishing cloth or grinding disc should be replaced select **Surface Lifetime** in the *Consumables* Menu.

- To set or change the values for the surface lifetime, press **Surface Lifetime** key.

- The first column "*Calculated*" records the time a certain MD-Surface has been used for and starts displaying a value as soon as 3 values (changing the consumable 3 times) have been registered. The average value will be displayed.

- The second column, "*Configured*" is used to set your own values, based on your experience. The surfaces that have been used on Hexamatic are displayed already, but other surfaces that you might want to use in future can be added by pressing the key **Add surface.**

User Defined Consumables

- To configure your own preparation surfaces, suspensions or lubricants touch the **User Defined Consumables** key.

User Surfaces

- To configure your own preparation surface touch the **User Surfaces** key.

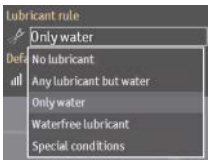
- Press the **Create** key to create a new surface.

- Press the **Rename** key to name the newly created preparation surface.

- Use the on-screen key board to provide a describing name for the new surface and press the **Enter** key to return to the previous screen.

- Touch the **Surface type** field to select between **User defined surface** or **User defined stone**.
  A User defined stone can only be used on the plane grinding station.
  A User defined surface can be used on position 2.

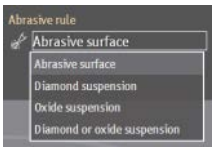
- Touch the **Lubricant rule** field to specify the lubricant that should be used on the user defined surface.



Five different selections can be made:

No lubricant:	The surface is used without any lubricant, i.e. with DiaPro or DiaDuo suspension.
Any lubricant but water:	All lubricants except water can be selected.
Only water:	This surface is only to be used with water.
Waterfree lubricant:	This surface is only to be used with a water-free lubricant.
Special conditions:	This selection is reserved for future possibilities.

- Touch the **Abrasive rule** field to specify the surface.



Four different selections can be made:

Abrasive surface: The abrasive is contained in the surface already, no suspension is added. Water will automatically be selected as lubricant.

Diamond suspension: This surface is only to be used with diamond suspensions.

Oxide suspension: This surface is only to be used with oxide polishing suspensions.

Diamond or oxide suspension: This surface can be used with either diamond or oxide polishing suspension.

Note:
Depending on the selection made here, the appropriate suspensions and lubricants will be displayed when a new method or preparation step is created.

- Touch the **Default speed** field to select the correct speed for the surface.
  Speeds from 500 - 1500 rpm can only be used on the plane grinding position.
  For all consumables used on position 2 speeds between 50 and 500 rpm can be selected.

Note:
For abrasive surfaces a default speed of 300 rpm is recommended whereas the surfaces that are used with suspensions have a recommended speed of 150 rpm.

- Touch the **Default pre-dosing** field to select the correct value.
  Pre-dosing is used on surfaces that are used with diamond or oxide polishing suspensions. Depending on the type of cloth and suspension pre-dosing values of 2 – 5 are recommended.

When all the parameters are configured correctly touch the green left arrow to return to the *User Consumables* screen or use the **Dash Board** to activate a different function.

User Suspensions

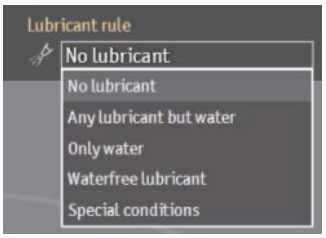
- To configure your own suspension press the **User Suspensions** key.

- Press the **Create** key to create a new suspension.

- Press the **Rename** key to name the newly created suspension.

- Use the on-screen key board to provide a describing name for the new suspension and press the **Enter** key to return to the previous screen.

- Touch the **Abrasive type** field to select between Diamond or Oxide. Diamond should of course be selected for all types of diamond suspensions.
  Oxide is selected for colloidal silica, Al_2O_3 or other oxide polishing suspensions.
- Touch the **Lubricant rule** field to specify if and what kind of lubricant is to be used with the suspension.



Four different selections can be made:

No lubricant:	The suspension already contains a lubricant; no additional lubricant is added during preparation.
Any lubricant but water:	Both water-free and water-based lubricants can be used together with the suspension.
Water-free lubricant:	The suspension should only be used with a water-free lubricant, e.g. for the preparation of water sensitive materials.
Special conditions:	This selection is reserved for future possibilities.

When all the parameters are configured correctly touch the green left arrow to return to the *User Consumables* screen or use the **Dash Board** to activate a different function.

User Lubricants

- To configure your own lubricant press the **User Lubricants** key

- Press the **Create** key to create a new lubricant.

- Press the **Rename** key to name the newly created lubricant.

- Use the on-screen key board to provide a describing name for the new lubricant and press the **Enter** key to return to the previous screen.

- Touch the **Lubricant type** field to select between **Containing water and WaterFree**, depending on the composition of the lubricant.

  When the parameter is configured correctly touch the green left arrow to return to the *User Consumables* screen or use the **Dash Board** to activate a different function.

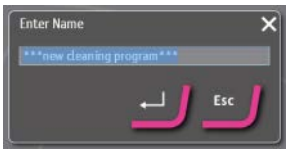
Cleaning Programs

In the Cleaning Programs screen you can define your own tailor made cleaning programs.

- From the *Configuration* screen press the **Cleaning Programs** key. The *Cleaning Programs* screen will open.

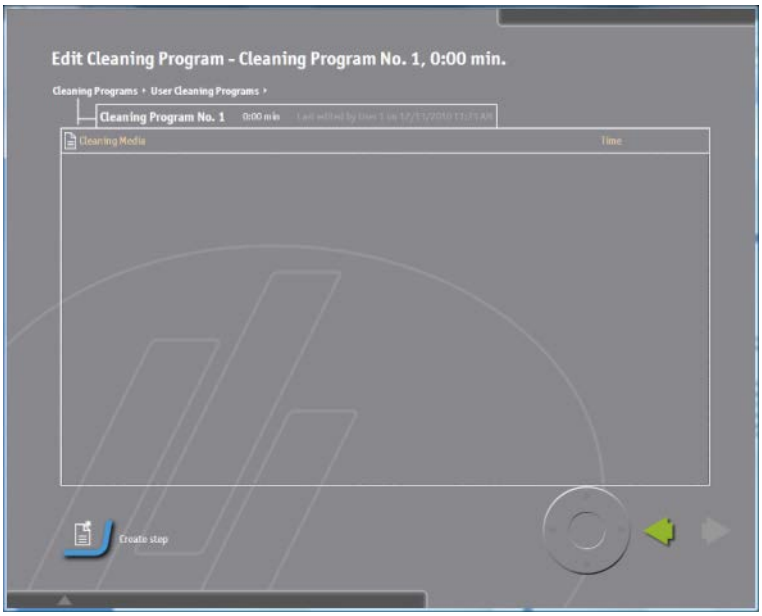
- Press the **Create** key to create a new cleaning program.

- Press the **Rename** key to name the new cleaning program.



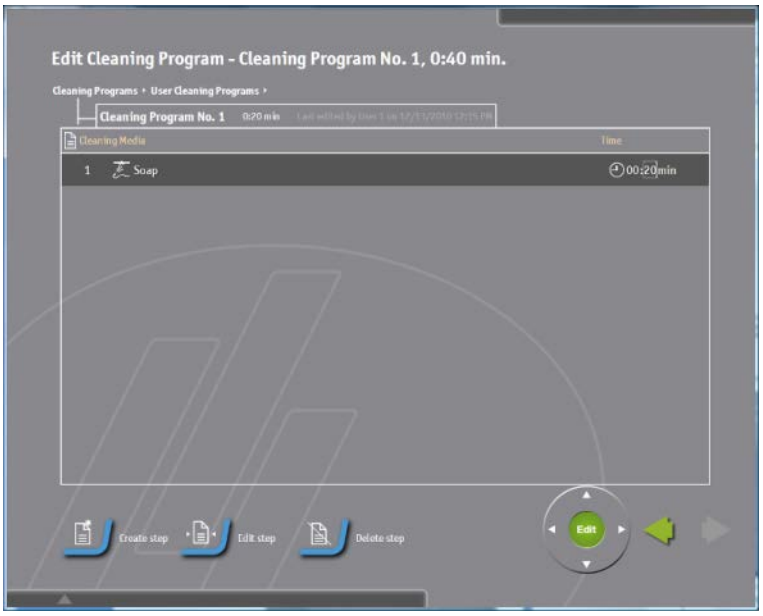
- Use the on-screen key board to name the cleaning program and press the **Enter** key to return to the previous screen.

- Touch the cleaning program to open it up for modification.



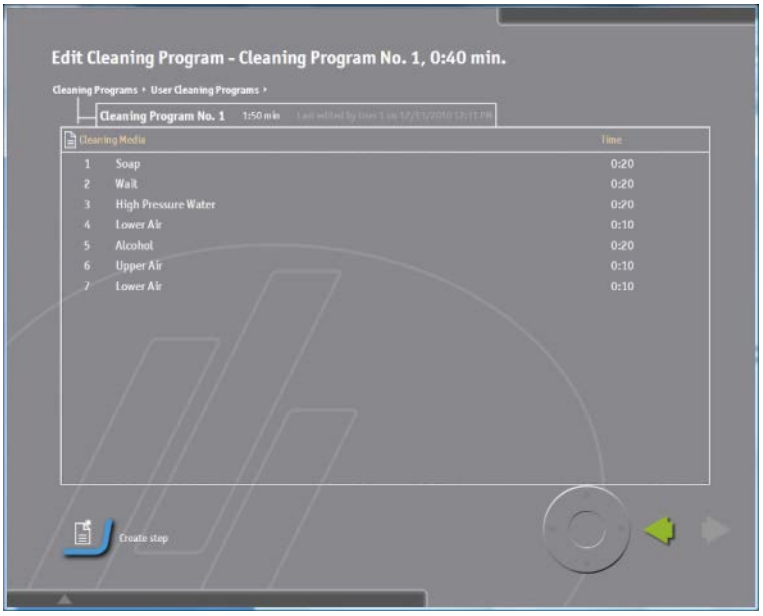
- Press the **Create step** key to start creating steps within the cleaning program.

9 different steps can be combined into a cleaning program. Depending on the type of material to be cleaned and the preparation step that has been carried out, different combinations can be selected.



- Select the step to be included in the cleaning program.
- Set the required time for that particular step.
- Keep creating steps until the cleaning program is completed.

A standard cleaning method could like that this:

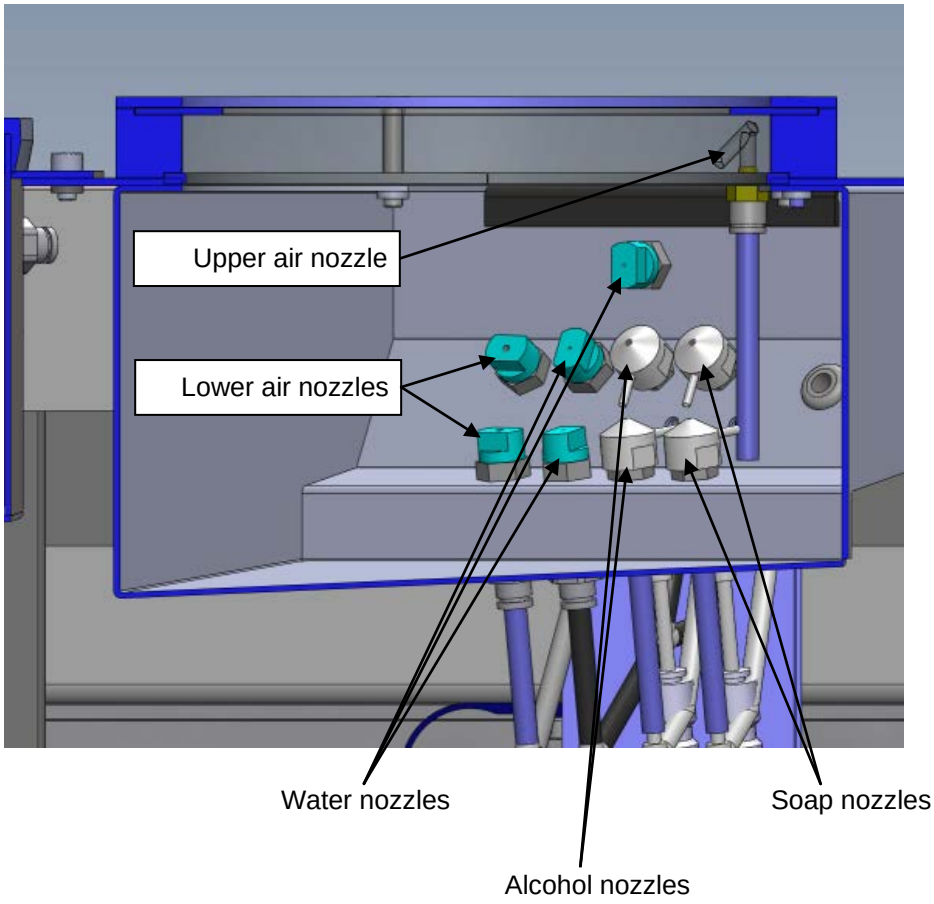


Note:
The Hexamatic software already contains pre-defined Struers cleaning programs which can be used for most requirements.
These programs can also be used as a starting point for modifications instead of creating a new cleaning program from the beginning.

Cleaning Chamber

The cleaning chamber contains 10 nozzles for different purposes.

Air nozzles



There are three air nozzles, two for drying the specimens and the holder from underneath, and one for drying the holder from above to avoid water from being left on top of the holder and running down after end cleaning. They can be activated independently by using *Lower air* (2 nozzles underneath) or *Upper air* (1 nozzle above), or together by using *Upper and Lower air*.

Water nozzles

The two water nozzles are used for either *High pressure water* or *Low pressure water*. They are always activated together.

Alcohol nozzles

The two alcohol nozzles are used to apply alcohol after rinsing the specimens with water. They are always activated together.

Soap nozzles

The two soap nozzles are used to apply soap solution on the specimens before cleaning. They are always activated together.

Cleaning programs are based on the sequential use of the different functions.
User defined cleaning programs should also be set up to use the different possibilities in the most effective way.

Configure Preparation

In the *Configure Preparation* screen you can adjust various parameters.

- From the *Configuration* screen press the **Configure Preparation** key.
  The *Configure Preparation* screen will open.

Surface Preparation

When a completely new preparation surface is used, some extra predosing is necessary for optimum performance.
To do that automatically,
set "*Multiply predosing times on a new surface*" to **Yes**.

The value on "*Multiply predosing times on a new surface*" can be set between 1 – 10.

Ultrasonic Tub

Depending on the type of soap used for ultra sonic cleaning, different concentrations can be necessary.
The value on "*Soap concentration*" can be set between 0 – 5%.

To allow for an automatic exchange of liquid,
set "*Automatic exchange of cleaning liquid*" to **Yes**.

Specify how often the liquid should be changed by setting the parameter on
"*Exchange cleaning liquid after using it*" to a value between 1 – 100.

Drying of Holder

It is possible to dry the specimens after the preparation is finished and the next holder has been moved into the Hexamatic.
To enable drying, set "*Drying on*" to Yes.
Set "*Drying time*" to a value of max. 9 minutes 50 seconds.

Configure Holder

Upon delivery of Hexamatic, the default setting showing up in the **Queue** picture when inserting a specimen holder or specimen mover plate in the conveyor is ***Single*** (for individual specimens in a specimen mover plate).
This default setting can be changed, depending on individual preferences.
Where only specimen holders or only specimen mover plates are to be used, it is not necessary to have the option of changing between the two types.
In this case "*Enable holder type selection*" should be set to **No.**
"*Default holder type*" must then be set to either ***Holder***, when using specimen holders or ***Single*** when using specimen mover plates.
When both types are used, the "*Enable holder type selection*" must be set to **Yes**.
"*Default holder type*" can be set to either ***Holder*** or ***Single***, depending on which one is used most.

> ***Important:***
> When a specimen mover plate for individual specimens is used, always make sure that ***Single*** is selected.
> Otherwise the specimen mover plate will not be in the correct position relative to the pressure feet and the individual specimens will not be loaded with a minimum force. This can result in specimens being thrown out of the specimen mover plate and damage the specimens, the specimen mover plate and the machine.
> As an extra safety, Hexamatic has a built-in check for the type of specimen holder/specimen mover plate used, and a wrong selection will result in an error message.

To save time, the most recent method used can be set as a default by setting *Use most recent preparation method as default method* to **Yes**. This is particularly useful when preparing a large number of identical samples.

OP Flush Time

The OP flush time can be set to a value between 0 – 60 seconds, the default being 15 seconds. We recommend using at least 15 seconds of flushing to avoid tubes becoming clogged.

Configure Dressing

In the *Configure Dressing* screen you can adjust the parameters for the dressing of the grinding stone.

- From the *Configuration* screen press the **Configure Dressing** key.
  The *Configure Dressing* screen will open.

Grinding on the grinding stone can either be carried out for a specified time or to remove a specific amount of material. When removal is selected, *Automatic dressing during process* should be enabled (set to **Yes**).
Hexamatic will then monitor the removal rate, and dress the stone as soon as the removal rate decreases below a certain level.

The dresser sensitivity can be set to a level between 20 to 100 %:

A low setting, 20 – 40%	allows the removal rate to get quite low before the stone is dressed
A high setting, 70 – 100%	will activate the dresser if the removal rate only decreases slightly.

Note:
High sensitivity - the stone is dressed more often, thus reducing the lifetime and increasing the cost.
Low sensitivity - dressing is less frequently and can thus increase the preparation time.

Select the appropriate level for your preparation requirements.

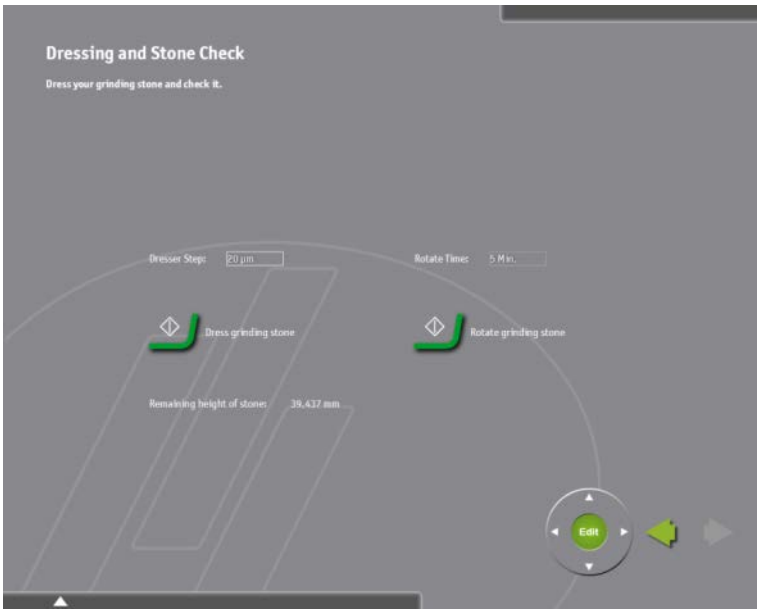
When grinding is carried out for a specific time, *Automatic dressing after process* should be enabled (set to **Yes**) to make sure that the stone is working perfectly when a new set of specimens is prepared. *Automatic dressing during process* should also be enabled when longer grinding times > 30 seconds are selected. This will provide an efficient, sharp grinding stone at all times.

Note:
The dressing settings are not available if a *Diamond Grinding Disc* or *No Disc* has been specified.

Manual Dressing

Manual dressing of the stone can be activated from the *Configure Dressing* screen.

- Press the **Manual dressing** key.
  The *Dressing* screen will open.



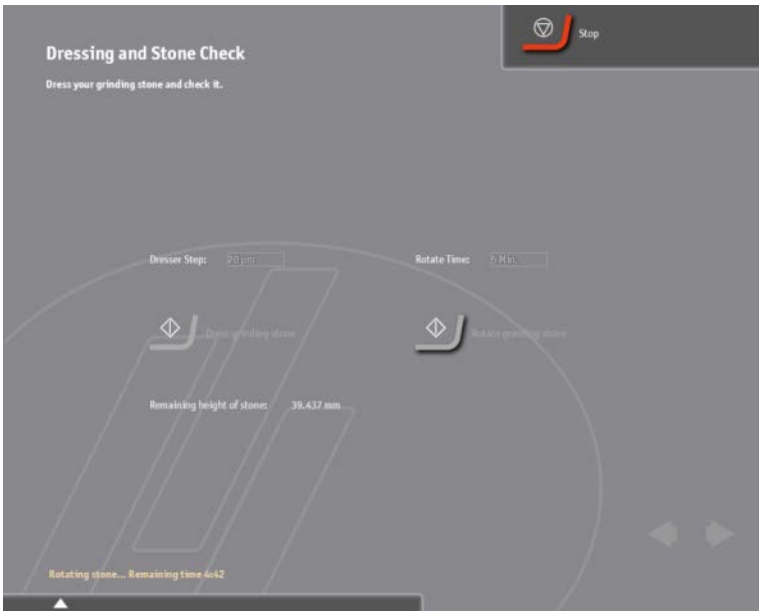
The dresser step can be set from 20 to 100 µm in intervals of 10 µm.

> ***Note:***
> The dresser steps should be large enough to adequately dress the stone resulting in an active and plane stone surface.
> At the same time the steps should be as small as possible to achieve the longest possible lifetime of the stone.

- Press the **Dress grinding stone** key to activate the manual dressing process.

Dressing and Stone check

After a new stone has been installed the stone can be rotated for a specified period of time to make sure that the stone is not damaged and is rotating properly.



The time can be set between 1 and 9 minutes in steps of 1 min.

- Press the ***Rotate grinding stone*** key to activate the test procedure.

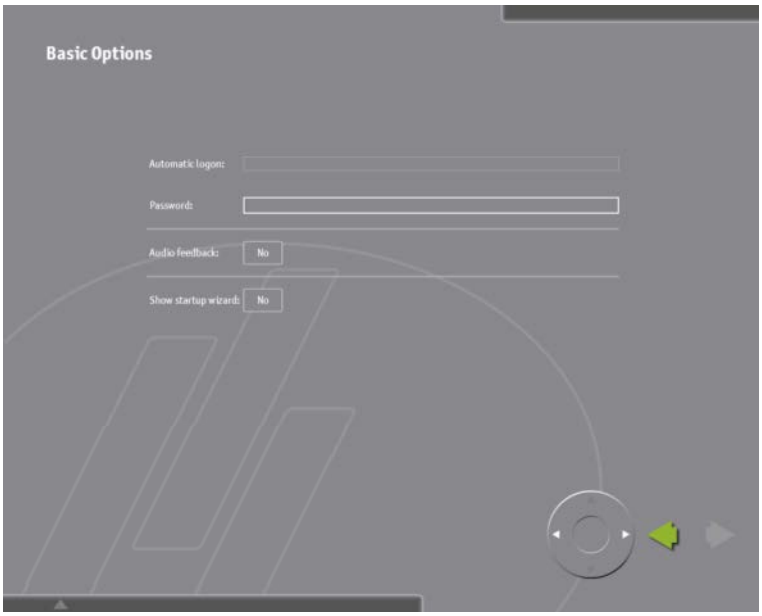
Options

In the *Options* screen there are several sub-menus to adjust and define various settings.

- From the *Configuration* screen press the **Options** key.
  The *Options* screen will open.

Basic Options

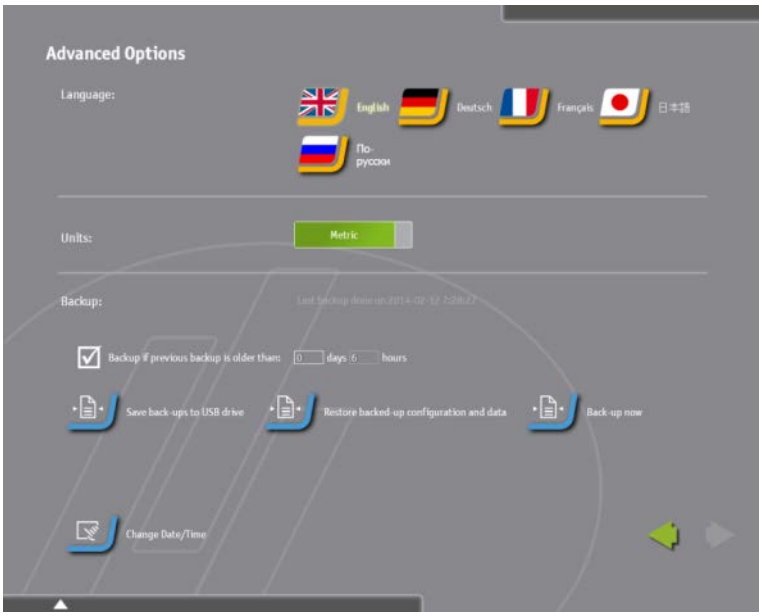
- Press the **Basic Options** key to open the underlying screen. The *Basic Options* screen will open.



Automatic logon:	A specific user can be selected to be logged in automatically every time Hexamatic is started. This function should not be used if several users with different access levels are using the machine frequently.
Password:	When automatic logon is used, the password associated with this user must be entered if a password has been created in this profile.
Audio feedback:	Can be set to **Yes** or **No** to enable or disable audible feed-back when activating keys on the touch screen.
Show start-up wizard:	Displays the different configuration screens during machine start-up. This function is normally only enabled during the very first start of Hexamatic.

Advanced Options

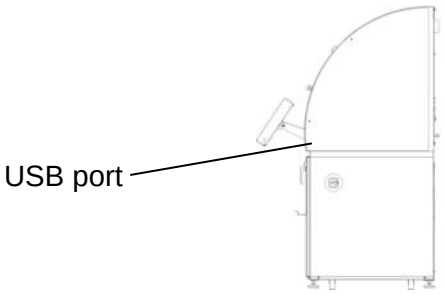
- Press the **Advanced Options** key.
  The *Advanced Options* screen will open.



Language: Pressing one of the flags activates the associated language.

Units: Toggles between Metric and US/Imperial units.

Backup: Specifies various back-up options.
The user can select Backup interval and to save or restore a Backup configuration.



Date/Time: The date and time settings can be changed in this screen.

Users

- Press the **Users** key.
  The *Users* screen will open.

- Press the **Create User** key to create a new user and use the on-screen keyboard to enter a name for the new user.

- Press the **Enter** key to return to the previous screen.

Specify the group to which the new user should belong.

- Touch the **Group** field and select between *User* or *Administrator*.

  The table below shows the different actions the individual user can perform.

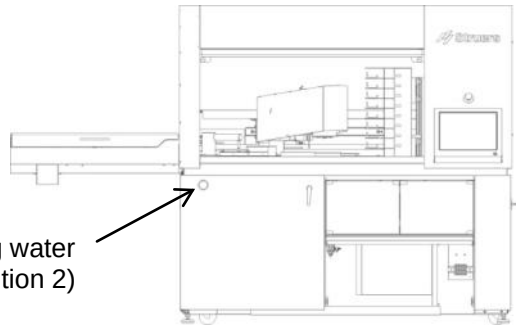
Action	User	Administrator
view methods	Yes	Yes
create/ edit/ delete user methods		Yes
create/ edit/ delete cleaning programs		Yes
create/ edit/ delete user consumables		Yes
create/ edit/ delete users of type User or Administrator		Yes
export methods	Yes	Yes
import methods		Yes
import consumables table		Yes
print methods /cleaning programs/ processed holders	Yes	Yes
add holders to queue	Yes	Yes
run queue	Yes	Yes
setup consumables (lub/sus/surf)	Yes	Yes
change basic and advanced options		Yes

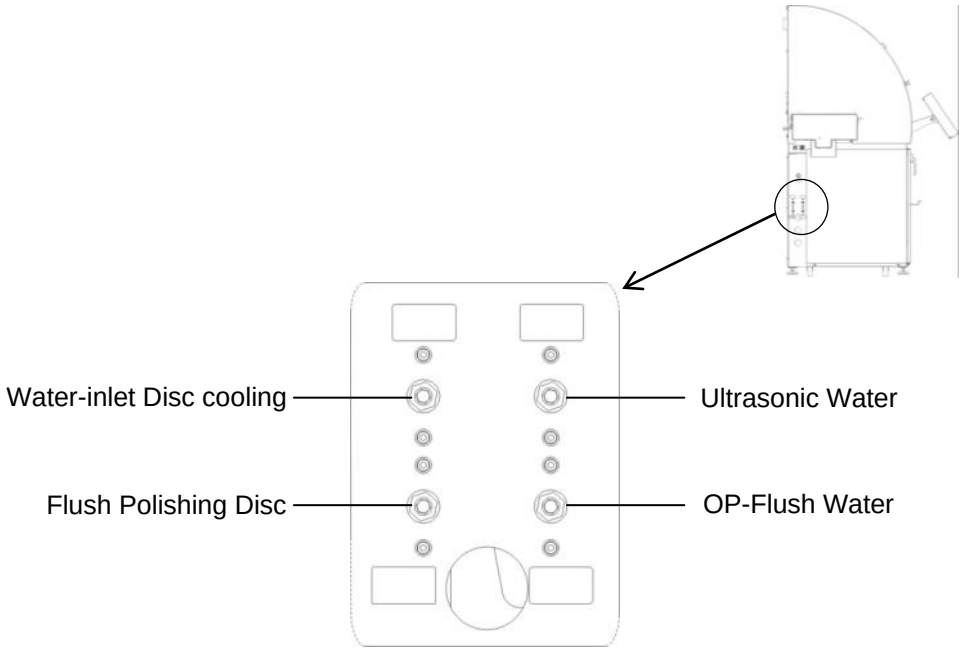
- Touch the **Password** field and use the on-screen keyboard to type the password for the new user.

- Touch the **Retype password** field and use the on-screen keyboard to confirm the password for the new user.

4. Machine Adjustments

The water flow regulators on Hexamatic will be adjusted during installation.
Should you need to make further adjustments, the flow regulators are located on the front or the left side of Hexamatic.





5. Preparing Specimens

The *Preparation* screen is used for the daily preparation work, and probably the most used function of Hexamatic.

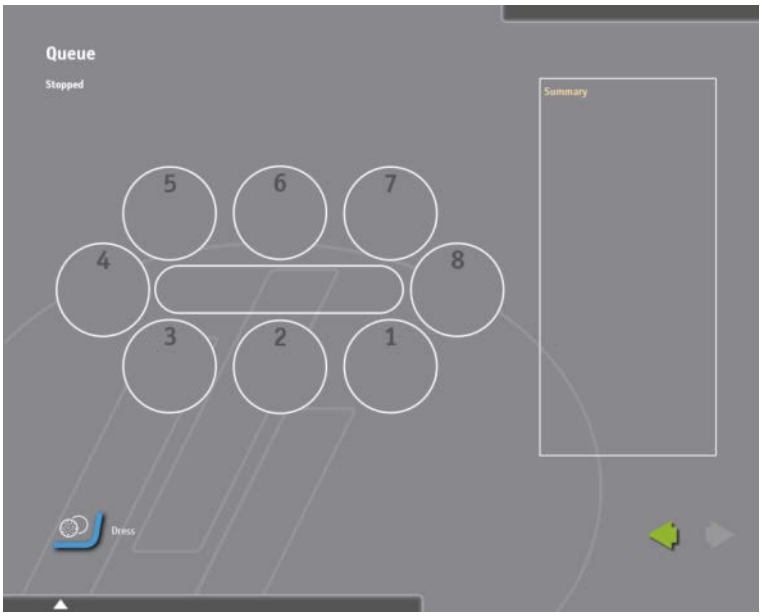
Activate Preparation Functions

- From the *Main Menu* press the **Preparation** key to open the *Preparation Menu*.

- From the *Preparation* Menu press **Queue**

Queue

In the *Queue* window the actual production of specimen holders is controlled.

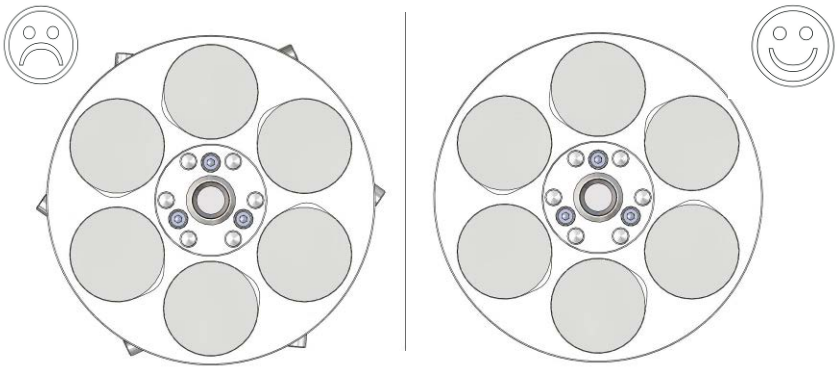


When entering the *Queue* screen for the first time no holders are displayed.

To start the preparation:

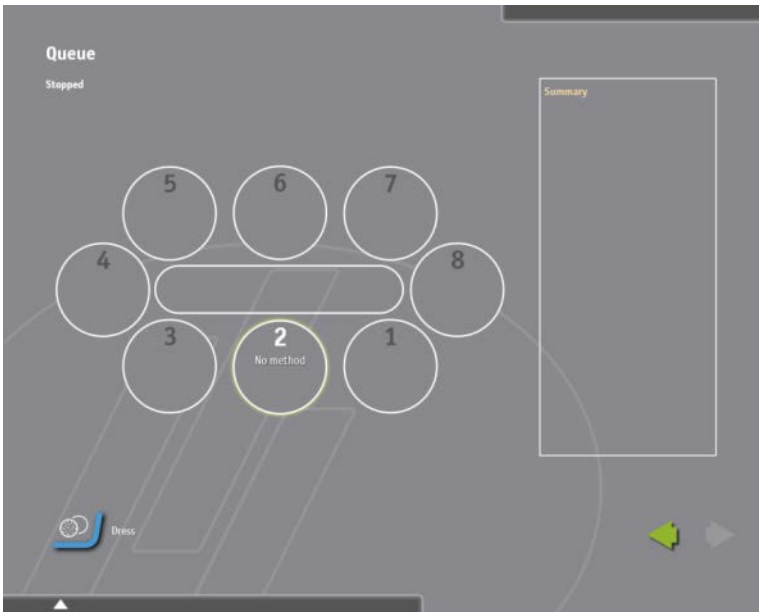
- Place a specimen holder or specimen mover plate with specimens in one of the positions on the conveyor.

Important:
When a specimen holder is used always make sure that the screws used for clamping the specimens do not protrude from the specimen holder. Otherwise the specimen holder will not be levelled correctly in the pick-up cup and cannot be picked up.



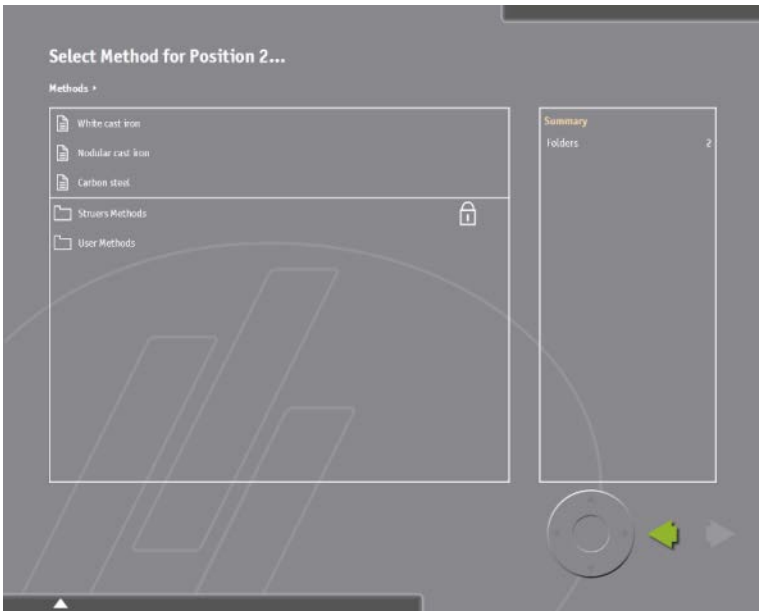
Important:
When a specimen mover plate for individual specimens is used always make sure that the specimen mover plate is balanced. That means a minimum of 2 specimens is required.
If the specimen mover plate is not balanced, this may result in tilting during transportation or pick-up leading to either machine damage or failure to pick up the specimen mover plate.

- The white position indicator changes to a yellow halo to indicate that a specimen holder / mover plate has been inserted; and the text "*No method*" appears.
  This will happen for every position where a specimen holder / mover plate is inserted to indicate that no preparation method has been selected yet.



- Touch **No method** and the *Methods* screen will open up automatically for easy selection of the appropriate preparation method.

Note:
The three preparations methods last used are displayed in the box at the top for easy and fast selection.

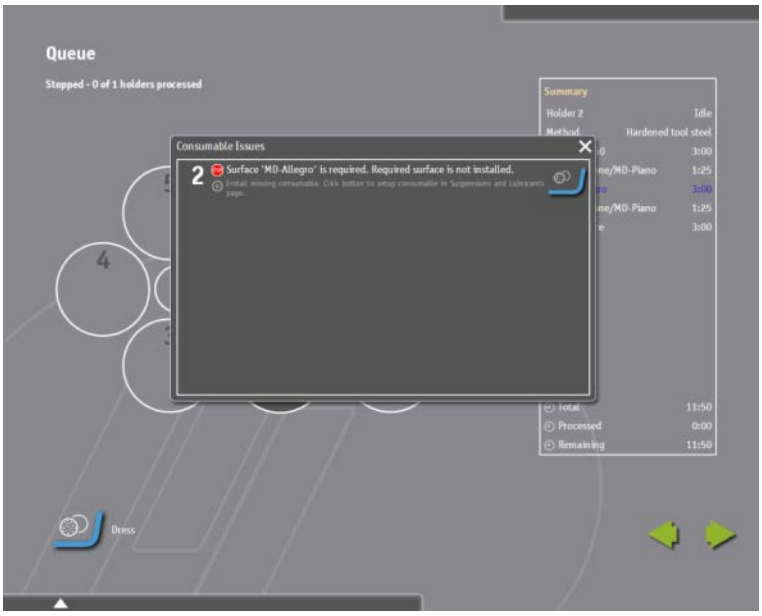


- Select one of the three preparation methods from the box at the top, or select any other preparation method by expanding the menu structure underneath.

When a preparation method is highlighted, a short summary is displayed at the right side of the screen.
To select the preparation method:

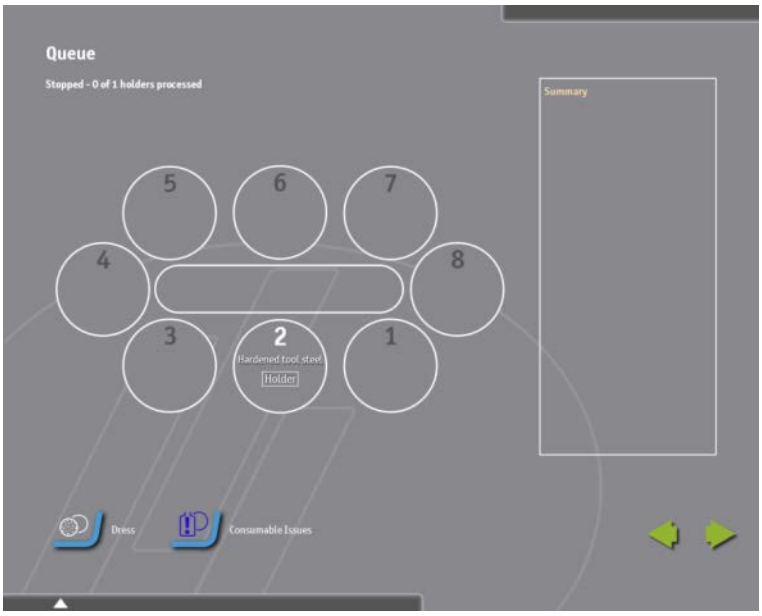
- Touch the green **OK** button. The method will then be linked to the specimen holder / mover plate.
  The screen changes automatically back to the *Queue* screen.

Consumable Issues



As soon as a method is selected, all installed consumables are checked and compared to the consumables required by the method. If a consumable is missing, the *Consumables Issues* box will appear detailing the issues that have to be solved.

From the box there is direct access to the relevant configuration menu where the settings can be changed.
When all settings have been changed the box disappears and the preparation process can be started.
If not all issues have been solved, a blue key at the lower left corner will be available to open the issues box.



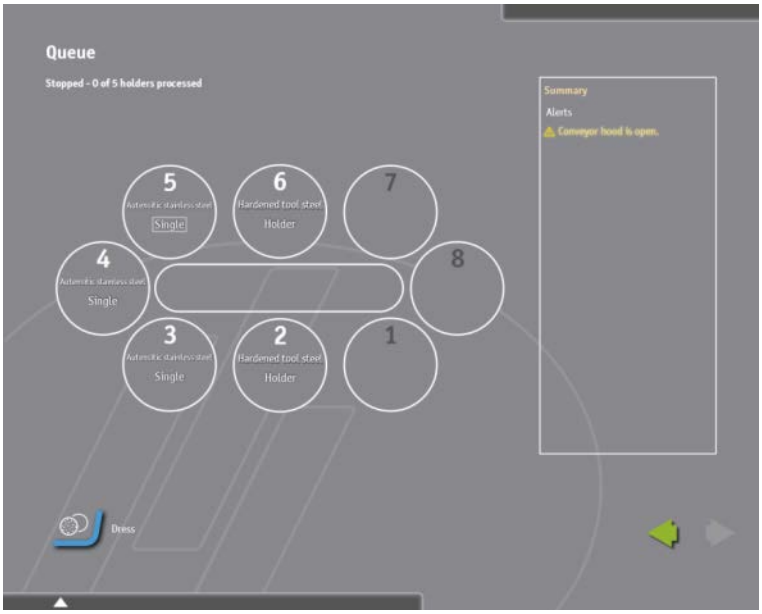
Changing from Single to Holder

One holder with the selected preparation method is now displayed. As default, all inserted holders or specimen mover plates are set to **Single**, meaning individual specimens being prepared using a specimen mover plate. To change to **Holder** simply touch **Single** and it toggles to **Holder**, touching **Holder** toggles to **Single** etc.

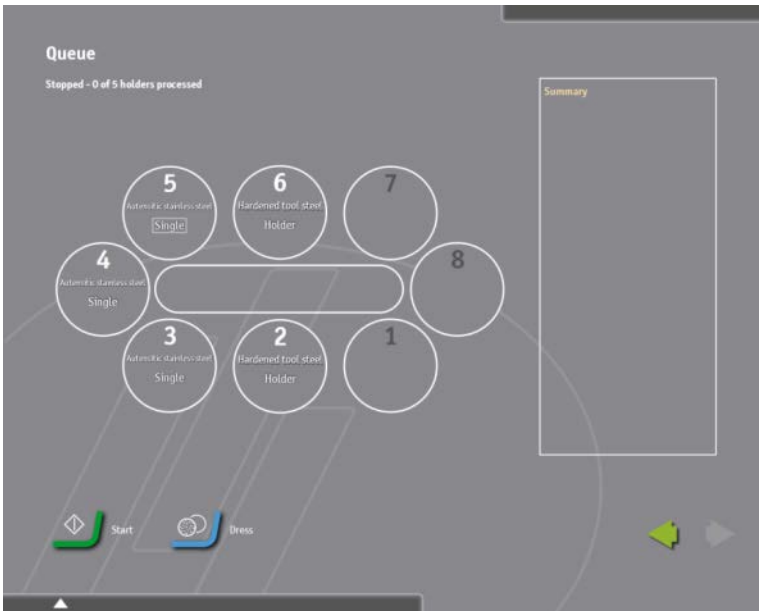
To add more specimen holders/specimen mover plates simply insert them into one of the positions in the conveyor and select the appropriate preparation method for each, followed by the **Single** or **Holder** definition.

> ***Note:***
> If ONLY specimen holders or ONLY specimen mover plates are used, the default settings in the *Configuration* menu can be changed so it is no longer necessary to select the type.
> Please see the section on *Configure Holder* for details.

> ***Important:***
> When a specimen mover plate for individual specimens is used, always make sure that ***Single*** is selected.
> Otherwise the specimen mover plate will not be in the correct position relative to the pressure feet and the individual specimens will not be loaded with a minimum force. This can result in specimens being thrown out of the specimen mover plate and damage the specimens, the specimen mover plate and the machine.



- When the preparation methods and holder types have been specified for each holder / specimen mover plate, the conveyor cover must be closed before **Start** can be pressed.

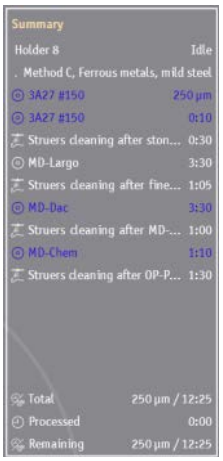


- Press the **Start** key to start the preparation process.

Summary box

The Summary box on the right hand side of the screen displays information on the selected position. Before a method is started, an overview of the different preparation steps is displayed. When the method is running, the progress of the preparation is shown with the time counting down to 0.

Consumables displayed in blue indicate that these are missing on the machine and must be inserted and configured before starting the preparation process.



Note:
Please see Chapter 2: *Introduction* for details on preparation methods.

6. Accessories and Consumables

Please refer to the *Hexamatic Brochure* for details of the range available.

The use of Struers consumables is recommended.
Other products (e.g. coolants) may contain aggressive solvents, which dissolve e.g. rubber seals. The warranty may not cover damaged machine parts (e.g. seals and tubes), where the damage can be directly related to the use of non-Struers consumables.

7. Maintenance

The *Maintenance* screen is used to carry out certain maintenance functions necessary to keep the machine in the best possible working condition.

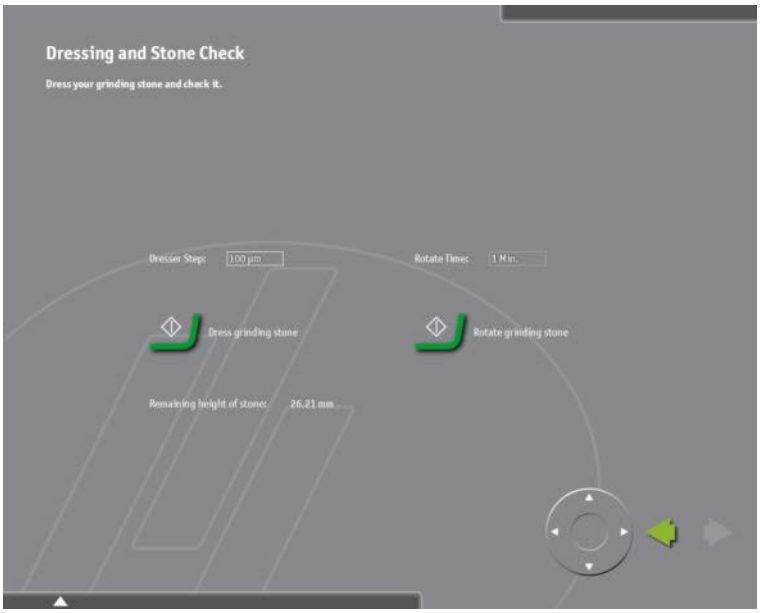
Activate Maintenance Functions

- From the *Main Menu* press the **Maintenance** key to open the *Maintenance* screen.

Dressing and Stone Check

In the *Dressing and Stone Check* screen it is possible to dress the stone even when no grinding operation is going on or no specimen holder is currently prepared.

- Press the **Dressing and Stone Check** key to open the *Dressing and Stone Check* screen.



- Set the *Dresser Step* to a value between 20 – 100 µm.
- Press the **Dress grinding stone** key to start the dressing process.

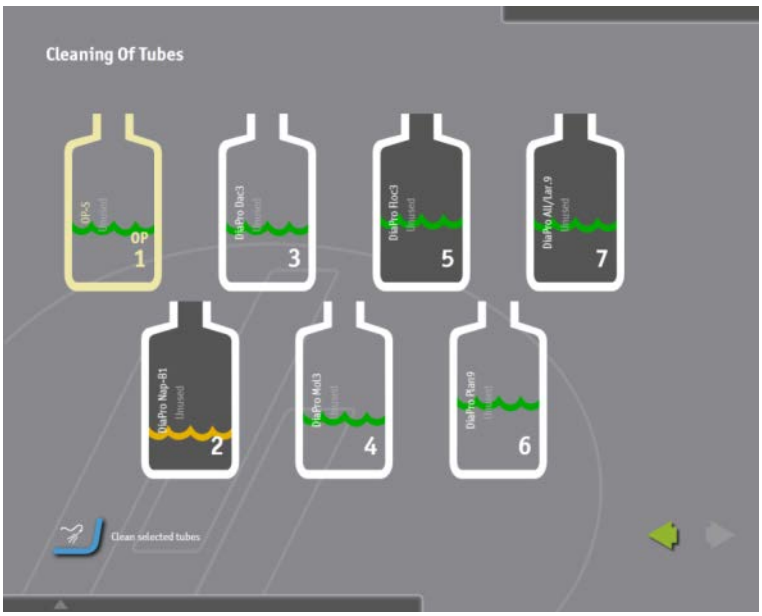
> ***Note:***
> When dresser steps larger than 50 µm are specified, the stone will be dressed twice, removing half the specified amount every time.
> ***Note:***
> If necessary, repeat the dressing operation until the noise created during dressing is uniform across the entire stone surface.

- Set the *Rotate time* to a value between 20 – 100 µm.
- Press the **Rotate grinding stone** key to rotate the grinding stone to check it is even and running smoothly.

Cleaning of Tubes

In the *Cleaning of tubes* screen it is possible to clean one or all of the tubes going from the bottles to the dosing nozzles. This can be necessary when changing from one type of liquid to another or also when Hexamatic is not going to be used for a longer period of time.

- Press the **Cleaning of tubes** key to open the *Cleaning of tubes* screen.
- To clean specific tubes e.g. to change from one suspension to another, touch the bottle(s) where the connected tube should be cleaned.



- Press the ***Clean selected tubes*** key to clean the selected tubes.
- The cleaning program will start. Follow the instructions on the screen.

> ***Note:***
> The main hood of Hexamatic must be closed. The preparation head will move to the cleaning station so that the water used for cleaning runs into the drain.

Soap/Alcohol

Level of liquid in the jars for the second cleaning station can be monitored in the *Soap/Alcohol* screen.

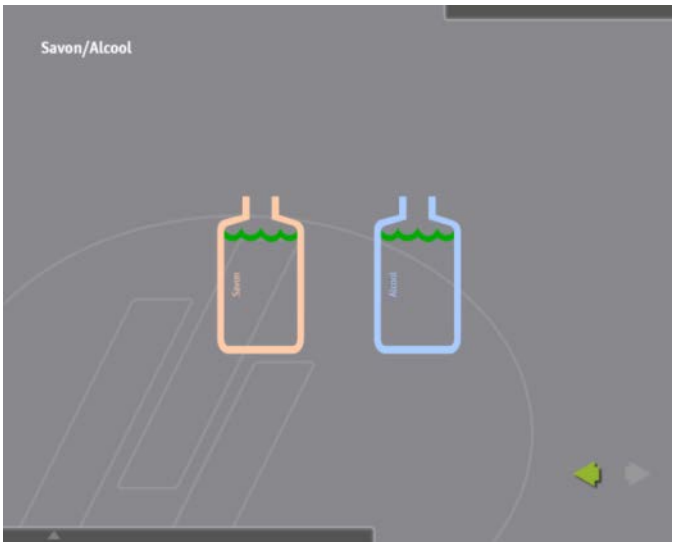
The jars for the soap solution and alcohol are placed on a trolley underneath the bottle compartment.
It is important to connect the 2 different cleaning liquids to the correct hoses:

Correct hose connections
- BLACK HOSE = Soap
- BLUE HOSE = Alcohol

Indicators:

Yellow wavy line	Refilling will soon be necessary
Red wavy line	Empty bottle, dosing is no longer possible, preparation process is stopped due to inadequate cleaning

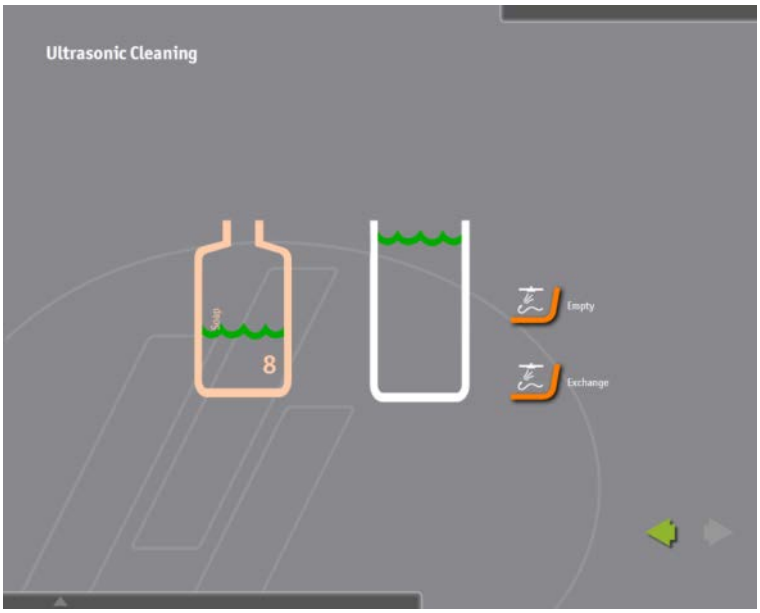
The *Soap/Alcohol* screen indicates the fill level:



- Fill the soap jar with a soap solution according to the instructions on the label.
- Fill the alcohol jar with ethanol or alternatively, with propanol.

Ultrasonic Cleaning

In the *Ultrasonic cleaning* screen it is possible to see the fill level of the soap bottle that is placed in position 8 of the bottle compartment. It is also possible to *Empty*, *Fill* or *Exchange* the ultrasonic bath.



- Press **Empty** to open the valve at the bottom of the ultrasonic bath and allow the cleaning liquid to drain away. After emptying a new button appears: **Fill**.
- Press the **Fill** button to refill the ultrasonic bath.

- Alternatively, press **Exchange** to empty and refill the ultrasonic tub in one process.

Cleaning Hexamatic

To facilitate cleaning, Hexamatic is equipped with an automatic function to access all positions for cleaning.

- Press *Clean the Hexamatic.*
- Close the main hood.
- Press *Start Cleaning.*

The grinding stone cover will move aside and the ultrasonic cleaning chamber is emptied. The centre part of the MD-Disc is moved upwards and the elevator with the MD-Consumables is moved to the top position.
The specimen mover head moves over the cleaning stations. The pressure feet for individual specimens move downwards.

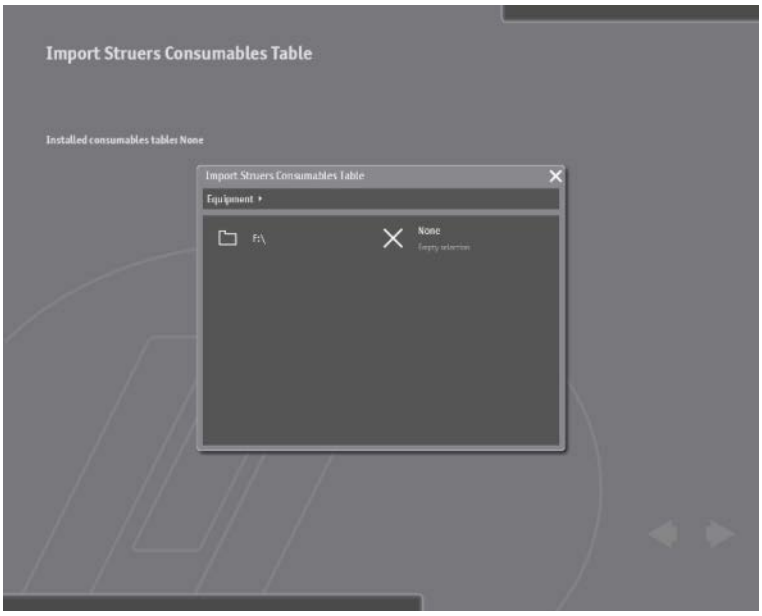
- Clean the different positions as described in the *Mechanical Maintenance* section.
- Close the cover when cleaning is complete.

Importing Struers Consumables Table

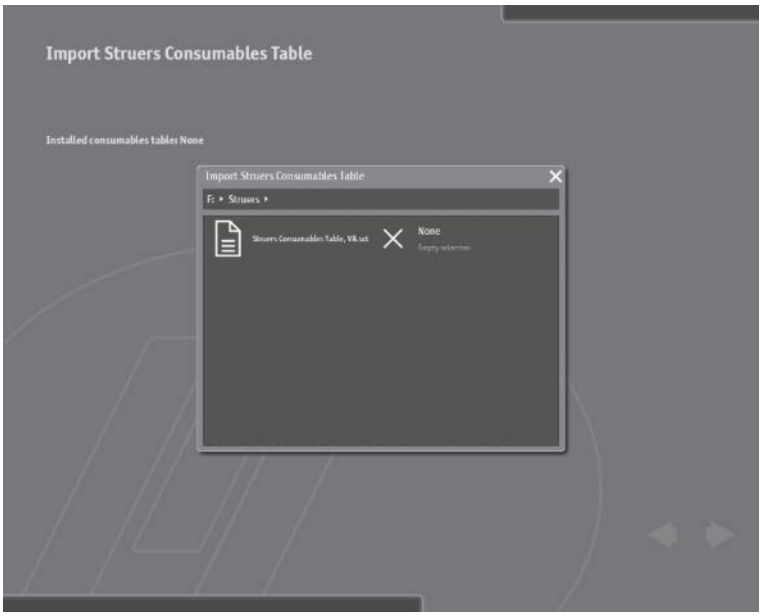
Whenever new consumables are developed by Struers the database file with all the names, the *Struers Consumables Table,* is updated. The most recent consumables table can be downloaded from *www.struers.com*.

- Unzip and copy the consumables table onto an USB stick and insert the USB stick into the USB connection of the Hexamatic, underneath the touch screen.

- Press the **Import Struers Consumables Table** key to open the *Import* screen.



- Select the folder with the **Struers Consumables Table**.



- Select the **Struers Consumable Tables** file.
- Press **Yes** to import the file.

- Press **OK** to close the *Import* screen.

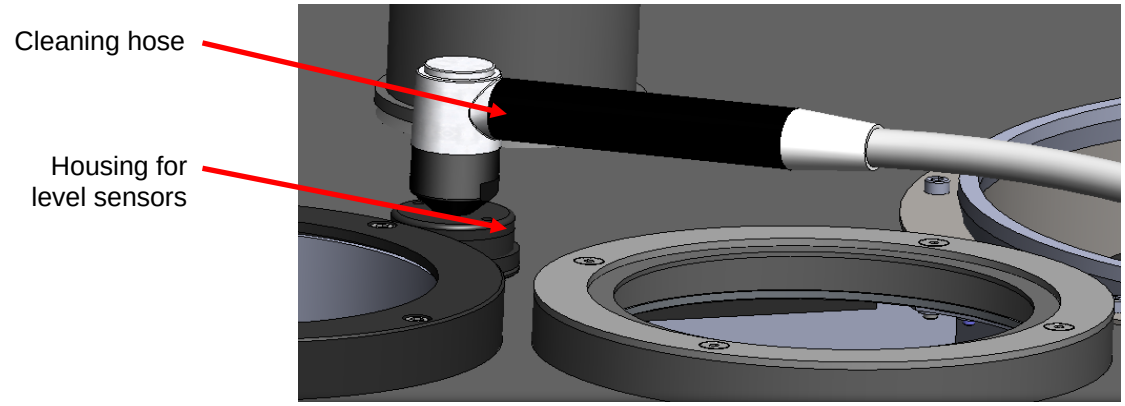
The newest consumables will now be available when programming preparation methods.

Mechanical Maintenance

Daily	■ Press *Clean the Hexamatic.* ■ Close the main hood.
Machine	■ Clean all accessible surfaces with a moist cloth.
MD-Surfaces	Check the MD-Surfaces every day to make sure that they are not damaged or contaminated: ■ Open the main hood and check each MD-Surface. ■ Replace damaged MD-Surfaces and remember to re-select the replaced surface to reset the usage counter. ■ Clean contaminated MD-Surfaces: – Carefully brush with a clean, soft nail brush under lukewarm running water. – Rinse with distilled water, dry the MD-Surface replace in the correct position in the elevator. ■ Close the Main hood to move the elevator into the park position.
OP-Suspensions	■ Go to *Cleaning of tubes* in the *Maintenance menu*. ■ Select the OP bottle and follow the cleaning procedure. ■ Refill the bottle if necessary before reinserting it.
MD-Disc	■ Clean the MD-Disc with a damp cloth.

Ultrasonic cleaning station

- Go to *Ultrasonic cleaning* in the *Maintenance* menu.
- Press **Empty** to empty the tub.
- Flush the level sensors in the ultrasonic tub using the cleaning hose.



- Check the bottom of the tub and remove any dirt using clean water from the cleaning hose and a brush.
- Press **Empty** again to re-empty the tub.
- Press **Fill** to fill the ultrasonic tub automatically with the correct amount of water and soap.

Every Second Day
Recirculation Cooling Unit

- Clean the filter unit of the recirculation tank.
- Clean the level sensor using the cleaning hose.
- Refill the recirculation tank until the level is about 3 cm from the upper rim (the cleaning hose can be used to fill the tank).
  Mix with Struers additive, Corrozip according to the instructions on the container.

Weekly
Machine
Cleaning Surfaces

- Clean painted surfaces and the control panel with a soft damp cloth and common household detergents.
- Clean the conveyor cover and main hood with a soft damp cloth and a common household anti-static window cleaning agent.

Tip:
Do not use a dry cloth as the surfaces are not scratch resistant.
Grease and oil can be removed with ethanol or isopropanol.

IMPORTANT
Never use acetone, benzol or similar solvents.

MD-Disc

- Apply a cleaning agent that has a slight grinding effect. Use Krestopol (available from Struers) with some water.
- Scrub the contact face with a brush or a hard sponge.
- Clean the contact face with a soft sponge.
- Rinse the contact face with clean water then wipe thoroughly with a soft cloth.

Spill pan

- Remove the splash guard.
- Remove accumulated grinding/polishing waste with a scraper.
- Clean the spill pan with a small brush and a little water.
- Wash the splash guard and remount it.

Cleaning the Cleaning Station

- Clean the nozzles.
  If the nozzle holes are clogged, remove the waste by carefully using the supplied cleaning tool (or a thin needle).

Ultrasonic Cleaning Station

- Empty the ultrasonic cleaning station by pressing the **Empty** key.
- Clean the inner wall of the cleaning tub with a brush and soap. Rinse with clean water from the cleaning hose.
- Press **Empty** again to re-empty the tub.
- Press the **Fill** key to refill the ultrasonic tub.

Grinding Stone Station

- Close the main hood.
- Got to: *Configuration, Consumables, Grinding disc* and touch the grinding disc.
- Move the water tube on the plane grinding station into an upright position, unscrew the three finger nuts and remove the cover.
- Remove the screw, the washer and the grinding disc.
- Remove accumulated abrasive grains and grinding dust from the plane grinding station.
- Pull out the recirculation tank and place a bucket underneath the drain tube of the grinding station.
  - Clean the tray using a brush.
  - Flush with plenty of clean water from the cleaning hose.
- Remove the bucket and reposition the recirculation tank.
- Place the grinding stone or diamond grinding disc on the driving plate and make sure that the two pins from the driving plate engage in the two holes at the bottom of the grinding stone or diamond grinding disc.
- Replace the washer and the screw and tighten the screw securely with the 8 mm Allen key.
- Replace the cover and secure with the three finger nuts.
- Move the water tube down into the correct position.
- Close the main hood.
- The lid will move back to close the opening of the plane grinding station.

When a grinding stone has been selected, the dresser will automatically move to find the top of the stone. After the top of the stone has been found the dresser moves into its parking position.

Specimen Mover Head

- Clean the pressure feet for the individual specimens and the driving pins for the specimen holder/mover plate.

Recirculation Cooling Unit

Water and Struers additive, Corrozip must be changed to avoid bacterial contamination which can emit an unpleasant smell.

Every time water is changed, the tank should be cleaned thoroughly to remove all grinding waste. By using Struers plastic inserts, cleaning is kept to a minimum.

> ***Remember...***
> to mix the cooling water with Struers additive, Corrozip in the correct concentration.

Monthly

- Clean the rubber seals in the grinding and cleaning chambers with a damp cloth.
- Apply a small amount of silicon oil to the seals to maintain flexibility and prevent water spillage.

Consumables

Refill/dispose Liquids

Cleaning Liquids

Jars for the soap solution and alcohol are placed on a trolley underneath the bottle compartment.
It is important to connect the 2 different cleaning liquid supplies to the correct hoses:

Correct hose connections
- BLACK HOSE = Soap
- BLUE HOSE = Alcohol

A dual level indicator warns when the liquid level in the soap and alcohol jars gets too low.

- Refill the jars when necessary.

Suspension and Lubricant

All suspensions and lubricants are contained in 1 l bottles.
All bottles are equipped with weighing cells. The contents of the bottle are measured continuously, and a warning is displayed when the level in the bottle is getting low.

- Refill the bottles whenever necessary.

Recirculation Cooling Unit

The Recirculation cooling unit is placed on wheels behind the door on the left hand side of Hexamatic. A level indicator warns when the water is too low.

- Check and refill the recirculation cooling unit frequently.

8. Technical data

General Technical Data

Subject		Specifications
Connections	Power	3-phase, consumption: see table below
	Compressed air: Pressure: Consumption: Recommended quality:	 Min. 6 bar (90 psi) Min. 200 l/min (53 g/min) Class-3, as specified in ISO 8573-1
	Water: Pressure: Consumption: Outlet	 2-9.9 bar (29 – 144 psi) Min. 800 l/h to normal drain
Dimensions Hexamatic	Height (with Beacon)	191 cm / 75.2" (228 cm / 89.8")
	Width Width with Conveyor	197 cm / 77.6" 298 cm / 117.3"
	Depth	88 cm / 34.6"
	Weight	840 kg/ 1850 lbs
Operating environment	Noise level	65 dBA
	Surrounding temperature	5-40°C/41-104°F
	Humidity	0-95% RH non condensing
Safety standard	Please refer to the Declaration of Conformity	
	Special demands	The machine must be placed on an even floor The room temperature must be 15°C to 30°C Recommended capacity for exhaust system: 150m^3/h at 0mm water gauge.
Specimen holder discs / specimen mover plates		140 mm
Specimen mover head	Motor for holder rotation	50 - 250 rpm, 0.44 kW (0.59 HP)
	Operating force	30-400 N in 10 N steps for specimen holders 5-65 N in 5 N steps for specimen mover plates
Plane grinding work station	Main motor	2.2 kW (2.9 HP)
	Rotational speed	500 - 1500 rpm
	Grinding stone	Ø 270 mm Grinding width 115 mm
	Dressing	Automatic dressing of grinding stone
	Recirculation cooling unit	60 l/min Container capacity 50 l

Subject		Specifications
Fine grinding and polishing work station	Main motor	0.75 kW (1.0 HP)
	Rotational speed	50 - 500 rpm
	Grinding/polishing disc	Ø 250 mm
Cleaning station	Cleaning time	User-defined
	Cleaning method	Ultrasound / water, detergent, alcohol, air
	Cleaning programs	10 Struers programs, indefinite user programs.
Recirculation cooling unit Capacity	Pump motor	0.13 kW (0.17 HP)
	Water tank capacity	50 l
	Weight	20 kg (empty) 70 kg (full)
Dosing system	Bottle unit capacity	DP-Suspension: 1 l DP-Lubricant: 1 l OPS/OPU Suspension: 1 l Soap for ultrasonic cleaning : 1 l Bottle for soap solution for cleaning : 5l Bottle for alcohol for cleaning : 5 l

Subject			Specifications
Conveyor			
	Conveyor connections	Power	24 V
		Cabling	To preparation module
	Conveyor main dimensions	Width	58 cm / 22.8"
		Length	128 cm / 50.4"
		Height	31 cm / 12.2"
		Weight	45 kg / 99 lbs
	General data, Conveyor chain	Speed	100 mm/s (3.9"/s)
		Control	Automatic drive controlled by the preparation module
		Chain capacity	8 specimen holder discs or specimen mover plates

Electrical Data:

Voltage / frequency:	Power consumption	Output main motor	Max. Load
3 x 200-240 V / 50/60 Hz 3 x 380-415 V / 50/60 Hz 3 x 460-480 V / 60 Hz CSA	3 kW 3 kW 3 kW	2.2 kW 2.2 kW 2.2 kW	31 A 17 A 16 A

Mains Cable Recommendation

Voltage / frequency:	Main supply connection			
	Min. Fuse size	Minimum cable size @ Min. fuse	Max. Fuse size	Minimum cable size @ Max. fuse
3 x 200 - 240 V / 50/60 Hz	20 A	3xAWG12 + PE	40 A	3xAWG12 + PE
3 x 380 - 415 V / 50/60 Hz	10 A	3x3,3mm² + PE	40 A	3x3,3mm² + PE
3 x 460 - 480 V / 60 Hz CSA	10 A	3xAWG12 + PE	40 A	3xAWG12 + PE
	Important: Local standards may overrule the recommendations for the main supply cable. If necessary, please contact a qualified electrician to verify which option is suitable for the local installation setup.			
Residual Current Circuit Breaker	type B, 30 mA (or better) is REQUIRED			

English

Declaration of Conformity

Manufacturer

Struers ApS
Pederstrupvej 84
DK-2750 Ballerup, Denmark
Telephone +45 44 600 800

Herewith declares that

Name:	Hexamatic
Cat. No.:	06406129, 06406146, 06406154
Function:	Automatic Grinding and polishing machine
Type No.:	594

fulfils all the relevant provisions of the:

Machinery Directive 2006/42/EC

according to the following standard(s):
EN ISO 12100:2010, EN ISO 13849-1:2015,
EN ISO 13850:2008, EN 60204-1:2006/AC:2010.

and is in conformity with the:

EMC Directive 2014/30/EU

according to the following standard(s):
EN 61000-6-2:2005, EN 61000-6-4:2007/A1:2011, EN 61000-3-2:2014,
EN 61000-3-3:2013.

RoHS Directive 2011/65/EU

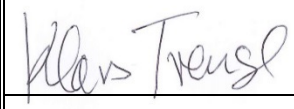
according to the following standard(s):
EN 50581:2012.

Supplementary Information

The equipment complies with the following standards:
NFPA70:2014, NFPA79:2012, FCC 47 CFR Part 15.

The above has been declared according to the global approach, module A.

Authorized to compile the Technical File:



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Date of Issue: 2017.10.05

Pederstrupvej 84
DK-2750 Ballerup
Denmark

Hexamatic

Spare Parts and Diagrams

Manual No.: 15947001

Date of Release 27.10.2015

Hexamatic
Spare Parts and Diagrams

Always state *Serial No* and *Voltage/frequency*
if you have technical questions or when ordering spare parts.

The following restrictions should be observed, as violation of the restrictions may cause cancellation of Struers legal obligations:
Instruction Manuals: Struers Instruction Manuals may only be used in connection with Struers equipment covered by the Instruction Manual.
Service Manuals: Struers Service Manuals may only be used by a trained technician authorised by Struers. The Service Manual may only be used in connection with Struers equipment covered by the Service Manual.

Struers assumes no responsibility for errors in the manual text/illustrations. The information in this manual is subject to change without notice. The manual may mention accessories or parts not included in the present version of the equipment.

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Spare Parts and Diagrams

Table of contents **Drawing**

Drawings

Drawings, continued

Table of contents **Drawing**

Diagrams

Some of the drawings may contain position numbers
not used in connection with this manual.

The following is a list of the spare parts that may need replacement during the lifetime of the equipment.

To check the availability of other replacement parts, please contact your local Struers Service Technician. It may help identify the part by referral to its position number on the assembly drawings included in this manual.

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
14590009		**Nozzle, assembled**	
	30	Nozzle Pl-st, Nickel mat-plat.	14598023
14590346		**Level indicator unit**	
	10	Level indicator unit, cable-cut	14590346
14590348		**Connection box, assembled**	
	10	Connection box, machined	14590342
14590355		**Jar, Soap, assembled**	
	10	Level indicator unit	14590346
	50	Cap, drilled	14590328
	60	Plastic jar 5l nature w white lid	71000057
14590356		**Jar, Alcohol, assembled**	
	10	Level indicator unit	14590346
	50	Cap, drilled	14590328
	60	Plastic jar 5l nature w white lid	71000057
14590360		**Tray for cans**	
	10	Tray for cans, painted	14590360
	20	Connection box, assembled	14590348
	30	MAPS-2 W15 Level sensor	16103515
	70	Jar, Alcohol, assembled	14590356
	80	Jar, Soap, assembled	14590355
15400020		**Base assembled**	
	10	Pump 24VDC SR10/30. 38ml/min	15400020
	50	Silicone hose ø2/ø4 (0.12m)	2NU11452

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
		Stepper motor assembled w. plug	
	10	Stepper motor. 6600R174	R5483547
15760011		**Reservoir 50L, complete**	
	80	Reduction	15760156
15760015		**Flow sensor, complete**	
		Flow sensor, complete	05766913
	100	Press. switch 0.5E BAR G¼in MS	2SP10011
	150	Wiring set for pres. Switch	15763597
	160	GEKA coupling 3/4 int. thread	2NF60002
		Static Filter	
	10	Static filter for 50L, compl	15760022
	10	Static filter for 50L, welded	05766908
	20	Filter paper 265x350mm (100pcs)	05766916
	10	**COLST 50 l Tank**	05766906
	20	COLSF 50 l Static Filter	05766908
	40	Cover, welded	15940345
	90	Bottle 1L, nipple ø3, assem (8 pcs)	16080601
	100	Nozzle cleaner 0425808	2GR95807
	150	Allen key 8 hardened DIN911	2GR00080
	160	Combinat. wrench DIN3113A NV13	2GR00413
	170	Container 5L, Soap, assembled	16080501
	180	Container 5L, Alcohol, assembled	16080502
	190	Rubber plate	15940686
	200	Drawer assembled	15940074
		Hexamatic + variants (15940005-29)	
	10	Hexamatic complete	15940010
	1000	NoiseFilt. 200V/24A V1000 24P0	2MO90032
	1001	Trafo 230-400V/2x115V, 630VA	2MT73001
	1002	Omron freq.inv. 3x200V 4.0kW	2PU13400
	1003	20.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11200
	1004	2.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11020
	1005	6.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11060
	1006	4.0 AT Cl.-CC fuse 10x38 CSA (2 pcs)	2FC11040

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
		Hexamatic + variants (15940005-46)	
	10	Hexamatic complete	15940010
	1000	Noise Filter 400V/10A V1000 42P2	2MO90033
	1001	Trafo 230-400V/2x115V, 630VA	2MT73001
	1002	Omron freq.inv. 3x400V 3.0kW	2PU14300
	1003	10.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11100
	1004	1.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11010
	1005	4.0 AT Cl.-CC fuse 10x38 CSA (3 pcs)	2FC11040
	1006	2.0 AT Cl.-CC fuse 10x38 CSA (2 pcs)	2FC11020
15940010		**Hexamatic complete**	
	10	Frame and table, assembled	15940095
	20	Cabinet assembled	15940016
	30	Cabinet for bottles	15940054
	40	Base assembled	15940020
	50	Storage for MD discs assembled	15940075
	60	MD disc exchanger assembled	15940034
	70	Conveyor, assembled	15940031
	90	High Pressure pump, assembled	15940024
15940015		**Specimen mover arm assembled**	
	120	Actuator, assembly	15940036
	180	Bearing housing, assembled	15940077
	190	Roller bearing 32016X ø80/125	2BN30801
	210	Pneumatic block 4, assembled	15940048
	280	Vibration damper type 4 ø15x6 M5x8 (2pcs)	2GS00160
15940016		**Cabinet assembled.**	
	170	Shock Absorber OEM 25MB adjust.	2YS10025
	360	LED module	15940090
	370	LED module	15940093
15940017		**Water inlet, assembled**	
	20	Sol. valve triple 24VDC Gn.311 (2 pcs)	15940017
15940020		**Base assembled**	
	40	Motor for grinding stone ass.	15940022
	50	Motor, Spec. mover arm, assembled	15940049
	70	Polishing station assembled	15940021
	80	Bearing, Grinding station	15940040

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
	90	V-belt SPZ-612 (2 pcs)	2JD40612
	100	Disc, Grinding stone, assembled	15940023
	110	Specimen mover arm assembled	15940015
	140	Tooth. belt Optibelt RB PJ660-6	2JT60660
	150	Tooth. belt GT3 550-5MGT-15	2JT20820
	220	Motor for polishing station	15940046
	230	Stepmotor with Spindle, assemb	15940070
	240	Elevation disc, assembled	15940032
	290	Disc brake caliper MU3	2YC94515
15940021		**Polishing station assembled.**	
	10	Bearing, Polishing station	15940041
	70	Ball bearing 6204-2RSR	2BK00025
	120	Cylinder CDQSD25-100DC	2YC20026
15940022		**Motor for grinding stone assembled.**	
		Motor 3x240VD/50 2,2kW 4p CSA	2ME60000
15940023		**Disc for Grinding stone**	
	10	Disc for Grinding stone	15940023
	50	MC SKRUE M10x16 A2	2TR51016
	80	Washer 10 A2 DIN9021A	2ZA20010
15940024		**High Pressure pump, assembled**	15940024
	20	MOTOR 3X220-440/50-60	375MP210
	30	Pump 1309P w. filter	15942911
	70	Coupling, High Press. pump, mach	15340714
	100	Press. switch 1-10 BAR G¼in MS (2 pcs)	375MP197
15940026		**Dresser assembled.**	
	10	Dresser bearing, assembled	15940025
	60	Diamond dresser CDP8181-18/22	40800045
	70	Rotex GS19 ø14/ø14 12.1 64Sh	2JH00019
	100	Stepper motor, assembled	15990029
15940027		**Stop bracket, assembled**	
	10	Stop bracket	15940027
15940028		**Pump, assembled**	
	10	Pump 24Vdc SR10/50, 52ml/min	15600026

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940029		**Main power connection, assembled**	
	20	DIN-rail clamp PE, WPE10	2XK41750
	30	DIN-rail clamp PE, WDU10 (3 pcs)	2XK41500
15940030		**Chain assembled**	
	10	10B1 anticorr 15 links (8 pcs)	2JK11015
	20	10B1 anticorr lock link (9 pcs)	2JK11001
15940031		**Conveyor assembled**	
	10	Conveyor interior, assembled	15940045
	80	Conveyor, assembled	15940060
	240	Buffer ø20x15/M6x8. Type D (2 pcs)	2GS00093
	330	SwitchAZM170SK-02zrka 24VDC/AC	2SS00019
15940032		**Elevation disc assembled**	
	80	Cylinder CDQ2B-32TF-40DZ	2YC20048
15940033		**Pump Assembled**	
	10	Pump 3x230V,3x415V,	15940033-46
	10	Pump 3x480V	15940033-54
15940034		**MD disc exchanger assembled.**	
	10	Interior of MD disc exch., asm	15940058
15940035		**Control Box II, assembled**	
	40	Contactor CI5-5-01 24VDC (2 pcs)	2KM04502
	70	Power Supply 85-264V, 24V/15A	2PA90360
	90	Power Supply 88-264V, 24V/10A	2PA90240
	120	Power Sup. DIN 88-264, 24/2,5A	2PA90060
15940036		**Actuator, assembled.**	
	80	Cylinder D40-100, custom made	15940036
15940037		**Signal tower, complete**	
	20	LED signal tower w. buzzer	2HL64471

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940038		**Specimen mover head assembled.**	
	30	O-ring 72 NBR 872. 6.00-2.00	2IO20007
	40	O-ring 72 NBR 872. 21-2	2IO20021
15940039		**Control Box, assembled**	
	20	USB-CANmodul1 conv., SysWORXX	2PC00500
	30	WAGO CAN open buscoupler	2PC00338
	60	WAGO End module	2PC00600
	70	WAGO 4x24Vdc/0.5A out, hi.side (2 pcs)	2PC50531
	90	PCB Tegramin, Tested+Bootload.	16013000
	170	Contactor CI5-5-01 24VDC (2 pcs)	2KM04502
	230	WAGO 24Vdc conn. module	2PC50603
	240	WAGO 0Vdc conn. module	2PC50604
	250	WAGO 8x24Vdc input, hi.side (4 pcs)	2PC50430
	260	WAGO 8x24Vdc/0.5A out, hi.side (3 pcs)	2PC50530
	270	WAGO int. supply module 24Vdc	2PC50613
	440	PCB for SMM, Tested	15483004
15940040		**Bearing for grinding station**	
	40	Bearing housing	15940040
15940041		**Bearing for polishing station**	
	10	Bearing housing	15940041
15940042		**Coupling assembled**	
	10	Coupling housing	15940042
	20	Compr.spring ø8.0xø0.8 Lo=21.5 (2 pcs)	15942902
	30	Driver pin (2 pcs)	
	90	Locking pin, assembled	16030050
	120	K-ring Nitril ø18.55 60Shore A	2IK00018
15940043		**Rail assembled**	
	10	Chain assembled	15940030
	20	Motor for conveyor, assembled	15940061
	30	Idle sprocket, assembled	15940030
15940044		**Idle Sprocket assembled**	
	40	Ball bearing 6004-2RSR	2BK00045

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940045		**Conveyor interior assembled**	
	10	Rail, assembled	15940043
	30	Sensor bracket, assembled	15940051
	40	Sensor bracket, assembled	15940056
15940046		**Motor for polishing station, assembled.**	
	20	Motor 3x230VD/50 750W 4p C-UL	2ME51751
15940048		**Pneumatic block 4, assembled**	
	20	Magnetvent. 3/2 24V DC 1/8 (4 pcs)	2YM10030
15940049		**Motor for specimen mover arm, assembled**	
	40	Gear MP60 i=35 for stepmotor	2MG40062
	50	Stepper motor, assembled	15990029
15940050		**Frame and Table, assembled**	
	20	Machine foot M75-16-070 (4 pcs)	2GB40075
15940054		**Cabinet for bottles**	
	30	Pump plate OP	15940087
	40	Pump plate	15940088
15940055		**Cubicle for electrical components assembled**	
	90	Touch screen assembled	15940092
	230	Ultrasonic generator, UL-200	2PH00594
	320	Industrial PC, NEXCOM 3140	2PC00810
15940058		**Interior of MD disc exchanger assembled.**	
	10	Stepmotor with Spindle, assemb	15940072
	20	Cable chain assembled	15940084
	30	MD holder with magnets	15940085
15940059		**Tool for single samples**	
	10	Tool, Single specimens	05946916

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940060		**Cover, assembled**	
	10	Cover	15940060
	20	Key for lock	15940385
	30	Handle, Nick. mat-plat.	2GH20162
15940061		**Motor for Conveyor, assembled**	
	30	Stepper motor, assembled	15990029
15940064		**Ventilator casing.**	
	10	EBM Pabst com vent 4114 NH3	2MW04114
	20	Air filter, Fan	2MW90207
	40	PTC element HRI 06 10/22	2RT61022
15940065		**Cover assembled.**	
	10	Cover painted	15940065
	20	window	15940238
	30	SwitchAZM170SK-02zrka 24VDC/AC	2SS00019
	50	Buffer ø25X15 Shore 40 M6X10 (2 pcs)	2GS00094
	70	Cell Sponge Rubb. Black 1016-112 (2 x 150 mm)	2IP31112
15940066		**Ultrasonic cleaner, assembly**	
	70	Float switch, STEM LA81 2B QL	2SL00081
	100	O-ring NBR 70. 31.42-1.78	2IO17829
	160	O-ring 72 NBR 872. 12.42-1.60	2IO17817
15940067		**Cleaning Chamber**	
	20	Nozzle HB-VV 1/8 6504 (3 pcs)	2YD10022
	52	Nozzle 65015 HB VV 1/8" (3 pcs)	2YD10030
	30	Cleaning nozzle, assembled (4 pcs)	13750463
	50	Sealing band 31.021 (2 x 110mm)	2IP30000
15940070		**Stepper motor with spindle, assembled**	
	40	Stepper motor, assembled	15990029

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940071		**Stepper motor with spindle assembled**	
	10	Stepper motor, assembled	15990029
	20	Trapezoid nut	15480120
	80	Spher. roll. bear. 2201 E-2RS1 (2 pcs)	2BK20012
	90	O-ring 28x6 NBR70	2IO60028
	120	Vibration damper type1 ø12x10 M5x10 (4 pcs)	2GS00140
15940072		**Stepper motor with spindle assembled.**	
	10	Stepper motor, assembled	15990029
	20	Trapezoid nut	15480120
	90	Coupling w.element CPS 15-1 12	2JH70016
	110	Vibration damper type1 ø12x10 M5x10	2GS00140
	130	Spherical roll. bear. 2201 E-2RS1 (2 pcs)	2BK20012
15940075		**Storage for MD discs assembled.**	
	20	Stepmotor with spindle, assembled	15940071
15940076		**Doser hoses and outlet, assembled**	
	10	Outlet nozzle, assembled	16030079
	20	TYGON hose AED00003 1/16x3/16, 9m	15942916
	30	TYGON hose AED00007 1/8x1/4, 1.5m	
	40	TYGON hose AED00007 1/8x1/4, 1.5m	
	50	Drain hose grey PVC ø25MM, 0.6m	
15940077		**Bearing housing assembled.**	
	20	Specimen mover head, assembly	15940038
	170	Roto Glyd ring TG3100220 (3 pcs)	2IR12200
	180	Rotating angle KLS04-M5	2NF10136
	190	Doser hoses and outlet, assemb	15940076
	200	Timing belt HTD 615 5M 15	2JT20428
15940078		**Pipe for recirculation water assembled.**	
	20	GEKA hose connection 1/2in	2NF60000
	30	Hose clamp NORMA S20/9Zy	2NS12009
15940079		**Top flange assembled.**	
	10	Shaft, assembled with plugs	R5940079

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
15940080		**Water adjustment assembled.**	
	90	Throttle valve MCO704-1/8	2YH00008
15940083		**Float switch**	
	10	Float switch, STEM LA81 2B QL	15940083
15940085		**MD holder with magnets.**	
	60	Magnet ø6x2.5 NdFeB (4 pcs)	2LS00050
15940086		**Cover assembled.**	
	10	Cylinder	15940047
	20	Cover plate	15940156
	50	Bearing (2 pcs)	15940496
15940087		**Pump Plate OP**	
	20	OP pump, assembled	16030037
	100	Pump, assembled (3 pcs)	15940028
	160	TYGON hose ENFT 21 ø2.06. (3 x 140mm)	2NU91221
	170	Silicone hose ø3/ø7 (1 x 140mm)	2NU11455
15940088		**Pump plate**	
	90	Pump, assembled (4 pcs)	15940028
	130	TYGON hose ENFT 21 ø2.06. (4 x 140mm)	2NU91221
15940089		**Pneumatic, assembled.**	
	20	Regulation manifold, assembled	15940081
	70	Precision regulator IR1000	2YR10001
	150	Filter regulator AW10-M5H-2	2YF00008
15940090		**LED module**	
	20	LED lamp 800lu, 4100k, 50gr	2HW00850
15940091		**Enclosure for polishing station assembled.**	
	30	Nozzle, Disc cooling (2 pcs)	15090885
	60	Nozzle HB-VV 1/8 6504	2YD10022

Spare part list for Hexamatic

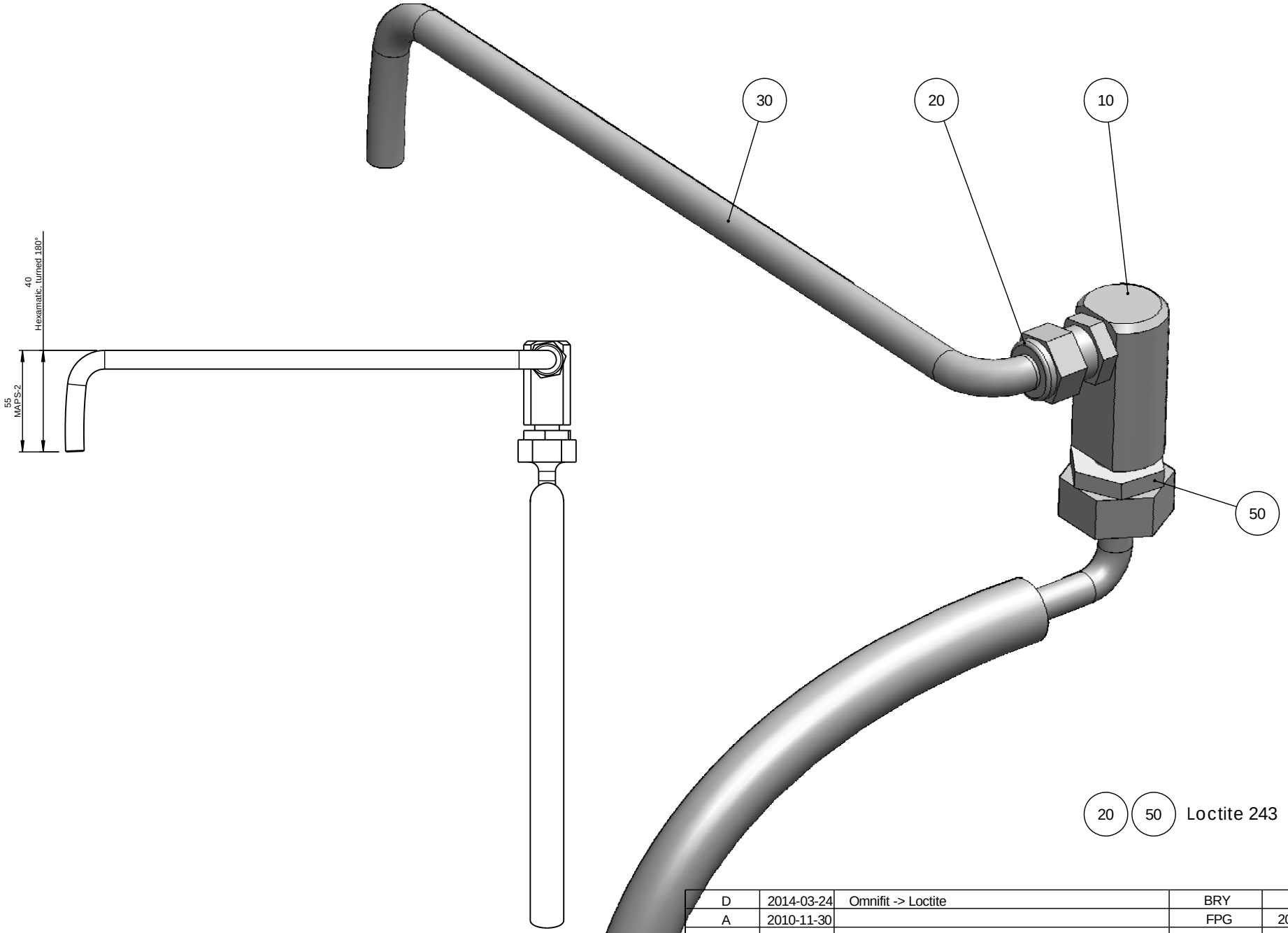
Drawing	Pos.	Spare Part	Cat no:
15940092		**Touch screen, assembled**	
	20	17" LCD w. SAW touch, ELO1739L	2HD17390
15940093		**LED module**	
	20	LED lamp 800lu, 4100k, 50gr	2HW00850
15940094		**Single sample rod, assembled**	
	10	K-ring Nitril ø18.55 60Shore A	2IK00018
	30	Pressure foot with groove	15942901
	40	Bellow, rubber V6/752	
	50	Clamping ring	
15940095		**Frame and Table, assembled**	
	100	Rubber sealing (3 pcs)	15940354
	120	Sealing band 1038-02 EPDM Sh.A (2 x 1.2m)	2IP21038
	280	Hose Danflex K-126 ø40 (0,7 m)	2NU30238
	285	Hose Danflex K-126 ø40 (2,5m)	RNU30238
15940098		**Plates for valves, assembled**	
	50	Air connection, assembled	15940063
	90	VDW33-5G-3-A for manifold (5 pcs)	2YM10041
	100	Magnetvent. 3/2 24V DC 1/8 (2 pcs)	2YM10030
	110	Pneumatic, assembled	15940089
	270	Valve SY5360-5G-C6	2YM15360
	280	Valve SY5460-5G-C6	2YM15460
		Wire set for Doser	**15943594**
		FC22 comp. load cell, 10lbf (8 pcs)	2PE02231
15946051		**Specimen holder 6x40, assembly**	
	10	Specimen holder D140 6x40	05946902
	30	Ball ø12 stainless	2BA00012
	50+ 60	Shim PS16x22x0.5 Nick.pl (3 pcs) O-ring 72 NBR 872. 14.30-2.40	260MP181
		Stepper motor assembled w.plug	15483547
		SMU EMBEDDED	15993016
		O-ring 47x2,5 FPM80 DIN3770	2IO04702

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
16030007		**Double water valve, assembled**	
	70	Silicone hose ø3/ø7 (2 x 175 mm)	2NU11455
	150	TYGON hose AED00007 1/8x1/4 (2 x 1.2m)	2NU91307
	160	Conn. Branch 1/8-3/16. Nylon (2 pcs)	2NF44478
16030037		**OP pump, assembled**	
	10	Pump 24Vdc, 100ml/min.ex.flang	16030037
16080601		**Bottle 1L, nipple ø3, assembled**	
	10	Plast. bottle Natural 1L ø92mm	71000120
	20	Screw cap, nipple ø3, assem	16080621
	30	PU Hose PU-3 Black ø2.9/ø4.3 **(0.2m)**	2NU14032
		Coupling specimen mover plate Hexamatic	05946901
		Pin, Clutch	05946901
		Allen key 2.5 hardened DIN911	2GR00025
		Specimen holder 6x40, assembled	05946902
	20	Allen Key w.Cross Handle 4x100	2GR02104
	4	Scr.knurl.cup M8x16 DIN916 Zn, 6 pcs	RTI50816
	5	Sock.setScr.M8x25 Zn pl.DIN916, 6 pcs	RTI50825
	6	Sock.setScr.M8x35.Zn pl.DIN916, 6 pcs	2TI50835

Spare part list for Hexamatic

Drawing	Pos.	Spare Part	Cat no:
		Wire set for Base	15943591
	10	Cable W1	15943501
	20	Cable W2	15943502
	60	Arm position ref.	15943628
	70	Namur for Horisontal ref	15943629
	80	Namur for Vertical ref	15943630
	110	REED SENSOR D-A93L (6 pcs)	2KR30179
		Wire set for Specimen Mover	15943592
		Lin.pot assembled w. plug	15943632
		Motor w. key BLDC 440W/48V	2MA05286
		Wire set for Conveyor	15943596
		Inductive sensor, TL-W3MB1	2HQ00003
		Photosensor Omron E3Z-LS81-2 (7 pcs)	2HB20081



20 50 Loctite 243

D	2014-03-24	Omnifit -> Loctite	BRY		TGS
A	2010-11-30		FPG	2010-11-30	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:1

Format: A3

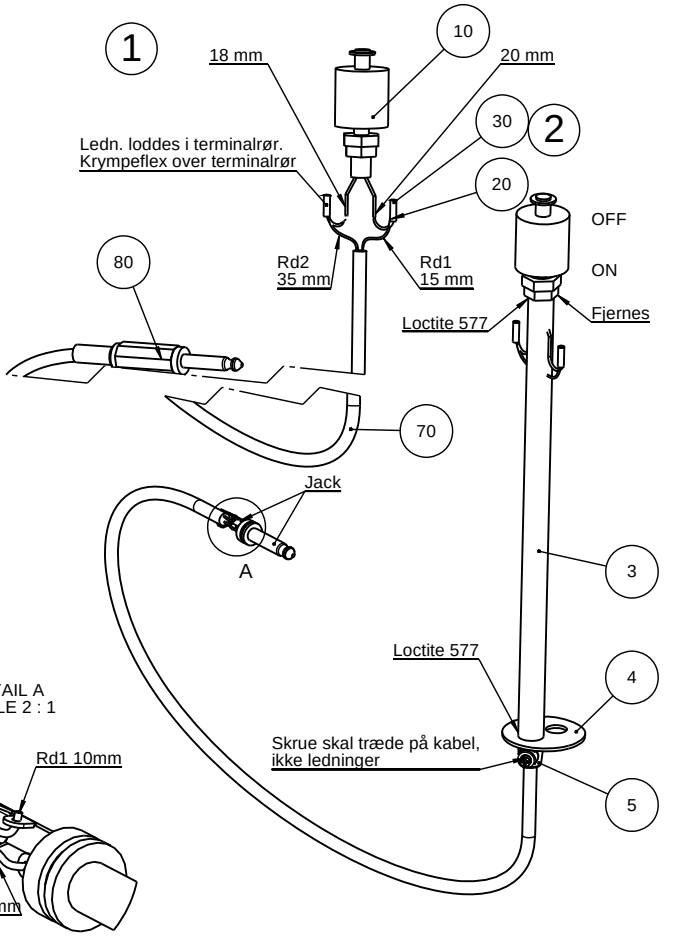
Tolerance: DS/ISO 2768- mK

Weight : g

ID: Description:

14590009 Nozzle, assembled

Rev: **D**



E	2012.02.09	14590347 overført til denne	SPE	2012.02.09	
A	1991-12-18		BRY	1992-02-24	CH
Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

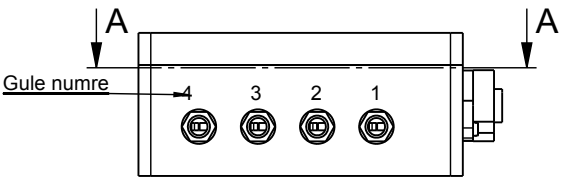
Struers
Pederstrupvej 84
DK-2750 Ballerup
Copenhagen
Denmark
Phone: +45 44600 800
Fax : +45 44600 804

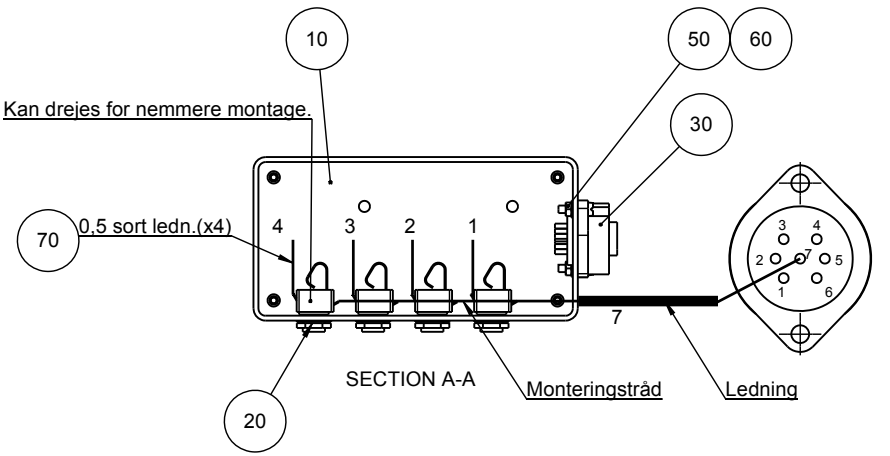
Material:	Scale: 1:2	Format: A4	Tolerance: DS/ISO 2768 - -	
			Weight :	g

ID: Description:

14590346 Level indicator unit

Rev: **E**





D	2011.08.24	Tegning opdateret		SPE	2011.08.24	
A	1992.02.21			BMJ		
Rev	Crea. date yyyy-mm-dd	Revision description		Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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Denmark
Phone :+45 44600 800
Fax : +45 44600 804

Material:

Scale: **1:2**

Format: **A4**

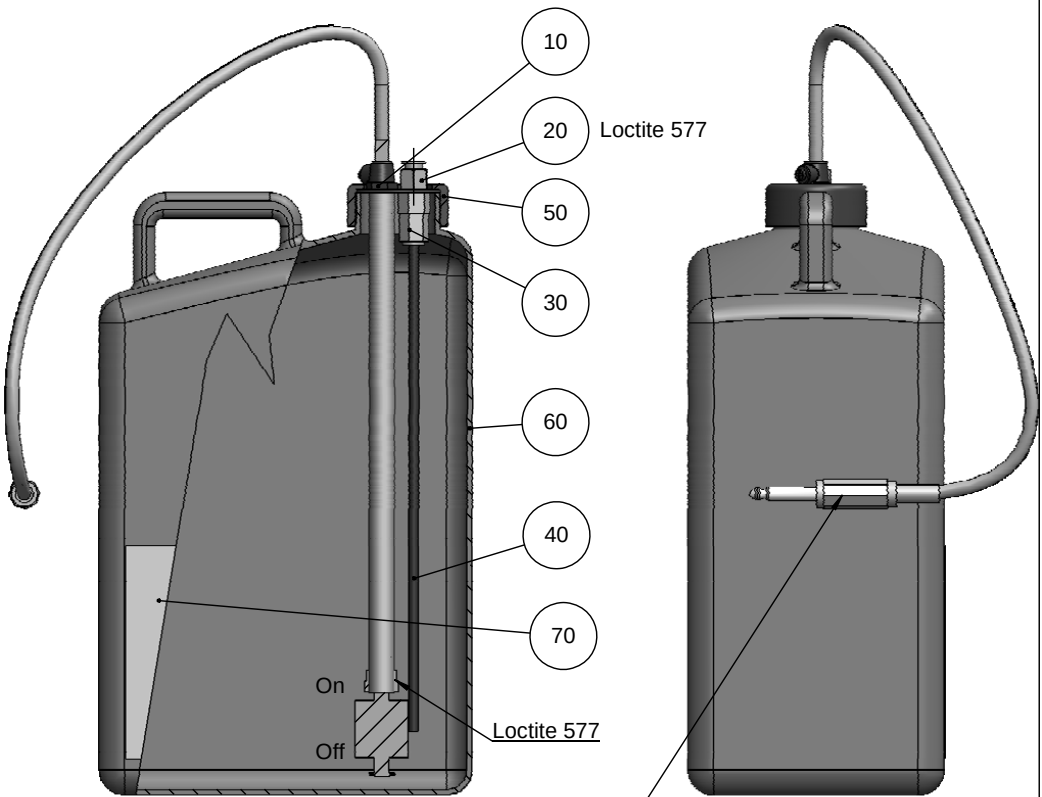
Tolerance: DS/ISO 2768 - mK

Surface treat.: None

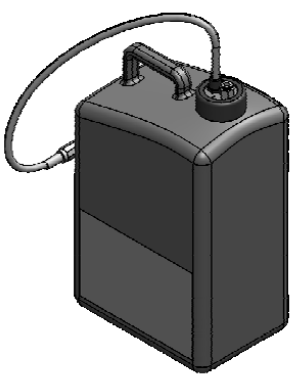
ID: Description:

14590348 Connection box, assembly

Rev: **D**



Label with nr. 3 on connector
(Label from TAFE)



If ON-OFF is opposite, turn the float.

G	2015-03-23	D2: Text corrected. nr.2 -> nr.3.	JJO	2015-03-23	JTV
A	1991-12-18		BRY	1992-02-24	CH
Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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Copenhagen
Denmark
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Fax : +45 44600 804

Material:

Scale: 1:2

Format: A4

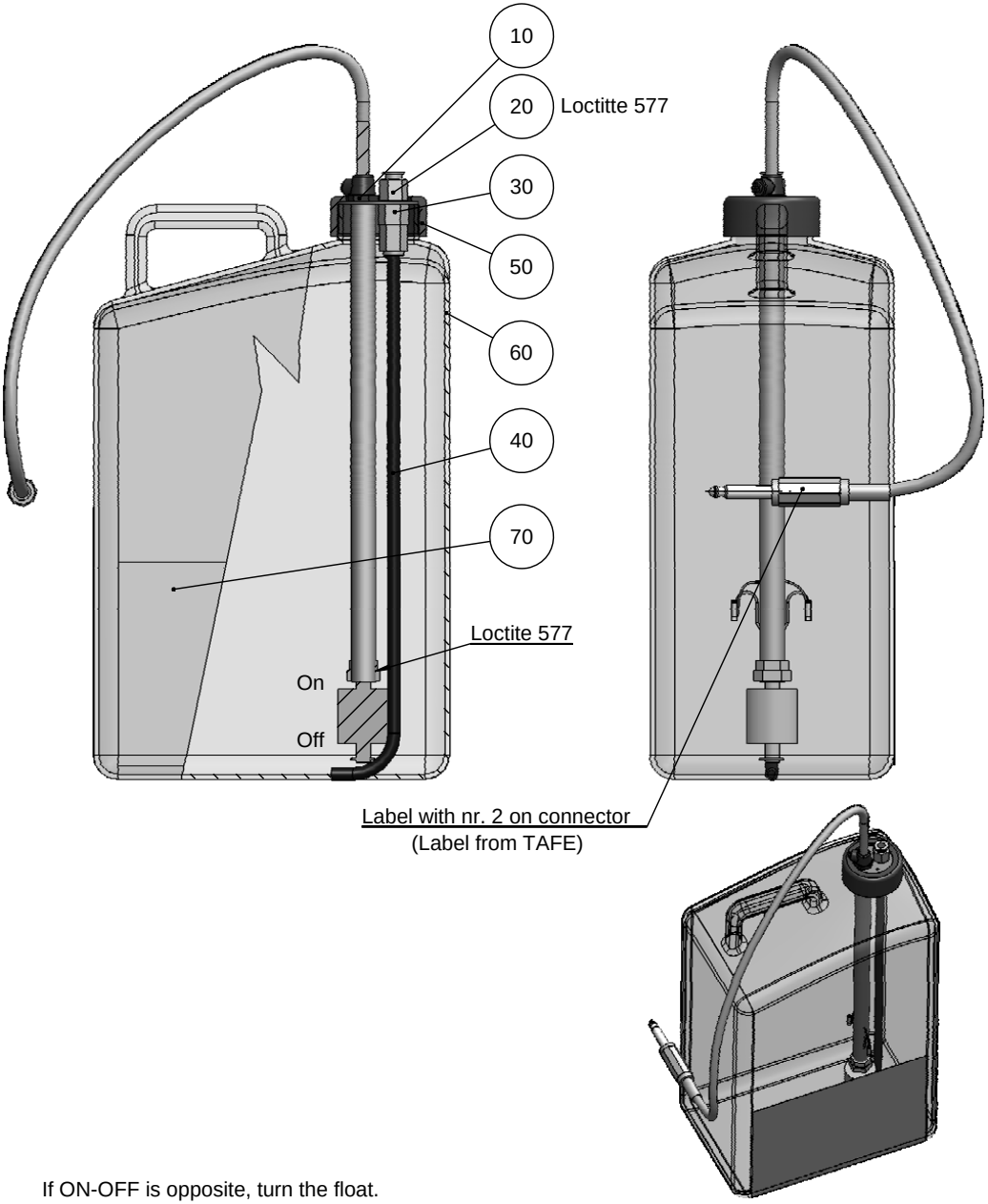
Tolerance: DS/ISO 2768 - -

Weight : g

ID: Description:

14590355 Jar, Soap, assembly

Rev: **G**



If ON-OFF is opposite, turn the float.

Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
F	2015-03-27	D2: Text added.	JJO	2015-03-27	JTV
A	1991-12-18		BRY	1992-02-24	CH

Struers
Pederstrupvej 84
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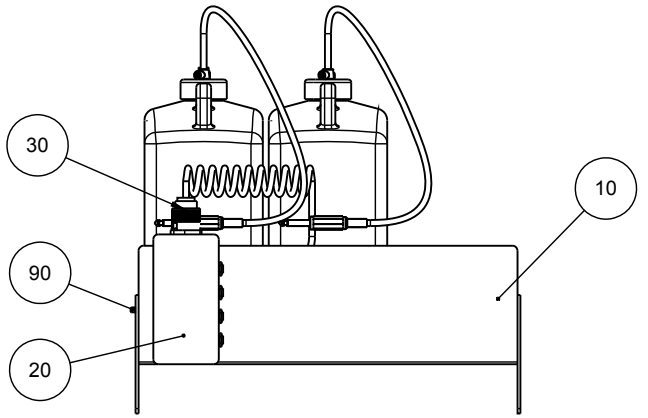
Copenhagen
Denmark
Phone :+45 44600 800
Fax : +45 44600 804

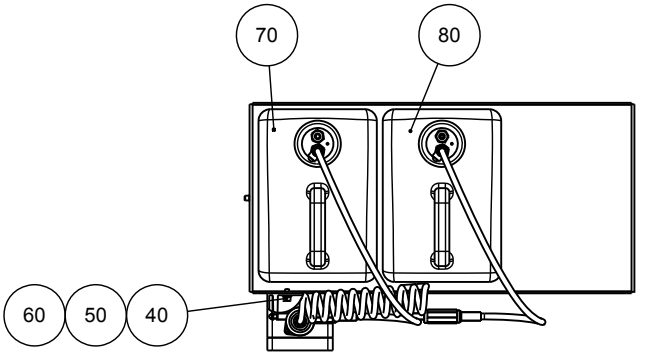
Material:	Scale:	Format:	Tolerance: DS/ISO 2768 - -
	1:2	A4	Weight : g

ID: Description:

14590356 Jar, Alcohol, assembly

Rev: **F**





A	2010.11.01	Redrawn, no changes	SPE	2010.11.02	
A	1994.12.15		BMJ	1994.12.20	JTV
Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

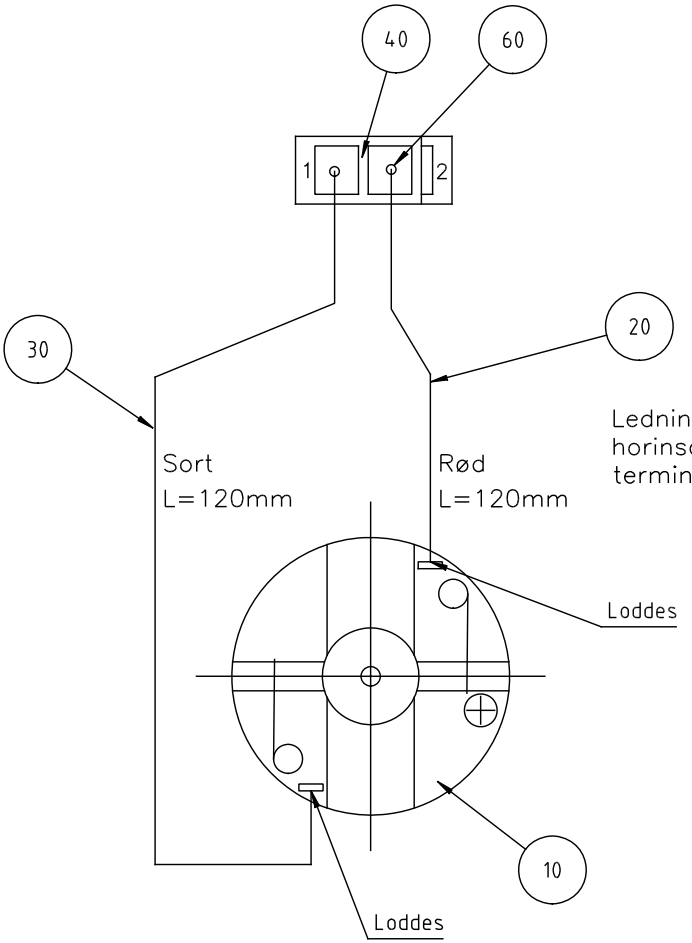
Struers
Pederstrupvej 84
DK-2750 Ballerup
Copenhagen
Denmark
Phone :+45 44600 800
Fax : +45 44600 804

Material:	Scale: 1:5	Format: A4	Tolerance: DS/ISO 2768 - mK	
			Weight : 4496.6 g	

ID: Description:

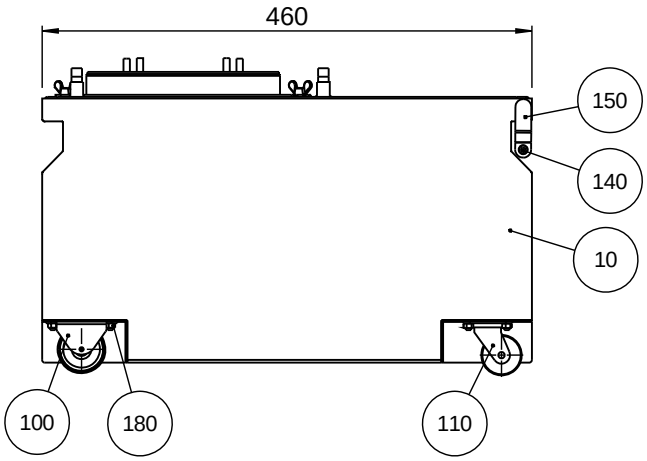
14590360 Tray for cans

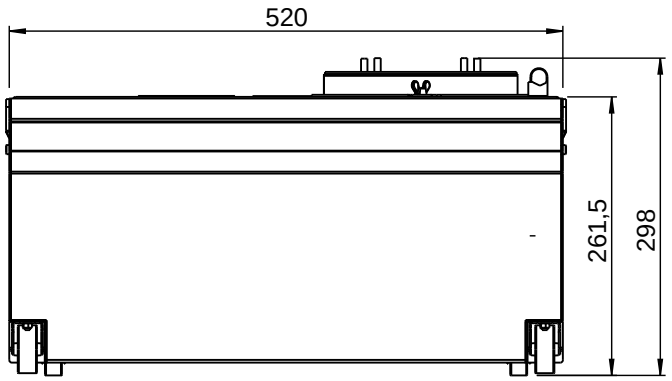
Rev: **A**

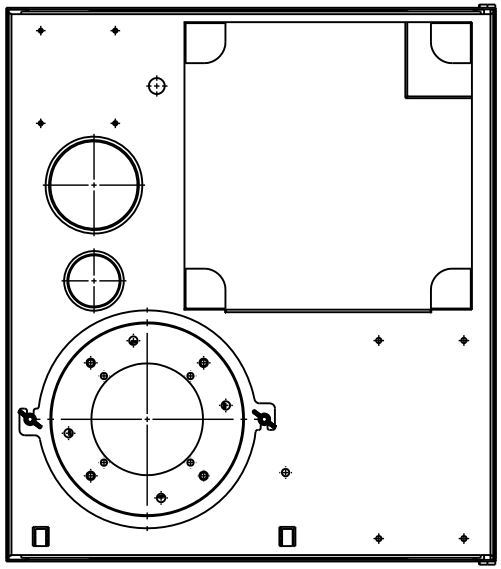


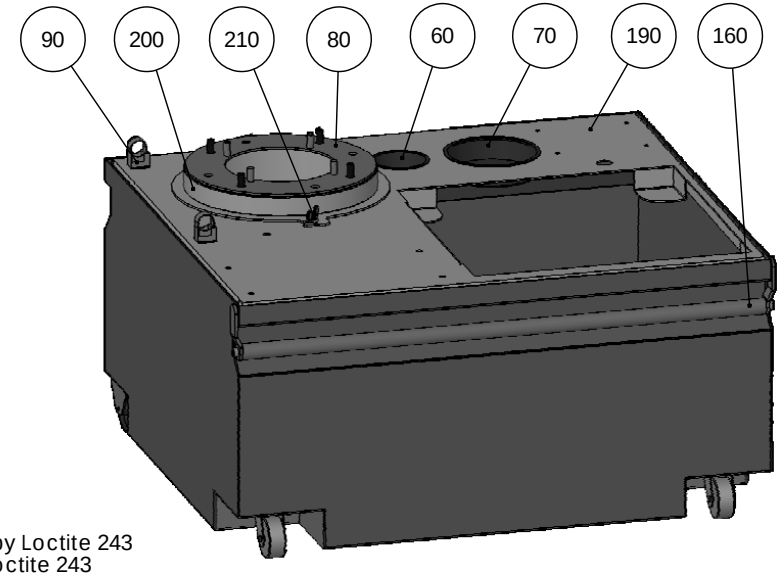
50 Slangen i pumpen udskiftes med 120 mm Silicone–slange ø2/ø4. Der skal være 70 mm imellem hver clips, og slangen skal sidde symmetrisk i pumpen.

Matr.:	Overfl.beh.: Nej	Målforhold: 2:1	Ikke ang. tol. efter DS/ISO 2768– mK	
Struers	Projektionsmetode			Dato / Sign.
			Tegn:	081003 BRY
			Kontr.	081003 FTH
C. Tekst: "Ledninger loddes ...." tlf. 2009-09-09 BRY/SPE	Pumpe, mont.	Erst.: 15400020 C		
B. Stik vendt. 230604 BRY/FTH				









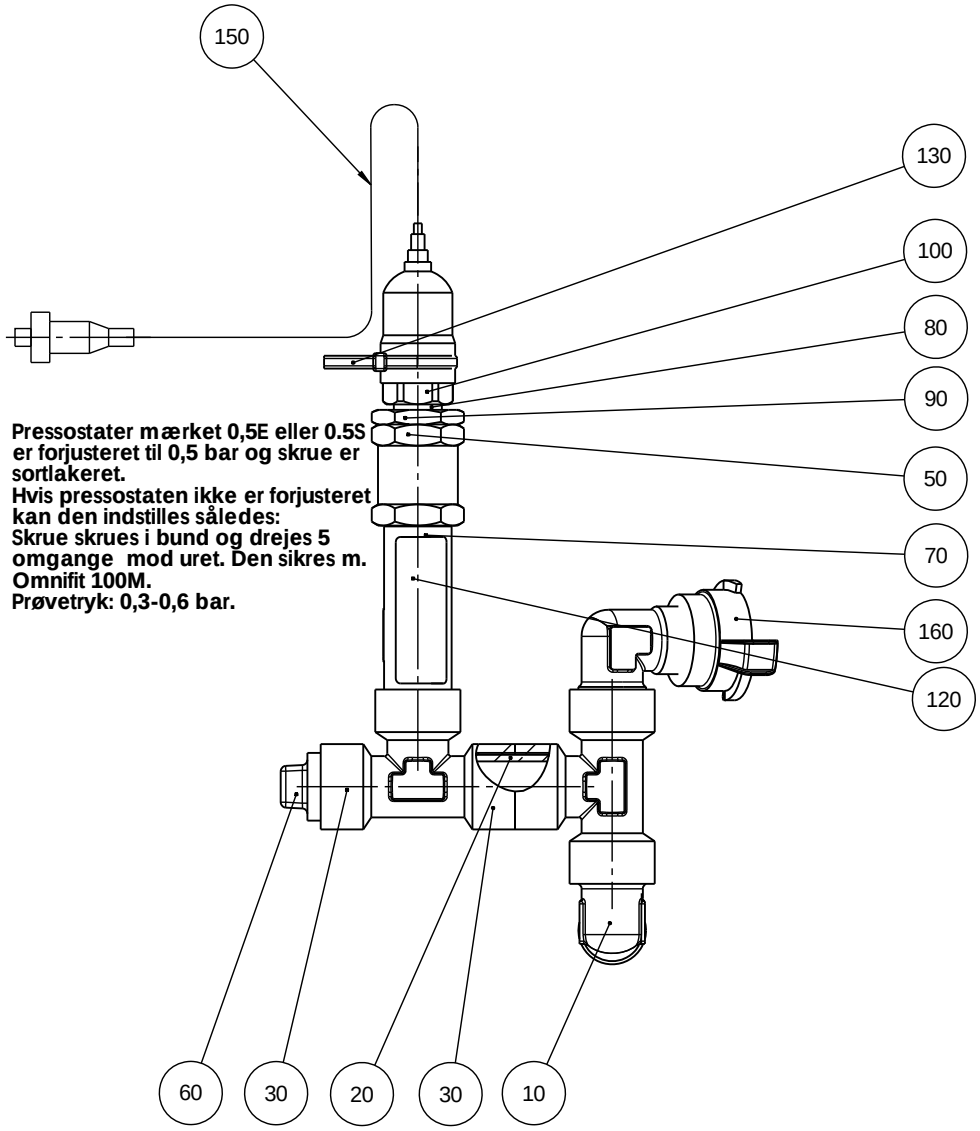
140 Secure by Loctite 243
Pojistit Loctite 243

F	2015-01-06	Pos. 30 -> pos. 190. Pos. 200 and 210 new item.	JJO		
A	2005.04.11		FPG	2005.04.11	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

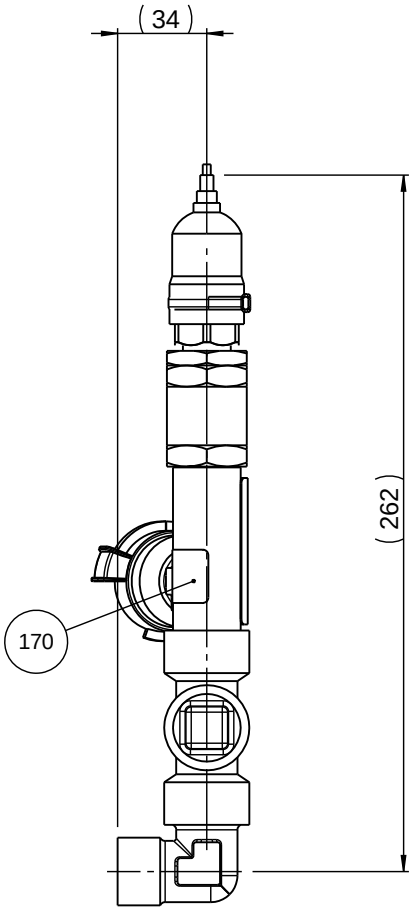
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

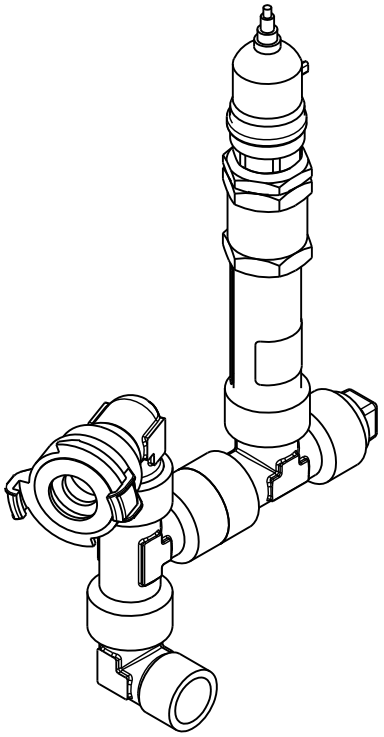
Material:
Scale: 1:1
Format: A3
Tolerance: DS/ISO 2768- mK
Surface treat.: None

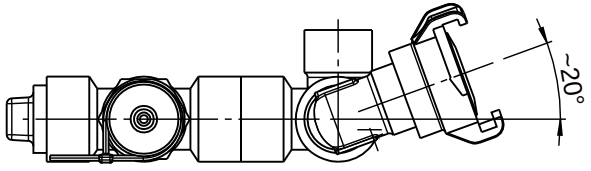
ID:
Description: **15760011 Reservoir 50L, complete**
Rev: **F**



Pressostater mærket 0,5E eller 0.5S er forjusteret til 0,5 bar og skrue er sortlakeret.
Hvis pressostaten ikke er forjusteret kan den indstilles således:
Skrue skrues i bund og drejes 5 omgange mod uret. Den sikres m. Omnifit 100M.
Prøvetryk: 0,3-0,6 bar.







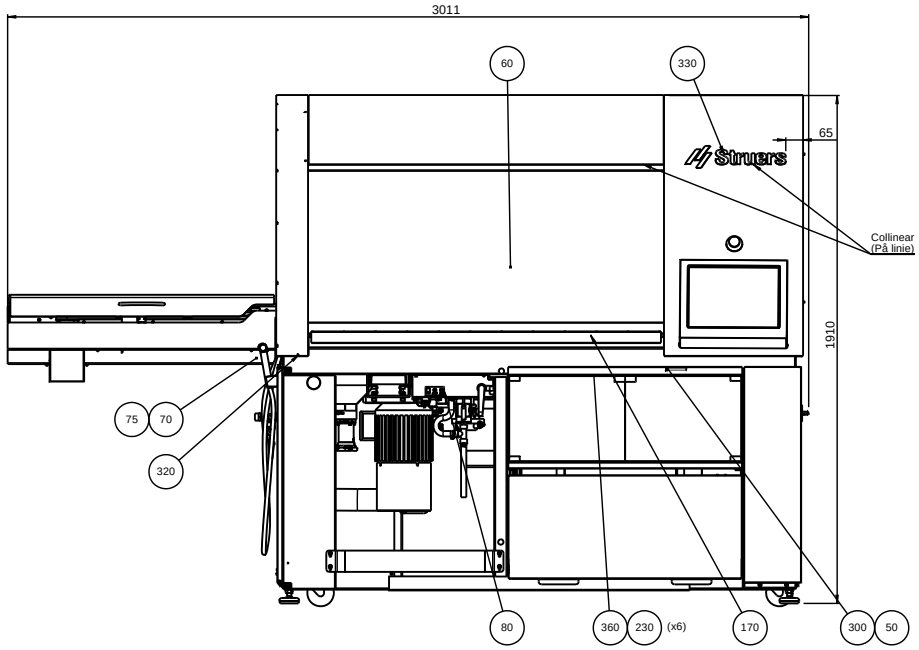
10 20 30 40 50 70 90 Seal 50H

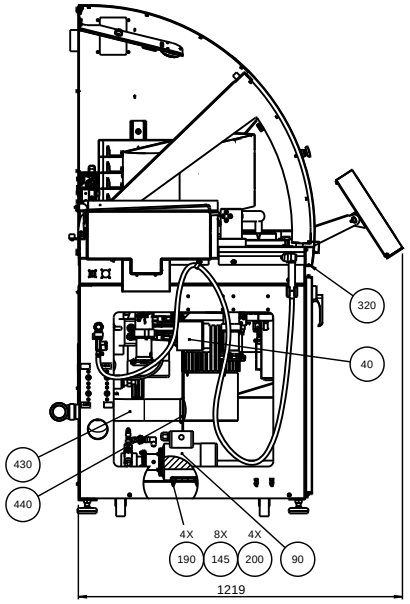
E	2012-10-16	Pos.170 added	JTV	2012-10-16	JTV
A	06-12-07		BRY		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

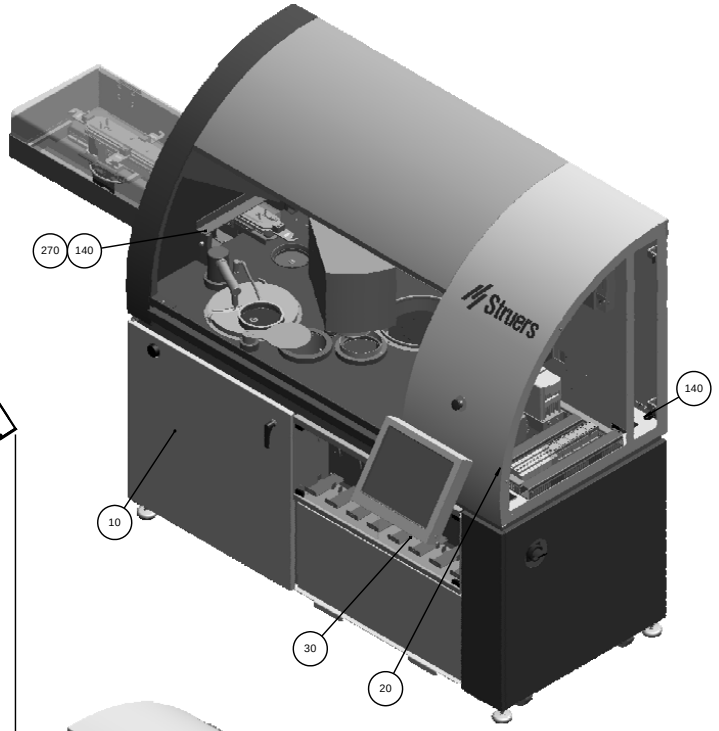
Material: | Scale: 1:2 | Format: A3 | Tolerance: DS/ISO 2768- mK | Surface treat.: None

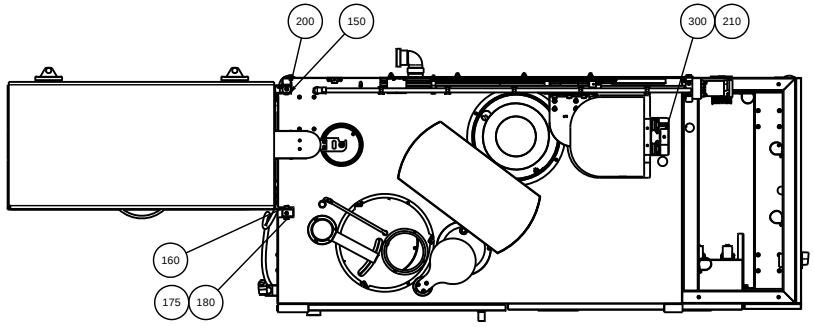
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

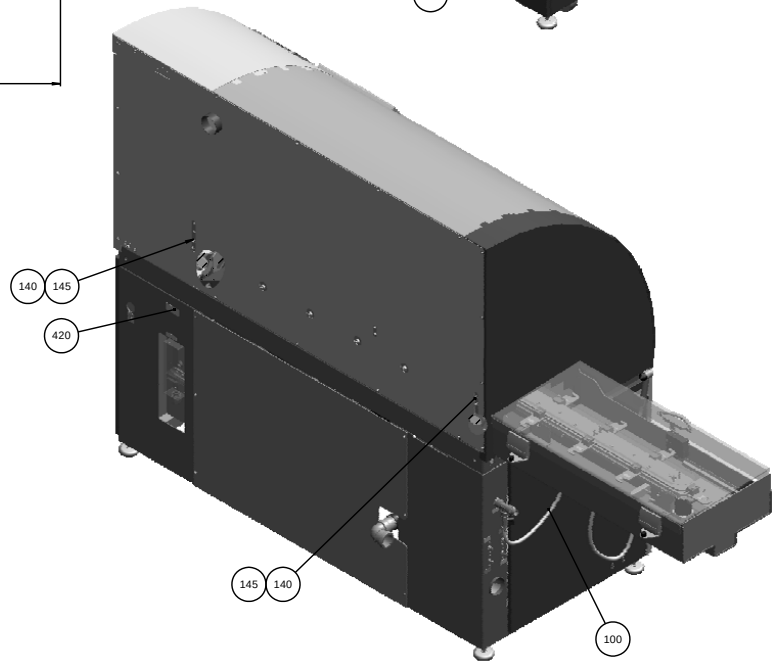
ID: Description: **15760015 Flow sensor, complete** | Rev: **E**











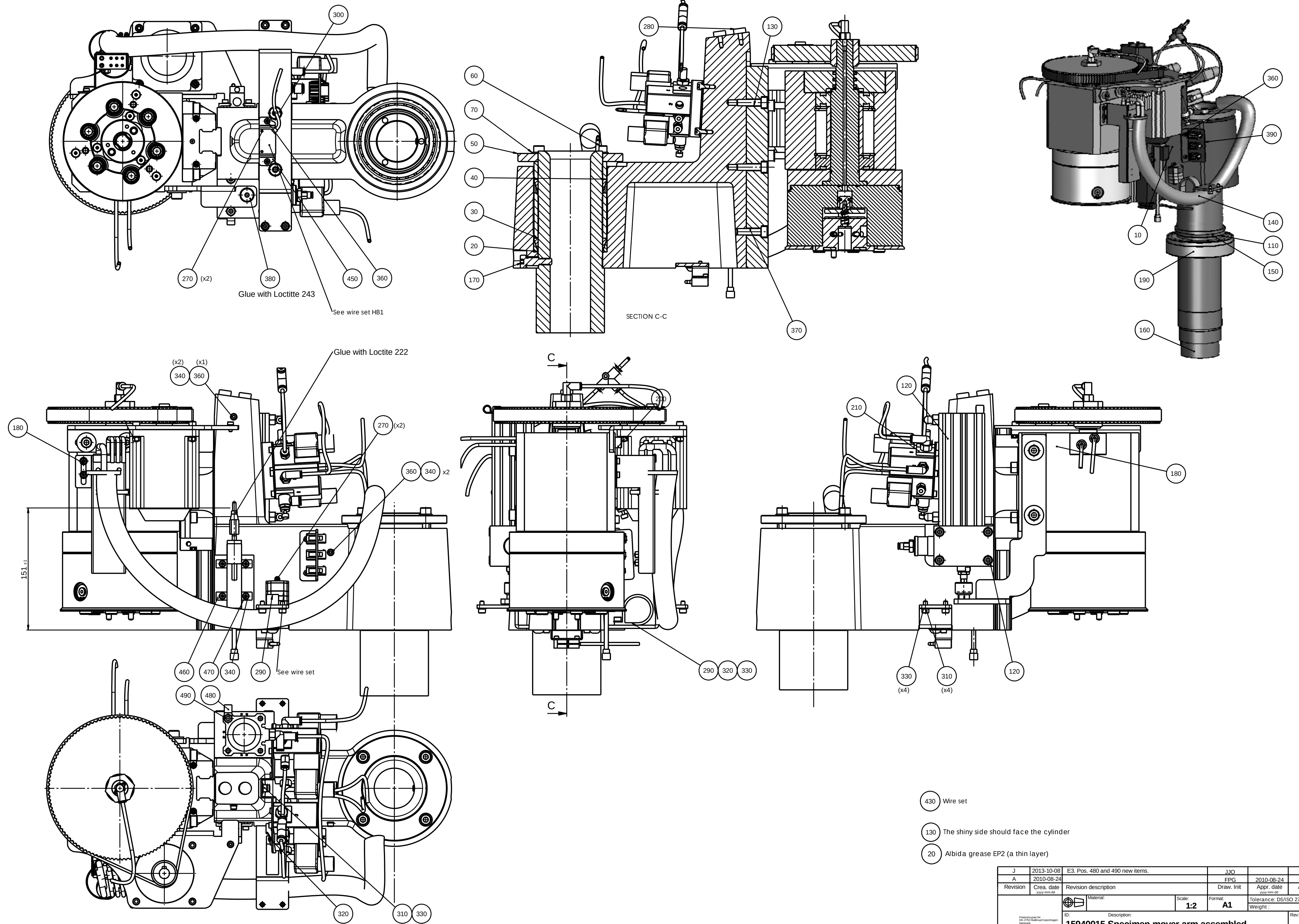
290 Wire set

J	2014-07-11	F4: Pos. 430 and 440 new item.	JJO		FPG
A	2010-11-15		FPG	2010-11-15	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone +45 44 600 800
Fax +45 44 600 801

Material:	Scale: 1:10	Format: A1	Tolerance: DS/ISO 2768- mK	
			Weight :	g

ID:
Description: **15940010 Hexamatic Complete**
Rev: **J**



430 Wire set

130 The shiny side should face the cylinder

20 Albida grease EP2 (a thin layer)

Revision	Crea. date (yyyy-mm-dd)	Revision description	Draw. Init	Appr. date (yyyy-mm-dd)	Appr. Init
J	2013-10-08	E3. Pos. 480 and 490 new items.	JJO		
A	2010-08-24		FPG	2010-08-24	FPG

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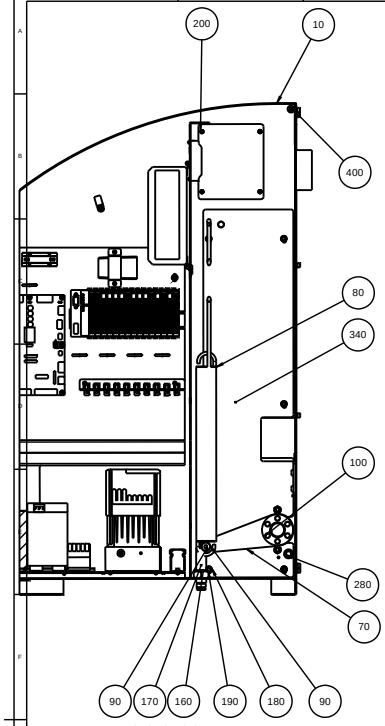
Phone:+45 44 600 800
Fax: +45 44 600 804

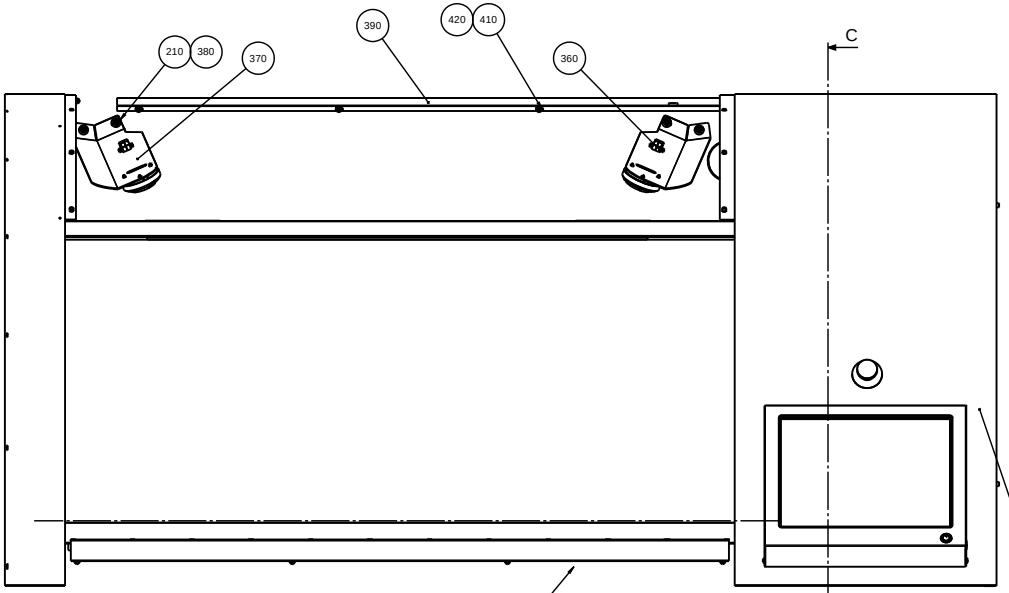
Material:	Scale: 1:2	Format: A1	Tolerance: DS/ISO 2768- mK
			Weight : g

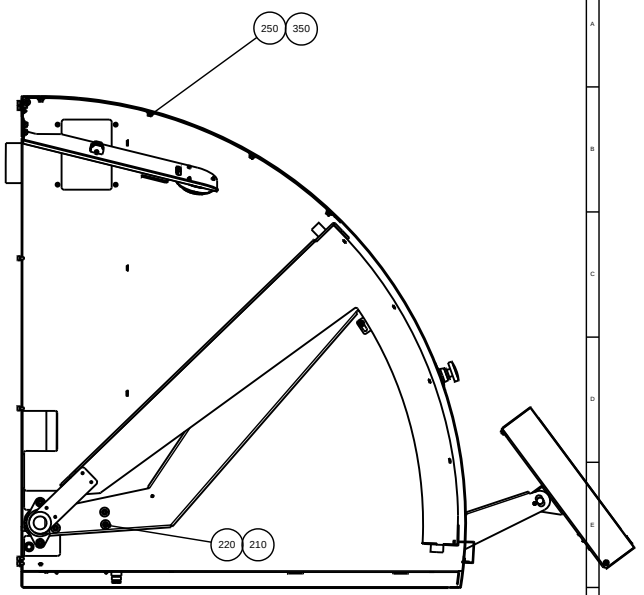
ID: Description: **15940015 Specimen mover arm assembled**

Rev: J

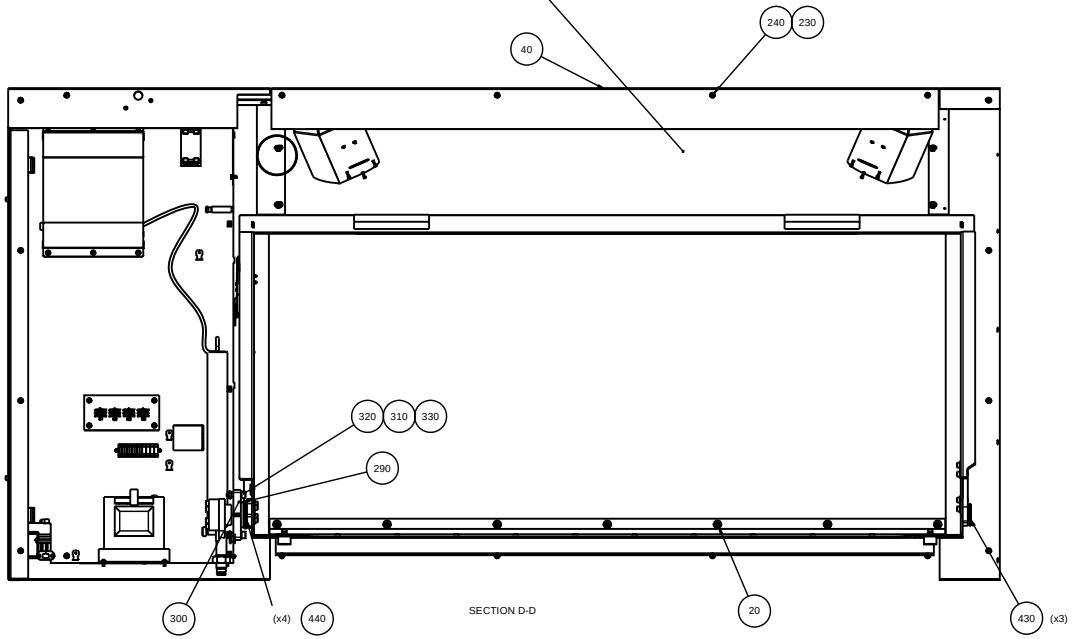


SECTION C-C

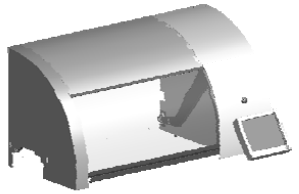




Shown without 15949025 Front Plate



SECTION D-D



F	2011-09-15	pos 160,170 changed	CJE		
A	2011.01.16		SPE		CJE
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Material:

Scale: 1:5

Format: A1

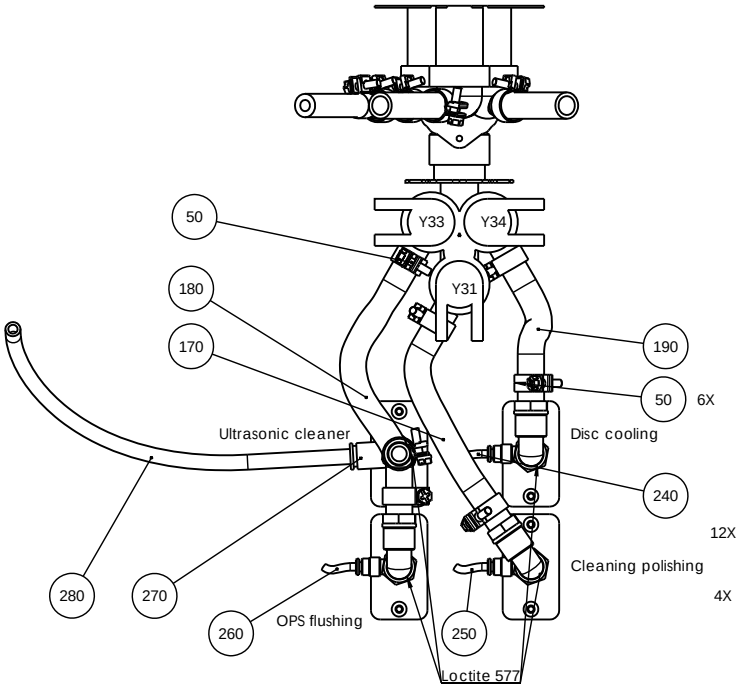
Tolerance: DS/ISO 2768- mK

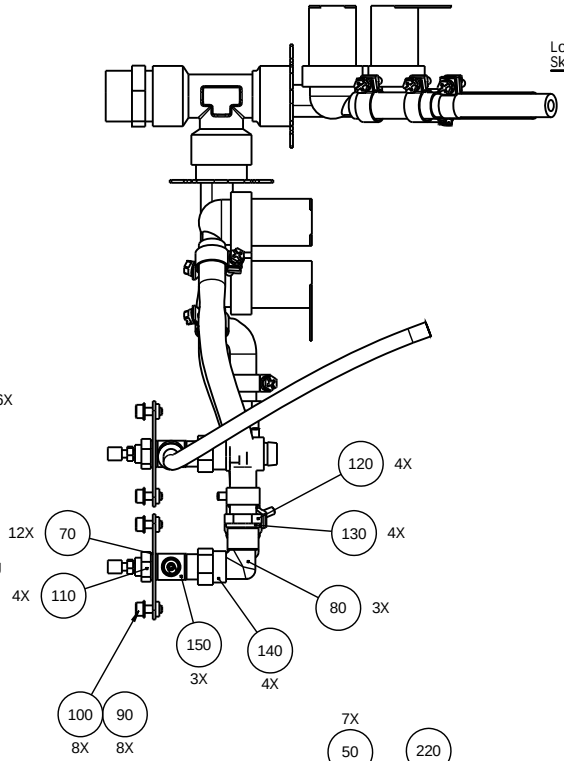
Weight : 186406.8 g

ID:

Description: **15940016 Cabinet assembled**

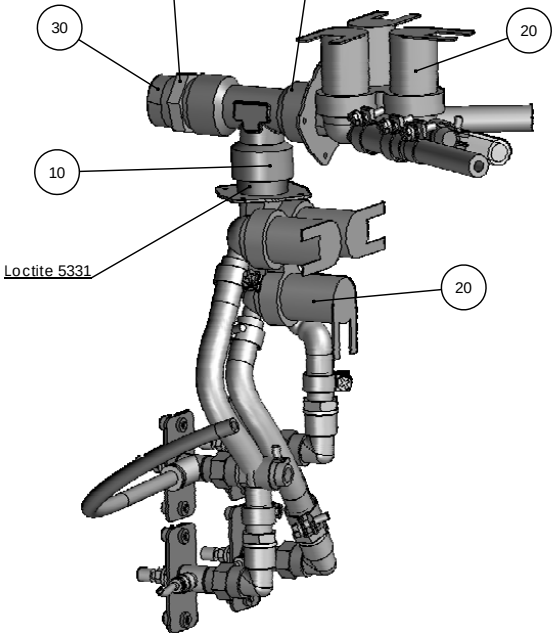
Rev: F

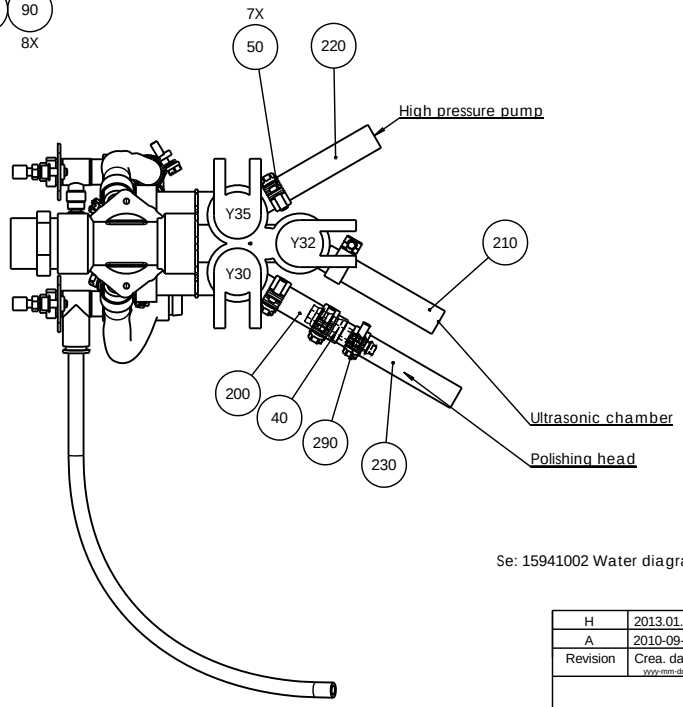




Loctite 577
Skal ikke limes før at ventilen monteres i Hexamatic

Loctite 5331





Se: 15941002 Water diagram HexaMatic

H	2013.01.16	2NS11309->2NS14129; 2NS11609->2NS14149	SPE	2013.01.16	
A	2010-09-16		FPG	2010-09-16	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : 822.6 g

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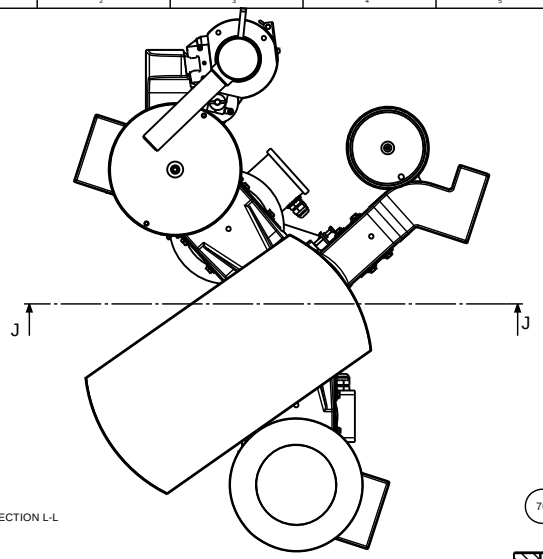
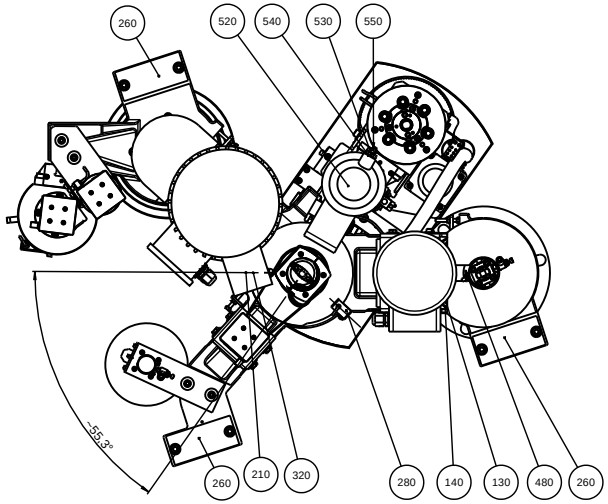
ID: Description:

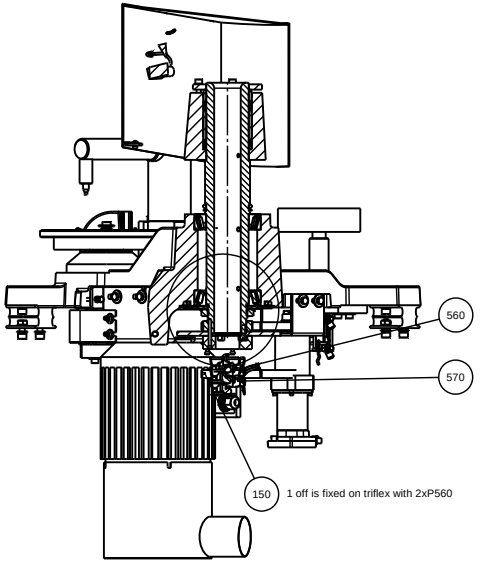
15940017 Water inlet, assembled

Rev: **H**

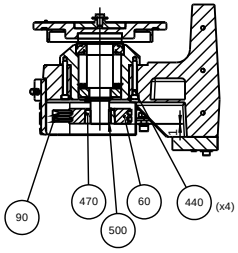


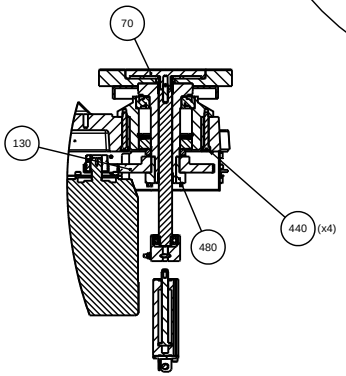


SECTION J-J



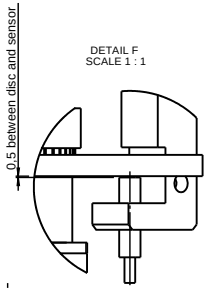
SECTION L-L



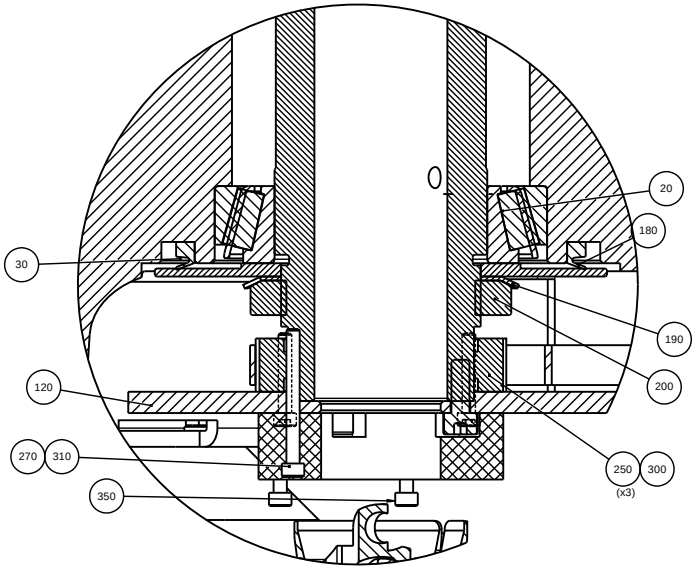


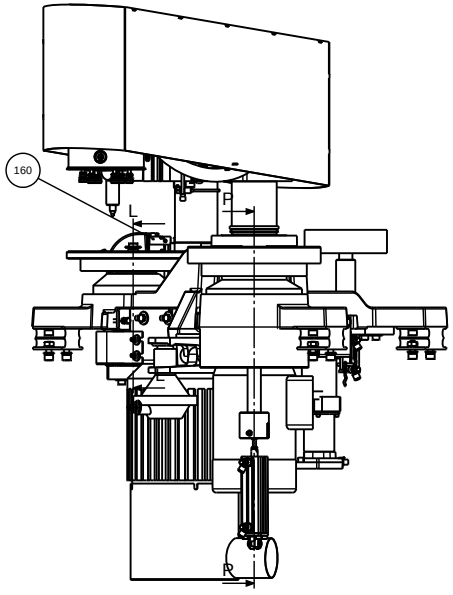
SECTION P-P

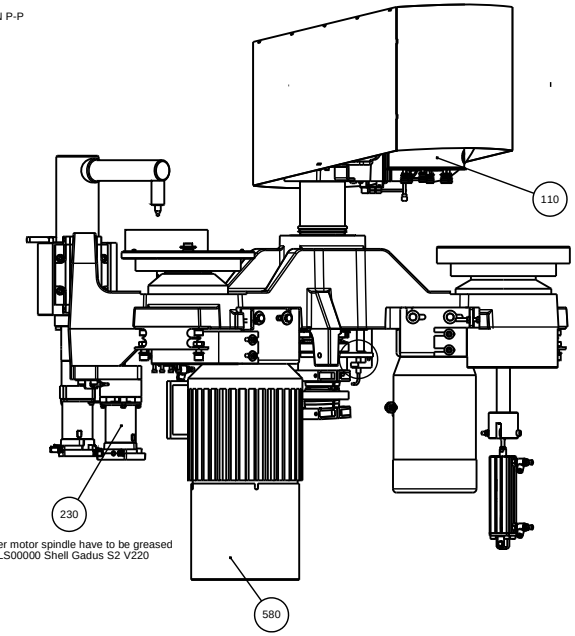
DETAIL F
SCALE 1 : 1



DETAIL K
SCALE 1 : 1







Stepper motor spindle have to be greased with 2LS00000 Shell Gadus S2 V220

510 Wire set

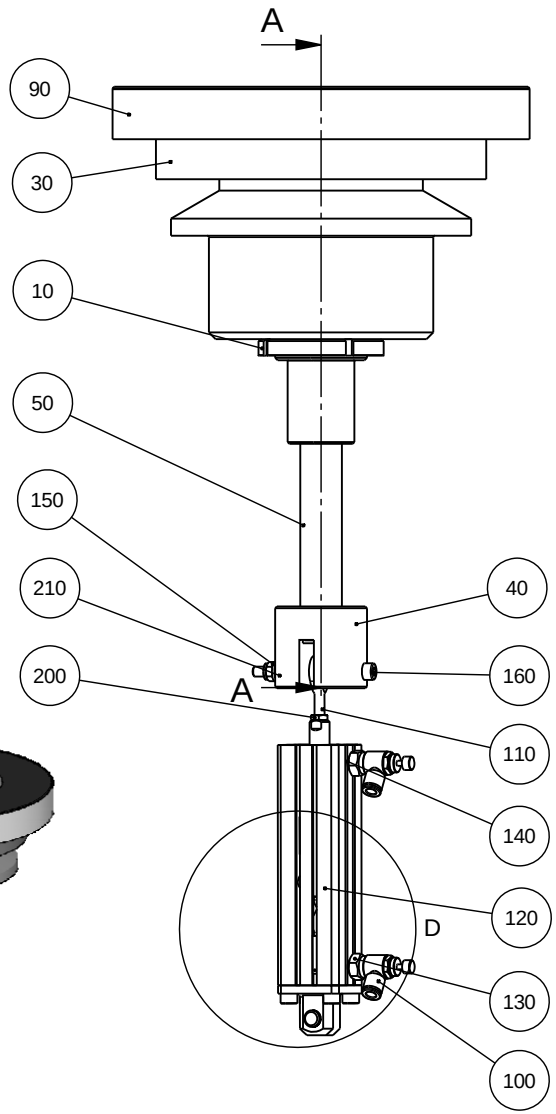
Sheet 1/2

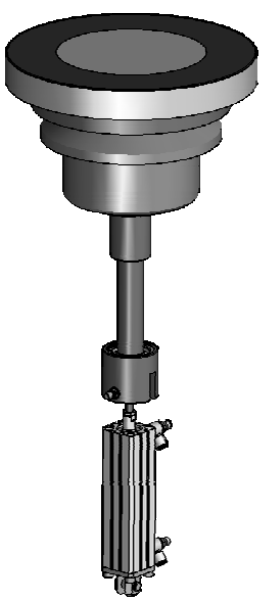
H	2014-07-11	M8: Pos. 580 new item.	JJO		
A	2010-08-28		FPG	2010-08-28	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone +45 44 600 800
Fax +45 44 600 80 0

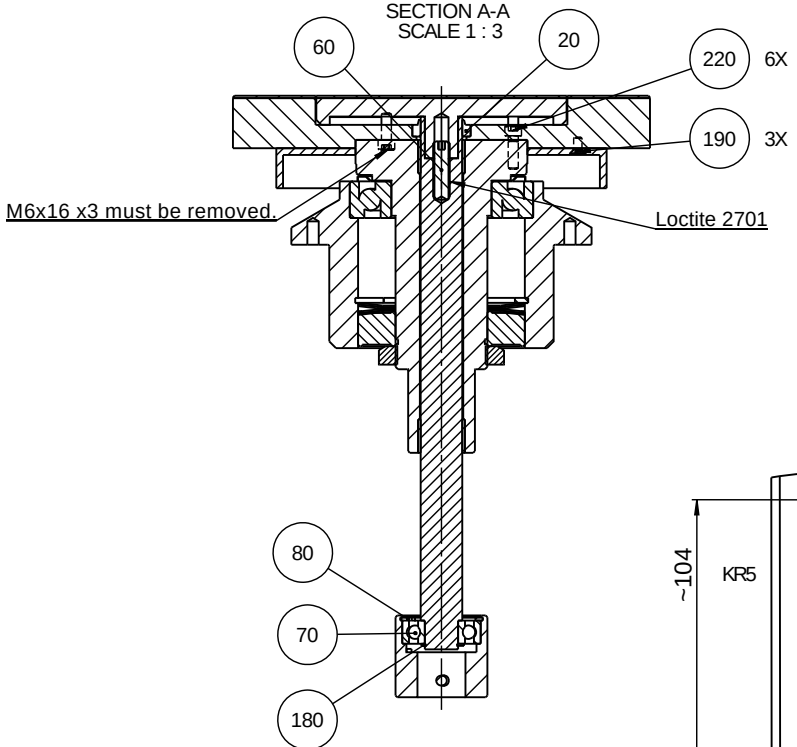
Material:
Scale: 1:5
Format: A1
Tolerance: DS/ISO 2768- mK
Weight : g

ID:
Description: **15940020 Base assembled**
Page 1 of 2
Rev: H

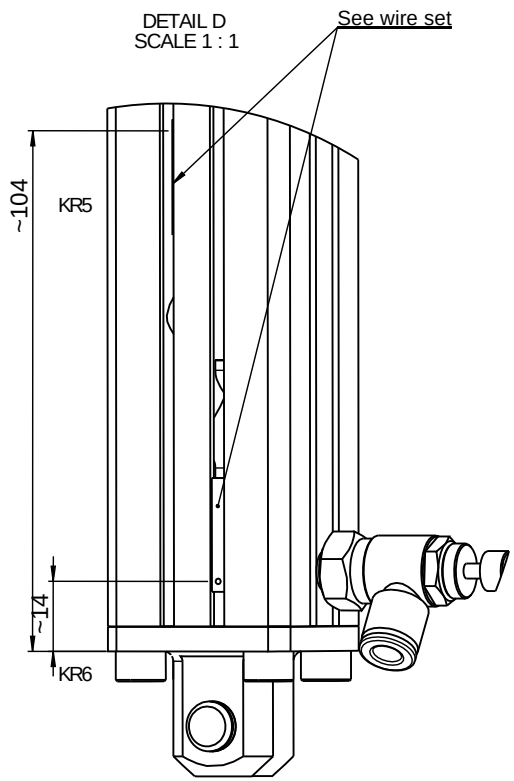




SECTION A-A
SCALE 1 : 3



DETAIL D
SCALE 1 : 1



E	2012-03-20	A,6: Pos. 20 changed scraper.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

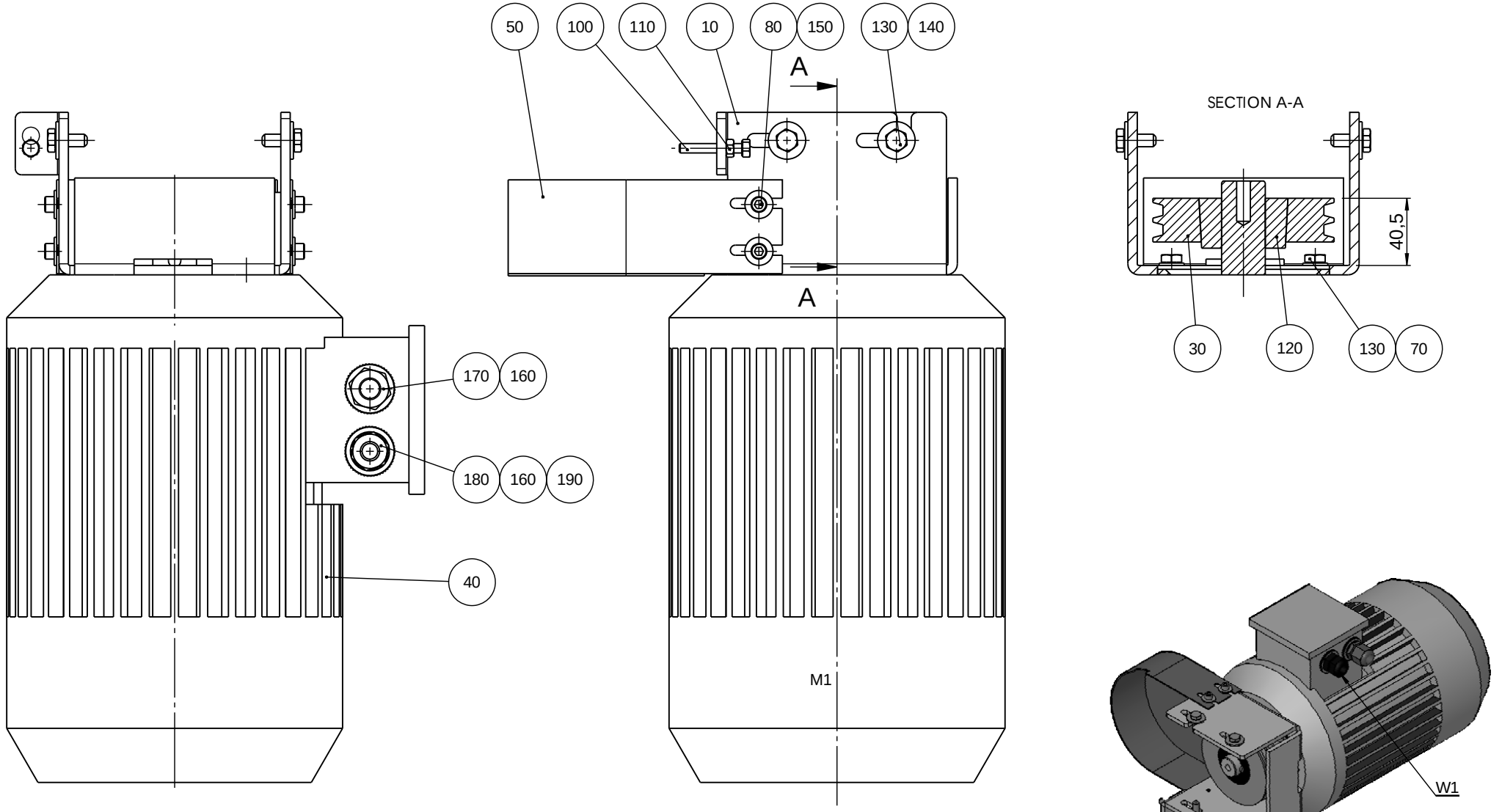
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:	Scale:	Format:	Tolerance: DS/ISO 2768- mK
	1:2	A3	Weight : g

ID: Description:

15940021 Polishing station assembled

Rev: **E**



G	2014-04-28	B8: 43 -> 40,5mm.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

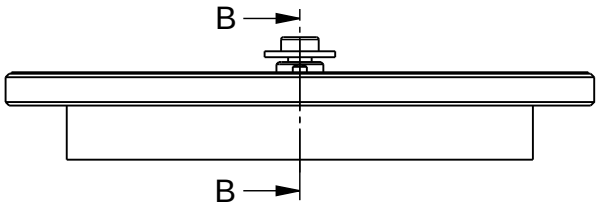
Material:	Scale: 1:2.5	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight :	g

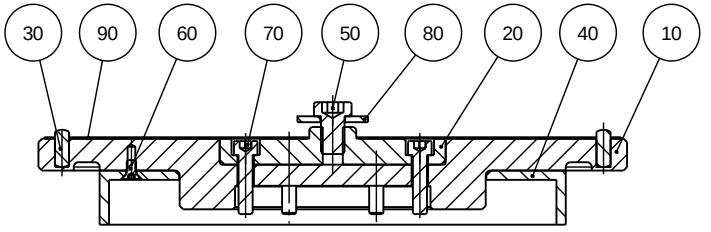
ID: Description:

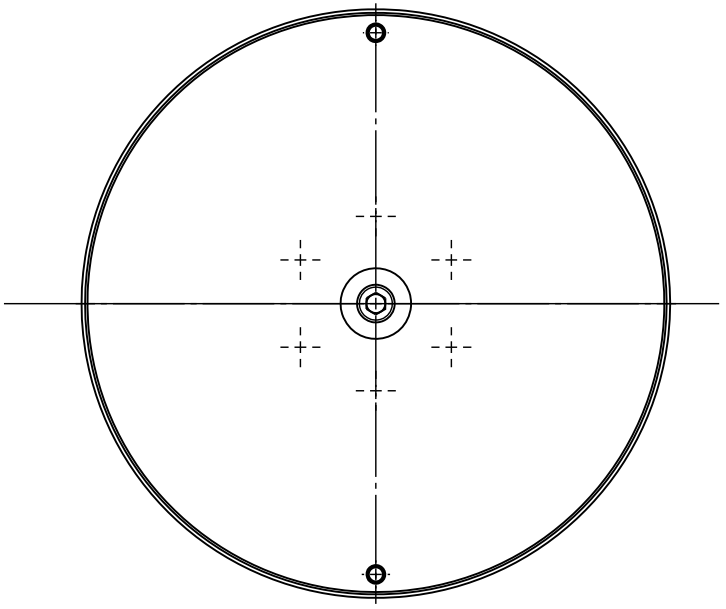
15940022 Motor for grinding stone assembled

Rev: **G**

SECTION B-B







F	2012-05-22	Pos. 90 added.	JJO		
A	2010-09-06		FPG	2010-09-06	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: **1:2**

Format: **A3**

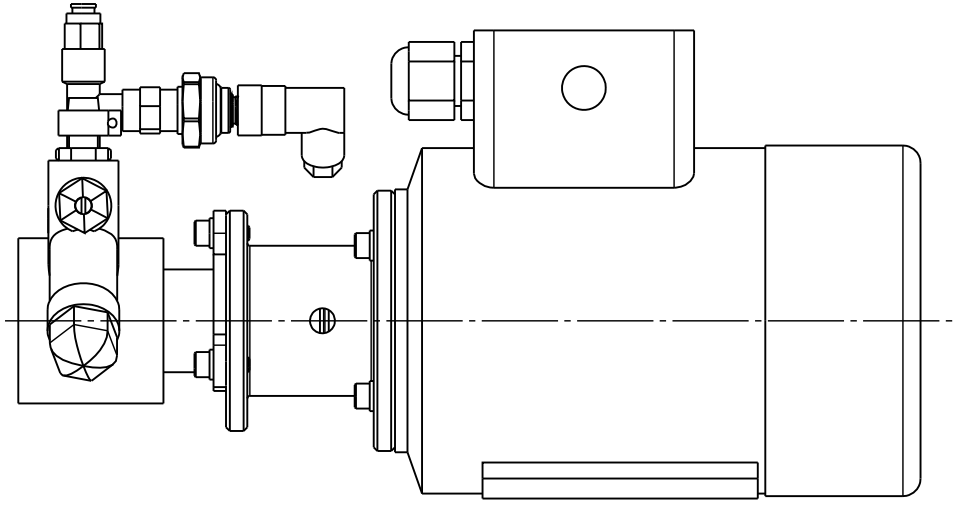
Tolerance: DS/ISO 2768- mK

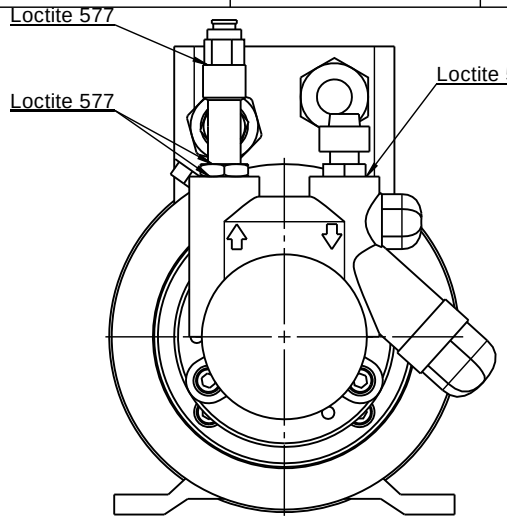
Weight : g

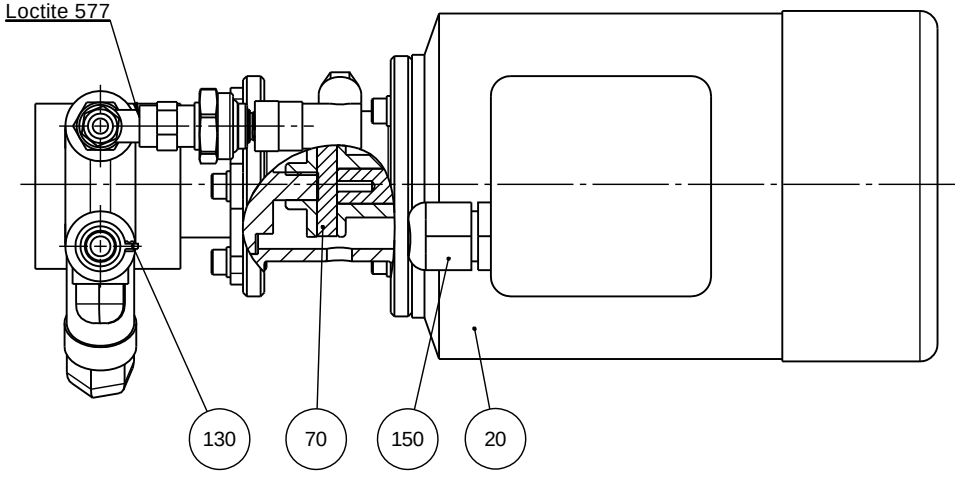
ID: Description:

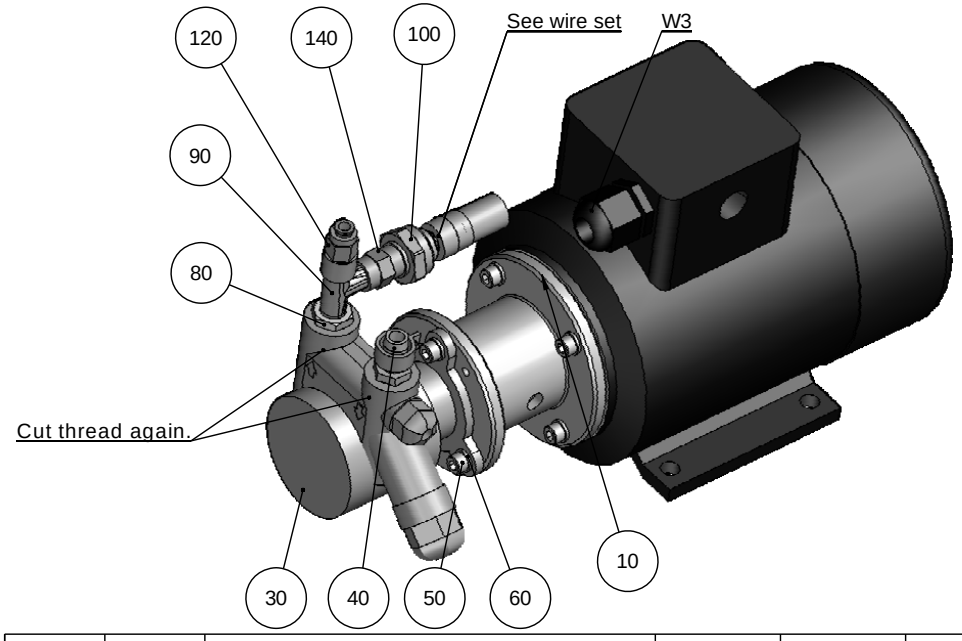
15940023 Disc for grinding stone

Rev: **F**









E	2012-03-06	E,2: New pressure transmitter added.	JJO		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

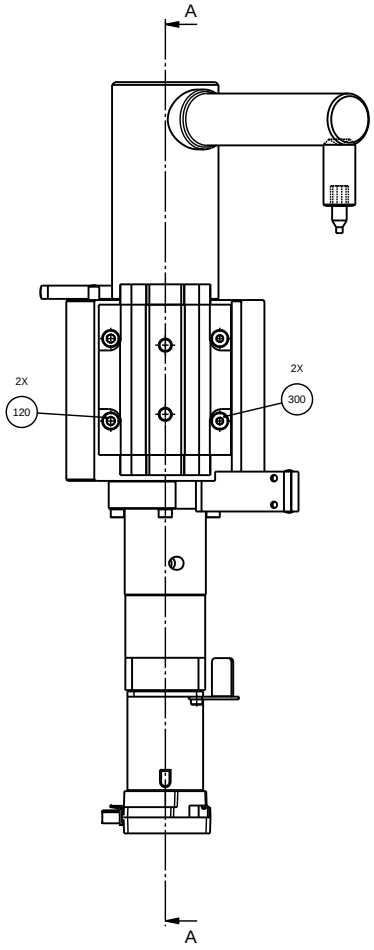
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

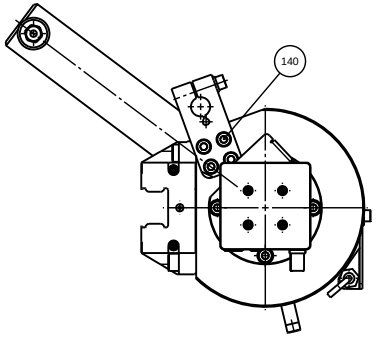
Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight :	g

ID: Description:

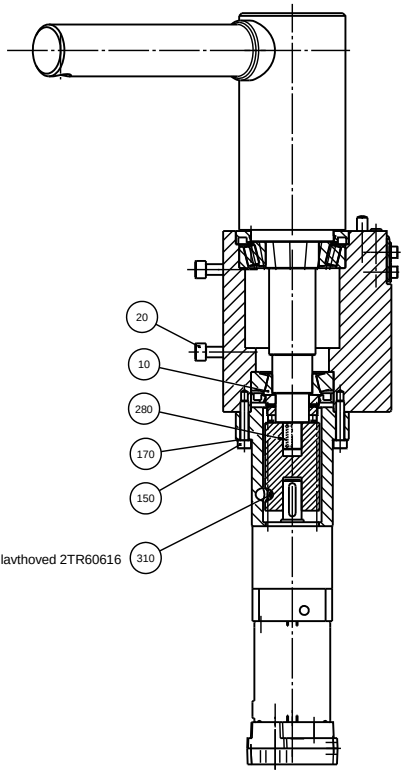
15940024 High Pressure pump assembled

Rev: **E**

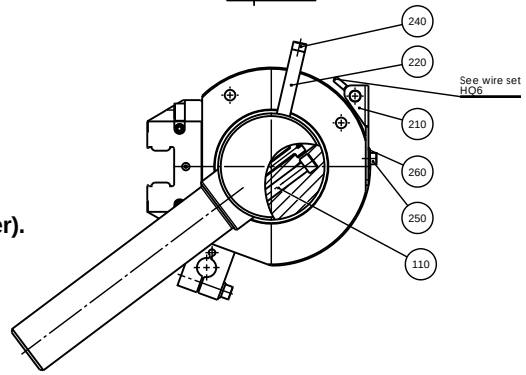


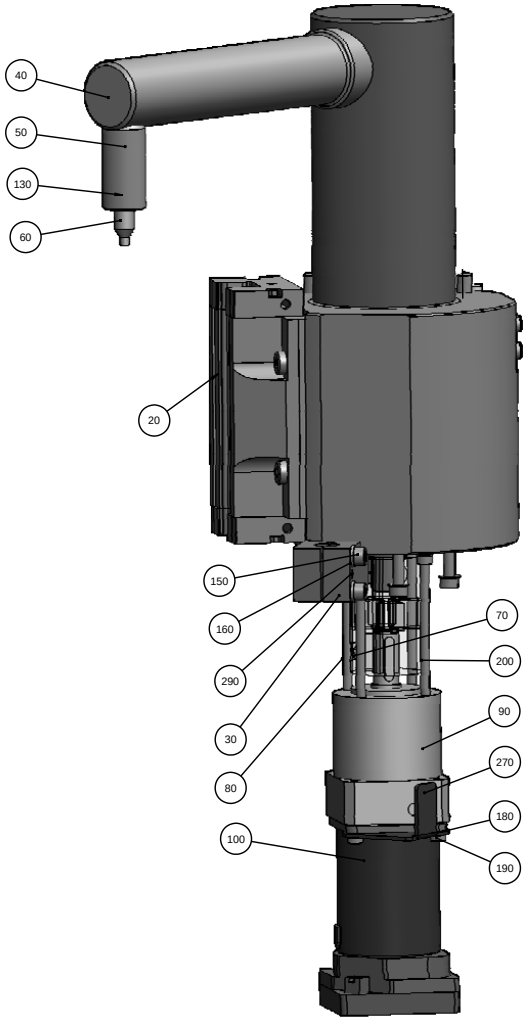


SECTION A-A



Skruer udskiftes med lavthoved 2TR60616





Ved montage af **15940025 Dresser bearing** tjekkes momentet på sammenspændingen af lejerne.

Hiv med en fjedervægt i **15940197 Rod for diamant** pos. 50 (eller en dummi aksel med tilsvarende længde som **15940196 Arm for dresser).**

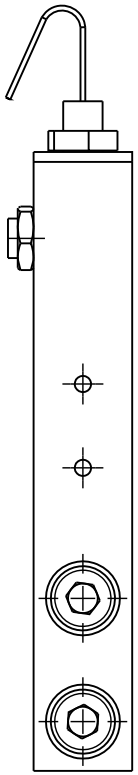
Fjedervægten skal vise ca. 0,75kg uden stepmotoren monteret, og ca. 1kg med stepmotoren monteret.

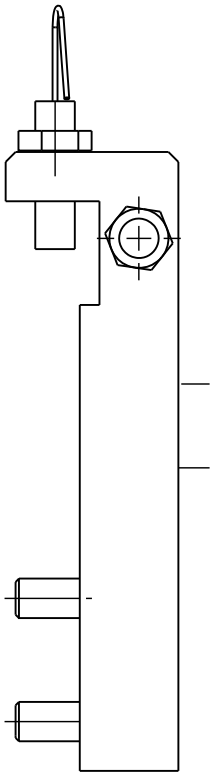
130 Loctite 2701

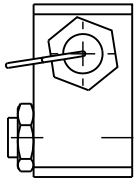
M	2014-12-05	F3: Pos. 300 and 310 added.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

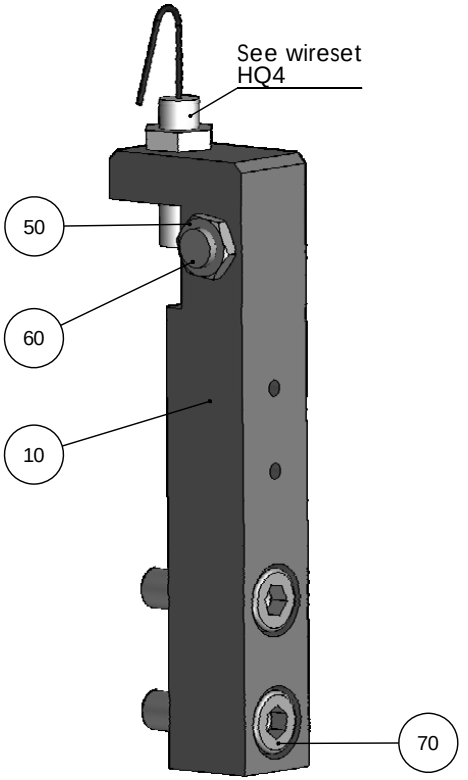
Struers — Material: — Scale: 1:2 — Format: A1 — Tolerance: DS/ISO 2768- mK — Weight : g

ID: — Description: **15940026 Dresser assembled** — Rev: **M**









D	2011-11-29	HQ4 added	SPE	2011.11.29	
A	2011-01-05		FPG	2011-01-05	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:1

Format: A3

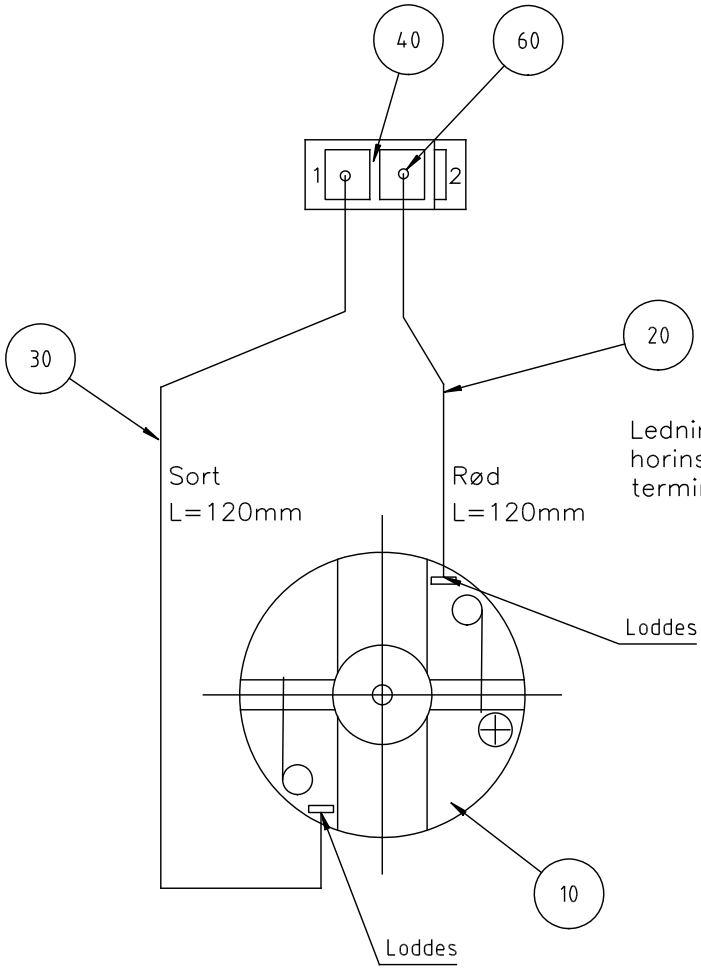
Tolerance: DS/ISO 2768- mK

Weight : 379.8 g

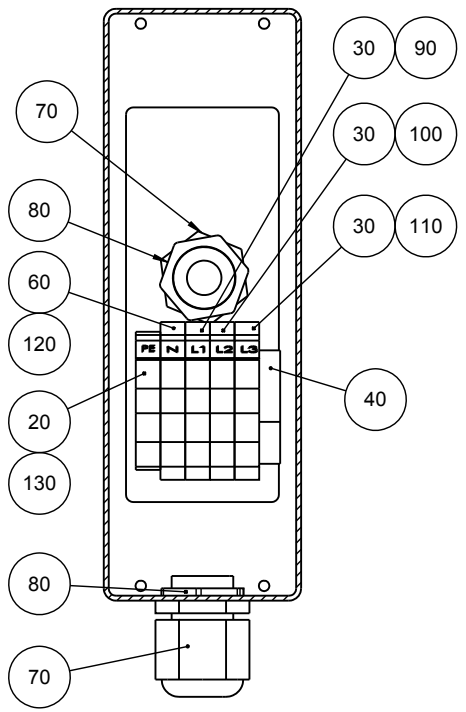
ID: Description:

15940027 Stop bracket, assembled

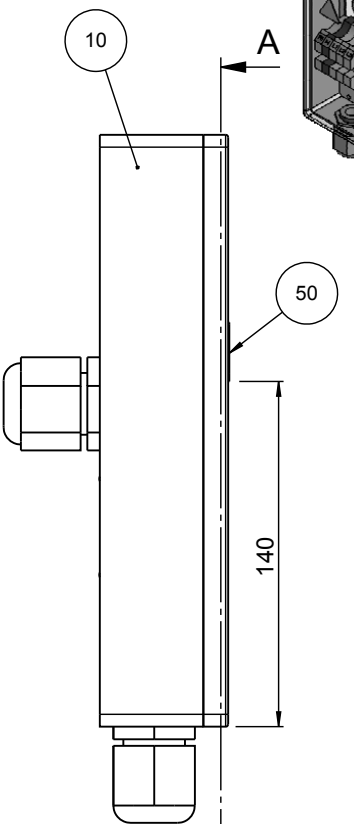
Rev: **D**

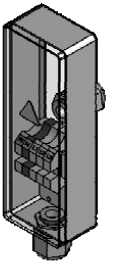


Matr.:	Overfl.beh.: Nej	Målforhold:	Ikke ang. tol. efter DS/ISO 2768– mK
Struers	Projektionsmetode	2:1	Dato / Sign. Tegn: 11–09–21 BRY Kontr.
Pump, assembl.		Erst.:	15940028 A



SECTION A-A





A					
A	2010-09-16		FPG	2010-09-16	FPG
Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
DK-2750 Ballerup
Copenhagen
Denmark
Phone :+45 44600 800
Fax : +45 44600 804

Material:

Scale: **1:2**

Format: **A4**

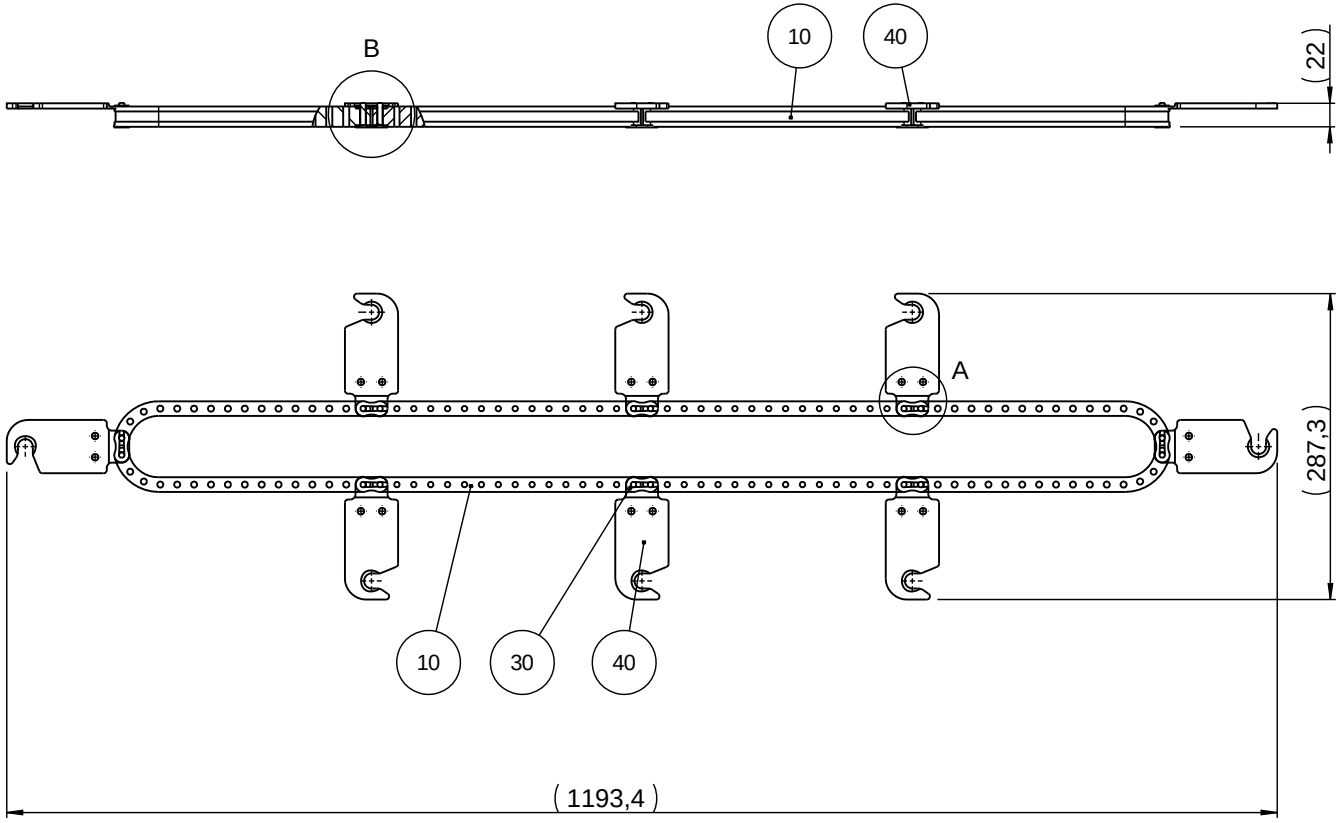
Tolerance: DS/ISO 2768 - mK

Weight : 2252.5 g

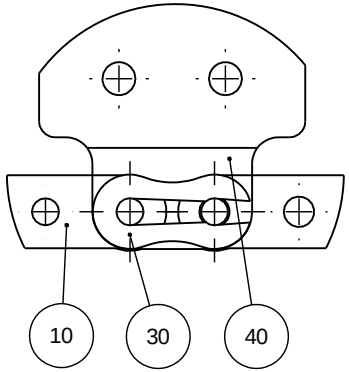
ID: Description:

15940029 Main power connection, assembled

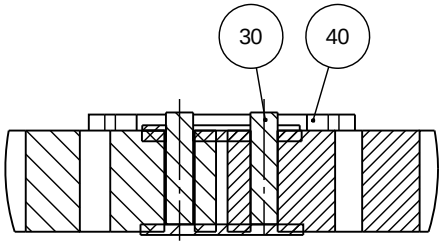
Rev: **A**

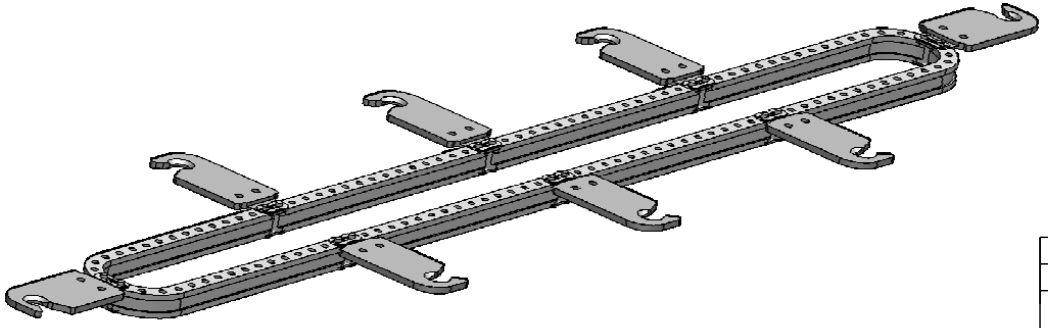


DETAIL A
SCALE 1 : 1



DETAIL B
SCALE 1 : 1





C	2014-04-24	Pos. 20 deleted.	JJO		
A	2010-09-17		TDR	2010-09-17	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:5

Format: A3

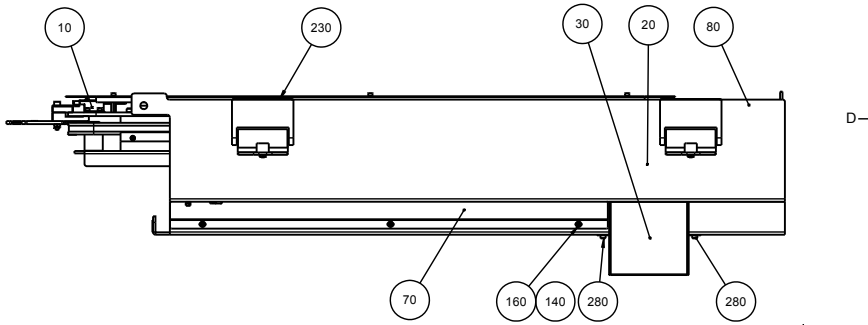
Tolerance: DS/ISO 2768- -

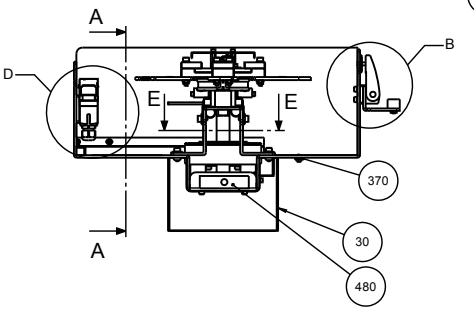
Weight : 4578.2 g

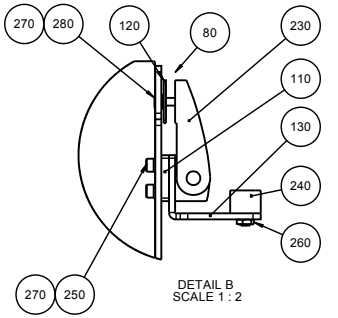
ID: Description:

15940030 Chain assembled

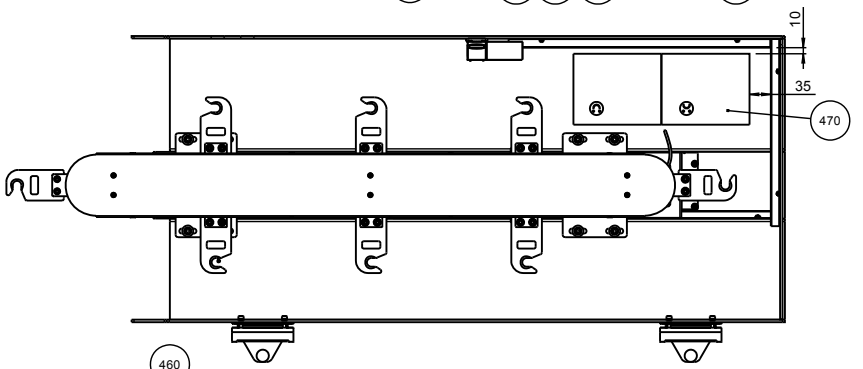
Rev: C

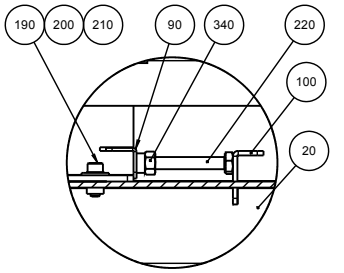




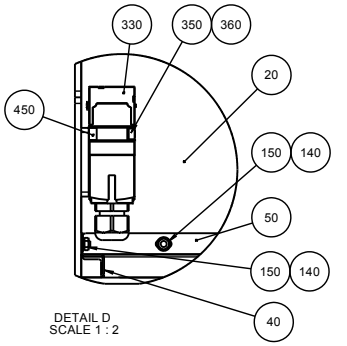


DETAIL B
SCALE 1 : 2

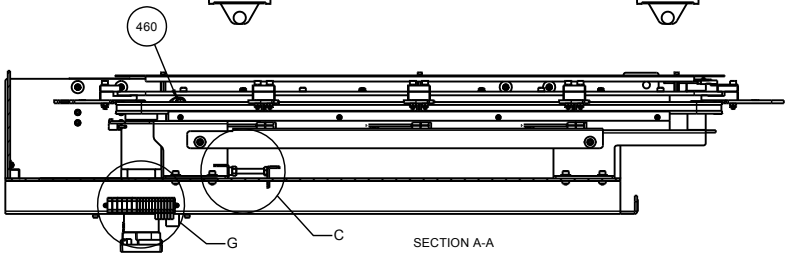




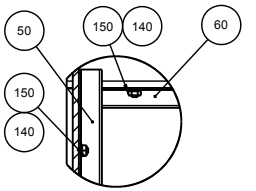
DETAIL C
SCALE 1 : 2



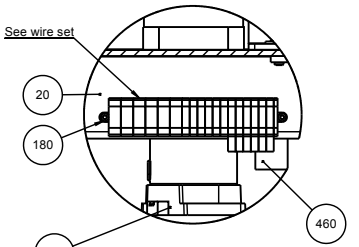
DETAIL D
SCALE 1 : 2



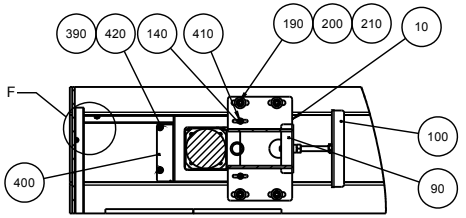
SECTION A-A



DETAIL F
SCALE 1 : 2



DETAIL G
SCALE 1 : 2



SECTION E-E

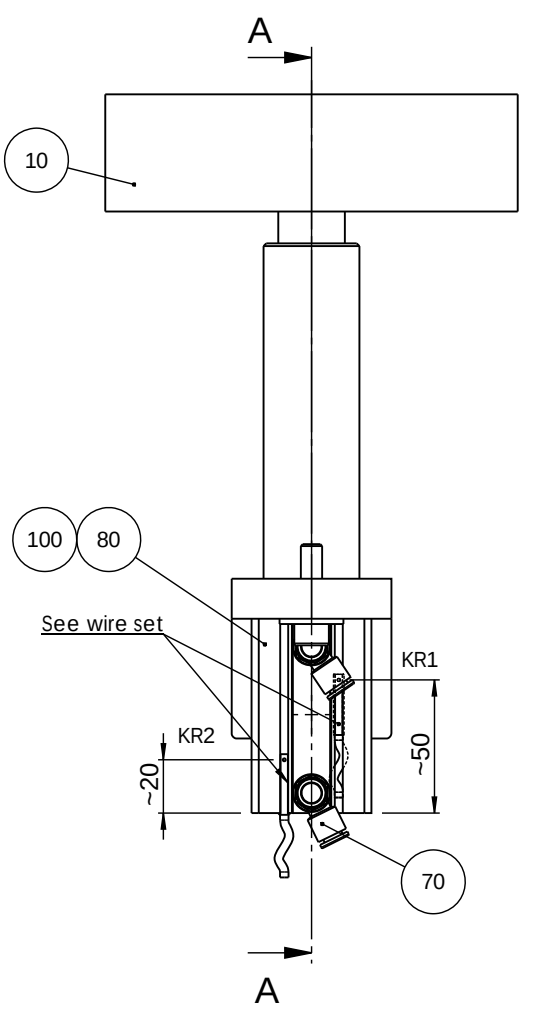
380 Wire set

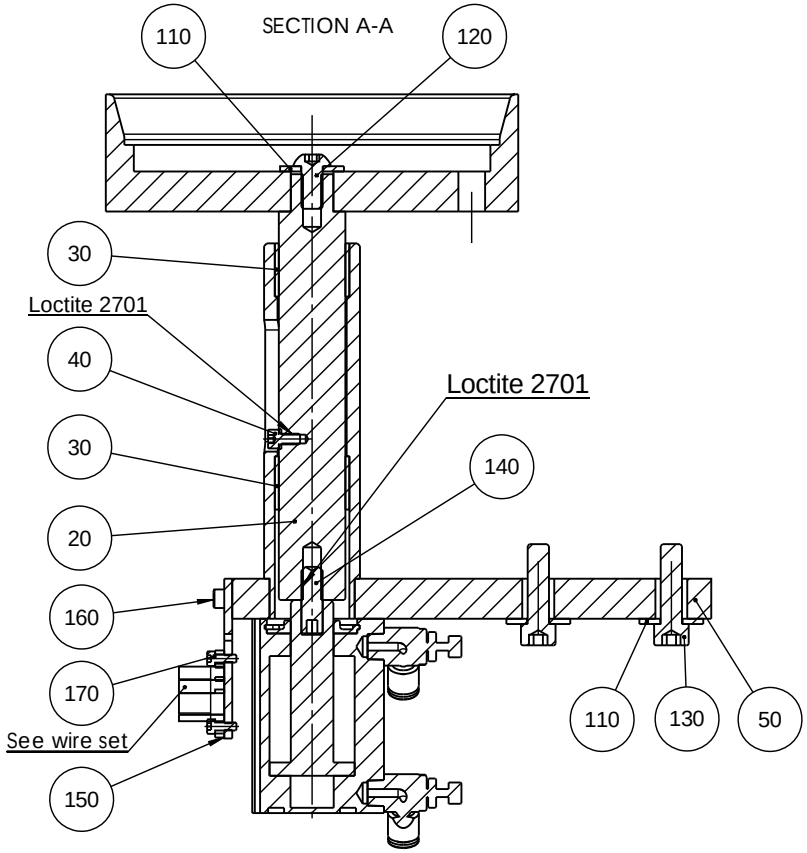
G	2012-01-02	Pos.480 added	CJE		
A	2010-09-17		TDR	2010-09-20	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

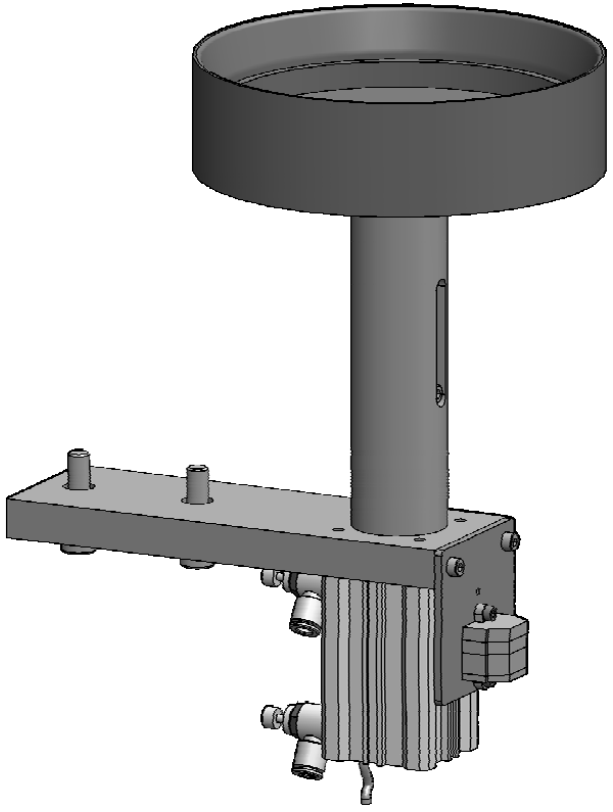
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 801

Material:
Scale: 1:5
Format: A2
Tolerance: DS/ISO 2768- -
Weight : 1005996.36 g

ID:
Description:
15940031 Conveyor assembled
Rev: G







E	2014-03-11	B3: Loctite 2701 added.	JJO		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:2

Format: A3

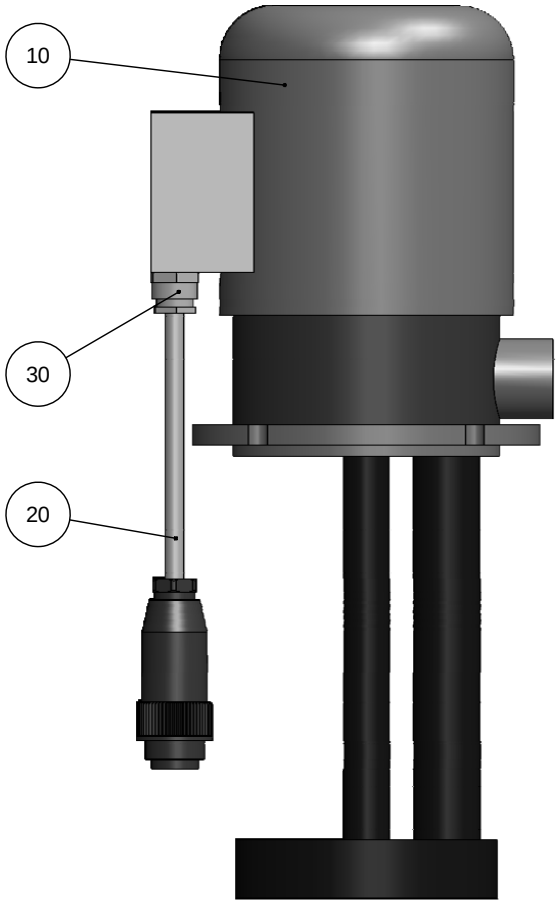
Tolerance: DS/ISO 2768- mK

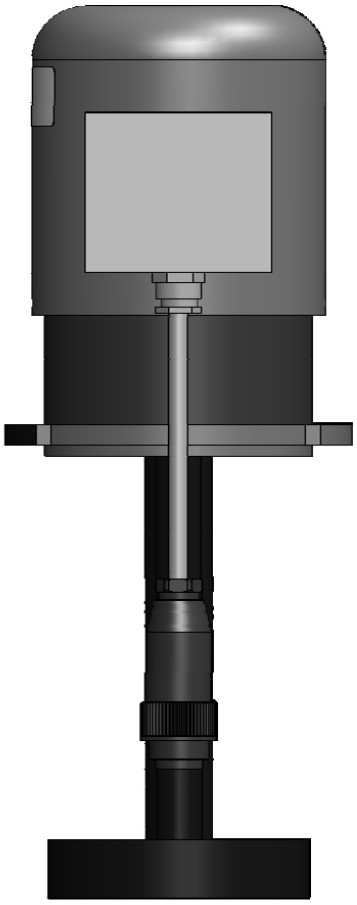
Weight : g

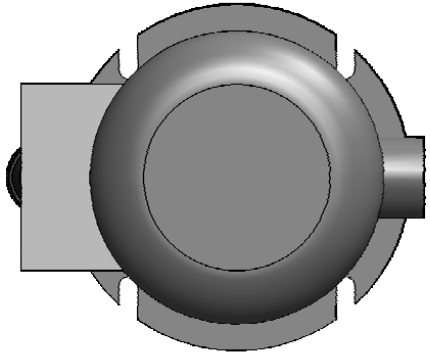
ID: Description:

15940032 Elevation disc assembled

Rev: E







Beskyttelsesleder (gul/grøn).

Gevindhul til jordledning skæres op til M4 før montagen.
Brug sprit på tappen.
Der klippes lidt af terminalringen for at den kan være der for væggen.
Ved montage bruges:
1 stk M4 x 8 hex sock screw (pos. 40)
2 stk Washer 4 (pos. 50)

G	2014-04-08	proper cable 15943538 added	OCR	2014-04-08	JTV
A	2011-02-15		FPG	2011-02-15	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:2

Format: A3

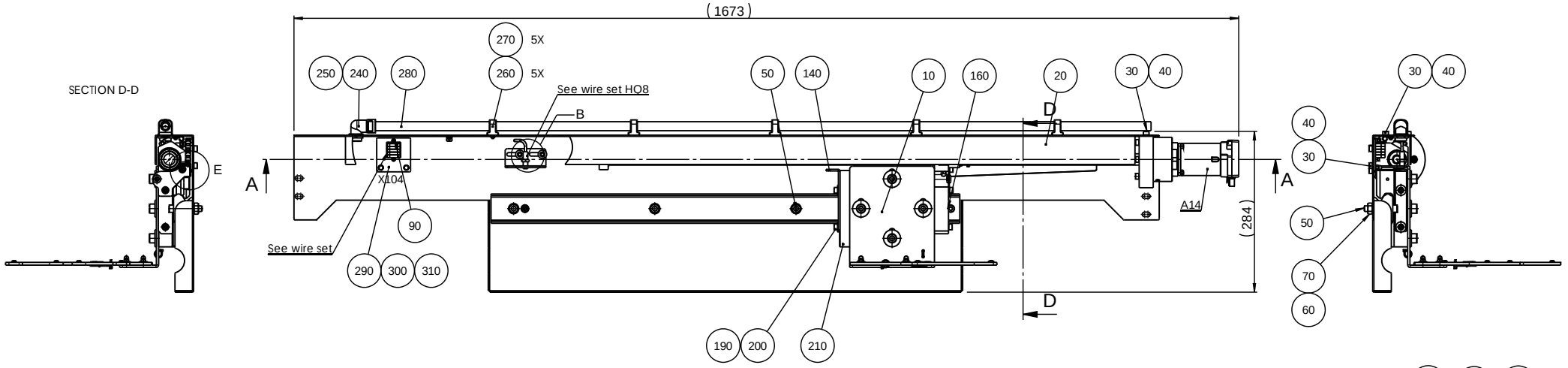
Tolerance: DS/ISO 2768- mK

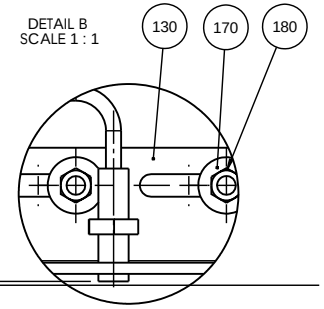
Weight : 15194.9 g

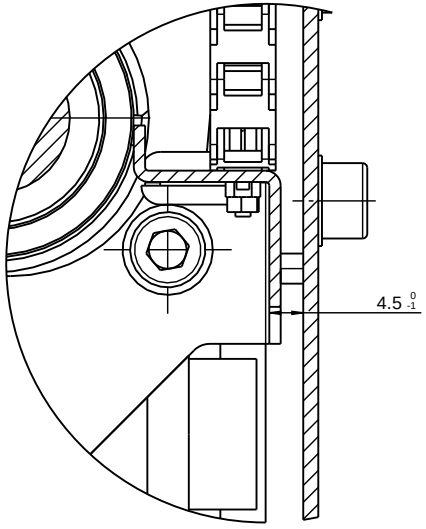
ID: Description:

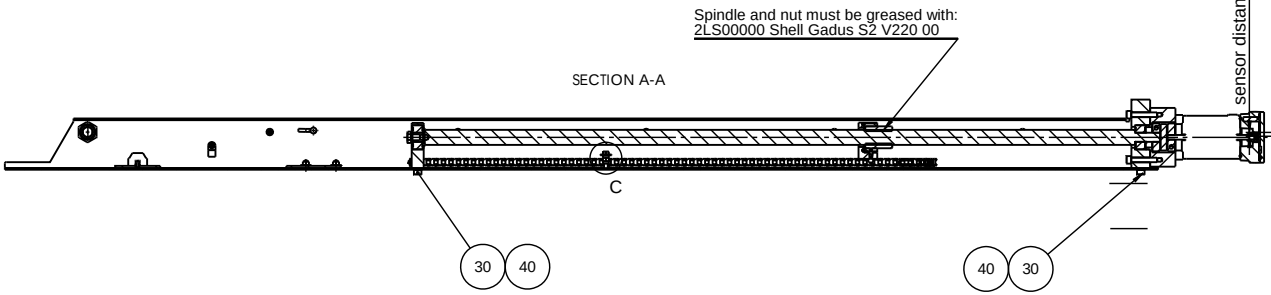
15940033 Pump assembled

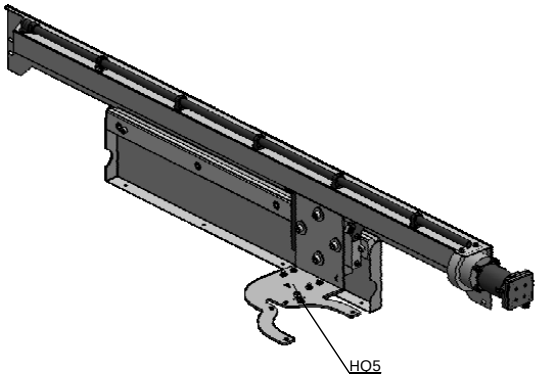
Rev: **G**

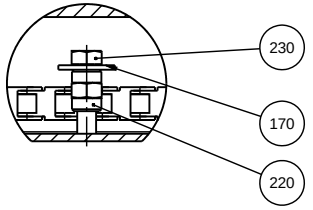










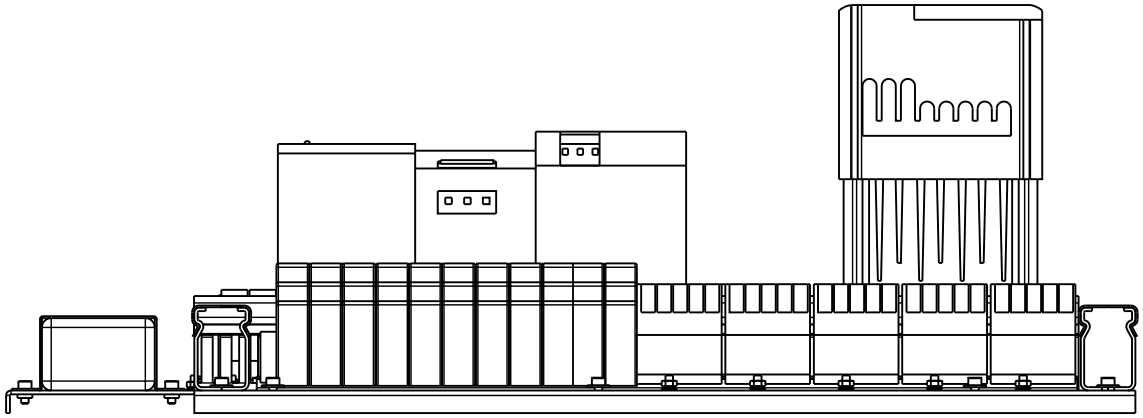


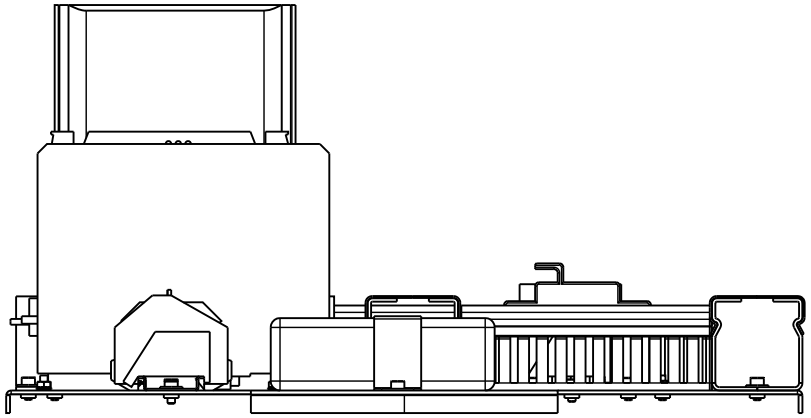
M	2015-10-15	pos 80 removed	OCR	2015-10-15	JTV
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

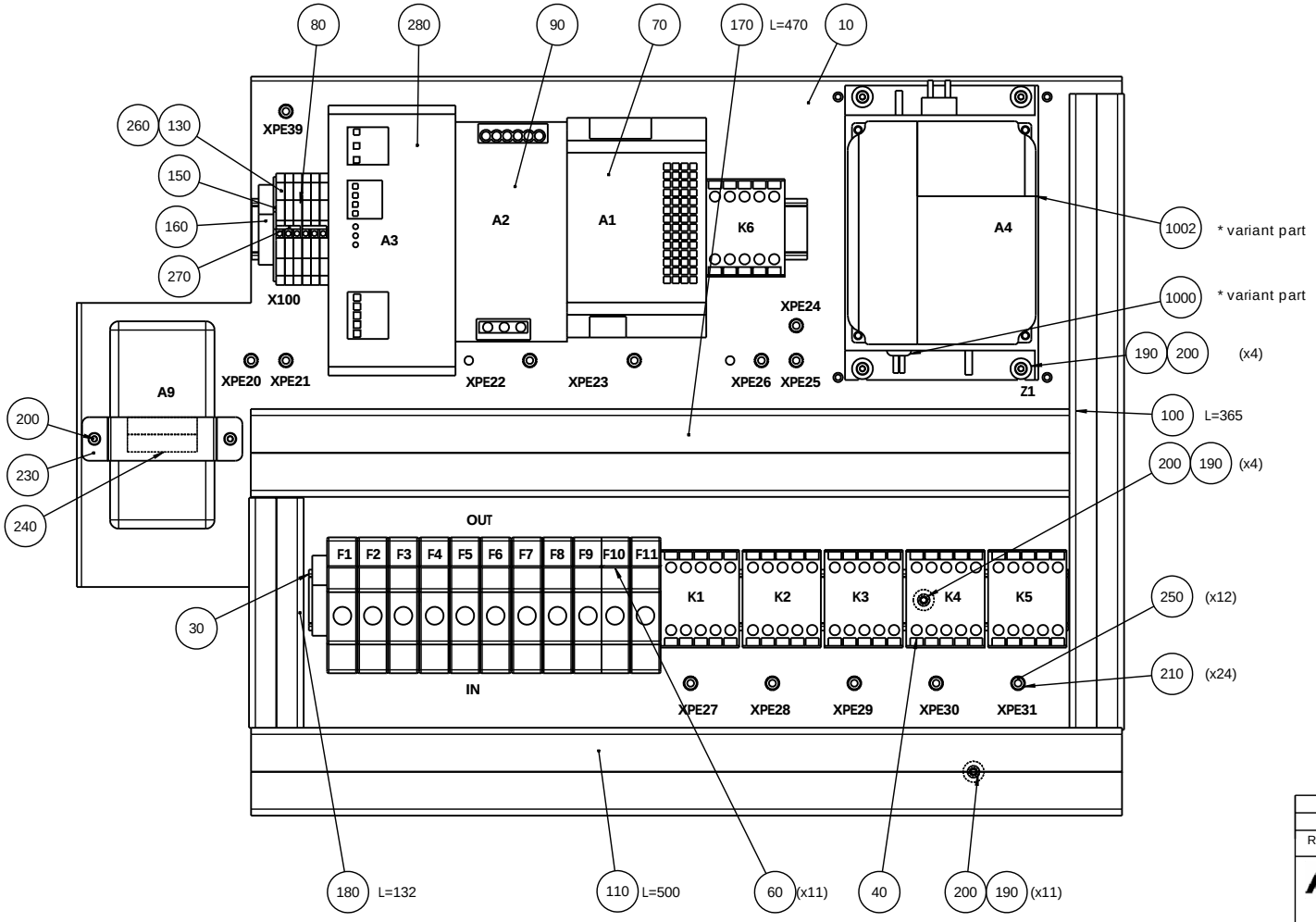
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

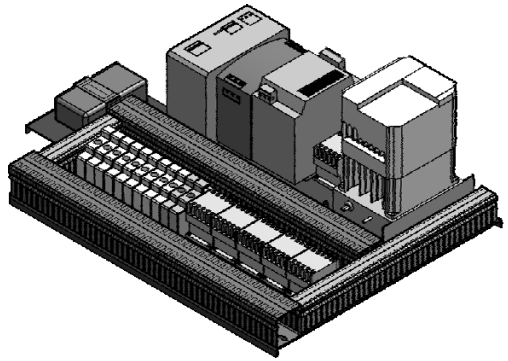
Material:
Scale: 1:5
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : 19634.9 g

ID:
Description: **15940034 MD disc exchanger assembled**
Rev: **M**







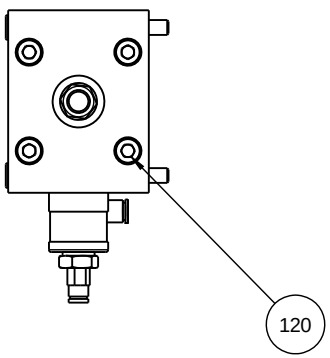


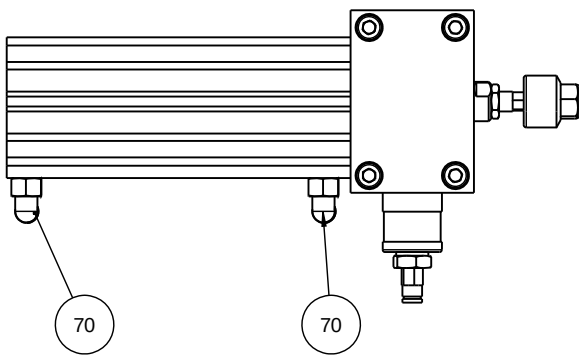
J	2014-10-02	Ny pos 240 (3D update)	OCR	2014-10-08	JTV
A	2010-09-09		FPG	2010-09-09	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

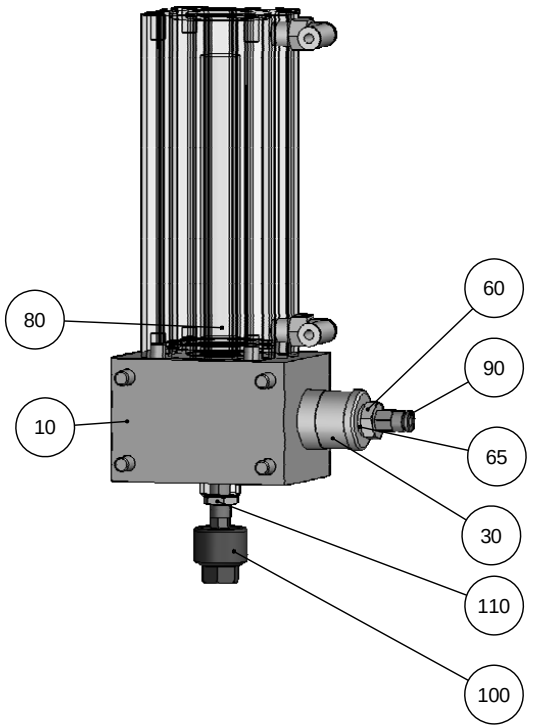
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : 14908.5 g

ID:
Description: **15940035 Control box II, assembled**
Rev: **J**







E	2011-08-30	pos 120 added	CJE		
A	2010-08-23		FPG	2010-08-23	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

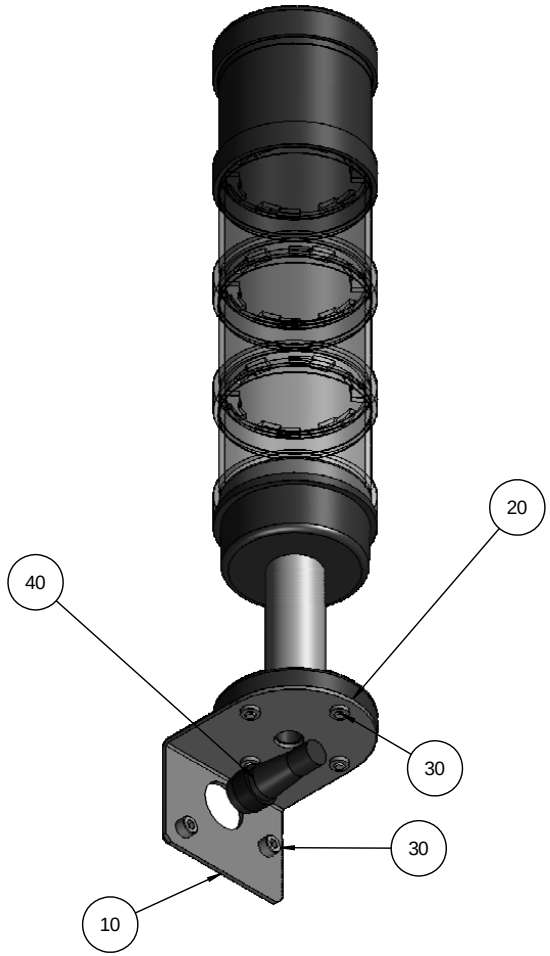
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK
			Weight : g

ID: Description:

15940036 Actuator, assembly

Rev: **E**



A					
A	2011-02-15		FPG	2011-02-15	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
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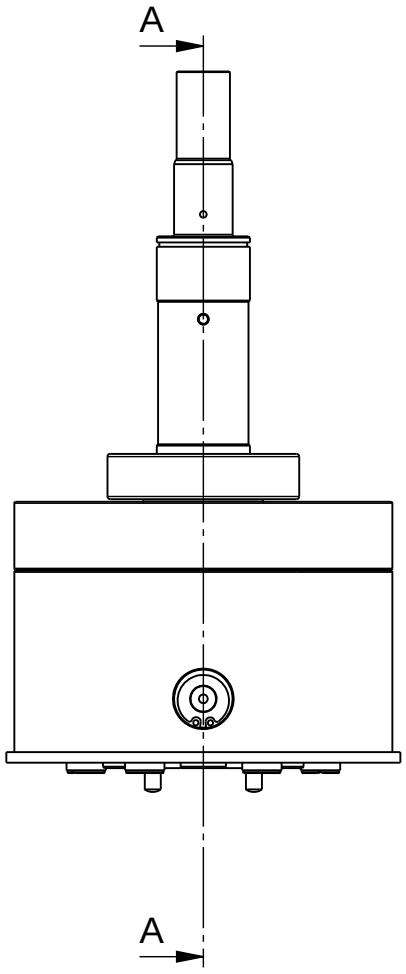
Phone: +45 44 600 800
Fax: +45 44 600 804

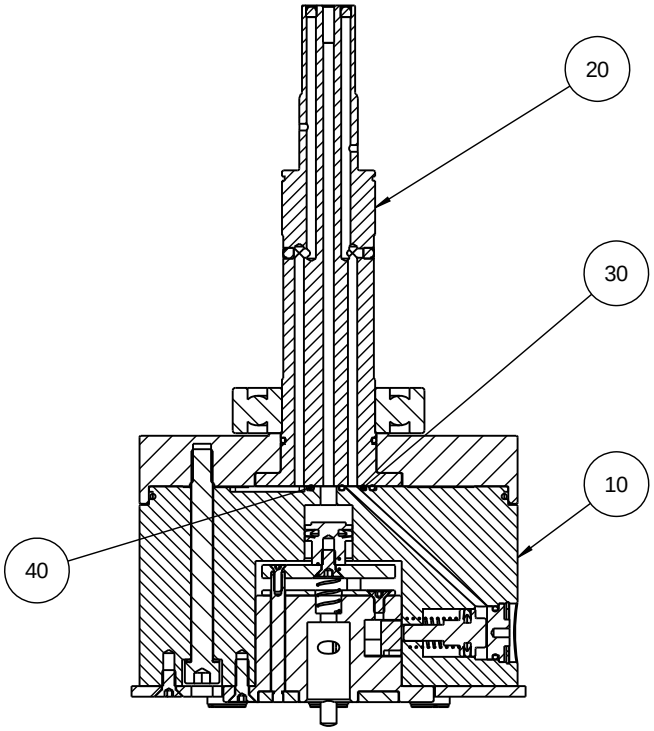
Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight : 463.9 g	

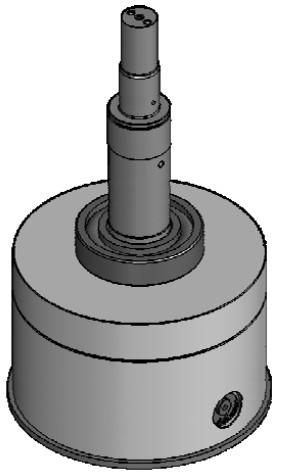
ID: Description:

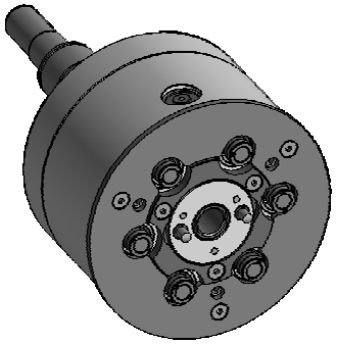
15940037 Signal tower, complete

Rev: **A**









30 40 High vacuum grease

C	2011-09-13	Pos 10-40 changed, the rest moved to 15940073	JLI	2011-09-13	JLI
A	2009-09-11		CJE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: 1:2

Format: A3

Tolerance: DS/ISO 2768- mK

Weight : g

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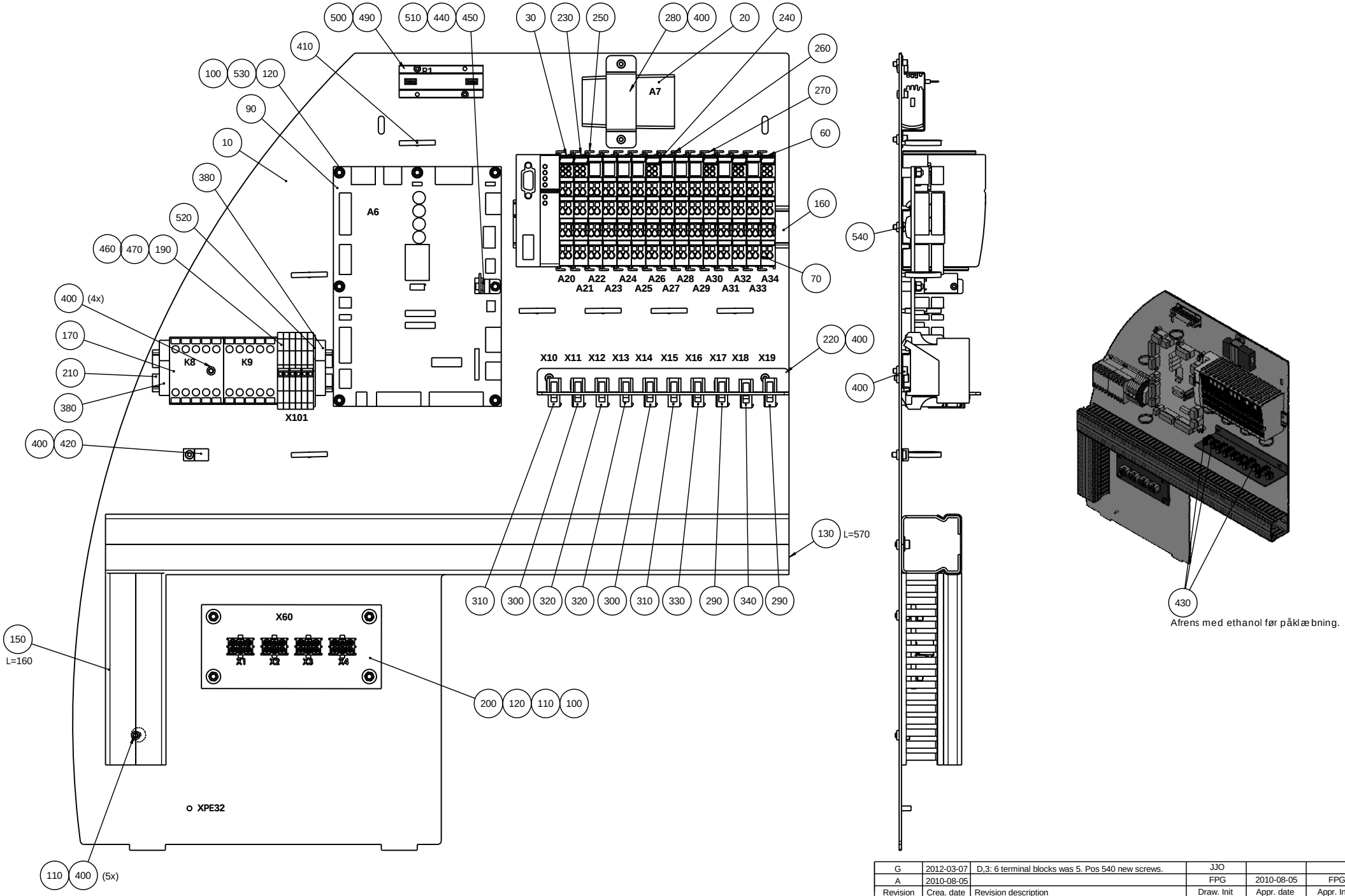
Phone:+45 44 600 800
Fax: +45 44 600 804

ID: Description:

15940038 Specimen mover head, assembly

Rev: **C**



Afrens med ethanol før påklæbning.

G	2012-03-07	D,3: 6 terminal blocks was 5. Pos 540 new screws.	JJO		
A	2010-08-05		FPG	2010-08-05	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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Phone: +45 44 600 800
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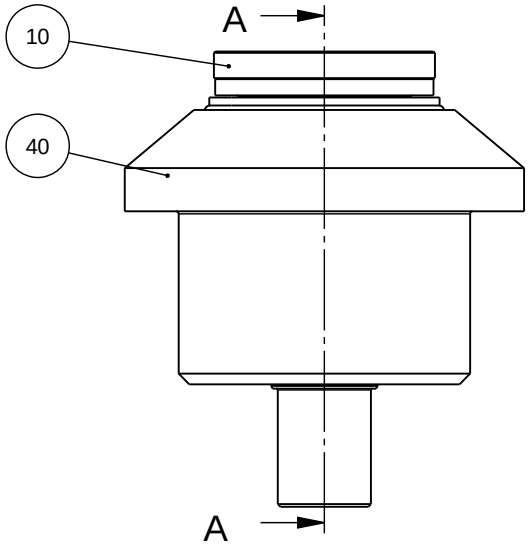
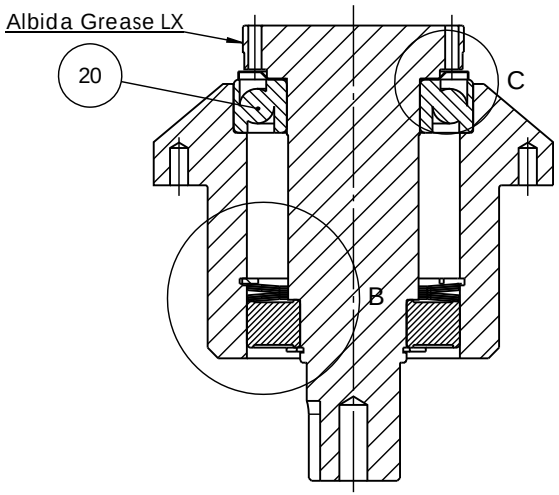
Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : g

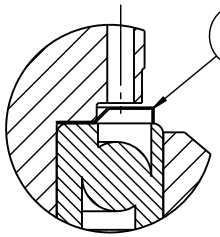
ID:
Description: 15940039 control box assembled
Rev: G

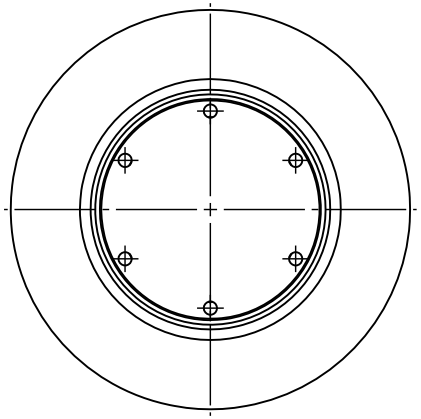


SECTION A-A

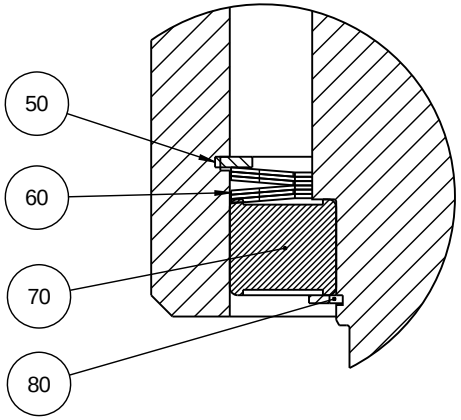


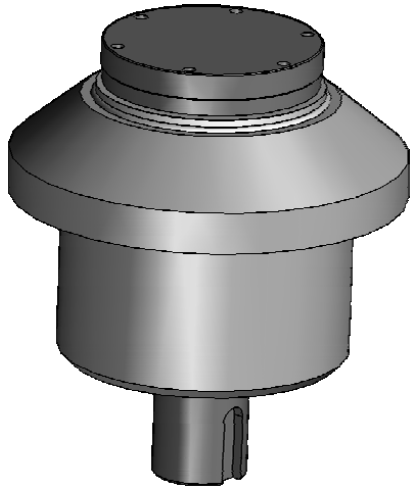
DETAIL C
SCALE 1 : 1





DETAIL B
SCALE 1 : 1





D	2012-11-05	F,4 Pos. 80 added.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: **1:2**

Format: **A3**

Tolerance: DS/ISO 2768- mK

Weight : g

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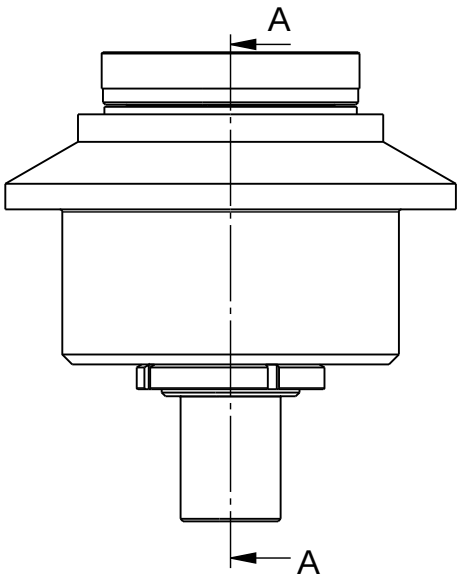
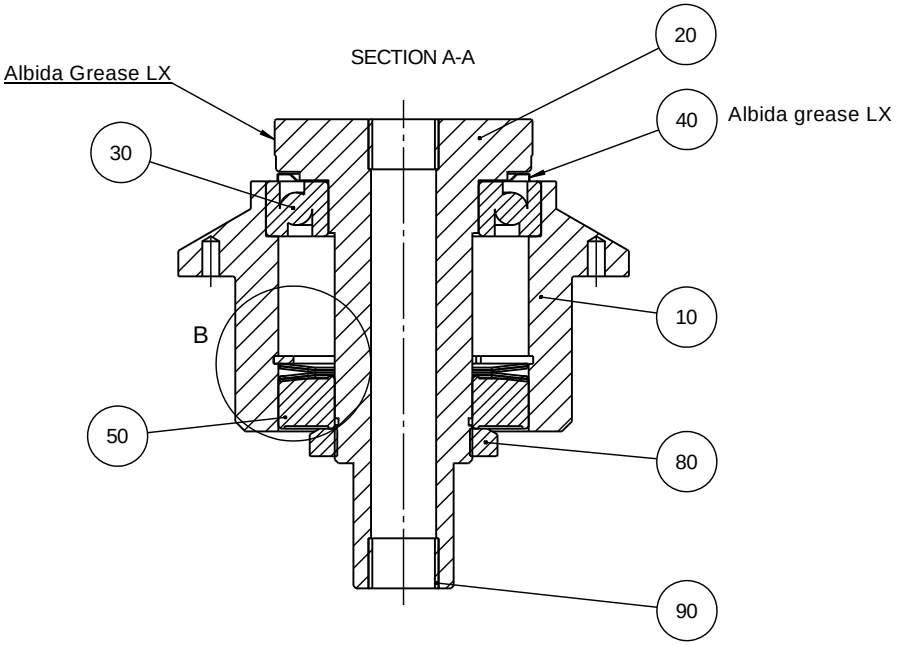
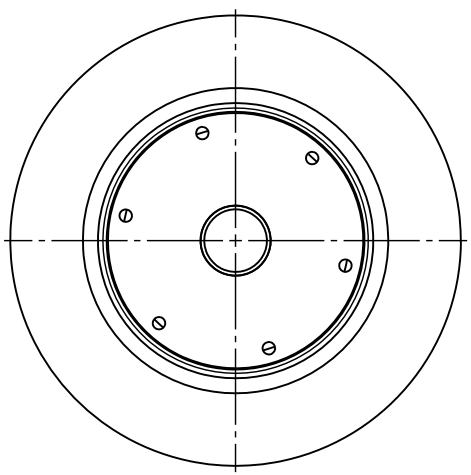
ID: Description:

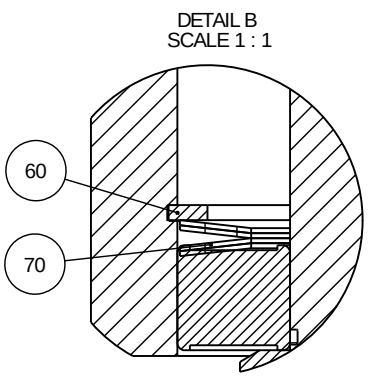
15940040 Bearing for grinding station

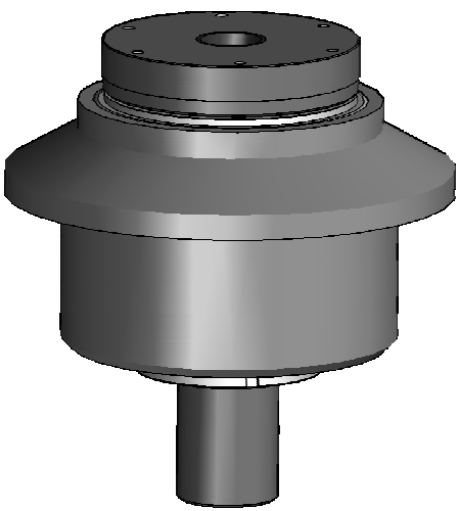
Rev: **D**











D	2012-03-20	O-ring pos. 100 removed.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
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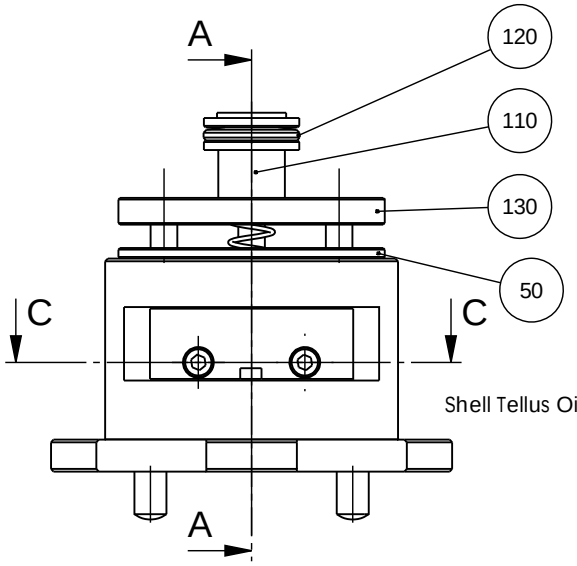
Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight :	g

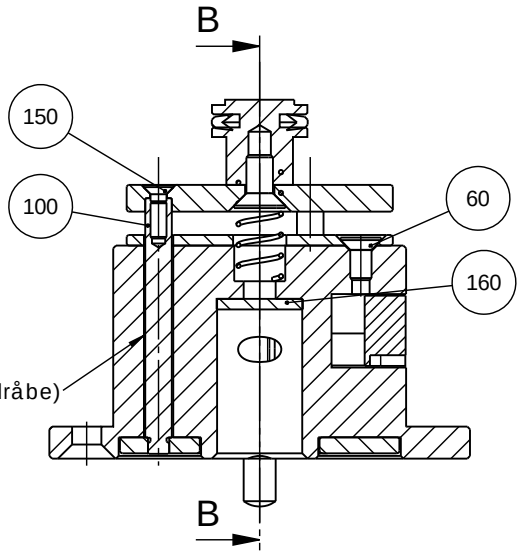
ID: Description:

15940041 Bearing for polishing station

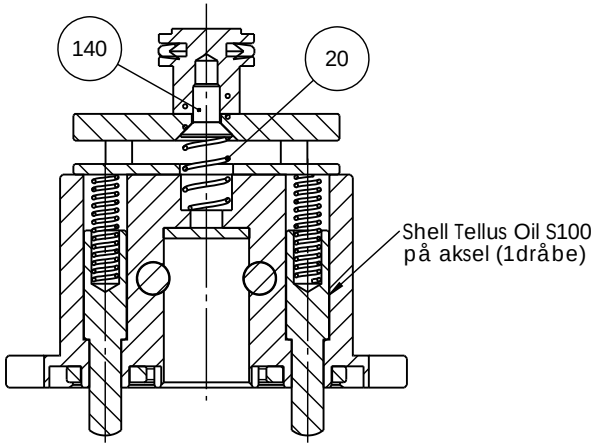
Rev: **D**



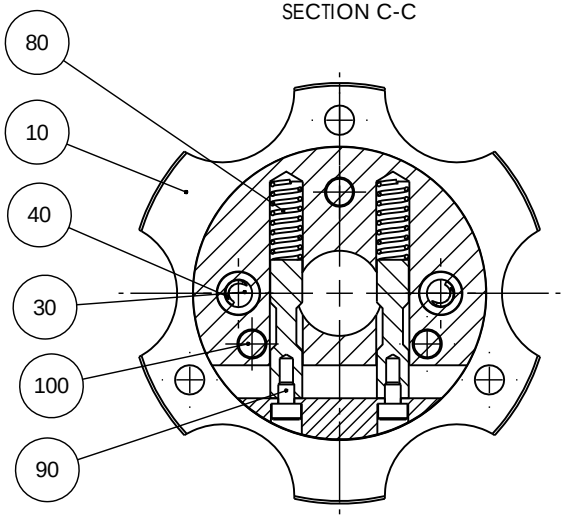
SECTION A-A

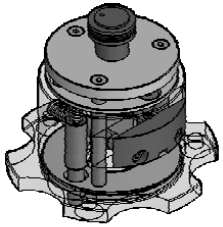


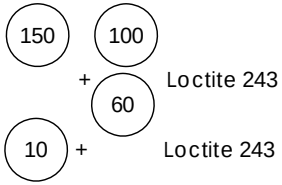
SECTION B-B

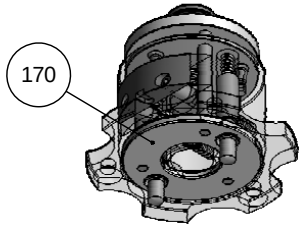


SECTION C-C









I	2012-11-01	E,7: New pos. 170 added. Pos. 70 deleted.	JJO		
A	2009-09-11		CJE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:	Scale: 1:1	Format: A3	Tolerance: DS/ISO 2768- mK	
			Surface treat.: None	

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Phone:+45 44 600 800
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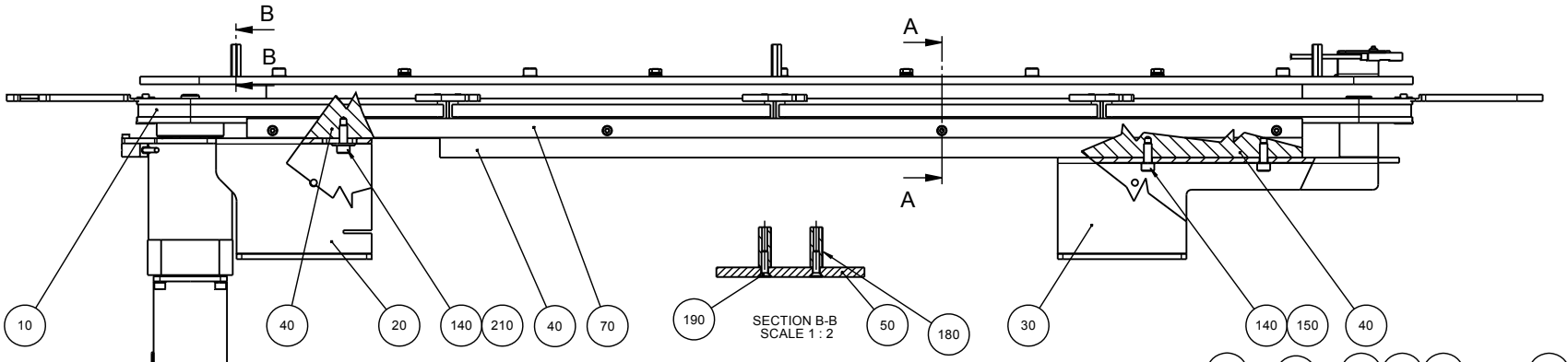
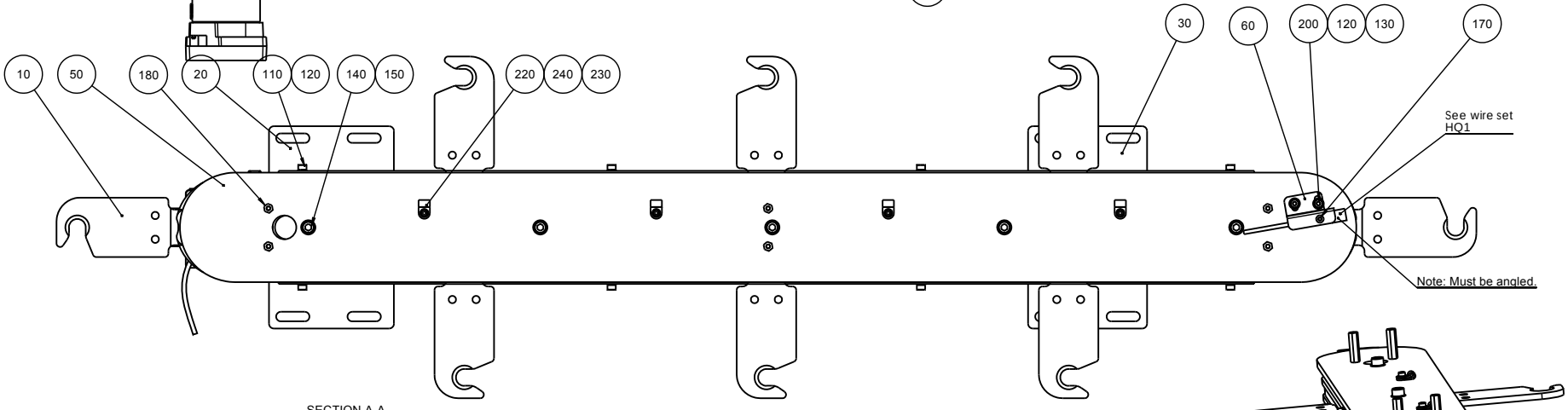
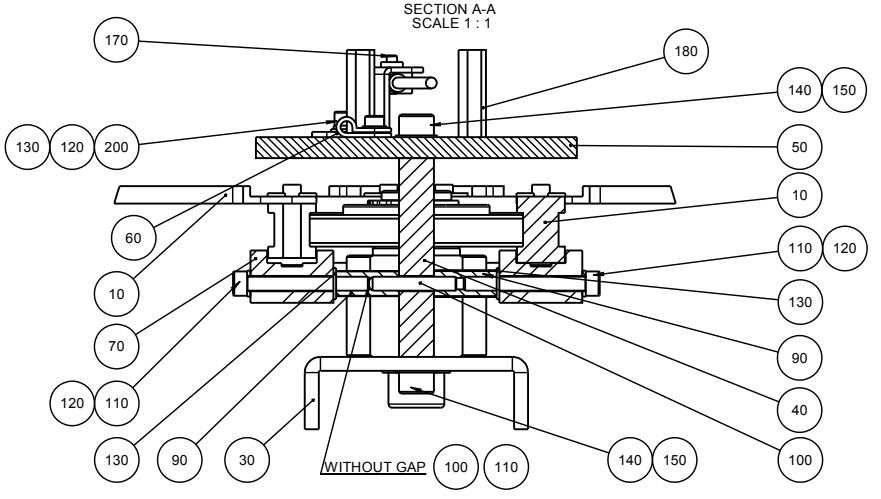
ID: Description:

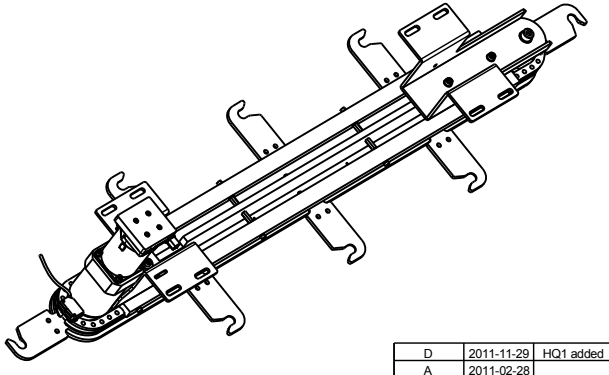
15940042 Coupling, assembly

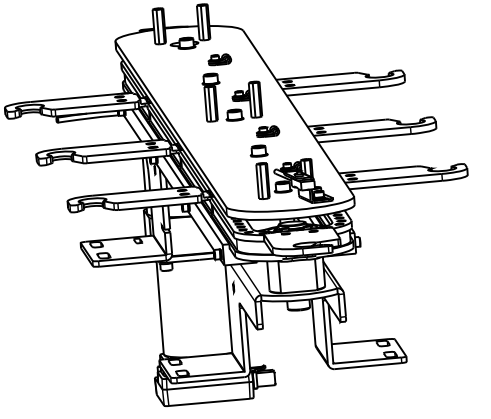
Rev: **I**









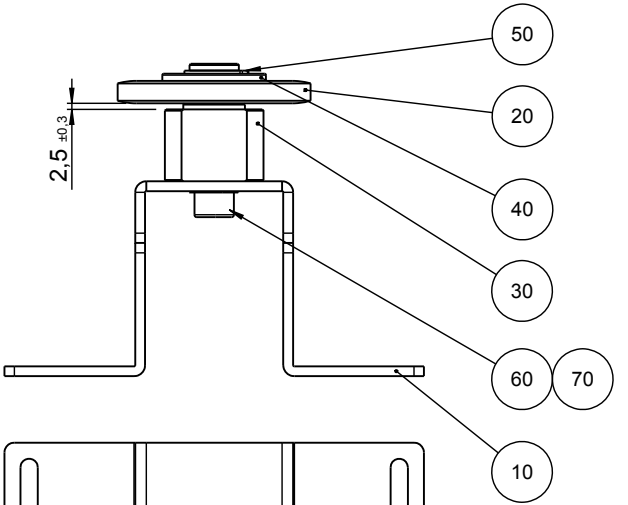


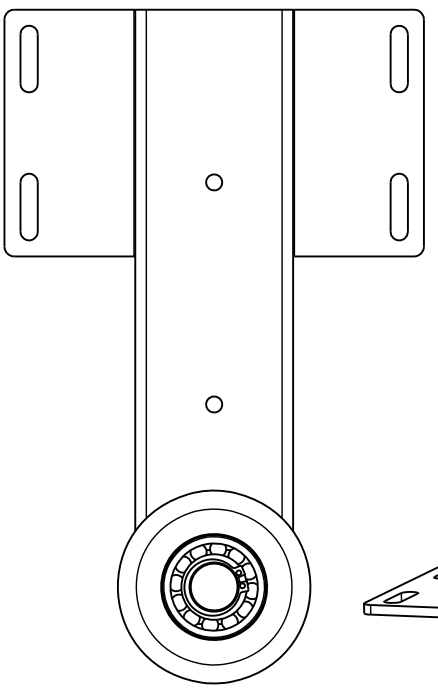
D	2011-11-29	HQ1 added	SPE	2011-11-29	
A	2011-02-28		TDR	2011-02-28	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

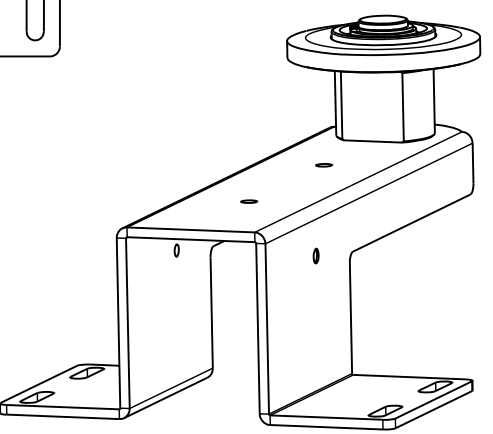
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 801

Material:
Scale: 2:5
Format: A2
Tolerance: DS/ISO 2768- -
Weight: 17933.9 g

ID:
Description: **15940043 Rail assembled**
Rev: **D**







A					
A	2011-02-22		TDR	2011-02-22	AKN
Rev	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
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Copenhagen
Denmark
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Fax : +45 44600 804

Material:

Scale: **1:2**

Format: **A4**

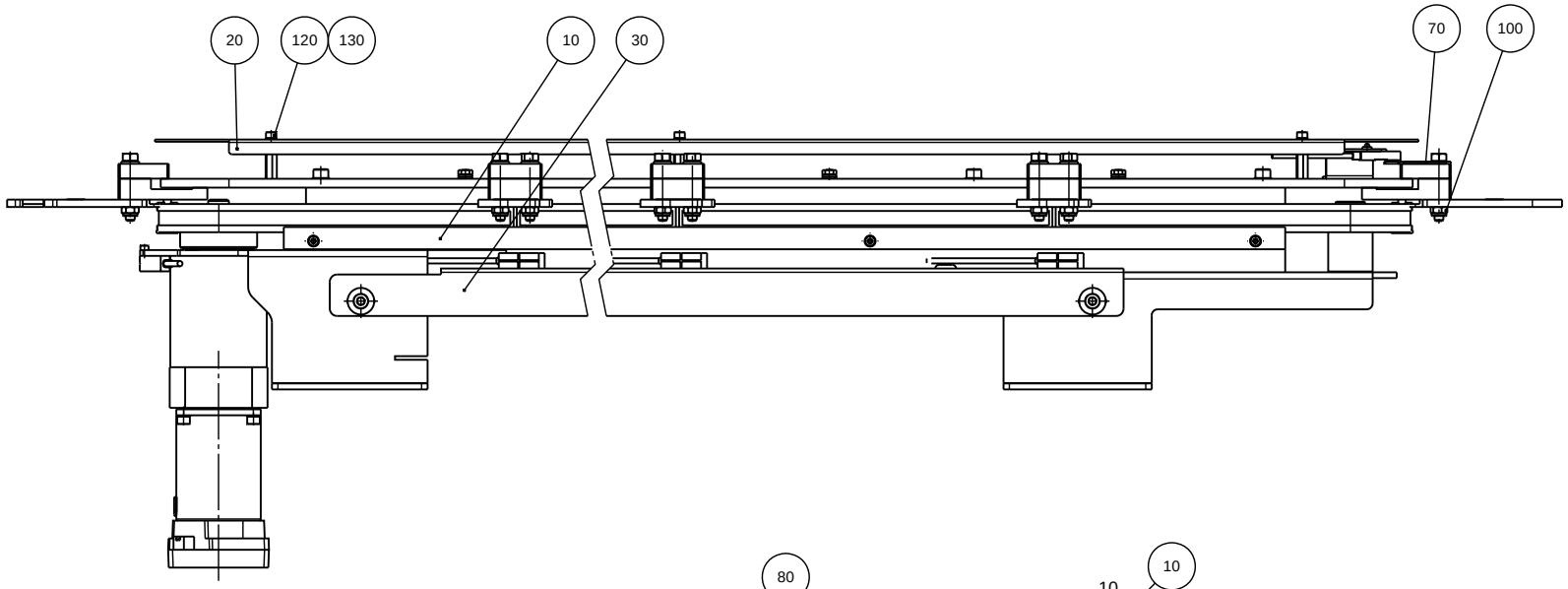
Tolerance: DS/ISO 2768 - -

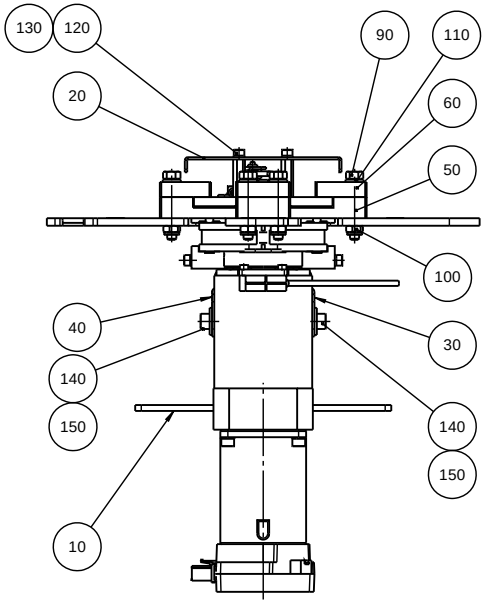
Weight : 1999.3 g

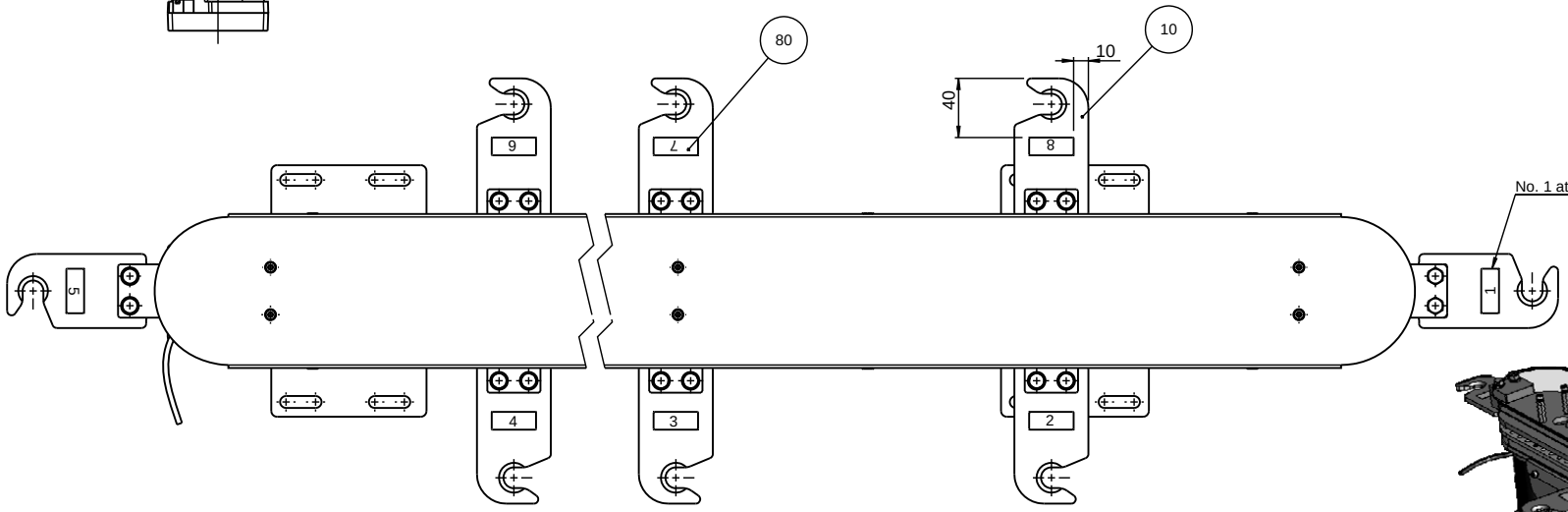
ID: Description:

15940044 Idle sprocket assembled

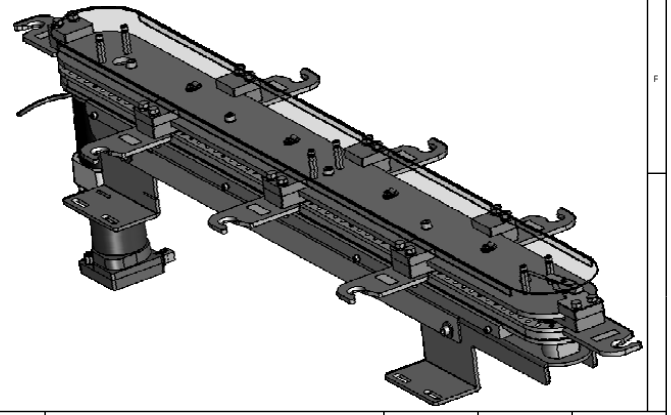
Rev: **A**







No. 1 at sensor plate



C	2013-09-04	A12: Pos. 90 screw head changed to hexs.	JJO		
A	2011-02-28		TDR	2011-02-28	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: 1:2

Format: A2

Tolerance: DS/ISO 2768- -

Weight : 20400.0 g

Pederstrupvej 84
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Phone: +45 44 600 800
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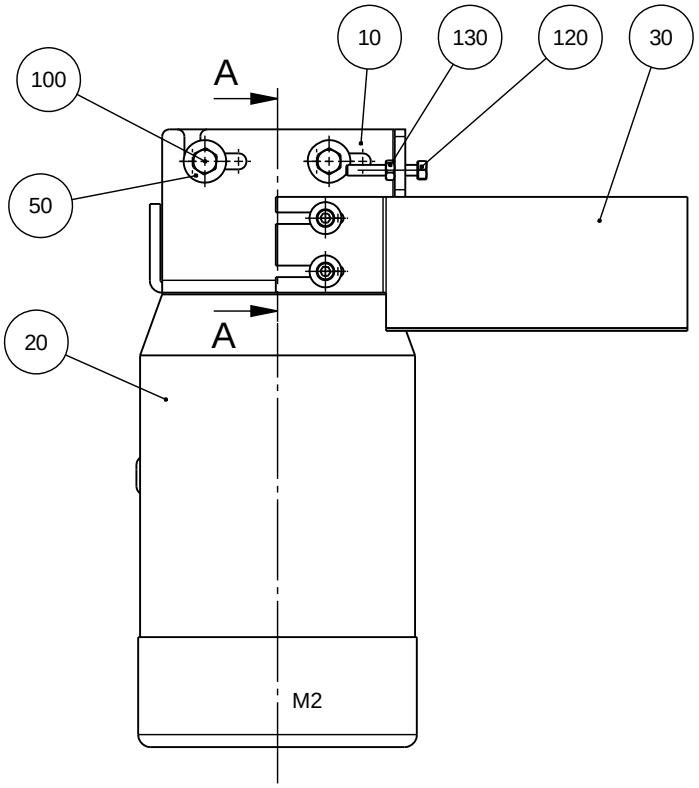
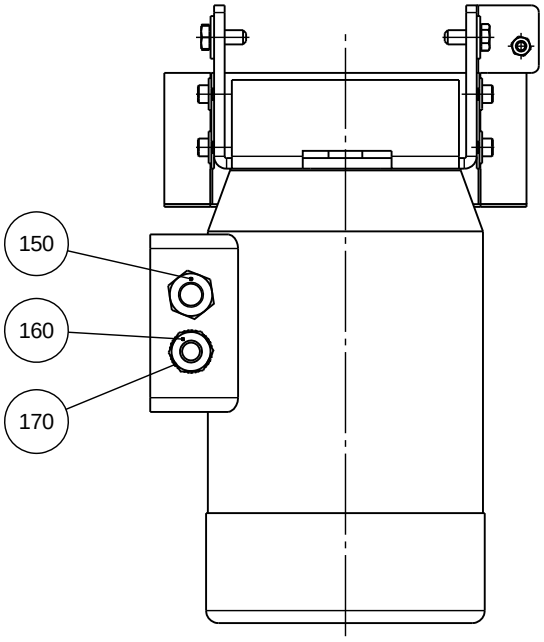
ID:

Description:

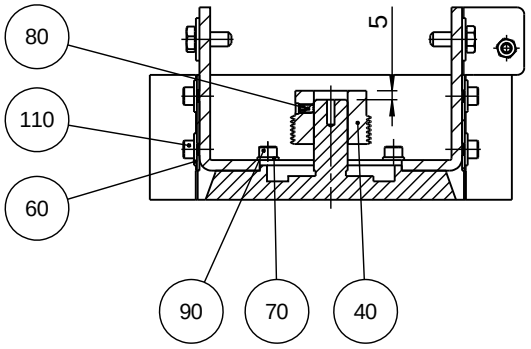
15940045 Conveyor interior assembled

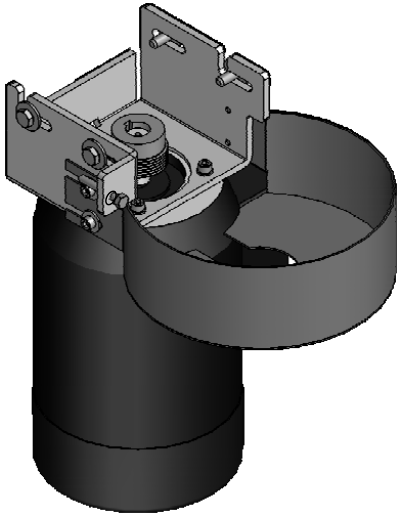
Rev: **C**

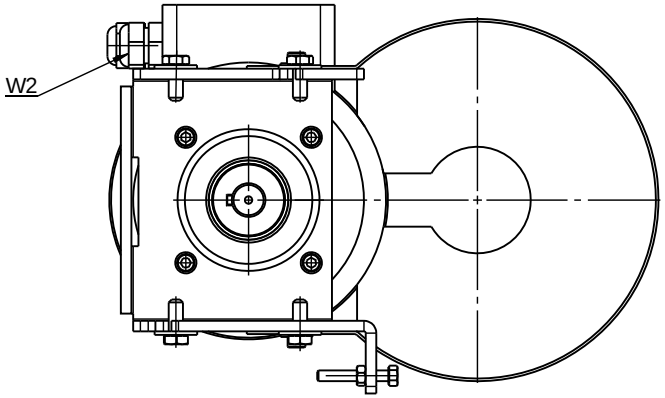




SECTION A-A
SCALE 1 : 3







F	2012-11-05	C,4: Pos. 170 added.	JJO		
A	2010-10-01		JJO	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:
Scale: 1:2
Format: A3
Tolerance: DS/ISO 2768- mK
Weight : g

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DK-2750 Ballerup/Copenhagen
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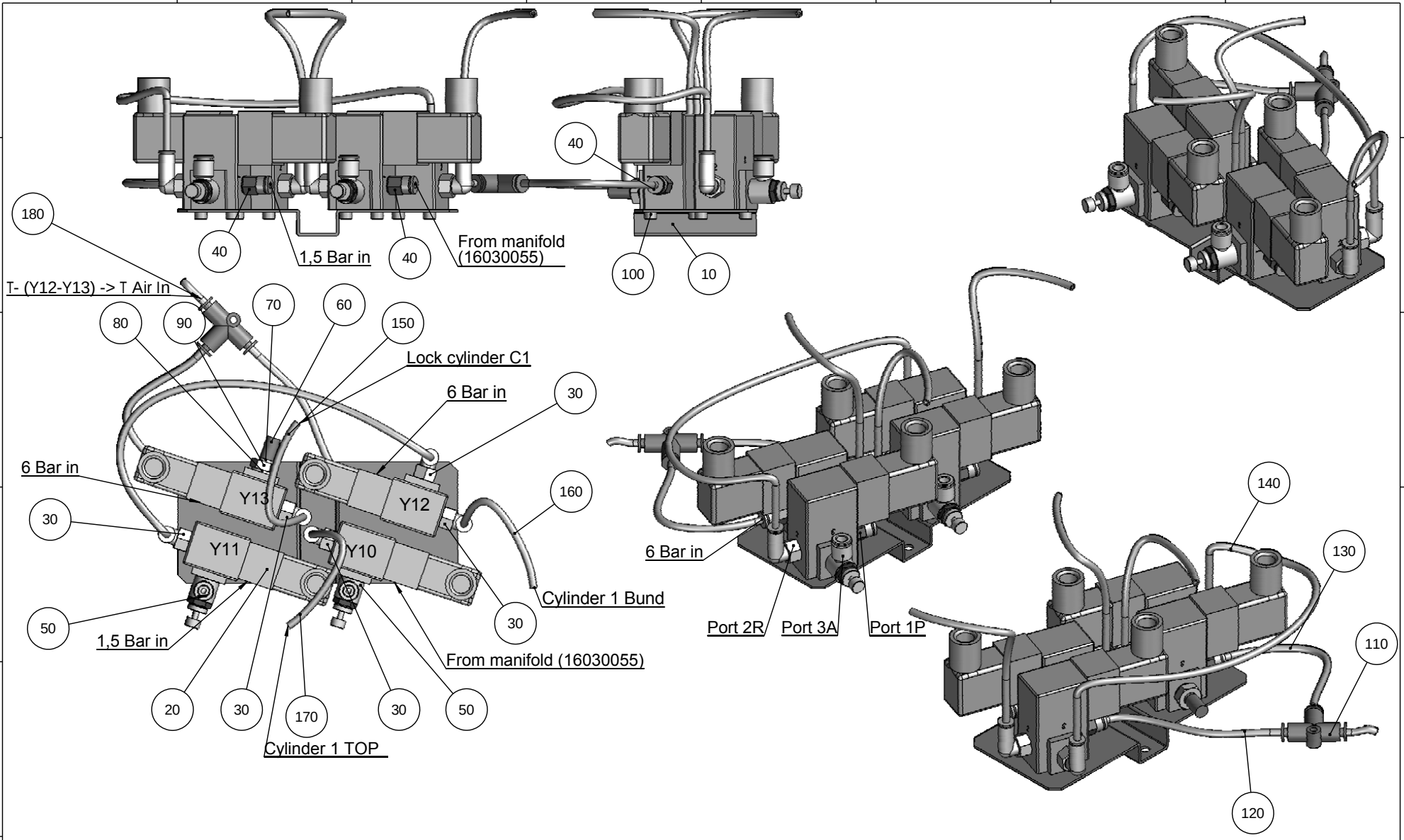
Fax: +45 44 600 804

ID: Description:

15940046 Motor for polishing station, assembled

Rev: **F**



D	2011.09.27	Changes for 1-series, Hose Pos.180 added	SPE	2011.09.27	
A	2011-02-14		JJO		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
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Phone:+45 44 600 800
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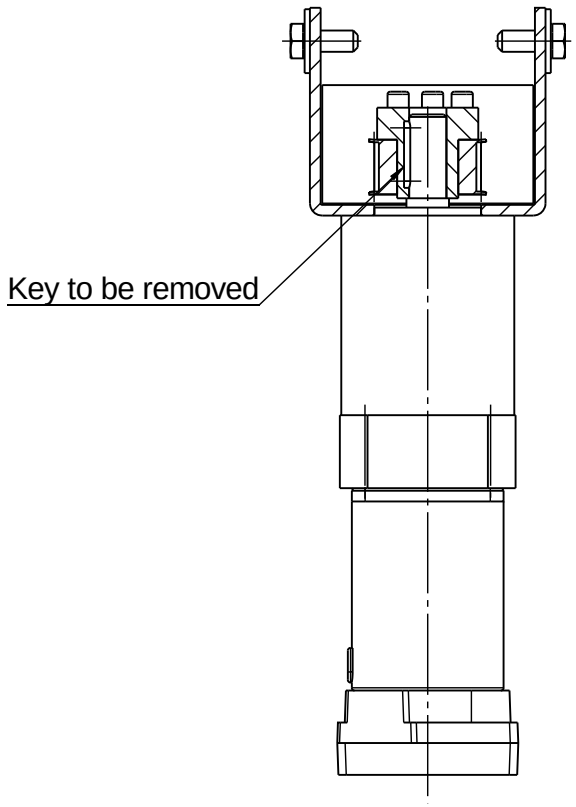
Material:	Scale:	Format:	Tolerance: DS/ISO 2768- mK
	1:2	A3	Weight : 703.2 g

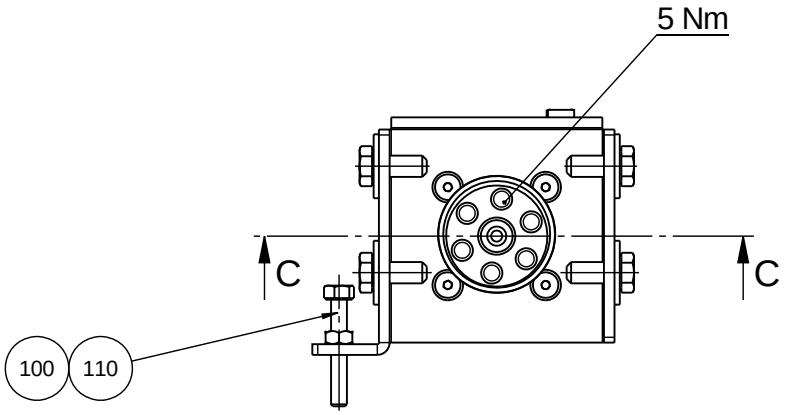
ID: Description:

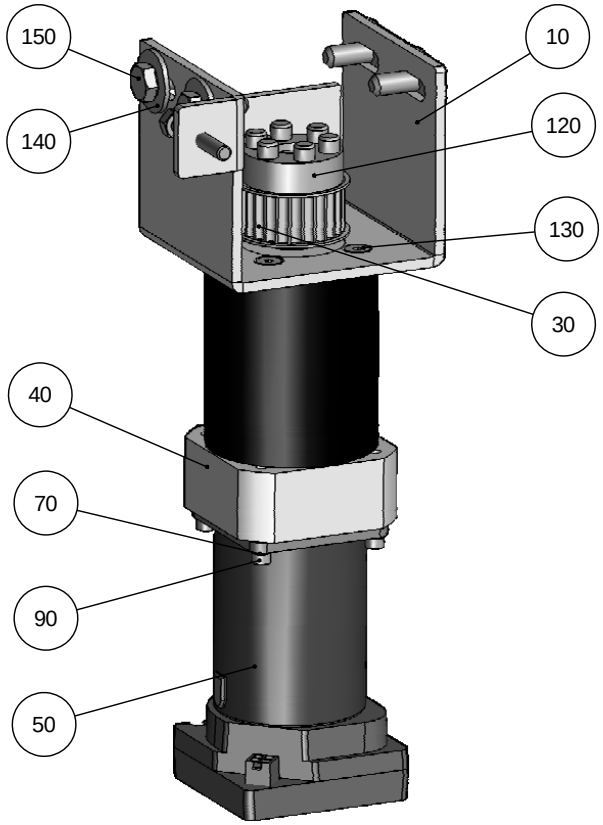
15940048 Pneumatic block 4, assembled

Rev: **D**

SECTION C-C







F	2012-11-19	Pos. 90,140 and 150 screws and washer changed	JJO		
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: 1:2

Format: A3

Tolerance: DS/ISO 2768- mK

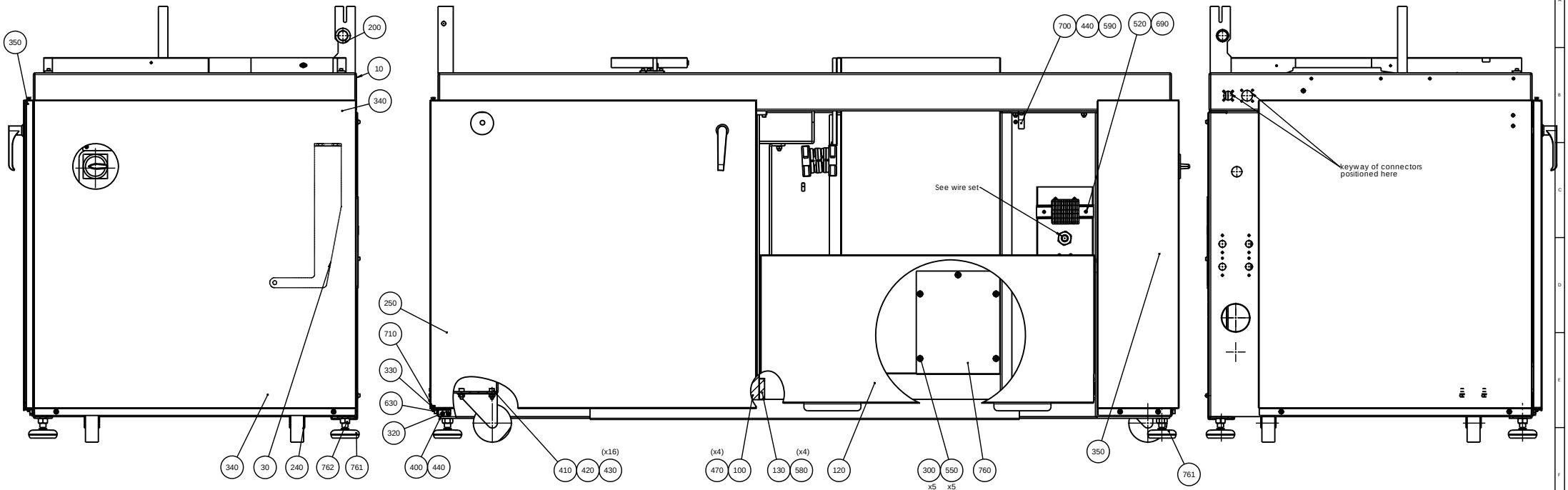
Weight : g

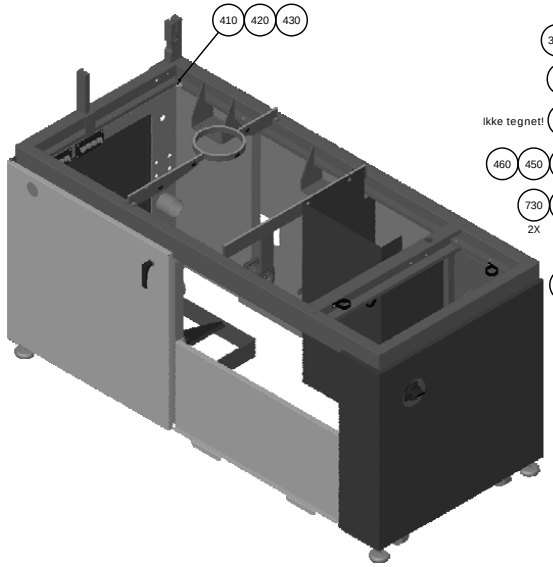
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

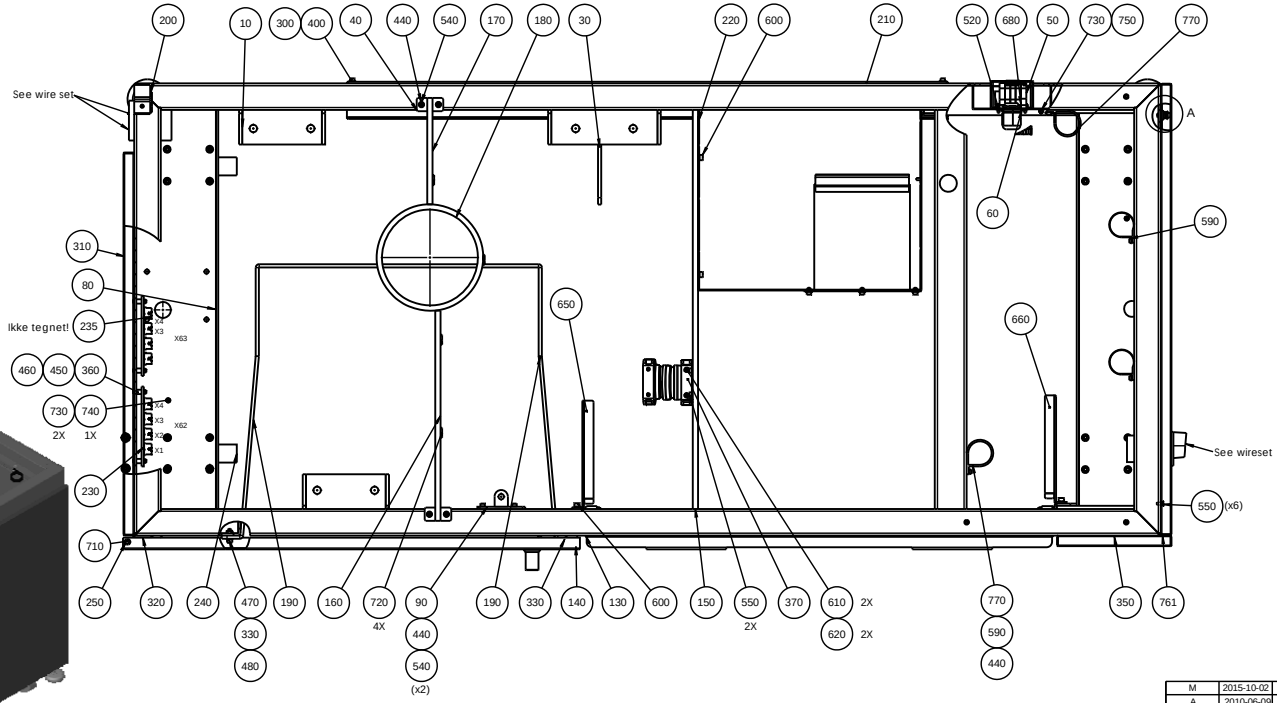
ID: Description:

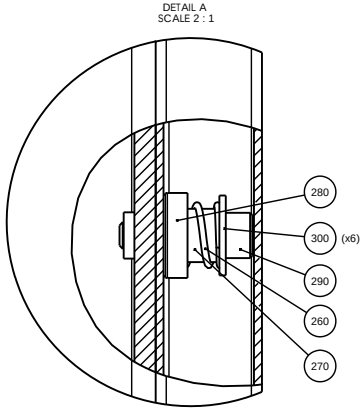
15940049 Motor for specimen mover arm, assembly

Rev: **F**









M	2015-10-02	K12-G12: Pos. 770 new item.	OCR	2015-10-02	JTV
A	2010-06-09		FPG	2010-06-09	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone +45 44 600 800
Fax +45 44 600 80 1

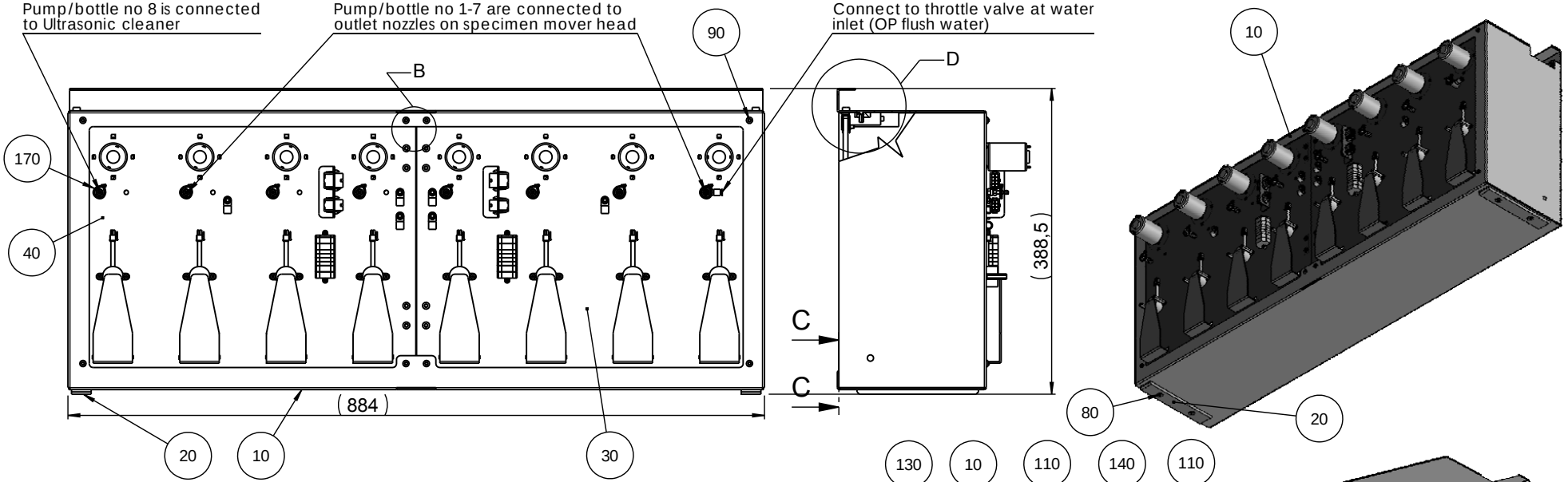
Material:
Scale: 1:5
Format: A1
Tolerance: DS/ISO 2768- mK
Surface treat.: None

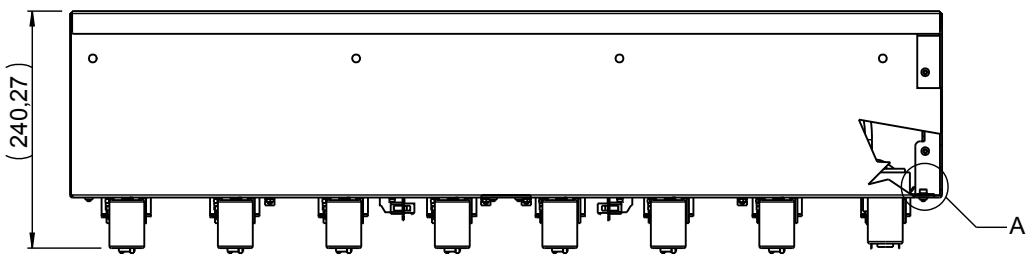
ID:
Description: **15940050 Frame assembled**
Rev: **M**

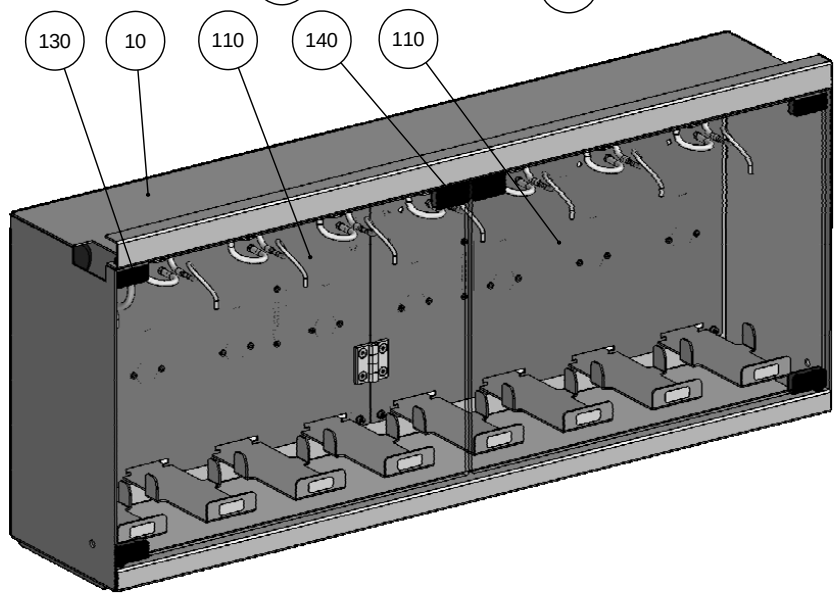
Pump/bottle no 8 is connected to Ultrasonic cleaner

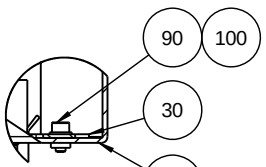
Pump/bottle no 1-7 are connected to outlet nozzles on specimen mover head

Connect to throttle valve at water inlet (OP flush water)

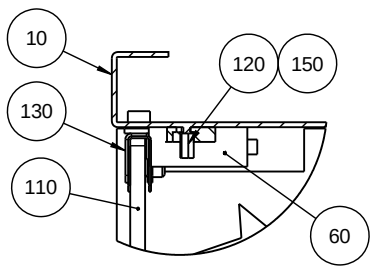




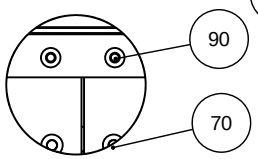




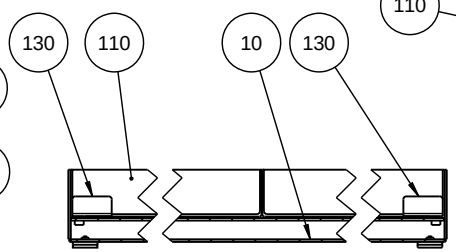
DETAIL A
SCALE 1 : 2



DETAIL D
SCALE 1 : 2



DETAIL B
SCALE 1 : 2



SECTION C-C

160 Wire set

E	2011.10.12	Text reg. pump connections added, pos 170 added	JLI		
A	2010-09-09		TDR	2010-09-09	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: **1:5**

Format: **A3**

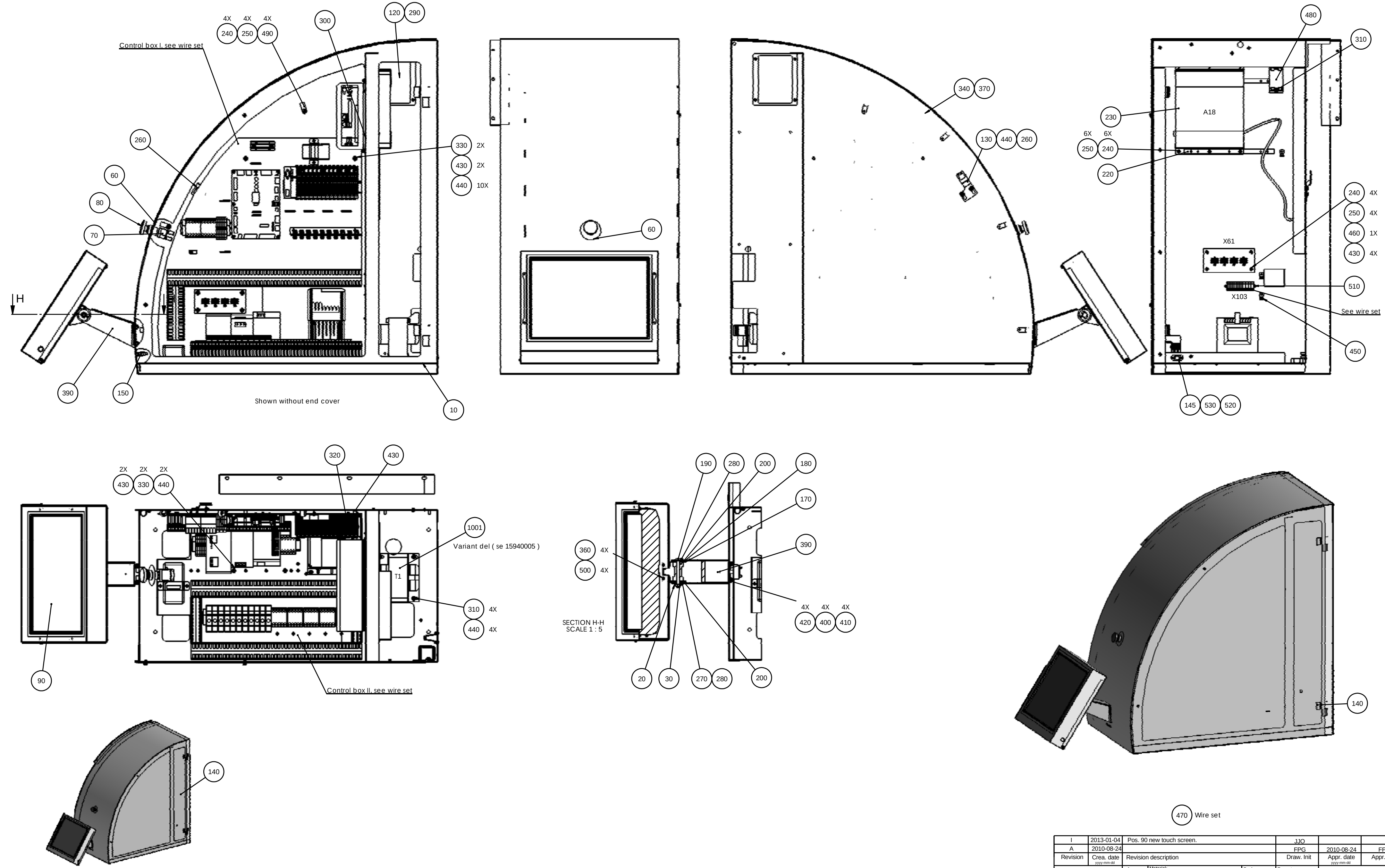
Tolerance: DS/ISO 2768- -

Weight : 18139.9 g

ID: Description:

15940054 Cabinet for bottles

Rev: **E**



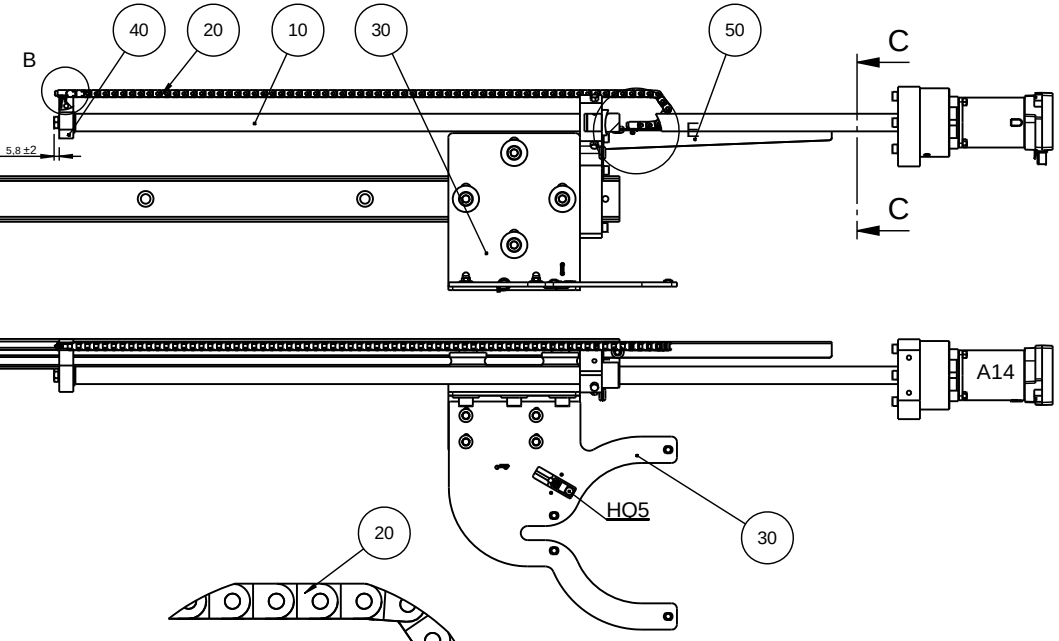
I	2013-01-04	Pos. 90 new touch screen.	JJO		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

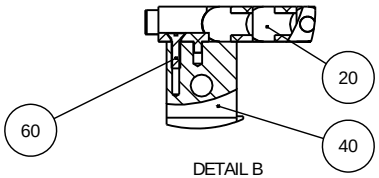
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:	Scale: 1:5	Format: A1	Tolerance: DS/ISO 2768- mK
			Weight : g

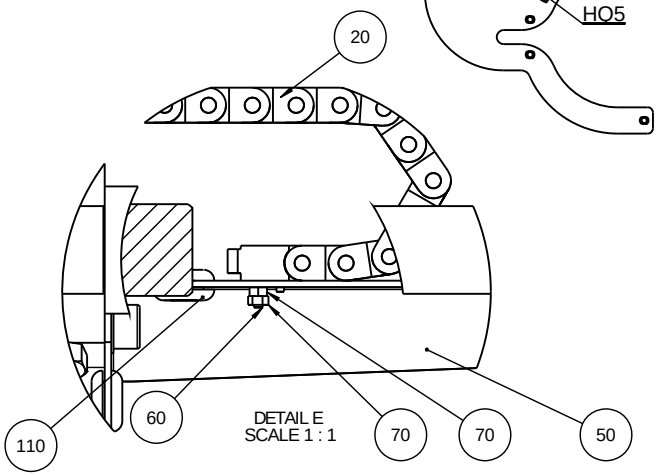
ID: Description: Rev:

15940055 Cubicle for electrical components assembled I

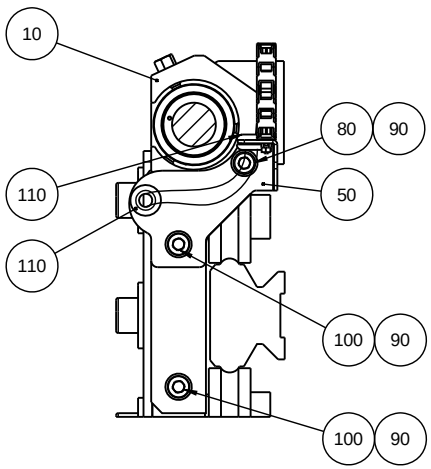




DETAIL B
SCALE 1 : 1



DETAIL E
SCALE 1 : 1



SECTION C-C
SCALE 1 : 2

B	2012-09-06	M2 møtrik tilføjet (kontra møtrik)	FPG	2012-09-06	FPG
A	2011-02-25		TDR	2011-02-25	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

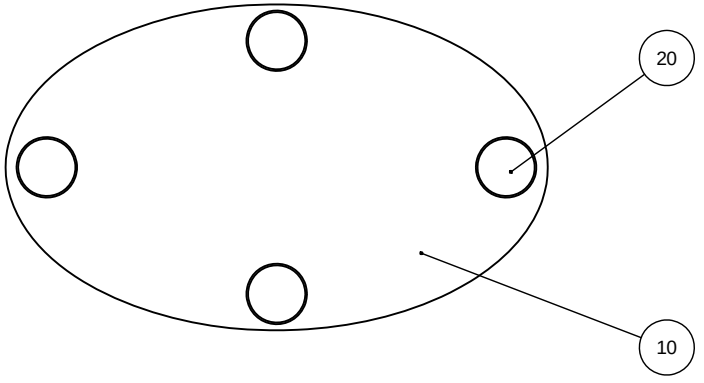
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

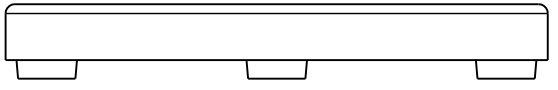
Material:
Scale: 1:5
Format: A3
Tolerance: DS/ISO 2768- -
Weight : 10900.6 g

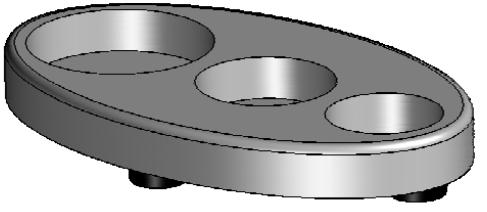
ID:
Description:

15940058 Interior of MD disc exchanger assembled

Rev: B







A					
A	2011-04-28		FPG	2011-04-28	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:1

Format: A3

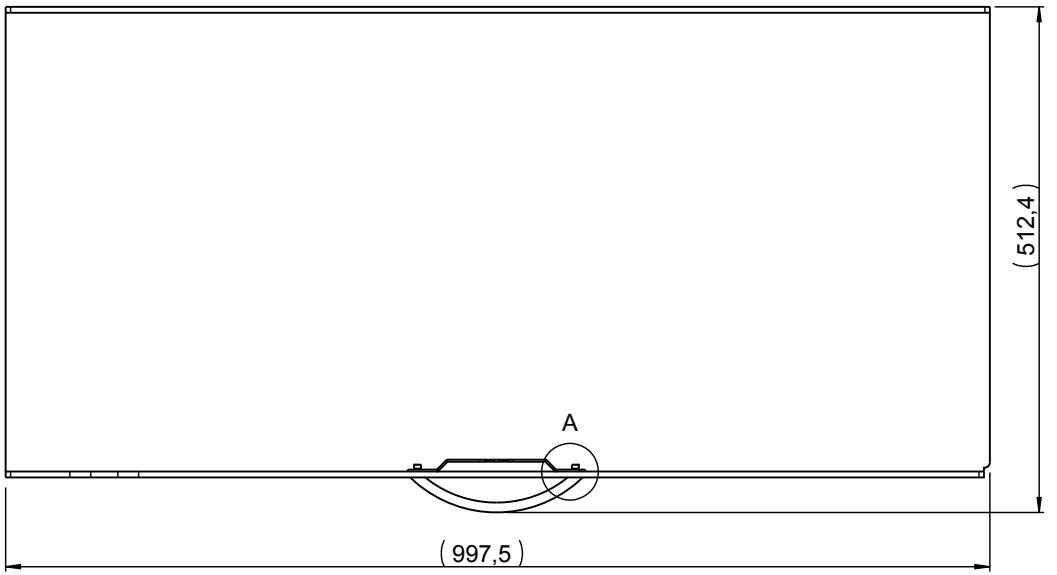
Tolerance: DS/ISO 2768- mK

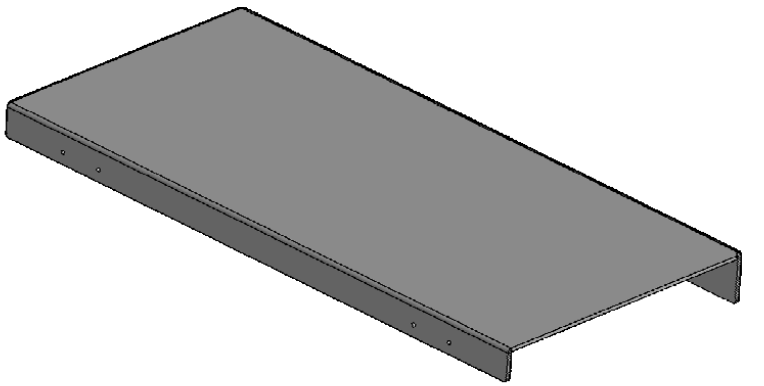
Weight : 144.0 g

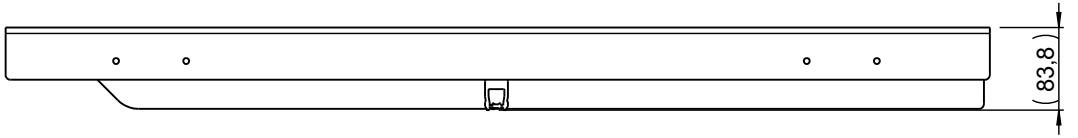
ID: Description:

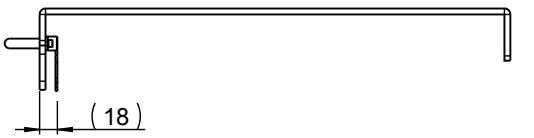
15940059 Tool for single samples

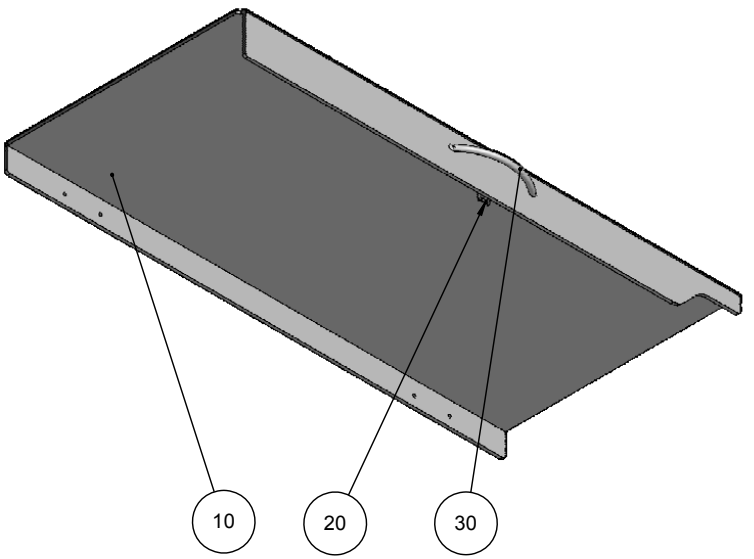
Rev: A

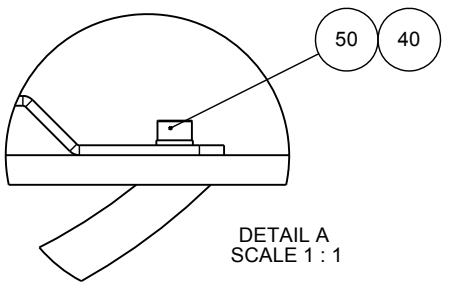












DETAIL A
SCALE 1 : 1

B	2011-02-22	assembly changed	TDR	2011-02-22	AKN
A	2010-09-09		TDR	2010-09-09	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:5

Format: A3

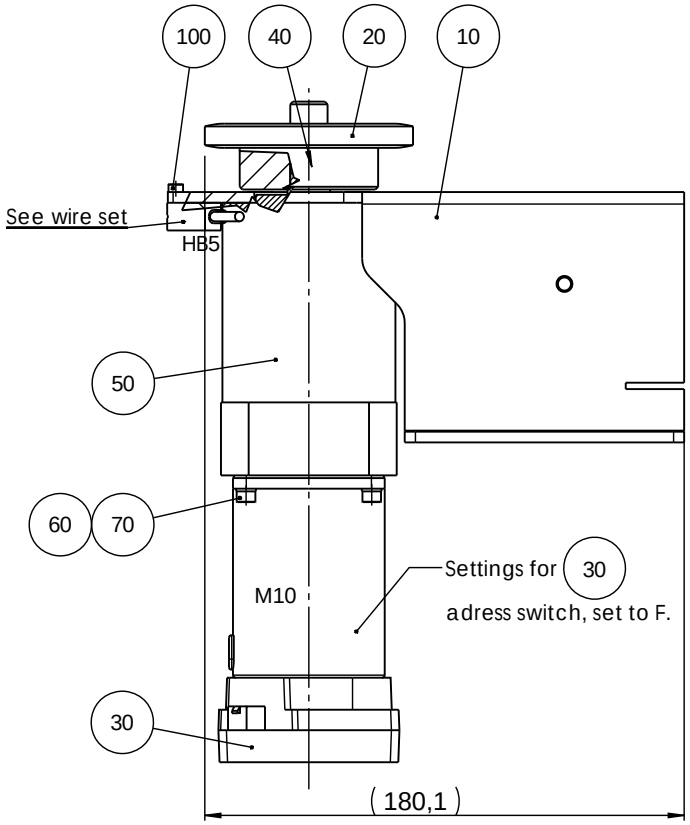
Tolerance: DS/ISO 2768- -

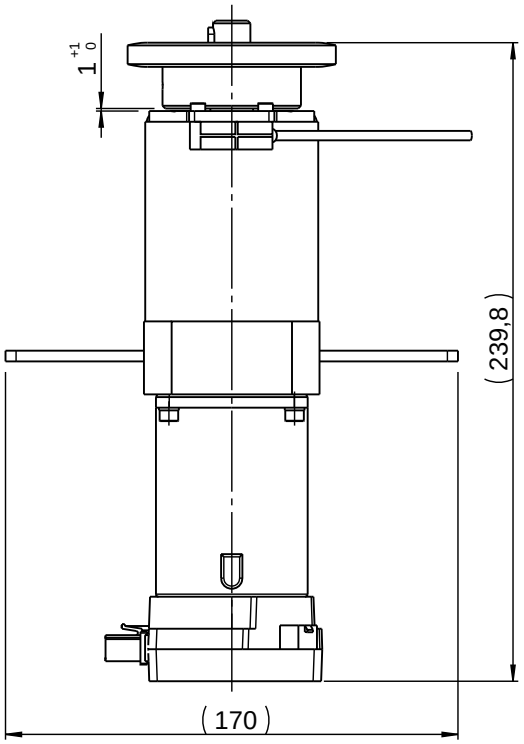
Weight : 4346.0 g

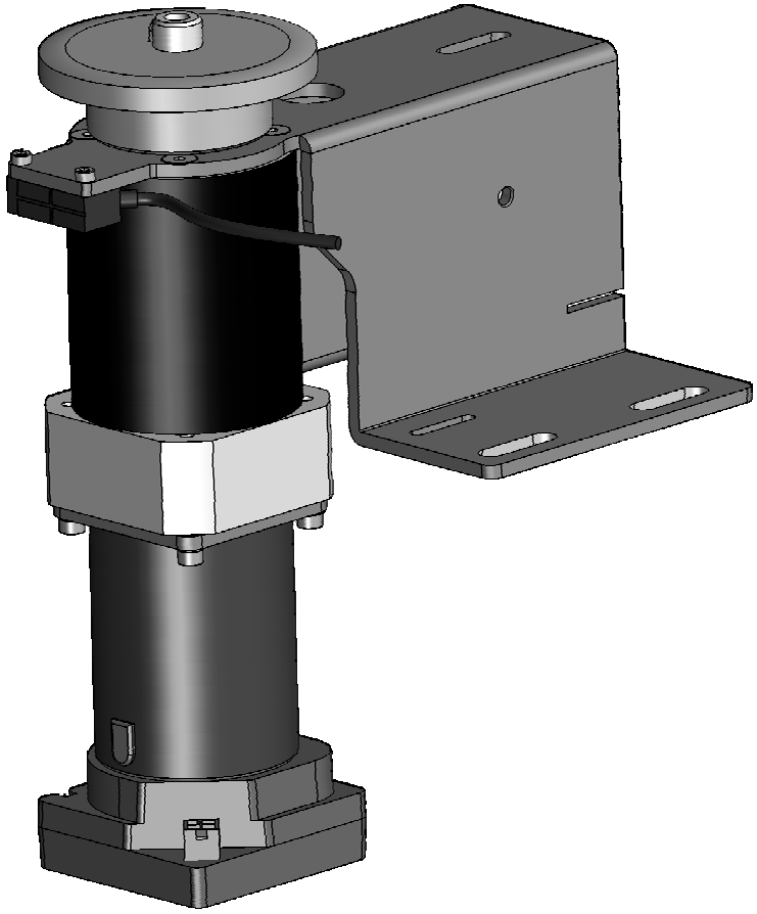
ID: Description:

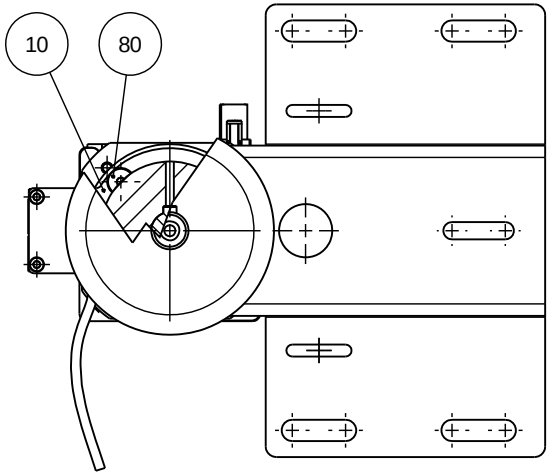
15940060 Cover assembled

Rev: **B**









J	2013-10-03	Pos. 60 and 70 new screw and washer added.	JJO	2013-10-03	JJO
A	2010-09-13		TDR	2010-09-13	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: **1:2**

Format: **A3**

Tolerance: DS/ISO 2768- -

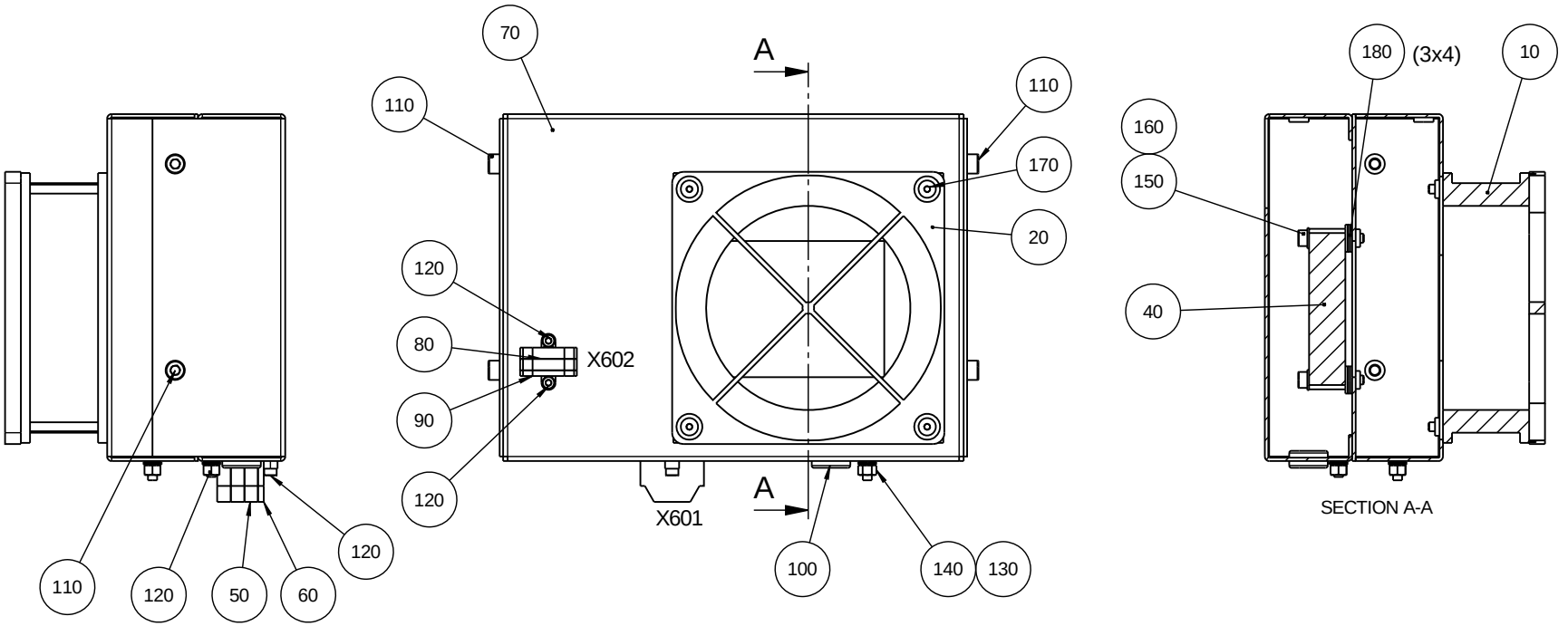
Weight : 5777.7 g

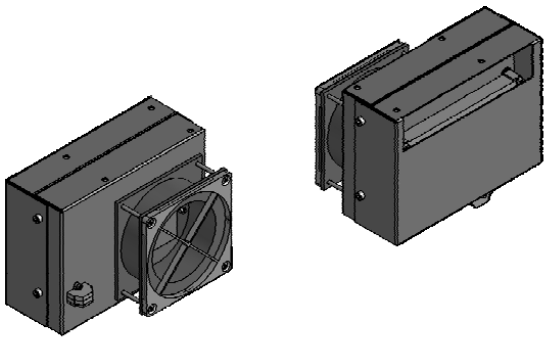
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

ID: Description:

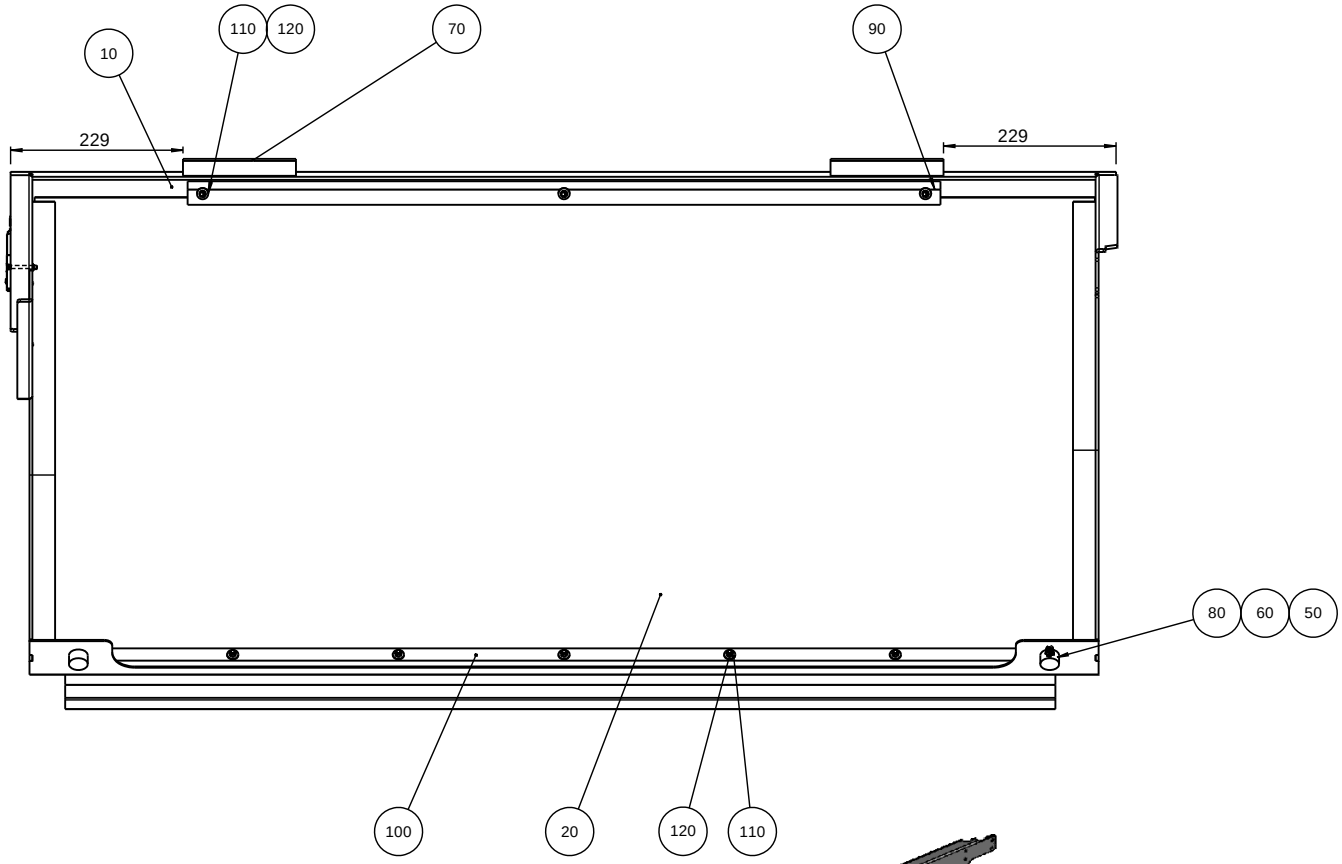
15940061 Motor for conveyor assembled

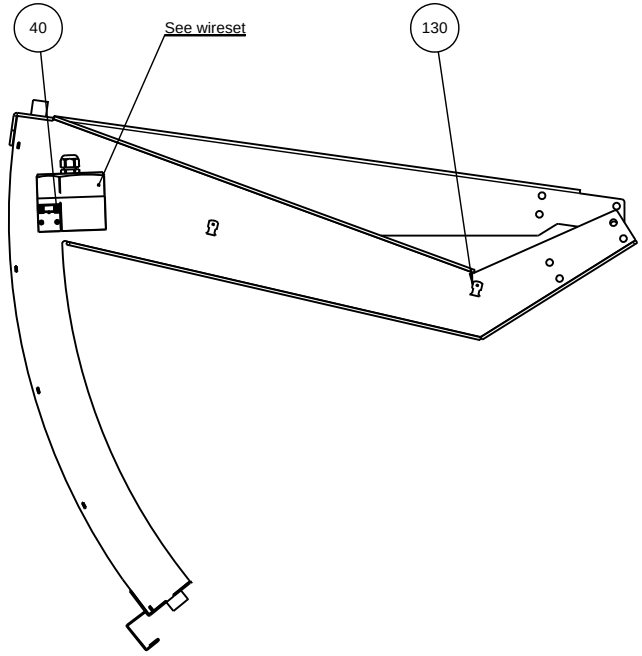
Rev: **J**

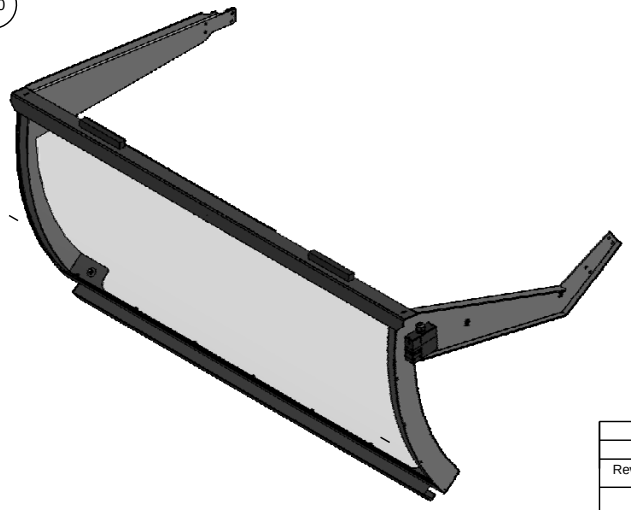




F	2012.01.19	Drawing updated, no changes		SPE	2012.01.19	
A	2010-11-03			JJO		
Revision	Crea. date yyyy-mm-dd	Revision description		Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
Struers		Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK	
					Weight : g	
Pederstrupvej 84 DK-2750 Ballerup/Copenhagen Denmark Phone:+45 44 600 800 Fax: +45 44 600 804		ID: Description: **15940064 Ventilator casing**				Rev: **F**







E	2012.09.26	2SS00019 removed, see wire set	SPE	2012.09.26	
A	2011.02.10		SPE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: 1:5

Format: A2

Tolerance: DS/ISO 2768- mK

Weight : g

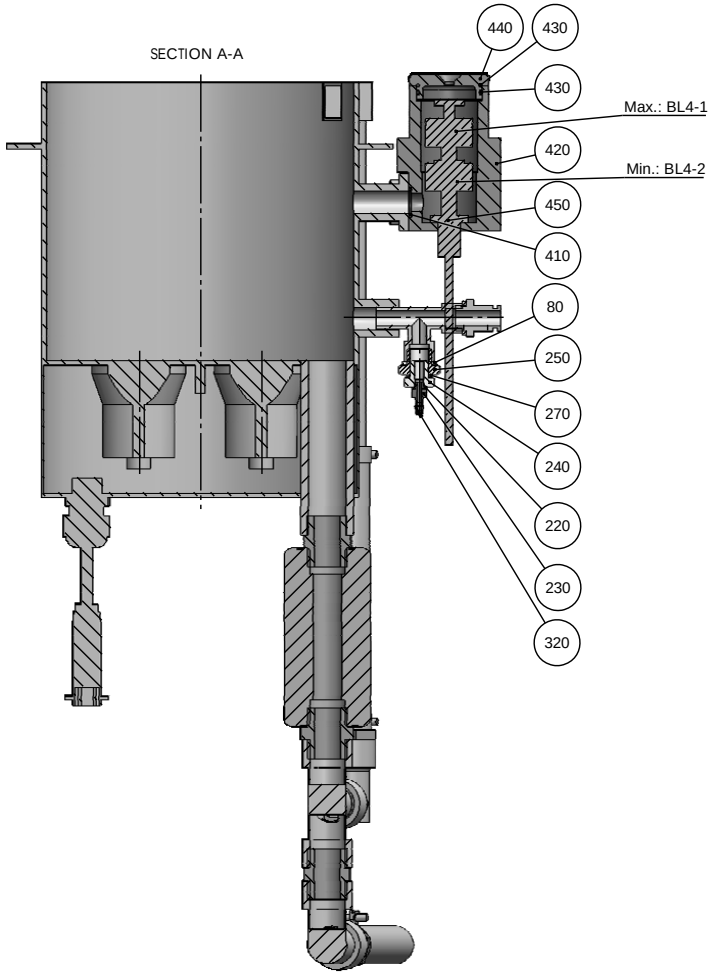
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

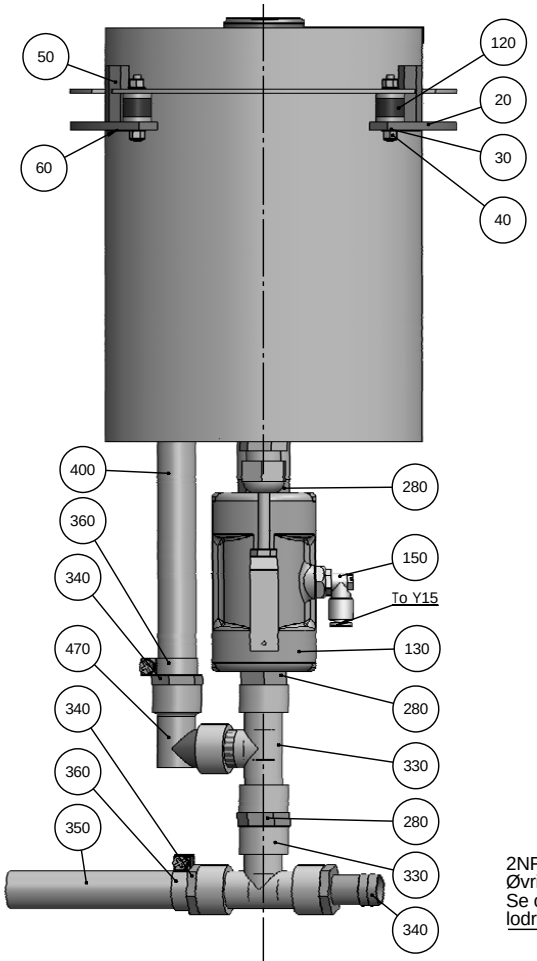
ID:

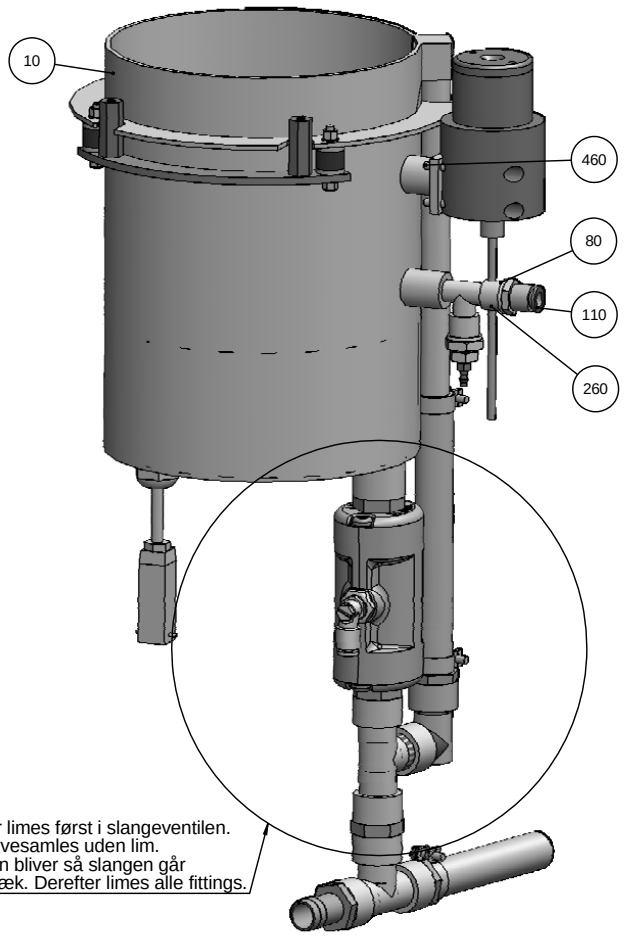
Description:

15940065 Cover assembled

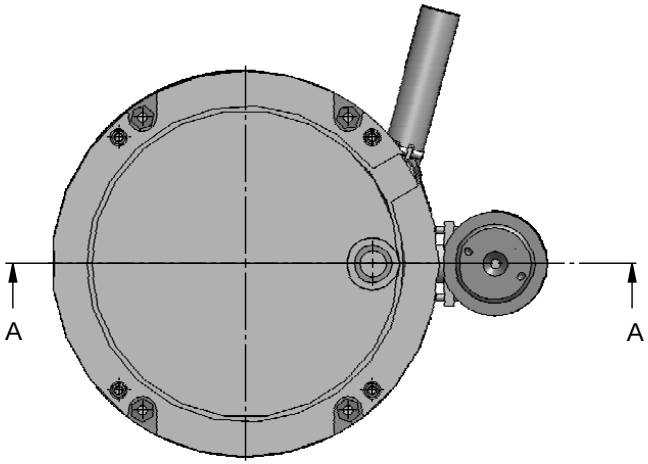
Rev: **E**







2NF40014 nipler limes først i slangeventilen.
Øvrige fittings prøvesamles uden lim.
Se om placeringen bliver så slangen går lodret op uden knæk. Derefter limes alle fittings.



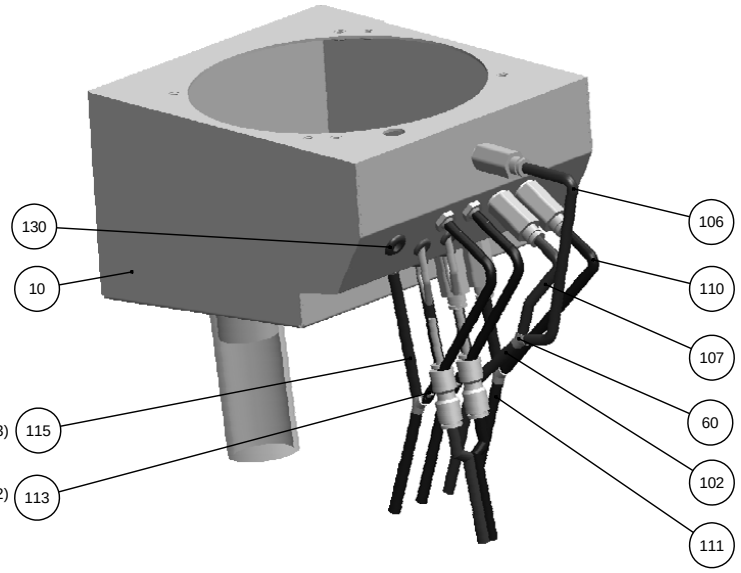
To seal fittings use Loctite 577

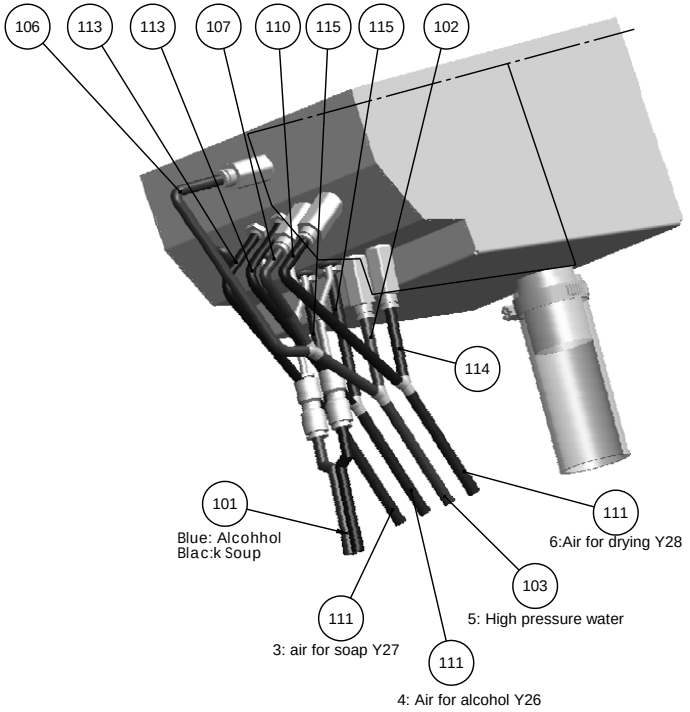
J	2015-02-13	F6: T-fittings added.	JJO	2015-02-13	JTV
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : g

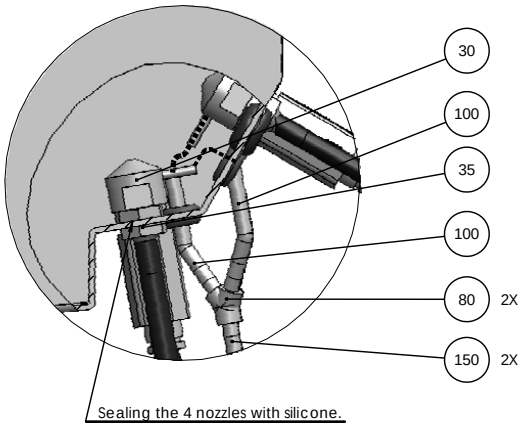
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

ID:
Description:
15940066 Ultrasonic cleaner, assembly
Rev: **J**

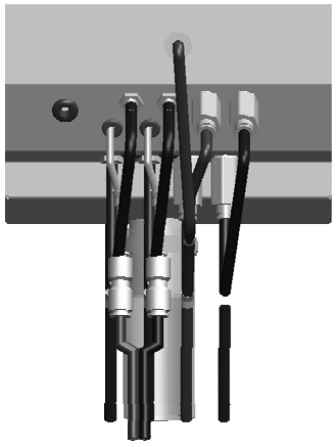


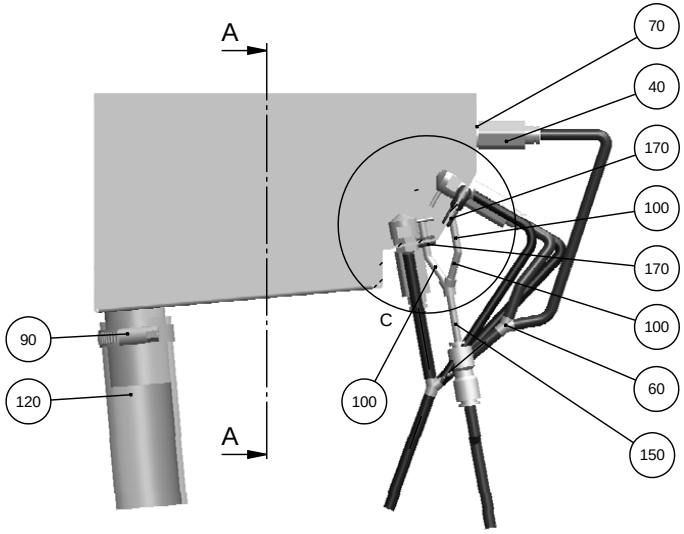


DETAIL C
SCALE 1 : 1

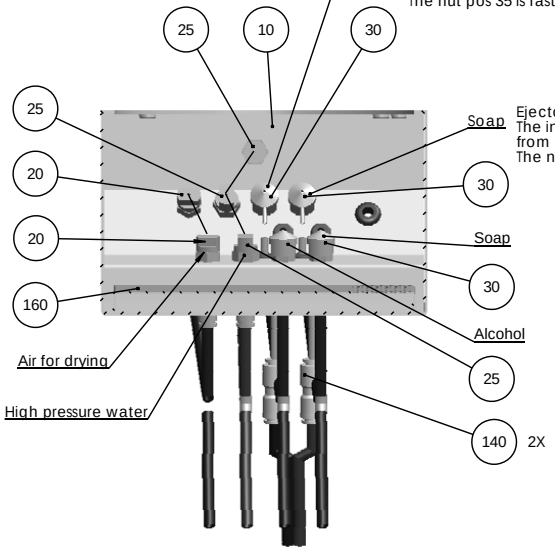


Sealing the 4 nozzles with silicone.





SECTION A-A



Hose numbers

1: Soap: 2EM06001 TAL 1
2: Alcohol: 2EM06002 TAL 2
3: Air for Soap : 2EM06003 TAL 3
4: Air for Alcohol: 2EM06004 TAL 4
5: High pressure water: 2EM06005 TAL 5
6: Air for drying: 2EM06006 TAL 6

Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
K	2014-03-14	B7: Sealing added.	JJO		
A	2010-08-20		FPG	2010-08-20	FPG

Struers
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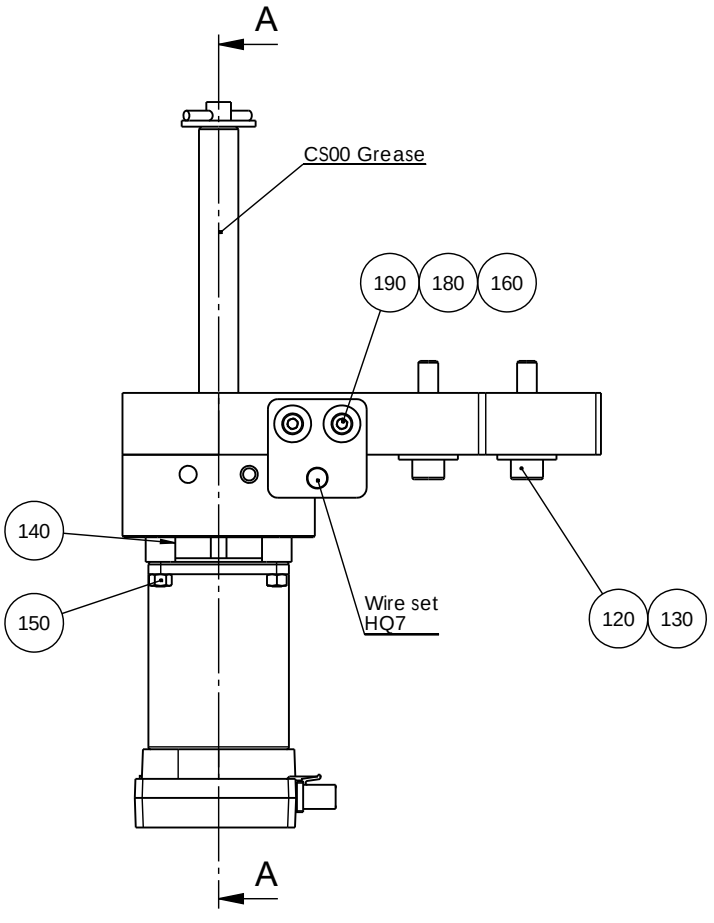
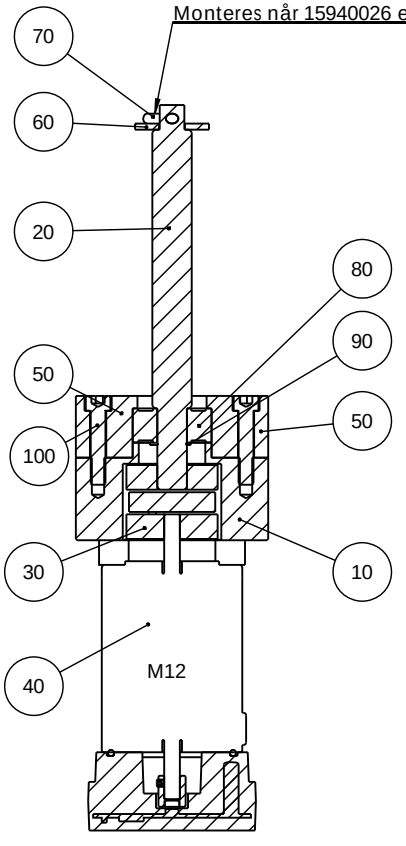
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

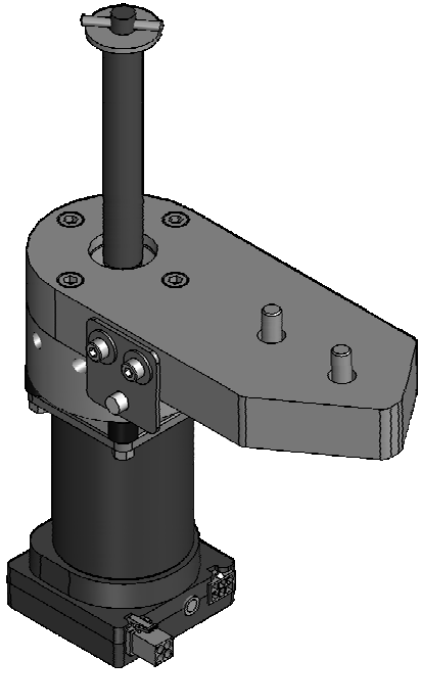
Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- mK
Weight : 1916.1 g

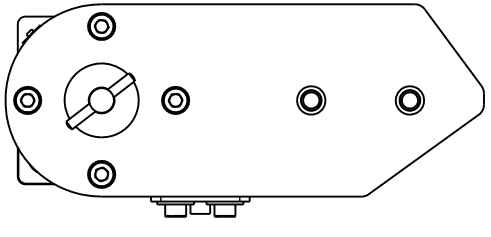
ID:
Description: **15940067 Cleaning Chamber**
Rev: **K**





SECTION A-A





F	2011.09.13	Changes for 1-series	SPE	2011.09.13	
A	2010-08-20		FPG	2010-08-20	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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Denmark
Phone:+45 44 600 800
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Material:

Scale: **1:2**

Format: **A3**

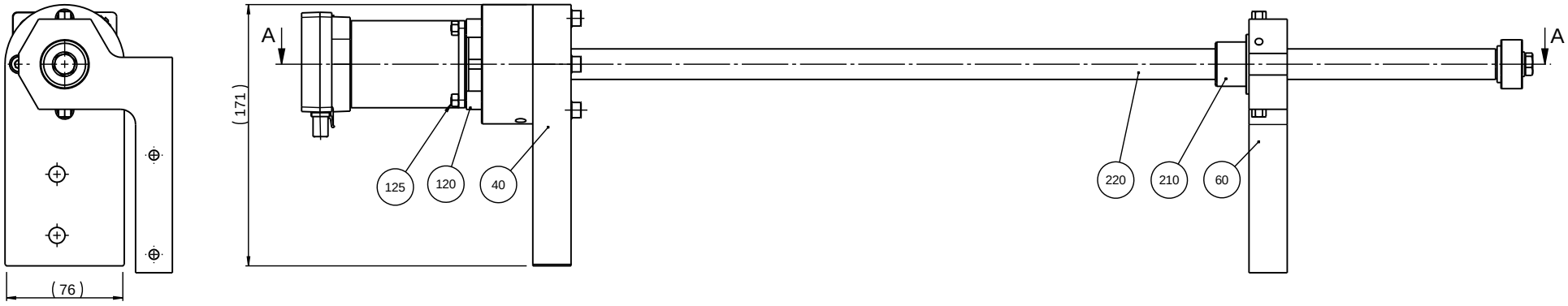
Tolerance: DS/ISO 2768- mK

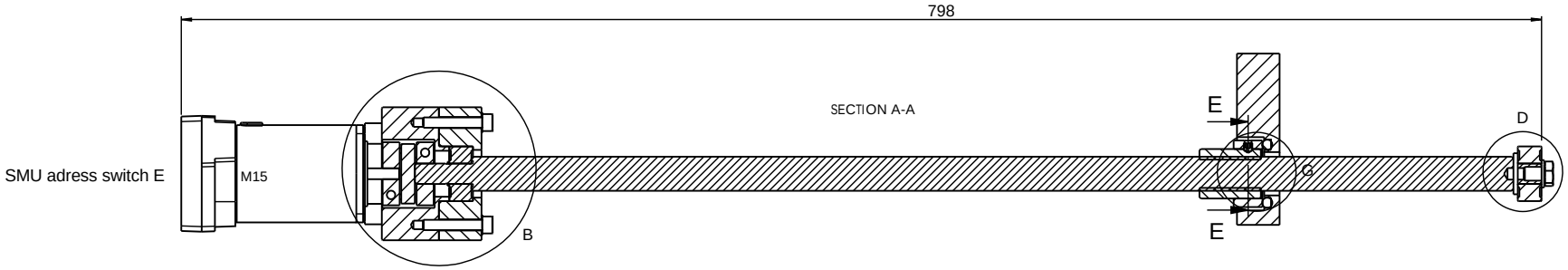
Weight : g

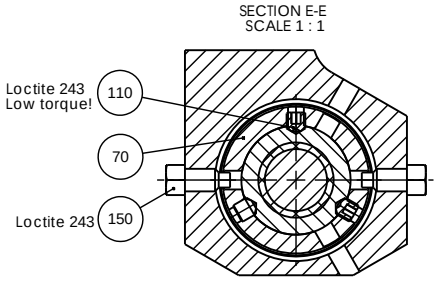
ID: Description:

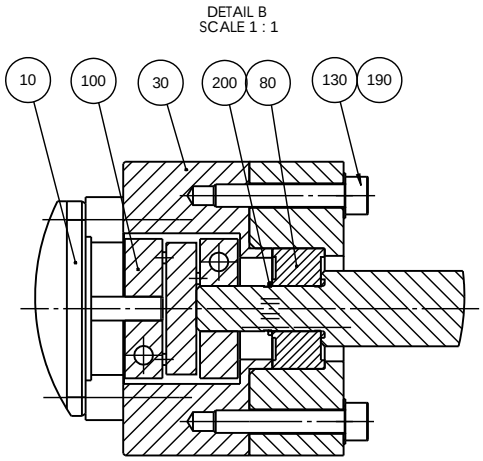
15940070 stepmotor with spindle, assembled

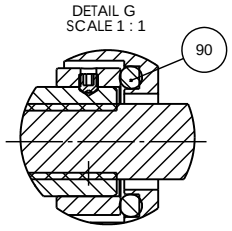
Rev: **F**

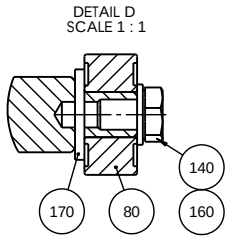


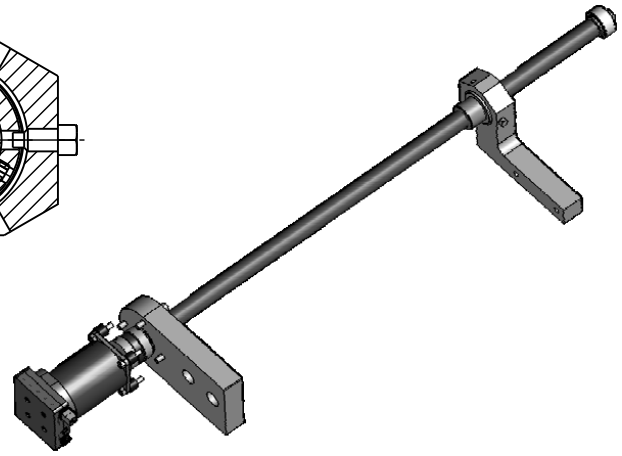












G	2012-09-24	New item: Pos. 20 -> 210 and pos.50 -> 220.	JJO		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material: | Scale: 1:2 | Format: A2 | Tolerance: DS/ISO 2768- - | Weight : 5118.7 g

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Phone: +45 44 600 800
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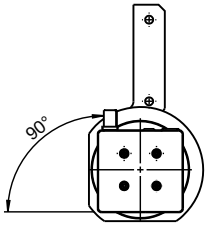
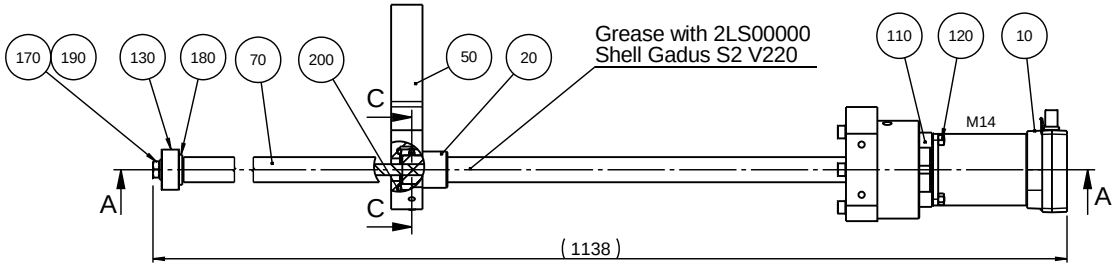
ID: Description:

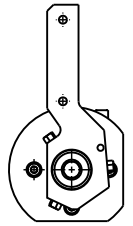
15940071 stepmotor with spindle, assembled

Rev: **G**

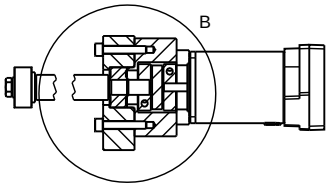




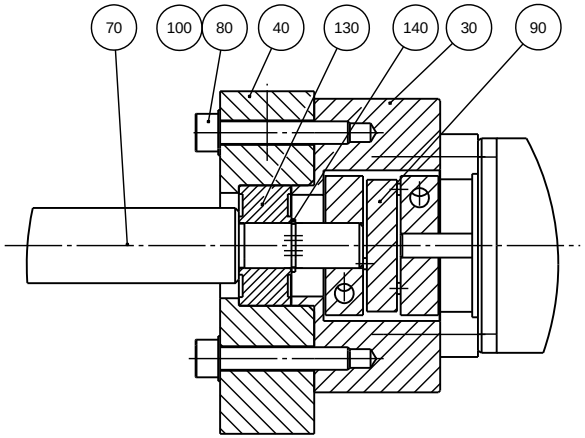
Adress switch C



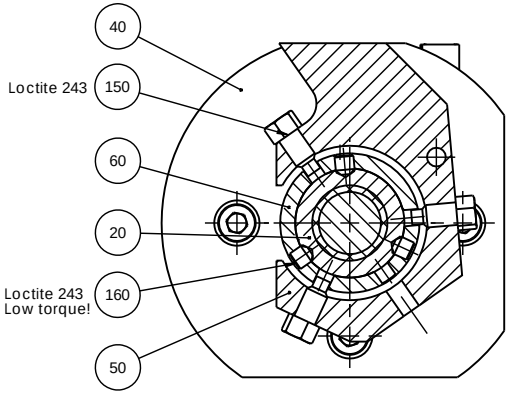
SECTION A-A



DETAIL B
SCALE 1 : 1



SECTION C-C
SCALE 1 : 1



I	2015-09-03	Pos. 20 changed supplier to IGUS.	JJO	2015-09-03	JTV
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
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Phone: +45 44 600 800
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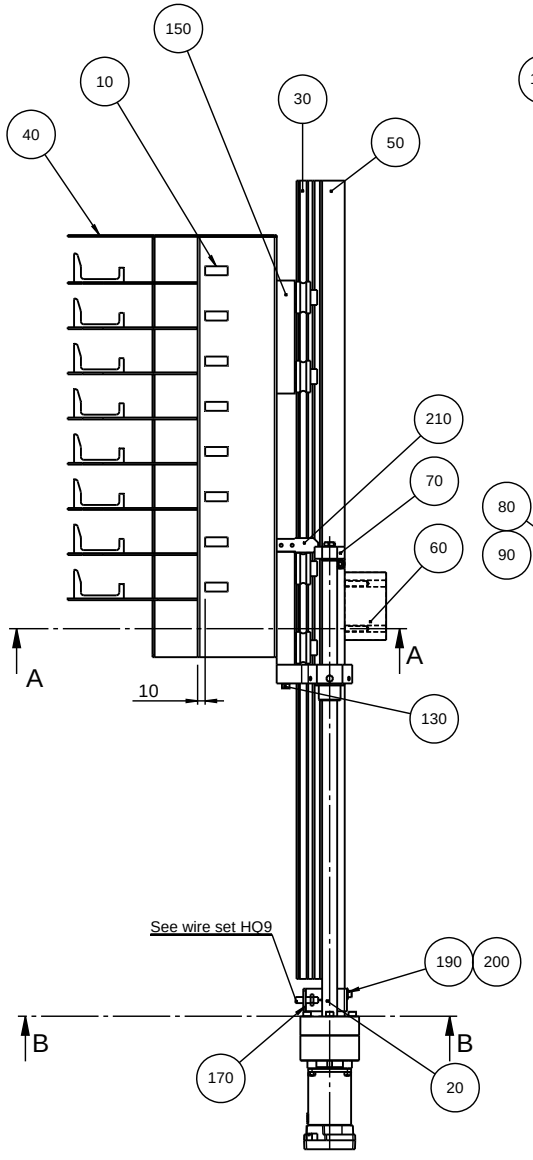
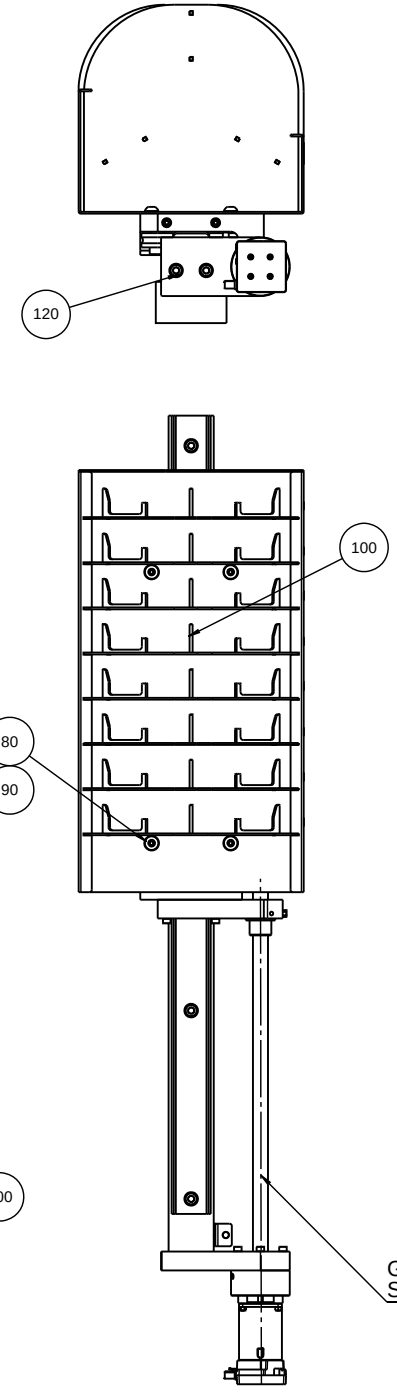
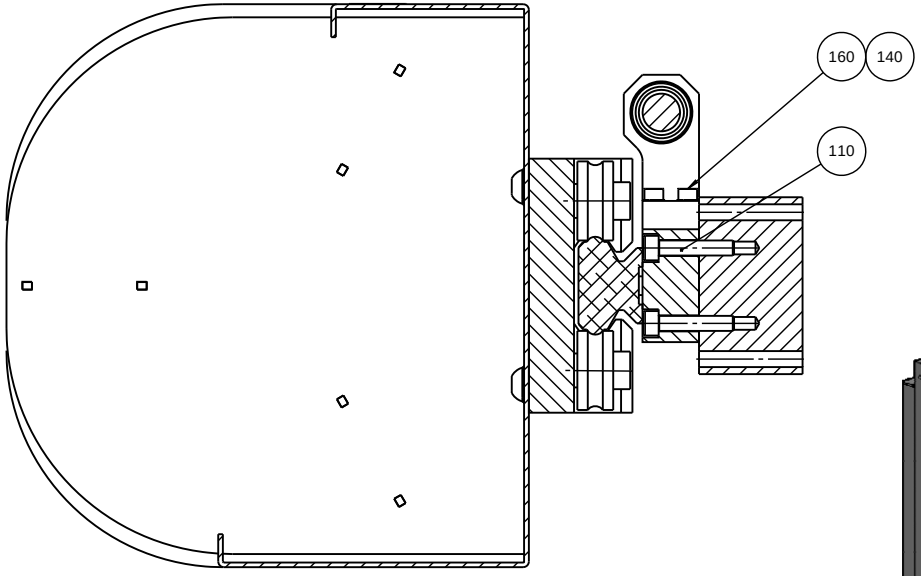
Material:
Scale: 1:2
Format: A2
Tolerance: DS/ISO 2768- -
Weight : 4701.0 g

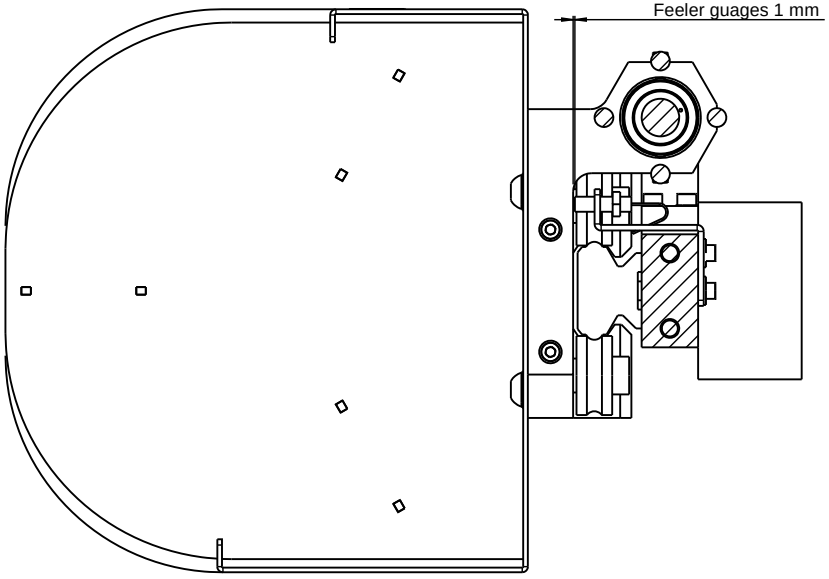
ID:
Description:
15940072 stepmotor with spindle, assembled
Rev: I



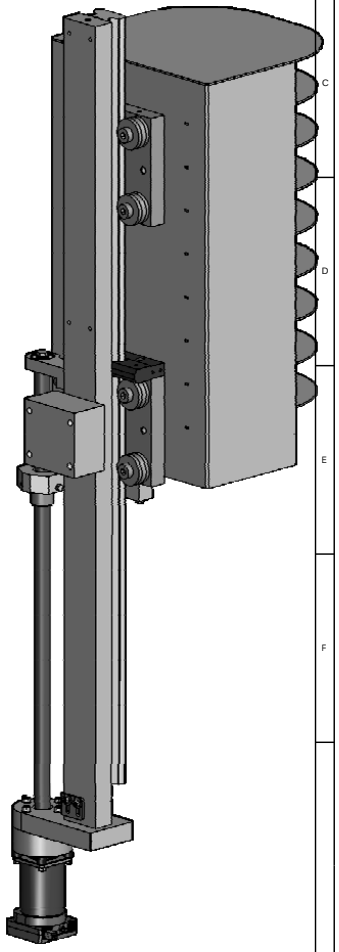




SECTION A-A
SCALE 1 : 2



SECTION B-B
SCALE 1 : 2



H	2012-06-29	G,6: tekst added	JJO		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:
Scale: 1:5
Format: A2
Tolerance: DS/ISO 2768- -
Weight : g

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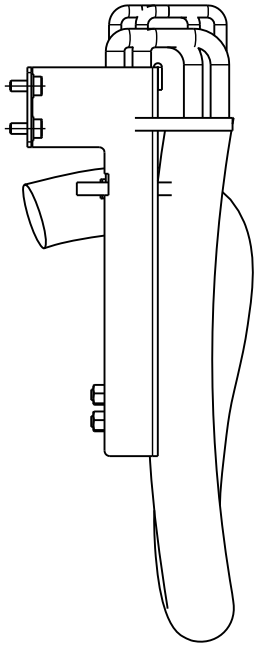
Fax: +45 44 600 804

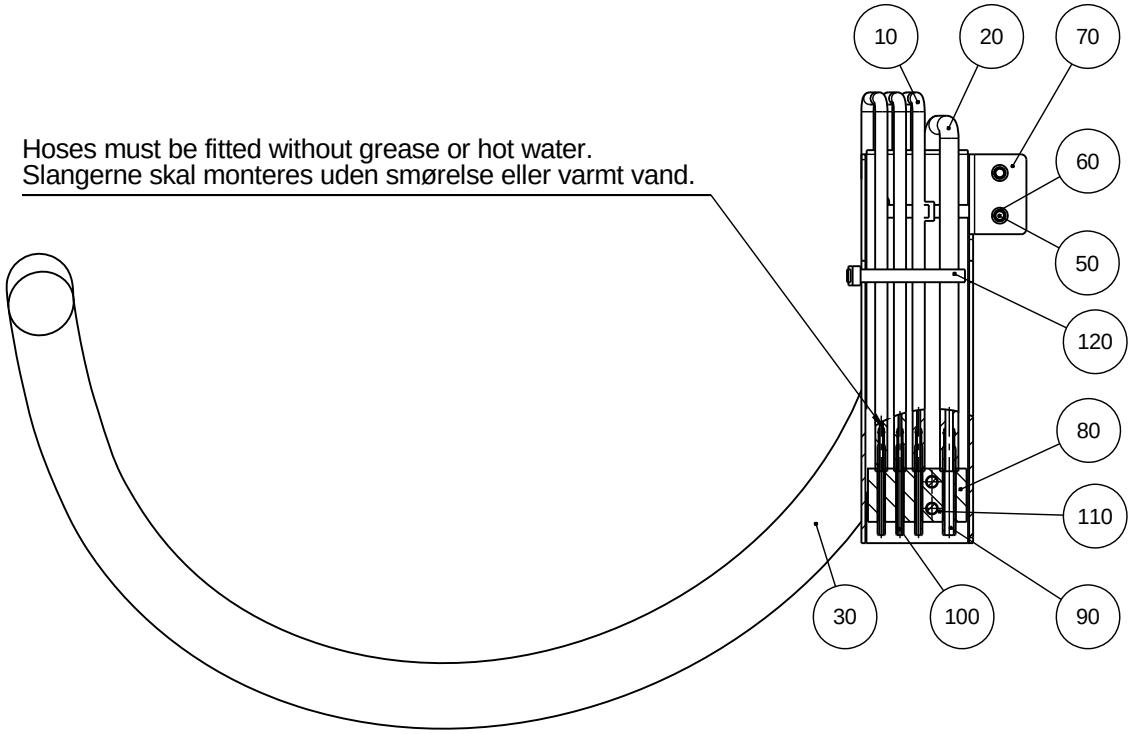
ID: Description:

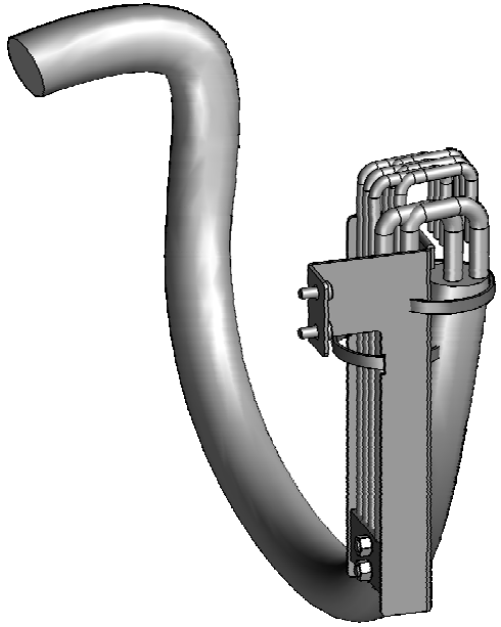
15940075 Storage for MD discs assembled

Rev: **H**



Hoses must be fitted without grease or hot water.
Slangerne skal monteres uden smørelse eller varmt vand.





F	2012-12-11	B,3: Installation instructions for tubes.	JJO		
A	2010-11-23		FPG	2010-11-23	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:2

Format: A3

Tolerance: DS/ISO 2768- -

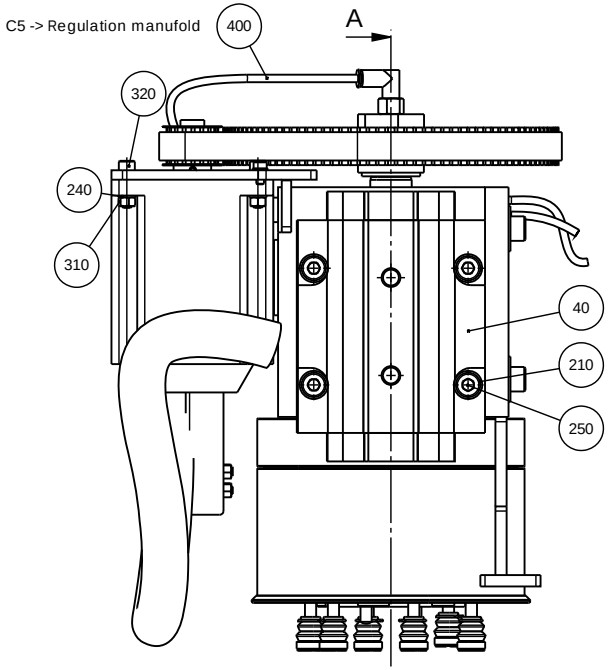
Weight : g

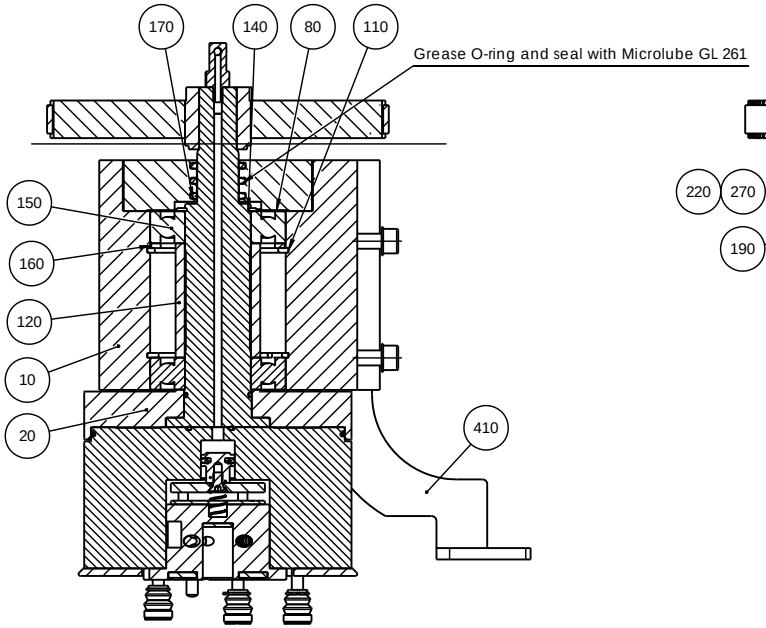
ID: Description:

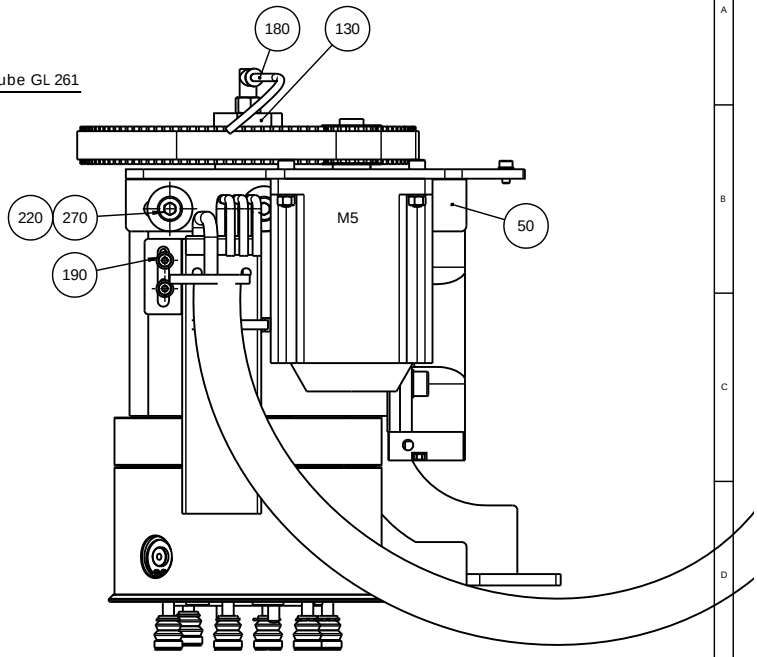
15940076 Doser hoses and outlet, assembled

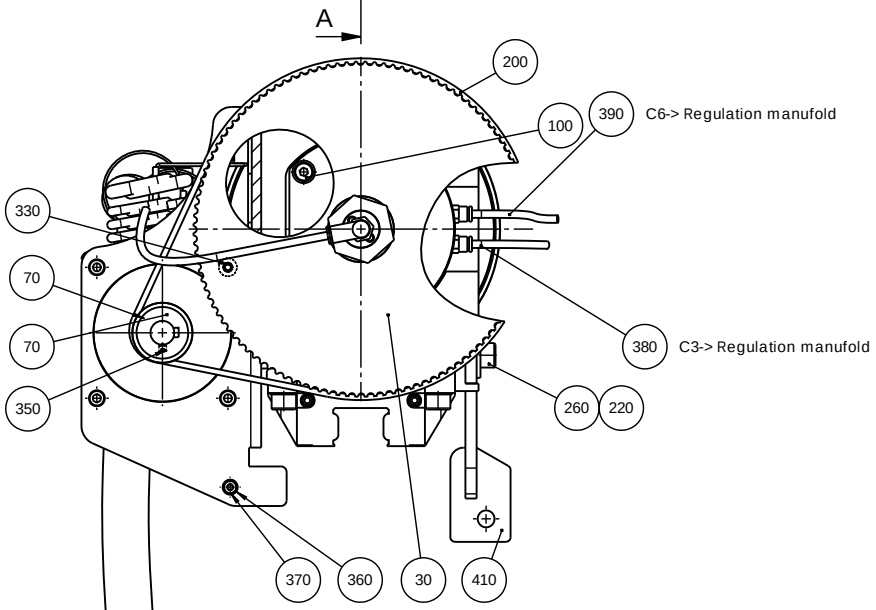
Rev: F

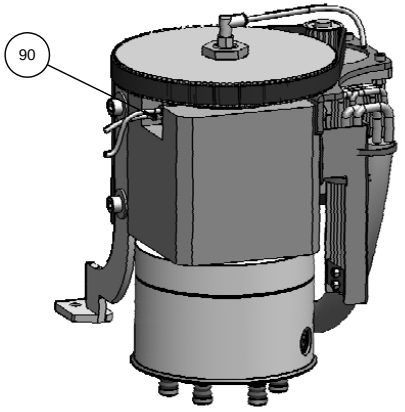
SECTION A-A

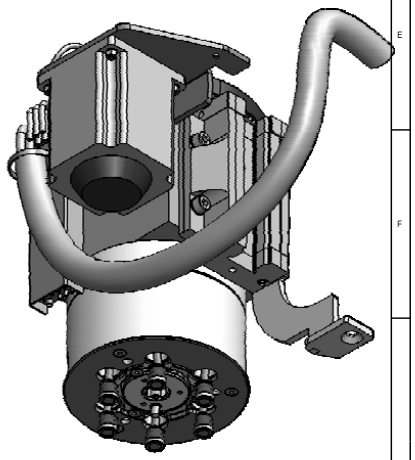












G	2015-02-06	C7: pos. 410 new item. A8: New text.	JJO	2015-02-11	JTV
A	2010-11-22		JJO		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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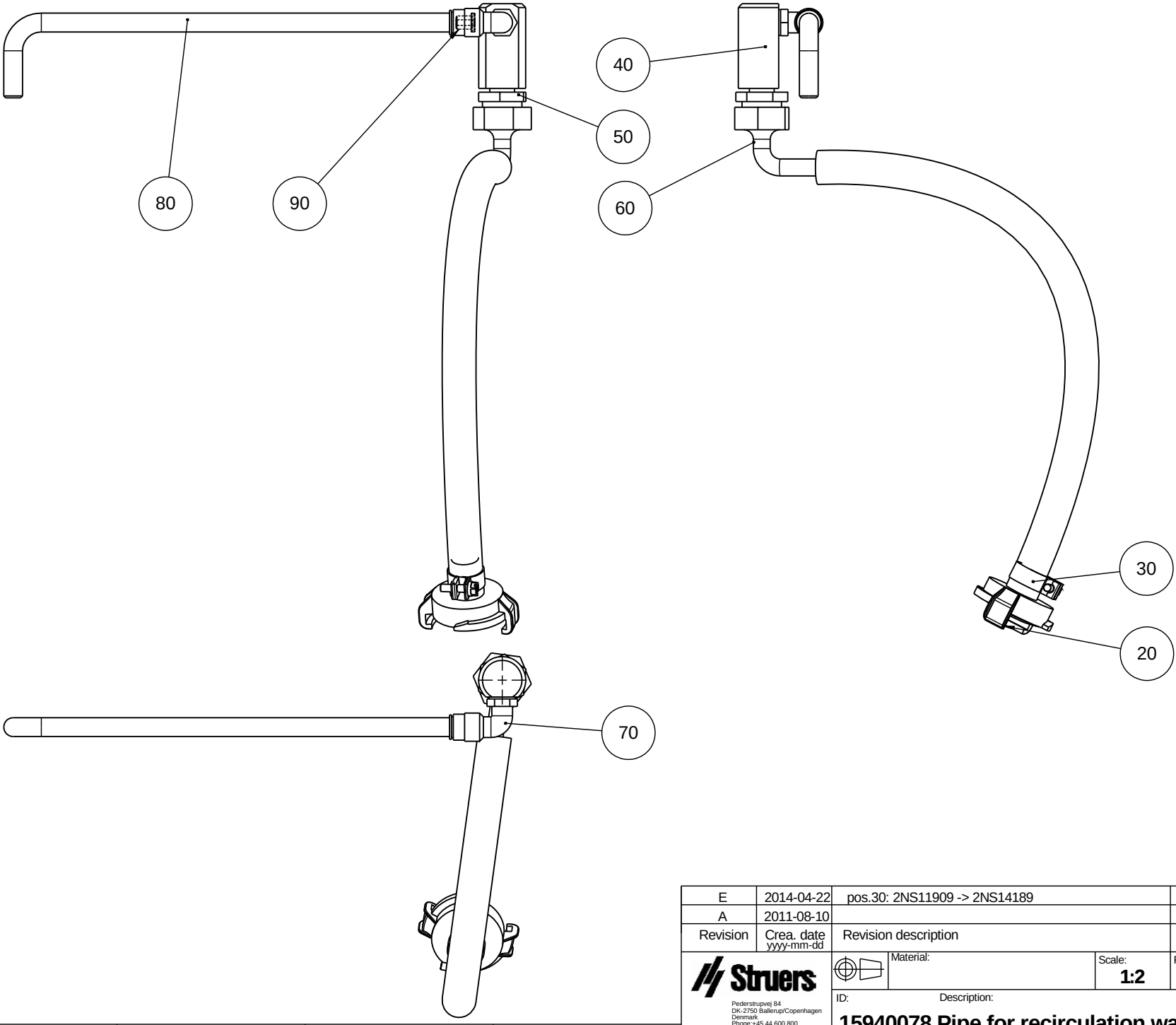
Phone: +45 44 600 800
Fax: +45 44 600 804

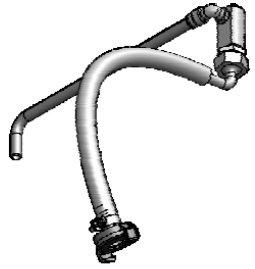
Material:	Scale: 1:2	Format: A2	Tolerance: DS/ISO 2768- mK
			Weight : g

ID: Description:

15940077 Bearing housing, assembled

Rev: **G**





E	2014-04-22	pos.30: 2NS11909 -> 2NS14189	OCR	2014-04-22	JTV
A	2011-08-10		CJE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: **1:2**

Format: **A3**

Tolerance: DS/ISO 2768- mK

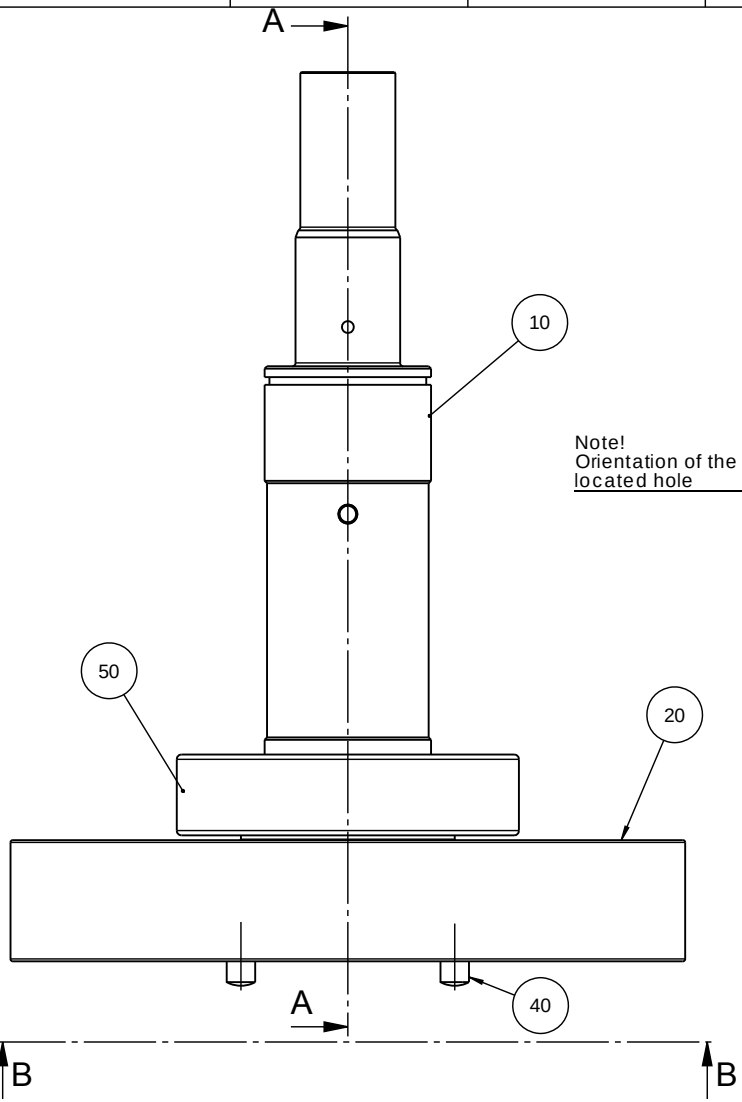
Weight : 469.7 g

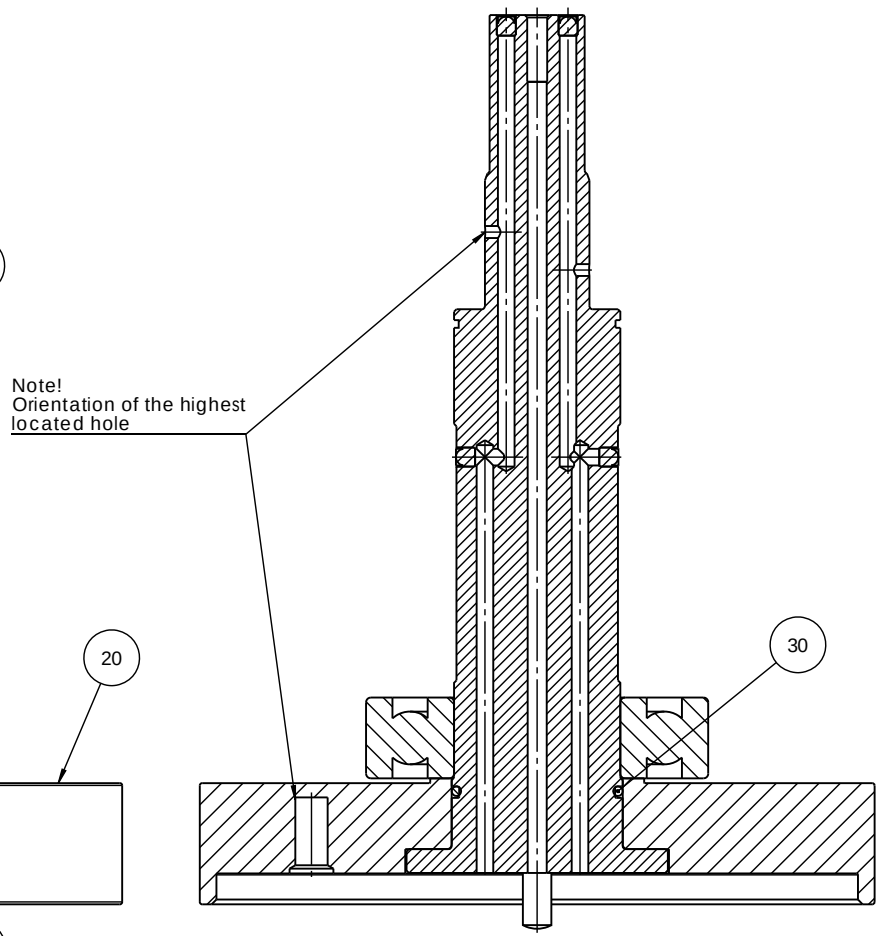
ID: Description:

15940078 Pipe for recirculation water assembled

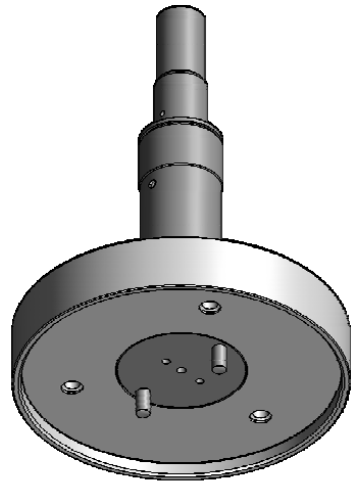
Rev: **E**

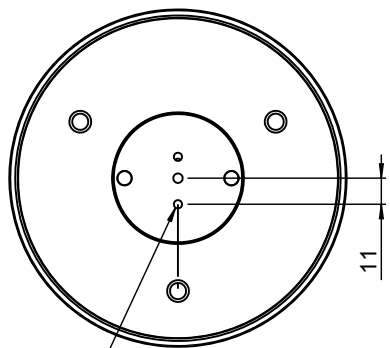
SCALE 1 : 5





SECTION A-A





Note!
Orientation of the hole

SECTION B-B
SCALE 1 : 2

30 High vacuum grease

Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
C	2011-09-13	Changes for 1-series	JLI	2011-09-13	JLI
A	2010-11-22		JJO		

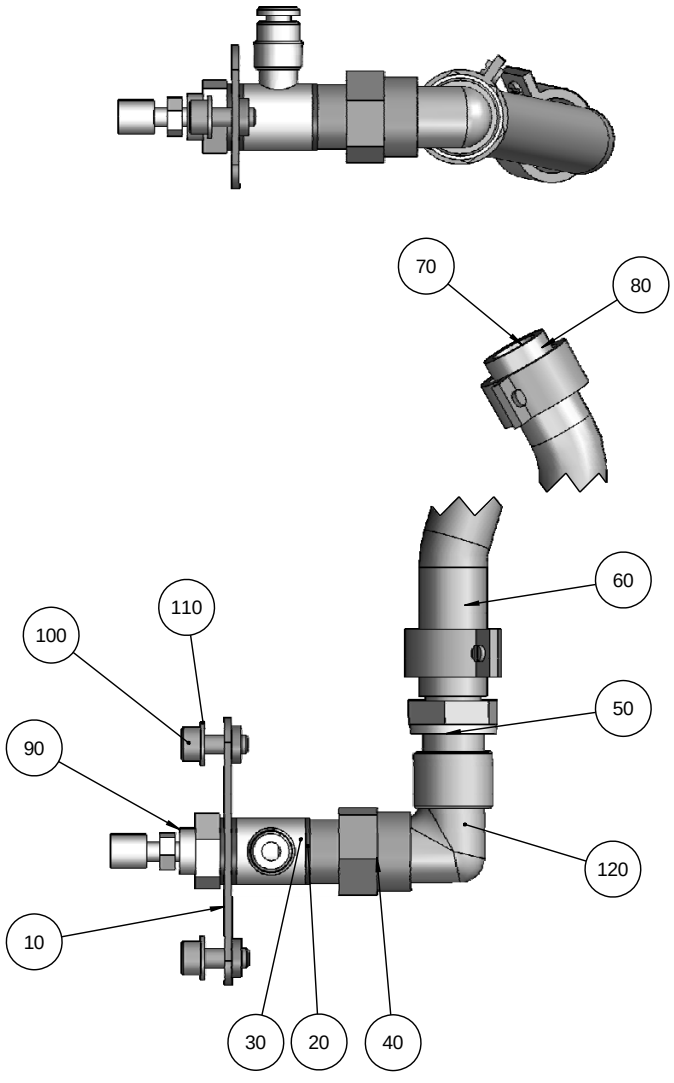
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:	Scale:	Format:	Tolerance: DS/ISO 2768- mK
	1:1	A3	Surface treat.: None

ID: Description:

15940079 Top flange, assembled

Rev: **C**

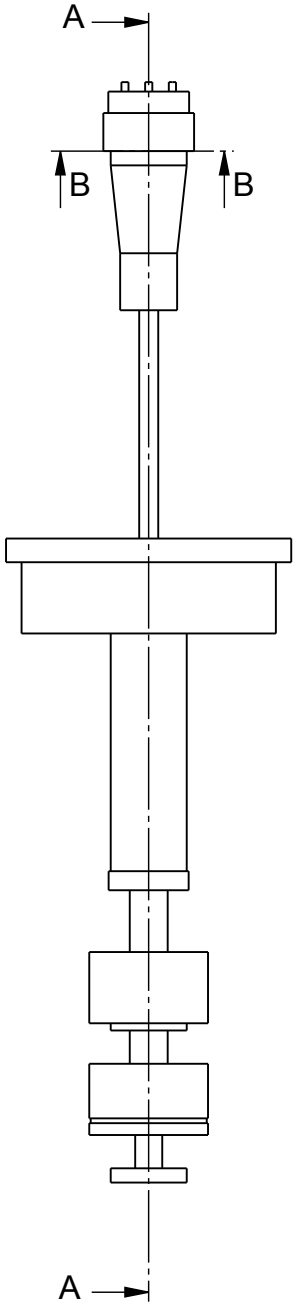


C	2011.06.28	2IF00011 (x2) -> 2IF51014 (x3)	JTV	2011.06.28	JTV
A	2010-11-18		FPG	2010-11-18	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

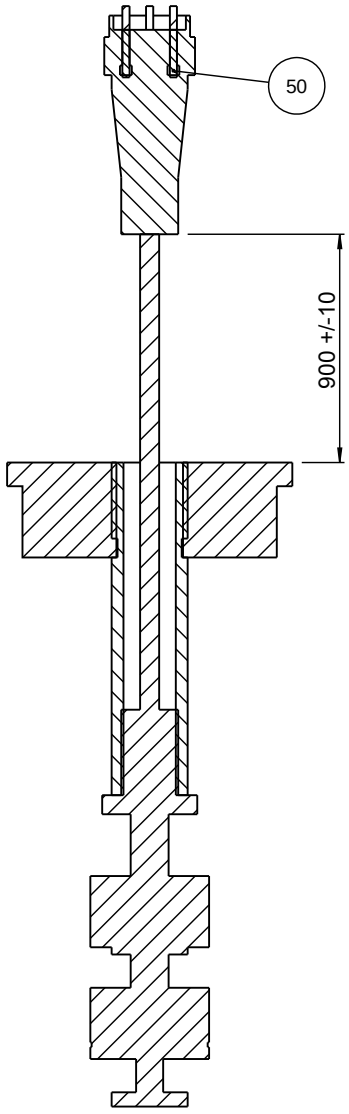
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

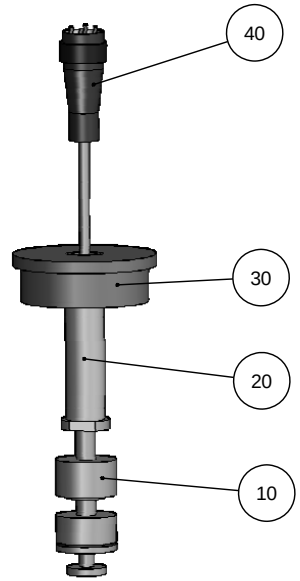
Material:
Scale: 1:1
Format: A3
Tolerance: DS/ISO 2768- mK
Weight : 81.7 g

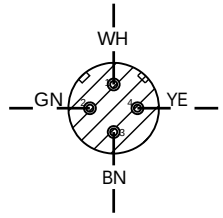
ID:
Description: **15940080 Water adjustment, assembled**
Rev: **C**



SECTION A-A
SCALE 1 : 1







SECTION B-B
SCALE 1 : 1

C	2011.11.29	Section B-B updated	SPE	2011.11.29	
A	2010-09-13		FPG	2010-09-13	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

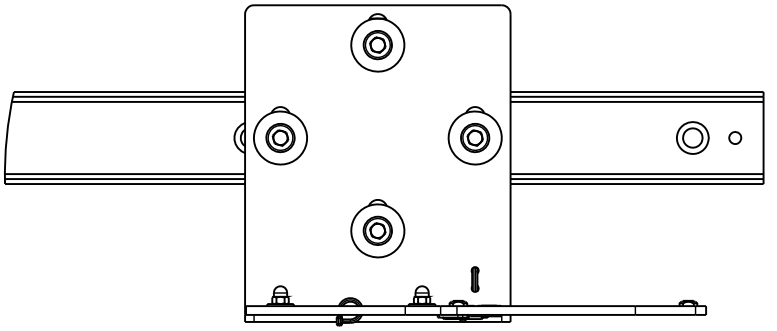
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

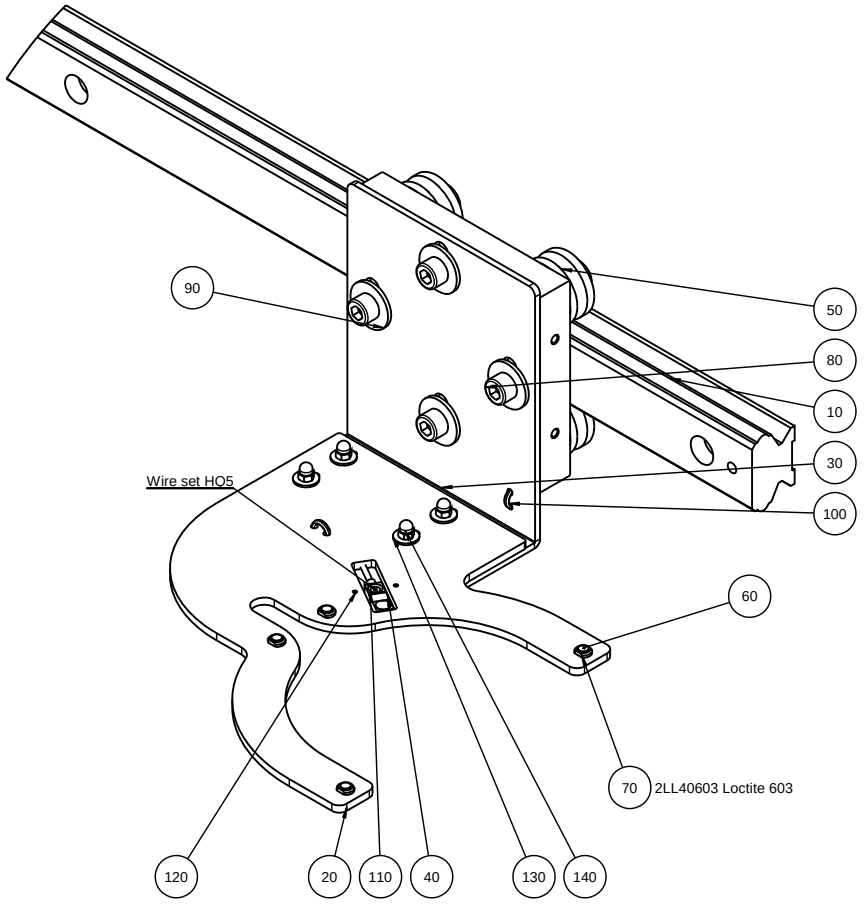
Material:	Scale: 2:1	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight :	g

ID: Description:

15940083 Float switch

Rev: **C**





G	2012-02-02	pos 70 added	CJE		
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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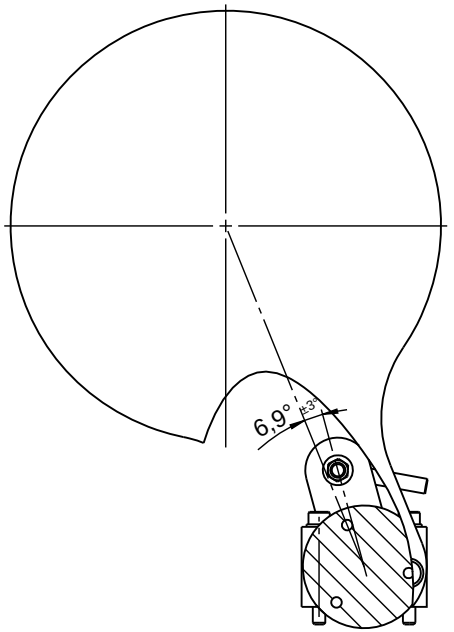
Phone: +45 44 600 800
Fax: +45 44 600 804

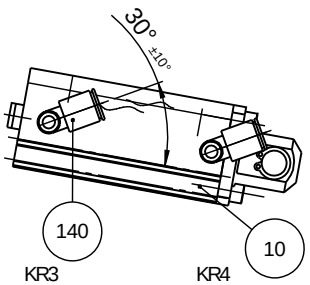
Material:	Scale: 1:2	Format: A2	Tolerance: DS/ISO 2768- -	
			Weight : 5971.5 g	

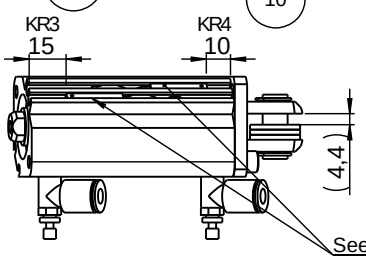
ID: 15940085 MD holder with magnets

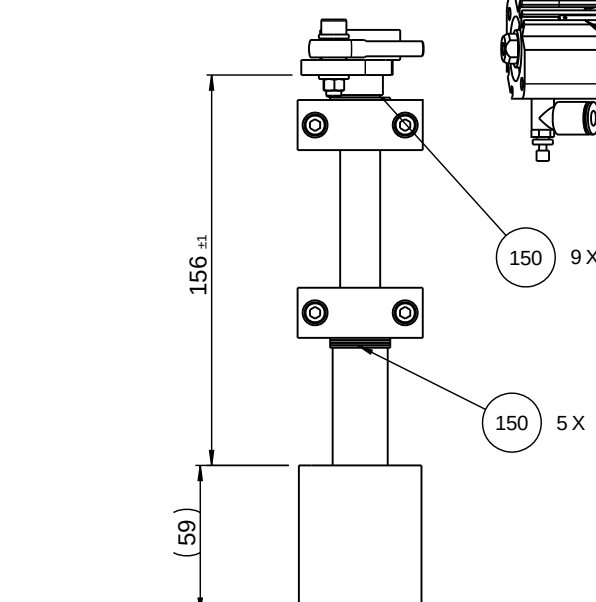
Description:

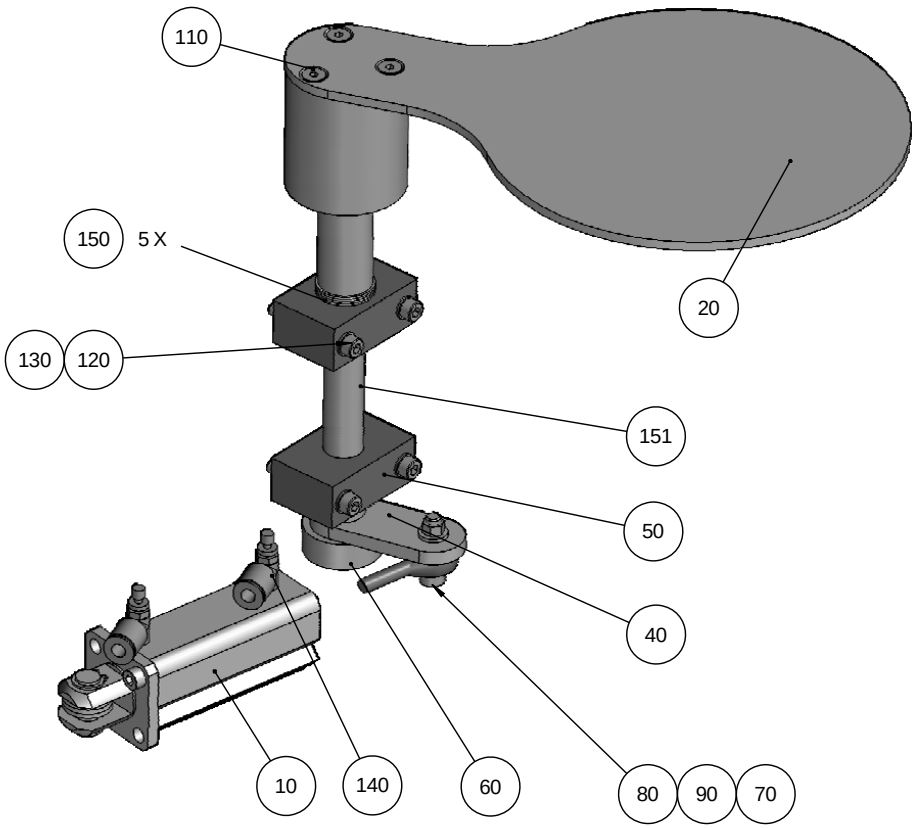
Rev: G











G	2012.01.19	KR3 and KR4 moved.	SPE	2012.01.19	
A	2010-08-24		FPG	2010-08-24	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
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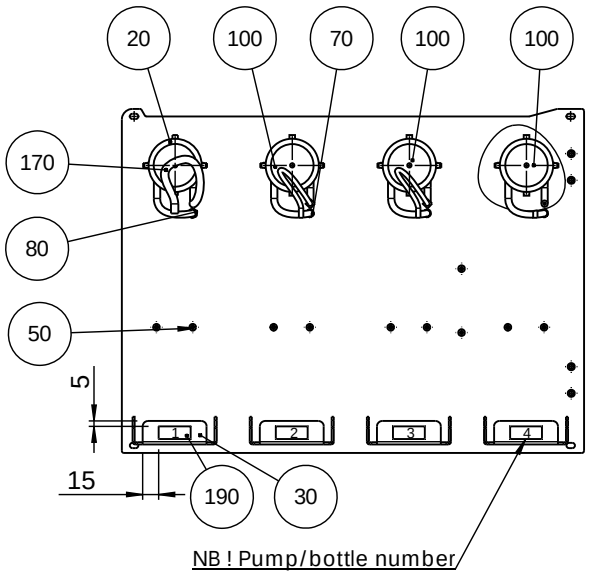
Phone:+45 44 600 800
Fax: +45 44 600 804

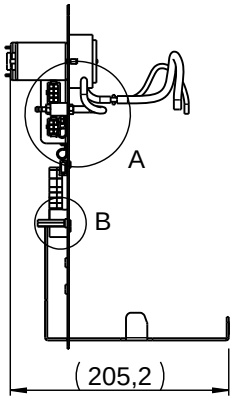
Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- -	
			Weight : 2575.0 g	

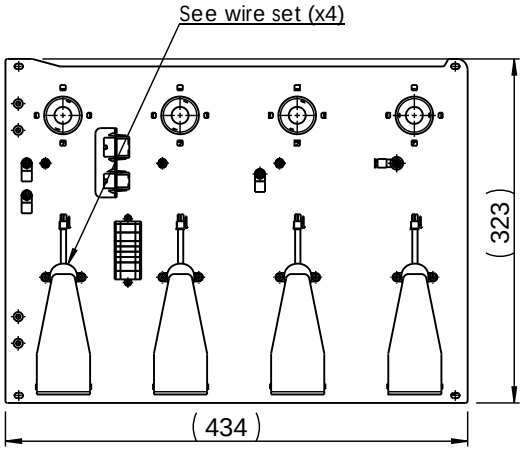
ID: Description:

15940086 cover assembled

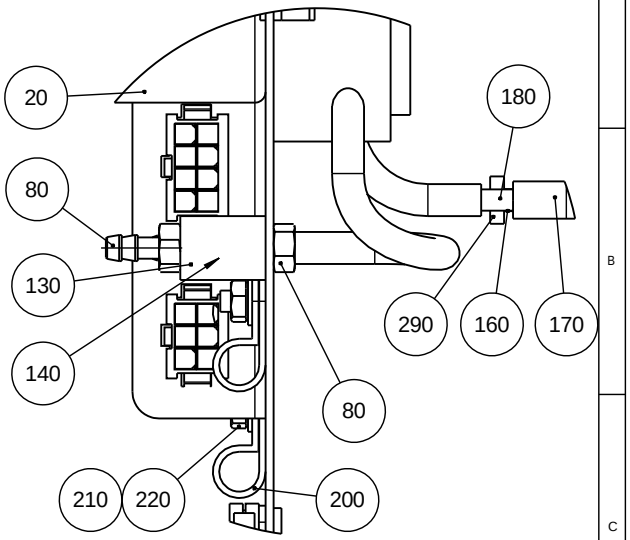
Rev: **G**

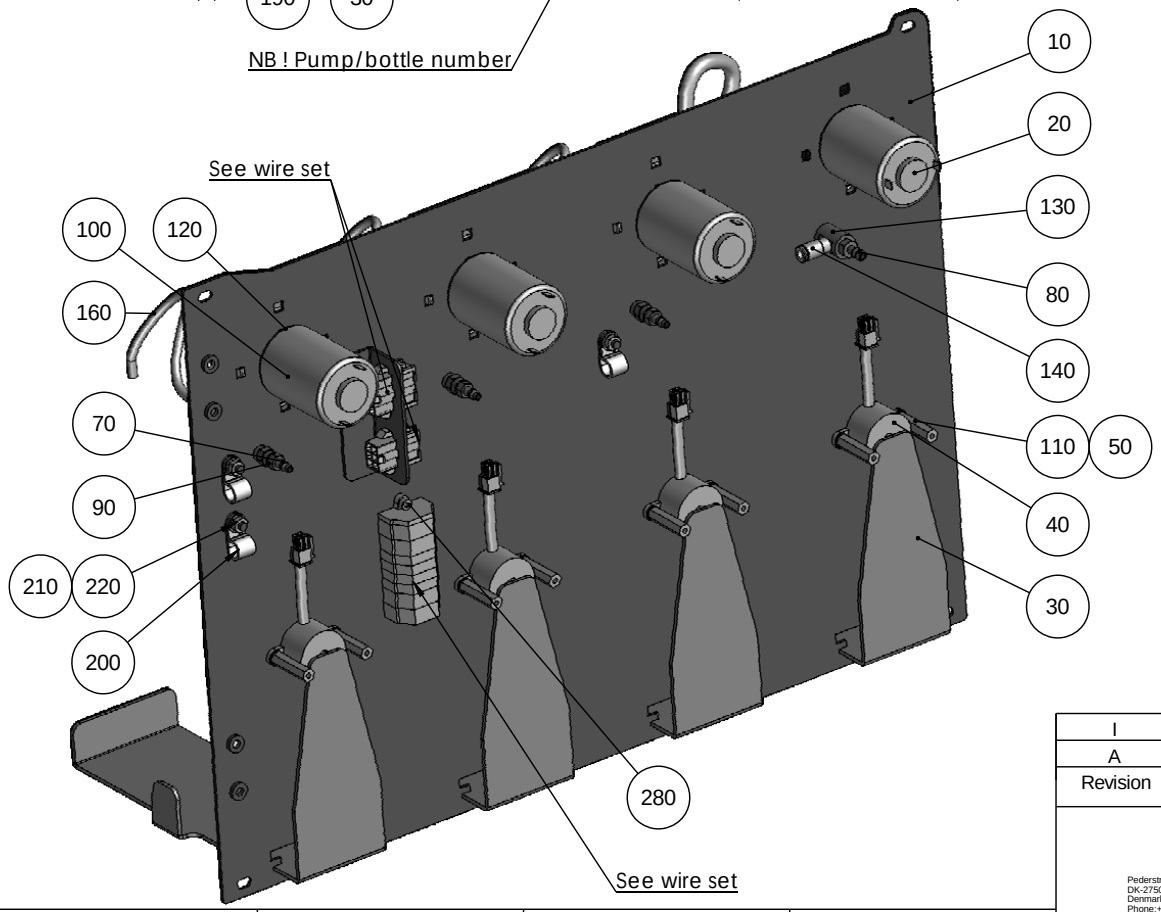


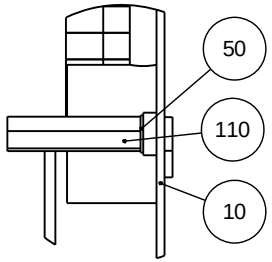




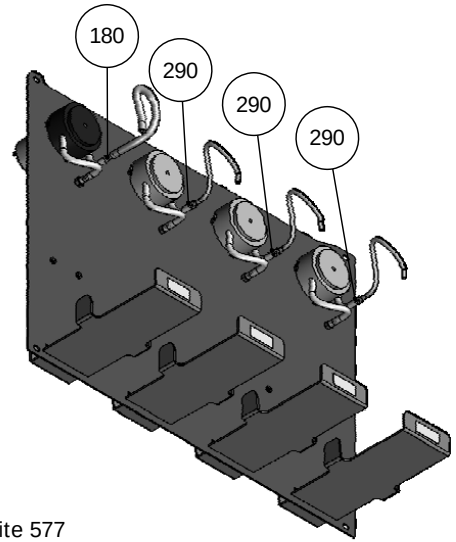
DETAIL A
SCALE 1 : 1







DETAIL B
SCALE 1 : 1



70 80 90 130 140 Loctite 577

I	2014-01-27	pos. 290 added	OCR	2014-01-27	JTV
A	2010-09-09		TDR	2010-09-09	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:
Scale: 1:5
Format: A3
Tolerance: DS/ISO 2768- -
Weight : 3217.5 g

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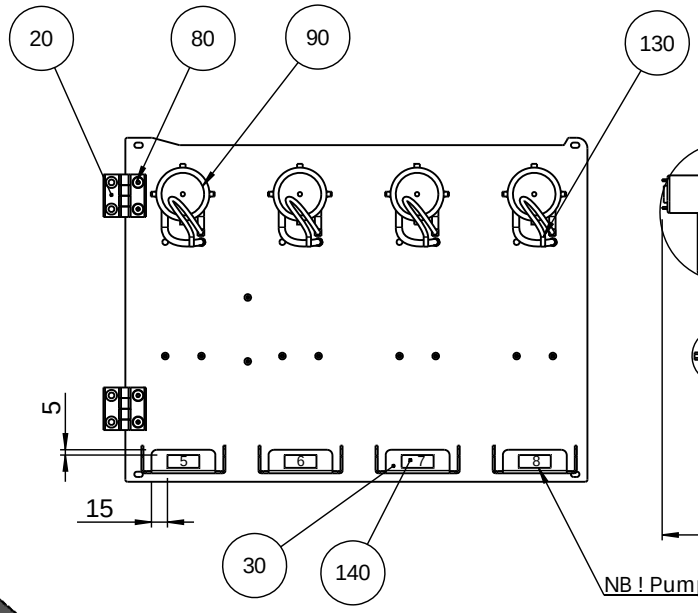
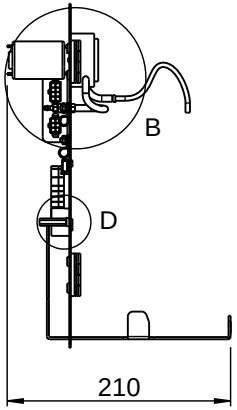
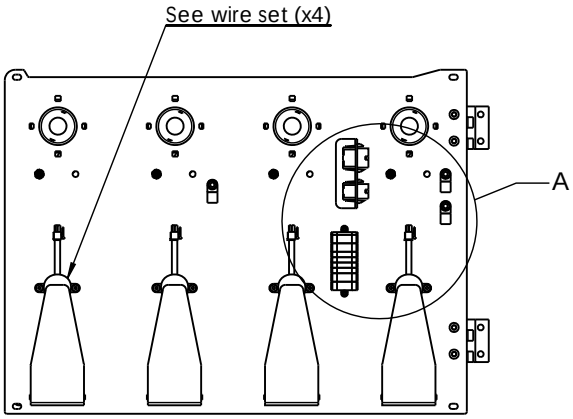
ID: Description:

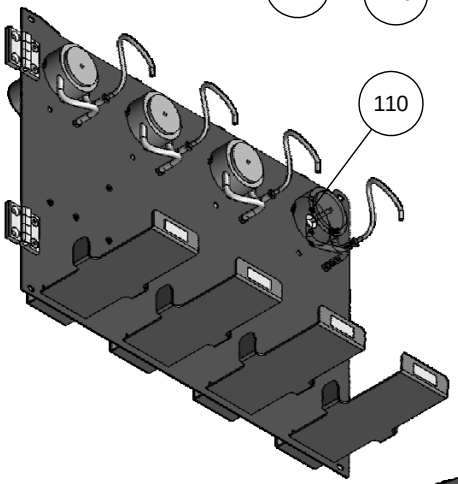
15940087 Pump plate OP

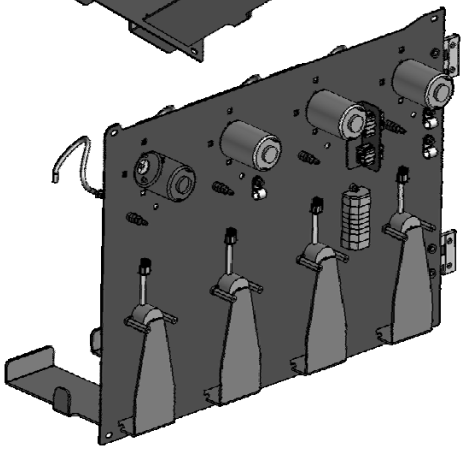
Rev: I

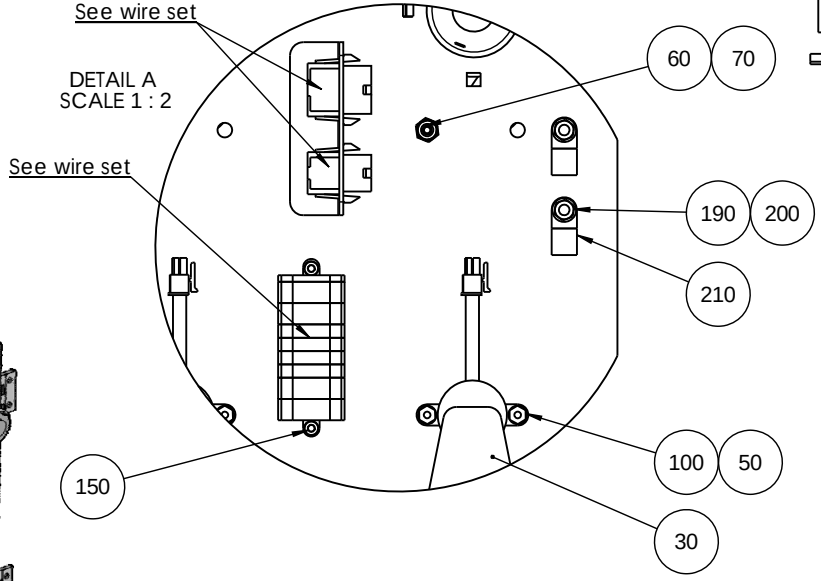


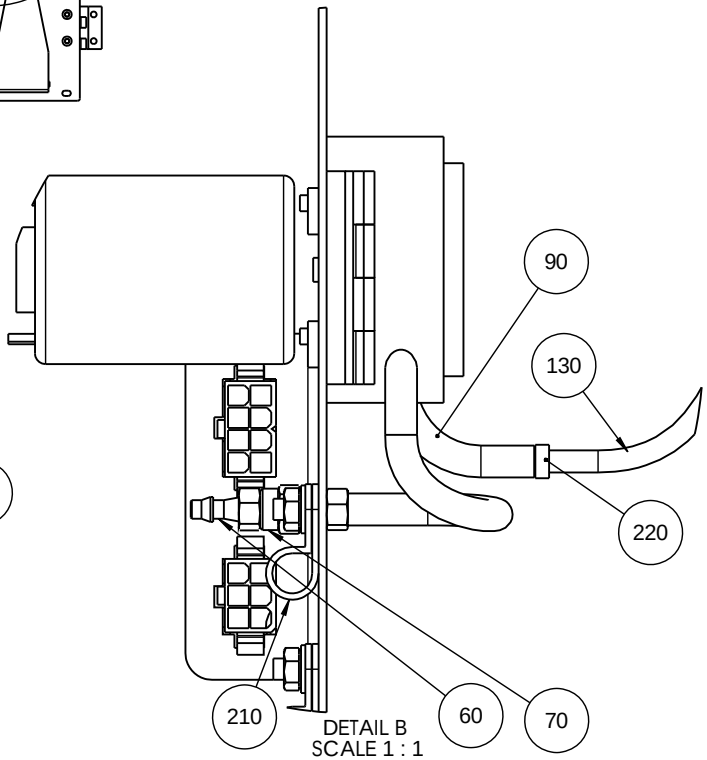


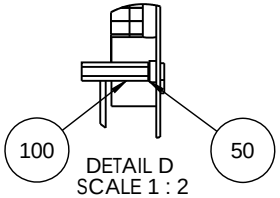












60 70 Loctite 557

H	2014-01-27	pos. 220 2NF44478 -> 2NF44500	OCR	2014-01-27	JTV
A	2010-09-09		TDR	2010-09-09	AKN
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: 1:5

Format: A3

Tolerance: DS/ISO 2768- -

Weight : 3320.8 g

Pederstrupvej 84
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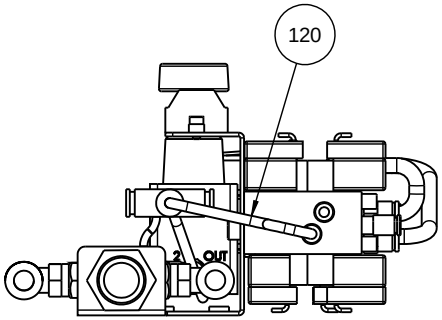
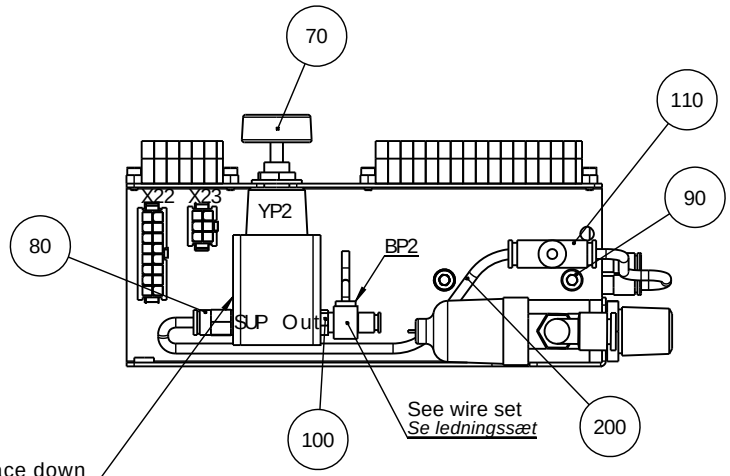
Phone:+45 44 600 800
Fax: +45 44 600 804

ID: Description:

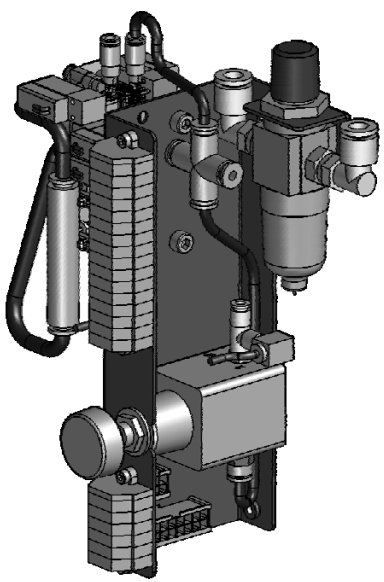
15940088 Pump plate

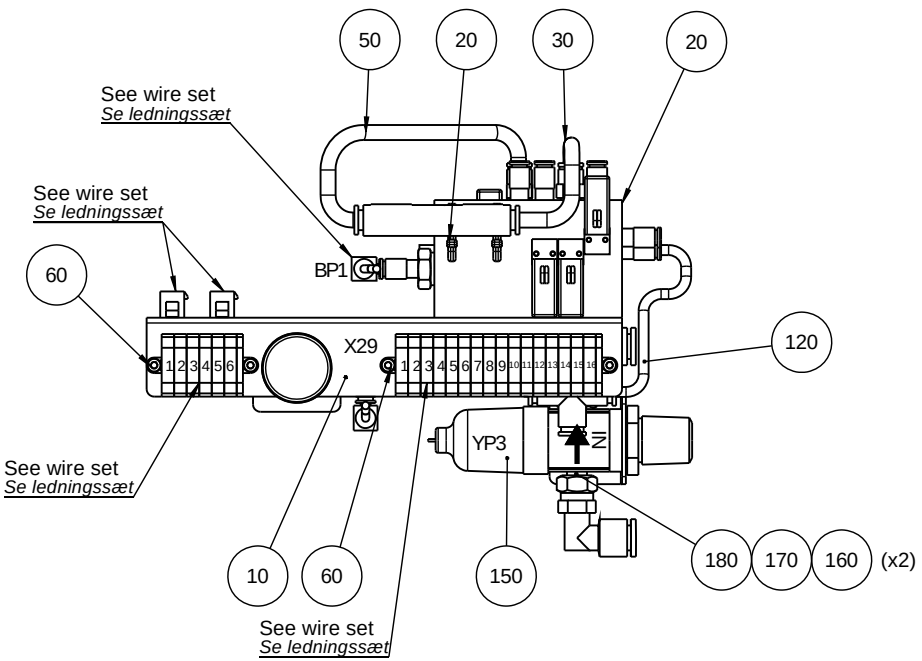
Rev: **H**





NB !
Bleed hole must face down
Udluftningshul skal vende ned





See PF 16037309
Se PF 16037309

E	2012.03.21	YP3 on pos.150 added	SPE	2012.03.21	
A	2010-12-14		FPG		FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
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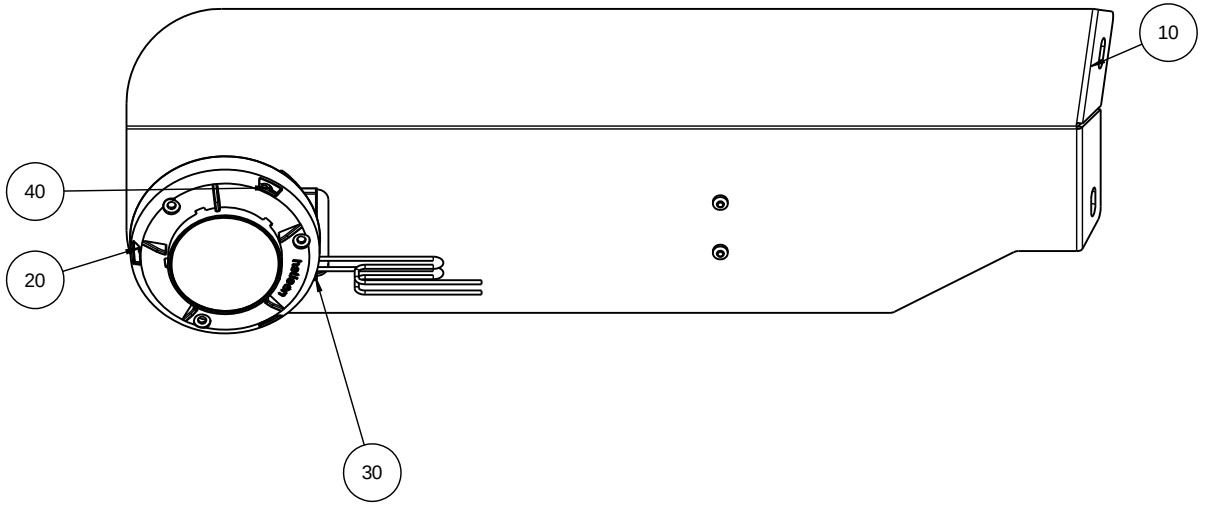
Phone:+45 44 600 800
Fax: +45 44 600 804

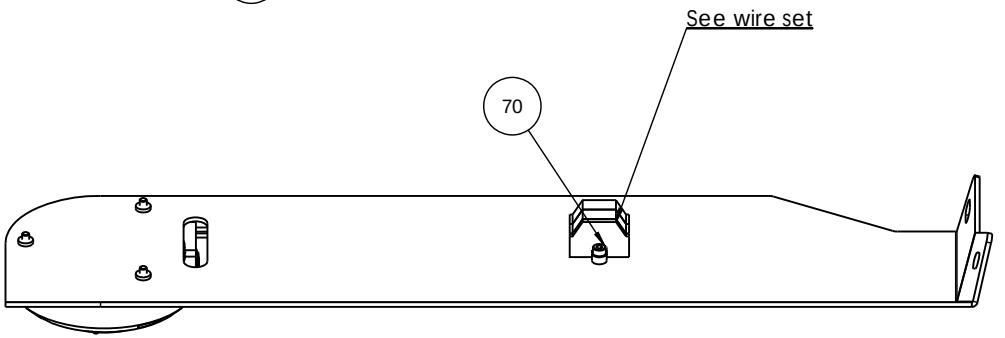
Material:
Scale: **1:2**
Format: **A3**
Tolerance: DS/ISO 2768- mK
Weight : 2638.6 g

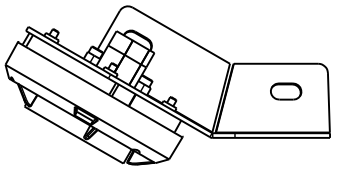
ID: Description:

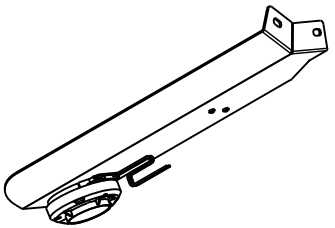
15940089 Pneumatic, assembled

Rev: **E**









B	2011.08.05	Pos.50+60 moved to wire set	SPE	2011.08.05	
A	2011-04-29		CJE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
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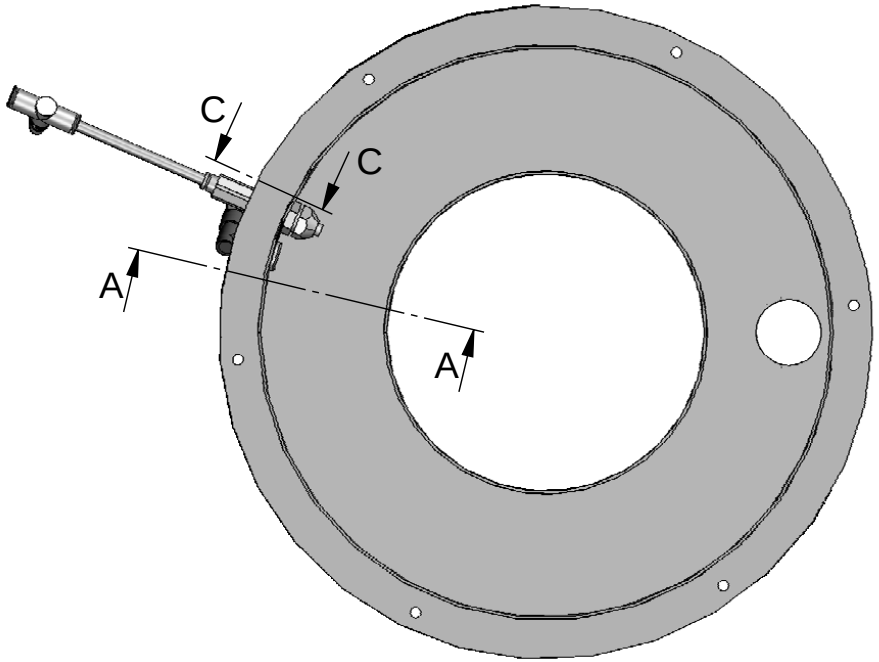
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK	
			Weight : 386.1 g	

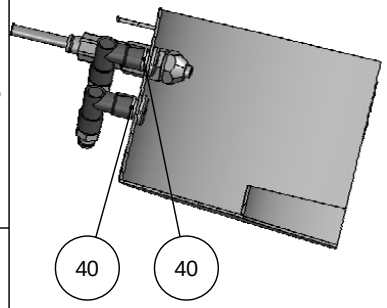
ID: Description:

15940090 LED module

Rev: **B**

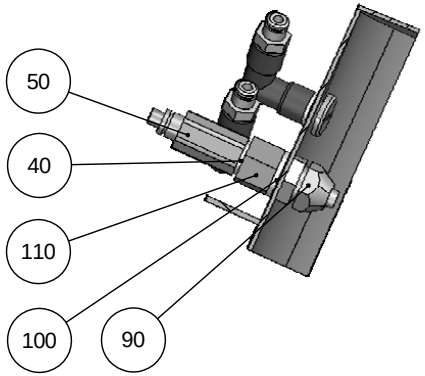


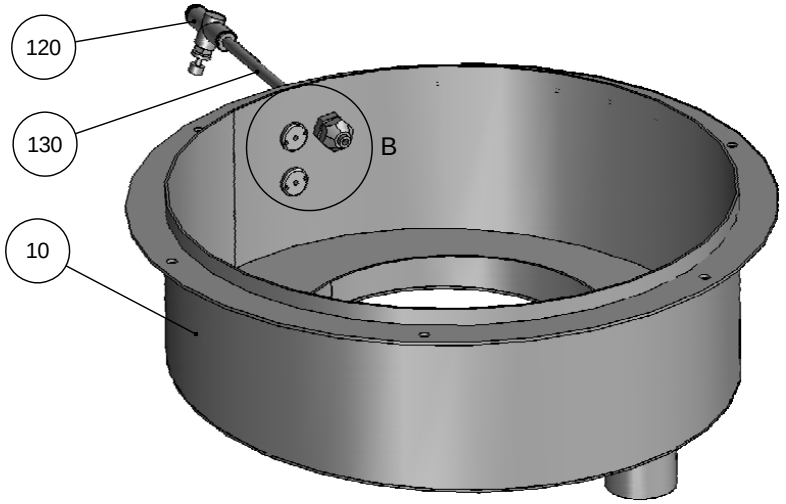
SECTION A-A
SCALE 1 : 3

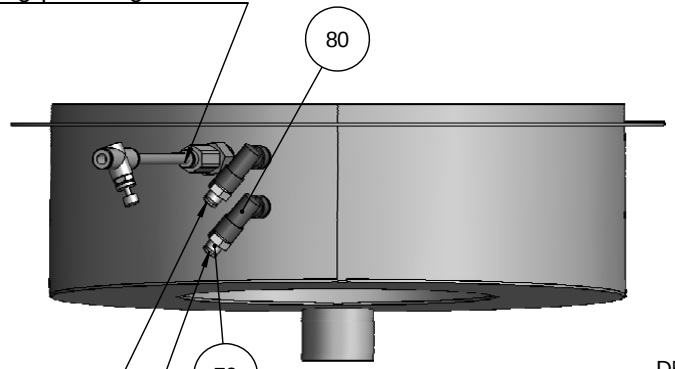


SECTION C-C

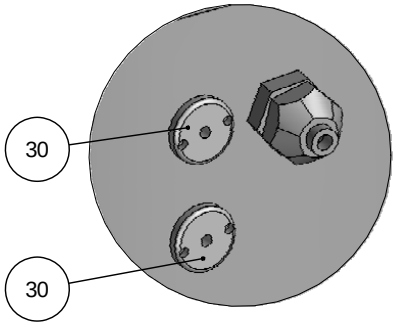
SCALE 1 : 2







DETAIL B
SCALE 2 : 2.5



E	2013-03-11	A6: Pos. 120 and 130 new items.	JJO		
A	2010-11-15		FPG	2010-11-15	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Material:

Scale: **1:2.5**

Format: **A3**

Tolerance: DS/ISO 2768- mK

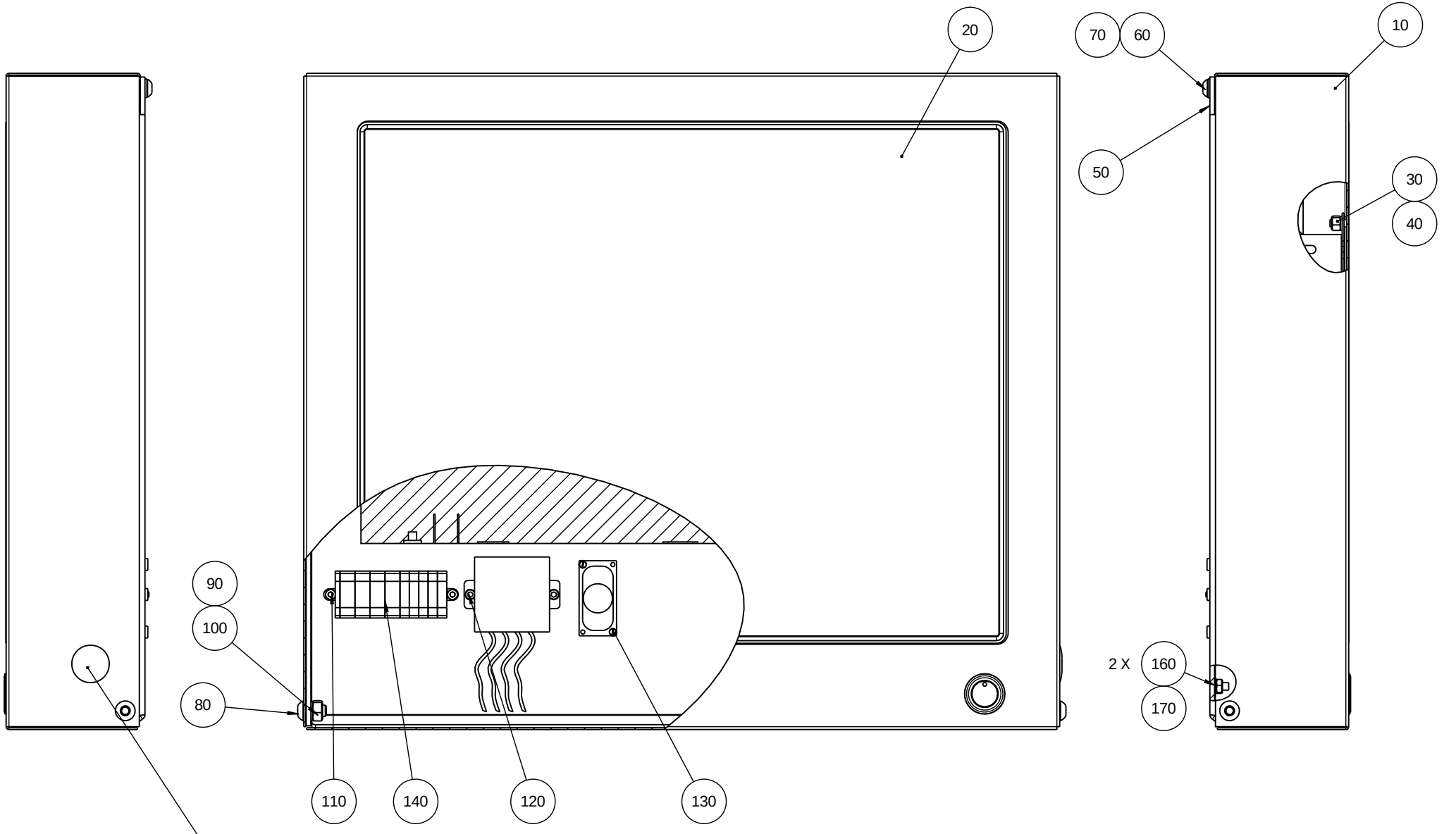
Weight : 2628.8 g

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

ID: Description:

15940091 Enclosure for polishing station assembled

Rev: **E**



C	2011.10.28	nut and washer added	SPE	2011.10.28	
A	2010.12.28		FPG	2010.12.28	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

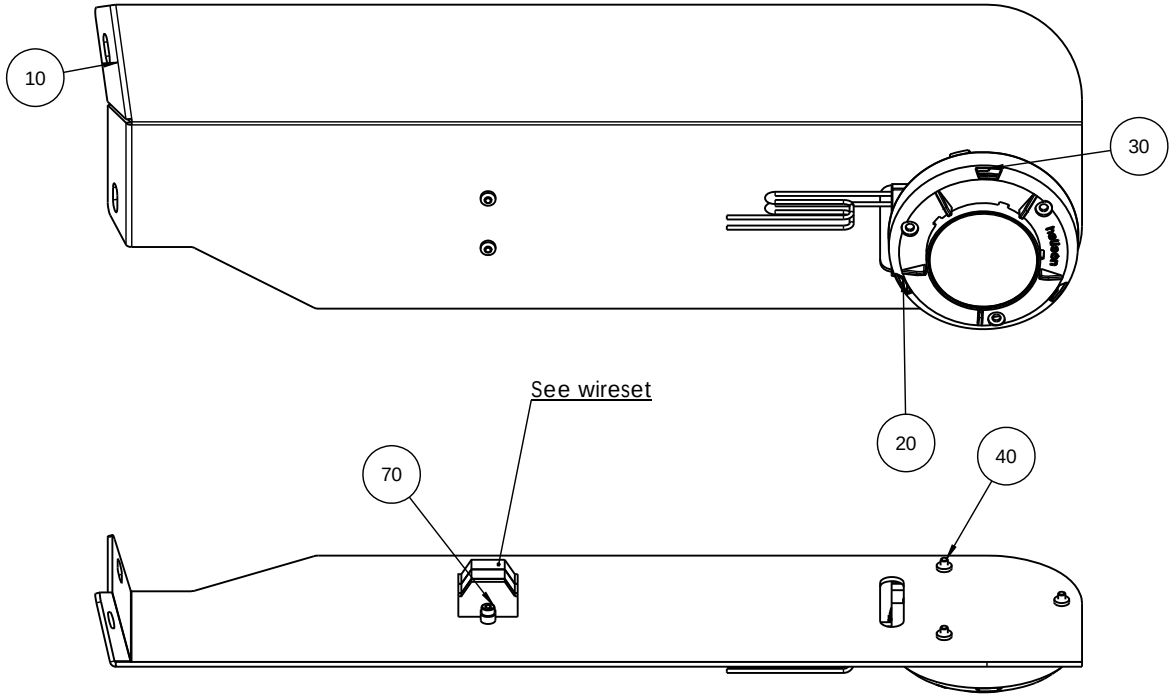
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

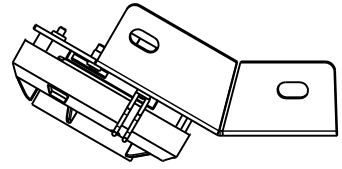
Material:	Scale: 1:2	Format: A3	Tolerance: DS/ISO 2768- mK
			Weight : 8592.7 g

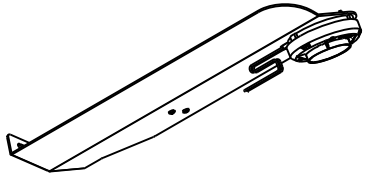
ID: Description:

15940092 Touch screen, assembled

Rev: **C**







C	2011.08.05	P50+60 moved to wire set		SPE	2011.08.05	
A	2011-04-29			CJE		
Revision	Crea. date yyyy-mm-dd	Revision description		Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: **1:2**

Format: **A3**

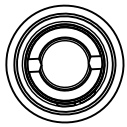
Tolerance: DS/ISO 2768- mK

Weight : fromparent+386g

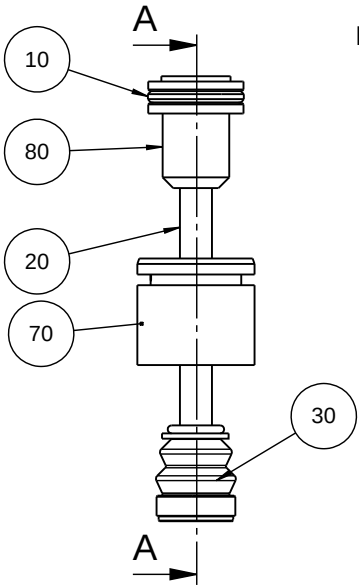
ID: Description:

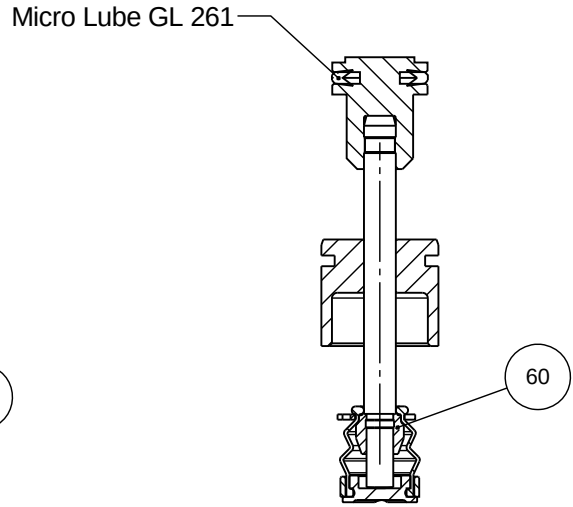
15940093 LED module

Rev: **C**



SECTION A-A





D	2014.12.04	Pos 30, 40, 50, 90 moved to Pos.30		SPE	2014.12.04	
A	2009-09-24			CJE		
Rev	Crea. date yyyy-mm-dd	Revision description		Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers

Pederstrupvej 84
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Copenhagen
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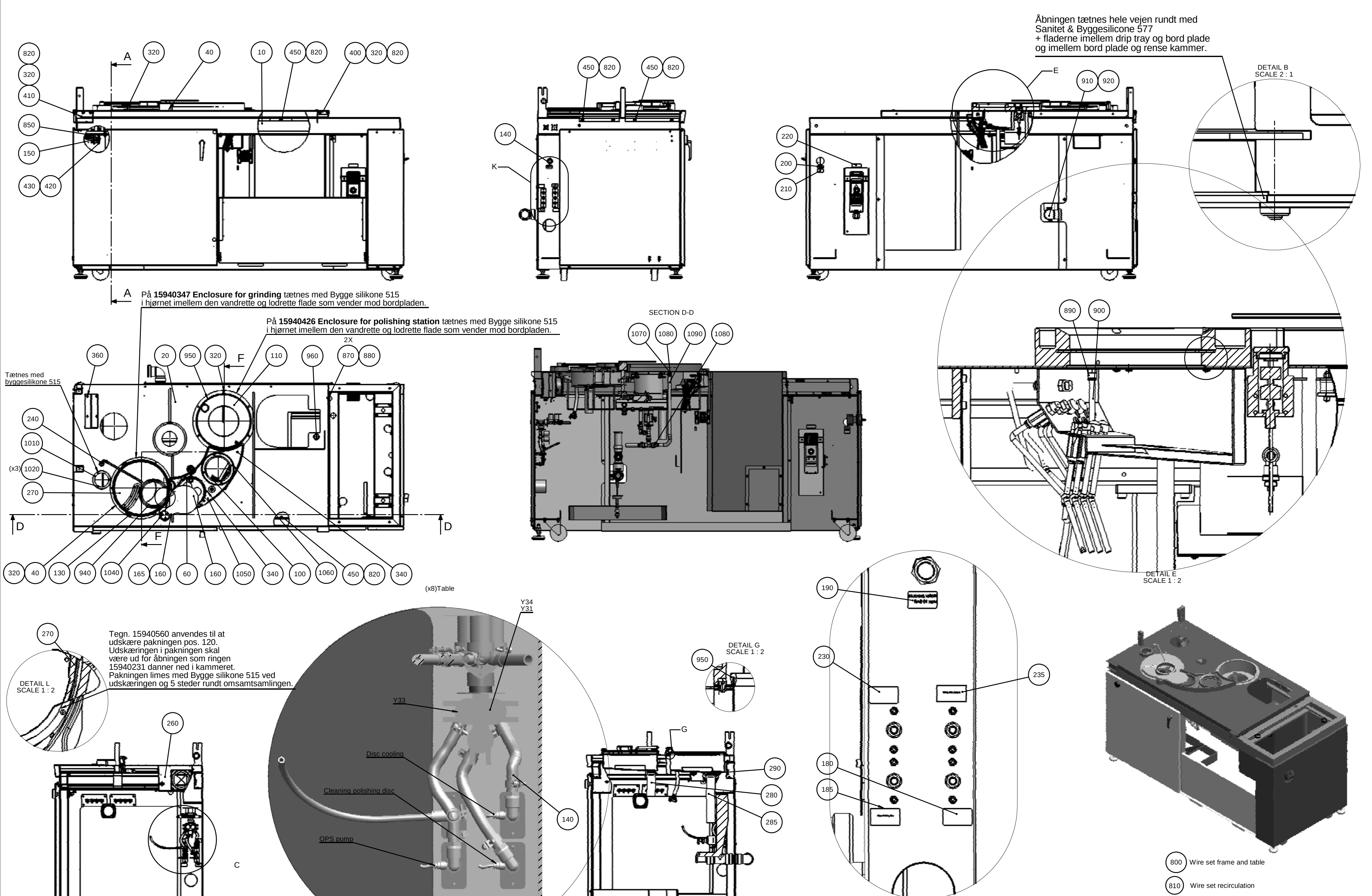
Phone :+45 44600 800
Fax : +45 44600 804

Material:	Scale:	Format:	Tolerance: DS/ISO 2768 - -
	1:1	A4	Surface treat.: None

ID: Description:

15940094 Single sample rod, assembled

Rev: **D**

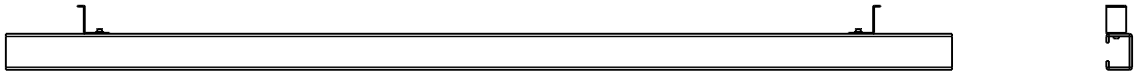


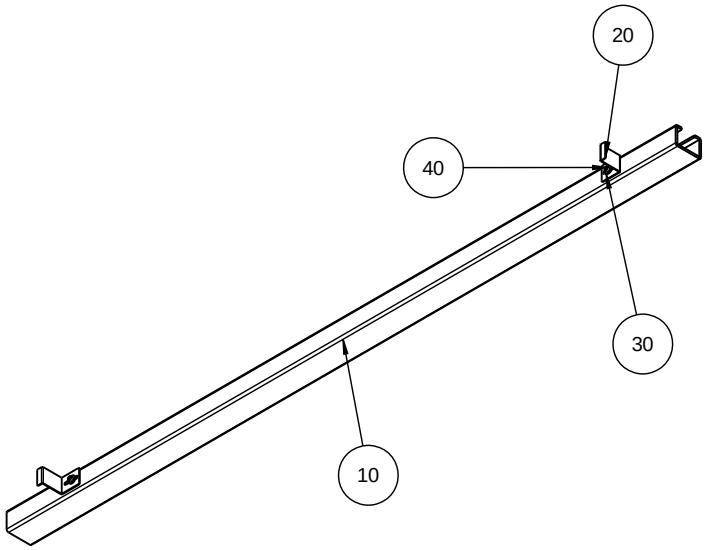
S	2015-02-04	Pos. 1050 to 1090 new items.	JJO	2015-02-11	JTV
A	2014-06-11		JJO		JJO
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material: | Scale: 1:10 | Format: A1 | Tolerance: DS/ISO 2768- - | Weight : g

ID: Description: **15940095 Frame and Table, assembled** | Rev: S





POS. NO.	AMOUNT	DRAW. NO.	NOTE
10	1	15949056 beam painted	
20	2	15940616 bracket	
30	2	2ZA20006 Skive 6 DIN 9021 A2	
40	2	2TR50612 MC Skrue M6x12 A2	

A					
A	2011-02-28		CJE		
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:

Scale: **1:10**

Format: **A3**

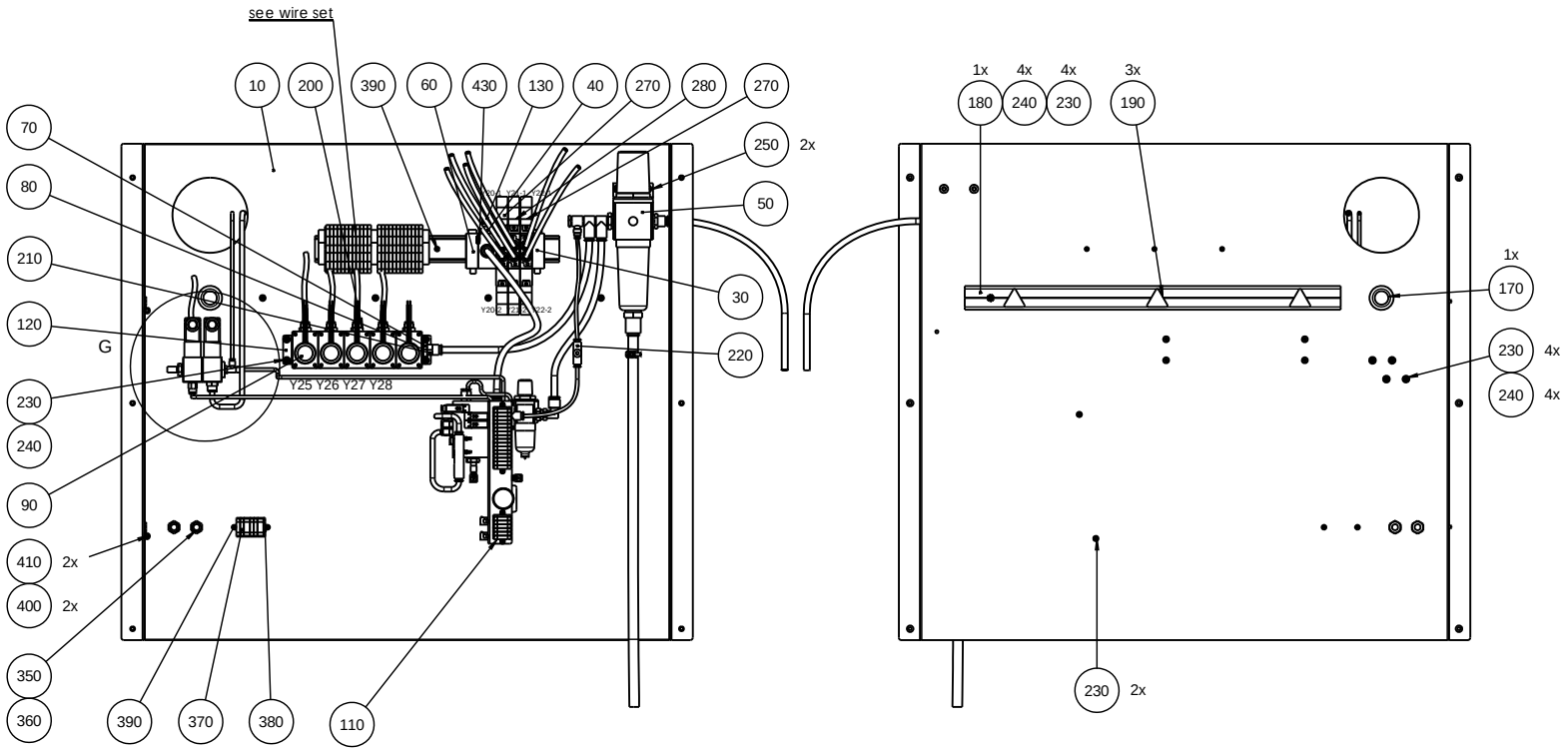
Tolerance: DS/ISO 2768- mK

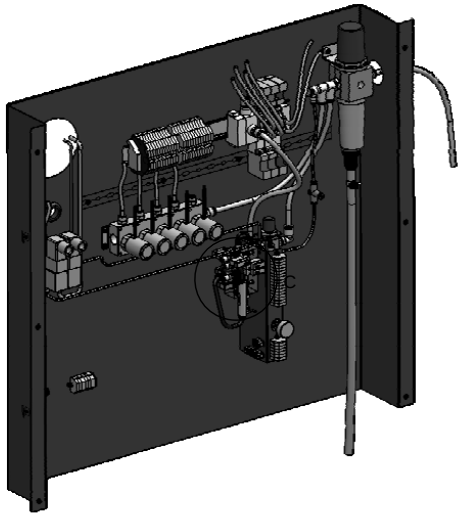
Weight : 14285.1 g

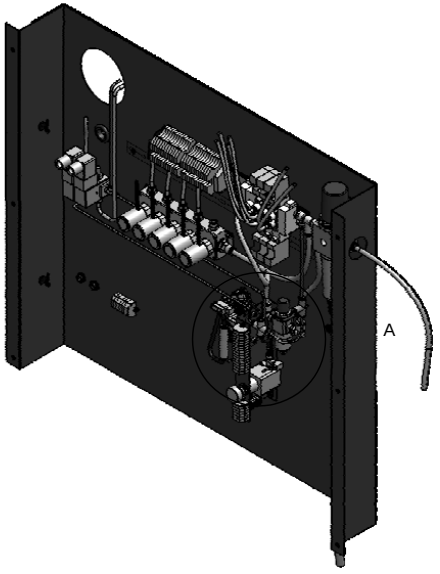
ID: Description:

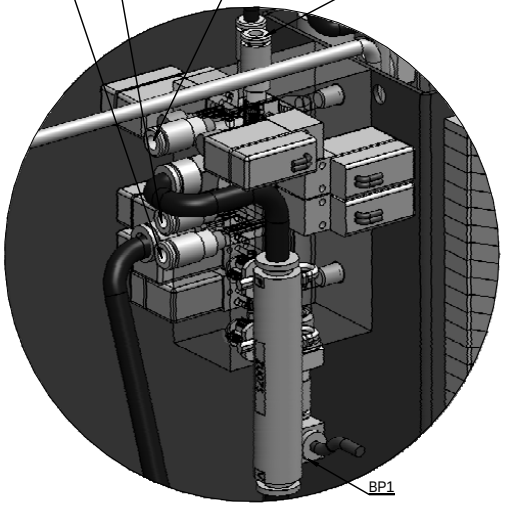
15940096 Lifting beam

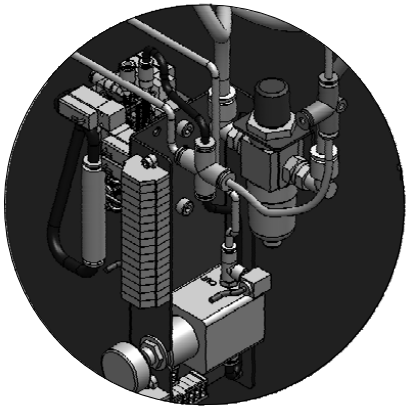
Rev: **A**

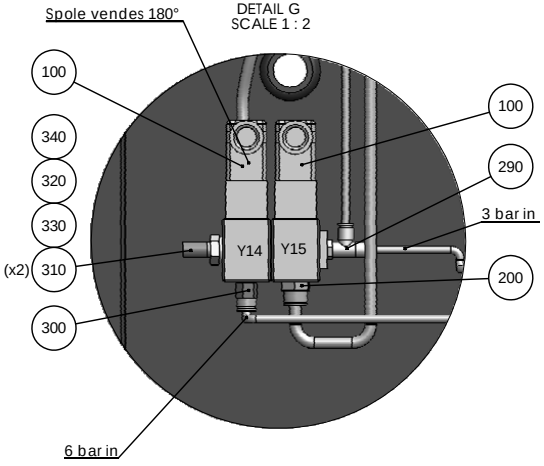












420 Wire set

See: 15941001 Air diagram for HexaMatic

Sheet 1/2

I	2014-06-13	G2: Valve Y15 canged to 3 bar.	JJO		
A	2010-09-06		FPG	2010-09-06	FPG
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:

Scale: 1:5

Format: A2

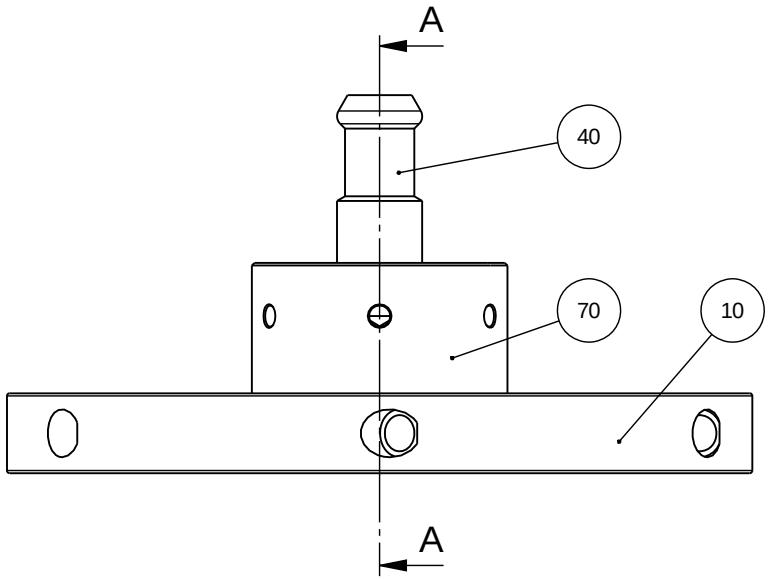
Tolerance: DS/ISO 2768- mK

Weight : 24721.4 g

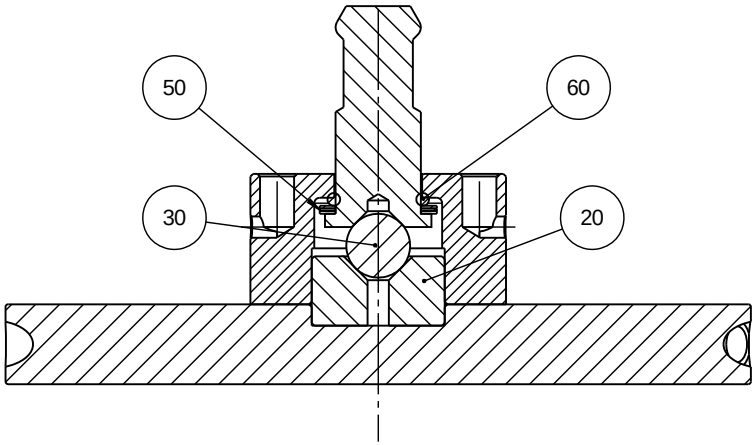
ID:

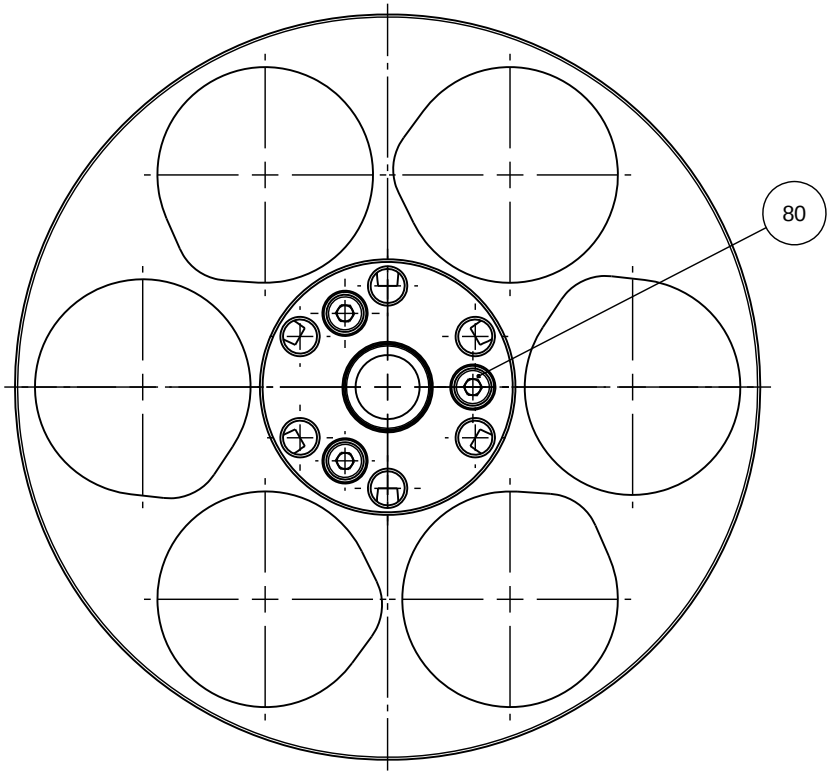
Description: **15940098 Plates for valves, assembled**

Rev: I

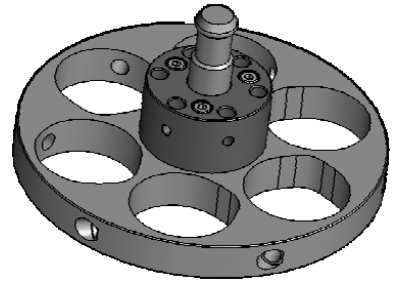


SECTION A-A





30	Albida Grease LX
50	I tilfælde af slør ved tryktappen indsættes passkiver mellem O -ring og tryktap
70	Der må ikke være fedt under medbringer
80	Loctite 243 tilspænding 5,0 Nm



Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
H	2013.01.24	Loctite changed from 2701 to 243	JTV	2013-01-24	JTV
A	2010-08-24		FPG	2010-08-24	FPG

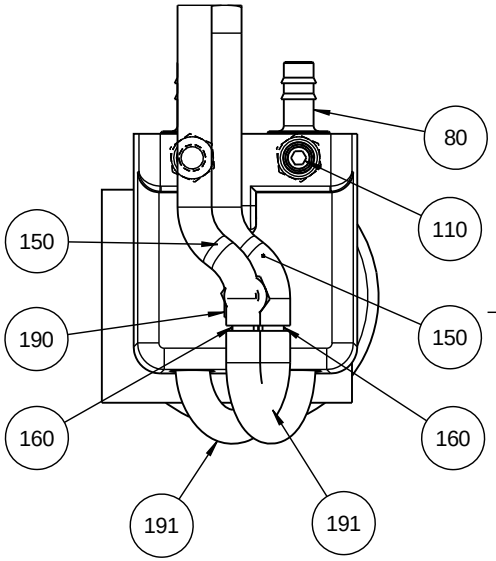
Material: | Scale: 1:1 | Format: A3 | Tolerance: DS/ISO 2768- mK | Weight : g

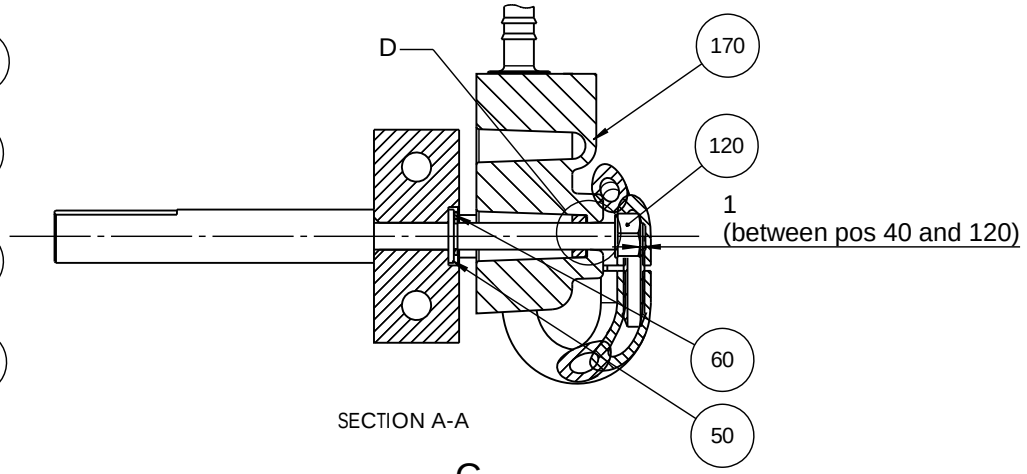
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

ID: Description:

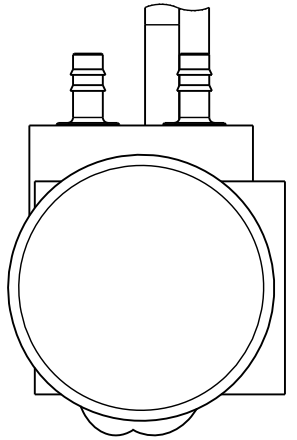
15946051 Specimen holder 6x40, assembly

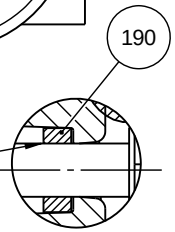
Rev: **H**





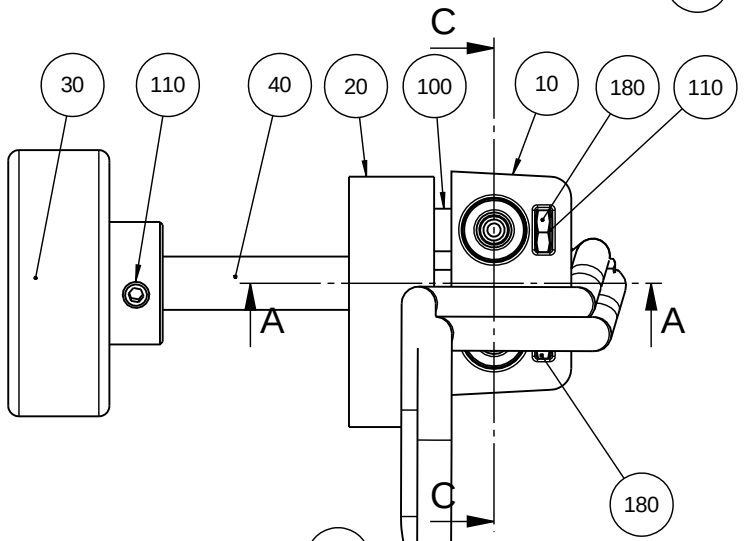
SECTION A-A

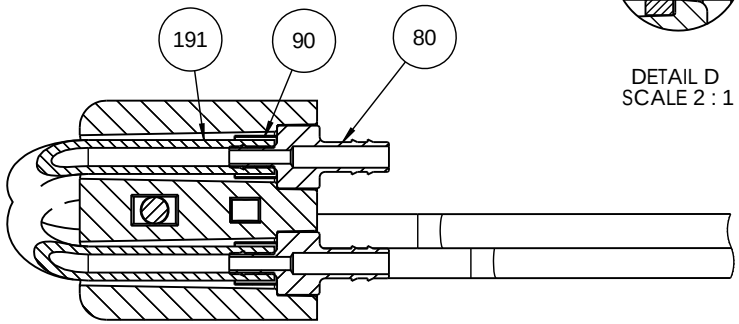




Chamfer pointed toward shaft
Rejfning mod gevind

DETAIL D
SCALE 2 : 1





SECTION C-C

(40) Grease thread + shaft inside pos. (20)
with normal grease NLGI2 (2LS00001)

F	2015-04-23	text / Grease added	OCR	2015-04-23	JTV
A	2009-10-28		JLI		JLI
Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init

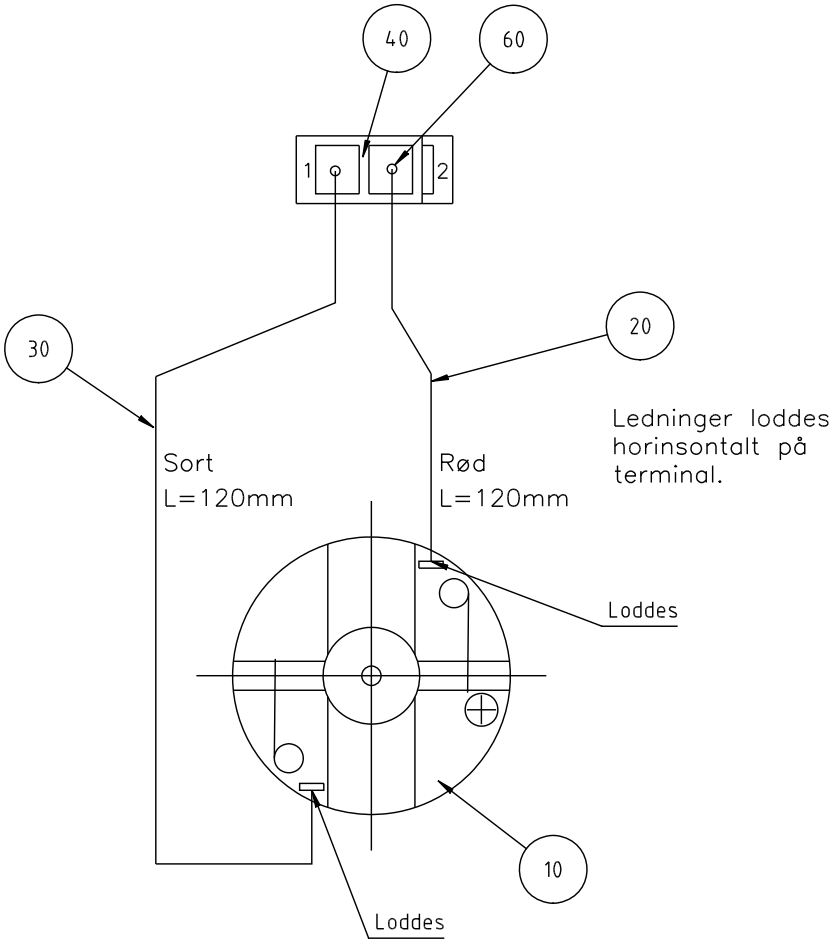
Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:
Scale: 1:1
Format: A3
Tolerance: DS/ISO 2768- -
Surface treat.: None

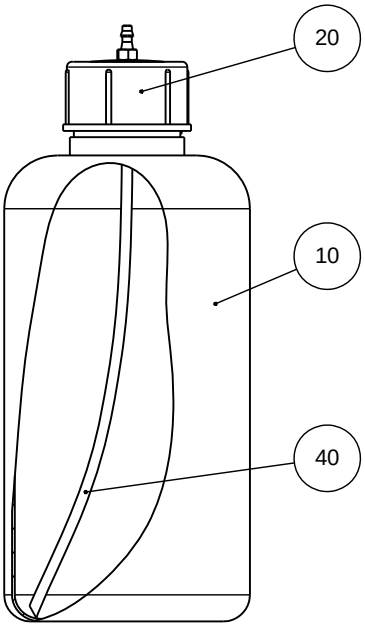
ID: Description:

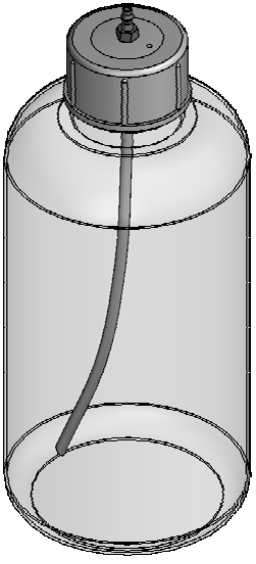
16030007 Double water valve, assembled

Rev: F



Matr.:	Overfl.beh.: Nej	Målforhold: 2:1	Ikke ang. tol. efter DS/ISO 2768– mK	
Struers	Projektionsmetode		Dato	Sign.
			Tegn: 110310	SPE
			Kontr. 110310	CZO
B: slange i pumpe 2NU11452 fjernet, skiftes ikke. 2010.10.29 SPE	OP Pumpe, mont.		Erst.: 16030037 B	





Slangens naturlige krumning placeres
som vist på tegning. Enden klippes skråt
som vist på tegning i forhold til krumningen.

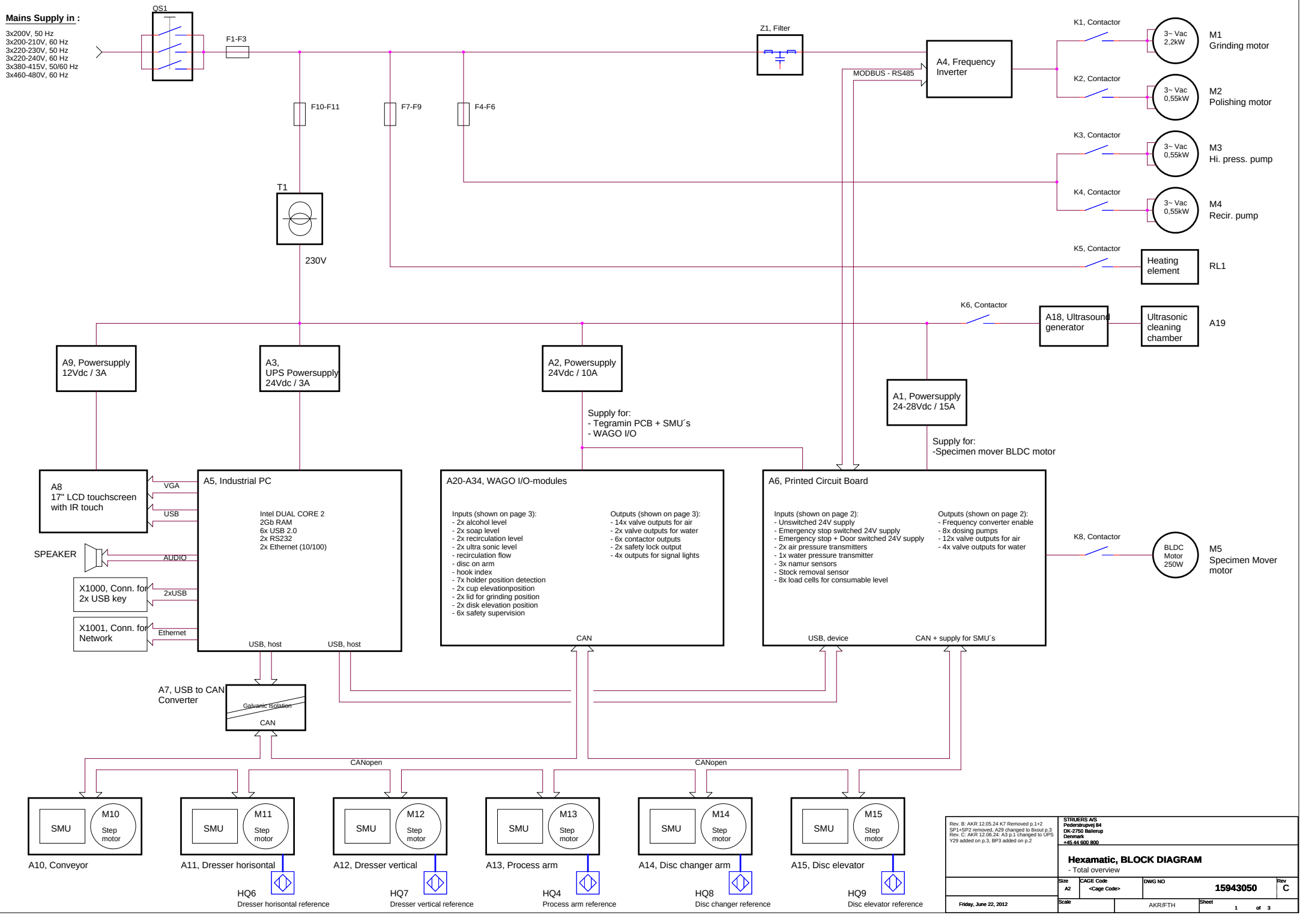
C	2013-04-09	Pos. 40 new tube.		JJO		
A	2009.04.24			SPE		
Rev	Crea. date yyyy-mm-dd	Revision description		Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
		Material:	Scale: 1:2	Format: A4	Tolerance: DS/ISO 2768 - mK	
					Surface treat.: None	

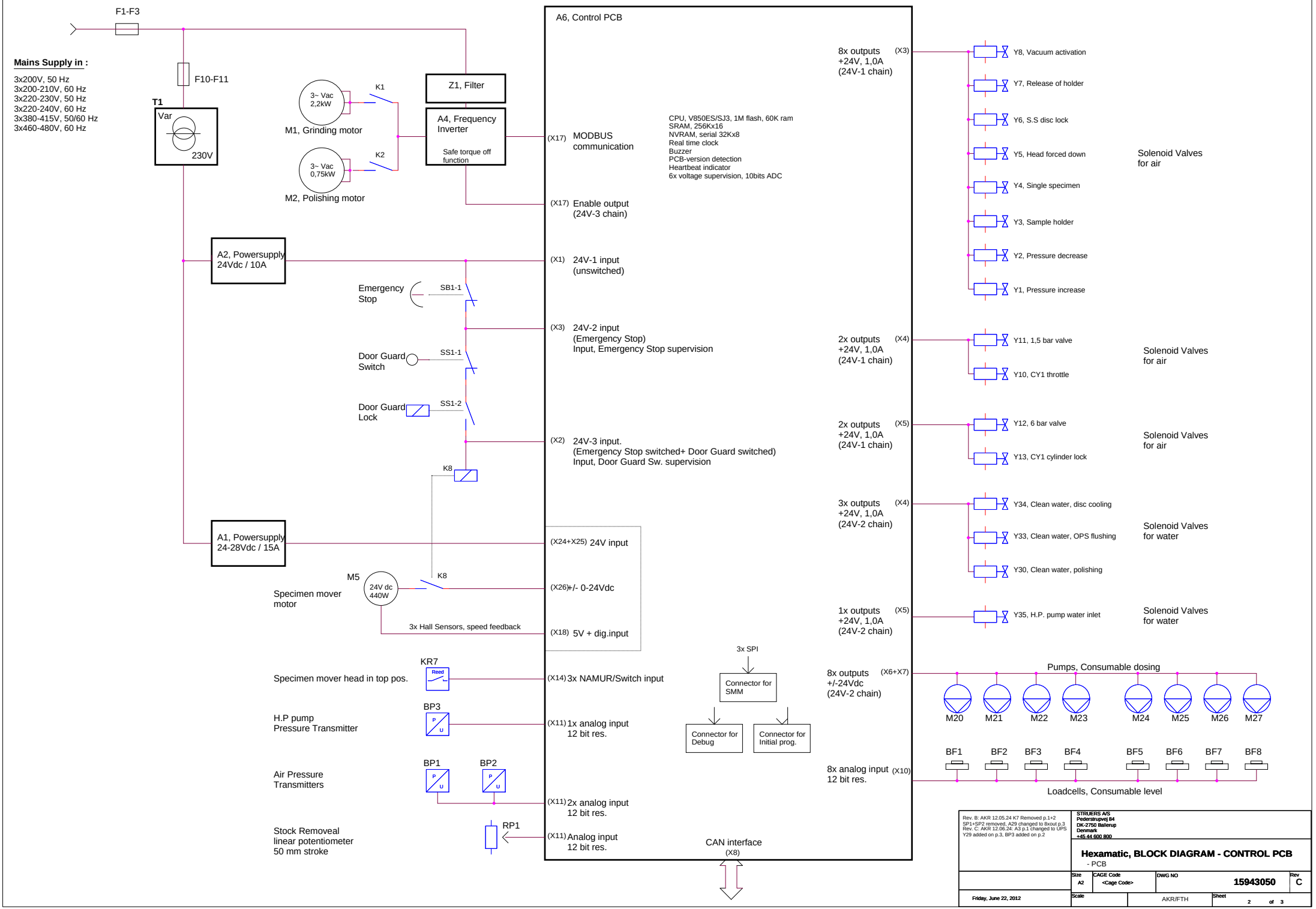
Pederstrupvej 84
DK-2750 Ballerup
Copenhagen
Denmark
Phone :+45 44600 800
Fax : +45 44600 804

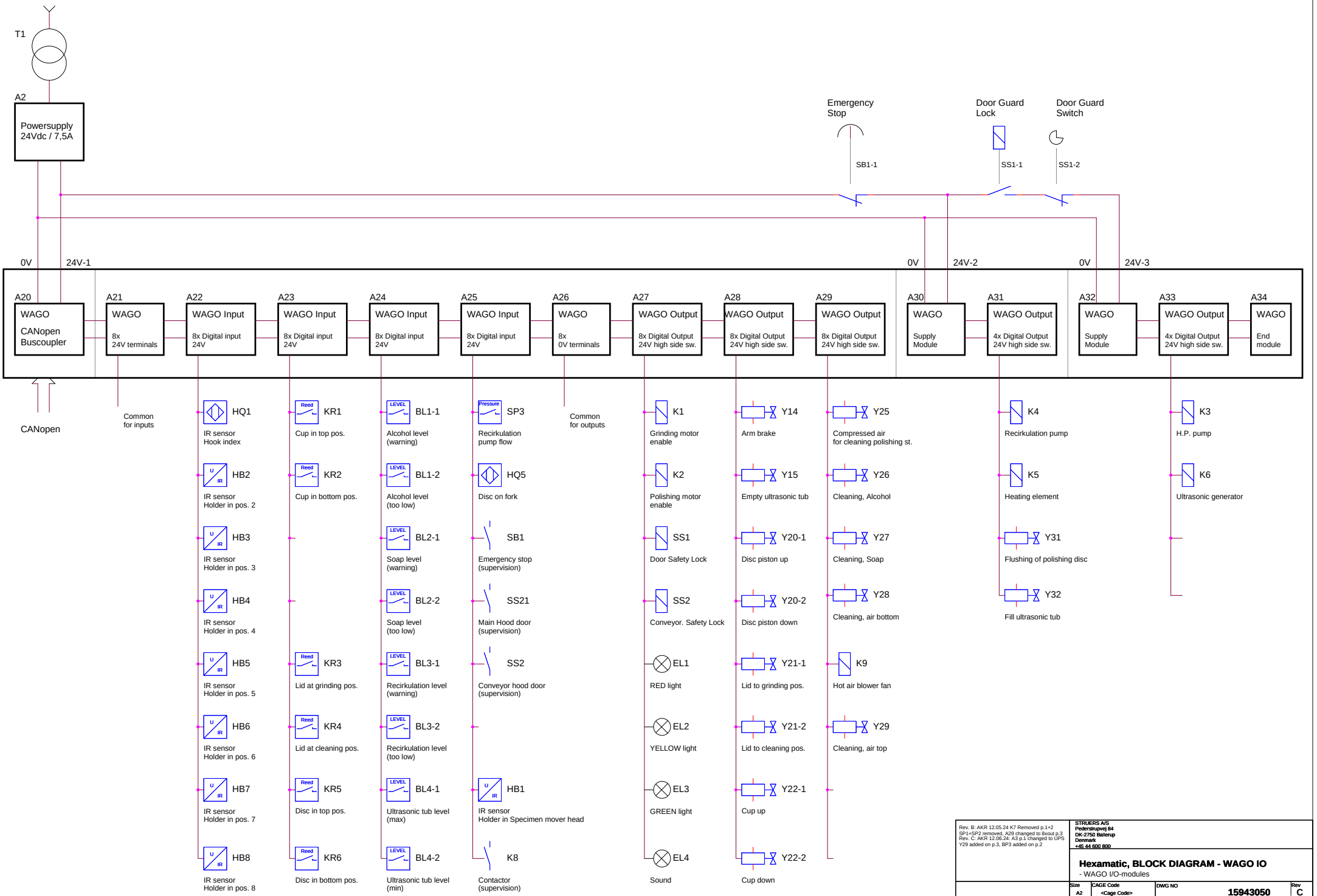
ID: Description:

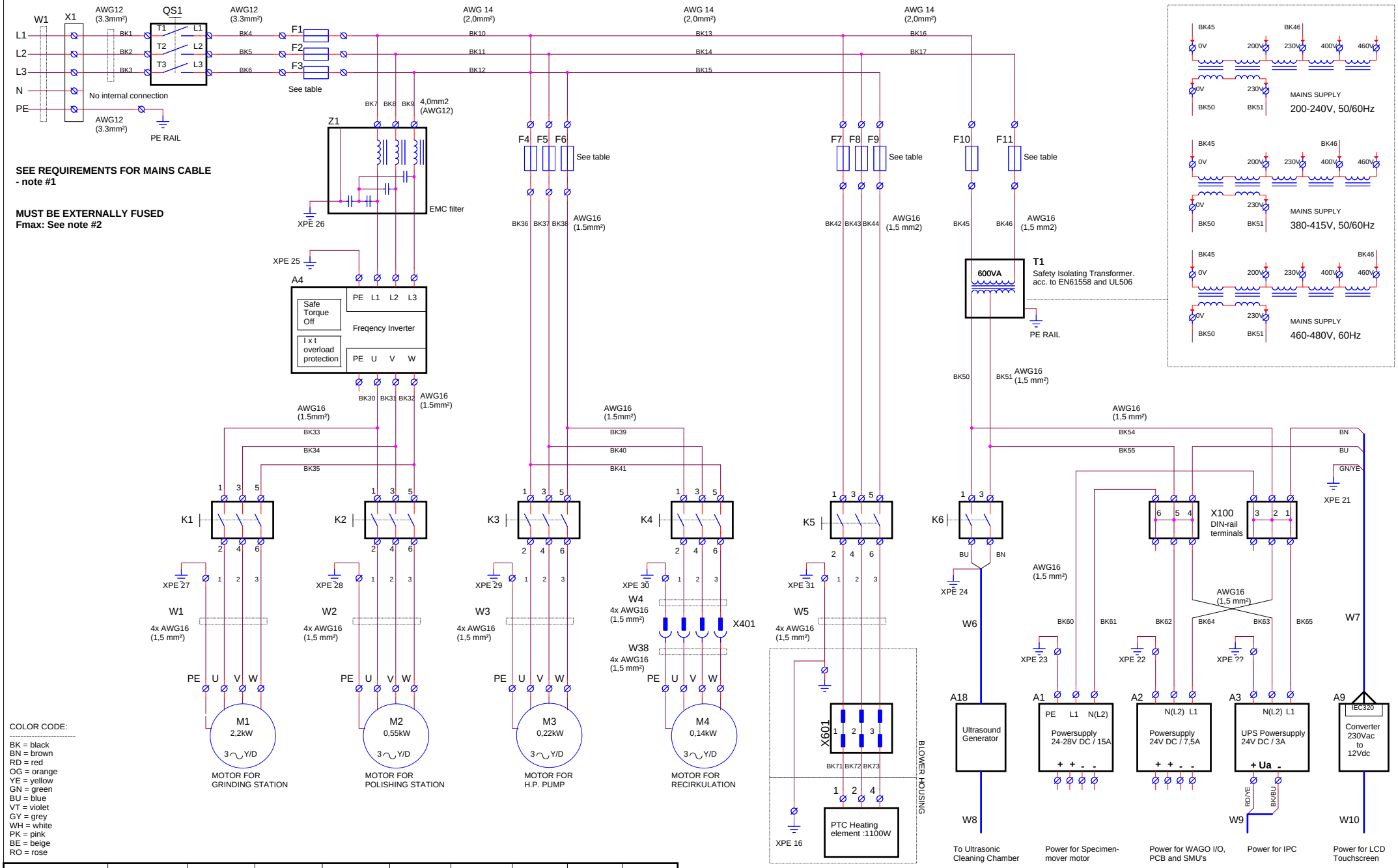
16080601 Bottle 1 L, nipple ø3, assembled

Rev: **C**


Mains Supply in :
3x200V, 50 Hz
3x200-210V, 60 Hz
3x220-230V, 50 Hz
3x220-240V, 60 Hz
3x380-415V, 50/60 Hz
3x460-480V, 60 Hz
QS1
F1-F3
Z1, Filter
A4, Frequency Inverter
MODBUS - RS485
K1, Contactor
3~ Vac 2,2kW
M1 Grinding motor
K2, Contactor
3~ Vac 0,55kW
M2 Polishing motor
K3, Contactor
3~ Vac 0,55kW
M3 Hi. press. pump
K4, Contactor
3~ Vac 0,55kW
M4 Recir. pump
K5, Contactor
Heating element
RL1
F10-F11
F7-F9
F4-F6
T1
230V
K6, Contactor
A18, Ultrasound generator
Ultrasonic cleaning chamber
A19
A9, Powersupply 12Vdc / 3A
A3, UPS Powersupply 24Vdc / 3A
A2, Powersupply 24Vdc / 10A
Supply for:
- Tegramin PCB + SMU´s
- WAGO I/O
A1, Powersupply 24-28Vdc / 15A
Supply for:
-Specimen mover BLDC motor
A8
17" LCD touchscreen with IR touch
VGA
USB
SPEAKER
AUDIO
X1000, Conn. for 2x USB key
2xUSB
X1001, Conn. for Network
Ethernet
A5, Industrial PC
Intel DUAL CORE 2
2Gb RAM
6x USB 2.0
2x RS232
2x Ethernet (10/100)
USB, host
USB, host
A20-A34, WAGO I/O-modules
Inputs (shown on page 3):
- 2x alcohol level
- 2x soap level
- 2x recirculation level
- 2x ultra sonic level
- recirculation flow
- disc on arm
- hook index
- 7x holder position detection
- 2x cup elevationposition
- 2x lid for grinding position
- 2x disk elevation position
- 6x safety supervision
Outputs (shown on page 3):
- 14x valve outputs for air
- 2x valve outputs for water
- 6x contactor outputs
- 2x safety lock output
- 4x outputs for signal lights
CAN
A6, Printed Circuit Board
Inputs (shown on page 2):
- Unswitched 24V supply
- Emergency stop switched 24V supply
- Emergency stop + Door switched 24V supply
- 2x air pressure transmitters
- 1x water pressure transmitter
- 3x namur sensors
- Stock removal sensor
- 8x load cells for consumable level
Outputs (shown on page 2):
- Frequency converter enable
- 8x dosing pumps
- 12x valve outputs for air
- 4x valve outputs for water
USB, device
CAN + supply for SMU´s
K8, Contactor
BLDC Motor 250W
M5 Specimen Mover motor
A7, USB to CAN Converter
Galvanic Isolation
CAN
CANopen
CANopen
SMU
M10 Step motor
A10, Conveyor
SMU
M11 Step motor
A11, Dresser horisontal
HQ6
Dresser horisontal reference
SMU
M12 Step motor
A12, Dresser vertical
HQ7
Dresser vertical reference
SMU
M13 Step motor
A13, Process arm
HQ4
Process arm reference
SMU
M14 Step motor
A14, Disc changer arm
HQ8
Disc changer reference
SMU
M15 Step motor
A15, Disc elevator
HQ9
Disc elevator reference
Rev. B: AKR 12.05.24 K7 Removed p.1+2 SP1+SP2 removed, A29 changed to 8xout p.3 Rev. C: AKR 12.06.24: A3 p.1 changed to UPS Y29 added on p.3, BP3 added on p.2
STRUERS A/S
Pederstrupvej 84
DK-2750 Ballerup
Denmark
+45 44 600 800
Hexamatic, BLOCK DIAGRAM
- Total overview
Size A2
CAGE Code <Cage Code>
DWG NO 15943050
Rev C
Friday, June 22, 2012
Scale
AKR/FTH
Sheet 1 of 3


F1-F3
Mains Supply in :
3x200V, 50 Hz
3x200-210V, 60 Hz
3x220-230V, 50 Hz
3x220-240V, 60 Hz
3x380-415V, 50/60 Hz
3x460-480V, 60 Hz
F10-F11
T1
Var
230V
3~ Vac 2,2kW
M1, Grinding motor
K1
3~ Vac 0,75kW
M2, Polishing motor
K2
Z1, Filter
A4, Frequency Inverter
Safe torque off function
A2, Powersupply 24Vdc / 10A
A1, Powersupply 24-28Vdc / 15A
A6, Control PCB
CPU, V850ES/SJ3, 1M flash, 60K ram
SRAM, 256Kx16
NVRAM, serial 32Kx8
Real time clock
Buzzer
PCB-version detection
Heartbeat indicator
6x voltage supervision, 10bits ADC
(X17) MODBUS communication
(X17) Enable output (24V-3 chain)
(X1) 24V-1 input (unswitched)
Emergency Stop
SB1-1
(X3) 24V-2 input (Emergency Stop) Input, Emergency Stop supervision
Door Guard Switch
SS1-1
Door Guard Lock
SS1-2
(X2) 24V-3 input. (Emergency Stop switched+ Door Guard switched) Input, Door Guard Sw. supervision
K8
(X24+X25) 24V input
M5
24V dc 440W
Specimen mover motor
(X26) +/- 0-24Vdc
3x Hall Sensors, speed feedback
(X18) 5V + dig.input
KR7
Reed
Specimen mover head in top pos.
(X14) 3x NAMUR/Switch input
BP3
H.P pump Pressure Transmitter
(X11) 1x analog input 12 bit res.
BP1
BP2
Air Pressure Transmitters
(X11) 2x analog input 12 bit res.
RP1
Stock Removeal linear potentiometer 50 mm stroke
(X11) Analog input 12 bit res.
CAN interface
(X8)
3x SPI
Connector for SMM
Connector for Debug
Connector for Initial prog.
8x outputs +24V, 1,0A (24V-1 chain)
(X3)
Y8, Vacuum activation
Y7, Release of holder
Y6, S.S disc lock
Y5, Head forced down
Y4, Single specimen
Y3, Sample holder
Y2, Pressure decrease
Y1, Pressure increase
Solenoid Valves for air
2x outputs +24V, 1,0A (24V-1 chain)
(X4)
Y11, 1,5 bar valve
Y10, CY1 throttle
Solenoid Valves for air
2x outputs +24V, 1,0A (24V-1 chain)
(X5)
Y12, 6 bar valve
Y13, CY1 cylinder lock
Solenoid Valves for air
3x outputs +24V, 1,0A (24V-2 chain)
(X4)
Y34, Clean water, disc cooling
Y33, Clean water, OPS flushing
Y30, Clean water, polishing
Solenoid Valves for water
1x outputs +24V, 1,0A (24V-2 chain)
(X5)
Y35, H.P. pump water inlet
Solenoid Valves for water
8x outputs +/-24Vdc (24V-2 chain)
(X6+X7)
Pumps, Consumable dosing
M20
M21
M22
M23
M24
M25
M26
M27
8x analog input 12 bit res.
(X10)
BF1
BF2
BF3
BF4
BF5
BF6
BF7
BF8
Loadcells, Consumable level
Rev. B: AKR 12.05.24 K7 Removed p.1+2
SP1+SP2 removed, A29 changed to 8xout p.3
Rev. C: AKR 12.06.24: A3 p.1 changed to UPS
Y29 added on p.3, BP3 added on p.2
STRUERS A/S
Pederstrupvej 84
DK-2750 Ballerup
Denmark
+45 44 600 800
Hexamatic, BLOCK DIAGRAM - CONTROL PCB
- PCB
Size A2
CAGE Code <Cage Code>
DWG NO 15943050
Rev C
Friday, June 22, 2012
Scale
AKR/FTH
Sheet 2 of 3


T1
A2
Powersupply
24Vdc / 7,5A
Emergency
Stop
SB1-1
Door Guard
Lock
SS1-1
Door Guard
Switch
SS1-2
0V
24V-1
0V
24V-2
0V
24V-3
A20
WAGO
CANopen
Buscoupler
A21
WAGO
8x
24V terminals
A22
WAGO Input
8x Digital input
24V
A23
WAGO Input
8x Digital input
24V
A24
WAGO Input
8x Digital input
24V
A25
WAGO Input
8x Digital input
24V
A26
WAGO
8x
0V terminals
A27
WAGO Output
8x Digital Output
24V high side sw.
A28
WAGO Output
8x Digital Output
24V high side sw.
A29
WAGO Output
8x Digital Output
24V high side sw.
A30
WAGO
Supply
Module
A31
WAGO Output
4x Digital Output
24V high side sw.
A32
WAGO
Supply
Module
A33
WAGO Output
4x Digital Output
24V high side sw.
A34
WAGO
End
module
CANopen
Common
for inputs
HQ1
IR sensor
Hook index
HB2
IR sensor
Holder in pos. 2
HB3
IR sensor
Holder in pos. 3
HB4
IR sensor
Holder in pos. 4
HB5
IR sensor
Holder in pos. 5
HB6
IR sensor
Holder in pos. 6
HB7
IR sensor
Holder in pos. 7
HB8
IR sensor
Holder in pos. 8
KR1
Cup in top pos.
KR2
Cup in bottom pos.
KR3
Lid at grinding pos.
KR4
Lid at cleaning pos.
KR5
Disc in top pos.
KR6
Disc in bottom pos.
BL1-1
Alcohol level
(warning)
BL1-2
Alcohol level
(too low)
BL2-1
Soap level
(warning)
BL2-2
Soap level
(too low)
BL3-1
Recirkulation level
(warning)
BL3-2
Recirkulation level
(too low)
BL4-1
Ultrasonic tub level
(max)
BL4-2
Ultrasonic tub level
(min)
SP3
Recirkulation
pump flow
HQ5
Disc on fork
SB1
Emergency stop
(supervision)
SS21
Main Hood door
(supervision)
SS2
Conveyor hood door
(supervision)
HB1
IR sensor
Holder in Specimen mover head
K8
Contactor
(supervision)
Common
for outputs
K1
Grinding motor
enable
K2
Polishing motor
enable
SS1
Door Safety Lock
SS2
Conveyor. Safety Lock
EL1
RED light
EL2
YELLOW light
EL3
GREEN light
EL4
Sound
Y14
Arm brake
Y15
Empty ultrasonic tub
Y20-1
Disc piston up
Y20-2
Disc piston down
Y21-1
Lid to grinding pos.
Y21-2
Lid to cleaning pos.
Y22-1
Cup up
Y22-2
Cup down
Y25
Compressed air
for cleaning polishing st.
Y26
Cleaning, Alcohol
Y27
Cleaning, Soap
Y28
Cleaning, air bottom
K9
Hot air blower fan
Y29
Cleaning, air top
K4
Recirkulation pump
K5
Heating element
Y31
Flushing of polishing disc
Y32
Fill ultrasonic tub
K3
H.P. pump
K6
Ultrasonic generator
Rev. B: AKR 12.05.24 K7 Removed p.1+2
SP1+SP2 removed, A29 changed to 8xout p.3
Rev. C: AKR 12.06.24: A3 p.1 changed to UPS
Y29 added on p.3, BP3 added on p.2
STRUERS A/S
Pederstrupvej 84
DK-2750 Ballerup
Denmark
+45 44 600 800
Hexamatic, BLOCK DIAGRAM - WAGO IO
- WAGO I/O-modules
Size
A2
CAGE Code
<Cage Code>
DWG NO
15943050
Rev
C
Friday, June 22, 2012
Scale
AKR/FTH
Sheet
3 of 3



VOLTAGE / FREQ. (from nameplate)	Note #1 W1 - mains cable (min. size)	Note #2 max. ext. fuse	F1+F2+F3 (fuse size)	F4+F5+F6 (fuse size)	F7+F8+F9 (fuse size)	F10+F11 (fuse size)	M1 Connection	M2 Connection	M3 Connection
3 x 200-240V / 50/60Hz	AWG12	3 x 40AT	3 x 20AT (CC)	3 x 2AT (CC)	3 x 6AT (CC)	2 x 4AT (CC)	DELTA	DELTA	DELTA
3 x 380-415V / 50/60Hz	AWG12	3 x 40AT	3 x 10AT (CC)	3 x 1AT (CC)	3 x 4AT (CC)	2 x 2AT (CC)	STAR	STAR	STAR
3 x 460-480V / 60Hz	AWG12	3 x 40AT	3 x 10AT (CC)	3 x 1AT (CC)	3 x 4AT (CC)	2 x 2AT (CC)	STAR	STAR	STAR

Rev.B: AKR 2012-02-02, K7 removed
T1 connections and XPE nr's updated
Rev.C: AKR 2012-02-02, A3 changed to UPS
XPE39 added

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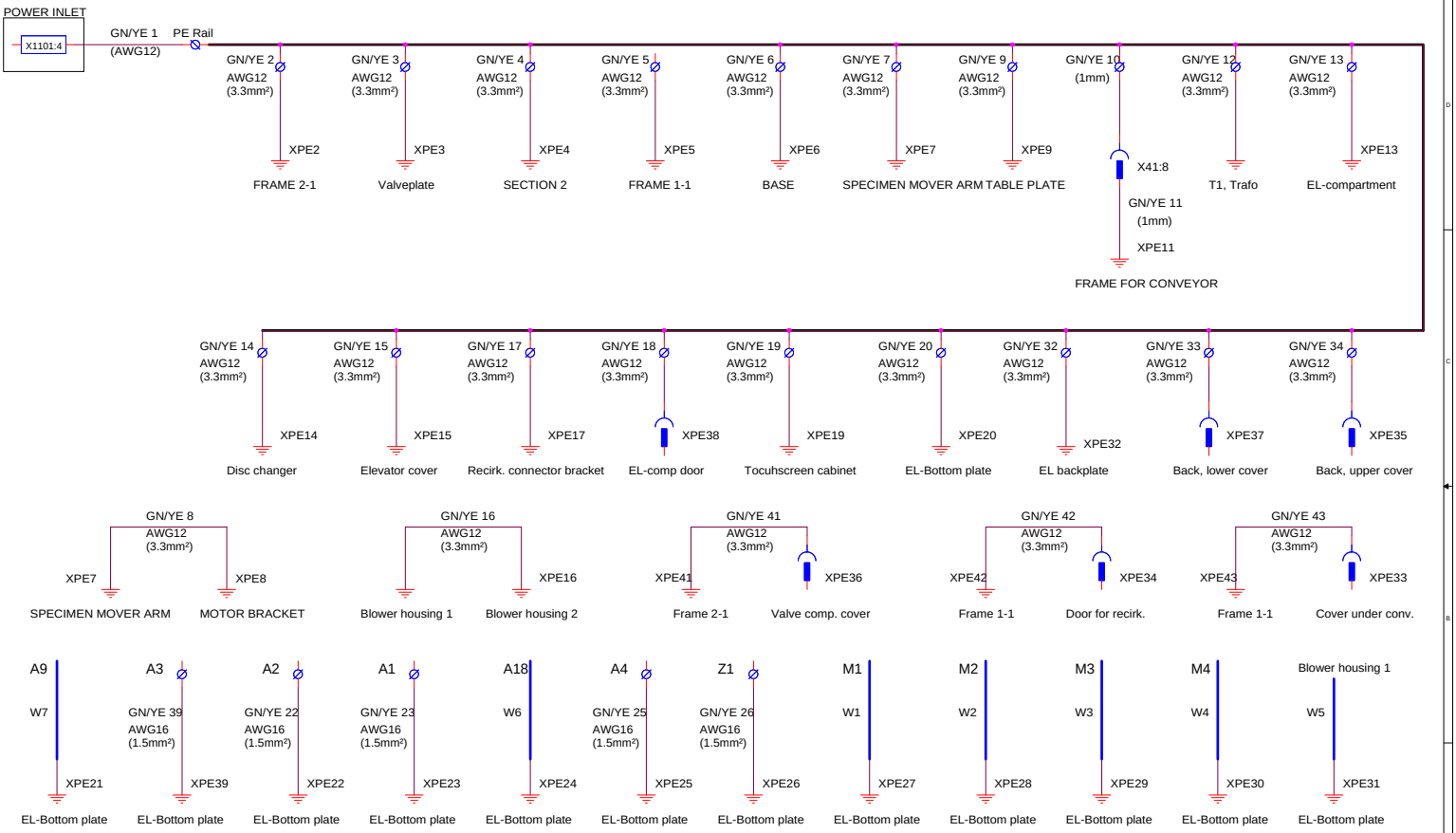
Hexamatic, CIRCUIT DIAGRAM - MAIN VOLTAGE

Size	CAGE Code	DWG NO	Rev
A2		15943100	C

Wednesday, June 27, 2012 | Scale | AKR | Sheet 1 of 2



Rev.B: AKR 2012-02-02,
T1 connections and XPE nr's updated
Rev.C: AKR 2012-02-02, A3 changed to UPS
XPE39 added

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Hexamatic, CIRCUIT DIAGRAM - MAIN VOLTAGE

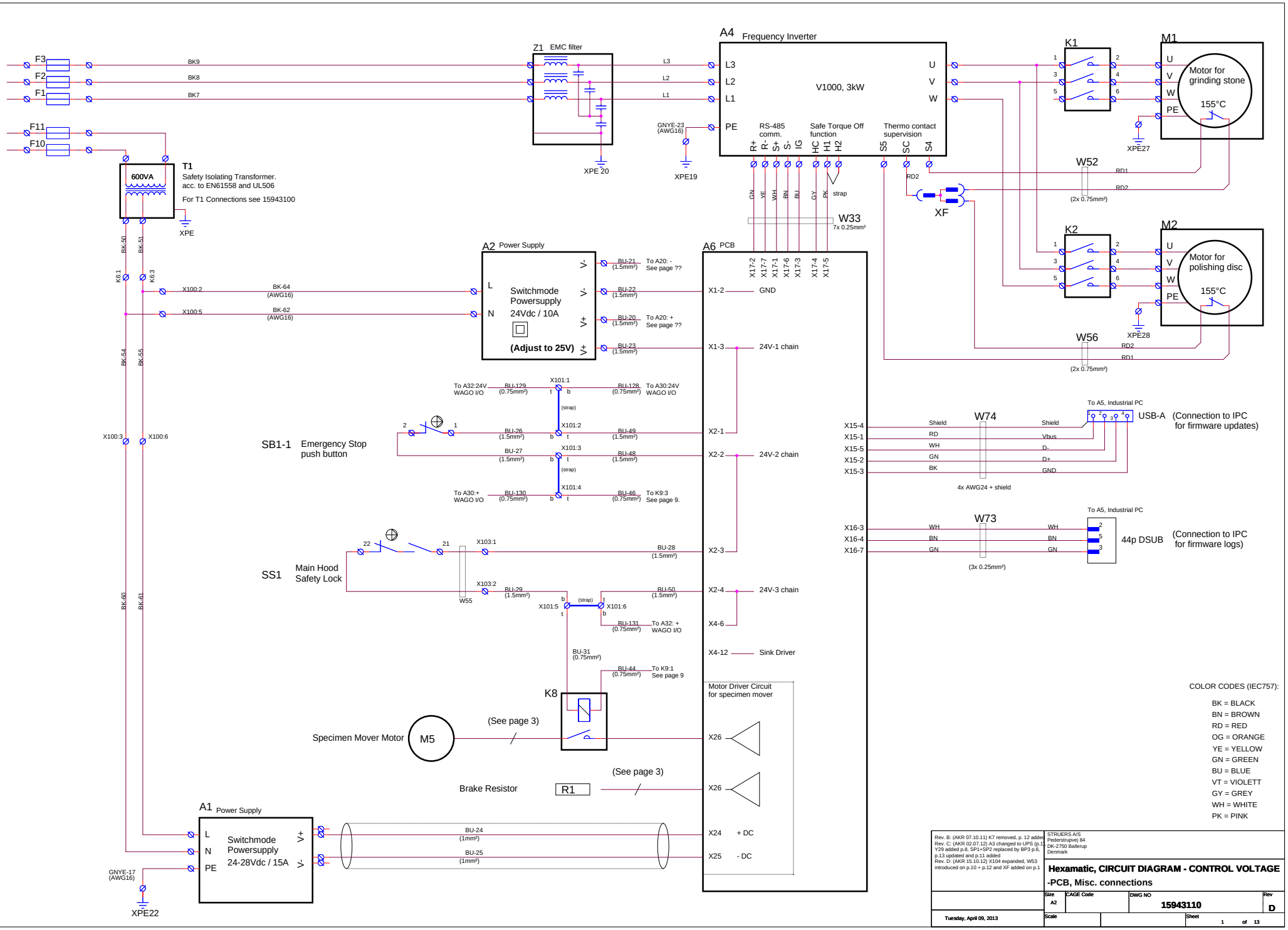
PROTECTIVE BONDING OVERVIEW

Size	CAGE Code	DWG NO	Rev
A3		15943100	C

Wednesday, June 27, 2012

Scale: AKR

Sheet: 2 of 2


F3
F2
F1
BK9
BK8
BK7
Z1 EMC filter
L3
L2
L1
A4 Frequency Inverter
V1000, 3kW
U
V
W
PE
RS-485 comm.
Safe Torque Off function
Thermo contact supervision
R+
R-
S+
S-
IG
HC
H1
H2
S5
SC
S4
GNYE-23 (AWG16)
XPE19
XPE 20
K1
M1
Motor for grinding stone
155°C
XPE27
W52
RD1
RD2
(2x 0.75mm²)
XF
F11
F10
600VA
T1
Safety Isolating Transformer. acc. to EN61558 and UL506
For T1 Connections see 15943100
XPE
BK-50
BK-51
K6:1
K6:3
X100:2
X100:5
BK-64 (AWG16)
BK-62 (AWG16)
A2 Power Supply
Switchmode Powersupply 24Vdc / 10A
(Adjust to 25V)
BU-21 (1.5mm²)
To A20: - See page ??
BU-22 (1.5mm²)
BU-20 (1.5mm²)
To A20: + See page ??
BU-23 (1.5mm²)
A6 PCB
X17-2
X17-7
X17-1
X17-6
X17-3
X17-4
X17-5
GN
YE
WH
BN
BU
GY
PK
strap
W33
7x 0.25mm²
X1-2 GND
X1-3 24V-1 chain
X2-1
X2-2 24V-2 chain
X2-3
X2-4 24V-3 chain
X4-6
X4-12 Sink Driver
K2
M2
Motor for polishing disc
155°C
XPE28
W56
RD2
RD1
(2x 0.75mm²)
BK-54
BK-55
X100:3
X100:6
To A32:24V WAGO I/O
BU-129 (0.75mm²)
X101:1
BU-128 (0.75mm²)
To A30:24V WAGO I/O
(strap)
SB1-1 Emergency Stop push button
BU-26 (1.5mm²)
X101:2
BU-49 (1.5mm²)
BU-27 (1.5mm²)
X101:3
BU-48 (1.5mm²)
To A30:+ WAGO I/O
BU-130 (0.75mm²)
X101:4
BU-46 (0.75mm²)
To K9:3 See page 9.
SS1 Main Hood Safety Lock
X103:1
BU-28 (1.5mm²)
X103:2
W55
BU-29 (1.5mm²)
X101:5
X101:6
BU-50 (1.5mm²)
BU-131 (0.75mm²)
To A32: + WAGO I/O
BU-31 (0.75mm²)
BU-44 (0.75mm²)
To K9:1 See page 9
K8
Motor Driver Circuit for specimen mover
Specimen Mover Motor
M5
(See page 3)
X26
Brake Resistor
R1
X24 + DC
X25 - DC
BK-60
BK-61
A1 Power Supply
Switchmode Powersupply 24-28Vdc / 15A
BU-24 (1mm²)
BU-25 (1mm²)
GNYE-17 (AWG16)
XPE22
To A5, Industrial PC
W74
Shield
RD
WH
GN
BK
Vbus
D-
D+
GND
USB-A
(Connection to IPC for firmware updates)
4x AWG24 + shield
W73
(3x 0.25mm²)
44p DSUB
(Connection to IPC for firmware logs)
COLOR CODES (IEC757):
BK = BLACK
BN = BROWN
RD = RED
OG = ORANGE
YE = YELLOW
GN = GREEN
BU = BLUE
VT = VIOLETT
GY = GREY
WH = WHITE
PK = PINK
Rev. B: (AKR 07.10.11) K7 removed, p. 12 added
Rev. C: (AKR 02.07.12) A3 changed to UPS (p.1), Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1
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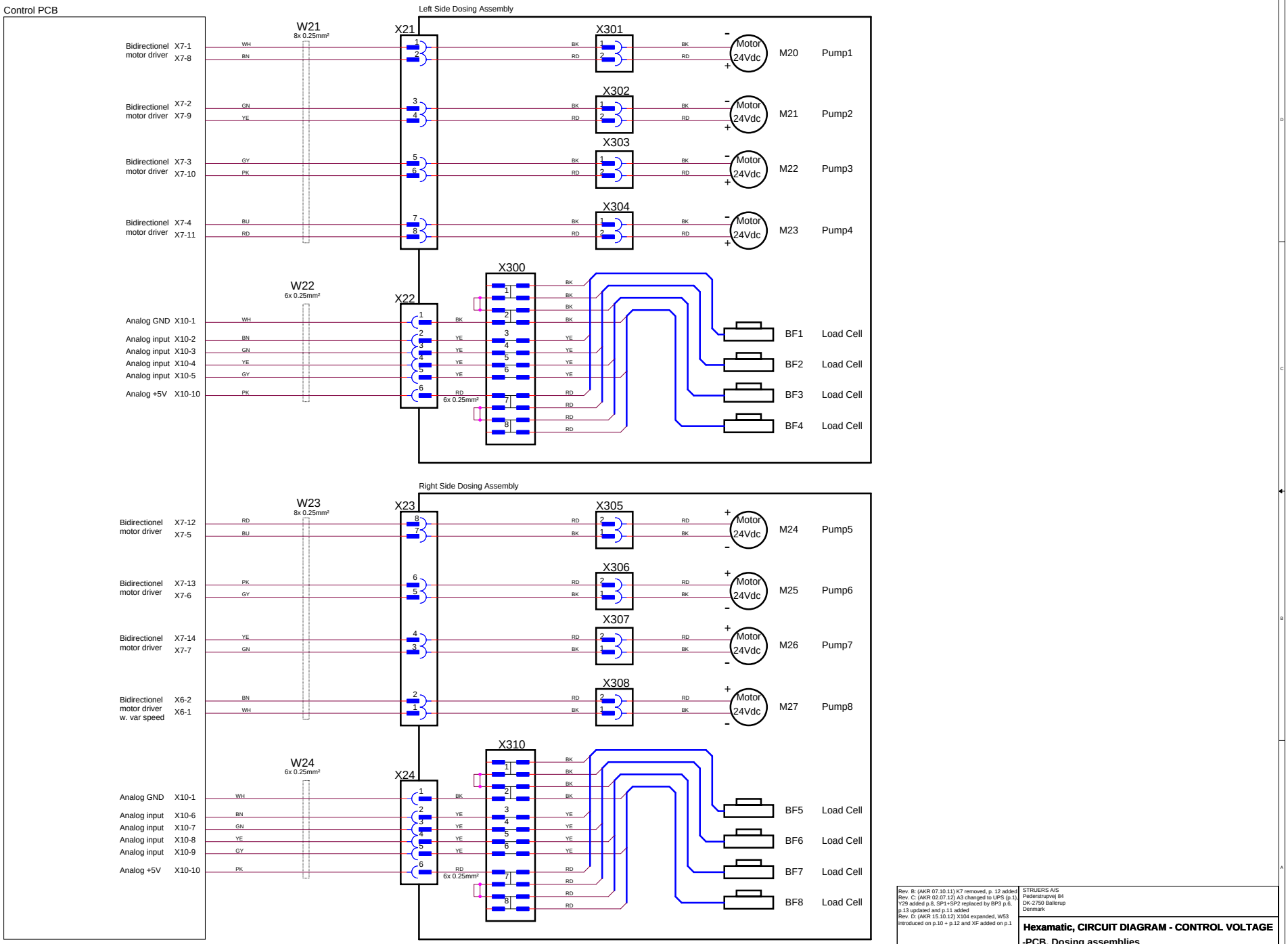
DK-2750 Ballerup
Denmark
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE
-PCB, Misc. connections
Size A2
CAGE Code
DWG NO 15943110
Rev D
Tuesday, April 09, 2013
Scale
Sheet 1 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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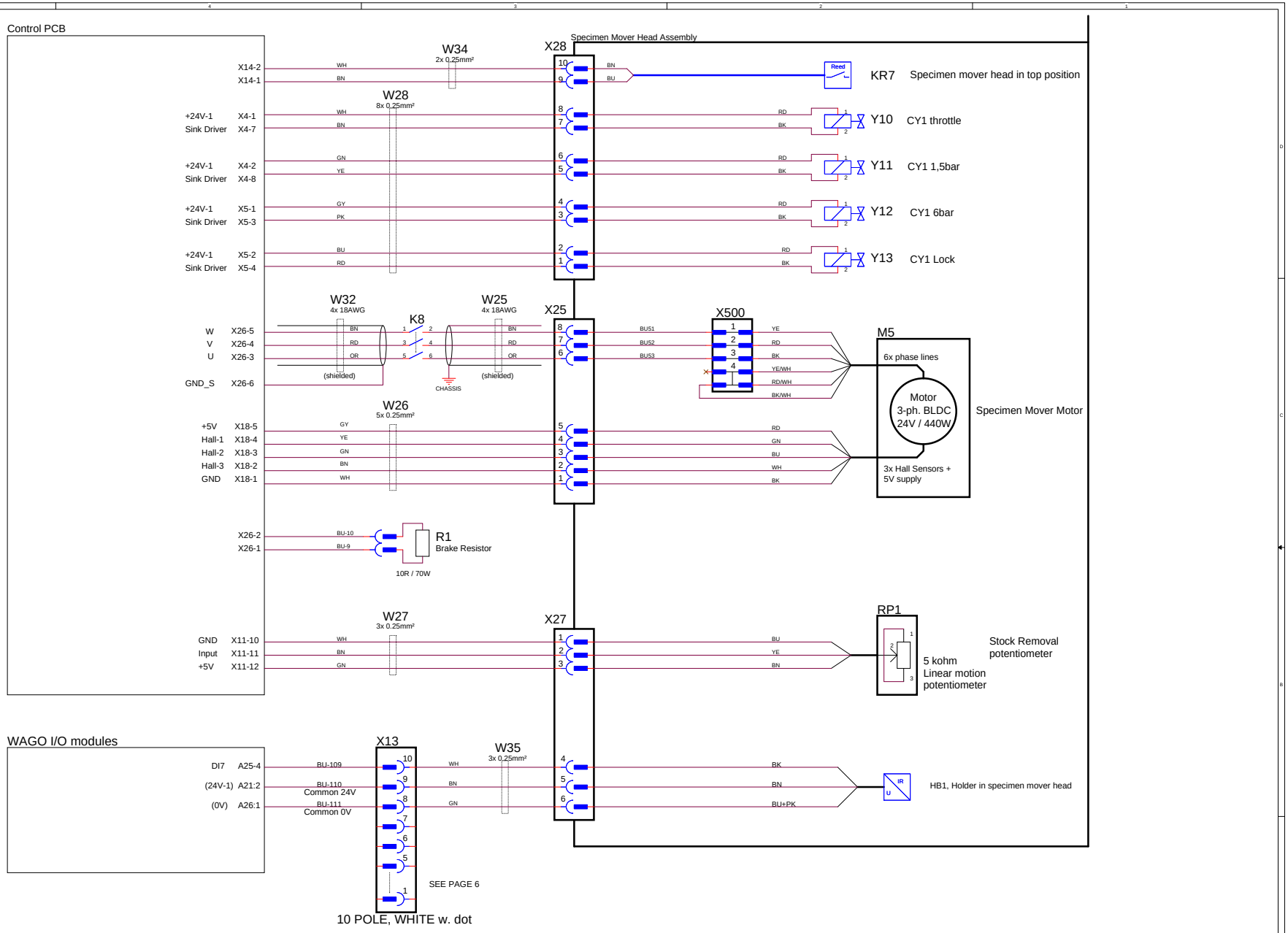
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -PCB, Dosing assemblies

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 2 of 13



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Rev. C: (AKR 02.07.12) A3 changed to UPS (p.1), Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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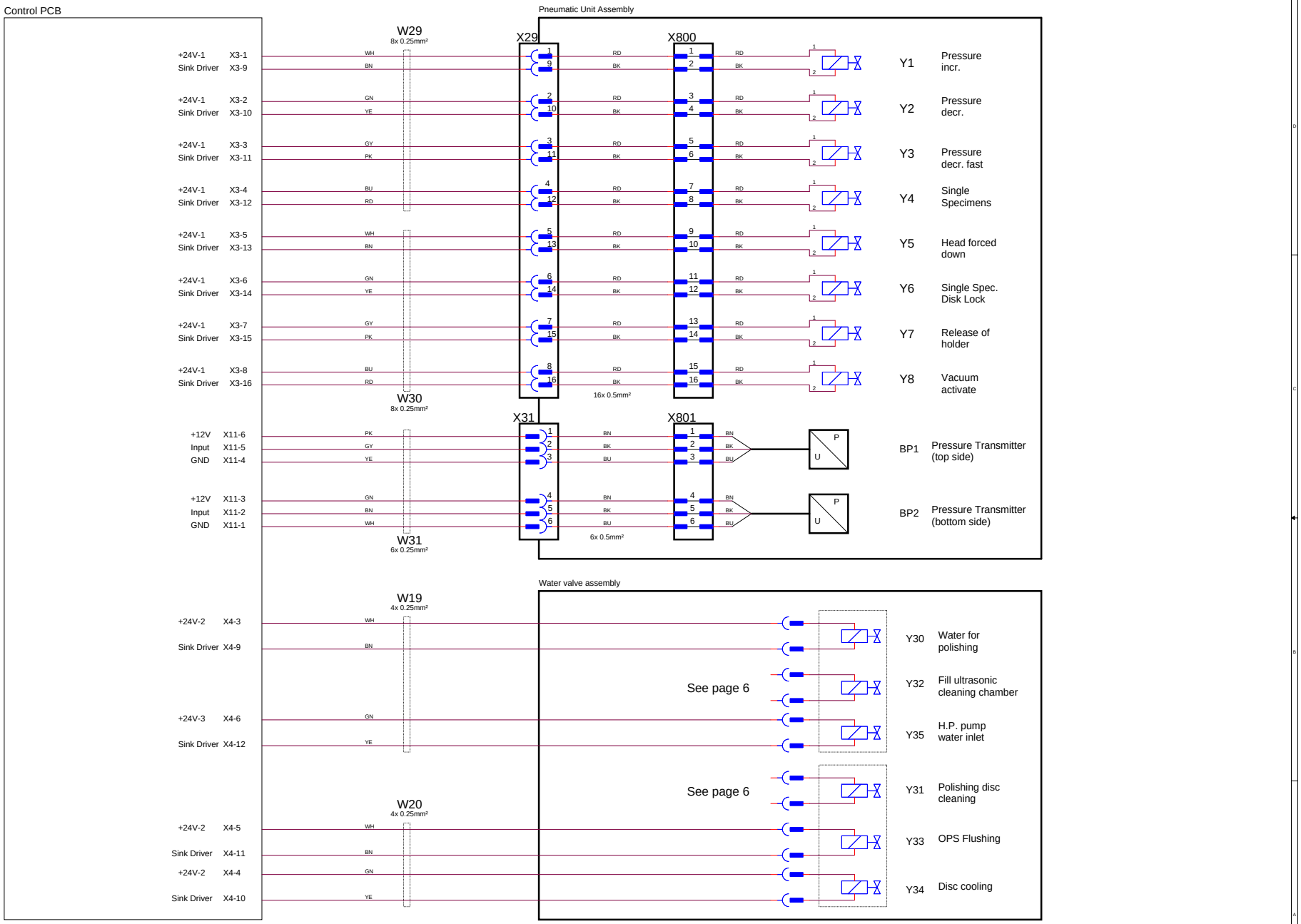
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -PCB, Specimen mover assembly and NAMUR sensors

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 3 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -PCB, Pneumatic assembly and water valves

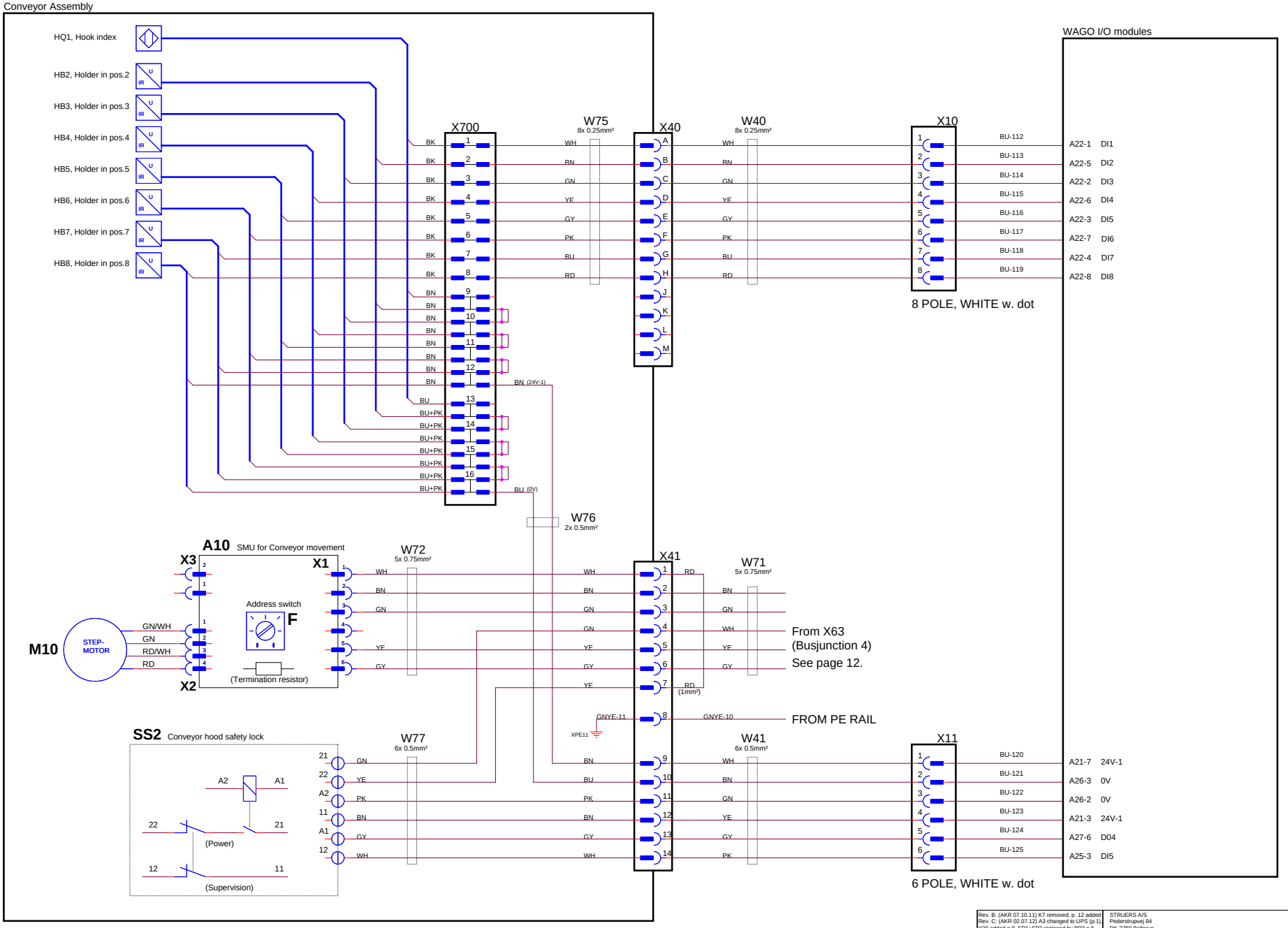
Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 4 of 13

Conveyor Assembly



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Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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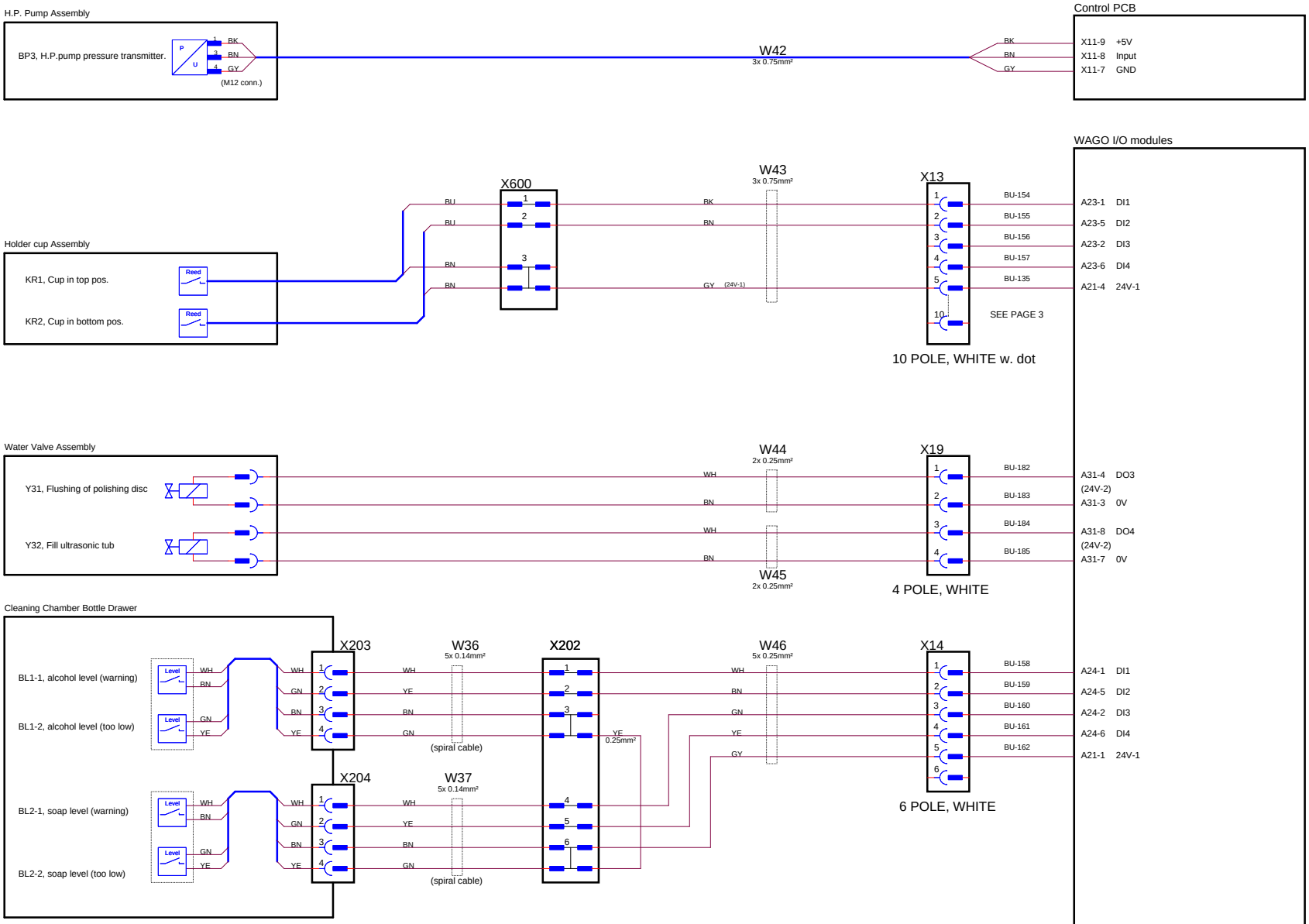
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE
WAGO, Conveyor sensors and actuators

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 5 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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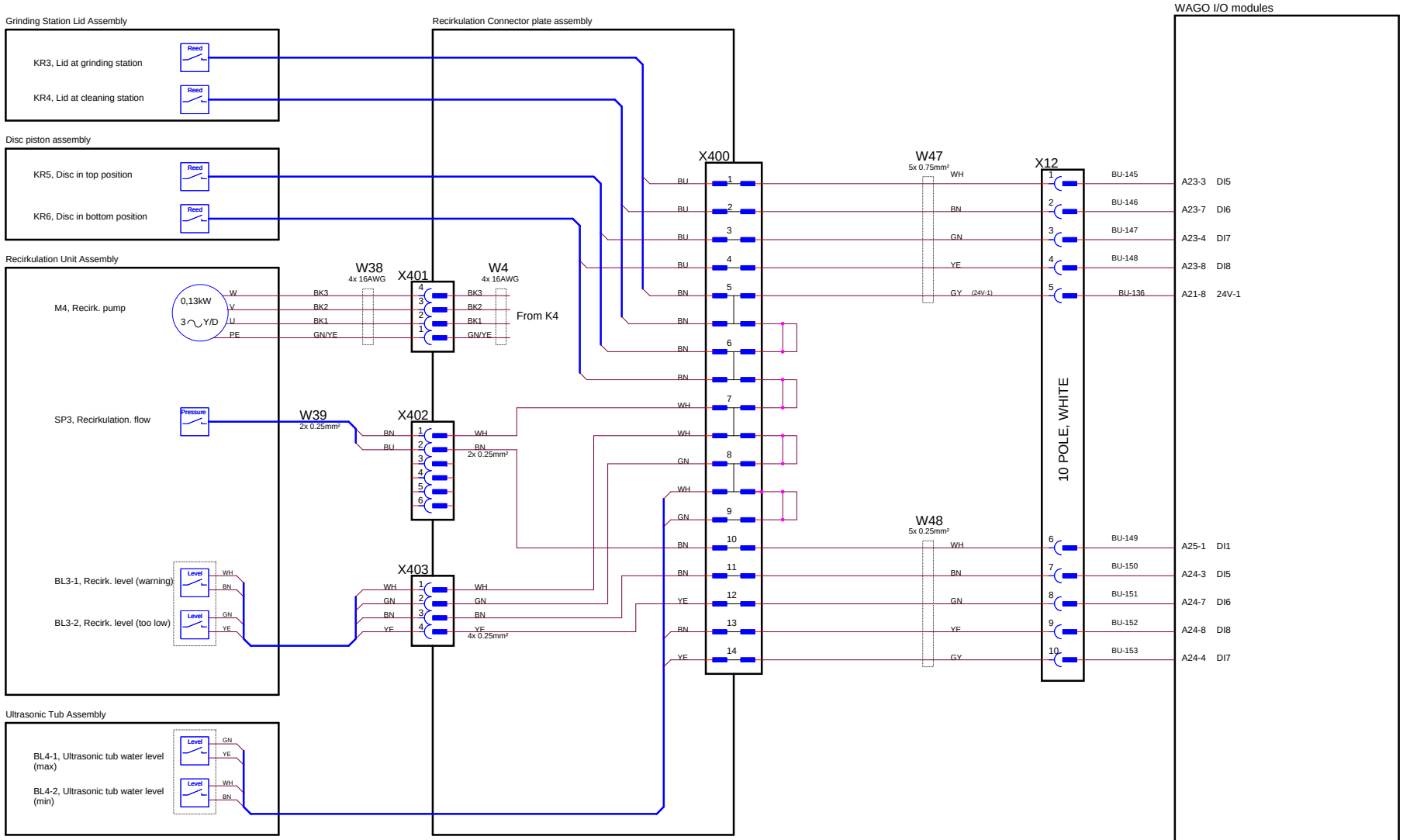
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Reed, pressure and level sensors

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 6 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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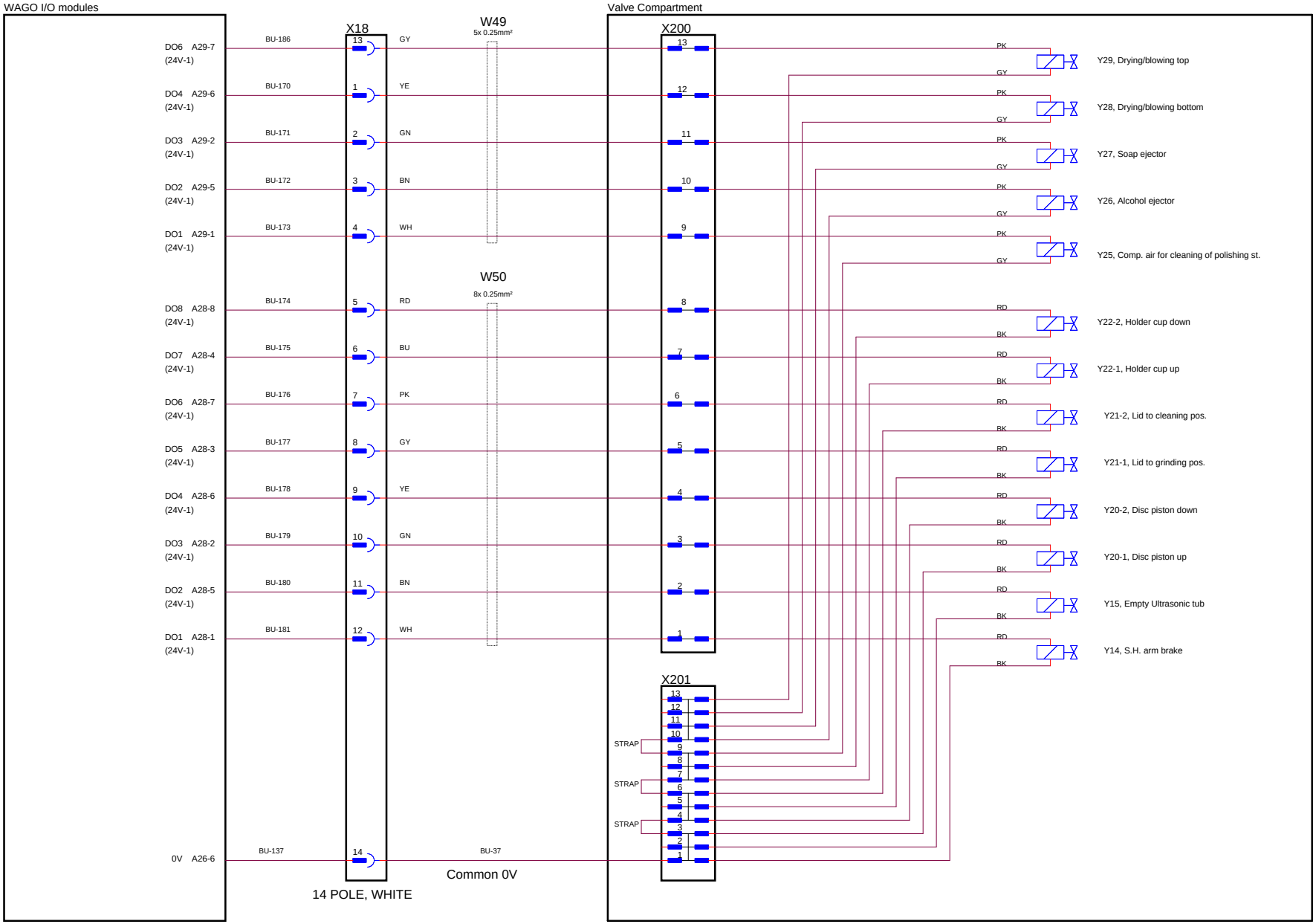
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Reed, pressure and level sensors

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 7 of 13



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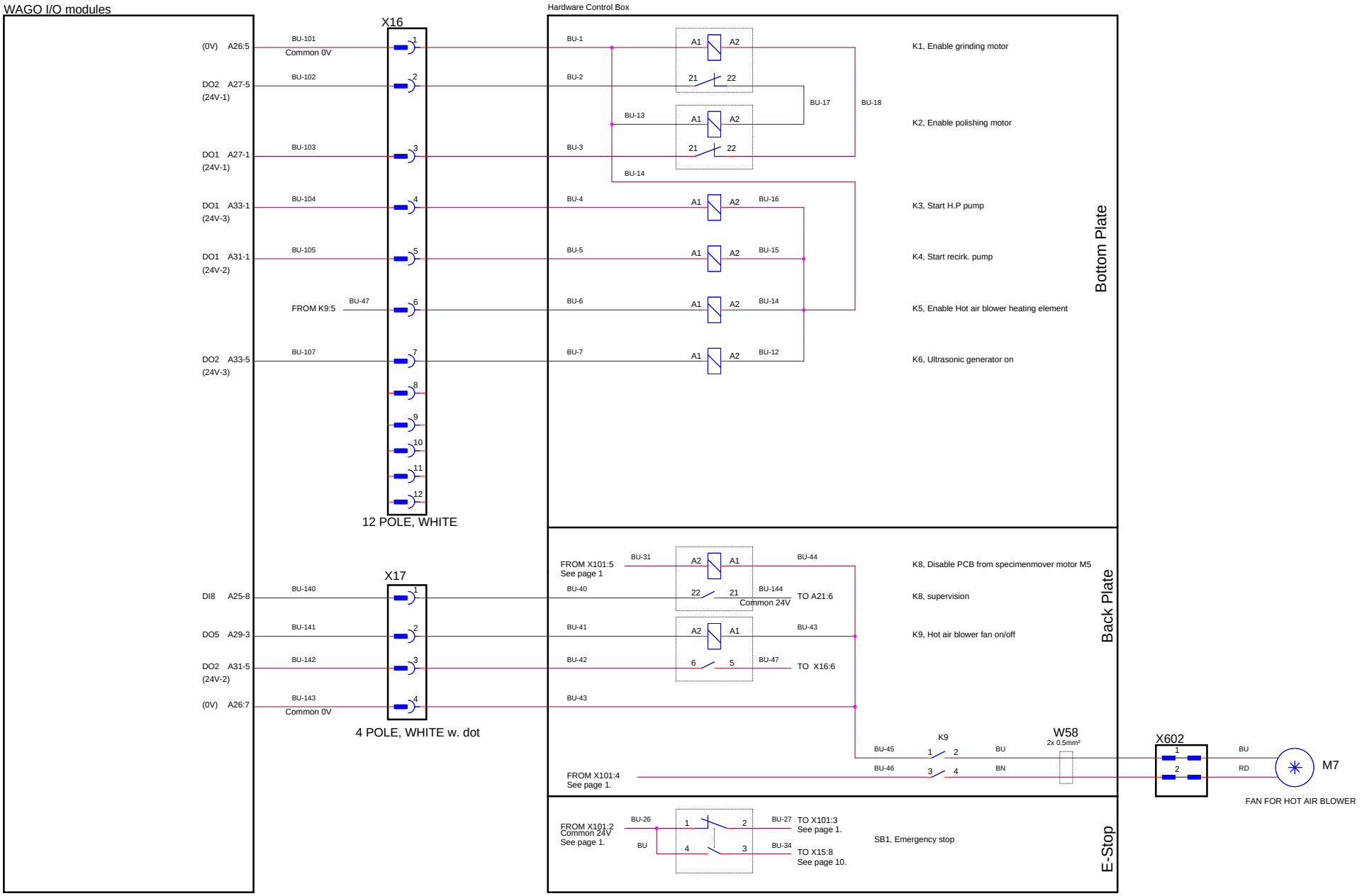
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Solenoid Valves for air

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 8 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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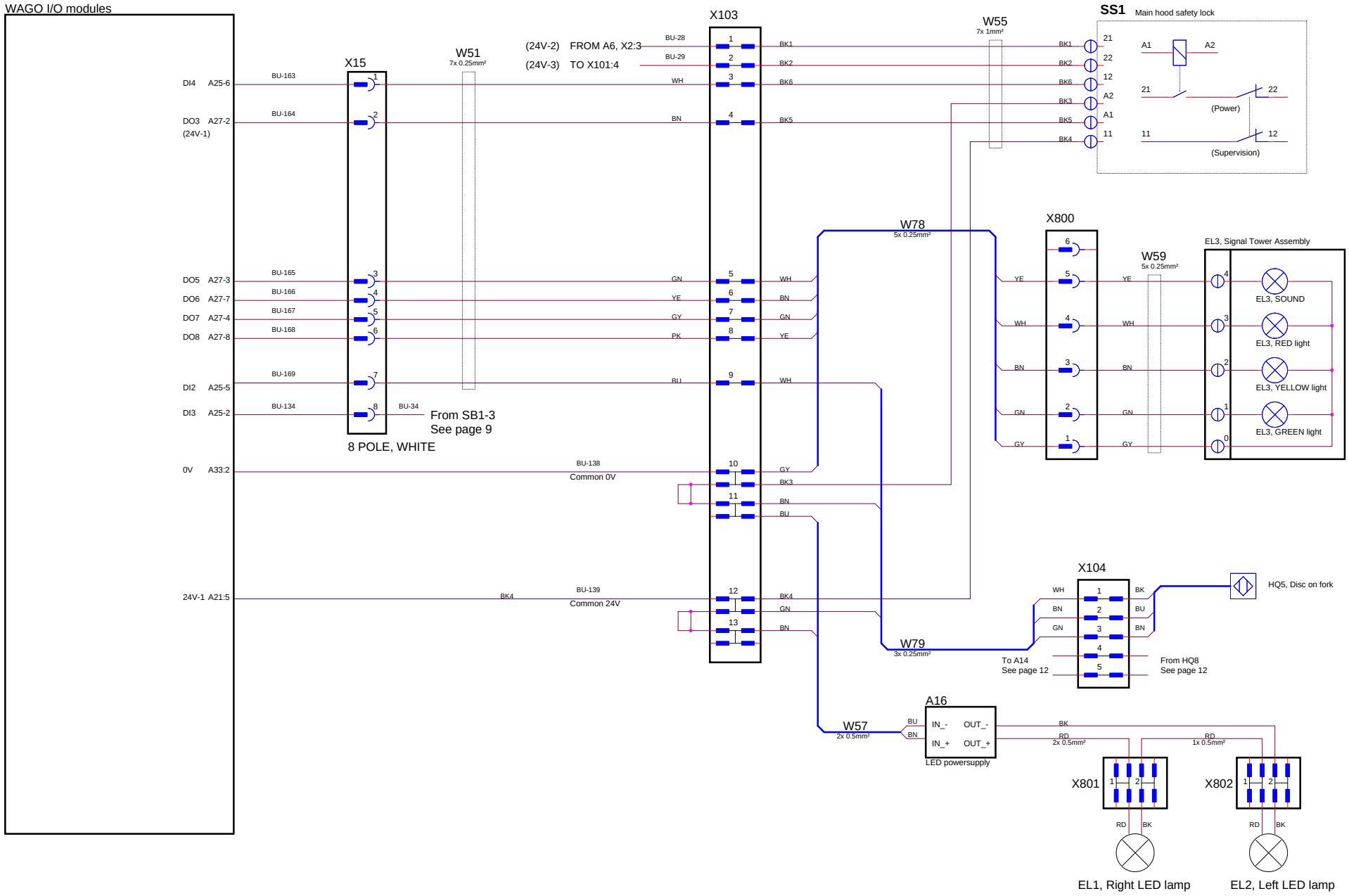
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Contactors

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 9 of 13



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Rev. C: (AKR 02.07.12) A3 changed to UPS (p.1). Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

Tuesday, April 09, 2013

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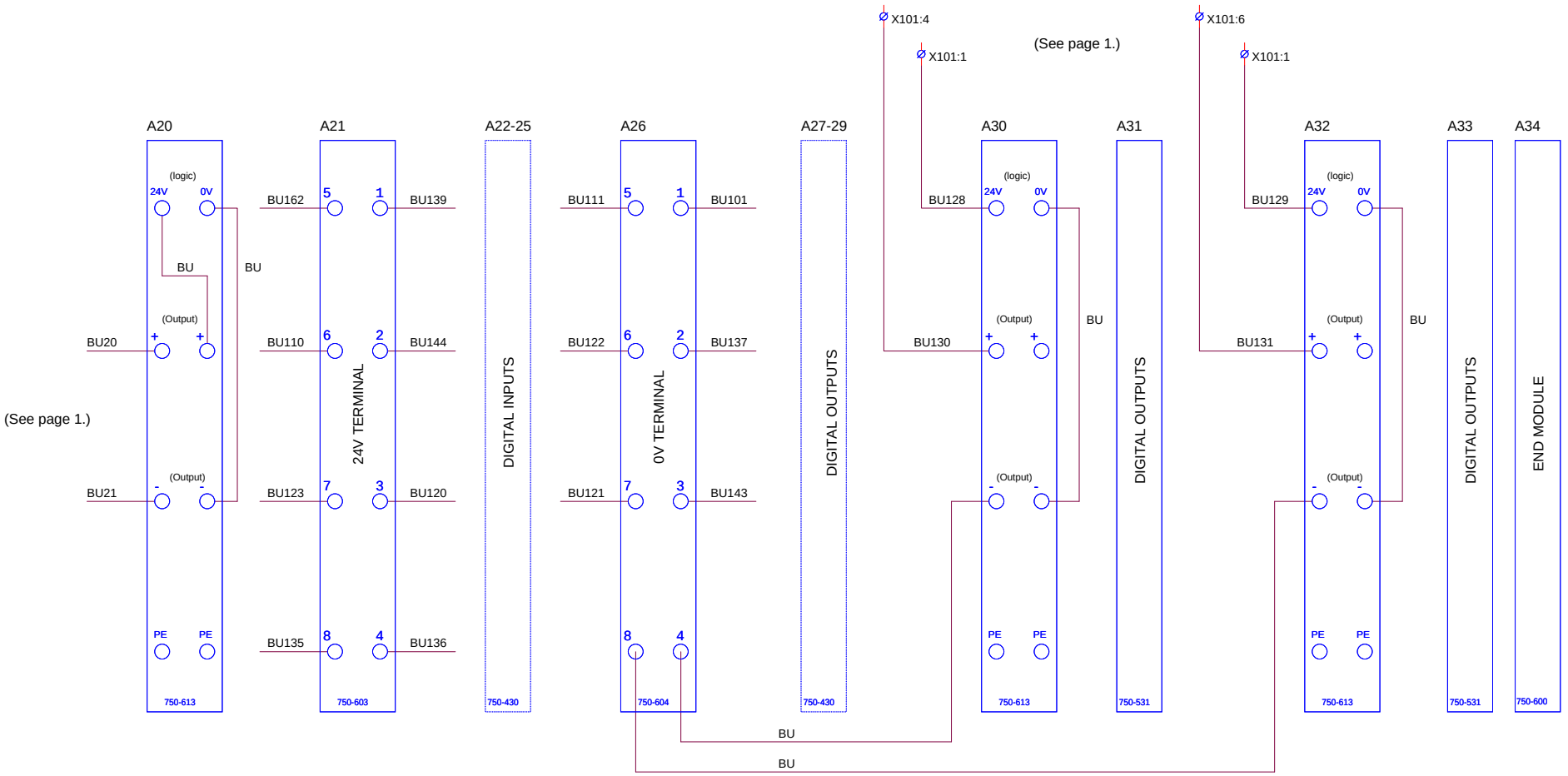
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Lamps and safety lock

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Scale

Sheet 10 of 13



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Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

Tuesday, April 09, 2013

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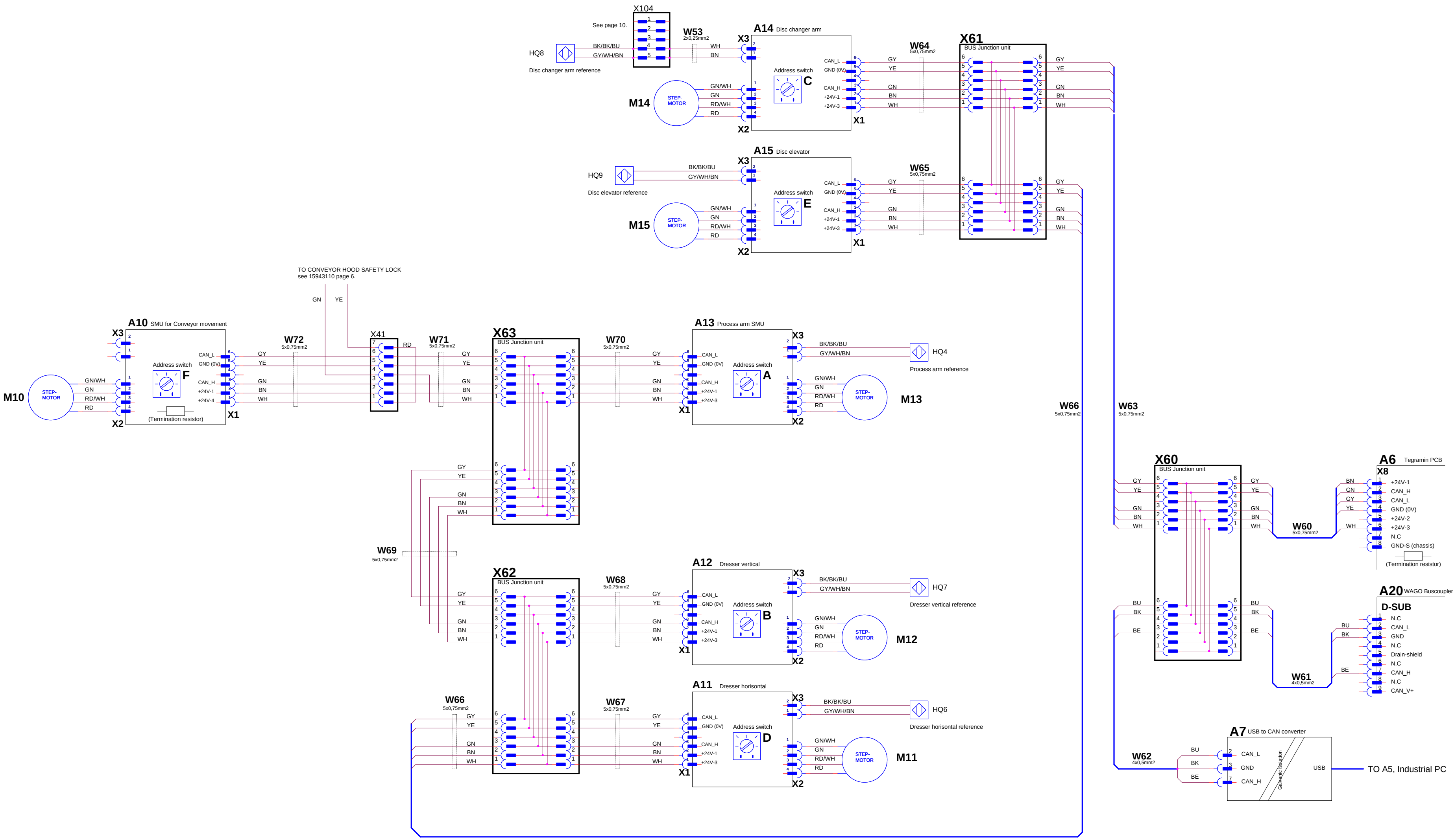
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -WAGO, Module Power Supply

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Scale

Sheet 11 of 13



CAN bus cables

PIN #	Color	CAN signal
PIN 1	WH	24 Protected
PIN 2	BN	24V for logic
PIN 3	GN	CAN_H
PIN 4		Not used
PIN 5	YE	GND
PIN 6	GY	CAN_L

Rev. B: (AKR 07.10.11) K7 removed, p. 12 added
Rev. C: (AKR 02.07.12) A3 changed to UPS (p.1), Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
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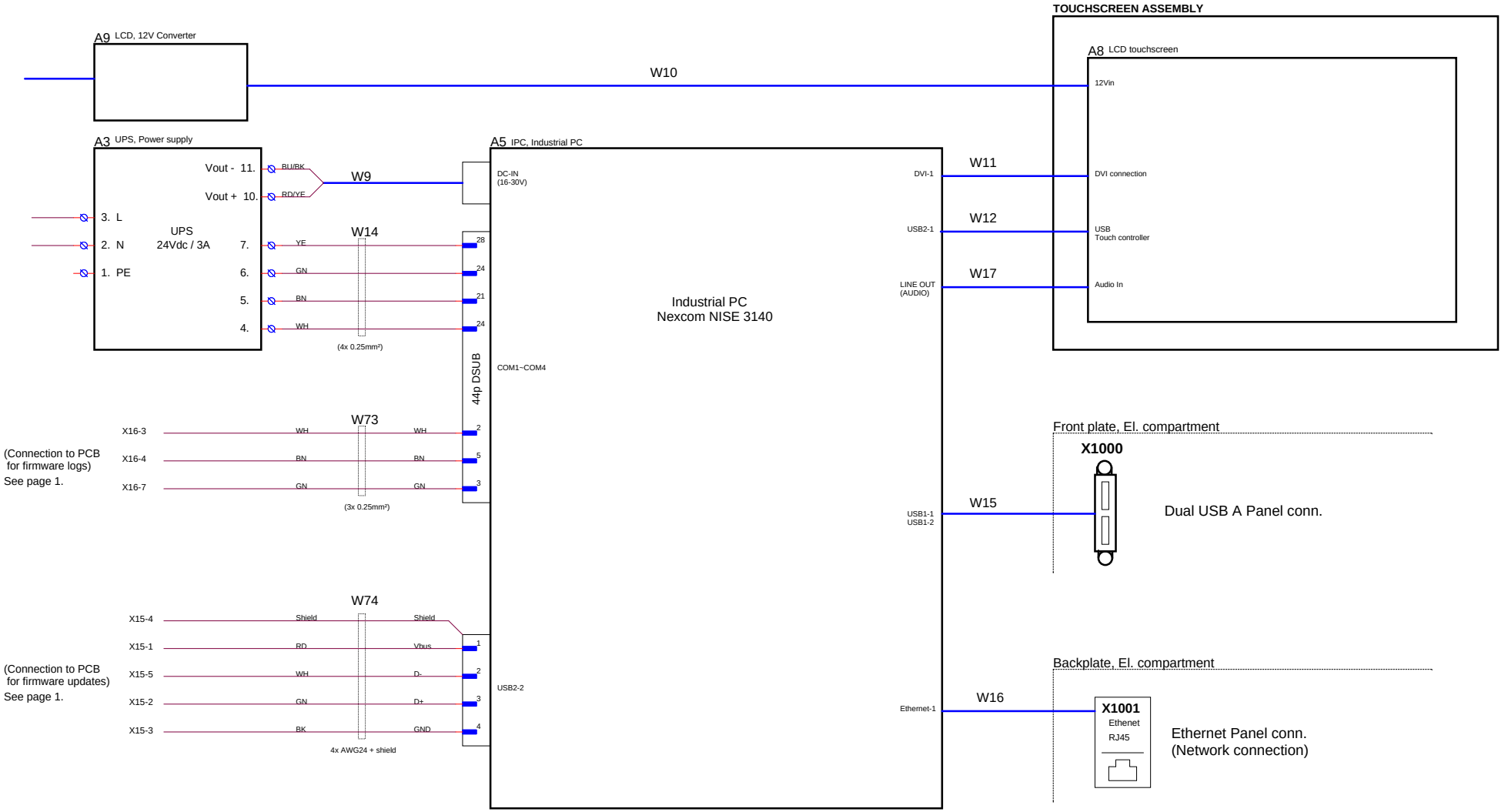
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -CANbus Overview

Size	CAGE Code	DWG NO	Rev
A1		15943110	D

Tuesday, April 09, 2013

Scale | AKR / AKR | Sheet 12 of 13



Rev. B: (AKR 07.10.11) K7 removed, p. 12 added
Rev. C: (AKR 02.07.12) A3 changed to UPS (p.1), Y29 added p.8, SP1+SP2 replaced by BP3 p.6, p.13 updated and p.11 added
Rev. D: (AKR 15.10.12) X104 expanded, W53 introduced on p.10 + p.12 and XF added on p.1

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DK-2750 Ballerup
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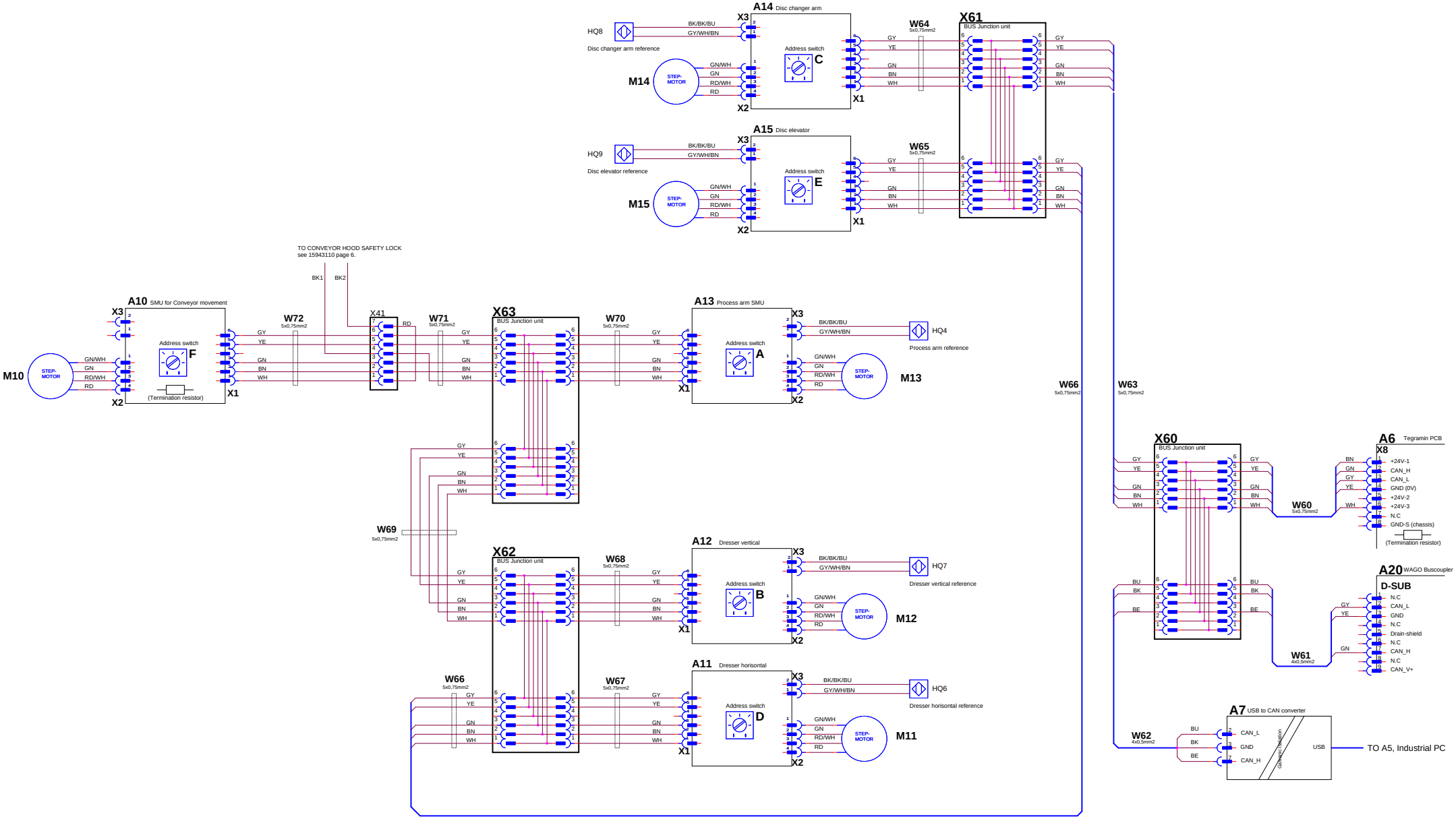
Hexamatic, CIRCUIT DIAGRAM - CONTROL VOLTAGE -Touchscreen and IPC connections

Size	CAGE Code	DWG NO	Rev
A2		15943110	D

Tuesday, April 09, 2013

Scale

Sheet 13 of 13



CAN bus cables

PIN #	Color	CAN signal
PIN 1	WH	24 Protected
PIN 2	BN	24V for logic
PIN 3	GN	CAN_H
PIN 4		Not used
PIN 5	YE	GND
PIN 6	GY	CAN_L

Rev. B: AKR 12.09.11 Busstables changed to 5x0,75mm2

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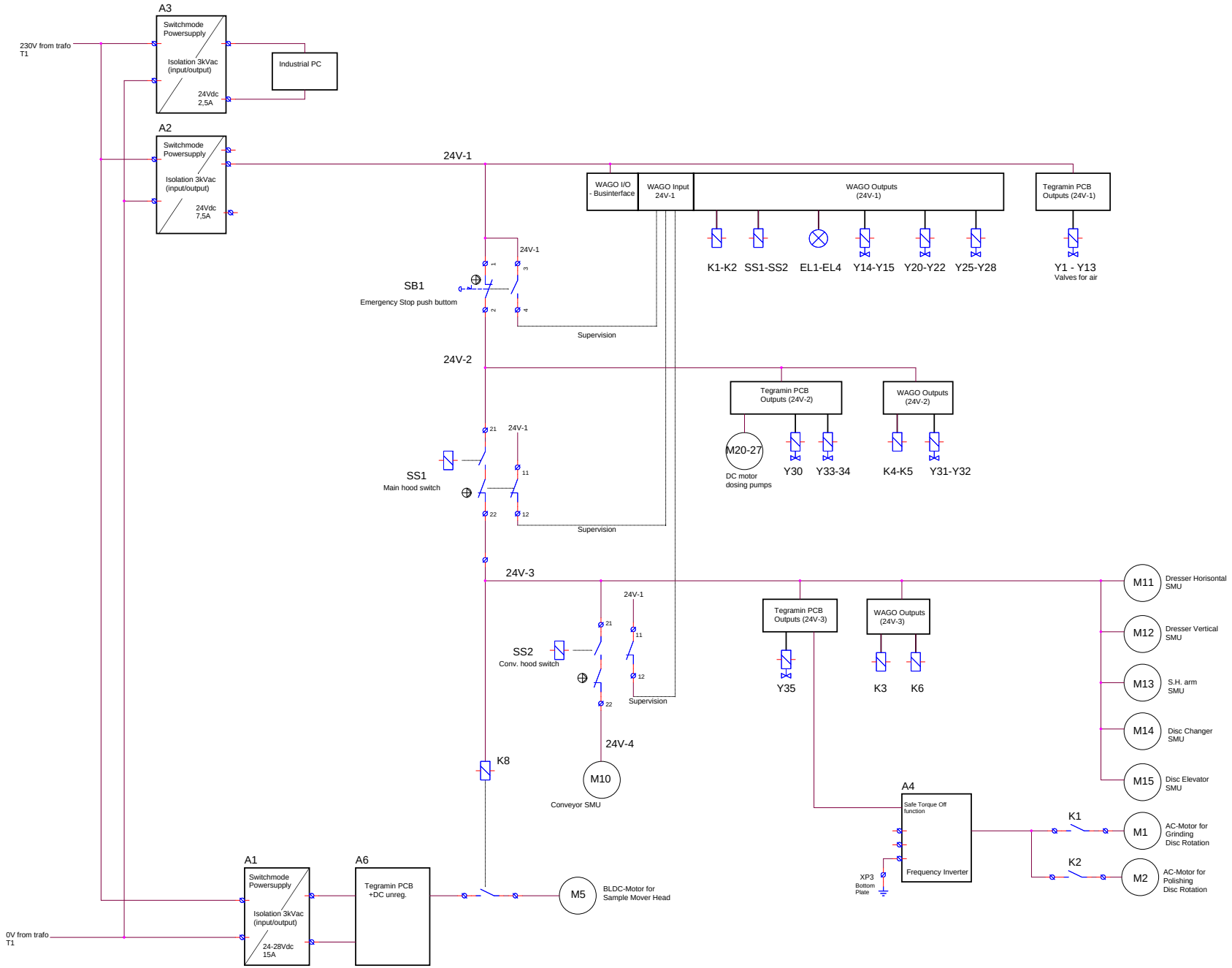
DK-2750 Ballerup
Denmark
telephone: +45 44 600 800

HexaMatic, Circuit Diagram

CAN bus overview

Size	CAGE Code	DWG NO	Rev
A1		15943111	B

Monday, September 26, 2011 | Scale: AKR / AKR | Sheet: 1 of 1



Rev. B: AKR 2013-02-02 , K7 removed

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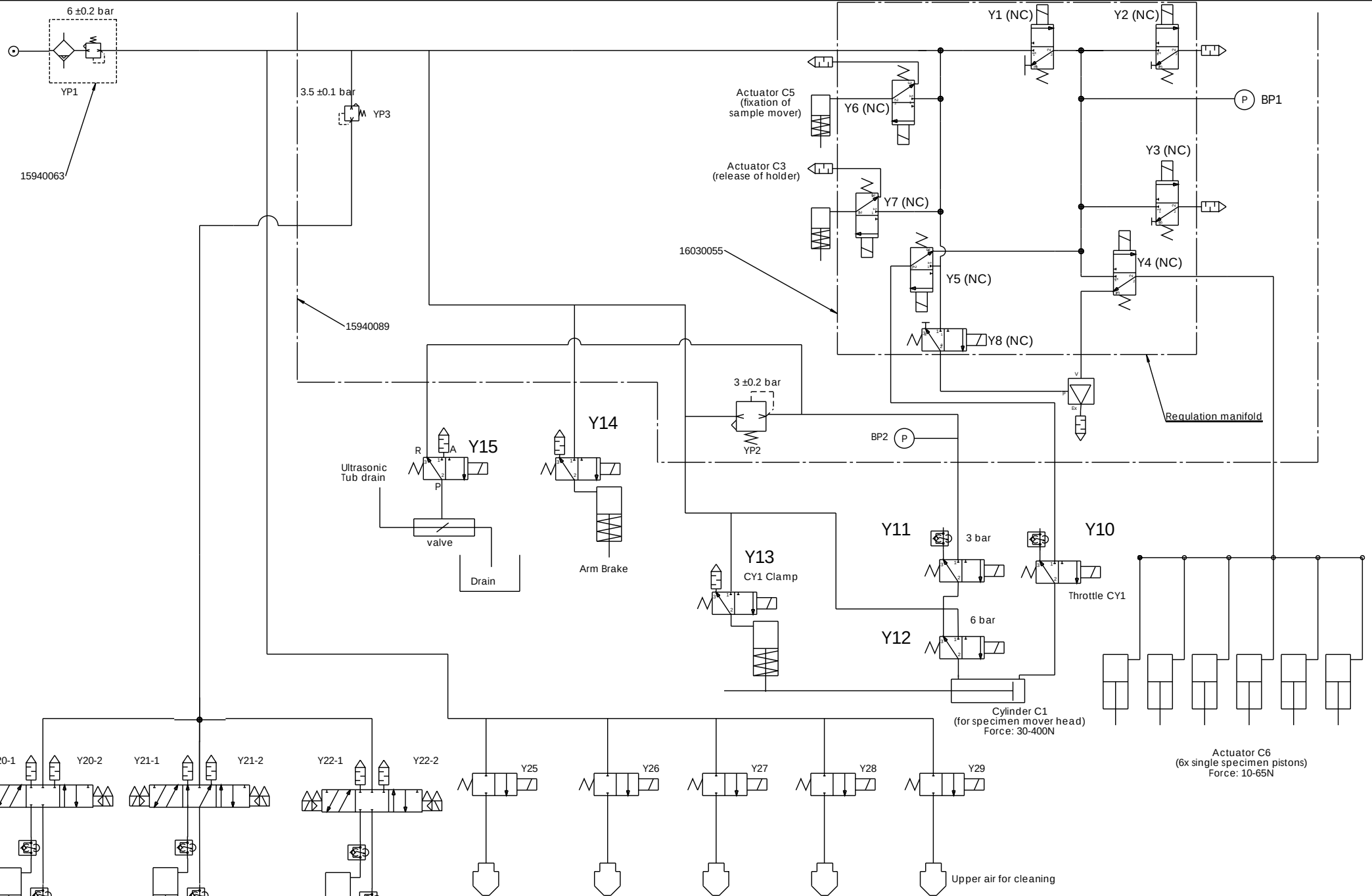
+45 44 600 800

Hexamatic, Circuit Diagram

- Safety Related Circuitry

Size	CAGE Code	DWG NO	Rev
A1	<Cage Code>	15943120	B
Scale		AKR/AKR	Sheet 1 of 1

Thursday, June 14, 2012

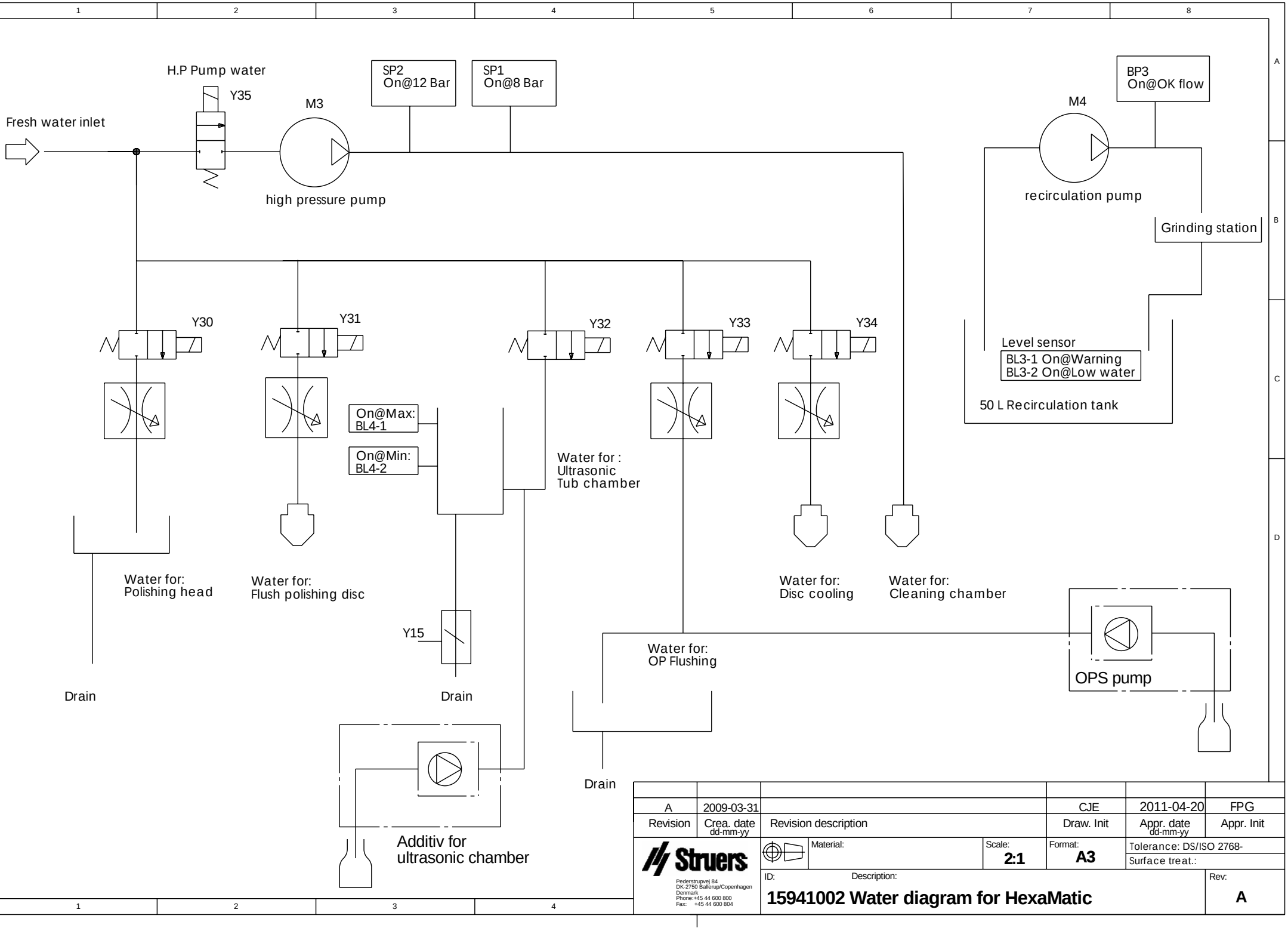


Revision	Crea. date yyyy-mm-dd	Revision description	Draw. Init	Appr. date yyyy-mm-dd	Appr. Init
E	2014-06-13	D,5: Valve Y15 new air supply.	JJO	2014-06-13	
B	2011-11-09	pressure regulation 1,5->3 bar	CJE	2011-04-20	FPG

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone: +45 44 600 800
Fax: +45 44 600 804

Material:
Scale: -
Format: A2
Tolerance: DS/ISO 2768-
Surface treat.:

ID:
Description: **15941001 Air diagram for HexaMatic**
Rev: **E**



A	2009-03-31		CJE	2011-04-20	FPG
Revision	Crea. date dd-mm-yy	Revision description	Draw. Init	Appr. date dd-mm-yy	Appr. Init

Struers
Pederstrupvej 84
DK-2750 Ballerup/Copenhagen
Denmark
Phone:+45 44 600 800
Fax: +45 44 600 804

Material:
Scale: 2:1
Format: A3
Tolerance: DS/ISO 2768-
Surface treat.:

ID: Description:

15941002 Water diagram for HexaMatic

Rev: **A**

Overview, variant parts in HexaMatic.

Country nom. Voltage /frequency	Motor M1 (Grinding)	Motor M2 (Polishing)	Noise Filter Z1	Frequency Converter A4	Motor M3 (H.P. pump)	Motor M4 (Recirculation)	Transformer T1	F1+F2+F3	F4+F5+F6	F7+F8+F9	F10+F11	Ordering Number
Japan 3x200V / 50Hz **CSA-norm.** Japan + USA + Canada 3x200-210V / 60 Hz	Item No.: 2ME60000 Voltage: 3 x 230 V Power: 2,2kW Connection: DELTA	Item No.: 2ME51751 Voltage: 3 x 230 V Power: 0,75kW Connection: DELTA	Item No.: 2MO90032 Voltage: 3 x 200 V Current: 24A	Item No.: 2PU13400 Voltage: 3 x 200 V Power: 4,0kW	Item No.: 13751030 Voltage: 3 x 230 V Power: 0,22kW Connection: DELTA	Item No.: 12530064 Voltage: 3 x 230 V Power: 0,13kW Connection: DELTA	Item No.: 2MT73001 Connection: 230 V See diagram: 15943100	Item No.: 2FC11200 20AT (class CC)	Item No.: 2FC11020 2AT (class CC)	Item No.: 2FC11060 6AT (class CC)	Item No.: 2FC11040 4AT (class CC)	05946129 3x200-240V / 50Hz or 60Hz
Norway, France, Belgium 3x220-230V / 50 Hz												
USA, Mexico, Brazil, S.Korea. 3x220-240V / 60 Hz												
Europe 3x380-415V / 50Hz South America 3x380-415V / 60Hz	Item No.: 2ME60000 Voltage: 3 x 400V Power: 2,2kW Connection: STAR	Item No.: 2ME51751 Voltage: 3 x 400 V Power: 0,75 kW Connection: STAR	Item No.: 2MO90033 Voltage: 3 x 400 V Current: 10A	Item No.: 2PU14300 Voltage: 3 x 400 V Power: 3,0kW	Item No.: 13751030 Voltage: 3 x 400 V Power: 0,22 kW Connection: STAR	Item No.: 12530064 Voltage: 3 x 415 V Power: 0,13 kW Connection: STAR	Item No.: 2MT73001 Connection: 400 V See diagram: 15943100	Item No.: 2FC11100 10 AT (CC)	Item No.: 2FC11010 1AT (CC)	Item No.: 2FC11040 4AT (CC)	Item No.: 2FC11020 2AT (CC)	05946146 3x380-415V / 50Hz or 60Hz
CSA-norm. USA + Canada 3x460-480V / 60 Hz						Item No.: 12530068 Voltage: 3 x 480 V Power: 0,13 kW Connection: STAR	Item No.: 2MT73001 Connection: 460 V See diagram: 15943100					05946154 460-480V / 60Hz

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