FEED MILL
Services & Equipment

USER MANUAL

SPECIAL DIE COUNTERSINK MACHINE AUTOMATICALLY

FME-CSA-1100

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IBAN NL44 RABO 0139 0699 09 · **BIC** RABONL2U · **CoC** 53598040 · **VAT** NL 8509.43.012.B01

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1. GENERAL INFORMATION

This user manual.

This user manual has been compiled in English by:

FEED MILL SERVICES & EQUIPMENT BV

Version: V2018
Version date: July 2018

1.1 Machinery Information

This user manual belongs to the machine of the type as indicated on the cover page.

This Special Die Countersink Machine, FME-CSA-1100, is produced by:

FEED MILL SERVICES & EQUIPMENT BV

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Date of issue at Feed Mill Services & Equipment BV: July 2018

1.2 IIB-Marking

The countersink machine has been constructed and implemented by Feed Mill Services & Equipment BV according to the relevant European directives on safety and health. This means that the machine complies with the IIB-marking. The Declaration of Conformity (included in this manual) indicates the guidelines applicable to this machine.

2. INTRODUCTION

This user manual is a support to allow you to handle your machine. You should read this documentation completely. For additional information we ask you to contact the Feed Mill Services & Equipment BV.

This user manual is part of the delivery and must remain in good hands while using the countersink machine. There must be a copy available for those working with this machine. When the machine is surrendered, it is intended that this user manual is also transferred.

Treat this instruction carefully. It is not allowed to change or delete pages. Feed Mill Services & Equipment BV reserves the right to replace parts of this manual, in the context of the improvement of the product, at any time without directly providing a new edition.

2.1 Staff

Certain operations can only be operated or made by qualified or trained staff. For the description of the qualification level the following standard features are used:

- The qualified staff must have sufficiently technical knowledge and/or work experience to be able to recognize and prevent potential danger (engineers and technicians).

- The staff must be adequately trained and/or controlled by the qualified staff to identify and prevent the potential danger (the operated and maintenance staff). They should have the following qualifications:

    1. They must be trained to operate the product safely. They must be capable to operate the equipment according to standard safety regulations.
    2. They must maintain the product and use the safety devices as described in this manual.

The customer and/or user is/are required to ensure, in particular, that the machine uses:

- that the staff has read and understood this manual.
- that the staff follows the instructions as given in this manual.

2.2 Individual Means Of Protection

The staff, mentioned in the previous paragraph, must wear protective clothing which is necessary for the employment of the machine.

Safety shoes are required. The need for wearing hearing protection, eye protection and a helmet can be defined by the user.

It isn't allowed to wear clothing that can get caught in moving machine parts.

2.3 Workplace

If workplace is intended and requires a space of at least 1 metre around the entire machine. From here, all operations can be performed.

2.4 General Safety Instructions

The following provisions and recommendations are primarily based on observing the rules of the safety regulations mentioned in this manual.

Feed Mill Services & Equipment BV isn't responsible for possible damage to persons or goods related to ignoring of the safety regulations and instructions in this manual.

Transportation, installation, operation and maintenance of the machine can only be performed by the staff which meets the conditions described in the previous section.

The countersink machine is designed and constructed so that it can be safely used and maintained. This applies to the application, the circumstances and the rules as described in this manual. Reading this manual and following the instructions is therefore **necessary** for anyone working with or to this machine.

Additional safety measures may be prescribed by the company or country in which the machine is in use. This concerns in particular working conditions. This manual describes **not** how to comply, however, the necessary information about the machine is given.

A distinction is made in this manual between normal use and other work on the machine. The reason for this is that, especially regarding safety, the service personnel are subject to different requirements than to operators.

2.5 Operational Restrictions

Attention is hereby drawn to the following applications, for which the machine **not** suitable:

- Processing of products other than those prescribed
- For functions other than those defined

Consequences regarding the use of the countersink machine in any application is not the responsibility of Feed Mill Services & Equipment BV in any form whatsoever.

All claims for damage caused by unintended use are not permitted. Here the owner/responsible is responsible for itself.

2.6 Protection Of The Environment

No special hazards are associated with the use, maintenance and demolition of this machine, taking into account the prescribed (safety) measures.

The machine itself does not contain any substances that may pose a danger to individuals.

2.7 Calamities

By calamities is meant: fire, flood and the like.

Measures must be taken in an emergency situation that don't endanger persons or goods. The usual extinguishing agents can be used.

In the event of fire, care must be taken to ensure that the galvanizing machine isn't connected to the electrical circuit when taking measures.

The machine must be de-energized when there is damage to the equipment. Keep moisture away from live parts. Moisture can lead to short circuit.

Repairs and work on electrical installations may only be carried out by a qualified electrician.

Ensure that hot surfaces can't be touched. Touching hot surfaces can lead to severe burns.

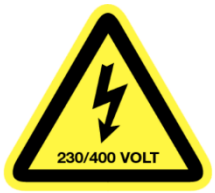
Improper use of environmentally-friendly and hazardous substances can cause serious damage to the environment.

2.8 Marking

The countersink machine is equipped with a type plate with a manufacturer-known and unique type number. The type plate gives various information for example about the year of construction and the manufacturer's details.

Figure 2.8.1
Example of a type plate (Your plate can be different)

If the following warning sticker is indicated, attention must be paid to electrical danger during repair or maintenance.



For indications on the standard parts see their own specifications.

Warnings:

- Read the user manual carefully before turning on the countersink machine.
- When products fall during import, they must be removed as soon as possible. Products that remain can be an obstacle to a subsequent import cycle.
- The casing and doors must always be in full stroke and must never be removed from a rotating machine.

Unreadable labels, symbols, etc. can lead to danger. They can become dirty or unreadable over time. Therefore:
- Labels, symbols, etc. must be clearly legible.
- Damaged labels, symbols, etc. must be replaced. For this we advise you to contact Feed Mill Services & Equipment BV.

2.9 Transport

Before shipment each machine has been examined and checked thoroughly. Check at reception of the goods the integrity and the contents of the package to ensure that nothing has been damaged during the transport. Check also if the delivery correspondents to the order.

When unloading should carefully be made to the equipment.

Report any defects or damage immediately to Feed Mill Services & Equipment BV and to the carrier responsible for the damage during the transport.

An objection to any defects or damages must be made within 10 days after receipt of the goods.

3. INSTALLATION AND COMMISSIONING

3.1 General

Requirements for installation are:
- a stable surface that is a burden of at least ± 5000 kg can carry
- a required floor space of ± 2,5 x 2 meter, the machine must be set up in such a way that there is sufficient space to carry out control and/or repair work
(maintains a minimum distance of 1 meter around the machine)
- the machine can be picked up by a forklift, which is certainly a burden of ± can carry 1500 kg.
See figure 3.1.1 Below of how the machine can be picked up.

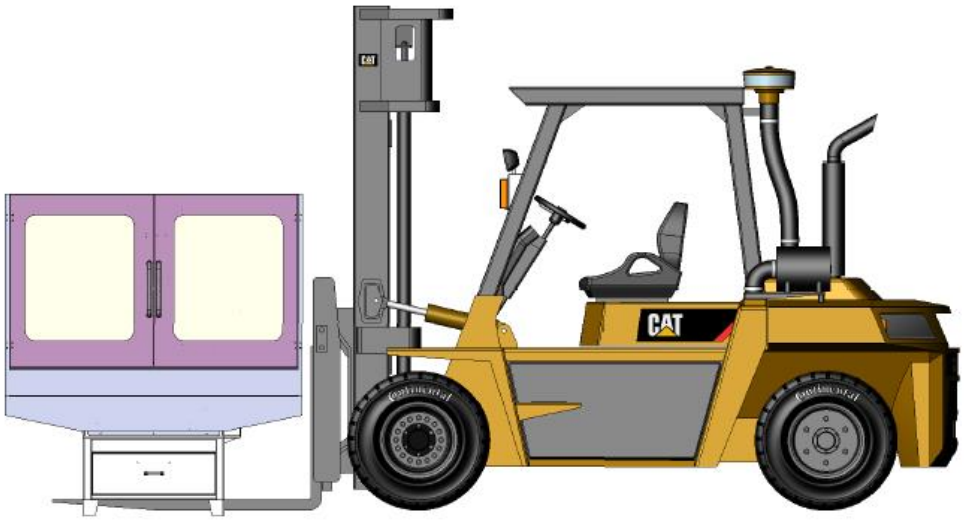


Figure 3.1.1
Picking up with a forklift

3.2 Commissioning

For the first use after a major overhaul, repair or long-term storage, machine should be recommissioned.

Check:
- Whether all parts and accessories are present
- Whether all moving parts can run freely
- Correct direction of rotation and connection of the motors
- Damage, especially external electrical wiring
- The correct operation of all mechanical control devices
- The correct settings corresponding to the type of product to be processed

Warning!
The risks of improper functioning are greater than normal during business counting. Take additional safety measures where necessary.

Installation

- Level the machine
- Remove the bracket (see figure 3.2.1)
- Connect the power (ensure a right-handed flow field)
- Switch on the machine (see chapter 6 on page 18)
- Bring up the countersink arm (+Z)
- Remove the wooden bracket (see figure 3.2.2)

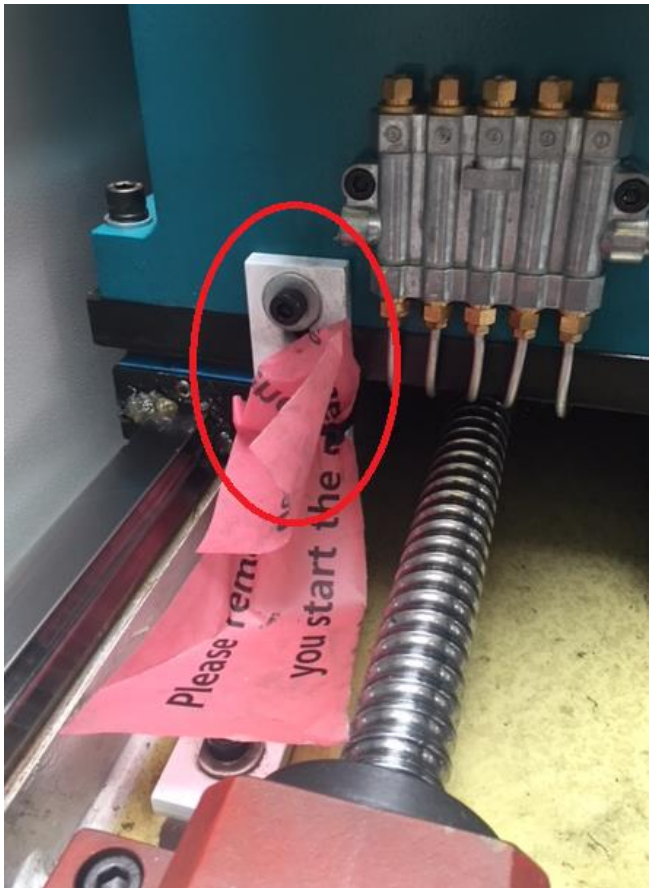


Figure 3.2.1
Bracket

Figure 3.2.2
Wooden bracket

4. SPECIFICATIONS

4.1 Machine Specifications

Machine dimensions (see chapter 8):	
Length:	± 2298 mm
Width:	± 1680 mm
Height:	± 1859 mm
Machine weight:	± 1500 kg
Spindle power:	2.2 kW
Voltage:	3 x 380V till 460 V (indicated by the customer)
Frequency:	50 or 60 Hz (indicated by the customer)
Horizontal stroke:	560 mm
Z-axis stroke:	330 mm
Position accuracy:	0.02 mm
Chamfering range / spindle speed:	ø1.2-ø6 mm / 0-3000 rpm ø6-ø12 mm / 0-1500 rpm

Figure 4.1.1
Countersink machine FME-CSA-1100

4.2 Product Specifications

Sample product to be processed: Ring Die

Max. outer diameter:	Ø1500 mm
Min. inner diameter:	Ø350 mm
Max. width:	550 mm

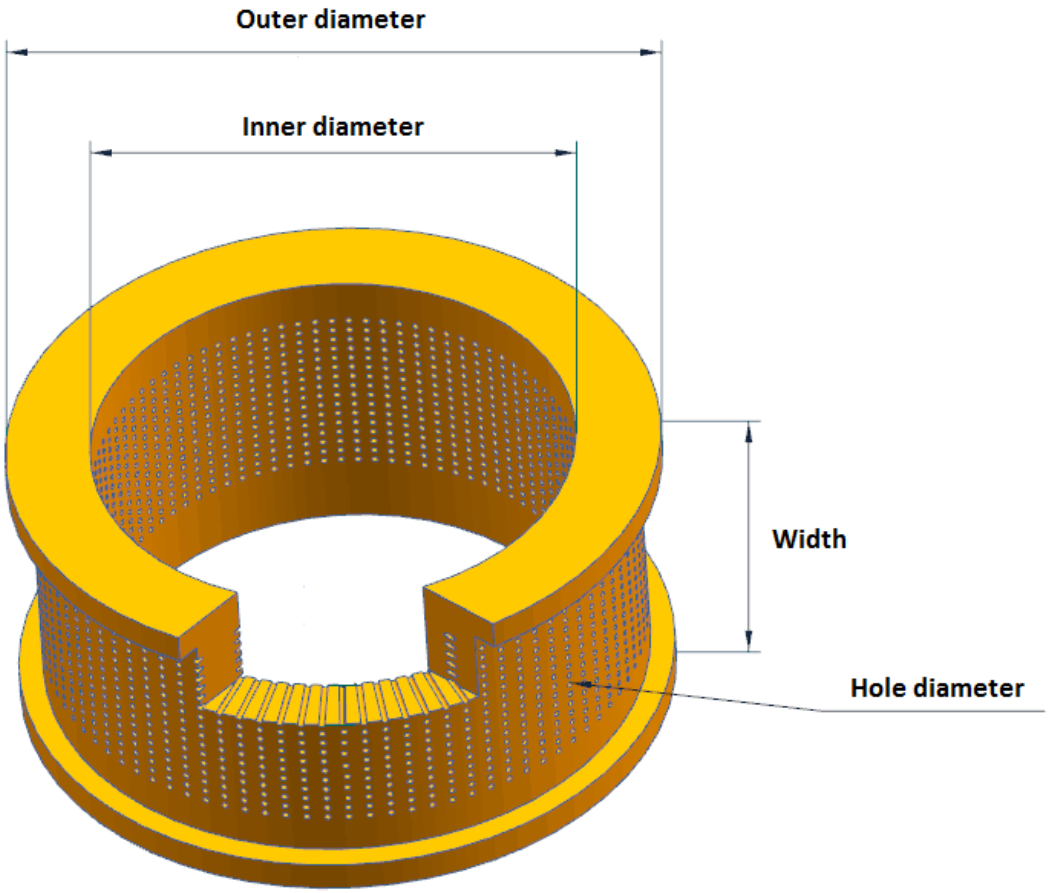


Figure 4.2.1
Example product: Ring Die

4.3 Conditions Of Use

- Ambient temperature: +5 till +40 Degrees Celsius
- During transport: 0 till +45 Degrees Celsius
- Storage temperature: +10 till +60 Degrees Celsius

The machine is not intended for use in the open air.
The machine is not suitable for an explosive atmosphere.

4.4 Machine-Overview

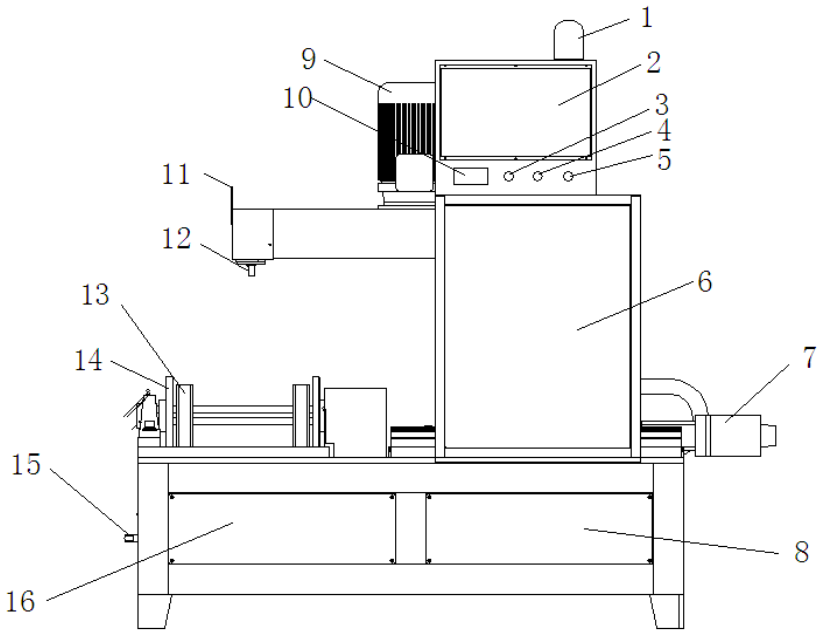


Figure 4.4.1
Countersink machine overview

1. Alarm lamp
2. Display
3. Power-On button
4. Power-Off button
5. Emergency switch button
6. Control cabinet
7. X-axis servo motor
8. Isolation transformer inside
9. Spindle motor
10. Torque testing table
11. Switch back to zero detection
12. Spindle drill chuck
13. Package of plastic rollers
14. Retainer ring
15. Precipitate drawer of cooling box
16. Cooling motor

5. MAINTENANCE AND REPAIR

5.1 Introduction

The appropriate maintenance is important for a long life of the countersink machine and its components, under good and functional conditions. It also guarantees the necessary long-term reliability.

5.2 Safety During Maintenance

The maintenance work of the countersink machine requires a few rules of conduct, namely:

- All maintenance work must be carried out by qualified personnel (see section 2.1).

- Maintenance work must be performed when the equipment is energized. The whole of the operational and maintenance staff must adhere strictly to the rules for the prevention of accidents of the equipment.

- Allow to cool hot surfaces

- Always wear safety shoes, protective clothing and other necessary equipment. During maintenance work do not wear jewellery or loose clothing.

- Use only original parts for proper operation of the equipment.

- Do not use abrasive or corrosive materials or solvents when cleaning the countersink machine. Do not use any cleaning agents that affect the parts and/or cause corrosion.

5.3 Maintenance Instructions

Daily maintenance:

- Check the machine's business situation completely, especially the conduction rails lubrication system
- Removing the rafters from the inside of the machine

Weekly maintenance:

- Check on traces of wear, which can be visually identifiable by product/machine damage

Other maintenance:

- When a notification is given of a low level of the pump (central lubrication system), the pump can be filled by means of the nipple on the front of the pump (see figure 5.3.1)

Viscosity machine oil: minimum below #100, recommended #46

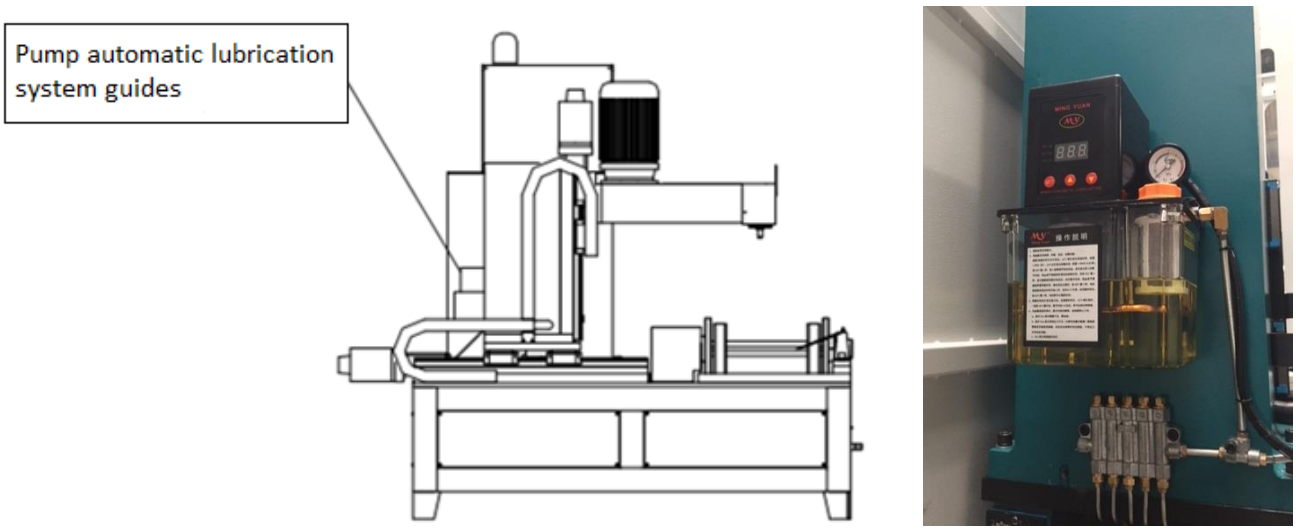


Figure 5.3.1
Automatic lubrication system

5.4 Repairs

During the warranty period, repairs can only be carried out under the manufacturer's direction. Each repair must be kept in a machine log. All parts that are replaced must meet the specifications of the original components at least.

5.5 Storage

There are no special requirements for storage, a cool and dry space is most suitable. After a long storage, the machine must be inspected by a technician for commissioning.

If the machine is brought from a cold in a warm space, it can occur during condensation (also internally in electrical components).
Direct switching can cause damage to the machine and danger to the operator. Let the machine first acclimatize.

6. CONTROL

- Switch On (Start-up)
  - Turn the Main Switch to “On”
  - Press the ‘Power On’ button

- Set Product
  - Press ‘HOLE’ (to be able to fill in the parameters)
  - Enter the parameters below that are shown in Figure 6.1

Figure 6.1
Machine parameters

- ‘Row holes’ = Number of holes per row
- ‘Row number’ = Number of rows
- ‘Hole Dis’ = Row distance → see following formula:
  (Working surface - (2 * groove distance)) / (number of rows - 1)
  - Groove distance = see table below
  - Working surface = see figure 6.2 for an example

Diameter	Groove distance	Diameter	Groove distance	Diameter	Groove distance	Diameter	Groove distance
ø1,2	3,1	ø 3	4,0	ø 5,2	5,5	ø 10,0	9,0
ø 1,4	3,2	ø 3,2	4,1	ø 5,3	5,5	ø 11,0	10,0
ø 1,5	3,3	ø 3,5	4,2	ø 5,5	6,0	Ø 12,0	10,0
ø 1,6	3,3	ø 3,6	4,3	ø 6,0	6,0	ø 12,5	10,5
ø 1,8	3,4	ø 3,7	4,3	ø 6,35	7,0	ø 14,0	11,0
ø 2,0	3,5	ø 3,8	4,4	ø 6,5	7,0	ø 15,0	11,5
ø 2,1	3,5	ø 4,0	4,5	ø 7,0	7,0	ø 16,0	13,0
ø 2,2	3,6	ø 4,2	4,6	ø 7,5	7,5	ø 17,0	13,5
ø 2,3	3,6	ø 4,4	5,0	ø 8.0	8,0	ø 18,0	14,0
ø 2,4	3,7	ø 4,5	5,0	ø 8,5	8,5	ø 19,0	14,5
ø 2,5	3,7	ø 4,8	5,0	ø 9,0	8,5	ø 20,0	14,5
ø 2,8	3,9	ø 5,0	5,0	ø 9,5	9,0	ø 22,0	16,0

Figure 6.2
Example thread

- 'Perimeter' = Ring die rotation detecting position information of a circle (see Figure 6.3)
  - Insert the clip (A) using the magnet on the product as shown in figure 6.3
  - Place the sensor (B) under the clip (A) as shown in figure 6.3
  - Press 'F2' (to set the 'Y-FEED' = 'F-HoleFeed' = rotation speed → advice: between 500-1000)
  - Press 'ESC' (to get to the main page, see figure 6.4)
  - Press 'F5' (to set 'Z' = 0, see figure 6.4)
  - Press 'STEP' and set with the handwheel: Z= +0,1
  - Press 'MEASURE' (so that the machine will measure the desired value)

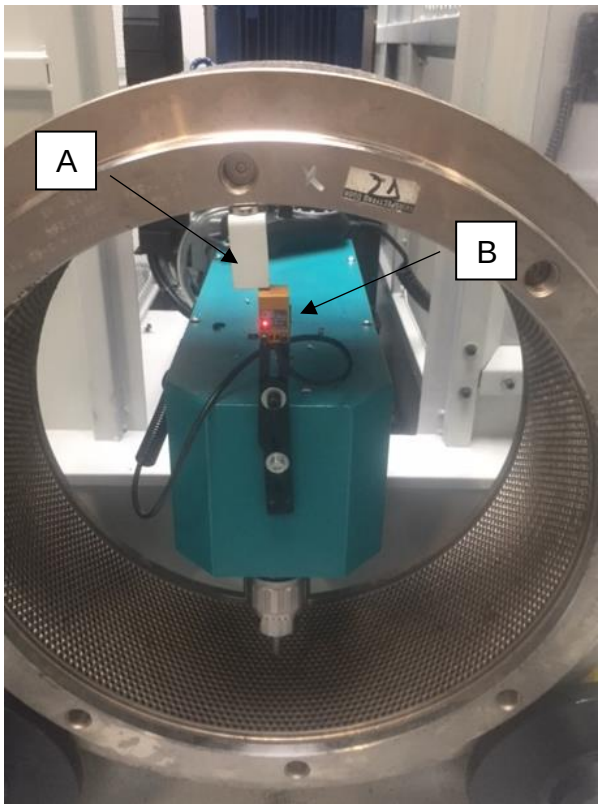


Figure 6.3
Measure perimeter

Figure 6.4
Control screen

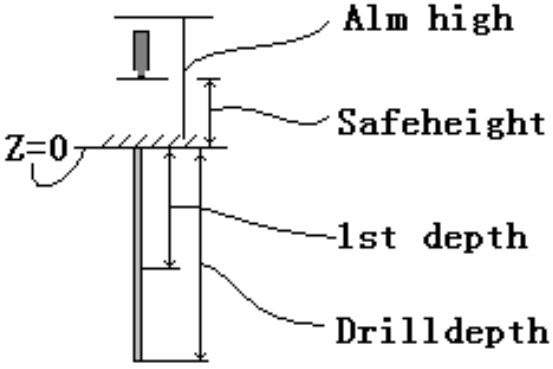


Figure 6.5
Schematic drill diagram

- Press 'HOLE' to return to the parameter screen
- 'Test Depth' = Drilling depth (product dependant)
- 'Min Depth' = Minimum drilling depth
- 'Safeheight' = Retraction Position
- 'Drill Depth' = Drilling depth (see figure 6.5)
- 'Drillspeed' = Drilling speed
- 'Drill RPM' = Drilling speed (set the same as 'Drillspeed')
- Press 'F2' = (to set the 'Y-FEED' = 'F-HoleFeed' = Rotation speed this is product dependant)
- Press 'H' (to set the 'H-Alm high' = Tool life)

- Torque Monitoring set up
  - Press the right button (Up arrow) and set to 'AH' with the 'SET' button.
  - Set with the up/down and left/right arrows.
  - Push ‘SET’ to confirm

Figure 6.6
Torque Monitoring set up

- Search the first hole
  - Press ‘POS’
  - Press 'STEP' to switch on the handwheel
  - Search using the handwheel the centre of the 1st hole: when you have the machine parameters (see figure 6.1) on FWD you have to find the first hole on the back as shown in figure 6.7. When it is on BWD you have to look for the first hole at the front (see figure 6.7). You can do this with the blue arrow keys (left/right).
  - Close doors
  - Press 'ESC' to return to the main screen (see figure 6.8)
  - Press ‘F3’ → 0 → Enter (to set ‘X’ = 0, see figure 6.8)
  - Press ‘F4’ → 0 → Enter (to set ‘Y’ = 0, see figure 6.8)
  - Press ‘F5’ (to set ‘Z’ = 0, see figure 6.8)
  - Press ‘F1’ → 1 → Enter (to set the first row)
  - Press ‘F2’ → 1 → Enter (to set the first row)
  - Press ‘RUN’ (to start the cycle)
    - Use 'STOP' to pause the cycle, so that parameters can be set differently
    - Use 'RUN' to restart the cycle
    - Use 'S-STOP' to stop completely

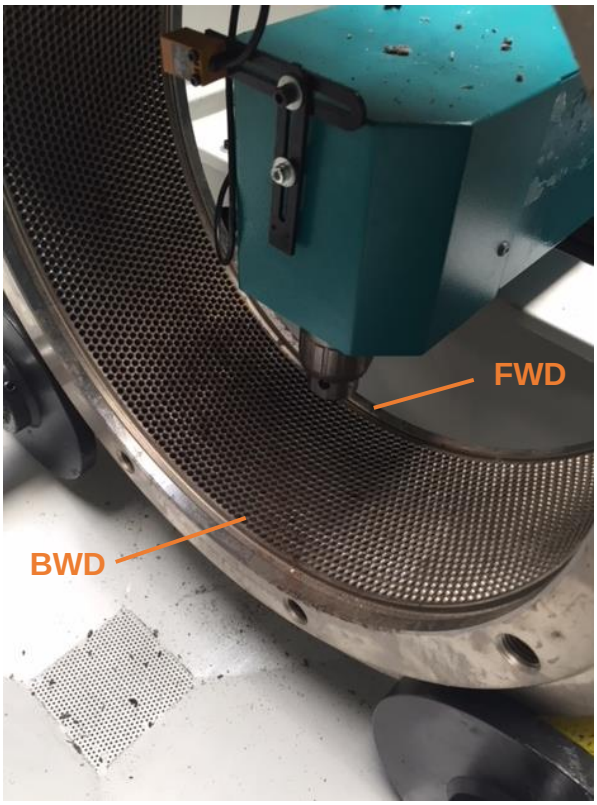


Figure 6.7
Look up 1st hole front or back

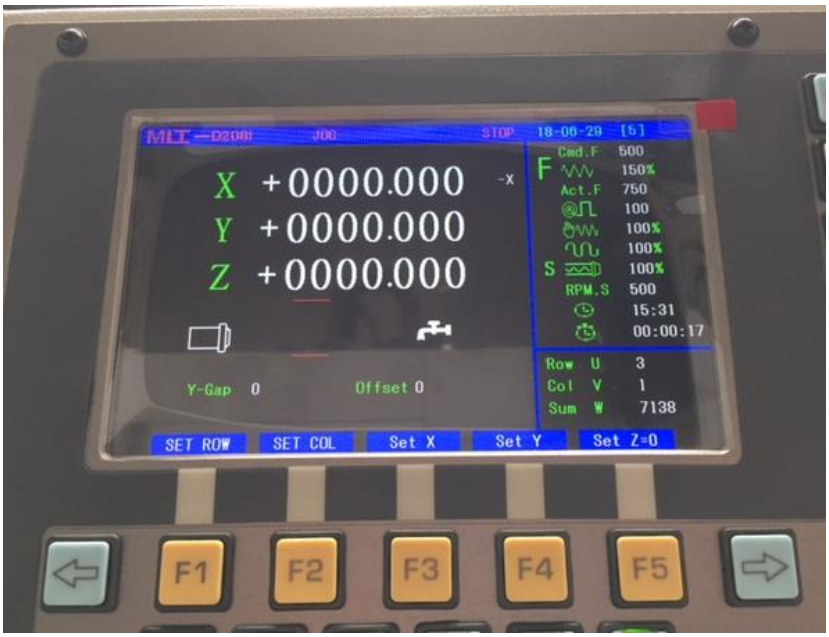


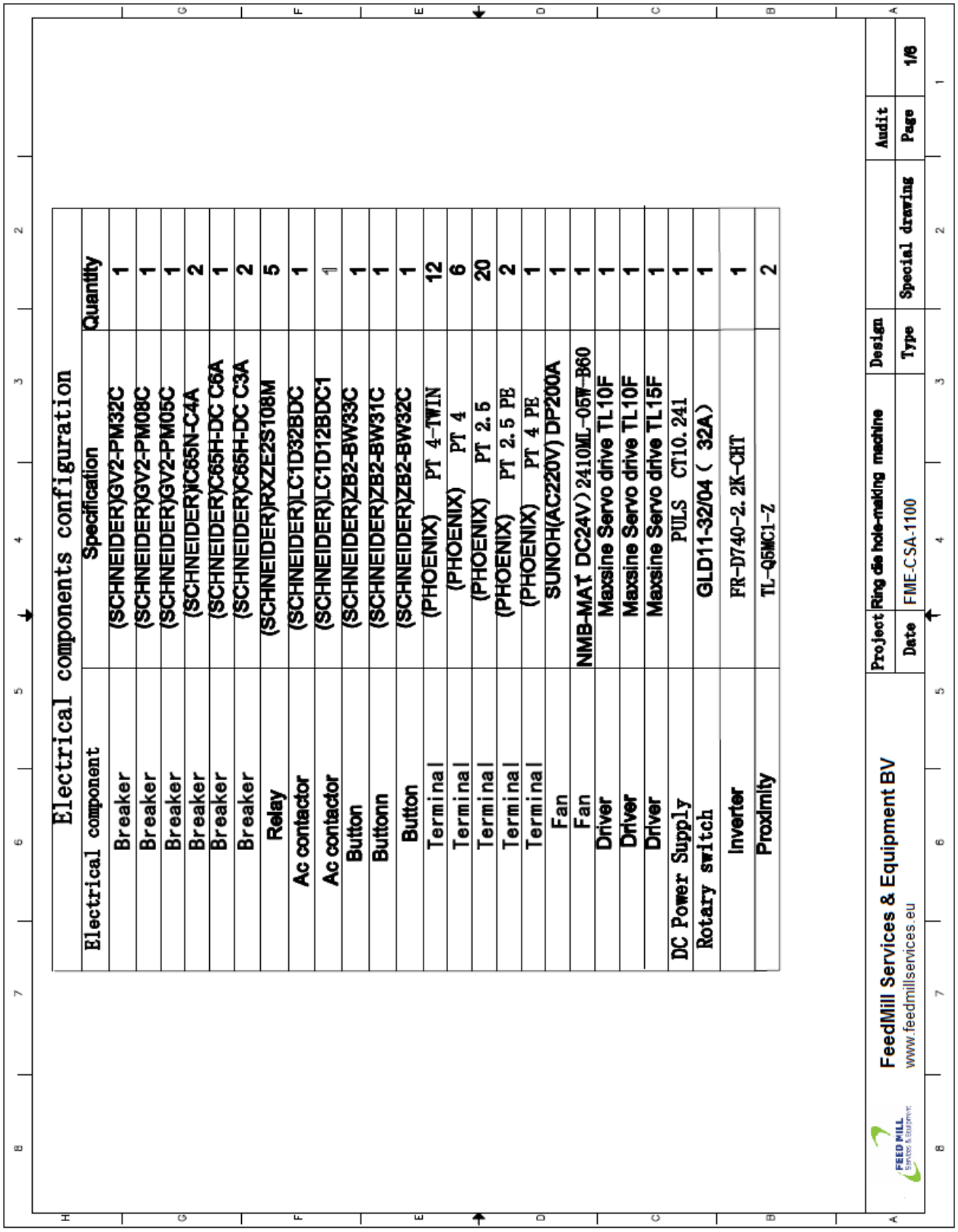
Figure 6.8
Set axes to zero

- Adjust row distance (can during the process
  - Press ‘STOP’
  - Press 'HOLE'
  - Adjust the 'Hole Dis' (increase or decrease max. 0.1 mm!)
  - Press 'RUN' to restart the cycle

- Switch Off
  - Press the 'Power Off' button
  - Turn the Main Switch to "Off"

- Additional functions
  - Press ‘COOL’ (to turn the cooling on or off)
  - In 'Alarm' press 'Reset' (to reset the alarm)

7. ELECTRICAL DIAGRAM



Electrical components configuration

Electrical component	Specification	Quantity
Breaker	(SCHNEIDER)GV2-PM32C	1
Breaker	(SCHNEIDER)GV2-PM08C	1
Breaker	(SCHNEIDER)GV2-PM05C	1
Breaker	(SCHNEIDER)iC65N-C4A	2
Breaker	(SCHNEIDER)C65H-DC C6A	1
Breaker	(SCHNEIDER)C65H-DC C3A	2
Relay	(SCHNEIDER)RXZE2S108M	5
Ac contactor	(SCHNEIDER)LC1D32BDC	1
Ac contactor	(SCHNEIDER)LC1D12BDC1	1
Button	(SCHNEIDER)ZB2-BW33C	1
Buttonn	(SCHNEIDER)ZB2-BW31C	1
Button	(SCHNEIDER)ZB2-BW32C	1
Terminal	(PHOENIX) PT 4-TWIN	12
Terminal	(PHOENIX) PT 4	6
Terminal	(PHOENIX) PT 2.5	20
Terminal	(PHOENIX) PT 2.5 PE	2
Terminal	(PHOENIX) PT 4 PE	1
Fan	SUNOH(AC220V) DP200A	1
Fan	NMB-MAT DC24V) 2410ML-05W-B60	1
Driver	Maxsine Servo drive TL10F	1
Driver	Maxsine Servo drive TL10F	1
Driver	Maxsine Servo drive TL15F	1
DC Power Supply	PULS CT10.241	1
Rotary switch	GLD11-32/04 (32A)	1
Inverter	FR-D740-2.2K-CHT	1
Proximity	TL-Q5MC1-Z	2

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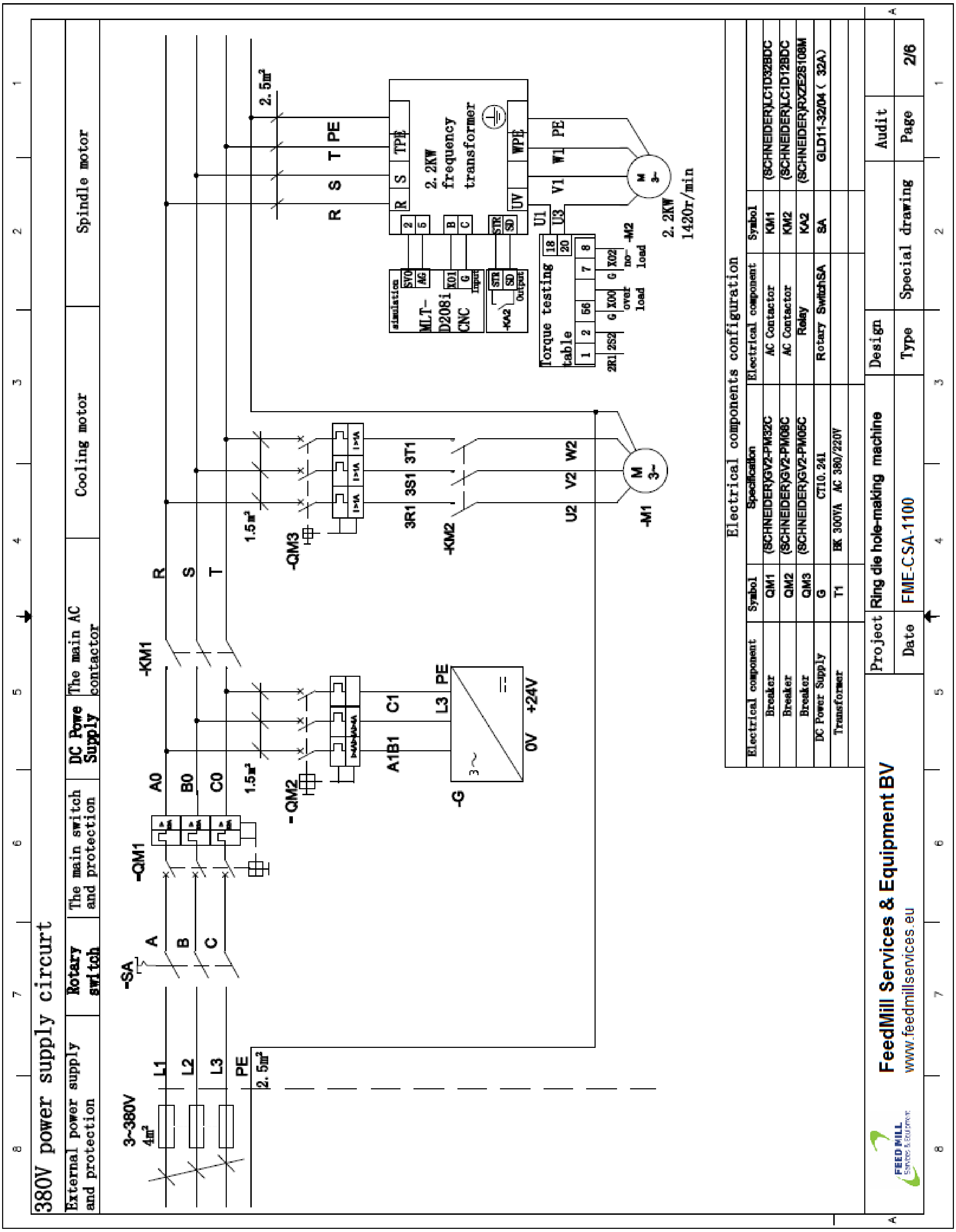
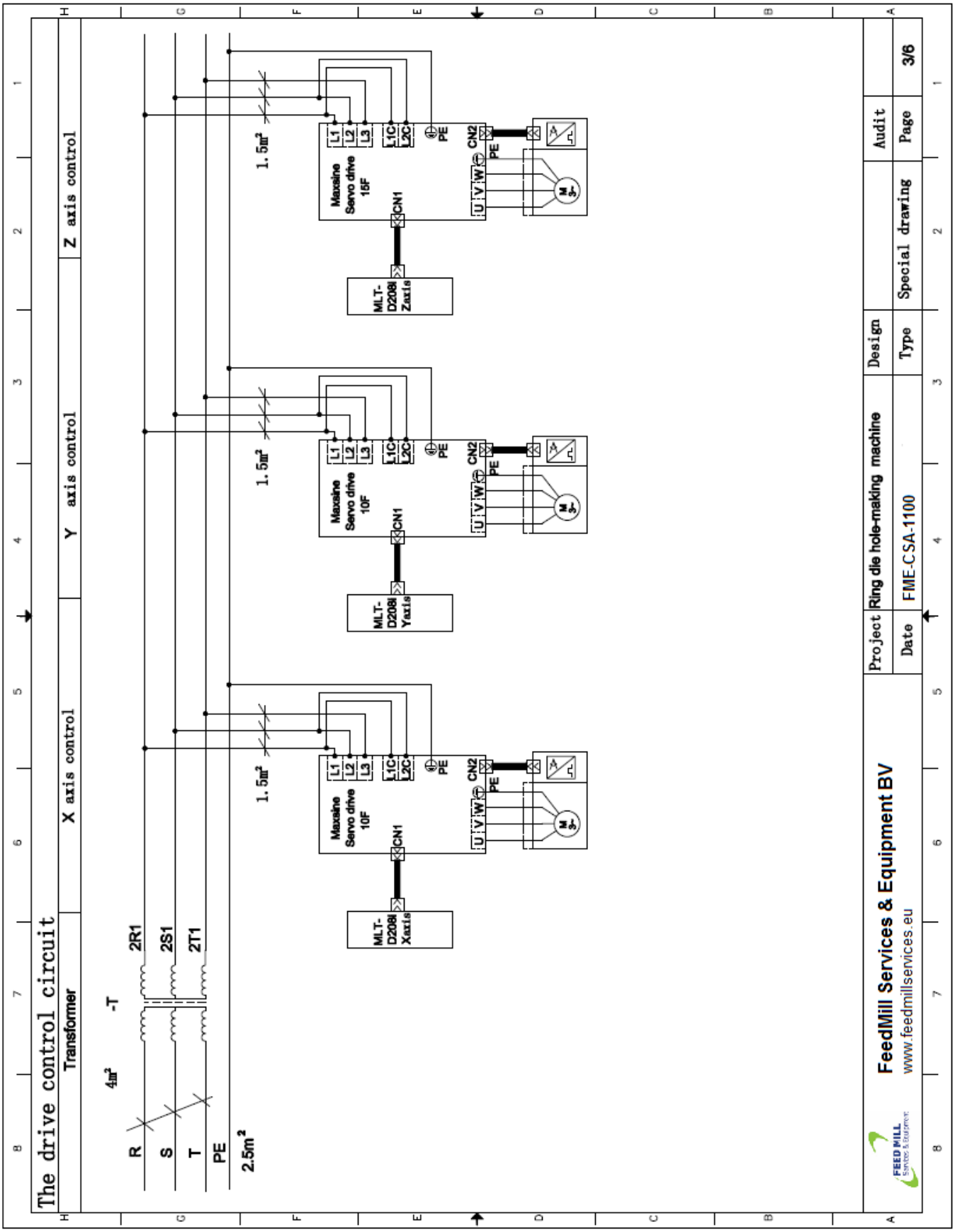
Project	Ring die hole-making machine	Design		Audit	
Date	FME-CSA-1100	Type	Special drawing	Page	1/6



Electrical component	Symbol	Specification	Electrical component	Symbol	Specification
Breaker	QM1	(SCHNEIDER)GV2-PM32C	AC Contactor	KM1	(SCHNEIDER)LC1D32BDC
Breaker	QM2	(SCHNEIDER)GV2-PM08C	AC Contactor	KM2	(SCHNEIDER)LC1D12BDC
Breaker	QM3	(SCHNEIDER)GV2-PM05C	Relay	KA2	(SCHNEIDER)RXZE2S108M
DC Power Supply	G	CT10.241	Rotary SwitchSA	SA	GLD11-32/04 (32A)
Transformer	T1	BK 300VA AC 380/220V			


The drive control circuit
Transformer
X axis control
Y axis control
Z axis control
-T
4m²
2R1
2S1
2T1
R
S
T
PE
2.5m²
1.5m²
Maxaine Servo drive 10F
Maxaine Servo drive 15F
MLT-D208I Xaxis
MLT-D208I Yaxis
MLT-D208I Zaxis
L1
L2
L3
L1C
L2C
PE
CN1
CN2
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V
W
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Ring die hole-making machine
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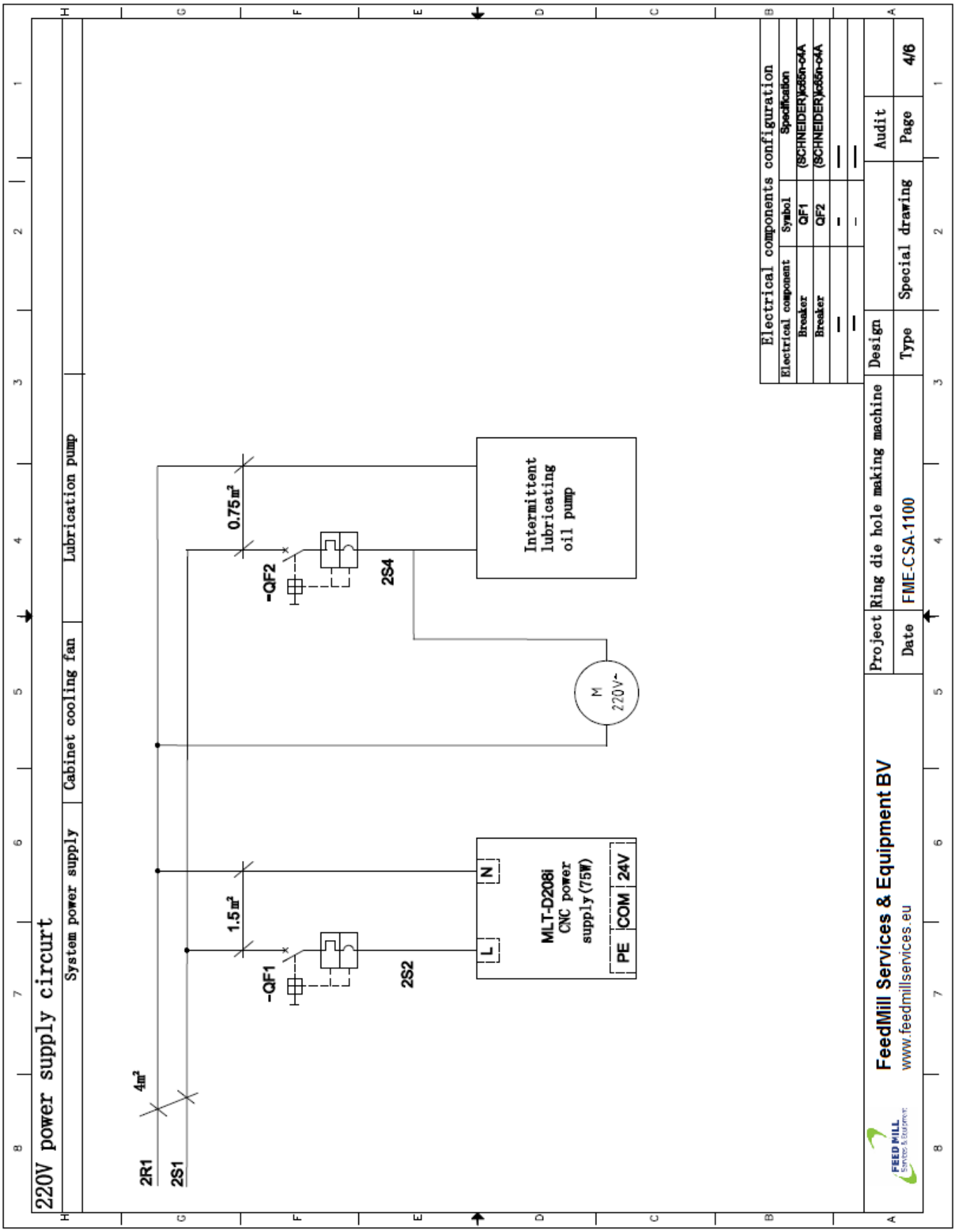
220V power supply circuit
System power supply
Cabinet cooling fan
Lubrication pump
Electrical components configuration
Electrical component
Symbol
Specification
Breaker
QF1
(SCHNEIDER)iC65n-C4A
Breaker
QF2
(SCHNEIDER)iC65n-C4A
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2R1
2S1
1.5m²
-QF1
2S2
0.75m²
-QF2
2S4
MLT-D208i
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Intermittent
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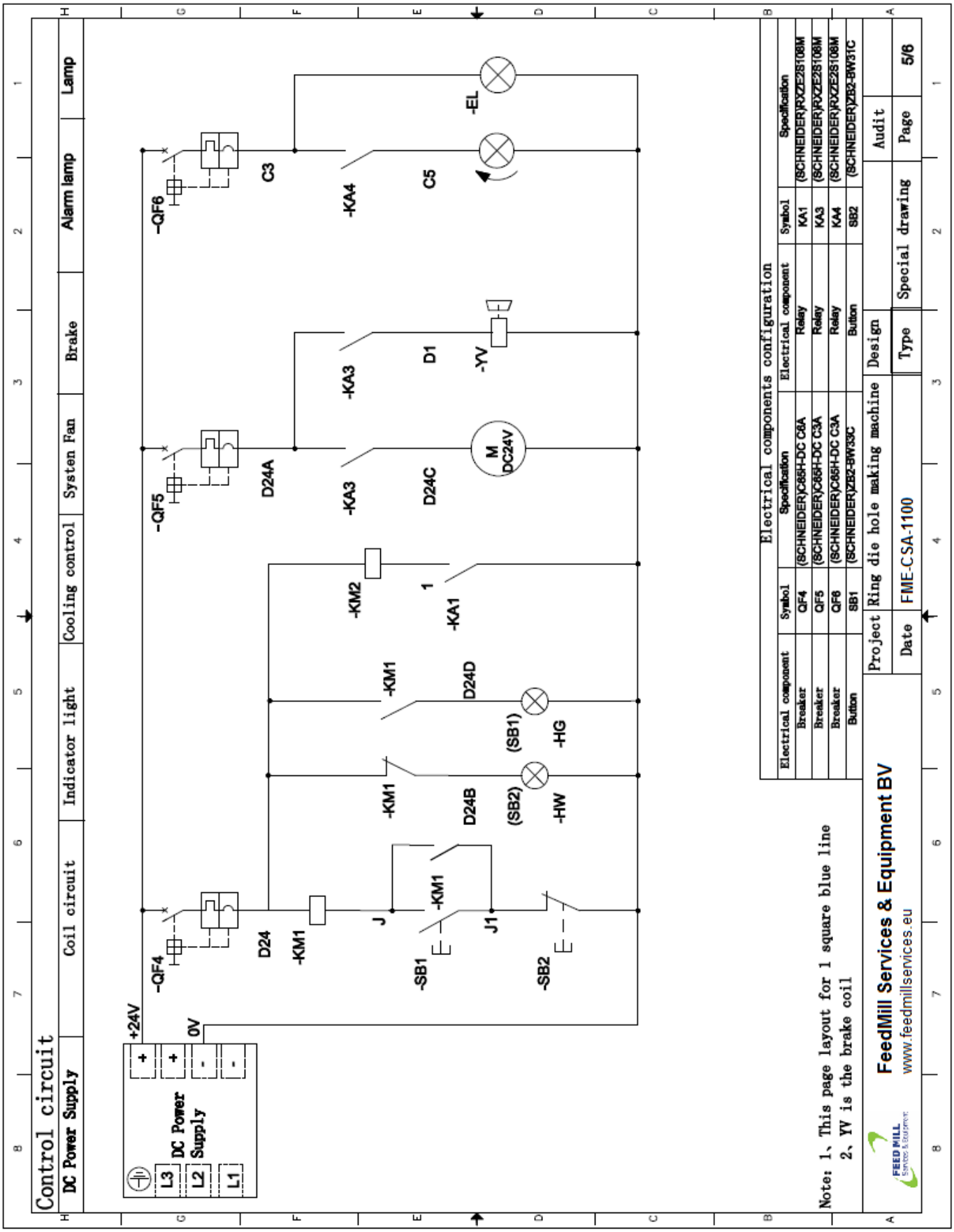
oil pump


Control circuit
DC Power Supply
Coil circuit
Indicator light
Cooling control
Systen Fan
Brake
Alarm lamp
Lamp
+24V
0V
DC Power Supply
L3
L2
L1
-QF4
-QF5
-QF6
D24
D24A
C3
-KM1
-KM2
-KA1
-KA3
-KA4
J
J1
D1
C5
-SB1
-SB2
-YV
-EL
D24B
D24C
D24D
(SB1)
(SB2)
-HG
-HW
M
DC24V
Electrical components configuration
Electrical component
Symbol
Specification
Breaker
QF4
(SCHNEIDER)C65H-DC C6A
Breaker
QF5
(SCHNEIDER)C65H-DC C3A
Breaker
QF6
(SCHNEIDER)C65H-DC C3A
Button
SB1
(SCHNEIDER)ZB2-BW33C
Relay
KA1
(SCHNEIDER)RXZE2S108M
Relay
KA3
(SCHNEIDER)RXZE2S108M
Relay
KA4
(SCHNEIDER)RXZE2S108M
Button
SB2
(SCHNEIDER)ZB2-BW31C
Project
Ring die hole making machine
Design
Audit
Date
FME-CSA-1100
Type
Special drawing
Page
5/6
Note: 1、This page layout for 1 square blue line
2、YV is the brake coil
FeedMill Services & Equipment BV
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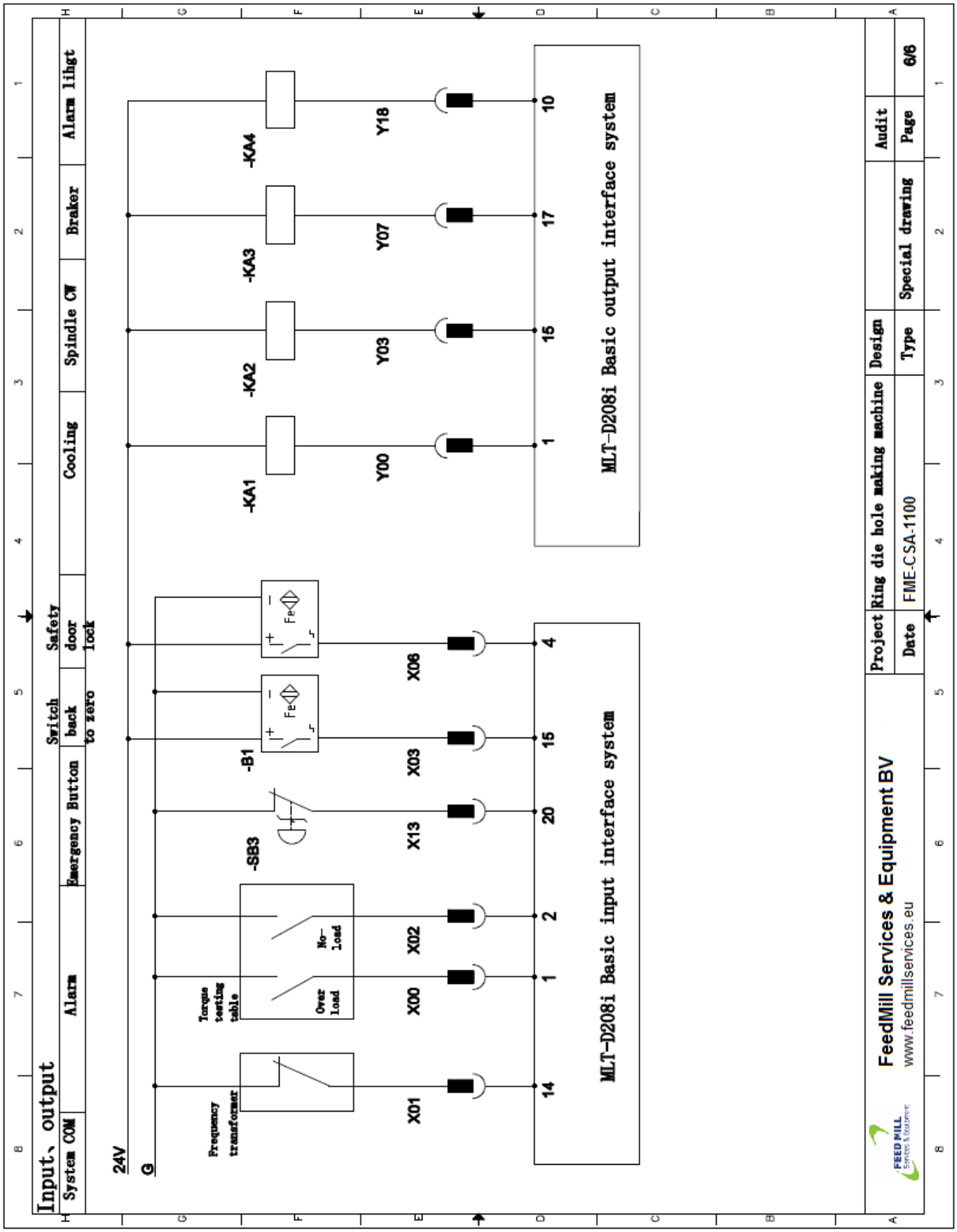
Input、output
System COM
Alarm
Emergency Button
Switch back to zero
Safety door lock
Cooling
Spindle CW
Braker
Alarm lihgt
24V
G
Frequency transformer
Torque testing table
Over Load
No-load
-SB3
-B1
X01
X00
X02
X13
X03
X06
14
1
2
20
15
4
MLT-D208i Basic input interface system
-KA1
-KA2
-KA3
-KA4
Y00
Y03
Y07
Y18
1
15
17
10
MLT-D208i Basic output interface system
Project
Ring die hole making machine
Design
Audit
Date
FME-CSA-1100
Type
Special drawing
Page
6/6
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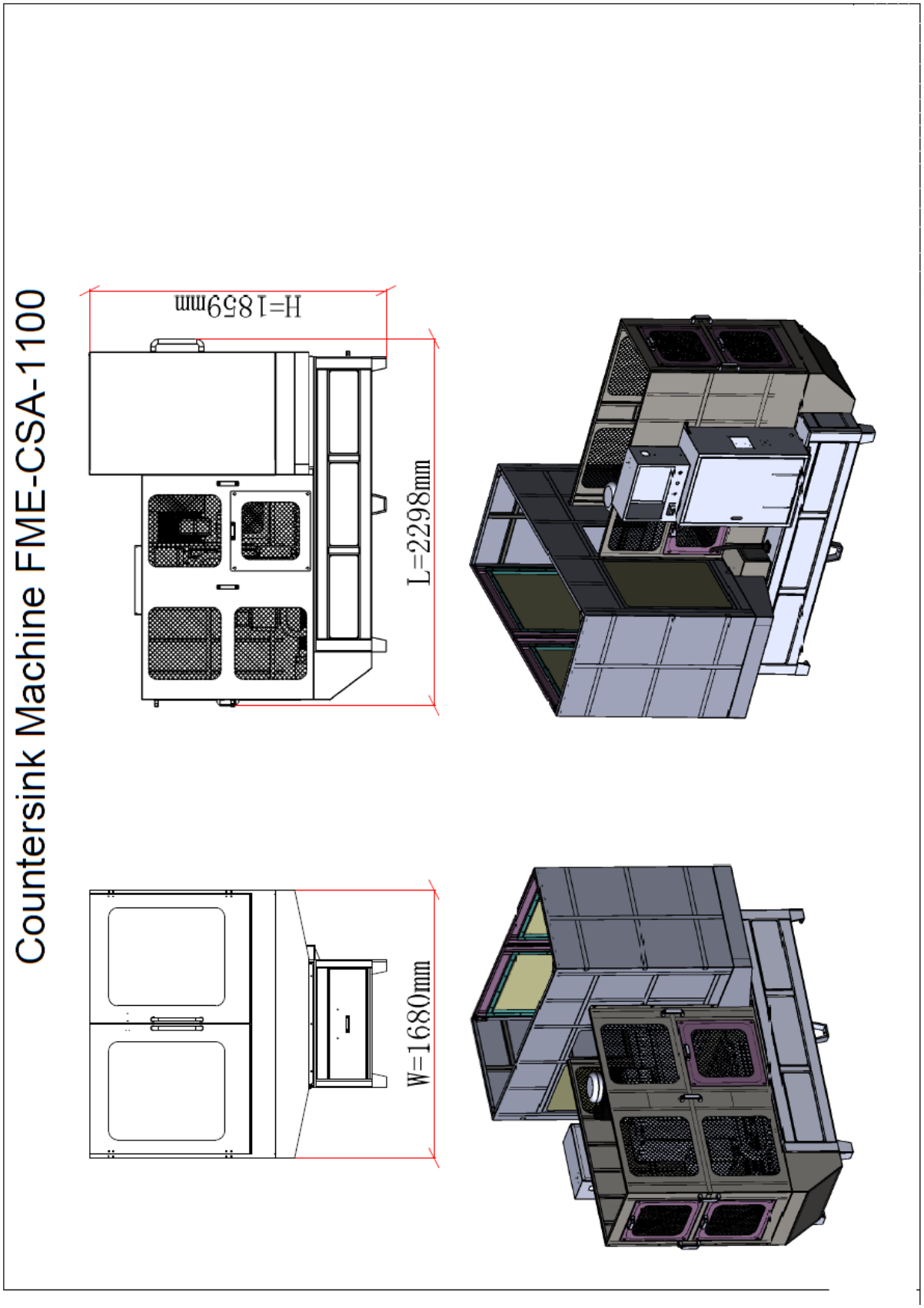
8. DIMENSIONS MACHINE



9. EC-DECLARATION OF CONFORMITY

This Declaration of conformity and the CE marking on the type plate are valid for the countersink machine which is part of the Feed Mill Services & Equipment BV delivery. When this countersink machine is built into a larger system, the manufacturer of this system (this can also be the operator) must carry out the conformity review process for this large system according to machinery Directive 2006/42/EC, the Declaration of Conformity and provide the system with the CE marking.

CE

We

Feed Mill Services & Equipment BV
Dr. Van Doorneweg 38
5753 PM DEURNE
The Netherlands

Declaring that countersink machine FME-CSA-1100,

In accordance with the EU Directives:
- “Machines” 2006/42/EC

Is designed and manufactured to the following standards:

- NEN-EN-ISO 12100-1/-2	Safety of Machinery – General Design Principles, Part 1 and 2
- NEN-EN-ISO 13857	Safety of Machinery – Safety distances to prevent hazard zones being reached by upper and lower limbs
- NEN-EN 349+A1	Safety of Machinery – Minimum gaps to avoid crushing of parts of the human body

Manufacturer

Mr. Frank Voss
Managing Director

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