FEED MILL
Services & Equipment

USER MANUAL

CNC GRINDING PELLET DIE MACHINE
FME-GPDM-1500

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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: May 2018

1.1 Machinery Information

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

This CNC grinding pellet die machine, FME-GPDM-1500, is produced by:

FEED MILL SERVICES & EQUIPMENT BV

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

1.2 IIB-Marking

The grinding 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 grinding 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 grinding 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 galvanizing 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 grinding 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

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 galvanizing 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 ± 15000 kg can carry
- a required floor space of ± 3 x 2,5 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 8500 kg.
See figure 3.1.1 Below of how the machine can be picked up.

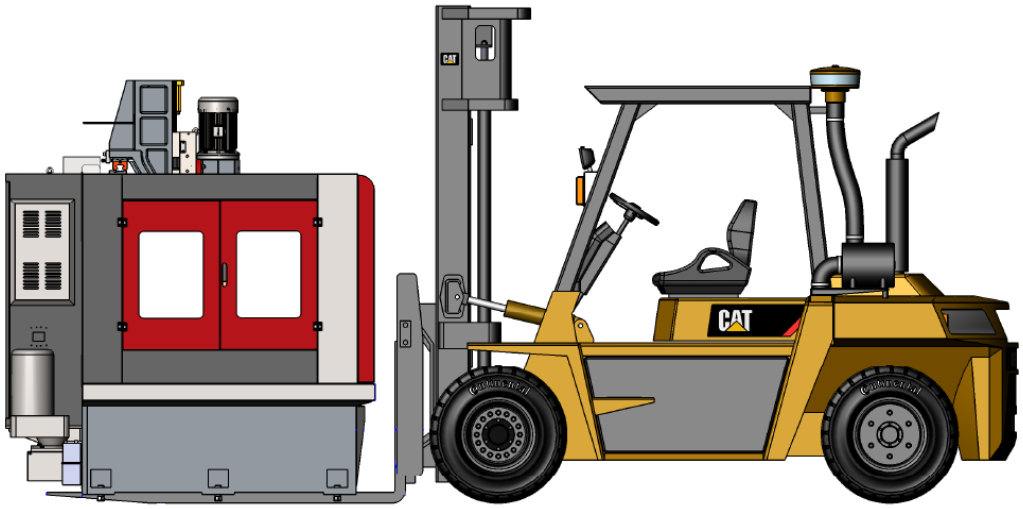


Figure 3.1.1
Picking up with a forklift

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
- Install the conveyor
- Connect the cooling pump
- Unscrew the control box arm, extend and tighten again (see figure 3.2.1)
- Mount the control box on the arm (see figure 3.2.2)
- Carry out the control box and connect the cables (see figure 3.2.3)
- Extend the door locking cables to the control box (see figure 3.2.4)
- Connect door locking cables in the control box (see figure 3.2.5 and 3.2.6)
- Connect voltage cables in the control box (see figure 3.2.7)
- Mount the lamp (see figure 3.2.8)
- Mount the servomotor and connect the plugs (see figure 3.2.9 and 3.2.10)
- Remove the X-axis support (see figure 3.2.11)
- Place the harmonica at the Z-axis
- Mount the cable chain (support) in the right place on the Z-axis (see figure 3.2.12)
- Connect Z-axis lubrication (see figure 3.2.12)
- Place the Z-axis sensor back in the right place
- Dismantle the support of the chucks (see figure 3.2.13 and 3.2.14)
- Switch on the machine (see chapter 6 on page 22)
- Steer the Z-axis upwards
- Remove the wooden block (see Figure 3.2.15)

Figure 3.2.1
Control box arm

Figure 3.2.2
Control box

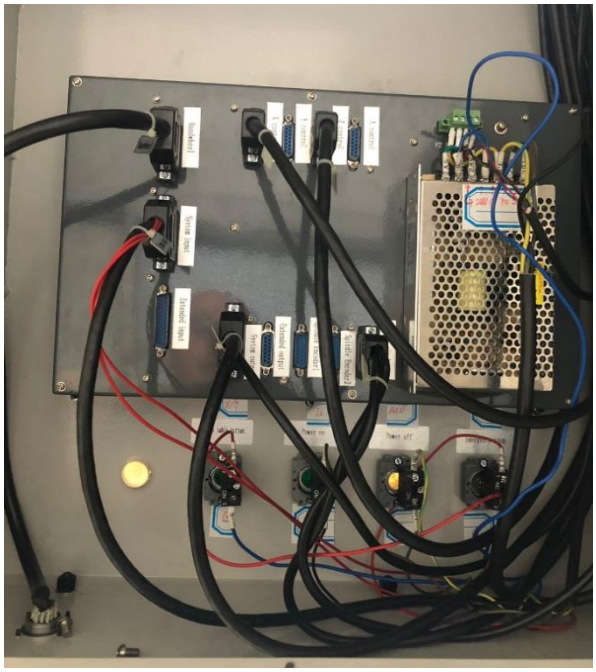


Figure 3.2.3
Connection control box

Figure 3.2.4
Door locking cables

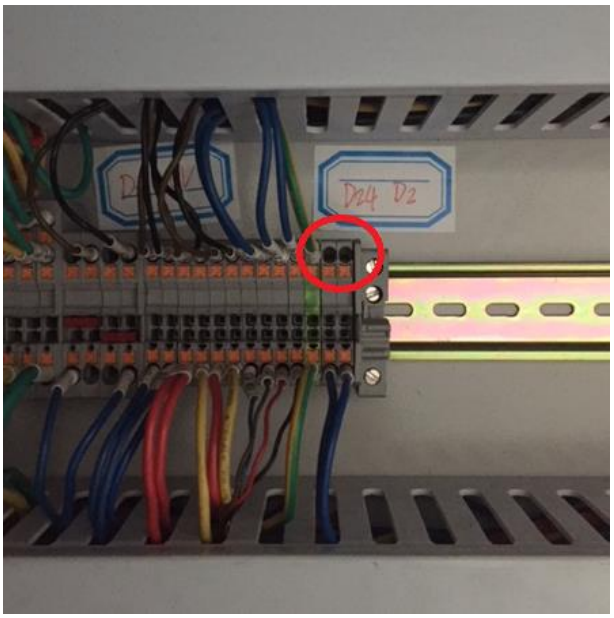


Figure 3.2.5
Connection cables

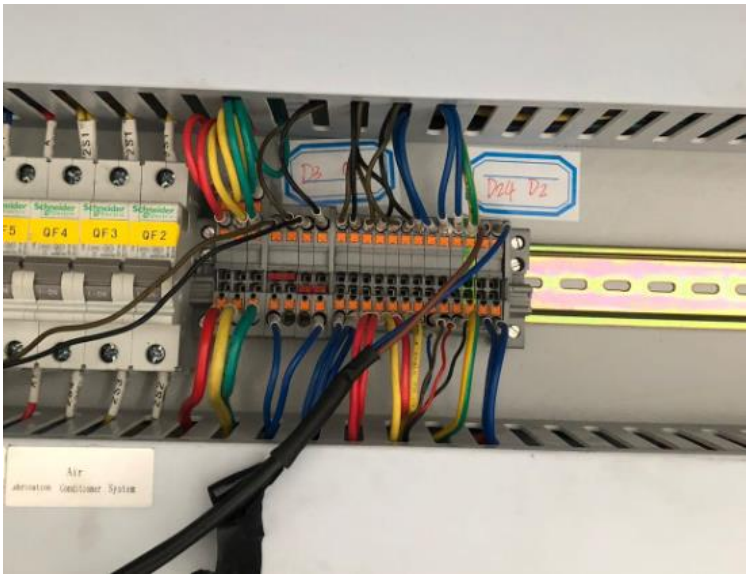


Figure 3.2.6
Connection cables

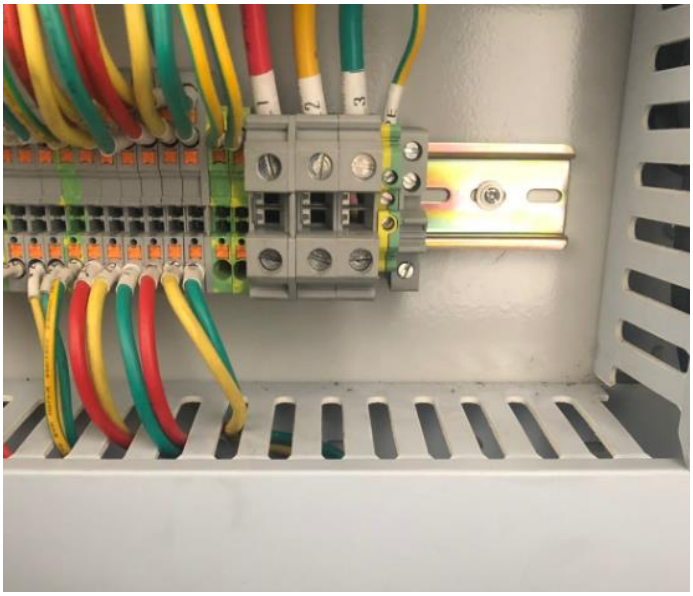


Figure 3.2.7
Connection voltage cables

Figure 3.2.8
Mount the lamp

Figure 3.2.9
Mount the servo motor

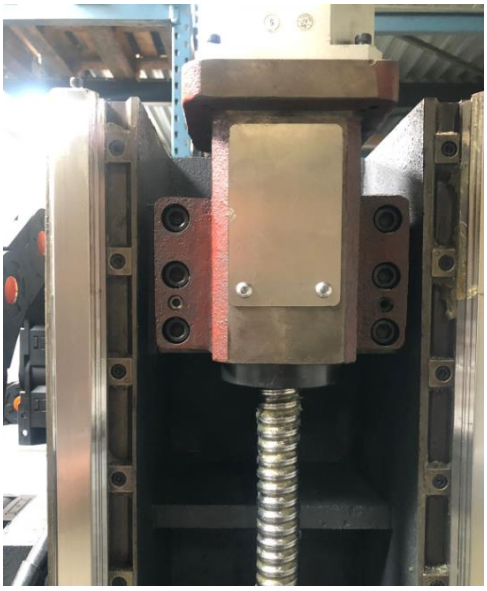


Figure 3.2.10
Mount the servo motor

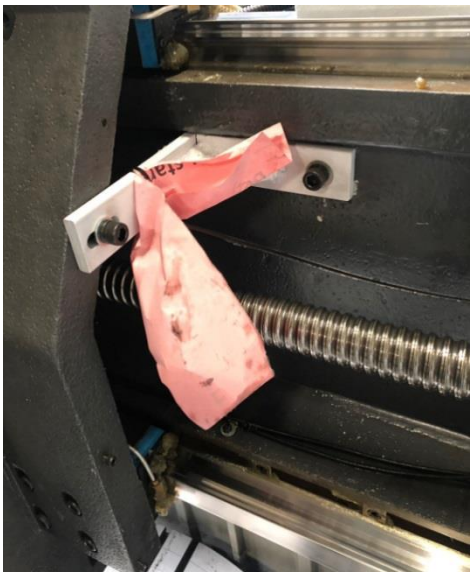


Figure 3.2.11
Removing X-axis support

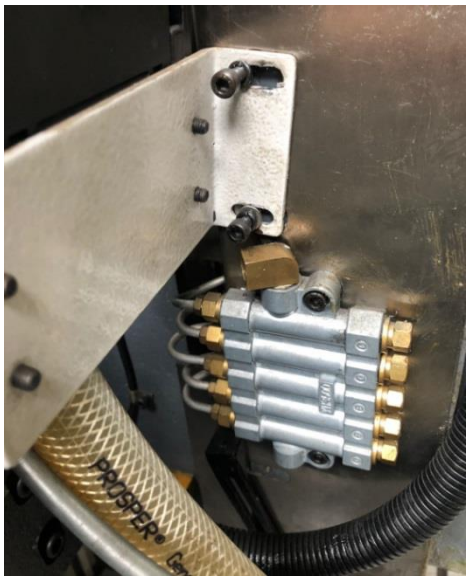


Figure 3.2.12
Mount the cable chain

Figure 3.2.13
Dismantle the support

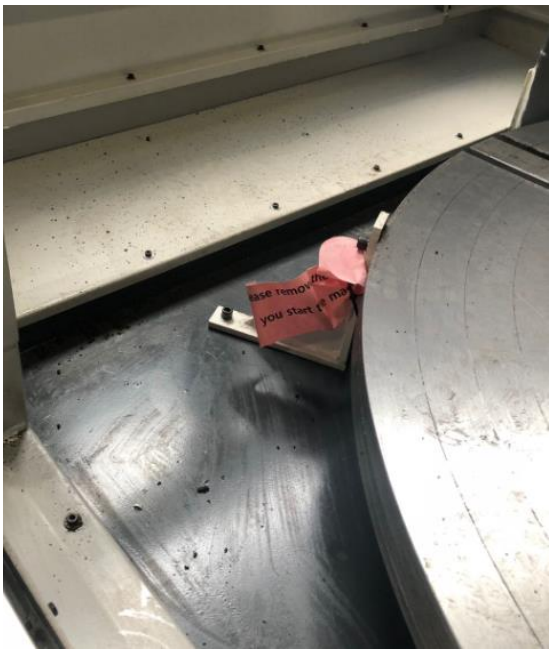


Figure 3.2.14
Dismantle the support

Figure 3.2.15
Remove wooden block

Warning!
During production, ensure that the 2 side doors (see figure 3.2.16) are locked with the corresponding key. If this isn't the case, the machine must not be started!

Figure 3.2.16
Side doors must be locked

4. SPECIFICATIONS

4.1 Machine Specifications

Machine dimensions (see chapter 8):	
Length:	± 2900 mm
Width:	± 2426 mm
Height:	± 2768 mm
Machine weight:	± 8500 kg
Spindle power:	4 kW
Wheel speed range:	1000-4000 rpm
Voltage:	3 x 400 V
Frequency:	50-60 Hz
Total power:	12.5 kW

Figure 4.1.1
Grinding Machine FME-GPDM-1500

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
Max. ring weight:	1200 kg

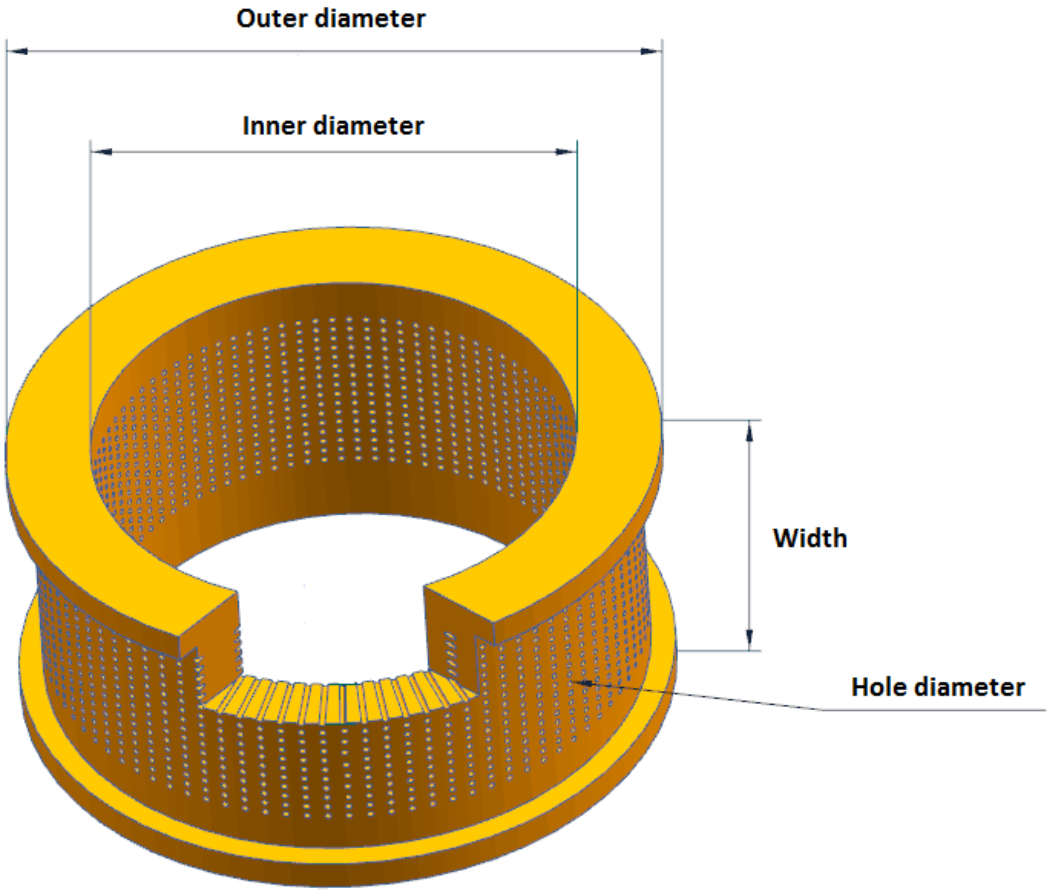


Figure 4.2.1
Example product: Ring Die

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

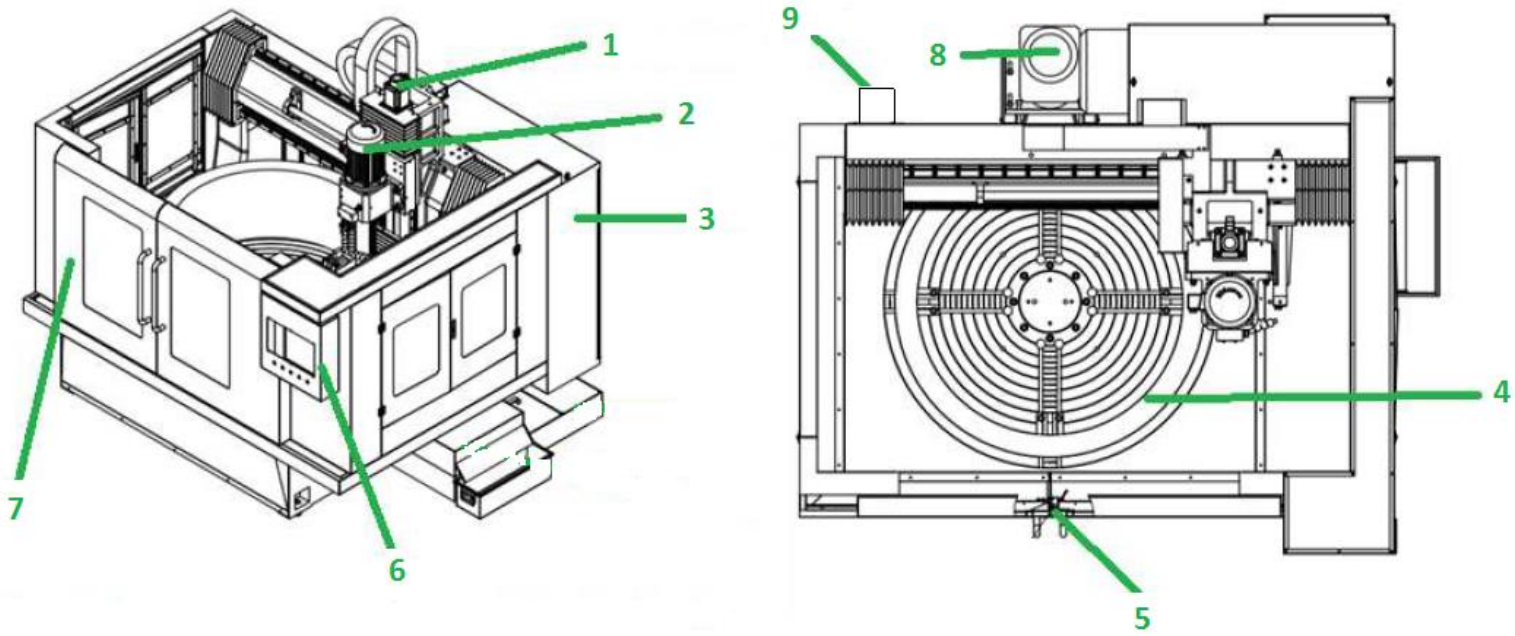


Figure 4.4.1
Grinding machine overview

1. Servomotor
2. Spindle motor
3. Control box
4. Turntable
5. Magnetic safety switch
6. Display
7. Machine tool cover
8. Servomotor turntable
9. Automatic lubrication system

5. MAINTENANCE AND REPAIR

5.1 Introduction

The appropriate maintenance is important for a long life of the grinding 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 grinding 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 grinding machine. Do not use any cleaning agents that affect the parts and/or cause corrosion.

5.3 Maintenance Instructions

Daily maintenance:

- Completely check the business situation of the machine, for the lubrication system of the conduction rails and the screw mandrel
- Removing the chips from the inside of the machine
- Control of the 3 indicator lights on the hydraulic device. When the red light is on, this means that the filter device is dirty and it needs to be cleaned
- Check the oil level on the hydraulic device and fill if necessary, otherwise this will cause insufficient pressure. The pressure can be set via the hydraulic device
- Check the rotary knob position to turn on the hydraulic pressure. When the knob is in a vertical position, it means that the electric machine delivers hydraulic pressure to two tubes
When the knob is in horizontal position, this means that the electric machine delivers hydraulic pressure to a single tube
- Check the indicator light of pumping oil. The yellow light of the sensor switch is not visible when the oil level is above or below the limit. In This situation, you should inspect and repair the fault to avoid an alarm
- Check the filter paper and replace it on time
- Check the temperature status of the air

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). The lubrication time is itself in the drawers by means of the pump knob. Recommended: Lubrication cycle of 200 min and lubrication time is 10 sec. per cycle.

- 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

Figure 6.1
Grinding wheel

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

- Refer
  - Press ‘ZRN’
  - Press ‘1’ → ‘Enter’
  - Press ‘2’ → ‘Enter’

- Bring grinding wheel in die
  - Press ‘JOG’ → -X (see figure 6.1)

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

Figure 6.2
Machine parameters

- ‘Z-Dir feed’ = Feed speed in Z (between 200-300)
- ‘Start PosX’ = Start position in X → 0 → ‘Enter’ (see figure 6.3)
- ‘Grind 1stX’ = The height of the first grinding (see A in figure 6.3)
- ‘GrindHeight’ = The height of the total grinding (see D in figure 6.3) → see following formula:
  (Working surface – grinding wheel height)
  - Working surface = to grind surface
- ‘GrindThickX’ = Tape thickness per side (see C in figure 6.3)
- ‘Per grindX’ = The thickness of each grinding (see B in figure 6.3)
- ‘ZSafeHeight’ = Safety height of Z axis
- ‘SafetyPos-X’ = The safe position of the X- axis
- ‘WheelSpeedS’ = Grinding wheel rotation speed
- ‘X approachF’ = Approaching velocity in the direction of X axis
- ‘Ring-dieSpd’ = Ring die rotation speed

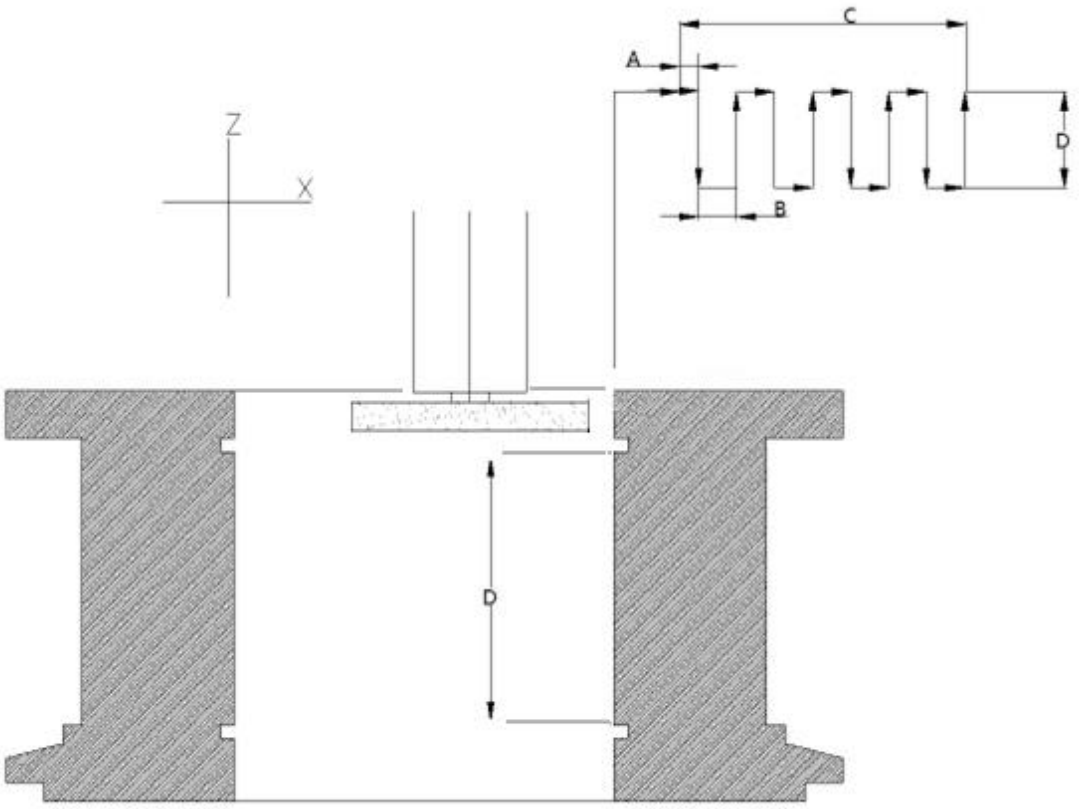


Figure 6.3
Grinding cycle (example)

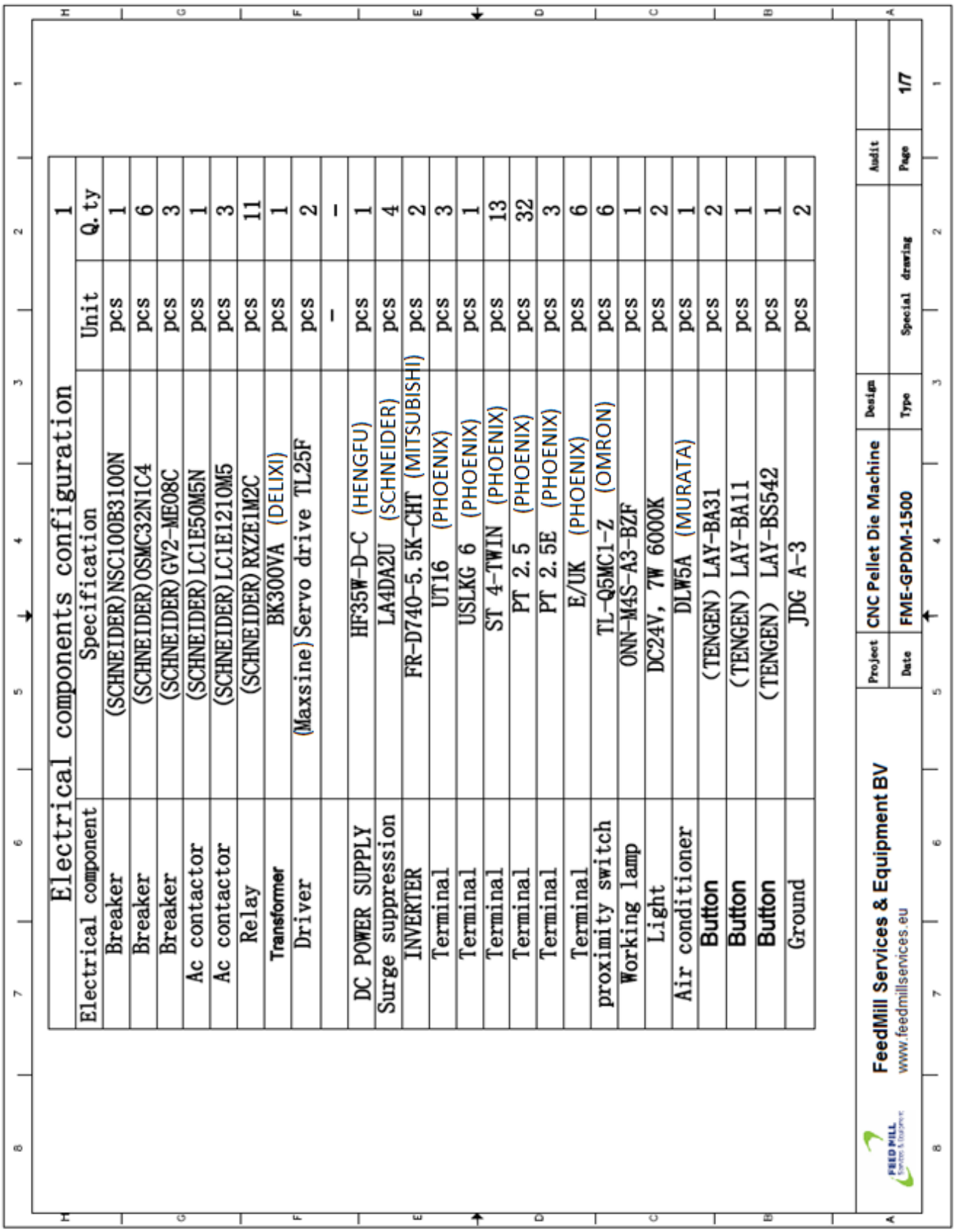
- To set zero point
  - Find zero point
  - Press ‘POS’
  - Press ‘MPG’
  - Press ‘F1’ → 3 → 0 → Enter (to make the position 0, see figure 6.4)
    → 4 → 0 → Enter (to make the position 0, see figure 6.4)
  - Close the doors
  - Press ‘Assit-Lock’ (to lock the doors)
  - Press ‘MEM’
  - Press ‘RUN’ and hold (to start the cycle)
    - Use 'STOP' to pause the cycle, so that parameters can be set differently
    - Use 'RUN' and hold to restart the cycle

Figure 6.4
Set zero point

- 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 — 1

Electrical component	Specification	Unit	Q.ty
Breaker	(SCHNEIDER) NSC100B3100N	pcs	1
Breaker	(SCHNEIDER) OSMC32N1C4	pcs	6
Breaker	(SCHNEIDER) GV2-ME08C	pcs	3
Ac contactor	(SCHNEIDER) LC1E50M5N	pcs	1
Ac contactor	(SCHNEIDER) LC1E1210M5	pcs	3
Relay	(SCHNEIDER) RXZE1M2C	pcs	11
Transformer	BK300VA (DELIXI)	pcs	1
Driver	(Maxsine) Servo drive TL25F	pcs	2
		-	-
DC POWER SUPPLY	HF35W-D-C (HENGFU)	pcs	1
Surge suppression	LA4DA2U (SCHNEIDER)	pcs	4
INVERTER	FR-D740-5.5K-CHT (MITSUBISHI)	pcs	2
Terminal	UT16 (PHOENIX)	pcs	3
Terminal	USLKG 6 (PHOENIX)	pcs	1
Terminal	ST 4-TWIN (PHOENIX)	pcs	13
Terminal	PT 2.5 (PHOENIX)	pcs	32
Terminal	PT 2.5E (PHOENIX)	pcs	3
Terminal	E/UK (PHOENIX)	pcs	6
proximity switch	TL-Q5MC1-Z (OMRON)	pcs	6
Working lamp	ONN-M4S-A3-BZF	pcs	1
Light	DC24V, 7W 6000K	pcs	2
Air conditioner	DLW5A (MURATA)	pcs	1
Button	(TENGEN) LAY-BA31	pcs	2
Button	(TENGEN) LAY-BA11	pcs	1
Button	(TENGEN) LAY-BS542	pcs	1
Ground	JDG A-3	pcs	2

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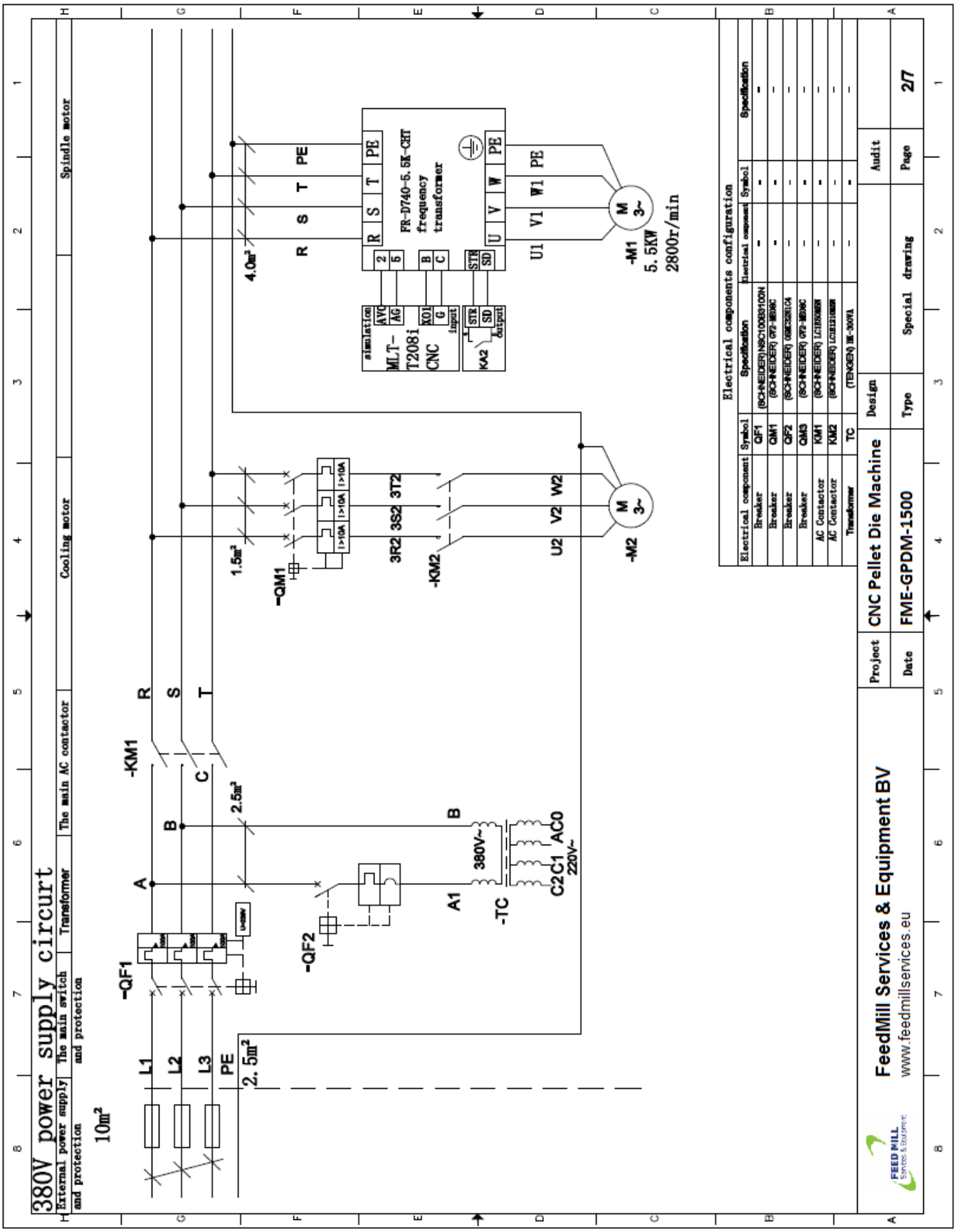
380V power supply circurt
External power supply and protection
10m²
The main switch and protection
Transformer
The main AC contactor
Cooling motor
Spindle motor
-QF1
-KM1
-QF2
-TC
-QM1
-KM2
-M1
-M2
L1
L2
L3
PE
2.5m²
1.5m²
4.0m²
10m²
380V~
220V~
FR-D740-5.5K-CHT frequency transformer
MLT-T2081 CNC
5.5KW
2800r/min
Electrical components configuration
Electrical component | Symbol | Specification | Electrial connect Symbol | Specification
Breaker | QF1 | (SCHNEIDER)NSC100B3100N | - | -
Breaker | QM1 | (SCHNEIDER) GV2-ME06C | - | -
Breaker | QF2 | (SCHNEIDER) GB2CB10C4 | - | -
Breaker | QM3 | (SCHNEIDER) GV2-ME09C | - | -
AC Contactor | KM1 | (SCHNEIDER) LC1D50A00 | - | -
AC Contactor | KM2 | (SCHNEIDER) LC1D12010B00 | - | -
Transformer | TC | (TENGEN) BK-300VA | - | -
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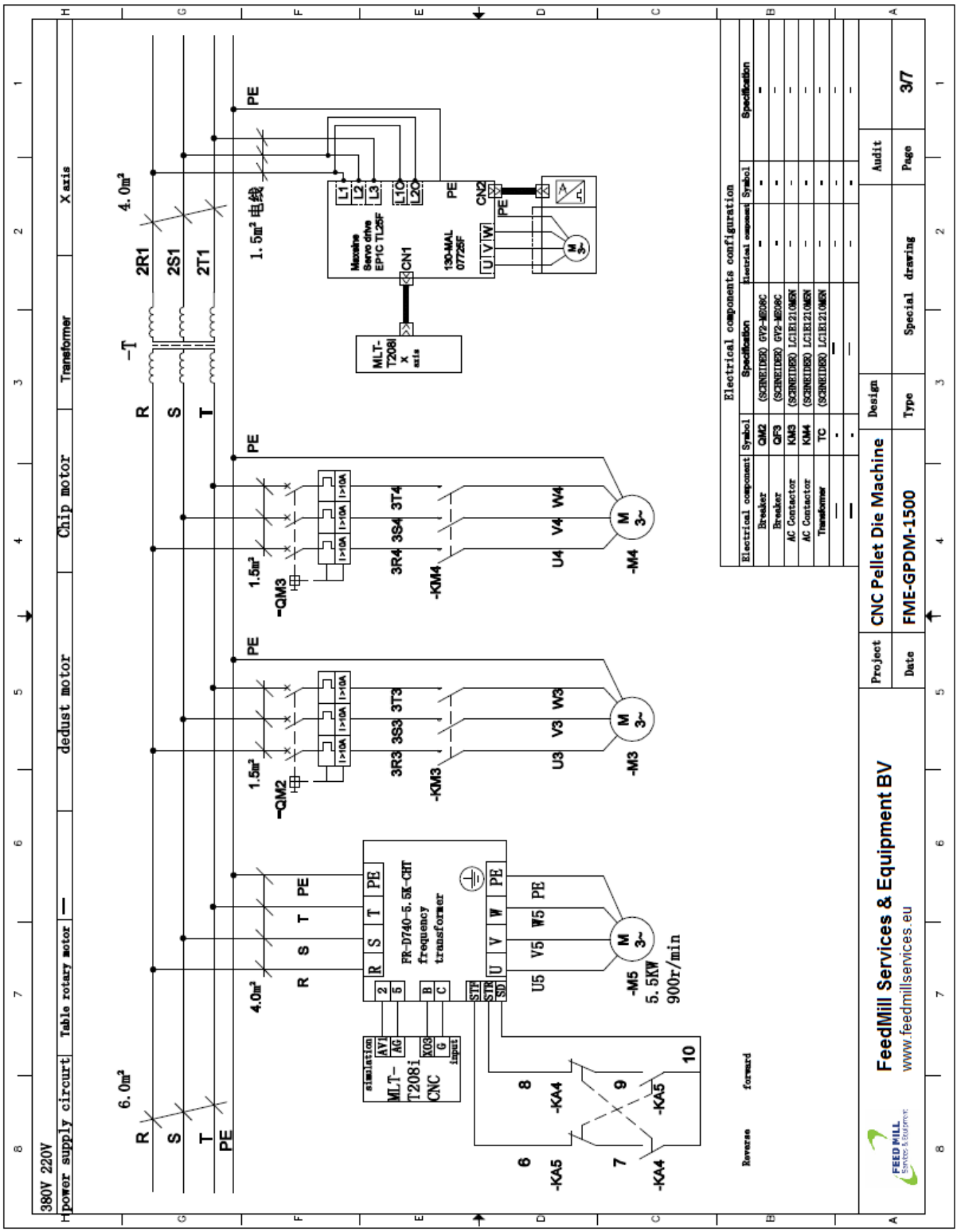
380V 220V
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Transformer
X axis
Electrical components configuration
Electrical component
Symbol
Specification
Electrical component
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QM2
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Breaker
QF3
(SCHNEIDER) GV2-ME06C
-
-
AC Contactor
KM3
(SCHNEIDER) LC1E1210M5N
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FR-D740-5.5K-CHT frequency transformer
MLT-T2081 CNC
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-QM2
-KM4
-KM3
-M4
-M3
-M5
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-KA5
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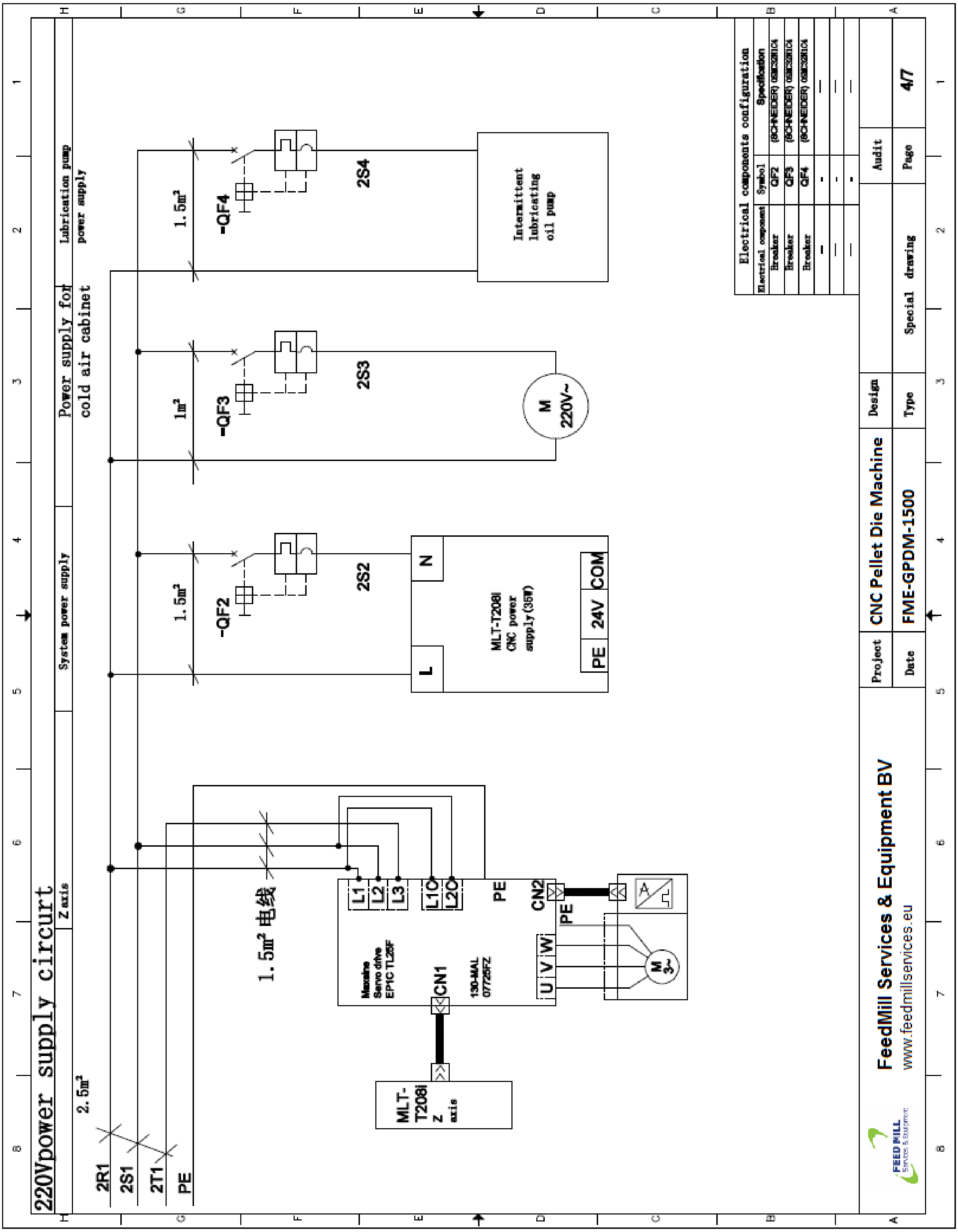

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Z axis
System power supply
Power supply for cold air cabinet
Lubrication pump power supply
2R1
2S1
2T1
PE
2.5㎡
1.5㎡ 电线
1.5㎡
1㎡
-QF2
-QF3
-QF4
2S2
2S3
2S4
L
N
PE
24V
COM
MLT-T208I CNC power supply(35W)
M 220V~
Intermittent lubricating oil pump
L1
L2
L3
L1C
L2C
PE
CN2
CN1
U
V
W
M 3~
MLT-T208I Z axis
Electrical components configuration
Electrical component
Symbol
Specification
Breaker
QF2
QF3
QF4
Project
CNC Pellet Die Machine
Date
FME-GPDM-1500
Design
Type
Special drawing
Audit
Page
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FeedMill Services & Equipment BV
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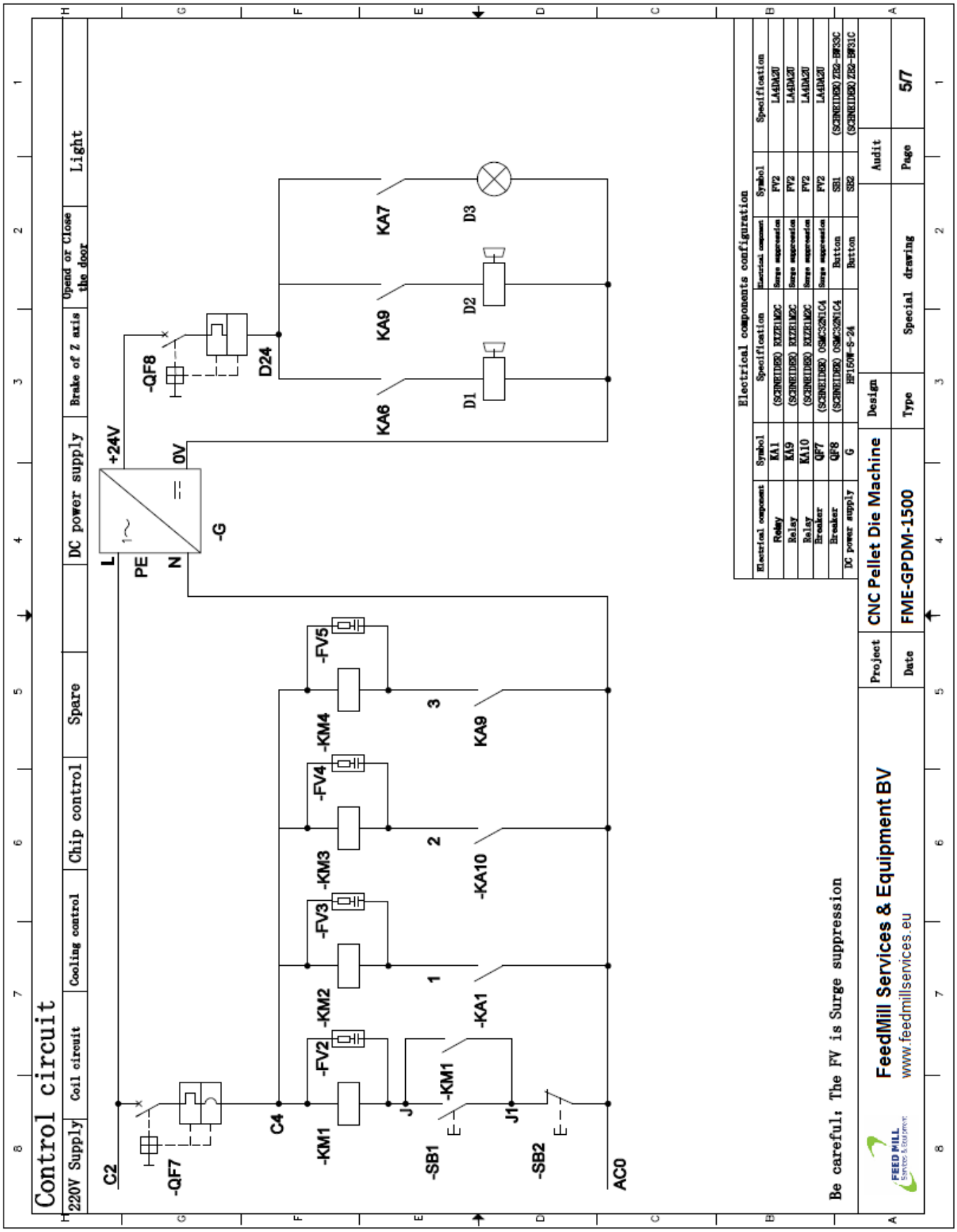
Control circuit
220V Supply
Coil circuit
Cooling control
Chip control
Spare
DC power supply
Brake of Z axis
Open or Close the door
Light
Be careful: The FV is Surge suppression
Electrical components configuration
Project
CNC Pellet Die Machine
Date
FME-GPDM-1500
Design
Type
Special drawing
Audit
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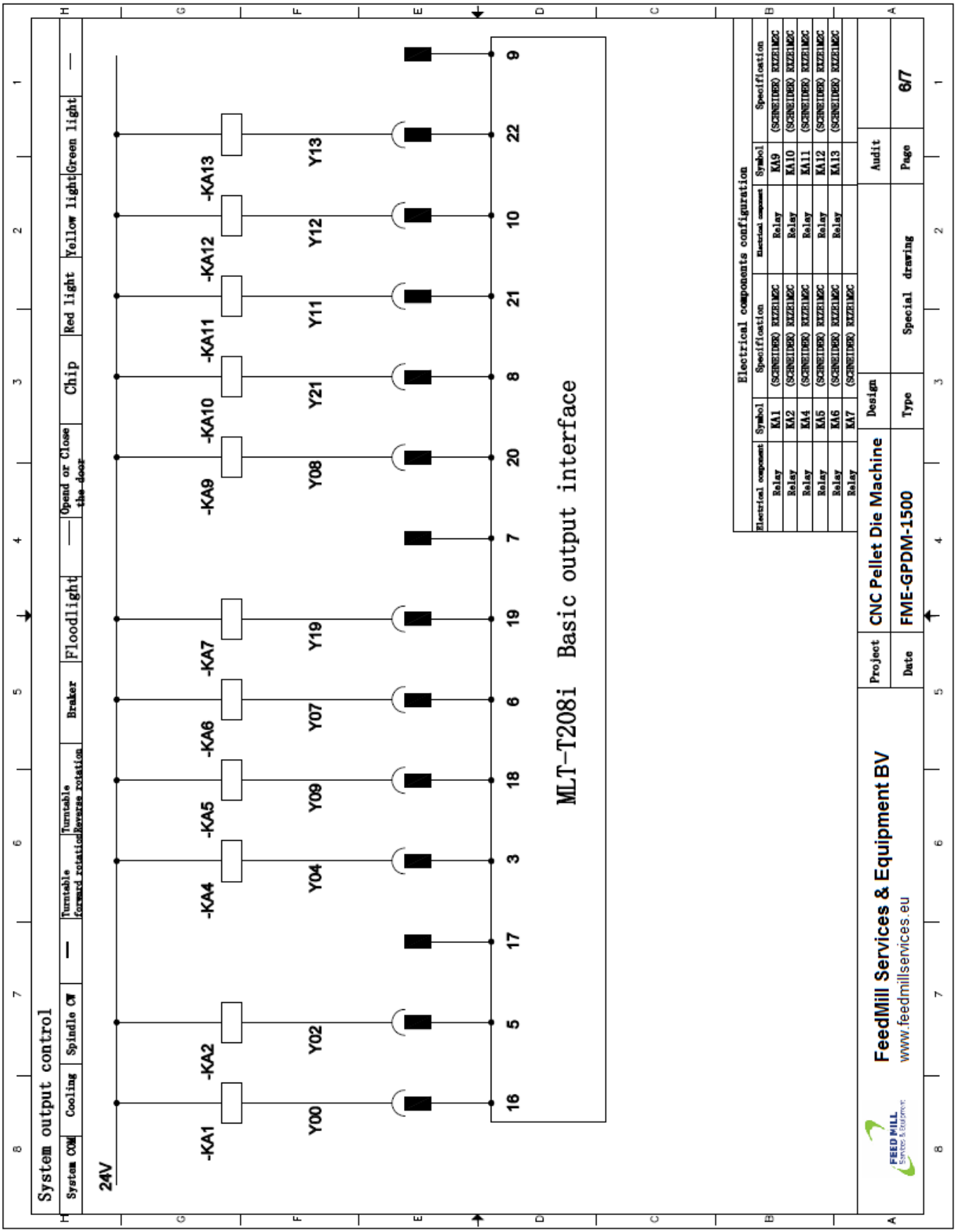
System output control
System COM
Cooling
Spindle CW
—
Turntable forward rotation
Turntable Reverse rotation
Brake
Floodlight
—
Open or Close the door
Chip
Red light
Yellow light
Green light
—
24V
-KA1
-KA2
-KA4
-KA5
-KA6
-KA7
-KA9
-KA10
-KA11
-KA12
-KA13
Y00
Y02
Y04
Y09
Y07
Y19
Y08
Y21
Y11
Y12
Y13
16
5
17
3
18
6
19
7
20
8
21
10
22
9
MLT-T208i Basic output interface
Electrical components configuration
Electrical component
Symbol
Specifiation
Electrical component
Symbol
Specifiation
Relay
KA1
(SCHNEIDER) RXZE1M2C
Relay
KA9
(SCHNEIDER) RXZE1M2C
Relay
KA2
(SCHNEIDER) RXZE1M2C
Relay
KA10
(SCHNEIDER) RXZE1M2C
Relay
KA4
(SCHNEIDER) RXZE1M2C
Relay
KA11
(SCHNEIDER) RXZE1M2C
Relay
KA5
(SCHNEIDER) RXZE1M2C
Relay
KA12
(SCHNEIDER) RXZE1M2C
Relay
KA6
(SCHNEIDER) RXZE1M2C
Relay
KA13
(SCHNEIDER) RXZE1M2C
Relay
KA7
(SCHNEIDER) RXZE1M2C
FEED MILL Services & Equipment
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Project
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Design
Audit
Date
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Type
Special drawing
Page
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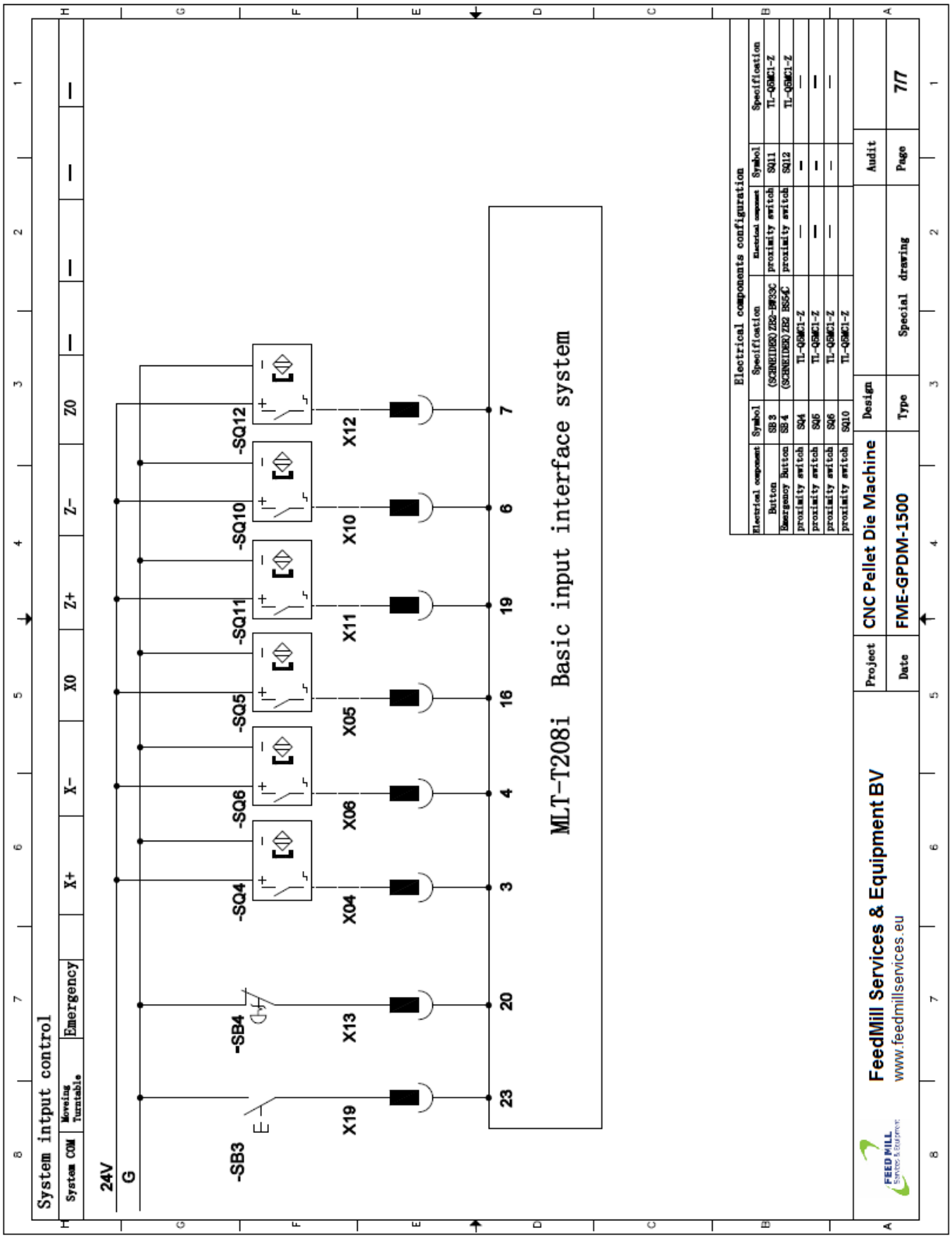
System intput control
System COM
Moveing Turntable
Emergency
X+
X-
X0
Z+
Z-
Z0
24V
G
-SB3
-SB4
-SQ4
-SQ6
-SQ5
-SQ11
-SQ10
-SQ12
X19
X13
X04
X06
X05
X11
X10
X12
23
20
3
4
16
19
6
7
MLT-T208i Basic input interface system
Electrical components configuration
Electrical component
Symbol
Specifiation
Special request
Symbol
Specifiation
Button
SB3
(SCHNEIDER)ZB2-BW33C
proximity switch
SQ11
TL-Q5MC1-Z
Emergency Button
SB4
(SCHNEIDER)ZB2 BS54C
proximity switch
SQ12
TL-Q5MC1-Z
proximity switch
SQ4
TL-Q5MC1-Z
—
—
—
proximity switch
SQ5
TL-Q5MC1-Z
—
—
—
proximity switch
SQ6
TL-Q5MC1-Z
—
—
—
proximity switch
SQ10
TL-Q5MC1-Z
Design
Audit
Project
CNC Pellet Die Machine
Type
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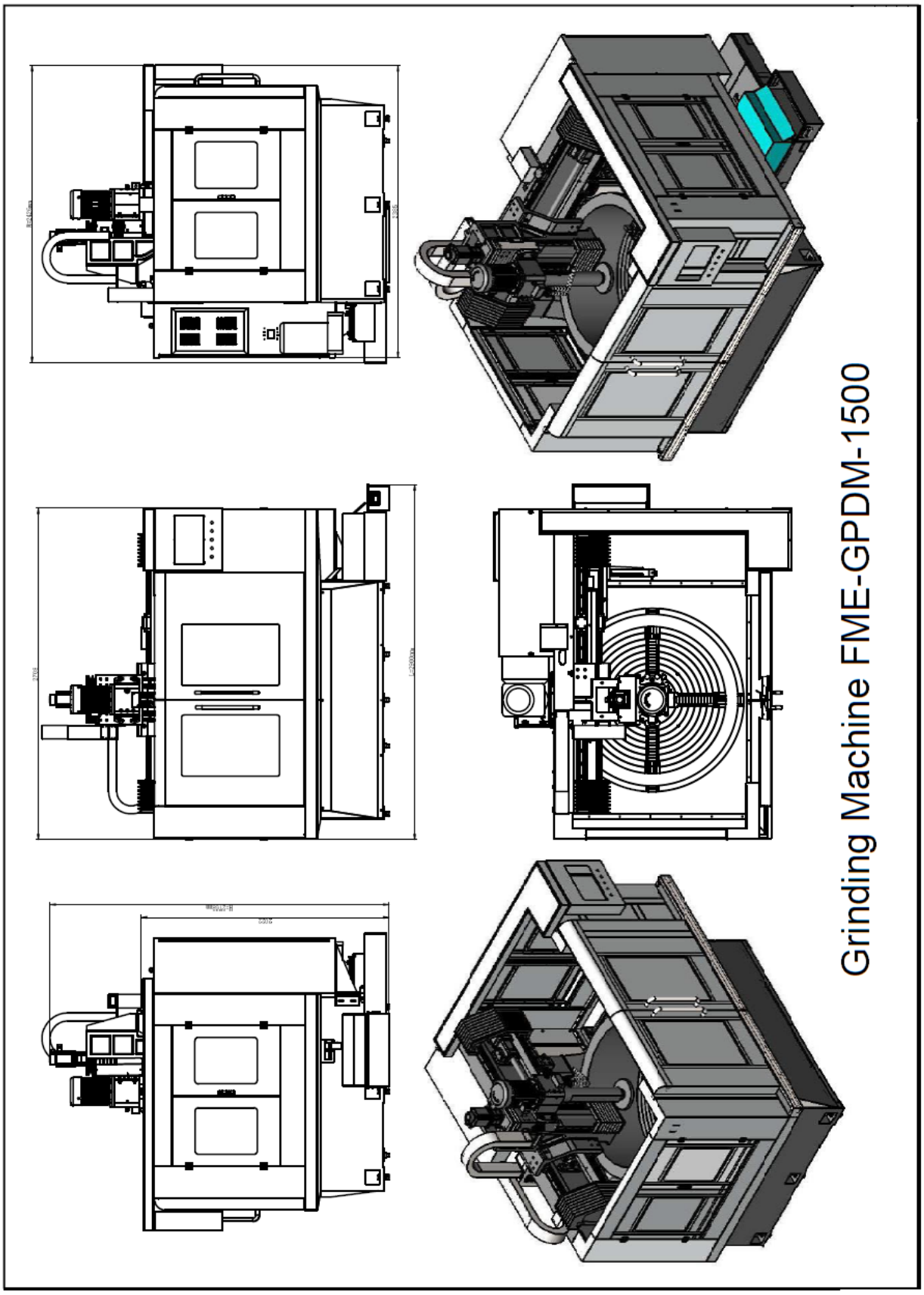
8. DIMENSIONS MACHINE



9. EC-DECLARATION OF CONFORMITY

This Declaration of conformity and the CE marking on the type plate are valid for the grinding machine which is part of the Feed Mill Services & Equipment BV delivery. When this grinding 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 grinding machine FME-GPDM-1500,

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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