KN-125 CUTTER

SERVICE INSTRUCTIONS

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CONTENTS:

DECLARATION OF CONFORMITY EC

nr 1/2012/KN1

Manufacturer: „Metalbud" Ltd.
Poland
96-200 Rawa Mazowiecka
Podlas 3

We hereby declare under our sole responsibility that the following products:

Machine name:	*Cutter*	
Type:	*KN-60*	*KN-550*
	KN-125	*KN-200V*
	KN-200	*KN-330V*
	KN-330	*KN-550V*

have been designed and manufactured in accordance with the following Standards and Harmonized European Standards:

PN-EN 614-1+A1:2009	PN-EN 1672-2:2009	PN-EN ISO 12100:2011
PN-EN 953+A1:2009	PN-EN 12855:2007	PN-EN ISO 13849-1:2008
PN-EN 1037+A1:2008	PN-EN 60204-1:2010	PN-EN ISO 13850:2008

and in conformity with:

- Machine Directive 2006/42/EC
- EMC Directive 2004/108/EC

The declaration of conformity has been issued based on the technical documentation, to preparation of which Ms. J.Wójciak is authorized.

The above qualifies for placing on the machine the CE mark. CE

This declaration loses validity if any changes in the machine have been made without agreed upon in writing with us.

Date & place of issue: 02.01.2012, Podlas

Production Chief

mgr inż. Dariusz Stefański

FOREWORD

Owing to permanent modification of the product, the manufacturer reserves for himself the right introducing changes, which might be not included in this manual.

1.TRANSPORT AND STORAGE

1.1.Condition of delivery

The cutter is sent assembled completely by the manufacturer. Motor–reducer of the pan drive is filled with proper gear oil.

1.2.Packing

- on customer request as well as in transport performed by other companies than producer's the machine can be delivered on the loading pallet or in wooden case.
- in other situation, the device is not packed and is protected only with foil.

On delivering of the machine, relatively on unpacking it – one has to check its condition and if there are any transport damages – the customer should put a complain to the transporting company (forwarding agent).

1.3. Temporary protection

For the time of transport and storage the outer surfaces of the cutter are coated with a thin film of cleaning – protective substance PELOX OS 540.

1.4. Storage

The cutter should be kept in the rooms preventing if from damages and atmospheric influences, ensuring normal storage environment (temperature, air moisture).
The temperature of transport and storage**: from -25°C ÷+ 40°C; humidity from 30% ÷ 90%**
The temperature of operation: from +5°C ÷+ 30°C; humidity from 30% ÷ 90%

ATTENTION !!!

Because of low temperatures of air in time of transportation or storing of machine, one should to place it in target room before starting of operation, in which temperature carries from +5°C to +25°C and humidity not overcoming +95% *at least for period 24 hours*. The target of required stop of machine is to bring machines mechanical systems, electric and electronic to admissible temperature for them to work. Moreover just before connecting of the machine to electric current one should additionally check, whether electric and electronic elements are not covered with moisture.

Above mentioned ELEMENTS HAVE to BE DRY.
These recommendation concern this machines including above mentioned systems and elements.
Not withstanding of above mentioned warnings and recommendations threatens damage of machine and loss of warrantee.

1.5. Preparing for transportation

1.5.1. Cutter packed

The parts for cutter safe catching and displacement are the base of the box or palette. Special cutter foot clamps make proper connection between the cutter and box base or the palette.
Fig.1 shows the way of connection between the cutter and box base or the palette.

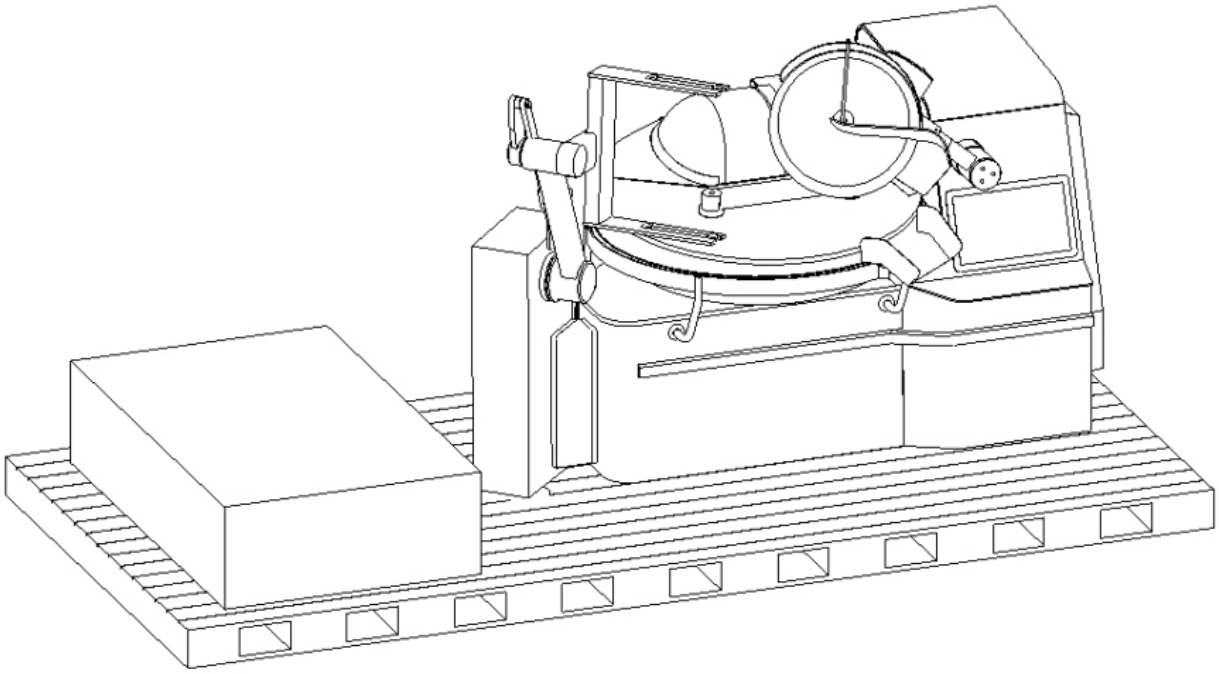


FIG 1. Attachment of the cutter on the box base or the palette

Outer dimensions (packing)

- length	3700 (3800) mm
- width	1700 (1800)mm
- height	2880 mm

Dimensions in brackets (dimensions of box packed cutter)

Dimensions without brackets (dimensions of the cutter with palette)

Box marking assures proper transportation. The box should be safe from sliding, tipping, hard shocks or mechanical damages.

1.5.2 Cutter not packed

The cutter can be hoisted and lifted by massive, supporting frame parts only. In no case to be hoisted or lifted by stuffing spreader or unloading hoist otherwise very severe damages can occur.
Minimum 3 tonne lift/hoist devices can be used for local cutter displacement at the user's.

NOTE

Lifting/transporting works should be subdued for authorised workers having indispensable qualifications and experience.

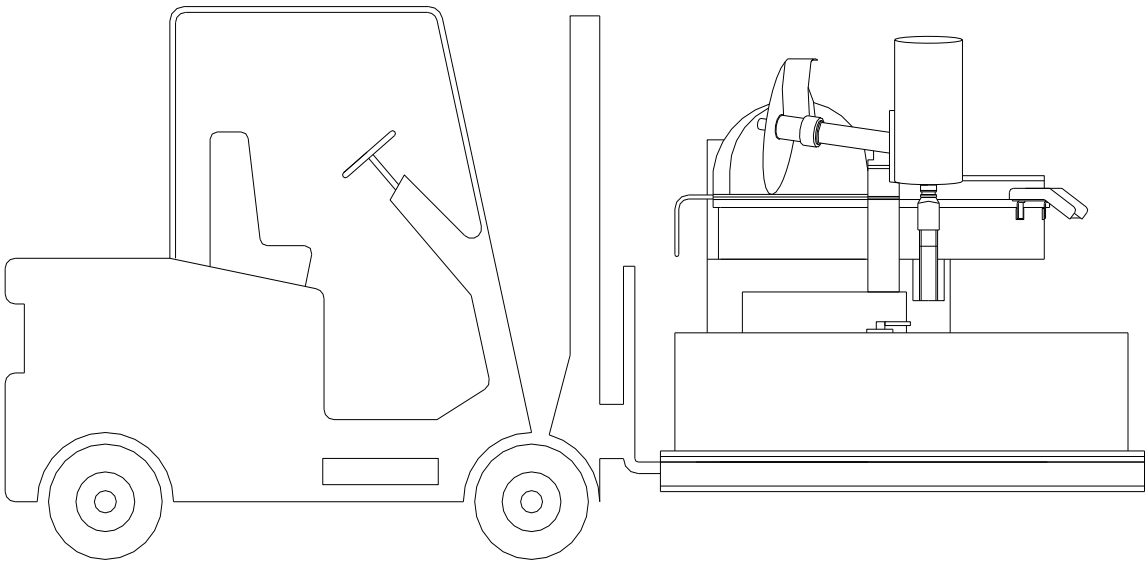


Fig 1a. Transport of the cutter with trolley

2. PREPARATION FOR RUNNING

2.1. Working place

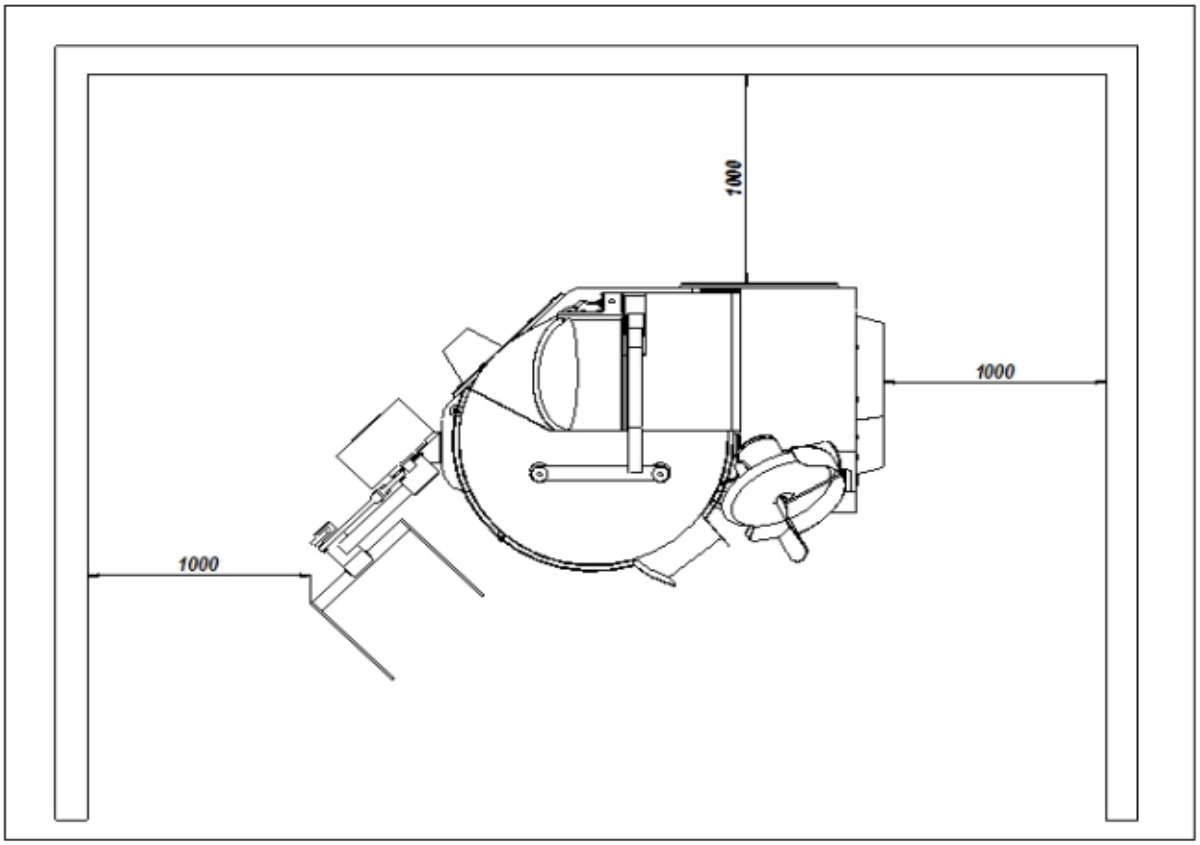


FIG 2. Cutter placement and operator working place.

2.1.1. Surface

Place for the cutter should ensure convenient and safe working conditions. Therefore the margins between the cutter and neighbouring objects (walls, pillars, equipment) to be wider than 1000 mm, in the sides and back of the cutter and more than 2000 mm in front in order to easy operate such devices as carts.
Surface of the place should:

- not to be uneven, without cracks and slots.
- enable cleaning it thoroughly, rinsing and disinfecting.
- exclude slip and stumble cases
- endure 0.5 MPa construction stress

2.1.2. Media supply

2.1.2.1. Electrical supply

Metalbud Ltd. delivers the cutter with control cabinet (of IP number 55), terminal blocks, protective terminal and switch. The control cabinet is connected to the cutter by means of suitable electrical conductors of 5 m standard length and is installed by authorized personnel of Metalbud Ltd.

The user should prepare stationary electrical connection to the control cabinet, using 4 – core cable with copper cores of cross-sectional area not less than 50mm^2. The connection should be provided with protective devices 3x160 A of time-lag characteristic. The wiring system should comply with applicable electrical regulations and standards. To protect conductors connecting the cutter with the control cabinet against mechanical damage and to prevent contact with water, the conductors should be installed either in protective tubes or in troughing. Horizontal parts of the tubes or troughings at the near-floor zone should be mounted at a height of 30 cm above the floor level in such a way that they do not impede operation and servicing of the cutter.

NOTE

Prior to putting the cutter into operation the user must carry out measurements of the electric system insulation resistance and check effectiveness of the used additional protection against electric shock, according to applicable regulations.

The supply voltages and frequency are also specified in chapters 3.2 and 3.3.1

!!! VERY IMPORTANT !!!

ALL OPERATIONS AT INSTALLING , MAINTENANCE AND REPAIRS OF THE ELECTRIC EQUIPMENT MUST BE CARRIED OUT BY A SPECIALIZED ELECTRICIAN OR OTHER QUALIFIED PERSON UNDER SURVEILLANCE OF A SPECIALIZED ELECTICIAN , IN ACCORDANCE WITH ELECTRO-TECHNIQUE PRINCIPLES. WHILE PERFORMING SAID WORKS OBSERVE THE LOCALLY VALID REGULATIONS CONCERINING ELECTICICTY. CIVIEL RESPOSIBILITY FOR CORRECT CONNECTION FO THE MACHINE TO LOCAL ELECTRIC SUPPLY INSTALLATION IS UP TO THE MACHNIE USER

2.1.2.2. Potable water supply.

Potable water source should be supplied at the cutter site, ended with the nozzle for connection by inner ∅13 mm TUVFLEX double-layer elastic hose with polyester mid-braid. Supply water temperature to be +15°C maximum.

2.1.2.3. Leading the hoses.

Potable water hoses should be led so as not cause a risk the operator stumble and fall.

2.1.3. Waste disposal.

Floor drain to be devised at working site for after-production and washing fluids disposal into sewage (sewage treatment device).

2.1.4. Environmental conditions.

The cutter is designed to work in +5°C to +40°C temperature, at maximum 95% relative humidity.

2.2. Assembly

2.2.1. Assembly guidelines.

The cutter is supplied to user fully assembled.. After transporting the cutter to its working place and incorporating it into technological line , the cutter should be leveled according to point 2.2.2.

Check the oil level in worm gear driving the pan (see Lubrication Instruction) The other lubrication points are greased by the manufacturer and do not need any greasing, only should be checked. Excessive filling them with grease may cause overheating the bearings.

The pan edge should be greased with pork fat, in order to avoid excessive friction of its seal.

Check the tension of cutter shaft drive belt according to point 8 in chapter 5.1 Maintenance The belt not enough tensioned undergoes premature wear and causes vibrations, on the other hand, excessively tensioned belt causes overloading of the shaft and its bearings.

Check whether there are no unwanted things in the pan , in particular, any hard metal materials, screws, nuts etc, which, upon putting the cutter into motion, could damage the cutting knives.

Check the direction of rotation of knife shaft, pan and stuffing ejector. In case of impossibility of switching-ON the knife shaft rotation, in the cycle of comminution, two-phase wire in the supply circuit should be interchanged. The pan always rotates in the direction opposite to that of watch hands, when viewing from above, so there is no need of checking its rotation direction.

Before starting the cutter , all its surfaces, covered with protective coating should be cleaned by means of a soft rag wetted in extraction naphtha.

The surfaces contacting the processed meat should be thoroughly cleansed using hot water with added some agent containing mild detergents and surface active substances, then should be rinsed with pure water.

NOTE

Prior to putting the cutter into operation the user must carry out measurements of the electric system insulation resistance and check effectiveness of the used additional protection against electric shock, according to applicable regulations.

2.2.2 Levelling

Prior to putting the cutter into operation, it should be levelled using a level and

adjustable feet with absorbing cushions, screwed into the cutter body. To level the cutter, apply a level to upper surface of the pan edge, at two places spaced by ¼ of the pan edge circumference.
Deviation from the horizontal level should not exceed 2 mm per 1 m of the circumference.

Care should be taken during the cutter levelling, to obtain identical loading of the support shock absorbers (check by hammering at the absorber foot in horizontal direction - proper support results in metallic sound).

3. DESIGN AND OPERATION

3.1. Purpose

The KN-125 cutter is designed for very fine meat grinding for stuffing and for spices and other edible products as well as raw pig skins grinding. Meat, skins, spices or other soft food loaded into the pan, are put through the rotating knife set grinding them due to pan turning.

Thanks to knives of longer cutting blade line and high revs knife set one can obtain emulsion made of even raw skins.

The cutter is universal machine as it can work in mixing mode apart from grinding mode. In order to keep proper stuffing temperature one shall add some scale ice while grinding.

Producer does not take responsibility for:

- **using of machine not with accordance with appropriation**
- **alteration of machine with neither knowledge nor agreement of manufacturer.**

ATTENTION:

Not applying to present instruction threatens loosing of guarantee.

3.2. Technical data

- pan capacity	[dm^3]	125
- number of blades	[pc]	6
- cutting speed of the blade head (infinitely variable within this range)	[rpm]	200 ÷ 5000 ±3%
- mixing speed of the blade head (infitely variable within this range)	[rpm]	(-100) to (-300)±3%
- bowl speed (infitely variable within this range)	[rpm]	2 to 20 ±3%
- stuffing ejector speed	[rpm]	0 to 130
- stuffing temperature measurement	[^{0}C]	continuous
- possibility of saving technological	[qt.]	50 (1 ÷ 50)
- **power supply voltage and frequency**	**[V]**	**3 x 400V; 50 Hz ; 3P+PE**
- rated power of the blade shaft drive motor	[kW]	50
- rated power of the pan drive motor	[kW]	1,5
- power of the stuffing ejector	[kW]	1,1 (only HL version)
- rated power of the hydraulic pump motor	[kW]	1,1
- total installed power	**[kW]**	**54**
- **max current**	**[A]**	**~130**
- overall dimensions		
- length	[mm]	2530
- width	[mm]	2130
- height	[mm]	1890
- dimensions of the control cabinet (width x height x depth)	[mm]	1000x1600x500
- cutter mass	[kg]	2400

3.3. Cutter description

The cutter can be made in three various versions:

- KN-125 S –standard version: knife cover and front cover are lifted by means of hydraulic servo-motors, stuffing spreader is placed on the left side of the cutter,
- KN-125 H – knife cover and front cover as well as the arm of the stuffing spreader are lifted by means of hydraulic servo-motors, the stuffing spreader is placed on the right side of the cutter,
- KN-125 HL – knife cover and front cover as well as the arm of the stuffing spreader are lifted by means of hydraulic servo-motors, the stuffing spreader is placed on the right side of the cutter; the 1201 trolley loading system is built-in on the left side of the machine.

Each of the versions above can be equipped with a reinforced motor.

3.3.1. Sets and assemblies

The cutter and its main sets and assemblies are shown in illustrative way in Fig. 3a,b,c.

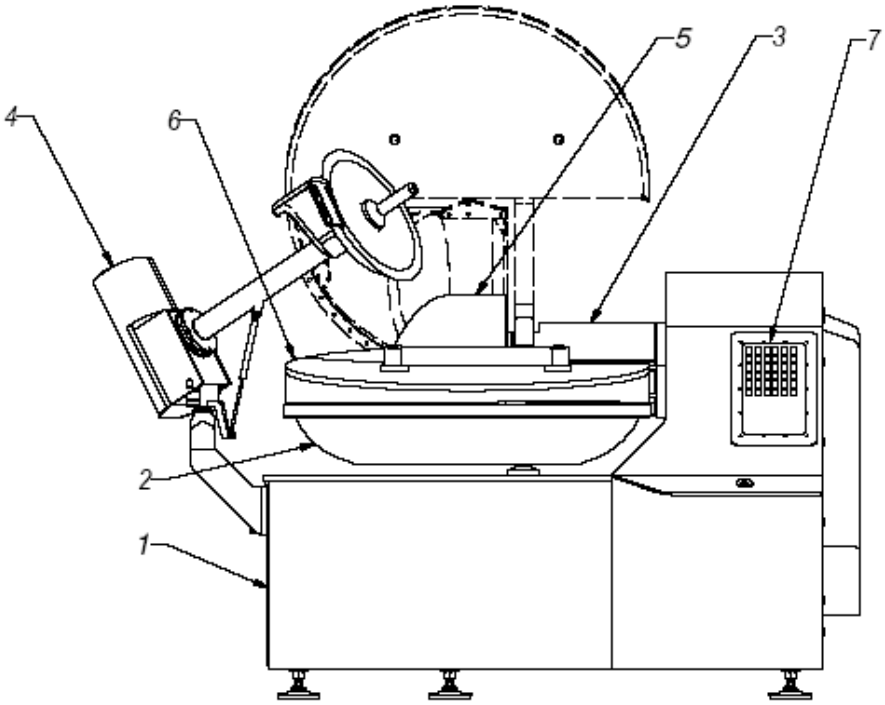


Fig 3a. Cutter "TAJFUN" type KN-125S

1-Frame, 2-Bowl with drive, 3-Knife set and the shaft, 4- Stuffing ejector, 5- Knife's cover, 6-Front cover, 7-Control panel

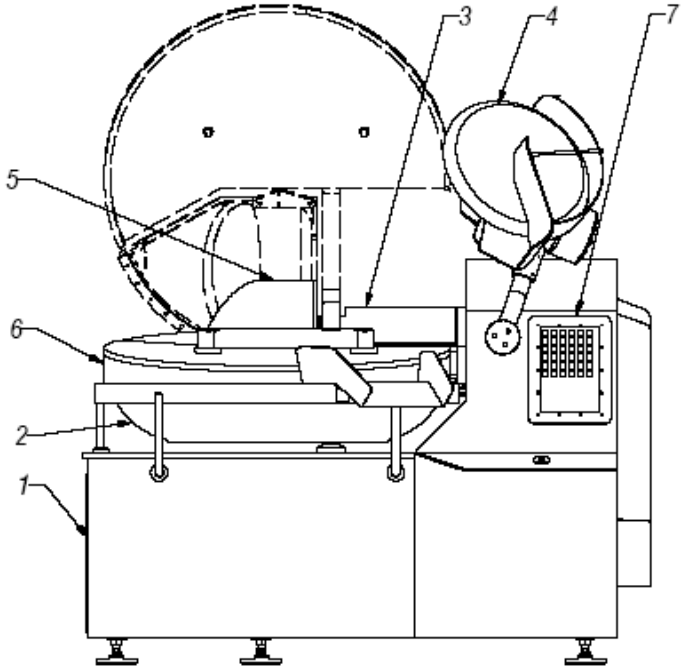


Fig 3b. Cutter "TAJFUN" type KN-12H

1-Frame, 2-Bowl with drive, 3-Knife set and the shaft, 4- Stuffing ejector, 5- Knife's cover, 6-Front cover, 7-Control panel

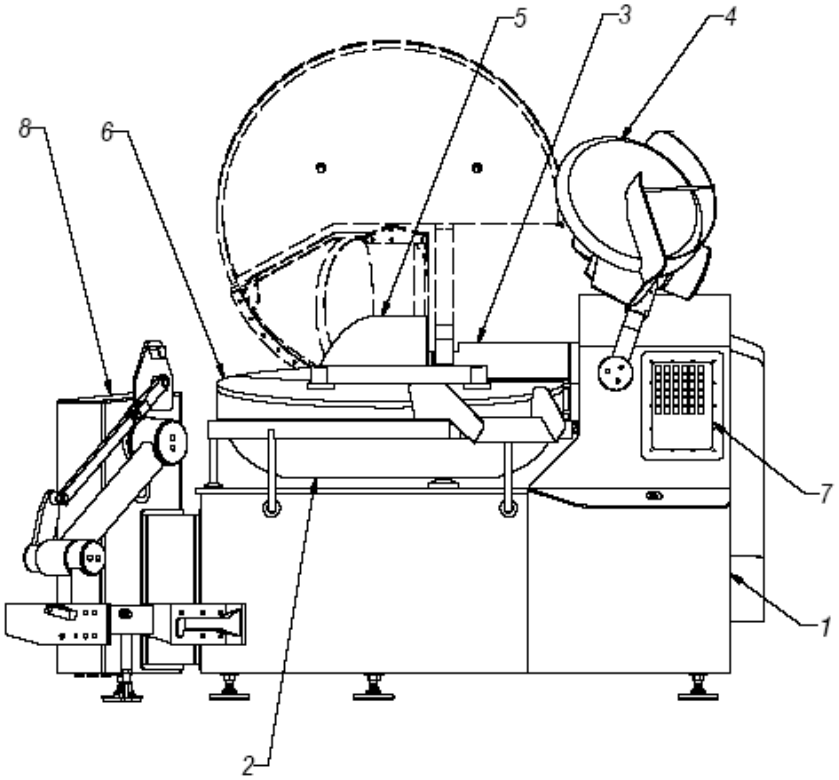


Fig 3c. Cutter "TAJFUN" type KN-12HL

1-Frame, 2-Bowl with drive, 3-Knife set and the shaft, 4- Stuffing ejector, 5- Knife's cover, 6-Front cover, 7-Control panel , 8- Loader

The cutter frame - is a welded construction made of acid resistance steel plates There is a seat for a bowl mounting on the horizontal plate of the frame. Vertical wall is made of thick plates reinforced by means of ribs. On the wall the knife frame together with shaft with bearings is fixed.

The bowl with drive - the bowl is cast from acid-resistant mechanically worked cast steel. It is fixed to the disk mounted on a vertical drive shaft neck with bearings in housing of bowl drive. The housing is fixed by means of bolts to the horizontal plate of the cutter's frame. The applied solution enables to displace the bowl in the horizontal and vertical directions. The bowl shaft is driven by electric motor by means of a warm gear.

Knife set with shaft – is mounted on the front neck of the knife shaft. It consists of a hub, knife setting rings, ending- and washer-rings, and 6 knives. The hub, together with the rings and knives are shaft mounted and fix on it by a key set. The knives are equipped with two fixing pins, and the rings have the proper number of holes drilled in their circumference. Knife shaft is borne in the in knife frame fixed to the frame of the cutter.. It is driven by AC motor with a belt. The motor is placed inside the lower cutter casing on the slidable frame.

Stuffing ejector (the H,HL version) – it is seated on front panel of cutter frame. In a sleeve of socket are pushed in sidle bearings. On those bearings is seated hollowed shaft of un-loader (shaft is made of stainless steel). The stuffing spreader is fixed at the end of the arm. There is a worm gear with the electric motor inside the frame. On the gear's pin the stuffing spreader disk made of polyamide plate is assembled. A lever coupled with a hydraulic servo-motor for lifting and lowering the disk is placed on the main shaft. Unloader is installed c/w inductive sensor, that automatically starts the un-loader disk in a fixed position – when operator approach it to bowl.

Stuffing ejector (the S version) - consists of a bracket, fastened to left hand sidewall of cutter body, a fork fixture pivotally fastened on the bracket, enabling the ejector assembly to swing in horizontal surface and an ejector body fastened on a bolt secured in the fork fixture. Inside the ejector body a worm gear with its drive motor is situated. Inside the worm gear bush a drive shaft is situated, shielded by a tube. On the shaft end pivot a disc of stuffing ejector is situated. The drive motor with the gear is encased in a casing mounted from above. The stuffing ejector assembly is equipped with induction sensor, which puts in motion the stuffing ejector disc in predetermined position when the disc approaches the pan.

Knife cover – made of steel plates as a two-layer construction. Internal space is filled with material dampening vibration and noise. The cover closes the bowl from knife head side. To lift or lower the cover one should use the hydraulic servo-motor.

Front cover– made of transparent material enabling to watch technological process during cutting. The cover is lifted by means of the hydraulic servo-motor.

Loading hoist (the HL version) – the hoist is a separate system, which frame is placed next to the cutter frame and connected with it by a connector. The hoist is equipped with the loading arm with rotationally seated connection clip of a trolley. The arm is situated on the shaft with a gear wheel in the middle. The shaft is on the rolling bearing placed in the hoist

frame. Gear wheel of the shaft meshes with toothed segment with rolling bearings coupled with hydraulic servo-motor. The hoist is adjusted to trolleys of 120l capacity.

Water installation (optional) – consists of manually operated cut-off valve, conduits, electronic flow meter, and two-way electromagnetic cut-off valve. Water is fed to the comminuted mass through a nozzle incorporated into knife frame The amount of water is set by means of pushbuttons on cutter control panel.

Lubrication system – see Grease Lubrication Table.

3.3.1.1. Electric equipment

Electric equipment consists of: AC knife shaft drive motor, induction motors: pan drive, vent drive, stuffing ejector motor, hydraulic pump motor, microprocessor control unit and independent control box. In the cutter control box there are placed: frequency converter for AC knife shaft drive motor, frequency converter for pan drive, and switch/control details explicated in the electric wiring scheme. The control box has been protected according to IP 55 standard.
Electric motors are placed inside casings and the microprocessor control unit – in a special niche in the cutter casing.

The cutter electric system is supplied from the alternating current mains (3P+PE) of 3 x 400V voltage and 50 Hz frequency. The cutter wiring system must be made as permanent installation.

Normal environment for non-trouble operation of the electric system is regarded as follows:

- ambient temperature not lower than 5°C and not to exceed 40°.
- relative air humidity not to exceed 50% at 40°C and 70% at 20°C respectively.
- supply voltage swing in the range of 90÷110% nominal and frequency swing within the range of ±2%.

3.3.2.Technical safety means

Basic risks emerging when running the KN-125 cutter comprise:

- biological hazard: risks of infection, disease or contagion
- risks of electric shock
- mechanical injury risks

To eliminate these risks the following technical means have been undertaken.

3.3.2.1. Biological hazard

1. The parts of meat contact are made of acid resistant materials that are easy to be kept clean, disinfected and washed.
2. The parts are smoothly welded and this design minimises excessive edges, caverns and niches being hard to access that are easy to post-production waste deposing. Easy install/uninstall screw/bolt operations have been ensured.
3. Large radius were applied in shaping every part where implied and possible, seals and shields against stuffing splash and leakage out of the pan.

4. Easy post-production and cleaning, disinfecting and washing fluids flow out has been enabled.

3.3.2.2. Electric shock hazard

The cutter is of the second level of electric shock risk. Considering this the basic protection with insulation of active parts with electric resistance and strength in accordance with the current standards and regulations has been applied. The switch and control equipment is placed in a casing that ensures IP 55 protection level. Lowered voltage 24V is used for protection from direct electric shock.
Additional protection against an indirect shock is acquired by safety PE contacts connection with safety neutral PEN wire for TN-C supply type or safety neutral PE wire for TN-S supply type.
Protection against direct and indirect touch contains:

- very low protection voltage (24V DC) applied in circuit of the machine's control.

REMARKS !!!

1. **Never direct the water jet onto the machine control panel, electric equipment, control cabinet, seals and into inside of the machine (space in which electric control and drive subassemblies are installed: namely pumps, motoreducers etc.).**
2. **The machine washing with a water jet can be carried-out only with all electric supply cut-off by means of a main-switch situated outside of the machine and with the electric equipment covers all closed.**
3. **After machine washing and before switching-on power supply, all the machine surfaces and in particular the electric equipment should be thoroughly dried.**
4. **The above-mentioned remarks and regulations should be strictly observed and applied in particular during rinsing and washing the machine with water.**

3.3.2.3. Mechanical injure hazard

Injury hazards of mechanical character occur when accidental contact with movable elements of knife shaft drive, knife assembly, pan and stuffing ejector takes place. In order to eliminate this hazard the following technical safety measures are applied: all drive elements of knife shaft and pan are situated within the body constructions and are covered by permanent covers fastened to the bodies by screws. The rotating knife assembly is shielded from below by the pan and from above; by two wings coat cover, mounted on its hinge. The cover along with its seal is supported on the pan and is secured against opening by a lock. With this cover cooperates:

- electromagnetic blocking that makes it impossible to open the knives cover when rotational speed of knives shaft differs from zero and machine control is in "on" position.
- limit switches in cooperation with safety relays switch off control circuit when operator tries to open cover and turn on electric circuit of knives shaft braking system.
- at the end of bolt in cover hinge there is attached a special arm that brakes knives shaft (pressing on brake block to brake disk) when cover is deflected from pan.

The drive of stuffing ejector is covered by a permanent cover, fastened by screws to the construction; the disc driving shaft is situated in a tube; the fixture for operating the ejector is separated from the disc by a flange; the stuffing ejector disc is switched on only in the close proximity to the pan and is switched-off just upon lifting it outside the pan.

3.3.3.Noise

Noise source – knife set drive (main motor, belt transmission), knife set, pan drive motor-reducer, hydraulic pump drive, vacuum pump drive.
Noise level suppressing means – shields installed on the cutter casings, knife set shield and pan shield.
Noise type – not indicated.
Measurement place – stationary working post (p-ts.1; 2) of Fig.4 at 1,6m height and in 1m distance to the cutter.

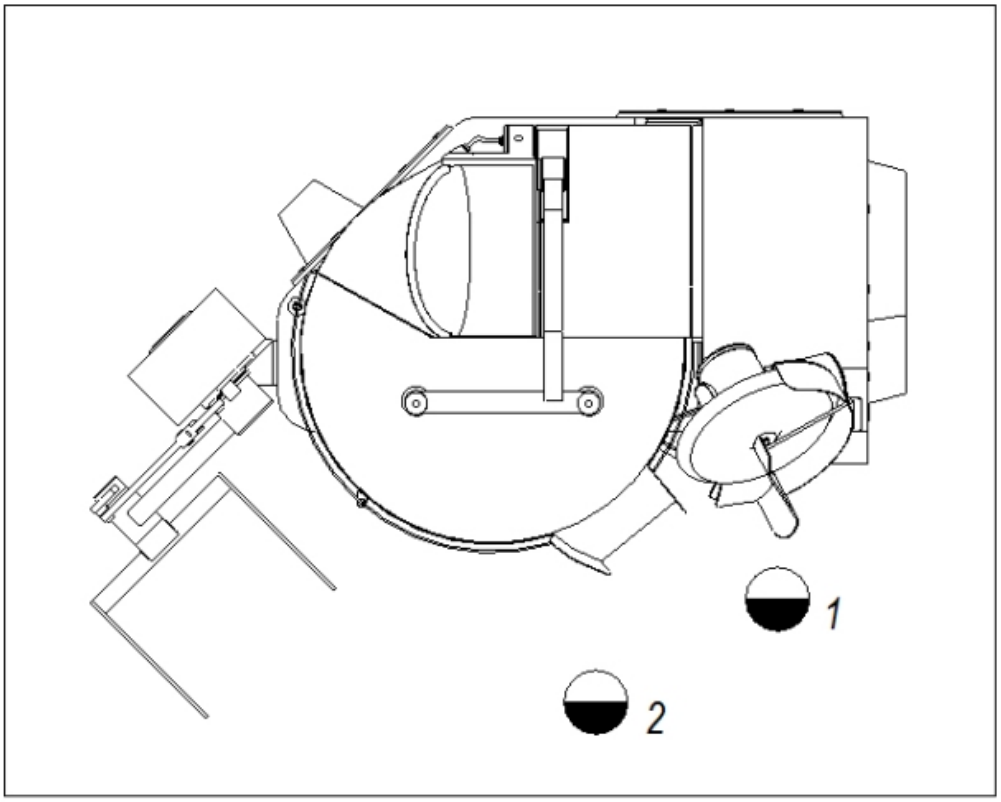


FIG 3. Place of noise measurement.

Measurement conditions – during the cutter run when stuffing being ground. Measurement to be made with dynamic profile S (Slow) of the meter set on and an equivalent noise level be found. General time of measurement should consist of three cycles. Each cycle should be technological program time comprising knife set operating in revs range from minimum to maximum and knife set operation along with stuffing being mixed. Duration of the cycle should not be longer than 10 min. The result is a mean of three cycles according to PN-N-01307:1994 standard.
Noise measurement results.

Measure No.	Equivalent noise level [dBA]			Mean of three measurements
	Cycle 1	Cycle 2	Cycle 3	mean
1	65	67	66	66 dBA
2	68	68	69	68 dBA

Measurement tool - noise level meter 1-st class acc. to PN EN-60651:2002.

4. OPERATION

4.1. Description of the controls

The device designed to control the work of KN-200V Cutter is system consisting of the PLC Mitsubishi drive and control panel produced by Metalbud Ltd.
Main functions of this control system are:

- monitoring and the adjustment of the rotational speed of knives;
- monitoring and the adjustment of the rotational speed of the mixing bowl;
- monitoring of the temperature of the stuffing;
- monitoring and the adjustment of vacuum (only for vacuum version);
- dosage of required amount of water to the mixing bowl of the cutter;
- control of executive devices (contactors, electro-valves, and the like);
- the analysis of states of work of the cutter and signaling of emergency states;
- automatic realization of the application of the technological cutting process;
- displaying time of work of the cutter;
- ensuring safety of operating the cutter.

The controller can have 99 technological applications programmed (from 1 to 99), that can be fully modified by the user, which allow to create the database of basic cutting parameters.

Every activity related with running the driver, programming, modification of settings etc. are executed by the means of control panel.

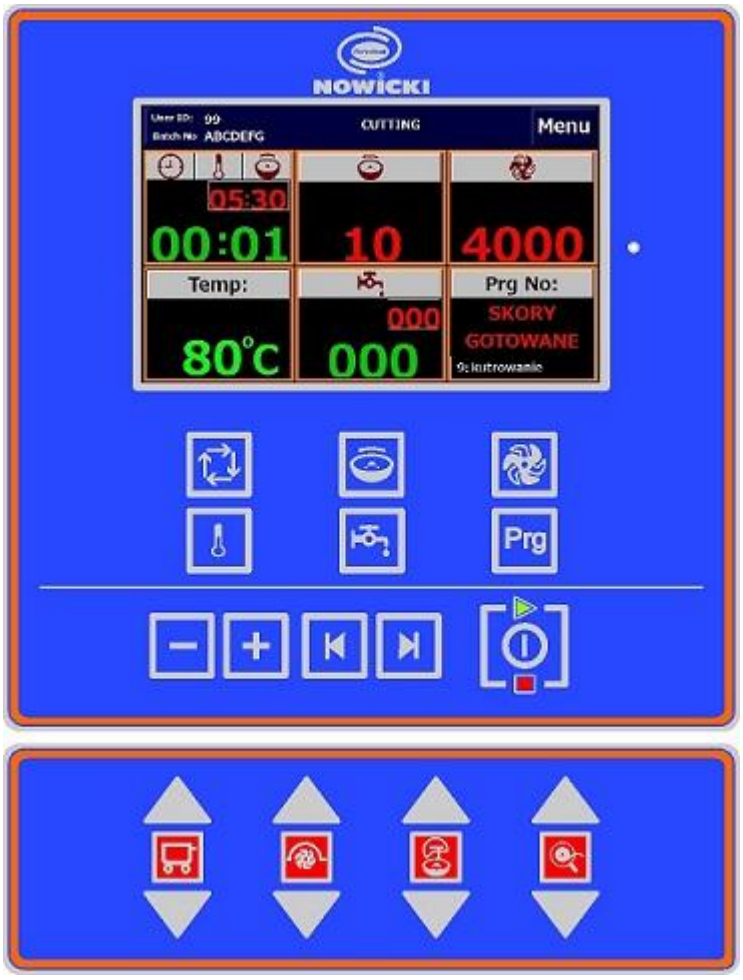
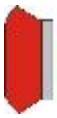
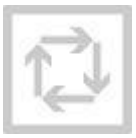
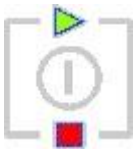


Fig. 4. Control panel

DESCRIPTION OF CONTROL ELEMENTS (fig. 4)		
1.		Graphical display
2.		S1 – emergency STOP button turning off the machine's power
3.		Button of choice of the panel: choice/switching the kind of the condition of cuttering ending
4.		Button of choice of the panel: bowl/switching on the drives of knives and bowl in Manual Work mode
5.		Button of choice of the panel: knife/switching on the drives of knives and bowl in Manual Work mode
6.		Button of choice of the panel: water/switching on water dispensing
7.		Button of choice of technological program/subprogram
8.		Button of choice of the previous subprogram
9.		Button of choice of next subprogram
10.		Button of increasing the value in active panel
11.		Button of reducing the value in active panel

12.		Button with signaling- lights START/STOP
13.		Buttons of moving up and down the extractor of stuffing
14.		Buttons of raising and pulling down the loading
15.		Buttons of raising and pulling down the front cover
16.		Buttons of raising and pulling down the upper cover

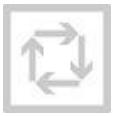
4.1.1. Elements of the graphical display

In the upper part of the display - in the so-called heading, there were inserted fields which have purpose according to the picture below:

The entire area of the display of the panel below the heading, is divided into a few areas called panels. Each of 6 panels is connected with suiting it button on the plastic keyboard. Pressing the appropriate button, causes activation of a proper panel what is signalled with change of the colour of the panel from black on white. If the given panel is active, with buttons:  and  it is possible to change the set value of the parameter shown in the panel (the set value is shown in red colour).

With buttons:  , the operator can turn on the activity of individual panels. After activating the suitable panel, with the same buttons, it is possible to turn on/turn off individual devices.

The list of panels and purpose of elements appearing in them were put in the list below:

-panel: **End condition:**  - active after pressing the button  . Each pressing this button during the activity of the panel, changes the condition of cuttering ending. Currently chosen condition, is signalled with the change of the colour on yellow of an appropriate icon:

- if there was chosen:  - end of cuttering will be held after passing the set time

- if there was chosen:  - end of cuttering will be held after reaching the set temperature of the batch

- if there was chosen:  - end of cuttering will be held after carrying out the set number of rotations of the bowl

Depending on the chosen condition, in field of the set value and real one, a value of the time of cuttering, temperatures of the batch or number of rotations of the bowl is shown.

- panel: **Bowl:** 

- active after pressing the button  . Each pressing of this button during the activity of the panel, switches on/turns off the drives of the bowl and knives with the set speed (the drive of the bowl cannot work independently except for the Washing mode).
In the mode Washing, pressing this button turns on/turn off the drive of the bowl. Switching on the drive of the bowl is signalled with change of the colour of field with the icon on yellow.

- panel: **Knives:** 

- active after pressing the button  . Each pressing this button during the activity of the panel, switches on/turns off the drive of knives with the set speed. Switching on the drive of the bowl is signalled with change of the colour of field with the icon on yellow.

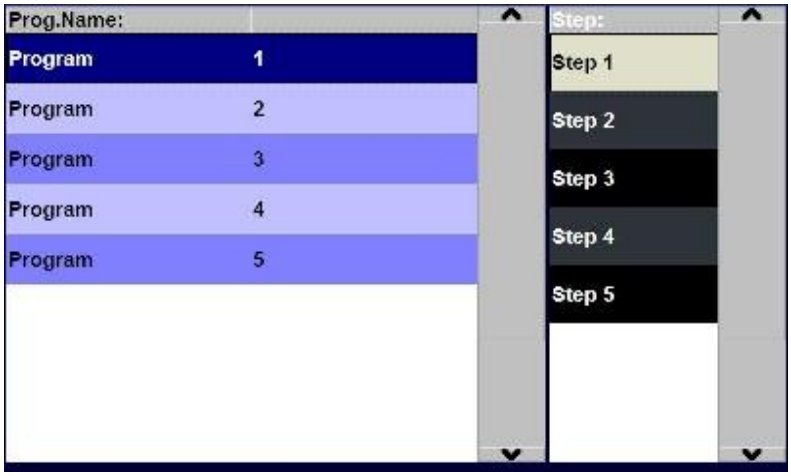
- panel: **Water:** 

- active after pressing the button  . Each pressing of this button during the activity of the panel, switches on/turns off the valve of water dispensing provided the set amount wasn't achieved. Switching on the valve of water is signalled with change of the colour of field with the icon on yellow.

- panel: **Program/subprogram:** 

- active after pressing the button: 

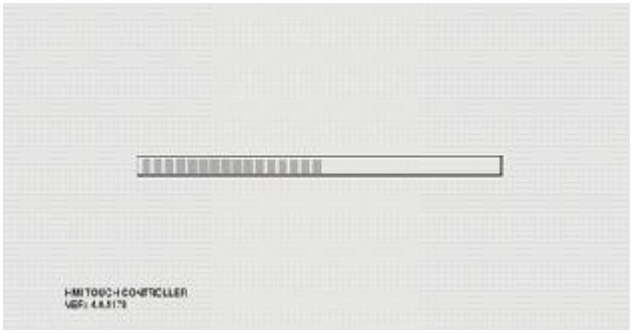
. In the heading of the panel, a number of the program is shown, lower the name of up-to-date program. In the bottom part of the panel: the number and name of the up-to-date subprogram. After pressing this button a transition to the screen of choice of the program/subprogram takes place:



where the operator with touching the appropriate program/subprogram on the list or buttons:  and  - for the choice of programs on the list and:  and  - for the choice of subprograms, it is possible to select parameters of cuttering. After repeated pressing of the button, loading of the selected technological program to the memory of the driver and the return to the previous side take place.

4.1.2. Starting of the control

After switching on the power supply, loading the system software takes place, what is signalled by displaying the following screen:



After loading the system, during few first seconds on the alphanumeric display the following message is shown:

During display of this message, the control system conducts an auto-diagnostic test and shows versions of program.
After successful passing the test on the graphical display in the field of messages, an inscription: CONTROL TURNED OFF – control turned off is displayed. It signals at the same time that the contractor of control is turned off. Simultaneously, in appropriate fields, values of set parameters and a name of the recently selected program and the first subprogram of this program are displayed like in the fig. below:

On the display the temperature of stuffing a current temperature is shown. In fields: No. of the operator and the No. of the batch of goods, values of these parameters are shown.

After unlocking the button "S1" - EMERGENCY STOP located in the side wall of the panel, on the graphical display in a message field an inscription is shown: AUTO MODE - which means that a mode AUTO WORK was switched on. This mode is turned on automatically upon completion of launching the control.

4.2. Cuttering process in AUTO MODE

Before starting the cuttering, one should adjust individual parameters of the technological process such as:
- a way of cuttering ending,
- depending on the condition of cuttering ending to place the set time, set temperature or set amount of rotations of the bowl,
- the rotation speed of the bowl,
- the speed of whirling of the knives,
- the size of the inflicted partial vacuum.

It is also possible to select a technological programme which will consist of a few subprograms. In this case after finishing the first subprogram automatic switching on takes place until carrying out all subprograms from the given program.

In the purpose of loading right parameters of cuttering, it is necessary with the button Prg to proceed to the display of the list of programs and as it was described in the section 6.2 make choice of relevant program from the list of subprograms. After repeated pressing this button, all data of the process of cuttering will be shown in the individual panels of the graphical display.

If a multistep programme was chosen (consisting of more than one subprogram), the operator can use the buttons: , in order to increase or reduce the number of subprogram. According to the selected subprogram, simultaneously set values will change (values programmed for the given number of the subprogram will be displayed), the name and the number of the subprogram displayed in the panel: Program/subprogram.

With buttons: , and , the operator may change current set values in the way described in section 6.2.

After pressing the button: , starting cuttering takes place according to set parameters and with the chosen number of the subprogram. A green signalling light turns on in the field of the button - simultaneously the red lamp is turned off. Signals of switching on the drive of the bowl, knives and vacuum pump in a suitable panel are switched on. In the panel: condition of ending, the set and current time of cuttering is shown. In the upper right corner, the button is displayed: PAUSE

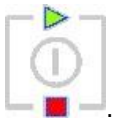
During the realization of cuttering in Auto mode, the operator may in the way described above change the set parameters apart from parameters in the panel "Condition" to which the access is blocked in working hours.
If a multistep program is carried out, in working hours the operator can also use buttons for the change of subprograms which may now have the following functionality:

-  - pressing the button causes stopping the carrying out of the current subprogram and going to next

-  - single pressing this button during cuttering causes launching the current subprogram from the beginning. If the button is pushed twice during 3 seconds, switching-over to the realization of the previous subprogram will take place

After pressing the button: 

, stopping of cuttering will take place (suming up the time is stopped, the drives of knives and bowls are turned off). Signaling switching on of the function Pause is signaled with change of the colour of the button on yellow. The operator can at that time check the state of the batch, complete supplements and the like. Turning off the Pause and return to continuation of cuttering will take place after repeated pressing this button.
Ending of cuttering will take place after ending of the program as the result of meeting the conditions of ending the cuttering in the last subprogram (passing of the set time, reaching set temperature or carrying out the set number of rotations by the bowlful).

Earlier turn-off of the cuttering will take place also after pressing the button during cuttering:  .
After ending of the cuttering a green lamp signalling the work turns off and a red lamp will turn on.

4.3. Cuttering process in MANUAL MODE

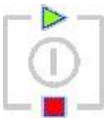
For the purpose of switching on cuttering in Manual Mode it is necessary to:
- adjust the set parameters such as the speed of knives and speed of the bowl in suitable panels (section 6.2)

- press the button:  - the knives and bowl will be switched on, in the field of the heading the message MANUAL MODE is displayed like in the picture below:

During cuttering in Manual Mode, as similarly as under the procedure Auto Mode, the operator may change values of the set speed of knives and bowls.

Turning off the cuttering may be carried out in two ways:

- pressing again the button:  will cause turning off work of knives and bowls

- pressing the button:  will cause simultaneous turning off all switched on earlier sub-assemblies.

After turning off the cuttering in the Manual Mode, automatic switching on the Auto Mode will take place.

4.4. Saving and editing of the technological programs

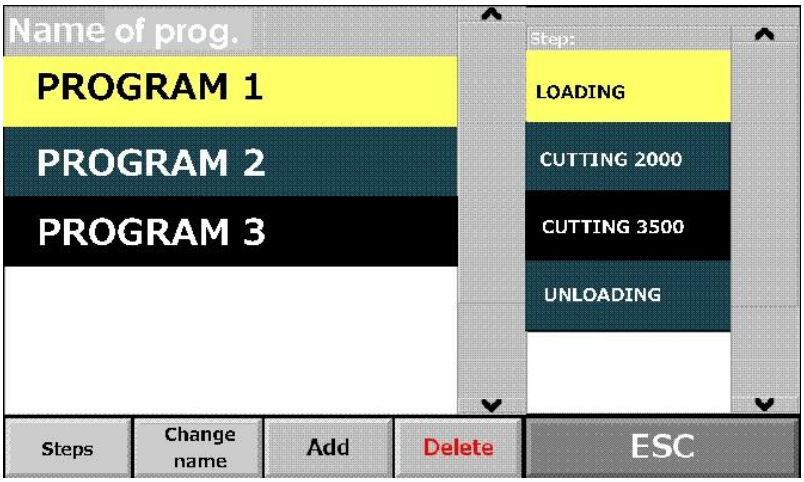
All activities not connected directly with the completion of the process of cuttering, can be made only during the stop of the cutter (when all drives are turned off).

In such a state, after pressing the button: 

, a main screen of the panel is displayed:

After pressing button: 

, the display of the screen Programming takes place::



On the screen on the left a list of technological programs is shown and on the right the list of subprograms being included in a selected program. In the bottom part of the screen, buttons about the following purpose are displayed:

- adding a new programme

- deleting the last programme from the list

- change of the name of the selected programme

- transition to the display of the content of subprograms

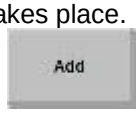
- exit to the previous page.

In order to change the name of the program, one should select a programme whose name has to be changed by pressing the appropriate name, press the button: 

- there is shown an alphanumeric keyboard with which it is possible to enter two-word name of the program. After accepting with button ENTER the first part of the name, there is shown its second part which is entered the same as the first one. After repeated pressing the button: ENTER, new name of the program is saved on the list of programs.

After pressing the button: 

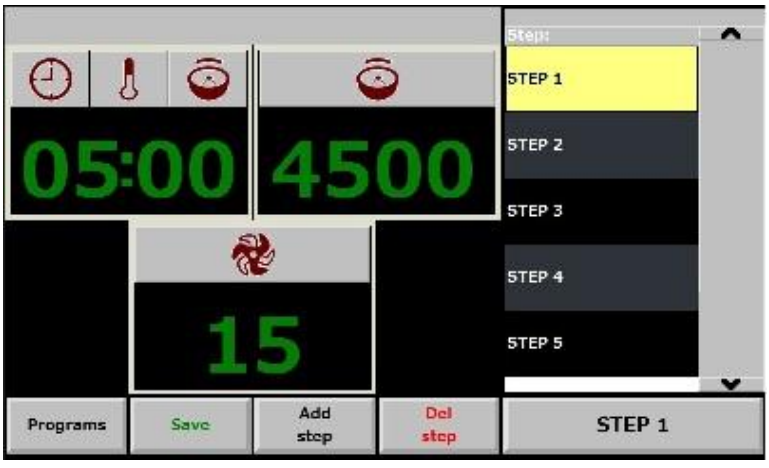
deleting the last program from the list of programs takes place.

Creating a new technological program, one should begin from pressing the button: 

- displaying the alphanumeric keyboard takes place. As in the case of the change of the name of the program, with its help one should enter the name of the program. After entering two-word name, the new program is added to the list of programs.

Now with the button: 

, one should go to the option: Subprograms Programming:



With the button: 

, one should add the subprogram to already existing "empty" program. With displayed alphanumeric keyboard, one should enter the appropriate name of the subprogram. Next touching right fields with data, one should adjust all parameters of the subprogram such as: the condition of ending the subprogram, time, temperature of the end or the set amount of rotations of the bowl after which endings of the subprogram will take place, the rotation speed of the bowl, speed of knives, set value of the partial vacuum. After finishing placing data in the subprogram, one should

press the button: 

- data of the subprogram is saved in the memory of the panel.

Exit from the option "subprograms programming" is blocked if there isn't at least one subprogram in the program.

After saving data of the subprogram, it is possible to add next subprograms in the same way. It is possible to save maximum 10 subprograms in the program.
Remaining buttons located in the bottom part of this screen, have the following purpose:

- deleting the existing step

- return to the list of programs

After the return to the option: "Edition of programs", exit from the mode Programming, will take place after pressing the button: 

.

At leaving the mode of programming, the program which contains no subprograms, will be removed from the list of programs.

4.5. Dosage of water

Setting the amount of dispensed water is independent of other parameters of cuttering and identically takes place for MANUAL and AUTO MODE.

The button of switching on the valve of dispensing water functions independently from remaining sub-assemblies of the cutter.

In order to dispense the determined amount of water into the bowl of the cutter, it necessary with buttons: 

, 

in active panel: water dispensing 

set the demanded amount of water in litres (the set value shown in red) and next press the button: 
. The valve of water is switched on - signalling with change of the colour of field with the icon on yellow.
In the field the real value of water in the panel, a current amount of water is shown in litres. Completing of dispensing takes place automatically after summing up the set amount of water or earlier after turning off the valve by repeated pressing the button: 
- dispensing is stopped.

If the valve of water is closed, the operator with buttons: 

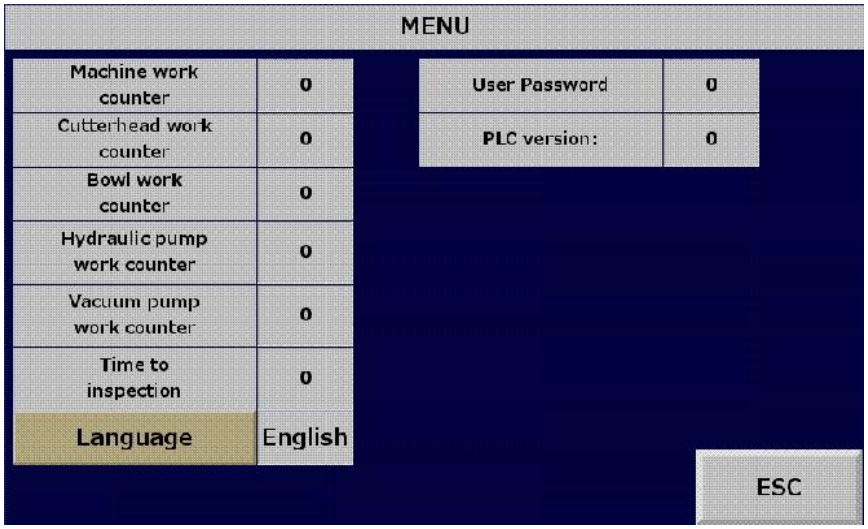
, 

in every moment can modify the set value of the amount of water. After pressing the button: 
for the time longer than 3 seconds, zeroing of the amount of water takes place.

4.6. User Menu

After pressing the button: 

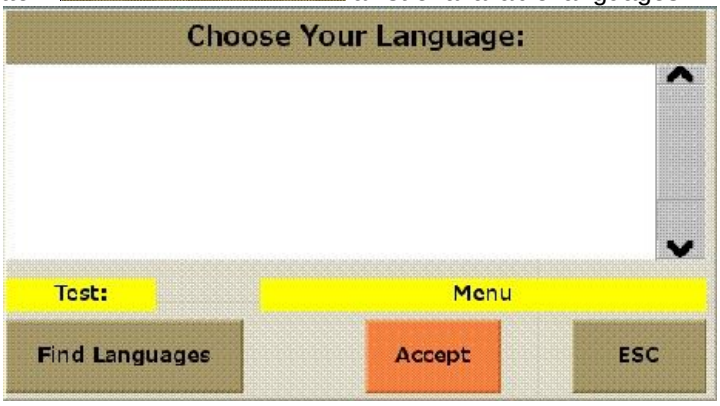
, on the main screen the display of the screen with User Menu is shown:



On the screen Menu, the user has a view of the following machine's parameters:
- Machine work counter- meter of hours of the work of a machine
- Cutterhead work counter - meter of working hours of the head knife
- Hydraulic pump work counter- meter of working hours of the plumbing aggregate
- Vacuum pump work counter- meter of working hours of a vacuum pump
- Time to inspection- time for performing the technical inspection of the cutter via a factory service centre (in the elaboration)
- PLC version: version of program in PLC
- in field: User Password – the operator can change the password of the access to programming (in the elaboration)

After pressing the button: 

a list of available languages will be shown:



After pressing the button: 

, all available linguistic options will be shown on the list. One should choose appropriate options touching proper line of the list and press the button: 

chosen linguistic version of messages, will be loaded to the panel.
After pressing the button: ESC, closing the list and the return to the display of the page Menu take place.

4.7. Emergency stopping of the machine

In case of appear risk to the life and health of service or risk of damage to the cutter or destroying the raw material, it is necessary to halt work of the cutter in the emergency state with the **EMERGENCY STOP button "S1**", being located in the lower part of the control panel.
For the longer period of stoppage, main electric switch placed in electric box should be off.

It is forbidding to switching the cutter off during normal work of the knives head with EMERGENCY SWITCH button, because it is risk to overload mechanical and electric systems and may to cause quicker wear of above mentioned systems of the cutter.

4.8. Assembly of knives on the knife shaft

Assembly and disassembly of the knives can be performer only with blocked Emergency stop button and after turning off the electric power with the main switch. As a result, control panel of the cutter will be inactive.

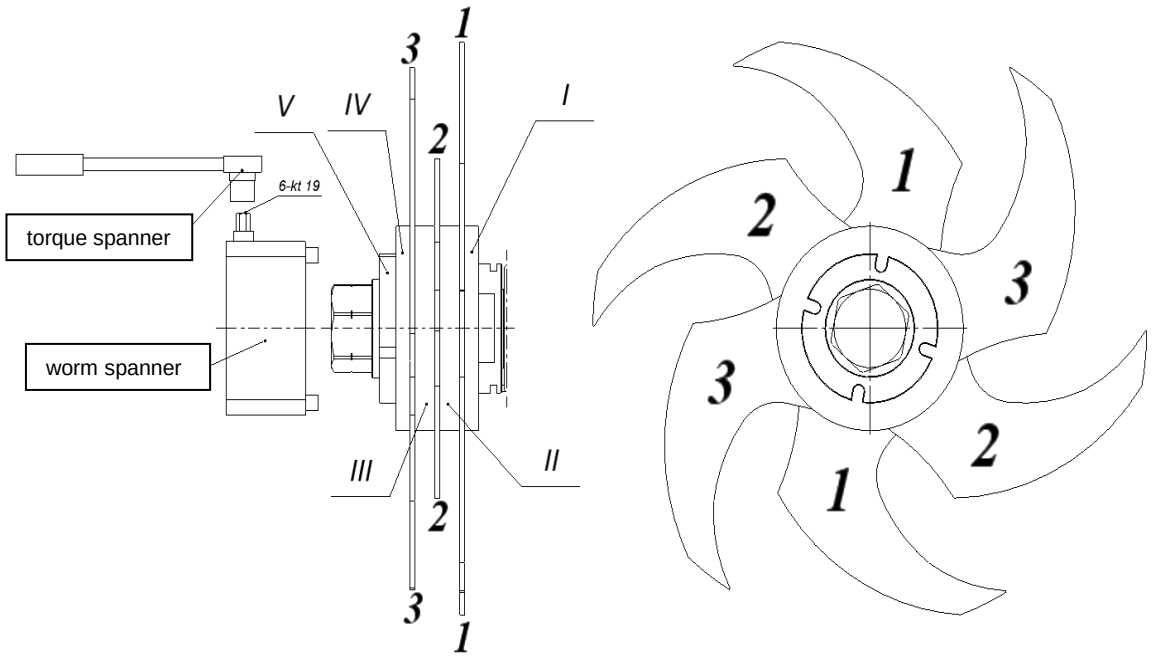


Figure 7. Knives unit

The knives unit, which is a part of the knives and shaft unit - p.2, fig. 5, consists of:
- a hub with a cylindrical opening, an external hexagonal surface and a collar with spanner slots,
- spacers: I, II, III, IV, V with hexagonal openings for determining their position on the hub and with openings for installing knives ,
- 6 pieces of knives ,
- a left-threaded nut for connecting all of the above-mentioned parts with the knives shaft pivot.

Assembly of knives should be carried out in the following way:

– insert the hub (6) on the neck of the knives shaft; the position of the hub is determined by the key and the flange,

- fix two knives on the spacer I; mutual position of knives and spacer in relation to each other is determined by pins in knives and cylindrical holes in the spacer. Insert the spacer with knives on the hub and shift it so that it rest on the flange of hub,
- fix next two knives on the spacer II; pins determining the position of knives with respect to the opening of the hexagonal ring have to be located in these openings in the ring that after installing the whole on the hub the knives were shifted about the angle 60° in counter-clockwise direction in the relation to knives installed on the spacer I,
- fix the two last knives on the spacer II. Their locating on the spacer has to guarantee after installing of spacers with knives on the hub the shift angle of 60° with respect to the knives installed on the spacer II in counter-clockwise direction,
- put the spacer III and spacer IV on the hub,
- screw manual (to the left) the nut compressing of the knives head,
- set the worm spanner; mount it in the seats of IV spacer,
- set the moment of the tightening M=70Nm on the torque spanner,
- tighten up a nut with the worm spanner and the torque spanner.

Disassembly of knives is moving in the inverse order than its installation; it is necessary to unscrew the nut first (left-hand thread).

Spacers marking (example)

6	8	-	1	1
6 knives head	8 knives head		Pos. Spacers after hub (6 knives head)	Pos. Spacers after hub (8 knives head)

The required momentum that guarantees proper tightening of the knives head with an adjustable spanner is 70 Nm.
The difference in weight between two knives installed on the same spacer cannot exceed 1 gram.

It is forbidden to mix knives with other from the same set or with another set.

Keep special caution during assembly/disassembly of the knives due to the risk of cutting with their blades.

4.9. Preparation for work

Before the work it is necessary to check:

- if space in the zone of cutter service is not blocked with others unnecessary objects,
- external condition of control elements and functioning of protecting devices,
- if all protective guards mounted,
- whether floor is clear and free from dust around the cutter,
- the state of cutting knives and its attaching, to tighten the nut fixing knives with the key, to take note of the mark of blunting of blades of each knives and distance between knives and the mixing bowl,

It is unacceptable to work with dull or wrongly sharpened knives due to:

- **overheating of the crumbled mass;**
- **breaking meat instead of cutting it;**
- **overloading of the drive of the knives shaft (quickened wear of bearings);**
- **prolongation of the cycle of cutting.**

- if in mixing bowl are no foreign matters that could cause damage to the knives, bowl or covers,
- if on the covers and main body there are no tools or other objects, if so, one should remove them.

4.10. Procedures during work

- Switch on the power with the main power switch,
- Switch on the controls by unblocking the EMERGENCY STOP safety switch (see 6.2.),
- Using buttons  raise the knife cover and the front cover,
- With the loading lift using buttons  fill the bowl with the materials prepared for processing,
- Depending on the operation mode selected, proceed according to the description in chapter 6 Control.

Speed of rotating knives head when the front cover is open is reduced to 2000 rpm due to safety reasons.

The rotary speed of knives in the panel: Knives while knives are switched on it pulses if the difference between the real value and set knife head is larger than error of the regulation placed in the service. Pulsing of rotations of knives can prove/indicate overloading the drive - in this case one should reduce the speed and the amount of given batch.

It is forbidden to:

- **Use the device by unauthorised and untrained persons.**
- **Enter the operation area by unauthorised persons.**
- **Leave items useless for production in the work area.**
- **Remove faults and conduct repairs by unauthorised persons.**
- **Start the device without installing protective covers.**
- **Remain in the operating range of the loading lift.**
- **Violently lower the rear and front covers.**
- **Exert too much pressure with the disc on the bowl or violently pull at the stuffing ejection and loading mechanism.**
- **Load too large amounts of meat mix into the bowl and distribute it unevenly inside the bowl. The volume of one load of the mix (all ingredients) is:**
  - **for boiling and cooked sausages ~70% of bowl capacity**
  - **for refrigerated sausages ~ 40% of bowl capacity**
- **Install knives that are improperly sharpened, with a wrong knife profile or use dulled knives and those that differ in weight more than 1 g from other knives mounted on the same spacer.**

4.11. Procedure after finishing work

- When the machine stops, without any message on the alphanumeric display, it means that cutting has finished.
- To empty the bowl, place a cart under the discharge chute, with button  lower the stuffing ejector and with button  start the bowl's rotations.
- Wash the machine as described in chapter 9.1.

4.12. Residual risk

Residual biological risk

Risk of infection can not be eliminated using only technical means. Rigorous observance of sanitary conditions obligatory in meat processing is of great importance.

Residual mechanical risk

Residual risk to safety exists when the following operations are carried out:

a) removal of meat material from the pan – risk is caused by movements of the ejector disk and pan;

b) mounting of blades on the blade shaft and their dismounting for sharpening; risk is caused by sharp edges of blades;

Additional protective means consist in the use of protective gloves.

Residual risk of electric shock

Residual risk of electric shock can be encountered in case of improper operation of

subassemblies closing, shielding and protecting electric drive and control systems during washing and maintenance of the cutter. Refer to section 3.3.2.2. and 4.3.2.

ATTENTION – DANGER!!

1. Never direct the water jet onto machine control panel, electric equipment , control cabinet, machine sealing and into inside of the machine(namely space where electric drive and control components are built-in like motors, pumps moto-reducers and so on).

2. Machine-washing with water jet may be carried-out with entirely cut-OFF electric supply by means of main switch, installed outside the machine and with entirely closed all covers protecting electric equipment.

3. **Before connecting the machine to electric supply, after washing it, dry all machine surfaces with particular care concerning electric equipment.**

4. **A/m recommendations and prohibitions contained in remarks above should be strictly observed and always applied during the machine washing and rinsing with water**

4.13. Troubleshooting and fault clearing

Identification of electric defects

One of the basic cutter control function is permanent analyze state of all machine assemblies and notification the operating staff in form of alarm message display about any defect found. When any signal concerning occurring danger appears, the respective message on the alphanumeric display (item 1, drg No 5) is being displayed and a diode in area of pushbutton  (item 2, drg No 5) become lighted-up. If signal, which had caused alarm, ceases, the message is still being displayed, but the diode in area of pushbutton  extinguishes. It allows notification of all, even very short time, disturbances

In case, when more than one alarm occur at the same time, all messages can be read in succession, by successive depressing pushbutton of alarm cancellation (item 2, drg. No5).

If in given moment, a signal causing alarm ceased, (diode in pushbutton  extinguishes) then depressing of pushbutton  conceals the message.

If, in given moment, a signal causing alarm is still being active, (diode in pushbutton  is lighted-up) then the cancellation of the message by depressing pushbutton  in not possible

Troubleshooting and fault clearing (electrical)

Item	Symptoms	Possible cause	Manner of repair
1.	No displays of parameters on the cutter control panel appear.	- lack of electric supply in the whole or part of electric circuits.	- Check correctness of the cutter main electric supply; - state of power fuses, quick-break fuses and protections in the cutter control cabinet
2.	On the control panel, a message " NO CONNECTION" is being displayed, but no other parameters	- Lack of connection between the control panel and controller, -defective controller PLC	- Check continuity of conduits between controller clamps and the control panel; - Check if signaling diode RUN on the microprocessor connector PLC is lighted-up; - Exchange connector PLC.
3.	On control panel message „OVERLOAD OF KNIFE DRIVE" is displayed	- overload or damage of thyristor set controlling the engine of knife drive	- Check the state of thyristor set supplying engine DC of knife drive according to diagnostic states (displays – diodes) enc. No1 - check state of protection of fan knife drive; - Read alarming messages in thyristor set (in cabine) and find reasons (look enc. No 1)
4.	Controller functions correctly and displays right parameters but cutter cannot be put into motion. Upon switching-ON knife drive, signal lamp alights and velocity set value pulsates.	- Lack of connection between controller and knife drive assembly (CONVERTER ASSEMBLY)	Check state of connections between controller and analogue module and thyristor assembly. Check the assembly acc to diagnostic states (Appendix. No 1). Check state of thyristor assembly communication module.
5.	On controller alphanumeric display a message „NO WATER" is displayed	- lack of water in supplying net; - dirty water filter; - dosage valve damaged;	- check the patency of water instalation; - change dirty water filter; - check dosage valve; - check impulsing sensor; - check electric system of flowmeter
6.	On controller alphanumeric displays a message „BOWL DRIVE OVERLOAD" is displayed	- overload or damage on frequency converter of engine of bowl drive.	Check frequency converter supply and read its diagnostic state acc to Appendix No
7.	On controller alphanumeric display a message „NO BOWL REVOLUTION is	- controller does not receive impulses from sensor of bowl	- check sensor of bowl rotation positioned under the power unit

Item	Symptoms	Possible cause	Manner of repair
	displayed. Rotation counting does not function in cutting option with pan revolution counting.	rotation; - bowl rotations are switched on bowl does not rotate .	
8.	Upon switching-ON the cutter, knives work but the pan does not revolve in spite that its activation is signaled.. Knife set rotary speed pulsates On controller display a message "NO TRANSMISION BELT" is displayed	Information about knife rotary speed from rotary speed sensor does not reach the controller. Drive belt slided-out from drive wheel	- Check position of knives revolution sensor Clean or, if needed, exchange the sensor, - Check position of drive belt. Adjust its tension if needed,
Remark: **Upon passage of displayed time, the controller blocks the whole cutter control.**			

Faults and disturbances of cutter work from mechanical causes

It. No.	Symptoms	Defect	Remedy
1	Irregular operation of the blade shaft drive, with intensive vibration. With the belt removed the motor operates without any trouble.	Too high belt pull. Improper position of the motor pulley in relation to the blade shaft pulley. Unbalance of driven parts.	Decrease the belt pull, readjust belt transmission. Check pulley, blades and balance them, if required.
2	Irregular operation of the blade shaft motor with belt removed.	Defective bearings. Loose bolts mounting the motor cover. Unbalance of pulley. Unbalance of the motor rotor.	Replace bearings. Tighten and lock bolts. Balance the pulley. Balance the rotor. Check commutator and repair it, if required.
3.	Damaged needle bearing	Normal bearing wear; shaft journal	Exchange the bearing.

		excessive load; excessive motor load	Lessen the load of shaft journal.
4	Excessive heating of the blade shaft bearings immediately after start or lubrication.	Lack of lubricant in bearings. Bearings overfilled with lubricant.	Lubricate bearings. Use suitable amount of lubricant, specified in lubrication instruction.
5.	Excessive bearing warming-up during prolonged work	Wear of seals in cover bearings	Dismantle the bearing covers ; exchange damaged seal rings
6.	Noisy operation of bearing.	Defective bearing.	Replace bearing;
7.	Whistling noise in bearing.	"Dry" operation of bearing. Damage of bearing cage.	Lubricate bearing. Replace bearing.
8.	Premature wear of bearing.	Loading of bearing too high. Incorrectly assembled bearing.	Replace bearing.

4.14. Safety precautions

Danger encountered during operation of any machine is a relative notion as it depends on variety of factors.

Satisfactory level of work safety depends not only on design solutions and technical safety measures used in the cutter by Metalbud but also on rigorous observance of the manufacturer's recommendations as regards operation of the cutter, professional qualifications of operators and service conditions.

In particular the following precautions should be taken:

1. Do not admit operators who have not been properly trained to operation of the cutter. Training program should include discussion of potential hazard, technical safety measures used in the cutter and service conditions specified in this instruction manual.
2. Do not admit unauthorized persons to troubleshooting and repairs.
3. Prior to proceeding with maintenance, repair or washing of the cutter, disconnect the cutter power supply and prevent incidental switching on.
4. The user is not allowed to make any design modifications which could result in deterioration of safety level or appearance of new hazards.
5. The cutter front and rear covers must not be lowered rapidly. Excessive pressure of the ejector disk on the pan and jerks of the ejector mechanism should be avoided.
6. The pan should not be loaded with excessive amount of meat. Meat material should be uniformly distributed in the pan. Permissible volumes of single batch of product (all components) loaded into the cutter are as follows:
    a. scalded and boiled pork-butcher's products: approx. 70% of the pan capacity (approx. 90 kg),
    b. unboiled pork-butcher's products: approx. 40% of the pan capacity (approx. 65 kg).
7. It is not allowed to mount improperly sharpened blades, with incorrect profile, and to operate with blunt blades or blades differing in weight by more than 1 g (difference between two blades mounted on the same ring).

4.14.1. Action preventing from knives' cracks in a cutter.

Attention!

Avoid reaction of side forces on knives.

Item	Action	Reason
1.	Bowl's filling up- max 75%	High level of filling up results in big side forces affecting the first knife.
2.	Emulsification – on small bowl's speeds only	Product's swelling results in very big side forces, which affect the first knife.
3.	Processed products – do not process hard objects such as bones, parts of plastics or metal with a product	Hard objects lead to cracks of knife-edges, thus worsening of cutting quality and increasing breaking hazard.
4.	Cutters with nitrogen – do not add liquid nitrogen directly onto knives	Too low temperature of knives leads to brittleness and cracking of knives.
5.	Cleaning – it is forbidden to operate on high revolutions of knives, when there is water without detergents in a bowl.	Possibility of knives' cracking resulted from hard scale water. Avoid knives' cracking by using of detergents.

4.15. Personal safety means

KN-125 operators should be provided with personal safety means foreseen by law and/or sanitary regulations for such working environment i.e. clothes and shoes aprons, hats, etc.

4.16. Competence of the staff

All the KN-125 cutter operators have to pass in site instruction which to comprise:

1. Design, operation and service of cutter.
2. Potential hazards and applied safety means to eliminate or to reduce them.
3. Residual risk safety means.
4. Discovering fails and disorders.

Apart from that some authorised staff should be taught:

- ways of fixing the fails
- maintenance, inspection and repair operations

5. PRESERVATION OF WORKING ORDER

5.1. Maintenance

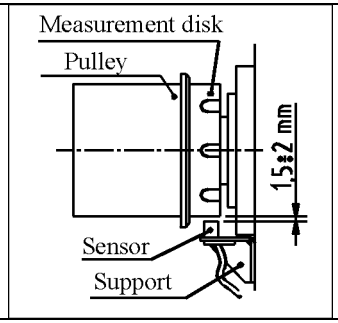
Regular inspections and maintenance as well as keeping the cutter in the working order are a base of reliable operation of the cutter.
Both maintenance and repairs should be carried out only by authorized and suitably qualified personnel.

To prolong the cutter service life, special attention should be paid to the following operations:
Everyday washing and cleaning of the cutter.
The blade head with labyrinth cover should be completely disassembled **every week.** Blades, spacers and cover should be dried after cleaning. Apply special nutritive grease to the shaft pin, blades, separators and labyrinth cover.
Other subassemblies and parts should be greased according to **Grease Lubrication Table.**

MAINTENANCE OPERATIONS

It. No.	Operation	Means	Frequency
1.	Cleaning of work stand and cutter.	Water with agents dissolving fat and proteins, at pressure; pure water for rinsing; brushes and cloth for washing and drying washed surfaces	every day, after termination of work
2.	Cleaning of air filter of the blade shaft motor fan.	Removal of accumulated dust.	every week
3.	Cleaning of cutter air inlet filter (in the cutter body shield)	Exchange for a new one; alternatively, clean by means of compressed air or vacuum clean. (filtration fabric 5205)	Once a week **Attention** **Dusty filters or lack of them will cause damage of main motor**
4*.	Cleaning of filter (in the control box)	Removal of accumulated dust.	Every week (in dustiness working) Every month
5.	Correction of blades. Professional sharpening of blades with regeneration of original blade profile and angles and balancing.	Grinding-polishing machine WIBO 7K Special grinding-polishing machine with water cooling of grinding wheel and abrasive tape, provided with polishing wheel. Electronic balance.	every day, depending on degree of dullness once a week (blades can be shipped to Metalbud)
6.	Lubrication	According to instruction and lubrication table.	
7.	Checking of O-type sealings on pins mounting blades in the ring.	Visual checking.	each time blades are dismounted and mounted
8.	Checking of wear of rings mounting blades and O-type sealings.	Visual checking.	each time blades are dismounted and mounted
9.	Checking and replenishment, if required, of oil in the pan drive gear.	Synthetic oil TIVELA OIL S 320 (SHELL)	once every three months

It. No.	Operation	Means	Frequency
9	Checking of tension of the blade shaft drive belt. a) with the use of the HABASIT device	Stretching of the belt by means of HABASIT device: Adjust position of motor so that deflection of the belt is minimum. Mount the HABASIT device on the belt and stretch the belt to obtain 1,6 to 1,8%. Put the machine into operation and check transverse swing of the belt on the head shaft pulley (maximum permissible deflection: approx. 3 mm at 1000 rpm). In case of greater deflection adjust position of the motor axis to change the belt tension.	once a month
		Do not ever stress the belt intuitionally. Given counted stress has to be exactly maintained. Exceeding ε=1,8 % results in permanent loss of the belt features.	
	b) Stretching of the belt without the use of the HABASIT device:	Loosen the belt and make two marks on it, spaced at 500 mm. Stretch the belt so as to increase distance between the marks about 8-9mm	
10	- checking of condition of electrical equipment and wiring system of the cutter and power supply circuit; - checking of electrical connections, particularly connections of protective devices; - measurement of insulation resistance, checking of effectiveness of protection against electric shock, measurements of loading of motors;	measuring equipment	after each replacement of any switch or control device but at least once a year;
11	- checking of condition and position of the rotation sensors of the blade head	Proper position of the blade shaft rotation sensor:	after each repair connected with longitudinal displacement of the shaft

It. No.	Operation	Means	Frequency
	shaft and pan; checking of the sensor mounting stiffness; checking of a distance between face and measurement disk – approx. 1.5 mm		but at least once every six months;
Notice: **Any of the activities described above must not to be made while the cutter 's supply is connected.**			

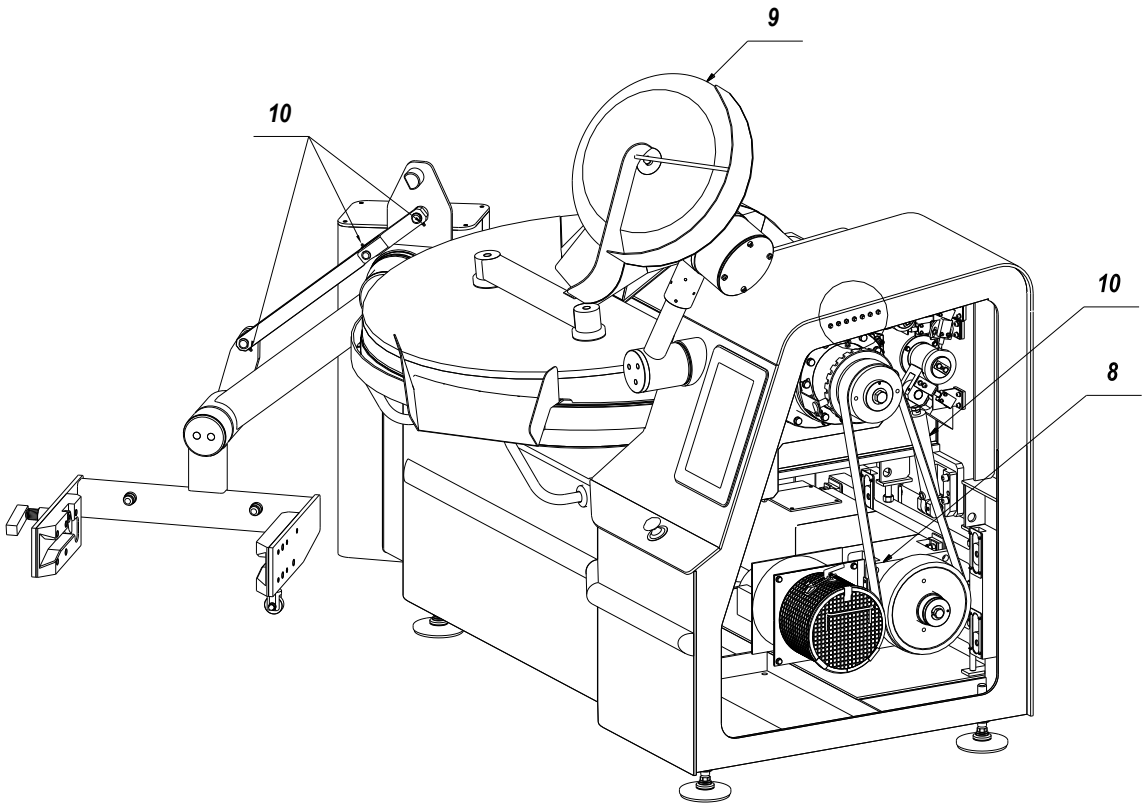
* - option

Table of grease lubrication

Point No.	Lubrication point	Lubricant	Frequency	Amount of lubricant	
1	labyrinth sealing of the blade shaft	Shell Cassida Rls2	every 8 hours of operation knife shaft or after each standstill longer than 60 min	until clear grease outflows from the labirynth	standard lubricator supplied with the cutter,
2	front bearing of the blade shaft	Shell Cassida Rls2	every 50 hours of operation knife shaft	dose (4 g) (1/2 container of lubricator)	Special lubricator 4248MS supplied with the cutter. Prior to greasing fill the lubricator as described.
3	packings of the blade shaft bearings	Shell Cassida Rls2	every 100 hours of operation knife shaft	dose (2 g) – 2 full turns of lubricator knob	
4	rear bearing of the blade shaft	Shell Cassida Rls2	every 50 hours of operation knife shaft	dose (4 g) (1/2 container of lubricator)	
5	Bearings of the bowl drive shaft	Shell Cassida Rls2	every 750 hours	8g	standard lubricator supplied with the cutter
6*	front bearing of stuffing ejector shaft	Shell Cassida Rls2	every 750 hours	1 g	
7*	rear bearing of stuffing ejector shaft	Shell Cassida Rls2	every 750 hours	1 g	
8**	front bearing of motor knives shaft	Shell Cassida Rls2	every 1000 hours of operation knife shaft	10 g	
9*	Plate of stuffing ejector	Shell Cassida Rls2	Every 75 hours	5g	
10	Rest of lubricator points (silentblocks)	Shell Cassida Rls2	Every 200 hours	1g for every lubrication point	

Note:
The user's failure to follow recommendations given in this Table will result in voidance of the guarantee.
Apply only the greases passed in schedule of lubricating

* - not applied "S" version
** - only for direct current motor version



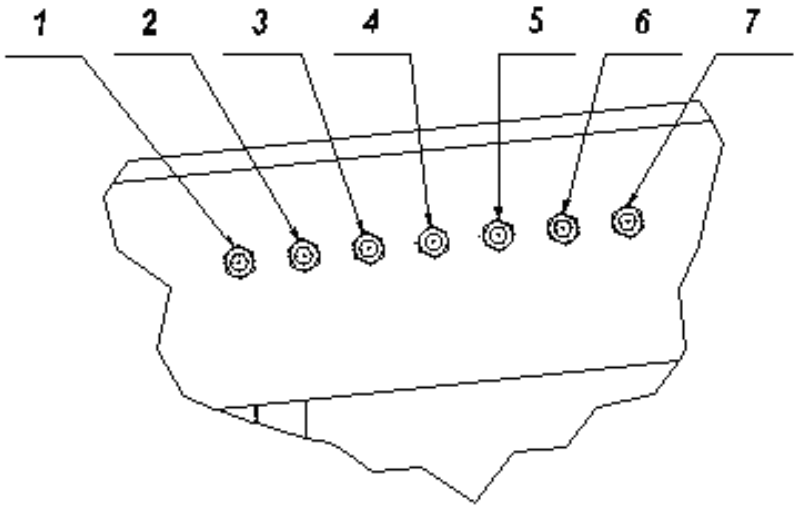


FIG 4. Main lubrication points of the cutter

Special 4248MS greaser and 0.5 kg of grease to be brought once by the manufacturer along with the cutter bought. Greaser capacity - abt. 8 grams.

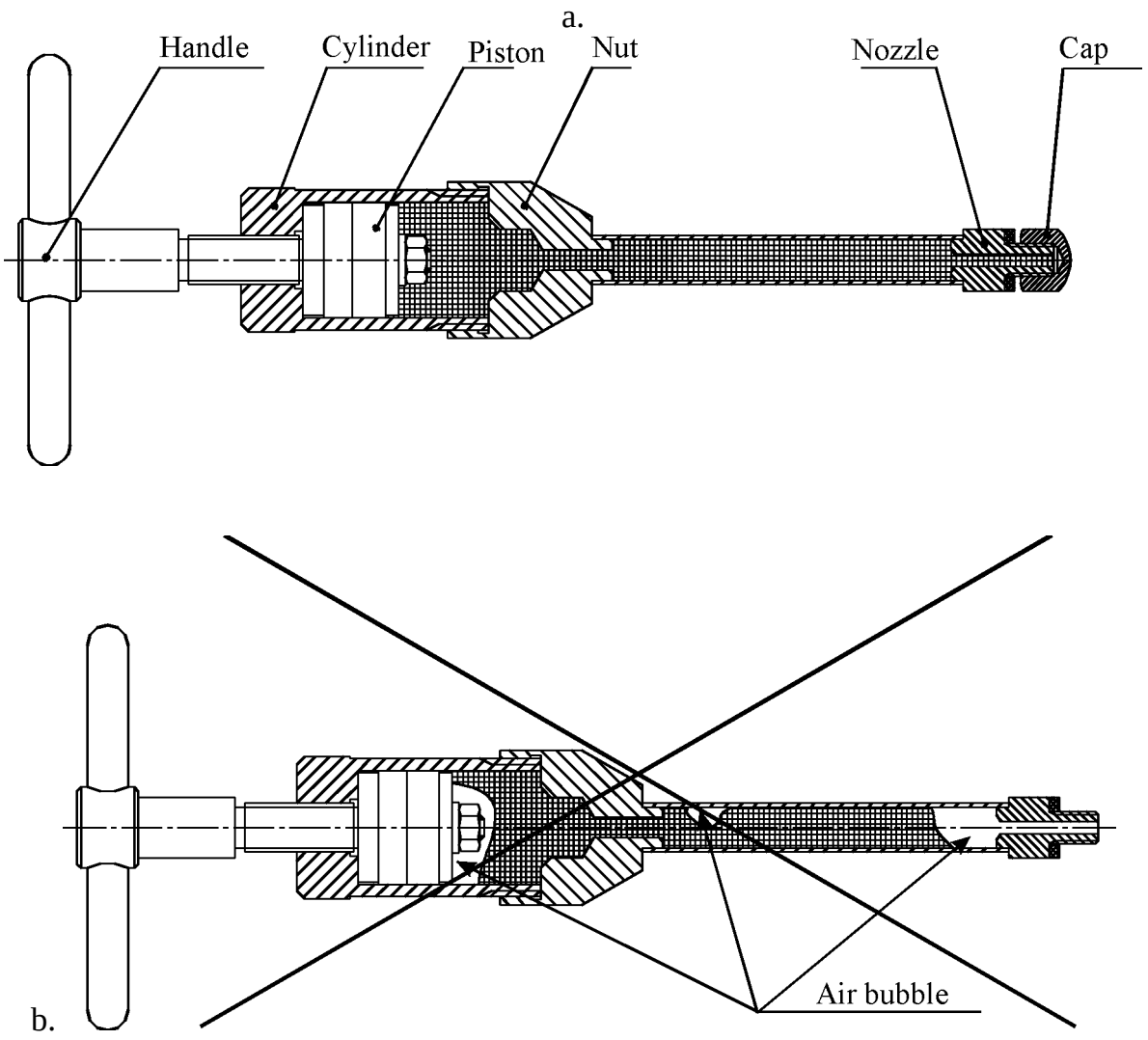


FIG 5. Special 4248 MS type greaser.

a. Proper grease filling (the greaser ready for operation)
b. Improper grease filling

Preparing the greaser for operation:

1. dismantle the greaser (turn off the cover from the greaser cylinder and put the cap off the nozzle)
2. remove the piston into the outer position (turning the knob lefthand-wise till stop)
3. fill the cylinder with the grease (with no air bubbles inside)
4. assemble the grease (turn the cover on the cylinder)
5. move the greaser piston forwards (turning the knob righthand-wise) till grease comes off the nozzle
6. operations mentioned in 1-5 p-ts. to be repeated until greaser filled full (at the outer position see Fig.8.)

NOTICE:

The greaser ready to operate as above to be preserved with cap nut during storage.

Way of greasing the 1; 2; 3 points (Fig. 7.)

- remove the protecting caps from the greasing nipples 1; 2; 3 shown in Fig. 7.
- screw the greaser nozzle to the nipples in consequence.
- apply the grease in the amount according to the Greasing Table (righ turns of the knob).
- protect the nipples to be protected again – turn the caps on.
- put a cap preventing the grease leaks on the greaser nozzle.

HINTS:

Always prepare the greaser in the way described in 1p-t. when start greasing the cutter.

Full greaser dose means amount of grease pressed through the nozzle moving the piston from outer to inner stop by turning the cover righthand-wise having the greaser full-filled.

5.1.1. Maintenance and grinding the knives

Dismantle the knife set at least once a month and clean its setting surfaces from stuffing remains. They should be derusted if needed and greased with animal fat. The surface of knife shaft neck to be greased as well before connect the knives. The slightest scratch on the polished knife surface can induce the corrosion due to chemical and mechanical interactions resulting in knife breakage. Weigh coupling the knives fixed on the same ring gives the whole set proper balance till the mass differences do not exceed **1 gram** per each knife couple. The knives coupled with bigger weigh differences cause noisy operation, soon wear of the knife shaft bearings, material stresses that in consequence can make other damages.

IMPORTANT !!! Cutter knives constitute high quality components, and they are responsible for quality of cutter work and its safety, and they undergo great stresses during operation, so they must be kept in great attention and thoroughly maintained and preserved

IT'S FORBIDDEN TO STRIPP KNIVES WITH SEPARATORS WITHOUT COVER PLATE. THIS ELEMENT PROTECT KNIFE'S SHAFT THREAD. COVER PLATE IS DELIVERED WITH CUTTER

GRINDING THE KNIVES

Knife sharpening

Knifes are made from hardened stainless steel, so, while performing their sharpening, observe following conditions:

- Perform sharpening operation using a special grinder with grinding wheel profusely cooled with water;
- In the course of sharpening operation particular care should be taken for not to overheat the knife material (tint yellow-brown or blue color). Overheating causes grinding cracks, breakings and loss of hardness;
- Preserve the "barrel" knife profile, as well as edge angle 25^0 given on drg. No 8 "a and b". At angle exceeding 25^0 great bending stresses occur, which may cause cracks during operation. At angle lesser than 25^0 or with "wedge" shape, the knife lifetime diminishes considerably.

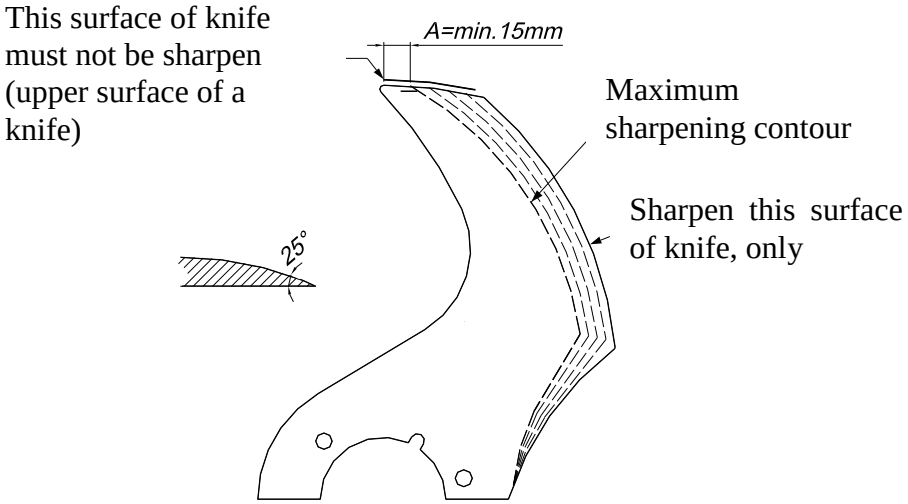


FIG 6a. KN-125 cutter knife type U2 profile and angle of blade to sharpen.

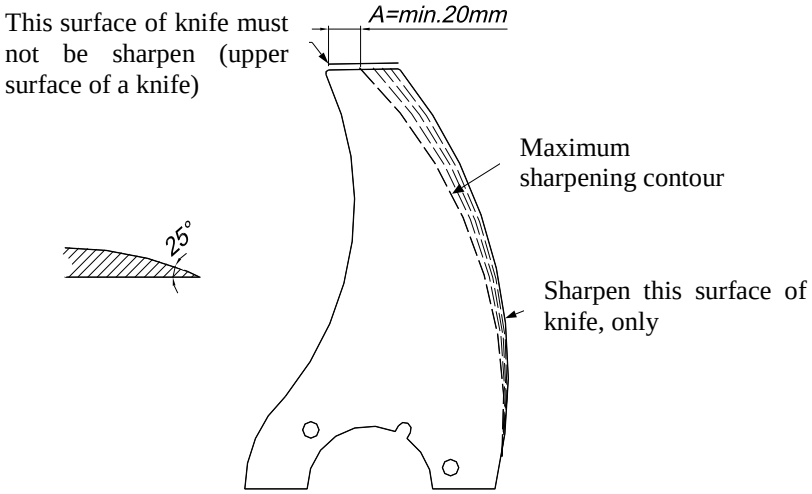


FIG 8b. KN-125 cutter knife type U3 profile and angle of blade to sharpen.

The large bending forces can appear at wider blade angle leading to vibration cracklings. Too narrow blade angle limits remarkably the blade durability. Scars can show

which cause knife breakage.
Couple grinding is recommended to the same shape and mass to keep the balance of the whole knife set.
After barrel-like shape and proper blade angle are acquired the blade should be finished on the band grinder with the band possibly long. First finish to be made using 280-grade band, then on 400-grade. The proper blade bevels to be formed next. At last the grinded surfaces to be polished with disk and paste till gloss.

NOTICE:

Operating the cutter with the knives sharpened not accordingly with the above hints shall avoid the guaranty !

It is forbidden to sharpening of an upper surface of a knife as well as applying knives, in which this edge is smaller than 15 or 20mm (fig. 8 a and b).

5.2 Periodical inspections

It. No.	Subject of inspection	Verification of the following items	Frequency of inspections, at least
1	**Operators' stand**		
	Surface condition	breachs, irregularities of the floor surface	once a year
	Positioning and levelling	loose adjusting bolts, deviation of the cutter body from horizontal position	every 3 months
2	**Mechanical subassemblies and parts**		
	Cutter body	fractures of welds mechanical defects of metal plates	once a year once a year
	Pan	loss of material, pits, mechanical defects, cracks	once a month and after each break-down of blades
	Covers	cracks, mechanical defects, excessive clearance on hinges	once a month and after each break-down of blades
	Blade assembly	nicks of blades, mechanical defects, scratches and cracks, excessive dullness; damage of blade mounting rings	every day once a week
	Stuffing ejector	slackness of disks and shields, deformation of mounting elements, mechanical defects	every day
	Belt transmission	excessive wear of belt, cracks, too low or too high tension, slackness of pulleys on shaft pins	once a month
	Gear transmissions	noisy operation, outflow of oil	once a year
	Blade shaft	mechanical defects of bearing seals, defects of bearings, correctness of lubrication, dirt, defects of key joints, defects of thread	once a month
3	**Potable water feed system (optional accessory)**		
	Connections, pipes	tightness	once a month
	Hoses	breaks, bends, other visible defects	once a month
	Flowmeter, valve	defects, improper operation	once a month
4	**Elecrtical circuits**		

It. No.	Subject of inspection	Verification of the following items	Frequency of inspections, at least
	Conductors and conduits or troughings protecting conductors	mechanical defects of insulation or defects of protective shields which could result in damage of insulation of external conductors	every day
	Internal conductors of the cutter and control cabinet	condition of insulation of conductors, moistness of electrical equipment, defects of seals of covers and door	every 3 months
	Terminal connections of power and control conductors in the cutter and control cabinet	loose terminal connections, especially in current circuits	every 3 months
	Blade shaft driving motor	wear of bearings, noisy operation, wear of motor brushes and windings, excessive sparking on commutator, condition of electrical and mechanical connections	every 6 months
	Motors of the pan, stuffing ejector and fan of the direct-current motor	wear of bearings, noisy operation, reliability of thread connections	every 6 months
	"ON" and "OFF" pushbuttons of the cutter controller	mechanical defects, leaks, incorrect operation	every day
	Cutter microprocessor controller	mechanical defects of external membrane, moistness from the inside	every day
	Resistance of insulation of electric system, effectiveness of additional protection against electric shock	defects of switching and controlling equipment	after each replacement of any switching or controlling device in the system
	Checking of insulation resistance and efficiency of additional protection against electric shock	periodically, according to applicable regulations but at least once a year.	

5.3. Replacement parts and usable materials.

See dispatch specification.

Appendix 1 Frequency converter of the bowl's drive - emergency statuses and locating malfunctions

The frequency converter that was used to control the rotation speed of the motor contains capacitors which accumulate high voltage after disconnecting the power. This voltage remains for some time.

Before beginning installation, maintenance or repair work on the frequency converter, it is important to:

1. **check if the power is disconnected;**
2. **wait 5 minutes in order for the capacitors to discharge to a safe voltage (<50V);**
3. **use a voltmeter to measure the voltage on DC+ and DC - clamps, if it is lower than 50V.**

After determining that the measured voltage is lower than 50V DC, the required maintenance and repair or installation operations can be started, with exercising special care**.**

DiagnosticsIn the event of an alarm a protective function is activated that stops the converter. The PU display panel or programmator will display the alarm indication. If the error does not correspond to any of the following descriptions, please contact your nearest Mitsubishi dealer.

- Error output signal backup ..... In case of converter supply contactor trip (MC) due to protection activaion, there is no power supply to the converter and the alarm output is not maintained.
- Alarm or error display..... When activated, it protects the programmator display from automatic switching and displays alarm notification.
- Reseting method ..... When the converter protective function is activated, the converter power output is disconnected (the engine stops in the rundown mode) The converter can start again only after reset has been executed or automatic reset function has been configured. Caution should be exercised when the reset is performed or during automatic restart configuration.
- When the protective function is active (ie, the inverter has been stopped and the error notification is displayed), follow the recommendations outlined in the description of particular errors and alarms. It is particularly important that: in the case of the converter output ground fault and too high power supply voltage, the cause is determined prior to restarting of the converter. Recurrence of t these errors can lead to shorter life of equipment components or even to the converter damage. Reset and restart of the converter is allowed only after finding and removing the causes of these errors.

Alarm list

Operation Panel Indication			Name	Refer to Page
Error message	E - - -	E---	Faults history	241
	HOLd	HOLD	Operation panel lock	246
	LOCd	LOCd	Password locked	246
	Er 1 to Er4	Er1 to 4	Parameter write error	246
	Err.	Err.	Inverter reset	247
Warnings	OL	OL	Stall prevention (overcurrent)	247
	oL	oL	Stall prevention (overvoltage)	247
	rb	RB	Regenerative brake prealarm	248
	TH	TH	Electronic thermal relay function prealarm	248
	PS	PS	PU stop	248
	MT	MT	Maintenance signal output	248
	UV	UV	Undervoltage	248
Alarm	FN	FN	Fan fault	249
Fault	E.OC1	E.OC1	Overcurrent trip during acceleration	249
	E.OC2	E.OC2	Overcurrent trip during constant speed	249
	E.OC3	E.OC3	Overcurrent trip during deceleration or stop	249
	E.OV1	E.OV1	Regenerative overvoltage trip during acceleration	250
	E.OV2	E.OV2	Regenerative overvoltage trip during constant speed	250
	E.OV3	E.OV3	Regenerative overvoltage trip during deceleration or stop	250
	E.THT	E.THT	Inverter overload trip (electronic thermal relay function)	250
	E.THM	E.THM	Motor overload trip(electronic thermal relay function)	250
	E.FIN	E.FIN	Fin overheat	251

Operation Panel Indication			Name	Refer to Page
Fault	E.ILF	E.ILF *	Input phase loss	251
	E.OLT	E.OLT	Stall prevention	251
	E. bE	E. BE	Brake transistor alarm detection	251
	E. GF	E.GF	Output side earth(ground) fault overcurrent at start	251
	E. LF	E.LF	Output phase loss	252
	E.OHT	E.OHT	External thermal relay operation	252
	E.PTC	E.PTC*	PTC thermistor operation	252
	E. PE	E.PE	Parameter storage device fault	252
	E.PUE	E.PUE	PU disconnection	252
	E.rET	E.RET	Retry count excess	253
	E.CPU	E.CPU	CPU fault	253
	E.CdO	E.CDO*	Output current detection value exceeded	253
	E.IOH	E.IOH *	Inrush current limit circuit fault	253
	E.AIE	E.AIE *	Analog input fault	253

* If a fault occurs when using with the FR-PU04, "Fault 14" is displayed on the FR-PU04.

LOCATING MALFUNCTIONS

Problem	Possible cause	Elimination method
The converter cannot be connected to power	Damaged fuses	Check the fuses, replace if necessary.
		Check the marking on the converter.
	Damaged power cords	Check the connections, if they are correct and solid.
		Check continuity of the wires.
The converter burns the fuses	Faulty or wrongly connected cables	Check the cause, replace the fuses before another test.
	Damaged converter	Send the converter to the manufacturer.
No work readiness (no HEALTH)	Incorrect power voltage	Examine the power supply carefully.
The motor does not start although the power module is working	Motor blocked	Stop the converter and eliminate the block.
The motor starts and then stops	The motor becomes blocked	Stop the converter and eliminate the block.
The motor starts at an incorrect speed	Reversing or breaking of the tachogenerator's connection	Check the tachogenerator's connection.
	Broken connection of the demand potentiometer	Check the control board.

MAINTENANCE AND REPAIRS

MAINTENANCE

Periodically check the converter's casing, ventilation and, if necessary, remove dust with dry compressed air and remove any obstructions on the way of ventilation air.

REPAIR

The converter contains parts non-serviceable by the user.

DO NOT ATTEMPT TO REPAIR THE CONVERTER, RETURN IT TO THE MANUFACTURER.

Save your data

Although the converter stores data after every power on, it is reasonable to store one's data in the control panel. If data had been saved before the converter became damaged, you can move the data back from the control panel back after repair.
If the control panel has been damaged, return it for repair.

Return

Please provide the following data:
Serial number of the converter and the warranty card
Damage situation description

Contact a representative of Metalbud Ltd
Attach all of the materials referring to the use of the converter. Pack the converter in the original packaging and send to the address of the service.

Appendix 1a Alarms in frequency converter (drive of knife-edges)

In additional book

APPENDIX 2

PRINCIPLES OF OPERATION OF CUTTERS WITH INFINITELY VARIABLE ADJUSTMENT OF KNIFE-EDGES SPEED AND PAN SPEED, manufactured by Metalbud Ltd.

The use of infinitely variable adjustment of speed of the pan and blade allows the user to set any ratio between the pan speed and the blade speed. This makes possible various cuttering and mixing processes to be used for different types of pork-butcher's raw material.

During the use of different configurations of the blade speed and the pan speed loading of the driving systems is monitored depending on amount and density of cuttered or mixed material.

Due to this monitoring, carried out by the cutter microprocessor controller, the operator is informed whether the used configuration of speeds is suitable for a given raw material.

If this configuration is correct, the blade speed indicator stops flickering after a set value of speed has been reached. If the speed indicator continues flickering, the operator should, as soon as possible in the course of cuttering, make correction either increasing the blade speed or decreasing the pan speed, as required by the cuttered material, until the indicator stops flickering.

The above correction should be made during any stage of cuttering or mixing when the operator is informed about the decrease of the blade speed and the blade speed indicator starts flickering.

NOTE:

If difficulties are encountered in adjusting the blade speed to the pan speed for a given raw material, make sure if correct amount of raw material has been not exceeded. If, with reduced amount of material in the pan, the blades reach the set speed in relation to the pan speed, this will mean that the batch must be suitably reduced – refer to section 4.6.6 of the Instruction Manual.

When some very difficult raw materials, such as skin, dense stuffing, etc., are cuttered, the manufacturer forbids to use the pan speed greater than 6 to 10 and recommends to use suitably reduced batch of the cuttered raw material.

In case of a great incorrectness of selected blade speed to pan speed ratio for a cuttered raw material, the cuttering process can be automatically stopped (the blade and pan drives will switch off) – message CHECK BLADE DRIVE UNIT is displayed. The drive stoppage may also occur after prolonged operation of the cutter when the speed has not been corrected in spite of flickering blade speed display. In this case the cutter electronic and mechanical subassemblies may become damaged.

Suitably qualified operators, acquainted with technical specifications of the cutter of Metalbud manufacture, will be able – after relatively short practice – to program parameters of the cutter operation suitable for the used raw materials, without necessity for current corrections of the speed during the cuttering process.

APPENDIX 3

Programming of the cuttering of stuffings and animal skins with the use of the KN-125 cutter

Examples of settings

I. Cuttering of tendinous meat, stuffings for sausages.

Meat – beef, pork with great number of tendons, with addition of spices and ice.

1. For loading and unloading the following settings are to be used:
   pan – 6 rpm, blade shaft – 1000 rpm.
2. For cuttering of tendinous stuffing the following settings are to be used:
   pan – 8 rpm, blade shaft – 4000 rpm

cuttering duration – 3 min or until the stuffing temperature of 6 – 8^0C is reached.

3. In case of sausage disintegrated to a high degree, e.g. hot dogs, etc., with addition of fat (dewlap, pork fat) the following settings should be programmed:
   pan speed – 10 rpm, blade shaft – 4200 rpm, duration of cuttering – until the stuffing temperature 10 – 12^0C is reached.

II. Cuttering of animal skins

At first skins to be used should be soaked during 24 hours in brine consisting of 7 kg of pecsalt dissolved in 100 l of water (the solution should be thoroughly intermixed).

1. Initial cuttering – cutting of skins with the following settings:
   pan speed – 2 rpm, blade shaft speed – 2200 rpm, duration of the cuttering – approximately 2 to 3 min.
2. Cuttering without ice with the following settings:
   pan speed – 8 rpm, blade shaft speed – 4500 rpm, cuttering duration – until the stuffing temperature 30^0C is reached.
3. After the material has been cuttered as described above, ice should be added and cuttering with the following settings should be carried out:
   pan speed – 8 rpm, blade shaft speed – 4500 rpm, duration of the cuttering – until 8^0C is reached.

NOTE:

The cuttering of animal skins must be preceded by the sharpening of blades.

III. Mixing of stuffing

1. Loading and unloading settings:
   pan speed – 5 rpm, blade shaft speed – 400 rpm
2. After the loading the mixing program is to be switched on:
   pan speed – 4 rpm, blade shaft speed – 300 rpm (counterclockwise rotation), mixing duration – 4 to 5 minutes.
3. Unloading of the mixed stuffing according to program described under 1.

IV. Cutting of frozen meat (salami)

FOR CUTTING FROZEN MEAT, ONLY A SET OF SPECIAL KNIVES FOR FROZEN MEAT MUST BE APPLIED

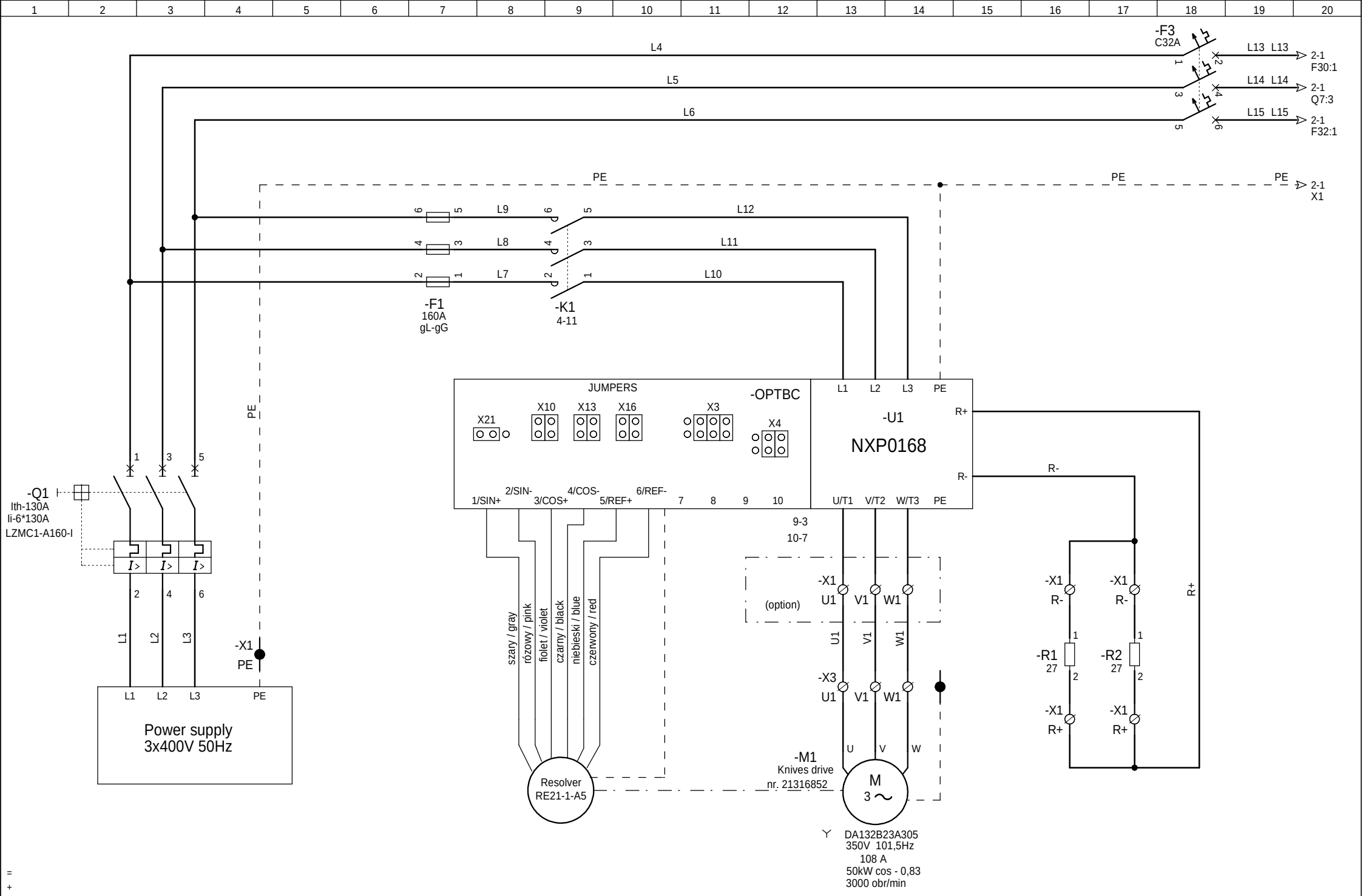
1. Blocks of frozen meat with temperature not lower than -10°C cut for slices with the thickness 5cm, next break in order to surface is no bigger than 10x10 cm.
2. In order to avoid high side strength operator can not tighten blocks of frozen meat to the knives. Use smooth knives (salami).
3. Fulfillment of bowl can not be bigger than pass under knife head is.
4. During loading knife shaft has to rotate.
5. For loading use: bowl 3 r.p.m., knife shaft 300-500 r.p.m. After finishing of loading cutter for about 3 min. up to achieving thick granulated product.
6. Cutting after achieving thick granulated produkt – use program: bowl 6 r.p.m., knife shaft 1000-1200
7. Further cutting conduct according to technology of achieving stuffing with needed granulation (salami, stuffing, sausage or pies).

V. Recommended filling of the pan with stuffing during cuttering

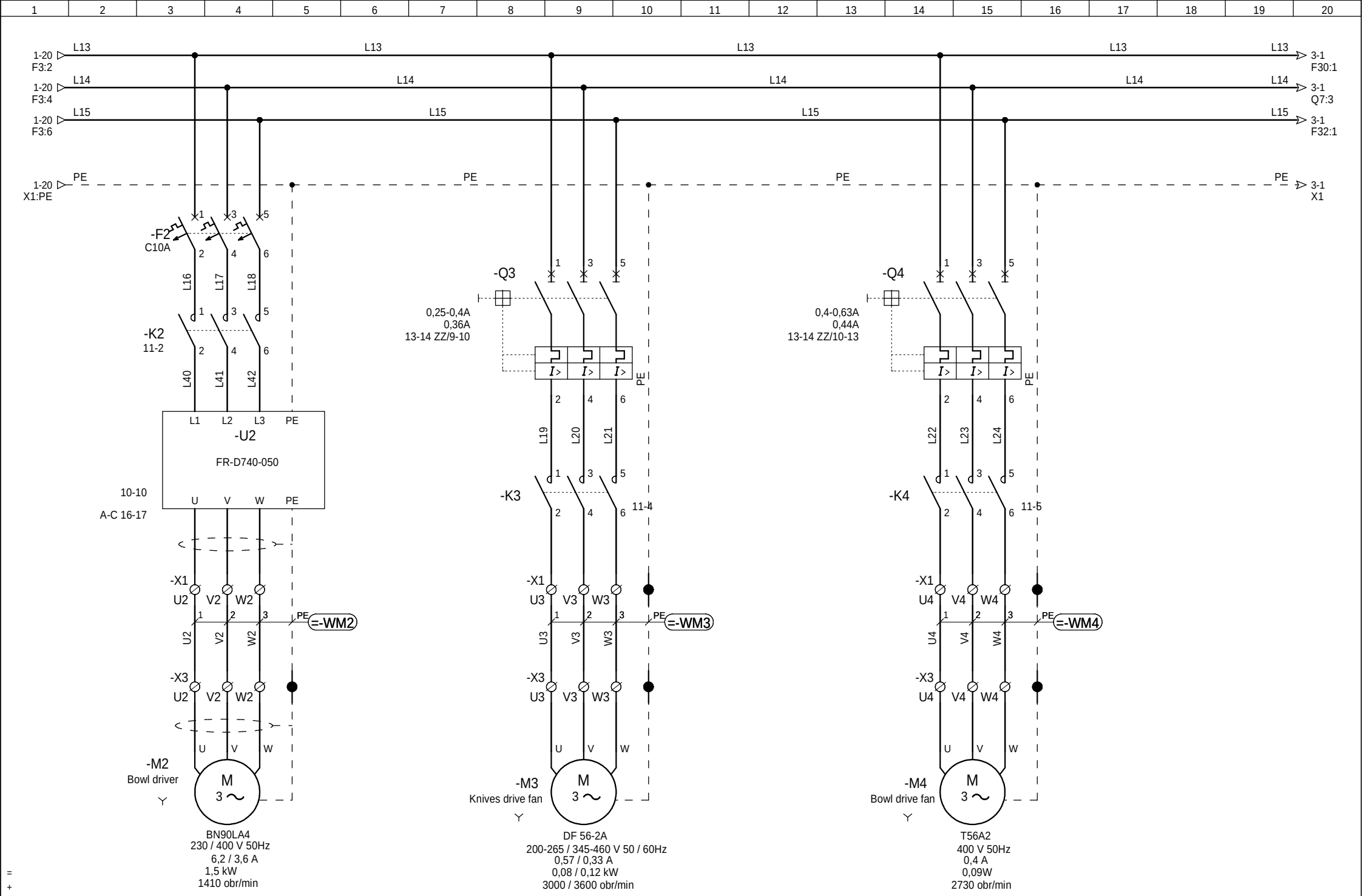
Type of cutter	Scalded and boiled pork-butcher's products. Final mass, kg (approx.)	Unboiled pork-butcher's products Final mass, kg (approx.)
KN- 125	90	65

APPENDIX 4 – Hydraulic system

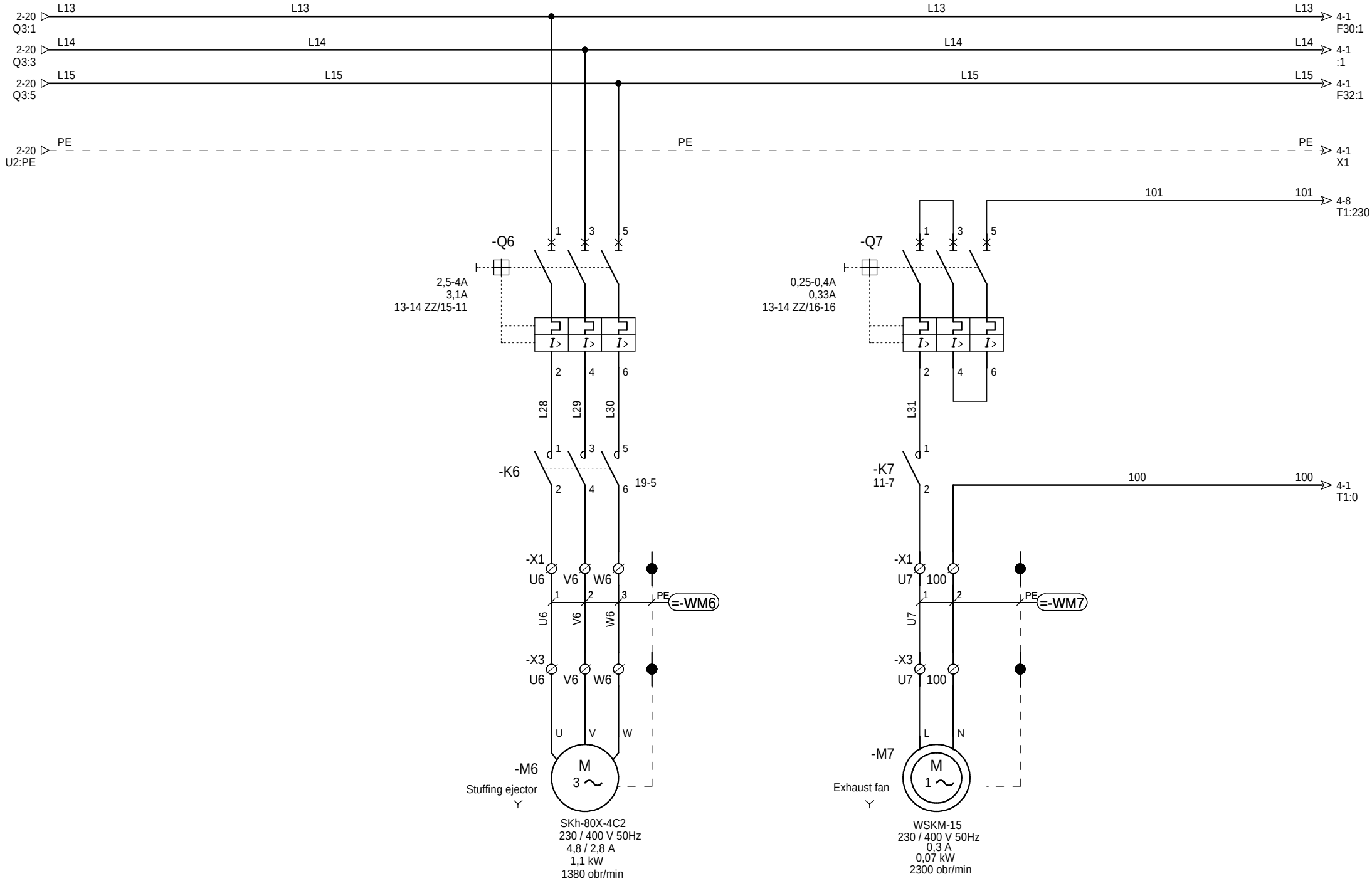
In additional book



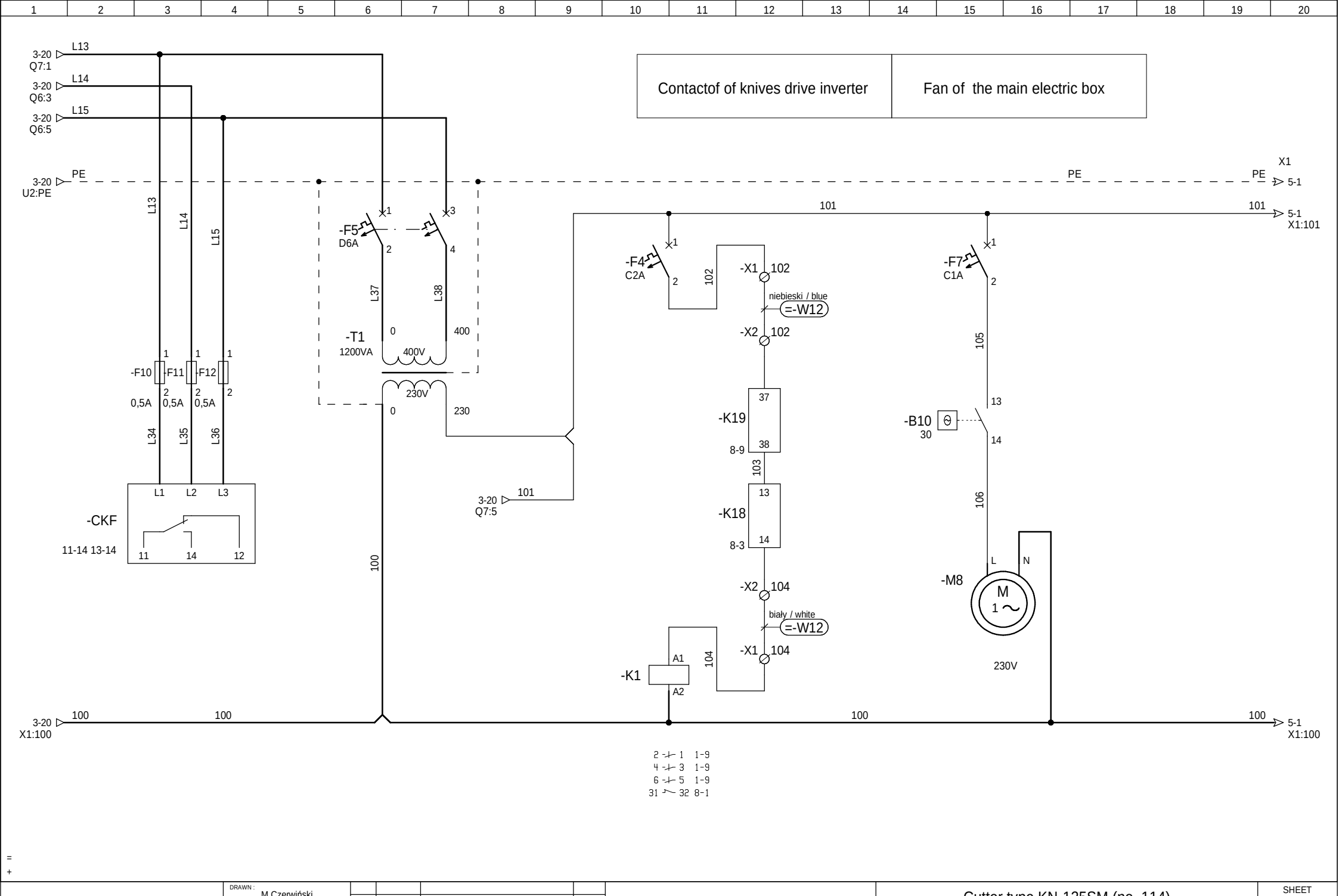
DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 1
CHECKED : M.Jarzębski						Power supply	◄ 2 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			



DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 2
CHECKED : M.Jarzębski						Power circuits 1	◄ 1 3 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			

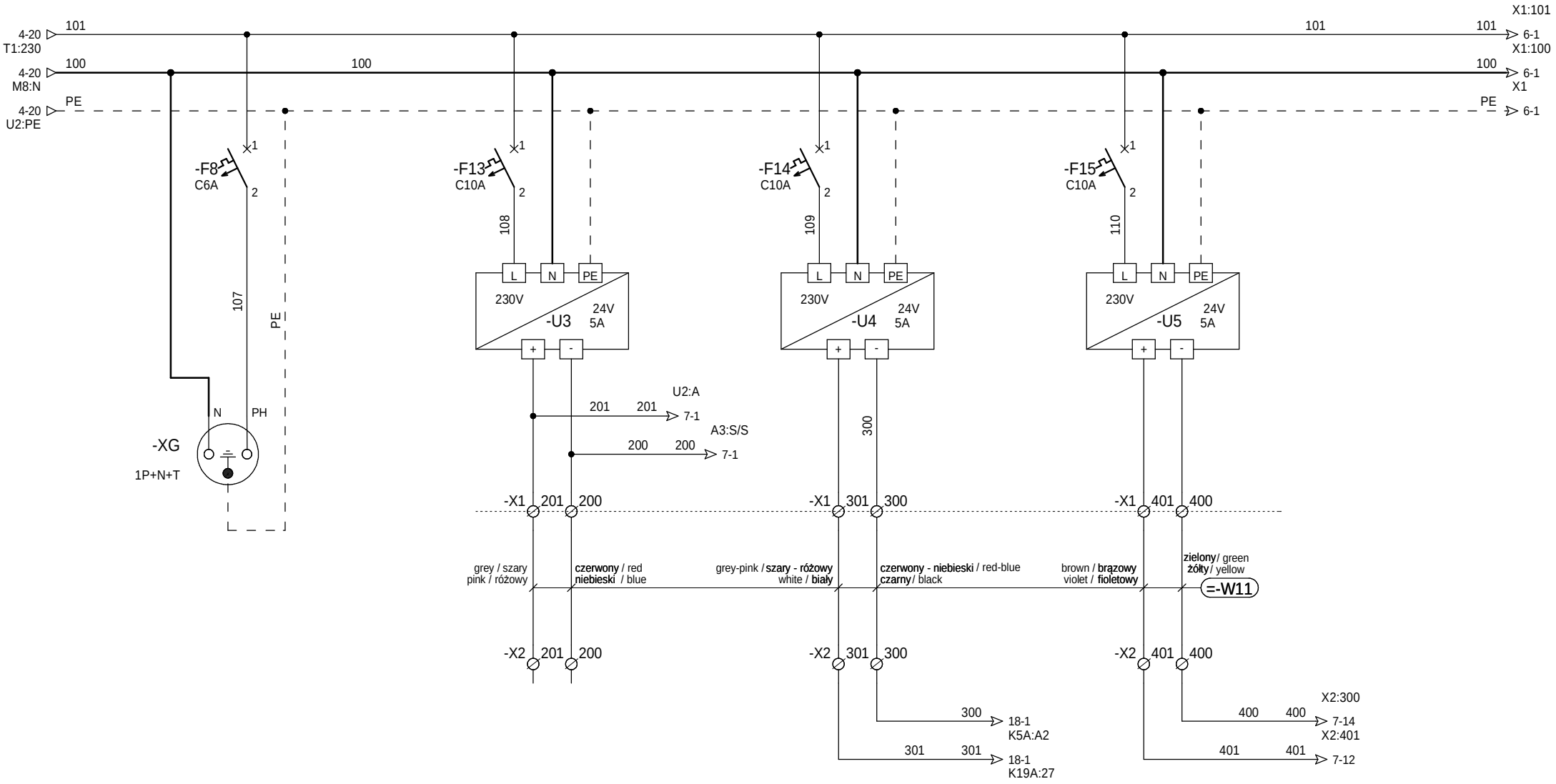


DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 3
CHECKED : M.Jarzębski						Power circuits 2	◄ 2 4 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			



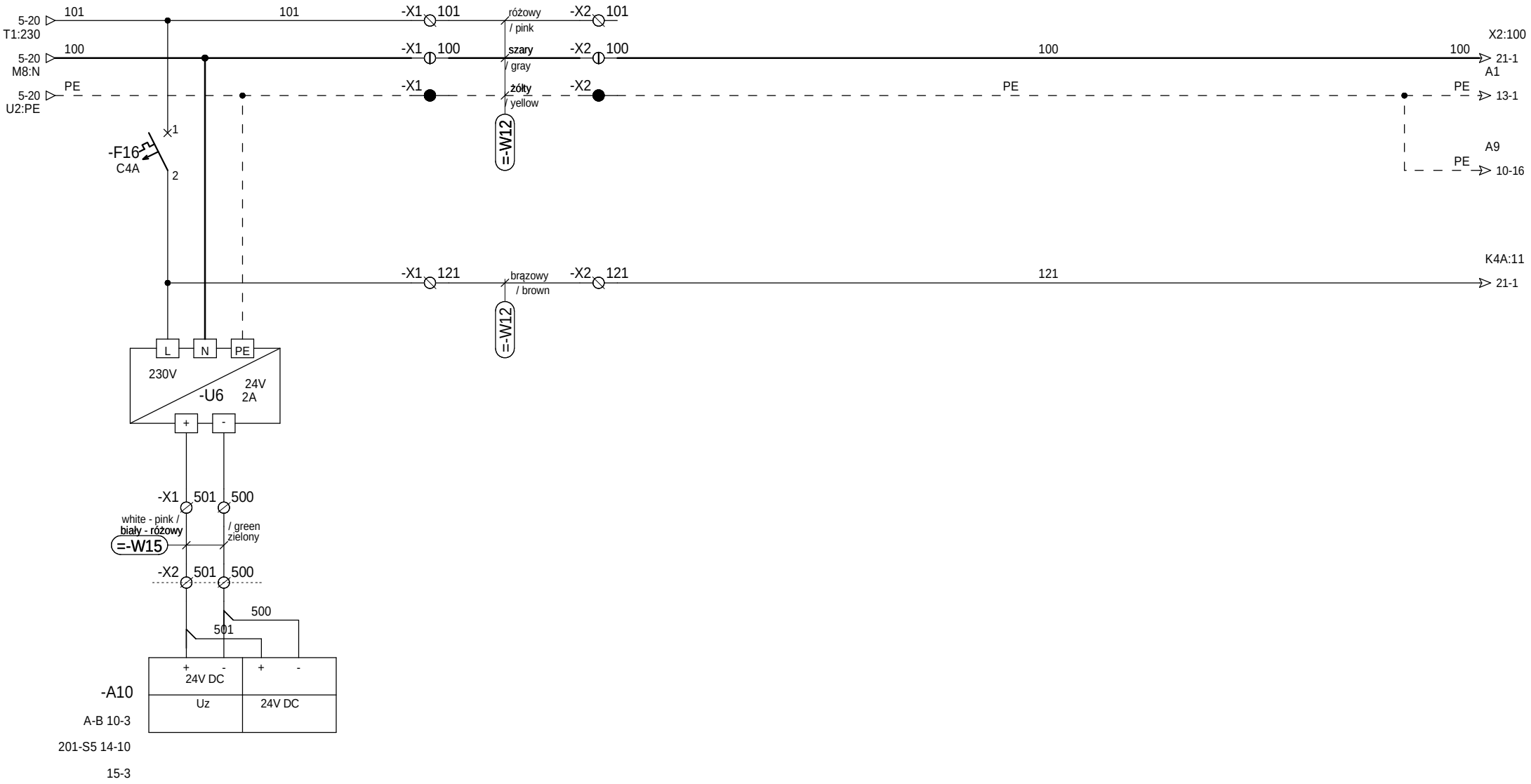
DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 4
CHECKED : M.Jarzębski						Transformer	◄ 3 5 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			

One phase service socket	Feeder - inputs power	Feeder - outputs power	Feeder - grease pump power



DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 5
CHECKED : M.Jarzębski						Power supplies	◄ 4 6 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			

Feeder - operational panel power



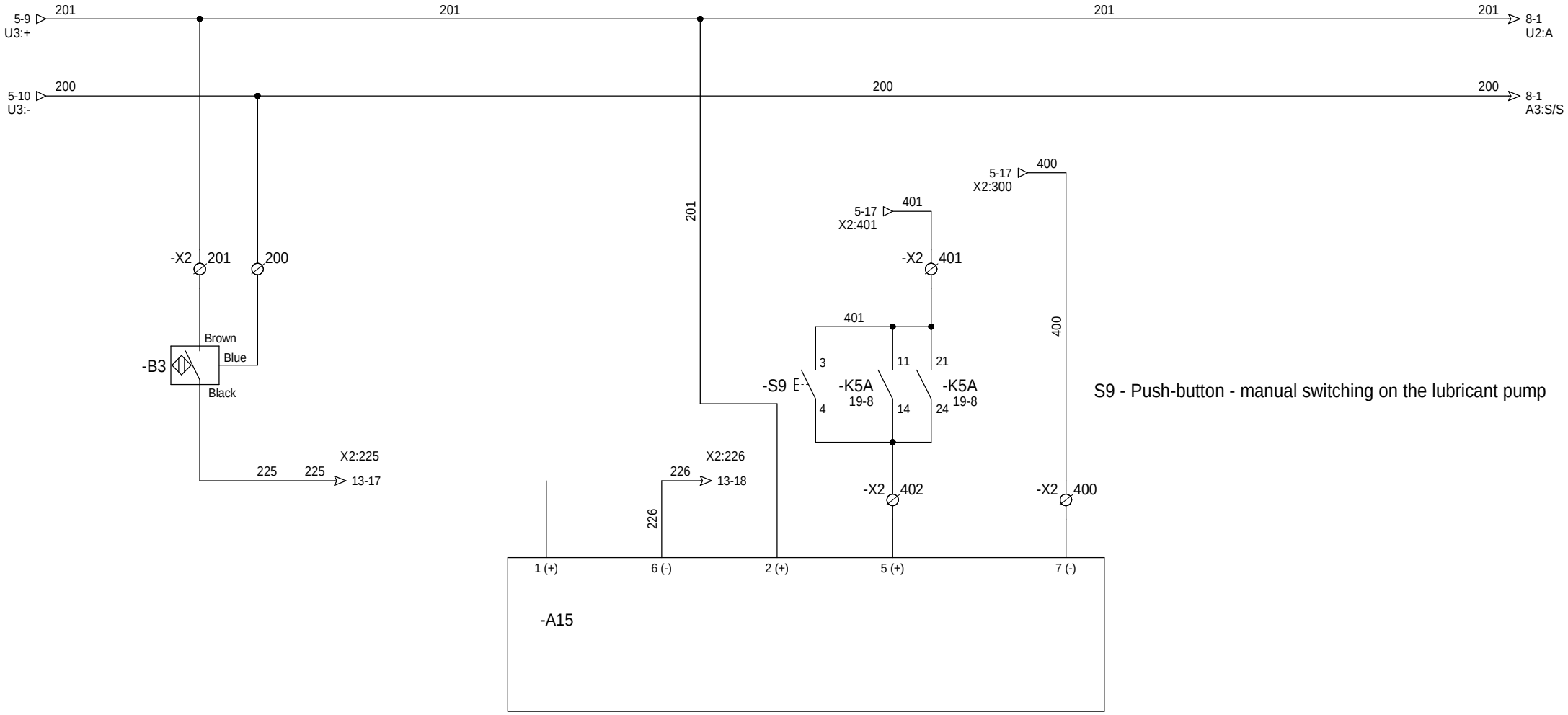
DRAWN : M.Czerwiński					
CHECKED : M.Jarzębski					
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :
	INDEX	DATE	MODIFICATION	DES.	

Cutter type KN-125SM (no. 114)
230V

SHEET 6
◄ 5 7 ►
Software SEE v. 3.00

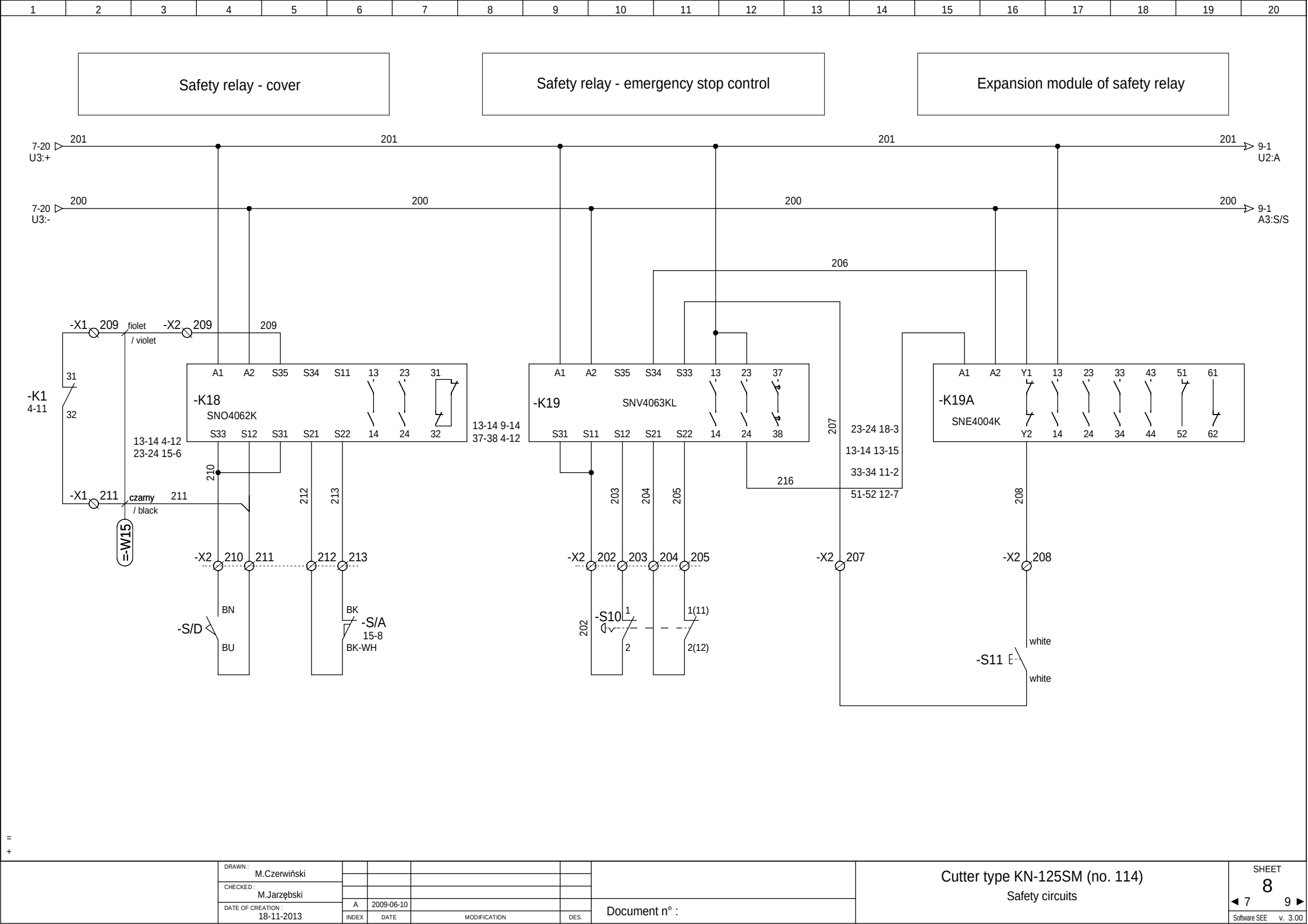
Dose of lubricant counting detektor

Central lubrication Block



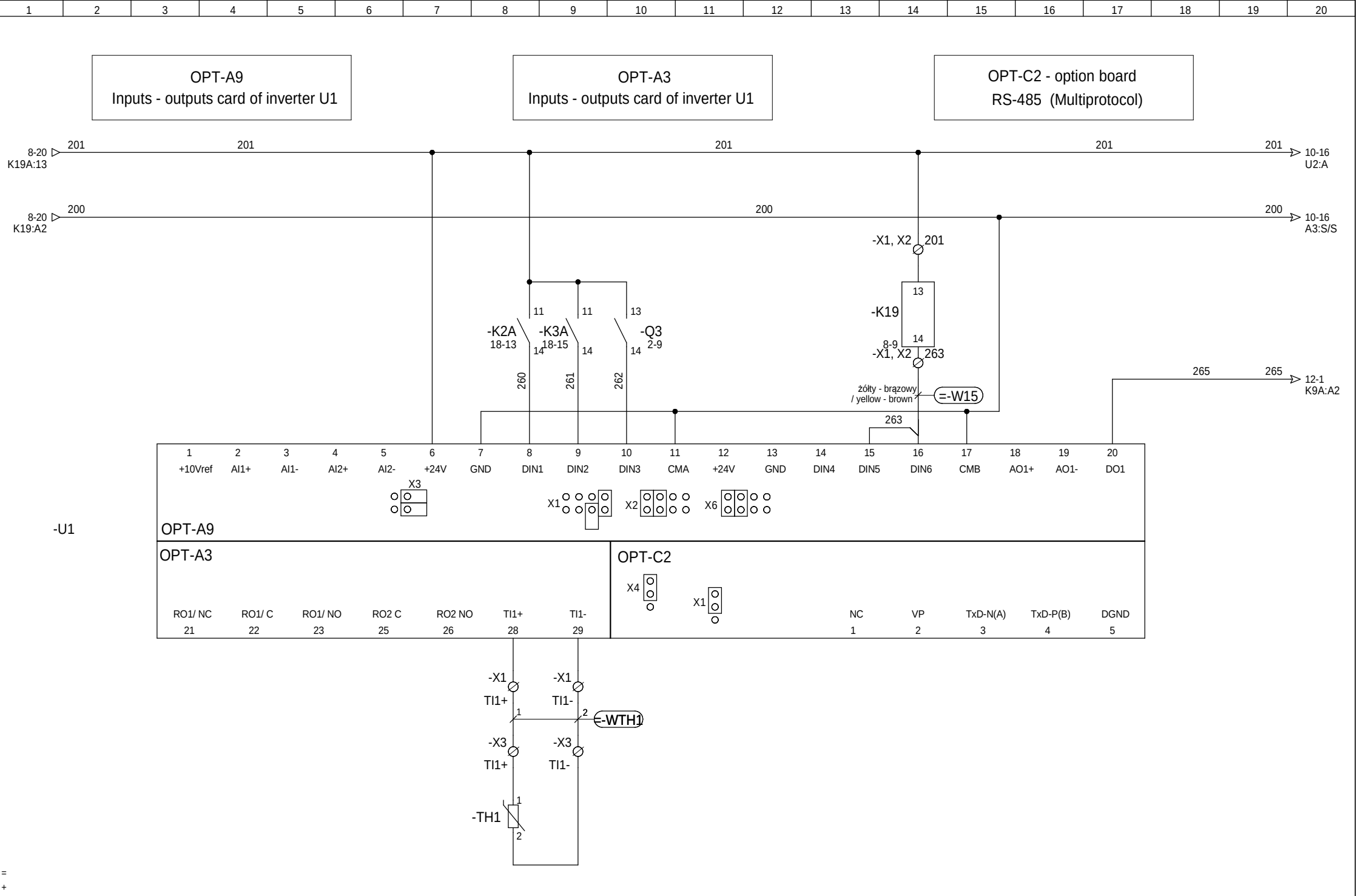
S9 - Push-button - manual switching on the lubricant pump

DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 7
CHECKED : M.Jarzębski						Grease pump	◄ 6 8 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			



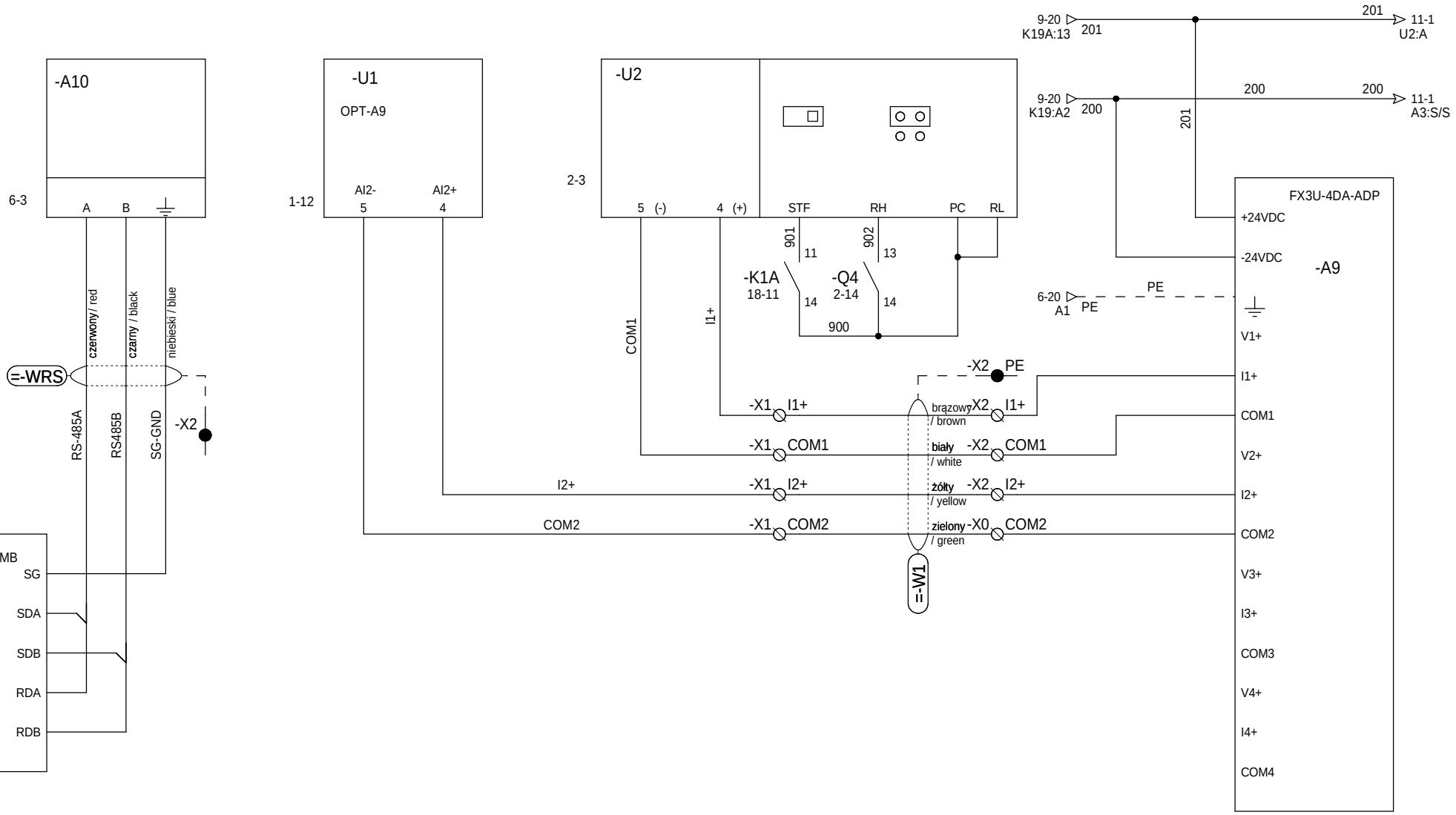
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski						Safety circuits
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	SHEET 8 ◄ 7 9 ►
	INDEX	DATE	MODIFICATION	DES.		Software SEE v. 3.00



DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski						Control of knives drive inverter
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	SHEET 9 ◄ 8 10 ►
	INDEX	DATE	MODIFICATION	DES.		Software SEE v. 3.00

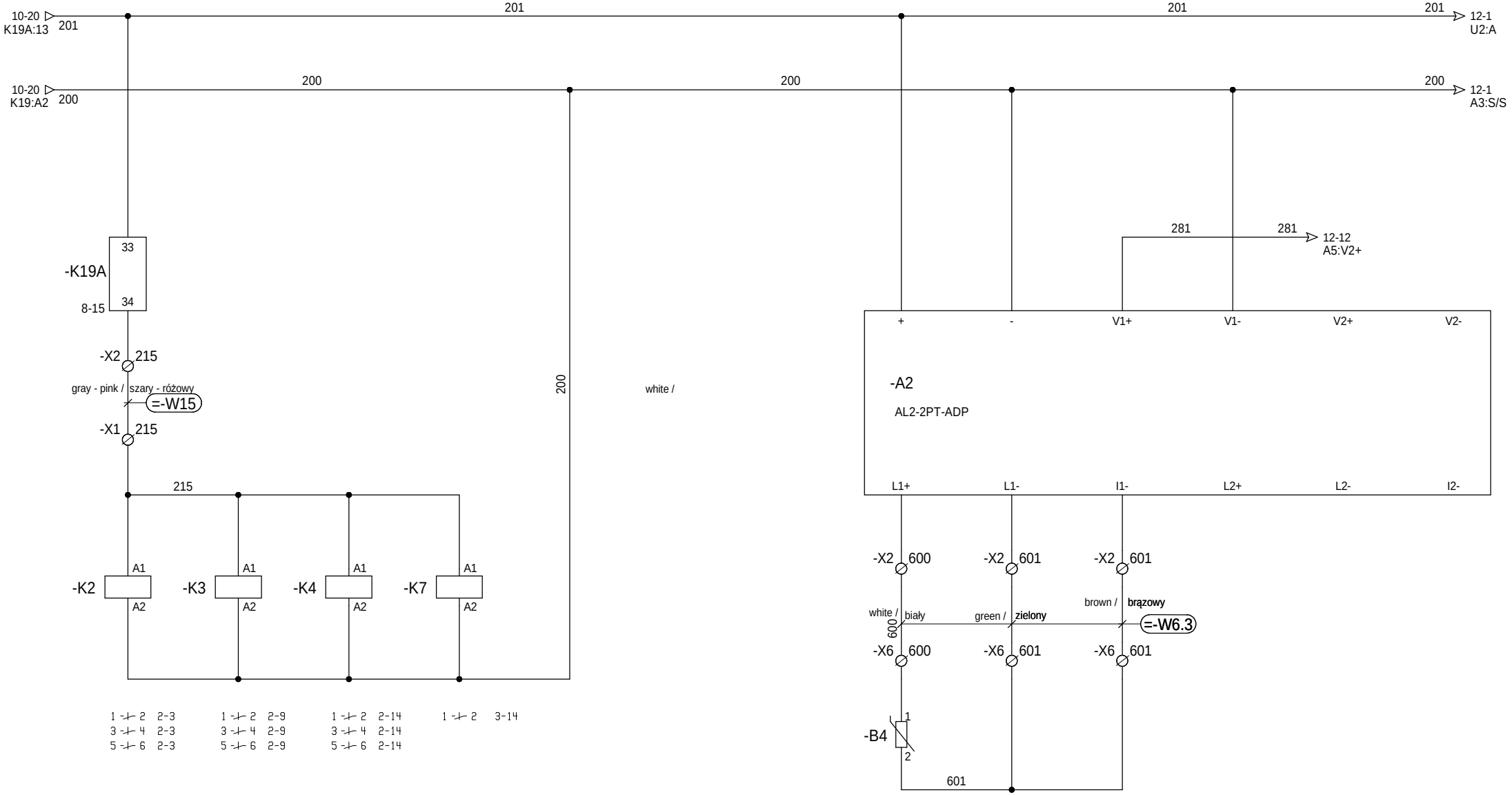
Transmission	Controlling the drive inverter knives	Controlling the drive inverter bowl



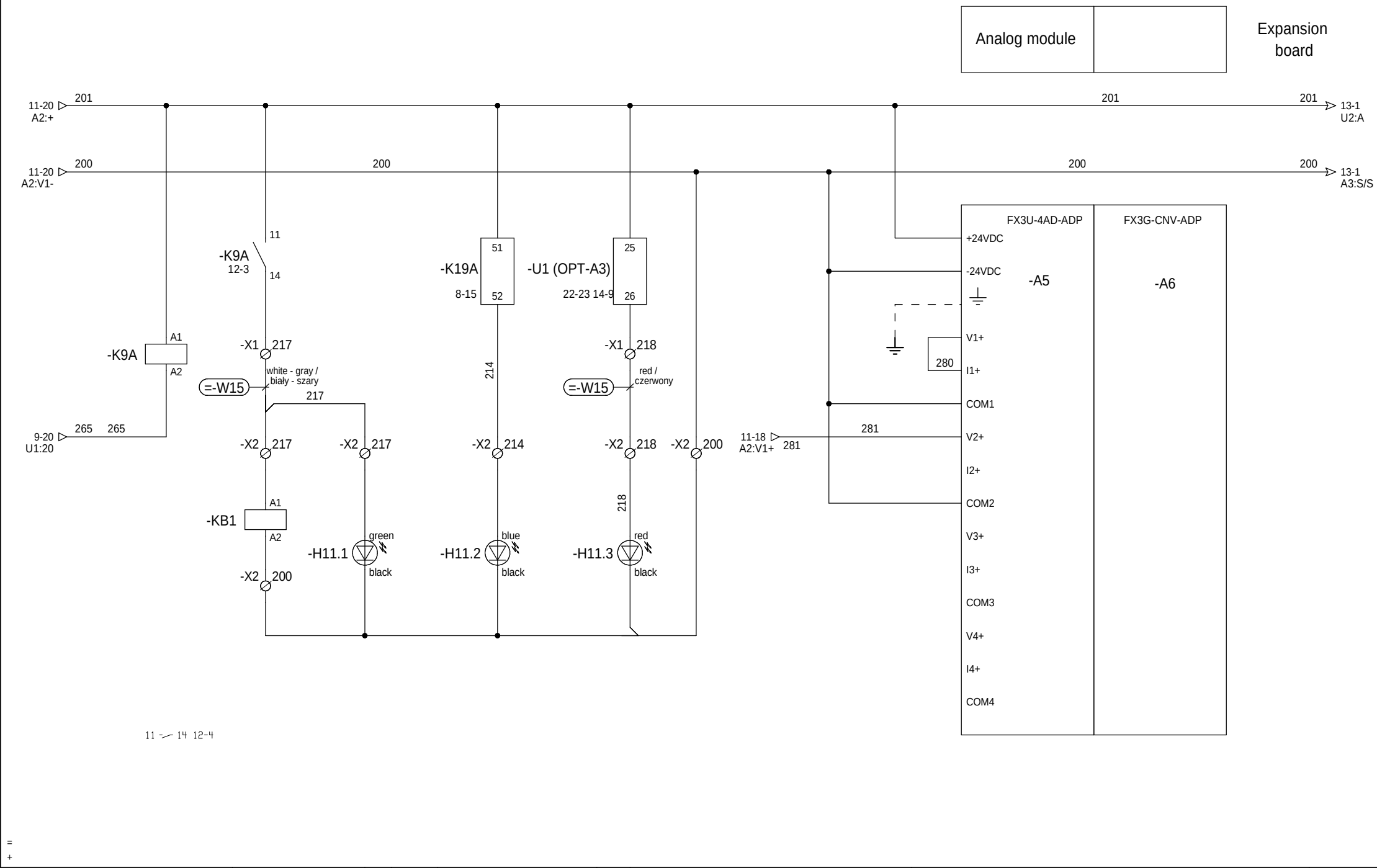
DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 10	
CHECKED : M.Jarzębski						Control	◄ 9 11 ►	
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00	
	INDEX	DATE	MODIFICATION	DES.				

Contactor of bowl drive inverter	Fan contactor of the knives motor	Fan contactor of the bowl motor	Contactor of the exhaust fan

Temperature transmitter

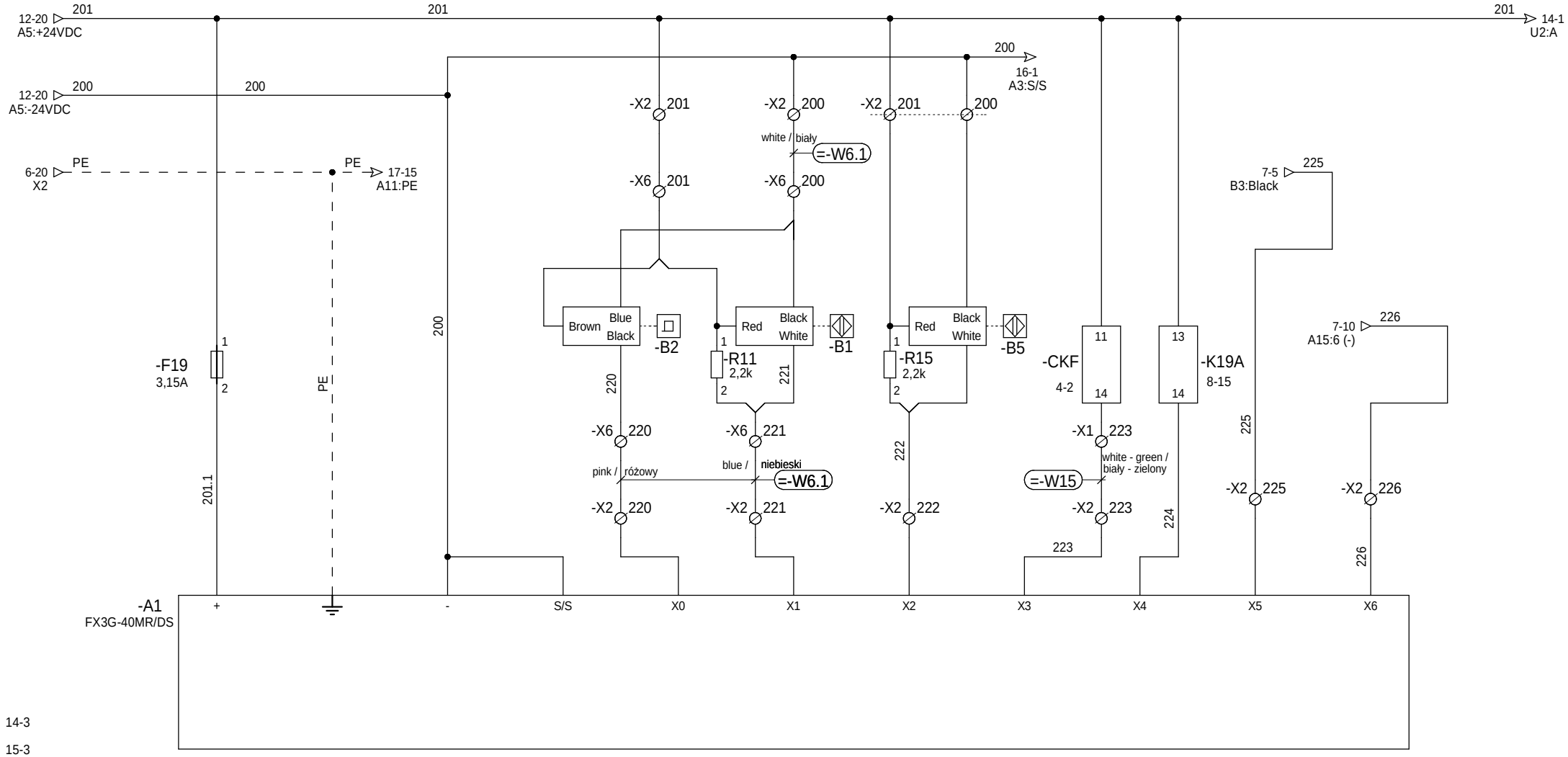


DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 11
CHECKED : M.Jarzębski						Contactors, temperature transmitter	◄ 10 12 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.			



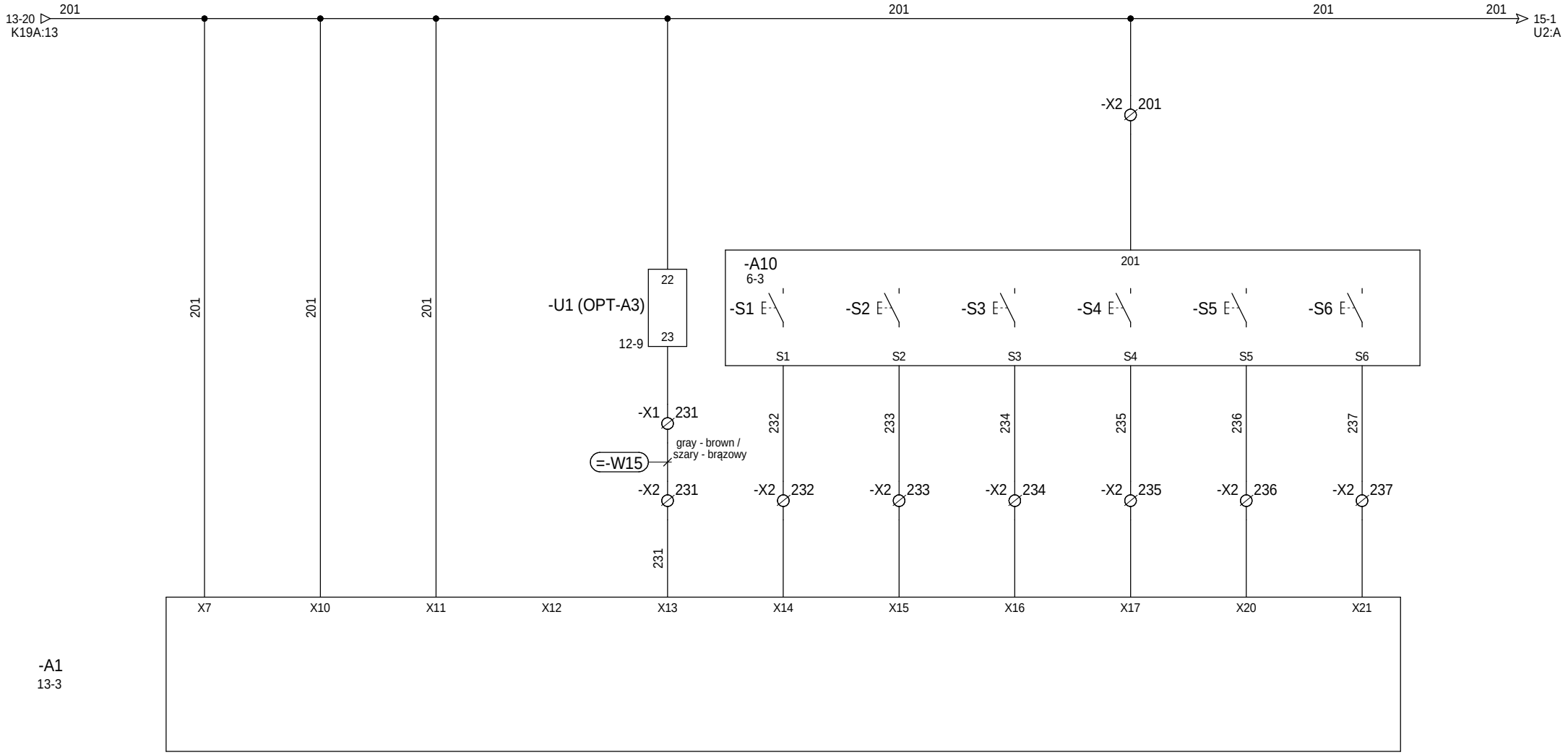
DRAWN : M.Czerwiński					Cutter type KN-125SM (no. 114)	SHEET 12
CHECKED : M.Jarzębski					Analog modules	◄ 11 13 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.		

Power supply	Inputs power	Water meter sensor	Bowl rotations hall sensor	Knives rotation hall sensor	Phase sequence sensor	Control off	Dose of grease - distributor	Grease level - distributor



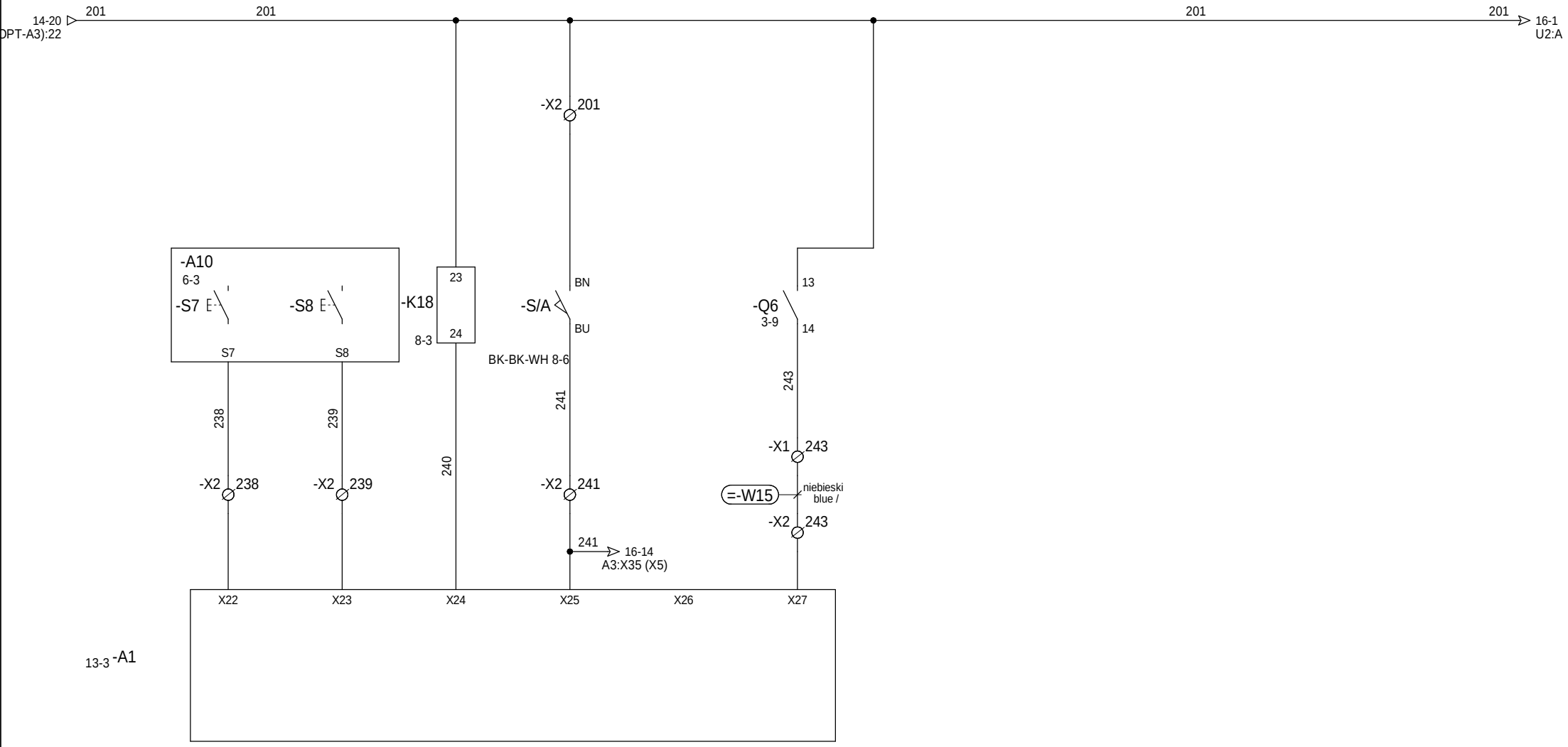
DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 13	
CHECKED : M.Jarzębski						PLC - input X0 - X6	◄ 12 14 ►	
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00	
	INDEX	DATE	MODIFICATION	DES.				

Motor switch hydraulic aggregate	Oil level hydraulic aggregate	Oil temperature hydraulic aggregate (option)	Oil filter pollution sensor	State of knives drive inverter	Push-button: Loading arm raising	Loading arm lowering	Top cover raising	Top cover lowering	Front cover raising	Front cover lowering



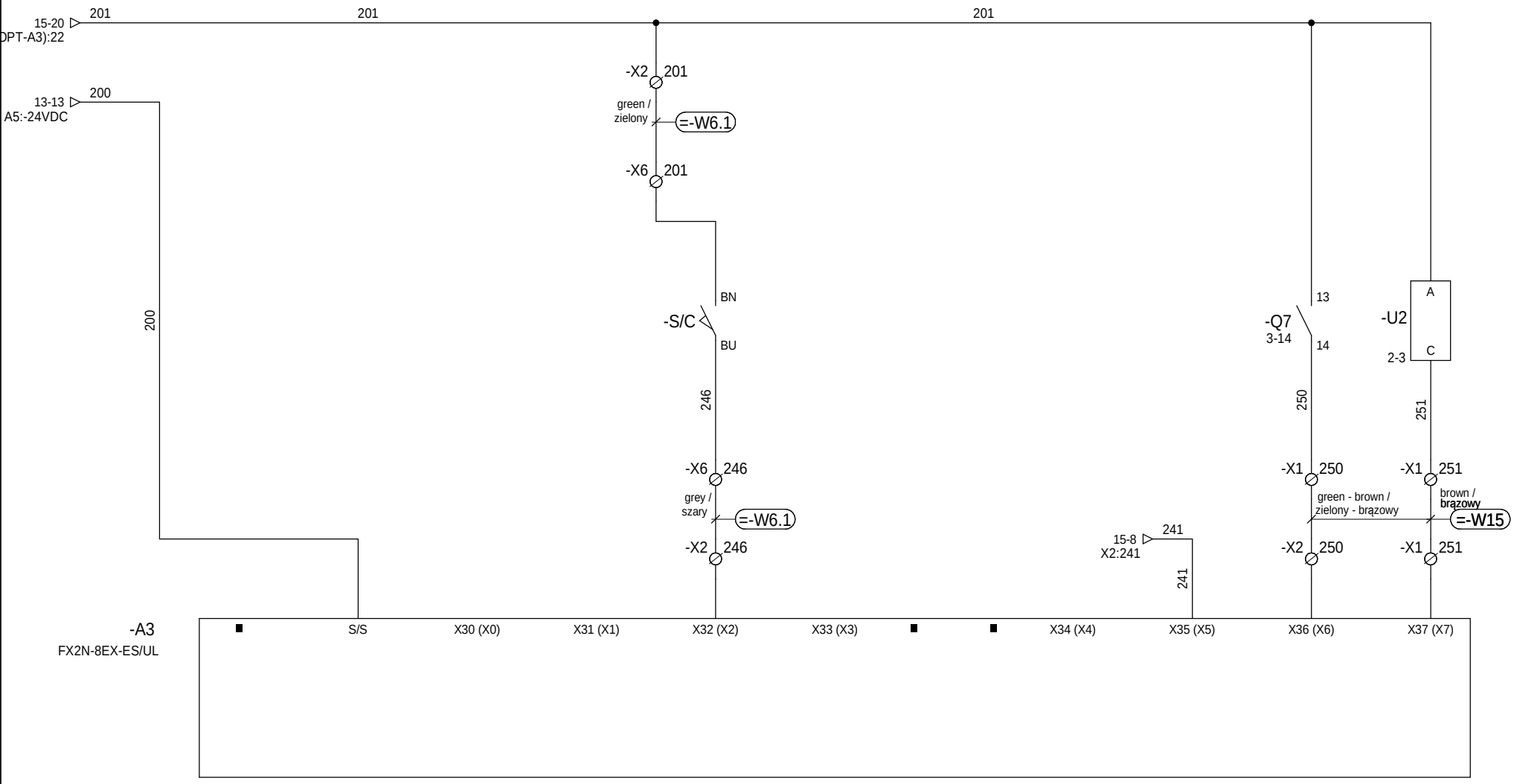
DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski						PLC - input X7 - X21
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	SHEET 14 ◄ 13 15 ►
	INDEX	DATE	MODIFICATION	DES.		Software SEE v. 3.00

Push-button					
Stuffing ejector raising	Stuffing ejector lowering	Safety relay - top cover closed	Limit switch top cover unclosed	Limit switch front cover is closed	



DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)	SHEET 15	
CHECKED : M.Jarzębski						PLC - input X22 - X27	◄ 14 16 ►	
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :		Software SEE v. 3.00	
	INDEX	DATE	MODIFICATION	DES.				

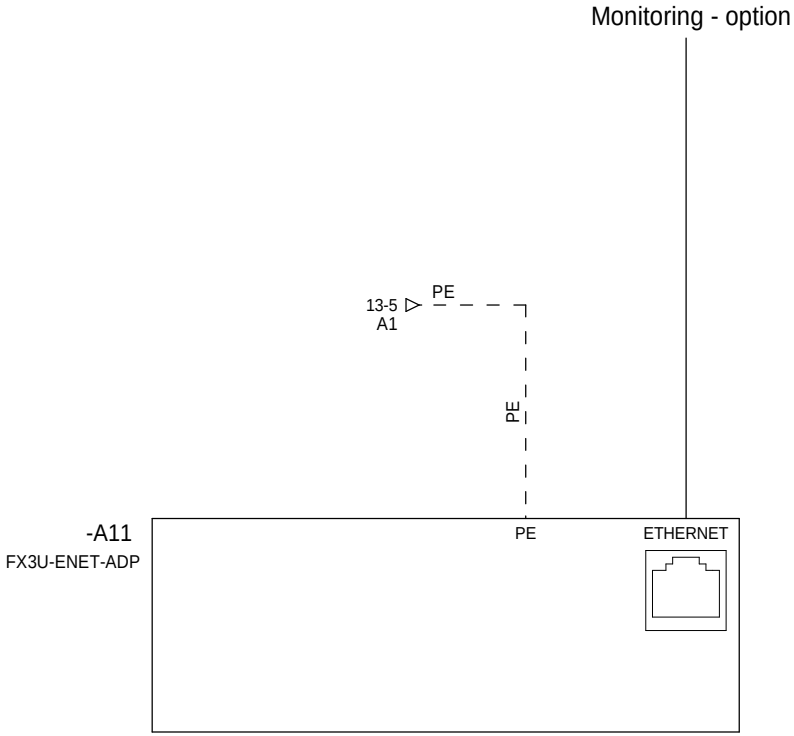
	Inputs power	Limit switch front cover is open	Limit switch stuffing ejector in upper position	Limit switch switching on on stuffing ejector rotations	Limit switch loading arm is in the lower position		Limit switch loading arm turn		Motor switch exhaust fan	State bowl drive inverter



DRAWN : M.Czerwiński					Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski					Input block X30 - X37
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :
	INDEX	DATE	MODIFICATION	DES.	

SHEET 16 ◄ 15 17 ►

Software SEE v. 3.00



DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski						Input block X40 - X43
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	SHEET 17 ◄ 16 18 ►
	INDEX	DATE	MODIFICATION	DES.		Software SEE v. 3.00

		Power output		Power output	Bowl start	Power output	Knives start	Knives direction (mixing)		Power output

13-3

-A1

COM0 Y0 COM1 Y1 COM2 Y2 Y3 COM3

302 302 → 19-1 A1:COM4

-X2 303 -X2 304 -X2 305

yellow / żółty — pink / różowy — gray / szary

=-W15

-X1 303 -X1 304 -X1 305

-K19A

8-15

5-13 X2:401 — 301 301 — 23 24 — 302

303 304 305

A1 -K1A A2 | A1 -K2A A2 | A1 -K3A A2

5-13 X2:300 — 300 300 300 300 → 19-1 K5A:A2

11 — 14 10-12 | 11 — 14 9-8 | 11 — 14 9-9

=
+

DRAWN : M.Czerwiński						Cutter type KN-125SM (no. 114)
CHECKED : M.Jarzębski						PLC - output Y1 - Y3
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	SHEET 18 ◄ 17 19 ►
	INDEX	DATE	MODIFICATION	DES.		Software SEE v. 3.00

Hydraulic pump	Stuffing ejector	Water metering solenoid valve (option)	Grease pump		Power output	Solenoid valve Y/E	Solenoid valve Y/F	Solenoid valve Y/C	Solenoid valve Y/D

13-3

-A1

Y4 Y5 Y6 Y7 COM4 Y10 Y11 Y12 Y13

18-20 A1:COM2 — 302 — 302 — 302 — 302 — 20-1 A1:COM5

-X2 307

=-W15 white / biały

-X1 307

308

309

307

-K4A A1 A2

-K5A A1 A2

-K6 A1 A2

18-20 K3A:A2 — 300 — 300

1 -| 2 3-9
3 -| 4 3-9
5 -| 6 3-9

11 -/ 14 21-11

11 -/ 14 7-12
21 -/ 24 7-12

=
+

DRAWN : M.Czerwiński					Cutter type KN-125SM (no. 114)	SHEET 19
CHECKED : M.Jarzębski					PLC - output Y4 - Y13	◄ 18 20 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :	Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.		

Power output	Solenoid valve Y/I	Solenoid valve Y/J	Solenoid valve Y/K	Solenoid valve Y/L		

13-3

-A1

302 302

19-20
A1:COM4

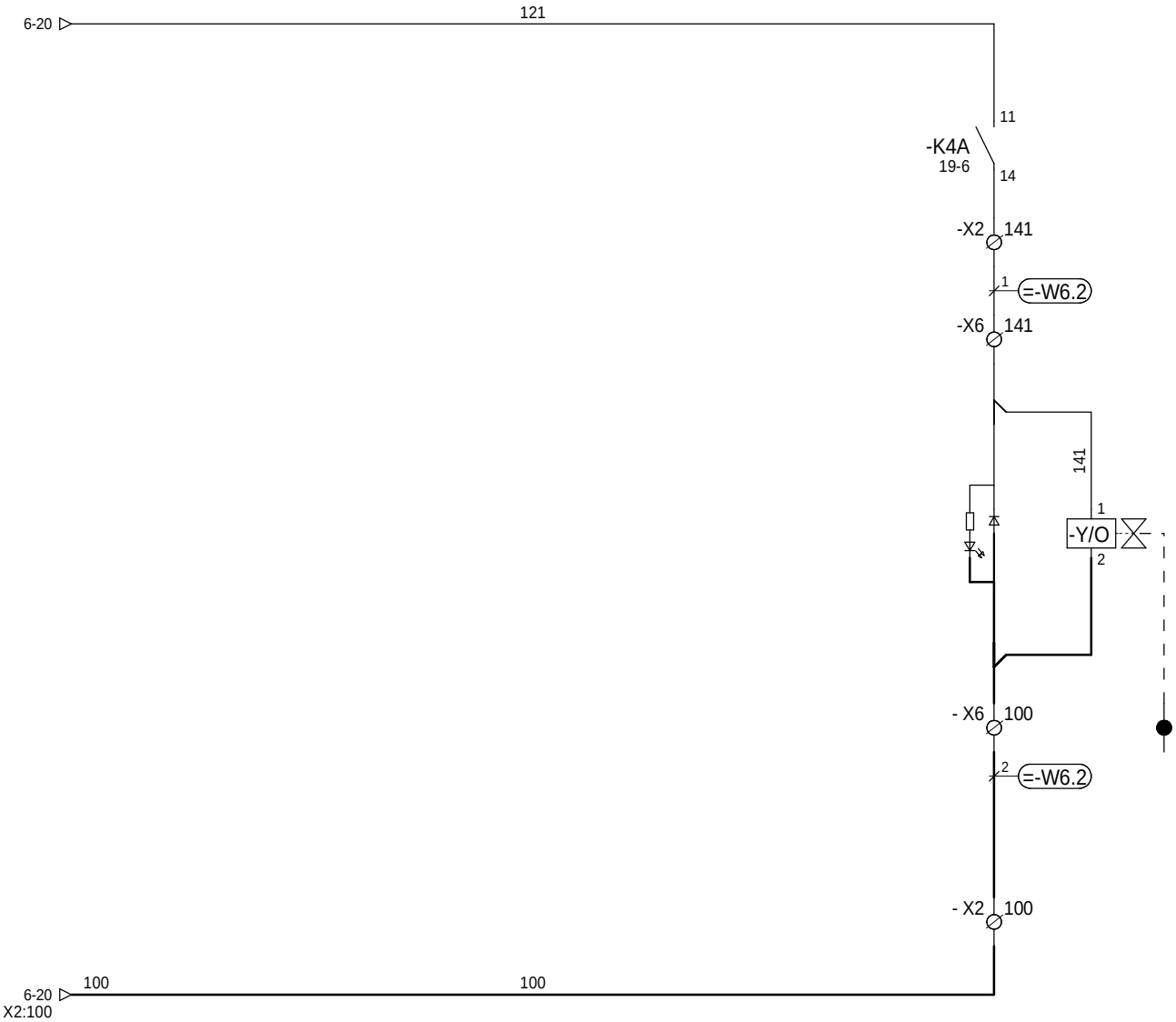
=
+

DRAWN : M.Czerwiński					
CHECKED : M.Jarzębski					
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :
	INDEX	DATE	MODIFICATION	DES.	

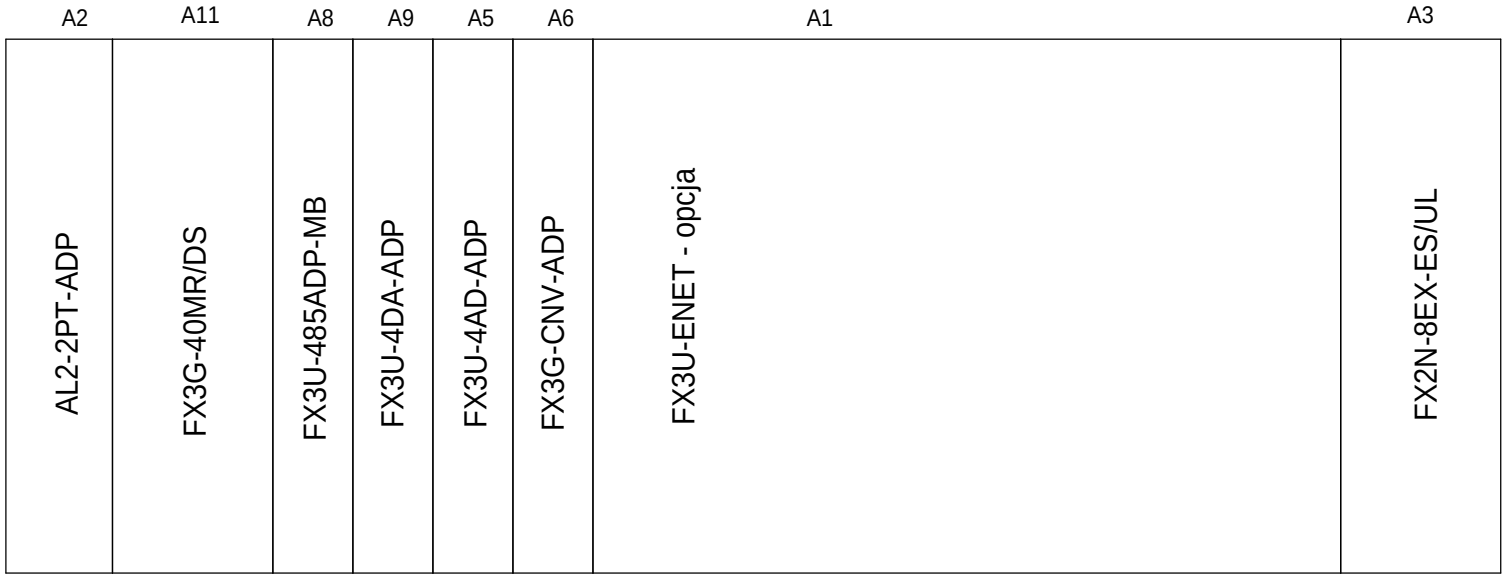
Cutter type KN-125SM (no. 114)

PLC - output Y14 - Y17

Water solenoid valve (option)



DRAWN :							Cutter type KN-125SM (no. 114)	SHEET 21
CHECKED :							Solenoid valves 4	◄ 20 22 ►
DATE OF CREATION : 18-11-2013	A	2009-06-10			Document n° :			Software SEE v. 3.00
	INDEX	DATE	MODIFICATION	DES.				



DRAWN :					Cutter type KN-125SM (no. 114)
CHECKED :					PLC
DATE OF CREATION : 18-11-2013	A	2009-06-10		Document n° :	SHEET 22 ◄ 21 25 ►
	INDEX	DATE	MODIFICATION DES.		Software SEE v. 3.00

Cutter KN-125 Wiring diagram description

114 – 181113

A1	Microprocessor controller
A2	Two-channel converter of temperature
A3	Digital input module
A5	Analog input module
A6	Expansion board
A7	Digital input-output module
A8	Communication RS-485
A9	Analog output module
A10	Control panel of cutter
A11	Network module- option
A15	Central lubrication block- option
B1	Bowl rotations hall sensor
B2	Magneto-inductive flow sensor (option)
B3	Lubricant portions inductive sensor
B4	Stuffing temperature sensor
B5	Shaft rpm hall sensor
B10	M8 engine thermostat- option
CKF	Phase sequence sensor
F1	Over current protection of frequency inverter (U1)
F2	Over current protection of frequency inverter (U2)
F3	Over current protection of motors group
F4	Over current protection of contactor's coil. (K1)
F5	Over current protection of transformer (T1)
F7	Over current protection of fan (M8)
F8	Over current protection of socket (XG)
F10, F11, F12	Over current protection of phase monitor (CKF)
F13	Over current protection of feeder (U3)
F14	Over current protection of feeder (U4)
F15	Over current protection of feeder (U5)
F16	Over current protection of 230V circuits
F19	Over current protection of controller (A1)
H11.1	Signalling lamp- knive's shield unlock
H11.2	Signalling lamp- control switch on
H11.3	Signalling lamp- knive's running
K1	Contactor of the frequency converter supplying (U1)
K2	Contactor of the frequency inverter supplying (U2)
K3	Fan contactor of the knives motor
K4	Fan contactor of the bowl motor
K6	Stuffing unloader motor contactor (M6)
K7	Fan contactor (fan that ventilate the cutter chamber) (M7)
K18	Safety relay – control of upper cover position and preventing from starting the cutter knives when the upper cover is in „open" position
K19	Safety relay - emergency stop control
K19A	Expansion module of safety relay (K19)
K1A	Auxiliary relay – bowl start
K2A	Auxiliary relay – knifes start
K3A	Auxiliary relay knifes direction (mixing)
K4A	Auxiliary relay of switching on the water solenoid valve Y/O

K5A	Auxiliary relay - switching the pump grease	
KB1	Interlock switch of the knive's cover	
K9A	Auxiliary relay of unlock of interlock switch (KB1) of the knive's cover	
M1	Motor of knives drive	
M2	Motor of bowl drive	
M3	Motor of fan for cooling motor of knives drive	
M4	Motor of fan cooling bowl motor	
M5	Hydraulic pump motor (P1) and (P2) - hydraulic diagram	
M6	Stuffing unloader motor	
M7	Motor of fan cooling cutter chamber	
M8	Fan of the main electric box	
R1, R2	Moderating resistor of frequency converter U1	
R11	Resistor of sensor (B1)	
R15	Resistor of sensor (B5)	
S/A	Limit switch – top cover is unclosed	
S/C	Limit switch – switching on stuffing ejector rotations	
S/D	Limit switch – top cover is closed	
S1	Push-button – loading arm raising	
S2	Push-button – loading arm lowering	
S3	Push-button – top cover raising	
S4	Push-button – top cover lowering	
S5	Push-button – front cover raising	
S6	Push-button – front cover lowering	
S7	Push-button – stuffing ejector raising	
S8	Push-button – stuffing ejector lowering	
S9	Push-button – manual switching on the lubricant pump- option	
S10	Emergency push-button STOP – switch off control	
S11(H11.1, H11.2, H11.3)	Illuminated button - reset the security system	
T1	Control transformer	
TH1	Thermistor of windings motor (M1)	
TM	Control transformer 400V AC/230V AC	
Q1	Main power-switch of supply cutter	
Q3	Overload protection of the fan motor (M3) – motor switch	
Q4	Overload protection of the fan motor (M4) – motor switch	
Q6	Overload protection of the stuffing unloader (M6)	
Q7	Overload protection of the fan motor (M7) – motor switch	
U1	Frequency inverter of knives drive motor (M1)	
	OPT-A9	Inputs - outputs card of inverter U1
	OPT-A3	Inputs - outputs card of inverter U1
	OPT-BC	Resolver option board
	OPT-C2	OPT-C2 - option board
U2	Frequency inverter of bowl drive motor (M2)	
U3	Feeder – inputs power	
U4	Feeder – outputs power	
U5	Feeder – grease pump power	
U6	Feeder – control panel power	
Y/O	Water metering solenoid valve (option)	
X1	Terminal strip in main electric box	
X2	Terminal strip in control box	
X3	Terminal strip of cutter motors	
X6	Terminal strip – interior of the cutter	

XG	Socket 1-phase – 230V (P+N+PE) (main electric box)
WM2	Connecting cable from terminal strip X1 to terminal strip X3 – motor (M2)
WM3	Connecting cable from terminal strip X1 to terminal strip X3 – motor (M3)
WM4	Connecting cable from terminal strip X1 to terminal strip X3 – motor (M4)
WM6	Connecting cable from terminal strip X1 to terminal strip X3 – motor (M6)
WM7	Connecting cable from terminal strip X1 to terminal strip X3 – motor (M7)
WRS	Connecting cable from terminal strip X1 to terminal strip X2 – RS485
WTH1	Connecting cable from terminal strip X1 to terminal strip X3 – termistor (TH1)
W6.1	Connecting cable from terminal strip X2 to terminal strip X6 – sensors, limit switches
W6.3	Connecting cable from terminal strip X2 to terminal strip X6 – temperature sensor (B4)
W1	Connecting cable from terminal strip X1 to terminal strip X2 – speed setting
W11	Connecting cable from terminal strip X1 to terminal strip X2 – 24VDC power supplies
W12	Connecting cable from terminal strip X1 to terminal strip X2 – 230V
W15	Connecting cable from terminal strip X1 to terminal strip X2 – 24VDC

NOWICKI®	CATALOGUE OF ELECTRIC SPARE PARTS			
	Name of the machine **Cutter**	Symbol of the machine KN-125SM	No. of series	
	Electric wiring	**Electric scheme**	Pcs./set **1**	Page **1**

Pos.	Marking on the sch.	Name of the part	Quantity	Notes
1.	A1	Microprocessor controller FX3G-40MR/DS	1	
2.	A2	Pt100 sensor to converter temperature AL2-2PT-ADP	1	
3.	A3	Digital inputs module FX2N-8EX-ES/UL	1	
4.	A5	Analog inputs module FX3U-4AD-ADP	1	
5.	A6	Communications adapter board FX3G-CNV-ADP	1	
6.	A7	Digital inputs/output module FX2N-8ER-ES/UL	1	
7.	A8	Interface adapters FX3U-485ADP-MB	1	
8.	A9	Analog output module FX3U-4DA-ADP	1	
9.	A10	Panel type Panel KN_touch_O_korpus	1	Metalbud
10.	A11	Ethernet module FX3U-ENET-ADP	1	
11.	B1, B5	Hall sensor type 1GT101DC	2	
12.	B4	Temperature sensor PL-100-S6-8/6-83/100/20-6-P /ϕ12	1	
13.	CKF	Phase unbalance monitoring relay type EWS 200 500VAC	1	
14.	F1	Switch Fuse type XLP-0 160/00/3F + fuses gL-gG 160A	3	
15.	F2	Circuit breaker – 3xC10 A / CLS6	1	
16.	F3	Circuit breaker – 3xC32 A / CLS6	1	
17.	F4; F7	Circuit breaker – 1xC1 A/S201M-C1	2	
18.	F5	Circuit breaker – 2xD10A / CLS6	1	
19.	F8	Circuit breaker – 1xC6 A / CLS6	1	
20.	F10; F11; F12	Fuse ZKT-0,5 A	3	
21.	F13; F14	Circuit breaker – 1xC10 A / CLS6	2	
22.	F16	Circuit breaker – 1xC4 A / CLS6	1	
23.	F19	Fuse ZKT-3,15A	1	
24.	K1	Contactor type DILM150 /RAC240/ 230VAC + DILM1000-XHI11-SI	1	
25.	K2; K3; K4; K6	Contactor DILM7-10 (24V DC)	4	
26.	K7	Relay Z-R23/SS 24VDC	1	
27.	K18	Safety relay SNO4062K 24V DC	1	
28.	K19	Safety relay SNV4063KL 24V DC	1	
29.	K19A	Safety relay SNE4004K 24V DC	1	
30.	K1A; K2A; K3A; K9A	Relay type 40.52; 24V DC + socket type 95.85 + module type 99.80.0.024.98	4	
31.	K4A	Relay type 34.81.7.024.8240 (240VAC) + socket type 93.01.7.024	1	
32.	KB1	Guard locking switch type TLS-1 24VAC/DC + key type 440G-A27143	1	
33.	R1, R2	Moderating resistor BWD 500-27R	2	
34.	R11; R15	Resistor 2.2K	2	
35.	S/A; S/C; S/D	Limit switch type 83-872-103	3	
36.	S9	Green button M22-D-G + clip M22-A+ contacting module M22-K10 + silicone cover plate M22-T-D	1	
37.	S10	Emergency push-button type M22-PV/K01 + module contact type M22-K01	1	

38.	S11(H11.1, H11.2, H11.3)	Switch PIEZO SBR1AAW8241N + cable EVC003 /10mb/ + plug E11504	1	
39.	T1	Transformer type AS1/114 1,2 kVA; 200-230-400-460-480V / 230V AC	1	
40.	Q1	Compact circuit-breaker 3-BIEG. LZMC1-A160 160A + NZM1/2-XV4/40 + NZM1-XTVDVR	1	
41.	Q3; Q7	Motor-protective circuit-breaker PKZM0-0,4 A + auxiliary contact NHI11-PKZ0	2	
42.	Q4	Motor-protective circuit-breaker PKZM0-0,63 A + auxiliary contact NHI11-PKZ0	1	
43.	Q6	Motor-protective circuit-breaker PKZM0-4 A + auxiliary contact NHI11-PKZ0	1	
44.	U1	Frequency inverter type NXP01685G2H1SSVA9A3BC00C2	1	
45.	U2	Frequency inverter type FR-D740-050-SC-EC (2,2kW 3x400V)	1	
46.	U3; U4	Feeder type PULS QS5.241 (24-28VDC/5A)	2	
47.	U6	Feeder type PULS ML50.100 (24-28 VDC/2,1 A)	1	
48.	XG	Socket 2P+Z	1	
49.		Cable type 12/15 POL 25mb	1	
50.		Box type ABS125/75HG/IP67 (130X130X75)	1	
51.		Cable type 12/15 POL 25mb	1	
52.		SBOX 2.6-150 /200X600X150/ AISI 304	1	
53.		Electrical box type SBOX 4.4-150 /400x400x150/ AISI 304	1	
54.		Control box type AISI 304 1000x1400x400	1	

KATALOG CZĘŚCI ZAMIENNYCH
SPARE PARTS CATALOGUE

NAZWA **KUTER**

TYP **KN 125**

NR .....

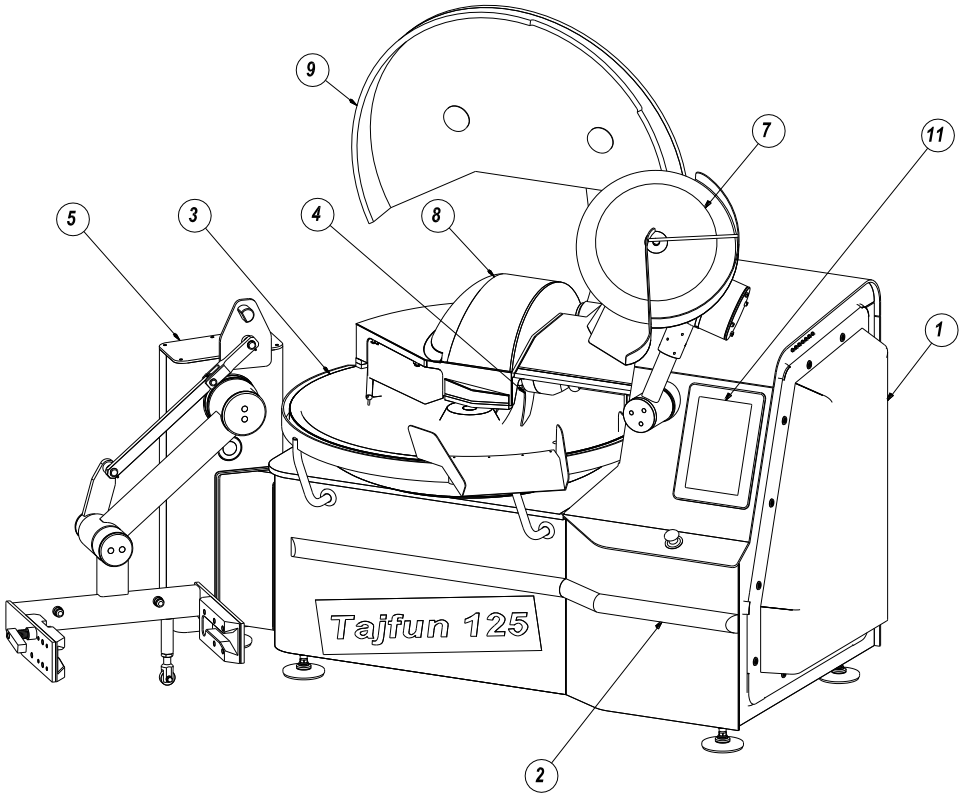
Spis treści

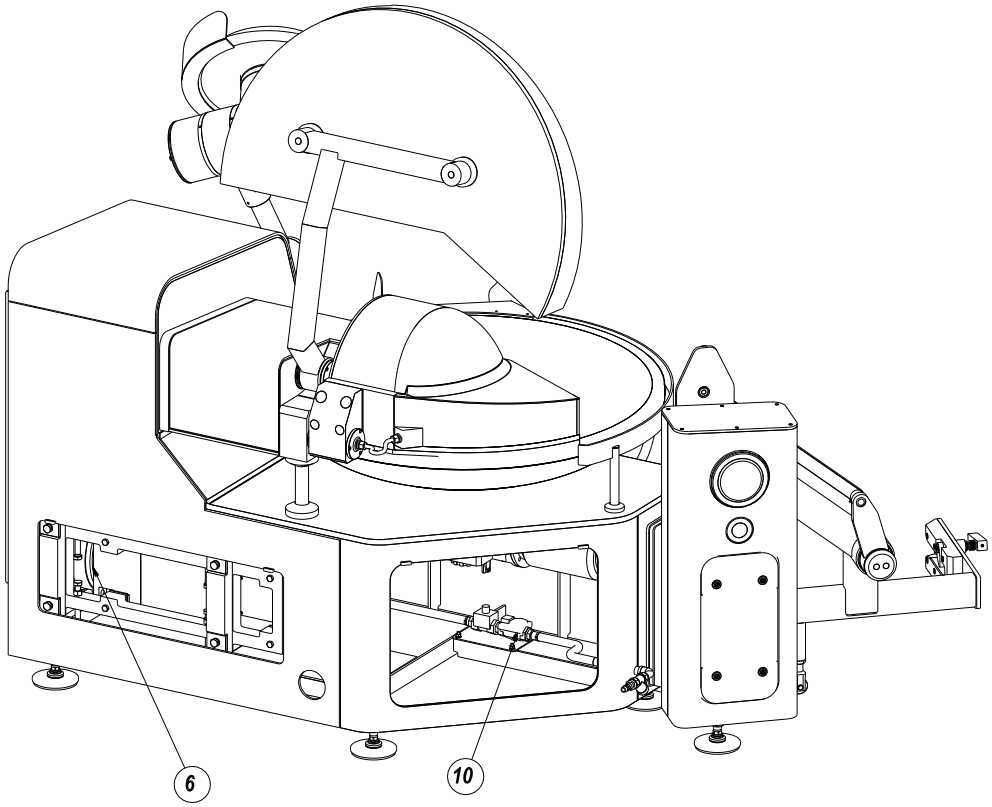
Design of table, according to which one should order spare parts

Wzór tabeli, według której należy zamawiać części zamienne.

NAZWA MASZYNY Name of machine	TYP MASZYNY Symbol of machine	NR MASZYNY Serial number	INDEX	NAZWA Name of Part	ILOŚĆ Qty	NR RYS. No of drawing

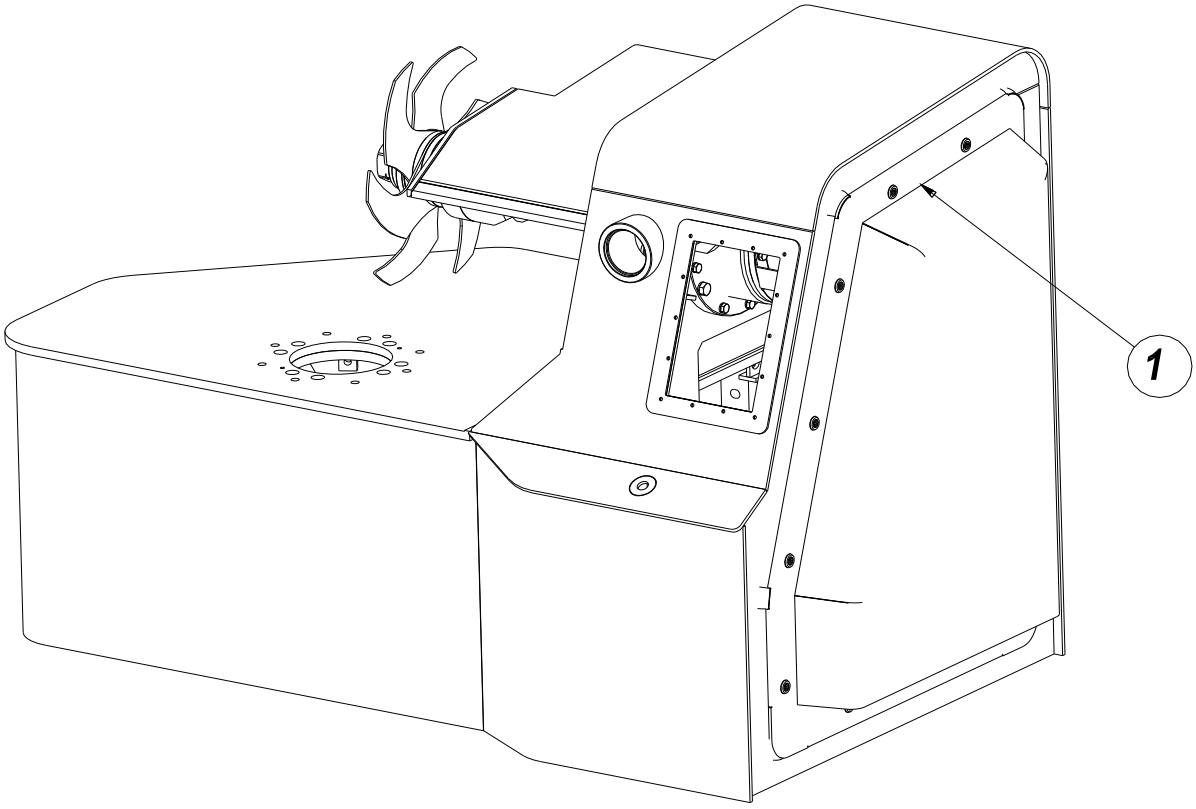
NAZWA RYS.	NR RYS.
KUTER KN 125	**N-125 K**

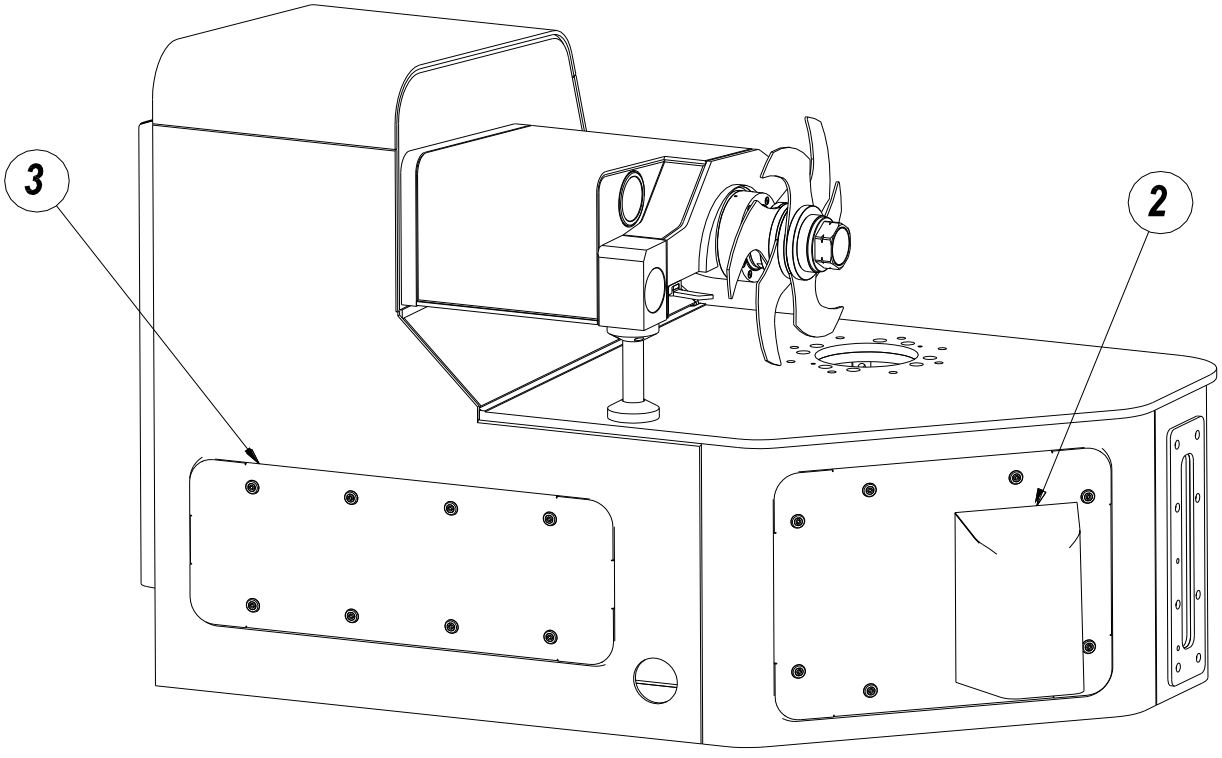




NAZWA RYS.				NR RYS.			
KUTER KN 125				**N-125**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KAA a	Zespół osłon / SET OF SHIELDS	1				
2	N-125 KAB a/17	Odboje / BUMPING BLOCKS	1				
3	N-125 KB a/17	Napęd misy / BOWL'S DRIVE	1				
4	N-125 KC III /32	Wał nożowy / KNIFE'S SHAFT	1				
5	N-125 KD c/18	Podnośnik załadunkowy (for ver. KN 125HL) / **LOADING LIFT**	1				
6	N-125 KE II a	Napęd główny / MAIN DRIVE	1				
6	*N-125 KE III*	Napęd główny / MAIN DRIVE	1				
6	*N-125 KE IV*	Napęd główny / MAIN DRIVE	1				
7	N-125 KF a/17	Wyrzutnik farszu / STUFFING EJECTOR	1				
7	*N-125 KF II a*	Wyrzutnik farszu -ręczny / STUFFING EJECTOR - MANUAL	1				
8	N-125 KGAA a/17	Napęd pokrywy nożowej / KNIVES COVER DRIVE	1				
8	*N-125 KGAA II a/32*	Napęd pokrywy nożowej / KNIVES COVER DRIVE	1				
9	N-125 KGC c/17	Pokrywa przednia / FRONT COVER	1				
10	N-125 KJ	Instalacja wodna / WATER INSTALLATION	1				
11	N-125 KPSt /17	Pulpit sterowniczy / CONTROL PANEL	1				

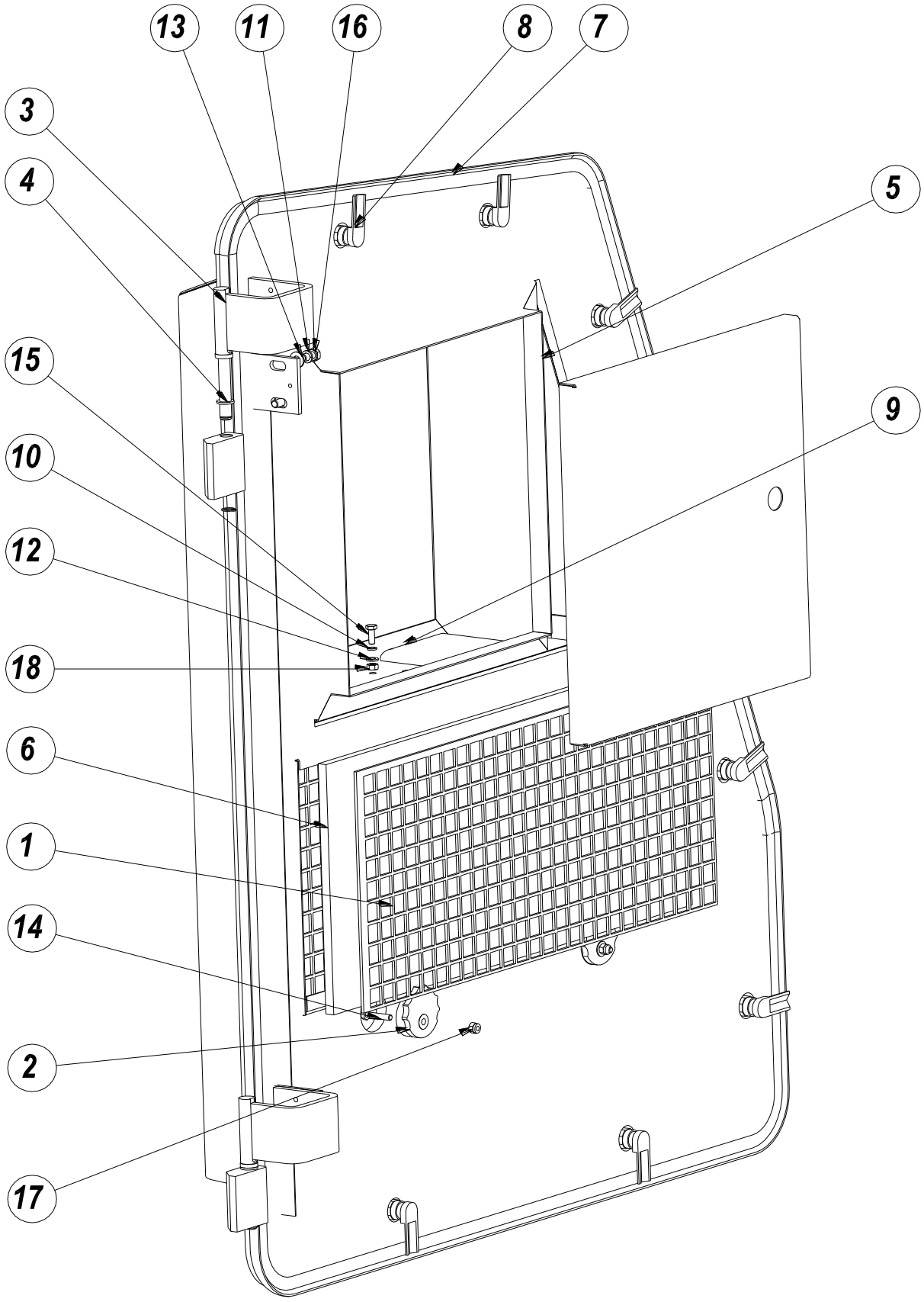
NAZWA RYS.	NR RYS.
Zespół osłon / SET OF SHIELDS	**N-125 KAA a**





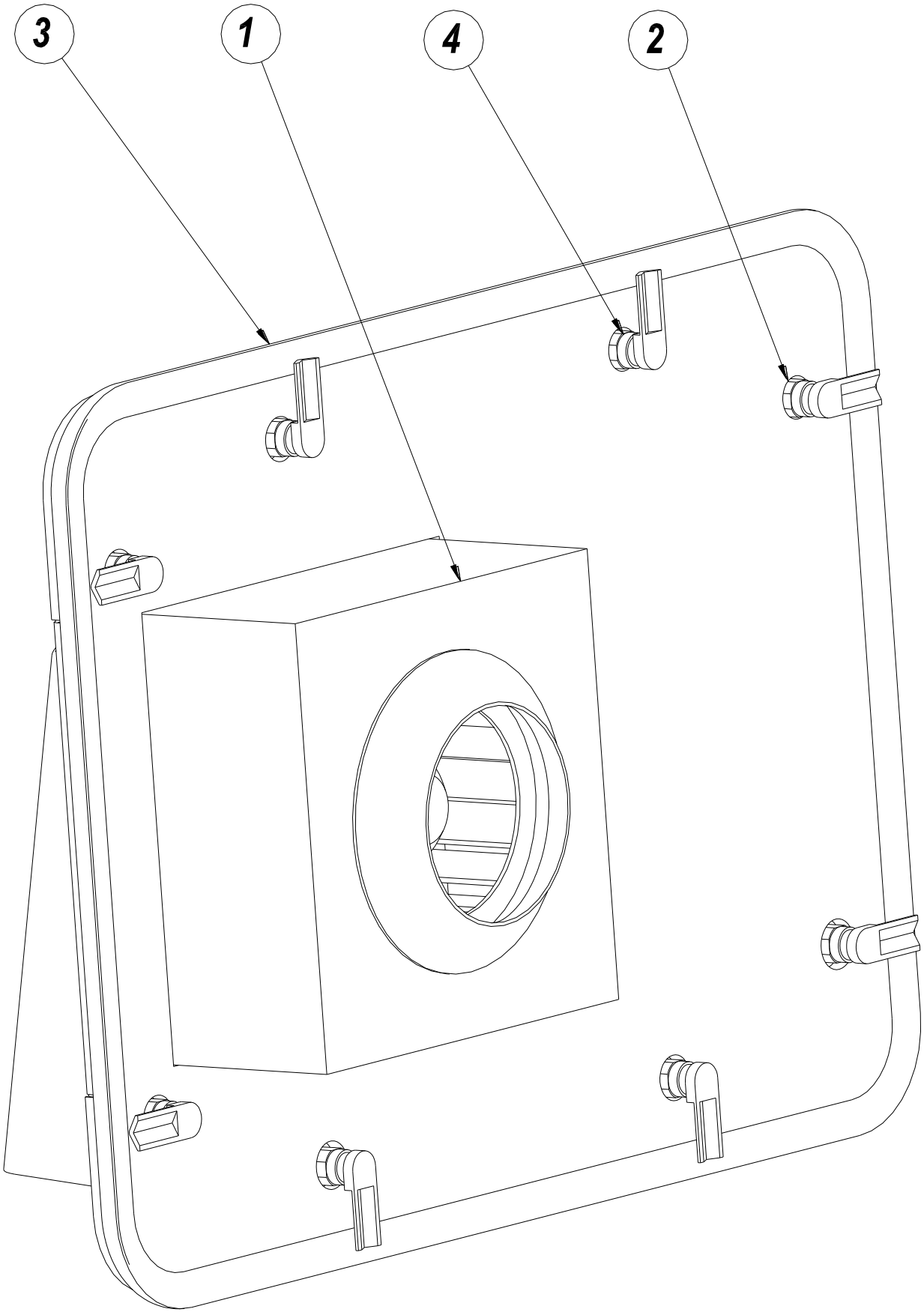
NAZWA RYS.				NR RYS.			
Zespół osłon / SET OF SHIELDS				**N-125 KAA a**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KAA 01a	Drzwi tylne / BACK DOOR	1	25			
2	N-125 KAA 03a	Osłona wentylatora / SET OF FAN	1	26			
3	N-125 KAA 12a	Osłona silnika / SHIELD OF MOTOR	1	27			
4				28			
5				29			
6				30			
7				31			
8				32			
9				33			
10				34			
11				35			
12				36			
13				37			
14				38			
15				39			
16				40			
17				41			
18				42			
19				43			
20				44			
21				45			
22				46			
23				47			
24				48			

NAZWA RYS.	NR RYS.
Drzwi tylne / BACK DOOR	**N-125 KAA 01a**



NAZWA RYS.				NR RYS.			
Drzwi tylne / BACK DOOR				**N-125 KAA 01a**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KAA 01 04	Siatka / NET	2	25			
2	45635	Docisk / PRESSURE	2	26			
3	50886	Wałek-oś zawiasu / SHAFT OF HINGE	2	27			
4	50887	Pierścień / RING	2	28			
5	52732	Skrzynka sterownicza / CONTROL BOX	1	29			
6	52941	Tkanina filtracyjna / FILTER CLOTH	1	30			
7	39340	Uszczelka osłony kutra / GASKET OF CUTTER COVER	1	31			
8	24560	Zamek do skrzynki 5 L=45 / LOCK	8	32			
9	52628	Kratka wentylacyjna GV 100 / VENTILATION	1	33			
10	24835	Podkładka sprężysta/ SPRING WASHER	6	34			
11	24834	Podkładka sprężysta / / SPRING WASHER	4	35			
12	24819	Podkładka / WASHER	6	36			
13	24820	Podkładka / WASHER	4	37			
14	24788	Śruba / SCREW	2	38			
15	25856	Śruba / SCREW	6	39			
16	24888	Śruba / SCREW	4	40			
17	25016	Nakrętka / NUT	2	41			
18	25016	Nakrętka / NUT	6	42			
19				43			
20				44			
21				45			
22				46			
23				47			
24				48			

NAZWA RYS.	NR RYS.
Osłona wentylatora / SHIELD OF FAN	**N-125 KAA 03a**



NAZWA RYS.				NR RYS.			
Osłona wentylatora / SHIELD OF FAN				**N-125 KAA 03a**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	24527	Wentylator / FAN	1	25			
2	23714	Izolacja / INSULATION	1	26			
3	39340	Uszczelka osłony kutra / GASKET OF CUTTER'S SHIELD	1	27			
4	24560	Zamek do skrzynki 5 L=45 / LOCK	8	28			
5				29			
6				30			
7				31			
8				32			
9				33			
10				34			
11				35			
12				36			
13				37			
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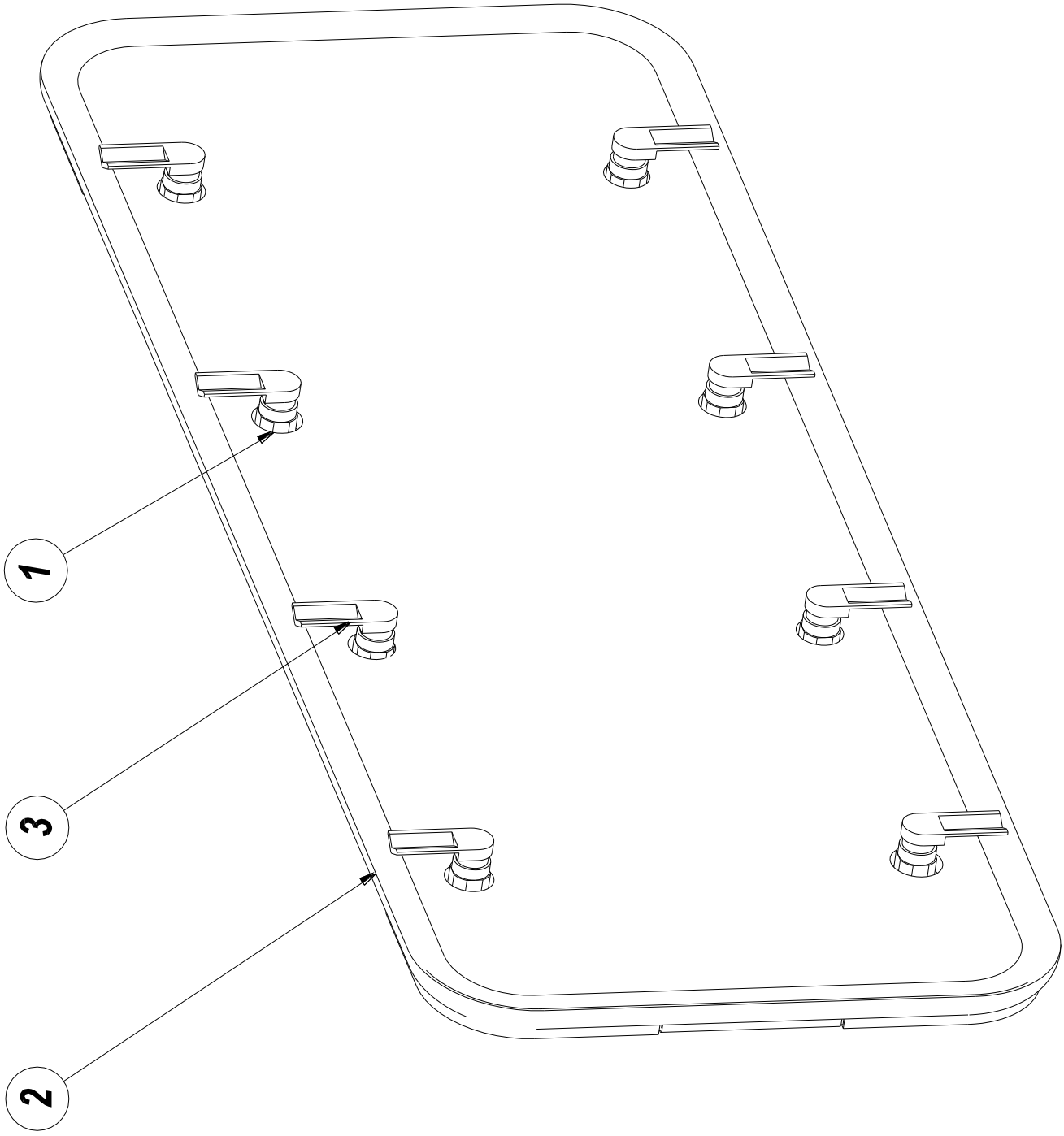
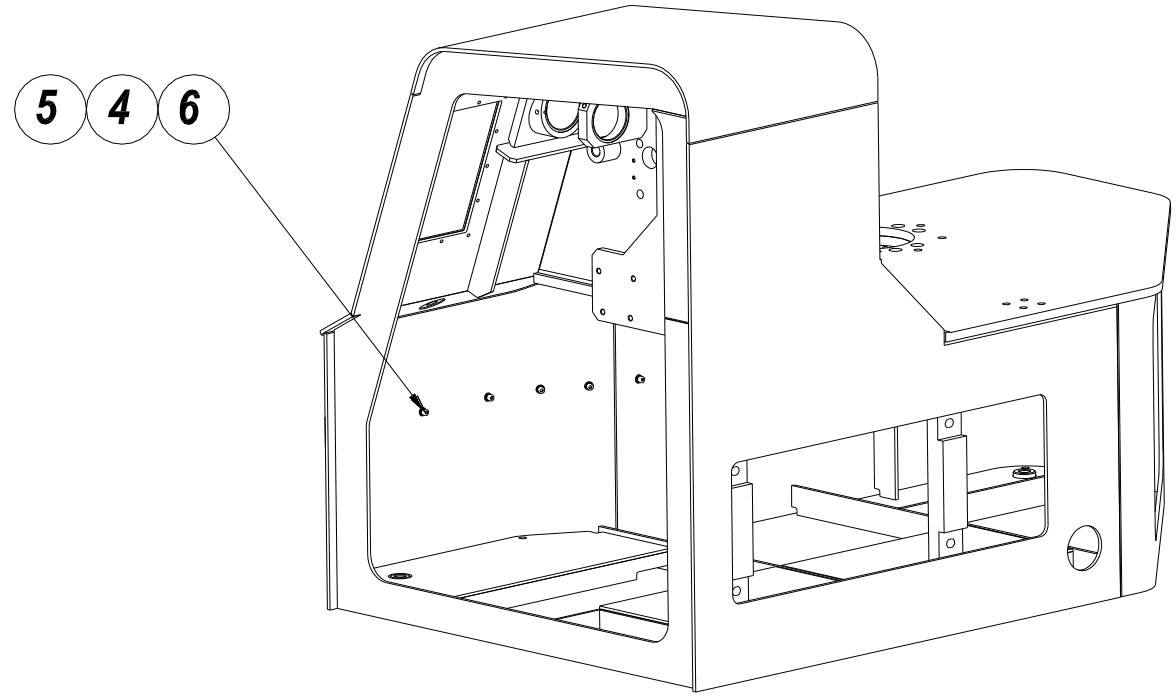
17				41			
18				42			
19				43			
20				44			
21				45			
22				46			
23				47			
24				48			

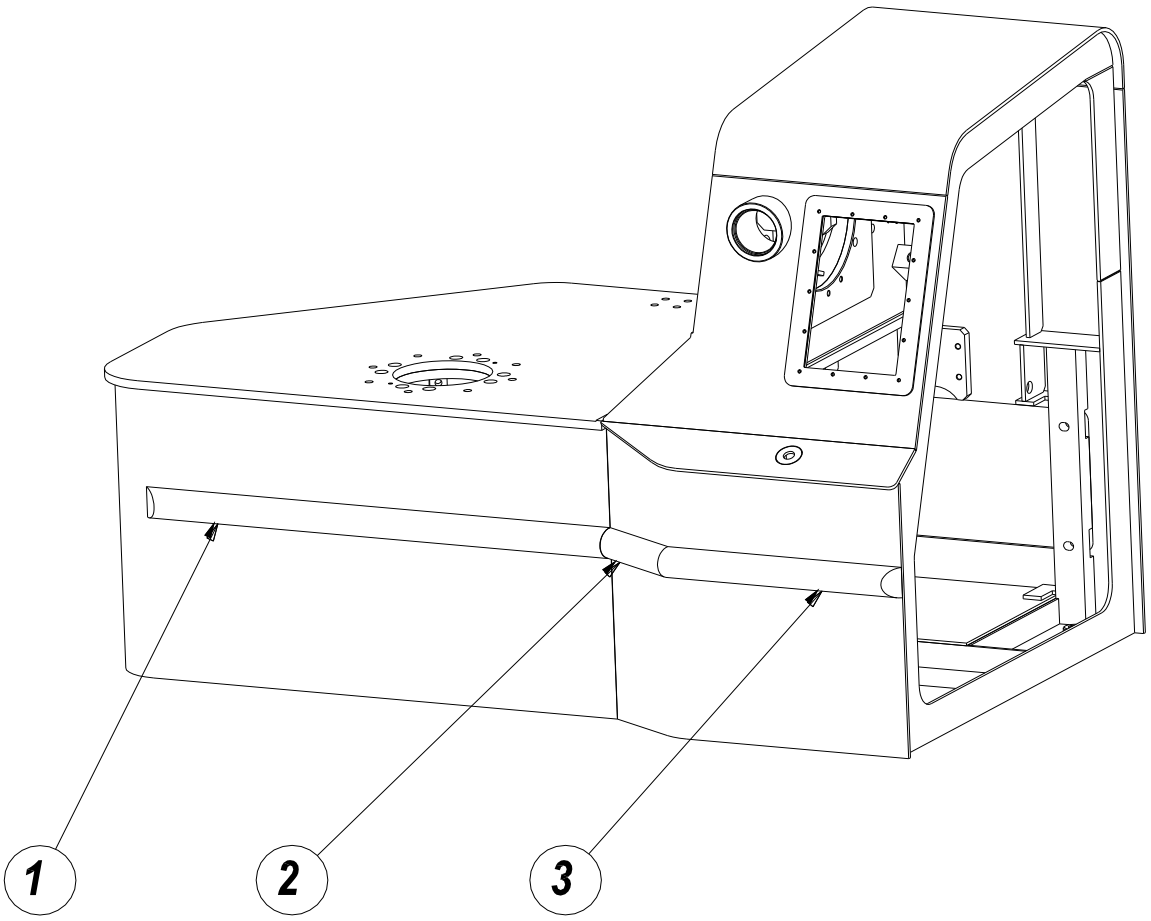
NAZWA RYS.	NR RYS.
Osłona silnika / SHIELD OF MOTOR	**N-125 KAA 12a**



NAZWA RYS.				NR RYS.			
Osłona silnika / SHIELD OF MOTOR				**N-125 KAA 12a**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	23714	Izolacja / INSULATION	1	29			
2	39340	Uszczelka osłony kutra/ GASKET OF CUTTER'S SHIELD	1	30			
3	24560	Zamek do skrzynki 5 L=45 / LOCK	8	31			
4				32			
5				33			
6				34			
7				35			
8				36			
9				37			
10				38			
11				39			
12				40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			
27				55			
28				56			

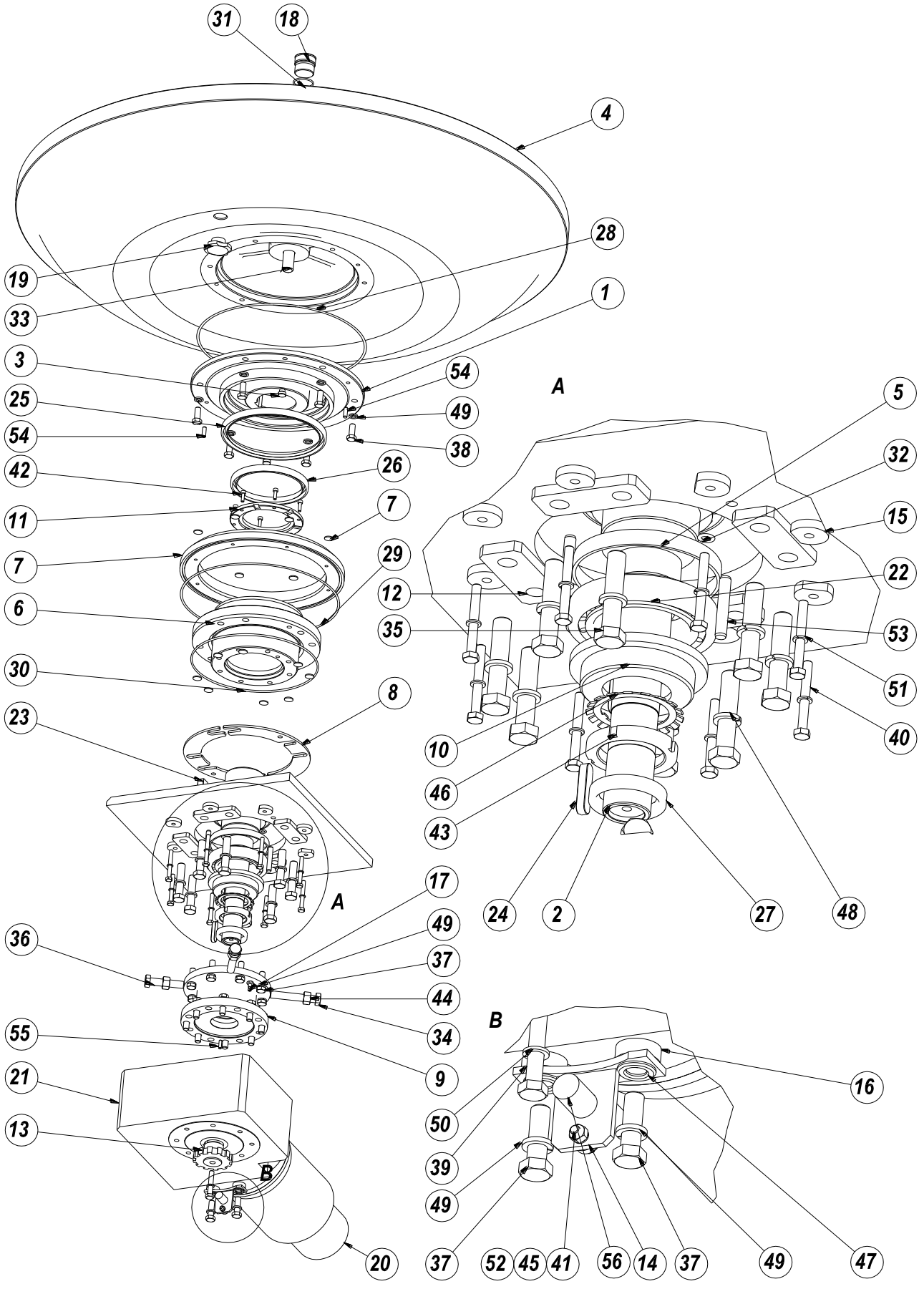
NAZWA RYS.	NR RYS.
Odboje / BUMPING BLOCKS	**N-125 KAB a/17**





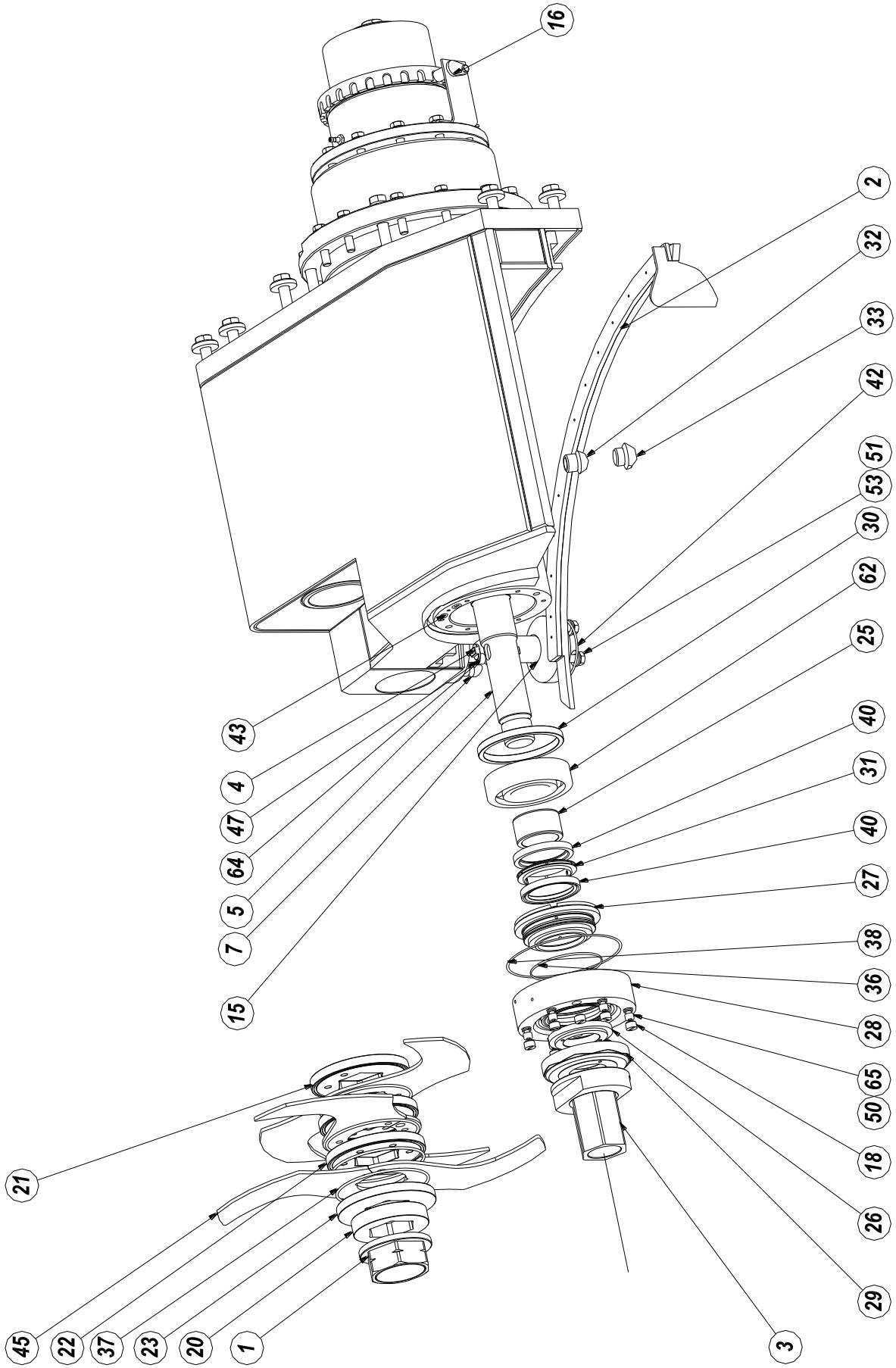
NAZWA RYS.				NR RYS.			
Odboje / BUMPING BLOCKS				**N-125 KAB a/17**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KAB 1 a/17	Odbojnica 1 / FENDER 1	1	29			
2	N-125 KAB 2 a/17	Odbojnica 2 / FENDER 2	1	30			
3	N-125 KAB 3 a/17	Odbojnica 3 / FENDER 3	1	31			
4	24834	Podkładka sprężysta / SPRING WASHER	9	32			
5	24820	Podkładka / WASHER	9	33			
6	24923	Śruba / SCREW	9	34			
7				35			
8				36			
9				37			
10				38			
11				39			
12				40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			
27				55			
28				56			

NAZWA RYS.	NR RYS.
Napęd misy / BOWL'S DRIVE	**N-125 KB a/17**

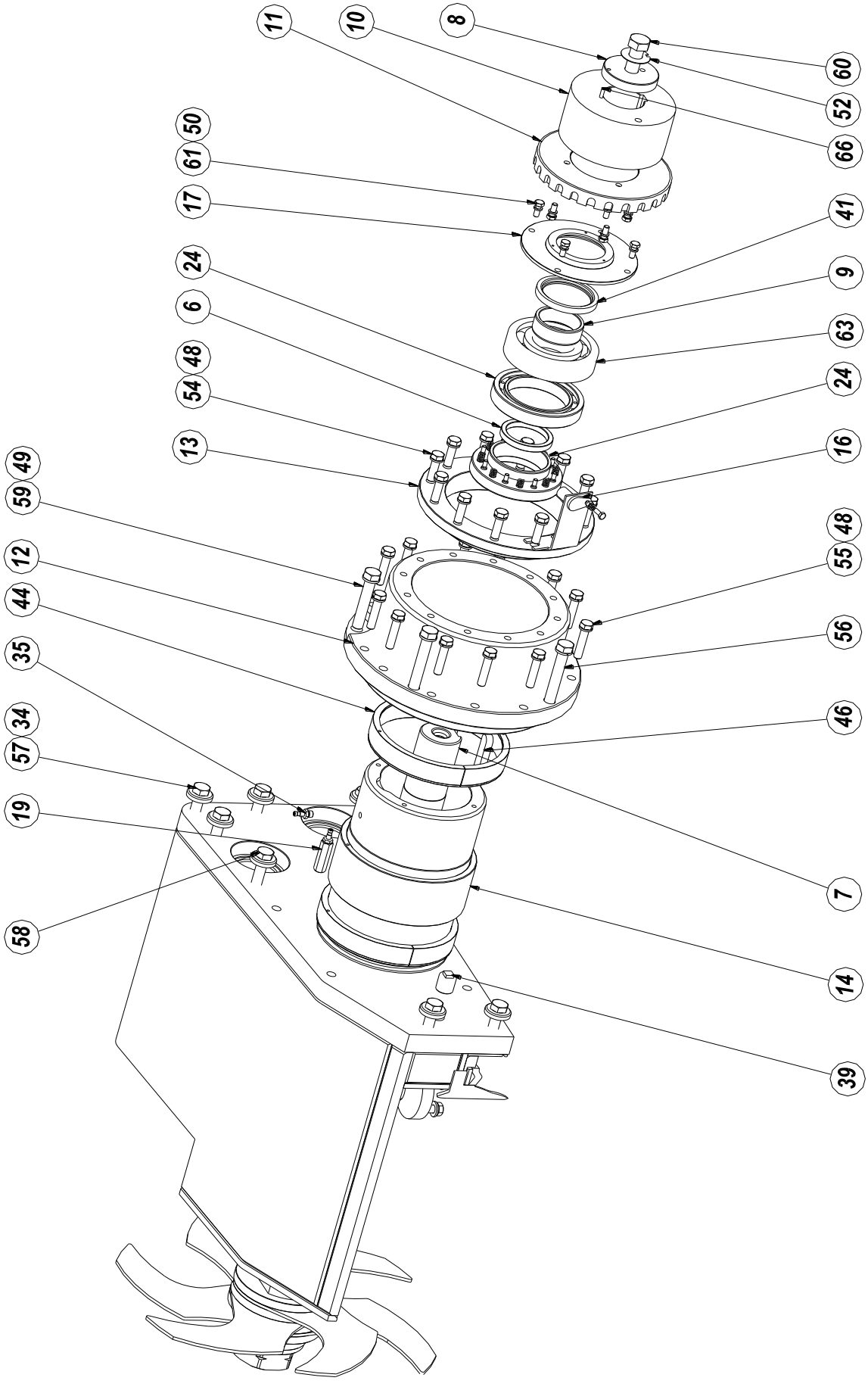


NAZWA RYS.				NR RYS.			
Napęd misy / BOWL'S DRIVE				**N-125 KB a/17**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	52483	Piasta / NAVE	1	29	29903	Sznur uszczelniający / SEAL LINE	1
2	52486	Wał / SHAFT	1	30	29903	Sznur uszczelniający / SEAL LINE	1
3	52487	Korek /PLUG	2	31	25233	Pierścień uszczelniający O / SEAL RING	1
4	26521	Misa / BOWL	1	32	29561	Pierścień uszczelniający O / SEAL RING	1
5	52077	Pierścień / RING	1	33	30521	Śruba / SCREW	1
6	47160	Korpus łożyska / BEARING FRAME	1	34	38715	Śruba / SCREW	3
7	41518	Obręcz / HOOP	1	35	41667	Śruba / SCREW	8
8	41978	Płyta dystansowa / DISTANCE PLATE	2	36	52518	Śruba / SCREW	1
9	47161	Kołnierz / COLLAR	1	37	41354	Śruba / SCREW	18
10	47163	Pierścień / RING	1	38	25807	Śruba / SCREW	6
11	47164	Pokrywka / COVER	1	39	24984	Śruba / SCREW	1
12	47165	Płytka / PLATE	4	40	41644	Śruba / SCREW	8
13	47167	Koło pomiarowe / WHEEL	1	41	24786	Śruba / SCREW	1
14	54161	Wspornik / BRACKET	1	42	29276	Śruba / SCREW	6
15	48484	Podkładka / WASHER	8	43	25245	Nakrętka łożyskowa / BEARING NUT	1
16	47168	Tulejka / SLEEVE	2	44	26050	Nakrętka / NUT	4
17	52491	Przyłącze / TERMINAL	1	45	25016	Nakrętka / NUT	1
18	47053	Korek / PLUG	1	46	25398	Podkładka zębata / RACK WASHER	1
19	47113	Korek / PLUG	1	47	24822	Podkładka / WASHER	2
20	56317	Silnik trójfazowy z obcym chłodzeniem przystosowany do zasilania z falowników (silnik wentylatora trójfazowy) / 3-PHASE MOTOR	1	48	25838	Podkładka sprężysta / SPRING WASHER	8
21	34239	Reduktor /REDUCER	1	49	24856	Podkładka sprężysta / SPRING WASHER	24
22	32715	Łożysko stożkowe / BEARING	2	50	24997	Podkładka sprężysta /SPRING WASHER	1
23	25002	Wpust pryzmatyczny skrócony L=68 / PRISMATIC INLET	1	51	24834	Podkładka sprężysta / SPRING WASHER	8
24	27245	Wpust pryzmatyczny / PRISMATIC INLET	2	52	24835	Podkładka sprężysta / SPRING WASHER	1
25	27809	Pierścień uszczelniający / SEAL RING	1	53	24992	Kołek walcowy / CYLINDRICAL PIN	2
26	28512	Pierścień uszczelniający / SEAL RING	1	54	24991	Kołek walcowy / CYLINDRICAL PIN	2
27	32913	Pierścień uszczelniający / SEAL RING	1	55	24940	Kołek walcowy / CYLINDRICAL PIN	1
28	29903	Sznur uszczelniający / SEAL LINE	1	56	32047	Czujnik Hall'a / HALL'S SENSOR	1

NAZWA RYS.	NR RYS.
Wał nożowy / KNIVES SHAFT	**N-125 KC III /32**



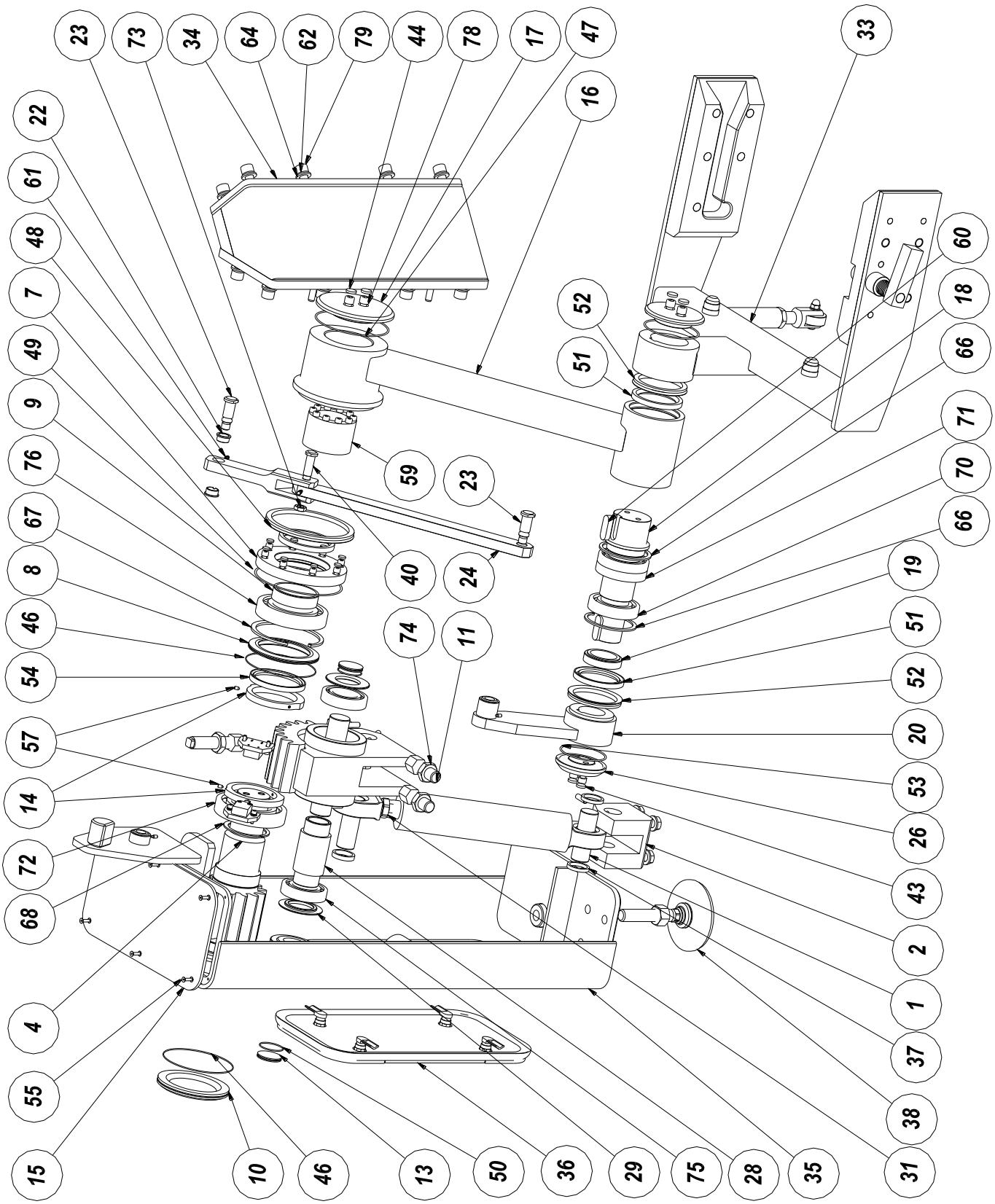
NAZWA RYS.	NR RYS.
Wał nożowy / KNIVES SHAFT	**N-125 KC III /32**



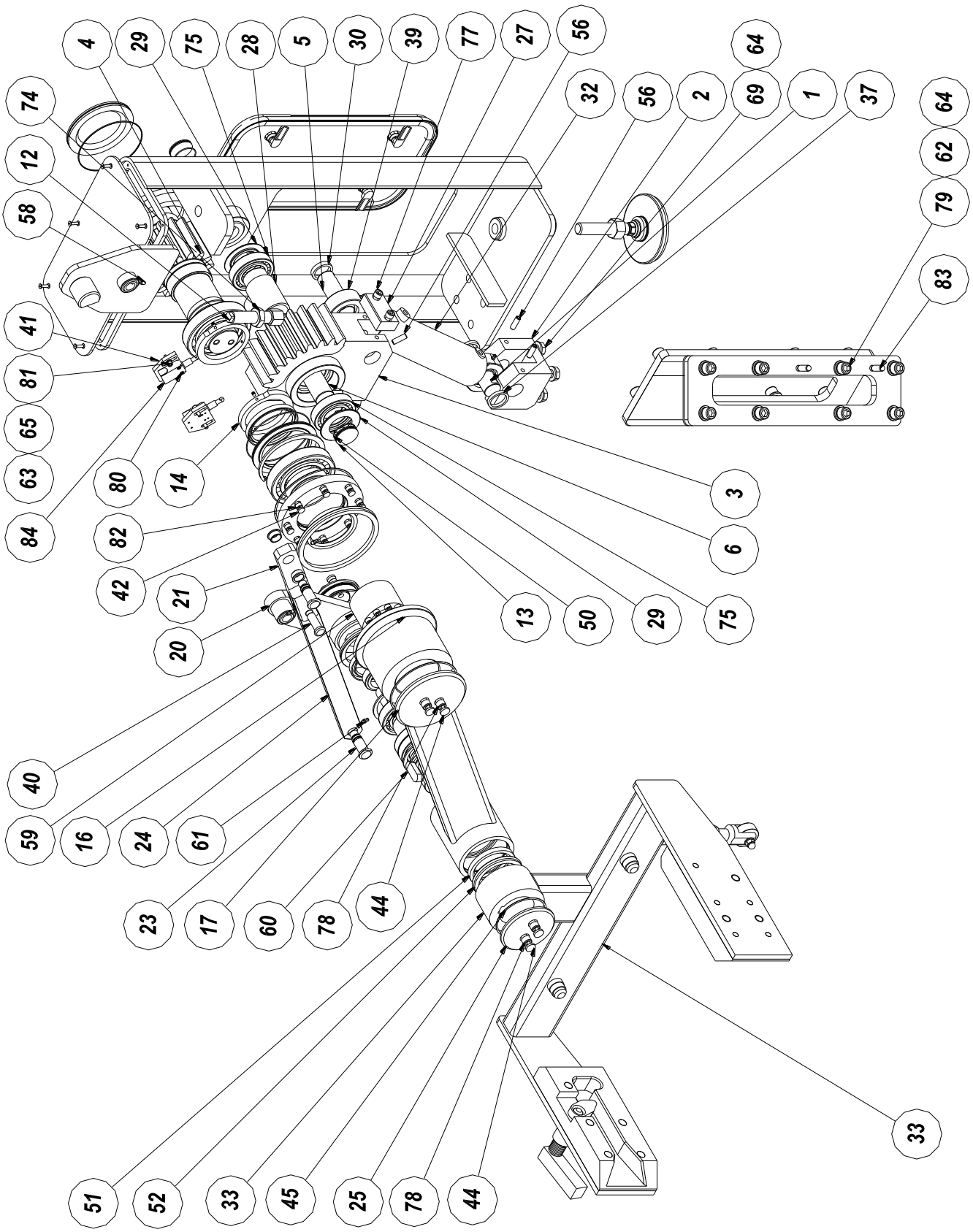
NAZWA RYS.				NR RYS.			
Wał nożowy / KNIVES SHAFT				**N-125 KC III /32**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	57288	Nakrętka / NUT	1	25	55059	Tuleja / SLEEVE	1
2	52139	Listwa kompletna / COMPLETE STRIP	1	26	52497	Pierścień / RING	1
3	61113	Tuleja głowicy / SLEEVE OF HEAD	1	27	52498	Pierścień / RING	1
4	52220	Wpust / INLET	2	28	61115	Pierścień / RING	1
5	52221	Zaślepka f 18 / STOPPER	4	29	52500	Pokrywa / COVER	1
6	52222	Pierścień / RING	1	30	52501	Pierścień / RING	1
7	61488	Wał / SHAFT	1	31	52502	Pierścień / RING	1
8	52224	Krążek / DISK	1	32	52995	Króciec / STUB PIPE	1
9	55058	Tuleja-tył / SLEEVE-BACK	1	33	48476	Korek / PLUG	1
10	52227	Koło pasowe d=162 / WHEEL	1	34	48473	Podkładka / WASHER	8
11	54140	Tarcza / SHIELD	1	35	52491	Przyłącze / TERMINAL	4
12	61114	Tarcza clampeksu / CLAMPEKS SHIELD	1	36	52963	Pierścień uszczelniający O / SEAL RING	1
13	52229	Kołnierz dociskowy / PRESSURE COLLAR	1	37	25497	Pierścień uszczelniający O / SEAL RING	6
14	52230	Tuleja dystansowa / DISTANCE SLEEVE	1	38	25558	Pierścień uszczelniający O / SEAL RING	1
15	52231	Wspornik / BRACKET	1	39	46728	Korek / PLUG	1
16	N-125 KC 23a	Zespół czujnika Hall'a / SET OF HALL'S SENSOR	1	40	53001	Pierścień uszczelniający O / SEAL RING	2
17	52225	Pokrywa / COVER	1	41	25660	Pierścień uszczelniający O / SEAL RING	1
18	52492	Zaślepka / STOPPER	8	42	52962	Pierścień uszczelniający O / SEAL RING	2
19	54936	Króciec / STUB PIPE	3	43	25470	Pierścień uszczelniający O / SEAL RING	2
20	54128	Pierścień dociskowy / PRESSURE RING	1	44	N-125 KCAa	Zacisk 190x211x33 / CLAMP	2
21	54711	Pierścień 1 / RING 1	1	45	-	Nóż-125 / KNIFE	6
22	54712	Pierścień 2 / RING 2	2	46	24974	Wpust pryzmatyczny / PRISMATIC INLET	1
23	54713	Pierścień 3 / RING 3	1	47	24997	Podkładka sprężysta / SPRING WASHER	4
24	52493	Napinacz / STRETCHER	1	48	24856	Podkładka sprężysta / SPRING WASHER	27

NAZWA RYS.				NR RYS.			
Wał nożowy / KNIVES SHAFT				**N-125 KC III /32**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
49	25838	Podkładka sprężysta / SPRING WASHER	4	73			
50	24834	Podkładka sprężysta / SPRING WASHER	14	74			
51	24822	Podkładka / WASHER	4	75			
52	45558	Podkładka odginana / WASHER	1	76			
53	41353	Śruba / SCREW	4	77			
54	41354	Śruba / SCREW	12	78			
55	30331	Śruba / SCREW	11	79			
56	44712	Śruba / SCREW	3	80			
57	38851	Śruba / SCREW	7	81			
58	40660	Śruba / SCREW	1	82			
59	56243	Śruba / SCREW	1	83			
60	36640	Śruba / SCREW	1	84			
61	24838	Śruba / SCREW	8	85			
62	52891	Łożysko kulkowe / BEARING	1	86			
63	29316	Łożysko kulkowe / BEARING	1	87			
64	24900	Śruba / SCREW	4	88			
65	45630	Śruba / SCREW	6	89			
66	24927	Kołek sprężysty / SPRING PLUG	1	90			
67				91			
68				92			
69				93			
70				94			
71				95			
72				96			

NAZWA RYS.	NR RYS.
Podnośnik załadunkowy / LOADING LIFT	**N-125 KD c/18**



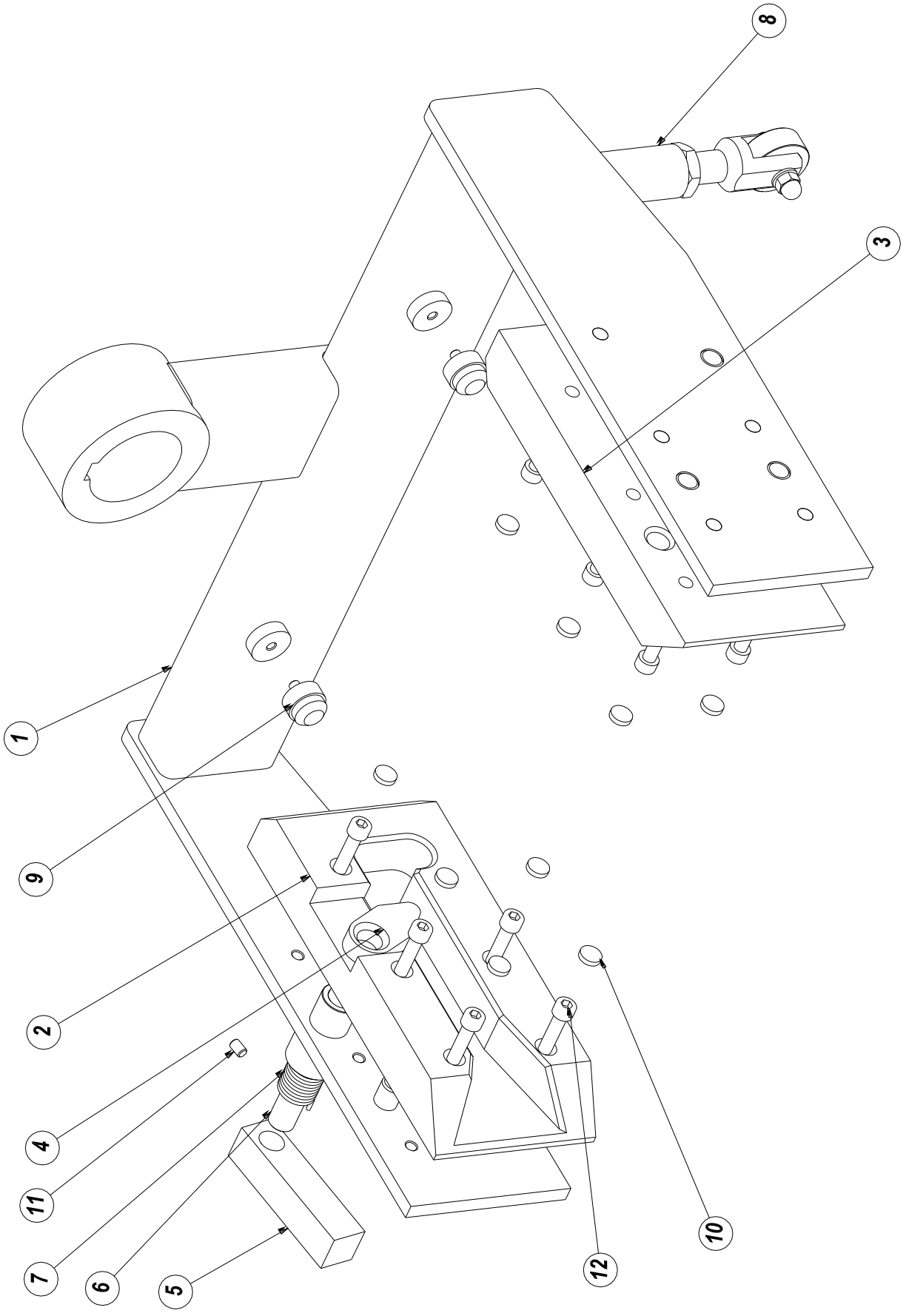
NAZWA RYS.	NR RYS.
Podnośnik załadunkowy / LOADING LIFT	**N-125 KD c/18**



NAZWA RYS.				NR RYS.			
Podnośnik załadunkowy / LOADING LIFT				**N-125 KD c/18**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	55194	Sworzeń / BOLT	1	27	55268	Nakładka / NUT	1
2	55359	Wspornik / BRACKET	1	28	55131	Tuleja / SLEEVE	1
3	55288	Koło z=28 / WHEEL	1	29	55129	Pierścień / RING	2
4	55293	Koło z=14 / WHEEL	1	30	58236	Pierścień / RING	1
5	55195	Sworzeń / BOLT	1	31	58238	Nakrętka / NUT	1
6	55204	Sworzeń / BOLT	1	32	52801	Cylinder hydrauliczny / HYDRAULIC CYLINDER	1
7	55191	Pokrywa / COVER	1	33	52804	Wywrotnica wózka / TIPPLER	1
8	54892	Pierścień / RING	1	34	55534	Wspornik / BRACKET	1
9	55197	Tuleja / SLEEVE	1	35	52712	Korpus podnośnika / LIFT FRAME	1
10	55202	Pokrywa / COVER	1	36	N-125 KAA 04	Osłona podnośnika / LIFT SHIELD	1
11	55201	Śruba M24x2x90 / SCREW	2	37	48880	Pierścień / RING	4
12	55199	Śruba / SCREW	1	38	53722	Stopa M24 / VEET	1
13	55294	Pierścień / RING	2	39	42982	Ucho cylindra / CYLINDER LUG	1
14	55198	Krzywka / CAM	2	40	49120	Sworzeń / BOLT	1
15	55267	Blacha / METAL PLATE	1	41	49786	Wspornik / BRACKET	2
16	53916	Ramię / ARM	1	42	Φ 14x3	Zaślepka / STOPPER	8
17	55192	Pokrywka / COVER	1	43	Φ 18x4	Zaślepka / STOPPER	2
18	55222	Wał / SHAFT	1	44	Φ 20x4	Zaślepka / STOPPER	4
19	55132	Tuleja / SLEEVE	1		25475	Pierścień uszczelniający O / SEAL RING	1
20	55265	Dźwignia / LEVER	1	46	55752	Pierścień uszczelniający O / SEAL RING	2
21	55203	Cięgno / STRING	1	47	38347	Pierścień uszczelniający O / SEAL RING	1
22	55206	Tulejka / SLEEVE	2	48	39214	Pierścień uszczelniający V / SEAL RING	1
23	55200	Sworzeń / BOLT	2	49	52964	Pierścień uszczelniający O / SEAL RING	1
24	54909	Cięgno / STRING	1	50	52961	Pierścień uszczelniający O / SEAL RING	2
25	55188	Pokrywka / COVER	1	51	36582	Pierścień uszczelniający / SEAL RING	2
26	55187	Pokrywka / COVER	1	52	25829	Pierścień uszczelniający V / SEAL RING	2

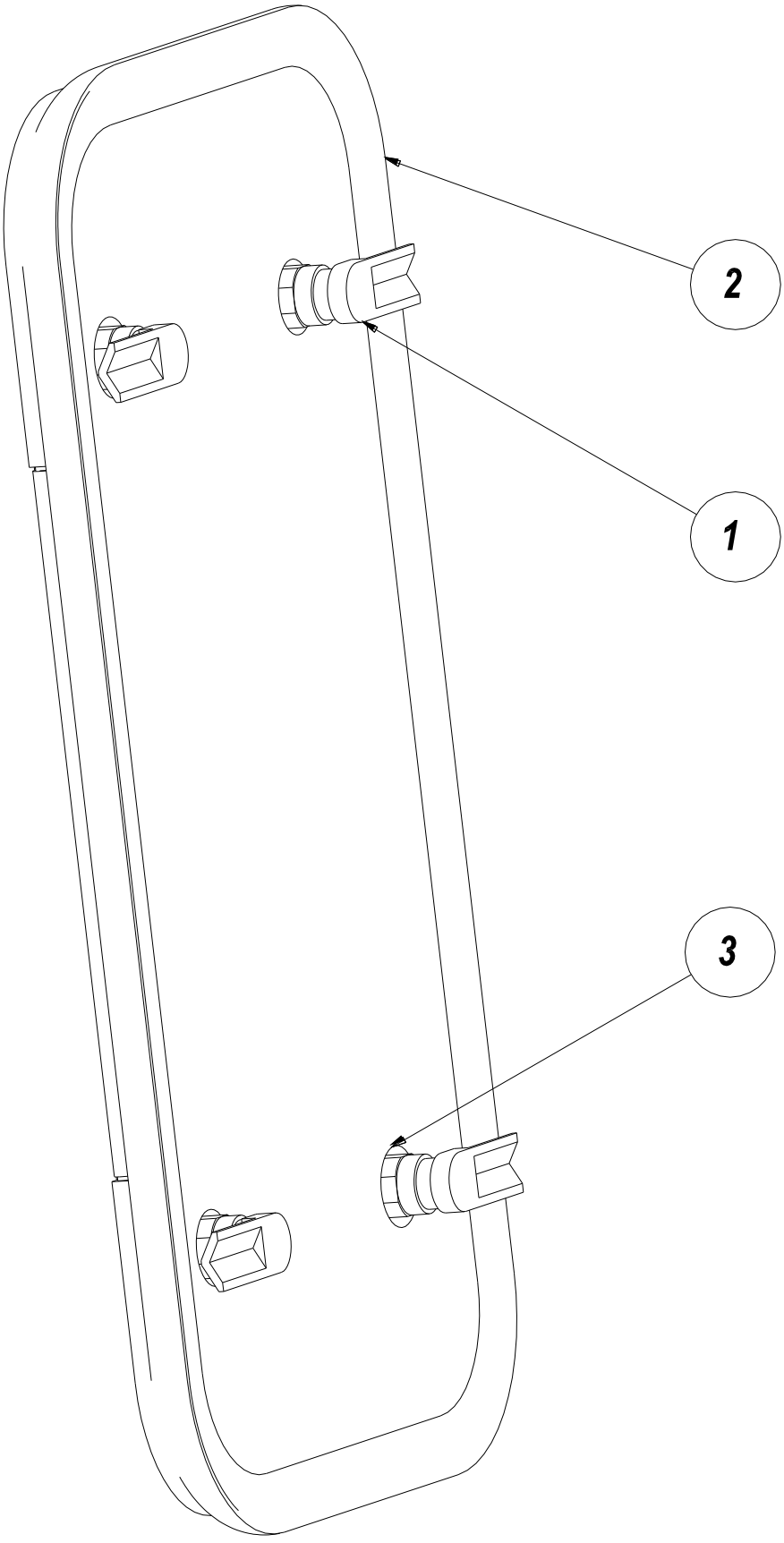
NAZWA RYS.				NR RYS.			
Podnośnik załadunkowy / LOADING LIFT				**N-125 KD c/18**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
53	52962	Pierścień uszczelniający O / SEAL RING	1	79	25811	Śruba / SCREW	4
54	53307	Pierścień uszczelniający / SEAL RING	2	80	24976	Śruba / SCREW	16
55	27242	Wkręt / SCREW	6	81	56653	Śruba / SCREW	4
56	34024	Wkręt dociskowy / PRESSURE SCREW	6	82	29276	Śruba / SCREW	4
57	37699	Wkręt dociskowy / PRESSURE SCREW	4	83	24791	Śruba / SCREW	8
58	27244	Wkręt dociskowy / PRESSURE SCREW	2	84	24970	Kołek walcowy / PIN	4
59	52514	Pierścień rozprężno-zaciskowy / CLAMPING RING	1	85	33218	Wyłącznik krańcowy / SWITCH OFF END	2
60	24873	Wpust pryzmatyczny / PRISMATIC INLET	2	86			
61	25779	Smarowniczka / LUBRICATOR	3	87			
62	25838	Podkładka sprężysta / SPRING WASHER	16	88			
63	24835	Podkładka sprężysta / SPRING WASHER	4	89			
64	25796	Podkładka / WASHER	20	90			
65	24819	Podkładka / WASHER	4	91			
66	25373	Pierścień osadczy sprężynujący / SPRIN RING	2	92			
67	25272	Pierścień osadczy sprężynujący / SPRIN RING	1	93			
68	25078	Pierścień osadczy sprężynujący / SPRIN RING	1	94			
69	M27x2	Nakrętka / NUT	1	95			
70	30603	Śruba / SCREW	4	96			
71	50536	Łożysko kulkowe / BEARING	1	97			
72	52883	Łożysko kulkowe / BEARING	2	98			
73	52882	Łożysko kulkowe / BEARING	1	99			
74	M14X1,5	Nakrętka / NUT	1	100			
75	25835	Nakrętka / NUT	3	101			
76	55182	Łożysko walcowe / CYLINDRICAL BEARING	2	102			
77	52905	Łożysko walcowe / CYLINDRICAL BEARING	1	103			
78	24900	Śruba / SCREW	4	104			

NAZWA RYS.	NR RYS.
Wywrotnica (dotyczy wer. KN 125HL) / TIPPLER	**N-125 KDB a/13**



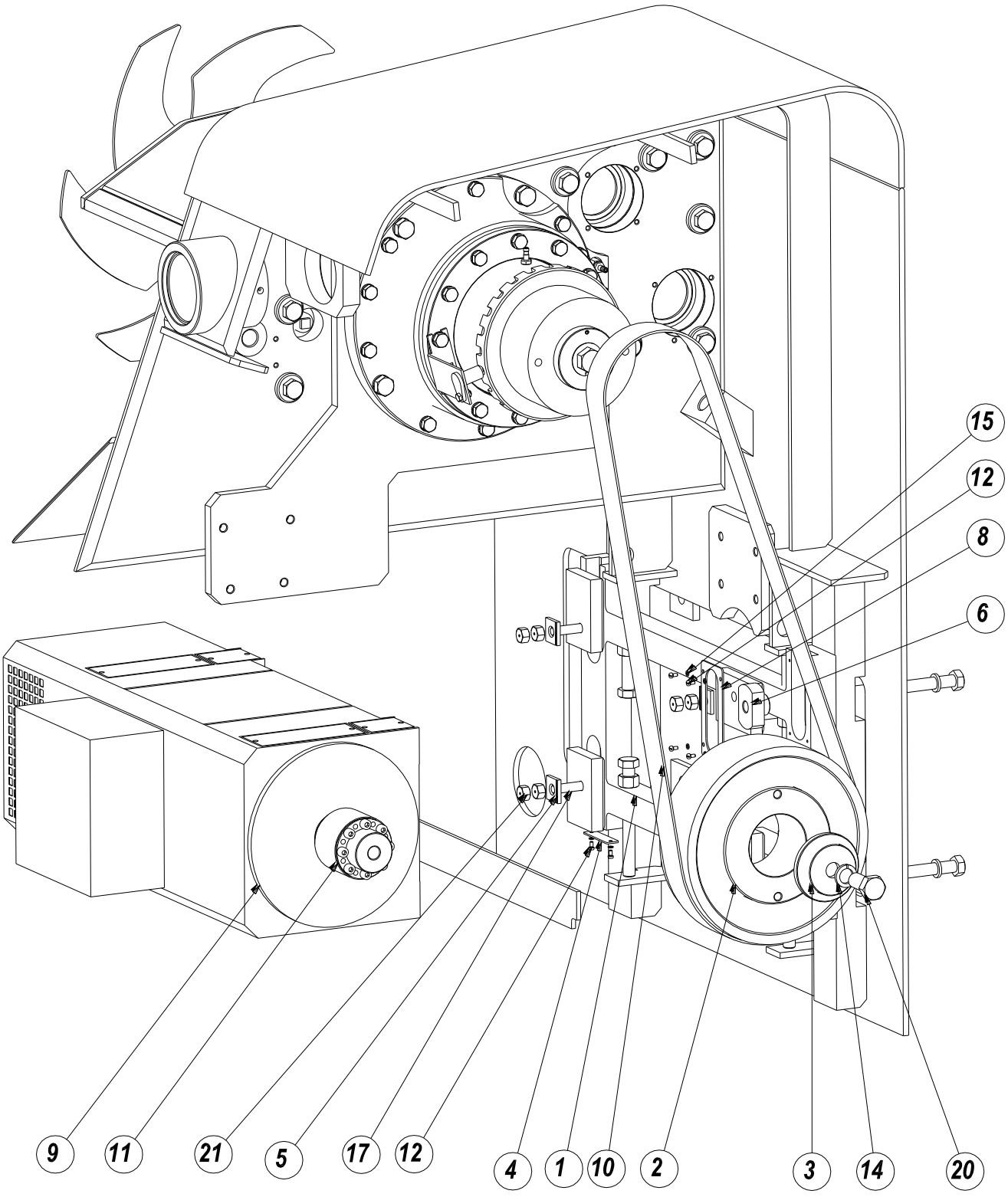
NAZWA RYS.				NR RYS.			
Wywrotnica (dotyczy wer. KN 125HL) / TIPPLER				**N-125 KDB a/13**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	O-N-125 KDB 01 a/13	Wywrotnica / TIPPLER	1	29			
2	55133	Prowadnica 1 / GUIDE 1	1	30			
3	55134	Prowadnica 2 / GIUDE 2	1	31			
4	54889	Blokada / BLOCKING	1	32			
5	55135	Dźwignia / LEVER	1	33			
6	55193	Trzpień / ARBOR	1	34			
7	N-125 KDB 08	Sprężyna / SPRING	1	35			
8	55304	Podpora / SUPPORT	1	36			
9	37297	Odbój / FENDER	2	37			
10	Φ 17x4	Zaślepka / STOPPER	10	38			
11	39172	Wkręt dociskowy / PRESSURE PIN	1	39			
12	40158	Śruba / SCREW	10	40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			

NAZWA RYS.	NR RYS.
Osłona podnośnika / LIFT SHIELD	**N-125 KAA 04**

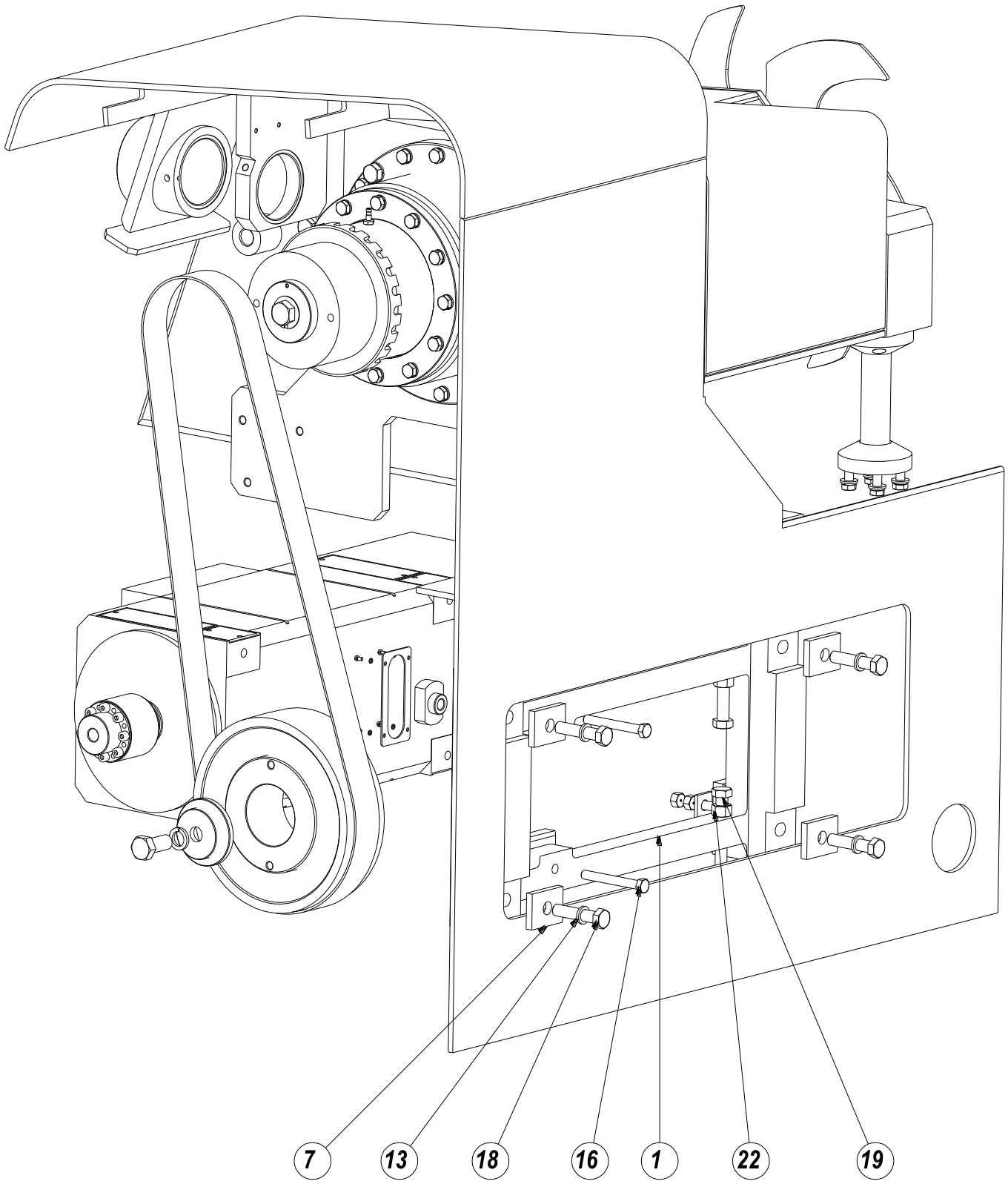


NAZWA RYS.				NR RYS.			
Osłona podnośnika / LIFT SHIELD				**N-125 KAA 04**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	24560	Zamek do skrzynki 5 L=45 / LOCK	4	29			
2	39340	Uszczelka osłony kutra / GASKET OF CUTTER'S SHIELD	1	30			
3	23714	Izolacja / INSULATION	1	31			
4				32			
5				33			
6				34			
7				35			
8				36			
9				37			
10				38			
11				39			
12				40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			
27				55			
28				56			

NAZWA RYS.	NR RYS.
Napęd główny / MAIN DRIVE	N-125 KE IV

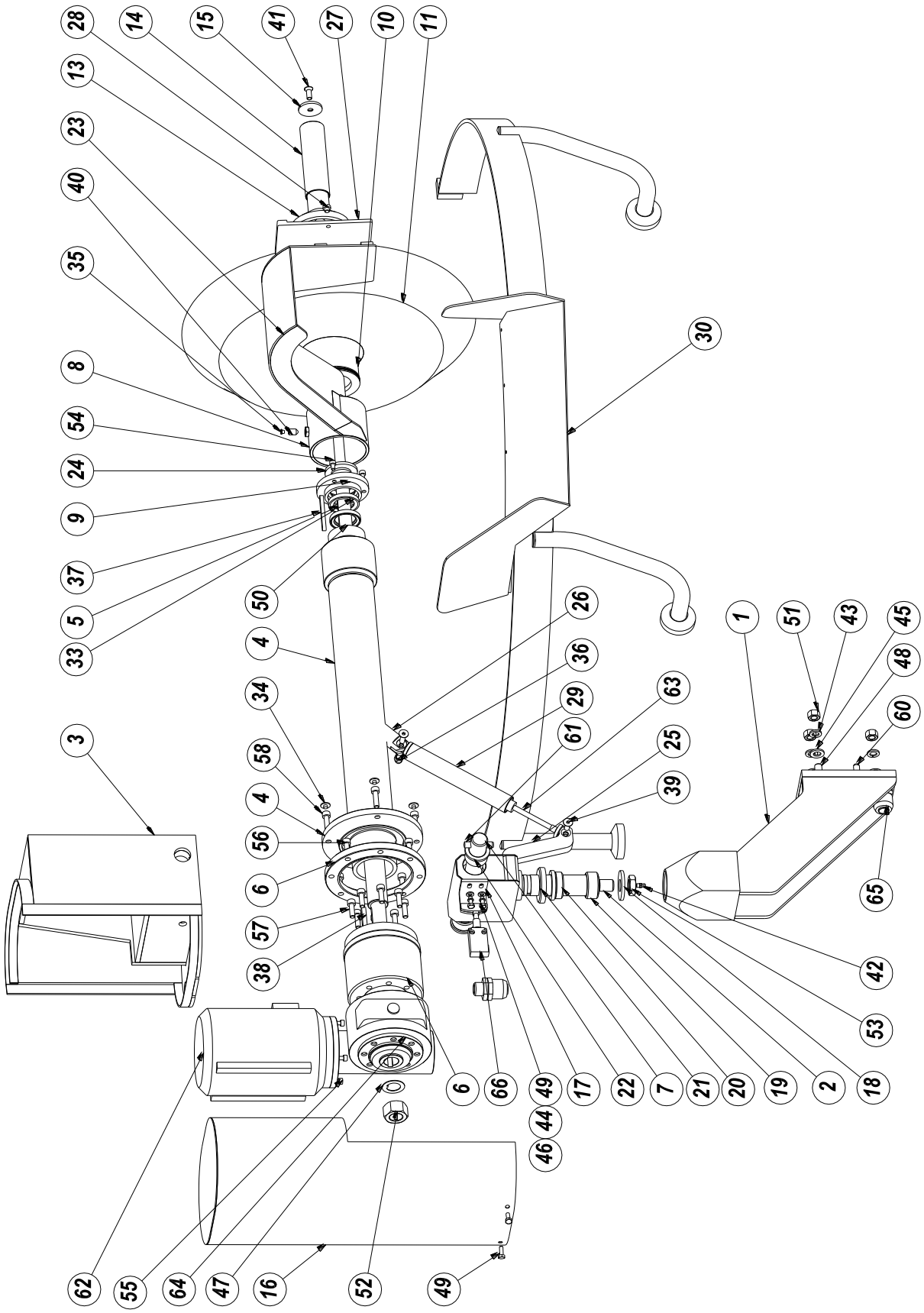


NAZWA RYS.	NR RYS.
Napęd główny / MAIN DRIVE	N-125 KE IV

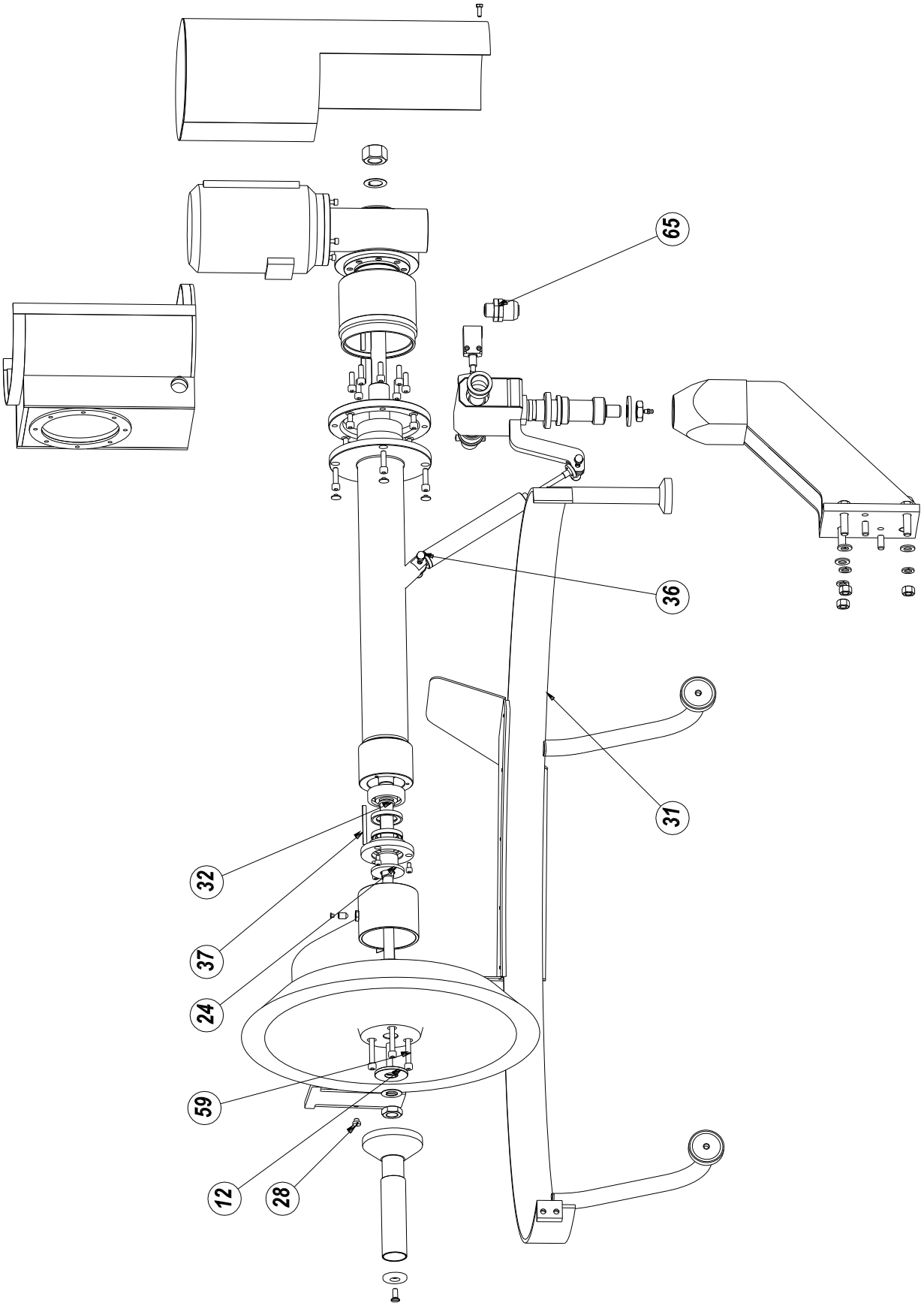


NAZWA RYS.				NR RYS.			
Napęd główny / MAIN DRIVE				N-125 KE IV			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	55104	Rama do silnika DA132B23A30-5 / FRAME	1	25			
2	39947	Koło pasowe Φ271 / BELT WHEEL	1	26			
3	58050	Tuleja zabezpieczająca / PROTECT SLEEVE	1	27			
4	200 KE 74	Blacha / METAL PLATE	1	28			
5	53460	Podkładka klinowa / WASHER	4	29			
6	53461	Nakrętka / NUT	4	30			
7	47738	Podkładka / WASHER	4	31			
8	47741	Blacha / METAL PLATE	2	32			
9	55103	Silnik prądu przemiennego / MOTOR	1	33			
10	58130	Pas napędowy płaski / DRIVE BELT	1	34			
11	45068	Pierścień rozprężno-zaciskowy / RING	1	35			
12	24859	Wkręt ze łbem walcowym / SCREW	10	36			
13	25838	Podkładka sprężysta / SPRING WASHER	4	37			
14	24821	Podkładka sprężysta / SPRING WASHER	1	38			
15	24837	Podkładka sprężysta / SPRING WASHER	10	39			
16	45754	Śruba / SCREW	2	40			
17	30331	Śruba / SCREW	2	41			
18	56243	Śruba / SCREW	4	42			
19	53618	Śruba / SCREW	4	43			
20	45806	Śruba / SCREW	1	44			
21	45409	Nakrętka / NUT	8	45			
22	44017	Nakrętka / NUT	4	46			
23				47			
24				48			

NAZWA RYS.	NR RYS.
Wyrzutnik farszu / STUFFING EJECTOR-MANUAL	N-125 KF II



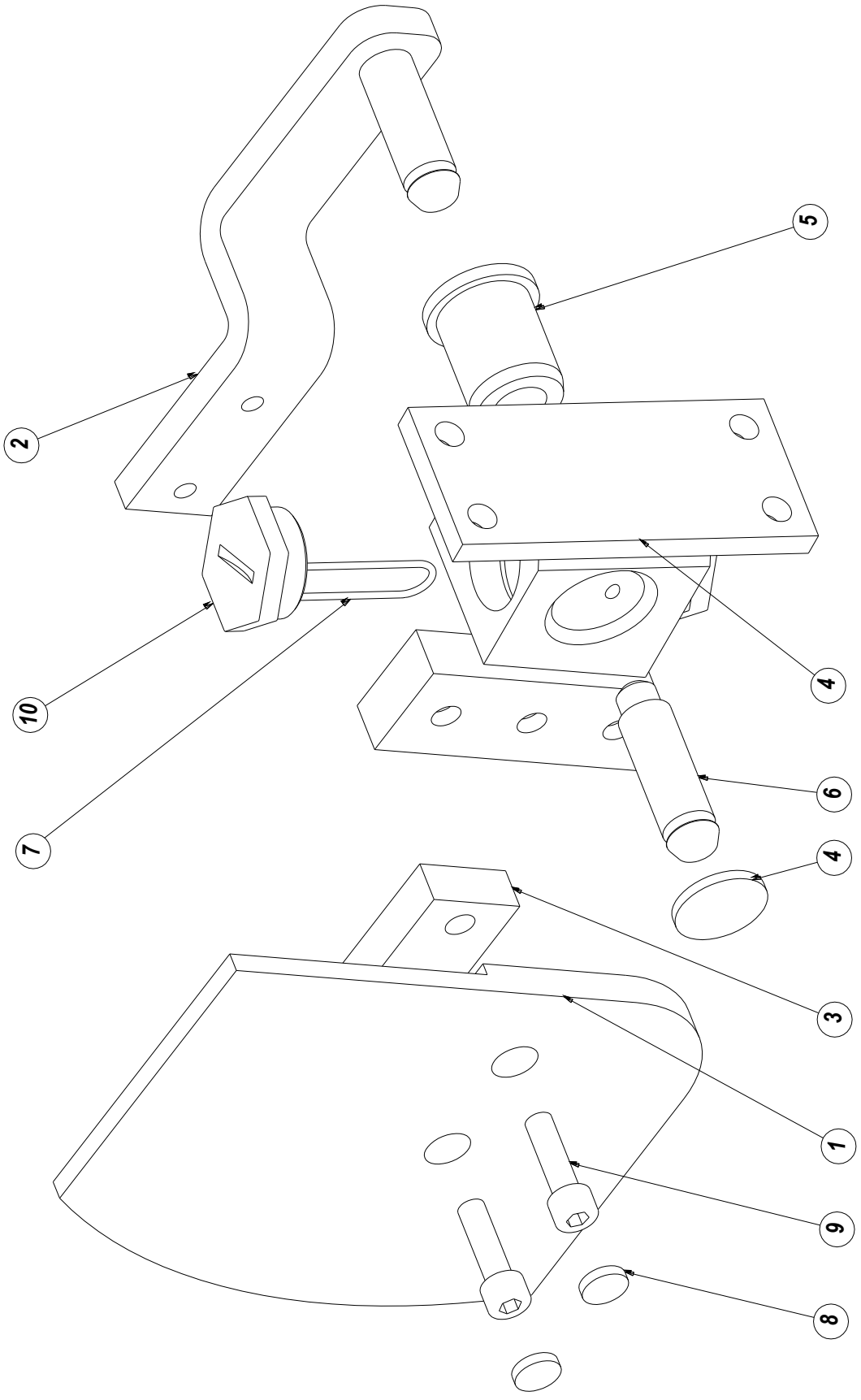
NAZWA RYS.	NR RYS.
Wyrzutnik farszu / STUFFING EJECTOR-MANUAL	N-125 KF II



NAZWA RYS.				NR RYS.			
Wyrzutnik farszu / STUFFING EJECTOR-MANUAL				N-125 KF II			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	54323	Wspornik / BRACKET	1	26	47267	Uchwyt amortyzatora II / SHOCK ABSORBER HANDLE	1
2	47225	Obrotnik / WELDING	1	27	53795	Płytka / PLATE	1
3	4248MF2a	Korpus / FRAME	1	28	53796	Wkręt / SCREW	1
4	47249	Tuleja / SLEEVE	1	29	4248MF30	Osłona amortyzatora kpl. / SHOCK ABSORBER COVER	1
5	26459	Wał / SHAFT	1	30	N-125 KF 27 a	Zsyp / CHUTE	1
6	47242	Tuleja / SLEEVE	1	31	54944	Obręcz / HOOP	1
7	47243	Oś / AXIS	1	32	25535	Pierścień uszczelniający O / SEAL RING	1
8	47244	Tuleja / SLEEVE	1	33	25861	Pierścień uszczelniający / SEAL RING	2
9	47246	Pokrywka / COVER	1	34	–	Zaślepka / STOPPER	4
10	53794	Tuleja / SLEEVE	1	35	–	Zaślepka / STOPPER	1
11	54346	Tarcza / SHIELD	1	36	62038	Nakrętka kołpakowa / NUT	2
12	47251	Podkładka / WASHER	1	37	24944	Wpust pryzmatyczny / PRISMATIC INLET	1
13	47253	Tulejka / SLEEVE	1	38	25009	Wpust pryzmatyczny / PRISMATIC INLET	2
14	4248MF15	Tulejka / SLEEVE	1	39	24956	Wkręt / SCREW	1
15	47255	Krążek / ROLLER	1	40	30065	Wkręt dociskowy / SCREW	1
16	4248MF17a	Osłona / COVER	1	41	–	Wkręt z rowkiem prostym / SCREW	1
17	4248MF18c	Przysłona czujnika / DIAPHRAGM	1	42	25779	Smarowniczka / LUBRICATOR	1
18	47256	Podkładka / WASHER	1	43	24856	Podkładka sprężysta / SPRING WASHER	3
19	47258	Tulejka / SLEEVE	1	44	24835	Podkładka sprężysta / SPRING WASHER	2
20	47259	Tulejka / SLEEVE	1	45	24822	Podkładka / WASHER	3
21	47260	Pierścień / RING	1	46	24819	Podkładka / WASHER	2
22	47261	Tulejka / SLEEVE	2	47	39467	Podkładka odginana / WASHER	1
23	53791	Osłona / COVER	1	48	24799	Śruba / SCREW	3
24	47265	Tulejka / SLEEVE	1	49	25856	Śruba / SCREW	4
25	54335	Uchwyt amortyzatora I / SHOCK ABSORBER HANDLE	1	50	25265	Łożysko kulkowe / BEARING	1

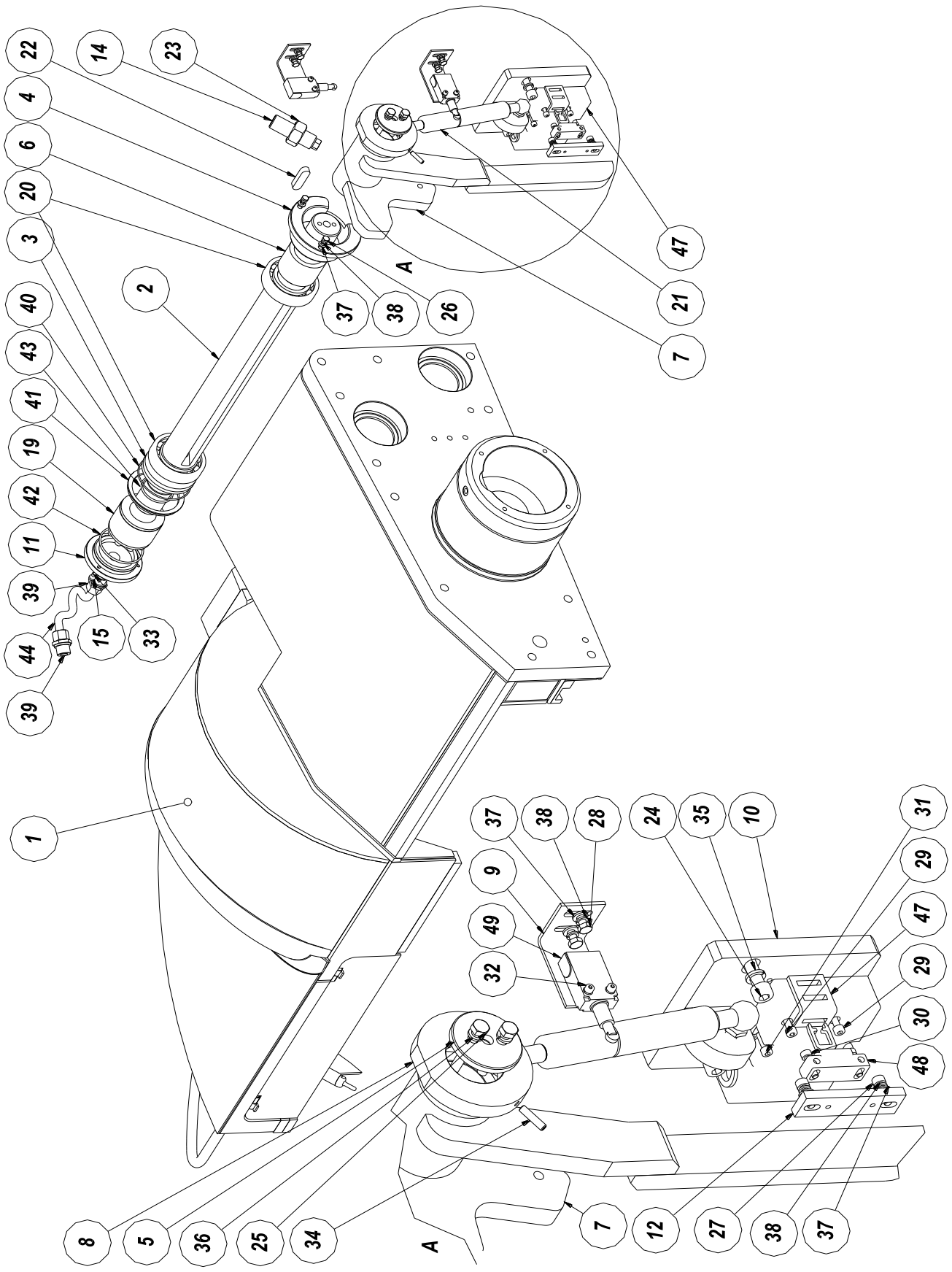
NAZWA RYS.				NR RYS.			
Wyrzutnik farszu ręczny				N-125 KF II			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
51	45409	Nakrętka / NUT	3	75			
52	–	Nakrętka / NUT	1	76			
53	–	Nakrętka / NUT	2	77			
54	36361	Śruba / SCREW	3	78			
55	29276	Śruba / SCREW	4	79			
56	24888	Śruba / SCREW	4	80			
57	24886	Śruba / SCREW	8	81			
58	24923	Śruba / SCREW	4	82			
59	24906	Śruba / SCREW	3	83			
60	24941	Kołek walcowy / PIN	2	84			
61	24972	Kołek walcowy / PIN	1	85			
62	42954	Silnik / MOTOR	1	86			
63	24219	Sprężyna gazowa / GAS SPRING	1	87			
64	45739	Reduktor / REDUCER	1	88			
65	44513	Dławica / GLAND	2	89			
66	26019	Wyłącznik krańcowy / SWITCH OFF END	1	90			
67				91			
68				92			
69				93			
70				94			
71				95			
72				96			
73				97			
74				98			

NAZWA RYS.	NR RYS.
Zespół klapki / SET OF FLAP	**N-125 KF 26**



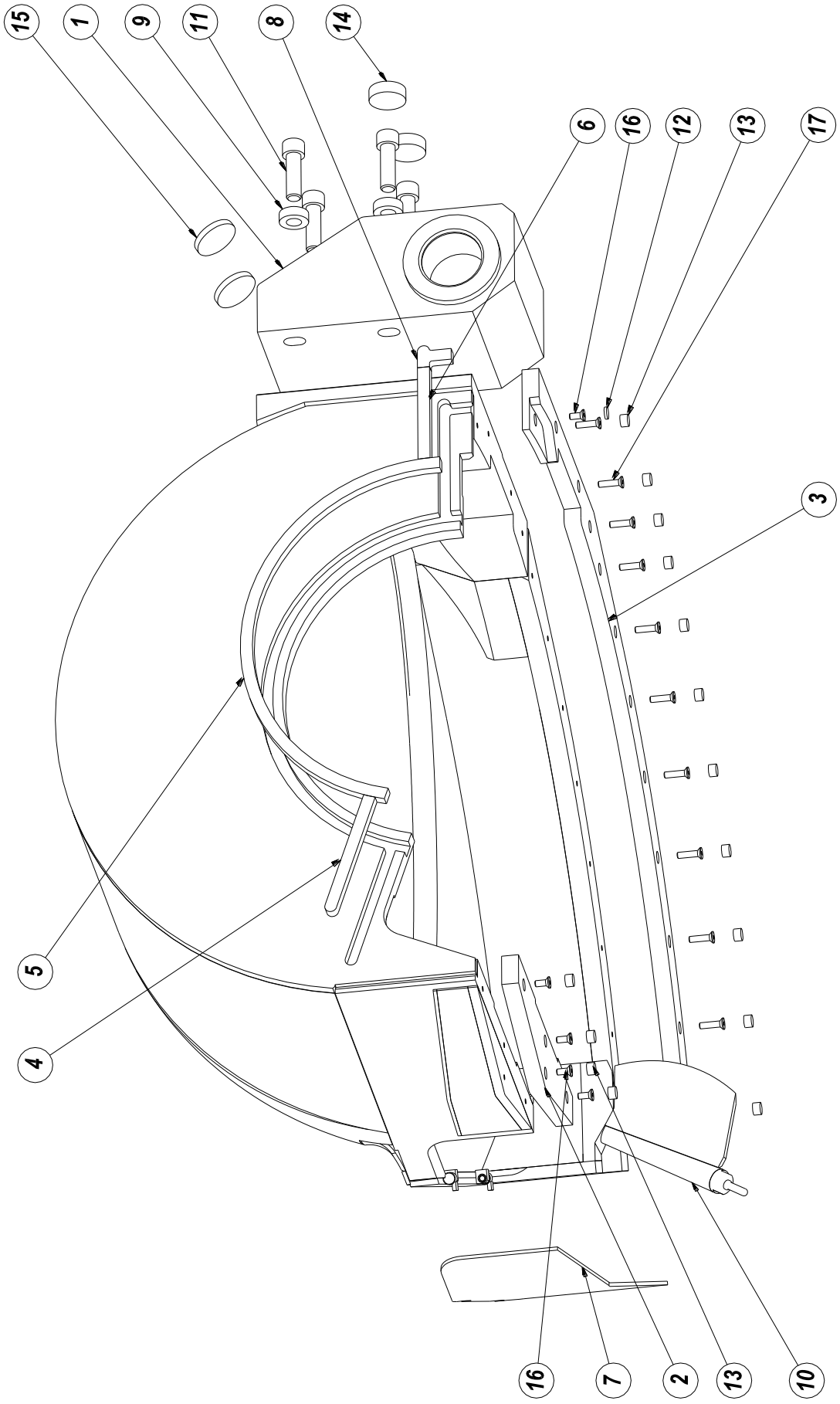
NAZWA RYS.				NR RYS.			
Zespół klapki / SET OF FLAP				**N-125 KF 26**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	54752	Płytka / PLATE	1	25			
2	54753	Wspornik / BRACKET	1	26			
3	55374	Kostka / BLOCK	1	27			
4	54746	Wspornik/ BRACKET	1	28			
5	48505	Tulejka / SLEEVE	1	29			
6	47850	Sworzeń / ARBOR	1	30			
7	330 KF 31 07	Zawleczka / COTTER PIN	1	31			
8	Φ 14x3	Zaślepka / STOPPER	2	32			
9	24923	Śruba / SCREW	2	33			
10	36503	Zaślepka / STOPPER	2	34			
11				35			
12				36			
13				37			
14				38			
15				39			
16				40			
17				41			
18				42			
19				43			
20				44			
21				45			
22				46			
23				47			
24				48			

NAZWA RYS.	NR RYS.
Napęd pokrywy nożowej / DRIVE OF KNIVES COVER	**N-125 KGAA II a /32**



NAZWA RYS.				NR RYS.			
Napęd pokrywy nożowej / DRIVE OF KNIVES COVER				**N-125 KGAA II a /32**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1		Pokrywa nożowa II / KNIVES COVER	1	27	29276	Śruba / SCREW	2
2	52744	Wał / SHAFT	1	28	25856	Śruba / SCREW	4
3	52745	Tuleja mocująca / SLEEVE	1	29	41742	Śruba / SCREW	2
4	52746	Tuleja dociskowa 2 / PRESSURE SLEEVE	1	30	24827	Śruba / SCREW	2
5	52747	Krążek / ROLLER	1	31	24881	Śruba / SCREW	2
6	52748	Tuleja / SLEEVE	1	32	56653	Śruba / SCREW	4
7	52749	Dźwignia / LEVER	1	33	56653	Śruba / SCREW	3
8	52752	Krzywka / CAM	1	34	39902	Wkręt dociskowy / SCREW	2
9	N-125 KGAA 09a/17	Blacha / METAL PLATE	2	35	24997	Podkładka sprężysta / SPRING WASHER	2
10	N-125 KGAA II 12 a/32	Wspornik /BRACKET	1	36	24834	Podkładka sprężysta / SPRING WASHER	2
11	52755	Pokrywka / COVER	1	37	24819	Podkładka / WASHER	9
12	N-125 KGAA II 18	Blacha 18 / METAL PLATE	1	38	24835	Podkładka sprężysta / SPRING WASHER	9
13	–	–	–	39	–	Przyłączka / STUD COUPLING	2
14	47485	Śruba zderzakowa / SCREW	1	40	52476	Pierścień uszczelniający O / SEAL RING	1
15	Ø10x3	Zaślepka / STOPPER	3	41	25566	Pierścień uszczelniający V / SEAL RING	1
16	–	–	–	42	52959	Pierścień uszczelniający O / SEAL RING	1
17	–	–	–	43	25391	Pierścień uszczelniający O / SEAL RING	2
18	–	–	–	44	24027	Wąż zbrojony włóknem HOSE	1
19	55171	Pierścień rozprężno-zaciskowy / RING	1	45	–	–	–
20	32715	Łożysko kulkowe 6210-2RS / BEARING	2	46	–	–	–
21	60797	Sprężyna gazowa / GAS SPRING	1	47	49835	Allen-Bradley - Guard master	1
22	24874	Wpust pryzmatyczny / PRISMATIC INLET	1	48	49837	Klucz / KEY	1
23	25835	Nakrętka / NUT	1	49	26019	Wyłącznik krańcowy / SWITCH OFF END	2
24	49797	Śruba / SCREW	2	50			
25	38998	Śruba / SCREW	2	51			
26	24840	Śruba / SCREW	3	52			

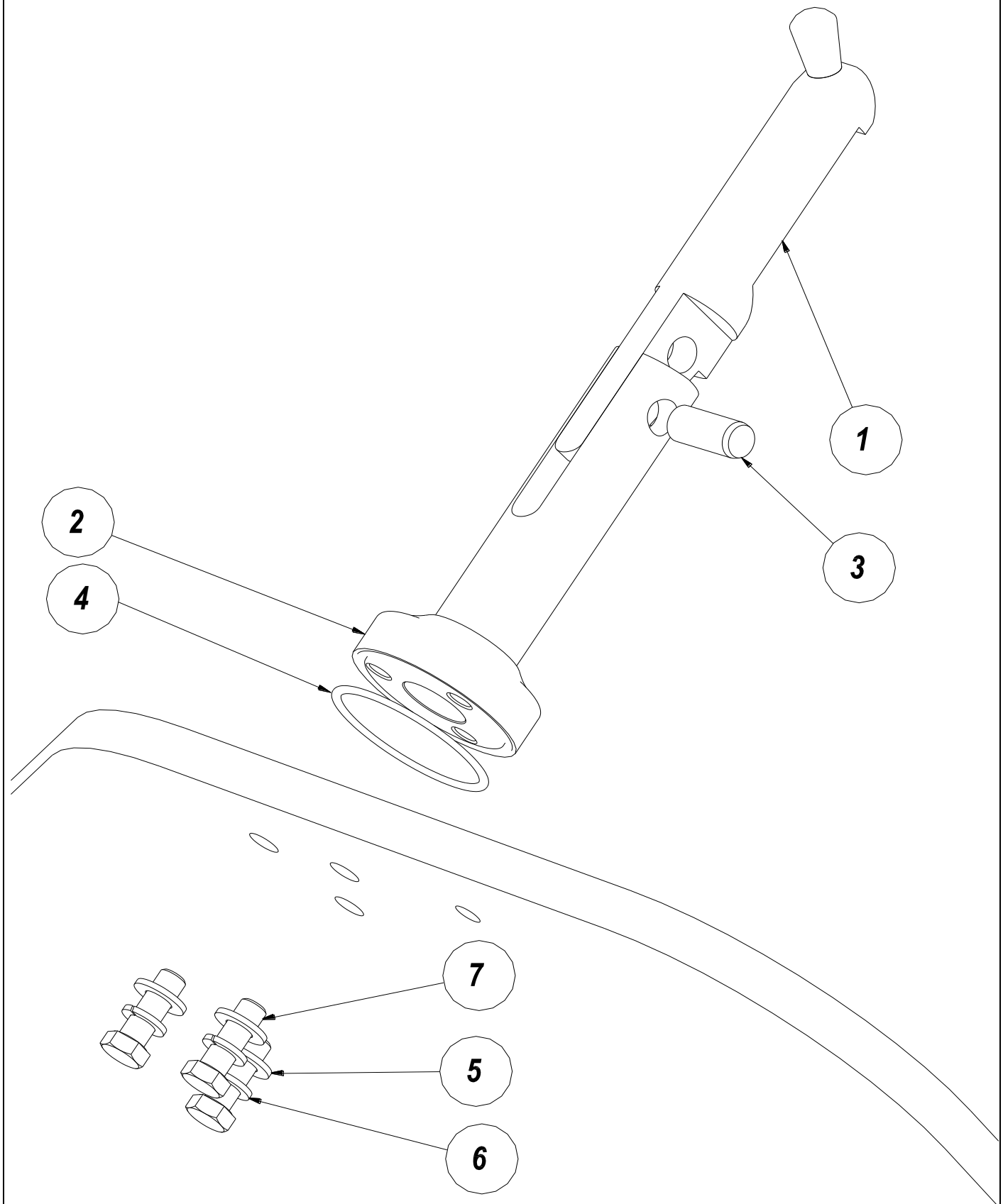
NAZWA RYS.	NR RYS.
Pokrywa nożowa / KNIVE'S COVER	**N-125 KGA I / 14**



NAZWA RYS.				NR RYS.			
Pokrywa nożowa / KNIVE'S COVER				**N-125 KGA I / 14**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	54389	Nakładka / COVER PLATE	1	29			
2	54393	Płytka / PLATE	1	30			
3	54394	Listwa/ SLAT	1	31			
4	54395	Listwa 1 / SLAT 1	1	32			
5	54396	Półpierścień / SEMI-RING	1	33			
6	54397	Listwa 2 / SLAT 2	1	34			
7	54399	Przysłona / DIAPHRAGM	1	35			
8	550 KGA 10	Zatyczka / STOPPER	1	36			
9	N-125 KGA 14-I/14	Tulejka / SLEEVE	4	37			
10	55627	Zespół czujnika / SET OF SENSOR	1	38			
11	24850	Śruba / SCREW	4	39			
12	Φ 10x2	Zaślepka / STOPPER	1	40			
13	Φ 10x6	Zaślepka / STOPPER	15	41			
14	Φ 30x10	Zaślepka / STOPPER	2	42			
15	Φ 36x5	Zaślepka / STOPPER	2	43			
16	27242	Wkręt / SCREW	5	44			
17	24958	Wkręt / SCREW	11	45			
18	52444	Blachy pokrywy METAL PLATE COVER	1	46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			

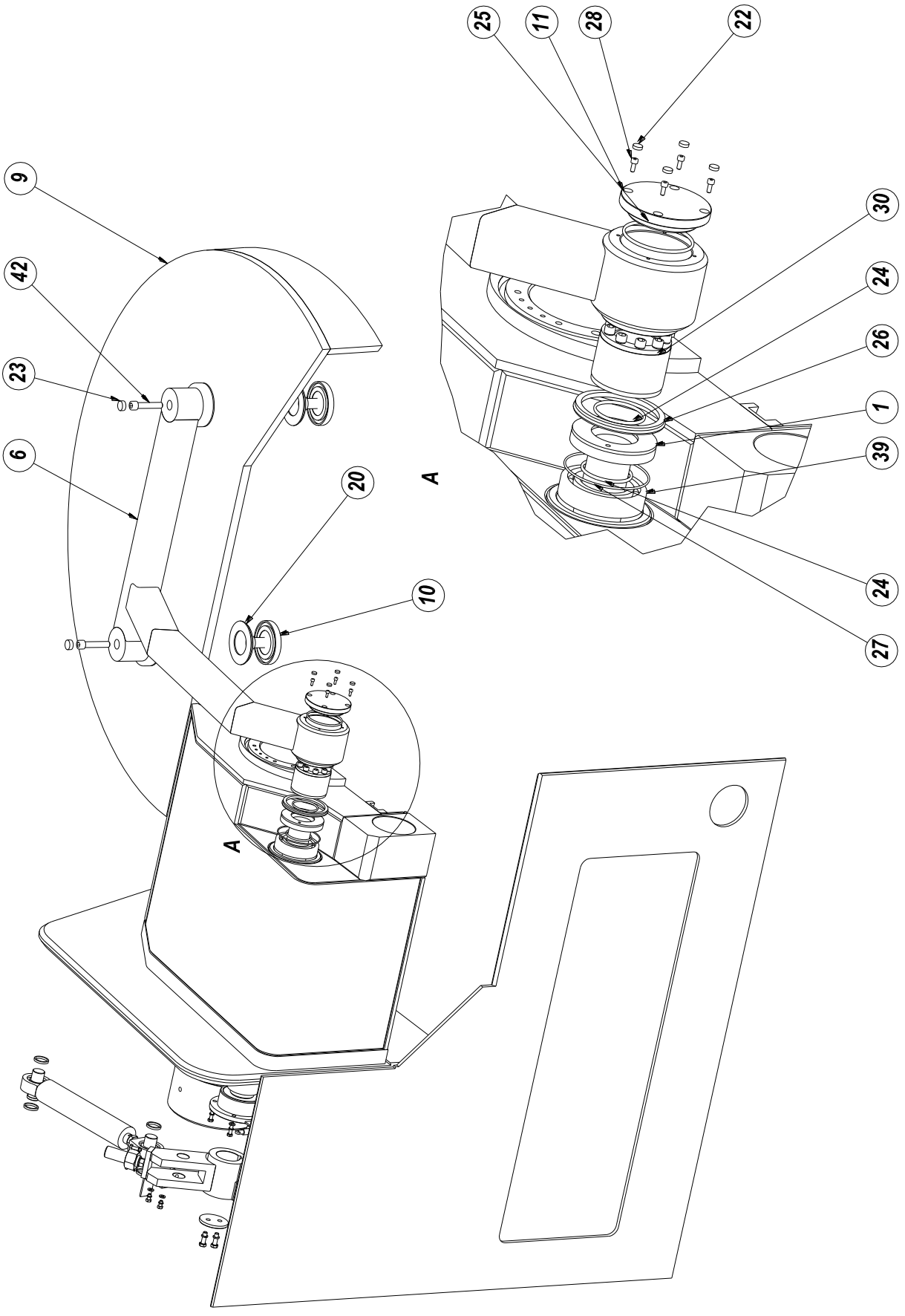
NAZWA RYS.				NR RYS.			
Pokrywa nożowa / KNIVE'S COVER				**N-125 KGA II**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	54389	Nakładka / COVER PLATE	1	29			
2	54393	Płytka / PLATE	1	30			
3	54394	Listwa/ SLAT	1	31			
4	54395	Listwa 1 / SLAT 1	1	32			
5	54396	Półpierścień / SEMI-RING	1	33			
6	54397	Listwa 2 / SLAT 2	1	34			
7	54399	Przysłona / DIAPHRAGM	1	35			
8	550 KGA 10	Zatyczka / STOPPER	1	36			
9	N-125 KGA 14-I/14	Tulejka / SLEEVE	4	37			
10	55627	Zespół czujnika / SET OF SENSOR	1	38			
11	24850	Śruba / SCREW	4	39			
12	Φ 10x2	Zaślepka / STOPPER	1	40			
13	Φ 10x6	Zaślepka / STOPPER	15	41			
14	Φ 30x10	Zaślepka / STOPPER	2	42			
15	Φ 36x5	Zaślepka / STOPPER	2	43			
16	27242	Wkręt / SCREW	5	44			
17	24958	Wkręt / SCREW	11	45			
18	N125 KGA II 1	Blachy pokrywy METAL PLATE COVER	1	46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			

NAZWA RYS.	NR RYS.
Blokada pokrywy nożowej / KNIVES COVERS BLOCKADE	**N-125 KGAB**

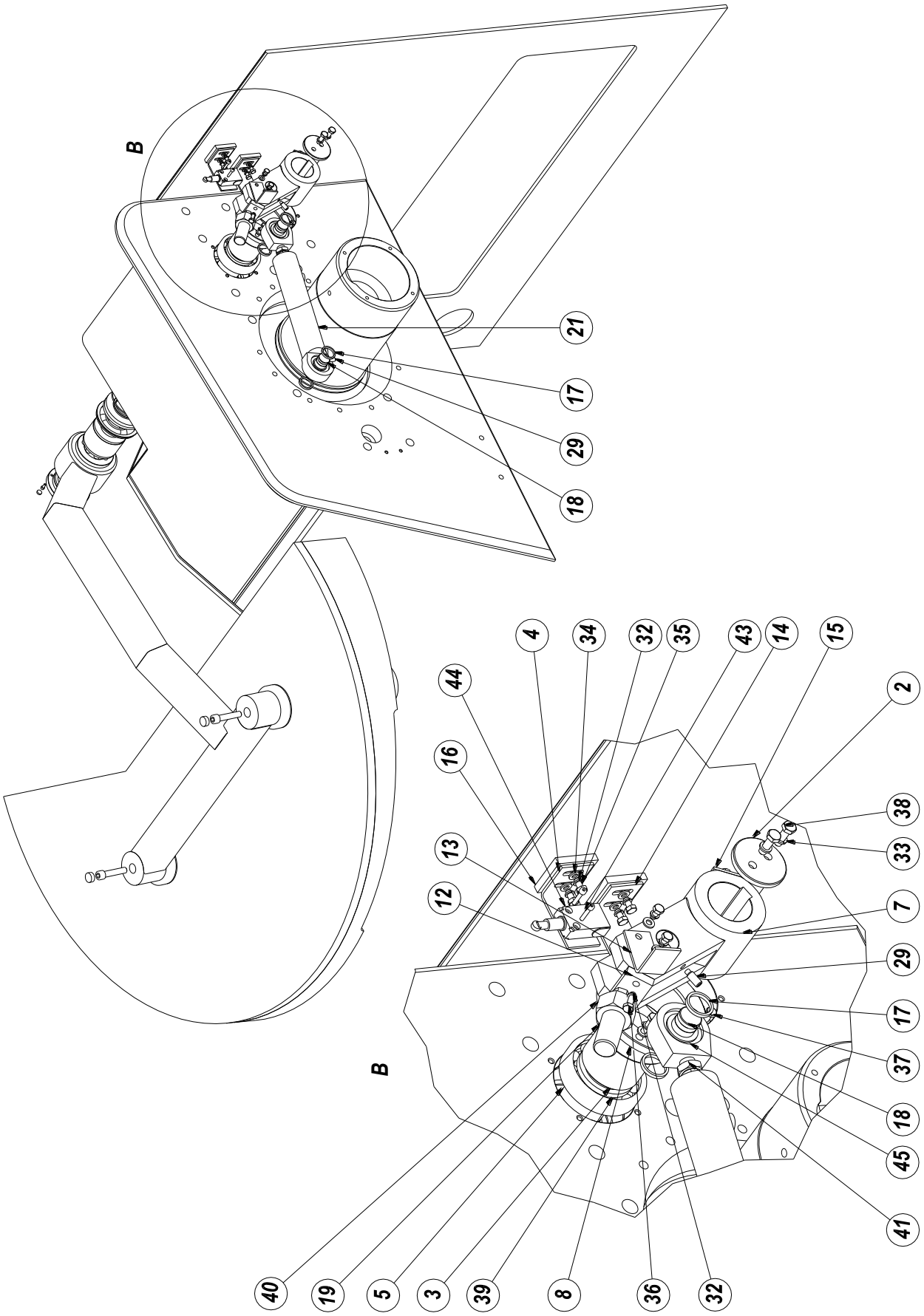


NAZWA RYS.				NR RYS.			
Blokada pokrywy nożowej / KNIVES COVERS BLOCKADE				**N-125 KGAB**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KGAB 32	Blokada / BLOCKADE	1	29			
2	N-125 KGAB 34	Podstawa / BASE	1	30			
3	24928	Kołek walcowy /STUD	1	31			
4	52959	Pierścień uszczelniający O / SEAL RING	1	32			
5	45410	Podkładka / WASHER	3	33			
6	24856	Podkładka sprężysta / SPRING WASHER	3	34			
7	56127	Śruba – A / SCREW	3	35			
8				36			
9				37			
10				38			
11				39			
12				40			
13				41			
14				42			
15				43			
16				44			
17				45			
18				46			
19				47			
20				48			
21				49			
22				50			
23				51			
24				52			
25				53			
26				54			
27				55			
28				56			

NAZWA RYS.	NR RYS.
Pokrywa przednia / FRONT COVER	**N-125 KGC c/17**

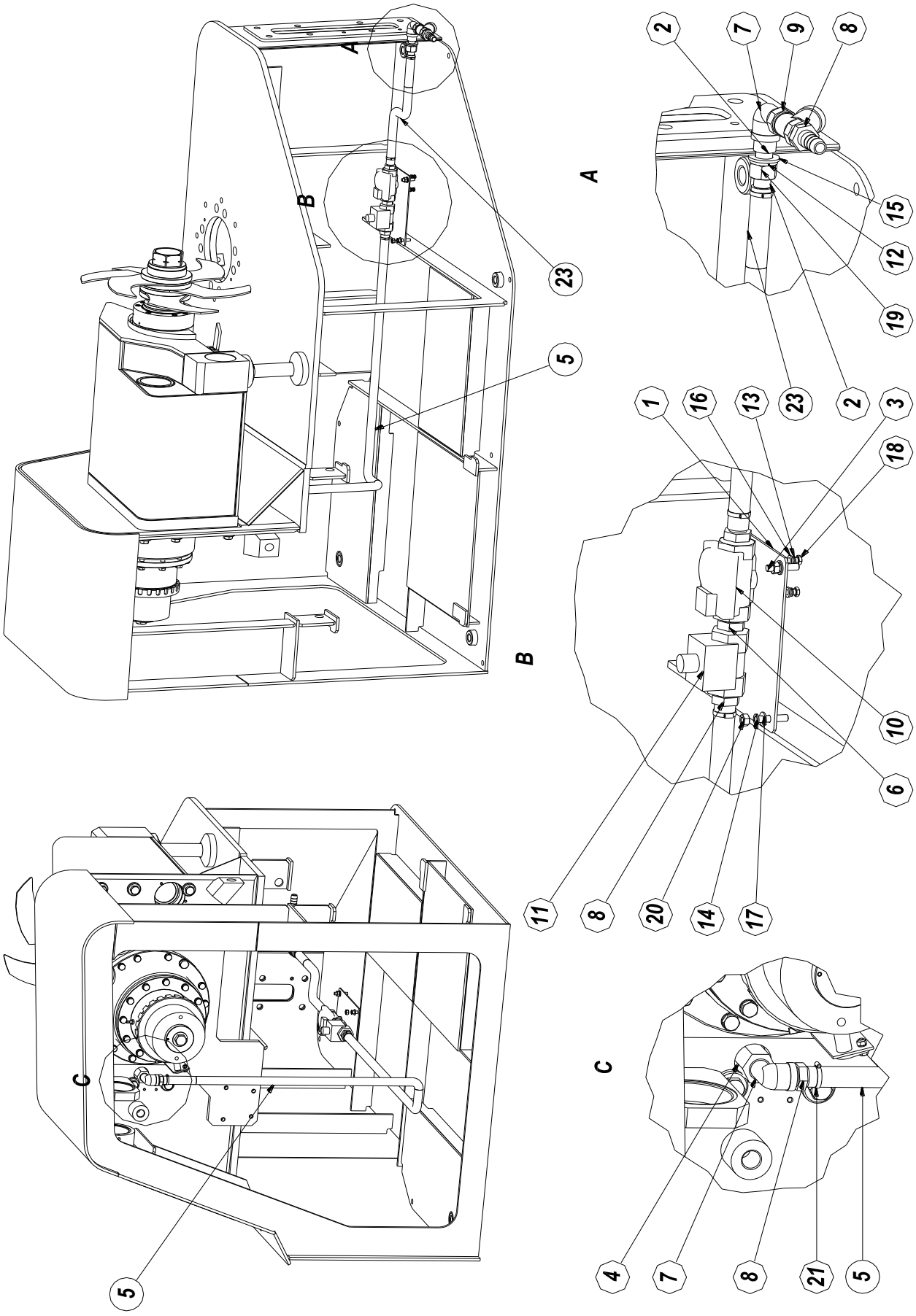


NAZWA RYS.	NR RYS.
Pokrywa przednia / FRONT COVER	**N-125 KGC c/17**



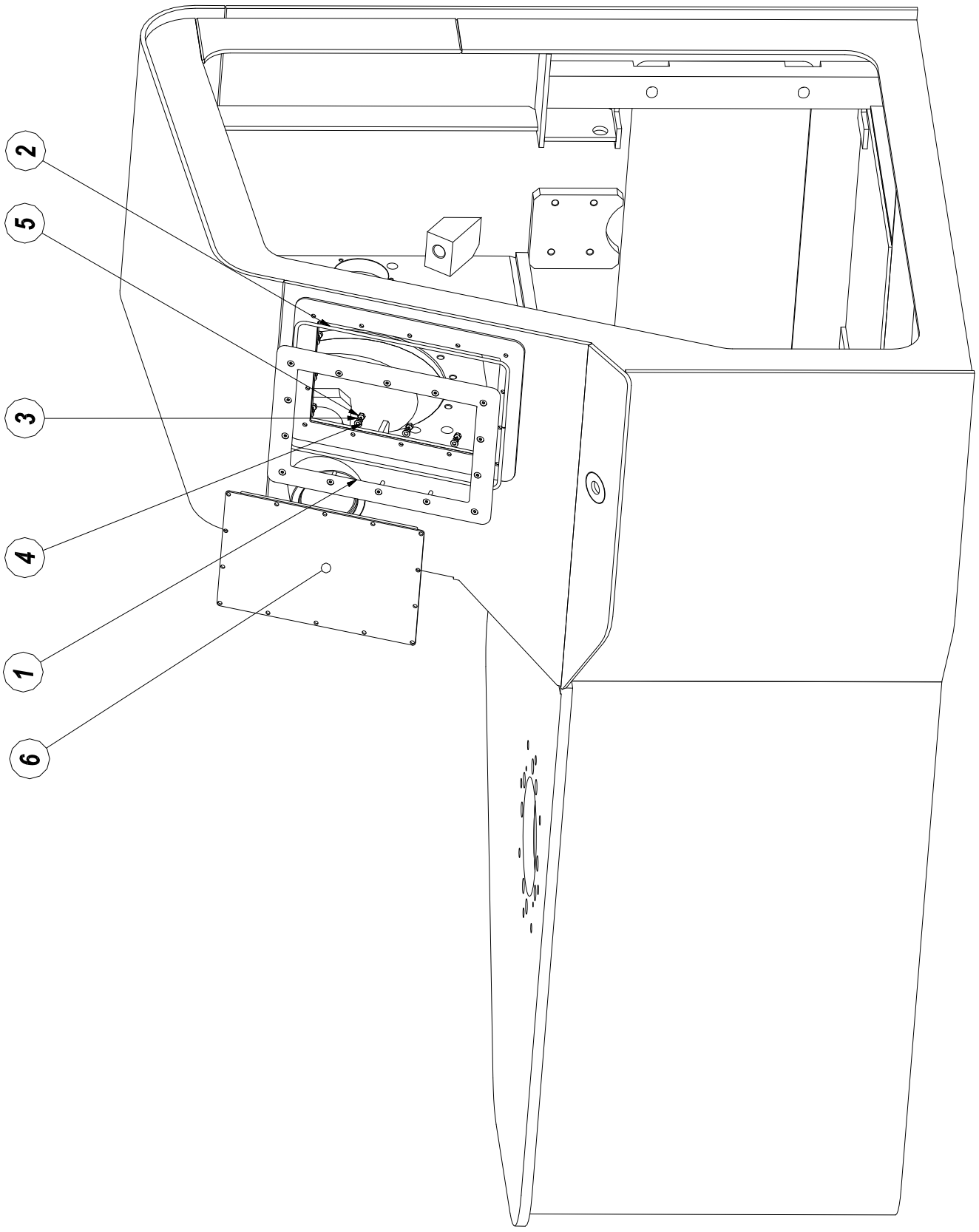
NAZWA RYS.				NR RYS.			
Pokrywa przednia / FRONT COVER				**N-125 KGC c/17**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	52745	Tuleja mocująca / SLEEVE	1	29	30064	Wkręt dociskowy / PRESSURE SCREW	2
2	52747	Krążek / DISK	1	30	55171	Pierścień rozprężno-zaciskowy	1
3	52748	Tuleja / SLEEVE	1	31	24874	Wpust pryzmatyczny / PRISMATIC INLET	1
4	N-125 KGAA 09a/17	Blacha / METAL PLATE	1	32	24835	Podkładka sprężysta / SPRING WASHER	14
5	52756	Wał pokrywy przedniej / SHAFT OF FRONT COVER	1	33	24834	Podkładka sprężysta / SPRING WASHER	2
6	52757	Rama / FRAME	1	34	24819	Podkładka / WASHER	12
7	52763	Dźwignia / LEVER	1	35	45510	Śruba / SCREW	8
8	54380	Tuleja dociskowa / SLEEVE	1	36	29276	Śruba / SCREW	2
9	52541	Pokrywa plexi / PLEXI COVER	1	37	24840	Śruba / SCREW	4
10	52676	Tarcza / SHIELD	2	38	24791	Śruba / SCREW	2
11	52768	Pokrywka / COVER	1	39	25050	Łożysko kulkowe / BALL BEARING	2
12	52769	Blacha / METAL PLATE	1	40	25835	Nakrętka / NUT	1
13	52770	Blacha / METAL PLATE	1	41	24994	Nakrętka / NUT	1
14	N-125 KGC 12a/17	Blacha / METAL PLATE	1	42	24899	Śruba / SCREW	2
15	N-125 KGC 13a/17	Blacha / METAL PLATE	1	43	56653	Śruba / SCREW	4
16	55621	Blacha / METAL PLATE	2	44	33218	Wyłącznik krańcowy / SWITCH-OFF END	2
17	47631	Pierścień / RING	4	45	200 KGC 51	Ucho / LUG	1
18	47933	Sworzeń / PIN	2	46			
19	47485	Śruba zderzakowa / BUFFER SCREW	1	47			
20	30534	Uszczelka / GASKET	4	48			
21	41883	Cylinder hydrauliczny / HYDRAULIC CYLINDER	1	49			
22	Φ 10x3	Zaślepka / STIOPPER	4	50			
23	Φ 20x8	Zaślepka / STOPPER	2	51			
24	25391	Pierścień uszczelniający O / SEAL RING	2	52			
25	52959	Pierścień uszczelniający O / SEAL RING	1	53			
26	25566	Pierścień uszczelniający V/ SEAL RING	1	54			
27	52476	Pierścień uszczelniający O / SEAL RING	1	55			
28	27481	Śruba / SCREW	4	56			

NAZWA RYS.	NR RYS.
Instalacja wodna (opcja) / WATER SYSTEM - OPTION	**N-125 KJ**



NAZWA RYS.				NR RYS.			
Instalacja wodna (opcja) / WATER SYSTEM - OPTION				**N-125 KJ**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KJ 01	Blacha / METAL PLATE	1	26			
2	57194	Przyłącze / TERMINAL	1	27			
3	N-125 KJ 04	Szpilka M8 / PIN	2	28			
4	57193	Króciec / STUB PIPE	1	29			
5	24029	Wąż techniczny zbrojony włóknem / HOSE	1	30			
6	40867	Nypel	1	31			
7	45904	Kolano nyplowe /	2	32			
8	42432	Króciec / STUB PIPE	4	33			
9	24736	Filtr siatkowy skośny / NET FILTER	1	34			
10	39137	Zawór / VALVE	1	35			
11	39194	Przepływomierz /FLOWMETER	1	36			
12	24821	Podkładka sprężysta / SPRING WASHER	1	37			
13	24835	Podkładka sprężysta / SPRING WASHER	2	38			
14	24834	Podkładka sprężysta / SPRING WASHER	2	39			
15	25833	Podkładka / WASHER	1	40			
16	24819	Podkładka / WASHER	2	41			
17	24820	Podkładka / WASHER	2	42			
18	25856	Śruba / SCREW	2	43			
19	24996	Nakrętka / NUT	1	44			
20	25017	Nakrętka / NUT	2	45			
21	24116	Opaska / BAND	4	46			
22				47			
23	24029	Wąż techniczny zbrojony włóknem / HOSE	1	48			
24				49			
25				50			

NAZWA RYS.	NR RYS.
Pulpit sterowniczy / CONTROL PANEL	**N-125 KPSt/17**



NAZWA RYS.				NR RYS.			
Pulpit sterowniczy / CONTROL PANEL				**N-125 KPSt/17**			
POZ.	INDEX	NAZWA	ILOŚĆ	POZ.	INDEX	NAZWA	ILOŚĆ
1	N-125 KPSt 101a/14	Płyta sterownika kpl / PLATE OF CONTROLLER	1	26			
2	29903	Sznur z gumy porowatej / LINE	1	27			
3	24835	Podkładka sprężysta / SPRING WASHER	14	28			
4	24819	Podkładka / WASHER	14	29			
5	25016	Nakrętka / NUT	14	30			
6	36504	Panel operatorski / CONTROL PANEL	1	31			
7				32			
8				33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			