RIVETEC
TITGEMEYER Group

RIVETING UNIT TIOS H450 TIOS H40

OPERATING MANUAL

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1. INTRODUCTION

We present you an operating manual, in which the data and instructions for unit commissioning are stated, as well as the instructions for its operation and maintenance. This documentation is designed for all employees, who come into contact with the unit. It is necessary to pay proper attention to the entire contents because possible lack of knowledge of operation and maintenance may lead to unit failures.

All data stated in this manual and in the documentation handed over together with the unit is the intellectual property of the manufacturer and may be used only for purposes of unit operation. Their abuse for other purposes creates liability according to legal regulations.

The operator is obliged to thoroughly familiarise himself with this operating manual and adhere to the requirements for operation and maintenance.

Unit type: **Riveting unit TIOS H450**

Riveting head type: **TIOS H40**

Riveting head production number:

Drive unit type:

Drive unit production number:

Production year:

Manufacturer's address:

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Further information:

Warning safety symbol:

This warning safety symbol informs about important safety communications in this operating manual. Whenever you see this symbol, read the following communication and information carefully. Inform other operators.

2. UNIT USE

2.1 Regular Scope and Manner of Use

The riveting unit is designed for riveting of ripping rivets, both single-side and multi-part (SRB), namely up to the max. stud dimension – diameter 8 mm and the max. force needed for breaking 39,4 kN. The unit is designed for use in production halls with a temperature range of 15 to 28 °C. The unit allows for checking and evaluating the riveting process. The unit can be operated connected with another unit using a connector HARTING or can be operated separately.

When using the riveting unit without connection with an external control unit, it is necessary to use the additional unit for controlling the riveting operation (see Chap. 10.3 Optional Accessories) or turn off the function of the riveting operation control.
This may only be performed by a qualified person – authorised service.

2.2 Expected Operation Level

Work with the unit may only be performed by persons meeting the legally determined age and health competence. Only demonstrably trained, informed, and operator authorised persons may work with the unit. Upon agreement, the manufacturer may perform training of the persons. The operator must clearly determine the scope of work for persons performing the operation, preparation works, maintenance, and repairs.

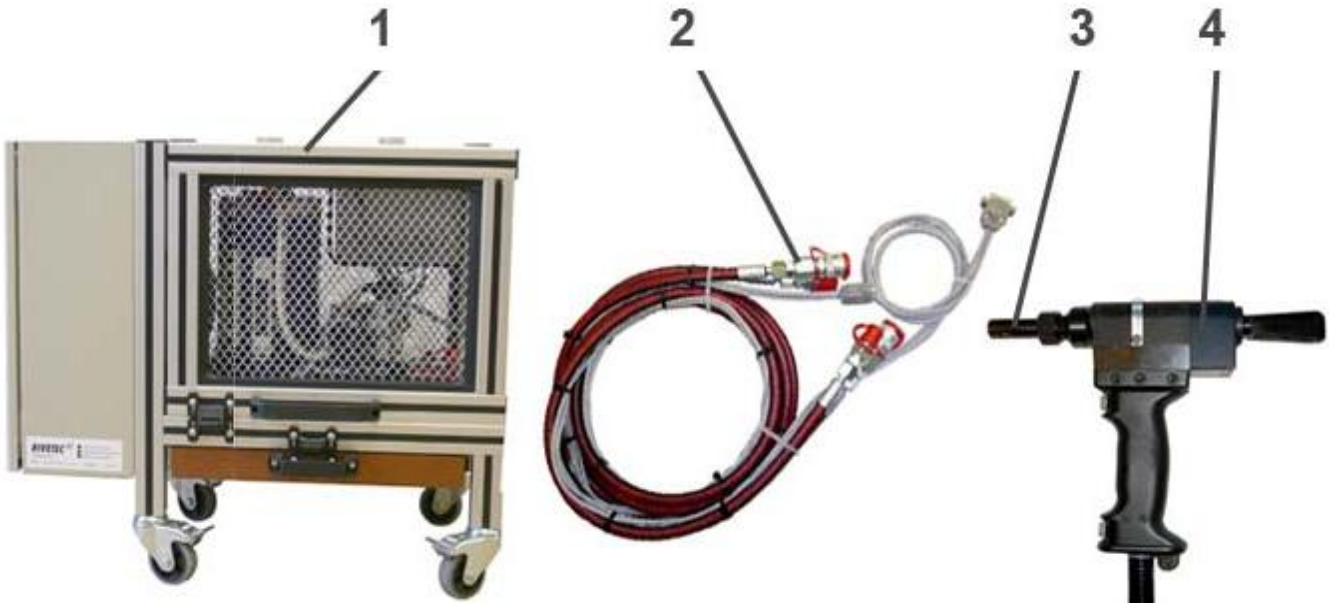
Maintenance works and repairs of the unit may be performed only be employees, who meet:

- Expert education with experience in the field
- Perfect knowledge of all safety regulations related to the performance of the requested work

3. TECHNICAL CHARACTERISTICS

3.1 Description

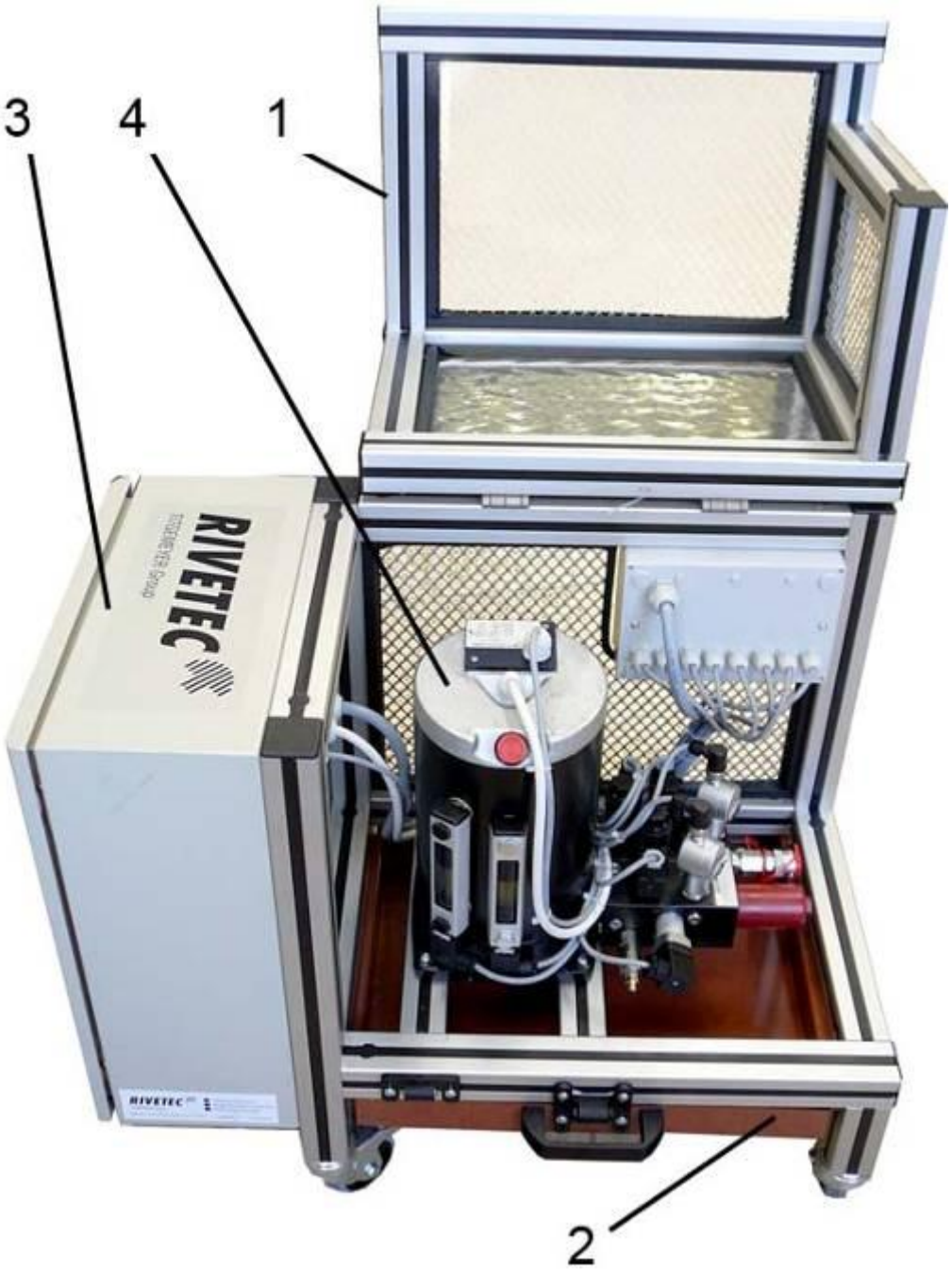
1 drive unit
2 connecting hoses
3 nose assembly
4 riveting head



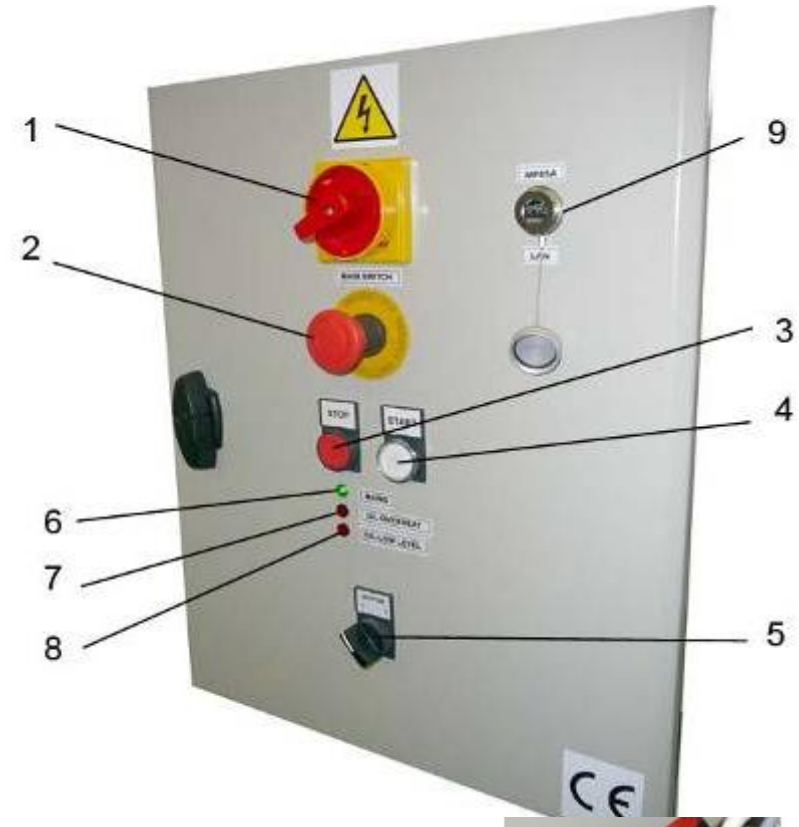
The nose assembly that is fastened to the riveting head, they must correspond to the rivet to be riveted. The connecting hose serves for connecting the riveting head with the drive unit and at the same time allow for increasing the action radius of the operator. The drive unit serves as a source of pressure oil for riveting head drive and at the same time it secures control, checking, and evaluation of the entire riveting process.

3.1.1 Drive Unit Description

1 base frame
2 catch bath
3 electric switchboard
4 hydraulic aggregate



3.1.1.1 Electric Switchboard Description



1 main switch

2 central STOP

3 aggregate stop

4 aggregate start

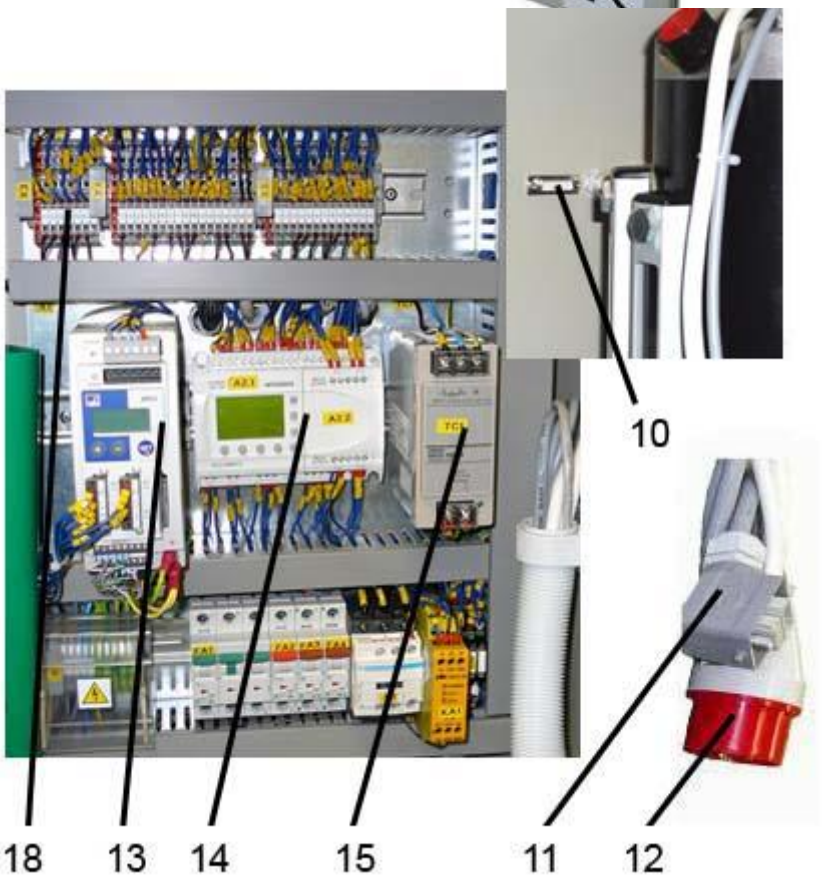
5 button switch – serves for activation of the corresponding button at the riveting head

6 power control light

7 oil overheating control lamp

8 low oil level and filter fouling control lamp

9 LAN



10 riveting head connecting connector

11 cable with a connector HARTING for connecting an external SPS – allows for connecting with the control system of another unit and signal exchange

12 cable with the power socket

13 amplifying and evaluation unit MP85 - checks and evaluates the riveting process and at the same time allows for storing the results and their transfer into the PC

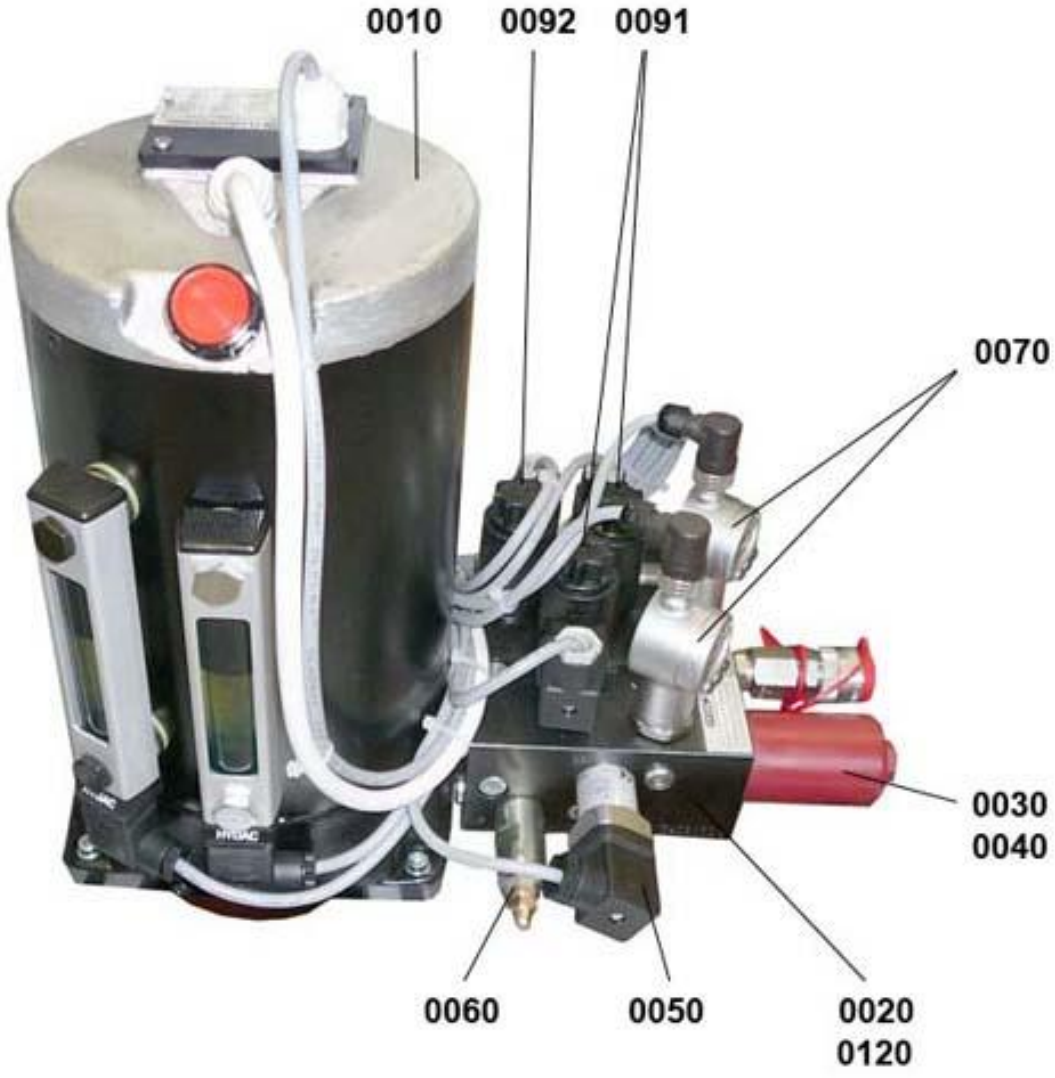
14 control programmable unit - controls the entire process of riveting,

15 supply unit 24 V

18 base terminal board

3.1.1.2 Hydraulic Aggregate Description

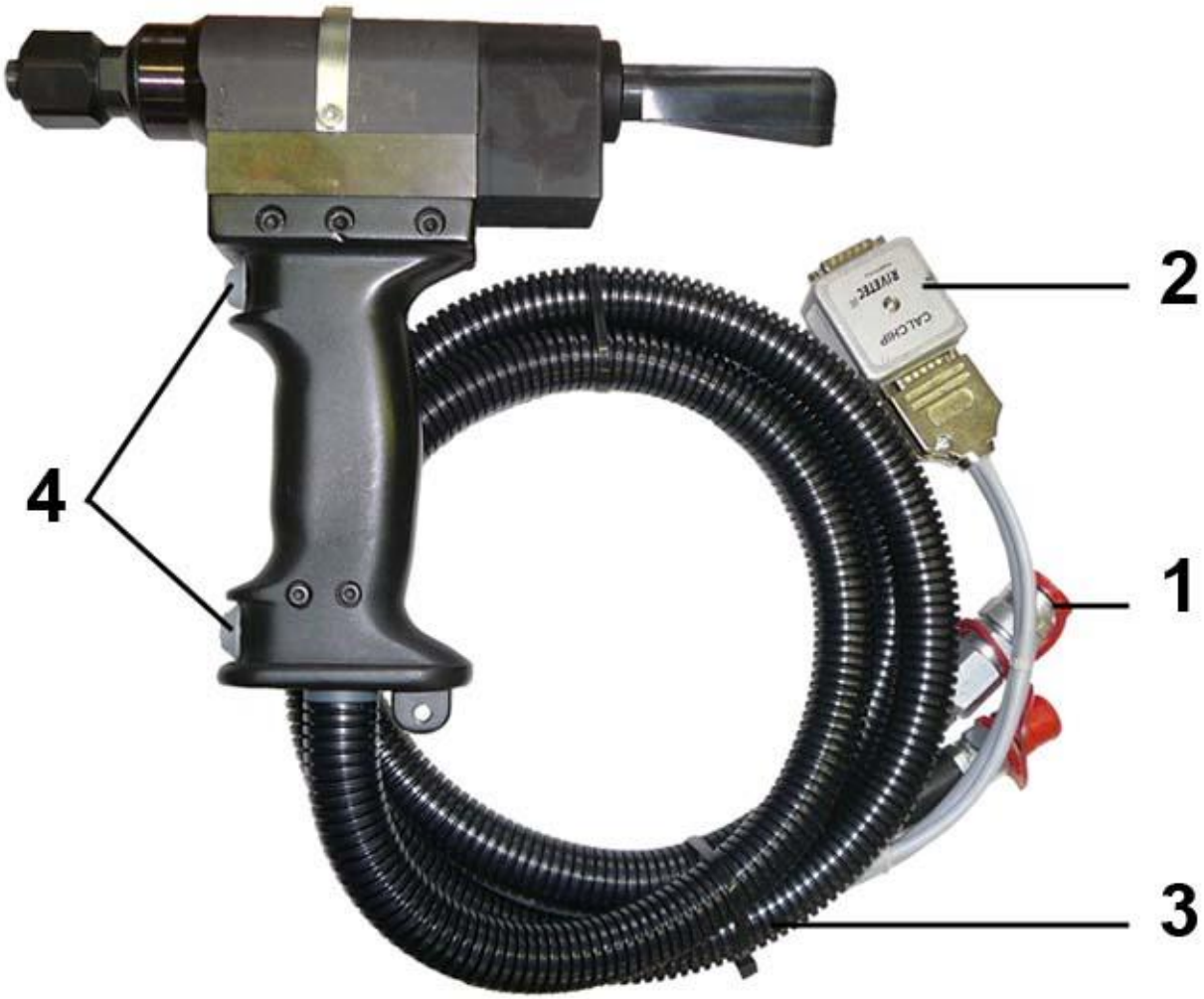
(0010) A compact unit consisting of an electromotor submersed in oil that drives the self-intake valves controlled by a radial piston pump with three pistons located in the aggregate base. The oil tank surrounds the motor and the pump – at its upper side, there is a motor terminal board and the venting filter. At the tank side, there are two level gauges with switches that show the oil level and signal the minimum.
At the base side, there is a control block fastened (0020), comprising of the following elements: filter (0030) wither filtering insert (0040) and electric signalling of clogging (0050) for securing oil filtering, securing valve (0060), using which the max. value of operating pressure is set. The switchboard (0091,0092) is a three-position four-way one – for controlling the oil flow direction with a relieving function in the middle position. Electronic pressure switches (0070) placed at the outlets have the task of signalling the pressure course.



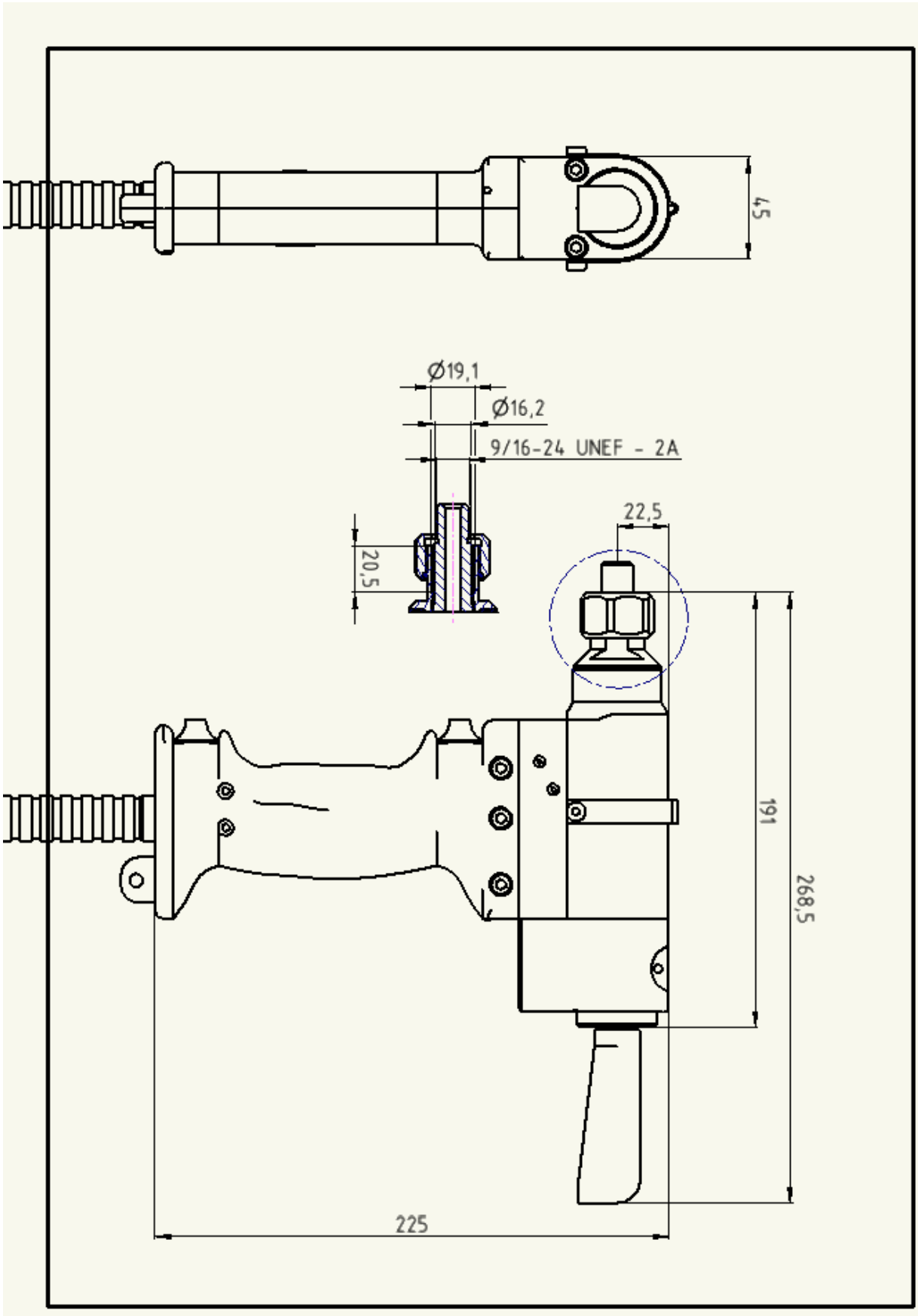
The aggregates may only be operated in a short-term operation S2 or an interrupted operation S3 (according to VDE 0530). They are not suitable for permanent loading with the working pressure. Overheating may cause motor burning or plastic part melting. Besides that, there is also the danger of injury! The aggregate contains thermal protection of the motor.

3.1.2 Riveting Head Description

The riveting head is a hand instrument, whose piston is driven in both directions by hydraulic oil. The riveting head is connected with the pressure oil source by hydraulic hoses (3) ended with quick couplers (1). The riveting head is equipped with force and distance sensors for evaluating the course of the riveting process. A part of the riveting head is the setting chip (2) that serves for storing the setting parameters and their use for connection to the amplifying and evaluating module. The riveting head is equipped with two starting buttons (4), which allows the operator to hold the head ergonomically in all positions. The riveting head may be suspended on a balancer. The head is standard equipped with a rubber extension for catching torn off studs, it is also possible to equip it with different unit for discharge and catching of torn off studs, see Optional accessories.



To the riveting head, it is possible to mount various types of nose assemblies for various types of rivets. The limiting factor when choosing is the opening diameter in the hydraulic piston of the riveting head, the dimension of the connecting threads and openings, and the force needed for rivet tearing off. In case of any doubt, it is necessary to address the authorised service or the manufacturer.


45
Ø19,1
Ø16,2
9/16-24 UNEF - 2A
22,5
20,5
191
268,5
225

3.1.3 Connecting Hose Description

The connecting hoses are designed as a complete set. They are fitted at both ends with hydraulic quick couplers and the set contains also an electric cable fitted from both sides with connectors. The connecting hoses have a length of 2.5 m. Other lengths are possible upon agreement with the manufacturer.

3.1.4 Nose Assembly Description

The nose assembly consists of at least the following parts: jaws (1), clamping head (2), front nozzle (3). There may be more parts – depending on the rivet type to be used with the nose assembly and the nose assembly manufacturer.

3.2 Technical Parameters

PARAMETER	UNIT	VALUE
Working fluid	Mineral hydraulic oil of class VG 32 according to ISO TC 28/SC4 (DIN 51524) with viscosity 32 mm^2/s at 40 °C	
Tank volume	dm^3	4
Working fluid purity according to	ISO 4406 NAS 1638	18/16/13 7
Max. securing pressure	MPa	45
Pump flow rate	l/min	1,0
Working fluid temperature range	°C	40÷55
Motor output	kW	1,6
Connecting voltage	V/Hz A	3x400/50 16
Control voltage	V	24
Pulling force of the riveting head	kN	39,4
Riveting head piston stroke (max.)	mm	30
Riveting head weight	kg	2.5
Drive unit weight	kg	85
Drive unit dimensions	mm	780x400x660

4. WORK SAFETY AND HYGIENE

4.1 Introduction

These safety instructions were prepared in accordance with the governmental directives:

No. 24/2003 Coll. (Technical requirements for machinery)

No. 17/2003 Coll. (Technical requirements for electric low voltage unit)

No. 18/2003 Coll. (Technical requirements for products from the standpoint of their electromagnetic compatibility)

4.2 Definitions of Terms

Machine user (machine operator)	- It is a physical or legal entity responsible for the machine operation and its technical condition, adherence to the work safety standards and corresponding national standards for machine operation.
Responsible person	- It is a person authorised by the user to check the machine operation and its technical condition, adherence to work safety standards and corresponding national standards for machine operation.
Maintenance	- A person or persons, whose task is transport, installation, repairs, and maintenance or cleaning of the machine.
Adjuster	- A person or persons, whose task is machine or tool adjustment.
Operator	- A person or persons, whose task is regular operation of the machine.
Dangerous space	- Any space inside or outside the machine, in which the person is exposed to danger, injury or health harm.
Dangerous points	- These are points on the machine with danger of injury or health harm.
Unit repair	- This means a product repair with a minor or even significant wear, where the nature of the repair does not change the original parameters and safety of the unit.

4.3 Other Safety Statements

- All defects and failures that occurred must be reported to the shift leader and recorded into the Operating book of the unit including the manner of repair securing.
- Machine user is obliged to train the employees for operation, adjustment, and maintenance of the unit, he is obliged to periodically train and check. He must record every instruction into the journal with signatures of interested persons.
- Operation and maintenance must be performed according to the manufacturer's regulations.
- The space, in which the unit is installed, must be equipped with anti-fire unit and the operator must be perfectly familiar with it. It is necessary to adhere to the safety regulations for flammable and oil substances valid for the country, where the unit is operated.

4.4 Conditions for Unit Use

4.4.1 Technical Condition

- The unit may only be used in a perfect technical condition.
- The operator is obliged to continuously ascertain this condition.
- The found failures, especially such that can adversely affect safety, must be removed immediately.
- Protective devices must be always functional and in a perfect technical condition – see chapter □ Protective devices)
- Protective Devices
  - Securing valve as protection against overload
  - Current securing of the electromotor
  - Central STOP

4.5 Organisation Measures

4.5.1 Obligations of the Machine Operator

- The operator of the unit must prepare an Unit Record with the dates of checks, the list of checked unit parts, and the list of persons to perform the checks are determined, with regard to the operating manual.
- The operator of the unit must maintain the unit in a perfect condition and order at the workplace.
- Works on the unit may be allowed by the operator to be performed only by competent persons, who were properly trained and instructed.
- The operator must adhere to the legally determined minimum age of the operator, maintenance, and adjusters.
- The operator of the unit must secure expert checking (review) of the production unit, especially its safety devices, namely:
- Before commissioning into regular operation
- At least once a year - after changes or repairs

4.5.2 Adherence to Regulations

The operator of the unit must take care about adherence to the corresponding safety regulations in order to secure safety of persons, who have the task of operating, maintaining, and repairing. The operator must check the persons coming into contact with the unit for adherence with safety regulations.

4.5.3 Personal Protective Unit, Tools

If a regulation or necessity requires, the employees must use personal protective unit and tools. The operator must check this adherence to regulations.

4.5.4 Failures

Should failures occur in the unit that would endanger the safety of operation or if there is doubt about the perfect condition of the unit during operation, it is necessary to stop the unit immediately and remove the failure. The failures must be removed only by trained and authorised employees by the unit operator.

4.5.5 Machine Modifications

Without the supplier's consent, no modifications of the design nature that would affect safety worsening may be performed on the unit. This measure applies also for welding works on bearing parts.

4.5.6 Spare Parts

It is necessary to use only such spare parts that meet the determined requirements of the manufacturer. Inexpertly performed repairs as well as use of incorrect spare parts results in voiding the product warranty. Use of an incorrect spare part is considered to be an intervention into the machine structure. The manufacturer therefore does not accept liability for such modified structure.

4.5.7 During Long-Term Unit Shutdown:

- Turn off the control voltage.
- Turn off the main voltage supply.

4.6 Instructions for Safety during Unit Operation

4.6.1 Obligations of the Operator during Regular Operation

The operator must observe the operating conditions. Adhere to all safety regulations and standards. Familiarise with the operating manual.
Before every commencing of work with the unit, make sure and continuously check, that no unauthorised person is present near dangerous points. During failures of function of the unit, immediately stop and prevent its starting, until the failure is removed. During work with the unit, use protective tools, e.g. protective gloves, hearing protectors, possibly other PE with regard to the performed operation.

4.6.2 Regular Operation of the Unit

- Avoid all manners of work that are in conflict with safe operation.
- Report changes during operation immediately to corresponding persons, possibly immediately stop and secure the unit.
- Start the unit only after removing the failure cause.

4.6.3 Preparation, Adjustment

- Perform preparation works and function verification only by a qualified person only in the ADJUSTMENT mode.
- During preparation and adjustment, take increased care because the interlocking and protective devices securing protection of the unit and the operator are inactive in the ADJUSTMENT mode.

4.7 Warning about Extraordinary Types of Danger

4.7.1 Electricity

The description is in this entire operating manual.

4.7.2 Dangerous Points

Dangerous points are the places, where upon non-adherence to the safety regulations, damage of the property or danger to personal health may occur.

Dangerous points are especially:
- Moving parts of the unit
- The working space of the unit
- Moving supplies
- Hose connections

Other dangerous places may arise according to the type of the operated technology at the unit. These dangers must be stated in the manual supplied by the technology operator.

4.7.3 Danger during Handling of Fire

- The working fluid – hydraulic oil is a flammable liquid with the flashpoint of about 200 °C.
- Works on the unit, such as welding, burning or grinding, may only be performed by an authorised person.

4.7.4 Noise

It is necessary to use the prescribed protective tools against noise.

4.8 Safety during Maintenance

- Screw connections, flanges or valves may be tightened only when the pipelines are not pressurised.
- Repairs and failures must not be removed at the unit under voltage and under oil pressure. It is necessary to turn off the unit and depressurise hydraulic circuits.
- During all maintenance or repair works, adhere to valid regulations for environmental protection.

4.9 Banned Activities

To perform any repairs under voltage and pressure of oil.

To remove and disable the safety devices and devices for signalling of failures and interlocking the machine operation or disconnect them electrically.

To operate the unit by persons younger than permitted by legal regulations for operation of this unit in the operator's country. The record of their training must be in writing.

To fill the unit with other than recommended operating substances with worse than prescribed purity.

To perform any welding works on the drive tank and the hydraulic pipeline.

To perform any repairs on the unit with non-depressurised hydraulic circuits and under voltage.

To handle open fire near hydraulic unit.

It is forbidden to perform any such design modifications and interventions that have not been recommended and approved by the unit manufacturer. The same applies to replacement of spare parts for another type or kind.

To perform any repairs without the supervision of a trained maintenance employee and consent of the responsible manager.

Only a person trained for this activity may remove failures on the electrical installation and electrical unit.

4.10 Environmental Protection

- During all works on the unit, it is necessary to adhere to the valid regulations about environmental protection.
- During the replacement of hydraulic oil and filtering elements, it is necessary to adhere to the regulations concerning their disposal with regard to local conditions.
- During disposal of waste, it is necessary to consider the possible health risks and compatibility with the environment.
- Upon a hydraulic oil leak, it is necessary to stop the operation immediately and proceed in accordance with the regulations for removal of effects of the emergency with oil products. New starting and performance of the instructions for operation are to be implemented only after removing the emergency causes!

4.11 Documentation

- The accompanying documentation complies in its design with corresponding standards and regulations valid at the time of the commissioning.
- The documentation contains all documents for operation and maintenance of the unit.
- The operator must ensure that there is at least one printout of the documentation accessible to the group of employees securing operation, adjustment, and maintenance of the machine.

Every person that is authorised to perform an activity on the machine is obliged to familiarise itself with the contents of the technical documentation (the operating manual) before commencing work.

4.12 Warranty

The manufacturer guarantees for supply defects according to the conditions agreed in the contract. The warranty period applies according to the contractual provisions. The warranty does not apply to damages caused by inexpert handling of the unit, use of unoriginal spare parts or upon non-adherence to the instructions stated in the operating manual. Non-adherence to safety instructions, especially ignoring forbidden activities prevent the manufacturer's liability.

5. STORAGE AND TRANSPORT

5.1 Storage

The storage premises must be dry and dust-free with low air humidity.

Acid or other chemical vapours must not be present. For storage longer than 6 months, it is necessary to proper conserve using conserving oil.

Store rubber parts in polythene bags and conserve with glycerine. Prevent access of ultraviolet radiation and humidity.

Spare parts (if the products contains them) are packaged according to the belonging to functional subgroups.

Clear arrangement of spare parts and their storage is a prerequisite of well working maintenance.

Lightly coat the riveting head and the nose assembly with conserving oil during long-term storage (e.g. ELFOLNA 46).

5.2 Transport Instructions

The unit is supplied completely assembled. From the manufacturer, it is transported without the working fill – the oil is drained.

5.2.1 Instructions for De-conserving

Conserved parts must be rid of conserving and all pollutants.

All inhibitors of rust, if they were used during transport and storage, must be removed. The inhibitors, if washed out with warm oil, cling and accumulate on the polished areas of the unit (pumps and hydro motors).

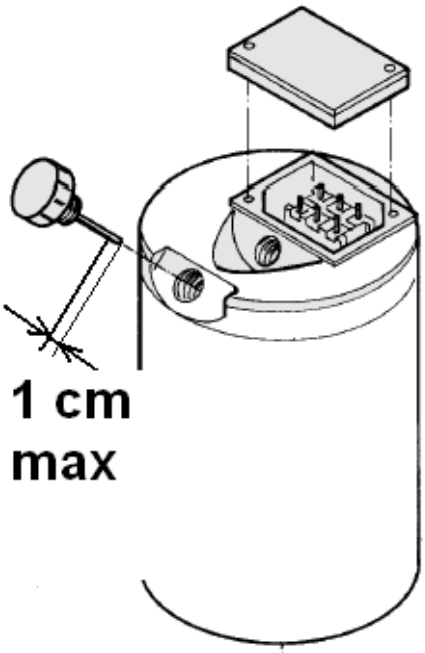
5.2.2 Dimensions and Weights of the Unit

PARAMETER	UNIT	VALUE
Unit weight	kg	90
Max. dimensions - plan - height	mm	780 x 400 660

6. COMMISSIONING

6.1 Installation

- The unit must be unpacked from the transport material and established in place, where it will be operated.
- The hydraulic aggregate must be filled with the operating fluid. Fill with a fluid prescribed by the unit manufacturer, namely in a volume of 4 litres. For filling, use the filling opening located at the top side of the aggregate.
- The maximum of the oil fill may be checked using the checking probe located on the closure – see the figure. The quality and cleanliness of the oil fill must correspond to the requirements of the regulations stated in Chapter Technical Parameters.



6.1.1 Conversion Table for Hydraulic Mineral Oils

Performance class according to ISO-TC 28-SC4, CETOP RP91H HM
according to DIN 51 524 part 2. HLP

VISC. GRADE (ISO)	VG 32	
ADDINOL	HYDRAULIKOL HLP 32	
AGIP	OSO 32	
ARAL	VITAM GF 32	
BENZINA	OH-HM 32	
BP	ENERGOL HLP 32	
CASTROL	HYSPIN AWS 32	
DEA	ASTRON HLP 32	
ELF	ELFOLNA DS 32	
ESSO	NUTO H 32	
FINA	HYDRAN C 32	
FUCHS	RENOLIN B 10 RENOLIN VG 32	
KORAMO	MOGUL HM 32	
MOBIL	DTE 24 HYDR.OIL. LIGHT	
MOL-LUB	**MADIT OH-HM 32**	**SUPPLIED FOR THE UNIT BY THE MANUFACTURER**
OMV	HLP 32, HYD HLP 32	
PARAMO	PARAMOL HM 32	
SHELL	TELLUS OIL 32	
TEXACO	RANDO OIL HDA-32	
TOTAL	AZOLLA ZS 32	
VALVOLINE	ULTRAMAX HLP 32	

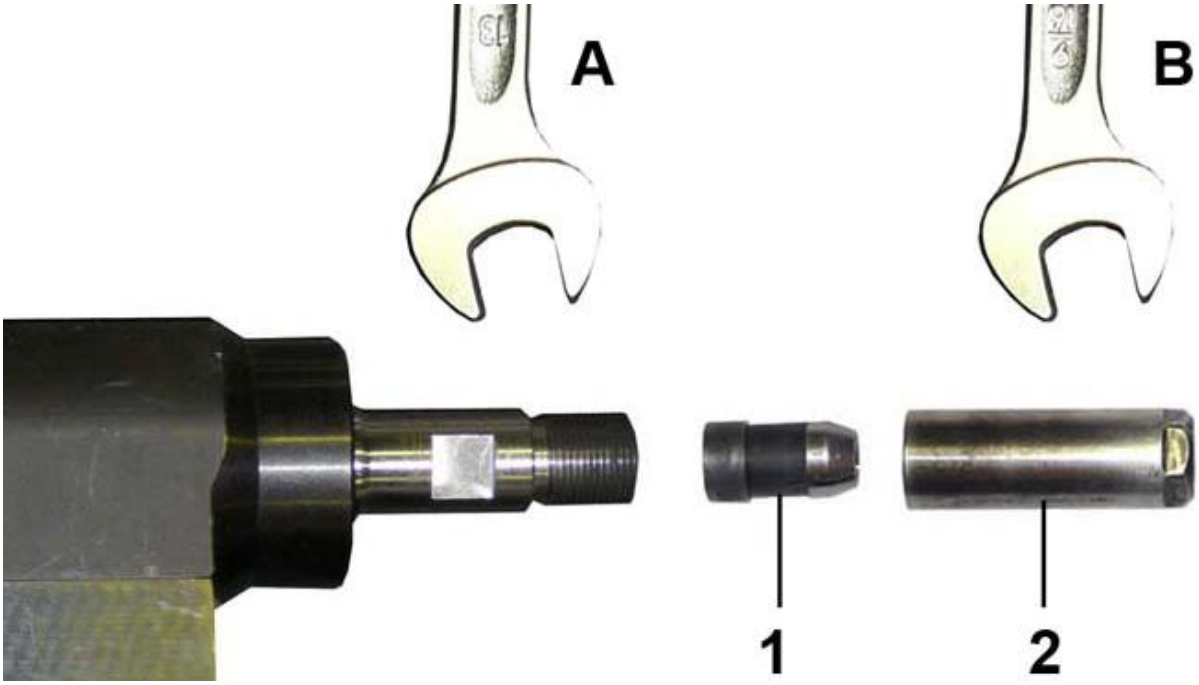
This table is compiled based on the documents and catalogue sheets of oils and does not guarantee the quality or miscibility of oils from individual producers. The use of oils must be consulted with the unit manufacturer.

As standard, oil MADIT OH-HM 32, whose **technical sheet** and **safety sheet** forms an appendix of this manual, is supplied with the unit.

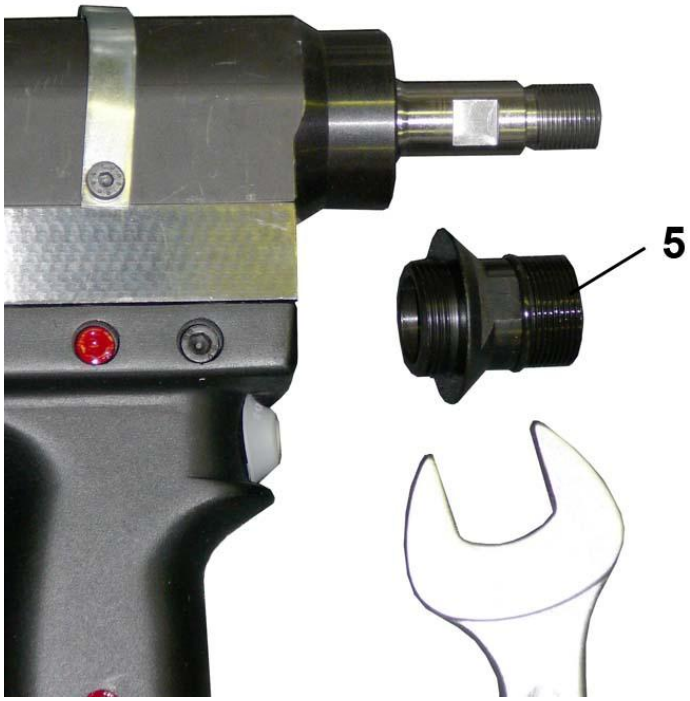
6.2 Assembly

6.2.1 Mount the nose assembly on the riveting head:

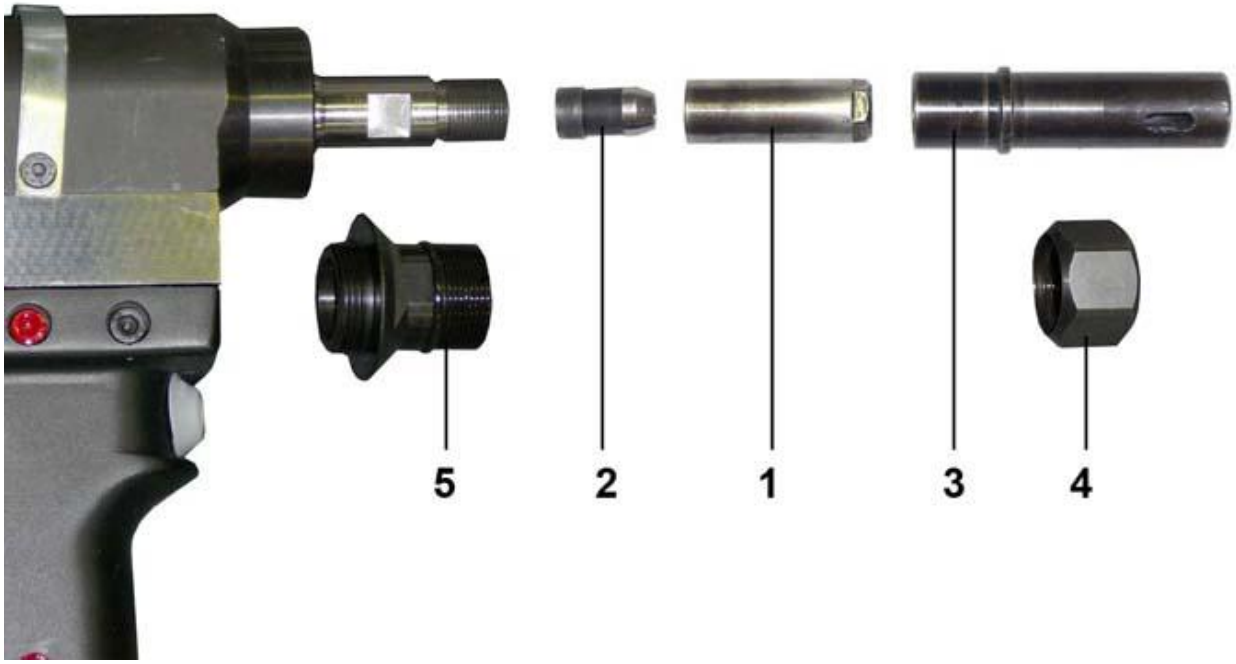
- Into the clamping head (1) insert the jaws (2), then turn the clamping head on the thread of the hydraulic piston. Then secure the clamping head (1) and tighten.
- Use the wrench A – 13 mm for tightening and wrench B – according to the clamping head.
- The tightening torque – 12 Nm.



- Screw the nose assembly on (5) and tighten using wrench 22. Tightening torque 20 Nm.



- Into the nose assembly (5) insert the front nozzle (3) and tighten the sleeve nut (4) at 8 Nm.



6.2.2 Connecting the Riveting Head and the Drive Unit

- Connect the hydraulic quick couplers of the riveting head into the quick couplers of the drive unit, in case of using connecting hoses, connect the quick couplers of the riveting head and the connecting hoses first and then the quick couplers of the hydraulic hoses and the drive unit.
  In the same manner, perform the connection of the connectors (setting chip) of signal transfer, for connecting the connectors, perform their securing.

6.2.3 Connecting an External SPS

- Using the connector, connect with an external SPS.
- For the type of the connector and individual signals see Appendices – “Electric wiring diagram”

6.2.4 Connecting the Unit to the Electricity Source

- The unit is equipped with a 5-pin plug 16A / 400V.
- The supply conductor is 3 m long.

6.3 Unit Starting

- By pulling and turning, unblock the central STOP (3).
- Turn on the main switch (2) – the power control light is lit (1).
- After 10 s, turn on the START button (4).
- Perform the starting button selection using the selector switch (6).

6.4 Adjustment and Setting

6.4.1 Adjustment of the Riveting Head and Entering the Values into the Setting Chip

All actions connected with adjustment of sensing elements on the riveting head and saving their setting data into the setting chip are performed already in the production plant. These actions are subject to internal regulations of the RIVETEC Company and are documented for the customer by the “Test Protocol” that is supplied to the riveting head.
Any adjustment and setting may only be performed by a competent person – authorised service.

6.4.2 Setting the Working Values of the Hydraulic Aggregate

All settings at the hydraulic aggregate are performed in the production plant. The procedure and manner of adjustment corresponds to the procedures of the supplier of the hydraulic unit and the setting values are governed by the internal regulations of the RIVETEC Company so that the required and declared output parameter of the unit are achieved. See Chap. 3.2 Technical Parameters.
Any adjustment and setting may only be performed by a competent person – authorised service.

6.4.3 Program and its Setting in the Control Programmable Unit

The control programmable unit is equipped with a program already in the production plant. The program is built so that the unit allows for using all functions described in Chapter 7. Unit Functions. The program is password protected so that its breach cannot occur. The safety password is stored at the manufacturer. A copy of the original program is stored on a CD and attached to the operating manual as an appendix.
Any program changes and program settings may only be performed by a competent person – authorised service.

6.4.4 Setting the Basic Data in the Program of the Amplifying and Evaluating Unit MP85

In the program of the amplifying and evaluating unit MP85, there are all basic settings already performed in the production plant. The basic settings of the program are performed so that the unit allows for using all functions in Chapter 7. Unit Functions. The program is password protected so that its breach cannot occur. The safety password is stored on a CD together with the program setting. The CD forms an appendix to the operating manual.
Only a competent person should enter the program using the password – a trained employee, authorised service. The basic settings may be changed only upon agreement with the riveting unit manufacturer.

6.4.5 Setting the Evaluating Criterions of the Riveting Process MP85

These are criterion settings, according to which the riveting process is evaluated and finally marked as good or bad. This setting can only be performed based on the knowledge of connected parts, used rivets, and the technological procedure that will be used during the process. This setting must be specified after the performed tests during regular operation. The process values that are decisive for its quality performance, must be determined by the customer (user). These values may be e.g. the value of the force upon rivet stud tearing off and its tolerance, the value of the rivet stud movement length, for which the rivet body deformation takes place, etc.

With regular supply of the unit, the evaluating criterions are not set. It is possible to agree a general preset already in the production plant.
The setting can be performed after connecting the MP85 with a PC. For this action, it is necessary to have the corresponding connecting cable and a control program installed in the PC. The connecting cable and the control program see Chap. 10 Optional Accessories .
The setting of the evaluating criterions may be performed only by a competent person – trained employee, authorised service.
The procedure of setting the evaluating criterions is not the subject of this manual. It requires a separate training and knowledge of the product MP85 by HBM. (Kontakt: www.hbm.com)

6.4.6 Setting the Riveting Process Data Saving

The basic setting during selling from the RIVETEC Company is without data saving. It is possible to preset the data storage already in the production plant upon agreement with the unit manufacturer.
For the possibilities of data storage, see Chap. 7.4 Riveting Process Data Saving.

The setting may be performed after connecting the MP85 with a PC. For this action, it is necessary to have the corresponding connecting cable and the control program installed in the PC. For the connecting cable and the control program see Chap. 10 Optional Accessories.

The data storage setting may only be performed by a competent person – a trained employee, authorised service.

The procedure of data saving setting is not a subject of this manual. It requires a separate training and knowledge of the MP85 product by HBM. Contact: www.hbm.com

7. UNIT FUNCTIONS

The riveting unit TIOS H450 / TIOS H85 is equipped with the following main functions:

7.1 Riveting

The riveting function is described in Chapter 8. Operation and control.

7.2 Riveting Process Evaluation

The riveting process is evaluated based on physical quantities (dependence of force on distance) sensed by sensors located in the riveting head. For the actual evaluation, it is necessary to determine the checking windows, through which the curve sensed during the riveting process must pass.
If the curve passes the correct windows, in the correct direction, and in the correct order, the process is evaluated as good (OK). If the curve does not pass some window or not in the correct direction or order, the process is evaluated as bad (NOK).
By the combination of the amount of check windows, their size and location, it is possible to check during the process and evaluate more facts. E.g. the rivet quality – whether it corresponds to the etalon, presence of riveted materials, adherence to basic dimensions of riveted materials and the opening for the rivet, etc.

Process evaluation – visualisation using a diode at the riveting head:

red NOK

green OK

7.3 Riveting Operation Control

The riveting unit is ready for connection to an external control unit. After connecting, signal exchange is made possible, which will secure control of the riveting process. Individual inputs and outputs are described in Appendix 15.2 Electric Wiring Diagram.
The actual connection is prepared using a connector HARTING – the type is described in the electric wiring diagram.

OUTPUTS – FROM THE INTERNAL SPS INTO THE EXTERNAL SPS	
KRB switched on	Signal is active, when KRB safety relay is switched on
NOK signal	Signal is active, when evaluation result is NOK. This signal is switched on for 300ms.
OK signal	Signal is active, when evaluation result is OK. This signal is switched on for 300ms.
Oil temperature - overheating	Signal referencing the oil temperature. This signal is on when oil temperature exceeds allowed value.
Oil level / filter	Signal referencing the oil level and oil filter conditions. This signal is on when some of these situations happens: - oil level is below value 1 - oil level is below value 2 - oil filter is needed to be exchanged
Emergency STOP	Contacts of this signal are used to be connected to safety circuit of upper control system.
INPUTS – FROM THE EXTERNAL SPS INTO THE INTERNAL SPS	
Emergency STOP	Contacts of this signal are used to connect the safety circuit of upper control system to safety circuit of KRB.
ON - KRBH	Signal is used to switch on the safety circuit of KRB.
ZERO - KRBH	Signal for setting a zero of sensors
Riveting enabled	Riveting is enabled only when contacts of this signal are in short circuit. This signal allows upper control system to disable riveting after NOK and so.

When using the riveting unit without connection with an external control unit, it is necessary to use the additional unit for controlling the riveting operation (see Chap. 10 Optional Accessories) or turn off the function of the riveting operation control.
This may only be performed by a qualified person – authorised service.

7.4 Riveting Process Data Saving

The data of the riveting processes may be stored in these manners:

A/ Medium type:
- MMC card (about 1000 riveting processes on a 512 MB card) see Optional Accessories
- Into the PC memory

B/ Types of processes to save:
- Only OK processes
- Only NOK processes
- OK and NOK processes

C/ Setting the amount of stored data:
- Without data loss
- With data loss – only the last X (10, 20, 50) processes are saved, old are deleted.

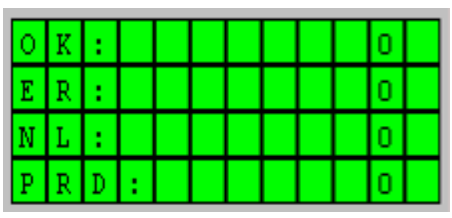
D/ Manner of saving:
- Only curves
- Result saving (also the check window setting is saved)

E/ Saving format:
- ASCI
- QDAS

7.5 Check and Securing Some Technical Parameters of the Unit

The unit is equipped with further auxiliary functions that serve for facilitating maintenance and checking:
- Quantity function: the number of OK, the number of NOK, the number of reset impulses, the number of idle cycles

Everything that is displayed on the control unit panel and individual counters can be reset (see Chap. Operation and Control)



OK riveting counter
NOK riveting counter
Reset impulses counter
Idle cycles counter

- Checking the hydraulic unit temperature: upon exceeding the permitted temperature, the hydraulic unit is turned off – information is displayed on the control unit panel, after temperature drop to the working temperature, it is possible to resume working.
- Check of the hydraulic oil level (two-stage):
  - First stage: the operator is informed at the control unit panel

- Second stage: until the hydraulic oil is refilled, the hydraulic aggregate is turned off (the information is at the control unit panel)

- Hydraulic oil purity check: in case of filter clogging, the operator is warned by information on the control unit panel, if the filter is not cleaned within 6 hours of operation, the hydraulic aggregate is turned off, namely until the filter is replaced.

Warning - high temperature
Warning - dearth of oil (1st stage)
Warning - replace the filter necessary
or refill the hydraulic oil

8. OPERATION AND CONTROL

Warning:

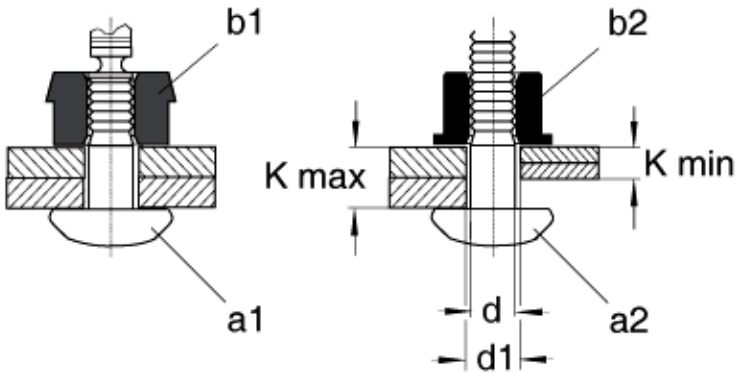
- The riveting head used by you and the rivet may look differently from the used figures.
- When riveting, the tool must be held perpendicular to the riveted material.
- The values of the opening size (D1) and the clamping area (K) must be obtained from the used rivet manufacturer.

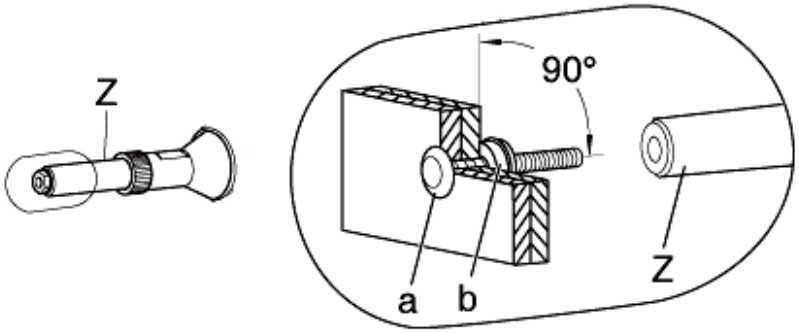
8.1 Return of the hydraulic piston to the front initial position

- is it necessary connect the riveting head and the drive unit (see chap. 6.2.2. – 6.2.4.). Start the unit (see chap. 6.3). For the return of the hydraulic piston to the front initial position press together buton 6 and 7 on the internal control system panel (see chap. 8.5)

8.2 Two-Part Rivet Riveting Procedure

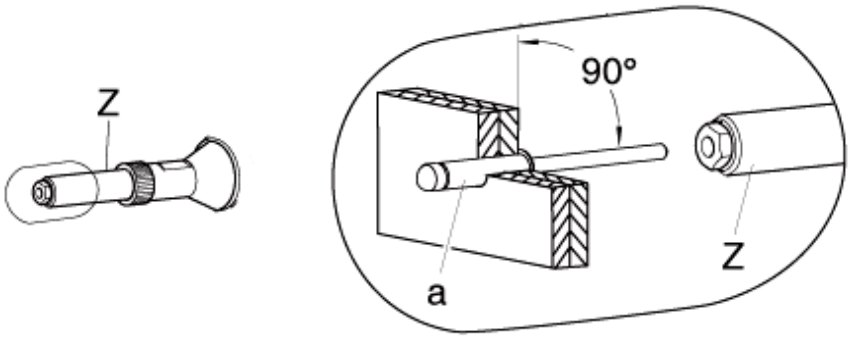
- Put the riveting stud (a) into an opening in the material
- Put the clamping ring (b) on the riveting stud
- Hold the riveting pivot head (a) and pull on the nose assembly (Z). Insert the nose assembly so that it pushes the clamping ring (b) to the material.
- Press the start button on the riveting head – the riveting operation is performed (the nose assembly is pulled on the clamping ring, which pushes it to the material and also deforms it). After tearing off the rivet stud, the hydraulic piston returns into the original position.
- The torn off rivet stud is discharged during the next riveting rearwards from the riveting head.
  Attention – it is necessary to use a torn stud catcher.

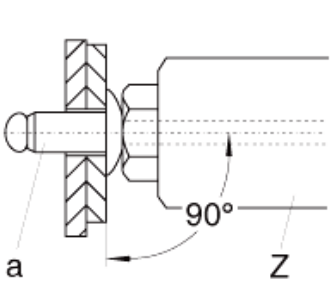


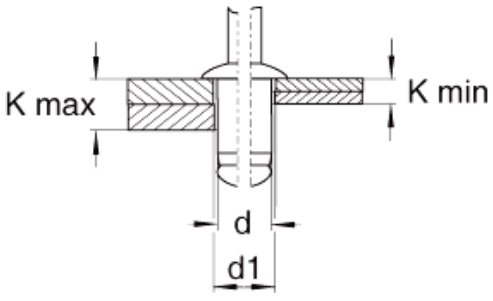


8.3 Procedure of Riveting a Single-Side Ripping Rivet

- Put the ripping rivet (a) into an opening in the material
- Pull on the nose assembly on the rivet stud (Z). Insert the nose assembly so that it pushes the rivet (a) to the material.
- Push the start button at the riveting head – the riveting operation is performed (the jaws grip the rivet stud and pull it inside the nozzle, which deforms the rivet body and the material is clamped). After breaking the rivet stud, the hydraulic piston returns into the original position.
- The torn off rivet stud falls in the direction of the riveting head tilt.
  Attention – it is necessary to use a torn stud catcher.





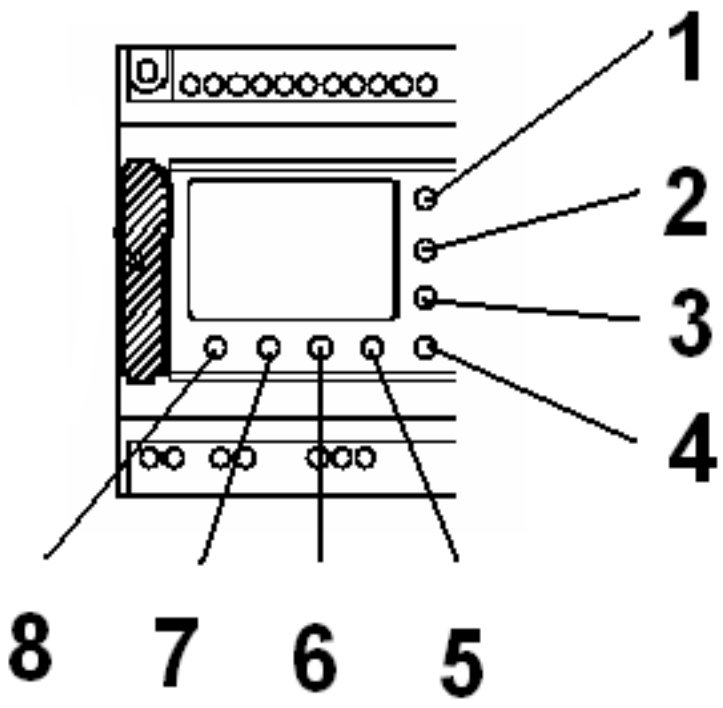


8.4 Process Evaluation

- If the process is evaluated as good, the green diode is lit on the riveting head and 1 pc is added in the control unit into the counter of good processes (OK). In case that the unit is connected with an external control unit, an OK signal is sent to it.
- If the process is evaluated as bad (NOK), the red diode is lit at the riveting head and 1 pc is added to the counter of bad processes (NOK). The riveting head is blocked for further use (unless the control unit program is changed upon the customer's wish). In case that the unit is connected with an external control unit, a NOK signal is sent to it.
- The NOK report must be unblocked, namely using an external control system (if connected) or using an additional unit for riveting operation control
  (See the Optional Accessories)

8.5 Internal Control System Panel Button Control

The internal unit of the control system (10) is fitted with 8 pcs of buttons that are programmable for the following use:



Button 1 - Resetting the amplifying and evaluation unit MP85

Button 2 - Resetting the good cycle counter - OK, the counter of signals for the MP85 used for setting a zero for sensors, the counter of riveting cycles – without rivets

Button 3 - Resetting the counter of bad cycles – NOK

Button 4 - Setting the zero of sensors in the riveting head.

Button 6 and 7 simultaneously – turning on the hydraulics and the command for return of the hydraulic piston in the riveting head into the start position.

ATTENTION – danger of injury by the riveting head (the nose assembly must not be dismounted)!

Buttons 5, 6, 7, and 8 - cause the displaying of the SW version.

9. MAINTENANCE

The activities described in this chapter must be performed after turning off the riveting unit and disconnecting the electricity source. In the opposite case, there is a danger of injury.

9.1 Maintenance of the Riveting Head and the Nose Assembly

- The riveting head and the nose assembly must be kept clean and perform cleaning of the clamping head (4), jaws (3), and the front nozzle (6) every day.
- Every day, before commencing work, it is necessary to check the condition of the front nozzle (6), whether it is not deformed or whether cracks are created. In case that there is a deformation or cracks, it is necessary to replace the nose assembly - see 6.2 Assembly .
- Every day before commencing work, it is necessary to check the tightening of the clamping head (4) and the sleeve nut (7). In case of tightening the clamping head, it is necessary to check the X dimension (see Chap. 6.2.1).
- Once a week, check the jaw condition (3), in case of their wear, replace them. See Chap. 6.2.
- Every day, check the nose assembly tightening (5).
- Regularly check a possible oil leak at the riveting head
- Once a year, it is necessary to perform setting of the values in the setting chip see chap. 6.4.1.

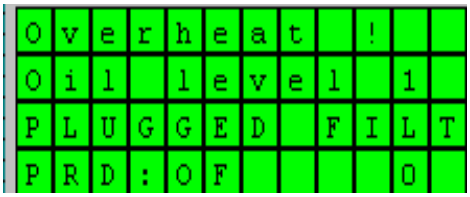
Tightening Torques

POSITION	DESIGNATION	THREAD	TIGHTENING TORQUE (Nm)
5	Nozzle	M 26x1.5	20
4	Sleeve nut	M 24x1,25	8
1	Clamping head	UNEF 9/16“-24	12

9.2 Drive Unit Maintenance

The drive unit is maintenance free, but it is necessary to regularly perform the following checking tasks:

Regular daily checking of reporting on the display of the internal control system:



Warning - high temperature
Warning - dearth of oil (1st stage)
Warning - replace the filter necessary or refill the hydraulic oil

- Message “high temperature of the hydraulic unit” – upon exceeding the permitted temperature, the hydraulic unit is turned off (information is displayed on the control unit panel), upon a temperature drop to the operating temperature, it is possible to resume working.

- Message “lack of oil – first level” – during the nearest shutdown of the unit, it is necessary to refill the hydraulic oil, see 6.1 Installation.

- Message “necessary filter replacement or lack of oil” – it is necessary to check the oil level and refill it (see Chap. 6.1 Installation, if the message lasts, it is necessary to replace or clean the filter of the hydraulic aggregate (this activity may only be performed by trained personnel or an authorised service).

- Once a week, perform a visual check of the entire hydraulic system, especially secure tightness of individual elements, pipelines, hoses, valves, and the tank.

- Regularly check the connections (once a month) and tighten using the prescribed tightening torque.

Screw Connections and Leak of Hydraulic Elements

The creation of a leak at the contact planes below and between the hydraulic elements, between flanges, etc. is significantly contributed by insufficiently pre-tensioned screw connections. This condition is a cause of abnormal wear of O-rings and subsequently then the loss of the packing effect. The impression that the screw is tightened enough is usually wrong.

Screws at the hydraulic blocks are well accessible in the vast majority of cases, therefore, it is desirable to tighten them using the prescribed torque using torque wrenches. The tightening torques are stated in the table below.

M4	3 Nm
M5	6 Nm
M6	14 Nm
M8	22 Nm

M10	44 Nm
M12	74 Nm
M16	165 Nm
M20	314 Nm

M24	549 Nm
M30	1020 Nm
M36	1740 Nm
M42	2670 Nm

The values apply to quality screws from materials with mechanical properties 8.8 (screws with a cylindrical head and an internal hexagon). Lower quality screws, mech. properties 5.8 and below, are not recommended for use.

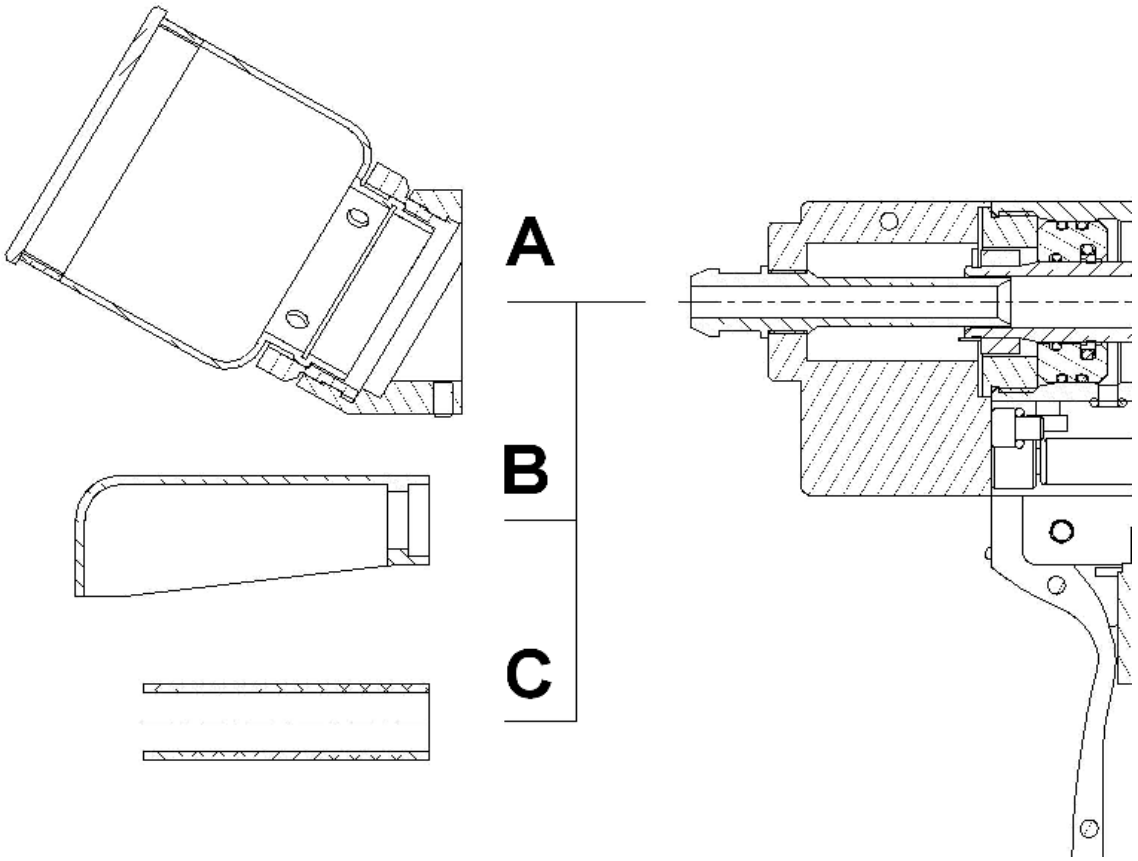
10. OPTIONAL ACCESSORIES

The optional accessories must be ordered separately.

10.1 Torn Stud Discharge

With the unit, it is possible to use 3 options for discharge or catching of torn studs:

A1 Catching vessel direct including a connecting adapter
A2 Catching vessel angular including an adapter for connection
B Catching rubber – it is supplied with the riveting head as standard.
C Discharge hose – length 2 m



10.2 Set for Connection of a PC with the MP85

- The set serves for the possibility of setting the basic data in the program of the amplifying and evaluating unit MP85, setting the evaluating criterions of the riveting process, setting the riveting process data saving, allows also for direct data saving.
- The set can only be used by a trained person, knowledgeable about the product of the HBM Company, the measuring and amplifying module MP85.
- Set parts: connecting cable, USB adapter, setting SW, SW – USB driver

10.3 Riveting Process Control Box

The box allows for working with the riveting unit in case that the riveting unit is not connected with an external control unit.

The box is connected with the riveting unit using the HARTING connector.

After connecting, all functions are available as described in Chapter 7.3 Riveting Operation Control.

10.4 MMC Memory Card

The MMC card serves for data storage of the riveting process. The MMC card can be bought in the regular business network.

11. FAILURES AND THEIR REMOVAL

When identifying the failure causes, it is always first necessary to determine, whether the unit function loss is caused by a failure of the electric or hydraulic unit part.

For repairs of failures on hydraulic systems, it is impossible to prepare a unified procedure. However, it is necessary to adhere to all general rules and work procedures:

Before disassembly of any parts of the hydraulic system, it is necessary to make sure that:

- The mechanism, whose hydraulic control will be dismounted, is in a stable position that allows for disconnecting the hydraulics (autonomous unit movement must not occur).
- The hydraulic circuit is disconnected from the pressure source (turned off and depressurised hydraulic drive).
- The hydraulic circuit is disconnected from the electricity source (it is disconnected at the central electric switchboard, the control voltage is turned off at the panel, and the connectors of electric switchboards are dismounted).
- Individual branches of the hydraulic circuit are without pressure (check at the measuring points using a manometer, possibly depressurise).
- During all disassembly works, thoroughly take care about maximum possible cleanliness of the workplace in order to prevent damage of the dismounted parts and introduction of pollutants into the system.
- Replace individual parts only with original spare parts. Use of other parts than original may lead to the unit function loss.
- After completing the assembly, carefully check the setting of the hydraulic elements according to the diagram.
- Before operation, clean individual parts of the hydraulic unit from oil.

Actions that the unit operator may perform – designed using the letter **B**
Other actions may only be performed by a trained qualified person – designated using letter **F**.

FAILURE	POSSIBLE CAUSE	FAILURE REMOVAL
The rivet cannot be torn off, but the hydraulic system works.	Clogged jaws Worn jaws Loose riveting nozzle	(B) Clean the nose assembly (B) Replace the jaws. (B) Perform tightening.
The rivet stud cannot be inserted into the nose assembly.	Incorrect nose assembly Loose nose assembly Clogged opening for stud discharge	(B) Replace the nose assembly. (B) Perform tightening. (B) Empty the device for stud discharge.
Hydraulic system leak	Loose connections Damaged packing	(B) Perform tightening (F) Replace – authorised service
Hydraulic piston has not returned into the original position.	Electric failure Low working temperature	(B) Return the piston using buttons to the SPS.
Aggregate does not work.	High working temperature Lack of oil Oil filter clogged	(B) Let the unit cool down. (F) Refill oil. (F) Replace or clean the filter.

12. WEARABLE PARTS

The wearable parts are contained in the nose assembly set. These parts must be regularly checked and based on a test and long-term monitoring, determine the rules and dates for their regular replacement.

Appearance of parts and ordering numbers depend on the type of the nose assembly and manufacturer.

13. SPARE PARTS

13.1 Spare Parts Storage

- The storage premises must be dry and dust-free with low air humidity.

- Acid or other chemical vapours must not be present. For storage longer than 6 months, it is necessary to proper conserve using conserving oil.

- Spare parts are packaged according to the belonging to functional subgroups.

- Rubber parts must be conserved with glycerine and stored in black polythene bags.

13.2 Exchangeability of Spare Parts

During production, assembly, commissioning, and work of the machine, there is constant modernisation of elements. For these reasons, it is necessary to write the order exactly according to the documentation and check with the actual condition mounted at the unit. Most new elements is exchangeable without modifications, but it is better to have the order assessed by an expert workplace of RIVETEC, spol. s r.o., that is capable of deciding about exchangeability, possibly about necessary modifications to perform.

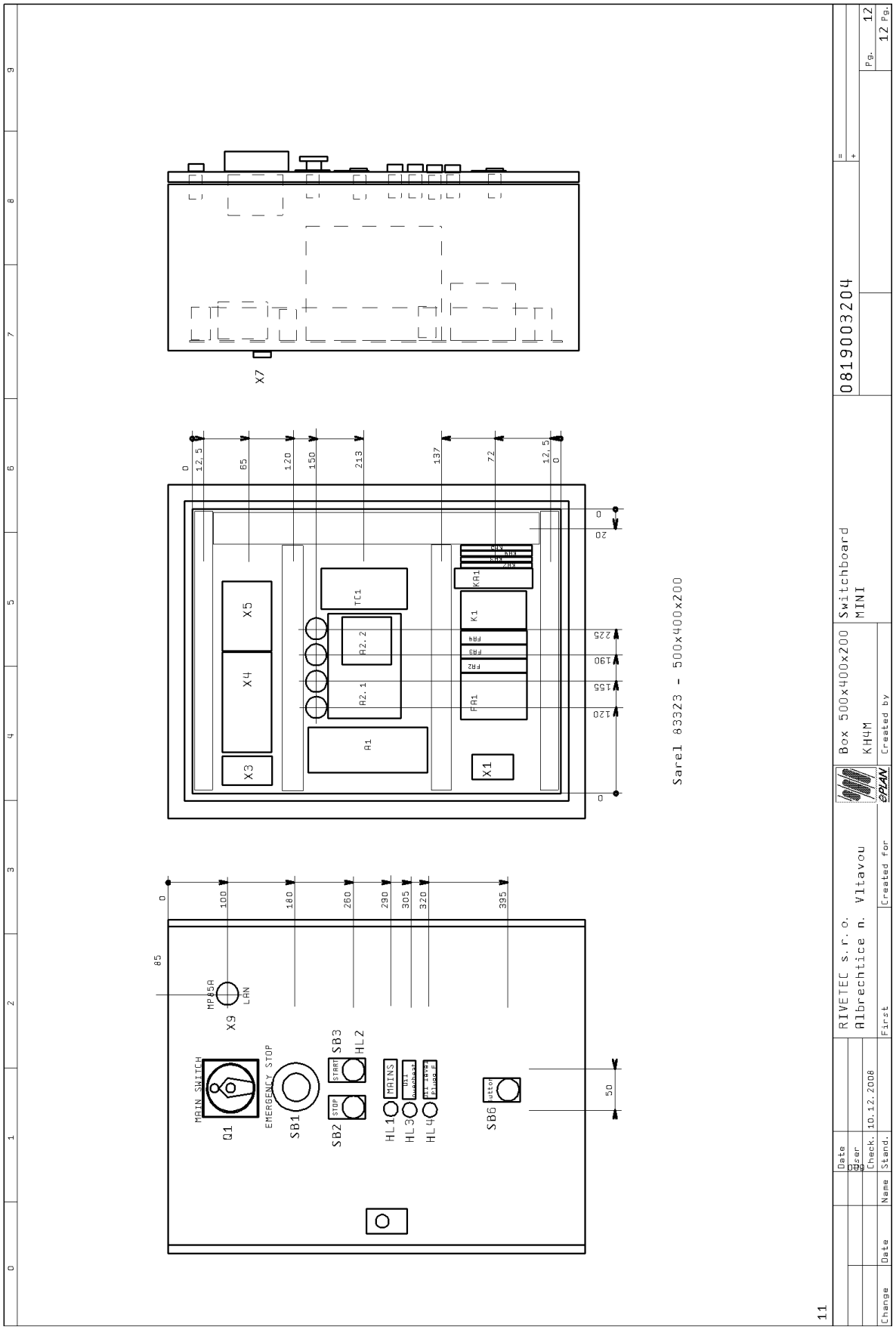
13.3 Ordering Manner:

- According to the following model:

DESCRIPTION	EXAMPLE		
Serial number	**xxxxxxxxxxxx**		
Unit title	**Drive unit / hydraulic aggregate / riveting head**		
System title / system drawing number	**xxxxxxxxxx**	**xxxxxxxxxx**	
Part title / part position number / ordering code	**Filtering element**	**x**	**x**
Number of pieces	**1**		
Complementary data	**xxxxxxxxxx**		
Required delivery date	**5/2008**		

13.4 Piece Lists

13.4.1 Electric Components



Bill of materials

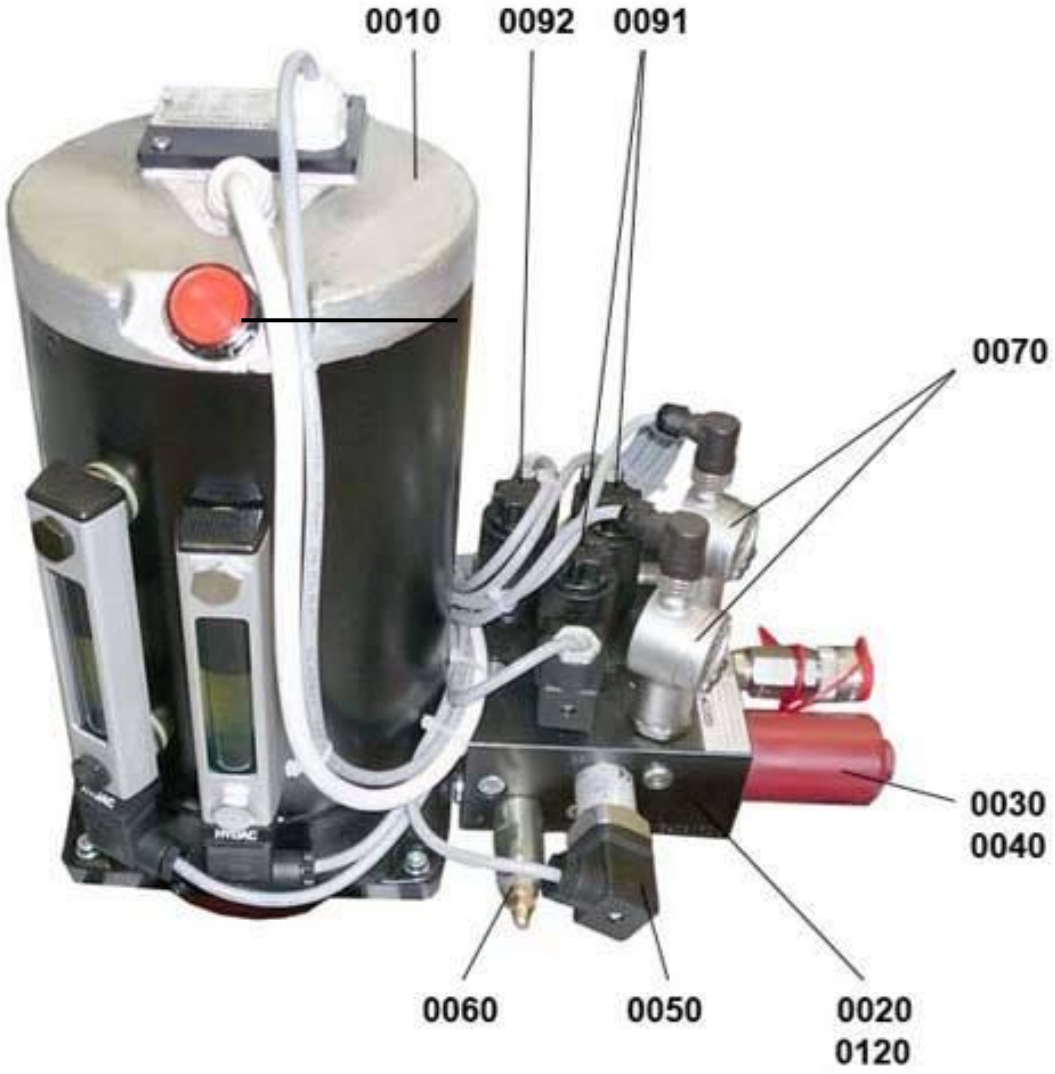
ES5000 4E

Component designation	Quantity	Designation	Type number	Supplier	Part number
Box	1	Sarel 500 x 400 x 200	83323	Sarel	
Box	1	Schyller 150 x 220 x 75	93244	Schyller	
Q1	1	Main switch 25A	GN25 10U 25,51	Končar	
FA1	1	Circuitbreaker 3P 6A D	PL7 - D6/3	Moeller	
FA2	1	Circuitbreaker 1P 10A D	PL7 - D10/1	Moeller	
FA3, FA4	2	Circuitbreaker 1P 4A C	PL7 - C4/1 DC	Moeller	
TC1	1	Power supply 230V/ 24V DC - 4,5A	S8VS-09024	Omron	
A1	1	Two-canal amplifier	MP85A	Titgemeyer	
A2.1	1	PLC	A12-24MR-D	Autocont	
A2.2	1	PLC - expansive plate outputs	4EYR	Autocont	
K1	1	Contactor 3P 9A . 24VDC	LC1-D09 BD	Schneider	
KA1	1	Emergency relay	PNOZ X5 24V DC	Pilz	
KA2, KA3, KA4, KA5,	4	SSR relay MIRO 6.2. 2A	52501	Murr	
XC1	1	Plug 16A (3P+N+PE) IEC 309	TYPE IV 1653	SEZ	
SB1	1	Push button - mushroom actuator with aretation RED	XB5-AS8445	Schneider	
SB2	1	Push button - actuatot RED	XB5-AA42	Schneider	
SB3, HL2	1	Push button - iluminated actuatot WHITE	XB5-AW31B5	Schneider	
SB4, SB5	2	Push button - actuator black (part rivetig gun)	P-DT6SW	GM	
SB6	1	Push button - selector black	XB5 - AD21 + ZBE - 102	Schneider	
HL1	1	Pilot light GREEN	XVL-A233	Schneider	
HL3, HL4,	2	Pilot light RED	XVL-A234	Schneider	
D1	1	Diode	1N407	GM	
D2, D3	1	LED diode twocoulor (part rivetig gun)	L-115 WEGW	GM	
R1	1	Resistor 3k9 0,6W	RR 3k9 110-089	GM	
X1	1	Terminal-3pcs grey, 1pc blue, 6pcs green/yelow	280641 + 280651 + 280637	Wago	
X3	1	Terminal-1pc orange, 10pcs grey	270564 + 270560	Wago	
X4	1	Terminal-1pc orange, 17pcs grey	270564 + 270560	Wago	
X5	1	Terminal-1pc orange, 13pcs grey	270564 + 270560	Wago	
X7	1	Connector CAN26Z	801E112	GM	
X8	1	Terminal-1pc orange, 20pcs grey	270564 + 270560	Wago	
X9	1	Socket LAN	2482.720	Rittal	
M1	1	Hydraulic pump	3268290	Flutec	
Y1, Y2, BS1, BS2	1	Block hydraulic valves and baroscops	4WE6G - 6004980	Hydac	
ST1	1	Thermal sensor - oil temperature (part of h. pump)		Hydac	
SL1, SL2	2	Level sensor - oil level 1 and 2 (part of h. pump)		Hydac	
SL3	1	Flow sensor (part of h. pump)		Hydac	
XC2 Connector Harting 6B	1	09140060303-1pc, 09140123001-1pc, 09140123101-1pc, 09150006102-12pcs, 09150006202-12pcs, 19300061541-1pc		Harting	
	2	Cover holder	HP3	Weidmüller	
	0,1 m	Cover	ADP3	Weidmüller	
	6	Cable clamps PG16	BS-05	Aspera	
	8	Cable clamps PG9	BS-02	Aspera	

10 12

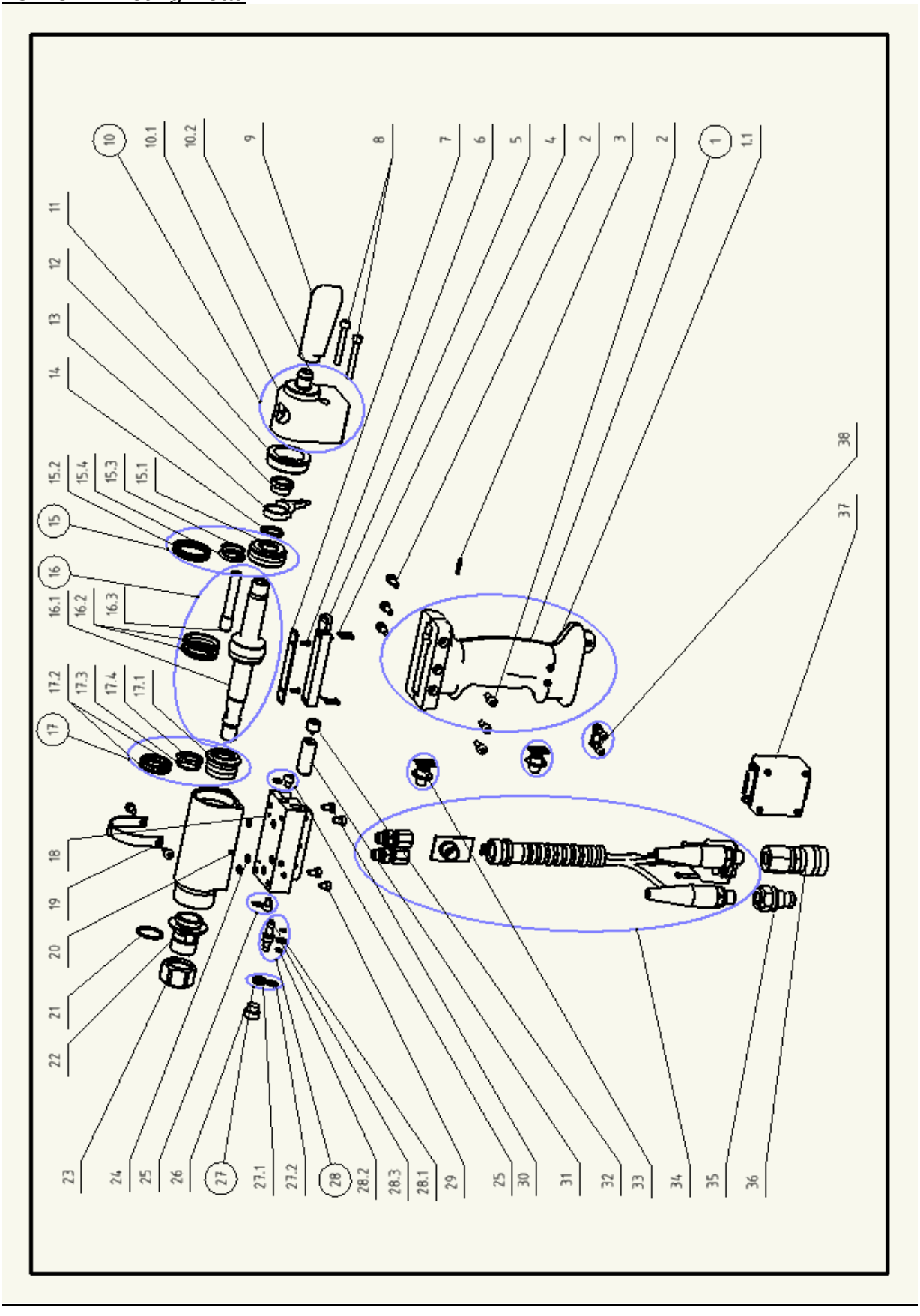
Change	Date	Name	Date / User / Check. / Stand.					
			Date	30.07.2003	RIVETEC s.r.o. Albrechtice n. Vltavou	Box 500x400x200 KH4M	Bill of materials	0819003204
			User	MAR				= +
			Check.	10.12.2008				Pg. 11
			Stand.		First / Created for / EPLAN	Created by		12 Pg.

13.4.2 Hydraulic Aggregate



ITEM no.	MATERIAL no.	DESIGNATION	QUANT	Q.U.	COMMENT
0010	3268290	HP200-1,00-05-XTS	1,00	pcs	HYDRAULIC PUMP
0091	710462	WSE3E0C.X/G24-Z4-N	2,00	pcs	VALVE 3/2
0092	710464	WSE3E0D.X/G24-Z4-N	1,00	pcs	VALVE 3/2
0120	710151	RVE-R1/4-X-0,5	1,00	pcs	CHECK VALVE
0030	1250583	MDF 30 SET XX W 1,0	1,00	pcs	OIL FILTER
0040	1260880	0030 D 020 BN4HC	1,00	pcs	FILTER CARTRIDGES
0050	311645	VM 2 C.0	1,00	pcs	PRESSURE SWITCH
0070	908169	EDS 3446-1-0600-000	2,00	pcs	PRESSURE SENZOR
0020	3438132	BLOCK RIVETEC 500 bar	1,00	pcs	DISTRIBUTION BLOCK
0060	716024	DB4E-01X-630P	1,00	pcs	PRESSURE REGULATOR

13.4.3 Riveting Head



POS.	STOCK No.	VOLUME TITLE	PCS.
1	20-0566	HANDLE	1
1.1	10-1326	HANDLE	1
1.2	30-1067	CROSS RECESSED PAN HEAD TAPPING SCREWS (ISO 7049 - ST4,2x19)	3
2	30-1064	HEXAGON SOCKET HEAD CAP SCREWS (ISO 4762 - M5x12)	6
3	20-0591	DIODE	1
4	30-0912	SLOTTED CHEESE HEAD SCREWS (ISO 1207 - M2x12)	4
5	20-0563	POTENTIOMETER	1
6	30-1068	CROSS RECESSED COUNTERSUNK HEAD SCREWS (ISO 7046 - M3x8)	2
7	10-1319	HOLDER	1
8	30-0738	HEXAGON SOCKET HEAD CAP SCREWS (ISO 4762 - M5x40)	2
9	30-0320	THORN POT	1
10	20-0565	COVER	1
10.1	10-1289	COVER	1
10.2	10-1318	GUIDE	1
11	10-1316	CAP	1
12	10-1334	HOLDER	1
13	10-1336	TENON	1
14	10-1333	WASHER	1
15	20-0608	BUSHING GUIDE	1
15.1	10-1382	GUIDE	1
15.2	30-1034	O-RING (DIN 3771 90° - 32x2)	2
15.3	30-0186	O-RING (DIN 3771 90° - 18x2)	1
15.4	30-1036	ROD SEALING	1
16	20-0609	HYDRAULIC PISTON	1
16.1	10-1383	HYDRAULIC PISTON	1
16.2	30-0263	PISTON SEALING	2
16.3	10-1324	GUIDE	1
17	20-0607	BUSHING GUIDE	1
17.1	10-1381	GUIDE	1
17.2	30-1176	O-RING (DIN 3771 90° - 26x2)	2
17.3	30-0186	O-RING (DIN 3771 90° - 18x2)	1
17.4	30-1036	ROD SEALING	1
18	10-1317	MODULE	1
19	10-1354	BAIL	1
20	10-1315	BODY	1
21	30-0211	O-RING (DIN 3771 70° - 18x2)	1
22	10-1284	FRONT NOZZLE	1
23	10-0194:A	NUT	1
24	30-0193:POLY	O-RING (94° POLYURETAN - 4x2)	3
25	20-0568	SEALING THREAD	2
26	10-1321	NUT	1
27	20-0570	GUIDE	1
27.1	10-1292	GUIDE 2	1
27.2	30-1031	O-RING (DIN 3771 90° - 8x1,5)	1
28	20-0569	COMPENSATOR SET	1
28.1	10-1294	COMPENSATOR	1

28.2	30-1032:POLY	O-RING (94° POLYURETAN - 3x1,5)	2
28.3	30-1033:POLY	O-RING (90° POLYURETAN - 6x2)	1
29	30-0073	HEXAGON SOCKET HEAD CAP SCREWS WITH LOW HEAD (DIN 7984 - M5x6)	1
30	30-1066	HEXAGON SOCKET HEAD CAP SCREWS WITH LOW HEAD (DIN 7984 - M5x8)	5
31	20-0531	TENZIOMETER	1
32	10-1320	NUT	1
33	20-0555	PUSH BUTTON	2
34	20-0564	CABLE HARNESS	1
35	30-1103	CONNECTOR MALE G1/4	1
36	30-1104	CONNECTOR FEMALE G1/4	1
37	20-0538	CALCHIP	1
38	20-0567	HOLDER	1

14. APPENDICES

Hydraulic Diagram

Electric Wiring Diagram

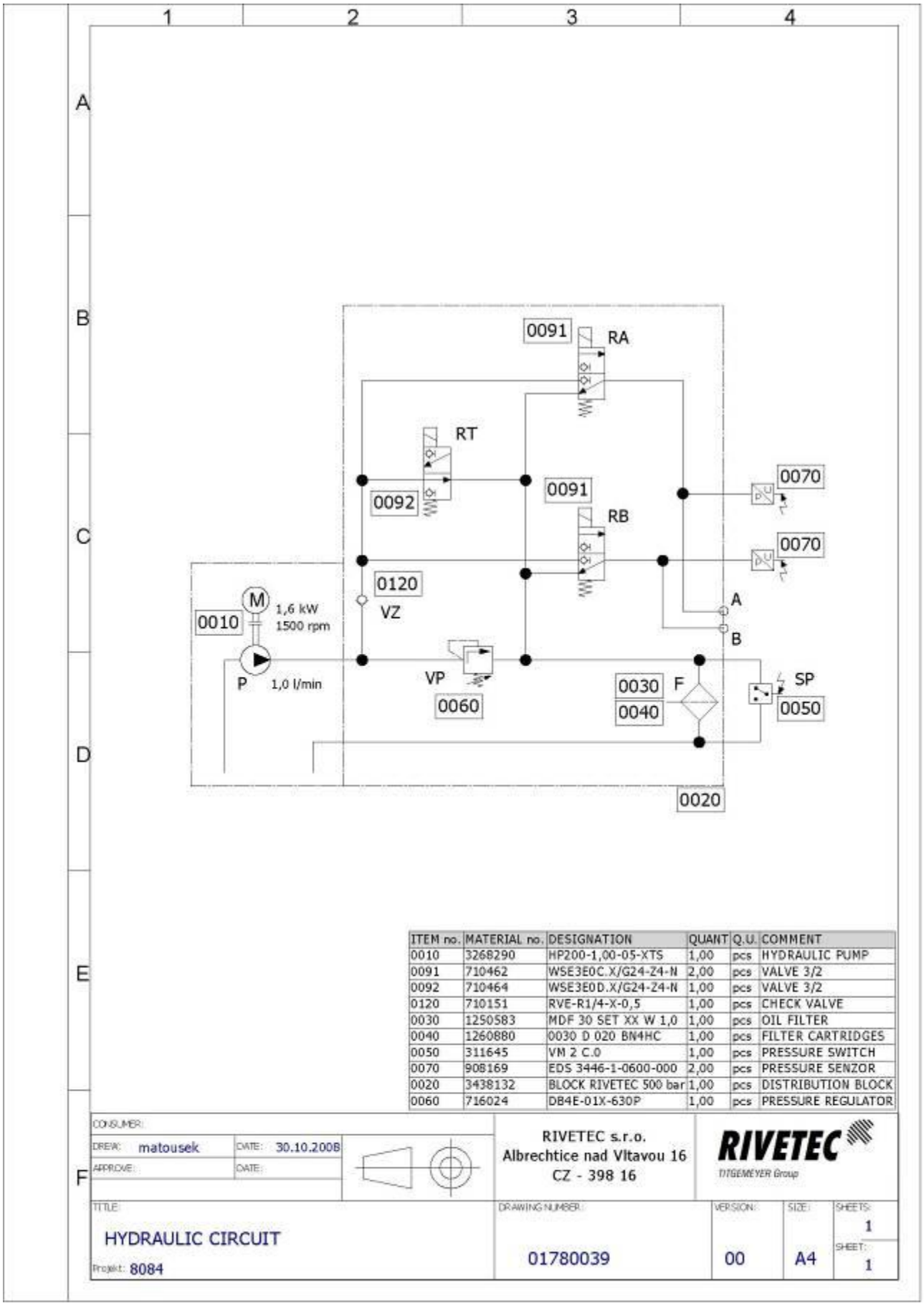
Oil Technical Sheet

Oil Safety Sheet

Protocol – Vibration measurement and evaluation

ES Declaration of conformity

Hydraulic Diagram



ITEM no.	MATERIAL no.	DESIGNATION	QUANT	Q.U.	COMMENT
0010	3268290	HP200-1,00-05-XTS	1,00	pcs	HYDRAULIC PUMP
0091	710462	WSE3E0C.X/G24-Z4-N	2,00	pcs	VALVE 3/2
0092	710464	WSE3E0D.X/G24-Z4-N	1,00	pcs	VALVE 3/2
0120	710151	RVE-R1/4-X-0,5	1,00	pcs	CHECK VALVE
0030	1250583	MDF 30 SET XX W 1,0	1,00	pcs	OIL FILTER
0040	1260880	0030 D 020 BN4HC	1,00	pcs	FILTER CARTRIDGES
0050	311645	VM 2 C.0	1,00	pcs	PRESSURE SWITCH
0070	908169	EDS 3446-1-0600-000	2,00	pcs	PRESSURE SENZOR
0020	3438132	BLOCK RIVETEC 500 bar	1,00	pcs	DISTRIBUTION BLOCK
0060	716024	DB4E-01X-630P	1,00	pcs	PRESSURE REGULATOR

CONSUMER:
DREW: matousek DATE: 30.10.2008
APPROVE: DATE:

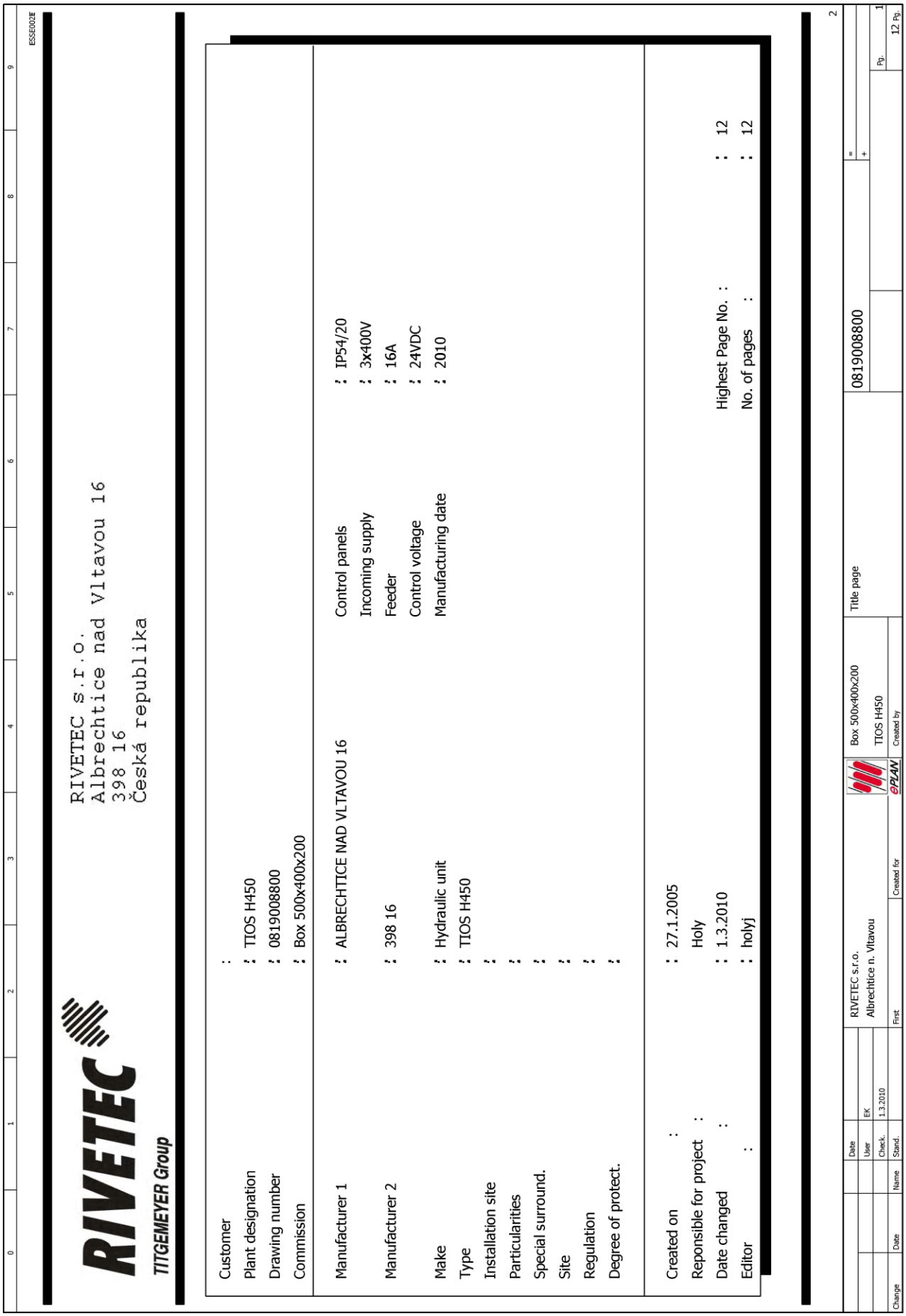
RIVETEC s.r.o.
Albrechtice nad Vltavou 16
CZ - 398 16

RIVETEC TITGEMEYER Group

TITLE: HYDRAULIC CIRCUIT
Projekt: 8084

DRAWING NUMBER: 01780039
VERSION: 00
SIZE: A4
SHEETS: 1
SHEET: 1

Electric Viring Diagram



0 1 2 3 4 5 6 7 8 9

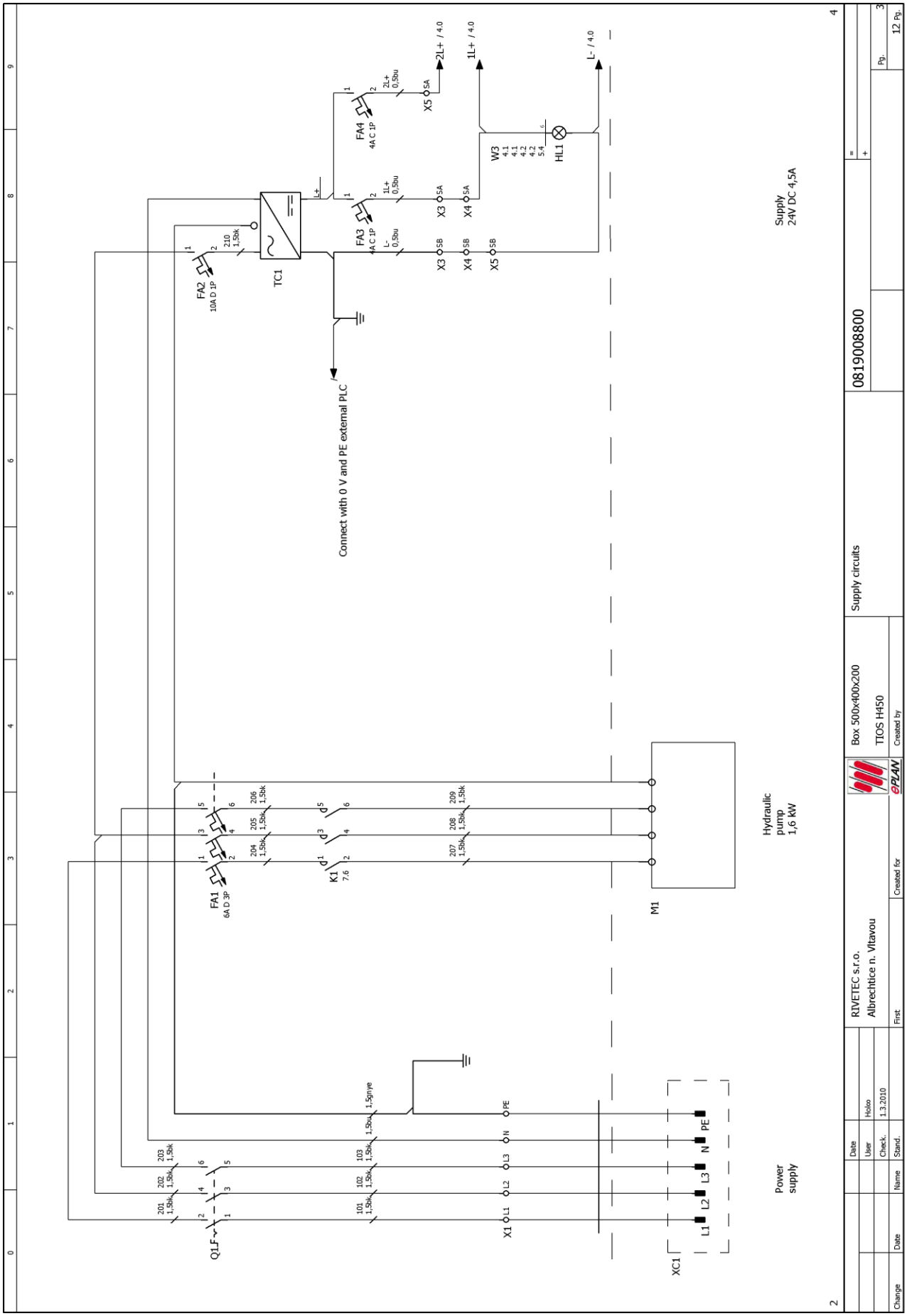
Table of contents

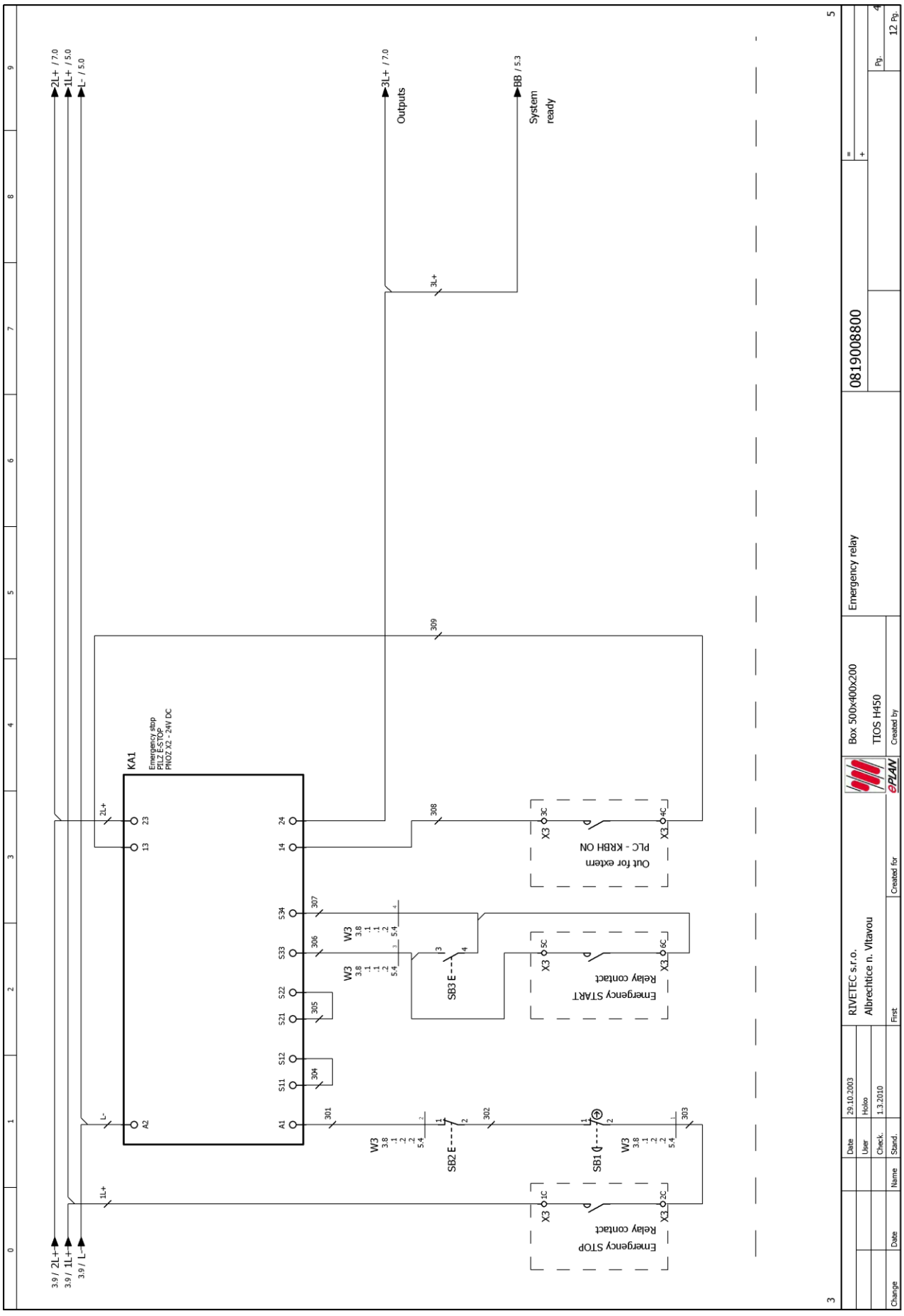
Column X: an automaticly created page is manual changed

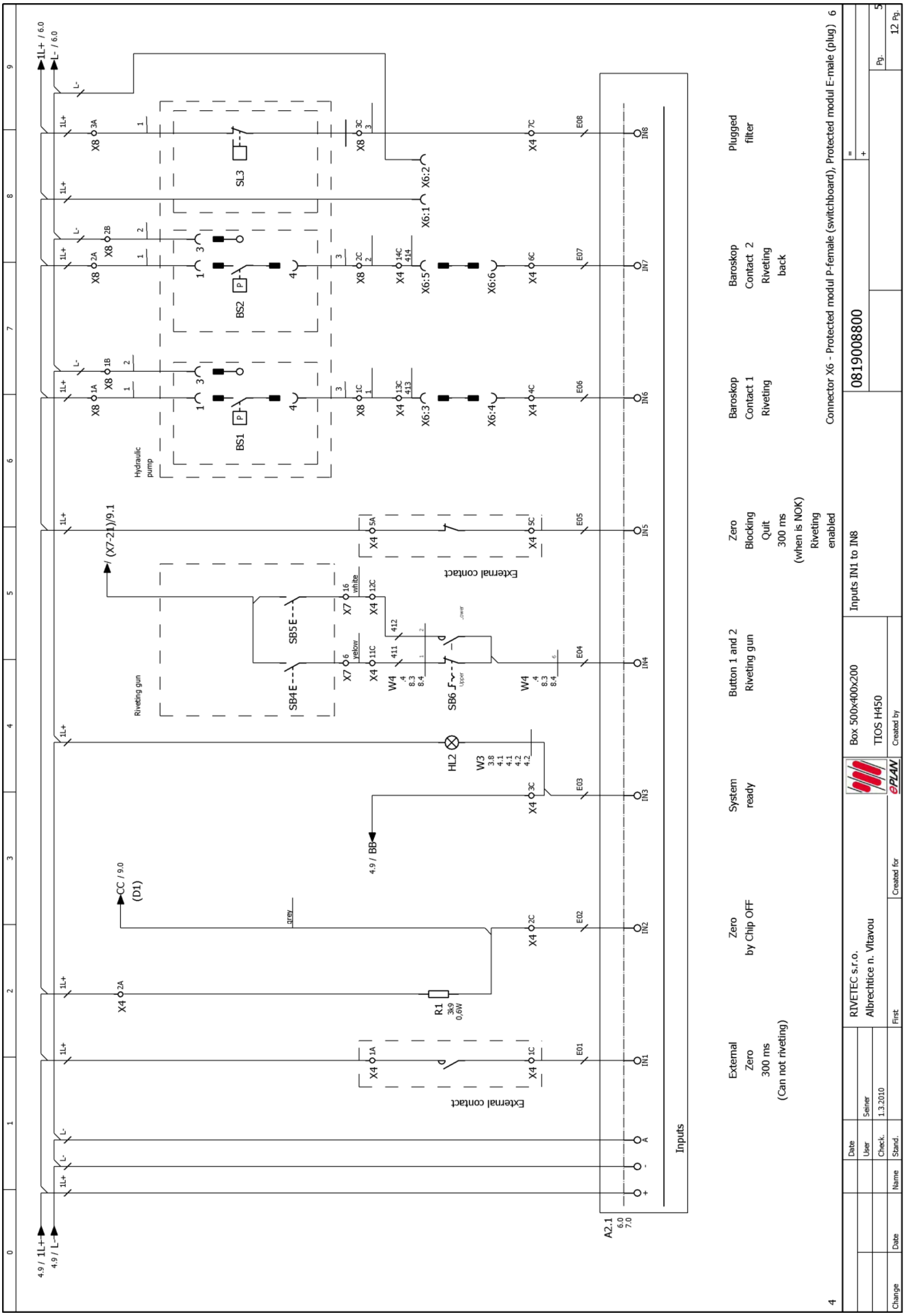
ESSJ010E

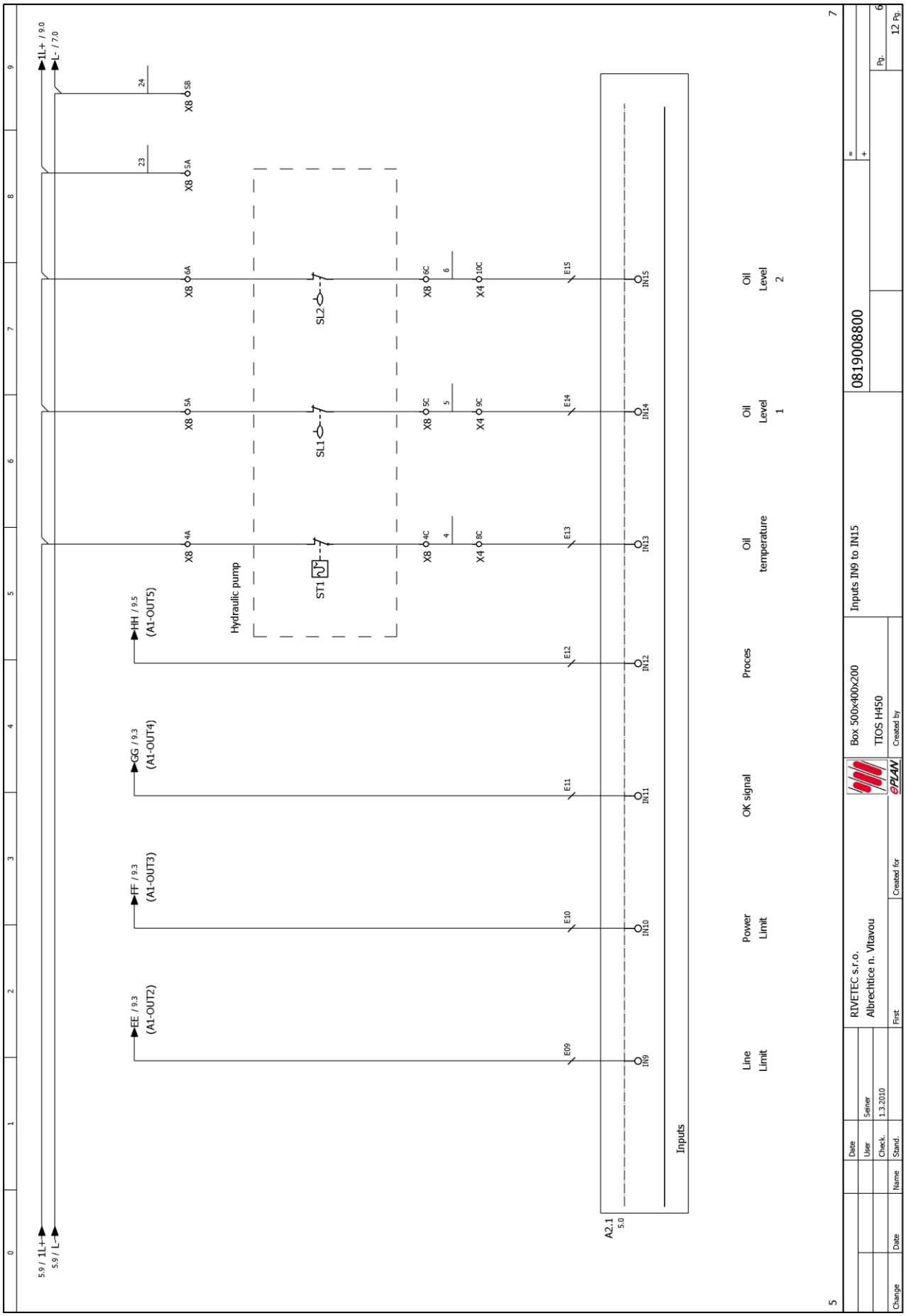
1 3

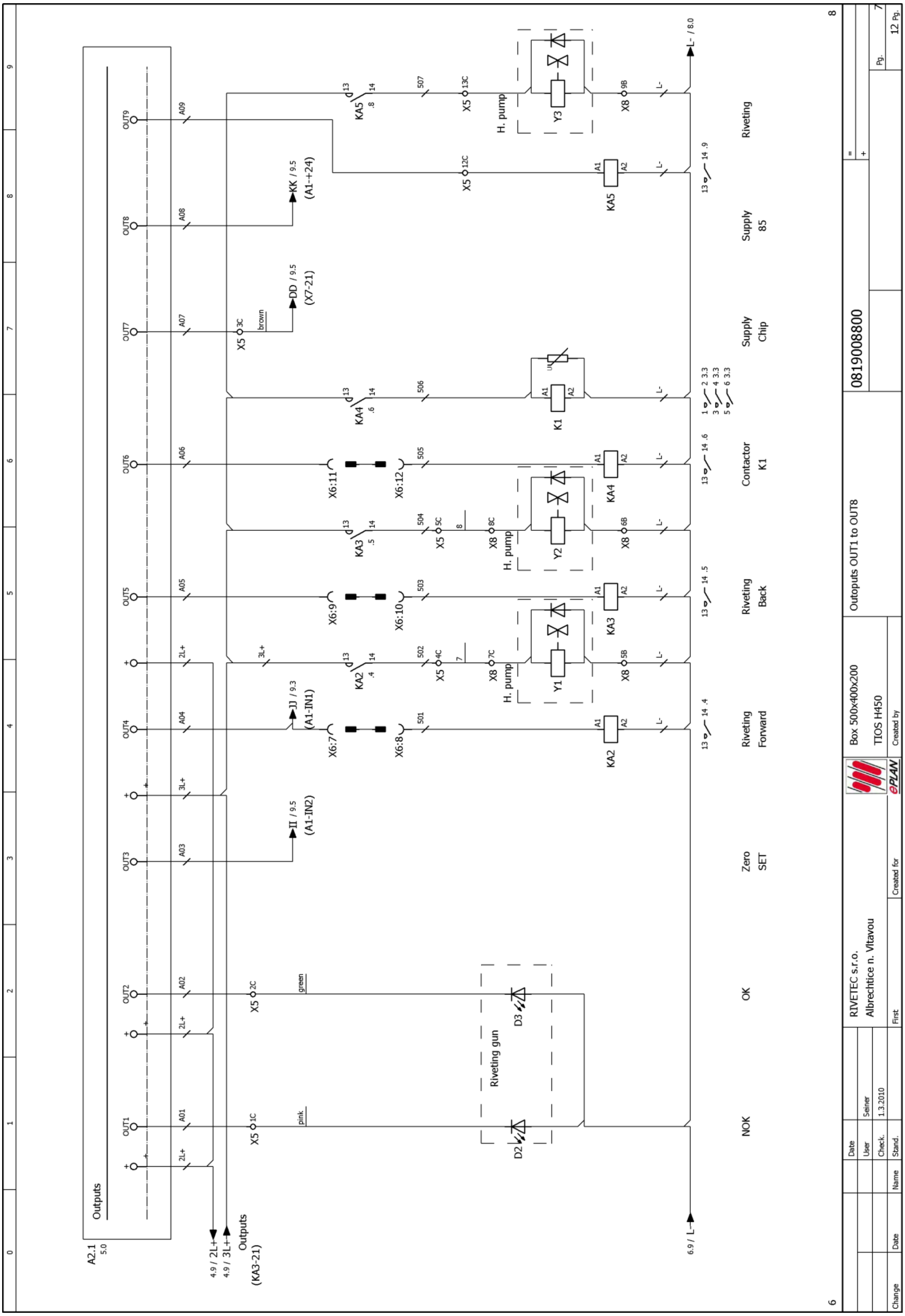
Change	Date	Name	Date / User / Check. / Stand.					
			Date		RIVETEC s.r.o. Albrechtice n. Vltavou	Box 500x400x200 TIOS H450	Table of contens	0819008800
			User	AAA				= +
			Check.	1.3.2010				Pg. 2
			Stand.		First / Created for	Created by		12 Pg.

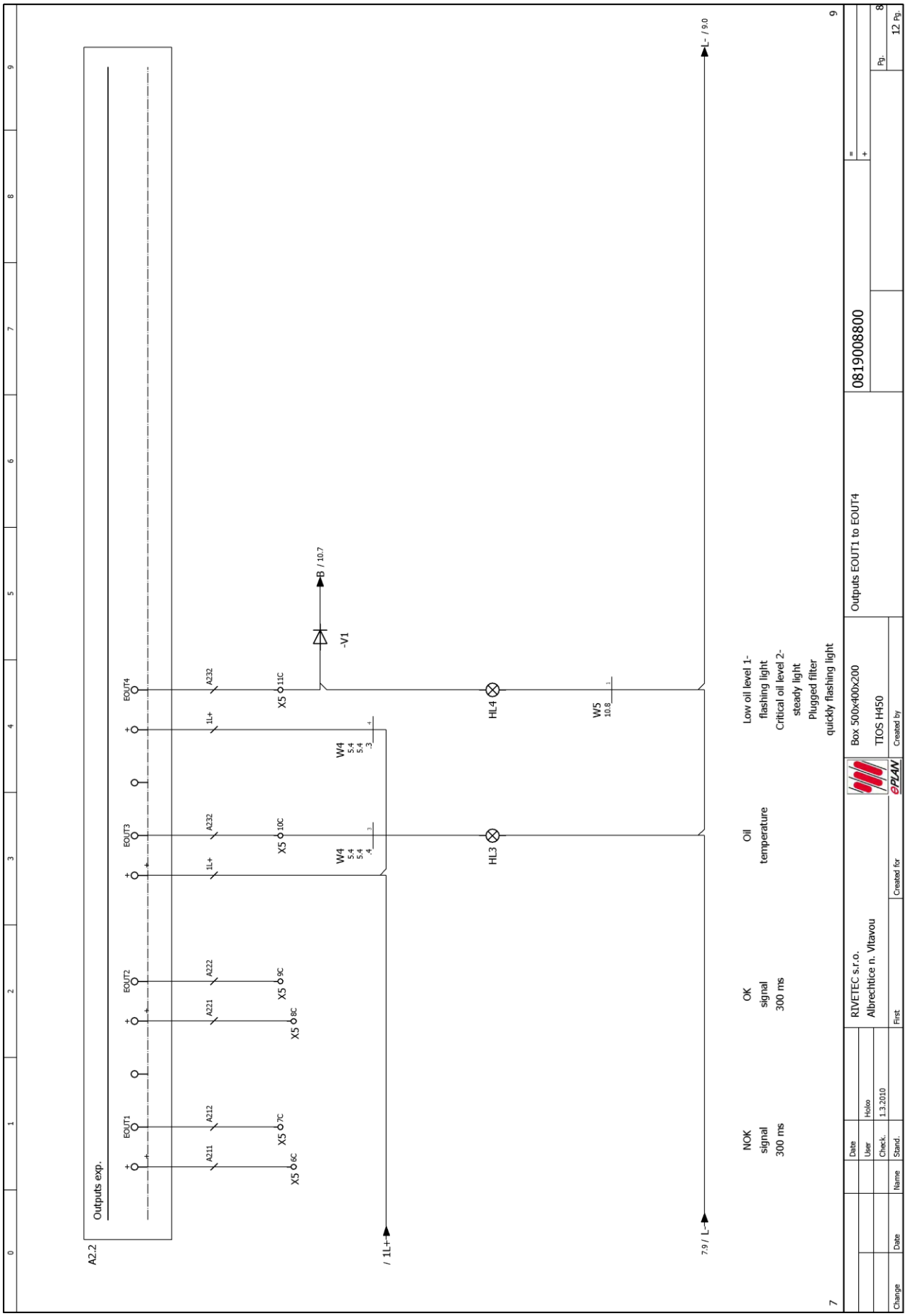

Supply
24V DC 4,5A
Connect with 0 V and PE external PLC
Hydraulic
pump
1,6 kW
Power
supply
0819008800
Supply circuits
Box 500x400x200
TIOS H450
RIVETEC s.r.o.
Albrechtice n. Vltavou
FA1
6A D 3P
FA2
10A D 1P
FA3
4A C 1P
FA4
4A C 1P
TC1
K1
M1
HL1
W3
Q1F
XC1
X1
X3
X4
X5


2L+ / 7.0
1L+ / 5.0
L- / 5.0
3L+ / 7.0
Outputs
BB / 5.3
System ready
KA1
Emergency stop PILZ E-STOP PNOZ X2 - 24V DC
Out for extern PLC - KRBH ON
Emergency START Relay contact
Emergency STOP Relay contact
SB1
SB2
SB3
0819008800
Box 500x400x200
TIOS H450
Emergency relay
RIVETEC s.r.o.
Albrechtice n. Vltavou


External Zero 300 ms (Can not riveting)
Zero by Chip OFF
System ready
Button 1 and 2 Riveting gun
Zero Blocking Quit 300 ms (when is NOK) Riveting enabled
Baroskop Contact 1 Riveting
Baroskop Contact 2 Riveting back
Plugged filter
Connector X6 - Protected modul P-female (switchboard), Protected modul E-male (plug)
External contact
Hydraulic pump
Riveting gun
Inputs
Inputs IN1 to IN8
0819008800
Box 500x400x200
TIOS H450
RIVETEC s.r.o.
Albrechtice n. Vltavou
Seiner
1.3.2010
12 Pg.


1L+ / 9.0
L- / 7.0
5.9 / 1L+
5.9 / L-
24
23
X8 5B
X8 5A
X8 6A
X8 5A
X8 4A
X8 6C
X8 5C
X8 4C
X4 10C
X4 9C
X4 8C
6
5
4
SL2
SL1
ST1
Hydraulic pump
HH / 9.5
(A1-OUT5)
GG / 9.3
(A1-OUT4)
FF / 9.3
(A1-OUT3)
EE / 9.3
(A1-OUT2)
E15
E14
E13
E12
E11
E10
E09
IN15
IN14
IN13
IN12
IN11
IN10
IN9
Inputs
A2.1
5.0
Oil
Level
2
Oil
Level
1
Oil
temperature
Proces
OK signal
Power
Limit
Line
Limit
RIVETEC s.r.o.
Albrechtice n. Vltavou
Box 500x400x200
TIOS H450
Inputs IN9 to IN15
0819008800
ePLAN
Created by
Created for
First
Date
User
Check.
Stand.
Name
Seiner
1.3.2010
Change
Pg. 6
12 Pg.


Outputs
OUT1
OUT2
OUT3
OUT4
OUT5
OUT6
OUT7
OUT8
OUT9
NOK
OK
Zero SET
Riveting Forward
Riveting Back
Contactor K1
Supply Chip
Supply 85
Riveting
Riveting gun
H. pump
Outputs OUT1 to OUT8
0819008800
Box 500x400x200
TIOS H450
RIVETEC s.r.o.
Albrechtice n. Vltavou


Outputs exp.
A2.2
EOUT1
EOUT2
EOUT3
EOUT4
A211
A212
A221
A222
A232
X5 6C
X5 7C
X5 8C
X5 9C
X5 10C
X5 11C
1L+
W4
5.4
W5
10.8
HL3
HL4
-V1
B / 10.7
/ 1L+
L- / 9.0
7.9 / L-
NOK
signal
300 ms
OK
signal
300 ms
Oil
temperature
Low oil level 1-
flashing light
Critical oil level 2-
steady light
Plugged filter
quickly flashing light
RIVETEC s.r.o.
Albrechtice n. Vltavou
Box 500x400x200
TIOS H450
Outputs EOUT1 to EOUT4
0819008800
ePLAN
Date
User
Holoo
Check.
1.3.2010
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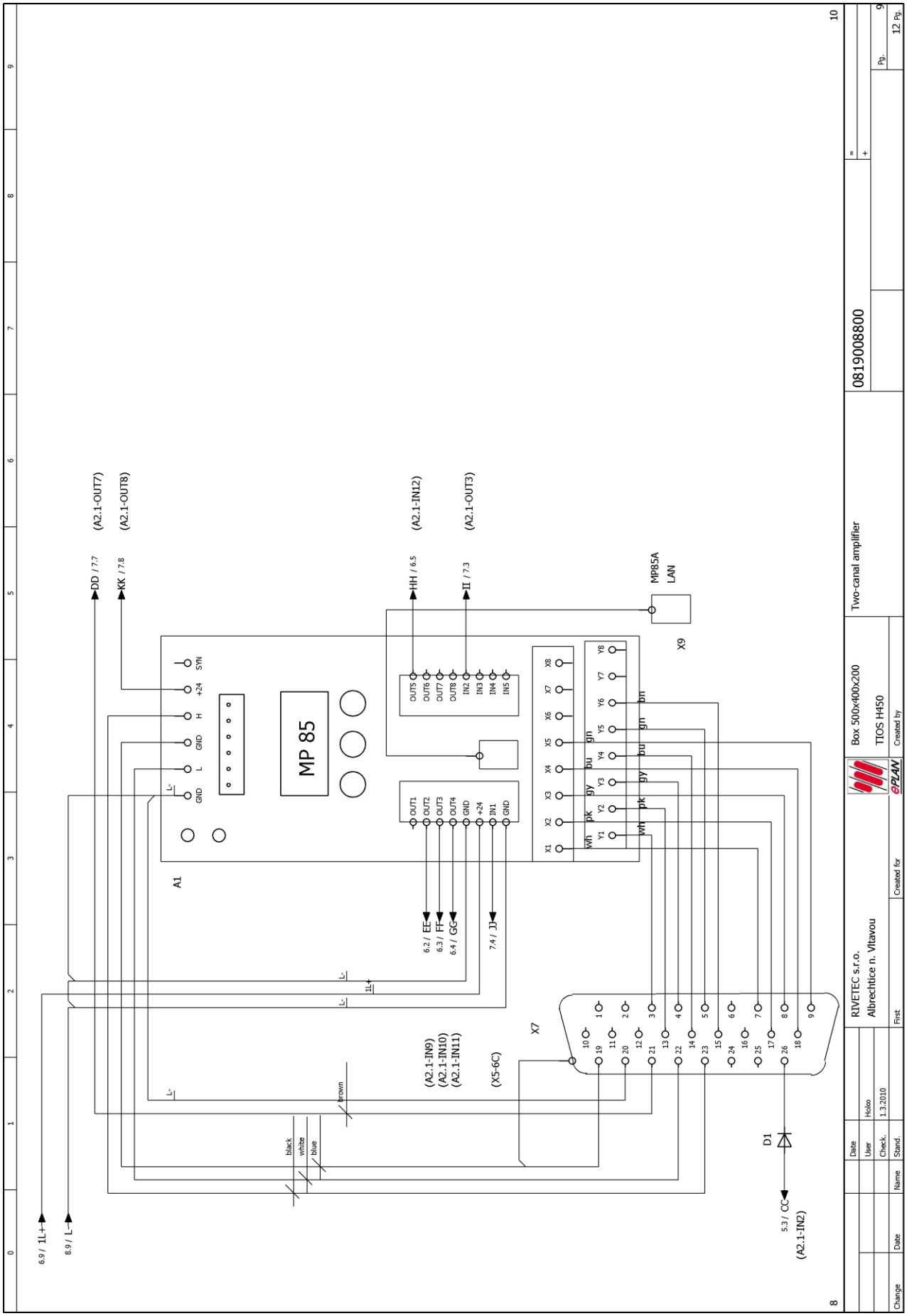
8
12 Pg.


(A2.1-OUT7)
(A2.1-OUT8)
(A2.1-IN12)
(A2.1-OUT3)
DD / 7.7
KK / 7.8
HH / 6.5
II / 7.3
MP85A
LAN
X9
MP 85
A1
SYN
+24
H
GND
L
GND
OUT5
OUT6
OUT7
OUT8
IN2
IN3
IN4
IN5
OUT1
OUT2
OUT3
OUT4
GND
+24
IN1
GND
X1
X2
X3
X4
X5
X6
X7
X8
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
wh
pk
gy
bu
gn
bn
6.2 / EE
6.3 / FF
6.4 / GG
7.4 / JJ
1L+
L-
X7
(A2.1-IN9)
(A2.1-IN10)
(A2.1-IN11)
(X5-6C)
brown
black
white
blue
D1
5.3 / CC
(A2.1-IN2)
6.9 / 1L+
8.9 / L-
0819008800
Two-canal amplifier
Box 500x400x200
TIOS H450
RIVETEC s.r.o.
Albrechtice n. Vltavou
Created by
Created for
First
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User
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Stand.
Name
Holoo
1.3.2010
Change
Pg. 9
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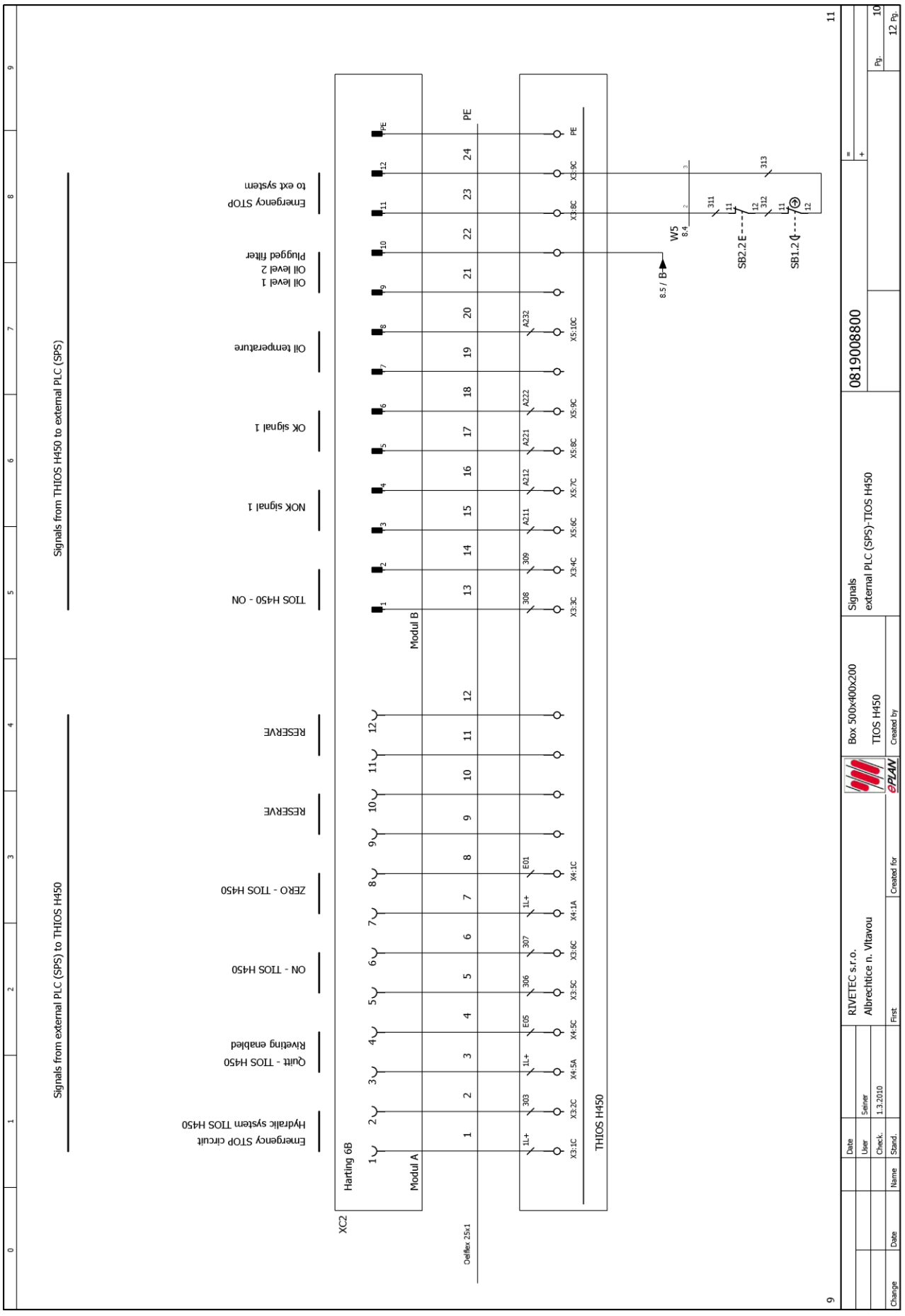
Signals from external PLC (SPS) to THIOS H450
Signals from THIOS H450 to external PLC (SPS)
Emergency STOP circuit
Hydraulic system TIOS H450
Quitt - TIOS H450
Riveting enabled
ON - TIOS H450
ZERO - TIOS H450
RESERVE
RESERVE
TIOS H450 - ON
NOK signal 1
OK signal 1
Oil temperature
Oil level 1
Oil level 2
Plugged filter
Emergency STOP
to ext system
XC2
Harting 6B
Modul A
Modul B
Oelflex 25x1
THIOS H450
PE
W5
SB2.2
SB1.2
RIVETEC s.r.o.
Albrechtice n. Vltavou
Box 500x400x200
TIOS H450
Signals
external PLC (SPS)-TIOS H450
0819008800

Bill of materials

ESSO004E

Component designation	Quantity	Designation	Type number	Supplier	Part number
Box	1	Schneider 500 x 400 x 200	NSYS3D5420P	Schneider	
Box	1	Schyller 150 x 220 x 75	93244	Schyller	
Q1	1	Main switch 25A	GN25 10U 25,51	Kon far	
FA1	1	Circuitbreaker 3P 6A D	PL7 - D6/3	Moeller	
FA2	1	Circuitbreaker 1P 10A D	PL7 - D10/1	Moeller	
FA3, FA4	2	Circuitbreaker 1P 4A C	PL7 - C4/1 DC	Moeller	
TC1	1	Power supply 230V/ 24V DC - 5A Eco rail	85303	Murr	
A1	1	Two-canal amplifier	MP85A	Titgemeyer	
A2.1	1	PLC	AI2-24MR-D	Autocont	
A2.2	1	PLC - expansive plate outputs	4EYR	Autocont	
K1	1	Contactor 3P 9A . 24VDC	LC1-D09 BD	Schneider	
KA1	1	Emergency relay	PNOZ X2 24V DC	Pilz	
KA2, KA3, KA4, KA5,	4	SSR relay MIRO 6.2. 2A	52501	Murr	
XC1	1	Plug 16A (3P+N+PE) IEC 309	TYPE IV 1653	SEZ	
SB1	1	Push button - mushroom actuator with aretation RED	XB5-AS8445	Schneider	
SB2	1	Push button - actuatot RED	XB5-AA42	Schneider	
SB3, HL2	1	Push button - iluminated actuatot WHITE	XB5-AW31B5	Schneider	
SB4, SB5	2	Push button - actuator black (part rivetig gun)	P-DT6SW	GM	
SB6	1	Push button - selector black	XB5 - AD21 + ZBE - 102	Schneider	
HL1	1	Pilot light GREEN	XVL-A233	Schneider	
HL3, HL4,	2	Pilot light RED	XVL-A234	Schneider	
D1	1	Diode	1N407	GM	
D2, D3	1	LED diode twocoulor (part rivetig gun)	L-115 WEGW	GM	
R1	1	Resistor 3k9 0,6W	RR 3k9 110-089	GM	
X1	1	Terminal-3pcs grey, 1pc blue, 6pcs green/yelow	280641 + 280651 + 280637	Wago	
X3	1	Terminal-1pc orange, 10pcs grey	270564 + 270560	Wago	
X4	1	Terminal-1pc orange, 17pcs grey	270564 + 270560	Wago	
X5	1	Terminal-1pc orange, 13pcs grey	270564 + 270560	Wago	
X7	1	Connector CAN26Z	801E112	GM	
X8	1	Terminal-1pc orange, 20pcs grey	270564 + 270560	Wago	
X9	1	Socket LAN	2482.720	Rittal	
M1	1	Hydraulic pump	3268290	Flutec	
Y1, Y2, Y3 BS1, BS2	1	Block hydraulic valves and baroscops	4WE6G - 6004980	Hydac	
ST1	1	Thermal sensor - oil temperature (part of h. pump)		Hydac	
SL1, SL2	2	Level sensor - oil level 1 and 2 (part of h. pump)		Hydac	
SL3	1	Flow sensor (part of h. pump)		Hydac	
X6	1	Connector R2,5 BAUF.A1+isol. body R 2,5-17 pol	72000000 R2,5 BAUF.A1+73006110-17p	Lapp Kabel	
Opposite pc X6	1	Connector R2,5 BAUF.D6+isol. body R 2,5-17 pollà	72041100 R2,5 BAUF.D6+73006610-17p	Lapp Kabel	
XC2 Connector Harting 6B	1	09140060303-1pc, 09140123001-1pc, 09140123101-1pc, 09150006102-12pcs,		Harting	
		09150006202-12pcs, 19300061541-1pc			
	2	Cover holder	HP3	Weidmüller	
	0,1 m	Cover	ADP3	Weidmüller	
	6	Cable clamps PG16	BS-05	Aspera	
	9	Cable clamps PG9	BS-02	Aspera	

10 12

			Date	30.7.2003	RIVETEC s.r.o. Albrechtice n. Vltavou		Box 500x400x200	Bill of materials	0819008800
			User	MAR			TIOS H450		
			Check.	1.3.2010					Pg. 11
Change	Date	Name	Stand.		First	Created for	Created by		12 Pg.

Prepared by: A. Solfronk

RIVETEC TITGEMEYER GROUP

OPERATING MANUAL
RIVETING UNIT TIOS H450
TIOS H40

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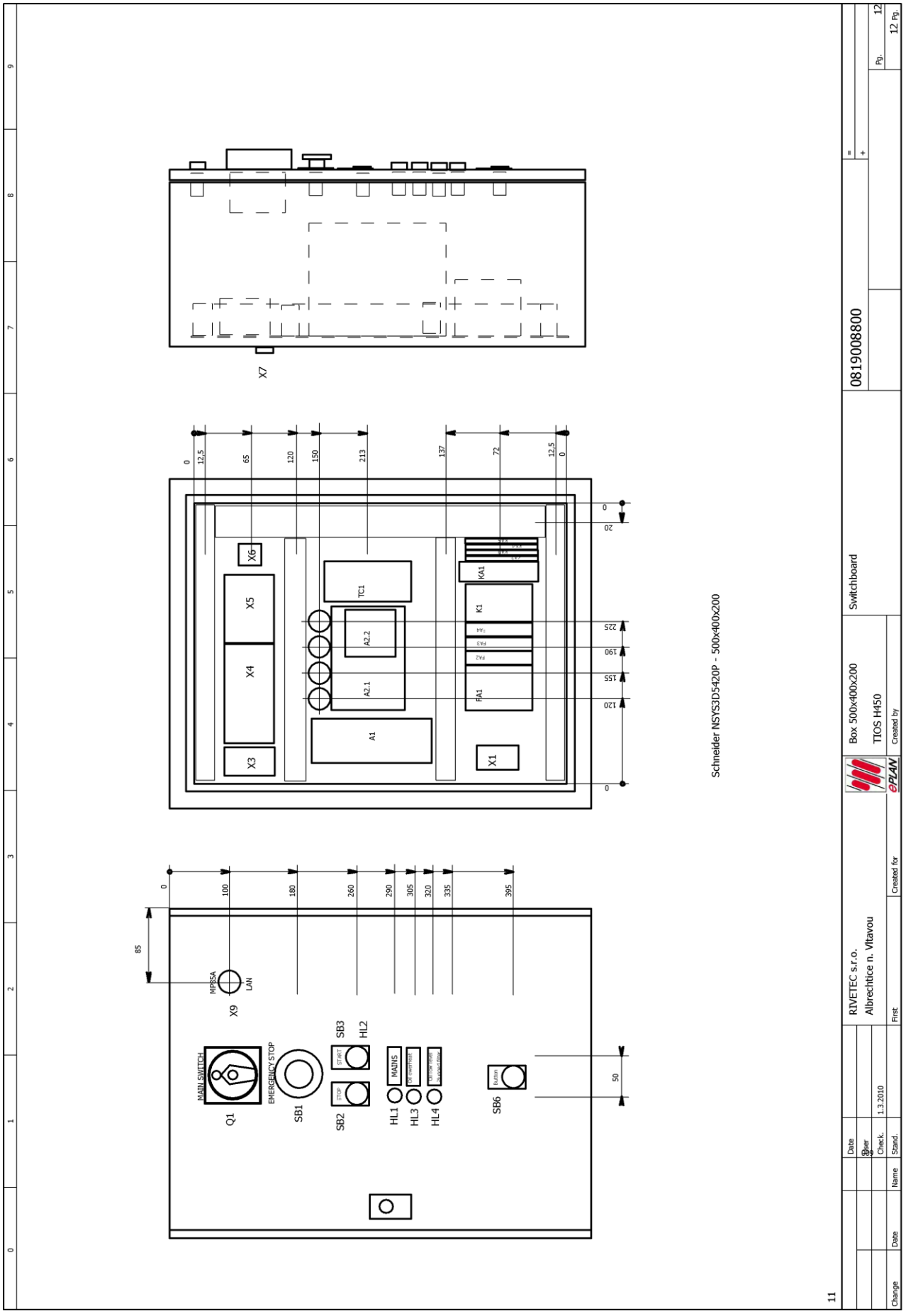
RIVETEC E100314


X7
0
12,5
65
120
150
213
137
72
12,5
0
20
225
190
155
120
0
X6
X5
X4
X3
TC1
A2.2
A2.1
A1
KA1
K1
FA3
FA2
FA1
X1
Schneider NSYS3D5420P - 500x400x200
0
100
180
260
290
305
320
335
395
85
MPBSA
LAN
X9
MAIN SWITCH
EMERGENCY STOP
SB3
HL2
START
STOP
MAINS
Q1
SB1
SB2
HL1
HL3
HL4
SB6
50
0819008800
Switchboard
Box 500x400x200
TIOS H450
RIVETEC s.r.o.
Albrechtice n. Vltavou
Created by
Created for
First
Date
Name
Stand.
Check.
1.3.2010
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Oil Technical Sheet

Slovnaft

INDUSTRIAL OILS

Madit OH-HM 32
HYDRAULIC OIL

Technical Information Bill

Description:

Hydraulic oil ***Madit*** **OH - HM 32** is solvent-refined and hydrotreated mineral oil with additives for improving oxidation stability, anticorrosion and antiwear properties, and antifoaming additives.

Use:

The oil ***Madit*** **OH - HM 32** is designed for hydrostatic mechanisms with high mechanical and thermal load; for stationary and mobile machines, working in the unprotected environment.
They are all-season oils and are compatible with most oils of other producers.
Approved by ZŤS, Dubnica nad Váhom, Slovakia.

Specifications:

Viscosity class:	ISO VG 32
Performance profile:	ISO-L-HM ISO 11158 HM HLP (DIN 51 524-2) HM (AFNOR NF E 48-603) Cincinnati Lamb P-68 Bosch Rexroth RE 90220

Physical & Chemical Properties:

Density at 15°C, kg/ m^3	informative	872
Kinematic viscosity at 40°C, mm^2/s		28,8 - 35,2
Kinematic viscosity at 100°C, mm^2/s	minimum	5
Dynamic viscosity at -20°C (CCS), Pa.s	maximum	2,5
Viscosity index	minimum	95
Open cup flash point according to Cleveland, °C	minimum	180
Pour point, °C	maximum	-33
Deemulsification characteristic at 54°C, min.	maximum	40

Packaging:

Madit **OH-HM 32** is supplied in 60 and 200 litres metal painted barrels, for wholesale in returnable containers, in tank cars and in railway tank cars.

Storage Conditions:

Madit **OH-HM 32** should be stored in closed original containers on the places protected against weather effect, strong sunlight and heating surfaces at the tem-perature to +40°C. Storage time at meeting above mentioned conditions is 3 years.

Manipulation:

Respect the safety principles at work with oil products.
For more information ask for the product's Safety Data Sheet.

Contact place for marketing information:
Slovnaft a.s., Technický servis mazív, Vlčie hrdlo, 824 12 Bratislava 23, Slovakia
Tel.: +421/2/5859 7646; 5859 7263; 5859 7647; 5859 7264; 5859 7399
Fax: +421/2/4524 6829
madit@slovnaft.sk, www.madit.sk

The data conform with the present technical state, we reserve the right of changes. January 2006

Oil Safety Sheet

MATERIAL SAFETY DATA SHEET MOL-LUB Ltd.

(91/155 EC)

Trade name: ***Madit* OH-HM 32 hydraulic oil**

Version: 3 Latest revision: 12. 09. 2006 Date of issue: 04. 12. 2003 Page: 1/(7)

14.1.1.1.1.2

1.

14.1.1.1.1.3 Identification of the substance / preparation and company

Product name:

14.1.1.2 *Madit* OH-HM 32

Product type / recommended uses:
preparation / hydraulic oil

Manufacturer / Supplier identification:
MOL-LUB Lubricant Production Trade and Service Limited Liability Company
H-2931 Almásfüzitő, Fő u. 21., Hungary

14.1.1.2.1 Phone / Fax: (+36-34) 526-330 / (+36-34) 526-391

14.1.1.2.2 For more information contact:

MSDS:
MOL-LUB Lubricant Production Trade and Service Limited Liability Company
Customer Service Center
H-2931 Almásfüzitő, Fő u. 21., Hungary

14.1.1.2.3 Phone / Fax: (+36-80) 201-296 / (+36-34) 348-010

Technical information:
MOL-LUB Ltd. Product Development and Technical Service
H-1117 Budapest, Október huszonharmadika u. 18., Hungary

15. Phone/Fax: (+36 - 80) 201-296 or (+36 - 1) 464-0236 / (+36 - 1) 464-0304

15.1 Emergency phone number: (+36) 34 526-210 or (+36) 34 526-144

15.2 Health Toxicological Information Service (ETTSZ 1096 Budapest, Nagyvárad tér 2.)

15.3 Tel.:(+36 - 1) 476-6464, or (+36 - 80) 201-199

15.4

2. Composition / information on ingredients

Chemical description: Refined mineral oil containing additives (antioxidant, corrosion-inhibitor, antiwear, viscosity modifier and pour point depressant).

Ingredients / Hazardous components:

15.4.1 Name	15.4.1.1 CAS/EINECS number	Hazard symbol	Risk phrase	Conc. %(m/m)
Base oil	101316-70-5/309-875-6	-	-	98 – 99.5
	101316-72-7/309-877-7	-	-	
Zinc alkyl dithiophosphate	confidential	Xi	R 36/38	max. 0.5

The full text of each relevant R phrase see in Section 16.

3. Hazards identification

Human health hazards: -
Note: Prolonged and/or repeated contact may cause irritation depending on individual sensitivity (see also Protective unit).
Safety hazards: -
Environmental hazards: -

4. First aid measures

General information: Never give anything by mouth to an unconscious person, or never induce vomiting.

Inhalation: Remove the affected person to fresh air. If rapid recovery does not occur, obtain medical attention.

Skin contact: Wash skin with large amounts of water, use soap. If irritation persists, obtain medical attention.

Eye contact: Flush eyes with plenty of water for 10-15 minutes. Obtain medical attention.

Ingestion: If swallowed, give water, **do not** induce vomiting. Get medical attention.

Note to physician:

5. Fire-fighting measures

Fire hazards:
Moderately hazardous (see also Section 9 - flash point).

Suitable extinguishing media:
Foam, carbon dioxide, dry chemical powder.

Unsuitable extinguishing media:
Water jet.

Hazardous decomposition products:
On burning, phosphor oxides, sulphur oxides, at elevated temperature hydrogen sulphide can be formed.
In case of incomplete combustion, carbon monoxide, various hydrocarbons and soot can be formed.

Special protective unit:

-

Further information:

-

6. Accidental release measures

Personal precautions:

See Section 8.

Environmental precautions:
Prevent spills from entering into natural water, soil and drains by containing the liquid. Notify relevant authority.

Clean-up procedures / recovery
On soil: Contain spilled liquid with sand, earth or other suitable absorbents. Recover free liquid by pumping. Dispose of according to local regulations.
On water: Confine the spillage. Remove from surface by skimming or suitable absorbents. Notify local authorities according to regulations.

7. Handling and storage

Handling:
Keep away from radiant heat and open flame.
Keep general measures applied for normal operations with lubricants. No special requirements.
When using do not eat, drink or smoke. Avoid splashing the product.

Storage:
Store in dry, well ventilated place in tightly closed containers.
Keep away from radiant heat, open flame and strong oxidizing agents.
Storage temperature: max. 40°C.

8. Exposure controls / personal protection

Engineering control measures:
Not required.

Exposure limits:
Mineral oil mist: TWA: **5 mg/m^3**; STEL: 10 mg/m^3, for oil mist, vapour excluded (ACGIH).

Personal protection:

Respiratory protection:	Breathing apparatus not required.
Hand protection:	Oil-proof gloves (e.g. – PVC, nitrile).
Eye protection:	Protective goggles not required.
Skin protection:	Protective clothing.
Other special:	

General protective measures / hygiene:
Avoid contact with skin and eyes. Avoid prolonged breathing of oil vapours or mists.
Ensure washing facilities after working hours and before breaks. Take off contaminated or oil-soaked clothing, wash with warm water and soap.

9. Physical and chemical properties

Appearance:	
Physical state:	liquid, viscous
Colour:	yellow to brownish red
Odour:	characteristic
Change in physical state:	
Pour point (ISO 3016):	typ. -36°C
Boiling point:	
Flash point (COC) (EN ISO 2592):	typ. 210°C
Ignition point (EN ISO 2592):	
Autoignition temperature:	not available
Explosive properties:	not explosive
Oxidizing properties:	
Vapour pressure at 20°C:	negligible
Density at 20°C (EN ISO 12185):	typ. 0.876 g/cm^3
Solubility in water:	practically insoluble in water
Solubility in other solvents:	gasoline, kerosene, toluene, etc.
n-Octanol/water partition coefficient:	not available
Others:	
Heating value:	inf. 42 000 kJ/kg
Kinematic viscosity (EN ISO 3104)	
at 40°C, mm^2/s:	typ. 32.4 mm^2/s
at 100 °C, mm^2/s:	typ. 5.5 mm^2/s
pH:	not applicable

10. Stability and reactivity

Stability:	No decomposition if stored and handled properly.
Conditions to avoid:	Direct heat or ignition sources.
Materials to avoid:	Strong oxidizing agents.
Hazardous decomposition products:	On burning, phosphor oxides, sulphur oxides, at elevated temperature hydrogen sulphide can be formed. In case of incomplete combustion, carbon monoxide, various hydrocarbons and soot can be formed. Under normal conditions no dangerous decomposition products are formed.
Notes:	

11. Toxicological information

Acute toxicity:

Oral (OECD 401):	LD_{50} (rat)	> 2000	mg/kg	(based on components)
Dermal (OECD 402):	LD_{50} (rabbit)	> 2000	mg/kg	(based on components)

Irritation, skin sensitization:

Skin:	not irritant (based on components)
Eye:	not irritant (based on components).
Note:	Prolonged and/or repeated contact may cause irritation depending on individual sensitivity.
Sensitization:	not sensitising (based on components)

Chronic toxicity: not known

Other information, specific effects:

The product does not contain PCBs, PCTs, and other chlorine compounds, and heavy metals, barium compounds.

The base oil(s) contain(s) less than 3% DMSO extract (IP 346), therefore not classified as carcinogenic material according to 67/548/EEC NOTE L.

Carcinogen effect:	not known
Mutagen effect:	not known
Reproduction-damaging effect:	not known

12. Ecological information

Mobility:	Floats on water. Absorbs on soil.
Degradability / persistence:	
	15.4.1.1.1 Biodegradability:
Bioaccumulative potential:	
Ecotoxicity:	Not available.
Aquatic organisms:	
Soil organisms:	
Plants:	
Biological oxygen demand:	
Chemical oxygen demand:	
Heavy metal content:	None.
PCT, PCB and other chlorinated hydrocarbons:	None.
Environmental effects:	Spills may form a film on water surfaces causing impaired oxygen transfer.

13. Disposal considerations

Product disposal:

Wastes of the product or used oil should be treated as hazardous waste.

EWC cod: 13 01 10* or 13 02 05*

Mineral-based non-chlorinated hydraulic oils. or

Mineral-based non-chlorinated engine, gear and lubricating oils.

Disposal must be in compliance with national and local regulations.

Packaging disposal:

Containers with product residue should also be treated as hazardous waste according to national and local disposal regulations.
EWC cod: 15 01 10*

Packaging containing residues of or contaminated by dangerous substances.

Disposal must be in compliance with national and local regulations.

Wastewater:

Quality of wastewater emitted to natural water must comply with national and local regulations.

Care should be taken in any case to ensure compliance with EC, national and local regulations. It is the responsibility of the user to know all relevant national and local regulations.

14. Transport information

Land transport: Road/ Railway	ADR/RID:	Not classified.
Waterways: Inland waterways/ Sea transport	ADN/IMDG:	Not classified.
Air transport:	ICAO / IATA:	Not classified.

15. Regulatory information

Hazard symbol according to EU directives (67/548/EEC, 2001/59/EC, 2004/73/EC and 88/379/EEC,1999/45/EC, 2001/60/EC) and to Hungarian regulation [44/2000. (XII. 27.) EüM rendelet (existing version)] for hazardous substances and hazardous preparations:

Not required.

Hazardous component(s): -

The packaging must bear the inscription: -

R-phrases: Not required.

S-phrases: S 60: This material and its container must be disposed of as hazardous waste.
S 61: Avoid release to the environment. Refer to special instructions/Safety data sheets.

16. Other information

Recommended application / restrictions:
See product sheets.

Information given is based on our best knowledge and is intended to describe the product for the purposes of safety of transporting and handling only. It should not be therefore construed as guaranteeing any specific property of the product.
This safety data sheet has been made according to 88/379/EEC, 91/155/EEC, 93/112/EEC and 2001/58/EC directives.

Source of data presented in this material safety data sheet:
Test results of this product
Material safety data sheets of product's components
Hungarian and EU lists of dangerous substances
Relevant Hungarian regulation and EU directives
CONCAWE database

15.4.1.1.1.1

***15.4.1.*. The full text of each relevant R phrase in Section 2.:**

15.4.1.1.1.3

R 36/38: Irritating to eyes and skin.

15.4.1.1.1.4

Revision Indicators:

Section	15.4.2 Subject of change	**15.5 Date**	Version
1.	Modification of the name	27.02.2004	1
1. 15.	**16. For more information contact** 16.1.1 Regulatory information 16.1.2 Other corrections	30.11.2004	2
1 2 9 11, 14, 15, 16	*16.1.2.1.1.1.1.1 For more information contact* 16.2.1 Composition / information on ingredients 16.3.1 Physical and chemical properties *16.4.1.1.1.1.1.1 Regulatory information and other corrections*	**16.2 12.09.2006** **16.3** **16.4** **16.5**	3

Ústav aplikované mechaniky Brno, s.r.o.
Zkušební laboratoř č. 1228
ČSN EN 17025:2005
Osvědčení o akreditaci č.593/2007 - ČIA Praha
Veveří 95, 611 00 Brno
www. uam.cz

PROTOKOL O ZKOUŠCE - archivní číslo: 4288_1/08

MĚŘENÍ A VYHODNOCENÍ VIBRACÍ U NÝTOVACÍHO ZAŘÍZENÍ

1. **Identifikace zkouseného zařízení:**
Nýtovací zařízení RIVETEC typ TIOS H75

2. **Výrobce zařízení:**
RIVETEC s.r.o., Albrechtice nad Vltavou 16, PSČ 398 16, CZ

3. **Zkouška provedena dle norem:**
ČSN P CEN ISO/TS 8662-11:2006 Ruční mechanizované nářadí – Měření vibrací na rukojeti
ČSN EN ISO 5349-1,2:2002 Vibrace – Měření a hodnocení expozice vibracím přenášeným na ruce – Část1: Všeobecné požadavky, Část2: Praktický návod pro měření na pracovním místě

4. **Použité měřící zařízení:**

Akcelerometr – výrobce, typ,hmotnost:.....	Brüel&Kjær, typ 4384, hmotnost 11 g
Akcelerometr – výr. číslo:.....	2213203
Mechanický filtr – výrobce, typ, hmotnost:.....	Brüel&Kjær, typ 0559, hmotnost 16g
Zesilovač – výrobce, typ, výr. číslo:	Brüel&Kjær, Nexus typ 2692, 2247655
Záznamové zařízení – typ, dodavatel:	Záznamový počítač s měř. kartou ADF 16 BMC-MESSSYSTEMS.DE
Použitý software – název, verze, dodavatel: ...	NextView, ver.4.2, BMC-MESSSYSTEMS FlexPro, ver. 7, WEISANG.DE

5. **Výsledky zkoušky** - expozice celkovým vibracím na ruce pracovníka pracujícího s RHPH 75 TC:

Naměřená průměrná souhrnná vážená hodnota zrychlení	a_{hv} :	**$0{,}70 \pm 0{,}18$ m.s^{-2}**
Hodnota použitá pro posouzení (maximálně možná hodnota)		**$0{,}97$ m.s^{-2}**

6. **Osvědčení o zkoušce**

Nýtovací zařízení RIVETEC **TIOS H75 nepřekračuje přípustný expoziční limit vibrací** přenášených na ruce obsluhy po osmihodinovou pracovní směnu $a_{hv,8h}$ stanovený podle **Nařízení vlády ČR č. 148/2008** o ochraně zdraví před nepříznivými účinky hluku a vibrací (podle §12 musí A(8) < 1,4 m/s^2) a podle **Směrnice EP a Rady č. 2002/44/ES** o minimálních požadavcích na bezpečnost a ochranu zdraví před expozicí zaměstnanců rizikům spojeným s fyzikálními činiteli (vibracemi), (podle § 3 musí A(8) < 2,5 m/s^2). Doba jednoho nýtování musí minimálně trvat 3 sekundy.
Nýtovací zařízení RIVETEC typ **TIOS H75 výše uvedené limity splňuje.**

Podrobný popis a vyhodnocení zkoušky je provedeno v technické zprávě **ÚAM TZ 4288/08: „Měření a vyhodnocení vibrací u nýtovacího zařízení TIOS H75“**, která je k dispozici u výrobce zkouseného zařízení na adrese: RIVETEC s.r.o., Albrechtice nad Vltavou 16, PSČ 398 16, CZ

Ing. FLORYÁN Josef
vedoucí zkušebny

Ústav aplikované mechaniky BRNO s.r.o. AKREDITOVANÁ ZKUŠEBNÍ LABORATOŘ L1228

Prof. Ing. VEJVODA Stanislav, CSc.
ředitel ÚAM

V Brně dne: 17.09.2008

Ústav aplikované mechaniky Brno, s.r.o. **ZL – protokol o zkoušce**	**Arch. číslo:** 4288_1/08	**Revize: 0**	**Strana: 1/1**

RIVETEC TITGEMEYER Group

ES PROHLÁŠENÍ O SHODĚ
EU DECLARATION OF CONFORMITY

1 / 1

Název produktu: Product Name:	**TIOS H450**	**TIOS H450**
Kat. číslo: Cat. Number:	**PZ 8084**	**99-0142**
Určení produktu: Specifications:	hydraulický agregát určený pro pohon nýtovacího nářadí RIVETEC hydraulic aggregate for drive of riveting tool RIVETEC	
Parametry: Characteristics:	max. 45 MPa, 400 V	

Výrobce / Manufacturer

RIVETEC s.r.o.
Albrechtice nad Vltavou 16
CZ-39816 Albrechtice nad Vltavou
IČ 60647761

prohlašuje, že výše uvedený výrobek odpovídá následujícím evropským normám a směrnicím a byl navržen, vyroben a posouzen ve shodě s platnou legislativou ČR:

declares that the product listed is in conformity with the essential requirements and provisions of following Council Directives and conforms to the following standards:

ČSN EN ISO 12100 Bezpečnost strojních zařízení
ČSN EN 349 Bezpečnost strojních zařízení – Nejmenší mezery k zamezení stlačených částí lidského těla
ČSN EN 953 Bezpečnost strojních zařízení – Ochranné kryty
ČSN CR 954-100 Bezpečnost strojních zařízení: části řídicích systémů
ČSN EN 983 Bezpečnost strojních zařízení – Bezpečnostní požadavky pro fluidní zařízení a jejich součásti – Pneumatika
ČSN EN 999 Bezpečnost strojních zařízení – Umístění ochranných zařízení s ohledem na rychlosti přiblížení částí lidského těla
ČSN EN 61000-6-1 ed. 2 Elektromagnetická kompatibilita – Odolnost
ČSN EN 61000-6-4 ed. 2 Elektromagnetická kompatibilita – Emise
ČSN EN 60204-1 Bezpečnost strojních zařízení – Elektrické zařízení strojů – Všeobecné požadavky
ČSN EN ISO 13850 Bezpečnost strojních zařízení – Nouzové zastavení – Zásady pro konstrukci
ČSN EN ISO 13857 Bezpečnost strojních zařízení – Bezpečné vzdálenosti k zamezení dosahu k nebezpečným místům horními a dolními končetinami
ČSN EN ISO 1037 Bezpečnost strojních zařízení – Zamezení neočekávanému spuštění
ČSN EN 614-1 Bezpečnost strojních zařízení – Ergonomické zásady navrhování – Část 1
ČSN EN 60439-1 ed. 2 Rozvaděče nn – Část 1
2006/95/ES Elektrická zařízení určená pro používání v určitých mezích napětí
2004/108/ES Elektromagnetická kompatibilita
2006/42/ES Směrnice o strojích a zařízeních

Zákon č. 22/1997 Sb. o technických požadavcích
Zákon č. 71/2000 Sb. (změna zákona č. 22/1997 Sb.)
Zákon č. 205/2002 Sb. (změna zákona č. 22/1997 Sb.)
Zákon č. 226/2003 Sb. (změna zákona č. 22/1997 Sb.)
Zákon č. 102/2001 Sb. o obecné bezpečnosti výrobků
Zákon č. 227/2003 Sb. (změna zákona č. 102/2001 Sb.)
Nařízení vlády č. 18/2003 Sb. o požadavcích na výrobky z hlediska jejich elektrické kompatibility
Nařízení vlády č. 204/2003 Sb. o technických požadavcích na strojní zařízení

Místo a datum: Place and date:	Albrechtice nad Vltavou 27.11.2008
Jméno, funkce a podpis autorizované osoby: Name, Title and Signature of Authorized Person:	Ing. Antonín Solfronk Managing Director

RIVETEC TITGEMEYER Group

ES PROHLÁŠENÍ O SHODĚ
EU DECLARATION OF CONFORMITY

1 / 1

Název produktu:
Product Name: **TIOS H40**

Kat. číslo:
Cat. Number: **99-0139**

Určení produktu: hydraulické nýtovací nářadí pro usazování nýtů
Specifications: hydraulic riveting tool for installing rivets

Parametry:
Characteristics: tažná síla / setting power: 30,7 kN / 35 MPa; 39,3 kN / 45 MPa

Výrobce / Manufacturer

RIVETEC s.r.o.
Albrechtice nad Vltavou 16
CZ-39816 Albrechtice nad Vltavou
IČ 60647761

prohlašuje, že výše uvedený výrobek odpovídá následujícím evropským normám a směrnicím a byl navržen, vyroben a posouzen ve shodě s platnou legislativou ČR:

declares that the product listed is in conformity with the essential requirements and provisions of following Council Directives and conforms to the following standards:

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ČSN EN 349 Bezpečnost strojních zařízení – Nejmenší mezery k zamezení stlačených částí lidského těla
ČSN EN 953 Bezpečnost strojních zařízení – Ochranné kryty
ČSN CR 954-100 Bezpečnost strojních zařízení: části řídicích systémů
ČSN EN 983 Bezpečnost strojních zařízení – Bezpečnostní požadavky pro fluidní zařízení a jejich součásti – Pneumatika
ČSN EN 999 Bezpečnost strojních zařízení – Umístění ochranných zařízení s ohledem na rychlosti přiblížení částí lidského těla
ČSN EN 61000-6-1 ed. 2 Elektromagnetická kompatibilita – Odolnost
ČSN EN 61000-6-4 ed. 2 Elektromagnetická kompatibilita – Emise
ČSN EN 60204-1 Bezpečnost strojních zařízení – Elektrické zařízení strojů – Všeobecné požadavky
ČSN EN ISO 13850 Bezpečnost strojních zařízení – Nouzové zastavení – Zásady pro konstrukci
ČSN EN ISO 13857 Bezpečnost strojních zařízení – Bezpečné vzdálenosti k zamezení dosahu k nebezpečným místům horními a dolními končetinami
ČSN EN ISO 1037 Bezpečnost strojních zařízení – Zamezení neočekávanému spuštění
ČSN EN 614-1 Bezpečnost strojních zařízení – Ergonomické zásady navrhování – Část 1
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Místo a datum: Albrechtice nad Vltavou
Place and date: 27.11.2008

Jméno, funkce a podpis autorizované osoby: Ing. Antonín Solfronk
Name, Title and Signature of Authorized Person: Managing Director