

PROVOTEC....

Röntgen- und Hochspannungssysteme

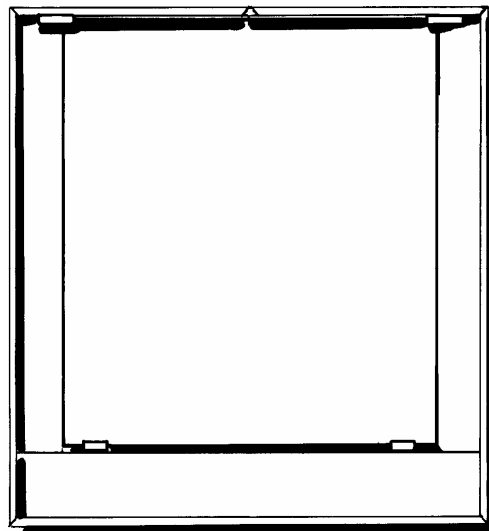
Bucky LRE, LRE-FSE and LREFA

Model/ID 0502 0000 – 0010

Model/ID 0502 0015 – 0021

Technical Description

Ident. No. 0502 7601 E



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Röntgen- und Hochspannungssysteme

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Schematics

Bucky 115/230 VAC Version with 24 V AC or DC start circuit	0502 7402
Bucky 115/230 VAC Version with 115/230 VAC start circuit	0502 7403
Bucky 24 VAC Version with 24 V start circuit.....	0502 7404
Cassette Tray KLFA (sensing)	0503 7400
Interface Control Dwg	0503 7213
Bucky LRE (FA) PCB Assy 115/230 VAC with 24 AC or DC V start circuit.....	0502 0800
Bucky LRE (FA) PCB Assy 115/230 VAC with 115/230 VAC start circuit.....	0502 0900
Bucky LRE (FA) PCB Assy 24 VAC with 24 V start circuit	0502 1000
Spare parts list	0502 7601 P

NOTE

The information contained in this document conforms with the configuration of the equipment as of the date of manufacture. Revisions to the equipment subsequent to the date of manufacture will be addressed in service updates distributed to the **PROVOTEC** Technical Service Organization.

Document Effectivity

Revision No.	Date	List of Effective Pages	Comments
	01/25/1999		Original Issue
01	02/11/1999	Warnings Chapter 1 Chapter 4 and 5	All pages revised new format
02	21/02/2000	Titel page Content NOTE Chapter 2 and 3 Chapter 6	
03	12/14/2005		Fail Safe unit
04	13/02/2006	Chapter 2.3	New picture, corrections
05	08/04/2006	Chapter 2.3, Spare parts list	Change from fail-safe magnet fixing to snap fixing
06	11.12.2006	Chapter 5	VDE marking removed

Radiation Warning

The component of the equipment described within this Document is part of a system for the intended generation of X-rays for medical diagnosis.

X-rays generate a potential risk for both patients and operators.

For this reason the application of X-rays for a given medical purpose must aim at the minimization of radiation exposition to any persons.

Those persons responsible for the application must have the specific knowledge according to legal requirements and regulations and must establish safe exposure procedures for this kind of systems.

Those persons responsible for the planning and installation of this equipment must observe the national regulations.

Mechanical - Electrical Warning

All of the **movable assemblies and parts of this equipment** should be operated with care and routinely inspected in accordance with the manufacturer's recommendations contained in the equipment Accompanying Documents.

Maintenance and service is only to be performed by personnel authorized by **PROVOTEC GmbH & Co. KG**.

Live electrical terminals are deadly.

Do not remove flexible high tension cables from X-ray tube housing or high tension generator and/or access covers from X-ray generator.

For all components of the equipment protective earthing means must be provided in compliance with the national regulations.

Failure to comply with the foregoing may result in serious or fatal bodily injuries to the operator or those in the area.

To the User

The user of this Document is directed to read and carefully review the instructions, warnings and cautions contained herein prior to beginning operation, installation or service activities. While you may have previously operated equipment similar to that described in this Document, changes in design, manufacture or procedure may have occurred which significantly affect the present operation.

The installation and service of equipment described herein is to be performed by authorized, qualified **PROVOTEC** personnel. Assemblers and other personnel not employed by nor directly affiliated with **PROVOTEC** technical services are directed to contact the local **PROVOTEC** office before attempting installation or service procedures.

Improvement Recommendations

Users of this Document are encouraged to report errors, omissions and improvement recommendations to the following address:

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Chapter 1

1 Equipment Description

1.1 Introduction

The Bucky is intended for installation and movement of an x-ray grid, for insertion of a cassette tray (alternatively with size sensing) and installation of a measuring chamber for x-rays and for operation of an X-ray generator with Automatic Exposure Control (AEC).

X-ray grid, cassette tray and measuring chamber with adaptation parts have separate order numbers.

The x-ray grid is being used for reduction of scatter radiation which causes a decrease of image quality. The oscillating movement of the x-ray grid avoids the visibility of grid lines on the film.

This Technical Description comprises two versions of the Bucky with different supply voltages; for 115 / 230 V AC (selectable) and 24 V AC

ATTENTION:

The bucky may be installed only in equipment designed according to EN 60601-1 or UL 2601-1 and operated within its specifications.

1.1.1 X-ray grid

X-ray grids with the following specifications can be used.

Dimensions:

Length in direction of movement	(479.5 +/- 1) mm
Width	(438 +/- 1) mm
Thickness	up to 5 mm
Max. weight:	2.4 kg

1.1.2 Cassette tray

Without size sensing:	Model No. 05010000
Without size sensing with fail safe:	Model No. 05010003
With size sensing:	Model No. 05030000

1.1.3 Measuring chambers

Length in direction of movement	max. 550 mm
Width	max. 470 mm
Thickness	=< 11 mm
Max. weight:	2.4 kg

Mounting and dimensions of usable measuring chambers have to be checked individually. Their design and corresponding adaptation parts determine the compatibility

1.2 Specifications

- The design of the Bucky is in compliance with class I, type B equipment of EN 60601-1, UL 2601-1 and CAN/CSA C22.2 No. 601.1-M90. The Bucky is suitable only for short time operation (refer to maximum exposure repetition rate).
- **Standards:**
 - EN 60601-1
 - UL 2601-1 and CAN/CSA C22.2 No. 601.1-M90
- **Product life:**
 - 10 years
- **Maintenance**
 - No maintenance required

- **Electrical interface**
Via a plug or a terminal strip (version according to customer requirement)
- **Line voltage** (Bucky models equipped with transformer T1):
115 V /230 VAC +/- 10%, 50 / 60 Hz (transformer inside the bucky)
Transient current: approx. 1 A
Nominal current: 0.35 / 0,16 A
Fuse: 0.5 / 0,25 A slow-blow

24 V AC +/- 10%, 50 / 60 Hz
Transient current: approx.. 3 A
Nominal current: 1.5A
Fuse: 2.0 A slow-blow (external fusing)
- **Grid start signal**
24VAC, 50/60Hz
24VDC
115/230V, 50/60 Hz (Version according to customer requirement)
- **Transport and stock environment:**
Temperature range: - 15 °C to + 70 °C
Relative humidity range: 10 % to 95 % (none condensing)
Atmospheric pressure range: 500 hPa to 1060 hPa
- **Operating environment:**
Temperature range: + 10 °C to + 40 °C
Relative humidity range: 30 % to 75 %
Atmospheric pressure range: 700 hPa to 1060 hPa
- **Exposure release contacts of the Bucky start relay:**
Voltage: max. 24 V DC
Current: max. 500 mA
- **Exposure time**
with grid 40 lines, 12:1 approx. 2,0 ms till 20 sec.
- **Maximum exposure repetition rate:**
Duty cycle 20%
6 exposures per minute
- **Exposure start position:**
8 mm from home position
(corresponds to 120 ms at a x-ray grid travel speed of 15 cm per second)
- **X-ray grid travel speed:**
Factory adjusted to 15 cm per second +/- 10 % (maximum 18.8 cm per second adjustable)
- **X-ray grid travel range:**
+/- 10,5 mm around the center
- **Outside dimensions**
Table top length direction 572 mm
Table top cross direction 584 mm
Height 68,5 mm
- **Operation**
Horizontal grid movement only
- **Mounting**
Horizontal to vertical
For mounting holes refer to dwg. 0502 7213 (interface control dwg.)

Weight	Product	included packing and Documentation
	Bucky LRE and cassette tray KL	13,00 kg 14,24 kg
	Bucky LRE and cassette tray KL-FSE	13,40 kg 14,54 kg
	Bucky LREFA and cassette tray KLFA	14,72 kg 16,24 kg
	Cassette tray KL	4,14 kg 5,00 kg
	Cassette tray KLFA	5,08 kg 5,94 kg

- **Explosion hazard**

This unit is not determined for use in areas of explosion hazards

- **EC Conformity**

This unit is in conformance with the basic requirements of the MDD 93/42 ECC for medical products according article 11 and Annex VII.

The declaration of conformity is available upon request at:

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1.3 Disposal

For disposal the national and regional regulations have to be considered.

The bucky consists mainly of mechanical and electrical parts and some plastic pieces.

In case of doubt contact Provotec GmbH & Co. KG

Chapter 2

2 Installation

Attention

Equipment installation may be performed only by Provotec GmbH & Co. KG service personal or agents expressly authorized by us.

The bucky may be installed only in equipment designed according to EN 60601-1. If the bucky should be installed in equipment, which does not meet the above mentioned regulations the system responsible has the duty to check that no risk exists. The bucky has to be operated within its specifications in each case.

The installation work must never be performed with line voltage connected or applied .

2.1 Mechanical installation

2.1.1 Installation of the measuring chamber within the bucky

- Unscrew cover plate (Figure 2-1, item 7)

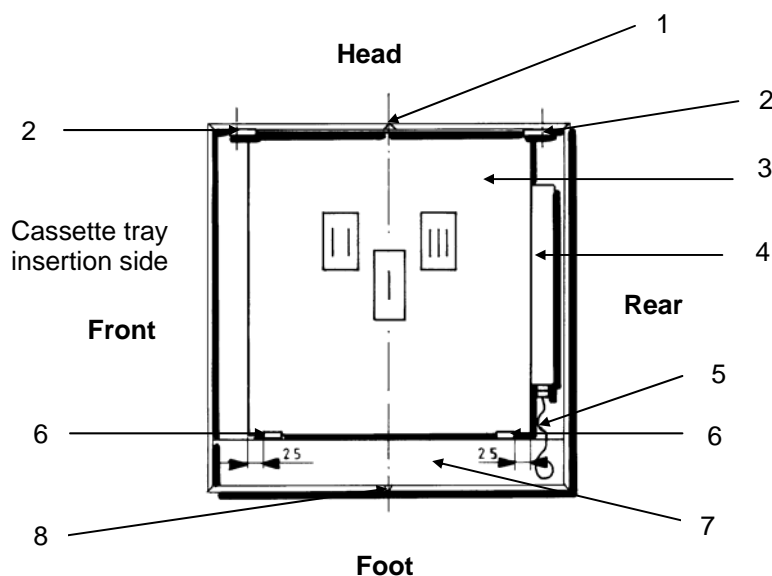


Fig. 2-1 Bucky with Measuring chamber

- Insert the measuring chamber (Figure 2-1, item 3) into the bucky with the preamplifier to the rear and the left measuring field (II) and the right field (III) to the head direction (Figure 2-1, item 4)
- Place positioning blocks (Figure 2-1, item 6) according to version of the chamber (Figure 2-1, item 3) approx. 25 mm apart from the border of the measuring chamber (refer to Fig 2-1) and insert chamber with blocks into the bucky.
- Position fasteners (figure 2-1, item 2) at the measuring chamber and tighten them at the corresponding holes of the bucky frame.
- Take care that the center of the chamber is in line with the center of the bucky. The front to rear center is marked by a notch (Figure 2-1, item 1) and a slotted hole (Figure 2-1, item 8). the head to foot center should be fixed automatically by the positioning blocks.
- Connect the chamber interface cable (Figure 2-1, item 5) at the preamplifier of the chamber (Figure 2-1, item 4)

2.1.2 Installation of the x-ray grid within the bucky.

- Place the x-ray grid (Figure 2-2, item 1) with marking for the x-ray tube (e.g. x-ray tube symbol) directed to the x-ray tube.
- Fix the grid with four clamping springs (Figure 2-2, item 2) and four nuts (Figure 2-2, item 3) at the movable grid frame of the bucky (Figure 2-2, item 4).

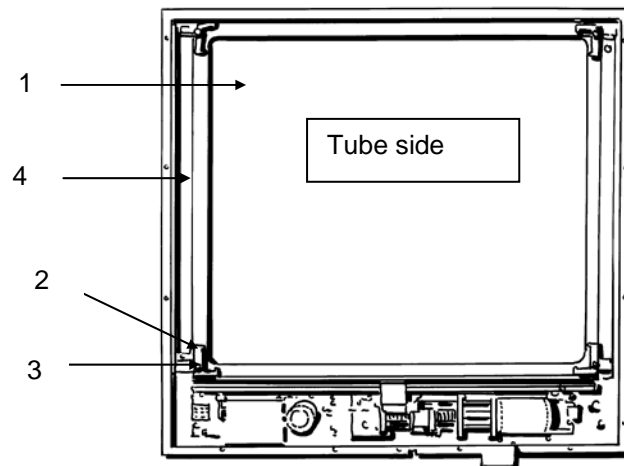


Fig. 2-2 Bucky with grid

2.1.3 Installation of Bucky within a table or a wall stand

At all sides of the Bucky there are tapped holes for mounting (refer to Interface control dwg. 05027213).

2.1.4 Wall stand Bucky conversion from left-hand to right-hand loading

NOTE

Due to installations requirements it might be necessary to convert the Bucky from left-hand loading (standard) to right-hand loading

2.1.4.1 Cassette tray without size sensing

1. Wall stand

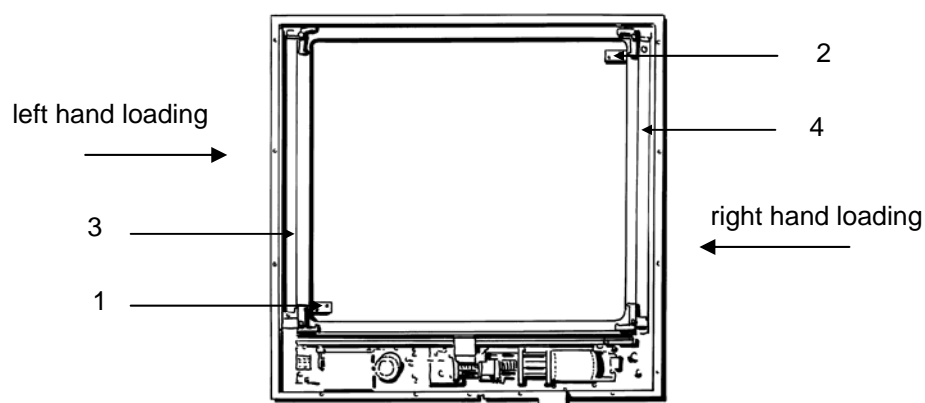


Fig. 2-3 Bucky

- Remove the cassette tray. From the bottom side of the Bucky unscrew the end stop (Figure 2-3, item 1) which prevents the cassette tray from being completely pulled out and the spring (Figure 2-3, item 3) which grounds the cassette tray and screw both parts again into the diagonal located holes (Figure 2-3, item 2 for the end stop and Figure 2-3, item 4 for the spring).

Attention: The hole to fasten the spring has to be cleaned from paint to ensure proper contact of the screw to the bucky housing.

Insert the cassette tray from the right side now.

2. Table

At standard installation the wall stand is located at the head end side of the bucky table.

If the wall stand is located at the foot end side of the bucky table due to installation requirements it is necessary to rotate the measuring chamber inside the table bucky. The patient head and foot end side are exchanged now.

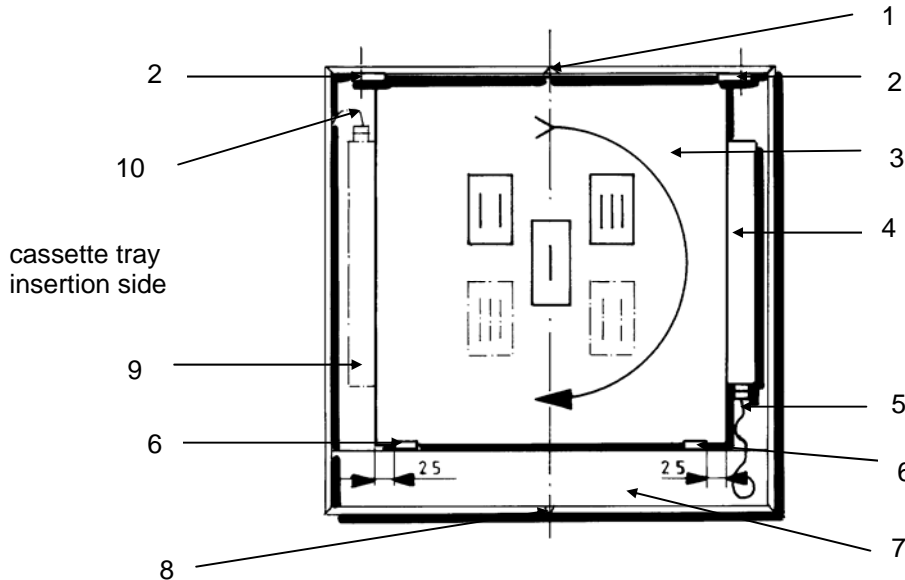


Fig. 2-4 Bucky with measuring chamber

- Unscrew cover plate (Figure 2-4, item 7).
- Remove the grid (Figure 2-2, item 1) by loosening the four nuts (Figure 2-2, item 3) and four clamping springs (Figure 2-2, item 2) from the frame (Figure 2-2, item 4).
- Disconnect the chamber interface cable (Figure 2-4, item 5) from the pre-amplifier of the measuring chamber (Figure 2-4, item 4).
- Remove the fasteners (Figure 2-4, item 2) from the measuring chamber.
- Pull out the measuring chamber (Figure 2-4, item 3) with positioning blocks (Figure 2-4, item 6) of the U-shaped rail of the Bucky.
- Turn the measuring chamber by 180 degrees (see Figure 2-4). The pre-amplifier of the measuring chamber (Figure 2-4, item 9) has to face the side for cassette tray insertion (see Figure 2-4).

ATTENTION

Ensure that the marked fields of the measuring chamber are upside after turning.

- Place the positioning blocks (Figure 2-4, item 6) at the measuring chamber (Figure 2-4, item 3) (approx. 25 mm apart from the border of the measuring chamber, see Figure 2-4) and insert them together with the measuring chamber into the U-shaped rail of the Bucky.
- Position the fasteners (Figure 2-4, item 2) at the measuring chamber and tighten them at the corresponding holes of the Bucky.
- Take care that the front to rear center of the measuring chamber and the front to rear center of the Bucky are in line. This center of the Bucky is marked by a notch (Figure 2-4, item 1) and a slotted hole (Figure 2-8, item 8).
- Connect the chamber interface cable (Figure 2-4, item 10) at the pre-amplifier of the measuring chamber (Figure 2-4, item 9).

3. Collimator

Corresponding to the measuring fields, the light centering pattern in front of the collimator has to be turned by 180 degrees.

2.1.4.2 Cassette tray with size sensing

1. Wall stand

- Remove the cassette tray. From the bottom side of the Bucky unscrew the end stop (Figure 2-3, item 1) which prevents the cassette tray from being completely pulled out and the spring (Figure 2-3, item 3) which grounds the cassette tray and screw both parts again into the diagonal located holes (Figure 2-3, item 2 for the end stop and Figure 2-3, item 4 for the spring).

Attention:

The hole to fasten the spring has to be cleaned from paint to ensure proper contact of the screw to the bucky housing.

- Unscrew the screws to fix the plate (Figure 2-5, item 3) and remove the plate from the Bucky.
- Unscrew the screws to fix the U-shaped bracket (Figure 2-5, item 1) from rear side of the plate and remove the U-shaped bracket with connector (Figure 2-5, item 2) from the plate (Figure 2-5, item 3) and mount it again at the opposite rear side of the plate.

Attention: The screws for the U-shaped bracket are fixed with Omnifit. Use this aneribic adhesive Omnifit 80 or 100 to fix the screws for the U-shaped bracket also.

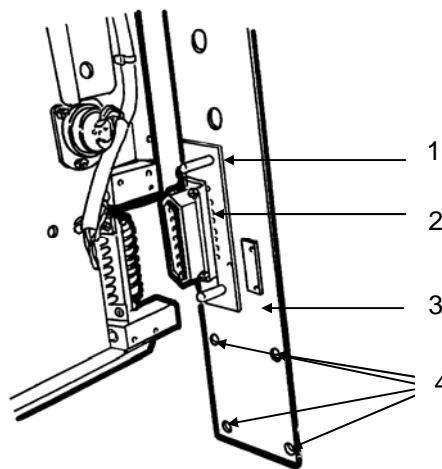


Fig. 2-5 Plate with U-shaped bracket and connector

- Unscrew the screws (Figure 2-6, item 3), remove the striker (Figure 2-6, item 2) from the plate (Figure 2-5, item 3) and mount it again at the opposite rear side into the middle slot of the plate (see Figure 2-6, item 1).

ATTENTION

Do not unsolder the cables/wires. The length is sufficient.

- Route the existing cable at the inner side at the upper Bucky frame through the motor drive part to the opposite side.

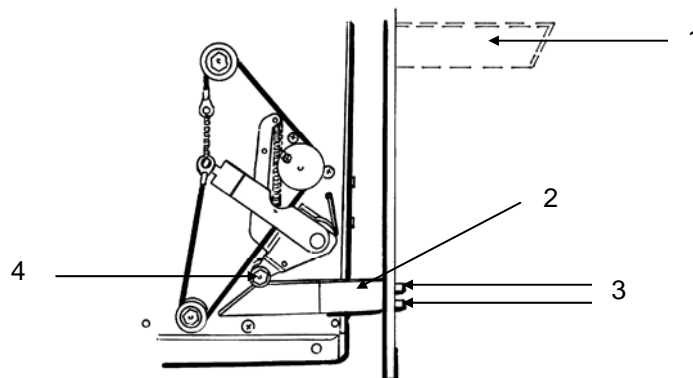


Fig. 2-6 Plate with striker

2.3 Bucky with Fail-Safe

Manual Cassette tray with Fail-Safe

The Bucky Fail-Safe contact block (Figure 2-8, item 1) detects the Fail-Safe signal of the manual cassette tray with Fail-Safe unit (Figure 2-8, item 3).

Via cable (Figure 2-8, item 2) the Fail-Safe signal is routed to Bucky electronic PCB (Figure 2-9, item 1) and controls the Bucky Contact release.

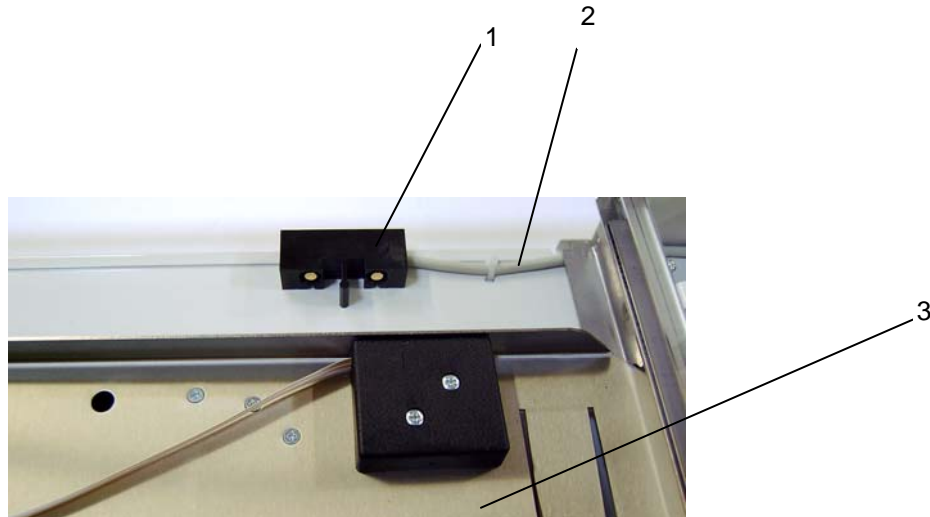


Figure 2-8 Bucky Fail-Safe contact block

Connection of Fail-Safe signal

Bucky with Manual Cassette tray with Fail-Safe unit:

The Fail-Safe signal comes from the Bucky Fail-Safe contact block (Figure 2-8, item 1) and is connected to the Bucky control PCB (Figure 2-9, item 1). Depending of the PCB version connections are made to the pads of position R22 or C.P.S. J5/1 and J5/2 (Figure 2-9, item 2)

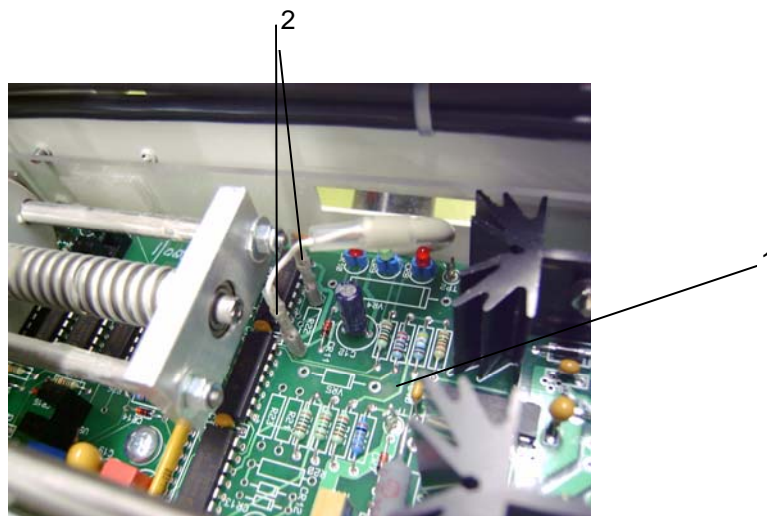


Fig. 2-9 Connection of Fail-Safe signal

Chapter 3

3 Functional Description

3.1 General description

The x-ray grid is being driven by a DC motor which is in line with an elastic clutch and a spindle with a feed screw which is elastically linked to the frame for the x-ray grid. The principle of movement is shown in the diagram travel range vs. time (see Figure 3-1).

The frame with x-ray grid starts from home position and travels with high speed to the first reversal. On that distance the exposure start signal is commanded. The majority of exposures is terminated prior to reaching the first reversal. The frame with x-ray grid continues with an oscillating movement at reduced speed.

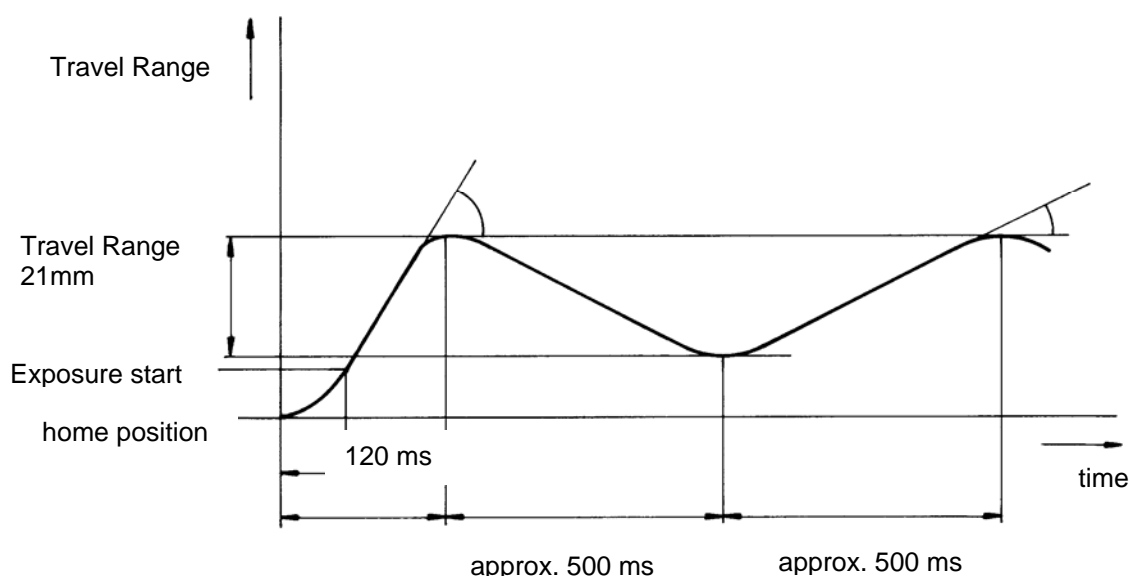


Fig. 3-1 Travel range vs. time diagram

3.2 Circuit description

The circuit description is based on Circuit Diagram 05027402 or 05027203 for 115 / 230 V ~ versions (with transformer T1) and on Circuit Diagram 05027404 at Buckys for 24 V ~ versions (without transformer T1).

The line voltages of 115 / 230 V ~ resp. 24 V ~ are rectified by the bridge CR4 and smoothed by capacitor C5.

At Buckys with transformer the no-load voltage at test point TP1 is 38 V DC and at Buckys (24VAC) without transformer is 36 DC.

Voltage regulator U3 and power transistor Q1 stabilize this DC voltage to approximately 24 V (TP3). Its level can be adjusted with potentiometer R15. This factory setting affects the grid travel speed and should not be changed in the field. Resistor R10 is the current limiter for voltage regulator U3.

The motor is driven via the Transistors Q5 to Q8 (for frame movement).

The motor drives a spindle and a lead screw transfers the motion to the frame for the x-ray grid.

The light barriers U9, U11 and U14 are actuated synchronously to the grid movement. Actuating light barriers U9 and U14 reverse the direction of the grid movement. U15 is actuated if the x-ray grid is in

its home position. When the x-ray grid moves approx. 8 mm away from its home position light barrier U11 becomes actuated and exposure release relay K1 becomes energized and the exposure release contacts are closed.

Actuating the trigger switch at the X-ray generator provides a Bucky start signal at the plug J1 directly or via terminal strip TB1 depending on version. By the start signal U1 becomes conductive so that the signal at pin 5 turns low. This low signal is supplied to inputs 6 and 8 of gate U7. The outputs 10 and 4 of gate U7 becomes high, which are fed to inputs 4 and 5 of the RS flip-flop U8.

If light barrier U9 is not actuated, the signal at its output is low. U6 (13, 12) inverts this low signal which causes input 3 of U8 (RS flip-flop) to go high as well. Input 2 of U8 is at high level because the signal at the output of light barrier U14 is high. U7 (12, 13) inverts that high signal so that output 11 of U7 becomes low and the signal at output 13 of U8 is high. Thus, the signals at the inputs 2, 3, 4 and 5 of U8 are high. Output 1 of U8 is low and output 3 of U10 high. The signals at the input 8 and 9 of U10 are high and output 10 of U10 is low.

Outputs 2, 4 and 6 of U12 have high signal levels and the transistor Q8 becomes conductive through R38. The transistor Q5 becomes conductive by U4 (14), Q4 and U13 (9, 11, 14, 10, 12, 15) via resistor R35, and the x-ray grid starts moving out of the home position.

When the light barrier U9 is actuated, the signal at the output of U9 becomes high and it makes input of U8 low via U6 (13, 12). The signal at output 1 of U8 turns high and the motor stops.

The RS flip-flop U8 is triggered. After a delay of 80 μ sec the motor is reactivated, but rotates in the opposite direction.

In standby the signal at output 16 of U4 is low. This reduces the reference voltage for voltage regulator U3 through the voltage divider formed by R9 and R13. With Bucky start signal on output 16 of U4 turns high. Via R9, and R11 charges capacitor C9 which provides a smooth motor start.

Simultaneously with the Bucky start signal capacitor C18 discharges through R26 and R27 until the low signal at input 2 of U7 allow the gate to reset. Output 3 of U7 turns high and output 16 of U4 turns low. The signal at the set point input 5 of voltage regulator U1 returns to low level and the motor rotates again with low speed. This change occurs prior to the first reversal of the motor.

Exposure release relay K1 with contacts K1A and K1B is energizes via the RS flip-flop U5 under the following conditions: If the temperature of Q 1 is normal the PTC PT2 has low resistance and the input 1 of U6 is high and output 2 of U6 low. Output 4 of U6 is high and the inputs 2 and 3 of U5 are high also.

With the Bucky start signal input 5 of U5 turns high. When the light barrier U11 is actuated the output signal at U11 goes high. Via U6 (11,10 and U5B) input 4 of U5A becomes high. The signal at output 1 of U5 goes low. Now relay K1 is energized through U4 (7, 10) and U4 (6, 11) and if existing via the cassette present switch.

3.3 Bucky with Fail-Safe present switch

Bucky with manual cassette tray

The Bucky contact releases an X-ray exposure only when the cassette present switch is closed and the Cassette Tray with Fail-Safe function is fully inserted into the Bucky.

Chapter 4

4 Replacement of Components

SERVICE NOTES

- The Bucky is maintenance-free. The spindle must not be lubricated, because the feed screw is made of self-lubricating plastic. Vestiges of a lubricant are caused by a single treatment during assembling for optimum running in.
- If the Bucky is contaminated by spilled liquids (e.g. contrast medium), the service should be called.
- In case of a breakdown of the Bucky the release of exposures is not generally disabled. If x-ray grid lines are visible on the film, the service should be called.

ATTENTION

The replacement of components may be performed only by PROVOTEC service personnel or agents expressly authorized by us. Replacement work must never be performed with the line voltage connected or applied.

4.1 Replacing the drive mechanism or PCB

- Remove the two inner Phillips screws and loosen the three Phillips screws at the frame of the Bucky. Now take off the cover of the PCB towards the inside..
- Unscrew the hex nut from the bolt that connects the shaft nut to the grid frame bracket.
- Move the frame with x-ray grid to the front until the bolt becomes free.
- Lift the x-ray grid frame off the foot end guide rail and remove it from the head end guide.
- Disconnect the plug P1 from the PCB and (if connected) the Fail-Safe signal (Fig. 2-9 item 2)
- Remove the 8 screws that fixes the PCB including the drive mechanism
- Now the PCB including the drive mechanism can be removed while slightly rotating it (lift the right frame section first).
- The motor drive mechanism can be removed by take out the two screws from the bottom side of the PCB.

ATTENTION







During remounting the motor drive mechanism with the 2 screws at the bottom side it is necessary to line-up the drive mechanism such that the two light barrier actuators run centrally between the two light barriers on the PCB. Check for correct alignment by turning the clutch by hand.

- Reinstall the PCB with drive mechanism in reverse order.

Chapter 5

5 Description of Graphic Symbols, Labels, and Abbreviations

5.1 Graphic symbols

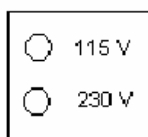
Symbol	Title
	Attention, consult accompanying documents
	Classification according EN 60601-1, Type B
	Alternating current
	Protective earth (ground)
	CE-marking
	UL-marking

5.2 Labels

Model Number 0502 0000-0010 and Model number 0502 0015-0021



Nameplate



Setted Line Voltage

5.3 Abbreviations

DC	Direct Current
mA	milliampere
V	volt
Hz	hertz
... A T fuse ...	ampere slow-blow
ms	milliseconds
kg	kilogramme
mm	millimetre
cm/s	centimetre per second
°C	degree Celsius
%	percent
hPa	hecto pascal
CE	Communautés Européennes

Chapter 6

6 List of Contact Functions and Potentiometers

Marking	Schematic Diagram Coordinates	Function
K1		Exposure release relay
Coil	0502 7402,3,4 B7	Energized by Bucky start, the light barrier U11 is actuated and temperature of Q1 is normal.
Contact		
A	0502 7402,3,4 AB8	Connects plug J1-1 and J1-2 resp. terminals TB1-1 and TB1-2 at terminal adapter. Contacts are in parallel to contact B
B	0502 7402,3,4 AB8	Connects plug J1-1 and J1-2 resp. terminals TB1-1 and TB1-2 at terminal adapter. Contacts are in parallel to contact A
Pots		
R27	0502 7402,3,4 B2	Adjustment of the period of high speed x-ray grid travel. The period is factory adjusted.
R15	0502 7402,3,4 B5	Adjustment of x-ray grid travel speed. The travel speed is factory adjusted.

6.1 External interface signal description.

6.1.1 115/230 VAC Version and 115/230 VAC start circuit (Dwg. 05027403)

Plug J1 Pin	Terminal TB	Function
1	1-1	Exposure release relay contacts A&B N.O.
2	1-2	Exposure release relay contacts A&B Arm
3		not used
4		not used
5		not used
6	1-3	Bucky start 115/230 V if jumper JP1 2-3 is inserted
7	1-4	115/230 VAC supply neutral
8		0 VDC of internal circuit for OEM purposes
9	1-8	115/230 V supply
GND Stud	1-6	PE

6.1.2 115/230 VAC supply voltage and 24 V start circuit (Dwg. 05027402)

Plug J1 Pin	Terminal strip TB1	Function
1	1-1	Exposure release relay contacts A&B N.O.
2	1-2	Exposure release relay contacts A&B Arm
3		not used
4	1-4	Bucky start signal 0 V
5		not used
6	1-5	24 V AC or DC supply for 0V bucky start signal
7	1-7	115/230 VAC supply neutral
8		0VDC of internal circuit for OEM purposes
9	1-8	115/230 VAC supply
GND Stud	1-6	PE

6.1.3 24 VAC Version and 24 V start circuit (Dwg. 05027404)

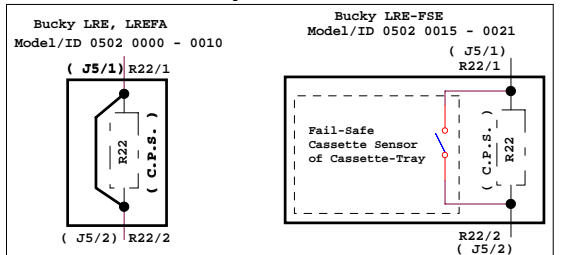
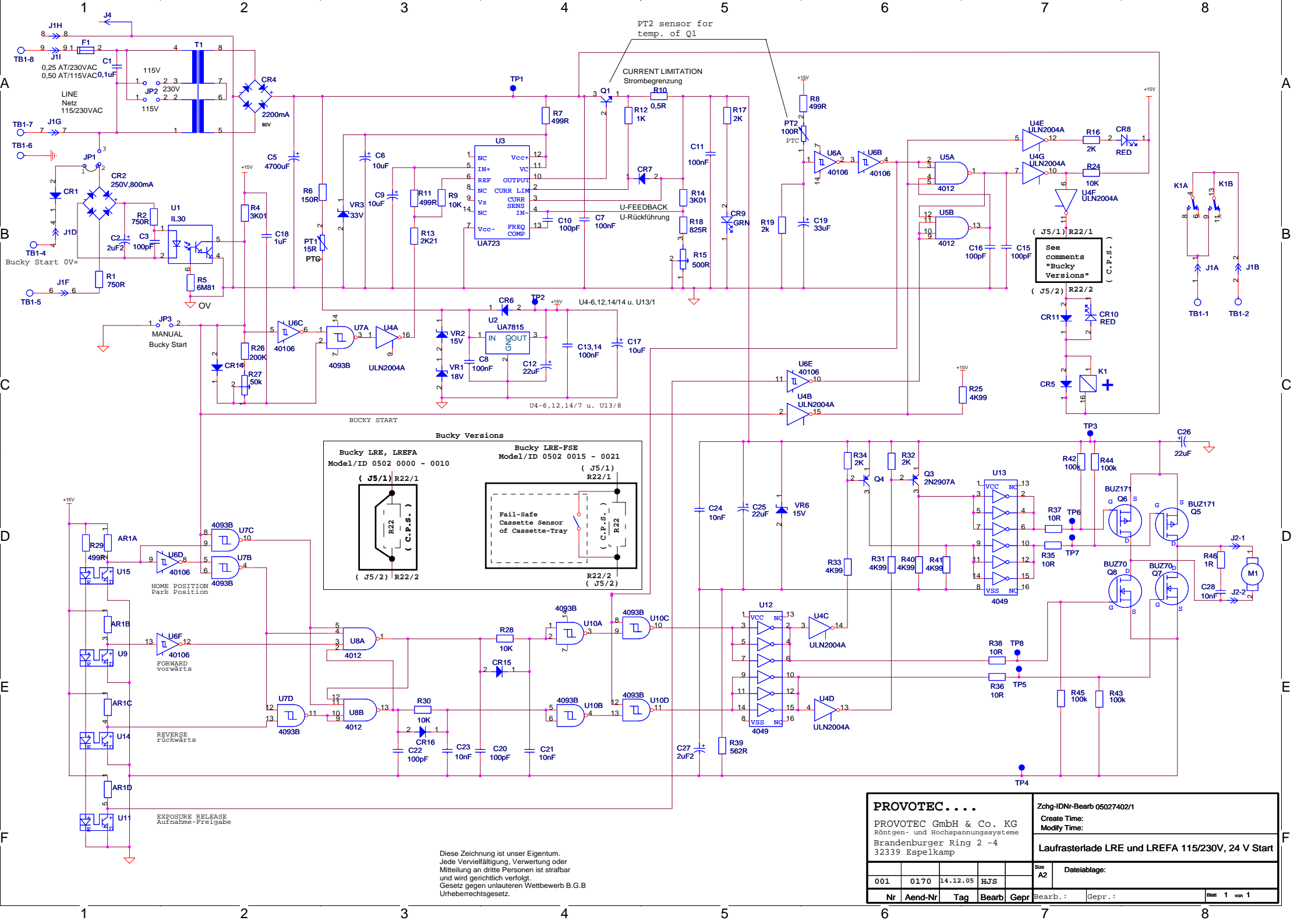
Plug J1 Pin	Terminal strip TB1	Function
1	1-1	Exposure release relay contacts A&B N.O.
2	1-2	Exposure release relay contacts A&B Arm
3		not used
4	1-4	Bucky start 0 VDC if jumper JP1 1-2 is inserted not used for 0 VAC start
5		not used
6	1-5	24 VDC supply for 0VDC bucky start. 0VAC bucky start if jumper JP1 2-3 is inserted.
7	1-7	24 VAC supply
8		0 VDC of internal circuit for OEM purposes
9	1-8	0 VAC supply
GND Stud	1-6	PE

6.1.4 Option for sensing (Dwg. 05037400)

Plug J3 Pin	Terminal strip TB 1	Function
1 + 8	1-9	Cassette present Sw. N.C.
2 + 9	1-10	Cassette present Sw. Arm
3 + 10	1-11	Cassette sense sign. transverse
4 + 11	1-12	Supply of sensing pots.
5 + 12	1-13	Cassette sense sign. longitudinal
6 + 13	1-14	Supply of sensing pots.
7 + 14		PE, internally connected to GND Stud

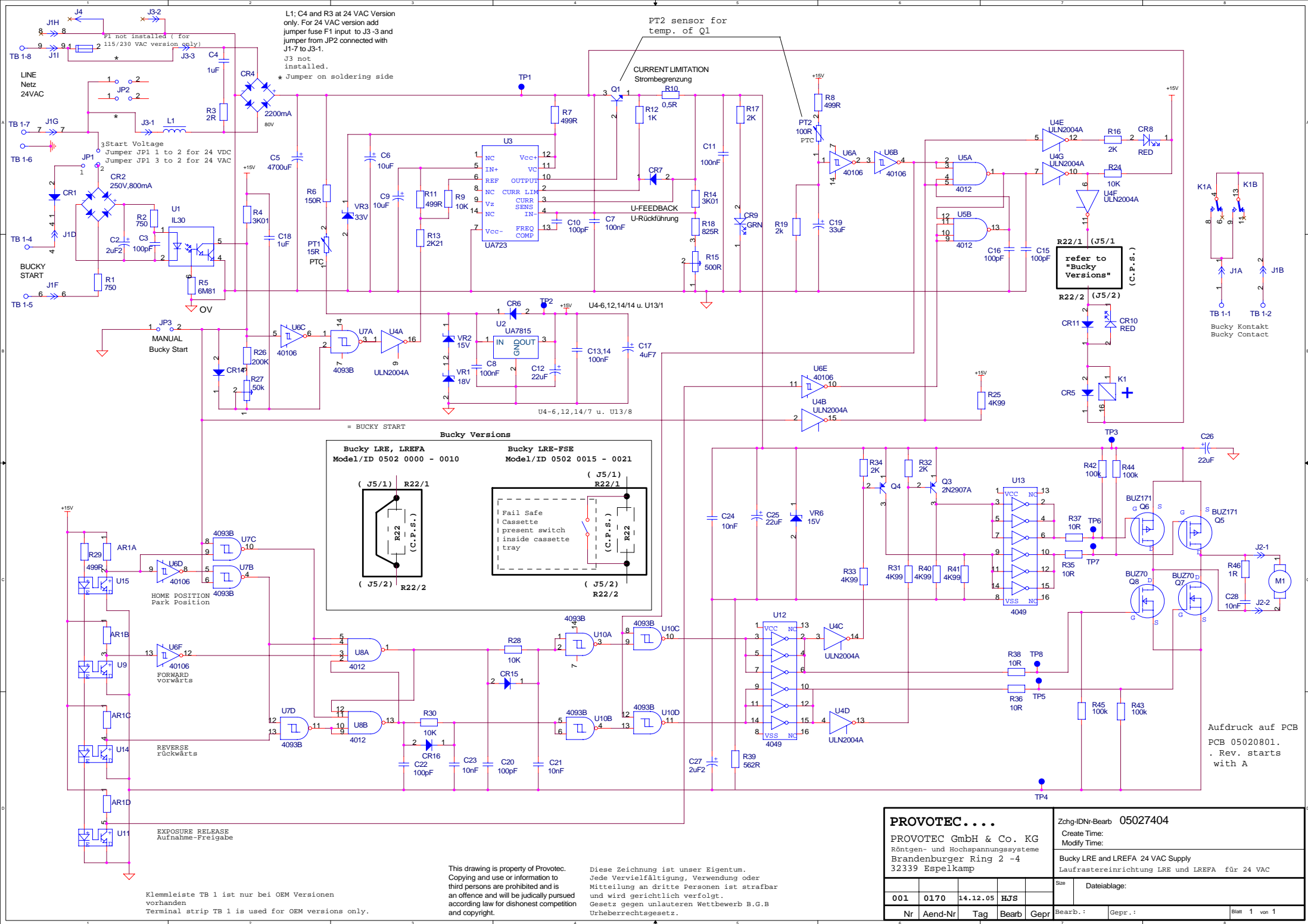
6.1.5 Bucky with Fail-Safe

See Chapter 2.3



PROVOTEC....					Zchg-IDNr-Bearb 05027402/1	
PROVOTEC GmbH & Co. KG Röntgen- und Hochspannungssysteme Brandenburger Ring 2 -4 32339 Espelkamp					Create Time: Modify Time:	
					Laufasterlade LRE und LREFA 115/230V, 24 V Start	
					Dateiablage:	
001	0170	14.12.05	HJS		Size A2	
Nr	Aend-Nr	Tag	Bearb	Gepr	Bearb.:	Gepr.:
						Blatt 1 von 1

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Mitteilung an dritte Personen ist strafbar
und wird gerichtlich verfolgt.
Gesetz gegen unlauteren Wettbewerb B.G.B
Urheberrechtsgesetz.

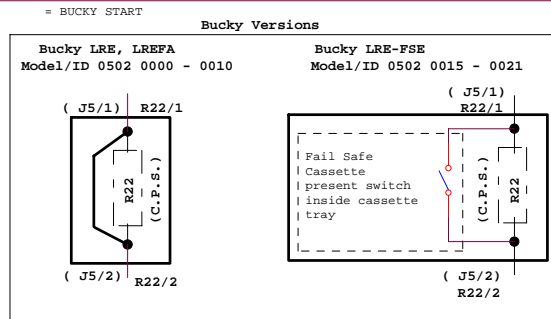


L1; C4 and R3 at 24 VAC Version only. For 24 VAC version add jumper fuse F1 input to J3 -3 and jumper from JP2 connected with J1-7 to J3-1.
 J3 not installed.
 * Jumper on soldering side

PT2 sensor for temp. of Q1

CURRENT LIMITATION
 Strombegrenzung

refer to "Bucky Versions" (C.P.+S.)



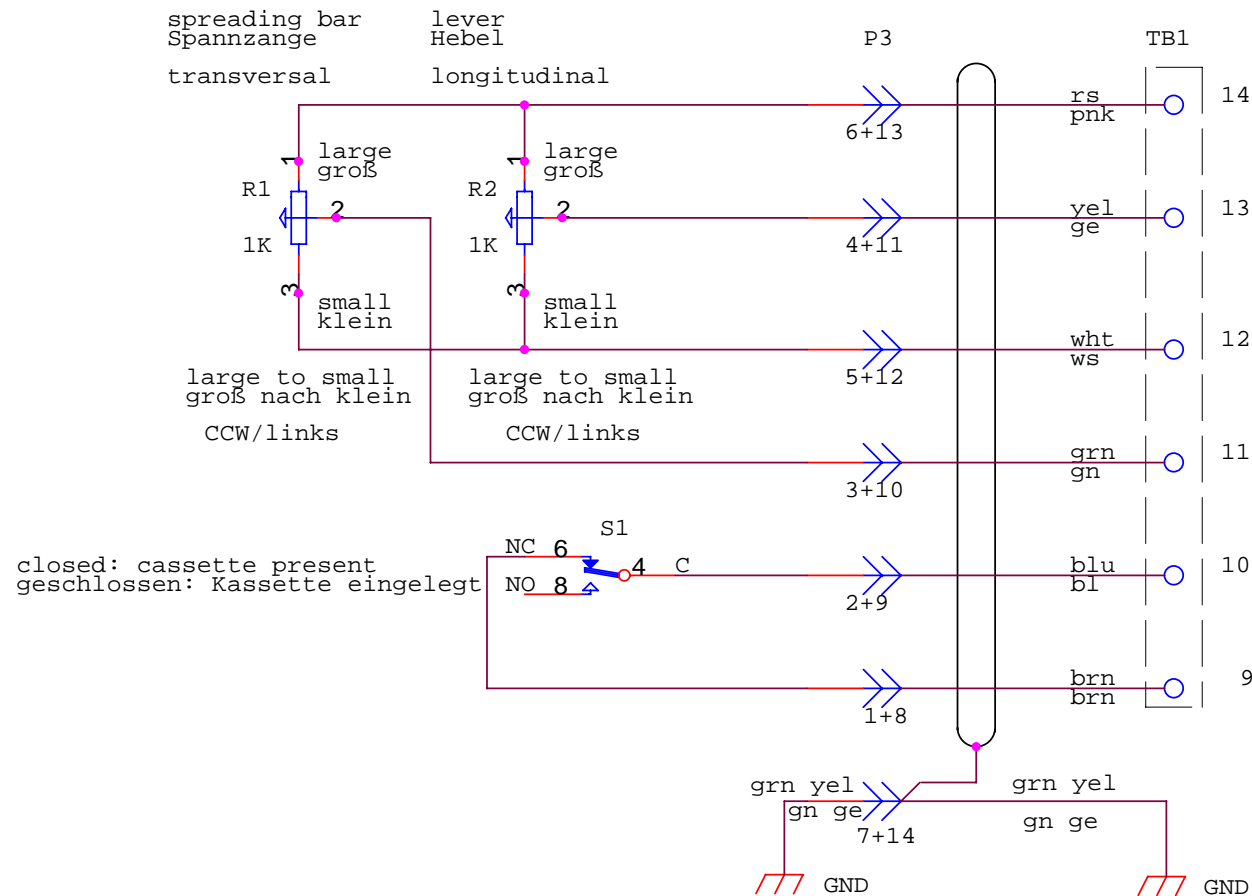
Klemmleiste TB 1 ist nur bei OEM Versionen vorhanden
 Terminal strip TB 1 is used for OEM versions only.

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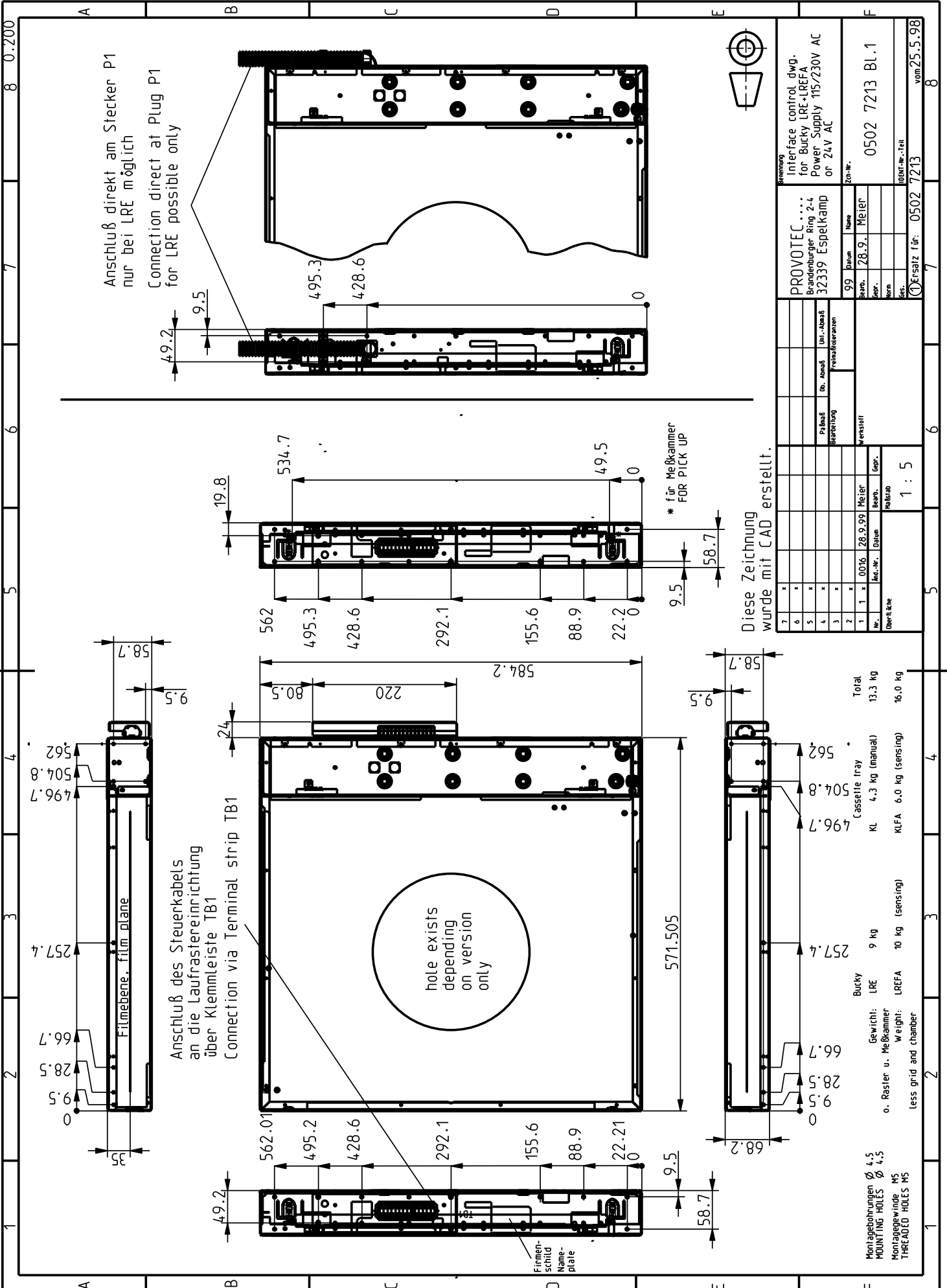
PROVOTEC					Zchg-IDNr-Bearb 05027404	
PROVOTEC GmbH & Co. KG Röntgen- und Hochspannungssysteme Brandenburger Ring 2 -4 32339 Espelkamp					Create Time: Modify Time:	
					Bucky LRE and LREFA 24 VAC Supply Laufstastereinrichtung LRE und LREFA für 24 VAC	
					Dateiablage:	
001	0170	14.12.05	HJS			
Nr	Aend-Nr	Tag	Bearb	Gepr	Bearb.:	Gepr.:
					Blatt 1 von 1	

Aufdruck auf PCB
 PCB 05020801.
 . Rev. starts with A



Gültig f. Standard Version
05030000
Used for standard version
05030000

PROVOTEC PROVOTEC GmbH & Co. KG Röntgen- und Hochspannungssysteme Brandenburger Ring 2-4 32339 Espelkamp					Zchg-IDNr-Bearb 05037400 Create Time: Modify Time:		
					Kassettenlade KLFA (Sensing) Cassette Tray KLFA (Sensing)		
					Size A4 Dateiablage:		
Nr	Aend-Nr	Tag	Bearb	Gepr	Bearb.:	Gepr.:	Blatt 1 von 1

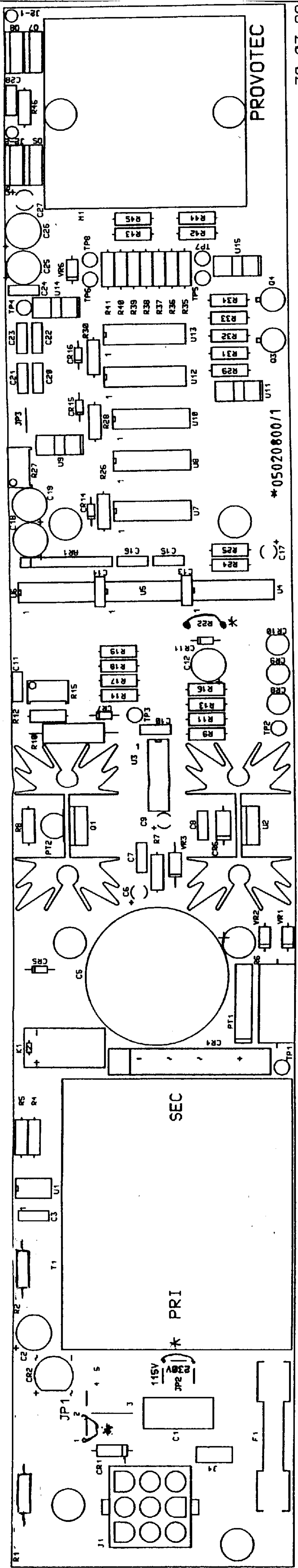


PROVOTEC... Braunburger Ring 2-4 32339 Espelkamp		Zur Nr. 0502 7213 Bl.1	
99	100	101	102
Bech.	728.9	Meier	
Norm.			
Ver.			
Ersatz für: 0502 7213		vom 25.5.98	

Benennung		Interface control dwg. for Bucky LRE+LREFA Power Supply 115/230V AC on 24V AC	
Paßmaß		Lin.-Abmaß	
Freimabmaßen			
Werkstoff			
Oberfläche		1 : 5	
Mater.-Nr.		0016	
Mitarbeiter		Meier	
Gepr.		Gepr.	
Halter		Halter	

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PCB 05020801 BEST.-DRUCK *05020800/1 30.03.98

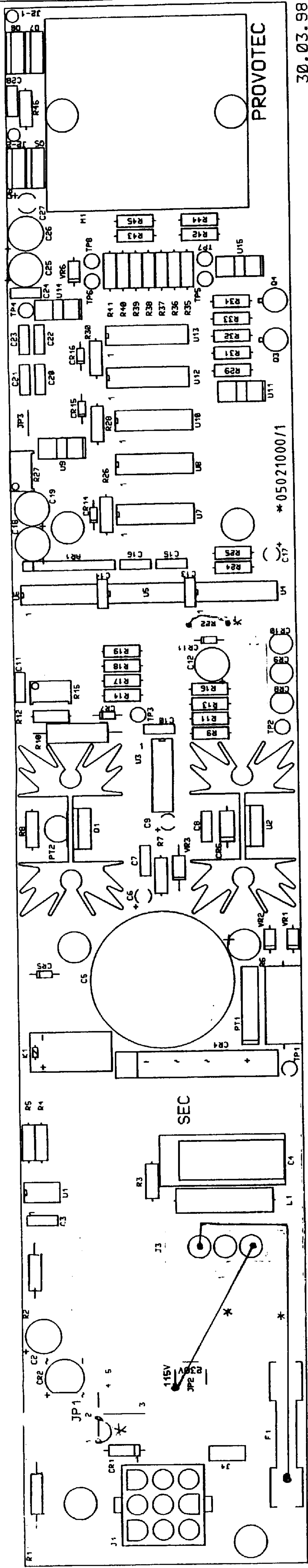
* IDENT-Nr. mit Schrägstrich u. Rev.-Index ergänzt u. als Aufkleber oder handschriftlich an gekennzeichnete Stelle auf der Leiterplatte angebracht.
Der Rev.-Index beginnt mit 1 und ist aus der linken Spalte des Schriftfeldes zu entnehmen.

* Jumper, Brücke

Notes:

1. Use conductive paste for Q1, U2 and PT2 between parts and the heat sinks.
Für die Montage von Q1, U2 und PT2 zum Kühlkörper ist Wärmeleitpaste zu benutzen.
2. Assemble resistors R6 and R10 that a distance of min. 6 mm is between the parts and the PCB.
Die Widerstände R6 and R10 müssen mit einem Abstand von mind. 6 mm zur Leiterplatte montiert werden.

PROVOTEC GmbH & Co. KG Röntgen- und Hochspannungssysteme Brandenburger Ring 2-4 32339 Espelkamp		Zchg-IDNr-Bearb 05020800 Create Time: Modify Time:			
Bucky LRE, PCB Assy, Laufstreifenrichtung LRE, PCB Bestückung					
Nr	Aend-Nr	Tag	Bearb	Gepr	Dateiablage:
1	0076	26.06.01	Kr.	hll	
Blatt 1 von 1					



30.03.98

PCB 05020801

BEST.-DRUCK

* IDENT-Nr. mit Schrägstrich u. Rev.-Index ergänzt u. als Aufkleber oder handschriftlich an gekennzeichnete Stelle auf der Leiterplatte angebracht.
Der Rev.-Index beginnt mit 1 und ist aus der linken Spalte des Schriftfeldes zu entnehmen.

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Die Widerstände R6 and R10 müssen mit einem Abstand von min. 6 mm zur Leiterplatte montiert werden.

PROVOTEC GmbH & Co. KG Röntgen- und Hochspannungssysteme Brandenburger Ring 2-4 32339 Espelkamp				Zchg-IDNr-Bearb	05021000
				Create Time:	
				Modify Time:	
Bucky LRE, PCB Assy, Laufstereinrichtung LRE, PCB Bestückung					
Nr		Aend-Nr		Dateiablage:	
1	0076	26.06.01	Tag	Bearb	Gepr
Nr		Aend-Nr		Blatt 1 von 1	

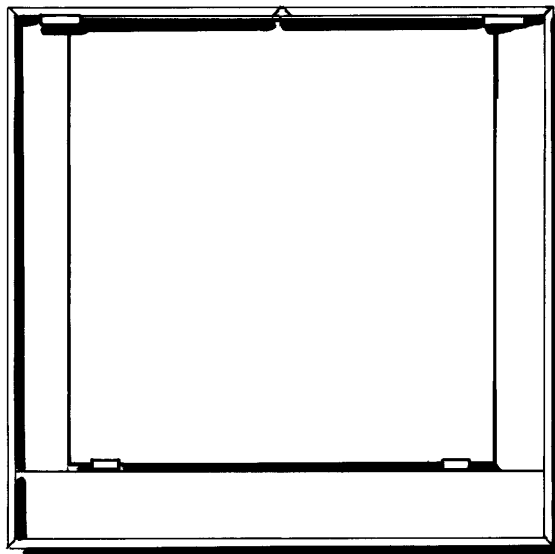
Bucky LRE, LRE-FSE and LREFA

Model/ID: 0502 0000 – 0010

Model/ID: 0502 0015 – 0021

Spare parts list

Ident. Nr. 0502 7601 P



PROVOTEC GmbH & Co. KG
Röntgen- und Hochspannungssysteme

Brandenburger Ring 2 - 4

32339 Espelkamp

Germany

Phone: (+49) 57 72 / 97 89 00

Fax: (+49) 57 72 / 97 89 10

e-mail: info@provotec.de

GENERAL:

This parts list was written with the intent of providing the user a complete listing of all electrical and main mechanical parts used in the assembly of this unit, with the exception of hardware items such as nuts, screws, blots and washers.

ORDERING:

When ordering parts the following details are necessary:

ORDERING EXAMPLE:

DEVICE TYPE: BUCKY LRE / LREFA
PARTS LIST NO.: 0502 7601 P
FIG. and ITEM NO.: 1-10
PART NO.: 3900 0251
DESIGNATION: FASTENING UNIT
QUANTITY: 6
EDITED: October 1999

If a part cannot be found in the Parts List, include the Catalogue No. of the unit, the serial No. and detailed descriptions or photos and part in question.

If there were wanted common nuts, screws and washers, please note and order.

The marked identifications of parts are only available in special kits.

Allgemeines:

Diese Ersatzteilliste enthält alle elektrischen und die wichtigsten mechanischen Teile. Nicht aufgeführt sind Muttern, Schrauben, Unterlegscheiben und ähnliche Teile.

Bestellung:

Bei Bestellung von Teilen sind folgende Angaben erforderlich:

Bestellbeispiel:

Geräte-Typ: Laufrastereinrichtung LRE / LREFA
Ersatzteillisten-Nr.: 0502 7601 P
Figur- und Teil-Nr.: 1-10
Ersatzteil-Nr.: 3900 0251
Bezeichnung: Befestigungselement
Menge: 6
Herausgabedatum: Oktober 1999

Falls ein Teil nicht in der Ersatzteilliste gefunden werden kann, sind Kat.-Nr. und Serien-Nr. des Gerätes sowie eine genaue Beschreibung oder ein Foto des infrage kommenden Teiles beizufügen; sollten evtl. DIN-Teile zu bestimmten Baugruppen gewünscht werden, ist dies bei der Bestellung zu vermerken.

Die Bestellangaben mit Index sind nur in Verbindung mit den angegebenen Baugruppen erhältlich.

Fig.2 Rahmen, Kompl.
Fig.2 FRAME ASSEMBLY
Part No. 0502 0300

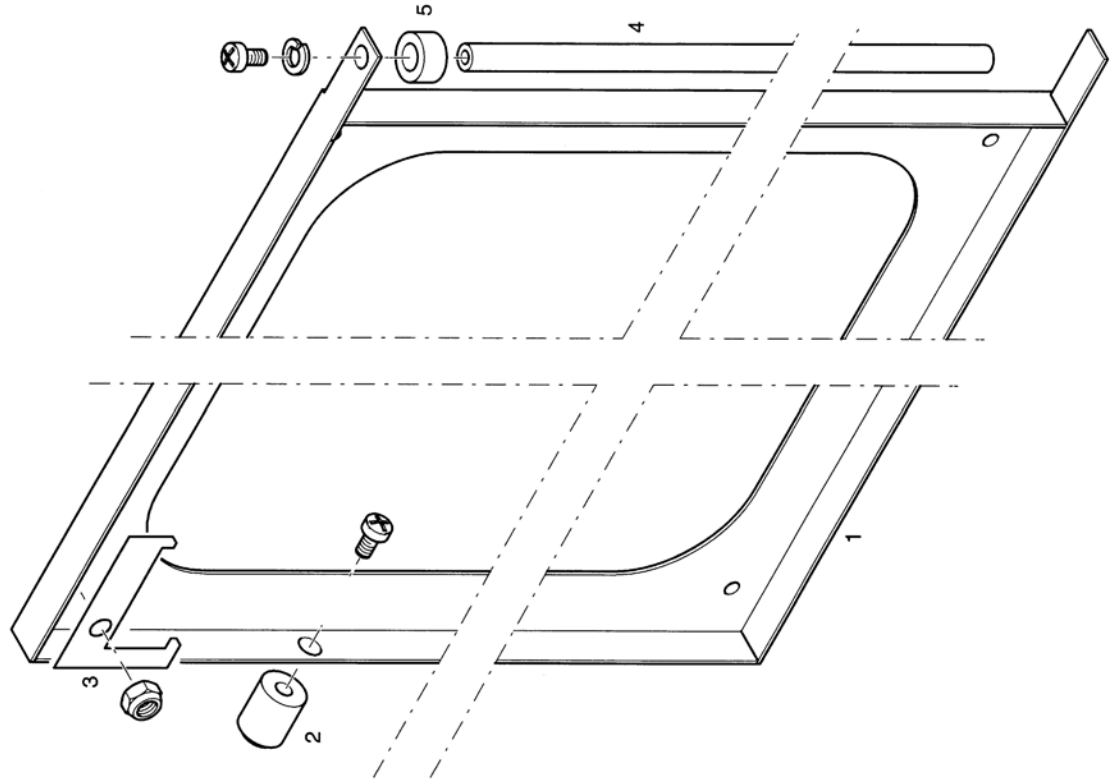


Fig.1 Laufstereinrichtung
Fig.1 BUCKY
Part No. 0502 0000

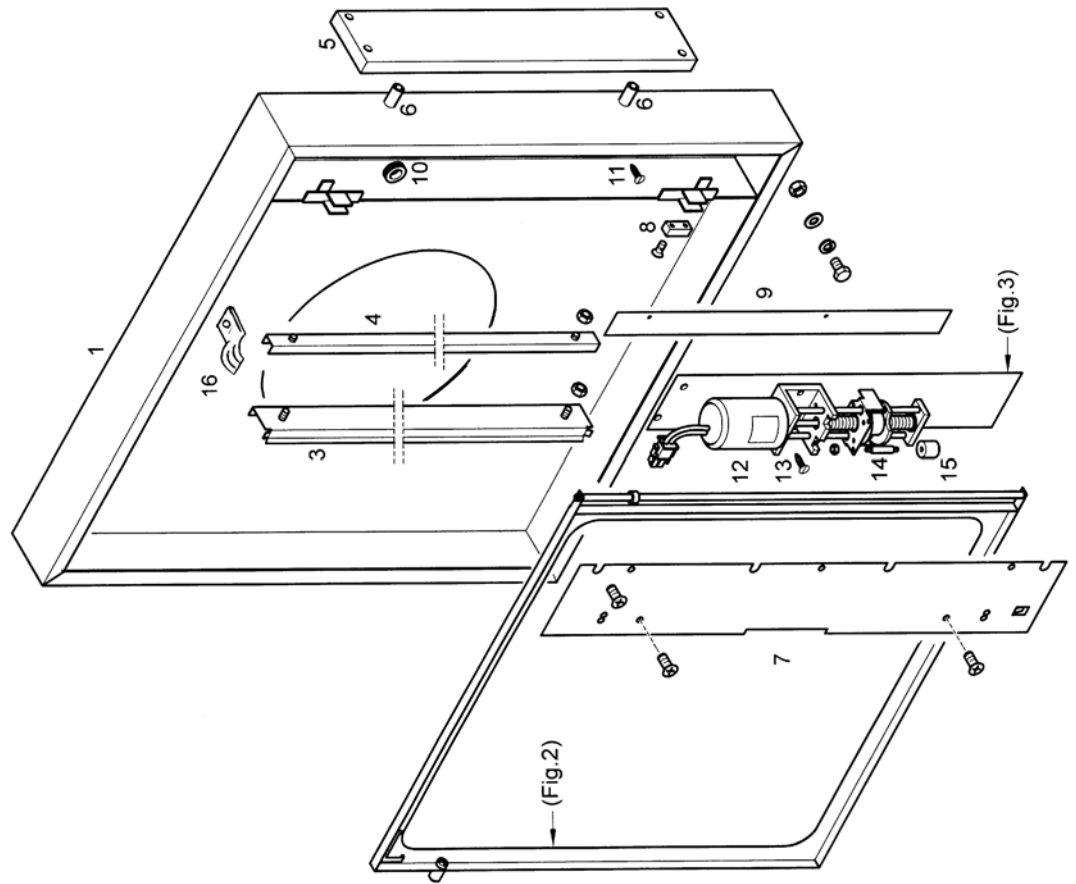


Figure	Part. No.	Description / Beschreibung	QTY / Menge
1	0502 0000 bis 0502 0011	Bucky Laufstereineinrichtung EP	1
Fig.-Item	Part. Nr.	Description / Beschreibung	QTY / Menge
1-1	0502 0200 oder 0502 1400	CASE Gehäuse, vollst.	1
1-2	0502 0300	FRAME ASSEMBLY Rahmen, kompl. Fig. 2	1
1-3	-	not used nicht verwendet	-
1-4	-	not used nicht verwendet	-
1-5	0502 1100	COVER Kappe, vollst.	1
1-6	0201 0106	THREADED STUD Gewindebolzen	2
1-7	0502 0101	COVER PLATE Abdeckplatte	1
1-8	0502 0102	STOP Anschlag	1
1-9	0502 0103	COVER Abdeckung	1
1-10	3900 0251	FASTENING UNIT Befestigungselement	8
1-11	2032 3321	TAPPING SCREW Blechschaube 4,2x16	6
1-12	0502 1600	DRIVE ASSEMBLY Antrieb, komplett (115/230V Std.) Fig. 3	1
1-13	2032 3323	TAPPING SCREW Blechschaube 4,2x25	2
1-14	0502 0104	THREADED STUD Gewindebolzen	1
1-15	2900 0203	BEARING Rundlager	1
1-16	0502 0110	SPECIAL SPRING Schleiffeder	1

Figure	Part. No.	Description / Beschreibung	QTY / Menge
2	0502 0300	FRAME ASSEMBLY Rahmen, komplett	1
Fig.-Item	Part. Nr.	Description / Beschreibung	QTY / Menge
2-1	0502 0700	FRAME Rahmen, vollst.	1
2-2	0502 0301	ROLLER Rolle	2
2-3	0502 0302	CLAMPING SPRING Klemmfeder	4
2-4	0502 0303	AXIS Achse	1
2-5	2410 2610	BRONCE BUSH Sinterbronze - Zylinderbuchse	2

Figure	Part. No.	Description / Beschreibung	QTY / Menge
Chapter 2.3 Fig.2-8,item 1,2	0501 1500	Bucky Fail-Safe contact block snap fixing (in combination with Manual Cassette Tray KL-FSE)	1