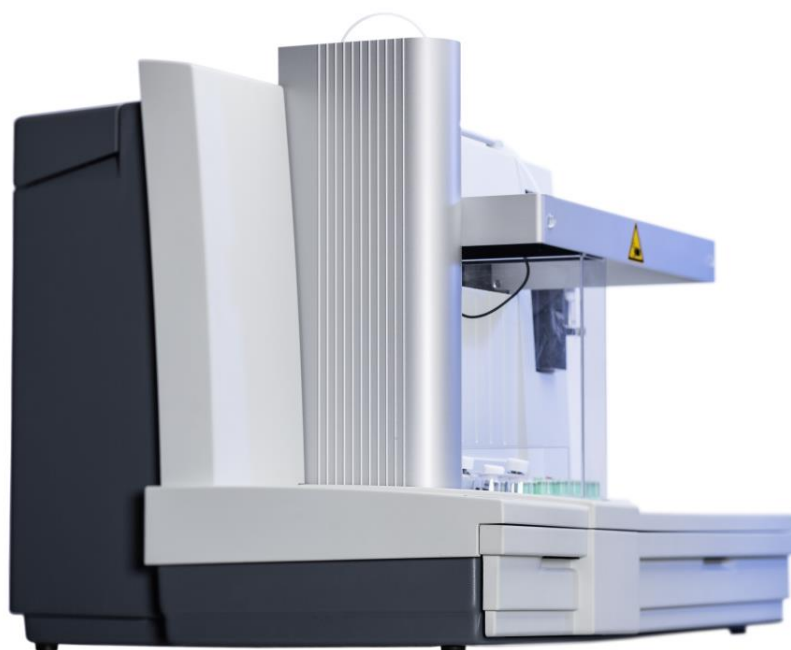


Coatron

A4/1800/A6/3000/A6

Plus/5000

Service Manual



Revision 12.0
Issue Mar-2020
Document No:21 445 01
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Service Manual Updates

Manual Version	Release Date	Fimware Version	Hardware Index			
			Contruction	Robotics	Electronics	Wiring
1	Okt 03	V1.01N23	a	a	a	a
2	Dez 05	V1.02.02	e	a	c	c
3	Mai 06	V1.03.00	e	a	c	c
4	Feb 09	V1.05.00	e	a	e	e
5	Sep 09	V1.05.02	e	a	e	e
6	Feb 10	V1.05.03	e	a	e	e
7	Oct 10	V1.06.01	e	a	e	e
8	May 11	V1.06.01SW4	e	a	e	e
9	Jun 14	V1.07.01SW3	e	a	e	e
10	Jul 18	A4: V1.07.04a A6: V1.03.04a	A4:e A6:a	A4:b A6:b	A4:f A6:f	A4:f A6:f
11	Feb 19	A4: V1.07.04d A6: V1.03.04d	A4:e A6:a	A4:b A6:b	A4:f A6:f	A4:f A6:f
12	Mar 20	A4: V1.07.05a A6: V1.03.05a	A4:e A6:a	A4:b A6:b	A4:f A6:f	A4:f A6:f

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The following standard symbols are used in this manual:

Symbol	Meaning	Explanation
Courier		Key on keypad.
CAPS		Screen message.
		Indicates important information and tips.
		Describes reaction of COATRON A6 to operator input.
	Warning!	Risk of possible health damage or considerable damage to equipment if warning is not heeded.
	Danger!	Potential risk to operating personnel or equipment due to electric shock.
	Biohazard !	Equipment can be potentially infectious due to the samples and reagents used .
	Laser Radiation	Avoid direct eye exposure

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1. Safety Information

	Authorized service ! Carry out only the maintenance, repair and replacement measures listed in this Operator's Manual. Improper manipulation of the device will void the manufacturer's liability obligations and may make service calls necessary, payment of which is not covered by warranty. Only the authorized Customer Service may carry out servicing. Only original replacement parts may be used. Before doing any servicing on the instrument it is very important to thoroughly disinfect all possibly contaminated parts
	Laser Radiation The internal barcode scanner is assigned to laserclass 2 – EN60825-1:2007. Avoid direct eye exposure max. power = 1.7 mW pulse period = 420 µs wavelength = 655 nm
	Cleaning and decontamination ! Before the instrument is removed from the laboratory for disposal or servicing, it must be decontaminated and should be performed by authorised well-trained personnel only, observing all necessary safety precautions
	Cleaning certificate required ! Instruments to be returned have to be accompanied by a decontamination certificate completed by the responsible laboratory manager. If a decontamination certificate is not supplied, the returning laboratory will be responsible for charges resulting from non-acceptance of the instrument by the servicing centre, or from authority's interventions.
	Infectious Material Regard all surfaces and materials which might be in contact with plasma or other biological liquid as potentially contaminated with infectious material. Wear medical infection grade protective gloves for all cleaning and maintenance works involving potential contact with infectious liquids and use each pair of gloves once only. Use a hand disinfectant product, e.g. Sterilium®, to disinfect your hands after completion of the work.
	Contact with cleaning solution Applied decontaminants, disinfections are mildly irritant. Avoid any direct contact, but in case apply water immediately to rinse off.

2. Service menu an functions



Detailed information about use of functions is provided in user manual.

SERVICE	
1	PRINT REPORT
2	ADJUST XYZ
3	ADJUST TEMPERATURE
4	CHECK OPTIC
5	CHECK ROBOTICS
6	MOVE CUVETTES
7	CLEAN NEEDLE
8	REPLACE RINSE TANK
9	REPLACE NEEDLE
10	REPLACE SYRINGE
11	ADJUST MOTOR
12	CAP PIERCING

2.1 Print report

SYSTEM - REPORT

DATE: 2012/25/10 13:59

SYSTEM: COATRON A6
SERIAL NO.: 1234567
SOFTWARE: 01.00.02

OPTIC 1: 80 30005 (162)
OPTIC 2: 62 29984 (169)
OPTIC 3: 85 29766 (153)
OPTIC 4: 50 29793 (165)
OPTIC 5: 50 29722 (135)
OPTIC 6: 50 29768 (144)

TEMPERATURE MESS: 39.2 °C (39.0)
34968 (34970)

TEMPERATURE HEAT: 37.1 °C (37.0)
34395 (34398)

CONTRAST: 225
MIXER: 200

-----WASH	REAG	CUV	PAT
OFFSET X: 1	-2	0	0
OFFSET Y: 3	1	0	-5
OFFSET Z: 0	13	0	850
OFFSET M: 4			
OFFSET P: 0			

RINSE INSTALLED: 108 ml
NEEDLE TIMER: 9212 Tests
SYRINGE TIMER: 33421
STOP-STOP IN: 905 TESTS
SERVICE IN 58001 TESTS

PT COUNTER: 344
PTT COUNTER: 6
FIB COUNTER: 302
ANALYSIS COUNTER: 1079

---- SYSTEM STATUS ---
SYSTEM = CLOSE
SERVICE = CLOSE
REAGENT = CLOSE

OPTICS : 80 30005 (162)

80 = Digital value when LED is off
30005 = Digital value when LED is on
162 = Amplification factor

Temperature cuvette: current celsius (target)
Current digits (target)

Temperature reagent PT: current celsius (target)
Current digits (target)

Display contrast
Reagent mixing speed

Needle Position for Wash, Reagent, Cuvette & Patient

X-Offset = left/right
Y-Offset = forward/backward
Z-Offset = up/down

Motor Adjustment: Offset=4
CAP PIERCING height

Remaining system liquid
Age of needle: number of performed tests
Age of syringe: number of up/down cycles
Remaining determination before system stop
Next service required in

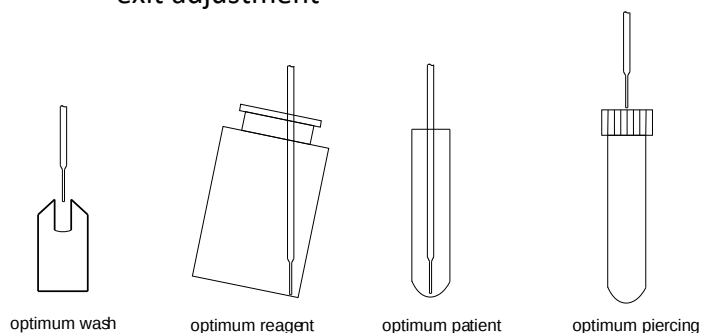
Number of carried out tests for counted
PT, PTT, FIB or all tests

System requires a barcode to run tests
System requires a barcode to reset service interval
System requires a barcode before use of reagent

2.2 Adjust XYZ

ADJUST XYZ				
	WASH	REAG	CUV	PAT
X=	0	0	0	0
Y=	0	0	0	0
Z=	0	0	0	1020
PIERCE=0				

Key 4/6 move needle left/right (X-offset)
 Key 2/8 move needle backward/forward (Y-offset)
 ARROW ↑/↓ move needle up/down (Z-offset)
 ENTER goto next position
 ESC exit adjustment

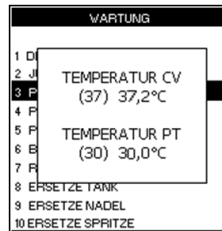


1. Place empty tubes into positions of Patient P01 and PT reagent
2. When needle is moved to WASH
 - a. Set x,y,z to zero
 - b. Open z-rack screw and shift needle in/out until optimum wash
 - c. Close screw. Bend needle until optimum wash
3. Continue with cleaner, cuvette and patient position
4. Skip CAP piercing with "ENTER" is not required



Skip cap piercing if not required. The value P-OFFSET must be 0 to deactivate cap piercing

2.3 Check Temperature



Temperature CV
(37) 37.2°C

Temperature inside of cuvette.
Target is 37°C, actual measured is 37.2C.

Temperature PT
(30) 30.2°C

Temperature inside of PT reagent
Target is 30°C, actual measured is 30.0C.

2.4 Check Optics

Remove the cuvette in the measurement optics.

CHECK OPTIK		
OFF	ON	AMP
1= 78	9851	185
2= 105	9624	192
3= 56	9799	171
4= 78	9851	185
5= 98	9245	155
6= 110	9967	145
T1=34302		(34310)
T2=34081		(34081)
T3=31707		(31800)
CV-Status: 1		
Shield: 0		

X=	Measurement channel 1-6
OFF	Digital value when LED is off. Target range 50 - 350 If out of range, then optic or mainboard is defect
ON	Digital value when LED is on. Target range 9000 – 11000 If out of range, then optic path is blocked or LED is defect
AMP	Signal amplification, Target range 100 - 400 If out of range, then optic path is blocked or LED is defect
T1	Digital value heat area, Target range 34000 - 34500 If out of range, then thermo sensor or mainboard is defect
T2	Digital value cuvette area, Target range 33500 – 34500 If out of range, then thermo sensor or mainboard is defect
T3	Digital value cool area (not used with A4) If out of range, then thermo sensor or mainboard is defect
CV-Status	1: cuvette detected
Shield	1: protection shield is closed

2.5 Check Robot

To check, if XYZ, pump and level sensor is working. Press ESC to abort this test. It is used for service and quality issues. Remove all vials and tubes before continue. Print "FALSE LEVEL" indicates that level detector stops false in air. In this case the insulation block must be replaced.

2.6 Move Cuvettes

Turns cuvette rotor for transport of cuvettes until Enter is pressed. It is used to empty the cuvette tower.

2.7 Clean Needle

Carries out an intensive needle cleaning cycle.

2.8 Replace Rinse tank

Reset the level of rinse tank to "full".

2.9 Replace Needle

Reset age of needle to "new".

2.10 Replace Syringe

Reset age of syringe to "new".

2.11 Adjust Motor

Changes the assignment of the cuvette to the measuring position. The cuvette must be positioned exactly centered to the optic. Use green water to make the light beams visible.

2.12 Cap Piercing



The system can only pierce 1mm membrans or less. Tubes like BD Vacutainer are not support and will damage the system, when installed with closed caps.

Activate CAP PIERCING

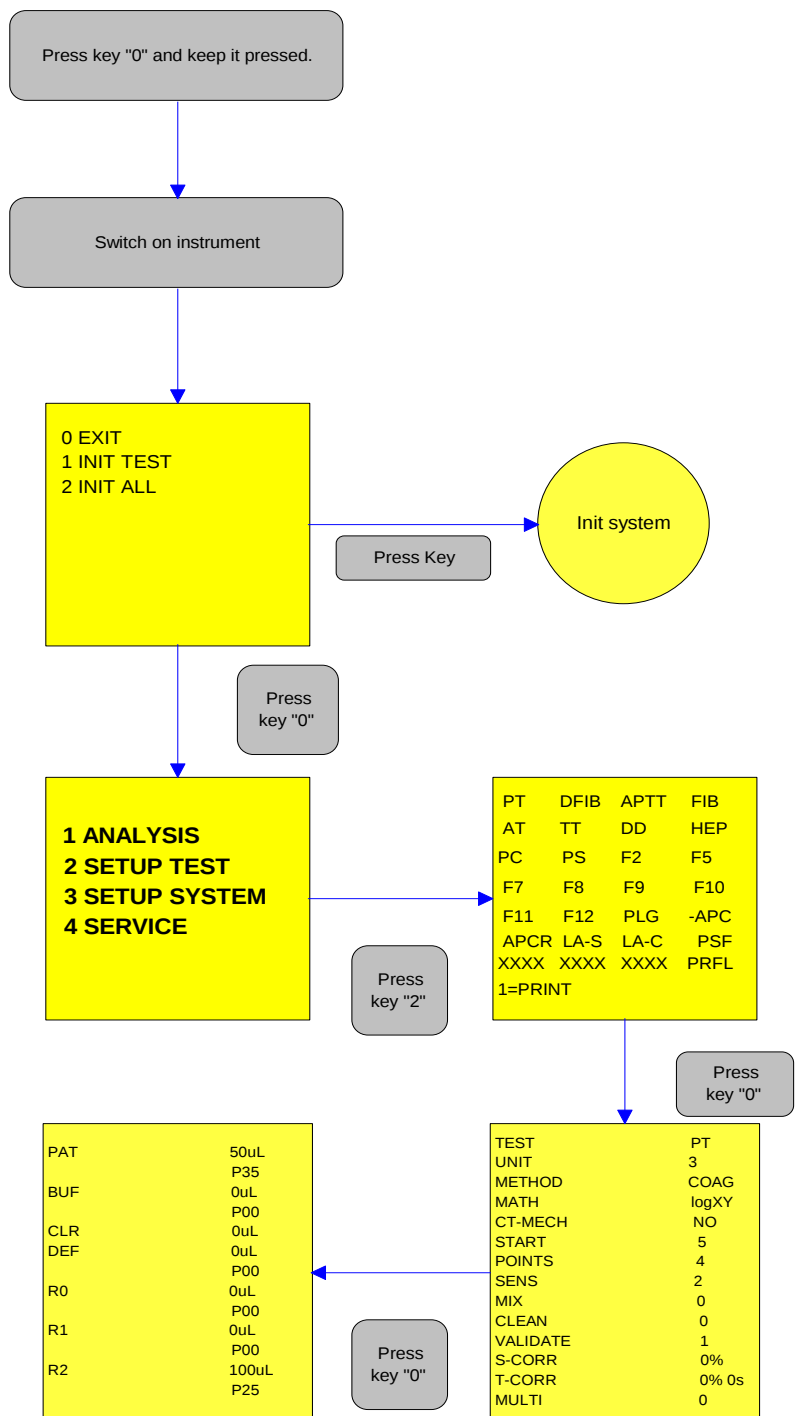
1. Place a capped tubes filled with water to P02
2. Drive needle down until membrane
3. Press "ENTER" to check

Deactivate CAP PIERCING

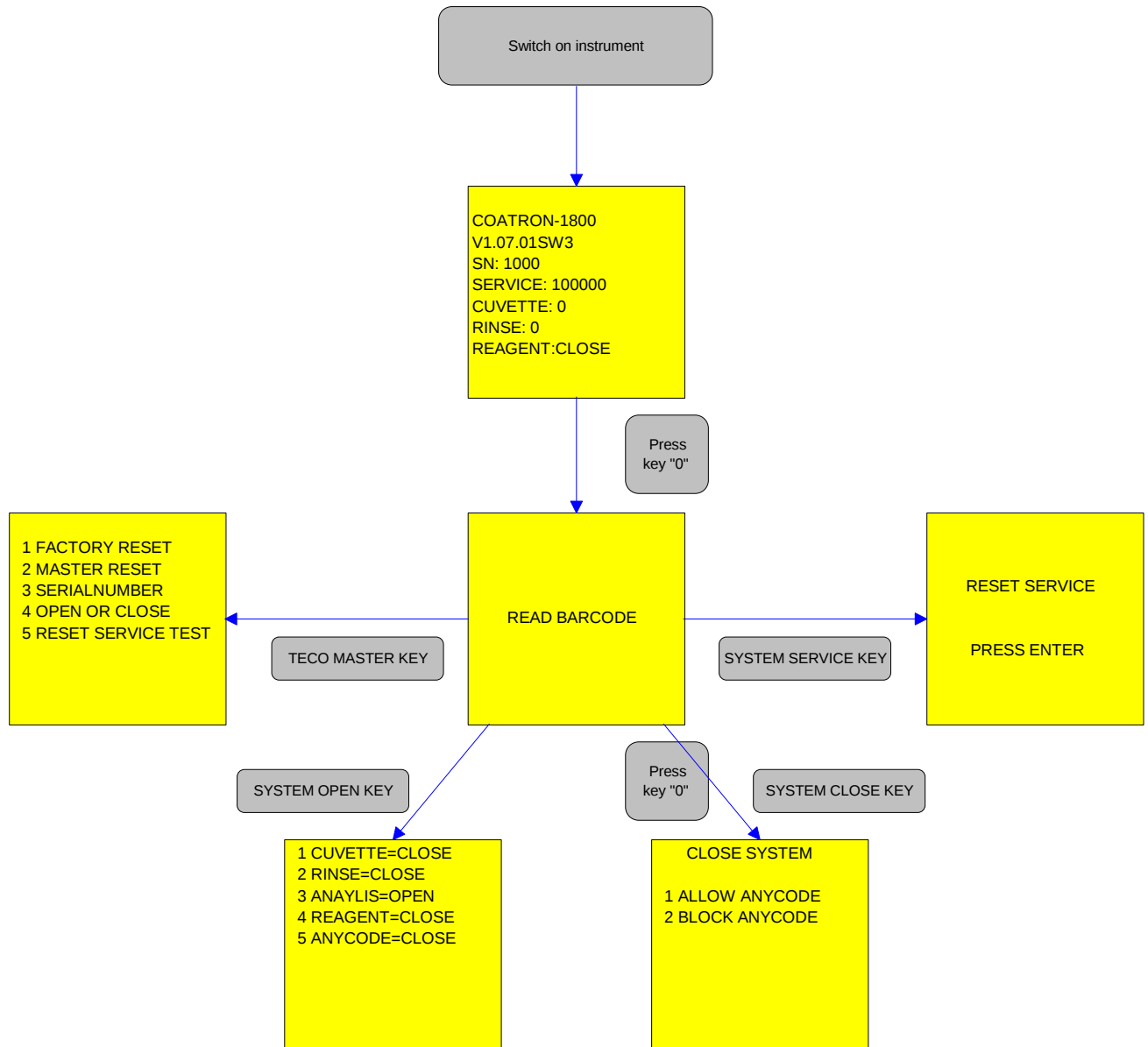
Set OFFSET-P to "0"

3. Hidden menus & functions

3.1 Overview of INIT SYSTEM



3.2 Overview of CLOSE and OPEN SYSTEM

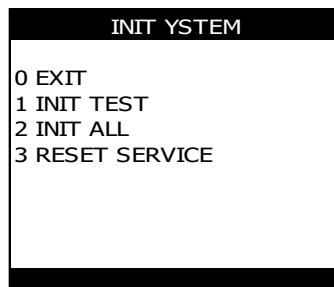


3.3 Boot menu of Coatron-A

- Entering the init menu:** Switch off instrument. Then switch on instrument and press down key “0” until init screen is displayed.
- Entering the activation menu:** Switch off instrument. Then switch on instrument. When welcome screen is displayed press key “0”. Afterwards “READ BARCODE” will be displayed.
- Entering hidden test protocol menu:** Enter init menu as described above. Press key “0” again. After startup the message “ADMIN” can be seen in the last line of display. Goto menu “SETUP TEST” and press key “0”. Access right “Bit3” is required to change the parameter “VALIDATE”

3.4 INIT SYSTEM

Switch off instrument. Then switch on instrument and press down key “0” until init screen is displayed



3.5 INIT TEST

All test calibration and protocol data will set to default:

TEST CALIBRATION:

- CURVE zero
- EXP zero
- LOT zero
- ISI zero
- UNIT “s”

TEST PROTOCOL:

- NAME 4 Characters for test
- UNITS selectable units, decimal code of every bit.
- METHODE COAG,FIB,CHROM,IMMUN
- MATH XY-calibration relationship (lin,1/X,logY,logXY)
- CT MECH Clotting Time Mechanical.
 - NO: Clot defined at turnpoint of reaction (default)
 - YES,50%: Clot defined at 50% of endpoint signal
 - YES,30%: Clot defined at 30% of endpoint signal
- START Time when measurements start (deadtime)
- POINTS data points for auto calibration
- SENS sensitivity of clotting test (Max=3 -> very sensitive)
- MIX After adding of start reagent the robot will mix in the cuvette
- CLEAN^(1,2,3) 0= standard cleaning cycle for all pipetting steps
 1= High Cleaning cycle for reagent R1
 2= High Cleaning cycle for reagent R2
 3= High Cleaning cycle for both reagent and force sample to sample washing
- S-CORR signal correction (eg. Caculate FIB signal 10% higher)
- T-CORR % time correction (eg. Calculate PT 10% shorter)
- T-CORR s time correction (eg. Calculate PT 2s longer)
- MULTI⁽⁴⁾ 0=multi dispensing disabled
 1=multi dispensing mode for reagent R1
 2=multi dispensing mode for reagent R2
 3=multi dispensing mode for reagent R1+R2
- Vol Pat Volume of patient in µL
- Pos CP Position of Control plasma
- Vol Buffer Volume of buffer
- Pos Buffer Position of buffer
- Vol Clr⁽⁵⁾ Clear Volume (eg. Remove 200µL plasma dilution from cuvette)
- Vol DP Volume of deficient plasma in µL
- Pos DP Position of deficient plasma
- Vol R0 Volume of reagent 0
- Pos R0 Position of reagent 0
- Vol R1 Volume of reagent 1
- Pos R1 Position of reagent 1
- Vol R2 Volume of reagent 2 = Start reagent
- Pos R2 Position of reagent 2

-
- (1) Hi clean cycle will decrease throughput, but reduce the risk for carryover . Reagent components with high amount of thrombin should always cleaned with high cycle.
 - (2) Very sensitive tests with high sample dilution like Protein-S should always applied with Clean=3
 - (3) Clean=3 should always be set , if accuracy and precision is not acceptable
 - (4) multi dispensing increase the throughput, but may reduce also the reproducibility.
 - (5) Minimum of 30µl must remain in the cuvette of A6 /A6 Plus or 60µL for A4 cuvette

3.6 INIT ALL

Reset all tests and following settings to default:

System setting:	Default	user action after reset
➤ language:	english	no
➤ signal:	on	no
➤ patient ID:	manual	no
➤ autoseries:	start PID at number 0	no
➤ format of date:	yyyy/mm/dd	no
➤ double determination:	no	no
➤ quality control:	no	no
➤ auto skip	no	no
➤ profil:	PT/APTT	no
➤ print options:	print report	no
➤ HCL-level:	0mm	no
➤ CAP-Piercing:	off	no
➤ speed of mixer:	200	no
➤ LCD-Contrast:	220	no

3.7 Master Reset

Switch on instrument and break bootup with key “0”. When “READ BARCODE” is displayed, then scan “TECO MASTER KEY”. This barcode is locked to serialnumber of instrument !

The master reset should be performed by manufacturer only !

		<u>required action after</u>
<u>reboot:</u>		
➤ language:	english	no
➤ signal:	on	no
➤ patient ID:	manual	no
➤ autoseries:	start PID at number 0	no
➤ format of date:	yyyy/mm/dd	no
➤ double determination:	no	no
➤ quality control:	no	no
➤ auto skip	no	no
➤ profil:	PT/APTT	no
➤ print options:	all active	no
➤ HCL-level:	0mm	no
➤ CAP-Piercing:	off	no
➤ speed of mixer:	200	no
➤ LCD-Contrast:	230	no
➤ rinse container :	0 mL (empty)	Replace Rinse Tank
➤ xyz offsets:	x = 0; y = 0; z = -95	Adjust XYZ
➤ motor adjustment:	8	Adjust motor
➤ Service Timer:	50000	no
➤ Test counter PT,aPTT,Fib,..	0	no
➤ Serialnumber:	0	Edit serialnumber

System Activation Configuration:

	OEM=1	OEM=6	OEM=11	Other
Cuvette	Open	Close	Open	Open
Rinse	Open	Close	Open	Open
Analysis	Open	Open	Open	Open
Reagent	Open	Close	Open	Open
Anycode	Open	Open	Open	Open
Service in 50.000 tests	Yes	Yes	Yes	Yes
installed cuvettes	-	600	-	-
installed rinse tanks	-	4	-	-
enabled test	-	999	-	-
Reset Barcode Lotnumbers	Yes	Yes	Yes	Yes

Temperatur Reagent	30°C	30°C	37°C	30°C
Temperatur Cuvette	37°C	37°C	39°C	37°C

3.8 Factory Reset

Switch on instrument and break bootup with key “0”. When “READ BARCODE” is displayed, then scan “TECO MASTER KEY”. The barcode must be requested from TECO by email. The factory reset should be performed before boxing and shipping instrument to customer !

- Worklist-ID: 1000
- Cap Piecing: 0
- Rinse installed: 0mL

System Activation Configuration:

	OEM=1	OEM=6	OEM=11	Other
Cuvette	Open	Close	Open	Open
Rinse	Open	Close	Open	Open
Analysis	Open	Open	Open	Open
Reagent	Open	Close	Open	Open
Anycode	Open	Open	Open	Open
Service in 50.000 tests	Yes	Yes	Yes	Yes
installed cuvettes	-	600	-	-
installed rinse tanks	-	4	-	-
installed rinse solution	Empty	Empty	Empty	Empty
enabled test	-	999	-	-
Reset Barcode Lotnumbers	Yes	Yes	Yes	Yes

3.9 Edit Serialnumber

Switch on instrument and break bootup with key “0”. When “READ BARCODE” is displayed, then scan “TECO MASTER KEY”. The barcode must be requested from TECO by email. Select edit serialnumber.

3.10 Open/Close System

Switch on instrument and break bootup with key “0”. When “READ BARCODE” is displayed, then scan “TECO MASTER KEY” or “System Open Key” or “System Close Key”. The barcode must be requested from TECO by email.

Cuvette:

Close: System will ask for cuvette activation.
Open: System will not ask for barcode

Rinse:

Close: System will ask for rinse tank activation+installation
Open: System will not ask for barcode

Reagents:

Close: System will ask for reagent barcode before starting the worklist
Open: System will not ask for barcode

3.11 Using Barcode (Tickets)

Tickets are required to activate consumables. How to create tickets is described on next chapter.

WORKLIST			
1 NEW LIST			
2 CONTINUE			
3 REPEAT			
4 STAT			
5 VIEW			
6 PRINT OPTION			
7 SYSTEM ACTIVATION			
8 TEST ACTIVATION			
12:00	1055mL	H0	37.0°C

Goto analysis

TEST ACTIVATION			
PT: THROMBOPLASTIN			
POS=25			
=====			
CP=P35 50µL			
R2=P25 100µL			
12:00	1055mL	H0	37.0°C

test

Select key “8” to activate reagent by scanning the barcodes of certain reagents. The activation is valid until next system reboot.

Barcodes will be rejected in case of

- invalid syntax of barcode
- date expired
- barcode differs to data stored in the SETUP



ACTIVATE SYSTEM			
SYSTEM STOP IN			
250 CUVETTES			
RINSE INSATLLED: 3			
SERVICE IN: 1455			
READ BARCODE			

Select key “7” to activate consumables. Scan the barcode, which is included to the consumable.

Barcode will be rejected in case of

- invalid syntax (security code)
- lotnumber already used
- serialnumber not valid

3.12 Creating tickets

Voucher: Included to each box of cuvettes or rinse solution contains.
Required to create a ticket

Ticket: Includes information to

- Activate of box of cuvettes
- Activate of box of rinse tanks
- Reset service interval

The ticket itself can be used only one time and one instrument to activate consumables.

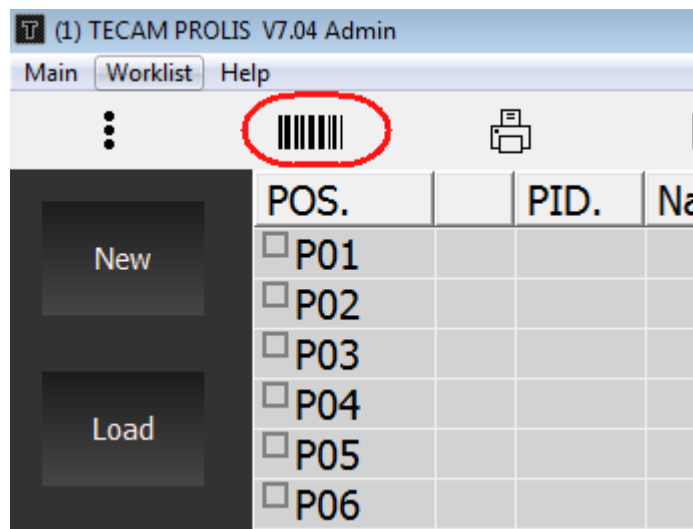
Step-1 Login to Teco Ticket system www.teco-reg.com

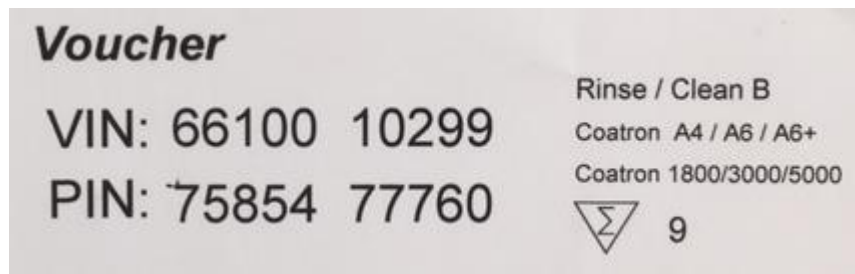
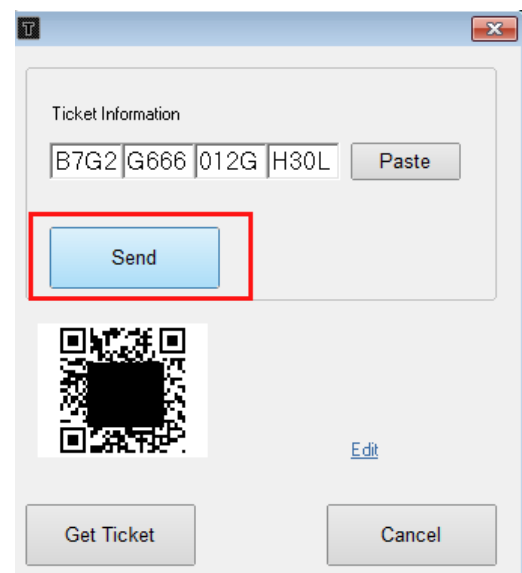
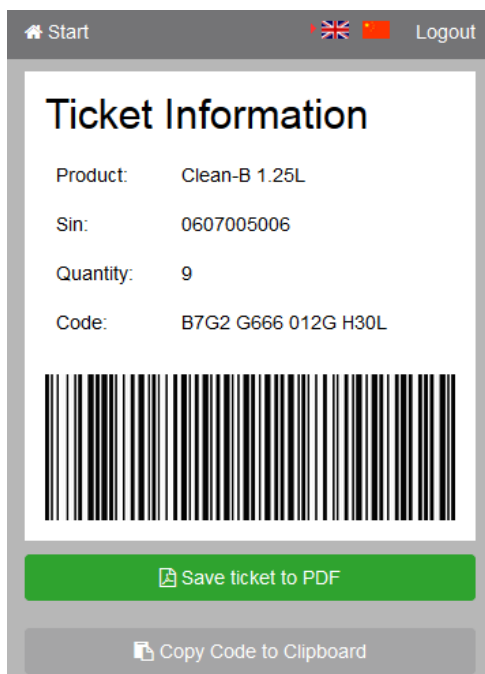
SIN+PIN is displayed during bootup or system report



Enter SIN+PIN manually or use QR code by TECAM System

- Connect TECAM with device
- Click on barcode icon
- Use QR code with your mobile device or select "Get ticket", if TECAM is connected to internet



Step-2 Enter Voucher information (VIN + PIN)**Step-3 Create ticket and transfer to instrument**

Use function	Description
Save ticket to PDF	Open ticket as PDF, which can be printed (air printer)
Copy to clipboard	the code is copied and can be paste to TECAM

4. Software Update

1. Save any important test setups of the instrument to paper
2. print a system report (SERVIVE/PRINT REPORT)
3. Reboot your PC. This will reset your comm ports !
4. Extract „Flash Disk“ to any local folder on your PC.
5. Connect Coatron to PC with 0 Modem cable (PIN 2-3-5 to PIN 3-2-5)
6. Double click to “upgrade.bat” and follow dialogue.
7. After a few minutes the COATRON A6 will reboot.
8. Re-Initialize the memory
 - a. Power off instrument
 - b. Press key “0” and keep it pressed while switching on the instrument
 - c. Select “1” INIT TESTS
 - d. Reboot analyser
9. Restore test setup or service parameter manually
10. Adjust XYZ (service menu of instrument)

Problems during updates:

-Update stays at following screen

```

C:\WINNT\system32\cmd.exe
D:\TECO\BAUMI\CA4\PROGRAMM>Download -c1 -iflashCA4 -y -q
TECO-DOWNLOAD TestVersion 2.00 Sep 14 1998
<C> DOLI Elektronik GmbH.(1995-1998)

MinimalDownload
Start-Segment (Hex) : 100
Serieller Download (115200 Baud)
Serieller Download (DE-Adr=00000009)

D:\TECO\BAUMI\CA4\PROGRAMM>d1CA4 -c1 -iCA4.bin -eC000 -q $r $x $v

DOLI FLASH-Programmierung
FLASHDL Version 2.03 Jun 2 1999
<C> DOLI Elektronik GmbH.(1995-1999)

Infile          CA4.bin
Backupfile      flash.sav
Kommunikation   COM1, 115200 Baud
Nur EraseBlock sichern!!!
NoSave!!!
NoVerify!!!
itarte Sync. zum SUB.
  
```

- ➔ Reboot PC and try again
- ➔ If transfer still failed, boot PC with MS DOS floppy disk and perform MS DOS update

- Nothing happened after click to upgrade.bat

- ➔ perform update with MS DOS commands

- MS DOS update (for Windows 2000 / XP)

- open data explorer and extract all files maybe to drive “C” , folder TECO
- goto MS Windows “START/RUN” and enter “cmd” -> DOS command window will open
- change to directory with command “cd c:\TECO”
- enter command “dir” -> all files including upgrade.bat should be listed
- enter command “upgrade.bat” -> a dialog should open.
- Follow dialog. Update will start and when finished the instrument will reboot.

5. Replacement and installation instructions

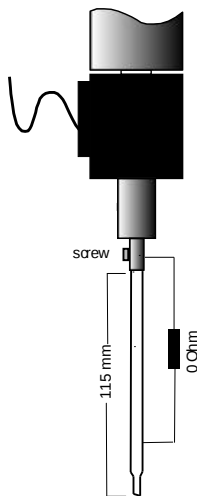
5.1 Installation of the tube system



1. Install tube system as shown
2. Screw the tube fittings until it is finger tight. an additional quarter turn by using a pliers

Figure 1: Installation of tube system

5.2 Installation of the pipetting needle



1. Check needle position
 - should be 115mm visible
 - open screw , fix length and tight screw
2. Electrical contact of needle and insulation block should be 0 OHM.
 - needle must be fixed very tight by screw
 - if resistance keeps > 0 then use longer screw
 - check also if the insulation block is fixed tightly the the z-rack and tight the screws in case if it is not.
 - if resistance keeps > 0 then replace needle

Figure 2: Pipetting needle

1. Goto Service Menu and select “Replace Needle”. Then switch off instrument.
2. skip to item #4 if there is no needle to remove
3. Drive needle directly over wash position and remove the tube fitting from the valve. Wait until needle is complete empty from rinse solution. Clean and dry needle outside, to avoid any liquid contamination with the insulation block.
4. Loosen the screw (see figure above) with the small screwdriver by a half-turn to the left.



Figure 3: Installation of pipetting needle

5. Move the pipetting needle from the right through the tube guide on the upper side of the housing.
6. Insert the pipetting needle from above into the z-rack until the needle position mark becomes visible. About 115 mm of the needle should now be visible.
7. Tighten the screw.
8. Screw the needle fittings to the left valve channel until it is finger tight and an additional quarter turn by using a pliers
9. Switch on instrument and adjust XYZ (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.**)



Any liquid contamination of the insulation block with the needle may malfunction the level sensing.



The used pipetting needle may contain infectious substances and must be handled and disposed of as infectious waste.

*Always wear gloves for infection protection when replacing the pipetting needle !
After this procedure, disinfect your hands with a hand disinfectant, e.g. Sterilium®.*

5.3 Replace cleaning position



Figure 4: Installation of syringe

1. open drawer of waste tank
2. push up cleaning position and remove it from system
3. Push down new cleaning position into the system.

5.4 Installation of the syringe

1. Goto Service Menu and select “Replace Syringe”. Then switch off instrument.
2. Drive needle directly over wash position. Shift plunger to zero position and remove then the empty syringe
3. Lower the plunger drive manually by pushing down on the carriage assembly until it reaches the bottom of travel.
4. Place the self-aligning ball on the syringe plunger into the matching space in the carriage assembly.
5. Pull up on the the syringe barrel and screw the fitting into the valve until it is finger tight. Using pliers on the syringe fitting, turn the syringe an additional quarter turn.

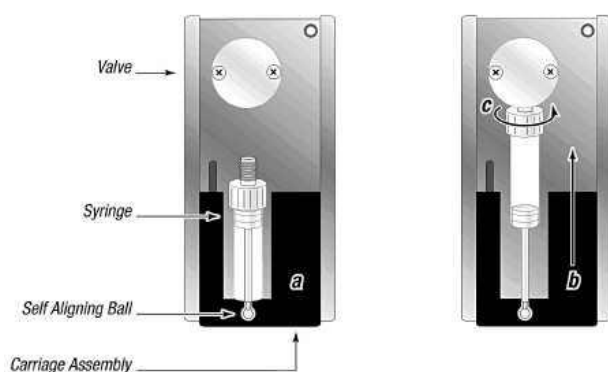


Figure 5: Installation of syringe

5.5 Replacement of valve

1. Switch off instrument
2. Remove the syringe and tubing.
3. Remove the two Phillips head screws on the front of the valve, then remove the valve from the pump.
4. Install the valve by placing it in the front panel so the screw holes line up. The valve coupler fitting should be in the correct position.
5. Replace the valve screws. Tighten $\frac{1}{4}$ to $\frac{1}{2}$ turn after the screws contact the valve body
6. Install tube system , syringe and needle and readjust XYZ coordinates.

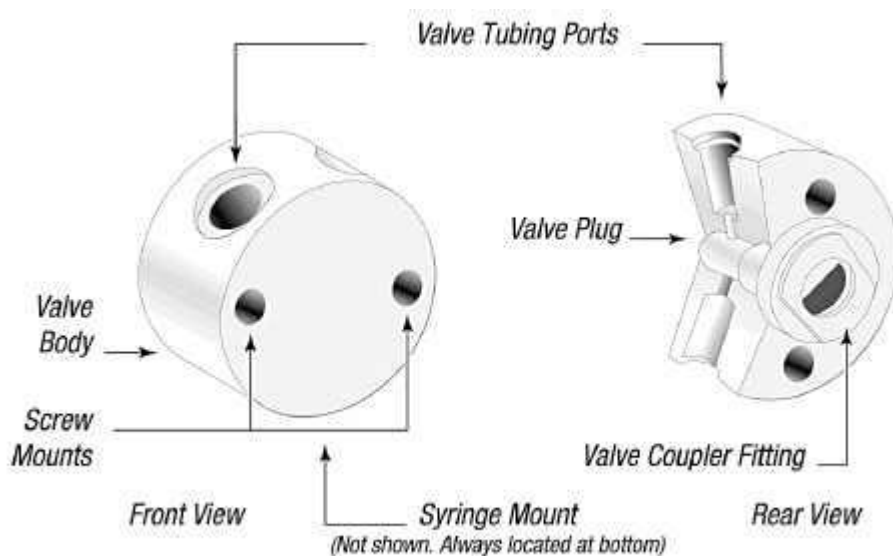


Figure 6: Replacement of valve

5.6 Replacement of insulation block

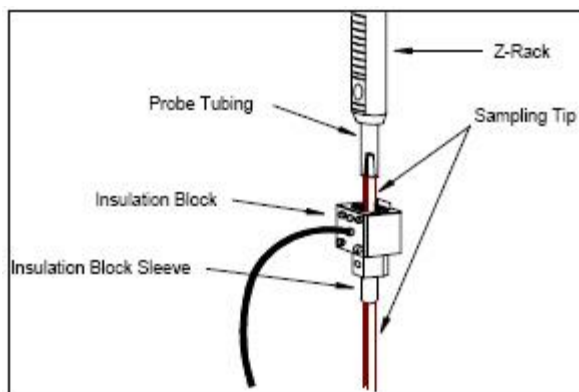


Figure 7: Replacement of insulation block

1. Turn off the power to the RSP 9000.
2. Remove the pipetting needle.
3. Remove the plastic cable binder underneath the arm(s) holding the coax cable.
4. Push the coax cable through the back end of the arm until the gold connector is visible.
5. Disconnect the coax cable by gently sliding back the releasing cover on the insulation block side of the gold connector. This will release the cable from the ALIDUM cable.
6. To remove the insulation block assembly, carefully pull the coax cable forward through the arm.
7. Install the new insulation block and feed the cable from the front through the hole in the arm mounting back.
8. Attach the gold connector to the matching connector on the coax cable. Be sure that the connector is firmly seated.
9. Reinstall the pipetting needle.
10. Adjust the ALIDUM coax cable until all of the slack is removed from behind the arm.
11. Fasten the coax cable to the arm using the new plastic cable binder provided.
12. Install needle and readjust XYZ coordinates.



Ensure the ALIDUM coax cable is not twisted or kinked.

5.7 Replacement of mainboard

- If possible print a SERVICE REPORT (goto service menu)
- Open instrument (see Disassembling Instruction, chapter 6.2)
- Unplug all wiring
- Shift old mainboard out of instrument
- Shift new mainboard into instrument

5.8 Replacement battery

Cat= 62 070 00 Battery SL 750 3.6V 1100mAh

- Remove mainboard
- Remove battery with wire cutter. Dispose the lithium battery according to local regulations.
- Remove remaining battery pins with soldering iron
- Solder back a new battery
- Install mainboard



6. Disassembling Instruction

6.1 Required accessory tools

- Screwdriver WZ 1, WZ 4
- Screwdriver , cross WZ 1
- Allen wrench , WZ 2 – WZ 7
- Ratchet toolbox

6.2 Open instrument

- Remove power plug
- Drive needle over wash position and syringe into zero position.
- Release tubes empty complete needle tube system from rinse solution.
- Remove rinse container including its fixation and the insuction tube.
- Release 6 screws of back casing and open case slightly.
- Unplug printer cable and remove back casing

6.3 Remove casing

- Open instrument
- Release 5 screws of right front casing and remove it by shifting slightly to the right side.
- Release 4 screws of left front casing and remove it by shifting slightly to the left side.
- Release 7 screws of central front casing (4 screws in front , 2 screws below right and left drawer and 1 screw below display).
- Unplug keyboard, display and display contrast and remove central front casing

6.4 Remove workdesk

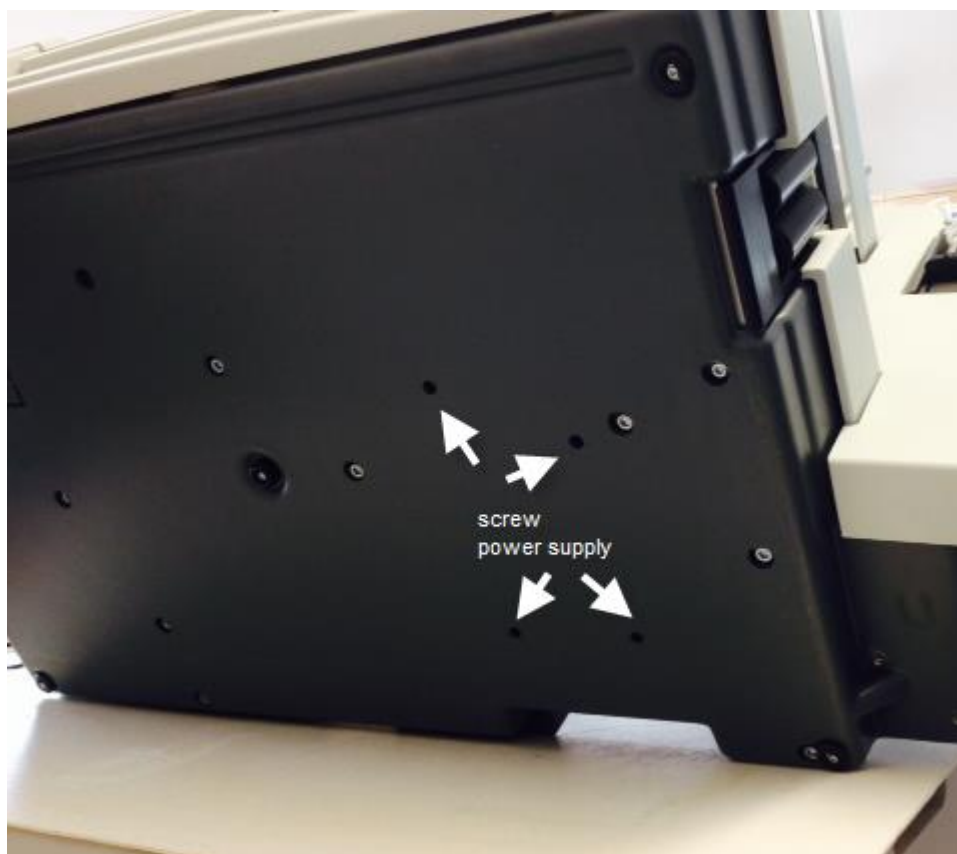
- Remove casing
- Remove XYZ protection frame (2 screws)
- Remove cuvette tower (3 screws)
- Remove cuvette rotation plate
- Cut cable binder of wiring harness
- Remove barcode scanner (
- Turn instrumet 90° backward , hold the workdesk unit and release its 4 screws at buttom side of the instrument.
- Turn instrument back and remove workdesk.

6.5 Remove Power Supply (old version)



Since 2018 a new power supply is integrated, which can be removed easily without flip of instrument

- Remove back casing
- Now flip instrument and open screw of power supply



6.6 Remove Cooling elements

Cat= 21 516 06 Peltier Element

- 1) Remove all casing part and then the cuvette tower



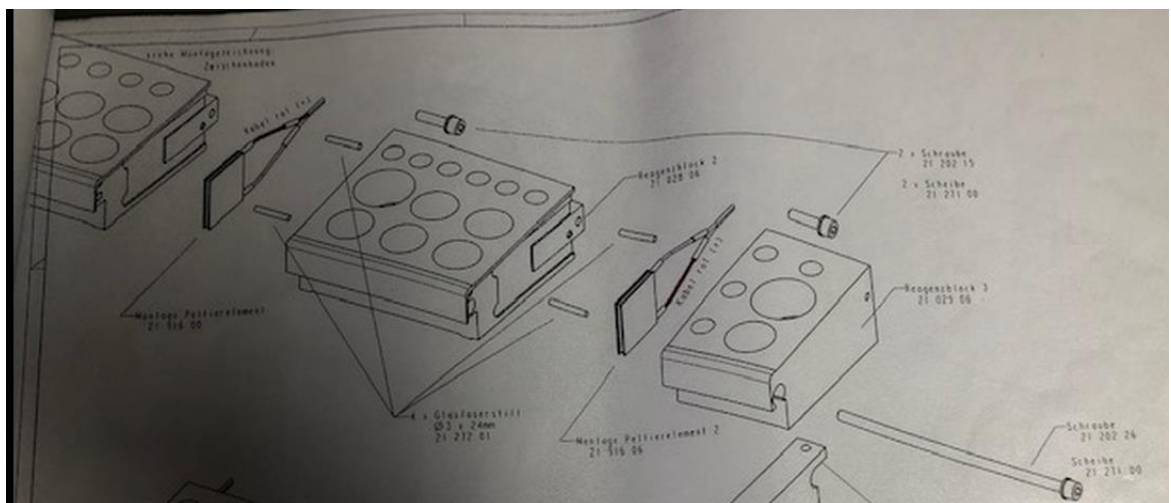
- 2) Remove the reagent block unit completely



- 3) Now disassemble the reagent block and replace the cooling elements

It is important to apply

- heat sink paste around peltier element
- avoid pressure at the peltier elements. Means tight the screws very carefully.



7. Service activities

	Laser Radiation The internal barcode scanner is assigned to laserclass 2 – EN60825-1:2007. Avoid direct eye exposure max. power = 1.7 mW pulse period = 420 µs wavelength = 655 nm
	Cleaning and decontamination ! Before the instrument is removed from the laboratory for disposal or servicing, it must be decontaminated and should be performed by authorised well-trained personnel only, observing all necessary safety precautions
	Cleaning certificate required ! Instruments to be returned have to be accompanied by a decontamination certificate completed by the responsible laboratory manager. If a decontamination certificate is not supplied, the returning laboratory will be responsible for charges resulting from non-acceptance of the instrument by the servicing centre, or from authority's interventions.
	Infectious Material Regard all surfaces and materials which might be in contact with plasma or other biological liquid as potentially contaminated with infectious material. Wear medical infection grade protective gloves for all cleaning and maintenance works involving potential contact with infectious liquids and use each pair of gloves once only. Use a hand disinfectant product, e.g. Sterilium®, to disinfect your hands after completion of the work.
	Contact with cleaning solution Applied decontaminants ,disinfections are mildly irritant. Avoid any direct contact, but in case apply water immediately to rinse off.



Detailed information is provided in service plan.

7.1 General information

Cleaning and maintenance must be performed on a regular basis in order to maintain accuracy and precision. The schedule below outlines the proper intervals to check or replace components of the instrument.

- Never pure any liquid into optic or working area
- Use lint free cotton cloth or stick to clean
- If a liquid has accidentally been spilt or pipetted into a measurement channel, remove it immediately with a pipette and clean the measurement channel with a lint-free cloth. Check the function of the optics in the menu SERVICE

7.2 Procedure of Cleaning

- Use detergent and water and 10% diluted bleach or commercial decontaminant
- Clean and wipe up all spills around the working area or needle pump system with detergent and water.

7.3 Procedure of Decontamination

- Use 30% diluted bleach and commercial disinfectant (e.g. Bacillol®AF)
- Decontaminate working area, needle area, patient racks, keyboard, LCD screen, front casings, printer and waste drawers

7.4 Service plan

Decontamination procedure (weekly or before each service) yes ☐

- Use 30% diluted bleach and commercial disinfectant (e.g. Bacillol®AF)
- Decontaminate working area, needle area, patient racks, keyboard, LCD screen, front casings, printer and waste drawers

Every year yes ☐

- | | | |
|--|------------------------------|-----------------------------|
| • Clean and decontaminate instrument | yes ☐ | no ☐ |
| • Remove syringe and clean plunger and glass with alcoholic solution | yes ☐ | no ☐ |
| • Clean the fan of power supply with a small brush | yes ☐ | no ☐ |

Every 50.000tests or 2 years yes ☐

Additionally to yearly service

- | | | |
|--|------------------------------|-----------------------------|
| • Replace needle cleaning position | yes ☐ | no ☐ |
| • Perform a system check according to PA-07-10 (document FB037) | yes ☐ | no ☐ |
| • Reset service interval | yes ☐ | no ☐ |
| • Print a service report 2x (Keep one for yourself and fix the other on the rear casing) | yes ☐ | no ☐ |

Every 100.000tests or 5 years yes ☐

Additionally to 50.000 service

- | | | |
|--|------------------------------|-----------------------------|
| • Replace needle | yes ☐ | no ☐ |
| • Replace syringe | yes ☐ | no ☐ |
| • Replace valve | yes ☐ | no ☐ |
| • Replace tubing | yes ☐ | no ☐ |
| • Replace insulation block | yes ☐ | no ☐ |
| • Check battery on mainboard (SL 750/PT 3.6V 1.1A) and replace if below 3.3V | yes ☐ | no ☐ |

Every 200.000tests or 10 years yes ☐

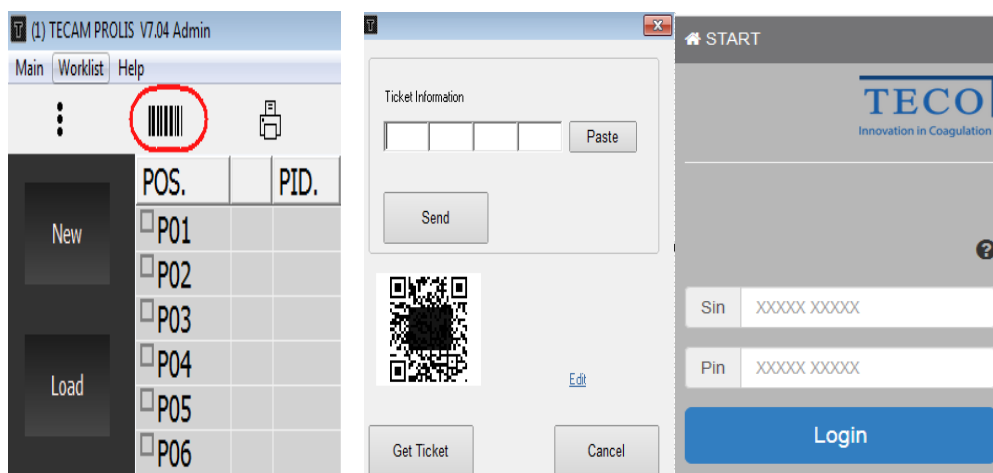
Additionally to 100.000 service

- | | | |
|--|------------------------------|-----------------------------|
| • Replace all belts (x,y,z) | yes ☐ | no ☐ |
| • Replace Z-Pinion | yes ☐ | no ☐ |
| • Replace Flatcable | yes ☐ | no ☐ |
| • Replace Y-Pulley | yes ☐ | no ☐ |
| • Clean all wheels, rollers and guide rails with alcoholic solution and apply silica oil | yes ☐ | no ☐ |
| • Check Z-Bearing and replace if required | yes ☐ | no ☐ |

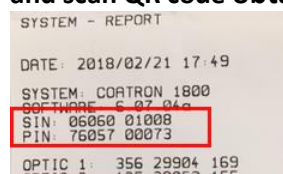
Reset Service Interval (Login to www.teco-reg.com and create a ticket) yes ☐

7.5 Reset service interval

1) Login to Teco Ticket system www.teco-reg.com

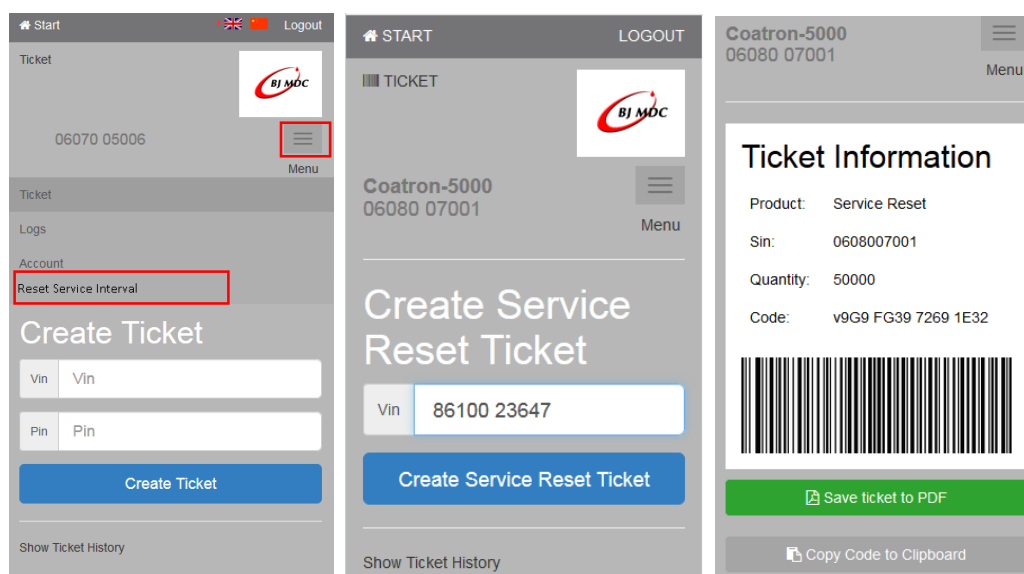


Open www.teco-reg.com and enter SIN+PIN. Alternative use your mobile device and scan QR code obtained by TECAM



SIN+PIN information can be obtained during instrument startup or menu SERVICE/PRINT REPORT

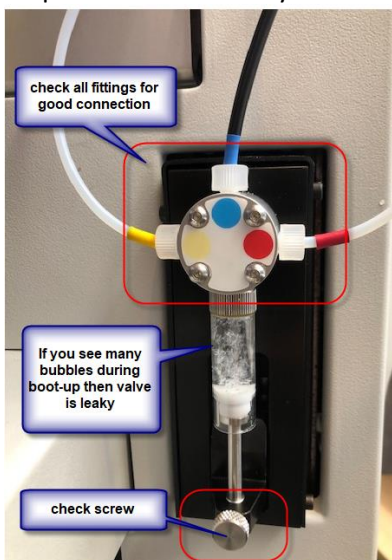
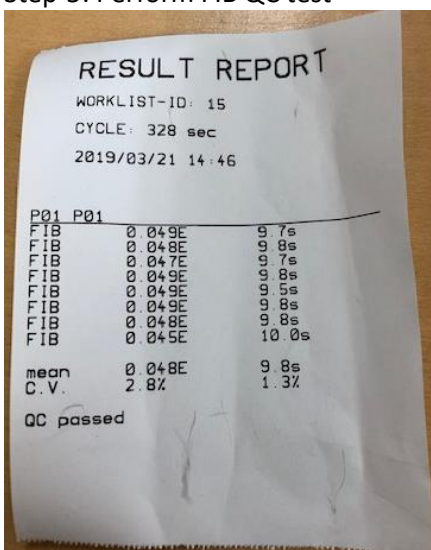
2) Create ticket



Print PDF and scan barcode on instrument or copy & paste to TECAM and send to instrument.

7.6 QC performance selftest

Since 2019 the instrument includes a selftest, which allows to be check for accurate.

Step-1 Goto instrument SERCIVE\ADJUST MOTOR and perform	The Coatron is very sensitive if cuvette is not exactly centered to the LED light beams. In this case especially FIB,DD,AT,FDP gives very poor precision.
Step-2 Goto instrument SERCIVE\ADJUST XYZ and perform	The two needles must be mounted at 110mm height. Fine XYZ adjustment is important to ensure correct inside and outside washing of needle probe
Step-3 Goto instrument SERCIVE\CLEAN NEEDLE and perform	Check , that needle is washed outside with rinse solution.
Step-4 : Check for leaky valve 	Reboot instrument • check for leaky valves • check that syringe and tube fittings are correct connected
Step-5: Perform FIB QC test 	• Place on-board FIB, IBS reagent + Normal control to P01 • Goto menu ANALYSIS/NEW LIST and set mode="QC" • Install paper into printer and start QC test • C.V. < 7.5% and E > 0.030E → Everything is fine QC-Results: - Failed if C.V. > 7.5% Higher results indicate false alignment of cuvette, imprecise volumes (needle, syringe, pump), carryover (needle, wash position) - Failed if Mean of "E" < 0.030E Results below indicate false alignment of cuvette or problem with normal control or FIB reagent

8. Typical malefunctions

8.1 Malfunction Coatron A4: Defect Cooling Function:

Error description

Temperature on reagent block is close to environmental condition or more than 20°C.

General

The cooling function can't be adjusted. It is always switched on with maximum power. The power of cooling is around 8°C (+/-2°C) below environmental conditions .

At room temperature 20°C it cools down to 12°C

At room temperature 24°C it cools down to 16°C

At room temperature 30°C it cools down to 22°C

The cooling element heats up the inner parts of instruments, which is contra productive to the cooling function. So after 2h of operation the

After switch on of device and at room temperature 24°C it cools down to 14°C

After 1h operation of device and at room temperature 24°C it cools down to 16°C

After more than 2h operation of device and at room temperature 24°C it cools down to 18°C

Corrective Actions:

(1) Check peltier element

Check cool temperature with finger 5-10min after first switch on in the morning.

If you can feel cold temperature, then cooling element is working.

If not, then Peltier element CAT = 21 916 00 (52,50 USD) must be replaced. The procedure is extremely complicated and should be done only by TECO. It included nearly the complete disassembling of instruments. A detailed description of service procedure would fill pages. These are just the main steps

- a. Remove all casing parts. You must lift instrument main frame out of button case.
- b. Remove complete optic and reagent block unit
- c. Pull the label foil from reagent block
- d. Now disassemble the reagent block unit and remove the defect peltier element.
- e. Insert new peltier element. Use heat sink paste to ensure good thermo-contact.
- f. Assemble reagent block completely
- g. Before continue of further assembling it is recommend to test the cool function.
For this power the peltier element with external volt generator with 15V 3A.

(2) Check air fan

The two air fans of power supply are used the blow heat out of instrument. It is essential for good and stable cooling power. Check of both fans are working and remove any dust

The air fan is produced by EPM PAPST TYPE 412. TECO doesn't support the air fans as spare parts, but just with the complete power supply. But maybe you can organize yourself the air fan.

(3) Clean air fan regular

It is recommend to remove all dust from air fan every 6month especially in dusty environments.

(4) Install and operate instrument in laboratory with conditioned air (20-24°C).

8.2 Malfunction ERROR 1-4: Cuvette detection:

Error description

Cuvette does not stop at correct position.

Error can happen

If cuvette motor does not stop at correct position

1. Cuvette not correct adjusted
2. optic, shifter, microswitch or motor does not work properly (replace shifter with new version Jan-2018)
3. no cuvette is inside
4. Optic-1 channel defect

If cuvette motor stops at wrong position and needle crash into table

1. Flag of microswitch does not release
2. gear motor is defective (wrong decoder signals)

Check:

1. Goto service menu "CHECK OPTIC" and read value "CV-STATUS":
 - a. Move a cuvette into the reading position. -> CV.-Status must switch to "1"
 - b. Remove a cuvette from reading position. -> CV.-Status must switch to "0"
 - c. Check Optic-1 value. High should be ~30000 digits and AMP < 300

Corrective Actions:

1. Remove shifter and press flag several times complete in and out
2. Mount shifter, but bend flag a little but to ensure better release of flag
3. shifter must move easily -> remove and clean
4. shifter must be adjusted with screw, so that the microswitch closed circuit only during cuvette.
5. microswitch does not close circuit at all -> exchange switcher , adjust shifter
6. Optic does not work -> Clean or exchange optic
7. Cuvette rotor does not or move slowly-> increase gear torque be turning gear-plate clockwise

Since 2018

Problem:

Cuvette don't stop at correct position.

Reason:

Microswitch don't change state correctly. The shifter trigger to less signal (move)

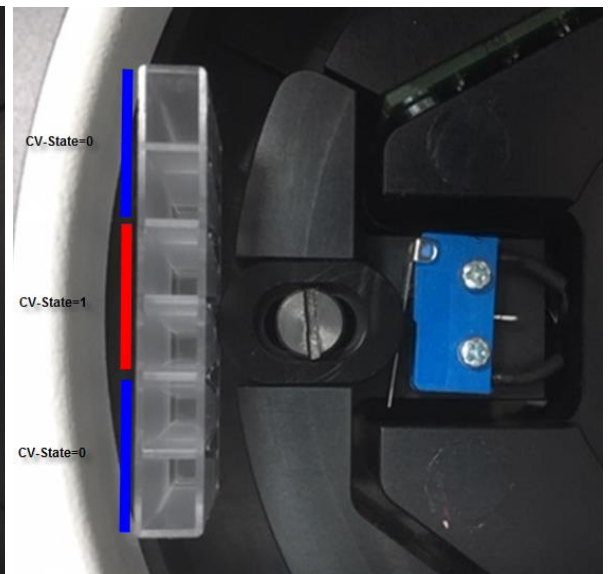
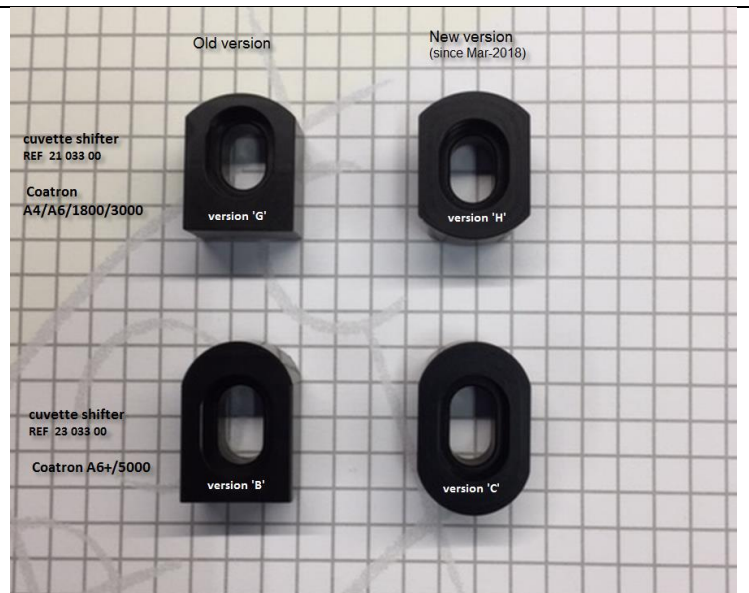
Solution:

The shifter is redesigned to allow more move (signal).

Service Call:

Must be installed on all instruments 5000 latest with next service

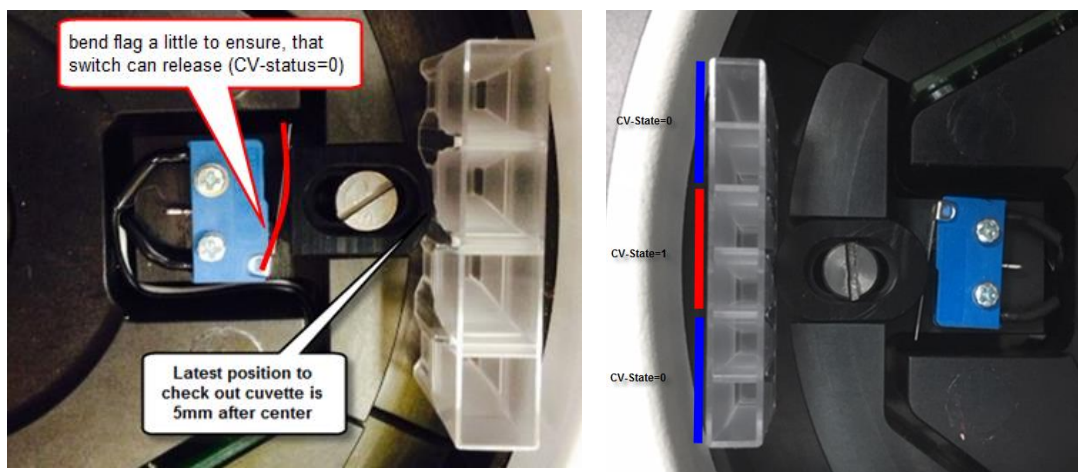
Should be installed on all instruments 1800/3000 in case of problems



Service Instructions:

Adjust Microswitch

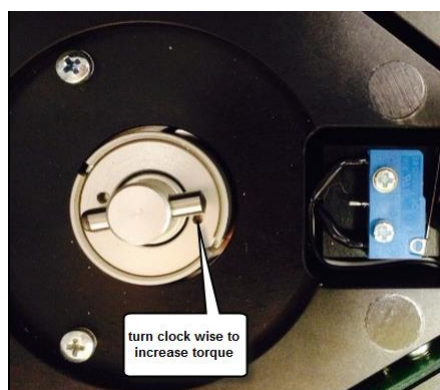
Remove all cuvettes and also the plate. Now you can see the cuvette microswitch and the shifter. Remove the shifter and clean the complete area and then rebuild it. Afterwards the shifter must move easily. The flag of the microswitch should be straight. Use a Voltmeter and check if microswitch do close electrically . Then goto service menu "CHECK OPTIC" optics, insert one cuvette and read CV.-STATUS. Back of the shifter you see a small screw, which can adjust the homeposition. The CV-Status should "1" at cuvette center +-5mm and "0" if cuvette is out of center !



Check-In and Check-Out position can be adjusted by bending the flag of microswitch. In default (like on all new instruments), the flag is straight.

Adjust Gear Torque

Remove all cuvettes and also the plate. Now you can see the gear. Turn manually the axis. The torque must be so strong, that you nearly can not turn the axis. You can increase the torque by turning the gear clockwise. For this use two small screwdrivers and place them into the small holes and then turn the gear.



8.3 Malfunction Coatron A6Plus: Blocking cuvettes

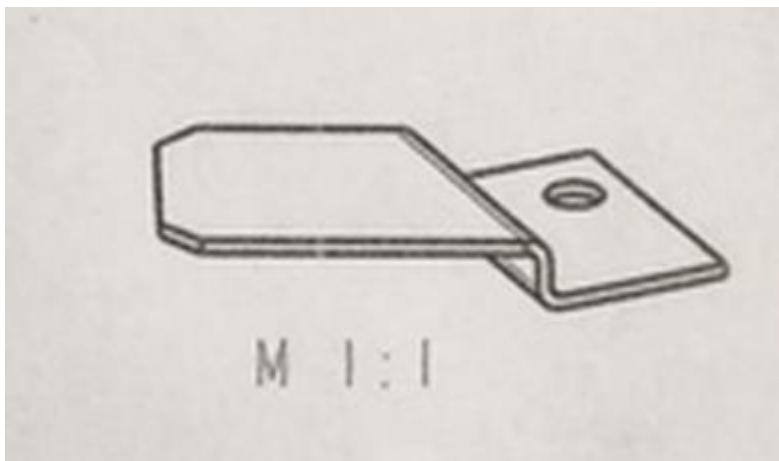
Error description

After measurement the used cuvette is blocking at output position and is not wasted into container. Afterwards the cuvette must be removed manually to continue system operation.

Corrective Actions:

Installation of new part

CAT = 21 023 05 Cuvette output rail



Related systems

Since Jun-2017 the part is installed on all new Coatron A devices

Service action

Coatron A6plus and 5000 with serialnumber xxxx-xxxx-7049 or below must upgrade

8.4 Malfunction: Defect optic

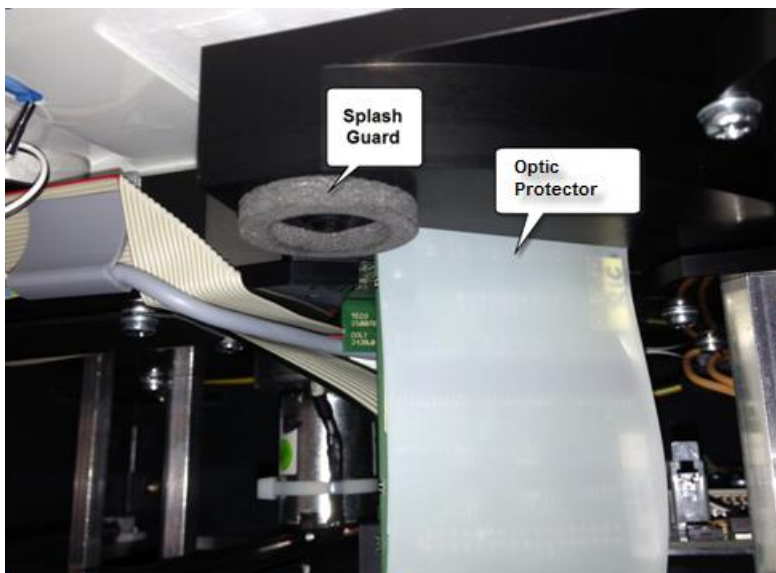
Description

Receiverboard is damaged by contamination with rinse solution. This can happen, if waste tank is completely full. In this case, drops of rinse solution will splash to the surface of the optic boards.

Precaution Actions (Service Action):

Splash Guard:	Does avoid splashes
Optic Protector:	Does protect optic from splashed

Both actions are applied on new instruments Coatron A4/A6 since Dec-2012. For older instrument at least the installation of splash guard is highly recommended.



How to install splash Guard:

First remove the wash position. Open cuvette waste drawer and remove it. Now you can go with your hand below the washing position and push it out of the system. Now place the splash guard directly under the wash position and press the adhesive side to the systemblock. Reinstall wash position and close drawer.

How to install optic protector:

This must be done by authorized service engineer and requires removal of optics.

Corrective Actions:

Damaged receiverboard must be replaced.

8.5 Malfunction: Poor precision of results

Error description:

Instrument gives prolonged or imprecise clotting time. Replicates are 20% and more in difference to first run.

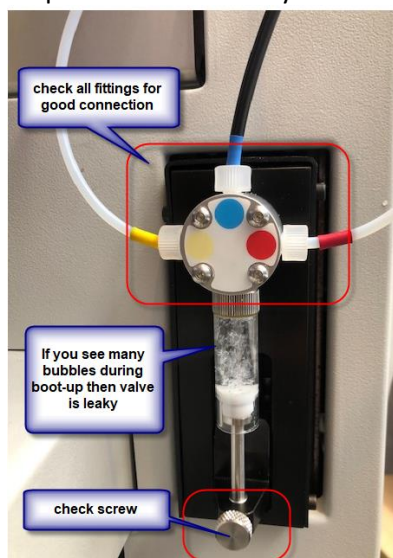
Major sources

- Run FIB and repeat a normal control 8x. The FIB test is excellent to check the quality of instrument.
- Cross-Check also versus other tests (PT, aPTT) and/or other instruments
- PT reagent sediment and must be permanent stirred with magnetic stir bar in the vial
- The cuvette motor adjustment has crucial impact to the performance.
- XYZ adjustment + Wash position is crucial to avoid carryover.
- Run worklist with TECAM "ECO" mode. If performance improve, then this indicates expired needle, syringe or valve
- Upgrading the firmware may helpful especially for imprecise results or carryover
- Remove cuvette from optic after use and check visually for correct volumes and air bubble

Recommended service actions:

Step-1 Install recent firmware 1.03.06a(52) or later You can download from https://1drv.ms/f/s!AoYVax1r2TZdZ5rkjiVSoyHundQ In case of software upgrade, we recommend also to upgrade clean position (REF 21 034 50 , see last page)	-The new firmware has significant improvements regarding precision, accuracy and optical interferences. -It is more tolerant to poor service like old needle, valve, -Additionally the consumption of rinse to reduced significantly. -The most important point is , that lifetime of valve is increased from 80.000 to 150.000 determinations by changing procedure of sample washing.
Step-2 Goto instrument SERCIVE\ADJUST MOTOR and perform	The Coatron A6+/5000 is very sensitive if cuvette is not exactly centered to the LED light beams. In this case especially FIB,DD,AT,FDP gives very poor precision.
Step-3 Goto instrument SERCIVE\ADJUST XYZ and perform	The two needles must be mounted at 110mm height. Fine XYZ adjustment is important to ensure correct inside and outside washing of needle probe

Step-4 : Check for leaky valve



During boot-up the instruments performs a complete wash cycle. Watch carefully

- The valve or tubing is leaky in case of airbubbles like on the picture
- Check that syringe-screw is connected
- Check that tube fittings are connected
- Check that needle is washed inside and outside with rinse solution.

Step-5: Perform FIB QC test



- Place on-board FIB, IBS reagent + Normal control to P01
- Goto menu ANALYSIS/NEW LIST and set mode="QC"
- Install paper into printer and start QC test
- C.V. < 7.5% and E > 0.030E → Everything is fine

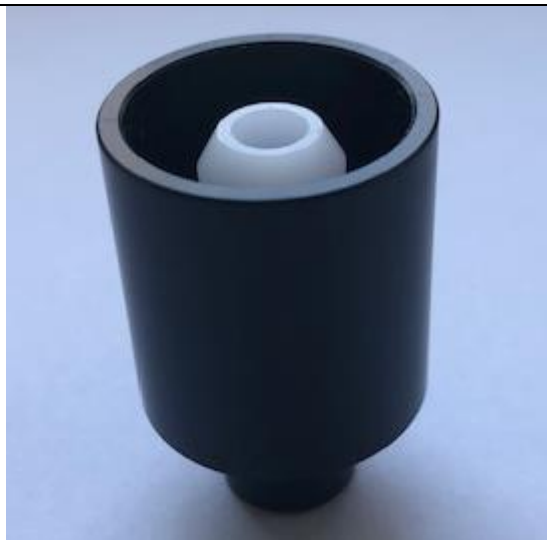
QC-Results:

- Failed if C.V. > 7.5%
Higher results indicate false alignment of cuvette, imprecise volumes (needle, syringe, pump), carryover (needle, wash position)
- Failed if Mean of "E" < 0.030E
Results below indicate false alignment of cuvette or problem with normal control or FIB reagent

Instrument problems	check		trouble shoot
Temperature at optic is not 37-38°C		Read manual, section Adjust temperature	Service menu \Adjust temperature
Cuvette not correct adjusted to optic		Especially Coatron A6 and A6 plus give were poor results for FIB or DD is cuvette is not centered to LED	Service menu \Adjust motor
Carryover	Needle not adjusted	Check XYZ, especially during washing or after needle crash	Adjust XYZ
	Defect wash membrane (Needle not cleaned outside)	Run service\clean needle and watch. Needle must be washed inside and outside !	Replace wash position
	Needle probe expired	Age of needle > 100.000 tests	Replacement
	Needle damaged	Several crashes or unblocking by steel wire	Replacement
Imprecise volume in cuvette	Needle probe is blocker	Tip of needle is partly blocked by poor cleaning or crashing	Replace needle probe
	Syringe is loose	Check screw of syringe	Tighten screw
	Syringe is expired	Age of syringe > 100.000 tests	Replacement
	Valve is leaky	Check for air bubbles in the syringe during washing	Install particle filter + replace valve
	Valve is expired	Age of valve > 100.000 tests	Replacement
	Valve is blocked by particles	check, if there are many air bubbles in the syringe	Remove tubing , needle, syringe and clean all with alcohol
	Liquid Level Sensor stops in air	Age of coax cable > 100.000 test Needle not fixed to z-rack	Replace insulation block or Coax cable latest every 100.000 tests
Reagent problems	Check		trouble shoot
Particles inside of diluent	visual check	shake diluent and see for particles	replacement
Particles inside of control		see vial 10min after reconstitution	replacement
Particles inside of control		after reconstitution	replacement
		after instrument use	check outside wash of needle
Reagent damaged	Run PT,aPTT	PT ok, aPTT not or reverse	Replace reagent
	Run reagent on other instrument	PT,PTT correct	Replace reagent
control plasma damaged	Run fresh normal patients	correct clotting time	Reassign QC target value or replace control
False sample collection	controls are ok, but patients not	Dilute venous blood 1:10 with 3.2% sodium citrate	centrifuge 10min 1500g and use within 4h
PT reagent is not stirred	Reagent is sediment		Place magnetic stir bar into vial

Information:

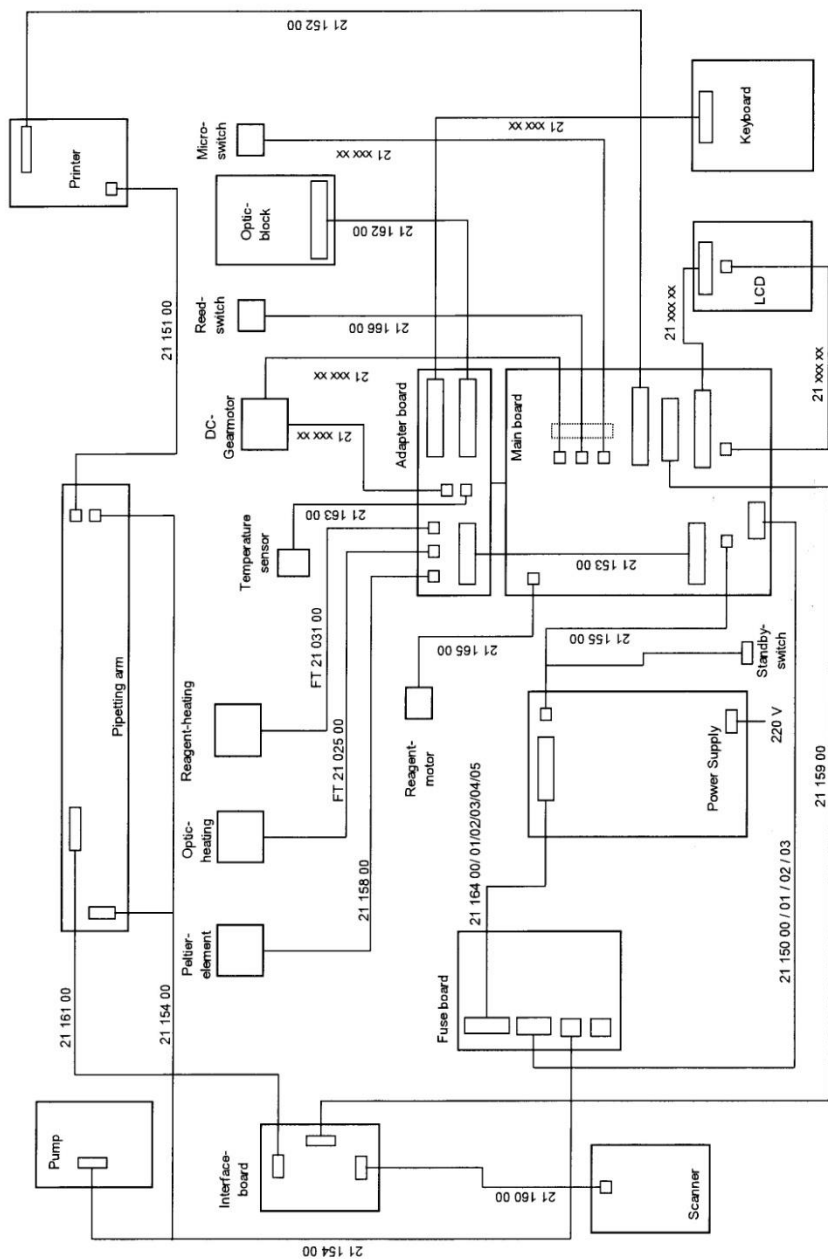
Since 2019 all instruments are delivered with a revised version of clean position. The new version has now a shelf life of 10 years and don't need to be replacement according to service plan.

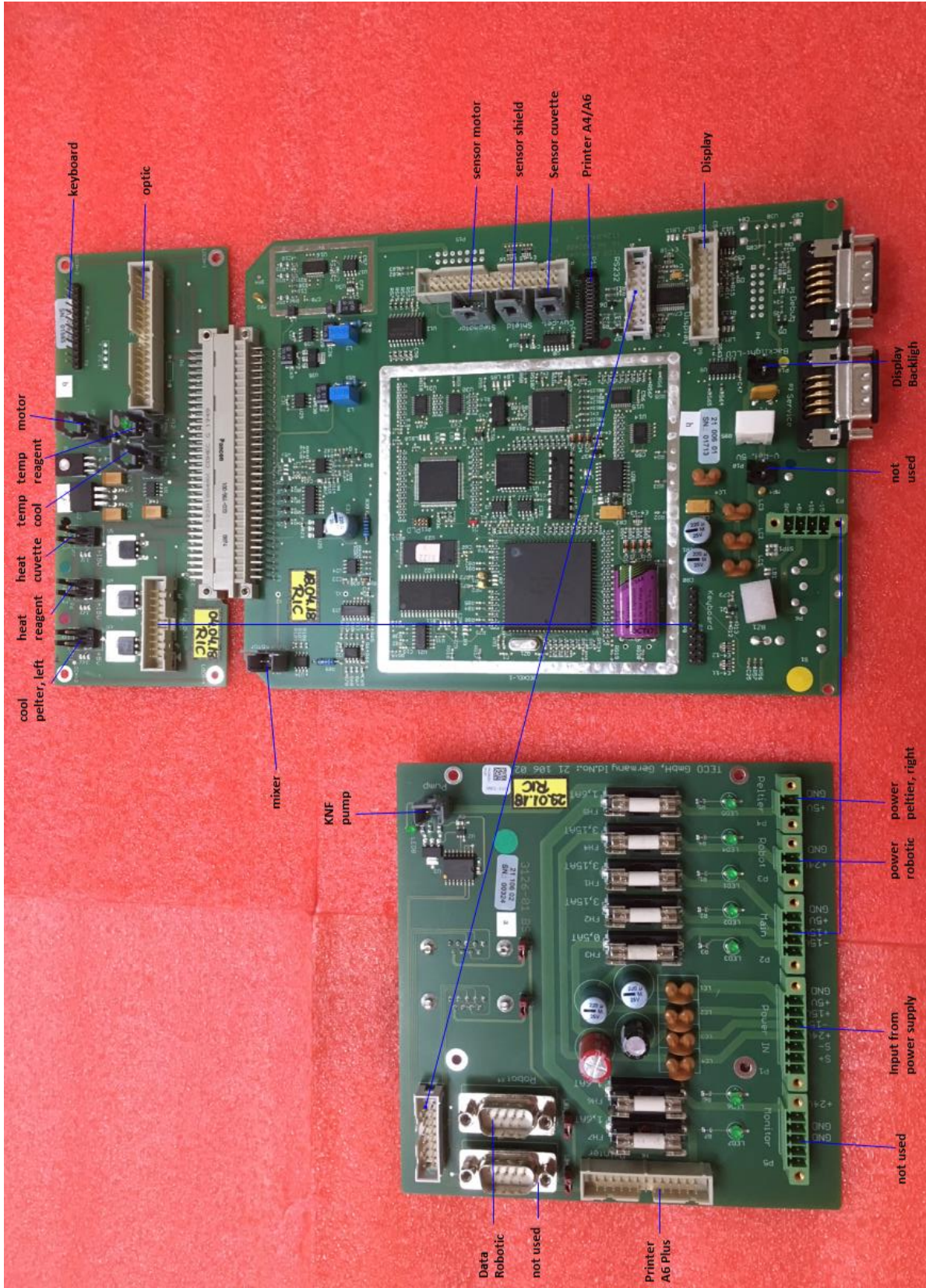
			
Old clean position:	REF= 21 034 00 ©	New clean position:	REF= 21 034 50 (a)
Compatibility:	With all firmware version	Compatibility:	Only with firmware versions released after 2019
Service plan:	Replacement every 50.000 tests	Service plan:	No regular replacement required

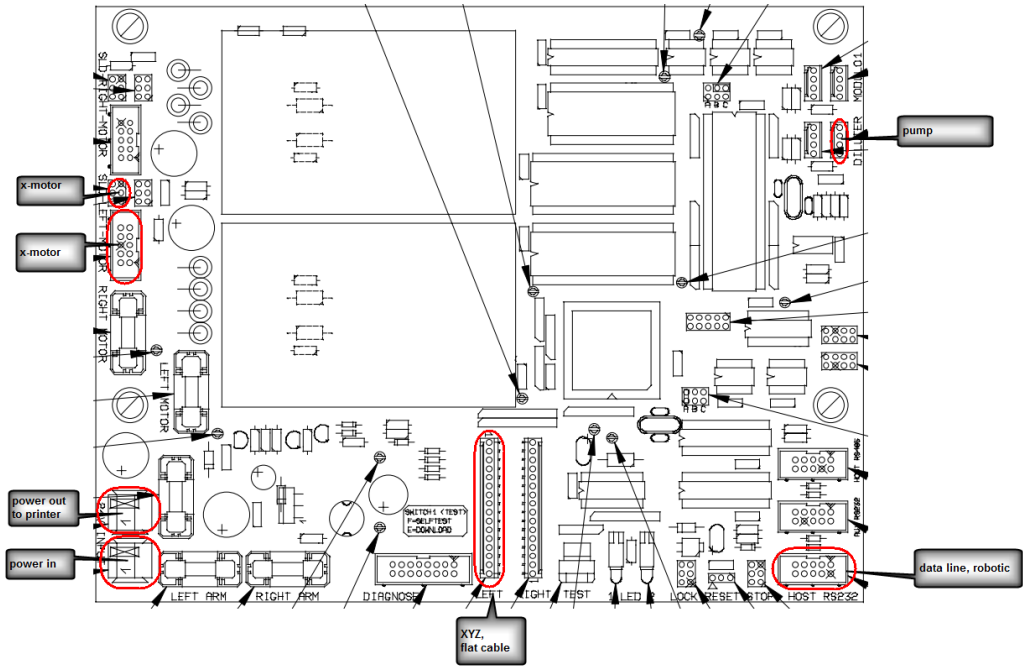
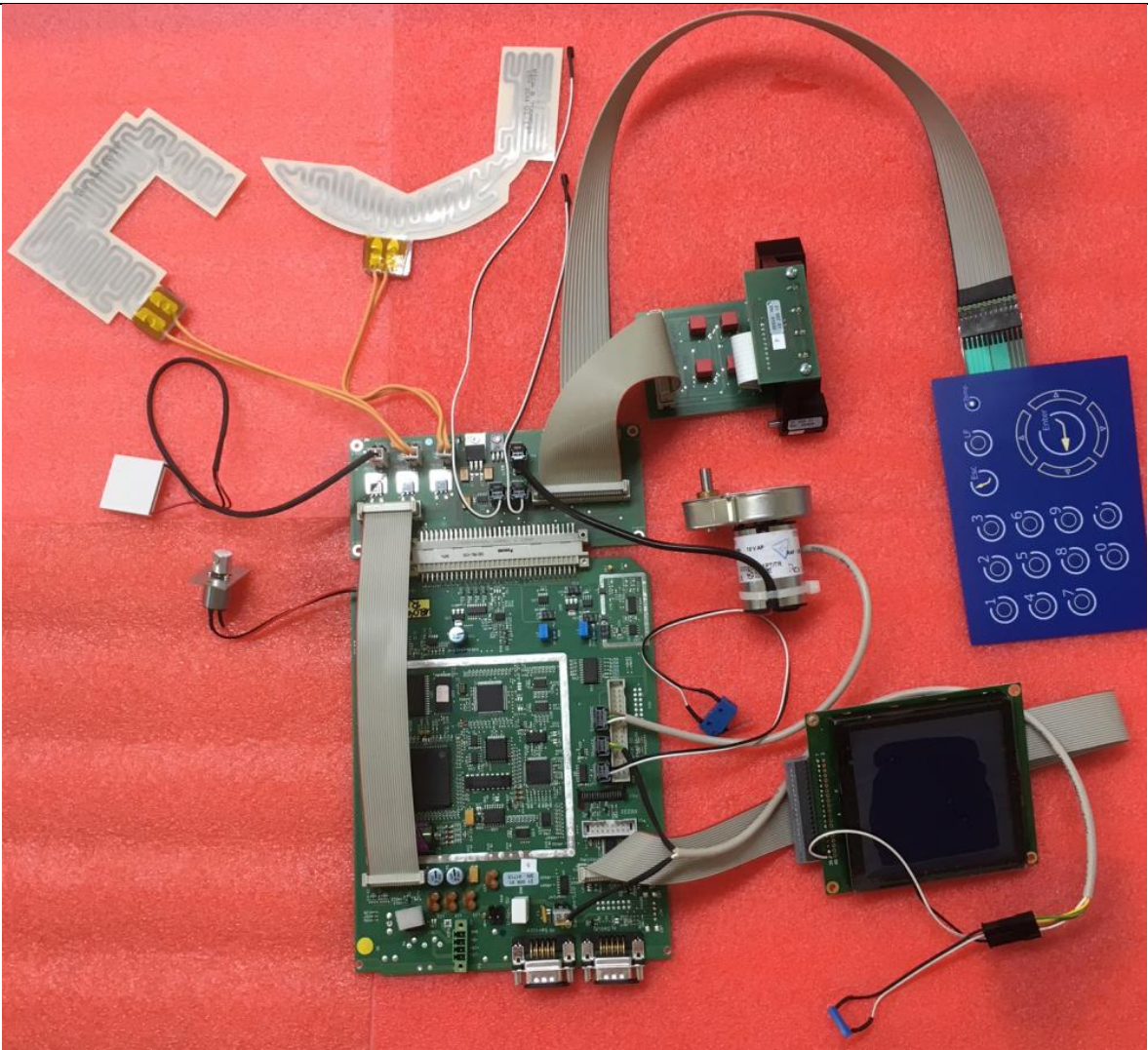
9. Electrical Diagrams and Wiring

9.1 Wiring overview

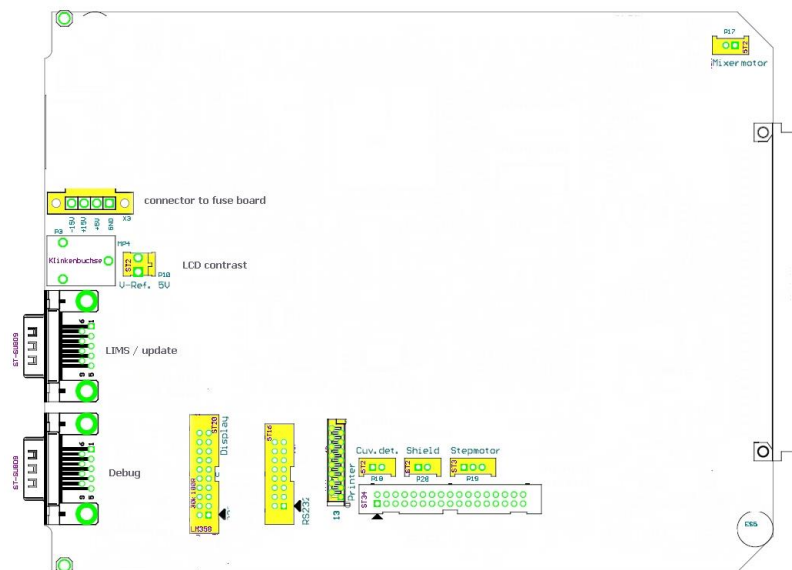
.



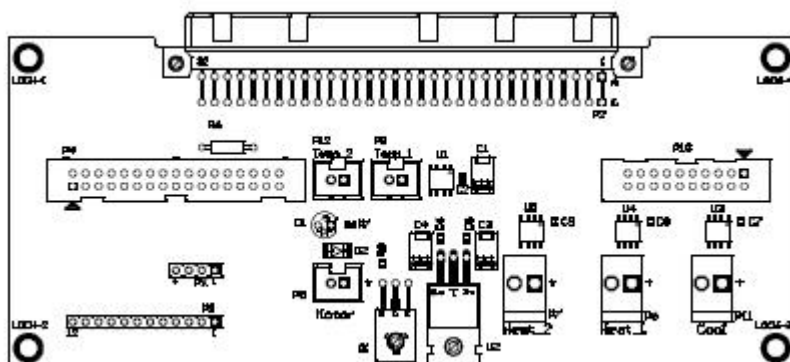




9.2 Mainboard



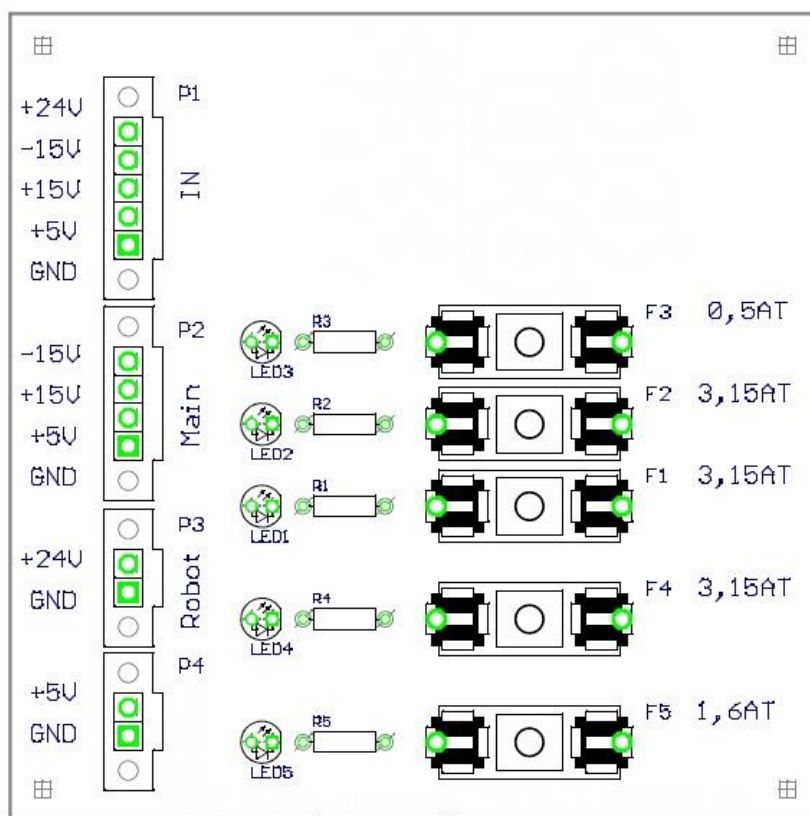
9.3 Adapterboard



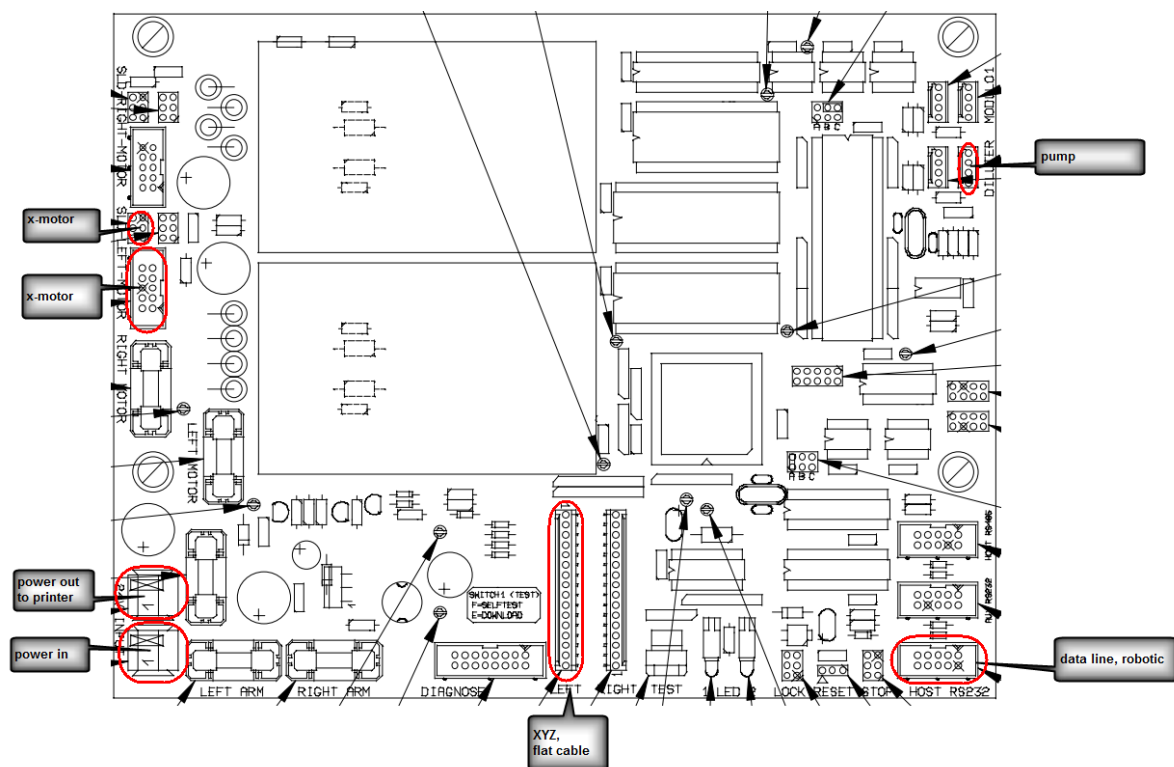
Connector:

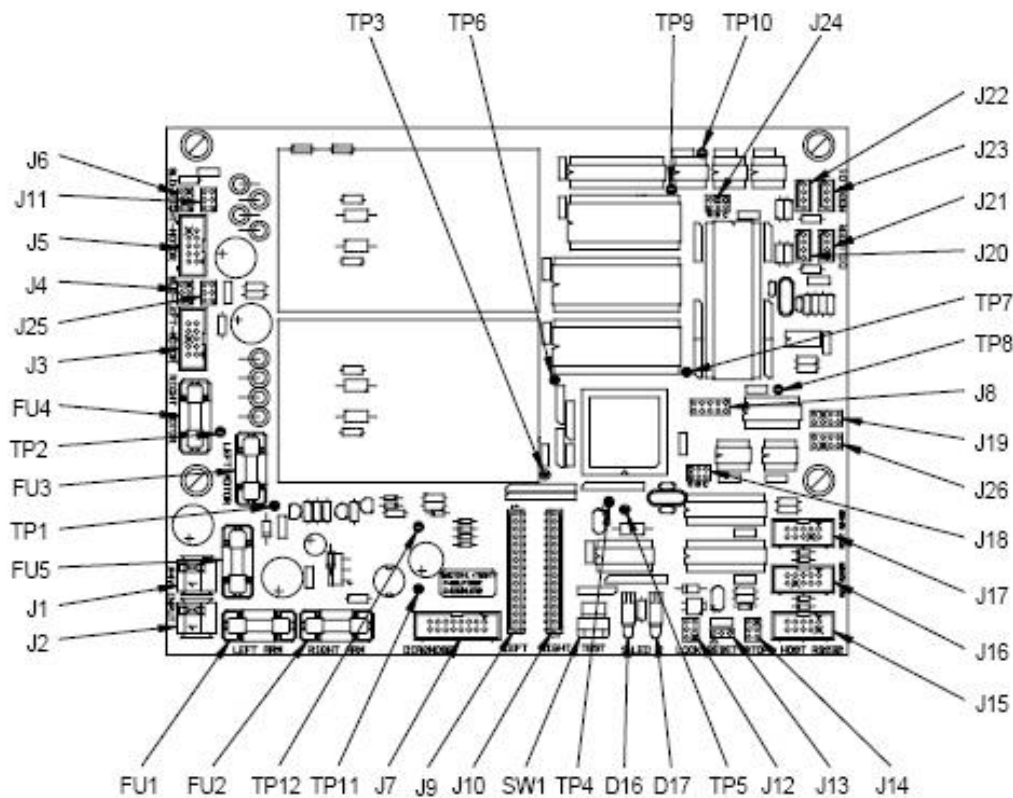
P2	connector to mainboard
P4	LCD display
P5	cuvette motor
P6	heating of reagent block
P7	heating of optic block
P8	not used
P9	keyboard
P10	keyboard bridge to mainboard
P11	cooling of reagent block
P12	temperature sensor of reagent block

9.4 Fusesboard



9.5 CCU roboter board (Coatron A4/A6)

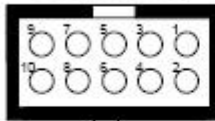




- J1: 24 VDC Input (parallel to J2)
J2: 24 VDC Output (parallel to J1)
J3: Left X-motor Connector
J4: Left X-motor Step Loss Detection Connector
J5: Right X-motor Connector
J6: Right X-motor Step Loss Detection Connector
J7: Diagnostic Device Connector
J8: Emulator Connector
J9: Left Flex Cable Connector
J10: Right Flex Cable Connector
J11: X Initialization Sensor Connector Right
J12: Cover Lock Connector (not implemented)
J13: Reset Switch Connector (not implemented)
J14: Stop Switch Connector (not implemented)
J15: RS 232 C External Computer Connector
J16: RS 232 C Auxiliary Device Connector
J17: RS 485 / 422 External Computer Connector
J18: Selector Jumper for RS 232 C or RS 485 / RS 422 to host
J19: I/O Connector Left Arm
J20: RS 485 Diluter Bus (terminator)
J21: RS 485 Diluter Bus Connector
J22: RS 485 Modulo-1 Bus (terminator)
J23: RS 485 Modulo-1 Bus Connector
J24: Configuration Selector (not implemented)
J25: X Initialization Sensor Connector Left
J26: I/O Connector Right Arm
FU1: Left Arm Fuse
FU2: Right Arm Fuse
FU3: Left X-motor Fuse
FU4: Right X-motor Fuse
FU5: 5 VDC Fuse
D16: LED - 1
D17: LED - 2
SW1: Address Switch (16 position)

- TP1: Test Point (VPP 24VDC)
TP2: Test Point (Power GND)
TP3: Test Point (VCC 5VDC)
TP4: Test Point (GND)
TP5: Test Point (CCU Reset)
TP6: Test Point (VPG 1.5 VDC nominal,
12.5 VDC for firmware download)
TP7: Test Point (GND)
TP8: Test Point (VCC 5VDC)
TP9: Test Point (GND)
TP10: Test Point (VCC 5VDC)
TP11: Test Point (VCC 5VDC)
TP12: Test Point (GND)

J15 / J16 / J17



J15 RS 232 C to Host

- 1: RTS
- 2: Indexing Key
- 3: CTS
- 4: GND
- 5: TxD
- 6: GND
- 7: RxD
- 8: GND
- 9: Not Connected
- 10: GND

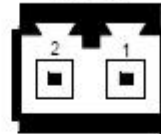
J16 Auxillary RS 232 *

- 1: RTS
- 2: +5VDC
- 3: CTS
- 4: +5VDC
- 5: TxD
- 6: Not Connected
- 7: RxD
- 8: Indexing Key
- 9: Not Connected
- 10: GND

J17 RS 485 / 422 to Host

- 1: B1 Sender
- 2: GND
- 3: B2 Receiver
- 4: Indexing Key
- 5: A1 Sender
- 6: GND
- 7: A2 Receiver
- 8: Not Connected
- 9: Not Connected
- 10: Not Connected

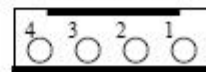
J1 / J2



- ### J1
1. +24 VDC Output
 2. GND

- ### J2
1. +24 VDC Input
 2. GND

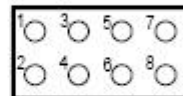
J20 / J21 / J22 / J23



- ### J20 / J21 Diluter / Option Bus
1. Bus Terminator
 2. RS 485 A Line
 3. RS 485 B Line
 4. Bus Terminator

- ### J22 / J23 Modulo-1 Bus
1. Bus Terminator
 2. RS 485 A Line
 3. RS 485 B Line
 4. Bus Terminator

J19 / J26



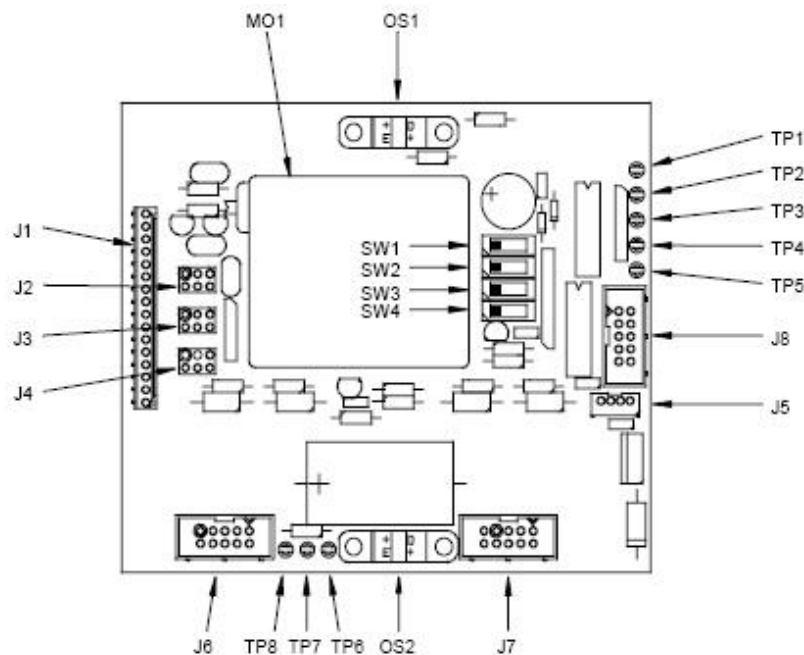
J19 I/O Lines Left

1. + 24 VDC
2. + 24 VDC
3. Indexing Key
4. + 5 VDC
5. Input Line 4
6. Input/Output Line 3
7. GND
8. GND

J26 I/O Lines Right

1. + 24 VDC
2. + 24 VDC
3. + 5 VDC
4. Indexing Key
5. Input Line 4
6. Input/Output Line 3
7. GND
8. GND

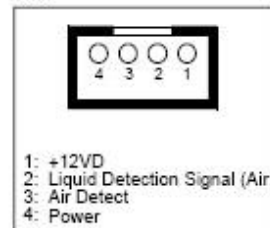
9.6 ADRI-9 board (level sensor board)



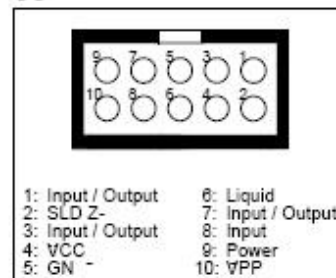
CodeDescription

- J1: Flex Cable
- J2: Optical Switch Connector (Y-
- J3: Optical Switch Connector (Step Loss
- J4: Optical Switch Connector (Step Loss
- J5: DITI Connector (Power /
- J6: Y-axis Motor
- J7: Z-axis Motor
- J8: Switchable Input / Output
- MO1 ALIDUM (Adaptive Liquid Level
- OS1 Optical Switch X-axis (Left Arm X-axis
- OS2 Optical Switch X-axis (Right Arm X-axis
- SW1- Selector Switches (see
- TP1 Test Point
- TP2 Test Point (VCC
- TP3 Test Point (X-axis Initialization
- TP4 Test Point (Y-axis Initialization
- TP5 Test Point (Liquid Detection
- TP6 Test Point (Power
- TP7 Test Point (VPP
- TP8 Test Point

J5



J8

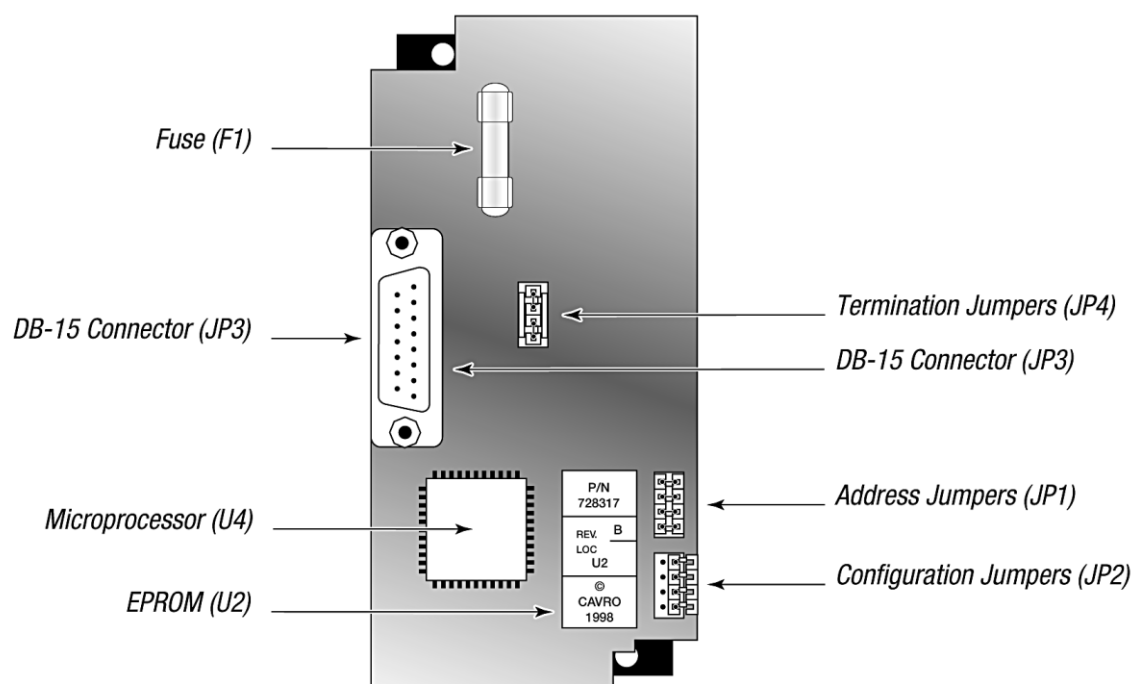


Selector

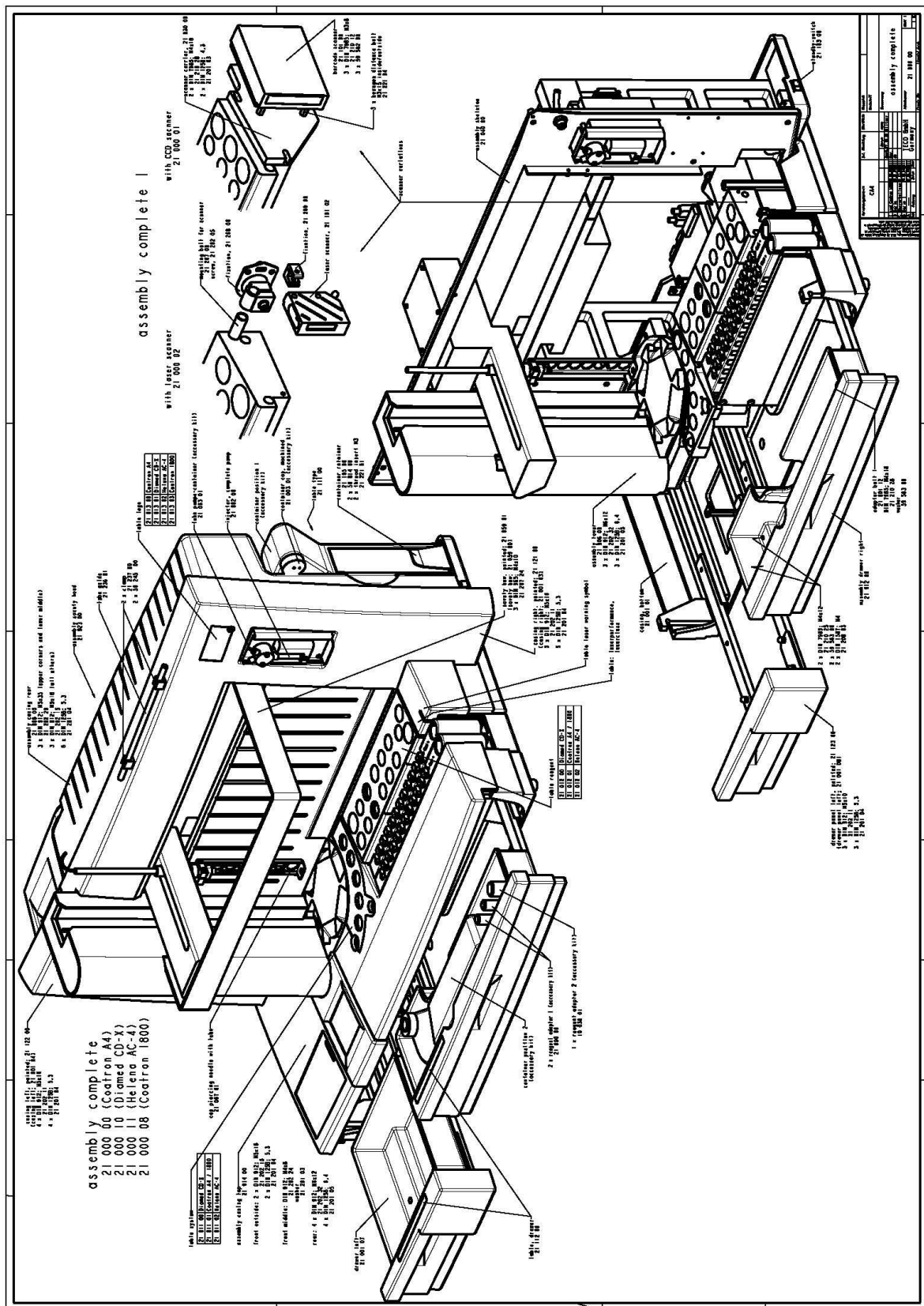
SW1	Arm	
	Left	Right
SW2	DITI	
	Enabl	Disabl
SW3	ALIDUM	
	Switching by	
SW4	Value for	
	Sensitivi	
	High	Very

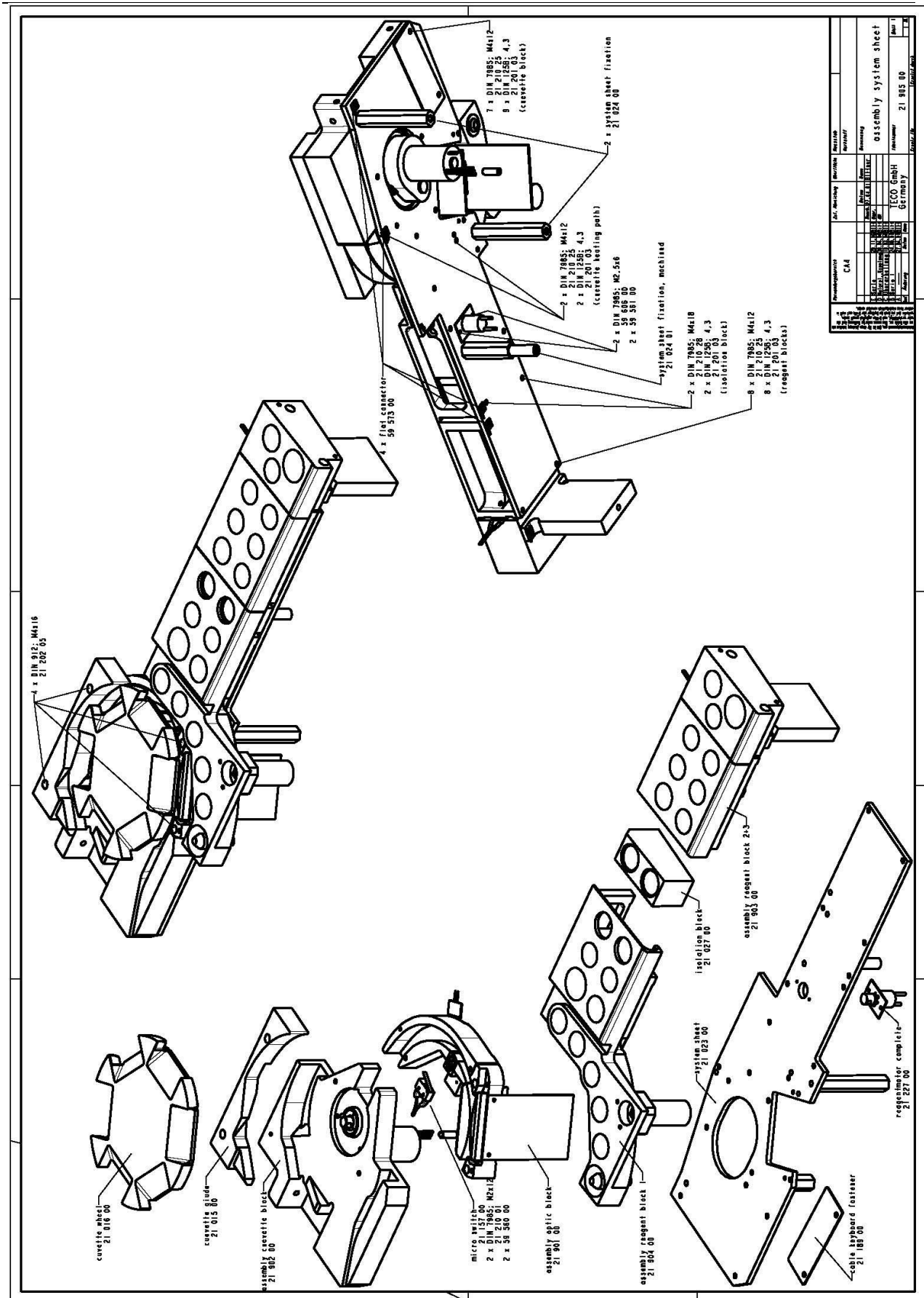
Standard settings for a left arm

9.7 CCU diluter board (pump control unit)



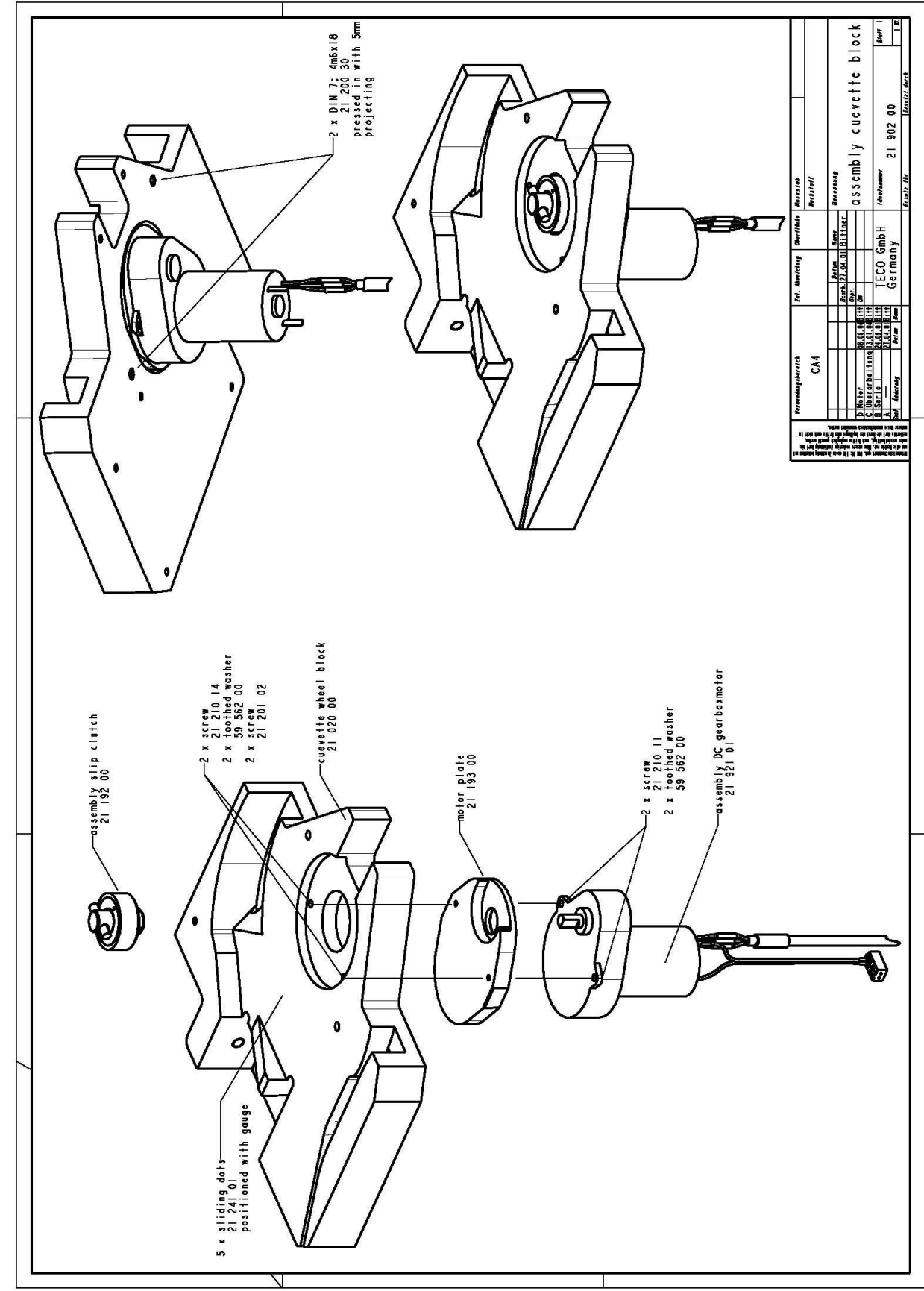
10. Technical Drawings (Coatron A4/A6)





Coatron A4

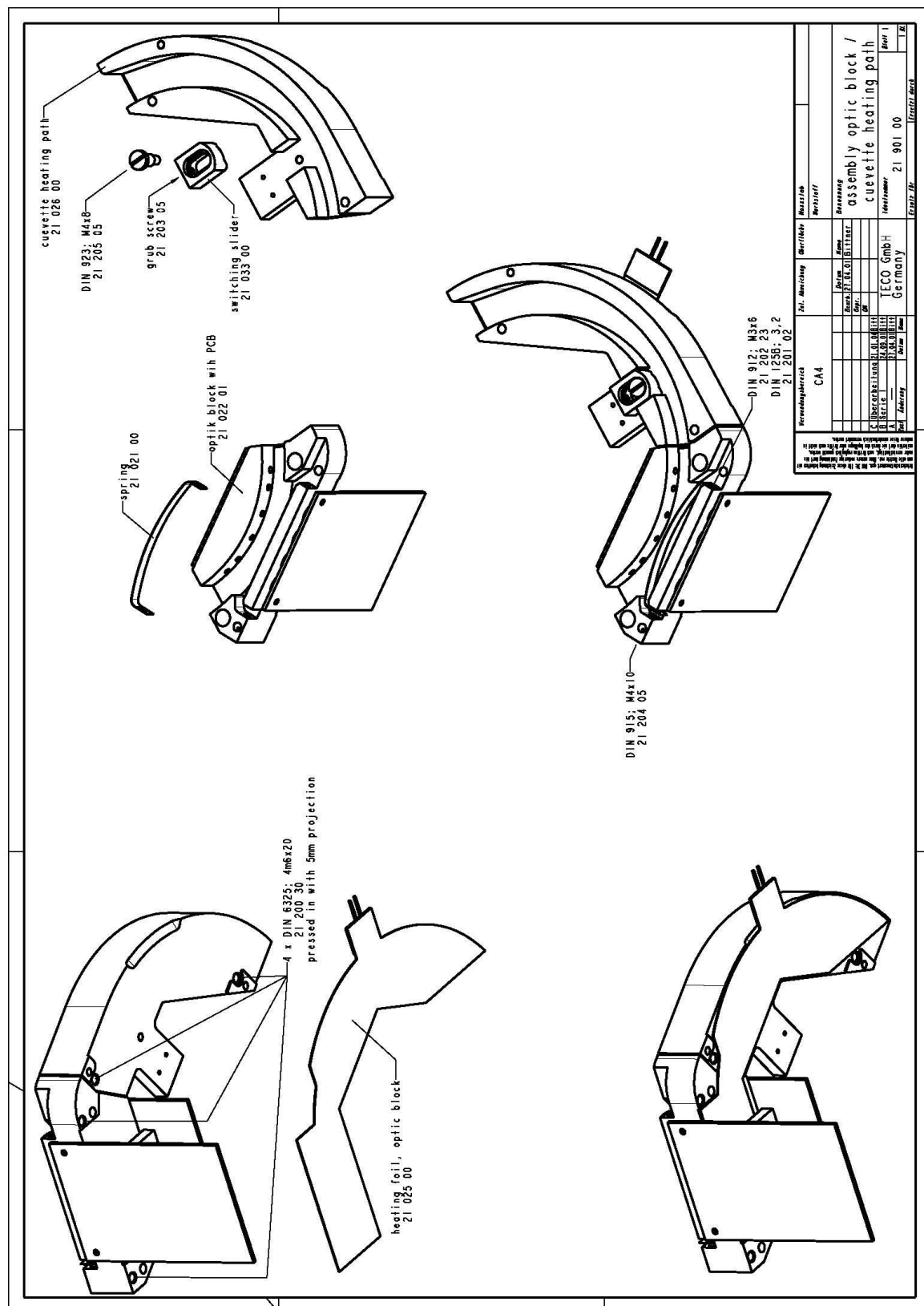




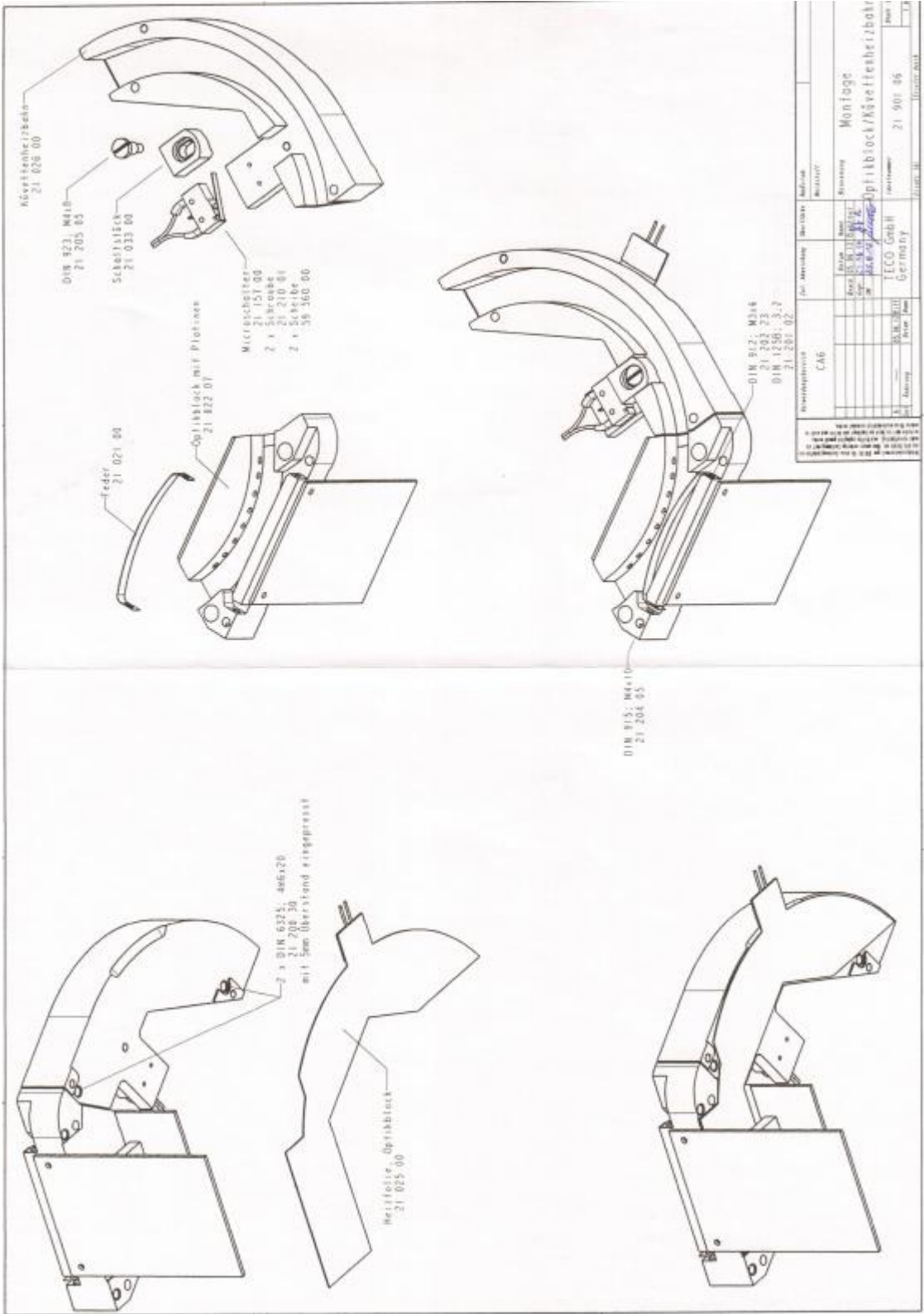
Coatron A4



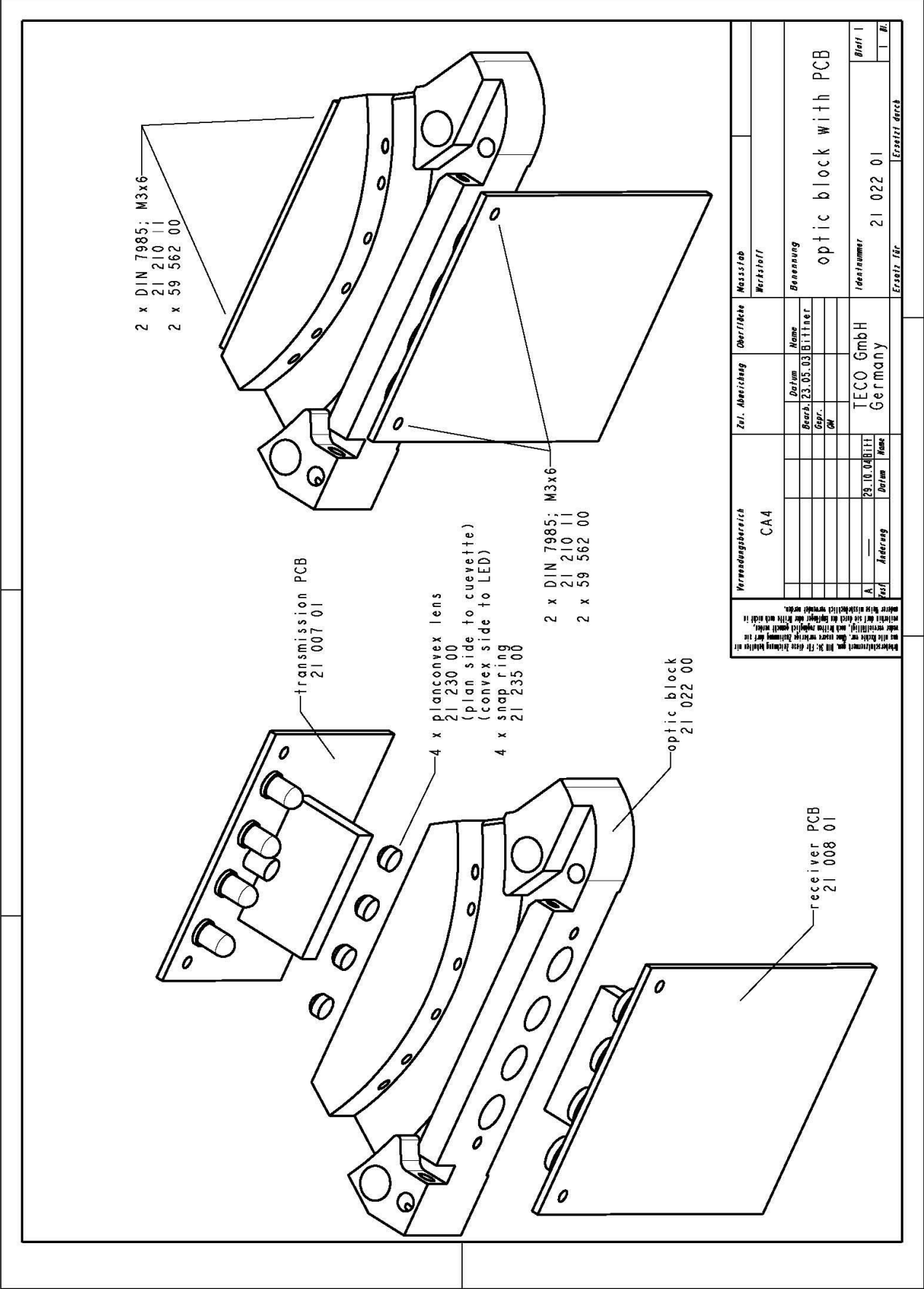
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Coatron A4



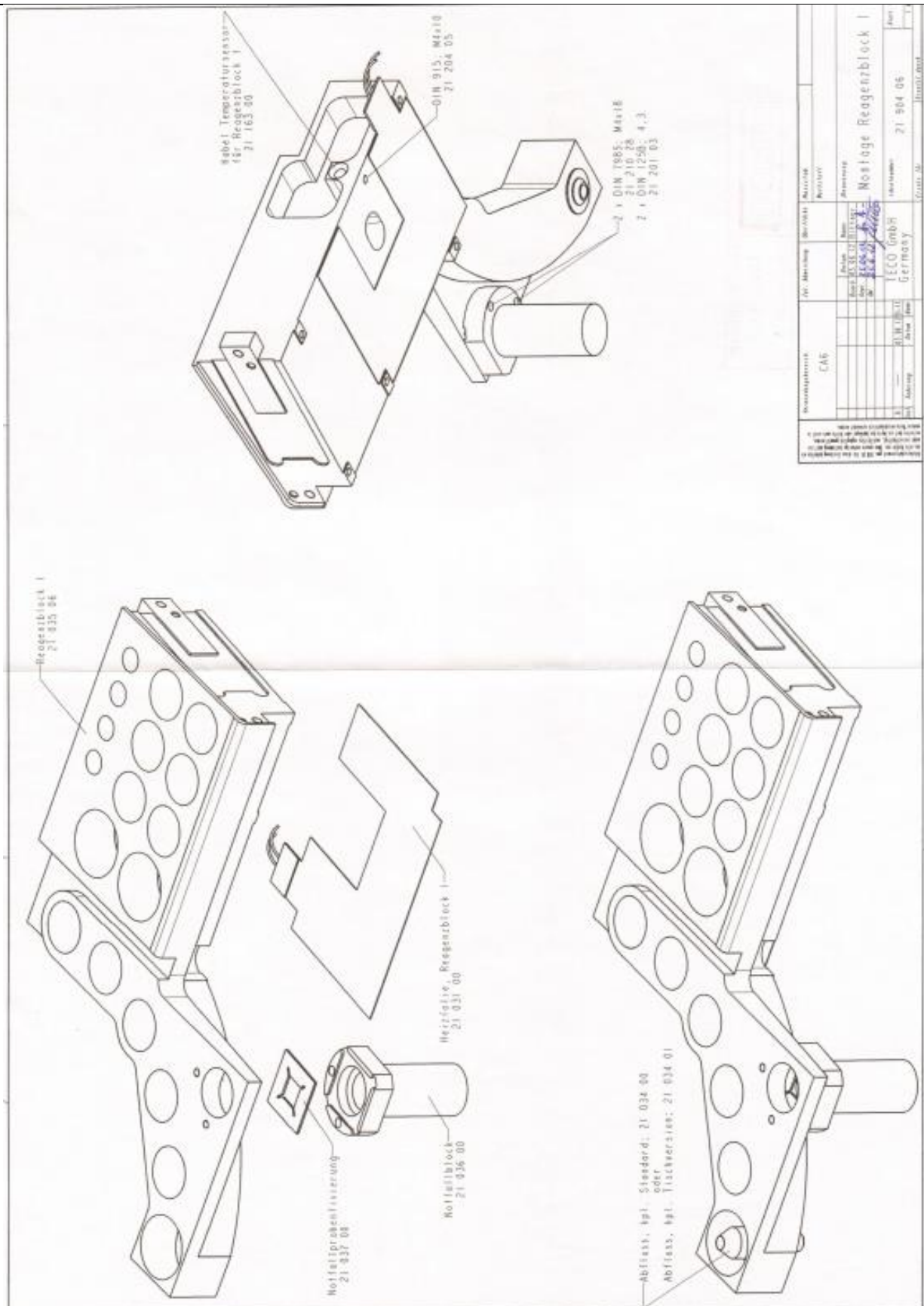
Coatron A6



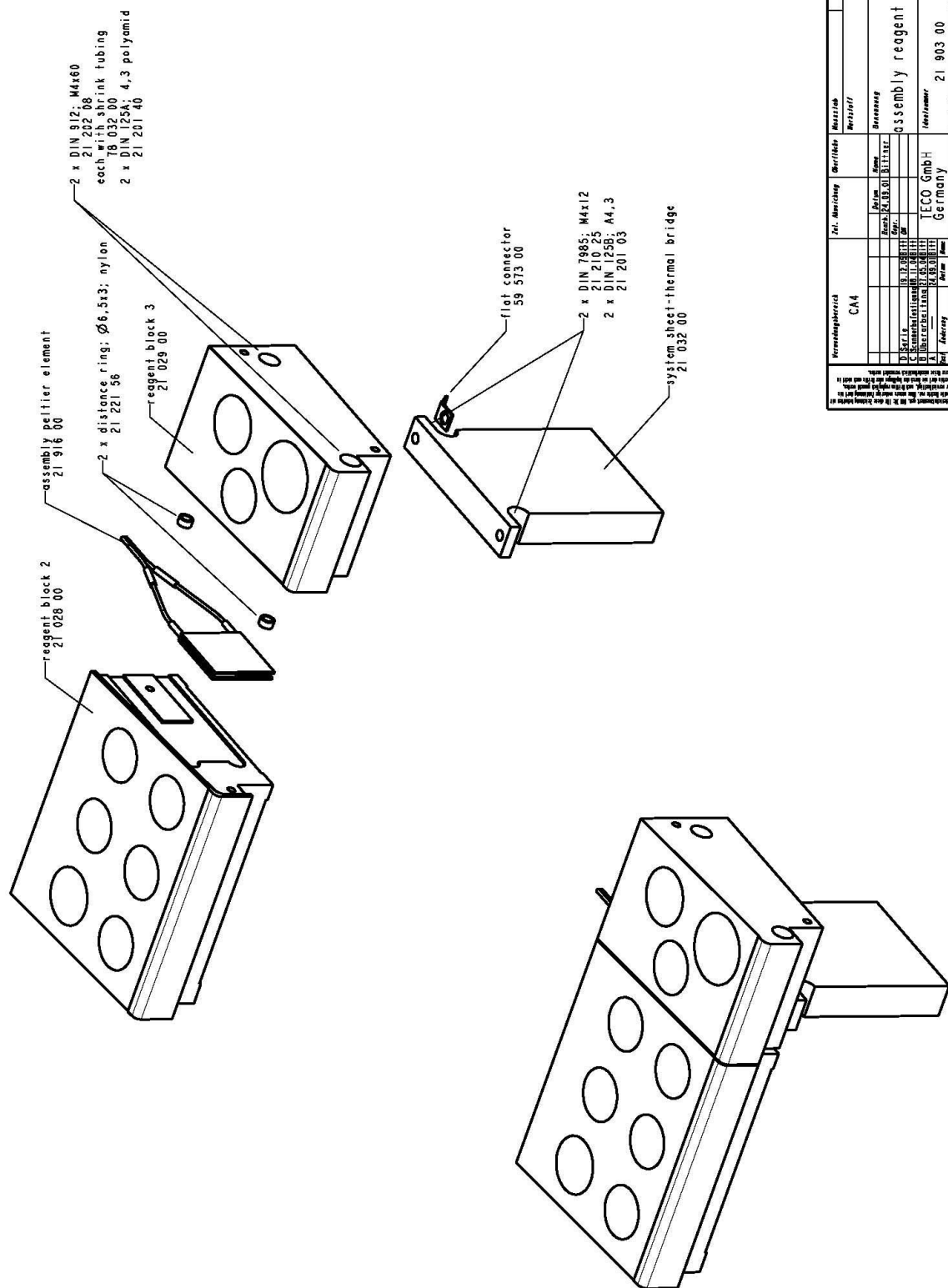
Coatron A4



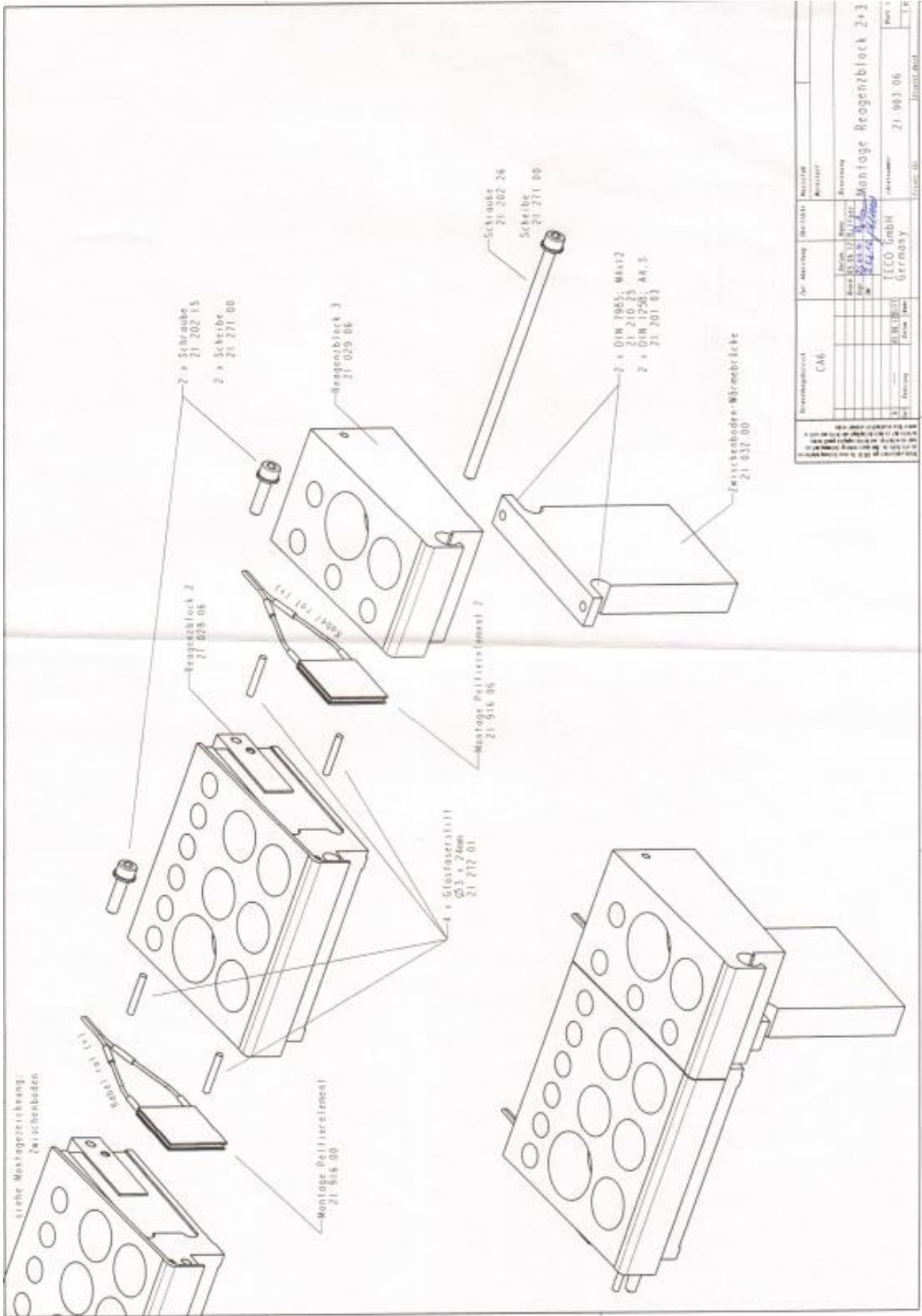




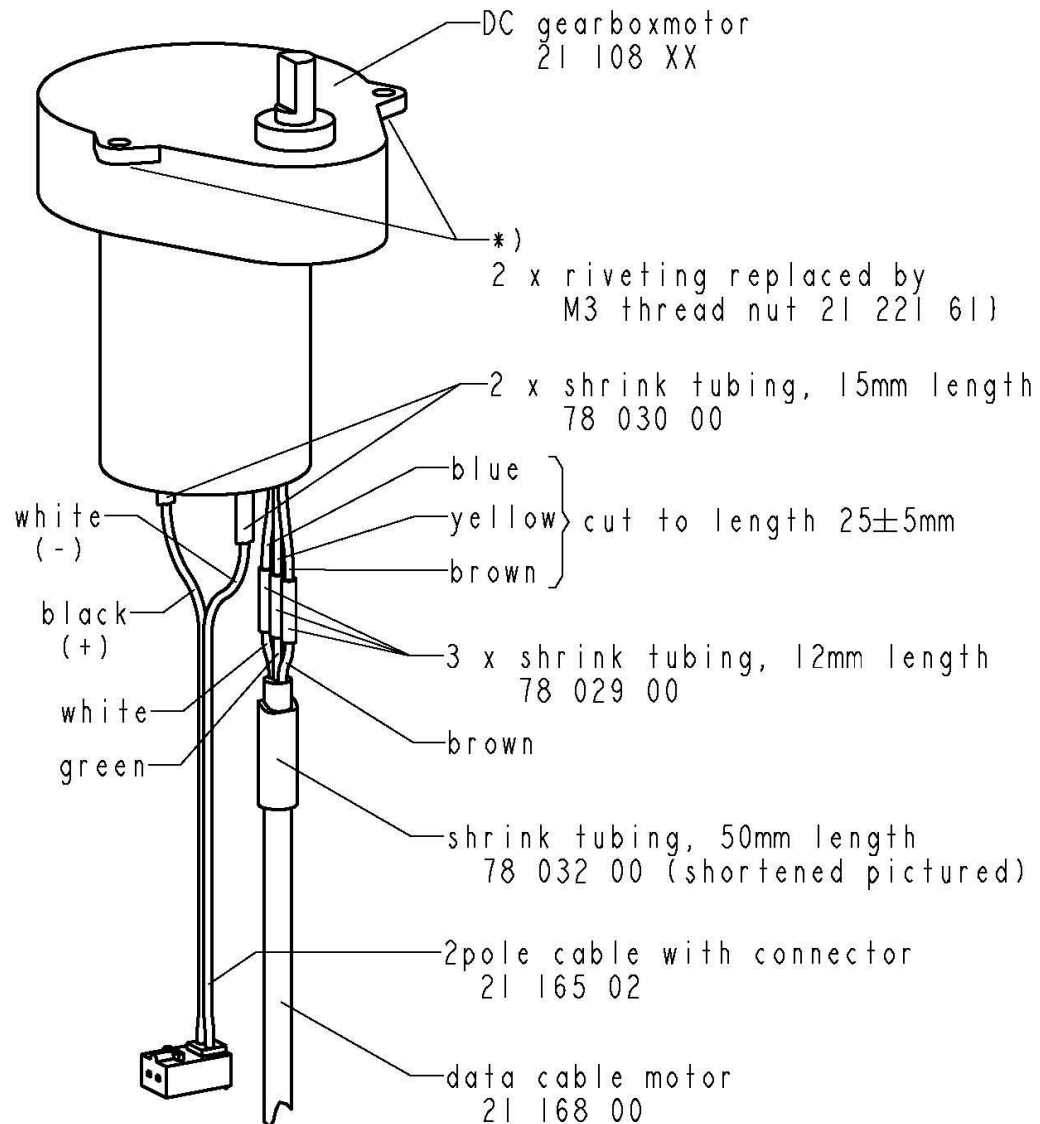
Coatron A6



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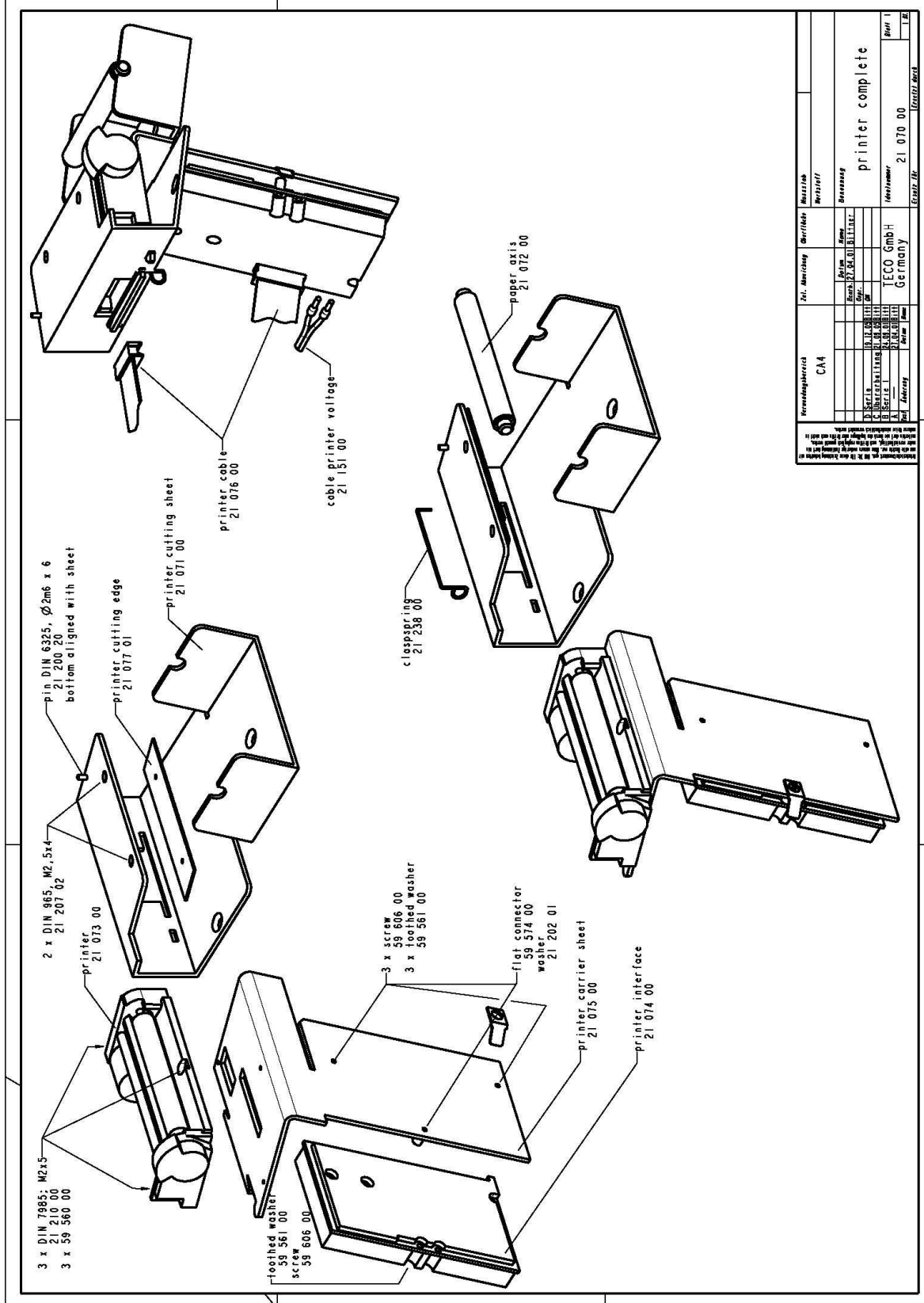
Coatron A6

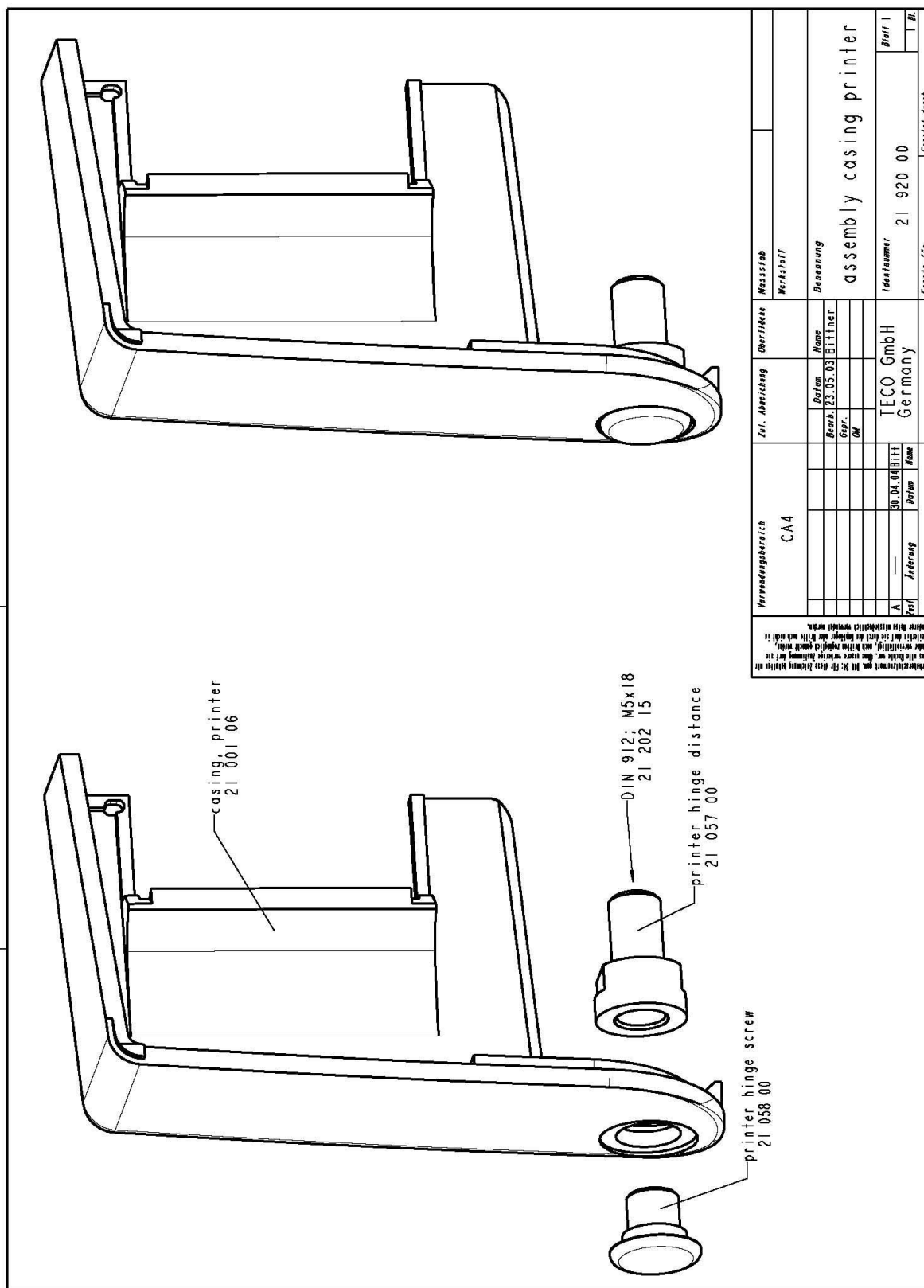


assembly DC gearboxmotor	part DC gearboxmotor	axis- $\varnothing$	*) riveting
21 921 00	21 108 00	4 mm	yes
21 921 01	21 108 01	6 mm	no

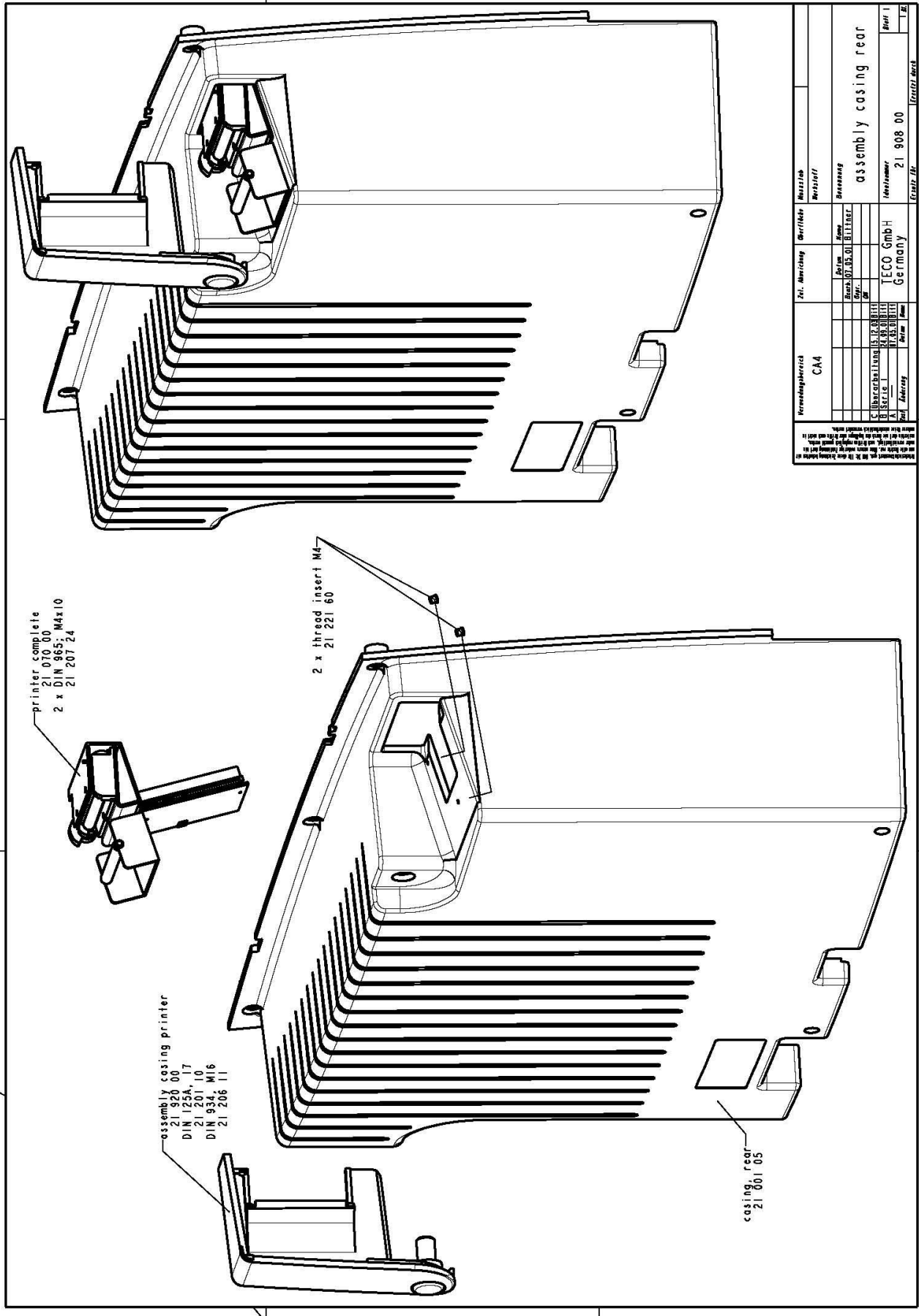
Unbedenklich gem. DIN 34: Für diese Zeichnung behalten wir uns alle Rechte vor. Ohne unsere vorherige Zustimmung darf sie weder vervielfältigt, noch Dritten zugänglich gemacht werden, wiewohl dies durch das Kopieren oder Drucken auch nicht in anderer Weise ausdrücklich verändert werden.

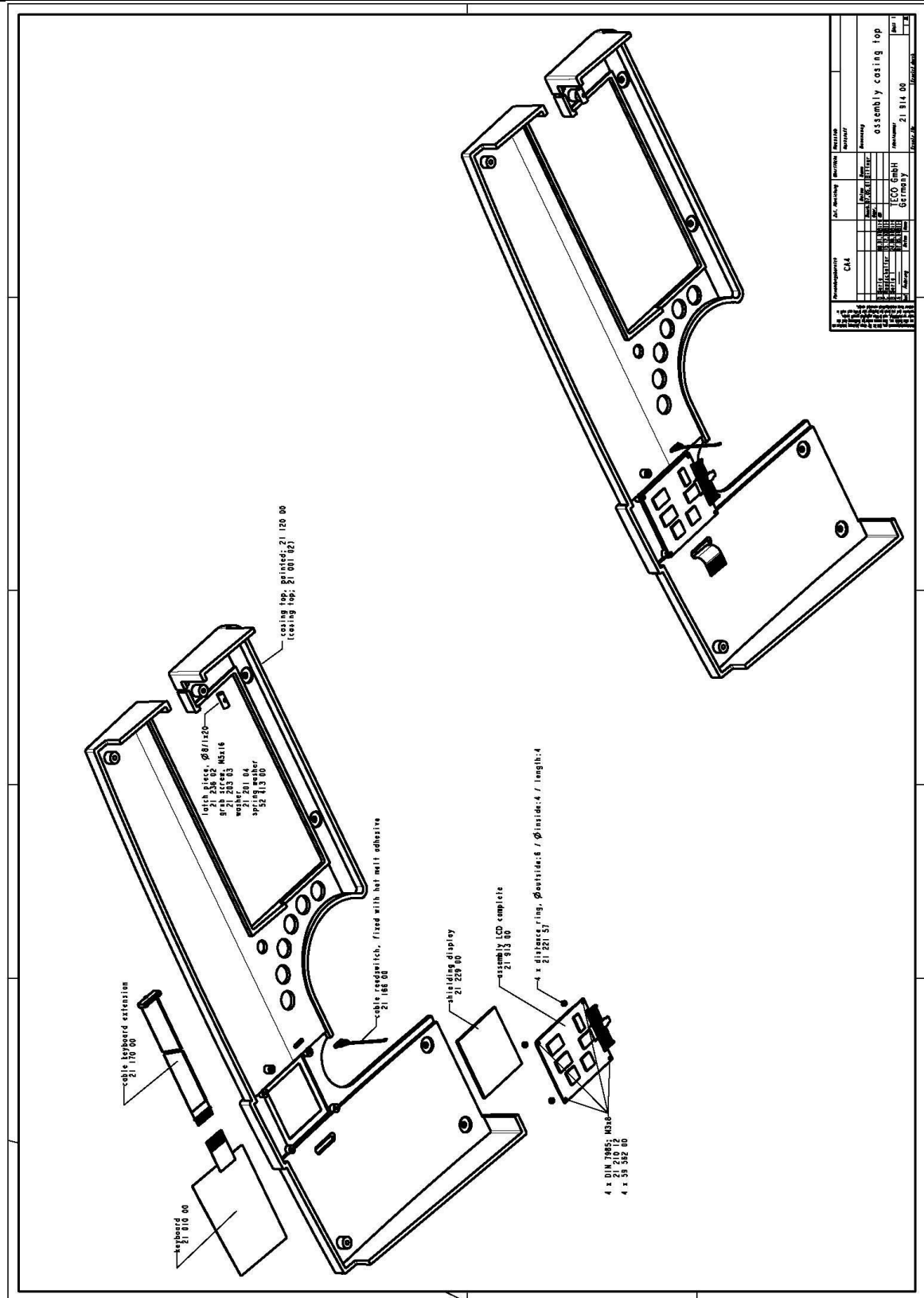
Verwendungsbereich				Zul. Abweichung		Oberfläche		Massstab			
CA4								Werkstoff			
					Datum	Name		Benennung			
				Bearb.	27.01.04	Bittner		assembly DC gearboxmotor			
				Gepr.							
				GM							
A	—	07.10.09	Bitt	TECO GmbH Germany				Identnummer			Blatt 1
Zust	Änderung	Datum	Name					21 921 XX			I Bl.
								Ersatz für		Ersetzt durch	

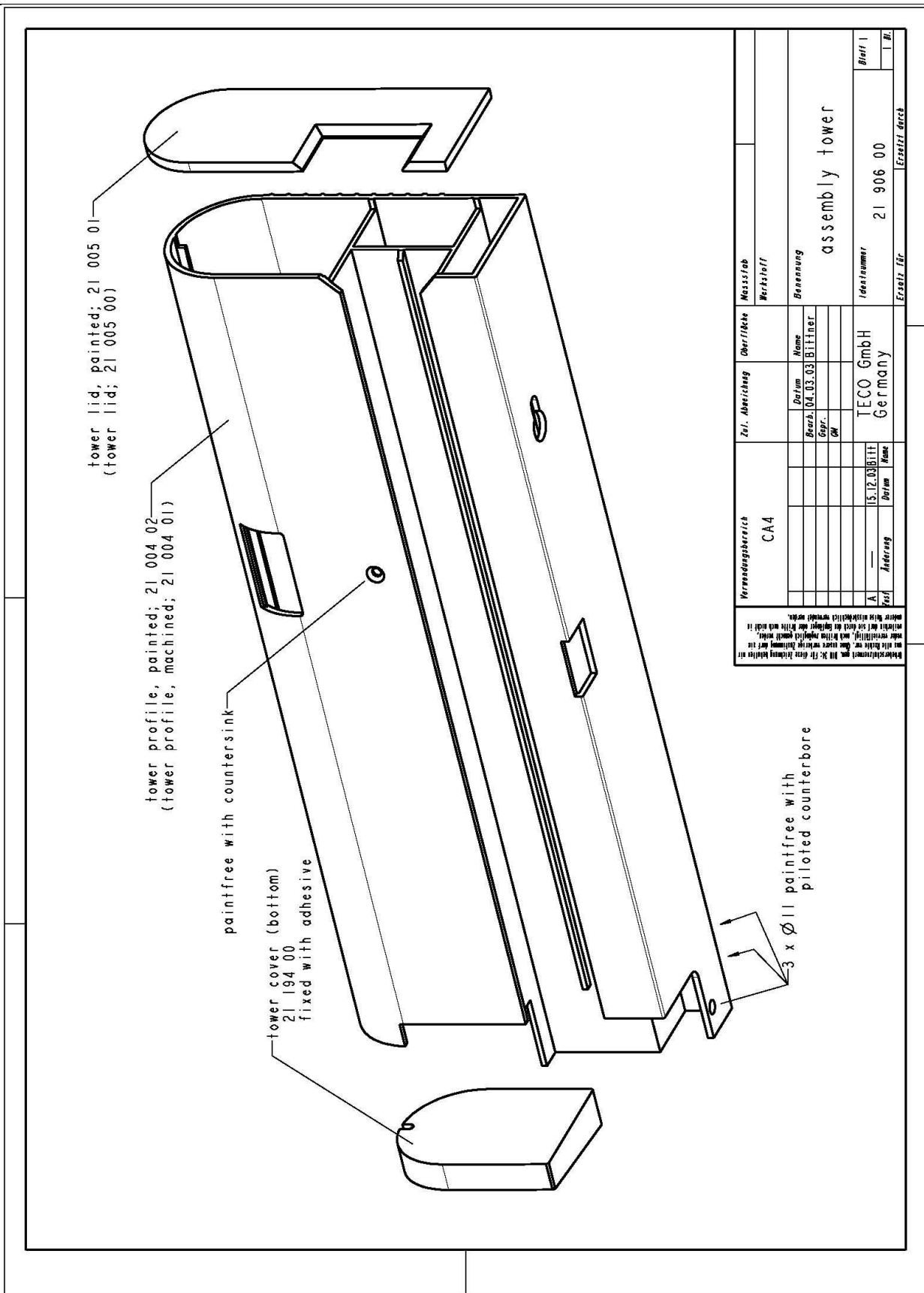




Verwendungsbereich		Zul. Abweichung		Oberfläche		Messstab	
CA 4						Werkstoff	
						Benennung	
						assembly casing printer	
						Identnummer	
						21 920 00	
						Erstellt durch	
						I. B.	
						Blatt 1	
						TECO GmbH	
						Germany	
						30.04.04B11	
						Datum	
						Name	
						Bearb. 23.05.03	
						Bittener	
						Gedr. 04	
						A	
						Teil	
						Änderung	
						Name	
						Datum	







11. List of spare parts

REF	Product	applied to
21 006 01*	Main board A4/A6, tested	A4/A6
21 006 01*	Main board Coatron A6+	A6+
21 009 02*	Adapter board Coatron A4/A6	A4/A6
21 010 00	Keyboard Coatron A4/A6	All
21 034 00	Waste complete, standard	All
21 061 00	Pump Coatron A4, complete	A4
21 061 06	Pump Coatron A6, complete	A6
21 063 01	Tubing A4/A6 (pump - container)	A4/A6
21 067 01	Pipette needle A4/A6, cap piercing	A4/A6
21 101 02	Laser-Barcodescanner (newer systems)	All
21 227 00	Reagent Motor cpl.	All
21 802 00	Alidum module	A4/A6
21 803 00	Main board pipetting system	A4/A6
21 804 00	ADRI-9 board without alidum module	A4/A6
21 806 00	Insulating block A4/A6 with cable	A4/A6
21 808 00	Syringe 1ml	A4
21 808 06	Syringe 2,5 ml	A6 / A6+
21 809 00	Valve A4 pump	A4
21 809 00	Valve XC , pump	A6
21 817 00	Optic block cpl. 405 nm (Coatron A4)	A4
21 817 06	Optic block cpl. A6	A6
21 910 00	Sample rack A4 P01-12	A4
21 911 00	Sample rack A4 P13-24	A4
21 913 00	Display cpl.	All
21 916 00	Peltierelement, 5V	All
21 916 06	Peltierelement 15V	A6 / A6+
21 918 00	Power supply	All
21 921 01	Gearboxmotor (6mm) new	All
23 063 01	Tubing blue (pump - container)	A6+
23 063 02	Tubing red (pump - needle)	A6+
23 063 03	Tubing yellow (pump - needle)	A6+
23 067 05	Pipette needle, A6+	A6+
23 070 00	Printer, easy paper load	A6+
23 803 00	Cable, liquid detection coax L=110	A6+
23 810 00	Main board pipetting system	A6+
23 811 00	Main board X, Y, Z-axis	A6+
23 814 00	PCBA board, dual Z box	A6+
23 816 00	Valve XC+, teflon M6 with label	A6+
23 817 00	Optic block cpl. A6+	A6+
23 818 00	Insulationblock cpl. Coatron A6Plus	A6+
62 070 00	Battery SL750/PT (Main board)	All

Sparte PARTS for COATRON A4/A6 ROBOTIC SYSTEM

PN	Description
20739256	Sensor Alidum Level
20733040	Z-Rack - 250 mm
20739765	Pulley Y-Idler Assy
30071112	PULLEY X-IDLER ASSY RSP SPR
30040427	Roller Track Y RSP (3) (for Y wagen)
20722415	Gear Pinion Z
30031272	MOTOR RSP Z ARM H-TORQUE
20738870	Kit Belt X Drive RSP L520 (3.310 FT)
20738876	Kit Belt Y Drive RPS 150
20738878	Kit Belt Z Drive RSP 85T
20726698	Belt Y-Motor
20739763	MOTOR ASSY X-AXIS
20973263	Z-Bearing
20729370	Valve, 3P, 1/4-28, XE/XC/XLP/SVP
20739046	PCBA XE RS-232/RS-485 Spare
20739717	PCBA RSP V4.2 CCU 1-Arm Spare
20739419	PCBA ADRI-9 V2.0
30045657	MOTOR VALVE ASSY XE 3P SPARE
30049748	MOTOR PLUNGER DRIVE XE 3P ASSY SPARE
20737945	Sensor Optical RSP9000
20739435	Flatcable Flex Left Arm RSP
20739429	Motor Assy Y Standard RSP

