

精液ストロー分注機

MPPクワトロ



13018/0000

CONTENTS

<u>1.</u>	<u>SAFETY INSTRUCTIONS.....</u>	<u>6</u>
<u>2.</u>	<u>DELIVERY</u>	<u>8</u>
<u>3.</u>	<u>ACCESSORIES AND CONSUMABLES</u>	<u>9</u>
3.1.	Optional Accessories	9
3.2.	Consumables	10
3.3.	Retrofitting the fixing unit.....	11
<u>4.</u>	<u>OVERVIEW ASSEMBLY</u>	<u>12</u>
<u>5.</u>	<u>DESCRIPTION</u>	<u>13</u>
5.1.	General.....	13
5.2.	Technical Data.....	14
5.3.	Intended use	15
5.4.	Function description	15
<u>6.</u>	<u>TRANSPORT, STORAGE, ASSEMBLY AND INSTALLATION</u>	<u>16</u>
6.1.	Transport	16
6.2.	Storage.....	16
6.3.	Installation site.....	16
6.4.	Connections	17
6.4.1.	Power Connection	17
6.4.2.	Installation (electrical).....	17
<u>7.</u>	<u>MPP QUATTRO INSTALLATION</u>	<u>22</u>
7.1.	Control elements and indicators on the control unit	22
7.2.	Control elements and indicators on the MPP Quattro	23
7.3.	Sensors of the MPP Quattro	24
7.4.	Others	24
<u>8.</u>	<u>PREPARATION.....</u>	<u>25</u>
8.1.	Safety instructions for the preparation of the MPP Quattro	26
8.2.	Switching on the MPP Quattro	28
8.3.	Language selection	29
8.4.	Mechanical preparation of the MPP Quattro	30
8.4.1.	Selection and preparation of the suction and filling heads	30
8.4.2.	Inserting the suction and filling heads	32
8.4.3.	Putting the spring balance into operation	38
8.4.4.	Checking the vacuum bottle	39
8.5.	Straw size selection and adjustment	40
8.5.1.	Adjusting the straw size on the supply wheel.....	40

8.5.2. Preparing the hopper retainer	42
8.5.3. Filling the hopper.....	44
8.5.4. Placing the hopper	45
8.5.5. Software settings for the straw size.....	47
8.6. Preparing the material to be processed	48
<u>9. QUALITY MANAGEMENT</u>	<u>49</u>
9.1. Parameter Settings	49
9.1.1. Basic Information.....	49
9.1.2. Sequence of adjustment works	50
9.1.3. Adjusting the filling time.....	50
9.1.4. Adjusting the vacuum	52
9.2. Sealing test.....	55
9.2.1. Daily test.....	55
9.2.2. Monthly test	55
9.2.3. Test routine	55
9.2.4. Causes	56
<u>10. PRODUCTION.....</u>	<u>57</u>
10.1. Start the filling process	58
10.2. Process optimization.....	62
10.2.1. Adjusting the signal threshold of the bubble detection sensor	62
10.2.2. Adjustment of the sealing parameters (amplitude and time)	64
10.3. Changing the ejaculate.....	66
10.4. Change filling mode (1/cycle↔4/cycle)	66
10.5. Changing the straw size.....	67
10.6. Processing less than 4 straws per cycle	69
10.7. Empty	70
10.8. Notes for longer breaks (> 1 h)	71
10.9. Read out number of produced straws	71
10.10. Switching off the MPP Quattro	72
<u>11. CLEANING AND MAINTENANCE.....</u>	<u>73</u>
11.1. General cleaning	73
11.2. Cleaning (daily cycle)	74
11.2.1. Cleaning when changing the ejaculate.....	74
11.2.2. Cleaning after the last ejaculate	74
11.2.3. Cleaning the vacuum bottle.....	75
11.2.4. Cleaning the sealing area.....	76
11.3. Cleaning works (weekly cycle)	77
11.3.1. Cleaning the sealing unit	77
11.4. Cleaning works as required	78
11.4.1. Cleaning the nozzle heads	78
11.4.2. Cleaning the bubble detection sensor.....	79
11.5. Maintenance	81

12.	<u>TROUBLE SHOOTING</u>	82
12.1.	Failures	85
12.1.1.	<i>Straws are not recognised</i>	85
12.1.2.	<i>The filling or suction nozzle is not in line with the straw</i>	87
12.1.3.	<i>Straw filling with bubbles</i>	91
12.1.4.	<i>Severe straw bending during the filling process</i>	92
12.1.5.	<i>Straw blockage</i>	92
12.1.6.	<i>The vacuum set value cannot be adjusted</i>	93
12.1.7.	<i>Ultrasonic sealing is defective/brittle/untight (replacing the compact sealing unit)</i>	94
12.1.8.	<i>Replacing the fuses</i>	101
12.2.	Error messages without confirming	103
12.2.1.	<i>Emergency stop button activated</i>	103
12.2.2.	<i>Error safety door open</i>	104
12.2.3.	<i>Error positioning</i>	104
12.3.	Error messages and confirming	105
12.3.1.	<i>Error vacuum</i>	105
12.3.2.	<i>Error transport star</i>	106
12.3.3.	<i>Error supply wheel</i>	108
12.3.4.	<i>Error ultrasonic generator</i>	109
12.3.5.	<i>Error sealing unit</i>	109
12.3.6.	<i>Error lifter</i>	110
12.3.7.	<i>Error motor filling and suction head</i>	112
12.3.8.	<i>Error cycle time</i>	112
12.4.	Instructions for Service Technicians	113
12.4.1.	<i>Test Mode</i>	113
12.4.2.	<i>Functional test ultrasonic sealing</i>	118
12.4.3.	<i>Adjustment of the movement profile sealing drive (Motor stop)</i>	119
13.	<u>EC-DECLARATION OF CONFORMITY</u>	120
14.	<u>APPENDIX / LEAFLET</u>	120

はじめに

MPPクワトロは、長さ133mmのストロー（0.25ml及び0.5ml）用の全自動注入・封印装置です。1サイクル約1秒の間に4本のストローを処理することができます。0.25mlと0.5mlとのストローサイズの変更は、部品交換なども必要なく、数分あればできます。

製造者： Minitube GmbH
Hauptstrasse 41
84184 Tiefenbach Germany

CEマーク： MPPクワトロにはCEマークが貼付されています。



本製品を安全に使用するため、操作を始める前に、取扱説明書と安全上の指示をよく読んで、その内容に従って下さい。本製品の損傷や使用者への事故を防ぐためにも欠かせません。取扱説明書は、いつでも手に取れるよう、安全な場所に備えておいて下さい。

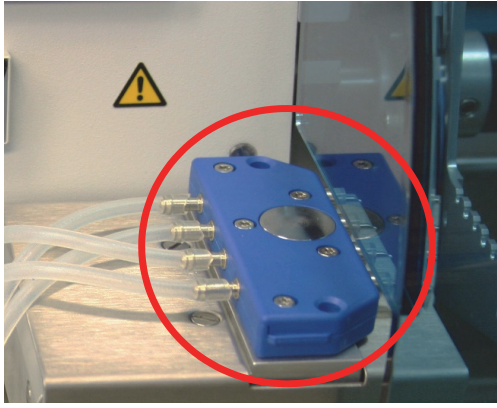
1. 安全上の指示



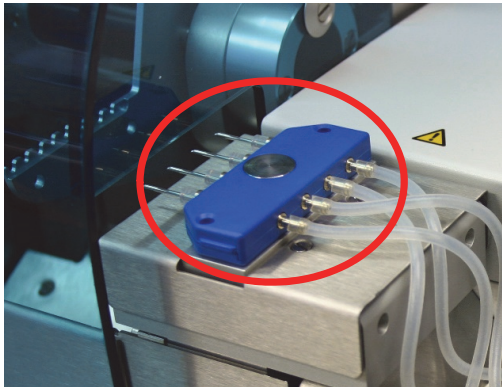
- **MPPクワトロは最先端の安全な操作ができるよう作られています。しかし、熟練した或いは操作を教わった人以外が操作すると、危険な機械にもなり得ます。不適切な又は誤った方法で使用された場合も同様です。**
- **MPPクワトロは、とくに指定がない限り、230V/50Hzの電源につないで下さい。**
- **MPPクワトロはアース付きの安全プラグを繋いで使用して下さい。**
- **The protection must not be reduced by using a flex without earth conductor. Any kind of interruption of the earth conductor inside or outside the machine is dangerous and not allowed.**
- **Pass the power supply cables in such a way, so that nobody can trip over them or get caught.**
- **Put the main switch to „0“ prior to cleaning the device and secure it against unauthorised switching on.**
- **Never interfere during the automatic operation of the machine; risk of injury !**
- **Make sure to wear tight fitting clothes when operating the device. Long hair must be secured with a hair net if necessary.**
- **非常時には緊急停止ボタンを押して下さい。**
- **Prior to trouble shooting, always wait for the machine to stop or stop the machine. In case of doubt, switch off the machine completely and unplug.**
- **Safety equipment must not be disassembled or put out of service. Especially putting the emergency off button out of service and removing protection covers is dangerous for the operator.**
- **Alterations are prohibited: for safety reasons any kind of retrofitting and alteration is prohibited.**
- **修理をする時は純正品のみを使用して下さい。**
- **Product liability: do not make any alterations on the machine respectively on the control unit. For any damages or hazards resulting from unauthorised alterations no liability is taken over.**



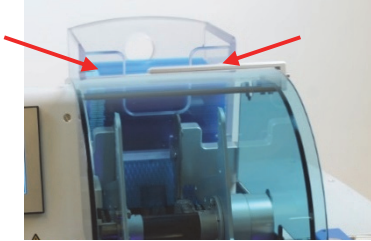
警告ラベルの内容に従って下さい。とくに吸引/注入ヘッドや封印ユニットの周辺では、注入作動中に誤って触れてしまい、ケガや骨折する危険があります。超音波発振器の周りでは封印作業中に火傷する恐れもあります！



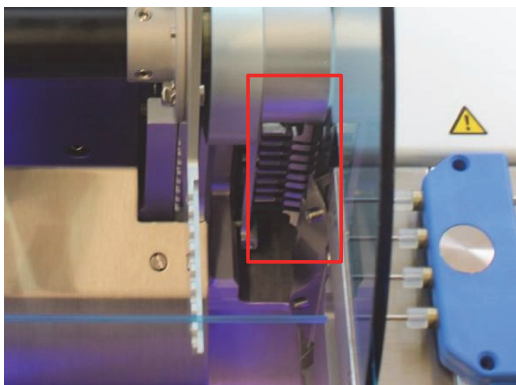
吸引ブロック側



注入ブロック側



ホッパー
フロントカバー



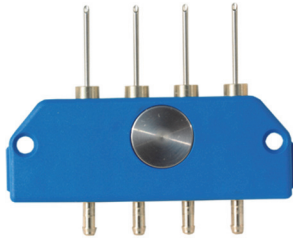
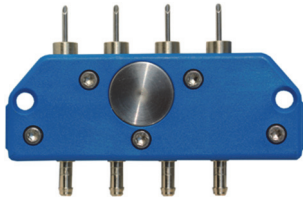
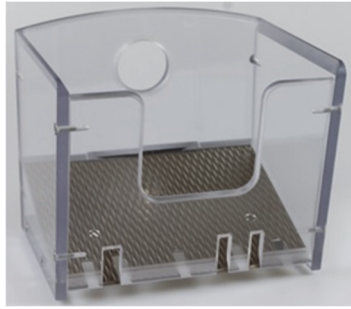
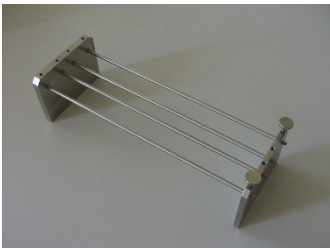
超音波発振器



2. 納品

数量	名称
1	MPPクワトロ
1	MPPクワトロ用コントロールユニット（電源）
1	ケーブル類： ラバーコネクタ付きケーブル 1本 電源コード 1本 9pinデータケーブル 1本 封印ユニット用HFケーブル 1本
1	ホッパー
2	真空ボトル 500ml
1	精液カップ用ステンレス製ホルダー
1	工具キット
1	カバー
各1	取扱説明書 交換部品リスト 手入れ方法
1	消耗品： 吸引ヘッド 0.25ml 1個 注入ヘッド 0.25ml 1個 チューブ 1袋 ワッシャー 1袋 精液カップ 1袋

3. 付属品及び消耗品

3.1. 付属品 (オプション)

名称	外観	品番
注入ヘッド 0.25ml		13018/0012
注入ヘッド 0.5ml		13018/0017
吸引ヘッド 0.25ml		13018/0022
吸引ヘッド 0.5ml		13018/0027
ホッパー		13018/0006
ストロー収集トレイ		13012/0003
固定ユニット (注入/吸引ヘッド 20個まで)		13017/0050

ストロー封印チェッカー (0.25ml/0.5ml)		13019/0200
ストロー封印チェッカー (10本用 0.25ml/0.5ml)		13019/0210
Styler	17207/0010	

3.2. 消耗品

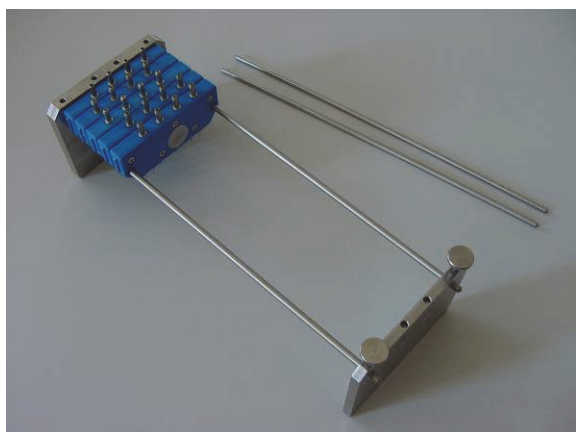
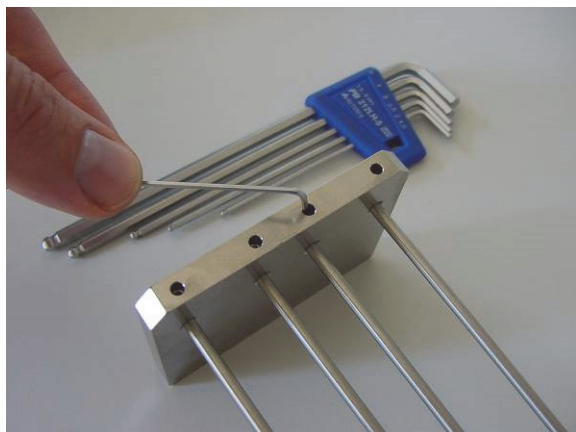
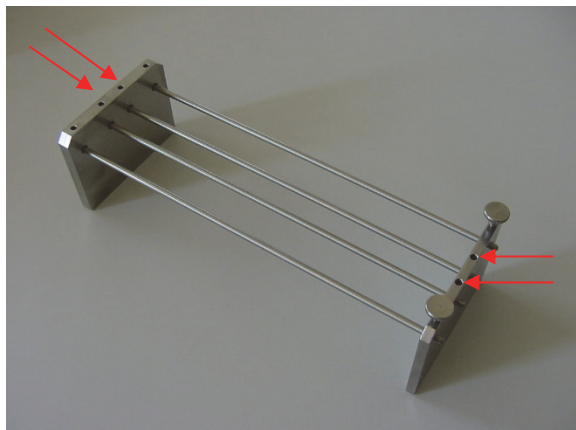


ワッシャ、チューブ、精液カップは使い切り用で、滅菌再利用はできません。ごみとして廃棄して下さい。

名称	外観	品番
注入/吸引ヘッド用ワッシャ 1袋 5000個入り		13021/3001
チューブ 1袋 100本入り		13021/3800
精液カップ 1袋 100個入り		13018/0100

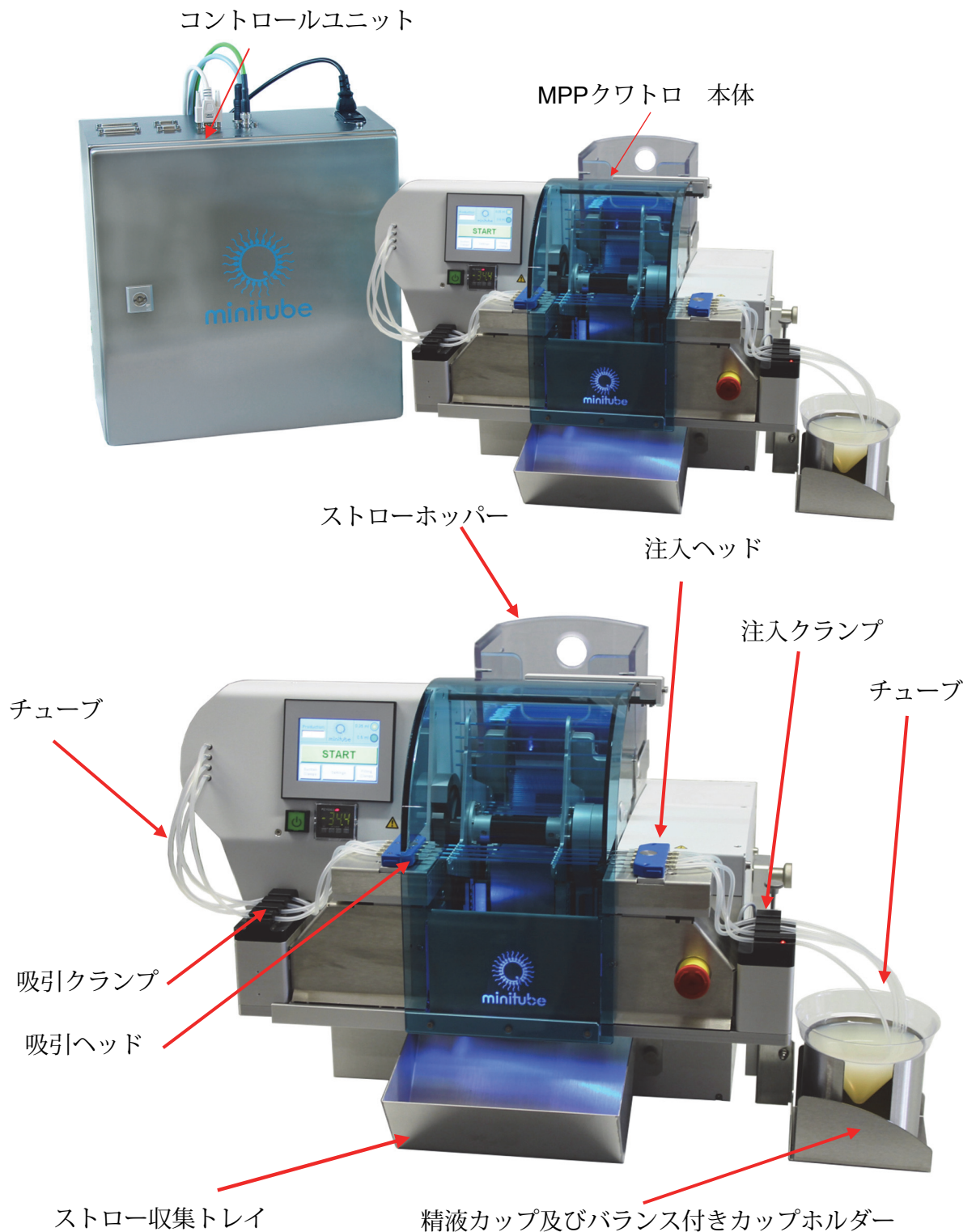
3.3. 固定ユニットの調整

まず初めに、注入/吸引ヘッド用に固定ユニットを準備します。ヘッドは最大20個まで対応できます。



- MPPクワトロの工具セットから六角レンチを選びます。
- 内側2本の棒を、内ネジを緩めて取り外します。

4. MPPクワトロの構成



5. Description

5.1. 一般事項

- 標準で、1サイクルにストロー4本を処理します。
- タッチパネルで1サイクルにストロー1本、へ変更することもできます。
- 最も重要な注入の工程全体、4本のストローの供給、精液注入作業、綿栓への浸透状態を、目で確認することができます。
- 1サイクルで処理するストローの数を、1～4本で変更することができます。
- 精液の残量減少を検知します。調整可能なバランスセンサーによって容器内の精液量の減少を感知し、1サイクルに処理するストローの数を、4本から1本に自動的に変更します。使用しなくなった3本のノズル及びチューブは開放され、チューブに残った精液は容器に戻されます。ノズル1本は、チューブに気泡を検出するまで、1サイクル1本の工程で注入作業を続けます。気泡を検知すると精液無しという信号を発生し、ホッパーからのストロー供給が止まり、MPPクワトロは停止します。このようにして精液を残さず利用することができます。
- 精液の交換が簡単にできます。4本のノズルは磁石式で脱着できるブロックにまとまっており、チューブは簡単に交換することができます。
- ストローホッパーは脱着式で、色やサイズの違うストローを準備しておくことができます。
- タッチパネルが操作・情報端末になっています。機械の状態を背景色で表示するので、離れたところからも読み取ることができます。エラーメッセージは確認するまでテキスト表示されます。
- Branson超音波封印ユニットは、ストローサイズなどに応じた封印状態の設定を、タッチパネルで調整することができます。
- 真空ポンプ、真空センサー、500mlのバッファ付き真空ボトルによって、大きな騒音を出さずに継続して一定の負圧がかけられます。真空圧制御（ヒステリシス）を調節できよう、センサーには圧力表示器があります。
- 注入時間はタッチパネルで調節できるので、個々にパラメーターを設定し、注入速度を変えることができます。
- PLC制御装置により信頼度の高いものとなっています。
- 単独の装置としても使用できますが、ストロープリンターMiniJetと併せて、ストロー印刷・注入複合システムとしても使用できます。
- 保護カバーが透明でスライド開閉式なので、各コンポーネントへのアクセスが容易にでき、掃除やメンテナンスが楽です。ストロー供給から封印、収集まで、作業工程全体を目で見ることができます。
- 装置寸法：66 x 39 x 50cm (幅x高さx奥行)
保護カバー込みで：73 x 39 x 50cm (幅x高さx奥行)
※配線等のスペースは除く
- 総重量 (制御ユニット含む): 約40 kg.

5.2. テクニカルデータ

Name plate:

モデル	MPPクワトロ
品番	13018/0000
シリアルナンバー	(銘板参照)
製造日	(銘板参照)
VA/Watt Voltage	100
	230 V AC/50-60 Hz

電源:

- 電圧: 220-240V, 50/60 Hz
(発注時指定により115V~, 60Hzも納品可)
- MPPクワトロ: 24 V DC

消費電力:

- オフ時: 約 0.6 VA
- 待機中: 約 45 VA
- 稼働中: 約 95 VA
- 最大消費電力: 約100 VA

ヒューズ:

寸法: 5 x 20 mm

- コントロールユニット電源: 2 x T 4 A
- コントロールユニット基板: 2 x T 0.16 A

使用環境:

- コントロールユニット: +18°C ~ +45°C
- MPPクワトロ: +5°C ~ +45°C
- 湿度: 10-85% RH 結露しないこと

寸法:

- コントロールユニット: 380 x 400 x 220 mm (幅 x 高さ x 奥行)
- MPPクワトロ: 650 x 390 x 500 mm

重量:

- コントロールユニット: 約12 kg
- MPPクワトロ: 約 28 kg

注入時間: 0.2秒~0.5秒

真空圧: 0~0.65kPa (0~650mbar)

5.3. 用途

MPPクワトロは、0.25ml 又は0.5mlの長さ133mmの全自動ストロー用注入封印装置として製造されています。1サイクルで4本まで処理することができます。

5.4. 機能

MPPクワトロは、ホッパーに投入されたストローを、1～4本単位で注入ユニットへ運びます。準備しておいた精液が真空ポンプ装置によって精液容器から吸引され、注入ヘッドを通過してストローへ注入されます。真空の設定を変えることで注入の具合を変えることができます。注入作業中でも綿栓への浸透具合を調整することができます。精液が注入されたストローは封印ユニットへ運ばれます。ストローは超音波で封印され、最後にトレーに集められます。精液容器の残量が少なくなると認識し、自動的に1サイクル1本へ変更し、その後、作業を停止します。

6. 輸送、保管、組立て、設置

MPPクワトロは、輸送及び保管中、振動や衝撃、温度、湿度、厳しい気候条件から保護するようにしてください。

MPPクワトロはMinitubeの技術者が設置し、使用できるよう設定します。工場出荷時には簡単な試運転を行っています。

MPPクワトロは水平で安定した場所に設置してください。



MPPクワトロを設置するときは、指定の工具を、用途とサイズの合わせて使用してください。

6.1. 輸送



安全な輸送についての安全注意事項を遵守してください。
滑ったり傾いたりすると壊れたり、周囲の人が怪我をする恐れがあります。
輸送するときは出荷時の梱包で行うこと。

6.2. 保管

一時的保管は乾燥した密閉空間で：
許容気温：+5℃～+50℃
許容湿度：10～85% RH、結露させないこと



保管場所が寒冷な場合、設置場所へ移動すると結露する可能性があります。室温に達し完全に乾くまで、最低でも1時間は待つようにしてください。

6.3. 設置場所

乾燥した密閉できる部屋に設置してください。許容気温は

MPPクワトロ：+5℃～+45℃
コントロールユニット：+18℃～+45℃
許容湿度：10～85% RH 結露させないこと



MPPクワトロは必ず水平な場所に設置してください。
※必要なスペース：1000×600×600mm (幅×高さ×奥行)
コントロールユニットは必ず水平な場所に設置してください。
※必要なスペース：380×500×220mm (幅×高さ×奥行)
電気コード、とくにコントロールユニットとMPPクワトロを繋ぐコードは外れることの無いようにしてください。

前面側から操作するので、手前に1mのスペースを空けてください。

6.4. 接続

6.4.1. 電源接続

電源の接続には絶縁ソケットを使用してください。

- 電圧 230 V
- ヒューズ 16 A
- 漏電遮断機

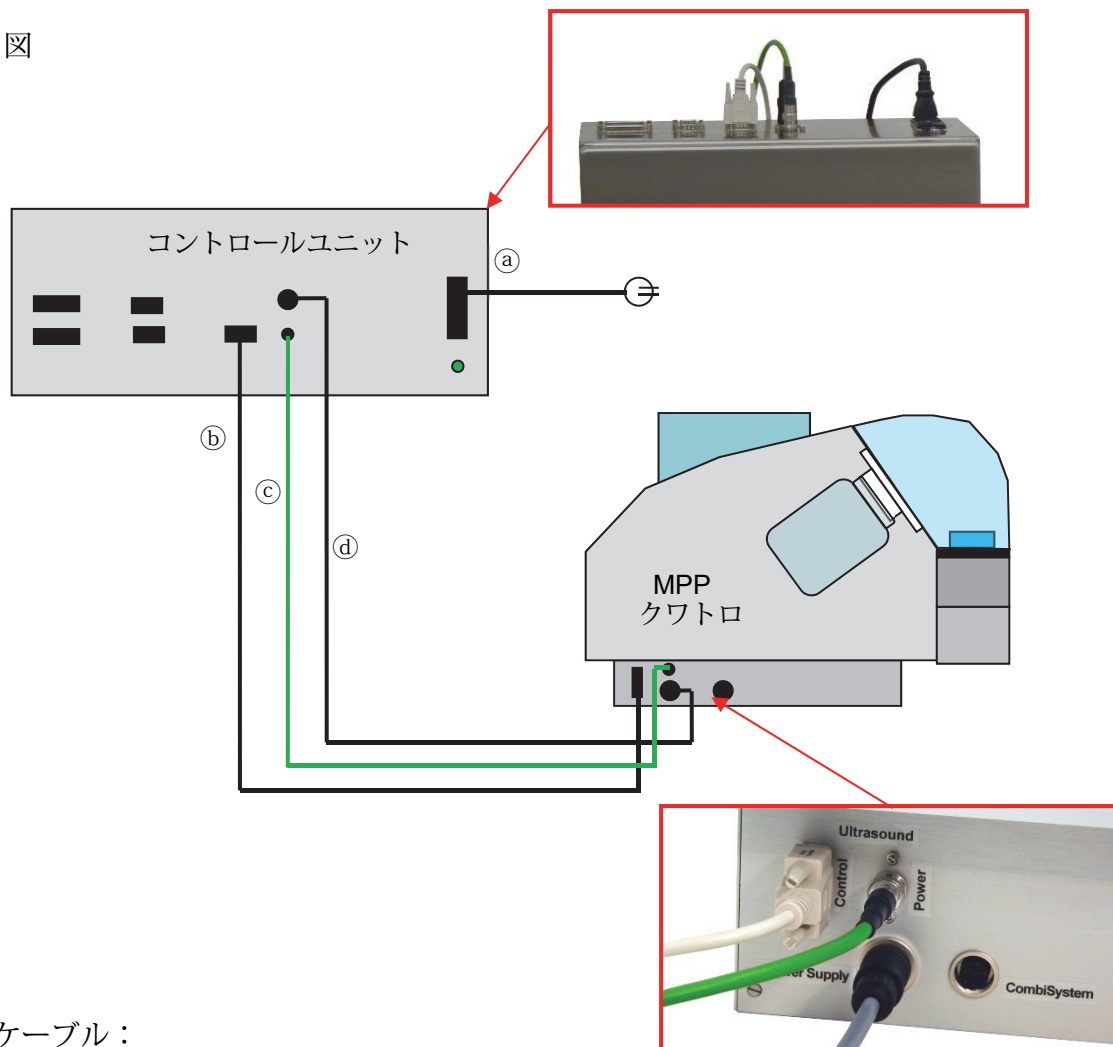
使用する前に、供給電圧が銘板に記載されているものと合うことを確認してください。



供給電圧が合わないと故障します！

6.4.2. 設置 (電気系統)

☒



使用するケーブル：

- ① 電源ケーブル/ コネクター付きケーブル (電源 - コントロールユニット)
- ② 9-pinデータケーブル (コントロールユニット - MPPクワトロ)
- ③ HFケーブル、封印ユニット用 (コントロールユニット - MPPクワトロ)
- ④ 電源コード (コントロールユニット - MPPクワトロ)

ケーブルを繋ぐときは、コントロールユニットとMPPクワトロとを接続し、外部電源に繋いで下さい。

➤ 9-pinデータケーブル⑥



※色は違うことがあります



➤ MPPクワトロの **Ultrasound Control** のコネクタ(雌)に9-pinプラグを接続します。



➤ もう一端をコントロールユニットの **Ultrasound Control** のコネクタ(雌)に接続します。

➤ HFケーブル◎



※色は違うことがあります



- MPPクワトロの **Ultrasound Power** のコネクタ(雌)にプラグを接続し、固定させます。

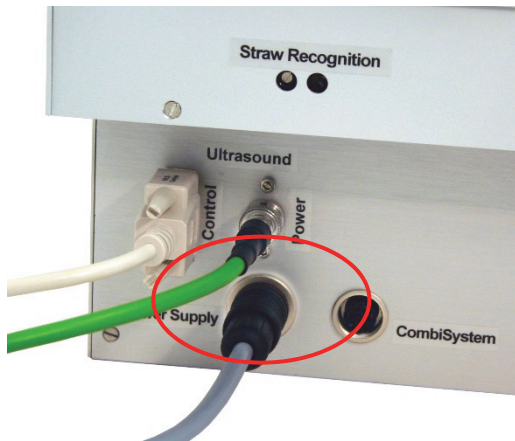


- もう一端をコントロールユニットの **Ultrasound Control** のコネクタ(雌)に接続します。

➤ 電源コード④



※色は違うことがあります



- MPPクワトロの **Power Supply** のコネクタ(雌)に5-pinプラグを接続します。



- もう一端をコントロールユニットの **MPP Quattro** のコネクタ(雌)に接続します。

➤ 電源ケーブル①



※色は違うことがあります



- ラバーコネクタをコントロールユニットのコネクタ(雌)を接続します。



- もう一端のプラグを本体の近くの外部電源に接続します。

- 電源の電圧を確認してください、銘板に記載されています。



電圧が適正でないと故障する危険があります！

7. MPPクワトロの設置

7.1. コントロールユニットの制御機構と表示器

コントロールユニットの電源スイッチはユニットの上面にあります。その隣にはLEDの通電表示器があります。



- ① 電源スイッチ **○-I**
- ② 表示器 “通電”

7.2. MPPクワトロの制御装置と表示器

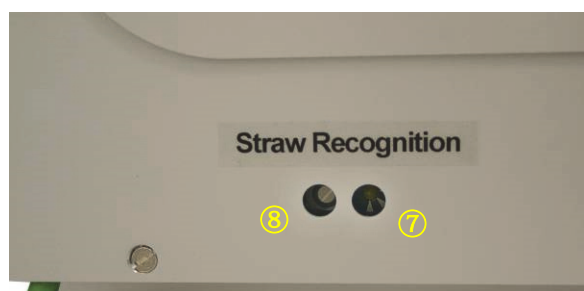
前面:

M:




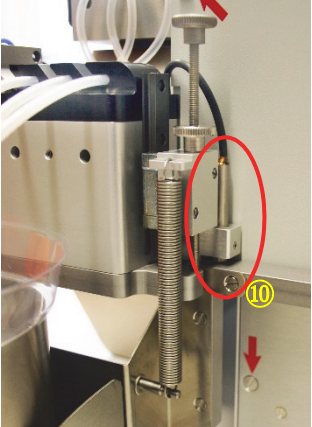
- ③ 電源スイッチ O-I
- ④ 真空制御装置
- ⑤ タッチパネル
- ⑥ 緊急停止ボタン

左側面:

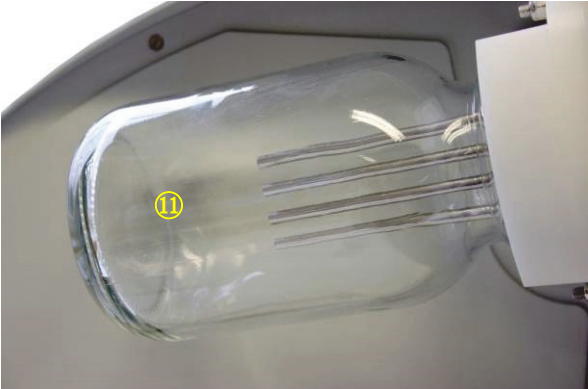


- ⑦ ストロー認識信号灯
ステータス：
LED点灯 – ストロー認識中
LED消灯 – ストロー無し
LED点滅 – 異常あり
- ⑧ ストローセンサーポテンシオメーター
ストロー認識

7.3. MPPクワトロのセンサー

	<p>左側面: ⑨ 気泡検出センサー</p>
	<p>右側面: ⑩ バランスセンサー</p>

7.4. その他

	<p>左側面: ⑪ 真空ボトル</p>
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8. 準備

MPPクワトロは、稼働中、機械の状態をタッチパネルの色で以下のように表示します。

白	始動（英文表記のみ）
青	4本注入モード
黄	1本注入モード、または空モード
緑	設定
灰	自動（操作できません）
橙	指示待ち（操作指示が必要）
赤	エラー

8.1. MPPクワトロ準備中の安全注意事項



MPPクワトロの準備には付属の工具以外使用しないでください。用途とサイズに合ったものを使用してください。

作業を開始する前に、電源を入れてチューブをクランプに通し、バランスセンサーを調整する必要があります。



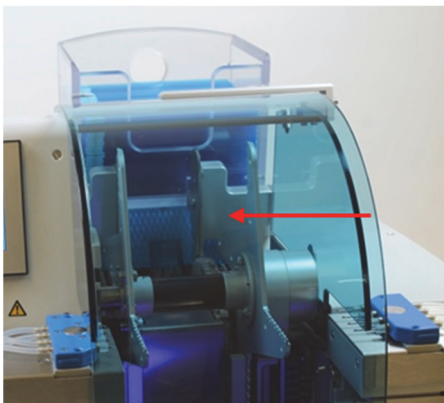
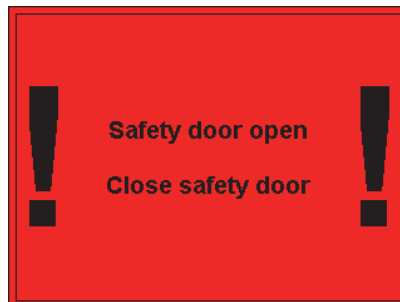
取扱説明書第1章の安全注意事項を遵守してください！



緊急停止ボタンは非常事態発生時の安全確保目的としたものです。ボタンを押すと直ちに完全に停止します。すべての機構が停止します。緊急停止状態を解除する前には、緊急停止の原因となる状況をすべて排除してください。

通常は緑色の電源スイッチを使用してください。

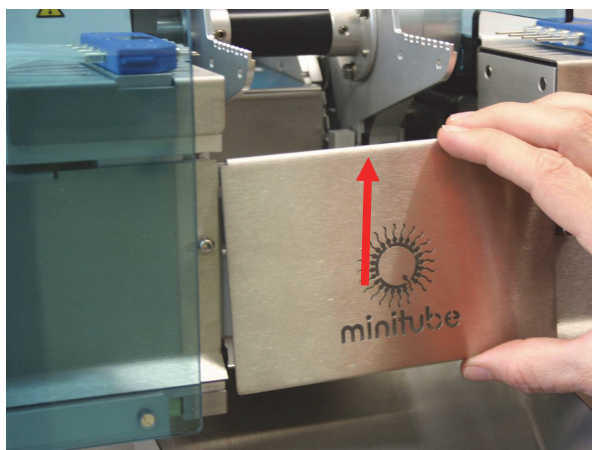
点検や調整を行うときはフロントカバーを開けて行います。注入工程の前や後では影響ありませんが、注入作業中にカバーが開くと直ちに機械は停止し、タッチパネル上に次のように表示されます。



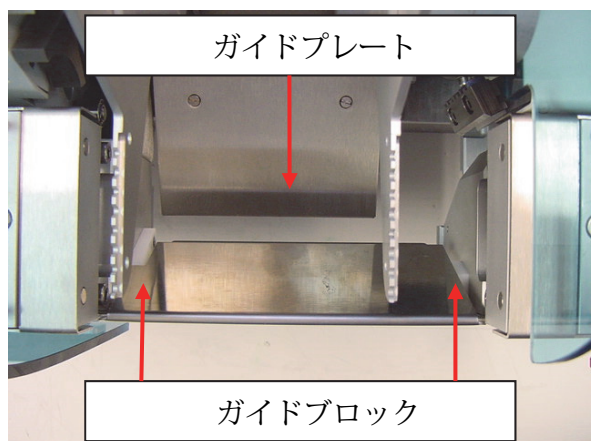
- フロントカバーを左にスライドさせてください。



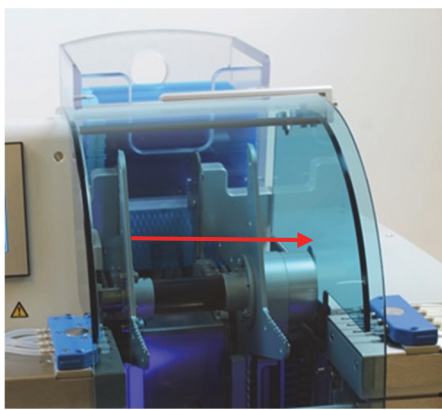
フロントカバーは無理に開けようとししないでください。注入チューブが緩んだりずれたりして、引っ掛かっている可能性があります。



- ログのあるカバーをはずしてください。



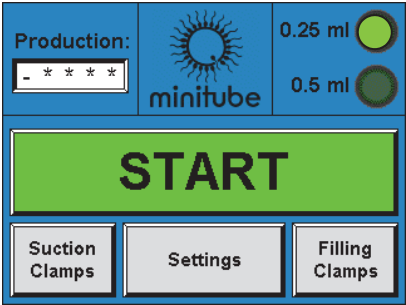
- カバーを戻すときは、ガイドブロックの後ろにカチッと嵌ることを確認してください。



- フロントカバーをゆっくりと右側にスライドさせてください。
- スタート画面が表示されます。

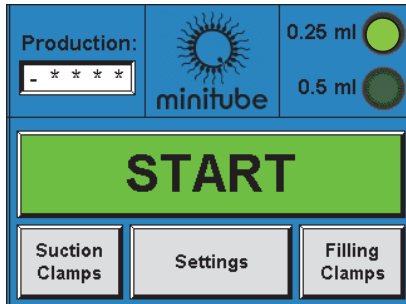
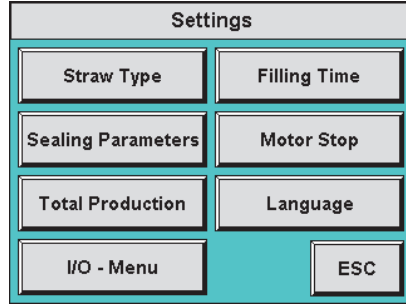

8.2. MPPクワトロの起動

	<ul style="list-style-type: none"> ➤ MPPクワトロの緊急停止ボタンを点検してください。 ● 赤いボタンの後の緑色の輪が見えることを確認してください。 ➤ 緊急停止ボタンを解除するには、赤いボタンを時計回りに約30°回してください。 ➤ 緊急停止ボタンが押されたままの場合は、解除してください。
	<ul style="list-style-type: none"> ➤ コントロールユニットの電源を入れてください。 ● スイッチ横のLEDの通電表示は点灯しません。
	<ul style="list-style-type: none"> ➤ MPPクワトロの電源を入れてください。 ● スイッチ横のLEDの通電表示が点灯します。
	<ul style="list-style-type: none"> ➤ スタート画面のMinitubeロゴが起動します。

 <p>The image shows the main start screen of the minitube device. At the top left, it says 'Production:' followed by a field containing '- * * * *'. To the right is the minitube logo and two volume indicators: '0.25 ml' with a green circle and '0.5 ml' with a grey circle. A large green 'START' button is in the center. At the bottom, there are three buttons: 'Suction Clamps', 'Settings', and 'Filling Clamps'.</p>	<ul style="list-style-type: none"> スタート画面が表示されます。
--	--

タッチパネル (= 複合入出力端末)での操作: 画像(ボタン)に触れることで、使用者がマウスではなく、指先で直接コンピュータを操作できるもの、以下“Activate”という

8.3. 言語の選択

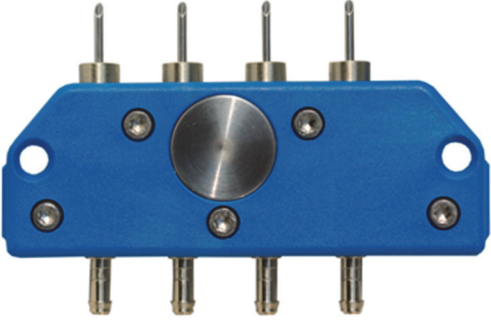
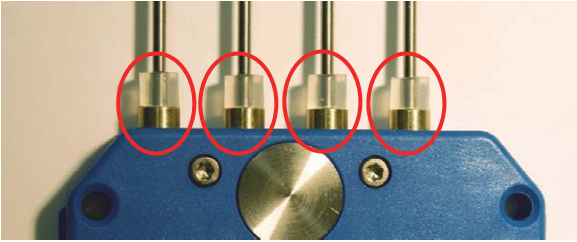
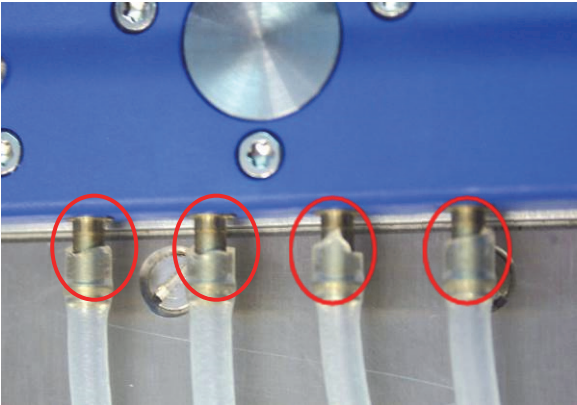
 <p>The image shows the main start screen of the minitube device, identical to the one in the previous section.</p>	<ul style="list-style-type: none"> ➤ Settings を選択
 <p>The image shows the 'Settings' menu. It has a title bar 'Settings' and several options: 'Straw Type', 'Filling Time', 'Sealing Parameters', 'Motor Stop', 'Total Production', 'Language', 'I/O - Menu', and 'ESC'.</p>	<ul style="list-style-type: none"> ➤ Language を選択
 <p>The image shows the 'Settings: Language' screen. It displays six flags: Germany, United Kingdom, Spain, France, Russia, and China. Below the flags is an 'OK' button.</p>	<ul style="list-style-type: none"> ➤ 現在選択中の言語は国旗に白枠で表示されます (左図ではドイツ)。言語を変更するときに対応する国旗を選択してください。 ➤ 確認して OK へ

8.4. MPPクワトロを使うときの準備

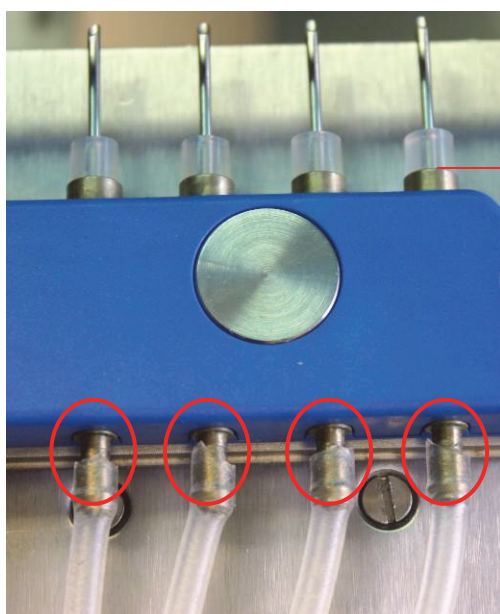
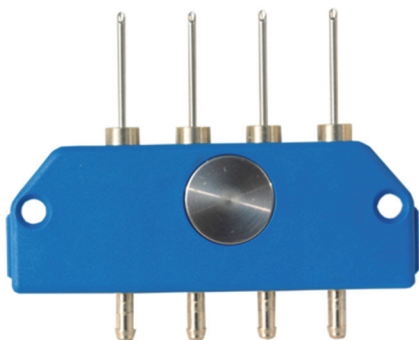
8.4.1. 吸引ヘッド及び注入ヘッドの準備

MPPクワトロを使用する前に、処理するストローのサイズを確認してください。MPPクワトロでは0.5mlと0.25mlのストローを処理することができます。

作業前に、処理したいストローのサイズに合った吸引及び注入ヘッドを、十分な量用意してください。通常はストローサイズごとに1つの吸引ヘッドで間に合いますが、注入側では使う精液ごとに注入ヘッド1つと、チューブ4本、ワッシャー4個を用意してください。品番は第3章「付属品及び消耗品」を参照してください。

<div data-bbox="323 663 687 757" style="border: 1px solid black; padding: 5px; text-align: center;"> <p>吸引ヘッドには 短い吸引ノズルが4本</p> </div>   	<h3>吸引ヘッドの選択と準備</h3> <ul style="list-style-type: none"> ➤ 使用するストローのサイズに合った吸引ヘッドを選んでください。 ➤ 吸引側には必ず吸引ヘッドを取り付けてください。ノズルの長さを比べると、吸引ヘッドのノズルは非常に短いです。 ➤ ノズルにはワッシャーを少しづつ回しながら取り付けて下さい。 ➤ ノズルの先端で傷付けるとワッシャーが真っ直ぐ嵌らず、空気が漏れる可能性があるため、取り付ける際は十分注意してください。指でつまんで少しづつ回しながら、真っ直ぐ、ノズルの付け根まで嵌め込んで下さい。 ➤ ノズルと反対側にはシリコンチューブを嵌めてください。チューブは奥まで嵌めず、ヘッドまで隙間を残してください。
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注入ヘッドには
長い注入ノズルが4本

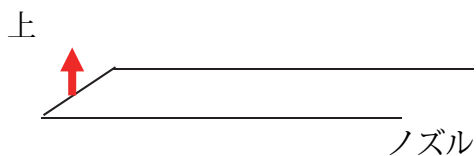
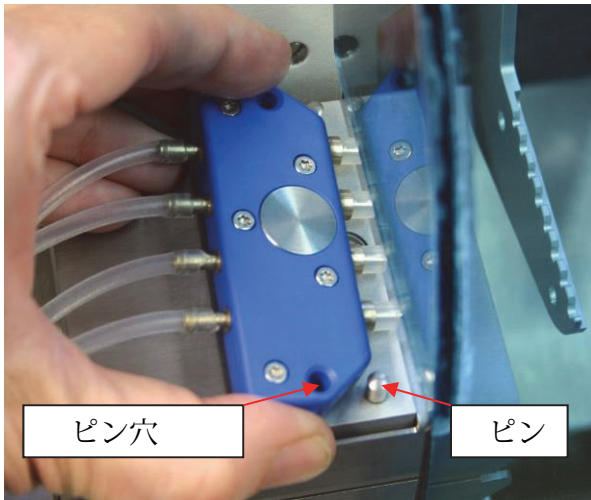


0.0 mm

注入ヘッドの選択と準備

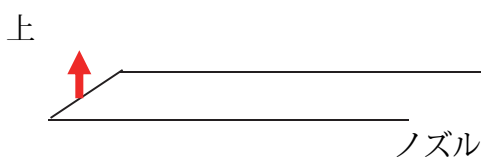
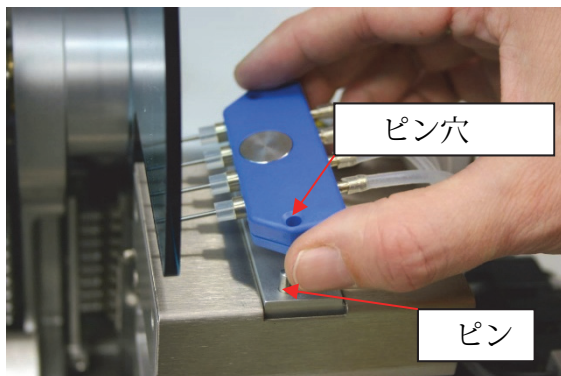
- ▶ 使用するストローのサイズに合った注入ヘッドを選んでください。
- 注入側には必ず注入ヘッドを取り付けてください。
 - ノズルの長さを比べてください。注入ノズルは細長くなっています。
- ▶ ノズルが傷ついたり曲がっていないか確認してください。
- ▶ ノズルにはワッシャーを少しづつ回しながら取り付けて下さい。
- ノズルの先端で傷付けるとワッシャーが真っ直ぐ嵌らず、空気が漏れる可能性があるため、ワッシャーを取り付ける時は十分に注意してください。
- ▶ 指でつまんで少しづつ回しながら、真っ直ぐ、ノズルの付け根まで嵌め込んで下さい。
- ▶ ノズルと反対側にはシリコンチューブを嵌めてください。チューブは奥まで嵌めず、ヘッドまで隙間を残してください。

8.4.2. 吸引ヘッド、注入ヘッドの装着



- 吸引ユニット（フロントカバー左側）の可動ホルダーに吸引ヘッドを装着してください。吸引ヘッドの穴をホルダーのピンに合わせて固定してください。磁石で固着するようになっています。

- ノズル先端の傾斜が上に向くように取り付けてください。
- 逆になっている場合はひっくり返して取り付けてください。



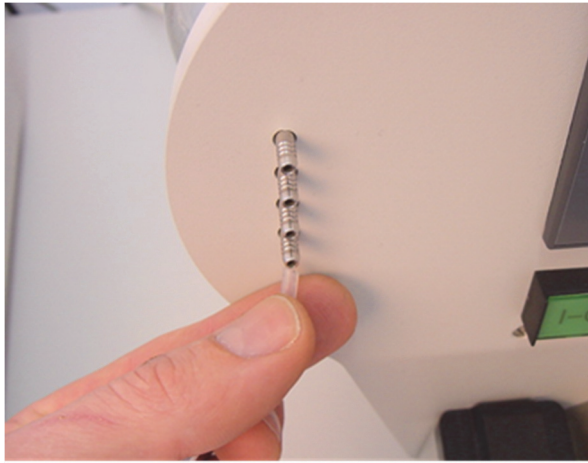
- 注入ユニット（フロントカバー右側）の可動ホルダーに注入ヘッドを装着してください。ヘッドの穴をホルダーのピンに合わせて固定してください。磁石で固着するようになっています。

- ノズル先端の傾斜が上に向くように取り付けてください。
- 逆になっている場合はひっくり返して取り付けてください。

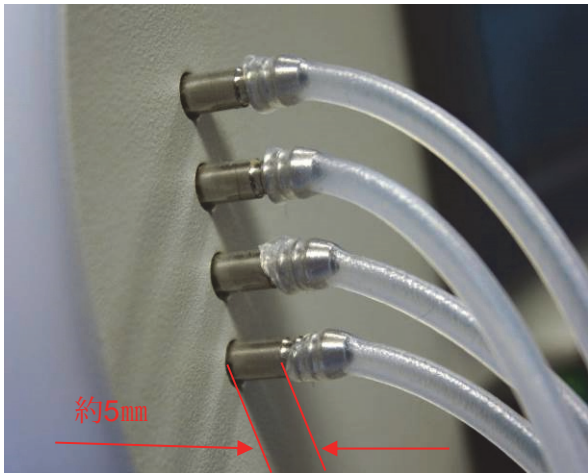


- 緑色の **On/Off** スイッチで電源を入れてください。
- スイッチと表示器が点灯するか、または **ON** になります。

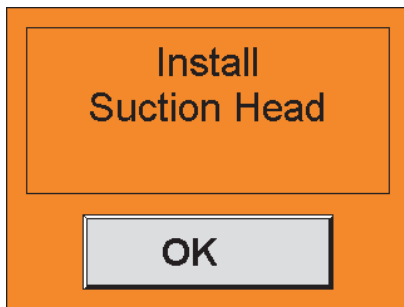
	<ul style="list-style-type: none"> ● タッチパネルにスタート画面が表示されます。 ➤ ミニチューブロゴの中心から起動させてください。
	<ul style="list-style-type: none"> ● 左のようなメッセージが画面に表示されます。 ➤ 80秒以内に吸引ヘッドを装着してください。 ➤ 装着したら OK で確認してください。 ● 80秒以内に吸引ヘッドを装着しない場合はスタート画面に戻ります。
	<p>吸引ヘッドの装着</p> <ul style="list-style-type: none"> ➤ 両手を使ってノズルの先端から約10cmのところまで各チューブをつまみ、吸引クランプに引き込んでください。 ➤ チューブを各ノズルのクランプに通してください。これで、吸引ノズルからのチューブがクランプに繋がります。 <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>チューブを装着するときは、写真のように少し撓ませてください。撓みがないと、注入工程の動作で吸引ヘッドに引っ張られ、損傷する恐れがあります。</p> </div>
<div style="border: 1px solid black; padding: 10px;">  <p>吸引ヘッドの稼働中にチューブが支障なく機能するよう、吸引ヘッドとクランプとの間はチューブにゆとりを持たせ（撓ませて）繋いでください。チューブをつまんで少し振じて延ばしながらクランプに装着してください、こうすると、ヘッド稼働中のチューブの折れ曲りを防ぐことができます。</p> </div>	



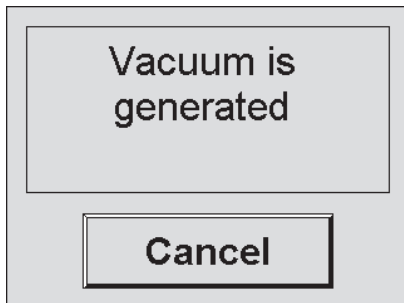
- 吸引チューブの端を、タッチパネル左にある真空装置の接続部に取り付けてください。順番は決まっていません。真空状態を維持できるようにチューブは4本すべて各接続部に繋いでください。




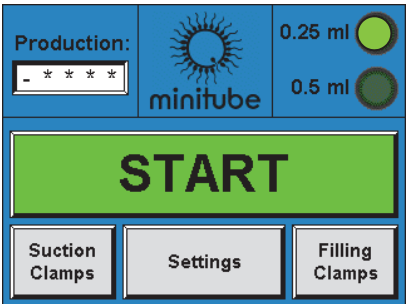
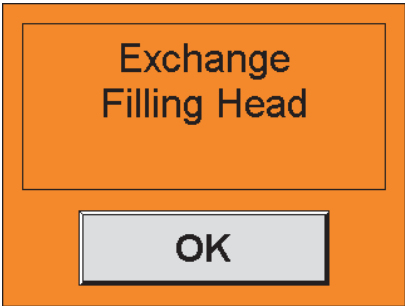
- チューブは接続部に完全に押し込まず、約5mm間隔をあけてください。

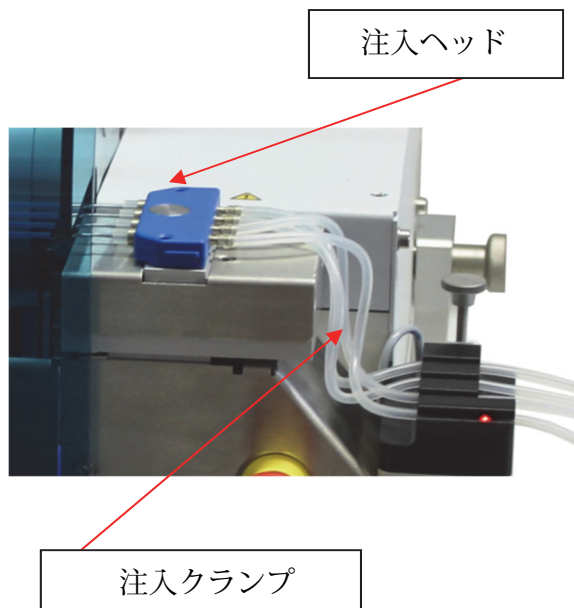


- 吸引ヘッドを装着し終わったら **OK** で確認してください。



- 左図のようなメッセージが表示されます。

	<ul style="list-style-type: none"> ● 真空ポンプが出荷時に設定した値の負圧を生成し始めます。 ● 真空制御装置のディスプレイ上で負圧の変化（低下）を確認することができます。ポンプの稼働中は数値が赤で表示されます。 ● 設定値に達すると数値が緑色になります。
	<ul style="list-style-type: none"> ➤ タッチパネルの表示がスタート画面になります。 ➤ Filling clamps で起動してください。 ➤ 注入ヘッドを装着してください。
	<ul style="list-style-type: none"> ➤ 注入クランプが約80秒、開きます。時間内に吸引ヘッドを装着し、OK で確認しないと、前の画面に戻ります。



注入ヘッドの装着



- 両手を使ってノズルの先端から約10cmのところまで各チューブをつまみ、注入クランプに引き込んでください。
- チューブを各ノズルのクランプに通してください。これで、注入ノズルからのチューブがクランプに繋がります。



チューブを装着するときは、写真のように少し撓ませてください。撓みがないと、注入工程の動作で注入ヘッドに引っ張られ、損傷する恐れがあります。



注入ヘッドの稼働中でもチューブが支障なく機能するよう、注入ヘッドとクランプとの間はチューブにゆとりを持たせ（撓ませて）繋いでください。注入ヘッドは吸引ヘッドよりも可動範囲が大きいので、長めに余裕を持たせてください。チューブをつまんで少しねじって延ばしながらクランプに装着してください、こうすると、ヘッド稼働中のチューブの折れ曲りを防ぐことができます。

	<ul style="list-style-type: none"> ➤ 処理する精液の容器をセットしてください。 ● 通常は使い捨てのカップを使用します。 ● カップの場合は、ステンレス製のカップホルダーを使用してください。 ➤ 吸入チューブの端部を容器に入れてください。 ➤ MPPクワトロ右側にあるばね秤の容器受けに容器を置いてください。 ● チューブの端部は容器の底の部分に来るようにしてください。 ● チューブが注入クランプに触れないよう注意してください。 ➤ 精液を最後まで使い切るよう、フロントクランプに装着された注入チューブが底部にあることを確認してください。 ● 気泡センサーがチューブをモニタリングし、容器が空になると自動的に注入工程を停止します。
	<ul style="list-style-type: none"> ➤ 確認 OK ➤ スタート画面に戻ります。


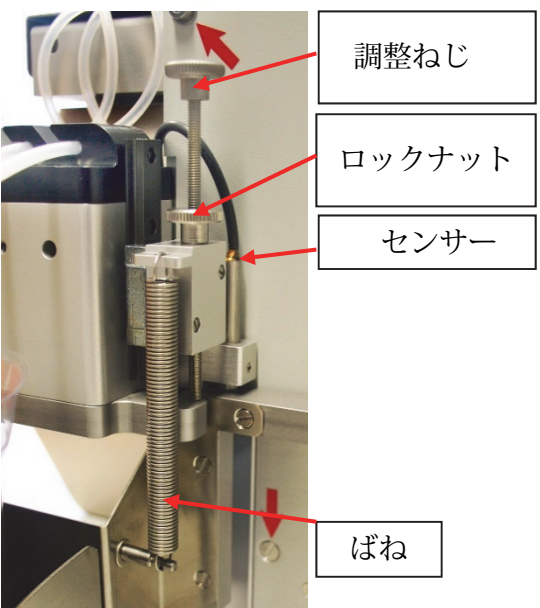
8.4.3. バランスセンサーの調整

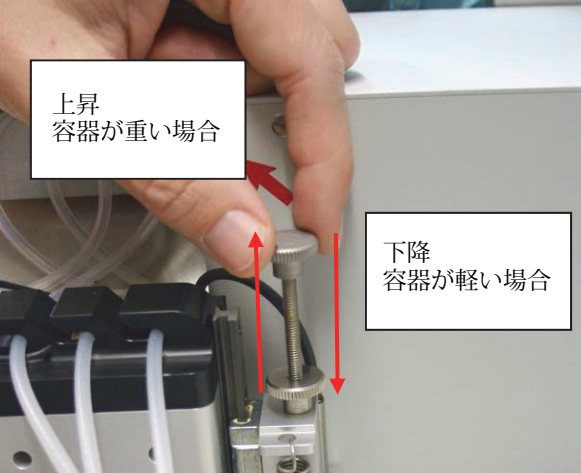
基本事項

MPPクワトロには、精液残量が少なくなったことを本体に伝えるバランスセンサーがあります。信号が伝わると、MPPクワトロは1サイクルに処理するストローの数を、4本から1本に変更します。

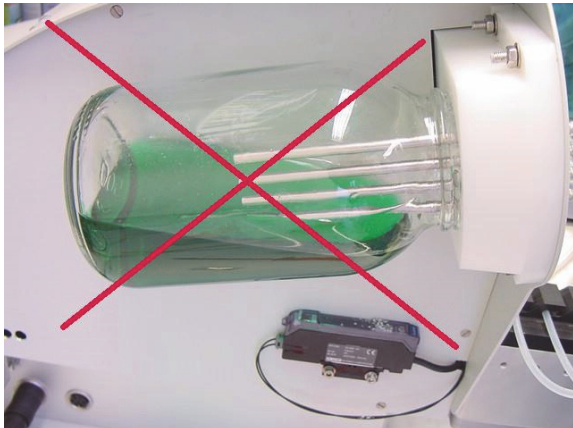

センサーの誤作動がないよう、容器は同じ重さのものを使用してください。使い捨てのカップがお勧めです。

バランスセンサー機能を利用しなくても注入作業はできます（この項の最後を参照）。

	<ul style="list-style-type: none"> ➤ センサーのLEDで切換状況を確認してください。 • 秤がばねで引き上げられているとセンサーが点灯します。（残量無し） • 下がっているとセンサーは点灯しません。（精液が十分残っている） ➤ そのまま容器が空になるまで待つか、1サイクル4本から1本へ切換えたい量まで満たしてください。 ➤ 調整ねじのロックナットを緩めてください。 ➤ 調整ねじを回して調節してください。 <ul style="list-style-type: none"> ・時計回り（ばね金具が上がる） ・反時計回り（ばね金具が下がる） ➤ 秤部分に触れるとセンサーが点滅を始める位置を確認してください。 ➤ ねじをロックナットで固定してください。 ➤ 注入工程中又は工程の最後に、調整を繰り返してください。チューブに精液が入っている状態の重量で調整する必要があります。
	

	<ul style="list-style-type: none"> ▶ バランスセンサー機能を使わない場合は、精液容器が空になっても容器受けが引き上げられないようばね秤を調整してください。 <p>1サイクル4本から1本への切換えは</p> <ul style="list-style-type: none"> • 時計回り：早め • 反時計回り：遅め • 1/2回転では、0.25mlストローで約10本、0.5mlで約5本、切換えのタイミングが変わります。
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8.4.4. 真空ボトルのチェック

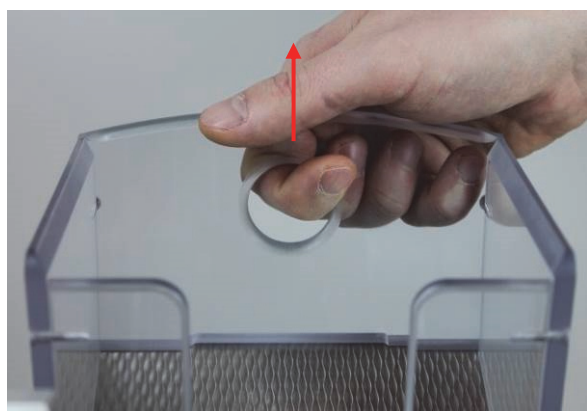
	 <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>真空ボトルを空にしてから作業を始めてください。液体が大量に残っていると、真空ポンプ内に液体が浸入し、故障して二度と使えなくなることがあります。</p> </div> <ul style="list-style-type: none"> • ストローの綿栓に浸透する水分が適量であれば真空ポンプに水が溜まることはほとんどありません。 ▶ 必要に応じて真空ボトルをクリーニングしてください。(11.2.3.「真空ボトルのクリーニング」参照)
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8.5. ストローの選択と調整



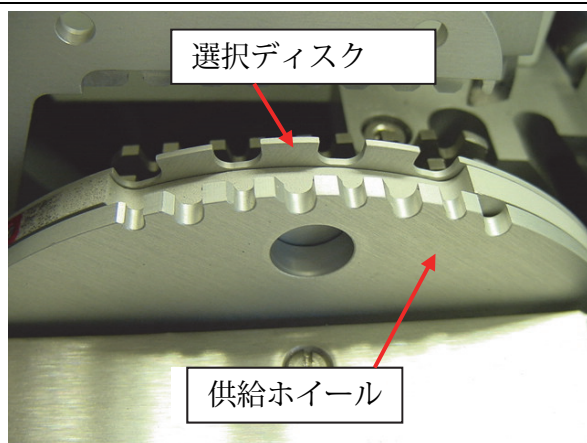
選択した注入ヘッド及び吸引ヘッドに合わせて、以下の操作を行って下さい。

8.5.1. ストローサイズによる供給ホイールの調整

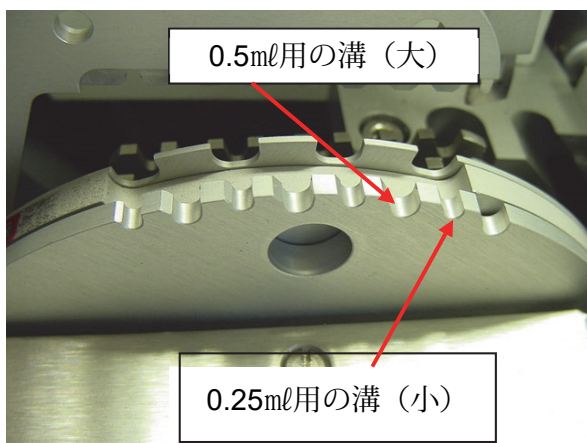


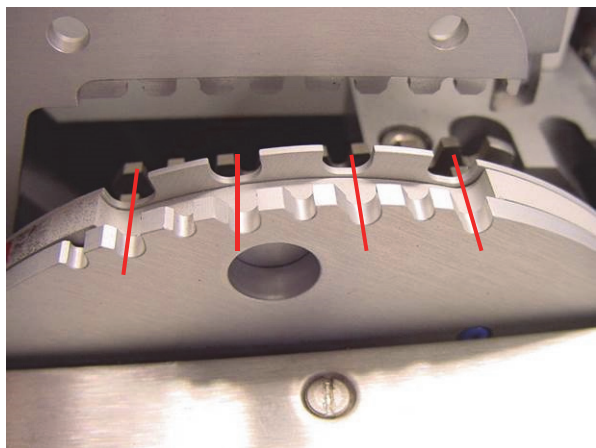
- 調整するときはホッパーを取り外してください。

- フロントカバーを開けてください。
- ストロー選択ディスクと供給ホイールの動きを見てください。



- 0.25mlストローには、供給ホイールの小さい方の溝が開き、大きい方の溝はブロックされます。

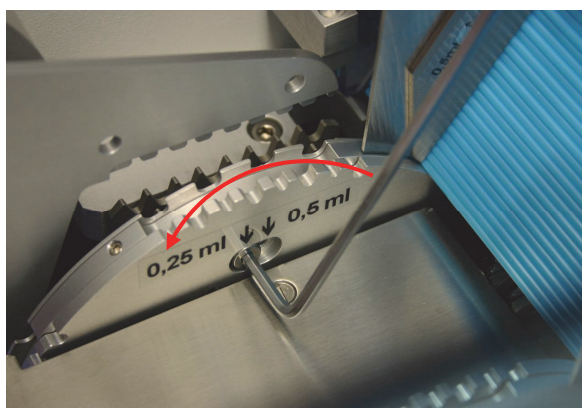




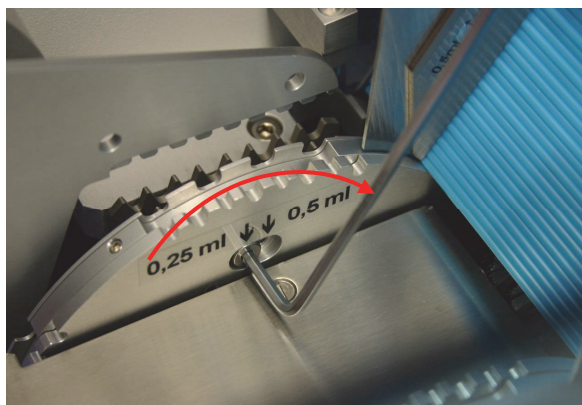
- 0.25mlストローには、供給ホイールの小さい方の溝が開き、大きい方の溝はブロックされます。



- 供給ホイールの内側を見てください。
- 供給ホイールを、**0.25ml**と**0.5ml**の文字が見えるまで回してください。
- ねじの位置が選んだストローのサイズを示します。

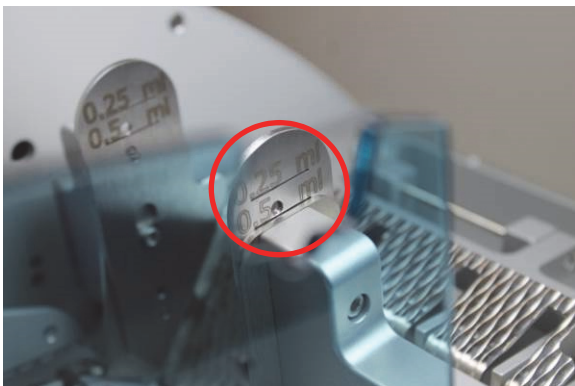
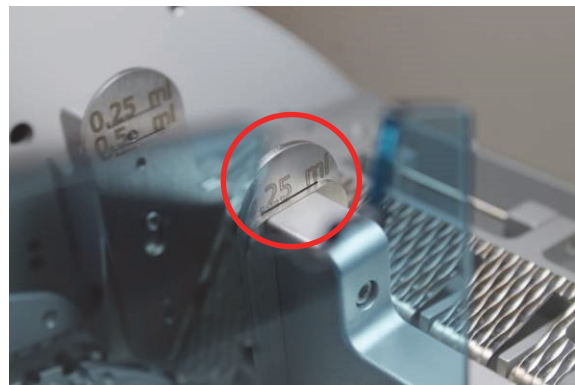
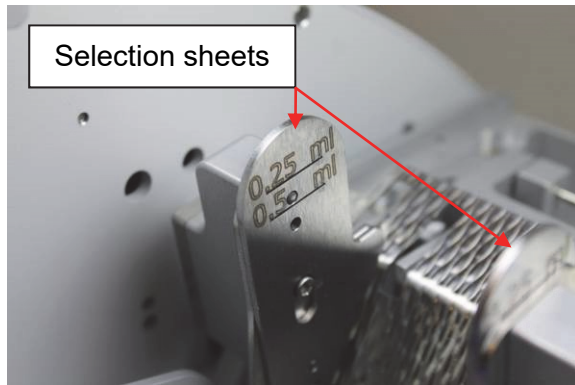


- 工具セットのレンチで、反時計回りに約90°ねじを緩めてください。



- 供給ホイールを固定してストロー選択ディスクを必要な位置まで回してください。
- その後、ゆっくりとねじを締めてください。

8.5.2. Preparing the hopper retainer



- Position the selection sheets on both sides according to the straw size to be processed.



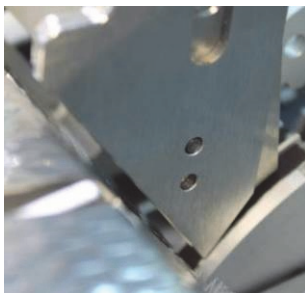
- For the 0.25ml straw processing push the selection sheets in the direction to the corrugated sheet.



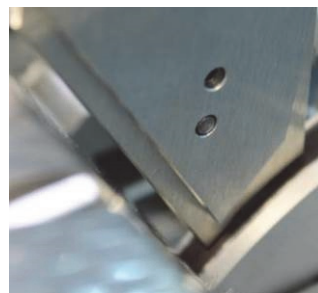
- For the 0.5ml straw processing pull the selection sheet away from the corrugated sheet.

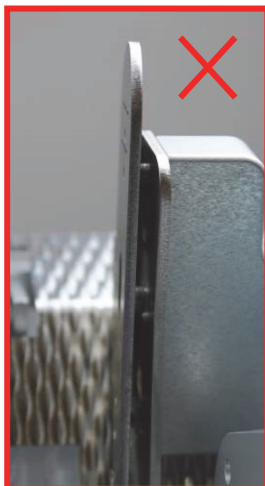
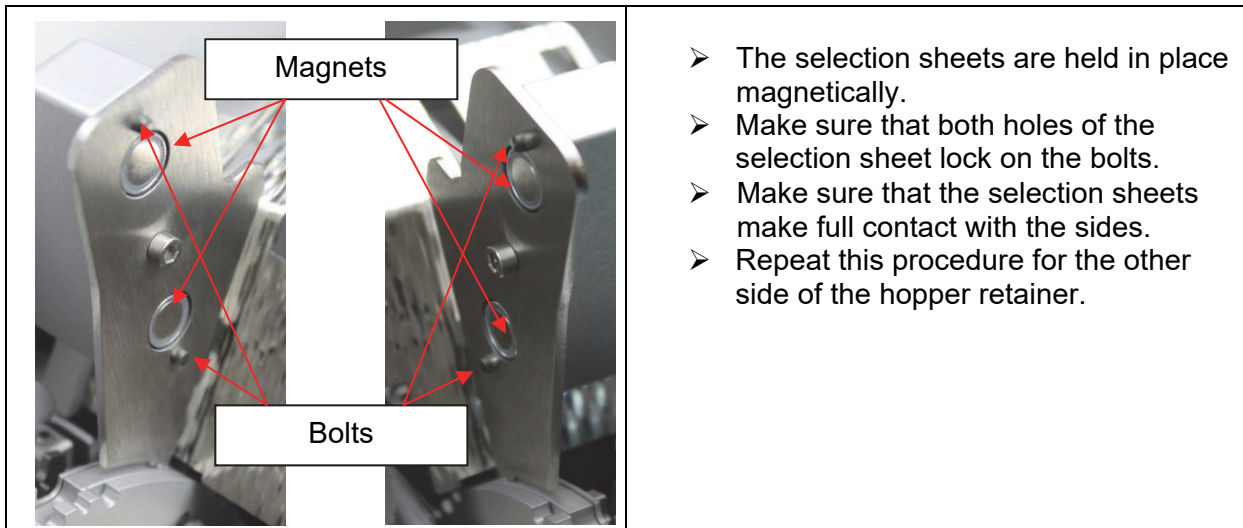


Small gap between selection sheet and corrugated sheet (約2mm): 0.25ml straws

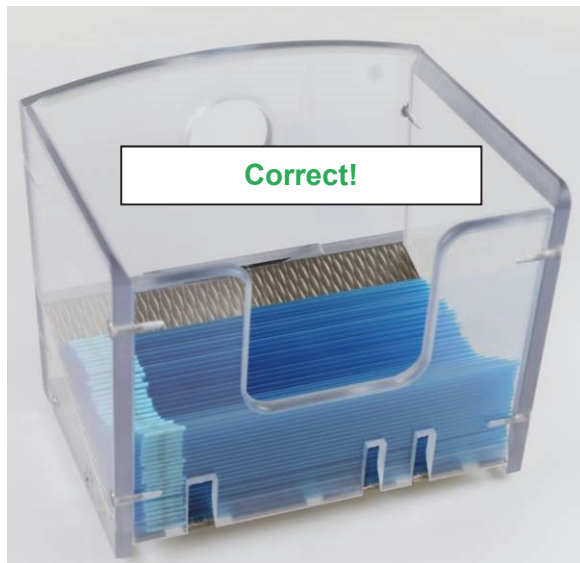


Large gap between selection sheet and corrugated sheet (約3mm): 0.5ml straws

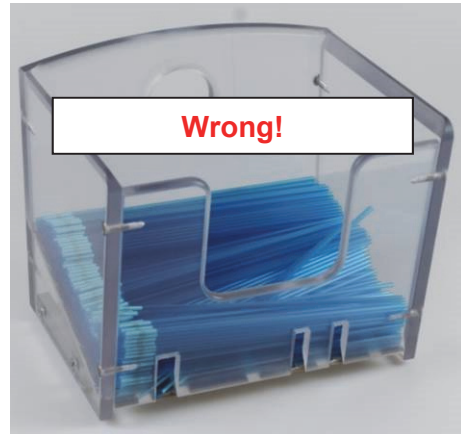




8.5.3. Filling the hopper



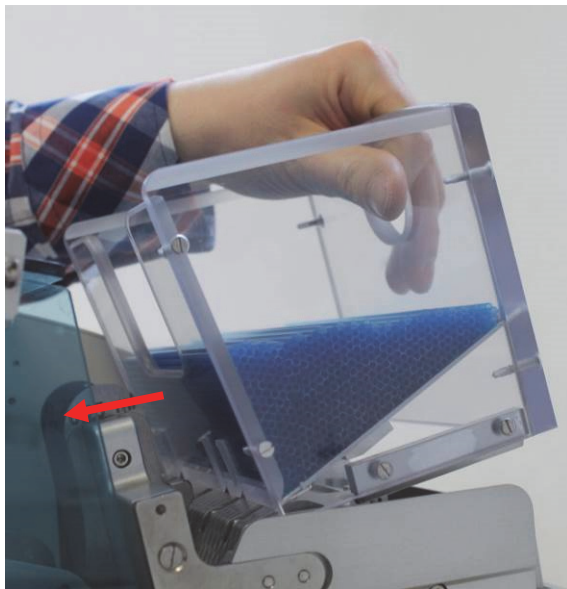
- Remove the hopper from the machine.
- Fill the straws into the hopper.
- Position the straws in such a way that the plugs of the straws are on the suction side.
- Make sure that the straws are positioned in a parallel way.



Hint:

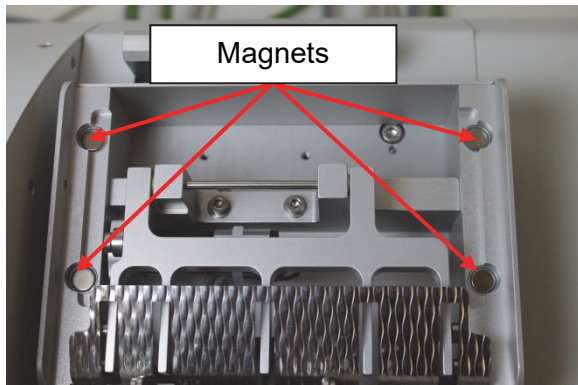
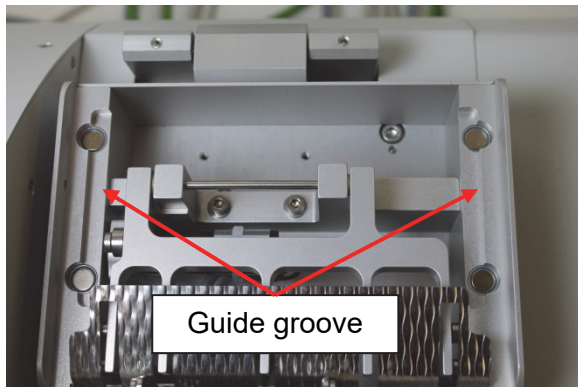
If the hopper has not yet run empty during production, straws may also be refilled directly without removing the hopper from the machine. Note: For this, the machine should always be stopped.

8.5.4. Placing the hopper

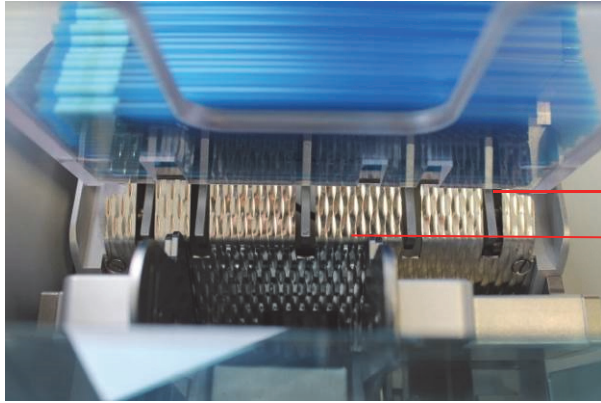


- Place the hopper slightly tilted forward.

- Make sure that the base of the hopper slides into the guide groove.



- The hopper is held in place magnetically.

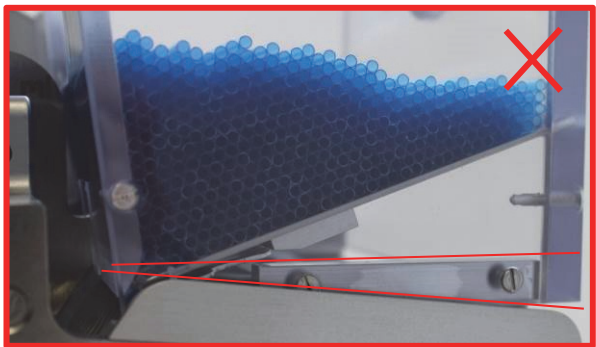
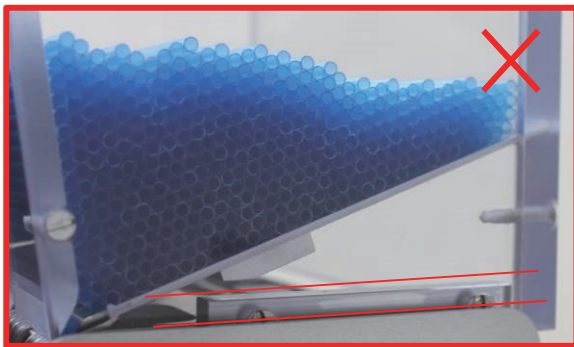
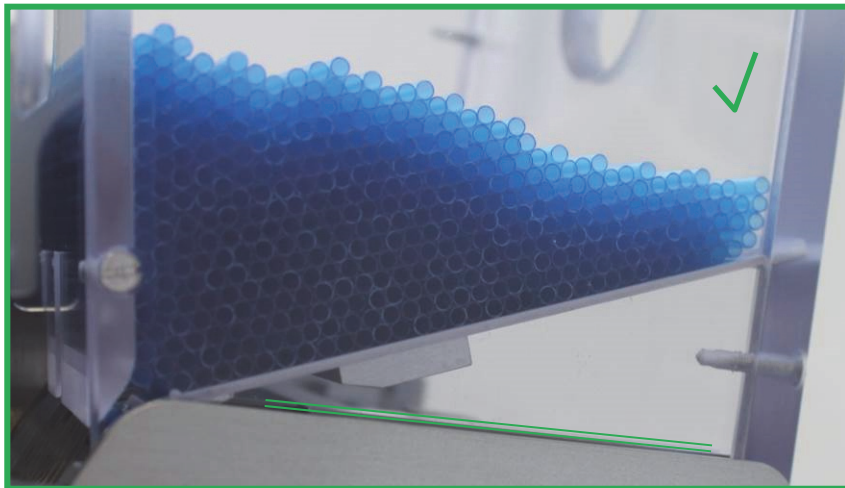


- Place the hopper 約2cm behind the selection sheets.

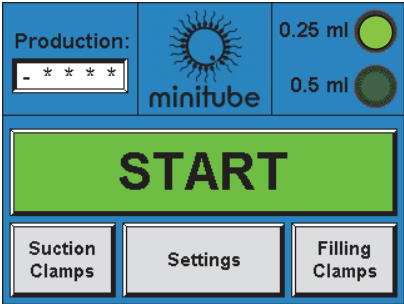
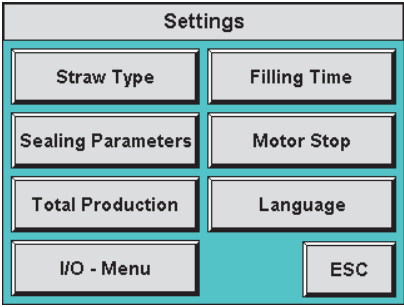
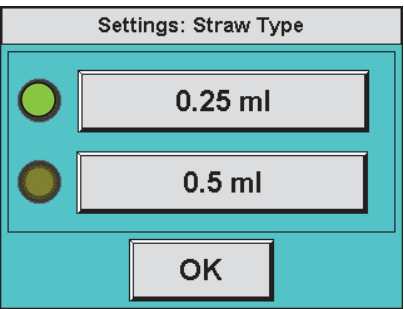
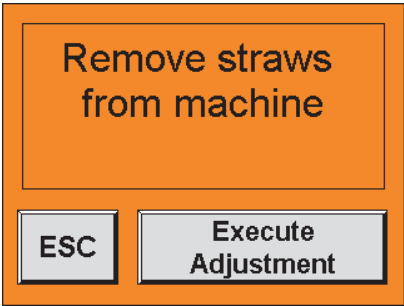
約2cm



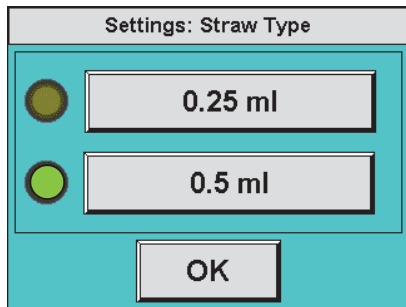
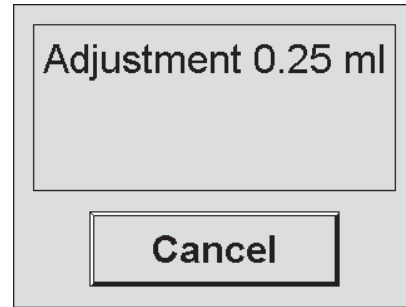
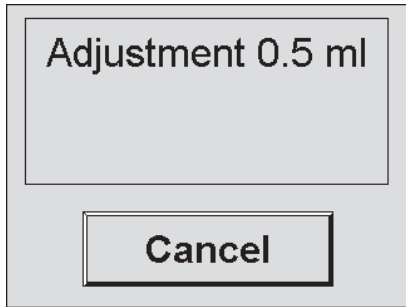
- Slide the hopper forward until it locks down.



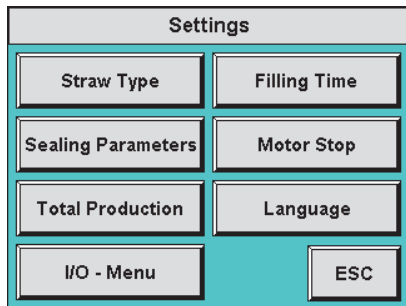
8.5.5. Software settings for the straw size

	<ul style="list-style-type: none"> • The Start screen is indicated on the touch screen. • The actually adjusted straw size is indicated. <ul style="list-style-type: none"> ○ (here: 0.25ml). ➤ Activate Settings for alterations.
	<ul style="list-style-type: none"> ➤ Activate Straw type.
	<ul style="list-style-type: none"> ➤ For alterations activate the corresponding button. ➤ Confirm with OK.
	<ul style="list-style-type: none"> ➤ Activating ESC immediately stops the process. You return to the previous screen. ➤ To perform the adjustment, make sure that no hopper is inserted, or that the hopper is empty and no straws remain in the supply channel. ➤ Confirm the adjustment with Execute Adjustment. • If necessary, the supply wheel will make a movement for adjusting. • Return to the previous screen with ESC.

- During the adjustment, one of the following screens will shortly appear, corresponding to the required straw size.



- The different straw size is indicated (here 0.5ml).
- Return to the superior screen with **OK**.



- with **ESC** you return to the start screen.

8.6. Preparing the material to be processed



Please prepare the extended semen solution according to the manufacturer's instructions.

- Fill the prepared ejaculate into the filling vessel.

9. Quality management



It is the responsibility of the semen processing laboratory to continuously monitor the quality – in particular the correct sealing – of the produced straws. This can only be guaranteed by a defined and documented test routine.

Check the quality of the filling at the beginning of each working day.

- To optimise the quality of the filling, proceed as described in chapter 9.1. „Parameter Settings“.

Check the quality of the sealing.

- Proceed as described in chapter 9.2. „Sealing test“.
- To optimise the quality of the sealing, proceed as described in chapter 10.2.2. Adjustment of the sealing parameters (amplitude and time)“.

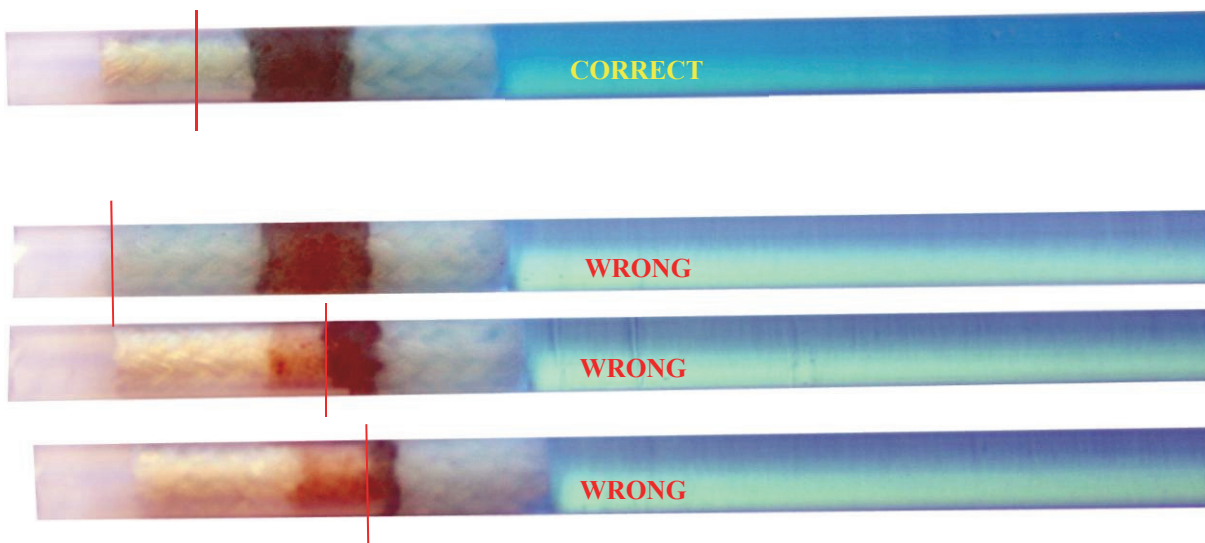
9.1. Parameter Settings



For settings on the MPP Uno only use the provided tools. Use the tools as intended and in the appropriate size.

9.1.1. Basic Information

A basic criterion for the correct filling of the straws is the degree of moisture penetration in the plug. In order not to waste semen a complete moisture penetration of the outer plug is not necessary. The powdery part of the plug package must be soaked completely. In addition, a quarter to one third of the outer plug must also be soaked. If the straw is not filled correctly, the plug might be expelled during the freezing process.



9.1.2. Sequence of adjustment works



Note that optimum moisture penetration of the plugs is influenced by various factors. These include especially:

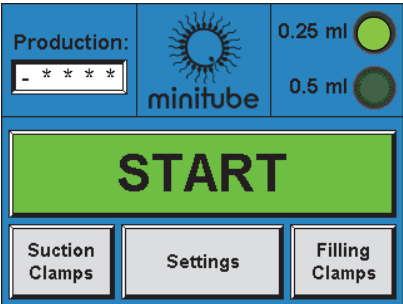
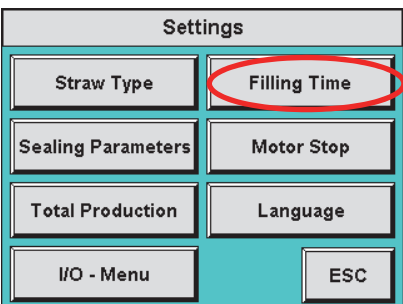
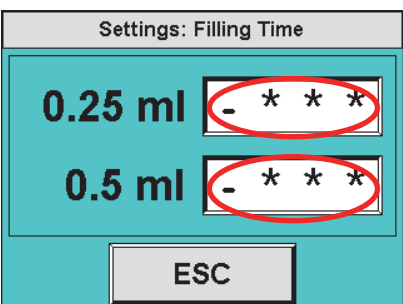
- Vacuum value and
- Filling time.

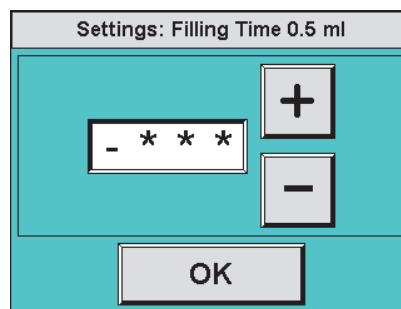
Other factors that influence the filling process are

- Straw size
- Viscosity of the used extender and
- The use of straws from other manufacturers.

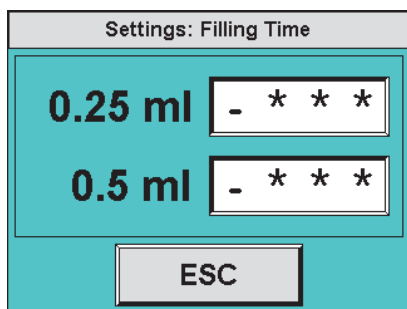
- Make the settings for the filling time and the vacuum values using the extender of the ready to use extended ejaculate you want to process. Once all values are optimally set, you can start the filling process.
- If necessary, change the parameter values for the filling time first.
- Only if the moisture penetration of the plugs is still not optimal, change the vacuum values.
- Afterwards optimise the setting again by adjusting the filling time.

9.1.3. Adjusting the filling time

	<ul style="list-style-type: none"> • The start screen is indicated on the touch screen. • The actually adjusted straw size is indicated (左図では0.25ml). ➤ Activate Settings for alterations.
	<ul style="list-style-type: none"> ➤ Activate Filling time.
	<ul style="list-style-type: none"> • The screen on the left with the actual filling times on the display is indicated. ➤ Activate the display for the actual straw size. • The filling time is adjusted ex works to 24 (± 240 ms) for 0.25ml straws and 34 (± 340 ms) for 0.5ml straws.



- Increase or reduce the filling time with **+** or with **-**.
- Confirm the entry with **OK**.



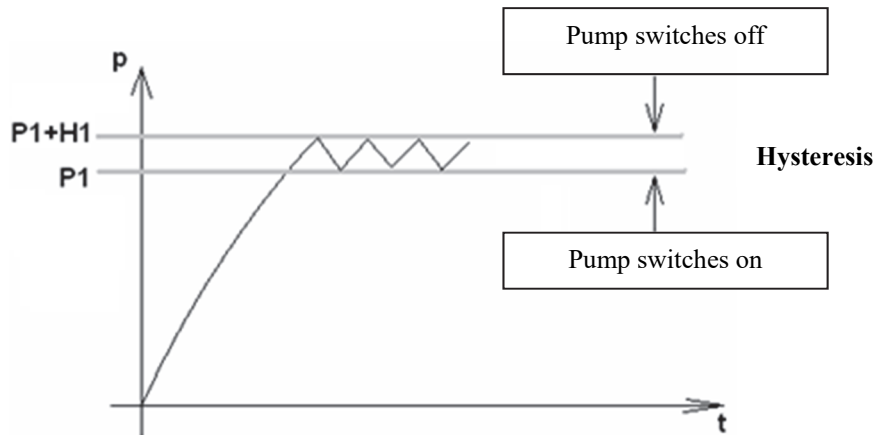
- The newly adjusted filling time is indicated in the field **-* * ***.
- with **ESC** you return to the start screen.

9.1.4. 真空の調整

k Basic Information:

The vacuum control of the MPP Uno allows holding the negative pressure constant in a defined range. The setting of this range is adjusted via the set value P and the hysteresis H.

- **Vacuum set value P1:** As soon as the actual measured negative pressure has reached this value, the vacuum pump switches off.
- **Hysteresis H1:** As soon as the actual measured negative pressure under-runs the set value P1 by this value „H1”, the pump switches on.
- This is to avoid that the pump starts working already at slight variations of the actual value. The vacuum value can vary in this range, without changing the switching status.
- The default value for the hysteresis is „1.0“ and is indicated in kPa (kilo Pascal).



- The actual vacuum value is indicated in kPa (kilo Pascal) during operation.
- Conversion: 1 kPA = 10 mbar
- Deviations of the actual value from the set value are indicated optically.
 - Digit indication „red“: the deviation from the set value is above the hysteresis value, the pump switches on.
 - Digit indication „green“: the actual value and the set value are in accordance to the range of the hysteresis.
 - Pump is off.

- A value can be stored.
- The settings are stored automatically; they are present when the machine is switched on again.

The vacuum values „P“ and „H“ of the MPP Uno are pre-set ex works. These values correspond to measured average values and must be changed depending on the ambient temperature, the type of straw and the material to be processed.



- Remove the transparent cover.

- Activate the „▲“ or „▼“ key.
One of the following displays is indicated: „P1“, „H1“, „P2“ or „H2“. Press the MODE key until „P1“ is indicated – alternately blinking with the actually adjusted negative pressure set value. The control is in the programming mode for 3秒.



- Adjust the required vacuum value with the „▲“ and „▼“ keys.
While pressing and holding the key, first the digit behind the decimal point starts changing. Then the first digits and then the decades of the set value change. Release the key when you are near the required value. For the exact adjustment only press the respective key shortly.
If none of the two keys is activated within 3秒, the control stores the adjusted value automatically.



Make sure to have a negative value when setting the vacuum „-“, „. A positive value causes machine malfunctions.

- If „P1“ is not indicated, activate an arrow key again in order to get into the programming mode. Then press the „MODE“ button until „P1“ is indicated. (Parameter sequence („P1“-„H1“-„P2“-„H2“)
- Do not press the „MODE“ button any longer, when P1 is indicated.
- If „P1“ and other parameters are not indicated, see chapter 12.1.6. „The vacuum set value cannot be adjusted“.



**Do not press the „SET“ key !
The set values are stored automatically.**

- Press the „▲“ or „▼“key.
One of the following displays is indicated: „P1“, „H1“, „P2“ or „H2“. Press the MODE button until „H1“ is indicated – alternately blinking with the actually adjusted hysteresis set value. The regulator is in the programming mode for 3秒.



- Adjust the required hysteresis value using the „▲“ and „▼“ keys.
While pressing and holding the key, first the digit behind the decimal point starts changing. Then the first digits and then the decades of the set value change. Release the key when you are near the required value. For the exact adjustment only press the respective key shortly.
- If none of the two keys is activated within 3秒、 the control stores the adjusted value automatically.
- If „H1“ is not indicated, press an arrow key again in order to get into the programming mode. Then press the „MODE“ key until „H1“ is indicated. (Parameter sequence („P1“-„H1“-„P2“-„H2“).
- Do not press the „MODE“ button any more, when the parameter P1 is indicated.
- If „H1“ and other parameters are not indicated, refer to chapter 12.1.6. „The vacuum set value cannot be adjusted“.



**Do not press the „SET“ key !
The set values are stored automatically.**

- Adjust the following values for the parameters P and H.

P1 = -25.0	H1 = 1.0	P2 = -50.0	H2 = 1.0
------------	----------	------------	----------

- If necessary, optimize the value P1 for an optimum moisture penetration of the plugs.



Note that the specified values for production were determined with Minitube straws. If straws from other manufacturers are used, the values may have to be adjusted individually. Use Minitube straws to prevent this problem.

- Do not change H1! Changes in the hysteresis value can impair the moisture penetration of the plugs.
- The values for P2 and H2 are not relevant for the moisture penetration of the plugs and must be set according to the above information.

- Reinsert the transparent cover again.

9.2. Sealing test

- Perform the tests before production start.
- For the test, use the extender that is usually taken for production in your facility.
- For the test, produce the appropriate number of straws as usual on the machine.

9.2.1. Daily test

A daily leak test should detect larger leak rates (> 10%) caused by inadequate sealing.



- Test 25 straws of each straw size used on that day (e.g. 25 x 0.25ml and 25 x 0.5ml straws).

9.2.2. Monthly test

The monthly test should detect smaller leak rates (< 10%) which are not visible at first sight.

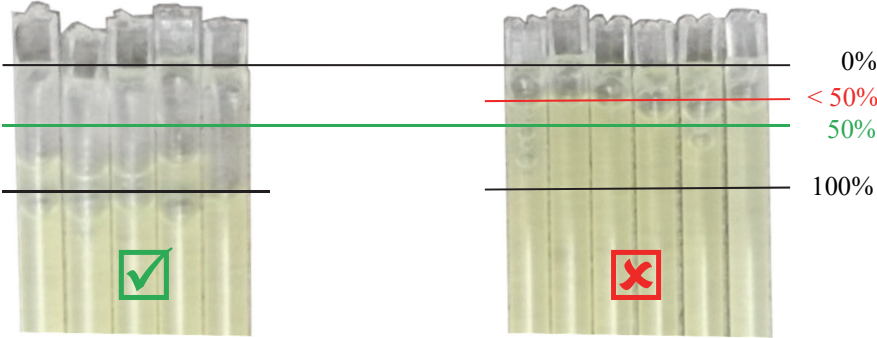
- At the beginning of each month, test 100 straws of each straw size used in that month (e.g. 100 x 0.25ml and 100 x 0.5ml straws).

9.2.3. Test routine

	<ul style="list-style-type: none"> ➤ Shake the test straws so that a continuous air bubble forms at the sealed straw tip.
	<ul style="list-style-type: none"> ➤ Push the plug forward in the straw using a suitable mandrel until the air bubble has completely disappeared. ➤ For an optimal seal test of the straw and for ergonomic working we recommend the use of the Straw Seal Tester (Ref. 13019/0200 or Ref. 13019/0210) see chapter 3.1. „Optional Accessories “. ➤ Maintain the pressure for 3 – 5 seconds.
<ul style="list-style-type: none"> ➤ Observe the following signs for leaking straws: 	
<p>1.</p>	<ul style="list-style-type: none"> ➤ Observe the straw tip while maintaining the pressure. <ul style="list-style-type: none"> • Liquid or air bubbles escape from the sealed straw tip.

2.

- Remove the mandrel from the straw and observe the air bubble at the straw tip.
 - The air bubble at the tip must form again.
 - For optimally sealed straws, the air bubble in the straw must reconstitute to at least 50% of its original size after approx. 2~3秒.



9.2.4. Causes

Straws that are not optimally sealed can have different causes.

e.g.

- Sealing parameters not optimal
Check the sealing gap and the sealing amplitude.
Proceed as described in chapter 12.1.7. „Ultrasonic sealing is defective/brittle/untight (replacing the compact sealing unit)“.
- Position of the straws during sealing not optimal
 - Damaged needles (bent needles, burr at needle tip)
Check the needles for damage and replace if necessary.
 - Incorrectly mounted washers on the filling heads
Proceed as described in chapter 8.4.1. “ „Selection and preparation of the suction and filling heads “.
 - Filling and suction heads are not freely movable.
Clean the filling and suction heads as described in chapter 11.4. „Cleaning works as required “.

If the error occurs again, contact Minitube International.

10. Production

MPPクワトロは、稼働中、機械の状態をタッチパネルの色で以下のように表示します。

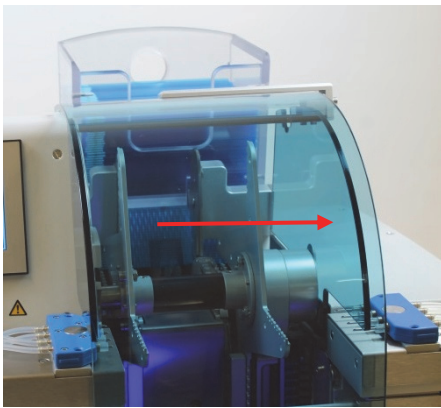
白色	始動（英文表記のみ）
青色	4本注入モード
黄色	1本注入モード、または空モード
緑色	設定
灰色	自動（操作できません）
橙色	指示待ち（操作指示が必要）
赤色	エラー

10.1. 注入工程の開始

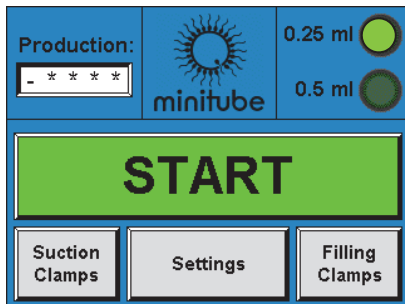


Check the quality of the sealing and filling at the beginning of each working day. To do this, use the Straw Seal Tester (Ref. 13019/0200) or the stylet (Ref. 17207/0010). See chapter 3.1. "Accessories".

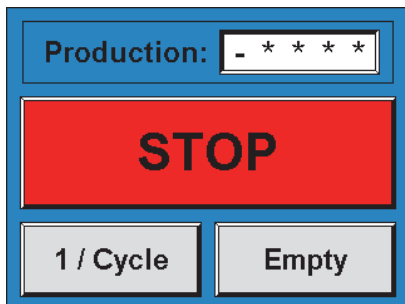
- To improve the quality of the sealing, refer to chapter 10.2.2. "Adjustment of the sealing parameters...". Make changes only in consultation with Minitube International.
- To improve the quality of the filling process, proceed as described in chapter 9.1.4. "Adjusting the vacuum" and 9.1.3. "Adjusting the filling time".



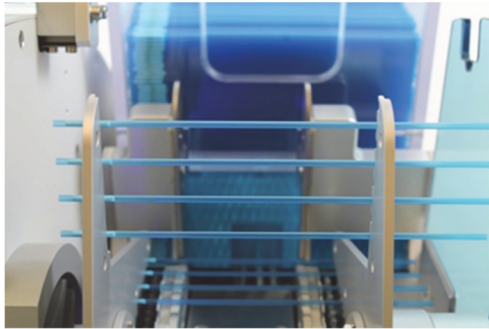
- Close the safety door.



- The Start screen is indicated on the touch screen.
- The actually adjusted straw size is indicated (here 0.25ml).
- Activate **START**.
 - The machine starts taking the straws from the hopper and proceeds with filling.
 - The first filling process is prolonged. The additional time is needed to fill the empty filling tubings.



- The straws are processed in the 4/cycle mode.
- In the field „Production: - * * * *“ the accumulated number of already filled straws is shown.



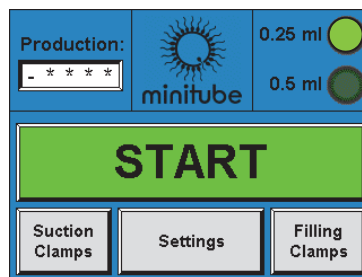
4/cycle:

- Machine with 4 straws in the processing position.
- The background colour of the touch screen is blue.

During processing the following options are available by activating the corresponding button:

STOP

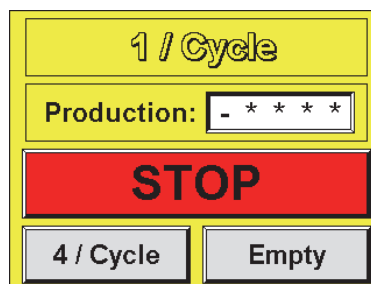
- **STOP** stops the machine after the last processing step has been performed.
The start screen is indicated.
The processing can be continued with **START**.

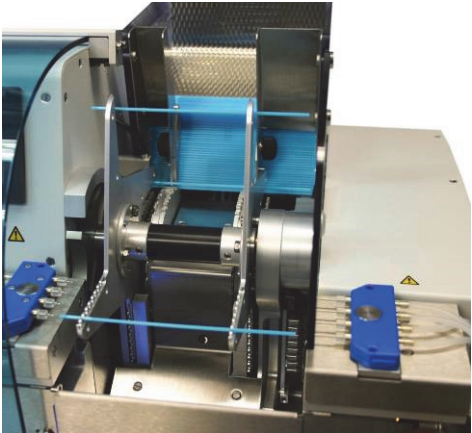


(The Emergency Stop immediately stops the machine).

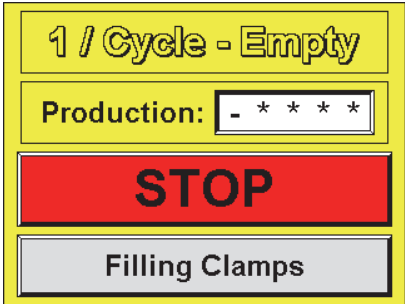
1 / Cycle

- **1/cycle** changes to one straw per cycle:
The three filling tubings that are no longer necessary, run dry, only one nozzle continues operating.
The background colour of the touch screen changes to yellow (refer to chapter 10.4. „Change filling mode“).



<div data-bbox="240 241 416 315" style="border: 1px solid black; padding: 5px; text-align: center;">Empty</div>	<ul style="list-style-type: none"> • Empty empties the device. All straws in the transport star are filled and ejected. No more new straws are taken from the hopper. (Refer to chapter 10.7. „Empty“). The following screen is indicated: <div data-bbox="775 454 1163 741" style="border: 2px solid yellow; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="border: 1px solid black; padding: 5px; text-align: center; background-color: yellow;">Empty</div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Production: - * * * *</div> <div style="border: 1px solid black; padding: 10px; text-align: center; background-color: red; color: white; font-weight: bold; font-size: 1.2em;">STOP</div> </div>
<ul style="list-style-type: none"> • During the filling process the volume in the ejaculate vessel decreases until a signal for single straw filling is triggered on the threshold level of the spring balance. • The machine automatically changes over to the mode <i>1/cycle</i>. 	
<div data-bbox="295 981 700 1279" style="border: 2px solid yellow; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="border: 1px solid black; padding: 5px; text-align: center; background-color: yellow;">1 / Cycle</div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Production: - * * * *</div> <div style="border: 1px solid black; padding: 10px; text-align: center; background-color: red; color: white; font-weight: bold; font-size: 1.2em;">STOP</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 5px; background-color: #cccccc;">4 / Cycle</div> <div style="border: 1px solid black; padding: 5px; background-color: #cccccc;">Empty</div> </div> </div>	<ul style="list-style-type: none"> • The straws are processed in the <i>1/cycle</i>. • The field „Production: - * * * * “ indicates the summed up number of straws, that have already been filled.
	<p><i>1/cycle</i>:</p> <ul style="list-style-type: none"> • Machine with 1 straw in the processing positions. • The background colour of the touch screen is yellow.
<p>During processing the following options are available by activating the corresponding button:</p>	

<div style="background-color: red; color: white; text-align: center; padding: 5px; font-weight: bold; font-size: 1.2em; margin-bottom: 20px;">STOP</div> <div style="background-color: #cccccc; padding: 5px; margin: 10px 0;">4 / Cycle</div> <div style="background-color: #cccccc; padding: 5px; margin: 10px 0;">Empty</div>	<ul style="list-style-type: none"> <p>STOP immediately stops the machine after the last processing step has been executed. Press START if you want to continue in the mode <i>1/cycle</i> afterwards.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <div style="background-color: yellow; text-align: center; padding: 2px 10px; font-weight: bold;">1 / Cycle</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px 0;">Production: - * * * *</div> <div style="background-color: green; text-align: center; padding: 5px; font-weight: bold; font-size: 1.2em;">START</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="background-color: #cccccc; padding: 2px 10px;">4 / Cycle</div> <div style="background-color: #cccccc; padding: 2px 10px;">Empty</div> </div> </div> <p>The mode <i>1/cycle</i> remains active even after the stop.</p> <p>4/cycle switches back to the processing of 4 straws per cycle.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <div style="border: 1px solid black; padding: 2px 5px; margin-bottom: 5px;">Production: - * * * *</div> <div style="background-color: red; text-align: center; padding: 10px; font-weight: bold; font-size: 1.2em;">STOP</div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="background-color: #cccccc; padding: 2px 10px;">1 / Cycle</div> <div style="background-color: #cccccc; padding: 2px 10px;">Empty</div> </div> </div> <p>Empty empties the device. All straws in the transport star are filled and ejected. No more new straws are taken from the hopper (refer to chapter 10.7. „Empty“ and chapter 10.3 „Changing the ejaculate“). The following screen is indicated:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <div style="background-color: yellow; text-align: center; padding: 2px 10px; font-weight: bold;">1 / Cycle - Empty</div> <div style="border: 1px solid black; padding: 2px 5px; margin: 2px 0;">Production: - * * * *</div> <div style="background-color: red; text-align: center; padding: 5px; font-weight: bold; font-size: 1.2em;">STOP</div> <div style="background-color: #cccccc; text-align: center; padding: 2px 10px; font-weight: bold;">Filling Clamps</div> </div>
<ul style="list-style-type: none"> <p>If you do not make a selection, the machine continues filling in the selected mode, until bubbles appear in the front filling tubing. The activated bubble detection switches the machine to <i>1/cycle– Empty</i>. Afterwards the machine stops automatically (refer to chapter 10.3 „Changing the ejaculate“).</p> 	

	<ul style="list-style-type: none"> ➤ When the ejaculate is finished, proceed as described in chapter 10.3. „Changing the ejaculate“).
---	--

10.2. Process optimization

Proceed to process optimization as described in the following chapters and chapter 9.1. "Set fill parameters".




For settings on the MPP Quattro only use the provided tools. Use the tools as intended and in the appropriate size.

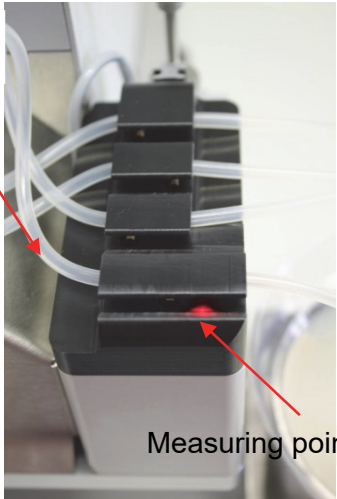
10.2.1. Adjusting the signal threshold of the bubble detection sensor

Basic principle:

The bubble detection sensor screens the front filling tubing at the clamp on the filling side. It detects air bubbles in the tubing when no more ejaculate is available and triggers a signal for terminating the filling process.


The signal threshold is adjusted at the initial operation. To change the value please proceed as follows:

	<ul style="list-style-type: none"> ➤ Open the tilting cover on the sensor. • Two values are indicated on the sensor. Red displayed value = actual measured value Green displayed value = signal threshold/sensor has detected a bubble.
---	---



Front tubing

Measuring point



Only use Minitube filling tubings.

- Prepare the MPP Quattro for normal production (insert filling and suction head).
- Make sure that the front filling tubing is empty.
- If the tubing is not empty or you are in production, stop the machine and proceed as described below.
- Activate the **Filling clamps** on the touch screen in order to open the clamps on the filling side. The tubing runs dry.
 - Note the indicated value (red display for measured value)
 - The value must be 4095.
 - If the value deviates, either the sensors are dirty or no original Minitube tubings are used.

Clean the sensors as described in chapter 11.4.2.

- Start a filling process with a standard laboratory extender.
 - Do not use a diluted ejaculate!**
- Interrupt the filling process after a few straws.
- Note the displayed value (red display for measured value).

➤ Determine the approximate value for the signal threshold as follows:

$$\frac{4095 - \langle \text{value "tubing full"} \rangle}{2} + \langle \text{value "tubing full"} \rangle = \text{signal threshold}$$

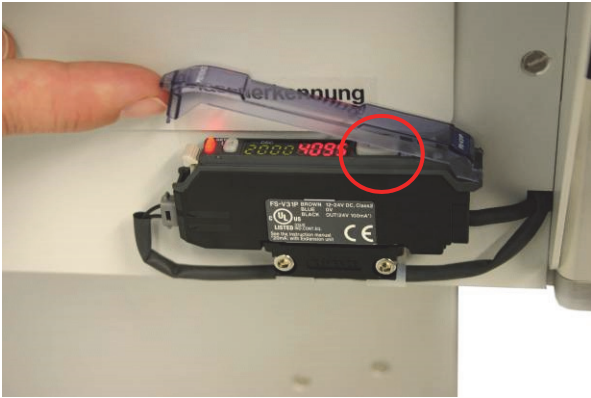
- Example calculation for 2654 = "tubing full"

$\frac{095 - 2654}{2}$	+ 2654	= signal threshold
------------------------	--------	--------------------


Round all values up or down (100s)

$\frac{4100 - 2700}{2}$	4+ 2700	= signal threshold
$\frac{1400}{2}$	+ 2700	= signal threshold
700	+ 2700	= signal threshold

„signal threshold“ ≈ 3400



- Adjust the determined value by means of the rocker switch.



Note that different extenders can lead to different values.

10.2.2. Adjustment of the sealing parameters (amplitude and time)

Basic principle:

While working with ultrasound, risk of skin burns on contact with the sonotrode. For this reason, **never** touch the sonotrode during operation.

Two adjustment parameters can influence the sealing result.

1. Sealing amplitude

The amplitude indicates the strength of the oscillation on the tip of the sonotrode.

and

2. Sealing time

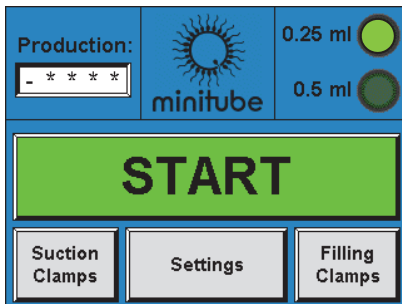
The sealing duration is the time while the oscillation is on the tip of the sonotrode.

Only change the values, when the straws are untight (refer to chapter 12.1.7. „Ultrasonic sealing is defective,...“ and only according to the agreement of a Minitube service technician.

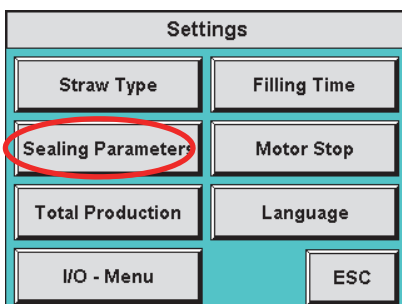


Caution: The mechanic of the sealing unit is constructed for high pressure forces.

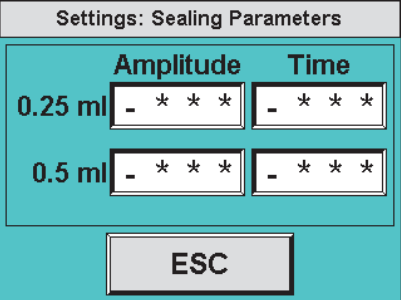
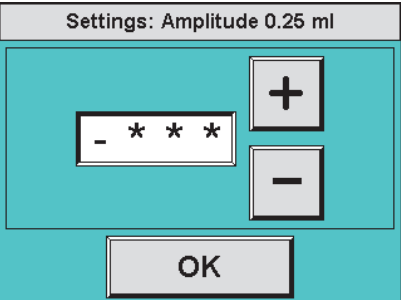
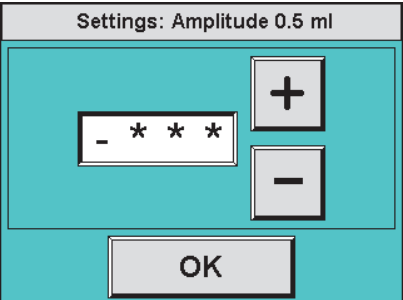
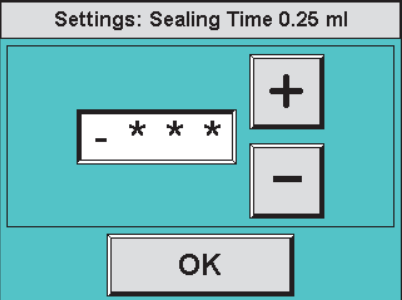
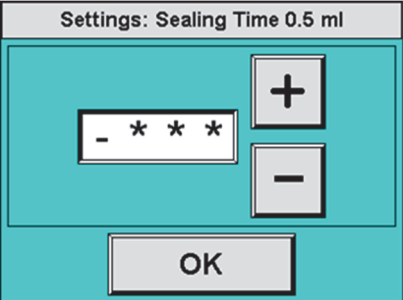
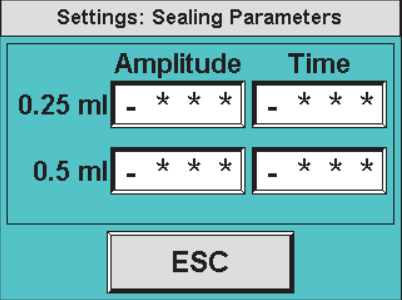
- **Never try to deactivate the safety device of the safety door.**
- **Never operate the machine without cover sheets.**
- **Never reach into the mechanic, when the machine is switched on.**
- **Never reach into the sealing unit! Crushing hazard!**



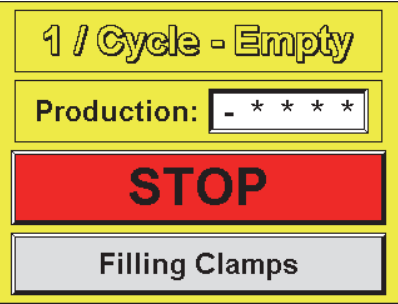
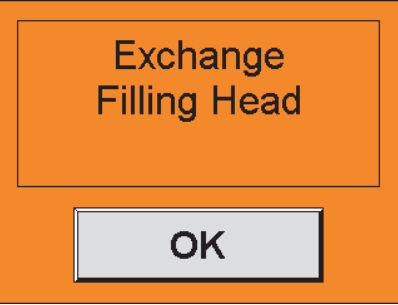
- The start screen is indicated on the touch screen.
- The actually adjusted straw size is indicated (here 0.25ml).
- Activate **Settings** for alterations.



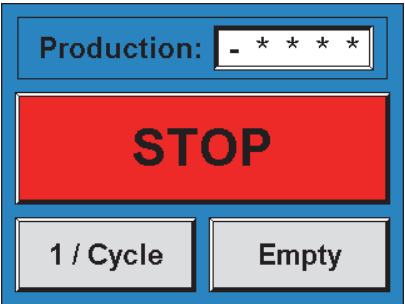
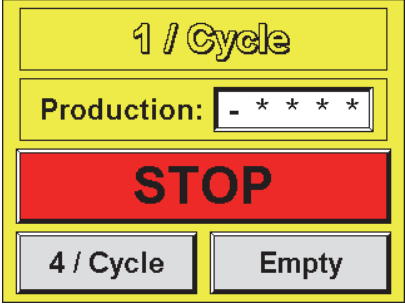
- Activate **Sealing parameters**.

	<ul style="list-style-type: none"> • The screen on the left with the actual values is indicated. ➤ Activate the display that should be altered. • The sealing parameters are set ex works individually for each device. The values are indicated on each compact sealing unit (refer to chapter 12.1.7. „Ultrasonic sealing...“).
	
<ul style="list-style-type: none"> ➤ Increase or reduce the amplitude with + or with - . ➤ Confirm the entry with OK. 	
	
<ul style="list-style-type: none"> ➤ Increase or reduce the sealing time with + or with - . ➤ Confirm the entry with OK. 	
	<ul style="list-style-type: none"> • The newly adjusted values are indicated. ➤ With ESC you return to the start screen.

10.3. Changing the ejaculate

	<ul style="list-style-type: none"> ➤ When the ejaculate is finished activate Filling clamps.
	<ul style="list-style-type: none"> • The clamps on the filling side are opened for 約80秒. If the replacement of the filling head is not confirmed with OK within this time, the machine switches back to the previous screen. ➤ During this time, please remove the filling head (held magnetically) and remove all filling tubings from the clamps with the other hand. ➤ Insert a new filling head and fit all tubings individually into the corresponding clamps (refer to chapter 8.4.2. „Insert the filling and suction heads“). ➤ Confirm with OK.
<ul style="list-style-type: none"> • The counter for the already produced straws is set to zero (here ****). • The machine automatically changes over to the 4/cycle mode. 	
<ul style="list-style-type: none"> ➤ Clean the filling heads as described in chapter 11.2.1. “Cleaning when changing the ejaculate”. 	

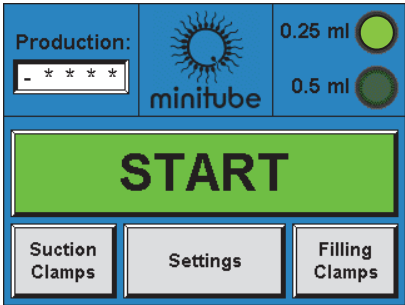
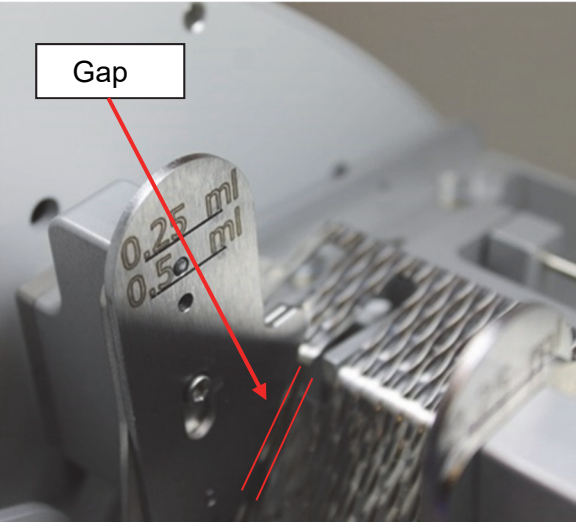
10.4. Change filling mode (1サイクル1本 ↔ 4本)

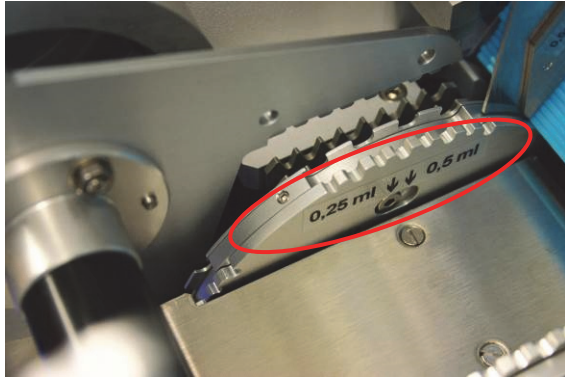
	<ul style="list-style-type: none"> ➤ During the filling process you can manually change to single straw filling. ➤ Activate 1/cycle in the stop screen.
	<ul style="list-style-type: none"> ➤ With 4/cycle you return to the previous filling mode. ➤ With Empty you complete the filling process (refer to chapter 10.7. „Empty“).

10.5. ストローサイズの変更

For changing the straw size (0.25ml or 0.5ml), software settings must be changed and mechanical adjustments of the MPP Quattro and of the hopper must be performed. Please also refer to the following chapters:

- Chapter 8.5.1. „Adjusting the straw size on the supply wheel“
- Chapter 8.5.2. „Preparing the hopper retainer“
- Chapter 8.5.4. „Software settings for the straw size“
- Chapter 10.2. “Process optimization”

<p>➤ Remove eventually remaining straws from the hopper and the machine.</p>	
<p>➤ If necessary, empty the ejaculate bottle or the semen cone and discard it.</p>	
	<p>➤ Select the new straw size (refer to chapter 8.5.5. „Software settings for the straw size“).</p>
	<p>➤ Adjust the new straw size at the hopper retainer.</p>
<p>➤ Fill the hopper with the new straws in the required size into the hopper.</p> <p>➤ Insert the hopper.</p>	



- Select the corresponding adjustment on the straw selection sheet and the supply wheel (refer to chapter 8.4. „Mechanical preparation of the MPP Quattro”).

- Remove the filling and suction heads.
- Insert the appropriate filling and suction heads corresponding to the selected straw size.

- Fill a semen cone with the liquid to be processed.

- Adjust an optimal moisture penetration of the plugs (refer to chapter 10.2. „Process optimization”).

- Start the machine.

10.6. Processing less than 4 straws per cycle

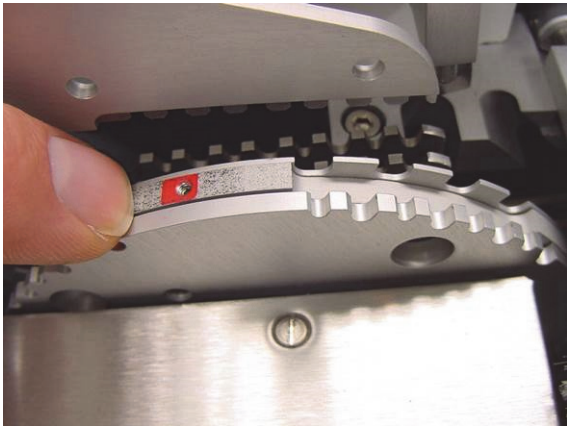
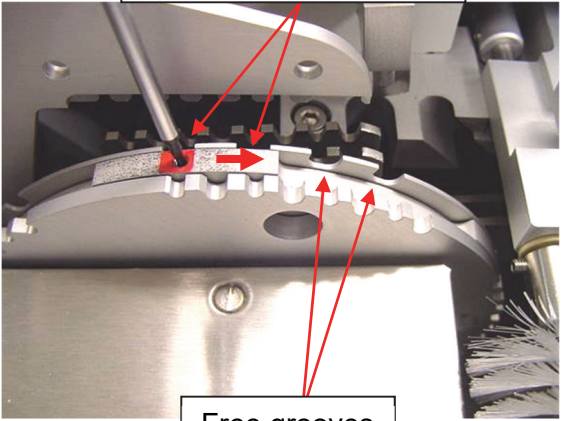

The machine enables the operator to process less than 4 straws per cycle.

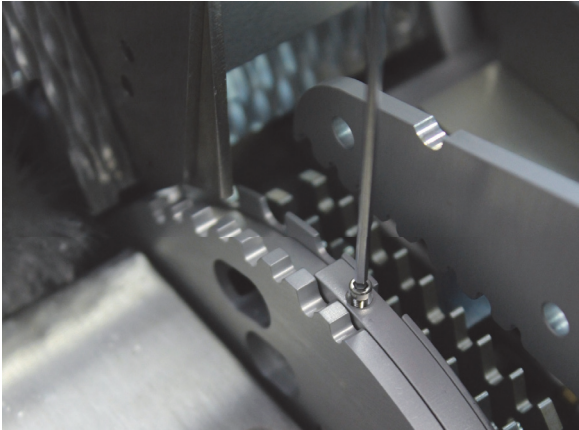
For processing only one straw per cycle, select *1/cycle* on the touch screen (refer to chapter 10.4. „Change filling mode“).

For processing two or three straws per cycle, mechanical alterations must be performed. Proceed as described below.

Basic principle:

The supply wheels are equipped with adjustable rings that enable to block the grooves for the straw reception mechanically. Only use the appropriate tool from the tool kit.

	<ul style="list-style-type: none"> ➤ Open the safety door. ➤ Slowly turn the supply wheel until the bore hole (here red marking) is visible.
 <p style="text-align: center;">Blocked grooves</p> <p style="text-align: center;">Free grooves</p>	<ul style="list-style-type: none"> ➤ Insert the tool into the bore hole and loosen the screw counter clockwise until the ring is movable. ➤ Turn the ring with the bore hole until the required number of grooves in the supply wheel is free, respectively blocked. ➤ The figure on the left shows 2 free and 2 blocked grooves. This adjustment is for filling two straws per cycle. <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;">  <p>Only tighten the screw very slightly in order not to damage the adjustment ring.</p> </div>



- Please proceed in the same way for the adjustment on the other side.

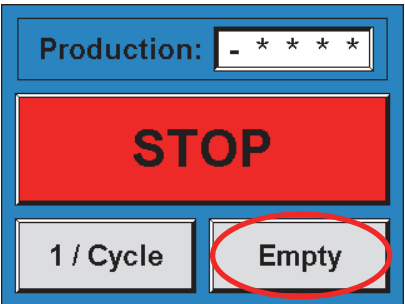
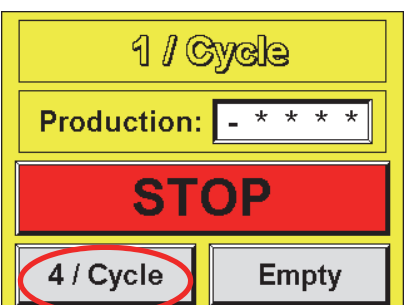


Always make sure that blocking the free grooves must be carried out from the front to the rear. E.g. the bore hole must always be turned to the „rear“ for reducing the number of straws per cycle and to the „front“ for increasing the number of straws. If you proceed in reverse order, single filling per software is not possible (mode 1/cycle).

- Insert appropriate filling and suction heads, where the tubings have been attached corresponding to the adjustment. Always start mounting from the front, that means if only one straw per cycle is to be filled, attach only the tubing in front that faces the operator. For several straws attach the required number of tubings proceeding from the front to the rear.
- Open the safety door.
- Start the filling process
- For resetting, adjust the rings in such a way so that all 4 grooves are free.

10.7. Empty

You can empty the device in the 1/cycle as well as in the 4/cycle mode. All straws in the processing positions are filled and ejected. No more new straws are fed from the hopper. The machine stops automatically.

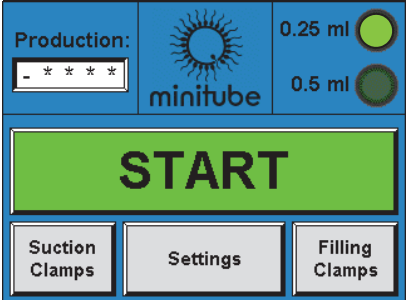
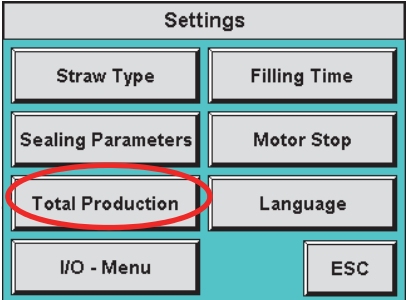

	<p>Empty in the 4/cycle mode:</p> <ul style="list-style-type: none"> ➤ Select Empty on the stop screen.
	<p>Empty in the mode 1/cycle:</p> <ul style="list-style-type: none"> ➤ Select Empty in the mode single filling.

10.8. Notes for longer breaks (> 1 h)

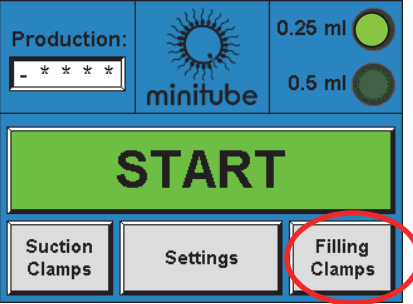
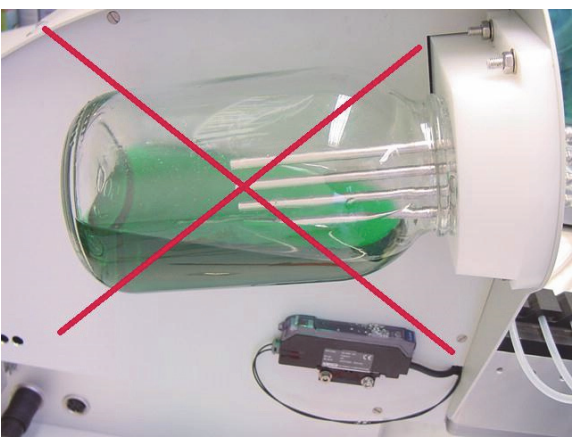


Remove all tubings from the clamps during periods when the machine is not in use. This prevents the tubings from agglutinating, thus causing problems when starting the next filling process.

10.9. Read out number of produced straws

	<ul style="list-style-type: none"> ➤ Activate Settings.
	<ul style="list-style-type: none"> ➤ Activate Production.
	<ul style="list-style-type: none"> • The number of produced straws is indicated. ➤ Return to the previous screen with ESC.

10.10. Switching off the MPP Quattro

<p>➤ Empty the device (refer to chapter. 10.7. “Empty”).</p>	
	<p>➤ Activate filling clamps in the start screen.</p> <ul style="list-style-type: none"> • The filling clamps open for approx. 80 seconds. <p>➤ Remove the filling tubings from the clamps.</p> <ul style="list-style-type: none"> • The tubings might agglutinate due to the constant pressure of the clamps, thus causing problems when starting the machine again. <p>➤ Repeat the process on the suction side. Activate suction clamps.</p> <p>➤ Clean the filling and suction heads as described in chapter 11.2.2. “Cleaning after the last ejaculate”.</p>
<p>➤ Activate the green On/Off switch “0-I” on the machine.</p> <ul style="list-style-type: none"> • The green LED <i>operating voltage</i> disappears. • The MPP Quattro is now in stand-by mode. 	
<p>➤ In order to disconnect the MPP Quattro from the power supply, put the mains switch (rocker switch) on the control unit to the position „0“ („0“ pressed).</p>	
	<p>➤ If necessary, remove the vacuum bottle from the vacuum unit by turning it and empty, respectively clean the vacuum bottle (refer to chapter 11.2.3. „Cleaning the vacuum bottle“).</p> <ul style="list-style-type: none"> • From experience, there rarely collects any liquid in the vacuum bottle at optimal moisture penetration of the straw plugs.

11. Cleaning and Maintenance

Generally, make sure to provide an optimal working environment for the operation. Maintain and clean the machine if necessary (e.g. spilled material) observing the following instructions and cycles.

11.1. General cleaning

In order to keep the machine in a good condition, and to maintain optimal hygiene conditions, it is recommended cleaning the machine thoroughly once a week or once a month, depending on the operating time. This concerns visible surfaces and areas typical for soiling, like the collection platform and the guide plate above for example (refer to chapter 8.1. "Safety instructions for the preparation of the MPP Quattro"). For antibacterial cleaning you may use a mixture of isopropyl alcohol and water or suitable disinfectants.



**Set the main switch to „0 “ for all kind of cleaning.
In case of non-observance there is electric shock hazard, respectively hazard due to unintended functions.**



Do not use any aggressive cleaning agents! Aggressive cleaning agents might damage the materials of the MPP Quattro.



Never pour water on the MPP Quattro, or the control unit. There is electric shock hazard. Only clean the surfaces with a damp cloth.

11.2. Cleaning (daily cycle)

11.2.1. Cleaning when changing the ejaculate

- Remove the filling head.
- Remove the washers and tubings and discard them with the domestic waste.
- Prepare a mild solution with water and customary dishwashing liquid. Never use disinfectants or soaps with additives such as cream, balm, etc.
- Put the filling head immediately into the dishwashing liquid, as otherwise extender remains might dry inside.
- When processing several ejaculates, collect the used filling heads in the detergent. Carry out the following instructions only after having completed all filling processes.
- After processing the last ejaculate clean the filling and suction heads, as described in chapter 11.2.2.

11.2.2. Cleaning after the last ejaculate

- Prepare a mild solution with distilled water and customary dishwashing liquid, if not yet prepared for the cleaning after changing the ejaculate. Do not use any disinfectants or soap with additives, such as cream, balm etc.
- Remove the filling and suction heads.
- Remove the washers and tubings and discard them with the domestic waste.
- Put the filling heads into the washing-up solution immediately, as otherwise extender remains could dry on them.
- Control the nozzles of the suction head for soiling caused by moist powder remains from the plugs of the straws.
- If necessary, use the provided piece of wire from the tool kit and pass it through the nozzle (0.25ml straw – thinner piece of wire, 0.5ml straw - thicker piece of wire).
- Put the suction heads into the washing up solution.
- Rinse the collected filling and suction heads with demineralised water.
- Dry the filling and suction heads by shaking them and put them on clean towels.
- Blow through the filling and suction heads with oil free compressed air.
- Sterilise the filling and suction heads by boiling them (time: min. 15 minutes) in demineralised water or by means of hot air (temperature: max. +140°C).
- The cleaning of the filling heads can also be done in an ultrasonic cleaning bath (for example Minitube ultrasonic bath Ref. 14400/8849). Sterilize as described above.



Make sure that the temperature does not exceed +140°C during the hot air sterilisation. Higher temperatures lead to deformation of the plastic parts thus causing malfunctioning of the filling machine.

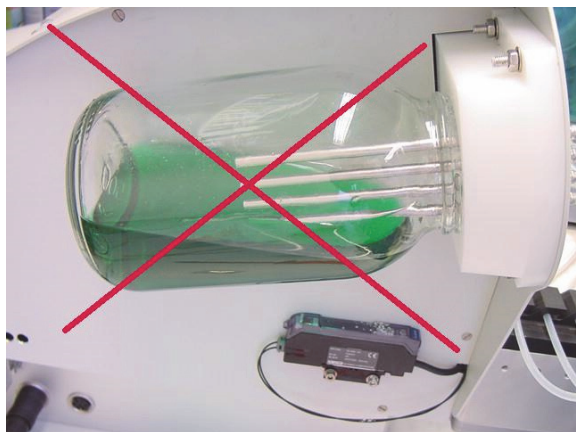


Make sure that the nozzle shafts and the nozzle points do not get damaged. Deformed nozzles lead to malfunctioning of the filling machine. In order to avoid damages we recommend using fixing units (refer to chapter 3. “Accessories”).

11.2.3. Cleaning the vacuum bottle



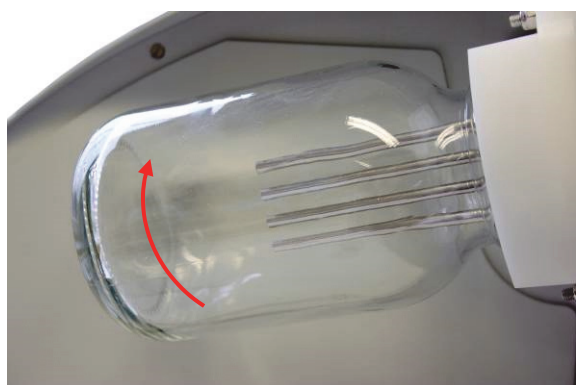
Never start the machine when there is liquid in the vacuum bottle !



- Check if there is any liquid in the vacuum bottle.
At optimal moisture penetration of the straw plugs, there rarely collects any liquid in the vacuum bottle.
- Control the vacuum settings or the filling time if such a situation occurs frequently.



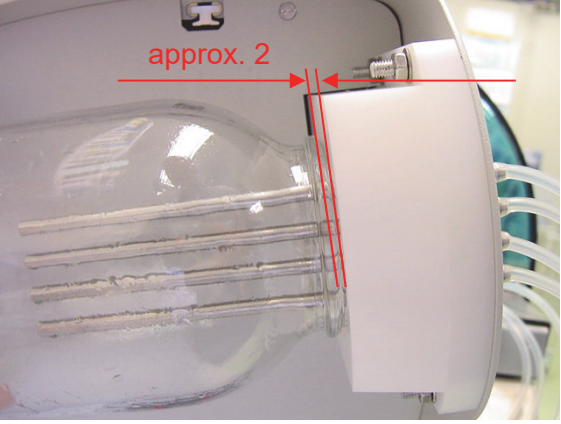
Start the machine only, when the vacuum bottle is empty. If there is too much liquid in the vacuum bottle, liquid might get into the vacuum pump thus damaging the vacuum pump irreparably.



- Turn the vacuum bottle counter-clockwise (seen from the right side of the machine) to remove it and clean it. Dry the vacuum bottle thoroughly, so that no liquid gets into the pump.



- You can clean a dirty supply tube by removing the tubings and passing a thin pipe cleaner from the tool kit through the metal tubes.

	<ul style="list-style-type: none"> ➤ Reattach the vacuum bottle tightly by turning it clockwise. Make sure that the vacuum bottle is securely screwed up to the seal. • The gap between the collar on the vacuum bottle and the plastic part is 約2mm. • Tightness is given when, while building up the vacuum, the pump switches off after 3 – 5 pump noises and the vacuum value remains stable. ➤ If necessary, check the edge of the vacuum bottle and the O-ring for damage and dirt.
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11.2.4. Cleaning the sealing area

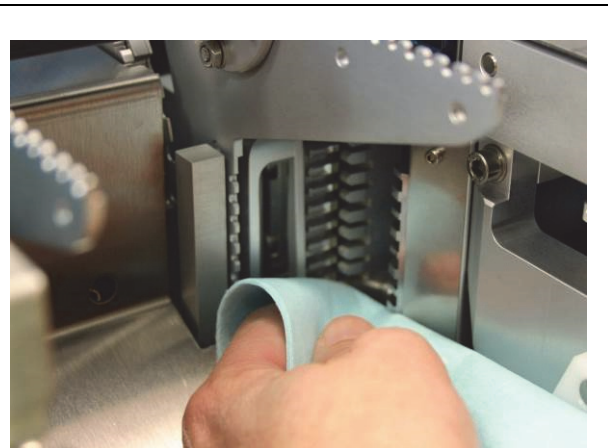


**Only clean the sealing unit, when the machine is switched off !
Risk of injury !**



The ultrasonic sealing unit is a highly sensitive precision component ! All parameters were optimised ex works thus making an interference of the operator unnecessary ! Do not manipulate the sealing unit ! This concerns especially the converter and the sonotrode ! For cleaning use only the described, respectively the provided tools! Do not use any pointed or hard tools !

<ul style="list-style-type: none"> ➤ Switch off the machine. ➤ Open the safety door. ➤ Open the cover with the company logo (refer to chapter 8.4. „Mechanical preparation of the MPP Quattro”).



<ul style="list-style-type: none"> ➤ Clean the sealing unit with a clean paper towel. If necessary, moisture the towel with water and some dishwashing liquid. Make sure that no paper remains in the sealing unit. ➤ In case of persistent soiling proceed as described in chapter 11.3.1. “Cleaning the sealing unit”.
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11.3. Cleaning works (weekly cycle)

11.3.1. Cleaning the sealing unit

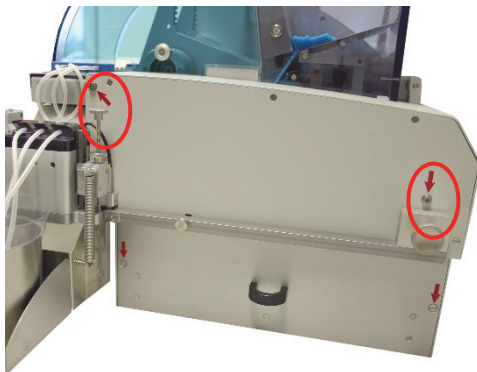


**Only clean the sealing unit, when the machine is switched off !
Risk of injury !**

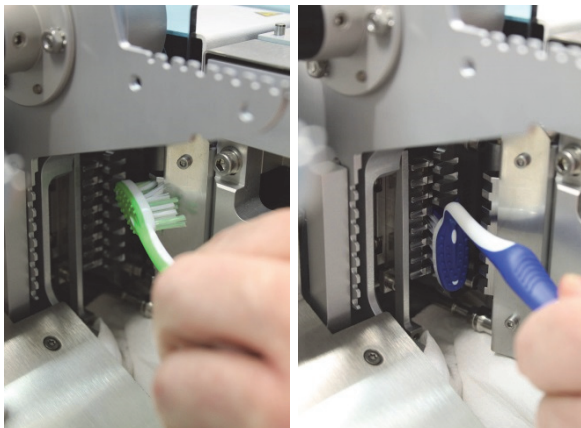
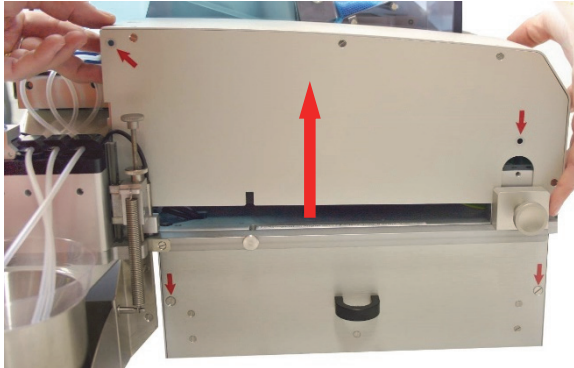


The ultrasonic sealing unit is a highly sensitive precision component ! All parameters were optimised ex works thus making an interference of the operator unnecessary ! Do not manipulate the sealing unit ! This concerns especially the converter and the sonotrode ! For cleaning use only the described, respectively the provided tools ! Do not use any pointed or hard tools !

- Switch off the machine and unplug.
- Open the safety door.
- Remove the cover with the company logo.



- Loosen the two screws on the right side of the casing. Use the appropriate tool from the tool kit.
- Remove the indicated part of the casing.



- Prepare a soap solution or a solution with dishwashing liquid.
- Introduce a paper towel in the gap between the sealing unit and the collection tray, in order to collect dishwashing liquid.
- Clean the teeth in the sealing area with the washing-up liquid, using the provided brushes (tooth brushes).

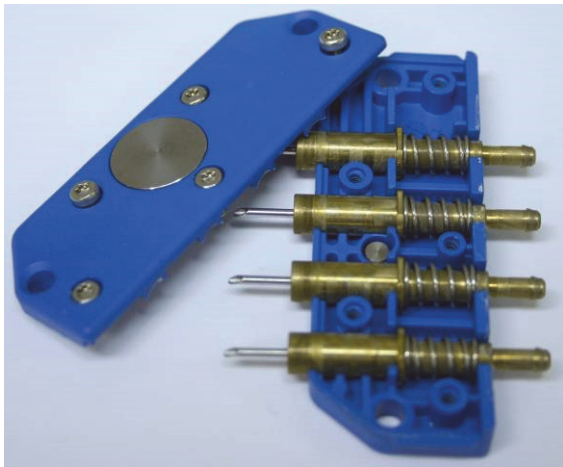
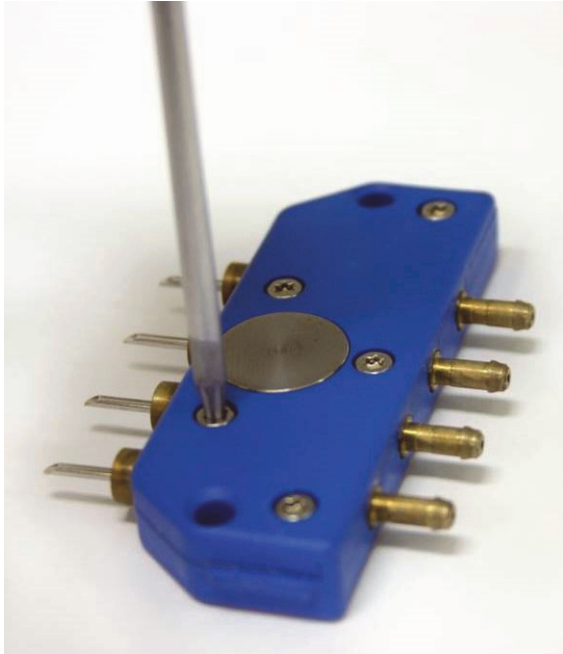


Do not dismantle any parts from the sealing unit.

- Remove the paper towel and dry the sealing area a little.
- Remount the removed part of the casing.

11.4. Cleaning works as required

11.4.1. Cleaning the nozzle heads



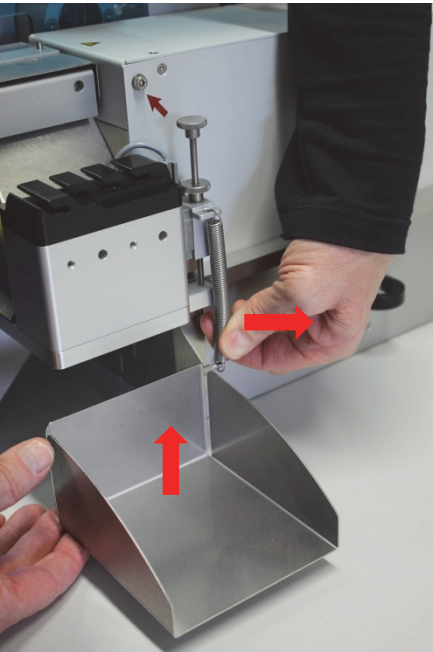
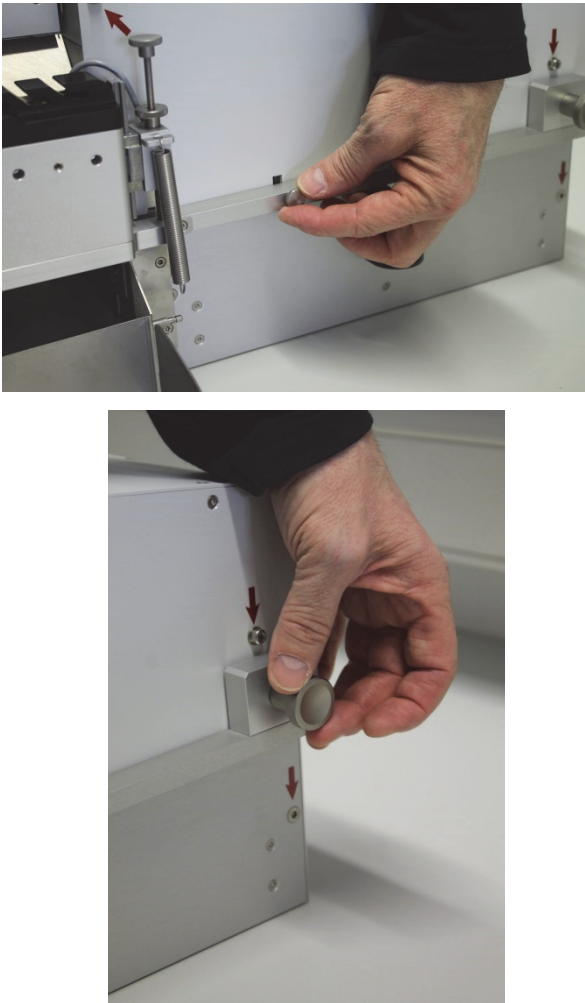
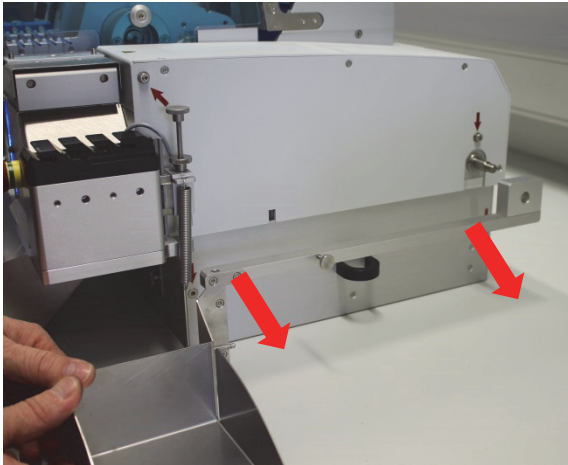
- Loosen the screws on the nozzle head with an appropriate tool from the tool kit.
- Remove the upper plastic shell.
- Clean the soiling from the mechanic.
- Use a soft cloth dampened with a washing up solution, or put the nozzle head into a washing-up solution.
- Put the plastic shells together again.
- First turn the screws counter-clockwise until the screw is inserted in the thread.
- Only then turn the screw clockwise and tighten it carefully.

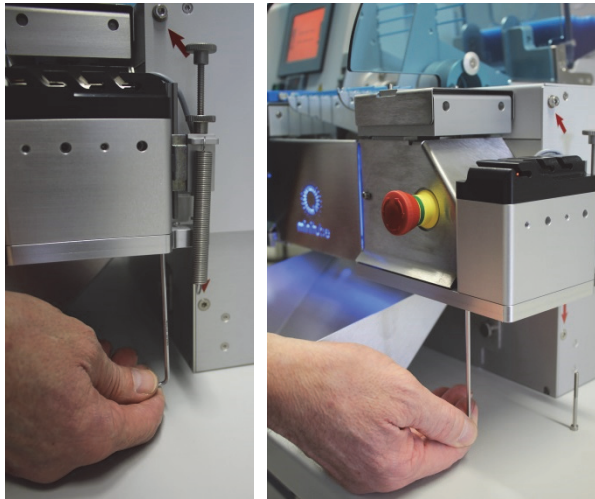


Make sure that the screws do not cut a new thread into the plastic. This would damage the nozzle head.

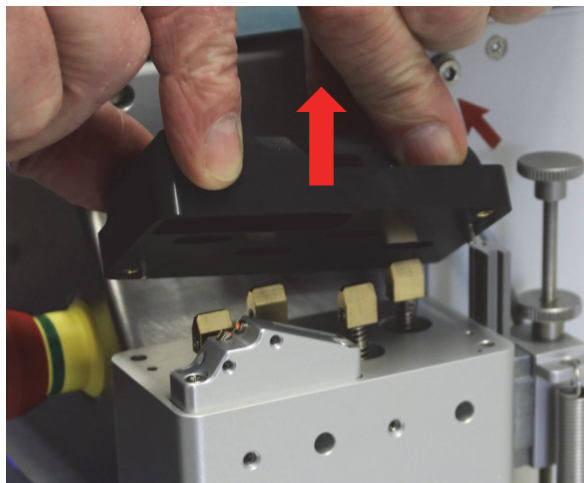
- Sterilise the nozzle head, as described in chapter 11.2 “Cleaning (daily cycle)”.

11.4.2. Cleaning the bubble detection sensor

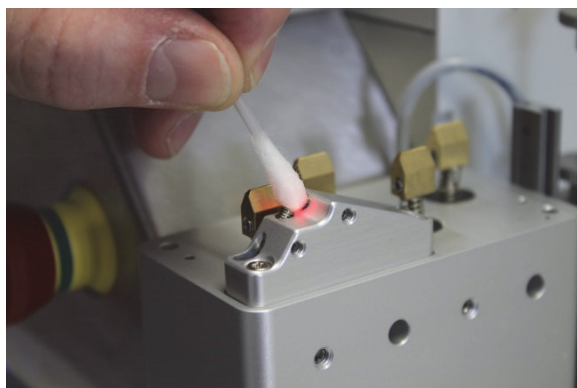
	<ul style="list-style-type: none"> ➤ Lift the reception platform of the spring slightly and unhook the spring.
	<ul style="list-style-type: none"> ➤ Loosen the two knurled screws and pull the entire spring balance to the side. 



- Loosen the two screws at the bottom of the filling side.

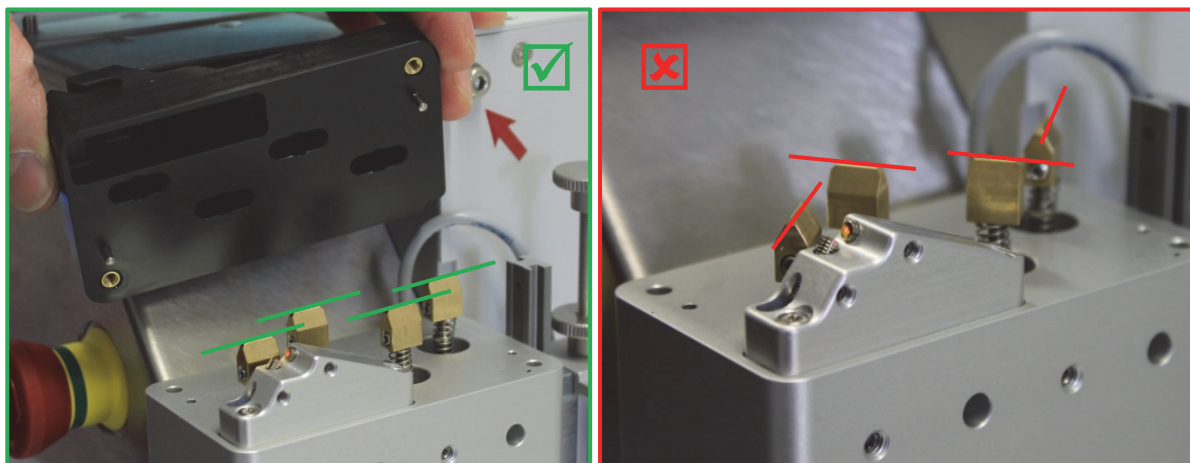


- Pull the cover of the filling head clamps upwards.



- Clean the sensor with a cotton swab and some alcohol.

- For assembly, proceed in reverse order as described above.
- When mounting the cover, pay attention to the alignment of the brass heads of the filling clamps.



11.5. Maintenance

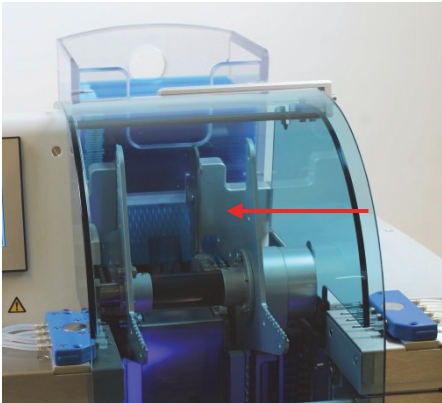

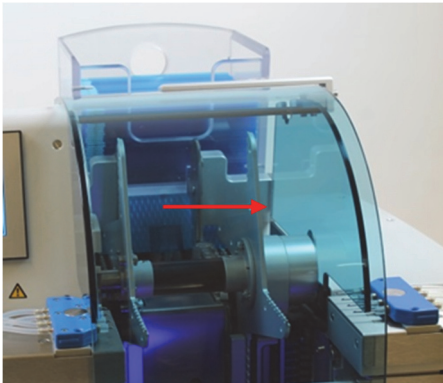
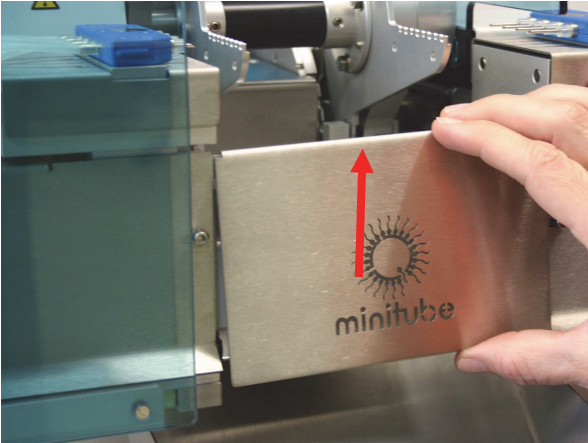
In order to keep the device in a good condition and to achieve optimal production results, it is recommended to check the machine optically for visible damages, regularly.

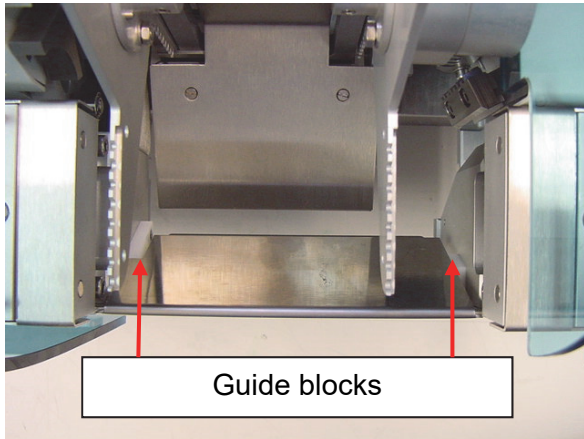
When used as intended, the MPPクワトロ is nearly maintenance free. Depending on the mechanical stress, a control of the ultrasonic sealing unit in regular intervals is recommended. In case of repeatedly obtaining unsealed straws despite of optimal operation parameters, please contact a Minitube service technician.

12. Trouble Shooting

For trouble shooting several covers must be removed. This is necessary for observation, for checking components and for adjustments. Prior to putting the machine into operation again all covers must be reattached. Only then confirm the error message on the screen.

The failures might have different reasons. For structured trouble shooting only change one setting or one parameter at a time. Test, if the problem is solved. Only take further steps if the error occurs again. Then adjust the previous operating status again, when it did not help solving the problem. The provided tool kit contains all necessary tools.

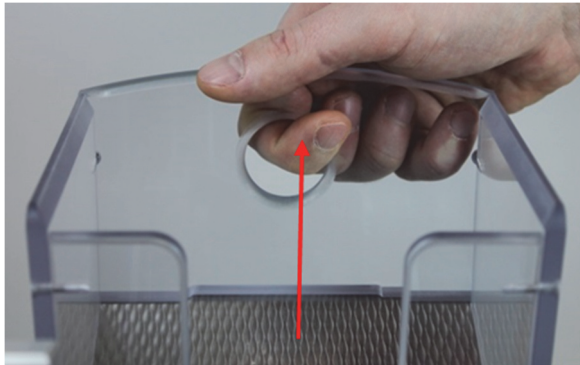
Opening and closing the safety door	
	<ul style="list-style-type: none"> ➤ Open the safety door to the left. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>Never open the safety door against any resistance. Pinching hazard ! Wrongly installed filling tubings might get pinched e.g.</p> </div>
	<ul style="list-style-type: none"> ➤ Carefully slide the safety door back to the right. ➤ The start screen appears.
Removing and reinserting the cover with the logo	
	<ul style="list-style-type: none"> ➤ Remove the cover with the company logo in order to access the lower area.



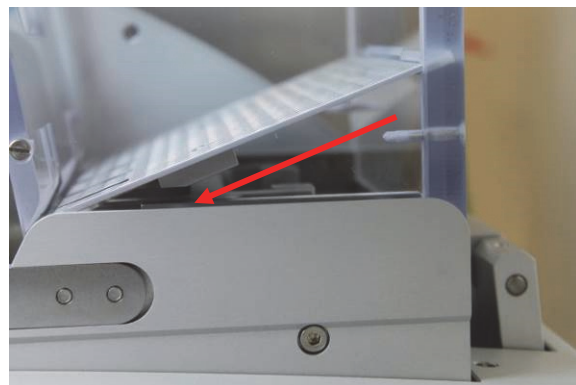
Guide blocks

- When reinserting the cover, please make sure that it snaps in correctly behind the guide blocks.

Removing and reinserting the hopper



- Remove the hopper upwards.



- Place the hopper on the hopper retainer.
- Make sure that the hopper slides into the guide groove.

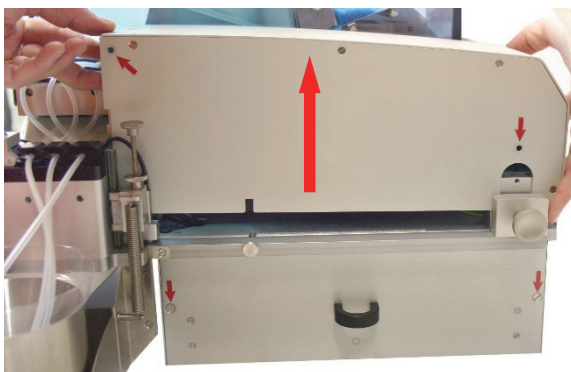
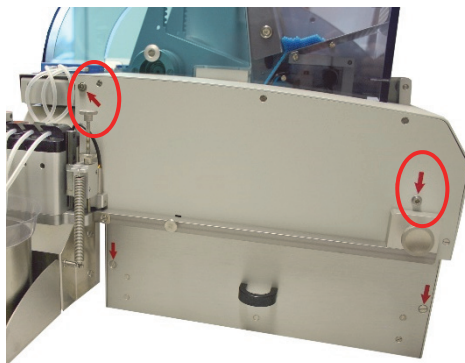
Disassembling the left side panel



- Open the screw on the left side of the MPP Quattro.

- Remove the cover to the rear.
- For reassembling please proceed in reverse order.

Disassembling the right side panel



- Open the screws on the right side of the MPP Quattro. Use the appropriate Allen key.

- Remove the cover upwards.
- For reassembling please proceed in reverse order.

12.1. Failures

Incorrect machine settings might lead to incorrect operation of the machine, respectively to faulty straw fillings. The errors mentioned in the following chapter can be solved by the operator himself.

In case that the problem cannot be solved, please contact Minitube International.

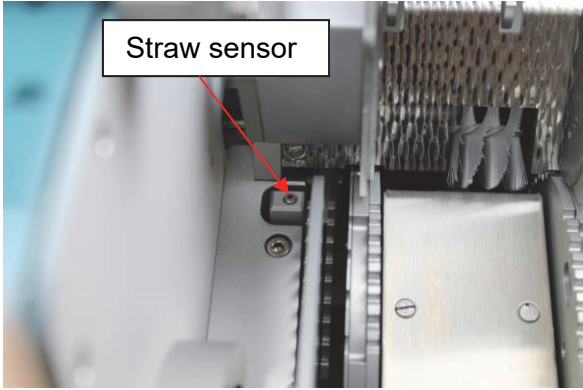


Observe the safety instructions !



Never put your fingers into areas of the device with moving parts during operation. Risk of injury !

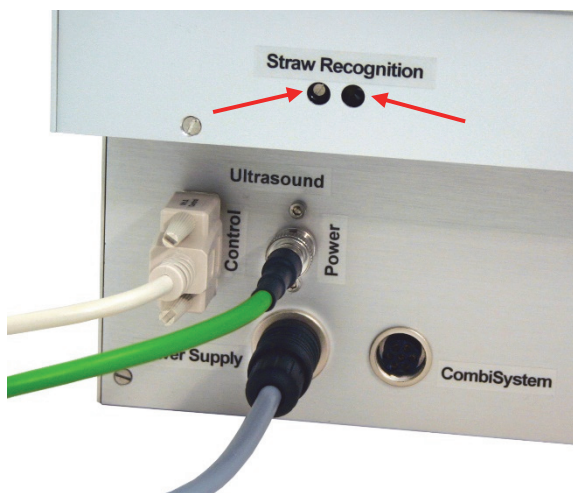
12.1.1. Straws are not recognised

<p>Error description: The machine does not switch off automatically, even though all straws have been processed.</p> <p>or</p> <p>Machine does not fill straws, even though straws are available</p> <p>or</p> <p>Machine stops with straws in the supply wheel.</p>	<p>Trouble shooting: Control the straw sensor.</p>
	<p>Basic principle: The machine is equipped with a photo electronic sensor that informs the control, whether a straw has been supplied or whether all straws have been used up.</p>



- Check if the measuring zone of the sensor is soiled.
- Remove all dirt and clean the sensor with a soft lint-free cloth and some ethyl alcohol.

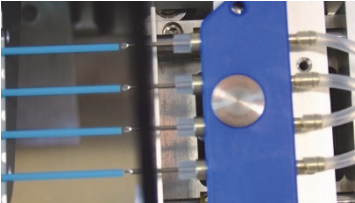
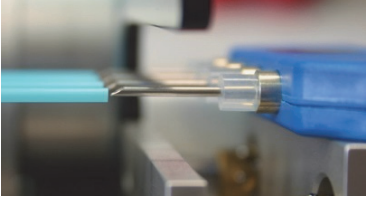
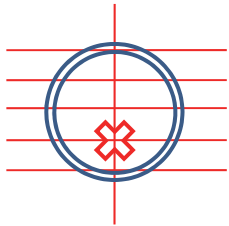
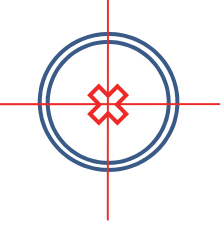
- If cleaning the sensor does not improve the situation, please adjust the sensor sensitivity as follows:



- On the left hand side of the machine two bore holes are located that release the signal light and the potentiometer for the straw recognition sensor.

- Switch on the machine.
- Make sure that no straws are in the scan area of the sensor (no straws in the supply wheel).
- Turn the potentiometer clockwise until the signal light is on constantly or flashes.
- Then, turn the potentiometer counterclockwise, until the signal light goes off constantly and then continue for a full turn (360°).

12.1.2. The filling or suction nozzle is not in line with the straw

<p>Error description: The filling heads respectively the suction heads are not in line with the straws</p>	<p>Trouble shooting: Optimize the filling respectively the suction head position.</p>
<p>Procedure after maintenance works:</p> <ul style="list-style-type: none"> ➤ Put several straws into the hopper of the machine. ➤ Check the straws. Bent straws cannot be filled. ➤ Start the machine and let four straws be transported to the filling position. ➤ Mount the filling and suction heads. ➤ Check the nozzles of the filling and suction heads. Replace damaged filling heads with bent nozzles. <p>Procedure during the filling operation:</p> <ul style="list-style-type: none"> ➤ Check the straws. Bent straws cannot be filled. ➤ Check the nozzles of the filling and suction heads. Replace damaged filling heads with bent nozzles. 	
<ul style="list-style-type: none"> ➤ If the problem persists, check the position of the needle tips from the filling and suction sides to the straw. <ol style="list-style-type: none"> 1. Look at the needle tip and the straw from above. <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> • The needle tip must always be centered to the straw. 2. Look at the needle tip and the straw from the front. <div style="text-align: center; margin: 10px 0;">  </div> <ul style="list-style-type: none"> • The needle tip of the filling side must be centered to the straw. • The needle tip of the suction side must be positioned in the lower quarter. <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> <p>Suction side</p>  </div> <div style="text-align: center;"> <p>Filling side</p>  </div> </div> <p style="text-align: center; margin-top: 10px;">1/4</p>	

If the positions differ, please contact Minitube International.



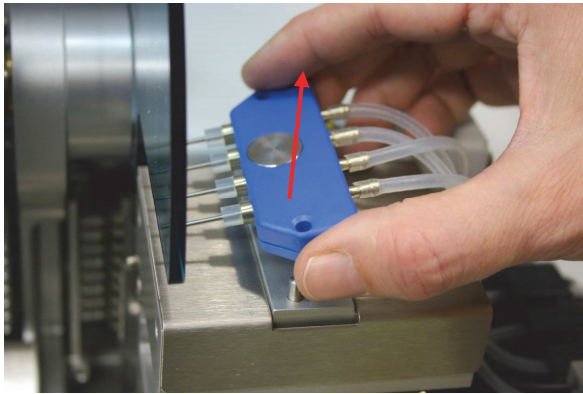
The following description will help you while in contact with a service technician. Perform the following work only after consultation or with the assistance of a Minitube International service technician.

- Open the safety door.
- Remove the cover with the company logo.

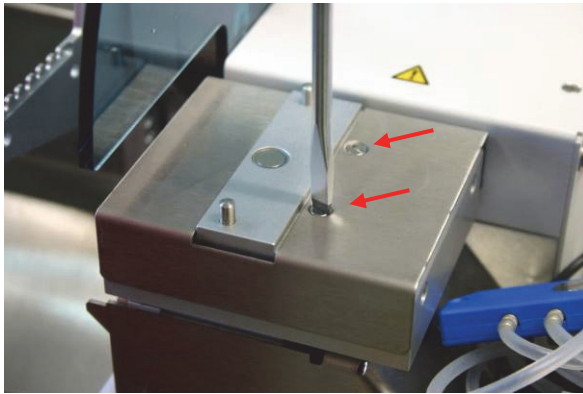


- 注入位置でストローに触れないようにしてください。

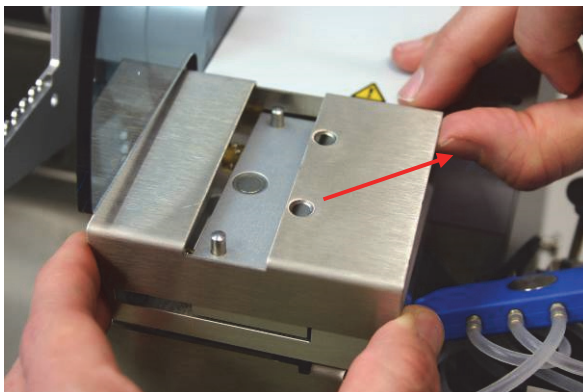
For optimizing the filling head position, please proceed as follows:




- Remove the filling head.

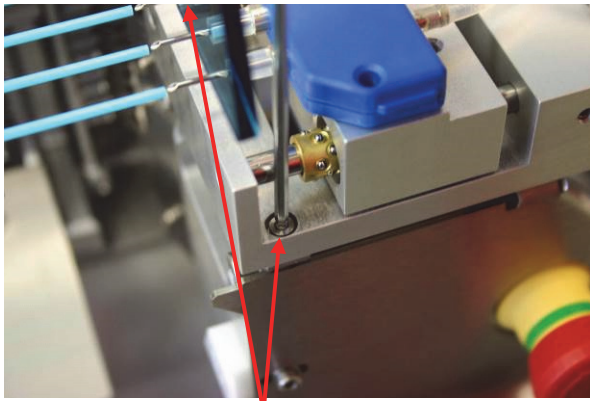


- Loosen both screws next to the filling head holder with the suitable screwdriver.

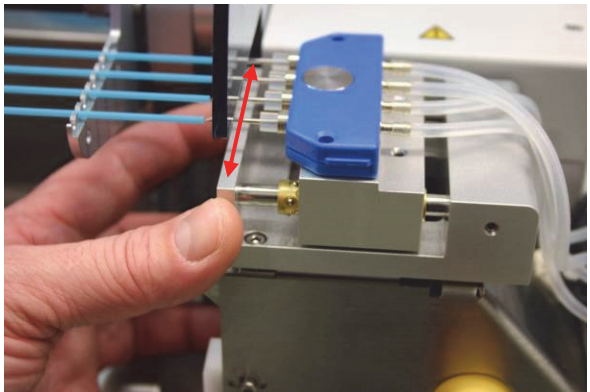


- Remove the cover.

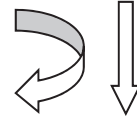
	<ul style="list-style-type: none"> ➤ Reinsert the filling head.
 <p>Eccentric</p>	<ul style="list-style-type: none"> ➤ Turn the eccentric manually. ➤ Observe the filling head. <ul style="list-style-type: none"> • The filling head moves forward and backward. ➤ Turn the eccentric until the nozzle point is positioned right in front of the straw. ➤ Now observe the position of the nozzles to the straws again. ➤ Make the necessary adjustments as described below. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <p>注入位置でストローに触れないようにしてください。</p> </div>
 <p>Screws</p>	<ul style="list-style-type: none"> ➤ Untighten the two screws on the front side underneath the filling head holder with a suitable Allen key. ➤ Do not loosen the screws completely.



Allen head screws



- Make the adjustments with the two Allen head screws, which can be accessed from the top.
- Turning clockwise → Position filling head moves down.



- Turning counter clockwise → Position filling head moves up.



- Change the vertical position by shifting the slide. Only small adjustments can be made here. (< 1 mm)

- Tighten the screws on the front side again.
- Hold the slide while fixing the screws, in order to avoid unintended changing of the settings.
- Check the adjustments.
- Remove the filling head.
- Reinsert the covers.
- Reinsert the filling head.

- Proceed in the same way on the suction side.

- Reinsert the cover.
- Close the safety door.

12.1.3. Straw filling with bubbles



Note that Minitube straws are produced with low tolerances. This applies to the length and diameter of the straws as well as their cutting edges. Using straws from other manufacturers can lead to increased bubble formation. Use Minitube straws to prevent this problem.

<p>Error description: There are bubbles in the straws.</p>	
<ul style="list-style-type: none"> ➤ Check the washers on the filling side (refer to chapter 8.4.1. “Selection and insertion of the suction and filling heads”). 	
<p>In rare cases dirt inside the mechanics of the filling head might be the reason for the malfunctioning.</p>	
<ul style="list-style-type: none"> ➤ Remove the filling head from the holder. ➤ Check if the nozzles can be moved against a slight spring pressure. The nozzles must be movable and must return to their basic position automatically. 	
<p>The nozzles are movable and return to their basic position:</p> <ul style="list-style-type: none"> ➤ Reinsert the nozzle head into the holder. 	<p>The nozzles are not movable or they do not return to their basic position:</p> <ul style="list-style-type: none"> ➤ Clean the nozzle head (refer to chapter 11.4. “Cleaning works as required”).
<ul style="list-style-type: none"> ➤ If the error occurs again, please contact Minitube International. 	



12.1.4. Severe straw bending during the filling process

<p>Error description: Straws get bent too much during the filling process.</p>	
<ul style="list-style-type: none"> ➤ Check the washers on the suction side (refer to chapter 8.4.1. “Selection and insertion of the suction and filling heads”). 	
<p>In rare cases dirt inside the mechanics of the suction head might be the reason for the malfunctioning.</p>	
<ul style="list-style-type: none"> ➤ Remove the suction head from the holder. ➤ Check if the nozzles can be moved against a slight spring pressure. The nozzles must be movable and must return to their basic position automatically. 	
<p>The nozzles are movable and return to their basic position:</p> <ul style="list-style-type: none"> ➤ Reinsert the nozzle head into the holder. 	<p>The nozzles are not movable or they do not return to their basic position:</p> <ul style="list-style-type: none"> ➤ Clean the nozzle head (refer to chapter 11.4. “Cleaning works as required”).
<ul style="list-style-type: none"> ➤ If the error occurs again, please contact Minitube International. 	

12.1.5. Straw blockage

<p>Error description: Straws are not transported in the area of the hopper or the supply wheels or they are jammed.</p>	<p>Trouble shooting: Solve the problem of the straw blockage. Check the following possibilities:</p>
<ul style="list-style-type: none"> • The machine was not or was only partly adjusted to the straw size to be processed (refer to chapter 10.5. “Changing the straw size”). • The straws are defective (defective form or wrong size). • The straw brush does not rotate. Remove the hopper and check if the brush is blocked. For further trouble shooting, please contact Minitube. 	

12.1.6. The vacuum set value cannot be adjusted

<p>Error description: The vacuum value cannot be adjusted on the controller. The parameters P1 and H1 are not indicated on the vacuum controller even after activating the „MODE“ key.</p> <p>or</p> <p>The vacuum controller indicates an error message</p>	<p>Trouble shooting: The vacuum controller is not configured correctly. Configure the controller.</p>												
<ul style="list-style-type: none"> ➤ Activate the „MODE“ key for 3 seconds. ➤ Adjust the display with the keys „▲“ and „▼“ : ➤ Then only activate the „MODE“ key shortly in order to proceed to the next parameter. ➤ Adjust the following values with the keys „▲“ and „▼“. <div style="text-align: right; margin-bottom: 10px;">  </div> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 12.5%;">Pa</td> <td style="width: 12.5%;">F-2</td> <td style="width: 12.5%;">Std</td> <td style="width: 12.5%;">Noo</td> <td style="width: 12.5%;">In</td> <td style="width: 12.5%;">5</td> <td style="width: 12.5%;">rGr</td> <td style="width: 12.5%;">nor</td> </tr> </table> <ul style="list-style-type: none"> ➤ Adjust the following values for the parameters P and H. <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25%;">P1 = -25.0</td> <td style="width: 25%;">H1 = 1.0</td> <td style="width: 25%;">P2 = -45.0</td> <td style="width: 25%;">H2 = 1.0</td> </tr> </table> <ul style="list-style-type: none"> ➤ It necessary, optimize the value P1 for an optimum moisture penetration of the plugs. <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <div style="display: flex; align-items: center;">  <div> <p>Note that the specified values for production were determined with Minitube straws. If straws from other manufacturers are used, the values may have to be adjusted individually, if necessary. Use Minitube straws to prevent this problem.</p> </div> </div> </div> <ul style="list-style-type: none"> ➤ Do not change H1 ! Changes in the hysteresis value can impair the moisture penetration of the plugs. ➤ The values for P2 and H2 are not relevant for the moisture penetration of the plugs and must be set according to the above information. 		Pa	F-2	Std	Noo	In	5	rGr	nor	P1 = -25.0	H1 = 1.0	P2 = -45.0	H2 = 1.0
Pa	F-2	Std	Noo	In	5	rGr	nor						
P1 = -25.0	H1 = 1.0	P2 = -45.0	H2 = 1.0										

12.1.7. Ultrasonic sealing is defective / brittle / untight (replacing the compact sealing unit)



For the ultrasonic sealing test, proceed as described in chapter 9.2 “Sealing test”.



If necessary, contact a Minitube International service technician.



Works on the compact sealing unit may only be carried out after consultation with a Minitube service technician.

<p>Error description: Straws are not tightly sealed.</p>	<p>Trouble shooting: Check the sealing gap and the sealing parameters for the ultrasonic sealing.</p>
<p>Basic principle: The machine is equipped with an ultrasonic sealing unit. As soon as the straws are to be sealed, they are clamped between the so called sonotrode and the anvil. By means of the controller and the ultrasonic generator an ultrasonic vibration of 40kHz with an amplitude of approx. 17µm is triggered. Due to the pressure and the vibration, the plastic particles in the straw are rubbed against each other and the material heats up. After a defined period of time, the vibration is switched off and the heat in the sealing area immediately merges into the metal of the anvil and the sonotrode. The plastic cools down and the sealing is completed. The lateral chamber limitation influences the shape of the sealing.</p> <p>If there is not enough heat capacity applied to the plastic, the sealing gap must be reduced or the vibration amplitude must be increased. A reason might be abrasion of the metal surfaces or the use of a different sort of plastic which requires higher melting temperatures.</p>	

An indicator for insufficient heat (amplitude) or a too large sealing gap is:

- Liquid leaks from the middle of the sealed tip of the straw, when a slight pressure is applied from behind.

Indicators for a too small sealing gap or a too large amplitude are:

- Liquid leaks from the base of the sealing
- The welded tip can very easily be bent (like a plastic foil)
- The welded tip easily breaks when frozen



**While working with ultrasound, risk of skin burns on contact with the sonotrode.
Do not touch the sealing unit when the ultrasound is switched on !**

The following reasons are possible:

- **Sealing amplitude or sealing time** must be changed. These operational steps must only be carried out according to the advice of a Minitube service technician. Proceed as described in chapter 10.2.2. “Adjustment of the sealing parameters (amplitude and time)”.



**We recommend to change sealing amplitude and sealing time only within narrow limits. If you want to change the amplitude by more than $\pm 5\%$ or the sealing time by more than ± 0.01 , contact Minitube International.
Note the original values before the change to restore the last operating status, if neither sealing amplitude nor sealing time are the cause of the problem.**

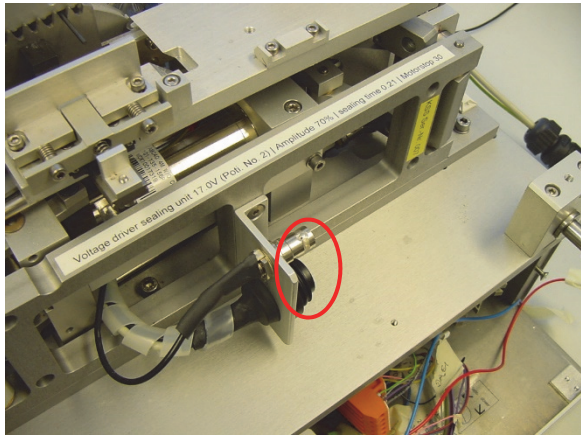
- The **compact sealing unit** is defective and must be replaced.



We recommend cleaning the compact sealing unit without removing before replacing it. Proceed as described in chapter 11.2.4 and 11.3.1..

Dismantling the compact sealing unit

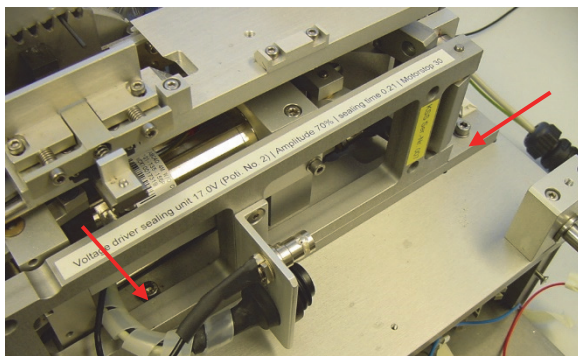
- Switch off the machine.
- Remove the right cover.



- Remove the two cables from the compact sealing unit.

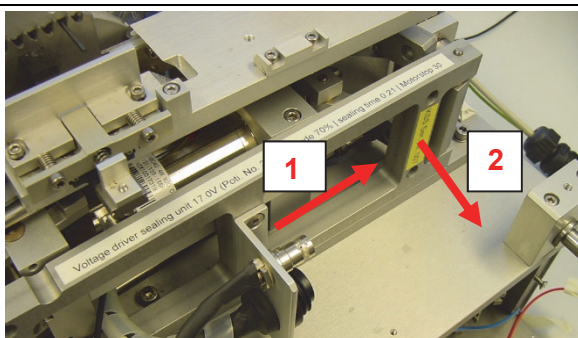
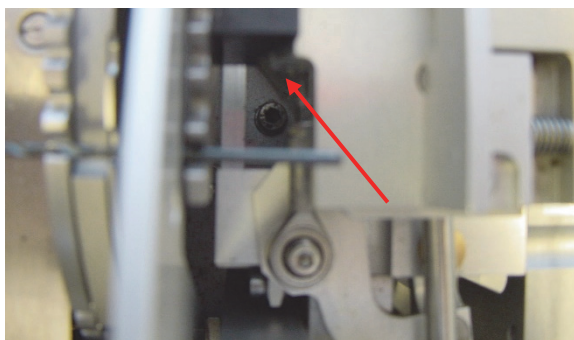


Each compact sealing unit has got specific adjustment values.
These values are only valid for this compact sealing unit.
These specific values are indicated on a label in each machine.



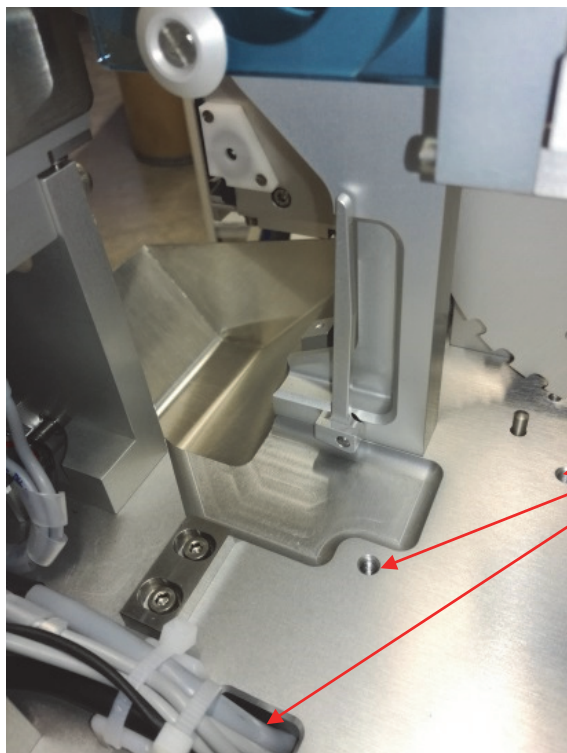
- Loosen the three marked screws with the corresponding Allen key.

View from above



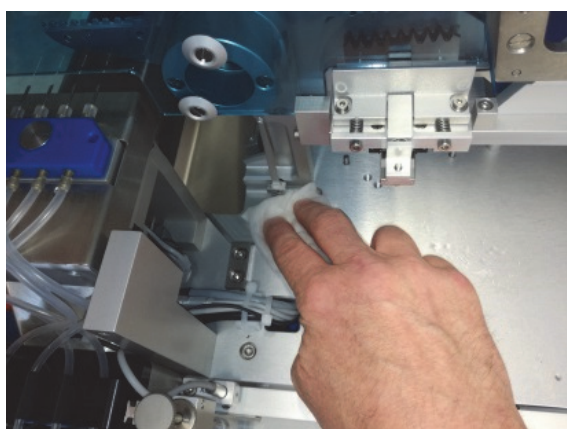
- Push the compact sealing unit first backwards (1) and then to the right (2) to remove it.

Cleaning of the MPPクワトロ (compact sealing unit area)



Cleaning the area of the compact sealing unit in the MPP Quattro

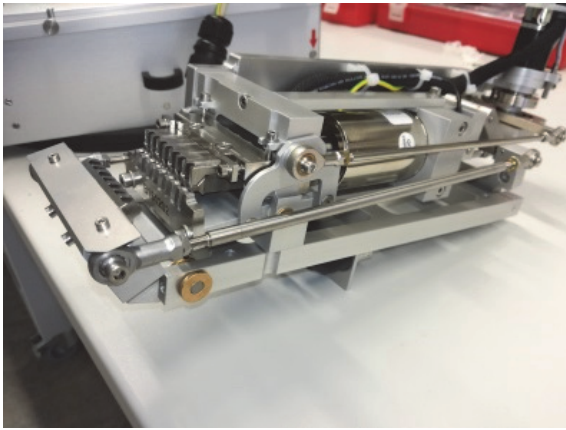
- Clean the area, where the compact sealing unit was mounted with a toothbrush or pipe cleaner and a lint-free cloth. Wet the brush or cloth with lukewarm water and a little dishwashing liquid.
- Make sure that no liquid remains in the mounting holes.



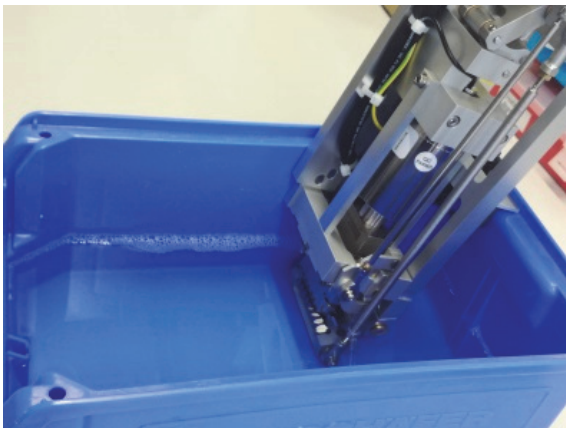
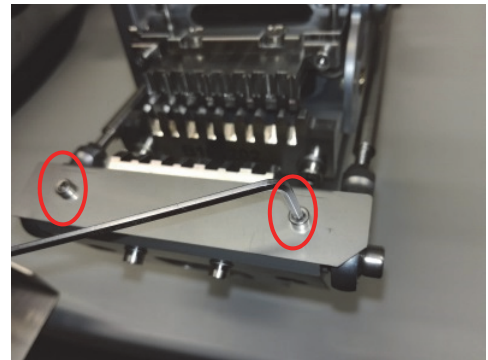
- Dry the area carefully with a dry cloth.

Cleaning the dismantled compact sealing unit

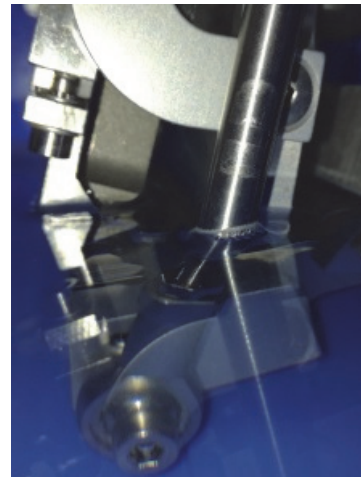
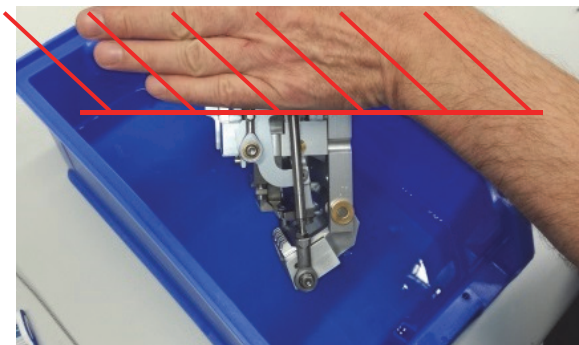
- Prepare a suitable container with lukewarm water and some dishwashing liquid.



- Place the compact sealing unit on a level, clean surface.
- Loosen the two grub screws of the sonotrode cover with a suitable tool and remove it.



- Immerse the sonotrode of the compact sealing unit in the prepared container with water and dishwashing liquid.

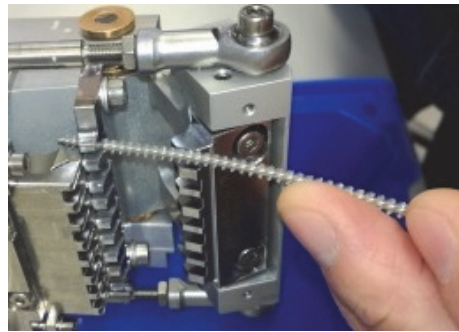
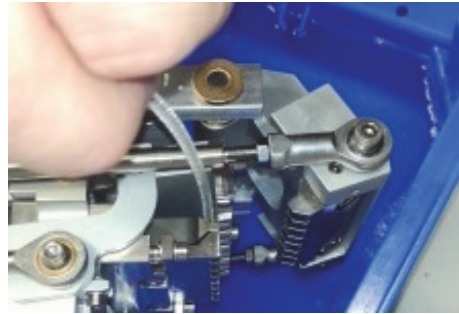


Never immerse the compact sealing unit completely. Refer to the adjacent illustration. Immerse only to the indicated line.

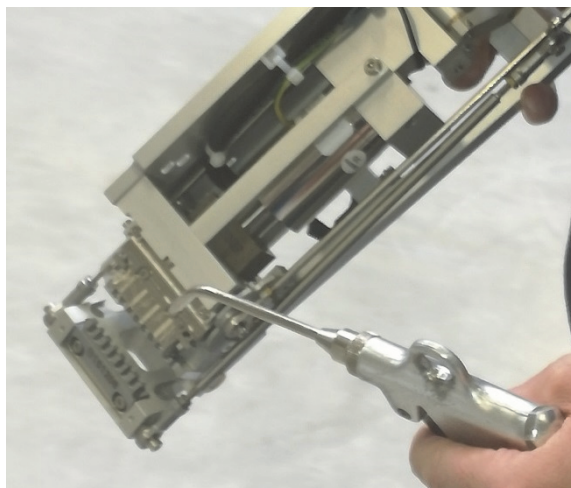
minitube

- Soak the compact sealing unit in the dishwashing solution for approx. 1 hour (may be longer in case of persistent soiling).

- Clean the sealing area with the tool shown below.
- Always make sure to keep the sealing area lower than the rest of the compact sealing unit so that no water can penetrate.



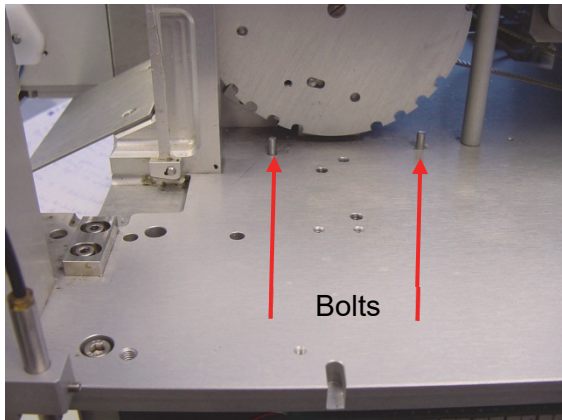
- Clean the gap between sonotrode and counter bracket **very carefully** with the sealing gap gauge from the tool kit.



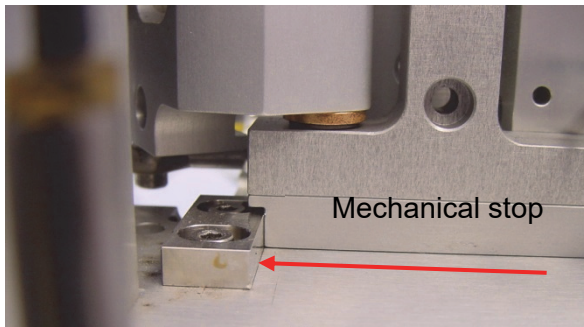
- Dry the compact sealing unit carefully.
- It is the best to use oil-free compressed air.
- Alternatively, you can also use dust-free air from the can (available in the laboratory supplies).

- Mount the cover of the compact sealing unit.

Assembly of the new or cleaned compact sealing unit



- Push the compact sealing unit onto both bolts.



- Push the compact sealing unit to the front mechanical stop.

- Fix the compact sealing unit with the three screws.
- Connect the two cables again.
- Switch the machine on again.

12.1.8. Replacing the fuses

A blown fuse is a reason for the non-functioning of a group of components. Keep in mind that the blowing of a fuse might have an individual reason or a fuse might blow due to temporary reasons. In this case it is sufficient to replace the fuse. If the fuse blows again, after having been replaced, it is necessary to find out the reason. For checking and replacing the fuses an intervention of the power pack is sometimes necessary. This can only be performed by an electrical technician.



Disconnect prior to opening the casing !

There are several points with electrical fuses on the control unit:

- Switch off the machine and unplug.
- Make sure that your body is not loaded electro statically (first touch any metal part of the casing).

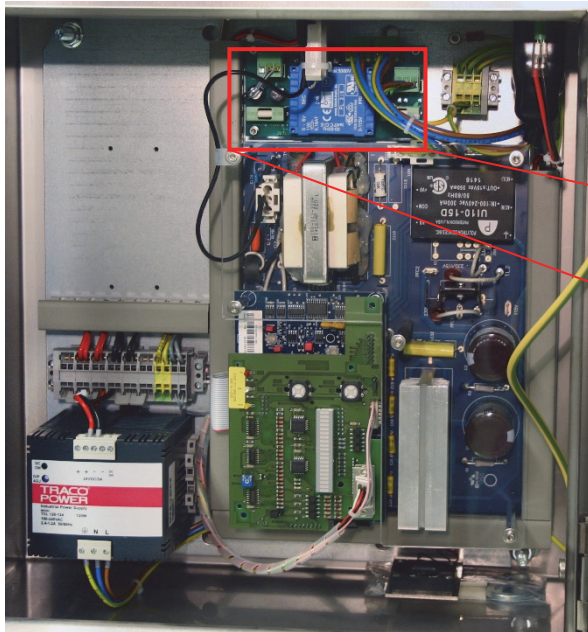


The main fuses are located in the mains plug.

- Use the small slotted screwdriver for the replacement. You can remove the fuse holder by releasing the latch.
- Fuse type: 2 pieces micro fuses 5x20 mm, slow-blow 4 A
- Replace both fuses, as in most cases both fuses are defective.



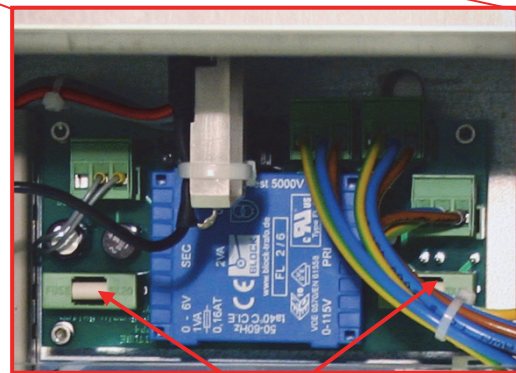
- Open the control unit.



Micro fuses on the stand-by circuit board.

Fuse type: 2 pieces micro fuses 5 x 20mm, slow-blowing 0.16 A

- Remove the fuses from the fuse holder upwards.



Micro fuses

12.2. Error messages without confirming

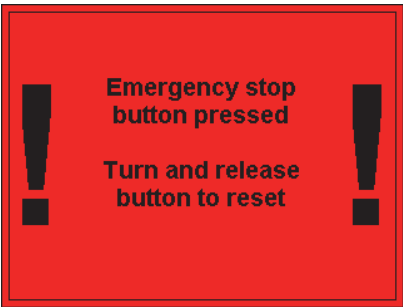


Error messages of the MPP Quattro are indicated on the screen. Proceed as described below.

12.2.1. Emergency stop button activated


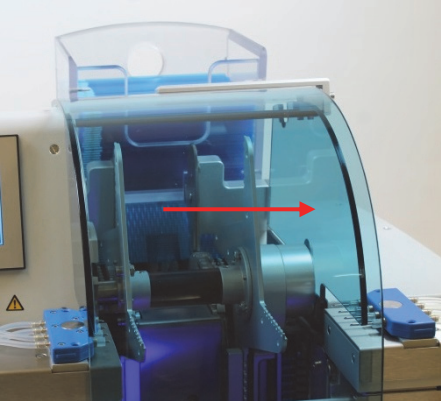
Basic principle:

The emergency stop button is a protection for emergencies. Pressing this button, the device immediately comes to a complete stop. All actuators in the device are switched off. During normal operation, switch off the machine with the green switch „I - O“.

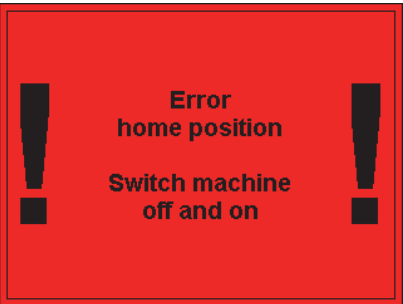

When the Emergency stop button was activated, this is immediately indicated on the screen, as soon as the machine is switched on.

	
<ul style="list-style-type: none"> ➤ Eliminate all circumstances that made the activation of the emergency stop button necessary. 	
	<ul style="list-style-type: none"> ➤ Release the activated emergency stop button, by turning the red knob clockwise for approx. 30°. This is indicated with arrows on the knob.
	<ul style="list-style-type: none"> ➤ Switch off the machine and then on again.

12.2.2. Error safety door open

	
	<ul style="list-style-type: none">➤ Close the safety door.

12.2.3. Error positioning

	
	<ul style="list-style-type: none">➤ Switch off the machine and then on again.

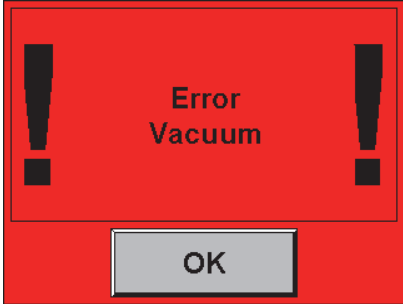
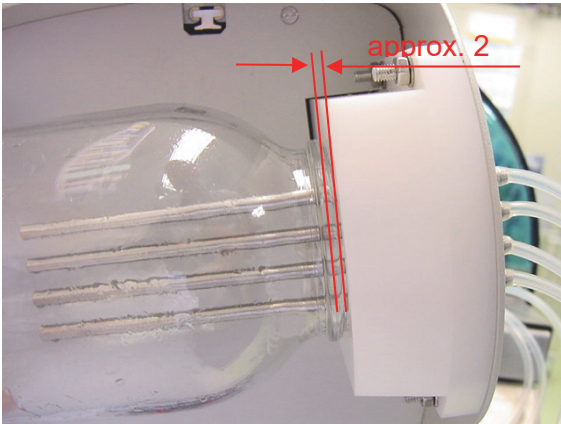
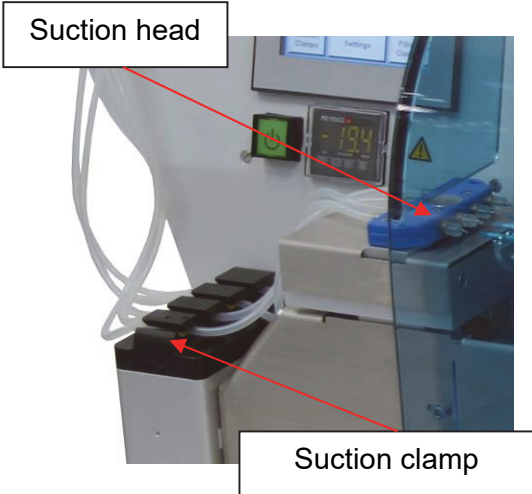
12.3. Error messages and confirming

- Error messages of the MPP Quattro are indicated on the screen. Proceed as described below. When the problem for the error message is solved, confirm with **OK**.

12.3.1. Error vacuum

Basic principle:

In case that either in the tubing or in the vacuum bottle a leakage occurs during the pressure build up, the pump automatically switches off 約20秒後. The following error message is indicated on the screen:

	
	<ul style="list-style-type: none"> ➤ Check if the position of the vacuum bottle is correct (refer to chapter 8.4.4. "Checking the vacuum bottle"). ➤ Make sure that the bottle is securely screwed up to the seal. <ul style="list-style-type: none"> • The gap between the collar on the bottle and the plastic part is 約2mm. • Tightness is given when, while building up the vacuum, the pump switches off after 3 – 5 pump noises and the vacuum value remains stable. ➤ If necessary, check the edge of the vacuum bottle and the O-ring for damage and dirt.
	<ul style="list-style-type: none"> ➤ Check the tubings on the suction side (refer to chapter 8.4.1. "Selection and insertion of the suction and filling heads"). • Watch out for tubings that are not completely inserted or loose.

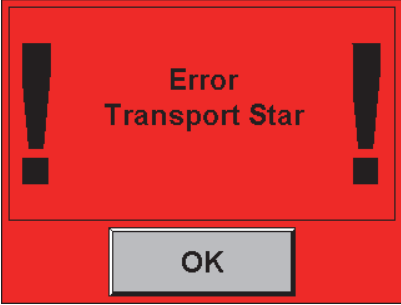
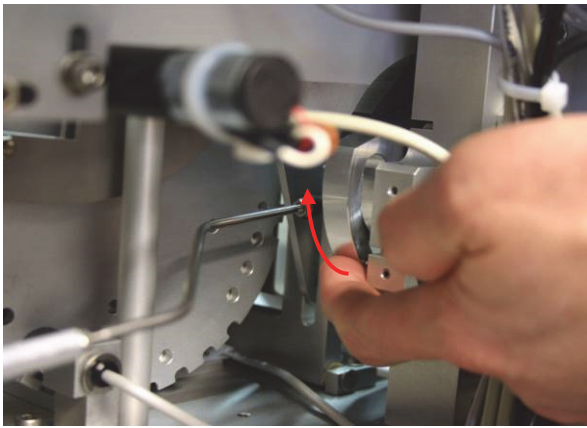
12.3.2. Error transport star

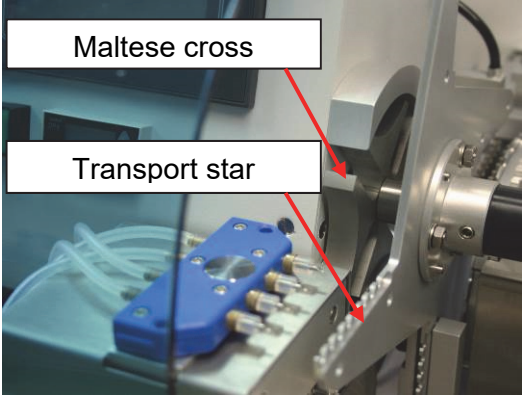
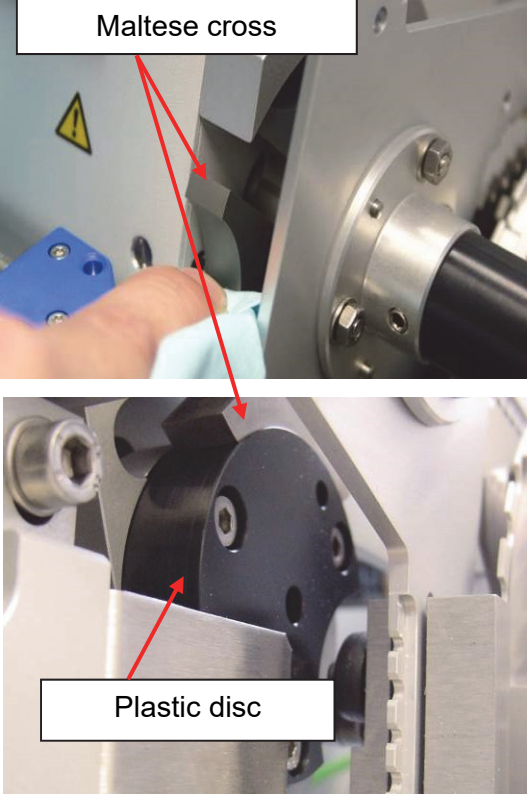
Basic principle:

The following screens indicate error messages of the transport star:

The following reasons are possible:

- Transport star does not move
- Transport star moves too slowly
- Transport star does not reach the final position

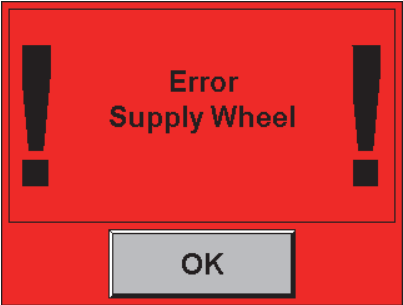
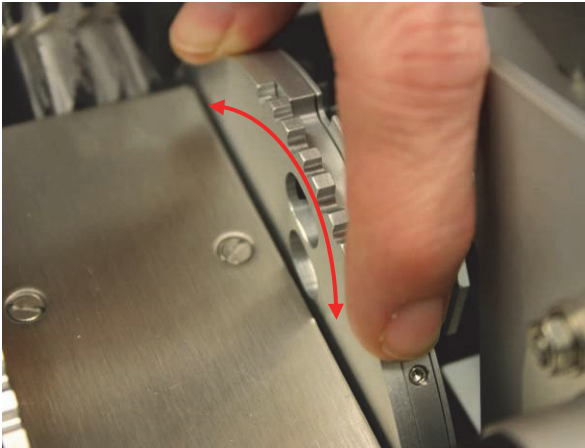
	
<ul style="list-style-type: none"> ➤ Switch off the machine. 	
<ul style="list-style-type: none"> ➤ Open the safety door. 	
<ul style="list-style-type: none"> ➤ Remove the left side panel. 	
	<ul style="list-style-type: none"> ➤ Check if the Maltese drive can freely be moved manually. ➤ If it can be moved freely, proceed as described below under point 1. ➤ In case of hard movement, please proceed as described under point 2.
<p>1.</p>	<ul style="list-style-type: none"> ➤ Switch on the machine. ➤ Select the output Y7 in the test mode (<i>I/O - Menu</i>) and check the control and the connection to the PLC (refer to chapter 12.4.1. "Test mode"). ➤ For further steps, please contact Minitube International. <p><i>*[PLC= Programmable logic control]</i></p>

<p>2.</p>	 <p>Maltese cross</p> <p>Transport star</p>	<ul style="list-style-type: none"> ➤ Check the transport star and the Maltese cross for blockages. • Especially make sure that there are no straws blocking the machine. ➤ If necessary, remove blockages.
	 <p>Maltese cross</p> <p>Plastic disc</p>	<ul style="list-style-type: none"> ➤ Check the mechanic of the Maltese drive for soiling. ➤ Clean the perimeter of the black plastic disc and the round surfaces of the Maltese cross with a soft, lint-free cloth and some ethyl alcohol.

12.3.3. Error supply wheel

The following reasons are possible:

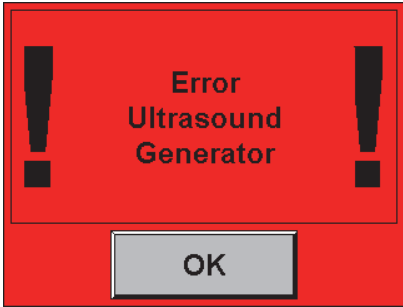
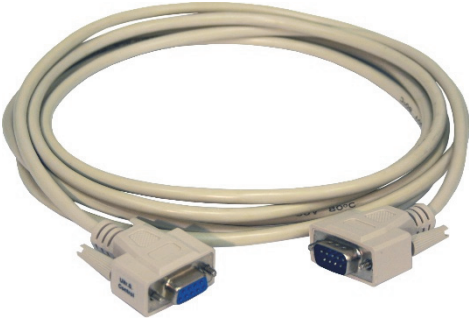
- Supply wheel does not move
- Supply wheel moves too slowly
- Supply wheel does not reach the final position

	
<ul style="list-style-type: none"> ➤ Switch off the machine. 	
	<ul style="list-style-type: none"> ➤ Check if the supply wheel can easily be moved manually. ➤ If it can be moved freely, proceed as described below under point 1. ➤ In case of hard movement, please proceed as described under point 2.
<p>1.</p>	<ul style="list-style-type: none"> ➤ Switch on the machine. ➤ Select the output Y3 in the test mode (<i>I/O - Menu</i>) and check the control and the connection to the PLC* (refer to chapter 12.4.1. "Test mode"). ➤ For further steps, please contact Minitube International. <p><i>*[PLC= Programmable logic control]</i></p>
<p>2.</p>	<ul style="list-style-type: none"> ➤ Check the supply wheel for blockages. Especially make sure that there are no straws blocking the machine. ➤ If necessary, remove blockages.
	<ul style="list-style-type: none"> ➤ Check the mechanic of the supply wheel for soiling.

12.3.4. Error ultrasonic generator

Possible errors:

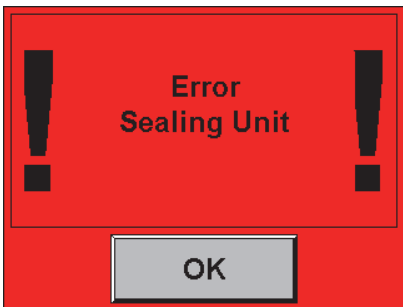
- No status message
- Cable connection is interrupted
- Ultrasonic generator is not ready for operation or defective.

	
	<ul style="list-style-type: none"> ➤ Check the data cable between control unit and MPP Quattro (refer to chapter 6.4.2. "Installation (electrical)").
<ul style="list-style-type: none"> ➤ Check the inputs X20 and X21 in the test mode (<i>I/O - Menu</i>) (refer to chapter 12.4.1. "Test mode"). ➤ For further steps, please contact Minitube International. 	

12.3.5. Error sealing unit

The following reasons are possible:

- Motor does not move
- Mechanic is blocked
- Mechanic can hardly be moved

	
<ul style="list-style-type: none"> ➤ Please contact Minitube International. 	

12.3.6. Error lifter

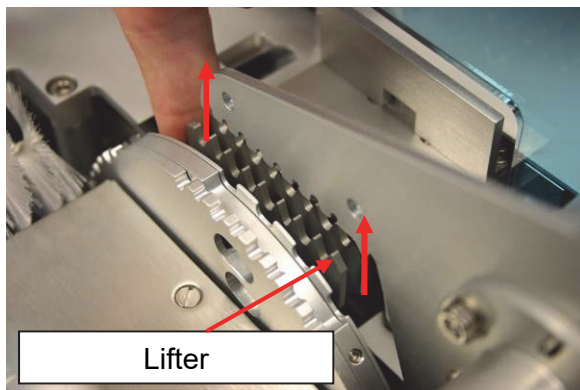
The following reasons are possible:

- Lifter does not move
- Lifter moves too slowly
- Lifter does not reach the final position



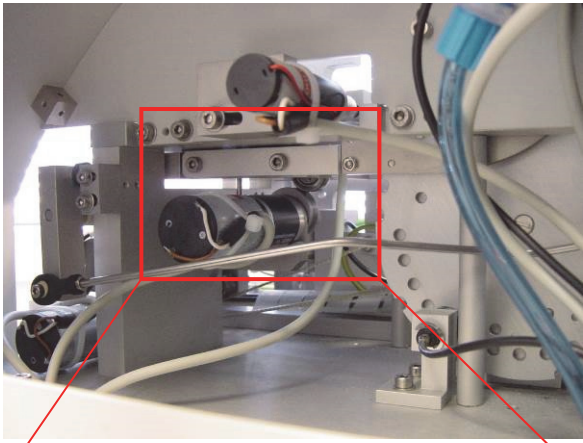
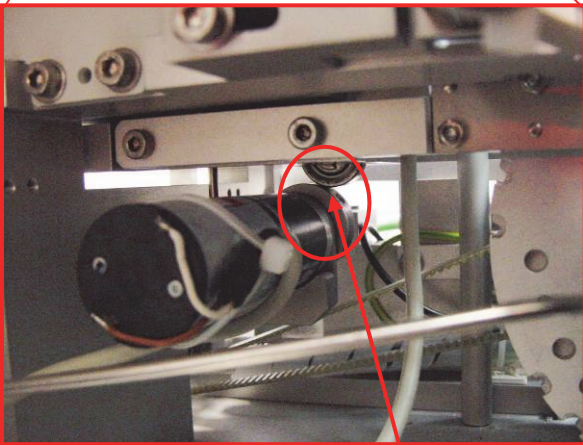
➤ Switch off the machine.

➤ Open the safety door.



- Check if the lifter can freely be moved manually.
- Remove the hopper.
- Check if you can lift the lifter.

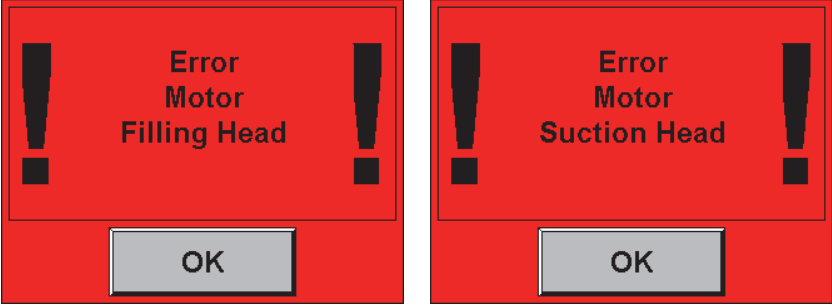
➤ Remove the left side panel.

	<ul style="list-style-type: none"> ➤ Manually activate the lifter by means of the eccentric. ➤ If it can be moved freely, proceed as described below under point 1. ➤ In case of hard movement, please proceed as described under point 2.
 <p style="text-align: center; border: 1px solid black; display: inline-block; padding: 2px;">Eccentric</p>	
<p>1.</p>	<ul style="list-style-type: none"> ➤ Switch on the machine. ➤ Select the output Y6 in the test mode (<i>I/O - Menu</i>) and check the control and the connection to the PLC* (refer to chapter 12.4.1. "Test mode"). ➤ For further steps, please contact Minitube International. <p><i>*[PLC= Programmable logic control]</i></p>
<p>2.</p>	<ul style="list-style-type: none"> ➤ Check the lifter for blockages. ➤ Especially make sure that no "lost" straws block the machine. ➤ If necessary, remove blockages.

12.3.7. Error motor filling and suction head

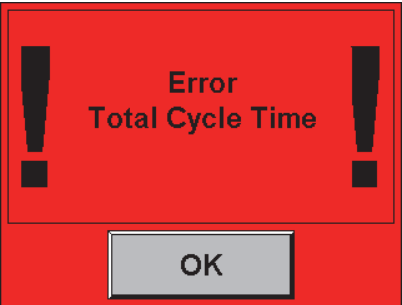
The following reasons are possible:

- Filling or suction head does not move
- Filling or suction head moves too slowly
- Filling or suction head does not reach the final position


<p>➤ Switch off the machine.</p>
<p>➤ Open the safety door.</p>
<p>➤ Check the filling or suction heads for blockages. Especially make sure that there are no straws blocking the machine.</p> <p>➤ If necessary, remove blockages.</p>
<p>➤ Switch on the machine.</p> <p>➤ Select the output Y0 and Y1 in the test mode (<i>I/O - Menu</i>) and check the control and the connection to the PLC* (refer to chapter 12.4.1. "Test mode").</p> <p>➤ For further steps, please contact Minitube International.</p>
<p><i>*[PLC= Programmable logic control]</i></p>

12.3.8. Error cycle time

After adjustment works or trouble shooting undefined statuses of the machine might occur. The following error message is indicated on the screen.


<p>➤ Switch off the MPP Quattro and then on again.</p>

12.4. Instructions for Service Technicians



The following chapter provides assistance for the user, after or while he is in contact with a Minitube technician.

Never carry out any modifications, settings or tests as described below on your own, without contacting a Minitube service technician.

12.4.1. Test Mode

In the test mode (*I/O - Menu*) you can control and test individual components and motor drives of the machine.



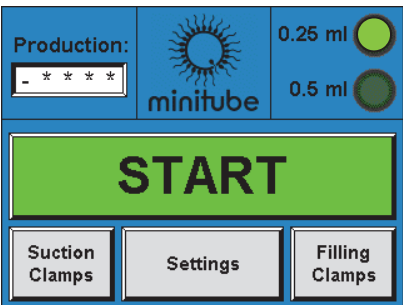
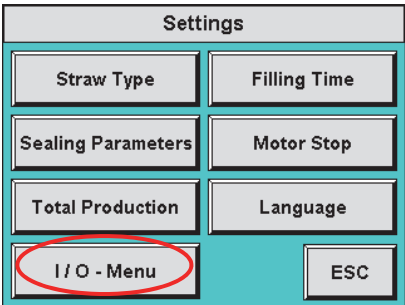
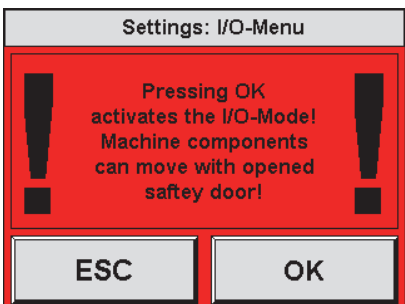
For this operation the safety switches and the safety programming is disabled !

Make sure that during the functional test of individual groups of components, other components do not get damaged (risk of collision !). Watch the parts of your body operating in the range of movement of the components ! (Risk of injury !)

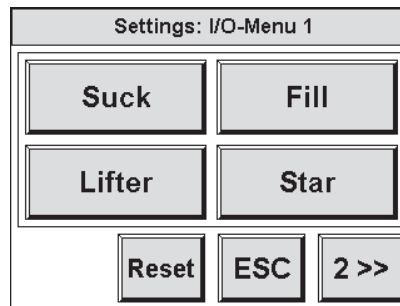
Take care of people present who are not familiar with the machine ! During operation, never put your hands into areas of the machine where motion takes place. (Risk of injury ! Crushing hazard !)



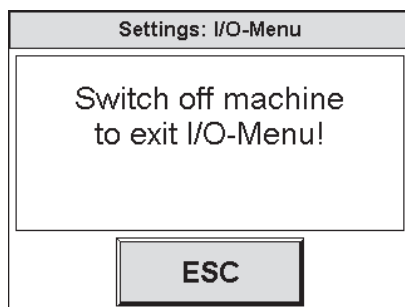
Note: For further normal operation switch off the machine once and then on again.

	<ul style="list-style-type: none"> ➤ Activate Settings in the start screen.
	<ul style="list-style-type: none"> ➤ Activate I/O-Menu.
	<ul style="list-style-type: none"> ➤ Confirm the safety instructions with OK. Afterwards the I/O-Menu opens up. With ESC you return to the menu Settings. ○ Outputs: Screen Settings: I/O-Menu 1-4 ○ Inputs Screen Settings: I/O-Menu 5-7

Screen **Settings : I/O-Menu 1**



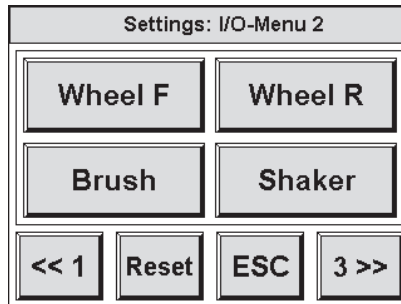
- **Suck:**
Motor suction nozzle (Y1)
Starts the motor for the suction nozzle drive and the machine stops automatically in the foremost and rearmost position (for controlling the two sensors and the motor speed).
- **Fill:**
Motor filling nozzle (Y0)
Same as suck, only for the filling side.
- **Lifter:**
Motor lifter (Y6)
Starts the lifter to transfer the straws into the transport star.
- **Star:**
Maltese drive transport star (Y7)
Starts the transport star for a quarter rotation.
- **ESC:** Leave I/O-Menu.



- Confirm the notice with **ESC** and switch off the machine.

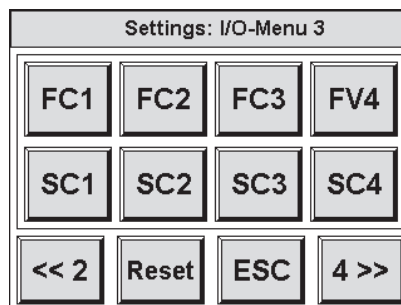
- **Reset:** Stops all motors.
- **2 >>:** Change to the next I/O-screen.

Screen Settings : I/O-Menu 2



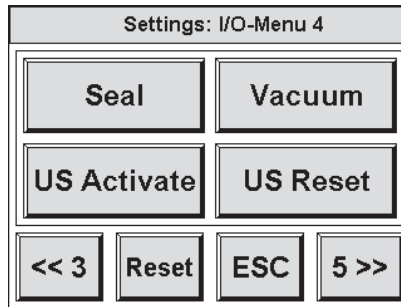
- **Wheel F:**
Motor Supply wheel (Y3)
Starts the supply wheel forward.
- **Wheel R:**
Motor supply wheel backwards (Y4)
- **Brush:**
Brush straw transfer (Y22)
Starts the brush on the hopper.
- **Shaker:**
Motor Shaker hopper (Y5)
Starts the shaker motor for the hopper (upper movement).
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **Reset:** Stops all motors.
- **<< 1:** Change to the previous I/O-screen.
- **3 >>:** Change to the next I/O-screen.

Screen Settings : I/O-Menu 3



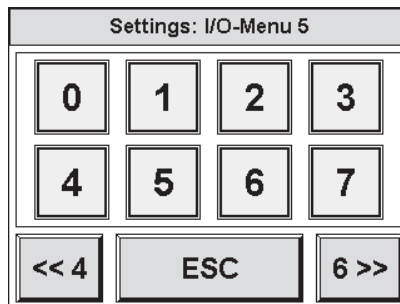
- **FC1 - 4:**
Filling clamp 1-4 (front – rear) (Y8-YB)
Activates the filling clamps 1 to 4.
- **SC1- 4:**
Suction clamp 1-4 (front – rear) (YC-YF)
Activates the suction clamps 1 to 4.
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **Reset:** All valves are open.
- **<< 2:** Change to the previous I/O-screen.
- **4 >>:** Change to the next I/O-screen.

Screen Settings : I/O-Menu 4



- **Seal:**
Motor Sealing unit (Y2)
Starts the sealing drive and makes a complete movement/ rotation.
- **Vacuum:**
Vacuum pump (Y23)
Starts the vacuum pump.
- **US Activate:**
Ultrasound start (Y20)
Starts US-generator.
- **US Reset:**
Ultrasound Reset (Y21)
Resets US-generator.
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **Reset:** Stops all motors.
- **<< 3:** Change to the previous I/O-screen.
- **5 >>:** Change to the next I/O-screen.

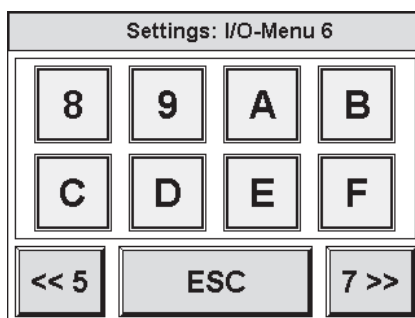
Screen Settings: I/O-Menu 5



The switching status of the sensors X0-X7 is indicated.

- **0:** Motor filling nozzle closed (X0)
- **1:** Motor filling nozzle open (X1)
- **2:** Motor suction nozzle closed (X2)
- **3:** Motor suction nozzle open (X3)
- **4:** Lifter basic position (X4)
- **5:** Start sealing (X5)
- **6:** Maltese star turning end (X6)
- **7:** Supply wheel basic position (X7)
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **<< 4:** Change to the previous I/O-screen.
- **6 >>:** Change to the next I/O-screen.

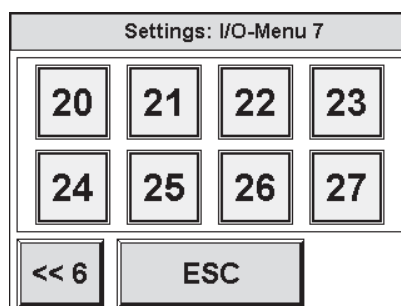
Screen Settings : I/O-Menu 6



The switching status of the sensors X8-XF is indicated.

- **8:** Cycle supply wheel (X8)
- **9:** Straw recognition (X9)
- **A:** Maltese star basic position (XA)
- **B:** Emergency Off (XB)
- **C:** Safety door open (XC)
- **D:** Vacuum sensor (XD)
- **E:** Sealing unit basic position (XE)
- **F:** Bubble control (XF)
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **<< 5:** Change to the previous I/O-screen.
- **7 >>:** Change to the next I/O-screen.

Screen Settings : I/O-Menu 7



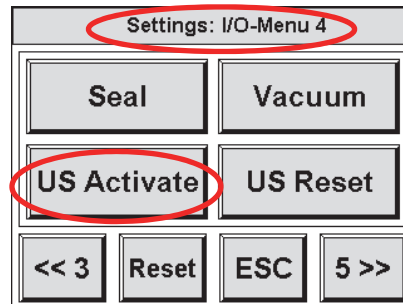
The switching status of the sensors X20-X27 is indicated.

- **20:** Ultrasonic generator overload (X20)
- **21:** Ultrasonic generator ready (X21)
- **22:** CombiSystem start (X22)
- **23:** CombiSystem stop (X23)
- **24:** not used
- **25:** Filling quantity semen vessel low (X25)
- **the following not used**
- **ESC:** Leave I/O-Menu – confirm the safety instructions and switch off the machine.
- **<< 6:** Change to the previous I/O-screen.

12.4.2. Functional test ultrasonic sealing

For the general functional test of the ultrasonic sealing proceed as described below.

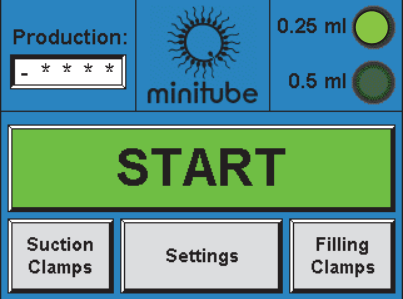
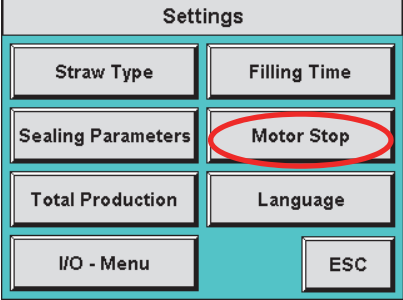
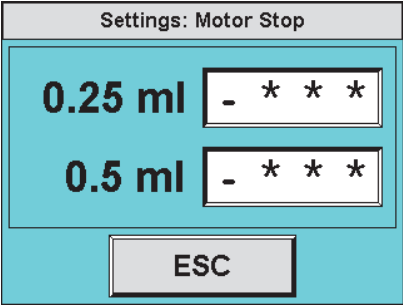
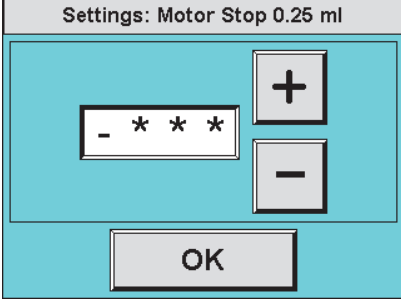
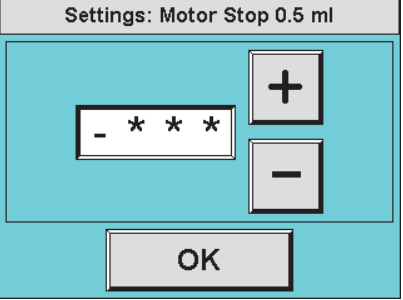
- Open the safety door.
- Remove the cover sheet.
- Activate **Settings** in the start screen.
- Activate *Settings I/O-Menu* on the screen.
- Select the screen *Settings I/O-Menu 4* in the I/O-Menu.
- The following screen is indicated:



- Press a straw tip onto the sonotrode.
- Activate **US Activate**.
- For the duration of the activation, the ultrasonic sealing is triggered. If the button is no longer activated, the ultrasonic sealing is finished.
- When the ultrasound is on, the tip of the straw must slightly melt.

12.4.3. Adjustment of the movement profile sealing drive (Motor stop)

In the test mode the machine provides the possibility to change the movement profile of the sealing drive. This parameter can be adjusted depending on the straw size. Change this parameter **only after consultation with a Minitube service technician**.

	<ul style="list-style-type: none"> ➤ Activate Settings in the start screen.
	<ul style="list-style-type: none"> ➤ Activate Motor stop.
	<ul style="list-style-type: none"> • The screen on the left with the actual filling times on the display is indicated. ➤ Activate the display of the actual straw size. • The settings for the motor stop are set ex works individually for each device. The values are indicated on each compact sealing unit (refer to chapter 12.1.7. „Ultrasonic sealing...“).
	 <ul style="list-style-type: none"> ➤ Increase or reduce the sealing time with + or with -. ➤ Confirm the entry with OK.

13. EC-Declaration of Conformity

Minitüb GmbH
by Minitube International AG
Hauptstrasse 41
84184 Tiefenbach, Germany
minitube@minitube.de
www.minitube.com



EC-Declaration of Conformity

In compliance with the requirements of the EC Directives

Machinery 2006/42/EC of 17 May 2006 (Official Journal L 157 of 9.6.2006)

Low Voltage 2014/35/EC of 26 February 2014 (Official Journal L 96 of 29.03.2014)

EMC 2014/30/EC of 26 February 2014 (Official Journal L 96 of 29.03.2014)

Hereby we declare that the following described machine

Manufacturer:	Minitüb GmbH
Machine name:	MPP Quattro
Machine type:	Filling and sealing machine
Ref.:	13018/0000

in the delivered version complies with the above mentioned directives.

The following harmonised standards were applied:

Machinery directive: EN ISO 12100:2010 (Off. Journal C 110 of 08.04.2011)
Low voltage directive: EN 60204-1:2006 + AC:2010 (Off. Journal C 126 of 08.04.2016)
EMC-directive: EN 61000-3-2:2014 (Off. Journal C 173 of 13.05.2016)
EN 61000-3-3:2013 (Off. Journal C 173 of 13.05.2016)
EN 61326-1:2013 (Off. Journal C 173 of 13.05.2016)

The validity of this EC declaration of conformity expires, if the unit is altered or modified without our confirmation.

In charge of documentation:
Name: Dr. Christian Simmet
Address: Hauptstrasse 41, 84184 Tiefenbach

Tiefenbach, October 30, 2018
Place, date



Signature

Dr. Christian Simmet
Managing director
(Information about the signer)

Fo-V10.3 EC-Declaration of Conformity En

14. Appendix / Leaflet

The following leaflet for the cleaning of the MPP Quattro can be attached directly to the working place (2 pages).

Cleaning of the MPP Quattro

General

- Make sure to provide a hygienic working environment.
- Clean the device when necessary (e.g. spilled material) and according to the cycles specified in the enclosed manual.
- Please observe the information and safety instructions.
- Set the main switch to „off“ for all kind of cleaning. In case of non-observance there is a danger of electric shock respectively unintended functions. Risk of injury !

Adequate cleaning agents

- Do not use aggressive cleaning agents that may damage the materials of the device.
- For antibacterial cleaning, use a mixture of isopropyl alcohol and water or a suitable disinfectant.
- Use lint-free cloths or paper towels.
- Use only the supplied tools for the cleaning of the sealing unit.
- Clean the surfaces with a damp cloth and some washing-up liquid.

Cleaning and maintenance of the filling and suction heads

- Change the suction heads every day.
- After using the filling and suction heads pull off the tubes and rubber seals.
- Place the filling and suction heads immediately in a mild soap solution. For this, use simple neutral soaps or soaps especially developed for laboratories (e.g. Edisonite). Never use disinfectants or soaps with additives !
- Rinse the needles of the filling and suction heads individually with demineralized water. This is the only way to remove all dirt and soap residues.
- Sterilization: either by shortly boiling in demineralized water or by hot air. Please note for the filling and suction heads made of injection-molded plastic:



Make sure that the maximum temperature for hot air sterilization does not exceed +140°C. Higher temperatures lead to deformation of the plastic parts which leads to malfunction of the filling machine.



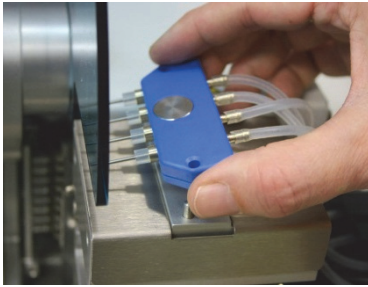
Give utmost care to the intactness of the needle shafts and needle tips. Bent needles lead to malfunction of the filling and sealing unit. In order to avoid damages, we recommend the use of fixing units (Ref. 13018/0050).

Cleaning and maintenance of the sealing unit



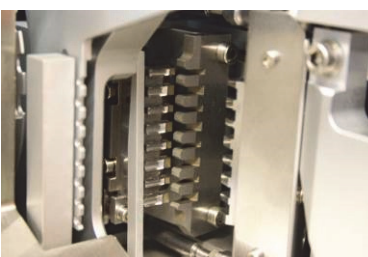
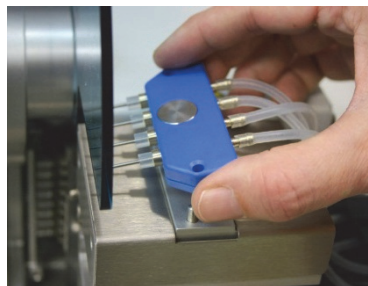
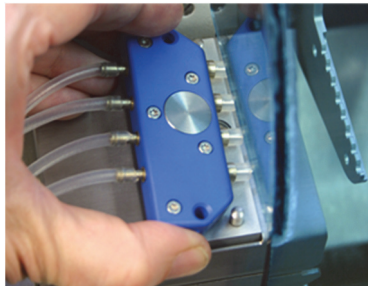
Do not carry out any manipulations on the sealing unit. Malfunctions are the result !

精液交換時のお手入れ



- Remove the filling head from the holder.
- Remove the washers and the tubing and discard them with the household waste.
- Put the filling head in the prepared washing-up liquid.
- If necessary, clean the area around the filling head with a damp cloth.

作業終了後のお手入れ

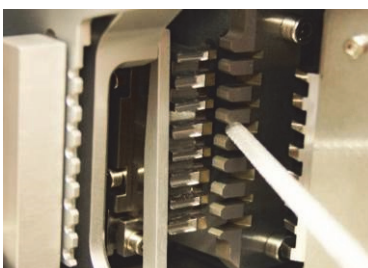


- Remove the suction and filling head from the holder.
- Remove the washers and tubing and discard them with the household waste.
- Put the filling head in the prepared dishwashing liquid.
- If necessary, clean the nozzle of the suction head with an appropriate piece of wire and put it in the dishwashing liquid.
- Rinse all suction and filling heads with demineralised water.
- Dry them and blow through with oil-free compressed air.
- Sterilise them according to the instructions.
- If necessary, clean the area around the filling and suction head with a damp cloth.

- Check the vacuum bottle and empty if necessary. A high liquid level in the vacuum bottle may cause irreparable damage to the vacuum bottle!
- Remove dirt from the 4 supply tubes with a suitable piece of wire.

- Open the operator safety door. Remove the cover with the company logo.
- Clean the sealing unit with a damp cloth. Clean the area around the sealing unit (ejector, baffle plate, cover with company logo) with a damp cloth.
- Fix the cover and close the operator safety door.

毎週のお手入れ



- Open the operator safety door and remove the cover with the company logo.
- Clean the sealing unit with a damp cloth, the supplied brush and a mild detergent. Fix the cover and close the operator safety door.