

## Peristaltic Pump Series SR<sup>®</sup>

**SR25.2, SR25.2-G, SR25.2-W**

**SR25.3, SR25.3-G, SR25.3-W**

**SR25.6, SR25.6-G, SR25.6-W**

Instruction Manual

Version 1.02.00



**Dear customer,**

Thank you for buying our product. In this instruction manual you will find all necessary information about this M&C product. The information in the instruction manual is fast and easy to find, so you can start using your M&C product right after you have read the manual.

If you have any question regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor. You will find all the addresses in the appendix of this manual.

For additional information about our products and our company, please go to M&C's website [www.mc-techgroup.com](http://www.mc-techgroup.com). There you will find the data sheets and manuals of all our products in German and English.

This Operating Manual does not claim completeness and may be subject to technical modifications.

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**SR**® is a registered trade mark.

Version: 1.02.00



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## 1 GENERAL INFORMATION

The product described in this manual has been built and tested in our production facility.

All M&C products are packed to be shipped safely. To ensure the safe operation and to maintain the safe condition, all instructions and regulations stated in this manual need to be followed. This manual includes all information regarding proper transportation, storage, installation, operation and maintenance of this product by qualified personnel.

Follow all instructions and warnings closely.

Read this manual carefully before commissioning and operating the device. If you have any questions regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor.

## 2 DECLARATION OF CONFORMITY



The product described in this operating manual complies with the following EU directives:

### RoHS Directive

The requirements of the RoHS2 ('Restriction of Hazardous Substances 2') directive 2011/65/EU and its annexes are met.

### EMC-Instruction

The requirements of the EU directive 2014/30/EU 'Electromagnetic compatibility' are met.

### Low Voltage Directive

The requirement of the EU directive 2014/35/EU 'Low Voltage Directive' are met.  
The compliance with this EU directive has been examined according to DIN EN 61010.

### Declaration of conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.

### 3 SAFETY INSTRUCTIONS

**Follow these safety directions and instructions regarding installation, commissioning, and operation:**

- Read this manual before commissioning and operating the product. Make sure to follow all safety instructions.
- Installation and commissioning of electrical devices must be carried out only by qualified skilled personnel in compliance with the current regulations.
- The installation and commissioning of the device must conform to the requirements of VDE 0100 (IEC 364) 'Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V' and must be in compliance with all relevant regulations and standards.
- Before connecting the device, please make sure to compare the supply voltage with the specified voltage on the product label.
- The peristaltic pumps SR25.X-X are not certified to be used in hazardous areas.
- Protection against damage caused by high voltages:  
Disconnect the power supply before opening the device for access. Make sure that all external power supplies are disconnected.
- Operate the device only in the permitted temperature and pressure ranges. For details please refer to the technical data sheet or manual.
- Install the device only in protected areas, sheltered from sun, rain and moisture. The product should not be exposed to the elements.
- Installation, maintenance, inspections and any repairs of the devices must be carried out only by qualified skilled personnel in compliance with the current regulations.

### 4 WARRANTY

In case of a device failure, please contact immediately M&C or your M&C authorized distributor.

We have a warranty period of 12 months from the delivery date. The warranty covers only appropriately used products and does not cover the consumable parts. Please find the complete warranty conditions in our terms and conditions.

The warranty includes a free-of-charge repair in our production facility or the free replacement of the device. If you return a device to M&C, please be sure that it is properly packaged and shipped with protective packaging. The repaired or replaced device will be shipped free of delivery charges to the point of use.

## 5 WARNING SIGNS AND DEFINITIONS



**Danger**

The 'Danger' warning sign indicates that death, serious injury and/or significant material damage will be the consequence, if the appropriate precautions should not be taken.



**Warning**

The 'Warning' warning sign indicates that death, serious injury or damage to property may occur if the relevant precautionary measures are not observed.



**Caution**

The 'Caution' warning sign indicates that slight personal injury can occur if the appropriate safety precautions are not observed.

**Caution**

'Caution' indicates that damage to property can occur if the appropriate safety precautions are not observed.

**Attention**

'Attention' indicates that an unintended result or situation can occur if the corresponding information is not taken into account.



**Note**

'Note' indicates important information relating to the product or highlights parts of the documentation for special attention.

**Qualified personnel**

'Qualified personnel' are experts who are familiar with the installation, mounting, commissioning and operation of these types of products.



High voltages!

Protect yourself and others against damage which might be caused by high voltages.



Toxic!

Acute toxicity (oral, dermal, inhalation)! Toxic when in contact with skin, swallowed or inhaled.



Corrosive!

These substances destroy living tissue and equipment upon contact. Do not breathe vapors; avoid contact with skin and eyes.



Contains gas under pressure. Do not open container!

Check pressure before opening container and adjust pressure to atmospheric pressure.



Hot surface!  
Contact may cause burn! Do not touch!



Caution, risk of being crushed due to rotating parts.  
Do not open the device. Use personal protective equipment (PPE).



Wear protective gloves!  
Working with chemicals, sharp objects or extremely high temperatures requires wearing protective gloves.



Wear safety glasses!  
Protect your eyes while working with chemicals or sharp objects. Wear safety glasses to avoid getting something in your eyes.



Wear protective clothes!  
Working with chemicals, sharp objects or extremely high temperatures requires wearing protective clothes.



Use foot protection



Use safety helmet and full protective goggles

## 6 INTRODUCTION

The peristaltic pump **SR25...** has been specially developed for the condensate removal in analysis applications. It ensures a continuous condensate discharge at gas sample coolers, condensate collecting vessels, etc.

Synchronous motor and gearing unit with return stop make a condensate backflow impossible. The safe disposal of condensate is guaranteed with the pumping capacities stated in the technical data table.

The 0.3 NI/h pumping capacity corresponds to the amount of condensate collected, when cooling a sample gas flow of 850 NI/h to 5 °C [41 °F] with an inlet dew point of +70 °C [158 °F].

## 7 TECHNICAL DATA

Peristaltic Pump Series SR25°	Version SR25.2	Version SR25.2-G	Version SR25.2 W
Part No.	SR25.2 01P1300 SR25.3 01P1310 SR25.6 01P1350	SR25.2-G 01P1120 SR25.3-G 01P1110 SR25.6-G 01P1400	SR25.2-W 01P1307 SR25.3-W 01P1320 SR25.6-W 01P1360
Housing	No	Yes, out of polystyrene	No
Method of mounting	Attached to a front plate	Wall mounting	Inside or attached to an enclosure
Protection / electrical standard	IP10 EN 60529	IP52 EN 60529	IP10 EN 60529
Electrical connection	Terminal 1.5 mm <sup>2</sup>	Terminal 1.5 mm <sup>2</sup> 1 x M20 x 1.5	Terminal 1.5 mm <sup>2</sup>
Dimensions* (HxWxD)	84 x 64 x 52 mm plus 40 mm for the motor [≈ 3.3" x 2.5" x 2" plus 1.6" for the motor]	126 x 105 x 108 mm [≈ 5" x 4.1" x 4.3"]	107 x 80 x 94 mm [≈ 4.2" x 3.2" x 3.7"]
Weight	0.4 kg [≈ 0.9 lb]	0.6 kg [≈ 1.3 lb]	0.5 kg [≈ 1.1 lb]
Pressure min.	200 mbar abs.		
Pressure max.	2200 mbar abs.		
Sample temperature	0 to +60 °C [32 to 140 °F]		
Ambient temperature	0 to +50 °C [32 to 122 °F]		
Storage temperature	-10 to +60 °C [14 to 140 °F]		
Power supply	230 V/50 Hz or 115 V/60 Hz		
Power consumption	5 VA		
Duty cycle	100 % duty cycle		
Gas connection	<b>Tube connection 4/6 mm (standard)</b> Tube support 4 Tube connection 6/8 Tube connection 1/4"		
Tube material	<b>Novoprene</b> (standard) used for water, weak acids or bases <b>Masterflex</b> ® (reinforced contact springs necessary!) used for strong acids or bases, carbon disulfide, toluene, gasoline; alcohols <b>Chemsure</b> ® used for methyl ethyl ketone, acetone, tetrahydrofuran		

Selection for Novoprene tubing (standard)				
Peristaltic pump		SR25.3	SR25.2	SR25.6
Rotational speed (revolutions per minute)		1 rpm	5 rpm	10 rpm
Pumping capacity	Tube Ø 1.6 mm ID	<b>0.012 l/h (standard)</b>	0.06 l/h	0.12 l/h
	Tube Ø 3.2 mm ID	0.05 l/h	<b>0.3 l/h (standard)</b>	0.6 l/h
	Tube Ø 4.8 mm ID	0.08 l/h	0.4 l/h	<b>0.8 l/h (standard)</b>

\* Metric dimensions are rounded. Inch dimensions are for reference only. In case of doubt or conflict, metric units take priority.





**8 IMPORTANT SAFETY INSTRUCTIONS FOR USING THE SR25.X-X**



**Warning**

Inhalation hazard possible, if using toxic or asphyxiant gases!



Purge peristaltic pump with inert gas or air before opening! If the pump is used for toxic gas or asphyxiant (oxygen-displacing) gas, it needs to be purged with inert gas or air before opening. Follow closely all relevant occupational safety regulations during operation.



**Warning**

Disconnect power supply before opening the device for access. Make sure that all external power supplies are disconnected.



Aggressive condensate possible!

Media residues in tubing!  
Chemical burns caused by aggressive media possible!



Wear protective gloves and protective glasses!



Wear proper protective clothing!



Peristaltic pump is under pressure! Do not open housing!

A peristaltic pump might be part of a system, which is under pressure. Check pressure before opening peristaltic pump, and adjust pressure to atmospheric pressure.

## 9 DESCRIPTION



### Note

Check the compatibility of the tube material with unknown gases before using the peristaltic pump.

The peristaltic pump **SR25.X-X** is self-suctioning and designed for continuous operation. It consists of 3 compact components:

- synchronous motor,
- gearing unit with return stop and
- pump head.

The slow speed of 1 to 5 rpm of the two PVDF hose contact pulleys together with the Novoprene tubing guarantee a good mechanical and chemical resistance with a long service life. Pre-assembled flexible tubing sets make it easy to replace tubing, even without using any tools. The tube connector DN 4/6 also allows connecting PTFE tubing. The peristaltic pump **SR25.X-X** can be equipped with a power supply of 230 V/50 Hz or 115 V/60 Hz.



### Danger

Type **SR25.X** has open electrical wiring!

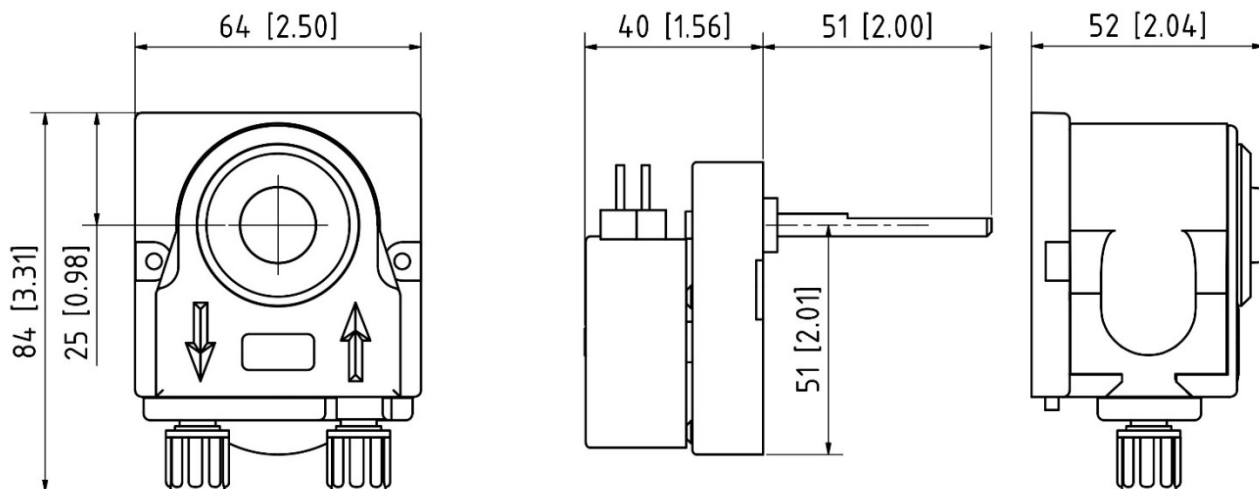
Risk of death due to electric shock!



The unused wires must be safely insulated, preferably to a third free terminal.

The following installation options are available:

- Type **SR25.X** to integrate into a front plate
- Type **SR25.X-G** with a wall mounting case
- Type **SR25.X-W** with mounting bracket



Metric dimensions (mm) are rounded. Inch dimensions are for reference only. In case of doubt or conflict, metric units take priority.

**Figure 1** Dimensions SR25.X

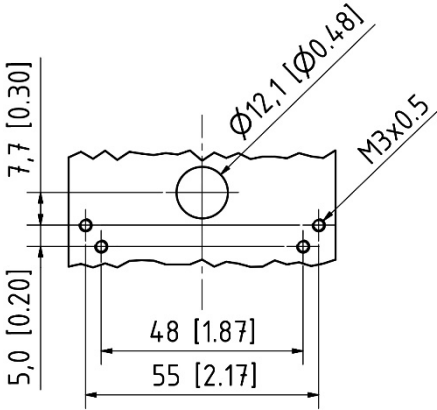
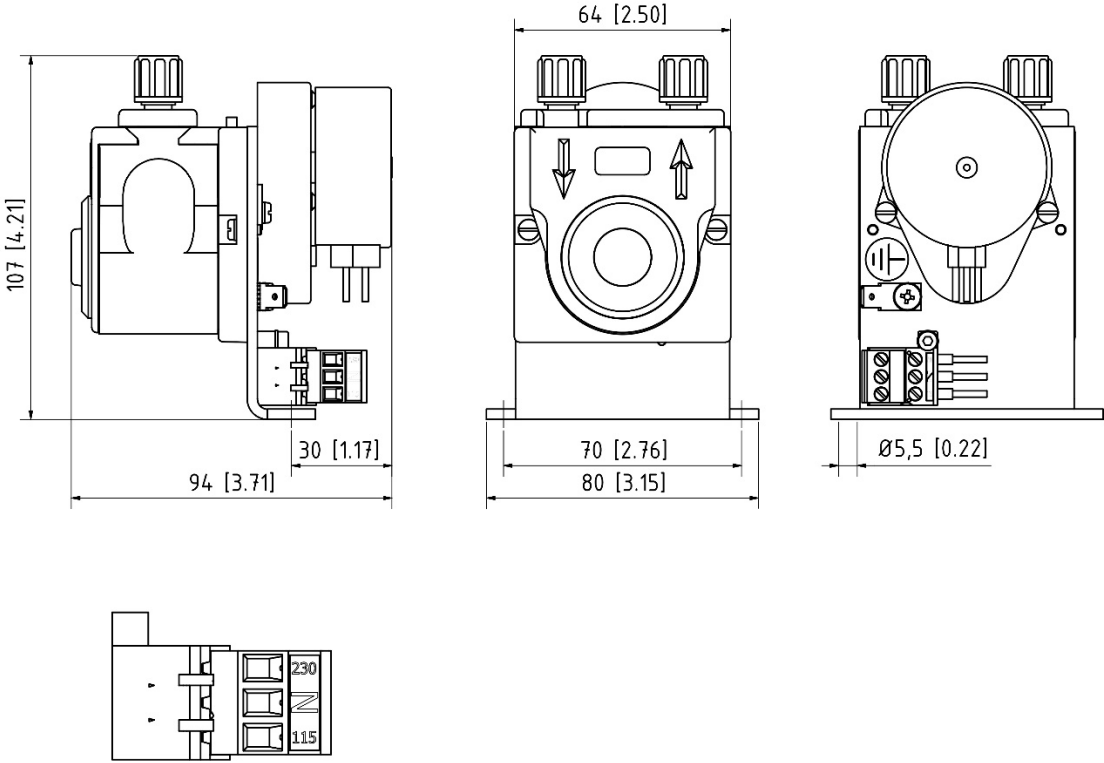
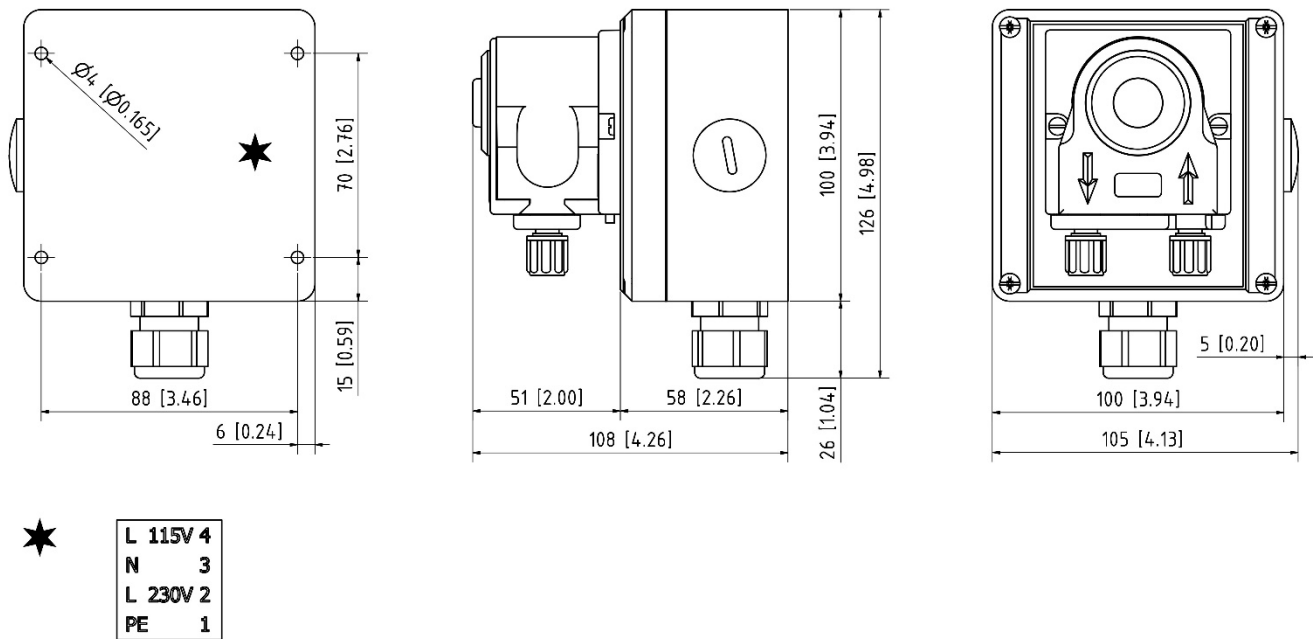


Figure 2 Drilling pattern for SR25.X



Metric dimensions (mm) are rounded. Inch dimensions are for reference only. In case of doubt or conflict, metric units take priority.

Figure 3 Dimensions SR25.X-W



Metric dimensions (mm) are rounded. Inch dimensions are for reference only. In case of doubt or conflict, metric units take priority.

**Figure 4 Dimensions SR25.X-G**

## 10 RECEPTION AND STORAGE

The peristaltic pump is a complete pre-installed unit.

- Please remove the peristaltic pump carefully from the packaging. Check the scope of the delivery specified on the delivery note. Please make sure that you have received all items stated on the delivery note.
- Please check the unit for any transport damage after receipt and report any complaints to the transport company immediately.



**Note**

The peristaltic pump must be stored in a weather protected frost-free area!

## 11 INSTALLATION INSTRUCTIONS

When installing the pump make sure that accident prevention regulations and safety instructions including those for subsequent operation are observed. The safety instructions in section must be observed.

The following ambient conditions must be observed:

- Ambient temperature during operation: max. +50 °C [122 °F]
- Protect the pump against water and dust.
- During operation, a sufficient supply of cooling air must be guaranteed.



**Danger**

Do not operate the peristaltic pump SR25.X-X in hazardous areas.



**Note**

The pump must only be used in the conditions specified in the technical data. The pump should be installed away from heat sources and freely ventilated to prevent any accumulation of heat.

For outdoor installation, the pump must be installed in a housing protected from frost in the winter and sufficiently ventilated in summer. Exposure to direct sunlight must be avoided.



**Danger**

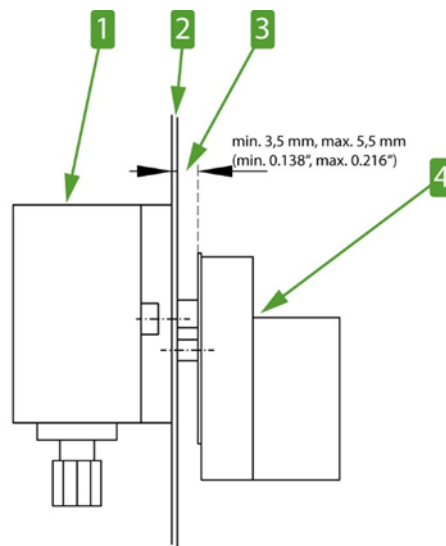
It is therefore essential to provide protection for persons against contact with alive parts (e.g. electrical connections, motor windings) and moving parts (e.g. fan). Protection against the entry of foreign bodies must also be provided.



### 11.1 MOUNTING INSTRUCTIONS FOR SR25.2 PERISTALTIC PUMP

Make sure to mount the peristaltic pump SR25.2 to a front plate with a minimum thickness of 3.5 mm [ $\approx 0.1$ "]. If the front plate is thinner than 3.5 mm [ $\approx 0.1$ "], use shims to adjust spacing. The maximum thickness of the front plate is 5.5 mm [ $\approx 0.2$ "].

The minimum distance avoids damage to the pump motor, and the maximum distance prevents the motor shaft from losing the guide inside the pump head.



- 1 Pump head [outside the cooler housing]    2 Cooler front panel  
3 Recommended mounting distance    4 Pump motor (inside the cooler housing)

**Figure 5 SR25.2: Mounting distance between front panel and pump motor**

## 12 SUPPLY CONNECTIONS

### 12.1 TUBING CONNECTIONS

The tube connections are on the upper side of the pump. The standard threaded tube connectors are DN 4/6. Tube connections with tube nipples are available as an option (see spare parts list chapter 16).



#### Note

Do not mix up tube connections for sample gas inlet and outlet; the connections are marked accordingly! Check for tightness of all sample lines after connecting!

Connect the tubing to the regular tubing connectors as follows:

- Remove the union nut from the sealing ring couplings by turning it anti-clockwise. The nut should be removed from the thread with great care to ensure that the loose sealing ring inside the nut is not lost.
- Place the union nut over the connecting hose.
- Place the sealing ring over the connecting hose with the thicker bead towards the nut.
- Place the tubing over the nipple on the thread.
- The union nut is to be screwed tight by hand.

The tubing will no longer be able to slip off, and is now compression-proof.



**Note**

The tightness of the connections can only be guaranteed if the connection tubing has a straight rim (hose cutter).



Aggressive condensate possible!

Media residues in tubing!  
Chemical burns caused by aggressive media possible!

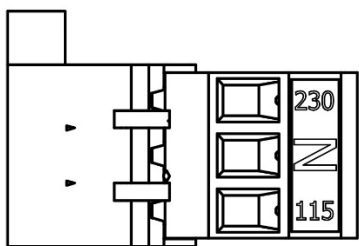


Wear protective gloves and protective glasses!

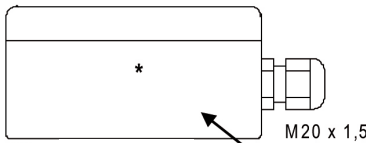
Wear proper protective clothing!

### 12.2 ELECTRICAL CONNECTIONS

Connect the cables for the power supply as follows:



SR25.X-W



\* PowerPower

1	2	3	4
PE	L 230V	N	L 115V

SR25.X-G

For connection of the mains loosen the 4 fixing screws of the housing and open it !

**Figure 6 Supply voltage connection for SR25.X-W and SR25.X-G**

The supply voltage of the SR25. X peristaltic pump must be connected as follows:

**Connection at 230 V:** blue wire  
red wire

**Connection at 115 V:** white wire  
blue wire



**Danger**

Open electrical wiring!

Risk of death due to electric shock!



The unused wires must be safely insulated, preferably to a third free terminal.

**Caution**

Incorrect system voltage can damage the unit. Before connecting the power supply, make sure that the system voltage corresponds with the voltage shown on the type plate!

The supply voltage is only allowed to deviate max. +6 % resp. -10 % from the specification on the model type plate.



Setting up of electrical power installations must be conform to the requirements of IEC 364 (DIN VDE 0100) 'Regulations on the Installation of Power Circuits with Nominal Voltages below 1000 V', and must be in compliance with all relevant regulations and standards.

- The main circuit of the pump type **SR25.X-X** must be equipped with a fuse (0.25 A recommended) corresponding to the nominal current (over current protection EN 60335-1);
- A device to separate the motor from the power supply needs to be provided as part of the electrical installation (EN 60335-1);
- The pump must be installed in such a way, that contact with alive parts (connections, possibly windings) is impossible.

### 13 PREPARATIONS FOR COMMISSIONING

Before initial startup, all plant- and process-specific safety measures must be observed. It is mandatory for the operator to complete the enclosed risk assessment of the product.

The gas exposure risk must be assessed by the operator regarding the hazards posed by process and calibration gas and the setup at the installation site (e.g. tubing, system cabinet/container/plant). If the risk assessment reveals increased exposure hazards, further measures are required.

A visible label must be attached to the installation site in accordance with the risk assessment provided by the operator.

### 14 START-UP

Specific safety instructions for media being handled must be observed. Before pumping a medium, the compatibility of the flexible tube material with the medium must be checked.

Before initial start-up and during operation, make sure to follow these instructions:

- Do not exceed the maximum allowed operating pressure (see technical data).
- For required ambient conditions: see technical data.



## 15 CLOSING DOWN



### Note

The installation site of the pump must be frost free at all times! Even if pump is not in use!

- If the pump is turned off, make sure to adjust the operating pressure to atmospheric pressure.

No other measures need to be taken.

## 16 MAINTENANCE

Before starting any maintenance work, make sure that any work done on the device is in compliance with all relevant regulations and standards.



**Warning**

Inhalation hazard possible, if using toxic or asphyxiant gases!



Purge peristaltic pump with inert gas or air before opening! If the pump is used for toxic gas or asphyxiant (oxygen-displacing) gas, it needs to be purged with inert gas or air before opening. Follow closely all relevant occupational safety regulations during operation.



**Warning**

Disconnect power supply before opening the device for access.  
Make sure that all external power supplies are disconnected.



Aggressive condensate possible!

Media residues in tubing!  
Chemical burns caused by aggressive media possible!



Wear protective gloves and protective glasses!

Wear proper protective clothing!



Peristaltic pump is under pressure! Do not open housing!

A peristaltic pump might be part of a system, which is under pressure. Check pressure before opening peristaltic pump, and adjust pressure to atmospheric pressure.

Flexible tube, conveying belt, contact pulleys and contact springs are the only parts of the pump subject to wear. They are simple to change.



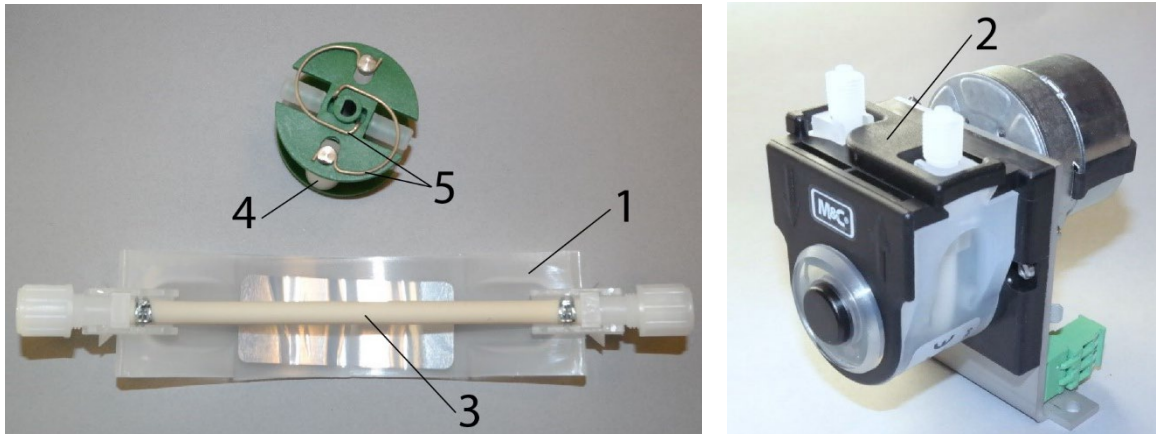
**Note**

If you send back the peristaltic pump to the M&C service for repair, please let us know what kind of condensate has been pumped.

For this purpose, use the form on our homepage at <https://www.mc-techgroup.com/en/service-support/return-of-products>.

Before sending the pump back clean all parts from dangerous or highly aggressive contaminants.

## 16.1 CHANGING THE PUMP TUBING



1 Conveying belt      2 S-bolt      3 Tubing set  
4 contact pulley      5 springs

**Figure 7** Changing the pump tubing

For changing the pump tubing please proceed as follows:

- Unplug the pump from the mains voltage. The device needs to be voltage free.
- Open tube connections at the pump;
- Press conveying belt ① at the recessed grips and turn S-bolt ② clockwise up to limit stop;
- Take away conveying belt ① and remove the old tubing set ③ from the guides by pulling on the tube connectors;
- Press the two contact pulleys ④ and check whether the spring pressure is still sufficient, if not, the contact springs have to be changed (see chapter 16.2);
- Put the new tubing set ③ with the tube connectors into the guides of the conveying belt ① ;

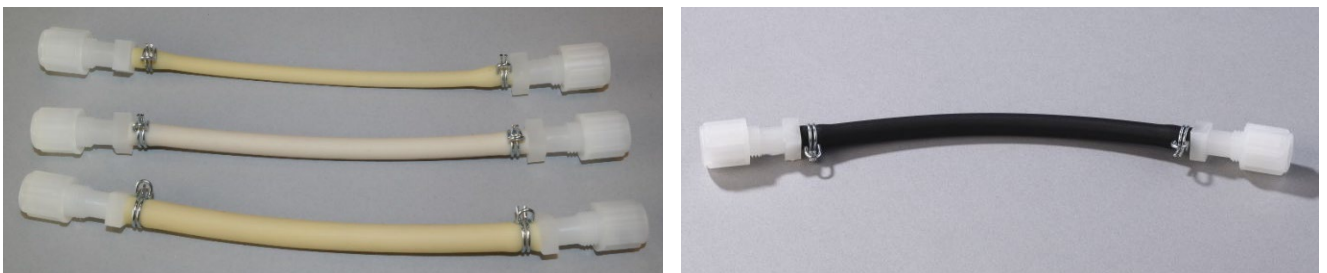


### Note

Only the usage of the original tubing set guarantees a proper functionality.  
Never lubricate the tube.

Before mounting the pump check all parts for contaminations and clean if necessary.

- Put the conveying belt ① with the new tubing ③ into the dovetail guide of the pump body;
- Press conveying belt at the recessed grips and simultaneously turn the S-bolt ② anticlockwise until it snaps;
- Switch on pump.



**Figure 8** Different pump tube sizes (Novoprene on the left, Masterflex® on the right)

## 16.2 CHANGING CONTACT PULLEYS AND SPRINGS



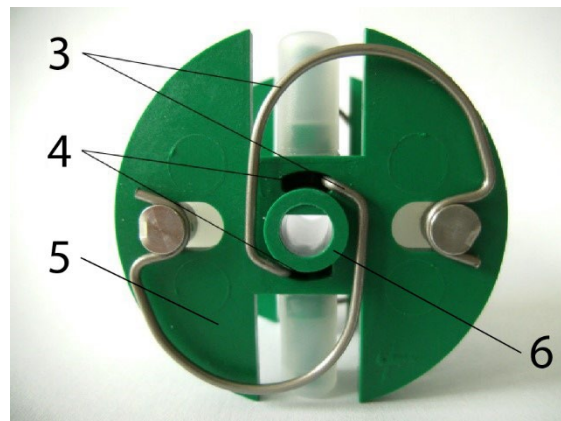
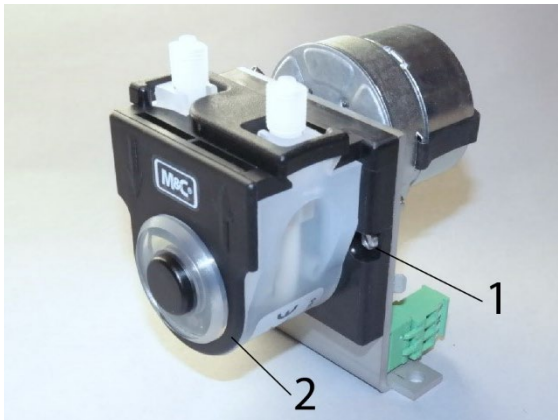
### Note

While mounting, make sure that the center of rotation and the driver are aligned.

Use genuine spare parts only!

Follow these instructions to change the contact pulley and springs:

- Disconnect the peristaltic pump from power supply;
- Unscrew nuts of the pump head (wrench size 5.5) ①;



1 Pump head nuts

2 Pump head

3 Springs

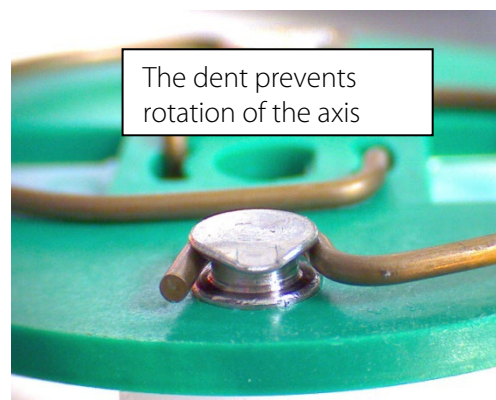
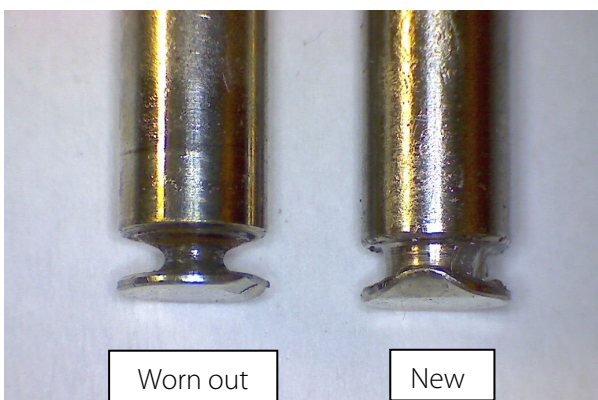
4 Groove

5 Driver (roll carrier)

6 Collar of the shaft bore

**Figure 9 Disassembly of pump head and driver**

- Remove the pump head ② from the motor shaft
- Now the driver can be removed from the pump head and is ready for maintenance.
- The removal of the springs (.4 pcs.) ③ away from the driver is easily possible without the aid of any tools. For this take spring out of the groove ④ near to the shaft bore.
- Dismount roller axes and change contact pulleys. Take care that axes are not worn out by the springs and have damaged the dent at the axes front end. In case of abrasion the axes have to be changed (see Figure 10).



**Figure 10 Check of axes and rolls**

**Note**

The springs may come in different colorings. This is not a quality impairment. Make sure to use the right spring strength. This can be identified by the spring wire diameter. The 'standard version for Novoprene pump tubing' (Part No. 90P1010) has a diameter of 1.1 mm and the 'reinforced version for FKM-, Acidflex®- or Masterflex®-tubing' (Part No. 90P1015) has a diameter of 1.2 mm.

**Note**

Two different types of springs are mounted inside the driver (right and left springs) for the first delivery. When spare springs are ordered, for simplified storage, only one type will be delivered (right spring) which can be used for all four springs and will replace without any problems the initial springs. The replacement springs guarantee full functionality when all four springs are replaced.

- Make sure that contact pulleys move easily on the axis. After remounting the axis with contact pulley into the driver the spring has to be mounted as shown as in Figure 10. Please pay attention to the alignment of the dent.

### 16.2.1 REASSEMBLY OF THE DRIVER

Reassemble the driver in reverse order:

- Insert the roll carrier back into the pump head.
- Push the pump head with the roll carrier onto the motor shaft ②.
- Tighten the nuts of the pump head fastening (SW 5.5) ①.

**Note**

While mounting, make sure that the center of rotation and the roll carrier (driver) are aligned.

Make sure that the collar of the shaft bore (see Figure 10) faces towards the front of the pump head while mounting the roll carrier.

Use genuine spare parts only!

### 16.3 CLEANING THE PUMP HEAD

- When changing flexible tube or other parts, inspect all parts for dirt before assembling the pump head and clean them if necessary.
- We recommend to clean the parts with a dry cloth. Solvent should not be used, because it can damage the plastics and synthetic rubber parts. Use oil-free compressed air to clean the parts if available.



Aggressive condensate possible!

Media residues in tubing!

Chemical burns caused by aggressive media possible!



Wear protective gloves and protective glasses!

Wear proper protective clothing!

### 17 REPAIR INFORMATION



**Note**

When sending the peristaltic pump to M&C customer service for repair, please indicate the type of medium pumped. For this purpose, use the form on our homepage at <https://www.mc-techgroup.com/en/service-support/return-of-products>.

Before shipping the pump, remove hazardous or aggressive contaminations from all parts of the pump!

### 18 PROPER DISPOSAL OF THE DEVICE

At the end of the service life of our products, it is important to take care of the appropriate disposal of obsolete electrical and non-electrical devices. To help protect our environment, follow the rules and regulations of your country regarding recycling and waste management.

## 19 SPARE PARTS LIST

Wear, tear and replacement part requirements depend on specific operating conditions. The recommended quantities are based on experience, and they are not binding.

Peristaltic pump SR25.X-X					
(C) Consumable parts					
(R) Recommended spare parts					
(S) Spare parts					
		Recommended quantity being in operation [years]			
Part No.	Indication	C/R/S	1	2	3
90P1007	Tubing set ③* with Novoprene tubing and PVDF-tube connectors DN 4/6	C	2**	4**	8**
90P1006	Tubing set ③* with Novoprene tubing and PVDF-tube nipples 6 mm	C	2**	4**	8**
90P1004	Tubing set ③* with Masterflex® tubing and PVDF-tube connectors DN 4/6	C	3**	6**	9**
90P1020	Roll carrier (driver) SR25, complete	S	-	1	1
90P1010	1 set (4 pcs) contact springs ⑤* SR25 for driver	R	1	2	2
90P1015	1 set (4 pcs) reinforced contact springs ⑤* SR25 for driver (Masterflex® tubing)	R	1	2	2
90P1045	Pressure roll (contact pulley) SR25 PVDF ④* for driver	S	2	4	4
90P1050	Conveying belt ①*	S	-	1	2
90P1025	Locking bolt S (S-bolt) ②*	S	-	-	1
90P1031	Head peristaltic pump SR25.2, complete without tube set, motor and gears	S	-	-	1

\* Numbers are shown in Figure 7

\*\* The recommended number of tubing sets per year may vary depending on the process conditions and pumped medium.

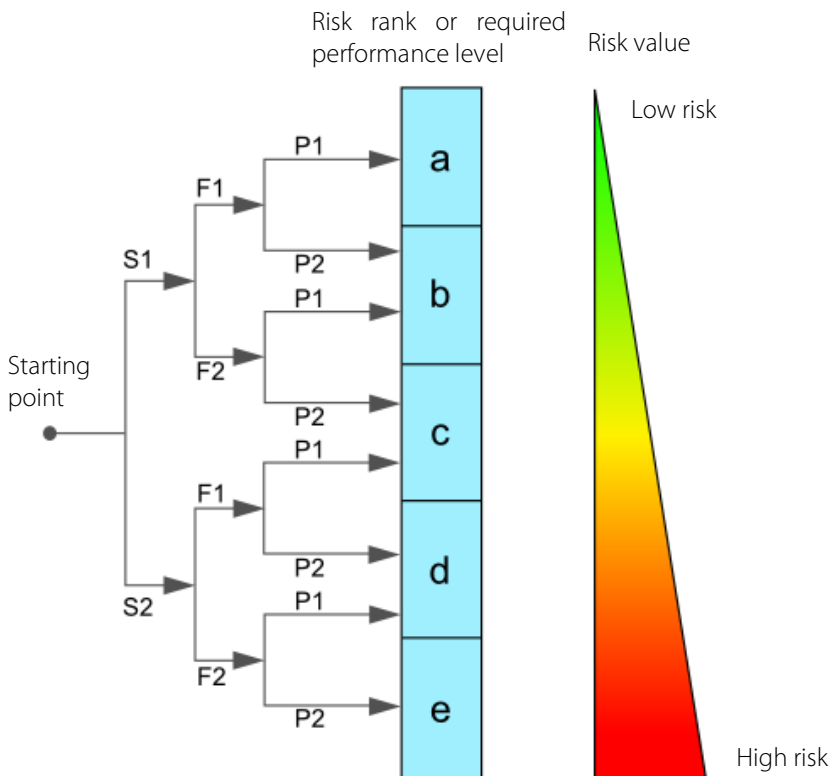
## 20 RISK ASSESSMENT

The risk assessment provided in this chapter is intended for all work activities on the product. The hazards can occur in the work steps of assembly, commissioning, maintenance, disassembly and in the event of a product fault. During normal operation, the product is protected by a system cabinet or appropriate covers.

Only qualified personnel is permitted to perform the work. The following minimum knowledge is required for the work:

- Employee instruction provided in process engineering
- Employee instruction provided in electrical engineering
- Detailed knowledge of the instruction manual and the applicable safety regulations

The product complies with the current regulations according to state-of-the-art science and technology. Nevertheless, not all sources of danger can be eliminated while observing technical protective measures. Therefore, the following risk assessment and the description of exposure hazards refer to the work steps mentioned above.



**Severity of injury:**

S1 = 1 = minor (reversible injury)  
 S2 = 2 = serious (irreversible injury, death)

**Frequency and duration:**

F1 = 1 = infrequent or short exposure to hazard  
 F2 = 2 = frequent (more than once per hour/shift)

**Possibility of preventing or limiting the damage**

P1 = 1 = possible  
 P2 = 2 = hardly possible

**Figure 11 Overview risk assessment**



**Aggressive condensate possible**

**Risk rank group A**

Chemical burns due to aggressive media possible!  
 This applies to all liquids in vessels and in the product.  
 In general, for electrical and mechanical work on the product, wear personal protective equipment (PPE) in accordance with the risk assessment.



**Caution risk of being crushed by rotating parts**

**Risk rank - group A**

The product contains rotating parts. Do not open covers until the device has been switched off.





### Caution electric shock

#### Risk rank group C

When installing high-power systems with nominal voltages of up to 1000 V, the requirements of VDE 0100 and their relevant standards and regulations must be observed!

This also applies to any connected alarm and control circuits. Before opening the products, they must always be disconnected from the power supply.



### Gas hazard

#### Risk rank group A-B-C

The hazard potential mainly depends on the gas to be extracted.

If toxic gases, oxygen displacing or explosive gases are conveyed with the product, an additional risk assessment by the operator is mandatory.

In principle, the gas paths must be purged with inert gas or air before opening the gas-carrying parts.

The escape of potentially harmful gas from the open process connections must be prevented.

The relevant safety regulations must be observed for the media to be conveyed. If necessary, flush the gas-carrying parts with a suitable inert gas. In the event of a gas leakage, the product may only be opened with suitable PPE or with a monitoring system. Furthermore, the work safety regulations of the operator must be observed.



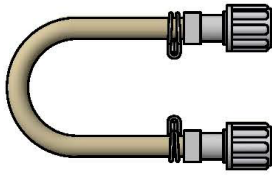
## 21 APPENDIX

- Spare parts drawing

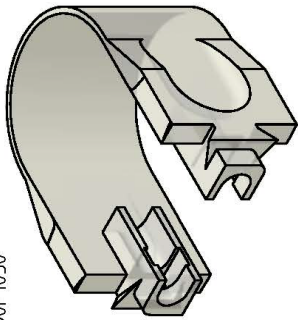


Further product documentation can be seen and downloaded from our home page:  
[www.mc-techgroup.com](http://www.mc-techgroup.com)

Art.No.	Tube set variants	
	Tube inner x outer dia.	Ext. couplings
90P1001	Chemsure 3,2x6,4	DN4,76 POM
90P1002	Novopren 4,8x8	DN4,76 PVDF
90P1003	Novopren 4,8x8	Nippel 5mm PVDF
90P1004	Masterflex 3,2x6,4	DN4,76 PVDF
90P1005	Novopren 3,2x6,4	DN6/8 PVDF
90P1006	Novopren 3,2x6,4	Nippel 5mm PVDF
90P1007	Novopren 3,2x6,4	DN4,76 PVDF
90P1008	Novopren 3,2x6,4	DN1/4" PVDF
90P1009	Acidflex 3,2x6,4	DN4,76 PVDF
90P1060	Novopren 1,6x4,8	DN4,76 PVDF



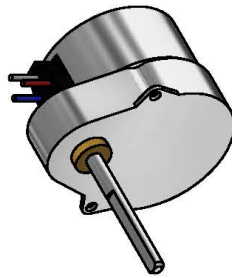
SR25 Conveying belt  
90P1050



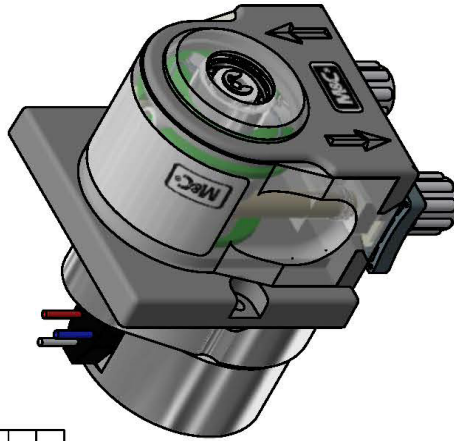
SR25 Pump head 90P1031, incl.  
- Roll carrier 90P1020,  
- Locking bolt S 90P1025,  
- Conveying belt 90P1050

Art.No.	Gear motor variants	
	RPM - Voltage	Spare part for
90P1036	5RPM - 115/230VAC	SR25.2 - 01P1300
90P1037	1RPM - 115/230VAC	SR25.3 - 01P1310
90P1038	10RPM - 115/230VAC	SR25.6 - 01P1350

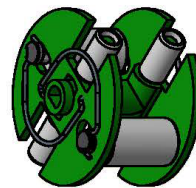
Wire assignment	
Wire	Potential
red	230VAC
white	115VAC
blue	N



SR25 Pressure spring set (4pcs.) 90P1010  
SR25 Reinforced pressure spring set (4pcs.) 90P1015  
for SR25 Tube set 90P1004 or 90P1009



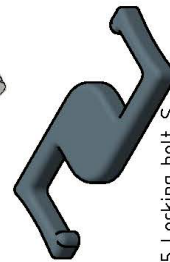
SR25 Roll carrier complete  
90P1020



SR25 Spindle for pressure roll  
90P1075



SR25 Pressure roll  
90P1045



SR25 Guide roll PVDF  
KD0003



SR25 Locking bolt S  
90P1025

Figure 12 Spare parts (Drawing No.: 2435-1.07.0)