

Zelflex Protect

Pneumatic 4-Side Stretching Frame with Protected Stencil

USER MANUAL

1 INTRODUCTION

Company name: LPKF Laser & Elektronika d.o.o.
Abbreviated name: LPKF d.o.o.
Address: Polica 33
SI – 4202 Naklo

Telephone: +386 (0)592 08 800
Fax: +386 (0)592 08 820

Internet: www.lpkf.si, www.zelflex.com

e-mail: support@lpkf.si, sales@lpkf.si

Trade-mark: 

LPKF ZelfFlex Protect



The ZelfFlex Protect is an advanced pneumatic direct clamping frame combining ZelfFlex advantages with increased operator safety and additional stencil protection.

A stencil firmly attached to a low-cost protective sub-frame can be operated very easily and quickly. Typical exchange time of the stencil is about 25s.

Furthermore stencils are washed and archived together with protective frame.

1.1 Warning

Copying and distributing these instructions in their entirety or in parts is permitted only with the written approval of LPKF.

Note: Data can be altered without prior warning.

The owner of the LPKF device is obligated to:

- Ensure that the device is used only for its intended purpose.
- Ensure that the device is used only under the specified operating conditions.
- Regularly check the safety and control devices.
- Ensure that only authorised and qualified personnel operate the device.
- Ensure all operators of the device have ready access to these instructions.
- Ensure that the device always has safety labels in place.

Remove the packaging and check the general state of the equipment, and check the contents against the enclosed packing list.

In the event of any damage immediately inform the transport agent!

Before starting-up the device, remove all packaging, which served as protection for the device during transport, otherwise severe damage could be caused to the device!

Please note: unauthorised repairs or modifications to the equipment will void the warranty!

In case of problems with the system, please immediately contact us, giving the serial number of the system!

Phone: +386 (0)592 08 800

Fax: +386 (0)592 08 820

e-mail: support@lpkf.si
sales@lpkf.si

2 CONTENTS

1 INTRODUCTION	2
1.1 Warning	3
2 CONTENTS	4
2.1 Symbols etc. used in this manual	5
3 BASIC DATA	6
3.1 Name and address of the manufacturer	6
3.2 Relevant model	6
3.3 Intended use	6
3.4 Technical data	6
3.5 Noise level/vibration/hazardous chemicals	7
4 SAFETY NOTES	8
4.1 General	8
4.2 Hazards	8
4.3 Safety measures	9
5 DEVICE DESCRIPTION	10
5.1 General	10
5.2 Compressed Air	10
5.3 Basic parts	11
6 USE OF ZELFLEX PROTECT	14
6.1 Zelflex Protect frame assembling	14
6.2 Protective sub-frame assembling	17
7 MAINTENANCE	21
7.1 General	21
7.2 Cleaning	21
7.3 Stencil care	21
8 TROUBLESHOOTING	22
9 APPENDICES	23

2.1 Symbols etc. used in this manual

Text, marked as **bold**, emphasizes the importance of the information.

Symbols that you will notice in some chapters have the following meaning:



Danger!

The symbol is used to highlight danger to life or health.



Caution!

The symbol warns us of circumstances which could threaten the safety and health of the device operator or cause a serious device defect.



Good advice and instructions

»Rapido« warns us of possible faults and recommends simple and effective solutions.

3 BASIC DATA

3.1 Name and address of the manufacturer

Company name: LPKF Laser & Elektronika d.o.o.
 Abbreviated name: LPKF d.o.o.
 Address: Polica 33
 SI – 4202 Naklo

Telephone: +386 (0)592 08 800
 Fax: +386 (0)592 08 820

Internet: www.lpkf.si, www.zelflex.com
 e-mail: support@lpkf.si, info@lpkf.si

Trade-mark:



3.2 Relevant model

LPKF ZelFlex Protect

3.3 Intended use

- SMT stencil printing using suitable SMT printer
- holding ZelFlex Protect perforated stencil in a ZelFlex protective frame, for handling and archive purposes

3.4 Technical data

- ZelFlex Protect 584x584x25

Outer dimension:	584 x 584 x 25 mm (23" x 23" x 1")
Inner dimension:	504 x 504 mm (19,8" x 19,8")
Max. print area:	464 x 464 mm (18,3" x 18,3")
Max. pressure:	6 bar (87 psi)
Weight:	3,8 kg (8.4 lb)
Ambient conditions:	room operation only

- ZelFlex Protect 584x584x25/736x736 (adapter 736x736 – 584x584x25)
 (for different printers with standard 29" x 29" clamping)

Outer dimension:	736 x 736 x 40 mm (29" x 29" x 1,75")
Inner dimension:	504 x 504 mm (19,8" x 19,8")
Max. print area:	464 x 464 mm (18,3" x 18,3")
Max. pressure:	6 bar (87 psi)
Weight:	7,6 kg (16.8 lb)
Ambient conditions:	room operation only

3.5 Noise level/vibration/hazardous chemicals

Device does not cause any noise or vibration.

Contact with chemicals (soldering pastes) is possible during the process of printing.



Soldering pastes can contain hazardous chemicals.
Soldering pastes can contain lead!



Check product data, both on the packaging and on any safety data sheets, for any harmful characteristics.



Soldering pastes could contain lead!
Please take into account the prescribed safety measures, and prescribed personal protective equipment, mentioned in the paste manufacturer's instructions.

4 SAFETY NOTES






Before using the device carefully read this chapter on health and safety. Familiarise yourself with potential risks and prescribed safety precautions.

4.1 General

1. The device has to be installed in accordance with the installation instructions.
2. The device should only be used for its designed purpose.
3. A suitable working environment has to be ensured.
4. The device can only be operated by qualified personnel.
5. Service work can only be performed by authorised and qualified personnel.
6. Ready access to "The Instructions for Use" has to be possible for all device operators.

4.2 Hazards

	CHEMICAL HAZARD	Soldering pastes can contain substances, which are hazardous to health.
	SENSOR STRESS	Unsuitable general lighting of the area can increase the level of the operator sensor stress.
	MECHANICAL HAZARDS	Risk of cuts is present in the process of clamping the stencil (use protective gloves).

4.3 Safety measures

- Before operating the device a full visual inspection should be carried out. In the event of any defects or malfunctions work must not be started until all faults have been corrected!
- It is of vital importance that the area around the device is maintained clean and tidy. A disorganised work-place can cause occupational injuries (i.e. a person can fall, slip or receive an injury).
- Please ensure that the environment in which the equipment is going to be used conforms to that specified in this document.
- While working with the device the complete attention of the operator is required. A person, who is feeling unwell or is having difficulties concentrating, should not operate the device!
- Only equipment, which has been approved by LPKF can be used in conjunction with the device. The use of unsuitable equipment could endanger the operator!
- Repairs can only be performed by authorised service personnel. These personnel should ensure that the safety of the equipment is not compromised by the repair.
- The storing or consuming of food and drinks in the work area is forbidden!
- Smoking is forbidden!
- When using hazardous substances, safety data sheet instructions and advice should be followed!
- Recommended personal protective equipment: protective gloves!



4.4 Procedures in the event of injury and other emergencies

In the event of a work-related injury, stop the work immediately, and if necessary seek professional medical support.

5 DEVICE DESCRIPTION

5.1 General

Frame is designed for holding SMT metal stencil tensioned during SMT printing process.

Metal stencils are usually provided from Laser Job Shop services, etching providers and electroforming providers. Electroformed stencils might have poor consistency, so we do not recommend using ZelFlex frames for stretching them.

The metal SMT stencil should be inserted into protective sub-frame. Goal is, that this is done by stencil supplier. Therefore, ZelFlex Protect owner get already framed (inexpensive protective sub-frame) SMT stencil from stencil manufacturer.

Stencils suppose to be kept in the protective sub-frame, as long related stencil is being used. When stencil is recycled, the protective sub-frame can be dismantled and reused.

Protective sub-frame, protect the sharp stencil edges from damages and operator from injuries. Additionally, protective sub-frame makes handling and archiving stencils easy. Protective sub-frame can be washed together with SMT stencil in an ultrasonic or cleaning agent stencil washing system.

SMT stencil together with protective sub-frame is placed over ZelFlex main frame, using sliding locking mechanism. When compressed air (5-6 bars) is supplied, frame is ready to be inserted to printer, according to instruction of printer producer. The frame should be fixed firmly!

ZelFlex dimensions should be selected according to printer data, either for direct inserting or using adapters. When printer supports various dimensions of frame, frame holders must be adjusted to ZelFlex frame dimensions.

5.2 Compressed Air

ZelFlex frames have to be supplied with compressed air for 5 – 10 s to provide necessary stretching force. Stretching force is related to compressed air pressure, recommended pressure is from 4,5 – 6 bar (65 – 87 psi), for stencils from 100 – 200 µm.



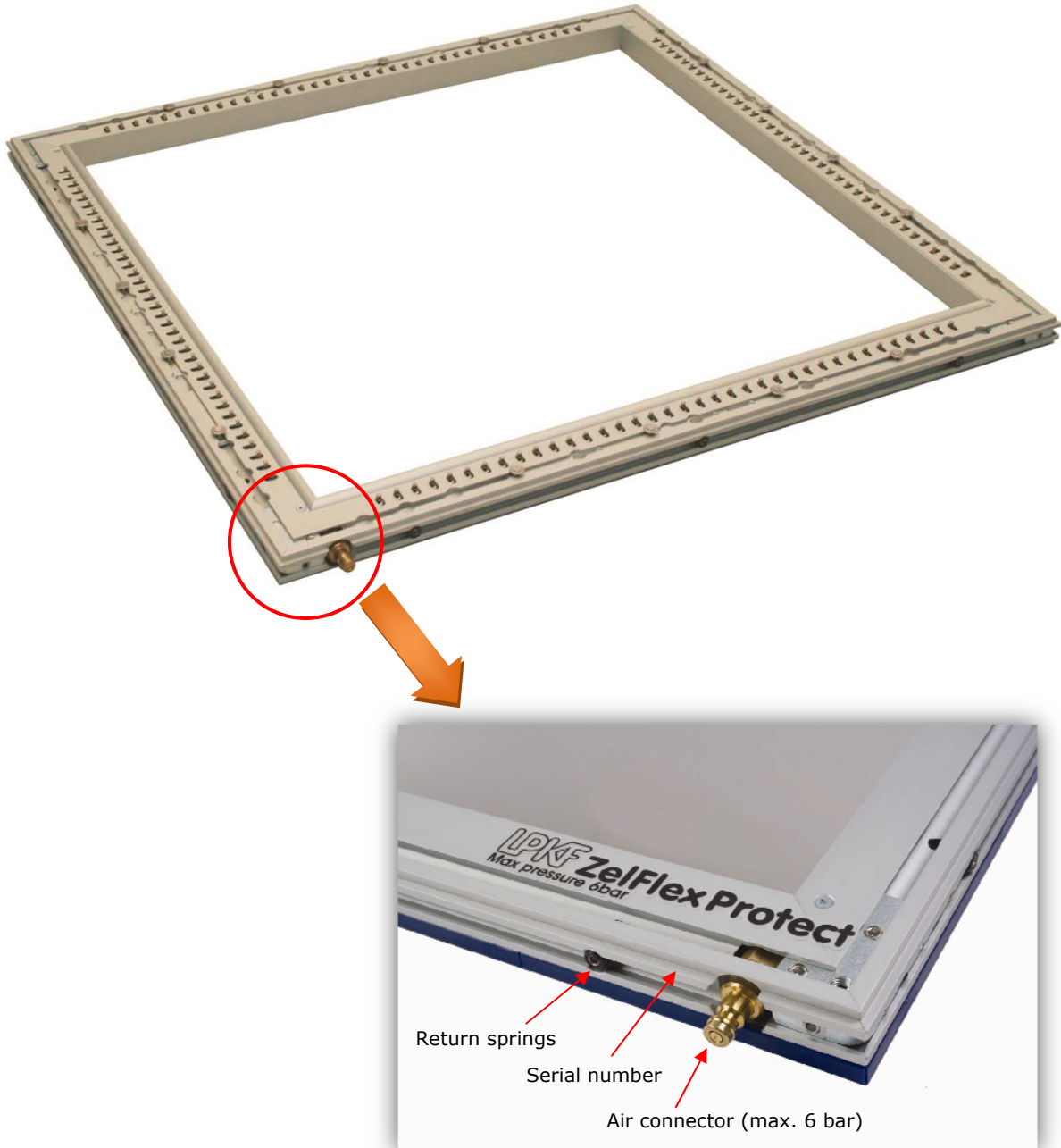
Exceeding pressure of 6 bars may damage stencil and frame.
Use only dry and clean air!



Air supply unit with pressure regulator, water separation and 5 µm filter is available as an option.

5.3 Basic parts

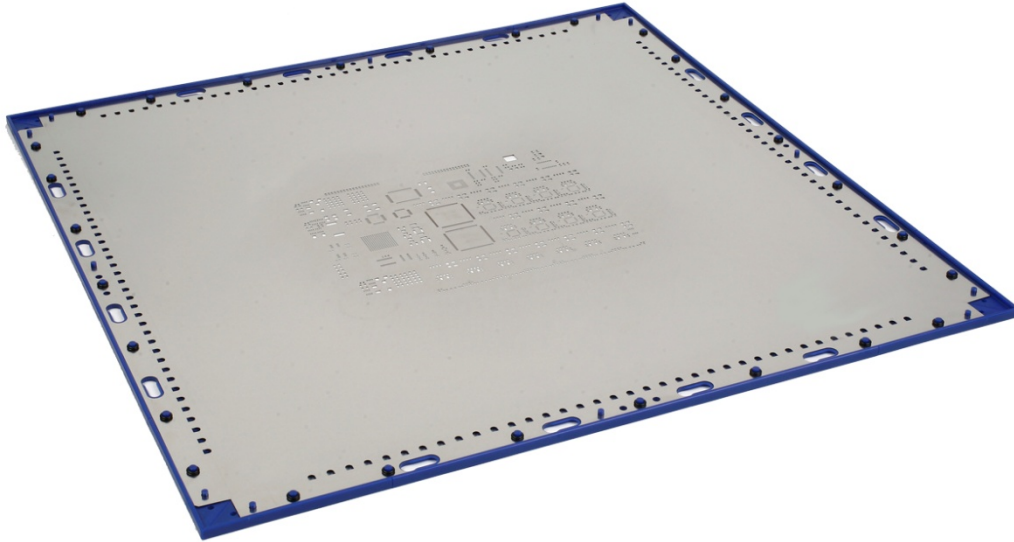
5.3.1 Zelflex Protect (main frame)



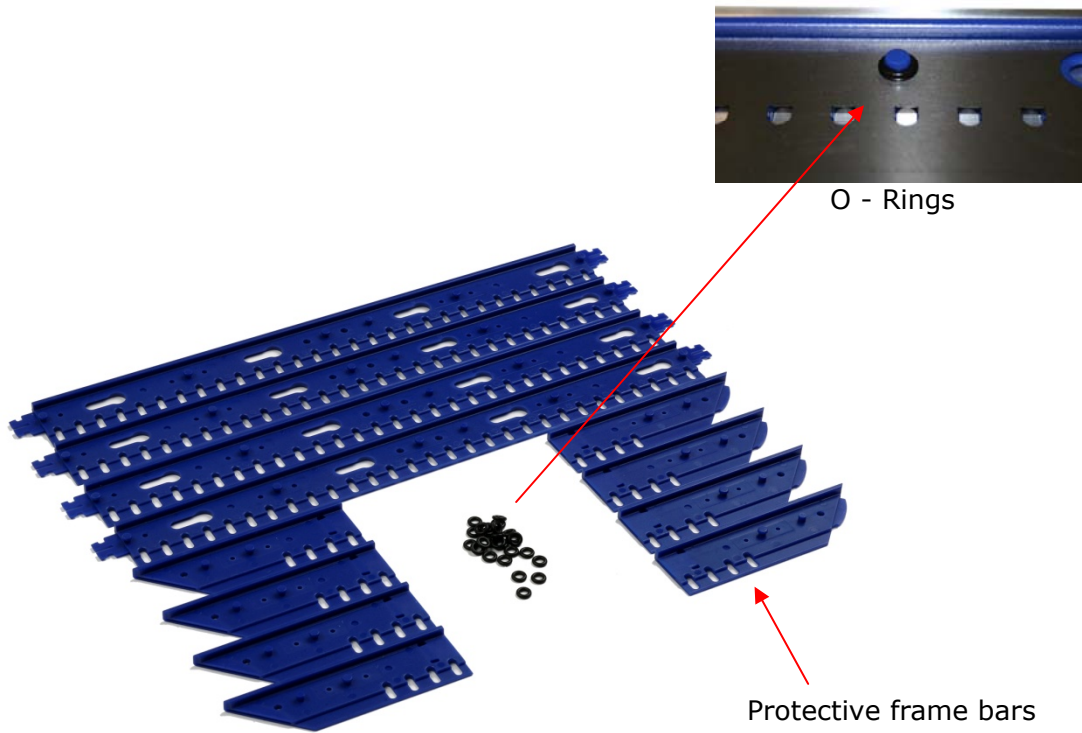
Return springs are factory adjusted for optimum operation.
Do not adjust or change their position!

Wrong settings may seriously damage frame and stencil!

5.3.2 Protective sub-frame (s)



The ZelFlex Protect system contains:



5.3.3 Air connection hose



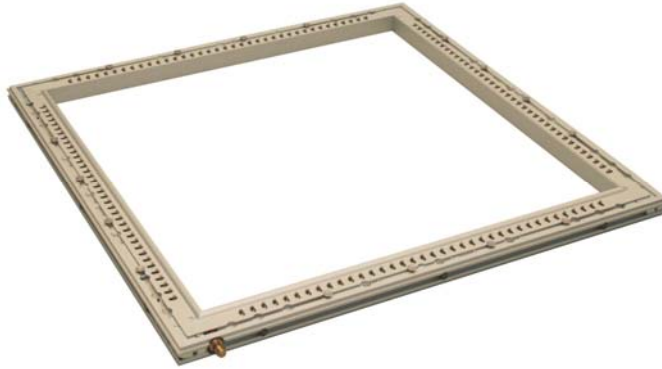
Connection hose is equipped with fast connector for fast and effective air connection with air supply unit.



Always use original air connector to protect valve on frame side!

6 USE OF ZELFLEX PROTECT

6.1 ZelFlex Protect frame assembling



ZelFlex Protect main frame



Protective sub-frame with assembled stencil

1. Turn around the main frame and place it over protective sub-frame.



2. Push firmly each side of the main frame down to ensure that all pins are within stencil preformation.



3. The sub-frame can be also locked to the main frame. For daily use of the stencil this is not necessary.



4. Apply compress air (5-6 bar according to stencil thickness) to the frame.





Use only dry and clean air!



For easy and reliable air distribution, use **air pressure regulator** with water separator and 5 μm filter (available as an option; order no. 010298).



5. Wait 5 sec. and disconnect compressed air from ZelFlex frame.



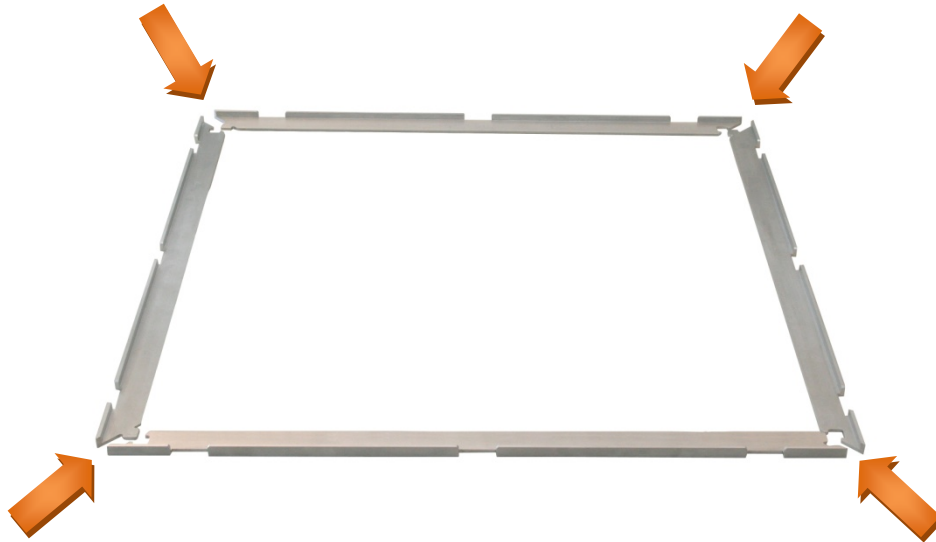
6. The ZelFlex Protect is **ready for use!**



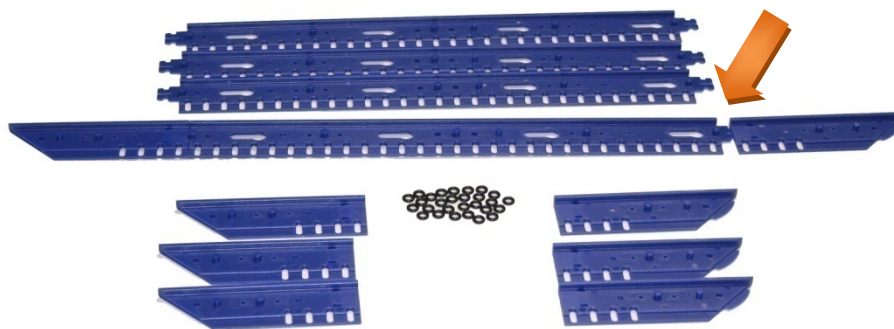
6.2 Protective sub-frame assembling

Stencil, cut according to perf. data, is necessary.

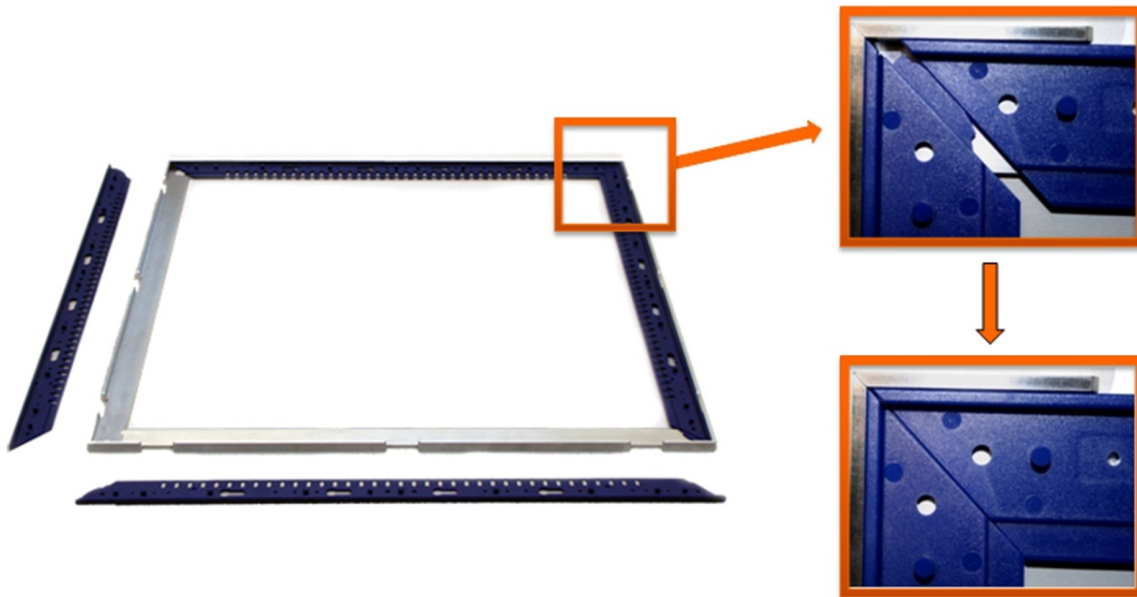
1. Put together the **auxiliary mounting frame** (available as an option; [order no. 010462](#)). For easier assembly of protective sub-frame and stencil on it, special auxiliary frame is available separately– it's assembled from 4 aluminium bars which we simply connect together. The sub-frame can be assembled also without this auxiliary frame.



2. For assembling one of four sides of the sub-frame, you need to assemble one central with two corner segments. Just simply slide locking mechanism into corner part on both sides.



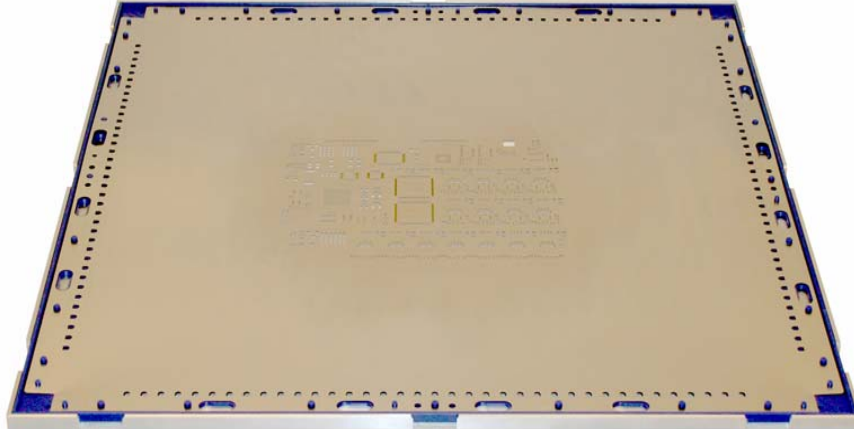
- Now you got four assembled bars which you have to connect together. Place the auxiliary frame on a flat surface and connect all four blue bars together as shown here.



- The sub-frame is prepared for stencil mounting. Leave the protective sub-frame on the auxiliary frame.



5. Place the stencil on the sub-frame with the squeegee side up.



6. For easier positioning of stencil, there are special centring pins on each bar – slightly left from the centre pin.

Positioning pin



Please note: on each bar, there are 3 straight, thinner positioning pins for easier assembly of stencil and 7 bigger, T-shape pins where o-ring should be placed.

7. With rubber o-rings you fix the stencil on the sub-frame. Simply press the o-ring with a finger over the pin.



The stencil is now firmly fixed on sub-frame. Remove the protective sub-frame from the auxiliary frame.

8. The protective stencil is ready for installation on the Zelflex Protect frame, for archiving or shipping.



7 MAINTENANCE

7.1 General

ZelFlex frame is designed, to be operated maintenance free, except for cleaning.

Always use clean and dry compressed air to avoid particle to enter ZelFlex frame.

Locking mechanism of ZelFlex Protect can be lubricated with a drop of machine oil, when necessary.

7.2 Cleaning

Protective sub-frame can be washed together with SMT stencil in an ultrasonic or cleaning agent stencil washing system.



Never clean ZelFlex Protect main frame using cleaning devices or dipping it into cleaning solvent!

For cleaning ZelFlex Protect, soft cloth, mild agent or isopropyl can be used.

Any cleaning solvent should not enter ZelFlex frame!

The pastes, solders or adhesives have to be cleaned in accordance with manufacturer instructions regarding each individual substance.



Most soldering pastes and glues can be cleaned using isopropyl alcohol.



Attention, follow the manufacturer instructions for each individual substance!

7.3 Stencil care

Care should be taken when inserting the stencil into the frame and when inserting the frame into the printer (please observe printer manufactures instructions if available).

Use metal or plastic spatula to remove the most part of solder paste from the stencil.

Care should be taken on removal of the stencil from the frame.

Final hand cleaning should be done with care by recommended cleaning agents recommended by manufacturers of the solder pastes and adhesives.

If screen wash machine is used please observe manufacturers instructions.

Damage could occur if the stencils are exposed for mechanical friction. Do not wash ZelFlex Protect frame in the cleaning machine.

If a brush is used for cleaning the stencil damage could occur especially in fine pitch areas.

8 TROUBLESHOOTING

Some faults can be corrected with the help of the following chart.

When this is not possible contact an authorised serviceman/distributor of Zelflex devices.

Fault/Defect	Procedure
Tensioning is lost after short time – air leaking.	Test the air connector for locking using drop of soap and water. When testing, air connector must be exchanged! Contact Zelflex distributor for spares and tools for exchange.
Locking mechanism is hard to move.	Lubricate locking mechanism with a drop of machine oil.
Sub-frame does not fit on main frame.	Adjust position of locking mechanism.
Air is leaking, air connection valve is OK.	Contact Zelflex representative, provide S/N and the type of frame.

Frame can only be repaired only by authorised Zelflex partner.



Never disassemble frame – no service able parts inside!
Special tools are required!
Improper dismounting can permanently damage frame!

9 APPENDICES

Shipped with all units:

- User Manual
- Spiral tube with fast connector for air supply

Options:

- Air pressure regulator



Please find further information about the LPKF ZelfFlex stretching frames on our web site:

<http://www.zelfflex.com>



ZelfFlex Pneumatic Stretching Frames

Home | Contact Us | About Us | Site Map | Search

The only pneumatic stretching frame with no need of constant air connection

PRODUCT RANGE | SUPPORTED PRINTERS | HOW TO BUY | FAQ | NEWS

ZelfFlex Z4P	ZelfFlex Protect	ZelfFlex ZR	How to buy
<p>LPKF ZelfFlex Z4P is the only real pneumatic stretching frame for fast and direct clamping of SMT metal stencil. Perfect tension of the stencil is guaranteed.</p>  <p>See product details >></p>	<p>LPKF ZelfFlex Protect is a unique protective system, specially designed for safe and easy handling with stencils. Sharp stencil edges are no more a problem.</p>  <p>See product details >></p>	<p>LPKF ZelfFlex ZR is a mechanical stretching frame, which allows direct, easy and fast clamping as polymer as metal stencils. Gap printing is possible.</p>  <p>See product details >></p>	<p>We provide you any kind of stencil frames in an easy, fast and reliable way. Only think you should do is fill in the inquiry.</p>  <p>More information >></p>

© 2006-2007 LPKF d.o.o. All rights reserved. | [Terms of Use](#) | [Privacy](#) | [Authors](#)