



DUNAFORM PLUS

Pressure thermoforming unit for foils Ø 120 mm and Ø 125 mm

Service Manual

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1. GENERAL

1.1 This operation manual allows a safe and efficient handling of this unit

The operation manual is part of the unit and has to be in close proximity of the unit and always accessible for the staff members. The staff members have to read and understand this manual before starting any work with this unit. The basis for safe working is the strict observance of all mentioned safety information and directions in this manual. Beyond that the local accident prevention regulations and general safety regulations for the application field of the unit are in force.

1.2 Limits of liability

The manufacturer does not assume any liability for damages due to

- Disregard of the operation manual
- Inappropriate use
- Employment of unskilled staff members
- Unauthorized conversion of the unit
- Technical modifications
- Use of non-licensed spare parts

The contractual commitments based on the delivery contract, the general terms and conditions, the delivery conditions of the manufacturer as well as the legal requirements valid at the date of the contract's conclusion are valid. Technical alterations due to improvement and further development are subject to modifications.

1.3 Copyright protection

This operation manual is copyright reserved and exclusively bound for internal purposes. Transferring this manual for use to third parties, duplication in any way and manner – even in extracts – as well as use and/or transfer of the content are prohibited without the manufacturer's permission in written except for internal use. Contraventions oblige for compensation. Further claims reserved.

1.4 Spare parts

False or faulty spare parts can affect safety and lead to damages, hazardous malfunctions or complete failure. Only use original spare parts of the manufacturer. Loss of any warranty/guarantee when using external parts that are not provided by your dealer – that are not coming from the original manufacturer. Provide spare parts through your dealer.

1.5 Warranty regulations

The relevant legal regulations are valid.

1.6 After-sales service

If you need further technical details, please do not hesitate to contact your distributor. Moreover our staff members are always interested in new information and experiences resulting from using this unit and which may be valuable for improving our products.

1.7 Disposal

For a proper disposal the national regulations are valid. You may also contact your dealer.

2. SAFETY

2.1 The operator's responsibility

The unit is exclusively used in the commercial field. Due to this fact the operator of the unit is subject to the legal obligations for safety at work. The operator has to make sure that all staff members using this unit have read and understood the operation manual. The unit needs to be used by trained and qualified personnel only.

2.2 Appropriate use

The unit is exclusively designed and constructed for the use herein described: Pressure thermoforming unit for all applications in dental thermoforming techniques used in dental technology and dentistry.

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2.3 Temperature monitoring



2.4 Extraneous Hazards

The herein mentioned safety notes as well as the warning notes mentioned in further chapters of this manual have to be observed in order to reduce health hazards and to avoid dangerous situations.

2.41 Electrical Shock Hazard!



Risk of fatal injury from touching live parts! Damaging of the insulation or of single components can be dangerous to life!

For this reason:

- When insulation is damaged, deactivate the power supply immediately and arrange for repair.
- Do not bridge or deactivate fuses. When changing fuses observe the correct amperage!
- Keep live parts from moisture. Danger of short circuit!
- After finishing thermoforming works switch off the unit.
- After finishing thermoforming works pull the power plug out of the socket and thereby cut the unit completely from electricity.

2.42 Caution! Hot surfaces!



Contact with hot surfaces heating cap (3) can cause burns.

DUNAFORM PLUS Emergency shut down Temperature too high Turn off the unith and have it cool down For this reason:

Emergency shutdown once the heating chamber's temperature has exceeded the safety values.

Display (4) indicates: Emergency shutdown – Temperature too high

Turn off the unit's power switch (10) – see page 6 - for approx. 30 minutes and have it cooled down.

Then a new thermoforming task can be started.

3. TECHNICAL DATA

Mains supply Max. power consumption Fuse of unit Operating pressure Pressure in hose Width / Depth / Height Weight 230 V AC 50/60 HZ ± 10 % 850 W 2 x T 4 A max. 6 bar max. 10 bar 350x300x190 mm 8,5 kg

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3.1 Mains supply

The electrical connection of the unit is only allowed in rooms which are equipped according to the directions of VDE 0107 or IEC 364-710.

Put the power cable included in the delivery into the female connector installed (12) and into an earthed wall socket. Due to safety reasons do not use flexible distributing sockets or extender cables. The power socket has to be fused with at least 10 A.

3.1 Compressed air connection

Connect the unit by means of a pressure hose (outer Ø6mm) to an on-site compressed air supply or compressor (13 plug-in connector). The working pressure may not exceed 6 bar, the safety valve opens automatically as soon as the working pressure exceeds 6,2 bar. **Working pressure factory set: 3,5 bar**.

4. OPERATING ELEMENTS



- 1 Foil tension ring
- 2 Foil reception for foils Ø 120 mm and Ø 125 mm
- 3 Heating cap (infrared lamp)
- 4 Display
- 5 Button "Setting"
- 6 Pressure regulator
- 7 Pressure chamber
- 8 Reception for granules and plate reception
- 9 Closing device for pressure chamber



- 10 Power switch ON-OFF
- 11 Female connector installed
- 12 Fuse carrier with fuses T 4 A
- 13 Pressure connector socket

5. TROUBLESHOOTING

Error description	Remedy	
No indication on display (4)	Check your power socket. If there is a defect in your power socket, use another socket. Check your power cord. If it is defective, the power cord should be exchanged.	
	Check the fuse. If there is a defect, exchange the fuse – see page 12.	
	There seems to be a defect on the control board, it needs to be exchanged (service technician), see page 12.	
Display (4) flashes and the acoustic signal gives acoustic sound	Defect of the temperature-sensor, it needs to be ex- changed (service engineer), see page 11	
Heating element (infrared lamp) (3) within the heating chamber does not light up	Defect of the heating element, it needs to be exchanged (service engineer), see page 11-12.	
	Defect of the control board: it needs to be exchanged (ser- vice engineer), see page 12.	
Pressure is not shown on display 4	Defect in pressure sensor, pressure hose from pressure regulator 8 to pressure sensor or pressure sensor defective, it needs to be exchanged control board, see page 11 (service technician)	
Thermoforming foil/sheet is not correctly pressed over the model	Heating time was too short. Chose the correct heating time for the corresponding foil.	
	Working pressure set too low, set higher pressure, see page 7.	

6. BASIC SETTINGS MENU

6.1 Selection of language

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kness: 1.0 m 35 s / 50 s)

Menu 📄 🕨

DUNAFORM PLUS

Main Menu

Exit + OK

 $\bullet \bullet \bullet$

Select one of the following languages: German English Spanish Italian French

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Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

Push button "Menu".

Display (4) indicates: Main Menu, Foil select, Foil processing, Signal, Language.

By pressing "Down" \downarrow or "Up" \uparrow choase language.

Confirm by pressing "OK".

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Display (4) indicates: Select language, German, English, Spanish, Italian.

By pressing "Down" \downarrow or "Up" \uparrow set the language (e.g. English).

Confirm by pressing "OK".

The language chosen is now set in all menus.

6.2 Adjusting working pressure



Attach compressed air connection (13).

Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

By lifting the pressure control's rotary knob (6) – see page 5 – and turning it clock- or anti-clock-wise the pressure set can be modified.

Working pressure factory set: 3,5 bar.

6.3 Signal ON / OFF







Display (4) indicates: Signal OFF

Confirm by pressing "OK".

Then the signal is turned off for all menus.

By pressing "UP" \uparrow the signal can be turned ON again.

6.4 Circuit diagram DUNAFORM PLUS 230V





6.5 Ciruit diagram DUNAFORM PLUS 115 V





6.6 Spare part list







Article number

212-000-014 Fuse T 4A , 20 x 5 mm bei 220V

212-000-015 Fuse T 8A , 20 x 5 mm bei 110V

210-500-012 Infrared heater 230 V 50 Hz 850 W

210-500-013 Infrared heater 110 V 50 Hz 850 W

212-401-016 Control board 230 V

212-401-017

Control board 115V

- L = Port for power (wire brown)
- N = Port for power (wire blue)
- 5 = Port for solenoid valve MV (wire brown)
- 6 = Port for solenoid valve MV (wire blue)
- HZ = Port for solenoid valve HZ (wire white/red 1.5 mm²)
- HZ = Port for solenoid valve HZ (wire white/red 1.5 mm²)
- 7 = Port for micro switch MV (wire whitee)
- 8 = Port for micro switch MV (wire black)
- 9 = Port for micro switch MV (wire red)
- 10 = Plug for cable strap Display board
- 11 = Pressure hose port
- 12 = Temperature sensor

212-401-020 Temperature sensor



7. REPLACEMENT OF COMPONENTS



When replacing the following components, the DUNAFORM PLUS unit must be disconnected from the customer's mains socket by disconnecting the mains cable.

7.1 Replacement temperature sensor 212-401-019







7.2 Replacement infrared heaters 212-500-012 or 212-500-013



Picture 1

5 x Unscrew the screw on the rear panel.

Fold down the rear panel of the housing.

Release the pressure hose (14) from the plug coupling. Remove the plug socket (13) from the plug strip (14).

Fold down the rear panel completely.

Picture 2

Remove the temperature sensor (12) from the control bord

Picture 3

Remove temperature sensor (12) from housing and heating bell.

Install the new temperature sensor in reverse order.

Attention!

Plug the temperature sensor plug (12) into the control board in the correct order (orange wire in direction CPU).

Picture 4

Fold down rear panel completely (see picture 1)

Cut cable tie (15) from cable harness.

Disconnect the white connection cable (HZ) from the control board.







7.3 Replacement control board 212-401-016 or 212-401-017



7.4 Replacement fuse 212-000-014 or 212-000-015



Picture 5

Unscrew screws (15) on housing.

Remove the heating cap assembly from the housing.

Picture 6

Unscrew 3 x screws from the heating cap. Remove the protective grid. Unscrew the bolt (16) and shift the spring sheet (17).

Remove the defective infrared heater (18)

Install the new infrared heater in reverse order.

Picture 7

Fold down the rear panel completely (see Fig. 1).

Cut cable tie (15) from cable harness.

Remove the temperature sensor (12) from the control board.

Loosen and remove all strands from connection L; N; 5; 6; HZ; HZ; 7; 8; 9.

Unscrew screws (19).

Remove and replace control board.

Install the new control board in reverse order.

Plug the temperature sensor plug (12) into the control board in the correct order (orange wire in direction CPU).

Picture 8

The device fuses are located in the cold device plug (20) on the back of the device. Pull the mains cable out of the cold appliance plug (20).

Using a screwdriver (size 1) at the notch, open the cover of the fuse holder (21) and pull it out.

Remove defective fuse.

Insert new fuse. Fuse values must be observed at all times. 2 x T 4A at 230 V 2 x T 8A at 115V

8.. SERVICE MODE

- Press button 1 on the control panel (4) for approx. 5 s and switch on the **DUNAFORM PLUS** mains switch (10). al dente 3 1 Display (4) shows: Service Mode 1 **DUNAFORM PLUS** Exit 🔺 🕈 OK al dente $\bullet \bullet \bullet \bullet$ DUNAFORM PLUS Switch heater Micro switch heating open 1 4.5 Ba Swivel the pressure 1 Micro switch is open and defect chamber (7) under the heating cap (3) 0 Micro switch is closed and OK al dente Select swivel valve with the key "Down \downarrow ' Switch valve 1 Micro switch valve open Swivel the closing 1 Micro switch is open and defect device (9) 90° clockwise 0 Micro switch is closed and OK Select AC heater with the key "Down ↓" AC heater >1 AC heating circuit is open 0 AC heating circuit Press the "OK" key is defect 1 AC heating circuit is **OK** Select AC heater with the key "Down \downarrow " AC valve >1 AC valve circuit is open Press the "OK" key 0 AC valve circuit is defect 1 AC valve circuit is **OK** Select AC relay with the key "Down ↓" AC relay >1 AC relay circuit is open Press the "OK" key 0 AC relay circuit is defect 1 AC relay circuit is **OK** Infrared heater is ok lights up, Valve opens and Pressure blowing
- 8.1 Service Mode 1 (Test micro switch heating, micro switch valve, AC heater, AC valve, AC relay)

8.2 Service Mode 2







Display (4) shows: Temperature limit setting.

With key "Down" \downarrow or key "Up" \uparrow the temperature limit in the heating cap can be set.

Press the "OK" key to confirm.

The factory setting is: 110° C as maximum. This setting should not be exceeded.

Display (4) shows compiler date

Press the "Exit" key to return to the start menu.

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