

	<p>General information for safe handling of gas cylinders:</p> <ul style="list-style-type: none"> • Store and use gas cylinders only in well ventilated areas. • Open the gas cylinder valve slowly to avoid pressure surges • Secure gas cylinders during storage and use against falling (chaining). • Transport gas cylinders with a cylinder cart, do not carry, roll, or throw them • Always close the valve even with apparently empty cylinders; screw on the cap when not in use. Return gas cylinders with the valve closed • Do not open gas cylinders by force. Mark them when damaged • Observe relevant regulations for dealing with gas cylinders.
---	---



Connect a flexible gas tube to the gas hose connection adapter (diameter 10mm), which is used for gas inlet, and secure it with hose clamps (hose and hose clamps are not enclosed). There is a constant gas flow after establishing the connection.


	<p>After connecting the gas cylinder, check all gas connections for leaks (e.g. with leak spray or diluted soap solution).</p>
---	--

Use a pressure reducer and make sure to avoid any excessive outlet pressure when connecting the gas hose to the oven.

	<p>The unit is not entirely gas-tight. Inert gases from inside the drying and heating oven can escape into the surrounding atmosphere.</p>
--	--

Inert gases in high concentrations is hazardous to health. They are colorless and almost odorless and therefore practically imperceptible. Inhalation of inert gases can cause drowsiness up to respiratory arrest. When the O₂ content of the air decreases below 18%, there is risk of death from lack of oxygen. Any gas that might escape has to be led out via good room ventilation or a suitable exhaust system.

	 WARNING
	<p>High concentration of inert gas.</p> <p>Risk of death by suffocation.</p> <ul style="list-style-type: none"> Ø Do NOT set up units in non-ventilated recesses. ➤ Ensure technical ventilation measures. ➤ Respect the relevant regulations for handling these gases.

	<p>Inert gases, which are heavier than air, may accumulate in low-lying areas of the installation site.</p>
---	---

The “Mostly gas-tight version” reduces the loss of gas.


Setting (sample values):

If you want to flush the unit with an air exchange rate of 1 per hour, set the flow rate on the pressure reducer according to the interior volume.

FED 53 with 53 l internal volume: The flow rate corresponding to 53 l / h is 0.9 l / min.

FED 115 with 115 l internal volume: The flow rate corresponding to 115 l / h is 1.9 l / min.

The air flap does not close the exhaust duct completely. The delivered plug serves to avoid loss of introduced inert gas via the exhaust duct. Due to special demands of heat resistance, use the delivered plug only.

	CAUTION
	<p>Use of inappropriate plug.</p> <p>Danger of inflammation.</p> <p>➤ To close the exhaust duct use the delivered plug only.</p>

For drying purpose, please remove the plug in order to permit dissipation of the generated vapor, which would lead to condensation in the inner chamber.

8.6 Analog output for temperature (option)

With this option the chamber is equipped with an analog output 4-20 mA for temperature. This output permits transmitting data to external data registration systems or devices.

The connection is carried out as a DIN socket at the rear of the chamber as follows:

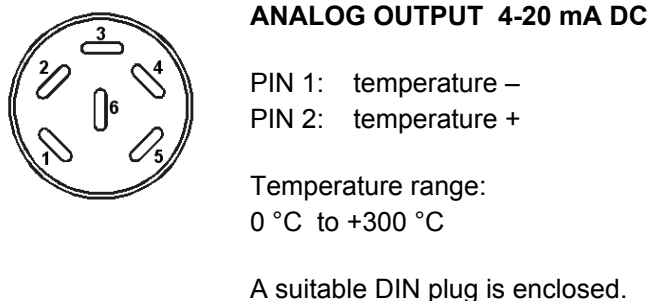






Figure 9: Pin allocation of DIN socket for option analogue outputs

9. Maintenance, cleaning, and service

9.1 Maintenance intervals, service

	 DANGER
	<p>Electrical hazard.</p> <p>Danger of death.</p> <ul style="list-style-type: none"> ⊘ The unit must NOT become wet during operation or maintenance work. ⊘ Do NOT remove the rear panel of the unit. ➤ Before conducting maintenance work, turn off the unit at the main power switch and disconnect the power plug. ➤ Ensure all maintenance work is conducted by licensed electricians or experts authorized by BINDER.

Ensure regular maintenance work is performed at least once a year.

	<p>The warranty becomes void if maintenance work is conducted by non-authorized personnel.</p>
	<p>Replace the door gasket only when cold. Otherwise, the door gasket may become damaged.</p>




We recommend taking out a maintenance agreement. Please consult BINDER Service.

BINDER telephone hotline:	+49 (0) 7462 2005 555
BINDER fax hotline:	+49 (0) 7462 2005 93555
BINDER e-mail hotline:	service@binder-world.com
BINDER service hotline USA:	+1 866 885 9794 or +1 631 224 4340 x3 (toll-free in the USA)
BINDER service hotline Asia Pacific:	+852 390 705 04 or +852 390 705 03
BINDER service hotline Russia and CIS	+7 495 988 15 16
BINDER Internet website	http://www.binder-world.com
BINDER address	BINDER GmbH, post office box 102, D-78502 Tuttlingen

International customers, please contact your local BINDER distributor.


9.2 Cleaning and decontamination

Clean the unit after each use to avoid potential corrosion damage by ingredients of the test material.

 	<div style="background-color: red; color: white; padding: 5px; text-align: center;">  DANGER </div> <p>Electrical hazard.</p> <p>Danger of death.</p> <ul style="list-style-type: none"> Ø Do NOT spill water or cleaning agents over the inner and outer surfaces. ➤ Before cleaning, turn off the unit at the main power switch and disconnect the power plug. ➤ Completely dry the appliance before turning it on again.
--	---

9.2.1 Cleaning


Disconnect the chamber from the power supply before cleaning. Disconnect the power plug.


	<p>The interior of the unit must be kept clean. Thoroughly remove any residues of the charging material</p>
---	---


Wipe the surfaces with a moistened towel. In addition, you can use the following cleaning agents:


Exterior surfaces	Standard commercial cleaning detergents free from acid or halides.
inner chamber	Alcohol-based solutions.
racks	We recommend using the neutral cleaning agent Art. No. 1002-0016.
door gaskets	
Instrument panel	Standard commercial cleaning detergents free from acid or halides.
	We recommend using the neutral cleaning agent Art. No. 1002-0016.
Zinc coated hinge parts	Standard commercial cleaning detergents free from acid or halides.
rear unit wall	Do NOT use a neutral cleaning agent on zinc coated surfaces.


Do not use cleaning agents that may cause a hazard due to reaction with components of the device or the charging material. If there is doubt regarding the suitability of cleaning products, please contact BINDER service.

	<p>We recommend using the neutral cleaning agent Art. No. Art. Nr. 1002-0016 for a thorough cleaning.</p> <p>Any corrosive damage that may arise following use of other cleaning agents is excluded from liability by BINDER GmbH.</p> <p>Any corrosive damage caused by a lack of cleaning, is excluded from liability by BINDER GmbH.</p>
---	---


	CAUTION
	<p>Danger of corrosion.</p> <p>Damage to the unit.</p> <ul style="list-style-type: none"> Ø Do NOT use acidic or chlorine cleaning detergents. Ø Do NOT use a neutral cleaning agent on other kind of surfaces e.g., the zinc coated hinge parts or the rear unit wall.

	<p>For surface protection, perform cleaning as quickly as possible.</p> <p>After cleaning, completely remove cleaning agents from the surfaces with a moistened towel. Let the unit dry.</p>
---	--







	<p>Soapsuds may contain chlorides and must therefore NOT be used for cleaning.</p>
--	--

	<p>With every decontamination method, always use adequate personal safety controls.</p>
---	---

Following cleaning, leave the unit door open or remove the access port plugs.

	<p>The neutral cleaning agent may cause health problems in contact with skin and if ingested. Follow the operating instructions and safety hints labeled on the bottle of the neutral cleaning agent.</p>
---	---

Recommended precautions: To protect the eyes use sealed protective goggles. Suitable protective gloves with full contact: butyl or nitrile rubber, penetration time >480 minutes.

    	 CAUTION
	<p>Contact with skin, ingestion.</p> <p>Skin and eye damage due to chemical burns.</p> <ul style="list-style-type: none"> Ø Do not ingest. Keep away from food and beverages. Ø Do NOT empty into drains. ➤ Wear protective gloves and goggles. ➤ Avoid skin contact.

9.2.2 Decontamination


The operator must ensure that proper decontamination is performed in case a contamination of the chamber by hazardous substances has occurred.


Disconnect the chamber from the power supply prior to decontamination. Pull the power plug.

Do not use decontamination agents that may cause a hazard due to reaction with components of the device or the charging material. If there is doubt regarding the suitability of cleaning products, please contact BINDER service.

You can use the following disinfectants:


Inner chamber	Standard commercial surface disinfectants free from acid or halides. Alcohol-based solutions. We recommend using the disinfectant spray Art. No. 1002-0022.
---------------	---

	For chemical disinfection, we recommend using the disinfectant spray Art. No. 1002-0022. Any corrosive damage that may arise following use of other disinfectants is excluded from liability by BINDER GmbH.
---	---



	With every decontamination method, always use adequate personal safety controls.
---	--


In case of impurity of the interior with biological or chemical hazardous material, there are three possible procedures depending on the type of contamination and of the charging material.

- (1) The drying and heating ovens FED can be hot air sterilized at 190 °C for at least 30 minutes. All inflammable goods must be removed from the interior before.
- (2) Spray the inner chamber with an appropriate disinfectant.
Before start-up, the unit must be absolute dry and ventilated, because explosive gases may form during the decontamination process.
- (3) If necessary, have strongly contaminated inner chamber parts removed by an engineer for cleaning, or have them exchanged. Sterilize the inner chamber parts in a sterilizer or autoclave.

	In case of eye contact, the disinfectant spray may cause eye damage due to chemical burns. Follow the operating instructions and safety hints labeled on the bottle of the disinfectant spray.
---	--


Recommended precautions: To protect the eyes use sealed protective goggles.

	 CAUTION
	Eye contact. Eye damage due to chemical burns. Ø Do NOT empty into drains. ➤ Wear protective goggles.



	After using the disinfectant spray, allow the unit to dry thoroughly, and aerate it sufficiently.
---	---

10.2 Decommissioning

Turn off units sizes 400 and 720 at the main power switch (10) and disconnect the unit from the power supply (pull the power plug).

	When turning off the main power switch ON / OFF (10), the stored parameters remain saved.
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- With option inert gas connection (chap. 8.5): Close the inert gas supply and remove the gas connection.

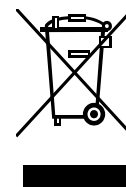
	 WARNING
	<p>High concentration of inert gas.</p> <p>Risk of death by suffocation.</p> <ul style="list-style-type: none"> ➤ Respect the relevant regulations for handling these gases. ➤ When decommissioning the unit, turn off the inert gas supply.

- Temporal decommissioning: See indications for appropriate storage, chap. 3.3.
- Final decommissioning: Dispose of the unit as described in chap. 10.3 to 10.5


10.3 Disposal of the unit in the Federal Republic of Germany

According to directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE), BINDER devices are classified as “monitoring and control instruments” (category 9) only intended for professional use“. They must not be disposed of at public collecting points.


The drying and heating oven FED bears the symbol for the marking of electrical and electronic equipment manufactured / placed on the market in the EC after 13 August 2005 and be disposed of in separate collection according to the directive 2002/96/EC on waste electrical and electronic equipment (WEEE) and German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG). WEEE marking: crossed-out wheeled bin with solid bar under. A significant part of the materials must be recycled in order to protect the environment.






At the end of the device's service life, have the device disposed of according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762 or contact BINDER Service who will organize taking back and disposal of the unit according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762.

	CAUTION
	<p>Violation against existing law.</p> <ul style="list-style-type: none"> Ø Do NOT dispose of BINDER devices at public collecting points. ➤ Have the device disposed of professionally at a recycling company that is certified according to the German national law for electrical and electronic equipment (Elektro- und Elektronikgerätegesetz, ElektroG) from 23 March 2005, BGBl. I p. 762. or ➤ Instruct BINDER Service to dispose of the device. The general terms of payment and delivery of BINDER GmbH apply, which were valid at the time of purchasing the unit.

Certified companies disassemble waste BINDER equipment in primary substances for recycling according to directive 2002/96/EC. The devices must be free from toxic, infectious or radioactive substances in order to eliminate any health hazards to the employees of the recycling companies.

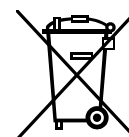
	<p>Prior to handing the unit over to a recycling company, it is the user's responsibility that it is free from toxic, infectious or radioactive substances.</p> <p>Prior to disposal, clean all introduced or residual toxic substances from the unit.</p> <p>Prior to disposal disinfect the unit from all sources of infection. Be aware of the fact that sources of infection may also be located outside the inner chamber.</p> <p>If you cannot safely remove all toxic substances and sources of infection from the unit, dispose of it as "special" waste according to national law.</p> <p>Fill out the contamination clearance certificate (chap. 13) and enclose it with the unit.</p>
---	--

 	<div style="background-color: orange; text-align: center; padding: 5px;"> WARNING</div> <p>Contamination of the device with toxic, infectious or radioactive substances.</p> <p>Danger of intoxication.</p> <p>Danger of infection.</p> <ul style="list-style-type: none"> Ø NEVER take a unit contaminated with toxic substances or sources of infection for recycling according to directive 2002/96/EC. ➤ Prior to disposal, remove all toxic substances and sources of infection from the unit. ➤ Dispose of a unit from which all toxic substances or sources of infection cannot be safely removed as special waste according to national law.
--	--


10.4 Disposal of the unit in the member states of the EC except for the Federal Republic of Germany

According to directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE), BINDER devices are classified as "monitoring and control instruments" (category 9) only intended for professional use". They must NOT be disposed of at public collecting points.


The drying and heating oven FED bears the symbol for the marking of electrical and electronic equipment manufactured / placed on the market in the EC after 13 August 2005 and be disposed of in separate collection according to the directive 2002/96/EC on waste electrical and electronic equipment (WEEE). WEEE marking: crossed-out wheeled bin with solid bar under.






At the end of the device's service life, notify the distributor who sold you the device, who will take back and dispose of the unit according to the directive 2002/96/EC of 27 January 2003 on waste electrical and electronic equipment (WEEE).



	<div style="background-color: yellow; text-align: center; padding: 5px;">CAUTION</div> <p>Violation against existing law.</p> <ul style="list-style-type: none"> Ø Do NOT dispose of BINDER devices at public collecting points. ➤ Have the device disposed of professionally at a recycling company that is certified according to conversion of the directive 2002/96/EC into national law. <i>or</i> ➤ Instruct the distributor who sold you the device to dispose of it. The agreements apply that were reached with the distributor when purchasing the unit (e.g. his general terms of payment and delivery). ➤ If your distributor is not able to take back and dispose of the unit, please contact BINDER service.
---	--

Certified companies disassemble waste BINDER equipment in primary substances for recycling according to directive 2002/96/EC. The devices must be free from toxic, infectious or radioactive substances in order to eliminate any health hazards to the employees of the recycling companies.

	<p>Prior to handing the unit over to a recycling company, it is the user's responsibility that it is free from toxic, infectious or radioactive substances.</p> <p>Prior to disposal, clean all introduced or residual toxic substances from the unit.</p> <p>Prior to disposal, disinfect the unit from all sources of infection. Be aware of the fact that sources of infection may also be located outside the inner chamber.</p> <p>If you cannot safely remove all sources of infection and toxic substances from the unit, dispose of it as "special" waste according to national law.</p> <p>Fill out the contamination clearance certificate (chap. 13) and enclose it with the unit.</p>
---	---

 	<div data-bbox="847 694 1126 763" style="background-color: orange; text-align: center; padding: 5px;">  WARNING </div> <p>Contamination of the device with toxic, infectious or radioactive substances.</p> <p>Danger of intoxication.</p> <p>Danger of infection.</p> <ul style="list-style-type: none"> Ø NEVER take a unit contaminated with toxic substances or sources of infection for recycling according to directive 2002/96/EC. ➤ Prior to disposal, remove all toxic substances and sources of infection from the unit. ➤ Dispose of a unit from which all toxic substances or sources of infection cannot be safely removed as "special" waste according to national law.
--	---

10.5 Disposal of the unit in non-member states of the EC

 	<div data-bbox="842 1254 1018 1301" style="background-color: yellow; text-align: center; padding: 5px;"> CAUTION </div> <p>Alteration of the environment.</p> <ul style="list-style-type: none"> ➤ For final decommissioning and disposal of the oven, please contact BINDER Service. ➤ Follow the statutory regulations for appropriate, environmentally friendly disposal.
--	--

The main board of the oven includes a lithium cell. Please dispose of it according to national regulations.

11. Troubleshooting

Fault description	Possible cause	Required measures
Temperature		
Set-point temperature is not reached after specified time.	Unit door not properly closed.	Completely close unit door.
	Door gasket defective.	Replace door gasket.
	Controller not adjusted..	Calibrate and adjust controller.
	Wrong voltage.	Check power supply for voltage of 115V or 230V.
The fan doesn't turn or turns too slowly.	Fan speed set too low	Set the fan speed to 100%.
	Fan defective.	Contact BINDER service.
Chamber heating permanently, set-point not held.	Controller defective.	Contact BINDER service.
	Pt 100 sensor defective.	
	Semiconductor relay defective	
	Controller not adjusted..	Calibrate and adjust controller.
Chamber doesn't heat up. Red heating control light in the display is lit.	Heating element defective.	Contact BINDER service.
	Semiconductor relay defective.	
Chamber doesn't heat up. Red heating control light in the display is not lit. Controller display working.	Timer has run off.	Program the timer or change to time function Continuous operation (chap. 6.3)
	Semiconductor relay defective.	Contact BINDER service.
	Controller defective.	
Unit without function, only the green "stand-by" LED is lit	Unit in stand-by mode	Press down the ON/OFF button (5) until the display lights up.
Unit without function. Red alarm pilot lamp of safety device (7a) is lit.	Safety device class 2 has turned off the chamber.	Let cool down the chamber and press down RESET button. Check the settings of the temperature set-point and of the safety device class 2 (chap. 7.1). If appropriate, select suitable limit value.
	Safety device class 2 defective.	Contact BINDER service.
Temperature inside the chamber too high, Red alarm pilot lamp of safety device (7a) is lit.	Safety device class 3.1 (option) has responded.	Check the settings of the temperature set-point and of the safety device class 3.1 (chap. 7.2).
Unit without any function.	No power supply.	Check connection to power supply.
	Unit fuse has responded.	Check unit fuse and replace it if appropriate. If it responds again, contact BINDER service.
	Controller defective.	Contact BINDER service.
Deviations from the indicated heating-up times.	Oven fully loaded.	Charge the oven less or consider longer heating-up times.
Controller		
Message „1999" in the controller display	Sensor rupture between sensor and controller.	Contact BINDER service.
The controller returns to Normal Display from any level.	No button was hit for more than approx. 30 sec.	Repeat entries, enter the values rapidly.



Only qualified service personnel authorized by BINDER must perform repair. Repaired units must comply with the BINDER quality standards.

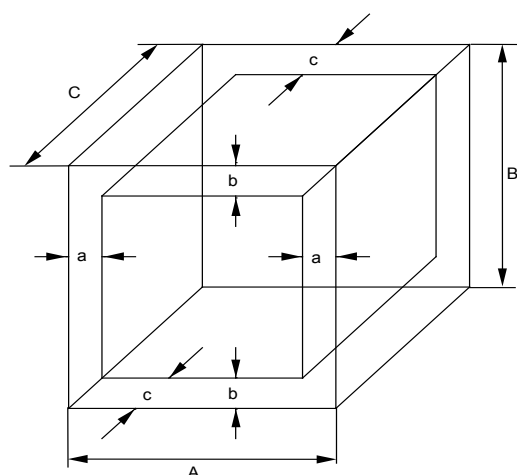
12. Technical description

12.1 Factory calibration and adjustment

This unit was calibrated and adjusted in the factory. Calibration and adjustment were performed using standardized test instructions, according to the QM DIN EN ISO 9001 system applied by BINDER (certified since December 1996 by TÜV CERT). All test equipment used is subject to the administration of measurement and test equipment that is also constituent part of the BINDER QM DIN EN ISO 9001 systems. They are controlled and calibrated to a DKD-Standard at regular intervals.

12.2 Definition of usable volume

The usable volume illustrated below is calculated as follows:



A, B, C = Internal dimensions (W, H, D)
a, b, c = Wall clearances

$$a = 0.1 \times A$$

$$b = 0.1 \times B$$

$$c = 0.1 \times C$$

$$V_{USE} = (A - 2a) \times (B - 2b) \times (C - 2c)$$

Figure 10: Determination of the useable volume

The technical data refers to the defined usable volume.



Do NOT place samples outside this usable volume.

Do NOT load this volume by more than half to enable sufficient airflow inside the chamber.

Do NOT divide the usable volume into separate parts with large area samples.

Do NOT place samples too close to each other in order to permit circulation between them and thus obtain a homogenous distribution of temperature.

12.3 Over current protection

Single-phase devices are protected by a miniature fuse against over current, accessible from the outside. The miniature fuse is located at the rear of the chamber below the strain relief of the power cord. The fuse holder is equipped with a fuse clip 5 mm x 20 mm (cUL-Version 6.3 mm x 32 mm). The fuse may be replaced only with a substitute of the same ratings. Refer to the technical data of the respective device type.

Three-phase devices are equipped with internal fuses not accessible from outside. If these fuses are blown, please inform an electronic engineer or BINDER Service.

12.4 FED technical data

Unit size		53	115	240	400	720
Exterior dimensions						
Width	mm inch	634 24.96	834 32.83	1034 40.71	1234 48.58	1234 48.58
Height (incl. feet/castors)	mm inch	617 24.29	702 27.64	822 32.36	1022 40.24	1528 60.16
Depth	mm inch	575 22.64	645 25.39	745 29.33	765 30.12	865 34.06
Depth incl. door handle, and exhaust duct	mm inch	90 3.54	90 3.54	90 3.54	90 3.54	90 3.54
Wall clearance rear	mm inch	100 3.94	100 3.94	100 3.94	100 3.94	100 3.94
Wall clearance side	mm inch	160 6.30	160 6.30	160 6.30	160 6.30	160 6.30
Exhaust duct, outer diameter	mm inch	52 2.05	52 2.05	52 2.05	52 2.05	52 2.05
Steam space volume	l cu.ft.	77 2.72	158 5.58	308 10.88	498 17.60	869 30.71
Number of door(s)		1	1	2	2	2
Interior dimensions						
Width	mm inch	400 15.75	600 23.62	800 31.50	1000 39.37	1000 39.37
Height	mm inch	400 15.75	480 18.90	600 23.62	800 31.50	1200 47.24
Depth	mm inch	330 12.99	400 15.75	500 19.69	500 19.69	600 23.62
Interior volume	l cu.ft.	53 1.9	115 4.1	240 8.6	400 14.3	720 25.7
Number of racks, regular / max.		2/4	2/6	2/7	2/10	2/15
Load per rack	Kg lbs	15 33	20 44	30 66	35 77	45 99
Permitted total load	Kg lbs	40 88	50 110	70 155	90 199	120 265
Weight (empty)	Kg lbs	44 97	62 137	96 212	145 320	195 430
Temperature data						
Temperature range, 5 °C / 9 °F above ambient up to		°C °F	300 572	300 572	300 572	300 572
Temperature fluctuation at 150 °C / 302 °F		≤± K	0.3	0.3	0.3	0.3
Temperature uniformity (variation) 1)	at 70 °C / 158 °F	± K	0.8	0.7	0.8	1
	at 150 °C / 302 °F	± K	2	1.8	2	2.5
	at 300 °C / 572 °F	± K	3.7	3.9	4.3	5.5
Heating up time 2)	to 70 °C / 158 °F	min	6	7	12	18
	to 150 °C / 302 °F	min	24	30	27	35
	to 250 °C / 482 °F	min	45	49	50	60
Recovery time after door was opened for 30 sec 2)	at 70 °C / 158 °F	min	2	2	2	2
	at 150 °C / 302 °F	min	5	8	10	17
	at 300 °C / 572 °F	min	10	15	16	21

Unit size			53	115	240	400	720
Ventilation data							
Air change	at 70 °C / 158 °F	x/h	***	29	19	17	11
	at 150 °C / 302 °F	x/h	43	32	20	18	12
	at 300 °C / 572 °F	x/h	66	26	18	16	10
Electrical data							
IP system of protection acc. to EN 60529			20	20	20	20	20
Nominal voltage (±10 %) 50/60 Hz		V	230 1N~	230 1N~	230 1N~	400 3N~	400 3N~
Nominal power		kW	1.20	1.60	2.70	3.40	5.00
Energy consumption	at 70 °C / 158 °F	Wh/h	162	230	370	520	570
	at 150 °C / 302 °F	Wh/h	397	544	850	1200	1320
	at 300 °C / 572 °F	Wh/h	933	1100	1400	2340	2600
Unit fuse 5 x 20 mm 230V / 10A / middle-time-lag (M)		A	10 A external	10 A external	16 A external	--	--
Over-current release category B			--	--	--	3 x 16A internal	3 x 16A internal
Power plug			shock proof plug			CEE plug 5 poles	
Installation category acc. to IEC 61010-1			II	II	II	II	II
Pollution degree acc. to IEC 61010-1			2	2	2	2	2


Electrical connection data FED-UL constructed acc. to cUL standard (for USA and Canada)

Unit size		53-UL	115-UL	240-UL	400-UL	720-UL
Electrical data						
Nominal voltage (±10%) 60 Hz		V	115 1N~	115 1N~	208 3N~	208 3N~
Power plug		NEMA	5-20P	5-20P	L21-20P	L21-20P
Nominal power		kW	1.20	1.60	2.70	3.40
Unit fuse 6,3 x 32 mm 250V / super-time-lag TT		A	16	16	16	20
			external	external	3 x internal	3 x internal


Legend: 1) without outer glass door 2) up to 98 % of the set value

All technical data is specified for unloaded units with standard equipment at an ambient temperature of +25 °C and a power supply voltage fluctuation of ±10. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances of 10 % of the height, width and depth of the inner chamber. Technical data refer to 100% fan speed.

All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

	If the cabinet is fully loaded, the specified heating up times may vary according to the load.
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12.5 Equipment and Options

	To operate the drying and heating oven FED, use only original BINDER accessories or accessories / components from third-party suppliers authorized by BINDER. The user is responsible for any risk arising from using unauthorized accessories.
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Unit size		53	115	240	400	720
Standard equipment						
Microprocessor temperature controller with LED display and several time functions		•	•	•	•	•
Controller Timer functions: Delayed ON, delayed Off and temperature dependent delayed OFF		•	•	•	•	•

Unit size	53	115	240	400	720
Standard equipment (continued)					
Temperature safety device class 2 acc. to DIN 12880 with visual temperature alarm	●	●	●	●	●
Adjustable ramp function	●	●	●	●	●
Rear exhaust duct, internal diameter 50 mm / 1,97 inch with ventilation slide	●	●	●	●	●
Adjustable air change by means of rear exhaust duct (50 mm) with ventilation flap and front ventilation slide	●	●	●	●	●
Four castors (2 lockable)	--	--	--	--	●
2 racks, chrome-plated	●	●	●	●	●
RS 422 interface for communication software APT-COM™ DataControlSystem, or switch over to printer output with RS 232/RS 422 interface converter	●	●	●	●	●

Unit size	53	115	240	400	720
Options / accessories					
Access ports with various diameters, with silicone plug	○	○	○	○	○
Rack, chrome-plated or stainless steel	○	○	○	○	○
Perforated rack, stainless steel	○	○	○	○	○
Rack lockings (4 pieces)	○	○	○	○	○
Reinforced rack stainless steel, with 1 set rack lockings	--	--	○	○	○
Reinforced inner chamber with 2 reinforced racks	--	--	○	○	○
Rubber pads for safe stacking (4 pieces)	○	○	○	--	--
Temperature safety device class 3.1 acc. to DIN 12880	○	○	○	○	○
Disconnectable audible over-temperature alarm	○	○	○	○	○
Door with window and interior lightning	○	○	○	○	○
Lockable door	○	○	○	○	○
FKM door gasket (temperature resistant up to 200 °C)	○	○	○	○	○
HEPA Fresh air filter, class H 14 (DIN EN 1822)	○	○	○	○	○
Measurement of air change rate acc. to ASTM D5374	○	○	○	○	○
Increased air change by stronger fan	○	○	○	○	○
Mostly gas-tight version	○	○	--	--	--
Inert gas connection (gas inlet and outlet), with mostly gas-tight version	○	○	--	--	--
Analog output 4-20 mA for temperature with 6 pole DIN socket, DIN plug included	○	○	○	○	○
Data Logger Kit T 350	○	○	○	○	○
Temperature calibration including certificate	○	○	○	○	○
Spatial temperature measurement including certificate	○	○	○	○	○
Qualification folder	○	○	○	○	○
Unit acc. to cUL standard in 115V 1N~60Hz	○	○	--	--	--
Unit acc. to cUL standard in 208 V 3N~60Hz	--	--	○	○	○
Base on castors	--	○	○	--	--
Sturdy trolley, castors with locking brakes	○	○	○	○	--

Legend: ● Standard equipment ○ Optional -- Not available

12.6 Accessories and spare parts

	BINDER GmbH is responsible for the safety features of the unit only, provided skilled electricians or qualified personnel authorized by BINDER perform all maintenance and repair, and if components relating to chamber safety are replaced in the event of failure with original spare parts. The user is responsible for any risks arising from using unauthorized accessories/components.
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Unit size	53	115	240	400	720
Description	Art. No.				
Rack, chrome-plated	6004-0002	6004-0003	6004-0004	6004-0005	6004-0006
Rack, stainless steel	6004-0007	6004-0008	6004-0009	6004-0011	6004-0010
Perforated rack, stainless steel	6004-0029	6004-0030	6004-0031	6004-0032	6004-0033
Door gasket silicone	6005-0095	6005-0096	6005-0097	6005-0069	6005-0099
Door gasket made of FKM (temperature resistant up to 200 °C)	8012-0494	8012-0495	8012-0496	8012-0497	8012-0498
Stable table on wheels with castors and locking brakes	9051-0018	9051-0018	9051-0019	9051-0019	--
Rubber pads for safe stacking (4 pieces)	8012-0001	8012-0001	8012-0001	--	--
Unit fuse 5x20mm 250V 10A semi time lag (M)	5006-0013	5006-0013	5006-0013	--	--
Over-current release category B 16 A	--	--	--	5006-0042	5006-0042

Description	Art. No.
Thermal cut-off device class 1	5006-0037
R3.2 controller	5014-0188
RS422 interface board	5014-0189
Thermostat class 2 30° to 320 °C	5006-0031
Turning knob for thermostat class 2	8009-0004
Data logger Kit T350	8012-0714
Data logger software, including converter-cable	8012-0821
Pilot lamp red	5008-0003
Pilot lamp green	5008-0001
Temperature sensor Pt 100 bend-off	5002-0022
Rack lockings (4 pieces)	8012-0531
HEPA Fresh air filter, class H 14 (DIN EN 1822)	8012-0076
Measurement of air change rate acc. to ASTM D5374	8012-0195
Calibration of temperature including certificate	DL004021
Spatial temperature measurement including certificate (2-5 measuring points)	DL004022
Spatial temperature measurement including certificate (6-9 measuring points)	DL004023
Spatial temperature measurement including certificate (10-18 measuring points)	DL004024
Spatial temperature measurement acc. to DIN 12880 including certificate (27 measuring points)	DL004025
Measurement of air ventilation acc. to ASTM D 5374, including certificate	DL004026
Qualification folder	DL004031
Neutral cleaning agent, 1 kg	1002-0016

13. Contamination clearance certificate


13.1 For units located outside North America and Central America

Declaration with regard to safety and health

Erklärung zur Sicherheit and gesundheitlichen Unbedenklichkeit

The German Ordinance on Hazardous Substances (GefStoffV), and the regulations regarding safety at the workplace, require that this form be filled out for all products that are returned to us, so that the safety and health of our employees can be warranted.

Die Sicherheit und Gesundheit unserer Mitarbeiter, die Gefahrstoffverordnung GefStoffV und die Vorschriften zur Sicherheit am Arbeitsplatz machen es erforderlich, dass dieses Formblatt für alle Produkte, die an uns zurückgeschickt wird.

	In the absence of a completely filled out form, a repair is not possible. Ohne Vorliegen des vollständig ausgefüllten Formblattes ist eine Reparatur nicht möglich.
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- A completely filled out form should be transmitted by Fax (+49 (0) 7462 2005 93555) or by letter in advance to us, so that this information is available before the equipment/component part arrives. A second copy of this form should accompany the equipment/component part. Eventually the carrier should be informed.

Eine vollständig ausgefüllte Kopie dieses Formblattes soll per Telefax (Nr. +49 (0) 7462 2005 93555) oder Brief vorab an uns gesandt werden, so dass die Information vorliegt, bevor das Gerät/Bauteil eintrifft. Eine weitere Kopie soll dem Gerät/Bauteil beigelegt sein. Ggf. ist auch die Spedition zu informieren.

- Incomplete information or non-conformity with this procedure will inevitably lead to substantial delays in processing. We hope you will have understanding for this measure, which lies outside of our area of influence, and that you will help us to speed up this procedure.

Unvollständige Angaben oder Nichteinhalten dieses Ablaufs führen zwangsläufig zu beträchtlichen Verzögerungen in der Abwicklung. Bitte haben Sie Verständnis für Maßnahmen, die außerhalb unserer Einflussmöglichkeiten liegen und helfen Sie mit, den Ablauf beschleunigen.

- Please fill out this form completely.**

Bitte unbedingt vollständig ausfüllen!

1. Unit/ component part / type: / Gerät / Bauteil / Typ:
2. Serial No./ Serien-Nr.:
3. Details about utilized substances / biological substances / Einzelheiten über die eingesetzten Substanzen/biologische Materialien:
3.1 Designations / Bezeichnungen: a) _____ b) _____ c) _____
3.2 Safety measures required for handling these substances / Vorsichtsmaßnahmen beim Umgang mit diesen Stoffen: a) _____ b) _____ c) _____

3.3	Measures to be taken in case of skin contact or release into the atmosphere / Maßnahmen bei Personenkontakt oder Freisetzung: a) _____ b) _____ c) _____ d) _____
3.4	Other important information that must be taken into account / Weitere zu beachtende und wichtige Informationen: a) _____ b) _____ c) _____
4.	Declaration on the risk of these substances (please checkmark the applicable items) / Erklärung zur Gefährlichkeit der Stoffe (bitte Zutreffendes ankreuzen) :
<input type="checkbox"/> 4.1 For non toxic, non radioactive, biologically harmless materials / für nicht giftige, nicht radioaktive, biologisch ungefährliche Stoffe: We herewith guarantee that the above-mentioned unit / component part... / Wir versichern, dass o.g. Gerät/Bauteil... <input type="checkbox"/> Has not been exposed to or contains any toxic or otherwise hazardous substances / weder giftige noch sonstige gefährliche Stoffe enthält oder solche anhaften. <input type="checkbox"/> That eventually generated reaction products are non-toxic and also do not represent a hazard / auch evtl. entstandene Reaktionsprodukte weder giftig sind noch sonst eine Gefährdung darstellen. <input type="checkbox"/> Eventual residues of hazardous substances have been removed / evtl. Rückstände von Gefahrstoffen entfernt wurden.	
<input type="checkbox"/> 4.2 For toxic, radioactive, biologically harmful or hazardous substances, or any other hazardous materials / für giftige, radioaktive, biologisch bedenkliche bzw. gefährliche Stoffe oder anderweitig gefährliche Stoffe. We herewith guarantee that ... / Wir versichern, dass ... <input type="checkbox"/> The hazardous substances, which have come into contact with the above-mentioned equipment/component part, have been completely listed under item 3.1 and that all information in this regard is complete / die gefährlichen Stoffe, die mit dem o.g. Gerät/Bauteil in Kontakt kamen, in 3.1 aufgelistet sind und alle Angaben vollständig sind. <input type="checkbox"/> That the unit /component part has not been in contact with radioactivity / das Gerät/Bauteil nicht mit Radioaktivität in Berührung kam	
5.	Kind of transport / transporter / Transportweg/Spediteur: Transport by (means and name of transport company, etc.) Versendung durch (Name Spediteur o.ä.) _____ Date of dispatch to BINDER GmbH / Tag der Absendung an BINDER GmbH: _____

We herewith declare that the following measures have been taken / Wir erklären, dass folgende Maßnahmen getroffen wurden:

- ☐ Hazardous substances were removed from the unit / component part, so that no hazard exists for corresponding persons in the handling or repair of these items / das Gerät/Bauteil wurde von Gefahrstoffen befreit, so dass bei Handhabung/Reparaturen für die betreffenden Person keinerlei Gefährdung besteht
- ☐ The unit was securely packaged and properly identified / das Gerät wurde sicher verpackt und vollständig gekennzeichnet.
- ☐ Information about the hazardousness of the shipment (if required) has been provided to the transporter / der Spediteur wurde (falls vorgeschrieben) über die Gefährlichkeit der Sendung informiert.

We herewith commit ourselves and guarantee that we will indemnify BINDER GmbH for all damages that are a consequence of incomplete or incorrect information provided by us, and that we will exempt BINDER GmbH from eventual damage claims by third parties./ Wir versichern, dass wir gegenüber BINDER für jeden Schaden, der durch unvollständige und unrichtige Angaben entsteht, haften und BINDER gegen eventuell entstehende Schadenansprüche Dritter freistellen.

We are aware that, in accordance with Article 823 of the German Civil Code (BGB), we are directly liable with regard to third parties, in this instance especially the employees of BINDER GmbH, who have been entrusted with the handling / repair of the unit / component. / Es ist uns bekannt, dass wir gegenüber Dritten – hier insbesondere mit der Handhabung/Reparatur des Geräts/des Bauteils betraute Mitarbeiter der Firma BINDER – gemäß §823 BGB direkt haften

Name: _____

Position: _____

Date / Datum: _____

Signature / Unterschrift: _____

Company stamp / Firmenstempel:



Equipment that is returned to the factory for repair must be accompanied by a completely filled out contamination clearance certificate. For service and maintenance works on site, such a contamination clearance certificate must be submitted to the service technician before the start of the works. No repair or maintenance of the equipment is possible, without a properly filled out contamination clearance certificate.

13.2 For units in North America and Central America

Product Return Authorization Request

Please complete this form and the Customer Decontamination Declaration (next 2 pages) and attach the required pictures. E-mail to: IDL_SalesOrderProcessing_USA@binder-world.com

After we have received and reviewed the complete information we will decide on the issue of a RMA number. Please be aware that size specifications, voltage specifications as well as performance specifications are available on the internet at www.binder-world.us at any time.

Take notice of shipping laws and regulations.

	Please fill:	
Reason for return request	<input type="radio"/> Duplicate order	
	<input type="radio"/> Duplicate shipment	
	<input type="radio"/> Demo	<i>Page one completed by sales</i>
	<input type="radio"/> Power Plug / Voltage	115V / 230 V / 208 V / 240V
	<input type="radio"/> Size does not fit space	
	<input type="radio"/> Transport Damage	Shock watch tripped? (pictures)
	<input type="radio"/> Other (specify below)	

Is there a replacement PO?	<input type="radio"/> Yes <input type="radio"/> No	
<i>If yes -> PO #</i>		
<i>If yes -> Date PO placed</i>		
Purchase order number		
BINDER model number		
BINDER serial number		
Date unit was received		
Was the unit unboxed?	<input type="radio"/> Yes <input type="radio"/> No	
Was the unit plugged in?	<input type="radio"/> Yes <input type="radio"/> No	
Was the unit in operation?	<input type="radio"/> Yes <input type="radio"/> No	
<i>Pictures of unit attached?</i>	<input type="radio"/> Yes <input type="radio"/> No	Pictures have to be attached!
<i>Pictures of Packaging attached?</i>	<input type="radio"/> Yes <input type="radio"/> No	

	Customer Contact Information	Distributor Contact Information
Name		
Company		
Address		
Phone		
E-mail		

Customer (End User) Decontamination Declaration

Health and Hazard Safety declaration

To protect the health of our employees and the safety at the workplace, we require that this form is completed by the user for all products and parts that are returned to us. (Distributors or Service Organizations cannot sign this form)



NO RMA number will be issued without a completed form. Products or parts returned to our NY warehouse without a RMA number will be refused at the dock.

A second copy of the completed form must be attached to the outside of the shipping box.

1.	Unit/ component part / type:
2.	Serial No.
3.	List any exposure to hazardous liquids, gasses or substances and radioactive material
3.1	List with MSDS sheets attached where available or needed (if there is not enough space available below, please attach a page):
a)	_____
b)	_____
c)	_____
3.2	Safety measures required for handling the list under 3.1
a)	_____
b)	_____
c)	_____
3.3	Measures to be taken in case of skin contact or release into the atmosphere:
a)	_____
b)	_____
c)	_____
d)	_____
3.4	Other important information that must be considered:
a)	_____
b)	_____
c)	_____

4. Declaration of Decontamination

For toxic, radioactive, biologically and chemically harmful or hazardous substances, or any other hazardous materials.

We hereby guarantee that

- 4.1 Any hazardous substances, which have come into contact with the above-mentioned equipment / component part, have been completely listed under item 3.1 and that all information in this regard is complete.
- 4.2 That the unit /component part has not been in contact with radioactivity
- 4.3 Any Hazardous substances were removed from the unit / component part, so that no hazard exists for a persons in the shipping, handling or repair of these returned unit
- 4.4 The unit was securely packaged in the original undamaged packaging and properly identified on the outside of the packaging material with the unit designation, the RMA number and a copy of this declaration.
- 4.5 Shipping laws and regulations have not been violated.

I hereby commit and guarantee that we will indemnify BINDER Inc for all damages that are a consequence of incomplete or incorrect information provided by us, and that we will indemnify and hold harmless BINDER Inc. from eventual damage claims by third parties.

Name: _____

Position: _____

Company: _____

Address: _____

Phone #: _____

Email: _____

Date: _____

Signature: _____



Equipment returned to the NY warehouse for repair must be accompanied by a completed customer decontamination declaration. For service and maintenance works on site, such a customer decontamination declaration must be submitted to the service technician before the start of work. No repair or maintenance of the equipment is possible without a completed form.