Weiss Technik FDC018

Fingerprint Development Chamber

Technical Specification

Introduction

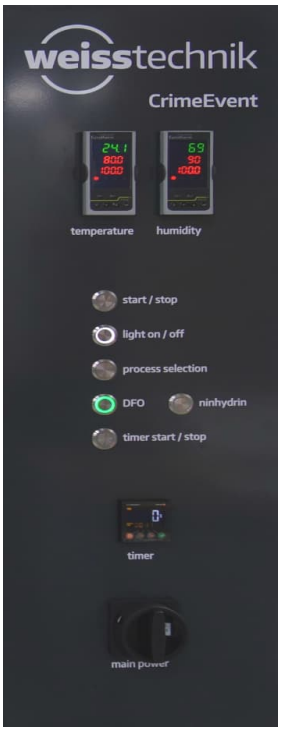
The FDC018 fingerprint development chamber was developed in collaboration with the UK Home Office Group for the rapid development of fingerprints using DFO and Ninhydrin processes. However it is also suitable for other processes requiring similar conditions of temperature and humidity such as 5-MTN and IND (Indandione).

The FDC018 complies with the Home Office Fingerprint Visualisation manual for development of fingerprints on a variety of porous surfaces. It is used by almost every police and forensic service in the United Kingdom and numerous services worldwide including both Australia and the USA.

The FDC018 is a bench top, 185litre capacity chamber designed to enable batch development of fingerprints at conditions of elevated temperature and with or without controlled relative humidity.

User benefits include:

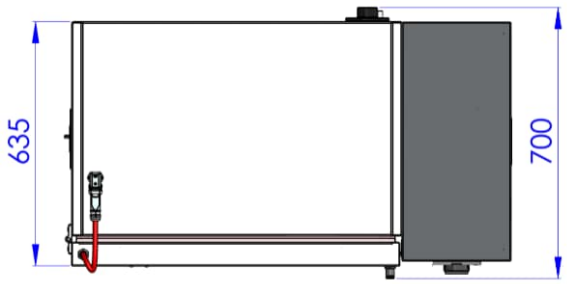
Speed- prints are developed in as little as three minutes
Volume- large numbers of samples can be processed
Efficiency-greater throughput in faster time
Clarity- controlled conditions ensure optimum clarity
Flexibility- can accommodate small and large objects
Calibration- in order to obtain or maintain ISO 17025

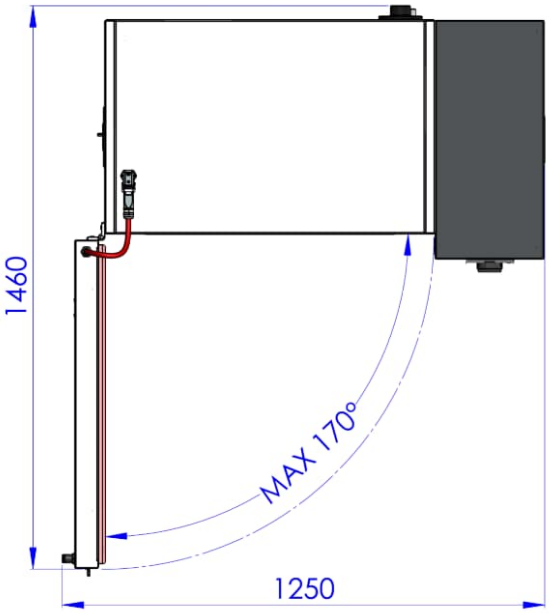


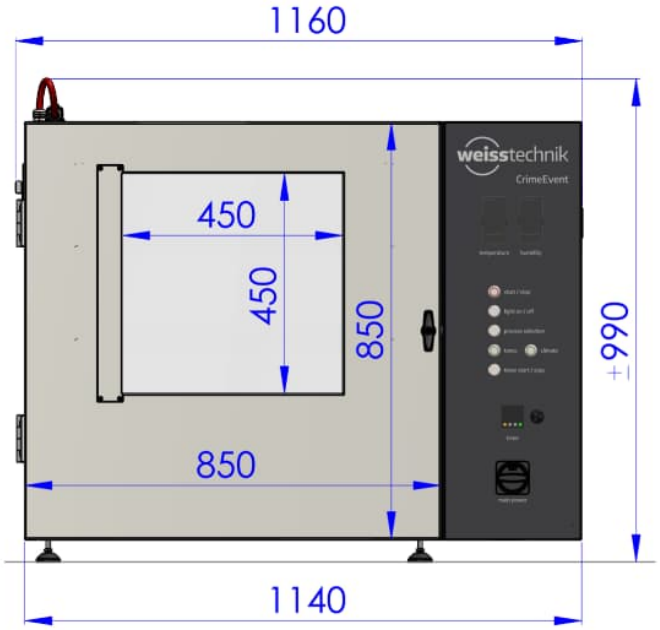
Dimensions FDC018

External Dimensions

Width (Chamber)	1140 mm
Width (incl. Fittings)	1160 mm
Width (with door open 90°)	1250 mm
Depth (Chamber)	635 mm
Depth (Incl. Fittings)	700 mm
Depth (Incl. Fittings & Door Swing)	1460 mm
Height (from Standing Surface)	990 mm
Door (wxh)	850 x 850 mm
Window (wxh, nominal)	450 x 450 mm

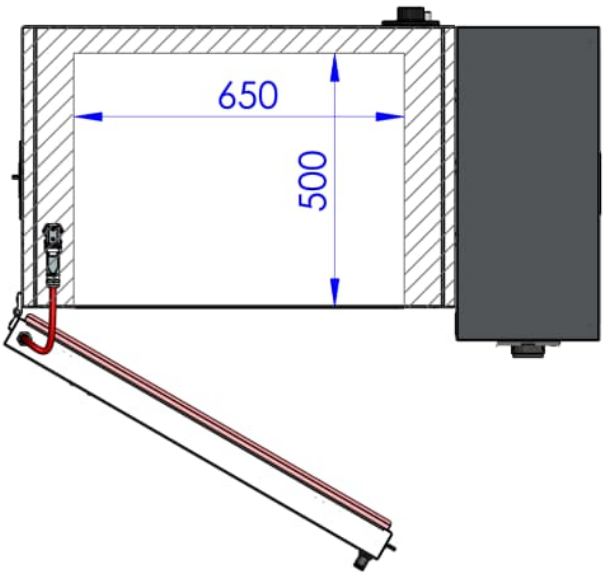


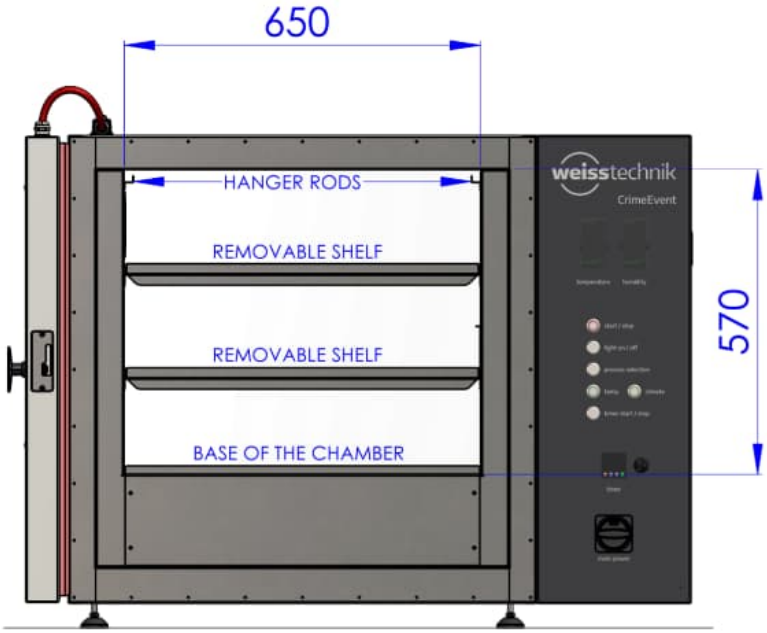




Internal Dimensions

Width (Sample Space)	650 mm
Depth (Sample Space)	500 mm
Shelf Area	0.325 m^2
Max Height (Sample Space)	570 mm
Removable Shelves	2 per chamber
Total Sample Area (over 2 shelves and base of chamber)	0.975 m^2
Volume (Sample Space)	ca. 185 liter





Chamber Construction

Interior:	Stainless Steel 304.
Exterior:	Zinc coated mild steel with painted textured finish.
Insulation:	50mm mineral wool, CFC and asbestos-free.
Equipment:	All fabricated equipment exposed to the conditioning air is constructed from 304 grade stainless steel. The use of aluminum inside the sample space is minimalized to reduce the risk of corrosion when using process chemicals in the chamber. For ease of service, all fixings are metric.
Door:	Fully insulated door, side hinged to left with multi-glazed observation window. The window is heated to remove condensate from the inside surface of the glass. The door is fitted with an observation light, switched on and off from the control panel. The door handle incorporates a key operated lock.

Climatic Performance

Temperature Range	Temperature Variation
Controlled from +40°C to +100°C	Stability (in time at the control point) ±0.3°C Uniformity (in centre of sample space) ±1.0°C
Humidity Range (over the specified temperature range)	**Humidity Variation**
Controlled from 50%RH to 90%RH	Stability (in time at the control point) ±3%

Conditioned Air Velocity
ca. 0.2 m/s (Turbulent) in centre of the sample space (empty chamber)

Control

The Weiss Technik FDC018 Fingerprint Development Chamber is designed for the rapid development of latent fingerprints on porous surfaces using DFO and Ninhydrin processes.

DFO Process:	The DFO process is enhanced by subjecting the samples to elevated temperatures with low humidity. The process switch is moved to the position where the “temp” light is illuminated. This disables the humidifier (VPG) and the humidity controller. The temperature controller is set to 100°C. When the chamber has reached a steady state, the samples are placed in the chamber for the required time which is set on the timer. The timer will give an audible indication when the set time has elapsed.
Ninhydrin Process:	The Ninhydrin process is enhanced by subjecting the samples to elevated temperatures and high humidity (normally 80°C and 62% RH) The process switch is moved to the position where the “climate” light is illuminated. The temperature controller is set to 80°C and the humidity controller is set to 62%. When the chamber has reached a steady state, both in terms of temperature and humidity, the samples are placed in the chamber for the required time which is set on the timer. The timer will give an audible indication when the set time has elapsed. The FDC018 chamber is also suitable for similar processes which require high temperature and high humidity (e.g. 5-MTN) and processes requiring conditions similar to the DFO process (e.g. 1,2-Indanedione)
Recovery Time:	The chamber is designed to exceed the requirements of the UK Home Office Group in respect of recovery time. The group’s criteria are that, at a steady state condition of 80°C / 62% RH, upon opening the chamber door for 1 minute, the temperature should recover to at least 76°C and the relative humidity to 58% RH within 5 minutes.
Controllers:	The Temperature Controller and the Humidity Controller show both the temperature/humidity setpoints and the actual conditions as measured by the temperature and humidity probe situated in the conditioned airflow, exhaust.

Systems

Pre-conditioning Chamber:	The insulated interior of the chamber is divided into two sections. The lower section, beneath the floor of the sample space, is the pre-conditioning chamber. Here the recirculating air is thoroughly mixed, heated and humidified, before being introduced into the sample space.
Sample Space:	Situated above the pre-conditioning chamber, samples to be subjected to the process selected are placed on the two shelves or the chamber base. To accommodate larger samples, the two shelves are removable.
Airflow:	The conditioned air is drawn from the pre-conditioning chamber to the sample space via a plenum wall at the side of the chamber. The air moves in a turbulent manner at a nominal speed of 0.2m/s across the sample space and back to the pre-conditioning chamber via a similar plenum wall on the opposite side.
Sensors:	Temperature Pt100 and capacitance relative humidity sensor, capacitance sensors are positioned inside the right-hand side plenum wall and measure the temperature and relative humidity of the recirculating air.
Heating:	A highly efficient, low watt density electrical resistive heater is used to give a long life, improved durability and fast temperature change rates.
Humidity:	The chamber uses a Weiss Technik designed and manufactured, vapour phase generator. (VPG) The VPG uses a powerful electrical heater to generate steam by boiling water. The use of the proportioning controller and the capacitance sensor, provide optimum control of steam generation and excellent humidity recovery rates. The use of steam generation to provide additive humidity removes the possibility of water-borne infections such as Legionella and does not require periodic dump-down of water.
Safety Thermostat:	The chamber is fitted with a high temperature limiting device, independent of the controller. In the event that the temperature exceeds the maximum limit, this safety thermostat will switch off the chamber.

Options

Purified Water Generation: The chamber can be supplied with either free-standing disposable de-ioniser cartridges or an recirculating pure water system to provide suitable water to the VPG humidifier when a central pure water supply does not exist.

Site Requirements

Electrical Supply:

Either:	230V 50Hz Phase L-N
Or:	230V 60Hz Phase L-L or L-N
Maximum Current:	Max. 13A.
Protection Required:	16A slow blow protection per phase.
Heat Dissipation:	ca. 1.8kW at 230V

Water Requirements:

Water Quality:	Low total dissolved solids, typically 5-20µS/cm conductivity
Water Pressure:	0.2 to 1 bar.
Water Flow:	Max. 1 Litre/hour
pH Level:	6 to 7

Water Drainage: Low level drain from chamber floor at rear and VPG overflow on RHS

Ambient Conditions: The chamber is designed to operate within an ambient range of +12°C to +25°C

Intended Use: The FDC018 chamber is intended for use only as a fingerprint development chamber and related applications. It is not to be used for human, medical and animal applications. It is not to be used for food or pharmaceutical storage.

Chamber Venting

All of the chemicals used in the development of latent fingerprints in the Fingerprint Development Chamber are either toxic, flammable, or both. It is essential that the correct procedures are followed in the application of these chemicals and that the samples are completely dry before being placed in the chamber.

During the development process, the conditioned air inside the chamber will contain small amounts of these chemicals, so it is important that the chamber is correctly and safely vented.

In use, the air being expelled from the exhaust vent at the rear of the chamber must be directed to a suitable fume extraction facility (fume hood, extraction duct, etc.) The chamber is fitted with a 50mm/2" spigot to which a suitable hose may be attached. It should be noted that the material used for this hose should be suitable for the exhaust air being expelled, which may be hot (up to 100°C) and the combination of process chemicals and high humidity may result in the air being slightly corrosive.

If using an extraction duct, it should be noted that the extract air may be flammable. It is the responsibility of the customer to ensure that the building extract systems are suitable for use with this equipment.

Ideally, the extract duct should be unpressurised.

If at a positive pressure, this may affect the ability of the chamber to ventilate and could cause problems with the recirculating air being expelled from the vent on the left hand side of the chamber.

If the duct is at a negative pressure (i.e. active extraction) it should not be allowed to extract more than 12 volumes per hour (2.22m^3/hr) otherwise the chamber may not be able to maintain the required conditions. Suitable damper devices or reduction valves would need to be fitted to the extract connections to prevent this maximum ventilation rate from being exceeded.

Failure to allow sufficient ventilation may result in excessive build-up of potentially harmful compounds in the chamber and possible chamber damage as a result of corrosive residues. Damage to the chamber as a result of these corrosive residues will not be covered by the chamber warranty.