The new 5008 CorDiax
Beyond your expectations

Best therapies
Advanced therapy options such as HighVolume HDF® enable Cardioprotective Haemodialysis – for best possible patient outcomes

Best handling
Sophisticated design guarantees outstanding usability and convenient handling for all users

Optimal use of resources
Efficient and sustainable use of dialysis-relevant resources result in excellent cost-effectiveness
Cardioprotective Haemodialysis

The reduction of risk factors for cardiovascular diseases (CVD) is core to the development of dialysis systems and products at Fresenius Medical Care. Outstanding cardioprotection must be reflected in all levels of product development and application.

Wide-ranging cardioprotection

There have been tremendous improvements in the quality and efficacy of haemodialysis (HD) therapy in recent years. Despite this, cardiovascular diseases (CVD) remain the leading cause of death for patients with end-stage renal disease (ESRD).

Best therapies

Advanced therapy options such as HighVolumeHD® enable Cardioprotective Haemodialysis – for best possible patient outcomes.

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Cardioprotective

Products

State-of-the-art technologies enable advanced cardioprotective therapies.

- CoDiax product line: 5008 CoDiax and 5008S CoDiax
- FX® CoDiax dialysers
- BCM® Body Composition Monitor
- Classic product line: 4008S, 5008S
- Therapy Data Management System (TDMS)
- Online Purification Cascade (OPC)

Technical Data 5008 CoDiax

<table>
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<tr>
<th>Category</th>
<th>CoDiax 5008S MAX</th>
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<td>DiaSafe® - Delivery System (CDS): 0.05 to 2.0 bar</td>
<td>DiaSafe® - Delivery System (CDS): 0.05 to 2.0 bar</td>
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<td>0°C to 40°C (32°F to 104°F)</td>
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<td></td>
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<td>± 0.5%</td>
<td>± 0.5%</td>
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<td>Max. drain height</td>
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<tr>
<td>Max. drain height</td>
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<td>500 mm</td>
<td>500 mm</td>
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</tr>
</tbody>
</table>

* Additional programme combinations available. Technical data subject to change without notice.
Moreover, both overall and cardiovascular mortality are markedly greater in ESRD patients than in the general population. This is why we put Cardioprotective Haemodialysis on the SPOT. A comprehensive approach that includes services, products and therapies is needed to achieve the best therapeutic performance — meaning improved clinical outcomes and better quality of life, enhanced control of therapy costs, and simpler, safer handling.

**Outcomes**

Achieving better outcomes with cardioprotective therapies.
- Reduced mortality risk
- Fewer cardiovascular complications
- Optimised use of resources

**Therapies**

Cardioprotective therapies designed by the world market leader in haemodialysis.
- High-Flux dialysis
- HighVolumeHDF®
- Advanced Fluid Management
Chronic kidney disease (CKD), as well as dialysis itself, can lead to cardiovascular alterations such as atherosclerosis and left ventricular hypertrophy (LVH), the largest causes of death in haemodialysis patients.¹

Fresenius Medical Care’s mission is to enable nephrologists to provide the best possible therapy for their long-term haemodialysis patients in order to minimise the risk of CVD.

The central point of Cardioprotective Haemodialysis is haemodiafiltration. By achieving high substitution volumes, HighVolumeHDF® therapy is credited with more effective elimination of middle molecules. With its numerous positive effects on cardiovascular risk factors, HighVolumeHDF® is currently considered as the most efficient renal replacement therapy.

Fresenius Medical Care is focused on continuous development and advancement to meet the changing requirements of dialysis today. Therefore, we are always in search of opportunities for improvement. The result of these efforts is our new product line CorDiax, which provides products for superior cardioprotective therapies.

Our latest machine software upgrades the 5008 Therapy System to the CorDiax product line, where it builds a perfect synergy with our FX CorDiax dialysers.

The highlights of this software are an innovative method for performing HighVolumeHDF® – AutoSub plus – and sophisticated safety features for venous access monitoring, allowing you to provide highly safe and effective treatment to your patients.

In fact, the new 5008 CorDiax is impressive not only thanks to the best therapy modalities, but also due to the perfect fusion of easy handling and thoughtful use of dialysis-relevant resources, representing the following three cornerstones:

**Best therapies**
- Effective removal of middle molecular toxins
- Defining and achieving the optimal dry weight
- Individual temperature control
- Ensuring effective dialysis dose
- Highest level of patient safety
- The right fit for paediatric patients

References
1. de Jager D. et al., JAMA (2009); 302: 1782-1789.
Best handling

- Optimised ergonomics
- Comfortable handling due to automated workflows
- Easy, rapid and safe data management
- Well-designed user interface

Optimal use of resources

- Optimised workflows
- Efficient and sustainable
- Unmatched service-friendliness

Various therapy concepts complement each other, thanks to the flexibility of the new 5008 CorDiax. The 5008 CorDiax is a perfect system for advanced cardioprotective therapies to cope with the growing number of medically challenging patients.
Protect your Patient

Best therapies

Nephrologists are today increasingly confronted with medically challenging haemodialysis patients who often suffer from multiple comorbidities such as CVD or diabetes. They have to consider potential intradialytic side effects as well as the long-term prognosis of their patients.

Our mission is to optimise therapies to achieve the best possible patient outcomes. The goal of the 5008 CorDiax is to deliver Cardioprotective Haemodialysis with advanced safety for reduced cardiovascular complications and mortality.

Effective removal of middle molecular toxins

- **AutoSub plus** – Maximising substitution volumes in haemodiafiltration (HDF) for high convective removal of middle molecules, significantly reducing the patient’s risk profile.

Defining and achieving the optimal dry weight

- Precise quantification of the patient’s fluid status using the BCM-Body Composition Monitor as the basis of our Advanced Fluid Management minimises the impact of impaired fluid status.
- Regulation of ultrafiltration based on relative blood volume changes using the Blood Volume Monitor (BVM) helps to achieve the prescribed dry weight and prevents intradialytic hypotensive episodes.

Individual temperature control

- Adapting dialysate temperature using the unique Blood Temperature Monitor (BTM) ensures the core body temperature remains constant, leading to better haemodynamic stability during dialysis.

Ensuring effective dialysis dose

- Online measurement of Kt/V with ONLINE Clearance Monitoring (OCM) assures adequacy of delivered dialysis dose in accordance with standards.
- Non-invasive measurement of total recirculation with BTM supports the early detection of vascular access problems.

Highest level of patient safety

- Sophisticated safety features integrated in the 5008 CorDiax set a new benchmark for patient safety.

The right fit for paediatric patients

Achieving the best possible patient outcomes is not limited to common dialysis treatment. Fresenius Medical Care, as the world market leader in haemodialysis, is also committed to providing the best possible therapies suitable for the special requirements of paediatric patients.

References

The 5008 CorDix allows you to deliver the full benefits of Cardioprotective Haemodialysis – every day, for every patient.
Effective removal of middle molecular toxins

**HighVolumeHDF® – Perfectly put together**
Haemodiafiltration is a combination of two principles – diffusion and convection. This allows the effective removal of smaller molecules as well as increased removal of larger solutes (see Figure 1). This outstanding clearance, specifically of middle weight molecules such as β₂-microglobulin (β₂-m), leads to a reduction of cardiovascular risks and to an improved survival rate for dialysis patients.¹,²

Recent publications have demonstrated that a large substitution volume in post-dilution mode (> 21 L per treatment) is required to achieve positive outcomes.³ However, reaching a large substitution volume for high convective transport is frequently compromised by haemoconcentration and filter clotting.

**AutoSub plus – Maximising substitution volume for high-efficiency HDF**
AutoSub plus enables substitution volumes to be maximised individually for every patient, while simultaneously avoiding haemoconcentration and filter clotting. The innovative AutoSub plus system goes beyond conventional pressure control. AutoSub plus continuously analyses the conditions directly in the fibre. From these analysis results, the substitution rate is permanently adapted to the current treatment conditions without any need for user interaction.

In combination with FX CorDiax HDF dialysers, AutoSub plus is the first choice to achieve maximum substitution volumes in post-dilution HDF (HighVolumeHDF®) in a highly safe manner compared to conventional methods.
ONLINE production of sterile substitution fluid

With the 5008 CorDiax, high volumes of sterile and non-pyrogenic substitution fluid can be prepared cost-effectively by ONLINE filtration of ready-prepared dialysis fluid across the endotoxin-retaining Diasafe®plus filters. This double-stage process has proven its superior efficiency, practicability and safety in innumerable routine treatments. It provides reliable quality and safety by preventing residual endotoxins and microorganisms from entering the substitution fluid.*

Effective removal of a broad range of substances with post-dilution HDF

<table>
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<th>Molecular weight</th>
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<tr>
<td>$\beta_2$-m</td>
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SPOT on:
- Large substitution volume (> 21 L) during HighVolumeHDF® treatment significantly reduces all-cause mortality.3
- Achieving large substitution volumes with AutoSub plus in post-dilution HDF.
- Sterile and non-pyrogenic substitution fluid with Diasafe®plus filters.

References

* in accordance with ISO 23500:2011 and ISO 11663:2009
Protect your Patient

Effective removal of middle molecular toxins

**MIXED HDF – High convective transport under unfavourable patient conditions**

Certain patients are unable to reach effective substitution volume targets in post-dilution HDF due to low blood flow or high blood viscosity. In order to achieve adequate convective transport for these patients as well, MIXED HDF is used to add a pre-dilution share to avoid the risk of haemoconcentration and filter clotting. The 5008 CorDiax, with its two substitution pumps, enables the simultaneous combination of post- and pre-dilution techniques in MIXED HDF. It also makes the benefits of high convective transport accessible to patients not suitable for standard HDF treatment.1

**Benefits for the patient**

HDF is the treatment modality which comes closest to the elimination profile of the natural kidneys. HighVolumeHDF®, together with the 5008 CorDiax and FX CorDiax HDF dialysers, improves patient outcomes and has beneficial effects on:

- Serum β₂-m and phosphate levels², ³, ⁴, ⁵
- Inflammatory response⁵
- Intradialytic haemodynamic stability⁶, ⁸
- Anaemia control⁷

These factors contribute to better quality of life and patient survival.

**MIXED HDF made possible by two substitution pumps**

Second substitution pump for MIXED HDF and single-needle

**Reduced β₂-m levels with HDF³**

![Graph showing reduced β₂-m levels with HDF³](Graph adapted from original publication)

β₂-m levels in the CONTRAST study³

(Graph adapted from original publication)
Benefits for the therapy provider

- Providing state-of-the-art therapy without additional user efforts
- High cost-effectiveness due to online production of sterile substitution fluid
- Easy application in daily routine

SPOT on:

- Improved patient outcomes through beneficial effects on cardiovascular risk factors.
- HighVolumeHDF® as standard in cardioprotective therapies.

Reduced mortality with HighVolumeHDF®

(Graph adapted from original publication)

References

Defining and achieving the optimal dry weight

Advanced Fluid Management
Chronic volume overload is a common condition among patients with ESRD and is directly associated with cardiovascular diseases. Thus, hydration status is an important and independent predictor of CVD-related morbidity and mortality in HD patients. However, the determination of fluid status with existing clinical methods is either imprecise or not suited to the daily routine in dialysis centres.

BCM-Body Composition Monitor
The BCM-Body Composition Monitor is the first and most proven body composition device specifically designed for use in patients with ESRD, and is therefore the cornerstone of the Advanced Fluid Management therapy programme by Fresenius Medical Care. As the only device the BCM-Body Composition Monitor precisely measures and quantifies overhydration and key nutritional parameters and, in combination with the Fluid Management Software, allows the optimal fluid status of dialysis patients to be determined and achieved.

Fluid Management with the BCM-Body Composition Monitor as an integrated component of the 5008 CorDix therapy concept provides non-invasive, fast and cost-effective measurements at the bedside and enables the continuous monitoring of the patient’s dry weight (see Figure 2).

Monitoring the patient’s dry weight

References
BVM – Blood Volume Monitor

Intradialytic hypotensive episodes are one of the most serious side effects of haemodialysis. The main reason for blood pressure instability is a reduction in blood volume as a result of excessive fluid removal. The infusion of saline solution and the reduction of the ultrafiltration rate are common measures to stabilise the patient in case of hypotensive events. Frequently, the prescribed dry weight is not achieved, exposing the patient to the risks of overhydration and poor dialysis efficacy.

In order to prevent excessive fluid removal, the Blood Volume Monitor (BVM) provides an automatic adaptation of the ultrafiltration rate according to the measured relative blood volume change (see Figure 3).

Blood volume control helps avoiding the vicious circle of intradialytic hypotension and subsequent postdialytic volume overload that can lead to hypertension and ultimately to cardiovascular disease. BVM is an essential part of Fresenius Medical Care’s Advanced Fluid Management, which enhances the patient’s cardiovascular stability.
Defining and achieving the optimal dry weight

Advanced Fluid Management – Benefits for the patient
Achieving normohydration and avoiding excessive ultrafiltration through effective Fluid Management therapy is associated with better outcomes for dialysis patients.\(^1\) Regulating the patient’s fluid status through Advanced Fluid Management with the BCM and BVM as its key components may lead to:

- Reduced cardiovascular mortality\(^1\)
- Better control of hypertension\(^2\)
- Reduction in antihypertensive medication\(^2\)
- Fewer intradialytic complications and hypotensive episodes thanks to individualised ultrafiltration rate\(^3,4\)
- Diminished risk of hypernatraemia
- Improved patient well-being

Less intradialytic morbidity and fewer hypotensive episodes with blood volume controlled ultrafiltration\(^4\)

Benefits for the therapy provider
- Easy to use
- Practical in daily routine
- Fewer complications during treatment period
- Automatic adaptation of ultrafiltration – no need for infusion of saline solution

Overhydration – a major risk factor for mortality\(^1\)

![Graph](adapted.png)

Impact on intradialytic morbid events and hypotension
(Graph adapted from original publication)
Individual temperature control

BTM – Blood Temperature Monitor
Symptomatic hypotension due to an increase of body temperature is a well-known complication affecting patients during dialysis. In view of these observations, the stabilisation of core body temperature is one of the basic requirements of HD treatment.

With the help of the unique Blood Temperature Monitor (BTM), an individual’s pre-dialytic body temperature can automatically be maintained throughout dialysis treatment. In the event that a modification of the body temperature is required, the BTM can slightly change the temperature within the set limits.

Benefits for the patient
- Significantly improved cardiovascular stability during treatment

Benefits for the therapy provider
- Fewer complications during treatment
- No user interaction required due to automatic measurement and adaptation

References
Ensuring effective dialysis dose

**OCM® – Online Clearance Monitor**
Kt/V is a well-established parameter for measuring the adequacy of dialysis treatment. The regular measurement of delivered Kt/V is required by guidelines and becomes an important parameter for documenting treatment quality.1,2

Up to now, conventional measurement techniques have been performed only once every one to three months in a process requiring laboratory values. Since there was no information available on the quality of treatment administered on a daily basis, an immediate response regarding quality issues was not possible.

With the Online Clearance Monitor (OCM®), the dialysis dose Kt/V is measured automatically and non-invasively during each dialysis treatment.* OCM® measures the effective \textit{in vivo} urea clearance (K) and calculates the accumulated cleared plasma volume (Kt). To determine Kt/V, the value for urea distribution volume (V) is required, which is precisely measured with the BCM-Body Composition Monitor. This results in a Kt/V which comes closest to the gold standard and can be monitored daily.3

In addition to the delivered dialysis dose, the OCM® also measures the patient’s level of plasma sodium. This information is a useful treatment aid as it allows the sodium concentration of the dialysis fluid to be adapted to the patient’s individual plasma sodium level.

Online Clearance Monitoring (OCM®) is a well-established method and a standard feature of the 5008 CorDiax.

\begin{center}
\textbf{Kt/V}_{\text{BCM}} \textit{is closest to the gold standard}^{3}
\end{center}

(Graph adapted from original publication)

* OCM® measurement is not possible in case of single needle and HF or ISO-UF treatment
**BTM recirculation measurement**

High blood flow rates correspond to a high clearance of uraemic toxins. Shunt recirculation is a common problem in dialysis when the actual blood flow is higher than the access flow provided. The resulting recirculation has insufficient vascular access, which can significantly reduce dialysis efficacy.

Assessing the quality of the access is difficult and hence not possible for daily quality assurance. The Blood Temperature Monitor, however, is able to measure potential recirculation during treatment and helps to evaluate the quality of vascular access and to monitor its trend.

**Benefits for the patient**
- Better patient outcome due to the prescribed dialysis dose being reached¹
- Non-invasive monitoring
- Effective dialysis dose (Kt/V) ensured thanks to early detection of potential recirculation and shunt problems

**Benefits for the therapy provider**
- Immediate transparency for fulfilling treatment quality requirements (Kt/V)
- Easy monitoring of delivered dose without extra costs
- Early detection of problems during dialysis treatment
- Runs automatically, meaning, no action is required
- Continuous monitoring of access condition without user interaction

**References**
Dialysis patients undergo dialysis treatment three times a week over a period of many years. Therefore, safety is one of the most important aspects of dialysis. In addition to the basic safety requirements each dialysis system already provides, sophisticated safety systems have to focus on the remaining challenges posed by modern renal replacement therapy:

- External bleeding
- Paravasal bleeding
- Haemolysis
- Coagulation
- Fluid removal

The challenge is to think beyond state-of-the-art technologies and approach well-known problems with innovative solutions, striving for superior patient safety.

The intelligent safety features of the 5008 CorDiax offer highest patient safety while minimising undesirable incidences and simultaneously easing daily routines and supporting the nursing staff’s responsibility as therapy providers.

**External bleeding**

Sudden dislodgement of the venous needle, partial disconnection of the Luer-Lock connections or any other untight connections can cause the patient to lose a critical amount of blood, which can even lead to death within a few minutes.

The 5008 CorDiax offers various novel solutions to minimise the risk of external blood loss:

- Venous Access Monitor (VAM) – optimised monitoring of the venous path increasing the probability of early detection of venous needle dislodgement
- Special wetness detector, VenAcc, for the quick detection of blood loss, especially in patients undergoing home or nocturnal dialysis as well as restless or confused patients
- Sensors and front doors which enable a fast recognition of leakages in the extracorporeal blood system
Paravasal bleeding
Venous needle dislodgement during dialysis may result in undetected internal blood loss, which is a serious complication during dialysis: when the venous needle perforates the vessel, blood leaks out into the surrounding tissue and causes large haematomas.

The 5008 CorDiax allows:
- Early detection of paravasal bleeding and prevention of large haematomas with Dynamic Pressure Monitoring – no more undetected paravasal blood loss

Haemolysis
A serious complication during dialysis is mechanically induced haemolysis which is primarily caused by kinking of the blood tubing. Conventional dialysis machines do often not detect kinking of the blood line between the blood pump and the venous bubble catcher, which is a potential cause of haemolysis.

The 5008 CorDiax reduces the risk of mechanical haemolysis by
- Closing the safety gap between the blood pump and venous bubble catcher with Blood Line Kinking & Filter Clotting Detection – enabling faster detection of potential haemolysis risks
Highest level of patient safety

Coagulation
Contact with any material foreign to the body or contact with air increases the likelihood of blood coagulating within the extracorporeal blood circuit. As a consequence, anticoagulants are given to prevent clotting. The amount of heparin should be as low as possible, meaning the air and blood contact during dialysis needs to be minimised.

The 5008 Cordiax enables:
- Non-invasive, air-free arterial pressure monitoring (see Figure 1) without a blood-air interface to reduce the risk of coagulation during dialysis.

Fluid removal
Removal of excess water is one of the key tasks of a dialysis machine. The removal of a precise amount of fluid is crucial for the well-being of the patient, as too much ultrafiltration could potentially result in hypotension or muscle cramps.

In HighVolumeHDF® this task is even more complex as the balance between the total fluid withdrawn from the patient and the fluid volume substituted has to be adhered to exactly.

The 5008 CorDiax provides:
- Balancing chamber that guarantees in combination with UF pump the precise removal of the prescribed amount of fluid.
- Continuous monitoring of the tightness of the complete hydraulic system by leakage sensors and integrity tests to avoid uncontrolled fluid loss.

Figure 1: Arterial pressure dome
Patient safety with Fresenius Medical Care means superior security on every level thanks to the highly-innovative safety features of the 5008 CorDiax. In the development of these safety features, we have united innovative ideas and state-of-the-art technologies to achieve the best possible results.

Fresenius Medical Care provides greater safety during all forms of treatment for both patients and operators. What’s more, as the world market leader in dialysis, with over 30 years of expert knowledge, we are committed to setting new benchmarks in patient safety – because conforming to standards alone is not enough.

**Patient Safety by Fresenius Medical Care – Where new benchmarks are set.**
Paediatric therapy

The right fit for paediatric patients
Children with ESRD require special care during haemodialysis treatment. Their smaller body volume, constant growth and increased metabolism are special challenges for the paediatric nephrologist. Moreover, children are usually long-term patients with a high exposure to biomaterials. All these requirements have to be considered when developing a treatment system for paediatric use.

Our 5008 CorDiax is the first haemodialysis machine to be validated for the treatment of paediatric* patients. It offers the best possible dialysis therapy:

- HighVolume HDF® with AutoSub plus for highly efficient removal of uraemic toxins even with reduced blood flow rates
- Haemodynamic stability is ensured during treatment thanks to the non-invasive monitoring of relative blood volume changes (BVM)
- Supervision of hydration and nutritional status during continuous growth: easy and precise determination of dry weight and body mass with the BCM-Body Composition Monitor
- FX CorDiax 40 highly efficient membrane designed for smaller body weight

The specifically developed paediatric treatment option adapts all relevant parameters to fit children’s needs while simultaneously fulfilling the highest safety requirements:

- Special paediatric user-setup with more sensitive thresholds
- Blood flow range limited according to body weight
- Reduced blood flow for a gentle dialysis start
- Special children cuff for comfortable, automatic blood pressure measurement
- Increased probability of early detection of venous needle dislodgement (VenAcc)
- Increased safety for active children with the optional device for detecting venous needle disconnection (VenAcc)

The 5008 CorDiax with the paediatric treatment option comes with special disposables for paediatric patients:

- Phthalate-free bloodlines (no DEHP)
- Bloodlines and dialysers to reduce the extracorporal blood volume, which are particularly suited to low blood flow rates

* for use in children >10 kg body weight
** confirmed for intensified dialysis regimens
Benefits for the children
- Increased well-being during treatment**
- Promotion of catch-up growth**,1
- Reduction of left ventricular hypertrophy (LVH)**,2
- Improved safety for children who move thanks to venous access monitoring features
- Non-invasive monitoring systems

Benefits for the therapy provider
- Application of HighVolumeHDF®, acknowledged as the best therapy in haemodialysis
- Validated and approved safety and user concept

References
Best handling

There is already a lack of qualified staff capable of offering high-quality haemodialysis therapy options to a growing number of medically challenging patients. This has resulted in an increased requirement for dialysis machines that can be operated easily and safely.

The 5008 CorDiax ably meets the demand for easy operability. With a design focused on easy-handling and usability, it is completely adapted to the user’s needs. All components of the 5008 CorDiax are aligned to simplify routine procedures in order to give nursing staff much needed time for individual patient care.

The 5008 CorDiax provides outstanding practicability thanks to:
- Optimised ergonomics
- Comfortable handling due to automated workflows
- Easy, rapid and safe data management
- Well-designed user interface

All these characteristics enable the full benefits of Cardioprotective Haemodialysis to be provided in everyday use.
The 5008 CorDias – Created by users for users.
Best handling

Optimised ergonomics
The ergonomic handling of the 5008 CorDiax assures outstanding usability and high convenience for the user (see Figure 1):

- Individually adjustable, freely rotatable flat-screen monitor (15” TFT) for perfect readability from every angle
- Clearly structured and well laid-out Extracorporeal Blood Module (EBM) offers extremely easy, machine-assisted set-up and dismantling of tubing systems
- Simple, one-handed and hygienic connection of bibag® (dry bicarbonate supply)

Comfortable handling due to automated workflows
The 5008 CorDiax ensures optimised workflows for all operators at a high level, which fit into their daily routines:

- Graphical-assisted preparation screens (see Figure 2)
- Self-initiating functions at start of treatment, e.g. Auto T1-Test, reduce number of handling steps
- Self-evident program settings minimise operational errors
- ONLINE Priming and ONLINE Bolus make saline solutions redundant*
- Emergency button initiating four essential steps at once (blood flow reduction, ONLINE Bolus, stop UF-rate and start blood pressure measurement)
- Timer function for setting a reminder of a definable task

* safety advice: It is recommended that you stock sodium chloride in case it might be required
Easy, rapid and safe data management
Therapy documentation and data management are important processes in the daily treatment of dialysis patients. Fresenius Medical Care provides:

- Retrospective treatment data documentation available directly on the 5008 CorDiax (current and previous three treatments)
- Individualised therapy by error-free prescription of treatment-relevant data and reliable documentation:
  - with PatientCard (current and previous three treatments of individual patients)
  - via Therapy Data Management System (TDMS)
- Advanced bed side monitoring via touchscreen in combination with TDMS

Well-designed user interface
The central navigation system of the 5008 CorDiax follows an “intuitively correct” user-guidance philosophy for the nursing staff:

- Centralised operation and information via a spacious touchscreen display (see Figure 3)
- Simple and logical data entry
- Sophisticated, stress-free handling of alarms during treatment
- Quick access to treatment information

Figure 3: Touchscreen display
Optimal use of resources

Increasing numbers of dialysis patients and restricted health care resources require novel solutions to provide the best dialysis therapy for all patients. The challenge for dialysis providers nowadays is to focus on investments that enable the most efficient use of limited resources.

Fresenius Medical Care has taken up this challenge with the introduction of the 5008 CorDiax. With its new software, the 5008 CorDiax allows you to perform advanced renal replacement therapies in a highly efficient way, involving both economical and ecological aspects.

By saving dialysis-relevant resources, the 5008 CorDiax offers a cost-effective treatment for implementation into the daily routine, while achieving a high level of sustainability. In this way, it fully takes into consideration the financial constraints faced by the health sector. Moreover, it supports nursing staff in all working processes, which results in them saving valuable time.

The 5008 CorDiax:
- Optimised workflows
- Efficient and sustainable
- Unmatched service-friendliness

Due to its fully integrated components and its eco-friendliness, the 5008 CorDiax allows the realisation of numerous synergies for an optimised use of dialysis-relevant resources.
The 5008 CorDiax – Combining sustainability and cost-effectiveness for highest efficiency.
Optimal use of resources

Optimised workflows
The innovative and highly-automated features of the 5008 CorDiax ensure highest availability and reliability for both operator and patient. In this way, the 5008 CorDiax supports nursing staff by optimising daily workflows while at the same time providing a high level of patient safety.

- Highly automated assistance for all users:
  - Diverse Auto-On/Off functions with full system integration of water technology and IT
  - Multiple automated tests during preparation – no need for nurse interaction
  - ONLINE solution preparation simplifies handling procedures
  - Five fully-automated heat and cold disinfection programs with preconnected disinfectants
- Full integration in our Therapy Data Management System (TDMS) allows for minimal handling steps for start-up and significantly reduces time needed to manage data
- Animated screens support quick learning of user procedures – less time and effort required during training period
- Interface Heat Disinfection (IHD) cleans and disinfects the interface between RO-ring and dialysis machine with hot water (in accordance with ISO 23500)*

Efficient and sustainable
It is not only the advanced treatment options that make the 5008 CorDiax unique, but also its eco-friendliness: with the 5008 CorDiax, Fresenius Medical Care supports the sensible and sustainable use of resources by saving dialysate, water and energy. This in turn leads to significant cost savings.

- ONLINEplus technology for production of sterile, endotoxin-free and bicarbonate-buffered electrolyte solutions#
  - Extensive amounts of substitution fluid for HDF available
  - No more need for ready-made rinse solutions: priming, reinfusion and bolus with ONLINE fluid in all treatment modes (also in HD)**
- AutoFlow automatically adjusts the dialysate flow rate to the effective blood flow rate during treatment
  - Substantial saving of water, waste water, concentrates and energy, leading to significant cost reductions (see Figure 1)
  - Automatic selection of AutoFlow factor based on treatment mode, always accomplishing an optimal ratio between economic considerations and treatment quality
- EcoFlow for minimised dialysate and energy consumption during preparation and after reinfusion while avoiding bacterial growth

* requires heat-resistant RO-system such as AquaA HT or AquaC Uno H
** safety advice: It is recommended that you stock sodium chloride in case it might be required
# in accordance with ISO 23500:2011 and ISO 11663:2009
## dialysis centre with 25 machines
Highly efficient heat exchanger for a lower carbon-footprint:

- Utilising the energy of waste dialysate to heat the incoming water
- Power savings of up to 40% significantly reduce the annual emission of CO₂

- For a typical dialysis centre, the annual reduction of CO₂ emissions and the saving of energy and water are equal to the daily consumption and emissions of a town with around 7,500 inhabitants¹

### Dialysate flow savings with AutoFlow without compromising $K_{\text{urea}}$

![Graph showing dialysate flow savings with AutoFlow](image)

- $K$ at $Q_o = 500$ mL/min in post HDF
- $K$ at $Q_o^* = 360$ mL/min in post HDF with AutoFlow ($Q_o = 1.2 \times Q_o^*$)

**Figure 1:** Internal data: Post-dilution with FX CorDiax 600
Hct = 35%; Recirculation = 5%

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1. Data on file, Fresenius Medical Care
Optimal use of resources

Unmatched service-friendliness

Fresenius Medical Care stands for superior quality, reliability and safety, as well as outstanding usability and service. As a result, our products make a significant contribution to supporting you and easing your daily routine. In particular, our 5008 CorDiax is characterised by its unmatched service-friendliness – from simple handling to technical services:

- Interactive, real-time hydraulic flow chart for rapid error diagnosis and easy maintenance
- Superior accessibility to all hydraulic and electronic parts in and around the machine
- Simple repair using “snap-lock” technology – fast and easy exchange of components
- Easy and comprehensive diagnosis of faults and detailed technical error memory with Service Software and Service Card
- High reliability due to long-lasting components, which are readily available should they need replacing
- Remote maintenance: quick diagnostic inspection via remote access to the dialysis machine
- Advanced diagnostics for pneumatics, which allow the technician to check all single pneumatic components by means of an interactive construction plan
- 24 months maintenance
### Product Configuration – 5008 CorDiax highlights

<table>
<thead>
<tr>
<th>Therapy highlights</th>
<th>5008 CorDiax</th>
</tr>
</thead>
<tbody>
<tr>
<td>HighVolumeHDF® – pre- and post-dilution</td>
<td>● / ●</td>
</tr>
<tr>
<td>AutoSub plus – automatically maximising substitution volumes in a highly safe manner</td>
<td>●</td>
</tr>
<tr>
<td>HighVolumeHDF® during Single Needle treatment</td>
<td>○</td>
</tr>
<tr>
<td>MIXED HDF – simultaneous pre- and post-dilution</td>
<td>○</td>
</tr>
<tr>
<td>Blood Temperature Monitor (BTM) – regulation of temperature and recirculation measurement</td>
<td>○</td>
</tr>
<tr>
<td>Blood Volume Monitor (BVM) – adaptation of ultrafiltration rate based on blood volume changes</td>
<td>○</td>
</tr>
<tr>
<td>Paediatric treatment option for patients with body weight 10-40 kg</td>
<td>○</td>
</tr>
</tbody>
</table>

### Safety features

- Integrated Venous Access Monitor – increased probability of detection of venous needle dislodgement
- Dynamic Pressure Monitoring – detection of paravascular bleeding (“infiltration”)
- VenAcc external device for detection of venous needle disconnection

### Basic features

- Dialysis fluid ultrafilter system – sterile and non-pyrogenic fluid for ONLINE use
- ONLINE Priming, bolus and reinfusion in HD / HDF / SN – no saline required in all treatment modes* ○ / ● / ●
- OCM® Kt/V Measurement with transfer of V from BCM-Body Composition Monitor in HD / HDF ○ / ●
- Single-needle double-pump ○
- 5008 PatientCard – prescription and documentation of treatment parameters ●
- Interface heat disinfection – fulfilling all requirements of ISO 23500 ●
- Advanced service tools for fast diagnostic and maintenance with interactive hydraulic and pneumatic flow charts and remote access ●
- Compliance to latest requirements of IEC 60601 ●
- Timer function for setting a reminder of a definable task ●

### Eco-friendly features

- Heat exchanger with high efficiency ●
- AutoFlow – automatic adaptation of dialysate flow for optimal balance of dialysate consumption and treatment efficiency ●
- EcoFlow – water and energy saving during standby conditions ●

* For more details please refer to the Technical Data

* = standard, ○ = optional

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* safety advice: It is recommended that you stock sodium chloride in case it might be required.
The 5008 CorDiax – Beyond your expectations

Almost one in two patients with ESRD dies as a result of cardiovascular disease. That is why Cardioprotective Haemodialysis is a core principle of Fresenius Medical Care, as we work and strive to solve the challenges of modern dialysis. Each step we take is focused on minimising cardiovascular risks and extending patients’ lives. Hence why the 5008 CorDiax is the fundamental element in our SPOT programme. It offers premium therapy options and excellent usability combined with the optimal use of dialysis-relevant resources. The 5008 CorDiax helps you to protect your patient – day by day.

State-of-the-art technologies enable advanced cardioprotective therapies.
Cardioprotective Haemodialysis

The new 5008 CorDix
Beyond your expectations

Best therapies
Advanced therapy options such as HighVolumeHDF® enable Cardioprotective Haemodialysis – for best possible patient outcomes.

Best handling
Sophisticated design guarantees outstanding usability and convenient handling for all users.

Optimal use of resources
Efficient and sustainable use of dialysis-relevant resources result in excellent cost-effectiveness.

Cardioprotective Haemodialysis

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### Cardioprotective Haemodialysis

The reduction of risk factors for cardiovascular diseases (CVD) is core to the development of dialysis systems and products at Fresenius Medical Care. Outstanding cardioprotection must be reflected in all levels of product development and application.

### Wider-ranging cardioprotection

There have been tremendous improvements in the quality and efficacy of haemodialysis (HD) therapy in recent years. Despite this, cardiovascular diseases (CVD) remain the leading cause of death for patients with end-stage renal disease (ESRD).

### Best therapies

Advanced therapy options such as HighVolumeHDF® enable Cardioprotective Haemodialysis – for best possible patient outcomes.

### Best handling

Sophisticated design guidelines outstanding usability and convenient handling for all users.

### Optimal use of resources

Efficient and sustainable use of dialysis-relevant resources result in excellent cost-effectiveness.

### Services

- Over 30 years of experience in dialysis at your service.
- Project Planning and Consulting
- Training and Education
- Technical Services
- Water Quality Service (WQS)
- Medical Information Services

### Products

State-of-the-art technologies enable advanced cardioprotective therapies.

- CoDiax product line:
  - 5008 CoDiax and 5008S CoDiax
  - FX CoDiax dialyzers
  - BCM Body Composition Monitor
- Classic product line:
  - 4008S Classic
  - FX Classic dialyzers
- Therapy Data Management System (TDMS)
- Online Purification Cascade (OPC)

### Cardioprotective

- FX classix dialysers
- 4008S classix
- BCM-Body Composition Monitor
- 5008 CorDiax and 5008S CorDiax

### Technical Data 5008 CoDiax

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid flow rate</td>
<td>100 to 1000 mL/min (max. 900 mL/min)</td>
</tr>
<tr>
<td>Ultrafiltration rate</td>
<td>12.5 to 200 mL/h (max. 100 mL/h)</td>
</tr>
<tr>
<td>Weight</td>
<td>35 kg</td>
</tr>
<tr>
<td>Height</td>
<td>1620 x 480 x 720 mm (H x W x D)</td>
</tr>
<tr>
<td>Approx. 6 A (at 230 V)</td>
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</tr>
</tbody>
</table>
Optimal use of resources
Efficient and sustainable use of dialysis-relevant resources result in excellent cost-effectiveness

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Sophisticated design guarantees outstanding usability and convenient handling for all users

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