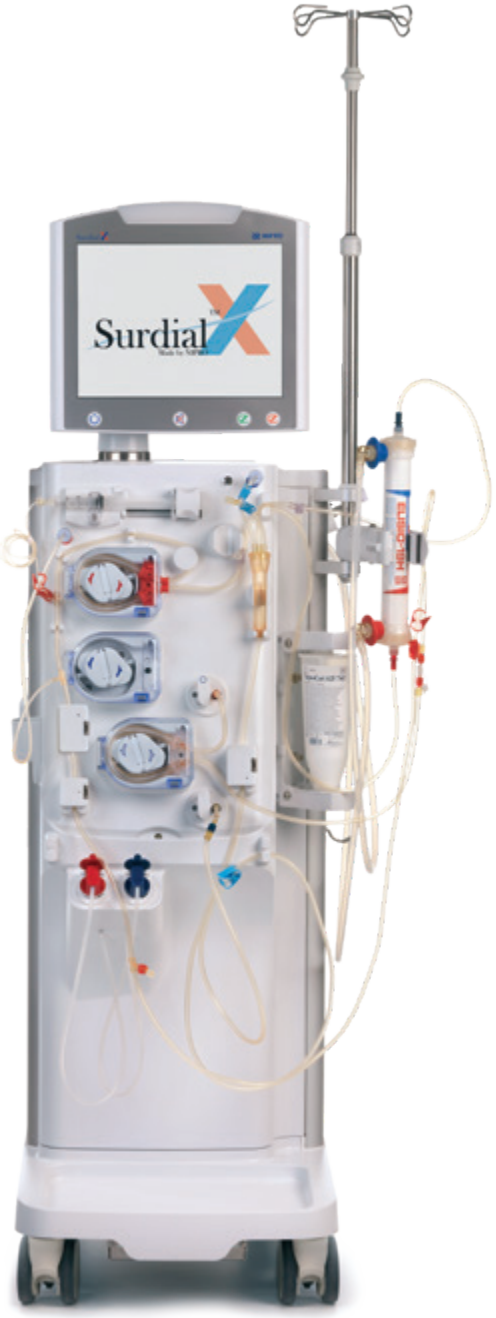
PRODUCT DATA SHEET



SURDIAL™ - X

SINGLE PATIENT DIALYSIS MACHINE

NIPRO

SURDIAL™ - X

SINGLE PATIENT DIALYSIS MACHINE

- Available in 1-pump (HD only), 2-pump (HD SN and HDF DN), and 3-pump (HDF SN) models
- Possible to treat patients with a body weight of more than 30 kg
- Multiple therapy modalities available – Hemodiafiltration (HDF), Hemodialysis (HD), and Hemofiltration (HF)
- Flexible switch from one modality to another during treatment
- Color-coded pump segment holders
- Automatic loading and ejection of the pump segments
- Programming of individualized ultrafiltration, bicarbonate, and sodium profiles possible

CE 0123

Class IIb Medical Devices

MDD 93/42/EEC

Product Compliance

- Complies with the following norms, directives, and regulations:
  - JIS Z 0200: 2013
  - JIS Z 0232: 2004
  - IEC 60601-1: 2005
  - IEC 60601-1-am1: 2012
  - IEC 60601-1-2: 2014
  - IEC 60601-1-6: 2010
  - IEC 60601-1-6-am1: 2013
  - IEC 60601-1-8: 2006
  - IEC 60601-1-8-am1: 2012
  - IEC 60601-1-10: 2007
  - IEC 60601-1-10-am1: 2013
  - IEC 60601-2-16: 2012
  - IEC 60825-1: 2014
  - IEC 62366: 2007
  - IEC 62366-am1: 2014
  - IEC 80601-2-30: 2013
  - ISO 10993-1: 2009

Manufacturing DETAILS

Legal manufacturer: NIPRO CORPORATION

Country of origin: JAPAN

Materials Used

- Cyclic olefin copolymer (COC)
- Styrene-acrylonitrile copolymer (AS)
- Polysulfone (PSU)
- Polyoxymethylene (POM)
- Stainless steel (SUS304)
- Acrylonitrile butadiene styrene (ABS)
- Polyamide (PA)
- Polycarbonate (PC)
- Polypropylene (PP)
- Silicone rubber (VMQ)
- Polyvinylchloride (PVC)

SURDIAL™ - X | MODEL - A

Number of pumps

1 (Arterial)

Therapy modalities

- HD Double Needle
- HD Single Needle Click Clack
- Isolated Ultrafiltration (ISO-UF)

Variants

Ordercode: 1

SURDIAL-X2-HD-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function

Ordercode: 2

SURDIAL-X2-HDBA-UJ

Included

- BPM Function
- B-Nozzle
- BPM remote button



Note:
All models are upgradable with BVM option (order code 0-704-162-UJ) if not installed in the factory (see above) as of the following serial numbers:

• Model A: 18DN0302 • Model B: 18DR0422 • Model C: 17DS3429 • Model D: 17EJ0743

It is NOT possible to upgrade from one model to another (e.g. Model A → Model B)

SURDIAL™ - X | MODEL - B

Number of pumps

2 (Arterial + Venous)

Therapy modalities

- HD Double Needle
- HD Single Needle Double Pump
- Isolated Ultrafiltration (ISO-UF)

Variants

Ordercode

SURDIAL-X2-SNDP-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function



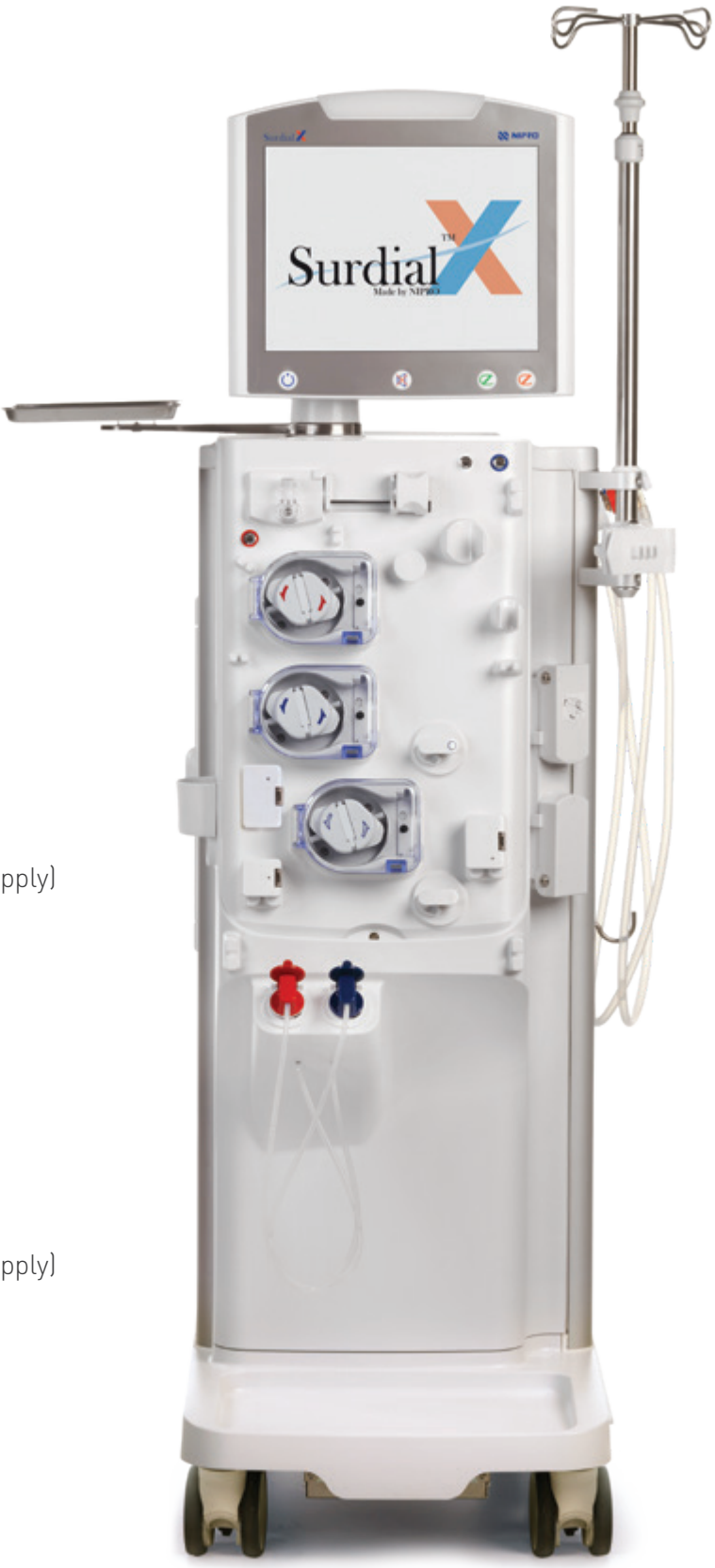
SURDIAL™ - X | MODEL - C

Number of pumps

3 (Arterial – Venous – Substitution)

Therapy modalities

- HD Double Needle
- HD Single Needle Double Pump
- HDF Double Needle Pre- and Post-dilution
- HDF Single Needle Pre- and Post-dilution
- HF Double Needle Pre- and Post-dilution
- HF Single Needle Pre- and Post-dilution
- Isolated Ultrafiltration



Variants

Ordercode : 1

SURDIAL-X2-HDF-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function

Ordercode: 2

SURDIAL-X2-HDF1-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- Card/Network (Lan) function

Ordercode: 3

SURDIAL-X2-CBVM-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function
- Blood Volume Monitoring (BVM)

SURDIAL™ - X | MODEL - D

Number of pumps

2 (Arterial – Substitution)

Therapy modalities

- HD Double Needle
- HD Single Needle Click Clack
- HDF Double Needle Pre- and Post-dilution
- HF Double Needle Pre- and Post-dilution
- Isolated ultrafiltration



Variants

Ordercode: 1

SURDIAL-X2-HFDP-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function

Ordercode: 2

SURDIAL-X2-DBVM-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- BPM remote button
- Card/Network (Lan) function
- Blood Volume Monitoring (BVM)

Ordercode: 3

SURDIAL-X2-D3-UJ

Included

- BPM function
- 2 x CDS (central concentrate distribution supply)
- B-Nozzle
- Card/Network (Lan) function

Specifications

Electrical supply

Voltage and Frequency	
230 V AC ±10%, 50 Hz/60 Hz	Removable Power cable 3 m from the back side of the machine to the tip of the plug
110 V AC ±10%, 50 Hz/60 Hz	Non removable Power cable 3 m from the back side of the machine to the tip of the plug

Available electrical cables

Ordercode	Description	Comment
0-702-258-UJ	Plug attached power cable Europe	Standard from Nipro Corporation
DM-30100	Plug attached power cable Europe	Separate order
DM-30101	Plug attached power cable, UK	Separate order
DM-30102	Plug attached power cable, CEE	Separate order
DM-30103	Plug attached power cable, South Africa	Separate order
DM-30104	Plug attached power cable, Australia 15A	Separate order
DM-30105	Plug attached power cable, Italy 16A	Separate order
DM-30106	Plug attached power cable, Israel	Separate order
0-702-464-UJ	FE Harness	Standard from Nipro corporation

Protection

Protection class	Class 1 ME
Protection degree	• Dialysate circuit: Type B • Cuff: Type BF
Protection against water penetration	Drip-proof machine IPX 1 (all panels must be closed)

Facility conditions

Requirement	Specification needed
Water supply pressure	0,05 to 0,74 MPa
Water supply flow	1200 ml/min
Drainage volume	1500 ml/min or more
Water Quality	Water coming from water treatment system needs to comply to ISO 23500-3: 2019 to be suitable for hemodialysis. For online HDF, the concentrates need to comply to ISO 23500-4. The acid concentrates and the bicarbonate concentrates offered by Nipro comply to this ISO
Central concentrate Distibution system pressure	5 to 98 kPa

Hydraulic Circuit

Dialysate Flow	• 100 to 800 ml/min (100 ml/min increment) • Use of dialysate factor linked to blood pump speed will be rounded up because of 100 ml mixing chambers
Dialysate Flow accuracy	0 to +10 % from the set value
Time until preparation complete	• Models A + B: 8 minutes • Models C + D: 11 minutes

UF control

Control method	Sealed method by the piston pump
Settable range	0,00, 0,10 to 4,00 L/h (0,01 L/h increment)
Accuracy	+/- 30 g/h when the equipment adjustment condition is the same as factory shipment

Temperature control

Setting range	32 to 39 °C (0,1°C increment)
Stability	Set value +/- 0,5 °C
Accuracy of indicated value	Mean Temperature +/- 0,3°C (Mean temperature is the mean value of dialysate temperature per minute)

Blood Pump, Single Needle Double Pump

Method	2-roller
Rotation Direction	Counter-clockwise rotation
Flow Setting range	10 to 600 ml/min (5 ml/min increment)
Flow Accuracy	Set value +/- 10%
Standard Tube	8,00 mm x 12,00 mm +/- 0,15 mm (inner diameter x outer diameter)
Minimum inlet pressure	-200 mmHg
Maximum inlet pressure	+500 mmHg

Online HDF Pump

Method	2-roller
Rotation Direction	Counter-clockwise rotation
Flow Setting range	10 to 500 ml/min (5 ml/min increment)
Flow Accuracy	Set value +/- 10%
Standard Tube	8 mm x 12 mm +/- 0,15 mm (inner diameter x outer diameter)
Minimum inlet pressure	-200 mmHg
Maximum inlet pressure	+500 mmHg

Air Bubble Detector

Detection	Ultrasonic transmission method	
Acceptable tube size	4,3 mm x 6,8 mm +/- 0,1 mm (inner diameter x outer diameter)	
Detection capability single bubble	10 µL	
Detection capability accumulative	0.3 µL accumulated over 1 minute according to the set value	
Accumulative setting range	Board before BLM-CPU-D	10, 50, 100
	Board after BLM-CPU-E	10, 50, 300

List of validated bloodlines according to specification of pumps and Air bubble detector

Description	Order code	Notes
HD DIF Double Needle	A363R-V849R-GT	Spike included
	A363R-V849R-BID	Spike included
	A372R-V858R-GT	No spike included
	A372R-V858R-BID	No spike included
	A367R-V853R-GT	Double transducer protectors on arterial and venous pressure lines
HDF Double Needle	A364R-V850R-GT	-
	A364R-V850R-BID	-
	A368R-V854R-GT	Double transducer protectors on arterial and venous pressure lines
	A438R-V918R-GT	-
	A446R-V926R-GT	Double transducer protectors on arterial and venous pressure lines

HD DIF Single Needle	A365R-V851R-GT	
	A369R-V855R-GT	
HDF Single Needle	A366R-V852R-GT	
	A370R-V856R-GT	Double transducer protectors on arterial and venous pressure lines
	A447R-V927R-GT	Double transducer protectors on arterial and venous pressure lines

Heparin Pump

Method	1-Tube method – Nipro Syringe 10 ml, 20 ml, 30ml
Injection direction	Leftward
Flow Setting	0 to 10 ml/h (0.1 ml/h increment)
Flow Accuracy	• Machine accuracy +/- 1% • Flow Accuracy +/- 10%
Pressure range	0 to 450 mmHg
Bolus range	0,5 to 10,0 ml (0,1 ml increment)
Fast-forward injection	• 10 ml: ±550 ml/h (± 9 ml/min) • 20 ml: ± 900 ml/h (± 15 ml/min) • 30 ml: ±1200 ml/h (±20 ml/min)

Blood leakage detector

Sensor method	Optical (infrared transmission method)
Detection accuracy	+/- 100 ppm
Detection value	Setting range: 50 – 500 ppm (10 ppm increment)
Detection point	Default 280 ppm (Ht 32%)

Temperature Monitor

Sensor method	Thermistor
Measurement accuracy	+/- 0,8°C (at actual temperature 37°C)
Alarm setting	• Max setting range: 37 to 40°C (0,1°C increment) • Min setting range: 33 to 36°C (0,1°C increment)

Cleaning/Disinfection

Hot Disinfection

Solution: Citric Acid	• Concentrate concentration 30 – 50% (50% recommended) • Concentrate after dilution 0,50% (fixed)
Time	• Model A+B : minimal 29 minutes — Pre rinse: 5,5 minutes — Post rinse: 8 minutes • Model C+D: Minimal 31 minutes — Pre rinse: 6,5 minutes — Post rinse: 8 minutes
Temperature	• T1: 70°C • T2: 96°C

Chemical disinfection : 1

Solution: Sodium hypochlorite	• Concentrate concentration 1 – 12% (6% and less recommended) • Concentrate after dilution 0,10 to 0,20% (0.10% recommended)
Time: 38 to 120 min (38 min recommended)	• Pre rinse: 8 minutes • Post rinse: 11 to 60 minutes
Temperature	T1: 35 to 40 °C

Chemical disinfection : 2

Solution: Peracetic acid	• Concentrate concentration 1 – 12% • Concentrate after dilution 0,03 to 0,20%
Time: 37 to 120 min (38 min recommended)	• Pre rinse: 8 minutes • Post rinse: 9 to 60 minutes
Temperature	T1: 35 to 40 °C

Decalcification

Solution: Acetic acid	• Concentrate concentration 30 to 70% (50% or less recommended) • Concentrate after dilution 1 - 5% (2% recommended)
Time: 25 to 120 min (60 min or less recommended)	• Pre rinse: 8 minutes • Post rinse: 10 to 60 minutes
Temperature	T1: 35 to 40 °C

Hot Rinse

Time	• Model A + B: 29 to 60 min — Pre-rinse: 5,5 min — Post-rinse: 8 min • Model C+ D: 31 to 60 min — Pre-rinse : 6,5 min — Post-rinse: 8 min
Temperature	T2: 96 °C

Hot Water Disinfection (HWD)

Time	• Model A + B: 35 min — Pre-rinse: 5,5 min — Post-rinse: 8 min • Model C+ D: 35 min — Pre-rinse: 6,5 min — Post-rinse: 8 min
Temperature	• T1 monitoring temperature: 85°C • T2: 96°C

Rinse

Setting range: 5 to 120 min (1 min increment)

IHR

- Setting range: 30 to 200 min (1 min increment)
- Flow: 100 – 800 ml/min (100 ml/min increment)
- Temperature (T2): 96°C (Fixed)
  - Water supply temperature requirement: 85 to 90°C

Consumption data

	Specification	Reference
Supply water consumption	Treatment: Approximately 30 L Hot Rinse/Hot Disinfection: Approximately 12 L	Per 1 hour of treatment Per 1 Hot rinse/disinfection
Acid concentrate consumption	Approximately 0,8 L	Per 1 hour of treatment
Bicarbonate concentrate consumption	Approximately 1,5 L	Per 1 hour of treatment
Energy consumption	Treatment: Approximately 0,55 kWh Hot Disinfection: Approximately 0,68 kWh	Per 1 Hour of treatment Per 1 disinfection
Energy emission (to drain)	Treatment: Approximately 0,20 kWh	Per 1 Hour of treatment
Energy emission (to the environment)	Treatment: Approximately 0,35 kWh	Per 1 Hour of treatment

The data in this table is based on the standard operation of Surdial X hemodialysis machine with default values, a supply water temperature of 20°C, and an ambient temperature of 20°C.

The following treatment parameters were applied: Hemodiafiltration (HDF), dialysate flow rate of 500ml/min, blood flow rate of 200 ml/min, and substitution flow rate of 50 ml/min.

Options

Blood Pressure Measurement Module

Module	M2500 from OMRON Healthcare Co., Ltd. is built-in in every model together with: • Cuff No. 3 (Medium) tube length 175 mm : 0-701-299-UJ • Blue Cuff Hose: 0-701-300-UJ	
Measurement method	Oscillometric	
Measurement part	Upper arm	
Pressure display range	0-300 mmHg	
Pressure display accuracy	Within ± 3 mmHG	
BP measurement ranges (adult)	• Systolic (SYS) : 60 – 250 mmHg • Average (MAP): 45 – 235 mmHg • Diastolic (DIA): 40 – 200 mmHg	
Data	Systolic (SYS), Diastolic (DIA), Mean arterial (MAP), Heart Rate (HP)	
Spare CUFF sizes available (tube length 1000 mm)	**Order code**	**Description**
	OMR-HXA-GCUFF-SSLB	Cuff No.1, Super Small 12-18 cm
	OMR-HXA-GCUFF-SLB	Cuff No.2, Small 18-22 cm
	OMR-HXA-GCUFF-MLB	Cuff No.3, Medium 22-32 cm
	OMR-HXA-GCUFF-LLB	Cuff No.4, Large 32-42 cm
	OMR-HXA-GCUFF-XLLB	Cuff No.5, Extra Large 42-50 cm

Central Alarm Output (CAO)

Description	Alarm sent to externally-connected device when Surdial X detects an alarm
Reaction time to output alarm	5 msec
Maximum voltage of contact	• DC: 30 V or less • AC: 100 V or less
Maximum current of contact	1A
Ordercode	0-704-168-UJ

Blood Volume Measurement (BVM) and Blood Volume Control (BVC)

Module	Class 1 laser product
Wavelength	905 nm
Measurement method	Optoacoustic effect
Measurement data	• Relative Blood volume — Range: 70 – 110% • Relative Blood volume change (ΔBV) — Range: -30 – +10 %
Measurement estimation	• Hemaglobin — Range: 6,8 – 20,4 % • Hematocrit — Range: 20 – 60 %
Control modes	• Ultrafiltration (UF) • Sodium (Na) • Combined Ultrafiltration and Sodium (Uf + Na)
Ordercode	0-704-162-UJ (if not installed from the factory – see above)

Patient Card and Network

Patient cards

Dimensions	ID-1 format: 85.6 mm x 53.98 mm
Memory	I2C 512 kb
Ordercodes	• PATIENT-CARD-UG: Chipcard information • HYBRID-CARD-UG : Chipcard information + RFID (Radio- Frequency Identification tag)

Network

Connection	LAN port at the backside of the machine
Data transfer possibilities	• Unidirectional: Treatment data to Database Electronic Health Care Record • Bidirectional: Patient prescription upload from Electronic Health care record database + Treatment data to database Electronic health care Record

Packaging Details

Individual unit			
Height (cm)	Width (cm)	Depth (cm)	Weight (kg)
162,5 cm (without IV pole)	48 cm	89,5 cm	120
174,5 – 199,5 (with IV pole)	48 cm	89,5 cm	120

Languages

Plate: EN (English)

Outer carton label: EN (English)

Software Display / Operator manual: EN (English), DE (German), FR (French), ES (Spanish), IT (Italian), EL (Greek), RU (Russian), NL (Dutch), RO (Romanian), CS (Czech), SE (Swedish), HR (Croatian), PL (Polish), TR (Turkish), LT (Lithuanian), UK (Ukrainian), PT (Portuguese), HU (Hungarian); SL (Slovenian)

Service manual: EN (English), FR (French)

Material spare part list: EN (English)

Other: Trouble shooting manual EN (English)

Transport and Storage conditions

- With liquid in the hydraulic circuit:
  - 5 to 50 °C
  - 35 to 85% RH
- Without liquid in the hydraulic circuit:
  - -10 to 50°C
  - 35 to 85% RH

Surrounding space

- Ensure following spaces from the outer size of the equipment:
  - Top: minimal 5 cm
  - Side: Minimal 10 cm
  - Back: Minimal 20 cm

Operating surrounding temperature and humidity

- Temperature: 15 – 35°C
  - at least 5°C lower than the set value of dialysate
- Humidity: 35-80 % RH

Barometric pressure (in use, storage or transport)

795 to 1062 hPa

Label details

	Individual unit	Outer box
Product name	✓	✓
Serial Nr.	✓	✓
CE 0123	✓	✓
	✓	—
	✓	✓
EC REP	✓	✓
	—	✓

	Individual unit	Outer box
	—	✓
	—	✓
	—	✓
	—	✓
 10°C- 50°C	—	✓
	—	✓
 IPX 1	—	✓

Barcode Details

Reference code	GTIN-14 Outer box
SURDIAL-X2-HD-UJ	04582395450494
SURDIAL-X2-SNDP-UJ	04582395450500
SURDIAL-X2-HDF-UJ	04582395450517
SURDIAL-X2-CBVM-UJ	
SURDIAL-X2-HDF1-UJ	
SURDIAL-X2-HFDP-UJ	04582395450531
SURDIAL-X2-DBM-UJ	
SURDIAL-X2-D3-UJ	

Customs code: 90189030

GMDN (Global Medical Device Nomenclature): 58130

MAF-1768 - Datasheet - Surdial X - 21.Apr2026