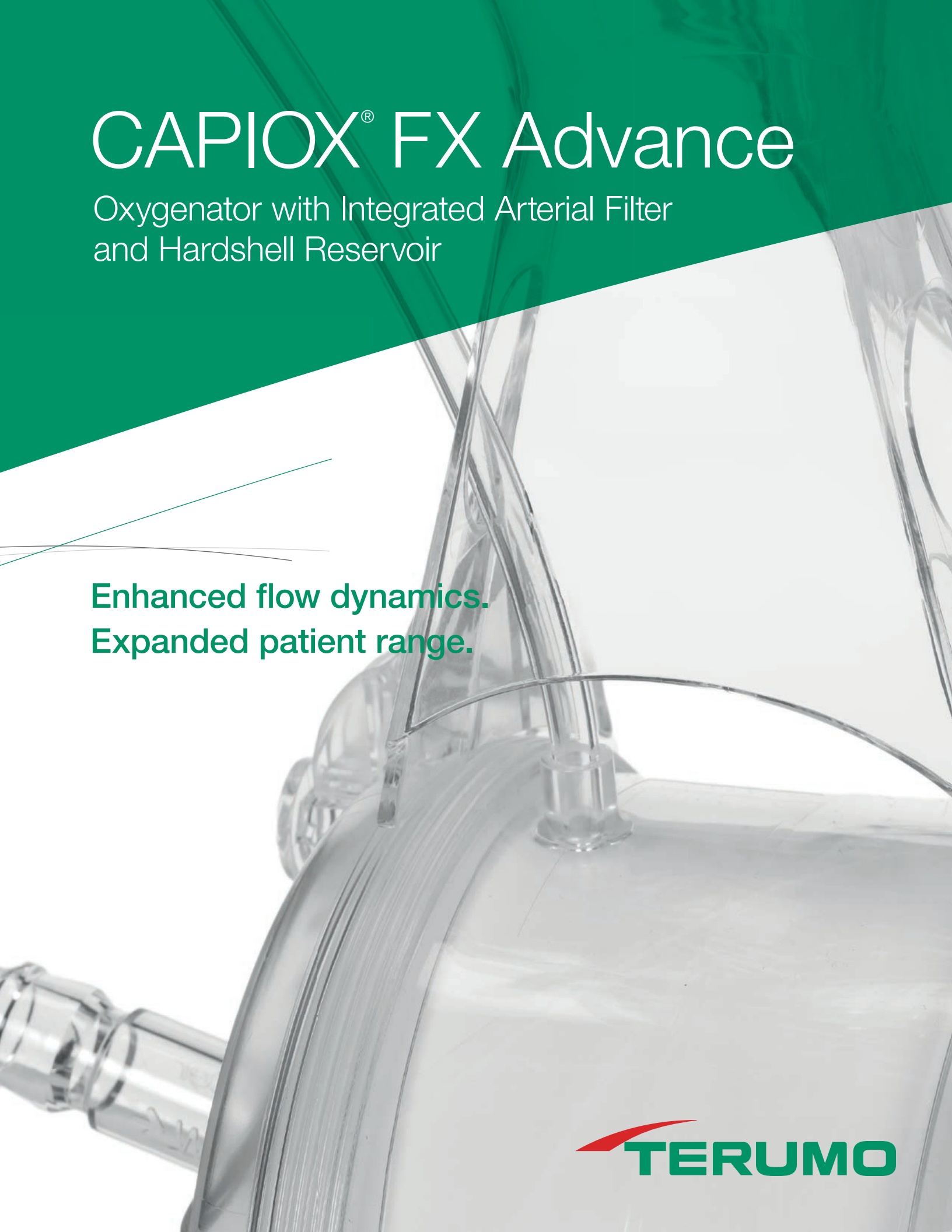
CAPIOX® FX Advance

Oxygenator with Integrated Arterial Filter and Hardshell Reservoir

Enhanced flow dynamics.
Expanded patient range.



TERUMO

TERUMO

Advance to the next level.

Terumo has led the way in oxygenator innovation and quality for more than 30 years and was the first company to manufacture its own hollow fiber.

The new CAPIOX® FX Advance Oxygenator advances your oxygenator to the next level by enhancing flow dynamics,[1] resulting in lower minimum operating levels and increased maximum blood flow rates. Now, you can expand your options and choose a smaller, lower prime oxygenator for even more patients.

Working together with your surgery team, Terumo Cardiovascular Group helps save lives every day. That's why we never compromise quality. And it's why we constantly strive to deliver new technologies that advance patient outcomes and deliver exceptional clinical value.

Choose the oxygenator that expands your options and advances patient outcomes. Choose the CAPIOX FX Advance Oxygenator.

Terumo Cardiovascular Group

terumo-cvgroup.com
terumo-europe.com

Introducing the CAPIOX® FX Advance Oxygenator with improved flow dynamics.

Patients come in all shapes and sizes — so do CAPIOX FX Oxygenators. Now, you can expand the use of CAPIOX FX Oxygenators through the enhanced flow dynamics offered on the CAPIOX Advance Hardshell Reservoir.

Advancements include an increased blood flow rate on the 3,000 mL reservoir — available on the CAPIOX FX15 Advance Oxygenator — and a lower minimum operating level on the 4,000 mL reservoir — available on the CAPIOX FX15 and FX25 Advance Oxygenators.

3,000 mL Hardshell Reservoir

Advantage:

Increased maximum blood flow to 5 L/min on the CAPIOX FX15 Advance Oxygenator*

Benefit:

Flexibility to use on a wider range of patients and the lowest prime adult oxygenator available today

*Use of Vacuum Assisted Venous Drainage may be required to achieve flow rate of 5 L/min.

4,000 mL Hardshell Reservoir

Advantage:

Reduced minimum operating level of 150 mL on the CAPIOX FX15 and FX25 Advance Oxygenators

Benefit:

Further helps minimize hemodilution with the lowest-prime full-size oxygenator[2]

CAPIOX FX15
Advance Oxygenator

TERUMO

Advancing Outcomes

Built around Terumo CV Group's integrated arterial filter with self-venting technology, the CAPIOX® FX Advance Oxygenator helps clinicians reduce prime volume and lower hemodilution.[2] The design of the CAPIOX FX Advance Oxygenator contributes to fewer blood transfusions[4] and reduced hospital costs.[2]

Curved venous inlet enhances flow dynamics

3/8" - 1/4" adapters for the CAPIOX FX15 Oxygenator with 3,000 mL reservoir

Enhanced flow dynamics.
Expanded patient range.

Low prime volume oxygenators reduce hemodilution, blood transfusions and the risk of Acute Kidney Injury

It is well known, with a high level of evidence (Class 1 level a), that excessive hemodilution during cardiopulmonary bypass (CPB) can lead to an increased incidence of red blood cell transfusions and other patient risks, including post-operative Acute Kidney Injury (AKI).

A recent study demonstrates that reducing hemodilution with a low prime volume oxygenator, by as little as 150 mL, is associated with fewer blood transfusions and reduced risk of post-operative AKI.[3]

CAPIOX FX Advance Oxygenators allow you to minimize hemodilution, resulting in fewer blood transfusions and may decrease the risk of AKI.

Hardshell Reservoir

Enhanced flow dynamics

- Improved flow dynamics reduces blood turbulance and enhances gaseous microemboli removal
- Rotating, curved venous inlet enhances ease-of-use
- Increased maximum blood flow to 5 L/min on the CAPIOX FX15 Advance Oxygenator, with 3,000 mL reservoir, for use on a wider range of patients*
- Decreased minimum operating level of 150 mL on the CAPIOX FX15 and FX25 Advance Oxygenators, with the 4,000 mL reservoir, reduces hemodilution
- Elongated shape provides stable, smooth blood flow path
- Volume indicators on three sides enhances visibility at all levels and angles
- Built-in positive pressure relief valve increases convenience and assurance

*Use of Vacuum Assisted Venous Drainage may be required to achieve flow rate of 5 L/min.

CAPIOX FX Oxygenator

Proven performance and fully integrated arterial filter

- Features self-venting technology
- Low priming volume, high gas exchange and low pressure drop are optimally balanced for superb performance
- Terumo's exclusive hollow fiber technology enables total process control from raw materials to finished product
- Woven fiber bundle design provides consistent and high-performance gas exchange
- Less foreign surface area contact minimizes systemic inflammatory response
- Multiple blood outlet port configurations allow easy access and circuit flexibility

West Outlet Port
Oxy inlet on right when outlet is facing away from user.

East Outlet Port
Oxy inlet on left when outlet is facing away from user.

TERUMO

CAPIOX® FX15 Advance Oxygenator

The CAPIOX FX15 Advance Oxygenator significantly lowers prime volume for patients at risk for a higher rate of blood transfusions. With the CAPIOX FX15 Advance Oxygenator, smaller patients can have surgery with an oxygenator that best fits their unique metabolic needs. And now, the increased blood flow rate available with the 3,000 mL hardshell reservoir expands the use of a smaller oxygenator to more patients.

- Maximum blood flow: 5.0 L/min
- Oxygenator priming volume: 144 mL
- Reservoir storage capacity:
  - 3,000 mL: 70 mL minimum operating level
  - 4,000 mL: 150 mL minimum operating level

FX15 Advance 4,000 mL

FX15 Advance 3,000 mL

CAPIOX FX25 Advance Oxygenator

The design of the CAPIOX FX25 Advance Oxygenator provides a full-size oxygenator with a low prime volume, and the hardshell reservoir offers a reduced minimum operating level.

- Maximum blood flow: 7.0 L/min
- Oxygenator priming volume: 260 mL
- Reservoir storage capacity: 4,000 mL
- Minimum operating level: 150 mL

FX25 Advance
4,000 mL

CAPIOX FX05 Oxygenator

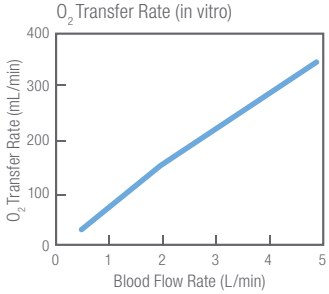
The CAPIOX FX05 Oxygenator offers exceptionally low prime volume and high performance.[5] Your most delicate patients deserve the lowest prime volume possible.

- Maximum blood flow: 1.5 L/min
- Oxygenator priming volume: 43 mL
- Reservoir storage capacity: 1,000 mL
- Minimum operating level: 15 mL

FX05
1,000 mL

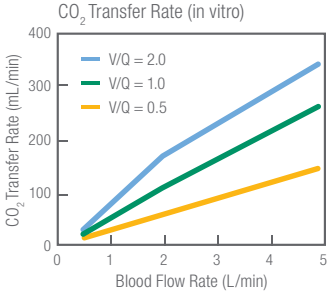
CAPIOX® FX15 Advance Oxygenator Performance Data[1]

O_2 Transfer Rate (in vitro)



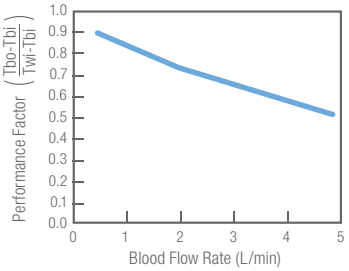
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L
V/Q = 1.0

CO_2 Transfer Rate (in vitro)



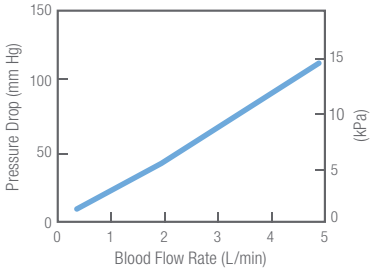
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L

Heat Exchanger Performance Factor (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Water Flow Rate = 15 L/min
Tbi = 30 ± 1ºC
Twi = 40 ± 1ºC

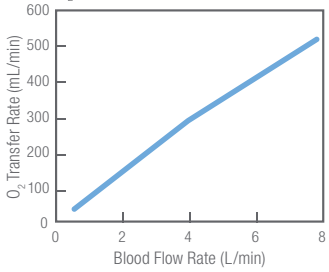
Blood Side Pressure Drop (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
B.E. = 0 ± 5 mEq/L
Temp = 37 ± 1ºC

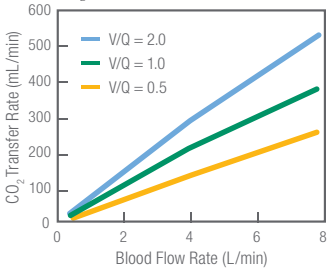
CAPIOX FX25 Advance Oxygenator Performance Data[1]

O_2 Transfer Rate (in vitro)



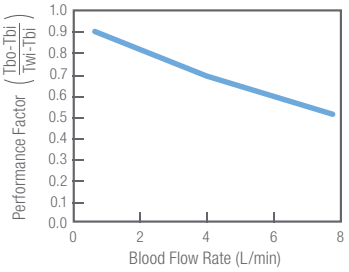
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L
V/Q = 1.0

CO_2 Transfer Rate (in vitro)



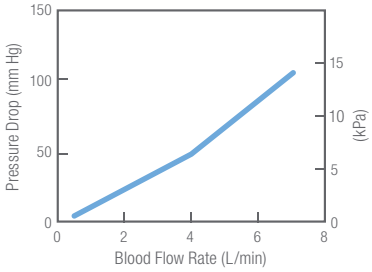
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L

Heat Exchanger Performance Factor (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Water Flow Rate = 15 L/min
Tbi = 30 ± 1ºC
Twi = 40 ± 1ºC

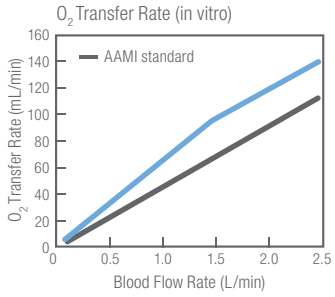
Blood Side Pressure Drop (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
B.E. = 0 ± 5 mEq/L
Temp = 37 ± 1ºC

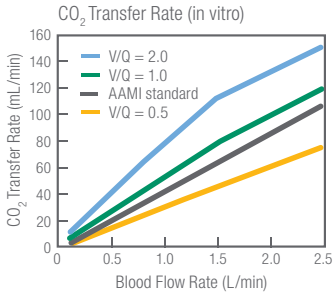
CAPIOX FX05 Oxygenator Performance Data[1]

O_2 Transfer Rate (in vitro)



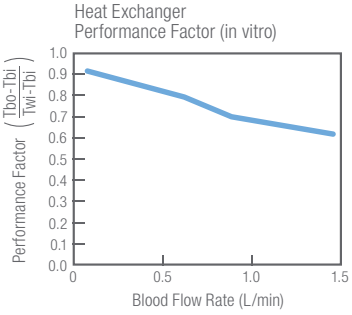
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L
V/Q = 1.0

CO_2 Transfer Rate (in vitro)



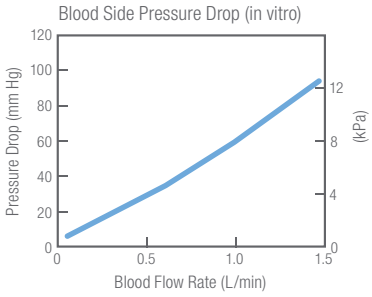
Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC
pH = 7.4
SvO_2 = 65 ± 5%
$PvCO_2$ = 45 ± 5 mm Hg
B.E. = 0 ± 5 mEq/L

Heat Exchanger Performance Factor (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Water Flow Rate = 15 L/min
Tbi = 30 ± 1ºC
Twi = 40 ± 1ºC

Blood Side Pressure Drop (in vitro)



Conditions:
Blood = Bovine
Hb = 12 ± 1 g/dL
Temp = 37 ± 1ºC

Holder Systems

XX*CXH18R/801804

XX*XH032

XX*CXH15

XX*CXH25F

XX*CXH05R

Specifications

Oxygenator and Heat Exchanger			
Material	Housing	Polycarbonate	
	Oxygenator fibers	Microporous polypropylene	
	Heat Exchanger	Stainless steel	
Oxygenator	**FX15**	**FX25**	**FX05**
Fiber bundle surface area	Approx. 1.5 m^2	Approx. 2.5 m^2	Approx. 0.5 m^2
Heat exchanger surface area	Approx. 0.14 m^2	Approx. 0.2 m^2	Approx. 0.035 m^2
Blood flow range	0.5 - 5.0 L/min	0.5 - 7.0 L/min	0.1 - 1.5 L/min
Priming volume (static)	144 mL	260 mL	43 mL
Blood inlet port (from pump)	3/8" (9.5 mm)		1/4" (6.4 mm)
Blood outlet port	3/8" (9.5 mm)		1/4" (6.4 mm)
Cardioplegia port	1/4" (6.4 mm)		N/A
Luer port (for recirc. or blood cardioplegia)	N/A		One luer lock on blood outlet port
Gas inlet port	1/4" (6.4 mm)		
Gas outlet port	1/4" (6.4 mm)		5/16" (7.9 mm)
Water ports	1/2" (12.7 mm) Hansen quick connect fitting		
Maximum pressure blood inlet	1.000 mm Hg (133 kPa) (1.36 kgf/cm^2)		
Maximum pressure water inlet	1,470 mm Hg (196 kPa) (2 kgf/cm^2)		
Arterial Filter			
Filter material	Polyester screen type		
Pore size	32 µm		
Surface area	360 cm^2	600 cm^2	130 cm^2

CAPIOX® FX15/FX25 Advance Hardshell Reservoir and CAPIOX® FX05 Hardshell Reservoir				
Material	Housing	Polycarbonate		
	Venous filter	Polyester screen type, pore size 47 µm		
	Cardiotomy filter	Polyester depth type		
	Defoamer	Polyurethane foam		
Hardshell Reservoir	**FX15**		**FX25**	**FX05**
	R30C	R40C		
Blood flow range • Venous flow • Cardiotomy inlet • Combined flow	 0.5 - 5.0 L/min Max. 4.0 L/min Max. 5.0 L/min	 0.5 - 5.0 L/min Max. 5.0 L/min Max. 5.0 L/min	 0.5 - 7.0 L/min Max. 5.0 L/min Max. 7.0 L/min	 0.1 - 1.5 L/min Max. 1.5 L/min Max. 1.5 L/min
Blood storage capacity	3,000 mL	4,000 mL	4,000 mL	1.000 mL
Minimum operating volume	70 mL	150 mL	150 mL	15 mL
Venous blood inlet port	3/8" (9.5 mm) Rotatable	1/2" (12.7 mm) Rotatable	1/2" (12.7 mm) Rotatable	1/4" (6.4 mm) Rotatable
Blood outlet port (to pump)	3/8" (9.5 mm)			1/4" (6.4 mm)
Suction ports	Six, 1/4" (6.4 mm)			Five, 3/16" - 1/4" (4.8 mm - 6.4 mm) Rotatable
Vertical port to CR filter	3/8" (9.5 mm)			N/A
Quick prime port	1/4" (6.4 mm)			
Vent port	1/4" (6.4 mm)			
Auxiliary port	1/4" - 3/8" (6.4 mm - 9.5 mm)			
Luer ports	Three filtered luer locks to cardiotomy filter. One non-filtered luer lock. Two luer locks on venous inlet.			
Maximum sustainable negative pressure in reservoir	-150 mm Hg (-20 kPa)			
Positive pressure relief valve	0 - 8 mm Hg (1.1 kPa)			N/A

Xcoating™ Surface Coating. Terumo's biocompatible amphiphilic polymer surface coating is a standard feature on all CAPIOX FX Advance Oxygenators.

Ordering Information

West Outlet Port
Oxy inlet on right when outlet is facing away from user.

East Outlet Port
Oxy inlet on left when outlet is facing away from user.

Catalog #	Description	Units/Case
CAPIOX® FX15 Oxygenator		
CX*FX15W+	With integrated arterial filter, “west” orientation	4
CX*FX15E+	With integrated arterial filter, “east” orientation	4
CAPIOX® FX15 Advance Oxygenator		
3CX*FX15RW30C#	With integrated arterial filter, 3,000 mL hardshell reservoir, “west” orientation	4
3CX*FX15RE30C#	With integrated arterial filter, 3,000 mL hardshell reservoir, “east” orientation	4
3CX*FX15RW40C	With integrated arterial filter, 4,000 mL hardshell reservoir, “west” orientation	4
3CX*FX15RE40C	With integrated arterial filter, 4,000 mL hardshell reservoir, “east” orientation	4
CAPIOX FX25 Oxygenator		
CX*FX25W	With integrated arterial filter, “west” orientation	4
CX*FX25E	With integrated arterial filter, “east” orientation	4
CAPIOX FX25 Advance Oxygenator		
3CX*FX25RWC	With integrated arterial filter, 4,000 mL hardshell reservoir, “west” orientation	4
3CX*FX25REC	With integrated arterial filter, 4,000 mL hardshell reservoir, “east” orientation	4
CAPIOX FX05 Oxygenator		
CX*FX05RW^	With integrated arterial filter, 1,000 mL hardshell reservoir, “west” orientation	4
CX*FX05RE^	With integrated arterial filter, 1,000 mL hardshell reservoir, “east” orientation	4
Holders for CAPIOX FX Oxygenators		
XX*CXH15	FX15/25 oxygenators	1
XX*CXH18R	FX15/25 Advance oxygenators with hardshell reservoir	1
XX*CXH25F	FX15/25 Advance oxygenators when separated from reservoir	1
XX*XH032	FX15/25 Advance oxygenators with hardshell reservoir, short arm	1
XX*CXH05	FX05 oxygenator	1
XX*CXH05R	FX05 oxygenator with hardshell reservoir	1
XX*CXH05AD	Adapter for SX holder for FX05	1
Accessories for CAPIOX FX Oxygenators		
CX*BP021	Blue thermistor wire	10
CX*BP022	Red thermistor wire	10

+ Contains two 1/4" - 3/8" adapters # Contains four 1/4" - 3/8" adapters ^ Contains four 3/16" - 1/4" adapters, one 1/4" - 3/8" adapters, and a recirculation line

REFERENCES:

1. Internal testing, data on file.
2. Bronson, S., et al. Prescriptive Patient Extracorporeal Circuit and Oxygenator Sizing Reduces Hemodilution and Allogeneic Blood Product Transfusion during Adult Cardiac Surgery. *JECT.* 2013; 45:167-172.
3. Ranucci, M., et al. Effects of priming volume reduction on allogeneic red blood cell transfusions and renal outcome after heart surgery. *Perfusion.* March 2015; 30(2).
4. Lahanas, A., et al. A retrospective comparison of blood transfusion requirements during cardiopulmonary bypass with two different small adult oxygenators. *Perfusion.* July 2013; 28(4).
5. Deptula, J., et al. Clinical Evaluation of the Terumo CAPIOX FX05 Hollow Fiber Oxygenator with Integrated Arterial Line Filter. *JECT.* 2009; 41:220-225.

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