

BIYOVENT
THE FIRST INTENSIVE CARE
MECHANICAL VENTILATOR
OF TURKEY



biosys
MİLLİ MEDİKAL SİSTEMLER



BIYOCEMENT

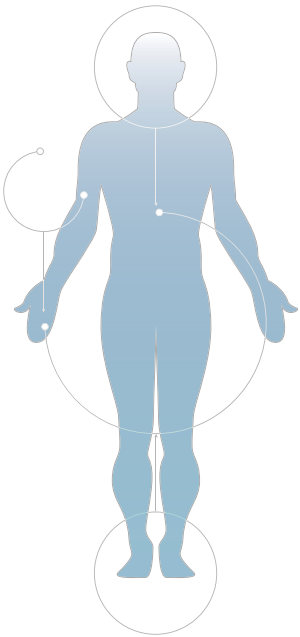
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Made In Türkiye



Biyovent is produced with the support of the Republic of Turkey Ministry of Industry and Technology, The Scientific and Technological Research Council of Turkey and Bilkent Cyberpark after a five-year research and development process.

The five-year design is verified and manufactured with the cooperation of engineers of defense industry and doctors who are experts at respiratory physiology.



BIYOVENT THE FIRST HIGH LEVEL INTENSIVE CARE MECHANICAL VENTILATOR OF TURKEY

DESIGNED AND PRODUCED FOR INTENSIVE CARE AND
REANIMATION UNITS.

- Modern and ergonomic lines.
- User-friendly interface.
- Perfect performance.
- Traditional and innovative operating modes.
- Compatible with pediatric and adult patients.
- Low cost and maintenance.



Biyovent Respiratory Therapy Equipment



Ergonomic Design

- Design with smooth and modern lines
- Right/left and up/down angled, 15 inches, high resolution full touch screen monitor
- Touch-operated rapid access keys
- Top section detachable from support legs
- User-friendly expiration valve
- Protective carrying handles
- Shock-absorbing and impact resistant wheels
- External humidification support



Smart Safety System and User-friendly Interface

- Smart alarm identification and alarm silence (2min)
- Gradual auditory and visual alarm
- Adjustable apnea time and apnea backup mode (5-60 sec.)
- Automatic bilateral apne ventilation mode
- 2 minute supply of oxygen (O2 suction)
- Stand-by mode
- Leak and trigger compensation
- Automatic tube compensation
- Comparative measurement of sensors and automatic calibration (when turning on the device and on request)
- Oxygen sensor
- Monitoring the trend of a patient for 1 week
- Logging the system for 6 weeks
- 2 hour internal battery
- 8 hour optional battery
- 5 ms valve response time
- 100 mbar emergency valve
- 50 mbar automatic expiration evacuation
- IP 21 impermeability
- Low air and oxygen pressure detection
- Automatic change of source
- Software update
- Working with a medical compressor
- Display of loss of main power and level of battery
- Display of technical failure, fan failure and connection loss alarm



Economic Solutions

- 100 % made in Türkiye
- Minimum maintenance cost
- Reusable expiration valve
- 2 years warranty + 3 years optional warranty extension
- Quick and qualitative technical service





Biyovent can support all female & male and pediatric & adult patients.

It can deliver up to 150 breaths and go down to 20 cc low Vtidal.

It can calculate the values of patient elastance and compliance fast and precisely.

It can automatically calibrates itself when it is turned on.

Automatic tube compensation.

It provides leak compensation up to 80 % .

Inspiration hold and expiration hold in 1-60 sec. intervals.

Advanced
Adaptive Control

Biyovent uses advanced adaptive control algorithms. It responds in milliseconds.



Biyovent has Nasal Cpap and High Flow Oxygen Therapy modes.

Biyovent has an integrated nebulizer system.

Advanced
Adaptive Control

Biyovent works both in traditional and innovative modes.



Pressure Controlled Modes:
P-ACV
P-SIMV+PS
P-CMV
P-PSV
P-Bilevel
APRV

Volume Controlled Modes:
V-ACV
V-ACV(PRVC)
V-CMV
V-SIMV+PS
V-SIMV(PRVC)+PS

Spontaneous and Smart Modes:
SPN-PS
SPN-VS

Interface of Biyovent and Features of Software



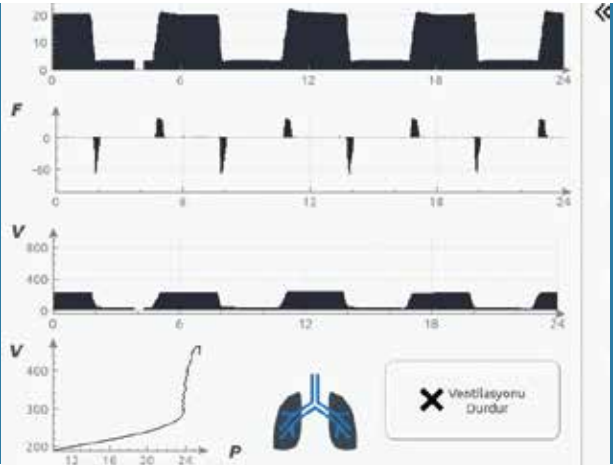
Full Touch Screen Monitor of 15 inches

Biyovent displays information on a 15-inch high resolution color screen and it provides ease of use with its sensitive touch screen. It also provides rapid access to respiration parameters like FiO₂, PEEP and respiratory rate.

It displays instant information about the patient and alarms on its big screen.

It has a user-friendly interface.

Biyovent is easy to use.



Biyovent Displays 3 Graphics, 3 Cycles (Pressure-Volume, Pressure-Flow, Flow-Volume) and the Dynamic State of Lungs Simultaneously

Biyovent displays instant measurement values on graphics.

Graphics: Pressure-Time, Volume-Time, Flow-Time

Loops: Pressure-Volume, Pressure-Flow, Flow-Volume

It is possible to freeze the graphics and loops to analyze them.



Just Identify the Patient, let Biyovent do the rest...

Biyovent has trigger compensation feature.



Gradual Alarm System and Setting Alarm Limits Automatically

Biyovent is equipped with an auditory and visual alarm system, which is gradual and easy to control. It has a mechanical and electronic software system of safety, so the patients who are ventilated are safe. There is an easy access button for silencing the alarm (2min).



Compatibility with Patient and Performance



Pediatric
Respiratory rate: 1-150 Per Minute
T inspiration: 0.1-10 Sec
Tidal Volume: 0.02-0.6 Ltr
Flow: 1-60 ltr per minute
Trigger Sensitivity: 0.1-20 ltr per minute 0.1-20 mbar
Leak and Tube Compensation
Invasive and Non-Invasive Ventilation

Adult
Respiratory rate: 1-100 Per Minute
T inspiration: 0.1-10 Sec
Tidal Volume: 0.1-3 Ltr
Flow: 1-120 ltr per minute
Trigger Sensitivity: 0.1-20 ltr per minute 0.1-20 mbar
Leak and Tube Compensation
Invasive and Non-Invasive Ventilation

Technical Features of Biyovent

Types of Patients:

Padiatric and Adult



Modes of Ventilation

P-ACV	Pressure Controlled, Assisted Ventilation
P-SIMV+PS	Pressure Controlled, Synchronized Mandatory Ventilation With Pressure Support
P-PSV	Pressure Controlled, Ventilation With Pressure Support
P-BILEVEL	Pressure Controlled, Two-Level Ventilation
P-CMV	Pressure Controlled, Continuous Mandatory Ventilation
APRV	Airway Pressure Release Ventilation
V-ACV	Volume Controlled, Assisted Ventilation
V-ACV(PRVC)	Volume targeted, Pressure Controlled, Assisted Ventilation
V-CMV	Volume controlled, Continuous Mandatory Ventilation
V-SIMV+PS	Volume controlled, Synchronized Mandatory Ventilation With Pressure Support
V-SIMV(PRVC)+PS	Volume Targeted, Pressure Controlled, Synchronized Mandatory Ventilation With Pressure Support
SPN-PS	Spontaneous Ventilation With Pressure Support
SPN-VS	Spontaneous Ventilation With Volume Support
nCPAP	Nasal CPAP Mode
High Flow Oxygen Therapy Mode, 2-120 ltr/min	
Spontaneous Breath Indicator	

Working Features

Inspiration pressure	2-100 mBar
Inspiration Time	0.1-10 sec
Peep Pressure	1-50 mBar
Respiatory rate	(p): 1-150/min (a): 1-100/min
Tidal Volume	(p): 20-600 mL (a): 100-3000 mL
Flow Rate	(p): 1-60 lt/min (a): 1-120 lt/min
O2 Mixture	21-100%
Spontaneous Pressure Support	0-100 mBar
I/E rate	1:10(x60*)-10:1

(p): pediatric (a): adult

Detailed Features

Apnea Time	5-60 sec, Bilateral Apnea Ventilation
Apnea Mode	P-CMV, V-CMV
Flow Trigger	0.1-20 lt/min
Pressure Trigger Termination	0.1-20 mBar
Termination Of Inspiration	0-80%
Tramp	0.1-5 sec
Automatic Tube Compensation	0-80%
Automatic Leak Compensation	0-80%
Trigger Compensation	On-Off
Inspiration Pause	1-60 sec
Expiration Pause	1-60 sec
Internal (Integrated) Nebulizer	1-20 Lt/min
O2 Support	2 min

Displayed Data on screen

P Peak	Measurement of Peak Pressure Inspiration	WOB	Energy Spent During Inspiration
P Peep	Measurement of PEEP	WOB/Lt	Energy Spent During Inspiration / Volume
P Plateau	Masurement of Plateau Pressure Inspiration	V Resudial	Resudial volume at the end of breathing
P Average	Masurement of Average pressure	V Expiration	Expiration Tidal Volume
F Inspiration	Inspiration Flow	V Ads	Anatomic Dead Space Measurement
F Expiration	Expiration Flow	AutoPeep	Trapped Air Pressure After Respiration Occlusion
MVe	Volume Measurement	PO.1	Pressure Measurement Per 100 milli Seconds
SpnMVe	Spontaneous Minute Volume Measurement	RSBI	Rapid Shallow Breathing Index
SpnMVe/MVe	Spontaneous Volume Per Minute / Volume Raito Per Minute	PTP	Negative Pressure x Negative Pressure Time
V Tidal	Tidal Volume	FTP	Negative Flow x Negative Flow Time
FiO2	Oxygen Ratio	P NIF	Negative Inspiration Pressure Force
Respiratory rate	Number of Breaths Per Minute	MVsp%	Spontaneous Ratio to Mandatory Minute Volume
Spontaneous respiratory rate	Spontaneous Number of Breaths Per Minute	Leak Rate	Leak Volume Rate
T Inspiration	Inspiration Time	Leak Volume	Leak Volume After Respiration Cycle
T Expiration	Expiration Time		
I/E	Inspiration and Expiration Time Ratio		
R Airway	Airway Resistance Measurement		
C Static	Static Compliance Measurement		
C Dynamic	Dynamic Compliance Measurement		
Elastance	Elastance Measurement		
RC Constant	Rc Time Constant Measurement		

Alarm Features

Auditory and Visual Alarm and Recording
Two-Minute Alarm Silence

Inspiration Pressure Lower Limit / Upper Limit
Tidal Volume Lower Limit / Upper Limit
Speed of Respiration Lower Limit / Upper Limit
Volume Per Minute Lower Limit / Upper Limit
I/E Ratio Lower Limit / Upper Limit
FiO2 Lower Limit / Upper Limit
Apnea Time Upper Limit
Leak Upper Limit

Graphic Features

Pressure Time Graphic
Flow Time Graphic
Volume Time Graphic
Pressure-Volume, Pressure-Flow, Volume-Flow Cycles

Patient Records and Logging

Last 3 Days Record of Ventilation Value Trend and Graphical Representation.
Information Storage With The Capauty of 2000 Record Alarm and Ventilation Alarm.

Electrical Features

Battery Time	2 Hours + 8 Hours Optional
Mains Voltage Power	180 - 264 VAC
Consumption	47-63 Hz 100W

Features of The Source of Pressure

O2 Pressure 2.5 - 7 Bar Central System / Tube
Air Pressure 2.5 - 7 Bar Central System / Tube
Automatic Change and Alarm Display When The Source is Consumed
Working With a Medical Compressor or Regulator

Size and Weight

Lenght	150cm
Depth	44cm
Width	42cm
Weight	55kg
Monitor Movement	Left and Right 150° Up and Down 15°
	15 inch Full Touch Screen Monitor Pendant and Column Mounting

Digital Interfaces

4 USB, 2 COM, 2 Ethernet

Comparison of Modes

Biosys	Puritan Bennett	Dräger	GE	Hamilton	Maquet	Mindray
P-ACV	A/C: PC	PC-AC	PCV	PCV	PC	P-AC
P-SIMV+PS	SIMV: PC	PC-SIMV	SIMV-PC	PSIMV+	SIMV-PC+PS	P-SIMV
P-PSV	PS	SPN-CPAP/PS	CPAP/PSV	Spont	PS	PSV
P-Bilevel	BiLevel	PC-BIPAP	BiLevel	DuoPAP	Bi Vent	DuoLevel
APRV	APRV	PC-APRV	APRV	APRV	Bivent-APRV	APRV
V-ACV	A/C: VC	VC-AC	VCV	(S)CMV	VC	V-AC
V-ACV(PRVC)	VC+	Autoflow	PCV-VG	APV/SIMV+	PRVC	PRVC
V-CMV	A/C: VC	VC-CMV	VCV	CMV	VC	V-AC
V-SIMV+PS	SIMV: VC	VC-SIMV	SIMV-VC	SIMV	SIMV-VC+PS	V-SIMV
V-SIMV(PRVC)+PS	VC+	VC-SIMV+ Autoflow	SIMV-PCVG	APV/SIMV+	SIMV-PRVC+PS	PRVC
SPN-PS	PS	SPN-CPAP/PS	CPAP	Spont.	PS/CPAP	-
SPN-VS	VS	SPN-CPAP/VS	-	-	VS	-

- +PS(Pressure Support) feature supports the breathing efforts with pressure.
- PRVC(Pressure Regulated Volume Control) feature provides pressure control for volume target.



Bilkent Üniversitesi, Cyberpark A303C, Çankaya, Ankara/Türkiye, 06800

www.biosys.com.tr

info@biosys.com.tr

