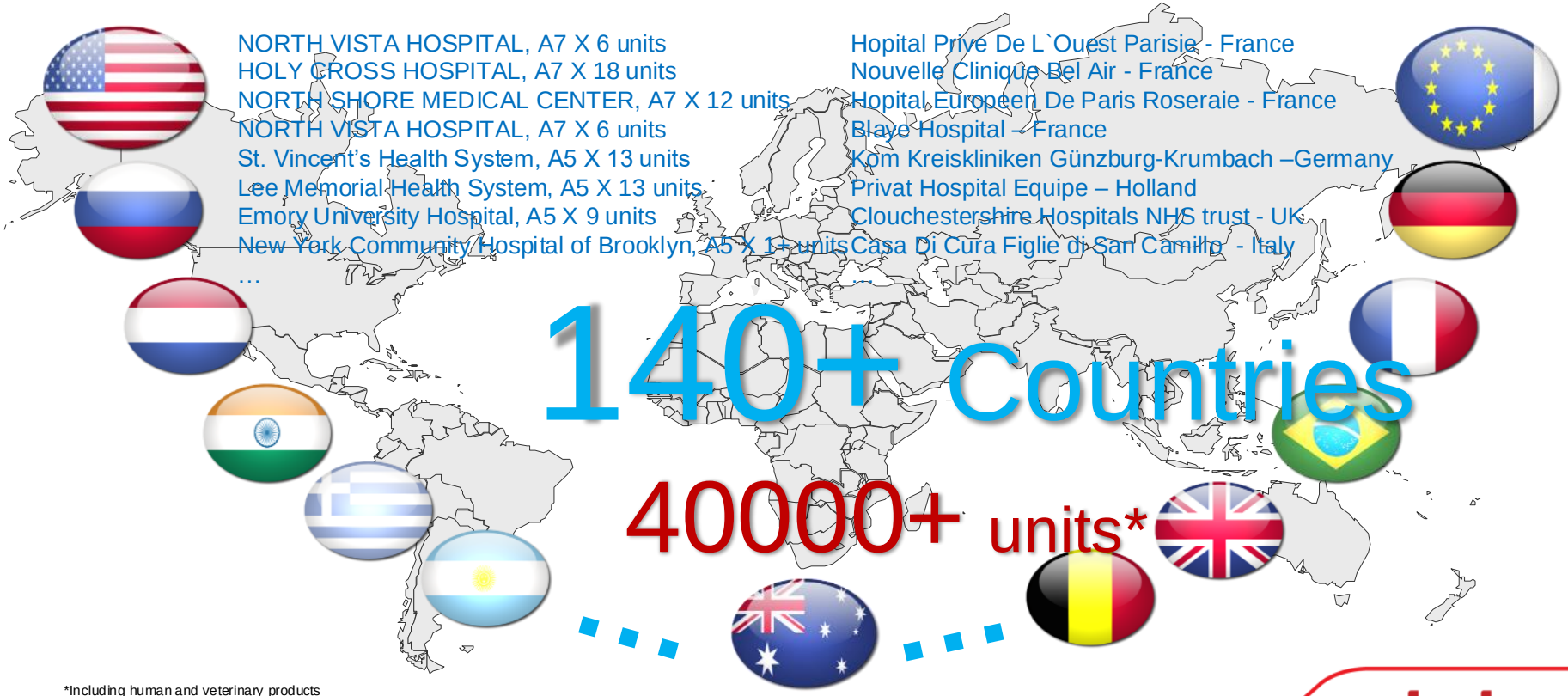
Mindray Veterinary Anesthesia Machine Introduction

Ver. 2019

2019-04

About Mindray

A Global View of Mindray Anesthesia



NORTH VISTA HOSPITAL, A7 X 6 units
HOLY CROSS HOSPITAL, A7 X 18 units
NORTH SHORE MEDICAL CENTER, A7 X 12 units
NORTH VISTA HOSPITAL, A7 X 6 units
St. Vincent's Health System, A5 X 13 units
Lee Memorial Health System, A5 X 13 units
Emory University Hospital, A5 X 9 units
New York Community Hospital of Brooklyn, A5 X 11 units
…

Hopital Prive De L`Ouest Parisie - France
Nouvelle Clinique Bel Air - France
Hopital Europeen De Paris Roseraie - France
Blaye Hospital – France
Kom Kreiskliniken Günzburg-Krumbach –Germany
Privat Hospital Equipe – Holland
Clouchestershire Hospitals NHS trust - UK
Casa Di Cura Figlie di San Camillo - Italy

140+ Countries

40000+ units*

*Including human and veterinary products

Mindray Veterinary Anesthesia Product

WATO Series Anesthesia System

WATO EX-20Vet

Veterinary anesthesia machine

WATO EX-35Vet

Veterinary anesthesia workstation

Specification Overview

WATO EX-20Vet

WATO EX-20Vet	Model	WATO EX-35Vet
7.0 inch color screen Key + Knob	**Screen**	10.4 inch touch screen Key + Knob
Mechanical control，Two tubes Low flow range: 0-1 L/min， High flow range: 1-15 L/min	**Flow meter**	Mechanical control，Two tubes Low flow range: 0-1 L/min， High flow range: 1-15 L/min
1.5 L	**CO2 canister**	1.5 L
Max 2 vaporizer position	**Vaporizer**	Max 2 vaporizer position
20-1500 ml	**Tidal volume**	20-1500 ml （Standard） 5-1500 ml (Opt, w/ PCV-VG)
VCV, PCV，SIMV –VC/PC，PSV， Spontaneous	**Vent Mode**	VCV, PCV，SIMV –VC/PC，PSV， PCV-VG，Spontaneous
Opt: O2	**Gas monitoring**	Opt:O2, Plug&Play CO2，Multi-Gas module
Rebreathing circuit, Non-rebreathing cicuit，(opt: ACGO)	**Breathing circuit**	Rebreathing circuit, Non-rebreathing cicuit，(opt: ACGO)
4 wheel brakers	**Brake**	4 wheel brakers
1	**Drawer**	3
/	**Smart Alarm Management**	Yes

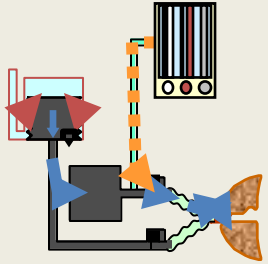
WATO EX-35Vet

Why Mindray Anesthesia System?

Safety

Fully automatic inhalation anesthetic solution for Veterinary

Intelligence ventilator



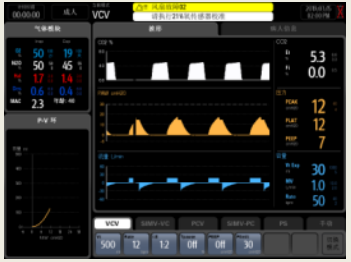
What you set is what you get

Precise Vaporizer

FDA Approval

Maintenance free for life span

Complete Monitoring



Respiratory status & gas monitoring

Why Mindray Anesthesia System?

Ease to use

Fully automatic inhalation anesthetic solution for Veterinary

Integrated breathing system

Less Leakage，Quick switch, Heating

Intuitive user interface

Simple and Clear

System leakage test

Quick start and direct result display

Waste gas scaveging

Quick start and direct result display

Ergonomics Design

Large worksurface and ease to move

WATO EX-20Vet

WATO EX-20Vet

Model	WATO EX-20Vet
Screen	7.0 inch color screen Key + Knob
Flow meter	Mechanical control，Two tubes Low flow range: 0-1 L/min， High flow range: 1-15 L/min
CO2 canister	1.5 L
Vaporizer	Max 2 vaporizer position
Tidal volume	20-1500 ml
Vent Mode	VCV, PCV，SIMV –VC/PC，PSV，Spontaneous
Gas monitoring	Opt: O2
Breathing circuit	Rebreathing circuit, Non-rebreathing cicuit，(opt: ACGO)
Brake	4 wheel brakers
Drawer	1

WATO EX-20Vet Overview

- Auxiliary O2 flow meter*
- Fresh gas flow meter
- Gas supply gauge
- Breathing system circuit
- System switch
- Breathing bag connector
- CO2 canister
- 7.0 inch screen
- Work Light*
- Vaporizer
- Handle
- ACGO*
- Drawer
- Wheel brakers

*Optional

mindray

Intelligence ventilator

- **Electronic control ventilator that allows users to choose the modes best fit for the veterinary needs**

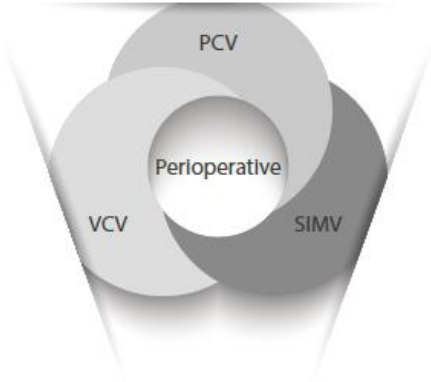
✓ VCV-Volume control ventilation， the most common used ventilation mode

✓ PCV- Pressure control ventilation， useful for animals with pulmonary disease or unnormal compliance

✓ SIMV/PS*- Synchronized Intermittent Mandatory Ventilation， balance between spontaneous breath and minimal mechanial ventilation support

✓ PSV*- Pressure support ventilation , for animals with spontaneous breath

✓ PEEP – positive end-expiratory pressure, avoid alveolar collaps during surgery



*Optional

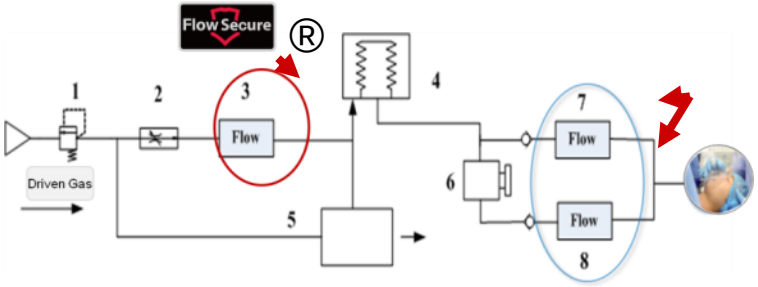
Intelligence ventilator

- **FlowSecure™ Patent Technology，What you set is what you get**

✓ Dynamic tidal volume compensation, prevent the influence of fresh gas flow or system compliance & leakage

✓ High-quality insp & exp flow sensors, precise and long service life

✓ Internal the 3rd flow sensor for calibration and safety backup



- **Full range precise tidal volume without changing bellows**

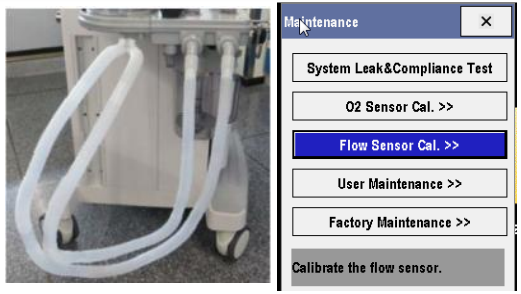
✓ Do not have to change bellows by animals' size, improve routine workflow

✓ Tidal volume down to 20ml (VCV) or 5ml(PCV), apply to tiny animals

One bellows from 20ml-1500ml

VS

Two bellows:
small : 20-300ml ; Large: 300-1500ml



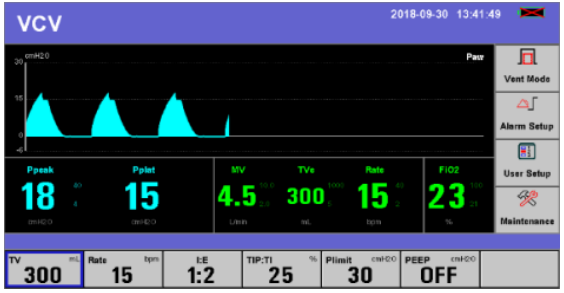
Calibrate by users, without extra device or service personal

Complete Monitoring & Alarm

- **Phisiological monitoring**

✓ Wavefrom: Airway Pressure , Flow, Volume

✓ Monitoring Parameters: PEAK ,MEAN, PEEP, TV, MV, Rate



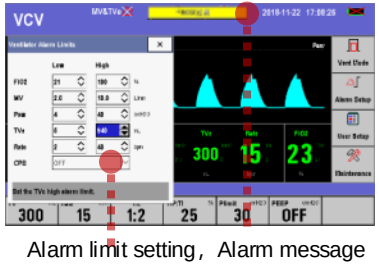
- **Alarm management system**

✓ Indicate the alarm cause by words directly, help to toubleshoot quickly, avoid damage of animals.

✓ Centralizaed alarm limit setting, including apnea, pressure, tidal volume, insp O2 concentration.

✓ Important system malfuction prompt: gas supply failure, power supply failure, circuit disconnection

WATO EX-20Vet



Alarm limit setting, Alarm message

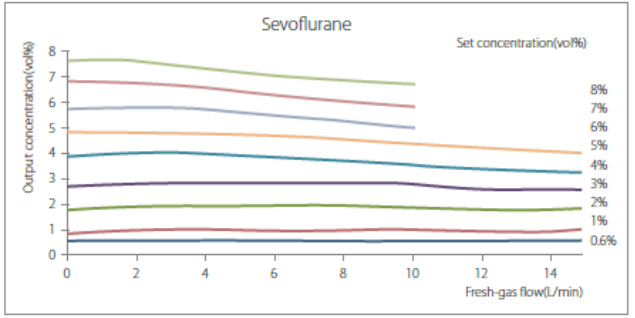
VS

Others

Only notice LED for limited alarms, hard to read and solve problem.

Maintenance-free Vaporizer

- ## Vaporizer
- ### Mindray V60 vaporizer （Iso, Sev, Hal)
  - ✓ Automated flow/ Temp/ Pressure compensation ensure a constant output and accurate concentration under different eviroment conditions.
  - ✓ Good air-tightness, reduce agent gas waste
  - ✓ **Maintenance-free** design ensure that no calibration is required throughout the entire life span
  - ✓ **FDA Approval**
  - ✓ Large capacity (300 ml with most wick, 360 ml with dray wick)
  - ✓ Highly compatible: support three different filling options and standard selectatec mounting system.



The diagrams show the influence of flow on the concentration delivered after 1 minute at 22°C, 101.3 k Pa when operating with Air.

Integrated Breathing System

- **Non-redundant tubes and cables**
  - ✓ Avoid system leakage, reduce agent cost
  - ✓ Avoid disconnection, mis-connection and intertwine
  - ✓ Save the space in the operation room

Integrated breathing system
WATO EX-20Vet

VS

Non-integrated breathing system

Messy and hard to use

Integrated Breathing System

- **Quick switch between Manual ventilation & Auto ventilation**

✓ Start ventilator quickly in emergence situation

✓ Without changing tubes

✓ Precise control of maimum airway pressure by APL valve

✓ Ensure the safety of animal

WATO EX-20 Vet

VS

Others: Need replace the breathing bag with tubes

- **Quick switch between rebreathing circuit and non-rebreathing circuit**

✓ Independent ACGO port

✓ Control by mechanical switch directly without inserting and extracting tubes

✓ Non-rebreathing circuit: for tiny animals down to 3-5kg

Independent ACGO port

Non-rebreathing circuit

Integrated Breathing System

- **Heating* for whole breathing system**

✓ Reduce the condensate water,

✓ Avoid the conflutination of bellows and valves

✓ Ensure the stable monitoring of flow sensors, ensure the stable of ventilation

✓ **Warmer gas into the animals' lung, decrease the heat loss during surgery**

Breathing system with Heating module

WATO EX-20Vet

VS

Breathing system without Heating module

Condendate water

- **CO2 caniter with large capacity**

✓ 1.5L volume, for larger animals or prolonged surgery

✓ Transparent material, clear to observe the absorbent color.

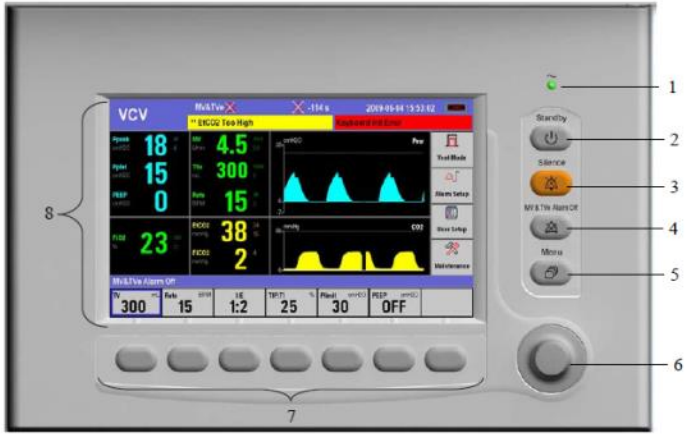
✓ Ease to disasesmble, without tools

✓ Non-cover design, refill absorbent directly

✓ Autocalvable (up to 134 ℃)

Intuitive User Interface

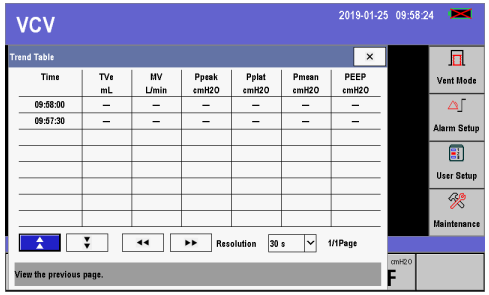
- 7.0 inch color TFT screen
- Flat-design UI, pop-up menu，Simple and Clear
- Button + Knob，The common operation needs less than 3 steps
- Provide waveforms and monitoring parameters including Flow, Volume ,Pressure
- **Provide important phisiological and technical alarms, ensure animals' safety during surgery**
- **Record the trend and logs during surgery for review**
- **Automatic system leakage test**



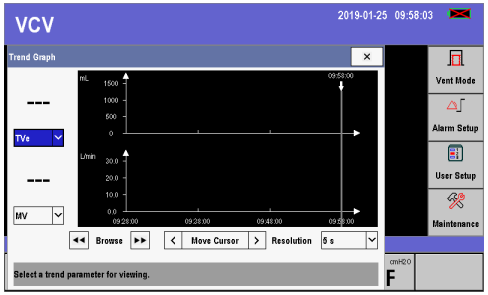
1 AC power LED	5 Menu
2 Standby	6 Control knob
3 Alarm Silence	7 Ventilator parameter setup quick keys
4 MV&Tve alarm off	8 Display screen

Intuitive User Interface

- **Record the trend and logs during surgery for review**



Trend Table



Trend Graph

Animal anesthesia record

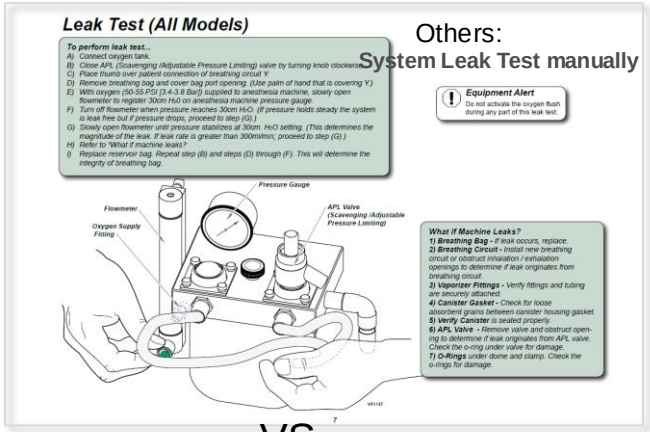
System leakage test

- **Automatic system leakage test, keep the users safe**

✓ **Simple**: One button start after operating as the instructions, without other interventions.

✓ **Quick**: Less than 30s to finish the test

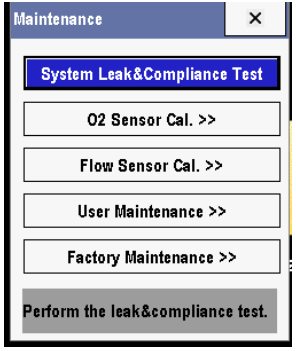
✓ **Complete**: Automatic circuit leak test (ventilator) & Manual circuit leak test (breathing bag)



Others:
System Leak Test manually

VS

WATO EX-20Vet



Waste gas scavenging system

- **Two optional type of waste gas scaventing system**
- **Reduce OR pollution and ensure the veterinrians health**

✓ Passive AGSS

✓ Active AGSS

Passive AGSS

Active AGSS

Ergonomics Design

- **Ergonomics Design**
- Handles for remove and extra device installation
- Drawer with large capacity for storage, e.g. Tubes, masks, etc

WATO EX-35Vet

WATO EX-35Vet

Model	WATO EX-35Vet
Screen	10.4 inch touch screen Key + Knob
Flow meter	Mechanical control，Two tubes Low flow range: 0-1 L/min， High flow range: 1-15 L/min
CO2 canister	1.5 L
Vaporizer	Max 2 vaporizer position
Tidal volume	20-1500 ml （Standard） 5-1500 ml (Opt, w/ PCV-VG)
Vent Mode	VCV, PCV，SIMV –VC/PC，PSV， PCV-VG，Spontaneous
Gas monitoring	Opt:O2， Plug&Play CO2，Multi-Gas module
Breathing circuit	Rebreathing circuit, Non-rebreathing cicuit，(opt: ACGO)
Brake	4 wheel brakers
Drawer	3
Smart Alarm Managment	Yes

WATO EX-35Vet Overview

- Fresh gas flow meter
- Module slot（optional），3 slots
- Gas supply gauge
- Breathing circuit system
- System switch
- CO2 canister
- ACGO*
- 10.4 inch touchscreen
- GCX rail
- Work light*
- Vaporizer position
- Handle
- Drawer *3
- Foor rest
- Wheel brake *4

* optional

mindray

Intelligence ventilator

- **Electronic control ventilator that allows users to choose the modes best fit for the veterinary needs**

✓ VCV-Volume control ventilation， the most common used ventilation mode, tidal volume down to 20 mL

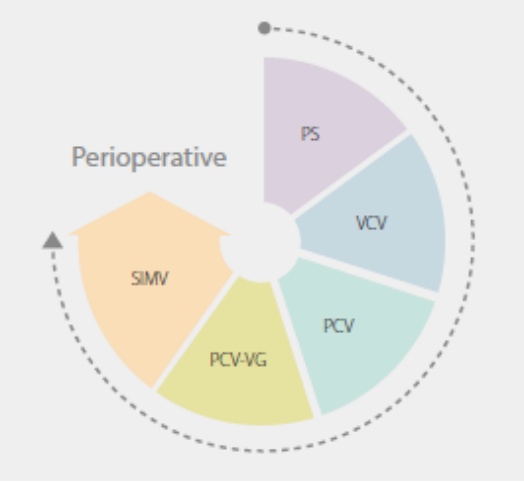
✓ PCV- Pressure control ventilation， useful for animals with pulmonary disease or unnormal compliance

✓ SIMV/PS*- Synchronized Intermittent Mandatory Ventilation， balance between spontaneous breath and minimal mechanial ventilation support

✓ PSV*- Pressure support ventilation , for animals with spontaneous breath

✓ PCV-VG* – Pressure control volume guarantee, avoid barotrauma and volutrama, tidal volume can be set down to 5 mL

✓ PEEP – positive end-expiratory pressure, avoid alveolar collaps during surgery



*Optional

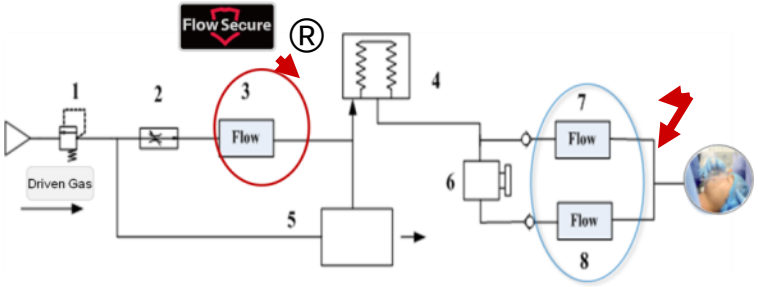
Intelligence ventilator

- **FlowSecure™ Patent Technology，What you set is what you get**

✓ Dynamic tidal volume compensation, prevent the influence of fresh gas flow or system compliance & leakage

✓ High-quality insp & exp flow sensors, precise and long service life

✓ Internal the 3rd flow sensor for calibration and safety backup



- **Full range precise tidal volume without changing bellows**

✓ Do not have to change bellows by animals' size, improve routine workflow

✓ Tidal volume down to 20ml (VCV) or 5ml(PCV), apply to tiny animals

One bellows from 20ml-1500ml

VS

Two bellows:
small : 20-300ml ; Large: 300-1500ml

Calibrate by users, without extra device or service personal

Complete Monitoring

- **Integrated plug-in & play CO2 and Anesthetic Gas module*, ensure animals safety during surgery**

✓ Module design, sharing with Patient monitors, reduce purchase cost

✓ CO2 module

  ✓ Inspiratory and expiratory CO2 concentration, CO2 waveform

✓ AG module

  ✓ Paramagnetic O2 sensor，maintenance-free

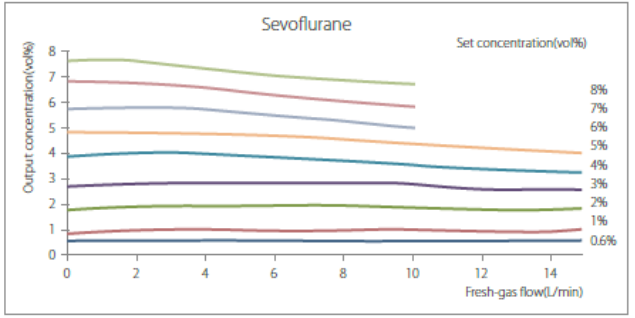
  ✓ Indentify 5 agent gases and N2O, CO2, O2

  ✓ FiCO2 & EtCO2，FiO2 & EtO2，FiN2O & EtN2O， FiAA & EtAA

*Optional

Maintenance-free Vaporizer

- ## Vaporizer
- ### Mindray V60 vaporizer （Iso, Sev, Hal)
  - ✓ Automated flow/ Temp/ Pressure compensation ensure a constant output and accurate concentration under different eviroment conditions.
  - ✓ Good air-tightness, reduce agent gas waste
  - ✓ **Maintenance-free** design ensure that no calibration is required throughout the entire life span
  - ✓ **FDA Approval**
  - ✓ Large capacity (300 ml with most wick, 360 ml with dray wick)
  - ✓ Highly compatible: support three different filling options and standard selectatec mounting system.



The diagrams show the influence of flow on the concentration delivered after 1 minute at 22°C, 101.3 k Pa when operating with Air.

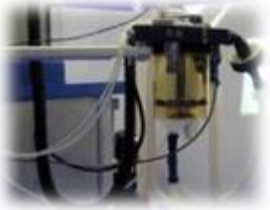
Integrated Breathing System

- **Non-redundant tubes and cables**
  - ✓ Avoid system leakage, reduce agent cost
  - ✓ Avoid disconnection, mis-connection and intertwine
  - ✓ Save the space in the operation room

Integrated breathing system
WATO EX-35Vet

VS

Non-integrated breathing system



Messy and hard to use

Integrated Breathing System

- **Quick switch between Manual ventilation & Auto ventilation**

✓ Start ventilator quickly in emergence situation

✓ Without changing tubes

✓ Precise control of maimum airway pressure by APL valve

✓ Ensure the safety of animal

WATO EX-35 Vet

VS

Others: Need replace the breathing bag with tubes

- **Quick switch between rebreathing circuit and non-rebreathing circuit**

✓ Independent ACGO port

✓ Control by mechanical switch directly without inserting and extracting tubes

✓ Non-rebreathing circuit: for tiny animals down to 3-5kg

Non-rebreathing circuit

Integrated Breathing System

- **Heating* for whole breathing system**

✓ Reduce the condensate water,

✓ Avoid the conflutination of bellows and valves

✓ Ensure the stable monitoring of flow sensors, ensure the stable of ventilation

✓ **Warmer gas into the animals' lung, decrease the heat loss during surgery**

Breathing system with Heating module

WATO EX-35Vet

VS

Breathing system without Heating module

Condendate water

- **CO2 caniter with large capacity**

✓ 1.5L volume, for larger animals or prolonged surgery

✓ Transparent material, clear to observe the absorbent color.

✓ Ease to disasesmble, without tools

✓ Non-cover design, refill absorbent directly

✓ Autocalvable (up to 134 ℃)

✓ Three kinds of caniter chosed by nessesary

Non-pre-pak w/o bypass

Non-pre-pak w/ bypass

Pre-pak w/ bypass

Intuitive User Interface

- 10.4 inch **touchscreen**, resolution 1024X768
- Operation princeple: Touchscreen & Knob & hard keys
- Flat UI design, the common operation need less than 2 steps
- Maximum 3 waveforms at the same time
- Waveforms and Loops* display stimultaneously
- Provide important phisiological and technical alarms, ensure animals' safety during surgery
- Smart alarm management with text and graphical instruction, help to slove problem quickly.
- Record the trend and logs during surgery for review
- Automatic system leakage test

*Optional

Intuitive User Interface

- **Smart alarm management**

✓ Indicate the alarm cause and remedy by words and pictures, help to toubleshoot quickly, avoid damage of animals.

✓ Centralizaed alarm limit setting, including apnea, pressure, tidal volume, insp O2 concentration, etc.

✓ Important system malfuction prompt: gas supply failure, power supply failure, circuit disconnection, etc

Quick Alarm Limit Setting

Graphical troubleshoot

- **Record the trend and logs during surgery for review**

List Trend

Graphical Trend

Event Log

Animal anesthesia record

System leakage test

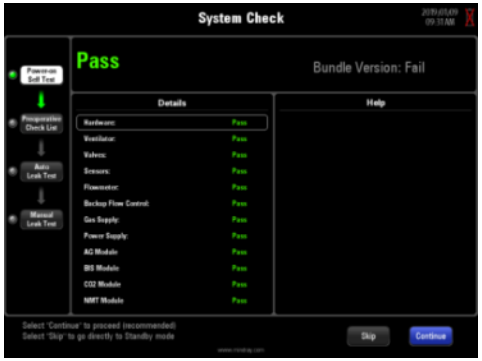
- **Automatic system leakage test, keep the users safe**

✓ **Simple**: graphical instructions, with least user interventions.

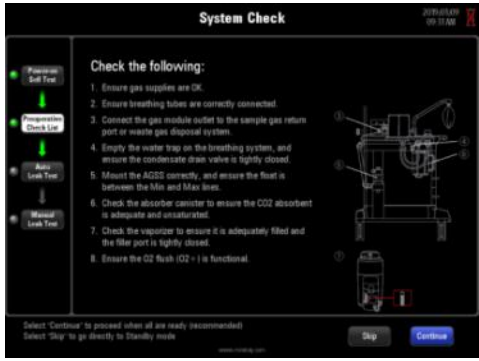
✓ **Quick**: Less than 30s to complete each item and 120s in total

✓ **Complete**: Power-on test (Hardware), preoperative checklist, Automatic circuit leak test (ventilator) & Manual circuit leak test (breathing bag)

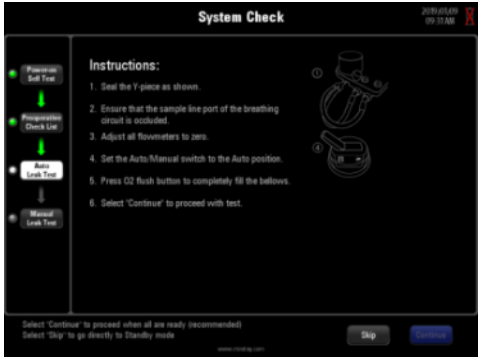
1 Power-on self test



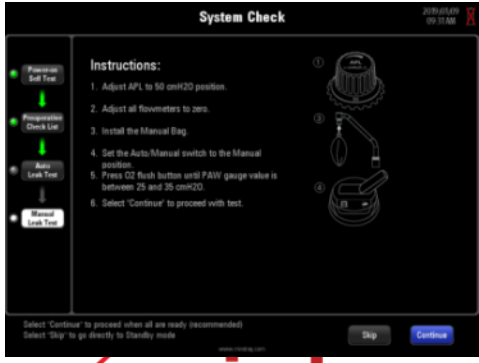
2 Preoperative check list



3 Auto Leak Test



4 Manual Leak Test



Waste gas scavenging system

- **Two optional type of waste gas scaventing system**
- **Reduce OR pollution and ensure the veterinrians health**

✓ Passive AGSS

✓ Active AGSS

Passive AGSS

Active AGSS

Ergonomics Design

- **Ergonomics Design**

✓ Handles for remove and extra device installation

✓ Large worksurface

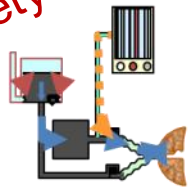
✓ Drawer with large capacity for storage, e.g. Tubes, masks, etc

Take Home Message

Why Mindray Anesthesia System?

Safety

Intelligence ventilator



What you set is what you get

Precise Vaporizer

FDA Approval
Maintenance free for life span

Complete Monitoring

Respiratory status & gas monitoring

Fully automatic inhalation anesthetic solution for Veterinary

Only by Mindray

Ease to use

Integrated breathing system
Less Leakage , Quick switch , Heating

Intuitive user interface
Simple and Clear

System leakage test
Quick start and direct result display

Waste gas scaveging
Quick start and direct result display

Ergonomics Design
Large worksurface and ease to move

mindray

Thank you!

mindray