

# KING SYSTEMS

C O R P O R A T I O N



T h e U n i v e r s a l F<sup>®</sup> C i r c u i t



## A Truly Universal Breathing System

From the beginning, King Systems Corporation's goal in developing products for the anesthesia professional has been based upon the desire to improve patient care and increase efficiency, while reducing the overall cost of anesthesia delivery. King Systems has made great strides in meeting that goal, with the 1992 introduction of the Universal F<sup>®</sup> anesthesia and transport system as an enhancement to the circle system of the past. King Systems, working in conjunction with Atsuo Fukunaga, M.D., Ph.D., refined the concept of the Universal F<sup>®</sup> by listening to the needs of the anesthesia community. The result was the creation of the only co-axial rebreathing and heat and moisture conservation system in the world.

The heat and moisture conservation properties make the Universal F<sup>®</sup> an ideal product to meet the clinical needs of the intubated patient during surgery. Using the Universal F<sup>®</sup> eliminates the need for the addition of a heat and moisture exchanger, and prevents the problems associated with the added dead space and weight, increased flow resistance, and the risk of disconnect. King Systems has been told by clinicians that, "Our patients are warmer and more comfortable when they leave the operating room because of the 'F circuit'."

The Universal F<sup>®</sup> is an ideal system to reduce the cost of delivered inhaled anesthetics because it handles lower flow rates, while delivering a high level of humidity.

The ability of the Universal F<sup>®</sup> to convert to a transport system, takes it beyond the operating room. No longer is the additional cost of a resuscitation bag incurred. The Universal F<sup>®</sup> can be used to "bag" your intubated patients during transport. The Universal F<sup>®</sup> transport system is driven by an oxygen source, and therefore the delivered concentration of oxygen is always higher than a self-filling resuscitator. Recent published studies have stated that, "the Universal F<sup>®</sup> is

compact, flexible and easy to handle" and the Universal F<sup>®</sup> can "provide cost savings by eliminating the need to use duplicate disposable equipment". "The cost benefit ratio was clearly on the side of King Systems' Universal F<sup>®</sup> circuit!"

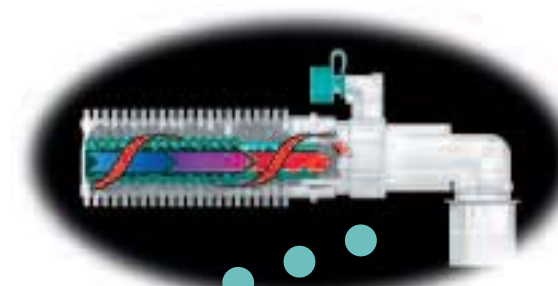
The Universal F<sup>®</sup> anesthesia and transport system represents one of the many steps King Systems has taken in meeting the needs of the anesthesia community now and into the next century. If you are interested in technical information, or the opportunity to trial the Universal F<sup>®</sup>, contact your local King Systems' representative, or call us direct so we can put the best anesthesia delivery system in your hands.

# U n i v e r s a l F<sup>®</sup>



*Tube-within-a-tube design creates a self-contained, thermally-efficient atmosphere wherein inspired gases are naturally warmed and humidified.*

## Anesthesia Delivery System



*Within the Universal F<sup>®</sup> circuit, the inspired gases (blue, purple, red arrows) are warmed and humidified by the patient's expired gases (red, curved arrows).*

*to*

*Clear housing at patient and machine connections allows for visualization of circuit function and patient condition.*

## Transport Unit or Resuscitation Circuit



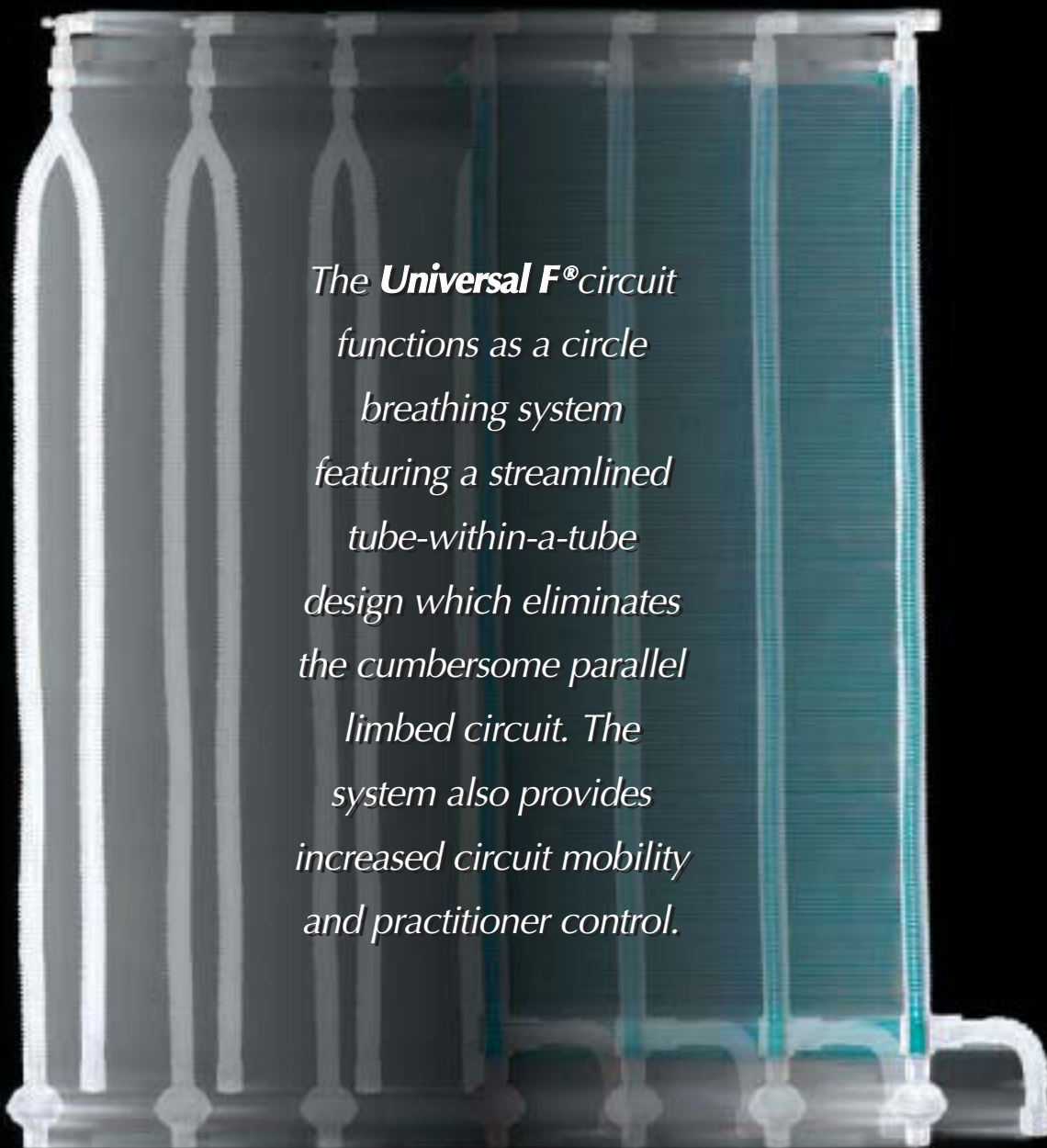
*The Universal F<sup>®</sup> transforms easily from an anesthesia delivery system to a transport unit, and if necessary, to a resuscitation circuit thereby increasing the quality of patient care and decreasing the number of products needed to serve a patient.*

The **Universal F<sup>®</sup>** is a single-limbed, multi-function unit designed to improve and simplify quality health care.



# *The Universal F<sup>®</sup>*

*The evolution of the circle breathing system.*



*The **Universal F<sup>®</sup>** circuit functions as a circle breathing system featuring a streamlined tube-within-a-tube design which eliminates the cumbersome parallel limbed circuit. The system also provides increased circuit mobility and practitioner control.*

*Traditional  
Two-Limbed Circuit*

*Universal F<sup>®</sup>*

## Universal F<sup>®</sup> Options

- |                                              |                                                             |
|----------------------------------------------|-------------------------------------------------------------|
| • 40" or 60" Hose                            | • Fresh Scent™ or Non-scented Mask (Size 4, 5, 6, or Round) |
| • Standard Elbow                             | • Swivel Luer                                               |
| • Sample Port Elbow                          | • Temperature Port Option                                   |
| • 2 End Cuffs                                | • Sampling Line Options                                     |
| • 2L or 3L Regular or Textured Breathing Bag | • Extension Kit                                             |
| • 1 or 2 Filters                             | • Transport Kit                                             |

## Universal F<sup>®</sup> Testing Data

### Thermal Efficiency (°C)

Temperature was continuously monitored at four positions in the circle system during the test: inspiratory dome valve ( $I_{vent}$ ) and patient inspiratory ( $I_{prox}$ ).

Temp. (Initial)	$I_{vent}$	$I_{prox}$
Univ. F	22.3	23.2
Std. Circle	21.5	23.1

Temp. (at 15 min.)

Univ F	23.6	29.2
Std. Circle	21.6	23.9

### Resistance (cmH<sub>2</sub>O/L/sec)

Defined as the pressure difference from inlet to outlet of the device per unit of flow.

Flow (L/sec.)	.5	1.0
Univ. F (insp.)	.98	2.16
Univ. F (exp.)	1.40	2.84

Comparison: The combined resistance of a standard adult breathing circuit with an HME could exceed 3.5 cm H<sub>2</sub>O/L/sec.

### Humidification Delivery (at 15 min.)

(Fresh gas flow rate: 4L/min.; tidal volume: 800ml; respiratory rate: 12 breaths/min.)

Absolute Humidity: 26.3 mg H<sub>2</sub>O/L

Relative Humidity: 90% at 29.5 °C

### Compliance (cc/cm H<sub>2</sub>O)

Defined as the change of volume per unit of pressure.

Univ. F	1.61 cc/cm H <sub>2</sub> O
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*Test results were derived from the study performed by the University of Cincinnati Medical Center in 1992.*

## KING SYSTEMS CORPORATION

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Products depicted meet  
MDD 93/42/EEC



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**CAUTION:** Federal law restricts this device to sale by or on the order of a physician.