DATASHEET

Non-Invasive Airway Mechanics

Non-Invasive Airway Mechanics measures Specific Airway Resistance (sRaw), using a Double-Chamber Plethysmograph (DCP).

FEATURES

- Well published and understood method
- Conscious measurement, no anaesthesia
- Direct measurement of Tidal Volume
- Fully non-invasive

OPTIONS

- Aerosol delivery, manual or software controlled
- Different species supported

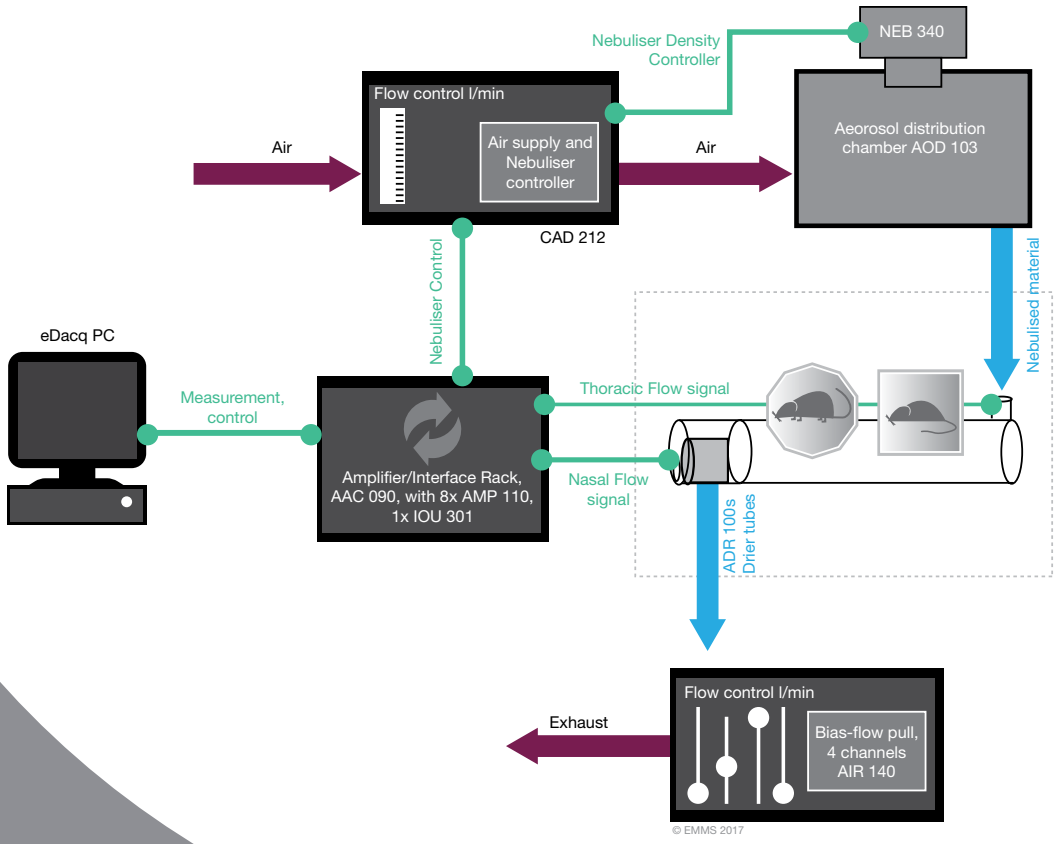
USES

- Chronic studies
- Suitable for long-term measurements

PRINCIPLES OF OPERATION

The EMMS non-invasive airway mechanics system uses a classic Pennock[1] style double-chamber plethysmograph to measure nasal and thoracic flow. The animal is placed in a double-chamber plethysmograph (eg. PLY 230 for guinea pig), and is restrained in the chamber with a rubber neck collar. This neck collar also provides an airtight seal between the thoracic and nasal chambers. Flow in the two chambers is measured across two pneumotachographs in the plethysmograph wall. A bias flow air supply is used to prevent build-up of CO2 in the plethysmograph, and may also be used to pull aerosol through the nasal chamber. sR_{aw} is calculated from the phase delay between the thoracic and nasal flow signals.

1. BE Pennock, CP Cox, RM Rogers, WA Cain, and JH Wells. A noninvasive technique for measurement of changes in specific airway resistance. Journal of Applied Physiology: Respirat. Environ. Exercise Physiol. 46 (2): 399-406, 1979



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SYSTEM OUTPUTS

Name	Units	Description
TV	ml	Tidal Volume, volume inspired during one breath
tI	s	Inspiration time
tE	s	Expiration time
PIf	ml/s	Peak inspiratory flow
PEf	ml/s	Peak expiratory flow
f	breaths/minute	Frequency of breathing
MV	ml	Minute Volume, volume inspired in one minute
tR	s	Relaxation time
AV	ml	Accumulated volume
EIP	s	End inspiratory pause
EEP	s	End expiratory pause
VolBal	%	Difference between inspiratory/expiratory volume
sR_{AW}	cmH2Os	Airway resistance x thoracic gas volume
sG_{aw}	1/cmH2Os	Specific airway conductance
dT	s	Time difference between nasal & thoracic flows
EF50	ml/s	Expiratory flow @ 50% TV

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