

Software 4.n - Primus® / Primus® IE

The Primus® Software 4.n upgrade is the result of feedback received from more than 20,000 Primus product family users worldwide. The innovative changes to the software contribute to even more improvements in patient care – and at the same time, increase efficiency and productivity.

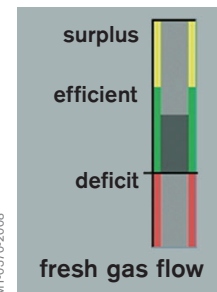


FUNCTIONALITY OF THE BASIC SOFTWARE 4.N

- Synchronization in pressure and volume controlled ventilation modes supports spontaneous breathing
- Individually configurable screen layout
- NEW!** - Automatic MAC monitoring
- NEW!** - Improved sensitivity of the flow measurement of smaller tidal volumes
- Intelligent alarm management
- Fully automatic, comprehensive self-test of all important system components
- Operation without nitrous oxide
- NEW!** - Breathing frequency up to 100 bpm

OPTION ADVANCED MONITORING

- Electronic econometer for display of efficiency of fresh gas consumption. This integrated “Low Flow Trainer“ helps to reduce cost.
- P/V and V/Flow loops Fast analysis of changes in the lung mechanics through simultaneous display of reference and real-time loops.
- Case dependent display of fresh gas consumption in the device logbook
- Automatic calculation and presetting of patient-specific ventilation parameters by entering the ideal body weight.
- NEW!** - Patient or case specific calculation of consumption and uptake of volatile anesthetic agents.



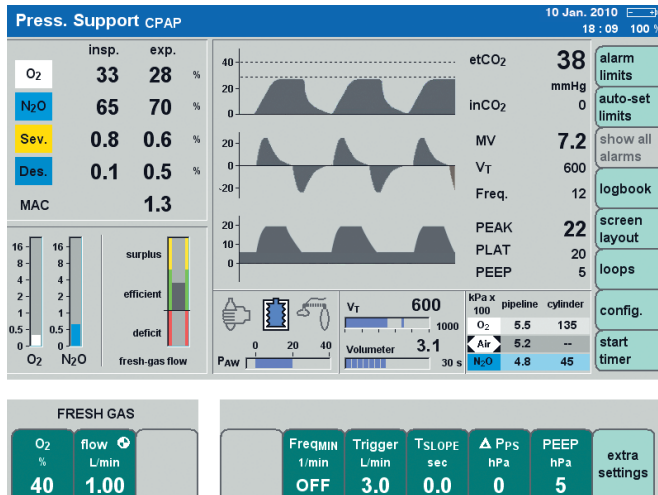
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Advanced monitoring:
integrated electronic econometer

Logbook							
time	alarm/event	etCO ₂ mmHg	O ₂ insp./exp.	prim. agent insp./exp.	MAC	P _{aw} PEAK / PEEP	MV
08:20	power on						
08:30	Standby						
09:05	SIMV						
09:05	leading agent			Iso.			
09:10		40	33 / 28	1.0 / 0.8	0.9	25 / 0	6.0
09:15		40	33 / 28	1.0 / 0.8	0.9	25 / 0	6.0
09:20		39	32 / 28	1.0 / 0.8	0.9	25 / 0	6.0
09:25		39	32 / 29	1.0 / 0.8	0.9	25 / 0	6.0
09:30		40	33 / 29	1.0 / 0.8	0.9	25 / 0	6.0
09:35	Standby						
09:35	12 Feb, 2008						
09:35	duration [min]: 0:30						
09:35	consumption [L] O ₂ : 6 Air: 8 N ₂ O: 0						
09:35	agent consumption [ml] (liquid) Sev: 0 Iso: 3 Des: 0 Hat: 0 Ent: 0						
09:35	agent uptake [ml] (liquid) Sev: 0 Iso: 2 Des: 0 Hat: 0 Ent: 0						

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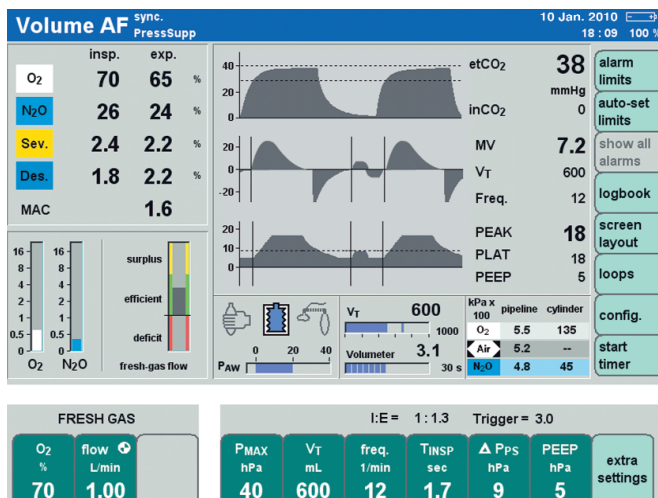
Advanced monitoring:
logbook with consumption data for fresh gas and anesthetic gas per case



- Press. Support
- Press. Support CPAP
- Volume ^{sync} PressSupp
- Pressure ^{sync} PressSupp

OPTION ADVANCED VENTILATION

- Pressure support (PS) is the primary feature of this upgrade option
- PS can be used in both standalone mode as well as in combination with all synchronized volume and pressure controlled types of mechanical ventilation.
- All PS parameters for mechanical ventilation, such as ΔP_{PS} , PEEP, T_{Slope} , $Freq_{MIN}$ and Trigger, can be directly selected and adapted.
- The PS option includes a shut on/off apnea ventilation.
- For volume controlled mechanical ventilation, the tidal volumes can be reduced to 5 ml.
- With CPAP pressure support the patient can be held at constant PEEP level.



- Volume AF
- Volume AF ^{sync}
- Volume AF ^{sync} PressSupp

NEW! OPTION VOLUME MODE AUTOFLOW

- Volume Mode AutoFlow combines the advantages of pressure and volume controlled ventilation. This mode uses a decelerated inspiratory flow, in order to ensure the lowest possible pressure without pressure peaks.
- Guaranteed tidal volume
- Automatic adaption of inspiratory pressure to changed lung conditions
- Lung protective ventilation used consistently even in volume controlled mode.
- Volume Mode Autoflow can be used with synchronization and optional pressure support.

TECHNICAL DATA PRIMUS® / PRIMUS® IE WITH SOFTWARE 4.N**Gas flow control**

Weight	115 kg / 147 kg (without vaporizer or reserve gas cylinders)
Dimensions (H x W x D)	137 cm x 80 cm x 80 cm / 138 cm x 80 cm x 80 cm
Power consumption	200 W/typical
Operating voltage	100 - 240 V~, 50-60 Hz
Integrated emergency power supply	for at least 30 minutes, up to 90 minutes. Depending on set ventilation parameters.
Ventilator E-Vent® plus	Electrically operated and electronically controlled
Operating modes	Manual, spontaneous, Volume mode (IPPV), Pressure mode (PCV), Optional: Pressure Support (PS) Optional: Volume Auto Flow Synchronized volume-controlled ventilation (SIMV), optional with PS Synchronized volume guaranteed ventilation volume AF, optional with PS
Pressure limitation P _{MAX} (in Volume Mode)	(PEEP+10) up to 70 hPa
Pressure limitation P _{INSP} (in Pressure Mode)	(PEEP+5) up to 70 hPa
Trigger	0.3 - 15 L/min
Tidal volume (in Volume Mode)	20 - 1400 mL 5 - 1400 mL (option)
Tidal volume (in Pressure Mode)	5 - 1400 mL
Breathing frequency	3 - 100 bpm
Inspiratory time (T _{INSP})	0.2 - 6.7 s
Breathing time ratio (I:E)	max. 5:1
Inspiratory pause (T _{IP} :T _{INSP})	0 - 60 %
Inspiratory flow	max. 150 L/min
PEEP in Volume Mode	0 - 20 hPa (max. P _{MAX} - 10 hPa)
PEEP in Pressure Mode	0 - 20 hPa (max. P _{INSP} - 5 hPa)
Fresh gas flow	0 and 0.2 - 18 L/min
Inspiratory ramp T _{SLOPE}	0.0 - 2 s (in Pressure Mode and Pressure Support)
System leak tightness	< 150 ml at 30 hPa (automatic leakage test)
O ₂ flow control	Sensitive ORC function: Minimum oxygen supply of 25 vol.% O ₂ or 200 ml/min in mixtures with nitrous oxide (N ₂ O); O ₂ concentration: 21 - 100 vol.%
O ₂ flush	> 35 L/min
O ₂ safety flow	0 - 12 L/min
External fresh gas outlet	Optional

Monitoring

Inspiratory and expiratory concentration of O₂, N₂O, CO₂ and volatile anesthetics (Halothane, Enflurane, Isoflurane, Sevoflurane, Desflurane); Minute Volume (M_V) and Tidal Volume (V_T); breathing frequency, peak pressure, plateau pressure, average pressure, PEEP; Patient Compliance C_{PAT}; Optional: functional oxygen saturation (SpO₂); Following measurement variables/parameters can be displayed as a graph: Concentration of CO₂, O₂, and volatile anesthetic agents, airway pressure, inspiratory and expiratory flow; Optional: plethysmogram; bar graph for breathing minute volume and tidal volume; virtual flow tubes for fresh gas flow (O₂, AIR, N₂O); display of graphic trends; numerical list of measurement values; AutoSet for alarm limits

Serial port	2 x RS 232
Protocol	Medibus
Absorber volume	1.5 L with reusable absorber canister, filled 1.3 L with CLIC Absorber 800+ 1.2 L CLIC Absorber Drägersorb CLIC Free

ORDER INFORMATION**Software 4.n**

Upgrade package basic software 4.n	8607885
Option package Advanced Monitoring	8605290
Option package Advanced Ventilation	8605290
Option package Volume Mode Autoflow	8605290

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From September 2010:
Dräger Medical AG & Co. KG
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certified according to ISO 13485,
ISO 9001 and Annex II.3 of Directive
93/42/EEC (Medical devices).