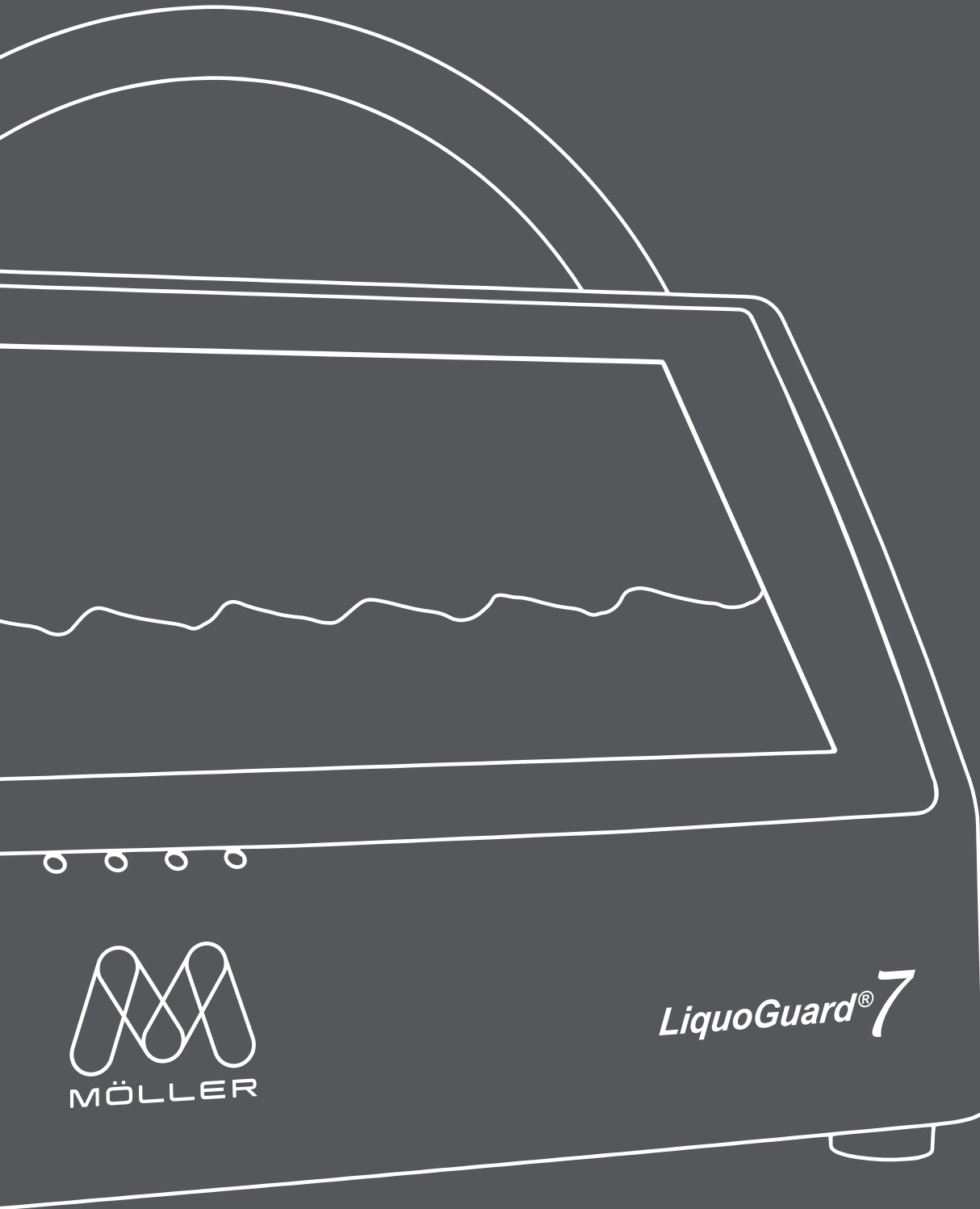




LiquoGuard[®]7 – CSF Management Device
Precise. Proactive. Efficient.

Amazing what's possible.

LiquoGuard®7
**Redefining CSF Management
for the modern era**

LiquoGuard®7
**MÖLLER's premier CSF
management Device**



*Simultaneously measures CSF
pressure and drain cerebrospinal
fluid under controlled conditions.*



Technology

Documented Treatment

Patient Safety Concept

Comfort

Full control of CSF pressure and outflow

Improves surgical and post-surgical safety

Application

Vascular surgery and Anesthesiology

Perioperative monitoring of neurological status
Pressure controlled CSF drainage

Neurosurgery, emergencies, and orthopedics

External ventricular CSF drainage
Lumbar CSF drainage
Pressure controlled CSF drainage
Volume controlled CSF drainage

Diagnostic and therapeutic support

Katzman Test (lumbar infusion for NPH diagnosis)
Determination of shunt opening pressures and possible suitable shunt settings
Control of shunt settings and functionality
Tap Test

Please note:

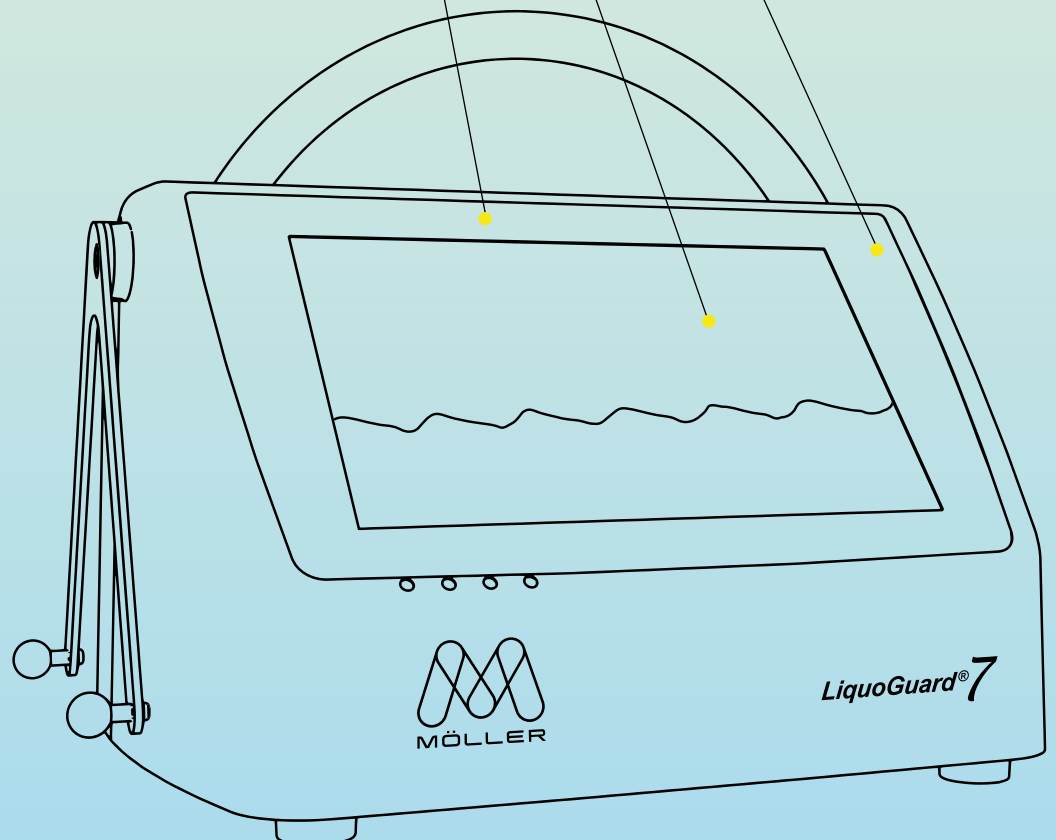
Indications are not approved in all countries.

LiquoGuard®7 **Automated CSF Management**

*Meticulous management
is required to prevent uncontrolled CSF
drainage; an issue common
with traditional gravity-based drip
chambers.*

*Continuous monitoring
and instant alerts
lower the burden of supervision, which frees up
time for neurosurgical teams to focus on other
patients, as well as removing concerns
about CSF drainage complications.*

*LiquoGuard®7 allows patients
to ambulate sooner
without having to interrupt the CSF drainage
process. Early ambulation leads to faster recovery
times and significantly reduces ICU costs
related to staffing and length of stay.*



LiquoGuard®7

Product Information

LiquoGuard®7 helps avoid common adverse events frequently associated with gravity-based drains, such as inadvertent under and/or over-drainage of CSF, which jeopardizes patient safety.

Meticulous management of ventricular and lumbar drains is required to prevent uncontrolled CSF drainage, which is a problem inherent with traditional gravity-based drip chambers. Hospitals around the world use *LiquoGuard®7*, the premier automated CSF management tool, to accurately measure intracranial pressure and precisely drain CSF simultaneously.

Continuous monitoring and instant alerts lower the burden of supervision, which frees up time for neurosurgical teams to focus on other critical patients as well as removing concerns about CSF drainage complications.

LiquoGuard®7 allows patients to ambulate sooner, which helps hospitals reduce ICU costs up to 7 times. *LiquoGuard®7* is CSF management for the 21st century.

Technical data

Dimension (W x H x D)	238.1 x 145 x 212.8 mm
Weight	3.7 kg
Voltage	100-240 VAC
Battery operation	Up to 2h
Pressure sensor Accuracy	± 0.375 mmHg (range of 0-75 mmHg)
Drift	<1 mmHg in long-term tests
Display accuracy	± 2 mmHg
Interfaces	USB (Memory stick, printer), parenchymal sensor, patient monitor



LiquoGuard®7

Reduce complications associated with CSF Drainage
Manage CSF pressure with ease

Gravity drip chambers cannot measure intracranial pressure while draining CSF. As such, inadvertent under and/or over-drainage of CSF poses a serious health risk to the patient. Anytime the patient moves, drainage must be stopped, and the transducer re-leveled.

*LiquoGuard®7 measures pressure and drains CSF simultaneously without the need to adjust stopcocks, re-zero, or re-level a transducer. *LiquoGuard®7* may be set to drain CSF based on pressure or drain a specific volume of CSF each hour.*

Nurses no longer must decide between transducing pressure or draining CSF. They need not worry about the pressure getting too high or too low, or the risk of accidental “dumping” of CSF.

Automation helps save time and enhances patient safety. Simply preset a desired pressure or hourly volume and *LiquoGuard®7* handles the rest.



LiquoGuard®7 Get Alerted to CSF Drainage Issues Immediately

When using gravity-based drains, neuro-surgical teams are typically not aware of a problem with the drainage process until well after it occurs.

LiquoGuard®7 is designed to continuously monitor the patient, catheter, and drain lines for problems. It is a proactive system, unlike gravity-based drains, which cannot actively monitor or detect issues.

LiquoGuard®7 notifies the staff immediately if/when an occlusion occurs, there are pressure discrepancies, a catheter becomes disconnected, or there is a leak in the drainage line.

Clinicians have the peace of mind their ventricular and lumbar drain patients are being monitored closely and continuously; and that they only need to intervene when the device senses and alerts them to a problem with the drainage process.

The device not only supervises the patient but also supervises itself. Any inconsistencies in the pressure measured promptly leads to an alarm that notifies the nurse a problem has been detected.

Automated notifications:

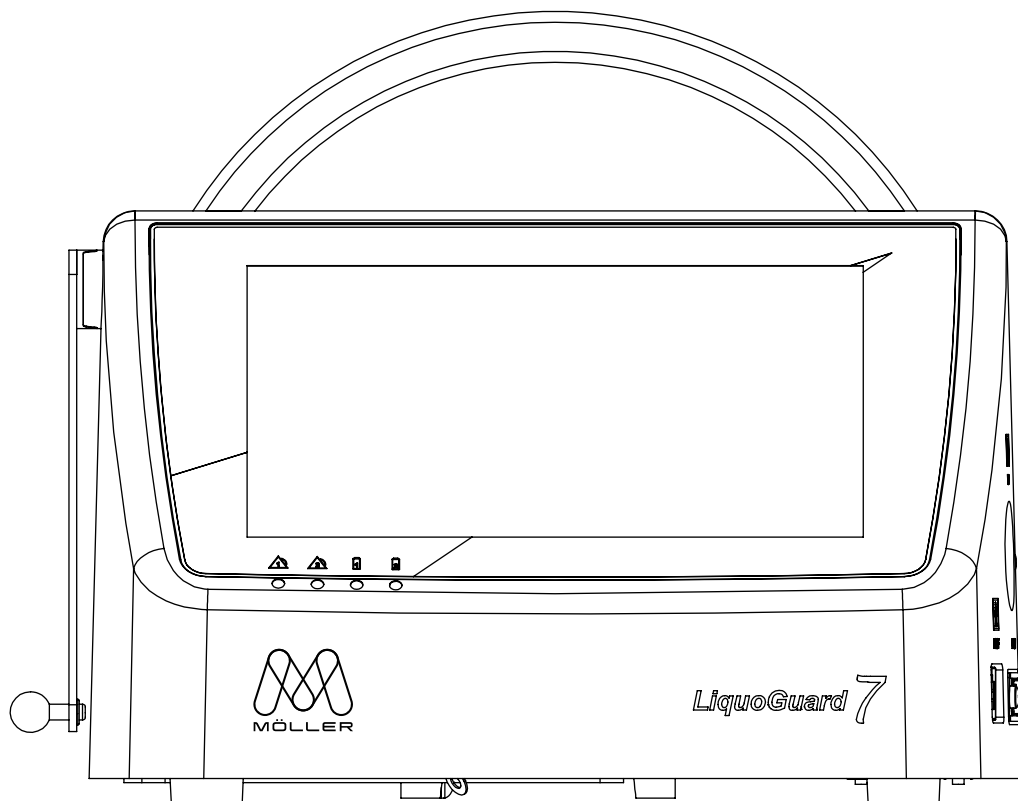
Occluded or kinked catheter

Too high or too low CSF pressure

The rate of CSF outflow is too rapid

Disconnected or broken catheter

Leak in the drainage line



LiquoGuard®7

Get Patients Moving to Expedite Post-Surgical Recovery

Patients connected to gravity drains cannot change their position without the risk of adversely impacting the drainage process. Various studies have shown that immobile patients tend to have longer recovery times.

Early ambulation improves post-surgical outcomes. An automated CSF drainage technology with smart sensors makes this possible.

The drainage bag of *LiquoGuard®7* is not height dependent thus reducing the potential for inadvertent under or over-drainage of CSF, a dangerous and typically underreported risk associated with gravity drains.

LiquoGuard®7 precisely controls the outflow of CSF mechanically, not by gravity. There is no need to open and close stopcocks to control CSF outflow. The patient may sit up in bed or walk freely while actively draining without the risk of “dumping” CSF.



LiquoGuard®7 **Reduce Hospital Costs**

CSF management is not without its share of complications. Over-drainage can lead to a subarachnoid hemorrhage, severe headaches, and even death.

These issues typically prolong the patient's ICU stay, which leads to increased costs for the hospital.

Investing in a smart CSF management device like *LiquoGuard®7* can help your hospital reduce ICU stays and exorbitant costs by significantly lowering the risk for CSF drainage complications.

Facilities already using *LiquoGuard®7* for CSF management are satisfied with their return on investment. Hospital costs are reduced by 50% or more when CSF drain patients are transferred out of the ICU and to the floor.



LiquoGuard®7

Advantages at a Glance



Improved Patient Safety

Lower the risk of inadvertent under and/or over-drainage by precisely controlling CSF outflow and eliminating the need to re-level a transducer.



Get Patients Moving

Early ambulation often leads to faster recovery times and improved patient satisfaction.



Fully Automated

Whether a pressure event, occluded, kinked, or disconnected catheter – the sophisticated alarm system informs you about issues when they occur.



Reduce Hospital Costs

Reduce by ~90% the time nurses spend managing CSF drains. *LiquoGuard®7* provides an option to treat patients outside the ICU.



Documented Care

Continuously record the course of treatment on-screen and/or via the bedside monitor.

LiquoGuard®7 automated CSF management technology is easy to program and manage.

There is no need to:

1

Level a transducer each time the patient moves

2

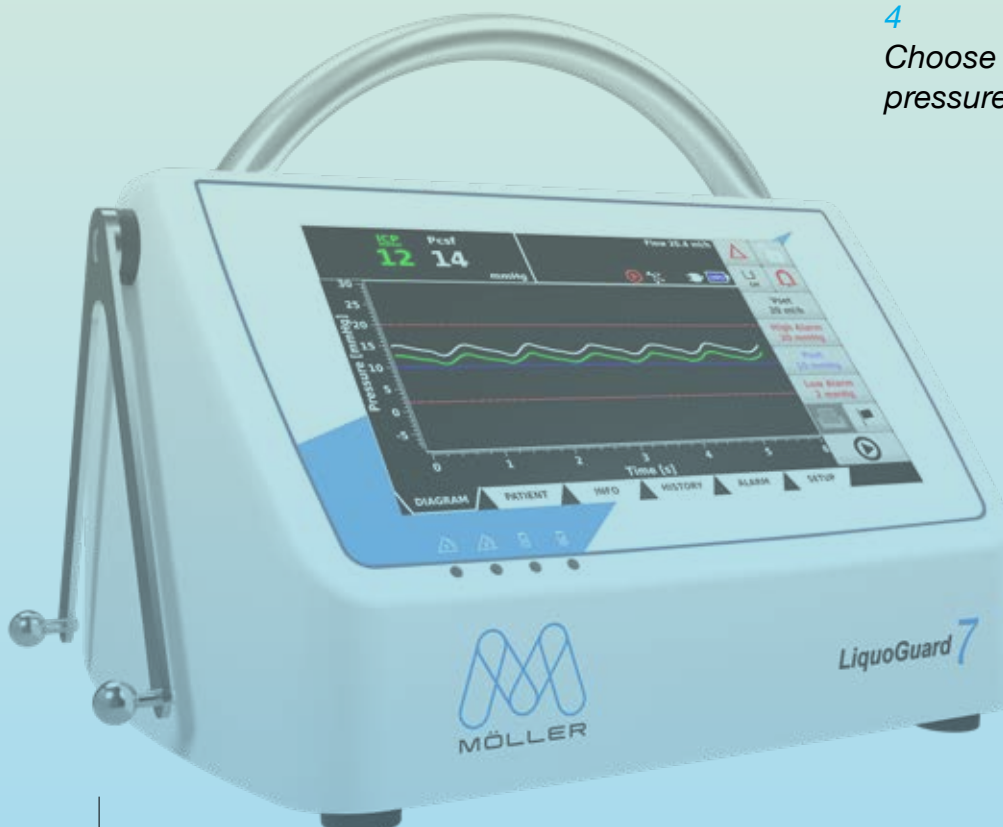
Open or close stopcocks

3

Keep the patient still or flat while draining to lower the risk of inadvertent under and/or over-drainage of CSF

4

Choose between measuring pressure or draining CSF



LiquoGuard®7 helps professionals prevent handling mistakes, which greatly improves patient safety and leads to faster recoveries

“Neither coughing, crying/screaming, unintended change of position, epileptic seizures or extreme mobility led to uncontrolled CSF losses.”

Manfred Kudernatsch, MD

Medical Director Schön Klinik Vogtareuth
Hospital for Neurosurgery and Epilepsy Surgery, Germany



“LiquoGuard®7 was a life changer. No longer was I unable to move or did I have to call a nurse every time I wanted to sit up, lay down, go to the bathroom, or out for a walk.”

Jason Kerr

Neurosurgical Patient

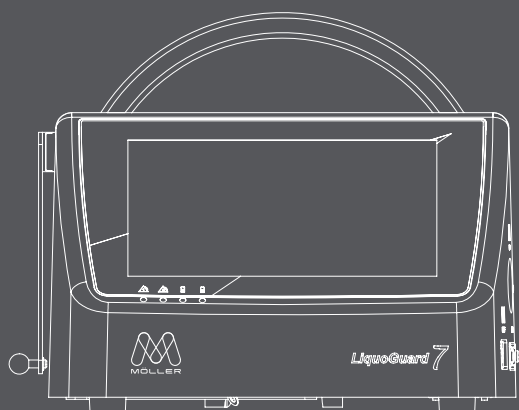
Patient, Jason Kerr, suffered from intractable, chronic hiccups for years. After four brain surgeries, a bout of postoperative meningitis, and countless gravity-drip chamber complications, *LiquoGuard®7* finally provided Mr. Kerr with much needed relief.





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