

PEM-HG

Hydrogen from deionised water — 250, 500 and 1000 ml/min

PEM-HG electrolyses pure water across a proton-exchange membrane and delivers hydrogen at up to 99.9995% purity, on demand. No cylinder inventory, no high-pressure storage: the generator holds only the water in its tank and produces gas at the flow the instrument actually draws.



FIG. 1 — PEM-HG BENCH UNIT

MODEL MATRIX

SPECIFICATION	HG - 250	HG - 500	HG - 1000
Maximum H ₂ generation	250 ml/min	500 ml/min	1000 ml/min
Continuous duty (70% of max.)	175 ml/min	350 ml/min	700 ml/min
H ₂ purity	up to 99.9995%		
Outlet pressure	Keypad-set, 90 PSI over-pressure cut-out		
Gas drying	Water trap + silica gel + 5 Å molecular sieve		
Feed water	Deionised, < 0.5 µS/cm (> 2 MΩ·cm) — no electrolyte added		
Interface	4-line LCD, 3-key panel, status & water-level LEDs, RS-232		

PURITY

99.9995%

H₂ from PEM electrolysis of pure water

FLOW RANGE

250 – 1000 ml/min

Three models, one control platform

OUTLET PRESSURE

up to 90 PSI

Set on the keypad · over-pressure cut-out

Water in the tank is fed to a proton-exchange membrane cell. Under DC power the cell splits the water: oxygen is vented, and hydrogen is drawn off the cathode side at the pressure set on the front panel. Because the gas is made as it is consumed, the only hydrogen in the instrument is the small volume in the filter train.

FEED WATER – CRITICAL

Deionised water only, below 0.5 $\mu\text{S}/\text{cm}$ (above 2 $\text{M}\Omega\cdot\text{cm}$). Never add KOH, NaOH or any other electrolyte. Replace the water and clean the tank every 30 days.

GAS PATH

- 01 Tank — deionised water reserve with 3-level sensing
- 02 PEM cell — electrolysis, O_2 vented
- 03 Water trap — automatic liquid knock-out, solenoid drain
- 04 Silica gel filter — residual water vapour
- 05 5 Å molecular sieve — final polish, H_2 out

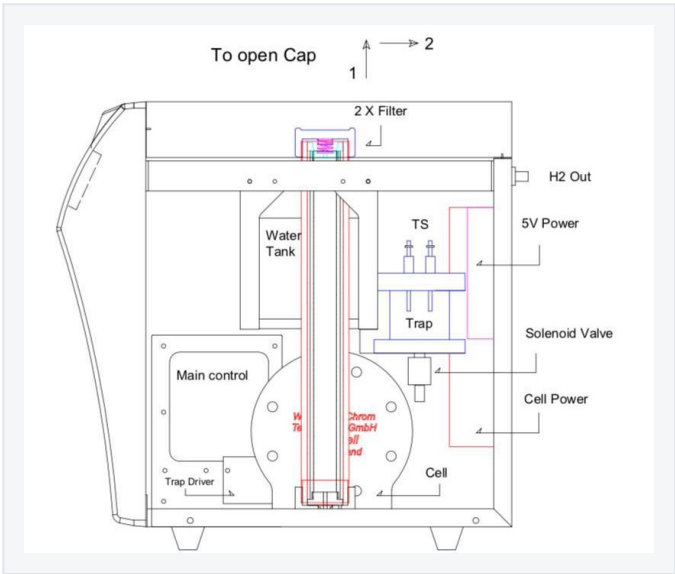


FIG. 2 – INTERNAL ARRANGEMENT, SIDE SECTION

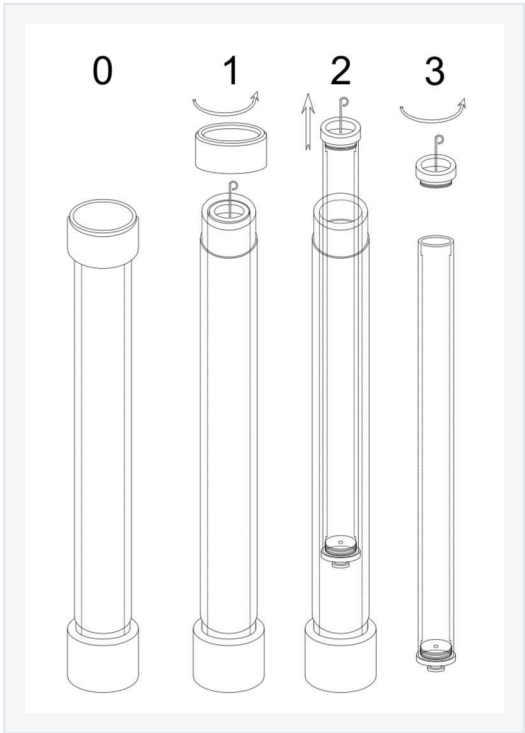


FIG. 3 – FILTER SERVICE SEQUENCE, STEPS 0-3

THREE-STAGE DRYING TRAIN

STAGE	MEDIUM	END OF LIFE	REGENERATION
1 · Water trap	Automatic liquid trap	—	Self-draining, no service medium
2 · Silica gel	Blue indicating gel	Turns pink at 60% saturation	Oven, 120 °C for 60–120 min
3 · Molecular sieve	5 Å sieve, dark yellow	No colour change — service monthly	Oven, 300 °C for 120–240 min

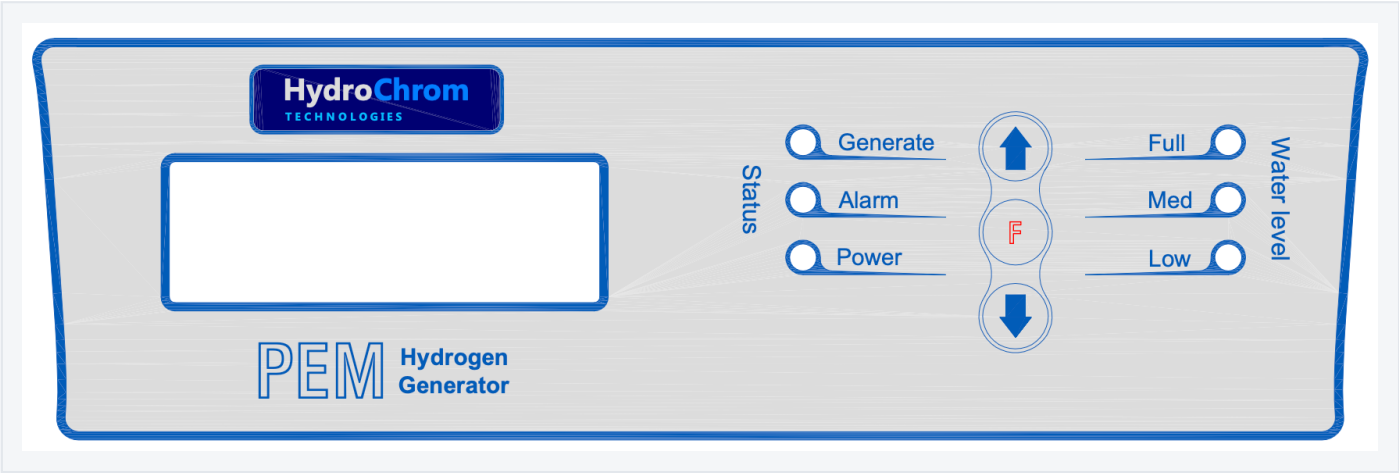


FIG. 4 – FRONT PANEL LAYOUT

LCD – NORMAL MODE

L1 HydroChrom Technologies
L2 H2 Flow: --- ml/min
L3 H2 Pres: --- PSI
L4 Status & alarm message

LCD – SET MODE

L1 OH = operating hours · WQ = water quality
L2 H2 overflow set point (ml/min)
L3 H2 output pressure set point (PSI)
L4 TH = total H2 generated (M / L / C)

KEYS

- ▲ increase set value
- ▼ decrease set value
- F toggle pressure / overflow

STATUS LEDS

- Power** — instrument energised
- Generate** — generating; brightness tracks rate
- Alarm** — blinks, buzzer every 10 s, message on line 4

WATER-LEVEL LEDS

- Full** — tank full; blinking = overfilled
- Med** — normal working level
- Low** — top up; blinking = empty, generation stops

ALARMS ON LCD LINE 4

MESSAGE	CAUSE	GENERATION	ACTION
Water empty	Tank empty	Stops	Fill with deionised water
Water over	Tank overfilled	Stops	Drain until the alarm clears
Pressure over	Outlet above 90 PSI	Stops	Switch off, contact service
H2 leak	Draw above rated flow for > 12 min	Continues	Blank off the outlet and re-test; check filter caps

OPTION – H₂ OVERFLOW CONTROL

An event output watches real flow against the SET flow. If real flow exceeds the set point for more than 60 seconds — a cracked GC column, an open fitting, a leak anywhere downstream — the generator stops making hydrogen, switches a three-port valve to purge the oven or chamber with neutral gas (N₂), writes the overflow error to LCD line 4 and sounds the buzzer.

INSTALLATION & SUPPLY

Mains supply	220 V AC, 50 Hz
Power / fuse	150 W · 5 A glass fuse [†]
Rear connections	H ₂ outlet, water drain, RS-232, fan
Service interval	Water change + tank clean every 30 days

[†] Rating as supplied for HG-250. Confirm the supply rating for HG-500 and HG-1000 at order.

ORDERING

ORDER CODE	DESCRIPTION
HG-250	PEM-HG hydrogen generator, 250 ml/min
HG-500	PEM-HG hydrogen generator, 500 ml/min
HG-1000	PEM-HG hydrogen generator, 1000 ml/min
HG-0FC	Overflow control kit with three-port N ₂ purge valve
HG-FLT	Filter refill set — silica gel and 5 Å molecular sieve

WARRANTY SERVICE IS NOT FREE OF CHARGE WHERE the generator is operated outside the operating manual · parts are disassembled by the user · the rated capacity is exceeded, or water of insufficient quality is used.

MAINTENANCE SCHEDULE

Daily	Check the water-level LEDs and the silica gel colour
As indicated	Regenerate the silica gel once it has turned pink
Monthly (30 days)	Change the water, clean the tank, change or regenerate the molecular sieve

SALES & TECHNICAL SERVICE

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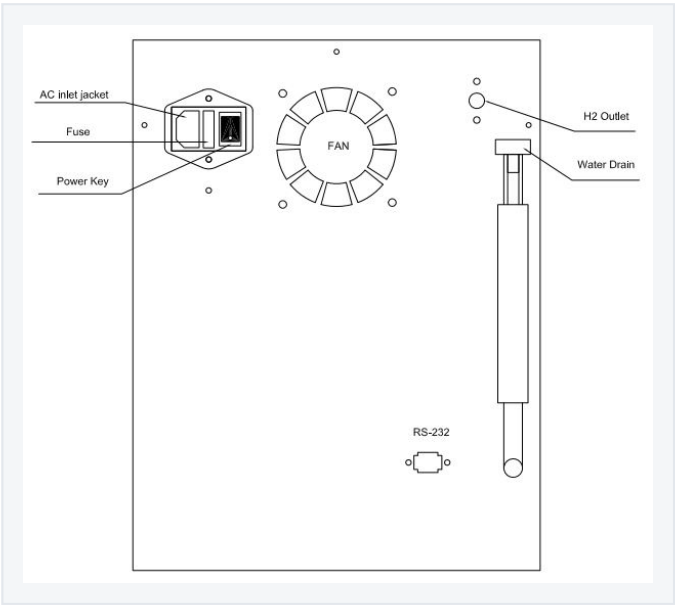


FIG. 5 – REAR PANEL AND CONNECTIONS