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MPI-G610

PIPELINE MAGNETIC PARTICLE FLAW DETECTOR

OPERATION MANUAL

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1、Instrument Overview

This instrument is battery-powered with an integrated design, eliminating the need for connecting cables. It is particularly suitable for magnetic particle inspection in high-altitude work, boilers, and the internal structures of pressure vessels. This design eliminates the hassle of setting up an AC power source during operation, enhancing safety during work. It supports both AC and DC inspection modes.

This instrument features newly added permanent magnet and replaceable battery pack functionality. It automatically detects magnetic field strength and intelligently adjusts output energy to ensure consistent magnetic field intensity at optimal inspection performance under any battery charge level (provided the battery pack is not under-discharge protected). This maintains stable inspection results, ensuring efficient and convenient operation. Equipped with one active and one standby battery pack, it offers easy installation/removal and extended operational endurance.

2、Specification

Sensitivity	15/100 engraved groove clearly displayed on A1 standard sensitivity test piece
Lifting power	≥12.04kg (118N)
Light source	white light illuminance
	≥2000Lux
Light source	ultraviolet irradiance
	≥7000W/cm ²
Duty cycle	50% maximum excitation time 600 seconds
Magnetic pole spacing	100mm×100mm
Gap between magnetic pole and workpiece	≤0.5mm
Battery voltage	14.8V
Battery capacity	2400mAh
Operation temperature	-10~40°C
Dimension (L×W×H)	200×143×196mm
Weight	3.6kg

3. Operating Instructions

3.1 Button Functions



When operating on battery power:

Press and hold the “Select” or “Set” button for over 1 second to display battery level and voltage. After releasing the button, the display will remain active for approximately 6 seconds before turning off.

When Probe is Connected:

1.Function “Select” key: Used for function selection, cycling through available settings.

2.In non-operating state, pressing the “Select” key enters function setup mode, with the selected function highlighted.

Function “Set” key: Used for function configuration, cycling through settings.

After entering setup mode, press the “Set” key.

Probe Buttons:

3.Operation key: Activates magnetization switch function.

3.2 AC Testing: Plug the power supply into the magnetic yoke probe.

After confirming the connection is secure, place the probe on the workpiece. Apply magnetic particles or magnetic suspension to the workpiece surface. Press the operation button to initiate AC testing.

3.3 Light Source Settings: Select the light source based on the magnetic particle type before inspection. Press the “Select” function key to enter settings mode, then choose white light or black light for high-brightness display. Press the “Set” function key to cycle through white light, violet light (ultraviolet), and no light. After configuring the desired light source, press the probe's operation key to exit settings mode.

3.4 Magnetization Mode Settings:

3.4.1 “Push-to-Activate” Mode: Press the operation button to start magnetization; release the button to stop magnetization. It operates in a cycle of 2–3 seconds of operation followed by 1–2 seconds of rest. The surge current generated upon power-up facilitates the movement of magnetic particles in the magnetic suspension and enhances defect visualization.

3.4.2 “Continuous” Mode: Press the operation key to start magnetization; press it again to stop magnetization. The magnetization mode can be set according to operational requirements before inspection. Press the “Select” key to enter the function setting state, where either “Pulse” or “Continuous” will be highlighted. Press the “Set” key to cycle between ‘Pulse’ and “Continuous” modes. After setting the desired magnetization mode, press the probe's work button to exit the setting state.

3.5 Auto Shutdown

After 3 minutes of inactivity with no button presses, the instrument automatically enters sleep mode and the display screen turns off. In sleep mode, the instrument operates in low-power mode. Pressing any function key immediately reactivates the instrument for magnetization.

During sleep mode, models with camera functionality maintain a lit Wi-Fi indicator to preserve mobile device connectivity.

If operating in “Continuous” mode, after 3 minutes of continuous operation, the illumination light will flash for 10 seconds before automatically entering sleep mode, halting magnetization and turning off the display. Pressing the operation key before sleep activation will cancel the sleep prompt, allowing magnetization to continue

uninterrupted.

The instrument will automatically power off after 20 minutes of no button operation.

3.6 Low Voltage Indication

During operation, the instrument automatically monitors battery voltage. When power is critically low, it immediately shuts off magnetization output. The power display shows “Low Voltage” and flashes continuously.

3.7 Magnetization Time: Operates in a cycle of 2–3 seconds of work followed by 1–2 seconds of rest. The surge current generated upon power-up facilitates the movement of magnetic particles in the magnetic suspension and enhances defect visualization.

3.8 After completing work, promptly recharge the power supply to prevent operational disruptions due to insufficient battery charge.

4. Power Supply Replacement Method:

Installing the Power Supply:

Snap the power supply unit onto the magnetic yoke slot, then push it in. After hearing a “click” to confirm it's locked, gently shake the power supply to ensure the latch is secure.

Removing the Power Supply:

Simultaneously press the quick-release latches on both sides of the front end of the magnetic yoke, then slide the power supply upward to remove it from the slot.

5. Precautions

5.1 When the main unit's battery level is low, promptly recharge using the dedicated charger. Charging is complete when the charger indicator light changes from red to green.

5.2 Minimize idle power-on cycles of the probe during flaw detection operations.

5.3 Storage Environment: Temperature $20 \pm 5^{\circ}\text{C}$, relative humidity $\leq 85\%$. Maintain the power supply charge level at no less than 60% of the standard capacity during storage.