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MPI-D730

AC/DC MAGNETIC PARTICLE FLAW DETECTOR

OPERATION MANUAL

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VIDEO

V1

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1、Instrument Overview

This instrument is battery-powered, eliminating the need for an external 220V AC power supply. Its integrated design combines the power source with the magnetic yoke, eliminating cables for convenient operation. 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.

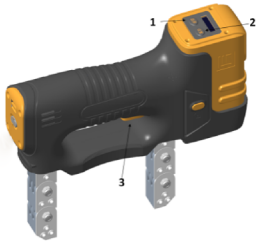
This instrument features newly added permanent magnet and replaceable battery pack functionality. It automatically detects magnetic field strength and intelligently adjusts output energy to ensure consistent magnetic field intensity at optimal inspection performance under any battery charge level (provided the battery pack is not under low-voltage protection). 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	AC	≥8kg (78.4N)
	DC	≥20kg (196N)
Magnetic field strength	pole pitch 75mm	2kA/m (2.5mT)
	vertical poles 93mm	1.48kA/m (1.85mT)
	pole pitch 140mm	1.35kA/m (1.35mT)
Light source	white light illuminance	≥2000Lux
	ultraviolet irradiance	≥7000μW/cm²
Duty cycle		50% maximum excitation time 600 seconds
Magnetic pole spacing		48~140mm
Battery voltage		14.8V
Battery capacity		12800mAh
Operation temperature		-10~40°C
Dimension (L×W×H)		219×54×191mm
Weight		1.9kg

3. Operating Instructions

3.1 Button Functions



Power Section:

1 Function “Select” key: Used for function selection, cycling through configurable functions.

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

2 Function “Set” key: Used for function configuration. After entering setup mode, pressing the Function “Set” key cycles through configuration options.

Magnetic Yoke Section:

3.Function Key, Magnetization Switch Function.

When the instrument enters the function setup state, press the function key to save the instrument settings and exit the setup state.

3.2 Battery Specifications:

The probe features an integrated lithium-ion battery design, eliminating the need for external 110V or 220V power sources while enabling AC/DC output for flaw detection. The battery operates at 14.8V with a capacity of up to 47.36Wh.

3.3 Flaw Detection Operation:

(1) Connect the power supply to the magnetic yoke. Press and hold the “Select” and 'Set' keys for 1 second to start the instrument. Press and hold the “Work” key for 3 seconds to power on the instrument and begin magnetization.

(2) AC/DC Flaw Detection Selection

The instrument magnetizes according to the flaw detection mode

displayed on the power supply: AC or DC. To change the flaw detection mode, press the “Select” function key while the instrument is off. This enters the function settings mode, where the selected function is highlighted. When “AC” or 'DC' is highlighted, press the “Set” function key to cycle through the function settings.

(3) Lighting Configuration

The instrument provides illumination during magnetization according to the lighting mode displayed on the power supply: white light, ultraviolet light, or no light. To change the inspection mode, press the “Select” function key while the instrument is inactive. This enters the function setup mode, where the selected function displays in high brightness. When “White Light,” “Ultraviolet Light,” or “No Light” is highlighted, press the “Set” function key to cycle through the settings for that function.

(4) Selection of Operating Modes

The instrument's operation button offers two selectable modes: momentary and continuous.

Momentary mode: Magnetization begins when the operation button is pressed and stops when released.

Continuous mode: Magnetization starts upon the first press of the operation button and stops upon subsequent presses.

3.4 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.

For models with camera functionality, the Wi-Fi indicator remains illuminated during sleep mode to maintain connection with the smartphone.

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

If no button is pressed for 20 minutes, the device will automatically power off. The Wi-Fi indicator will turn off, disconnecting from the

smartphone.

3.5 Manual Shutdown

When the instrument is inactive, press and hold the “Select” or “Settings” button for 3 seconds to power off.

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 inrush current generated upon power-up facilitates the movement of magnetic particles in the magnetic suspension and enhances defect visualization.

3.8 Post-Operation Maintenance

Recharge the power supply promptly after use to prevent operational disruptions due to insufficient battery charge.

4 Power Supply Replacement Method:

4.1 Installing the Power Supply:

Snap the power supply 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.

4.2 Removing the Power Supply:

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

Note: If you attempt to pull the power supply without first unlocking I t, the latches will automatically lock to prevent disengagement. Once locked, you must reinsert the power supply fully before unlocking again.

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±5°C, relative humidity ≤85%. Maintain the power supply charge level at no less than 60% of the standard capacity during storage.