Portable magnetic flux leakage of drill pipe

User's Manual

Nanjing BKN Automation System Co., Ltd.

Catalog

1.Application Notes

The equipment is suitable for various types of drill pipe testing, such as 2 3/8"、2 7/8"、3 1/2"、4"、4 1/2"、5"、5 1/2"、6 5/8", suitable for field, portable use, convenient and reliable, English interface.

2. Safety Notes

The central part of the magnetic saturator of this detection system is a strong magnetic field during operation. When the device is in operation, it may cause strong interference or even damage to the surrounding electronic devices. It has an attractive effect on ferromagnetic materials. Any magnetic sensitive and ferromagnetic devices or objects should be kept away from this device.

Only trained operators can operate this equipment. Equipment maintenance and repair operations should be performed when the power is turned off. At least two persons with operating qualifications should be present during this operation.

禁止佩戴心
脏起搏器者靠近
No access for persons
with pacernakers

3. Use Note

(1) The electronic parts of this equipment, the power supply specifications are:

Voltage :180~240 V/AC

Frequency :50/60 Hz

Note: Make sure the enclosure is connected to the earth reliably before the equipment is energized.(Use a three-core power socket with secure grounding)

Failure caused by the use of power specifications other than the provisions is not covered by warranty.

(2) use of the electronic part of the equipment ambient temperature of 0℃ ~40℃, humidity of 10%~85%.

(3) earthing resistance of this equipment enclosure shall be less than 100Ω.

(4) the electronic part of the device is energized, open the enclosure.

(5) the electronic part of the equipment is a precision equipment, in the process of moving, transport should be lightly held gently. Special packing boxes shall be used during transportation.

4. summary

4.1 Technical background

Based on the theory of classical magnetic flux leakage detection technology, BKN MFL-06 magnetic flux leakage flaw detector has accumulated a lot of practical

experience on the basis of traditional theory after ten years of deep research. In recent years, with the rapid development of large-scale integrated circuit technology, real-time large data computing algorithm can be realized. The company keeps track of the latest technology, in the circuit, software, probe and other aspects of breakthrough. BKN MFL-06 magnetic flux leakage flaw detector benefits from the above aspects, excellent performance, far exceeding various industry standards.

4.2 Scope of application

BKN MFL-06 magnetic flux leakage flaw detector can be used for the detection of various magnetic materials, such as steel pipe, steel bar, steel wire, etc. on-line or off-line inspection.

Compared with eddy current detection, magnetic flux leakage has the advantages of large penetration depth and certain detection ability to the inner wall of pipe. The instrument has been widely used in oil industry sucker rod, pumping pipe, steel pipe and other detection. also suitable for tube rod detection in other industries.

5. technical parameters

◆Electricity: AC220V 250W

◆Temperature :-10℃~40℃

◆Ambient temperature :10~85 per cent

◆Probe form: differential coils and magnetic sensors

◆Detection channel :3

◆High pass :2 Hz~500 Hz step 1 Hz

◆ Low pass :1 Hz~1000 Hz step 1 Hz

◆Multiple :0-100 continuously adjustable

◆Suppression :0%~100%

◆(Early warning values):1-100(Unit) adjustable

◆(scrap value):1-100(Unit) adjustable

◆Detection speed :0~300 m/min

◆blind area setting :1~10000 ms

6. equipment composition

A ,feeding mechanism lift cylinder;

B ,magnetic flux leakage detection instrument;

C, portable magnetic leak detection bracket;

D, magnetic saturation system;

E, pneumatic systems;

F, portable notebook and magnetic flux leakage interface operating system;

G,supporting control and distribution, instrumentation, power, randomly provided tools and spare parts;

magnetization system

For magnetic nondestructive testing, the first is the design of magnetization to let the detected workpiece reach the magnetic saturation state, which is the basis of magnetic detection. In order to improve the efficiency of magnetic circuit, it is necessary to optimize the structure of magnetic circuit.

The function of the excitation power supply is to provide the current for the transverse magnetization, and then to convert it into a steady magnetic field through the magnetization. In testing, the magnetic field magnetized the drill pipe passing through the magnetizing device, and then formed an inductive magnetic field of sufficient strength in the drill pipe, which provided the basis for the feasibility of magnetic flux leakage detection. thus, it seems that whether a sufficient intensity excitation magnetic field source and a sufficient intensity magnetic induction intensity can be generated in the steel tube will determine whether the defects in the detection can be detected; in order to optimize the detection signal, there needs to be a best magnetization state in the detection, which can be achieved by adjusting the current size of the magnetic saturation power supply (the current regulation operation is simple and should be the preferred method).

7. equipment operation sequence

(1) Turn on the POWER main power switch on the right side of the distribution cabinet.


(2) The drill pipe is placed on the lifting support, and the magnetic flux leakage detection probe is selected and installed on the portable flaw detection support according to the type of drill pipe tested, and the lock is opened and loaded into the drill pipe, and then the lock is closed

(3) Connect the probe 2, probe 3, probe 4, I/O interface, network communication, power supply line behind the instrument, and dial the power switch to the starting block. Note: Do not connect probe line in probe 1 position

Then the other end of the probe line is connected to the probe socket, and the magnetic saturation power cord is connected to the magnetic saturation socket.
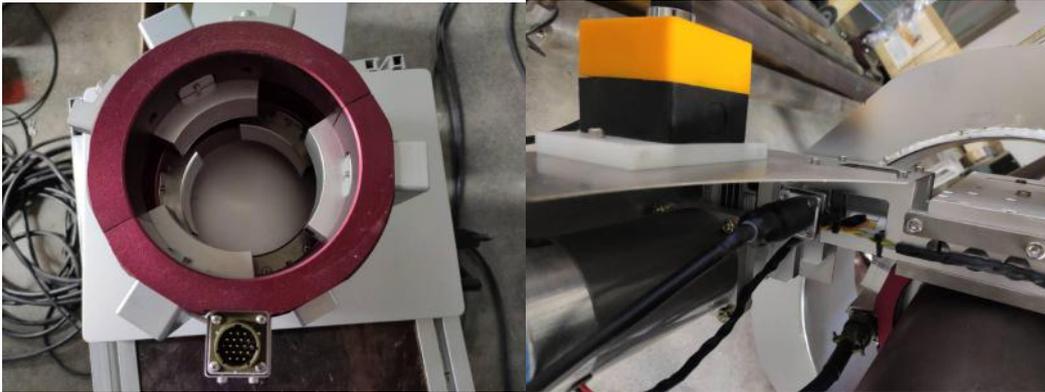
(4) Open the magnetic flux leakage software of the portable computer type, check the connection status of the software and instrument and set the parameters.

(5) Start the motor switch on the portable magnetic flux leakage, set the reference, collect the signal, then detect the drill pipe and observe the interface diagram.

(6) Take the file name, and when the steel pipe passes, the subsequent drill pipe can be automatically collected by computer software.

8. Software Operations Guide

For Nanjing BKN Automation System Co., Ltd. BKN MFL-06 magnetic flux leakage detection system matching application software. The main functions of the software are detection signal acquisition, real-time data processing, control signal output and input, real-time transmission of detection data; the main functions of the server program are related parameters manual and automatic setting, system settings, speed testing, channel testing, data acquisition and analysis, including data real-time receiving, processing, graphical display, data storage, analysis, automatic calibration, single steel tube detection report, the total report of this test, detection waveform and report printing.

The software interface is mainly divided into: the whole interface waveform display area, circuit equipment area (most parameters are related to the hardware performance of magnetic flux leakage instrument), filter setting area, record preservation and printing area.

8.1 Parameter setting

Considering that it is inconvenient to input the keyboard in outdoor use, the company adopts the humanized pure mouse input method. To set parameters, click on the number to set the parameters, and then the system will pop up a digital soft keyboard. Use the mouse on the soft keyboard to click on the value to enter, click on the "ENTER" to complete the input, if you want to give up the input, click ESC "."Note: the power supply of the instrument must be turned on when setting the parameters, so that the instrument is in working condition, otherwise the set parameters are invalid!

I. Above the interface:

1. Shows whether the instrument is connected to the instrument, i.e. the instrument and magnetic flux leakage software are successfully communicated

2. Current detection information: record setting information, can record drill pipe magnetic flux leakage detection information

II. Below interface: Record batch number query

system

III. Right side of interface:

◆◆: Instrument detection status, operation and stop
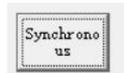
◆◆: synchronous mode, when the instrument starts to check whether in the synchronous gear, when the magnetic flux leakage equipment motor switch on, in this mode the instrument starts to detect at the same time
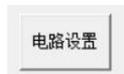
◆◆: adjustment of parameters in circuit setting, adjustment interface appears after clicking

: How long is the time delay after the motor switch is turned on to open the detection ms generally set to 50

: Click on the switch after the delay of how long to stop detection, generally set ms 50

sampling rate: the frequency of data collected by the instrument, generally set to 1000 sps..

高通-- 3.0 (Hz) : Circuit Parameters The internal parameters of the instrument are generally set Hz.0.2

增益-- 55 (dB) : Circuit Parameters The internal parameters of the instrument are generally set dB.5

Alarm area parameters:

预警值-- 99 (Unit) This parameter is used to set the first level alarm value. When the magnetic flux leakage detected reaches this value, the system outputs an alarm signal. unit of this parameter is "Unit", please select between 1 and 99.

报废值-- 99 (Unit) This parameter is used to set the second level alarm value. When the magnetic flux leakage detected reaches this value, the system outputs an alarm signal. unit of this parameter is "Unit", please select between 1 and 99.Usually this parameter is larger than the previous one. Normally 75-80

板级FirHp 200 (Hz)
板级FirLp 1200 (Hz)
板级FirBw 241 (Hz) These parameters are system parameters and are used for further data processing. Users can keep factory settings, please do not modify, the modification may occur abnormal.
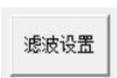
滤波设置 ◆◆: The instrument adjusts the signal state parameter, after clicking enters the adjustment interface

高通(Hz) 低通(Hz) 带宽(Hz) These three parameters are used for the first stage processing of the magnetic flux leakage signal collected by the embedded system. Reasonable setting of these two parameters can maximize the program to remove the interference signal and retain the magnetic flux leakage signal. it should be noted that the "high pass" value must be less than the "low pass" value, and the "broadband" value is a bifurcation band of high pass and low pass, which has been tested and optimized by our company's technicians.

High pass :0-500 Hz, generally set range between 1-20, adjusted according to magnetic flux leakage detection.

low pass :0-1000 Hz, general set range between 80-200, adjusted according to magnetic flux leakage detection.

Broadband: Generally set to 20-40.

信数 This parameter is the signal gain adjustment, generally set in the range of 1-100, according to the magnetic flux leakage size adjustment.

偏移 This parameter is the detection signal offset position ,0 in the middle of the interface, the larger the adjustment to the lower offset, generally set to 0 can not be adjusted.

 If you need to unify the other channel parameters, you can select the o button of the channel you want to change, then click the copy parameter, click the application below the interface-save the key, the parameter can be copied to the changed parameter.

9. equipment status

This identification indicates that the data collected by the system is not recorded in the computer, even if the device is started and the waveform is displayed. will not display only after clicking this button. When "calibration, record search" will show "data is not recorded ", please pay special attention to this.
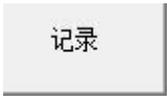
indicates the connection state of the instrument, normally the first two should be green connection state, the latter two groups should be red unconnected state. please note any red logo on the software interface, generally this represents abnormal status, please confirm it before use.

10. Recording and reporting functions
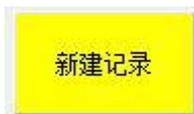
 This button is used to create a set of record data. Users can establish records according to their job management requirements, such as: records of a certain day, records of a certain type of steel pipe, and so on,

generally we call it batch number. In the computer's file system, the batch number exists as a folder, which is stored in a data directory. Generally this directory is "E：\data\".. Users can also set their own. Set up method please consult the trainer. For each steel pipe to be tested, its record is a file under this batch directory.
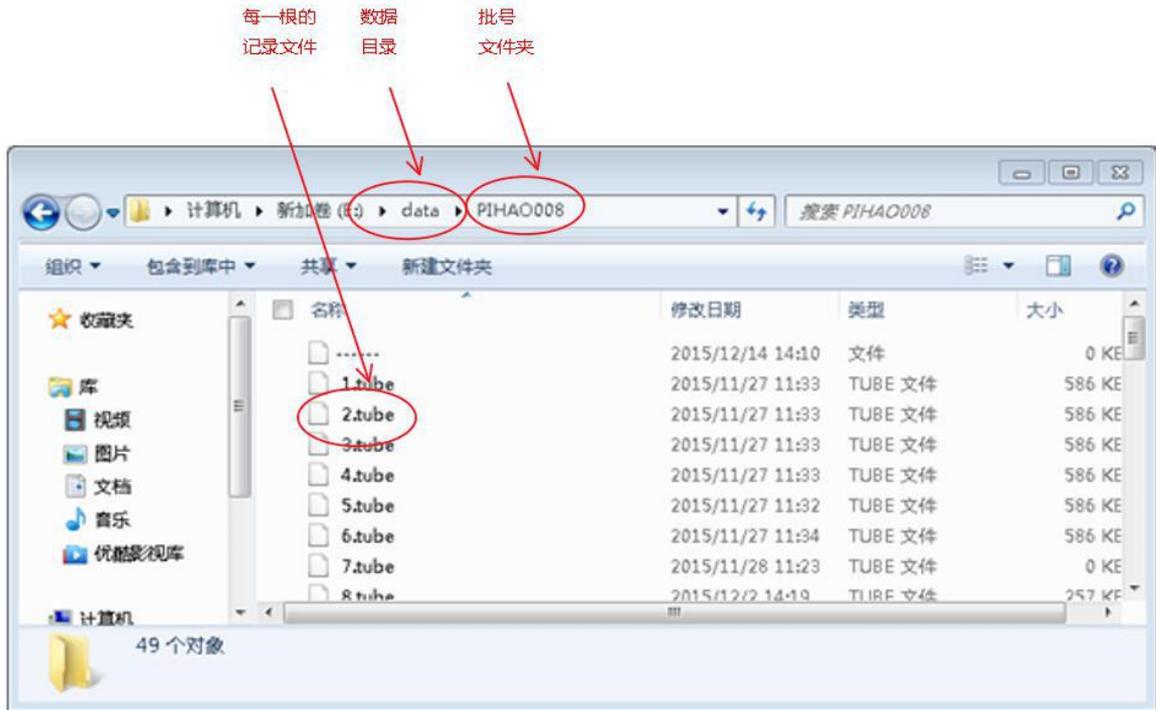

Start a batch number step:
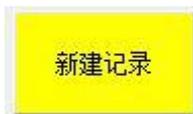
Click the following window:
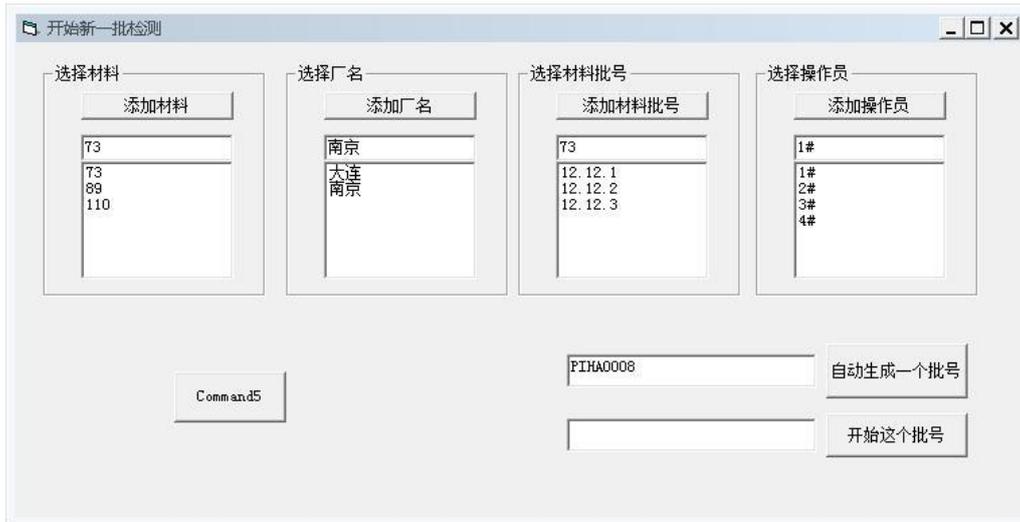
Enter the name of a batch number on the left of the Start this batch number button, click, and the batch number establishment is


complete.

Another way to create a batch number is to automatically generate a new batch number by clicking on the existing batch number. When a batch number has not been completed, the computer is shut down, the next boot is the default batch number.

The batch directory currently in use is displayed in the upper right corner of the main

interface. display green when in record state and red when not record state.
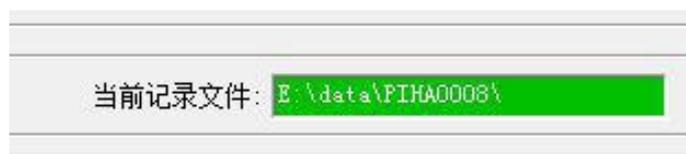
When the batch number has been set up, or using the existing batch number, click this button to start normal detection and record.

Click this button after the program does not record the number of detection, but can normally display the detection curve, to restore the recording function click the "record" button can.

To view previously recorded data, click the Record Search button to keep the program in search. When in search, the data being detected is not recorded and

displayed

Each query button in the middle of the main interface becomes available. (These buttons are not available when not in search

status)

Click the pop-up data file directory dialog box
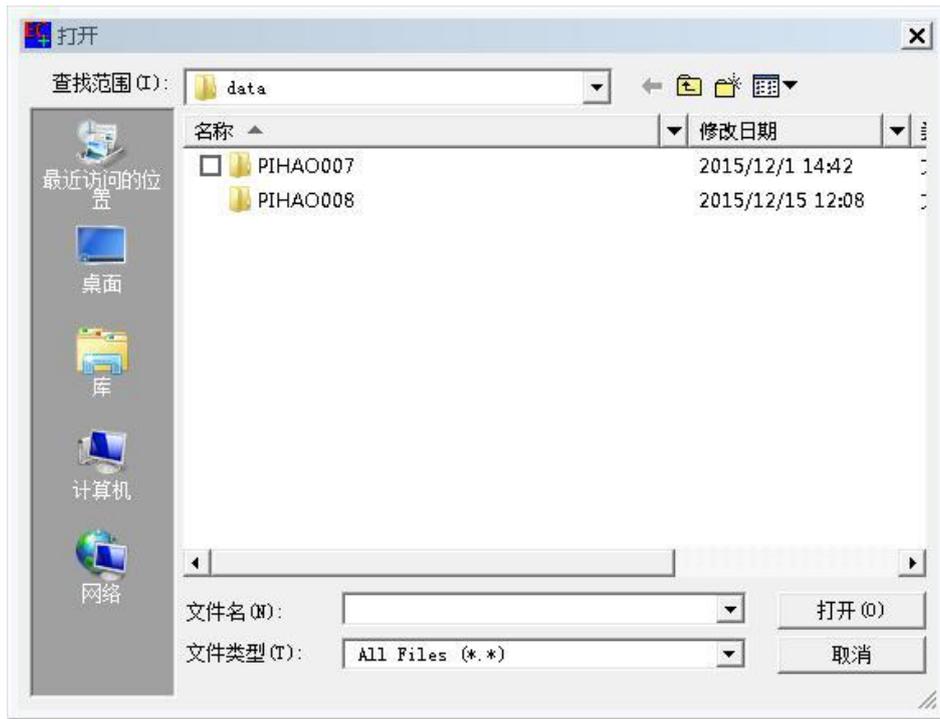
Select Lot Number folder
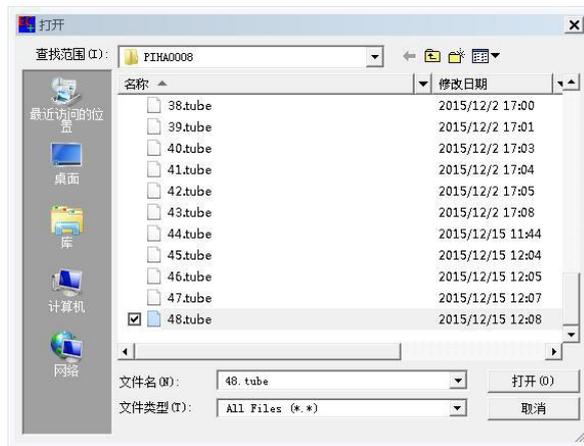
Select the drill pipe record file, click on ″open ″, the main interface search related content becomes like this:

Click on the ″open″ button on the main interface to display the record of the selected drill pipe.

If you want to view other records in this batch number, click these two buttons.

Click this button to print the record of the current view.