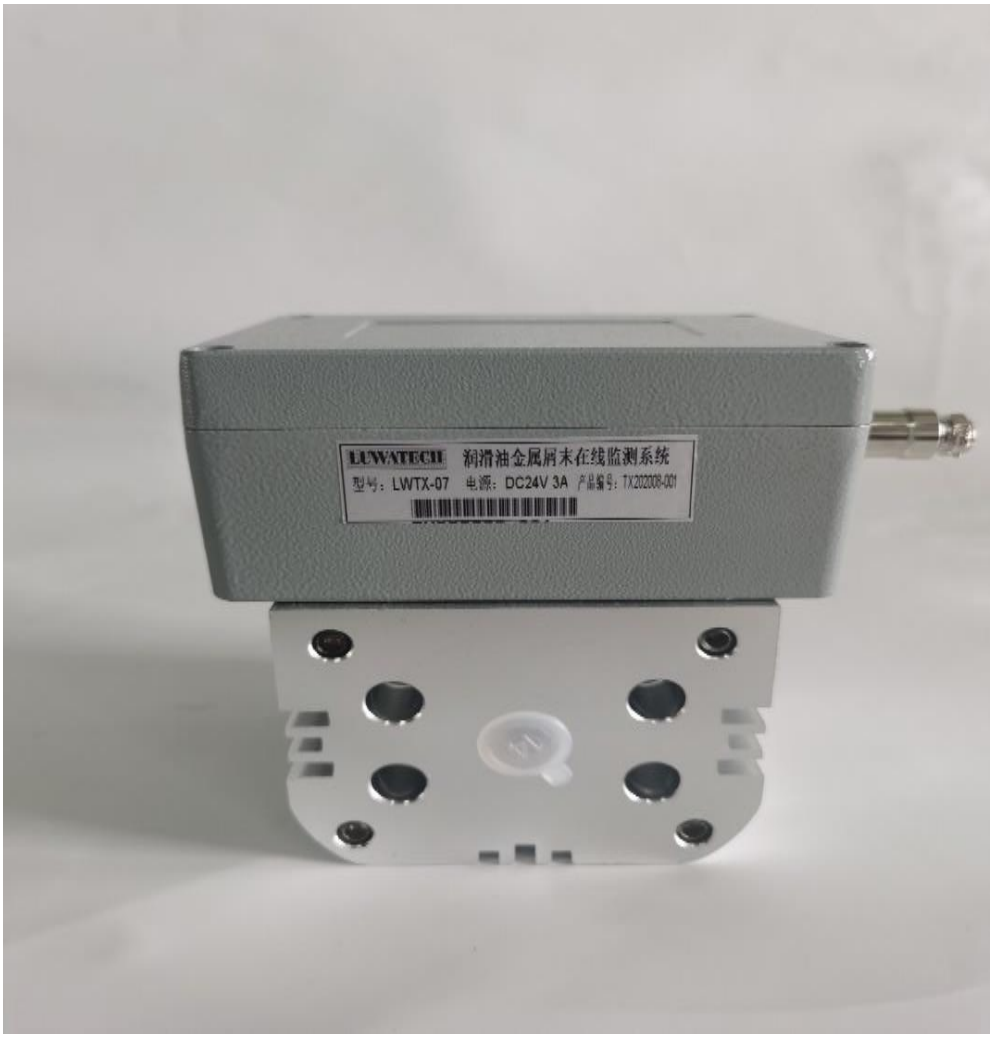
On line monitoring system of metal dust in lubricating oil

Product introduction



ShangHai LUWATECH Industrial Co.,Ltd

1. Company profile

Shanghai Luowan Industrial Co., Ltd. is an enterprise engaged in lubricating oil detection instruments. Its technical research and development, production and supporting processing provide guarantee for the safe operation of aeroengine, steam turbine, gas turbine, wind turbine and marine power equipment.

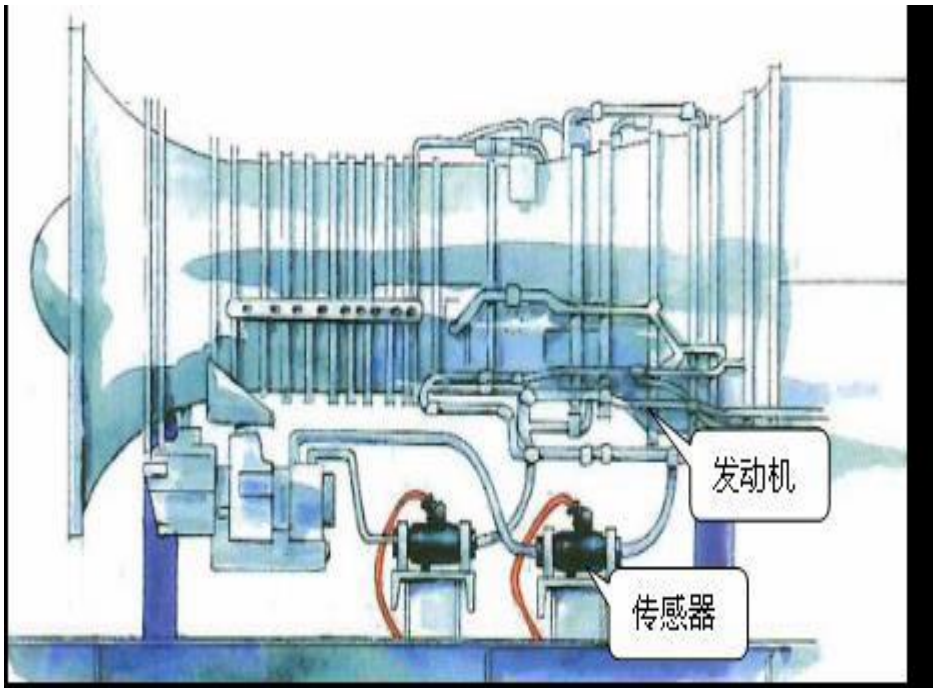
2. System function

The metal debris in the transmission oil will enter the transmission pipeline and generate metal debris.The on-line monitoring sensor of lubricating oil metal dust is installed in the oil return pipeline. By monitoring the size, quality, property (ferromagnetic or non ferromagnetic dust) and cumulative trend of the metal dust in the oil return pipeline, the monitoring data is recorded in real time, and the health status of the transmission equipment is determined through data demodulation.Provide reliable early warning and life prediction for mechanical equipment.

The on-line monitoring sensor for metal dust of lubricating oil is mainly composed of sensor, signal conditioning module and connecting cable

(see Fig. 1), which involves knowledge in the fields of mechanics, electronics, signal processing and computer, is a typical product of the fusion of various high and new technologies.The sensor is installed on the oil circuit of the lubricating oil system (as shown in Fig. 2). Through online real-time monitoring of the cumulative state of the parameters such as the number and size of the lubricating oil metal chips in the power transmission system, the health status of the power transmission system is analyzed, so as to take active maintenance measures to ensure the reliable operation of the system.

Figure 1 system installation diagram

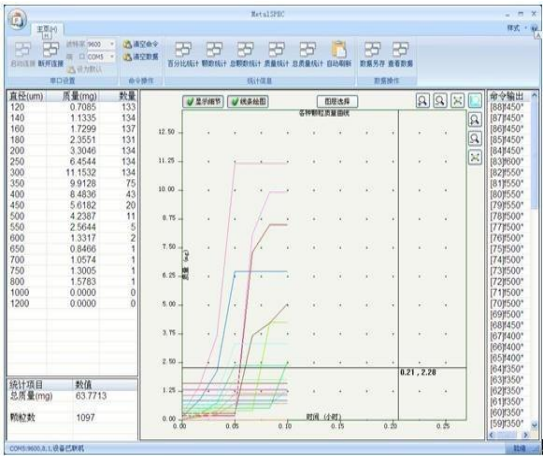


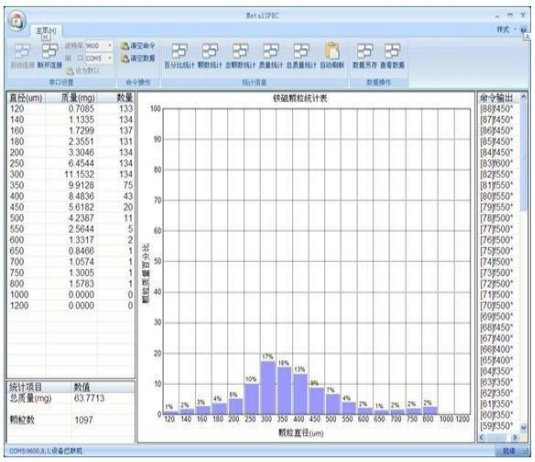
3. Product picture information

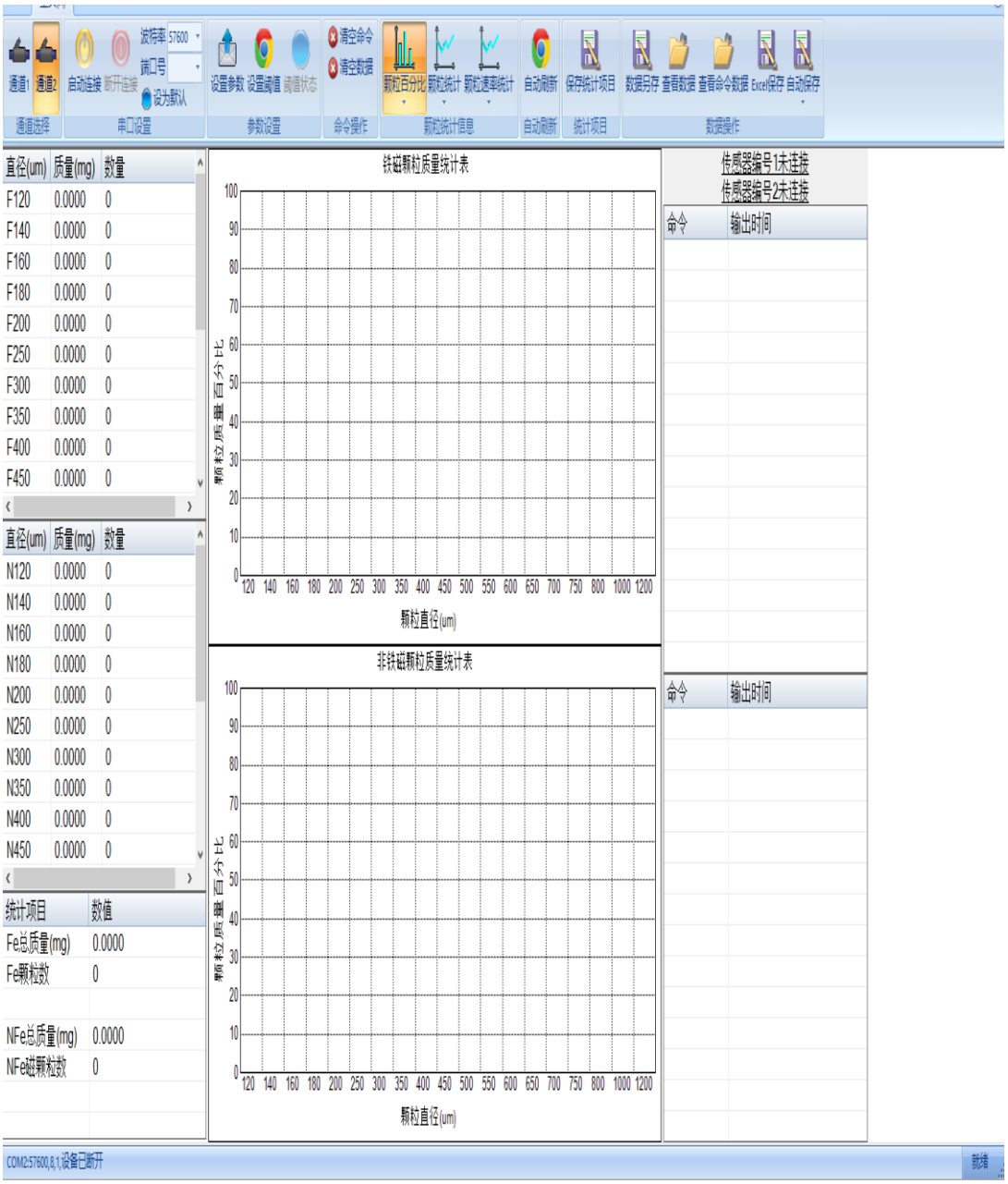
Figure 5 product application example

Figure 6 product diagram

Figure 3 software interface of metal chip mass percentageFig. 4 interface of metal chip data analysis software






通道1
通道2
通道选择
自动连接
断开连接
波特率
57600
端口号
设为默认
串口设置
设置参数
设置阈值
调值状态
参数设置
清空命令
清空数据
命令操作
颗粒百分比
颗粒统计
颗粒速率统计
颗粒统计信息
自动刷新
保存统计项目
数据另存
查看数据
查看命令数据
Excel保存
自动保存
数据操作
直径(um) 质量(mg) 数量
F120 0.0000 0
F140 0.0000 0
F160 0.0000 0
F180 0.0000 0
F200 0.0000 0
F250 0.0000 0
F300 0.0000 0
F350 0.0000 0
F400 0.0000 0
F450 0.0000 0
直径(um) 质量(mg) 数量
N120 0.0000 0
N140 0.0000 0
N160 0.0000 0
N180 0.0000 0
N200 0.0000 0
N250 0.0000 0
N300 0.0000 0
N350 0.0000 0
N400 0.0000 0
N450 0.0000 0
统计项目 数值
Fe总质量(mg) 0.0000
Fe颗粒数 0
NFe总质量(mg) 0.0000
NFe磁颗粒数 0
铁磁颗粒质量统计表
颗粒质量百分比
颗粒直径(um)
非铁磁颗粒质量统计表
颗粒质量百分比
颗粒直径(um)
传感器编号1未连接
传感器编号2未连接
命令
输出时间
命令
输出时间
COM2:57600,8,1,设备已断开
就绪

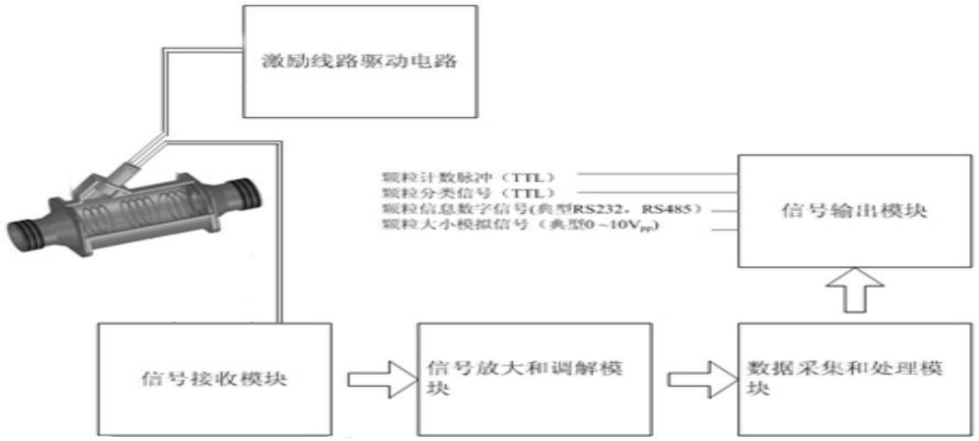


Figure 7 system structure block diagram

4. Application of civil products

At present, our company has developed an on-line monitor for oil metal dust for wind turbine, as shown in Figure 8.The three-dimensional mechanical interface diagram is shown in Figure 9, and the electrical interface signal and wire number are shown in Table 1.

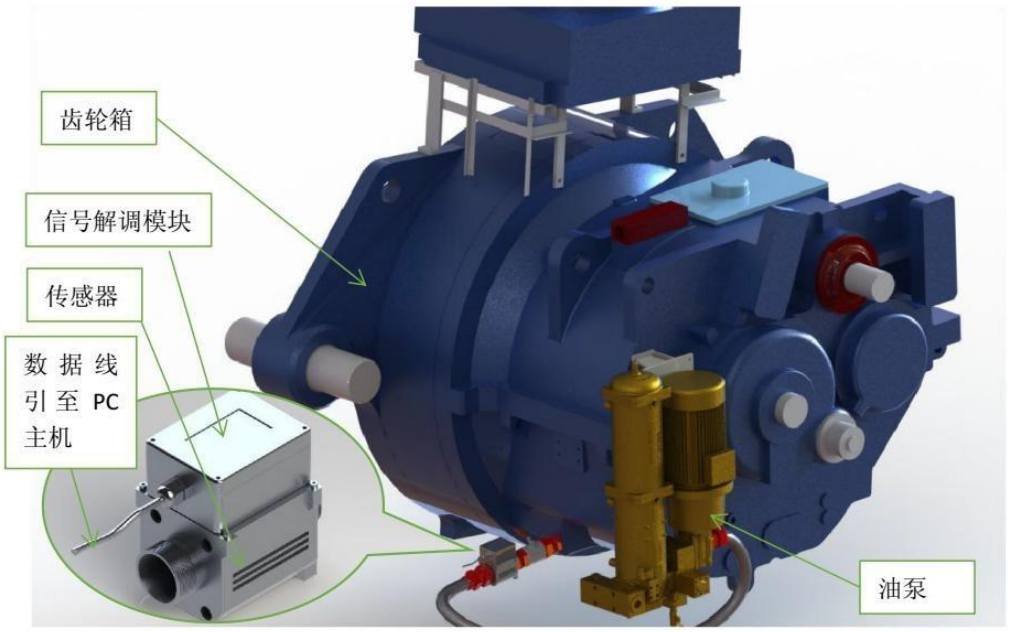
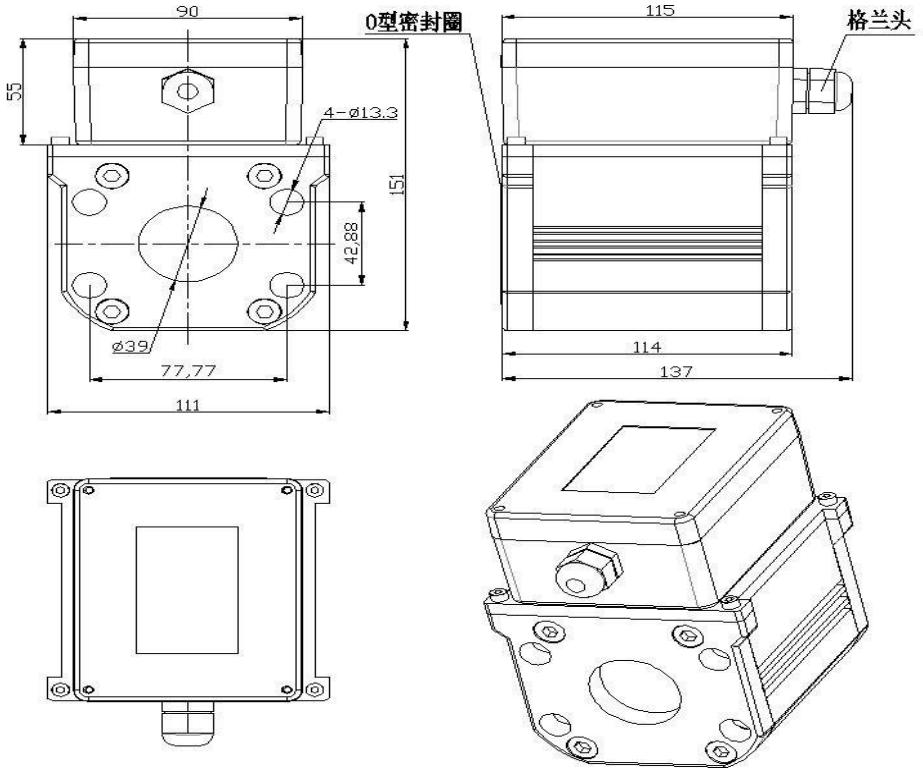


Fig. 8 on line monitoring sensor of lubricating oil metal dust for monitoring wind turbine gearbox

Table 1 electrical interface signal line number table

Wire	Signal	type	Electrical description	remarks
1	Power supply positive	Input, DC voltage	18-36vdc, maximum power consumption 10W,416mA@24VDC。	
2	Power input			
3	Positive output of iron particles	Output, square wave pulse	The pulse width is 14 MS (± 1ms) low level 20ms (± 1ms).The pulse amplitude is supply voltage + 00-2v, load > 1K Ω.Low level (resistance grounded) when idle.	When a particle is detected, Output 1 pulse. The system needs to count pulses by the host.
4	Positive non iron particl e	Output, square wave pulse	The pulse width is 14 MS (± 1ms) low level 20ms (± 1ms).The pulse amplitude is supply voltage + 00-2v, load > 1K Ω.Low level (resistance grounded) when idle.	
5	Particle		Common ground with	
6	Positive bit output	Output, logic level	Fault free output high level (supply voltage +00-2v), load > 1K Ω.Output low level in case of fault.	When necessary, the system host monitors the signal and judges the equipment
7	Self test		Common ground with	
8	(other			



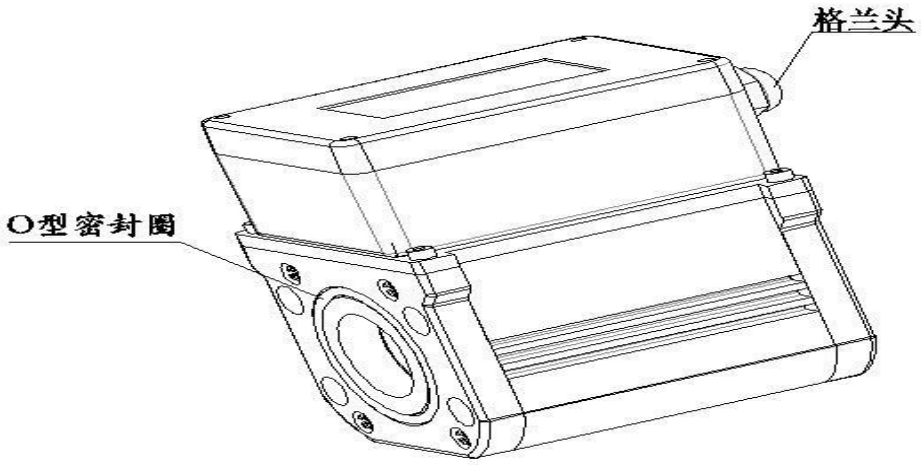


Figure 9 Three dimensional diagram of lwtx-39 on-line monitor for metal dust of lubricating oil

The on-line monitoring of lubricating metal dust on-line monitors the lubrication state of wind turbine, which can effectively provide the indication index of early wear of equipment, let the operation and maintenance personnel judge the current wear status of the equipment, arrange the operation and maintenance of the worn equipment in advance, avoid the occurrence of malignant accidents, reduce the maintenance cost, and change the regular maintenance to the condition based maintenance.

5. Technical parameters of civil products

	Sensor parameters						Oil parameters		
model	Tube in ne	Weight kg	Overall dimension inch mm	Working tempe	Monitoring range of metal dust		temperature /℃	pressure /MPa	Minimum velocity L/min
					Magnetic	Non ferroma			
LWTX-07	Φ7	≤3	115×90×125	-40~190	≥65	≥300	≤190	≤3.5	0.9
LWTX -26	Φ26	≤3	160×40×90	-40~190	≥255	≥590	≤190	≤3.5	10
LWTX -39	Φ39	≤3	160×40×90	-40~190	≥345	≥980	≤190	≤3.5	38

ShangHai LUWATECH Industrial Co.,Ltd
building 9 No. 333 Kangqiao East Road Pudong Shanghai China
Tel (fax): 021-58073569 Tel: 13917337146 (wechat)
E-mail：maorong.long@luowansy.com https://luwatech.1688.com
http://www.luowansy.com
http://www.luwatech.com.cn