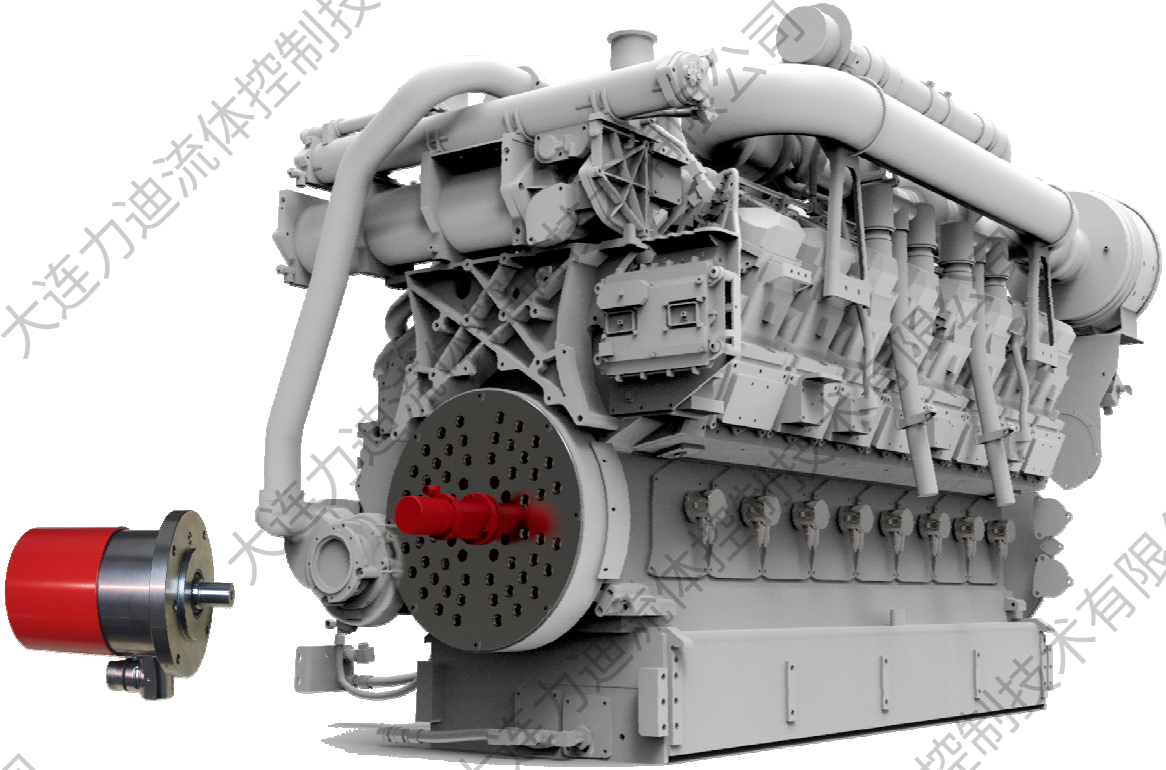


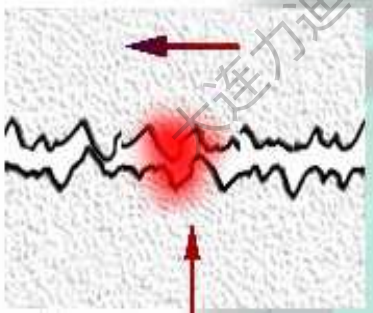
BeCOMS® / BCom

轴承状态在线监测系统

物理原理

Lubricated sliding bearings
beginning of a "hot spot"

润滑滑动轴承从一个“热点”开始



dry friction
intensive heat generation

干摩擦
密集热量产生

increase of temperature

温度上升

partial overheating
small bearing areas

小部分轴承过热

"hot spot" is formed

“热点”形成

物理原理

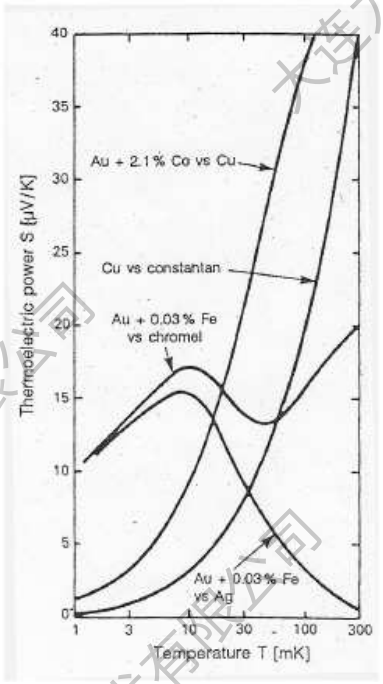
OMDs工作状态

油雾探测器探测

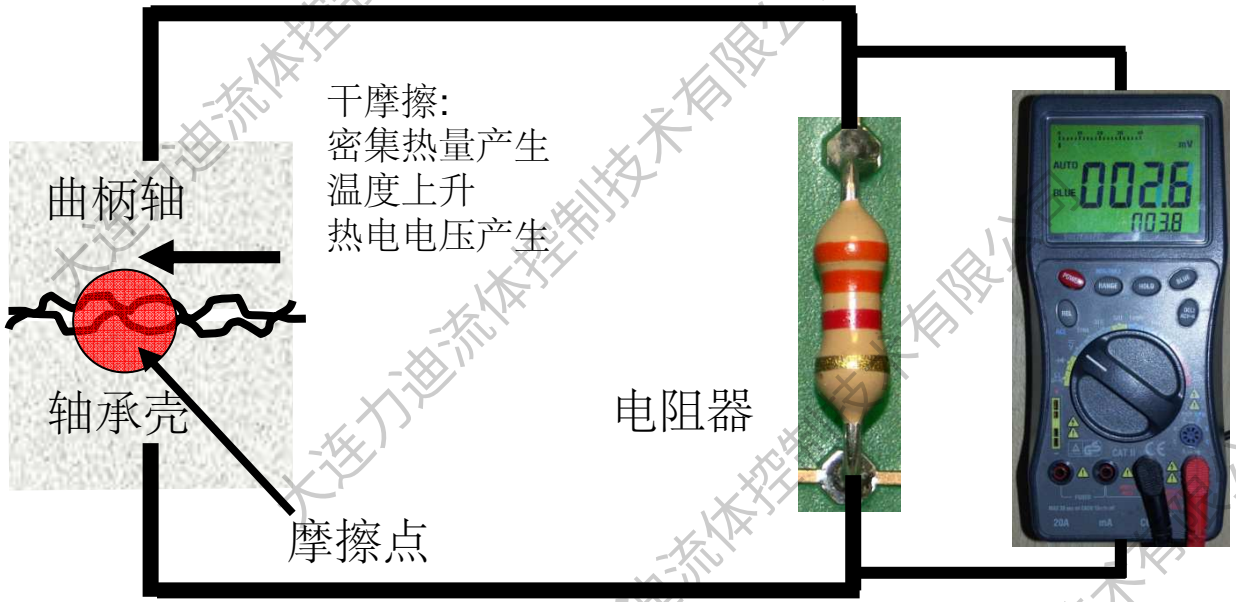
BeCOMS 工作状态

BeCOMS 早期探测

BeCOMS® / BCom 原理

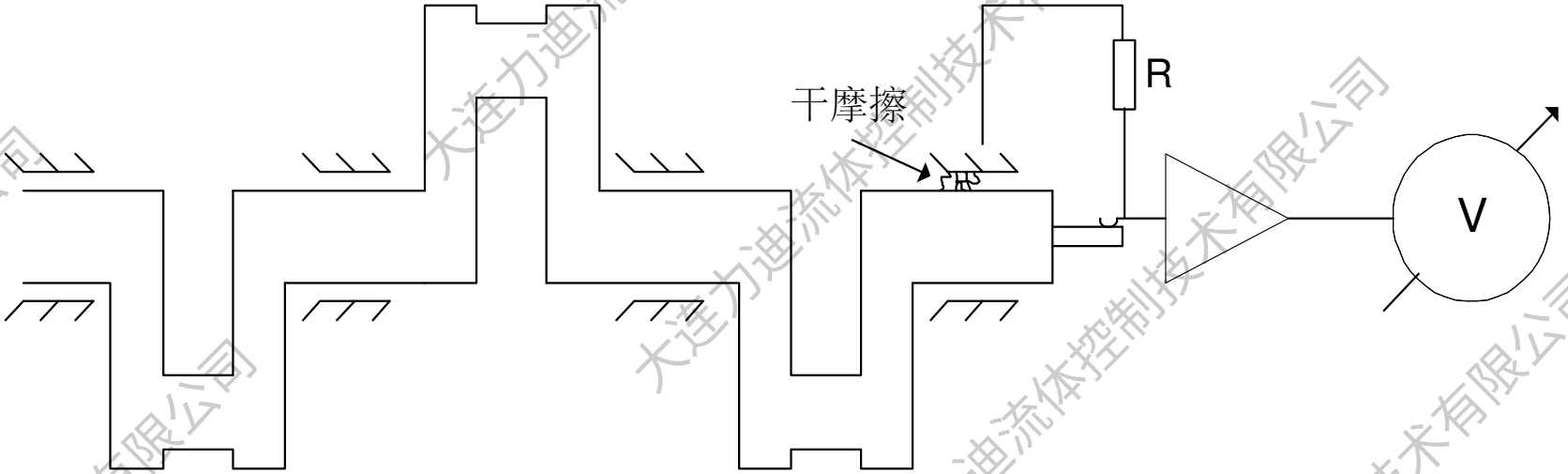


热电偶效应



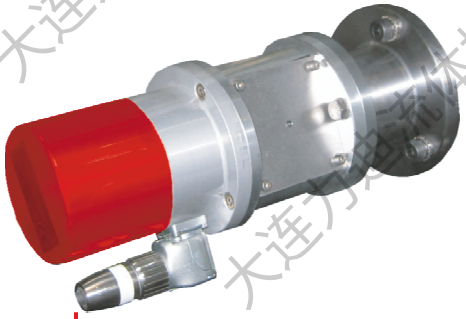
BeCOMS® / BCom 应用

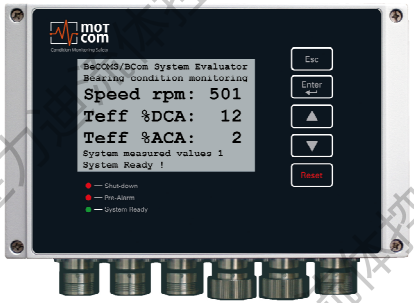
运用在柴油发动机上



motcom
Condition Monitoring Safety

BeCOMS / BCom sensor mounted at engine





24V DC

relays, optional Canbus / Modbus

RS485

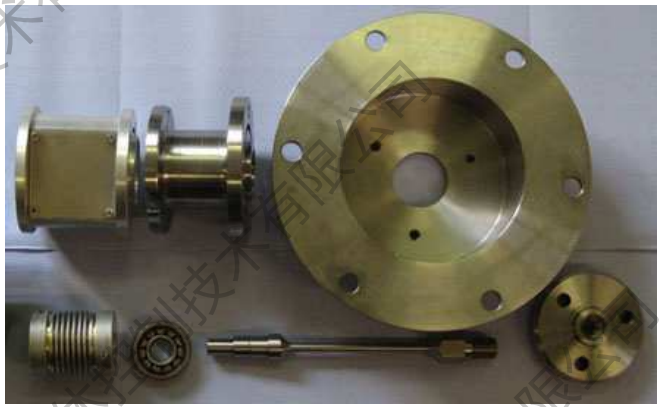
BeCOMS / BCom Evaluator

Local Alarm System

Computer with Logger,
Data_Indicator and
motcom loganalyser software

optional printer

BeCOMS® / BCom
系统概述



安装BeCOMS传感器的发动机类型专用机械适配器

BeCOMS® / BCom系统的一些应用领域

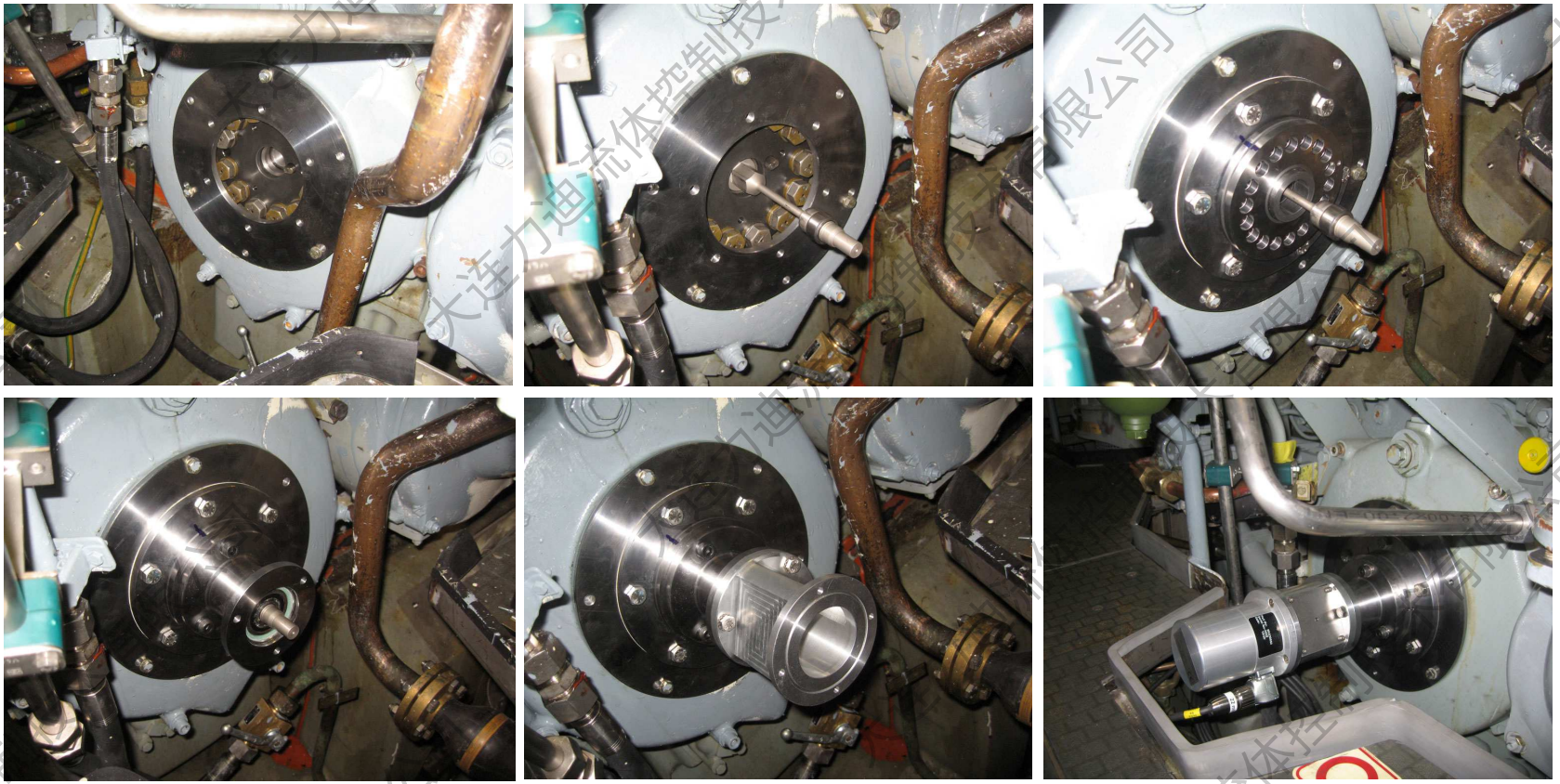
商船和邮轮

火车头

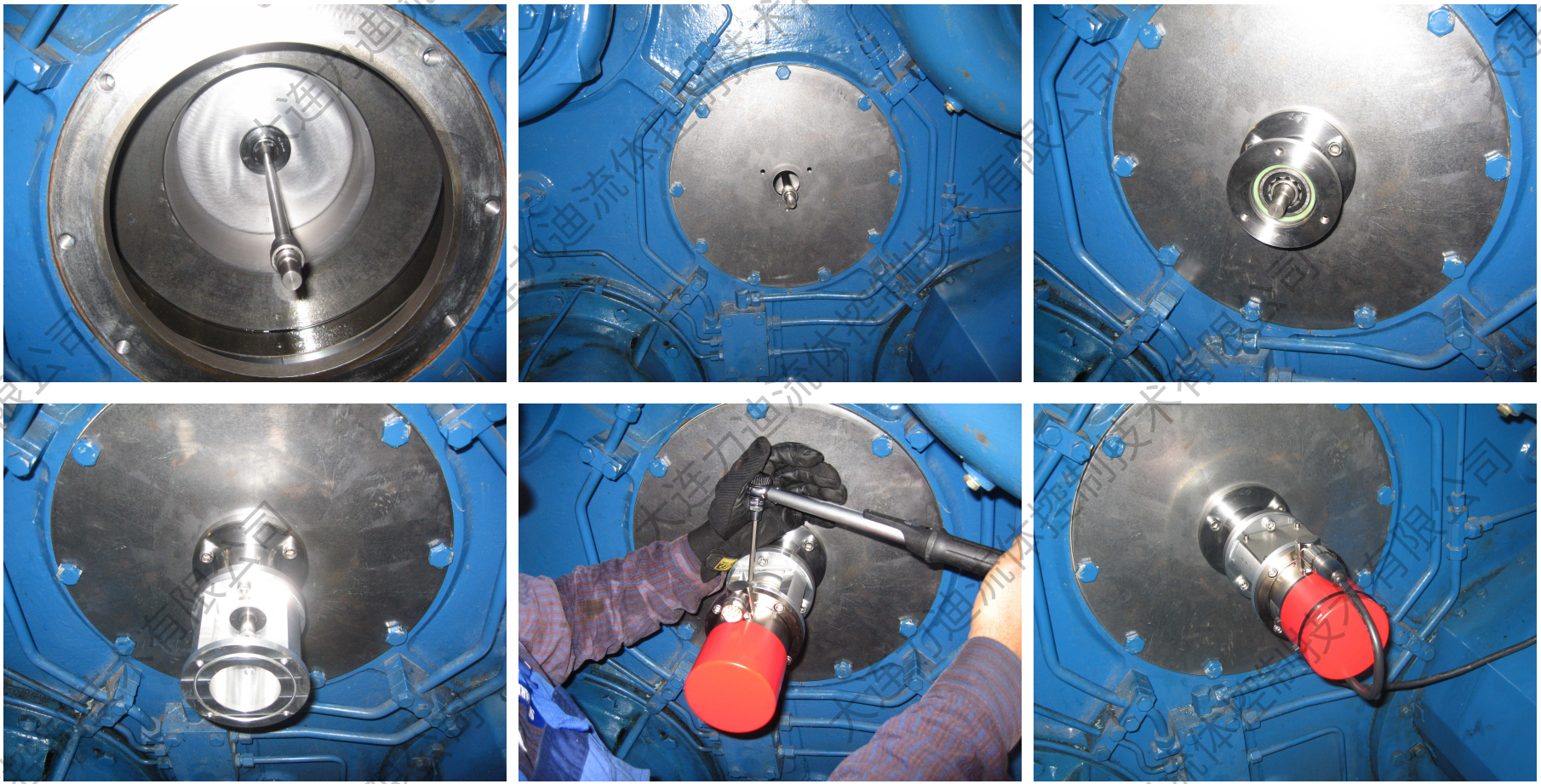
军用船舶

发电站

BeCOMS SRE传感器逐步安装在军用舰船上的MTU 16V396TB高速4冲程发动机上



BeCOMS SRE传感器逐步安装在瓦锡兰18V50DF中速4冲程发动机上

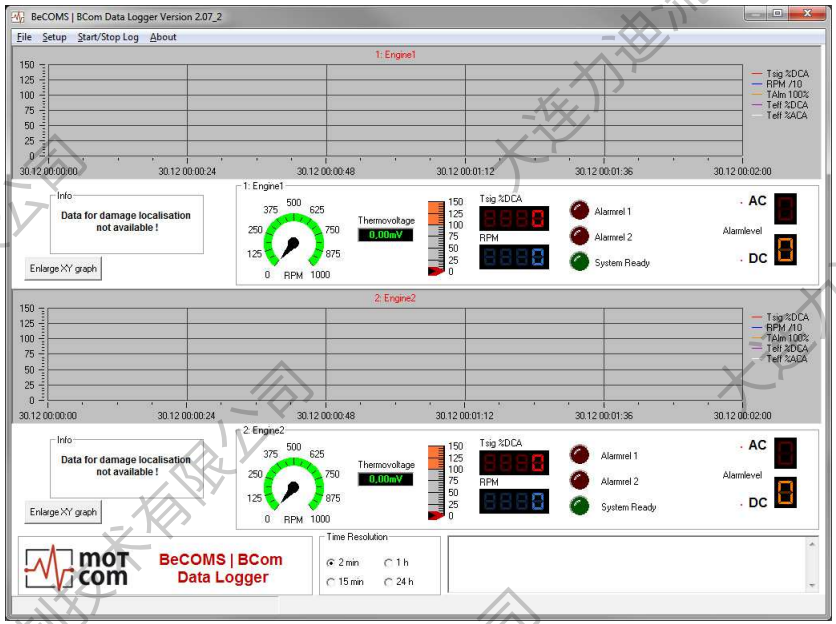


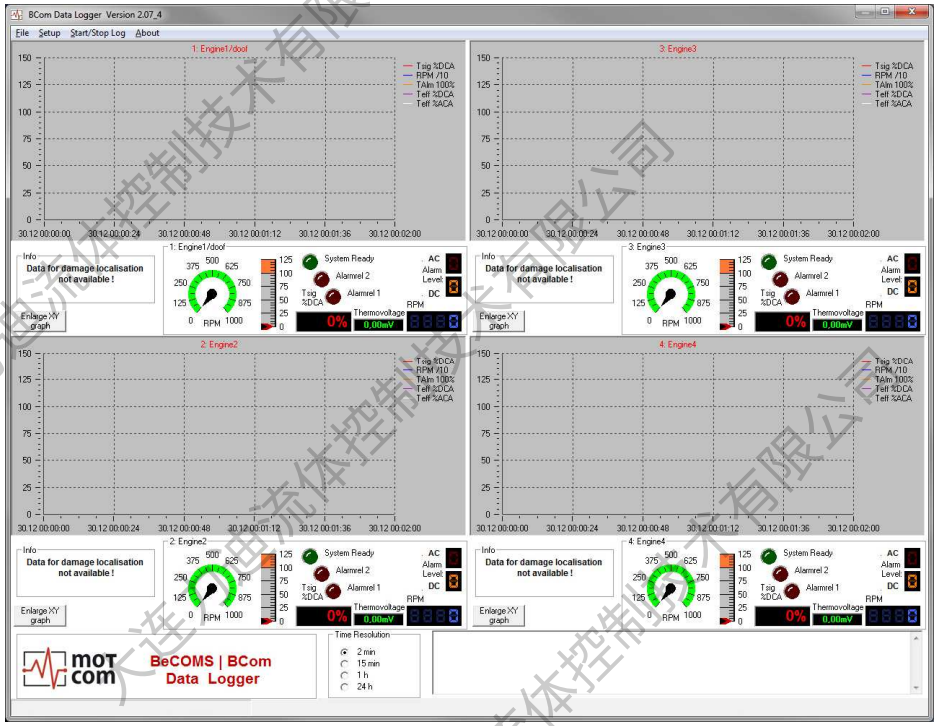
在PC上安装评估仪和数据记录器

安装好的评估仪和记录器软件的屏幕

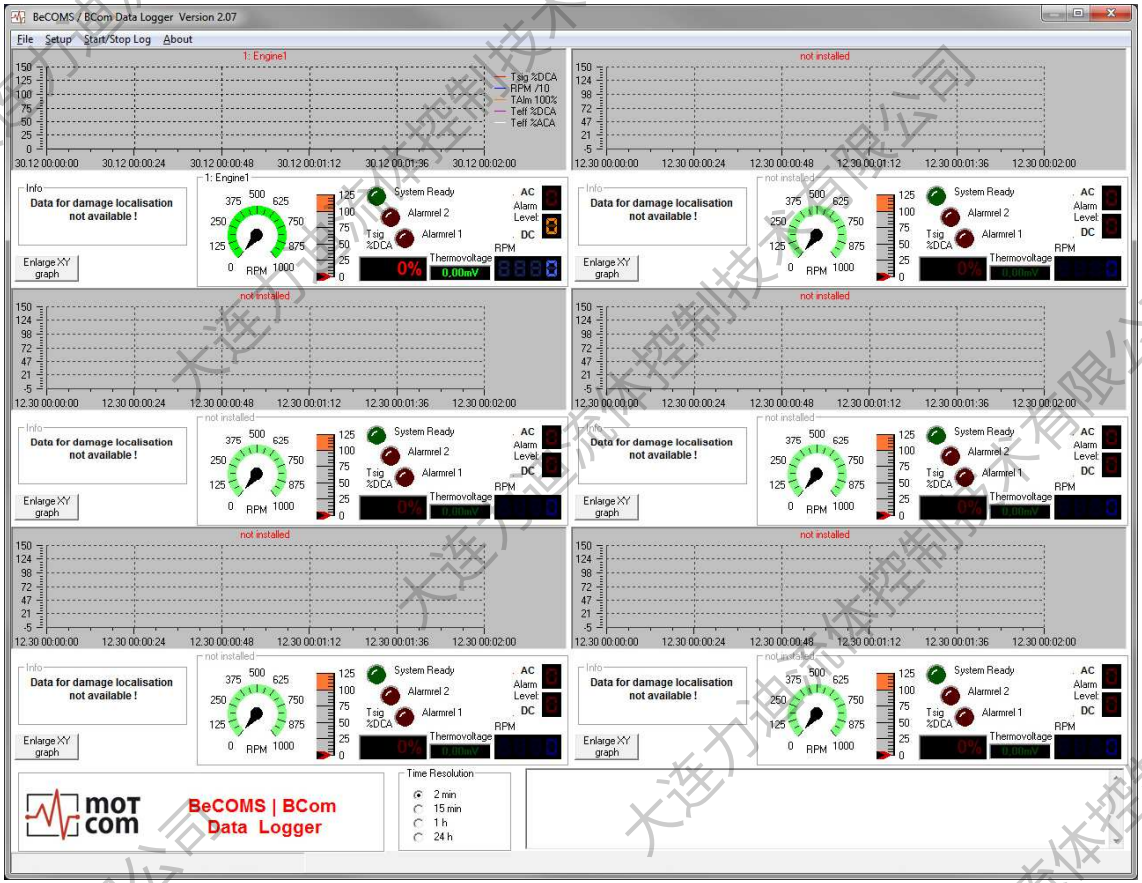
当前BeCOMS®软件显示

BeCOMS记录仪软件有4个版本，可同时显示和记录1,2,4或6个安装的BeCOMS系统的数据。为了显示和在线分析存储的日志，必须使用数据指示器Data_indecator软件或motcom loganalyser软件。

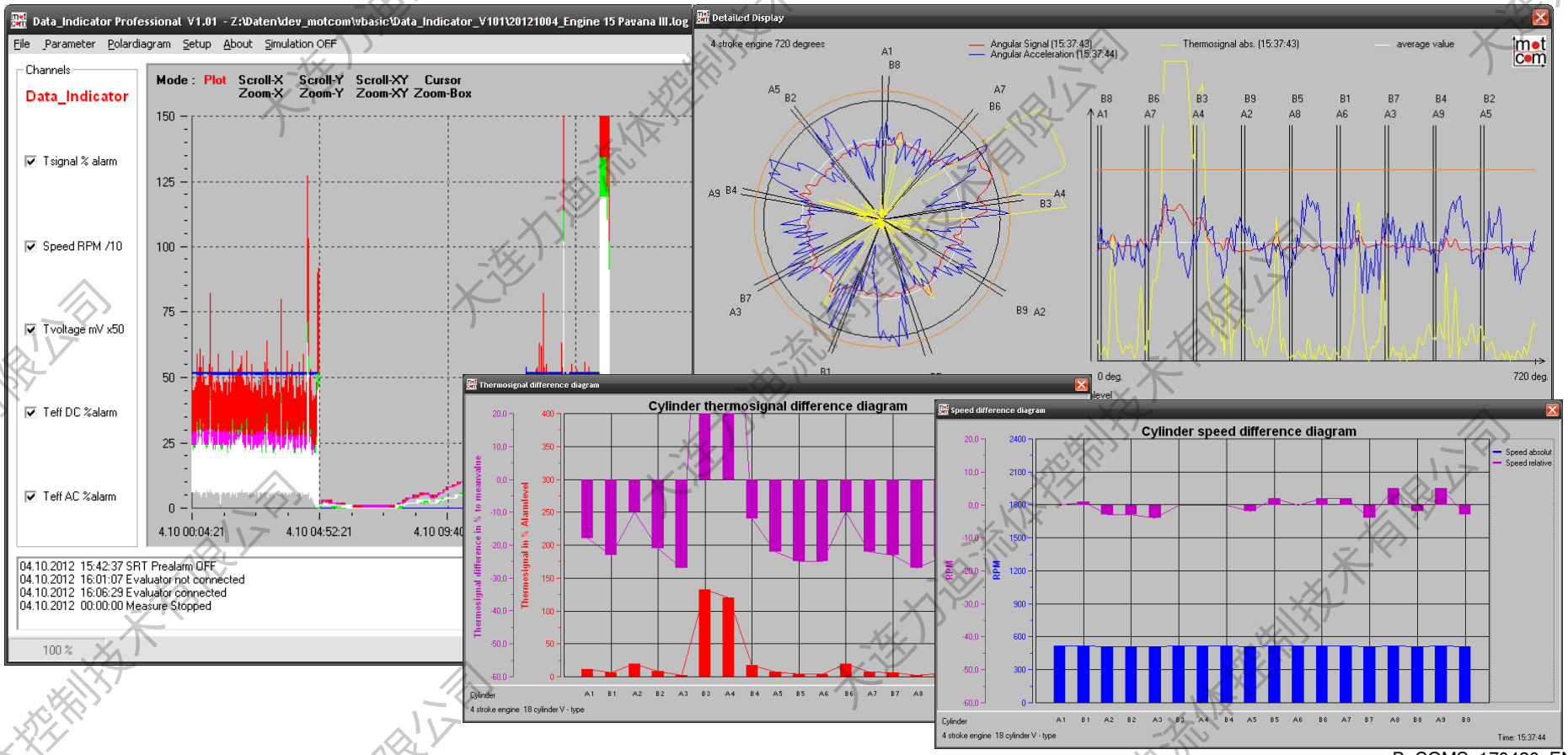




当前BeCOMS® 软件显示6个系统



当前BeCOMS® 软件显示

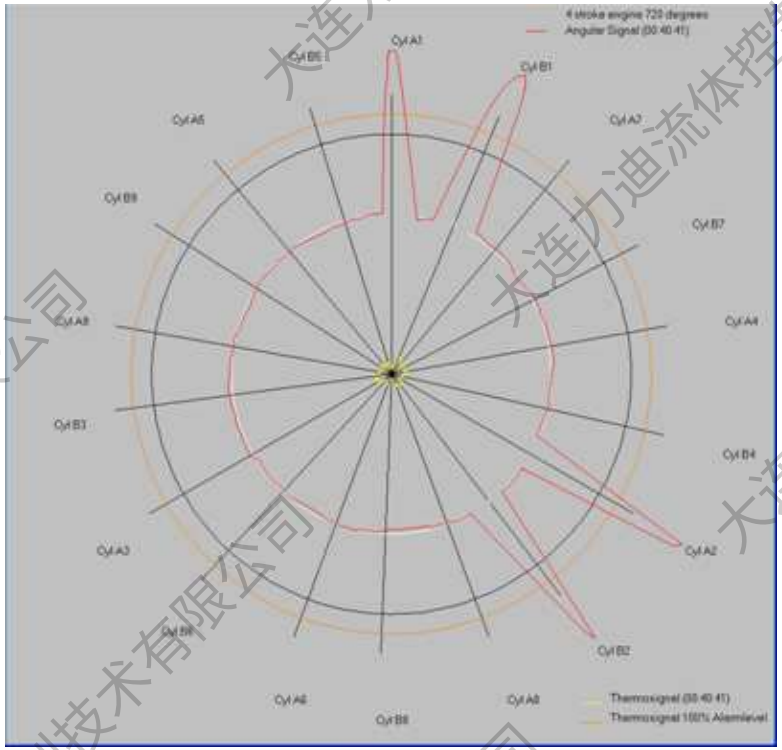


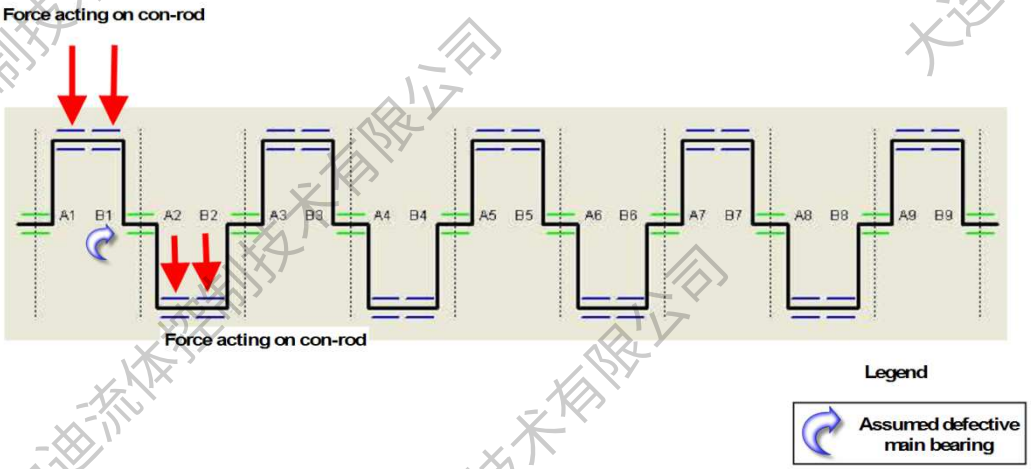
V型发动机的主轴承缺陷

主轴承底壳缺陷/摩擦引起的信号:

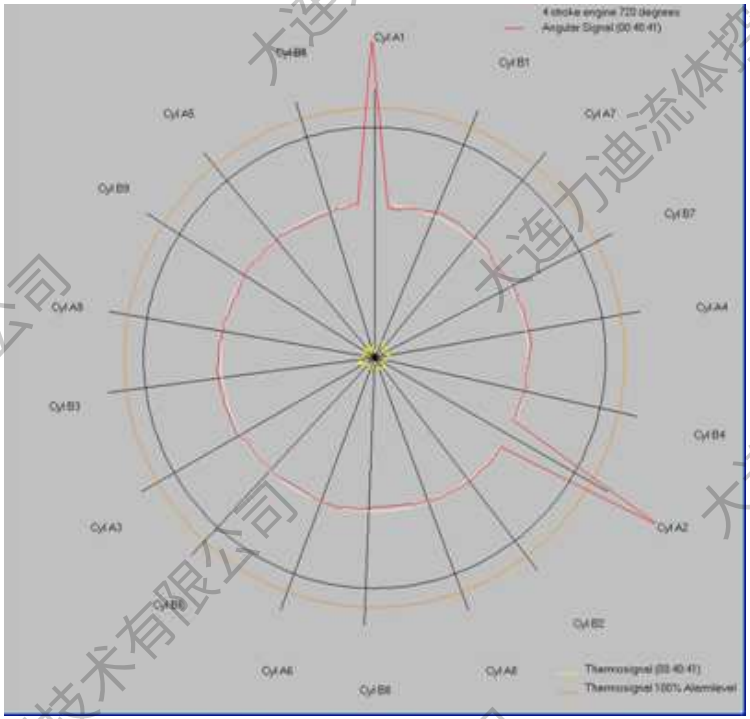
- 当摩擦蔓延超过半个底壳时最大4个峰值
- 当摩擦开始于底壳左半边或右半边（取决于点火时的A&Bbanks）时最大2个峰值

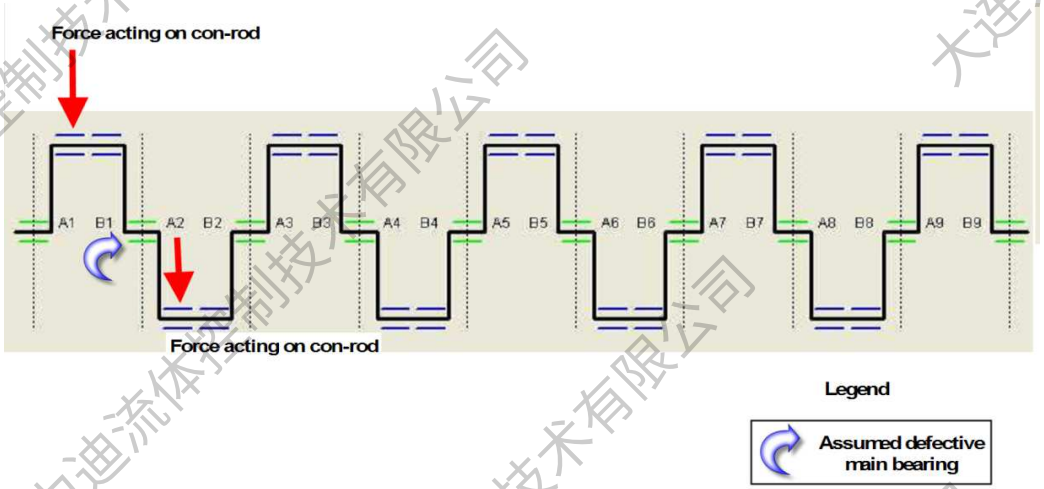
（假设主轴承2/被指示为主轴承故障）当摩擦蔓延超过半个底壳时最大4个峰值的例子



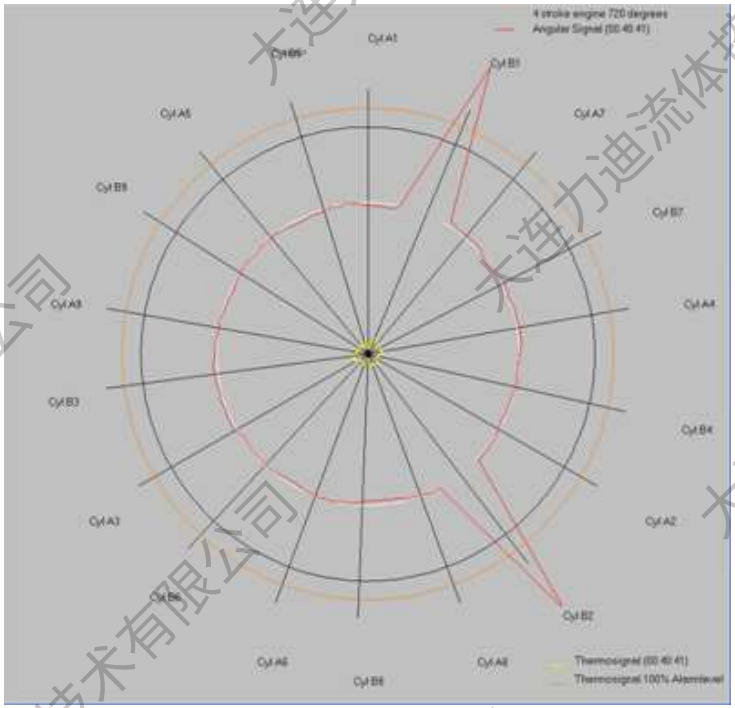


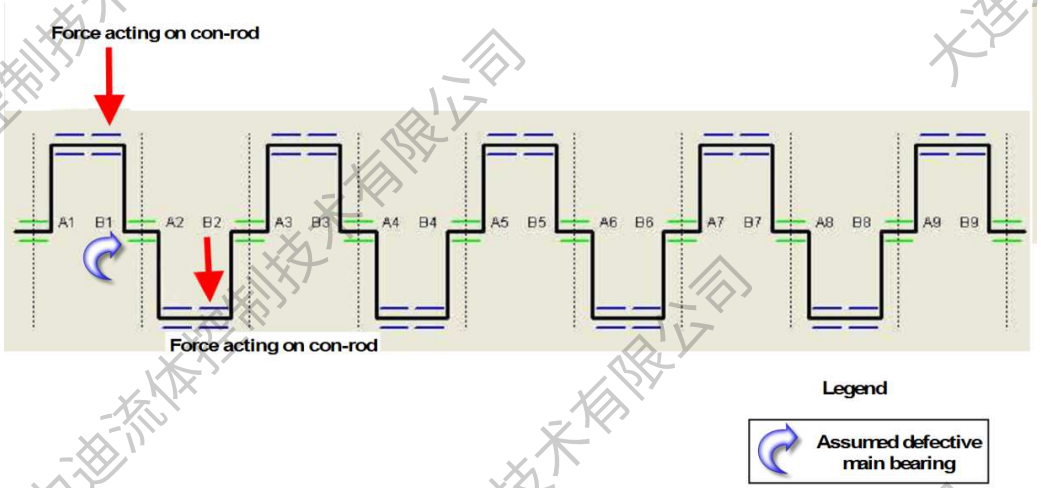
（假设A-banks在着火循环时）当摩擦开始于底壳左半边或右半边时最大2个峰值的例子





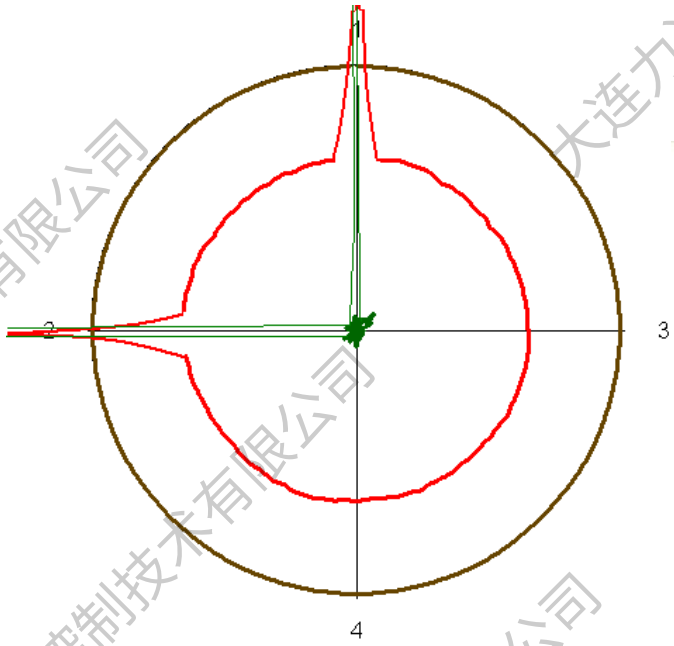
E(假设B-banks在着火循环时）当摩擦开始于底壳左半边或右半边时最大2个峰值的例子

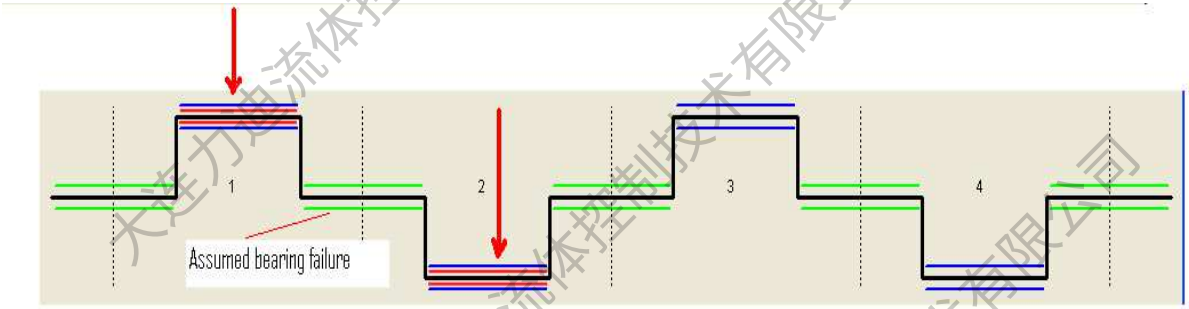




直列式发动机主轴承缺陷

直列式发动机主轴承故障示例



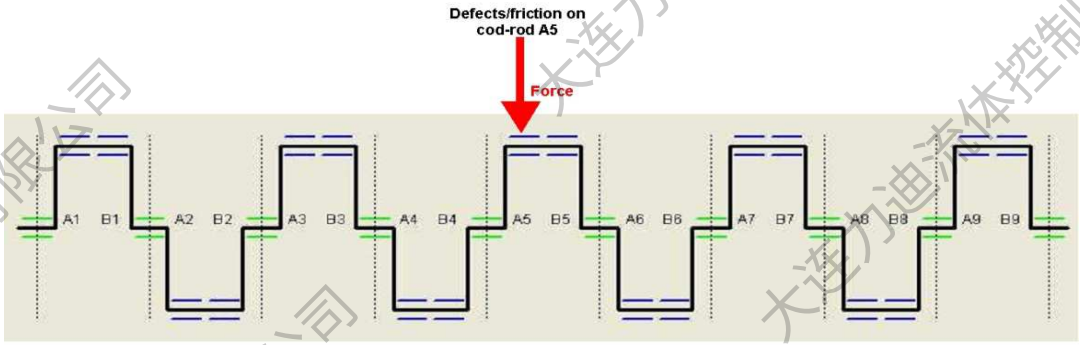


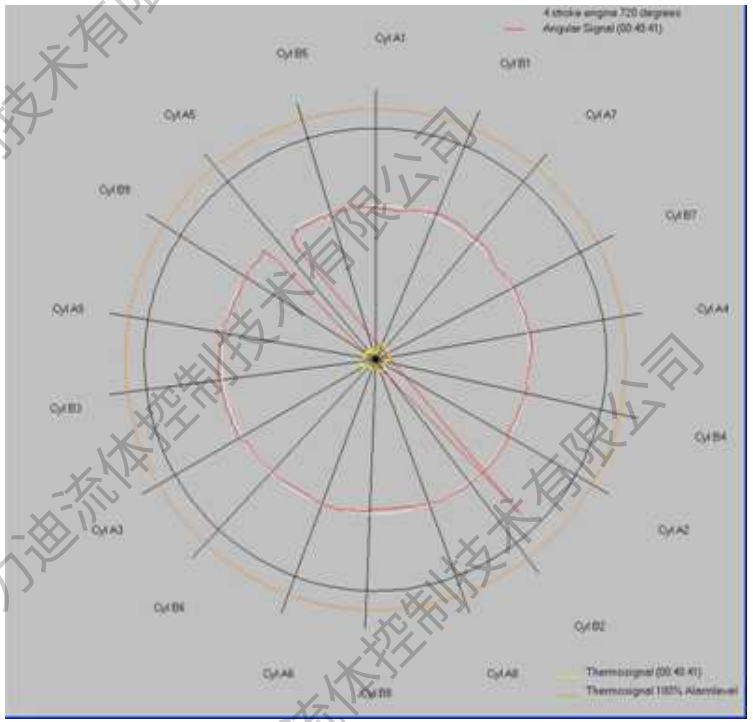
V型或直列式发动机的连杆缺陷

- 由于连杆轴承上部壳体缺陷/摩擦产生的信号
- 与气缸no.对应的1个峰值向内指向圆心

V型发动机的连杆缺陷

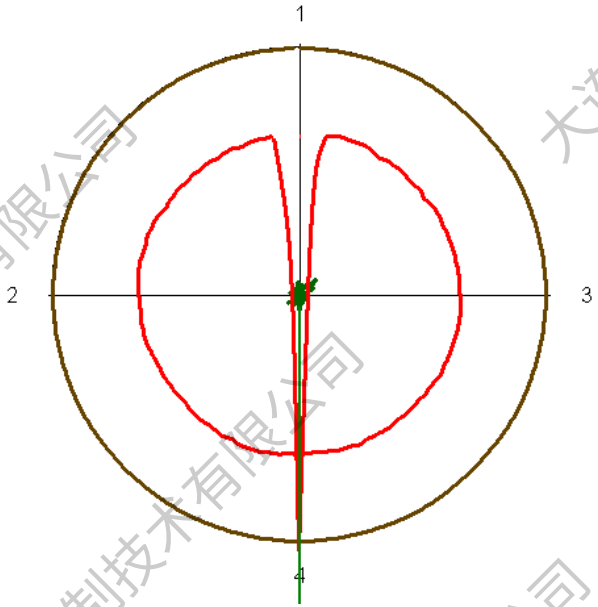
连杆缺陷示例:与气缸no.对应的1个峰值向内指向圆心。

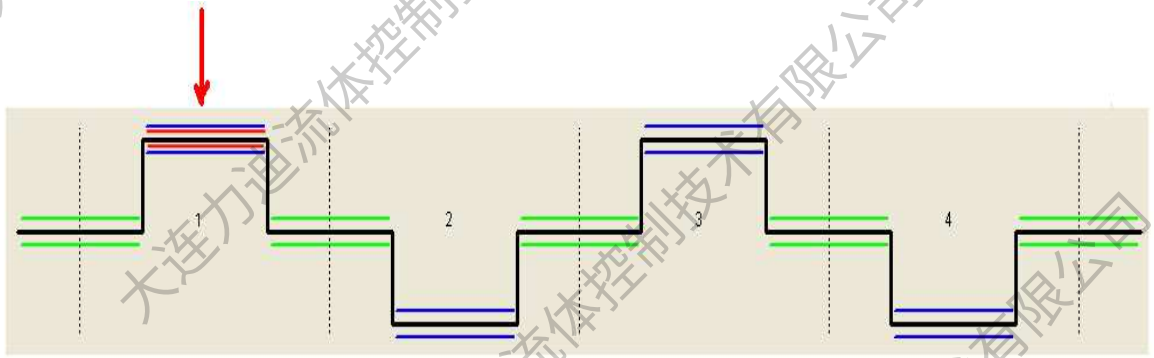




直列式发动机的连杆缺陷

连杆缺陷示例:与气缸no.对应的1个峰值向内指向圆心。





BeCOMS® / BCom系统特点:

- 持续在线监测发动机状态
- 及早可靠探测异常现象；即使当发动机组件还未发生故障。
- 发动机停机检查或维修可以及时安排

- 无任何不必要的轴承检查
- 寿命长，无需维护
- 用固体颗粒和水监测润滑油的质量和质量劣化。

- 优化发动机的可用性和可靠性
- 发动机功率平衡

BeCOMS® / BCom优势

- ✓ 可用性和可靠性最大化
- ✓ 减少停机时间
- ✓ 降低操作和维护成本
- ✓ 由于摩擦而造成的引擎损坏不需要昂贵的修理

motcom® loganalyser

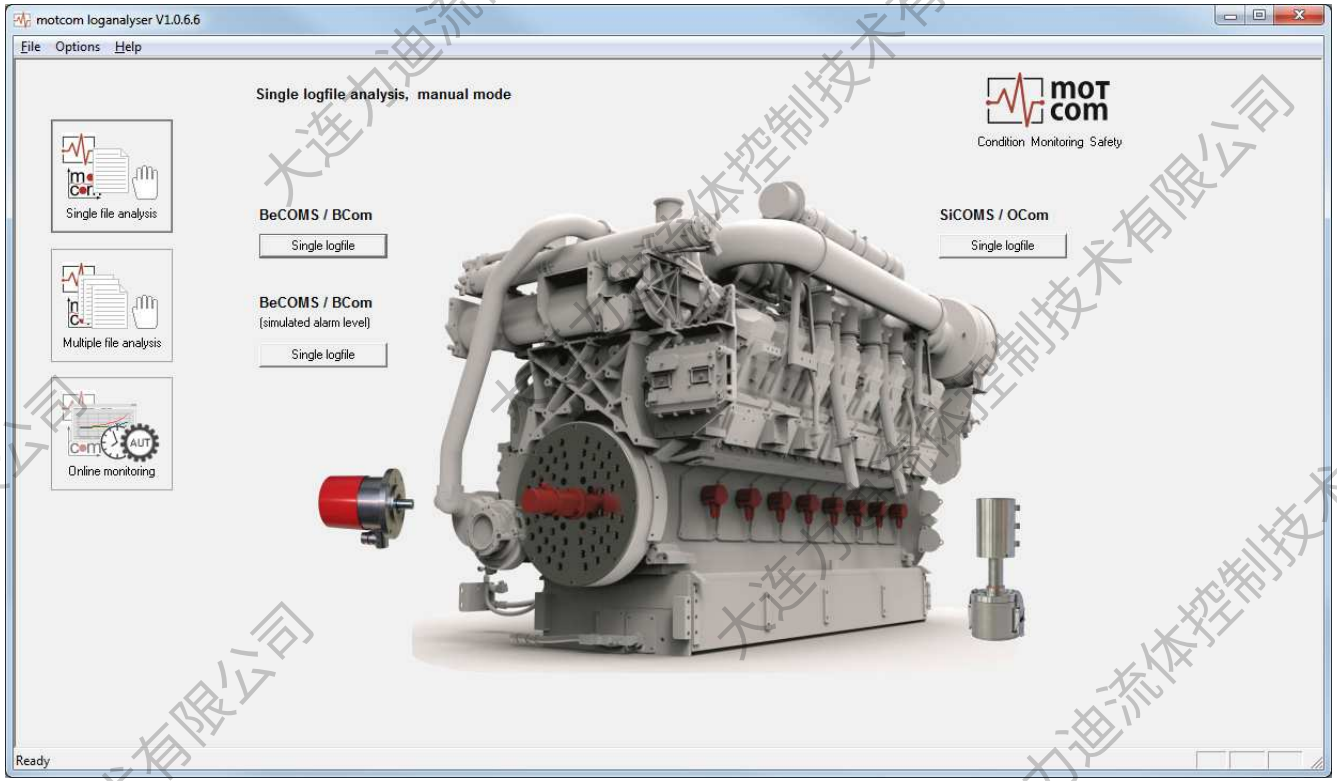
BeCOMS®/BCom和SiCOMS®/OCom日志的手动和自动在线分析软件

motcom® loganalyser完全由C++语言开发，无第三方附加的开发和分析工具

优势:

-无需昂贵的工具许可证
-独立于第三方制造商的发布/版本变更
-软件安装简单
-更多的分析能力可通过直接使用系统资源来分析
-在新的操作系统版本中易于集成
-分析功能的完全控制(不依赖第三方库和工具)
-未来新客户的特殊要求的易于集成性

motcom® loganalyser

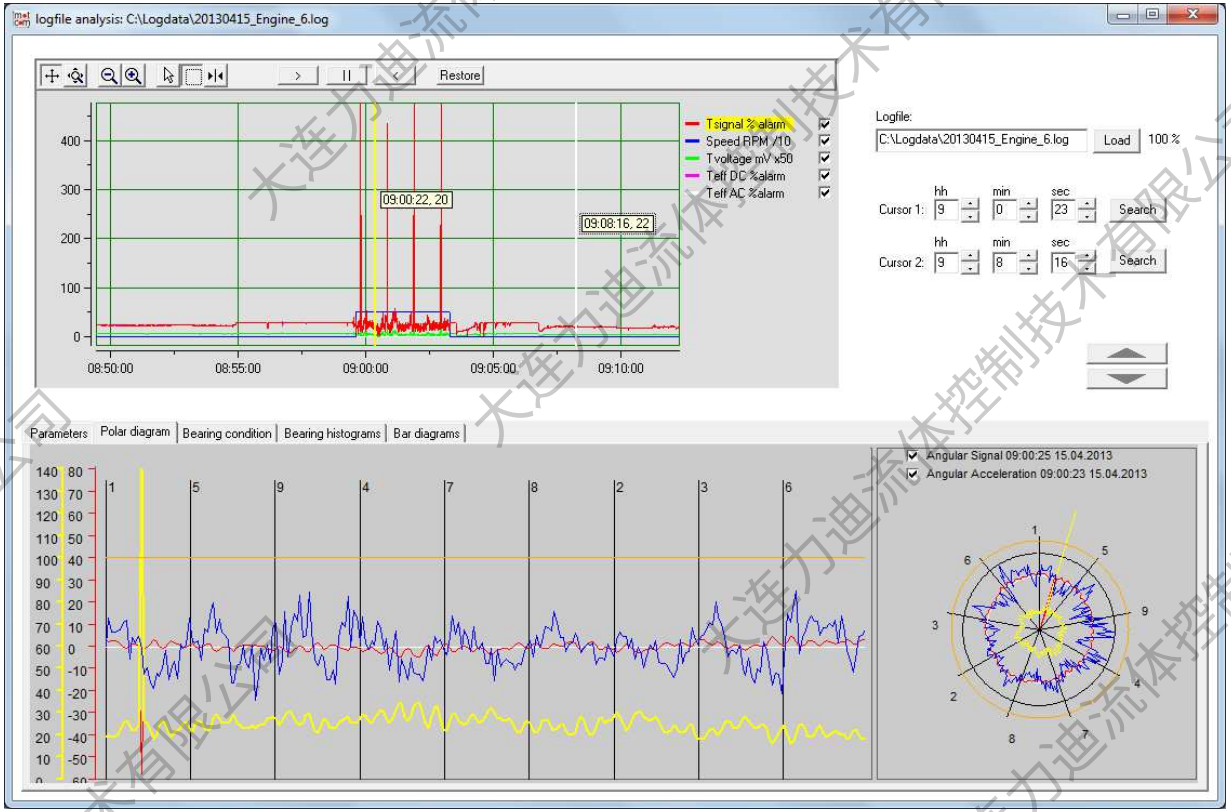


- 扩展和详细查看BCom和OCom系统收集的测量数据

- 先进的工具用于评估发动机状态“离线”

- 在线监测和长期趋势分析具有告知系统

motcom® loganalyser BCom / BeCOMS 单个文件分析



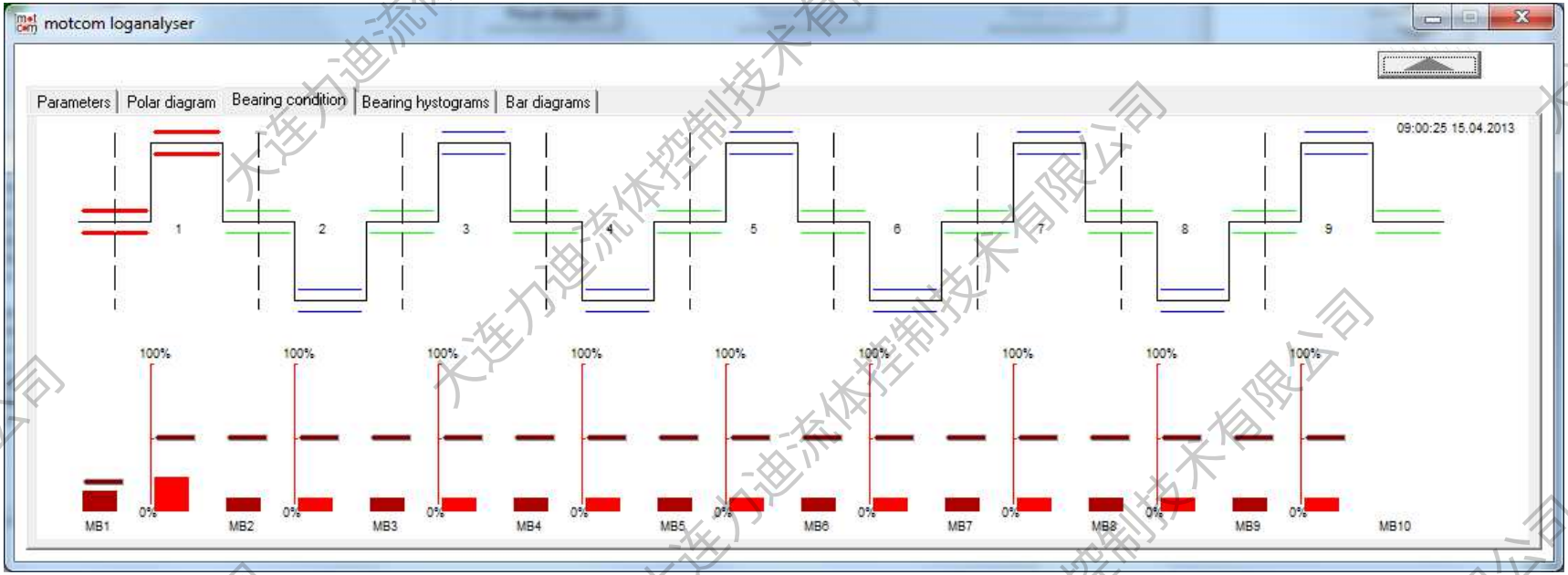
(离线监控)

上图显示的是线性测量数据，底部图显示了在整个燃烧循环中测量的极坐标数据，这是最接近于线性图上选择的时间点。

它们是:

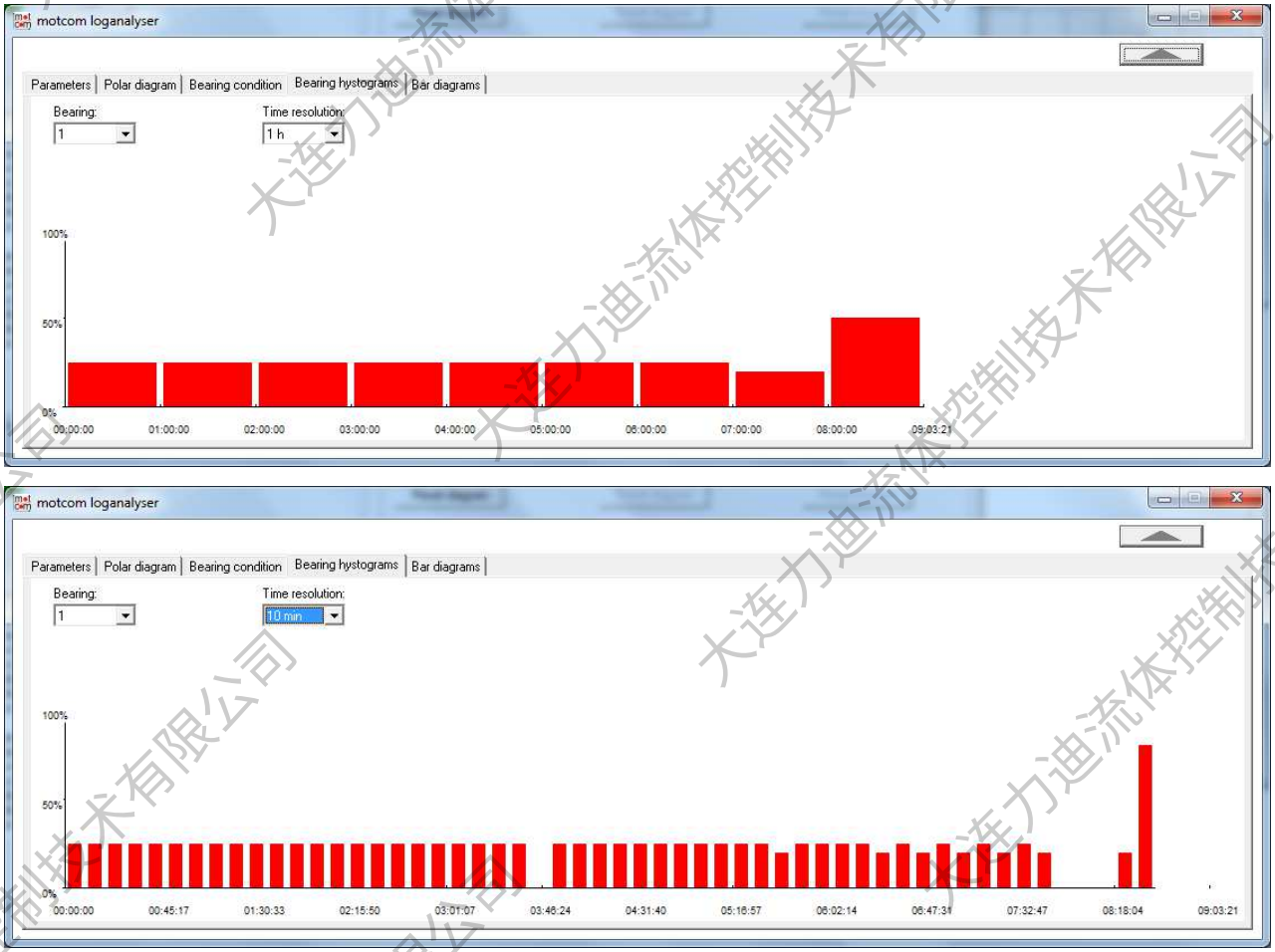
- 热电压与周期平均值有关
- 热电压占报警级别的百分之几
- 曲轴角加速度
- 100%的热信号报警级别

motcom® loganalyser 轴承状态



带摩擦点指示器的曲轴图示模型。 蓝线显示大端轴承，绿线对应主轴承。 如果选定时间点上，极坐标数据中直流报警水平的百分比的相对热信号值达到或超过100%，则轴承显示为红色线，并记录该轴承的摩擦点。每一条表示在线性图上两个光标之间的采样时间间隔内，该轴承上记录的总数据点的摩擦点百分比的最大值。

motcom® loganalyser 轴承直方图



这些柱状图表示由时间分辨率选项定义的时间间隔内的摩擦点数量，以百分比表示所选轴承此间隔内的数据点总数。 大文件的默认时间分辨率设置为1或2小时。 更改为显示更详细的图片：

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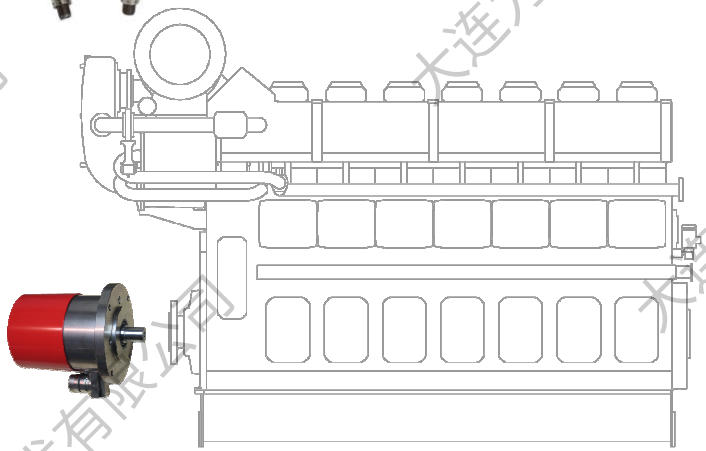
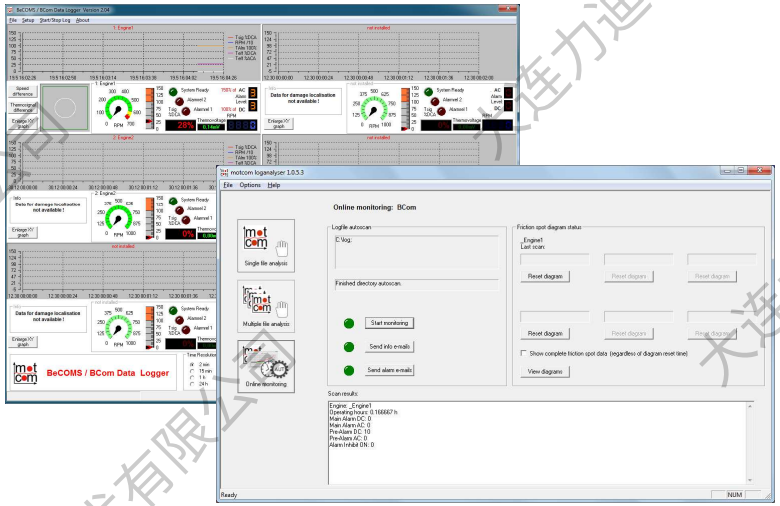
motcom® loganalyser 在线监测

BCom 数据记录器和 loganalyser 同时在PC 端运行



BeCOMS / BCom 传感器安装在发动机上

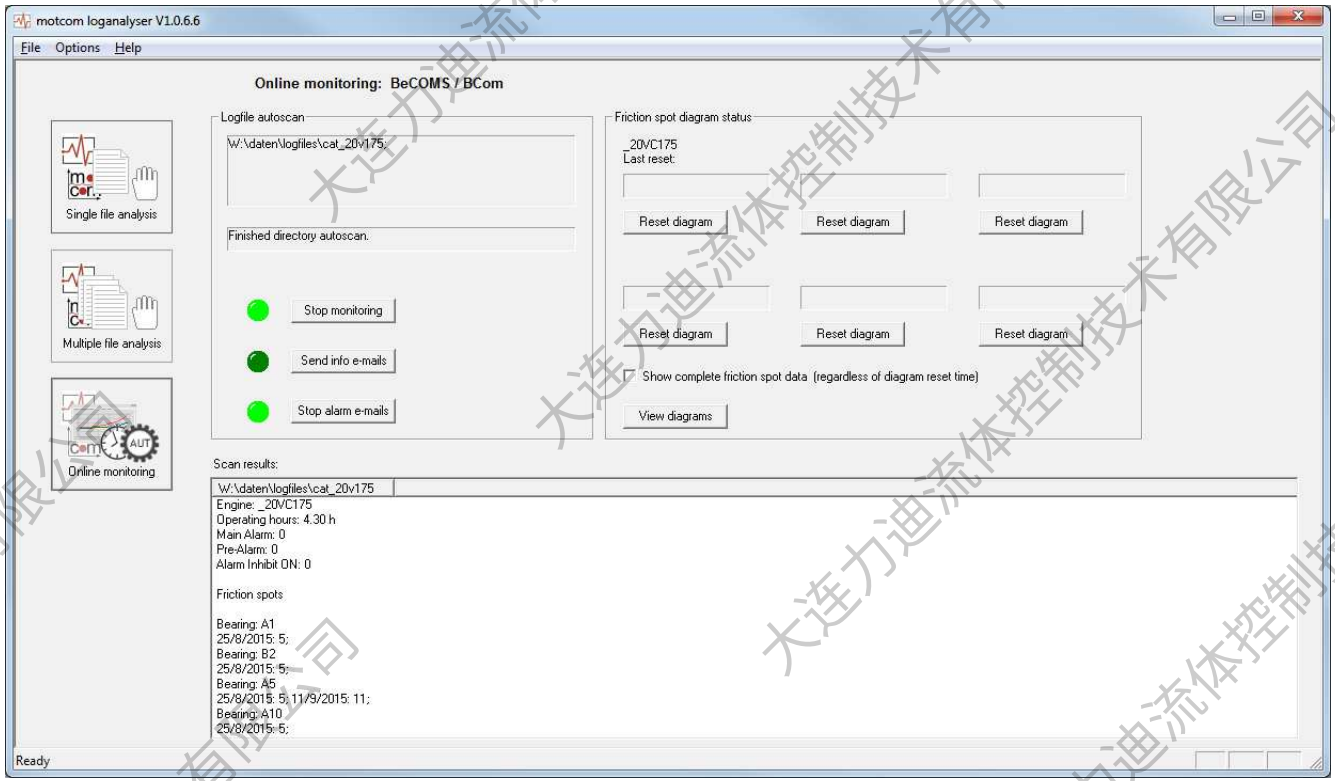


本地报告

定期信息邮件

警报邮件

motcom® loganalyser 在线监测 (自动扫描)

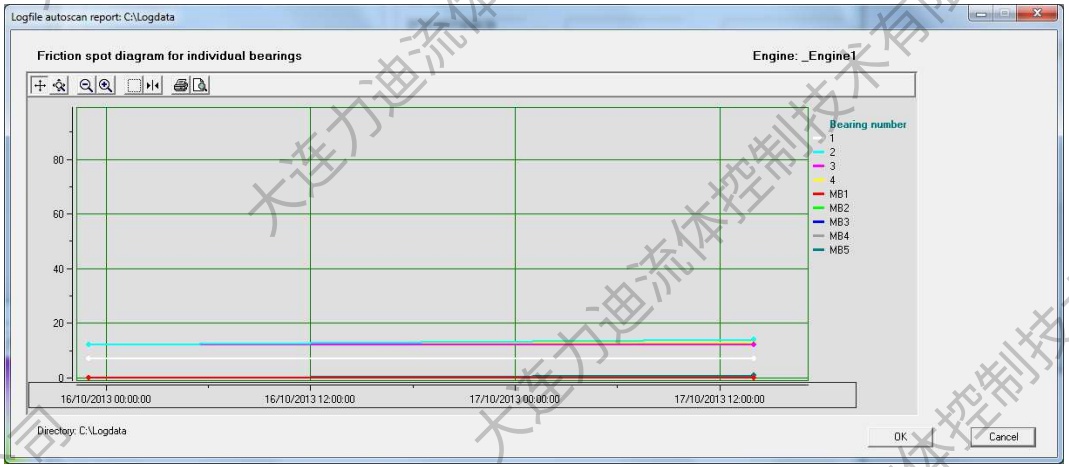


自动扫描功能是日志数据长期趋势分析的工具

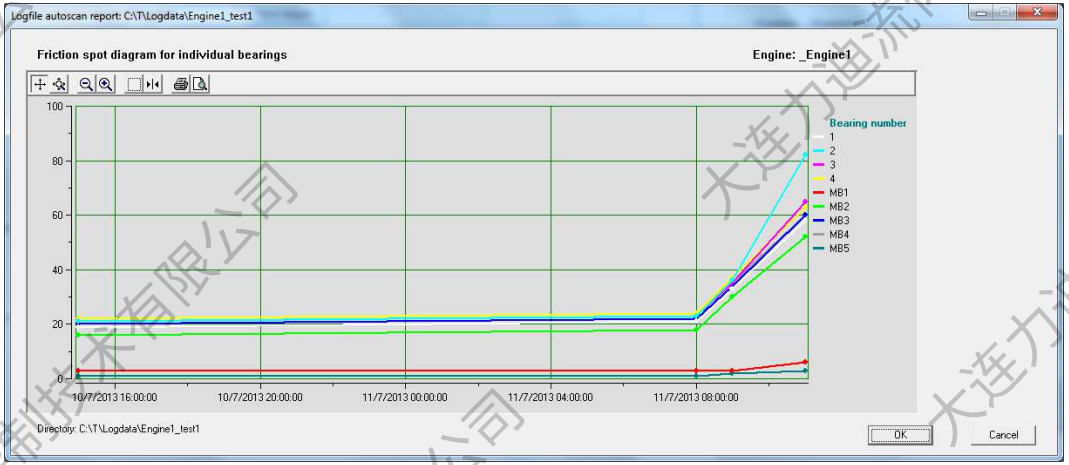
自动扫描可以作为一次性程序运行，也可以在与BCom Logger软件同样的特定时间间隔内定期执行。

电子邮件通知系统允许定期发送信息电子邮件，和/或在检测到警报或系统故障信息时立即发出“警报”电子邮件。

motcom® loganalyser 摩擦点图形

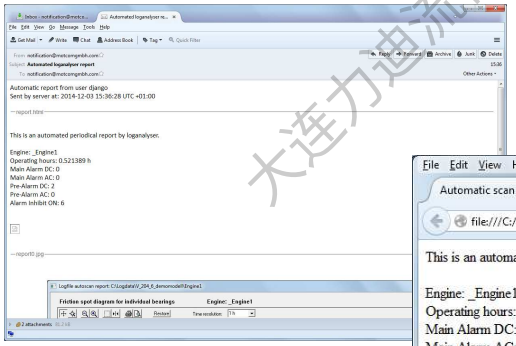


记录在日志文件中的摩擦点以每个扫描目录的单独窗口的累积图形式显示：

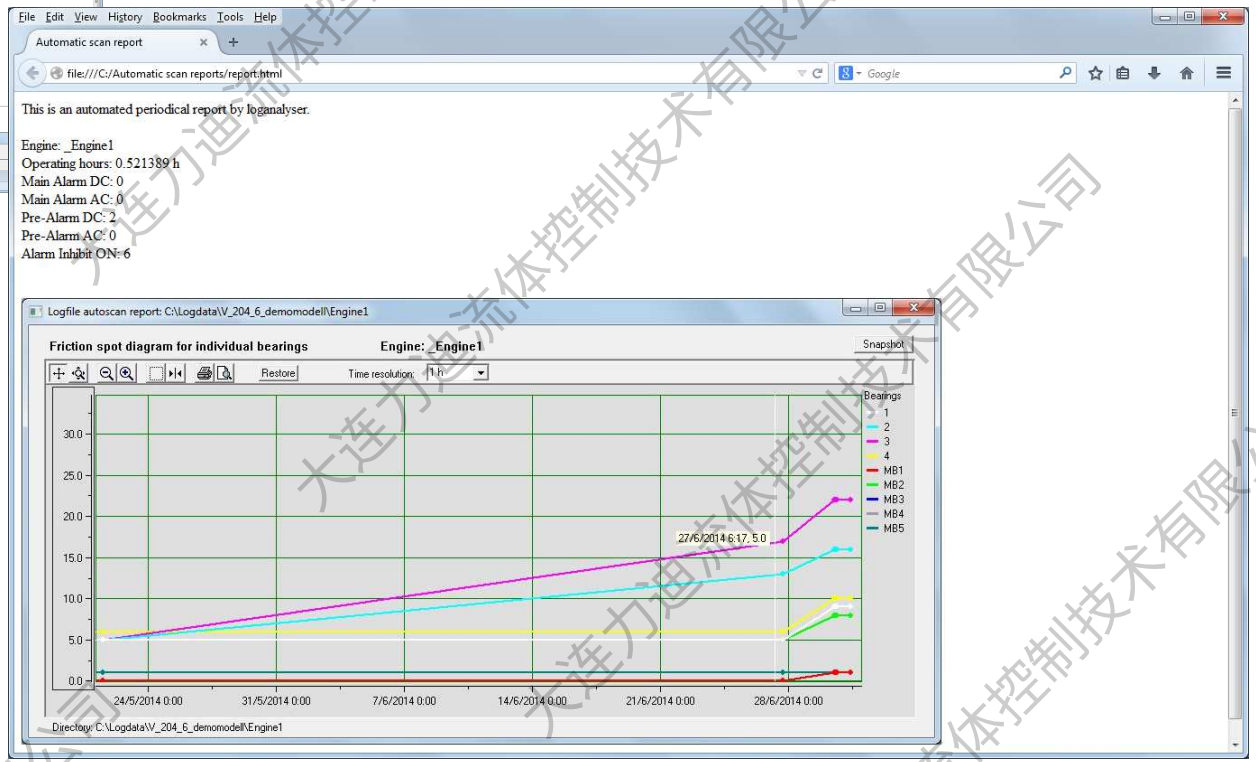


x轴上的每个点表示一个日志文件。 下面是摩擦点高速发动机的图表：

motcom® loganalyser 定期信息电子邮件



通知电子邮件附有HTML报告。 它可以直接在电子邮件客户端或浏览器中查看：



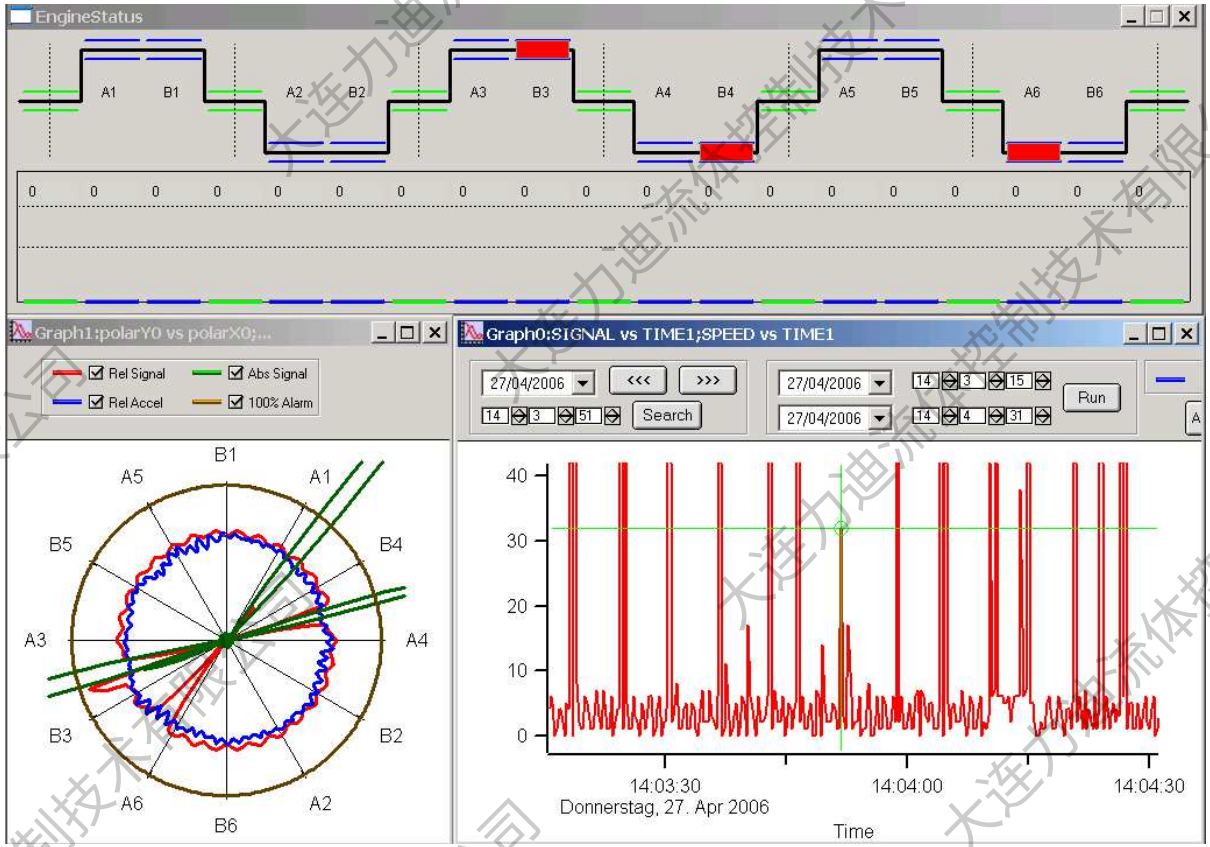
分析软件的特性和未来

- ✓ 自动下载和分析日志文件
- ✓ 生成每日总结报告
- ✓ 持续监测润滑油状态
- ✓ 建立数据库和专家系统（未来）

mot com
Condition Monitoring Safety

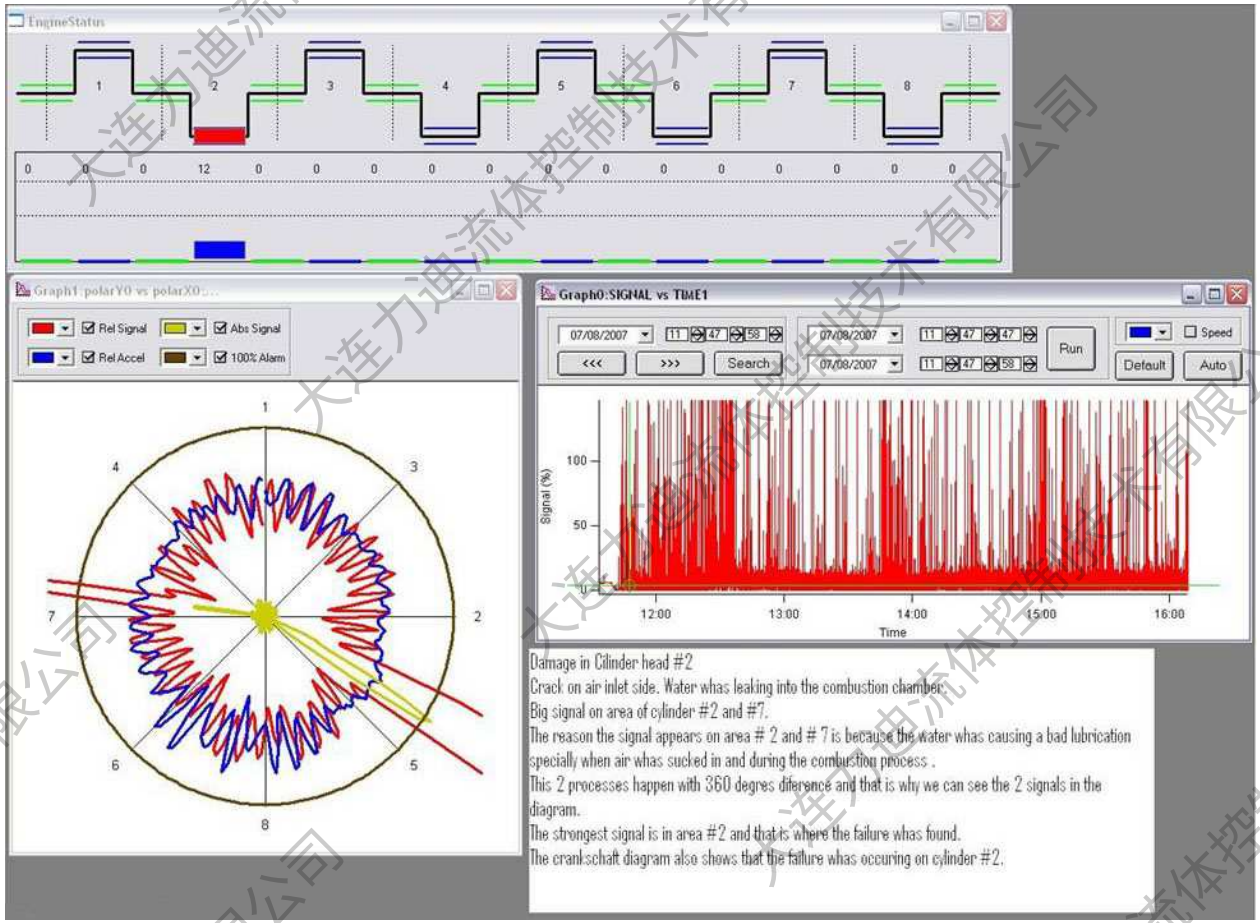
BeCOMS® 监测案例

连杆轴承故障



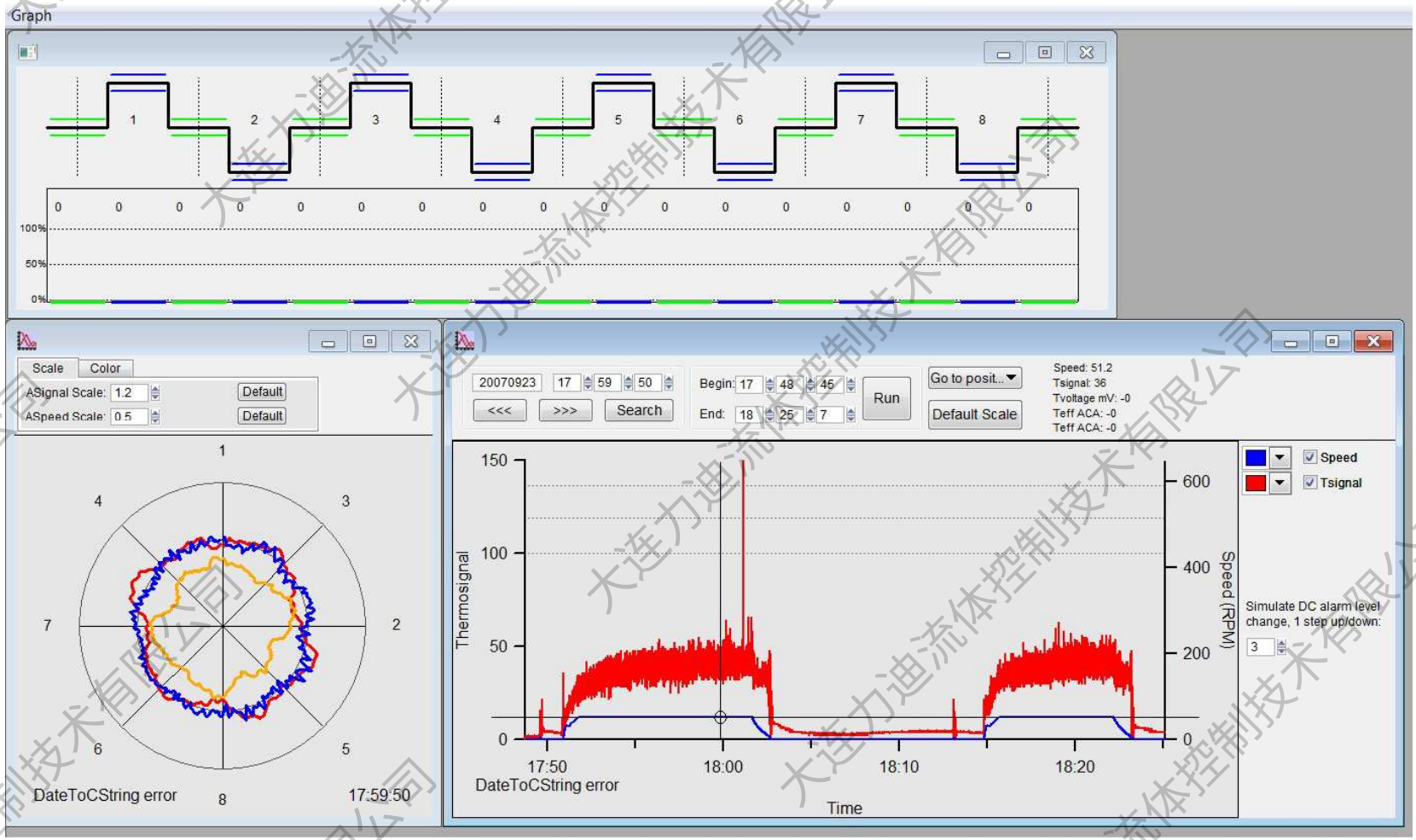
BeCOMS® 监测案例

气缸故障



BeCOMS® 监测案例

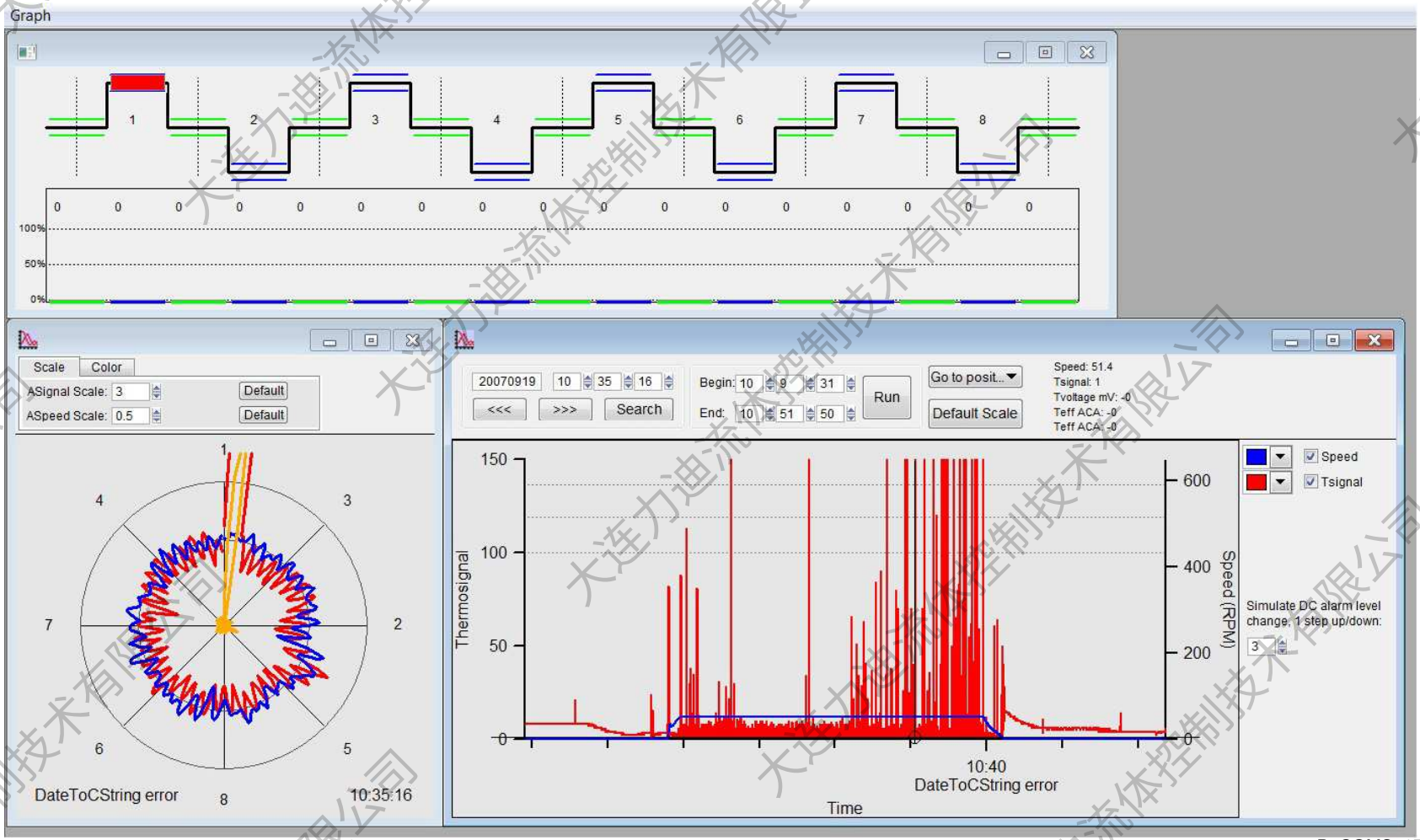
润滑油中的水探测



Condition Monitoring Safety

BeCOMS® 监测案例

轴承故障探测



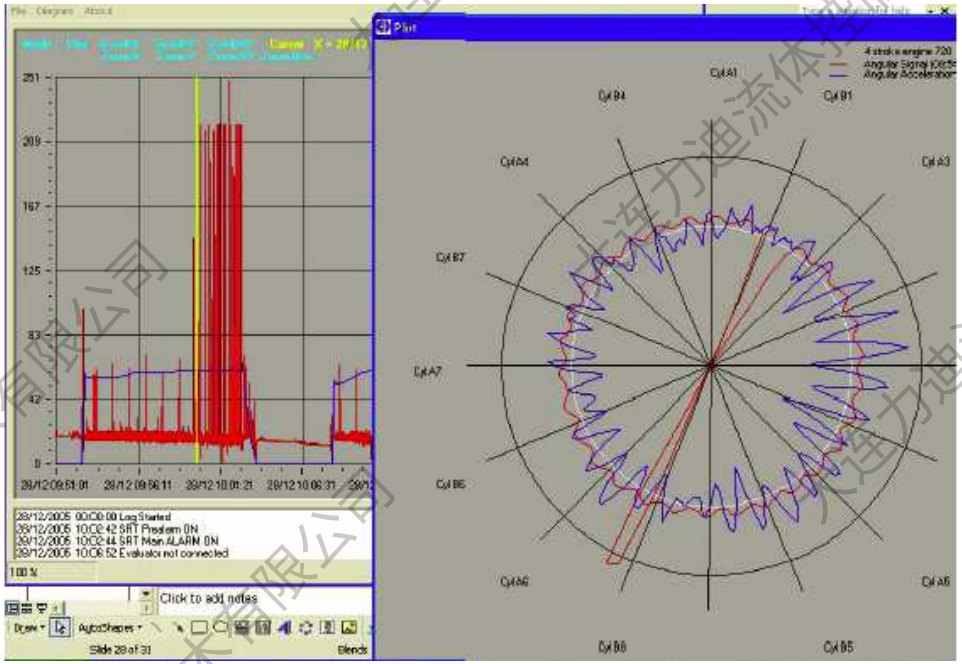
BEB 日报中的划痕

BEB上的划痕

巴氏合金层上的小洞

连杆轴承故障

趋势和极坐标图



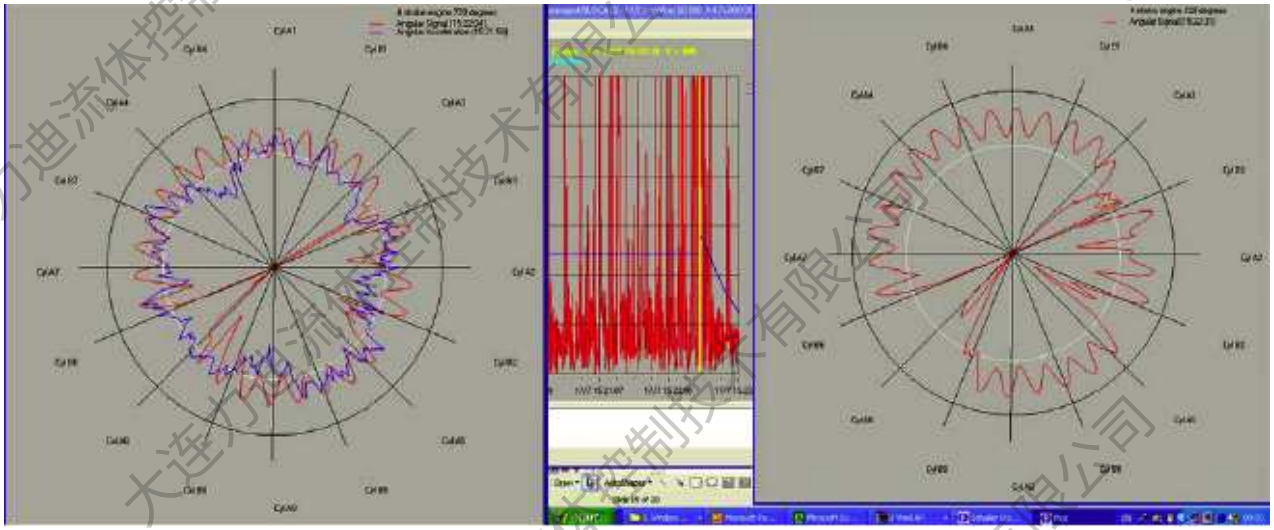
缺陷图片

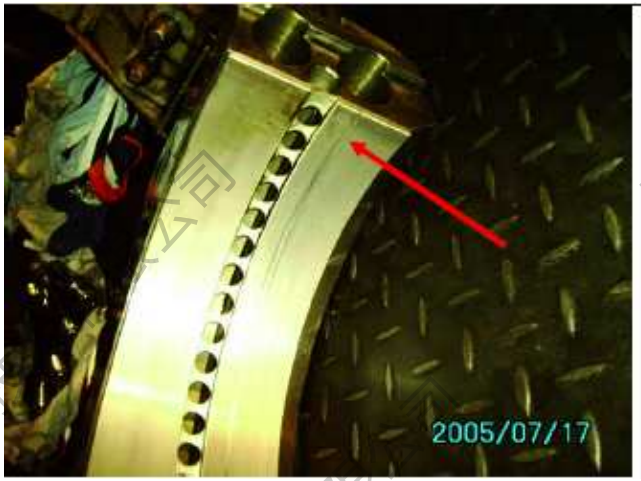
B1 Con-rod Detection on 28.12.2005 on DEUTZ 16M640 DG#3

连杆故障

发动机类型DEUTZ 16M640

趋势 & 极坐标图

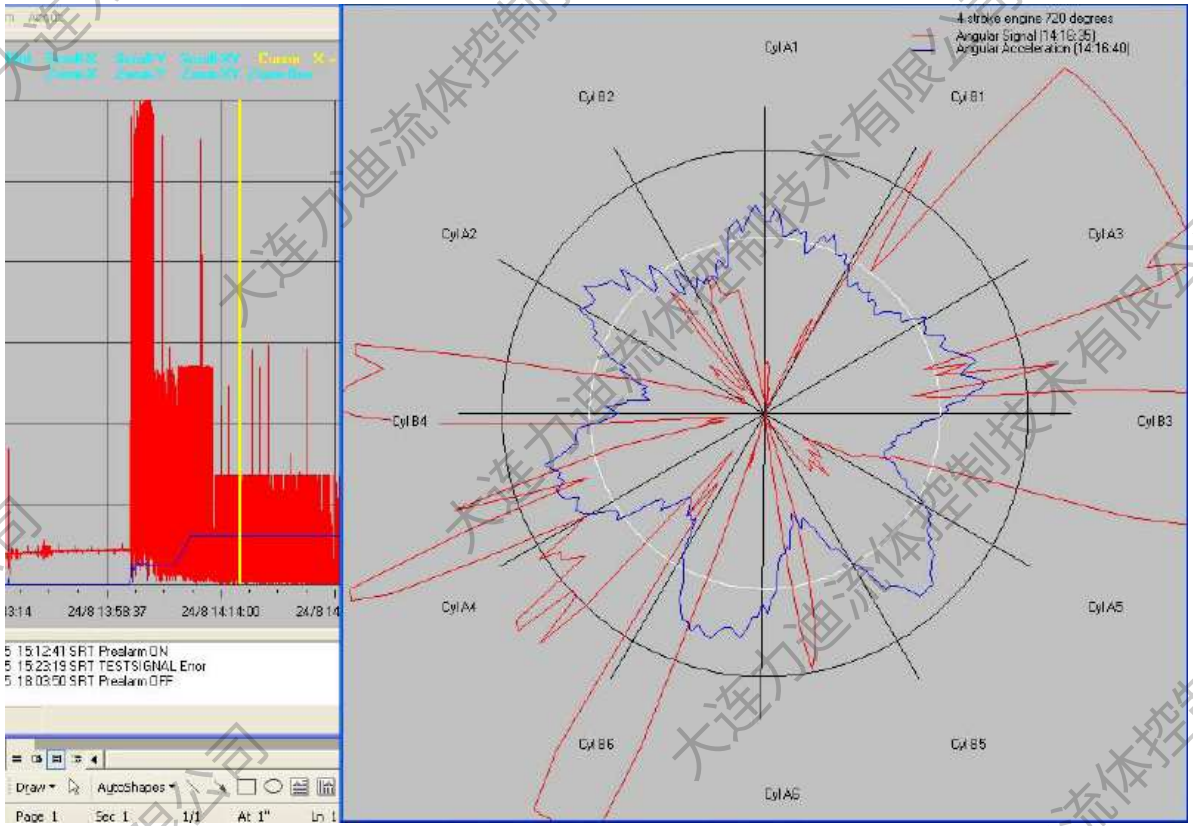




缺陷图片

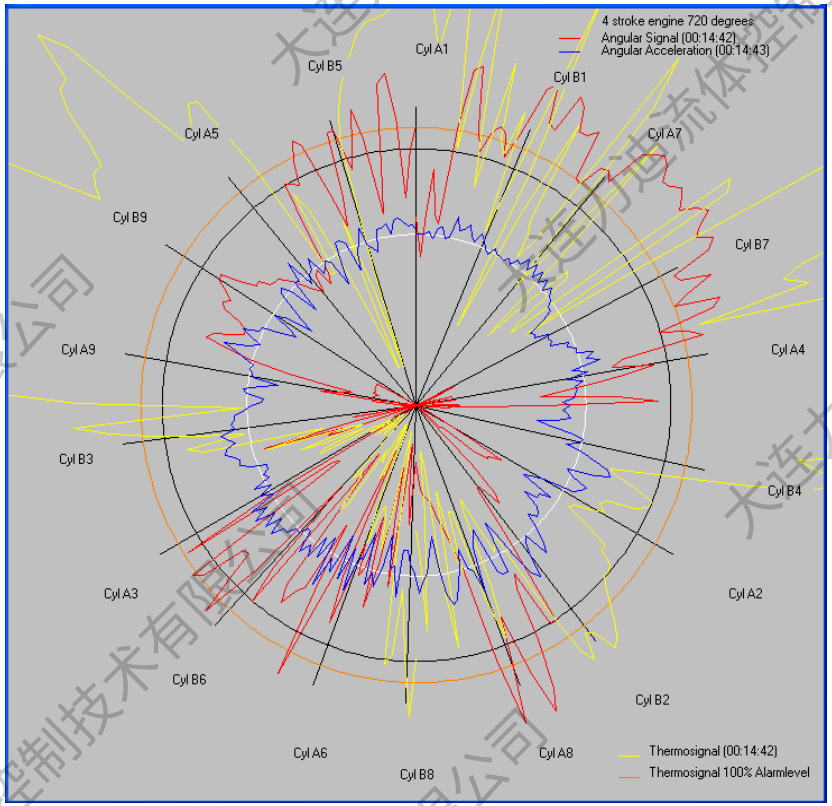
主轴承

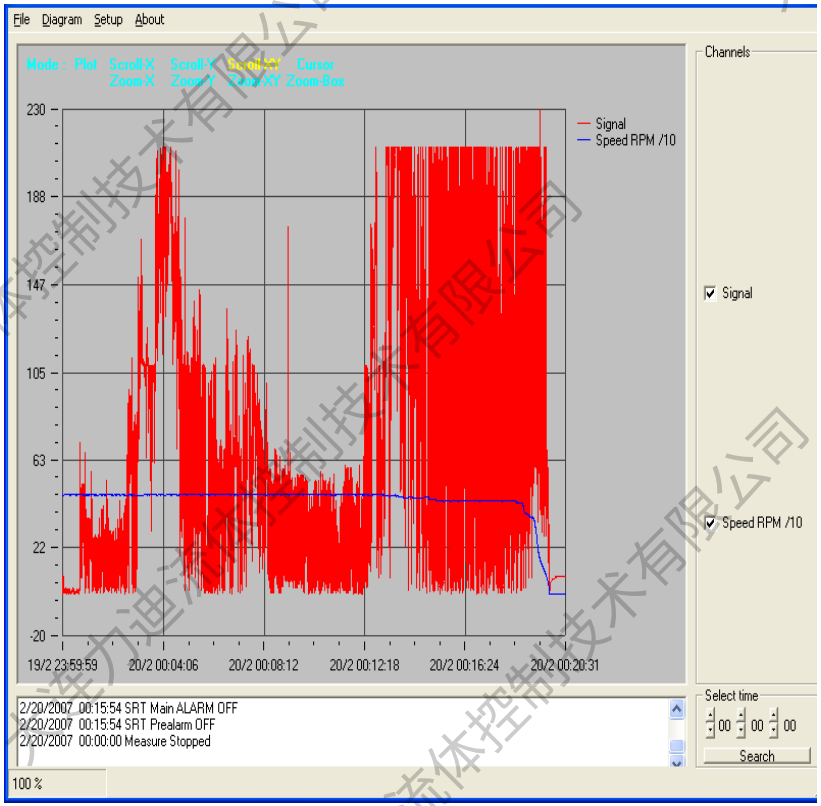
MIP – 菲律宾发电厂安装
在主轴承隔室3 & 4之间的高摩擦探测



主轴承

BeCOMS 在菲律宾的船舶上安装





主轴承

缺陷图片

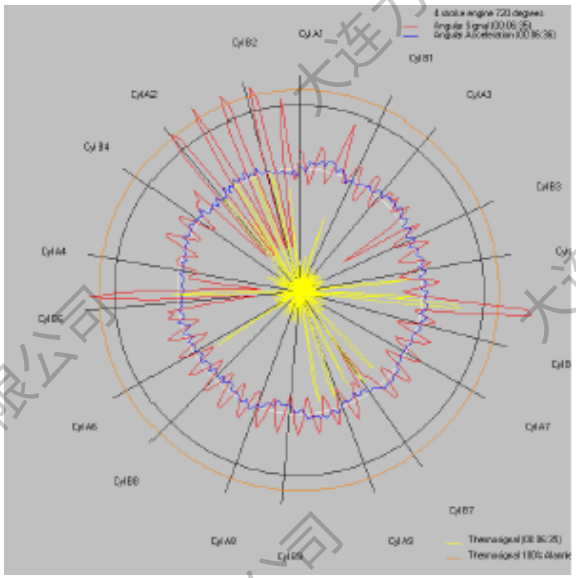

Main Bearing
6
Feb. 21, 2007
SF-9

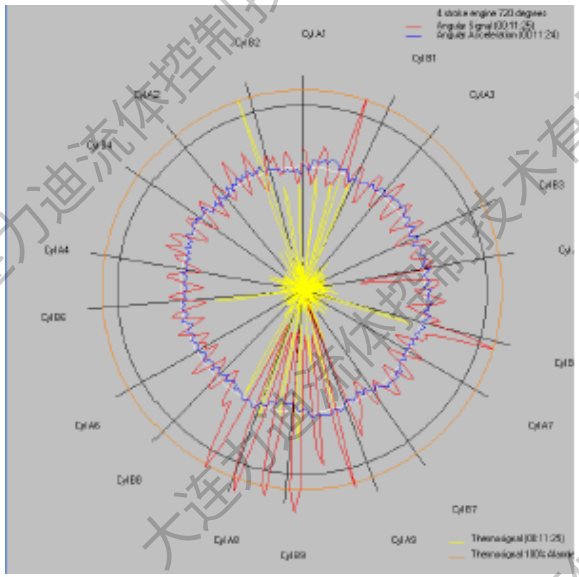

MAIN BEARING
#7 LOWER
FEB 21, 2007
Main Bearing
7
Feb. 21, 2007
SF-9

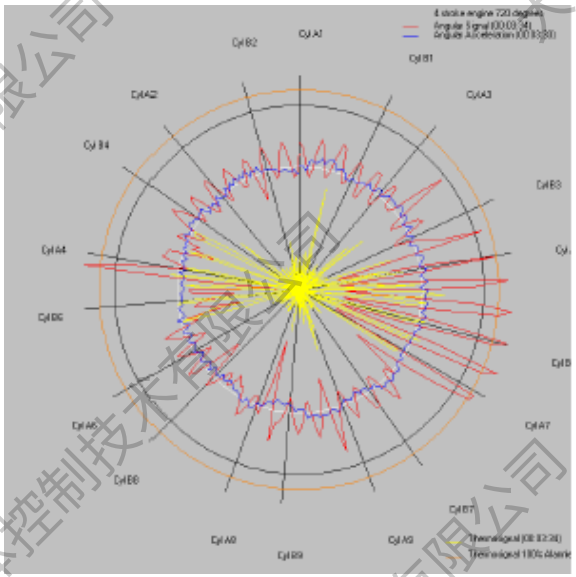

Main Bearing
8
Feb. 21, 2007
SF-9

“额外”探测

缸套故障







中部美洲 **BeCOMS** 安装

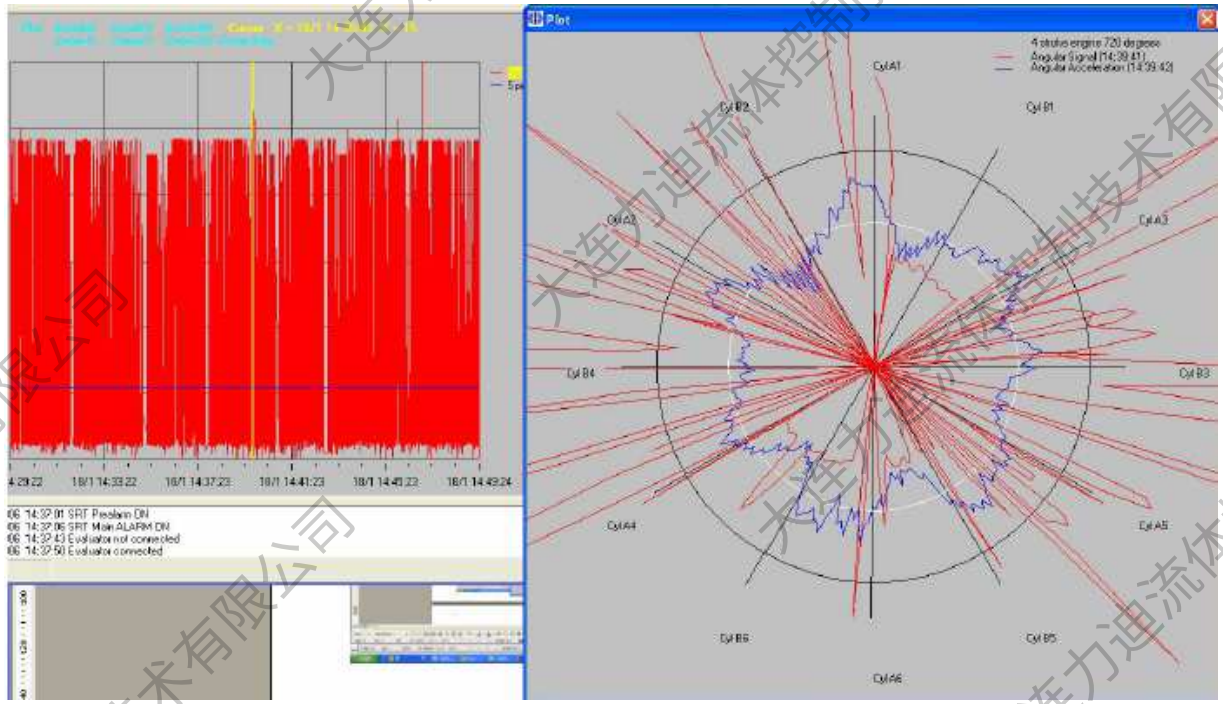
缸套故障

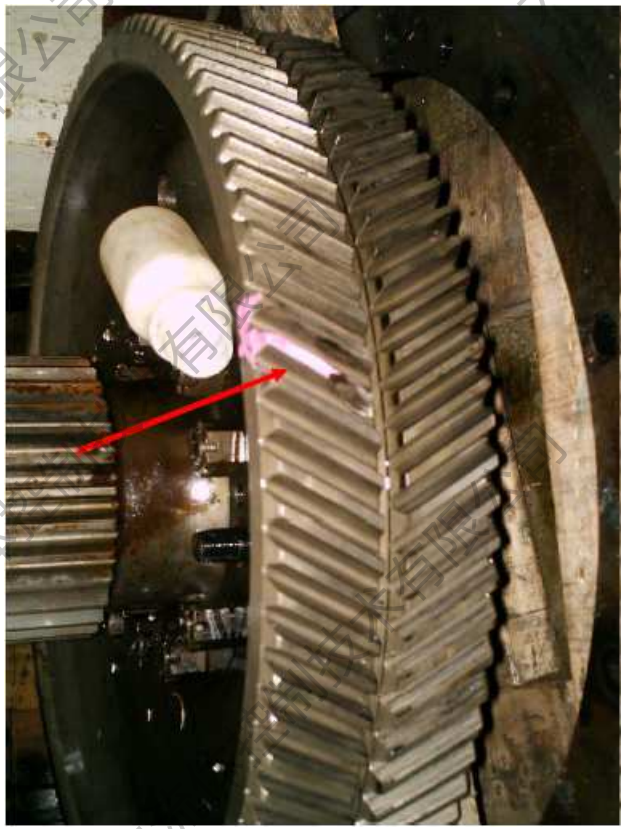
缺陷图片

Piston-Liner
impending seizure
problem
at B6 Cylinder at
DG#4

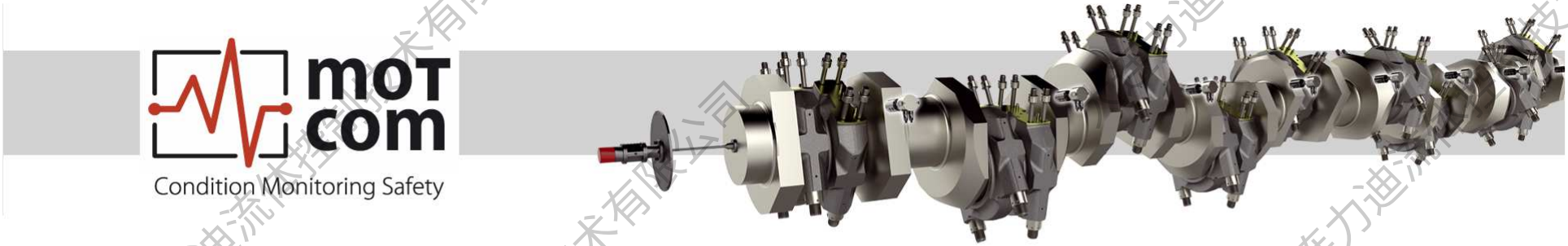
主齿轮齿损坏

Pielstick 12PC2.5V, V-型,额定转速514 RPM

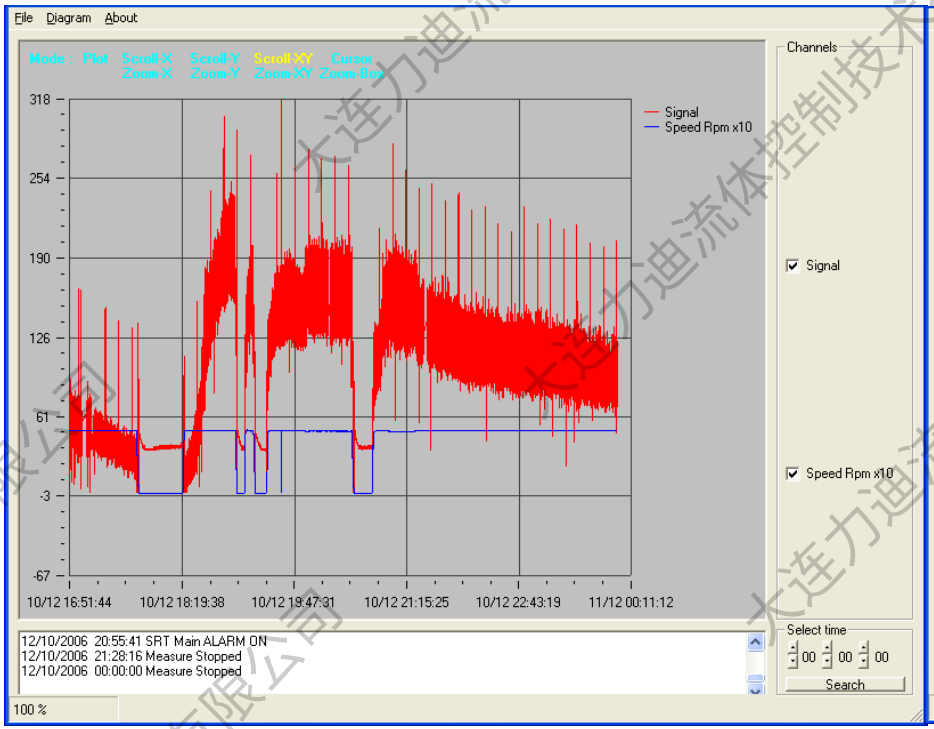


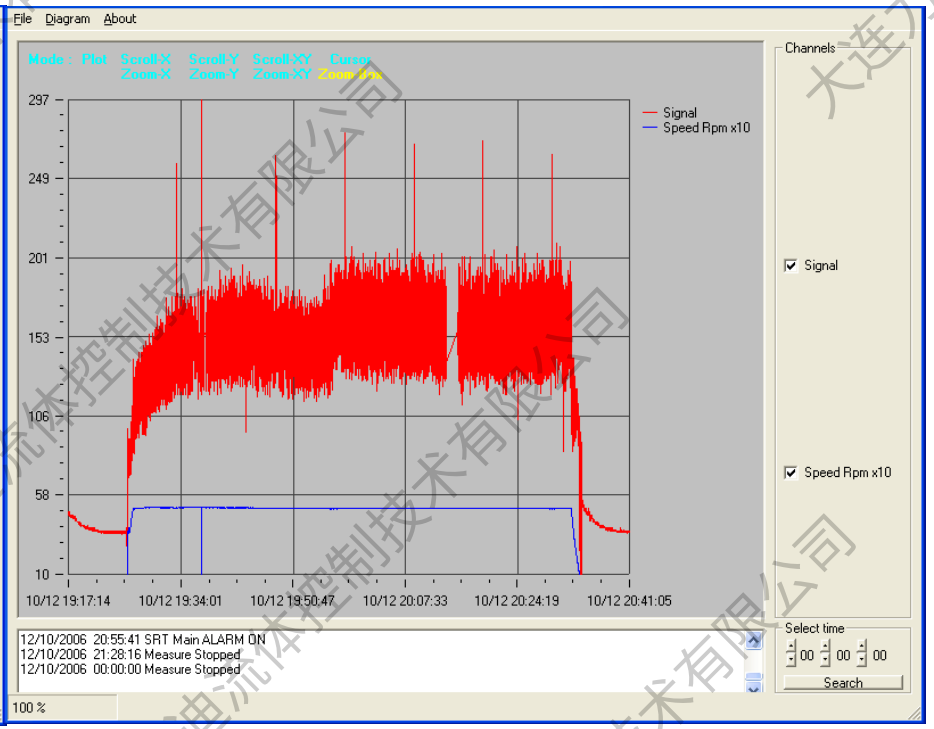


MIP – 菲律宾发电厂BeCOMS安装



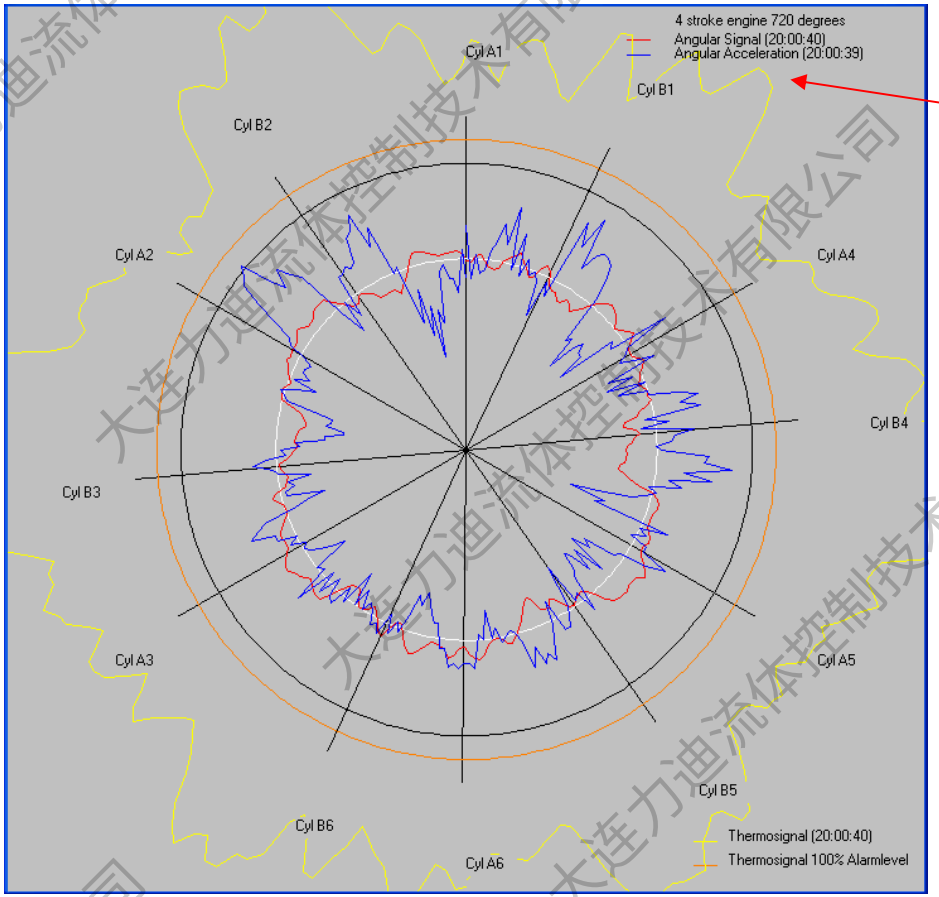
涡轮增压器轴承故障





印尼(Lombok) - PLTD Ampenan BeCOMS 安装

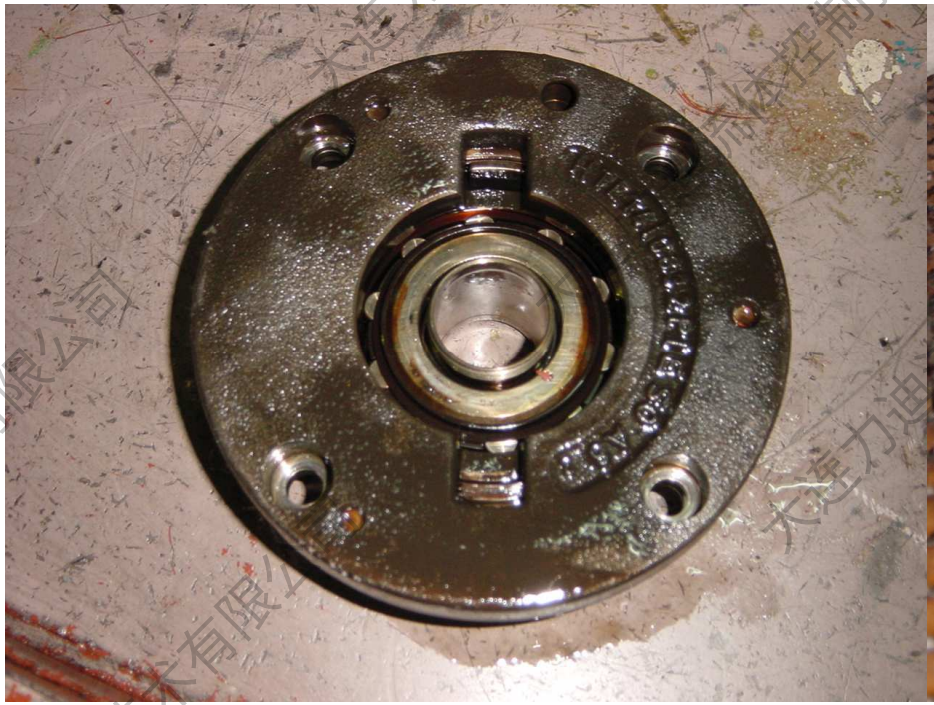
涡轮增压器轴承故障



增加的外部摩擦

绝对读数显示外部摩擦

涡轮增压器轴承故障



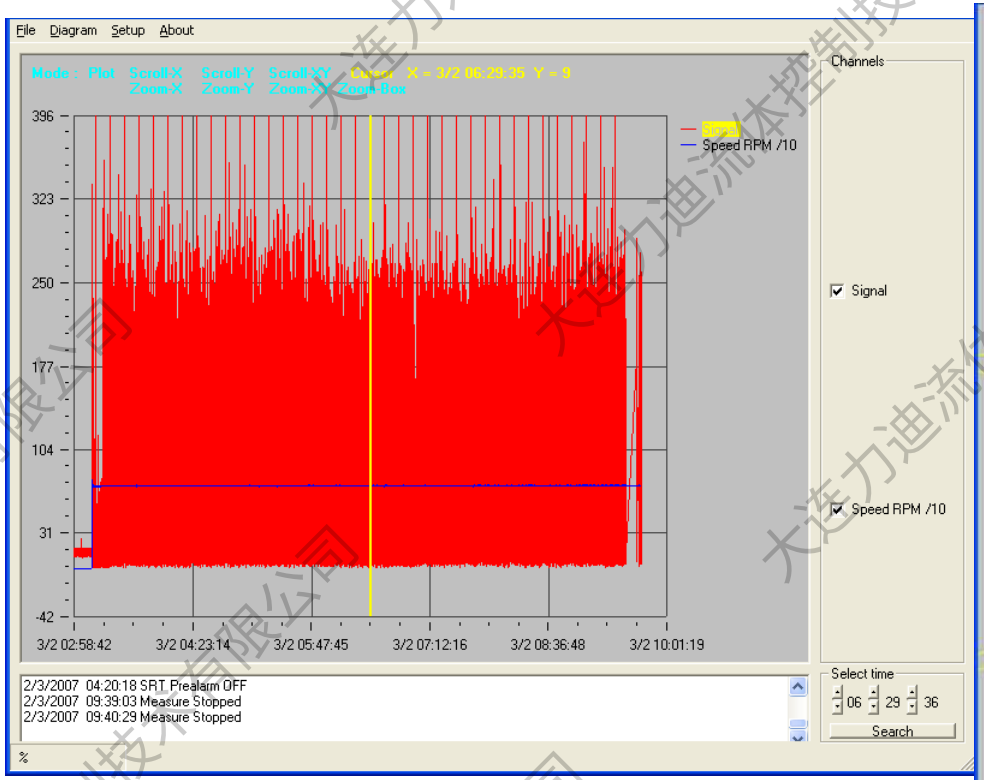
涡轮机一侧的轴承

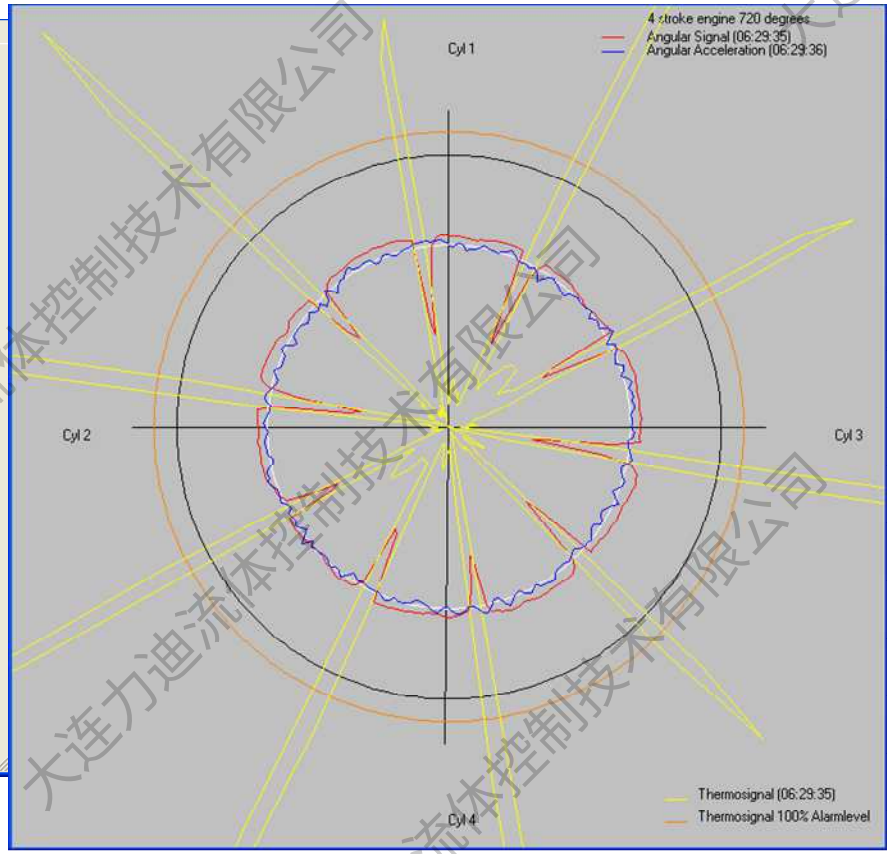
叶轮侧的轴承

moT com
Condition Monitoring Safety

交流发电机轴承

BeCOMS 安装在航线船舶的辅助发电机上



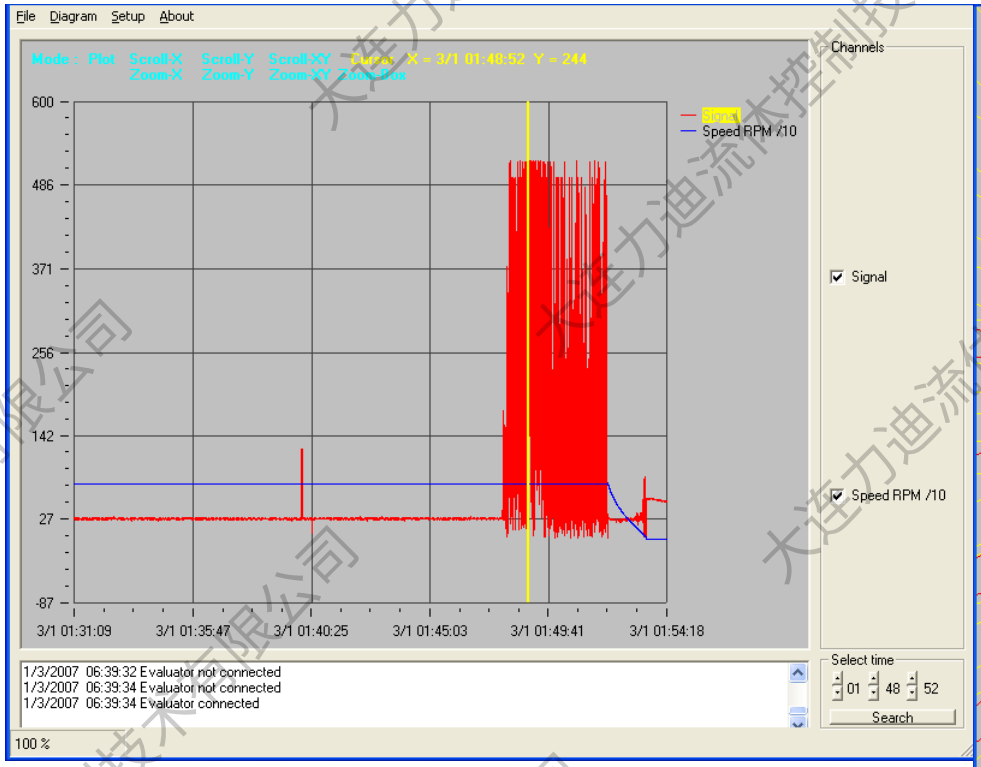


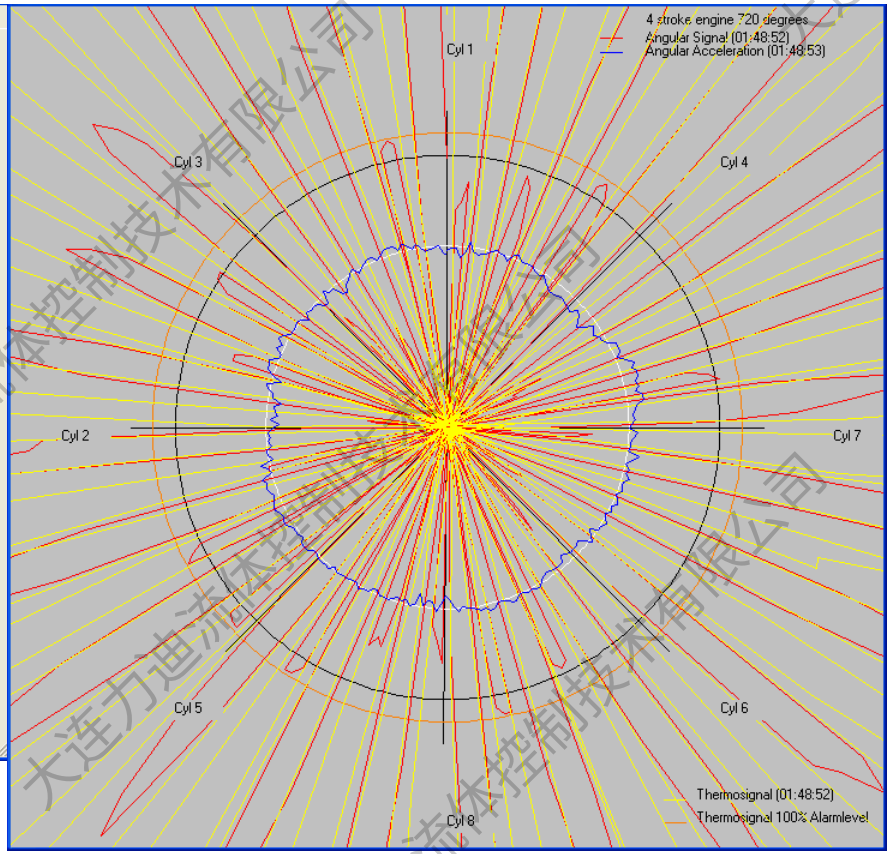
交流发电机轴承

缺陷图片

主发电机故障

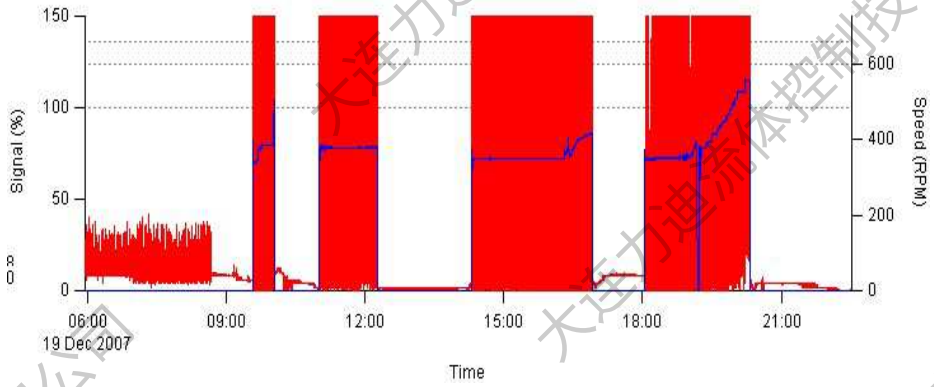
印尼, 加里曼丹 – PLTD打拉根 BeCOMS安装





非球面轴承 & 缸套

BeCOMS安装在苏尔寿12ZV40/48 发动机发现的缺陷



Log File : 20071219_PLTD Ampenan Sulzer 12ZV40_48 DG#02.log
Version : BECOMS Version 1.11_15 26.12.2006
Log Date : 20071219

Log Message

```
00:00:00 Log Started
09:42:46 SRT Prealarm AC ON
09:42:46 SRT Prealarm ON
09:42:51 SRT Prealarm AC OFF
09:42:51 SRT Prealarm OFF
10:02:14 SRT Main ALARM AC ON
10:02:14 SRT Prealarm AC ON
10:02:14 SRT Main ALARM ON
10:02:14 SRT Prealarm ON
10:12:02 SRT Main ALARM AC OFF
10:12:02 SRT Prealarm AC OFF
10:12:02 SRT Main ALARM OFF
10:12:02 SRT Prealarm OFF
11:22:20 SRT Prealarm AC ON
11:22:20 SRT Prealarm ON
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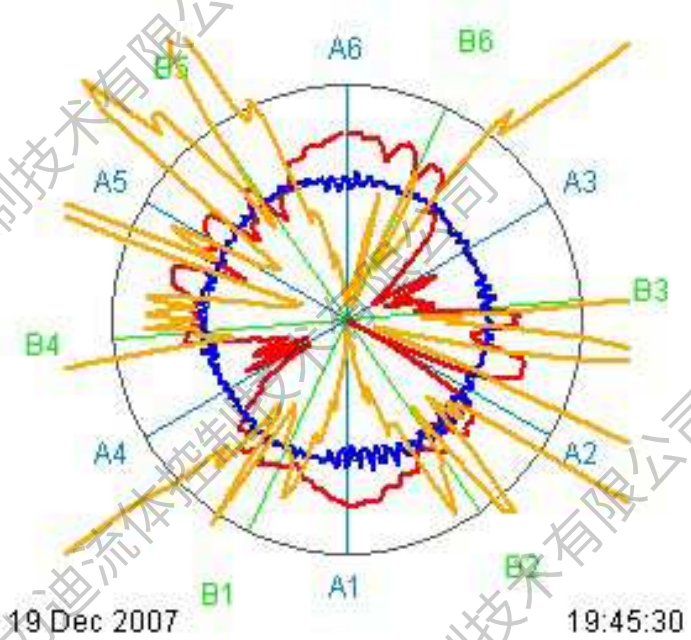
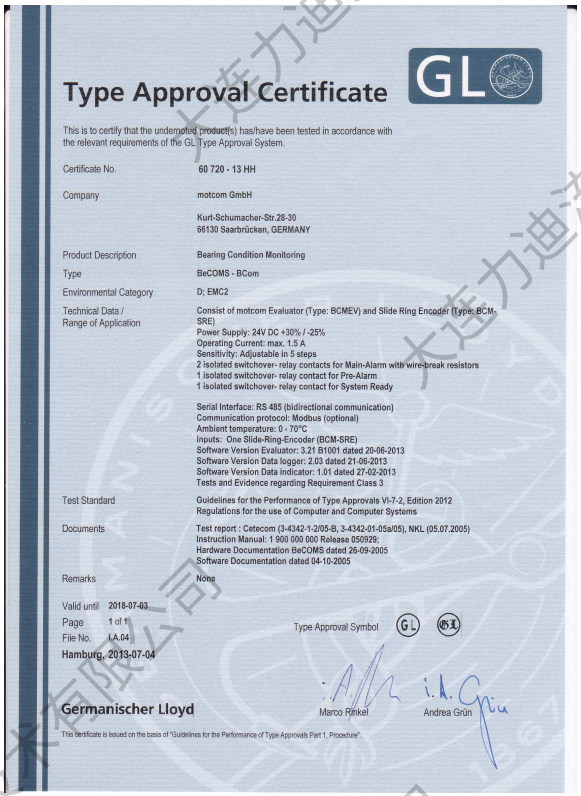


非球面轴承 & 缸套

BeCOMS安装在苏尔寿12ZV40/48 发动机发现的缺陷

motcom
Condition Monitoring Safety

BeCOMS® / BCom系统由德国船级社认证



Type Approval Certificate

GL

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No.	60 720 - 13 HH
Company	motcom GmbH Kurt-Schumacher-Str.28-30 66130 Saarbrücken, GERMANY
Product Description	Bearing Condition Monitoring
Type	BeCOMS - BCom
Environmental Category	D; EMC2
Technical Data / Range of Application	Consist of motcom Evaluator (Type: BCMEV) and Slide Ring Encoder (Type: BCM-SRE) Power Supply: 24V DC +30% / -25% Operating Current: max. 1.5 A Sensitivity: Adjustable in 5 steps 2 isolated switchover- relay contacts for Main-Alarm with wire-break resistors 1 isolated switchover- relay contact for Pre-Alarm 1 isolated switchover- relay contact for System Ready Serial Interface: RS 485 (bidirectional communication) Communication protocol: Modbus (optional) Ambient temperature: 0 - 70°C Inputs: One Slide-Ring-Encoder (BCM-SRE) Software Version Evaluator: 3.21 B1001 dated 20-06-2013 Software Version Data logger: 2.03 dated 21-06-2013 Software Version Data indicator: 1.01 dated 27-02-2013 Tests and Evidence regarding Requirement Class 3
Test Standard	Guidelines for the Performance of Type Approvals Vi-7-2, Edition 2012 Regulations for the use of Computer and Computer Systems
Documents	Test report : Cetecom (3-4342-1-2/05-B, 3-4342-01-05a/05), NKL (05.07.2005) Instruction Manual: 1 900 000 000 Release 050929; Hardware Documentation BeCOMS dated 26-09-2005 Software Documentation dated 04-10-2005
Remarks	None

Valid until 2018-07-03
Page 1 of 1
File No. I.A.04
Hamburg, 2013-07-04

Type Approval Symbol GL BX

Germanischer Lloyd

Marco Rinkel i.A. Andrea Grün

This certificate is issued on the basis of "Guidelines for the Performance of Type Approvals Part 1, Procedure".

BeCOMS®和motcom®注册商标:

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