BRANKAMP

CMS

机器（机床）安全控制系统

Control Machine Security

机器（机床、加工中心）碰撞检测系统防止机器损害发生

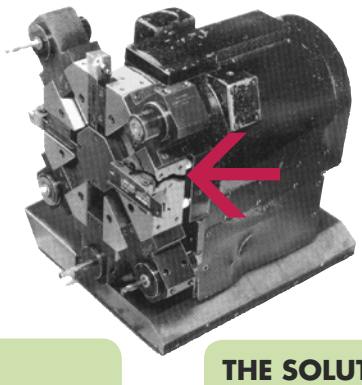
Collision Monitoring to protect against severe machine damage

Innovative BRANKAMP Technologie

问题
机器碰撞引起的损害

机器设备频繁的碰撞(撞车)后停机的间接损失有时会高达五位数字的金额。这同时还会引起机器长时间的停机和因生产拖延交货时间引起客户的抱怨。

THE PROBLEM
Damage caused by collision of machines

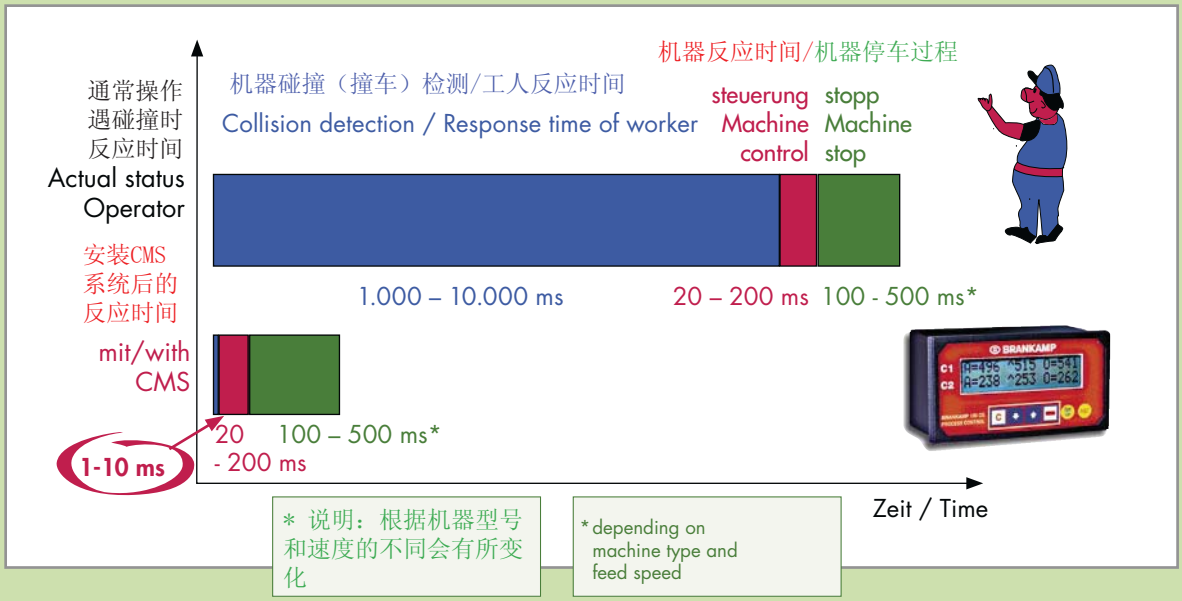


Consequential damage after a collision frequently amounts up to five-digit sums in Euro. This is accompanied by long machine downtimes and unsatisfied customers, because delivery deadlines must be considerably postponed.

解决方法
通过迅速提高反应速度减少损害限度

THE SOLUTION
Damage limitation by short response time

对比图



BRANKAMP CMS系统是一套简单、高效的预防和减少机器设备碰撞（撞车）的系统；其可以大大减少和避免机器损害的发生。
如果机器突然或意外的出现碰撞（撞车）生产操作人员需要几秒钟才能反应过来。这样在机器紧急停车前有1到10秒的延迟。CMS系统使这段延迟的反应时间缩短到千分之一。赢得宝贵的时间更快的执行停机命令，最后也是最最重要的是：造成的损害被避免或是有限的。

BRANKAMP CMS is a simple but highly effective tool for reducing such damage to a minimum or to even avoid it completely.
In case of sudden and unexpected collisions the response time of a machine operator lies in the range of a few seconds. Approx. 1 to 10 seconds will elapse before the emergency stop is actuated. CMS reduces this response time to 1/1000 of this time. Valuable time is gained, the stop command is executed much quicker and, last but not least, the damage is limited.

好处和作用
好处和作用是由生产工作决定的

- 及时检测到力的快速变化
- 使程序设定和操作错误带来的损失降到最少
- 延长机器的使用寿命
- 提高了机器的工作效率
- 可以快速简单的安装在现有的机器上
- 支持多机运行和无人值守运行
- 被财产保险承认的防范措施

THE BENEFIT
is determined by the manufacturing task

- Immediate detection of rapid force changes
- Minimizing of subsequent damage caused by programming, setup and operating errors
- Extends the expected lifetime of your machine
- Increases the availability of machine tools
- Simple retrofitting on existing machines
- Enables multi-machine operation and operation during breaks
- Precautionary measure accepted by property insurances

STANDARD

不同的效果
安装CMS系统与不安装CMS系统的不同效果

THE DIFFERENCE
– with and without CMS

原因：工具安装错误（用T型槽铣刀进行镗孔/扩孔）

① 机器开始运转时动态显示

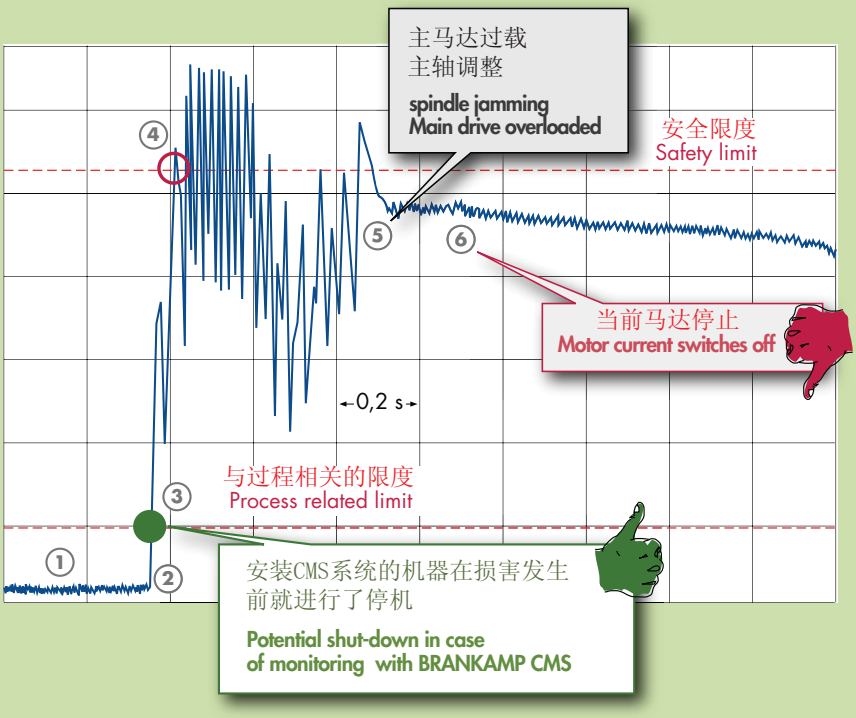
② 机器模具(工具)与工件开始接触时的显示

③ 机器模具(工具)的力在不断增加的过程

④ T型槽铣刀被损坏的时刻(点)

⑤ 机器主马达过载对主轴进行调整

⑥ 马达处于关闭状态



一个加工中心出现撞车时力的变化过程
Course of force in a collision on a machining center

Cause: Wrong tool (T-slot cutter instead of counterbore)

① Undisturbed rapid motion

② First contact between tool and work piece

③ Erratic increase of process forces

④ Time of complete destruction of T-slot cutter

⑤ Spindle jamming. Main connection overloaded

⑥ Motor current is switched off

工具装置错误，把埋头钻误装成铣削刀后。

没有安装CMS系统：错误的工具与工件接触。机器接触有点拥塞，但主轴仍然在旋转，力突然增大，接下来的机器的铣削刀具冲坏（损坏）主轴的夹具，对机器当前的生产产生影响。机器马达过载停机。

安装CMS系统后：能够有效的避免此类故障发生。装配BRANKAMP CMS系统后能够设定最佳的模具限定，甚至在NC程序开始工作之前（③）停止机器，但最迟在超过安全的上限设定后会停止机器（④）。从而避免机器设备损害的发生，降低了生产成本。

A wrong tool was inserted: An end milling cutter was used instead of a countersink.

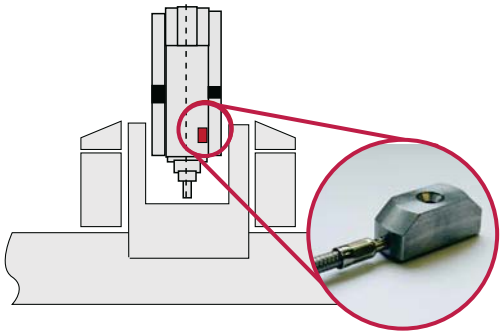
Without BRANKAMP CMS: The wrong tool contacts the workpiece. It slowly jams, but the spindle continues to rotate. The force rises suddenly. In the further course the end milling cutter is completely destroyed the spindle clamped and the motor current increased . The machine is switched off by the motor current overload switch.

With BRANKAMP CMS: This could have been avoided: With BRANKAMP CMS – and optimal limit setting for the tool – the machine would be switched off, even before the NC-program starts work (point 3), but at the latest when exceeding the upper safety limit (point 4). Highly expensive machine damage could have been avoided.

传感器
高效-精密-小巧

THE SENSOR
Powerful. Precise. Small.

石英晶体张力传感器和声音发射测量动态（动力）的延长。传感器配有高密度的钢编制连接线，安装在机器的主轴架上或模具的旋转架上。



Quartz crystal (QC) strain transducer and AcousticEmission to measure dynamic elongations. The sensor with high density special connection cables with steel braiding is mounted to the spindle housing or the tool revolver.

STANDARD

STANDARD SPECIAL

显示
显示机器的重要加工过程数据

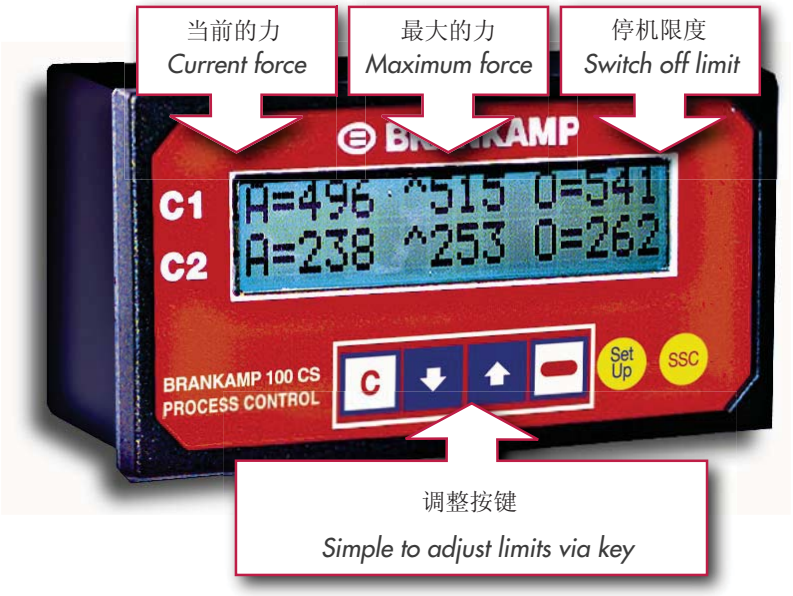
LCD屏显示当前的力和最大力，机器停机设定限度。

- 冲撞监控
- LCD显示
- 简单的限度调整
- 机器停车的文本显示
- 实时的停机命令输出
- 无需在机器的（PLC）上增加控制界面
- 实用的数据记录系统
- 停机代码记录功能

THE DISPLAY
Important process data at a glance

LCD showing the current and maximum force and the switch off limt on a clear layout.

- Collision monitoring
- LCD display
- Simple to adjust limits
- Plain text display for machine shut-down
- Floating output to shut down the machine
- No interface for machine control (PLC) required
- Utilization counter
- Stop Code Memory



CMS 系统的分类
单机或配电箱（结合）

BRANKAMP CMS系统安装在机器的控制箱里。

CMS系统既可以单机运行。也可以统一到机器的控制箱里作为新功能。

THE Type
Stand-Alone or switch cabinet

The BRANKAMP CMS unit is installed in the control cabinet. It can alternatively also be used as a stand-alone device. BRANKAMP CMS can also be integrated into new controls.


CMS 100 在控制箱里安装
CMS for installation in the control cabinet

实用的生产记录系统
优点

停机计算器显示停车的所有数据。这样您可以直观的看到检测碰撞发生和机器停车的频率，避免损害发生。

THE UTILIZATION COUNTER
Your benefit

The shut-down counter shows the total number of standstills. This shows you at a glance how often a crash was detected and how often standstills were avoided.

停机原因分析
储存停机记录

CMS 系统最多可以自动存储多达99个机器停机的：日期-时间-停机数值和停机限度等数据；所有这些储存都无需额外的操作。

WHAT HAS HAPPENED?
Storage of events

Up to 99 shut-down events are automatically saved with date, time, shut-down value and shut-down limit, without any possibility of manipulation.

SPECIAL

授权操作人员专设过载限度
避免碰撞 – 减少损害

通过这个限定BRANKAMP CMS 系统能够预防由于机器设备的设定和操作错误而引起的碰撞损害。当机器因不当设定停车后只有经过授权人员设定才能启动。这样会使机器设备的设定和操作更加安全，避免非授权人员的错误操作和设定引起的间接损害。

THE RELEASE LIMIT
Avoid crashes – minimize damage

With this addition limit BRANKAMP CMS provides protection against consequential collision damage caused by setup or operating errors. After a shut-down the machine can only be released again by an authorized person. This provides even more safety and voids consequential damage caused by unauthorized resets.

对于机器（设备）组（线）
通过CMS系统扩展和延伸统计和管理功能

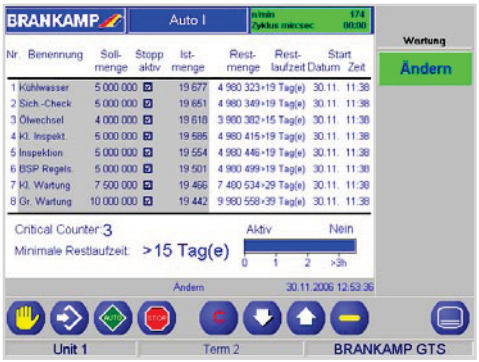
您的CMS系统不仅是一款简单和经济的机器设备保护系统，而且能够提供很多非常重要的延伸和拓展功能。您可能正在寻找一套对特殊模具进行监控和评价的监测系统，您现有的CMS机器设备保护系统，根据现有机器设备控制界面的兼容性，Brankamp可以为您提供各种解决方案，通过网络连接您机器设备与Brankamp终端系统。Brankamp终端系统为您提供更多的比现有CMS 更有吸引力的实用功能；例如：生产过程显示，停机原因代码记录；机器运行图；生产数据记录等功能。

FOR MACHINE GROUPS
Possible upgrading/extension with CMS

Your CMS is an economical solution – but no dead-end street. Because it offers many possibilities for extension. You are probably looking for a tool monitoring system for particularly critical tools, in addition to your existing CMS machine protection. For this case BRANKAMP offers various solutions, depending on the available interface to the NC. networking with a BRANKAMP Terminal (GT/ET) would also be possible. These terminals offer further attractive features, beyond the standard functions of the CMS, like: Online Process Display, Stop Code Memory, Stop & Go Diagram, counter, etc.

机器维护检修记录
控制和管理机器维护的周期

通过查看机器运行维护数据记录您将不会错过或耽误任何机器的例行或定期的维护工作。系统能够监控和记录不同类型的维护工作；从而延长机器的使用寿命。

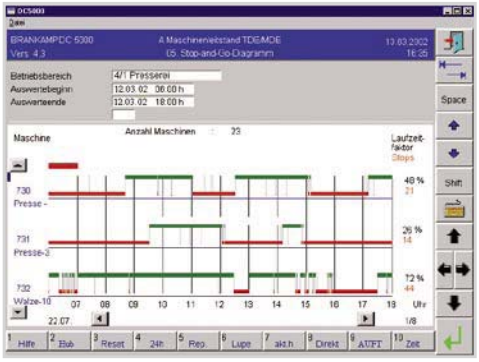


PREVENTIVE MAINTENANCE
Maintenance intervals under control!

With the maintenance counter you will no longer miss any maintenance deadlines. Diverse types of maintenance can be monitored.

机器运行状态图
机器设备的运行时间，停机待机时间显示

机器设备停&走图界面，显示机器的停机和生产运行的时间及周期；使您对机器的运行时间周期更加了解，为制定轮班计划提供参考，从而提高了机器的利用率。



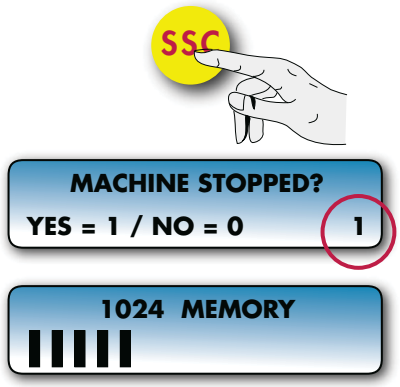
STOP & GO
Which machine is running? Which machine is stopped?

The Stop & Go masks shows you at a glance when and how long you machine was productive. The shift protocol therefore is a valuable tool to enhance the degree of utilization of your machine.

SPECIAL

安全检查
自动的系统检查

有了CMS 您的机器增加了一个安全控制系统。安全要求定期进行系统检查。按SSC键开始对系统的整个功能和监测链进行检查。操作人员移动机器。SSC程序监测到这个移动然后停止机器的进料。在显示屏上出现错误的数字提醒。这个安全检查是操作人员对机器系统的性能进行检验；操作人员必须确认机器是否停机。这个安全检查适用于所有部件。



THE SAFETY CHECK
Automatic system check

With the CMS you have decided on an additional safety control for your machine. Safety requires regular checking. Pressing the SSC-key (System Security Checker) starts a complete check of the overall system functions and the measuring chains. The machine is moved by the operator. The SSC–program detects this movement and stops the feed. Faults are output on the display. This safety check is performed in dialogue with the operator. He must e.g. acknowledge whether the machine was shut down or not.
The safety check for all components!

为您的机器设备进行联网
网络化工厂

生产机器设备运行状况与公司的所有部门进行智能连接还有很大潜力。Brankamp网络化工厂，使得生产过程程序更加透明，并且非常快捷和经济。网络化工厂使得生产数据能够进行实时传送，使得生产经理可以随时在线了解生产状况。其他的生产记录和资料都有一定的延迟性这无疑给你提供了真正的竞争优势。请参阅Brankamp以下网站：

NETWORKING OF YOUR PRODUCTION
Factory M

High potential still lies dormant in the intelligent linking of production to all other company departments. Brankamp **Factory M** makes production sequences more transparent, considerably faster and more economical. With **Factory M** production data are transmitted in real-time and are thus online available for the production manager at any time. Recording or data with considerably temporal delay are things of the past. This gives you a real advantage in competition.

mehr / more: www.brankamp.com/factoryM

其他领域的应用
同时适用以下领域

碰撞监控保护：

- 数控车床
- 加工中心
- 卧式镗床和铣床
- 数控磨床
- 机器人和机械手

THE APPLICATIONS
We do them all.

Collision monitoring for:

- NC-lathes
- Machining centres
- Horizontal boring and milling machines
- Grinding machines
- Robot and handling units

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