安装和操作说明书
（原版安装和操作说明书翻译文件）

BTS
非接触式热控开关装置

版本 11, 2020-7-15
3626-011500 zh，防护等级 0：公然
联系

Voith Group  
St. Pöltener Str. 43  
89522 Heidenheim, 德国

电话: +49 7951 32 1666  
电子邮件: Industry.Service@voith.com  
网址: www.voith.com/fluid-couplings

如果您有关于本产品的问题，请与 Voith 的客服部门联系并说明序列号（参见铭牌）

3626-011500 zh

本文档描述的是编辑结束时间截至 2020 年 7 月 15 日的产品技术状态。

版权 © 属于  
J.M. Voith SE & Co. KG

本文件受版权保护。如未经发行方书面许可，严禁翻译部分或全部内容，也不得以机械/电子手段复制或传播给第三方。
# 内容

1. 应用，BTS 特性 5
2. BTS 的功能 6

2.1 开关元件 7
2.2 引引发器 7
2.3 计算器 7
2.4 绝缘开关放大器 7
2.5 BTS 部件的相互作用 8

3. 技术参数 9

3.1 开关元件 9
3.2 引引发器、固定法兰 10
3.3 计算器和绝缘开关放大器 10
3.3.1 计算器 10
3.3.2 绝缘开关放大器 230 V AC 10
3.3.3 绝缘开关放大器 20…30 V DC 10

4. 使用者提示 11

5. 安全 13

5.1 安全提示 13
5.1.1 安全提示的组成 13
5.1.2 安全标志定义 14
5.2 按规定使用 14
5.3 不按规定使用 14
5.4 一般危险说明 14
5.5 其他危险 18
5.6 在出现事故时的措施 18
5.7 运行提示 18
5.8 人员资质 19
5.9 产品监督 19

6. 安装 20

6.1 交货状态 20
6.2 供货范围 20
6.3 安装 — 开关元件和引发器 21
6.4 安装、连接 — 计算器、绝缘开关放大器 26
<table>
<thead>
<tr>
<th>章目</th>
<th>内容</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>计算器的显示与设置</td>
</tr>
<tr>
<td>7.1</td>
<td>显示 - 计算器</td>
</tr>
<tr>
<td>7.2</td>
<td>设置 - 计算器</td>
</tr>
<tr>
<td>8</td>
<td>调试</td>
</tr>
<tr>
<td>9</td>
<td>保养、维护</td>
</tr>
<tr>
<td>9.1</td>
<td>外部清洁</td>
</tr>
<tr>
<td>10</td>
<td>废弃处理</td>
</tr>
<tr>
<td>11</td>
<td>故障 - 解决措施、故障查找</td>
</tr>
<tr>
<td>12</td>
<td>咨询、安装和备件订购</td>
</tr>
<tr>
<td>13</td>
<td>备件信息</td>
</tr>
<tr>
<td>13.1</td>
<td>开关元件</td>
</tr>
<tr>
<td>13.2</td>
<td>引发器、固定法兰</td>
</tr>
<tr>
<td>13.3</td>
<td>计算器</td>
</tr>
<tr>
<td>13.4</td>
<td>绝缘开关放大器</td>
</tr>
<tr>
<td>14</td>
<td>附录</td>
</tr>
<tr>
<td>14.1</td>
<td>引发器 NJ10-22-N-E93-Y106925</td>
</tr>
<tr>
<td>14.2</td>
<td>引发器 NJ10-22-N-E93-Y30627</td>
</tr>
<tr>
<td>14.3</td>
<td>引发器 NJ10-22-N-E93-Y30629</td>
</tr>
<tr>
<td>14.4</td>
<td>引发器 NJ10-22-N-E93-Y245590</td>
</tr>
<tr>
<td>14.5</td>
<td>引发器 NJ10-22-N-E93-Y246868</td>
</tr>
<tr>
<td>14.6</td>
<td>引发器 NJ10-22-N-E93-Y246869</td>
</tr>
<tr>
<td>14.7</td>
<td>计算器 KFU8-DW-1.D-Y209869</td>
</tr>
<tr>
<td>14.8</td>
<td>绝缘开关放大器 KFD2-SOT2-Ex2</td>
</tr>
<tr>
<td>14.9</td>
<td>绝缘开关放大器 KFA6-SOT2-Ex2</td>
</tr>
</tbody>
</table>
1 应用，BTS 特性

非接触式热控开关装置（BTS）是 Voith 液力偶合器的监控系统。

- BTS 可以方便地监控液力偶合器的温度。
- 当温度过高时，会根据应用情况
  - 向用户发出警告，
  - 使驱动电机停机，
  - 通过作功机械降低载荷。
- 如果能够及时发现超温情况，就可避免偶合器中的工作液从熔断螺栓中流出。
- 液力偶合器冷却后，BTS 自动复位。
- BTS 可以在尺寸大于 206 的 Voith 液力偶合器上使用。

警告

爆炸危险
如果不使用绝缘开关放大器，会存在爆炸危险。
• 因为运算器的控制回路非本安隔爆，须在运算器和引发器之间放置相应的绝缘开关放大器！
• BTS 不允许在有爆炸危险的区域中，作为限制液力偶合器最高许可表面湿度的安全装置使用！
2 BTS 的功能

非接触式温度开关装置（BTS）由三个部件组成:

- 开关元件
- 装有固定法兰的引发器
- 计算器

在要求本安隔爆的控制回路时可以选择:

- 绝缘开关放大器，双通道，用于最多 2 个引发器

图 1
2.1 开关元件

开关元件是从动部件（简单电子设备）。它插在外壳或液力偶合器外壳中。这使得开关元件和液力偶合器内的工作液之间有了一个热接点。

在开关元件内集成了一个线圈和恒温开关。恒温开关的转换点与开关元件的反应温度相对应。

高于额定反应温度时，恒温开关闭合，接通线圈。高于额定反应温度时，恒温开关打开，断开电路。当温度降低时，恒温开关再次关闭电路。BTS 自动复位。

2.2 引发器

引发器是一种极化双线传感器。它依照感应传感器原理工作。

引发器内集成了一个电振荡器，可产生高频振荡。振荡器控制一个振荡电路，是决定频率的元件，由一个线圈和一个电容器组成。

振荡电路的线圈位于传感头内。电磁交变场通过此线圈离开传感头。

2.3 计算器

计算器是一个电子单元，用于记录电脉冲，计算脉冲之间的时间。

通过接通供电电压或外部触发信号开始进行计算。

计算开始后，必须在一段时间内（起动延时时间）中断脉冲的监测。

如果每单位时间的脉冲数降低到某个值以下，则具有转换接点的继电器将被释放。

2.4 绝缘开关放大器

绝缘开关放大器传输来自有爆炸危险区域的信号。

信号传感器可以是传感器或机械触点。

本安隔爆输入端与输出端和电源安全隔开。
2.5 BTS 部件的相互作用

开关元件取代盲孔螺钉旋入液力偶合器中。带固定法兰的引发器平行于液力偶合器轴安装，并连接到计算器。

如果开关元件在引发器头部的前面，则开关元件内的线圈与引发器内的线圈感应耦合。如果恒温开关关闭，则能量从引发器传递到开关元件，振荡衰减，且电流消耗量较低。

如果偶合器温度超过开关元件的反应温度，则恒温开关将切断开关元件中的电路。开关元件就不再使引发器中的振荡衰减。

计算器可识别因引发器电流消耗而导致的振荡衰减。

当开关元件在液力偶合器旋转情况下通过引发器时，开关元件持续在引发器上运转。振荡脉冲连续产生。计算器中的输出继电器被拾取。

当温度过高时，将不再发生这些衰减脉冲，也就是低于计算器上调整的极限频率。计算器发现丢失的脉冲，输出继电器被释放。

在起动液力偶合器时，计算器设置了一个起动延时时间。只要起动延时功能有效，输出继电器一直保持拾取。

在这个设定的时间过后，带开关元件的液力偶合器的转速应超过设置的极限频率。

警告

人身伤害和物品损害的危险
在关闭以后，要保证控制装置不会自动重新起动。
- 关掉与液力偶合器安装在一起的设备，并固定开关，防止其被重新接通。
- 对于在液力偶合器和 BTS 上进行的所有工作，要确保驱动电机和工作机器已经停止运行，并且决不可能起动。
- 只有当液力偶合器的温度低于接通电机许可的最高许可温度时，才允许重新起动。
3 技术参数

3.1 开关元件

图 2

不同规格的液力偶合器有以下开关元件:

<table>
<thead>
<tr>
<th>螺纹尺寸</th>
<th>M12x1.5</th>
<th>M18x1.5</th>
<th>M24x1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>额定反应温度</td>
<td>125 °C</td>
<td>85 / 90 / 100 / 110 / 125 / 140 / 160 / 180 °C</td>
<td>85 / 125 / 140 / 160 / 180 °C</td>
</tr>
<tr>
<td>适用于偶合器尺寸</td>
<td>206 – 274</td>
<td>366 – 650</td>
<td>750 – 1330</td>
</tr>
<tr>
<td>反应温度公差</td>
<td>± 5 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>复位温度</td>
<td>比反应温度低约 40 K</td>
<td></td>
<td></td>
</tr>
<tr>
<td>拧紧扭矩</td>
<td>22 Nm</td>
<td>60 Nm</td>
<td>144 Nm</td>
</tr>
<tr>
<td>分类是</td>
<td>II 2GD</td>
<td>U1 = 10 V</td>
<td>I1 = 50 mA</td>
</tr>
<tr>
<td>线圈区域内的工作温度</td>
<td>-40 °C 至 +120 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>恒温开关区域内的工作温度</td>
<td>至 90 °C (T5)，至 125 °C (T4)，至 190 °C (T3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

表 1

安全提示

- 外壳上标有开关元件的型号，包括:
  - Voith
  - 额定反应温度
  - 防爆标志 II Ex i X
  - 序列号（示例：Voith 140 °C II Ex i X 1234 5678）
- 设计偶合器时就决定了开关元件的额定反应温度。
3.2 引发器、固定法兰

引发器与固定法兰一起显示

图 3

附录 类型：
NJ 10-22-N-E93-Y106925
NJ 10-22-N-E93-Y30627
NJ 10-22-N-E93-Y30629
NJ 10-22-N-E93-Y245590（新版本，电缆长度 2 m）
NJ 10-22-N-E93-Y246868（新版本，电缆长度 5 m）
NJ 10-22-N-E93-Y246869（新版本，电缆长度 10 m）

3.3 计算器和绝缘开关放大器

3.3.1 计算器

附录 类型： KFU8-DW-1.D-Y209869

3.3.2 绝缘开关放大器 230 V AC

附录 类型： KFA6-SOT2-Ex2

3.3.3 绝缘开关放大器 20…30 V DC

附录 类型： KFD2-SOT2-Ex2
4 使用者提示

本手册会指导您安全、正确、经济地使用非接触式热控开关装置（BTS）。

只要遵守本手册中的相关说明，就可
- 增加设备的可靠性，并延长其使用寿命，
- 避免危险，
- 减少维修和停机时间。

本手册必须
- 始终放置在 BTS 工作现场，
- 供在设备上进行工作或运营设备的人员阅读及使用。

也可在这些必须遵守的操作说明书的附录中找到其他文件。

非接触式热控开关装置是按照目前的技术发展水平和批准的安全条例制造的。但在处理不当和未按规定使用时，可能对用户或第三人的生命造成危险，或对设备和其他有形资产产生损害。

配件：
配件必须符合 Voith 规定的技术要求。要求使用原配件。
非原装备件的安装及/或使用可能改变 BTS 的规定性能从而影响其安全性。
凡因使用非原装备件而造成的任何损失，Voith 概不承担责任。

维护时使用合适的车间设备。只有生产商或经过授权的专业工厂才能保证专业化维修或修理。
本说明书内容已经尽可能谨慎地完成编制。如果需要进一步的信息请联系:

Voith Group  
St. Pölten Split 43  
89522 Heidenheim, 德国

电话: +49 7951 32 1666  
电子邮件: Industry.Service@voith.com  
网址: www.voith.com/fluid-couplings

© Voith 2020。  
未经授权不得复制本手册，禁止利用和传播其内容。如有违反行为要承担赔偿责任。保留对专利、实用新型专利或外观设计注册案件的所有权利。

Voith 公司保留进行变更的权利。
5 安全

5.1 安全提示

在操作说明书中，使用了带有如下所述名称和符号的安全提示。

5.1.1 安全提示的组成

<table>
<thead>
<tr>
<th>警示语</th>
<th>危险后果</th>
<th>危险源</th>
<th>危险防范</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ 危险</td>
<td>死亡或者重伤（不可挽回的人身伤害）</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 警告</td>
<td>可能会造成死亡或重伤</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ 小心</td>
<td>可能会造成轻伤或者中度伤害</td>
<td></td>
<td></td>
</tr>
<tr>
<td>提示</td>
<td>可能的物品损坏</td>
<td>产品</td>
<td>环境</td>
</tr>
<tr>
<td>安全提示</td>
<td>通用应用提示和有用信息，安全的操作和正确的安全措施</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

表 2

危险后果
危险后果指的是危险的类型。

危险源
危险源被称作危险起因。

危险防范
危险防范描述防范危险的措施。
5.1.2 安全标志定义

<table>
<thead>
<tr>
<th>符号</th>
<th>定义</th>
</tr>
</thead>
<tbody>
<tr>
<td>[\text{Ex}]</td>
<td>爆炸危险</td>
</tr>
<tr>
<td></td>
<td>防爆符号标志提示可能存在危险,有爆炸危险的区域尤其值得注意。</td>
</tr>
</tbody>
</table>

表 3

5.2 按规定使用

- 非接触式热控开关装置（BTS）以非接触方式监控 Voith 液力偶合器的温度，专为工业应用而设计。如果用在其它场合，例如在未经同意的工作条件下使用，则是对非接触式热控开关装置的不当使用。
- 正确使用还包括遵守安装与操作说明书中的要求。
- 对于不按照规范使用所引起的损失厂家概不负责。其风险只能由用户承担。

5.3 不按规定使用

- 不遵守设计范围。
- 在高功率、高转速或者不协调的运行条件下，其它用途或超出范围的使用被视为不合规。
- 不得使用第三方供应商的 BTS 或备件。

5.4 一般危险说明

对于在非接触式热控开关装置上进行的所有工作，请遵守事故预防地性规定以及电气设备安装规则！

警告

爆炸危险
在不遵守规定或未经许可变更时，存在爆炸危险。
- 在有爆炸危险的区域内使用热控开关装置，必须遵守在有爆炸危险区域内使用电气设备的地方性法规！不允许对包括连接电缆在内的潜在爆炸区域的电气设备进行修改。
在非接触式热控开关装置上进行操作时存在的危险：

💡 **危险**

**电击**
在安装错误，接线错误的组件和松动的电路连接上，人们会受到电击和受重伤，甚至死亡。
安装错误或者接线错误的电子组件和松脱的电路连接会造成机器损坏。
- 电气专家应根据系统额定电压及最大消耗功率，完成与电网的正确联接。
- 线路电压必须与铭牌上的指示值一致。
- 电源端应配置相匹配的保险装置。

**静电载荷**
静电可使人们受到电击。
- 设备安装，应由电力专家将液力偶合器安装在设备中。
- 机器和电力安装应有接地点。
在液力偶合器上进行操作:

**警告**

### 受伤危险

在恒压式液力变矩器工作时，有割伤、挤伤及在零下温度时冻伤的危险。

- 请遵守液力偶合器的安装与操作说明书！
- 未配戴防护手套时，严禁碰触液力偶合器。
- 在液力偶合器冷却后，才可开始作业。
- 在液力偶合器上执行作业时，应确保光线充足、有足够的作业空间和通风良好。
- 关掉与液力偶合器安装在一起的设备，并固定开关，防止其被重新接通。
- 对于在液力偶合器上进行的所有工作，要确保发动机和工作机已经停止运行，并且决不可能起动。

### 噪声:

**警告**

#### 听力下降，持久听力损伤

液力偶合器运行时产生噪声。如果声压等级达到 A 级，L_{A},超过 80 dB(A) 可能导致听力损伤。

- 使用耳塞。

声压等级

液力偶合器的操作说明书封面
喷液及排液:

⚠️ 警告

喷出的热工作液可能导致失明的危险，烧伤危险
液力偶合器过热时易熔塞反应。工作液会从易熔塞中流出。
这仅可能在不按规定使用时发生。
• 在液力偶合器旁工作的人员须配戴护目镜。
• 请确保喷出的液体不会与人接触。
• 如果易熔塞喷液，立即关闭驱动装置。
• 液力偶合器旁的电控装置应考虑喷液保护。

火灾危险
易熔塞反应后，喷出的油可能在热表面上点火从而引起火灾，同时亦释放出毒气和水蒸汽。
• 请确保喷出的热工作液不与机械零件、加热器、火星及明火接触。
• 易熔塞反应后，立即关闭驱动装置。
• 请注意安全数据页中的提示。

小心

滑倒的危险
易熔塞溢出的铅和流出的工作液会造成滑倒的危险。
• 必要时，请提供足够的收集槽。
• 直接分离流出的易熔液和工作液。
• 请注意安全数据页中的提示。
5.5 其他危险

警告

人身伤害和物品损害的危险
不正确的使用及运行会引起人员死亡、重伤或轻伤，并对财产及环境造成损害。
- 只允许合格的、经过培训和授权的人员对液力偶合器以及非接触式热控开关装置进行操作或检修。
- 请注意警告及安全提示。

5.6 在出现事故时的措施

安全提示

- 在出现事故时，请遵守当地的规定以及操作手册和运营商的安全措施。

5.7 运行提示

安全提示

- 如果液力偶合器在运行过程中出现异常，立即关掉驱动装置。

监测装置：

提示

财产损失
由于未准备就绪的监测装置造成液力偶合器的损坏。
- 检查现有的监测装置是否处于准备就绪状态。
- 立即维修出现故障的监测装置。
- 禁止桥接安全装置。
5.8 人员资质

仅允许具有资质、经过授权的专业人员执行相关作业，例如运输、入库、安装、电气接线、调试、运行、保养、维护及修理。

所谓有资质的专业人员，是指按照操作说明书熟悉运输、入库、安装、电气接线、调试、保养、维护和修理操作流程，并且具有相应资质的人员。通过培训和指导保证资质。

该人员须经过以下方面的培训、指导并得到授权以胜任如下要求：
- 按照专业规范并且根据相关安全标准运行、维护设备。
- 按照专业规范使用起重工具、吊装索具和起吊点。
- 按照专业规范处理废弃的介质与部件，例如润滑脂。
- 根据安全技术标准维护和使用安全装备。
- 预防事故，实施急救。

学徒人员仅可在具有资质的指定人员监督下对液力偶合器以及非接触式热控开关装置进行检修。

负责非接触式热控开关装置任何工作的人员必须：
- 可靠，
- 达到法律规定的最小年龄，
- 经过相关操作培训、指导，并且经过授权；
- 在有爆炸危险环境中使用时，要遵守 EN 1127-1 附录 A 和 EN 1127-1 第 7 部分的规定。仅采用在有爆炸危险范围允许使用的工具。避免火花。

5.9 产品监督

即使发货以后，我们有法定义务对我们的产品进行监控。因此，请与我们分享所有我们感兴趣的信息。例如：
- 运行数据变化。
- 在使用设备过程中获得的经验。
- 反复出现的问题。
- 在使用本安装与操作说明书过程中出现的问题。

我们的地址

à 第 2 页
6 安装

警告

受伤危险
在非接触式热控开关装置上作业时，请尤其注意第5章（安全）！

• 请在开始安装前确保所有部件都没有电势。
• 易熔塞保护液力偶合器不会因过热而损坏。
  在使用 BTS 时也不允许用平头螺栓或具有其他额定反应温度的易熔塞代替易熔塞。
• 在没有易熔塞的情况下切勿操作液力偶合器！

6.1 交货状态

- 带密封环的开关元件。
- 带安装法兰的引发器和
- 计算器

通常作为散装部件与液力偶合器一起提供。

6.2 供货范围

如果之后将 BTS 安装到尺寸为 206 和 274 的液力偶合器上，请与 Voith 保持联系！

开关元件和易熔塞的标准组合：

<table>
<thead>
<tr>
<th>额定反应温度</th>
<th>开关元件</th>
<th>易熔塞</th>
<th>色标</th>
</tr>
</thead>
<tbody>
<tr>
<td>160°C</td>
<td>180°C</td>
<td>蓝色</td>
<td></td>
</tr>
</tbody>
</table>

| 140°C         | 160°C    | 绿色   |

| 125°C         | 160°C    | 绿色   |

| 110°C         | 140°C    | 红色   |

表 4

开关元件与易熔塞的分配可随项目设计的不同而改变。同样可以获得不同的开关元件额定反应温度（85°C、90°C、100°C、110°C、125°C、140°C、160°C 和 180°C）（参第 13 章）。
6.3 安装 — 开关元件和引发器

警告

爆炸危险
不遵守安装规定。

• 为避免任何损坏，应在液力偶合器安装后，充液前安装开关元件和引发器。
• 切勿损坏开关设备和连接导线。必须将所有导线放置在不受机械影响的地方。
• 不得对在易爆危险区域中使用的设备进行改动。
• 不能对这些设备进行维修。
• 要避免对引发器产生冲击影响。只允许在无爆炸危险的环境中在机器上工作。
• 为防止产生静电，应按照 EN 60079-14 的要求敷设连接电缆，在运行过程中，决不能使它们发生磨损/摩擦。

• 将开关元件用密封圈取代盲孔螺钉旋入液力偶合器的外轮（项号 0300）或外壳（项号 0190）1) 中。

外轮侧开关元件的排列 2)

图 4

1) 在 DT 型液力偶合器中没有。
2) 对于 DT 型液力偶合器，也可在相对外轮侧进行安装。
开关元件和引发器的安装尺寸：

<table>
<thead>
<tr>
<th>液力偶合器型号</th>
<th>节圆直径 Ø F [mm]</th>
<th>距离 ~ H [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>206 T</td>
<td>196 ± 1</td>
<td>111.5</td>
</tr>
<tr>
<td>206 DT</td>
<td>196 ± 1</td>
<td>151.5</td>
</tr>
<tr>
<td>274 T</td>
<td>268 ± 1</td>
<td>152</td>
</tr>
<tr>
<td>274 DT</td>
<td>268 ± 1</td>
<td>190</td>
</tr>
<tr>
<td>366 T</td>
<td>350 ± 1</td>
<td>193</td>
</tr>
<tr>
<td>422 T</td>
<td>396 ± 1</td>
<td>206</td>
</tr>
<tr>
<td>497 T</td>
<td>470 ± 1</td>
<td>228</td>
</tr>
<tr>
<td>562 T</td>
<td>548 ± 1</td>
<td>248</td>
</tr>
<tr>
<td>650 T</td>
<td>630 ± 1</td>
<td>289</td>
</tr>
<tr>
<td>750 T</td>
<td>729 ± 1</td>
<td>318</td>
</tr>
<tr>
<td>866 T</td>
<td>840 ± 1</td>
<td>356</td>
</tr>
<tr>
<td>866 DT</td>
<td>840 ± 1</td>
<td>600</td>
</tr>
<tr>
<td>1000 T</td>
<td>972 ± 1</td>
<td>369</td>
</tr>
<tr>
<td>1000 DT</td>
<td>972 ± 1</td>
<td>672</td>
</tr>
<tr>
<td>1150 T</td>
<td>1128 ± 1</td>
<td>458</td>
</tr>
<tr>
<td>1150 DT</td>
<td>1128 ± 1</td>
<td>783</td>
</tr>
<tr>
<td>1330 DT</td>
<td>1302 ± 1</td>
<td>912</td>
</tr>
</tbody>
</table>

表 5

不同排列方式的安装尺寸，请参见液力偶合器的装配图。
开关元件在外壳侧的排列（不适用 DT 或 T…S 型液力偶合器）：

图 5

开关元件在外壳侧的排列（仅适用 T…S 型液力偶合器）：

图 6
开关元件和引发器的安装尺寸:

<table>
<thead>
<tr>
<th>液力偶合器型号</th>
<th>节圆直径 Øf [mm]</th>
<th>距离 ~ h [mm]</th>
<th>节圆直径 Øf [mm]</th>
<th>距离 ~ h [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>206 T</td>
<td>200 ± 1</td>
<td>-16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>274 T</td>
<td>264 ± 1</td>
<td>2.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>366 T</td>
<td>355 ± 1</td>
<td>16</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>422 T</td>
<td>398 ± 1</td>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>487 T</td>
<td>480 ± 1</td>
<td>29</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>582 T</td>
<td>556 ± 1</td>
<td>28.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>650 T</td>
<td>649 ± 1</td>
<td>51.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>750 T</td>
<td>742 ± 1</td>
<td>52.5</td>
<td>815 ± 1</td>
<td>25</td>
</tr>
<tr>
<td>866 T</td>
<td>862 ± 1</td>
<td>65</td>
<td>954 ± 1</td>
<td>25</td>
</tr>
<tr>
<td>1000 T</td>
<td>990 ± 1</td>
<td>54</td>
<td>1092 ± 1</td>
<td>25</td>
</tr>
<tr>
<td>1150 T</td>
<td>1140 ± 1</td>
<td>86</td>
<td>1250 ± 1</td>
<td>25</td>
</tr>
</tbody>
</table>

表 6

不同排列方式的安装尺寸，请参见液力偶合器的装配图。
提示

财产损失
不遵守安装规定。
• 确保托架足够稳定（不包括在 Voith 的供货范围内）！
• 避免任何振动，因为振动可能会产生错误信号！
• 观察引发器头周围的无金属区 (15 mm)（参见原理图）！

图 7

• 将带有固定法兰的引发器安装到开关元件的节圆直径，以及与液力偶合器轴平行的托架上。
• 引发器末端安装在与固定法兰齐平的位置处。固定法兰的前面与托架齐平。
• 将引发器头部和开关元件之间的距离设成 4 ± 1 mm！
6.4 安装、连接 - 计算器、绝缘开关放大器

提示

财产损失
因为不恰当地连接电子部件或不符合安装说明而损坏设备。

- BTS 的接线不在供货范围内！
- 当引发器和计算器之间的距离较大时，我们建议使用屏蔽电缆以便进行延长。
- 引发器和计算器之间延伸电缆的总电阻要小于 100 Ω。

- 将计算器（必要时也将绝缘开关放大器）安装在适当的控制柜内，并按照接线图进行连接。

接线图：

图 8
端子分配： 计算器

<table>
<thead>
<tr>
<th>端子编号</th>
<th>说明</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>用于触发器输入端的 GND</td>
</tr>
<tr>
<td>2</td>
<td>启动延时触发器输入端，+24 DC</td>
</tr>
<tr>
<td>3</td>
<td>触发器输入端电源。在通过接通电源电压触发时，在端子 3 和 2 之前设置电桥（交货状态）。</td>
</tr>
<tr>
<td>4</td>
<td>电源电压，+24 V DC</td>
</tr>
<tr>
<td>5</td>
<td>电源电压，GND</td>
</tr>
<tr>
<td>6</td>
<td>不连接！</td>
</tr>
<tr>
<td>7</td>
<td>不连接！</td>
</tr>
<tr>
<td>8</td>
<td>NAMUR 输入端，L-</td>
</tr>
<tr>
<td>9</td>
<td>NAMUR 输入端，L+</td>
</tr>
<tr>
<td>10</td>
<td>输出继电器，常开触点，NO</td>
</tr>
<tr>
<td>11</td>
<td>输出继电器，常闭触点，NC</td>
</tr>
<tr>
<td>12</td>
<td>输出继电器，方根，COM</td>
</tr>
<tr>
<td>13</td>
<td>不连接！</td>
</tr>
<tr>
<td>14</td>
<td>不连接！</td>
</tr>
<tr>
<td>15</td>
<td>不连接！</td>
</tr>
<tr>
<td>16</td>
<td>电源电压，230 V AC，L1</td>
</tr>
<tr>
<td>17</td>
<td>电源电压，115 V AC，L1</td>
</tr>
<tr>
<td>18</td>
<td>电源电压，N</td>
</tr>
</tbody>
</table>

表 7
警告

爆炸危险
在不遵守防爆条件时，存在爆炸危险。
- 计算器的控制电路非本安隔爆！
- 在要求本安隔爆控制电路时，要在计算器和引发器之间接通适当的绝缘开关放大器！

端子分配：绝缘开关放大器

<table>
<thead>
<tr>
<th>端子编号</th>
<th>说明</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+</td>
<td>NAMUR 输入端 1，L+</td>
</tr>
<tr>
<td>2+</td>
<td>不连接！</td>
</tr>
<tr>
<td>3-</td>
<td>NAMUR 输入端 1，L-</td>
</tr>
<tr>
<td>4+</td>
<td>NAMUR 输入端 2，L+</td>
</tr>
<tr>
<td>5+</td>
<td>不连接！</td>
</tr>
<tr>
<td>6-</td>
<td>NAMUR 输入端 2，L-</td>
</tr>
<tr>
<td>7</td>
<td>输出端 1 +</td>
</tr>
<tr>
<td>8</td>
<td>输出端 1/2 -</td>
</tr>
<tr>
<td>9</td>
<td>输出端 2 +</td>
</tr>
<tr>
<td>14+</td>
<td>电源电压，230 V AC，L1</td>
</tr>
<tr>
<td>15-</td>
<td>电源电压，N</td>
</tr>
</tbody>
</table>

表 8
7 计算器的显示与设置

7.1 显示 - 计算器

运行模式:

<table>
<thead>
<tr>
<th>图 9</th>
<th>意思</th>
</tr>
</thead>
<tbody>
<tr>
<td>图 9</td>
<td>意思</td>
</tr>
<tr>
<td>图 9</td>
<td>意思</td>
</tr>
<tr>
<td>图 9</td>
<td>意思</td>
</tr>
</tbody>
</table>

设置模式

<table>
<thead>
<tr>
<th>图 10</th>
<th>意思</th>
</tr>
</thead>
<tbody>
<tr>
<td>图 10</td>
<td>意思</td>
</tr>
<tr>
<td>图 10</td>
<td>意思</td>
</tr>
</tbody>
</table>
7.2 设置 - 计算器

- 必要时设置起动延时时间，出厂设置：10 s！
  根据（下面的原理草图）通过正面的按键进行设置。

警告

人身伤害和物品损害的危险
在起动延时时间内，不记录液力偶合器的超温！
- 只允许合格的、经过培训和授权的人员对液力偶合器进行操作或检修。
- 请注意警告及安全提示。

安全提示

- 起动延时时间从触发起动延时开始。
- 起动延时时间过后，带开关元件的液力偶合器的速度必须明显超过 60 min！
- 起动延时时间的工厂设定：10 s。

图 11
8 调试

注意：调试运行不当会造成人身伤害、财产损失及破坏环境！

调试运行时，必须由专业人员实施，特别是液力偶合器的首次起动！

警告

受伤危险
在非接触式热控开关装置上作业时，请尤其注意第5章（安全）！
• 调试运行不当会造成人身伤害、财产损失及破坏环境！
• 只允许专业人员实施调试运行，特别是液力偶合器的首次起动！
• 请防止设备未经授权起动！

• 根据接线图检查布线（第6.4章）。
  要特别注意电源电压的布线是否正确！
• 首先给计算器加上电源电压，不起动液力偶合器。在激活起动延时时，设备显示
  输出继电器已拧紧，前面的 LED 灯亮起。
• 在起动延时时间结束之后，设备显示输出继电器落下，前面的 LED 熄灭。
• 必要时根据第7.2章设置起动延时时间。
• 在外部触发时，去除出厂安装的端子2和3之间的电桥。
• 正常起动带液力偶合器的BTS。起动延时时间过后，带开关元件的液力偶合器的转速必须明显超过60 min⁻¹。如果不存在低温，计算器显示输出继电器保持拧紧，前面的 LED 灯亮起。
• 关闭带液力偶合器的驱动，使BTS保持在运行准备就绪的状态中。如果带开关元件的液力偶合器转速超过60 min⁻¹，计算器会显示输出继电器落下，前面的 LED 熄灭。
• 可以进行正常运行。在出现故障时，第10章。
9 保养、维护

定义以下进行的维护工作（依据 IEC 60079）：

保养和维护： 使目标保持一种状态，或者重新恢复该状态，从而与相关标准要求相符，保证了执行所需的功能的一系列活动的组合。

检查： 仔细调查对象的一种活动，目标是对目标的状态给出可靠的说法，不需要拆卸，或在必要时部分拆卸，并通过措施比如测量进行补充。

目视检查： 目视检查是指一种不使用接触装置或工具能确定可见缺陷的检查，比如缺少螺栓。

近距离检查： 一种除了包括目视检查以外，通过使用接触装置，比如移动楼梯（如果需要）和工具识别螺栓松落等错误。为了进行复检，通常不需要打开外壳或关闭设备的电压。

细节检查： 一种除了包括近距离检查以外，必须需要打开外壳，如果需要时通过使用工具和检测装置识别出连线松落等错误的检查。

警告

受伤危险
在非接触式热控开关装置上作业时，请尤其注意 à 第 5 章（安全）！
• 注意始终保持液力偶合器旁通畅无阻！
• 只允许有资质且经授权的专业人员进行维护以及保养工作！通过指导和培训液力偶
合器保证质量。
• 维护和保养不当会导致死亡、重伤或轻伤而且会造成财产损失或破坏环境。
- 关掉与液力偶合器安装在一起的设备，并固定开关，防止其被重新接通。
- 对于在液力偶合器上进行的所有工作，要确保驱动电机和工作机已经停止运行，并且决不可能启动！
- 只允许使用原装备件更换部件。

完成维护和保养工作后，立即安装所有安全罩及安全装置并检查设备性能。检查功能是否正常！

**维护计划：**

<table>
<thead>
<tr>
<th>期限</th>
<th>保养工作</th>
</tr>
</thead>
<tbody>
<tr>
<td>每 1000 个运行小时，最晚每 6 个月</td>
<td>检查设备是否有异常（目视检查，灰尘沉淀）。</td>
</tr>
<tr>
<td>最晚在起动 6 个月以后，之后每 2 年</td>
<td>检查电子设备的完整性（细节检查）。</td>
</tr>
<tr>
<td>在有污染物时</td>
<td>清洁（6 第 9.1 章）。</td>
</tr>
</tbody>
</table>

表 9

- 根据报告进行保养工作及常规检查工作。
- 记录保养工作。

报告模板

6 液力偶合器操作说明书
防爆液力偶合器须进行如下附加的保养工作:

在有污染物或堵塞时:
要定期清洁爆炸区域中的设备。周期由运营商根据环境应力现场确定，比如在灰尘沉淀大于或约为 0.2...0.5 mm 时。

表 10

<table>
<thead>
<tr>
<th>保养间隔</th>
<th>保养工作</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>清洁（6 第 9.1 章）。</td>
</tr>
</tbody>
</table>

警告

爆炸危险
不符合规定的保养工作会产生爆炸危险。
为确保根据防爆规定运行，请依照保养计划完成作业。

• 立即清除设备上堆积的易燃灰尘。

9.1 外部清洁

提示

财产损失
因不恰当的外部清洗损坏 BTS。

• 请清洁剂与 BTS 塑料外壳以及电缆接线橡胶密封垫的兼容性！
• 请不要使用高压清洁设备！
• 小心处理密封垫。避免高压水枪以及压缩空气。

• 根据需要使用溶脂性溶剂清洁 BTS。
10 废弃处理

废弃处理包装
根据当地的规定将包装进行废弃处理。

工作液的废弃处理
废弃处理工作液时，请恪守相应的法律法规及制造商或供应商的规定。

清理 BTS
请根据当地的规定清理 BTS。

参考下表中废弃处理使用的材料和原料的特殊提示:

<table>
<thead>
<tr>
<th>材料</th>
<th>再利用</th>
<th>剩余垃圾</th>
<th>特殊垃圾</th>
</tr>
</thead>
<tbody>
<tr>
<td>金属</td>
<td>X</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>电缆</td>
<td>X</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>密封件</td>
<td>–</td>
<td>X</td>
<td>–</td>
</tr>
<tr>
<td>塑料</td>
<td>X ¹</td>
<td>(x)</td>
<td>–</td>
</tr>
<tr>
<td>设备</td>
<td>–</td>
<td>–</td>
<td>X ², ³</td>
</tr>
<tr>
<td>包装</td>
<td>X</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

表 11

1) 如可能
2) 按照安全规章和生产规定清理
11 故障 – 解决措施、故障查找

下表可用来迅速查找故障或问题原因，并根据需要，采取相应措施。

<table>
<thead>
<tr>
<th>运行故障</th>
<th>可能的原因</th>
<th>补救</th>
<th>参见</th>
</tr>
</thead>
<tbody>
<tr>
<td>计算器不显示。</td>
<td>在计算器上没有电源电压。</td>
<td>施加电源电压。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td></td>
<td>计算器损坏。</td>
<td>更换计算器。</td>
<td></td>
</tr>
<tr>
<td>通电后无法触发起动延时</td>
<td>去除了计算器上端子 3 和 2 之间的电桥。</td>
<td>插入电桥。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td>外部信号无法触发起动延时</td>
<td>未去除计算器上端子 3 和 2 之间的电桥。</td>
<td>去除电桥。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td></td>
<td>外部触发信号过短。</td>
<td>至少在起动延时时间内提供触发信号。</td>
<td></td>
</tr>
</tbody>
</table>
### 运行故障

<table>
<thead>
<tr>
<th>可能的原因</th>
<th>补救</th>
<th>参见</th>
</tr>
</thead>
<tbody>
<tr>
<td>计算器上的显示：</td>
<td>电子装置故障。</td>
<td>断开并重新接通电源电压。</td>
</tr>
<tr>
<td>在断开和重新接通之后重新出现显示。</td>
<td>计算器损坏。</td>
<td>更换计算器。</td>
</tr>
<tr>
<td>在起动延时时间结束之后，始终显示超温（），尽管不存在超温。</td>
<td>起动延时时间选择得过短。</td>
<td>起动延时时间过后，带开关元件的液力偶合器的转速必须明显超过 60 min⁻¹ 相应地提高起动延时时间。</td>
</tr>
<tr>
<td>引发器电级错误。</td>
<td>检查引发器接线。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td>引发器头与开关元件间的距离过大。</td>
<td>将距离设置为 4 ± 1 mm。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td>引发器损坏。</td>
<td>检查引发器，需要时更换。</td>
<td></td>
</tr>
<tr>
<td>开关元件损坏。</td>
<td>检查开关元件，如果需要，进行更换。</td>
<td></td>
</tr>
<tr>
<td>在起动延时时间结束之后，偶尔显示超温（），尽管不存在超温。</td>
<td>引发器头与开关元件间的距离过大。</td>
<td>将距离设置为 4 ± 1 mm。</td>
</tr>
<tr>
<td>引发器的托架不够稳定。通过振动可能出现错误信号。</td>
<td>将托架足够稳定地进行设置。</td>
<td>第 6.4 章</td>
</tr>
<tr>
<td>当起动延时功能激活时，工作液从易熔塞泄漏。</td>
<td>起动延时时间选择得太长。</td>
<td>设一个较短的起动延时时间，这样，当起动延时时间过后，带开关元件的液力偶合器的速度将会明显超过 60 min⁻¹</td>
</tr>
<tr>
<td>起动延时时间过后，工作液从熔断螺栓漏出，BTS 不显示超温。</td>
<td>开关元件和熔断螺栓的额定反应温度不匹配。</td>
<td>请与 Voith 联系。</td>
</tr>
<tr>
<td>开关元件损坏。</td>
<td>检查开关元件，如果需要，进行更换。</td>
<td></td>
</tr>
</tbody>
</table>

如果发生了本表中未列出的故障，请向 Voith 咨询（第 12 章）。

表 12
为更加准确地确定故障原因，可按相应顺序采取以下措施：

<table>
<thead>
<tr>
<th>测量</th>
<th>结果</th>
<th>可能的故障查找</th>
</tr>
</thead>
<tbody>
<tr>
<td>在计算器上施加电源电压。测量 NAMUR 输入端上的无载电压和短路电流。</td>
<td>与以下额定值有明显偏差： - 无载电压： 8.2 V DC  - 短路电流： 6.5 mA</td>
<td>计算器损坏。</td>
</tr>
<tr>
<td>将引发器与计算器相连接。测量未衰减的引发器的电流消耗量。</td>
<td>电流消耗 &gt; 6.0 mA 或 &lt; 2.1 mA</td>
<td>引发器损坏。</td>
</tr>
<tr>
<td>将引发器与计算器相连接。测量已衰减的引发器的电流消耗量。提示：</td>
<td>流量消耗 &gt; 1.2 mA 或 &lt; 0.1 mA</td>
<td>引发器损坏。</td>
</tr>
<tr>
<td>通过比如直接放在引发器前面的金属板使引发器振荡衰减。</td>
<td>电流消耗 &gt; 1.2 mA 和 &lt; 6.0 mA</td>
<td>开关元件损坏。</td>
</tr>
</tbody>
</table>

表 13
12 咨询、安装和备件订购

如需

- 查询
- 委任装配工
- 订购备件
- 调试时

我们需要：

我们需要序列号和采用了 BTS 的液力偶合器的型号名称。

δ 液力偶合器的序列号及型号名称可在液力偶合器的外轮/轴瓦（A）或者在液力偶合器的外缘（B）上找到。

δ 序列号为数字钢印。

δ 如果液力偶合器防爆，在液力偶合器的外围可以找到 CE-Ex 认证防爆标记。

图 12

如果需要预约服务工程师、进行调试或维修，我们额外需要

- 偶合器安装地点，
- 联系人及地址，
- 问题的详细描述。

如果要订购备件，我们还需要

- 备件供货的发运地址。

联系

δ 第 2 页
### 13 备件信息

**提示**

不得擅自进行改动或改造！
不得使用其它制造商的设备或设施进行改造！
未征得 Voith 公司的书面批准就擅自更改或改动会使保修无效！将丧失一般索赔权！
- 只有生产商才能保证专业化的维修！

### 13.1 开关元件

<table>
<thead>
<tr>
<th>BTS 开关元件</th>
<th>密封圈</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>用于液力偶合器尺寸</strong></td>
<td><strong>螺纹尺寸</strong></td>
</tr>
<tr>
<td>206 - 274</td>
<td>M12x1.5</td>
</tr>
<tr>
<td>366 - 650</td>
<td>M18x1.5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>750 - 1330</td>
<td>M24x1.5</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

表 14
### 13.2 引发器、固定法兰

<table>
<thead>
<tr>
<th>引发器的型号</th>
<th>材料号</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ 10–22–N–E93–Y30629–70</td>
<td>TCR. 10678650</td>
</tr>
<tr>
<td>NJ 10–22–N–E93–Y30627–100</td>
<td>TCR. 10678670</td>
</tr>
<tr>
<td>NJ 10–22–N–E93–Y106925</td>
<td>TCR. 11960550</td>
</tr>
<tr>
<td>NJ 10–22–N–E93–Y245590 （新版本, 电缆长度 2 m）¹</td>
<td>201.02171810</td>
</tr>
<tr>
<td>NJ 10–22–N–E93–Y246868 （新版本, 电缆长度 5 m）¹</td>
<td>201.02171910</td>
</tr>
<tr>
<td>NJ 10–22–N–E93–Y246869 （新版本, 电缆长度 10 m）¹</td>
<td>201.02172010</td>
</tr>
<tr>
<td>固定法兰 BF22</td>
<td>TCR. 03668170</td>
</tr>
</tbody>
</table>

表 15

¹ 新版本，允许的环境温度为 -40 °C 至 100 °C。引发器仅在电缆长度上有所不同。

### 13.3 计算器

<table>
<thead>
<tr>
<th>计算器的型号</th>
<th>材料号</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFU8–DW–1. D–Y209869</td>
<td>201.01630810</td>
</tr>
</tbody>
</table>

表 16

### 13.4 绝缘开关放大器

<table>
<thead>
<tr>
<th>绝缘开关放大器型号</th>
<th>材料号</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFA6 – SOT2 / Ex2</td>
<td>TCR. 11952640</td>
</tr>
<tr>
<td>KFD2 – SOT2 / Ex2</td>
<td>TCR. 11975630</td>
</tr>
</tbody>
</table>

表 17
14 附录

14.1 引发器 NJ10–22–N–E93–Y106925

<table>
<thead>
<tr>
<th>部分</th>
<th>内容</th>
<th>Pepperl+Fuchs</th>
</tr>
</thead>
<tbody>
<tr>
<td>操作说明书</td>
<td></td>
<td></td>
</tr>
<tr>
<td>技术参数</td>
<td></td>
<td></td>
</tr>
<tr>
<td>一致性声明</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Instruction manual

Marking

<table>
<thead>
<tr>
<th>Inductive sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E00-Y109925</td>
</tr>
<tr>
<td>116696</td>
</tr>
<tr>
<td>Pepperl+Fuchs GmbH</td>
</tr>
<tr>
<td>Lilienthalstraße 200, 68307 Mannheim, Germany</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range of application</th>
<th>Certification</th>
<th>Group, category, type of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX 2G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>6II 2G Ex ia IIC T6…T1 Gb</td>
</tr>
<tr>
<td>ATEX 1D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>6II 1D Ex iaD 20 T85 °C (185 °F)</td>
</tr>
</tbody>
</table>

Validity

Specific processes and instructions in this document require special precautions to guarantee the safety of the operating personnel.

Target group, personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator. Mounting, installation, commissioning, operation, maintenance and disassembly of any devices may only be carried out by trained, qualified personnel. The instruction manual must be read and understood.

Reference to further documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas. The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com. Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

Intended use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Range of application

Manual electrical apparatus for hazardous areas

Range of application 1D
for use in hazardous areas with combustible dust

Range of application 2G
for use in hazardous areas with gas, vapour and mist

Improper use

Protection of the personnel and the plant is not ensured if the product is not being used according to its intended use.

Mounting and installation

Prior to mounting, installation and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual. Mount the device so that it is not exposed to any mechanical hazard. For example, mount the device in a protective housing.

Range of application 1D

Electrostatic charge
The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Range of application 2G

Protection from mechanical danger
When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Operation, maintenance, repair

The device must not be repaired, changed or manipulated. In the event of a fault, always return the device to Pepperl+Fuchs. If there is a defect, the device must always be replaced with an original device from Pepperl+Fuchs.

Delivery, transport, disposal

Check the packaging and contents for damage. Check if you have received every item and if the items received are the ones you ordered. Keep the original packaging. Always store and transport the device in the original packaging. Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered. Disposing of device, packaging material, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
## Technical Data

### General specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching function</td>
<td>Normally closed (NC)</td>
</tr>
<tr>
<td>Output type</td>
<td>NAMUR</td>
</tr>
<tr>
<td>Rated operating distance $s_r$</td>
<td>10 mm</td>
</tr>
<tr>
<td>Installation</td>
<td>non-flush</td>
</tr>
<tr>
<td>Assured operating distance $s_a$</td>
<td>0 – 10 mm</td>
</tr>
</tbody>
</table>

### Nominal ratings

<table>
<thead>
<tr>
<th>Rating</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage $U_0$</td>
<td>8 V</td>
</tr>
<tr>
<td>Switching frequency $f$</td>
<td>0 – 1000 Hz</td>
</tr>
<tr>
<td>Hysteresis $H$</td>
<td>typ. 5 %</td>
</tr>
<tr>
<td>Current consumption</td>
<td></td>
</tr>
<tr>
<td>Measuring plate not detected $I_{nc}$</td>
<td>≥ 3 mA</td>
</tr>
<tr>
<td>Measuring plate detected</td>
<td>≤ 1 mA</td>
</tr>
</tbody>
</table>

### Ambient conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-40 ... 70 °C (-40 ... 158 °F)</td>
</tr>
</tbody>
</table>

### Mechanical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection type</td>
<td>cable silicone , 2 m</td>
</tr>
<tr>
<td>Core cross-section</td>
<td>0.75 mm²</td>
</tr>
<tr>
<td>Housing material</td>
<td>PBT</td>
</tr>
<tr>
<td>Sensing face</td>
<td>PBT</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP68</td>
</tr>
<tr>
<td>Bending radius</td>
<td>&gt; 10 x cable diameter</td>
</tr>
</tbody>
</table>

### General Information

| Use in the hazardous area    | see instruction manuals |
| Category                     | 2G, 1D               |

### Compliance with standards and directives

**NAMUR**
- EN 60947-5-6:2000
- IEC 60947-5-6:1999

**Standards**
- EN 60947-5-2:2007
- IEC 60947-5-2:2007

### Approvals and certificates

<table>
<thead>
<tr>
<th>UL approval</th>
<th>c/ULus Listed, General Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA approval</td>
<td>cCSAus Listed, General Purpose</td>
</tr>
</tbody>
</table>

## Dimensions

- Turbo coupling
- Initiator embeddable with mounting flange
- In this area no metal parts

## Electrical Connection
Equipment protection level Gb

Instruction

Device category 2G
EC-Type Examination Certificate
CE marking

ATEX marking

Standards

Appropriate type
Effective internal inductivity $C_i$
Effective internal inductance $L_i$
General

Manual electrical apparatus for hazardous areas

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

II 2G Ex ia IIC T6... T1 Gb

EN 60079-0:2012, EN 60079-11:2012
Ignition protection "Intrinsic safety"

Use is restricted to the following stated conditions
NJ 10-22-N...

$\leq 130$ nF; a cable length of 10 m is considered.

$\leq 100$ mH; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-type examination certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The use in ambient temperatures of $>60$ °C was tested with regard to hot surfaces by the mentioned certification authority.

If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.

The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.

Installation, commissioning

Laws and/or regulations and standards governing the use or intended usage must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

Special conditions

Protection from mechanical danger

When used in the temperature range below $-20$ °C the sensor should be protected from knocks by the provision of an additional housing.
Equipment protection level Da

Instruction

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

ZELM 03 ATEX 0128 X

C E 0128

ATEX marking

II 1D Ex iaD 20 T 85 °C (185 °F)

Standards

IEC 61241-11:2002; draft prEN91241-0:2002

type of protection intrinsic safety “ID”

Use is restricted to the following stated conditions:

NJ 10-22-N-E93-Y106925

Appropriate type

NJ 10-22-N-E93-Y106925

Effective internal inductivity

≤ 130 nF; a cable length of 10 m is considered.

Effective internal inductance

≤ 100 nH; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU-type examination certificate has to be observed.

The special conditions must be adhered to!

Maximum housing surface temperature

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

Installation, commissioning

Laws and/or regulations and standards governing the use or intended usage of apparatus must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy at least the requirements of category ia IIb or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met. The intrinsically safe circuit has to be protected against influences due to lightning.

When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

Special conditions

Electrostatic charge

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Inductive sensor

NJ10-22-N-E93-Y106925
EU-Declaration of conformity

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y106925</td>
<td>116696</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30627</td>
<td>116697</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30629</td>
<td>116698</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y52737</td>
<td>116699</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoHS 2011/65/EU (L174/88–110)</td>
<td>EN 50581:2012-09</td>
</tr>
</tbody>
</table>

Affixed CE Marking / Angebrachte CE-Kennzeichnung

<table>
<thead>
<tr>
<th>Key for Issuer ID / Schlüssel zur Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
</tr>
<tr>
<td>0820</td>
</tr>
<tr>
<td>0102</td>
</tr>
</tbody>
</table>

Pepperl+Fuchs GmbH declares that the products are only affected by minor or formal changes with respect to the new edition of the standards. These changes are not relevant for compliance with the essential health and safety requirements. The products still comply with the ATEX Directive. This declaration is also valid if the marking and the certificates of the listed devices correspond to previous editions of standards.


ANNEX ATEX
Notified Body QM-System / Notizierte Stelle des QM-Systems
Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Marking / Kennzeichnung</th>
<th>Certificate / Zertifikat</th>
<th>Issuer ID / Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 2 G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>0102</td>
</tr>
<tr>
<td>II 1 D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>0820</td>
</tr>
</tbody>
</table>

Signatures / Unterschriften

Mannheim, 2017-04-11

ppa. Wolfgang Helm
Global Product Manager
14. 2 引发器 NJ10–22–N–E93–Y30627

操作说明书
技术参数
一致性声明

Pepperl+Fuchs
Pepperl+Fuchs
Pepperl+Fuchs
Instruction manual

Marking

<table>
<thead>
<tr>
<th>Inductive sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y3087</td>
</tr>
<tr>
<td>116697</td>
</tr>
<tr>
<td>Pepperl+Fuchs GmbH</td>
</tr>
<tr>
<td>Lilienthalstraße 200, 68307 Mannheim, Germany</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range of application</th>
<th>Certification</th>
<th>Group, category, type of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX 2G</td>
<td>PTB 09 ATEX 2048 X</td>
<td>Il II 2G Ex ia IIC T6...T1 Gb</td>
</tr>
<tr>
<td>ATEX 1D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>Il II 1D Ex iaD 20 T 108 °C (226.4 °F)</td>
</tr>
</tbody>
</table>

Validity
Specific processes and instructions in this document require special precautions to guarantee the safety of the operating personnel.

Target group, personnel
Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.
Mounting, installation, commissioning, operation, maintenance and disassembly of any devices may only be carried out by trained, qualified personnel. The instruction manual must be read and understood.

Reference to further documentation
Observe laws, standards, and directives applicable to the intended use and the operating location.
Observe Directive 1999/92/EC in relation to hazardous areas.
The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable (see datasheet) are an integral part of this document.
You can find this information under www.pepperl-fuchs.com.
Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

Intended use
The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Range of application
Manual electrical apparatus for hazardous areas

Range of application 1D
for use in hazardous areas with combustible dust

Range of application 2G
for use in hazardous areas with gas, vapour and mist

Improper use
Protection of the personnel and the plant is not ensured if the product is not being used according to its intended use.

Mounting and installation
Prior to mounting, installation and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.
Mount the device so that it is not exposed to any mechanical hazard. For example, mount the device in a protective housing.

Range of application 1D

Electrostatic charge
The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Range of application 2G

Protection from mechanical danger
When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Operation, maintenance, repair
The device must not be repaired, changed or manipulated.
In the event of a fault, always return the device to Pepperl+Fuchs.
If there is a defect, the device must always be replaced with an original device from Pepperl+Fuchs.

Delivery, transport, disposal
Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Keep the original packaging. Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.
Disposing of device, packaging material, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
**Technical Data**

**General specifications**
- Switching function: Normally closed (NC)
- Output type: NAMUR
- Rated operating distance $s_1$: 10 mm
- Installation: non-flush
- Assured operating distance $s_2$: 0 ... 9 mm

**Nominal ratings**
- Nominal voltage $U_0$: 8 V
- Switching frequency $f$: 0 ... 1300 Hz
- Hysteresis $H$: typ. 5 %
- Current consumption
  - Measuring plate not detected: ≥ 3 mA
  - Measuring plate detected: ≤ 1 mA

**Ambient conditions**
- Ambient temperature: -25 ... 100 °C (-13 ... 212 °F)

**Mechanical specifications**
- Connection type: cable silicone , 2 m
- Core cross-section: 0.75 mm²
- Housing material: PBT
- Sensing face: PBT
- Degree of protection: IP68
- Cable Bending radius: > 10 x cable diameter

**General information**
- Use in the hazardous area: see instruction manuals
- Category: 2G; 1D

**Compliance with standards and directives**
- Standard conformity
  - NAMUR: EN 60947-5-6:2000
  - IEC 60947-5-6:1999
- Standards
  - EN 60947-5-2:2007
  - IEC 60947-5-2:2007

**Approvals and certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**

**Electrical Connection**
## Inductive sensor

**NJ10-22-N-E93-Y30627**

<table>
<thead>
<tr>
<th>Equipment protection level Gb</th>
<th>Manual electrical apparatus for hazardous areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Instruction</strong></td>
<td>for use in hazardous areas with gas, vapour and mist</td>
</tr>
<tr>
<td><strong>Device category 2G</strong></td>
<td>PTB 00 ATEX 2048 X</td>
</tr>
<tr>
<td>EC-Type Examination Certificate</td>
<td>C EEx112</td>
</tr>
<tr>
<td>ATEX marking</td>
<td>II 2G Ex ia IIC T6... T1 Gb</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60079-0:2012, EN 60079-11:2012</td>
</tr>
<tr>
<td>Appropriate type</td>
<td>ignition protection &quot;Intrinsic safety&quot;</td>
</tr>
<tr>
<td>Effective internal inductivity</td>
<td>Uses is restricted to the following stated conditions</td>
</tr>
<tr>
<td>Effective internal inductance</td>
<td>NJ 10-22-N...</td>
</tr>
<tr>
<td>General</td>
<td>≤ 130 nF; a cable length of 10 m is considered.</td>
</tr>
<tr>
<td></td>
<td>≤ 100 μH; a cable length of 10 m is considered.</td>
</tr>
<tr>
<td></td>
<td>The apparatus has to be operated according to the appropriate data in the data sheet</td>
</tr>
<tr>
<td></td>
<td>and in this instruction manual. The EU-type examination certificate has to be</td>
</tr>
<tr>
<td></td>
<td>observed. The special conditions must be adhered to!</td>
</tr>
<tr>
<td></td>
<td>The ATEX directive and therefore the EU-type examination certificates apply in general</td>
</tr>
<tr>
<td></td>
<td>only to the use of electrical apparatus under atmospheric conditions.</td>
</tr>
<tr>
<td></td>
<td>The use in ambient temperatures of &gt; 60 °C was tested with regard to hot surfaces</td>
</tr>
<tr>
<td>Maximum permissible ambient temperature $T_{\text{med}}$</td>
<td>by the mentioned certification authority.</td>
</tr>
<tr>
<td>Installation, commissioning</td>
<td>If the equipment is not used under atmospheric conditions, a reduction of the permissible</td>
</tr>
<tr>
<td></td>
<td>minimum ignition energies may have to be taken into consideration.</td>
</tr>
<tr>
<td></td>
<td>The temperature ranges, according to temperature class, are given in the EC-Type</td>
</tr>
<tr>
<td></td>
<td>Examination Certificate.</td>
</tr>
<tr>
<td></td>
<td>Laws and/or regulations and standards governing the use or intended usage goal</td>
</tr>
<tr>
<td>Maintenance</td>
<td>must be observed. The intrinsic safety is only assured in connection with an appro-</td>
</tr>
<tr>
<td>Special conditions</td>
<td>priate related apparatus and according to the proof of intrinsic safety.</td>
</tr>
<tr>
<td>Protection from mechanical danger</td>
<td>No changes can be made to apparatus, which are operated in hazardous areas.</td>
</tr>
<tr>
<td></td>
<td>Repairs to these apparatus are not possible.</td>
</tr>
<tr>
<td></td>
<td>When used in the temperature range below -20 °C the sensor should be protected</td>
</tr>
<tr>
<td></td>
<td>from knocks by the provision of an additional housing.</td>
</tr>
</tbody>
</table>
Inductive sensor

Equipment protection level Da

Instruction

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust
ZELM 03 ATEX 0128 X

II 1D Ex iaD 20 T 108 °C (226.4 °F)

CE marking

ATEX marking

IEC 61241-11:2002; draft prEN61241-0:2002

Type of protection intrinsic safety “ID”

Use is restricted to the following stated conditions

NJ 10-22-N...

Effective internal inductivity \( C_i \)

≤ 130 nF; a cable length of 10 m is considered.

Effective internal inductance \( L_i \)

≤ 100 \( \mu \)H; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet

The EU-type examination certificate has to be observed.

The special conditions must be adhered to!

Maximum housing surface temperature

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

Installation, commissioning

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy at least the requirements of category IIA or IIB. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met. The intrinsically safe circuit has to be protected against influences due to lightning.

When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 und Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way, that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

Special conditions

Electrostatic charge

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.
Pepperl+Fuchs GmbH
Lilenthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-1582
Date / Datum: 2017-04-11

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

■ Declaration of conformity / Konformitätserklärung

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten genannten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y106925</td>
<td>116696</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30627</td>
<td>116697</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30629</td>
<td>116698</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y52737</td>
<td>116699</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

■ Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive / EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoHS 2011/65/EU (L174/88-110)</td>
<td>EN 50581:2012-09</td>
</tr>
</tbody>
</table>

■ Affixed CE Marking / Angebrachte CE-Kennzeichnung

■ ANNEX ATEX

Notified Body QM-System / Notifizierte Stelle des QM-Systems
Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Marking / Kennzeichnung</th>
<th>Certificate / Zertifikat</th>
<th>Issuer ID / Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 2 G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>0102</td>
</tr>
<tr>
<td>II 1 D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>0820</td>
</tr>
</tbody>
</table>

Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
<tbody>
<tr>
<td>0820</td>
<td>ZELM ex Siekgraben 56 38124 Braunschweig Germany</td>
</tr>
<tr>
<td>0102</td>
<td>Physikalisch Technische Bundesanstalt Bundesallee 100 38116 Braunschweig Germany</td>
</tr>
</tbody>
</table>

Pepperl+Fuchs GmbH declares that the products are only affected by minor or formal changes with respect to the new edition of the standards. These changes are not relevant for compliance with the essential health and safety requirements. The products still comply with the ATEX Directive. This declaration is also valid if the marking and the certificates of the listed devices correspond to previous editions of standards. Die Pepperl+Fuchs GmbH erklärt hiermit, dass die Produkte nur von kleineren oder formalen Änderungen in Bezug auf die neue Ausgabe der Normen betroffen sind. Diese Änderungen sind nicht relevant für die Konformität mit den wesentlichen Gesundheits- und Sicherheitsanforderungen. Die Produkte erfüllen nach wie vor die ATEX-Richtlinie. Diese Erklärung gilt auch, wenn die Kennzeichnung und die Zertifikate der aufgeführten Geräte vorangegangenen Normenständen entsprechen.

Signature / Unterschriften

Mannheim, 2017-04-11

ppa. Wolfgang Helm i.v. Tobias Dittmer
Director Business Unit Sensors Global Product Manager
14.3 引发器 NJ10-22-N-E93-Y30629

操作说明书
技术参数
一致性声明

Pepperl+Fuchs
Pepperl+Fuchs
Pepperl+Fuchs
Instruction manual

Marking

<table>
<thead>
<tr>
<th>Inductive sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y30529</td>
</tr>
<tr>
<td>116698</td>
</tr>
<tr>
<td>Pepperl+Fuchs GmbH</td>
</tr>
<tr>
<td>Lilenthalstraße 200, 68307 Mannheim, Germany</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Range of application</th>
<th>Certification</th>
<th>Group, category, type of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX 2G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>6II 2G Ex ia IIC T6...T1 Gb</td>
</tr>
<tr>
<td>ATEX 1D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>6II 1D Ex iaD 20 T 85 °C (185 °F)</td>
</tr>
</tbody>
</table>

Validity

Specific processes and instructions in this document require special precautions to guarantee the safety of the operating personnel.

Target group, personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.
Mounting, installation, commissioning, operation, maintenance and disassembly of any devices may only be carried out by trained, qualified personnel. The instruction manual must be read and understood.

Reference to further documentation

Observe laws, standards, and directives applicable to the intended use and the operating location.
Observe Directive 1999/92/EC in relation to hazardous areas.
The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable (see datasheet) are an integral part of this document.
You can find this information under www.pepperl-fuchs.com.
Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

Intended use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Range of application

Manual electrical apparatus for hazardous areas

Range of application 1D
for use in hazardous areas with combustible dust

Range of application 2G
for use in hazardous areas with gas, vapour and mist

Improper use

Protection of the personnel and the plant is not ensured if the product is not being used according to its intended use.

Mounting and installation

Prior to mounting, installation and commissioning of the device you should make yourself familiar with the device and carefully read the instruction manual.
Mount the device so that it is not exposed to any mechanical hazard. For example, mount the device in a protective housing.

Range of application 1D

Electrostatic charge
The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.

Range of application 2G

Protection from mechanical danger
When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.

Operation, maintenance, repair

The device must not be repaired, changed or manipulated.
In the event of a fault, always return the device to Pepperl+Fuchs.
If there is a defect, the device must always be replaced with an original device from Pepperl+Fuchs.

Delivery, transport, disposal

Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Keep the original packaging. Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.
Disposing of device, packaging material, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
Technical Data

General specifications
- Switching function: Normally closed (NC)
- Output type: 2 wire analog output
- Rated operating distance: 10 mm
- Installation: non-flush
- Assured operating distance: ≤ 10 mm

Nominal ratings
- Nominal voltage: $U_o = 8 \, \text{V}$
- Switching frequency: $f = 0 \ldots 1500 \, \text{Hz}$
- Hysteresis: $H = \text{typ. 5\%}$
- Current consumption: $I_E \geq 3 \, \text{mA}$
- Measuring plate not detected: $I_E \leq 1 \, \text{mA}$

Functional safety related parameters
- $MTTF_d = 11260 \, \text{a}$
- Mission Time ($T_M$): 20 a
- Diagnostic Coverage (DC): 0 %

Ambient conditions
- Ambient temperature: $-25 \ldots 70 \, ^\circ\text{C} (-13 \ldots 158 \, ^\circ\text{F})$

Mechanical specifications
- Connection type: cable PVC, 2 m
- Core cross-section: 0.75 mm$^2$
- Housing material: PBT
- Sensing face: PBT
- Degree of protection: IP68
- Cable: $\geq 10 \times$ cable diameter

General information
- Use in the hazardous area: see instruction manuals
- Category: 2G; 1D

Compliance with standards and directives
- Standard conformity: EN 60947-5-6:2000

Approvals and certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions

Electrical Connection

![Diagram of electrical connection](image-url)
## Equipment protection level Gb

**Instruction**

**Device category 2G**

EC-Type Examination Certificate

**ATEX marking**

Standards

**Appropriate type**

Effective internal inductivity $C_i$

Effective internal inductance $L_i$

**General**

Maximum permissible ambient temperature $T_{amb}$

**Installation, commissioning**

Laws and/or regulations and standards governing the use or intended usage must be observed. The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

**Maintenance**

No changes can be made to apparatus, which are operated in hazardous areas. Repairs to these apparatus are not possible.

**Special conditions**

Protection from mechanical danger

---

**Manual electrical apparatus for hazardous areas**

for use in hazardous areas with gas, vapour and mist

PTB 00 ATEX 2048 X

EC Ex i a IIC T6...T1 Gb

EN 60079-0:2012, EN 60079-11:2012

Ignition protection “Intrinsic safety”

Use is restricted to the following stated conditions

NJ 10-22-N...

$\leq 130 \text{ nF}$; a cable length of 10 m is considered.

$\leq 100 \text{ mm}$; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual. The EU-type examination certificate has to be observed. The special conditions must be adhered to!

The ATEX directive and therefore the EU-type examination certificates apply in general only to the use of electrical apparatus under atmospheric conditions.

The use in ambient temperatures of $\leq 60$ °C was tested with regard to hot surfaces by the mentioned certification authority.

If the equipment is not used under atmospheric conditions, a reduction of the permissible minimum ignition energies may have to be taken into consideration.

The temperature ranges, according to temperature class, are given in the EC-Type Examination Certificate.

When used in the temperature range below -20 °C the sensor should be protected from knocks by the provision of an additional housing.
Inductive sensor

NJ10-22-N-E93-Y30629

Equipment protection level Da

Instruction

Manual electrical apparatus for hazardous areas

for use in hazardous areas with combustible dust

ZELM 03 ATEX 0128 X

ATEX marking

II 1D Ex iaD 20 T 85 °C (185 °F)

EC-Type Examination Certificate

CE marking

IEC 61241-11:2002; draft prEN61241-0:2002

type of protection intrinsic safety “ID”

Use is restricted to the following stated conditions

NJ 10-22-N-E93-Y30629

Appropriate type

NJ 10-22-N-E93-Y30629

Effective internal inductivity  C_i

≤ 130 nF; a cable length of 10 m is considered.

Effective internal inductance  L_i

≤ 100 uH; a cable length of 10 m is considered.

The apparatus has to be operated according to the appropriate data in the data sheet and in this instruction manual.

The EU-type examination certificate has to be observed.

The special conditions must be adhered to!

Maximum housing surface temperature

The maximum surface temperature of the housing is given in the EC-Type Examination Certificate.

Installation, commissioning

Laws and/or regulations and standards governing the use or intended usage goal must be observed.

The intrinsic safety is only assured in connection with an appropriate related apparatus and according to the proof of intrinsic safety.

The associated apparatus must satisfy at least the requirements of category ia IIB or iaD. Because of the possibility of the danger of ignition, which can arise due to faults and/or transient currents in the equipotential bonding system, galvanic isolation in the power supply and signal circuits is preferable. Associated apparatus without electrical isolation must only be used if the appropriate requirements of IEC 60079-14 are met.

The intrinsically safe circuit has to be protected against influences due to lightning. When used in the isolating wall between Zone 20 and Zone 21 or Zone 21 and Zone 22 the sensor must not be exposed to any mechanical danger and must be sealed in such a way that the protective function of the isolating wall is not impaired. The applicable directives and standards must be observed.

Maintenance

No changes can be made to apparatus, which are operated in hazardous areas.

Repairs to these apparatus are not possible.

Special conditions

Electrostatic charge

The connection cables are to be laid in accordance with EN 50281-1-2 and must not normally be subjected to chaffing during use.
EU-Declaration of conformity
EU-Konformitätserklärung

Pepperl+Fuchs GmbH
Lilentialstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-1582
Date / Datum: 2017-04-11

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

Declaration of conformity / Konformitätserklärung

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiner Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y106925</td>
<td>116696</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30627</td>
<td>116697</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y30629</td>
<td>116698</td>
<td>Inductive sensor</td>
</tr>
<tr>
<td>NJ10-22-N-E93-Y52737</td>
<td>116699</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive / EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
</table>
| ATEX 2014/34/EU (L96/309-356) | EN 60079-0/A11:2013-11
EN 60079-0:2012-08
EN 60079-11:2012-01
prEN 61241-0:2002-04 |
| EMC 2014/30/EU (L96/79-106) | EN 60947-5-2/A1:2012-11
EN 60947-5-2:2007-12
EN 60947-5-6:2000-01 |
| RoHS 2011/65/EU (L174/88-110) | EN 50581:2012-09 |

Affixed CE Marking / Angebrachte CE-Kennzeichnung

0102

Signatures / Unterschriften

Mannheim, 2017-04-11

ppa. Wolfgang Helm
Global Product Manager

ANNEX ATEX

Notified Body QM-System / Notifizierte Stelle des QM-Systems
Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Marking Kennzeichnung</th>
<th>Certificate Zertifikat</th>
<th>Issuer ID Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 2 G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>0102</td>
</tr>
<tr>
<td>II 1 D</td>
<td>ZELM 03 ATEX 0128 X</td>
<td>0820</td>
</tr>
</tbody>
</table>

Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
</table>
| 0820 | ZELM ex
Siekgraben 56
38124 Braunschweig
Germany |
| 0102 | Physikalisch Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
Germany |

Pepperl+Fuchs GmbH declares that the products are only affected by minor or formal changes with respect to the new edition of the standards. These changes are not relevant for compliance with the essential health and safety requirements. The products still comply with the ATEX Directive. This declaration is also valid if the marking and the certificates of the listed devices correspond to previous editions of standards. Die Pepperl+Fuchs GmbH erklärt hiermit, dass die Produkte nur von kleineren oder formalen Änderungen in Bezug auf die neue Ausgabe der Normen betroffen sind. Diese Änderungen sind nicht relevant für die Konformität mit den wesentlichen Gesundheits- und Sicherheitsanforderungen. Die Produkte erfüllen nach wie vor die ATEX-Richtlinie. Diese Erklärung gilt auch, wenn die Kennzeichnung und die Zertifikate der aufgeführten Geräte vorangegangenen Normenständen entsprechen.
14.4 引发器 NJ10-22-N-E93-Y245590

操作说明书
技术参数
一致性声明

Pepperl+Fuchs
Pepperl+Fuchs
Pepperl+Fuchs
Instruction Manual

1. Marking

Inductive sensor
NJ10-22-N-E93-Y245590

- Equipment protection level: Gb
  - ATEX certificate: PTB 00 ATEX 2048 X
  - ATEX marking: II 2G Ex ia IIC T6...
  - IECEx certificate: IECEx PTB 11.0037X
  - IECEx marking: Ex ib IIC T6

- Equipment protection level: Da
  - ATEX certificate: PTB 00 ATEX 2048 X
  - ATEX marking: II 1D Ex ia IIC T135°CDa

- Equipment protection level: Mb
  - IECEx certificate: IECEx PTB 11.0037X
  - IECEx marking: Ex ia I

Pepperl+Fuchs GmbH
Lilienthalstraße 200, 68307 Mannheim, Germany

2. Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

3. Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

4. Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

5. Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Technical data provided in the datasheet may be partly restrained by the information given in this instruction manual.

Use the device only within the specified ambient and operating conditions. The device is an electrical apparatus for hazardous areas.

The device can be used in hazardous areas containing gas, vapor, and mist.

The device can be used in hazardous areas containing combustible dust.

The device can be used in underground parts of mines as well as those parts of surface installations of such mines containing firedamp and/or combustible dust.

The certificate applies only to the use of apparatus under atmospheric conditions.

If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.

5.1. Requirements for Equipment Protection Level Gb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.2. Requirements for Equipment Protection Level Da

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.3. Requirements for Equipment Protection Level Mb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

6. Improper Use

Protection of the personnel and the plant is not ensured if the device is not used according to its intended use.

7. Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14.

Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Attach the nameplate supplied in the immediate vicinity of the device. Attach the nameplate so that it is legible and indelible. Take the ambient conditions into account.

Do not mount a damaged or polluted device.

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

If you use the device in environments subject to adverse conditions, you must protect the device accordingly.

Do not remove the warning markings.

7.1. Requirements for Usage as Intrinsically Safe Apparatus

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

The type of protection is determined by the connected intrinsically safe circuit.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

7.2. Special Conditions

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

7.2.1. Requirements in Relation to Electrostatics

Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

7.2.1.1. Requirements for Equipment Protection Level Da

Avoid electrostatic charges which could result in electrostatic discharges while installing or operating the device.

Do not mount the supplied nameplate in areas that can be electrostatically charged.

7.2.2. Requirements to Mechanics

7.2.2.1. Requirements for Usage as Intrinsically Safe Apparatus

Protect the device from impact effects by mounting in a surrounding enclosure if it is used in the temperature range between the minimum permissible ambient temperature and -20 °C.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

8. Operation, Maintenance, Repair

Observe the special conditions.

Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Do not use a damaged or polluted device.

Do not repair, modify, or manipulate the device.

Modifications are permitted only if approved in this instruction manual.

If there is a defect, always replace the device with an original device.

Do not remove the warning markings.

8.1. Requirements for Usage as Intrinsically Safe Apparatus

Only operate the device with intrinsically safe circuits according to IEC/EN 60079-11.

The type of protection is determined by the connected intrinsically safe circuit.

8.2. Requirements for Equipment Protection Level Gb

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

8.3. Requirements for Equipment Protection Level Da

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.
8.4. Requirements for Equipment Protection Level Mb

Observe the temperature table for the corresponding equipment protection level in the certificate.
Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

9. Delivery, Transport, Disposal

Check the packaging and contents for damage. Check if you have received every item and if the items received are the ones you ordered.
Keep the original packaging. Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.
Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
Model Number
NJ10-22-N-E93-Y245590

Features
- Comfort series
- 10 mm non-flush

Technical Data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operating distance $s_n$</td>
</tr>
<tr>
<td>Installation</td>
</tr>
<tr>
<td>Output polarity</td>
</tr>
<tr>
<td>Assured operating distance $s_a$</td>
</tr>
<tr>
<td>Output type</td>
</tr>
<tr>
<td>Nominal ratings</td>
</tr>
<tr>
<td>Nominal voltage $U_0$ 8 V</td>
</tr>
<tr>
<td>Switching frequency $f$ 0 ... 1000 Hz</td>
</tr>
<tr>
<td>Hysteresis typ. 5 %</td>
</tr>
<tr>
<td>Current consumption</td>
</tr>
<tr>
<td>Measuring plate not detected $\geq 3 mA$</td>
</tr>
<tr>
<td>Measuring plate detected $\leq 1 mA$</td>
</tr>
</tbody>
</table>

Ambient conditions
-40 ... 100 °C (-40 ... 212 °F)
Also observe the maximum permissible ambient temperature stated in the data for application in connection with hazardous areas. Keep to the lower of the two values.

Mechanical specifications
- Connection type cable silicone , 2 m
- Core cross-section 0.75 mm²
- Housing material PBT
- Sensing face PBT
- Degree of protection IP68
- Cable Bending radius $> 10 \times$ cable diameter

General information
Use in the hazardous area see instruction manuals
Compliance with standards and directives
- Standard conformity NAMUR EN 60947-5-6:2000 IEC 60947-5-6:1999

Approvals and certificates
- EAC conformity TR CU 012/2011
- UL approval cULus Listed, General Purpose

Dimensions

Electrical Connection
Inductive sensor
NJ10-22-N-E93-Y245590

Release date: 2017-12-13 09:46  Date of issue: 2017-12-13 245590_eng.xml

Data for application in connection with hazardous areas

<table>
<thead>
<tr>
<th>Equipment protection level</th>
<th>Gb , Da , Mb</th>
</tr>
</thead>
</table>

Equipment protection level Gb

Type of protection intrinsic safety
CE marking CE 0102

Certificates
Appropriate type NJ 10-22-N...
ATEX certificate PTB 00 ATEX 2048 X
ATEX marking II 2G Ex ia IIC T6 ... T1 Gb
IECEEx certificate IECEx PTB 11.0037X
IECEEx marking Ex ib IIC T6
Effective internal inductivity $C_i \leq 130 \text{ nF}$
Effective internal inductance $L_i \leq 100 \mu\text{H}$

Maximum permissible ambient temperature $T_{amb}$ Also observe the maximum permissible ambient temperature stated in the general technical data.
Keep to the lower of the two values.

at $U_i = 16 \text{ V} , I_i = 25 \text{ mA} , P_i = 34 \text{ mW}$,
$T_6 : 73 °C (163.4 °F)$
$T_5 : 88 °C (190.4 °F)$
$T_4 : 100 °C (212 °F)$
$T_3 : 100 °C (212 °F)$
$T_2 : 100 °C (212 °F)$
$T_1 : 100 °C (212 °F)$

at $U_i = 16 \text{ V} , I_i = 52 \text{ mA} , P_i = 169 \text{ mW}$,
$T_6 : 69 °C (156.2 °F)$
$T_5 : 84 °C (183.2 °F)$
$T_4 : 100 °C (212 °F)$
$T_3 : 100 °C (212 °F)$
$T_2 : 100 °C (212 °F)$
$T_1 : 100 °C (212 °F)$

at $U_i = 16 \text{ V} , I_i = 76 \text{ mA} , P_i = 242 \text{ mW}$,
$T_6 : 59 °C (138.2 °F)$
$T_5 : 74 °C (165 °F)$
$T_4 : 80 °C (176 °F)$
$T_3 : 80 °C (176 °F)$
$T_2 : 80 °C (176 °F)$
$T_1 : 80 °C (176 °F)$

Equipment protection level Da

Type of protection intrinsic safety
CE marking CE 0102

Certificates
Appropriate type NJ 10-22-N...
ATEX certificate PTB 00 ATEX 2048 X
ATEX marking II 1D Ex ia IIIC T135°C Da
Effective internal inductivity $C_i \leq 130 \text{ nF}$
Effective internal inductance $L_i \leq 100 \mu\text{H}$

Maximum permissible ambient temperature $T_{amb}$ Also observe the maximum permissible ambient temperature stated in the general technical data.
Keep to the lower of the two values.

at $U_i = 16 \text{ V} , I_i = 25 \text{ mA} , P_i = 34 \text{ mW}$,
$T_6 : 100 °C (212 °F)$
$T_5 : 100 °C (212 °F)$
$T_4 : 100 °C (212 °F)$
$T_3 : 100 °C (212 °F)$
$T_2 : 100 °C (212 °F)$
$T_1 : 100 °C (212 °F)$

at $U_i = 16 \text{ V} , I_i = 52 \text{ mA} , P_i = 169 \text{ mW}$,
$T_6 : 80 °C (176 °F)$
$T_5 : 80 °C (176 °F)$
$T_4 : 80 °C (176 °F)$
$T_3 : 80 °C (176 °F)$
$T_2 : 80 °C (176 °F)$
$T_1 : 80 °C (176 °F)$

Equipment protection level Mb

Type of protection intrinsic safety

Certificates
Appropriate type NJ 10-22-N...
IECEEx certificate IECEx PTB 11.0037X
IECEEx marking Ex ia I
Effective internal inductivity $C_i \leq 130 \text{ nF}$
Effective internal inductance $L_i \leq 100 \mu\text{H}$

Maximum permissible ambient temperature $T_{amb}$ Also observe the maximum permissible ambient temperature stated in the general technical data.
Keep to the lower of the two values.

at $U_i = 16 \text{ V} , I_i = 25 \text{ mA} , P_i = 34 \text{ mW}$,
$T_6 : 100 °C (212 °F)$
$T_5 : 100 °C (212 °F)$
$T_4 : 100 °C (212 °F)$
$T_3 : 100 °C (212 °F)$
$T_2 : 100 °C (212 °F)$
$T_1 : 100 °C (212 °F)$

at $U_i = 16 \text{ V} , I_i = 52 \text{ mA} , P_i = 169 \text{ mW}$,
$T_6 : 80 °C (176 °F)$
$T_5 : 80 °C (176 °F)$
$T_4 : 80 °C (176 °F)$
$T_3 : 80 °C (176 °F)$
$T_2 : 80 °C (176 °F)$
$T_1 : 80 °C (176 °F)$
### Inductive sensor

**NJ10-22-N-E93-Y245590**

**Maximum permissible ambient temperature \( T_{\text{amb}} \):** Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values.

- at \( U_i = 16 \text{ V}, I_i = 25 \text{ mA}, P_i = 34 \text{ mW} \): 100 °C (212 °F)
- at \( U_i = 16 \text{ V}, I_i = 25 \text{ mA}, P_i = 64 \text{ mW} \): 100 °C (212 °F)
- at \( U_i = 16 \text{ V}, I_i = 52 \text{ mA}, P_i = 169 \text{ mW} \): 80 °C (176 °F)
- at \( U_i = 16 \text{ V}, I_i = 76 \text{ mA}, P_i = 242 \text{ mW} \): 61 °C (141.8 °F)

Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.

Pepperl+Fuchs Group
USA: +1 330 486 0001
www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com
EU-Declaration of conformity

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y245590</td>
<td>245590</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX 2014/34/EU (L96/309-356)</td>
<td>EN 60079-0:2012-08 EN 60079-11:2012-01</td>
</tr>
</tbody>
</table>

Affixed CE Marking / Angebrachte CE-Kennzeichnung

Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
<tbody>
<tr>
<td>0102</td>
<td>Physikalisch Technische Bundesanstalt Bundesallee 100 38116 Braunschweig Germany</td>
</tr>
</tbody>
</table>

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com
14.5 引发器 NJ10-22-N-E93-Y246868

操作说明书 Pepperl+Fuchs
技术参数 Pepperl+Fuchs
一致性声明 Pepperl+Fuchs
Instruction Manual

1. Marking

Inductive sensor
NJ10-22-N-E93-Y246868

Equipment protection level: Gb
ATEX certificate: PTB 00 ATEX 2048 X
ATEX marking: IIC 2G Ex ia IIC T6...T1 Gb
IECEx certificate: IECEx PTB 11.0037X
IECEx marking: Ex ia IIC T6

Equipment protection level: Da
ATEX certificate: PTB 00 ATEX 2048 X
ATEX marking: II 1D Ex ia IIC T135°C Da

Equipment protection level: Mb
IECEx certificate: IECEx PTB 11.0037X
IECEx marking: Ex ia I

Pepperl+Fuchs GmbH
Lilienthalstraße 200, 68307 Mannheim, Germany

2. Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

3. Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

4. Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

5. Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Technical data provided in the datasheet may be partly restrained by the information given in this instruction manual.

Use the device only within the specified ambient and operating conditions. The device is an electrical apparatus for hazardous areas.

The device can be used in hazardous areas containing gas, vapor, and mist.

The device can be used in hazardous areas containing combustible dust.

The device can be used in underground parts of mines as well as those parts of surface installations of such mines containing firedamp and/or combustible dust.

The certificate applies only to the use of apparatus under atmospheric conditions.

If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.

5.1. Requirements for Equipment Protection Level Gb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.2. Requirements for Equipment Protection Level Da

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.3. Requirements for Equipment Protection Level Mb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

6. Improper Use

Protection of the personnel and the plant is not ensured if the device is not used according to its intended use.

7. Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14. Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Attach the nameplate supplied in the immediate vicinity of the device. Attach the nameplate so that it is legible and indelible. Take the ambient conditions into account.

Do not mount a damaged or polluted device.

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

If you use the device in environments subject to adverse conditions, you must protect the device accordingly.

Do not remove the warning markings.

7.1. Requirements for Usage as Intrinsically Safe Apparatus

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

The type of protection is determined by the connected intrinsically safe circuit.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

7.2. Special Conditions

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

7.2.1. Requirements in Relation to Electrostatics

Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

7.2.1.1. Requirements for Equipment Protection Level Da

Avoid electrostatic charges which could result in electrostatic discharges while installing or operating the device.

Do not mount the supplied nameplate in areas that can be electrostatically charged.

7.2.2. Requirements to Mechanics

7.2.2.1. Requirements for Usage as Intrinsically Safe Apparatus

Protect the device from impact effects by mounting in a surrounding enclosure if it is used in the temperature range between the minimum permissible ambient temperature and -20 °C.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

8. Operation, Maintenance, Repair

Observe the special conditions.

Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Do not use a damaged or polluted device.

Do not repair, modify, or manipulate the device.

Modifications are permitted only if approved in this instruction manual.

If there is a defect, always replace the device with an original device.

Do not remove the warning markings.

8.1. Requirements for Usage as Intrinsically Safe Apparatus

Only operate the device with intrinsically safe circuits according to IEC/EN 60079-11.

The type of protection is determined by the connected intrinsically safe circuit.

8.2. Requirements for Equipment Protection Level Gb

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

8.3. Requirements for Equipment Protection Level Da

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.
8.4. Requirements for Equipment Protection Level Mb

Observe the temperature table for the corresponding equipment protection level in the certificate.
Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

9. Delivery, Transport, Disposal

Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Keep the original packaging. Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.
Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
## Technical Data

### General specifications
- **Rated operating distance** $s_n$: 10 mm
- **Installation**: non-flush
- **Output polarity**: NAMUR
- **Assured operating distance** $s_a$: 0 ... 10 mm
- **Output type**: 2-wire

### Nominal ratings
- **Nominal voltage** $U_o$: 8 V
- **Switching frequency** $f$: 0 ... 1000 Hz
- **Hysteresis** $H$: typ. 5 %

### Current consumption
- Measuring plate not detected: $\geq 3$ mA
- Measuring plate detected: $\leq 1$ mA

### Ambient conditions
- **Ambient temperature**: -40 ... 100 °C (-40 ... 212 °F)
- Also observe the maximum permissible ambient temperature stated in the data for application in connection with hazardous areas. Keep to the lower of the two values.

### Mechanical specifications
- **Connection type**: cable silicone, 5 m
- **Core cross-section**: 0.75 mm$^2$
- **Housing material**: PBT
- **Sensing face**: PBT
- **Degree of protection**: IP68
- **Cable Bending radius**: > 10 x cable diameter

### General information
- Use in the hazardous area: see instruction manuals

### Compliance with standards and directives
- **Standard conformity**: NAMUR EN 60947-5-6:2000
- **Standards**: EN 60947-5-6:1999
- **EN 60947-5-2:2007**
- **EN 60947-5-2/A1:2012**
- **IEC 60947-5-2:2007**
- **IEC 60947-5-2 AMD 1:2012**

### Approvals and certificates
- **EAC conformity**: TR CU 012/2011
- **UL approval**: cULus Listed, General Purpose

### Dimensions

![Dimensions Diagram]

### Electrical Connection

![Electrical Connection Diagram]
# Inductive sensor

**NJ10-22-N-E93-Y246868**

## Data for application in connection with hazardous areas

### Equipment protection level Gb, Da, Mb

<table>
<thead>
<tr>
<th>Type of protection</th>
<th>CE marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>intrinsic safety</td>
<td>☑ 0102</td>
</tr>
</tbody>
</table>

### Certificates

<table>
<thead>
<tr>
<th>Type</th>
<th>Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate type</td>
<td></td>
</tr>
<tr>
<td>ATEX certificate</td>
<td>PTB 00 ATEX 2048 X</td>
</tr>
<tr>
<td>ATEX marking</td>
<td>☑ II 2G Ex ia IIC T6... T1 Gb</td>
</tr>
<tr>
<td>IECEx certificate</td>
<td></td>
</tr>
<tr>
<td>IECEx marking</td>
<td>Ex ib IIC T6</td>
</tr>
</tbody>
</table>

### Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th></th>
</tr>
</thead>
</table>

### Effective internal inductivity $C_i$

\[ C_i \leq 130 \text{ nF} \]

A cable length of 10 m is considered.

### Effective internal inductance $L_i$

\[ L_i \leq 100 \mu\text{H} \]

A cable length of 10 m is considered.

### Maximum permissible ambient temperature $T_{amb}$

Also observe the maximum permissible ambient temperature stated in the general technical data.

Keep to the lower of the two values.

- **Gb**
  - at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$ : $73 \degree \text{C}$ (163.4 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$ : $69 \degree \text{C}$ (156.2 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$ : $78 \degree \text{C}$ (172.4 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$ : $80 \degree \text{C}$ (176 \degree \text{F})

- **Da**
  - at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$ : $78 \degree \text{C}$ (172.4 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$ : $80 \degree \text{C}$ (176 \degree \text{F})

- **Mb**
  - at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$ : $73 \degree \text{C}$ (163.4 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 64 \text{ mW}$ : $70 \degree \text{C}$ (158 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$ : $80 \degree \text{C}$ (176 \degree \text{F})
  - at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$ : $82 \degree \text{C}$ (179.6 \degree \text{F})
<table>
<thead>
<tr>
<th>Maximum permissible ambient temperature $T_{amb}$</th>
<th>Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values.</th>
</tr>
</thead>
<tbody>
<tr>
<td>at $U_i = 16,V$, $I_i = 25,mA$, $P_i = 34,mW$ : $100,°C (212,°F)$</td>
<td></td>
</tr>
<tr>
<td>at $U_i = 16,V$, $I_i = 25,mA$, $P_i = 64,mW$ : $100,°C (212,°F)$</td>
<td></td>
</tr>
<tr>
<td>at $U_i = 16,V$, $I_i = 52,mA$, $P_i = 169,mW$ : $80,°C (176,°F)$</td>
<td></td>
</tr>
<tr>
<td>at $U_i = 16,V$, $I_i = 76,mA$, $P_i = 242,mW$ : $61,°C (141.8,°F)$</td>
<td></td>
</tr>
</tbody>
</table>
EU-Declaration of conformity

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-3336
Date / Datum: 2017-01-26

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y246868</td>
<td>246868</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive / EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
</table>
|                              | EN 60079-0:2012-08
|                              | EN 60079-11:2012-01 |
|                              | EN 60947-5-2:2007-12 |
|                              | EN 60947-5-6:2000-01 |

Affixed CE Marking / Angebrachte CE-Kennzeichnung

Annex ATEX
Notified Body QM-System / Notifizierte Stelle des QM-Systems
Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Marking / Kennzeichnung</th>
<th>Certificate / Zertifikat</th>
<th>Issuer ID / Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 1 G</td>
<td>PTB 00 ATEX 2048 X</td>
<td>0102</td>
</tr>
</tbody>
</table>

Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
</table>
| 0102 | Physikalisch Technische Bundesanstalt
|     | Bundesallee 100
|     | 38116 Braunschweig
|     | Germany |

Signatures / Unterschriften

Mannheim, 2017-01-26

ppa. Wolfgang Helm
Director Business Unit Sensors

i.V. Tobias Dittmer
Global Product Manager
14. 6 引发器 NJ10–22–N–E93–Y246869

操作说明书	Pepperl+Fuchs
技术参数	Pepperl+Fuchs
一致性声明	Pepperl+Fuchs
Instruction Manual

1. Marking

Inductive sensor
NJ10-22-N-E93-Y246869

Equipment protection level: Gb
ATEX certificate: PTB 00 ATEX 2048 X
ATEX marking: II 2G Ex ia IIC T6...

Equipment protection level: Da
ATEX certificate: PTB 00 ATEX 2048 X
ATEX marking: II 1D Ex ia IIC T135°C Da

Equipment protection level: Mb
IECEx certificate: IECEx PTB 11.0037X
IECEx marking: Ex ib IIC T6

2. Validity

Specific processes and instructions in this instruction manual require special provisions to guarantee the safety of the operating personnel.

3. Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

4. Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location. Observe Directive 1999/92/EC in relation to hazardous areas.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

Due to constant revisions, documentation is subject to permanent change. Please refer only to the most up-to-date version, which can be found under www.pepperl-fuchs.com.

5. Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

Technical data provided in the datasheet may be partly restrained by the information given in this instruction manual.

Use the device only within the specified ambient and operating conditions. The device is an electrical apparatus for hazardous areas. The device can be used in hazardous areas containing gas, vapor, and mist.

The device can be used in hazardous areas containing combustible dust. The device can be used in underground parts of mines as well as those parts of surface installations of such mines containing firedamp and/or combustible dust. The certificate applies only to the use of apparatus under atmospheric conditions.

If you use the device outside atmospheric conditions, consider that the permissible safety parameters should be reduced.

5.1. Requirements for Equipment Protection Level Gb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.2. Requirements for Equipment Protection Level Da

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

5.3. Requirements for Equipment Protection Level Mb

Refer to the relevant certificate to see the relationship between the connected circuit type, the maximum permitted ambient temperature, the effective inner reactances, and if applicable the surface temperature or the temperature class.

The suitability for use of the device at ambient temperatures > 60 °C in conjunction with hot surfaces has been checked by the notified body.

6. Improper Use

Protection of the personnel and the plant is not ensured if the device is not used according to its intended use.

7. Mounting and Installation

Observe the installation instructions according to IEC/EN 60079-14. Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Attach the nameplate supplied in the immediate vicinity of the device. Attach the nameplate so that it is legible and indelible. Take the ambient conditions into account.

Do not mount a damaged or polluted device.

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

If you use the device in environments subject to adverse conditions, you must protect the device accordingly.

Do not remove the warning markings.

7.1. Requirements for Usage as Intrinsically Safe Apparatus

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

The type of protection is determined by the connected intrinsically safe circuit.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

7.2. Special Conditions

Mount the device so that it complies with the specified degree of protection according to IEC/EN 60529.

7.2.1. Requirements in Relation to Electrostatics

Information on electrostatic hazards can be found in the technical specification IEC/TS 60079-32-1.

7.2.1.1. Requirements for Equipment Protection Level Da

Avoid electrostatic charges which could result in electrostatic discharges while installing or operating the device.

Do not mount the supplied nameplate in areas that can be electrostatically charged.

7.2.2. Requirements to Mechanics

7.2.2.1. Requirements for Usage as Intrinsically Safe Apparatus

Protect the device from impact effects by mounting in a surrounding enclosure if it is used in the temperature range between the minimum permissible ambient temperature and -20 °C.

Mount the device with at least a degree of protection of IP20 according to IEC/EN 60529.

8. Operation, Maintenance, Repair

Observe the special conditions. Safety-relevant markings are found on the nameplate of the device or the nameplate supplied.

Do not use a damaged or polluted device.

Do not repair, modify, or manipulate the device.

Modifications are permitted only if approved in this instruction manual.

If there is a defect, always replace the device with an original device.

Do not remove the warning markings.

8.1. Requirements for Usage as Intrinsically Safe Apparatus

Only operate the device with intrinsically safe circuits according to IEC/EN 60079-11.

The type of protection is determined by the connected intrinsically safe circuit.

8.2. Requirements for Equipment Protection Level Gb

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

8.3. Requirements for Equipment Protection Level Da

Observe the temperature table for the corresponding equipment protection level in the certificate.

Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.
8.4. Requirements for Equipment Protection Level Mb

Observe the temperature table for the corresponding equipment protection level in the certificate. Also observe the maximum permissible ambient temperature stated in the technical data. Keep to the lower of the two values.

9. Delivery, Transport, Disposal

Check the packaging and contents for damage. Check if you have received every item and if the items received are the ones you ordered. Keep the original packaging. Always store and transport the device in the original packaging. Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet. Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
### Technical Data

#### General specifications
- **Rated operating distance** $s_n$: 10 mm
- **Installation**: non-flush
- **Output polarity**: NAMUR
- **Assured operating distance** $s_a$: 0 ... 10 mm
- **Output type**: 2-wire

#### Nominal ratings
- **Nominal voltage** $U_o$: 8 V
- **Switching frequency**: $f$: 0 ... 1000 Hz
- **Hysteresis**: $H$: typ. 5 \%

#### Current consumption
- When measuring plate not detected: $\geq 3$ mA
- When measuring plate detected: $\leq 1$ mA

#### Ambient conditions
- **Ambient temperature**: -40 ... 100 °C (-40 ... 212 °F)
  - Also observe the maximum permissible ambient temperature stated in the data for application in connection with hazardous areas.
  - Keep to the lower of the two values.

#### Mechanical specifications
- **Connection type**: cable silicone, 10 m
- **Core cross-section**: 0.75 mm²
- **Housing material**: PBT
- **Sensing face**: PBT
- **Degree of protection**: IP68
- **Bending radius**: $> 10 \times$ cable diameter

#### General information
- **Use in the hazardous area**: see instruction manuals

#### Compliance with standards and directives
- **Standard conformity**:
  - NAMUR: EN 60947-5-6:2000
  - IEC 60947-5-6:1999
- **Standards**:
  - EN 60947-5-2:2007
  - EN 60947-5-2/A1:2012
  - IEC 60947-5-2:2007
  - IEC 60947-5-2 AMD 1:2012

#### Approvals and certificates
- **EAC conformity**: TR CU 012/2011
- **UL approval**: cULus Listed, General Purpose

### Dimensions

| Turbo coupling |

### Electrical Connection

<table>
<thead>
<tr>
<th>BN</th>
<th>L+</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU</td>
<td>L-</td>
</tr>
</tbody>
</table>
**Data for application in connection with hazardous areas**

<table>
<thead>
<tr>
<th>Equipment protection level</th>
<th>Gb , Da , Mb</th>
</tr>
</thead>
</table>

**Equipment protection level Gb**

<table>
<thead>
<tr>
<th>Type of protection</th>
<th>intrinsic safety</th>
</tr>
</thead>
</table>

**Certificates**

- **Appropriate type**: NJ 10-22-N...
- **ATEX certificate**: PTB 00 ATEX 2048 X
- **ATEX marking**: II 2G Ex ia IIC T6... T1 Gb
- **IECEx marking**: Ex ib II T6
- **Standards**: IEC 60079-0:2004 , IEC 60079-11:2006

**Effective internal inductivity** \( C_i \) \( \leq 130 \) nF

A cable length of 10 m is considered.

**Maximum permissible ambient temperature** \( T_{amb} \)

Also observe the maximum permissible ambient temperature stated in the general technical data.

Keep to the lower of the two values.

- at \( U_i = 16 \text{ V} , I_i = 25 \text{ mA} , P_i = 34 \text{ mW} , \)
  - \( T_6 : 73 \text{ °C} (163.4 \text{ °F}) \)
  - \( T_5 : 88 \text{ °C} (190.4 \text{ °F}) \)
  - \( T_4 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_3 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_2 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_1 : 100 \text{ °C} (212 \text{ °F}) \)

- at \( U_i = 16 \text{ V} , I_i = 52 \text{ mA} , P_i = 169 \text{ mW} , \)
  - \( T_6 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_5 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_4 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_3 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_2 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_1 : 80 \text{ °C} (176 \text{ °F}) \)

- at \( U_i = 16 \text{ V} , I_i = 76 \text{ mA} , P_i = 242 \text{ mW} , \)
  - \( T_6 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_5 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_4 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_3 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_2 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_1 : 61 \text{ °C} (141.8 \text{ °F}) \)

**Effective internal inductance** \( L_i \) \( \leq 100 \) µH

A cable length of 10 m is considered.

**Equipment protection level Da**

<table>
<thead>
<tr>
<th>Type of protection</th>
<th>intrinsic safety</th>
</tr>
</thead>
</table>

**Certificates**

- **Appropriate type**: NJ 10-22-N...
- **ATEX certificate**: PTB 00 ATEX 2048 X
- **ATEX marking**: II 1D Ex ia IIIC T135°C Da

**Effective internal inductivity** \( C_i \) \( \leq 130 \) nF

A cable length of 10 m is considered.

**Effective internal inductance** \( L_i \) \( \leq 100 \) µH

A cable length of 10 m is considered.

**Maximum permissible ambient temperature** \( T_{amb} \)

Also observe the maximum permissible ambient temperature stated in the general technical data.

Keep to the lower of the two values.

- at \( U_i = 16 \text{ V} , I_i = 25 \text{ mA} , P_i = 34 \text{ mW} , \)
  - \( T_6 : 73 \text{ °C} (163.4 \text{ °F}) \)
  - \( T_5 : 88 \text{ °C} (190.4 \text{ °F}) \)
  - \( T_4 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_3 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_2 : 100 \text{ °C} (212 \text{ °F}) \)
  - \( T_1 : 100 \text{ °C} (212 \text{ °F}) \)

- at \( U_i = 16 \text{ V} , I_i = 52 \text{ mA} , P_i = 169 \text{ mW} , \)
  - \( T_6 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_5 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_4 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_3 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_2 : 80 \text{ °C} (176 \text{ °F}) \)
  - \( T_1 : 80 \text{ °C} (176 \text{ °F}) \)

- at \( U_i = 16 \text{ V} , I_i = 76 \text{ mA} , P_i = 242 \text{ mW} , \)
  - \( T_6 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_5 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_4 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_3 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_2 : 61 \text{ °C} (141.8 \text{ °F}) \)
  - \( T_1 : 61 \text{ °C} (141.8 \text{ °F}) \)

**Equipment protection level Mb**

<table>
<thead>
<tr>
<th>Type of protection</th>
<th>intrinsic safety</th>
</tr>
</thead>
</table>

**Certificates**

- **Appropriate type**: NJ 10-22-N...
- **IECEx certificate**: IECEx PTB 11.0037X
- **IECEx marking**: Ex ia I
- **Standards**: IEC 60079-0:2012 , IEC 60079-11:2006

**Effective internal inductivity** \( C_i \) \( \leq 130 \) nF

A cable length of 10 m is considered.

**Effective internal inductance** \( L_i \) \( \leq 100 \) µH

A cable length of 10 m is considered.
### Inductive sensor

<table>
<thead>
<tr>
<th>Maximum permissible ambient temperature $T_{amb}$</th>
<th>Also observe the maximum permissible ambient temperature stated in the general technical data. Keep to the lower of the two values.</th>
</tr>
</thead>
<tbody>
<tr>
<td>at $U_i = 16 \text{ V}$, $I_i = 25 \text{ mA}$, $P_i = 34 \text{ mW}$ : 100 °C (212 °F)</td>
<td></td>
</tr>
<tr>
<td>at $U_i = 16 \text{ V}$, $I_i = 52 \text{ mA}$, $P_i = 169 \text{ mW}$ : 80 °C (176 °F)</td>
<td></td>
</tr>
<tr>
<td>at $U_i = 16 \text{ V}$, $I_i = 76 \text{ mA}$, $P_i = 242 \text{ mW}$ : 61 °C (141.8 °F)</td>
<td></td>
</tr>
</tbody>
</table>

Refer to “General Notes Relating to Pepperl+Fuchs Product Information”.

Pepperl+Fuchs Group USA: +1 330 486 0001 Germany: +49 621 776 4411 Singapore: +65 6779 9091
www.pepperl-fuchs.com fa-info@us.pepperl-fuchs.com fa-info@de.pepperl-fuchs.com fa-info@sg.pepperl-fuchs.com
# Declaration of conformity / Konformitätserklärung

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

## Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ10-22-N-E93-Y246869</td>
<td>246869</td>
<td>Inductive sensor</td>
</tr>
</tbody>
</table>

## Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive / EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
</table>
| ATEX 2014/34/EU (L96/309-356) | EN 60079-0/A11:2013-11
EN 60079-0:2012-08
EN 60079-11:2012-01 |
| EMC 2014/30/EU (L96/79-106) | EN 60947-5-2/A1:2012-11
EN 60947-5-2:2007-12
EN 60947-5-6:2000-01 |

## Affixed CE Marking / Angebrachte CE-Kennzeichnung

![CE Marking]

## Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
</table>
| 0102 | Physikalisch Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
Germany |

---

**ANNEX ATEX**

**Notified Body QM-System / Notifizierte Stelle des QM-Systems**

Physikalisch Technische Bundesanstalt (0102)
Bundesallee 100
38116 Braunschweig
Germany

**Marking and Certificates / Kennzeichnung und Zertifikate**

<table>
<thead>
<tr>
<th>Marking / Kennzeichnung</th>
<th>Certificate / Zertifikat</th>
<th>Issuer ID / Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II 1 D</td>
<td>PTB 00 ATEX 2048 X</td>
<td>0102</td>
</tr>
<tr>
<td>II 2 G</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Signatures / Unterschriften**

Mannheim, 2017-01-26

ppa. Wolfgang Helm
Director Business Unit Sensors

i.V. Tobias Dittmer
Global Product Manager
14.7 计算器 KFU8-DW-1. D-Y209869

<table>
<thead>
<tr>
<th>技术参数</th>
<th>Pepperl+Fuchs</th>
</tr>
</thead>
<tbody>
<tr>
<td>一致性声明</td>
<td>Pepperl+Fuchs</td>
</tr>
</tbody>
</table>
Model Number
KFU8-DW-1.D-Y209869
Evaluation unit

Features
- Rotational speed monitoring up to 10 kHz
- 1 pre-select value with relay output and LED indicator
- Multi-range power pack
- NAMUR sensors connectable
- Adjustable start-up override
- Menu driven operation via 4 front keys
- Period measurement

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-selection</td>
</tr>
</tbody>
</table>

### Functional safety related parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTTFd</td>
<td>100 a</td>
</tr>
</tbody>
</table>

### Supply

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage Ur</td>
<td>200 ... 230 V AC; 100 ... 130 V AC; 50 Hz</td>
</tr>
<tr>
<td>Fusing</td>
<td>external fusing 4 A</td>
</tr>
<tr>
<td>Power consumption</td>
<td>AC: &lt; 5 VA  DC: &lt; 5 W</td>
</tr>
</tbody>
</table>

### Indicators/operating means

<table>
<thead>
<tr>
<th>Type</th>
<th>7-segment LED display, red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of digits</td>
<td>4</td>
</tr>
<tr>
<td>Display value</td>
<td>digit height 7 mm, in Hz or 1/min</td>
</tr>
<tr>
<td>LED yellow</td>
<td>switching state</td>
</tr>
<tr>
<td>Accuracy</td>
<td>± 1 digit</td>
</tr>
</tbody>
</table>

### Input

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control input</td>
<td>NAMUR: 1.2 mA ≤ x ≤ 2.1 mA (terminal 8, 9), max. 8.2 V and 6.5 mA, impedance 1.2 kΩhm</td>
</tr>
<tr>
<td>Trigger input</td>
<td>12 V (terminal 2), max. 30 V, impedance 2.8 kΩhm</td>
</tr>
<tr>
<td>Pulse duration</td>
<td>20 µs</td>
</tr>
</tbody>
</table>

### Input 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching point</td>
<td>1.2 ... 2.1 mA</td>
</tr>
<tr>
<td>Switching hysteresis</td>
<td>approx. 0.2 mA</td>
</tr>
<tr>
<td>Input frequency</td>
<td>0.002 ... 10000 Hz, pulse length/duration: ≥ 20µs</td>
</tr>
<tr>
<td>Impedance</td>
<td>1.2 kΩ</td>
</tr>
</tbody>
</table>

### Input 3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-up override</td>
<td>Triggering by external signal 16 ... 30 V or Place jumper between terminals 2/3 or by switching on supply voltage (terminal 2 and terminal 3 permanently bridged)</td>
</tr>
<tr>
<td>Jumpering time</td>
<td>1 ... 9999 s (External trigger signal)</td>
</tr>
</tbody>
</table>

### Output

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relay</td>
<td>1 changeover contact</td>
</tr>
<tr>
<td>Sensor supply</td>
<td>24 V DC ± 10 %, 30 mA , short-circuit protected</td>
</tr>
<tr>
<td>Contact loading</td>
<td>250 V AC/2 A/ cos φ ≥ 0.7 40 V DC/2 A</td>
</tr>
</tbody>
</table>

### Delay times

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time delay before availability</td>
<td>≤ 400 ms</td>
</tr>
<tr>
<td>Start-up override</td>
<td>1 ... 9999 s</td>
</tr>
<tr>
<td>Relay</td>
<td>≤ 20 ms</td>
</tr>
</tbody>
</table>

### Transfer characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring error</td>
<td>0 ... 10 kHz: ± 0.1 % Display: ± 1 digit</td>
</tr>
</tbody>
</table>

### Standard conformity

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic</td>
<td>compatibility acc. to EN 50081-2 / EN 50082-2</td>
</tr>
</tbody>
</table>

### Ambient conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 40 °C (-13 ... 104 °F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (-40 ... 185 °F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>max. 80 %, not condensing</td>
</tr>
<tr>
<td>Altitude</td>
<td>0 ... 2000 m</td>
</tr>
</tbody>
</table>

### Operating conditions

The device has only to be used in an indoor area.

### Mechanical specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection assembly</td>
<td>Caution: Please be aware that the device may only be connected to a switchable power supply. The switch or circuit breaker must be easy to reach and identified as the separator for the device.</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Connection</td>
<td>coded, removable terminals , max. core cross-section 0.34 ... 2.5 mm²</td>
</tr>
<tr>
<td>Construction type</td>
<td>modular terminal housing in Makrolon, System KF</td>
</tr>
<tr>
<td>Mounting</td>
<td>snap-on to 35 mm standard rail or screw fixing</td>
</tr>
<tr>
<td>Life span</td>
<td>30 x 10⁸ switching cycles</td>
</tr>
</tbody>
</table>

Refer to “General Notes Relating to Pepperl+Fuchs Product Information”. 
Function

The KFU8-DW-1.D Speed Monitor is a device used to indicate and monitor periodic signals (frequencies and rotational speeds) which occur in almost all areas of automation and process engineering. The input signals are evaluated in accordance with the cycle method. That is, by measuring the duration of a period and then converting it with a very fast micro controller to a frequency or rotational speed.

The Speed Monitor can be supplied with 115 V AC, 230 V AC or by a 24 V DC supply and when connected to an alternating voltage it provides a 24 V DC source to supply the signal sensor.
**Dimensions**

**Indicators/operating means**

- Yellow LED, Relay switch state indication
- 7-segment-display
- Control keys

**Electrical connection**

Bridge fitted: start-up bypass triggered by switching on the power supply

- External trigger signal
- Sensor power supply 24 V DC
- Trigger input for start-up bypass
- Sensor power supply GND
- Not connected

- Power supply 24 V DC
  - or
  - Power supply 230 V AC
    - or
    - Power supply 115 V AC
- Relay output

- NAMUR
- Sensor
- Sensor power supply GND
- Not connected

- Power supply 115 V AC
- Power supply 24 V DC
- Sensor power supply 24 V DC
- Not connected

- 8/BU
- 9/BN
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- yellow

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
EU-Declaration of conformity

EU-Konformitätserklärung

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-1838A
Date / Datum: 2016-12-01

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

Declaration of conformity / Konformitätserklärung

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten genannten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFU8-FSSP-1.D</td>
<td>181191</td>
<td>Frequency voltage current converter</td>
</tr>
<tr>
<td>KFU8-FSSP-1.D-Y180599</td>
<td>180599</td>
<td>Frequency voltage current converter</td>
</tr>
<tr>
<td>KFU8-DW-1.D</td>
<td>190149</td>
<td>Overspeed/underspeed Monitor</td>
</tr>
<tr>
<td>KFU8-DW-1.D-Y209869</td>
<td>209869</td>
<td>Overspeed/underspeed Monitor</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014/30/EU (EMC) (L96/79-108)</td>
<td>EN 61326-1:2013</td>
</tr>
<tr>
<td>2014/35/EU (LV) (L96/357-374)</td>
<td>EN 61010-1:2010</td>
</tr>
</tbody>
</table>

Affixed CE Marking / Angebrachte CE-Kennzeichnung

Signatures / Unterschriften

Mannheim, 2016-12-01

ppa. Dr. Thomas Sebastiani
i.V. Erwin Schmidt
Director Business Unit SYSTEMS
Product Manager
14. 8绝缘开关放大器 KFD2-SOT2-Ex2

操作说明书  Pepperl+Fuchs
技术参数  Pepperl+Fuchs
一致性声明  Pepperl+Fuchs
Instruction Manual

Marking

K-System, Isolated barriers for Zone 2

Device identification

Model number

ATEX approval

Group, category, type of protection, temperature classification

Table 1

The exact designation of the device can be found on the name plate on the device side.

Pepperl+Fuchs GmbH
Lilienthalstrasse 200, 68307 Mannheim, Germany

Table 2

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

Mounting, installation, commissioning, operation, maintenance and dismounting of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood.

Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.

Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location.

The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals.

The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas. Use the device only within the specified ambient conditions.

The device is designed for mounting on a 35 mm DIN mounting rail according to EN 60715.

Only use the device stationary.

The device is an associated apparatus according to IEC/EN 60079-11.

The device is an electrical apparatus for hazardous areas of Zone 2.

Improper Use

Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use.

The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

Mounting and Installation

Do not mount a damaged or polluted device.

Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example.

Do not mount the device in the dust hazardous area.

The device fulfills a degree of protection IP20 according to IEC/EN 60529.

Only use the device stationary.

The device is an electrical apparatus for hazardous areas of Zone 2.

Requirements for Equipment Protection Level Ge

The device must be installed and operated only in surrounding enclosures that:

comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,

are rated with the degree of protection IP54 according to IEC/EN 60529.

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the presence of a potentially explosive atmosphere.

Provide a transient protection. Ensure that the peak value of the transient protection does not exceed 140 % of the rated voltage.

Place warning label "Warning – Do not remove or replace fuse when energized" visibly on the housing.

Operation, Maintenance, Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.

2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Equipment Protection Level Gc

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the presence of a potentially explosive atmosphere.

Only use operating elements in the absence of a potentially explosive atmosphere.

Only use the programming socket in the absence of a potentially explosive atmosphere.

Only change the replaceable fuse, when the device is de-energized.

Delivery, Transport, Disposal

Check the packaging and contents for damage. Check if you have received every item and if the items received are the ones you ordered.

Always store and transport the device in the original packaging.

Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.

The device, device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.
**Features**

- 2-channel isolated barrier
- 24 V DC supply (Power Rail)
- Dry contact or NAMUR inputs
- Passive transistor output, non-polarized
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508

**Function**

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

A unique collective error messaging feature is available when used with the Power Rail system.

**Connection**

![Connection Diagram](image-url)
General specifications

- Signal type: Digital Input

Supply

- Connection: Power Rail or terminals 14+, 15-
- Rated voltage $U_n$: 20 ... 30 V DC
- Ripple: $\leq 10 \%$
- Rated current $I_n$: $\leq 50$ mA

Input

- Connection: terminals 1+, 2+, 3-; 4+, 5+, 6-
- Rated values: acc. to EN 60947-5-6 (NAMUR), see system description for electrical data
- Open circuit voltage/short-circuit current: approx. 8 V DC / approx. 8 mA
- Switching point/switching hysteresis: 1.2 ... 2.1 mA / approx. 0.2 mA
- Line fault detection: breakage $I \leq 0.1$ mA, short-circuit $I > 6$ mA

Output

- Connection: output I: terminals 7, 8 ; output II: terminals 8, 9
- Switching voltage: $\leq 30$ V
- Switching current: $\leq 100$ mA, short-circuit protected
- Signal level: 1-signal: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current
- 0-signal: switched off (off-state current $\leq 10 \mu$A)
- Output I, II signal: electronic output, passive
- Collective error message: Power Rail

Transfer characteristics

- Switching frequency: $\leq 5$ kHz

Electrical isolation

- Input/Output: reinforced insulation acc. to IEC 62103, rated insulation voltage $300$ V rms
- Input/power supply: reinforced insulation acc. to IEC 62103, rated insulation voltage $300$ V rms
- Output/power supply: basic insulation according to IEC 62103, rated insulation voltage $50$ V eff
- Input/input: not available
- Output/Output: not available

Directive conformity

- Electromagnetic compatibility: Directive 2014/30/EU
- EN 61326-1:2013 (industrial locations)
- Conformity: IEC 62103:2003
- NE 21:2004
- Degree of protection: IEC 60529:2001
- Input: EN 60947-5-6:2000

Ambient conditions

- Ambient temperature: -20 ... 60 °C (-4 ... 140 °F)

Mechanical specifications

- Degree of protection: IP20
- Mass: approx. 150 g
- Dimensions: 20 x 119 x 115 mm (0.8 x 4.7 x 4.5 in), housing type B2
- Mounting: on 35 mm DIN mounting rail acc. to EN 60715:2001

Data for application in connection with Ex-areas

- EC-Type Examination Certificate: PTB 00 ATEX 2035
- Group, category, type of protection: Ex ia IIC, Ex ia IIIC
- Voltage $U_o$: 10.5 V
- Current $I_o$: 13 mA
- Power $P_o$: 34 mW (linear characteristic)

Supply

- Maximum safe voltage $U_m$: 40 V DC (Attention! The rated voltage can be lower.)

Output

- Maximum safe voltage $U_m$: 40 V DC (Attention! The rated voltage can be lower.)
- EC-Type Examination Certificate: DMT 01 ATEX E 133
- Group, category, type of protection: Ex I (M1) [Ex ia] I
- Statement of conformity: TÜV 99 ATEX 1499 X
- Group, category, type of protection, temperature class: Ex II 3G Ex nA II T4
- Electrical isolation: safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V

Input/Output

- safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
**Technical data**

**KFD2-SOT2-Ex2**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>International approvals</strong></td>
<td></td>
</tr>
<tr>
<td>FM approval</td>
<td>116-0035</td>
</tr>
<tr>
<td>Control drawing</td>
<td>116-0035</td>
</tr>
<tr>
<td>CSA approval</td>
<td>116-0047</td>
</tr>
<tr>
<td>Control drawing</td>
<td>116-0047</td>
</tr>
<tr>
<td>IECEx approval</td>
<td>IECEx PTB 05.0011</td>
</tr>
<tr>
<td>Approved for</td>
<td>[Ex ia] IIIC, [Ex ia] I, [Ex ia] IIIC</td>
</tr>
</tbody>
</table>

**General information**

| Supplementary information | EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com. |

Reprint date: 2016-05-15 23:28
Date of issue: 2016-05-16 18:10:05_eng.xml
Technical data

Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.

\[\text{Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!}\]
EU-Declaration of conformity

EU-Konformitätserklärung

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-0030B
Date / Datum: 2016-04-06

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

 Declaration of conformity / Konformitätserklärung
We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.
Die Pepperl+Fuchs GmbH erklärt hiermit in alleiner Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

 Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFD2-SOT2-Ex1.LB</td>
<td>181002</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex1.LB.IO</td>
<td>181004</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex1.N</td>
<td>195092</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex1.R1</td>
<td>238071</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex2</td>
<td>181005</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex2.IO</td>
<td>181007</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-SOT2-Ex2:IO-Y181008</td>
<td>181008</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-ST2-Ex1.LB</td>
<td>180997</td>
<td>Switch Amplifier</td>
</tr>
<tr>
<td>KFD2-ST2-Ex2</td>
<td>181000</td>
<td>Switch Amplifier</td>
</tr>
</tbody>
</table>

 Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive</th>
<th>Standards / Normen</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/108/EC (EMC)</td>
<td>EN 61326:1-2013 (Industrial locations)</td>
</tr>
<tr>
<td>2014/30/EU (EMC)</td>
<td>EN 60079-0:2012+A11:2013</td>
</tr>
<tr>
<td>94/9/EC (ATEX)</td>
<td>EN 60079-11:2012</td>
</tr>
<tr>
<td>2014/34/EU (ATEX)</td>
<td>EN 60079-15:2010</td>
</tr>
<tr>
<td>50303:2000</td>
<td></td>
</tr>
</tbody>
</table>

 Affixed CE Marking / Angebrachte CE-Kennzeichnung

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Products / Produkte</th>
<th>KFD2-SOT2-Ex1.LB</th>
<th>KFD2-SOT2-Ex1.LB.IO</th>
<th>KFD2-SOT2-Ex2</th>
<th>KFD2-SOT2-Ex2.IO</th>
<th>KFD2-SOT2-Ex2:IO-Y181008</th>
</tr>
</thead>
</table>

Marking
Kennzeichnung: Certificate Zertifikat
Issuer ID / Aussteller ID:

I (1) G
II (1) D
PTB 00 ATEX 2035 0102

I (M1)
DIT 01 ATEX E 133 0158

II 3 G
TÜV 99 ATEX 1499 X
### Products / Produkte

<table>
<thead>
<tr>
<th>Marking Kennzeichen</th>
<th>Certificate Zertifikat</th>
<th>Issuer ID Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ II (1) G</td>
<td>PTB 00 ATEX 2035</td>
<td>0102</td>
</tr>
<tr>
<td>☑ II (1) D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ I (M1)</td>
<td>DMT 01 ATEX E 133</td>
<td>0158</td>
</tr>
<tr>
<td>☑ II 3 G</td>
<td>PF11CERT1046X</td>
<td>PF</td>
</tr>
</tbody>
</table>

### Products / Produkte

<table>
<thead>
<tr>
<th>Marking Kennzeichen</th>
<th>Certificate Zertifikat</th>
<th>Issuer ID Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑ II (1) G</td>
<td>PTB 00 ATEX 2035</td>
<td>0102</td>
</tr>
<tr>
<td>☑ II (1) D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>☑ II 3 G</td>
<td>TÜV 99 ATEX 1499 X</td>
<td>TÜV</td>
</tr>
</tbody>
</table>

### Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
<tbody>
<tr>
<td>0102</td>
<td>Physikalisch-Technische Bundesanstalt (PTB) 38116 Braunschweig Germany</td>
</tr>
<tr>
<td>0158</td>
<td>DKEKRA EXAM GmbH Dinanderiestrasse 9 44609 Bochum Germany</td>
</tr>
<tr>
<td>TÜV</td>
<td>TÜV NORD CERT GmbH Langemarckstraße 20 45141 Essen Germany</td>
</tr>
<tr>
<td>PF</td>
<td>Pappel + Fuchs GmbH Lilienthalstraße 200 53307 Mannheim Germany</td>
</tr>
</tbody>
</table>
14. 9绝缘开关放大器 KFA6-S0T2-Ex2

操作说明书
技术参数
一致性声明

Pepperl+Fuchs
Pepperl+Fuchs
Pepperl+Fuchs
Instruction Manual

Marking
K-System, Isolated barriers

Device identification

Model number

ATEX approval

Group, category, type of protection, temperature classification

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The exact designation of the device can be found on the name plate on the device side.</td>
</tr>
</tbody>
</table>

Pepperl+Fuchs GmbH
Lilienthalstrasse 200, 68307 Mannheim, Germany

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Group, Personnel</td>
</tr>
<tr>
<td>Responsibility for planning, assembly, commissioning, operation, maintenance, and disconnecting lies with the plant operator. Mounting, installation, commissioning, operation, maintenance and disconnecting of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood. Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.</td>
</tr>
</tbody>
</table>

Reference to Further Documentation
Observe laws, standards, and directives applicable to the intended use and the operating location. The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

Intended Use
The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability. The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals. The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas. Use the device only within the specified ambient conditions.

Requirements for Usage as Associated Apparatus
If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i. Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14. Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

Improper Use
Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use. The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

Mounting and Installation
Do not mount a damaged or polluted device. Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example. The device must be installed outside of the hazardous area. The device fulfills a degree of protection IP40 according to IEC/EN 60529. The device must be installed and operated only in an environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1. If used in areas with higher pollution degree, the device needs to be protected accordingly. All circuits connected to the device must comply with the overvoltage category II (or better) according to IEC/EN 60664-1.

Requirements for Cables and Connection Lines
Observe the following points when installing cables and connection lines: Solve the permissible core cross-section of the conductor. If you use stranded conductors, crimp wire end ferrules on the conductor ends. Use only one conductor per terminal. When installing the conductors the insulation must reach up to the terminal. Observe the tightening torque of the terminal screws. If the rated voltage is greater than 50 V AC, proceed as follows: 1. Switch off the voltage. 2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Usage as Associated Apparatus
If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i. Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14. Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

Operation, Maintenance, Repair
The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device. If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Delivery, Transport, Disposal
Check the packaging and contents for damage. Check if you have received every item and if the items received are the ones you ordered. Always store and transport the device in the original packaging. Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered. All used up batteries in the packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.

Improper Use
The device is an associated apparatus according to IEC/EN 60079-11.

Operation, Maintenance, Repair
The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device. If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Usage as Associated Apparatus
If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i. Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14. Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

Requirements for Usage as Associated Apparatus
If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i. Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14. Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.
Features

- 2-channel isolated barrier
- 230 V AC supply
- Dry contact or NAMUR inputs
- Passive transistor output, non-polarized
- Line fault detection (LFD)
- Reversible mode of operation
- Up to SIL 2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications. It transfers digital signals (NAMUR sensors/mechanical contacts) from a hazardous area to a safe area.

Each proximity sensor or switch controls a passive transistor output for the safe area load. The normal output state can be reversed using switch S1 for channel I and switch S2 for channel II. Switch S3 enables or disables line fault detection of the field circuit.

During an error condition, the transistors revert to their de-energized state and LEDs indicate the fault according to NAMUR NE44.

Assembly

Connection

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".
## General specifications

<table>
<thead>
<tr>
<th>Signal type</th>
<th>Digital Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>terminals 14, 15</td>
</tr>
<tr>
<td>Rated voltage $U_r$</td>
<td>207 ... 253 V AC</td>
</tr>
<tr>
<td>Power dissipation</td>
<td>1 W</td>
</tr>
<tr>
<td>Power consumption</td>
<td>≤ 1.5 W</td>
</tr>
</tbody>
</table>

## Input

| Connection | terminals 1+, 2+, 3-; 4+, 5+, 6- |
| Rated values | acc. to EN 60947-5-6 (NAMUR), see system description for electrical data |
| Open circuit voltage/short-circuit current | approx. 8 V DC / approx. 8 mA |
| Switching point/switching hysteresis | 1.2 ... 2.1 mA / approx. 0.2 mA |
| Line fault detection | breakage I ≤ 0.1 mA, short-circuit I > 6 mA |

## Output

| Connection | output I: terminals 7, 8; output II: terminals 8, 9 |
| Switching voltage | ≤ 40 V |
| Switching current | ≤ 100 mA, short-circuit protected |
| Signal level | 1-signat: switching voltage - 2.5 V max. at 10 mA switching current or 3 V max. at 100 mA switching current |
| 0-signat: switched off (off-state current ≤ 10 μA) |

## Transfer characteristics

| Switching frequency | ≤ 5 kHz |

## Galvanic isolation

| Output/power supply | reinforced insulation acc. to EN 50178, rated insulation voltage 300 V eff |
| Output/Output | not available |

## Directive conformity

| Low voltage | Directive 2014/35/EU EN 61010-1:2010 |
| Conformity | Electromagnetic compatibility NE 21 |
| Degree of protection | IEC 60529 |
| Protection against electrical shock | IEC 61140 |

## Ambient conditions

| Ambient temperature | -20 ... 60 °C (-4 ... 140 °F) |

## Mechanical specifications

| Degree of protection | IP20 |
| Mass | approx. 150 g |
| Dimensions | 20 x 119 x 115 mm (0.8 x 4.7 x 4.5 inch), housing type B2 |
| Mounting | on 35 mm DIN mounting rail acc. to EN 60715:2001 |

## Data for application in connection with hazardous areas

| EC-Type Examination Certificate | PTB 98 ATEX 2164 |
| Group, category, type of protection | II (1) G [Ex ia] IIC |
| II (1) D [Ex ia] IIC |
| Input | Ex ia IIC, Ex ia IIIC |
| Voltage $U_o$ | 10.5 V |
| Current $I_o$ | 13 mA |
| Power $P_o$ | 34 mW (linear characteristic) |
| Supply | Maximum safe voltage $U_m$ 253 V AC (Attention! $U_m$ is no rated voltage.) |
| Output | Maximum safe voltage $U_m$ 253 V AC (Attention! The rated voltage can be lower.) |
| Galvanic isolation | not available |
| Input/Output | safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V |
| Input/power supply | safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V |

## International approvals

<p>| UL approval | 116-0145 |
| CSA approval | 116-0047 |</p>
<table>
<thead>
<tr>
<th>General information</th>
<th>Supplementary information</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see <a href="http://www.pepperl-fuchs.com">www.pepperl-fuchs.com</a>.</td>
<td></td>
</tr>
</tbody>
</table>
Configuration

Switch position

<table>
<thead>
<tr>
<th>S</th>
<th>Function</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mode of operation Output I active</td>
<td>with high input current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with low input current</td>
</tr>
<tr>
<td>2</td>
<td>Mode of operation Output II active</td>
<td>with high input current</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with low input current</td>
</tr>
<tr>
<td>3</td>
<td>Line fault detection</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Operating status

<table>
<thead>
<tr>
<th>Control circuit</th>
<th>Input signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiator high impedance/</td>
<td>low input current</td>
</tr>
<tr>
<td>contact opened</td>
<td></td>
</tr>
<tr>
<td>Initiator low impedance/</td>
<td>high input current</td>
</tr>
<tr>
<td>contact closed</td>
<td></td>
</tr>
<tr>
<td>Lead breakage, lead short-circuit</td>
<td>Line fault</td>
</tr>
</tbody>
</table>

Factory settings: switch 1, 2 and 3 in position I
EU-Declaration of conformity

EU-Konformitätserklärung

Pepperl+Fuchs GmbH
Lilienthalstraße 200
68307 Mannheim
Germany
Phone +49 621 776-0
Fax +49 621 776-1000

No. / Nr.: DOC-0974
Date / Datum: 2016-10-24

Copyright Pepperl+Fuchs
www.pepperl-fuchs.com

Declaration of conformity / Konformitätserklärung

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten genannten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

Products / Produkte

<table>
<thead>
<tr>
<th>Product / Produkt</th>
<th>Item number</th>
<th>Description / Beschreibung</th>
</tr>
</thead>
<tbody>
<tr>
<td>KFA5-SOT2-EX2</td>
<td>233751</td>
<td>Switch amplifier</td>
</tr>
<tr>
<td>KFA6-SOT2-EX2</td>
<td>233753</td>
<td>Switch amplifier</td>
</tr>
</tbody>
</table>

Directives and Standards / Richtlinien und Normen

<table>
<thead>
<tr>
<th>EU-Directive / EU-Richtlinie</th>
<th>Standards / Normen</th>
</tr>
</thead>
</table>
| ATEX 2014/34/EU (L96/309-356) | EN 60079-0/A11:2013-11
|                              | EN 60079-0:2012-08
|                              | EN 60079-11:2012-01 |
| EMC 2014/30/EU (L96/79-106)  | EN 61326-1:2013-01
|                              | (industrial locations) |
| LVD 2014/35/EU (L96/357-374) | EN 61010-1:2010-10 |

Affixed CE Marking / Angebrachte CE-Kennzeichnung

Marking and Certificates / Kennzeichnung und Zertifikate

<table>
<thead>
<tr>
<th>Marking Kennzeichnung</th>
<th>Certificate Zertifikat</th>
<th>Issuer ID Aussteller ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>II (1) G</td>
<td>PTB 98 ATEX 2164</td>
<td>0102</td>
</tr>
</tbody>
</table>

Key for Issuer ID / Schlüssel zur Aussteller ID

<table>
<thead>
<tr>
<th>ID</th>
<th>Issuer / Aussteller</th>
</tr>
</thead>
</table>
| 0102| Physikalisch Technische Bundesanstalt
      | Bundesallee 100
      | 38116 Braunschweig
      | Germany                                               |

Pepperl+Fuchs GmbH declares that the products are only affected by minor or formal changes with respect to the new edition of the standards. These changes are not relevant for compliance with the essential health and safety requirements. The products still comply with the ATEX Directive. This declaration is also valid if the marking and the certificates of the listed devices correspond to previous editions of standards.


Signatures / Unterschriften

Mannheim, 2016-10-24

ppa. Michael Kessler
Executive Vice President Components & Technology

i.V. Friedrich Füß
Product Portfolio Manager Interface Technology