

西门子PLC模块一级供应商6ES7193-0CA10-0XA0

产品名称	西门子PLC模块一级供应商6ES7193-0CA10-0XA0
公司名称	湖南西控自动化设备有限公司
价格	.00/件
规格参数	西门子:授权代理商 ET-200:一级代理商 德国:售后保障服务
公司地址	中国（湖南）自由贸易试验区长沙片区开元东路1306号开阳智能制造产业园（一期）4#栋301
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产品详情

扇出控制介绍及应用Fan-Out Control Functional Specification（中英文双语）

写在前面

近在温习《过程控制》相关知识时候，遇到一个之前没有了解过的“复杂PID控制回路”——“Fan-Out Control扇出控制”。它是属于“分程控制”的一个特殊应用。

在网搜索到一篇英文讲解，搬运过来（节选翻译）分享给大家。。。

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Introduction 简介:

Fan-out control is used in situations where a single PID controller adjusts multiple control elements (e.g., controllers or valves) operating in parallel. Typical applications are:扇出控制用于单个 PID 控制器调节并行运行的多个控制元件（例如控制器或阀门）的情况。典型应用有：

Multiple boilers on a common steam header.

连接到公共集流管（总管）上的多个锅炉

Multiple compressors on a common header.

连接到公共集流管（总管）上的多个压缩机

Multiple air fan exchangers whose louvers are adjusted by a single temperature controller in the combined outlet.

连接到公共集流管（总管）上的，由一个温度控制器调节的多个风扇（百叶开度）

Each application is discussed below in more detail. 下面分别详细讨论各个应用。

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Boiler Controls 锅炉控制

Figure 1 illustrates a typical control scheme for multiple boilers. Each boiler has a bias controller (HC), called a Boiler Master, which applies a bias to the output of a header pressure controller (PC), called a Plant Master. The Boiler Master output goes to the boiler firing controls. The bias allows a boiler to have a different firing rate than the other boilers. 图 1 展示了多台锅炉的典型控制方案。每个锅炉都有一个称为 Boiler Master 的偏置控制器 (HC)，它的偏置量来自于称为 Plant Master 的集管压力控制器 (PC) 的输出。Boiler Master 输出进入锅炉燃烧控制装置。该偏置量允许锅炉之间具有不同的燃烧率。The Plant Master adjusts all Boiler Masters that are in automatic mode. An individual boiler can be disconnected from the Plant Master and base-loaded by putting its Boiler Master in manual mode. Plant Master 可调整所有处于自动模式的 Boiler Master。通过将 Boiler Master 置于手动模式，可以将单个锅炉与 Plant Master 断开并进行基本加载。The Boiler Master output can be overridden in the firing controls because of insufficient combustion air or high fuel burner pressure. In this event, the Plant Master must continue controlling the steam header pressure with the other boilers. 由于燃烧空气不足或燃油燃烧器压力过高，Boiler Master 输出可能会在燃烧控制中被超驰。在这种情况下，Plant Master 必须利用其他锅炉继续控制蒸汽集管压力。图 1

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Compressor Controls 压缩机控制

Figure 2 illustrates a typical control scheme for multiple compressors. Each compressor has a bias controller (HC) which applies a bias to the output of a header pressure controller (PC). The HC output goes to the compressor performance controls. The bias allows a compressor to have a different loading than the other compressors, thus providing a means for implementing load balance control. 图 2 展示了多压缩机的典型控制方案。每个压缩机都有一个偏置控制器 (HC)，它的偏置量来自于集管压力控制器 (PC) 的输出。偏置控制器 (HC) 输出进入压缩机负载性能控制。该偏置量允许压缩机之间具有不同的加载量，从而提供用于实现负载平衡控制的手段。The PC adjusts all HCs that are in automatic mode. An individual compressor can be disconnected from the PC and base-loaded by putting its HC in manual mode. 压力控制器 (PC) 调整所有处于自动模式偏置控制器 (HC)。通过将偏置控制器 (HC) 置于手动模式，可以将单个压缩机与压力控制器 (PC) 断开并进行基本加载。The HC output can be overridden in the compressor controls by motor amps (motor-driven compressors) or by low suction pressure. In this event, the PC must continue controlling the header pressure with the other compressors. 由于电机电流限值或吸气压力过低，偏置控制器 (HC) 输出可能会被超驰。在这种情况下，压力控制器 (PC) 必须利用其他压缩机继续控制集管压力。图 2

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Air Fan Controls 风扇（百叶）控制

Figure 3 illustrates the control scheme for multiple air fan exchangers. Each air fan louver is adjusted by a HC which applies a bias to the TC output and sends the result on to the louver. The bias allows a louver to be in a different position than the other louvers. This feature is necessary to compensate for different degrees of cooling in the air fans. For example, the bias can be increased for an air fan that is not cooling as much as the others.图3展示了多个风扇热交换器的控制方案。每个风扇百叶均由偏置控制器 (HC)调节，偏置控制器 (HC)对温度控制器 (TC)输出施加偏置并将结果发送到百叶。该偏置允许百叶之间处于不同的位置。此功能对于补偿不同冷却程度的风扇是必要的。例如，对于冷却效果略差的风扇，可以增加偏置量。The TC adjusts all HCs that are in automatic mode. An individual louver can be disconnected from the TC and adjusted separately by putting its HC in manual mode.温度控制器 (TC)调整所有处于自动模式的偏置控制器 (HC)。单个百叶可以与温度控制器 (TC)断开，并通过将偏置控制器 (HC)置于手动模式来单独调整。

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其他

除了以上基本概念原理以及应用场景，还有一些使用中的注意事项以及优化方法，详见原文：<https://www.sas-web.com/fan-out-control-functional-specification/>原文同样给出了扇出控制在 Foxboro I/A DCS控制系统中的具体实现方法：