Oliver Amm
05.02.2016

FC01 FC100 family – part 1
FC01 FC100 家族-第一节

At the end of technical training part 5 I announced that you will get an introduction to the FC01/FC100 family. FC01 and FC100 measuring systems always consist of at least three parts: An electronic control unit, a sensor and a cable between sensor and electronic control unit.
在技术培训的最后部分，我宣布你将会得到FC01 / FC100家族产品的介绍。FC01和FC100测量系统通常至少由三个部分组成:一个电子控制单元，一个传感器和一个传感器和电子控制单元之间的电缆。

First step – electronic control unit 第一步-电子控制单元

You have to distinguish between four different types: FC01/FC100, FC01-LQ/FC100-LQ, FC01-CA/FC100-CA and FC01-CC.
你必须区分四种不同的类型：FC01/FC100, FC01-LQ/FC100-LQ, FC01-CA/FC100-CA 和 FC01-CC.
In technical training part 5 I showed you how to find the suitable type for the customer's application using the "Product Selection" flyer. For the next step you have to work with the catalogue or the datasheet:
在技术培训第5部分，我向您展示了如何使用"产品选择"传单找到客户应用的合适类型。下一步，你必须使用目录或数据表:
For example, if the "Product Selection" flyer says that FC100-CA is the most suitable device for the application, then please look at the datasheet of the FC100-CA. On the first page you find information about the electronic control unit:
例如，如果"产品选择"资料显示说FC100 - CA是应用程序最合适的设备，那么请查看FC100 - CA的数据表。在第一页，你可以找到关于电子控制单元的信息:

Flow Meter **FC100-CA** (compressed air/gases)
流量计 FC 100-CA (压缩空气/气体)

Description 描述

Microcontroller operated Flow Meter for gases such as air, compressed air, oxygen, nitrogen, argon, carbon dioxide, methane/natural gas and hydrogen. The FC100-CA is particularly suited to consumption measurement and leakage detection in compressed air systems. It is suitable for use with calorimetric monitoring heads.

Please note for use with carbon dioxide and argon that measurement is only possible with adapters TP-01 through TP-04.

The RS232 interface allows configuration, operation and data logging by means of a PC software.

FC100-CA
rail-mounted version — surface mounted version

Features 属性

- Menu driven (keypads)
- LC display (2 x 16 digits) can show:
  - actual operating flow velocity/standard flow velocity, operating volume flow/standard volume flow, mass flow, medium temperature;
  - directions for parameter assignment, configuration, diagnostics and error correction;
  - peak value indication
  - display illumination
- Two scalable analogue outputs
- Minimum/maximum memory of flow velocity and temperature
- Two freely selectable limit contacts
- Volume- or mass flow dependent pulse output
- Totalizer (with external reset), power fail-safe
- RS232 interface allows configuration, operation and data logging by means of a PC software

Dimensions

FC100-CA (rail-mounted version)

FC100-FH-CA (surface mounted version)

Ordering information 预定信息

Type		
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted	
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted	
	Input voltage	
	U1	DC 10 ... 40 V
	Signal outputs	
	R2	2 relay outputs (2 limit values)
	T4	4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)
	Analogue outputs	
	V1	0/1-5 Volt
	V2	0/2-10 Volt
	C1	0/4-20 mA (self-powered, galvanically isolated)
	Serial interface	
	K1	RS232 (with PC-Software)

FC100-CA - U1 R2 V1 K1 ordering example

The most important thing on this page is the ordering information in the bottom left corner. In the first column you find two different housing types: FC100-CA (rail mounted) and FC100-FH-CA (surface mounted). 这个页面最重要的是在左下角的排序信息。在第一列中，您可以找到两种不同的外壳类型:FC100 - CA(轨道安装)和FC100 - FH - CA(表面主体安装)。

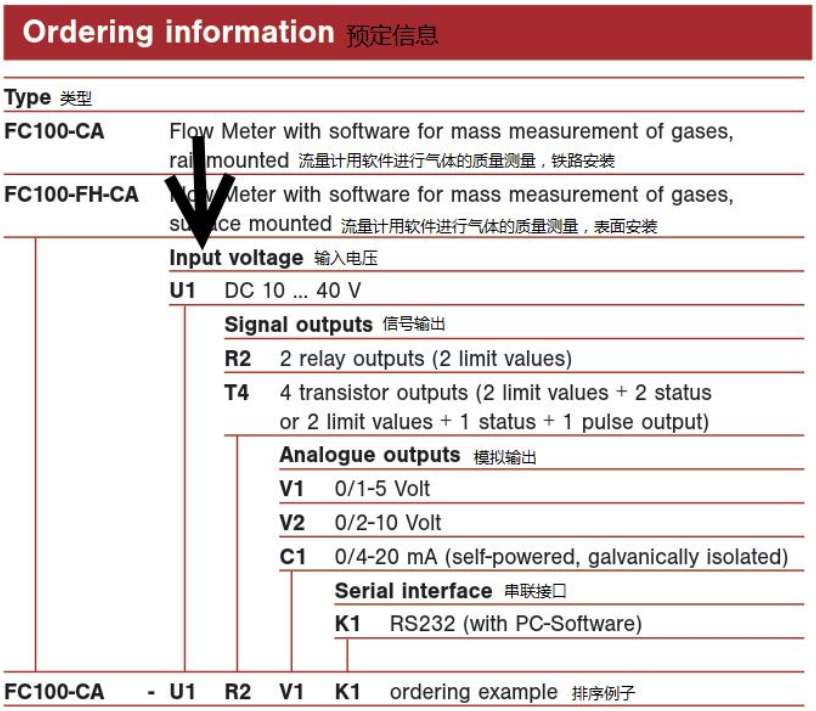
Ordering information 预定信息

Type 类型					
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted 流量计用软件进行气体的质量测量，铁路安装				
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted 流量计用软件测量气体的质量，表面安装				
	Input voltage 输入电压				
	U1 DC 10 ... 40 V				
		Signal outputs 信号输出			
		R2 2 relay outputs (2 limit values)			
		T4 4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)			
			Analogue outputs 模拟输出		
			V1 0/1-5 Volt		
			V2 0/2-10 Volt		
			C1 0/4-20 mA (self-powered, galvanically isolated)		
				Serial interface 串连接口	
				K1 RS232 (with PC-Software)	
FC100-CA	**- U1**	**R2**	**V1**	**K1**	ordering example 排序例子

When you look at the picture on the top right corner you see the difference between both. FC100-CA (rail mounted) is usually installed in control cabinets. FC100-FH-CA (surface mounted) is usually installed somewhere else in the factory, for example at any wall:
当你看右上角的图片时，你会看到两者的区别。FC100 - CA(轨道安装)通常安装在控制柜里。FC100 - FH - CA(表面主体安装)通常安装在工厂的其他地方，例如在任何墙壁上:

轨道安装版本 rail-mounted version — **FC100-CA** — 表面安装版本 surface mounted version

In the second column you find the information about the input voltage. There is only one option (DC 10…40 V), so you don't have to choose. 在第二栏中，你可以找到关于输入电压的信息。只有一个选项(DC = 10…40 V),所以你不需要选择。

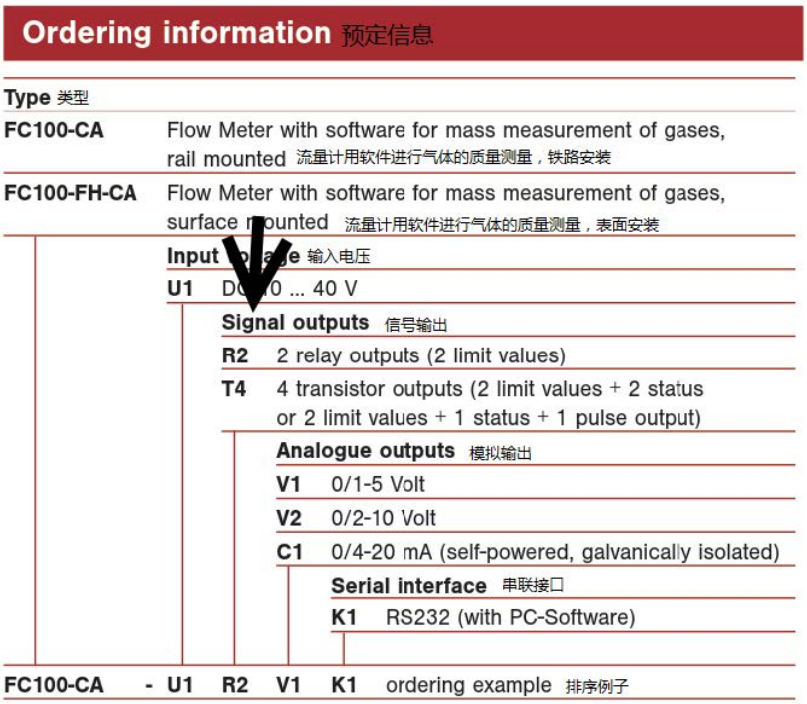


Ordering information 预定信息

Type 类型	
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted 流量计用软件进行气体的质量测量，铁路安装
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted 流量计用软件进行气体的质量测量，表面安装
Input voltage 输入电压	
U1	DC 10 ... 40 V
Signal outputs 信号输出	
R2	2 relay outputs (2 limit values)
T4	4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)
Analogue outputs 模拟输出	
V1	0/1-5 Volt
V2	0/2-10 Volt
C1	0/4-20 mA (self-powered, galvanically isolated)
Serial interface 串联接口	
K1	RS232 (with PC-Software)

FC100-CA - U1 R2 V1 K1 ordering example 排序例子

In the third column you find two different signal outputs: R2 (relay outputs) and T4 (transistor outputs).
在第三列，你会发现两个不同的信号输出:R2(继电器输出)和T4(晶体管输出)。



Ordering information 预定信息

Type 类型	
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted 流量计用软件进行气体的质量测量，铁路安装
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted 流量计用软件进行气体的质量测量，表面安装
Input voltage 输入电压	
U1	DC 10 ... 40 V
Signal outputs 信号输出	
R2	2 relay outputs (2 limit values)
T4	4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)
Analogue outputs 模拟输出	
V1	0/1-5 Volt
V2	0/2-10 Volt
C1	0/4-20 mA (self-powered, galvanically isolated)
Serial interface 串联接口	
K1	RS232 (with PC-Software)

FC100-CA - U1 R2 V1 K1 ordering example 排序例子

Relay outputs (R2 means two relay outputs) are used for switching points only. For example you can define switching points at 10 m³/h and 15 °C. If the FC100-CA usually measures more than 20 m/s and 20 °C and then falls below 10 m/s you will get a signal from one of the relays. If the temperature falls below 15 °C you will get a signal from the other relay.
继电器输出(R2意味着两个继电器输出)只用于开关点。例如你可以定义切换点10 m³/ h和15°C。如果FC100-CA通常措施超过20米/秒,20°C,然后低于10 米/秒，你会从一个继电器得到一个信号。如果温度低于15°C你会得到一个信号从另一个继电器。
Two of the transistor outputs (T4 means four transistor outputs) are also used for switching points. The third one is a status indication and the fourth one is a pulse output. You can define a quantity per pulse, for example 10 m³. Everytime when 10 m³ have flown through the pipe you will get a pulse.
两个晶体管输出(T4意味着四个晶体管输出)也被用于开关点。第三个是状态指示，第四个是脉冲输出。您可以定义一个每脉冲数量,例如10 m³。每次当10 m³流过你会得到一个脉冲。

Those pulses are counted. So if you get 500 pulses per day you know that you have a consumption of 500 * 10 m³ = 5000 m³.
这些脉冲数会被计算出来。所以如果你每天得到500次脉冲，你就知道你消耗了500 * 10 m³ = 5000 m³.

In the fourth column you find three different analogue outputs.
在第四栏中，你会发现三种不同的模拟输出。

Ordering information 预定信息

Type 类型						
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted 流量计用软件进行气体的质量测量，铁路安装					
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted 流量计用软件进行气体的质量测量，表面安装					
	Input voltage 输入电压					
	U1 DC 10 ... 40 V					
		Signal outputs 信号输出				
		R2 2 relay outputs (2 limit values)				
		T4 4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)				
			Analogue outputs 模拟输出			
			V1 0/1-5 Volt			
			V2 0/2-10 Volt			
			C1 0/4-20 mA (self-powered, galvanically isolated)			
				Serial interface 串联接口		
				K1 RS232 (with PC-Software)		
FC100-CA	- **U1**	**R2**	**V1**	**K1**	ordering example 排序例子	

The most common analogue output is 4-20 mA. I described it in technical training part 6. The other two analogue output types work in the same way.
最常见的模拟输出是4 -20 mA。我在技术培训第6部分描述了它。另外两个模拟输出类型以同样的方式工作。

In the last column you find the serial interface.
在最后一栏中，你可以找到串联接口。

Ordering information 预定例子

Type 类型					
FC100-CA	Flow Meter with software for mass measurement of gases, rail mounted 流量计用软件进行气体的质量测量，铁路安装				
FC100-FH-CA	Flow Meter with software for mass measurement of gases, surface mounted 流量计用软件进行气体的质量测量，表面安装				
	Input voltage 输入电压				
	U1 DC 10 ... 40 V				
		Signal outputs 信号输出			
		R2 2 relay outputs (2 limit values)			
		T4 4 transistor outputs (2 limit values + 2 status or 2 limit values + 1 status + 1 pulse output)			
			Analogue outputs 模拟输出		
			V1 0/1...5 Volt		
			V2 0/2...10 Volt		
			C1 0/4...20 mA (self-powered, galvanically isolated)		
				Serial interface 串联接口	
				K1 RS232 (with PC-Software)	
FC100-CA	- **U1**	**R2**	**V1**	**K1**	ordering example 排序例子

It is used to communicate with a PC or a PLC. This enables the customer for example to use the FC100 PC software for configuration or for exporting measured values to Microsoft Excel.
它用于与PC或PLC进行通信。这使得客户可以使用FC100 PC软件进行设定配置，或者以Microsoft Excel档案导出数据。

Exercise 练习

A customer wants to count pulses in a main compressed air pipe which is located in the basement of a factory. There is no cabinet nearby. The customer hates to configure devices by the three keys.
一个客户想要数一数在一个主压缩空气管道的脉冲，它位于一个工厂的地下室。附近没有机柜。客户讨厌通过三个键进行设备配置。

Which ordering key would you offer? Please send me your answer until 2016-02-18.
你能提供什么订购的钥匙?请把你的答案发给我。

Second step – Sensor
第二步—传感器

the technical training will continue with the sensors CSP/CST/CSF.
技术培训将继续使用传感器CSP /CST/ CSF。