

流量计选型样本

FLOWMETER

PRODUCT SELECTION CATALOGUE

INNOVATION MAKES EXCELLENT

有 | 跨 | 越 | 才 | 有 | 卓 | 越



ABOUT US

关于我们

长江宛如一条巨龙奔腾不息，在长江之滨的天长市有这样一颗璀璨的明珠——安徽天康（集团）股份有限公司，在经历了岁月的历练与洗礼后愈发闪耀夺目。

安徽天康（集团）股份有限公司创建于1974年，总部位于“长三角”经济圈核心区域——天长市，是中国民营企业制造业500强企业、中国电子信息百强企业、国家级守合同重信用企业、国家高新技术企业、安徽省依法纳税先进企业、银行资信AAA级企业、中国仪表行业十强企业、中国电线电缆十强企业、安徽省重点骨干企业、“全国五一劳动奖状”获得者等荣誉。

天康集团历经四十年的蓬勃发展，已形成集仪器仪表、光电缆、医疗卫生、锂电池等跨行业、多元化的集团公司，下属子公司达二十余家。旗下产品凭借良好的质量与服务，被广泛应用于石油、电力、化工、通讯、卫生、新能源汽车及储能等行业和领域。

作为皖东经济最具活力与贡献的骨干企业之一，天康集团以“追求卓越，缔造满意”为目标，依托一流的产品、一流的管理、一流的服务，不仅在国内市场中赢得了广泛赞誉；在国际市场中，天康产品远销欧洲、非洲、亚洲等46个国家和地区。

天康集团在发展中逐步形成了独特的品牌文化及着眼全球的经营布局，全力塑造“高科技、高品质、国际化”的品牌形象。始终秉承“有跨越才有卓越”的天康精神，在创建和谐企业的基础上，引进国际先进的构架与模式，组织企业的生产经营管理体系。在积极参与国际化竞争的基础上，不断把握市场发展脉搏，寻求经济战略联盟，与全球伙伴共同发展与进步。如今天康人将全新的投入化为无私的奉献，与世界共同发展，与人类一起进步。

1974

成立于1974年

多项行业第一



Yangtze River like a dragon Pentium, there is such a shining pearl - Anhui Tiangkang (Group) Co., Ltd. in Tianchang City in the Yangtze River offshore, in after years of experience and baptism increasingly shining brightly.

Anhui Tiangkang (Group) Co., Ltd. created in 1974, the headquarters is located in the "Yangtze River Delta" economic circle core area - Tianchang City, is China's private enterprises in the manufacturing industry 500 strong enterprises, China's electronic information hundred enterprises, state-level keep contract re credit enterprise, national new and high technology enterprise, Anhui Province tax law advanced enterprises, bank credit AAA level enterprise, China instrument industry ten strong enterprises, top ten enterprises in the Chinese wire and cable, Anhui province key enterprises, "national labor certificate" get "and other honorary.

After forty years of vigorous development, the group has formed a set of instruments, optical cable, medical and health, lithium batteries, such as cross industry, diversified group companies, subsidiaries of more than twenty. Products with good quality and service, is widely used in oil, electricity, chemicals, communications, health, new energy vehicles and energy storage and other industries and areas.

As one of the backbone enterprises in Anhui east economy the most vitality and contribution, tecon group to "the pursuit of excellence, creating satisfaction" as the goal, relying on the first-class products, first-class management, first-class service, not only in the domestic market won wide acclaim; in the international market, the day Kang products are exported to 46 countries and regions, including Europe, Africa, and Asia.

Tecon group in the developing gradually formed a unique brand culture and focus on global business department bureau, spare no effort to shape the brand image of "high-tech, high-quality, internationalization". Always adhering to the "excellence," the spirit of Tiangkang across only, to create the basis for a harmonious enterprise, the introduction of international advanced framework and patterns, organization of production management system. Actively participate in the international competition, and continue to grasp the pulse of the market development, to seek economic and strategic alliances, and global partners to develop and progress. Such as today, the people will be a new investment into the selfless dedication, and the common development of the world, together with the progress of mankind.

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TK1100系列电磁流量计

Electromagnetic flowmeter for TK1100 series

工作原理

法拉第感应定律(指的是当导体通过磁场时会在导体内部产生感应电势)即为电磁流量计测量的基础原理。这种测量原理可应用于具有导电性的流体,该流体流入磁场垂直于流体方向的管道,在流体中感应生成的电势可利用对称布置的两个电极进行测量。信号电压 U_E 与磁感应强度 B ,电极间距 D 以及流体平均速度 v 成正比。由于磁感应强度 B 与电极间距 D 为常量,所以信号电压 U_E 与平均流速 v 成正比。用于计算体积流速的等式表明信号电压 U_E 与体积流量成线性正比。

感应的信号电压被转化为转换器中的分度,模拟以及数字输出信号。

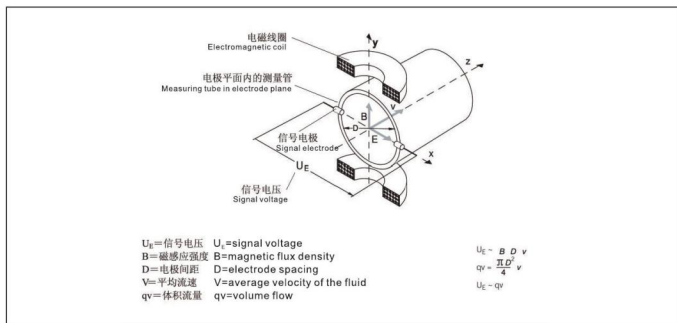
Working principle

Faraday law of electromagnetic induction(It means when the conductor flow through the magnetic field, it can cause induced electromotive force in conductor). It is the measuring principle of electromagnetic flowmeter. This measuring principle can be applied to conductive fluid. The fluid flows into a pipeline which is perpendicular to the direction of the fluid. The electromotive force induced in the flow can use the two symmetrical electrodes to measure. Signal voltage U_E is proportional to magnetic flux density B , electrode spacing D and average velocity of the fluid V . Magnetic flux density B and electrode spacing D are constants, so signal voltage U_E is proportional to average flow velocity of the fluid V . Equation for calculating the volume flow rate means signal voltage U_E is linearly proportional to volume flow.

The induced signal voltage is converted to the indexing of the converter, analog and digital output signals.

电磁流量计示意图

Schematic of electromagnetic flow meter



产品特点

- 1) 采用国际领先的励磁技术,励磁电路简洁,稳定可靠,具备人工智能的性能。管道内无可动部件,无阻流部件,测量中几乎没有附加压力损失。
- 2) 测量结果与流速分布、流体压力、温度、密度、粘度等物理参数无关。
- 3) 在现场可根据用户在线修改量程。
- 4) 适用于各种导电液体的流量测量,如自来水、污水、泥浆、各类饮料、化学原料、粘稠液体和悬浮物。具有低电导测量功能。
- 5) Ex防爆设计,符合国家防爆技术要求,已通过鉴定验收,可应用于各类防爆场所。

Product features

It uses the international leading excitation technology. The excitation circuit is simple, stable and reliable, it has the performance of artificial intelligence. There are no movable parts and no resisting flow parts in the pipeline. There is no additional pressure-loss. The measurement results have no relationship to flow velocity distribution, fluid pressure, temperature, density, viscosity and other physical parameters. It can modify the range online according to the actual need of users. It can be used to measure the flow of conductive liquid, such as tap water, sewage, mud, all kinds of drinks, chemical materials, viscous liquid and suspended solids. It has low conductivity measurement function. Ex explosion-proof design meet the requirements of the national explosion-proof technology, it has passed the identification and acceptance, and it can be used in all kinds of explosion-proof places.

6) 高阻快速响应设计, 无失真地采集微弱信号和快速反应流量变化, 量程比可达 100: 1。

7) 采用电容式技术的空、满管检测技术, 杜绝误报警的出现。

8) 具备转换器互换的一致性, 无须重新输入参数。

9) 宽范围电源模式可供选择 (DC: 18V~36V AC: 85V~265V)。

10) 采用出厂保存设置功能, 使仪表各参数万无一失。

11) 红外遥控功能以及按键操作, 操作更加方便。

12) 提供传感器零点修正以及自动校准功能。

13) 全中文 (英文) 友好界面, 满足各方使用要求。

14) 具备转换器本机自校、自检功能。

15) 具备防雷电保护设计电路。高效抗干扰电路, 适用各种恶劣环境。

16) 具有 RS485、RS232、Hart、Modbus 和 Profibus 等数字通讯信号输出。

17) 转换器和传感器具有多种防护等级及安装方式, 有适用于潜水安装的 IP68 等级。

18) 插入式电磁流量计在大管道流量检测中, 安装简单, 不需断流, 现场可带压开孔, 具有绝对的安装优势与价格优势。插入式电磁流量的测量只与插入深度有关, 故该流量计通用性广, 互换性强。一种型号就可适用于各种规格管道的流体测量要求。

Fast response design of high resistance can collect the weak signals without distortion and reflect the change of the flow. The range ratio can reach to 100:1.

It used the empty and full pipe detection of capacitive technology and prevent the false alarm of emergence.

It has the consistency of the converter swap, it's no need to re-enter the parameters.

And it has wide range power type to choose (DC: 18V~36V AC: 85V~265V).

It uses the factory function to save the settings and to ensure that no danger of anything going wrong with the instrument parameters. Infrared remote control function and keys operation let the operation more convenient.

It has the function of sensor zero correction and automatic zero calibration.

Chinese (English) interface can meet different kinds of requirements.

It also has converter self-calibration and self check function.

The circuit has anti lightning protection design. Anti-interference circuit can apply to harsh environment.

It has digital communication signal output, like RS485, RS232, Hart, Modbus and Profibus, etc.

Converters and sensors have a variety of protection levels and installation methods. IP68 level is suitable for diving installation. Inserted electromagnetic flowmeter in large pipe flow measurement has advantages, like simple installation, without interrupting scene and hot tapping, so it has installation advantage and price advantage.

The measurement of the inserted electromagnetic flowmeter is only related to the depth of insertion, so the flowmeter is widely used and has high interchangeability. A kind of type can be applied to a variety of specifications of the pipeline fluid measurement.

标准技术规格

1. 正常工作条件

环境温度: $-30 \sim +65^{\circ}\text{C}$;

相对湿度: $5\% \sim 90\%$;

供电电源: 单相交流电源 $85 \sim 265\text{V}$, $45 \sim 63\text{Hz}$;

直流电源: $18\text{VDC} \sim 36\text{VDC}$ 。

2. 测量精度

TK1100标准型: $\pm 0.5\%$;

TK1200高精度: $\pm 0.15\%$;

TK1300卫生型: $\pm 0.2\%$, $\pm 0.5\%$;

TK1400插入式: $\pm 1.5\%$;

TK1500电池供电型: $\pm 0.5\%$ 。

Standard technical specifications

1. Normal working conditions

ambient temperature: $-30 \sim +65^{\circ}\text{C}$;

relative humidity: $5\% \sim 90\%$;

power supply:

single phase AC power supply $85 \sim 265\text{V}$, $45 \sim 63\text{Hz}$;

DC power supply $18\text{VDC} \sim 36\text{VDC}$ 。

2. Measurement accuracy

TK1100 standard type: $\pm 0.5\%$;

TK1200 high accuracy type: $\pm 0.15\%$;

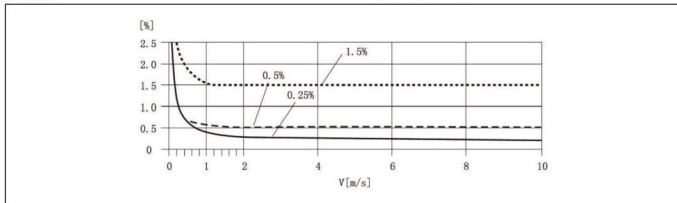
TK1300 hygienic type: $\pm 0.2\%$, $\pm 0.5\%$;

TK1400 insert type: $\pm 1.5\%$;

TK1500 battery powered type: $\pm 0.5\%$ 。

测量误差

Measurement error



3. 输出变量

3.1 模拟电流输出

负载电阻：0~10mA时，0~1.5k Ω ； 4~20mA时，0~750 Ω 。

基本误差：0.1% \pm 10 μ A。

3.2 数字频率输出

频率输出范围：1~5000Hz；

输出电气隔离：光电隔离，隔离电压：>1000VDC；

频率输出驱动：场效应管输出，最高承受电压36VDC，最大负载电流250mA。

3.3 数字脉冲输出

输出脉冲范围：0~100脉冲/秒（高于上限时，会丢失脉冲）；

输出脉冲当量：0.001~1.000m³/cp；

0.001~1.000 LTR /cp；

0.001~1.000 USG /cp；

0.001~1.000 UKG /cp；

输出脉冲宽度：用户软件设置；输出电气隔离：光电隔离，隔离电压：>1000VDC；脉冲输出驱动：场效应管输出，最高承受电压36VDC，最大负载电流250mA。

3.4 报警输出

报警输出接点：ALMH—上限报警；ALML—下限报警；

输出电气隔离：光电隔离，隔离电压>1000VDC；

报警输出驱动：达林顿管输出，最高承受电压36VDC，最大负载电流250mA

3.5 数字通讯接口及通讯协议

MODBUS接口：RTU格式，物理接口RS-485，电气隔离1000V；

HART接口：支持标准HART协议，配置HART手操器，可在线显示测量值，并可修改仪表参数。

3. Output variable

3.1 Analog current output

Load resistance: 0~1.5k Ω when 0~10mA; 0~750 Ω when 4~20mA.

Basic error: 0.1% \pm 10 μ A.

3.2 Digital frequency output

Frequency output range: 1~5000Hz;

Output electrical isolation: photoelectric isolation, isolation voltage: >1000VDC;

Frequency output driver: field effect transistor output, the maximum withstand voltage is 36VDC, the maximum load current is 250mA.

3.3 Digital pulse output

Output pulse range: 0~100 pulse per second (higher than the upper limit, the pulse will be lost).

Output pulse equivalent: 0.001~1.000m³/cp;

0.001~1.000 LTR /cp;

0.001~1.000 USG /cp;

0.001~1.000 UKG /cp;

Output pulse width: user software settings; output electrical isolation: photoelectric isolation, isolation voltage: >1000VDC;

pulse output driver: field effect transistor output, the maximum withstand voltage is 36VDC, the maximum load current is 250mA.

3.4 Alarm output

Alarm output contact: ALMH - limit alarm; ALML - lower alarm.

output electrical isolation: photoelectric isolation, isolation voltage:>1000VDC.

Alarm output driver: Darlington output, maximum withstand voltage is 36VDC, the maximum load current is 250mA.

3.5 Digital communication interface and communication protocol Alarm output contact: ALMH - limit alarm; ALML - lower alarm; output electrical isolation: photoelectric isolation, isolation voltage:>1000VDC;

HART interface: it support the standard HART protocol, configure the HART hand held device, it can display the measured value online, and can modify the instrument parameters.

电磁流量计的主要技术参数

Technical parameters of the electromagnetic flowmeter



型号 Model	TK1100标准型系列 TK1100 standard series	TK1200高精度系列 TK1200 high accuracy series
口径 Caliber	DN3-DN3000	DN10-DN300
精度 Accuracy	0.5%	±0.15%, 0.2%, 0.3%
安装方式 Installation method	夹持, 法兰 Hold, flange	夹持, 法兰 Hold, flange
重复性 Repeatability	0.1%	0.06%, 0.1%
测量范围 Measuring range	0.3-12m/s(流量单位可改变) 0.3-12m/s(flow unit can be changed)	0.3-12m/s(流量单位可改变) 0.3-12m/s(flow unit can be changed)
连接法兰 Connecting flange	GB/T9119-2000或其他选择 GB/T9119-2000 or any other choice	GB/T9119-2000或其他选择 GB/T9119-2000 or any other choice
压力 Pressure	4.0MPa-0.25 Mpa (最高过程压力40MPa/2500LB) (按口径分classify by caliber Maximum process pressure 40MPa/2500LB)	
衬里材料 Lining material	F46,PO,PTFE,PFA (耐负压negative pressure resistance, 氯丁橡胶Chloroprene rubber, 天然橡胶Natural rubber, 聚氨酯polyurethane, 陶瓷ceramics)	
电极材料 Electrode material	碳化钨, 316L, HC, HB, 钛, 钽, 铂金, 蒙乃尔合金 Tungsten carbide, 316L, HC, HB, titanium, tantalum, platinum, Monel alloy	
电极形式 Electrode form	标准, (刮刀, 可更换 DN>350) Standard, (scraper, it can be replaced by DN>350)	标准, (刮刀, 可更换 DN>350) Standard, (scraper, it can be replaced by DN>350)
传感器防护等级 Protection level of sensor	IP65, IP67, IP68	IP65, IP67, IP68
电导率 Conductivity	> 5μS/cm (水water>20μS/cm)	> 0.1μS/cm (水water>20μS/cm)
介质最高温度 Maximum temperature of medium	一体型≤90℃, 分体型≤180℃ (橡胶, PO ≤ 70℃) Integrated types 90℃, split types 180℃ (rubber, PO ≤ 70℃)	一体型≤90℃, 分体型≤180℃ (橡胶, PO ≤ 70℃) Integrated types 90℃, split types 180℃ (rubber)
环境最高温度 Ambient maximum temperature	-30℃ ~ +65℃	-30℃ ~ +65℃
转换器安装形式 Converter installation mode	一体, 分体 Integrated, split	一体, 分体 Integrated, split
输出信号 Output signal	4-20mA 电流信号, 频率 / 脉冲输出 4-20mA current signal, frequency / pulse output	4-20mA 电流信号, 频率 / 脉冲输出 4-20mA current signal, frequency / pulse output
电源 Power supply	AC:85V~265V, DC:18V~36V	AC:85~265, DC:18V~36V
自诊断 Self diagnosis	有 yes	有 yes
空管清零 Zero setting of empty pipe	有 yes	有 yes
通讯 Communication	RS485/Modbus, HART, PROFIBUS, FF总线	
防爆防护等级 Explosion protection grade	非防爆 / 隔爆, IP65/IP67 No explosion proof/explosion proof	非防爆 / 隔爆, IP65/IP67 No explosion proof/explosion proof
最高防爆区域 Highest explosion proof area	1区	2区
语言 Language	中文, 英语 Chinese, English	中文, 英语 Chinese, English
产品标准 Product standards	JB/T 9248-1999	JB/T 9248-1999



型号 Model	TK1300 卫生型系列 TK1300 hygienic series	TK1500 电池供电系列 TK1500 battery powered series
口径 Caliber	DN3-DN150	DN10-DN1200
精度 Accuracy	0.2%, 0.5%	0.5%
安装方式 Installation method	螺纹, 卡箍 Thread, clamp	夹持, 法兰 Hold, flange
重复性 Repeatability	0.06%, 0.1%	0.15%
测量范围 Measuring range	0.3-12m/s(流量单位可改变) 0.3-12m/s(flow unit can be changed)	0.3-12m/s(流量单位可改变) 0.3-12m/s(flow unit can be changed)
连接法兰 Connecting flange	/	GB/T9119-2000 或其他选择 GB/T9119-2000 or any other choice
压力 Pressure	最高4.0MPa The highest 4.0MPa	4.0MPa-0.6 Mpa (按口径分类by caliber)
衬里材料 Lining material	PFA (耐负压) PFA(negative pressure resistance)	PO,PTFE,PFA (耐负压negative pressure resistance), 橡胶rubber, 聚氨酯polyurethane, 陶瓷ceramics)
电极材料 Electrode material	316L,HC,HB, 钛, 钽, 铂金, 蒙乃尔合金 316L,HC,HB, titanium, tantalum, platinum, Monel alloy	316L,HC,HB, 钛, 钽, 铂金, 蒙乃尔合金 316L,HC,HB, titanium, tantalum, platinum, Monel alloy
电极形式 Electrode form	标准 Standard	标准, (刮刀, 可更换 DN>350) Standard, (scraper, it can be replaced by DN>350)
传感器防护等级 Protection level of sensor	IP65, IP67, IP68	IP65, IP67, IP68
电导率 Conductivity	> 2μS/cm (水 > 20μS/cm) > 2μS/cm (water > 20μS/cm)	> 5μS/cm (水 > 20μS/cm) > 5μS/cm (water > 20μS/cm)
介质最高温度 Maximum temperature of medium	一体型 ≤ 90°C, 分体型 ≤ 180°C Integrated types 90°C, split types 180°C	一体型 ≤ 90°C, 分体型 ≤ 180°C (橡胶, PO ≤ 70°C) Integrated types 90°C, split types 180°C (rubber, PO ≤ 70°C)
环境温度 Ambient maximum temperature	-30°C ~ +65°C	-30°C ~ +65°C
转换器安装形式 Converter installation mode	一体, 分体 Integrated, split	一体, 分体 Integrated, split
输出信号 Output signal	4-20mA 电流信号, 频率 / 脉冲输出 4-20mA current signal, frequency / pulse output	频率 0-5kHz Frequency 0-5kHz
电源 Power supply	AC:85V~265V,DC:18V~36V	3.6V
自诊断 Self diagnosis	有 yes	有 yes
空管清零 Zero setting of empty pipe	有 yes	有 yes
通讯 Communication	RS485/Modbus, HART, PROFIBUS	RS485/Modbus, GPRS
防爆 Explosion-proof	非防爆 / 隔爆 No explosion proof/explosion proof	非防爆 / 隔爆 No explosion proof/explosion proof
语言 Language	中文, 英语 Chinese, English	中文, 英语 Chinese, English
产品标准 Product standards	/	JB/T 9248-1999



型号 Model	TK1800 高压型系列 TK1800 High pressure series
口径 Caliber	DN10-DN1200
精度 Accuracy	0.5%
安装方式 Installation method	夹持, 法兰 Hold, flange
重复性 Repeatability	0.15%
测量范围 Measuring range	0.3-12m ³ /s (流量单位可改变) 0.3-12m ³ /s(flow unit can be changed)
连接法兰 Connecting flange	GB/T9119-2000 或其他选择 GB/T9119-2000 or any other choice
压力 Pressure	40 Mpa
衬里材料 Lining material	PO,PTFE,PFA (耐负压/negative pressure resistance) , 橡胶/rubber, 聚氨酯/polyurethane)
电极材料 Electrode material	316L,HC,HB, 钛, 钽, 铂金, 蒙乃尔合金 316L,HC,HB, titanium, tantalum, platinum, Monel alloy
电极形式 Electrode form	标准, (刮刀, 可更换 DN>350) Standard, (scraper, it can be replaced by DN>350)
传感器防护等级 Protection level of sensor	IP65, IP67, IP68
电导率 Conductivity	> 5μS/cm (水 > 20μS/cm) > 5μS/cm (water > 20μS/cm)
介质最高温度 Maximum temperature of medium	一体型 ≤ 90℃, 分体型 ≤ 180℃ (橡胶, PO ≤ 70℃) Integrated types 90℃, split types 180℃ (rubber, PO ≤ 70℃)
环境最高温度 Ambient maximum temperature	-30℃ ~ +65℃
转换器安装形式 Converter installation mode	一体, 分体 Integrated, split
输出信号 Output signal	频率 0-5kHz Frequency 0-5kHz
电源 Power supply	3.6V
自诊断 Self diagnosis	有 yes
空管报警 Zero setting of empty pipe	有 yes
通讯 Communication	RS485/Modbus, GPRS
防爆 Explosion-proof	非防爆 / 隔爆 No explosion proof/explosion proof
语言 Language	中文, 英语 Chinese, English
产品标准 Product standards	JB/T 9248-1999



型号 Model	TK1400 插入式系列 TK1400 inserted type series	TK1600 电磁热能表系列 TK1600 electromagnetic heat meter series
口径 Caliber	DN200-DN3000	DN15-DN1200
精度 Accuracy	1.5%, 2.5%	1.0%, 2.0%, 2.5%
安装方式 Installation method	法兰, 螺纹, 在线 Flange, thread, on-line	夹持, 法兰, 螺纹 Hold, flange, thread
重复性 Repeatability	0.5%	0.3%, 0.5%
测量范围 Measuring range	0-10m/s(流量单位可改变) 0-10m/s(flow unit can be changed)	0-12m/s(流量单位可改变) 0-12m/s(flow unit can be changed)
连接法兰 Connecting flange	GB/T9119-2000 或其他选择 GB/T9119-2000 or any other choice	GB/T9119-2000 或其他选择 GB/T9119-2000 or any other choice
压力 Pressure	1.6 MPa	4.0MPa~0.6 MPa (按口径分classify by caliber)
衬里材料 Lining material	POM, PTFE, PFA	PO, PTFE, PFA (耐负压negative pressure resistance), 橡胶rubber, 聚氨酯polyurethane)
电极材料 Electrode material	316L, HC, HB, 钛, 钽, 铂金 316L, HC, HB, titanium, tantalum, platinum	316L, HC, HB, 钛, 钽, 铂金 316L, HC, HB, titanium, tantalum, platinum
电极形式 Electrode form	标准 Standard	标准 Standard
传感器防护等级 Protection level of sensor	IP65, IP67, IP68	IP65, IP67, IP68
电导率 Conductivity	> 5µS/cm (水 > 20µS/cm) > 5µS/cm (water > 20µS/cm)	> 5µS/cm (水 > 20µS/cm) > 5µS/cm (water > 20µS/cm)
介质最高温度 Maximum temperature of medium	一体型≤90℃, 分体型≤130℃ (POM ≤ 100℃) Integrated types 90℃, split type ≤ 130℃ (POM ≤ 100℃)	一体型≤90℃, 分体型≤160℃ (橡胶, PO ≤ 70℃) Integrated types 90℃, Split type ≤ 160℃ (rubber, POM ≤ 70℃)
环境最高温度 Ambient maximum temperature	-30℃ ~ +65℃	-30℃ ~ +65℃
转换器安装形式 Converter installation mode	一体, 分体 Integrated, split	一体, 分体 Integrated, split
输出信号 Output signal	4-20mA 电流信号, 频率 / 脉冲输出 4-20mA current signal, frequency / pulse output	4-20mA 电流信号, 频率 / 脉冲输出 4-20mA current signal, frequency / pulse output
电源 Power supply	AC:85V~265V, DC:18V~36V	AC:85V~265V, DC:18V~36V
自诊断 Self diagnosis	有 yes	有 yes
空管清零 Zero setting of empty pipe	有 yes	有 yes
通讯 Communication	RS485/Modbus, HART, PROFIBUS	RS485/Modbus, HART, PROFIBUS
防爆 Explosion-proof	非防爆 / 隔爆 No explosion proof/explosion proof	非防爆 / 隔爆 No explosion proof/explosion proof
语言 Language	中文, 英语 Chinese, English	中文, 英语 Chinese, English
产品标准 Product standards	/	参照 JB/T 9248-1999 Refer to 9248-1999 JB/T

流量计口径、公称压力和流量范围 Caliber, nominal pressure and flow range of flowmete

瞬时体积流量是流速和传感器口径的函数。瞬时流量列线图表明每一口径流量计可以测量的流量范围，同时给出适合测量某给定流量的几种传感器口径规格。

The instantaneous volume flow rate is a function of velocity and the sensor diameter. Instantaneous flow nomograms shows that the flow range that each caliber flowmeter can measure, and give several sensor caliber specifications which is suitable for a given flow.

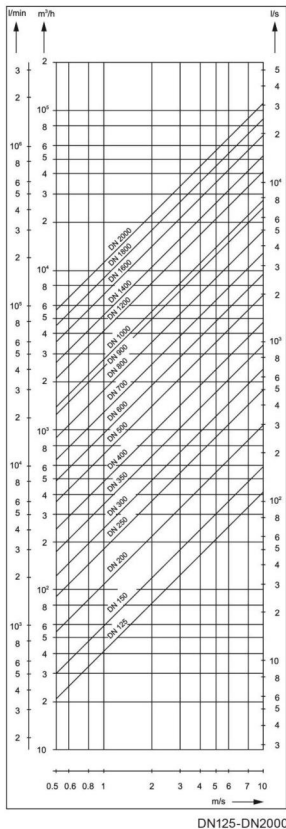
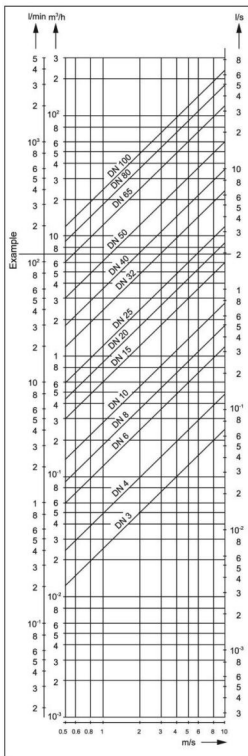
口径 DN	压力 MPA	最小流量范围 Minimum flow range 流速0-0.5m/s Flow0-0.5m/s	最大流量范围 Maximum flow range 流速0-12m/s Flow0-12m/s
3	4.0	0-0.2L/min	0-4L/min
4	4.0	0-0.4L/min	0-8L/min
6	4.0	0-1.0L/min	0-20L/min
8	4.0	0-1.5L/min	0-30L/min
10	4.0	0-2.25L/min	0-45L/min
15	4.0	0-5L/min	0-100L/min
20	4.0	0-7.5L/min	0-150L/min
25	4.0	0-10L/min	0-200L/min
32	4.0	0-20L/min	0-400L/min
40	4.0	0-30L/min	0-600L/min
50	4.0	0-3m ³ /h	0-60m ³ /h
65	4.0	0-6m ³ /h	0-120m ³ /h
80	4.0	0-9m ³ /h	0-180m ³ /h
100	1.6	0-12m ³ /h	0-240m ³ /h
125	1.6	0-21m ³ /h	0-420m ³ /h
150	1.6	0-30m ³ /h	0-600m ³ /h
200	1.6	0-54m ³ /h	0-1080m ³ /h
250	1.6	0-90m ³ /h	0-1800m ³ /h
300	1.0	0-120m ³ /h	0-2400m ³ /h
350	1.0	0-165m ³ /h	0-3300m ³ /h
400	1.0	0-225m ³ /h	0-4500m ³ /h
500	1.0	0-330m ³ /h	0-6600m ³ /h
600	1.0	0-480m ³ /h	0-9600m ³ /h
700	1.0	0-660m ³ /h	0-13200m ³ /h
800	1.0	0-900m ³ /h	0-18000m ³ /h
900	1.0	0-1200m ³ /h	0-24000m ³ /h
1000	1.0	0-1350m ³ /h	0-27000m ³ /h
1200	0.6	0-2100m ³ /h	0-42000m ³ /h
1400	0.6	0-2700m ³ /h	0-54000m ³ /h
1600	0.6	0-3600m ³ /h	0-72000m ³ /h
1800	0.6	0-4500m ³ /h	0-90000m ³ /h
2000	0.6	0-5700m ³ /h	0-114000m ³ /h

电磁流量计的瞬时流量列线图

The instantaneous flow diagrams of electromagnetic flowmeter

例：瞬时流量=7m³/h（最大值即量程的上限），流速介于0.5-10m/s之间时，适用的传感器口径(DN20-DN65)。

Example: instantaneous flow =7m³/h (maximum value means the upper limit of the measuring range). When the flow rate is between 0.5-10m/s, the sensor diameter (DN20-DN65) is suitable.



电磁流量计的电极材料选择

Selection of electrode materials for electromagnetic flowmeter

根据被测流体的腐蚀性来选择电极的材料。

The material of the electrode is selected according to the corrosive of the tested fluid.

材料 Material Science	耐腐蚀性 Material Science
316L	适用: 1.生活用水, 工业用水, 原水井水, 城市用水。 Application: domestic water, industrial water, raw water well water, urban water. 2.稀酸, 稀碱等弱腐蚀性, 碱盐液。 Weak corrosion such as dilute acid and dilute alkali, alkali salt solution
哈氏合金B Hastelloy alloy B	适用: 1.盐酸 (浓度小于10%) 等非氧化性酸。 Application: non oxidative acid, like hydrochloric acid (concentration is less than 10%), etc. 2.氢氧化钠浓度小于50%一切浓度的氢氧化铵碱溶液。 Sodium hydroxide (concentration of less than 50%) ammonium hydroxide solution of all concentrations. 3.磷酸, 有机酸。 Phosphoric acid, organic acid
	不适用: 硝酸。 Not applicable: nitric acid
哈氏合金C Hastelloy alloy C	适用: 1.混合酸如铬酸与硫酸的混合溶液。 Application: Mixed acid such as the mixed solution of chromic acid and sulfuric acid. 2.氧化性盐类如Fe ⁺⁺⁺ , Cu ⁺⁺⁺ , 海水。 Oxidizing salts such as Fe ⁺⁺⁺ , Cu ⁺⁺⁺ , sea water
	不适用: 盐酸。 Not applicable: hydrochloric acid
钛(Ti) Titanium (Ti)	适用: 1.盐, 如 (1) 氯化物 (氯化物 / 镁 / 铝 / 钙 / 铁等)。 Application: salt, such as chloride / magnesium / aluminum / calcium / ammonium / iron, etc.) (2) 钠盐, 铵盐, 次氯酸盐, 海水。 Sodium salt, ammonium salt, hypochlorite, sea water 2.浓度小于50%氢氧化钾, 氢氧化铵, 氢氧化钡碱溶液。 Potassium hydroxide (concentration of less than 50%), ammonium hydroxide, alkali solution of barium hydroxide
	不适用: 盐酸, 硫酸, 磷酸, 氢氟酸等还原性酸。 Not applicable: reductive acid, such as hydrochloric acid, sulfuric acid, phosphoric acid, hydrofluoric acid, etc.
钽(ta) Tantalum	适用: 1.盐酸 (浓度小于40%), 稀硫酸和浓硫酸 (不包括发烟硫酸)。 Application: salt, such as chloride (chloride / magnesium / aluminum / calcium / ammonium / iron, etc.) 2.二氧化氯, 氯化铁, 次氯酸, 氰化钠, 乙酸铅等。 Chlorine dioxide, ferric chloride, sodium hypochlorite, sodium cyanide, lead acetate etc. 3. 硝酸 (包括发烟硝酸) 等氧化性酸, 温度低于80°C的王水。 Oxidizing acid such as nitrate (including fuming nitric acid), aqua regia lower than 80°C
	不适用: 碱, 氢氟酸。 Not applicable: alkali, hydrofluoric acid
铂(Pt) Platinum	适用: 几乎所有酸, 碱, 盐溶液 (包括发烟硫酸, 发烟硝酸)。 Application: almost all acid, alkali, salt solution (including smoke sulfuric acid, smoke nitric acid)
	不适用: 王水, 铵盐。 Not applicable: aqua regia, ammonium salt
碳化钨 Tungsten Carbide	适用: 纸浆, 污水, 能抗固体颗粒干扰。 Application: pulp, sewage, can resist the solid particle interference
	不适用: 无机酸, 有机酸, 氧化物。 Not applicable: inorganic acid, organic acid, chloride
蒙乃尔合金 Monel alloy	适用: 海水, 弱有机酸, 80%浓度的NaOH, 中性、苛性盐 Application: Seawater, weak organic acid, 80% NaOH, neutral and caustic salt
	不适用: 禁铜工况, 强酸 Not applicable: No copper working condition, strong acid

衬里材料的选择

应根据被测介质的腐蚀性、磨损性及温度来选择。硬/软橡胶可耐一般的弱酸、碱的腐蚀，耐温65℃，软橡胶有耐磨性，聚四氟乙烯(PTFE)几乎能耐除热磷酸以外的强酸、碱腐蚀，介质温度可达130℃，但不耐磨损。

聚胺脂橡胶有较好的耐磨损，但不耐酸、碱腐蚀，耐温度性也较差，介质温度小于65℃。

Selection of lining material

It should be chosen by the corrosive property, abrasibility and temperature of the measured medium. Hard / soft rubber can resist general corrosion of weak acid, alkali, high temperature of 65℃. Soft rubber has wear resistance. Polytetrafluoroethylene (PTFE) can resist the corrosion of alkali, strong acid except hot phosphoric acid. Medium temperature can be up to 130℃, but can't resist abrasion. Urethane rubber has good abrasiveness, but can't resist the corrosion of acid and alkali, temperature resistance is also poor. Medium temperature is less than 65℃.

衬里材料 Lining material	主要功能 Major function	适用范围 Scope of application
硬橡胶 Hard rubber	<ol style="list-style-type: none"> 1. 可耐常温下的盐酸、醋酸、草酸、氨水、磷酸及50%的硫酸、氢氧化钠、氢氧化钾。 2. 忌强氧化剂。 <p>1.It can resist hydrochloric acid, acetic acid, oxalic acid, ammonia, phosphoric acid and 50% sulfuric acid, sodium hydroxide, potassium hydroxide under normal temperature.</p> <p>2. avoid strong oxidizing agent.</p>	<ol style="list-style-type: none"> 1. 低于70℃; 2. 一般的酸、碱、盐溶液。 <p>1 Below 70.</p> <p>2.General acid, alkali, salt solution.</p>
软橡胶 Soft rubber	<ol style="list-style-type: none"> 1. 有较好的弹性，耐磨性较好; 2. 耐一般的低浓度酸、碱、盐介质的腐蚀，不耐氧化性介质的腐蚀。 <p>1.It has better flexibility and better wear resistance</p> <p>2.It can resist corrosion of low concentration acid, alkali, salt medium .But it can not resist the corrosion of oxidizing medium.</p>	<ol style="list-style-type: none"> 1. 低于70℃; 2. 测一般水、污水、泥浆、矿浆 <p>1 Below 70.</p> <p>2.It can measure water, sewage, slurry, pulp.</p>
聚四氟乙烯 Polytetrafluoroethylene (PTFE) 改性聚四氟乙烯 Modified Polytetrafluoroethylene (PFA)	<ol style="list-style-type: none"> 1. 塑料中化学性能最稳定的一种材料，能耐沸腾的盐酸、硫酸、硝酸和王水，也能耐浓碱和各种有机溶剂; 2. 耐磨性和粘接性差。 <p>1. A material with the most stable chemical properties in plastic. It can resist the boiling hydrochloric acid, boiling hydrochloric acid, sulfuric acid, nitric acid, aqua regia, concentrated alkali and various organic solvents.</p> <p>2. Poor wear resistance and poor adhesion.</p>	<ol style="list-style-type: none"> 1. -40℃~+130℃ (PTFE) ; -40℃~+160℃(PFA); 2. 酸、碱等强腐蚀介质; 3. 卫生的类介质。 <p>1. -40℃~+130℃(PTFE)</p> <p>2.Strong corrosive medium, such as acid, alkali.</p> <p>3.Hygienic medium</p>
PO	<ol style="list-style-type: none"> 1. 可耐常温下的盐酸、醋酸、草酸、氨水、磷酸及硫酸、氢氧化钠、氢氧化钾。 2. 能耐浓碱和各种有机溶剂。 <p>1. It can resist hydrochloric acid, acetic acid, oxalic acid, ammonia, phosphoric acid and sulfuric acid, sodium hydroxide, potassium hydroxide under normal temperature</p> <p>2. It can resist concentrated alkali and various organic solvents</p>	<ol style="list-style-type: none"> 1. 低于70℃; 2. 一般的酸、碱、盐溶液; 3. 一般水、污水、泥浆、矿浆。 <p>1 Below 70℃.</p> <p>2.General acid, alkali, salt solution.</p> <p>3.General water, sewage, slurry, pulp.</p>
陶瓷 Ceramics	耐磨，耐高温，耐腐蚀 Wear resistance, high temperature resistance and corrosion resistance	低于200℃ Below 200℃

防护等级的选择

按照国际GB/T4208-1993关于外壳防护等级可分为：IP65为防喷水型，即可允许水龙头从任何方向对仪表喷水，喷水压力为30kPa，出水量为12.5升/分，喷水离仪表距离3米。IP67为防浸水型，即仪表可短时间全部浸入水中，试验时最高点应在水下至少150cm，持续时间至少为30分钟。IP68为潜水型，应能长期在水中工作，其浸入的最大深度由制造厂与用户协商。防护等级选用原则应根据以上要求及仪表实际的条件选定。若仪表在地面以下的，经常受水淹的，宜选用IP68；若仪表在地面上的，可选用IP65。

Selection of protection level

According to the international GB/T4208-1993 for the shell protection level, it can be divided into: anti water spray type-IP65. It allows the faucet to water from any direction of the instrument, the water spray pressure is 30kPa, the water volume is 12.5 liters / min, water spray from the meter distance is 3 meters; Water immersion proof type-IP67. Instruments can be immersed in water for a short time. The highest point should be at least 150cm in the water when it is tested, and it should last for at least 30 minutes; Diving type-IP68, it can work in the water for a long time. The maximum depth of immersion should be negotiated with the manufacturer. The selection principle of the protection level should be selected by the above requirements and the actual conditions of the instrument. If the instrument is below the ground, and it is often flooded, you can choose IP68; If the instrument is on the ground, you can choose IP65.

电磁流量计的正确安装

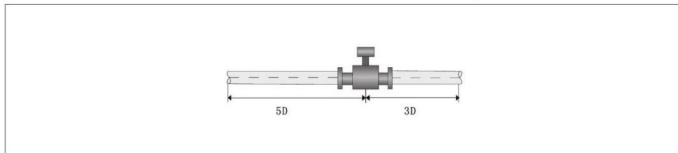
1. 安装场所的选择

- 1) 选择测量管内不会出现负压的场所;
- 2) 避免安装在电机、变压器强电设备附近, 以免引起电气干扰;
- 3) 避免安装位置周围有强腐蚀性气体的场合;
- 4) 测量混合相流体时, 避免引起相分离的场所;
- 5) 环境温度一般在 -25°C ~ 60°C 范围内, 尽可能避免阳光直射;
- 6) 安装在无振动或选择振动小的场合, 如果振动过大, 应该在传感器前后的管道上加固定支撑;
- 7) 环境相对湿度应该在 5% ~ 90% 范围内;
- 8) 避免安装在能被雨水直淋或者浸没的场所。

2. 对直管段长度的要求 (D为流量计的内径)

电磁流量计对前后直管段的要求比较低, 一般对于900弯头, T形三通、异径、全开阀门等流动阻力件, 离电磁流量计的电极轴中线(不是传感器的端面)应该有5D的直管段; 对于不同开度的阀门(比如可调开度的阀门), 则上游侧的直管段长度需要10D。一般传感器下游的直管段只需要3D就可以满足要求。

如下图所示



测量不同介质的混合液体时, 混合点与流量计之间的距离至少要大于30D, 如下图所示:

Correct installation of electromagnetic flowmeter

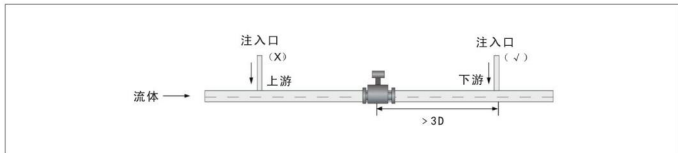
1. Selection of installation site

1. Choose a place where negative pressure will not appear in the measuring tube.
2. Avoid installing in the motor place, near the transformer in electrical equipment place, so as not to cause electrical interference.
3. Choose a place to avoid strong corrosive gas around the installation position.
4. When measuring mixed phase fluid, we should choose a place to avoid causing phase separation;
5. Ambient temperature is generally in the range of -25°C ~ 60°C , and it should avoid the direct sunlight.
6. Installed in a place without vibration or a place with small vibration. If the vibration is too large, it should be fixed a support in front of the sensor and behind the sensor.
7. Relative humidity of environment should be in the range of 5% ~ 90%
8. Avoid installing in the place where the rain can be directly poured or immersed.

2. Requirements for length of straight pipe (D is the inner diameter of the flowmeter)

Electromagnetic flowmeter has lower requirement for the straight pipeline. For 90° elbow, flow resistance parts, like T-type three links, different diameter, fully open valve, the center line of the electrode for the electromagnetic flowmeter (not the end of sensor) should have 5D straight pipe. For different open degrees of the valve (such as adjustable open valve), the upstream side of the straight pipe length needs 10D. The side of the straight pipe length only needs 3D.

Shown as the following figure

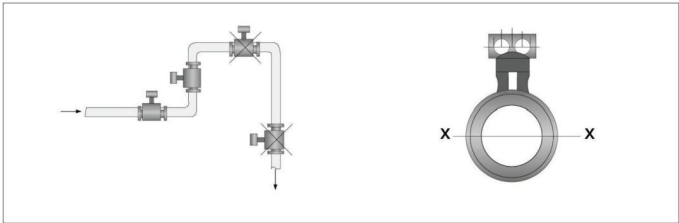


3. 安装位置和流动方向

电磁流量计可以水平、垂直和倾斜安装在管道上。在水平安装时, 电磁流量计的电极轴必须水平, 防止由于流体所夹带的气泡而产生电极短时间的绝缘, 也可以防止电极被流体中的沉积物覆盖。不应该将传感器安装在最高位置处, 以免有气体积聚。

3. Installation position and flow direction

The electromagnetic flowmeter can be installed on the pipe in horizontal, vertical and inclined way. When it is installed in horizontal way, The electrode shaft of the electromagnetic flowmeter must be horizontal. It can prevent electrode insulation for a short time because of bubbles carried by fluid. The electrode can also be prevented from being covered by the sediment in the fluid. The sensor should not be installed at the highest position, so as to avoid the accumulation of gas.

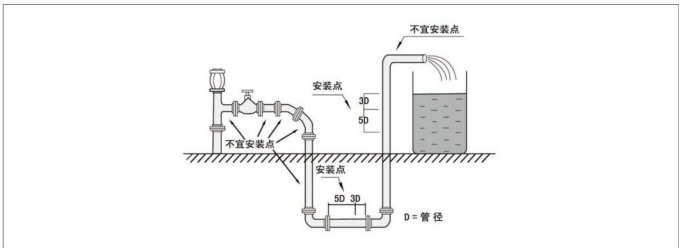
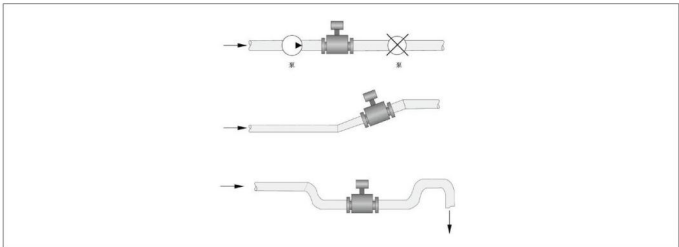


垂直安装时, 应该使流动方向向上, 这样可以使无流量或者流量很小时, 流体中夹带的较重固体颗粒下沉, 而轻的脂肪类物质 上升离开电磁流量计的传感器电极区, 在测量泥浆、矿浆等液固两相介质时避免固相沉淀和传感器衬里不均匀摩擦, 如图所示。

传感器的测量管道必须充满流体, 必须有一定的背压。为防止出现负压(损坏衬里), 电磁流量计不应该安装在泵的进口, 而应该 安装在泵的出口; 在倾斜安装时, 必须安装在上升管道; 在开口排放的管道安装时, 必须安装在管道的较低处。

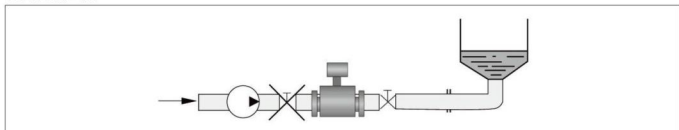
When it is installed in vertical way, The flow direction should be upward, in this case, when there is no flow or the flow is very small, the sinking of heavier solid particles entrained in fluid, The light of the fat mass rises away from the sensor electrode area of the electromagnetic flowmeter, In the measurement of liquid-solid two-phase medium, like slurry and pulp, it can avoid solid precipitation and uneven friction of sensor lining, shown as the following figure.

Measuring pipe of sensor must be full of fluid and a certain back pressure. In order to prevent negative pressure (damage to the lining), Electromagnetic flowmeters should not be installed in the pump inlet, it should be installed in the pump outlet, When it is installed in inclined way, it must be installed in the rising pipe. When it is installed in open discharge pipe, it must be installed in the lower parts of the pipe.



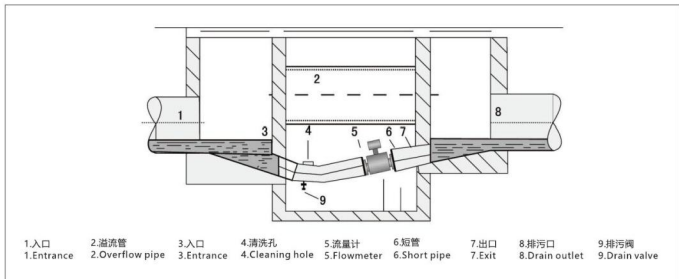
应在传感器的下游安装控制阀和切断阀，而不应该安装在传感器上游。

Control valves and cut off valve should be installed in downstream of the sensor, not in upstream of the sensor.



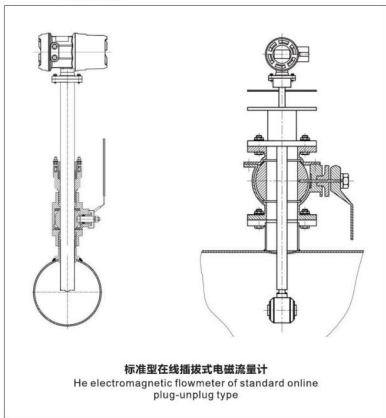
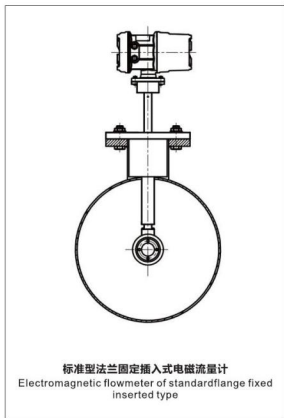
在测量井内安装流量计的方法

Method for installing flow meter in measuring well



4.插入式电磁流量计安装图

4. Installation diagram of inserted electromagnetic flowmeter



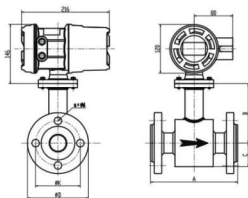
现场管道上开取DN100/DN50口径的孔，再焊接通径DN100/DN50的管子，和DN100 PN1.6MPa/DN50 PN1.6MPa法兰或螺纹底座。将标准型法兰固定插入式电磁流量计安装在法兰上。

在标准型法兰固定插入式电磁流量计安装法兰的基础上，增加了全通DN100/DN50的球阀。用户可在不切断介质的情况下，将标准型在线插拔式电磁流量计抽至最高点，关闭球阀，取出流量计。

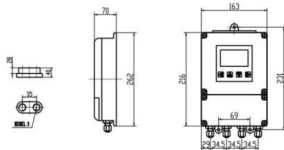
Open a hole of DN100/DN50 diameter on the pipeline, weld the pipe of DN100/DN50 diameter and PN1.6MPa/DN50 PN1.6MPa DN100 flange or screw base, then install the electromagnetic flowmeter of standard flange fixed inserted type on the flange. On the basis of the installation flange of the standard flange fixed inserted type electromagnetic flowmeter, it also add the ball valve of all passed DN100/DN50. The user can pump the electromagnetic flowmeter of standard online plug-unplug type to the highest point without cutting off the medium, close ball valve and take out the flowmeter.

电磁流量计外形尺寸图

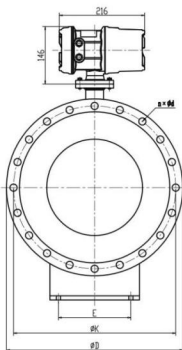
Overall dimension of the electromagnetic flowmeter



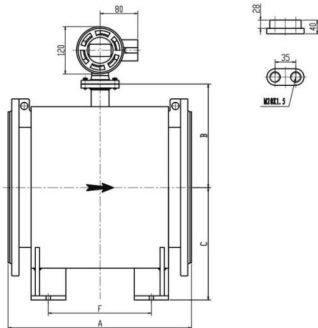
DN15-DN450管道法兰式电磁流量计
Electromagnetic flowmeter of pipe flange type DN15-DN450



分体式变送器
Split type transmitter



Dn500以上管道法兰式电磁流量计
Electromagnetic flowmeter of pipe flange type over Dn500



电磁流量计尺寸表图

Dimension table of electromagnetic flowmeter

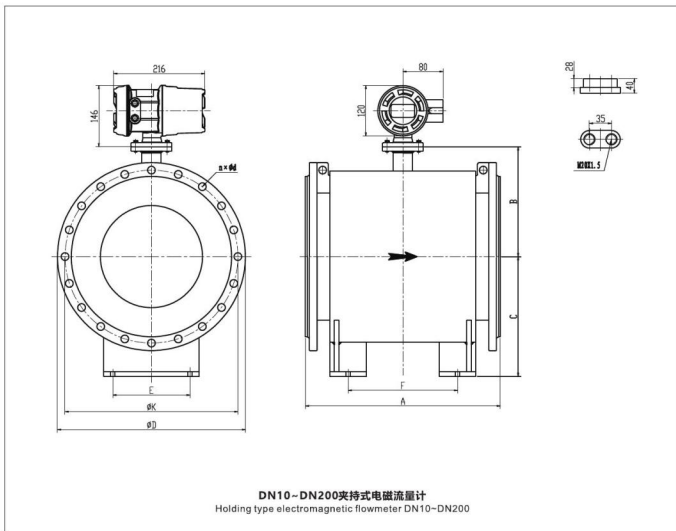
管道法兰式

Pipeline flange type

DN	额定压力 Rated pressure	仪表外形尺寸 单位: mm Overall dimension of instrument											
	Mpa	A	B	C	E	F	φD	φK	n×φ12				
10	4.0	150	90	50			90	60	4×φ14				
15		200		95			53	95	65	4×φ14			
20							62	105	75	4×φ18			
25							100	62	115	85	4×φ18		
32							105	72	140	100	4×φ18		
40							110	72	150	110	4×φ18		
50							121	72	165	125	4×φ18		
65							130	82	185	145	8×φ18		
80							135	89	200	160	8×φ18		
100							1.6	250	145	99	220	180	8×φ18
125									161	115	250	210	8×φ18
150									171	130	285	240	8×φ22
200	350				199	158			340	295	8×φ22		
250	450	224	185	395	350	12×φ22							
300	500	249	210	445	400	12×φ22							
350	550	274	241	505	460	16×φ22							
400	600	305	269	565	515	16×φ26							
450	600	330	294	615	656	20×φ26							
500	600	360	321	300	240	670	20×φ26						
600	600	410	374		270	780	725	20×φ30					
700	700	467	560	400	350	895	840	24×φ30					
800	800	517	610		400	1010	950	24×φ33					
900	900	567	660		470	1110	1050	28×φ33					
1000	1000	617	712	600	570	1225	1160	28×φ36					
1200	1200	719	814		710	1400	1340	32×φ33					
1400	1400	819	914		900	1625	1560	36×φ36					
1600	1600	919	1036		1040	1825	1760	40×φ36					
1800	0.6	1800	1021	1138	800	1180	2045	1970	44×φ39				
2000		2000	1121	1238		1350	2265	2180	48×φ42				

DN3~DN8电磁流量计外形尺寸及安装方式请联系天康工程师洽询。

Please contact Tiankang engineer about overall dimension and installation of DN3~DN8 electromagnetic flowmeter.



夹持式电磁流量计外形尺寸

Overall dimension of clamping type electromagnetic flowmeter

公称通径(mm) Nominal diameter	DN10	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
L(mm)	80	80	80	80	80	80	120	120	120	120	140	160	220

电气接线

必须按照《电磁流量计安装手册》的图例及要求接线。

所有电缆必须用外径5-8mm的护套线，电源采用2芯护套线（导体截面积 $\geq 0.75\text{mm}^2$ ）。接线完成后必须检查外壳盒盖和电缆旋紧格兰接头，避免灰尘及水进入。接线后，旋紧格兰头不可更换，以防止漏水和受潮。

现场走线采用穿线管时，应注意穿线管下端预留排水口，防止水通过穿线管流进电磁流量计电子单元及表体。

供电电源注意区分是交流AC 220V还是直流DC 24V，注意电源极性。电源错接将造成仪表故障或损坏。

将配套的接地线与上下游金属管道相连，保持传感器外壳与被测介质等电位。

Electrical wiring

The wiring must be in accordance with the "electromagnetic flowmeter Installation Manual" illustration and requirements.

All cables must be covered with sheathed wire of 5-8mm outer diameter, and the power supply shall be twin core cable with sheathed wire (conductor cross-sectional area $\geq 0.75\text{mm}^2$). After wiring is complete, be sure to check whether the cable gland of the housing cover and cable has been tightened, to prevent dust and water from entering. After wiring, the tightened cable gland shall not be replaced to prevent leakage and moisture.

When the conduit is used on the spot, the drainage outlet should be reserved at the lower end of the conduit to prevent water from flowing into the electronic unit and the surface of the electromagnetic flowmeter through the conduit.

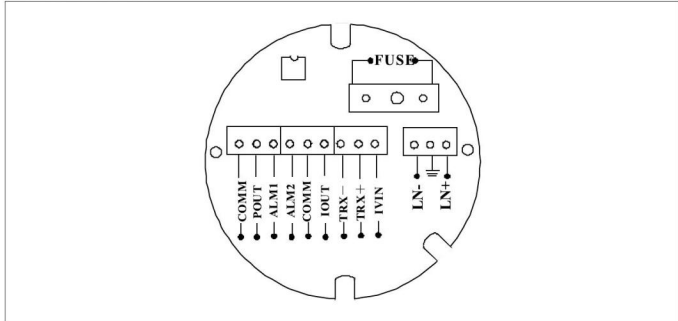
The power supply should be distinguished between AC 220V and DC 24V. Pay attention to the polarity of power supply. Faulty wiring of power supply will cause instrument failure or damage. (Connect the matching grounding wire to the upstream and downstream metallic conduits, and keep the sensor shell and the measured medium are equipotential.)

1. 接线图

1.1 电磁流量计端子接线图

Wiring diagram

Electromagnetic flowmeter terminal connection diagram



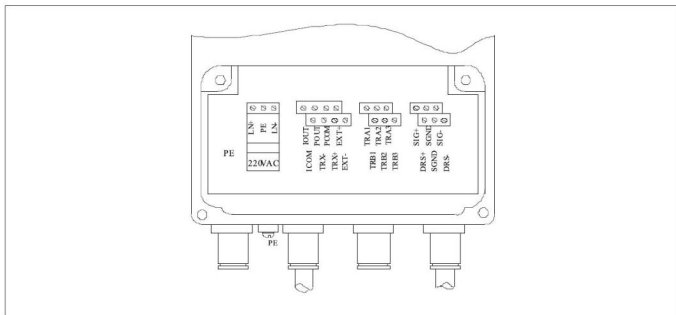
各接线端子标示含义如下

The meaning of each wiring terminal is as follows:

POUT	双向流量频率 / 脉冲输出	Two-way flow frequency/pulse output
ALM1	上限报警输出	Upper limit alarm output
ALM2	下限报警输出	Lower limit alarm output
COMM	频率、脉冲、电流公共端（地线）	Frequency, pulse, current common terminal (earth wire)
COMM	频率、脉冲、电流公共端（地线）	Frequency, pulse, current common terminal (earth wire)
IOUT	流量电流输出 / 两线制电流输出	Flow current output/Two-wire current output
IVIN	两线制24V电压输入	Two-wire 24V voltage input
TRX+	通讯输入(RS485-A)	Communication input(RS485-A)
TRX-	通讯输入(RS485-B)	Communication input(RS485-B)
LN+	220V电源输入	220V power input
LN-	220V电源输入	220V power input

1.2 电磁热能表端子接线图

Electromagnetic heat meter terminal connection diagram



各接线端子标示含义如下

The meaning of each wiring terminal is as follows

TRA1	入口温度输入 Inlet temperature input	TRA2	入口温度输入 Inlet temperature input
TRA3	入口温度输入 Inlet temperature input	TRA1	出口温度输入 Outlet temperature input
TRA2	出口温度输入 Outlet temperature input	TRA3	出口温度输入 Outlet temperature input
TRA4	预留 Reservation	TRA4	预留 Reservation
SIG+	信号1 Signal 1	SGND	信号地 Signal earth
SIG-	信号2 Signal 2	DRS+	激励屏蔽1 Excitation shielding 1
DRS-	激励屏蔽2 Excitation shielding 2	MTDR	保留 Retention
EXT+	励磁电流+ Exciting current+	EXT-	励磁电流- Exciting current -
POUT	频率输出正 Frequency output positive	PCOM	频率输出地 Frequency output field
IOUT	电流输出正 Current output positive	ICOM	电流输出地 Current output field
TRX-	通讯接口 (RS485-B) Communication interface(RS485-B)	TRX+	通讯接口 (RS485-A) Communication interface (RS485-A)
LN-	220V电源输入 220V power input	LN+	220V电源输入 220V power input
开关A Switch A	热电阻选择 Thermal resistance selection	DIOP	预留 Reservation

注：图2开关A为pt1000热电阻与pt100热电阻选择开关。出厂时默认pt1000热电阻，将开关1和2都拨到OFF。若用户采用Pt100热电阻，则将开关1和2都拨到ON即可。

Note: In fig. 2, switch A is pt1000 thermal resistance and pt100 thermal resistance selector switch. Default is pt1000 thermal resistance when delivery, place switches 1 and 2 to OFF. If you choose Pt100 thermal resistance, place switch 1 and 2 to ON.

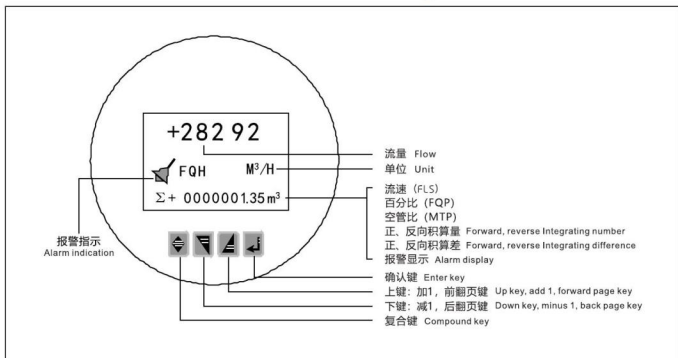
仪表参数设置

TK1000系列电磁流量计转换器、传感器连接到流体管道上后（无论是标定还是使用），应首先进行如下工作：

- 将传感器前后的管道用铜线良好紧固连接。
- 将传感器良好接地。
- 调仪表零点时确保管道内流体静止。
- 确保传感器电极氧化膜稳定生成（电极与流体连续接触48小时即可）。

TK1000系列电磁流量计采用LCD大屏幕，人性化操作界面，易于使用，可显示瞬时流量、正向/反向累计流量及各类报警信息。

1.电磁流量计操作键盘定义与液晶显示



说明：

在测量状态下，按“复合键+确认键”，出现转换器功能选择画面“参数设置”，按一下确认键，仪表出现输入密码状态，根据保密级别，按本厂提供的密码对应修改。再按“复合键+确认键”后，则进入需要的参数设置状态。如果想返回运行状态，请按住确认键数秒。

Instrument parameter setting

TK1000 series electromagnetic flowmeter converters, after the sensor is connected to the inter connection pipe (whether for calibration or use), the following steps should be taken first:

- Fasten the pipe before and after the sensor with copper wire.
 - Ground the sensor well.
 - When adjusting the zero point of the instrument, make sure that the fluid in the pipeline is still.
 - Ensure that the sensor electrode oxide film generate stably (electrode and fluid continuously contact for 48 hours).
- Tk1000 series electromagnetic flowmeter adopts LCD large screen, user-friendly operation interface, which is easy to use and can display instantaneous flow, forward/reverse cumulative discharge and various alarm information.

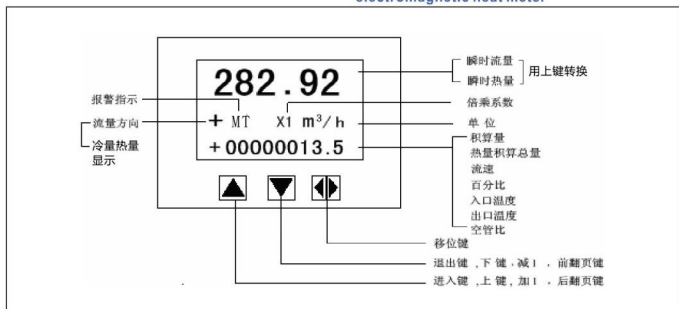
1.Function keyboard definition and LCD for electromagnetic flowmeter

Note:

In the measuring condition, press the "Compound key + Enter key", appears converter function selection screen "parameter setting", press the enter key and the instrument will in password input state. According to the security classification, change the password provided by the factory correspondingly. Press the "Compound key + Enter key" again, then enter the desired parameter setting state. If you want to return to the operating state, press the enter key for several seconds.

2.电磁热能表操作键盘定义与液晶显示

Function keyboard definition and LCD for electromagnetic heat meter



仪表上电时，自动进入测量状态。在自动测量状态下，仪表自动完成各测量功能并显示相应的测量数据。在参数设置状态下，用户使用三个面板键，完成仪表参数设置。

When the instrument is power on, it enters the measuring condition automatically. In the automatic measuring condition, the instrument automatically completes the measuring functions and displays the corresponding measuring data. In the parameter setting state, the user uses three panel keys to complete the instrument parameter setting.

3. 转换器参数及操作

3. Converter parameters and operation

3.1 电磁流量计转换器参数及操作

3.1 Electromagnetic flowmeter converter parameters and operation

仪表上电时，自动进入测量状态。在自动测量状态下，仪表自动完成各测量功能并显示相应的测量数据。在参数设置状态下，用户使用四个面板键，完成仪表参数设置。

When the instrument is power on, it enters the measuring condition automatically. In the automatic measuring condition, the instrument automatically completes the measuring functions and displays the corresponding measuring data. In the parameter setting state, the user uses four panel keys to complete the instrument parameter setting.

3.2 按键功能

3.2 Key function

3.2.1 自动测量状态下键功能

上键：循环选择屏幕下行显示内容；
复合键 + 确认键：进入参数设置状态；
确认键：返回自动测量状态。

3.2.1 Key functions in automatic measuring condition
Up key: Cycle picking the next display content on the screen
Compound key + Enter key: Enter parameter setting state;
Enter key: Return to automatic measuring condition.

在测量状态下，LCD显示器对比度的调节方法，通过“复合键 + 上键”或“复合键 + 下键”来调节合适的对比度。

In measuring condition, is to adjust the appropriate contrast ratio by “Compound key + Up key” or “Compound key + Down key”.

3.2.2 参数设置状态下各键功能

3.2.2 Key functions in parameter setting state

下键：光标处数字减1；
上键：光标处数字加1；
复合键 + 下键：光标左移；
复合键 + 上键：光标右移；
确认键：进入/退出子菜单；
确认键：在任意状态，连续按下两秒钟，返回自动测量状态。

Down key: the number minus 1 at the cursor position;

Up key: the number plus 1 at the cursor position;

Compound key + Up key: cursor runs left

Compound key + Down key: cursor runs right

Enter key: enter / exit submenu;

Enter key: In any state, press it two seconds continuously, then return to the automatic measuring condition.

注：(1) 使用“复合键”时，应先按下复合键再同时按住“上键”或“下键”。

Note: (1) when using “compound key”, press the compound key first and then press “Up key” or “Down key” at the same time.

(2) 在参数设置状态下, 3分钟内没有按键操作, 仪表自动返回测量状态。

(3) 流量零点修正的流向选择, 可将光标移至最左面的“+”或“-”下, 用“上键”或“下键”切换使之与实际流向相反。

3.2.3 参数设置功能及功能键操作

功能选择画面

按一下“复合键+确认键”进入功能选择画面, 然后再按“上键”或“下键”进行选择, 在此画面里共有3项功能可选择。

参数编号 Parameter number	功能内容 Function content	说明 Description
1	参数设置 Parameter settings	选择此功能, 可进入参数设置画面 Select this function to enter the parameter settings screen
2	总量清零 Total reset	选择此功能, 可进行仪表总量清零操作 Select this function to perform the instrument total reset operation
3	系数更改记录 Coefficient change record	选择此功能, 可进行查看流量系数更改记录 Select this function to view the flow coefficient change record

4. 参数设置

按一下“复合键+确认键”显示“参数设置”功能, 仪表进入到功能选择画面“参数设置”, 然后按确认键进入输入密码状态, “00000”状态, 输入密码进入按一下“复合键+确认键”进入参数设置画面。

4.1 总量清零

按一下“复合键+确认键”显示“参数设置”功能, 然后再按“上键”翻页到“总量清零”, 输入总量清零密码, 按一下“复合键+确认键”, 当总量清零密码自动变成“00000”后, 仪表的清零功能完成, 仪表内部的总量为0。

4.2 系数更改记录

按一下“复合键+确认键”显示“参数设置”功能, 然后再按“上键”翻页到“系数更改记录”

5. 参数设置菜单

参数 Paramete	参数文字 Parameter literal	设置方式 Setting mode	参数范围 Parameter range	密码级 Password level
1	语言 language	选择 Select	中文、英文 Chinese /English	2
2	仪表通讯地址 Instrument communication address	置数 Set number	0 ~ 99	2
3	仪表通讯速度 Instrument communication speed	选择 Select	300 ~ 38400	2
4	测量管口径 Measuring pipe caliber	选择 Select	3 ~ 3000	2
5	流量单位 Flow Unit	选择 Select	L/h, L/m, L/s, m ³ /h, m ³ /m, m ³ /s	2
6	仪表量程设置 Instrument range setting	置数 Set number	0 ~ 99999	2

(2) In the parameter setting state, if there is no key operation in 3 minutes, the instrument will automatically return to the measuring condition.

(3) For the flow direction of flow zero point modification, to move the cursor to the leftmost+ "or" -, using "Up key" or "Down key" to switch it contrary to the actual direction.

3.2.3 Parameter setting function and function key operation

Function selection screen

Press "Compound key + Enter key" to enter the function selection screen, and then press "Up key" or "Down key" to select, in this screen there are three functions to choose.

4. Parameter setting

Press the "Compound key + Enter key", it appears the "parameter setting" function, and the instrument enters the function selection screen of "parameter setting", then press the enter key to enter the password input state, the password is "000000", input the password to enter the "Compound key + Enter key" and to the parameter setting screen.

4.1 Total reset

Press the "Compound key + Enter key", it appears the "parameter setting" function, Then press "Up key" to the page of "total zero", input the total reset password, press the "Compound key + Enter key", when the total reset password automatically changed to "000000", the instrument's total reset function is finished, the total amount in the instrument is 0.

4.2 Coefficient change record

Press the "Compound key + Enter key", it appears the "parameter setting" function, Then press "Up key" to the page of "Coefficient change record"

5. Parameter setting menu

参数 Parameter	参数文字 Parameter literal	设置方式 Setting mode	参数范围 Parameter range	密码级 Password level
7	测量阻尼时间 Measuring damping time	选择 Select	1 ~ 64	2
8	流量方向选择 Flow direction selection	选择 Select	正向、反向 Forward, reverse	2
9	流量零点修正 Flow zero correction	置数 Set number	0 ~ ±9999	2
10	小信号切除点 Small-signal cutting point	置数 Set number	0 ~ 599.99%	2
11	允许切除显示 Allowable cutting display	选择 Select	允许/禁止 Permit/Prohibit	2
12	流量积算单位 Flow computing unit	选择 Select	0.001m ³ ~ 1m ³ 、0.001L ~ 1L	2
13	反向输出允许 Reverse output enable	选择 Select	允许/禁止 Permit/Prohibit	2
14	电流输出类型 Current output type	选择 Select	4 ~ 20mA	2
15	脉冲输出方式 Pulse output mode	选择 Select	频率/脉冲 Frequency / pulse	2
16	脉冲单位当量 Pulse unit equivalent	选择 Select	0.001m ³ ~ 1m ³ 、0.001L ~ 1L	2
17	频率输出范围 Frequency output range	选择 Select	1 ~ 5999 Hz	2
18	空管报警允许 Blank pipe Alarm permission	选择 Select	允许/禁止 Permit/Prohibit	2
19	空管报警阈值 Blank pipe alarm threshold	置数 Set number	59999 %	2
20	上限报警允许 Upper limit alarm permission	选择 Select	允许/禁止 Permit/Prohibit	2
21	上限报警数值 Upper limit alarm value	置数 Set number	000.0 ~ 599.99 %	2
22	下限报警允许 Lower limit alarm permission	选择 Select	允许/禁止 Permit/Prohibit	2
23	下限报警数值 Lower limit alarm value	置数 Set number	000.0 ~ 599.99 %	2
24	励磁报警允许 Excitation alarm permission	选择 Select	允许/禁止 Permit/Prohibit	2
25	总量清零密码 Total reset password	置数 Set number	0 ~ 99999	3
26	传感器编码1 Sensor coding 1	用户设置 User setting	出厂年、月 (0-99999) Factory date of year, month (0-99999)	4
27	传感器编码2 Sensor coding 2	用户设置 User setting	产品编号 (0-99999) Product number (0-99999)	4
28	励磁方式选择 Excitation mode selection	选择 Select	方式1、2、3 Mode 1, 2, 3	4
29	传感器系数值 Sensor coefficient value	置数 Set number	0.0000 ~ 5.9999	4
30	流量修正允许 Flow correction permission	选择 Select	允许/禁止 Permit/Prohibit	2
31	流量修正点1 Flow correction point1	用户设置 User setting	按流速设置 Set by flow rate	5
32	流量修正数1 Flow correction number1	用户设置 User setting	0.0000 ~ 1.9999	5

参数 Parameter	参数文字 Parameter literal	设置方式 Setting mode	参数范围 Parameter range	密码级 Password level
33	流量修正点2 Flow correction point2	用户设置 User setting	按流速设置 Set by flow rate	2
34	流量修正数2 Flow correction number2	用户设置 User setting	0.0000 ~ 1.9999	2
35	流量修正点3 Flow correction point3	用户设置 User setting	按流速设置 Set by flow rate	2
36	流量修正数3 Flow correction number3	用户设置 User setting	0.0000 ~ 1.9999	2
37	流量修正点4 Flow correction point4	用户设置 User setting	按流速设置 Set by flow rate	2
38	流量修正数4 Flow correction number4	用户设置 User setting	0.0000 ~ 1.9999	2
39	正向总量低位 Forward total low-order	可以修改 Changeable	00000 ~ 99999	2
40	正向总量高位 Forward total high-order	可以修改 Changeable	0000 ~ 9999	2
41	反向总量低位 Reverse total low-order	可以修改 Changeable	00000 ~ 99999	2
42	反向总量高位 Reverse total high-order	可以修改 Changeable	0000 ~ 9999	2
43	尖峰抑制允许 Peak suppression permission	选择 Select	允许/禁止 Permit/Prohibit	2
44	尖峰抑制系数 Peak suppression coefficient	选择 Select	0.010 ~ 0.800m/s	2
45	尖峰抑制时间 Peak suppression time	选择 Select	400 ~ 2500ms	2
46	密码1 Security code 1	用户可改 Changeable	00000 ~ 99999	2
47	密码2 Security code 2	用户可改 Changeable	00000 ~ 99999	2
48	密码3 Security code 3	用户可改 Changeable	00000 ~ 99999	2
49	密码4 Security code 4	用户可改 Changeable	00000 ~ 99999	2
50	电流零点修正 Current zero point correction	置数 Set number	0.0000 ~ 1.9999	2
51	电流满度修正 Current full scale correction	置数 Set number	0.0000 ~ 3.9999	3
52	出厂标定系数 Default calibration coefficient	置数 Set number	0.0000 ~ 5.9999	4
53	仪表编码1 Instrument coding 1	厂家设置 Factory setting	出厂年、月 (0-99999) Factory date of year, month (0-99999)	4
54	仪表编码2 Instrument coding 2	厂家设置 Factory setting	产品编号 (0-99999) Product number (0-99999)	4

仪表参数确定仪表的运行状态、计算方法、输出方式及状态。正确地选用和设置仪表参数，可使仪表运行在最佳状态，并得到较高的测量显示精度和测量输出精度。

仪表参数设置功能设有6级密码。其中，1~5级为用户密码，第6级为制造厂密码。用户可使用第5级密码来重新设置第1~4级密码。

The instrument parameters determine the operating state, calculation method, output mode and status of the instrument. Choosing and setting the parameters of the instrument correctly can make the instrument run in the best condition and obtain higher measurement display accuracy and measurement output precision.

The instrument parameter setting function has 6 levels password. Among them, level 1-5 is user password, level 6 is manufacturer password. The user can use the level 5 password to reset the password at level 1-4.

无论使用哪级密码，用户均可以察看仪表参数。但若用户若想改变仪表参数，则必须使用不同级别的密码。

第1级密码（出厂值00521）：用户只能查看仪表参数；

第2级密码（出厂值03210）：用户能改变1~24仪表参数；

第3级密码（出厂值06108）：用户能改变1~25仪表参数；

第4级密码（出厂值07206）：用户能改变1~29仪表参数；

第5级密码（固定值）：用户能改变1~52仪表参数。建议由用户较高级别的人员掌握，第5级密码；第4级密码，主要用于设置总量；第1~3级密码，由用户决定何级别的人员掌握。

5. 电磁热能表转换器参数及操作

5.1 按键功能

a) 自动测量状态下键功能

上键：瞬时热（冷）量与瞬时流量的转换；热量显示：H，冷量显示：R。

下键：循环选择屏幕下行显示内容；

移位键：按一下移位键，仪表进入到仪表功能选择画面；

对比度调节：上键+下键（长按）对比度变暗；上键+移位键（长按）对比度变亮；

b) 参数设置状态下各键功能

下键：光标处数字减1，前翻页；

上键：光标处数字加1，后翻页；

按移位键将光标移到上键下面，按下键进入子菜单。按移位键将光标移到下键下面，按下键返回上一级菜单。

5.2 参数设置功能及功能键操作

要进行仪表参数设定或修改，必须使仪表从测量状态进入参数设置状态。在测量状态下，按一下“移位键”，仪表进入到功能选择画面“仪表参数设置”，然后再按移位键将光标移到“上键”下面，按一下“上键”进入输入密码“00000”状态，输入密码后按移位键将光标移到“上键”下面，按一下“上键”进入选择操作主菜单，如下图所示：



如若改变主菜单，按“上键”即可，如要进入主菜单改写子菜单参数，请将光标移到“上键”下方，按“上键”仪表进入当前主菜单的子菜单，如下图所示：



No matter which level of password is used, the user can view the instrument parameters. However, if the user wants to change the instrument parameters, different levels of passwords need to be used.

Level 1 password (factory default 00521): the user can only view instrument parameters;

Level 2 password (factory default 03210): the user can change the instrument parameters of 1~24;

Level 3 password (factory default 06108): the user can change the instrument parameters of 1~25;

Level 4 password (factory default 07206): the user can change the instrument parameters of 1~29;

Level 5 password (fixed value): the user can change the instrument parameters of 1~52.

It is suggested that the password is controlled by person at a higher user level, level 5 password; level 4 password, mainly used to set the total amount; level 1~3 password, are for user to decide which level of person to hold.

5. Converter parameters and operation of electromagnetic heat meter

5.1 Key function

a) Key function in automatic measuring condition

Up key: The conversion between instantaneous heat (cooling) and instantaneous flow rate;

Down key: Cycle picking the next display content on the screen

Shift key: press the shift key, the instrument enter the instrument function selection screen;

Contrast ratio adjustment: Up key+ Down key(long press)Contrast darkens; Up key+ Shift key(long press)Contrast ratio brightens;

b) Key function in parameter setting state

Down key: the number minus 1 at the cursor position, to forward page;

Up key: the number plus 1 at the cursor position, to back page;

Press the shift key to move the cursor below the up key and press the key to enter the submenu.

Press the shift key to move the cursor below the down key and press the key to return to the previous menu.

5.2 Parameter setting function and function key operation

In order to set or modify the instrument parameters, the instrument must be changed from the measuring condition to the parameter setting state. In the measuring condition, press "Shift key" and the instrument enters the function selection screen "instrument parameter setting", then press the shift key to move the cursor under "Up key" and press "Up key" to enter the password input "00000" state, after input the password and press the shift key to move the cursor below "Up key", and press "Up key" to enter the main menu of the selection operation, as shown in the following figure:

If you want to change the main menu, press "Up key". To enter the main menu change submenu parameter, move the cursor below the "Up key" and press the "Up key", then the instrument to enter the submenu of the current main menu, as shown in the following figure:

如若进入此子菜单，将光标移到“上键”下方，按一下此键进行参数改写。

根据保密级别，按本厂提供的密码对应修改。在按“移位键”后，则进入需要的功能选择画面。

仪表设计有2级密码，其中1级用户可以自行设置密码值，2级密码为固定密码值，两级密码分别用于不同保密级别的操作者。

5.3 按键功能

按一下“移位键”进入功能选择画面，然后再按“进入键”进行选择，在此画面里共有5项功能可选择。

参数编号 Parameter number	功能内容 Function content	说明 Description
1	仪表参数设置 Instrument parameter setting	选择此功能，可进入参数设置画面 Select this function to enter the parameter settings screen
2	记录总量清零 Total record reset	选择此功能，可进行仪表总量清零操作 Select this function to perform the instrument total reset operation
3	月积总量显示 Monthly gross display	选择此功能，可查看32个月的月积总量 Select this function to view the total monthly gross for 32 months
4	掉电计时显示 Power down timing display	选择此功能，可查看32次掉电记录 Select this feature to view 32 power down records
5	系数修改记录 Coefficient change record	预留 Reservation

5.4 仪表参数设置

按一下“移位键”显示“参数设置”功能，输入仪表密码后，按“移位键”将光标移到“进入键”下面，按一下“进入键”进入参数设置状态。

5.5 记录总量清零

按一下“移位键”显示“仪表参数设置”，然后再按“上键”翻页到“记录总量清零”，输入总量清零密码，按“移位键”将光标移到“进入键”下面，按一下“进入键”，当总量清零密码自动变成“00000”后，仪表的清零功能完成，仪表内部的总量为0。

5.6 月积总量显示

仪表内部设计有不停电时钟（内部电池供电），可连续工作5年以上。若要使用月积总量及掉电计时功能，必须保证内部不掉电时钟工作正常；

调准时钟的年、月、日、时、分、秒数值；

保证内部电池电力充足（5年一换电池）；

If you want to enter this submenu, move the cursor below the "Up key" and press this key to change the parameters.

According to the security classification, change the password provided by the factory correspondingly. After pressing "Shift key", enter the desired function selection screen.

The instrument has two levels of password, in which the user of level 1 can set the password value, level 2 is a fixed value, and the two level passwords are used for operators of different security classifications.

5.3 Function selection screen

Press "Shift key" to enter the function selection screen, and then press "Enter key" to select, in this screen there are 5 functions to choose;

5.4 Instrument parameter setting

Press "Shift key", it appears the "parameter setting" function, after inputting the instrument password, Press "Shift key" to move cursor below "Enter key", press "Enter key" to enter parameter setting state.

5.5 Total record reset

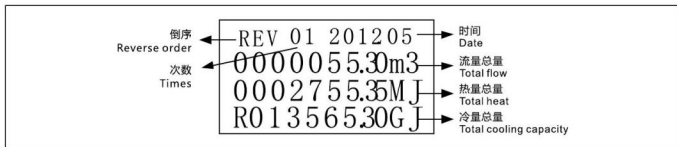
Press "Shift key", it appears the instrument "parameter setting" function, then press "Up key" to turn the page of record "Total record reset", input the total reset password, press "Shift key" to move the cursor below "Enter key", when the total amount of total reset password automatically becomes "00000", the instrument's total reset function is completed, and the total amount inside the instrument is 0.

5.6 Monthly gross display

In the instrument has a non-blackout clock (internal battery power supply), which can continue to work for more than 5 years. If you want to use the Monthly gross display and power down timing function, it must be ensured that the internal power clock operation is normal;

calibrate the year, month, day, hour, minute, and second value of the clock;

Ensure adequate internal battery power (5 years for battery change);



月积总量最多可记录32次数据，当超过32次时，新记录自动依次覆盖原始数据！

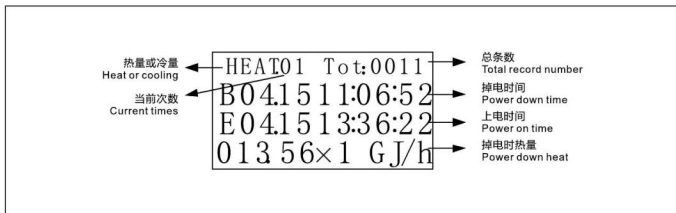
The monthly gross display can record up to 32 times of data, when more than 32 times, the new records automatically cover the original data in turn!

5.7 掉电计时显示

使用方法同月积总量。最多可记录32条掉电记录，可记录9999次掉电。

5.6 Power down timing display

The usage is the same as monthly gross display, with up to 32 power down records, and 9,999 power downs can be recorded



TK1100系列标准型电磁流量计选型编码说明
Description of standard type for TK1100 series

Tk1100系列电磁流量计DN3-DN2200;
精度 ≤0.5%。

TK1100 series electromagnetic flow meter DN3-DN2200
Accuracy ≤0.5%

型号 Model	TK1100														
安装方式 Installation method															
法兰型 Flange type		F													
夹持型 Holding type		W													
衬里 Lining															
硬橡胶 (Dn>50) Hard rubber(DN>50)		H													
软橡胶 (DN>40) Soft rubber(DN>40)		S													
聚氨酯 (DN>50~300) Polyurethane(DN>50~300)		E													
PTFE(DN>20)		T													
F46		F													
PFA		P													
PO(DN>50)		Z													
口径 Caliber															
DN3															03
DN6															06
DN8															08
DN10															10
DN15															15
DN20															20
DN25															25
DN32															32
DN40															40
DN50															50
DN65															65
DN80															80
DN100															1H
DN125															1Q
DN150															1F
DN200															2H
DN250															2F
DN300															3H
DN350															3F
DN400															4H
DN450															4F
DN500															5H
DN600															6H
DN700															7H
DN800															8H
DN900															9H
DN1000															1T
DN1200															2M
DN1400															4M
DN1600															6M
DN1800															8M
DN2000															0M
Dn2200															P2

TK1200系列高精度电磁流量计选型编码说明
Description of high accuracy type for TK1200 series

Tk1200系列电磁流量计DN10-DN1200;
 精度 ≤0.2%.

Tk1200 series electromagnetic flow meter DN10-DN1200
 Accuracy ≤0.2%

型号 Model	TK1200														
安装方式 Installation method															
法兰型 Flange type															
夹持型 Holding type															
衬里 Lining															
硬橡胶 (Dn>50) Hard rubber(DN>50)															
软橡胶 (DN>40) Soft rubber(DN>40)															
聚氨酯 (DN>50-300) Polyurethane(DN>50-300)															
PTFE(DN>20)															
F46															
PFA															
PO(DN>50)															
口径 Caliber															
DN10															10
DN15															15
DN20															20
DN25															25
DN32															32
DN40															40
DN50															50
DN65															65
DN80															80
DN100															1H
DN125															1Q
DN150															1F
DN200															2H
DN250															2F
Dn300															3H

型号 Model	Tk1200									
电极材料 Electrode material	接地电极材料 Grounding electrode material									
316L	无 NO		S							
哈氏合金B2 Hastelloy alloy B2	无 NO		B							
哈氏合金C4 Hastelloy alloy C4	无 NO		H							
钛 Titanium	无 NO		M							
钽 Tantalum	无 NO		T							
铂铱 Platinum iridium	无 NO		P							
碳化钨 Tantalum	无 NO		U							
316L	有 Yes		E							
哈氏合金B2 Hastelloy alloy B2	有 Yes		N							
哈氏合金C4 Hastelloy alloy C4	有 Yes		J							
钛 Titanium	有 Yes		A							
钽 Tantalum	有 Yes		Q							
铂铱 Platinum iridium	有 Yes		G							
碳化钨 Tantalum	有 Yes		V							
额定压力 Rated pressure	0.6Mpa		B							
	1.0Mpa		C							
	1.6Mpa		D							
	2.5Mpa		E							
	4.0Mpa		F							
	其它 Other		Z							
本体法兰材料 Flange material	配对法兰 Companion flange									
无(夹持式) None(clamping type)	0	无 None		0						
碳钢 Carbon steel	1	碳钢 Carbon steel		1						
304不锈钢 304 Stainless steel	2	304不锈钢 304 Stainless steel		3						
316不锈钢 316 Stainless steel	3	316不锈钢 316 Stainless steel		5						
其他 Other	4	其他 Other		7						
接地环 Grounding ring	无 No			A						
	接地环 Grounding ring			C						
温度范围 Temperature range	标准温度 <70°C Standard temperature <70°C			0						
	标准温度 <130°C Standard temperature <130°C			1						
	标准温度 <160°C Standard temperature <160°C			2						
转换器形式 Converter form	一体 Integrated type			T						
	分体 Split type			R						
输出模式 Output mode	4-20mA	+ 脉冲		01						
	4-20mA	+ Pulse								
	4-20mA	+ HART 通讯		02						
	4-20mA	+ HART communication								
	4-20mA	+ Modbus 协议		03						
	4-20mA	+ Modbus protocol								
	4-20mA	+ Profibus 协议		04						
	4-20mA	+ Profibus protocol								
供电电源 Power supply	220VAC			G						
	24VDC			K						
防护等级 Protection level	Ip65			0						
	Ip67			1						
	Ip68			2						
防爆等级 Explosion proof grade	无 No			0						
	隔爆 Explosion suppression			EX						

说明: 以上为标准型电极, 刮刀 (RE), 可更换 (WE)请标明; 一体型防护等级为IP65, 分体可选IP67, IP68 (仅传感器)。

Note:The above is a standard type electrode, scraper (RE), can be replaced(WE) please mark.The protection level of integrated type is IP65, and IP67 or IP68(only sensor) can be selected for split type.

TK1300系列卫生型电磁流量计选型编码说明

Description of hygienic type for TK1300 series

TK1300系列电磁流量计DN3-DN150
精度 ≤0.2%, ≤0.5%.

Tk1400 series electromagnetic flow meter DN3-DN150
Accuracy ≤0.2%, ≤0.5%

型号 Model	TK1300							
工艺接头 Process joints 三卡箍(3A) Three-clamps DIN11851 其它 Other								
衬里 Lining PTFE F46 PFA						T F P		
口径 Caliber DN3 DN6 DN10 DN15 DN20 DN25 DN32 DN40 DN50 DN65 DN80 DN100 DN125								03 06 10 15 20 25 32 40 50 65 80 1H 1Q
电极材料 Electrode material 316L 哈氏合金B2 Hastelloy alloy B2 哈氏合金C4 Hastelloy alloy C4	接地电极材料 Grounding electrode material 无 NO 无 NO 无 NO							S B H
钛 Titanium 钽 Tantalum 铂铱 Platinum iridium	无 NO 无 NO 无 NO							M T P
316L 哈氏合金B2 Hastelloy alloy B2 哈氏合金C4 Hastelloy alloy C4	有 Yes 有 Yes 有 Yes							E N J
钛 Titanium 钽 Tantalum 铂铱 Platinum iridium	有 Yes 有 Yes 有 Yes							A Q G
温度范围 Temperature range	标准温度 <90°C Standard temperature <90°C 高温 <160°C High temperature <160°C							1 3
转换器形式 Converter form	一体 Integrated type 分体 Split type							T R
供电电源 Power supply	220VAC 24VDC							G K
输出模式 Output mode	4-20mA + 脉冲 4-20mA + HART 通讯 4-20mA + HART communication 4-20mA + Modbus 协议 4-20mA + Modbus protocol 4-20mA + Profibus 协议 4-20mA + Profibus protocol							01 02 03 04
防护等级 Protection level	Ip65 Ip67 Ip68							0 1 2

TK1400插入式电磁流量计选型编码说明

Description of inserted type for TK1400 series

Tk1400系列电磁流量计DN250-DN3000
精度 ≤1.5%

Tk1400 series electromagnetic flowmeter DN250-DN3000
Accuracy ≤1.5%

型号 Model	TK1400												
标准型 Standard type		B											
在线插拔式 On line plug and unplug		Z											
安装方式 Installation method													
螺纹固定式 Screw thread fixed type			M										
法兰固定式 Flange fixed type			G										
衬里 Lining													
PTFE				T									
POM				M									
口径 Caliber													
DN200												2H	
DN250												2F	
DN300												3H	
DN350												3F	
DN400												4H	
DN450												4F	
DN500												5H	
DN600												6H	
DN700												7H	
DN800												8H	
DN900												9H	
DN1000												1T	
DN1200												2M	
DN1400												4M	
DN1600												6M	
DN1800												8M	
DN2000												0M	
DN2200												2P	
DN2400												4P	
DN2500												5P	
DN2600												6P	
DN2800												8P	
DN3000												3Q	

型号 Model	TK1400										
电极材料 Electrode material 316L 哈氏合金B2 Hastelloy alloy B2 哈氏合金C4 Hastelloy alloy C4 钛 Titanium											S B H M
额定压力 Rated pressure 0.6Mpa 1.0Mpa 1.6Mpa											B C D
法兰材料 Flange material 不锈钢 Stainless steel 不锈钢 Stainless steel	配对法兰 Companion flange 无 None 有 Yes										0 1
温度范围 Temperature range	标准温度 <60℃ Standard temperature <60℃ 高温 <100℃ High temperature <100℃										0 1
转换器形式 Converter form	一体 Integrated type 分体 Split type										T R
输出模式 Output mode	4-20mA + 脉冲 4-20mA + Pulse 4-20mA + HART 通讯 4-20mA + HART communication 4-20mA + Modbus 协议 4-20mA + Modbus protocol 4-20mA + Profibus 协议 4-20mA + Profibus protocol										01 02 03 04
供电电源 Power supply	220VAC 24VDC										G K
防护等级 Protection level	Ip65 Ip67 Ip68										0 1 2
防爆等级 Explosion proof grade	无 No 隔爆 Explosion suppression										0 EX

说明：以上为标准型电极，一体型防护等级为IP65，分体可选IP67，IP68(仅传感器)。

Note: The above is a standard type electrode, The protection level of integrated type is IP65, and IP67 or IP68(only sensor) can be selected for split type.

TK1500系列标准型电磁流量计选型编码说明

Description of battery powered type for TK1500 series

Tk1500系列电磁流量计DN10-DN1200
精度 ≤0.5%

Tk1500 series electromagnetic flow meter DN10-DN1200
Accuracy ≤0.5%

型号 Model	TK1500																					
安装方式 Installation method																						
法兰型	Flange type																					
夹持型	Holding type																					
衬里 Lining																						
硬橡胶 (DN > 50)	Hard rubber(DN > 50)																			H		
软橡胶 (DN > 40)	Soft rubber(DN > 40)																				S	
聚氨酯 (DN > 50~300)	Polyurethane(DN > 50~300)																					E
PTFE(DN > 20)																						T
F46																						F
PFA(DN > 10~150)																						P
PO(DN > 50)																						Z
口径 Caliber																						
DN15																						15
DN20																						20
DN25																						25
DN32																						32
DN40																						40
DN50																						50
DN65																						65
DN80																						80
DN100																						1H
DN125																						1Q
DN150																						1F
DN200																						2H
DN250																						2F
DN300																						3H
DN350																						3F
DN400																						4H
DN450																						4F
DN500																						5H
DN600																						6H
DN700																						7H
DN800																						8H
DN900																						9H
DN1000																						1T
DN1200																						2M

型号 Model	TK1600									
电极材料 Electrode material	接地电极材料 Grounding electrode material									
316L	无 NO		S							
哈氏合金B2 Hastelloy alloy B2	无 NO		B							
哈氏合金C4 Hastelloy alloy C4	无 NO		H							
钛 Titanium	无 NO		M							
钽 Tantalum	无 NO		T							
铂铱 Platinum iridium	无 NO		P							
碳化钨 Tantalum	无 NO		U							
316L	有 Yes		E							
哈氏合金B2 Hastelloy alloy B2	有 Yes		N							
哈氏合金C4 Hastelloy alloy C4	有 Yes		J							
钛 Titanium	有 Yes		A							
钽 Tantalum	有 Yes		Q							
铂铱 Platinum iridium	有 Yes		G							
碳化钨 Tantalum	有 Yes		V							
额定压力 Rated pressure	0.6Mpa		B							
	1.0Mpa		C							
	1.6Mpa		D							
	2.5Mpa		E							
	4.0Mpa		F							
	其它 Other		Z							
本体法兰材料 Flange material	配对法兰 Companion flange									
无(夹持式) None(clamping type)	0	无 None	0							
碳钢 Carbon steel	1	碳钢 Carbon steel	1							
304不锈钢 304 Stainless steel	2	304不锈钢 304 Stainless steel	3							
316不锈钢 316 Stainless steel	3	316不锈钢 316 Stainless steel	5							
其他 Other	4	其他 Other	7							
接地环 Grounding ring	无 No			A						
	接地环 Grounding ring			C						
温度范围 Temperature range	标准温度 <70°C Standard temperature <70°C		0							
	标准温度 <130°C Standard temperature <130°C		1							
	标准温度 <160°C Standard temperature <160°C		2							
转换器形式 Converter form	一体 Integrated type		T							
	分体 Split type		R							
输出模式 Output mode	4-20mA+脉冲		01							
	4-20mA+ Pulse									
	4-20mA+HART 通讯		02							
	4-20mA+HART communication									
	4-20mA+Modbus 协议		03							
	4-20mA+Modbus protocol									
	4-20mA+Profibus 协议		04							
	4-20mA+Profibus protocol									
供电电源 Power supply	220VAC		G							
	24VDC		K							
防护等级 Protection level	Ip65		0							
	Ip67		1							
	Ip68		2							
防爆等级 Explosion proof grade	无 No		0							
	隔爆 Explosion suppression		EX							

说明：以上为标准型电极，刮刀（RE），可更换（WE）请标明：一体型防护等级为IP65，分体可选IP67，IP68（仅传感器）。

Note: The above is a standard type electrode, scraper (RE), can be replaced(WE) please mark. The protection level of integrated type is IP65, and IP67 or IP68(only sensor) can be selected for split type.

电极材质防腐选用参考表

Reference table for anti-corrosion of electrode materials

介质名称 Dielectric name	浓度% Concentration	温度℃ Temperature	316L	哈氏C Hastelloy C	钛 Titanium	钽 Tantalum	铂 Platinum	
硫酸 Sulfuric acid	2-5	室温 Room temperature	N	X	X	A	A	
		沸点 Boiling point	N	N	X	N	A	
	10	室温 Room temperature	N	X	X	A	A	
		沸点 Boiling point	N	N	N	N	A	
	25-60	室温 Room temperature	N	X	B	A	A	
		沸点 Boiling point	N	N	N	N	A	
	70-85	室温 Room temperature	N	X	N	A	A	
		沸点 Boiling point	N	N	N	N	A	
	90-96	室温 Room temperature	X	X	N	A	A	
		沸点 Boiling point	N	N	N	N	A	
	盐酸 Hydrochloric acid	0.5-5	室温 Room temperature	N	X	A	A	A
			沸点 Boiling point	N	N	A	X	X
10-20		室温 Room temperature	N	B	A	A	A	
		沸点 Boiling point	N	N	N	X	X	
37		室温 Room temperature	B	N	N	A	X	
		沸点 Boiling point	N	N	N	X	X	
硝酸 Nitric acid	7-65	室温 Room temperature	X	X	X	A	A	
		沸点 Boiling point	X	N	X	A	A	
	100	室温 Room temperature	N	-	X	A	A	
		沸点 Boiling point	-	-	X	A	A	
铬酸 Chromic acid	10	室温 Room temperature	A	A	A	A	A	
		沸点 Boiling point	N	A	A	A	N	
	50	室温 Room temperature	N	A	A	A	A	
		沸点 Boiling point	N	A	A	A	A	
	100	室温 Room temperature	N	N	-	A	A	
		沸点 Boiling point	N	N	-	A	A	

符号说明：A-适用，B-可用，寿命短；N-不能用；X-耐腐蚀；空白-无数据；Sat-饱和。

Symbol notes: A-applicable, B-available, shot life, N-not available, X-corrosion resistance.

介质名称 Dielectric name	浓度% Concentration	温度°C Temperature	316L	哈氏C Hastelloy C	钛 Titanium	钽 Tantalum	铂 Platinum
王水 Aqua regia	100	室温 Room temperature	N	N	B	A	N
		沸点 Boiling point	N	N	N	N	A
氢氟酸 Hydrofluoric acid	1-50	室温 Room temperature	N	N	N	N	A
	98-100	沸点 Boiling point	N	N	N	N	A
磷酸 Phosphoric acid	1-30	室温 Room temperature	X	X	X	A	A
	45-Sat	室温 Room temperature	B	X	B	A	A
	80-Sat	沸点 Boiling point	N	N	N	A	A
乙酸 Acetic acid	5-10	室温 Room temperature	A	A	A	A	A
	50以上 More than 50	室温 Room temperature	N	A	A	A	A
	Sat	室温 Room temperature	A	A	A	X	A
□ □ Methanol	100	室温 Room temperature	A	A	A	X	A
	100	沸点 Boiling point	B	A	B	X	A
污水 Wastewater	-	室温 Room temperature	A	A	A	A	A
海水 Seawater	-	室温 Room temperature	B	A	A	A	A
甲酸 Formic acid	10-20	室温 Room temperature	N	A	A	A	A
		沸点 Boiling point	N	B	A	A	A
	50-100	室温 Room temperature	N	B	B	A	A
		沸点 Boiling point	N	N	N	A	A
草酸 Oxalic acid	5-10	室温 Room temperature	A	A	A	X	A
	25-50	沸点 Boiling point	-	A	A	X	A
	sat	室温 Room temperature	-	N	B	X	A
	5-sat	沸点 Boiling point	N	N	N	X	A
柠檬酸 Citric acid	5-25	室温 Room temperature	A	A	A	X	A
		沸点 Boiling point	A	A	A	X	A
	50	室温 Room temperature	A	A	A	X	A
		沸点 Boiling point	A	A	B	X	B

符号说明: A-适用, B-可用, 寿命短; N-不能用; X-耐腐蚀; 空白-无数据; Sat-饱和。
Symbol notes: A-applicable, B-available, shot life, N-not available, X-corrosion resistance.

介质名称 Dielectric name	浓度% Concentration	温度°C Temperature	316L	哈氏C Hastelloy C	钛 Titanium	钽 Tantalum	铂 Platinum
氯化铁 Ferric chloride	10-sat	室温 Room temperature	N	A	A	A	N
		沸点 Boiling point	N	A	A	A	N
氯化钠 Sodium chloride	100	室温 Room temperature	B	A	A	X	A
		沸点 Boiling point	B	A	A	X	A
氯化铵 Ammonium chloride	10-20	室温 Room temperature	N	B	B	A	A
		沸点 Boiling point	N	B	B	A	A
	50-100	室温 Room temperature	N	B	B	X	A
		沸点 Boiling point	N	B	B	X	A
氯化钙 Calcium chloride	100	室温 Room temperature	N	N	-	A	A
		沸点 Boiling point	-	X	-	A	A
氯化镁 Magnesium chloride	10-30	室温 Room temperature	N	B	B	A	A
		沸点 Boiling point	N	B	-	X	A
硝酸钾 Potassium nitrate	20-50	室温 Room temperature	A	A	A	X	A
		沸点 Boiling point	A	A	A	X	A
	80-Sat	室温 Room temperature	A	A	A	X	A
		沸点 Boiling point	A	A	A	X	A
硫酸钠 Sodium sulfate	Sat	室温 Room temperature	A	A	A	A	A
		沸点 Boiling point	N	N	N	A	A
脂肪酸 Fatty acids	100	室温 Room temperature	A	A	A	X	A
	100	沸点 Boiling point	B	A	A	X	A
乳酸 Lactic acid	1.5-10	室温 Room temperature	A	A	A	X	-
	1.5-10	沸点 Boiling point	N	A	A	X	-
		Sat	沸点 Boiling point	N	N	A	A
硝酸铝 Aluminum nitrate	10	室温 Room temperature	A	X	A	A	A
	10-100	室温 Room temperature	-	X	A	X	-
	57	120°C	-	X	A	X	-
纸浆 Paper pulp	-	室温 Room temperature	B	A	A	A	A
石灰浆 Calcium hydroxide	-	室温 Room temperature	N	B	A	A	A

符号说明：A-适用，B-可用，寿命短；N-不能用；X-耐腐蚀；空白-无数据；Sat-饱和。
Symbol notes: A-applicable, B-available, shot life, N-not available, X-corrosion resistance.

常见液体电导率参数表

Parameter table of liquid conductivity parameter table

介质名称 Dielectric name	浓度% Concentration	温度℃ Temperature	电导率(S/cm) Conductivity
硫酸 Sulfuric acid	5	18	20.85×10^{-2}
	85	-	98.50×10^{-1}
	99.4	-	85.00×10^{-4}
盐酸 Hydrochloric acid	5	15	39.48×10^{-2}
	40	-	51.52×10^{-2}
硝酸 Nitric acid	6.2	18	31.23×10^{-2}
	31	-	79.19×10^{-2}
	62	-	49.04×10^{-2}
氢氟酸 Hydrofluoric acid	0.004	18	2.50×10^{-4}
	0.121	-	21.00×10^{-4}
	4.80	-	59.3×10^{-1}
	29.80	-	34.11×10^{-2}
醋酸 Acetic acid	0.30	18	3.18×10^{-4}
	20	-	16.05×10^{-2}
	70	-	2.35×10^{-4}
	99.70	-	4.00×10^{-8}
	100(纯)	25	1.20×10^{-8}
磷酸 Phosphoric acid	10	15	56.6×10^{-2}
	70	-	14.73×10^{-2}
	87	-	70.90×10^{-2}
氨水 Ammonium hydroxide	0.10	15	2.51×10^{-4}
	8.03	-	10.38×10^{-4}
	30.50	-	1.93×10^{-4}
丁酸 Butyric acid	1.00	18	4.55×10^{-4}
	50.04	-	2.96×10^{-4}
	70.01	-	5.6×10^{-7}
	100	-	6.0×10^{-9}
氢溴酸 Hydrobromic acid	5	15	19.08×10^{-2}
	15	-	49.40×10^{-2}
	100	-	8.0×10^{-4}
氯化钡 Barium chloride	5	18	3.89×10^{-2}
	24	-	15.34×10^{-2}
硫酸钾 Potassium sulphate	5	18	45.80×10^{-1}

介质名称 Dielectric name	浓度% Concentration	温度℃ Temperature	电导率(S/cm) Conductivity
甲酸 Formic acid	4.94	18	55.00×10^{-4}
	39.955	-	98.40×10^{-4}
	100	-	2.80×10^{-4}
	100(纯)	-	5.60×10^{-5}
草酸 Oxalic acid	3.5	18	5.08×10^{-2}
	5	18	67.20×10^{-3}
氯化钠 Sodium chloride	10	-	12.11×10^{-2}
	26	-	21.51×10^{-2}
氯化钙 Calcium chloride	5	-	6.43×10^{-2}
	25	-	17.81×10^{-2}
	35	-	13.66×10^{-2}
氯化铵 Ammonium chloride	5	18	91.80×10^{-3}
	25	-	40.25×10^{-2}
氯化钾 Potassium chloride	5	18	69.90×10^{-3}
	21	-	28.10×10^{-2}
氯化镁 Magnesium chloride	5	18	68.30×10^{-3}
	30	-	10.61×10^{-2}
硫酸钠 Sodium sulfate	5	18	40.90×10^{-3}
	15	-	88.60×10^{-3}
硫酸铜 Cupric sulfate	2.50	18	10.90×10^{-3}
	17.50	-	45.80×10^{-3}
硝酸钾 Potassium nitrate	5	15	45.4×10^{-3}
	22	-	16.25×10^{-2}
硫酸铵 Ammonium sulfate	5	15	55.20×10^{-3}
	31	-	23.21×10^{-2}
硝酸铵 Ammonium nitrate	5	15	55.20×10^{-3}
	50	-	23.21×10^{-2}
	2.5	15	27.60×10^{-3}
氯化锌 Zinc chloride	30	-	92.60×10^{-3}
	60	-	36.9×10^{-3}
	5	18	45.10×10^{-3}
碳酸钠 Sodium carbonate	15	-	83.60×10^{-3}
	100	145	5.0×10^{-3}

组态数据表

Data table of configuration

客户名称 Client name				日期 Date
联系人 Client name				部门 Department
电话 TEL				传真 FAX
产品型号 Product model				位号 No.
测量介质 Measuring medium	液体Liquid (是否带有固体颗粒 With solid particles		Yes	No)
电导率 Conductivity	是否大于 More than	<input type="checkbox"/> 5 μ s	<input type="checkbox"/> Yes	<input type="checkbox"/> No
流量范围 Flow range				
工作压力 Working pressure	<input type="checkbox"/> 最大 Maximum	<input type="checkbox"/> 正常 Normal	<input type="checkbox"/> 最小 Minimum	
介质温度 Working pressure	<input type="checkbox"/> 最大 Maximum	<input type="checkbox"/> 正常 Normal	<input type="checkbox"/> 最小 Minimum	
工艺管径 Working pressure				
法兰材质 Flange material	<input type="checkbox"/> 碳钢 Carbon steel		<input type="checkbox"/> 不锈钢 Stainless steel	
转换器 Converter	<input type="checkbox"/> 一体 One type		<input type="checkbox"/> 分体 (电缆长度) Split type(cable length)	
供电电源 Power supply	<input type="checkbox"/> 220V AC		<input type="checkbox"/> 24VDC	
防护等级 Ingress protection	<input type="checkbox"/> Ip65		<input type="checkbox"/> Ip68	
防爆要求 Explosion proof requirement	<input type="checkbox"/> Yes		<input type="checkbox"/> No	
电气输出 Electrical output	<input type="checkbox"/> 脉冲Pulse		<input type="checkbox"/> 4-20mA 电流Current	
	<input type="checkbox"/> HART		<input type="checkbox"/> MODBUS	<input type="checkbox"/> PROFIBUS

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