



压力变送器选型样本

PRESSURE TRANSMITTER
PRODUCT SELECTION CATALOGUE

安徽天康(集团)股份有限公司
ANHUI TIANKANG(GROUP) SHARES CO.,LTD

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 foreshore, 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.

STRATEGIC TARGET

战略目标

打造百年天康 拉动千亿产业

“引领民族工业发展，成为技术领先与产品领先型企业，
备受瞩目的国际化经营公司”

TEN BILLION TIANKANG, HUNDRES BILLION INDUSTRY

Lead the development Chinese national industry, become technology and products leading enterprises,
Spotlighted global management enterprise.

目录

CONTENTS

工作原理 Working principle	1
TK3051系列压力变送器 Series Pressure Transmitter	4
1199 远传膜片密封件系统 1199 Remote Transmitting Diaphragm Sealing System	26
TK3051F卫生型压力变送器 TK3051F Hygiene Pressure Transmitter	32
3051F型订货信息表 3051F Type Order Information	36
TK3051P高温防腐型压力变送器 TK3051P High Temperature Anti-Corrosion Pressure Transmitter	37
TK208、TK316系列扩散硅变送器 TK208, TK316 series diffusion silicon transmitter	42
TK型扩散硅压力变送器选型表 TK Diffusion Silicon Pressure Transmitter Selection	43
TK-YB静压式/TK-HB导压式液位变送器 TK-YB Static Pressure Pressure /TK-HB Guiding Liquid Level Transmitter	44
TK-YB型静压式液位变送器选型表 Type selection table of Tk-YB type static pressure type liquid level transmitter	45
TK-HB型导压式液位变送器选型表 Type selection table of Tk-TB type static pressure type liquid level transmitter	46
TK301一体化浓度/密度变送器 TK 301 Integrated Concentration/Density Transmitter	47
TK6800电动压差式液位变送器 TK6800 Electric Pressure Differential Liquid Level Transmitter	50
TK-3051-DPG井下压力计/变送器 TK-3051-DPG downhole pressure gauge/transmitter	52

工作原理

Working Principle

一、传感器原理

差压变送器包括两个功能单元：

①主单元，②辅助单元。

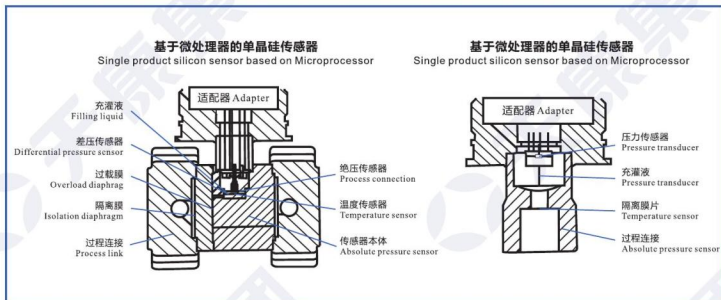
主单元包括传感器和过程连接，工作原理如下：传感器模块采用全焊接技术，内部拥有一个整体化的过载膜片，一个绝对压力传感器、一个温度传感器和一个差压传感器。绝压传感器只装在传感器膜盒的高压侧，做为静压测量和补偿的参考价值。温度传感器做为温度补偿的参考值，差压传感器的负压侧与传感器膜盒的低压腔相连，差压通过隔离膜片和填充液，传递给差压传感器的硅芯片，使差压传感器的芯片的阻值发生变化，从而导致检测系统输出电压变化，该输出电压与压力变化成正比，再由适配单元和放大器转化成以标准化信号输出。

Sensor principle

The differential pressure transmitter consists of two functional units:

Main unit, Auxiliary unit.

The main unit comprises a sensor and process links, the working principle is as follows: the sensor module adopts the welding technology, has an integrated overload diaphragm, an absolute pressure sensor, a temperature sensor and a pressure sensor. The pressure sensor is installed on the high pressure side of the sensor box, which is the reference value of static pressure measurement and compensation. As the temperature sensor for temperature compensation of the reference value, the low pressure chamber side and negative pressure sensor diaphragm differential pressure sensor is connected to the differential pressure through the diaphragm and liquid filling, transfer to the silicon chip differential pressure sensor, the differential pressure sensor chip resistance changes, resulting in the detection system of the change of output voltage, the output voltage changes with pressure the signal is proportional to the output of the amplifier adapter unit and transformed into a standard.



压力变送器包括两个功能单元：

主单元，辅助单元。

主单元包括传感器的过程连接，工作原理如下：过程介质通过柔性、抗腐蚀性的隔离膜片以及填充液的压力传感器测量膜片上施加压力，压力传感器测量膜片的另一端接大气（用于表压测量）或真空（用于绝压测量）。从而使传感器硅芯片的阻值发生变化，导致检测系统输出电压变化。该输出电压与压力变化成正比。再由适配单元和放大器转化成一标准化信号输出。

The pressure transmitter consists of two functional units:

Main unit, Auxiliary unit

The main unit comprises a sensor process link, the working principle is as follows: the pressure diaphragm process through the medium of flexibility, corrosion resistance and pressure sensor diaphragm of filling liquid, the other end is connected with the atmospheric pressure sensor (for measuring diaphragm gauge pressure (or vacuum) for absolute pressure measurement). Therefore, the resistance of the silicon chip of the sensor changes, which results in the change of the output voltage. The output voltage is proportional to the pressure change. And then converted into a standard signal output by the adapter unit and amplifier.

二、技术优势

- 差压变送器中心传感单元采用国内外领先的高精度单晶硅传感器技术，最高可达 $\pm 0.025\%$ 的高精度；
- 微差压变送器采用全球领先的双过载保护膜专利技术，最高可达 $\pm 0.075\%$ 的高精度；
- 差压变送器工作压力分别为16MPa、25MPa和40MPa三档，单向过载压力最高到40MPa；
- 差压变送器可选封装静压传感器，可用于现场工作静压的测量和显示，也可应用于静压补偿，静压性能极佳，静压误差最优 $\leq \pm 0.05\%/10\text{MPa}$ ；
- 传感器内部集成高灵敏度传感器，变送器温度性能极佳，最优 $\leq \pm 0.04\%/10\text{K}$ ；
- 全不锈钢316L硅油充灌焊接密封性结构；
- 微量程表压/绝压变送器采用全球领先的无传压损耗过载保护膜专利技术，单向过压最高达7MPa，即满量程的1166倍；
- 稳定可靠，长期漂移为 $\pm 0.1\%/3\text{年}$ ，5年免维护；
- 极宽的测量范围100Pa~40MPa（最高可扩展至60MPa）；
- 最高100:1的可调节量程比；
- EMC符合GB/T 18268, 1-2008标准要求。

三、主要特点

- 采用先进的单晶硅传感器技术及电容传感技术；
 - 高稳定性、高可靠性、高抗干扰性；
 - 多种调试方式：就地按钮、手操器、通信软件；
 - 就地按钮与LCD表头可实现变送器的功能组态；
 - 可选防雷保护（耐瞬变电压）功能；
 - 可选不锈钢电子外壳
- 液位、远传变送器：形式、隔离膜片、灌充液选择丰富；
- 测量介质：液体、蒸汽和气体；
 - 基本误差： $\pm 0.025\% \sim \pm 0.1\%$ ；
 - 最大量程比：100 : 1；
 - 测量范围（未迁移时）
- 差压范围：0-50Pa~1MPa；
压力范围：0-1kPa~40MPa；
绝压范围：0-10kPa~3MPa；
环境温度：-40°C~+60°C
(防爆、防雷：-40°C~+60°C)（带LCD表头、充氟油：-20°C~+60°C）；
- 最高防爆区域（气体）：0级区域；
 - 最高防爆区域（粉尘）：20区；
 - 被测介质温度：-110°C~580°C；
 - 温度影响
- 20°C ~ +65°C 时： $\pm (0.03\% \text{URL} + 0.05\% \text{Span})$
/20°C； -40°C ~ +85°C 时： $\pm (0.1\% \text{URL} + 0.1\% \text{Span})$
/120°C；
- 静压等级：16MPa、25MPa、40MPa；
 - 静压影响
- $\pm 0.05\% \text{URL}/10\text{MPa}$ *长期漂移：0.10%URL/3年。

Technical advantage

The center sensor unit of the differential pressure transmitter adopts the leading high-precision single product silicon sensor technology at home and abroad, which can reach up to $\pm 0.025\%$ high precision;

Micro differential pressure transmitter using the world's leading double overload protection diaphragm patented technology, up to $\pm 0.075\%$ high precision;

The transmitter pressure differential pressure were 16MPa, 25MPa and 40MPa gear, one-way overload pressure up to 40MPa;

Differential pressure transmitter optional static pressure sensor package, can be used to measure the static pressure field work and display, but also can be applied to static compensation, excellent static performance, static optimal error less than $0.05\%/10\text{MPa}$;

The sensor integrated sensor with high sensitivity, excellent performance of optimal temperature transmitter, less than $0.04\%/10\text{K}$;

Full stainless steel 316L silicone oil filling welding sealing structure;

Micro range gauge / absolute pressure transmitter with no loss of pressure overload protective membrane patent technology leading, one-way overvoltage of up to 7MPa, which is the full range of 1166 times;

Stable and reliable, long-term drift of $\pm 0.1\%/3\text{ years}$, 5 years free maintenance;

Very wide measurement range 100Pa~40MPa (up to 60MPa);

Adjustable range of maximum 100:1;

EMC comply with GB/T 18268, 1-2008 standard requirements;

Main features

• advanced single crystal silicon sensor technology and capacitive sensing technology

• High stability, high reliability, high anti-interference

A variety of debugging methods: on the spot button, hand operator, communications software

• the local button and the LCD header can realize the transmitter function configuration

• optional lightning protection (transient voltage resistance) function optional stainless steel electronic case

Liquid level, remote transmitter: form, isolation diaphragm, filling fluid selection rich

Measuring medium: liquid, steam and gas

• basic error: $\pm 0.025\% \sim \pm 0.1\%$

Maximum range ratio: 100:1

- measuring range (no migration)

Differential pressure range: 0-50Pa~1MPa pressure range: 0-1kPa ~ 40MPa absolute pressure range: 0-10kPa ~ 3MPa

Ambient temperature: -40°C~+60°C (explosion-proof, lightning protection: -40 degrees C ~ +60 degrees C) (with LCD header, fluorine oil: -20 degrees C ~ +60 degrees C)

• Highest explosion-proof area (gas): Class 0 area

• Maximum explosion-proof area (dust): zone 20

• measured medium temperature: -110 degrees C ~ +580 degrees C

• temperature affect -20 C ~ +65. (when):

Shi (0.03%URL+0.05%Span)/20 C -40 DEG C ~ +85 DEG C:

Soil (0.1%URL+0.1%Span)/120°C

Static pressure level: 16MPa, 25MPa, 40MPa

Static pressure effects: $\pm 0.05\% \text{URL}/10\text{MPa}$ *long drift: $\pm 0.10\% \text{URL}/3\text{ years}$

- 防爆标志: Ex d IIC T4-T6> Exia IIC T4-T6;
- 输出通信协议: HART、PROFIBUS-PA、FF、无线通讯;

- 输出功能: 线性、平方根等;
- 电磁兼容性: 符合EN 61326-1: 2006;
- 快速的动态响应;
- 防护等级: IP68;
- 灌充液: 硅油、氟油、高温硅油等;
- 基型表隔离膜片: 316L、哈氏合金C等;
- LCD表头: 显示工程单位、百分数、电流值等;
- 远传形式: 平法兰式、插入筒式、对夹式、法兰安装式、螺纹安装式、夹持式、耦合式、微型等;
- 液位、远传隔离膜片: 316L、哈氏合金C、钽、PFA涂层、F46覆膜、镀金等。

TK-3051系列产品仍保留基于传统金属电容式差压压力传感器的应用。其高性价比可满足不同用户的需求。

- Explosion proof mark: Ex D T4-T6> Ex IA IIC T4-T6
- Reference output communication protocol: HART, PROFIBUS-PA, FF, Telecommunications
- Output function: linear, square root isoparametric electromagnetic compatibility: EN 61326-1:2006
- Fast dynamic response
- Protection level: Ip68
- Filling fluid: silicone oil, fluorine oil, high temperature silicone oil, etc.
- Base type isolation diaphragm: 316L, Hastelloy C, etc.
- LCD header: display engineering units, percentage, current value, etc.
- Remote form: flat flange, tube insertion of the clip, flange mounted, screw type, clamp type, coupling type, micro - level, remote diaphragm: 316L, Hastelloy C, tantalum, PFA coating, F46 coating, plating etc.

TK-3051 series products are still based on the traditional metal capacitive differential pressure sensor applications. Its high performance price ratio can meet the needs of different users.

TK3051系列压力变送器

Series Pressure Transmitter



一、产品概述

TK3051系列压力变送器用于工业过程全系列差压、压力、绝对压力的测量，具有模拟或数字输出信号。广泛应用于石油、化工、电力、食品、造纸、市政工程等行业。

Summary

TK3051 series pressure transmitters with analog or digital signal are used to measure the full series of differential pressure, pressure, absolute pressure of industrial process in industries like petroleum, chemistry, electric power, food, paper making and municipal works.

TK3051系列产品 TK3051 series products

CD系列差压变送器
CD series differential pressure transmitters
CG系列压力变送器
CG series pressure transmitters
CA系列绝压变送器
CA series absolute pressure transmitters
L系列液位变送器
L series liquid level transmitters

H系列高温高压型压力变送器
H series high temperature and high pressure pressure transmitters
T系列表压与绝压变送器
T series gauge pressure and absolute pressure transmitters
F系列卫生型压力变送器
F series sanitation pressure transmitters
P系列高温防腐型压力变送器
P series high temperature anti-corrosive pressure transmitters

全面解决方案

TK-3051系列变送器采用先进的单晶硅传感器技术及金属电容传感器技术，满足多种应用范围。小巧而轻质的设计，具有最佳的性能，高量程比对现场的库存要求最低。

可采用一体化安装阀组，可节约安装费，因为公司可将变送器和阀组在工厂一体化装配，并在工厂完成了泄漏检查和校验。

1199“调整型”直接安装式远传可节约采购和安装费用20%以上，性能提高超过10%，响应时间加快10%以上主要元件均采用进口，具有国内外最新压力变送器的结构优点和良好性能。

通用型安装结构及规格，替代能力强，是新一代压力测量的优秀换代产品。

Overall solution

TK-3051 transmitter adopts advanced single product silicon sensor technology and metal capacitance sensor technology to meet a wide range of applications. Small and light design with the best performance, high range comparison, on-site inventory requirements minimum.

elicate and light design with optimal performance, high range ratio requires the minimum of inventory on site.

Integrated installation valves can be adopted to save money since the company can assemble the transmitters and valves at the plant in an integrated way and the leakage check and test are finished on site.

With the 1199 “adjustment type” direct installed remote signaling, more than 20% of the purchase and installation expense can be saved, the performance is improved by more than 10% and the response time is more than 10% faster.

The main elements are imported.

With structure advantages and good performance of latest pressure transmitter at home and abroad

General type of installation structure and size, highly replaceable and it is new generation of excellent replacement product for pressure measurement.

二、产品介绍

3051C型差压，表压与绝压变送器

性能优异：精度0.025%~0.1%；

差压：校验量程从0.1kPa至21MPa；

表压：校验量程从0.12kPa至21MPa；

绝压：校验量程从1.5kPa至21MPa；

过程隔离膜片：不锈钢，哈氏合金，蒙乃尔，钽（仅限CD，CG）及镀金蒙乃尔，镀金不锈钢，钛。

设计小巧，坚固而质轻，易于安装，复合量程（仅限CD，CG），可测量负压。

3051T型差压，表压与绝压变送器

性能优异：精度0.025%~0.1%；

绝压：校验量程从0.12kPa至120MPa；

表压：校验量程从0.12kPa至120MPa；

不锈钢与哈氏合金C过程隔离膜片；

灌装液：硅油与惰性液，可选DIN和与压力反应罐相配的过程相连复合量程（仅限TG），可测量负压最大过压达1000倍以上。

3051型液位变送器

液位测量精度达0.075~0.2%；

校验量程从0.4kPa至2.1MPa；

平膜片式，2-，4-，与6英寸伸出膜片；

多种灌装液可选，可满足不同应用场合的要求小巧而质轻，易于安装与维护；

接液件材料：不锈钢，哈氏合金和钽。

三、产品说明

传感膜头

3051C型采用先进技术及生产线制造的高品质传感器。传感器与过程介质和外部环境保持机械、电气及热隔离。传感器远离过程法兰，移至电子外壳的颈部，可实现机械隔离和热隔离。该设计使传感器不与过程热源直接接触，并释放了传感器杯体上的机械应力，可提高静压性能。

玻璃密封的压力输送管与传感器杯体绝缘安装，保证了电气绝缘，可提高电子线路的灵活性、性能与耐瞬变电压保护的能力。

3051C型传感膜头还可以进行温度测量，用于补偿温度影响。

在工厂的特性化过程中，所有传感器都经受了整个工作范围内的压力与温度循环测试。根据由此得来的数据产生修正系数，然后将系数贮存于传感膜头的内存中，从而可保证变送器运行过程中能精确地进行信号修正。

Product Introduction

3051C differential pressure, gauge pressure and absolute pressure transmitter

Excellent performance: accuracy 0.025%~0.1%.

Differential pressure: the inspection range from 0.1kPa to 21MPa.

Gauge pressure: the inspection range from 0.12kPa to 21MPa.

Absolute pressure: the inspection range from 1.5kPa to 21MPa.

Process isolation diaphragm: stainless steel, hastelloy, Monel, tantalum (only for CD, CG) and gold plated Monel, gold plated stainless steel, Titanium.

Compact design, solid and light in weight, easy to install
Compound range (only for CD, CG), able to measure the negative pressure

3051T differential pressure, gauge pressure and absolute pressure transmitter

Excellent performance: accuracy 0.025%~0.1%.

Absolute pressure: the inspection range from 0.12kPa to 120MPa.

Gauge pressure: the inspection range from 0.12kPa to 120MPa.

Stainless steel and hastelloy C process isolation diaphragm.

Filling liquid: silicon oil and inertia fluid.

Optional DIN and connected to process matching pressure reaction tank

Compound range (only for TG), able to measure negative pressure

Maximum overpressure over 1000 times.

3051L liquid level transmitter

Liquid level measuring accuracy up to 0.1%~0.2%

Inspection range from 0.4kPa to 2.1MPa

Flat diaphragm type, 2-, 4-, and 6 inch projected diaphragm

Multiple kinds of filling liquid optional, able to meet the requirements of different application fields

Delicate and light in weight, easy to install and maintain

Liquid connection material: stainless steel, hastelloy and tantalum

Product Description

Sensing film head

3051C is high quality sensor manufactured with advanced technology and production line. The sensor is isolated mechanically, electrically and thermally from process medium and external environment. The sensor is away from the process flange, moved to the neck of the external electronic shell and able to realize the mechanical and thermal isolation. With this design, the sensor does not contact directly the process thermal source and the mechanical stress on the sensor cup is released so that the static pressure performance can be improved.

The pressure transportation pipeline sealed with glass is installed with sensor cup in insulated way, which guarantees the electric insulation, improves the flexibility and performance of electronic circuit and the protection ability to withstand transient voltage.

3051C sensing film head can also be used to measure the temperature and compensate for the temperature influence.

During the plant characterization process, all the sensors experience the pressure and temperature cycle test within the whole operation range. The correction coefficient is produced based on the obtained data and then the coefficient is stored in the memory of the sensing film head so as to guarantee that the transmitter can make correct signal correction during the operation.

这种传感膜头的内存也可帮助加快维修过程。因为所有膜头的特性值都贮存在膜头中，所以可直接更换线路板而无需重新校验或拆下独立的贮存。使用HART手操器可以方便地对3051型进行组态。组态由两部分组成。首先，设定变送器的技术参数，包括：修正系数的PROM。

传感膜头内还有线路板，它将输入的电容与温度信号直接转换成可供电子板模块进一步处理的数字化信号。

电子线路板

电子板采用专用集成电路(ASIC)与表面封装技术。该板接收来自传感膜头的数字输入信号及其修正系数，然后对信号进行修正与线性化。电子板模块的输出部分将数字信号转为模拟输出，并与HART手操器进行通讯。标准的模拟型输出为4-20mA。

可选液晶表头插在电子板上，以压力、流量或液位工程单位或模拟量程值百分比显示数字输出，变送器均可选用液晶表头。

数据存储

组态数据存储在变送器电子板模块的永久性EEPROM存储器中。变送器断电后，数据仍保存，故而上电后变送器能立即工作。

数/模转换与信号传送

过程变量以数字式数据存储，可以进行精确地修正和工程单位的转换。信号经修正后的数据转换为模拟输出信号。HART手操器可以直接以数据信号方式存取传感器读数，不经过数/模转换以得到更高精度。

通讯格式

3051型采用HART协议进行通讯，该协议使用了工业标准Bell202频移调制(FSK)技术。在模拟输出上叠加高频信号可以进行远程通讯。采用该技术，能在不影响回路完整性的情况下，实现同时通讯和输出。

软件功能

HART协议使用户可以容易地使用3051型的组态，测试与具体设定的功能。

组态

使用HART手操器可以方便地对3051型进行组态。组态由两部分组成。首先，设定变送器的技术参数，包括：零点与量程设定点。

线性或平方根输出

阻尼

工程单位选择

其次，可将信息性数据输入变送器，以便对变送器进行识别与物理描述，包括：

The memory of this kind of sensing film head can also help facilitate the maintenance. Since all the characteristic value of the film head is stored in the film head, the circuit board can be replaced directly without re-calibration or removing the independent storage. It is easy to configure 3051 type with HART communicator. The configuration consists of two parts. Firstly, set the working parameters of the transmitter, including: store the PROM of correction coefficient.

There is also circuit board in the film sensing head which converts directly the input capacitance and temperature signal to the digital signal which can be further processed by the electronic board module.

Electronic circuit board

The electronic circuit board uses special integrated circuit (ASIC) and surface mount technology. This board receives the digital input signal from the sensing film head and its correction coefficient and then make correction and linearization for the signal. The output part of the electronic board module converts the digital signal to analog output and communicates with the HART. Standard analog output is 4-20mA.

Optional liquid crystal meter is inserted on the electronic board which shows the digital output with pressure, flow or liquid level engineering unit or analog range percentage. The transmitter can use liquid crystal meter.

Data storage

The configuration data is stored in the permanent EEPROM memory of the electronic board module of the transmitter. After the transmitter loses power, the data is still kept, thus the transmitter can start work immediately after power on.

D/A conversion and signal transmitting

The process variable is stored in the form of digital data which can correct accurately the conversion with engineering unit. The signal is converted to analog output signal via converted data. HART device can access directly the reading of sensor in the form of the digital signal and get higher accuracy without A/D conversion.

Communication format

3051 type adopts HART protocol for communication which uses industrial standard Bell202 frequency shifting keying (FSK) technology. High frequency signal is superposed on the analog output to make remote communication. This technology enables communication and output at the same time without affecting the integrity of the circuit.

Software function

HART protocol enables the user to use easily the 3051 type configuration and test the specifically set functions.

Configuration

It is easy to configure the 3051 type with HART communicator. The configuration consists of two parts. Firstly, set the working parameters of the transmitter, including: zero point and range set points

Linear or square root output

Delay time

Selection of engineering unit

Secondly, the information data can be input to the transmitter so that the transmitter can make recognition and physical description, including:

工位号：8个字母数字字符
描述符：16个字母数字字符
日期
一体化表头安装
法兰类型 排液 / 排气
阀材料 O型环材料
远传信息

除以上讨论的可组态参数外，3051型软件中还包含一些用户不可变更的信息：变送器类型，传感器极限值，最小量程，灌充液，隔离膜片材料，膜头系列号及变送器软件版本号。

自诊断与测试

3051型可以进行连续自检。当出现问题时，变送器将激活用户选定的模拟输出报警，显示故障代码。HART手操器可以查询变送器，确定问题所在。变送器向手操器输出特定信息，以识别问题，从而快速而便捷地采取维修措施。若操作员确认是回路有问题，可让变送器给出特定输出，以供回路测试。

具体设定

在变送器初始化阶段和数字电子板维护时需进行具体设定。它允许对传感器与模拟输出进行微调，以符合工厂压力标准。此外，特性化功能令用户可防止模拟输出设定点被意外或故意调整。

四、选项

液晶表头

M5数字表头，液晶显示

直接显示数字数据，精度更高

按用户要求显示流量、液位、体积或压力单位

显示诊断信息，用于现场故障检修

可旋转90°，便于安装

本机量程与零点调整

作为标准配制，变送器带有本机量程与零点调整钮

非交互式外部零点与量程调整，易于校验

按钮代替标准电位计进行调整，以实现最佳性能

耐瞬变电压保护

一体化耐瞬变电压保护端子块

法兰与接头用螺栓

法兰与接头可配用不同材料的螺栓

标准材料为电镀碳钢

五、规格

性能指标

总体性能是基于参考精度，环境温度影响与量程静压影响的综合误差。

3051C型(量程4-9)、3051T

参数精度

$\pm 0.025\%$ ， $\pm 0.05\%$ ， $\pm 0.075\%$ ， $\pm 0.1\%$ 量程

Work position No.: character of eight letters and number

Descriptor: character of sixteen letters and number

Date

Integrated meter installation

Flange type liquid/air drain

Valve material O-ring material

Remote transmitting information

Apart from the configurable parameters above, there is also some information that the user can not change in the 3051 type software: transmitter type, limit value of the sensor, minimum range, filling liquid, material of isolation diaphragm, film head type and version of transmitter software.

Self diagnosis and testing

3051 type can make continuous self-check. When there is problem, the transmitter will activate the analog output alarm selected by the user. Display fault code. HART device can inquire about the transmitter and determine the problems. The transmitter outputs specific information to the HART device so as to recognize the problem and take maintenance measures rapidly and conveniently. When the operator confirms that there is problem with circuit, he can let the transmitter give specific output to test the circuit.

Specific setting

Specific setting is required during initialization of transmitter and maintenance of digital electronic board. It allows the fine tuning of the sensor and analog output so as to meet the pressure standard of the plant. Besides, characterized function enables the user to prevent the analog output setting point from accident or intentional adjustment.

Option

Liquid crystal meter

M5 digital meter, liquid crystal display

Direct display of digital data, higher accuracy

Display the flow, liquid level, volume or pressure unit as per customer requirements

Display the diagnosis information, for repair of fault on site

It can turn 90 degrees, easy to install

Range and zero point adjustment of this machine.

As standard make-up, the transmitter has the adjustment button for range and zero point of this machine.

Non-interactive external zero point and range adjustment, easy to inspect.

Button replacing the standard potentiometer to make adjustment to realize the optimum performance.

Resistant to transient voltage protection.

Integrated protection terminal block resistant to transient voltage.

Flange and joint bolts.

Bolts of different materials can be used for flange and joint.

The standard material is galvanized carbon steel.

Specification

Performance index

The overall performance is the comprehensive error based on reference accuracy, ambient temperature influence and range static pressure influence.

3051C. (range type4-9), 3051T

Reference accuracy

$\pm 0.025\%$ ， $\pm 0.05\%$ ， $\pm 0.075\%$ ， $\pm 0.1\%$ range

总体性能提高

±0.15%量程，在±500F(28°C)温度变化，最大6.9MPa静压(仅限CD)，1:1至5:1量程比的条件下。

稳定性提高

±0.125%URL，5年，在温度变化±500F(28°C)，静压最大为6.9MPa条件下。

动态性能

总的响应时间(Td+Tc)，100毫秒(HART输出)。

3051CD型，微差压(量程2-3)

参考精度

±0.10%量程。

稳定性

±0.2%URL，1年。

参考精度

±1%量程。

稳定性

3051 H型—高温、高压力

±0.2%URL，1年。

Overall performance improvement

±0.15% range, under the condition of temperature change ±500F (28°C), maximum static pressure of 6.9MPa (only for CD) and range ratio 1:1 to 5:1.

Stability is improved

±0.125%URL, five years, under the condition of temperature change ±500F(28°C) and maximum static pressure of 6.9MPa.

Dynamic performance

Total response time (Td+Tc), 100 millisecond (HART output)

3051CD type, micro differential pressure (range 2-3)

Reference accuracy

±0.10% range

Stability

±0.2%URL, one year

Reference accuracy

±0.1% range

3051 H type-high temperature, high pressure

Stability

±0.2%URL, one year

具体性能指标 Specific performance index**环境温度影响 (每50°F (28°C) 影响)****3051 CD / CG**

1:1至5:1: ± (0.0125%URL+0.0625%量程) ;

5:1至40:1: ± (0.025%URL+0.125%量程) ;

量程0: ± (0.25%URL+0.05%量程) ;

量程1: ± (0.1%URL+0.25%量程) 。

3051T和3051CA

1:1至40:1: ± (0.025%URL+0.125%量程) ;

3051T量程5: ± (0.1%URL+0.15%量程) 。

3051T量程1

1:1至40:1:±(0.025%URL+0.125%量程)

静压每变化6.9MPa的影响**3051CD****零点误差(可标定消除)**

静压从2至4, 13.7MPa时, ±0.05%URL;

静压大于13.7MPa时, 见用户手册;

量程2: ±0.125%量程/689kPa;

量程3: ±0.25%URL。

参考精度

量程4-5: ±0.1%读数;

量程2: ±0.15%量程/689kPa;

量程3: ±0.4%读数。

动态性能

延迟时间和刷新速率适用于所有型号和量程, 仅限模拟输出。

延迟时间 (Td): 45毫秒(名义值) ;

刷新速率: 22闪/秒总的影响时间(Td+Tc):3051C, 4-

20mA/HART;

量程4-9: 100毫秒;

量程3: 255毫秒;

量程2: 700毫秒。

3051T

量程3-10: 100毫秒

Ambient temperature influence (influence of each 50°F(28°C))**3051 CD / CG**

1:1 to 5:1:±(0.0125%URL+0.0625% range)

5:1 to 40:1:±(0.025%URL+0.125% range)

Range 0:±(0.25%URL+0.05% range)

Range 1:±(0.1%URL+0.25% range)

3051T and 3051CA

1:1 to 40:1:±(0.025%URL+0.125% range)

3051T range 5:±(0.1%URL+0.15% range)

3051T range 1

1:1 to 40:1:±(0.025%URL+0.125% range)

3051T and 3051CA**3051CD****Zero point error (can calibrate to eliminate)**

When the static pressure from 2 to 4, 13.7MPa, ±0.05%URL,

When static pressure larger than 13.7MPa, see user manual

Range 2:±0.125% range/689kPa

Range: 3:±0.25%URL

Range error

Range 4-5:0.1% reading

Range 2:±0.15% range/689kPa

Range 3:±0.4% reading

Dynamic performance

The delay time and refresh rate applicable to all models and range, only for analog output

Delay time (Td): 45 milliseconds (nominal value)

Refresh rate: 22 flashes/second

Total influence time (Td+Tc):

3051C 4-20mA/HART

Range 4-9:100 milliseconds

Range 3:255 milliseconds

Range: 2:700 milliseconds

3051T

Range 3-10:100 milliseconds

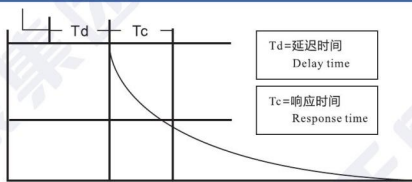


图1.典型的智能变送器的响应时间

Fig 1. Response time of typical intelligent transmitter

安装位置影响

3051T

零点最多漂移 $\pm 0.31\text{kPa}$ ，可修正掉。无量程影响。

3051L

若液位膜片处于垂直位置，零点最多漂移 0.25kPa 。

若液位膜片处于水平位置，零点最多漂移 1.25kPa 加上伸出装置的伸出长度。所有零点漂移均可修正掉。无量程影响。

3051T/CA

零点最多漂移 0.6kPa ，可修正掉。无量程影响。

振动影响

所有型号

只考虑谐振频率影响，其它振动影响均忽略不计。

在谐振下，与管道轴向成任意角度的方向施加 $15\text{--}2000\text{Hz}$ 的振动进行测试，振动影响小于 $\pm 0.1\%$ URL/g。

电源影响

所有型号

小于 $\pm 0.01\%$ 量程/伏。

射频干扰影响

所有型号

小于 $\pm 0.1\%$ 量程， $20\text{至}1000\text{MHz}$ ，场强达到 30伏/米 。

耐瞬变电压保护(选项代码T1)

所有型号

6kV峰值 ($0.5\ \mu\text{s}\text{--}100\text{kHz}$) ;
3kV峰值 ($8\times 20\text{ms}$) ;
6kV峰值 ($12\times 50\text{ms}$) ;
SWC2.5kV峰值, 1.25MHz 波形。

综合性能指标

响应时间: $<1\text{纳秒}$;
浪涌峰值电流: $5,000\text{安培}$, 对外壳;
瞬变峰值电压: 100VDC ;
回路阻抗: $<25\Omega$ 。

注意:

按ASME Z210.1(ANSI)在 $68\text{OF}(20^\circ\text{C})$ 下进行校验

Installation position influence

3051T

Maximum zero point drifting $\pm 0.31\text{kPa}$, can be corrected. No range influence.

3051L

When the liquid level diaphragm is in the vertical position, the maximum zero point drifting is 0.25kPa .
When the liquid level diaphragm is at the horizontal position, the maximum zero point drifting is 1.25kPa plus the protruding length of the protruding device. All the zero point drifting can be corrected. No range influence.

3051T/CA

The maximum zero point drifting is 0.6kPa , it can be corrected. No range influence.

Vibration influence

All the model

Only the resonance frequency influence is considered and other vibration influence is neglected.

Under the resonance, apply $15\text{--}2000\text{Hz}$ of vibration in the direction of any angle with the axial direction of the pipeline to conduct the test. The vibration influence is smaller than $\pm 0.1\%$ URL/g.

Power supply influence

All the model

Smaller than $\pm 0.01\%$ range/radiation

Frequency interference influence

All the model

Smaller than $\pm 0.1\%$ range, $20\text{ to }1000\text{MHz}$, filed strength up to 30 voltage/meter

Resistant to transient voltage protection (option code T1)

All the model

6kV peak value ($0.5\ \mu\text{s}\text{--}100\text{kHz}$)
3kV peak value ($8\times 20\text{ms}$)
6kV peak value ($12\times 50\text{ms}$); SWC2.5kV peak value, 1.25MHz waveshape

Comprehensive performance index

Response time: $<1\text{ nanosecond}$.
Surge peak current: $5,000\text{ ampere}$, to the shell.
Transient peak voltage: 100VDC .
Circuit impedance: $<25\Omega$.

Note:

Check under $68\text{OF}(20^\circ\text{C})$ as per ASME Z210.1(ANSI)

量程与传感器的极限值

Limit Value of Range and Sensor

表1.

3051CD, 3051CG, 3051L, 3051H程与传感器极限值。

Table 1

Limit value of range and sensor of 3051CD, 3051CG, 3051L and 3051H.

量程 Range	量程与传感器极限值 Limit Value of Range and Sensor							
	最小量程 Min. Range	量程上限 (URL) Upper range limit (URL)	量程下限 (URL) Lower range limit(URL)					
	3051CD CG, L,H型 (Type)		3051CD差压 Differential pressure	3051CG表压 Gauge pressure	3051L差压 Differential pressure	3051L表压 Gauge pressure	3051H差压 Differential pressure	3051H表压 Gauge pressure
2	10mmH ₂ O (100Pa)	150mmH ₂ O (1500Pa)	-150mmH ₂ O (-1500Pa)	-150mmH ₂ O (-1500Pa)	NA	NA	NA	NA
3	12mmH ₂ O (0.12kPa)	750mmH ₂ O (7.5kPa)	-750mmH ₂ O (-7.5kPa)	-750mmH ₂ O (-7.5kPa)	-750mmH ₂ O (-7.5kPa)	-750mmH ₂ O (-7.5kPa)	-750mmH ₂ O (-7.5kPa)	-750mmH ₂ O (-7.5kPa)
4	40mmH ₂ O (0.4kPa)	4mH ₂ O (40kPa)	-4mH ₂ O (-40kPa)	-4mH ₂ O (-40kPa)	-4mH ₂ O (-40kPa)	-4mH ₂ O (-40kPa)	-4mH ₂ O (-40kPa)	-4mH ₂ O (-40kPa)
5	200mmH ₂ O (2.0kPa)	20mH ₂ O (200kPa)	-20mH ₂ O (-200kPa)	-10mH ₂ O (-100kPa)	-20mH ₂ O (-200kPa)	-20mH ₂ O (-200kPa)	-20mH ₂ O (-200kPa)	-10mH ₂ O (-100kPa)
6	700mmH ₂ O (7.0kPa)	70mH ₂ O (700kPa)	-70mH ₂ O (-700kPa)	-10mH ₂ O (-100kPa)	-70mH ₂ O (-700kPa)	-70mH ₂ O (-700kPa)	-70mH ₂ O (-700kPa)	-10mH ₂ O (-100kPa)
7	2.1mmH ₂ O (2.1kPa)	210mH ₂ O (2.1MPa)	-210mH ₂ O (-2.1MPa)	-10mH ₂ O (-100kPa)	-210mH ₂ O (-2.1MPa)	-210mH ₂ O (-2.1MPa)	-210mH ₂ O (-2.1MPa)	-10mH ₂ O (-100kPa)
8	7.0m H ₂ O (70kPa)	700MH ₂ O (7MPa)	-700mH ₂ O (-7MPa)	-10mH ₂ O (-100kPa)	NA	NA	-700mH ₂ O (-7MPa)	-10mH ₂ O (-100kPa)
9	12mH ₂ O (120kPa)	2100mH ₂ O (21MPa)	-2100mH ₂ O (-21MPa)	-10mH ₂ O (-100kPa)	NA	NA	-2100mH ₂ O (-21MPa)	-10mH ₂ O (-100kPa)

表2. 3051T型量程与传感器极限值

Table 2 Limit value of 3051T range and sensor

量程 Range	最小量程 Min. Range	量程与传感器极限值 Limit Value of Range and Sensor		
		量程上限 Upper range limit	量程下限绝对压 Lower range limit Absolute pressure	
			量程下限表压 Lower range limit Gauge pressure	
3	12mmH ₂ O (0.12kPa)	750mmH ₂ O (7.5kPa)	0mmH ₂ O (0kPa)	-750mmH ₂ O (-7.5kPa)
4	40mmH ₂ O (0.4kPa)	4mH ₂ O (40kPa)	0mmH ₂ O (0kPa)	-4mH ₂ O (-40kPa)
5	200mmH ₂ O (2.00kPa)	20mH ₂ O (200kPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)
6	700mmH ₂ O (7kPa)	70mH ₂ O (700kPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)
7	2.1mH ₂ O (2.1kPa)	210mH ₂ O (2.1MPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)
8	10mH ₂ O (100kPa)	1000mH ₂ O (10MPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)
9	40mH ₂ O (400kPa)	4000mH ₂ O (40MPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)
10	120mH ₂ O (1.2MPa)	12kmH ₂ O (120MPa)	0mmH ₂ O (0kPa)	-10mH ₂ O (-100kPa)

设大气压为14psi

Set the barometric pressure to be 14psi

零点与量程调整要求

零点与量程值可在表1-表3中所标明的量程极限内任意设定。量程必须大于或等于表1-表3中所标明的最小量程。

应用场合

液体，气体与蒸汽的测量场合。

输出

二线4-20mA，用户可选线性或平方根输出。数字过程变量叠加于4-20mA信号上，适用于任何使用HART协议的主机。

电源

需要外部电源。标准变送器(4-20mA)空载时工作。在回路负载极限最大回路电阻由外部电源供电电压决定，关系如下：

最大回路电阻=41.5(电源电压-10.5)

Adjustment requirements for zero point and range

The zero point and range value can be set arbitrarily within the range limit indicated in table 1-table 3.

The range must be larger than or equal to the minimum range indicated in table 1-table 3.

Application occasions

Application When liquid, gas and steam is measured.

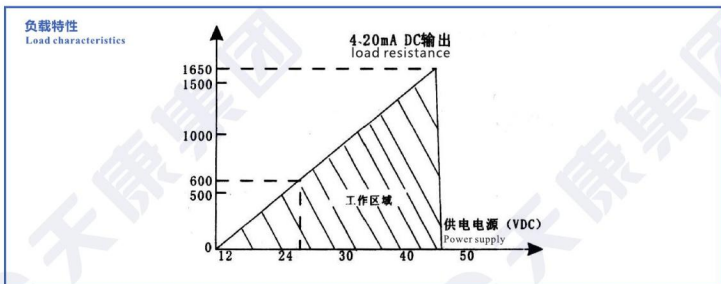
Output

Two wire 4-20mA, the user can select linear or square root output. The digital process variable is superposed on the signal of 4-20mA, applicable to the host using HART protocol.

Power supply

External power supply is required. Standard transmitter (4-20mA) works during no load condition. The maximum circuit resistance is determined by the voltage of external power supply with the relationship as follows:

Maximum circuit resistance = 41.5 (power supply voltage - 10.5)



指示

可选数字液晶表头。

过压极限

变送器可承受以下极限压力而不致损坏。

3051CD/CG型

量程2-6: 0.6MPa; 量程7: 2.1MPa;
量程8: 6MPa; 量程9: 20MPa。

3051CA型

量程2-6: 0.6MPa; 量程7: 2.1MPa;
量程8: 6MPa; 量程9: 20MPa。

3051TG / TA型

量程3-6: 3.5MPa; 量程7: 10MPa;
量程8: 13.8MPa; 量程9: 60MPa;
量程10: 150MPa。

对于3051L型或选项代码为FA, FB, FC与FD的液位法兰，极限值为0kPa至法兰额定值或传感器额定压力值中的小者。

Indication

Optional digital liquid crystal meter.

Over-voltage limit

The transmitter is able to withstand the following limit pressure while not being damaged.

3051CD/CG type

Range 2-6: 3.5MPa
Range 7: 13.8MPa
Range 8: 40MPa
Range 9: 100MPa

3051CA type

Range 2-6: 3.5MPa
Range 7: 13.8MPa
Range 8: 40MPa
Range 9: 100MPa

3051TG / TA type

Range 3-6: 3.5MPa
Range 7: 10MPa
Range 8: 13.8MPa
Range 9: 60MPa
Range 10: 150MPa

As for 3051L type or liquid flange with the option code of FA, FB, FC and FD, the limit value is 0kPa to the rated value of the flange or the rated pressure value of the sensor, whichever is the smaller.

表3.3051L型与液位法兰额定压力极限

Table 3. Rated pressure limit of 3051L type and liquid level flange

标准 Standard	类型 Type	碳钢额定值 Standard	不锈钢额定值 Rated valc of stainless steel
ANSI/ASME	Class150	285psig	275psig
ANSI/ASME	Class300	740psig	720psig
ANSI/ASME	Class600	1480psig	1440psig
100°F(38°C)下, 额定值随温度升高而降低。 Under 100°F(38°C), the rated value decreases with the increase of temperature.			
DIN	pn10-40	40bar	40bar
DIN	pn10/16	16bar	16bar
DIN	pn25/40	40bar	40bar
100°F(38°C)下, 额定值随温度升高而降低。 Under 100°F(38°C), the rated value decreases with the increase of temperature.			

静压极限

仅限3051CD型

在3.45kPa至24.8MPa (选项P9为31.0MPa)的静压下, 工作在指标范围内。

量程3: 3.45kPa至5.1MPa

量程4: 3.45kPa至13.7MPa

冲击压力极限

3051T型冲击压力为:

量程3-6: 13MPa

量程7-10: 175MPa

温度极限**环境**

-40至85°C, 带一体化表头: -20至80°C。

贮存

-46至110°C, 带一体化表头: -40至85°C。

过程

法兰表接液温度极限 (见表4)。

最小: -77°C。

最大: 405°C。

Static pressure limit

Only for 3051CD type

Under the static pressure of 3.45kPa to 24.8MPa (option P9 is 31.0MPa), working within the index range.

Range 3: 3.45kPa to 5.1MPa

Range 4: 3.45kPa to 13.7MPa

Impact pressure limit

3051T type impact pressure is:

Range 3-6: 13MPa

Range 7-10: 175MPa

Temperature limit**Environment**

-40 to 85°C

With integrated meter: -20 to 80°C

Storage

-46 to 110°C

With integrated meter: -40 to 85°C

Process

Temperature limit of flange surface contact liquid, see Table 4.

Minimum: -77°C. Maximum: 405°C.

表4. 3051型过程温度极限
Table 4. 3051 type process temperature limit

3051CD, 3051CG, 3051CA	
充硅油传感器 Sensor filled with silicon oil	-40至121℃ ⁽²⁾
配传统法兰 With traditional flange	-40至149℃ ⁽²⁾
配液位法兰 With level flange	-40至149℃ ⁽²⁾
一体化阀组 Integrated valve block	/
充惰性液传感器 sensor filled with inertial liquid	-18至85℃ ⁽³⁾⁽⁴⁾
3051H型(过程充液) 3051H type (process filled witquid)	
充硅油传感器 Sensor filled with silicon oil	-40至121℃ ⁽²⁾
充惰性液传感器 Sensor filled with inertia liquid	-30至121℃ ⁽²⁾
3051 L型低压侧温度极限 3051 L type temperature limit at the low pressure side	
充硅油传感器 Sensor filled with silicon oil	-40至121℃ ⁽²⁾
充惰性液传感器 Sensor filled with inertia liquid	-85至85℃
3051 L型高压侧温度极限(过程充液) 3051 L type temperature limit at the high pressure side (process filled with liquid)	
SylthermXLT Syltherm硅油704 ⁽⁵⁾ Syltherm silicon oil 704 ⁽⁵⁾ D.C. 硅油200 D.C. Silicon oil 200 惰性液 Inertial liquid	-100至300°F (-73至149℃) 60至786°F (15至405℃) -40至400°F (-40至205℃) -50至350°F (-45至177℃)

(1) 过程温度超过1850F (85°C), 要求环境温度极限降低超出值的1/1.5 (3051H型降低1/0.6)。

(2) 真空环境下极限为220°F (104°C), 压力低于3.4kPa时极限为1300F (54°C)。

(3) 真空环境下极限为1600F (71°C)。

(4) 不适用于3051CA型。

(5) 温度上限适用于使用毛细管, 远离变送器安装的远传密封装置。

容积变化量

小于0.005in3 (0.08cm³)。

阻尼

模拟输出对阶跃输入变化的响应时间是由用户选择的一个时间常数(0-36秒)。该软件设定阻尼值不包括传感膜头的响应时间。

机械性能指标

电气接口

1/2-14NPT, PG13.5, G1/2与M20 x1.5 (CM20) 导线管。HART接口固定于端子块上。

(1) Process temperature exceeds 1850F(85°C), it is required that the ambient temperature limit decrease exceeds 1/1.5 of the value (3051H type reduces by 1/0.6)

(2) the limit under vacuum environment is 2200F(104°C), the limit is 1300F(54°C) when the pressure is lower than 3.4kPa.

(3) The limit under vacuum environment is 1600F(71°C).

(4) Not applicable to 3051CA type.

(5)The upper limit of the temperature is applicable to the capillary, away from the remote transmitting sealing device installed on the transmitter

Volume variation

Smaller than 0.005in3(0.08cm3)

Damp

The response time of analog output to the step input change is one time constant selected by the customer (0-36 seconds). The set damping value of this software does not include the response time of the sensing film head.

Mechanical performance index

Electric interface

1/2-14NPT, PG13.5, G1/2 and M20 x 1.5(CM20) wire conduit. The HART interface is fixed on the terminal block.

过程接口

所有型号(除3051L与3051T)
1/4-18NPT, 中心距为21/8英寸。
1/2-14NPT, 中心距为2, 21/8或21/4英寸。

3051L型

高压侧: 2-, 3-或4-英寸, ANSI150、300或600级法兰;
50、80或100毫米, PN40或10/16法兰。
低压侧: 法兰上, 1/4-18NPT; 接头上, 1/2-14NPT。

3051L型

1/4-18NPT、1/2-14NPT阴螺纹, G1/2A DIN16288阳螺纹(仅限不锈钢, 量程3-7变送器), 或压力反应罐F-250-C型(减压9/16-18压盖螺栓; 1/4OD高压60°锥型管; 仅限不锈钢, 量程7变送器)。

过程接液件
过程隔离膜片

隔离膜片材料 Isolation diaphragm material	3051CD/CG	3051T	3051CA	3051H	3051L
316L不锈钢 316L stainless steel	•	•	•	•	见后 See later
哈氏合金C-276 Hastelloy C-276	•	•	•	•	
蒙乃尔 Monel	•		•		
钽 Tantalum	•			•	

排液/排气阀

316不锈钢, 哈氏合金C或蒙乃尔材料。

过程法兰与接头

电镀碳钢, 316不锈钢, 哈氏合金C或蒙乃尔。

接液O型环

氟橡胶(或聚四氟乙烯)。

3051 L型过程接液件
法兰式过程接口(变送器高压侧)
过程膜片, 包括过程垫圈接触表面

316L不锈钢, 哈氏合金C-276或钽。

伸出部分

316L不锈钢, 或哈氏合金C。适用Schedule40与80管。

安装法兰

碳钢镀锌或不锈钢。

参考侧过程连接(变送器低压侧)
隔离膜片

316L不锈钢或哈氏合金C-276。

参考侧法兰与接头

316L不锈钢, 非接液件。

电子外壳

低铜铝或316L不锈钢, NENA4X, IP65, IP66。

涂层(仅限铝外壳)

聚氨酯。

表盖O型环

丁腈橡胶。

Process interface

All the model (except 3051L and 3051T)
1/4-18NPT, the center distance is 21/8 inch.
1/2-14NPT, the center distance is 2, 21/8 or 21/4 inch.

3051L type

High pressure side: 2-, 3- or 4- inch, ANSI150, 300 or 600 class flange; 50, 80 or 100 millimeters, PN40 or 10/16 flange.
Low pressure side: on the flange, 1/4-18NPT; On the joint, 1/2-14NPT

3051L type

1/4-18NPT, 1/2-14NPT female thread, G1/2A DIN16288 male thread (only for stainless steel, range 3-7 transmitter), or pressure reaction tank F-250-C type (pressure relief 9/16-18 gland thread; 1/4OD high pressure 60° conical tube; only for stainless steel, range 7 transmitter)

Process liquid connection part
Process isolation diaphragm
Liquid/gas drain valve

316 stainless steel, hastelloy C or Monel material

Process flange and joint

Galvanized carbon steel, 316 stainless steel, hastelloy C or Monel.

Liquid connection O-ring

Fluorine rubber (teflon)

3051 L process liquid connection part
Flange process interface (high pressure side of the transmitter)
Process diaphragm, including process washer contact surface

316L stainless steel, hastelloy C-276 or tantalum

Protruding part

316L stainless steel, or hastelloy C. Applicable to tube Schedule40 and 80.

Installation flange

Carbon steel galvanized or stainless steel

Reference side process connection (low pressure side of the transmitter)
Isolation diaphragm

316L stainless steel or hastelloy C-276.

Reference side flange and joint

316L stainless steel. Non liquid connection part.

Electronic external shell

Low copper-aluminum or 316L stainless steel, NENA4X, IP65, IP66.

Electronic external shell

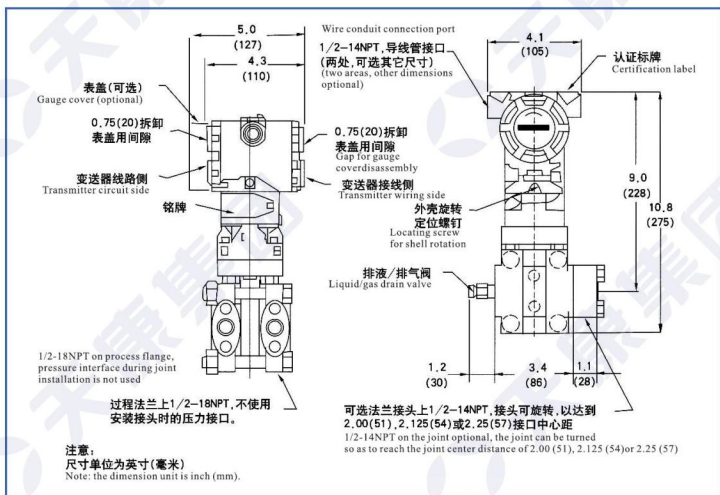
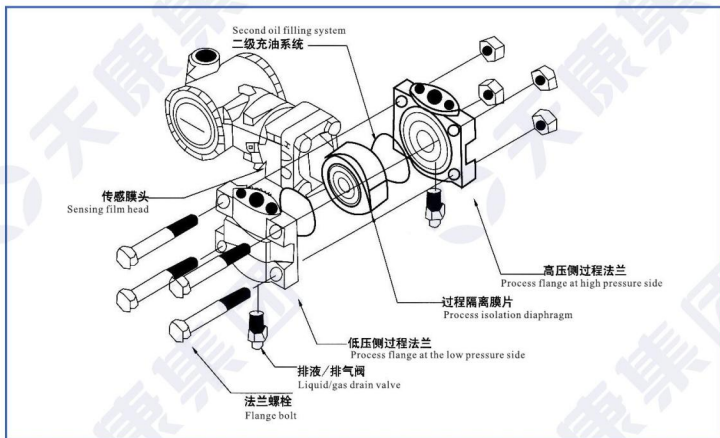
PU

Meter cover O-ring

Nitrile-butadiene rubber.

3051 C型压力变送器部件分解图与尺寸图

Exploded View and Dimensions of 3051 Type Pressure Transmitter

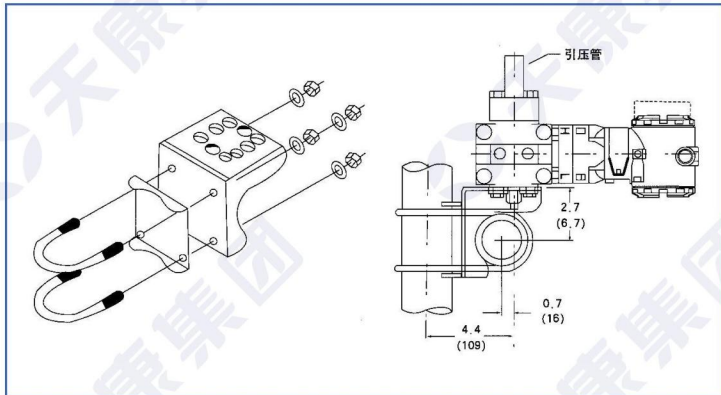


3051C型安装支架，用于2英寸管道安装和面板的安装

3051C Type Installation Frame, for 2 Inch Pipeline Installation and Panel Installation

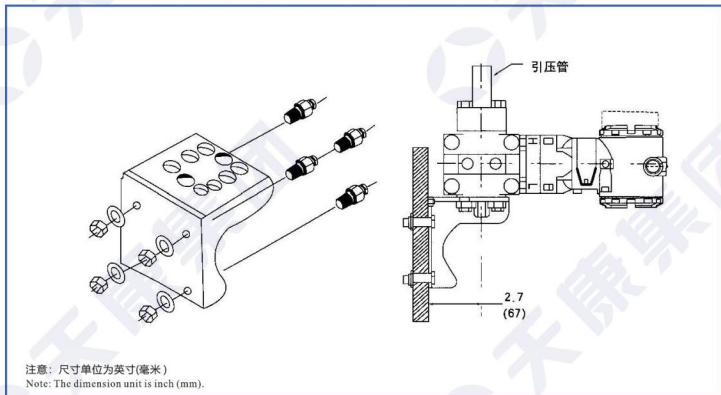
管道安装结构图

Structure diagram of pipeline installation



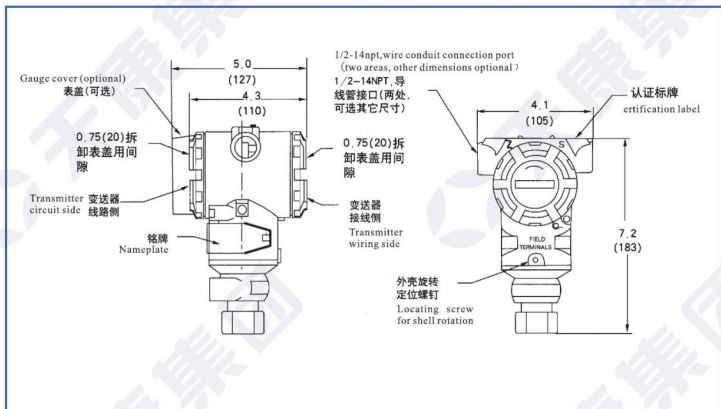
面板安装结构图提供 (7/16) -20× (3/4) 螺栓用于支架与变送器相连

Diagram of Panel installation structure (7/16) -20× (3/4) bolt is provided for connection



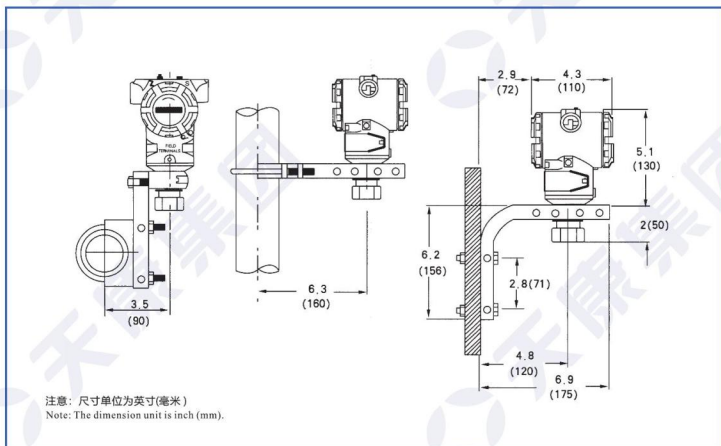
3051T型典型安装结构, 带有可选安装支架

3051T typical installation structure, with optional installation frame



3051T型尺寸图

3051T Dimensions



3051C型差压、表压与绝压变送器选型

3051C type differential pressure, meter pressure and absolute pressure transmitter selection

TK3051C型差压、表压与绝压变送器选型						
TK3051C type differential pressure, meter pressure and absolute pressure transmitter selection						
型号 Model	变送器类型 (选择一) Transmitter type (select one)			CD	CG	CA
TK3051CD	差压变送器 Differential pressure transmitter					
TK3051CG	表压变送器 Gauge pressure transmitter					
TK3051CA	绝压变送器 Absolute pressure transmitter					
代码 Code	压力范围 (量程/最小量程) Pressure range (range/minimum range)			CD	CG	CA
	3051CD型 3051CD type	3051CG型 3051CG type	3051CA型 3051CA type			
2	-150至150mmH ₂ O/10mmH ₂ O (-1500至1500Pa/100Pa)	不提供 Not	不提供 Not	•	•	•
3	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	•	•	•
4	-4.0至4.0mmH ₂ O/40mmH ₂ O (-40至40kPa/400Pa)	-4.0至4.0mmH ₂ O/40mmH ₂ O (-40至40kPa/400Pa)	-4.0至4.0mmH ₂ O/40mmH ₂ O (-40至40kPa/400Pa)	•	•	•
5	-20至20mH ₂ O/0.2mH ₂ O (-200至200kPa/2.0kPa)	-10至20mH ₂ O/0.2mH ₂ O (-100至200kPa/2.0kPa)	-10至20mH ₂ O/0.2mH ₂ O (-100至200kPa/2.0kPa)	•	•	•
6	-70至70mH ₂ O/0.7mH ₂ O (-700至700kPa/7.0kPa)	-10至70mH ₂ O/0.7mH ₂ O (-100至700kPa/7.0kPa)	-10至70mH ₂ O/0.7mH ₂ O (-100至700kPa/7.0kPa)	•	•	•
7	-210至210mH ₂ O/2.1mH ₂ O (-2.1至2.1MPa/21kPa)	-10至210mH ₂ O/2.1mH ₂ O (-0.1至2.1MPa/21kPa)	-10至210mH ₂ O/2.1mH ₂ O (-0.1至2.1MPa/21kPa)	•	•	•
8	-700至700mH ₂ O/7.0mH ₂ O (-7.0至7.0MPa/70kPa)	-10至700mH ₂ O/7.0mH ₂ O (-0.1至7.0MPa/70kPa)	-10至700mH ₂ O/7.0mH ₂ O (-0.1至7.0MPa/70kPa)	•	•	•
9	-2100至2100mH ₂ O/21mH ₂ O (-2.1至2.1MPa/210kPa)	-10至2100mH ₂ O/21mH ₂ O (-0.1至2.1MPa/210kPa)	-10至2100mH ₂ O/21mH ₂ O (-0.1至2.1MPa/210kPa)	•	•	•
注: 3051CG型的量程下限随大气压的变化而改变 note: change with the change of barometric pressure under 3051 type						
代码 Code	输出 Output			CD	CG	CA
A	4-20mA, 带有基于HART协议的数字信号 4-20mA, with digital signal based on HART protocol			•	•	•
B	PROF 1BUS-PA总线			•	•	•
C	Foundation Fieldbus FF			•	•	•
D	MODBUS			•	•	•
E	无线通讯 Telecommunications			•	•	•
代码 Code	结构材料 Material of structural part			CD	CG	CA
	法兰材料 Flange material	排液/排气阀 Liquid/gas drain valve	法兰接头材料 Flange joint material			
2	不锈钢 Stainless	不锈钢 Stainless	不锈钢 Stainless	•	•	•
3	不锈钢 Stainless	哈氏合金C HastelloyC	哈氏合金C HastelloyC	•	•	•
7	不锈钢 Stainless	哈氏合金C HastelloyC	不锈钢 Stainless	•	•	•
代码 Code	隔离膜片材料 Isolated membrane material			CD	CG	CA
2	316L不锈钢 316L Stainless			•	•	•
3	哈氏合金C-276 HastelloyC-276			•	•	•
4	蒙乃尔 Monel			•	•	•
5	钽 (仅适用于3051CD与CG型, 量程4-9, 不适用于3051CA型) Tantalum (only applicable to 3051CD and CG, range 4-9, Not applicable to 3051CA type)			•	•	•
6	钛 Titanium			•	•	•
7	锆 Zirconium			•	•	•
代码 Code	O型环 O-ring			CD	CG	CA
A	氟橡胶 Fluoride rubber			•	•	•
B	聚四氟乙烯 PTFE			•	•	•
代码 Code	灌充液 Filling liquid			CD	CG	CA
1	硅油 Silicon oil			•	•	•
2	惰性液 (卤代烃) Inertia oil (halogenated hydrocarbon)			•	•	•
代码 Code	外壳材料 Shell material		导线管入口尺寸 Entry size of wire conduit	CD	CG	CA
1	铝, 覆聚胺酯涂层 Aluminum, covered with PU coating		M20×1.5 (CM20)	•	•	•

注意: 特殊选项请与销售代表联系。

续选型号
Continuous option type

代码 Code	阀组一体化安装选型 Valve integration installation option	CD	CG	CA
S5	一体化安装型阀组 Integrated installation valve block	•	•	•
代码 Code	远传(可选)注: 标准法兰和接头螺栓是316不锈钢 Remote transmitting (Remote possible) Note: standard flange and joint bolt are made from stainless	CD	CG	CA
S1	一体化安装型阀组 Integrated installation valve block	•	•	•
S2	两个远传(直接安装式或毛细管式) Two remote transmitting (directly installed or capillary type)	•	•	•
代码 Code	可造全焊接远传(用于高真空场合)注: 标准法兰和接头螺栓是不锈钢 Optional fully-welded remote transmitting (applicable to the high vacuum situation) Note: standard flange and joint bolt are made from stainless steel	CD	CG	CA
S7	一个远传, 全焊接系统(毛细管式) One remote transmitting, fully welded system (capillary type)	•	•	•
S8	两个远传(直接安装式或毛细管式) Two remote transmitting (directly installed or capillary type)	•	•	•
S0	一个远传, 全焊接系统(直接安装式) One remote transmitting, fully welded system (directly installed type)	•	•	•
S9	两个远传, 全焊接系统(一个直接安装式, 一个毛细管式) Two remote transmitting, fully welded system (one directly installed type, one capillary type)	•	•	•
代码 Code	阀组一体化安装选项 Valve integration installation option	CD	CG	CA
B1	传统法兰支架, 用于2英寸管道安装, 碳钢螺栓 Two remote transmitting, fully welded system (one directly installed type, one capillary type)	•	•	•
B2	碳钢镀锌螺栓 Carbon steel galvanized bolt	•	•	•
B3	316不锈钢螺栓 316 stainless bolt	•	•	•
B7	碳钢镀锌螺栓 Carbon steel galvanized bolt	•	•	•
B8	316不锈钢螺栓 316 stainless bolt	•	•	•
B9	碳钢镀锌螺栓 Carbon steel galvanized bolt	•	•	•
BA	316不锈钢螺栓 316 stainless bolt	•	•	•
BC	碳钢镀锌螺栓 Carbon steel galvanized bolt	•	•	•
代码 Code	螺栓选项 Bolt option	CD	CG	CA
L4	316不锈钢螺栓 316 stainless bolt	•	•	•
L5	碳钢镀锌螺栓 Carbon steel galvanized bolt	•	•	•
代码 Code	表头可选 Meter optional	CD	CG	CA
M5	液晶表头, 用于铝制外壳 Liquid crystal meter, used for aluminum shell	•	•	•
代码 Code	其他选项 Other options	CD	CG	CA
Q4	校验证书 Inspection certificate	•	•	•
Q16	卫生型远传膜片表面光洁认证 Surface finish certification for hygiene remote transmitting diaphragm	•	•	•
Q3	安全型仪表系统的质量认证 Quality certification of safe instrument system	•	•	•
J1	有本机零点或量程调整 Zero point or range adjustment with native machine	•	•	•
J3	有本机零点或量程调整 Zero point or range adjustment with native machine	•	•	•
T1	耐瞬变电压保护端子块 Protection terminal block resistant to transient voltage	•	•	•
C1	定制软件组态 Customized software configuration	•	•	•
P1	静压测试 Static pressure test	•	•	•
P2	清洗, 用于特殊应用场合 Cleaning, for special application site	•	•	•
DF	1/2-14NPT过程接口(法兰按头)-材料与法兰材料相同 1/2-14NPT Process interface (flange joint)-the material is the same as the flange material	•	•	•
P9	30.1MPa静压极限(仅限3051 CD型, 量程3-9) 30.1MPa static pressure limit (only for 3051 CD, range 3-9)	•	•	•
V5	外部接地螺钉组件 Screw assembly of external grounding	•	•	•
代码 Code	危险场所认证 Certification of dangerous site	CD	CG	CA
E5	本安ia II CT4/CT6 Intrinsic safety ia II CT4/CT6	•	•	•
K5	隔爆d II CT4/CT6 Explosion suppression d II CT4/CT6	•	•	•

3051L型液位变送器选型 3051L type liquid level transmitter selection

型号 Model	变送器类型 Transmitter Type					
3051L	法兰安装液位变送器 Flange installed liquid level transmitter					
代码 Code	压力范围 (量程/最小量程) Pressure scope (range/minimum range)					
3	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/4kPa)					
4	-4至4.0mmH ₂ O/40mmH ₂ O (-40至40kPa/6kPa)					
5	-20至20mmH ₂ O/40mmH ₂ O (-200至200kPa/20kPa)					
6	-70至70mmH ₂ O/40mmH ₂ O (-700至700kPa/70kPa)					
7	-210至210mmH ₂ O/2.1mmH ₂ O (-2.1至2.1MPa/21kPa)					
代码 Code	输出 Output					
A	4-20mA 带有基于HART协议的数字信号 4-20mA with the digital signal based on HART					
B	PROFIBUS-PA总线 Flange installed liquid level transmitter					
代码 Code	高压侧 High pressure side		材料 Material	伸出长度 Protruding length		
	隔膜片尺寸 Diaphragm					
H0	2英寸/DN50		316L不锈钢	只有平膜片式		
H9	2英寸/DN50		哈氏合金	只有平膜片式		
J0	2英寸/DN50		钽	只有平膜片式		
A0	3英寸/DN80		316L不锈钢	平膜片式		
A2	3英寸/DN80		316L不锈钢	2英寸/50mm		
A4	3英寸/DN80		316L不锈钢	4英寸/100mm		
A6	3英寸/DN80		316L不锈钢	6英寸/150mm		
B0	4英寸/DN100		316L不锈钢	平膜片式		
B2	4英寸/DN100		316L不锈钢	2英寸/50mm		
B4	4英寸/DN100		316L不锈钢	4英寸/100mm		
B6	4英寸/DN100		316L不锈钢	6英寸/150mm		
C0	3英寸/DN80		哈氏合金	平膜片式		
C2	3英寸/DN80		哈氏合金	2英寸/50mm		
C4	3英寸/DN80		哈氏合金	4英寸/100mm		
C6	3英寸/DN80		哈氏合金	6英寸/150mm		
D0	4英寸/DN100		哈氏合金	平膜片式		
D2	4英寸/DN100		哈氏合金	2英寸/50mm		
D4	4英寸/DN100		哈氏合金	4英寸/100mm		
D6	4英寸/DN100		哈氏合金	6英寸/150mm		
E0	3英寸/DN80		钽	只有平膜片式		
F0	4英寸/DN100		钽	只有平膜片式		
代码 Code	安装法兰 Installation flange		高压侧 High pressure side		材料 Material	伸出长度 Protruding length
	尺寸 Dimensions		隔膜片尺寸 Diaphragm			
M	2英寸		150磅		碳钢	2英寸DN50
A	3英寸		150磅		碳钢	3英寸DN80
B	4英寸		150磅		碳钢	4英寸DN100
N	2英寸		300磅		碳钢	2英寸DN50
C	3英寸		300磅		碳钢	3英寸DN80
D	4英寸		300磅		碳钢	4英寸DN100
P	2英寸		600磅		碳钢	2英寸DN50
E	3英寸		600磅		碳钢	3英寸DN80
X	2英寸		150磅		不锈钢	2英寸DN50
F	3英寸		150磅		不锈钢	3英寸DN80
G	4英寸		150磅		不锈钢	4英寸DN100
Y	2英寸		300磅		不锈钢	2英寸DN50
H	3英寸		300磅		不锈钢	3英寸DN80
J	4英寸		300磅		不锈钢	4英寸DN100
Z	2英寸		600磅		不锈钢	2英寸DN50
L	3英寸		600磅		不锈钢	3英寸DN80
Q	DN50		PN10/16		碳钢	2英寸DN50
R	DN50		PN40		碳钢	3英寸DN80
S	DN100		PN40		碳钢	4英寸DN100
V	DN100		PN10/16		碳钢	4英寸DN100
K	DN50		PN10/40		不锈钢	2英寸DN50
T	DN80		PN40		不锈钢	3英寸DN80
U	DN100		PN40		不锈钢	4英寸DN100
W	DN100		PN10/16		不锈钢	4英寸DN100
代码 Code	过程液体-高压侧 Process Liquid Filling - High Pressure Side					
A	Syltherm XLT		-100至300°F (-73至135°C)			
C	Syltherm硅油704 Syltherm silicon oil 704		60至786°F (15至405°C)			
D	D.C.硅油200 D.C. Silicon oil 200		-40至400°F (-40至205°C)			

续选型号

Continuous option type

代码 Code	低压侧结构 Structure at Low Pressure Side	法兰接头 Flange Joint	膜片材料 Diaphragm Material	传感器填充液 Liquid Filling of Sensor		
11	表压 Gauge pressure	不锈钢 Stainless steel	316L SST	硅油 Silicon oil		
21	表压 Gauge pressure	不锈钢 Stainless steel	316L SST	硅油 Silicon oil		
22	表压 Gauge pressure	不锈钢 Stainless steel	哈氏合金C-275 Hastelloy C-275	硅油 Silicon oil		
23	表压 Gauge pressure	不锈钢 Stainless steel	316L SST	硅油 Silicon oil		
2A	表压 Gauge pressure	不锈钢 Stainless steel	钽 Tantalum	惰性液 (卤代烃) Inertia liquid(Halogenated hydrocarbon)		
2B	表压 Gauge pressure	不锈钢 Stainless steel	316L SST	惰性液 (卤代烃) Inertia liquid(Halogenated hydrocarbon)		
2C	表压 Gauge pressure	不锈钢 Stainless steel	哈氏合金C-275 Hastelloy C-275	惰性液 (卤代烃) Inertia liquid(Halogenated hydrocarbon)		
31	表压 Gauge pressure	不锈钢 Stainless steel	316L SST	硅油 (要求选代码S1) Silicon oil(It is required to select code S1)		
代码 Code	O形环材料 O-ring material					
A	氟橡胶 Fluore rubber					
代码 Code	外壳材料 Material of external shell		导管入口尺寸 Entry size of the conduit			
B	铝, 覆氟树脂涂层 Aluminum, covered with PU		M20×1.5(CM20)			
代码 Code	远传 (可选) Remote transmitting(Optional)					
S1	一个远传 (低压侧代码应为31, 采用毛细管式远传) One remote transmitting(The code at the low pressure side should be 31, with capillary type of remote transmitting)					
代码 Code	法兰与接头用螺栓 (可选) Flange and joint bolts(Optional)					
L5	碳钢镀锌螺栓 Carbon steel galvanized bolt					
代码 Code	表头 (可选) Meter(Optional)					
M5	液晶表头, 用于铝制外壳 Liquid crystal meter, for aluminum shell					
代码 Code	其他选项 Other options					
Q4	检验数据单 Check the data sheet					
Q8	材料可跟踪证书 Material traceability certificate					
C1	定制软件组态 Customized software configuration					
CN	外部接地螺栓组件 External grounding bolt assembly					
V5	下套冲洗连接选项 Lower sleeve flushing connection option					
代码 Code	冲洗连接环材料 Flushing Connection Ring Material	冲洗连接 Flushing Connection		膜片尺寸 Diaphragm Size		
		数量 Qty.	尺寸 Size	2英寸 2-inch	3英寸 3-inch	4英寸 4-inch
F1	不锈钢 Stainless steel	1	1/4	•	•	•
F2	不锈钢 Stainless steel	2	1/4	•	•	•
F2 ⁽¹⁾	哈氏合金 Hastelloy	1	1/4	•	•	•
F4 ⁽¹⁾	哈氏合金 Hastelloy	2	1/4	•	•	•
F7	不锈钢 Stainless steel	1	1/4	•	•	•
F8	不锈钢 Stainless steel	2	1/4	•	•	•
F9	哈氏合金 Hastelloy	1	1/4	•	•	•
F0	哈氏合金 Hastelloy	2	1/4	•	•	•
注: F3, F4不适用于选项代码A0, B0, G0。 Note: F3 and F4 are not applicable to option code A0, B0, G0						
典型型号: 3051L 2 A A0 A D 21 A A M5 Typical model:305L 2 A A0 A D 21 A A M5						
代码 Code	危险场所认证 Dangerous site certification					
E5	本安II CT4/CT6 Intrinsic safety II CT4/CT6					
K5	隔爆d II CT4/CT6 Explosion suppression d II CT4/CT6					

高温高压变送器

High temperature and high pressure transmitter

型号 Model	变送器类型 (选一) Transmitter type (select one)		HD	HG	
3051HD	差压变送器, 用于高温高压过程 Differential pressure, used for high temperature and high pressure process		•	/	
3051HG	表压变送器, 用于高温高压过程 Gauge pressure transmitter, used for high temperature and high pressure process		/	•	
代码 Code	压力范围 (量程/最小量程) Pressure scope (range/minimum range)		HD	HG	
	3051HD	3051HG			
3	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	•	•	
4	-4.0至4.0mH ₂ O/40mmH ₂ O (-40至40kPa/0.4kPa)	-4.0至4.0mH ₂ O/40mmH ₂ O (-40至40kPa/0.4kPa)	•	•	
5	-20至20mH ₂ O/0.2mH ₂ O (-200至200kPa/2.0kPa)	-20至20mH ₂ O/0.2mH ₂ O (-200至200kPa/2.0kPa)	•	•	
6	-70至70mH ₂ O/0.7mH ₂ O (-700至700kPa/7.0kPa)	-10至70mH ₂ O/0.7mH ₂ O (-100至700kPa/7.0kPa)	•	•	
7	-210至210mH ₂ O/2.1mH ₂ O (-2.1至2.1MPa/21kPa)	-10至210mH ₂ O/2.1mH ₂ O (-0.1至2.1MPa/21kPa)	•	•	
8	-700至700mH ₂ O/7.0mH ₂ O (-7.0至7.0MPa/70kPa)	-10至700mH ₂ O/7.0mH ₂ O (-0.1至7.0MPa/70kPa)	•	•	
9	-2100至2100mH ₂ O/21mH ₂ O (-21至21MPa/210kPa)	-10至2100mH ₂ O/21mH ₂ O (-0.1至21MPa/210kPa)	•	•	
注: 3051HG型的量程下限随大气压的变化而改变。 Note: alter with the change of barometric pressure under 3051HG type range.					
代码 Code	输出 Output		HD	HG	
A	4-20mA, 带有基于HART协议的数字信号 4-20mA, with digital signal based on HART protocol		•	•	
代码 Code	结构件材料 Structure material			HD	HG
	法兰材料 Flange Material	排液/排气阀 Liquid/Gas Drain Valve	法兰接头材料 Flange Joint Material		
2	不锈钢 Stainless steel	不锈钢 Stainless steel	不锈钢 Stainless steel	•	•
7	不锈钢 Stainless steel	哈氏合金C Hastelloy C	不锈钢 Stainless steel	•	•
代码 Code	隔离膜片材料 Isolation diaphragm material			HD	HG
2	316L不锈钢 316L stainless steel			•	•
3	哈氏合金C-276 HastelloyC-276			•	•
5	钽 Tantalum			•	•
代码 Code	O型环 O-ring			HD	HG
A	氟橡胶 Fluorine rubber			•	•
代码 Code	灌充液 Filling liquid			HD	HG
1	硅油 Silicon oil			•	•
2	惰性液 (卤代烃) Inertia liquid(Halogenated hydrocarbon)			•	•
代码 Code	外壳材料 Material of external shell		导管入口尺寸 Entry size of the conduit		
B	铝, 覆氟碳涂层 Aluminum, covered with PU		M20×1.5(CM20)		
代码 Code	安装支架选项 Installation frame option				
B1	传统法兰支架, 用于2英寸管道安装, 碳钢螺栓 Traditional flange frame, used for 2 inch pipeline installation, carbon steel bolt.				
B2	传统法兰支架, 用于面板安装, 碳钢螺栓 Traditional flange frame, used for panel installation, carbon steel bolt.				
B3	传统法兰支架, 用于面板安装, 碳钢螺栓 Traditional flange frame, used for panel installation, carbon steel bolt.				
B7	B1支架, 配不锈钢螺栓 B1 support, with stainless steel bolt				
B8	B2支架, 配不锈钢螺栓 B2 support, with stainless steel bolt				
B9	B3支架, 配不锈钢螺栓 B3 support, with stainless steel bolt				
BA	不锈钢B1支架, 配不锈钢螺栓 Stainless B1 frame, with stainless steel bolt				
BC	不锈钢B3支架, 配不锈钢螺栓 Stainless B3 frame, with stainless steel bolt				

高温高压变送器 High temperature and high pressure transmitter

代码 Code	螺栓选项 Bolt option
L4	316不锈钢螺栓 316 stainless steel bolt
L5	碳钢镀锌螺栓 Carbon steel galvanized bolt
代码 Code	表头可选 Meter optional
L4	液晶表头, 用于铝制外壳 Liquid crystal, for aluminum shell
代码 Code	其他选项 Other options
Q4	检验证书 Check the certificate
Q16	卫生型远传膜片表面光洁认证 Hygiene remote transmitting diaphragm surface finish certification
Q3	安全型仪表系统的质量认证 Quality certification of safety instrument system
J1	有本机零点或量程调整 Zero point or range adjustment without native machine
J3	有本机零点或量程调整 Zero point or range adjustment without native machine
T1	耐瞬变电压保护端子块 Protection terminal block resistant to transient voltage
C1	定制软件组态 Customized software configuration
P1	静压测试 Static pressure test
P2	清洗, 用于特殊应用场合 Cleaning, used for special applications
DF	1/2-14NPT过程接口 (法兰按头) 材料与法兰材料相同 1/2-14NPT process interface(Flange joint)- material is the same as the flange material
P9	31MPa静压极限 (仅限305 I CD型, 量程2-5) 31MPa static pressure limit(Only for 305 I CD type, range 2-5)
V5	外部接地螺钉组件 External grounding bolt assembly
代码 Code	危险场所认证 Dangerous site certification
E5	本安II CT4/CT6 Intrinsic safety ia II CT4/CT6
K5	隔爆d II CT4/CT6 Explosion suppression d II CT4/CT6

3051T型表压与绝压变送器选型

High temperature and high pressure transmitter

型号 Model	变送器类型 Transmitter type	
3051T	压力变送器 Pressure transmitter	
代码 Code	压力类型 Pressure type	
G	表压 Gauge pressure	
A	绝压 Absolute pressure	
代码 Code	压力范围 (量程/最小量程) Pressure scope (range/minimum range)	
	3051TG	3051TA
3	-750至750mmH ₂ O/12mmH ₂ O (-7500至7500Pa/120Pa)	0至750mmH ₂ O/12mmH ₂ O (0至7500Pa/120Pa)
4	-4.0至4.0mH ₂ O/40mmH ₂ O (-40至40kPa/0.4kPa)	0至4.0mH ₂ O/40mmH ₂ O (0至40Pa/0.4kPa)
5	-10至20mH ₂ O/0.2mH ₂ O (-100至200kPa/2.0kPa)	0至20mH ₂ O/0.2mH ₂ O (0至200kPa/2.0kPa)
6	-10至70mH ₂ O/0.7mH ₂ O (-100至700kPa/7.0kPa)	0至70mH ₂ O/0.7mH ₂ O (0至700kPa/7.0kPa)
7	-10至210mH ₂ O/2.1mH ₂ O (-0.1至2.1MPa/21kPa)	0至210mH ₂ O/2.1mH ₂ O (0至2.1MPa/21kPa)
8	-10至1000mH ₂ O/10mH ₂ O (-0.1至10MPa/100kPa)	0至1000mH ₂ O/10mH ₂ O (0至10MPa/100kPa)
9	-10至4000mH ₂ O/40mH ₂ O (-0.1至40MPa/400kPa)	0至4000mH ₂ O/40mH ₂ O (0至40MPa/400kPa)
10	-10至12000mH ₂ O/120mH ₂ O (-0.1至120MPa/1200kPa)	0至12000mH ₂ O/120mH ₂ O (0至120MPa/1200kPa)
注: 3051TG型的量程下限随大气压的变化而改变。 Note: Alter with the change of barometric pressure under 3051TG type range.		
代码 Code	输出 Output	
A	4-20mA, 带有基于HART协议的数字信号 4-20mA, with digital signal based on HART protocol	
B	PROFIBUS-PA总线	
代码 Code	过程连接型式 Process connection type	
2B	1/2—14NPT阴螺纹 1/2-14NPT Female screw	
2C	G 1/2 A DIN 16288阳螺纹 G 1/2 A DIN 16288 Male screw	
2G	M20×1.5 DIN1616288阳螺纹 M20×1.5 DIN1616288 Male screw	
2F	锥形和螺纹方式, 适用于F-250-C型压力容器 (包括压盖与筒, 仅限不锈钢, 量程5) Conical and thread method, applicable to F-250-C pressure reaction tank (including gland hoop, only for stainless steel, range 5)	
代码 Code	过程连接液件材料 Process connection liquid material	
2	316LSST	
3	哈氏合金C-276 Hastelloy C-276	
4	钽膜片 Tantalum diaphragm	
6	镀金 Gold-plating	
注: 符合NACE MR01-75要求。 Note: meeting the requirements of NACE MR01-75.		
代码 Code	灌充液 Filling liquid	
1	硅油 Silicon oil	
2	惰性液 Inertial liquid	
代码 Code	表头 (选项) Meter (option)	
M5	液晶表头, 用于铝制外壳 Liquid crystal meter, used for aluminum shell	
代码 Code	远传 (可选) Remote transmitting (optional)	
A	一个远传 (直接安装式或毛细管式) One remote transmitting (direct installation or capillary type)	
代码 Code	安装支架 (可选) Installation frame (optional)	
B4	2英寸管道安装或面板安装支架, 全部为不锈钢 2-inch pipeline installation or panel installation frame, all is stainless steel	
代码 Code	危险场所认证 Dangerous site certification	
E5	本安II CT4/CT6 Intrinsic safety ia II CT4/CT6	
K5	隔爆d II CT4/CT6 Explosion suppression d II CT4/CT6	
注: 如果加远传装置, 量程比为10:1。 Note: If the remote transmitting device is added, the range ratio is 10:1.		

RTW型螺纹安装远传法兰 RTW type bolt installation remote transmitting flange

型号 Model	法兰过程连接型式 Flange process connection type
1199RTW	螺纹安装远传法兰 Thread installation remote transmitting flange
代码 Code	清洗连接孔 Cleaning connection hole
11	无 None
21	有 Yes
代码 Code	清洗连接孔 Cleaning connection hole
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	钽 Tantalum
代码 Code	结构件材料 Material of structure part
11	上套为316LSST, 安装环为碳钢 316LSST for upper sleeve Carbon steel for installation ring
代码 Code	下套材料 Material for lower sleeve
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	碳钢(电镀) Hastelloy C Carbon steel (electroplating)
代码 Code	引压连接孔 Pressure-leading connection hole
11	1/4"NPT (锥管螺纹) (Conical pipe thread)
12	3/8"NPT (锥管螺纹) (Conical pipe thread)
13	1/2"NPT (锥管螺纹) (Conical pipe thread)
15	1"NPT (锥管螺纹) (Conical pipe thread)
17	1-1/2"NPT (锥管螺纹) (不带清洗备用孔) (Conical pipe thread) (Without cleaning standby hole)
典型型号 (Typical model) : 1199RTW 11A 11A 17	

PFW扁平式远传法兰 PFW flat remote transmitting flange

型号 Model	法兰过程连接型式 Flange process connection type
1199PFW	扁平式远传法兰 Flat type remote transmitting flange
代码 Code	型式 Type
11	标准3"-150和300 lb Standard 3"-150 and 300 lb
代码 Code	远传装置膜片材料 Diaphragm material for remote transmitting device
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	钽 Tantalum
代码 Code	结构件材料 Material of structure part
11	上套为316LSST, 安装环为碳钢 316LSST for upper sleeve Carbon steel for installation ring
代码 Code	外壳材料 Shell material
11	316LSST
典型型号 (Typical model) : 1199PFW 11A 11A 17	

1199远传膜片密封件系统

1199 Remote Transmitting Diaphragm Sealing System

TK3051CD/TK3051T变送器带远传密封装置后, 就成为TK3051CD/TK3051T远传差压/压力变送器

TK3051CD/TK3051T远传差压/压力变送器, 可避免被测介质直接和变送器的隔离膜片接触的可靠测量方法, 它适用于下面几种情况:

- 1、被测介质对变送器接头和敏感元件有腐蚀作用时;
- 2、需要将高温被测介质与变送器隔离时;
- 3、被测介质中有固体悬浮物或高粘度易堵塞变送器接头和压力容器时;
- 4、被测介质用引压管引出易固化或结晶时;
- 5、更换被测介质需要冲洗而不容许混时;
- 6、必须保持卫生条件, 防止污染时。

TK3051CD/TK3051T型带远传密封装置的远传差压/压力变送器, 仍具有TK3051CD/TK3051T型差压/压力变送器的各种特点:

提供多种结构材料, 远传装置组件焊接结构, 可靠性强。充液腔低容积设计, 减少温度影响, 根据温度要求使用相应的灌充液。

When TK3051CD/TK3051T transmitter has remote sealing device, it becomes TK3051CD/TK3051T remote differential pressure/pressure transmitter.

TK3051CD/TK3051T remote transmitting differential pressure/pressure transmitter is a reliable measurement approach which can prevent the medium being measured from directly contacting the isolation diaphragm of the transmitter and it is applicable to the following conditions:

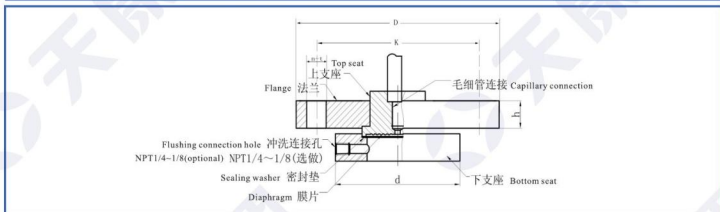
1. When the medium being measured is corrosive to the transmitter joint and sensitive elements;
2. When the high temperature medium being measured has to be isolated from the transmitter;
3. When there are solid suspended matters in the medium or when the medium is highly viscous which is easy to block the transmitter joint and pressure chamber;
4. When the leading-out medium with the pressure-leading tube is easy to solidify or crystallize.
5. When medium replacement requires flushing and it is not easy to mix.
6. When hygiene conditions must be kept to prevent the pollution.

TK3051CD/TK3051T remote transmitting differential pressure/pressure transmitter with sealing device still has various characteristics of TK3051CD/TK3051T differential pressure/pressure transmitter.

Various structure materials are provided. The assembly welding structure for remote transmitting device is highly reliable. The liquid filling chamber is designed with low volume to reduce the temperature influence. Relevant filling liquid shall be used depending on the temperature requirements.

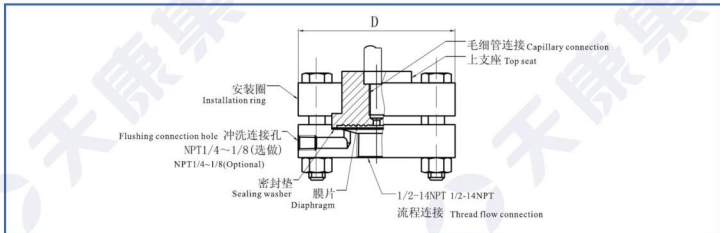
1199RTW型螺纹安装式远传装置 (外形尺寸)

1199RTW screw installation remote transmitting device (Outline dimensions)



1199PFW型扁平式远传装置 (外形尺寸)

1199PFW Flat remote transmitting device (Outline dimensions)



法兰安装远传法兰

Flange installed remote transmitting flange

型号 Model	安装法兰类型 Installed flange type
1199FFW	法兰安装远传法兰 Flange installation remote transmitting flange
代码 Code	冲洗备用孔 Standby hole for flushing
11	无 None
21	有 Yes
代码 Code	远传装置膜片材料 Diaphragm material for remote transmitting device
A	316LSSST
B	哈氏合金C Hastelloy C-276
C	钽 Tantalum
D	蒙耐尔 Monel
E	钛 Titanium
代码 Code	结构件材料 Material of structure part
11	上套为316SS, 法兰为碳钢(电镀) Upper sleeve is 316SS, the flange is carbon steel (electroplating)
代码 Code	下套尺寸和材料 Lower sleeve size and materia
A21	150lb 316SS
B21	150lb 哈氏合金C Hastelloy C
E21	150lb 碳钢 Carbon steel
A41	150lb 316SS
B41	150lb 哈氏合金C Hastelloy C
E41	150lb 碳钢 Carbon steel
A51	150lb 316SS
B51	150lb 哈氏合金C Hastelloy C
E51	150lb 碳钢 Carbon steel
A71	150lb 316SS
B71	150lb 哈氏合金C Hastelloy C
E71	150lb 碳钢 Carbon steel
A22	300lb 316SS
B22	300lb 哈氏合金C Hastelloy C
E22	300lb 碳钢 Carbon steel
A42	300lb 316SS
B42	300lb 哈氏合金C Hastelloy C
E42	300lb 碳钢 Carbon steel
A52	300lb 316SS
B52	300lb 哈氏合金C Hastelloy C
E52	300lb 碳钢 Carbon steel
A72	300lb 316SS
B72	300lb 哈氏合金C Hastelloy C
E72	300lb 碳钢 Carbon steel
A24	600lb 316SS
B24	600lb 哈氏合金C Hastelloy C
E24	600lb 碳钢 Carbon steel
A44	600lb 316SS
B44	600lb 哈氏合金C Hastelloy C
E44	600lb 碳钢 Carbon steel
A54	600lb 316SS
B54	600lb 哈氏合金C Hastelloy C
E54	600lb 碳钢 Carbon steel
A74	600lb 316SS
典型型号 (Typical model) : 1199FFW 11A A21	

法兰安装远传法兰 Flange installed remote transmitting flange

型号 Model	安装法兰类型 Installed flange type		
I199RFW	法兰安装远传法兰 Flange installation remote transmitting flange		
代码 Code	冲洗备用孔 Standby hole for flushing		
11	无 None		
21	有 Yes		
代码 Code	远传装置膜片材料 Diaphragm material for remote transmitting device		
A	316LSST		
B	哈氏合金C Hastelloy C-276		
C	钽 Tantalum		
代码 Code	结构件材料 Material of structure part		
11	上套为316SS, 法兰为碳钢 (电镀) Upper sleeve is 316SS, the flange is carbon steel (electroplating)		
代码 Code	下套尺寸和材料 Lower sleeve size and materia		
A21	1"	150lb	316SS
B21	1"	150lb	哈氏合金C Hastelloy C
E21	1"	150lb	碳钢 Carbon steel
A41	1-1/2"	150lb	316SS
B41	1-1/2"	150lb	哈氏合金C Hastelloy C
E41	1-1/2"	150lb	碳钢 Carbon steel
A51	2"	150lb	316SS
B51	2"	150lb	哈氏合金C Hastelloy C
E51	2"	150lb	碳钢 Carbon steel
A71	3"	150lb	316SS
B71	3"	150lb	哈氏合金C Hastelloy C
E71	3"	150lb	碳钢 Carbon steel
A22	1"	300lb	316SS
B22	1"	300lb	哈氏合金C Hastelloy C
E22	1"	300lb	碳钢 Carbon steel
A42	1-1/2"	300lb	316SS
B42	1-1/2"	300lb	哈氏合金C Hastelloy C
E42	1-1/2"	300lb	碳钢 Carbon steel
A52	2"	300lb	316SS
B52	2"	300lb	哈氏合金C Hastelloy C
E52	2"	300lb	碳钢 Carbon steel
A72	3"	300lb	316SS
B72	3"	300lb	哈氏合金C Hastelloy C
E72	3"	300lb	碳钢 Carbon steel
A24	1"	600lb	316SS
B24	1"	600lb	哈氏合金C Hastelloy C
E24	1"	600lb	碳钢 Carbon steel
A44	1-1/2"	600lb	316SS
B44	1-1/2"	600lb	哈氏合金C Hastelloy C
E44	1-1/2"	600lb	碳钢 Carbon steel
A54	2"	600lb	316SS
B54	2"	600lb	哈氏合金C Hastelloy C
E54	2"	600lb	碳钢 Carbon steel
A74	3"	600lb	316SS
B74	3"	600lb	哈氏合金C Hastelloy C
E74	3"	600lb	碳钢 Carbon steel
典型型号 (Typical model) : I199RFW 11 A 11 A71			

RTW型螺纹安装远传法兰 RTW type bolt installation remote transmitting flange

型号 Model	法兰过程连接型式 Flange process connection type
1199RTW	螺纹安装远传法兰 Thread installation remote transmitting flange
代码 Code	清洗连接孔 Cleaning connection hole
11	无 None
21	有 Yes
代码 Code	清洗连接孔 Cleaning connection hole
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	钽 Tantalum
代码 Code	结构件材料 Material of structure part
11	上套为316LSST, 安装环为碳钢 316LSST for upper sleeve Carbon steel for installation ring
代码 Code	下套材料 Material for lower sleeve
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	碳钢(电镀) Hastelloy C Carbon steel (electroplating)
代码 Code	引压连接孔 Pressure-leading connection hole
11	1/4"NPT (锥管螺纹) (Conical pipe thread)
12	3/8"NPT (锥管螺纹) (Conical pipe thread)
13	1/2"NPT (锥管螺纹) (Conical pipe thread)
15	1"NPT (锥管螺纹) (Conical pipe thread)
17	1-1/2"NPT (锥管螺纹) (不带清洗备用孔) (Conical pipe thread) (Without cleaning standby hole)
典型型号 (Typical model) : 1199RTW 11A 11A 17	

PFW扁平式远传法兰 PFW flat remote transmitting flange

型号 Model	法兰过程连接型式 Flange process connection type
1199PFW	扁平式远传法兰 Flat type remote transmitting flange
代码 Code	型式 Type
11	标准3"-150和300 lb Standard 3"-150 and 300 lb
代码 Code	远传装置膜片材料 Diaphragm material for remote transmitting device
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	钽 Tantalum
代码 Code	结构件材料 Material of structure part
11	上套为316LSST, 安装环为碳钢 316LSST for upper sleeve Carbon steel for installation ring
代码 Code	外壳材料 Shell material
11	316LSST
典型型号 (Typical model) : 1199PFW 11A 11A 17	

EFW型插入筒式远传法兰

EFW type inserted cylindrical remote transmitting flange

型号 Model	法兰过程连接型式 Flange process connection type
1199EFW	插入远传法兰 Inserted remote transmitting flange
代码 Code	插入筒直径和接液部材料 Insertion cylinder diameter and material of the liquid connection parts
11	3#316SST 不锈钢 Stainless steel
12	3#哈氏合金C 不锈钢 Stainless steel
13	4#316SST 不锈钢 Stainless steel
14	4#哈氏合金C 不锈钢 Stainless steel
代码 Code	远传装置膜片材料 Diaphragm material for remote transmitting device
A	316LSST
B	哈氏合金C-276 Hastelloy C-276
C	钽 Tantalum
代码 Code	插入筒长度 Insertion cylinder length
20	50mm
40	100mm
60	150mm
代码 Code	法兰规格和材料 Flange specification and material
A11	50#有镀层碳钢, 最大工作压力=1.97MPa, 在38°C时 50# with coated carbon steel, maximum working pressure=1.97MPa,At 38°C
A12	300#有镀层碳钢, 最大工作压力=5.1MPa, 在38°C时 300# with coated carbon steel, maximum working pressure=5.1MPa,At 38°C
C13	600#有镀层碳钢, 最大工作压力=9.9MPa, 在38°C时 600# with coated carbon steel, maximum working pressure=9.9MPa,At 38°C
典型型号 (Typical model) : 1199EFW 11 A 20 A11	

注：法兰规格、材料和工作压力，如有特殊需求可另行定制。

Note: The flange specification, material and working pressure can be customized if you have special requirements

毛细管型号规格表

Capillary mode specification

型号 Model	名称 Name
199CAP	毛细管 Capillary
代码 Code	毛细管材料和尺寸 Material and size of capillary
11	316SST, 内径为 $\phi 0.71\text{mm}$ 316SST, the inner diameter is $\phi 0.71\text{mm}$
13	316SST, 内径为 $\phi 1.09\text{mm}$ 316SST, the inner diameter is $\phi 1.09\text{mm}$
代码 Code	变送器端配件 Accessory parts at the transmitter end
D	1/2-20UNF-2A螺纹 1/2-20UNF-2A thread
代码 Code	结构件材料 Material for structure part
11	上者为316SST, 安装环为碳钢 316SST for upper part, carbon steel for installation ring
代码 Code	插入筒长度 Insertion cylinder length
5	1.5米 1.5m
10	3.0米 3.0m
15	4.5米 4.5m
20	6.0米 6.0m
25	7.5米 7.5m
30	10米 10m
代码 Code	远传法兰端配件 Accessory parts for remote transmitting flange end
A	1/2-20UNF-2A螺纹 1/2-20UNF-2A thread
C	1/2-20UNF-2A螺纹 1/2-20UNF-2A thread
代码 Code	保护套管 Protection sleeve
11	铠装300SST系列不锈钢 Armored 300SST series stainless steel
12	PVC护套, 铠装300SST系列不锈钢 PVC jacket, armored 300SST series stainless steel
典型型号 (Typical model) : 1199EFW 11 A 20 A11	

远传法兰灌充液

Filling liquid for remote transmitting flange

代码 Code	远传法兰的灌充液 Filling liquid for remote transmitting flange
C10485-0007	DC-200硅油: 稳定范围 -40 ~ +149°C (比重0.934) DC-200 silicon oil: stability range -40 ~ +149°C (specific weight 0.934)
01199-0032-0004	Slyatherm704硅油: 稳定范围 -15 ~ +300°C (比重0.934) Slyatherm704 silicon oil stability range -15 ~ +300°C (specific weight 0.934)
01199-0032-0012	丙油: 稳定范围 -45 ~ 205°C (比重1.85) Propylene oil stability range -45 ~ 205°C (specific weight 1.85)
典型型号 (Typical model) : C10485-0007	

注: 不能用于测量真空+测真空时温度极限应降低

Note: It can not be used to measure the vacuum + the temperature limit shall be lowered when the vacuum is measures

TK3051F卫生型压力变送器

TK3051F Hygiene Pressure Transmitter

优异的产品

绝压和表压测量范围：0-21至0-5512kPa/0.2%参考精度，包括线性、迟滞性和重复性影响量程比20:1。

稳定性0.1%URL/年；

用于CIP/SIP应用场合，温度上限248°F (140°C)；

采用HART通讯协议通讯；

基于微处理器的电子线路板；

双室结构外壳（水密性电性电子外壳）；

模块化设计，令维修快速且经济；

抗射频干扰能力；

变送器逐台特性化和数字化补偿，可优化变送器在整个工作范围内的性能；

外部零点和量程调整。

Excellent product

Absolute pressure and gauge pressure measurement range: 0-21 to 0-5512 kPa 0.2% parameter accuracy, including linearity, hysteresis and repeatability influence Range ratio 20:1.

Stability 0.1%URL/year.

Applied in CIP/SIP, upper limit of temperature 248°F(140°C).

Adopt HART communication protocol.

Electronic circuit board based on micro processor.

Modular design, rapid and economical maintenance.

Ability to withstand radio frequency interference.

Characterization of the transmitters one by one and digital compensation, able to optimize the performance within the whole operation range.

External zero point and range adjustment.

Design for professional hygiene application.

专业卫生型应用场合设计

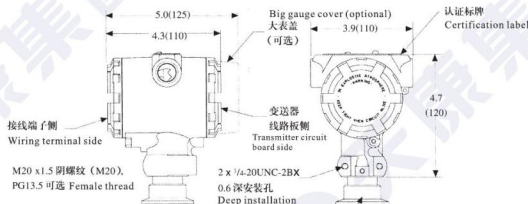
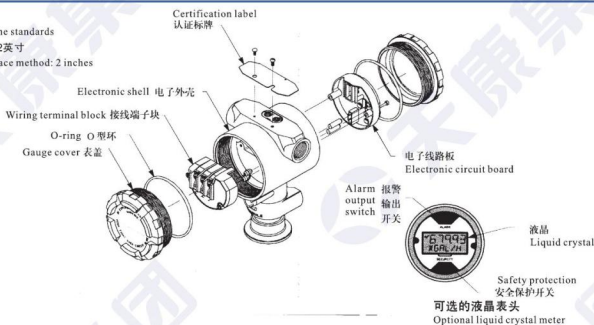
Design for professional hygiene application

符合卫生标准

In line with hygiene standards

安装接口方式：2英寸

Installation interface method: 2 inches



注释：

尺寸单位为英寸（毫米）

Note: The size unit is inch (mm)

简介

3051F卫生型压力变送器符合卫生标准，产品接触表面为CIP清洗而设计，结构件材料符合卫生要求。

应用

3051F型小巧、稳定、可靠，是食品和制药行业的理想产品，可直接安装在过程管线或罐上，无需支架。过程温度上限为140°C，令3051F型变送器适用于有高温蒸汽清洗的情况。

Introduction

3051F hygiene pressure transmitter meets the hygiene standards. The product contact face is the designed for CIP cleaning and the material of structural part meets the hygiene standards.

Application

Being small, stable and reliable, 3051F product is the ideal product for food and pharmaceutical industries and it can be installed directly on the process pipeline or cans without requiring frames. The upper limit of process temperature is 140°C so that the 3051F transmitter is able to be applied to high temperature steam cleaning.



应用场合

液体、气体、蒸汽和高粘度应用场合。

Applications

Liquid, gas, steam and high viscosity application.

量程

量程 Range	最小量程 (智能) Min. Range (Intelligent)	UPL/最大量程/传感器上限 UPL/MAX. Range/Upper Limit of Sensor
1	10.3kPa(103mbar)	200kPa(2.06bar)
2	51.7kPa(517mbar)	1034kPa(10.34bar)
3	276kPa(2.76bar)	2068kPa(20.68bar)

Range

输出

4-20mA dc/HART数字通讯。

Output

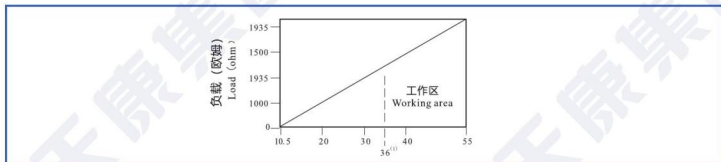
4-20mA dc/HART digital communication.

量程比

20:1负载限制。
最大回路负载=43.5 (电源电压-10.5)。

Range ratio

20:1 load limit.
Maximum circuit load = 43.5 (power supply voltage - 10.5)



电源

要求外部电源供电，无负载时变送器工作电压10.5-36V，反向保护是标准的。

Power supply

External power supply is required. The operation voltage for the transmitter without load is 10.5-36V. Reverse protection is standard.

零点正、负迁移

零点可在大气压与量程上限之间(3051FG型)或0kPa与量程上限之间(3051FA型)进行迁移,且校验量程大于或等于最小量程,最程上限值不大于URL(量程上限)。3051FG型不可真空校验。

过压极限

量程1: 826.8kPa,
其它: 2URLh,

温度极限

过程: -4至284°F(-20至140°C)
环境: -4至185°F(-20至85°C)
贮存: -22至185°F(-30至85°C)
过程温度高于185°F(85°C),要求环境温度极限降低超出值的1/1.5。

Zero point positive and negative shift

The zero point can shift between the barometric pressure and the upper limit of range (3051FG type) or between 0kPa and upper limit of range (3051FA type) and the check range is larger than or equal to the minimum range. The upper limit of the range shall not be larger than URL (upper limit of the range). 3051FG transmitter can not be checked with vacuum.

Overpressure limit

Range1: 826.8kPa
Others: 2URL

Temperature limit

Process: -4 to 284°F(-20 to 140°C)
Environment: -4 to 185°F(-20 to 85°C)
Storage: -22 to 185°F(-30 to 85°C)
When the process temperature is higher than 185°F(85°C), it is required that the reduction of the ambient temperature limit shall exceed 1/1.5 of the value.

$$\text{最大环境温度(}^{\circ}\text{C)} = 85 - \frac{\text{过程温度} - 85^{\circ}\text{C}}{1.5}$$

$$\text{Maximum ambient temperature (}^{\circ}\text{F)} = 185 - \frac{\text{Process temperature} - 85^{\circ}\text{C}}{1.5}$$

$$\text{最大环境湿度(}\% \text{)} = 185 - \frac{\text{过程温度} - 85^{\circ}\text{C}}{1.5}$$

$$\text{Maximum ambient humidity (}\% \text{)} = 185 - \frac{\text{Process temperature} - 85^{\circ}\text{C}}{1.5}$$

湿度极限: 0~100%相对湿度。
容积变化量: 小于0.00042cm³。
启动时间: 2秒, 无需预热。

故障报警

如自诊断出传感器或微处理故障,变送器则驱动输出一个高或低的报警信号以提醒用户。高或低的报警方式由用户改变变送器的跳线插卡选择。报警输出值取决于变送器的工厂组态方式:是标准操作还是符合NAMUR的操作。

标准操作

线性输出: $3.9 \leq I \leq 20.8$,
故障高: $I \geq 21.75\text{mA}$,
故障低: $I \leq 3.75\text{mA}$ 。

符合NAMUR的操作

线性输出: $3.8 \leq I \leq 20.5$,
故障高: $I \geq 22.5\text{mA}$,
故障低: $I \leq 3.6\text{mA}$ 。

变送器安全保护

启动变送器安全保护功能可防止对变送器组态的修改,包括本机零点和量程调整功能。调整内部的安全保护开关可启动保护功能。

功能指标

零基量程,参考条件,316SST隔离膜片。

参考精度

$\pm 0.2\%$ 校验量程,包括线性、迟滞性和重复性影响。

Temperature limit: 0~100% relative humidity
Volume change: smaller than 0.00042cm³
Start time: 2 seconds without preheating

Fault alarm

When the sensor or the microprocessor is self-diagnosed with fault, the transmitter will drive one high or low alarm signal to alarm the customer. The high or low alarm method is selected by the user by changing the jumper insertion technology. The alarm output value depends on the plant configuration method for the transmitter: standard operation or operation in line with NAMUR.

Standard operation

Linear output: $3.9 \leq I \leq 20.8$
Fault high: $I \geq 21.75\text{mA}$
Fault low: $I \leq 3.75\text{mA}$

Operation in line with NAMUR

Linear output: $3.8 \leq I \leq 20.5$
Fault high: $I \geq 22.5\text{mA}$
Fault low: $I \leq 3.6\text{mA}$

Safety protection of transmitter

The safety protection function of the transmitter can prevent the transmitter configuration from changing, including the zero point and range adjustment function for the machine. The adjustment of internal safety protection switch can start the protection function.

Function index

(zero base range, reference conditions, 316SST isolation diaphragm)

Reference accuracy

$\pm 0.2\%$ calibration range, including linearity, hysteresis and repeatability influence

环境温度影响 (每100°F(56°C)影响)

± (0.3%URL+0.3%量程) , -40至185°F (-40至85°C)。

稳定性

±0.10%URL, 12个月。

时间相应

时间响应时间常数小于200毫秒(阶跃压力变化输出达到63.2%的响应时间)。

振动影响

小于±0.10%URL, 振动测试条件: 峰-峰值4mm(5-15Hz)加速度2g(15-150Hz), 及1g(150-2000Hz)。

电源影响

小于±0.01%校验量程/伏。

安装位置影响

零点最多漂移0.3kPa, 可修正掉。无量程影响。

射频干扰(RFI)影响

<±0.25%URL, 在20~100MHz, 30伏/米场强下, 引线在导线管内; <±0.25%URL, 10伏/米场强下, 使用不带屏蔽的双绞线(无导线管)。

Environmental temperature influence (influence of each 100°F(56°C))

± (0.3%URL+0.3% range), -40 to 185°F(-40 to 85°C).

Stability

±0.10%URL, 12months.

Time response

Time constant smaller than 200 milliseconds (the response time for the step pressure change output to reach 63.2%)

Vibration influence

Smaller than ±0.10%URL, vibration test conditions: peak-peak value 4mm(5-15Hz). Acceleration 2g(15-150Hz) and 1g(150-2000Hz).

Power supply influence

Acceleration 2g(15-150Hz) and 1g(150-2000Hz).

Installation position influence

Maximum drift of zero point is 0.3kPa and it can be corrected. No range influence.

Radio frequency interference (RFI) influence

<±0.25%URL, under 20-100MHz, 30 volts/meter field strength, the leading wire is in the wire conduit; under <±0.25%URL, 10 volts/meter field strength, use non-shielded twisted pair (without wire conduit).

机械性能指标

Mechanical performance index

电气接口

1/2-14NPT, M20x1.5 (CM20) 或PG13.5导线管入口。

过程接液件

隔离膜片: 316L不锈钢;
过程接头: 316L不锈钢。

非接液件

电子外壳: 低铜铝, NEMA 4X, IP65, IP68;
喷涂: 聚氨酯;
表盖O型环: 丁腈橡胶;
重量: 约1.24公斤。

Electrical interface

1/2-14NPT, M20x1.5(CM20) or PG13.5 wire conduit entry.

Process liquid connection part

Isolation diaphragm: 316L stainless steel
Process joint: 316L stainless steel

Non liquid connected part

Electronic shell: low copper aluminum, NEMA 4X, IP65, IP68.
Spray: PU.
Gauge cover O-ring: nitrile butadiene rubber.
Weight: about 1.24 kilograms.

3051F型订货信息表

3051F Type Order Information

型号 Model	产品描述 Product Description	
3051FA	卫生型绝压变送器 Hygiene absolute pressure transmitter	
3051FG	卫生型表压变送器 Hygiene gauge pressure transmitter	
代码 Code	量程 Range	
1	0-200kPa(0-2bar)	
2	0-1030kPa(0-10.3bar)	
3	0-5515kPa(0-55.15bar)	
代码 Code	输出 Output	
S	4-20mAdc/HART数字通讯 4-20mAdc/HART digital communication	
代码 Code	结构件材料 Material of structure part	隔离膜片 Isolation diaphragm
	过程接口 Process interface	
2D	316SST	316SST
代码 Code	过程接口 Process interface	
F	2英寸Tri-clamp接口 2-inch Tri-clamp interface	
G	3英寸Tri-clamp接口 3-inch Tri-clamp interface	
代码 Code	导线管入口螺纹 Entry thread of wire conduit	
2	M20X1.5(CM20)	
代码 Code	表头 (选项) Meter (optional)	
M5	液晶表头 Liquid crystal meter	
代码 Code	产品描述 Product Description	
E5	本安 Intrinsic safety ia II CT4/CT6	
K5	隔爆 Explosion suppression d II CT4/CT6	
典型型号: 30 Typical mode:30	IFG 2 S 2D F 1	

校验

变送器由工厂按用户指定量程校验。如果不指定校验范围，则按变送器所选量程的最大测量范围校验。校验在环境温度和常压下进行。

Calibration

The transmitter shall be calibrated by the plant according to the amount designated by the user. When the calibration range is not specified, it shall be calibrated according to the maximum measurement range of the selected range. The calibration is conducted with ambient temperature and normal pressure.

TK3051P高温防腐型压力变送器

TK3051P High Temperature Anti-Corrosion Pressure Transmitter

一、产品简介

该型号是TK3051T型标准智能压力变送器的变形产品。在TK3051T的基础上加装密封隔离膜结构。过程连接方式为螺纹旋入式，平型法兰式、延伸凸型法兰式及焊接螺纹式。法兰式隔离膜片可用多种合金材料和塑料涂层合金制作。加装温度隔离器或毛细管，可耐300℃介质。极大扩展了应用范围、适用于高温、强腐蚀和粘度大介质的测量，除温度影响指标与TK3051T型有所不同外，其它性能基本一致。

二、测量范围

相对压力

最大测量范围0~40MPa；最小测量范围0~4kPa。

绝对压力

最大测量范围0~4MPa；最小测量范围0~50kPa。

表相对压力

最大测量范围-0.1MPa~39.9MPa；

最小测量范围-50kPa~0kPa。

Product introduction

This model is the variant of TK3051T standard intelligent pressure transmitter, which has seal isolation diaphragm structure added on TK3051T. The process connection type is thread screw-in type, flat flange type, extended convex flange and welded thread type. The flange type isolation diaphragm can be made of multiple kinds of alloy material and plastic coated alloy. With temperature isolator or capillary, it is able to withstand 300°C medium. It expands greatly the application range and suitable for measurement of medium with high temperature, strong corrosion and large viscosity. Its performance is basically the same as TK3051T type except the temperature influence index.

Measurement range

Relative pressure

Maximum measurement range 0~40MPa

Minimum measurement range 0~4kPa

Absolute pressure

Maximum measurement range 0~4MPa

Minimum measurement range 0~50kPa

Relative pressure

Maximum measurement range -0.1MPa~39.9MPa

Minimum measurement range -50kPa~0kPa

TK3051P高温防腐型连接件数据

Data of TK3051P high temperature anti-corrosion connection parts

选型代码 Selection code	连接螺纹						密封隔离膜片				
	公称直径 G	公称压力 PN	直径 d1 mm	直径 d mm	直径 d2 mm	螺纹长度X1 mm	外侧面间距 SW mm	膜片直径 dm mm	推荐最小 测量值 mm	高度 A mm	总质量 kg
AF	G1/A	40MPa	29	39	sw41	21	41	27	1	175	1.6
AG	G11/2A	40MPa	42	54.5	58	30	41	38	0.04	177	2.3
AR	G2A	40MPa	56	68	78	30	60	44	0.01	182	3.3

隔膜材料

过程连接件螺纹部分不锈钢1 Cr 18Ni9Ti；

特殊要求可供不锈钢316L，哈氏合金C276；

波纹膜片不锈钢316L；

哈氏合金C276。

Diaphragm material

Partial stainless steel for threads of process connection parts. Stainless steel 316L, Hastelloy C276 can be provided for special requirements.

Corrugated diaphragm stainless steel 316L.

Hastelloy C276.

温度影响

隔离膜片G1A +1200Pa/10K；

隔离膜片G11/2A +600Pa/10K；

隔离膜片G2A +300Pa/10K。

Temperature influence

Isolation diaphragm G1A +1200Pa/10K

Isolation diaphragm G11/2A +600Pa/10K

Isolation diaphragm G2A +300Pa/10K

过程连接1

外螺纹旋入式焊接密封隔膜结构连接；

螺纹标准G1A、G11/2A、G2A PN40MPa。

(特殊要求可供NPT标准)

Process connection 1

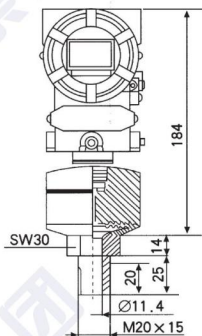
External thread screw-in welded seal diaphragm structure connection.

Thread standard G1A, G11/2A, G2A PN40MPa.

(NPT standards can be provided for special requirements)

外型结构1

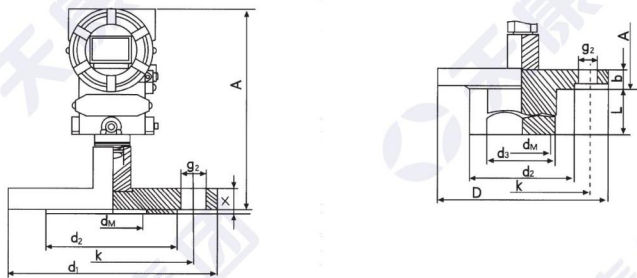
Outer structure 1



图中数据
Data in the drawing
详见“过程”连接(一)栏
See column connection (I) of “process”

外型结构2

Outer structure 2



过程连接2

平法兰或延伸平法兰式焊接密封隔膜结构连接。
法兰标准 GB9123-88。
TK3051P高温防腐型DN50、DN80、PN1/4MPa、
DN25、DN50、PN6/40MPa。
(结构见上图数据见下表)
(特殊要求可供DIN、ANSI标准)

Process connection 2

Flat flange or extended flat flange type welded seal diaphragm structure connection.
Flange standard GB9123-88.
TK3051P high temperature anti-corrosion DN50, DN80, PN1/4MPa, DN25, DN50, PN6/40MPa.
(See the drawing above for structure and see the following table for data.)
(Standards DIN and ANSI can be provided for special requirements)

TK3051P高温防腐型连接件数据

Data of TK3051P high temperature anti-corrosion connection parts

选型代码 Selection code			DK	AK	BK	CK	SU	NU	NU	PU	
法兰 Flange	公称直径 Nominal diameter	DN	/	50	50	50	80	80	80	80	
	公称压力 Nominal pressure	PN	MPa	1/4	1/4	1/4	1/4	1/4	1/4	1/4	
	压径 (D) Pressure diameter	d1	mm	165	165	165	165	200	200	200	
	厚度 (X) Thickness	b	mm	20	20	20	20	24	24	24	
	延伸膜长度 Length of extended film	l	mm	/	50	100	200	/	50	100	200
	延伸膜直度 Straightness of extended film	d3	mm	/	48.3	48.3	48.3	/	76.5	76.5	76.5
	凸台直径 Diameter of boss	l	mm	99	99	99	99	132	132	132	132
螺孔 Thread	孔数 Number of holes	/	/	4	4	4	4	4	4	4	
	孔径 Hole diameter	g2	mm	18	18	18	18	18	18	18	
	孔中心距 Center distance of holes	K	mm	125	125	125	125	160	160	160	
	膜片直径 Diaphragm diameter	dm	mm	46	46	46	46	70	70	70	
密封隔离膜片 Sealing isolation diaphragm	高度 Height	A	mm	200	204	204	204	204	204	204	
	总重量 Total weight	/	kg	3.72	4.48	8.11	3.72	6.23	6.23	4.48	4.48

3051P型连接件数

Number of 3051P type connection parts

SU	NU	NU	PU
25	25	25	25
5/10	15/25	5/15	15/25
125	150	165	215
17.5	20	20	20
/	/	/	/
/	/	/	/
50.8	50.8	92.1	92.1
4	4	8	8
20	26	20	26
89	101.5	127	165
28	28	46	46
204	204	204	204
2.9	5.45	11.4	16.9

外形结构2

过程连接件:

平法兰, 延伸平法兰部分, 不锈钢,

1Cr18Ni9Ti (特殊要求可供不锈钢316L)。

温度影响2

DN25: 2kPa/10K;

DN50: 300Pa/10K;

DN50 (包括延伸50mm、100mm、200mm): 300Pa/10K;

DN80 (包括延伸50mm、100mm、200mm): 200Pa/10K。

Outer structure 2

Process connection parts:

Flat flange, extended flat flange part, stainless steel

1Cr18Ni9Ti (Stainless steel 316L can be provided for special requirements)

Humidity influence 2

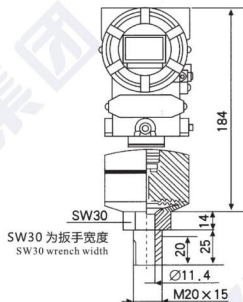
Process connection parts:

Flat flange, extended flat flange part, stainless steel

1Cr18Ni9Ti (Stainless steel 316L can be provided for special requirements)

外型结构3

Outer structure 3



过程连接3

焊接式外螺纹焊接密封隔膜结构连接。

螺纹标准：外螺纹G1/2A内孔 ϕ 11.4mm，
PN4MPa（特殊要求可供NPT标准）。

隔膜材料3

过程连接件焊接螺纹部分：不锈钢。

1Cr18Ni9Ti（特殊要求可供不锈钢316L、哈氏合金C-276）。

隔离波纹膜片部分：不锈钢316L、哈氏合金C 276、钽、
不锈钢316L带PTFE涂层。

隔离波纹膜片部分：不锈钢316L哈氏合金C276、钽及不
锈钢316带PTFE涂层。

温度影响3

200Pa/10K，

Process connection2

Welded external thread welded seal diaphragm structure connection.

Thread standard: external thread G1/2A inner hole ϕ 11.4mm,
PN4MPa (NPT standard can be provided for special requirements)

Diaphragm material 3

Welded thread part of process connection parts: stainless steel

1Cr18Ni9Ti (Stainless steel 316L and hastelloy C-276 can be provided for special requirements)

Isolation corrugated diaphragm part: stainless steel 316L, hastelloy C 276, tantalum, stainless steel 316L with PTFE coating

Temperature influence 3

200Pa/10K.

TK3051P高温防腐型压力变送器

TK3051P High Temperature Anti-Corrosion Pressure Transmitter

型号 Model	变送器型号 Transmitter type	
R	标准型 Standard type	
G	本安型 ia II CT4/T6 Intrinsic safety type ia I CT4/T6	
I	隔爆型 dII CT4/T6 Explosion suppression type dII CT4/T6	
代号 Code	外壳、显示 shell, display	
3	铝外壳, 电缆孔 M20×1.5 M20×1.5带数字显示器 Luminum shell, cable hole, M20×1.5 M20×1.5 with digital display	
4	铝外壳, 电缆孔 M20×1.5 Aluminum shell, cable hole, M20×1.5	
9	约定的特殊要求 Stipulated special requirements	
代号 Code	传感器标准量程 (量程比10:1) Standard range of sensor (Range rate 10:1)	最大过压 Maximum overpressure
	表压传感器 Gauge pressure sensor	
1F	传感器40kPa Sensor 40kPa	1MPa
1K	传感器200kPa Sensor 200kPa	2MPa
1P	传感器1MPa Sensor 1MPa	4MPa
1S	传感器4MPa Sensor 4MPa	6MPa
1G	传感器7MPa Sensor 7MPa	10MPa
1L	传感器10MPa Sensor 10MPa	15MPa
1X	传感器20MPa Sensor 20MPa	30MPa
1H	传感器40MPa Sensor 40MPa	60MPa
	绝压传感器 Gauge pressure sensor	
2F	传感器40kPa Sensor 40kPa	1MPa
2K	传感器200kPa Sensor 200kPa	2MPa
2P	传感器1MPa Sensor 1MPa	4MPa
2S	传感器4MPa Sensor 4MPa	6MPa
代号 Code	标定、压力单位 Calibration, pressure unit	
2	0—标准量程, 标定kPa/MPa 0—standard range, calibration kPa/MPa	
9	约定的特殊要求 Stipulated special requirements	
代号 Code	电子部件、通讯协议 Electronic part, communication protocol	
H	输出4—20mA, HART协议 Output 4—20mA, HART protocol	
S	输出4—20mA Output 4—20mA	
Y	约定的特殊要求 Stipulated special requirements	
代号 Code	隔膜中介液 Diaphragm medium liquid	
A	硅油 Silicon oil	
G	高温油+温度隔离器 High temperature oil + temperature isolator 100mm	
K	高温油, 1m毛细管 High temperature oil, 1m capillary	
L	硅油, 1m毛细管 High temperature oil, 1m capillary	
Y	约定的特殊要求 Stipulated special requirements	
代号 Code	过程连接标准 Process connection standards	
AF	外螺纹G1A, 推荐最小测量值 200KPa Outer thread G1A, recommended minimum measurement value 200KPa	
AG	外螺纹G1 1/2A, 推荐最小测量值40KPa Outer thread G1 1/2A, recommended minimum measurement value 40KPa	
AR	外螺纹G2A, 推荐最小测量值10KPa Outer thread G2A, recommended minimum measurement value 10KPa	
CA	焊接螺纹外螺纹G1/2A内孔φ11.4mm Welded thread outer thread G1/2A inner hole φ11.4mm	
DK	平法兰GB9123-88 DN50, PN1MPa/4MPa	Flat flange GB9123-88 DN50, PN1MPa/4MPa
SU	平法兰GB9123-88 DN80, PN1MPa/4MPa	Flat flange GB9123-88 DN80, PN1MPa/4MPa
AK	平法兰GB9123-88 DN50, PN1MPa/4MPa, 延伸50mm	Flat flange GB9123-88 DN50, PN1MPa/4MPa, extend 50mm
BK	平法兰GB9123-88 DN50, PN1MPa/4MPa, 延伸100mm	Flat flange GB9123-88 DN50, PN1MPa/4MPa, extend 100mm
OK	平法兰GB9123-88 DN50, PN1MPa/4MPa, 延伸200mm	Flat flange GB9123-88 DN50, PN1MPa/4MPa, extend 200mm
MU	平法兰GB9123-88 DN50, PN1MPa/4MPa, 延伸50mm	Flat flange GB9123-88 DN50, PN1MPa/4MPa, extend 50mm
NU	平法兰GB9123-88 DN80, PN1MPa/4MPa, 延伸100mm	Flat flange GB9123-88 DN80, PN1MPa/4MPa, extend 100mm
PU	平法兰GB9123-88 DN80, PN1MPa/4MPa, 延伸200mm	Flat flange GB9123-88 DN80, PN1MPa/4MPa, extend 200mm
YY	约定的特殊要求 Stipulated special requirements	
代号 Code	波纹膜片材料 Corrugated diaphragm material	
1	不锈钢316L Stainless steel 316L	
2	哈氏合金C276 Hastelloy C276	
5	钽 Tantalum	
7	不锈钢316L带PTFE涂层 Stainless steel 316L with PTFE painting	
9	约定的特殊要求 Stipulated special requirements	

TK3051P-R 3 1F 2 H A DK I

安装附件
 安装支架G
 标准电缆密封套
 外螺纹M20×1.5T
 隔爆电缆密封套
 外螺纹M20×1.5T2
 用户选用附件, 请在选型代码后的括号内注明所要附件的代码。

Installation accessories
 Installation frameG
 Standard cable seal cartridge
 External screw M20×1.5T
 Explosion suppression cable seal cartridge
 External screw M20×1.5T2
 When the user chooses accessory, please indicate the code of the required accessory in the bracket after the selection code.

TK208、TK316系列扩散硅变送器

TK208, TK316 series diffusion silicon transmitter



一、产品简介

TK208、TK316系列扩散硅变送器，选取进口高性能隔离式扩散硅传感器，采用国际上的先进制造工艺，具有同类进口变送器的坚固性和可靠性，适用于各种工业领域中腐蚀性介质的表压、绝压和负压的检测。

二、产品特点

- 性能价格比高
- 过程直接安装
- 温度特性好
- 综合精度高

三、技术参数

电源：24VDC 输出4-20mA二线制；
零位可调范围：±50%；
量程调节比：3:1以上；
量程范围：-100kPa~0~60MPa；
负载特性：负载在0~600Ω内(24VDC供电)维持恒流输出；
显示：5位LCD,工程单位%等；
隔爆型d II CT4，本安型ia II CT6；
过压极限：2倍于上限压力；
温度范围：过程：-20~60°C；
精度等级：±0.2%, ±0.5%；
稳定性：±0.2%F·S；
重量：约1kg；

Product introduction

TK208 and TK316 series diffusion silicon transmitter uses imported high performance isolation diffusion silicon sensor and internationally advanced manufacturing process. It has the rigidity and reliability of similar imported transmitter and is applicable to detection of gauge pressure, absolute pressure and negative pressure of the corrosive medium in the industrial field.

Product characteristics

- High cost performance
- Direct process installation
- Good temperature characteristics
- High overall accuracy

Technical parameters

Power supply: 24VDC output, 4-20mA two-wire system
Adjustable range of zero position: ±50%
Adjustment ration of the range: above 3: 1
Range scope: -100kPa~0~60MPa
Load characteristics: constant current output is maintained when the load in within 0~600Ω (24VDC power supply)
Display: 5 LCD, engineering unit, etc.
Explosion suppression dIICT4, intrinsic safety iaIICT6
Overpressure limit: twice the upper limit pressure
Temperature range: process: -20~60°C
Accuracy class: ±0.1%, ±0.5%
Stability: ±0.2%F·S
Weight: about 1kg
TK Diffusion Silicon Pressure Transmitter Selection

TK型扩散硅压力变送器选型表

TK Diffusion Silicon Pressure Transmitter Selection

型号 Model	变送器型号 Transmitter type
TK208	压力变送器 Pressure transmitter
TK316	压力变送器 Pressure transmitter
代码 Code	过程连接膜片及材料 Process connection diaphragm and material
1	不锈钢316L膜片/过程1Cr18Ni9Ti Stainless steel 316L diaphragm/process 1Cr18Ni9Ti
2	钽膜片/过程316L Tantalum diaphragm/process 316L
9	陶瓷膜片/过程316L Ceramic diaphragm/process 316L
代码 Code	过程连接标准 Process connection standard
R	外螺纹G1/2A Outer screw G1/2A 内孔φ8mm Inner hole φ8mm
B	外螺纹M20×1.5 Outer screw M20×1.5 内孔φ8mm Inner hole φ8mm
Y	约定的特殊要求 Specified special requirements
代码 Code	密封圈材料 Sealing material
1F	氟橡胶 (低温限制-20℃) Fluoride rubber(Low temperature limitation-20℃)
3F	氟硅橡胶 (低温限制-20℃) Fluorinated silicone rubber (Low temperature limitation-20℃)
4F	EPDM (低温限制-40℃) EPDM(Low temperature limitation-40℃)
9Y	约定的特殊要求 Specified special requirements
代码 Code	信号输出 Signal output
2	模拟信号4-20mA二线 Analog signal 4-20mA two wire
9	约定的特殊要求 Specified special requirements
代码 Code	外壳显示 Shell display
5	铝外壳, 电缆孔M20×1.5 Aluminum shell, cable hole M20 * 1.5
9	数字显示31/ LCD现场压力值(BPS316不配) Digital display 31/ LCD, pressure value on site (BPS316 not provided)
N	无显示 No show
代码 Code	精度等级 Accuracy class
3	0.20%
6	0.50%
代码 Code	量程、压力单位 Range, pressure unit
G1G	表压 Gauge pressure
G2G	绝压 Absolute pressure
Y	负压 Negative pressure
代码 Code	泵压专用 Special pump pressure
A	阻尼装置 Damping device
Tk208 1B 1F 5 6 G1G	

安装附件
 安装支架G
 标准电缆密封套
 外螺纹M20×1.5T
 隔爆电缆密封套
 外螺纹M20×1.5T2
 用户选用附件, 请在选型代码后的括号内注明所要附件的

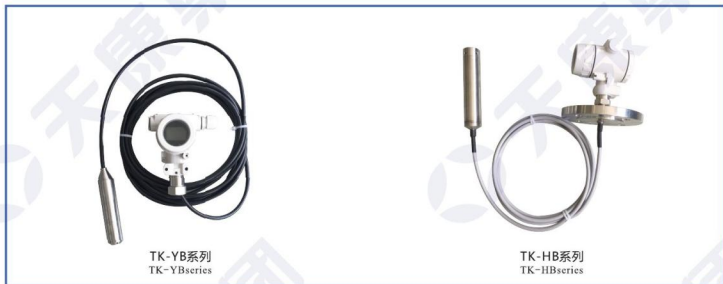
代码。

例: TK208 1B 1F 5 6 G1G

Installation accessories
 Installation frameG
 Standard cable seal cartridge
 Outer thread M20×1.5T
 Explosion proof cable seal cartridge
 Outer thread M20×1.5T2
 When the user selects the accessories, please indicate the code of the required accessories in the bracket after the selection code.
 E.g.: TK208 1B 1F 5 6 G1G

TK-YB静压式/TK-HB导压式液位变送器

TK-YB Static Pressure Pressure /TK-HB Guiding Liquid Level Transmitter



TK-YB系列
TK-YBseries

TK-HB系列
TK-HBseries

一、TK-YB静压式液位变送器

TK-YB Transmitter

静压式液位变送器采用德国SENSE压力传感器原装组件生产，主要用于城市给排水、水处理厂、水库、河流、海洋、储油罐、及石油、化工、电力等部门的液位测量，被测介质可以是水、油、碱性液体。仪表输出二线制4~20mA DC标准电流信号，具有技术先进、精度高、质量稳定可靠，安装使用方便等优点，是一种过程检测控制系统中理想的液位仪表。

Static pressure liquid transmitters are manufactured with original assemblies of German SENSE pressure sensors. It is mainly used for level measurement in urban water supply and drainage, water treatment plant, reservoir, river, ocean, oil tank, and departments like petroleum, chemical engineering and electric power. The medium being measured can be water, oil, and alkaline liquid. The instrument outputs two-wire system of 4~20mA DC standard current signal. Being advanced in technology, high in accuracy, stable and reliable in quality and convenient to install and use, it is an ideal liquid level instrument in process detection and control system.

主要技术参数 Main technical parameters

- 测量范围：0.3~100m（由用户自选）；
- 精度：0.1级、0.5级；
- 工作温度：-20~80℃；
- 输出信号：二线制4~20mA DC；
- 电源电压：24VDC， $\pm 1.0\%$ PS；
- 负载能力：0.600Ω；
- 相对温度： $\leq 85\%$ ；
- 防护等级：IP68；
- 防爆标志：ExiaII CT4~6。
- Measurement range: 0.3~100m(selected by user himself).
- Working temperature: -20~80℃.
- Accuracy: 0.1□ 0.5.
- Output signal: two-wire system 4~20mA DC.
- Power supply voltage: 24VDC, $\pm 1.0\%$ PS.
- Load capacity: 0.600Ω.
- Relative temperature: $\leq 85\%$.
- Protection class: Ip68.
- Explosion proof sign: ExiaII CT4~6.

二、TK-HB导压式液位变送器

TK-HB air guide type liquid level transmitter

TK-HB导压式（静压）液位变送器是一种结构独特、实用性很强的液位仪表。它与传统的投入式液位计的最大不同点在于传感器不直接与介质接触，是通过导压管内空气将液位的高低变化，传到传感器上。这样就避免了传感器的堵塞，损害腐蚀，大大延长了仪表的使用寿命，因其独特的设计，使之特别适用于测量高温、高粘度、混浊、强腐蚀性液体。如重油、渣油、浆料、硫酸、污水等，是传统投入式液位变送器的理想替代品，导压式液位变送器广泛应用于石化、钢铁、能源、食品、污水处理、制药、自来水等行业的敞口容器的液位测量。

导压式液位变送器应用：工业现场液位测量与控制、城市供水及污水处理、石油、化工、电厂、水文监测、水库、大坝、水电建设等领域的液位的测量与控制。

TK-HB air guide type liquid level transmitter(TK-HB pressure (static pressure) liquid level transmitter is a liquid level instrument with unique structure, strong practicability. The biggest difference between it and the traditional input type liquid level gauge is that the sensor is not directly contact with the medium. The liquid level is changed by the air in the air guide pipe, and the air is transferred to the sensor. In this way, the blockage of the sensor is avoided, the corrosion is damaged, and the service life of the meter is prolonged. Because of its unique design, so that it is particularly applicable to the measurement of high temperature, high viscosity, turbidity, strong corrosive liquid. As of heavy oil and residual oil slurry and sulfuric acid, sewage and other, traditional investment type liquid level transmitter is an ideal substitute of guide type liquid level transmitter is widely used in petrochemical, steel, energy, food, sewage treatment, pharmaceutical, water and other industries of the exposure container liquid level measurement.

Guide pressure liquid level transmitter application: industrial field liquid level measurement and control, urban water supply and wastewater treatment, petroleum, chemical industry, power plants, hydrological monitoring, reservoirs, dams, hydropower construction and in the field of liquid level measurement and control.

TK-YB型静压式液位变送器选型表

Type selection table of Tk-YB type static pressure type liquid level transmitter

型号 Model	变送器型号 Transmitter type	
TK-YB	静压式 Static pressure type	
代码 Code	过程连接膜片及材料 Process connection diaphragm and material	
1	不锈钢316L膜片/过程1Cr18Ni9Ti Stainless steel 316L diaphragm/process 1Cr18Ni9Ti	
2	钽膜片/过程316L Tantalum diaphragm/process 316L	
9	陶瓷膜片/过程316L Ceramic diaphragm/process 316L	
代码 Code	过程连接标准 Process connection standard	
R	支架 L型	Frame L type
B	板状	Plate installation
Y	约定的特殊要求 Specified special requirements	
代码 Code	密封材料 Seal material	
1F	钢缆式 Cable type	
3F	杆式 Rod type	
9Y	约定的特殊要求 Specified special requirements	
代码 Code	信号输出 Signal output	
2	模拟信号4-20mA二线 Analog signal 4-20mA two wire	
9	智能HART协议 Intelligent HART protocol	
代码 Code	外壳显示 Shell display	
5	铝外壳, 电缆孔M20×1.5 Aluminum shell, cable hole M20 * 1.5	
9	数字显示31/2 LCD现场压力值 Digital display 31/2LCD, pressure value on site	
代码 Code	精度等级 Accuracy class	
3	0.10%	
6	0.50%	
1	1.00%	
代码 Code	防爆等级 Explosion proof class	
1	d II CT4隔离爆 II 类C级T6组 d II CT4 isolation explosion Category II Class C Group T6	
2	ia II CT6本安型 II 类C级T4区 ia II CT6 intrinsic safety Category II Class C Group T4	
代码 Code	量程、压力单位 Range, pressure unit	
A	Kpa	
B	mH2O	
Y	其他 Other	

安装附件

安装支架

标准电缆密封套

外螺纹M20×1.5

防爆电缆密封套

外螺纹M20×1.5

用户选用附件, 请在选型代码后的括号内注明所要附件的

代码。

订货时请注明: 量程L=米

请注明: 缆长或杆长H=米

法兰安装式: 请注明法兰规格

installation accessories

installation frame

standard cable sealing cartridge

outer threadM20×1.5

Explosion proof cable seal sleeve

outer threadM20×1.5

When the user selects the accessories, please indicate the code of the required accessories in the bracket after the selection code.

Please note during order:

Range L = meter

Please indicate cable length or rod length H = meter

Flange installation type: please indicate the flange specification re Guiding Liquid Level Transmitter

TK-HB型导压式液位变送器选型表

TK-HB type guide pressure liquid level transmitter selection table

型号 Model	变送器型号 Transmitter type	
TK-HB	导压式 Guide pressure type	
代码 Code	过程连接膜片及材料 Process connection diaphragm and material	
1	不锈钢316L膜片/过程1Cr18Ni9Ti Stainless steel 316L diaphragm/process 1Cr18Ni9Ti	
2	钽膜片/过程316L Tantalum diaphragm/process 316L	
9	陶瓷膜片/过程316L Ceramic diaphragm/process 316L	
代码 Code	过程连接标准 Process connection standard	
R	支架 L型	Frame L type
B	法兰 (用户指定) Flange(User specified)	
Y	约定的特殊要求 Specified special requirements	
代码 Code	密封材料 Seal material	
1F	钢缆式 Cable type	
3F	杆式 Rod type	
4F	防腐PTFE (与介质接触部分) Corrosion protection PTFE (contact with the medium)	
9Y	高温: ≤240℃	
代码 Code	信号输出 Signal output	
2	模拟信号4-20mA二线 Analog signal 4-20mA two wire	
9	智能HART协议 Intelligent HART protocol	
代码 Code	外壳显示 Shell display	
5	铝外壳, 电缆孔M20×1.5	Aluminum shell, cable hole M20 * 1.5
9	数字显示31/2 LCD现场压力值 Digital display 31/2LCD, pressure value on site	
代码 Code	精度等级 Accuracy class	
3	0.10%	
6	0.50%	
代码 Code	量程、压力单位 Range, pressure unit	
A	Kpa	
B	mH2O	
Y	其他 Other	

安装附件

安装支架

标准电缆密封套

外螺纹M20×1.5

防爆电缆密封套

外螺纹M20×1.5

用户选用附件, 请在选型代码后的括号内注明所要附件的代码。

订货时请注明: 量程L=米

请注明: 缆长或杆长H=米

法兰安装式: 请注明法兰规格

installation accessories

installation frame

standard cable sealing cartridge

outer threadM20×1.5

Explosion proof cable seal sleeve

outer threadM20×1.5

When the user selects the accessories, please indicate the code of the required accessories in the bracket after the selection code.

Please note during order:

Range L= meter

Please indicate cable length or rod length H= meter

Flange installation type: please indicate the flange specification re Guiding Liquid Level Transmitter

TK301一体化浓度/密度变送器

TK301 Integrated Concentration/Density Transmitter



一、产品简介

TK310智能浓度/密度变送器是一种用于连续在经理测量液体浓度和密度的仪表,可直接用于工业生产过程。

它的独创设计在于采用一个电容式差压传感器以及与其相连的、插入生产过程的一对压力中继器。在两个压力继电器之间有一个温度传感器,用以补偿过程液体的温度变化。一个专用软件利用特定的算法计算密度。

二、产品应用

制糖和酒精业奶制品业采矿食品加工制浆造纸业酿酒及饮料加工化工,石化,制药。

三、技术提要

精度: $\pm 0.0004\text{g/cm}^3$ ($\pm 0.10\text{Brix}$) ;

量程: $0.5\text{g/cm}^3 \sim 5\text{g/cm}^3$ 。

四、电子线路图示

Product introduction

TK310 intelligent concentration/density transmitter is one instrument measuring continuously the liquid concentration and density and it can be used directly to the industrial production.

Its original design lies in one capacitance differential pressure sensor and one pressure relay connected with it and inserted into the production. There is one temperature sensor between two pressure relays to compensate for the temperature change of the process liquid. One special software uses particular algorithm to calculate the density.

Product application

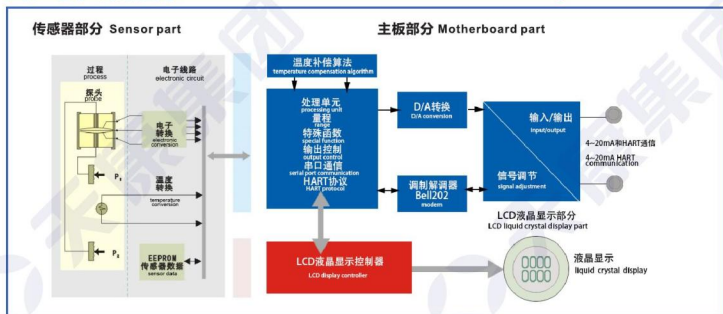
Sugaring, alcohol industry, dairy industry, mining, food processing, slurring, paper making, brewing, beverage processing, chemical engineering, petrochemical industry and pharmacy.

Technical summary

Accuracy: $\pm 0.0004\text{g/cm}^3$ ($\pm 0.10\text{Brix}$).

Range: $0.5\text{g/cm}^3 \sim 5\text{g/cm}^3$.

Electronic circuit diagram



TK301 工业型密度/浓度变送器 Industrial density/concentration transmitter

代码 Code	量程 Range	最小范围 Minimum scope
1	0.5-1.8g/cm ³	0-0.025g/cm ³
2	1.0-2.5g/cm ³	0-0.050g/cm ³
3	2.0-5.0g/cm ³	0-0.250g/cm ³

代码 Code	触液部分材质 Material for part contacting liquid
H	哈氏合金C276 Hastelloy C276
I	316L不锈钢 316L Stainless steel
Z	其他-指定 Others designated

代码 Code	填充液 Filling liquid
N	Neobee-M20 Propylene Glycol (食品级) (Food class)
D	DC-704 硅油 DC-704 silicon oil
S	DC200/20 硅油 DC200/20 silicon oil
G	甘油和水 Glycerin and water
T	Syltherm 800
Z	其他-指定 Others designated

代码 Code	液晶显示
0	不带显示
1	带显示

代码 Code	电气接口
O	1/2-14NPT
A	M20×1.5
B	Pg13.5DIN
Z	其他-指定 Others designated

代码 Code	安装 Installation
0	顶 Top
1	侧 Side

代码 Code	过程连接持尺寸、耐压等级和标准 Process connection size, withstand voltage class and standard
5	1 3" 150#ANSIB-16.5
5	2 3" 150#ANSIB-16.5
5	3 3" 150#ANSIB-16.5
A	C DN80PN25/40 IN2526-FORMD
Z	Z 其他-指定 Others designated

代码 Code	其他选项 Others designated
H1	316L不锈钢壳体 316L Stainless steel shell
Z2	其他-指定 Others designated

TK301 - 1 1 A - 1 1 1 - 5 1 / H1

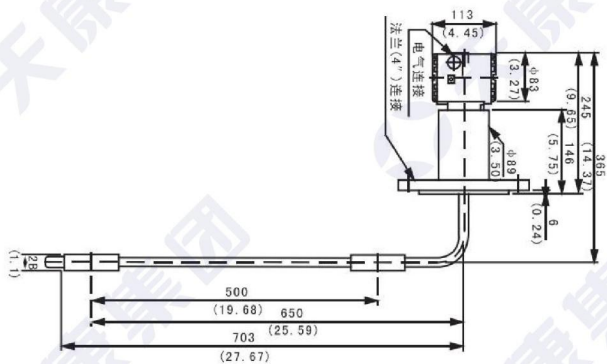
若无关选项，此栏不填。

No filling in this column when no relevant option

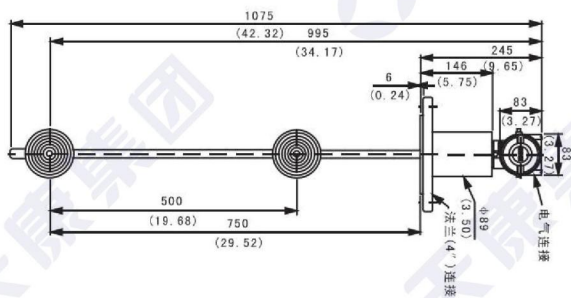
尺寸 Size

(工业型) Industrial type

尺寸单位 mm (英寸)



侧安装类型
Side installation type



顶安装类型
Top installation type

TK6800电动压差式液位变送器

TK6800 Electric pressure differential liquid level transmitter

采用成熟的压差测量技术，通过特殊的结构设计使TK6800电动压差式液位变送器具有以下特点：

1、测量精度高、性能可靠、长期稳定性好，使用方便，广泛适用于电力、石油、化工、冶金、环保、建筑、食品等各行业生产过程的液位测量与控制。

2、通用性强：可满足不同温度、压力、介质的液位测量要求，并可应用于腐蚀、高温、高压、冲击等恶劣场合。

3、免维护：测量过程无可动部件，不存在机械部件损坏问题，无需维护。

4、准确可靠：测量量多样化，使测量更加准确，测量不受环境变化影响，稳定性高，使用寿命长。

5、多数应用场所可替代电动浮筒式或射频导纳及雷达式液位变送器。

Mature pressure differential measurement technology is adopted. Special structural design is used so that the TK6800 electric pressure differential liquid level transmitter has following characteristics:

1. High measurement accuracy, reliable performance, good long term stability, convenient use, widely applicable to liquid level measurement and control in production in industries like electric power, petroleum, chemical engineering, metallurgy, environmental protection, architecture and food.

2. Highly general use: able to meet the measurement requirements of different temperature, pressure and medium and applicable to harsh conditions with corrosion, high temperature, high pressure and impact.

3. Maintenance-free: no movable part during measurement, no mechanical part damage, no need for maintenance

4. Accurate and reliable: diversified measurement, more accurate measurement, not affected by environmental change, high stability, long service life.

5. In most application cases, it is able to replace the electric buoy or radio frequency admittance and radar liquid level transmitter.



主要技术参数

- 测量范围：300-20000mm（更大量程可定做）
 - 精度：液位测量±0.1%FS
 - 量程比：10:1
 - 重复性：≤±0.05%FS
 - 电源：16~36VDC
 - 输出信号：模拟量4-20mADC（HART协议）
 - 液晶显示：mmH₂O, KPa, %
 - 最大负载电阻：24VDC供电时
 - 密度范围：100 < ρ < 3000Kg/m³
 - 工作压力：2.5~16MPa
 - 介质温度：-60℃~280℃
 - 环境温度：-40℃~70℃
 - 工作条件影响：
- 供电影响：当电压在规定电压的最小值与最大值之间变化时，输出变化≤±0.02%FS
- 温度影响：≤0.05%/10℃
- 防护等级：IP68(NEMA 4X)
 - 防爆等级：本安型ExialICT4-T6，隔爆型ExdIICT4-T6
 - 电气接口：1/2-14NPT内螺纹，M20×1.5内螺纹
 - 接线盒：铝合金

Main technical parameters

- Measurement scope: 300-20000mm(customized for larger range)
- Accuracy: liquid level measurement±0.1%FS
- Rang ratio: 10:1
- Repeatability: ≤±0.05%FS
- Power supply: 16~36VDC
- Output signal: analog 4-20mADC (HART protocol)
- Liquid crystal display: mmH₂O, KPa, %
- Maximum load resistor: when 24VDC power supply
- Density range: 100 < ρ < 3000Kg/m³
- Working pressure: 2.5~16MPa
- Medium temperature: -60℃~280℃
- Ambient temperature: -40℃~70℃
- Influence of working conditions:
- Power supply influence: when the voltage changes between the minimum value and the maximum value of the specified voltage, the output changes≤±0.02%FS
- Temperature influence≤0.05%/10℃
- Protection class: IP68(NEMA 4X)
- Explosion proof class: intrinsic safety type, explosion proof type.
- Electric interface: 1/2-14NPT inner thread, M20×1.5 inner thread
- Terminal box: aluminum alloy

TK6800电动差压式液位变送器型号规格

Model and specification of TK6800 electric differential

型号 Model	变送器型号 Transmitter type	
TK6800	电动差压式液位变送器 Electric differential pressure liquid level transmitter	
代码 Code	压力量程 Pressure range	
1	插入式200~300mmH ₂ O	Inserted type 200~300mmH ₂ O
2	沉入式1000~20000mmH ₂ O	Immersion type 1000~20000mmH ₂ O
3	汽包液位式 (选型材料另询)	Bubble level type (please inquire the selection material separately)
代码 Code	变送器类型 Transmitter type	
A	基本型 -40~80℃	Basic type -40~80℃
B	高温型 -40~280℃	High temperature type -40~280℃
C	防腐型 -40~120℃	Corrosion prevention type -40~120℃
代码 Code	安装方式 Installation type	
N	顶装式	Top installation type
H	侧侧外装式	Side side external installation type
C	侧底外装式	Side bottom external installation type
D	汽包液位型	Bubble level type
I	特殊型 (客户提供图纸) Special type (Drawing provided by the customer)	
代码 Code	配套选择 Accessory selection	
X1	不带连通器	No communicating vessel
X2	配套连通器 (用户提供参数) Supporting communicating vessel (Parameter provided by the user)	
代码 Code	输出信号 Output signal	
H	4~20mA HART	
代码 Code	接液材质 Liquid connection material	
A	316L	Top installation type
B	316L+特氟龙	316L+Teflon
C	316L+聚四氟乙烯	316L+PTFE
代码 Code	安装法兰 Installation flange	
A	DN80	
B	DN65	
C	用户指定	Customer designated
代码 Code	工作压力 Working pressure	
P1	≤6.3MPa	
P2	≤16MPa	
代码 Code	电气接口 Electric interface	
A	M20×1.5	
B	1/2NPT	
代码 Code	显示方式 Display method	
A	mmH ₂ O	
B	Kpa	
C	%	
代码 Code	防爆等级 Explosion-Proof	
A	本安iaⅡCT4/CT6 Intrinsic safety iaⅡCT4/CT6	
B	隔爆dⅡCT4/CT6 Explosion isolation dⅡCT4/CT6	
出厂量程 L = mm Ex-work range L = mm 探极长度 H = mm Probe length H = mm		
TK6800 1 B H X2 C A P1 A B E5		

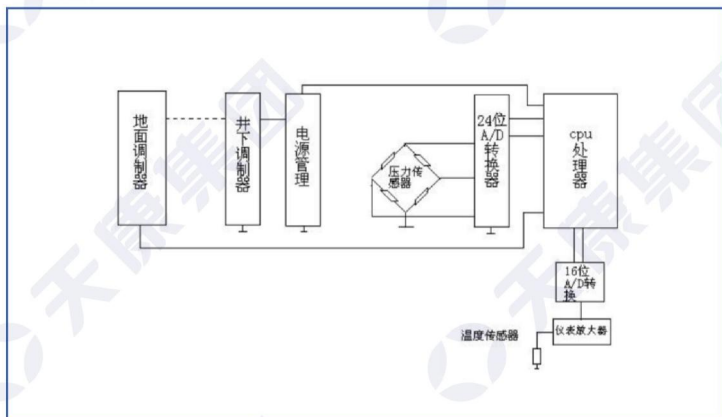
TK-3051-DPG井下压力计/变送器

TK-3051-DPG downhole pressure gauge/transmitter

一、工作原理

数字井下压力计的工作原理，压力传感器将压力信号转换为电压信号，经仪表放大器放大后再经A/D转换器转换为数字信号，然后由微处理器采样并处理，采用测井专用电缆传送至地面，由地面的调制解调器传给测控系统。

原理图如下：



Working principle

Working principle of digital downhole pressure gauge: The pressure sensor converts the pressure signal into a voltage signal, and the instrument amplifier is amplified and then converted to digital signal by A/D converter. After that, It is sampled and processed by the microprocessor. The special logging cable is sent to the ground, and the modem on the ground is transmitted to the measurement and control system.

The schematic is as follows

二、主要特点

井下压力计的稳定性，可靠性，漂移量是压力计的核心指标，其性能的优势，主要取决于以下几个方面：

- 1、天康TK-3051-DPG系列数字井下压力计均选用进口压力传感器；
- 2、天康TK系列数字井下压力计均进行温压补偿，以消除不同温度工作条件下可能产生的漂移；
- 3、采用进口24位高精度转换电路。

Main features

The stability, reliability and drift quantity of downhole pressure gauge are the core indexes of pressure gauge. Its performance mainly depends on the following aspects:

1. Tiankang TK-3051-DPG series digital downhole pressure gauge adopts imported Pressure sensor.
2. Tiankang TK series digital downhole pressure gauge are compensated for temperature and pressure to eliminate drift that may occur under different operating conditions.
3. Imported 24-bit high-precision conversion circuit is adopted.

三、主要参数

1. 技术标准

供应商制造的井下压力计应遵循以下技术标准:

- JG875-2005《数字压力计检定规程》
- SY/T6231-2006《电子式井下压力计》

2. 主要技术指标

- 压力测量范围: 0.6 ~ 60MPa;
- 压力测量精确度: 0.05%Fs;
- 压力读数分辨率: 0.05KPa;
- 温度测量范围: -40℃~150℃;
- 温度测量精确度: 0.25℃;
- 温度读数分辨率: 0.1℃;
- 供输出信号: MODBUS-RTU协议, RS485通讯;
- 输入电源: 直流24V, 18V~30VDC;
- 工作温度范围: 从机-40℃~150℃, 主机-25℃~80℃(含LCD显示);
 - 能接受外部指令完成现场零点校准、大气压校准;
 - 井下密封: 不小于60MPa
- 3.2、井口密封: 不小于5MPa, 支持级联式安装, 在发生井口漏气时能不开井实施补救措施。

3. 井下安装

提供井下固定底座安装, 有配套减震措施。

4. 电缆选型

- 外径不大于8毫米, 耐磨抗拉, 能支持重复作业;
- 信号电缆能支持压力和温度同步传输;
- 电缆内部应有阻气工艺, 在电缆蹭破后能避免气体从电缆内部窜出。

四、压力计密封性

TK-3051-DPG系列数字井下压力计均采用行业成熟的封装技术, 重要部位采用传感器行业的特别焊接工艺。保证产品的密封耐压下限大于60MPa, 或量程的200%。

五、电磁兼容性

井下压力计符合“JB/T3369”工业仪表电磁兼容。

数字井下压力计符合Modem通讯协议的相关要求, 可在恶劣电磁环境下, 长距离可靠的传送信号。

六、维护与校准

井下压力计需定期(不长于三年零位校准)取到井上在实验室校准, 主要是消除零位误差。

数字井下压力计可地面或远程无线人工定期对井下压力计的进行在线调整, 迁移或设置。以满足使用过程中符合用户实用需求, 故可长期工作于井下, 必要时可协助用户进行实验室检定(提供检定软件及技术支持)。

Main parameters

1. Technical standard

Downhole pressure gauges manufactured by the supplier shall comply with the following technical standards

- 1.1 JG875-2005 Verification regulation of digital pressure gauge
- 1.2 SY/T6231-2006 (Electronic downhole pressure gauge)

2. Main Technology Parameters

- 2.1 Pressure Measuring Range: 0.6~60MPa.
- 2.2 Accuracy of pressure measurement: 0.05%Fs.
- 2.3 Pressure reading resolution: 0.05KPa.
- 2.4 Temperature Measuring Range: -40℃~150℃.
- 2.5 Accuracy of temperature measurement: 0.25℃.
- 2.6 Temperature reading resolution: 0.1℃.
- 2.7 Supply output signal: MODBUS-RTU protocol, RS485 communication.
- 2.8 Input Current: DC 24V, 18V~30VDC
- 2.9 Operating Temperature Range: slaves -40℃~150℃, master -25℃~80℃ (Including LCD indication).
- 3.0 Can accept external instructions to complete on-site zero point calibration and atmospheric pressure calibration.
- 3.1 Downhole seal: not less than 60MPa.
- 3.2 Wellhead seal: not less than 5MPa. Support cascaded installation. In the event of wellhead leakage can be closed to implement remedial measures.

3. Downhole installation

Provide underground fixed base installation, with supporting shock absorption measures.

4. Selection of the cable

- 4.1 Outside diameter not more than 8 mm, wear-resistant tensile, can support repeated operations.
- 4.2 A signal cable that supports simultaneous transmission of pressure and temperature.
- 4.3 The inside of the cable should have a gas blocking process, which can prevent the gas from escaping from the inside of the cable after the cable is damaged.

Pressure gauge tightness

TK-3051-DPG series digital downhole manometer adopts the mature packaging technology of the industry, and the special welding technology of sensor industry for the important parts. Make sure the lower limit of sealing pressure of the product is more than 60MPa, or 200% of the range.

Electromagnetic compatibility

The downhole pressure gauge is electromagnetic compatible with "JB/T3369" industrial instrument.

The digital downhole pressure gauge conforms to the requirements of Modem communication protocol and can reliably transmit signals over long distances in harsh electromagnetic environment.

Maintenance and calibration

The downhole manometer should be taken to the well regularly (not longer than three years) and calibrated in the laboratory, mainly to eliminate zero error.

Digital downhole manometer can be manually adjusted, migrated or set up on the ground or by remote wireless, in order to meet the practical needs of users in the process of use. It can work in the underground for a long time and assist users in laboratory verification (providing verification software and technical support) when necessary.



TK-3051-DPG-1系列井下压力计/变送器

TK-3051-DPG-1 Series downhole pressure gauge/transmitter

参数名称 Parameter	技术指标 Technical indicators	参数名称 Parameter	技术指标 Technical indicators
压力测量范围 Pressure measuring range	0~10MPa	温度测量范围 Temperature measuring range	-4~150℃
压力测量精度 Accuracy of pressure measurement	0.1%FS	温度测量精度 Accuracy of temperature measurement	0.5℃
压力分辨率 Pressure resolution	1KPa	温度分辨率 Temperature resolution	0.1℃
压力刷新周期 Pressure refresh cycle	1S	温度刷新周期 Temperature refresh cycle	1S
适用井深 Apply well depth	0~1200米	工作温度 Working temperature	-20~85℃
配套选型 The selection			
井下附件 Downhole accessories	用户定制 Users to customize		
井口附件 Wellhead accessories	用户定制 Users to customize		
配套电缆 Suitable cable	单芯测井电缆 Single-core logging cable		

应用范围

- 煤层气直井、油气井；
- 深水井、水平井。

主要特点

高性价比，稳定可靠，安装方便。

Main purpose

Straight coalbed methane wells, oil and gas wells.
Deep wells, horizontal wells.

Main features

High cost performance, stable and reliable, easy to install.



TK-3051-DPG-2系列井下压力计/变送器

TK-3051-DPG-2 Series downhole pressure gauge/transmitter

参数名称 Parameter	技术指标 Technical indicators	参数名称 Parameter	技术指标 Technical indicators
压力测量范围 Pressure measuring range	0~6~25MPa	温度测量范围 Temperature measuring range	-40~150℃
压力测量精度 Accuracy of pressure measurement	0.1%FS	温度测量精度 Accuracy of temperature measurement	0.25℃
压力分辨率 Pressure resolution	0.5KPa	温度分辨率 Temperature resolution	0.1℃
压力刷新周期 Pressure refresh cycle	1S	温度刷新周期 Temperature refresh cycle	1S
适用井深 Apply well depth	0~2000米	工作温度 Working temperature	-30~105℃
配套选型 The selection			
井下附件 Downhole accessories	用户定制 Users to customize		
井口附件 Wellhead accessories	用户定制 Users to customize		
配套电缆 Suitable cable	单芯钢制测井电缆 Single-core steel logging cable		

应用范围

- 煤层气直井、定向井；
- 油气井、水平井等重点井。

主要特点

支持电缆通路双备份，可靠性高，抗干扰能力强。

Main purpose

Straight coalbed methane wells, Directional well. Oil and gas wells, horizontal wells etc.

Main features

Support cable channel double backup, high reliability, strong anti-interference ability.



TK-3051-DPG-3系列井下压力计/变送器

TK-3051-DPG-3 Series downhole pressure gauge/transmitter

参数名称 Parameter	技术指标 Technical indicators	参数名称 Parameter	技术指标 Technical indicators
压力测量范围 Pressure measuring range	0~6~60MPa	温度测量范围 Temperature measuring range	-40~150℃
压力测量精度 Accuracy of pressure measurement	0.1%FS	温度测量精度 Accuracy of temperature measurement	0.5℃
压力分辨率 Pressure resolution	1KPa	温度分辨率 Temperature resolution	0.1℃
压力刷新周期 Pressure refresh cycle	1S	温度刷新周期 Temperature refresh cycle	1S
适用井深 Apply well depth	0~5000米	工作温度 Working temperature	-40-150℃ (MAX)
配套选型 The selection			
井下附件 Downhole accessories	用户定制 Users to customize		
井口附件 Wellhead accessories	用户定制 Users to customize		
配套电缆 Suitable cable	单芯钢制测井电缆 Single-core steel logging cable		

应用范围

- 常规油气井、页岩气井；
- 煤层气超深直井、定向井；
- 水平井。

主要特点

可承受高温高压，采用钢制电缆。

Main purpose

Conventional oil and gas Wells, shale gas Wells,
Coal-bed methane ultra-deep vertical Wells, directional Wells,
Horizontal wells.

Main features

High temperature and high pressure, steel cable.



地址(ADD): 安徽省天长市仁和南路20号
NO.20 South Renhe Road, Tianchang City, Anhui Province
邮编(ZIP): 239300
电话(TEL): 86-0550-7777777 7038698 7308802
传真(FAX): 86-0550-7028077 7038699
网址(HTTP): www.tiankang.com
邮箱(E-mail): xsc@tiankang.com