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。小巧而质轻的设计，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0.05%~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。

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0.05%~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；

灌充液：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；

多种灌充液可选，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。

Product Introduction

3051C differential pressure, gauge pressureand absolute pressure transmitter

Excellent performance: accuracy 0.05%~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.
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 pressureand absolute pressure transmitter

Excellent performance: accuracy 0.05%~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

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 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.

该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， 设定变送器的工作参数，包括：储存修正系数的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。

数据存贮

组 态 数 据 存 贮 于 变 送 器 电 子 板 模 块 的 永 久 性 EEPROM存贮器中。变送器掉电后，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贮，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，设定变送器的工作参数，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 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。

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.

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。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。

Test

3051 type can make continuous self-check. When there is problem, the transmitter will activate the analog output alarm selected by the user. 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.

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。

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.

四、选项

Option

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

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.

五、规格

Specification

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

±0.05%,±0.075%,±0.1%量程

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

±0.05%,±0.075%,±0.1% range

总体性能提高

±0.15%量程，在±50OF（28℃）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℃），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。

3051 H型—高温度、高压力

稳定性

±0.2%URL，1年。

Overall performance improvement

±0.1 5 % range, under the condition of temperature change ±50OF (28℃), 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℃) 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℃）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；
里程4-9：100毫秒；
里程3：255毫秒；
里程2：700毫秒。

3051T

里程3-10：100毫秒

Ambient temperature influence (influence of each 50°F(28℃))

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 range1

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

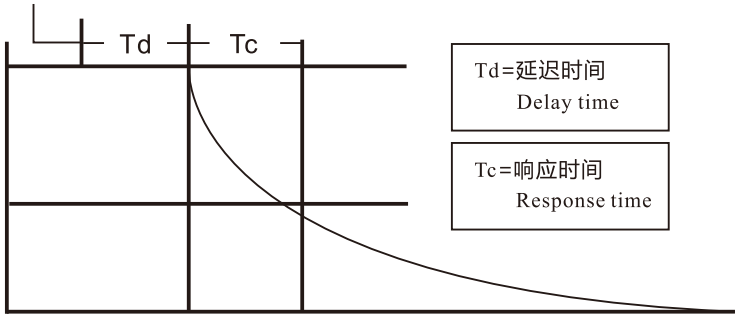


图1.典型的智能变送器的响应时间

Fig 1. Response time of typical intelligent transmitter

安装位置影响

3051T

零点最多漂移±0.31kPa，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15-2000Hz的振动进行测试，振动影响小于±0.1%URL/g。

电源影响

所有型号

小于±0.01%量程/伏。

射频干扰影响

所有型号

小于±0.1%量程，20至1000MHz，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 μs-100KHz）；
3kV峰值（8×20ms）；
6kV峰值（12×50ms）；
SWC2.5kV峰值，1.25MHz波形。

综合性能指标

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

注意：

按ASME Z210.1(ANSI)在68 0F(20℃)下进行校验

Installation position influence

3051T

Maximum zero point drifting ±0.31kPa, 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 15-2000Hz 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 ±0.1%URL/g.

Power supply influence

All the model

Smaller than ±0.01% range/radiation

Frequency interference influence

All the model

Smaller than ±0.1% range, 20 to 1000MHz, filed strength up to 30 voltage/meter

Resistant to transient voltage protection (option code T1)

All the model

6kV peak value (0.5 μs-100KHz)
3kV peak value (8×20ms)
6kV peak value (12×50ms); SWC2.5kV peak value, 1.25MHz waveshape

Comprehensive performance index

Response time: <1 nanosecond.
Surge peak current: 5,000 ampere, to the shell.
Transient peak voltage: 100VDC.
Circuit impedance: <25Ω.

Note:

Check under 680F(20℃) as per ASME Z210.1(ANSI)

量程与传感器的极限值

表1.
3051CD，3051CG，3051L，3051H程与传感器极限值。

Limit Value of Range and Senor

Table 1
Limit value of range and sensor of 3051CD, 3051CG, 3051L and 3051H.

量程 Range	最小量程 Min. Range	量程与传感器极限值 Limit Value of Range and Senor						
	3051CD CG, L,H型（Type）	量程上限 (URL) Upper range limit (URL)	量程下限（URL） Lower range limit(URL)					
			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_2O (100Pa)	150mmH_2O (1500Pa)	-150mmH_2O (-1500Pa)	-150mmH_2O (-1500Pa)	NA	NA	NA	NA
3	12mmH_2O (0.12kPa)	750mmH_2O (7.5kPa)	-750mmH_2O (-7.5kPa)	-750mmH_2O (-7.5kPa)	-750mmH_2O (-7.5kPa)	-750mmH_2O (-7.5kPa)	-750mmH_2O (-7.5kPa)	-750mmH_2O (-7.5kPa)
4	40mmH_2O (0.4kPa)	4mH_2O (40kPa)	-4mH_2O (-40kPa)	-4mH_2O (-40kPa)	-4mH_2O (-40kPa)	-4m H_2O (-40kPa)	-4m H_2O (-40kPa)	-4mH_2O (-40kPa)
5	200mmH_2O (2.0kPa)	20mH_2O (200kPa)	-20mH_2O (-200kPa)	-10mH_2O (-100kPa)	-20mH_2O (-200kPa)	-20mH_2O (-100kPa)	-20mH_2O (-200kPa)	-10mH_2O (-100kPa)
6	700mmH_2O (7.0kPa)	70mH_2O (700kPa)	-70mH_2O (-700kPa)	-10mH_2O (-100kPa)	-70mH_2O (-700KPa)	-70m H_2O (-100kPa)	-70m H_2O (-700kPa)	-10mH_2O (-100kPa)
7	2.1mmH_2O (21kPa)	210mH_2O (2.1MPa)	-210mH_2O (-2.1MPa)	-10mH_2O (-100kPa)	-210mH_2O (-2.1MPa)	-210mH_2O (-100KPa)	-210mH_2O (-2.1MPa)	-10mH_2O (-100kPa)
8	7.0m H_2O (70kPa)	700MH_2O (7MPa)	-700mH_2O (-7MPa)	-10mH_2O (-100kPa)	NA	NA	-700mH_2O (-7MPa)	-10mH_2O (-100kPa)
9	12mH_3O (120kPa)	2100mH_2O (21MPa)	-2100mH_2O (-21MPa)	-10mH_2O (-100kPa)	NA	NA	-2100mH_2O (-21MPa)	-10mH_2O (-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 Senor		
		量程上限 Upper range limit	量程下限绝压 Lower range limit Absolute pressure	量程下限表压 Lower range limit Gauge pressure
3	12mmH_2O (0.12kPa)	750mmH_2O (7.5kPa)	0mmH_2O (0kPa)	−750mmH_2O (-7.5kPa)
4	40mmH_2O (0.4kPa)	4mH_3O (40kPa)	0mmH_2O (0kPa)	−4mH_2O (-40kPa)
5	200mmH_2O (2.00kPa)	20mH_2O (200kPa)	0mmH_2O (0kPa)	−10mH_2O (-100kPa)
6	700mmH_2O (7kPa)	70mH_2O (700kPa)	0mmH_2O (0kPa)	−10mH_2O (-100kPa)
7	2.1mH_2O (21kPa)	210mH_2O (2.1MPa)	0mmH_2O (0kPa)	−10mH_2O (-100kPa)
8	10mH_2O (100kPa)	1000mH_2O (10MPa)	0mmH_2O (0kPa)	−10mH_2O (-100kPa)
9	40mH_2O (400kPa)	4000mH_2O (40MPa)	0mmH_2O (0kPa)	−10mH_2O (-100kPa)
10	120mH_2O (1.2MPa)	12kmH_2O (120MPa)	0mmH_2O (0kPa)	−10mH_2O (-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.

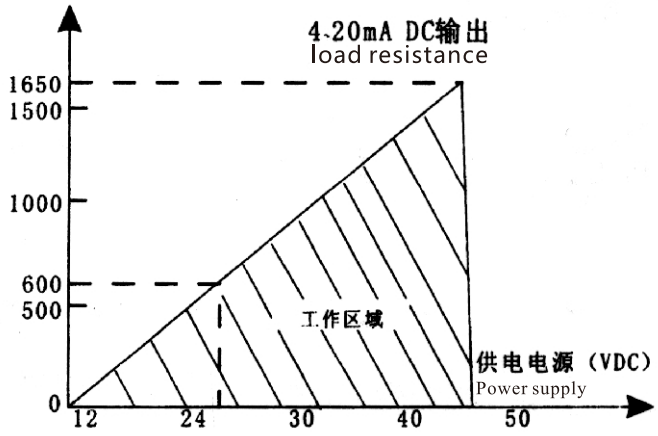
Output

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)

负载特性
Load characteristics



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 vale of stainless steel
ANSI/ASME	Class150	285psig	275psig
ANSI/ASME	Class300	740psig	720psig
ANSI/ASME	Class600	1480psig	1440psig
100°F(38℃)下，额定值随温度升高而降低。 Under 100°F(38℃), 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℃)下，额定值随温度升高而降低。 Under 100°F(38℃), the rated value decreases with the increase of temperature.			

静压极限

仅限3051CD型

在345kPa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℃，带一体化表头：-20至80℃。

贮存

-46至110℃，带一体化表头：-40至85℃。

过程

大于等于大气压下，见表4。

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℃
With integrated meter: -20 to 80℃

Storage

-46 to 110℃
With integrated meter: -40 to 85℃

Process

Larger than or equal to the barometric pressure, see Table 4.

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 Sylltherm硅油704(5)　Sylltherm 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572°F（15至300℃） -40至400°F（-40至205℃） -50至350°F（-45至177℃）

（1）过程温度超过1850F（85℃），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℃），压力低于3.4kPa时极限为1300F（54℃）。

（3）真空环境下极限为1600F（71℃）。

（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。

(1) Process temperature exceeds 1850F(85℃), 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℃), the limit is 1300F(54℃) when the pressure is lower than 3.4kPa.
(3) The limit under vacuum environment is 1600F(71℃).
(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

容积变化量

小于0.005in3（0.08cm³）。

Volume variation

Smaller than 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。

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.

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。

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压盖螺纹；1/4OD高压60°锥型管；仅限不锈钢，量程7变送器）。

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 3-7transmitter), 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)

过程接液件
过程隔离膜片

Process liquid connection part
Process isolation diaphragm

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。

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.

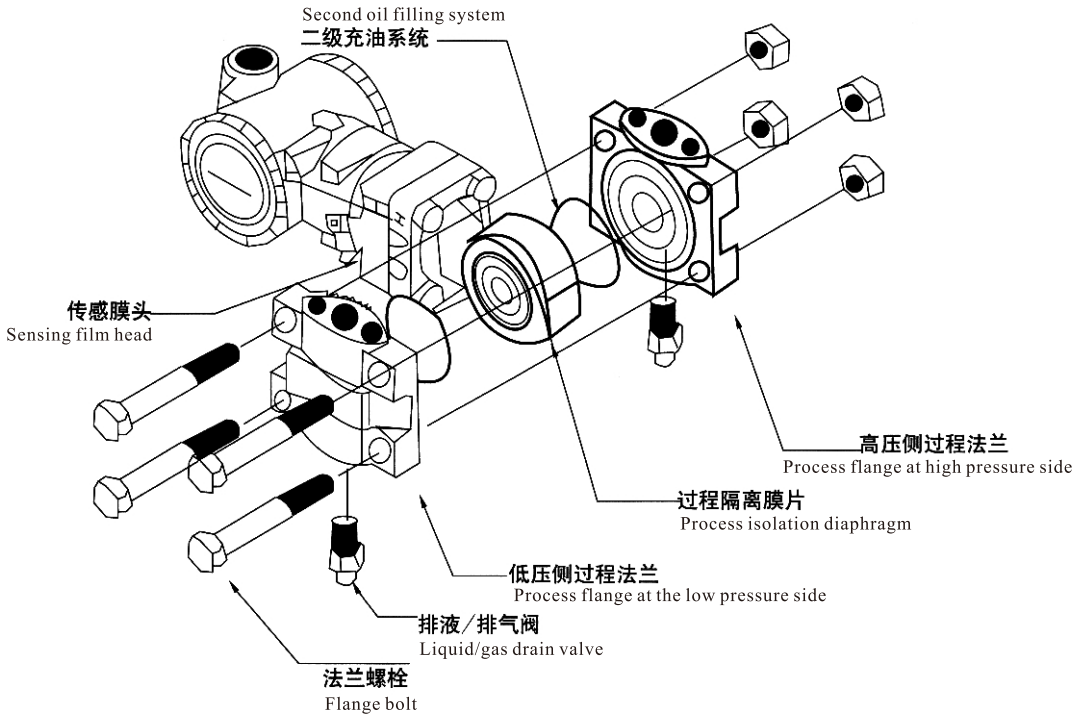
Electronic external shell

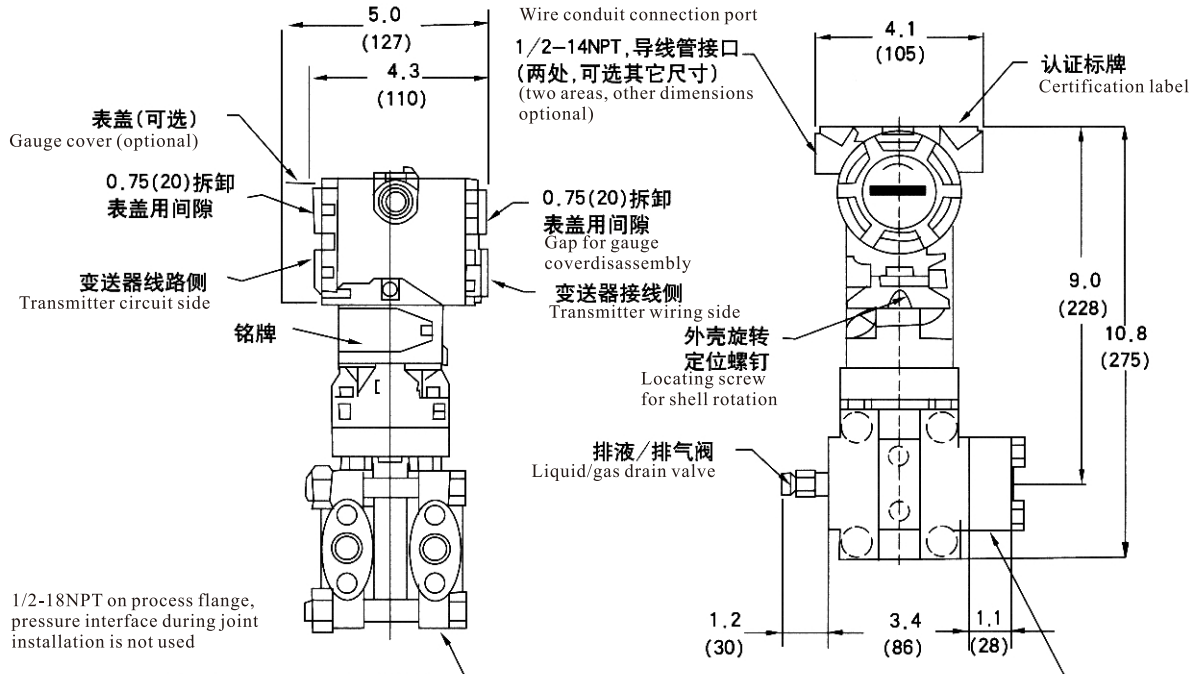
PU

Meter cover O-ring

Nitrile-butadiene rubber.

3051C型压力变送器部件分解图与尺寸图
Exploded View and Dimensions of 3015 Type Pressure Transmitter

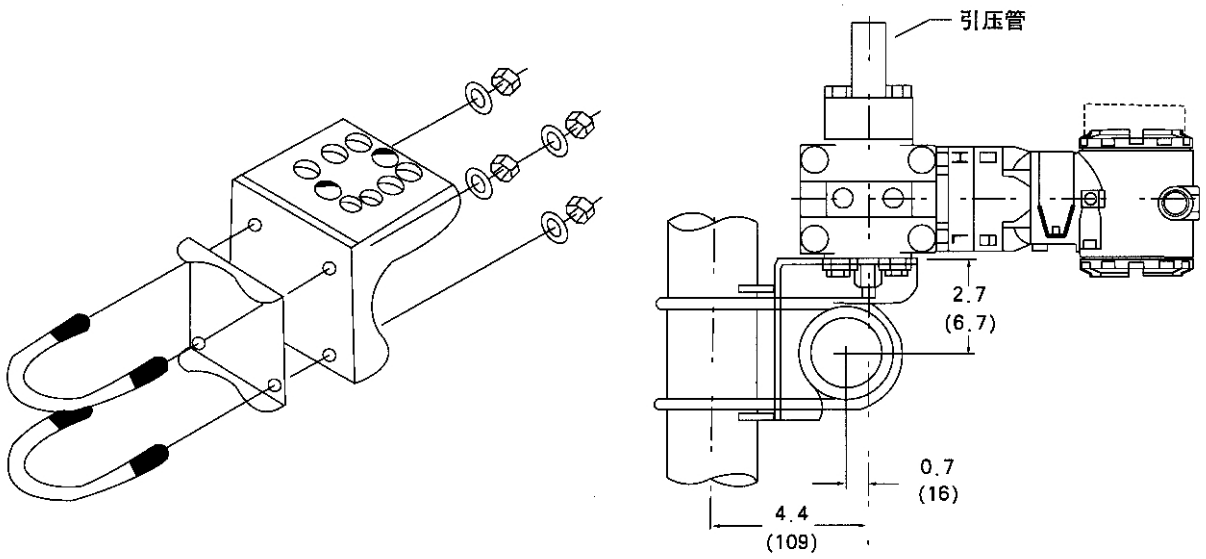




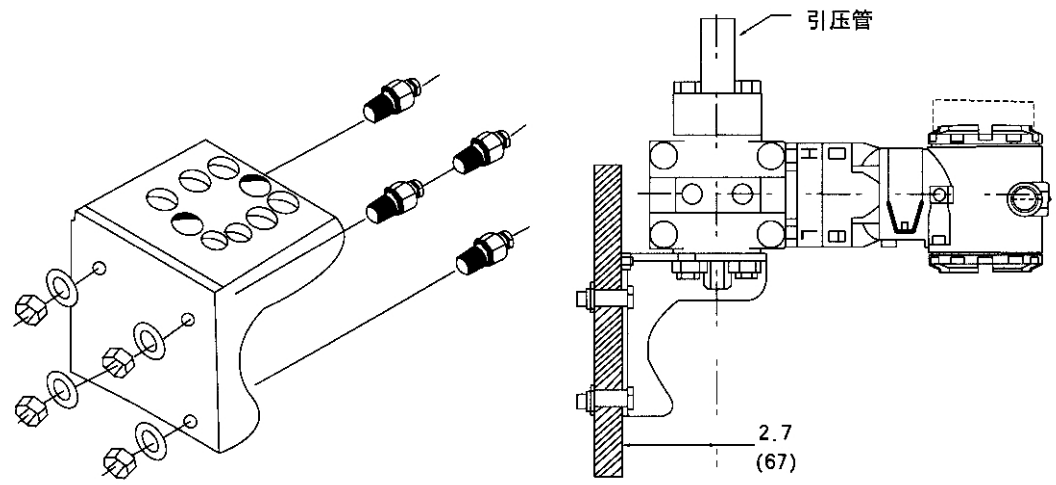
注意:
尺寸单位为英寸(毫米)
Note: the dimension unit is inch (mm).

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

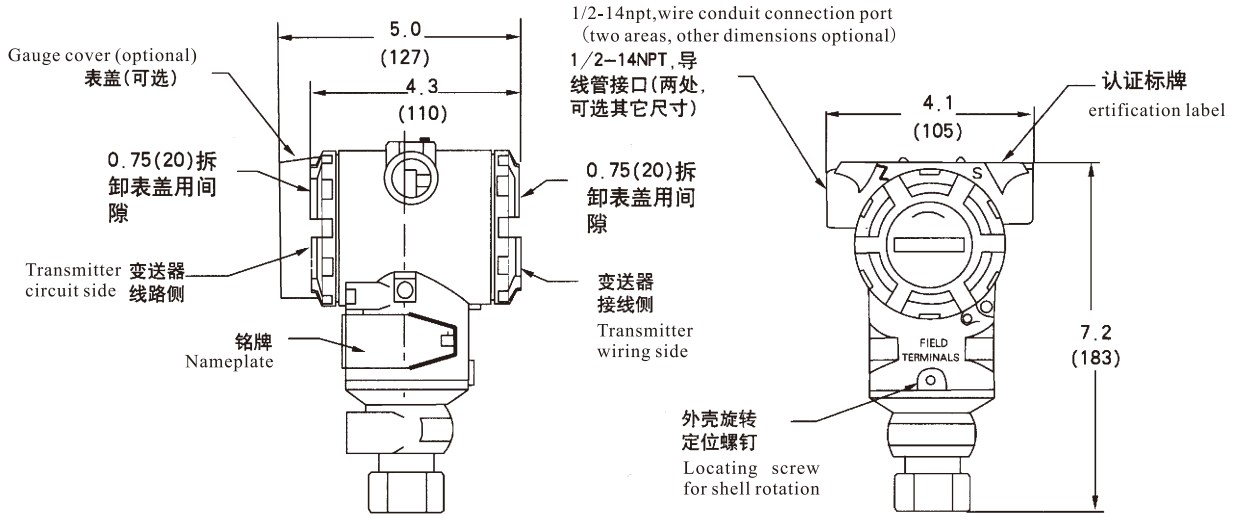


面板安装结构图提供（7/16）-20×（3/4）螺栓用于支架与变送器相连
Diagram of Panel installation structure(7/16)-20×（3/4）bolt is provided for connection

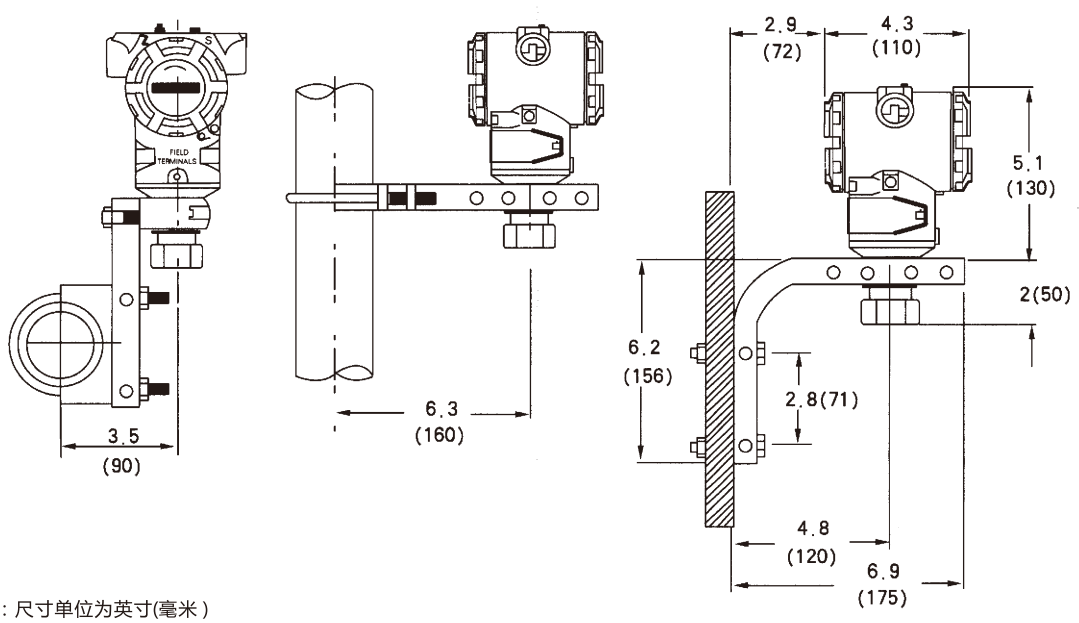


注意：尺寸单位为英寸(毫米)
Note: The dimension unit is inch (mm).

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



注意：尺寸单位为英寸(毫米)
Note: The dimension unit is inch (mm).

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

TK3051A/B型差压、表压与绝压变送器选型（A型为高精度）
TK3051A/B type differential pressure,meter pressure and absolute pressure transmitter selection

型号 Model	变送器类型（选其一） 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_2O/10mmH_2O (-1500至1500Pa/100Pa)	不提供 Not	不提供 Not	●	●	●
3	-750至750mmH_2O/12mmH_2O (-7500至7500Pa/120Pa)	-750至750mmH_2O/12mmH_2O (-7500至7500Pa/120Pa)	-750至750mmH_2O/12mmH_2O (-7500至7500Pa/120Pa)	●	●	●
4	-4.0至4.0mH_2O/40mmH_2O (-40至40kPa/400Pa)	-4.0至4.0mH_2O/40mmH_2O (-40至40kPa/400Pa)	-4.0至4.0mH_2O/40mmH_2O (-40至40kPa/400Pa)	●	●	●
5	-20至20mH_2O/0.2mH_2O (-200至200kPa/2.0kPa)	-10至20mH_2O/0.2mH_2O (-100至200kPa/2.0kPa)	-10至20mH_2O/0.2mH_2O (-100至200kPa/2.0kPa)	●	●	●
6	-70至70mH_2O/0.7mH_2O (-700至700kPa/7.0kPa)	-10至70mH_2O/0.7mH_2O (-100至700kPa/7.0kPa)	-10至70mH_2O/0.7mH_2O (-100至700kPa/7.0kPa)	●	●	●
7	-210至210mH_2O/2.1mH_2O (-2.1至2.1MPa/21kPa)	-10至210mH_2O/2.1mH_2O (-0.1至2.1MPa/21kPa)	-10至210mH_2O/2.1mH_2O (-0.1至2.1MPa/21kPa)	●	●	●
8	-700至700mH_2O/7.0mH_2O (-7.0至7.0MPa/70kPa)	-10至700mH_2O/7.0mH_2O (-0.1至7.0MPa/70KPa)	-10至700mH_2O/7.0mH_2O (-0.1至7.0MPa/70kPa)	●	●	●
9	-2100至2100mH_2O/21mH_2O (-21至21MPa/210kPa)	-10至2100mH_2O/21mH_2O (-0.1至21MPa/210kPa)	-10至2100mH_2O/21mH_2O (-0.1至21MPa/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			●	●	●
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			
5	电镀碳钢 Electroplated carbon steel	不锈钢 Stainless	电镀碳钢 Electroplated carbon steel	●	●	●
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	●	●	●
8	电镀碳钢 Electroplated carbon steel	哈氏合金C HastelloyC	电镀碳钢 Electroplated carbon steel	●	●	●
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	镀金 Gold-plating			●	●	●
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，覆聚氨酯涂层 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(可远) 注：标准法兰和接头螺栓是316不锈钢** **Emote 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	**可选全焊接远传（用于高真空场合）注：标准法兰和接头螺检是不锈钢** **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iaⅡCT4/CT6 Intrinsic safety ia Ⅱ CT4/CT6	●	●	●
K5	隔爆dⅡCT4/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750mmH2O/12mmH2O（-7500至7500Pa/4kPa）
4	-4至4.0mmH2O/40mmH2O（-40至40kPa/6kPa）
5	-20至20mmH2O/40mmH2O（-200至200kPa/20kPa）
6	-70至70mmH2O/40mmH2O（-700至700kPa/70kPa）
7	-210至210mmH2O/2.1mmH2O（-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	PROF1BUS-PA总线 Flange installed liquid level transmitter

代码 Code	高压侧 High pressure side 隔膜片尺寸 Diaphragm	材料 Material	伸出长度 Protruding length
G0	2英寸/DN50	316L不锈钢	只有平膜片式
H0	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 尺寸 Dimensions	高压侧 High pressure side 隔膜片尺寸 Diaphragm	材料 Material	伸出长度 Protruding length
M	2英寸	150级	碳钢	2英寸DN50
A	3英寸	150级	碳钢	3英寸DN80
B	4英寸	150级	碳钢	4英寸DN100
N	2英寸	300级	碳钢	2英寸DN50
C	3英寸	300级	碳钢	3英寸DN80
D	4英寸	300级	碳钢	4英寸DN100
P	2英寸	600级	碳钢	2英寸DN50
E	3英寸	600级	碳钢	3英寸DN80
X	2英寸	150级	不锈钢	2英寸DN50
F	3英寸	150级	不锈钢	3英寸DN80
G	4英寸	150级	不锈钢	4英寸DN100
Y	2英寸	300级	不锈钢	2英寸DN50
H	3英寸	300级	不锈钢	3英寸DN80
J	4英寸	300级	不锈钢	4英寸DN100
Z	2英寸	600级	不锈钢	2英寸DN50
L	3英寸	600级	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	过程充液体-高压侧 Process Liquid Filling – High Pressure Side	
A	Syltherm XLT	-100至300℉（-73至135℃）
C	Syltherm硅油704 Syltherm silicon oil 704	60至572℉（15至300℃）
D	D.C.硅油200 D.C. Silicon oil 200	-40至400℉（-40至205℃）

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	传感器接充液 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 Tantalun	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 Florine 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，覆聚氨酯涂层 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	材料可跟踪性证书	Material tracebility certificate
C1	定制软件组态	Customized software configuration
CN	外部接地螺钉组件	External grounding bolt assembly
V5	下套冲洗连接选项	Lower sleeve fiushing 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ia Ⅱ CT4/CT6 Intrinsic safety ia Ⅱ CT4/CT6
K5	隔爆d Ⅱ CT4/CT6 Explosion suppression d Ⅱ CT4/CT6

高温高压力变送器
High temperature and high pressure transmitter

型号 Model	变送器类型（选其一） 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_2O/12mmH_2O （-7500至7500Pa/120Pa）		-750至750mmH_2O/12mmH_2O （-7500至7500Pa/120Pa）	●	●
4	-4. 0至4. 0mH_2O/40mmH_2O （-40至40kPa/0. 4kPa）		-4. 0至4. 0mH_2O/40mmH_2O （-40至40kPa/0. 4kPa）	●	●
5	-20至20mH_2O/0. 2mH_2O （-200至200kPa/2. 0kPa）		-20至20mH_2O/0. 2mH_2O （-100至200kPa/2. 0kPa）	●	●
6	-70至70mH_2O/0. 7mH_2O （-700至700kPa/7. 0kPa）		-10至70mH_2O/0. 7mH_2O （-100至700kPa/7. 0kPa）	●	●
7	-210至210mH_2O/2. 1mH_2O （-2. 1至2. 1MPa/21kPa）		-10至210mH_2O/2. 1mH_2O （-0.1至2. 1MPa/21kPa）	●	●
8	-700至700mH_2O/7. 0mH_2O （-7. 0至7. 0MPa/70kPa）		-10至700mH_2O/7. 0mH_2O （-0.1至7. 0MPa/70kPa）	●	●
9	-2100至2100mH_2O/21mH_2O （-21至21MPa/210kPa）		-10至2100mH_2O/21mH_2O （-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 Florine 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	HD	HG
B	铝，覆聚氨酯涂层 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，配不锈钢支架 B2 support, with stainless steel bolt				
B9	B3支架，配不锈钢支架 B3 support, with stainless steel bolt				
BA	不锈钢B1支架，配不锈钢螺栓 Stainless B1 frame, with stanless steel bolt				
BC	不锈钢B3支架，配不锈钢螺栓 Stainless B3 frame, with stanless steel bolt				

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iaⅡCT4/CT6 Intrinsic safety ia Ⅱ CT4/CT6
K5	隔爆dⅡCT4/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_2O/12mmH_2O（−7500至7500Pa/120Pa）	0至750mmH_2O/12mmH_2O（0至7500Pa/120Pa）
4	−4.0至4.0mH_2O/40mmH_2O（−40至40kPa/0.4kPa）	0至4.0mH_2O/40mmH_2O（0至40Pa/0.4kPa）
5	−10至20mH_2O/0.2mH_2O（−100至200kPa/2.0kPa）	0至20mH_2O/0.2mH_2O（0至200kPa/2.0kPa）
6	−10至70mH_2O/0.7mH_2O（−100至700kPa/7.0kPa）	0至70mH_2O/0.7mH_2O（0至700kPa/7.0kPa）
7	−10至210mH_2O/2.1mH_2O（−0.1至2.1MPa/21kPa）	0至210mH_2O/2.1mH_2O（0至2.1MPa/21kPa）
8	−10至1000mH_2O/10mH_2O（−0.1至10MPa/100kPa）	0至1000mH_2O/10mH_2O（0至10MPa/100kPa）
9	−10至4000mH_2O/40mH_2O（−0.1至40MPa/400kPa）	0至4000mH_2O/40mH_2O（0至40MPa/400kPa）
10	−10至12000mH_2O/120mH_2O（−0.1至120MPa/1200kPa）	0至12000mH_2O/120mH_2O（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	BROFIBUS-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型压力反应罐（包括压盖与箍，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	**过程连接接夜件材料 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iaⅡCT4/CT6 Intrinsic safety iaⅡCT4/CT6	
K5	隔爆dⅡCT4/CT6 Explosion suppression dⅡCT4/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 tread)
12	3/8"NPT（锥管螺纹）（Conical pipe tread)
13	1/2"NPT（锥管螺纹）（Conical pipe tread)
15	1"NPT（锥管螺纹）（Conical pipe tread)
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 11 A 11 A 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 11 A 11 A 17	