

现场通讯器用户手册

COMMUNICATOR User' s Manual



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第一章 简介

感谢您使用 HART475D 现场通讯器，本通讯器适合 HART 协议智能变送器的通讯操作，与 HART275、HART375、兼容，具有极好的兼容性，可通讯 1151，3051，EJA,ABB，科式及流量等方面的 HART 协议的进口仪表。完全兼容国产的各种智能变送器。

该手册介绍了现场通讯器基本的使用、连接和操作方面的内容以及故障的排除和在使用过程中应该注意的事项。

在使用 HART 现场通讯器之前，请阅读该该操作手册，为了更好发挥该产品的最佳性能，在使用或维修本产品之前，请深入掌握相应的内容。

如若设备需要维修，请联系我们公司。我们将竭尽所能为您服务。

该设备配备：	手操器	一台
	电池（手操器内）	一块
	包	一个
	充电器	一部
	通讯线缆	一条
	操作手册	一本

第二章 基本使用

2.1 现场通讯器的基本性能和功能



现场通讯器示图

2.2 开机注意事项

在开机前，请确保以下几点：

- 该现场通讯器没有物理机械损坏
- 电池已充满电。
- 将现场通讯器连接到仪表（如图 2-2）

连接图：



通讯接线图。

启动现场通讯器

在启动前请保证该设备已充好电。启动时按住电源开关键，直到液晶屏亮，开机成功。

关闭

如若要关闭现场通讯器，可按住开关键直至其显示关闭，关闭输出电源开关，关机完成。

充电

充电时使用通讯器配备的专用充电器，将充电插头插入通讯器充电口，充电器指示灯由绿色变为红色，开始充电，电池从没电到充满大约需要八小时，当电充满后，指示灯会变为绿色。

2.3 键区的使用和说明

开关键



该键用于启动或关闭现场通讯器。

箭头导航键

四个导航箭头键提供菜单的选择功能。

按  右箭头的导航键，可以进入某一菜单的具体选项。按  左导航键返回上级菜单，  上下导航键可以在菜单中上下切换。在字符数字输入模式， 下导航键可以作为退格键使用。

回车键



在进入菜单后，对于可以修改的内容，液晶的最下面一行会自动显示“修改”字样若需修改则按下回车键，即修改成功。

字符数字键盘

字符数字键盘可以输入字符、数字以及其他符号，他有数字和

字符两种输入模式，现场通讯器可根据需要选择相应的输入模式。若要输入数字，直接按下数字所在的键，若要输入字符，可根据字

符在键盘上的位置，先按下



中的一个键，再按下字符所在的键。例如要输入字符“A”，先



按下



再按下字符数字 1 键盘。

PV 键



监测实时变量的快捷键，观察实时压力、电流、百分比、温度、频率等实时变量。在字符数字输入模式下，该键无效。

第三章 在线操作菜单

3.1 检测菜单

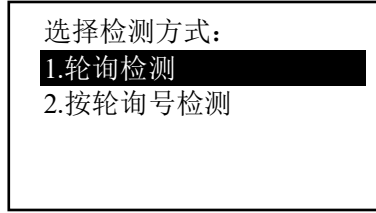






图 3-1

3.1.1 轮询检测

选择该菜单，现场通讯器将从轮询号 0 到轮询号 15 依次检测设备，若检测到设备，将自动显示检测到变送器及工位号（如图

3-1-1），按  右导航键进入设备类型选择菜单（图 3-1-2）；若没有检测到设备，将出现没有检测到变送器的警告。

3.1.2 按轮询号检测

对指定轮询号的设备进行检测，按 上下导航键可以在 0~15 之间选择轮询号，然后按右导航键开始检测（检测结果同于 3-1-1）。

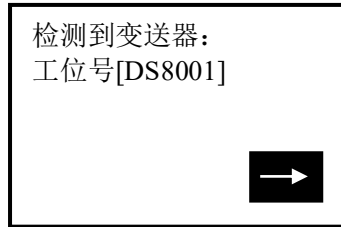


图 3-1-1

3.1.3 选择设备类型

1. 压力变送器
2. 电磁流量计
3. 涡街流量计
4. 靶式流量计/浮筒液位计
5. 金转流量计
6. 科式质量流量计
7. 通用菜单
8. 语言设置

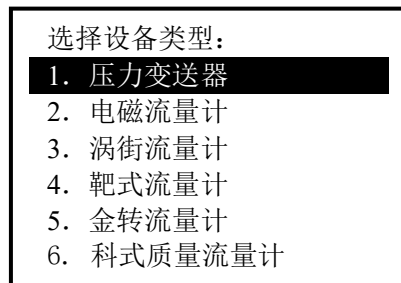



图 3-1-2

对设备类型进行选择时，必须根据现场设备类型进行选择进入具体的菜单，如果选择类型与实际类型不符，会造成错误。

如果现场设备非压变、电磁、涡街、靶式、金转、科式设备则进入通用菜单进行连接。按   上下导航键选择好设备类型，再按  右导航键进入所选设备类型检测，并进入相应的菜单，如果选择类型与检测不符合会进行提示。

3.2 压力变送器主菜单

子菜单

1. 过程变量
2. 组态与测试
3. 特征化
4. 校准
5. 显示模式选择
6. 通用格式化

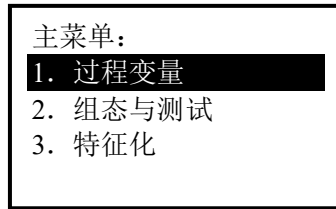

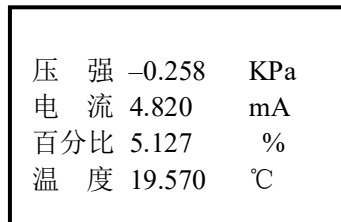


图 3-2-1

3.2.1 过程变量

实时显示变送器的压力，百分比，电流，温度等参数。按  左导航键 3 秒后弹起方可退出实时变量监测模式。



压 强	-0.258	KPa
电 流	4.820	mA
百分比	5.127	%
温 度	19.570	°C

图 3-2-2

3.2.2 组态与测试

子菜单:

1. 设备测试
2. 回路测试
3. 用户量程
4. 基本设置

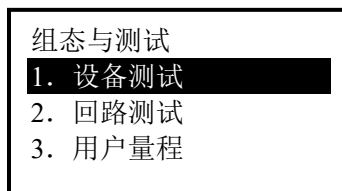


图 3-2-3

3.2.2.1 设备测试

检测设备状态，若一切正常，液晶显示“设备正常”，若有错误，将出现警告提示。

3.2.2.2 回路测试

检测 D/A 的电流输出。先在回路里串连一个电流表，再键入一个 4—20mA 之间的电流值，送入变送器，变送器会自动输出键入的电流值，若键入的值与电流表的显示值不相等，需做电流微调。

3.2.2.3 基本设置

子菜单:

1. 单位
2. 写保护
3. 阻尼
4. 输出方式
5. 设备信息
6. 材料信息

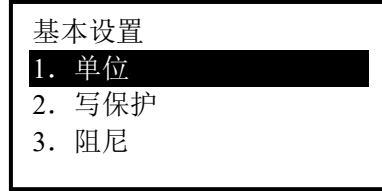


图 3-2-4

单位

修改主变量的单位，以及显示的单位。提供 MPa, Kpa, Pa, InH₂O, InHg, psi, g/cm², kg/cm², FtH₂O, torr, ATM, mmH₂O, mmHg, Bar, mBar 这 15 种单位。当测量单位代号无法识别时会自动显示 “No” 即表示单位 “unknow”。修改方法见菜单树。

写保护

读写设备的保护状态，当为写保护时，变送器内部数据不可改。

阻尼

读写设备的阻尼系数（保留三位小数点）。单位为秒。

输出方式

读写设备的输出方式。分为线性、开方以及未知。默认为线性。

设备信息

读写工位号，日期，描述符，信息，最终装配号。

轮询号

3.2.2.4 用户量程

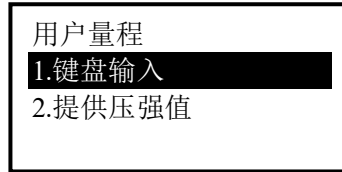





图 3-2-5

键盘输入

选择此菜单后，首先提示传感器的量程范围，然后进入量程设定菜单，按   上下导航键选择零点或量程，然后输入用户需要设定的数值（保留三位小数），再按  右导航键送入变送器。

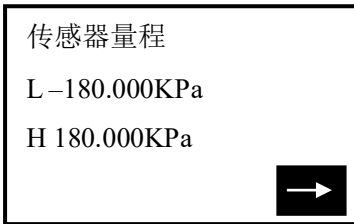


图 3-2-6

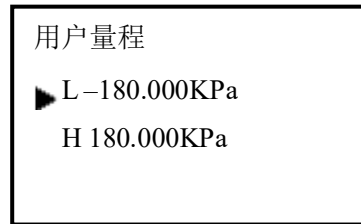





图 3-2-7

提供压力值

用变送器当前所受压力值设定零点和量程，按   上下导航键选择，按  右导航键确定。

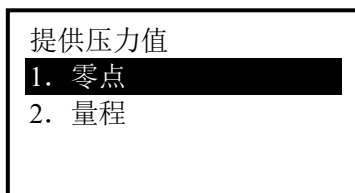


图 3-2-8

3.2.3 特征化

子菜单：

1. 传感器微调
2. 传感器量程
3. 用户量程
4. K 系数
5. 温度补偿
6. 小信号切除
7. 设备地址
8. 数据备份
9. 数据恢复

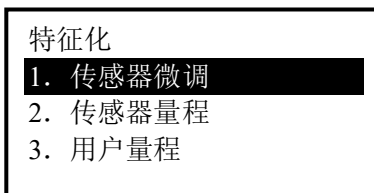


图 3-2-9

该菜单下的操作会严重影响变送器的正常工作和精度，因此在进入此菜单时，需要输入验证密码(如图 3-2-10)。

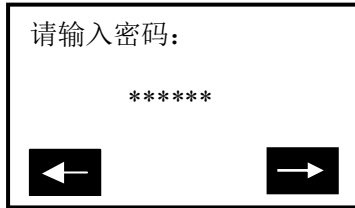


图 3-2-10

默认密码为：666666

3.2.3.1 传感器微调

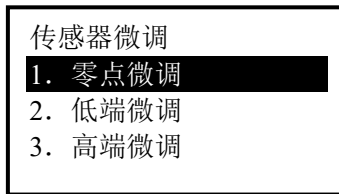


图 3-2-11

零点微调

给变送器加 0 压力后选择此操作，变送器自动调节零点。

低端微调

给变送器加低端压力（单位 KPa），键入所加的压力值（保留三位小数），变送器自动校正，使输出为所加的压力值。

高端微调

给变送器加高端压力（单位 KPa），键入所加的压力值（保留三位小数），变送器自动校正，使输出为所加的压力值。

3.2.3.2 传感器量程

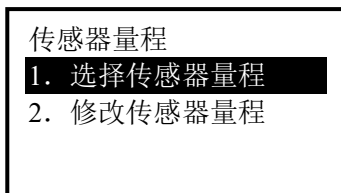


图 3-2-12

选择量程

先选择传感器的类型，然后选择传感器的量程代码,再按下回车键送入变送器。（如图 3-2-13、3-2-14）

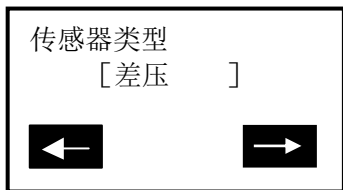


图 3-2-13



图 3-2-14

修改量程

先选择传感器的量程代码，然后输入该量程代码的量程范围。

注意：输入的压力单位为 Pa,只能输入正整数。改后再选择传感器量程。

3.2.3.3 用户量程

键盘输入

选择此菜单后，首先提示传感器的量程范围，然后进入量程设定菜单，按 \blacktriangle \blacktriangledown 上下导航键选择零点或量程，然后输入用户需要设定的数值（保留三位小数），输入好后 \blacktriangleright 按右导航键送入变送器。



图 3-2-15

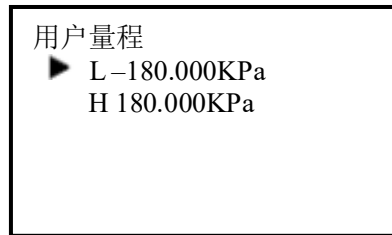


图 3-2-16

提供压力值

用变送器当前所受压力值设定零点和量程，按 \blacktriangle \blacktriangledown 上下导航键选择，按 \blacktriangleright 右导航键确定。

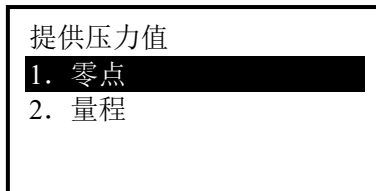


图 3-2-17

3.2.3.4 K 系数

必须先做低端，再做高端。

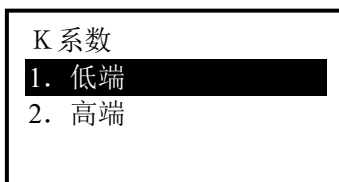




图 3-2-18

低端

给变送器加 0 压力，键入所加的压力值 0，按  右导航键送入变送器，变送器自动调节 k 系数低端。

高端


给变送器正端加一个压力(接近或等于物理量程)，所加压力必须大于 0 压力，键入所加的压力值（保留三位小数，单位 KPa），按  右导航键送入变送器，变送器自动调节 k 系数高端。

注意：K 系数必须在正压力情况下操作，且输入的单位为 KPa。

3.2.3.5 格式化

全量程格式化

注意：该操作会严重影响变送器的精度，建议用户最好不要自己做格式化。

操作方法：先给变送器加压力（各点压力必须从负压力最大到正压力最大），然后输入所加的压力值（图 3-2-16，**注意：**在负压力端做格式化时，输入的压力值前面要加负号。），再按  右导

航键执行格式化，成功后返回到下一个点的格式化，不成功返回警告提示。

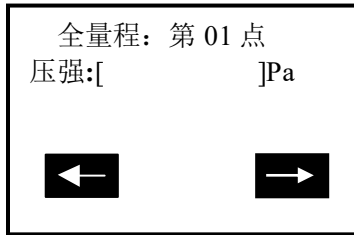


图 3-2-19


插补

校正格式化后超差的点。

注意：该操作会严重影响变送器的精度，建议用户最好不要自己做格式化。

操作方法：先给变送器加压力，然后输入所加的压力值。

（注意：在负压力端做格式化时，输入的压力值前面要加负号）。

按  右导键后，插补完成，此时该点测得的压力应基本等于所加压力。

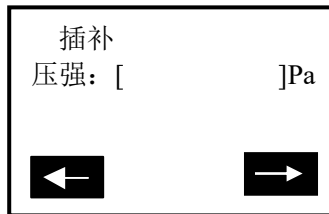


图 3-2-20

3.2.3.6 小信号切除

该功能是为了消除零点漂移。输入的数为用户量程的万分之一。

3.2.3.7 设备地址

查看设备的地址。设备地址是该智能板的唯一识别号。

3.2.3.8 数据备份

数据备份：将当前用户量程值和格式化的数据全部备份到 FLASH 数据库中，此功能是以便于误操作后数据恢复。单击菜单中“数据备份”即可

3.2.3.9 数据恢复

数据恢复：在仪表出厂前，厂商已经对仪表进行了格式化操作，并将格式化后的正确数据做了备份，当用户误操作使仪表不能工作时，可以使用“数据恢复”功能将其误操作内容清除，并且重新将厂商初始化的备份数据重新写入仪表，便于仪表恢复原数据。单击菜单中“数据恢复”即可。

3.2.4 校准

子菜单

- 1.传感器微调
- 2.输出微调

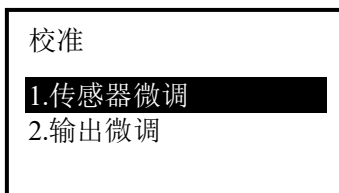


图 3-2-21

3.2.4.1 传感器微调

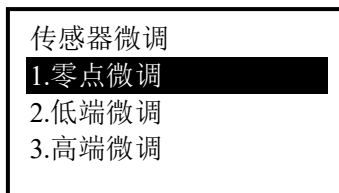


图 3-2-22

零点微调

给变送器加 0 压力后选择此操作，变送器自动调节零点。

低端微调

给变送器加低端压力（单位 KPa），键入所加的压力值（保留三位小数），变送器自动校正，使输出为所加的压力值。

高端微调

给变送器加高端压力（单位 KPa），键入所加的压力值（保留三位小数），变送器自动校正，使输出为所加的压力值。

3.2.4.2 输出微调

输出微调需要将一个高精度电流表串联到回路，在进入微调时，液晶会提示接入电流表，在退出电流微调时，液晶会提示恢复回路。

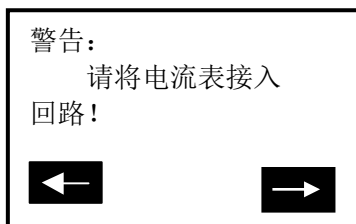



图 3-2-23

4mA 电流微调

选择 4mA 电流微调，此时输出应该为 4.000mA，若电流表显示的数值不等于 4.000mA，选择“否”，出现输入框，在输入框里键入电流表显示的数值（保留三位小数），然后按  右导航键把输入的电流值送入变送器，变送器会自动校正电流输出，使输出为 4.000mA，若一次达不到理想效果，可重复此操作。

（注意：电流表精度应该高于表的输出精度）

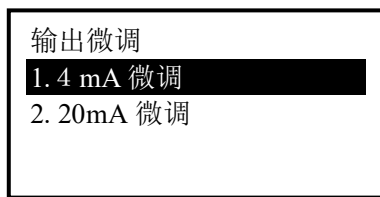


图 3-2-4

20mA 电流微调

操作方法与 4mA 电流微调相同。

3.2.5 显示模式

1. %

选择此模式，变送器显示百分比。

2. USER SET

选择此模式，变送器显示用户设置。

3. USER SET&%

选择此模式，变送器显示用户设置和百分比每隔 4S 交替显示。

4. INPUT PRESS

选择此模式，变送器只显示输入压力。

5. INPUT PRESS&%

选择此模式，变送器显示输入压力和百分比每隔 4S 交替显示。

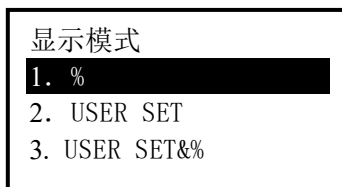


图 3-2-25

3.2.6 通用格式化

通用格式化：（即通常所说的三点，五点格式化）

- (1) 选择仪表类型和量程代码，确定仪表的物理量程。
- (2) 在通用格式化里进入格式化，原装板 1151 电流会为 22mA,次序为物理量程的 0%，60%，100%三点格式化，或 0%，60%，100%，-60%，-100%五点格式化。根据通讯器第一行显示的物理量程的百分数计算压力，输入其压力并填写压力值（单位为 Pa），待压力稳定后按右键头发送。
- (3) 操作成功后，显示下一点的百分数，继续操作或退出。
操作失败（如加的压力与显示百分比对应的压力相差太大会返回此点重做。三点格式化在做完 100%点后按退出完成，五点格式化在做完-100%自动退出。退出后电流由 22mA 变为测量值的电流。

3.3 电磁流量计主菜单

见附图

3.4 涡街流量计

见附图

3.5 靶式流量计/浮筒液位计

见附图

3.6 金转流量计

见附图

3.7 科式质量流量计

见附图

3.8 通用菜单

见附图

3.9 语言设置

设置语言提示设置成功后：**重启设备或退出到最顶层菜单**

备注：

本手操器所包含涡街流量计、靶式流量计、金转流量计、科式质量流量计、通用菜单和电磁流量计菜单操作相似，在此不一一说明，具体菜单分布请参考附页菜单树进行操作。

第四章 故障排除

4.1 故障介绍和排除方法

开不开机

在使用过程中如果出现开不了机，即无法启动现场通讯器，首先检查电池。如若电池有电还是启动不了，则有可能是现场通讯器的开关键已损坏。（注意：在使用过程中请不要用坚硬的东西去触碰现场通讯器的按键贴膜，以免造成损坏。）

通讯不上或通讯中断

- a. 若出现通讯不上，首先检查 HART 回路中现场设备的电流和电压。几乎所有的现场设备都至少需要 4mA 和 12VDC 以维持正常运行。
- b. 检查回路中的阻抗，看回路中是否接入了 250 欧姆的外部阻抗。接入 250 欧姆电阻，将引线接入 250 欧姆电阻的两端。再查看通讯是否正常。
- c. 检查接线端子和 HART 通讯线缆是否损坏。
- d. HART 通讯受到控制系统的干扰。此时停止控制系统中的 HART 通讯，确认现场设备和通讯器之间的通讯。

4.2 提示界面

电池欠压警告

当电池电压不足时，在液晶显示的右上方会有一个电池形状的模式闪烁。

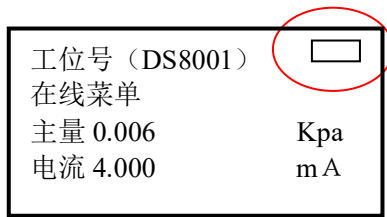


图 4-2-1

通信故障警告

当现场通讯器与变送器之间的通信出现故障时出现警告（图 4-2-2）。

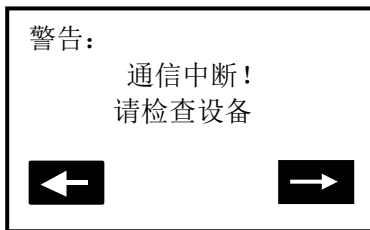


图 4-2-2

日期输入错误

允许输入的日期范围为 1900 年 1 月 1 日到 2155 年 12 月 31 日,当输入的日期不在这个范围时,会出现输入错误提示(图 4-2-3),注意日期的输入格式为 xxxx 年 xx 月 xx 日。

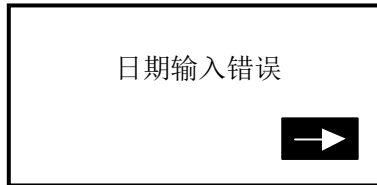


图 4-2-3

数据输入错误

当输入的参数不正确时,会出现该提示,比如小信号切除只能输入正整数,若输入一个负数,会出现错误提示(图 4-2-4)。

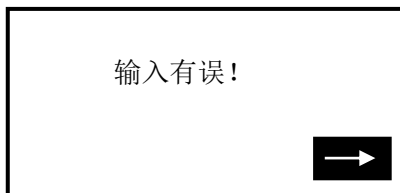


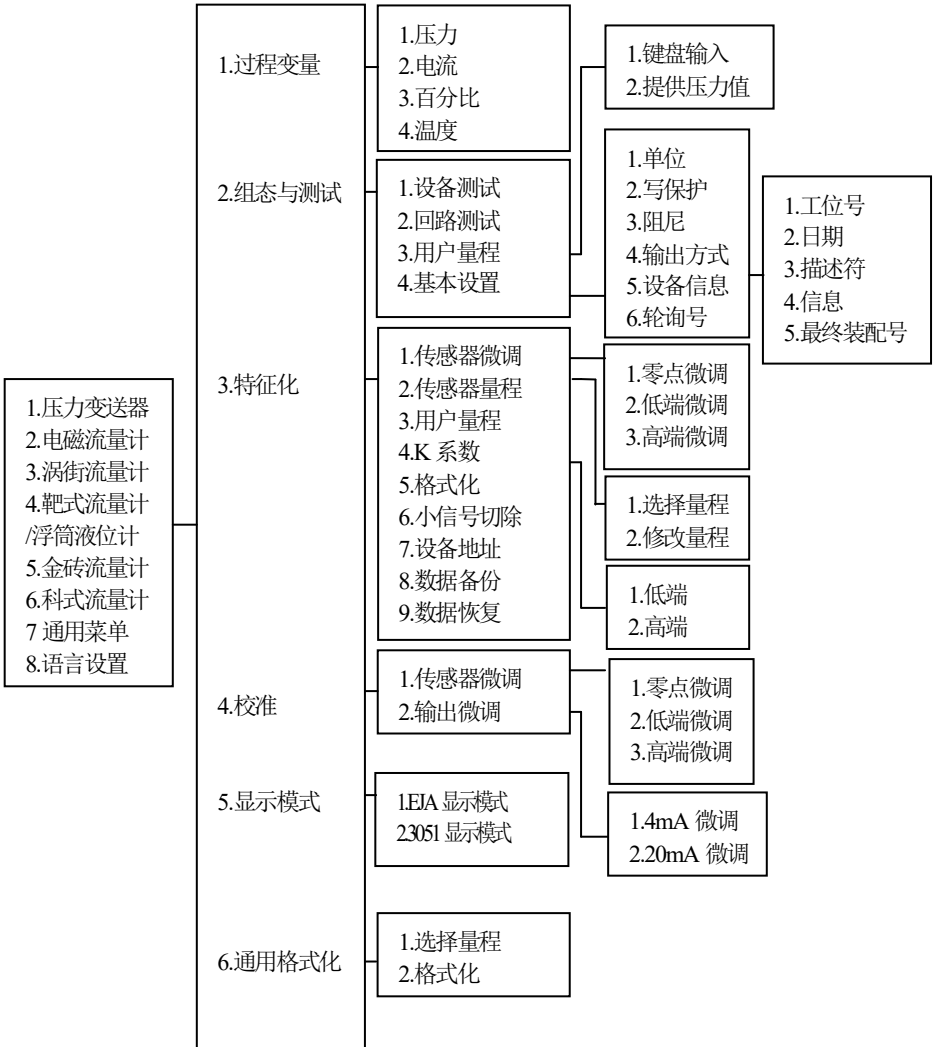
图 4-2-4

附一：通用菜单单位种类列表

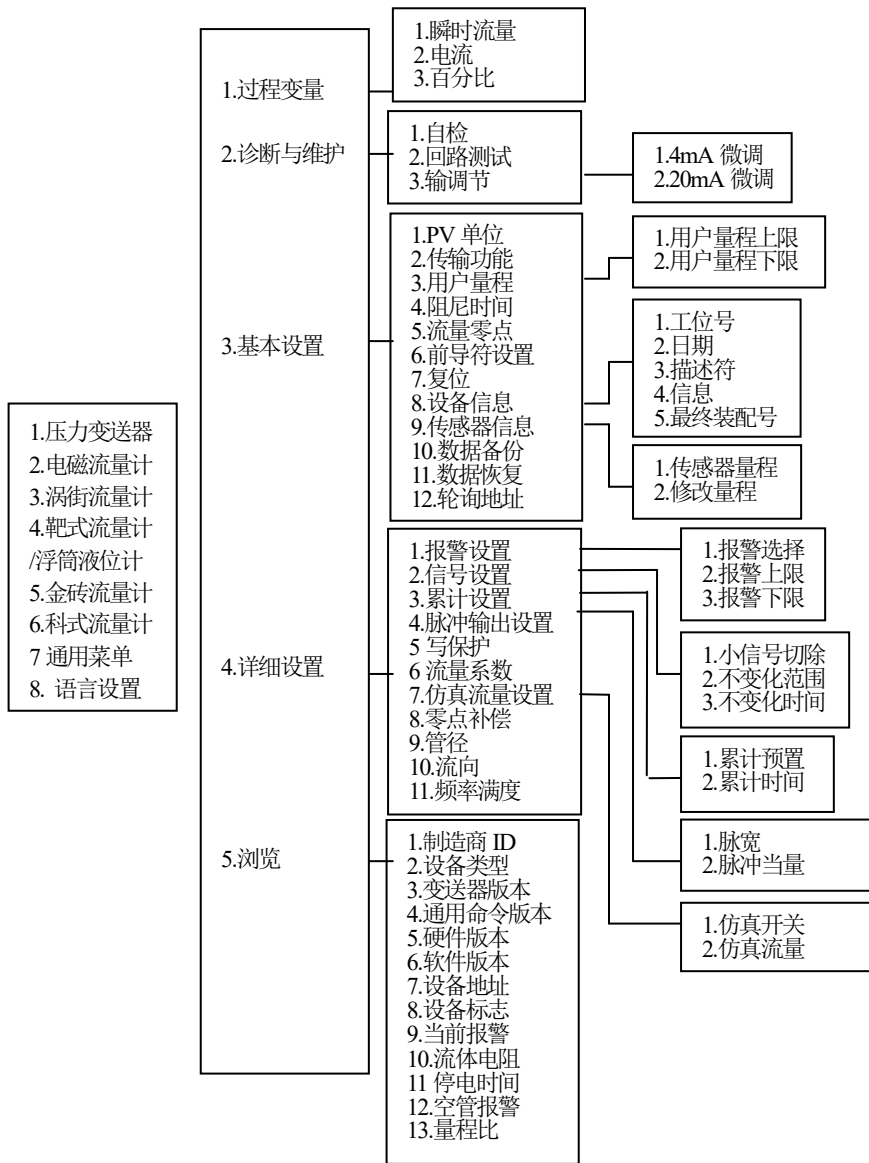
序号	单位	序号	单位	序号	单位	序号	单位
1	InH ₂ O	2	InHg	3	mmH ₂ O	4	mmHg
5	psi	6	bar	7	mbar	8	g/cm ²
9	kg/cm ²	10	Pa	11	kPa	12	torr
13	ATM	14	L/min	15	m ³ /h	16	m/s
17	L/S	18	m ³ /s	19	°C	20	mv
21	Ω	22	Hz	23	mA	24	L
25	m ³	26	m	27	cm	28	mm
29	min	30	s	31	h	32	%
33	v	34	pH	35	kg	36	MT
37	lb	38	ST	39	LT	40	g/s
41	g/min	42	g/h	43	kg/s	44	kg/min
45	kg/h	46	MT/min	47	MT/h	48	lb/s
49	lb/min	50	lb/h	51	ST/min	52	ST/h
53	LT/h	54	g/cm ³	55	kg/m ³	56	g/ml
57	kg/l	58	g/l	59	m/h	60	m ³ /min
61	L/h	62	Nm ³ /h	63	Nm ³ /min	64	KJ/h
65	KJ	66	MJ/h	67	MJ	68	GJ/h
69	GJ	70	MPa	71	None	72	No

附二：各类型设备菜单树

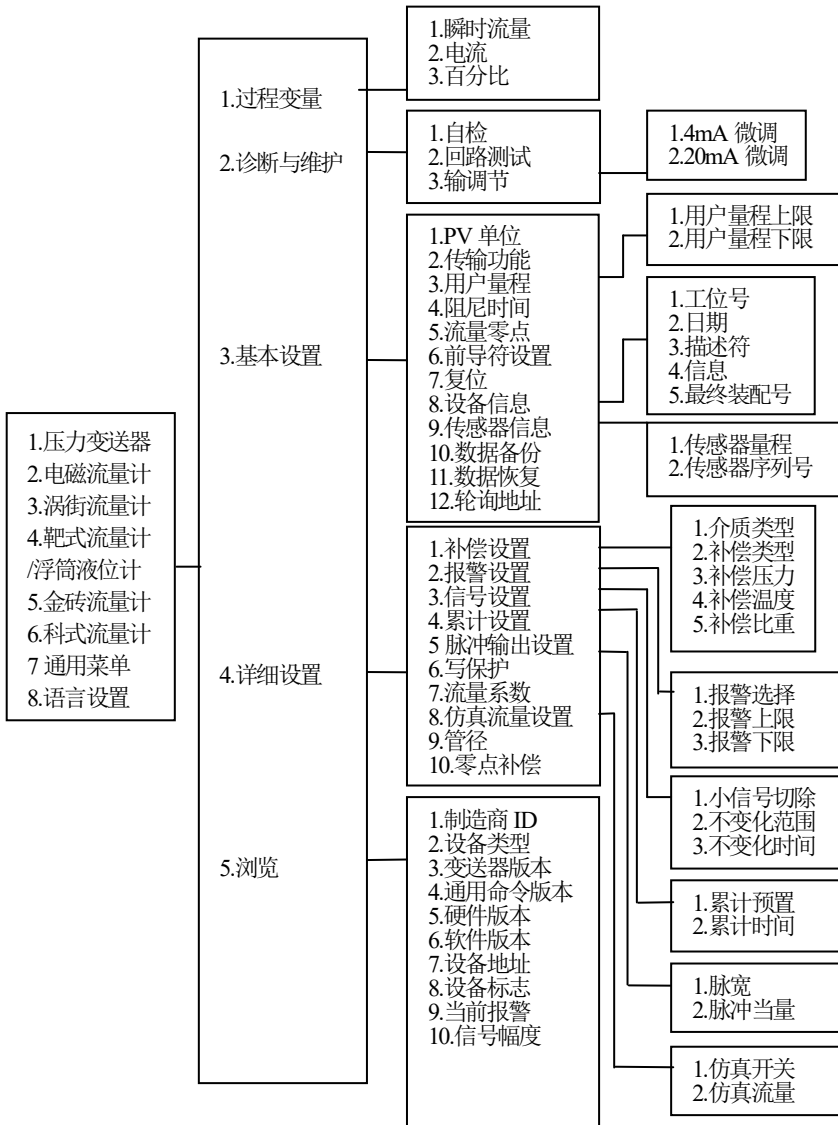
压力变送器菜单树：



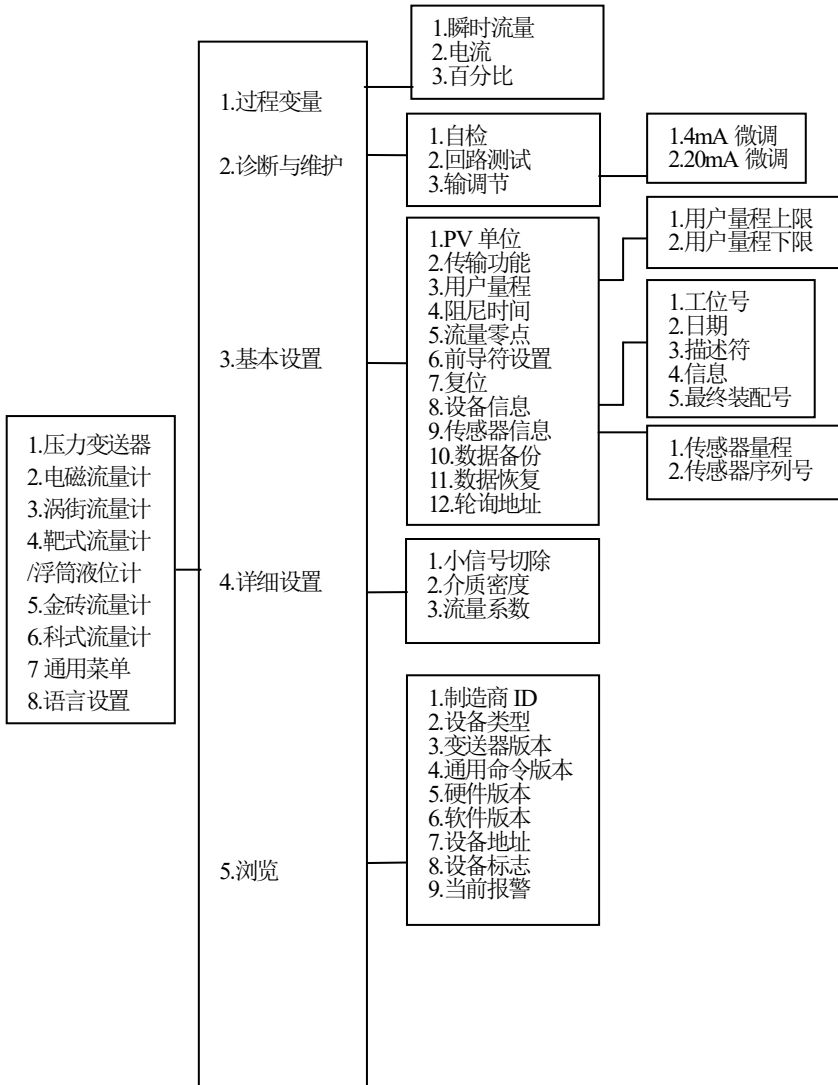
电磁流量计菜单树:



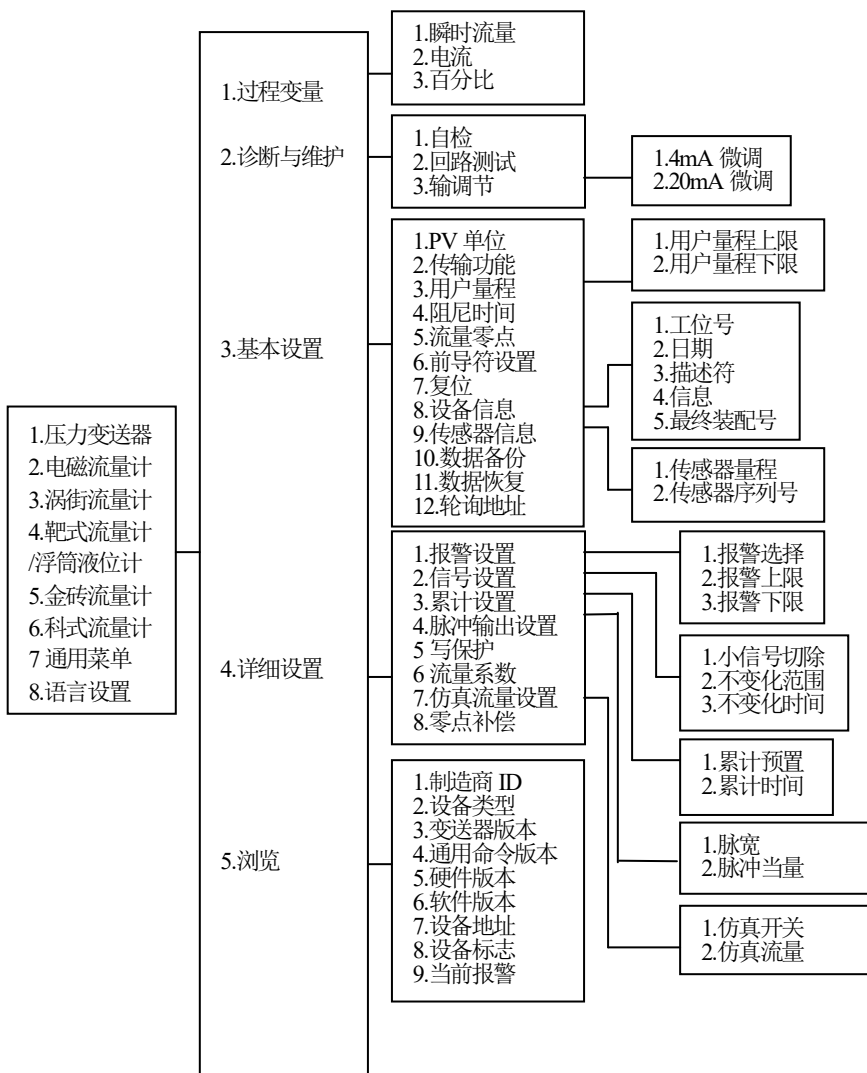
涡街流量计菜单树:



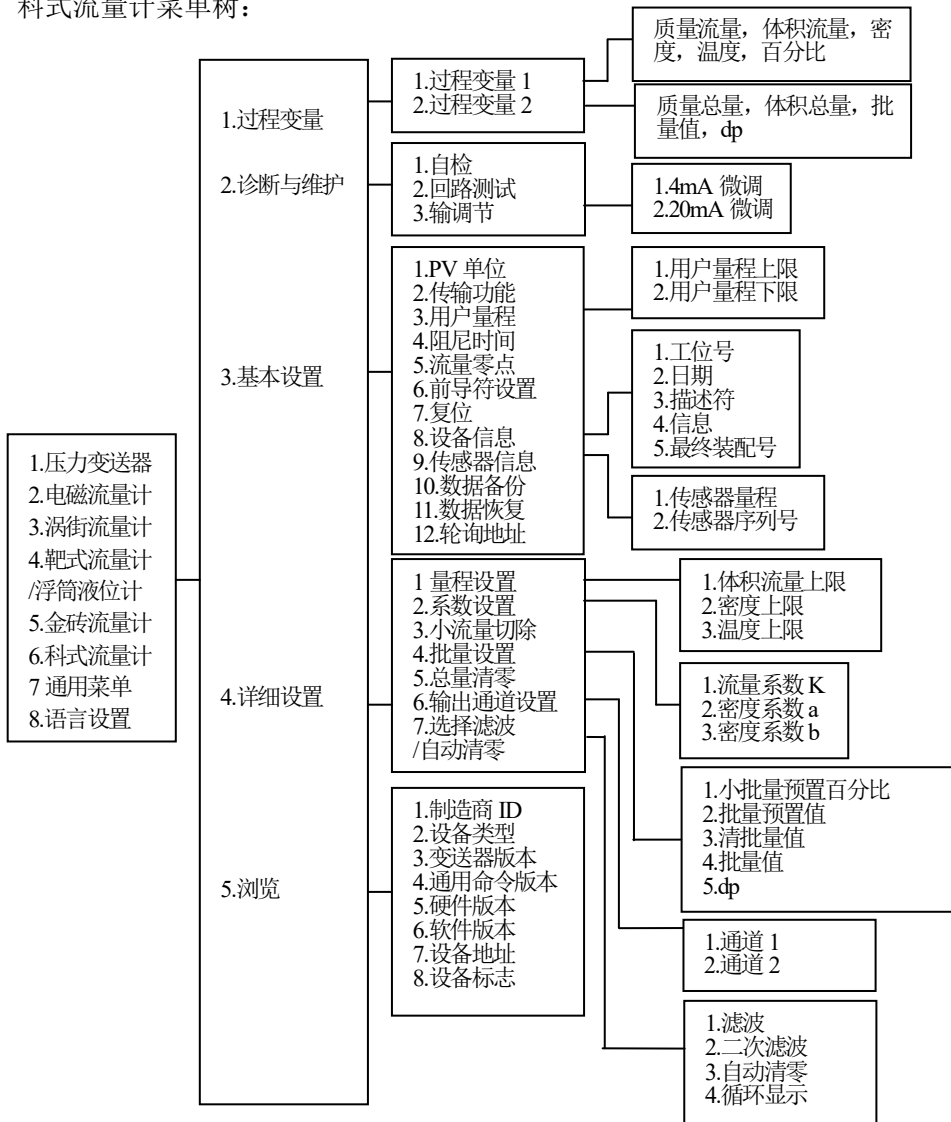
靶式流量计/浮筒液位计菜单树:



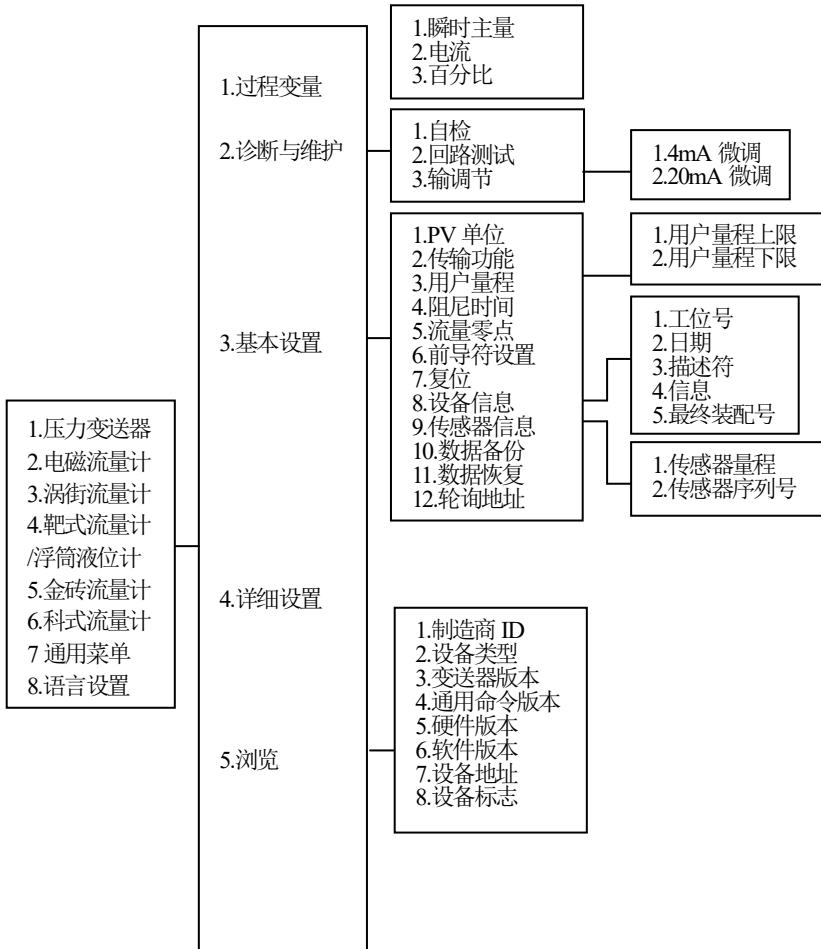
金转流量计菜单树：



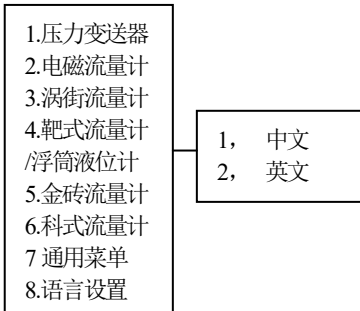
科式流量计菜单树：



通用菜单树：



语言设置菜单树：



附三：术语表

字母数字的

字母和数字的字符集，通常还包括其他的字符集，例如标点符号。

设备组态

定义设备物理属性和运行特性的参数。不包括动态数据。

设备描述

写在 HART 基金会现场总线设备中的指令集，设备描述语言对主机应用程序和 HART 或基金会现场总线设备通信的参数、指令和方法进行定义。

现场设备

除 HART 数字通信信号外，现场设备可以产生或接收模拟信号。

HART 设备

采用 HART 协议进行信息通信的设备。

HART 回路

一中通讯网络，其主设备和从设备都是 HART 智能或 HART 兼容设备。

HART 协议

高速远程寻址的转换器通信协议。一种适用于数字式增加型 4-20mA 通信和智能现场设备的工业标准协议。

轮询

一种依次查询网络以确定那些设备在线的方法。

输出电缆说明

两个夹子为通讯电缆，四个夹子为输出电缆

输出电缆的两根长线为 DC24V 输出线 红 24V+ 黑 24V-

输出电缆的两根短线为仪表已有外供电时的通讯接口，短线蓝+ 短线黄-

通讯器前端输出开关说明

打在 ON 为开，DC24V 输出正常。

打在 OFF 为关，DC24V 输出关闭。

通讯器注意事项

关机后确保输出开关打在 OFF 档，否则长时间会造成电池失效。

充电时充电指示灯由绿色变为红色，开始充电，电池从完全没电或电量严重不足到充满大约需要 12 小时，当电充满后指示灯会变为绿色。注意充电时需使用通讯器配备的专用充电器。

HART475D 通讯器接线说明

1: HART475D 通讯器为仪表供电情况下，使用通讯电缆连接仪表进行通讯（须注意通讯电缆插头红线对应红端子插入，黑线对应黑端子插入）。HART475D 通讯器前端输出开关打在 ON 档，通讯电缆红色夹子夹在仪表电源+极，黑色夹子夹在仪表电源-极。此时不需要外部电源给仪表供电，打开通讯器开关可进行通讯。充满电的 HART475D 通讯器可连续为仪表供电通讯 20 小时以上。

2: 仪表已有外部供电情况下，HART475D 通讯器前端输出开关需打在 OFF 档。使用 24V 输出线缆中的两条短线通讯（短蓝线红，短黄线黑）。
1: 将 250Ω 电阻串联在仪表电源回路中，短蓝线和短黄线两根线夹在 250Ω 电阻两端，打开通讯器开关可进行通讯。
2: 仪表供电电源+接短蓝线红，短黄线黑接仪表电源+端子，外部电源负极接仪表负极端子（即将短蓝线红，短黄线黑串联进入仪表供电回路）打开通讯器开关可进行通讯。

注意事项

1: 仪表在已有外部供电情况下, 切勿使用通讯电缆通讯, 此时要使用 24V 输出线缆通讯, 用时请勿打开通讯器前端 24V 输出开关。(开关打在 ON 档为开, 打在 OFF 档为关)

2: 通讯器在为仪表供电情况下, 通讯线缆需要注意正负极不要接反, 正负极不要短路, 且通讯器前端 24V 开关需要打在 ON 档。

3: 通讯器的两条电缆不能同时为一台仪表供电或通讯, 否则会使通讯器损坏。

绍兴中仪电子有限公司
地址: 绍兴市玛格丽特开发区西区 A2
电话: 0575-85118510
网址: <http://www.ybsell.com>

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CHAPTER I Introduction

Thank you for using HART475 Field Communicator, Communicator for the HART Communication protocol smart transmitter operation, and HART275, HART375, HART475 compatible with excellent compatibility, communication 1151,3051,EJA, ABB and flow aspects of the HART protocol imported instruments. Completely and yung made a variety of smart transmitters.

The manual describes the basic use of field communication device, connection and operation in Content as well as troubleshooting and in the course should pay attention.

Field Communicator using the HART475, please read the manual, In order to better play to the best performance of the product in use or maintenance of the product Before understanding of the appropriate content.

Should the equipment needs repair, please contact our company. We will do our best to for you.

The device is equipped with:

a manual operator

Battery a

Pack a

A charger

A communication cable

Manual a

A 250 ohm resistor

CHAPTER II Basic use

2.1 Field communicator basic performance and functions



Field Communicator

2.2 Power Considerations

In turn, ensure the following:

- * The Field Communicator is no mechanical damage
- * Battery is fully charged.
- * The Field Communicator to connect to the circuit (Figure 2-2)
- * String loop resistance of 250 ohms



Start Field Communicator

Before starting to ensure that the device is fully charged. Start holding down the power key until To the bright LCD screen, a successful boot.

Close

Such as to close the Field Communicator, hold the key to open up their show off, shutdown complete.

2.3 Key areas of use and instructions






Open key



The key is used to enable or disable the Field Communicator.

Arrow navigation keys

Four navigation arrow keys provide menu options.

Press  the right arrow navigation key to enter a menu of specific options. Press  Left navigation key to return to the previous menu,   up and down navigation keys can be cut down in the menu Change. In the character input mode digital  down navigation keys can be used as a backspace key.

Enter



After entering the menu, you can modify the contents of the LCD's bottom Line will automatically display the "Edit" to modify the words For you press the Enter key, the change was successful.

Alphanumeric keyboard

Character numeric keypad to enter characters, numbers and other symbols, numbers, and he has Characters in both input modes, field communication device according to the need to select the appropriate input mode. To enter numbers, press the number directly to where the keys to enter characters, according to the word Character position on the keyboard, first press

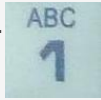


A key, then press the character

key is located. For example, to enter the character "A", the first Press



the left selection key, then press the number 1



PV key



Monitoring real-time variable shortcuts, view real-time

pressure, current, percentage, Temperature, frequency and other real-time variable. Digital input mode, the character, the key is invalid.

CHAPTER III menu online operation

3.1 Detection menu

How to poll:

1. Always Poll

2. Ask Bef Poll

Figure 3-1

3.1.1 Polling Detection

Select the menu, Field Communicator polling numbers from the polling numbers from 0 to 15 followed by detection equipment, if detected, the device will automatically detect the transmitter and the station number(Figure 3-1-1), press the right navigation key to enter the device type selection menu (Figure

3-1-2); if not Have detected the device does not detect the transmitter will appear warning.

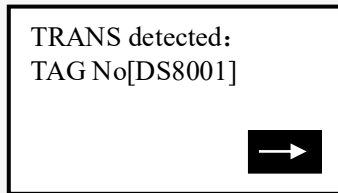




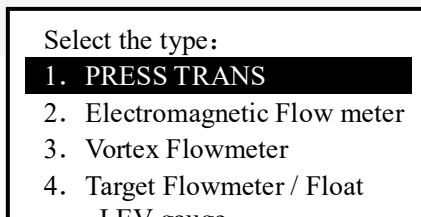
Figure 3-1-1




3.1.2 Detection by poll numbers

Specified number of polling devices to detect, according to  the up and down navigation keys Choose between 0 to 15 polling numbers, then press  the right navigation key to start the test (test results If the same as Figure 3-1-1).

3.1.3 Select Device Type

1. Pressure Transmitter
- 2 electromagnetic flowmeter
3. Vortex Flowmeter
4. Target Flowmeter / float level gauge
5. Turn meter gold
- 6 General menu



When choosing the type of equipment must be selected according to the type of field device into a specific menu, if you select the type does not match the actual type, will cause an error. If the site becomes non-pressure equipment, electromagnetic, vortex, target-style, gold transfer device is connected into the general menu. Press   the down navigation key to select the device type, then press  the right navigation key to enter the selected device type detection, and enter the corresponding menu, if you select the type does not match with the test will be prompted.

3.2 Pressure Transmitter Main Menu

Submenu

- 1 Process Variable
- 2 Configuration and testing
- 3 Characterization
- 4 Calibration
- 5 Display Modes
- 6 common format

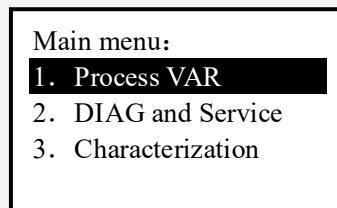


Figure 3-2-1

3.2.1 Process Variable

Real-time display of pressure transmitter, the percentage of current, temperature and other parameters (Figure 3-2-2).

Press the left navigation button for 3 seconds before the bounce out of real-time variable monitoring model.

PRESS	-0.258	Kpa
AO	4.820	mA
PC	5.127	%
TEMP	19.570	°C

Figure 3-2-2

3.2.2 Configuration and Testing

Submenu:

1. Equipment Testing
2. Loop test
3. Basic Settings
4. User range

DIAG and Service
1. Test Device
2. Loop Test
3. Basic setup

Figure 3-2-3

3.2.2.1 Test equipment

Testing equipment status, if everything is normal, liquid crystal display "device normal", if wrong, will be a warning.

3.2.2.2 Loop Test

Detection of the D / A current output. First, a series ammeter in the circuit, and then type a 4-20mA current between the values into the transmitter, the transmitter will automatically output the current value type, if the type of value and ammeter display values are not equal, current fine-tuning to be done.

3.2.2.3 Basic Settings

Submenu:

1. Unit

Basic Setup
1. Unit
2. Write Protect
3. Damping

2. Write Protect
3. Damp
4. Output
5. Device Information
6. Polling numbers

Unit

Change the primary variable units and display units. Provide MPa, Kpa, Pa, InH2O, InHg, psi, g / cm ², kg / cm ², FtH2O, torr, ATM, mmH2O, mmHg, Bar, mBar these 15 units. When the unit of measure on behalf of the Not recognize the number will automatically display "No" means that the unit "unknow". Repair Change methods, see the menu tree.

Write Protect

Read-write device protection status, when the write-protected, the transmitter can not change the internal data.

Damp

Read-write device damping coefficient (rounded to three decimal places). Seconds.

Output

Read-write device output. Divided into linear, square root, and the unknown. The default is linear.

Device Information

Read and write tag number, date, descriptor, message, final assembly number

Polling numbers

3.2.2.4 User range

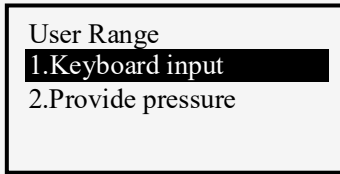


Figure 3-2-5

Keyboard input

Select this menu, the first prompt sensor range, then enter

the range of the setup menu, press the down navigation key to select zero or range, then enter the user needs to set the value (rounded to three decimal places), then press the right navigation key into the transmitter.

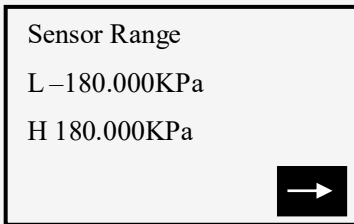


Figure 3-2-6

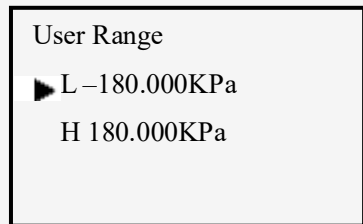



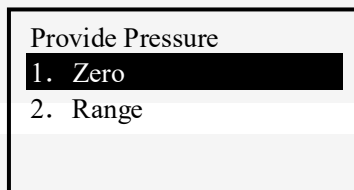


Figure 3-2-7

Provide pressure values

Pressure on the current value with the transmitter zero and span settings, press   the up and down navigation keys, press  the right navigation key to confirm.



3.2.3 Characterization

Submenu:

- 1 .Sensor trim
2. Sensor measuring range
- 3 user range
- 4.K coefficient
- 5 Formatting
- 6 small-signal removal
- 7 Device Address
8. Data Backup
9. Data Recovery

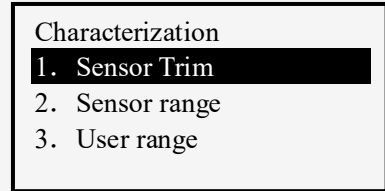


Figure 3-2-9

The menu will seriously affect the operation of the transmitter to work and accuracy, so enter this menu, you need to enter the authentication password (Figure 3-2-10).

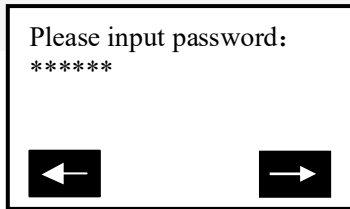
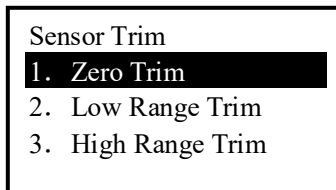


Figure 3-2-10

The default password is: 666666

3.2.3.1 Sensor trim



Zero trim

Figure 3-2-11

After the pressure transmitter with 0 to select this operation, the transmitter automatically adjust zero.

Low fine-tuning

To increase low-pressure transmitter (in KPa), type the applied pressure values (rounded to three decimal places), the transmitter automatically corrected, so that the output value of the applied pressure.

High-end fine-tuning

To the transmitter plus high pressure (in KPa), type the applied pressure values (rounded to three decimal places), the transmitter automatically corrected, so that the output value of the applied pressure.

3.2.3.2 Sensor Range

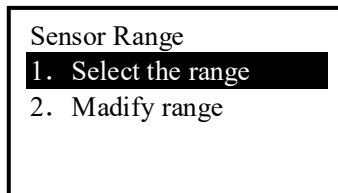


Figure 3-2-12

Select the range

First select the type of sensor, and then select the range of the sensor code, then press the Enter key into the transmitter. (Figure 3-2-13,3-2-14)

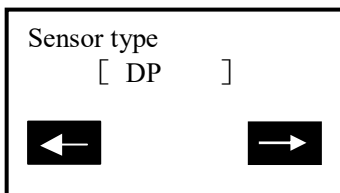


Figure 3-2-13

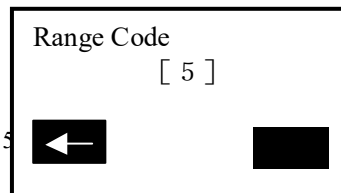





Figure 3-2-14

Modify Range

First select the range sensor code, then enter the code in the range of the scale. Note: The input pressure is measured in Pa, can only enter a positive integer. Change and then select the sensor range.

3.2.3.3 User range

Keyboard input

Select this menu, the first prompt sensor range, then enter the range of the setup menu, press   the up and down navigation key to select zero or range, then enter the user needs to set the value (rounded to three decimal places), enter and press  the right navigation key to send into the transmitter.

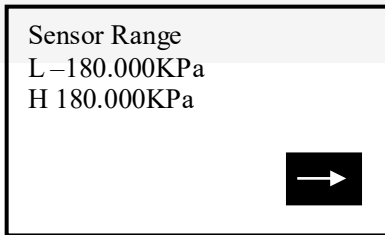


Figure 3-2-15

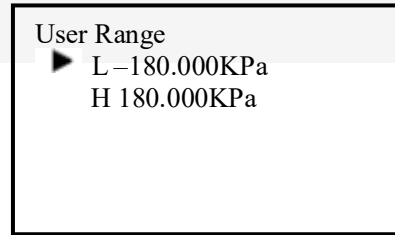




Figure 3-2-16

Provide pressure values

Pressure on the current value with the transmitter zero and span settings, press   the up and down navigation keys,

press  the right navigation key to confirm.

3.2.3.4 K factor

Low-end need to be done, do high-end.

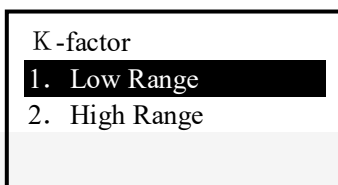


Figure 3-2-18

Low Range

Add 0 to the pressure transmitter, type 0 in the increase of pressure, press the right navigation key into the transmitter, the transmitter automatically adjust the k-factor low.

High Range


Added to the positive terminal of a pressure transmitter (close to or equal to the physical range), the pressure increases the pressure must be greater than 0, type in the increase of pressure values (rounded to three decimal places, units KPa), press the right navigation key into the transmitter device, the transmitter automatically adjusts the k-factor high.

Note: K factors must be operated in positive pressure conditions, and the input unit KPa.

3.2.3.5 Format

Full-scale format

Note: This action will seriously affect the accuracy of the transmitter, the user is best not to make their own format.

How-to: give added pressure transmitter (pressure points must be positive from the negative pressure up to maximum pressure), then enter the applied pressure (Figure 3-2-19, note: do the negative pressure side formatting , the input pressure to a minus sign in front.), then press  the right navigation key to format it, after a successful return to the next point format, an unsuccessful return warning.

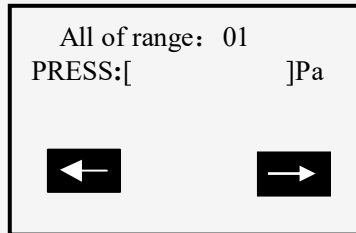


Figure 3-2-19

Interpolation

After the ultra-poor calibration point format.

Note: This action will seriously affect the accuracy of the transmitter, the user is best not to make their own format.

How-to: give added pressure transmitter, and then enter the increase of pressure. (Note: do the formatting in the negative pressure side, the input pressure to a minus sign in front). Press the right navigation key, the interpolation done at this time point measured the pressure should be basically equal to the applied pressure.



3.2.3.6 Small-signal removal

This function is to eliminate the zero drift. Enter the number of users than the extreme range.

3.2.3.7 Device address

View a device's address. Device address is the unique identification number the smart board.

3.2.3.8 Data Backup

Data backup: the value of the current user scale and format all the data back to FLASH the database, this function is to facilitate data recovery after a mistake. Click the menu "Backup" button

3.2.3.9 Data Recovery

Data Recovery: The instrument factory, manufacturers have the formatting operation on the instrument, and the correct data formatted to do a backup, misuse of the instrument when the user does not work, you can use the "Data Recovery" function of its error Content removal operation, and re-manufacturers will re-initialize the backup data is written instrument, easy instrument to restore the original data. Click the menu "Data Recovery" button.

3.2.4 Calibration

Submenu

- 1 Sensor trim
- 2 Output Trim

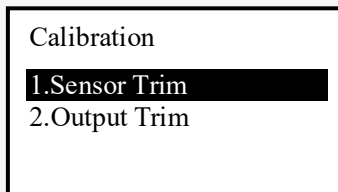
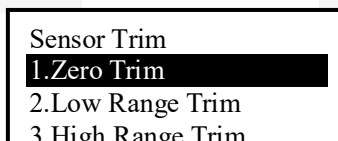


Figure 3-2-21



3.2.4.1 Sensor trim

Zero trim

After the pressure transmitter with 0 to select this operation, the transmitter automatically adjust zero.

Low fine-tuning

To increase low-pressure transmitter (in KPa), type the applied pressure values (rounded to three decimal places), the transmitter automatically corrected, so that the output value of the applied pressure.

High-end fine-tuning

To the transmitter plus high pressure (in KPa), type the applied pressure values (rounded to three decimal places), the transmitter automatically corrected, so that the output value of the applied pressure.

3.2.4.2 Output Trim

Output fine-tuning needs to be a precision ammeter in series to the circuit, into the fine-tuning, the LCD will prompt access ammeter, the current fine-tuning exit, the LCD will prompt recovery circuit

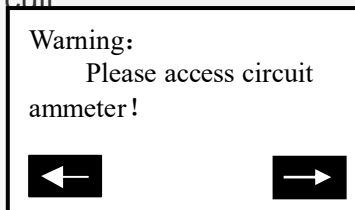


Figure 3-2-23

4mA current fine-tuning

Choose 4mA current fine-tuning, the output should be 4.000mA, if the ammeter shows the value is not equal to 4.000mA, select "No", an input box, type the ammeter shows the input box value (rounded to three decimal places), then press right navigation key to enter the current value into the transmitter, the transmitter will automatically calibrate the current output, the output of 4.000mA, if a less than satisfactory results, repeat this operation.(Note: The meter accuracy should be higher than the output precision of the table)

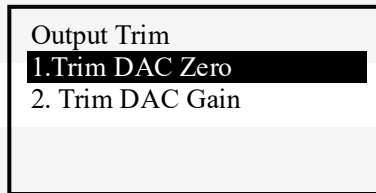


Figure 3-2-24

20mA current fine-tuning

4mA current methods of operation and fine-tuning the same.

3.2.5 Display Mode

1.%

Select this mode, the transmitter displays the percentage.

2.USER SET

Select this mode, the transmitter displays the user settings.

3.USER SET &%

Select this mode, the transmitter displays the percentage of

user settings and are displayed alternately every 4S.

4.INPUT PRESS

Select this mode, the transmitter only the input pressure.

5.INPUT PRESS &%

Select this mode, the transmitter displays the percentage of input pressure and alternating every 4S.

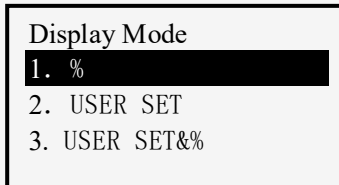


Figure 3-2-25

3.2.6 General Formatting

General Format: (known as three, five-point format)

This menu requires a password to enter the default password is 666666.

(1) Select the instrument type and range of code to determine the instrument's physical range.

(2) in the common format into the format, the original plate for 1151 current 22mA, the order of the physical range of 0%, 60%, 100% three-point format, or 0%, 60%, 100%, -60%, 100% five-point format. Communication device according to the first line shows the calculation of the percentage range of physical pressure, the pressure and the input Fill pressure (in Pa), right-click until the pressure stabilized first sent.

(3) operation is successful, display the percentage of the next point, to continue or exit.

Operation failed (such as the pressure increases the pressure

and display the corresponding percentage difference too large to return to this point redo. Done 100% in three-point format according to exit after completion of five-point format at 100% done automatically exit. withdrawal of current from 22mA into a measurement of current.

3.3 Electromagnetic Flowmeter Main Menu

See photos

3.4 Vortex Flowmeter

See photos

3.5 Target Flowmeter / float level gauge

See photos

3.6 meter gold transfer

See photos

3.7 Common main menu

See photos

3.8 Language Setting main menu

See photos

Remarks:

The handheld contains vortex flowmeter, the target flowmeter, flow meter gold turn, Common menu and menu operation is similar to the electromagnetic flow meter, this is not setting them in, with Please refer to the distribution of body attached page menu menu tree operation.

CHAPTER IV Troubleshooting

4.1 Introduction and troubleshooting faults

It does not really start

If in the course can not be switched, that can not start the Field Communicator, First check the battery. Should the battery power is still not start, there may be on-site Communication device to open the key is damaged. (Note: Please do not use the process of firm Hard thing to touch the buttons Field Communicator film to avoid damage.)

Communication or communications are not interrupted

If there is no communication on the first check HART field device loop and voltage. Almost all field devices have at least 4mA and 12VDC to Victoria maintain normal operation.

Check the loop impedance, to see whether the access loop 250 ohm external Impedance. Access to 250 ohm resistors, will lead 250 ohm resistor at both ends of the access. And then view the communication is normal.

Check the terminal and HART communications cable is damaged.

HART communication by the control system interference. At this point stop control system HART communication, recognition and communication between the field device communication.

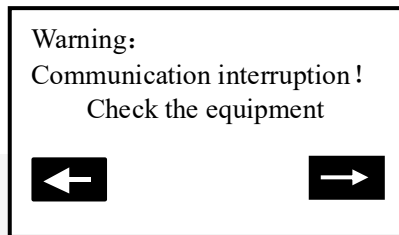
4.2 Tips interface

Low battery warning

When the battery voltage is low, top right of the LCD display will flash a battery-shaped pattern.

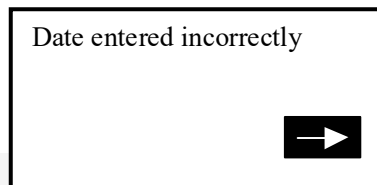
Communication Failure Warning

When the Field Communicator to the transmitter with the communication failure warning (Figure 4-2-2).



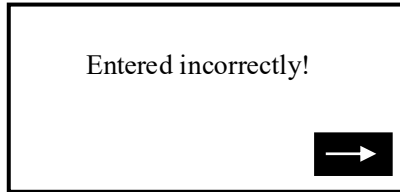
Date Input Error Figure 4-2-2

Allows you to enter a date range January 1, 1900 to December 31, 2155, when the input is not in the range of dates, enter the error message will appear (Figure 4-2-3), note the date input format xxxx xx xx day in May.



Data entry errors Figure 4-2-3

When the input parameter is incorrect when the prompt appears, such as the removal of only a small signal input is an integer, if you enter a negative number, an error message will appear (Figure 4-2-4).



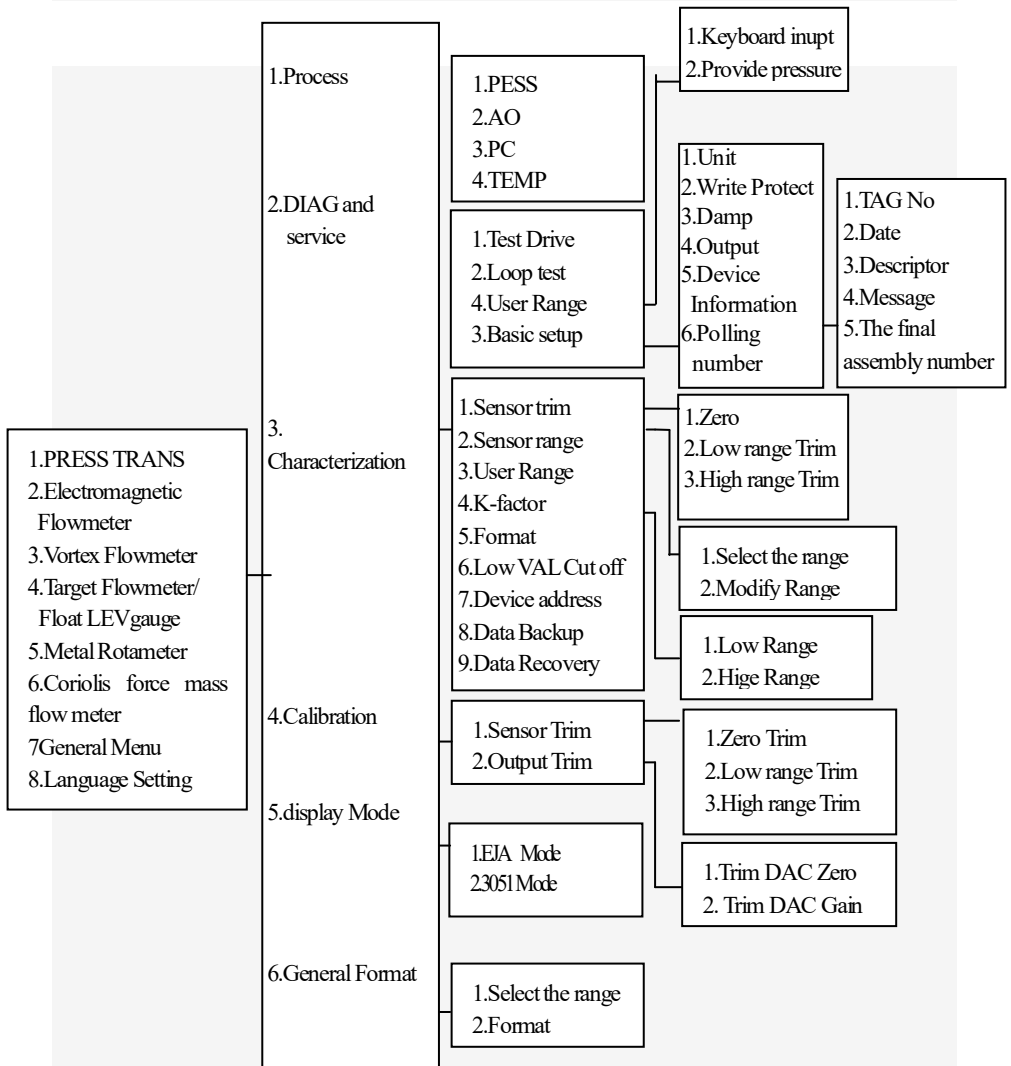
Appendix I: General menu list of unit types

Figure 4-2-4

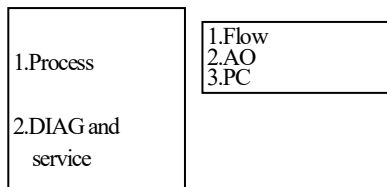
No.	Unit	No.	Unit	No.	Unit	No.	Unit
1	InH ₂ O	2	InHg	3	mmH ₂ O	4	mmHg
5	psi	6	bar	7	mbar	8	g/cm ²
9	kg/cm ²	10	Pa	11	kPa	12	torr
13	ATM	14	L/min	15	m ³ /h	16	m/s
17	L/S	18	m ³ /s	19	°C	20	mv
21	Ω	22	Hz	23	mA	24	L
25	m ³	26	m	27	cm	28	mm
29	min	30	s	31	h	32	%
33	v	34	pH	35	kg	36	MT
37	lb	38	ST	39	LT	40	g/s
41	g/min	42	g/h	43	kg/s	44	kg/min
45	kg/h	46	MT/min	47	MT/h	48	lb/s
49	lb/min	50	lb/ h	51	ST/min	52	ST/h
53	LT/h	54	g/cm ³	55	kg/m ³	56	g/ml
57	kg/l	58	g/l	59	m/h	60	m ³ /min
61	L/h	62	Nm ³ /h	63	Nm ³ /min	64	KJ/h
65	KJ	66	MJ/h	67	MJ	68	GJ/h
69	GJ	70	MPa	71	None	72	No

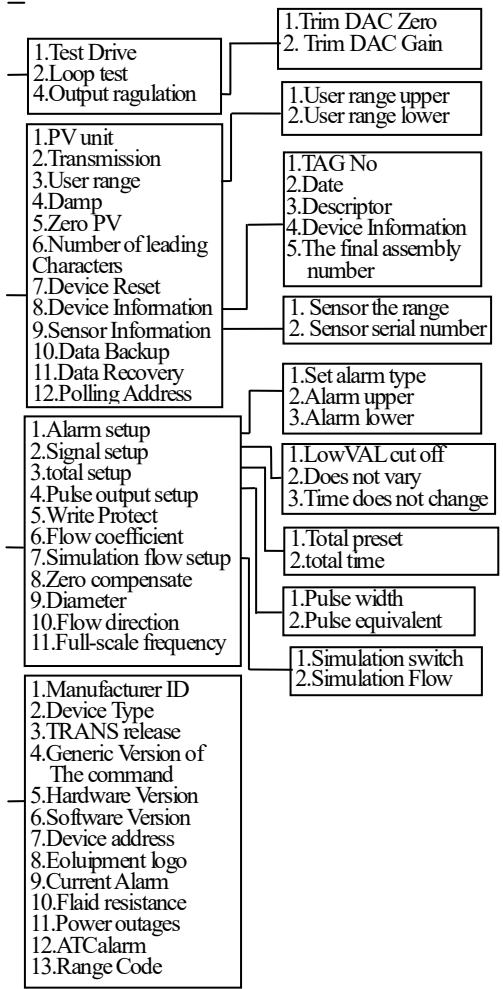
Appendix II: various types of equipment menu tree

Pressure Transmitter menu tree:

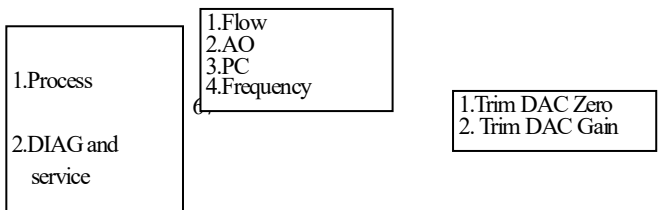


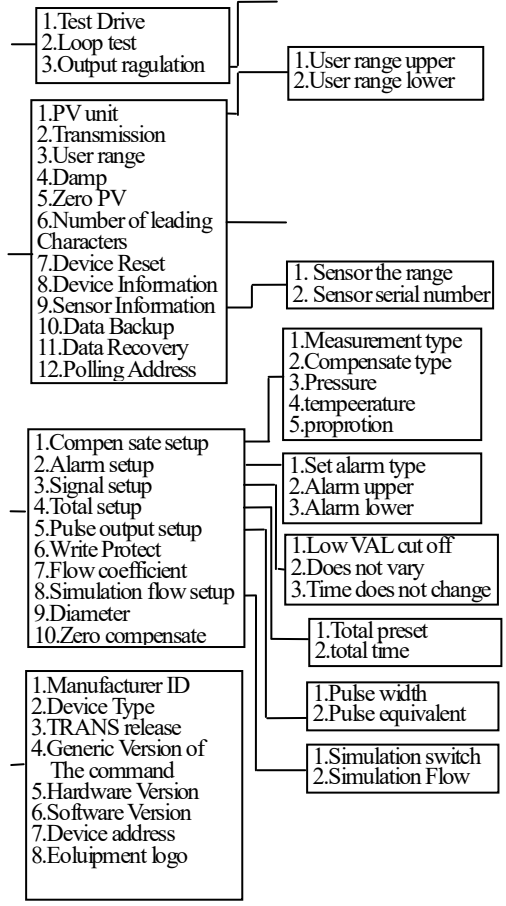
Electromagnetic Flowmeter menu tree:



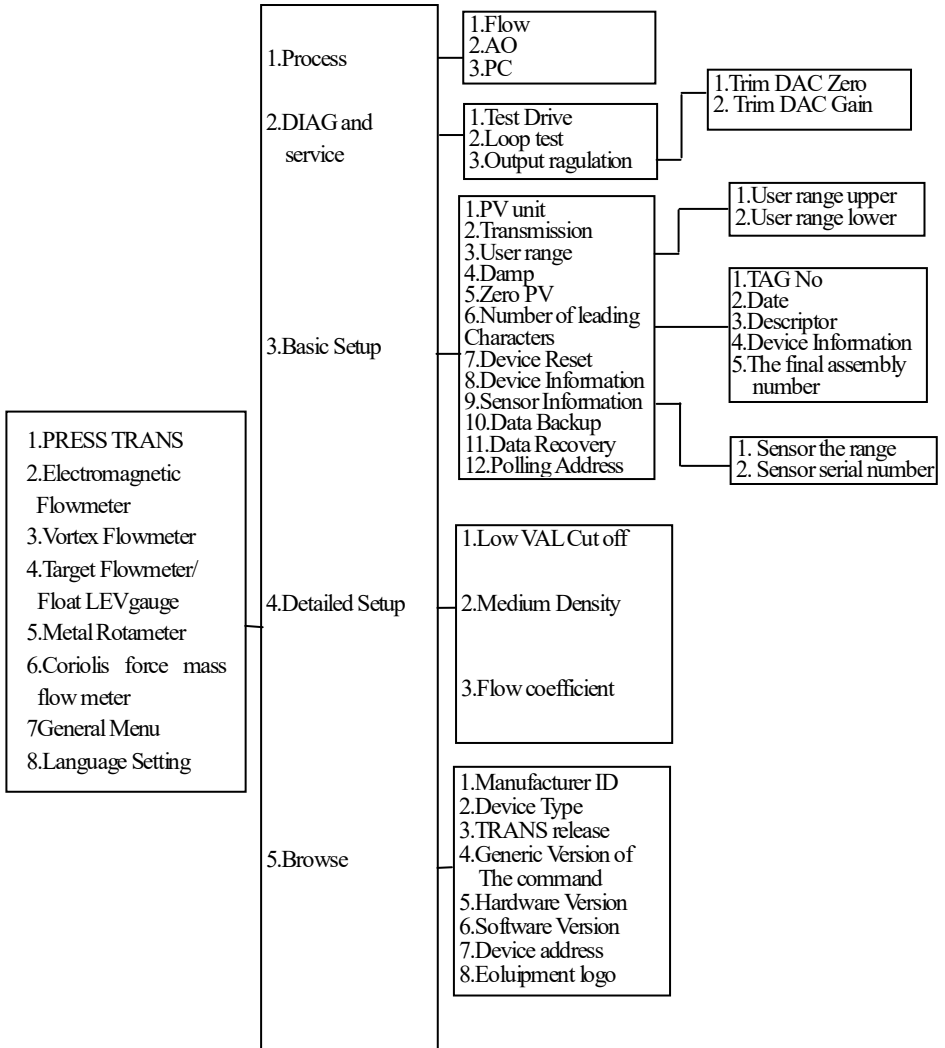


Vortex Flowmeter menu tree:

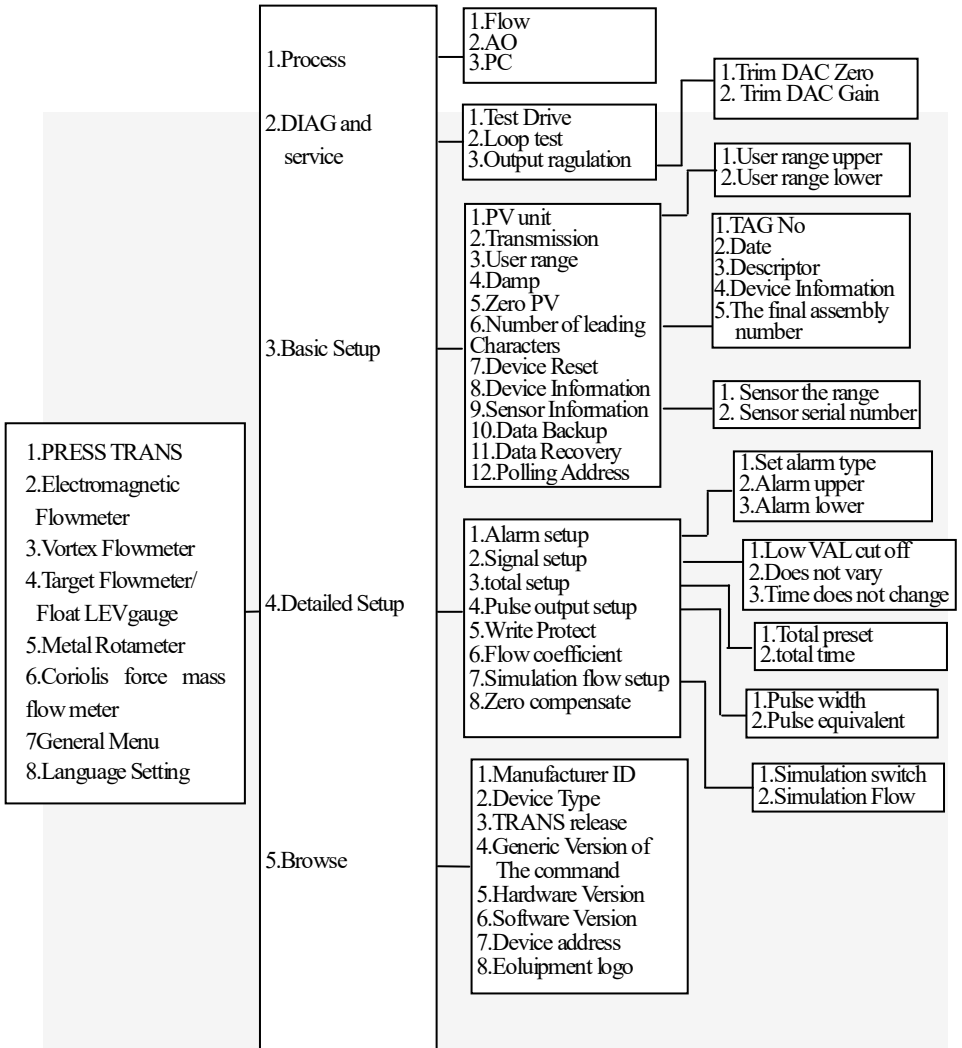




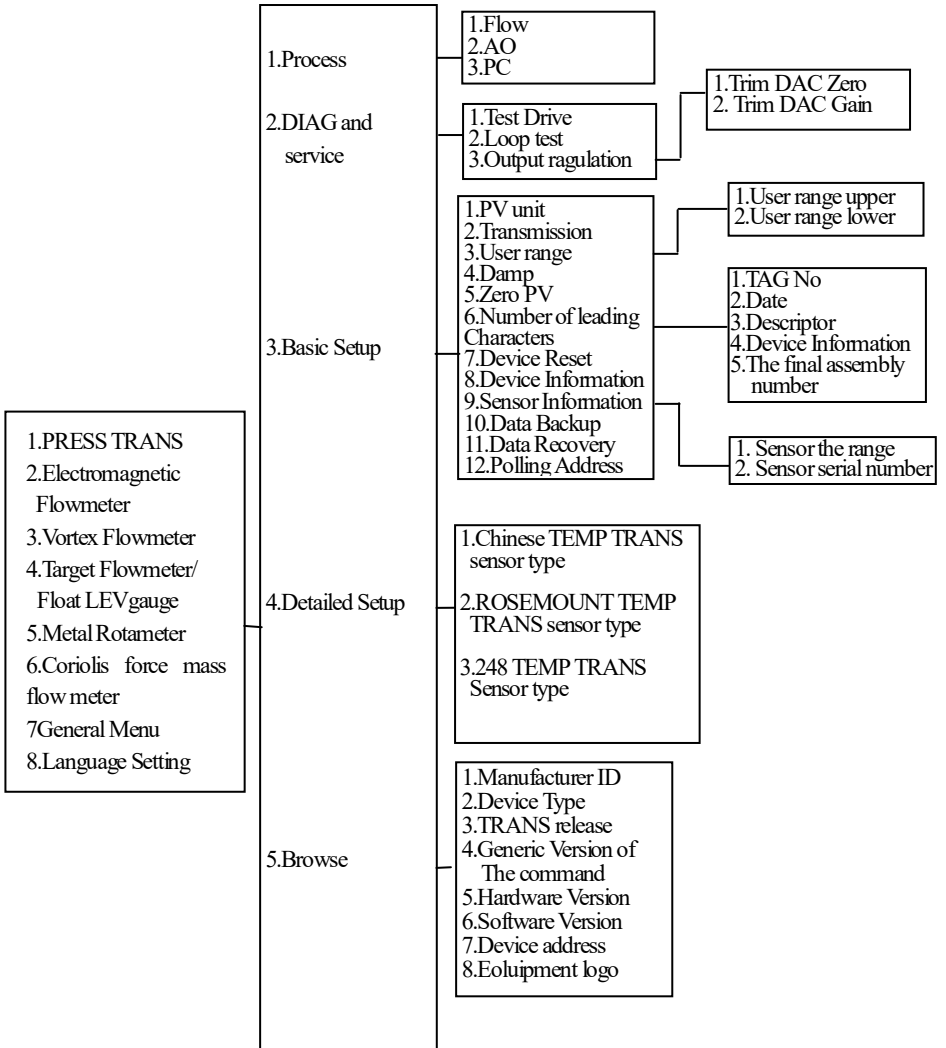
Target Flowmeter / float level gauge menu tree:



Gold transfer meter menu tree:

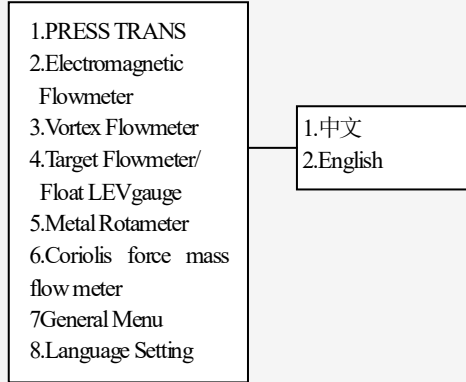


Common menu tree:



Language Setting menu tree:

Language setting after a successful reboot device or exit to the top menu.



Appendix 3: Glossary

Alphanumeric

Alphanumeric character set, often including other character sets, such as punctuation marks.

Device configuration

Define the physical properties and operating characteristics of the device parameters. Does not include dynamic data.

Device Description

Written in the HART Foundation fieldbus devices instruction set, the device description language of the host application and the HART or FOUNDATION fieldbus device communication parameters, and methods of instruction are defined.

Field Equipment

In addition to HART digital communication signal, the field device can generate or receive analog signals.

HART devices

Using the HART protocol for information communication equipment.

HART Loop

One communication network, the master and slave devices are HART smart or HART compatible devices.

HART protocol

Addressing a high-speed remote communications protocol converter. One for the digital add-type 4-20mA communications and intelligent field devices, industry-standard protocols.

Poll

One kind of query the network in order to determine the method that the device online.

Output cable description

Two clamps for communication cable and four clamps for output cable

The two long lines of the output cable are DC 24V output red 24V + Black 24V-

The two short wires of the output cable are the communication interfaces when the instrument has external power supply, short-wire blue + short-wire yellow-

Transmitter front-end output switch description

On on, DC 24V output is normal.

The DC 24V output is off by off.

Notes for communicators

Make sure the output switch hits the off file after shutdown, otherwise the battery will fail for a Long Time

The charging light changes from green to red and starts charging, and the battery goes from completely dead or severely undercharged to about 12 hours full, which turns green when the electricity is full. Pay attention to the need to use the special charger provided by the communicator when charging.

Hart 475D COMMUNICATOR WIRING INSTRUCTIONS

1: Hart 475d communicators, in the case of instrumentation, communicate using the Communications Cable Connection Instrument(note that the communications

cable plug red wire is inserted on the red terminal and the black line is inserted on the Black Terminal). Hart 475D The front-end output switch of the communicator hits on the on file, the communication cable red clamp in the instrument power supply + Pole, the black clamp in the instrument power supply-pole. No external power is required to power the instrument, and the communicator switch is turned on for communication. The Electric Hart 475d communicator can supply the instrument with power for over 20 hours in a row.

2: 2: In case of external power supply, the front output switch of Hart 475d communicator needs to be hit off. Use Two short lines of communication(short blue red, short yellow black) in the 24V output cable. 1: A 250 Omega resistance is connected in series to the Instrument Power Supply Circuit, the Short Blue Line and the short yellow line are clamped at the end of the 250 Omega Resistance, and the communicator switch is turned on for communication. 2: Instrument Power Supply + Short Blue Line red, short yellow line black connected instrument power supply + terminal, external power supply negative connected instrument negative terminal(short Blue Line red, short Huangxianhei series into the Instrument Power Supply Circuit) open the transmitter switch to communicate.

Points to note

1: In case of external power supply, do not use communication cable communication, use 24V output cable communication at this time, do not turn on the forward 24 v output switch when using. (switch on on file, off off file)

2: 2: Communicator in the case of power supply for the instrument, communication cable needs to pay attention to the positive and negative poles do not receive the reverse, positive and negative poles do not short circuit, and the front of the communicator 24 v Switch needs to hit on file.

3: The two cables of the communicator can not power or communicate simultaneously with an instrument, otherwise the communicator will be damaged.