TKWL-1200系列智能型雷达物位计

TKWL -1200 Intelligent Radar Level Meter

一、产品概述

TKWL-1200系列物位计是先进的雷达式物位测量仪表，测量距离最大35米，可以用于存储罐、中间缓冲罐或过程容器的物位测量，输出4~20mA模拟信号。

二、特点

- 采用先进的非接触式测量；
- 采用极其稳定的材料制造；
- 测量液体、固体介质的物位；
- 可以测量所有介电常数＞1.8的介质；
- 测量范围0~20m(可以扩展到35米)；
- 采用两线制、回路供电的技术，供电电压和输出信号通过一根两芯电缆传输；
- 4~20mA输出或数字型信号输出；
- 分辨率1mm；
- 不受噪音、蒸汽、粉尘、真空等工况影响；
- 不受介质密度、粘稠度和温度的变化的影响；
- 过程压力可达4MPa；
- 过程温度可达250℃。

三、原理

6.8G高频微波脉冲通过天线系统发射并接收，雷达波以光速运行，运行时间可以通过电子部件被转换成物位信号。一种特殊的时间延伸方法可以确保极短时间内稳定和精确的测量。

即使工况比较复杂的情况下，存在虚假回波，用最新的微处理技术和调试软件也可以准确的识别出物位的回波。

Products Introduction

TKWL-1200 series sensor is advanced material level measuring instrument of radar type with maximum measuring distance of 35 meters, which can be applied to material level measurement for storage tank, intermediate buffer tank or process container and outputs 4~20mA analog signal.

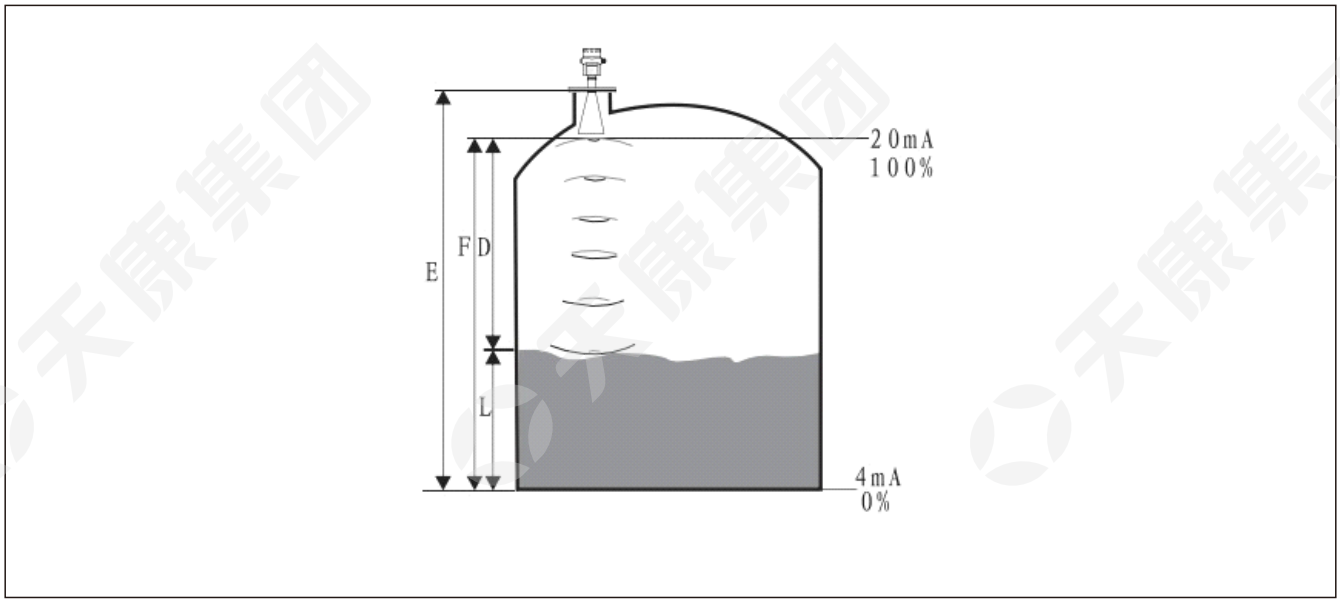
Characteristics

- Adopt the advanced non-contact measurement
- Manufactured with the extremely stable material
- Measure the material level of liquid and solid medium
- Can measure all mediums with dielectric constant＞1.8
- Measuring range 0~20m (can be extended to 35 meters)
- Adopt technologies of two wire system and loop power supply, voltage of power supply and output signal can be transmitted by two-core cable
- 4~20mA output or digital signal output
- Resolution 1mm
- Not affected by noise, steam, dust, vacuum and other working conditions
- Not affected by medium density, viscosity and changes of temperature
- Process pressure can reach 4MPa
- Process temperature can reach 250℃

Principle

6.8G high-frequency microwave pulse transmits and receives through antenna system, radar wave operates at the speed of light and the operation time can be converted to material level signal through electronic components. A special time extension method can ensure the stable and accurate measurement in a short time.

Even under the situation of complicated working conditions, virtual echo exists and use the latest micro-processing technology and debug software can identify the echo of material level accurately.



四、产品款型信息　　Product model information

 TKWL-1201	应　用 Application	过程条件简单，腐蚀性的液体、浆料、固体。 比如：污水储罐，酸碱储罐，浆料储罐，固体颗粒，小型储油罐 Process conditions are simple, corrosive liquids, pastes and solids, such as sewage tank, acid storage tank, paste storage tank, solid particles, small oil storage tank
	测量范围 Measurement range	20米 20 meters
	过程连接 Process Connection	G11/2螺纹或11/2NPT G11/2 screw thread or 11/2NPT
	介质温度 Medium Temperature	-40~120℃
	过程压力 Process Pressure	-1.0~3bar
	重复性 Repeatability	±2mm
	精度 Accuracy	< 0.1%
	频率范围 Frequency Range	6.8GHz
	防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
	信 号 输 出 Signal Output	4~20mA/HART（两线） 4~20mA/HART (two-wire)

 TKWL-1202	应　用 Application	存储或过程容器腐蚀性的液体、浆料、固体。 比如：水液储罐,酸碱储罐,浆料储罐,固体颗粒，小型储油罐 store or process container corrosive liquids, pastes and solids, such as water tank, acid storage tank, paste storage tank, solid particles and small oil storage tank
	测量范围 Measurement range	20米 20 meters
	过程连接 Process Connection	法兰 Flange
	介质温度 Medium Temperature	-40~150℃
	过程压力 Process Pressure	-1.0~20bar
	重复性 Repeatability	±2mm
	精度 Accuracy	< 0.1%
	频率范围 Frequency Range	6.8GHz
	防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
	信 号 输 出 Signal Output	4~20mA/HART（两线） 4~20mA/HART (two-wire)



TKWL-1203

应　用 Application	适应各种存储容器或过程计量环境，液体、浆料、固体。 比如：原油、轻油储罐，原煤、粉煤仓位，挥发性液体储罐，焦碳料位，浆料储罐，固体颗粒 Suitable for all kinds of storage containers or process measurement environment, liquids, pastes and solids, for example, crude oil, light oil tank, raw coal, pulverized coal position, volatile liquid storage tank, coke level, paste storage tank, solid particles.
测量范围 Measurement range	35米 35meters
过程连接 Process Connection	法兰 Flange
介质温度 Medium Temperature	-40~250℃
过程压力 Process Pressure	-1.0~40bar
重复性 Repeatability	±2mm
精度 Accuracy	< 0.1%
频率范围 Frequency Range	6.8GHz
防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
信 号 输 出 Signal Output	4~20mA/HART（两线） 4~20mA/HART (two-wire)



TKWL-1204

应　用 Application	适用于粉状料，固体颗粒，块状料的测量 Suitable for the measurement of powder material, solid particles and bulk material
测量范围 Measurement range	35米 35 meters
过程连接 Process Connection	万向法兰 Universal flange
介质温度 Medium Temperature	-40~250℃
过程压力 Process Pressure	-1.0~3bar
重复性 Repeatability	±2mm
精度 Accuracy	< 0.1%
频率范围 Frequency Range	6.8GHz
防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
信 号 输 出 Signal Output	4~20mA/HART（两线） 4~20mA/HART (two-wire)

 TKWL-1205	应 用 Application	适用于低介电常数液体和带搅拌器的液体储罐测量 Suitable for liquid storage tank measurement with low dielectric constant liquid and liquid with stirrer
	测量范围 Measurement range	0-30米可选 0-30 meters optional
	过程连接 Process Connection	法兰 Flange
	介质温度 Medium Temperature	-40~250℃
	过程压力 Process Pressure	-1.0~20bar
	重复性 Repeatability	±2mm
	精度 Accuracy	< 0.1%
	频率范围 Frequency Range	6.8GHz
	防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
	信 号 输 出 Signal Output	4~20mA/HART (两线) 4~20mA/HART (two-wire)

 TKWL-1206	应 用 Application	适用于高炉料位，较厚罐顶的储罐和安装短管较高的工况测量 Suitable for measurements for material level of blast furnace, storage tank with thicker tank roof and working conditions with higher short installation tube
	测量范围 Measurement range	35米 35 meters
	过程连接 Process Connection	法兰 Flange
	介质温度 Medium Temperature	-40~250℃
	过程压力 Process Pressure	-1.0~40bar
	重复性 Repeatability	±2mm
	精度 Accuracy	< 0.1%
	频率范围 Frequency Range	6.8GHz
	防爆/防护等级 Explosion-proof/ protection Class	Exia IIC T6/IP67
	信 号 输 出 Signal Output	4~20mA/HART (两线) 4~20mA/HART (two-wire)

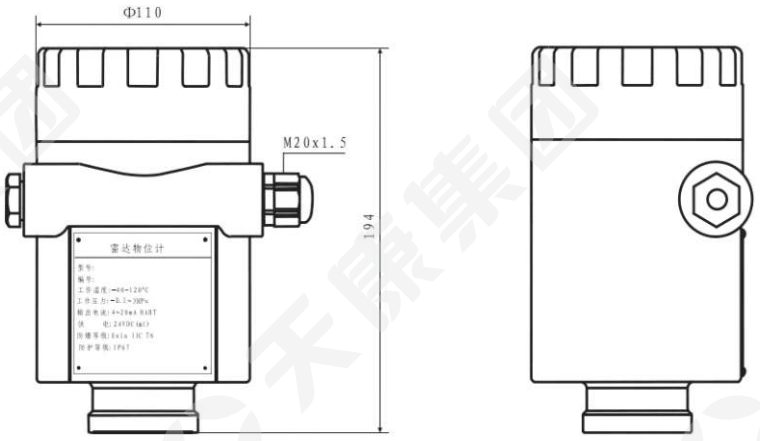
五、产品系列尺寸

Dimensions of products series

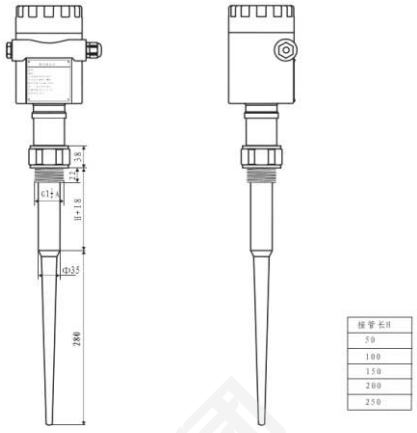
外壳

Shell

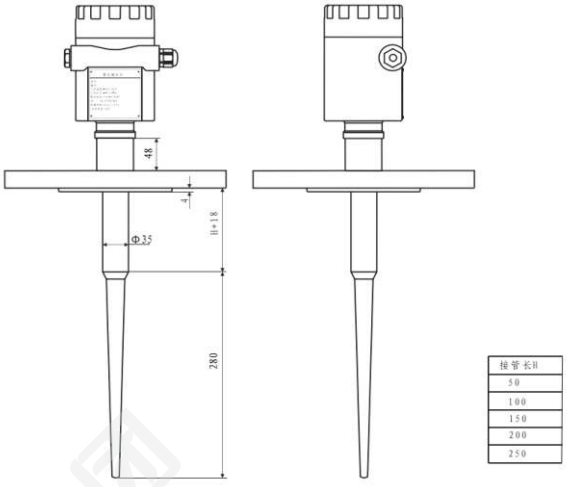
材质：AL/316L
Material: AL/316L



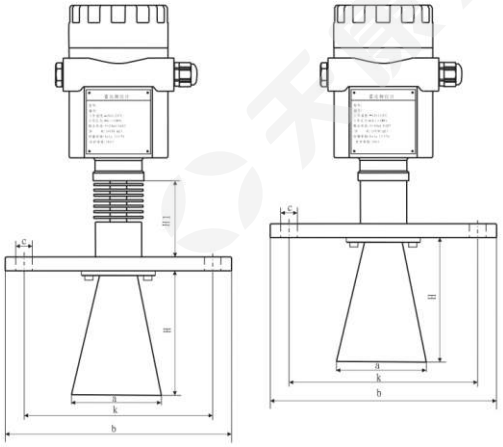
TKWL-1201螺纹型
TKWL-1201 Screw Thread model



TKWL-1202法兰型
TKWL-1202 flange model



TKWL-1202 Flange model



	n	k	b	c	H	H1
DN50		Φ125	Φ165	Φ18x4		125
DN80	Φ76	Φ160	Φ200	Φ18x8	75	125
DN100	Φ96	Φ180	Φ220	Φ18x8	120	125
DN150	Φ146	Φ240	Φ285	Φ22x8	205	125
DN200	Φ196	Φ295	Φ340	Φ22x12	296	125
DN250	Φ242	Φ355	Φ405	Φ26x12	380	125

六、技术参数

1、基本参数

工作频率：6.8GHz；

波束角： 24°RD51，Rd52；

20°RD53，带DN150法兰；

16°RD53，带DN200法兰；

14°RD53，带DN250法兰；

测量范围：0~35m；

重复性：±2mm；

分辨率：1mm；

采样：回波采样55次/s；

响应速度：>0.2s（根据具体使用情况而定）；

电流信号：4~20mA；

精度：<0.1%。

2、天线材质

RD51：PP或PTFE；

RD52：PTFE；

Rd53：Stainless steel。

3、通讯接口

HART通讯协议。

4、过程连接

RD51（PP，PTFE棒式天线）：G11/2A或11/2NPT；

RD52（PTFE棒式天线）：翻边法兰DN50、DN80、DN100、DN150、DN200、DN250；

RD53（喇叭口形式天线）：法兰DN50、DN80、DN100、DN150、DN200、DN250。

5、电源

电源：24V DC(±10%)；

波纹电压：1Vpp；

耗电量：max22.5mA。

6、环境条件

温度：-40℃~+70℃；

容器压力（表压）-1~4MPa。

7、防爆认证

ExiaIICT6。

8、外科保护等级

Ip67。

9、两线制接线

供电和信号输出共用一根两芯导线。

10、电缆入口

2个M20*1.5或2个1/2NPT（电缆直径5...9mm）。

Technical parameter

1.Basic parameters

Work frequency: 6.8GHz

Beam angle:24°RD51，Rd52

20°RD53 with DN150 flange

16°RD53 with DN200 flange

14°RD53 with DN250 flange

Measurement range: 0...35m

Repeatability: ±2mm

Resolution: 1mm

Sampling: echo sampling 55 times/s

Response speed: >0.2s

(Based on specific situations)

Current signal: 4...20mA

Accuracy: <0.1%

2.Antenna material

Rd51 ： PP or PTFE

RD52 ： PTFE

Rd53 ： Stainless steel

3.Communication interface

HART communication protocol

4.Process connection

Rd51 (PP，PTFE rod antenna) ：G11/2A or 11/2NPT

RD52(PTFE rod antenna) ：flange DN50、DN80、DN100、DN150、DN200、DN250

RD53(horn form antenna)：flange DN50、DN80、DN100、DN150、DN200、DN250

5.Power

Power: 24V DC(+/-10%), ripple voltage: 1Vpp

Electricity consumption: max22.5mA

6.Environmental condition

Temperature: -40℃~+70℃

Container pressure (meter pressure) -1~4MPa

7.Explosion proof certification

ExiaIICT6

8.Shell protection class

Ip67

9.Two-wire connection

Power supply and signal output use the same two-core wire

10.Cable entrance

2M20*1.5 or 2 1/2NPT (cable diameter 5...9mm)

七、产品选型 Products Selection

TKWL-1201									
量程 (mm) **Measuring range (mm)**									
编程器 **Programmer** 带 With 不带 Without		B X							
现场显示 **Status display** 带 With 不带 Without			V X						
电缆进线 **Cable inlet wire** M20*1.5 ½NPT				M N					
外壳/防护等级 **Shell/protection grade** 铝/IP67 Aluminum/IP67 塑料/IP66 Plastics/IP66					L P				
容器接管长度 **Length of container connection tube** 50mm 100mm 150mm 200mm 250mm 特殊约定 Special agreement						A B C D E Y			
过程连接 **Process connection** 螺纹 G1½A Screw thread G1½A 螺纹 1½NPT Screw thread 1½NPT 不锈钢法兰 DN50 PN16C型 Stainless steel flange DN50 PN16C model 不锈钢法兰 DN80 PN16C型 Stainless steel flange DN80 PN16C model 不锈钢法兰 DN100 PN16C型 Stainless steel flange DN100 PN16C model 不锈钢法兰 DN150 PN16C型 Stainless steel flange DN150 PN16C model 不锈钢法兰 DN200 PN16C型 Stainless steel flange DN200 PN16C model 不锈钢法兰 DN250 PN16C型 Stainless steel flange DN250 PN16C model							G N A B C D E F		
天线形式/材料/过程温度 **Antenna forms/ materials/process temperature** SP 塑料棒/PP/-40~100℃SP Plastic rod/PP/-40~100℃ SF 塑料棒/PTFE/-40~120℃SF Plastic rod/PTFE/-40~120℃									

防爆形式
Anti-explosion type

标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC	P
本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC	I
本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC	D

TKWL-1202										
量程 (mm) **Measuring range (mm)**										
编程器 **Programmer** 带 With B 不带 Without X										
现场显示 **Status display** 带 With V 不带 Without X										
电缆进线 **Cable inlet wire** M20*1.5 M ½NPT N										
外壳/防护等级 **Shell/protection grade** 铝/IP67 Aluminum/IP67 L 塑料/IP66 Plastics/IP66 P										
密封温度 **Seal temperature** 普通密封-40~100℃ Common seal -40~100℃ P 高温密封-40~150℃带散热器 High temperature seal -40~150℃ with radiator G										
过程连接 **Process connection** 万向节法兰DN150 Universal flange Dn150 D 万向节法兰DN200 Universal flange Dn200 E 万向节法兰DN250 Universal flange Dn250 F 特殊约定 Special agreement Y										
容器接管长度 **Length of container connection tube** 50mm A 100mm B 150mm C 200mm D 250mm E 特殊约定 Special agreement Y										
天线形式/材料/过程温度 **Antenna forms/ materials/process temperature** SP 塑料棒/PP/-40~100℃SP Plastic rod/PP/-40~100℃ SF 塑料棒/PTFE/-40~120℃SF Plastic rod/PTFE/-40~120℃										
防爆形式 **Anti-explosion type** 标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC P Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC I Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC D Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC										

TKWL-1203										
量程 (mm) **Measuring range (mm)**										
编程器 Programmer 带 With 不带 Without		B X								
现场显示 Status display 带 With 不带 Without			V X							
电缆进线 Cable inlet wire M20*1.5 ½NPT				M N						
外壳/防护等级 Shell/protection grade 铝/IP67 Aluminum/IP67 塑料/IP66 Plastics/IP66					L P					
密封/过程温度 Seal/process temperature 普通密封-40~100℃ Common seal -40~100℃ 高温密封-40~150℃带散热器 High temperature seal -40~150℃ with radiator						P G				
天线延长管 Antenna extension tube 无 No 200mm 300mm 400mm							1 2 3 4			
天线型式/材料 Antenna type/material 导波管/不锈钢316L Stilling well/stainless steel 316L 喇叭天线76mm/不锈钢316 Horn antenna 76mm/stainless steel 316 喇叭天线96mm/不锈钢316 Horn antenna 96mm/ stainless steel 316 喇叭天线146mm/不锈钢316 Horn antenna 146mm/ stainless steel 316 喇叭天线196mm/不锈钢316 Horn antenna 196mm/ stainless steel 316 喇叭天线242mm/不锈钢316 Horn antenna 242mm/ stainless steel 316								A B C D E F		
过程连接 **Process connection** 法兰DN50 PN16 C型 Flange DN50 PN16 C model 法兰DN80PN16 C型 Flange DN80PN16 C model 法兰DN100PN16 C型 Flange DN100 PN16 C model 法兰DN150PN16 C型 Flange DN150 PN16 C model 法兰DN200 PN16 C型 Flange DN200 PN16 C model 法兰DN250 PN16 C型 Flange DN250 PN16 C model G21/2A 特殊约定 Special agreement									A B C D E F G Y	
防爆形式 **Anti-explosion type** 标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC										P I D

TKWL-1204									
量程 (mm) **Measuring range (mm)**									
编程器 Programmer 带 With 不带 Without		B X							
现场显示 Status display 带 With 不带 Without			V X						
电缆进线 Cable inlet wire M20*1.5 ½NPT				M N					
外壳/防护等级/天线防护等级 **Shell/protection class/antennaprotection class** 铝/IP67 Aluminum/IP67 塑料/IP66 Plastics/IP66					L P				
密封 Seal temperature 普通密封-40~100℃ Common seal -40~100℃ 高温密封-40~150℃带散热器 High temperature seal -40~150℃ with radiator						P G			
天线延长管 Antenna extension tube 无 No 200mm 300mm 400mm							1 2 3 4		
过程连接 **Process connection** 法兰DN50 PN16 C型 Flange DN50 PN16 C model 法兰DN80 PN16 C型 Flange DN80 PN16 C model 法兰DN100 PN16 C型 Flange DN100 PN16 C model 特殊约定 Special agreement								A B C D	
防爆形式 **Anti-explosion type** 标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC									P I D

TKWL-1205									
量程 (mm) **Measuring range (mm)**									
编程器 Programmer 带 With 不带 Without		B X							
现场显示 Status display 带 With 不带 Without			V X						
电缆进线 Cable inlet wire M20*1.5 ½NPT				M N					
外壳/防护等级/天线防护等级 **Shell/protection class/antennaprotection class** 铝/IP67 Aluminum/IP67 塑料/IP65 Plastics/IP65					L P				
密封温度 **Seal temperature** 普通密封-40~100℃ Common seal -40~100℃ 高温密封-40~150℃带散热器 High temperature seal -40~150℃ with radiator						P G			
天线型式/材料 **Antenna type/material** DN50导波管/不锈钢316 DN50 Stilling well /stainless steel 316 DN80导波管/不锈钢316 DN80 Stilling well / stainless steel 316 DN100导波管/不锈钢316 DN100 Stilling well / stainless steel 316							A B C		
过程连接 **Process connection** 法兰DN50 PN16 C型 Flange DN50 PN16 C model 法兰DN80PN16 C型 Flange DN80PN16 C model 法兰DN100PN16 C型 Flange DN100 PN16 C model 特殊约定 Special agreement								A B C D	
防爆形式 **Anti-explosion type** 标准型（非防爆）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC									P I D

TKWL-1206										
量程 (mm) **Measuring range (mm)**										
编程器 Programmer 带 With 不带 Without		B X								
现场显示 Status display 带 With 不带 Without			V X							
电缆进线 Cable inlet wire M20*1.5 ½NPT				M N						
外壳/防护等级/天线防护等级 **Shell/protection class/antennaprotection class** 铝/IP67 Aluminum/IP67 塑料/IP66 Plastics/IP66					L P					
密封温度 Seal temperature 普通密封-40~100℃ Common seal -40-100℃ 高温密封-40~250℃带散热片 High temperature seal -40~250℃ with radiator						P G				
天线延长管 Antenna extension tube 1000mm 1500mm 2000mm 2500mm 3000mm							1 2 3 4 5			
天线型式/材料 Antenna type/material 喇叭天线146mm/不锈钢316 Horn antenna 146mm/stainless steel 316 喇叭天线196mm/不锈钢316 Horn antenna 196mm/stainless steel 316 喇叭天线242mm/不锈钢316 Horn antenna 242mm/stainless steel 316								D E F		
过程连接 **Process connection** 法兰DN150 PN16 C型 Flange DN150 PN16 C model 法兰DN200 PN16 C型 Flange DN200 PN16 C model 法兰DN250 PN16 C型 Flange DN250 PN16 C model 特殊约定 Special agreement									A B C D	
防爆形式 **Anti-explosion type** 标准型(非防爆)电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型（ExiaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC 本安型+隔爆型（Exd iaIICT6）电流信号输出（4~20mA）HRAT协议24VDC Standard type (not explosion proof) Current signal output (4~20mA), HRAT protocol 24VDC										P I D