

致用户：

尊敬的用户：

非常感谢您购买本公司的产品，在使用流量计前，请按以下步骤操作：

- 第一步：检查产品外包装是否完好无损。若损坏严重，应立即与运输部门交涉，并请致电本公司；
- 第二步：打开产品外包装，清点包装箱里的部件是否齐全，流量计外表有无损坏；
- 第三步：请仔细阅读本使用手册，并完全理解其内容，若有不明白的地方请致电本公司；
- 第四步：重新确认所购流量计是否符合实际工况(流量、压力、温度)；
- 第五步：在办公室给流量计接上电源，观察显示是否正常；
- 第六步：正确选择安装点，确认安装点是否符合要求；
- 第七步：将流量计移至安装现场，按要求安装好流量计；
- 第八步：将电源接好，分体安装的请特别注意屏蔽层是否牢固地接在传感器的接地端，屏蔽线的布线是否正确；
- 第九步：接通电源，慢慢地打开阀门，先观察流量计周围是否泄露(请注意人身安全)，再观察显示仪是否有瞬时流量变化。若不正常，请先按以上步骤全部仔细检查一遍，特别是接线是否接错、电源是否正确、屏蔽层是否接地、屏蔽线接线是否正确、流量是否符合要求、周围环境是否符合要求等，否则请致电本公司售后服务部。

希望我们的产品和服务能给您带来效益和价值。

再次感谢您的帮助和支持！

您可信赖的朋友

Respected User:

Thank you so much for purchased our products, when you get it, please following the steps:

1. Check the package is ok, if it is broken, please contact to the deliverer, and call us.
 2. When you open the package, make sure everything is in it, whether the flow meter is ok.
 3. Read through this instruction book, if there is any question, please call us.
 4. Confirm the flow meter you get, can fit your actually needs, (flow range, pressure, temperature)
 5. Power the flow meter before you implement it, check whether the flow meter can work.
 6. Chose the right place for installation where this instruction book tells you.
 7. Install the flow meter following the instruction book.
 8. Wiring the power line, if you use the LUGB-A remote type, please wiring the lines as noticed.
 9. Power on, and open the valve slowly. First check the Leak Detection, then the display of the flow meter (any changing of instantaneous flow).
- If you followed these steps and do nothing wrong, Then the flow meter will working good. If you found anything irregular, Please check the steps again, especially the wiring, you have problem, no hesitate to call us.

Wish our product and service can bring you well benefit and value.

Thanks again for your support!

Your trustworthy friend

► 工作原理 operational principle

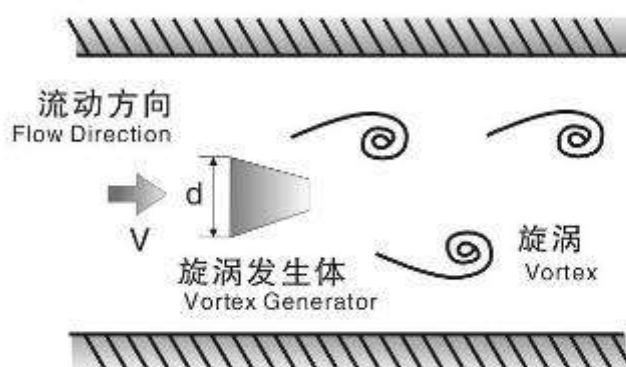
在测量管中垂直插入一个柱状物时，流体通过柱状两侧就交替地产生有规则的旋涡(如下所示)，这种旋涡被称为卡门涡街。卡门涡街的释放频率与流体的流动速度及柱状物的宽度有关，可用下式表示：

When a column body placed in flowing fluids in pipe, a series of vortices will be generated alternately on each side of the object as shown as below, these eddies known as "KARMAN VORTICES", the frequency of the vortex shedding is related to the velocity of the fluid and the width of the body. Expressed by formula as below:

$$f = St \cdot v/d$$

式中：f——卡门涡街的释放频率；
st——系数(称为斯特罗哈数)；
v——流速；
d——柱状物的宽度。

While: f——frequency of karman vortex shedding;
st——coefficient(STROUHAL Number);
v——Velocity;
d——width of the pillar-shaped object.



卡门涡街释放频率f和流速v成正比，因此通过测量卡门涡街释放频率就可算出瞬时流量。

斯特罗哈数是涡街流量计的重要系数，旋涡的释放频率与流速成正比，所以检出频率f就可求得流速v，由v求出体积流量。

Strouhal number is an important coefficient for a vortex flowmeter. Within a certain scope of reynolds number, Strouhal number is close to the constant, as following figure. the vortex releasing frequency is in a direct ratio with the velocity. The velocity V can be obtained once the frequency f is measured, so as to get the value of the volume flow via V.

BRLU系列涡街流量传感器的旋涡释放频率是由旋涡交替地作用于检测传感器(探头)上的应力通过它在内部的压电元件来检出的，传感器将信号送转换器放大整形后得到与流速成线性比例的脉冲信号直接输出或将其转换成4~20mA标准信号输出，流量Q与频率f的关系如下式：

BRLU series of vortex flowmeters are a type of stress-based vortex flowmeters; their vortex releasing frequencies of the sensors are measured by testing the internal piezoelectric elements of the sensors. A amplifier is to carry out amplifying, filtering and shaping of the weak electrical signals to the testing components, and then put out pulse signals that are in a direct ration with the velocity or convert the signals to be 4~20mA signals. flow Q and frequency f expressed by formula as below:

$$Q = \frac{f}{K}$$

式中：Q——瞬时流量(升/秒) f——频率(Hz) K——仪表常数(次/升)

While: Q——instantaneous flowrate(L/s) f——Frequency (Hz) K——meter factor (n/L)

► 技术参数 technical parameters

测量介质 Fluid	饱和蒸汽, 过热蒸汽, 气体, 液体 Saturated Vapor, super-heated steam, gas, liquid
口径规格 Inner Diameter	常规口径Normally: DN25~DN300 可定制口径customize: DN15~DN500 ;
流速范围 Velocity	气体, 蒸汽 Gas, steam: 7~70m/s 液体Liquid: 0.7~7m/s ;
精度等级 Correctness	气体, 蒸汽 Gas, steam: 1.5级 Grade 1.5 液体Liquid: 1.0级 Grade 1.0
重 复 性 Repeatability	气体, 蒸汽 Gas, steam: 0.5% 液体Liquid: 0.3%
工作压力 Rated Pressure	2.5Mpa
流体温度 Rated Pressure	一体型: -20~150℃ 分体型: -40~250℃
结构类型 Type of stucture	LUGB-L 一体型; LUGB-A 温压补偿型; LUGB-D 普通分体型; LUGB-H 热量计量型
表体材料 Body Material	DN25~DN100----304不锈钢 304Stainless steel; ≥DN125-----304不锈钢或WCB碳钢 304Stainless steel or WCB carbon steel
探头材料 Detecting Probe Material	316L 不锈钢 316L Stainless steel
法兰材料 Flange Material	304不锈钢 或 WCB碳钢 304Stainless steel or WCB Carbon steel
垫片材料 Gasket Material	耐高温石棉垫, 丁腈橡胶垫片, 石墨垫片 asbestos gasket, rubber gasket, graphite gasket
输出信号 Output Signal	脉冲, 4~20mA, Rs485, U盘, HART等, pulse output, 4~20mA, RS485, U disk, HART
工作环境 Environmnet	温度 Temperture: -35℃~60℃, 湿度Humidity: 5%~95%
防护等级 Protection Grade	Ip65 exible t1~t5
压力损失 Pressure loss	$\Delta P = 1.1 \cdot r \cdot V^2$ ΔP : 压力损失pa; V=流速m/s; r=流体重度kgf/m
工作电源 Power supply	3.6V 锂电池供电 (一体型) 3.6V Li battery (instant display)
	12V Dc供电
	220Vac 电源供电

注: 一体型智能涡街流量计可在三种供电方法中任选供电, 其他型号只能220V供电。
Vortex Flowmeter can chose any of 3 ways of power supply, other type only use the 220V.

► 如何正确选型 Model selection

仪表的选型是仪表应用中非常重要的工作，有关资料表明，仪表在实际应用中2/3的故障是仪表的错误选型或错误的安装而造成的，选型的时候，请认真考虑流量是否处于仪表的最佳工作范围（上限流量的1/2~2/3处）。

It is very important to select right meter model in flowrate measurement. Many relative information points out that meter using problems happened in application, two thirds is due to wrong selection meter model and installation. Right selection of meter model should be according to the following table:

the velocity limit is within the applicable flow range of measurement. (Best range is 1/2~2/3 of up limits)

测量饱和蒸汽的范围

Flowrate Measurement of Saturated Steam

流量测量范围（吨/每小时） Flowrate Measurement Range(t/h)

内径(mm) Diameter	0.2MPa	0.3MPa	0.4MPa	0.5MPa	0.6MPa	0.7MPa	0.8MPa
25	18~115kg/h	20~150kg/h	23~185kg/h	25~220kg/h	27~255kg/h	28~290kg/h	30~320kg/h
32	30~190kg/h	34~245kg/h	37~300kg/h	41~360kg/h	44~415kg/h	47~470kg/h	49~530kg/h
40	46~295kg/h	52~385kg/h	58~475kg/h	64~560kg/h	68~650kg/h	73~740kg/h	77~830kg/h
50	72~460kg/h	82~600kg/h	91~740kg/h	0.100~0.880	0.110~1.020	0.110~1.160	0.120~1.290
65	0.121~0.775	0.138~1.010	0.154~1.250	0.170~1.480	0.180~1.720	0.190~1.950	0.200~2.180
80	0.183~1.170	0.210~1.550	0.233~1.895	0.260~2.200	0.270~2.600	0.290~2.960	0.310~3.300
100	0.286~1.850	0.328~2.400	0.364~2.960	0.400~3.500	0.430~4.100	0.460~4.620	0.480~5.160
125	0.448~2.860	0.512~3.750	0.569~4.650	0.630~5.470	0.670~6.360	0.710~7.220	0.750~8.060
150	0.645~4.120	0.738~5.400	0.819~6.660	0.900~7.880	0.960~9.160	1.020~10.40	1.080~11.60
200	1.150~7.130	1.310~9.600	1.460~11.80	1.600~14.00	1.710~16.30	1.820~18.50	1.920~20.60
250	1.790~11.40	2.050~15.00	2.280~18.50	2.500~21.90	2.670~25.40	2.840~28.90	3.010~32.30
300	2.580~16.50	2.950~21.60	3.280~26.60	3.600~31.50	3.840~36.60	4.100~41.60	4.330~46.40
350	3.510~22.40	4.020~29.40	4.460~36.30	4.900~42.90	5.230~50.00	5.570~56.60	5.900~63.20
400	4.580~29.30	5.250~38.40	5.830~47.40	6.400~56.00	6.830~65.10	7.280~74.00	7.700~82.60
450	5.800~37.10	6.640~48.60	7.370~60.00	8.100~70.90	8.650~82.40	9.210~93.60	9.740~104.5
500	7.160~45.80	8.200~60.00	9.100~74.00	10.00~87.50	10.70~101.8	11.40~115.5	12.00~129.0

内径(mm)	0.9MPa	1.0MPa	1.1MPa	1.2MPa	1.3MPa	1.4MPa	1.5MPa
25	32~360kg/h	33~390kg/h	34~425kg/h	36~460kg/h	37~490kg/h	38~530kg/h	40~560kg/h
32	52~585kg/h	54~640kg/h	56~700kg/h	59~750kg/h	61~810kg/h	63~860kg/h	65~920kg/h
40	81~910kg/h	85~1000kg/h	88~1090kg/h	92~1.170kg/h	95~1260kg/h	98~1350kg/h	0.100~1.430
50	0.130~1.430	0.130~1.560	0.140~1.700	0.140~1.840	0.150~1.970	0.150~2.110	0.160~2.240
65	0.210~2.410	0.220~2.640	0.230~2.870	0.240~3.100	0.250~3.330	0.260~3.560	0.270~3.970
80	0.320~3.650	0.340~4.000	0.350~4.350	0.370~4.700	0.380~5.040	0.390~5.390	0.410~5.730
100	0.510~5.710	0.530~6.250	0.550~6.800	0.570~7.340	0.590~7.880	0.610~8.420	0.630~8.960
125	0.790~8.920	0.830~9.770	0.860~10.60	0.900~11.50	0.930~12.30	0.960~13.20	0.990~14.00
150	1.140~12.80	1.190~14.10	1.240~15.30	1.290~16.50	1.340~17.70	1.380~18.90	1.430~20.20
200	2.020~22.80	2.120~25.00	2.200~27.20	2.290~39.40	2.380~31.50	2.460~33.70	2.540~35.80
250	3.160~35.70	3.310~39.10	3.440~42.50	3.580~45.90	3.710~49.30	3.840~52.60	3.960~56.00
300	4.550~51.40	4.770~56.30	4.950~61.20	5.160~66.10	5.350~70.90	5.530~75.80	5.710~80.60
350	6.200~70.00	6.490~76.60	6.740~83.30	7.020~89.90	7.280~96.50	7.520~103.1	7.770~109.8
400	8.100~91.40	8.480~100.0	8.800~108.8	9.170~117.4	9.500~126.1	9.820~134.7	10.10~143.4
450	10.20~115.6	10.70~126.6	11.10~137.7	11.60~148.6	12.00~159.6	12.40~170.5	12.80~181.4
500	12.70~142.8	13.30~156.3	13.80~170.0	14.30~183.5	14.90~197.0	15.40~210.5	15.90~224.0

注：根据上表选择的口径不一定与实际管道通径一致，如不同时连接异形管，并留有选定口径的必要直管长度。

Note: If the diameter from table above is different from your actually one, please use converging tube, and should be enough straight tubes for flowmeter.

测量过热蒸汽和液体的范围

Flowrate Measurement of Super-Heated Steam and Liquid

内 径(mm)	测量过热蒸汽质量的流量范围(t/h) Super-Heated Steam (t/h)	测量液体体积的流量范围(m ³ /h) Liquid (m ³ /h)
25	14.063/ρ kg/h~70.684/ρ kg/h	0.9~12
32	23.043/ρ kg/h~115.80/ρ kg/h	1.5~20
40	36.005/ρ kg/h~180.94/ρ kg/h	2.5~30
50	56.257/ρ kg/h~282.73/ρ kg/h	3.5~50
65	95.075/ρ kg/h~477.81/ρ kg/h	6~80
80	144.02/ρ kg/h~723.77/ρ kg/h	10~126
100	225.03/ρ kg/h~1.1309/ρ	15~200
125	351.61/ρ kg/h~1.7670/ρ	28~310
150	506.31/ρ kg/h~2.5445/ρ	40~445
200	900.12/ρ kg/h~4.5236/ρ	75~790
250	1.4064/ρ ~7.0681/ρ	100~1237
300	2.0253/ρ ~10.178/ρ	200~1780
350	2.7566/ρ ~13.854/ρ	270~2430
400	3.6005/ρ ~18.094/ρ	360~3170
450	4.5568/ρ ~22.901/ρ	450~4100
500	5.6257/ρ ~28.273/ρ	560~4950
ρ 为工作状态下的过热蒸汽密度kg/m ³ 参见附录里面<过热蒸汽密度表>		常温常压下水的密度=1000Kg/m ³ Density of water=1000Kg/m ³

测量气体的范围

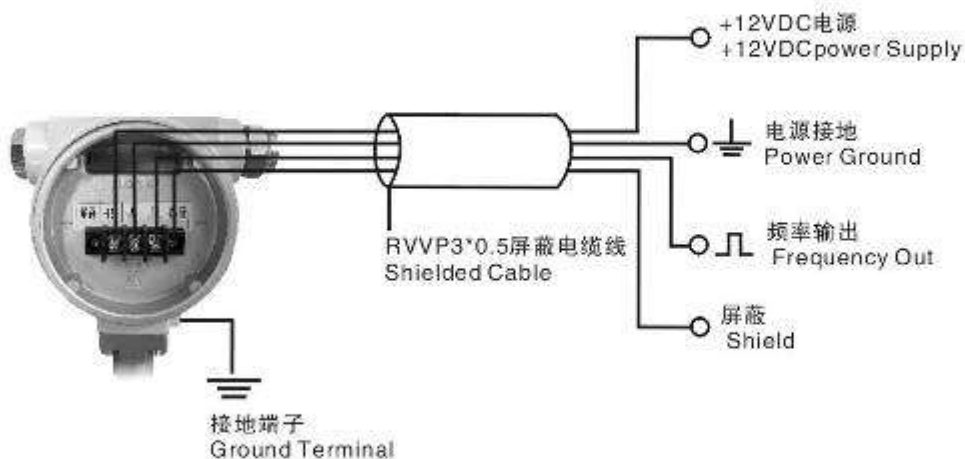
Flowrate Measurement of Gas

内 径(mm) Diameter	测量气体(标准状态)体积的流量范围(Nm ³ /min) Standard Status Gas	测量气体(工作状态)体积的流量范围(m ³ /h) Working Status Gas
25	0.2344k/ρ ~1.470K	7~88
32	0.3841k/ρ ~2.410K	10~145
40	0.6001k/ρ ~3.770K	16~220
50	0.9376/ρ ~5.890K	25~353
65	1.5846k/ρ ~9.950K	42~600
80	2.4003k/ρ ~15.10K	63~900
100	3.7505k/ρ ~23.60K	100~1400
125	5.8602k/ρ ~36.80K	155~2200
150	8.4385k/ρ ~53.00K	222~2800
200	15.002k/ρ ~94.20K	400~5100
250	23.440k/ρ ~147.3K	700~7950
300	33.755k/ρ ~212.0K	1000~10100
350	45.943k/ρ ~288.6K	1700~15000
400	60.008k/ρ ~377K	2260~18000
450	75.947k/ρ ~477.1K	2860~22900
500	93.762k/ρ ~589.0K	3540~28200
ρ 为工作状态下的气体密度kg/m ³ $K = \frac{P+0.101325}{0.101325} \times \frac{293.15}{t+273.15}$ 式中: P为工作压力(表压)MPa t为介质工作温度℃		常温常压空气, t=20℃, P=0.1Mpa 气体密度 ρ =1.205kg/m ³

► 涡街流量计结构组成 Structures of Vortex Flowmeter

涡街流量传感器主要由传感器（内有放大板）、支架、漩涡发生器组件（内有三角柱、探头）和表体组成，如右图所示

Structure of Vortex Flowmeter consists of a converter (with a amplifier), a support, components of vortex generator (included a triangular prism and a probe) as well as the bulk. See the left:



注：所有分体型涡街流量计，均采用以上方法接线。
NOTE: All remote type vortex flowmeter, using the way above.



普通分体型涡街流量计



冷热计量型涡街流量计



温压补偿型涡街流量计

■ 涡街流量计的安装要求 Installation Requirements of Vortex Flowmeter

本仪表采用法兰夹装式（又叫对夹式、夹持式），拧紧长螺栓用两片法兰夹住传感器。
法兰凹部套传感器，法兰凸部套用户管，安装步骤如下：

- 1、先计算好安装尺寸；
- 2、将与要安装的管道放在锯床上锯开，并修好锯口；
- 3、将法兰套在管道上，固定好后先点焊，再整圈焊好，检查是否完好；
- 4、重复上一步，将另一边法兰焊好；
- 5、将焊好法兰的管道移到安装现场，把管道与传感器安装成一体，再安装在管线上；
- 6、检查各环节是否完好，慢慢打开阀门，观察是否有泄漏。

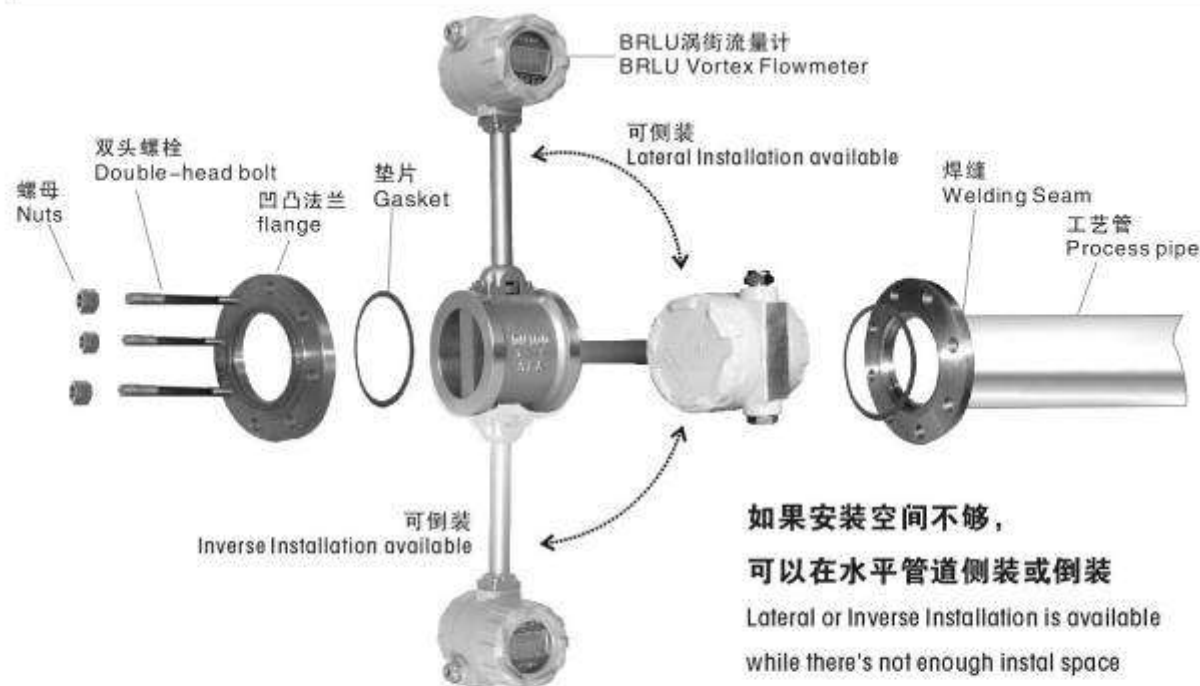
BRLU Vortex Flowmeter employs flange clamped (wafer type). Tighten long bolts and clamp transducer with pieces of flange.
Concave side connects with transducer and convex side connects with customer's pipe. Installing procedure in detail is as follow:

1. First calculate the size for Flowmeter installation;
2. Place the pipe to be mounted on sawing machine to cut-off and debur the kerf;
3. Connect flange with pipe, then fix and spot-weld, next weld all-around. Last check if perfect;
4. Repeat steps above, weld another flange;
5. Move the pipe with flange welded to installing site, mount the pipe with transducer, then install it on the pipeline;
6. Check if everything is OK, then open the valve slowly and check if leakage occurs.

▽ 特别注意Caution:

- ① 流体流向必须与传感器表体上的流向箭头保持一致；
- ② 安装传感器时，在法兰或管道的焊接过程中，传感器须不在管道上，以免损坏传感器的电子放大电路；
- ③ 传感器两边的法兰必须保持平行，否则容易泄露。

- ① Flowing Direction must be conformed with the arrow on the transducer.
- ② During welding pipe or flange, flowmeter should not be placed on the pipe to avoid damage the electronic amplifier unit.
- ③ Flanges on both side of transducer must be parallel, or will leak.



无论测量何种流体，传感器可以在水平管道上侧装，这样流体的温度对放大器的影响较小。

Whatever the measured fluid is, Lateral installation is recommended, for fluid temperature have less influence to converter.

一般情况下不推荐倒装方法。此安装方法不适用于测量一般气体、过热蒸汽。

Generally, Inverse installation is not commended, not suitable for common gases and super-heated steam.

涡街流量计的安装要求 Installation Requirements of Vortex Flowmeter

应避开强电力设备，高频设备，强电源开关设备；避开高温热源和辐射源的影响，避开强烈震动场所和强腐蚀环境等。同时要考虑安装维修方便。

Avoid high voltage equipments, high frequency equipments and high voltage switches; keep away from high temperatures and heat resources; avoid sites with violent vibrations and strongly corrosive environments and take easy installations into considerations.



- 若流量计安装点的上游有大于 $>15^\circ$ 渐缩管，则流量计上游直管段 $\geq 15D$ ，下游直管段 $\geq 5D$ ；
 If there is any converging tube that is $>15^\circ$ on the upper reach of the sensor installation location, then the straight tube on the upper reach should be $\geq 15D$, and that on the lower reach should be $\geq 5D$;



- 若流量计安装点的上游有大于 $>15^\circ$ 渐扩管，则流量计上游直管段 $\geq 18D$ ，下游直管段 $\geq 5D$ ；
 If there is any diverging tube that is $>15^\circ$ on the upper reach of the sensor installation location, then the straight tube on the upper reach should be $\geq 18D$, and that on the lower reach should be $\geq 5D$;



- 若流量计安装点的上游有 90° 弯头或T型接头，则流量计上游直管段 $\geq 20D$ ，下游直管段 $\geq 5D$ ；
 If there is any 90° elbow or T-joint on the upper reach of the sensor installation location, then the straight tube on the upper reach should be $\geq 20D$, and that on the lower reach should be $\geq 5D$;



- 若流量计安装点的上游在同一平面上有二个 90° 弯头，则流量计上游直管段 $\geq 25D$ ，下游直管段 $\geq 5D$ ；
 If there is two 90° elbow on the same plane of the upper reach of the sensor installation location, then the straight tube on the upper reach should be $\geq 25D$, and that on the lower reach should be $\geq 5D$;



- 若流量计安装点的上游在不同平面上有二个 90° 弯头，则流量计上游直管段 $\geq 40D$ ，下游直管段 $\geq 5D$ ；
 If there is two 90° elbow on the different plane of the upper reach of the sensor installation location, then the straight tube on the upper reach should be $\geq 40D$, and that on the lower reach should be $\geq 5D$;



- 调节阀应安装在流量计下游 $5D$ 以后，若必须安装在流量计上游，则流量计上游直管段 $\geq 50D$ ，下游直管段 $\geq 5D$ ；
 The regulating valve should be assembled at a location more than $5D$ behind the flowmeter. If it is assembled on the upper reach of the flowmeter, the straight tube forward should be $50D$, and $5D$ behind.



- 测量液体流量时，若被测液体中含有少量的气体，流量计应安装在管路的较低处。
 In measurements of liquid flow, if a small amount of liquid exist in the measured gas, the sensor should be installed in a location higher than the pipeline.



- 测蒸汽或其它气体，流量计应安装在管路的较高处。
 In measurements of liquid flow, if a little gas is contained in the measured liquid, the sensor should be assembled in a location lower than the pipeline.



- 测量气体流量时，传感器可以安装在垂直管道上，流向不限。若被测气体中含有少量的液体，气体流向应由下向上。测量液体流量时，液体流向应由下向上：这样不会将液体重量额外附加在探头上。
 In measurements of gas flow, flowmeter can be installed in a vertical pipe without any limit to flow directions, if the measured gas contains a little liquid, the gas flow should be top to down. In measurements of liquid flow, the liquid flow should be down to up, so the weight of the liquid will not be add to the probe additionally.

涡街流量计的安装要求 Installation Requirements of Vortex Flowmeter



- 流量计尽量避免安装在振动较强的管道上，特别是横向震动。若不得已安装时，必须采取减震措施，可在流量计上下游2D处设置管道紧固装置。

Try to avoid any installation of the flowmeter on violent vibration pipe, especially horizontal vibrations. If no other way, vibration reducing measures must be taken. fix tightening devices at the 2D locations on the upper and lower reaches of the flowmeter.

特别注意Caution:

- ① 在锅炉蒸汽出口处流速不均匀，不能安装流量计，应安装在储气罐前后。
Flowmeter can't instal at the steam exit of the boiler, but on the pipe behind air tank.
- ② 在空气压缩机出口处振动较强，不能安装流量计，应安装在储气罐之后。
Flowmeter can't instal at the output of air compressor, but on the pipe behind air tank.

- 测量高温蒸汽时，有绝热材料把蒸汽管道周围包起来防止散热，这时要注意切勿用绝热材料把流量计的支架包起来，最多不超过支架的高度的三分之一，流量计表体可用保温材料包裹。

When measure high temperature steam, wrap pipe with heat insulating material to avoid heat dissipation. Pay attention not to cover bracket totally with heat insulating material, with height no more than 1/3 of bracket. Transducer body can be covered by heat insulating material.

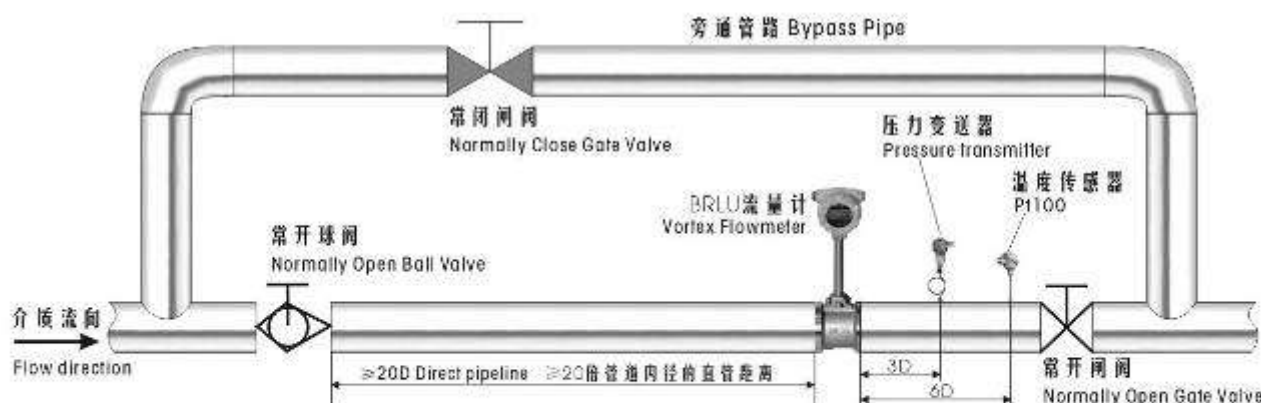
测压点和测压点的选择：Selections of the pressure detecting point and temperature measuring point

- 根据测量的需要，需在流量计附近测量压力和温度时，特别是BRLU-A温压补偿型涡街流量计的安装。

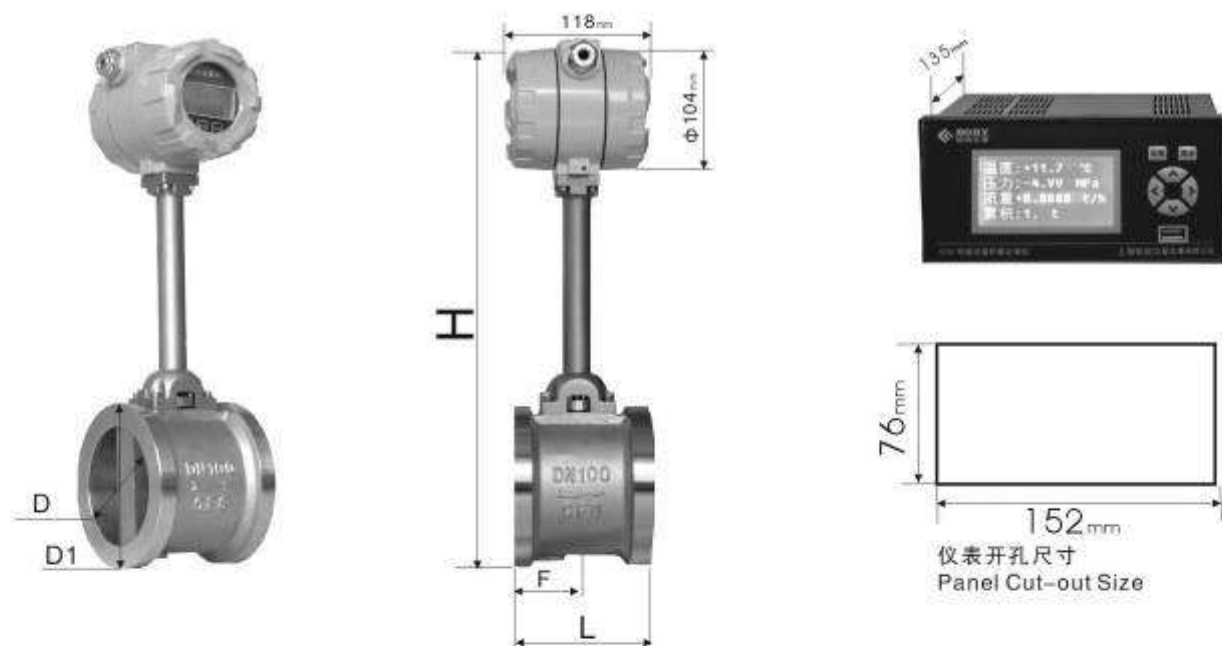
测压点应在流量计下游的3-5D处，测温点应在流量计下游的6-8D处。

According to needs of measurements, when it needs to measure the pressure and temperature near the senso, especially for installation of BRLU-A vortex flowmeter. The pressure detecting point should near at a location 3-5D behind the flowmeter, and the temperature measuring point should be at a location 6-8D away from the lower reach of the sensor.

- 为了方便流量计的维护，需要安装旁通管路，特别是管道需要清洗，或者仪表需要维修的情况。
For convenient maintenance, it had better install a by-pass pipe for transducer. In addition, in pipeline needed cleaning or if the fluid in pipeline cannot be shut down for meter checking, the by-pass pipe must be mounted.



► 流量计的外形尺寸 Overall Dimension of Vortex Flowmeter



渦街传感器的安裝尺寸

Dimension of BRLU Vortex Flowmeter

单位unit: mm

传感器型号	D	D1	F	L	H
Dn25	25	63	45	80	373
Dn32	32	70	45	80	380
Dn40	40	78	45	80	388
Dn50	50	88	45	80	398
Dn65	65	105	50	88	415
Dn80	80	120	58	96	430
Dn100	100	140	68	114	450
Dn125	125	165	80	132	475
Dn150	150	190	92	152	500
Dn200	200	244	112	188	554
Dn250	250	294	135	178	656
Dn300	300	344	152	216	719

► 流量计型号说明 model of flowmeter

规格代码 Model code		说明 instruction	
LUGB-		涡街流量计vortex flowmeter	
仪表种类 Flowmeter type	A	温压补偿型涡街流量计 compensation type vortex flowmeter	
	D	远传分体型涡街流量计 remote type vortex flowmeter	
	H	冷热量计量型涡街流量计 Heat & Cold quantity type vortex flowmeter	
	K	定量控制型涡街流量计 controlling type vortex flowmeter	
	L	一体化型涡街流量计 compact type vortex flowmeter	
	Y	压力补偿型涡街流量计 Pressure compensation type vortex flowmeter	
壳体材料	-C	WCB碳钢 Carbon steel	
body materials	-F	304不锈钢 304 stainless steel ≤DN100	
传感器口径 Nominal diameter	-25	Dn 25	
	-32	Dn32	
	-40	Dn40	
	-50	Dn50	
	-65	Dn65	
	-80	Dn80	
	-100	Dn100	
	-125	Dn125	
	-150	Dn150	
	-200	Dn200	
	-250	Dn250	
	-300	Dn300	
工作压力 Pressure rating	-1.6	1.6Mpa	≤DN100
	-2.5	2.5Mpa	
	-0	特殊要求	Special required
介质温度 temperature	E	≤160℃	BRLU-L 一体化涡街流量计
	H	≤250℃	中温型
	S	≤300℃	高温型
配对法兰螺栓材质 Auxiliary flange & fasteners material	-C	WCB碳钢 Carbon steel	
	-F	304不锈钢 304 stainless steel	
通讯接口 communication	0	无	
	1	RS485	
	2	RS232	标准配置 Standard configuration
	3	HART	
	4	4-20mA	
	5	U盘	SD CARD
电源 Power supply	0	220VAV 50Hz	
	1	12VDC	
	2	3.6V	内置电池 inner battery
被测介质 medium	S	液体	Liquid
	Y	油	oil
	Q	气体	air
	Z	蒸汽	steam
防爆类别 Anti-explosion	无注	No sign	非防爆 non-anti-explosive
	EX	Ex sign	防爆 anti-explosive

► 一体化涡街流量计compact vortex flowmeter:

打开涡街流量计传感器的后端盖，接通内置电池，流量计即可工作。

Open the back cover of flowmeter, connect the inner battery, then flowmeter can work.



► 打开涡街流量计传感器的前端玻璃盖，可见此面板。
Open the front glass cover of flowmeter, can see this panel.

瞬时流量Q

Instantaneous Flowrate Q

量程棒条

Flowrate Range Show

累积流量

Cumulate Flowrate

$$\text{瞬时流量} \quad Q = \frac{3.6 \times Fr(\text{频率}) \times dE(\text{密度})}{U(\text{流量系数})}$$

Instantaneous Flowrate

按键: Keys:	自动测量状态按键功能: Keys Function for measuring type:	参数设定状态按键功能: Keys Function for parameters setting:
	显示瞬时流量或累积流量 Display Instantaneous or Cumulate Flowrate	使设定字 (闪烁字) 移位 Move the setting number (winkly)
	显示涡街频率 Display frequency of Vortex flowmeter	使设定字 (闪烁字) 增数 Add the setting number (winkly)
	依次显示频率(Fr), 温度(C), 补偿密度(dE), 密度补偿方式(Ur), 设定密度(dEn), 流量系数(U), 阻尼系数(Lr), 流量上限(Fh), 流量下限(FL), 累积量清零(Un)等。 Show content in proper order of Frequency, Temperature, compensated density dE, compensate type Ur, density dEn, Meter Factor U, Damping Factor Lr, Flowrate High limit Fh, Flowrate Low Limit FL, Cumulate Reset Un.	确认并翻页 Confirm and turn to the next setting

► 流量计的显示



流量显示 Flowrate Display

五位瞬时量,
5Numbers Instantaneous Flowrate
八位累积量
8Numbers Instantaneous Flowrate



频率显示 Frequency Display

单位: **Hz**
Unit:

瞬时量单位: 立方米每小时 m³/h 或 吨每小时 t/h
累积量单位: 立方米 m³ 或 吨 t



温度显示 Temperature Display

单位: **°C**
Unit:



补偿密度显示 Compensated Density Display

单位: **t/m³**
Unit:

► 一体化涡街流量计的参数设置 Parameter setting

先按下 **内容**，再同时按下 **频率** 则进入设定状态，这时显示屏出现“Ur”的闪烁字，由此可通过 **累积** 来移动位置，用 **频率** 对闪烁字改变，用 **内容** 确认和翻页来依次完成以下参数的设定。所有的参数设定完成以后，

Position, use **频率** to add numbers, use **内容** to confirm and turn next page until setting done. When all the parameter setting, Push **内容**, & also push **频率** down, can quit setting, and into working status.

Ur--
1.000000

密度补偿方式 Compensate type Ur

Ur=1.000000
Ur=3.000000

设置密度 Density Identified
温度补偿密度 Temperature Compensated Density

dEn--
1.000000

设置密度显示 Density Identified

单位: t/m^3
Unit:

只有在密度补偿方式为设置密度 (Ur=1) 的情况下才有效，请根据实际压力温度值参考附录表设置此项参数。
Please seting according to the Density Table on the appendix, and it only work when the compensate type is Density Identified (Ur=1)

U---
3.600000

流量系数 Meter Factor

单位: n/L
Unit:

请查看传感器铭牌或产品合格证获得此项参数。
Please get this Factor from the Brand or Certification of the flowmeter

Lr--
1.000000

阻尼系数 Damping Factor

单位: 秒 S
Unit:

设置该项来调节瞬时流量的稳定度，数值越大，流量越稳定，反应越滞后。数值1~9有效。
Setting this factor to adjust stabilization of Flowrate, bigger the number, more stable the flowrate, and more delay the reflection. (1~9 is valuable.)

Fh--
345.0000

流量上限 Flowrate High limit

单位: m^3/h
Unit:

流量上限设定，为4~20mA中20mA的输出对应值。
High limit equal to the 20mA output value of 4~20mA output.

FL--
0.000000

流量下限 Flowrate low limit

单位: m^3/h
Unit:

流量下限即小信号切除点，为4~20mA中4mA的输出对应值。当实际流量小于该设定时，瞬时流量显示为零，不累积。
Low limit is Small Signal Elimination, which equal to the 4mA output value of 4~20mA output. When actual flowrate under this setting, Instantaneous flowrate will be zero, and don't be accumulated.

Un--
4321.0000

累积量清零 Totalizer reset

单位: m^3
Unit:

在设定状态下输入“4321.000”，按内容键，可将累积量清零。
Enter 4321.000 in parameter setting mode, push the right button, the cumulate flowrate will be reset.

■ 一体化涡街流量计4~20mA信号输出

4~20mA信号输出的涡街流量计，是在原有的一体化涡街流量计的功能上，增加了4~20mA电流输出的功能，为两线制的电流信号输出，需要24V直流外供电。

4~20mA Vortex Flowmeter, is based on LUGB-L vortex flowmeter, and has 4~20mA Current output. It's Double line way current signal output, and need 24V DC power supply.

在显示内容和编程设定上面，会比基础功能多出以下数据。

More data setting will show than basic one on display and parameter setting.



输出流量显示

Output Current Value

单位: mA
Unit:

瞬时流量转换为4~20mA信号输出的电流值。

The Current Value of 4~20mA from Instantaneous Flowrate.



电流满度校验

20mA adjustment

校验4~20mA中满度的电流毫安值。

注意：产品出厂前均已校验，非专业人士不得操作。

Adjust the highest output current valve in 4~20mA0.

Warning: all had been adjusted Pre Delivery, just for expert operation.



电流零度校验

4mA adjustment

校验4~20mA中零度的电流毫安值。

注意：产品出厂前均已校验，非专业人士不得操作。

Adjust the lowest output current valve in 4~20mA0.

Warning: all had been adjusted Pre Delivery, just for expert operation.

■ 一体化涡街流量计的接线 Wiring

1.放大板上的S,T接线柱 接涡街流量计的探头信号线。

S,T wiring terminal on Amplifier Board connect sensor signal wire.

2.转换板上的接线柱，请按如下说明操作：

Wiring terminal on Convert Board, please connect as follow instruction:

24+	DC24V电源正极 positive pole of 24VDC
24-	DC24V电源负极 negative pole of 24VDC
GND	放大板的频率输出地，同下面的GND为通路 Frequency Output Ground of Amplifier Board
FOUT	转换板频率输出 Frequency Output from Convert Board
T+	Pt100铂电阻输入端1 input of Pt100
T-	Pt100铂电阻输入端2 input of Pt100
FIN+	放大板频率输出 Frequency Output from Amplifier Board
GND	转换板给放大板的电源负极 Power Ground of Convert Board to Amplifier Board
+5V	转换板给放大板的+5V电源 5V Power supply of Convert Board to Amplifier Board

▽ 特别注意Caution:

1.流量小于设定的“流量下限”，当作小信号切除，不显示流量。

Flowmeter don't work when actual flowrate lower than Flowrate low limit.

2.液晶屏工作环境温度为0~50℃。

Ambient temperature for LCD screen is 0~50℃

3.屏幕出现闪烁，表示电池电量不足，应更换电池。

Change the inner Li battery when LCD Screen get glimmer.

4.可配温度压力补偿，但需在订货时注明。

Temperature and Pressure Compensate is available, but should be noticed in order.

▶ 涡街流量计不能正常工作原因及处理方法 Trouble Shooting

故障现象 Symptom	可能原因 Reasons	处理方法 Trouble shooting
仪表无显示 Display is blank	1)电源接错或电源线松动 Supply connected with reverse polarity or loose 2)供电电压不对 Supply voltage is not available 3)显示屏损坏 Display screen damaged	1)连接电源 Connection the power supply correct and well greased 2)调整供电电压，一体化涡街为3.6V直流供电 Supply voltage is 3.6VDC or 220VAC 3)更换显示屏 Change a display screen
通电后无介质流动时有流量显示 None zero flow indicated when no actual flow in the pipe	1)输入屏蔽或接地不良，引入自激频率 Improper earthing, or not shield. 2)仪表靠近强电设备或高频脉冲干扰源 Disturb by heavy current installation nearby 3)管道有较强振动 Excessive mechanical vibration in the pipe 4)转换器灵敏度过高 Too high sensitivity of converter 5)管道阀门有泄露 Valve leakage	1)改善屏蔽与接地，排除电磁干扰 The protective earth PE terminal should be properly grounded. 2)远离干扰源安装，采取隔离措施加强电源滤波 Change the installation position 3)采取减震措施，加强信号滤波降低放大器灵敏度 Support the pipeline near the flowmeter perpendicular to both the axis of pipe and the axis of bluff body. 4)降低灵敏度，提高触发电平 Lower the sensitivity of converter, 5)检修阀门 Check Valve leakage and repair it.
通电通流后无流量显示 Flowrate indicated is 0.0 even with flow in the pipe	1)电源出故障 Power Supply mistake 2)输入信号线断线 Vortex signal cable disconnected or not properly connected. 3)放大器或检测探头元件损坏 Converter trouble or Vortex sensor damage 4)无流量或流量过小达不到该口径测量范围 Flowrate too low to measure 5)管道堵塞或阀门损坏	1)检查电源与接地 Check the power supply 2)检查信号线与接线端子 Check the signal cable 3)检测工作点，检查元器件 Check the converter and the vortex sensor 4)增大流量或缩小管径 Increase the flowrate or reduce the pipeline diameter 5)检查清理管道，清洗传感器 Clean the pipe and check the valve
流量显示不规则不稳定(实际流量稳定，流量计显示波动很大)	1)有较强电干扰信号 Disturb by heavy current installation nearby 2)传感器灵敏度过高 Too sensitive measuring 3)传感器受损或引线接触不良 Vortex sensor damaged or terminal loose 4)介质出现两相流或脉动流 two-phase flow or pulsating flow in measurement. 5)管道震动的影响 mechanical vibration in the pipe 6)直管段不够或管道内径与流量计内径不一致 too short flow development length or inner diameter of pipe is different from flowmeter's 7)传感器安装不同心或密封垫凸入管内 Disalignment of flowmeter and pipeline, or gaskets at the meter are protruding into pipe bore.	1)加强屏蔽和接地 Grounding earth or change installation position 2)降低增益，提高触发电平 Reduce sensitive 3)检查传感器及引线 Check the vortex sensor and well greased the cable 4)加强工艺过程管理，消除两相流或脉动流现象 Change the production process to avoid two-phase flow and pulsating flow. 5)采取减震措施 Reduce the vibration 6)调整安装位置，保证前方20D直管。 Change the installation, at least 20D pipe length upstream. 7)检查安装情况，改正密封垫内径 Check the installation, gaskets must not project into effective cross-section of the pipe

故障现象 Symptom	可能原因 Reasons	处理方法 Trouble shooting
flowrate indicate change abnormity which the actual flow in the pipe is steady	8)介质流向不正确 Wrong direction of flow direction 9)上下游阀门扰动 Disturbe from the vavle 10)流体未充满管道 Underfilling the pipe 11)发生体有缠绕物 Vortex Sensor wrapped by something 12)存在气穴现象 air pocket in the pipe	8)保持介质流量同流量计箭头方向一致 Check the flow direction & direction of arrow in the primary 9)加长直管段或加装流动调整器 More pipe length upstream and downstream 10)更换装流量传感器地点和方式 Fill the pipe wholly, or change the installation 11)消除缠绕物 Clear the pipe 12)降低流速, 增加管内压力 Reduce the flowrate, and increase the pressure
测量误差大 Big error in measurement	1)直管段长度不足 Insufficient upstream/downstream pipe lengths 2)模拟转换电路零漂或满量程调整不对 Programming mistake 3)供电电压变化过大 Too high power supply voltage 4)仪表超过检定周期 Too long time usage of flowmeter 5)传感器与配管内径差异较大 Differentiated inner diameter 6)安装不同心或密封垫凸入管内 Disalignment of flowmeter and pipeline, or gaskets at the meter are protruding into pipe bore. 7)传感器沾污或损伤 Vortex sensor damage 8)有两相流或脉动流 two-phase flow or pulsating flow in measurement. 9)管道泄漏 pipe leakage	1)加长直管段或加装流动调整器 More pipe length upstream and downstream 2)校正零点和量程刻度 reprogramming 3)检查电源 check the power supply 4)返厂标定 calibration the flowmeter 5)检查配管内径, 修正仪表系数 check the inner diameter or correction factor 6)调整安装, 修整密封垫 Check the installation, gaskets must not project into effective cross-section of the pipe 7)清洗更换传感器 Clean or change a vortex sensor 8)排除两相流或脉动流 Change the production process to avoid two-phase flow and pulsating flow. 9)排除泄漏 Debar leakage
测量管泄漏 Flowmeter leakage	1)管内压力过高 Too high pressure 2)公称压力选择不对 Wrong chose pressure rate 3)密封件损坏 Damage of seal components 4)传感器被腐蚀 Flowmeter is ERODED	1)调整管压, 更改安装位置 Change the pressure 2)选用高一档公称压力传感器 Chose higher pressure rate flowmeter 3)更换密封件 Change the seal components 4)采取防腐和保护措施 Change the material of flowmeter or need protection
传感器发出异常声响 Abnormal sound from the flowmeter	1)流速过高, 引起强烈颤动 Too high flow speed bring the noise 2)产生气穴现象 air pocket in the pipe 3)发生体松动 vortex sensor get loosening	1)调整流量或更换通径大的仪表 Change the flow speed or have a bigger flowmeter 2)调整流量和增加液流压力 Reduce the flowrate, and increase the pressure 3)紧固发生体 Fastening the vortex sensor