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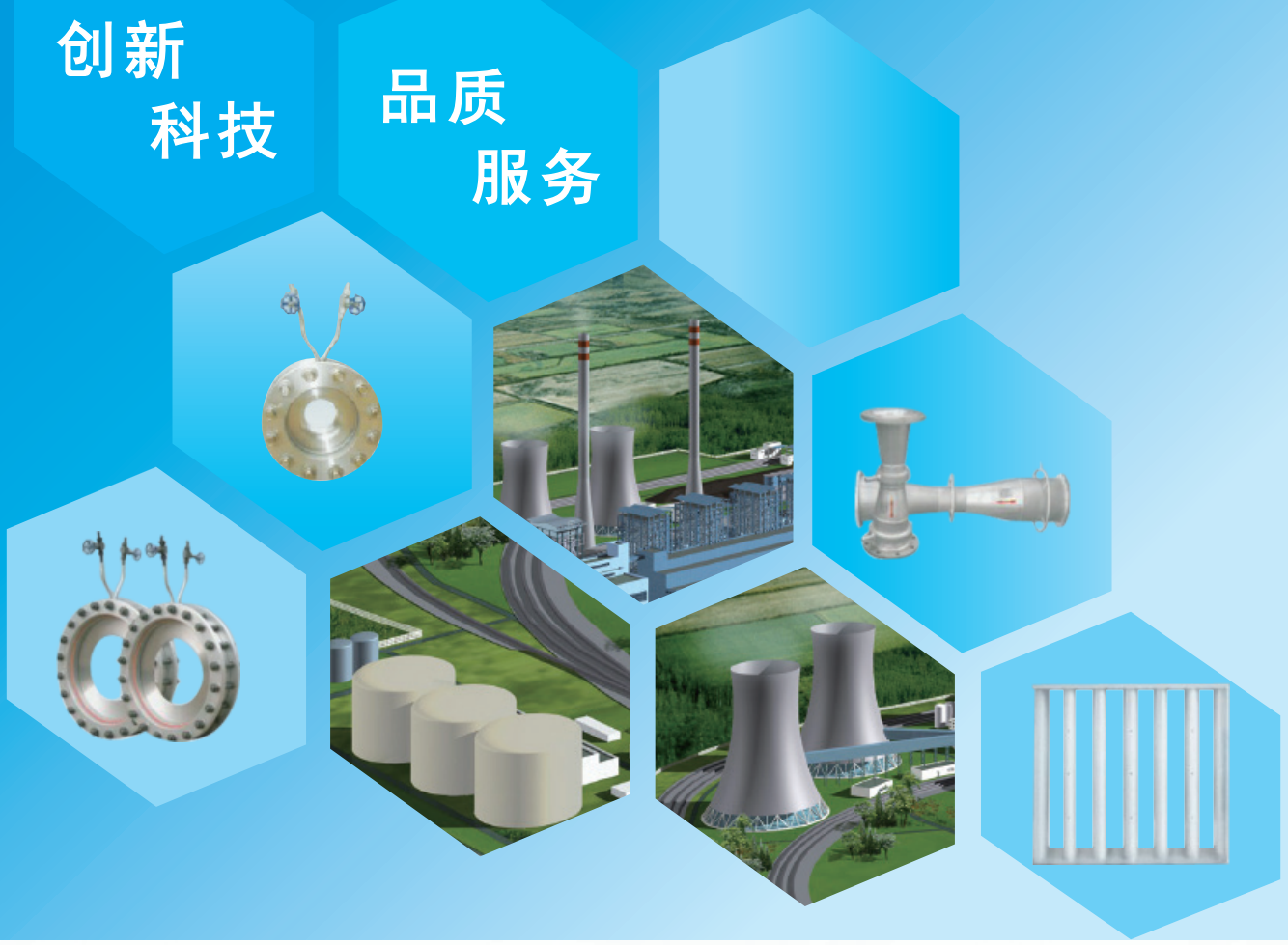


节流元件产品说明书

*使用产品前请阅读使用说明书

和利时集团

HollySys Group

HollySys

公司简介 >>>

杭州和利时自动化有限公司成立于 2003 年 9 月，是国内最大的自动化系统制造商 – 和利时集团子公司，专业从事过程自动化业务。杭州和利时自动化系统工程有限公司是杭州和利时自动化有限公司的全资子公司，致力于工业自动化仪表产品的研发和制造，是目前国内集成技术领先的自控系统集成商。

杭州和利时公司 HOLLIAS 工业控制平台下拥有一系列先进、实用、可靠的工业自动化系统以及和利时品牌的自动化仪表产品，系统产品包括 MACS–K、MACS–S 工业控制系统 DCS，DEH、ETS、SIS 等专业控制系统，生产企业的全过程信息化软件。仪表产品包括隔离式安装栅、信号隔离器、浪涌保护器、电量变送器、压力变送器、电磁流量计、金属管浮子流量计、磁性液位计、雷达物位计、节流元件、热元件及压力表等。

公司产品已成功应用于重大工程、关键装备中，包括 1000MW 超临界大型火电机组、120 万吨尿素、500 万吨炼油主装置，在业界树立了良好的声誉。

公司具有强大的自动化控制系统集成和工程实施能力，能为广大企业的自控系统的新建项目以及技术改造项目提供和利时自主产品、电气仪表成套、自控设计咨询、现场安装与调试等全方位的工程服务。

目　录

1. 概述 Resume

本公司设计标准采用国家标准 GB/T2624–2006、 国际标准 ISO5167–2003 及其他相关的标准，检验标准采用 JJG640–94 及相应的国家和国际标准。

Our company adopts GB/T2624–2006、ISO5167–2003 and other relevant standards. It adopts JJG640–94 and the relevant national or international standards as the inspection standards.

本公司生产的节流元件——标准孔板、ISA1932 喷嘴、长径喷嘴、经典文丘里管和文丘里喷嘴等，采用整套角接取压，法兰取压、D–D/2 径距取压及其他特殊取压等取压方式，不需要进行标定，除非在精度要求较高时，可根据要求进行个别标定。我公司除生产上述标准节流元件外，还生产目前国内普通应用的各种特殊的节流元件，如机翼型测风装置、1/4 圆孔板（喷嘴）、偏心孔板、圆缺孔板等 30 多种品种，1000 多种规格，管径从 DN6–5000mm，压力最高 PN42.0Mpa(2500#), 温度范围 –196℃ ~ 1200℃。本公司可向用户提供包括节流件、取压装置、连接法兰、引压管、阀和紧固件等）及附件（冷凝器、沉降器、集气器、平衡器、隔离器等）外，还生产多（单）级节流孔板、高温节流杆等电站用管道杂项组件，亦可根据用户需要单独提供各种节流件和取压装置等，同时亦可按提供图纸要求来图或来样加工配套供货。

The various kinds of throttling elements produced by our company such as orifice plates, ISA 1932 Nozzle, Long Radius Nozzle, classic venturi tubes and venturi Nozzle etc. with Angular contact, flange, and D–D/2 taps pressure taking mode. They don't need to be calibrated,except high accuracy requirements. We also supplies special throttling elements such as airfoil type volume measuring elements,1/4 circle orifice plate(nozzle), excenric orifice plate,segmental orifice plate,etc,over 30 kinds and more 1000 specifications of products may be offered for pipe size from DN6 to 5000mm,max. Pressure PN42.0MPa(2500 Class),and temp. from –196 ℃ to 1200 ℃ .We will supply complete set including the primary element,tappings, flanges,pressure lines,valves,and fittings.By order,some essential accessories as condenser,balancer,gas chambers,etc.We can also offer in accordance with clients requirement.

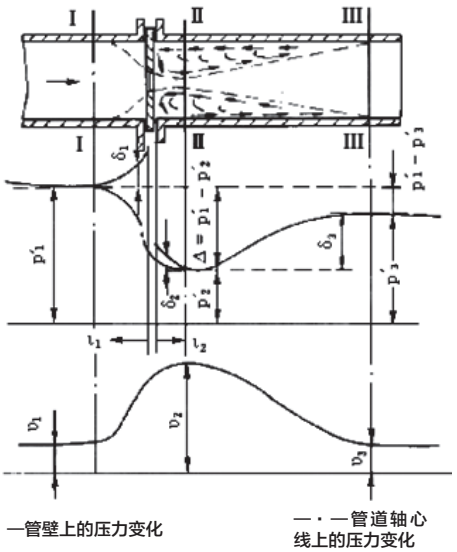
本公司生产的节流元件用于流量测量和控制，与差压计或差压变送器配套构成差压式流量计，该流量计在石油、化工、冶金、电力、轻纺、食品、军工、科研等工业部门的生产过程中，用来进行流体（液体、气体和蒸气）的流量测量、控制和调节。它具有结构简单，维护方便、使用可靠、性能稳定、测量精度高等优点，因此，在各工业部门得到最广泛的应用，它占整个流量仪表的百分之七十左右。

The throttling elements made by the company, together with the differential pressure meters or transmitters, can be widely used in petrochemical plant,metallurgical,power plants,textile,food industrial,refineries,etc,for flow measurement and control of all kinds of fluid such as liquid, gas and steam, with advantages of simple structure,easy maintenance,high reliability,stable characteristics and accurate measurement. it uses widely in industrial sectors and its occupancy reached about 70% in whole flow instruments.

2. 工作原理 Working Principle

2.1 基本原理 Basic Principle

充满管道的流体，当它流经管道内的节流件时，如图 1 所示，流速将在节流件处形成局部收缩，因而流速增加，静压力降低，于是在节流件前后便产生了压差。流体流量愈大，产生的压差愈大，这样可依据压差来衡量流量的大小。这种测量方法是以流动连续性方程 (质量守恒定律) 和伯努利方程 (能量守恒定律) 为基础的。压差的大小不仅与流量还与其他许多因素有关，例如当节流装置形式或管道内流体的物理性质 (密度、粘度) 不同时，在同样大小的流量下产生的压差也是不同的。



孔板附近的流速和压力分布
Flow Rate And Pressure Distribution Nearby Orifice Plate

When the fluid is flowing through the throttling element within the pipeline,the flux will be narrowed partially in throttling throat to increase the flow rate and reduce the static pressure,therefore,the deviation of static pressure (or called differential pressure) between the front part and the rear part of the throttling element shall be formed. The more flow rate,the larger diff. Pres., by measuring the diff. Pres., you can evaluate flow passing through device.

The measurement method is based on law of conservation of matter and energy. The diff. Pres. not only relates to flow, but also other factors. Such as, if throttling device type or fluid physical properties is different, the diff. Pres. is different in the same flow.

2.2 流量方程 Flow Equation

$$Qm = \frac{C}{\sqrt{1-\beta^4}} \times \varepsilon \times \frac{\pi}{4} \times d^2 \times \sqrt{2\Delta P \times \rho}$$

$$Qv = \frac{Qm}{\rho}$$

式中：

in which:

Qm — 质量流量 Kg/s
Mass rate of flow

C — 流出系数
Coefficient of discharge

ε — 流束膨胀系数
Expansibility factor

d — 工作条件下节流件的孔径 m
Diamter of orifice (or throat) of primary device at working conditions

ρ — 上游流体密度 Kg/m^3
Density of the fluid

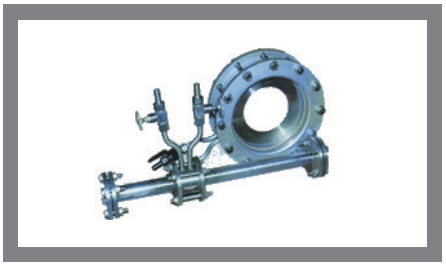
Qv — 体积流量（工况） m^3/s
Volume rate of flow at working conditions

β — 直径比，β=d/D
Diamter ratio

△P — 差压 Pa
Differential pressure

D — 工作条件下上游管道内径 m
Upstream internal pipe diameter at working conditions

3. 主要产品图片 Main Products Picture



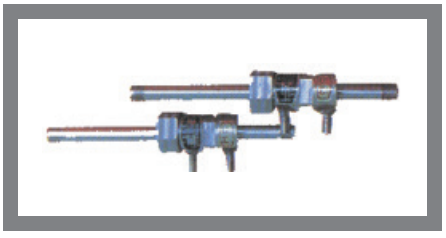
标准孔板或 ISA1932 喷嘴平焊法兰组件
standard orifice plate or ISA1932 nozzle with downward welding flange component

长径喷嘴 long radius nozzle

紧固式八槽孔板或八槽喷嘴
tightening type 8 slots orifice plate or nozzle

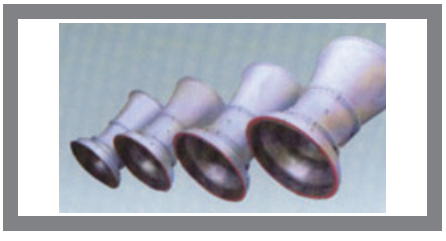
高压透镜孔板
high pressure orifice plate with lens washer

焊接式八槽孔板或八槽喷嘴
welding type 8 slots orifice plate or nozzle

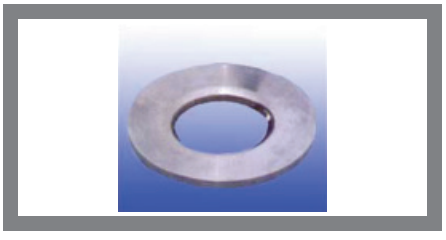


内藏小孔板
inner small orifice plate

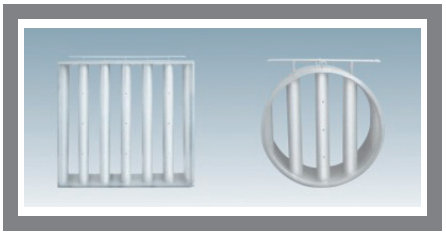
文丘里管 classic venturi tube



文丘里喷嘴 venturi nozzle

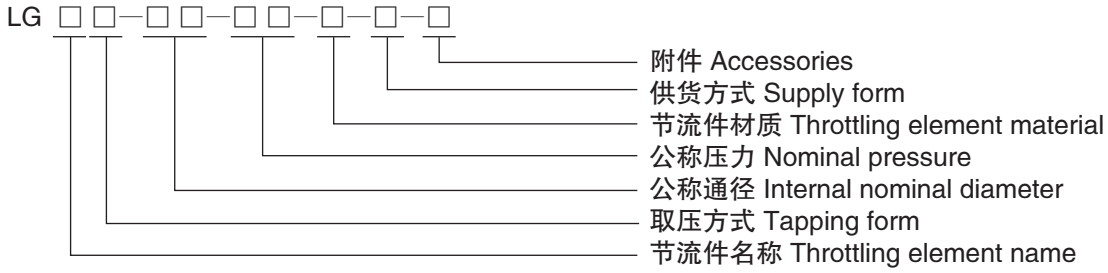


1/4 圆孔板 1/4 circle orifice plate(nozzle)



机翼型测风装置 airfoil type volume measuring device

4. 型号说明 Model Instruction



4.1 节流件名称 Throttling Element Name

代号 Code	名称 Name	代号 Code	名称 Name	代号 Code	名称 Name
A	限流孔板 Restriction orifice	K	宽边孔板 Wide edge orifice plate	R	锥形入口孔板 Fastigiate entry orifice plate
B	标准孔板 standard orifice	L	文丘里喷嘴 Venturi Nozzle	S	双重文丘里管 double-tier venturi tube
C	长径喷嘴 long radius nozzle	M	小孔板 Small orifice plate	T	机加工文丘里管 mechanical processed venturi tube
D	端头孔板（喷嘴） orifice(nozzle) without upstream or downstream pipe	N	内藏孔板 Inner small orifice plate	W	粗焊铁板文丘里管 rough welding iron plate venturi tube
E	1/4 圆孔板（喷嘴） 1/4 circle orifice plate(Nozzle)	O	偏心孔板 excenric orifice plate	X	粗铸文丘里管 rough molten venturi tube
G	透境垫孔板 high pressure orifice plate with lens washer	P	ISA1932 喷嘴 ISA1932 Nozzle	Y	双重孔板 double-tier orifice plate
J	机翼测风装置 airfoil type volume measuring device	Q	圆缺孔板 segmental orifice plate		

4.2 取压方式 Tapping Form

代号 Code	H	Z	F	J	T
名称 Name	角接（环室）取压 corner (ring chamber) tappings	角接（钻孔）取压 corner (single drill) tappings	法兰取压 flange tappings	径距取压 D-D/2 tappings	特殊取压 Special tappings

4.3 公称通径 Internal Nominal Diameter

代号 Code	006	008	01	015	02	025	03	04	05	06	08	10	12	15
管径 Pipe Diam. (mm)	6	8	10	15	20	25	32	40	50	65	80	100	125	150
代号 Code	17	20	22	25	30	35	40	45	50	60	70	80	90	99
管径 Pipe Diam. (mm)	175	200	225	250	300	350	400	450	500	600	700	800	900	1000

★ 管径大于 1000mm 的以实际管径的 1/10 表示。

★ If the pipe diameter is larger than 1000mm,the pipe Diam. Shall be indicated as 1/10 of the actual pipe diameter.

4.4 公称压力 Nominal Pressure

代号 Code	025	00	01	016	02	03	04	05	06	10	16	20	25	32	42
公称压力 Nominal pres. (Mpa)	0.25	0.6	1.0	1.6	2.0	2.5 (150#)	4.0	5.0 (300#)	6.4 (400#)	10 (600#)	16 (900#)	20	25 (1500#)	32	42 (2500#)

★ 特殊公称压力按设计压力值填写。

★ The special nominal pressure shall be filled in according to the actual designing pressure value.

4.5 节流件材质 Throttling Element Material

代号 Code	1	2	3	4	5	6	7	8
材质 Material	304	304L	321	316	316L	双相钢 Binocular steel	哈氏合金 Hastelloy	特殊要求 special requirements

4.6 供货方式 Supply Form

代号 Code	供货方式 Supply form
A	带前 10d 后 5d 测量管 (包括连接法兰和工艺法兰) The complete set with the front 10d and the back 5d measuring pipe (including the connecting and process flange)
A1	带前 10d 后 5d 测量管 (包括连接法兰) The complete set with the front 10d and the back 5d measuring pipe (including the connecting process flange)
A2	带前 10d 后 5d 测量管 (管端坡口) The complete set with the front 10d and the back 5d measuring pipe (the bevel of pipe end)
B	按石化标准 (HG/T21581-95) 带上下游测量管 (包括连接法兰和工艺法兰) The complete set with the up-and-down measuring pipe according to HG/T21581-95 (including the connecting and process flange)
B1	按石化标准 (HG/T21581-95) 带上下游测量管 (包括连接法兰) The complete set with the up-and-down measuring pipe according to HG/T21581-95 (including the connecting flange)
B2	按石化标准 (HG/T21581-95) 带上下游测量管 (管端坡口) The complete set with the up-and-down measuring pipe according to HG/T21581-95(the bevel of pipe end)
B3	按石化标准 (HG/T21581-95) 不带上下游测量管 The complete set without the up-and-down measuring pipe according to HG/T21581-95
C	按电力部标准 (GD87-1101) 带上下游测量管 (前后各约 2D) The complete set with the up-and-down measuring pipe(upstream 2D & downstream 2D) according to GD87-1101
D	法兰、(环室)、或取压法兰、节流件、导压管、紧固件 the flange, the ring chamber, the pressure flange, the throttling element, the pressure tube, the fastener
E	单节流件 single throttling element
T	特殊供货方式，由用户在合同或有关技术文件中注明 special supply form, please give clear indication in the contract or the relevant technical documents.
F	带筒体 (管道) 法兰连接式 flange connection type with duct (pipe)
W	带筒体 (管道) 焊接式 welding type with duct (pipe)
H	整体焊接连接方式 connection with integral welding mode

★ F 及 W 方式主要对长径喷嘴、文丘里管、双重文丘里、机翼测风装置而言。

The form F and W are meant for long radius nozzle, classic venturi tube, double–tier venturi tube, airfoil type volume measuring device.

4.7 附件 Accessories

代号 Code	V	L	P1	P2	G1	G2	J	C
名称 Name	阀门 Valve	冷凝器 Condenser	单层平衡器 Single Layer Balancer	双层平衡器 Double Layer Balancer	A 型隔离器 A Type Seal Pod	B 型隔离器 B Type Seal Pod	集气器 Gas Chamber	沉降器 Sediment

★ 阀门一般指截止阀，特殊阀门应注明。

★ As a rule,valve is globe valve. If special, please remark.

5. 节流元件选用一览表 Throttling Device List For Selection

名 称 Name	型 号 Model	取压方式 Tappings	公称通径 Diam.	公称压力 Pres.	直径比 β Diam. Ratio	适用雷诺数 R_{eD} Reynolds	说 明 Description	采用标准 / 手册 Standard/Handbook	供货方式 Supply form	参考图样 Figure
标准孔板 standard orifice plate	LGBH	环室取压 ring chamber tappings	50 ~ 400	≤32.0	0.2 ~ 0.75	≥5000(0.2≤β≤0.45) ≥10000(β≥0.45)	适用于各种介质的流量测量，主要用于电力、纺织、冶金、轻工等行业；高温高压场合多用八槽孔板 For all kinds of fluids, main suitable for power plant, textile, metallurgy, light industry,etc. use mainly 8 solt orifice plate under high temp. and pres..	ISO5167-1 GB/T2624-2006 GD87-1101 HG/T21581-95	A,A1,A2 B,B1,B2 C,D,E,T,F,W	图 1,2,4,5
	LGBZ	钻孔取压 single drill tappings	400 ~ 3000	≤6.4						图 3
	LGBF	法兰取压 flange tappings	50 ~ 3000	≤42.0		≥1260β^2D	适用于各种介质的流量测量，主要用于石化行业 For all kinds of fluids, main suitable for petrochemical.			图 7,8
	LGBJ	径距取压 D-D/2 tappings	50 ~ 3000	≤25.0		≥1260β^2D	适用于各种介质的流量测量，主要用于冶金行业 For all kinds of fluids, main suitable for metallurgy.			图 6
长径喷嘴 long radius nozzle	LGCJ	径距取压 D-D/2 tappings	50 ~ 630	≤42.0	0.2 ~ 0.8	10^4 ~ 10^7	压损小寿命长，一般用于电厂主给水和主蒸汽等重要场合 low pressure loss, long life, mainly used for main feedwater & main steam.	ISO5167-1 GB/T2624-2006 GD87-1101	F,W	图 9
ISA1932 喷嘴 ISA1932 nozzle	LGPH	环室取压 ring chamber tappings	50 ~ 500	≤42.0	0.2 ~ 0.8	2×10^3 ~ 10^7	适用于压损要求较小和寿命长的场合；高温高压的场合多用八槽喷嘴 low pressure loss, long life, use mainly 8 solt nozzle under high temp. and pres..		A,A1,A2 C,D,E,T	图 10,11
	LGPZ	钻孔取压 single drill tappings								

粗铸文丘里管 rough molten venturi tube	LGXT	特殊取压 Special tappings	100 ~ 800	≤2.5	0.3 ~ 0.75	2×10^5 ~ 2×10^6	压力损失特小，一般大管径大流量场合使用较多 lower pressure loss, mainly used for larger pipe, larger flow.	ISO5167-1 GB/T2624-2006 HG/T21581-95	F,W	
机加工文丘里 mechanical processed venturi tube	LGTT	特殊取压 Special tappings	50 ~ 250	≤42.0	0.4 ~ 0.75	2×10^5 ~ 2×10^6	压力损失特小，特别适用于高温高压场合 lower pressure loss, main suitable for high temp. and pres.		F,W	图 13
粗焊文丘里管 rough welding iron plate venturi tube	LGWT	特殊取压 Special tappings	200 ~ 3000	≤6.4	0.4 ~ 0.7	2×10^5 ~ 2×10^6	压力损失特小，一般大管径大流量场合使用较多 lower pressure loss, mainly used for larger pipe, larger flow.		F,W	图 14
文丘里喷嘴 Venturi Nozzle	LGLT	特殊取压 Special tappings	65 ~ 500	≤6.4	0.316 ~ 0.775	1.5×10^5 ~ 2×10^6	压力损失特小，一般大管径大流量场合使用较多 lower pressure loss, mainly used for larger pipe, larger flow.		F,W	图 12
高压透镜孔板 high pressure orifice plate with lens washer	LGGZ	钻孔取压 single drill tappings	15 ~ 200	20 ~ 32	0.2 ~ 0.75	≥5000(0.2≤β≤0.45) ≥10000(β≥0.45)	适用于高压场合，一般化工行业测量高压介质较多 main suitable for high pres., main suitable for petrochemical., refinery.		A,A1,A2 C,D,E,T	图 15
宽边孔板 Wide edge orifice plate	LGKZ	钻孔取压 single drill tappings	50 ~ 400	≤25.0	0.2 ~ 0.75		适用于各种介质的流量测量，主要用于石化行业 For all kinds of fluids, main suitable for petrochemical.			图 16
圆缺孔板 segmental orifice plate	LGQZ	钻孔取压 single drill tappings	50 ~ 2000	≤25.0	0.1 ~ 0.8	10^4 ~ 10^6	适用于测量各种脏污介质如煤气等，使含有沉淀杂质或悬浮杂质的介质更容易通过孔板，不会在孔板前端形成堆积而影响测量。不适用于垂直管道 . For dirty fluid such as coal gas, the fluid contained of sediment and suspension shall pass easily through orifice, not form accumulation in front of the orifice and affect measurment. Not suitable for vertical pipe.	BS1042 ISO/TR15377 HGJ516-87	A,A1,A2 B,B1,B2 C,D,E,T	图 17
	LGQJ	径距取压 D-D/2 tappings								
	LGQF	法兰取压 flange tappings								

偏心孔板 excenric orifice plate	LGOZ	钻孔取压 single drill tappings	100 ~ 1000	≤25.0	0.46 ~ 0.84	$2.5\times10^5\beta^2$ ~ $10^6\beta$ (d≥50)	适用于测量各种脏污介质如煤气等，使含有沉淀杂质或悬浮杂质的介质更容易通过孔板，不会在孔板前端形成堆积而影响测量。不适用于垂直管道 For dirty fluid such as coal gas, the fluid contained of sediment and suspension shall pass easily through orifice, not form accumulation in front of the orifice and affect measurment. Not suitable for vertical pipe.	BS1042 ISO/TR15377 HG/T21581-95	A,A1,A2 B,B1,B2 C,D,E,T	图 18
	LGOJ	径距取压 D-D/2 tappings								
	LGOF	法兰取压 flange tappings								
端头孔板（喷嘴） orifice(nozzle) without upstream or downstream pipe	LGDH	环室取压 ring chamber tappings	50 ~ 400	≤6.4	0.2 ~ 0.75	$\geq5.5\times10^3$	适用于管道入口或出口处的流量测量 suitable for pipe inlet or outlet.	ISO/TR15377 HG/T21581-95 流量测量装置手册 flow handbook	A,A1,A2 C,D,E,T	
	LGDZ	钻孔取压 single drill tappings	400 ~ 3000							
1/4 圆孔板（喷嘴） 1/4 circle orifice plate (Nozzle)	LGEH	环室取压 ring chamber tappings	50 ~ 500	≤25.0	0.245 ~ 0.6	$\leq10^5\beta$ (d≥15)	适用于低雷诺数、高粘度介质的测量，一般用于电厂燃料油测量。 For low Reynolds number, high viscosity fluid, suitable for fuel oil in plant.	BS1042 ISO/TR15377 HG/T21581-95	A,A1,A2 B,B1,B2 C,D,E,T	图 19
	LGEZ	钻孔取压 single drill tappings	25 ~ 500							
	LGEF	法兰取压 flange tappings	40 ~ 500							
锥形入口孔板 Fastigiate entry orifice plate	LGRH	环室取压 ring chamber tappings	50 ~ 500	≤25.0	0.1 ~ 0.316	80 ~ $2\times10^5\beta$ (d > 6)	适用于低雷诺数介质的测量，雷诺数比 1/4 圆孔板更低，一般用于电厂燃料油测量 For lower Reynolds number, suitable for fuel oil in plant.	BS1042 ISO/TR15377	A,A1,A2 C,D,E,T	图 20
	LGRZ	钻孔取压 single drill tappings	25 ~ 500							
双重孔板 double-tier orifice plate	LGYH	环室取压	50 ~ 400	≤25.0	0.2 ~ 0.75	3×10^3 ~ 3×10^5	适用于雷诺数较小的场合 For lower Reynolds number	流量测量装置手册 flow handbook HG/T21581-95	A,A1,A2 C,D,E,T	
	LGYZ	钻孔取压 single drill tappings	25 ~ 400							

小孔板 small orifice plate	LGMH	环室取压 ring chamber tappings	15 ~ 50	≤42.0	0.2 ~ 0.75	≥1000	适用于小管径流量测量 For small pipe.	GB2624-81 ISO/TR15377 流量测量装置手册 flow handbook	A,A1,A2 B,B1,B2 C,D,E,T	图 21
	LGMZ	钻孔取压 single drill tappings								
	LGMF	法兰取压 flange tappings								
内藏小孔板 Inner small orifice plate	LGNF	法兰取压 flange tappings	10 ~ 50	≤42.0	0.1 ~ 0.75	≥1000	适用于小管径流量测量，主要用于石化行业 For small pipe. main suitable for petrochemical.	流量测量装置手册 flow handbook	A	图 22
双重文丘里管 double-tier venturi tube	LGST	特殊取压 Special tappings	360 ~ 3000	≤6.4	————	10^4 ~ 10^7	适用于大管径、压损要求特小的风量的测量，直管段要求较短 lower pressure loss, mainly used for larger pipe, short straight pipe requirement.	本厂标准 manufacturer standard	E,F,W	图 24
机翼测风装置 airfoil type volume measuring device	LGJT	特殊取压 Special tappings	≥300	≤6.4	0.3 ~ 0.65	2.5×10^5 ~ 10^7	适用于风量测量，大量应用于电厂锅炉风量的测量，直管段要求短 mainly used for wind rate measurement , short straight pipe requirement.	本厂标准 manufacturer standard	F,W	图 25
限流孔板 Restriction orifice	LGA	无取压 No tappings	不限	≤42.0	————	————	非流量测量装置，仅用于对流体压力或流量的限制 not for flow measurement, to restrict the fluid pressure.	流量测量装置手册 flow handbook	D,E	图 27
ASME 喉部取压长径喷嘴 ASME throat-pressure long radius nozzle	LGCT	喉部取压 Throat tappings	50 ~ 630	≤42.0	0.2 ~ 0.8	10^4 ~ 10^7	重复性和长期稳定性好，寿命长，精度高。用于电厂凝结水测量等重要场合及高精度测量 . Good repeatability and long-term stability. long life, High precision. For power plant condenser water measurement and other important occasions and high precision measurement.			图 33

6. 参考图样 Reference Drawing

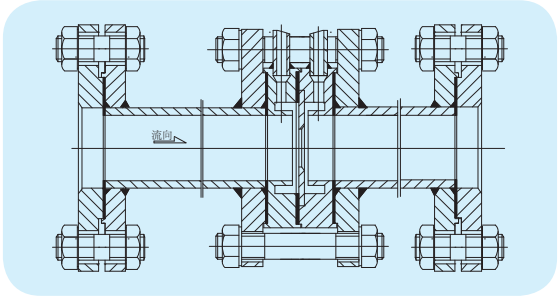


图 1 环室取压标准孔板
figure 1 ring chamber tappings standard orifice plate

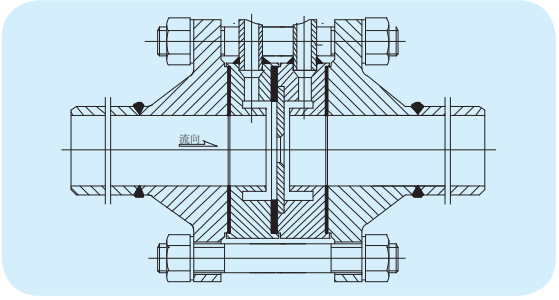


图 2 环室取压标准孔板
figure 2 ring chamber tappings standard orifice plate

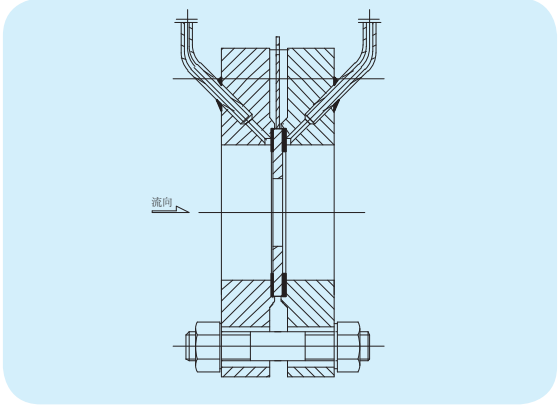


图 3 钻孔取压标准孔板
figure 3 single drill tappings standard orifice plate

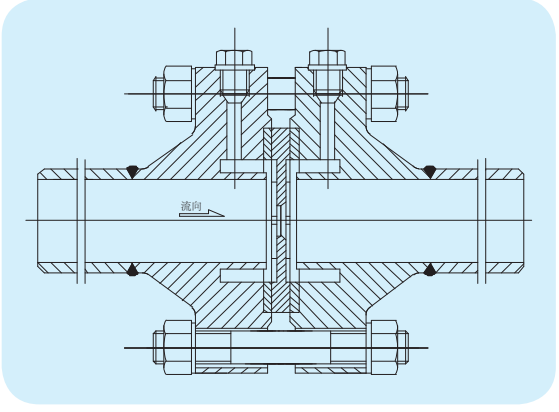


图 4 紧固式八槽孔板
figure 4 tightening type 8 slots orifice plate

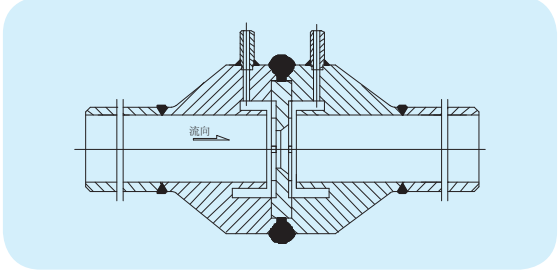


图 5 焊接式八槽孔板
figure 5 welding type 8 slots orifice plate

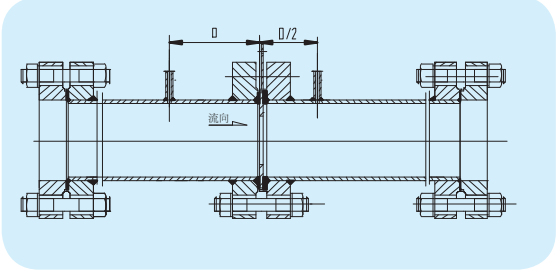


图 6 径距取压标准孔板
figure 6 D–D/2 tappings standard orifice plate

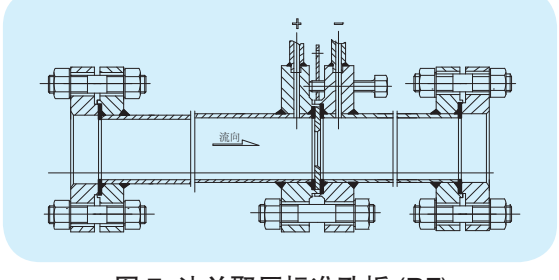


图 7 法兰取压标准孔板 (RF)
figure 7 flange tappings standard orifice plate (RF)

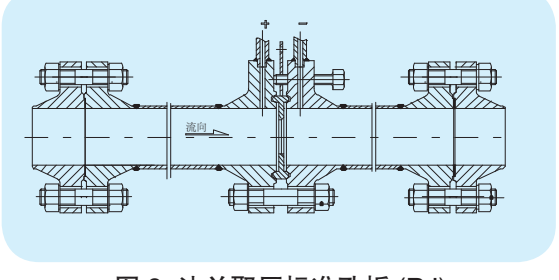


图 8 法兰取压标准孔板 (RJ)
figure 8 flange tappings standard orifice plate (RJ)

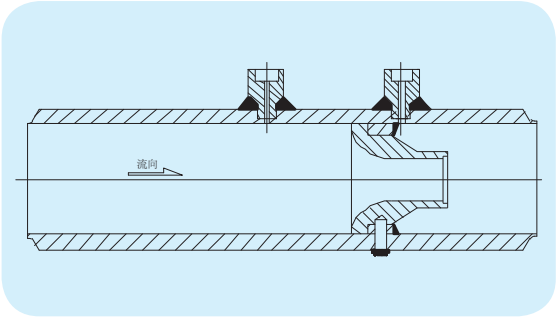


图 9 长径喷嘴
figure 9 long radius nozzle

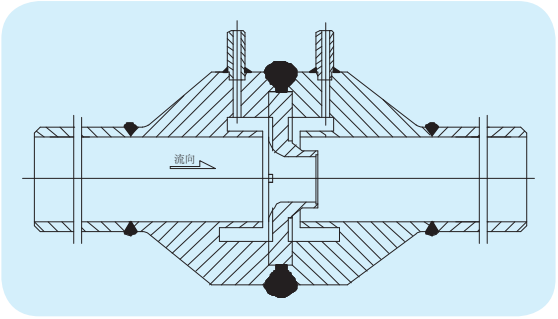


图 10 焊接式八槽喷嘴
figure 10 welding type 8 slots nozzle

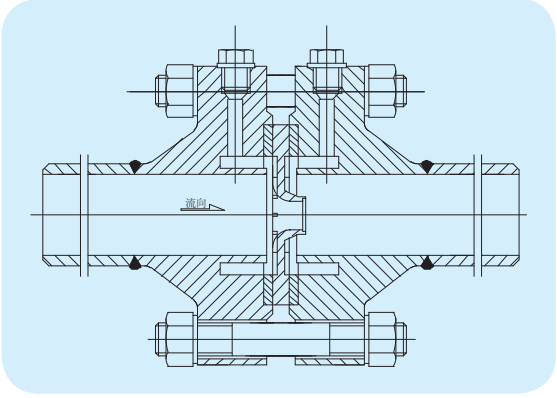


图 11 紧固式八槽喷嘴
figure 11 tightening type 8 slots nozzle

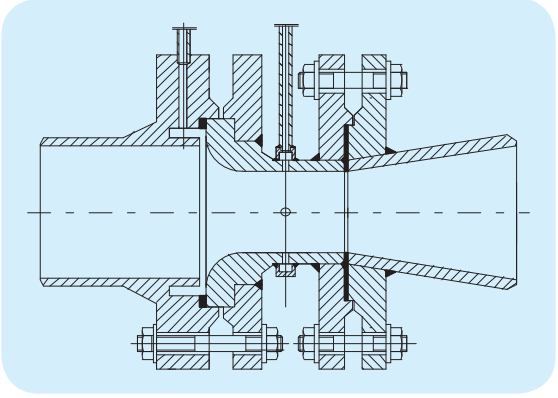


图 12 文丘里喷嘴
figure 12 venturi nozzle

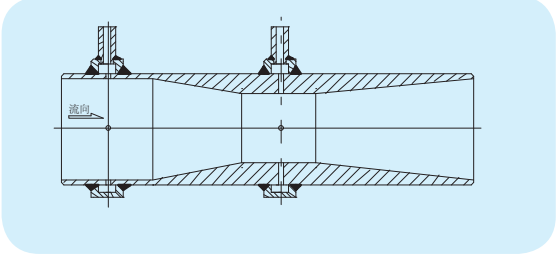


图 13 机加工文丘里管
figure 13 mechanical processed venturi tube

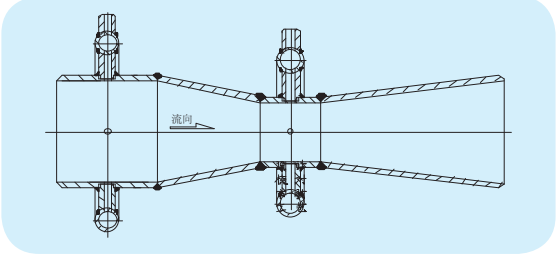


图 14 粗焊铁板文丘里管
figure 14 rough welding iron plate venturi tube

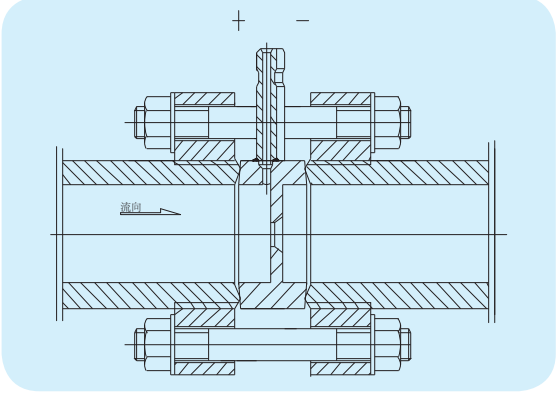


图 15 高压透镜孔板
figure 15 high pressure orifice plate with lens washer

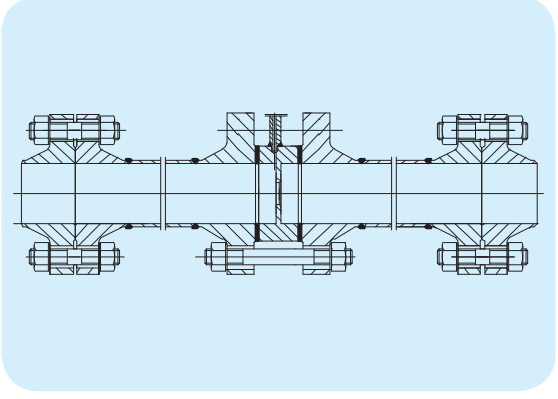


图 16 宽边孔板
figure 16 Wide edge orifice plate

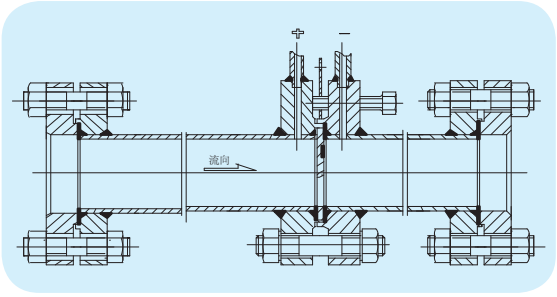


图 17 法兰取压圆缺孔板
figure 17 flange tappings segmental orifice plate

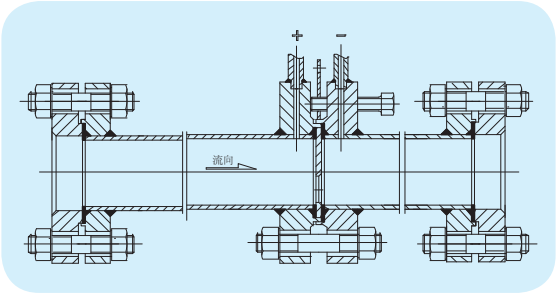


图 18 法兰取压偏心孔板
figure 18 flange tappings excenric orifice plate

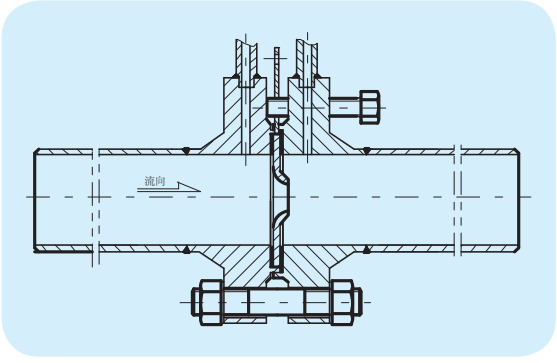


图 19 1/4 圆孔板
figure 19 1/4 circle orifice plate(Nozzle)

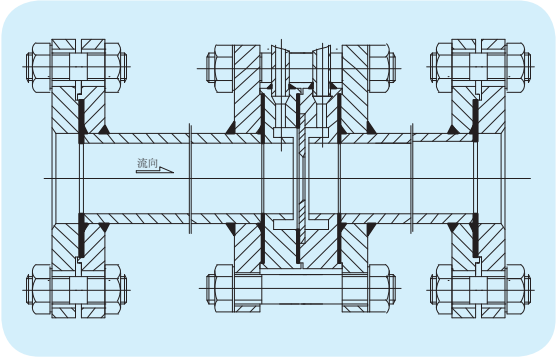


图 20 锥形入口孔板
figure 20 Fastigiate entry orifice plate

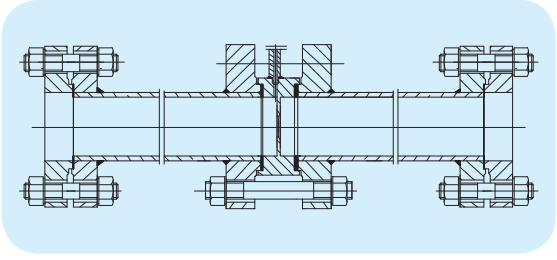


图 21 整体小孔板
figure 21 Small orifice plate

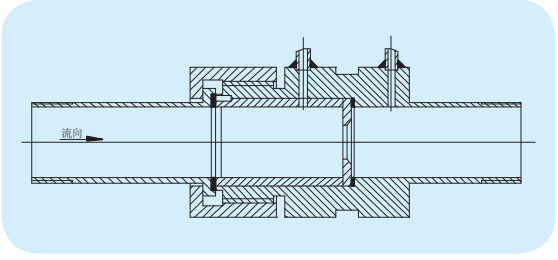


图 22 内藏小孔板
figure 22 Inner small orifice plate

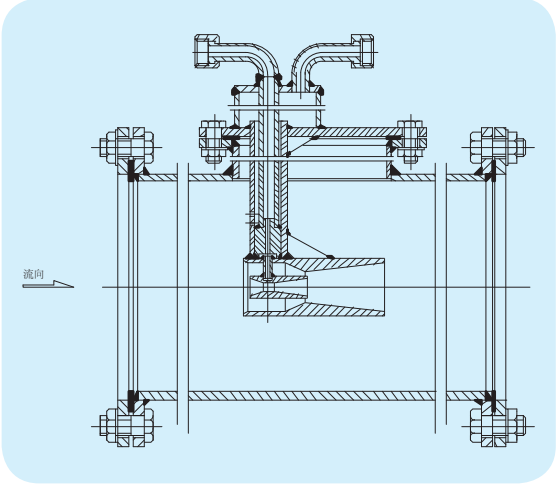


图 23 双重文丘里管
figure 23 double–tier venturi tube

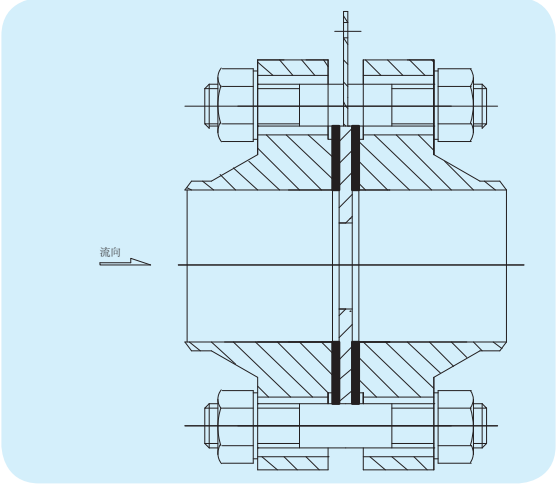


图 24 限流孔板
figure 24 Restrictionorifice

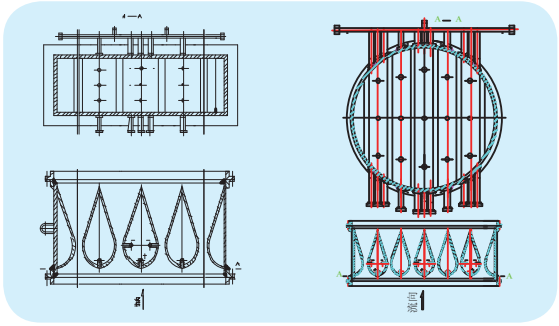


图25 机翼测风装置
figure 25 airfoil type volume measuring device

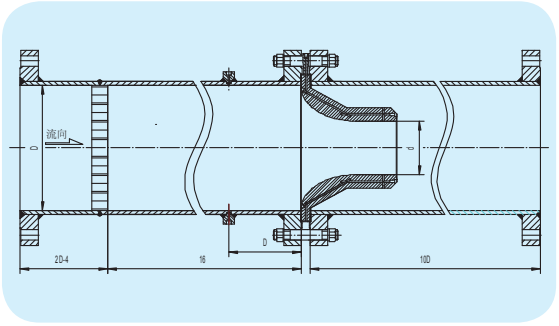


图26 ASME喉部取压长径喷嘴
figure 26 ASME throat–pressure long radius nozzle

7. 火力发电公司管道杂项组件
THE PIPE SUNDRY COMPONENTS FOR POWER PLANT

1	节流孔板 适用压力 ≤10.0MPa 适用管径：DN25-DN65mm 组件标准：D-GD87-0901 Throttling orifice plate, applied pressure≤10.0MPa applied pipe diam.: DN25-DN65mm component standard: D-GD87-0901 名称种类：疏水管用三、四、六、八级节流孔板、高温节流杆和单级节流孔板。 name sort:grade 3, grade 4, grade 6, grade 8 throttling orifice plate for the hydrophobic pipes, high temp. throttling bar, and single level orifice plate
2	给水泵给水再循环节流装置 组件标准：D-GD87-0902 throttling device for the recirculating feedwater system with the feedwater pump component standard: D-GD87-0902
3	锅炉排汽管用疏水盘 组件标准：D-GD87-0904 drain pan for the exhaust pipe of boiler component standard: D-GD87-0904
4	汽水管道三向位移指标器 组件标准：D-GD87-0905 three-dimensional displacement indicator for carbonated drinks component standard: D-GD87-0905
5	汽水管道双向位移指标器 组件标准：D-GD87-0906 double-dimensional displacement indicator for carbonated drinks component standard: D-GD87-0906
6	排水漏斗 组件标准：D-GD87-0907 drain funnel component standard: D-GD87-0907
7	汽水管道蠕胀测点和蠕胀监察段 组件标准：D-GD87-0908 the creeping bulge measuring point and monitoring section for carbonated drinks component standard: D-GD87-0908
8	凝结水泵及给水泵入口滤网 组件标准：D-GD87-0909 the filter net of the entrance for feedwater pump and condensation water component standard: D-GD87-0909
9	给水泵进口滤网 组件标准：D-GD87-0910 the filter net of the entrance for feedwater pump component standard: D-GD87-0910
10	水流指标器 组件标准：D-GD87-0912 water flow indicator component standard: D-GD87-0912
11	疏水收集器 组件标准：D-GD87-0913 collector for drainage component standard: D-GD87-0913

8. 节流元件附件 The Accessories For Throttling Elements

节流元件在现场使用过程中，为达到不同的测量要求，还需配各种附件：

In the process of field use, in order to measure up to various requirement, all kinds of the accessories for throt tling elements are in need:

8.1 冷凝器 Condenser

（1）用途：冷凝器是测量蒸汽流量用的附件。在容器及导压管、二次仪表腔内部充满冷凝液，以免蒸汽直接进入仪表。如图一所示。

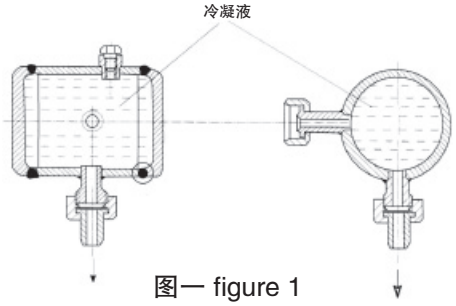
usefulness: the condenser is the accessories measuring steam flow. In order to avoid the steam going into instrument, the condensate should be filled in the condenser, the connecting pipe, the quadratic instrument. See figure 1.

（2）技术数据 technical data

① 工作压力 working pressure：6.4、10.0、30.0MPa

② 型号及适用范围 model and application range：

型 号 model	适 用 范 围 application range
FL—6.4	压力 ≤6.4MPa pres. ≤6.4MPa
FL—10	压力 ≤10.0MPa pres. ≤10.0MPa
FL—30	压力 ≤30.0MPa pres. ≤30.0MPa



图一 figure 1

8.2 平衡器 Balancer

（1）用途：平衡器是测量液位用的附件。当测量开口容器或低压容器的液位时，采用单层平衡器，即 A 型，如图二所示。当测量锅炉汽包等的水位时，采用双层平衡器，即 B 型，如图二所示。

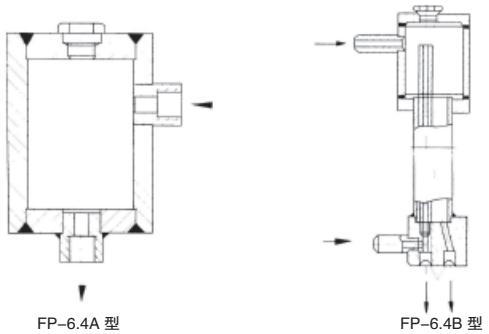
usefulness: the balancer is the accessories measuring liquid level. When measuring the liquid level of the open-top container or low pressure container, the single layer balancer (A type) shall be adopted. See figure 2. When measuring the water level of the boiler steam drum, the double layers balancer (B type) shall be adopted. See figure 2.

（2）技术数据 technical data

① 工作压力 working pressure:：6.4、20.0、25.0、32.0MPa

② 型号及使用范围 model and application range：

型 号 model	名 称 name	使 用 范 围 application range
FP—6.4A	单层平衡器 single layers balancer	压力 ≤6.4MPa pres.≤6.4MPa
FP—20A	单层平衡器 single layers balancer	压力 ≤20.0MPa pres.≤20.0MPa
FP—32A	单层平衡器 single layers balancer	压力 ≤32.0MPa pres.≤32.0MPa
FP—6.4B	双层平衡器 double layers balancer	压力 ≤6.4MPa pres.≤6.4MPa
FP—25B	双层平衡器 double layers balancer	压力 ≤25.0MPa pres.≤25.0MPa



图二 figure 2

8.3 隔离器 Isolator

（1）用途：隔离器是测量腐蚀性液体或气体流量时用的附件，在容器及导压管、二次仪表内腔充满隔离液，以免使腐蚀性介质直接进入二次仪表。当被测介质比重小于隔离液比重，则采用 A 型，如图三所示。当被测介质比重大于隔离液比重，则采用 B 型，如图三所示。

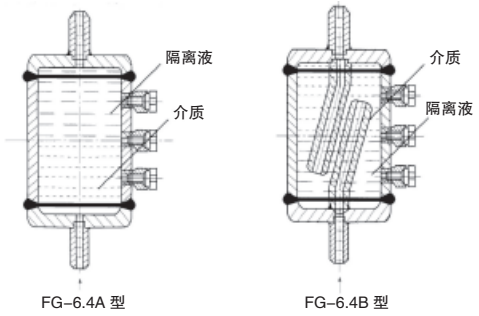
usefulness: the isolator is the accessories measuring corrosivity liquid or gas. In order to avoid the corrosivity fluid going into instrument, the insulating liquid should be filled in the isolator , the connecting pipe, the quadratic instrument.When the fluid weight is more than the insulating liquid weight, the A type isolator shall be adopted. See figure 3. When the fluid weight is less than the insulating liquid weight, the A type isolator shall be adopted. See figure 3.

（2）技术数据 technical data

① 工作压力 working pressure：6.4、10.0MPa

② 型号及使用范围 model and application range：

型　号　model	适 用 范 围 application range	
FG—6.4A	压力 ≤6.4MPa	pres.≤6.4MPa
FG—10A	压力 ≤10.0MPa	Pres.≤10.0MPa
FG—6.4B	压力 ≤6.4MPa	pres.≤6.4MPa
FG—10B	压力 ≤10.0MPa	pres.≤10.0MPa



图三 figure 3

8.4 沉降器、集气器 Sediment & Gas chamber

（1）用途：对于各种被测流体，在导压管的最低点应装设沉降器或排污阀，以便收集和定期排出信号管路中的污物和气体信号管路中的积水，达到提高测量精度的目的。如图四所示。

当被测流体为液体时，在导压管的各最高点上应装设集气器或排气阀，以便收集和排出信号管路中的气体，达到提高测量精度的目的。当差压计或差压变送器的安装位置高于主管道时，更应装设集气器或排气阀。如图四所示。

1. usefulness: meant for various fluids, the sediment or sewer valve shall be installed at the bottom of the pressure line, so as to entrap and drain away the fouled waste and water log in the pressure line and attain to the purpose of increasing the measuring accuracy. See figure 4.

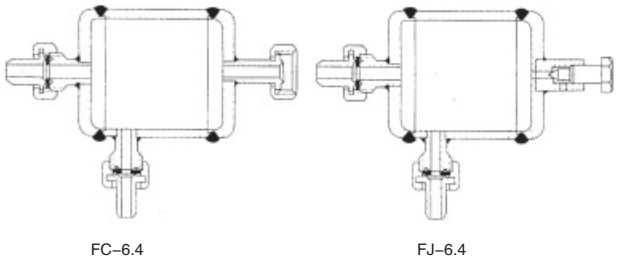
When the fluid is liquid, the gas chamber or discharge valve shall be installed at the top of the pressure line, so as to entrap and drain away the gas in the pressure line and attain to the purpose of increasing the measuring accuracy. When the installing point of the DP is higher than the main pipe, the gas chamber or discharge valve should be much more installed. See figure 4.

（2）技术数据 technical data

① 工作压力 working pressure：6.4、10.0MPa

② 型号及适用范围 model and application range：

型 号　model	适 用 范 围 application range
FC—6.4	压力 ≤6.4MPa pres.≤6.4MPa
FC—10	压力 ≤10.0MP pres.≤10.0MPa
FJ—6.4	压力 ≤6.4MPa pres.≤6.4MPa
FJ—10	压力 ≤10.0MPa pres.≤10.0MPa



图四 figure 4

9. 安装要求 Installation Requirements

9.1 流体必须充满圆形管道，在紧邻节流元件的流体应是充分发展的紊流状态且无旋涡、流体必须保持亚音速，且是稳定的或仅随时间缓慢变化的；流体必须是单相流体或者可认为是单相流体。

9.1 The fluid should be filled in the circle pipe, fully developmental turbulent flow and no eddy, should be subsonic and steady or varies only slowly with time, should be single phase fluid or be taken for single phase.

9.2 管道冲扫之前，节流件必须（孔板、喷嘴等）取下，焊接式装置（包括长径喷嘴）用一段直管替代，待管道吹扫后再把焊接式装置安装上，以免冲管时损坏节流件，影响测量精度。

9.2 The elements (orifice, nozzle, etc.) should be taken down before cleaning and purging of the pipe line. The welding device should be taken place of one straight pipe, then installing the device after cleaning and purging of the pipe line, in order to avoid damaging the elements and affecting the measuring accuracy.

9.3 安装过程中，密封垫不得凸入管道内，垫片内径必须比管道内径大 1 ~ 3mm。如采用缠绕式石墨垫或金属垫等密封垫片，则此垫片应在最后安装时才装上，避免多次重复拆装而损坏。我公司在产品组装时采用普通橡胶石棉垫片，待冲管结束后，再换上随箱小木箱中的缠绕式石墨垫。

9.3 in installation process, the gasket shall be unable to enter into the pipe. The inside diameter of the gasket should be larger 1 ~ 3mm than the inside pipe diameter. If adopting the wound graphitic gasket or metallic gasket, the gasket should be installated finally so as to damage by reason of multi unseal and loading. We adopt the ordinary vulcanized asbestos gasket on product assembly, replacing the wound graphitic gasket or metallic gasket in the small wooden case after cleaning and purging of the pipe line.

9.4 节流件应垂直于管道轴线，其偏差允许在 ±1° 之间。

9.4 The elements should be perpendicular to the central line of pipeline, the deviation shall be ±1o.

9.5 节流件与管道的同轴度要求应满足式（1）或（2）要求，我公司产品已从结构上进行了特殊设计，安装时能自动达到同轴度要求。

9.5 The concentric between the elements and the pipeline should be up to the formula 1 and 2, our products take the special design in structure, thus it can be able to attain concentric requirement automatically.

GB/T2624–93 和 ISO5167–1 标准规定，孔板安装后与管道的同轴度应满足下式：

According to GB/T2624–93 and ISO5167–1, the concentric between the elements and the pipeline should be up to the formula 1:

$$e \leqslant \frac{0.0025 \times D}{0.1 + 2.3 \times \beta^4} \qquad (1)$$

式中，D 为管道内径，β 为孔径比。β =0.75 ~ 0.2 时的不同轴度如下表：

In which: D is the inside pipe diameter, β is diameter ratio, the concentric is as below when β is equal to 0.75 ~ 0.2.

公称直径 Dn nominal diam. Dn	50	65	80	100	125	150	200
不同轴度 mm concentric mm	0.15~1.2	0.19~1.57	0.24~1.93	0.30~2.41	0.38~3.01	0.45~3.62	0.60~4.82
公称直径 Dn nominal diam. Dn	250	300	350	400	450	500	600
不同轴度 mm concentric mm	0.76~6.03	0.91~7.23	1.06~8.44	1.21~9.64	1.36~10.85	1.51~12.05	1.81~14.47

☆ 当锐孔轴线与管道轴线的不同轴度小于或等于上表中的数值时，则流量系数不附加任何误差。

☆ when the concentric is less than or equal to the value in the above list, the flow coefficient is zero additional uncertainty.

如安装后同轴度满足下式：

$$\frac{0.0025\times D}{0.1+2.3\times\beta^{4}} \leqslant e_x \leqslant \frac{0.005\times D}{0.1+2.3\times\beta^{4}} \qquad (2)$$

则孔板流出系数 C 不确定度将算术相加 ±0.3%。

the discharge coefficient is ±0.3%additional uncertainty.

9.6 按照 ISO5167 — 1 和 GB/T2624–93 的规定，“离节流件 2D 之外的直管段可由一种或多种截面的管道组成，只要任一台阶不超过直径平均值的 ±0.3%，即符合要求，如任一台阶高度超过此极限值，但符合下式 (3) 和 (4) 的要求，则流出系数不确定度算术相加 ±0.2%。

9.6 According to GB/T2624–93 and ISO5167–1, “the straight pipe being off at least a length of 2D may be composed of one or multi section pipe, so long as any perron is less than or equal to ±0.3%of pipe diameter average value, it shall be conform to the requirment. If any perron is greater than the limit value, but it is conform to the requirment of formula 3 and 4, the discharge coefficient is ±0.2%additional uncertainty.

$$\frac{h}{D} \leqslant 0.002\times \frac{(S/D)+0.4}{0.1+2.3\times\beta^{4}} \qquad (3)$$

$$\frac{h}{D} \leqslant 0.05 \qquad (4)$$

式中： h: 台阶高度； D: 管道内径； S：台阶处到取压孔的距离。

In which: h is the perron height D is the inside pipe diameter, S is the distance between the perron and pressure tap.

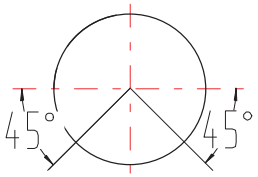
节流元件带管段时，与管道的接口焊接处，产生的错位台阶，应不大于下表所列数值：

when the element is with pipe, the perron height at the wiped joint is not greater than the value in the below list:

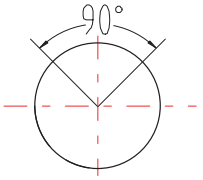
公称直径 Dn nominal diam. Dn	50	65	80	100	125	150	175	200	250	300	350	400
台阶 mm perron height mm	±2.5	±3	±3	±3	±3	±3	±3.5	±3.5	±4.5	±5	±5.5	±6

9.7 取压孔视需要可取 1 ~ 4 对，管道为水平安装时根据不同的介质及具体要求按下图确定，管道为垂直安装时可任意方向。

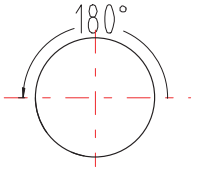
9.7 According to the requirment, the pressure tap may be 1 ~ 4 couple. When the pipe is horizontal, according to the various fluids and concrete requirment, its place is conform to the requirment of the below figure.



被测介质为液体
liquid



被测介质为蒸气和湿气体
steam and wet gas



被测介质为干气体
dry gas

9.8 节流元件应安装在恒定截面的圆筒形管道之间，其前后直管段长度应符合表 1、表 2 规定。

9.8 The throttling element should be installed in cylindrical pipe with constant section, is upstream and downstream straight pipe is conform to the table 1 and 2.

表 1 孔板、喷嘴和文丘里喷嘴所要求的最短直管段长度

Table 1 Required straight lengths for orifice plates, nozzles and venturi nozzles

直径比 β ≦ diam. Ratio β ≦	节流件上游阻流件形式和最短直管段长度 upstream (inlet) side of the primary device							上游最短直管段长度（包括本表中所有阻流件） downstream (inlet) side of the primary device
	单个 90° 弯头或三通（流体仅从一个支管流出） single 90° bend or tee(-flow from one branch only)	在同一个平面上的两个或多个 90° 弯头 two or more 90° bends in the same plane	在不同平面上的两个或多个 90° 弯头 two or more 90° bends in different plane	渐缩管（在 1.5D 至 3D 的长度内由 2D 变为 D） reducer(2D to D over a length of 1.5D to 3D)	渐扩管（在 1D 至 2D 的长度内由 0.5D 变为 D） expander(0.5D to D over a length of D to 2D)	球型阀全开 globe valve fully open	全孔球阀或闸阀全开 full bore ball or gate valve fully open	
0.20	10(6)	14(7)	34(17) 34(17)	5	16(8)	18(9)	12(6)	4(2)
0.25	10(6)	14(7)	34(17)	5	16(8)	18(9)	12(6)	4(2)
0.30	10(6)	16(8)	36(18) 36(18)	5	16(8)	18(9)	12(6)	5(2.5)
0.35	12(6)	18(9)	38(19)	5	16(8)	18(9)	12(6)	5(2.5)
0.40	14(7)	18(9)	40(20)	5	16(8)	20(10)	12(6)	6(3)
0.45	14(7)	20(10)	44(22)	5	17(9)	20(10)	12(6)	6(3)
0.50	14(7)	22(11)	48(24)	6(5)	18(9)	22(11)	12(6)	6(3)
0.55	16(8)	26(13)	54(27)	8(5)	20(10)	24(12)	14(7)	6(3)
0.60	18(9)	18(14)	62(31)	9(5)	22(11)	26(13)	14(7)	7(3.5)
0.65	22(11)	32(16)	70(35)	11(6)	25(13)	28(14)	16(8)	7(3.5)
0.70	18(14)	36(18)	80(40)	14(7)	30(15)	32(16)	20(10)	7(3.5)
0.75	36(18)	42(21)		22(11)	38(19)	36(18)	24(12)	8(4)
0.80	46(23)	50(25)		30(15)	54(27)	44(22)	30(15)	8(4)

表 2 文丘里管所要求的最短直管段长度

Table 2 Required straight lengths for classical venturi tubes

	节流件上游阻流件形式和最短直管段长度 upstream (inlet) side of the primary device					
	单个 90° 短半径弯头 single 90° bend	在同一个平面上的两个或多个 90° 弯头 two or more 90° bends in the same plane	在不同平面上的两个或多个 90° 弯头 two or more 90° bends in different plane	在 3.5D 范围内由 3D 变为 D 的渐缩管 reducer 3D to D over a length of 3.5D	在 1D 范围内由 0.75D 变为 D 的渐扩管 expander 0.75D to D over a length of D	全孔球阀或闸阀全开 full bore ball or gate valve fully open
0.30	0.5	1.5(0.5)	(0.5)	0.5	1.5(0.5)	1.5(0.5)
0.35	0.5	1.5(0.5)	(0.5)	1.5(0.5)	1.5(0.5)	2.5(0.5)
0.40	0.5	1.5(0.5)	(0.5)	2.5(0.5)	1.5(0.5)	2.5(1.5)
0.45	1.0(0.5)	1.5(0.5)	(0.5)	4.5(0.5)	2.5(1.0)	3.5(1.5)
0.50	1.5(0.5)	2.5(1.5)	(8.5)	5.5(0.5)	2.5(1.5)	3.5(1.5)
0.55	2.5(0.5)	2.5(1.5)	(12.5)	6.5(0.5)	3.5(1.5)	4.5(2.5)
0.60	3.0(1.0)	3.5(2.5)	(17.5)	8.5(0.5)	3.5(1.5)	4.5(2.5)
0.65	4.0(1.5)	4.5(2.5)	(23.5)	9.5(1.5)	4.5(2.5)	4.5(2.5)
0.70	4.0(2.0)	4.5(2.5)	(27.5)	10.5(2.5)	5.5(3.5)	5.5(3.5)
0.75	4.5(3.0)	4.5(3.5)	(29.5)	11.5(3.5)	6.5(4.5)	5.5(3.5)

1. 括号外的值为 " 零附加不确定度 "

2. 括号内的值为 " 0.5% 附加不确定度 "

3. 文丘里管下游直管段：位于喉部取压口平面下游至少 4 倍喉部直径处的管件或其它阻流件不影响测量的不确定度。

1. values without parentheses are “zero additional uncertainty” value.

2. values in parentheses are “0.5% additional uncertainty” value.

3. for classic venturi tubes downstream straight lengths: fittings or other disturbances (as indicated in this table) situated at least four throat diameters downstream of the throat pressure tappings plane do not affect the accuracy of the measurement.

9.9 导压管的材质应按被测介质的性质和参数确定，其内径不小于 6mm，长度最好在 16m 以内，各种被测介质在不同长度时导压管内径的建议值如表 3 所示。导压管应垂直或倾斜敷设，其倾斜度不小于 1：12，粘度高的流体，其倾斜度应更增大。当导压管长度超过 30m 时，导压管应分段倾斜，并在最高点与最低点装设集气器（或排气阀）和沉淀器（或排污阀）。正负导压管应尽量靠近敷设，防止两管子温度不同使信号失真，严寒地区导压管应加防冻保护，用电或蒸汽加热保温，要防止过热，导压管中流体汽化会产生假差压应予注意。

9.9 The material of the pressure line is according to the property and parameter of the fluid, its ID is not less than 6mm, its length is in 16m. when its lengths are different for various fluids, its ID is as indicated in below table. The pressure line should be installed vertically or with a obliquity of less than 1:12, the more viscosity, the more obliquity. When the pressure line length is over 30m, it should be obliquity by stages, also the sediment or sewer valve shall be installed at the bottom of the pressure line and the gas chamber or discharge valve shall be installed at the top. In order to avoid signal distortion, the pressure line of high and low pressure should be laid down nearby, should be protection of frost in frostiness area. Heating insulation by power or steam, preventing superheat, otherwise, it will bring out signal distortion.

表 3 导压管的内径和长度

Table 3 inside diameter and length of the pressure line

导压管长度 /mm pressure line length 导压管直径 /mm pressure line diameter 被测流体 fluid	＜ 16000	16000 ~ 45000	45000 ~ 90000
水、水蒸气、干气体	7 ~ 9	10	13
湿气体	13	13	13
低、中粘度的油品	13	19	25
脏液体或气体	25	25	38

10. 开箱检查及运输贮存
Unpacking inspection and storage and transportation

10.1 开箱检查 Unpacking inspection

开箱时检查包装是否完好，并核对节流元件的型号、规格是否与订货合同符合，随机所附文件是否齐全。

Open the packing box, check the packaging is intact, and check the throttling elements model, specifications and the order of the contract in line with the random documents are complete.

10.2 附件 accessory

产品说明书 1 份　Product instructions　1

产品合格证 1 份　Product qualification certificate 1

装箱单　　Packing list

其他附件 (以实际订货清单为准) Other accessories (based on actual order list)

10.3 运输与贮存 storage and transportation

10.3.1 产品适用陆运、空运、水（海）运的要求。运输装卸按包装的标志进行。产品不得受到剧烈冲撞和暴晒雨淋，不得倒置， 且在装卸过程中应轻搬轻放， 禁止摔掷、翻滚重压。

For land, air, water (SEA) transport requirements. Transportation is carried out according to the marking of the packing. The product shall be subjected to the severe impact and exposure to rain, not inverted, and in the process of loading and unloading should be handled with care, prohibit throw, rolling pressure.

10.3.2 节流元件和附件应在出厂原包装条件下，存放于室内，环境温度为 –40℃ ~ +60℃，相对湿度不大于 90%，干燥通风的室内，且空气中不含腐蚀性介质。

The throttling elements and accessories factory in the original packaging conditions, stored in the indoor environment temperature of –40℃ to +60℃ , relative humidity is less than 90%, dry indoor air, and the air can not contain corrosive medium.

11. 质保期说明 Warranty period description

11.1 产品整机的质保期为 12 个月。The product warranty for 12 months.

11.2 产品在质保期内返修的，修理或更换的零部件质保期自修理出厂之日起延长一年，未修理部分的零部件质保期依旧。Product repair during the warranty period, repair or replacement of parts of self repair warranty period extended for one year from the date of shipment, not repair the parts warranty period remain unchanged.

11.3 产品在质保期外返修的，修理或更换的零部件质保期延长一年，其它部分无质保期。In the product warranty repair, repair or replacement of parts of the extended warranty period of one year, not including other parts.

11.4 从第三方采购的产品附件质保期依据第三方确定的质保期执行。The warranty period of the product accessories purchased from third parties shall be executed according to the warranty period determined by the third party.

12. 订货须知 Guide for order

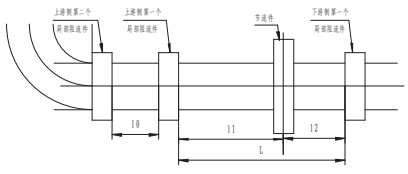
为方便用户，保证节流产品使用可靠，测量准确，并减少不必要的中途周折，请用户提供完整的设计清册或按订货单 (见附表) 要求填写清楚后，派人来公司或来函订货。

For convenience, reliable application and accurate measurement, please clearly fill the order form firstly, and order by mail or to discuss personally，as shown in table after the text. We are sincerely looking forward to your visit and cooperation.

附表：技术规格单 Technical specifications

杭州和利时自动化系统工程有限公司

节 流 元 件 技 术 规 格 单

<table>
<tr><td>订货单位</td><td></td><td>合 同 号</td><td></td></tr>
<tr><td>电　话</td><td></td><td>数　量</td><td></td></tr>
<tr><td>代 表 人</td><td></td><td>订货日期</td><td></td></tr>
<tr><td>地　址</td><td></td><td>交货日期</td><td></td></tr>
<tr><td>节流元件型号</td><td></td><td>取压孔对数</td><td>(对)</td></tr>
<tr><td>流体名称</td><td></td><td>安装位号</td><td></td></tr>
<tr><td>变送器型号</td><td></td><td rowspan="5">气体请确定流量状态</td><td rowspan="5">1. 工作状态下的值
2. 0℃ 760mmHg 状态下的值
3. 20℃ 760mmHg 状态下的值</td></tr>
<tr><td>最大流量</td><td>□t/h □m^3/h □Nm^3/h</td></tr>
<tr><td>常用流量</td><td>□t/h □m^3/h □Nm^3/h</td></tr>
<tr><td>最小流量</td><td>□t/h □m^3/h □Nm^3/h</td></tr>
<tr><td>刻度流量</td><td>□t/h □m^3/h □Nm^3/h</td></tr>
<tr><td>工作压力</td><td>MPa(□ 表压 □ 绝压)</td><td>地区大气压</td><td>Pa</td></tr>
<tr><td>工作温度</td><td>℃</td><td>液体密度</td><td>kg/m^3 在　状态下</td></tr>
<tr><td>流体粘度</td><td>mPa.S(CP)</td><td>相对湿度</td><td>%　在　状态下</td></tr>
<tr><td>设计差压</td><td>kPa　　mmH_2O</td><td>允许压损</td><td>kPa　　mmH_2O</td></tr>
<tr><td>管道规格</td><td>Φ　×　mm</td><td>管道材质</td><td></td></tr>
<tr><td>法兰标准</td><td colspan="3"></td></tr>
<tr><td>联接方式</td><td colspan="3">□ 法兰联接　□ 焊接</td></tr>
<tr><td>安装方式</td><td colspan="3">□ 水平　□ 垂直　□ 自上而下↓　□ 自下而上↑</td></tr>
<tr><td rowspan="2">管　道
敷 设 图</td><td>  </td><td rowspan="2">混合气体请提供成份容积百分比</td></tr>
<tr><td>上游侧第一个局部阻流件形式
上游侧第二个局部阻流件形式
下游侧第一个局部阻流件形式
上游侧第一个和第二个局部阻流件之间的直管段长度 l_0=　m
供安装节流装置用的直管段总长：L =　m
(l_1=　m l_2=　m)</td></tr>
<tr><td>备　注</td><td colspan="3"></td></tr>
</table>

注意事项：

1. 规格单是与合同一起作为订货的依据，数据必须正确无误，单位一致，不得涂改。
2. 测量水或水蒸汽时，流体密度和流体粘度可不填。
3. 气体流量单位的基准状态应正确选择，否则对流量测量的精度影响很大。
4. 混合气体容积百分比之和应等于 100%。
5. 组件产品法兰无特殊说明均按本公司标准提供。
6. 由本公司计算确定差压后，再选择变送器型号。

Hangzhou HollySys Automation System Engineering Co. Ltd.
Throttling element specificatio

Name of order company		Contract number	
The telephone number		Quantity	
Agent name		Order date	
Address		Delivery date	
Throttling element model		Pressure port quantity	(A pair of two)
Fluid name		Installation position number	
Transmitter model			
Max flow	□t/h □m^3/h □Nm^3/h	Make sure the gas flow status	1. Value in working condition 2. Value at 0℃ 760mmHg 3. Value at 20℃ 760mmHg
Common flow	□t/h □m^3/h □Nm^3/h		
Min flow	□t/h □m^3/h □Nm^3/h		
Scale flow	□t/h □m^3/h □Nm^3/h		
Working pressure	MPa □ manometer pressure □ absolute pressure	Regional atmos.	Pa
Working temperature	℃	Liquid density	kg/m^3 status
Fluid viscosity	mPa.S(CP)	Relative humidity	% status
Differential pressure designed	kPa mmH_2O	Pressure loss allowed	kPa mmH_2O
Pipe size	Φ × mm	Pipe material	
Flange standard			
Connection mode	□ flange connection □ welding		
Installation mode	□ horizontal □ vertical □ come from above↓ □ come from below↑		
Pipeline laying drawing	Baffle form in the upstream and downstream:	For mixed gases, please provide the percentage of component volume.	
	Length of straight pipe section for installation of throttling device: L= m (l_1= m l_2= m)		
Remarks			

Notes:

1. Specification and contract are the basis of ordering, the data must be correct, consistent units, shall not be altered.

2. When measuring water or steam, fluid density and fluid viscosity do not need to be filled.

3. The gas flow unit reference state should be chosen correctly, otherwise it will have a great influence on the accuracy of the flow measurement.

4. The sum of the volume percentage of the mixture shall be equal to 100%.

5. Component product flanges are provided in accordance with the company standards without special requirements.

6. Calculated by the company to determine the differential pressure, and then select the transmitter model.

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