

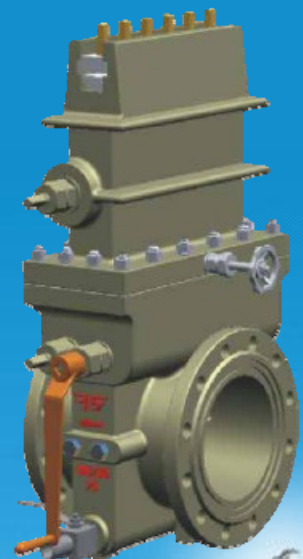


**CHENGDU HOLY VALVE & COMPLETE
EQUIPMENT CO., LTD.**

INTEGRATIVE ORIFICE PLATE FLOW METER

ORIFICE PLATE PRESSURE DEVICE

TUBE BUNDLE FLOW CONDIONER



HOLY VALVE





★ ABOUT GROUP COMPANY



Chengdu Holy Valve & Complete Equipment Co., Ltd. is affiliated to Chengdu Holy Group.

Chengdu Holy Group located in Chengdu city, Sichuan Province, has three industrial parks in Chengdu High-tech Industrial Development Zone, Pengzhou City and Jiujiang town of Shuangliu county. The total area is about 980,000 m² and the total assets is over RMB1.5 billion. The group company is national large-scale enterprise. The business range of the group is diversified, including maintenance of aviation power, manufacturing of steel structure, die type color steel plate, equipments for power transmission & distribution and special valves for oil and natural gas, real estate development, industrial and civil structural design & construction, architectural decoration, etc. The

group company has been awarded 'National Quality & Benefit Type Advanced Enterprise' twice, and has been awarded the many titles of honor, such as 'Top 100 Enterprise of Performance Evaluation in National Mechanism Industries', 'Prominent Contribution Units for National Day Parade', 'Home of National Model Employees', 'National First Class Measuring Units', 'Superexcellent Enterprise of Sichuan Province', and 'National May Day Award', etc.

★ HISTORY OF DEVELOPMENT

At the middle of 1980s, the group company cooperated with scientific research institutions, Sichuan Petroleum Survey & Design Institute, to develop and manufacture the products, including through conduit slab gate valves, ball valves, orifice type pressure measuring equipments for nature gas treatment, transportation and distribution. After devoting the marketing, because of the reasonable design, excellent performance, and good quality, the products made by our company has been used to main natural gas collection, transportation pipeline, and treatment station in Sichuan district, the market of our products has been enlarged rapidly and the products has been used to national mayor oil & gas company, and its usage range has been enlarged to petroleum, finished oil, crude oil, waste water, etc. The suitable temperature range of the valves has been enlarged from low temperature to high temperature.

In 1993, the valve manufacturing scale was augmented increasingly, with nice market foreground, valve branch plant became to valve plant to be professionally in charge of design and manufacturer of valve products, special processing treatment and sealing parts for aviation rubber, etc. through group manufacturing lines. In order to meet marketing demand and improve our quality management level, the valve branch plant joined the China Valve Industries Association in 1996, and been awarded the ISO9001 certificate issued by Det Norske Veritas (DNV) and passed the replacement of version of DNV ISO9001:2000 Quality System in 2005. Except for this point, based on the quality intention of our factory –'Zero Defect, Excellent Quality', our factory acquired the 'Manufacturer License of Special Equipment' issued by General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China in January 2003 and acquired 'Certificate of Conformity of Occupational Health and Safety Management System Certification' issued by CNAS in 2007. In 2009, the company had been awarded API 6D certificate (License No.: 6D-0703).

In December 2004, the valve branch plant renamed Chengdu Holy Valve & Complete Equipment Co., Ltd.



★ ABOUT COMPANY

The covering area of the valve company is about 15,000 square meters and there are more than 200 employees in our company, including 10 mechanical engineering technicians with senior title and 26 mechanical engineering technicians with middle and primary title. The company owns over 200 sets kinds of large and common equipments, including processing centers, CNC lathes, large vertical lathe, general lathe, milling machine, boring machine, surface grinder, cylindrical grinder, rubber vulcanization machines, large type nitriding furnace, etc.

★ PRODUCTS RANGE

The company has adopted computer-aided to design products, the key pieces for stress analysis, and fully guarantee its structure and the stress distribution is reasonable and reliable. Good quality tracking system to enhance the technical level and product quality to provide a fundamental guarantee. The valves designed by our company were acquired many national patents. The major products provided by our company are below:

Name of Products	Nominal Diameter (mm/inch)	Nominal Pressure (MPa/Lbs)	Suitable Temperature (°C)	Remark
Slab Gate Valve With or Without Guiding hole	DN25~1500 (1"~60")	PN1.6~42 (class150~2500)	-101~350	HOV,BGO,MOV
API 6D Ball Valve	DN50~1200 (1/2" ~48")	PN1.6~25 (class150~1500)	-46~250	HOV,AOV,MOV
Senior Orifice Fitting	DN50~700 (2" ~28")	PN1.6~16 (class150~900)	-46~121	Patent Products
Junior Orifice Fitting	DN50~700 (2" ~28")	PN1.6~16 (class150~900)	-46~121	/
Under Ground Slab Gate Valve	DN50~700 (2" ~28")	PN1.6~16 (class150~900)	-29~121	(Patent Products) HOV, BGO
Non-rising Stem Slab Gate Valve With or Without Guiding Hole	DN50~700 (2" ~28")	PN1.6~10 (class150~600)	-46~250	HOV,AOV,MOV
Double Acting Throttle & Globe Valve	DN20~250 (3/4" ~10")	PN1.6~16 (class150~900)	-29~121	HOV
Valve Case Type Drain Valve	DN20~250 (3/4" ~10")	PN1.6~16 (class150~900)	-29~121	HOV
Under Ground PE Ball Valve	DN50~200 (2" ~8")	≤0.4	-60~60	(Patent Products) HOV

Note 1: Except underground PE ball valve, all the other valves mentioned above are of non-sulphur resistant type, sulphur resistant type, and high sulphur resistant type.

Note 2: Abbre. Explanation

MOV: Motor Operated Valve

HOV: Handwheel Operated Valve,

BGO: Bevel Gear Operated Valve,

AOV: Actuators Operated Valve (Electric, pneumatic, hydraulic, etc various actuators upon request)



Our company is the first class member of valve supplier net of CNPC, SINOPEC and CNOOC, our products are widely used in China mayor oil & gas field, like Sichuan Oil & Gas Field, Xinjiang Oil & Gas Field, Qinghai Oil & Gas Field, Changqing Oil & Gas Field, Daqing Oil & Gas Field, North China Oil & Gas Field, Jiangsu Oil & Gas Field, Shengli Oil & Gas Field and West China Petroleum Corporation, etc.

★ COMPANY CULTURE

Our Consciousness Idea — Crisis, High-quality Products, and Beyond

We sincerely thank our customers and friends for your persistent supply and trust. Face to the future, we purpose to improve the product quality and strengthen the cooperation with the customers with more zealous service and agiler system to make the bigger contribution to the construction of oil and gas industries at home and abroad.



Chengdu Holy Valve is one of the biggest and best professional valve manufacturers and measurement systems in China. We are the leading provider of valves and measurement systems to oil and gas industry and general industrial applications. We commit to supply products with excellent quality and suitable price to our customers to enhance our customers' working site safety, system stability and convenient operation. The valves provided by our company have enough safety design, service life and reliable operation.

Integrative Orifice Plate Flowmeter

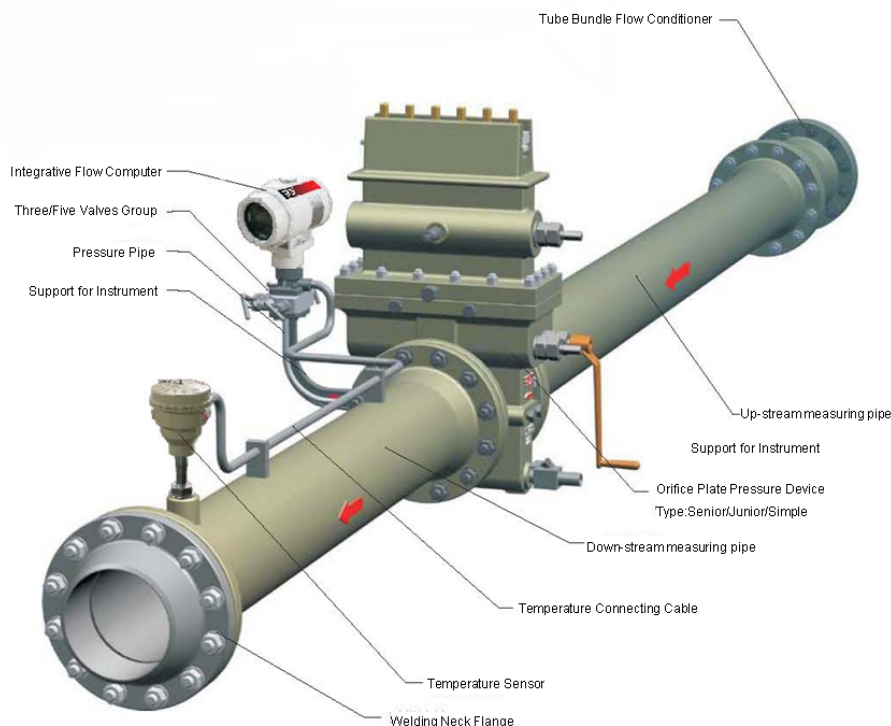
Chengdu Holy Valve & Complete Equipment Co., Ltd.



OVERVIEW

The integrative orifice plate flowmeter produced in our company is designed to assemble the orifice plate pressure device and integrative flowmeter at the factory, minimize the measure error caused by assembling or mismatching with the second instrument, maximize improvement of measurement accuracy of orifice plate pressure device. At the same time, to meet the requirements of customers, the installation and maintenance costs will be at least. Integrative flowmeter integrates differential pressure and pressure transmitter, support input of PT100 temperature sensor.

- Meet accuracy of trade measurement of AGA, API.
- Suitable for measurement for natural gas, coal gas, steam, etc. including be used at high temperature and high pressure conditions.
- Large range ratio, up to 10:1. Please use it in the effective range (see table 2).
- Calibration not needed.
- Operate simply, easy to use, test and maintain, lower costs of installation and maintenance.
- Pre-assembled with the second instrument at the factory to ensure the high-precision of installation.
- The second instrument is close to the orifice plate, rapid response, high accuracy.
- Reduce the leakage point, make it safe and reliable.



STANDARDS

- AGA3/AGA8 Orifice Metering of Natural Gas/ Compressibility Factors of Natural Gas and other Related Hydrocarbon Gases
- GB/T2624 Measurement of Fluid Flow by Means of Orifice Plates, Nozzles and Venturi Tubes Inserted in Circular Cross-section Conduits Running Full.
- GB/T21446 Metering the Flow Rate of Natural Gas With Standard Orifice Plate.
- JB/T7252 Valve Type Orifice Plate Pressure Device.
- JJG640 Pressure Differential flowmeter (Regulations governing metrological verification of the People's Republic of China).
- JB/T82 Steel Pipe Welding Neck Flanges with Male and Female Face (Male and Female Face as well when for low pressure).
- GB/T5464 General-purpose Specification for the Packaging of Instrumentation Products.
- GB/T8603 Technical Requirements of Measuring Systems for Natural Gas.

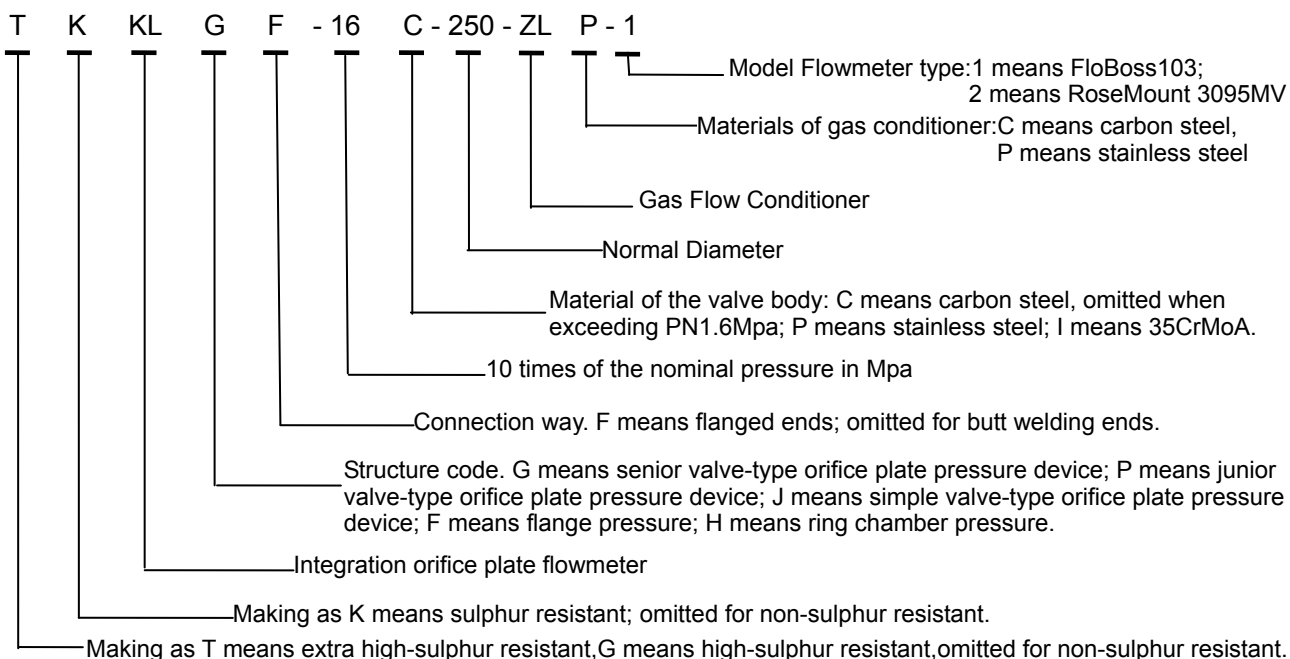
MATERIALS OF MAIN PARTS

Component description	Non-sulfur resistant	Sulfur resistant
Valve body, valve cap	Cast iron WCB	
Orifice plate	Austenitic Stainless Steel	
Seals	Rubber 5080	Fluorine rubber F370
Valve plate	2Cr13	318
Flange	20 (unless otherwise specified in contract)	
Flowmeter case	Casting aluminum alloy	



MODEL EXPLANATION

Example:



TECHNICAL SPECIFICATIONS

- Suitable medium: natural gas, sulf-natural gas, gas, steam and cleaning oil, etc.
- Medium temperature: -29°C~121°C
- Pressure class: PN1.6~16MPa (to be customized when over PN 16MPa)
- Size: DN50~DN600mm (to be customized when over 600mm)

MAIN PERFORMANCE

To meet the different requirements of customers, our company introduces the following two kinds of flow computers for selection:

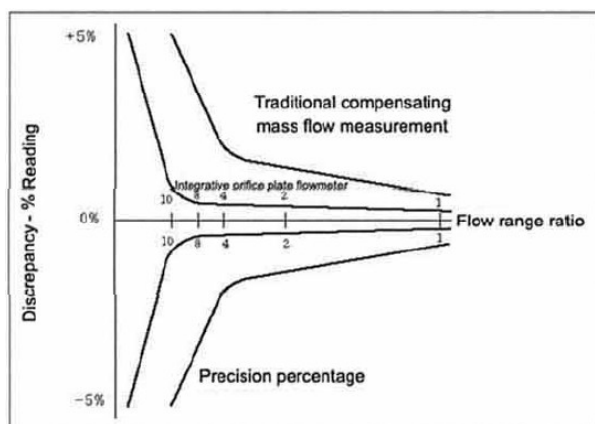
Model	FloBoss103	RoseMount3095MV
Executive Standards	AGA3/AGA8	AGA3/AGA8, ASME Steam density
Precision	1%	1%
Range Ratio	10:1	8:1
Local Display	Pressure, temperature, differential pressure, instant flow, accumulated flow etc.	Pressure, temperature, differential pressure, instant flow, accumulated flow etc.
Communications	Built-in port LOI/RS485, ROC or MODBUS agreement.	HART agreement, after matching the signal distributor, the received digital signal will be converted to multi-channel 4-20mA current (DP, AP, GP, PT, flow) for far spread (Optional)
Far-distance Communications	Communication card (RS232 card or MODEM card) (Optional)	
Internal Records	Ten minutes report of 4 data points can be saved for 30 days (Can be configured)	Accumulate total flow
Power Supply	DC12V/24V	DC24V (Two-wire system)
Connection Lines	Four lines, I / O card to be an additional line	Signal and power sharing two lines
Battery Configuration	Built-in battery-powered (about 7 days)/ Optional solar panel	N/A
Input	4 points I / O card (optional)	
Output	Digital signals, analog signals and on-off signals (optional)	Digital signal be added on the instant flow signal of 4-20mA.

Notes: Please see the operation manual for the details.



SYSTEM MEASUREMENT PRECISION

Mass flow precision: 1%, Range ratio: 10:1



- Within the valid flow range (see Table 2), unnecessary calibration to satisfy the required precision.
- Repeated precision: 0.2%.

Table 1: Measurement precision

$\beta = \frac{d_{20}(\text{ID of orifice plate})}{D_{20}(\text{ID of measuring pipe})}$	Uncertainty of orifice coefficient	
	With mating straight pipe	Without mating straight pipe
$\beta \leq 0.1$ (Use after calibration)	2.5%	5%
$0.1 < \beta < 0.2$	1.25%	2.5%
$0.2 < \beta \leq 0.65$ (Recommended)	0.75%	1.5%
$0.65 < \beta < 0.75$	1.5%	3%

FLOW RANGE

Table 2: Ensure the best accuracy of the measuring range

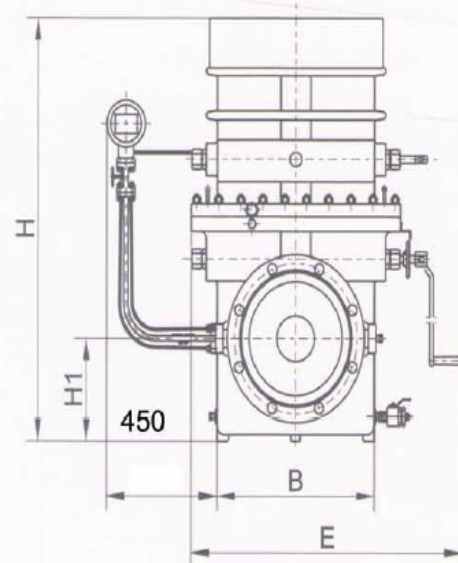
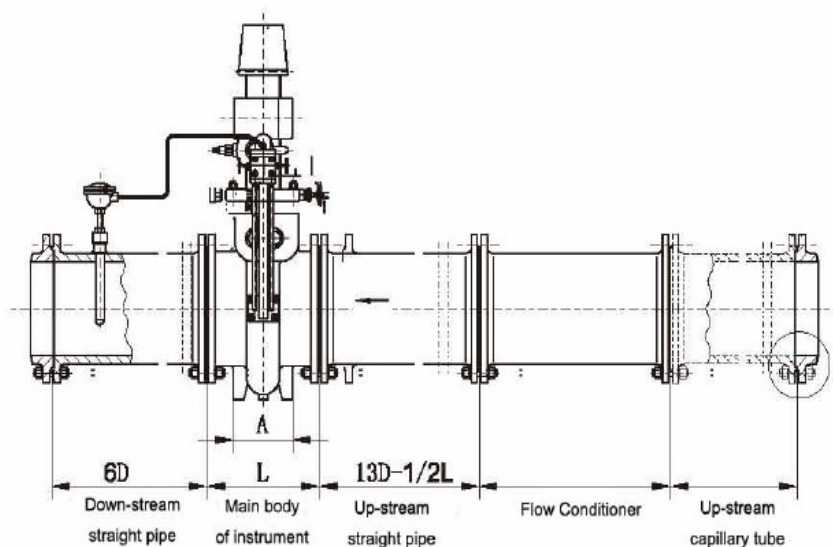
Measuring range DN	Medium measurement working pressure										
	0.16	0.25	0.4	0.64	1.0	1.6	2.5	4.0	6.4	10.0	13.5
50	50-800	64-1400	76-1700	92-2150	110-2660	140-3350	177-4210	226-5400	290-7000	380-9000	448-10700
65	54-1710	62-2200	82-2950	100-3600	120-4500	153-5600	190-7100	244-9100	320-11800	410-15200	484-18000
80	91-3150	106-3740	127-4570	155-5650	190-6980	238-8800	297-11000	380-14100	432-16100	500-18700	594-22200
100	140-4000	160-5704	190-7000	250-8600	290-10600	365-1340	460-16800	580-21500	690-25700	820-30000	970-36000
150	255-8900	360-12600	435-15400	530-19000	650-23500	810-29700	1010-37200	1290-47700	1535-56900	1760-65500	2090-77700
200	490-17200	695-24300	830-29700	1020-36700	1245-45400	1560-57200	1980-71800	2440-72400	2970-90000	3530-107000	4180-127000
250	765-27000	890-31800	1065-38500	1300-47400	1600-58400	2000-73400	2490-92000	3130-116000	3860-143000	4590-170000	5435-202000
300	875-31400	1015-36800	1215-44400	1480-54400	1820-66900	2280-83900	2840-105000	3530-131000	4380-163000	5070-188000	6000-223000
350	1180-42300	1370-49600	1640-59800	2000-73400	2450-90000	3060-113000	3820-142000	4770-177000	5760-214000	6920-257000	8200-305000
400	1530-55200	1780-64600	2130-77900	2600-95600	3180-117000	3980-147000	4880-181000	6100-227000	7350-273000	8940-330000	10590-391000
500	2330-83800	2710-98200	3240-118000	3950-145000	4840-178000	6050-224000	7440-276000	9350-347000	11800-438000	14900-560000	17200-670000
600	3250-113000	3740-132000	4490-159000	5450-196000	6620-240000	8350-302000	10200-378000	13000-483000	16800-625000	21700-807000	25700-956000
700	4500-155000	5150-181000	6200-218000	7500-268000	9200-329000	11500-474000	14500-518000	18500-660000	23800-857000	31000-110000	37000-131000
800	5800-210000	6700-244000	8100-290000	9800-360000	12000-440000	15000-55500	18800-695000	24000-888000	31000-115000	40000-148000	47500-175000
900	7350-263000	8500-308000	10200-371000	12500-455000	15200-560000	19000-70000	24000-880000	31000-112000	39500-145000	51000-187000	60000-222000
1000	9000-320000	10500-380000	12600-450000	15500-560000	18800-690000	23500-86000	29500-108000	37500-130000	48580-180000	63000-230000	70000-275000

Notes:

- The above calculated results are based on the following assumption:
 - Medium temperature is 20°C, gas relative density is 0.6, local atmosphere pressure is 101.32KPa.
 - β value of orifice plate valve pressure device is 0.2-0.65.
 - Range of differential pressure transmitter is 60Kpa.
- Due to the different working conditions, these above figures only as reference for select instrument.
- As recommendation, the common flow value of instrument is about 40% in maximum of above mentioned data.



● INSTALLATION DIAGRAM



Notes:

1. Parts of solid line in above drawing will be completely provided by our company.
2. In the main body of instrument, senior, junior or simple valve-type orifice plate pressure device can be chosen.
3. Flow conditioner is divided into fixed, expansion tube type and rectifier board. The length of its structure will be based on specified order requirements.



■ The integrative orifice plate flowmeter produced in our company passed the actual flow calibration measuring by the national grand flow meter measuring station, the overall system precision is better than 1%.

Orifice Plate Pressure Device

Chengdu Holy Valve & Complete Equipment Co., Ltd.

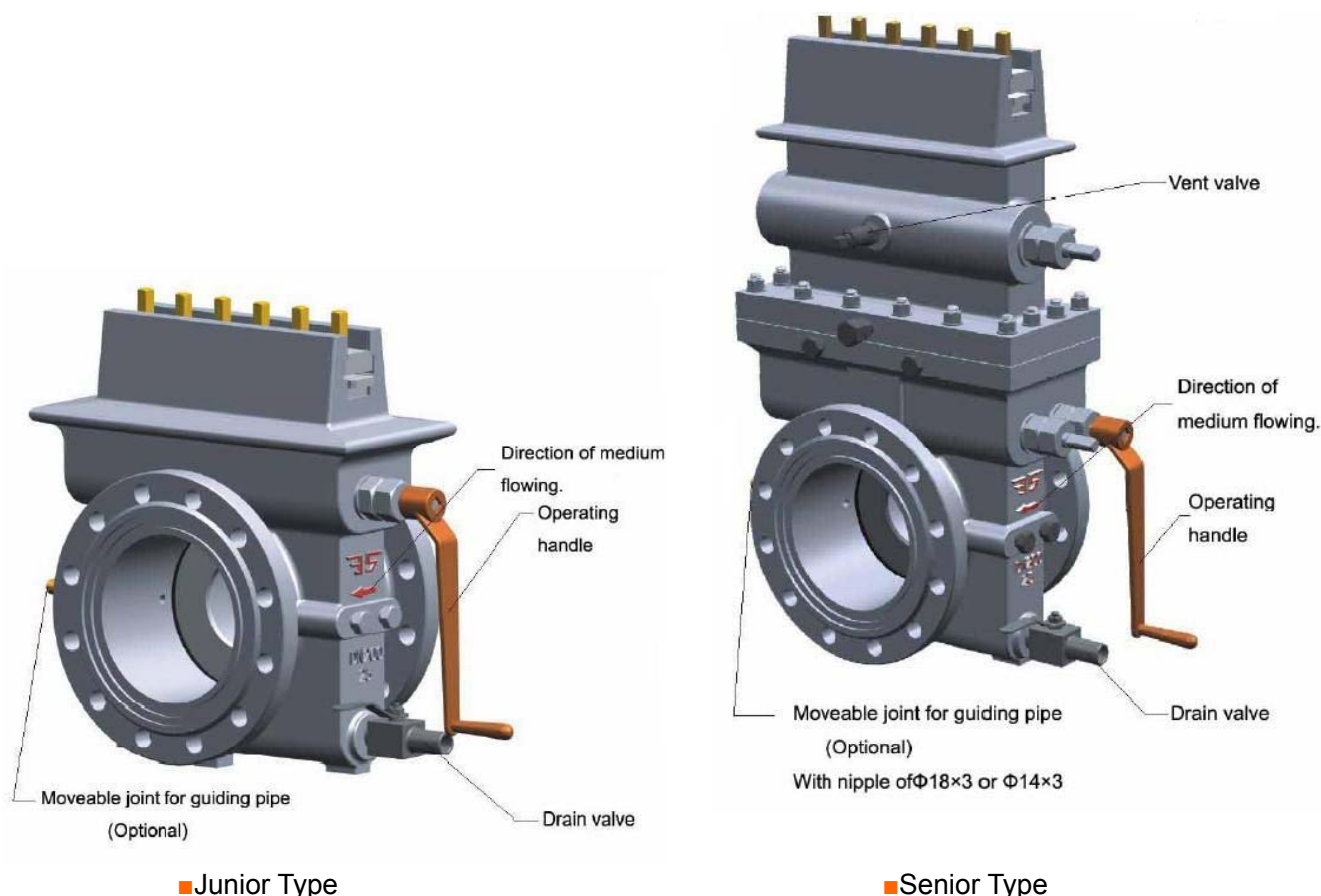


OVERVIEW

The valve-type orifice plate pressure device produced in our company is a patented product as utility model by the state (Patent No. ZL99231419.4). Flange pressure is generally adopted unless otherwise noted, for which senior, junior and simple types are available. All products feature reliable installation precision of orifice plate and accurate measurement. After calibration on-line, the instrument system can reach Class A (Class 1.0) specified in Table A1 of GB/T18603-2001 for the accuracy. If without any calibration, the system accuracy can get to Class 1.5 if the secondary instruments are properly installed with the optimized accuracy obtained. It is easy for operation, and replacement of orifice plate can be made conveniently without intervening doing anything on pipelines. For the senior orifice pressure device, the orifice plate can be inspected and replaced within 3 to 5 minutes without stopping medium transmission. Its reasonable structure, reliable seal, safety and economy make it an ideal accessory product for flow measuring instrument.

The pressure device and orifice plate are designed, produced and inspected as per JB/T 7252-94 "Valve-type Orifice Plate Throttle Device" and conform to the requirements stipulated in GB/T2624-2006 and GB/T 21446-2008.

All Dual Chamber Orifice Fittings are designed and manufactured to meet latest ANSI/ API 14.3 / AGA 3 recommendations, compliance with industry standards, and satisfaction of specific application requirements for custody transfer of oil and gas.



Orifice Plate Pressure Device

Chengdu Holy Valve & Complete Equipment Co., Ltd.



TECHNICAL SPECIFICATIONS

- Typical application: metering of natural gas and gas main pipelines, or gas distribution station with large flow.
- Suitable medium: purified natural gas, sour natural gas, gas, air and cleaning oil.
- Medium temperature: $-29^{\circ}\text{C} \sim 121^{\circ}\text{C}$
- Pressure Class: PN1.6~16MPa (class150~900) (to be customized above 16MPa/class900)
- Size: DN50~DN600mm (to be customized above 700mm)

MAIN STANDARDS

ISO 5167 Measurement of Fluid Flow by Means of Orifice Plates, Nozzles and Venturi Tubes Inserted in Circular Cross-section Conduits Running Full.

AGA Report No. 3 Orifice Metering Of Natural Gas And Other Related Hydrocarbon Fluids

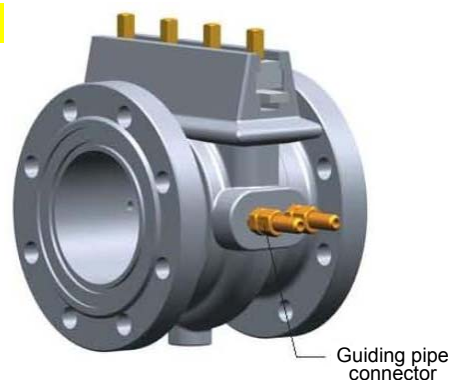
ANSI/API 14.3.2 Chapter 14 - Natural Gas Fluids Measurement, Section3 - Concentric, Square-Edged Orifice Meters, Part 2- Specification and Installation Requirements

GB/T21446 Metering Flow Rate of Natural Gas With Standard Orifice Plate.

JB/T7252 Valve Type Orifice Plate Pressure Device.

MATERIALS OF MAIN PARTS

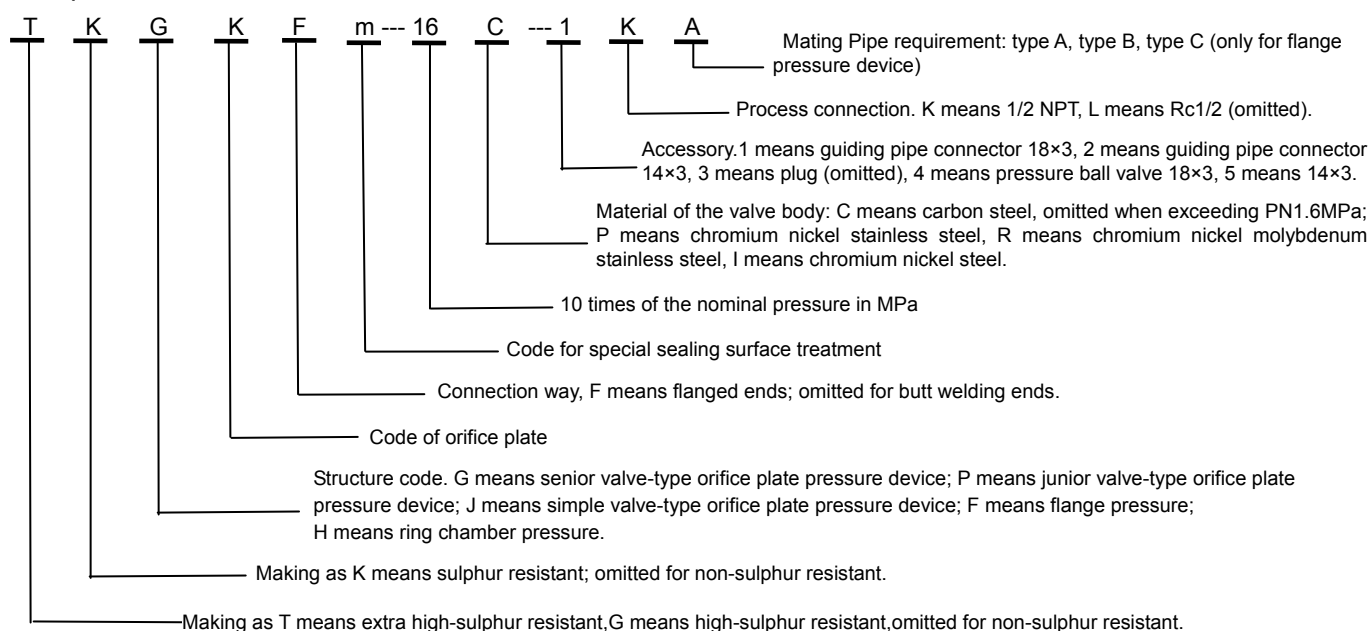
Name of Parts	Non-Sulphur resistant	Sulphur resistant
Body, Bonnet	WCB Casting steel	
Orifice Plate	Austenitic Stainless Steel	
Sealing Plate	Rubber 5080	Fluorine rubber F370
Valve Plate	2Cr13	318
Mating Flanges	20 (unless otherwise specified in contract)	



Simple Type

MODEL EXPLANATION

Example:



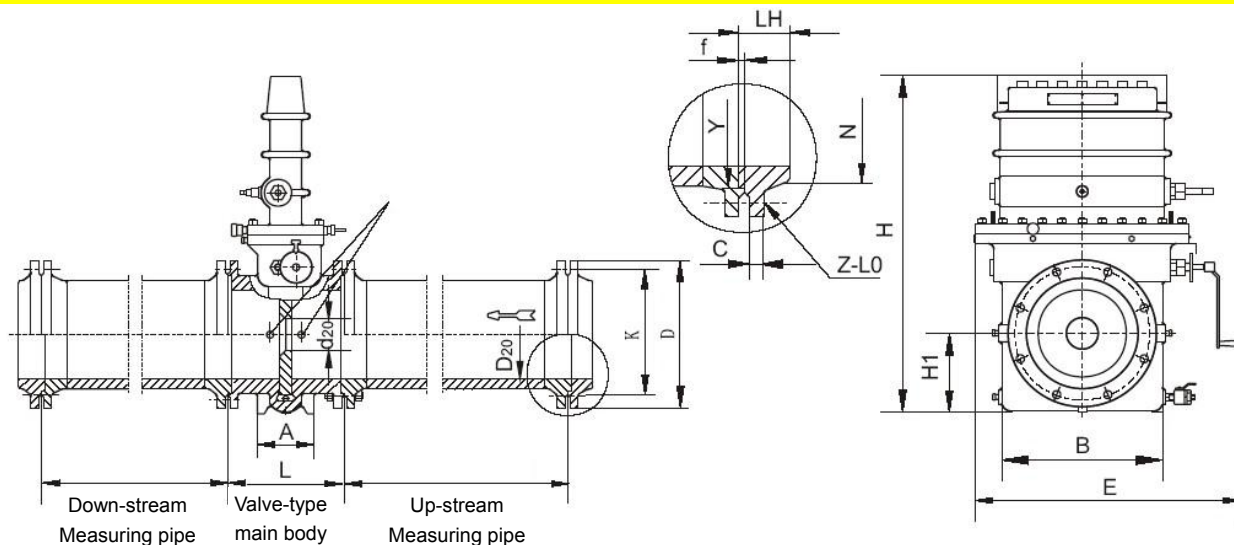
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Orifice Plate Pressure Device

Chengdu Holy Valve & Complete Equipment Co., Ltd.



SENIOR VALVE-TYPE ORIFICE PLATE PRESSURE DEVICE ZL99231419.4



Notes:

1. Orifice plate can be replaced on line without affecting medium transmission. No additional pipeline needed and small space required offers it a good cost performance.
2. It is recommended that the device be installed vertically and the pipeline concerned horizontally.
3. The diameter of pressure tapping is $\Phi 8$. The distance between the axis of pressure tapping and the face of adjacent orifice is 25.4mm (same for the below).
4. It is characterized by compact structure, less weight, smooth transmission, reliable sealing and accurate measurement.
5. The manufacturer can supply complete set of device shown, the size of the openings decided by the Customer.

Table 1

Unit:mm

PN (MPa)	DN	Dimensions of main body						Dimensions of connection flange								Wt.(kg)
		D20	L	H	H1	E	A×B	D	K	C	LH	N	Y	f	Z-L0	
GKFM-16C KGKFM-16C	50	50	270	455	115	500	130×190	160	125	16	48	57	88	4	4-18	85
	65	67	273	510	118	500	160×207	180	145	18	50	76	110	4	4-18	95
	80	81	273	510	118	500	160×207	195	160	20	52	89	121	4	8-18	100
	100	100	279	520	117	515	160×220	215	180	20	52	108	150	4.5	8-18	118
	150	149	286	640	153	550	130×270	280	240	22	60	159	204	4.5	8-23	173
	200	207	318	830	186	690	150×370	335	295	24	62	219	260	4.5	12-23	258
	250	259	360	930	225	750	200×420	405	355	26	68	273	313	4.5	12-25	400
	300	311	380	1150	272	1000	200×526	460	410	28	70	325	364	4.5	12-25	560
	350	361	400	1160	285	1000	200×562	520	470	32	78	377	422	5	16-25	658
	400	412	460	1400	320	1120	240×646	580	525	36	90	426	474	5	16-30	1250
	500	508	440	1860	360	1300	290×775	705	650	42	98	530	576	5	20-34	1400
GKFM-25 KGKFM-25	600	602	500	1860	472	1450	300×816	840	770	46	105	630			20-41	1950
	50	50	270	475	115	500	130×200	160	125	20	48	57	88	4	4-18	85
	65	67	273	510	118	500	160×207	180	145	22	52	73	110	4	8-18	102
	80	81	273	510	118	500	160×207	195	160	22	55	89	121	4	8-18	108
	100	100	305	520	122	515	160×220	230	190	24	62	108	150	4.5	8-23	115
	150	149	286	640	153	550	130×270	300	250	28	72	159	204	4.5	8-25	142
	200	207	318	830	186	690	150×370	360	310	30	80	219	260	4.5	12-25	270
	250	259	360	950	225	750	200×420	425	370	32	85	273	313	4.5	12-30	375
	300	311	380	1150	272	1000	200×540	485	430	36	92	325	364	4.5	16-30	580
	350	361	400	1160	290	1000	200×530	550	490	40	98	377	422	5	16-34	720
	400	408	460	1400	320	1120	240×650	610	550	44	115	426	474	5	16-34	1020
	500	504	440	1570	360	1300	290×775	730	660	48	120	530	576	5	20-41	1480
	600							840	770	54	130	630			20-41	

Orifice Plate Pressure Device

Chengdu Holy Valve & Complete Equipment Co., Ltd.



● SENIOR VALVE-TYPE ORIFICE PLATE PRESSURE DEVICE ZL99231419.4

Continued above table: Advanced valve-type orifice plate pressure device

Unit:mm

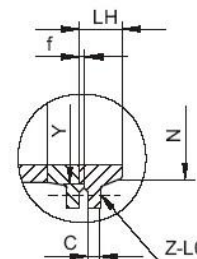
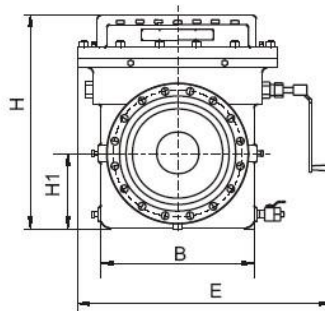
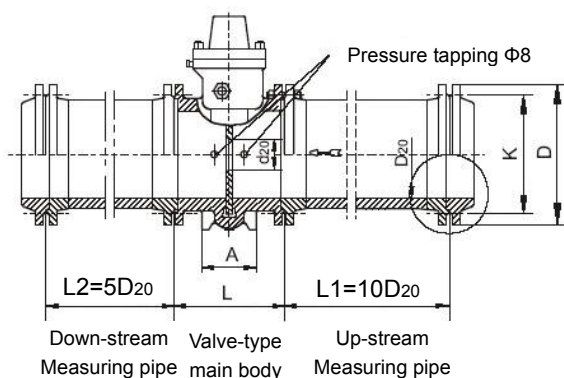
PN(MPa)	DN	Dimensions of main body						Dimensions of connection flange								Wt.(kg)
		D20	L	H	H1	E	A×B	D	K	C	LH	N	Y	f	Z-Lo	
GKFm-40 KGKFm-40	50	50	270	475	115	500	130×190	160	125	20	48	57	88	4	4-18	85
	65	67	273	530	118	500	160×207	180	145	22	52	73	110	4	8-18	115
	80	81	273	530	118	500	160×207	195	160	24	58	89	121	4	8-18	110
	100	100	305	550	122	515	160×220	230	190	26	68	108	150	4.5	8-23	125
	150	149	340	650	163	550	140×290	300	250	30	72	159	204	4.5	8-25	180
	200	205	360	836	196	690	170×384	375	320	38	88	219	260	4.5	12-30	305
	250	257	430	950	278	720	230×460	445	385	42	102	273	313	4.5	12-34	440
	300	307	470	1150	271	1000	230×560	510	450	46	116	325	364	4.5	16-34	520
	350	357	495	1400	295	1050	240×590	570	510	52	120	377	422	5	16-34	740
	400	404	510	1450	335	1120	260×690	655	585	58	142	426	474	5	16-41	1220
	500	500	525	1625	400	1300	310×740	755	670	62	156	530	576	5	20-48	1650
	600															
GKFm-64 KGKFm-64	50	50	310	485	117	500	130×200	175	135	26	70	57	88	4	4-23	110
	65	67	360	570	155	550	160×235	200	160	28	75	73	110	4	8-23	135
	80	79	360	570	155	550	160×235	210	170	30	75	89	121	4.5	8-23	130
	100	96	400	575	147	550	190×262	250	200	32	80	108	150	4.5	8-25	160
	150	143	415	660	175	590	160×294	340	280	38	108	159	204	4.5	8-34	270
	200	199	430	875	211	700	215×450	405	345	44	116	219	260	4.5	12-34	470
	250	251	450	950	250	750	220×450	470	400	48	122	273	313	4.5	12-41	690
	300	301	500	1170	286	1000	240×570	530	460	54	136	325	364	4.5	16-41	920
	350	345	500	1225	303	1050	245×620	595	525	60	154	377	422	5	16-41	1020
	400	390	530	1320	345	1150	260×680	670	585	66	170	426	474	5	16-48	1580
GKFm-100 KGKFm-100	50	50	360	520	121	550	210×150	195	145	28	72	57	88	4	4-25	130
	65	67	385	570	161	560	190×245	220	170	32	84	73	110	4	8-25	190
	80	77	385	570	161	560	190×245	230	180	34	90	89	121	4	8-25	195
	100	92	420	580	152	550	104×274	265	210	38	100	108	150	4.5	8-30	200
	150	135	430	720	180	660	216×330	350	290	46	130	159	204	4.5	12-34	360
	200	191	440	855	220	700	220×390	430	360	54	145	219	260	4.5	12-41	510
	250	241	500	985	258	760	260×470	500	430	60	170	273	313	4.5	12-41	780
	300	285	640	1200	316	1050	300×600	585	500	70	195	325	364	4.5	16-48	1080
	350	333	630	1300	345	1200	315×650	665	560	76	210	377	422	5	16-54	1200
	400	375	440	1318	352	1600	360×660	685	603	79	185	408	471	7	20-41	1780
GKFm-160 KGKFm-160	50	50	440	520	125	551	200×214	215	165	36	90	60	88	4	8-25	300
	65	64	440	600	185	650	244×304	245	190	44	105	73	110	4	8-30	500
	80	71	460	700	185	650	244×304	260	205	46	110	89	121	4	8-30	500
	100	92	500	600	162	560	220×370	300	240	48	120	114	150	4.5	8-34	650
	150	135	540	776	199	720	272×372	390	318	66	155	168	204	4.5	12-41	880
	200	191	480	820	250	850	300×470	480	400	78	185	219	260	4.5	12-48	1000
	250	241	480	900	190	1000	320×590	580	485	88	230	273	313	4.5	12-54	1400
	300	298.5	440	1200	316	1050	350×620	610	533.5	79.5	210	326	382.5	5	20-39	1500
	400	375	460	1618	352	1080	360×660	705	616	89	216	508	471	7	20-45	1850

Orifice Plate Pressure Device

Chengdu Holy Valve & Complete Equipment Co., Ltd.



JUNIOR VALVE-TYPE ORIFICE PLATE PRESSURE DEVICE ZL99231419.4



Notes:

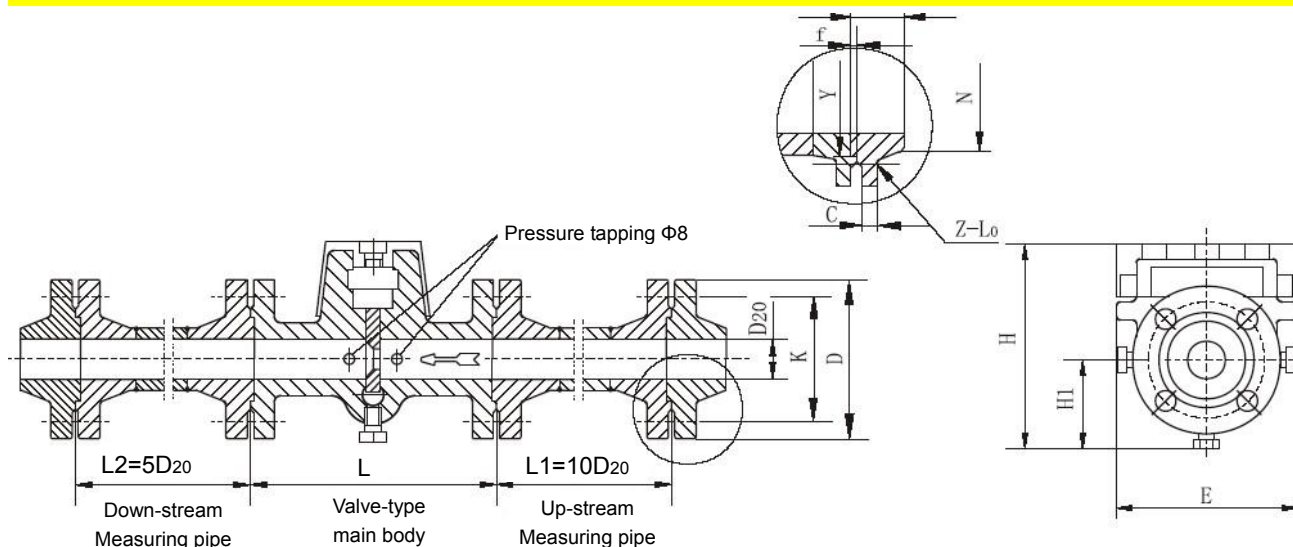
1. In addition to the features of valve-type orifice plate pressure device, orifice plate lifting mechanism is also provided. Fluid transmission, however, has to be stopped for replacement of orifice plate. Compared with that of senior type, the product of this type features simple structure and lower price.
2. The product of this type is further classified into sulfur-resistant and sulfur-irresistant type.
3. The manufacturer can supply complete set of device shown, the size of the openings decided by the customer. Table 2

Unit: mm

PN (MPa)	DN	Dimensions of main body						Dimensions of connection flange								Wt.(kg)
		D20	L	H	H1	E	A×B	D	K	C	LH	N	Y	f	Z-L0	
PKFm-16C KPKFm-16C	200	207	318	600	186	690	150×370	335	295	24	62	219	260	4.5	12-23	220
	250	259	360	620	210	720	200×440	405	355	26	68	273	313	4.5	12-25	300
	300	311	380	750	281	1000	200×526	460	410	28	70	325	364	4.5	12-25	480
	350	361	400	800	285	1050	200×562	520	470	32	78	377	422	5	16-25	640
	400	412	420	850	327	1150	280×620	580	525	36	90	426	474	5	16-30	730
	500	508	440	950	360	1300	290×775	705	650	42	98	530	576	5	20-34	1100
	600	602	500	1150	472	1450	300×815	840	770	46	105	630			20-41	1600
PKFm-25 KPKFm-25	200	207	318	620	196	690	150×370	360	310	30	80	219	260	4.5	12-25	230
	250	259	360	630	225	720	200×440	425	370	32	85	273	313	4.5	12-30	345
	300	311	380	780	272	1000	200×526	485	430	36	92	325	364	4.5	16-30	490
	350	361	400	820	290	1050	200×562	550	490	40	98	377	422	5	16-34	650
	400	408	420	980	320	1150	280×620	610	550	44	115	426	474	5	16-34	740
	500	504	440	1050	360	1300	290×775	730	660	48	120	530	576	5	20-41	1200
	600							840	770	54	130	630			20-41	
PKFm-40 KPKFm-40	200	205	360	640	196	690	170×384	375	320	38	88	219	260	4.5	12-30	235
	250	257	430	680	228	720	230×460	445	385	42	102	273	313	4.5	12-34	350
	300	307	520	800	281	1000	230×560	510	450	46	116	325	364	4.5	16-34	495
	350	357	495	850	295	1050	240×590	570	510	52	120	377	422	5	16-34	655
	400	404	510	1000	335	1150	290×650	655	585	58	142	426	474	5	16-41	750
	500	500	525	1080	400	1300	310×740	755	670	62	156	530	576	5	20-48	1350
	600															
PKFm-64 KPKFm-64	200	199	430	670	211	700	215×450	405	345	44	116	219	260	4.5	12-34	340
	250	251	450	740	250	750	220×450	470	400	48	122	273	313	4.5	12-41	510
	300	301	485	780	280	1000	240×565	530	460	54	136	325	364	4.5	16-41	690
	350	345	500	870	303	1050	245×620	595	525	60	154	377	422	5	16-41	730
	400	390	530	1050	345	1150	260×680	670	585	66	170	426	474	5	16-48	1100
	500	508	590	1150	444	1350	550×850							5		1500
PKFm-100 KPKFm-100	200	191	440	670	220	700	220×390	430	360	54	145	219	260	4.5	12-41	470
	250	241	500	740	255	760	260×470	500	430	60	170	273	313	4.5	12-41	650
	300	285	500	810	290	1050	255×590	585	500	70	195	325	364	4.5	16-48	880
	350	333	530	900	320	1050	270×650	665	560	76	210	377	422	5	16-54	1230
	400	377	560	1080	355	1150	290×780	715	620	80	220	426	474	5	16-54	1350
	500													5		



● SIMPLE VALVE-TYPE ORIFICE PLATE PRESSURE DEVICE ZL99231419.4



Notes:

1. The product of this type is only provided with features of valve-type orifice plate pressure device without orifice plate lifting mechanism. Fluid transmission has to be stopped for replacement of orifice plate. Yet it features simple structure and lower price.
2. The manufacturer can supply complete set of device shown, the size of the openings decided by the customer.
3. The device can be installed in any direction.

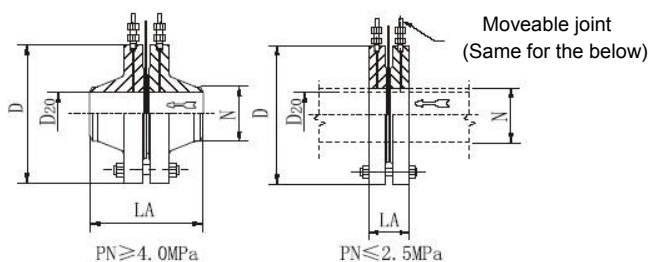
Table 3

Unit: mm

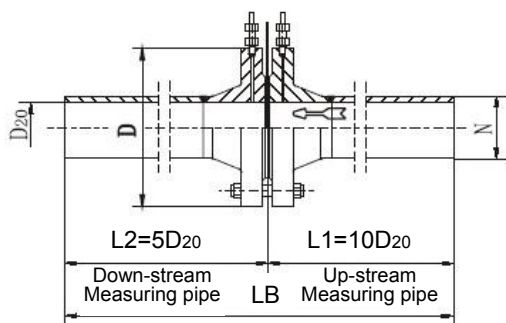
PN (MPa)	DN	Dimensions of main body					Dimensions of connection flange								Wt.(kg)
		D20	L	H	H1	E	D	K	C	LH	N	Y	f	Z-L0	
JKFm-16C KJKFm-16C	50	50	190	220	90	260	160	125	16	48	57	88	4	4-18	32
	65	64	200	240	100	280	180	145	18	50	76	110	4	4-18	35
	80	81	200	245	105	290	195	160	20	52	89	121	4	8-18	38
	100	100	230	275	115	300	215	180	20	52	108	150	4.5	8-18	42
	150	149	260	330	145	360	280	240	22	60	159	204	4.5	8-23	90
JKFm-25 KJKFm-25	50	50	220	220	90	280	160	125	20	48	57	88	4	4-18	32
	65	64	220	235	100	290	180	145	22	52	73	110	4	8-18	35
	80	81	240	245	105	300	195	160	22	55	89	121	4	8-18	38
	100	100	230	275	115	300	230	190	24	62	108	150	4.5	8-23	42
	150	149	290	335	145	380	300	250	28	72	159	204	4.5	8-25	120
JKFm-40 KJKFm-40	50	50	220	230	100	280	160	125	20	48	57	88	4	4-18	
	65	64	230	235	120	290	180	145	22	52	73	110	4	8-18	
	80	81	240	265	120	300	195	160	24	58	89	121	4	8-18	
	100	100	250	295	130	300	230	190	26	68	108	150	4.5	8-23	
	150	149	290	335	160	380	300	250	30	72	159	204	4.5	8-25	
JKFm-64 KJKFm-64	50	50	260	240	100	280	175	135	26	70	57	88	4	4-23	
	65	64	280	265	120	290	200	160	28	75	73	110	4	8-23	
	80	79	280	275	120	300	210	170	30	75	89	121	4.5	8-23	
	100	96	290	300	130	300	250	200	32	80	108	150	4.5	8-25	
	150	143	320	365	170	390	340	280	38	108	159	204	4.5	8-34	
JKFm-100 KJKFm-100	50	50	300	260	120	300	195	145	28	72	57	88	4	4-25	
	65	64	320	265	120	320	220	170	32	84	73	110	4	8-25	
	80	77	340	280	120	340	230	180	34	90	89	121	4	8-25	
	100	92	370	310	130	380	265	210	38	100	108	150	4.5	8-30	
	150	135	460	400	130	470	350	290	46	130	159	204	4.5	12-3	



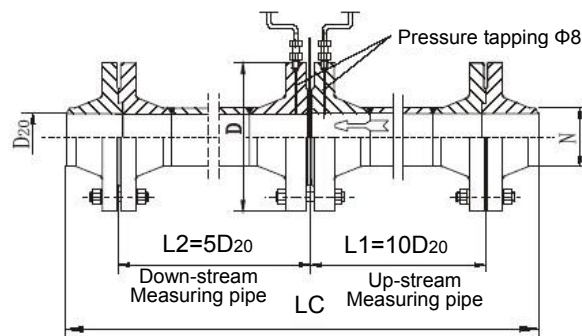
FLANGE PRESSURE DEVICE



Type-A: without straight pipe



Type-B: with straight pipe, no welding flange



Type-C: Complete Equipment

Features:

1. as a conventional orifice plate pressure device, its price is attractive.
2. It is difficult to replace orifice plate.
3. It is only suitable to the conditions where the Orifice plate is not required to be cleaned or replaced frequently.
4. It features flange pressure.

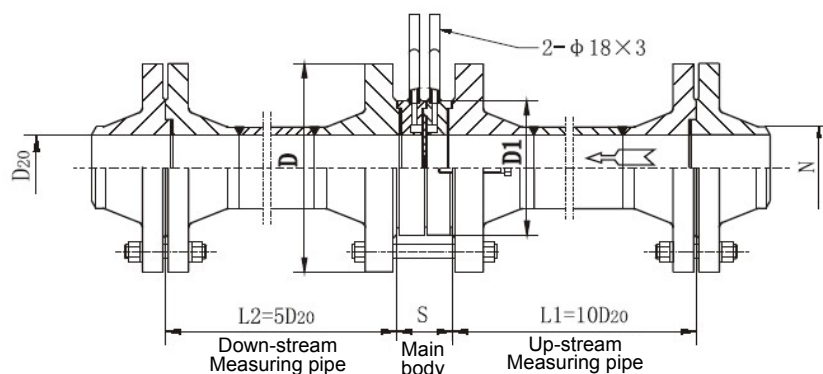
Table 4

Note: See Table 1 for dimension N.

Model	Dimensions(mm)													
	DN	50	65	80	100	125	150	200	250	300	350	400	450	500
FKF-16C KFKF-16C	D20	50	64	81	100	121	149	207	259	311	361	412	450	508
	D	160	180	195	215	245	280	335	405	460	520	580	640	705
	LA	84	84	84	84	84	84	86	86	90	90	94	94	100
	LB	450	960	1215	1145	1826	2186	3053	3821	4609	5357	6114	6827	7505
	LC	546	1060	1320	1559	1938	2298	3173	3953	4737	5493	6266	6995	7727
FKF-25 KFKF-25	D20	50	64	81	100	121	149	207	259	311	361	412	450	508
	D	160	185	195	230	270	300	360	425	485	550	610	660	730
	LA	84	84	84	84	84	84	86	86	90	90	94	94	100
	LB	450	960	1215	1451	1822	2182	3049	3825	4601	5341	6042	6755	7467
	LC	546	1065	1327	1563	1942	2302	3177	3961	4745	5509	6218	6947	7675
FKF-40 KFKF-40	D20	50	64	81	100	121	149	205	257	307	357	404		
	D	160	180	195	230	270	300	375	445	510	570	655		
	LA	150	150	160	160	170	180	200	220	240	260	280		
	LB	659	906	1104	1371	1746	2098	2907	3659	4381	5125	5786		
	LC	853	1110	1338	1646	2018	2389	3262	4010	4848	5609	6358		
FKF-64 KFKF-64	D20	50	64	79	96	118	143	199	251	301				
	D	175	200	210	250	295	340	405	470	530				
	LA	170	170	180	180	200	220	240	260	290				
	LB	600	815	1040	1287	1626	1936	2761	3529	4251				
	LC	882	1117	1342	1610	2018	2371	3228	4020	4798				
FKF-100 KFKF-100	D20	50	64	77	92	118	135	191						
	D	195	220	230	265	310	350	430						
	LA	190	190	200	200	230	260	300						
	LB	536	737	980	1187	1532	1772	2583						
	LC	826	1075	1342	1590	1992	2295	3166						



RING CHAMBER PRESSURE



Features:

1. As a conventional orifice plate pressure device, its price is attractive.
2. It is difficult to replace orifice plate.
3. It is suitable to the conditions where the orifice plate is not required to be cleaned or replaced frequently.
4. It features ring chamber pressure.

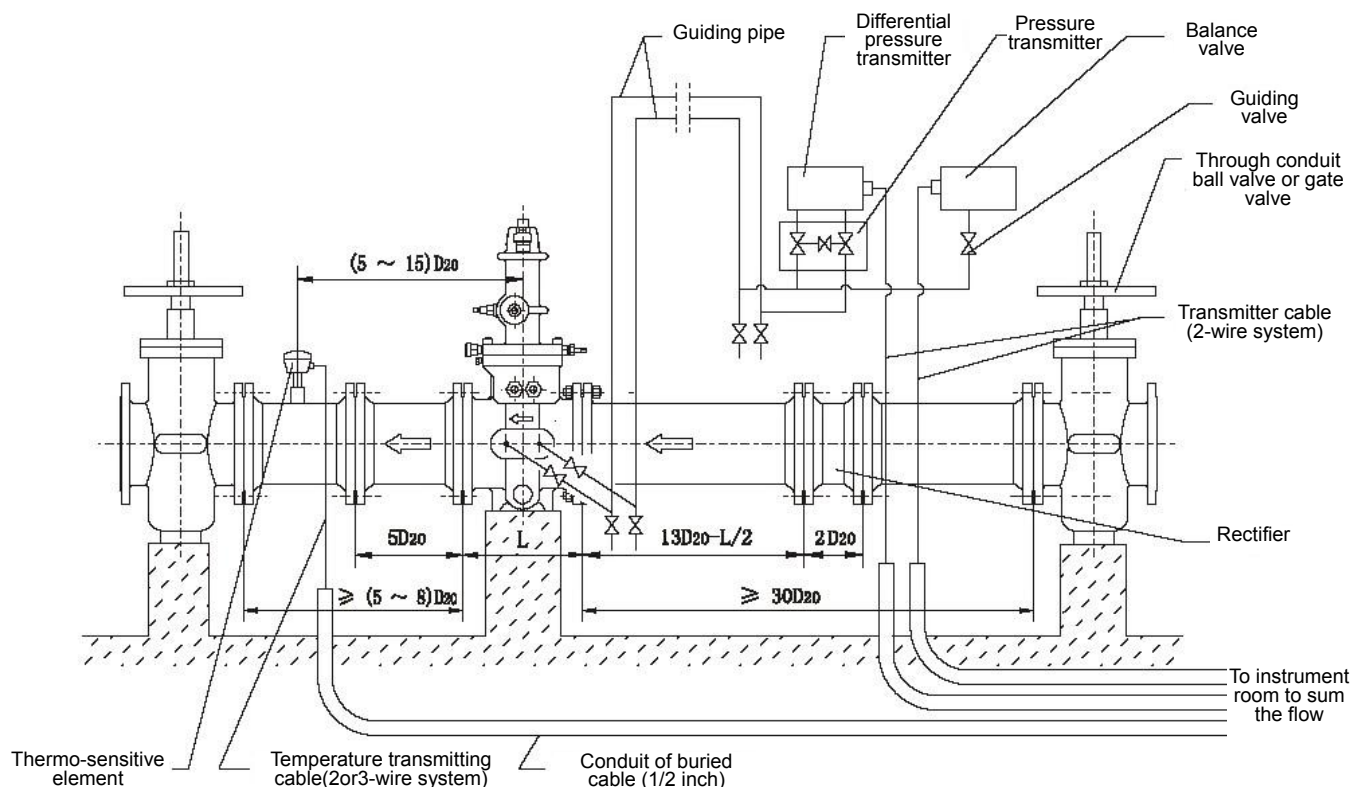
Table 5

Note: See Table 1 for dimension N.

Model	Dimensions(mm)													
	DN	50	65	80	100	125	150	200	250	300	350	400	450	500
FHF-16C KHKF-16C	D20	50	64	81	100	121	149	207	259	311	361	412	450	508
	S	65	65	65	65	65	65	65	71	71	71	71	71	71
	D	160	180	195	215	245	280	335	405	460	520	580	640	705
	D1	100	120	135	155	185	210	265	320	375	435	485	545	608
	N				108	133	159	219	273	325	377	426	480	530
FHF-25 KHKF-25	D20	50	64	81	100	121	149	207	259	311	361	412	450	508
	D	160	180	195	230	270	300	360	425	485	550	610	660	730
	S	65	65	65	65	65	65	65	71	71	71	71	71	71
	D1	100	120	135	160	188	218	278	332	390	448	505	555	610
	N				108	133	159	219	273	325	377	426	480	530
FHF-40 KHKF-40	D20	50	64	81	100	121	149	205	257	307	357	404		
	D	160	180	195	230	270	300	375	445	510	570	655		
	S	65	65	65	65	65	65	65	71	71	71	71		
	D1	100	120	135	160	188	218	282	345	408				
	N	57	73	89	108	133	159	219	273	325				
FHF-64 KHKF-64	D20	50	64	79	96	118	143	199	251	301				
	D	175	200	210	250	295	340	405	470	530				
	S	65	65	65	65	65	65	65	71	71				
	D1	105	130	140	168	202	240	300	352	412				
	N	57	73	89	108	133	159	219	273	325				
FHF-100 KHKF-100	D20	50	64	77	92	118	135	191						
	S	65	65	65	65	65	65	65						
	D1	112	138	148	172	210	250	312						
	S	65	65	65	65	65	65	65						
	N	57	73	89	108	133	159	219						



TYPICAL INSTALLATION DRAWING

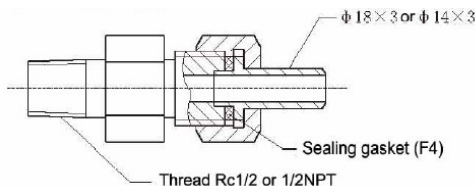


Notes:

1. We can provide all the products shown here as a whole.
2. The standard configuration of our orifice plate pressure device include the main body of orifice plate pressure device, measuring pipe (10 times of D20 for up stream, 5 times of D20 for down stream), two pieces of mating flanges, mating fastening piece, one piece of orifice plate (with the size of openings decided by customer), a set of seals for orifice plate and flange. If gas tube bundle flow conditioner required, the length of up stream measuring pipe is 13 times of D20-L/2.
3. Besides the standard length of delivered measuring pipe, the customer shall extend the length according to the aspect ratio of orifice plate and the actual conditions (Refer to the standards GB/T2624-2006, GB/T21446-2008 or other applicable standards for details).
4. For the secondary instruments such as gas tube bundle flow conditioner for orifice plate flowmeter and flow calculator, refer to our catalogues.

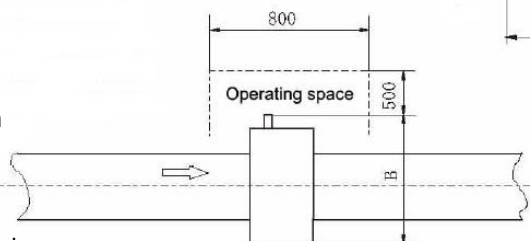
ATTACHMENT

Joint of guiding pipe

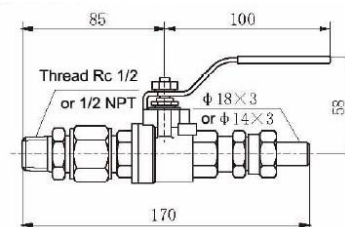


Installation

The operating handle of the senior and junior orifice plate pressure device is provided at the side of the device, which requires an operation space as shown below. For the device with the nominal pipe size exceeding DN300, operating handle is provide at both sides of the device.



Integrative pressure ball valve





● PREFACE

With the development of flowmeter technology and in depth study in the natural gas measuring technology, our company has a new understanding on interference by up-stream flow resistant part to the fluid state and influence to the measuring accuracy. In the natural gas flow measuring, the latest study both at home and abroad shows that orifice plate flowmeter, ultrasonic flowmeter and turbine flowmeter. But interference by commonly used equipment such as collecting gas pipe, separator and control valve to fluid state needs over 145D (D means internal diameter, the same below) straight pipe sections to be eliminated. By using the method of lengthening the straight pipe sections to eliminate the interference of fluid state caused by flow resistant parts, not only exists technical difficulty, but also covers larger area and needs high-investment. At present, flow conditioner used to eliminate the interference to shorten the length of straight pipe and improve the measurement accuracy at home and abroad. To meet the application requirements, our company has been developed 19 tube bundle type flow conditioner and plate type flow conditioner in line with standards.

● STRUCTURE FEATURES

1. Fixed flow conditioner: Composed of the enclosure, flow conditioner tube bundle which is made up of 19 nos of flow conditioning tubes and pressure ring (see figure 1), structure size is complied with national standards 19 tube bundle is molded one-time welding by using fixture positioning to ensure the accurate location of each flow conditioning tube and the performance of craters to symmetrical, orderly, smooth and firm.
2. Extendible flow conditioner: Composed of 19 nos of tube bundle flow conditioner and expansion pipe (See figure 2). This flow conditioner makes the pipeline disassemble easily, more suitable for the working condition of dirty medium and need to be often cleaned, and the situation required calibration regularly. Its expansion distance is 30 mm (Longer expansion distance can be designed upon request).
3. Board type flow conditioner: Composed of flow conditioning board with flow conditioning hole and seals in both (See figure 3). Its flow conditioning holes symmetrically distribute just like rays, its shape coincides with the fully developed velocity distribution. CNC boring machine processing to ensure the accurate position of each hole and roughness, so it has good flow conditioning performance.

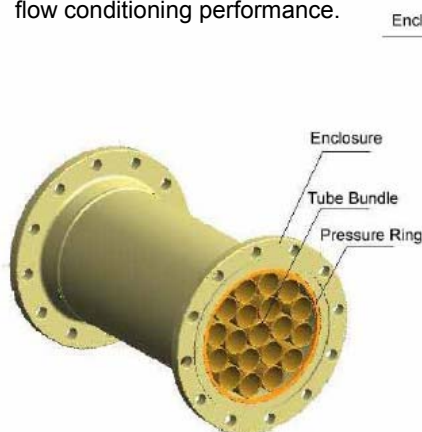


Figure 1 Fixed Flow Conditioner

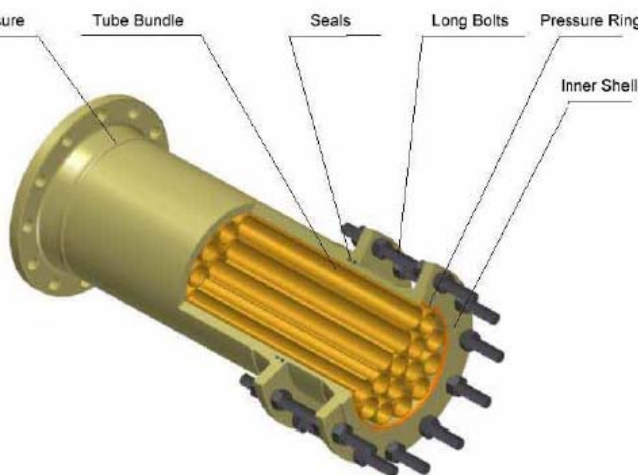


Figure 2 Extendible Flow Conditioner



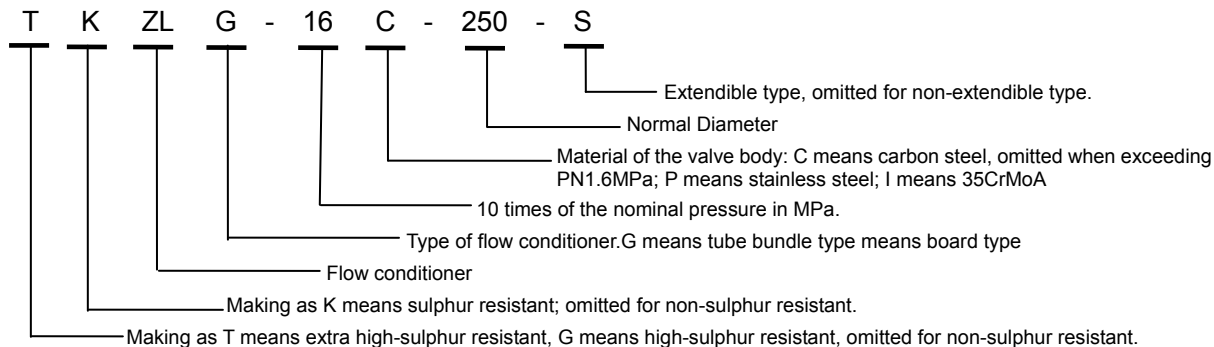
Figure 3 Zanker Board-type Flow Conditioner

● MATERIALS OF MAIN PARTS

Name of Parts	Non-Sulphur resistant	Sulphur resistant
Enclosure, Inner Shell	20	
Flow Conditioning Tube, Flow Conditioning Board	Austenitic Stainless Steel 1Cr8Ni9Ti	
Sealing Plate	Rubber 5080	Fluorine rubber F370
Pressure Ring	Austenitic Stainless Steel 1Cr8Ni9Ti	
Long Bolt	45 (unless otherwise specified in contract)	



MODEL EXPLANATION



TECHNOCAL SPECIFICATION

- Medium: purified natural gas, sulf-natural gas, coal gas, air, steam and light oil etc.
- Pressure class: PN1.6~16MPa
- Nominal diameter and end-to-end dimension is shown in Table 1.
- The inner diameter of the flow conditioner is the same with that of the measuring tube of flow meter, it should be provided by the flow meter manufacturers or customers.

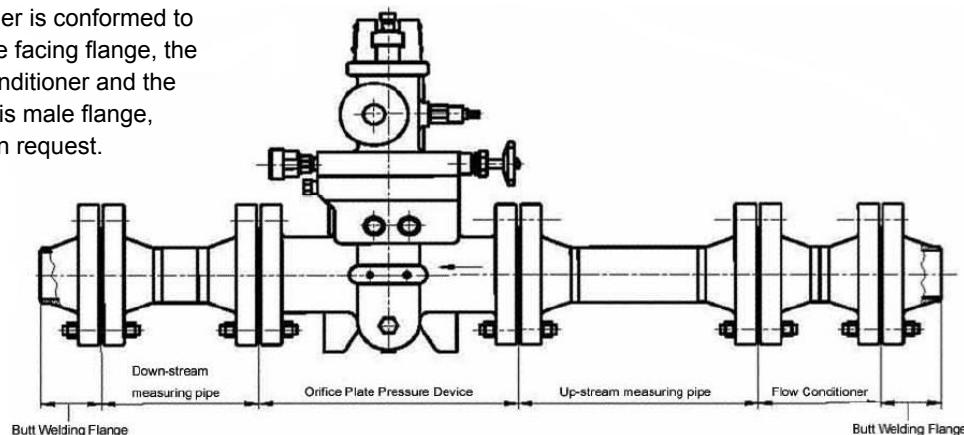
Table 1 Nominal diameter and end-to-end dimension

Unit: mm

End-to-end Dimension DN	Pressure	Nominal Diameter of Flow Conditioner(MPa)					
		Tube Bundle Type					Board Type
		1.6	2.5	4.0	6.4	10.0	16.0
50		110/140	110/140	110/140	130/160	135/165	150/180
80		180/210	180/210	180/210	180/210	180/210	170/200
100		226/256	226/256	226/256	220/250	205/235	205/235
150		330/360	330/360	330/360	320/350	302/332	302/332
200		460/490	460/490	456/486	446/476	426/456	426/456
250		576/606	576/606	566/596	556/586	536/566	536/566
300		690/720	690/720	676/706	666/696	636/666	596/626
350		796/826	796/826	786/816	766/796	736/766	
400		910/940	906/936	890/920	866/896	836/866	
450		986/1016	976/1006	966/996			
500		1126/1156	1116/1146	1106/1136			
600		1316/1346					

REQUIREMENT OF INSTALLATION

- Flow conditioner should be installed between the flow meter and the first flow resistant part at up-stream.
- The flange of flow conditioner is conformed to JB/T82-94 male and female facing flange, the flange between the flow conditioner and the up-stream measuring pipe is male flange, also can be other type upon request.



USE AND MAINTENANCE

No special maintenance needed, except for the seals when aging or cleaning for dirt jamming.

Our company reserves the right to change the contents of this catalogue without notice

CHENGDU HOLY VALVE & COMPLETE EQUIPMENT CO., LTD.

MAIN MANUFACTURING FACILITIES

SN	Name	Model and Specification	Qty
1	Single Arm Vertical Type Lathe	C5116A Ø1600	1
2	Single Arm Vertical Type Lathe	C5112A Ø1250	1
3	Vertical Type Lathe (4m)	CQX5240	1
4	Numerical Display Double Arm Vertical Type Lathe	CX5225/1 Ø2500	1
5	Large Type General Lathe	CW611001	1
6	Horizontal Type Processing Center	FBM-11025	1
7	Numerical Control Lathe	CAK63135D	2
8	Numerical Control Lathe	CAK4085DJ	1
9	Ball Surface Lathe	C6595/1500	1
10	Ball Surface Lathe	CR6532 Ø50~320	1
11	Numerical Display Lathe	CX616A-1 320×750	1
12	Numerical Display Lathe	CA6140 800×5000	2
13	General Lathe	C6140 400×1000	5
14	General Lathe	CW6180A 800×5000	1
15	Saddle Bed Lathe	CW6263B 630×750	1
16	Horizontal Type Boring Machine	TX68 Ø85	3
17	Floor Type Boring & Milling Machine	TX6213	1
18	Plano Milling Machine	X2012C 1250×4000	1
19	Vertical Type Knee Type Milling Machine	X53K 400×1600	2
20	Vertical Type Knee Type Milling Machine	X52K 320×1250	2
21	Vertical Type Knee Type Milling Machine	X5032 320×1320	2
22	Universal Knee Type Milling Machine	B1-400W 400×1600	3
23	Numerical Display Horizontal Type Knee Type Milling Machine	FX6045/1	1
24	Numerical Display Universal Knee Type Milling Machine	X6132/1	1
25	Slotting Machine	B5032	1
26	Numeral Control Lathe	180-CNC	5
27	Turning & Milling Processing Center	INTE200SY	1
28	Numeral Control Line Cutter	DK720	2
29	Numeral Control Water Knife Cutting Machine	CX5225	1
30	Universal Cylindrical Grinding Machine	M1432A Ø320×1500	1
31	Universal Cylindrical Grinding Machine	M1432B Ø320×1000	1
32	Universal Tool Grinding Machine	M6025C Ø250	1
33	Universal Tool Grinding Machine	M612K Ø200	1
34	Surface Grinding Machine With Horizontal Spindle And Rectangular Table	M7132H	1
35	Surface Grinding Machine With Horizontal Spindle And Rectangular Table	M7150A 500×2000	1
36	Plano Surface Grinding Machine	CC1-033	1
37	Cylinder Column Vertical Type Drilling Machine	Z525B Ø25	2
38	Radial Drilling Machine	Z3063 Ø63×2000	5



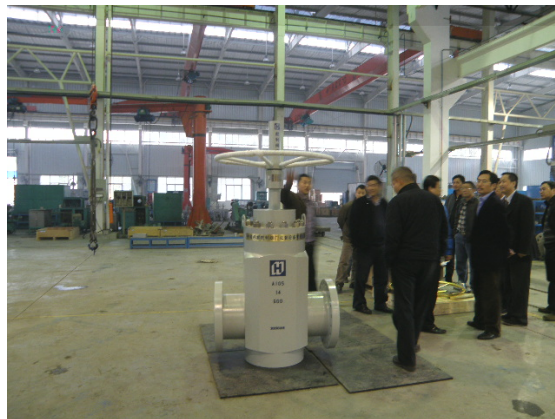
CHENGDU HOLY VALVE & COMPLETE EQUIPMENT CO., LTD.

MAIN REFERENCE

- ★ Indian Oil Corporation Limited
Viramgam Kandla Pipeline Project
- ★ Goodwell Engineering Ltd Part.
Oil Pipeline of Thai Petroleum Pipeline Co., Ltd.
- ★ China Petroleum Pipeline Material And Equipment Corporation:
Chas Permit H Crude Oil Transportation Pipeline Project
Niger Agadem Field Crude Oil Pipeline Project
- ★ Xinjiang Petroleum Engineering Construction Co., Ltd.
Kazakhstan Hope Oil Field Oil Transfer Station
- ★ China Petroleum Engineering Construction (Group) Company
China to Kazakstan Oil Transportation Pipeline Project
- ★ Zigong Rocky Union Valve Co., Ltd.
Export to American, Mexico, etc.
- ★ PetroChina Pipeline Co., Ltd.
Shilan-Huiyin Oil Transportation Pipeline Project
Lanzhou-Zhengzhou-Changqing Oil Transportation Pipeline Project
China to Russian Crude Oil Pipeline Project
Qinhuangdao-Beijing Oil Transportation Pipeline Project
Renqiu--Beijing Oil Transportation Pipeline Project
Northeast China Pipeline Net
Daqing – Tieling Pipeline Capacity Expansion Rebuilding Project and Oil Tank
Dagang-Zaozhuang Oil Transportation Pipeline Project
Changling - Songlan Nature Gas Transportation Pipeline Project
Dalian- Xiaosonglan Oil Transportation Pipeline Project
- ★ PetroChina Talimu Oil Field Co., Ltd.
West To East Gas Transportation Pipeline Project
- ★ PetroChina Talimu Oil Field Co., Ltd.
Yingmaili Gas Field Project
- ★ Xinjiang Oil Managing Bureau Material Provide Head Company
West China Crude Oil and Finished Oil Pipeline Project
- ★ Xuzhou Chengda Petroleum & Chemical Equipment Installation Co., Ltd.
China Petroleum Ningbo Daxie Fuel Oil House Project
- ★ China Petroleum Pipeline Materials & Equipment Corporation Pipeline Bureau
West China Crude Oil and Finished Oil Pipeline Project
Lanzhou Commercial Oil Tank Project



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