



A+K Balanced Flow Meter

Fluid Flow Metering Specialists



Flow Measurement Revolution Licensed from NASA USA



A+K Balanced Flow Meter was initially invented by NASA to measure liquid oxygen of the spacecraft and introduced from A+FlowTek company to Shanghai Keyontechs Co., Ltd. in 2006. Up to now, Keyontechs has produced more than 50,000 sets of BFM that are widely used in oil & gas, chemical, electric power, metallurgical and other industries at home and abroad.

A+K Balanced Flow Meter integrates the function of the rectifier and throttling sensor to meet the measurement requirements whatever under high temperature & high pressure, or low temperature or other severe working conditions. A+K BFM is also with short straight pipe requirement, high accuracy, wide application, low pressure loss and other excellent performance, winning great recognition from more and more customers.

Keyontechs has patented A+K Balanced Flow Meter and calibration laboratory approved by China National Accreditation Service for Conformity Assessment. Keyontechs always advances with the times, engaging in improving technology and service as per national and industry requirements. By doing so, Keyontechs has won numbers of honors.

A+K Balanced Flow Meter is in conformity with ISO-5167, GB/T-2624, JJG640 standards and installation regulations of D/P flow meters.



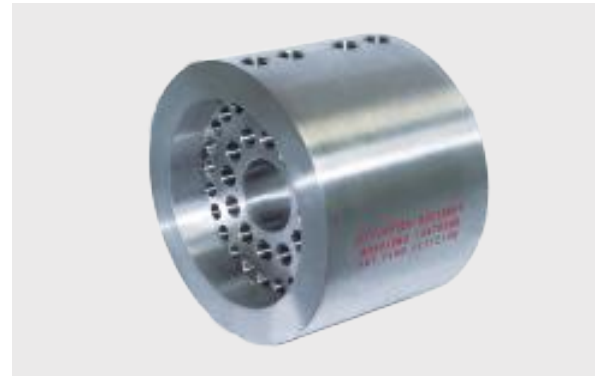
BASIC PRINCIPLE

A+K Balanced Flow Meter—Revolutionary differential pressure type flow meter. The core part of the A+K Balanced Flow Meter is a multi-hole throttling and conditioning element mounted on the cross-section of the pipe. The size and layout of each hole are customized according to unique equation and numerous real flow testing data, which is called function hole. When the fluid is running through function holes, the flow is rectified, at the same time, the vortex, kinetic energy loss, dead-zone effect and signal fluctuation of the pressure tapping point are significantly reduced, forming an ideal flow field. And a stable D/P signal is obtained by the pressure tapping device, then the volume flow or mass flow is calculated according to the Bernoulli equation.

Theoretical Formula:
$$Q_m = C \frac{1}{\sqrt{1-\beta^4}} \varepsilon \frac{\pi}{4} d^2 \sqrt{2\Delta p \rho_1}$$

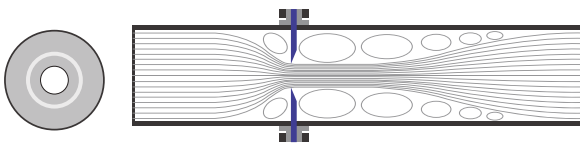
Simplified Formula for D/P and Flow Rate:
$$Q = K \sqrt{\Delta p}$$

Standard orifice plate only has one throttling hole and dead zones at the sides of the hole can form large amount of vortex which leads to kinetic energy consumption and permanent pressure loss; the noise caused by random and cluttered vortex can make the signals of pressure point fluctuate and reduce measurement linearity and repeatability; single-hole structure requires long straight pipe to make flow field adjustment and pressure recovery.

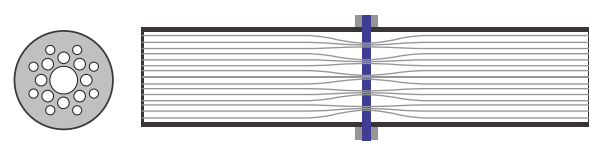


BFM Multi-hole Throttling Element

The test and verification of A+K Balanced Flow Meter are finished by American aerospace technicians and the technology and testing data are confirmed by Tennessee A&M University. The testing result shows that A+K BFM can rectify flow field, and reduce vortex, dead zone effect, kinetic energy loss, also minimise the fluctuation of pressure points caused by vortex.



Standard orifice plate generates a large amount of vortex and kinetic energy loss



A+K BFM rectifies the flow field to reduce vortex and pressure loss

EXCELLENT PERFORMANCE

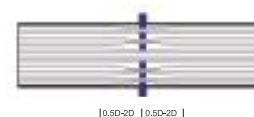
Balanced flow meter is with multiple advantages including high accuracy, large turndown ratio, short straight pipe requirement, low pressure loss, long-term stability, dirt-resistance, wide measuring range, wide application range and so on.

1. High Accuracy

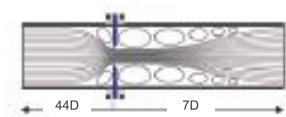
- ※ The multi-hole and symmetrical structure enables balanced flow meter to rectify flow field and reduce vortex, vibration as well as signal noise, largely improving the stability of flow field. BFM also can reach 5-10 times higher accuracy than traditional throttling plate by adopting specialized precision pipe and pressure tapping device.
- ※ After factory calibration, sensor accuracy can reach to $\pm 0.30\%$ - $\pm 0.50\%$ suitable for custody transfer.
- ※ According to geometric dimension verification, sensor accuracy can reach to $\pm 0.50\%$, $\pm 1.00\%$ suitable for process control.
- ※ BFM is with much high machining reproducibility and can make geometric dimension verification based on site calibration data, which is as the same as traditional throttling plate.

2. Short Straight Pipe Requirement

- ※ Balanced flow meter can rectify the flow field and make pressure recovery twice as quick as traditional orifice plate, largely shortening straight pipe.
- ※ Balanced flow meter supports the minimum 0.5D straight pipe, which saves a large amount of pipe cost especially for specialized expensive pipe.



Balanced flow meter requires short straight pipe

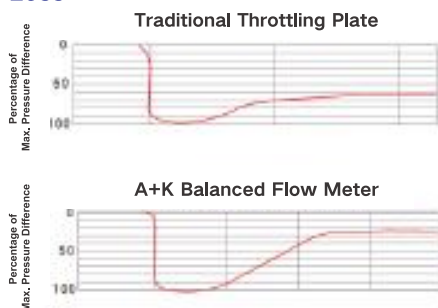


Orifice plate requires long straight pipe

EXCELLENT PERFORMANCE

3. Low Permanent Pressure Loss

The multi-hole and symmetrical structure of balanced flow meter can reduce vortex and turbulence to lower the kinetic energy loss. When it is under same working condition and the D/P value is kept no reduction, the permanent pressure loss of balanced flow meter can decrease to 1/2-1/3 of traditional throttling plate, saving much operating cost. As a kind of energy-saving instrument, balanced flow meter is reliable.



5. Dirt-resistance and Anti-clogging

The multi-hole and symmetrical structure enables balanced flow meter to reduce vortex and turbulence, greatly decreasing dead zones and making sure dirty fluids smoothly run through multiple holes.

6. Wide Measuring Range

According to test results, balanced flow meter can be used in fluid measurement even when flow velocity of the fluid is equal to sound velocity; its measurable Reynolds number range can be 200-10⁷; its β range can be 0.25-0.90.

4. Large Turndown Ratio

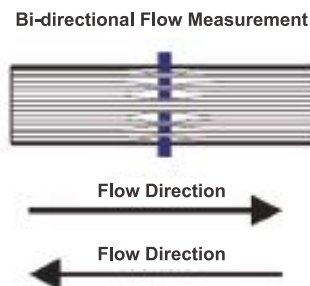
- ※ Balanced flow meter largely improves measurement turndown ratio compared with traditional throttling plate.
- ※ American research shows when Reynolds number is $>5 \times 10^4$, the turndown ratio of balanced flow meter is without upper limit if suitable pore size is chosen.
- ※ A+K Balanced Flow Meter can satisfy regular turndown ratio 7:1-10:1 in industry measurement, but it can also reach to 20:1, 30:1 and larger turndown ratio by choosing suitable parameters in many situations.

7. High Repeatability and Long-term Stability

- ※ Balanced flow meter can rectify flow field and improve repeatability to 0.1%.
- ※ The multi-hole structure of balanced flow meter can disperse stress and avoid the abrasion of sharp angle, keeping β value no change and improving long-term stability.

8. Wide Application Range

- ※ The operating temperature and pressure of balanced flow meter are up to 850°C, 42MPa, which depend on the material and rank of pipe and flange.
- ※ Balanced flow meter can be applied in liquid gases measurement and effectively prevent vaporization to achieve the best measurement results.
- ※ Balanced flow meter can be used in the measurement of dirty, slurry and other fluids.
- ※ The bilaterally symmetrical design is suitable for bi-directional flow measurement.



Technical Data

Fluid	Normal fluids: liquid, gas, steam Special fluids: dirty, corrosive, highly viscous, high/low temperature, high pressure, liquefied gas fluids
Temperature	-250°C - 850°C
Operating Pressure	Max. 42MPa
Size	DN15-DN3000 (1/2"-120")
Uncertainty Degree	±0.5%
Repeatability	±0.1%
Turndown Ratio	10:1
β Value	0.25-0.9
Permanent Pressure Loss	10-30% DP
Reynolds Number	200-10 ⁷
Straight Pipe	Upstream 2D + downstream 2D
Material	CS, SS304, SS316, HASTELLOY, INCONEL, MONEL...
Process Connection	Flange connection type, wafer type, welding type, diaphragm sealed type, square pipe type, etc.

ENERGY SAVING AND EFFICIENCY IMPROVING TYPE FLOW METER

- ※ Balanced flow meter is typically a kind of energy saving & efficiency improving D/P flow meter.
- ※ Flow meter as one of measurement instruments is also an energy consumption element whose operating costs contain measurement accuracy cost and fluid transfer cost. Custody transfer loss caused by inaccurate measurement is called measurement accuracy cost which is essential for valuable fluids.
- ※ The energy consumption in fluids transferring process is called fluid transfer cost which takes permanent pressure loss caused by measurement element as symbol and takes a big cost (electric power consumption of the pump) especially for liquid and other heavy fluids.

Comparison with Traditional Throttling Plate

A+K Balanced Flow Meter	One-time Investment (Static Mode)					Two-time Investment (Dynamic Mode)	
Short Straight Pipe	Labor	Material	Construction	Bracket	Land	Operation	Maintenance
	15% Saved	20% Saved	4% Saved	5% Saved	5% Saved	3% Saved	3% Saved
	A+K Balanced Flow Meter takes the lead in cost saving aspect						
Low Permanent Pressure Loss						50%~70% energy consumption saved	
High Measurement Accuracy	Material & energy measurement balance improved and production benefits increased						
Long-term Stability						Spares and period calibration cost saved	

Comparison with Other Flow Meters

	A+K BFM	Orifice Plate	Venturi	Nozzle	V-Cone	Vortex	Ultrasonic	Turbine	Coriolis
Type	Differential Pressure Flow Meter	Differential Pressure Flow Meter	Differential Pressure Flow Meter	Differential Pressure Flow Meter	Differential Pressure Flow Meter	Velocity Flow Meter	Velocity Flow Meter	Velocity Flow Meter	Mass Flow Meter
Basic Principle	Balanced Throttle	Edge Throttle	Taper Pipe Throttle	Edge Throttle	Center Throttle	Karman Vortex Theory	Ultrasonic Time Difference Method and Doppler Method	Turbine Rotating	Coriolis Force
Fluid	Gas Liquid Steam	Gas Liquid Steam	Gas Liquid Steam	Gas Liquid Steam	Gas Liquid Steam	Gas Liquid Steam	Clean Liquid and Gas	Clean Gas or Liquid	High-density Gas and Liquid
Pipe Size	15~3000mm	50~1000mm	50~1200mm	50~500mm	15~3000mm	15~300mm	20~5000mm	15~600mm	< 200mm
Straight Pipe	Upstream 2D Downstream 2D	Upstream 44D Downstream 7D	Upstream 16D Downstream 4D	Upstream 36D Downstream 8D	Upstream 3D Downstream 1D	Upstream 20D Downstream 5D	Upstream 20D Downstream 5D	Upstream 20D Downstream 5D	Upstream 0D Downstream 0D
Accuracy	0.5%	1%~2%	1%~2%	1%~2%	0.5%~1.0%	1%	0.5~1.5%	Max. 0.2%~1%	Liquid 0.2%~0.5% Gas 1.0%
Long Term Stability	Best	Worst	Good	Poor	Good	Medium	Medium	Poor	Medium
Turndown Ratio	> 10:1	3:1	5:1	3:1	10:1	> 10:1	50:1	10:1	25:1~40:1
Pressure Loss	10%~30% DP	60%~100% DP	10%~30% DP	60%~100% DP	30%~50% DP	Medium	N/A	High	Very High
Dirt Resistance & Anti-clogging Property	Good	Poor	Good	Poor	Good	Poor	Good	Poor	Poor
Bi-directional Measurement	Yes	N/A	N/A	N/A	N/A	N/A	Yes	N/A	Customizable
Measurement Range	ReD: $2 \times 10^2 \sim 10^7$	ReD: $> 5 \times 10^3$	ReD: $2 \times 10^5 \sim 2 \times 10^8$	ReD: $2 \times 10^4 \sim 10^7$	ReD: $8 \times 10^3 \sim 5 \times 10^6$	ReD: $2 \times 10^4 \sim 10^8$	Flow Rate: 0.5-30m/s	Flow Rate: 0.5-12m/s	Flow Rate: depend on the size
High Flow Velocity Measurement	Good	Poor	Good	Good	Good	Medium	Good	Medium	Medium
Low Flow Velocity Measurement	Good	Poor	Poor	Poor	Good	Poor	Good	Good	Medium
Volume	Medium	Small	Very Large	Medium	Relatively Large	Small	Medium	Medium	Very Large
Price	Medium	Very Low	High	Medium	Medium	Medium	High	Medium	Very High
Service Life	Very long	Short	Long	Medium	Long	Medium	Short	Short	Short

THROTTLING DEVICE

PRODUCT CLASSIFICATION

Flange Connection Type AKPP	DN15-DN600; with precision pipes, pressure tappings and body flanges; bilateral symmetry design for the sensor; bi-directional flow measurement; suitable for precision measurement of various fluids under different working conditions; high accuracy; simply installation; easy maintenance.	
Wafer Type with Spool Piece AKHF	DN15-DN80: integral processing; with A+K throttling element and pressure tappings; DN100-DN600: semi-integral processing; with A+K throttling element and specialized pressure tappings; bilateral symmetry design for the sensor; bi-directional flow measurement; suitable for precision measurement of various fluids under different working conditions; high accuracy; simply installation; easy maintenance.	
Throttling Element with Flange Assembly Type AKFF	DN50-DN3000; with flanges and fasteners; bilateral symmetry design for the sensor; bi-directional flow measurement; suitable for precision measurement of various fluids under different working conditions; high accuracy; simply installation; easy maintenance.	
Welding Type AKFW	DN15-DN3000; with precision pipes, pressure tappings and A+K throttling element; bilateral symmetry design for the sensor; bi-directional flow measurement; suitable for high temperature and high pressure flow measurement; directly welded to process pipes.	
Diaphragm Sealed Type AKDF	DN50-DN600; normal materials for flanges and pipes; double flanges tapping; suitable for viscous, dirty, easily crystallized and other fluids measurement.	
Diaphragm Sealed Type (DN50-DN150) with Loose Flanges and Special Materials AKDS	DN50-DN150; Monel, Inconel, Hastelloy and other special materials for pipes and throttling element; process connection by stainless loose flanges; double flanges tapping; suitable for highly corrosive fluids measurement.	
Diaphragm Sealed Type (DN200-DN600) with Loose Flanges and Special Materials AKDG	DN200-DN600; Monel, Inconel, Hastelloy and other special materials for pipes and throttling element; process connection by stainless loose flanges; double flanges tapping; suitable for highly corrosive fluids measurement.	
Anti-corrosive and Diaphragm Sealed Type with PTFE Liner AKDP	DN50-DN600; carbon steel and stainless steel material with PTFE liner for flanges and pipes; PTFE and other special materials for throttling element; double flanges tapping; suitable for highly corrosive fluids measurement.	
Diaphragm Sealed Type with Heat-insulating Jacket AKDB	DN40-DN400 (inner pipe nominal diameter); heat tracing jacket structure; double flanges tapping; suitable for insulation required fields.	
Square Pipe Type AKSP	L200mm-3000mm; carbon steel material for pipes; SS304/CS material for throttling element; suitable for the air flow measurement of square pipes.	

Type		Regular Working Condition			Special Working Condition				Pipe Size
		Liquid	Gas	Steam	Viscous	Corrosive	High Temperature & High Pressure	Square Pipe	
Balanced Flow Meter	AKPP	•	•	•			•		DN15-DN600
	AKHF	•	•	•					DN15-DN600
	AKFF	•	•	•					DN50-DN3000
	AKFW	•	•	•			•		DN15-DN3000
	AKDF	•	•		•	•			DN50-DN600
	AKDS	•	•		•	•			DN50-DN150
	AKDG	•	•		•	•			DN200-DN600
	AKDP	•	•			•			DN50-DN600
	AKDB	•							DN40-DN400
	AKSP							•	200mm-3000mm

FLANGE CONNECTION

TYPE AKPP

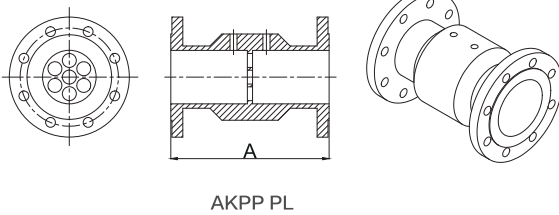
Pipe size range: DN15-DN600

Pressure rating range: CL150-CL2500, PN2.5-PN320

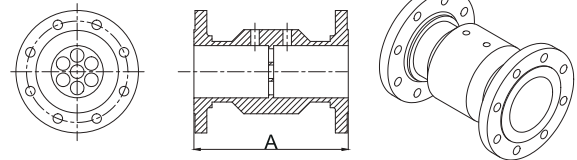
Structural features: the meter is equipped with partial precision pipes, pressure tapplings and body flanges. The flange material is the same with pipes and the throttling element of the meter is placed in the center of meter body.

Scope of application: it is suitable for precision measurement of various liquid, gas, steam and other fluids under regular working conditions. It is also with high accuracy, simply installation, easy maintenance properties and able to be applied in bi-directional flow measurement.

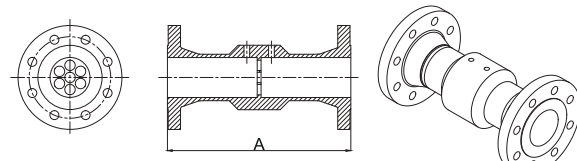
Profile



AKPP PL



AKPP SO



AKPP WN

Structural Length Table of Slip-on Flange

Nominal Diameter		Flange Rating (lb/bar)		ANSI B16.5/ HG/T20615-2009	HG/T20592-2009					Pressure Tapping
					CL150	PN2.5	PN6	PN10	PN16	
DN	NPS	OD(mm)		RF/SO	RF/PL		RF/SO			inch
		I	II	A	A	A	A	A	A	
15	1/2"	21.3	18	226	226	226	226	226	226	1/4
20	3/4"	26.7	25	226	226	226	226	226	226	1/4
25	1"	33.4	32	226	226	226	226	226	226	1/4
32	1 1/4"	42.2	38	226	226	226	226	226	226	1/4
40	1 1/2"	48.3	45	226	226	226	226	226	226	1/4
50	2"	60.3	57	226	226	226	226	226	226	1/2
65	2 1/2"	73	76	290	290	290	290	290	290	1/2
80	3"	88.9	89	290	290	290	290	290	290	1/2
100	4"	114.3	108	290	290	290	290	290	290	1/2
125	5"	141.3	133	310	310	310	310	310	310	1/2
150	6"	168.3	159	310	310	310	310	310	310	1/2
200	8"	219.1	219	314	314	314	314	314	314	1/2
250	10"	273	273	354	354	354	354	354	354	1/2
300	12"	323.8	325	394	394	394	394	394	394	1/2
350	14"	355.6	377	394	394	394	394	394	394	1/2
400	16"	406.4	426	428	428	428	428	428	428	1/2
450	18"	457	480	458	458	458	458	458	458	1/2
500	20"	508	530	488	488	488	488	488	488	1/2
600	24"	610	630	558	558	558	558	558	558	1/2

FLANGE CONNECTION

TYPE AKPP

Structural Length Table of Welded Flange

Nominal Diameter		Flange Rating (lb)	ANSI B16.5/HG/T20615-2009										Pressure Tapping
			CL300	CL600	CL900	CL1500	CL2500	CL300	CL600	CL900	CL1500	CL2500	
DN	NPS	OD(mm)	RF/WN					RJ/WN					inch
		I	A	A	A	A	A	A	A	A	A	A	
15	1/2"	21.3	326	338	354	354	380	333	335	353	353	379	1/4
20	3/4"	26.7	336	348	374	374	392	345	347	373	373	391	1/4
25	1"	33.4	344	358	380	380	412	353	357	379	379	411	1/4
32	1 1/4"	42.2	352	368	380	380	424	361	367	379	379	426	1/4
40	1 1/2"	48.3	358	374	400	400	456	367	373	399	399	458	1/4
50	2"	60.3	360	380	438	438	488	372	382	440	440	490	1/2
65	2 1/2"	73	434	452	504	504	580	446	454	506	506	585	1/2
80	3"	88.9	440	460	498	528	630	452	462	500	530	635	1/2
100	4"	114.3	455	501	525	545	677	464	500	524	544	682	1/2
125	5"	141.3	501	545	571	629	775	510	544	570	628	783	1/2
150	6"	168.3	501	551	597	659	863	510	550	596	658	871	1/2
200	8"	219.1	527	583	641	743	953	536	582	640	748	965	1/2
250	10"	273	579	661	725	865	1195	588	660	724	870	1213	1/2
300	12"	323.8	645	709	797	963	1325	654	708	796	975	1343	1/2
350	14"	355.6	669	727	823	993	-	678	726	828	1008	-	1/2
400	16"	406.4	705	783	859	1049	-	714	782	864	1067	-	1/2
450	18"	457	761	825	915	1111	-	770	824	923	1129	-	1/2
500	20"	508	797	867	983	1199	-	809	869	991	1217	-	1/2
600	24"	610	881	963	1141	1369	-	896	968	1156	1393	-	1/2

Nominal Diameter		Flange Rating (bar)	HG/T20592-2009								Pressure Tapping
			PN40	PN63	PN100	PN160	PN63	PN100	PN160		
DN	NPS	OD(mm)	RF/WN				RJ/WN				inch
		I	II	A	A	A	A	A	A	A	
15	1/2"	21.3	18	296	310	310	310	323	323	323	1/4
20	3/4"	26.7	25	300	316	316	324	329	329	337	1/4
25	1"	33.4	32	300	336	336	336	349	349	349	1/4
32	1 1/4"	42.2	38	304	340	340	340	353	353	353	1/4
40	1 1/2"	48.3	45	310	344	344	348	357	357	361	1/4
50	2"	60.3	57	316	344	356	370	360	372	386	1/2
65	2 1/2"	73	76	384	416	432	444	434	450	462	1/2
80	3"	88.9	89	396	424	436	452	440	452	468	1/2
100	4"	114.3	108	413	439	463	483	452	476	496	1/2
125	5"	141.3	133	439	479	513	533	494	528	548	1/2
150	6"	168.3	159	453	493	533	559	506	546	576	1/2
200	8"	219.1	219	479	523	563	583	536	576	602	1/2
250	10"	273	273	553	593	657	653	609	673	675	1/2
300	12"	323.8	325	613	663	723	733	679	739	761	1/2
350	14"	355.6	377	633	683	761	-	696	785	-	1/2
400	16"	406.4	426	683	733	-	-	749	-	-	1/2
450	18"	457	480	713	-	-	-	-	-	-	1/2
500	20"	508	530	753	-	-	-	-	-	-	1/2
600	24"	610	630	843	-	-	-	-	-	-	1/2

FLANGE CONNECTION

TYPE AKPP

Structural Length Table of High Pressure Threaded Flange

Nominal Diameter	JB2769–2008 High Pressure Threaded Flange	
	16.0–32.0 MPa	Pressure Tapping
DN	A	inch
15	240	1/4
20	240	1/4
25	260	1/4
32	280	1/4
40	280	1/4
50	300	1/2
65	320	1/2
80	340	1/2
100	380	1/2
125	380	1/2
150	410	1/2
200	480	1/2

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	AKPP	Code	DN	Code	Type	Code		Rating	Code	Material	Code
	D00A	15	P	RF	11	CL150	XXXX	MA	CS	N	NPT
	D00B	20	J	RJ/RTJ	12	CL300		MB	SS304	S	PSW
	D001	25	T	LG	13	CL600		MC	SS304L	#	Others
	D00C	32	X	Others	14	CL900		MD	SS316		
	D00D	40			15	CL1500		ME	SS316L		
	D002	50			16	CL2500		MF	SS321		
	D00E	65			21	PN2.5		MG	15CrMo		
	D003	80			22	PN6		MH	1Cr5Mo		
	D004	100			23	PN10		MI	SS347H		
	D005	125			24	PN16		MJ	SAF2507		
	D006	150			25	PN25		MK	HASTELLOY C276		
	D008	200			26	PN40		ML	HASTELLOY B		
	D010	250			27	PN63		MN	16Mn		
	D012	300			28	PN100		MO	SS310S		
	D014	350			29	PN160		MP	INCONEL 625		
	D016	400			30	PN250		MQ	MONEL 400		
	D018	450			31	PN320		MR	ZR702		
	D020	500						MV	SS316Ti		
	D024	600						MW	12CrMoV		
								TA	TA2		
							TH	SS317L			
							TI	A671 Gr.CC60 CL22			
							TJ	904L			
							TK	1Cr12Mo			
							TL	SAF2205			
							TM	Ta			
							TO	MONEL 500			



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKPPD008P13XXXXMGMS—A+K Balanced Flow Meter; flange connection type; nominal diameter is DN200; process connection surface is RF; pressure rating is CL600; meter body material is 15CrMo; throttling element material is SS316; pressure tapping type is φ23PSW; XXXX is customer identification No.

WAFER TYPE WITH SPOOL PIECE AKHF

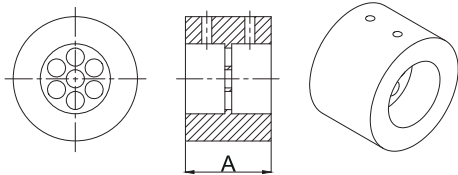
Pipe size range: DN15-DN600

Pressure rating range: CL150-CL600, PN2.5-PN100

Structural features: the meter is equipped with pressure tappings and few pipes and connected with field pipes by flange clamping. The throttling element of the meter is placed in the center of meter body.

Scope of application: it is suitable for the measurement of various liquid, gas, steam and other fluids under regular working conditions and able to be applied in bi-directional flow measurement. It requires no welding process, simplifying the installation and maintenance.

Profile



Structural Length Table

Nominal Diameter	HG/T20592-2009	ANSI B16.5/HG/T20615-2009	Pressure Tapping
	PN2.5-PN100	CL150-CL600	
	RF		
	A	A	inch
DN15-DN40	100	100	1/4
DN50-DN65	100	100	1/2
DN80-DN600	120	120	1/2

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	DN	Code	Type	Code	Rating		Code	Material	Code	Type
AKHF	D00A	15	P	RF	11	CL150	XXXX	MA	CS	N	NPT
	D00B	20	X	Others	12	CL300		MB	SS304	S	PSW
	D001	25			13	CL600		MC	SS304L	#	Others
	D00C	32			21	PN2.5		MD	SS316		
	D00D	40			22	PN6		ME	SS316L		
	D002	50			23	PN10		MF	SS321		
	D00E	65			24	PN16		MG	15CrMo		
	D003	80			25	PN25		MH	1Cr5Mo		
	D004	100			26	PN40		MI	SS347H		
	D005	125			27	PN63		MJ	SAF2507		
	D006	150			28	PN100		MK	HASTELLOY C276		
	D008	200						ML	HASTELLOY B		
	D010	250						MM	AL5052/5083		
	D012	300						MN	16Mn		
	D014	350						MO	SS310S		
	D016	400						MP	INCONEL 625		
	D018	450						MQ	MONEL 400		
	D020	500						MR	ZR702		
	D024	600						MV	SS316Ti		
								MW	12CrMoV		
								TA	TA2		
								TH	SS317L		
								TI	A671 Gr.CC60 CL22		
								TJ	904L		
								TK	1Cr12Mo		
								TL	SAF2205		
								TM	Ta		
								TO	MONEL 500		



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKHFD006P24XXXXMAMDN—A+K Balanced Flow Meter; wafer type with spool piece; nominal diameter is DN150; process connection surface is RF; pressure rating is PN16; meter body material is carbon steel; throttling element material is SS316; pressure tapping type is 1/2NPT; XXXX is internal customer identification No.

THROTTLING ELEMENT WITH FLANGE ASSEMBLY TYPE AKFF

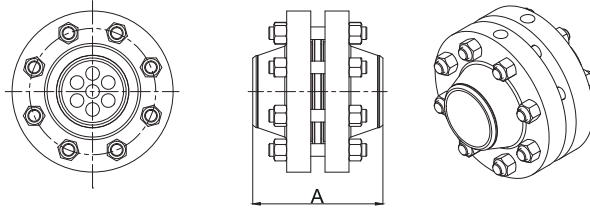
Pipe size range: DN50-DN3000

Pressure rating range: CL150-CL2500, PN2.5-PN160

Structural features: the throttling element is sandwiched between two pieces of orifice flanges or customized flanges with pressure tapplings and a full set of gasket fasteners. The on-site process connection is a direct welding of the flanges to the field pipes.

Scope of application: it is suitable for the measurement of various liquid, gas, steam and other fluids under regular working conditions and with simple structure to simplify the replacement.

Profile



Structural Length Table

Nominal Diameter		OD(mm)		Flange Rating (bar)	GB/T9115-2000		HG/T20592-2009						Pressure Tapping
					PN6	PN10	PN16	PN25	PN40	PN63	PN100	PN160	
DN	NPS	I	II	A	A	A	A	A	A	A	A	inch	
50	2"	60.3	57	-	149	149	151	151	167	175	189	1/2	
65	2 1/2"	73	76	-	142	153	159	159	183	190	185	1/2	
80	3"	88.9	89	-	161	161	169	169	189	193	201	1/2	
100	4"	114.3	108	-	152	152	170	170	184	196	212	1/2	
125	5"	141.3	133	-	158	165	183	183	207	233	253	1/2	
150	6"	168.3	159	-	158	158	186	186	210	246	272	1/2	
200	8"	219.1	219	-	168	168	192	200	236	276	296	1/2	
250	10"	273	273	-	180	180	204	226	266	330	326	1/2	
300	12"	323.8	325	-	196	192	208	246	296	356	366	1/2	
350	14"	355.6	377	-	204	196	216	266	316	394	-	1/2	
400	16"	406.4	426	-	213	201	239	289	339	-	-	1/2	
450	18"	457	480	-	213	193	239	289	-	-	-	1/2	
500	20"	508	530	-	219	199	269	299	-	-	-	1/2	
600	24"	610	630	-	229	209	269	319	-	-	-	1/2	
700	28"	711	720	-	195	229	-	-	-	-	-	1/2	
800	32"	813	820	-	211	239	-	-	-	-	-	1/2	
900	36"	914	920	-	218	249	-	-	-	-	-	1/2	
1000	40"	1016	1020	-	218	269	-	-	-	-	-	1/2	
1200	48"	1219	1220	-	256	289	-	-	-	-	-	1/2	
1400	56"	1422	1420	-	265	318	-	-	-	-	-	1/2	
1600	64"	1626	1620	-	285	348	-	-	-	-	-	1/2	
1800	72"	1829	1820	-	305	368	-	-	-	-	-	1/2	
2000	80"	2032	2020	236	325	388	-	-	-	-	-	1/2	
2200	88"	-	2220	246	-	-	-	-	-	-	-	1/2	
2400	96"	-	2420	266	-	-	-	-	-	-	-	1/2	
2600	104"	-	2620	276	-	-	-	-	-	-	-	1/2	
2800	112"	-	2820	286	-	-	-	-	-	-	-	1/2	
3000	120"	-	3020	296	-	-	-	-	-	-	-	1/2	



1. The orifice flange meets the HG/T20592-2009 standard and the dimension meets the requirements of field piping connections.
2. The pressure rating PN6 is designed and implemented in accordance with GB/T9115-2000 standard. If there are other requirements, please contact the manufacturer for more information.

THROTTLING ELEMENT WITH FLANGE ASSEMBLY TYPE AKFF

Structural Length Table

Nominal Diameter		OD(mm)	Flange Rating (lb)	ANSI B16.36 / HG/T20615-2009						Pressure Tapping
				CL150	CL300	CL600	CL900	CL1500	CL2500	
DN	NPS	I	RF						inch	
50	2"	60.3	185	193	203	237	243	287	1/2	
65	2 1/2"	73	190	218	200	233	233	317	1/2	
80	3"	88.9	197	205	215	243	273	375	1/2	
100	4"	114.3	194	196	230	254	274	406	1/2	
125	5"	141.3	228	226	251	277	335	481	1/2	
150	6"	168.3	220	218	264	310	372	576	1/2	
200	8"	219.1	240	240	296	354	456	666	1/2	
250	10"	273	240	252	334	398	538	868	1/2	
300	12"	323.8	258	278	342	430	596	958	1/2	
350	14"	355.6	276	302	360	456	626	-	1/2	
400	16"	406.4	279	311	389	465	655	-	1/2	
450	18"	457	299	337	401	491	687	-	1/2	
500	20"	508	309	343	413	529	745	-	1/2	
600	24"	610	325	357	439	617	845	-	1/2	
650	26"	662	200	312	398	554	-	-	1/2	
700	28"	711	214	322	416	588	-	-	1/2	
750	30"	764	222	338	446	614	-	-	1/2	
800	32"	813	238	360	468	642	-	-	1/2	
850	34"	866	244	368	502	674	-	-	1/2	
900	36"	914	258	384	528	692	-	-	1/2	
950	38"	968	270	408	-	-	-	-	1/2	
1000	40"	1016	280	419	-	-	-	-	1/2	
1050	42"	1070	296	438	-	-	-	-	1/2	
1100	44"	1121	302	458	-	-	-	-	1/2	
1150	46"	1173	318	474	-	-	-	-	1/2	
1200	48"	1219	328	476	-	-	-	-	1/2	
1250	50"	1273	336	498	-	-	-	-	1/2	
1300	52"	1324	344	514	-	-	-	-	1/2	
1350	54"	1375	352	508	-	-	-	-	1/2	
1400	56"	1422	362	566	-	-	-	-	1/2	
1450	58"	1476	378	578	-	-	-	-	1/2	
1500	60"	1524	388	572	-	-	-	-	1/2	



The orifice flange meets the ANSI B16.36/HG/T20615-2009 standard and the dimension meets the requirements of field piping connections.

THROTTLING ELEMENT WITH FLANGE ASSEMBLY TYPE AKFF

Model Selection Table

Model AKFF	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	DN	Code	Type	Code	Rating		Code	Material	Code	Type
	D002	50	P	RF	11	CL150	XXXX	MA	CS	N	NPT
	D00E	65	J	RJ/RTJ	12	CL300		MB	SS304	S	PSW
	D003	80	X	Others	13	CL600		MC	SS304L	#	Others
	D004	100			14	CL900		MD	SS316		
	D005	125			15	CL1500		ME	SS316L		
	D006	150			16	CL2500		MF	SS321		
	D008	200			22	PN6		MG	15CrMo		
	D010	250			23	PN10		MH	1Cr5Mo		
	D012	300			24	PN16		MI	SS347H		
	D014	350			25	PN25		MJ	SAF2507		
	D016	400			26	PN40		MK	HASTELLOY C276		
	D018	450			27	PN63		ML	HASTELLOY B		
	D020	500			28	PN100		MN	16Mn		
	D024	600			29	PN160		MO	SS310S		
	D026	650						MP	INCONEL 625		
	D028	700						MQ	MONEL 400		
	D030	750						MR	ZR702		
	D032	800						MV	SS316Ti		
	D034	850						MW	12CrMoV		
	D036	900						TA	TA2		
	D038	950						TH	SS317L		
	D040	1000						TI	A671 Gr.CC60 CL22		
	D042	1050						TJ	904L		
	D044	1100						TK	1Cr12Mo		
	D046	1150						TL	SAF2205		
	D048	1200						TM	Ta		
	D050	1250						TO	MONEL 500		
	D052	1300									
	D054	1350									
	D056	1400									
	D058	1450									
	D060	1500									
	D064	1600									
	D072	1800									
	D080	2000									
	D088	2200									
	D096	2400									
	D104	2600									
	D112	2800									
	D120	3000									



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKFFD010P11XXXXMBMDN—A+K Balanced Flow Meter; throttling element with flange assembly type; nominal diameter is DN250; process connection surface of the orifice flange is RF; pressure rating is CL150; meter body material is SS304; throttling element material is SS316; pressure tapping type is 1/2NPT; XXXX is customer identification No.

WELDING

TYPE AKFW

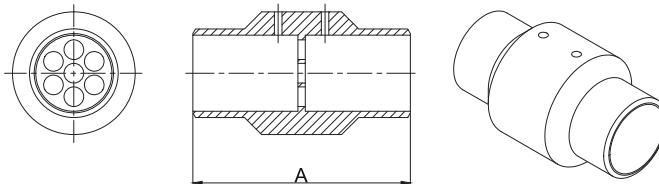
Pipe size range: DN15-DN3000

Pressure rating range: CL150-CL2500, PN2.5-PN160

Structural features: the meter body is directly welded to the field pipes without flanges and seals, reducing leakage points of the pipe.

Scope of application: it is suitable for high-pressure and ultra-high pressure flow measurement, such as hydrocracking, polyethylene, steam & water supply of power plant. It is suitable for fluid measurement in high-strength long-distance steel pipelines, such as long-distance pipelines and heat supply piping networks.

Profile



Structural Length Table

Nominal Diameter		OD		A	Pressure Tapping	Nominal Diameter		OD		A	Pressure Tapping
DN	NPS	I	II	mm	inch	DN	NPS	I	II	mm	inch
15	1/2"	21.3	18	220	1/4	800	32"	819.2	-	600	1/2
20	3/4"	26.7	25	220	1/4	850	34"	870	-	600	1/2
25	1"	33.4	32	220	1/4	900	36"	920.8	-	600	1/2
32	1 1/4"	42.2	38	220	1/4	950	38"	971.6	-	600	1/2
40	1 1/2"	48.3	45	220	1/4	1000	40"	1022.4	1020	600	1/2
50	2"	60.3	57	220	1/2	1050	42"	1074.7	-	600	1/2
65	2 1/2"	73	76	280	1/2	1100	44"	1125.5	-	600	1/2
80	3"	88.9	89	280	1/2	1150	46"	1176.3	-	600	1/2
100	4"	114.3	108	280	1/2	1200	48"	1227.1	1220	600	1/2
125	5"	141.3	133	300	1/2	1250	50"	1277.9	-	600	1/2
150	6"	168.3	159	300	1/2	1300	52"	1328.7	-	600	1/2
200	8"	219.1	219	300	1/2	1350	54"	1379.5	-	600	1/2
250	10"	273	273	340	1/2	1400	56"	1430.3	-	600	1/2
300	12"	323.8	325	380	1/2	1450	58"	1481.1	-	600	1/2
350	14"	355.6	377	380	1/2	1500	60"	1557.3	-	600	1/2
400	16"	406.4	426	410	1/2	1600	64"	1626	1620	1500	1/2
450	18"	457	480	440	1/2	1800	72"	1829	1820	1500	1/2
500	20"	508	530	470	1/2	2000	80"	2032	2020	1500	1/2
550	22"	559	-	500	1/2	2200	88"	-	-	1500	1/2
600	24"	610	630	540	1/2	2400	96"	-	-	1500	1/2
650	26"	665.2	-	600	1/2	2600	104"	-	-	1500	1/2
700	28"	716	-	600	1/2	2800	112"	-	-	1500	1/2
750	30"	768.4	-	600	1/2	3000	120"	-	-	1500	1/2



The structural length of the material code MM (material: AL5052/5083) is as follows:

The structural length for DN50-DN300 is 150mm; the structural length for DN350-DN600 is 210mm; please contact the manufacturer for confirmation of the out-of-range design.

WELDING

TYPE AKFW

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	AKFW	Code	DN	Code	Type	Code		Rating	Code	Material	Code
	D00A	15	P	NC	11	CL150	XXXX	MA	CS	N	NPT
	D00B	20			12	CL300		MB	SS304	S	PSW
	D001	25			13	CL600		MC	SS304L	#	Others
	D00C	32			14	CL900		MD	SS316		
	D00D	40			15	CL1500		ME	SS316L		
	D002	50			16	CL2500		MF	SS321		
	D00E	65			21	PN2.5		MG	15CrMo		
	D003	80			22	PN6		MH	1Cr5Mo		
	D004	100			23	PN10		MI	SS347H		
	D005	125			24	PN16		MJ	SAF2507		
	D006	150			25	PN25		MK	HASTELLOY C276		
	D008	200			26	PN40		ML	HASTELLOY B		
	D010	250			27	PN63		MM	AL5052/5083		
	D012	300			28	PN100		MN	16Mn		
	D014	350			29	PN160		MO	SS310S		
	D016	400						MP	INCONEL 625		
	D018	450						MQ	MONEL 400		
	D020	500						MR	ZR702		
	D024	600						MV	SS316Ti		
	D026	650						MW	12CrMoV		
	D028	700						TA	TA2		
	D030	750						TH	SS317L		
	D032	800						TI	A671 Gr.CC60 CL22		
	D034	850						TJ	904L		
	D036	900						TK	1Cr12Mo		
	D038	950						TL	SAF2205		
	D040	1000						TM	Ta		
	D042	1050						TO	MONEL 500		
	D044	1100									
	D046	1150									
	D048	1200									
	D050	1250									
	D052	1300									
	D054	1350									
	D056	1400									
	D058	1450									
	D060	1500									
	D064	1600									
	D072	1800									
	D080	2000									
	D088	2200									
	D096	2400									
	D104	2600									
	D112	2800									
	D120	3000									



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKFWD006P14XXXXMGMS—A+K Balanced Flow Meter; welding type; nominal diameter is DN150; welding groove is without flange sealing surface; pressure rating is CL900; meter body material is 15CrMo; throttling element material is SS316; pressure tapping type is PSW; XXXX is customer identification No.

DIAPHRAGM SEALED TYPE AKDF

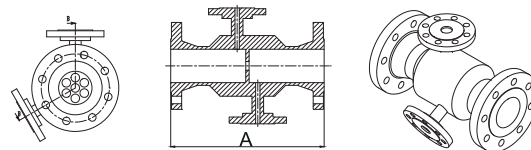
Pipe size range: DN50-DN600

Pressure rating range: CL150-CL2500, PN2.5-PN160

Structural features: the throttling element is placed in the center of the meter body and both ends of the meter body are equipped with instrument flanges to be connected with field pipeline. The two pieces of tapping flanges are connected with the diaphragm sealed differential pressure transmitter or flanged ball valves.

Scope of application: it is suitable for measuring the viscous liquids (crude oil, residual oil, raw oil, and recycle oil), coal slurry fluids (including tar) and dirty & dust gas. For high viscosity and dust fluids, the purge port can be increased according to design requirements.

Profile



Structural Length Table

Nominal Diameter		OD(mm)	Flange Rating (lb)	ANSI B16.5/HG/T20615-2009						Tapping Flange
				CL150	CL300	CL600	CL900	CL1500	CL2500	
DN	NPS	I	RF/SO	RF/WN						inch
			A	A	A	A	A	A	A	
50	2"	60.3	340	358	377	435	435	485	2	
65	2 1/2"	73.0	340	430	449	501	501	577	2	
80	3"	88.9	340	436	457	495	525	627	2	
100	4"	114.3	420	450	495	519	539	671	2	
125	5"	141.3	420	494	539	565	623	769	2	
150	6"	168.3	420	494	545	591	653	857	2	
200	8"	219.1	420	520	577	635	737	947	2	
250	10"	273.0	420	572	655	719	859	1189	2	
300	12"	323.8	420	638	703	791	957	1319	2	
350	14"	355.6	420	664	721	817	987	-	2	
400	16"	406.4	420	700	777	853	1043	-	2	
450	18"	457.0	450	756	819	909	1105	-	2	
500	20"	508.0	500	792	861	977	1193	-	2	
600	24"	610.0	600	874	957	1135	1363	-	2	

Nominal Diameter		OD(mm)	Flange Rating (lb)	ANSI B16.5/HG/T20615-2009					Tapping Flange
				CL300	CL600	CL900	CL1500	CL2500	
DN	NPS	I	RJ/WN					inch	
			A	A	A	A	A		
50	2"	60.3	374	380	438	438	488	2	
65	2 1/2"	73.0	446	452	504	504	583	2	
80	3"	88.9	452	460	498	528	633	2	
100	4"	114.3	466	498	522	542	680	2	
125	5"	141.3	510	542	568	624	781	2	
150	6"	168.3	510	548	594	659	869	2	
200	8"	219.1	536	580	638	746	961	2	
250	10"	273.0	588	658	722	868	1211	2	
300	12"	323.8	654	706	794	973	1341	2	
350	14"	355.6	680	724	826	1006	-	2	
400	16"	406.4	716	780	862	1065	-	2	
450	18"	457.0	772	822	921	1127	-	2	
500	20"	508.0	811	867	989	1215	-	2	
600	24"	610.0	896	966	1104	1391	-	2	

DIAPHRAGM SEALED TYPE AKDF

Nominal Diameter		Flange Rating (bar)		HG/T20592-2009									Tapping Flange
				PN2.5	PN6	PN10	PN16	PN25	PN40	PN63	PN100	PN160	
DN	NPS	OD(mm)		RF/PL		RF/SO			RF/WN				inch
		I	II	A	A	A	A	A	A	A	A		
50	2"	60.3	57	340	340	340	340	340	314	342	370	384	2
65	2 1/2"	73.0	76	340	340	340	340	340	382	414	446	458	2
80	3"	88.9	89	340	340	340	340	340	394	422	450	466	2
100	4"	114.3	108	420	420	420	420	420	408	434	474	494	2
125	5"	141.3	133	420	420	420	420	420	434	474	524	544	2
150	6"	168.3	159	420	420	420	420	420	448	488	544	574	2
200	8"	219.1	219	420	420	420	420	420	474	518	574	600	2
250	10"	273.0	273	420	420	420	420	420	548	588	668	670	2
300	12"	323.8	325	420	420	420	420	420	608	658	734	756	2
350	14"	355.6	377	420	420	420	420	420	628	678	778	-	2
400	16"	406.4	426	420	420	420	420	420	678	744	840	-	2
450	18"	457.0	480	450	450	450	450	450	708	-	-	-	2
500	20"	508.0	530	500	500	500	500	500	748	-	-	-	2
600	24"	610.0	630	600	600	600	600	600	838	-	-	-	2

Nominal Diameter		Flange Rating (bar)		HG/T20592-2009			Tapping Flange
				PN63	PN100	PN160	
DN	NPS	OD(mm)		RJ/WN			inch
		I	II	A	A	A	
50	2"	60.3	57	374	378	414	2
65	2 1/2"	73.0	76	444	462	504	2
80	3"	88.9	89	444	484	514	2
100	4"	114.3	108	454	494	534	2
125	5"	141.3	133	510	544	594	2
150	6"	168.3	159	530	574	628	2
200	8"	219.1	219	546	604	690	2
250	10"	273.0	273	598	694	820	2
300	12"	323.8	325	666	784	956	2
350	14"	355.6	377	702	820	-	2
400	16"	406.4	426	764	870	-	2

DIAPHRAGM SEALED TYPE AKDF

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping		
	AKDF	Code	DN	Code	Type	Code		Rating	Code	Material	Code	Type
	D002		50	P	RF	11	CL150	XXXX	MA	CS	1	1"
	D00E		65	J	RJ/RTJ	12	CL300		MB	SS304	2	2"
	D003		80	T	LG	13	CL600		MC	SS304L	3	3"
	D004		100	X	Others	14	CL900		MD	SS316		
	D005		125			15	CL1500		ME	SS316L		
	D006		150			16	CL2500		MF	SS321		
	D008		200			21	PN2.5		MG	15CrMo		
	D010		250			22	PN6		MH	1Cr5Mo		
	D012		300			23	PN10		MI	SS347H		
	D014		350			24	PN16		MJ	SAF2507		
	D016		400			25	PN25		MK	HASTELLOY C276		
	D018		450			26	PN40		ML	HASTELLOY B		
	D020		500			27	PN63		MN	16Mn		
	D024		600			28	PN100		MO	SS310S		
						29	PN160		MP	INCONEL 625		
									MQ	MONEL 400		
									MR	ZR702		
									MV	SS316Ti		
									MW	12CrMoV		
									TA	TA2		
									TH	SS317L		
									TI	A671 Gr.CC60 CL22		
									TJ	904L		
									TK	1Cr12Mo		
									TL	SAF2205		
									TM	Ta		
									TO	MONEL 500		



1. More material details please refer to the additional code table.
2. Special material codes MI/MK/ML/MP/MQ/MR/MV/TA/TJ/TM/TO are only applicable to the throttling element, and are not suitable for pipe flanges.

Model selection example:

AKDFD006P11XXXXMBMD2—A+K Balanced Flow Meter; diaphragm sealed type; nominal diameter is DN150; process connection surface is RF; pressure rating is CL150; meter body material is SS304; throttling element material is SS316; the pressure tappings are two pieces of 2" tapping flanges; XXXX is customer identification No.

DIAPHRAGM SEALED TYPE (DN50-DN150) WITH LOOSE FLANGES AND SPECIAL MATERIALS AKDS

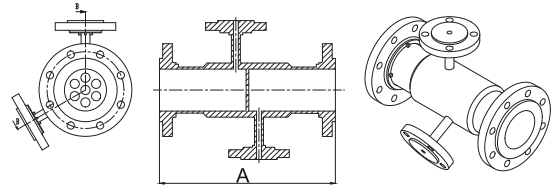
Pipe size range: DN50-DN150

Pressure rating range: CL150-CL600, PN6-PN40

Structural features: the throttling element is placed in the center of the meter body; the meter body and the throttling element are made of special metal materials; the meter body is connected with field pipeline by loose flanges. The two pieces of tapping flanges are connected with the diaphragm sealed differential pressure transmitter or flanged ball valves.

Scope of application: it is suitable for the corrosive fluid measurement with special material requirement in small pipeline.

Profile



Structural Length Table

Nominal Diameter		OD(mm)		Flange Rating (lb/bar)	ANSI B16.5/HG/T20615-2009			HG/T20592-2009					Tapping Flange
					CL150	CL300	CL600	PN6	PN10	PN16	PN25	PN40	
DN	NPS	I	II	A	A	A	RF/PJ/SE-LOOSE FLANGE					inch	
50	2"	60.3	57	321	337	345	303	311	311	311	311	311	2
65	2 1/2"	73	76	376	394	400	350	358	358	362	362	362	2
80	3"	88.9	89	400	426	432	376	380	380	388	388	388	2
100	4"	114.3	108	436	466	478	406	414	414	422	422	422	2
125	5"	141.3	133	460	490	508	424	432	432	444	444	444	2
150	6"	168.3	159	505	529	559	465	473	473	485	485	485	2

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	DN	Code	Type	Code	Rating		Code	Material	Code	Type
AKDS	D002	50	P	RF	11	CL150	XXXX	MI	SS347H	1	1"
	D00E	65	X	Others	12	CL300		MK	HASTELLOY C276	2	2"
	D003	80			13	CL600		ML	HASTELLOY B	3	3"
	D004	100			22	PN6		MP	INCONEL 625		
	D005	125			23	PN10		MQ	MONEL 400		
	D006	150			24	PN16		MR	ZR702		
					25	PN25		MV	SS316Ti		
					26	PN40		TA	TA2		
							TJ	904L			
							TM	Ta			
							TO	MONEL 500			

- Notes:**
1. More material details please refer to the additional code table.
 2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKDSD004P11XXXXMKMK2—A+K Balanced Flow Meter; diaphragm sealed type with loose flanges and special materials; nominal diameter is DN100; process connection surface is RF; pressure rating is CL150; meter body material is Hastelloy C276; throttling element material is Hastelloy C276; the pressure tappings are two pieces of 2" tapping flanges; XXXX is customer identification No.

DIAPHRAGM SEALED TYPE (DN200-DN600) WITH LOOSE FLANGES AND SPECIAL MATERIALS AKDG

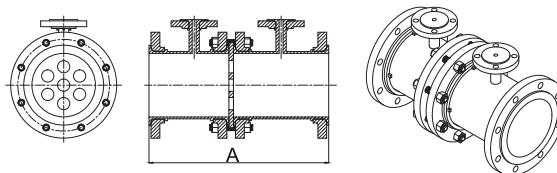
Pipe size range: DN200-DN600

Pressure rating range: CL150-CL600/PN6-PN40

Structural features: The pipe sections with loose flanges at both ends clamp the throttling element made of special material, and the loose flanges made of stainless steel, with a full set of sealing fasteners. The meter body is connected with field pipeline by loose flanges. The two pieces of tapping flanges are connected with diaphragm sealed differential pressure transmitter or flanged ball valve.

Scope of application: it is suitable for the corrosive fluid measurement with special material requirement in large pipeline.

Profile



Structural Length Table

Nominal Diameter		OD(mm)		ANSI B16.5/HG/T20615-2009			HG/T20592-2009					Tapping Flange
				CL150	CL300	CL600	PN6	PN10	PN16	PN25	PN40	
DN	NPS	I	II	RF/LF/SE-LOOSE FLANGE			RF/PJ/SE-LOOSE FLANGE					inch
200	8"	219.1	219	590	624	648	544	548	552	564	572	2
250	10"	273	273	673	765	797	623	627	631	645	659	2
300	12"	323.8	325	752	854	884	698	706	714	726	746	2
350	14"	355.6	377	883	947	979	777	785	795	809	835	2
400	16"	406.4	426	974	1042	1080	856	864	876	892	920	2
450	18"	457	480	1069	1135	1179	935	945	959	975	1007	2
500	20"	508	530	1156	1230	1280	1014	1026	1042	1062	1094	2
600	24"	610	630	1322	1404	1468	1172	1184	1204	1236	1268	2

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	DN	Code	Type	Code	Rating		Code	Material	Code	Type
AKDG	D008	200	P	RF	11	CL150	XXXX	MI	SS347H	1	1"
	D010	250	X	Others	12	CL300		MK	HASTELLOY C276	2	2"
	D012	300			13	CL600		ML	HASTELLOY B	3	3"
	D014	350			22	PN6		MP	INCONEL 625		
	D016	400			23	PN10		MQ	MONEL 400		
	D018	450			24	PN16		MR	ZR702		
	D020	500			25	PN25		MV	SS316Ti		
	D024	600			26	PN40		TA	TA5/TA2		
								TJ	904L		
								TM	Ta		
								TO	MONEL 500		



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKDGD010P11XXXXMKMK2—A+K Balanced Flow Meter; diaphragm sealed type with loose flanges and special materials; nominal diameter is DN250; process connection surface is RF; pressure rating is CL150; meter body material is Hastelloy C276; throttling element material is Hastelloy C276; the pressure taps are two pieces of 2" tapping flanges; XXXX is customer identification No.

ANTI-CORROSIVE AND DIAPHRAGM SEALED TYPE WITH PTFE LINER AKDP

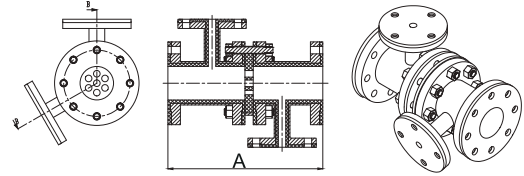
Pipe size range: DN50-DN600

Pressure rating range: CL150, PN2.5-PN25

Structural features: equipped with a full set of PTFE gaskets and fasteners, the throttling element made of PTFE is clamped between the PTFE-lined pipe sections by flanges. The meter body is directly connected with site process pipeline by flanges. Both the pressure tapping pipes and tapping flanges are lined with PTFE for the connection with the diaphragm sealed differential pressure transmitter or the anti-corrosive ball valves.

Scope of application: suitable for the measurement of highly corrosive fluids, such as wet chlorine, hydrogen chloride, hydrofluoric acid, sulfuric acid, etc.

Profile



Structural Length Table

Nominal Diameter		OD(mm)		Flange Rating (lb/bar)	HG/T20615-2009		HG/T20592-2009					Tapping Flange
					CL150	PN2.5	PN6	PN10	PN16	PN25		
DN	NPS	I	II	RF/SO	RF/PL		RF/SO			inch		
				A	A	A	A	A	A			
50	2"	60.3	57	360	360	360	360	360	360	2		
80	3"	88.9	89	375	376	376	376	376	376	2		
100	4"	114.3	108	413	413	413	413	413	413	2		
125	5"	141.3	133	474	474	474	474	474	474	2		
150	6"	168.3	159	514	514	514	514	514	514	2		
200	8"	219.1	219	595	595	595	595	595	595	2		
250	10"	273.0	273	716	716	716	716	716	716	2		
300	12"	323.8	325	832	834	834	834	834	834	2		
350	14"	355.6	377	879	912	912	912	912	912	2		
400	16"	406.4	426	990	1019	1019	1019	1019	1019	2		
450	18"	457.0	480	1096	1130	1130	1130	1130	1130	2		
500	20"	508.0	530	1202	1235	1235	1235	1235	1235	2		
600	24"	610.0	630	1425	1455	1455	1455	1455	1455	2		

Model Selection Table

Model	Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	DN	Code	Type	Code	Rating		Code	Material	Code	Type
AKDP	D002	50	P	RF	11	CL150	XXXX	MK	HASTELLOY C276	2	2"
	D00E	65			21	PN2.5		ML	HASTELLOY B	3	3"
	D003	80			22	PN6		MP	INCONEL 625		
	D004	100			23	PN10		MQ	MONEL 400		
	D005	125			24	PN16		MR	Zr702		
	D006	150			25	PN25		MS	CS with PTFE		
	D008	200			26	PN40		MT	SS with PTFE		
	D010	250						MU	PTFE		
	D012	300						TA	TA2		
	D014	350						TJ	904L		
	D016	400						TM	Ta		
	D018	450						TO	MONEL 500		
	D020	500									
	D024	600									



- The material codes MS and MT are only applicable to the meter body, and other codes can only be used for the throttling element.
- More material details please refer to the additional code table.
- Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKDPD006P11XXXXMTM2—A+K Balanced Flow Meter; anti-corrosive and diaphragm sealed type with PTFE liner; nominal diameter is DN150; process connection surface is RF; pressure rating is CL150; meter body material is stainless steel lined with PTFE; throttling element material is PTFE; the pressure tapings are two pieces of 2" tapping flanges lined with PTFE; XXXX is customer identification No.

DIAPHRAGM SEALED TYPE WITH HEAT-INSULATING JACKET AKDB

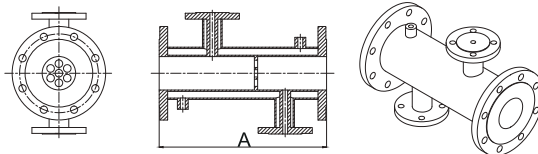
Pipe size range: inner pipe nominal diameter DN40-DN400

Pressure rating range: CL150-CL300, PN16-PN40

Structural features: the throttling element is placed in the center of the pipe, and a thermal insulation jacket and a fluid heat tracing port are added outside the pipe. The two ends of the pipe section are connected with the process pipeline by jacket flanges. The two pieces of tapping flanges are connected with diaphragm sealed differential pressure transmitter.

Scope of application: designed for the flow measurement with jacketed heating tracing process requirements.

Profile



Structural Length Table

Code	Nominal Diameter	Flange Rating (lb/bar)		HG/T20615-2009		HG/T20592-2009			Tapping Flange Size	Heat Tracing Port
				CL150	CL300	PN16	PN25	PN40		Bell and Spigot
		OD(mm)	I	II	RF		RF			DN
0D0E	40×65	48	45	A	A	A	A	A	50	15
0203	50×80	60	57	372	385	322	336	336	50	15
0304	80×100	89	89	390	408	350	366	366	50	20
0406	100×150	114	108	505	526	458	484	484	50	20
0608	150×200	168	159	569	570	501	541	541	50	20
0810	200×250	219	219	676	695	596	632	648	80	20
1012	250×300	273	273	773	803	709	745	779	80	25
1216	300×400	325	325	878	910	806	834	880	80	25
1416	350×400	325	325	982	1020	898	948	998	80	40
1620	400×500	356	377	1070	1106	984	1034	1084	80	40
		406.4	426	1150	1200	992	1100	1100	80	40

DIAPHRAGM SEALED TYPE WITH HEAT-INSULATING JACKET AKDB

Model Selection Table

Model		Size		Process Connection Surface		Pressure Rating		Customer Identification No.	Meter Body / Throttling Element Material		Pressure Tapping	
AKDB	Code	DN	Code	Type	Code	Rating	Code	Code	Material	Code	Type	
	0D0E	40x65	P	RF	11	CL150	XXXX	MA	CS	2	2"	
	0203	50x80			12	CL300		MB	SS304	3	3"	
	0304	80x100			24	PN16		MC	SS304L			
	0406	100x150			25	PN25		MD	SS316			
	0608	150x200			26	PN40		ME	SS316L			
	0810	200x250						MF	SS321			
	1012	250x300						MG	15CrMo			
	1216	300x400						MH	1Cr5Mo			
	1416	350x400						MI	SS347H			
	1620	400x500						MJ	SAF2507			
								MK	HASTELLOY C276			
								ML	HASTELLOY B			
								MN	16Mn			
								MO	SS310S			
								MP	INCONEL 625			
								MQ	MONEL 400			
								MR	ZR702			
								MV	SS316Ti			
								MW	12CrMoV			
								MX	CS with Jacket			
								MY	SS with Jacket			
								TA	TA2			
								TH	SS317L			
								TI	A671 Gr.CC60 CL22			
								TJ	904L			
								TK	1Cr12Mo			
								TL	SAF2205			
								TM	Ta			
								TO	MONEL 500			



1. The material codes MX and MY are only applicable to the meter body, and other codes can be only used for the throttling element.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKDB0406P11XXXXMYMD2—A+K Balanced Flow Meter; diaphragm sealed type with heat-insulating jacket; the nominal diameter of the inner pipe is DN100 whilst outer pipe is DN150; process connection surface is RF; pressure rating is CL150; meter body material is stainless steel with jacket pipe; throttling element material is SS316; the pressure taps are two pieces of 2" tapping flanges; XXXX is customer identification No.

SQUARE PIPE TYPE AKSP

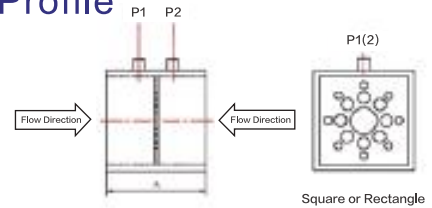
Pipe size range: the dimension of the square pipe type flow meter is represented by length × width and it can be customized on demand.

Pressure rating range: CL150-CL600, PN2.5-PN63

Structural features: square pipes, square throttling element, and process connection designed according to site requirements.

Scope of application: suitable for the air flow measurement of square pipes.

Profile



Structural Length Table

Side Length (Long Side) mm	A mm	Pressure Tapping inch
200mm-900mm	254	1/2
> 1000mm	508	1/2

Model Selection Table

Model AKSP	Size		Process Connection Surface		Pressure Rating		Customer Identification No. Code	Meter Body / Throttling Element Material		Pressure Tapping	
	Code	Side length mm	Code	Type	Code	Rating		Code	Material	Code	Type
	D008	200	P	NC	11	CL150	XXXX	MA	CS	N	NPT
	D010	250	X	Others	12	CL300		MB	SS304	S	PSW
	D012	300			13	CL600		MD	SS316	#	Others
	D014	350			21	PN2.5					
	D016	400			22	PN6					
	D018	450			23	PN10					
	D020	500			24	PN16					
	D024	600			25	PN25					
	D026	650			26	PN40					
	D028	700			27	PN63					
	D030	750									
	D032	800									
	D034	850									
	D036	900									
	D038	950									
	D040	1000									
	D042	1050									
	D044	1100									
	D046	1150									
	D048	1200									
	D050	1250									
	D052	1300									
	D054	1350									
	D056	1400									
	D058	1450									
	D060	1500									
	D064	1600									
	D072	1800									
	D080	2000									
	D088	2200									
	D096	2400									
	D104	2600									
	D112	2800									
	D120	3000									



1. More material details please refer to the additional code table.
2. Please contact the manufacturer for confirmation of the out-of-range design.

Model selection example:

AKSPD008D012X24XXXXMAMB — A+K Balanced Flow Meter; square pipe type; side length is 200×300mm; process connection surface is other type; pressure rating is PN16; meter body material is carbon steel; throttling element material is SS304; pressure tapping type is 1/2NPT; XXXX is customer identification No.

ADDITIONAL CODE TABLE (SINGLE CHOICE)

Basic Model	Extension Code	Meaning
Basic Model of Balanced Flow Meter	2R	2 groups of pressure tapplings
	3R	3 groups of tpresure tapplings
	4R	4 groups of pressure tapplings

Model selection example:

AKPPD008P13XXXXMGMS2R—The basic model of the balanced flow meter is AKPPD008P13XXXXMGMS, and the extension code 2R represents the design of the two groups of pressure tapplings.

Additional Code Table:

The materials in the model selection table mentioned above are common materials. If it is beyond the scope of the model selection table, please refer to the following additional code table:

Code	Extension Material
MA	10# / Q235 / A3 / 20# / 20G / A105 / A106-B / A53-B / WCB / L245 / API 5L-B / ST45.8 / III
MB	SS400 (22)
MF	1Cr18Ni9Ti
MG	WB36 / 15NiCuMoNb5 / 15NiCuMoNb564 / 35CrMo
MH	12Cr5Mo
MI	SS347 / 06Cr18Ni11Nb
MJ	A182-F53 / A182-F51
MM	AL5052 / AL5083
MN	16MnD / Q345 / L415 / A333-Gr3 / A333-Gr6 / A694-F60 / A210-C / A350-LF2 / API5L-X60
MO	SS310 / XDS-8
MP	INCONEL600 (N06600) Incoloy800H (No8810) Incoloy800 (No800)
MV	1.4571 SST DIN X6CrNiMoTi17122
MW	12Cr1MoV / 10Cr9Mo1VNbN (A335-P91) / 12Cr2Mo / (A335-P22) / 10MoWVNb / 10CrMo910 / 10CrMo50 / A672 Gr.A55 CL.12 (19)
TA	TA5
TL	A182-F60



In the material selection, the code shall represent one of materials in the additional code table. The specific meaning is subject to the final order.

Installation

The following installation methods are limited to horizontal pipe installation. For vertical pipe installation, please consult the manufacturer for more information.

Fluid	Gas	Liquid	Steam
Instruction	The pressure tapplings are located above the pipeline, within the scope of inclined angle 45° vertically upward to avoid the entry of the liquid and foreign matters into the pressure pipes.	The pressure tapplings are located below the pipeline, within the scope of inclined angle 45° horizontally downward to avoid the entry of gas into the pressure pipes.	The pressure tapplings are located above the pipeline, within the scope of inclined angle 45° horizontally upward to ensure the reflux of the condensate.
Orientation			
Typical Field Assembly			

QUALIFICATION CERTIFICATE



U.S. Patent



Chinese Patent



Chinese Patent



CNAS Certificate



ISO9001: 2015



ISO14001: 2015



OHSAS18001: 2007



Water Flow Calibration Station (Size: DN15–DN600)



Gas Flow Calibration Station (Size: DN15–DN300)

PRODUCT DISPLAY



Flange Connection Type



Wafer Type with Spool Piece



Welding Type for High Temperature
& High Pressure Applications



Diaphragm Sealed Type



Diaphragm Sealed Type with
Heat-insulating Jacket



Square Pipe Type



BFM for Dirty Fluid Measurement



BFM with Zirconium Material



BFM with Special Material



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