LL-D
Roots Flow Meter for Sandy Fluids

Model LL-D roots flow meter is based on normal roots meter and designed with certain additional measures to deal with sandy fluid. It can be used to measure crude oil containing sand or sand-like impurities.

This flow meter can provide on-site display of accumulated flow. When coupled with photoelectron pulse converter and flow totalizer through transmission interface, it can carry out remote measurement、display、and control.

Its unique features are high accuracy、good repeatability、wide range ability、and lower demand for straight pipes on upstream or downstream side of the flow meter.

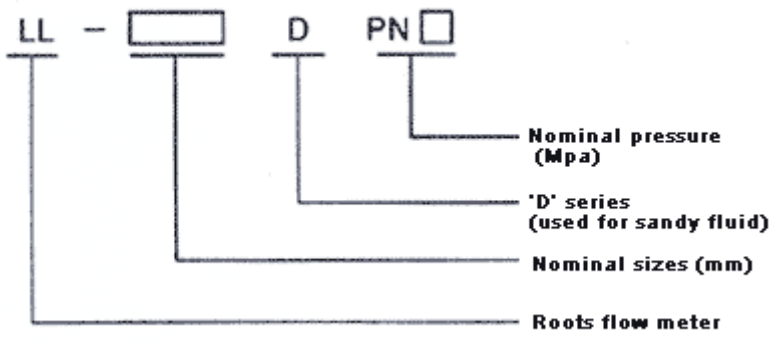
The standard for this flow meter is Q/YXBM 368-2000, while the inspecting regulation thereof is JJG 667-97 "Inspecting regulation of volumetric liquid flow meter".

□Principal Specifications

Nominal sizes DN (mm)	Maximum flow rate m^3/h	Elementary error limit (%)		Temperature of medium ℃	Speed of transmission output shaft m^3/r	Nominal pressure MPa	Maximum pressure loss MPa	Viscosity range mPa·s
		Range ability 5：1	Range ability 10：1					
50	25	±0.2	±0.5	0～120	0.01	1.6	＜0.12	3～500
80	60					2.5		
100	100					6.3		
150	250				0.1	1.6		
200	400					2.5		
250	600					4.0		
300	1000					6.3		

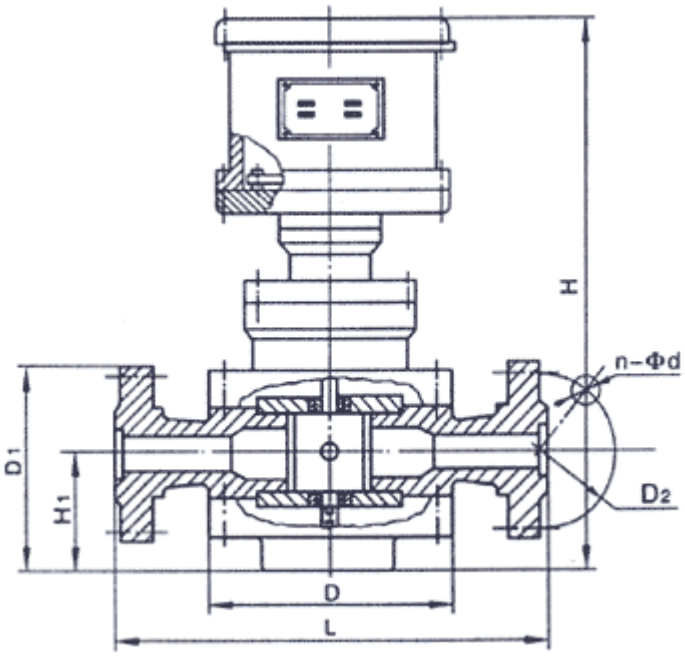
Note: If temperature of medium exceeds 120 0C, the flow meter should be purchased by special order.

□Model Designation



□Model Designation

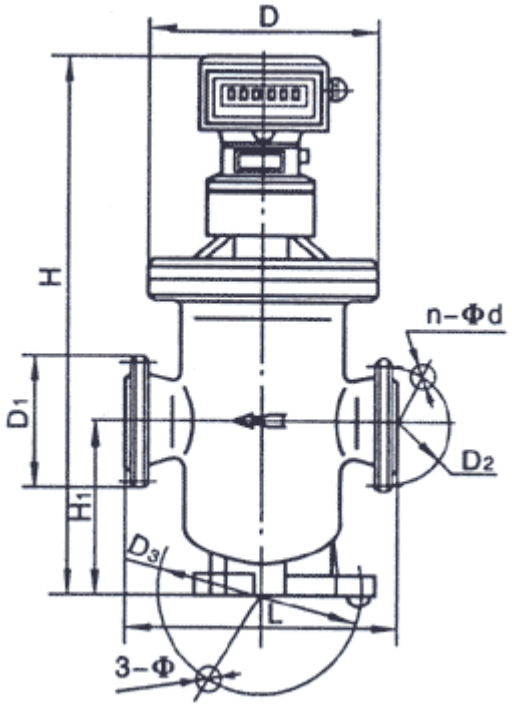
・Nominal sizes DN 50～100mm, PN 1.6



Unit：mm

Model Dimensions	Overall height H	Height of cente H1	Outside diameter of large plane D	Distance between two flanges L	Outside diameter of flanges D1	Circle of bolt hole centers D2	Apertures for bolts n-Φd	Connecting bolts n-Md1	Weight (kg)
LL-50D，PN1.6	526	179	Φ216	300	Φ160	Φ125	4-Φ18	4-M16	52
LL-80D，PN1.6	635	225	Φ300	400	Φ195	Φ160	8-Φ18	8-M16	106
LL-100D，PN1.6	710	268	Φ350	460	Φ215	Φ180	8-Φ18	8-M16	155

• Nominal sizes DN 50～100 mm, PN 2.5、PN 4.0、PN 6.3

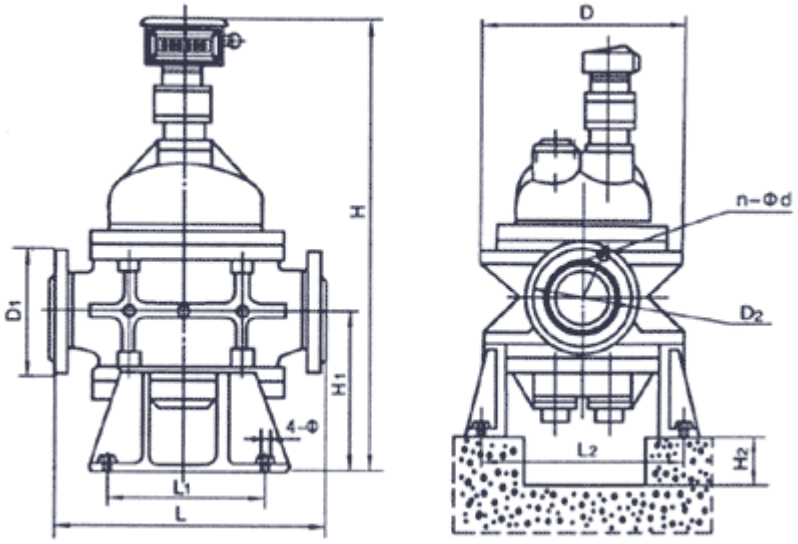


Unit：mm

Model	Overall	Height	Outside	Location	Base	Distance	Outside	Circle	Apertures	Connecting	Weight

Dimensions	height H	of center H_1	diameter of large plane D	of base bolts D_3	bolt apertures 3-Φ	between two flanges L	diameter of flanges D_1	of bolthole centers D_2	for bolts n-Φd	bolts n-Md_1	(kg)
LL-50D，PN2.5	940	237	Φ300	Φ240	3-Φ18	360	Φ160	Φ125	4-Φ18	4-M16	128
PN4.0							Φ160	Φ125	4-Φ18	4-M16	129
PN6.3							Φ175	Φ135	4-Φ23	4-M20	130
LL-80D，PN2.5	1037	289	Φ400	Φ370	3-Φ23	460	Φ195	Φ160	8-Φ18	8-M16	228
PN4.0							Φ195	Φ160	8-Φ18	8-M16	229
PN6.3							Φ210	Φ170	8-Φ23	8-M20	231
LL-100D，PN2.5	1100	318	Φ425	Φ370	3-Φ23	500	Φ230	Φ190	8-Φ23	8-M20	280
PN4.0							Φ230	Φ190	8-Φ23	8-M20	282
PN6.3							Φ250	Φ200	8-Φ25	8-M22	286

• Nominal sizes DN 150～300 mm



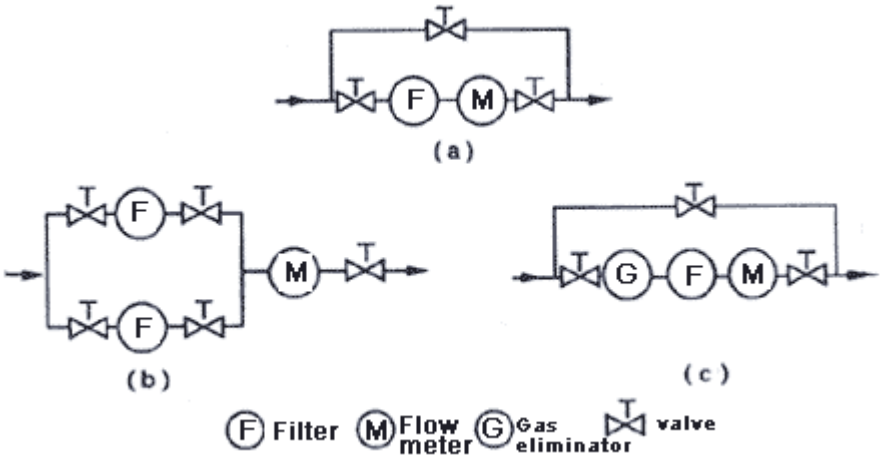
Unit：mm

Model / Dimensions	Overall height H	Height of center H1	Outside diameter of large plane D	Location of base bolts L1×L2	Base bolt apertures 4-Φ	Distance between two flanges L	Outside diameter of flanges D1	Circle of bolt hole centers D2	Apertures for bolts n-Φd	Connecting bolts n-Md1	Maintenance notch depthof foundation H2＞	Weight (kg)
LL-150D，PN1.6	1467	462	Φ470	355×360	4-Φ25	650	Φ280	Φ240	8-Φ23	8-M20	60	460
PN2.5							Φ300	Φ250	8-Φ25	8-M22		470
PN4.0							Φ300	Φ250	8-Φ25	8-M22		470
PN6.3							Φ340	Φ280	8-Φ34	8-M30		490
LL-200D，PN1.6	1528	488	Φ500	570×440	4-Φ27	700	Φ335	Φ295	12-Φ23	12-M20		625
PN2.5							Φ360	Φ310	12-Φ25	12-M22		640
PN4.0	1540	500	Φ520				Φ375	Φ320	12-Φ30	12-M27		650
PN6.3							Φ405	Φ345	12-Φ34	12-M30		670
LL-250D，PN1.6	1731	576	Φ670	580×840		1000	Φ405	Φ355	12-Φ25	12-M22	100	1562
PN2.5							Φ425	Φ370	12-Φ30	12-M27		1578

PN4.0			Φ720				Φ445	Φ385	12-Φ34	12-M30		1595
PN6.3							Φ470	Φ400	12-Φ41	12-M36		1620
LL-300D，PN1.6	1936	680	Φ670				Φ460	Φ410	12-Φ25	12-M22		1780
PN2.5							Φ485	Φ430	16-Φ30	16-M27		1800
PN4.0			Φ720				Φ510	Φ450	16-Φ34	16-M30		1825
PN6.3							Φ530	Φ460	16-Φ41	16-M36		1860

JB/T81-94(PN1.6，PN2.5) or JB/T82.2-94(PN4.0，PN6.3)

☐Mode of pipe installation (sketch)



Notes: Requirements for mounting

• Select mounting location with less vibration and free from high temperature and moisture.

• Mount the flow meter upright on a horizontal pipe.

• Before mounting flow meter, it is necessary to clear away all impurities as sludge and welding dregs out of the pipe.

• The flow meter should be located at a lower place so as to separate the gas from the measured fluid at other higher places. If necessary, a gas eliminator should be mounted ahead of the flow meter.

• Filter and gas eliminator should be mounted on the upstream side of flow meter, while adjusting valves should be mounted on the downstream side.

☐Attachable Instruments

• Photoelectron pulse converters

Model	Function Description
LPJ-12D	Explosion isolation type, contact signal: 1 time / round, dual channel pulse signal: 1000 times / round with phase difference 90°..
LPJ-12D/FI	In addition to the function of LPJ-12D, output of analogue signal 4～20 mA could be provided.

• Digital flow totalizers

Model	Function description
XSJ-39A(I、K)	Simultaneously displaying momentary flow rate and total flow; 4 to 20 mA output; flow control for fixed displacement is feasible.
XSJ-39B(I)	Total flow and flow rate display; 4 to 20 mA output; with error less than ±0.1%; compact structure; LED or LCD display selectable; power off protection durable over five years.
XSF-40A	Accumulating total flow and indicating momentary flow rate; 0 to 10 mA or 4 to 20 mA output.
SXP-3113	Modular design; compensating for temperature、pressure as desired; displaying total amount, momentary rate and its percentage of mass or volume flow; 0 to 10 mA or 4 to 20 mA output; also usable for accumulating and indicating gas flow.
XSK-10B	Digital flow controller for fixed displacement, usable for proportional bottling; displaying flow rate and total flow of liquid.

☐Wiring terminal diagram of photoelectron pulse converter

• LPJ-12D (explosion-proof type)