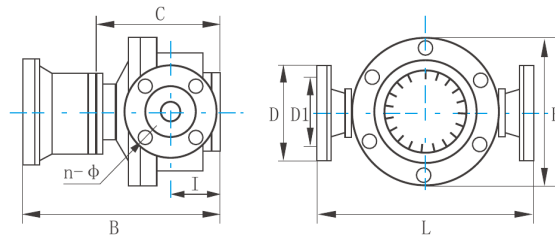


OVAL GEAR FLOWMETER, DN10 TO DN200



- MECHANICAL COUNTER · FLANGED · FIVE MATERIAL VERSIONS
- ACCURACY CLASS 0.5 OR 0.2
- 1.6 ... 6.3 MPa BY MODEL AND SIZE · OPTIONAL PULSE OR 4 ... 20 mA

KEY DATA

Property	Value	Property	Value
Nominal size	DN10 ... DN200, flanged	Accuracy class	0.5 or 0.2
Flow range	0.03 ... 340, see the flow tables	Working temperature	-10 ... +60 °C in general
Ambient temperature	-40 ... +50 °C	Materials	Cast iron · cast steel · stainless · aluminium
Nominal pressure	1.6 · 2.5 · 4.0 · 6.3 MPa by model	Reading	Mechanical counter · pulse or 4 ... 20 mA

Two oval gears turn once per known volume and drive a counter through a gear train. It is a mechanical meter: it reads without power, and an electrical output is an accessory.



MEASUREMENT

Measuring principle	Positive displacement — two oval gears, each turn a known volume, geared to a mechanical counter. No straight inlet run is needed
Nominal sizes	DN10, 15, 20, 25, 40, 50, 65, 80, 100, 150 and 200, flanged
Flow range	From 0.03 at DN10 to 340 at DN200, see the flow tables
Accuracy	Class 0.5 or class 0.2
Pressure loss	Given as a curve, about 0.025 MPa at full flow for gasoline and 0.075 for transformer oil

MATERIALS AND PROCESS

Model A	Cast iron body and covers, cast-iron and engineering-material gears, stainless shaft, oil bronze or rolling bearing · 1.6 MPa
Model B	Cast steel body, cast-iron and stainless gears · 6.3 MPa below DN50, 4.1 MPa at DN80 ... DN100, 2.5 MPa at DN150 ... DN200
Models D and E	Stainless steel throughout, graphite sleeve · 1.6 or 2.5 MPa
Model F	Aluminium-alloy body, cast-iron, aluminium and engineering-material gears, ball bearing · 1.6 MPa · lightweight version
Working temperature	-10 ... +60 °C in general, -20 ... +60 °C for models C and F
Ambient temperature	-40 ... +50 °C

READING AND OUTPUT

Reading	A mechanical counter. The meter works without power; type A or J1 for DN40 and below, A5 or J1 from DN50, or an electronic counter
Transmitter QF	Photoelectric, three-wire, 12 or 24 V, pulse output. The pulse constant runs from 0.00171 L/P at DN10 to 0.31538 L/P at DN200
Transmitter FX	A second pulse type, with constants for DN10 to DN40
Transmitter MF	4 ... 20 mA, offered for every size. Housing PX, LC-13 or BCF-I
Explosion protection	Ex d IIB T4

HEAT AND ACCESSORIES

Insulation jacket	Order field U. A jacket around the body for hot water, hot oil or steam below 200 °C, so that a medium that solidifies stays liquid. Jacket connections DN15 flanged, jacket pressure 0.5 MPa
Radiator	For the high-temperature version. Ø150 mm over a length of L – 160
Filter and counters	A filter belongs before the meter, with the same jacket if wanted. Counters: A, A1, A5, J1, ELZ electronic, A6/Z resettable, KF filling type



FLOW RANGES

FLOW RANGE, CLASS 0.2 — VISCOSITY IN
mPa·s

Size	< 0.3	0.8 ... 2	2 ... 200	200 ... 1000
DN10	—	—	0.08-0.5	0.06-0.3
DN15	—	—	0.3-1.5	0.2-1.0
DN20	—	1-3	0.5-3	0.4-2.1
DN25	4-6	2-6	1-6	0.8-4.2
DN40	9-15	5-15	2.5-15	2.1-10.5
DN50	10-24	8-24	4.8-24	2.4-16.8
DN65	27-40	—	8-40	5.6-28
DN80	40-60	20-60	12-60	8.4-42
DN100	64-100	34-100	20-100	14-70
DN150	127-190	64-190	38-190	26.6-133
DN200	227-340	114-340	56-340	47.6-238

FLOW RANGE, CLASS 0.5 — VISCOSITY IN
mPa·s

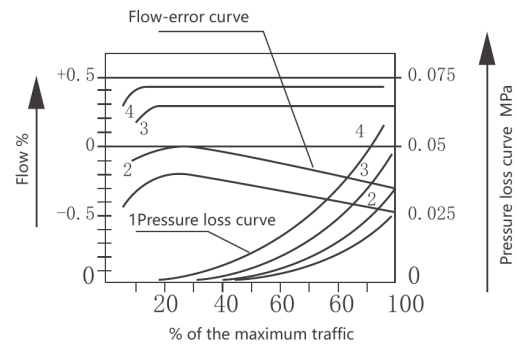
Size	0.3 ... 0.8	0.8 ... 2	2 ... 200	200 ... 1000	1000 ... 2000
DN10	0.2-0.5	0.08-0.5	0.05-0.5	0.03-0.3	0.03-0.2
DN15	0.75-1.5	0.3-1.5	0.15-1.5	0.1-1.05	0.07-0.75
DN20	1.5-3	0.5-3	0.3-3	1.2-2.1	0.15-1.5
DN25	—	1-6	0.6-6	0.4-4.2	0.3-3
DN40	7.5-15	2.5-15	1.5-15	1.0-10.5	0.7-7.5
DN50	8-24	4.8-24	2.4-24	1.6-16.8	1.2-12
DN65	20-40	8-40	4-40	2.8-28	2-20
DN80	30-60	12-60	6-60	4.2-42	3-30
DN100	50-100	20-100	10-100	6-70	5-50
DN150	95-190	38-190	19-190	13.3-133	9.5-95
DN200	170-340	56-340	34-340	23.8-238	17-170



Elliptic gear flowmeter error and pressure loss curve

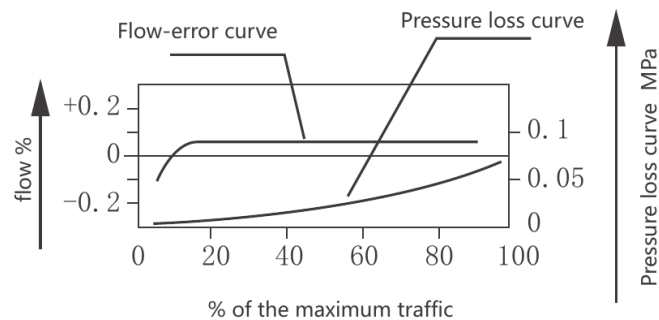
Curve of error and pressure loss of 0.5 stage flowmeter

1. Aviation gasoline 0.7mPa.s
2. water 1mPa.s
3. light diesel 5mPa.s
4. transformer oil 20mPa.s



The error and the pressure loss of the class 0.5 meter over the flow, for four media: 1 aviation gasoline 0.7 mPa.s, 2 water 1, 3 light diesel 5, 4 transformer oil 20.

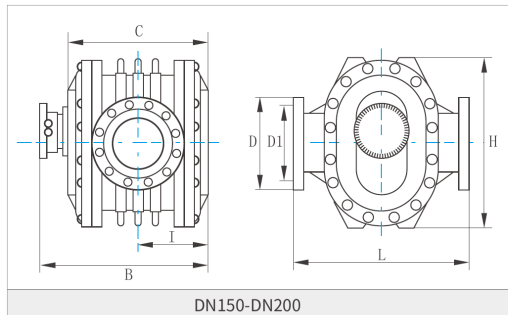
Error and pressure loss curves of 0.2 flowmeter



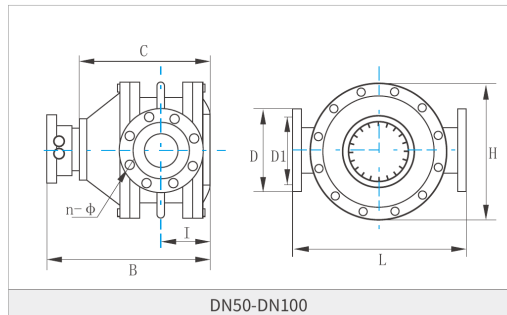
The same for the class 0.2 meter. The error band is narrower and the pressure loss higher.



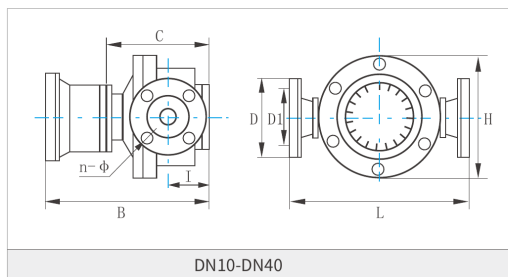
DIMENSIONS (mm)



DN150-DN200



DN50-DN100



DN10-DN40

The three body shapes with the letters of the tables below: DN150 ... DN200 above left, DN50 ... DN100 above right and DN10 ... DN40 below. The counter sits on top and the flanges are in line.

L is the face-to-face length, H the height over the counter, B the width over the flanges, C the counter height, I the flange thickness, D the flange diameter, D1 the bolt circle and n x Ø the bolt holes. The B dimension applies to the A and J1 counters. Each material version has its own table; DN65 exists in the stainless version only, and DN10 in the cast-iron and stainless versions only.

CAST IRON VERSION

DN	L	H	B	C	I	D / D1	n x Ø	kg
10	150	100	213	135	45	90 / 60	4 x 14	6
15	170	118	226	147	48	95 / 65	4 x 14	8
20	200	150	238	155	53	105 / 75	4 x 14	11
25	260	180	246	164	60	115 / 85	4 x 14	18
40	245	180	271	199	77	145 / 110	4 x 18	20
50	340	250	379	249	88	165 / 125	4 x 18	46
80	420	325	441	311	118	195 / 160	8 x 18	87
100	515	418	467	337	131	215 / 180	8 x 18	160
150	540	515	565	435	210	280 / 240	8 x 23	245
200	650	650	624	494	247	335 / 295	12 x 23	400

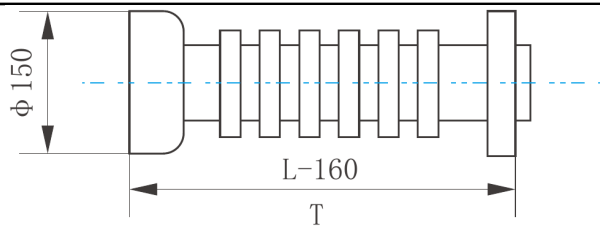


CAST STEEL VERSION

DN	L	H	B	C	I	D / D1	n x Ø	kg
15	200	120	228	150	46	95 / 65	4 x 14	12
20	230	150	240	162	54	105 / 75	4 x 14	18
25	280	195	248	170	55	115 / 85	4 x 14	22
40	265	184	340	210	79	145 / 110	4 x 18	60
50	265	184	340	210	79	165 / 125	4 x 18	66
80	300	247	504	364	169	200 / 160	8 x 18	118
100	555	442	485	355	131	235 / 190	8 x 22	210
150	540	515	565	435	210	300 / 250	8 x 26	260
200	650	650	625	495	247	360 / 310	12 x 26	430

STAINLESS STEEL VERSION

DN	L	H	B	C	I	D / D1	n x Ø	kg
10	170	100	216	133	45	90 / 60	4 x 14	7
15	200	120	228	150	46	95 / 65	4 x 14	11
20	230	150	240	162	54	105 / 75	4 x 14	17
25	280	195	248	170	55	115 / 85	4 x 14	21
40	265	184	340	210	79	150 / 110	4 x 18	24
50	265	184	340	215	79	165 / 125	4 x 18	24
65	300	247	504	364	169	185 / 145	4 x 18	56
80	300	247	504	364	169	200 / 160	8 x 18	60
100	515	400	538	400	180	220 / 180	8 x 18	127
100 short	380	395	470	337	131	220 / 180	8 x 18	95
150	540	515	575	435	210	280 / 240	8 x 23	280
200	650	650	637	495	247	335 / 295	12 x 23	435



The radiator of the high-temperature version: Ø150 mm over a length of L – 160, between the body and the counter.

LIGHTWEIGHT ALUMINIUM VERSION

DN	L	H	B	C	I	D / D1	n x Ø	kg
65	265	248	378	284	120	185 / 145	4 x 18	40
80	265	248	378	284	120	200 / 160	8 x 18	67
100	380	395	470	337	131	220 / 180	8 x 18	100



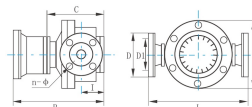
COMPLIANCE AND CERTIFICATION

Measuring principle	Positive displacement, two oval gears
Accuracy	Class 0.5 or 0.2
Ambient temperature	-40 ... +50 °C
Pressure rating	1.6 to 6.3 MPa by model and size
Materials	Cast iron, cast steel, stainless steel or aluminium alloy
Weight	6 kg at DN10 to 435 kg at DN200, per size and material version

TRANSMITTERS AND ORDER CODE

Accessories

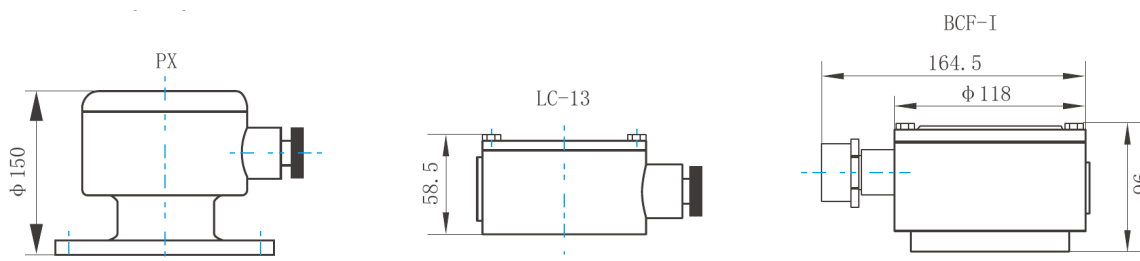
- A filter belongs before this meter; it can be had with the same insulation jacket. The counters, the transmitters, the insulation jacket and the radiator are fields of the order code, not part numbers.



Pressure
1.6 ... 6.3 MPa

Class
0.5 or 0.2

The transmitter turns the same mechanical movement into a pulse or a current. QF and FX are pulse types and their figures are litres per pulse; MF is the 4 ... 20 mA type. The flow column repeats the 2 ... 200 mPa·s band of the class-0.5 table.



The three transmitter housings: PX, LC-13 and BCF-I. Their height adds to the C dimension of the meter.



TRANSMITTERS AND PULSE CONSTANTS

Size	Flow range, 2 ... 200 mPa·s	QF, L/P	FX, L/P	MF
DN10	0.05-0.5	0.00171	0.000425	4 ... 20 mA
DN15	0.15-1.5	0.00598	0.0015	4 ... 20 mA
DN20	0.3-3	0.01218	0.0015	4 ... 20 mA
DN25	0.6-6	0.011936	0.003	4 ... 20 mA
DN40	1.5-15	0.0374	0.0078	4 ... 20 mA
DN50	2.4-24	0.024	—	4 ... 20 mA
DN65	4-40	0.0547	—	4 ... 20 mA
DN80	6-60	0.1224	—	4 ... 20 mA
DN100	10-100	0.26178	—	4 ... 20 mA
DN150	19-190	0.31476	—	4 ... 20 mA
DN200	34-340	0.31538	—	4 ... 20 mA

Example: QZKH-U-A-T-S1-10-A-016-A/A1-KF-J. Where the gear material equals the body material the gear field may be left out; a B before the transmitter means a flameproof transmitter; a high-temperature meter takes the T mark directly and needs no radiator field.

ORDER CODE

Field	Code	Meaning
1 Series	QZKH	QZKH oval gear flowmeter
2 Version	U · G · L	Insulation jacket · pipe thread · lightweight
	P · PI	Nuclear product · nuclear seismic product
	A · B	High-viscosity liquid · food
	C · D	High-temperature radiator · petrol metering
3 Body	T · G	Cast iron · cast steel
	S · L	Stainless steel · aluminium alloy
4 Rotor	T1 · S1	Cast iron · stainless steel
	L1 · EM	Aluminium alloy · engineering material
5 Size	10 ... 200	Nominal diameter in mm
6 Flange	A · B	Flanging · improved model
7 Pressure	016 · 025	1.6 MPa · 2.5 MPa
	040 · 063	4.0 MPa · 6.3 MPa
8 Counter	A/A1 · A5/J1	Up to DN40 · DN50 and above
	ELZ · A6/Z	Electronic digital · resettable
9 Type	KF	Filling flowmeter, type 13
10 Transmitter	QF-I · QF-II	Three-wire photoelectric, 12 or 24 V
	MF	4 ... 20 mA analogue output
11 Class	— · J	Class 0.5 · class 0.2, high precision

