

Oval Wheel Meters, Type OI

for industrial liquids



- Sizes: 25 to 100 mm (1" to 4")
Flow rates: 0,3 to 72 m³/h
Viscosities: < 0.3 to 100 000 cP
Operating pressure: 10 to 40 bar
Oper. temp: 110°C
(180°C upon request)



- Approved by weights and measures authorities
- High accuracy with low pressure drops
- Pulse and current output for remote transmission
- Safe operation and long service life
- High flow capacity with little space requirement



Flow ranges for Toshniwal single case oval wheel meters: Expressed as a function of the viscosity of the liquid for normal applications. For cold / hot water or sulphuric acid, reduced measuring ranges are to be applied. Please consult us.

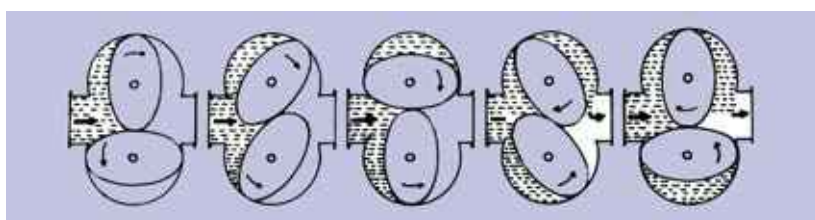
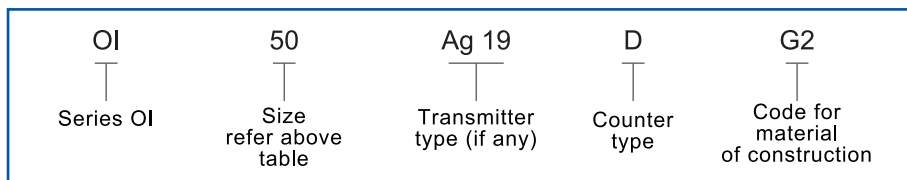
These viscosities and flow ranges are given as a guide line only. Flow ranges for intermediate viscosities are to be interpolated.

For example, meter OI 400 can be used at continuous flow rate of 450 lpm at an operating viscosity of 2000 mPa·s.

Basic Type	Int. Dia. (DN) in mm	Nominal Flow rate [l/min]	Ranges at viscosities	< 0.3 mPa · s		0.3–1.5 mPa · s		1.5–150 mPa · s		up to 350 mPa · s		up to 1000 mPa · s		up to 3000 mPa · s	
				[l/min]	[m³/h]	[l/min]	[m³/h]	[l/min]	[m³/h]	[l/min]	[m³/h]	[l/min]	[m³/h]	[l/min]	[m³/h]
OI 5	25	50	min	8	0,5	5	0,3	5	0,3	2,5	0,15	1,25	0,075	0,45	0,027
			max	40	2,5	50	3	50	3	25	1,5	12,5	0,75	4,5	0,27
			continuous serv.	16	1,0	33	2	40	2,4	7	0,42	3,5	0,20	1,2	0,072
			batching			45	2,7	45	2,7						
OI 10	25	100	min	16	1,0	10	0,6	10	0,6	7	0,42	3,5	0,20	1,2	0,072
			max	80	5	100	6	100	6	70	4,2	35	2	12	0,72
			continuous serv.	33	2	66	4	80	4,8	18	1,08	95	0,54	3	0,18
			batching			90	5,4	90	5,4						
OI 50	50	300	min	50	3	30	1,8	30	1,8	18	1,08	95	0,54	3	0,18
			max	250	15	300	18	300	18	180	10,8	90	5,4	30	1,8
			continuous serv.	100	6	200	12	240	14,4	30	1,8	15	0,9	5	0,3
			batching			270	16,2	270	16,2						
OI 115	65	500	min	80	5	50	3	50	3	30	1,8	15	0,9	5	0,3
			max	400	25	500	30	500	30	300	18	150	9	50	3
			continuous serv.	166	10	330	20	400	24	50	3	25	1,5	12	0,72
			batching			450	27	450	27						
OI 200	80	700	min	110	6,6	70	4,2	70	4,2	50	3	25	1,5	12	0,72
			max	560	34	700	42	700	42	500	30	250	15	120	7,2
			continuous serv.	230	14	420	25,2	525	31,5	500	30	250	15	120	7,2
			batching			560	33,6	630	37,8						
OI 400	100	1200	min	200	12	120	7,2	120	7,2	100	6	60	3,6	30	1,8
			max	1000	60	1200	72	1200	72	1000	60	600	36	300	18
			continuous serv.	400	24	720	43,2	1000	60	1000	60	600	36	300	18
			batching			960	57,6	1100	66						

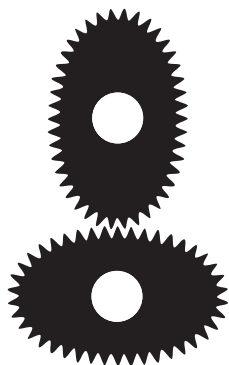
[1 mPa · s=1 cP]

Meter type designation, e.g. OI 50 Ag 19 D/G2

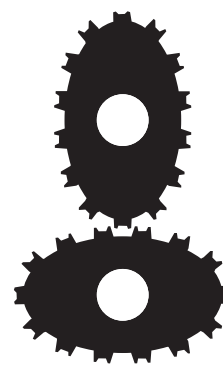


To reduce the pressure drop across Oval wheel meters when measuring viscous liquids oval wheels with special tooth profile have been designed. These high viscosity trim wheels are always installed when the operating viscosity is above 150 mPa.s.

Each revolution of the oval wheels displaces a precisely known volume of liquid through the meter, from inlet to outlet. The number of revolutions therefore is directly proportional to the measured volume. Transmission gearing transmits the revolutions of the oval wheels to a mechanical register which counts the flow in volumetric units (Litres, Cubicmetres, Gallons, etc.).



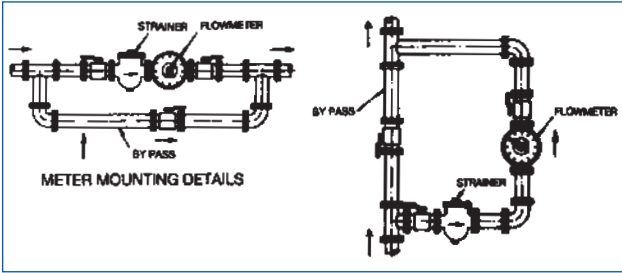
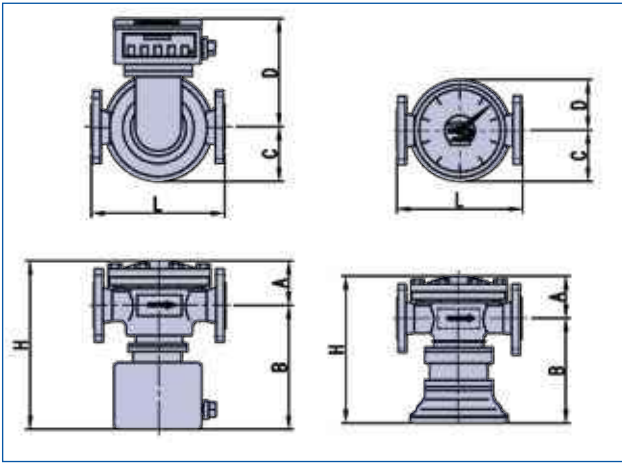
Oval wheels with normal gearing



Oval wheels with special gearing

Register Data

Single pointer dial E, Double pointer dial D, Reset roller register M5 / V5



Meter Model (DN)		OI5 (25)	OI10 (25)	OI50 (50)	OI115 (65)	OI200 (80)	OI400 (100)
L	E	220	220	300	390	450	550
	V5	220	220	300	390	450	550
H	E	262	287	334	428	440	513
	V5	382	402	449	493	535	603
A	E	52	72	104	138	145	183
	V5	52	72	104	138	145	183
B	E	210	215	230	290	295	330
	V5	330	330	345	355	390	420
C	E	110	110	123	153	183	223
	V5	68	75	123	153	183	223
D	E	110	110	123	153	183	223
	V5	330	330	345	355	390	420

* DIMENSION ARE IN "mm"

* FOR "D" COUNTER ADD 20 IN THE DIMENSION FOR H&B OF "E" COUNTER

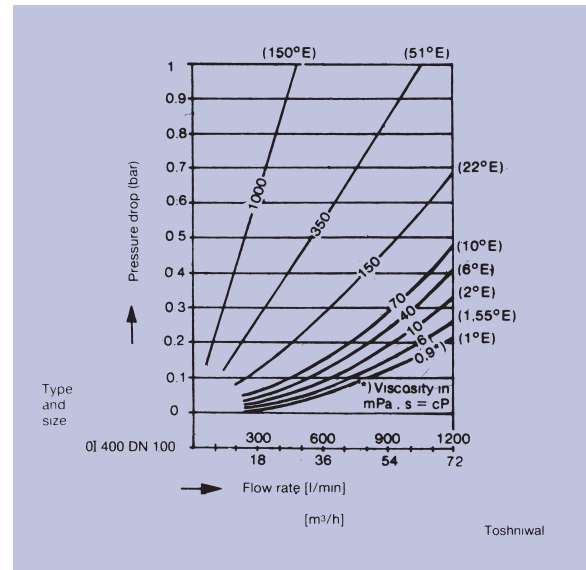
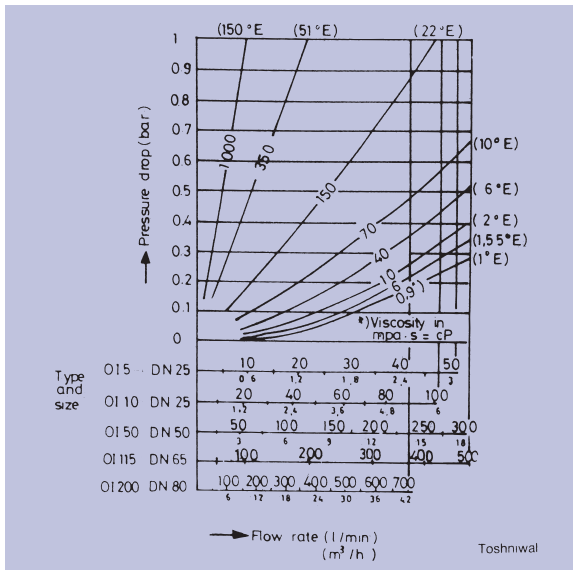
Meter accessories

Dimensions H&B will change for meters against built-on-accessories.

Pressure Drop Curves

Pressure drops across different types and designs of oval wheel meters series OI

Meters with normal tooth profile and graphite bushings (sleeve bearings)



Material Groups

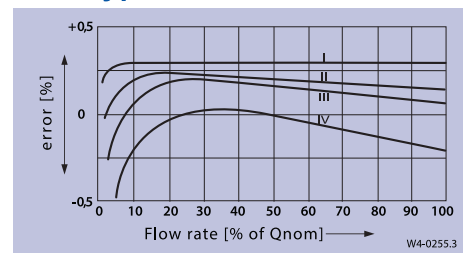
Meter Type	Meter Components	Material Groups (Standard) *										
		G1		G2		F2		F5				
		Cast iron	Graphite	Carbon steel	Cast iron	Graphite	Carbon steel	SS 316	Cast iron	Graphite	SS 316	Graphite
OI 5 / OI 10		PN 25		PN 40								
	Meter body	•	•	•	•	•	•	•	•	•	•	
	Oval wheels	•	•	•	•	•	•	•	•	•	•	
	Cover for measuring chamber and body	•	•	•	•	•	•	•	•	•	•	
	Bearing plates	•	•	•	•	•	•	•	•	•	•	
	Bearing	•	•	•	•	•	•	•	•	•	•	
OI 50		PN 16				PN 40						
OI 115 / OI 200 / OI 400		PN 25										
	Meter body	•	•	•	•	•	•	•	•	•	•	
	Oval wheels	•	•	•	•	•	•	•	•	•	•	
	Cover for measuring chamber and body	•	•	•	•	•	•	•	•	•	•	
	Bearing plates	•	•	•	•	•	•	•	•	•	•	
	Bearing	•	•	•	•	•	•	•	•	•	•	

* Special material combination offered depending on application

Accuracy

Between 0.1 and 0.3 % (depending on range and properties of liquid)

Typical Error Curves



- I for liquids with Viscosity 100 cP (mPa·s)
- II for liquids with Viscosity 6 cP (mPa·s)
- III for liquids with Viscosity 1.5 – 6 cP (mPa·s)
- IV for liquids with Viscosity 0.5 – 1.5 cP (mPa·s)

Application & Accessories

For the protection of oval wheel meters and turbine meters against foreign matter and solids contained in the liquids measured with these meters. These strainers may also be used for protection of piping systems for contamination. Strainers: Type Nwithout heating jacket sizes 15-100mm(1/2" to 4")

Design & Operation

Strainers size 15-100mm consist of a cast body and a filter element (basket). The liquid flows through the filter basket from its top where foreign matter or solids are retained by the fine wire mesh. For cleaning, the filter basket can easily be removed, after removal of the cover of the filter housing. At the base, the strainer is provided with a drain plug and with an eye bolt or hexagon nut on the top for ventilation. The direction of flow is marked by an arrow cast onto the housing

Pressure Loss

Depending on strainer size, flow rate and viscosity (filter basket clean) max. differential pressure for contaminated strainer 3 bar

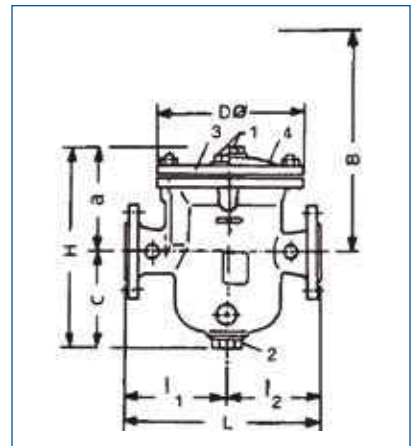
Filter basket

Preforated sheet-metal with wire mesh of stainless steel for all types mesh size 0.25 mm (576 mesh/cm² = 250μ) or with mesh size 0.1 mm (3600 mesh/cm² = 100μ) Both mesh sizes have an open filtering surface of 37.8%. Upon request we can also supply these strainers with mesh size 0.5 mm

Other Accessories

- Centrifugal gas separators
- Pulse amplifiers/scalers/convertors
- Flowrate indicators
- Additional accessories on request
- Pulse transmitters
- Pulse counters/totalizers
- Batch controllers
- Heat extension

Type	Dn	Type N (without heating jacket)							Clearance for replacing filter basket B
		L	H	DØ	a	c	l ₁	l ₂	
N 1/	15	165	210	132	110	100	82,5	82,5	180
N 5/	25	185	210	132	110	100	92,5	92,5	180
N 10/	25	250	260	190	135	125	130	120	300
N 50/	50	330	325	255	170	155	175	155	400
N 115/	65	350	410	255	190	220	190	160	500
N 200/	80	410	435	320	215	220	220	190	530
N 400/	100	420	555	320	235	320	220	200	680

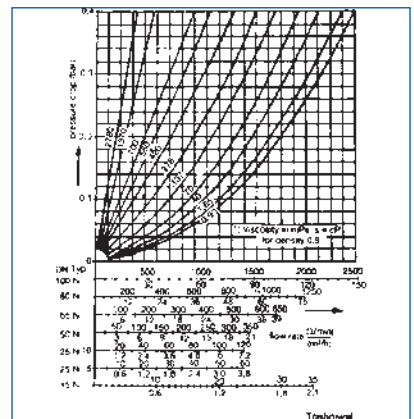


1. Hexagon nut for ventilation
2. Drain plug
3. Body cover (types N/F)
4. Body cover (types N/A0., N/A2)

Dimensions (in mm)
Strainers type N(without heating jacket)

Material:

Type	Body/Body Cover
N/A0	Cast iron
N/A2	Carbon steel
N/F	Stainless steel-316



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