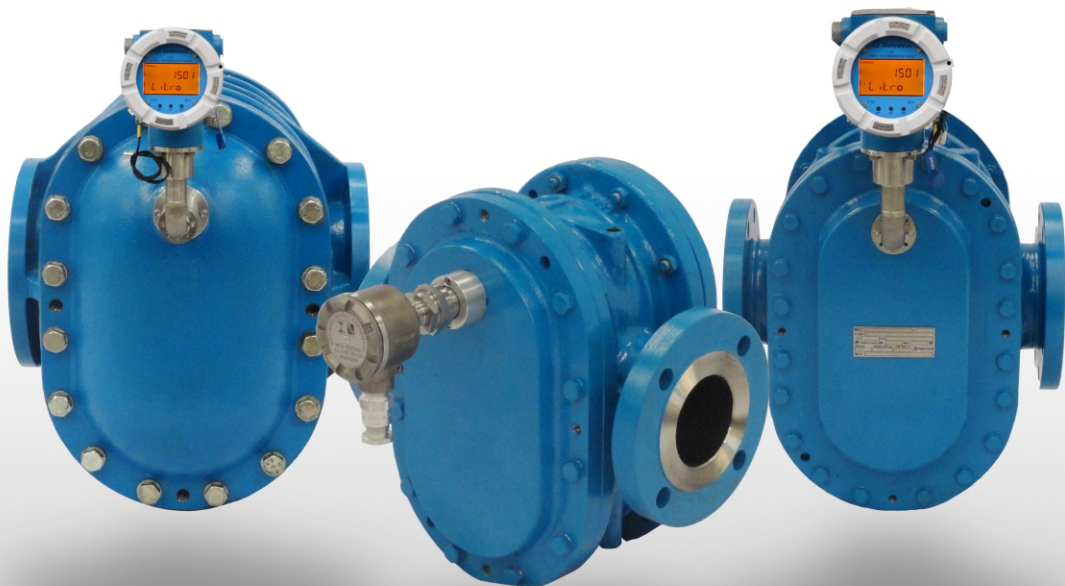


OSC
SINGLE CASE
OVAL GEAR





OVAL GEARS METERS

MEDIDORES DE ENGRENAGENS OVAIS

deslocamento positivo **Positive displacement**

OS MEDIDORES METROVAL
POSSUEM APROVAÇÃO DE MODELO
PELO INMETRO E SE ENQUADRAM
NA CLASSE 0.3 DA PORTARIA N° 64.

**Metroval's
meters has
the model
approval
from
INMETRO in
the 0.3
ordinance
n°64 class.**

Application

Normally industrial processes demand high accuracy **in the measurement in the measurement** of the liquids used. To achieve this accuracy, project and materials of the meters must suit the operating conditions and the properties of the liquids. Metroval's OSC series oval gear meters fill those needs and are used successfully to measure liquids such as: LPG, polimers, adhesives, paint, asphalt, resins, acids, among others.

One of its distinctive characteristics is the accurate measurement of high viscosity liquids up to 100.000 cP, eith minimum pressure drop. OSC series meters are available from 6 to 100mm (1/4" to 4"), stand a maximum operating pressure of ANSI 300# (740 psig) and a maximum operating remperature of 180°C (365F). Due to its modular design the same meter can be fitted with a simple local analog display or with electronic units, enabling our product to work isolated or to take part in a complex control assembly.



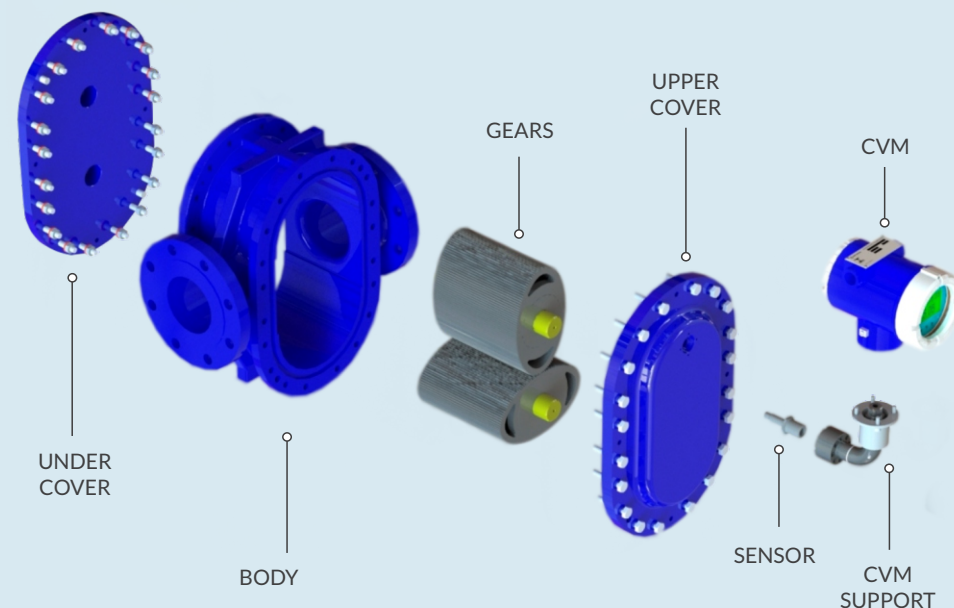
-  Sugar and Alcohol
-  Food and Beverage
-  Automotive
-  Biofuel Industries
-  Pharmaceutical
-  LPG and Industrial Gas
-  Oil and Gas
-  Pulp and Paper
-  Paints and Coatings
-  Thermoelectric
-  Petrochemical and Chemical Industry



Construction

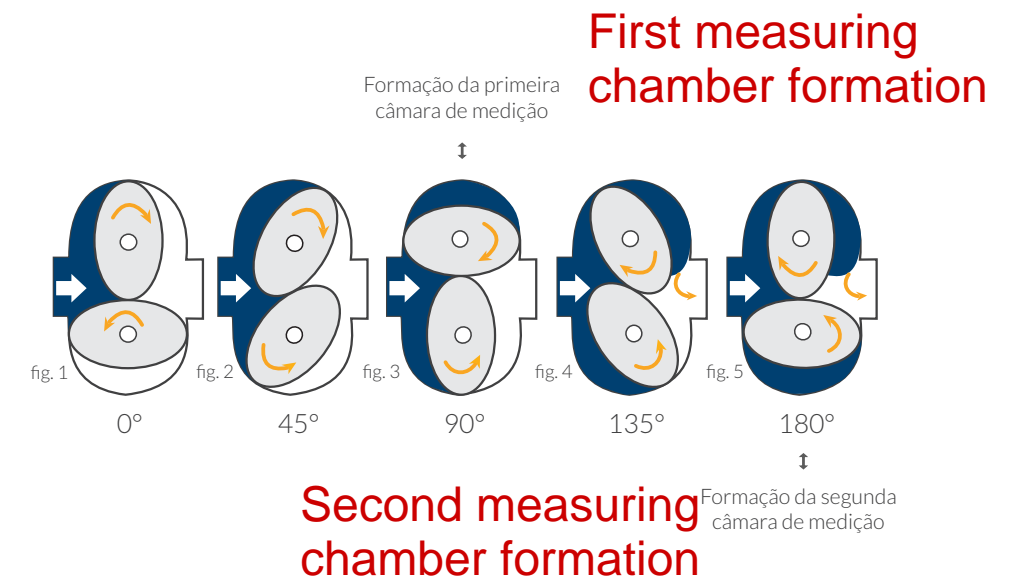
The oval gear meter OSC series are single chamber meters, meaning that the meter body, besides protecting the gears, serves as measuring chamber. The shafts on which the gears rotate are press fitted on the bottom of the measuring chamber. The bearings are graphite or cast iron. Ball bearings can be used depending on basic construction materials or application.

The register assembly is hermetically isolated from the mechanism by a permanent magnet coupling that transmits the gear movement from the wet to the dry chamber. The magnetic coupling is embedded concentrically in one of the shafts, making the meter leak-proof. The mechanism has only four basic parts: the body, a pair of oval gears, the body cover and the register. A proper combination of materials for the body, gears and bearings make the meter suitable for almost all work conditions.



Operating principle

The measurement is performed by a pair of oval gears, driven by the fluid itself. As we can see in the schematics beside, each complete turn of the pair of gears, displaces **na** exact known volume of liquid. The number of turns of the gears is directly proportional to the measured volume. The gear movement is transmitted through a magnetic coupling to a register.



The illustration above shows only half cycle (180°). When the cycle is completed, it will form 2 chambers with known volume.

Na ilustração acima mostra apenas meio ciclo (180°). Ao percorrer uma volta completa, formam-se mais 2 câmaras com volume conhecido.

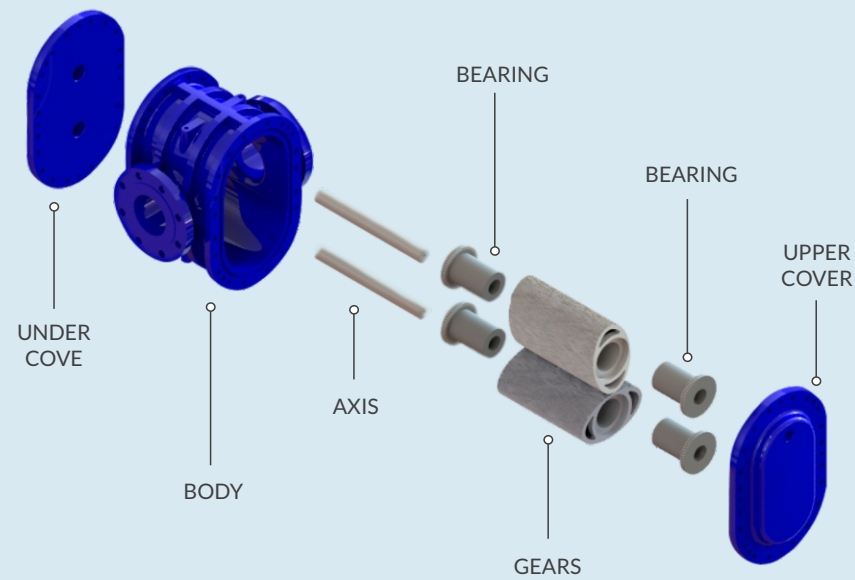
Os medidores série OI são fabricados com diâmetro de 6 a 200mm (1/4" a 8") e suportam pressões de operação de até 325 BAR (OI 03, 06 e 1) e temperatura máxima de serviço de 290°C.

The OI meters are manufactured in a range diameter from 6 to 200mm (1/4" to 8"), and supports operation pressures until 325 BAR



Special Bearings

To measure high viscosity or nonnewtonian liquids such as resins and polymers oval gear meters with special tooth profile gears and stainless steel ball bearings instead of graphite bearings are recommended. See table of graphite material groups, groups F57 and F27.



Gear profile

Perfil de engranagens

Normal tooth profile

These gears are standard to fluids with viscosity less than 150mPa. For fluids with viscosity less than 1mPa.s., the gear is manufactured with special tolerance to ensure a better performance..



Suitable for clean and low (up to 150 cP) viscosity liquids.

Special tooth profile

Special tooth profile The oval gears with special tooth profile were designed do reduce pressure drop across the meter when measuring high viscosity liquids and to avoid blockage when measuring liquids with solids in suspension. These gears are recommended when viscosity exceeds 150 mPa.s.

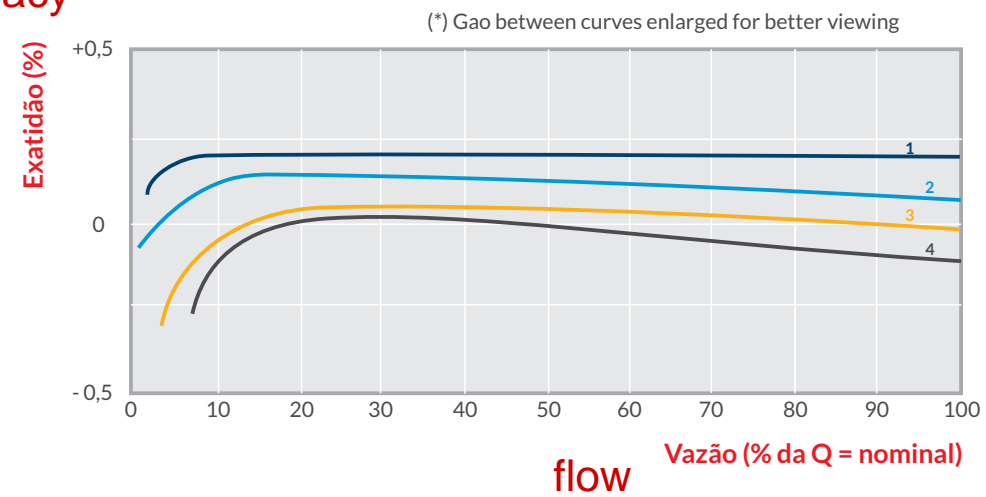


Suitable for high viscosity liquids.

Typical Performance Curves

Accuracy of OSC meters varies Between 0,1 and 0,5%. This variation, as another types of meter, Is due to range and properties of the Liquids being measured, (See chart below).

accuracy



- 1 Viscosity > 100 mPa.s
- 2 Viscosity > 6 - 10 mPa.s
- 3 Viscosity > 1,5- 6 mPa.s
- 4 Viscosity > 0,5- 1,5 mPa.s

Accuracy: $\pm 0,02\%$ Repeatability: $\pm 0,05\%$

Flow rates

Single case oval gear meter range

Faixas de medição dos medidores de engrenagens ovais de corpo simples série OI

OSC meters – Small flow rates

Ranges are function of viscosity.

TYPE	DN (mm)	FLOW RATE l/min	RANGE	VISCOSITY											
				0,3 a 0,8 mPa.s		0,8 a 2 mPa.s		2 a 50 mPa.s		50 a 150 mPa.s		150 a 350 mPa.s		350 a 1000 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
OSC 03	6	120	Minimal	20	0,02	12	0,01	12	0,01	11	0,01	6	0,006	2	0,002
			Maximum	80	0,1	96	0,12	120	0,12						
			Continuous	60	0,06	80	0,08	110	0,11	110	0,11	60	0,06	25	0,03
			Dosage	80	0,08	110	0,11	120	0,12						
OSC 06	10	240	Minimal	40	0,04	25	0,03	25	0,03	20	0,02	13	0,013	5	0,005
			Maximum	160	0,2	200	0,25	250	0,25						
			Continuous	130	0,13	160	0,16	225	0,23	225	0,23	130	0,13	50	0,05
			Dosage	160	0,16	225	0,23	250	0,25						
OSC 1	15	600	Minimal	100	0,1	60	0,06	60	0,06	54	0,05	36	0,036	12	0,012
			Maximum	400	0,5	480	0,6	600	0,6						
			Continuous	300	0,3	400	0,4	540	0,54	540	0,54	360	0,36	120	0,12
			Dosage	450	0,45	540	0,54	600	0,6						
OSC 2	20	1800	Minimal	300	0,3	180	0,18	180	0,18	160	0,16	100	0,1	36	0,036
			Maximum	1200	1,5	1440	1,8	1800	1,8						
			Continuous	900	0,9	1200	1,2	1600	1,6	1600	1,6	1000	1	360	0,36
			Dosage	1300	1,3	1600	1,6	1800	1,8						



OSC meters – Medium and large flow rates

Ranges are function of viscosity.

TYPE	DN (mm)	FLOW RATE l/min	RANGE	VISCOSITY											
				< 0,8 mPa.s		<0,8 a 1,5 mPa.s		1,5 a 150 mPa.s		Até 350 mPa.s		Até 1000 mPa.s		Até 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
				l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h
OSC 5	25	50	Minimal	8	0,5	5	0,3	5	0,3	2,5	0,15	1,25	0,075	0,45	0,027
			Maximum	40	2,5	40	2,4	50	3						
			Continuous	16	1	33	2	40	2,4	25	1,5	12,5	0,75	4,5	0,27
OSC 10	25	100	Dosage	16	1	45	2,7	45	2,7						
			Minimal	16	1	10	0,6	10	0,6	7	0,42	3,5	0,2	1,2	0,072
			Maximum	80	5	80	4,8	100	6						
OSC 50	50	300	Continuous	33	2	66	4	80	4,8	70	4,2	35	2	12	0,72
			Dosage	33	2	90	5,4	90	5,4						
			Minimal	50	3	30	1,8	30	1,8	18	1,08	9	0,54	3	0,18
OSC 115	50	500	Maximum	250	15	240	14,4	300	18						
			Continuous	100	6	200	12	240	14,4	180	10,8	90	5,4	30	1,8
			Dosage	100	6	270	16,2	270	16,2						
OSC 200	80	700	Minimal	80	4,8	50	3	50	3	30	1,8	15	0,9	7,5	0,45
			Maximum	400	24	400	24	500	30						
			Continuous	166	10	330	19,8	400	24	300	18	150	9	75	4,5
OSC 400	80/100	1200	Dosage	166	10	450	27	450	27						
			Minimal	110	6,6	70	4,2	70	4,2	50	3	25	1,5	12	0,72
			Maximum	560	34	560	33,6	700	42						
OSC 600	100	3000	Continuous	230	14	420	25,2	525	31,5	500	30	250	15	120	7,2
			Dosage	230	14	560	33,6	630	37,8						
			Minimal	200	12	120	7,2	120	7,2	100	6	60	3,6	30	1,8
OSC 800	150	4000	Maximum	1000	60	960	57,6	1200	72						
			Continuous	400	24	720	43,2	1000	60	1000	60	600	36	300	18
			Dosage	400	24	960	57,6	1100	66						
OSC 2000	200	8000	Minimal	400	24	300	18	300	18	200	12	150	9	75	4,5
			Maximum	2000	120	2400	144	3000	180						
			Continuous	1000	60	1650	100	2500	150	2500	150	1500	90	750	45
OSC 5	25	50	Dosage	1200	72	3200	192	3200	192	3300	198	2000	120	1000	60
			Minimal	600	36	400	24	400	24	330	19,8	200	12	100	6
			Maximum	3000	180	3200	192	4000	240						
OSC 10	25	100	Continuous	1300	78	800	48	800	48	660	40	400	24	200	12
			Dosage	1200	72	3200	192	3200	192	3300	198	2000	120	1000	60
			Maximum	6500	400	6400	384	8000	48						
OSC 50	50	300	Minimal	2600	160	4000	240	5500	330	6600	400	4000	240	2000	120
			Continuous	2600	160	4000	240	5500	330	6600	400	4000	240	2000	120
			Dosage	2600	160	5000	300	6600	396						

Cold water ranges: Column <0,8 – 1,5 mPa.s less 30% for continuous service and less 20% for maximum flow rate and dosage.

Hot water ranges (>60°C): Column <0,8mPa.s assume continuous service flowrate as new maximum flowrate.

Ranges for low and high viscosity Newtonian liquids

Meters from material groups F27 and F57 with ball bearings and special tooth profile, except OSC-5 and smaller

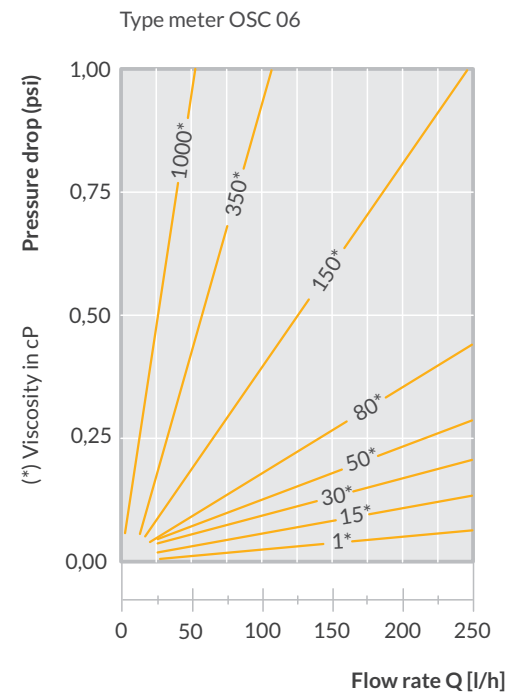
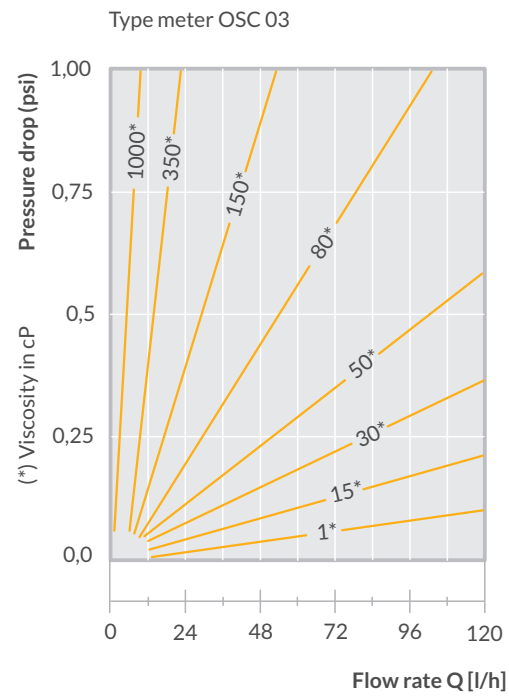
TYPE	RANGE	VISCOSITIES															
		1,5 a 20 mPa.s		Até 350 mPa.s		Até 2000 mPa.s		Até 5000 mPa.s		Até 10000 mPa.s		Até 20000 mPa.s		Até 60000 mPa.s		Até 100000 mPa.s	
		l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h
OSC 5	Minimal	15	0,9	5	0,3	2,5	0,15	1,2	0,072	0,6	0,036	0,3	0,018	0,1	0,006	-	-
	Maximum	50	3	50	3	25	1,5	12	0,72	6	0,36	3	0,18	1	0,06	-	-
OSC 10	Minimal	30	1,8	10	0,6	8	0,5	4	0,24	2	0,12	1	0,06	0,3	0,018	-	-
	Maximum	100	6	100	6	80	5	40	2,4	20	1,2	10	0,6	3	0,18	-	-
OSC 50	Minimal	60	3,6	30	1,8	15	0,9	7,5	0,45	4	0,24	2	0,12	1	0,06	0,6	0,036
	Maximum	300	18	300	18	200	12	150	9	80	5	40	2,4	12	0,72	6	0,36
OSC 115	Minimal	100	6	50	3	22,5	1,35	12,5	0,75	6,5	0,39	3	0,18	1,38	0,08	0,7	0,04
	Maximum	500	30	500	30	450	27	250	15	130	7,8	60	3,6	18	1,08	9	0,54
OSC 200	Minimal	140	8,4	70	4,2	30	1,8	15	0,9	10	0,6	4	0,25	3	0,18	1	0,06
	Maximum	700	42	700	42	700	42	350	20	180	11	80	5	25	1,5	12	0,72
OSC 400	Minimal	240	14,5	120	7,2	60	3,6	35	2	17	1	10	0,6	4	0,24	2	0,12
	Maximum	1200	72	1200	12	1200	72	700	42	350	21	180	11	50	3	25	1,5
OSC 600	Minimal	600	36	300	18	150	9	80	5	40	2,4	20	1,2	9,2	0,6	4,2	0,3
	Maximum	3000	180	3000	180	3000	180	1600	96	800	48	400	24	120	7,2	55	3,3
OSC 800	Minimal	800	48	400	24	200	12	107	6	53	3,2	27	1,6	11	0,7	6	0,3
	Maximum	4000	240	4000	240	4000	240	2130	128	1065	64	533	32	147	8,8	73	4,4
OSC 2000	Minimal	1600	96	800	48	400	24	213	13	107	6,4	53	3,2	23	1,4	11	0,7
	Maximum	8000	480	8000	480	8000	480	4260	256	2130	128	1065	64	293	18	147	9

Ranges for low and high viscosity no Newtonian liquids

Meters from material groups F27 and F57 with ball bearings and special tooth profile, except OSC-5 and smaller.

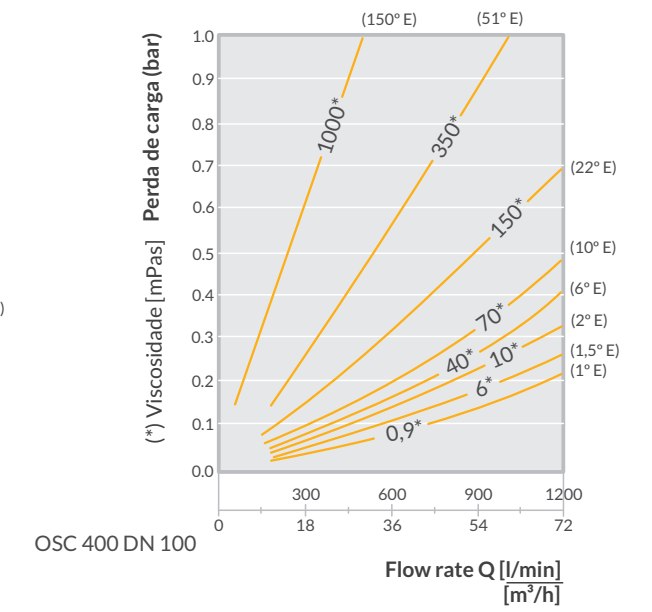
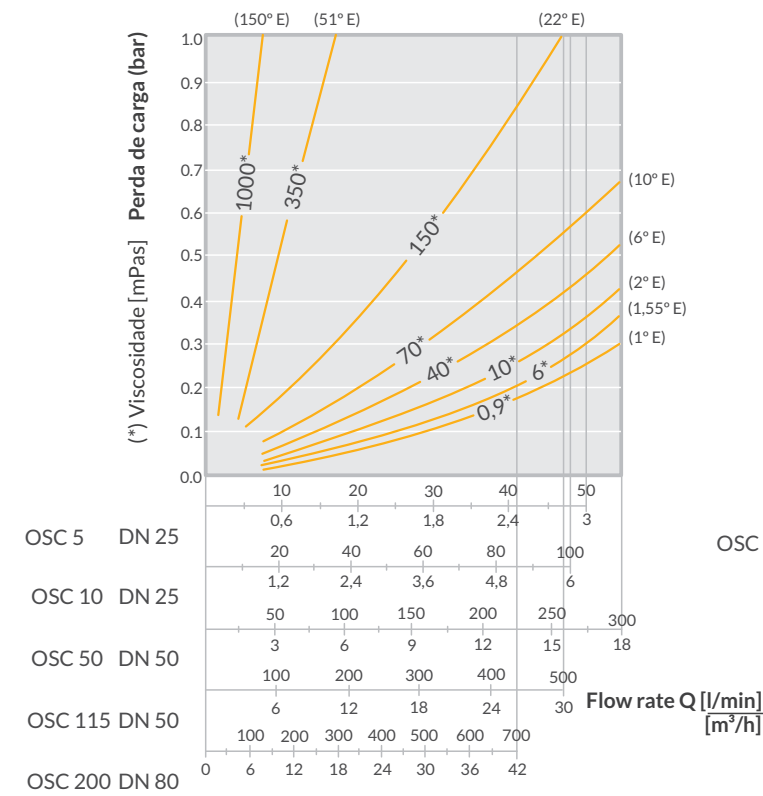
TYPE	DN (mm)	FLOW RATE (l/min)	RANGE	VISCOSITIES									
				1,5 a 20 mPa.s		Até 300 mPa.s		Até 3000 mPa.s		Até 6000 mPa.s		Até 10000 mPa.s	
				l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h	l/min	m³/h
OSC 5	25	50	Minimal	15	0,9	5	0,3	3,5	0,21	2,5	0,15	1,5	0,09
			Maximum	50	3	50	30	35	2,1	25	1,5	15	0,9
OSC 10	25	100	Minimal	30	1,8	10	0,6	7,5	0,45	5	0,3	3	0,18
			Maximum	100	6	100	6	75	4,5	50	3	30	1,8
OSC 50	50	300	Minimal	60	3,6	30	1,8	12	0,72	7,5	1,45	4,5	0,27
			Maximum	300	18	300	18	240	14,5	150	9	90	5,4
OSC 115	50	500	Minimal	100	6	50	3	18,5	1,1	11	0,66	7	0,42
			Maximum	500	30	500	30	370	22,2	220	13,2	140	8,4
OSC 200	80	700	Minimal	140	8,4	70	4,2	25	1,5	15	0,9	10	0,6
			Maximum	700	42	700	42	500	30	300	18	200	12
OSC 400	100	1200	Minimal	240	14,5	120	7,2	45	2,7	30	1,8	18	1,1
			Maximum	1200	72	1200	72	900	54	600	36	360	22
OSC 600	100	3000	Minimal	600	36	300	18	112,5	6,75	75	4,5	45	2,7
			Maximum	3000	180	3000	180	2250	135	1500	90	900	54
OSC 800	150	4000	Minimal	800	48	400	24	150	9	100	6	60	3,6
			Maximum	4000	240	4000	240	3000	180	2000	120	1200	72
OSC 2000	200	8000	Minimal	1600	96	800	48	300	18	200	12	120	7,2
			Maximum	8000	480	8000	480	6000	360	4000	240	2400	144

Pressure drop small Flow rate

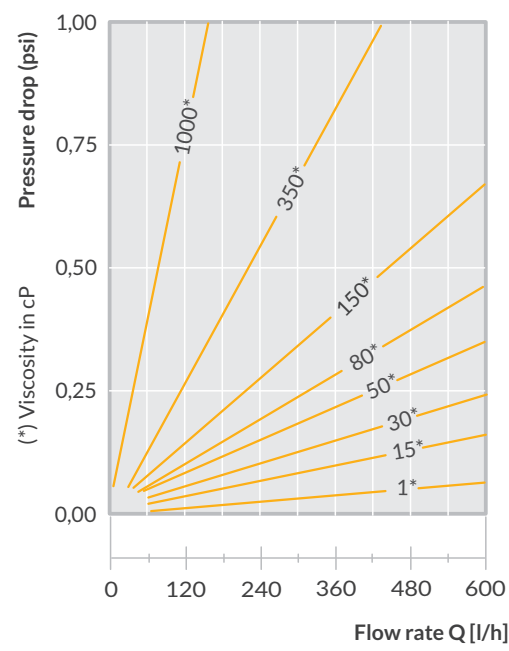


Pressure drop small Flow rate

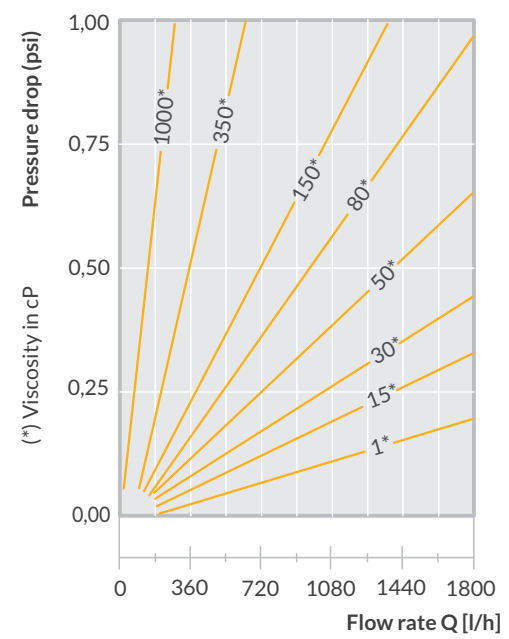
Normal tooth profile, sliding graphite bearings



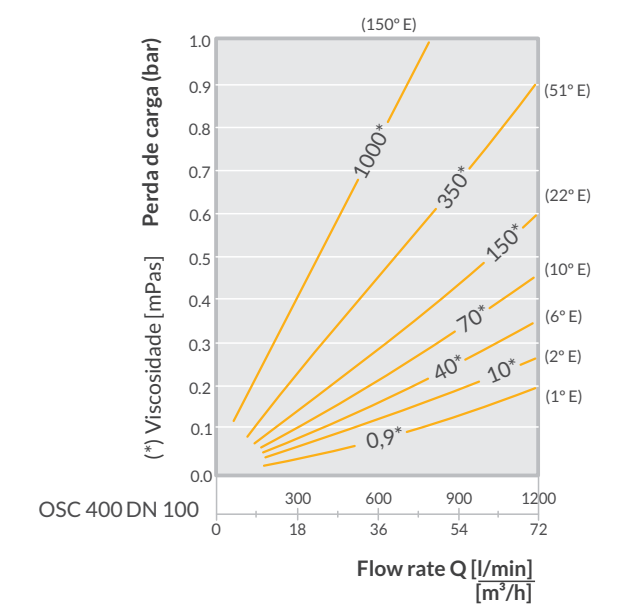
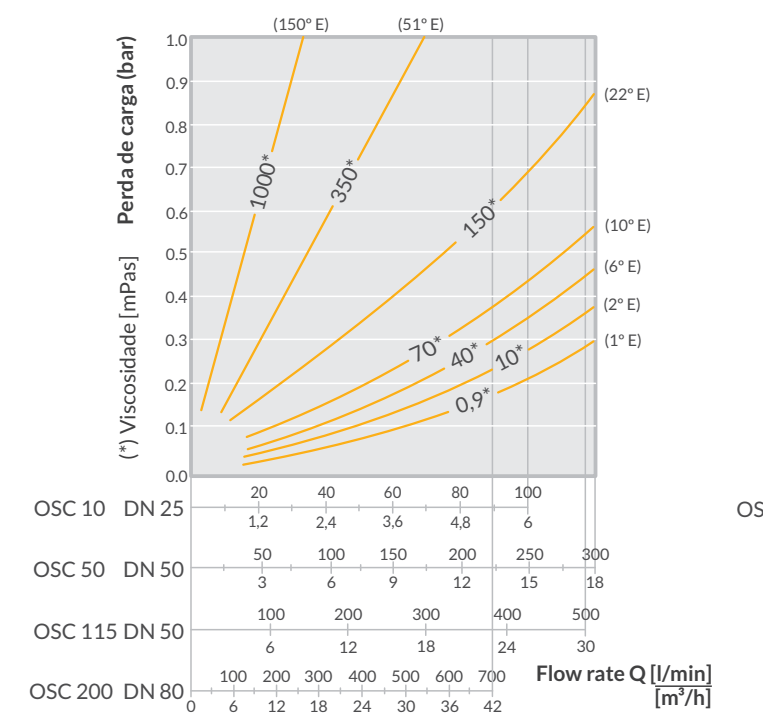
Type meter OSC 1



Type meter OSC 2



Special tooth profile, sliding graphite bearings





Acessórios

Accessories

Toda a linha de medidores de engrenagens ovais Metroval foi projetada para trabalhar de forma modular. Por este sistema mesmo o medidor mais simples pode ser equipado, com saídas mecânicas, pneumáticas, eletrônicas fornecendo sinais digitais ou analógicos para controle ou indicação a distância de volume, vazão, alimentação de computadores e comandos de válvulas para automatização de sistemas diversos. Enfim, os medidores OI podem trabalhar de forma simples e isoladamente ou integrar a mais complexa malha de controles.

Para fluidos que tenham presença de sólidos em suspensão, a Metroval indica a utilização de filtros tipo cesto. Para maiores informações, verificar catálogo do "filtro cesto" de fabricação Metroval.

All the Metroval oval gear line was designed to work in a modular way. With this system, even the simplest meter can be equipped with mechanical, pneumatic, and electronics, providing digital or analog signals to remote control or indication of volume, flow, computer power and valve controls for automating different systems. Finally, the OI meters can work simply and alone or integrate the most complex mesh of controls.

For fluids that have solids present in suspension, Metroval indicates the use of basket filters. For more information, check the manufacturing "basket filter" catalog Metroval.



Eletronic transmitter

Transmissores eletrônicos

METROBATCH GB - Características técnicas	Technical Features
Caixa de alumínio	Aluminum box
Fusíveis para saídas AC	Fuses for outputs AC
Comunicação 2x Rs485	Communication 2x Rs485
Nível de proteção IP-65 total	Full IP-65 protection level
Proteção para cargas indutivas	Inductive loads protection
Alimentação 24Vdc / 90-240Vac	Power supply 24Vdc/90-240Vac
Proteção AC power Fusível / NTC	AC power Fuse protection/ NTC
Dimensões (LxAxP) 234x121,2x33mm	Dimensions (WxHxD) 234x121.2x33mm
Uma saída de pulso opto-isolada	One opto-isolated pulse output
Protocolo de comunicação Modbus	Modbus communication protocol
Memória de dados / Programa EEPROM	Data memory / EEPROM program
Máxima contagem maior que 99999999	Maximum count greater than 99999999
Dois entradas de pulso Opto-Isoladas	Two opto-isolated pulse inputs
Temperatura ambiente de operação 0°C a 60°C	Ambient operating temperature 0° to 60°C
2x16 digit alphanumeric LCD display with backlight Display alfanumérico LCD 2x16 dígitos com backlight	
Connectivity to Metroval products (bobtail system, CDM controller) Conectividade aos produtos Metroval (sistema bobtail, controladora CDM)	
Dois saídas para solenoide a triac 12A / 127-240V ou 2 saídas Mosfet 28V -4A (todas saídas opto isoladas)	

Two 12A / 127-240V triac solenoid outputs or 2 28V -4A Mosfet outputs (all outputs opto isolated)

CVM-01 - Características técnicas	Technical Features
Entrada digital de reset	Reset digital input
Invólucro IP66W - Exd / Exi	IP66W enclosure - Exd / Exi
Saída digital de pulsos para automação	Digital pulse output for automation
Alimentação 85 a 250 VAC ou 16 a 30 VDC	Power supply 85 to 250 VAC or 16 to 30 VDC
Display local em LCD com backlight	Local LCD display with backlight
Analog current output 4 to 20mA (active or passive) Saída analógica de corrente 4 a 20mA (ativa ou passiva)	
Interface serial de comunicação RS 485 - MODBUS/HART/ PROFIBUS PA/ FIELDBUS	
Entrada digital de pulsos para sensores magnéticos de proximidade com saída a transistor NPN, PNP, padrão TTL, NAMUR ou Reed Switch	

RS 485 serial communication interface - MODBUS/HART/ PROFIBUS PA/ FIELDBUS

Digital pulse input for magnetic proximity sensors with NPN transistor output, PNP, TTL standard, AMUR or Reed Switch

Registrador mecânico

REGISTRADOR RESETÁVEL M5 - Características técnicas	Technical Features
8-digit perpetual totalizer	Totalizador perpétuo de 8 dígitos
5-digit resettable totalizer	Totalizador resetável 5 dígitos
Pneumatic outlet (OPTIONAL)	Saída pneumática (OPCIONAL)
5-digit preset (OPTIONAL)	Pré-determinador de 5 dígitos (OPCIONAL)
Emergency stop button (OPTIONAL)	Botão de "stop" para emergências (OPCIONAL)
8-digit card printers (OPTIONAL)	Impressoras de cartões de 8 dígitos (OPCIONAL)
Pulse emitter (OPTIONAL)	Emissor de pulsos (OPCIONAL)



MAIN FACILITY NOVA ODESSA-SP



BRANCH MACAÉ -RJ

Jorge Romald

MED OI - Ago/2018



Metroval
Soluções personalizadas em medição de fluidos

TALK TO METROVAL

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