FITTING INSTRUCTIONS

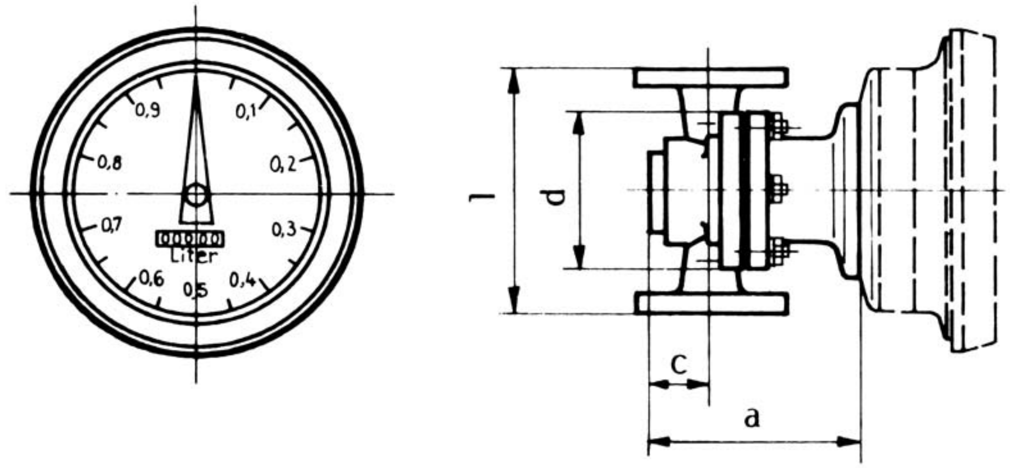
- The arrow on the body shows the direction of flow
- Can be fitted on either horizontal or vertical pipes
- The axis of oval wheels must be horizontal
- Air blasts must not be used (risk of breaking wheels or cog skip)
- Flowrates must not cause headlosses exceeding 0.8 bars (vibrations)
- Dynamic pressure overloads are dangerous (risk o buckling of axis)
- 100μ filter essential with liquids containing particles in suspension.

FLANGES

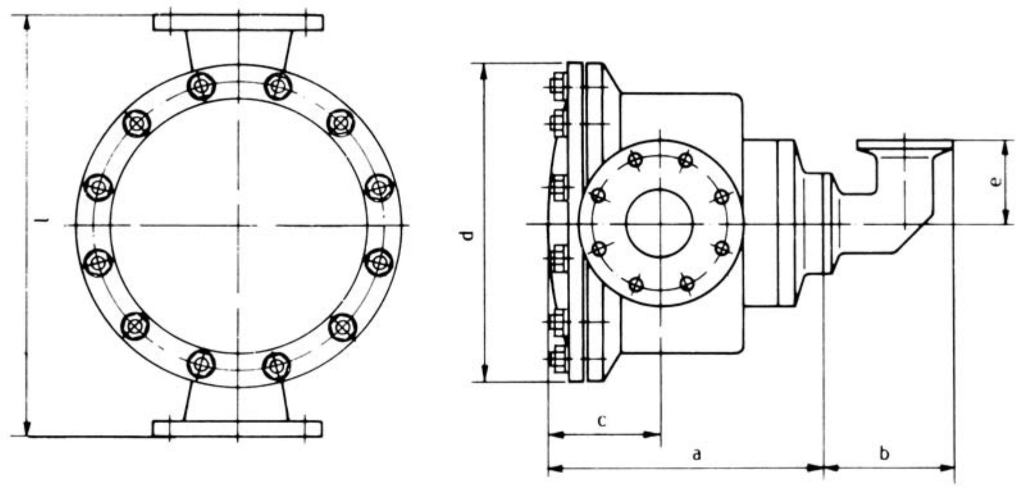
Flat faced flange with raised joining surface according to NF E 29 203 (DIN 2526 form C)

Cast iron	: ISO PN 16
Inox	: ISO PN 16 to 40 according to ND
Steel	: ISO PN 20 (ANSI 150 lbs)

DIMENSIONS (see hydraulics parts)



Nominal diameter 15 - 20

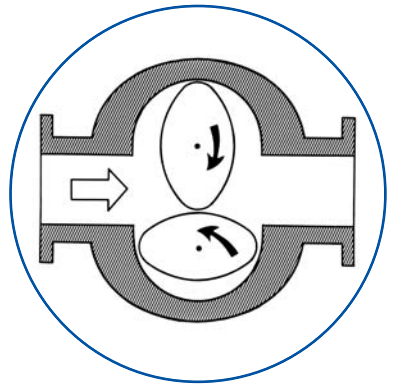


Nominal diameter 25 - 32 - 40 - 50 - 65 - 80 - 100

RO

Oval gear meter for chemical liquids: Sturdy and precise for any viscosity

Oval gear meters belong to the category of positive-displacement meters.
They have the accuracy and wide measurement range of this category, with the further advantage of accepting big differences in the viscosity of the liquids metered.
In addition to these qualities, the RO meter is very sturdy, easy to disassemble, resistant to high working pressures and temperatures.
Made from materials specifically selected to measured products, the RO meter is equally able to meter fuel oil or milk as well as mastic or food pastes. Equipped with a high-frequency pulse emitter, the RO meter is particularly suitable for process applications as well as batching operations calling extreme precision and perfect reliability.



industry range

sappel

Sappel reserves the right to alter the information given in this brochure without notice.

Non contractual document. Please have the features specified before ordering.

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If you have any question, please do not hesitate to contact us :

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G8836 07-06

Technical characteristics

	WG - WN								
Nominal Diameter	15	20	25	32	40	50	65	80	100
	1/2"	3/4"	1"	1"1/4	1"1/2	2"	2"1/2	3"	4"

USABLE FLOW RANGE (m³/h)

Qmin	0,24	0,48	0,96	1,44	1,92	3,84	7,2
Qn	1,5	3	6	9	12	24	45
Qmax (*)	3,9	7,8	15,6	23,4	31,2	62,4	117

(*) one hour per day or 15 days per year

APPROVAL

EEC Approved Commercial Classification under the following conditions

Approval number	D91 5.241 .39						
Qmin	0,3	0,6	1,2	1,8	2,4	4,8	9
Qmax	3	6	12	18	24	48	90
Visco- V1	from 0,3 to 17						
sity V2	from 3,5 to 120						
range V3	from 8 to 350						
mPa.s V4	from 100 to 1 000						
Temp. °C	from – 10 to + 170°C						

OPERATIVE PRESSURE (bar) AND MATERIAL

Cast iron C.I.	16	16	16	16	16	16	16	16	16
Inox I	40	40	25	25	25	25	25	25	16
Steel S	40	40	40	40	40	25	25	25	16

OPERATIVE TEMPERATURE

Standard ROI	-40°C to +90°C	-40°C to +120°C
Standard RDA ROF	-20°C to +90°C	-20°C to +120°C
High T°	90°C to +170°C (maxi 270°C sur demande avec roues spéciales)	

HEADLOSS (for standard wheels and a viscosity of 1 mPa.s)

kVs=Qv/ΔP	5	11,5	30	38	60	100	200

CHOOSING A NON-STANDARD METER

If a liquid can be pumped, it can generally be metered. Above 2300 mPa.s, special high-viscosity wheels should be ordered (fig. 2 and fig. 10).

The maximum viscosity is 500 000 mPa.s. Depending on the flowrate of the liquid be measured, see technical specification.

Correspondence of viscosity units

Dynamic viscosity :
1 centipoise (cp) = 1 mPa.s = 6.548 degrees Engler (°E) for °E > 4

Kinematic viscosity :
Centistoke (cst) = $\frac{\text{centipoise}}{\text{specific weight (g/cm}^3)}$

CHOOSING A METER FOR A LIQUID WITH A VISCOSITY HIGHER THAN 1MPA.S (viscosity of the water at 20°C)

The two graphs below can be used to obtain the correction factor by means of which the calculated flowrate will be determined.

Calculated flowrate= $\frac{\text{True flowrate}}{\text{Correction factor}}$

Example 1 :
Standard meter - Viscosity < 2300 mPa.s

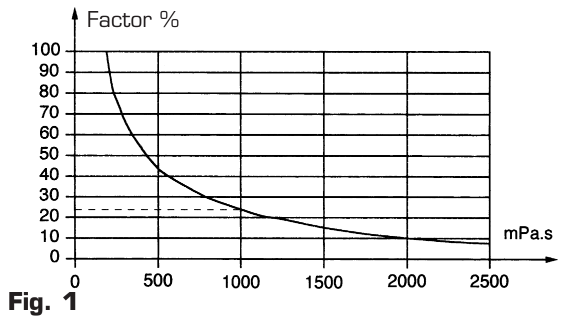

Fig. 1

Viscosity of product = 1000 mPa.s
True max. flowrate = 4.8 m³/h
Correction factor = 23%

Calculated flowrate = $\frac{4.8 \times 100}{23}$ = 20.86 m³/h

Recommended meter according to technical characteristics : ø 50

Example 2 :
High-viscosity wheel meter
Viscosity between 1000 and 500 000 mPa.s

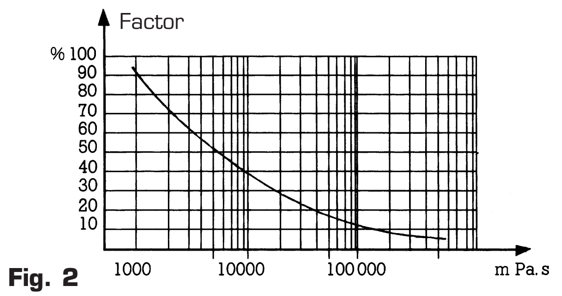

Fig. 2

Viscosity of product = 10 000 mPa.s
True max. flowrate= 18 m³/h
Correction factor = 40%

Calculated flow rate = $\frac{18 \times 100}{40}$ = 45 m³/h

Recommended meter according to technical characteristics : ø 80

DETERMINING THE RANGE OF THE METER

The true maximum flowrate is limited by the viscosity to a certain percentage of the theorical maximum flowrate

True max. flowrate = $\frac{\text{True max. flowrate at visco. 1 mPa.s} \times \text{Correction factor}}{100}$

Nota :The minimum flowrate will be calculated with the same factor, since the dynamics of measurement remain constant.

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

READING DISPLAY

			1 pointer revolution large	small	Check scale and pointer indication	Maximum registering
Simple display	C1	DN 15 - 32	1 l		0,01 l	999 999 l
	C2	DN 40 - 65	10 l		0,1 l	9 999 990 l
	C3	DN 80 - 100	100 l		1 l	99 999 900 l
With zero reset	C4	DN 15 - 65	10 l	500 l	0,1 l	9 999 999 l
	C5	DN 80 - 100	100 l	5 000 l	1 l	99 999 990 l

VEEDER ROOT DIGITAL DISPLAY HEAD

Simple register	M1	DN 15 - 32	0,01 l	99 999 999 l
	M10	DN 40 - 65	0,1 l	99 999 999 l
	M100	DN 80 - 100	1 l	99 999 999 l
Register with preselector	MV1	DN 15 - 32	0,01 l	99 999 999 l
	MV10	dn 40 - 65	0,1 l	99 999 999 l
	MV100	DN 80 - 100	1 l	99 999 999 l
Register with printout	MD1	DN 15 - 32	0,01 l	99 999 999 l
	MD10	DN 40 - 65	0,1 l	99 999 999 l
	MD100	DN 80 - 100	1 l	99 999 999 l
Register with printout and preselector	MDV1	DN 15 - 32	0,01 l	99 999 999 l
	MDV10	DN 40 - 65	0,1 l	99 999 999 l
	MDV100	DN 80 - 100	1l	99 999 999 l

Nota : the heads MV and MVD can be equipped with a double electric contact (SE2) or a double pneumatic contact (SP 2).

NAMUR ELECTRIC PULSE EMITTER

Pulse value in liters / Nominal diameter	15*	20*	25*	32*	40	50	65	80	100
0,01	E100	E100	E100	E100					
0,1	E10	E10	E10	E10	E100	E100	E100		
1	E1	E1	E1	E1	E10	E10	E10	E100	E100
10					E1	E1	E1	E10	E10
100								E1	E1

ATEX	on request

* If assembling with reset, the pulse value is multiplied by 10

ISOLATORS

i - LT: 125 mm (temperature < 0°C)
i - 1 : 125 mm
i - 2 : 250 mm
i - 3 : 500 mm
i - 4 : 750 mm
i - 5 : 1000 mm

ELBOWS

R1 = 45° R2 = 90°

HYDRAULIC PART (see scheme: dimensions)

Nominal Diameters		15	20	25	32	40	50	65	80	100
l		170	170	220	220	300	300	400	450	550
a		146	146	142	142	175	206	272	338	398
b		160	160	160	160	160	160	160	160	160
c		43	43	74	74	86	100	117	140	178
d		124	124	155	155	225	255	293	375	460
e		100	100	100	100	100	100	100	100	100
Weigt (kg)	Cast iron	7,0	7,3	13	13	26	37	59	96	150
	Inox	7,6	7,6	14,5	14,5	29	38	65	115	158
	Steel	7,5	7,5	14	14	29	38	62	115	158

VISCOUS LIQUIDS

Precision of mesure
The graph below shows the effect of viscosity on precision.

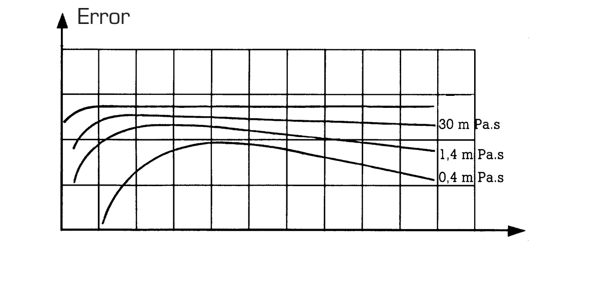

Fig. 8

THE EFFECTS OF VISCOSITY ON HEAD LOSS

Curves 1 and 2 are plotted with constant headloss. They can be used to determine the calculated flowrate of which the true headloss can be known.ge constante.

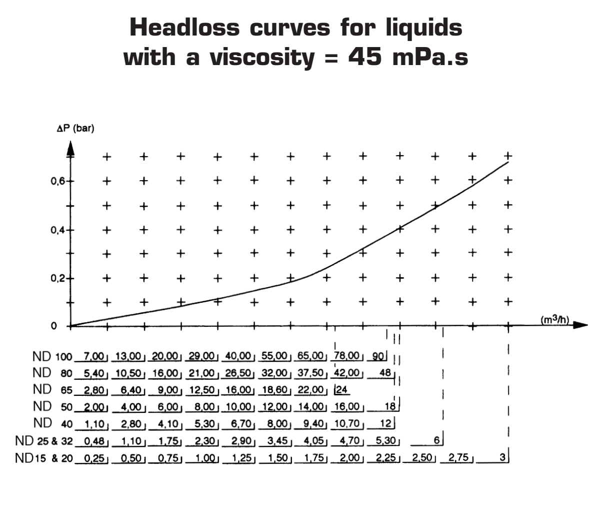

Fig. 9

SPECIAL HIGH-VISCOSITY GEARS

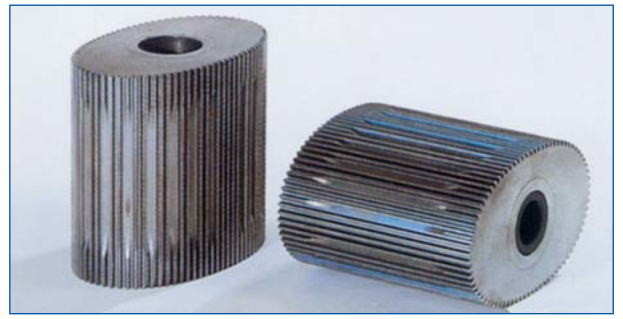

Fig. 10

Examples of typical liquids

	Concentration	Temperature	I	F
Amyl acetate C			☐	+
Vinyl acetate			☐	+
Acetic acid			☐	
Formic acid			☐	
Fatty acids			☐	
Nitric acid	< 95%	< 30%	☐	
Phosphoric acid	< 80%	< 80%	+	
Sulphuric acid	< 72% > 93%	< 40%	+	
Alcohols			☐	☐
Ammonia			☐	
Aniline			☐	+
Pure benzene				☐
Beer	< 100%	< 37%	☐	
Butylene glycol (viscous)				☐
Sodium chlorite			☐	
Chloroform			☐	
Calcium chloride solution				☐
Methylene chloride			☐	+
Potassium chloride aqueous solution			☐	+
Sodium chloride aqueous solution			+	
Potassium cyanide			☐	
Cyclohexane				☐
Dichlorethane			☐	+
Dimethylformamide (DMF)			☐	
Dimineralised softened water (do not use with 20 mm DN)			☐	
Permutited and sea water			☐	
Hydrogen peroxide			☐	
Ether (ethyl or sulphuric)			☐	☐
Isopropyl ether				☐
Formalin			☐	
Glycerine			☐	+
Glycol			☐	+
Animal fat			☐	+
Mineral grease and oil				☐
Vegetable table oil			☐	
Hydrazine			☐	
Sodium hypochlorite			+	
Potassium iodide			☐	
Fruit juice			☐	
Kerosene			☐	
Phenol			☐	
Potash			☐	
Brine			☐	+
Caustic soda			☐	
Carbon disulphide				☐
Carbon tetrachloride			☐	+
Tetrahydrofurane				☐
Toluene				☐
Triethylamine, trimethylamine				☐
Wine			☐	
Xylene			☐	+

☐ Recommanded version + Version withstanding conditions

PRÉCISION OF MESUREMENT

± 0.3% for approved flowrates
± 0.6% for usable flowrates

Nota : At a point of the curve, the measurement precision can be fitted at ± 0.1%.