

**ORLITA®**  
A ProMinent® Company



# High-end Metering Pumps

**ProMinent®**

# High-end Metering Pumps

ORLITA® is one of the world leading manufacturers of intelligent dosing technology. We design and produce reciprocating positive displacement pumps which encompasses the liquid delivery, measurement and control within one machine.

ORLITA® metering pumps are motor-driven reciprocating pumps of controlled volume type. Four different types are available.

**Mf diaphragm metering pump**  
with hydromechanic double PTFE diaphragm

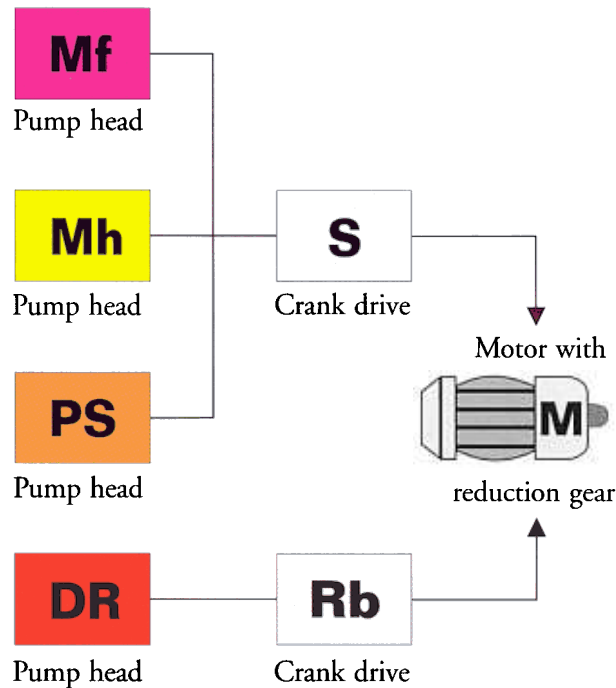
**Mh diaphragm metering pump**  
with hydraulic stainless steel diaphragm

**PS plunger type metering pump**  
with stuff box packing

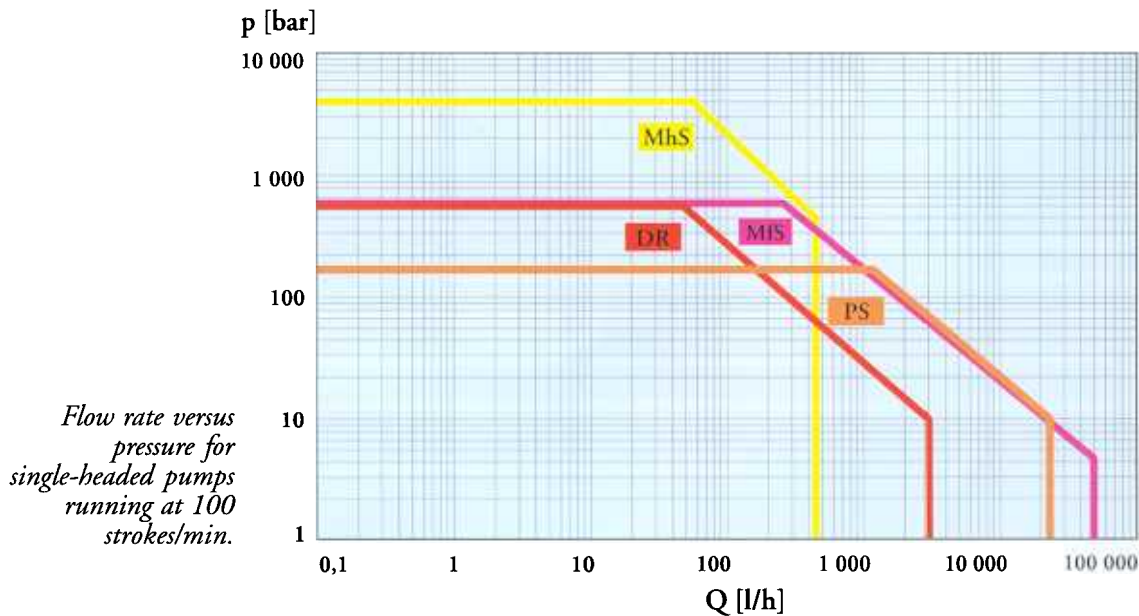
**DR valveless metering pump**  
with rotary control piston

ORLITA® pumps are modular based and mainly consists of three functional items:

ORLITA® metering pumps offer economic benefit and therefore gained a wide range of applications in the process technology.



## Performance diagram of ORLITA® metering pumps



Flow rate versus pressure for single-headed pumps running at 100 strokes/min.



## Batch delivery

The metering pump is absolutely suitable for batch dosing by cyclic displacement of a defined stroke volume whilst counting the number of strokes.

This digital flow characteristics allow programming the batch size in a simple manner.

## Characteristics

Outstanding feature of metering pumps is their pressure-band characteristic which offers the user a mainly independence of the flow rate from the discharge pressure.

The flow rate of the metering pump is linear depending on the stroke length setting and the stroke frequency. This relation offers a very easy adjustment of the capacity.

# Crank drives

ORLITA® metering pumps are equipped with robust and proven crank drives. Two different series are available. Both are of positive return type and guarantee a reliable operation of the total pump aggregate.

The stroke length is adjustable both during operation and stationary – manually or optionally electric or pneumatic.

The stroke is infinitely variable from zero stroke to maximum stroke.

The actual setting can be read from a counter or mechanical display.

Multi-ganged units are built up by the combination of equal as well as various crank drives sizes.

## Highlights

- stroke adjustment 0 – 100 % in operation and stationary*
- easy to combine*
- high efficiency*
- positive return mechanism*
- electric and pneumatic stroke adjustment available*
- proven, robust and reliable*

## Crank drives series S

Crank drives of series S are used for all ORLITA® plunger type and diaphragm metering pumps. The various sizes allow a modular combination of different pump heads to an economic solution.

The crank drives of series S do not have internal reduction gears. Different stroke frequencies are achieved by using external reduction gears. Especially with multi-headed aggregates a high efficiency is yielded.

The stroke adjustment of the crank drives type S is achieved by a lever mechanism with a constant bottom dead center. This characteristics offers advantages especially for high pressure applications.

Except for the crank shaft the lever mechanism only has swivelling components where by a wear-resistant operation and a high overload safety is guaranteed.



## Crank drives series Rb

Crank drives of series Rb are designed to operate the valveless metering pump DR.

The special construction of the crank mechanism combines two movements:

*reciprocating movement*

*(piston stroke)*

*rotation*

*(control of inlet and outlet)*

An internal worm gear reduces the speed of the drive motor to the stroke frequency of the pump.

### ORLITA® crank drives

type	S 15	S 30	S 80	S 600	S 1 400	Rb 15	Rb 150
stroke length (mm)	0–15	0–20	0–20	0–40	0–60	0–15	0–32
piston rod load (N)	1 500	3 500	14 000	40 000	60 000	1 800	15 000
hydraulic power kW/100 min <sup>-1</sup>	0.038	0.117	0.467	2.667	6.000	0.045	0.800



# Diaphragm head Mf

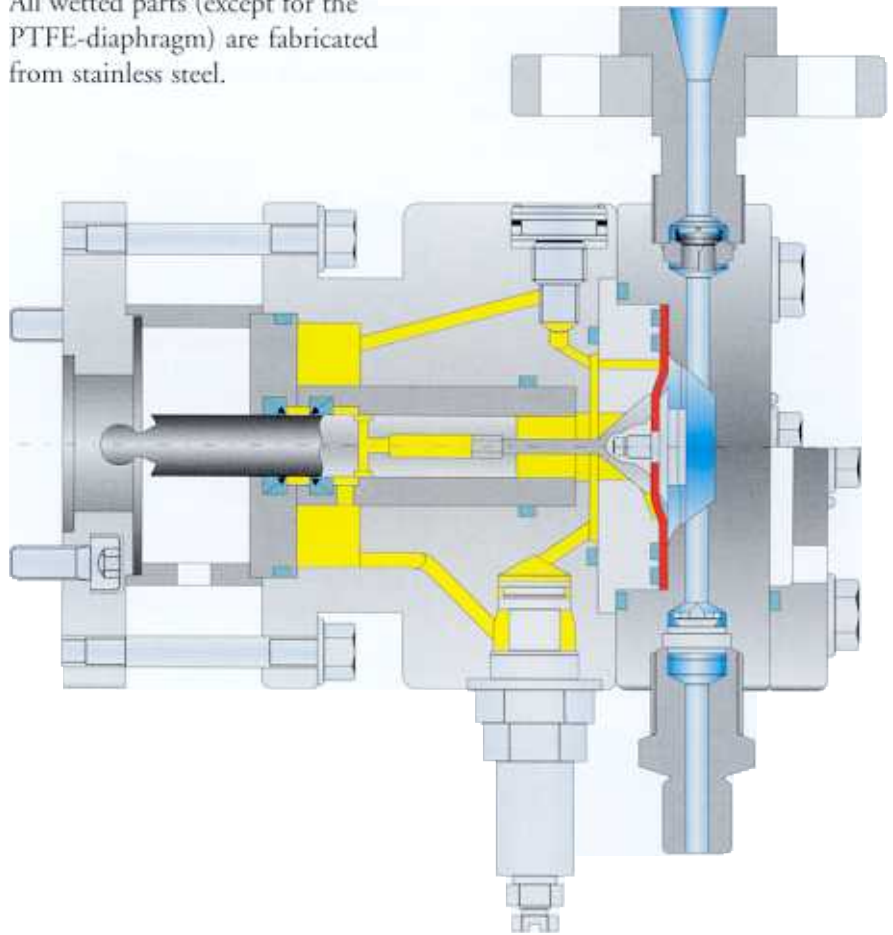
Hydromechanic actuated diaphragm head. A double PTFE diaphragm hermetically separates the wetted area from the hydraulic chamber.

During the discharge stroke the diaphragm is balanced by the hydraulic liquid only. During the suction stroke the diaphragm operation is aided by the mechanical coupling. This combined principle offers an extraordinary suction lift capability of the Mf pump

Integrated in the hydraulic chamber are the pressure relief valve and an automatic venting valve. The valveless forced reflow of the internal oil leakage operates wearfree and guarantees optimum metering accuracy.

The pump check valves are of cone type. This guarantees low wear, short pressure loss ( $NPSH_R$ ) and self-cleaning.

All wetted parts (except for the PTFE-diaphragm) are fabricated from stainless steel.



Metering diaphragm pump type Mf2S 600/30-30 with electric stroke adjustment

## Highlights

- hermetically tight
- pressure up to 630 bar
- temperature range  
– 40 °C to + 160 °C
- PTFE double diaphragm
- suction lift up to 8 m
- accuracy  $\pm 0,5 \%$
- diaphragm rupture control



## Options:

- special materials like Hastelloy, zirconia, titanium, Alloy 20, tantalum and plastics
- diaphragm failure indication
- heatable or coolable pump head
- other type of valve arrangements e.g. double valves etc.
- special nozzles on request
- other options on request

# Diaphragm head Mh

Hydraulic actuated diaphragm head. A metal diaphragm hermetically separates the wetted area from the hydraulic chamber.

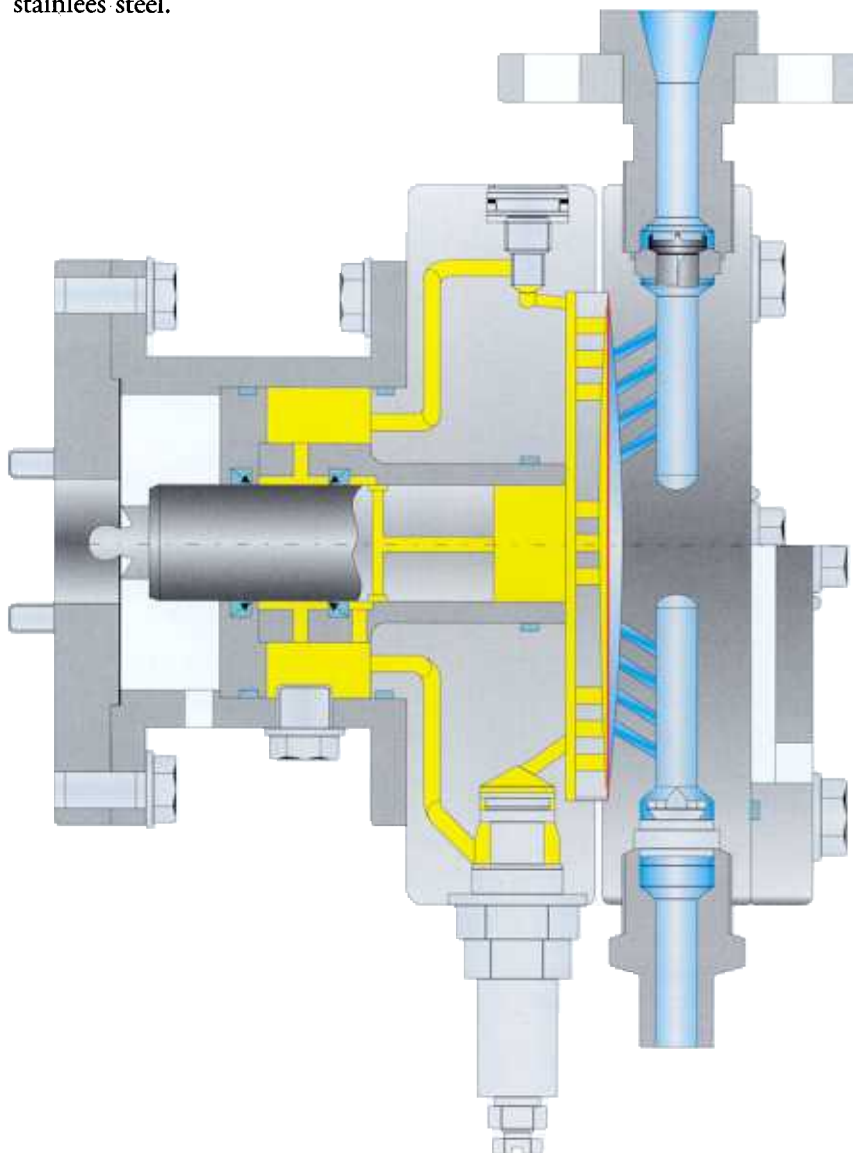
Both during discharge and suction stroke the diaphragm is balanced by the hydraulic liquid which has been displaced by the piston.

Integrated in the hydraulic chamber are the pressure relief valve and an automatic venting valve. The valveless forced reflow of the internal oil leakage operates wearfree and guarantees optimum metering accuracy.

The pump check valves are of cone, ball or prismatic type depending on size and design pressure. All wetted parts are fabricated from stainless steel.



*Metering diaphragm pump type Mh3S 30/32-32-32*



## *Highlights*

- hermetically tight*
- pressure up to 4000 bar*
- temperature range  
- 60 °C to + 160 °C*
- accuracy ± 0,5 %*
- diaphragm rupture control*

## *Options:*

- special materials like Hastelloy, zirconia, titanium, Alloy 20*
- multi diaphragm with failure indication*
- heatable or coolable pump head*
- other type of valve arrangements e.g. double valves etc.*
- special nozzles on request*
- other options on request*

# Plunger head PS

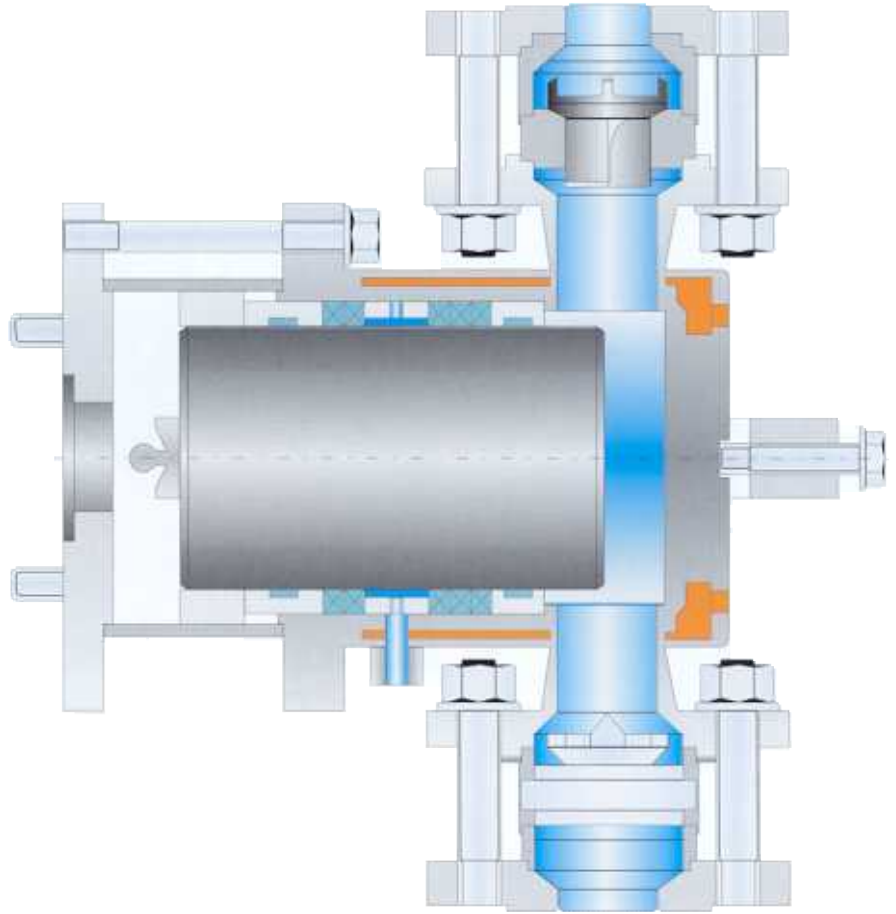
Plunger head with stuff box packing.  
The plunger oscillates in the cylinder and displaces the liquid.

The packing adjustment is achieved by the front-sided adjusting screw, which is also possible during operation.

The lantern on the rear head end serves to drain the leakage or can be used as an area to flush, lubricate or seal the pump with suitable media.

The pump check valves are of cone type. This guarantees low wear, short pressure loss ( $NPSH_R$ ) and self-cleaning.

All wetted parts are fabricated from stainless steel and sealed by PTFE.



Plunger pump type PS 80/100 with heating jacket

## Highlights

- best hydraulic efficiency
- pressure up to 1000 bar
- temperature range  
– 40 °C to + 400 °C
- accuracy  $\pm 0,5 \%$
- easy to maintain by central packing adjustment

## Options:

- special materials like Hastelloy, titanium, Alloy 20, ceramics
- special seal materials
- pump head with heating/cooling jacket
- other type of valve arrangements e.g. double valves etc.
- special nozzles on request
- other options on request



# Valveless metering pump DR

Valveless operating metering pump with rotary control piston. It works by the combined oscillating and rotating movement of the piston. Thus the displacer itself opens and closes discharge and suction. Valves are not required. The pump can be operated through a very wide range of stroke frequencies.

This principle enables the exact metering of highly viscous liquids which also might contain – even large – solids.

The pump head is fabricated from stainless steel. Piston and liner are treated by a special wear-resistant coating.

Depending on the application the pump head also is available from other high performance materials.

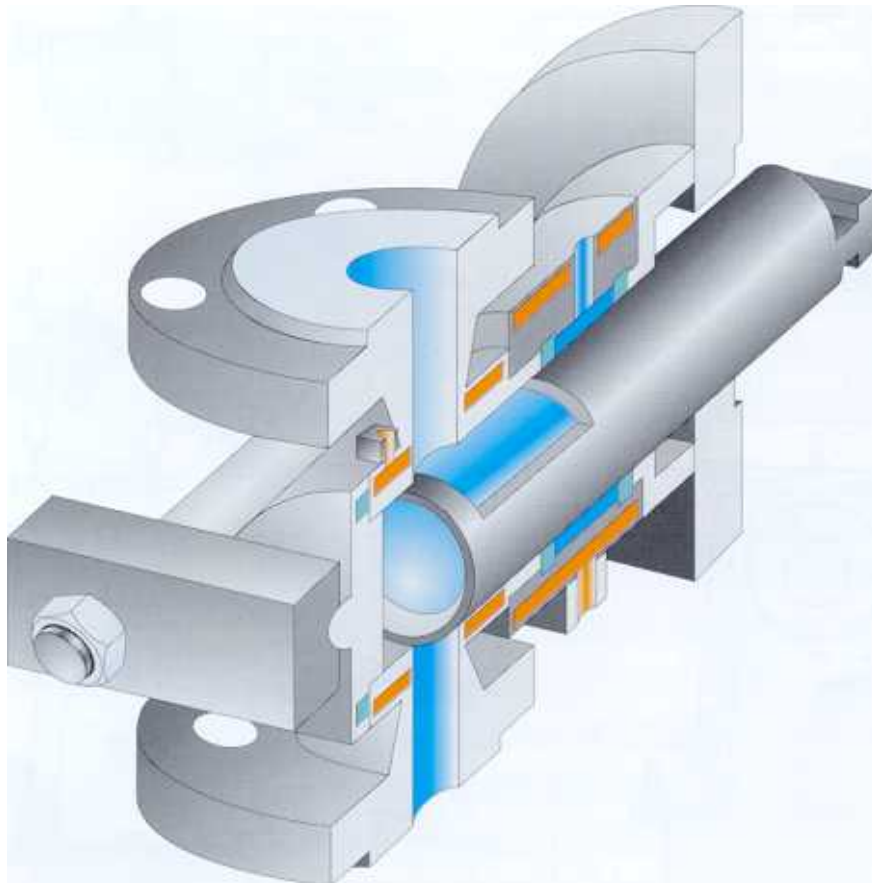
The clearance between piston and liner which mainly seals the pump is adapted to the viscosity of the liquid.

The lantern on the rear head end serves to drain the leakage or can be used as an area to flush, lubricate or seal the pump with suitable media.

The lantern is sealed by elastomer lip rings. The flow direction is selectable by the assembly position of the piston. By turning the head around its horizontal axis an effect of re-suction is adjustable.



Valveless metering pump type DR 150/36 with heating jacket



## Highlights

- valveless
- viscosities up to 10<sup>6</sup> mPas
- pressure up to 630 bar
- temperature range – 40 °C to + 400 °C
- accuracy ± 0,5 %
- wide range of stroke frequency

## Options:

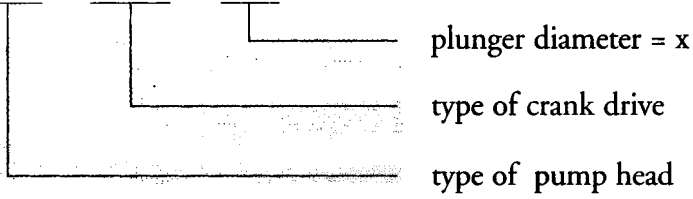
- plunger and liner from ceramics or hard metal
- pump head with heating or cooling jacket
- sealless with metallicly sealed lantern
- other options on request

# Selection guide

## Classification of ORLITA® pumps

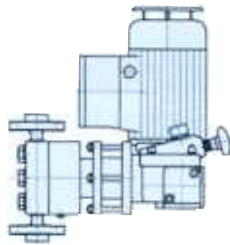
Example:

**Mf S80 / 50**

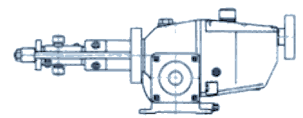


## Side view of ORLITA® pumps

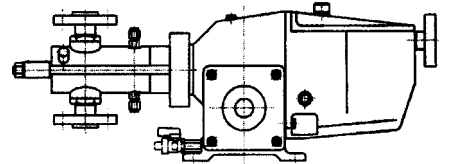
MfS 15/x



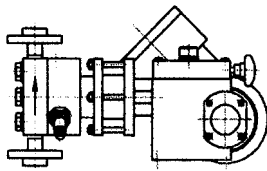
DR 15/x



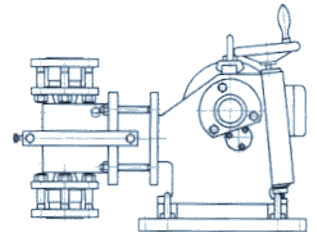
DR 150/x



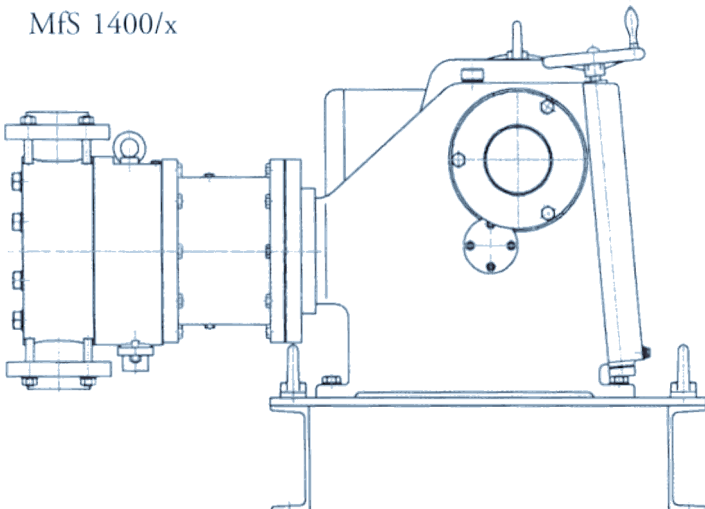
MfS 30/x



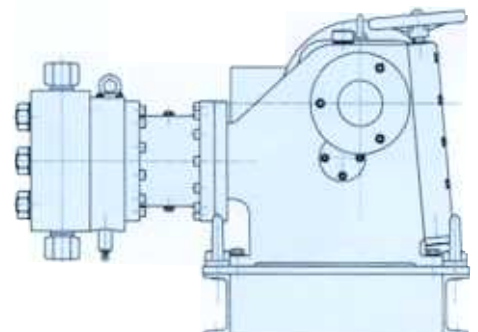
PS 80/x



MfS 1400/x



MhS 600/x





# Selection guide

## Technical tables



**ORLITA**

PS 15/x  
MfS 15/x

Ø = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]			PS 15/x	MfS 15/x
		91*	136*	170*	bar	bar
5	0.29	1.6	2.4	3.0	200	-
6	0.42	2.3	3.4	4.3	200	-
8	0.75	4.1	6.1	7.7	200	-
10	1.18	6.5	9.6	12	191	191
12	1.70	9.3	14	17	-	133
16	3.02	17	25	31	63	75
20	4.71	26	38	48	40	48
25	7.36	40	60	75	31	-
30	10.60	58	87	108	21	21
36	15.27	84	125	156	15	-
40	18.85	103	154	192	12	12
50	29.45	161	240	300	8	8
65	49.77	272	406	508	5	5

PS 30/x  
MfS 30/x

Ø = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]				PS 30/x	MfS 30/x
		92*	111*	138*	172*	bar	bar
8	1.01	5.6	6.7	8.4	10.4	200	-
10	1.57	8.7	10.5	13	16	200	400
12	2.62	13	15	19	23	-	309
16	4.02	22	27	33	42	160	174
20	6.28	35	42	52	65	100	111
25	9.82	54	65	81	101	63	-
30	14.14	78	94	117	146	50	50
36	20.36	112	136	169	210	34	-
40	25.13	139	167	208	259	25	28
50	39.27	217	262	325	405	16	18
65	66.37	366	442	550	685	10	11
80	100.53	555	670	832	1037	6	7
100	157.08	867	1046	1300	1621	4	-

PS 80/x  
MfS 80/x

Ø = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]						PS 80/x	MfS 80/x
		84*	96*	116*	130*	167*	188*	bar	bar
10	1.57	7.9	9.0	11	12	16	18	1000	-
16	4.04	20	23	28	31	40	45	160	400
20	6.28	32	36	44	49	63	71	160	400
25	9.82	49	57	68	77	98	111	160	-
30	14.14	71	81	98	110	142	160	160	198
36	20.36	103	117	142	159	204	230	138	-
40	25.13	127	145	175	196	252	283	111	100
50	39.27	198	226	273	306	393	443	63	71
65	66.37	335	382	462	518	665	749	42	40
80	100.53	507	579	700	784	1007	1134	25	28
100	157.08	792	905	1093	1225	1574	1772	16	16
120	226.19	1140	1303	1574	1764	2266	2551	-	12
140	307.88	1552	1773	2143	2401	3085	-	9	9
160	402.12	2027	2316	2799	3137	4029	-	7	-

PS 600/x  
MfS 600/x

Ø = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]					PS 600/x	MfS 600/x
		81*	109*	138*	165*	201*	bar	bar
30	28.27	138	184	234	280	341	400	400
36	40.72	198	266	337	403	491	400	-
40	50.27	244	329	416	498	606	160	318
50	78.54	382	514	650	778	948	160	204
65	132.73	645	868	1099	1314	1600	121	121
80	201.06	977	1315	1665	1990	2425	80	80
100	314.16	1527	2055	2600	3110	3789	51	51
120	452.39	2199	2959	3746	4479	5456	35	35
140	615.75	2993	4027	5098	6096	-	25	25
160	804.25	3909	5260	6659	7962	-	20	20
200	1256.64	6107	8218	10405	12441	-	13	13
240	1809.56	8795	11835	14983	-	-	9	9
280	2463.01	11970	16108	20394	-	-	6	6

\*) stated stroke frequencies are selected standard values at 50 Hz. Others on request.  
\*\*) stated plunger diameters are selected standard values. Others on request.

# Selection guide

## Technical tables



**ORLITA®**

### PS 1400/x MfS 1400/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]							PS 1400/x	MfS 1400/x
		86*	103*	117*	136*	155*	179*	212*	bar	bar
30	42.41	219	262	298	346	394	455	539	–	400
40	75.40	389	466	529	615	701	810	959	400	400
50	117.81	608	728	827	961	1095	1265	1499	306	306
65	199.10	1027	1230	1398	1625	1852	2138	2533	160	180
80	301.59	1556	1864	2117	2461	2805	3239	3836	100	119
100	471.24	2432	2912	3308	3845	4383	5061	5994	76	76
120	678.58	3501	4194	4764	5537	6311	7288	8632	53	53
140	923.63	4766	5708	6484	7537	8590	9920	–	39	39
160	1206.37	6225	7455	8469	9844	11219	–	–	25	25
200	1884.96	9726	11649	13232	15381	17530	–	–	19	19
240	2714.34	14006	16775	19055	22149	25244	–	–	13	13
280	3694.51	19064	22832	25935	30147	34359	–	–	10	10
320	4825.49	24900	29822	33875	39376	44877	–	–	–	7.5
360	6107.26	31513	37742	42873	49835	56798	–	–	–	5.9
420	8312.65	42893	51372	58355	67831	77308	–	–	–	4.3

### DR 15/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]			DR 15/x
		54*	72*	108*	bar
7	0.58	1.9	2.5	3.8	400
12	1.70	5.5	7.3	11	159
18	3.82	12	17	25	71
25	7.36	24	32	48	37
36	15.27	50	66	99	18
50	29.45	95	127	191	9
70	57.73	187	249	374	4.7
90	95.43	309	412	618	2.8

### DR 150/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]			DR 150/x
		54*	72*	111*	bar
18	8.14	26	35	54	400
25	15.71	51	68	105	306
36	32.57	106	141	217	147
50	62.83	204	271	418	76
70	123.15	399	532	820	39
90	203.58	660	879	1356	24
120	361.91	1173	1563	2410	13
140	492.60	1596	2128	3281	10

### MhS 15/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]			MhS 15/x
		91*	136*	170*	bar
5	0.29	1.6	2.4	3.0	500
6	0.42	2.3	3.4	4.3	500
7	0.58	3.2	4.7	6.0	390
8	0.75	4.1	6.1	7.7	298
10	1.18	6.4	9.6	12	191
12	1.70	9.3	14	17	133

\*) stated stroke frequencies are selected standard values at 50 Hz. Others on request.

\*\*) stated plunger diameters are selected standard values. Others on request.

# Selection guide

## Technical tables



**ORLITA®**

### MhS 30/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]				MhS 30/x
		92*	111*	138*	172*	bar
5	0.39	2.2	2.6	3.2	4.0	1000
6	0.57	3.2	3.8	4.7	5.8	1000
7	0.77	4.3	5.1	6.4	8.0	700
8	1.01	5.6	6.7	8.4	10	700
10	1.57	8.7	11	13	16	400
12	2.26	13	15	19	23	310
14	3.08	17	21	26	32	227
16	4.02	22	27	33	42	174
18	5.09	28	34	42	53	138
20	6.28	35	42	53	65	111
22	7.60	42	51	63	78	92
28	12.32	68	82	102	127	57
32	16.08	89	107	133	166	44
36	20.36	112	136	169	210	34
40	25.13	139	167	208	259	28
45	32	176	212	264	328	22

### MhS 80/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]						MhS 80/x
		84*	96*	116*	130*	167*	188*	bar
10	1.57	7.9	9.0	11	12	16	18	1600
11	1.90	9.6	11	13	15	19	21	1473
12	2.26	11	13	16	18	23	26	1237
14	3.08	16	18	21	24	31	35	909
16	4.02	20	23	28	32	40	46	630
18	5.09	26	29	35	40	51	57	550
20	6.28	32	36	44	49	63	71	446

### MhS 600/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]					MhS 600/x
		81*	109*	138*	165*	201*	bar
10	3.14	15	21	26	31	38	3200
11	3.80	19	25	32	38	46	3200
12	4.52	22	30	37	45	55	3200
14	6.16	30	40	51	61	74	2500
16	8.04	39	53	67	80	97	1990
18	10.18	50	67	84	101	123	1572
20	12.57	61	82	104	124	152	630
22	15.21	74	100	126	151	183	400
28	24.63	120	161	204	244	297	400
32	32.17	156	210	266	319	388	400

### MhS 1400/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]							MhS 1400/x
		86*	103*	117*	136*	155*	179*	212*	bar
14	9.24	48	57	65	75	86	99	118	3200
16	12.06	62	75	85	98	112	130	153	3000
18	15.27	79	94	107	125	142	164	194	2400
20	18.85	97	117	132	154	175	203	240	1910
28	36.95	191	228	259	302	344	397	470	975
32	48.25	249	298	339	394	449	518	614	746
36	61.07	315	377	429	498	568	656	777	400
40	75.40	389	466	529	615	701	810	959	400

### MhR 150/x

∅ = x mm**	V <sub>H</sub> cm <sup>3</sup>	Q <sub>th</sub> [l/h] at n [min <sup>-1</sup> ]			MhR 150/x
		54*	72*	111*	bar
6	0.90	2.9	3.8	6.0	3000
7	1.23	4.0	5.3	8.2	3000

*\*) stated stroke frequencies are selected standard values at 50 Hz. Others on request.  
\*\*) stated plunger diameters are selected standard values. Others on request.*



# More than 40 years ORLITA® High-end metering pumps on the international market!

For 40 years ORLITA® is a world-wide known partner for high-end metering pumps.

This success is based on comprehensive knowledge of metering liquids, experience in pumping, measuring and controlling as well as know-how on the viscous

characteristics of different media used in many ranges of the process technology, experienced engineers, qualified experts, trained field service, and a distribution network with service close to you.

We deliver our metering pumps manufactured according to each

requirement world-wide to user as well as to engineering companies building turnkey plants or plant components.

It's your turn to benefit from the know-how of ORLITA and ProMinent.

## Our manufacturing program

### Metering pumps for industries such as

- chemical
- petrochemical
- refinery
- oil & gas production

### Special metering pumps for the process industry

- valveless metering pump for high and highest viscous media
- highest pressure diaphragm metering pumps for the LDPE production

### Filling pumps (CIP/SIP, viscous media) for

- food
- sweets
- dairies
- cosmetics
- pharmacy



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