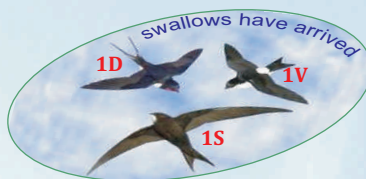


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SEPTEMBER 2006



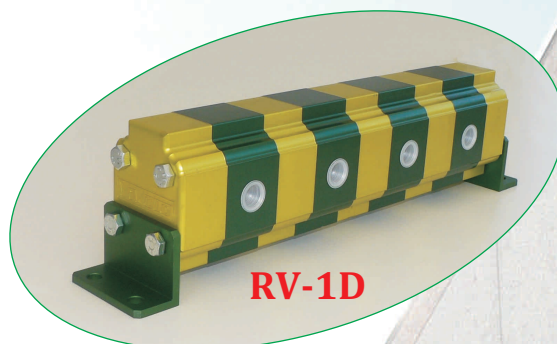
Flow Dividers

"RV" series Group 1

Swallow line

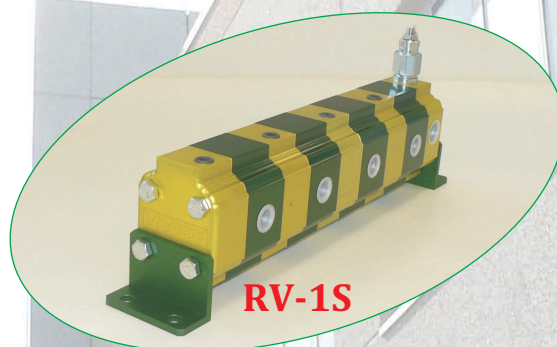
RV - 1D

Flow Dividers
basic model
(Internal drain)



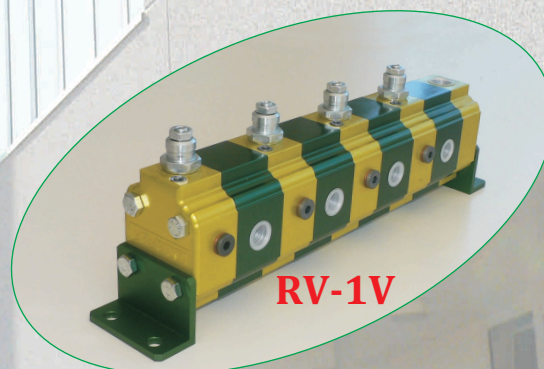
RV - 1S

Flow Divider with
single phase correction
valve common
to all the elements
(Internal or external drain)



RV-1V

Flow Divider with
independent phase correction
and anticavitation valves
for each single element
(Internal or external drain)



DAL 1986 PRODUTTORE DI DIVISORI DI FLUSSO

VIVOIL OLEODINAMICA VIVOLO

Via Leone Ginzburg, 2 - 4 - 40054 Cento di Budrio, BOLOGNA (ITALY)

Tel. +39 051.803689 Fax +39 051.800061

www.vivoil.com

12-10-2006

Flow divider (Basic model)
(internal drain)

Code:

9RD	NN	CC
-----	----	----

9RD	Type of flow divider
NN	Number of elements
CC	Code of the displacements of the elements

Example: Flow divider with 2 elements with equal displacements:

RV-1D / 3,8 x 2

9RD	02	25
-----	----	----

Example: Flow divider with 4 elements with different displacements (max 7)

RV-1D / 3,8+4,9+4,9+6,5

9RD	04	25	29	29	32
-----	----	----	----	----	----

NOTE: to codify flow dividers with different displacements with more than 7 elements please ask our sales department.

Table: 1

TYPE RV-1D	CC	p. max. bar	Capacity of one element l/min		
			MIN	RECOMMENDED	MAX
0,9	16	220	1	2	6
1,2	17	220	1,5	3	7
1,7	18	220	2	4	9,5
2,2	20	220	2,5	5	13
2,6	21	220	3	6	16
3,2	23	220	3,5	7	19
3,8	25	220	4,5	8	22,5
4,3	27	220	5	9	26
4,9	29	220	5,5	11	29
5,9	31	220	6,5	13	30
6,5	32	220	7,5	14	33
7,8	34	210	8,5	17	38
9,8	36	200	11	22	38

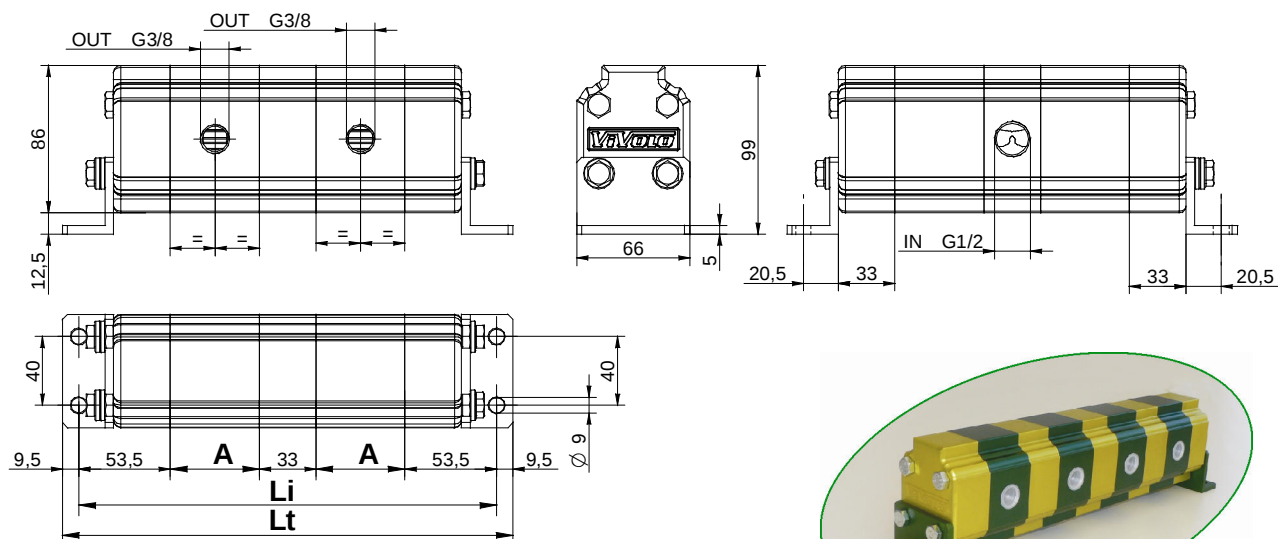


Table: 2

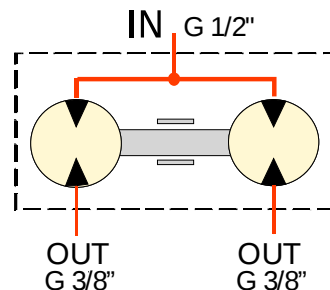
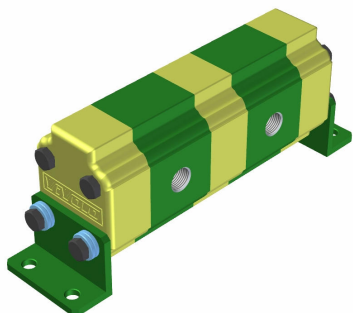
TYPE RV-1D	A	Li = Distance between fixing ports (with equal displacements)														
Cm³/rev		Number of elements														
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0,9	41,5	223	297,5	372	446,5	521	595,5	670	744,5	819	893,5	968	1042,5	1117	1191,5	1266
1,2	42,5	225	300,5	376	451,5	527	602,5	678	753,5	829	904,5	980	1055,5	1131	1206,5	1282
1,7	44	228	305	382	459	536	613	690	767	844	921	998	1075	1152	1229	1306
2,2	46	232	311	390	469	548	627	706	785	864	943	1022	1101	1180	1259	1338
2,6	48	236	317	398	479	560	641	722	803	884	965	1046	1127	1208	1289	1370
3,2	50	240	323	406	489	572	655	738	821	904	987	1070	1153	1236	1319	1402
3,8	52	244	329	414	499	584	669	754	839	924	1009	1094	1179	1264	1349	1434
4,3	54	248	335	422	509	596	683	770	857	944	1031	1118	1205	1292	1379	1466
4,9	57	254	344	434	524	614	704	794	884	974	1064	1154	1244	1334	1424	1514
5,9	60,5	261	354,5	448	541,5	635	728,5	822	915,5	1009	1103	1196	1289,5	1383	1476,5	1570
6,5	63	266	362	458	554	650	746	842	938	1034	1130	1226	1322	1418	1514	1610
7,8	67	274	374	474	574	674	774	874	974	1074	1174	1274	1374	1474	1574	1674
9,8	76	292	401	510	619	728	837	946	1055	1164	1273	1382	1491	1600	1709	1818

Table 3 : in this table the number of inlets in function of the number of elements are indicated.

Number of elements	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
"IN" Number of inlets	1	2	2	2	3	4	4	4	5	6	6	6	7	8	8

Flow divider (Basic model)
(internal drain)

INTERNAL DRAIN



In **table 1** the functioning range of single flow divider elements is indicated.

The higher is the feeding capacity (q), the higher is the precision of flow division, but in opposition there are losses of loading and higher noise. Therefore we suggest to feed the elements with capacities equal or a few superior to the ones indicated in the column "**RECOMMENDED**".

Remember to verify the capacities even in phase of flow reunion.

The pressures indicated are to be considered as maximum of functioning, the flow divider is able to bear peaks of pressure 20% superior.

How to calculate the "Li" and "Lt" measures of flow dividers:

From **table 2** it is possible to obtain the "Li" measure for flow dividers up to 16 elements with equal displacements; for flow dividers with different elements or with more than 16 elements the "Li" and "Lt" measure have to be calculated by the following formula:

$$Li = [(n-1) \times 33] + 107 + (A1 + A2 + A3 + \dots)$$

$$107 = 53,5 + 53,5$$

n = Number of elements of flow divider

A1..An = heights of elements of flow divider

$$Lt = Li + 19$$

$$19 = 9,5 + 9,5$$

EXAMPLE: To obtain the measures Li and Lt of a flow divider with three elements (n=3), TYPE RV-1D /4,3 + 2,2 +0,9

Distance between fixing ports

$$Li = [(3-1) \times 33] + 107 + 54 + 46 + 41,5 = 314,5 \text{ mm}$$

Total lenght

$$Lt = 314,5 + 19 = 333,5$$

In **table 3** the number of inlets in fuction of the number of elements are indicated.

For flow dividers with many inlets, as they are all communicating it is even possible to use only one of them, by plugging the other ones.

We suggest to make full us at least of **1** inlet every **40 l/min** capacity.

To obtain errors of division **inferior to 3%** there must be no difference of pressure between the elements superior to **30 bar**. To obtain high precisions the respect of the following parametres is also important:

- Enviroment temperature: -10°C ÷ +60°C
- Hydraulic oil based on hlp, hv (din 51524) minerals
- Oil filtering 10 ÷ 25 µ

- Oil temperature: +30°C ÷ +60°C
- Oil Viscosity 20 ÷ 40 cSt

Flow divider with **single phase correction valve** common to all the elements
(external or internal drain)

Code:

9RS	NN	M	CC
-----	----	---	----

9RS	Type of flow divider
NN	Number of elements
M	Code of setting range of the valves
CC	Code of the displacements of the elements

Table "M"

C	10 ÷ 105 bar
D	70 ÷ 210 bar
E	140 ÷ 350 bar

Example: Flow divider with 2 elements with equal displacements

RV-1S / 3,8 x 2 WITH VALVE 10÷105 bar

9RS	02	C	25
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Example: Flow divider with 4 elements with different displacements (max 7)

RV-1S / 3,8+4,9+4,9+6,5 WITH VALVE 70÷210

9RS	04	D	25	29	29	32
-----	----	---	----	----	----	----

NOTE: to codify flow dividers with different displacements with more than 7 elements please ask our sales department.

Table: 1

TYPE RV-1S	CC	p. max. bar	Capacity of one element l/min		
Cm³/rev	Code		MIN	RECOMMENDED	MAX
0,9	16	220	1	2	6
1,2	17	220	1,5	3	7
1,7	18	220	2	4	9,5
2,2	20	220	2,5	5	13
2,6	21	220	3	6	16
3,2	23	220	3,5	7	19
3,8	25	220	4,5	8	22,5
4,3	27	220	5	9	26
4,9	29	220	5,5	11	29
5,9	31	220	6,5	13	30
6,5	32	220	7,5	14	33
7,8	34	210	8,5	17	38
9,8	36	200	11	22	38

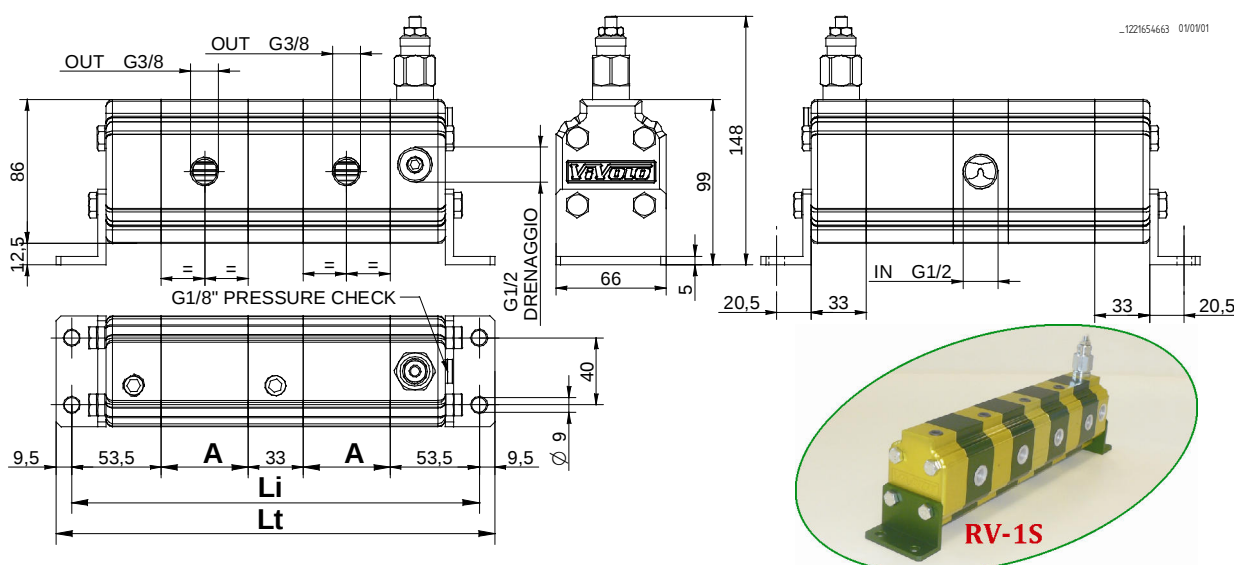


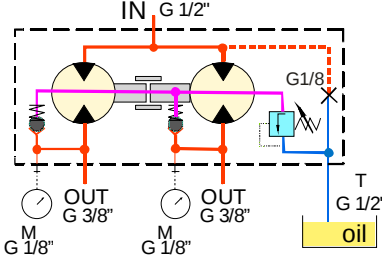
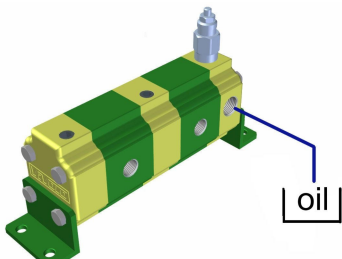
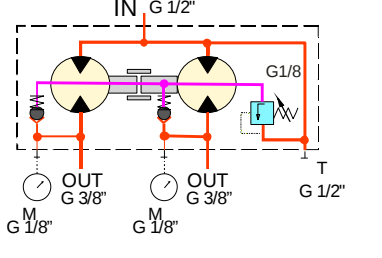
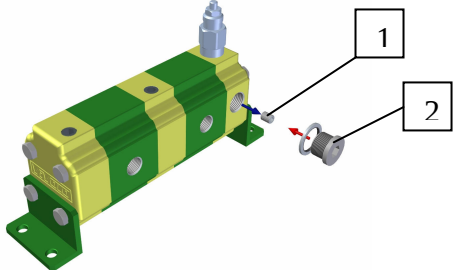
Table: 2

TYPE RV-1D	A	Li = Distance between fixing ports (with equal displacements)														
Cm³/rev		Number of elements														
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0,9	41,5	223	297,5	372	446,5	521	595,5	670	744,5	819	893,5	968	1042,5	1117	1191,5	1266
1,2	42,5	225	300,5	376	451,5	527	602,5	678	753,5	829	904,5	980	1055,5	1131	1206,5	1282
1,7	44	228	305	382	459	536	613	690	767	844	921	998	1075	1152	1229	1306
2,2	46	232	311	390	469	548	627	706	785	864	943	1022	1101	1180	1259	1338
2,6	48	236	317	398	479	560	641	722	803	884	965	1046	1127	1208	1289	1370
3,2	50	240	323	406	489	572	655	738	821	904	987	1070	1153	1236	1319	1402
3,8	52	244	329	414	499	584	669	754	839	924	1009	1094	1179	1264	1349	1434
4,3	54	248	335	422	509	596	683	770	857	944	1031	1118	1205	1292	1379	1466
4,9	57	254	344	434	524	614	704	794	884	974	1064	1154	1244	1334	1424	1514
5,9	60,5	261	354,5	448	541,5	635	728,5	822	915,5	1009	1103	1196	1289,5	1383	1476,5	1570
6,5	63	266	362	458	554	650	746	842	938	1034	1130	1226	1322	1418	1514	1610
7,8	67	274	374	474	574	674	774	874	974	1074	1174	1274	1374	1474	1574	1674
9,8	76	292	401	510	619	728	837	946	1055	1164	1273	1382	1491	1600	1709	1818

Table 3 : in this table the number of inlets in function of the number of elements are indicated.

Number of elements	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
"IN" Number of inlets	1	2	2	2	3	4	4	4	5	6	6	6	7	8	8

Flow divider with **single phase correction valve** common to all the elements
(external or internal drain)

EXTERNAL DRAIN STANDARD BRAND PREDISPOSITION	INTERNAL DRAIN
Connect the drain port (T) to the tank	To predispose the divider to the internal drain, execute the following operations: 1. remove the G 1/8 dowel inside the drain port 2. with a 1/2 G plug, plug the drain port (T)
 	 

In **table 1** the functioning range of single flow divider elements is indicated.

The higher is the feeding capacity (q), the higher is the precision of flow division, but in opposition there are losses of loading and higher noise. Therefore we suggest to feed the elements with capacities equal or a few superior to the ones indicated in the column "**RECOMMENDED**".

Remember to verify the capacities even in phase of flow reunion.

The pressures indicated are to be considered as maximum of functioning, the flow divider is able to bear peaks of pressure 20% superior.

How to calculate the "Li" and "Lt" measures of flow dividers:

From **table 2** it is possible to obtain the "Li" measure for flow dividers up to 16 elements with equal displacements; for flow dividers with different elements or with more than 16 elements the "Li" and "Lt" measure have to be calculated by the following formula:

$$Li = [(n-1) \times 33] + 107 + (A1 + A2 + A3 + \dots)$$

$$107 = 53,5 + 53,5$$

n = Number of elements of flow divider

A1..An = heights of elements of flow divider

$$Lt = Li + 19$$

$$19 = 9,5 + 9,5$$

EXAMPLE: To obtain the measures Li and Lt of a flow divider with three elements (n=3), TYPE **RV-1S /4.3 + 2,2 +0,9**

Distance between fixing ports
Total lenght

$$Li = [(3-1) \times 33] + 107 + 54 + 46 + 41,5 = 314,5 \text{ mm}$$

$$Lt = 314,5 + 19 = 333,5$$

In **table 3** the number of inlets in fuction of the number of elements are indicated.

For flow dividers with many inlets, as they are all communicating it is even possible to use only one of them, by plugging the other ones.

We suggest to make full us at least of **1** inlet every **40 l/min** capacity.

To obtain errors of division **inferior to 3%** there must be no difference of pressure between the elements superior to **30 bar**. To obtain high precisions the respect of the following parametres is also important:

- Enviroment temperature: -10°C ÷ +60°C
- Hydraulic oil based on hlp, hv (din 51524) minerals
- Oil filtering 10 ÷ 25 µ

- Oil temperature: +30°C ÷ +60°C
- Oil Viscosity 20 ÷ 40 cSt

Flow divider with independent **phase correction** and **anticavitation valves** for each element (external or internal drain)

Code:

9RV	NN	M	CC
-----	----	---	----

9RV	Type of flow divider
NN	Number of elements
M	Code of setting range of the valves
CC	Code of the displacements of the elements

Table "M"	
A	7 ÷ 210 bar
B	105 ÷ 420 bar

Example: Flow divider with 2 elements with equal displacements
RV-1V / 3,8 x 2 WITH VALVE 7÷210 bar

9RV	02	A	25
-----	----	---	----

Example: Flow divider with 4 elements with different displacements (max 7)
RV-1V / 3,8+4,9+4,9+6,5 WITH VALVE 105÷420 bar

9RV	04	B	25	29	29	32
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NOTE: to codify flow dividers with different displacements with more than 7 elements please ask our sales department..

Table: 1

TYPE RV-1S	CC	p. max. bar	Capacity of one element l/min		
			MIN	RECOMMENDED	MAX
0,9	16	220	1	2	6
1,2	17	220	1,5	3	7
1,7	18	220	2	4	9,5
2,2	20	220	2,5	5	13
2,6	21	220	3	6	16
3,2	23	220	3,5	7	19
3,8	25	220	4,5	8	22,5
4,3	27	220	5	9	26
4,9	29	220	5,5	11	29
5,9	31	220	6,5	13	30
6,5	32	220	7,5	14	33
7,8	34	210	8,5	17	38
9,8	36	200	11	22	38

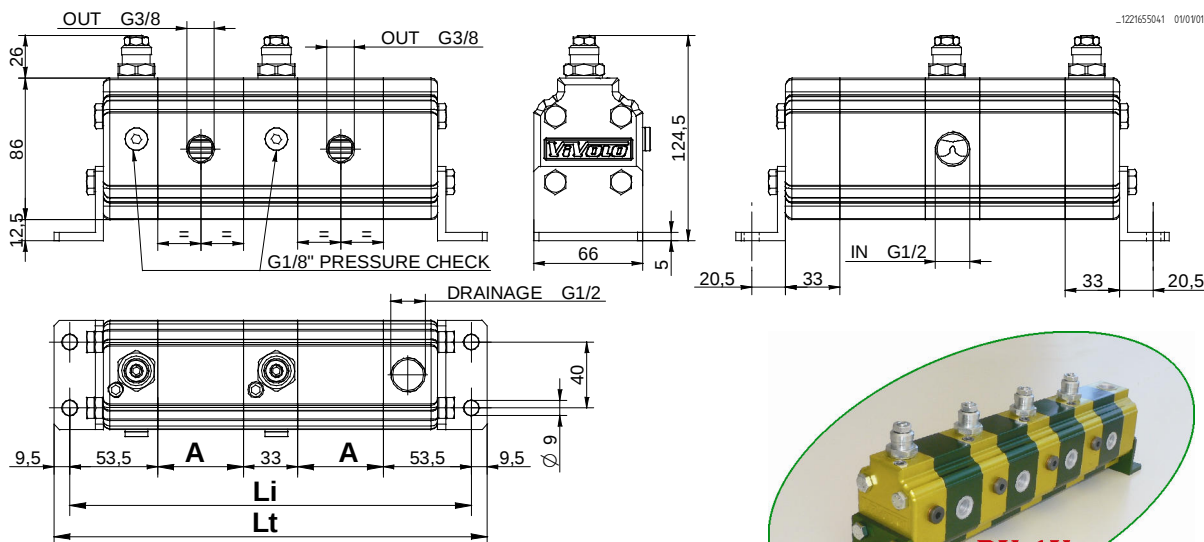


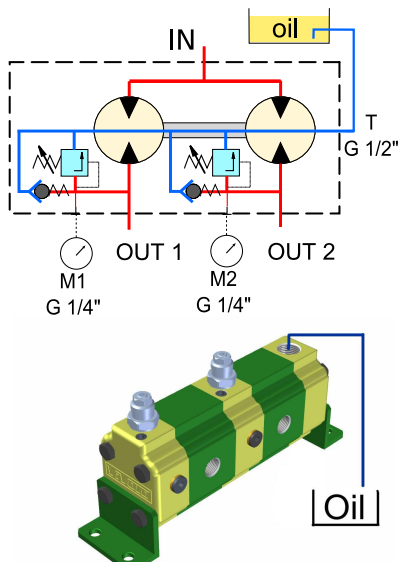
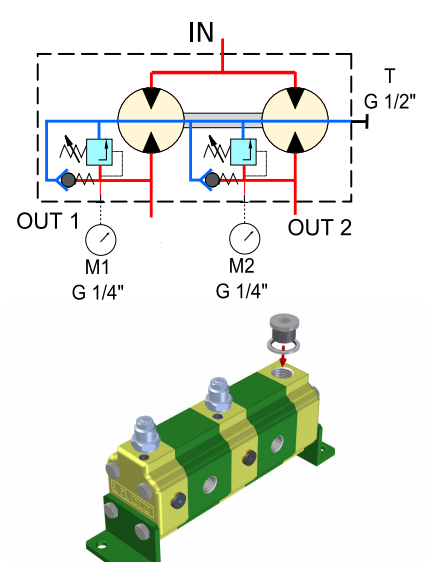
Table: 2

TYPE RV-1D	A	Li = Distance between fixing ports (with equal displacements)														
		Number of elements														
Cm³/rev		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0,9	41,5	223	297,5	372	446,5	521	595,5	670	744,5	819	893,5	968	1042,5	1117	1191,5	1266
1,2	42,5	225	300,5	376	451,5	527	602,5	678	753,5	829	904,5	980	1055,5	1131	1206,5	1282
1,7	44	228	305	382	459	536	613	690	767	844	921	998	1075	1152	1229	1306
2,2	46	232	311	390	469	548	627	706	785	864	943	1022	1101	1180	1259	1338
2,6	48	236	317	398	479	560	641	722	803	884	965	1046	1127	1208	1289	1370
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4,3	54	248	335	422	509	596	683	770	857	944	1031	1118	1205	1292	1379	1466
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6,5	63	266	362	458	554	650	746	842	938	1034	1130	1226	1322	1418	1514	1610
7,8	67	274	374	474	574	674	774	874	974	1074	1174	1274	1374	1474	1574	1674
9,8	76	292	401	510	619	728	837	946	1055	1164	1273	1382	1491	1600	1709	1818

Table 3 : in this table the number of inlets in function of the number of elements are indicated.

Number of elements	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
"IN" Number of inlets	1	2	2	2	3	4	4	4	5	6	6	6	7	8	8

Flow divider with independent **phase correction** and **anticavitation** valves for each element (external or internal drain)

EXTERNAL DRAIN <i>STANDARD BRAND PREDISPOSITION</i>	INTERNAL DRAIN
For the correct functioning of the flow divider, it has to be installed <i>under the oil level</i>. The drain tube has to pick up under the oil level and it has not to aspire air.	To predispose the divider to the internal drain, plug the ½ G drain port (T) Note:: with this configuration the function of anticavitation valves is annulled
	

In **table 1** the functioning range of single flow divider elements is indicated.

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Remember to verify the capacities even in phase of flow reunion.

The pressures indicated are to be considered as maximum of functioning, the flow divider is able to bear peaks of pressure 20% superior.

How to calculate the "Li" and "Lt" measures of flow dividers:

From **table 2** it is possible to obtain the "Li" measure for flow dividers up to 16 elements with equal displacements; for flow dividers with different elements or with more than 16 elements the "Li" and "Lt" measure have to be calculated by the following formula:

$$Li = [(n-1) \times 33] + 107 + (A1 + A2 + A3 + \dots)$$

$$107 = 53,5 + 53,5$$

n = Number of elements of flow divider

A1..An = heights of elements of flow divider

$$Lt = Li + 19$$

$$19 = 9,5 + 9,5$$

EXAMPLE: To obtain the measures **Li** and **Lt** of a flow divider with three elements (n=3), TYPE **RV-1V /4.3 + 2,2 +0,9**

Distance between fixing ports

$$Li = [(3-1) \times 33] + 107 + 54 + 46 + 41,5 = 314,5 \text{ mm}$$

Total lenght

$$Lt = 314,5 + 19 = 333,5$$

In **table 3** the number of inlets in fuction of the number of elements are indicated.

For flow dividers with many inlets, as they are all communicating it is even possible to use only one of them, by plugging the other ones.

We suggest to make full us at least of **1** inlet every **40 l/min** capacity.

To obtain errors of division **inferior to 3%** there must be no difference of pressure between the elements superior to **30 bar**. To obtain high precisions the respect of the following parametres is also important:

- Enviroment temperature: -10°C ÷ +60°C
- Hydraulic oil based on hlp, hv (din 51524) minerals
- Oil filtering 10 ÷ 25 µ

- Oil temperature: +30°C ÷ +60°C
- Oil Viscosity 20 ÷ 40 cSt

Vivoil grows and renews itself....



External view



Main entrance



Main front



Manager's office



Metrological room



1st floor waiting-room



Mounting-testing



Workings

