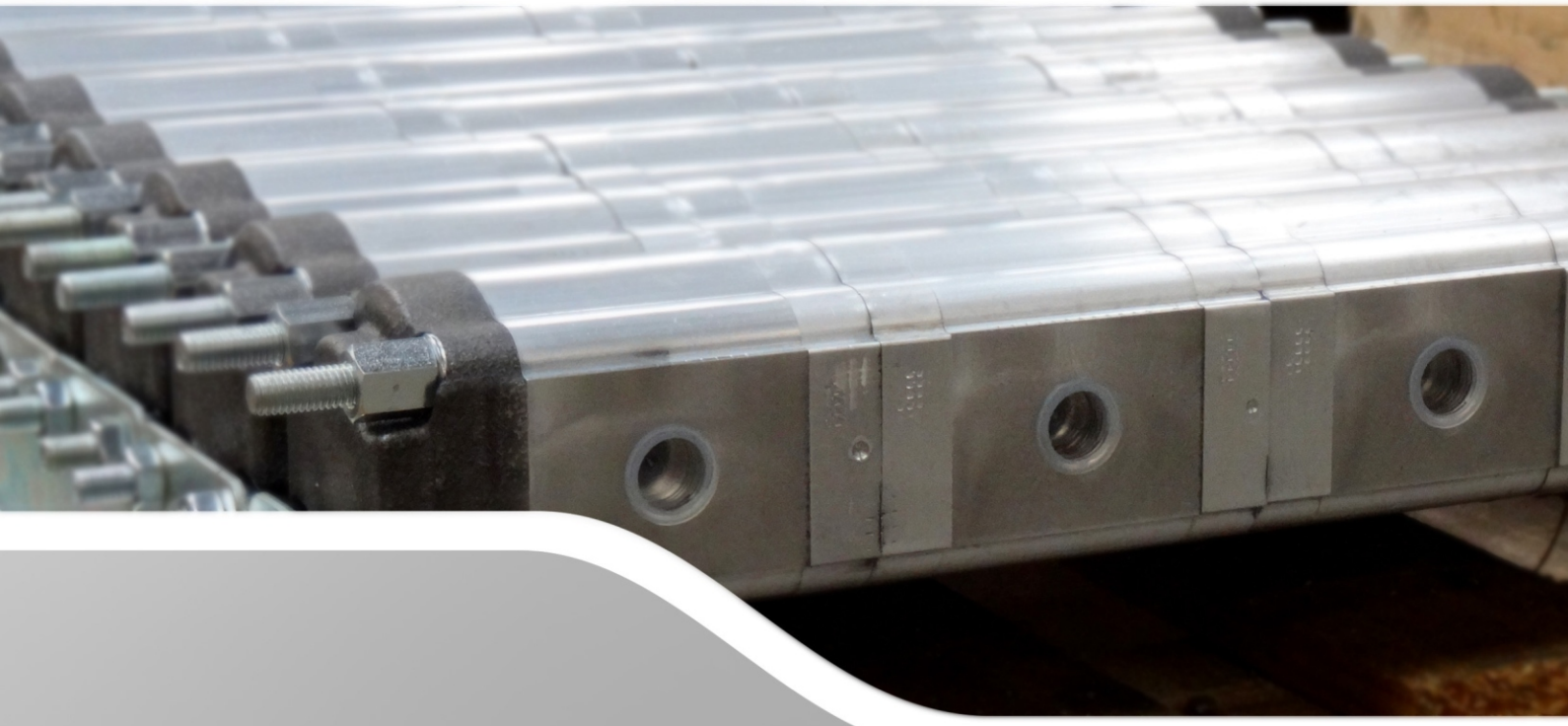
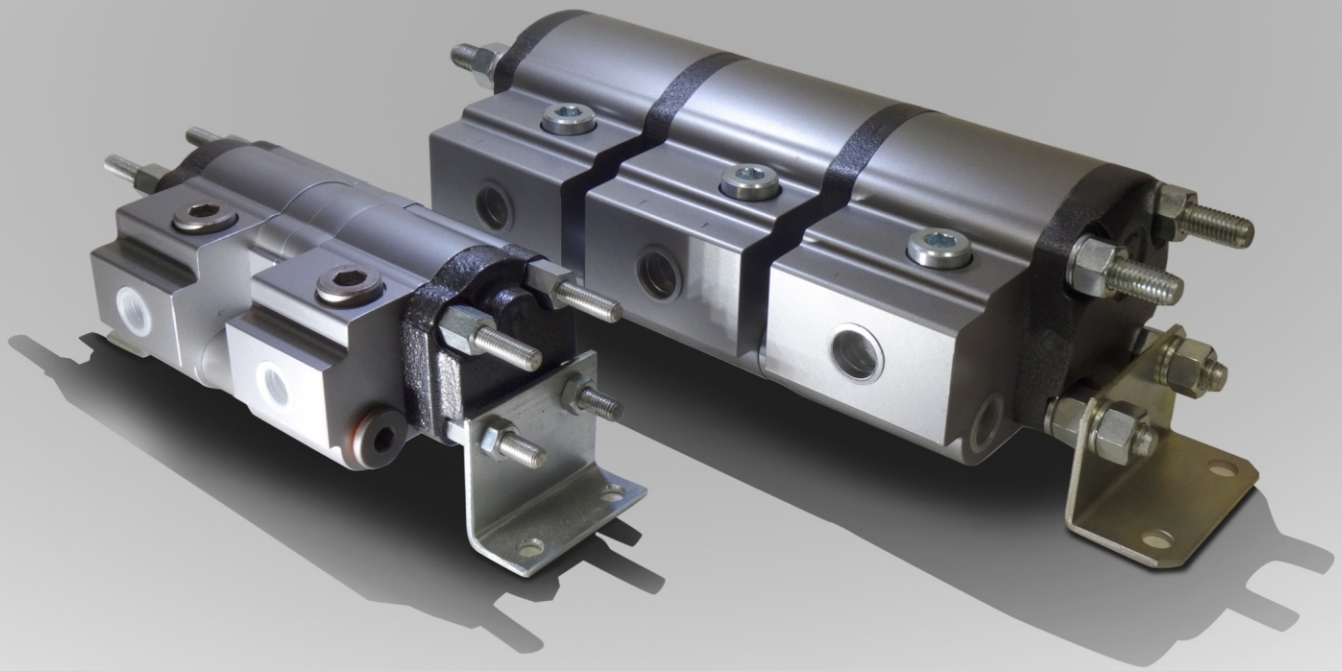




CAST IRON AND ALUMINIUM FLOW DIVIDERS

DIVISORI DI FLUSSO IN GHISA E ALLUMINIO

MADE IN ITALY

REV MARZO 15

Enlarged program in flow-dividers with aluminium and cast-iron boxes.

We started in developing flow-dividers on customer's demands. Based on our experience in this new technique, we decided the issue of this "wide range products" catalogue:

- Aluminium-flow-dividers in 2 sizes starting from approximately 3,5 ccm/rev. up to 31 ccm/rev. The units come out of our pump program Z1 and Z2 using special extras for flow dividers.
- Cast-iron flow-dividers in 2 sizes starting from approximately 35 ccm/rev up to 150 ccm/rev

Technical details for the use of gear flow-dividers.

Flow-dividers aren't hydraulic driving devices like pumps or motors, although they have been developed using many components of them. Their function is to avoid a hydraulic drawback. By feeding several motors or cylinders with a single oil flow, only the motor or cylinder with the lowest resistance will run.
Only by resistance increasing due to a higher load or end-stroke, the oil will drive the next device.
As a consequence all connected motors/cylinders may run one after another, but a synchronous rotation or stroke will be never achieved.
Working under different loads is the most normal application; working with the same load is the minority.
These **disadvantages** can be avoided without using synchronisers (flow-dividers belong to them) only under the following conditions:

- Use of 1 motor or cylinder only without synchronisation. Surely not realistic often.
- Mechanic synchronisation by guiding elements with the risk of seizing, friction and damages.
- Serial connection of 2 or more cylinders with rods on both sides. Generally this solution is not accepted because you start loosing part of the synchronism bringing the three cylinders one after the other from 0 bar to load pressure. Cylinders with 2 rods have to be projected with bigger diameters and cost in general is higher than gear flow-dividers.
- Flow-regulator valves or throttles in every cylinder. These valves are pressure dependant. The synchronisation is worse than with gear flow-dividers. You can never achieve it because you often need to regulate the valves, which is not acceptable if you want to change the flows during the work-cycle.
- Other solutions, far from gear flow-dividers, need the same loads on the working cylinders. This is rather impossible to fulfil in the daily duty. Friction or other loads can cause the loss of the exact load-balance destroying important parts of the machine.

The gear flow-dividers have the following **advantages**:

- Good synchronisation, compared with other solutions (described above)
- No adjustment or setting is necessary after the first installation.
- The synchronization is acceptable even with big load differences on the working cylinder. (You can discuss your application with our technical office) (see the tel number in the last page).
- Flow-dividers work within a wide range of oil-flow, not only in a pre-setted flow like the flow regulator valves.

Besides the job as synchroniser, flow-dividers are used today as:

- Oil-dividers for bearing-lubrication
- Pressure-multiplier

Item 1:
We supply special flow-dividers with external shafts, where you can install impulse-counters. So it is possible to have a good flow-supervision to know that bearing-lubrication is working well.

Item 2 :
The flow-divider-design can create pressure-multiplication, so that the output-pressure is higher than the input, If a 2 sectional flow-divider has a hydraulic resistance in 1 section and the second section runs at about 0 bar, the second section works as a motor and gives its torque to the first section. If we don't consider the efficiency and the inner Δp of the divider, we can create a double output-pressure with the disadvantage that you need double low-pressure oil-flow. 50 % of this flow goes back to the tank and cannot be used for other hydraulic functions.
The relatively low efficiency of this combination leads to an increase of pressure of about 35 % using 2 sections with the same displacement. That's why this pressure-multiplier is only used:

- If a big oil-flow is installed in the machine and consequently the loss of a small quantity of oil for high pressure doesn`t create problems. Specially very successful, if you need high pressure at nearly 0 l/min high pressure flow!
- Cheap producing of high pressure if a low-pressure oil-flow already exists and the high-pressure oil flow is only needed when the other circuit doesn't work.

Although the pressure-increase is only 35% using two equal displacements, you can create much higher pressure-multiplication in enlarging the displacement in the „driving" low-pressure-section. So you can reach for example 240 bars out of 30 bars. For this case you need not only 8 times bigger driver displacement, but due to efficiency about 13 times bigger one (connect more sections as driver).

Flow-dividers need a certain Δp to overcome the inner friction necessary for good synchronisation and the small inner leakage from section to section (further details see next pages). This can be a disadvantage specially using plunger-cylinders where the pressure to press back the cylinders under load/weight is not big enough to produce the necessary pressure to turn the flow-divider. So it comes to a standstill. The solution is given by an additional section in the flow-divider, working as „driver". This driver gets full-pressure oil from the pump if the cylinders should go downwards by weight. The driven driver and the rest of small pressure in the cylinders turn back the flow-divider and the plungers return in starting position.

A general important point is that, all cylinders should press upwards and downwards always against the flow-divider. Specially if the flow-divider works joining all cylinder-flows into one flow, this detail is important!

This simple demand is often forgotten developing the system: cylinders are drawn by external mechanic forces quicker than pushed by the oil-flow. The synchronous running is often lost and the quick movement of the cylinder creates air-suction, because piping is leak proof with oil, but not tight enough for air-suction. Specially the pull-push movement creates this phenomenon. To solve these problems, please contact our consulting office.

Technical data and explanations of the gear flow-dividers

Synchro-errors

The most important fact using flow-dividers is to accept their synchro-errors, because – unfortunately they don't work 100 % accurately.
The degree of synchro running is dependant on:

- Pressure load variability
- Viscosity and temperature of the used fluid
- Pressure level of the system
- Speed of the chosen flow-divider
- Permanent or not permanent oil-flow.

Precise indications of synchronisation levels are only possible if the details of all parameters are known. Please consider that you can have different tolerances between flow-dividers of the same design and size.
Top results in the first flow-divider cannot be subject of complaints, if the next is not so precise.

To give ideas of synchronisation performance you should already accept the following conditions:

- Flow divider must run at minimum 1000 rpm.
- The load on all lifting cylinders should not be different.
- The used oil should have a viscosity of about 40 cSt, a constant oil-temperature and pressures between 100 and 210 bars.

A general indication may be obtained from the following values
±1,5 bis ±2,5 % synchro error using the aluminium flow-dividers
±2,5 bis ± 3,5 % synchro error using the cast iron flow-dividers
Cast iron flow-divider react more negative if there are differences in cylinder loads. The reason is that the aluminium dividers fraises a slight trace with the tooth-wheels in the aluminium bodies. This leads to better „sealing“ of the metallic parts, body and tooth-wheels. This doesn't happen with cast bodies due to the hardness of the material.
If you like it, we can make working-point simulations using flow-dividers with max. 4 sections. We measure the synchronisation with the flow and load-pressure you give us. The load-pressures, like in your application, can differ according to your need.
If you need these special tests please contact our technical office...

Pressure drop

The flow-dividers are equipped with self-moving axial bearing-plates to achieve good synchronisation. They are pressed against the tooth-wheels by the system pressure of the input. This creates a Δp of about 10-12 bar between input and output. We could create, as a special solution, flow-dividers without this pressure-balanced plates, but nearly all customers prefer to have a good synchronism and accept the Δp.
An additional section working as a „driver“ could offer a solution too.

Minimal flow

Gear-pumps and motors normally are high speed runners. We have created the possibility to run with 400 rpm only to make synchronisation for small flows, but you should work with minimum 1000 rpm to get good synchronisation

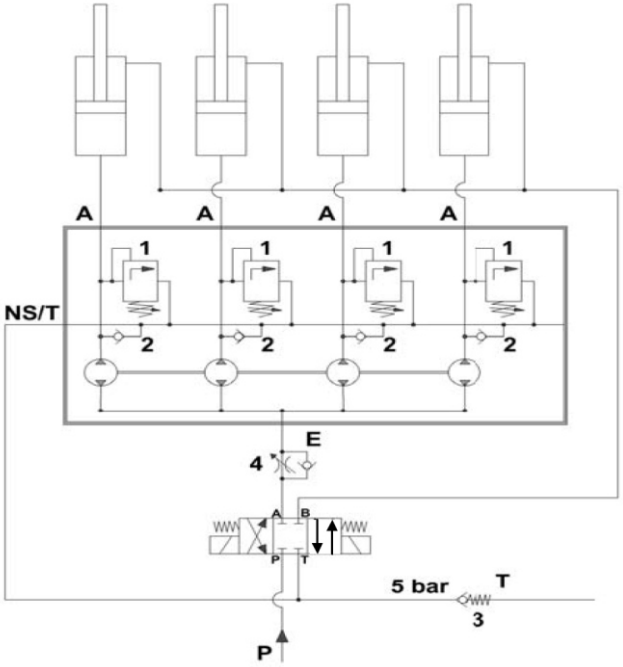
Limits: minimum speed - maximum speed

These limits lie normally between 700 rpm and 2.300 rpm using aluminium flow-dividers.
The cast iron flow-dividers afford a minimum speed of 1000 rpm.

Synchro error elimination

A good synchronisation can be achieved by quick error elimination at the stroke-ends. The error-elimination only by oil-leakage between the sections is slow and not so precise. We suggest to equip each section with a pressure-relief-valve and a check-valve according to the hydraulic circuit you see on the next page.
The thick black line means the flow-divider with these valves incorporated.
The pressure relief valves have the further function of safety-valves, because there is no other safety between flow-divider outputs and cylinder inputs (maybe dangerous due to the pressure multiplier effect using multi-section-flow-dividers)
Check-valves are even more important than the pressure relief valves. They allow the input of low-pressure oil into the sections when the flow-divider works as a “collector” of oil of the working cylinder. This happens normally if the cylinders are on return-moving. Without this circuit, the cylinder, being the quickest, would have, at stroke end, the disadvantage that the still running flow-divider driven by the other cylinders would suck oil out of the pipe, what automatically means cavitations and air sucking.
By the way: if you have directly a difference in stroke that doesn't grow during further movement of the cylinders, you have air in the system and the error is not caused by the flow-divider. The low-oil-feeding should lie between >1 bar and< 5 bar. The hope to get this oil by sucking it from the tank is an error, because already the spring-pretension of the check-valve is bigger than the potential to suck oil into the sections.

Typical hydraulic circuit using FDR..WV



1. ***pressure relief valves (safety + error-elimination at max-stroke-end).***
2. ***low pressure feed (not suction-line, as customer often say!) avoid cavitation and air-suckingt.***
3. ***pretension of return-oil to use it for low-pressure feed. pretension pressure 3 to 5 bar .***
4. ***brake“ to realize the function of the flow-divider as „collector“. stops the qicker return movement of the quickest cylinder in comparison to the others.***

Work with flow-dividers under special conditions

As you know, our company is not only components seller, but helps the customer to discuss the use of flow-dividers under „exotic“ conditions. It can be, that as result of these discussions we develop new special flow-dividers. We expect your inquiries for specialities.

Interesting and important details

End-covers generally made of cast-iron, because they are stronger with high pressures.
Max allowed pressures are higher than in former versions (see lists).
Axial bearing-plates for best synchronisation.
The single sections achieve generally an efficiency of > 97 %!
Bodies of the smaller series out of extruded aluminium.
Precisely machined tooth-profiles decrease noise, although gear-pumps and motors cannot be considered as extremely noisless machines.
We supply the dividers with viton-seals, too.
Assembly up to 12 sections. If you need 6 sections or more you can discuss the application with our technical office because longer tie rods, than standard lengths, to join all the sections. We allow very big pressure-differences between the sections. Several competitors limit these values much stronger. If there is a need to check these conditions in your application, please call us.
Test of each section in combination with load-simulation and synchronisation-measurement.
This is an advance that you don't find often.

Fluids

You should use the aluminium flow-dividers only with mineral oil (DIN 51524). Cast iron flow-dividers are recommended if you use other fluids, but, even in this case, we need your description of the used fluid.

Oil-temperature -10 degrees celsius up to +80 degrees celsius.

Oil-viscosity 20 to 120 cSt

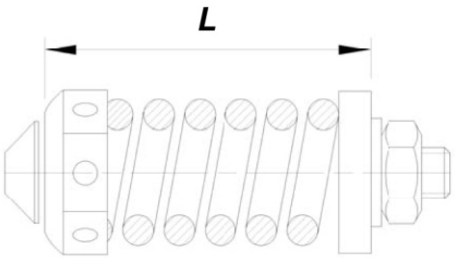
max viscosity at start: 700 cSt

filtration at <200 bar: pollution-class NAS 1638 : 10 µm
pollution-class ISO 4406 : 19/16 µm
ratio βx : 25 µm

filtration at >200 bar: pollution-class NAS 1638 : 9 µm
pollution-class ISO 4406 : 18/15 µm
ratio βx : 15 µm

Incorporated pressure- and check-valves in the flow-divider motor-bodies.

The advantages of incorporated a.m. valves have been discussed on the pages before. In the past, we offered solutions with adjustable pressure relief valves without any specialties. This solution had separate valve-blocs. They were expensive, leaking was more possible at connections and many customers haven't desired the easy adjustment of these valves by everybody. Maladjustment by not authorized people could create danger and damages. Then we presented the type with preset pressure valves – fix pressure. The disadvantage was, that the theoretical foreseen pressure should be changed after the first tests and the preset valves should have been changed by others.
The new solution is the mix of both. This length hasn't a big possible hysteresis. Stronger or weaker springs are marked by their colours.
After having installed the pressure, the cartridge is mounted within the section-body. A plug with weak spring for check-valve-function makes invisible the relief-valve, so that only insiders see the possibility to change the pressure-set.
Our customers appreciate this new solution, especially due to the possibility to hinder the disassembly of plugs by leaded wire-connections



BLACK SPRING "S"

Preset pressure	Spring lenght "L"
30	26.6
40	26.3
50	26
60	25.7
70	25.4
80	25.1

BLUE SPRING "B"

Preset pressure	Spring lenght "L"
60	27.2
70	26.9
80	26.6
90	26.3
100	26
110	25.7
120	25.4

RED SPRING "R"

Preset pressure	Spring lenght "L"
130	27.5
140	27.35
150	27.2
160	27.05
170	26.9
180	26.75
190	26.6
200	26.45
210	26.3
220	26.15
230	26.05
240	25.9
250	25.8
260	25.65
270	25.55
280	25.4
290	25.25
300	25.15

Technical data

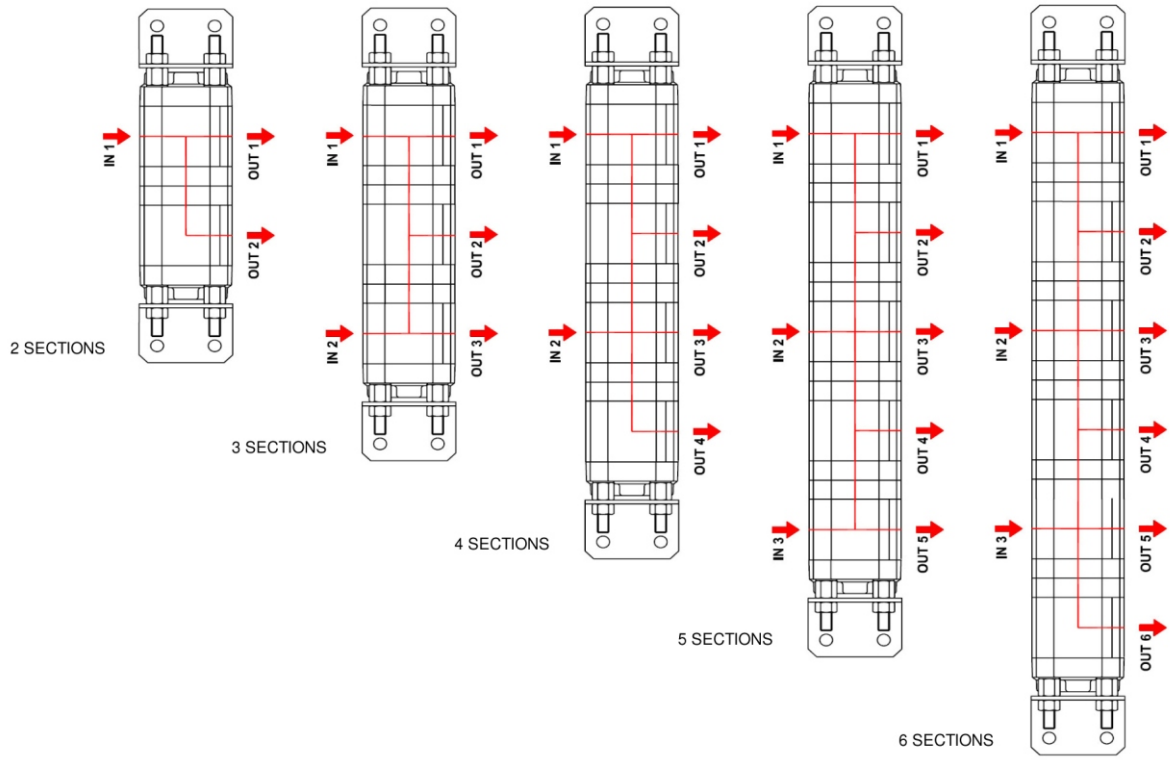
Type	Oil-flow each section (l/min)	Min.oil-flow each section (l/min)	Max.oil-flow each section (l/min)	Peak oil-flow each section higher noise (l/min)	Permanent pressure (bar)	Peak pressure (bar)	Max pressure difference between sections (bar)
Aluminium flow-divider							
FDRA1 - ... - 3,7	3,68	1,5	9	11	220	250	200
FDRA1 - ... - 4.2	4.19	1,7	10	12	220	250	200
FDRA1 - ... - 4,8	4,79	2	12	14	220	230	200
FDRA1 - ... - 5.5	5.49	2	12	16	180	220	190
FDRA1 - ... - 6,2	6,2	3	16	17,5	160	200	180
FDRA2 - ... - 6,3	6,28	3,5	16	18	280	300	200
FDRA2 - ... - 11,3	11,3	5,5	25	27	280	300	200
FDRA2 - ... - 14	14.45	7	31	34	280	300	200
FDRA2 - ... - 17	16,95	8,5	34	37	260	290	200
FDRA2 - ... - 25,8	25,75	12	48	53	190	220	150
FDRA2 - ... - 31	31,4	14	60	65	180	220	150
Cast iron flow-divider							
FDRC3 - ... - 35	34,3	18	74	83	270	290	200
FDRC3 - ... - 55	54,5	24	98	108	250	270	200
FDRC3 - ... - 80	78,7	50	135	142	230	250	200
FDRC4 - ... - 90	88,7	80	140	156	270	290	200
FDRC4 - ... - 110	105.4	95	160	180	260	280	200
FDRC4 - ... - 130	127,5	100	170	210	230	250	200
FDRC4 - ... - 150	149,7	140	200	250	190	220	180

Advantages of using cast iron bodies:

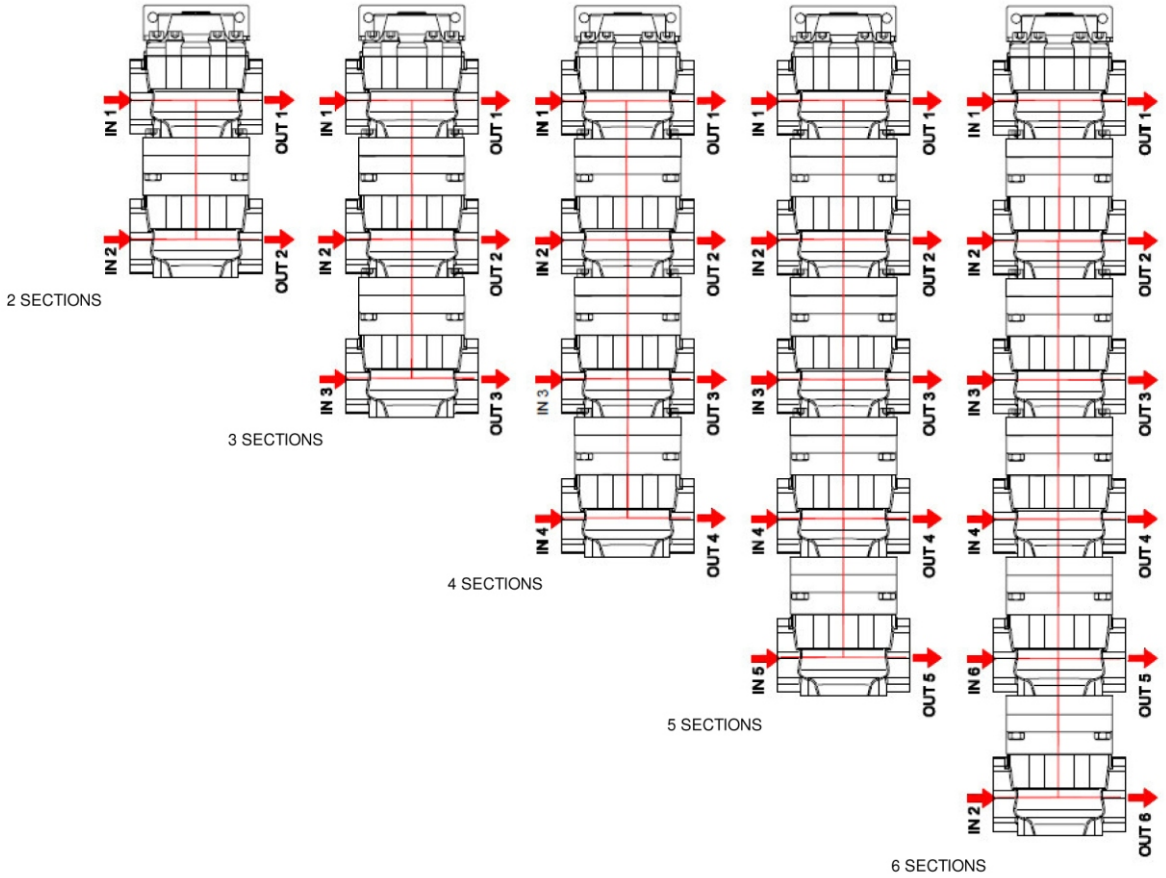
- Many industries where aluminium is not accepted .
- Running under low speed gives a better accepted noise than in the aluminium version.
- Cast iron is more rigid.
- Cast iron is necessary if you use other fluids than mineral oil.

Assembly of the gear flow-dividers FDRA (aluminium body)

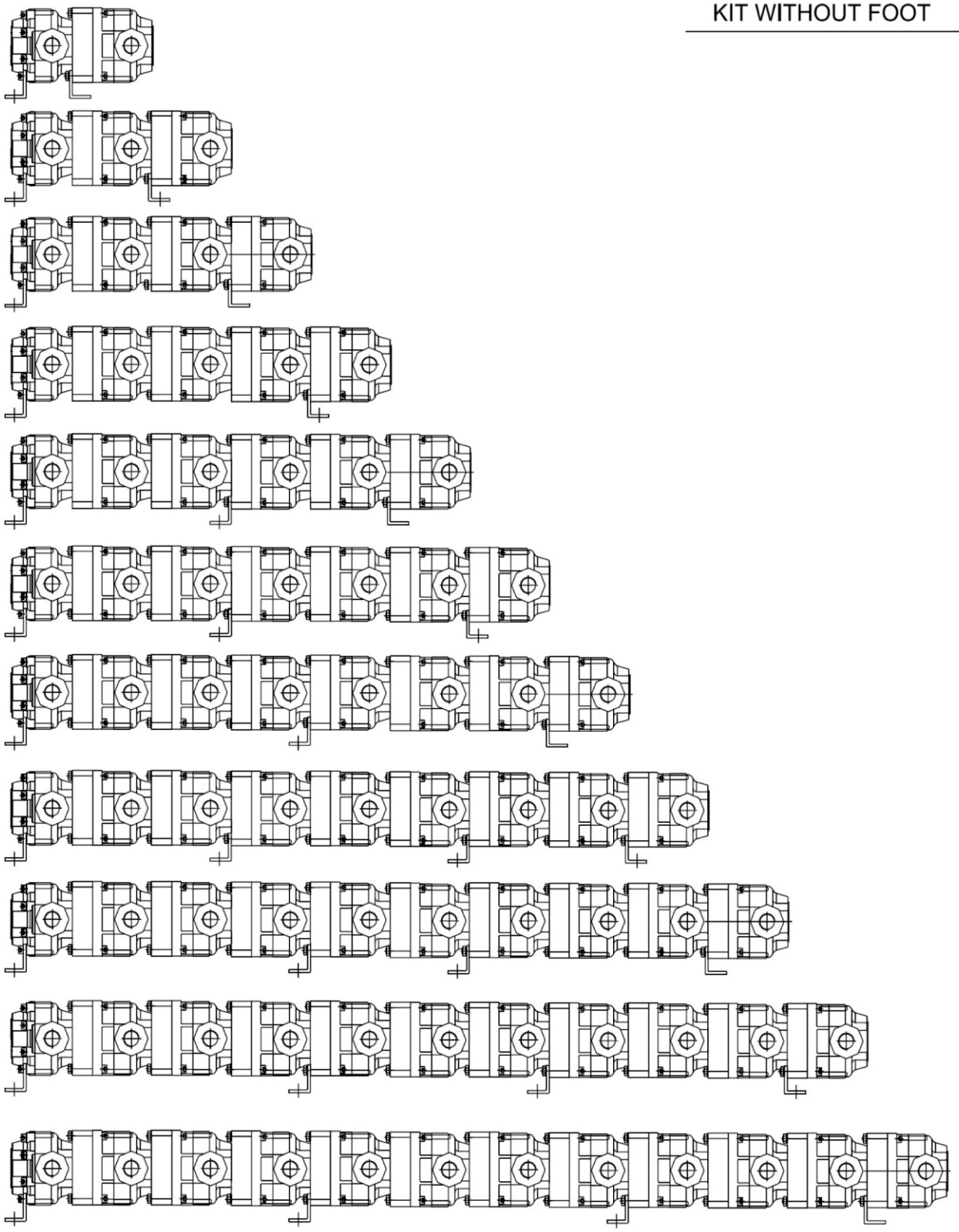
The single sections of the flow-dividers change continuously. We produce one section with the input connection and the following without the input connection as in the below drawing. Inside the flow-divider all sections are connected with their inputs. According to the total oil-input flow, you can choose to have some inputs, all inputs or only 1 input. The allowed Δp determinates how many inputs you can connect. The rest of open inputs is plugged.



Assembly of the gear flow-dividers FDRC (cast iron body)

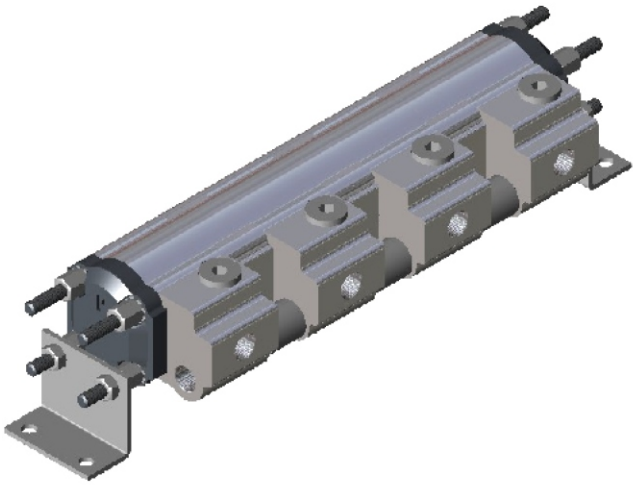


FLOW DIVIDERS W3 FEET SCHEME



KIT WITHOUT FOOT	KIT WITH FOOT	n° FEET
0	1	2
1	1	2
2	1	2
3	1	2
3	2	3
4	2	3
5	2	4
5	3	4
6	3	4
7	3	4
8	3	4

HOW TO ORDER



	1	2	3	4	5	6	7
FDR	A	0	2	11.3	3	NV	R

1	*BODY*	*CODE*
	ALUMINIUM	**A**
	CAST IRON	**C**

2	*OR*	*CODE*
	NBR (STANDARD)	**0**
	VITON	**V**

3	*GROUP*	*CODE*
	GR.1 *ALUMINIUM*	**1**
	GR.2 *ALUMINIUM*	**2**
	GR.3 *CAST IRON*	**3**
	GR.4 *CAST IRON*	**4**

4	*CAPACITY cm³*	*CODE*
	SEE PAGE 9	

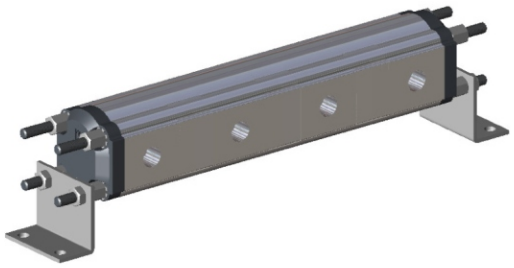
5	*N° SECTIONS*	*CODE*
	PUT N° OF SECTIONS REQUIRED	

6	*VALVES*	*CODE*
	NO VALVES	**NV**
	CON VALVOLE / WITH VALVES	**WV**

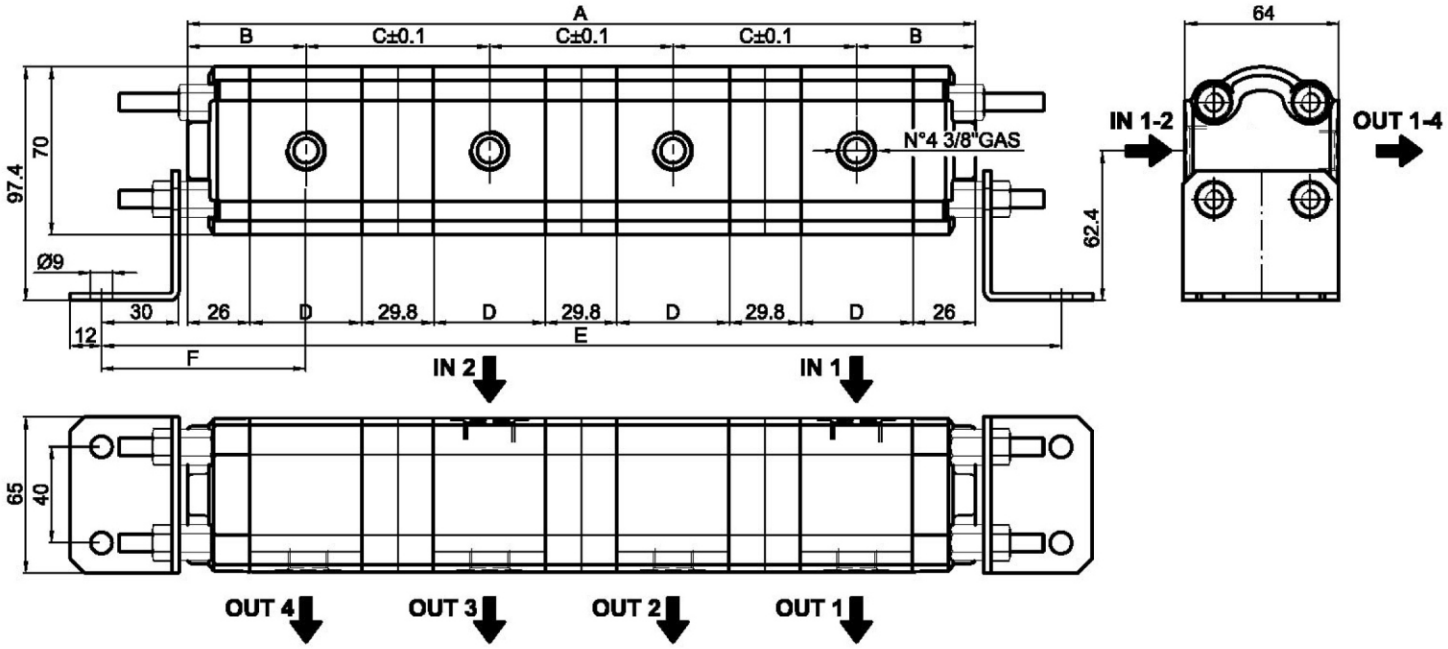
7	*VALVES TYPE*	*CODE*
	BLACK VALVE	**PAG. 8**
	BLUE VALVE	**PAG. 8**
	RED VALVE	**PAG. 8**

ALUMINIUM FLOW DIVIDERS SIZE 1

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.



FDRA 1 … 4 NV



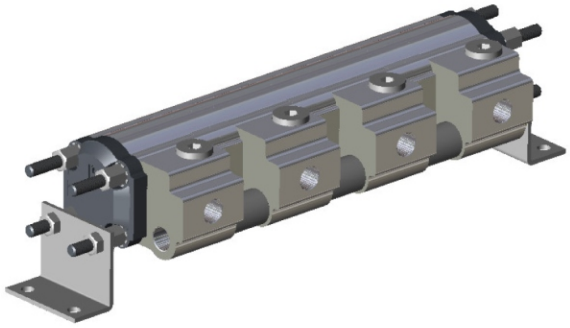
CONNECTIONS:

- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output

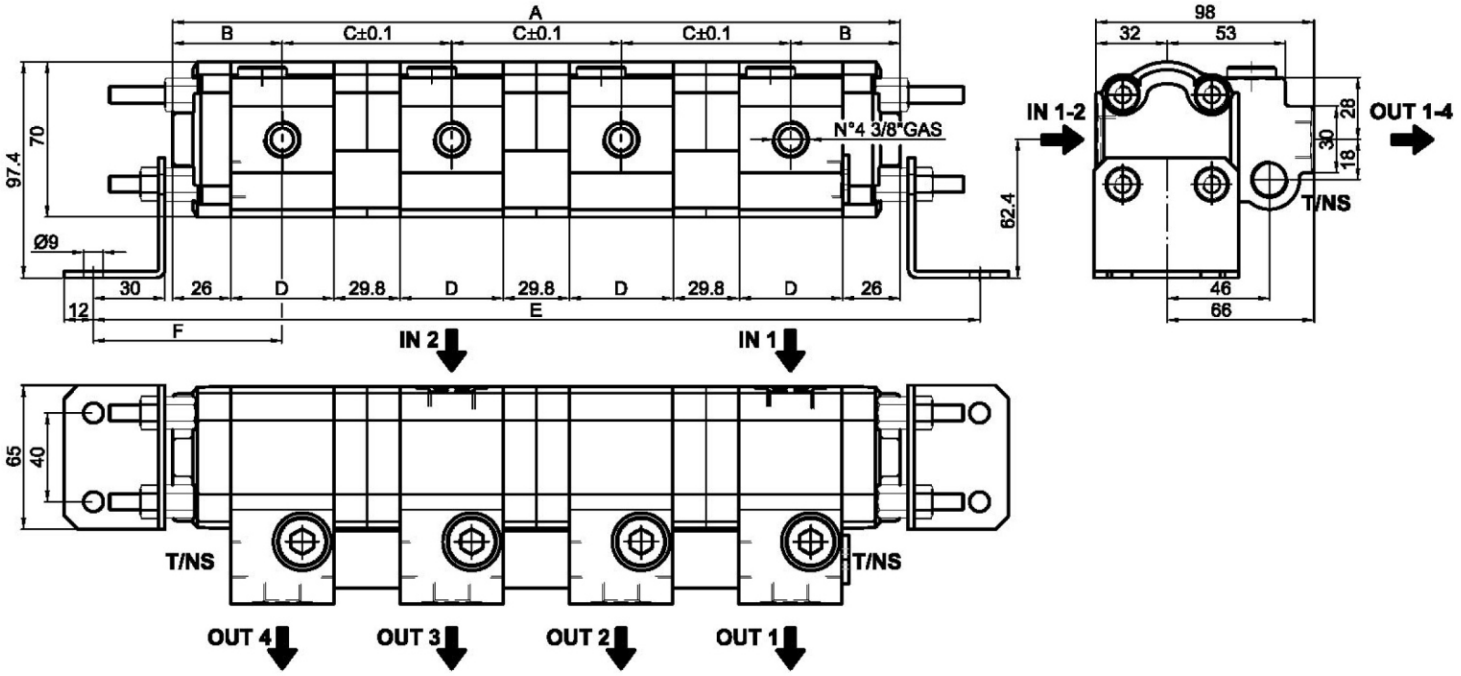
TYPE	CAPACITY	IN	OUT	A	B	C	D	E	F
FDRA 10 37	3.7	1/2 BSP	3/8 BSP	335.8	50.3	78.4	48.6	403.4	84.1
FDRA 10 42	4.2	1/2 BSP	3/8 BSP	346.6	51.3	80.4	50.6	410.4	83.1
FDRA 10 48	4.8	1/2 BSP	3/8 BSP	353.4	52.5	82.8	53	421	86.3
FDRA 10 55	5.5	1/2 BSP	3/8 BSP	364.6	53.9	85.6	55.8	429	85.7
FDRA 10 62	6.2	1/2 BSP	3/8 BSP	375.4	55.3	88.4	58.6	443.4	89.1

ALUMINIUM FLOW DIVIDERS SIZE 1

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.

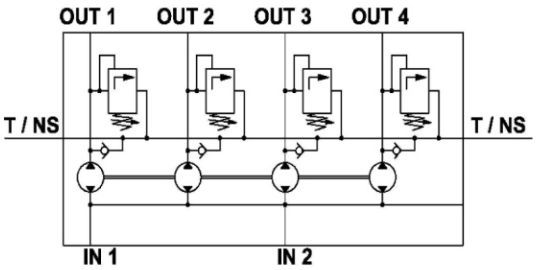


FDRA 1 … 4 WV



CONNECTIONS:

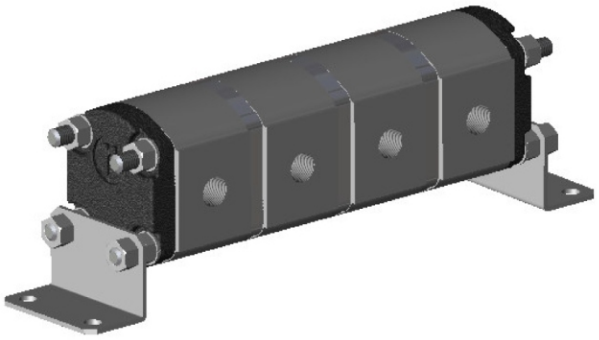
- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output
- T/NS: Tank and low-pressure-feeding



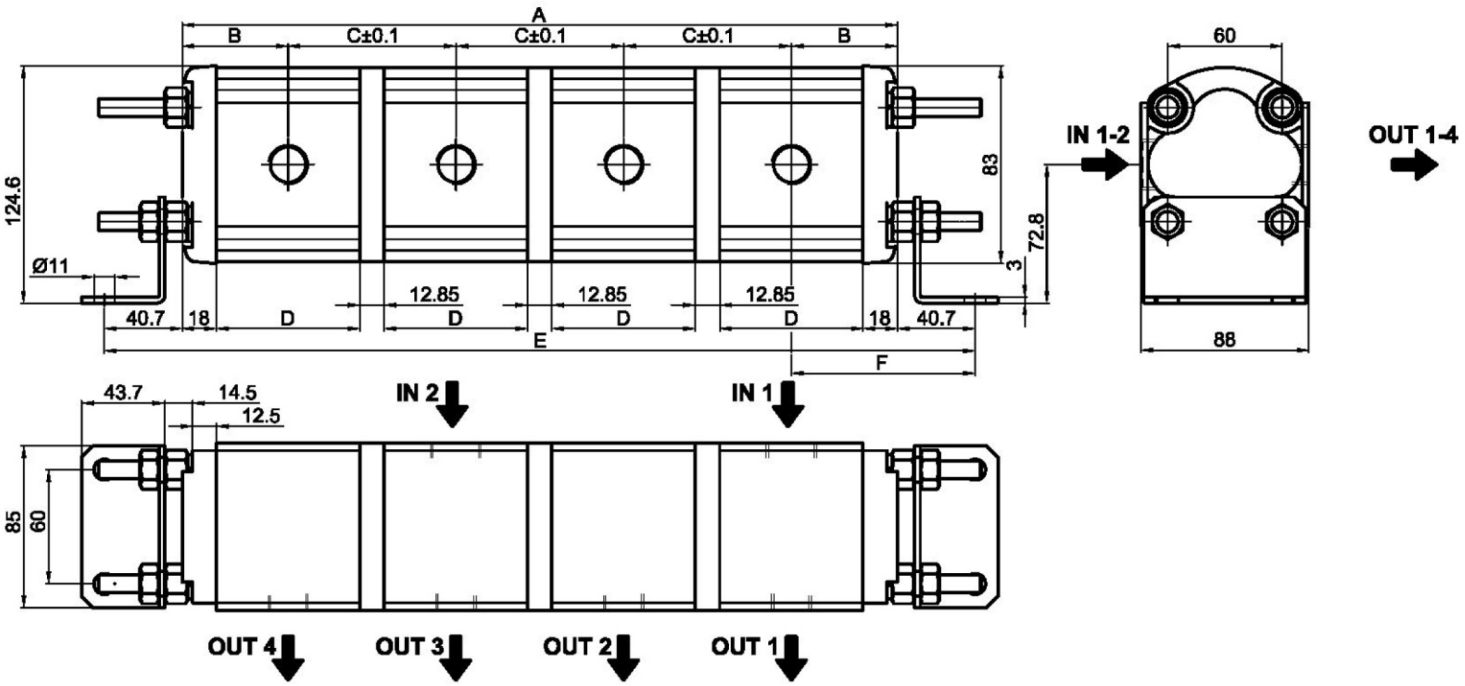
TYPE	CAPACITY	IN	OUT	T/NS	A	B	C	D	E	F
FDRA 10 37	3.7	1/2 BSP	3/8 BSP	3/8 BSP	335.8	50.3	78.4	48.6	403.4	84.1
FDRA 10 42	4.2	1/2 BSP	3/8 BSP	3/8 BSP	346.6	51.3	80.4	50.6	410.4	83.1
FDRA 10 48	4.8	1/2 BSP	3/8 BSP	3/8 BSP	353.4	52.5	82.8	53	421	86.3
FDRA 10 55	5.5	1/2 BSP	3/8 BSP	3/8 BSP	364.6	53.9	85.6	55.8	429	85.7
FDRA 10 62	6.2	1/2 BSP	3/8 BSP	3/8 BSP	375.4	55.3	88.4	58.6	443.4	89.1

ALUMINIUM FLOW DIVIDERS SIZE 2

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.



FDRA 2 … 4 NV



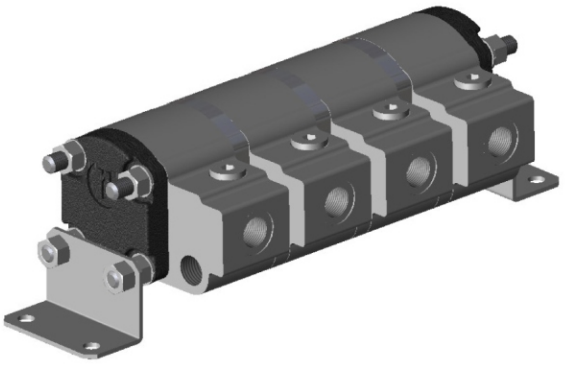
CONNECTIONS:

- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output

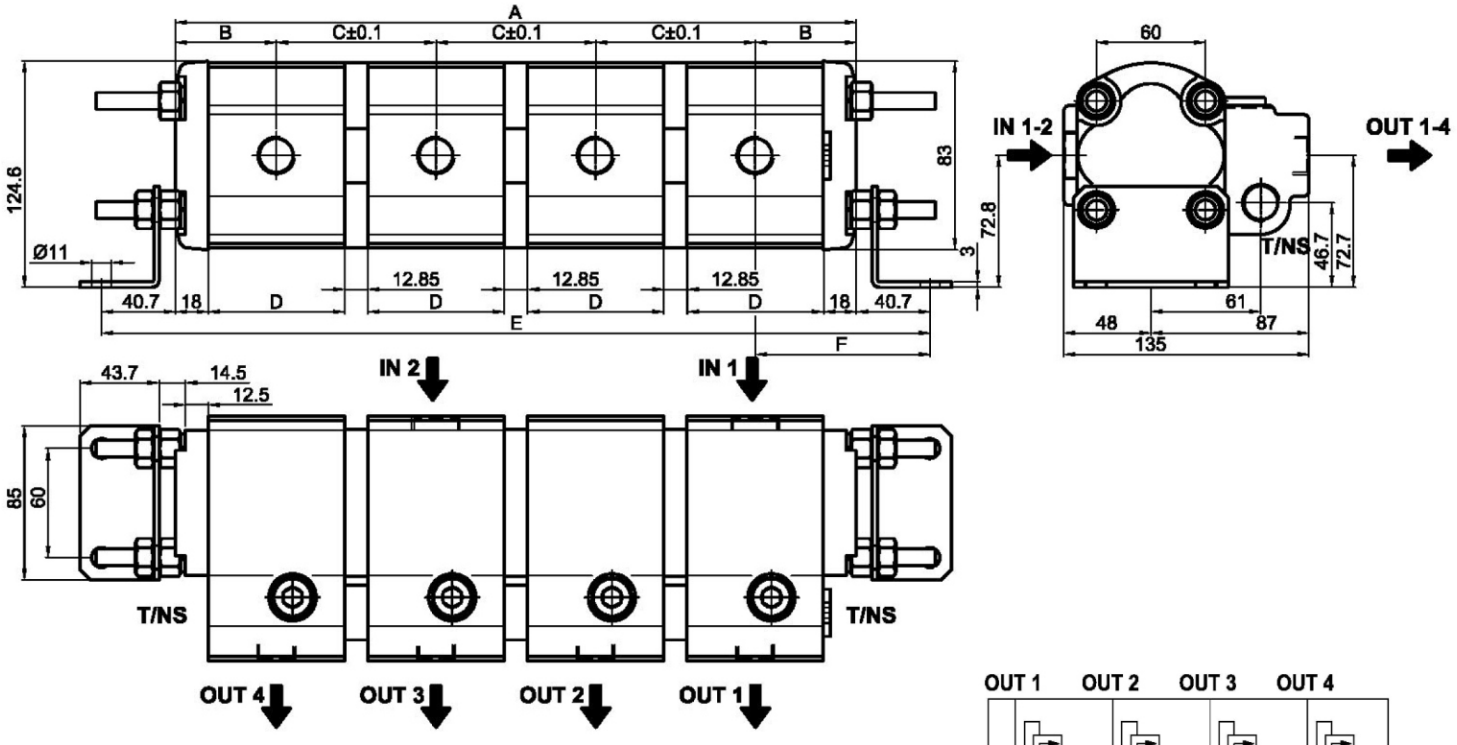
TYPE	CAPACITY	IN	OUT	A	B	C	D	E	F
FDRA 20 06	6	3/4" BSP	1/2" BSP	291	45	66,95	54,1	368	112,8
FDRA 20 11	11	3/4" BSP	1/2" BSP	355	53	82,95	70,1	432	93,8
FDRA 20 14	14	3/4" BSP	1/2" BSP	375	55.5	87.9	75.1	451	94.5
FDRA 20 17	17	3/4" BSP	1/2" BSP	391	57,5	91,95	79,1	468	98,3
FDRA 20 25	25	3/4" BSP	1/2" BSP	447	64,5	105,95	93,1	524	105,3
FDRA 20-31	31	1" BSP	3/4" BSP	483	69	114,95	102,1	560	109,8

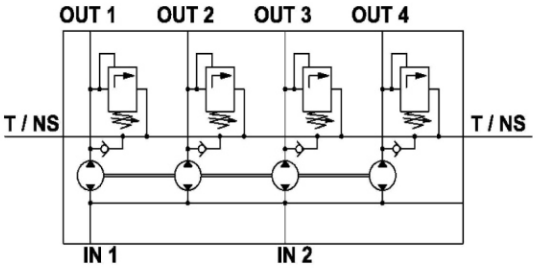
ALUMINIUM FLOW DIVIDERS SIZE 2

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.



FDRA 2 … 4 WV





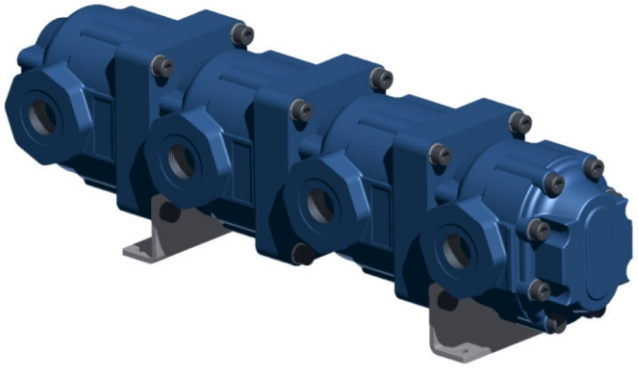
CONNECTIONS:

- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output
- T/NS: Tank and low-pressure-feeding

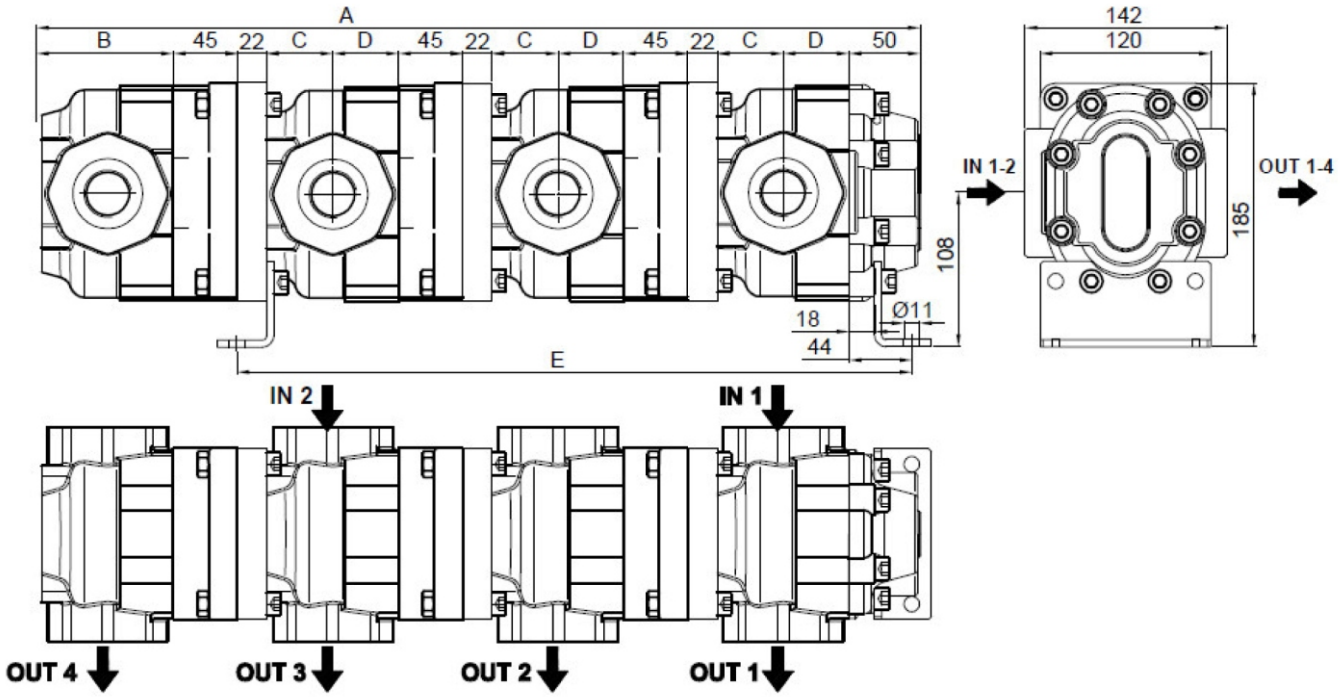
TYPE	CAPACITY	IN	OUT	T/NS	A	B	C	D	E	F
FDRA 20 06	6	3/4" BSP	1/2" BSP	1/2" BSP	291	45	66,95	54,1	368	112,8
FDRA 20 11	11	3/4" BSP	1/2" BSP	1/2" BSP	355	53	82,95	70,1	432	93,8
FDRA 20 14	14	3/4" BSP	1/2" BSP	1/2" BSP	375	55.5	87.9	75.1	451	94.5
FDRA 20 17	17	3/4" BSP	1/2" BSP	1/2" BSP	391	57,5	91,95	79,1	468	98,3
FDRA 20 25	25	3/4" BSP	1/2" BSP	1/2" BSP	447	64,5	105,95	93,1	524	105,3
FDRA 20-31	31	1" BSP	3/4" BSP	1/2" BSP	483	69	114,95	102,1	560	109,8

CAST IRON FLOW DIVIDERS SIZE 3

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.



FDRC 3 … 4 NV



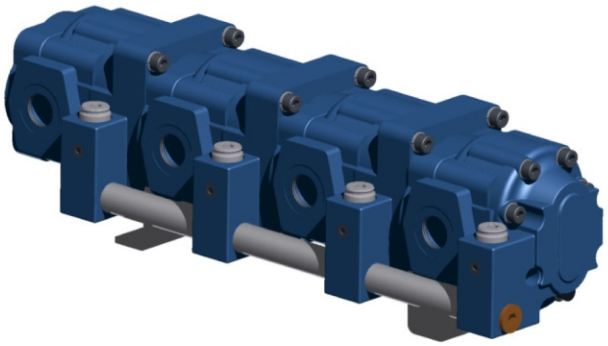
CONNECTIONS:

- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output

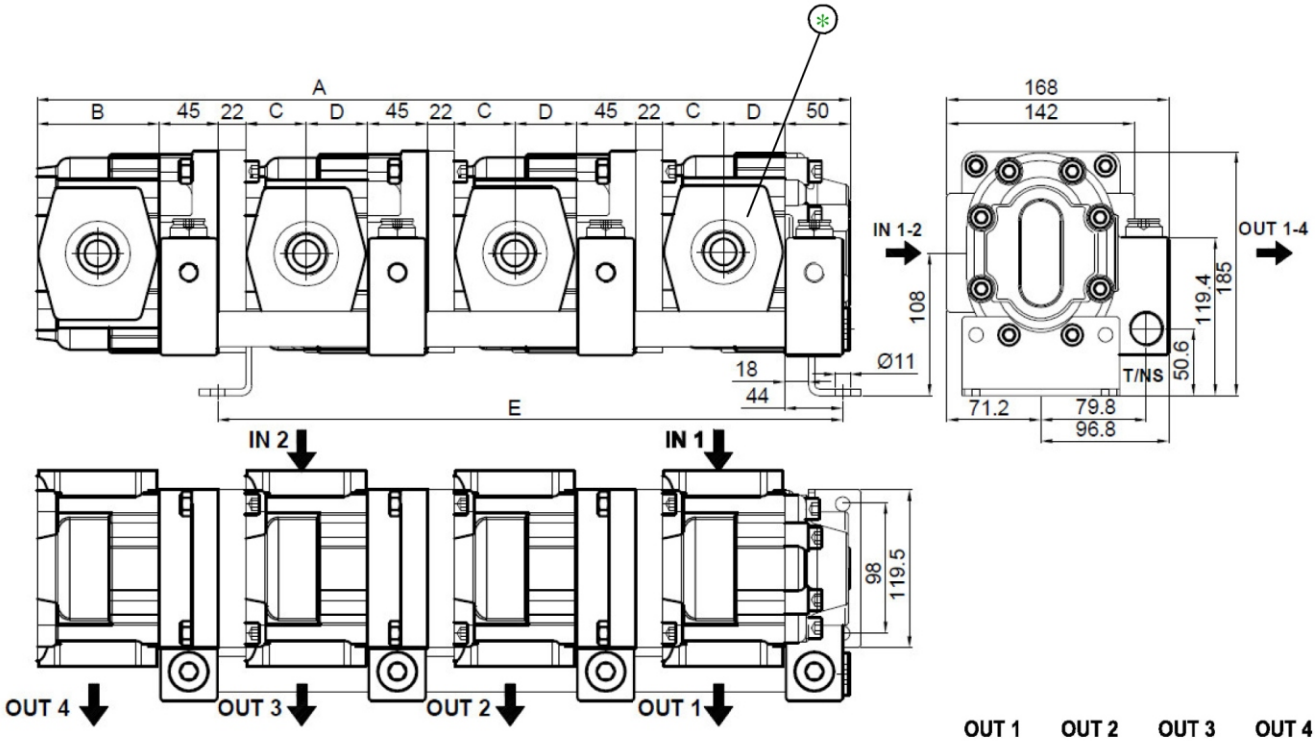
TYPE	CAPACITY	IN	OUT	A	B	C	D	E	F
FDRC 30 35	35	1"1/4 BSP	1" BSP	572,5	83	42,5	37	393,5	112,8
FDRC 30 55	55	1"1/4 BSP	1" BSP	624,5	96	42,5	50	432,5	93,8
FDRC 30 80	80	1"1/4 BSP	1" BSP	686,5	111,5	58	50	479	94.5

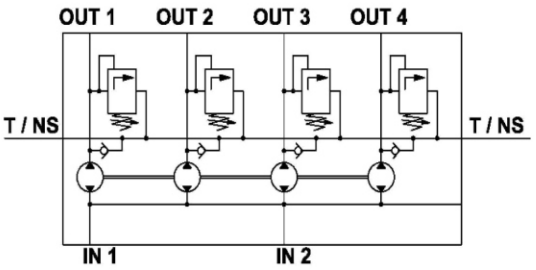
CAST IRON FLOW DIVIDERS SIZE 3

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.



FDRC 3 … 4 WV





CONNECTIONS:

- IN 1 to IN 2: Input
- OUT 1 to OUT 4: Output
- T/NS: Tank and low-pressure-feeding

TYPE	CAPACITY	IN	OUT	T/NS	A	B	C	D	E	F
FDRC 30 35	35	1"1/4 BSP	1" BSP	3/4" BSP	572,5	83	42,5	37	393,5	112,8
FDRC 30 55	55	1"1/4 BSP	1" BSP	3/4" BSP	624,5	96	42,5	50	432,5	93,8
FDRC 30 80	80	1"1/4 BSP	1" BSP	3/4" BSP	686,5	111,5	58	50	479	94.5

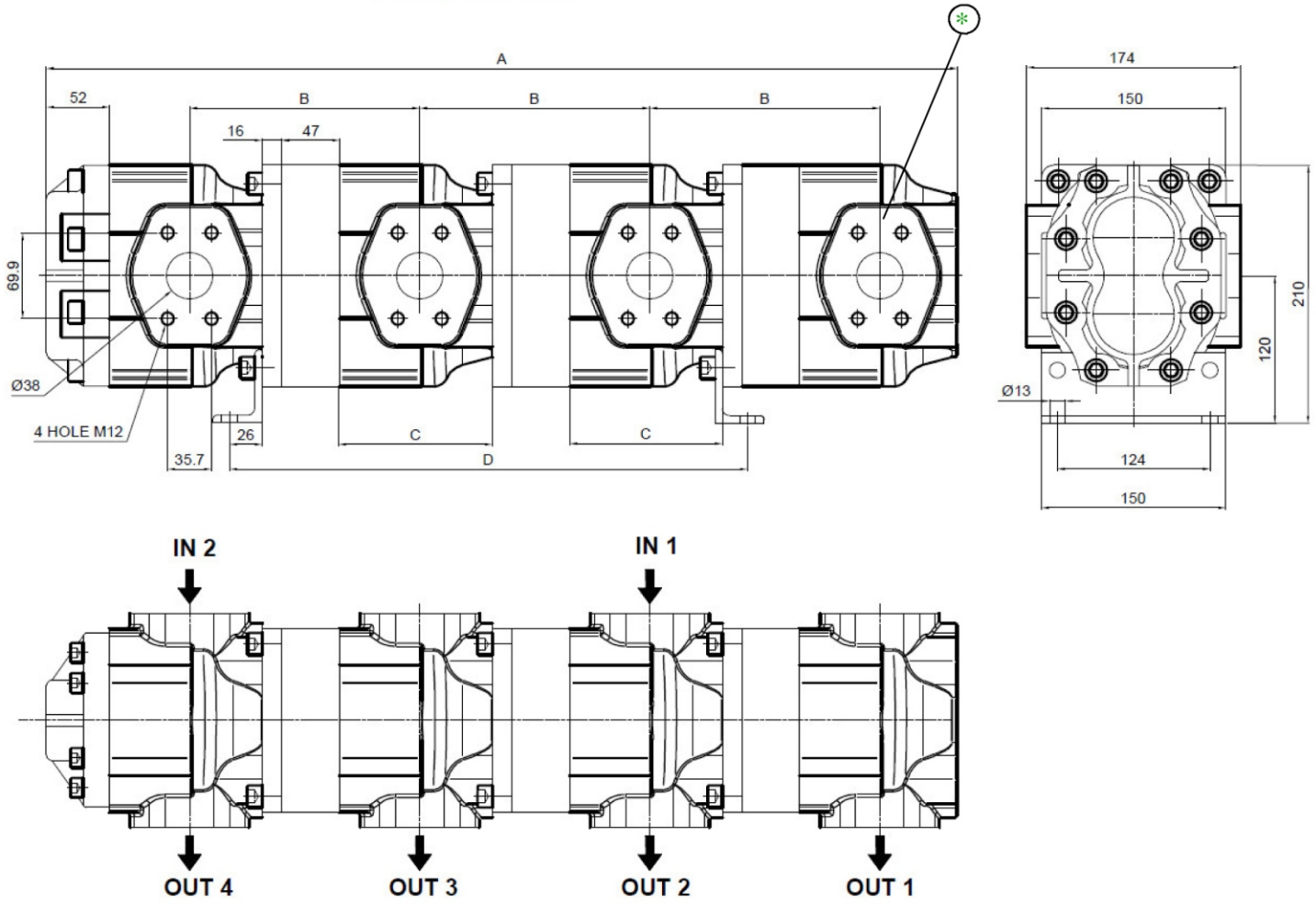
*** ALTRE TIPOLOGIE DI CONNESSIONI DISPONIBILI SU RICHIESTA**

**** OTHER INLET/OUTLET PORTS ARE AVAILABLE ON REQUEST***

CAST IRON FLOW DIVIDERS SIZE 4

Generally, we present the four section flow-divider. One or more sections can be easily added or removed according to personal needs. You can ask our technical office the exact dimensional drawing for the ordered type.

FDRC 4 … 4 NV



CONNECTIONS:

- IN 1 to IN 4: Input SAE 1" ½ 3000 psi
- OUT 1 to OUT 4: Output SAE 1" ½ 3000 psi

TYPE	CAPACITY	IN	OUT	A	B	C	D	E
FDRC 40 90	90	1"1/2 SAE-3000PSI	1"1/2 SAE 3000 PSI	667,5	167	101	381	162
FDRC 40 110	110	1"1/2 SAE-3000PSI	1"1/2 SAE 3000 PSI	693.5	174	108	401	192
FDRC 40 130	130	1"1/2 SAE-3000PSI	1"1/2 SAE 3000 PSI	711,5	178	112	403	192
FDRC 40 150	150	1"1/2 SAE-3000PSI	1"1/2 SAE 3000 PSI	747,5	187	121	421	210

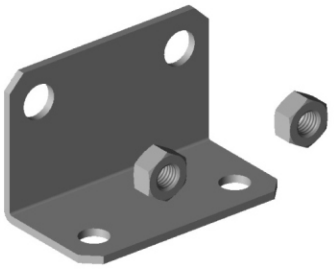
*** ALTRE TIPOLOGIE DI CONNESSIONI DISPONIBILI SU RICHIESTA**

**** OTHER INLET/OUTLET PORTS ARE AVAILABLE ON REQUEST***

FLOW DIVIDERS KITS

KIT FEET FOR SIZE 1

Code: K1000003



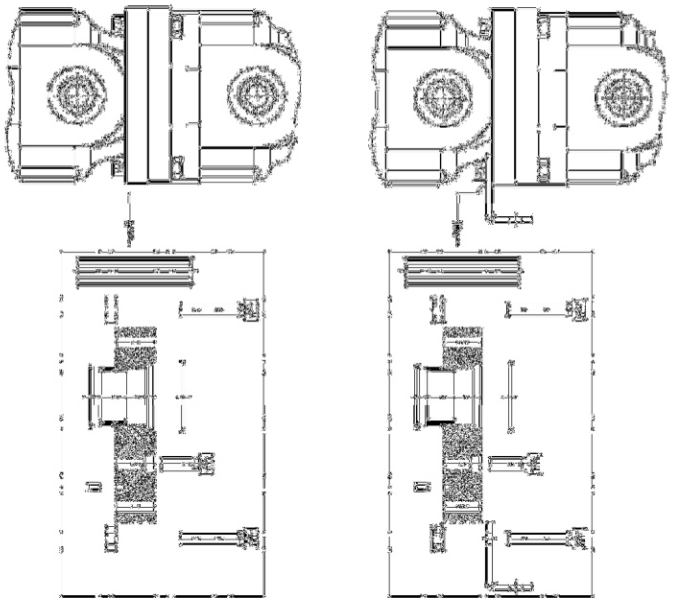
KIT FEET FOR SIZE 2

Code: K1000015

KIT FEET FOR SIZE 3

Code: K3000031 (without feet)

Code: K3000032 (with feet)



KIT FEET FOR SIZE 4

Code: K4000002 (without feet)

Code: K4000003 (with feet)