

**PARTS IN BODY**  
**PRESSURE CONTROL VALVES**



**PRESSURE CONTROL VALVES**

**INTRODUCTION**

**PROPORTIONAL IT PRESSURE REDUCING VALVES**

The proportional IT pressure reducing valves, are made to remotely control directional control valves with hydraulic actuators or to control variable displacement pump regulator devices.

Thanks to the special architecture that enables all the components to be build into the electro-proportional coil, the IT pressure reducing valves are very compact having a flange mounting assembly, this solution does not require any machining of the cavity.

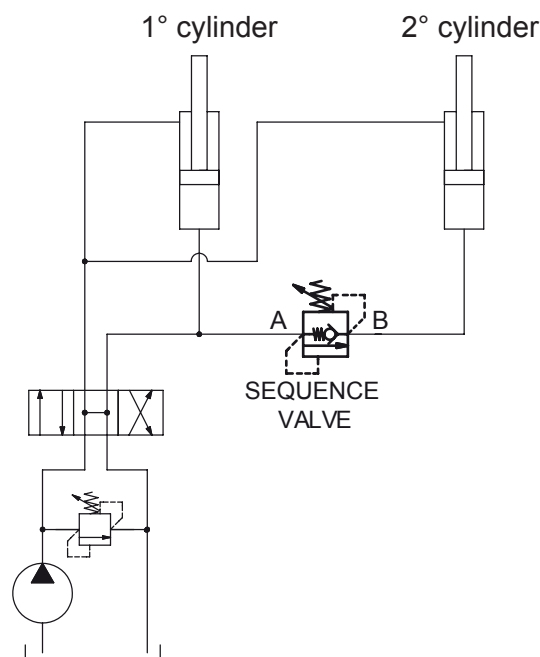
Feeding the coil with current (PWM 120Hz) from “0” to “I max” it is possible to create a proportional increase of the regulated pressure in the V port.

Besides the IT27 version, as a single components, we can offer solutions that are already assembled into a body with CETOP 2 and CETOP 3 flanging or for in-line assembly.

**IN LINE SEQUENCE VALVES**

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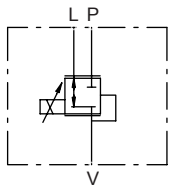
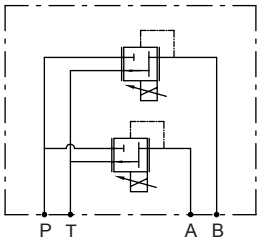
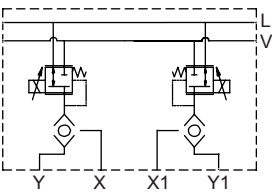
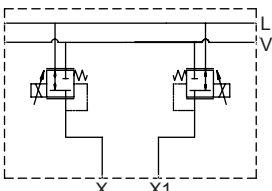
The sequence valves are used when it is necessary to hydraulically control the sequence of two or more movement using a single source of power, establishing the priority of a movement versus another one. As an example, we may allow the start of a cylinder only after the system reaches a specific pressure. Sequence valve are based on a relief valve combined with a check valve that allow the oil passage in reverse with a low pressure drop.



As per the relief valves, also the sequence valves can be produced as direct acting or pilot operated as well as fully balanced not sensitive to back pressure.

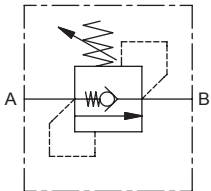
**PRESSURE CONTROL VALVES**

**PROPORTIONAL PRESSURE REDUCING VALVES**

		<b>Q l/min</b>	<b>Pmax bar</b>	<b>PORTS</b>	<b>PAGE</b>
	IT-027	2	50	FLANGIATA	7.01.001
	IT-044-CETOP2	2	50	CETOP 2	7.01.002
	IT-043-CETOP3	2	50	CETOP 3	7.01.003
	IT-128	2	50	G 1/4"	7.01.004
	IT-128	2	50	G 1/4"	7.01.004

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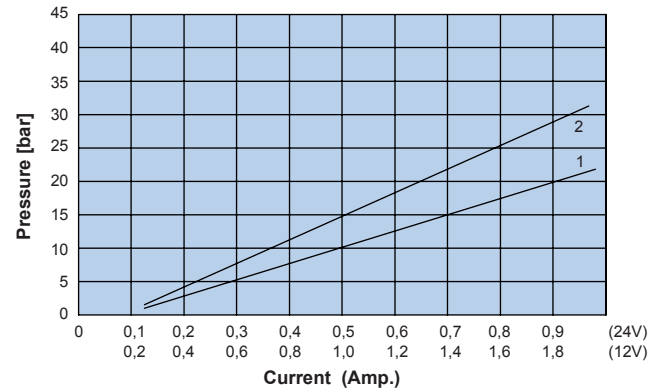
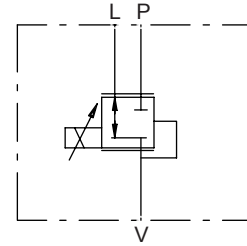
**SEQUENCE VALVES**

	P-SL-LHD05XA-N	80	350	G 1/2"	7.01.005

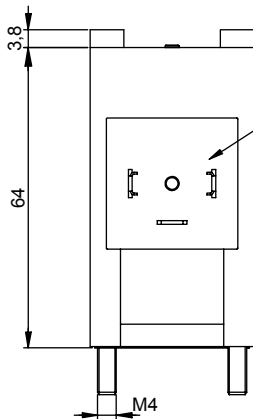
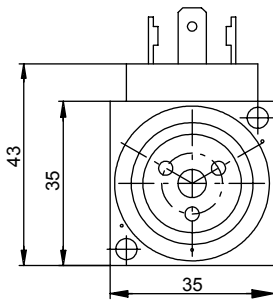


**PROPORTIONAL PRESSURE REDUCING VALVE FLANGE MOUNTING**

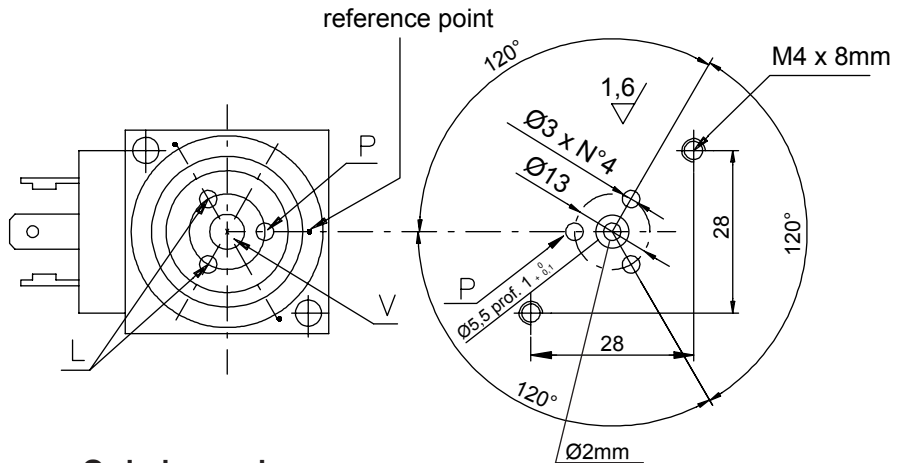
- Max working pressure in P..... **50 bar**
- Max working pressure in L..... **1 bar**
- Max working flow..... **2 l/min**
- Leakage..... **8 cc/min**
- Seals..... **NBR**
- Max current at 12 Vcc..... **1600 mA**
- Max current at 24 Vcc..... **800 mA**
- Hysteresis..... **5%**
- PWM..... **120 HZ**
- Resistance..... **12Vcc: 3,7Ω - 24 Vcc: 15,5Ω**
- Protection index with standard connector..... **IP-65**
- Screw tightening torque..... **3 Nm**
- Weight..... **0,44 Kg**



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DIN 43650



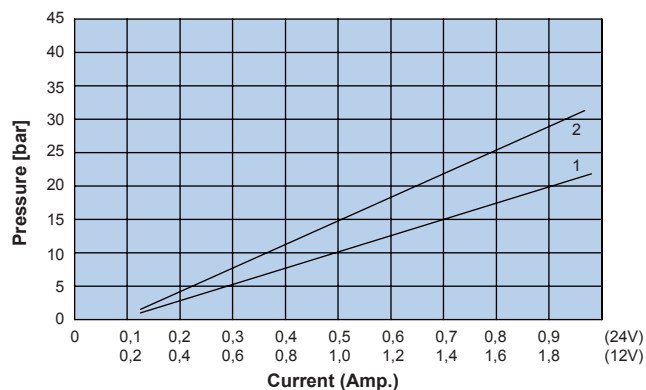
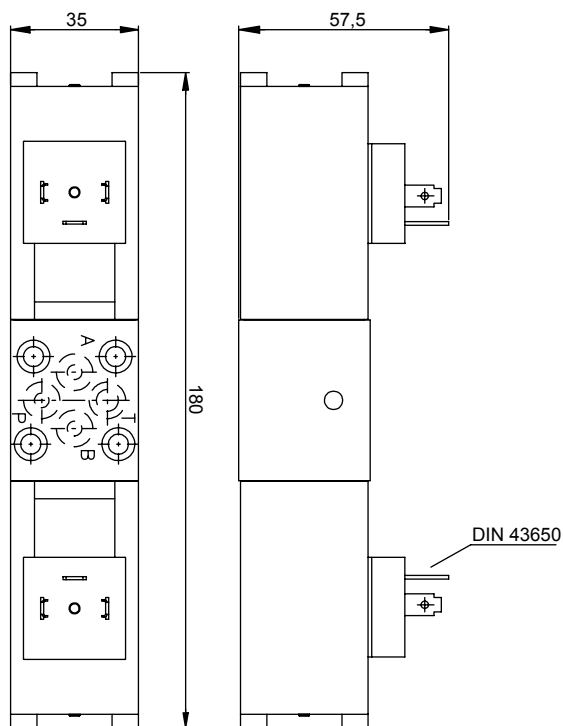
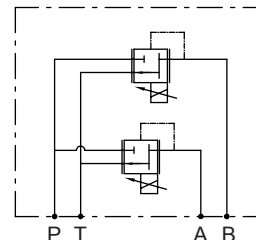
Ordering code

1 0 2 7 0 0    0    0

REDUCED PRESSURE		VOLTAGE	
1	2	1	2
3:18 bar	3:28 bar	12 Vcc	24Vcc

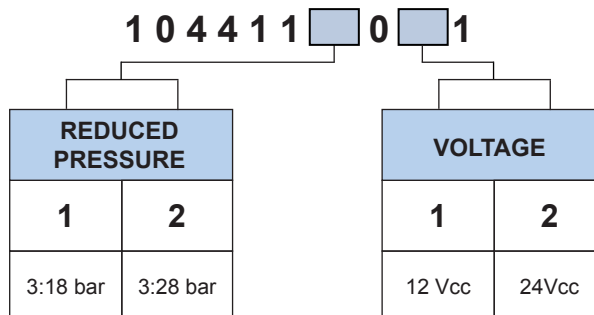
**DOUBLE PROPORTIONAL PRESSURE REDUCING VALVE ON BODY WITH CETOP-2 FACE MOUNTING**

- Max working pressure in P. .... **50 bar**
- Max working pressure in T. .... **1 bar**
- Max working flow. .... **2 l/min**
- Leakage. .... **8 cc/min**
- Seals. .... **NBR**
- Max current at 12 Vcc .... **1600 mA**
- Max current at 24 Vcc .... **800 mA**
- Hysteresis. .... **5%**
- PWM .... **120 HZ**
- Resistance. .... **12Vcc: 3,7Ω - 24 Vcc: 15,5Ω**
- Protection index with standard connector. .... **IP-65**
- Weight .... **1,42 Kg**



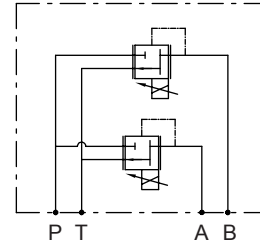
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**Ordering code**

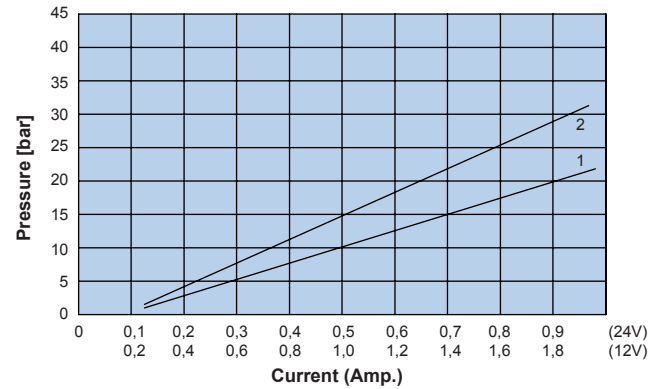
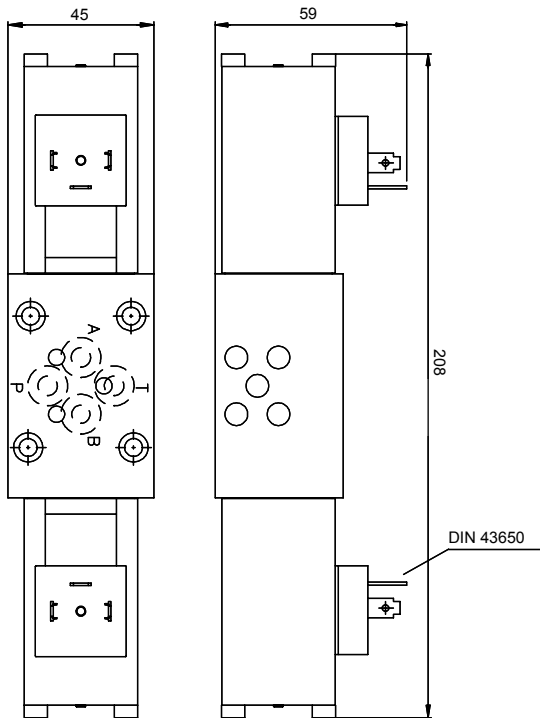


**DOUBLE PROPORTIONAL PRESSURE REDUCING VALVE  
ON BODY WITH CETOP-3 FACE MOUNTING**

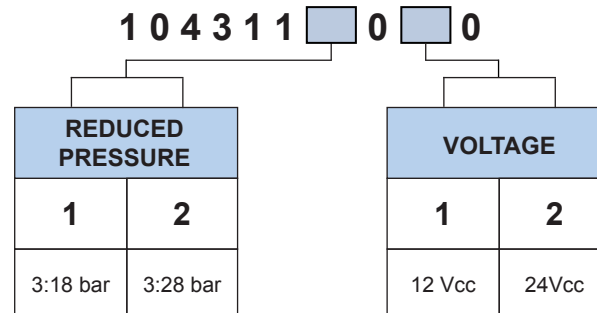
- Max working pressure in P ..... **50 bar**
- Max working pressure in T ..... **1 bar**
- Max working flow ..... **2 l/min**
- Leakage ..... **8 cc/min**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1600 mA**
- Max current at 24 Vcc ..... **800 mA**
- Hysteresis ..... **5%**
- PWM ..... **120 HZ**
- Resistance ..... **12Vcc: 3,7Ω - 24 Vcc: 15,5Ω**
- Protection index with standard connector ..... **IP-65**
- Weight ..... **1,42 Kg**



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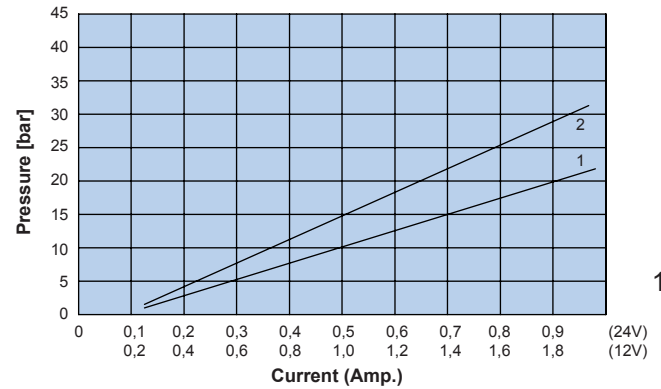
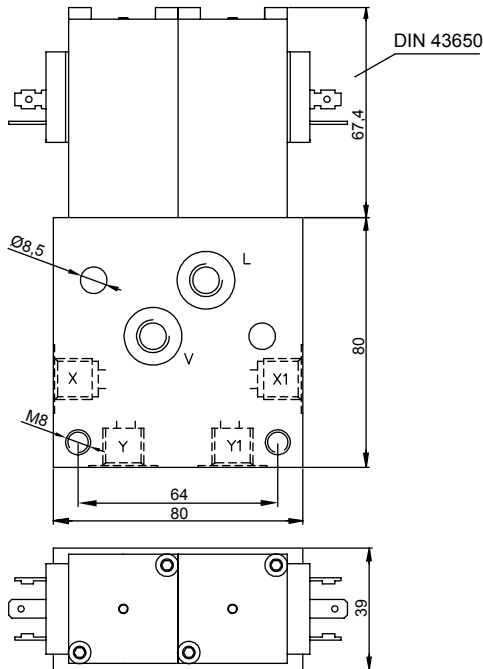
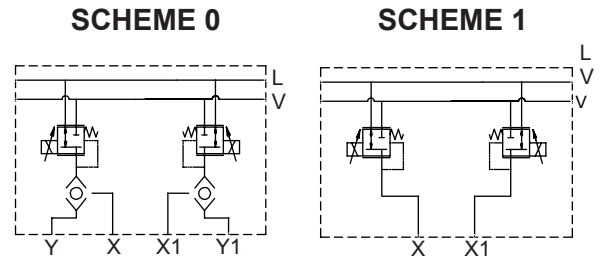


**Ordering code**



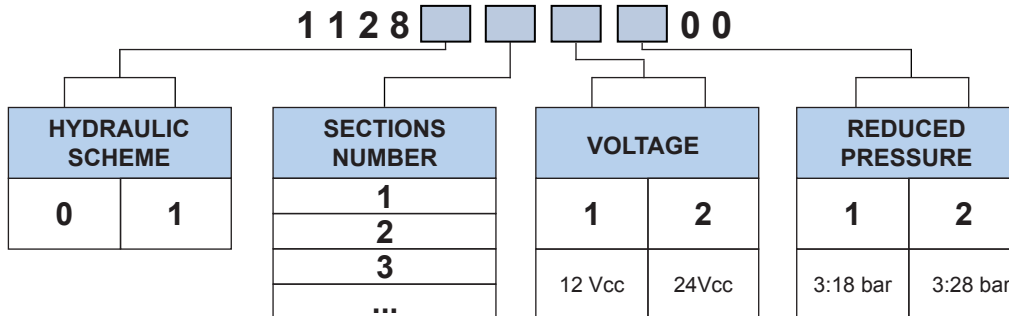
**REMOTE CONTROL MANIFOLDS FOR HYDRAULIC PILOT OPERATED CONTROL VALVES AND VARIABLE PUMPS**

- Max working pressure in V. .... **50 bar**
- Max working pressure in X:X1:Y:Y1 ..... **28 bar**
- Max working pressure in L ..... **1 bar**
- Max working flow. .... **2 l/min**
- Leakage. .... **16 cc/min**
- Seals. .... **NBR**
- Max current at 12 Vcc. .... **1600 mA**
- Max current at 24 Vcc. .... **800 mA**
- Hysteresis ..... **5%**
- PWM ..... **120 HZ**
- Resistance. .... **12Vcc: 3,7Ω - 24 Vcc: 15,5Ω**
- Protection index with standard connector. .... **IP-65**
- Weight ..... **2,5 Kg**



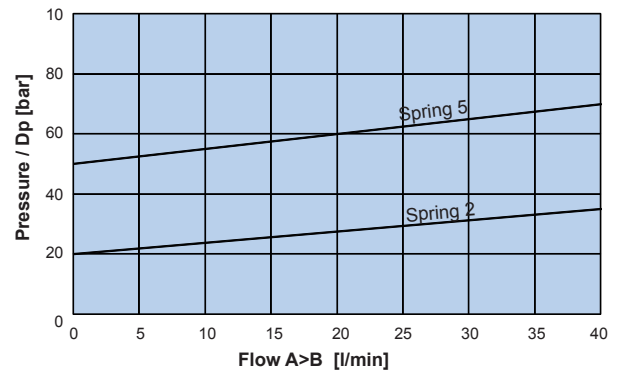
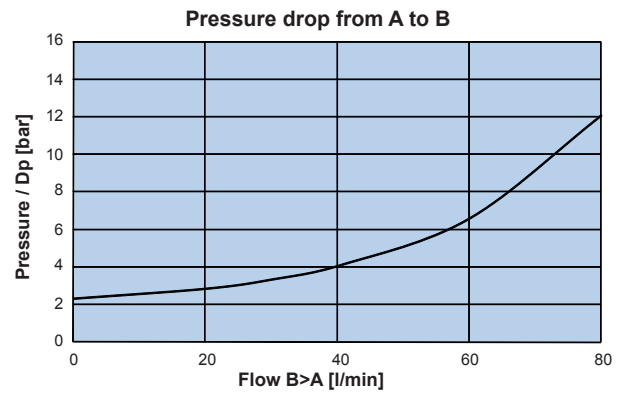
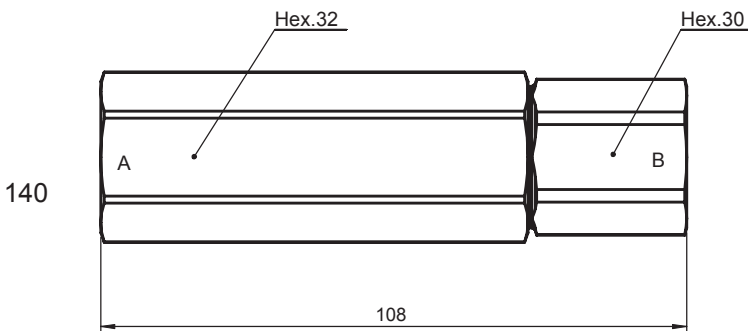
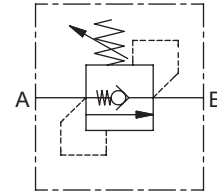
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**Ordering code**



**IN LINE SEQUENCE VALVE G1/2"**

- Flow ..... **80 l/min**
- Pressure ..... **350 bar**
- Weight ..... **0,6 Kg**



**Ordering code**

**P 0 6 0 5 0 0 0**   **S**   **0 0**

SPRINGS	2	5
Setting range min - max	10 - 30	25 - 90
bar/turn	9	28
Standard setting 4 l/min	20	50

PORTS	04
A,B	G 1/2"



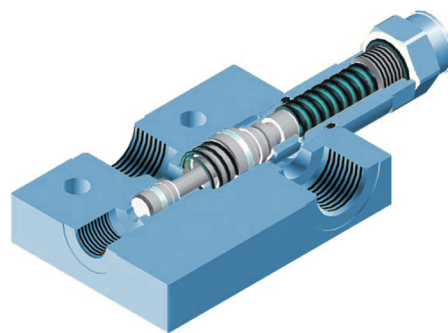
**PARTS IN BODY**  
**COUNTERBALANCE VALVES**



**COUNTERBALANCE VALVES**

**INTRODUCTION**

Counterbalance Valves of the Parts-in-Body line, are hydraulic valves designed specifically to hold and control negative and gravitational loads. They are meant to serve all those applications that involve the control of suspended loads, such as mechanical joints, lifting applications, winches, etc. These valves are characterized by internal movable parts sliding directly inside the manifold, allowing direct installation onto the hydraulic actuators: line-mounting or flange-mounting. Parts in body counterbalance valves are an alternative solution to the cartridge counterbalance valves as their design allows the direct mounting on the application.

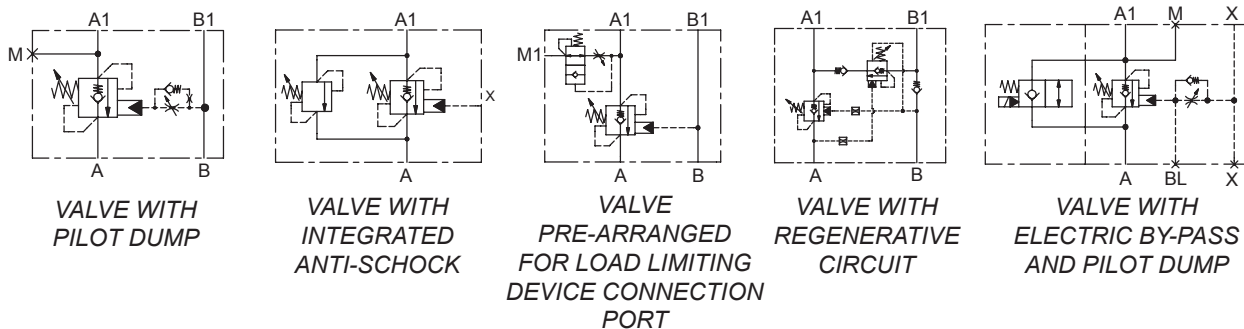


*Parts-in-Body valve section view*

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Further on its simple installation, **Parts-in-Body** counterbalance valves allow to obtain specialized valves: valves which are able to optimize their functionality in particular situations/working conditions, since they are equipped with specific components.

Examples of specialized valves:



**COUNTERBALANCE VALVES**

**NEM'S RANGE**

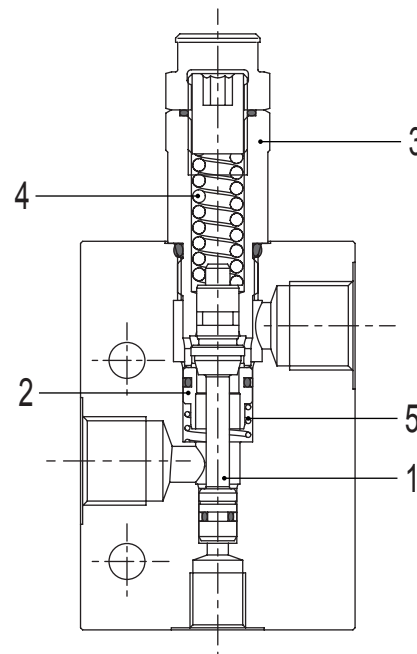
Nem's range of **Parts in body** counterbalance valves come in 4 series types, named LHD (acronym for Load Holding Devices)

	Qmax [lpm]	Pmax [bar]	Pilot Ratio	Compensation*	
<b>LHD03X</b>	40	350	4:1	N - C	<i>N - Not-compensated Version</i> <i>C - Fully Compensated Version</i> <i>S - Partially compensate Version</i> (See Compensation Paragraph)
<b>LHD05X</b>	70	350	4:1 9,5:1	N - S - C	
<b>LHD10X</b>	110	410	4:1 8:1	N - C	
<b>LHD15X</b>	180	410	4:1 8:1	N - C	

**LHD\_X** valves are made up of different parts mounted inside a body made of either steel or aluminium.

LHD\_X valves internal main parts are:

1. A sealing piston which bears both actuators and pilot pressure.
2. A unidirectional valve which also works as sealing seat for position n°1.
3. A spring-case cap, whose design determines the behaviour of the valve, in function of the back pressure.
4. An adjustable spring to regulate the pressure on piston n°1.
5. A non adjustable spring to bring the unidirectional valve 2 back to its initial position.



**CIRCUITS**

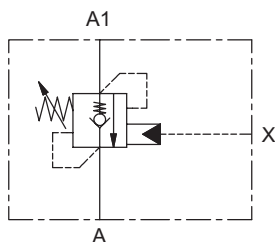
The type of movement required by the actuators determines the valve circuit design. For instance: if in a specific application where the external loads always move in the same direction, it's possible to choose **Single Acting** valves (circuit **A**). If instead, external loads will act alternatively on both sides of the hydraulic actuator, a **Double Acting** valve (circuits **AB1 – AB2**) should be used.



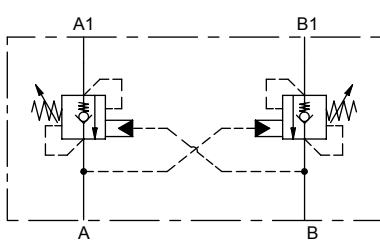
**COUNTERBALANCE VALVES**

LHD\_X double acting valves, can be designed in 2 different ways: the choice between them depends on the installation or on the type of compensation required:

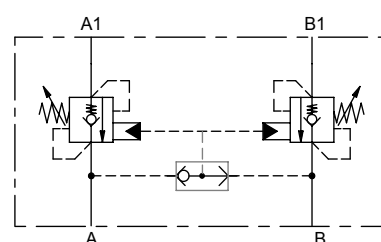
- When the cavities are independent (Circuit **AB1**) we will have a double acting valve in which the 2 sections (A/A1 e B/B1) are completely independent from each other (crossed pilot line). This characteristic allows to install either Compensated and Not-Compensated types.
- With coaxial cavities (Circuit **AB2**), we will have a double acting valve in which the 2 sections (A/A1 e B/B1) are designed on the same axis, sharing part of the pilot circuit. This characteristic makes it possible to install either Partially-Compensated and Not-Compensated types.



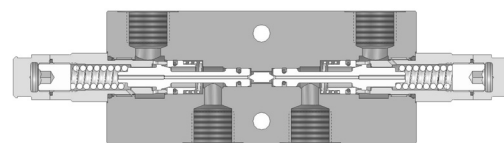
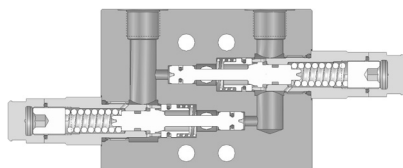
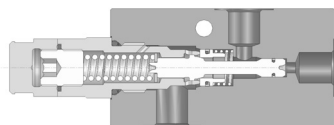
Single Acting Circuit (A)



Double Acting Circuit with independent cavities (AB1)



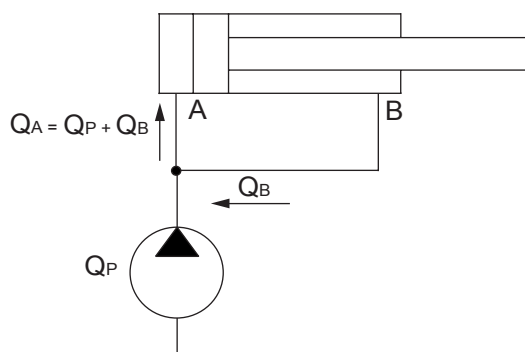
Double Acting Circuit with coaxial cavities (AB2)



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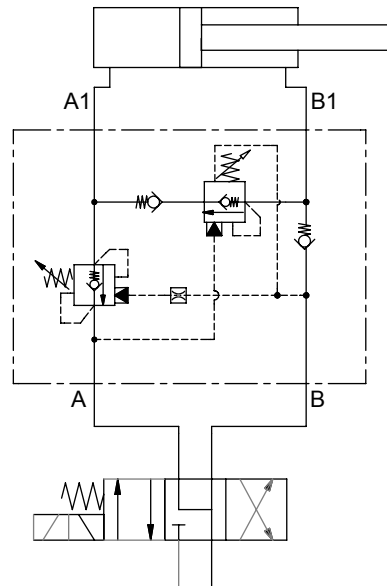
For applications on cylinders, it's possible to increase the actuators extension speed through a **Regen-Block (R Circuit)**. This type of circuit is advisable for all those applications characterized by long stroke of the actuators with no loads or very small ones, for instance, truck mounted telescopic cranes, loaders, hook loaders, hydraulic presses, garbage trucks.

**Regenerative circuits** base their functioning on retrieving of the oil coming out of ring chamber during the differential-area cylinder extension. The oil coming from the ring chamber is driven into the cylinder cap to join with oil flow coming from the pump. In this way the cylinder outgoing speed corresponds to the pump flow related to the rod area, and not related to the cap area, creating a considerable speed increase.



More specifically, the **counterbalance valves for regenerative circuits** allow not only for the management of regenerated flow but also to control the speed and to lock the cylinders even in case of dragged loads.

**COUNTERBALANCE VALVES**



*Example of counterbalance valve for regenerative circuit*

**COMPENSATION**

The coupling of counterbalance valves with directional control valves requires to determine the type of spools to be used. When the counterbalance valves are in charge of the pressure relief function, it's essential to make a distinction between "closed-centre" spool applications and "open-centre" spool application.

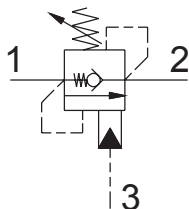
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Generally, when "closed-centre" spools are installed, it's necessary to use compensated counterbalance valves: since these valves are insensitive to back-pressure on the return line (A-2), their pressure setting will not change.

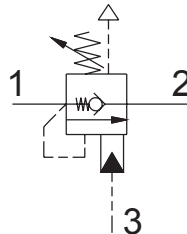
Two examples of compensated valves application are regenerative circuits and circuits in which the darning of the eventual pressure peaks must be relieved in series by the anti-shock valves installed inside the directional control valve.

In case of "open-centre" directional spool applications, non-compensated valves are compulsory, in which the spring is connected to the return line (A-2).

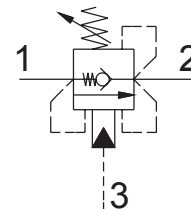
*\*Non Compensated Version (N)*



*\*Fully Compensated Version (C)*



*\*Partially Compensated Version (S)*



In **Non-Compensated (N)** type valves, back-pressure determines both the pressure setting and the pilot pressure. In these valves the return line is directly connected to the spring.  
Main use: In combination with open centre spool applications.



**COUNTERBALANCE VALVES**

In **Fully compensated (C)** type valves, back-pressure does not influence neither pressure setting nor pilot pressure. This valve type belongs the family of valves in which the adjustable spring is separated from return line (A-2) and is connected to a draining line or air-vented.

In these valves, back-pressure (A-2) is balanced, so it will not find any area on which it can apply its force, so that both setting and pilot pressures are independent from pressure on return line (A).

Main use: In combination with closed-centre spool applications, regenerative circuits.

In **Partially-Compensated (S)** type valves, only the pressure setting is independent from back-pressure, while the pilot pressure is influenced by back-pressures, which sometimes can be helpful in stabilizing the system.

This valve type belongs to the family of valves in which only the areas subject to the load (A1-1) are balanced Vs the back pressure (A - 2).

Main use: In combination with closed-centre spool applications.

**SETTINGS**

Counterbalance valves setting corresponds to the opening pressure of pressure relief section. This pressure determines the max load which counterbalance valve is able to hold.

Usually the setting pressure value must be at least 1.3 times the max load induced pressure to hold. That tolerance allows induced loads safe holding.

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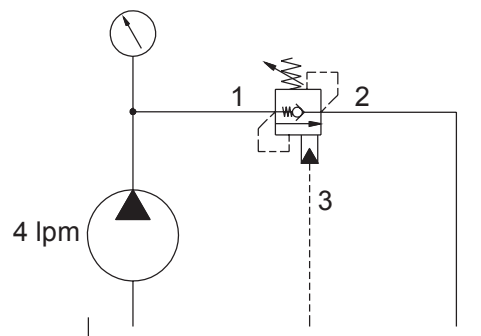


Fig.3

The **standard pressure setting (Pt)** of the counterbalance valves corresponds to pressure detected on port (1) while the valve is crossed by 4 l/min. (fig.3)

**es. Pt: 350 bar @ 4 l/min**

In particular cases, and generally upon customers' request, the pressure can be set considering the initial opening value, corresponding almost to 20 ml/min. flow.

**es. Pt: 350 bar @ 20 ml/min**

**PILOT RATIOS**

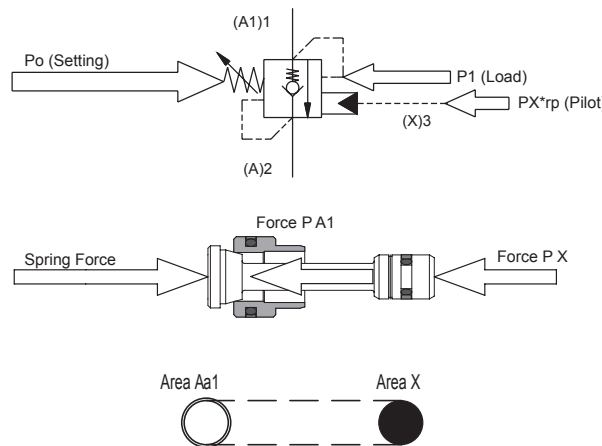
As mentioned before, counterbalance valves are characterized by a pilot area on which pressure coming from the actuator's feeding line acts. Such pressure, together with the pressure due to the load, opens the pilot piston, progressively contrasting the force generated by the setting spring.

**COUNTERBALANCE VALVES**

As mentioned before, counterbalance valves are characterized by a pilot area on which pressure coming from the actuator's feeding line acts. Such pressure, together with the pressure due to the load, moves pilot piston, progressively contrasting the force generated by the setting spring.

Hence the combined action of the two pressures is connected to the ratio between the pushing areas on which they act. This ratio is known as "Pilot Ratio" (pr), and it is the basic parameter for any counterbalance valve.

Pilot Ratio (pr) is defined as the geometrical ratio between the area on which the load acts (port 1) and the pilot area (port 3). Thanks to this parameter, it is possible to calculate the values of pilot pressures first opening (Px):



$$P_x = (P_t - P_1) / r_p$$

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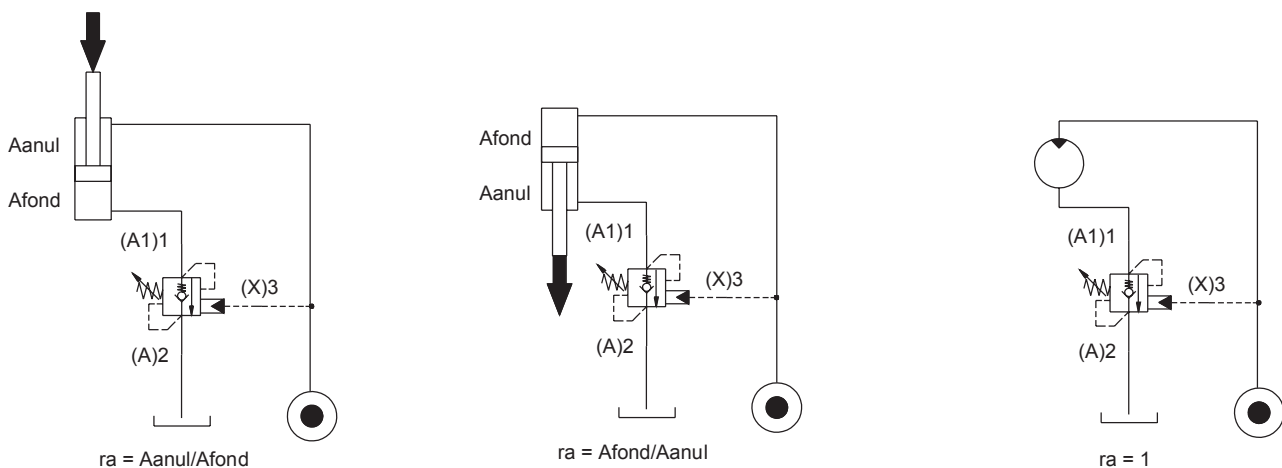
According to the Pilot Ratio, counterbalance valves can be divided into 2 types:

**High Pilot Ratio (>6:1):** suitable for those applications where the loads are constant (for instance, hydraulic motors) and very stable, where low pilot pressures are demanded in favour of speed and energy savings.

**Low Pilot Ratio (<5:1):** suitable for those applications where loads can vary (for instance, trucks cranes) and for those mechanical structures are not stable, where more control and more stability are needed, a higher pilot pressure is required.

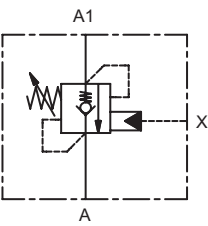
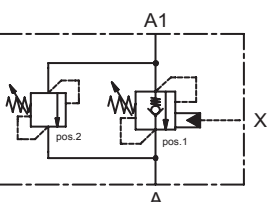
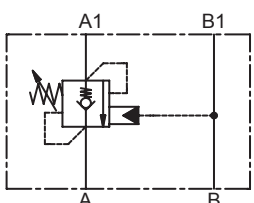
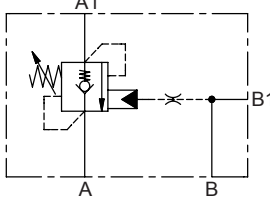
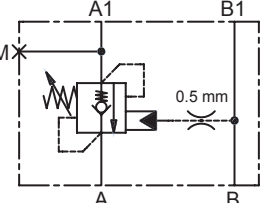
When counterbalance valves are installed on hydraulic actuators, to determine the correct value of pilot pressure it is necessary to introduce in the calculation the ratio between the areas of the actuator itself.

$$P_x = (P_t - P_1) / (r_p + r_a) \quad r_a = \text{ratio between the areas of the hydraulic actuator}$$



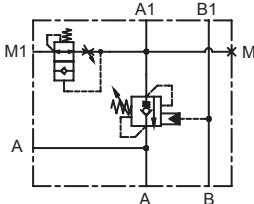
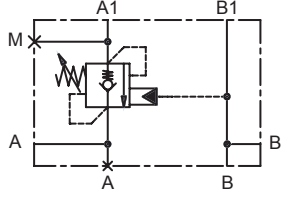
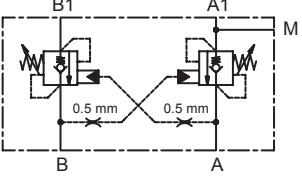
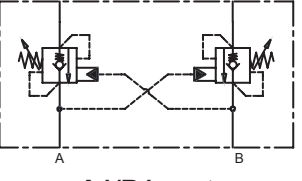
**COUNTERBALANCE VALVES**

**NOT COMPENSATED MODELS**

	<b>SINGLE</b>	<b>Q l/min</b>	<b>P bar</b>	<b>PILOT RATIO</b>	<b>PORTS</b>	<b>PAGE</b>	
	 <b>In line</b>	H3001N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.001
		H5001N	70	350	4 : 1 - 9 : 1	G 3/8" - G 1/2"	8.01.002
	 <b>In line</b>	H3001N463	40	350	4 : 1	G 1/4" - G 3/8"	8.01.003
		H5001N463	70	350	4 : 1	G 3/8" - G 1/2"	8.01.004
148	 <b>In line</b>	H3004N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.005/A
		H5004N	70	350	4 : 1	G 3/8" - G 1/2"	8.01.006
		H1004N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.007
		H1504N	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.008
	 <b>In line</b>	H3004N41	40	350	4 : 1	G 3/8"	8.01.005/B
	 <b>A1 port flanged</b>	H3005N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.009
		H3007N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.010
		H5005N	70	350	4 : 1	G 3/8" - G 1/2"	8.01.011
		H1005N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.012
		H1505N	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.013

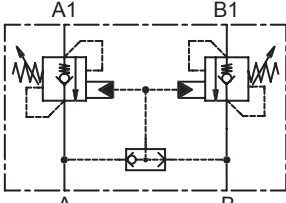
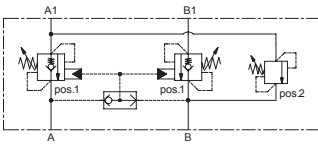
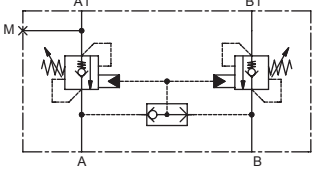
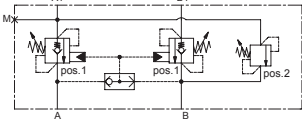
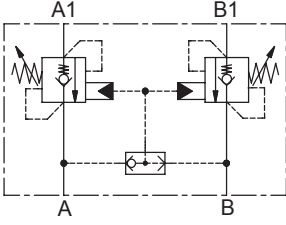


**COUNTERBALANCE VALVES**

		<b>Q</b> l/min	<b>P</b> bar	<b>PILOT</b> <b>RATIO</b>	<b>PORTS</b>	<b>PAGE</b>
 <p><b>A1 port flanged</b></p>	H3005N433	40	350	4 : 1	G 1/4" - G 3/8"	8.01.014
 <p><b>A1/B1 port flanged</b></p>	H3006N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.015
	H3008N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.016
	H5006N	70	350	4 : 1	G 3/8" - G 1/2"	8.01.017
	H1006N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.018
	H1506N	110	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.019
<b>DOUBLE</b>						
 <p><b>In line</b></p>	H1030N	110	410	4 : 1	G 1/4" - G 3/4"	8.01.020
	H1530N	180	410	4 : 1 - 8 : 1	G 3/4"	8.01.021
 <p><b>A1/B1 port flanged</b></p>	H5032N	72	350	4 : 1	G 3/8"	8.01.022
	H1532N	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.023



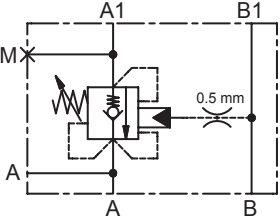
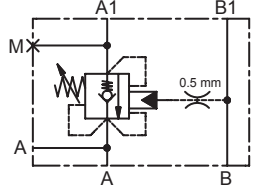
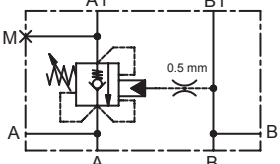
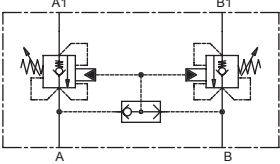
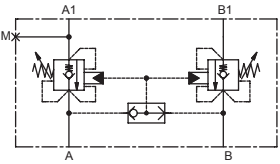
**COUNTERBALANCE VALVES**

		<b>Q</b> l/min	<b>P</b> bar	<b>PILOT</b> <b>RATIO</b>	<b>PORTS</b>	<b>PAGE</b>
 <p><b>In line</b></p>	H3060N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.024
	H5060N	70	350	4 : 1 - 9 : 1	G 3/8" - G 1/2"	8.01.025
	H1060N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.026
 <p><b>In line</b></p>	H5060N473	70	350	4 : 1	G 3/8" - G 1/2"	8.01.027
 <p><b>A1 port flanged</b></p>	H3061N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.028
	H5061N	70	350	4 : 1	G 3/8" - G 1/2"	8.01.029
	H1061N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.030
 <p><b>A1 port flanged</b></p>	H5061N473	70	350	4 : 1	G 3/8" - G 1/2"	8.01.031
 <p><b>A1/B1 port flanged</b></p>	H3062N	40	350	4 : 1	G 1/4" - G 3/8"	8.01.032
	H5062N	70	350	4 : 1 - 9 : 1	G 3/8" - G 1/2"	8.01.033
	H1062N	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.034

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**COUNTERBALANCE VALVES**

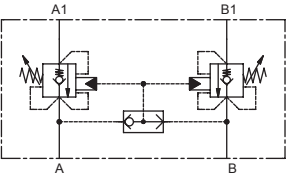
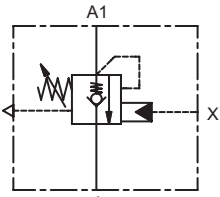
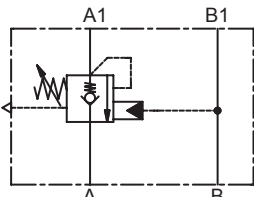
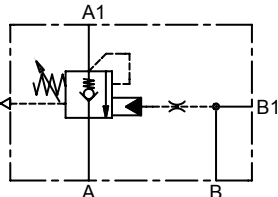
**PARTIALLY COMPENSATED MODELS**

SINGLE	Q l/min	P bar	PILOT RATIO	PORTS	PAGE	
 <p><b>In line</b></p>	H5304S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.035
 <p><b>A1 port flanged</b></p>	H5305S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.036
 <p><b>A1/B1 port flanged</b></p>	H5306S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.037
<b>DOUBLE</b>						
 <p><b>In line</b></p>	H5360S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.038
 <p><b>A1 port flanged</b></p>	H5361S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.039

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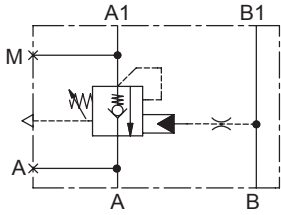
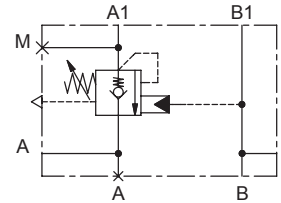
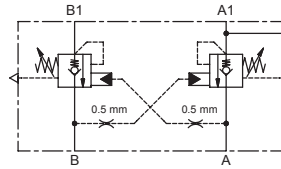
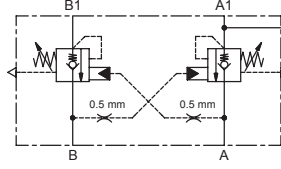


**COUNTERBALANCE VALVES**

		<b>Q</b> l/min	<b>P</b> bar	<b>PILOT</b> <b>RATIO</b>	<b>PORTS</b>	<b>PAGE</b>
 <p><b>A1/B1 port flanged</b></p>	H5362S	70	350	4 : 1	G 3/8" - G 1/2"	8.01.040
<b>FULLY COMPENSATED MODELS</b>						
<b>SIMPLE</b>						
 <p><b>In line</b></p>	H3001C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.041
	H5001C	70	350	4 : 1	G 3/8" - G 1/2"	8.01.042
 <p><b>In line</b></p>	H3004C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.043/A
	H5004C	70	350	4 : 1	G 3/8" - G 1/2"	8.01.044
	H1004C	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.045
	H1504C	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.046
 <p><b>In line</b></p>	H3004C41	40	350	4 : 1	G 3/8"	8.01.043/B

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**COUNTERBALANCE VALVES**

	<b>Q</b> l/min	<b>P</b> bar	<b>PILOT</b> <b>RATIO</b>	<b>PORTS</b>	<b>PAGE</b>	
 <p><b>A1 port flanged</b></p>	H3005C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.047
	H3007C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.048
	H5005C	70	350	4 : 1	G 3/8" - G 1/2"	8.01.049
	H1005C	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.050
	H1505C	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.051
 <p><b>A1/B1 port flanged</b></p>	H3006C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.052
	H3008C	40	350	4 : 1	G 1/4" - G 3/8"	8.01.053
	H5006C	70	350	4 : 1	G 3/8" - G 1/2"	8.01.054
	H1006C	110	410	4 : 1 - 9 : 1	G 1/2" - G 3/4"	8.01.055
	H1506C	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.056
<b>DOUBLE</b>						
 <p><b>In line</b></p>	H1530C	180	410	4 : 1 - 8 : 1	G 3/4"	8.01.057
 <p><b>A1/B1 port flanged</b></p>	H5032C	70	350	4 : 1	G 3/8"	8.01.058
	H1532C	180	410	4 : 1 - 8 : 1	G 1/2" - G 3/4"	8.01.059



**COUNTERBALANCE VALVES**

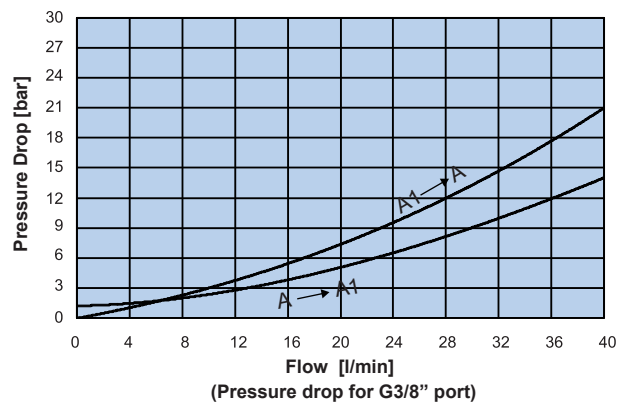
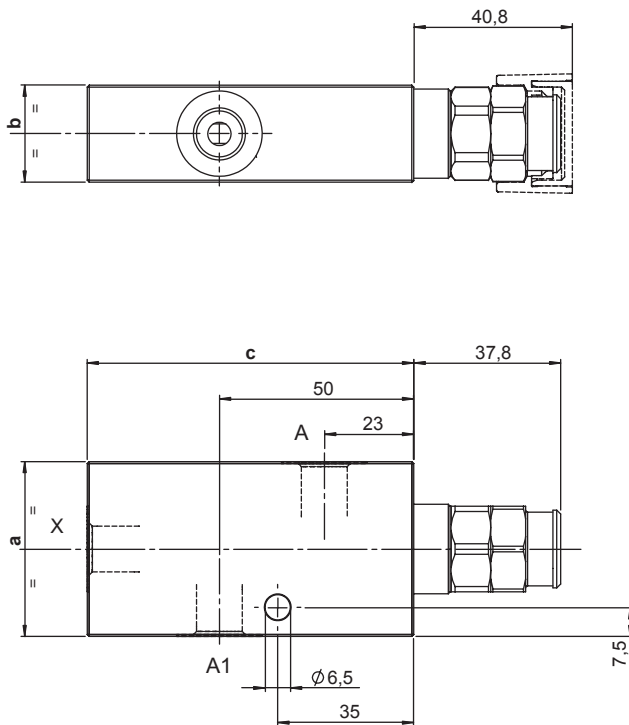
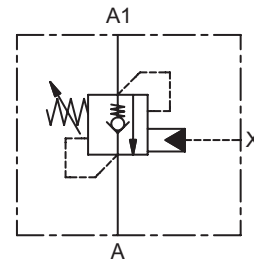
**REGENERATIVE CIRCUIT**

	<b>Q l/min</b>	<b>P bar</b>	<b>PILOT RATIO</b>	<b>PORTS</b>	<b>PAGE</b>	
	H3080C	40	350	4 : 1	G 1/2"	8.01.060
	H1080C	110	410	4 : 1	G 1/2"	8.01.061

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**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **0,8 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c
<b>02</b>	45	25	84
<b>03</b>	50	30	90

**Ordering code**

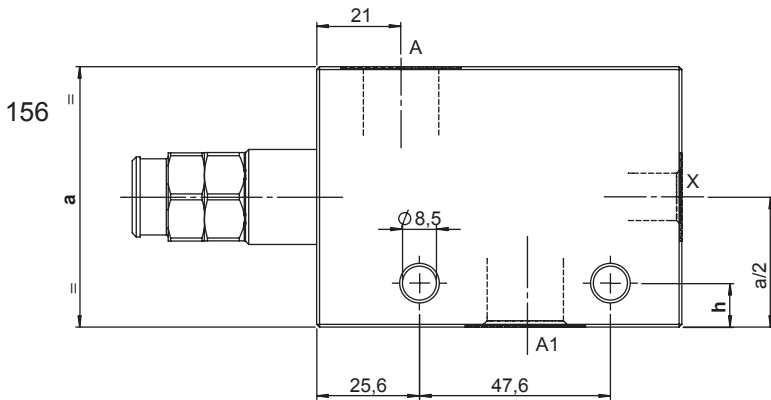
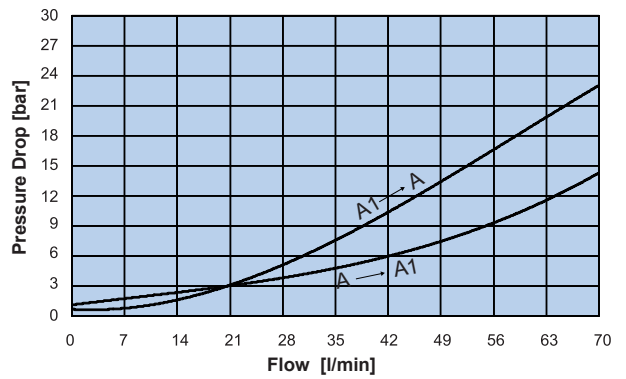
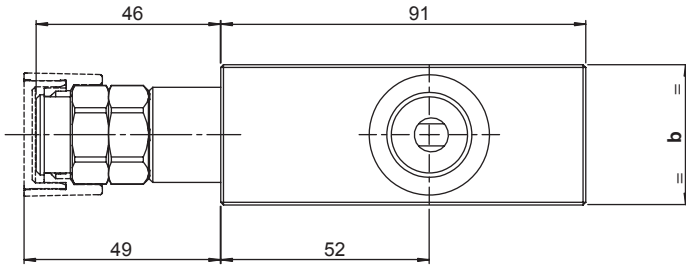
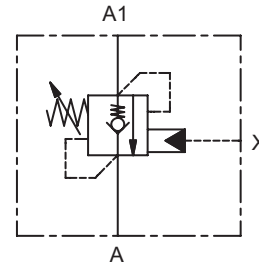
**H 3 0 0 1 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210 / 150 - 350	A,A1,X	G 1/4" / G 3/8"
		Pressure Increase [bar/turn]	41 / 100		
		Standard setting 4 l/min [bar]	200 / 350		



**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b	h
<b>03</b>	55	30	7
<b>04</b>	65	35	11

**Ordering code**

**H 5 0 0 1 N**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

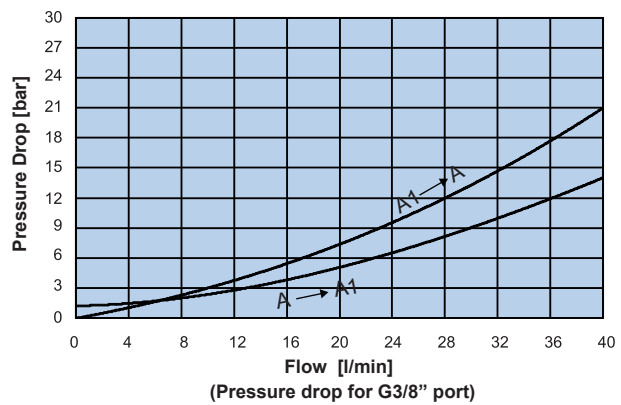
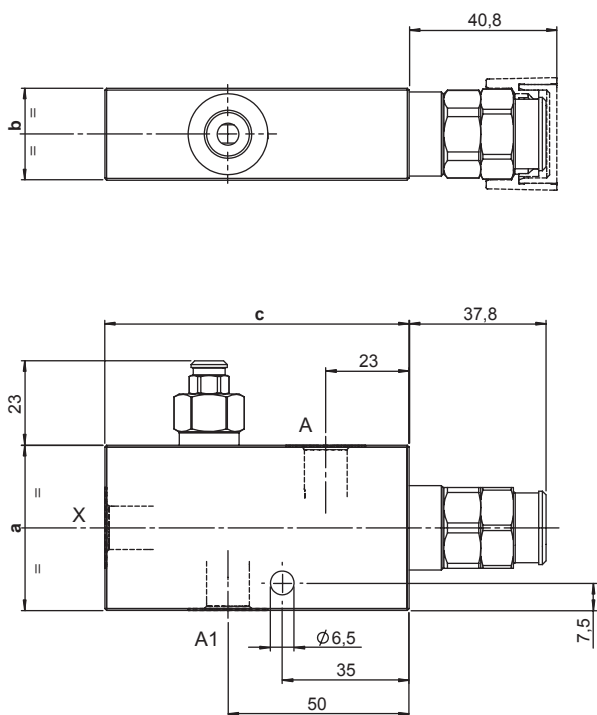
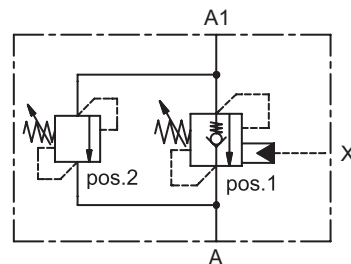
SPRINGS	rp 4:1		rp 9:1	
	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
Setting range min.-max. [bar]	60 - 210	120 - 350	80 - 250	190 - 350
Pressure Increase [bar/turn]	62	114	50	121
Standard setting 4 l/min [bar]	200	350	200	350

PORTS	<b>03</b>	<b>04</b>
A,A1	G 3/8"	G 1/2"
X	G 1/4"	G 1/4"



**SINGLE ACTING COUNTERBALANCE VALVE WITH PRESSURE RELIEF**

- Flow ..... **40 l/min**
- Max working pressure ..... **350 bar**
- Compensation ..... **Not Compensated**
- Weight ..... **0,85 Kg**
- Tamper proof cap ..... **cod. 9021030190**



**Note:**  
 - Antishock valve pos.2 max flow 3 l/min  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c
<b>02</b>	45	25	84
<b>03</b>	50	30	90

**Ordering code**

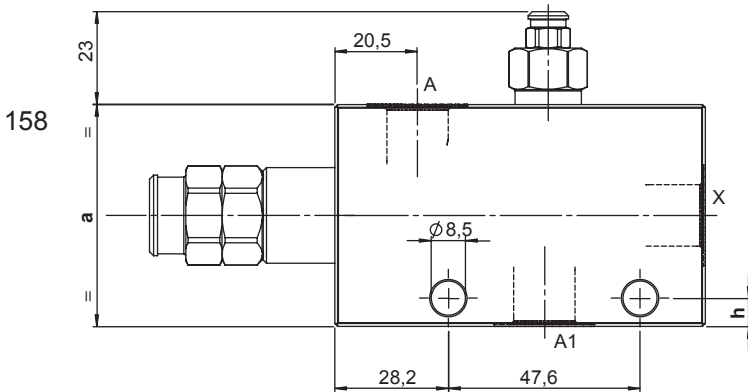
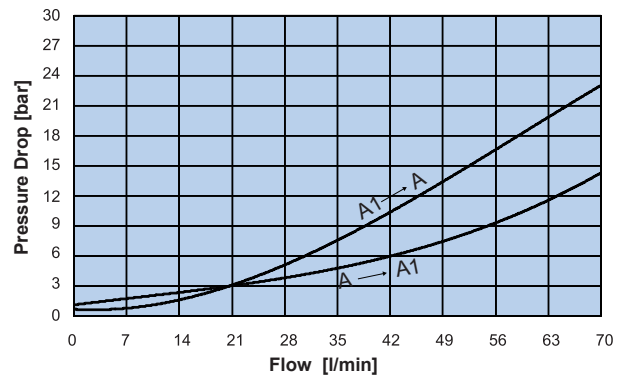
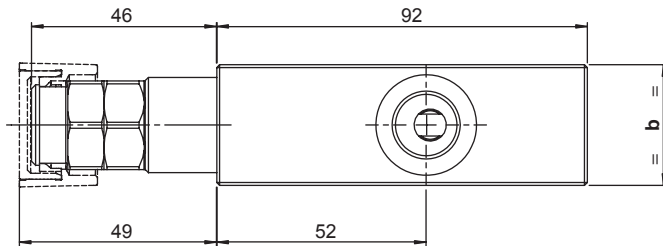
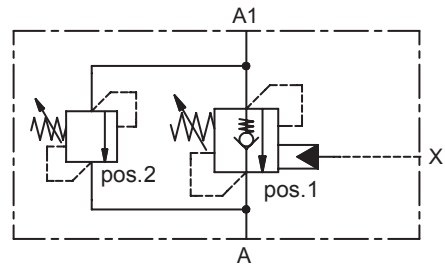
**H 3 0 0 1 N**     **S**   **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>46</b>	<b>4:1+RELIEF A1&gt;A</b>	<b>3</b>		<b>02</b>	<b>03</b>
		pos.1	pos.2	A,A1,X	G 1/4" G 3/8"
		Setting range min.-max. [bar]	120 - 350	250 - 400	
		Pressure Increase [bar/turn]	100	250	
		Standard setting [bar]	350 ∞ a 44 l/min	300 ∞ a 20 cc/min	



**SINGLE ACTING COUNTERBALANCE VALVE WITH PRESSURE RELIEF**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,7 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Antishock valve pos.2 max flow 3 l/min  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b	h
<b>03</b>	55	30	7
<b>04</b>	65	35	11

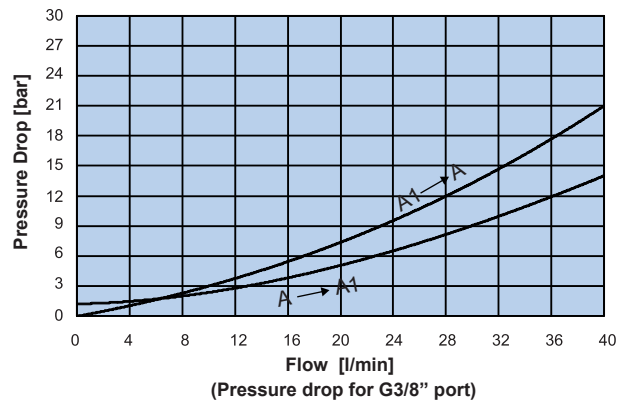
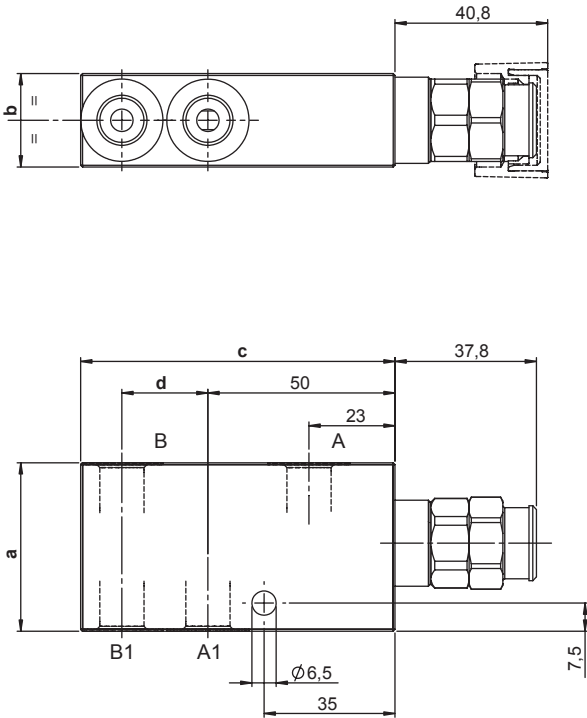
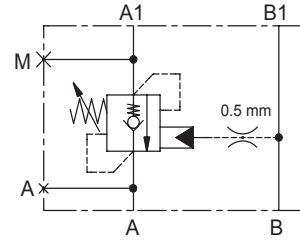
**Ordering code**

**H 5 0 0 1 N**     **S**   **0 0**

PILOT RATIO		SPRINGS	3		PORTS		
46	4:1+RELIEF A1>A		pos.1	pos.2	03	04	
		Setting range min.-max. [bar]	120 - 350	250 - 400	A,A1	G 3/8"	G 1/2"
		Pressure Increase [bar/turn]	114	250	X	G 1/4"	G 1/4"
		Standard setting 4 l/min [bar]	350 a 4 l/min	300 a 20 cc/min			

**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **0,75 Kg**
- Tamper proof cap..... **cod.9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d
<b>02</b>	45	25	84	23
<b>03</b>	50	30	95	30

**Ordering code**

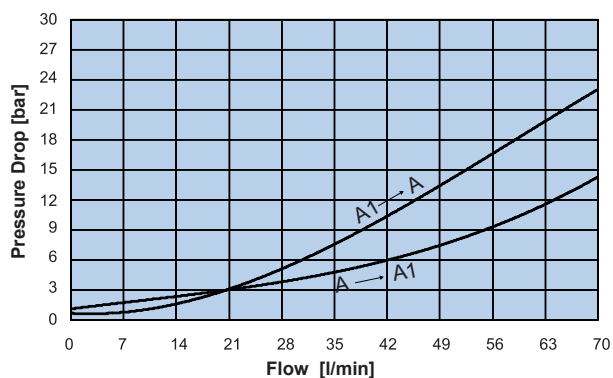
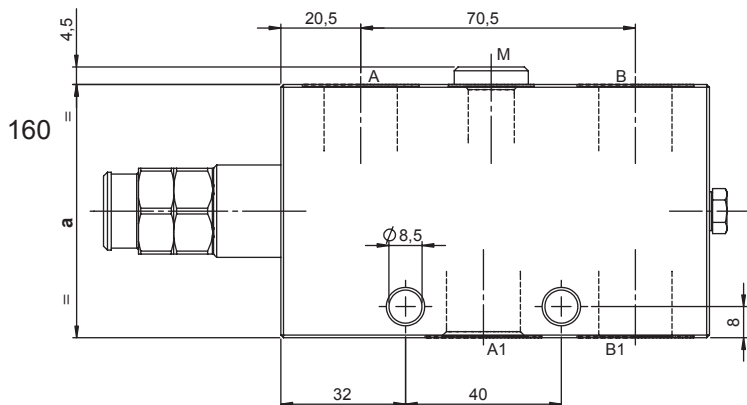
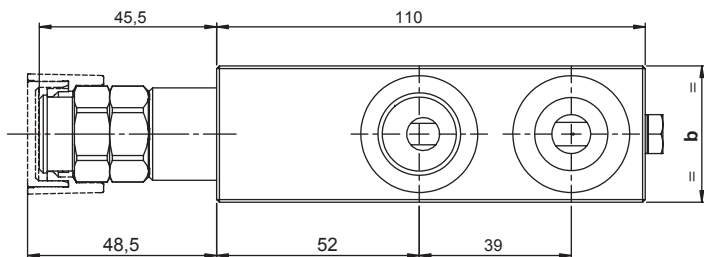
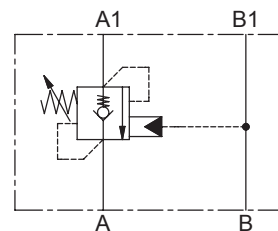
**H 3 0 0 4 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210 / 150 - 350	A,B,A1,B1	G 1/4" / G 3/8"
		Pressure Increase [bar/turn]	41 / 100		
		Standard setting 4 l/min [bar]	200 / 350		



**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b
<b>03</b>	55	30
<b>04</b>	65	35

**Ordering code**

**H 5 0 0 4 N**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

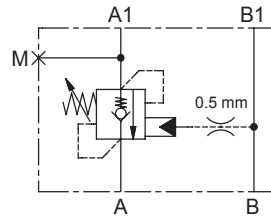
SPRINGS	4:1	
	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,A1,B,B1	G 3/8"	G 1/2"
M	G 1/4"	G 1/4"

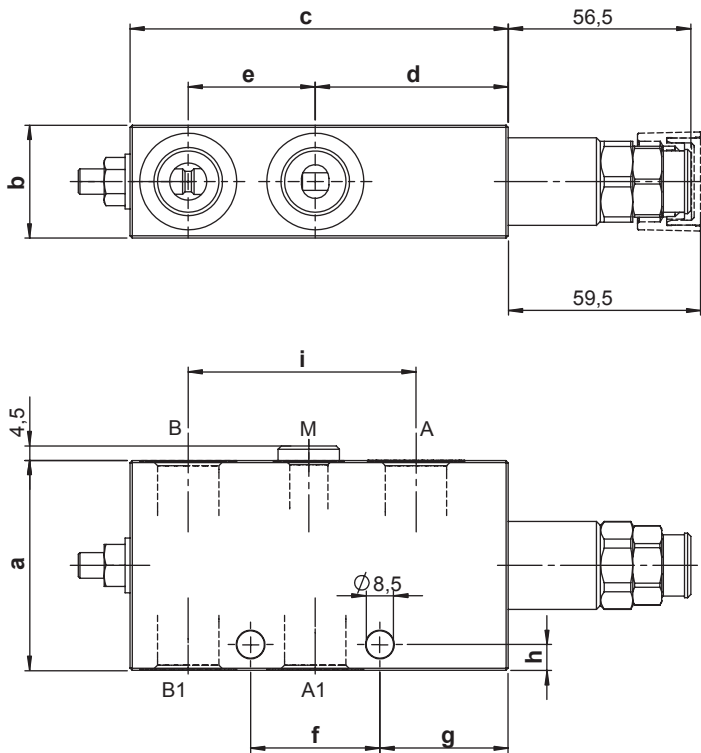
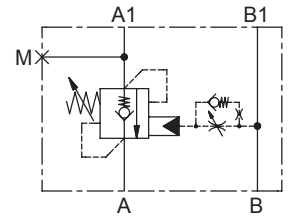
**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **2,5 Kg**
- Tamper proof cap..... **cod.9021030190**

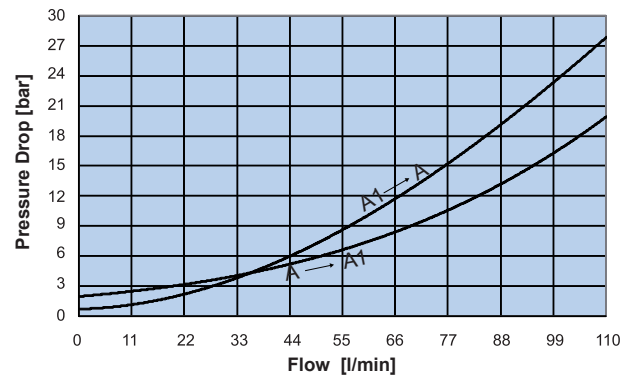
**SCHEME 40 - 90**



**SCHEME 42 - 92**



	a	b	c	d	e	f	g	h	i
<b>04</b>	65	35	117	59,7	39.3	40	39,7	8	70.5
<b>05</b>	70	40	130	60	47	47.6	36	11	78



**Note:**

- Pressure setting must be 30% higher than pressure induced by the load.
- Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 0 0 4 N**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

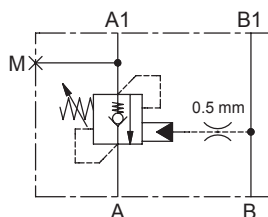
PORTS	<b>04</b>	<b>05</b>
A,A1,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"



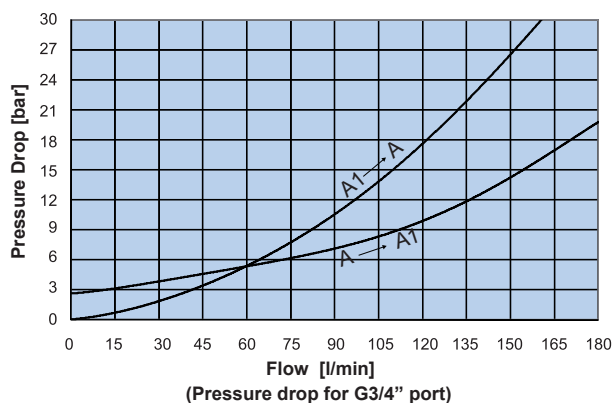
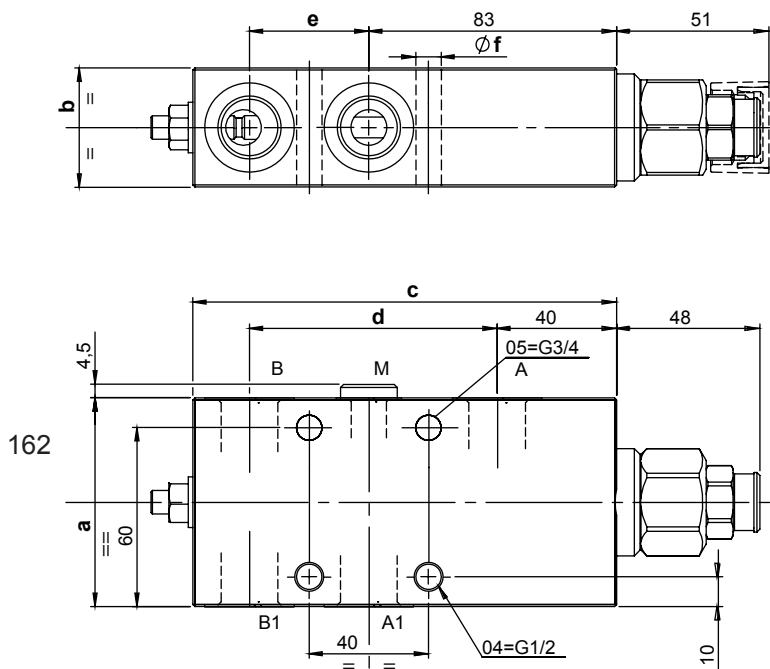
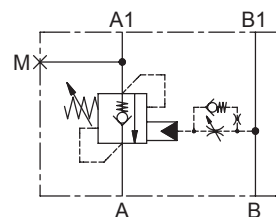
**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3,3 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD15X-C is recommended for circuits with high back pressure)

	a	b	c	d	e	f
<b>04</b>	70	40	142	83	40	8,5
<b>05</b>	80	40	147	86	43	10,5

**Ordering code**

**H 1 5 0 4 N**     **S**   **0 0**

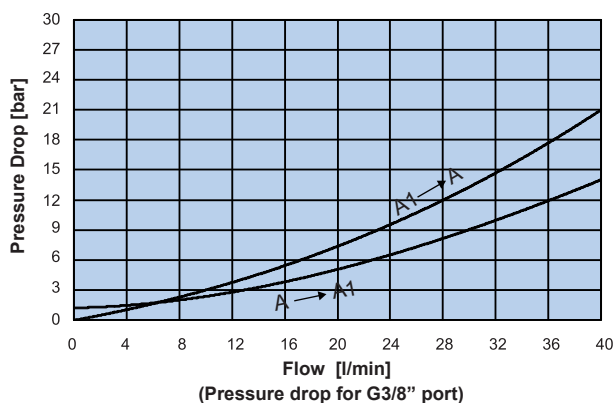
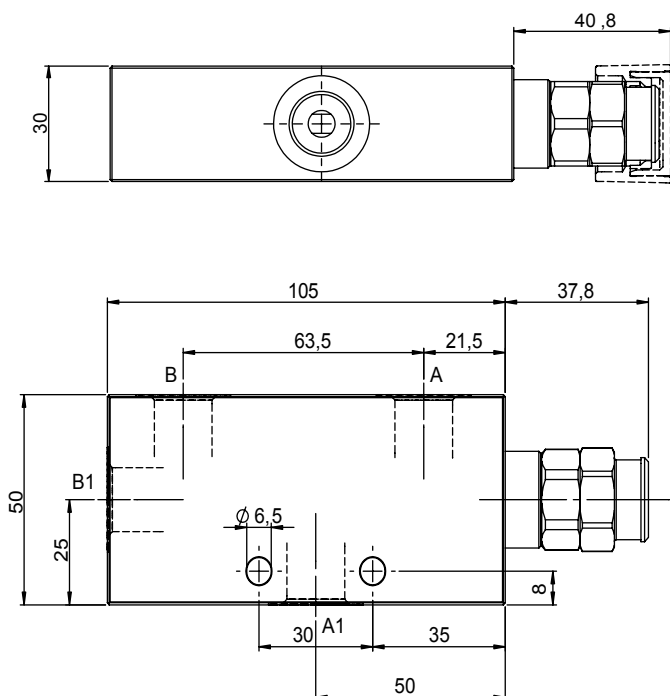
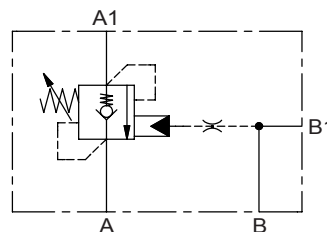
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,A1,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"

**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **0,75 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 3 0 0 4 N**   **S**  **0 0**

PILOT RATIO	
<b>41</b>	<b>4:1+dia.0,5mm</b>

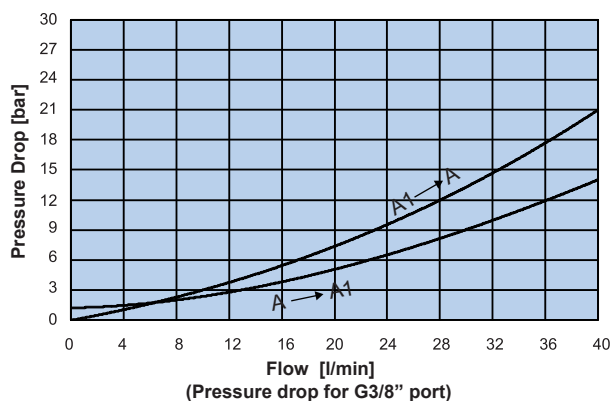
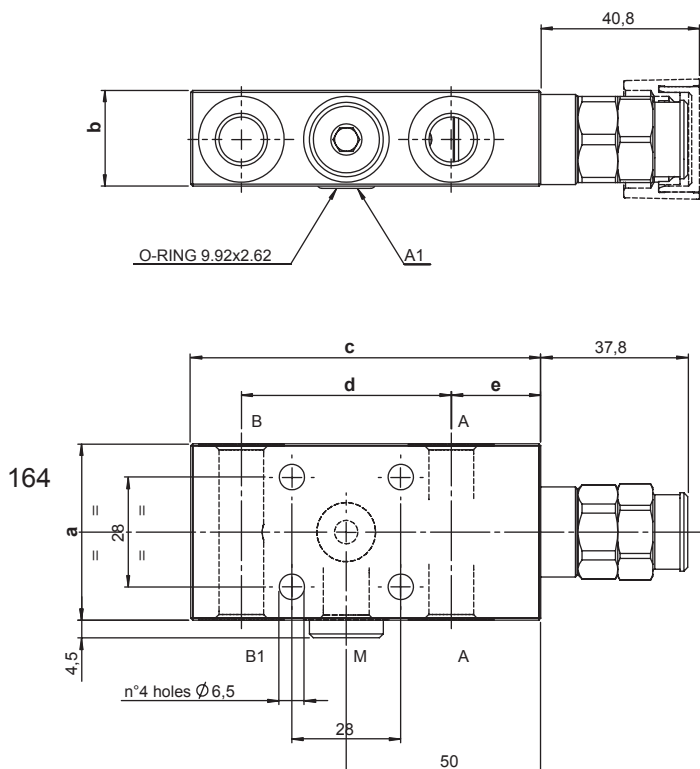
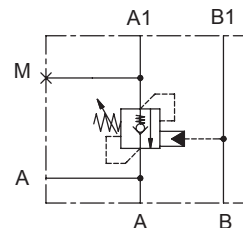
SPRINGS	2	3
Setting range min.-max. [bar]	80 - 210	150 - 350
Pressure Increase [bar/turn]	41	100
Standard setting 4 l/min [bar]	200	350

PORTS	03
A,B,A1,B1	G 3/8"



**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **0,7 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>02</b>	45	24,5	90	54	23
<b>03</b>	50	29,5	95	59	21

**Ordering code**

**H 3 0 0 5 N**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

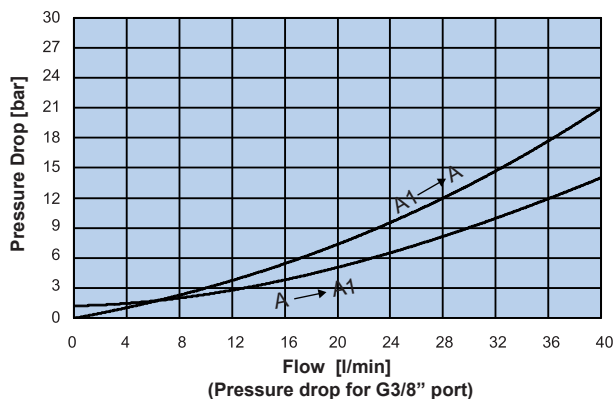
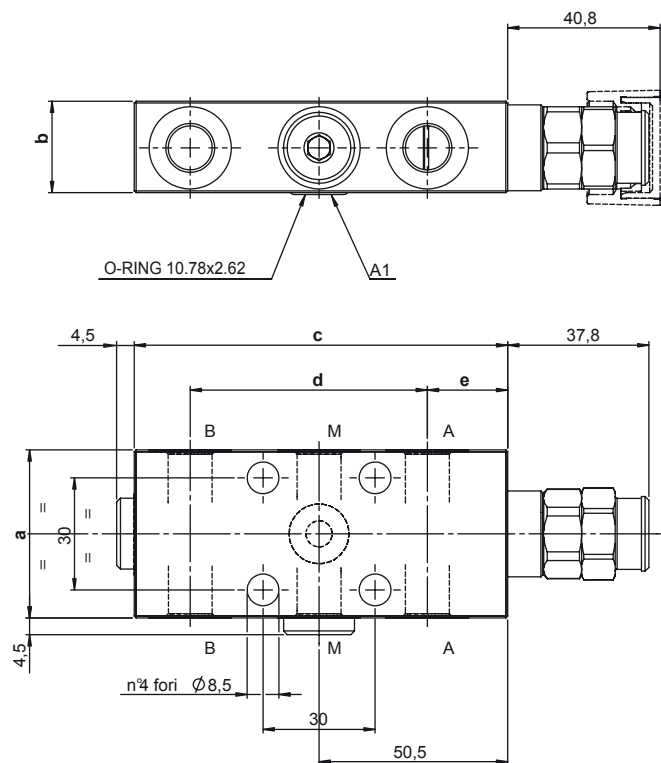
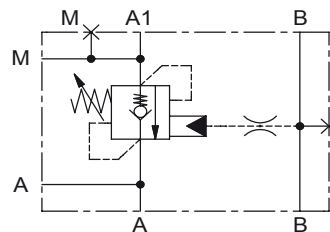
SPRINGS	2	3
Setting range min.-max. [bar]	80 - 210	150 - 350
Pressure Increase [bar/turn]	41	100
Standard setting 4 l/min [bar]	200	350

PORTS	02	03
A,B,B1	G 1/4"	G 3/8"
A1	Ø 6	Ø 6
M	G 1/4"	G 1/4"



**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **0,85 Kg**
- Tamper proof cap. . . . . **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>02</b>	45	24,5	100	63,5	21,5
<b>03</b>	50	29,5	100	66	19,5

**Ordering code**

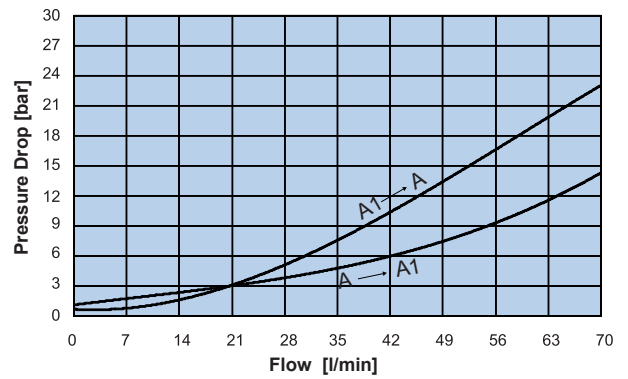
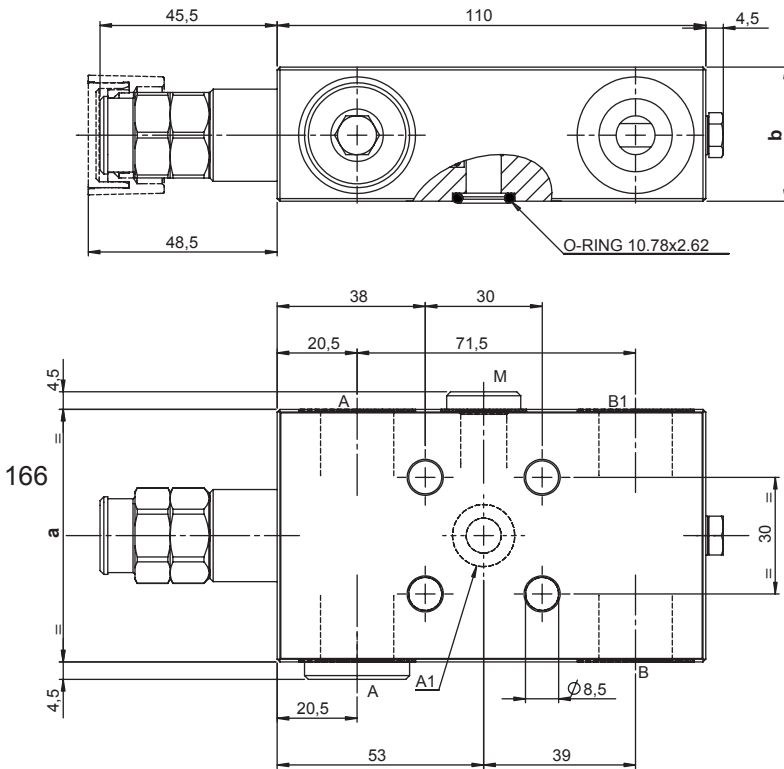
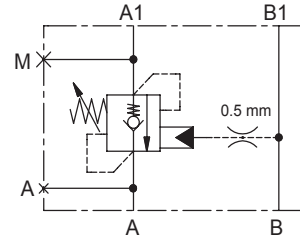
**H 3 0 0 7 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41    100	A1	Ø 6    Ø 6
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"



**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 0 0 5 N**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

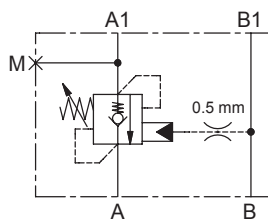
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,B,B1	G 3/8"	G 1/2"
A1	Ø 9	Ø 9
M	G 1/4"	G 1/4"

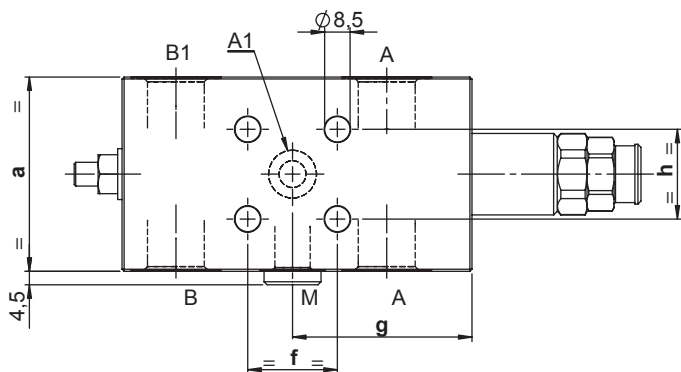
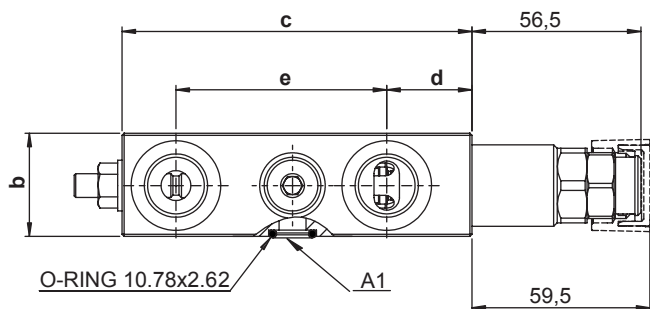
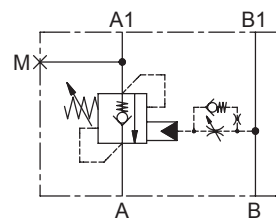
**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**

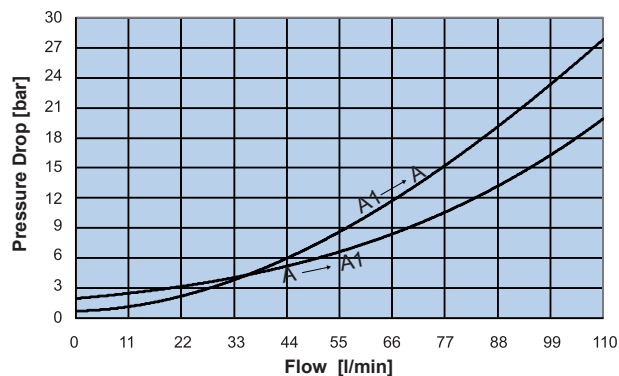
**SCHEME 40 - 90**



**SCHEME 42 - 92**



	a	b	c	d	e	f	g	h
<b>04</b>	65	34,5	117	28,5	70,5	30	45	30
<b>05</b>	80	39,5	130	22	86	40	45	40



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 0 0 5 N**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

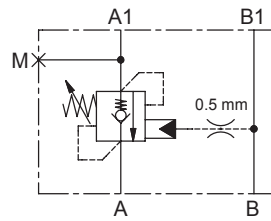
PORTS	<b>04</b>	<b>05</b>
A,B,B1	G 1/2"	G 3/4"
A1	Ø 9	Ø 9
M	G 1/4"	G 1/4"



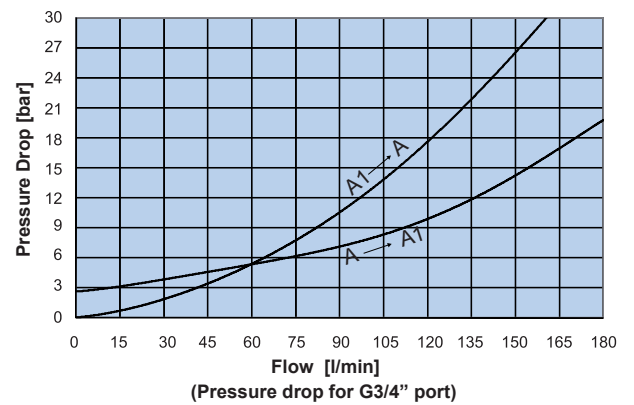
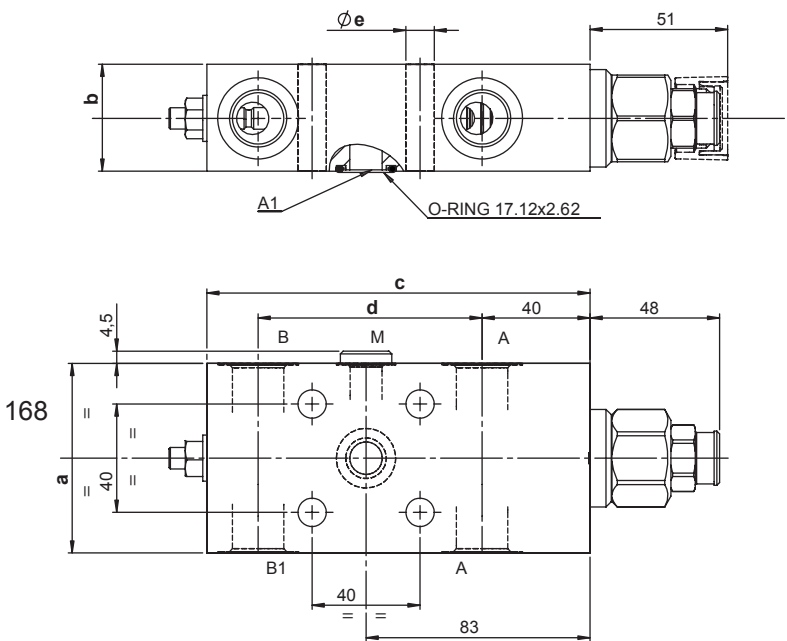
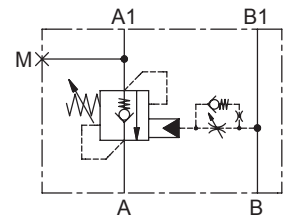
**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3,2 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD15X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>04</b>	70	39,5	142	83	10,5
<b>05</b>	80	39,5	147	86	10,5

**Ordering code**

**H 1 5 0 5 N**       **S**    **0 0**

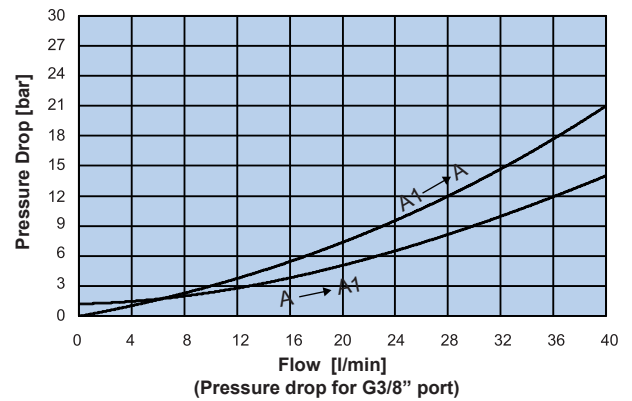
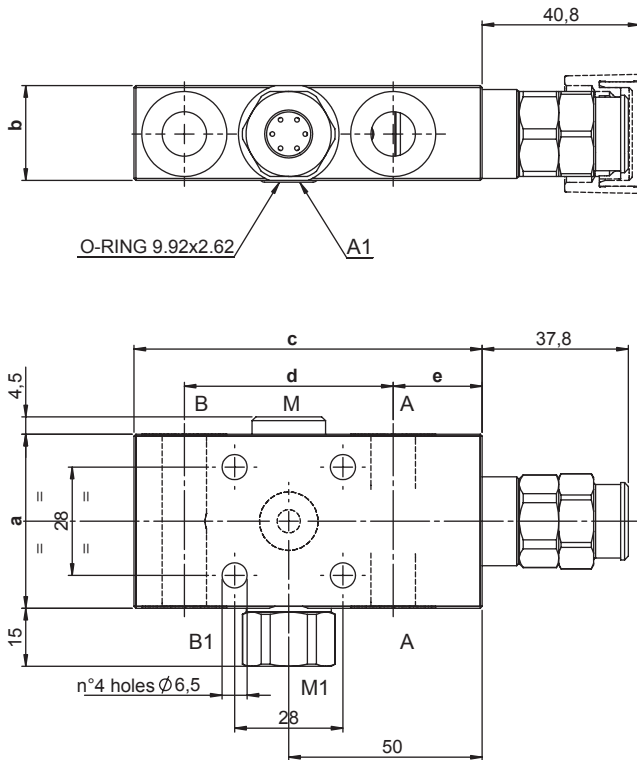
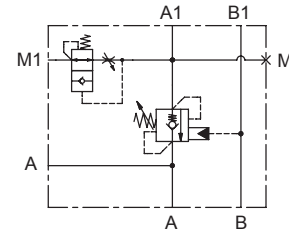
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"
A1	Ø 12	Ø 12

**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **0,7 Kg**
- Tamper proof cap..... **cod. 9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>02</b>	45	24,5	90	54	23
<b>03</b>	50	29,5	95	59	21

**Ordering code**

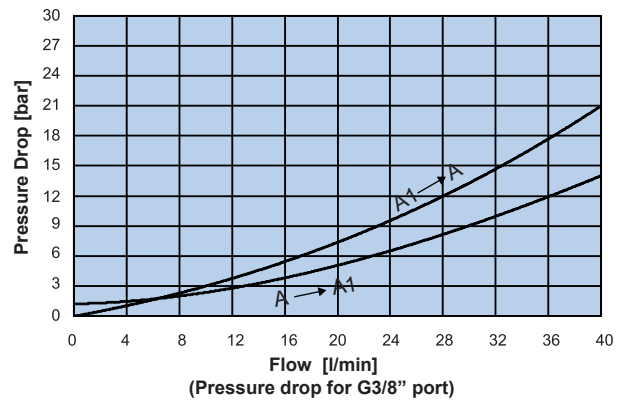
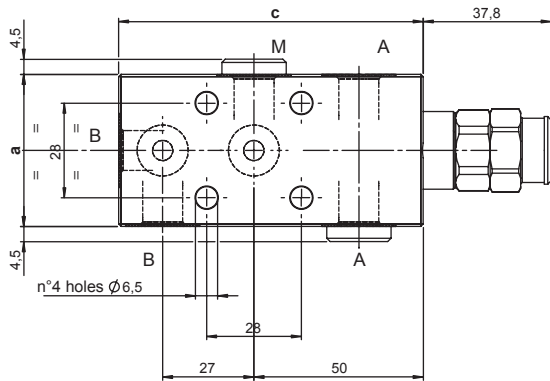
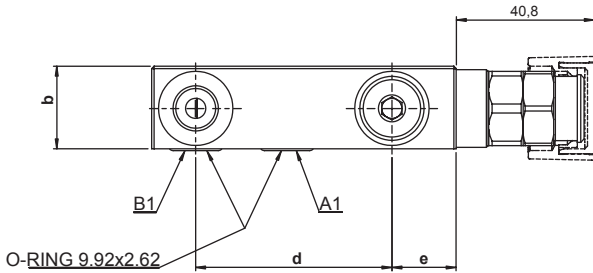
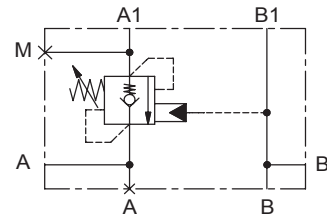
**H 3 0 0 5 N**       **S**    **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>43</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B,B1	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41            100	A1	Ø 6        Ø 6
		Standard setting 4 l/min [bar]	200          350	M	G 1/4"    G 1/4"



**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **0,8 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>02</b>	45	24,5	90	58	19
<b>03</b>	50	29,5	95	59	21

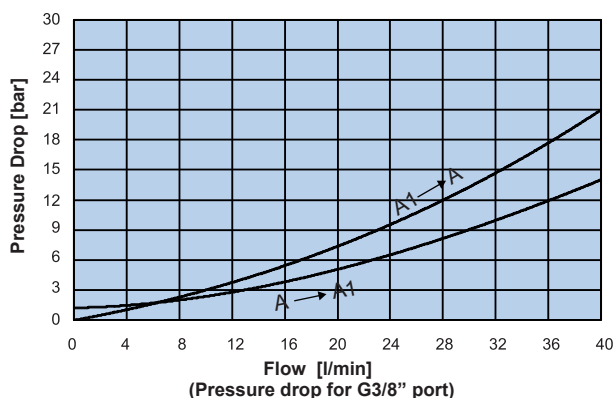
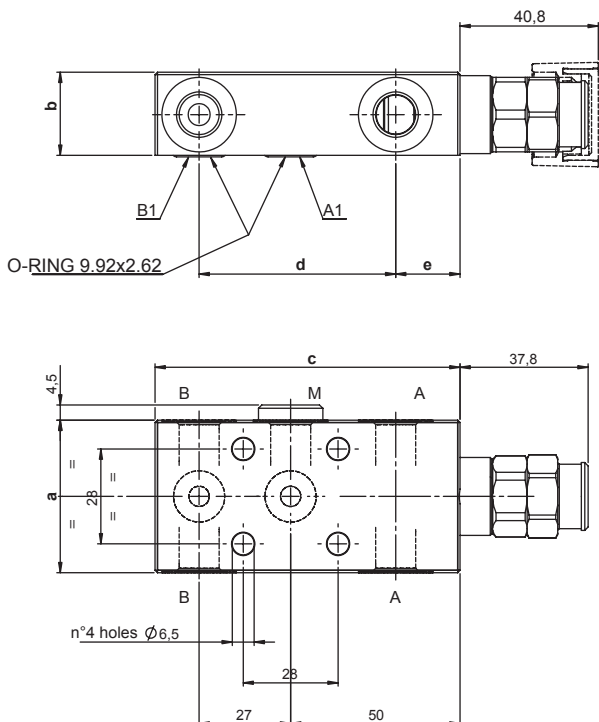
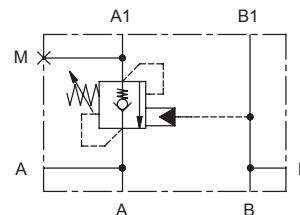
**Ordering code**

**H 3 0 0 6 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210 / 150 - 350	A,B	G 1/4" / G 3/8"
		Pressure Increase [bar/turn]	41 / 100	A1,B1	Ø 6 / Ø 6
		Standard setting 4 l/min [bar]	200 / 350	M	G 1/4" / G 1/4"

**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **0,8 Kg**
- Tamper proof cap..... **cod.9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e	g
<b>02</b>	45	24,5	90	58	19	8,5
<b>03</b>	50	29,5	95	59	21	1,1

**Ordering code**

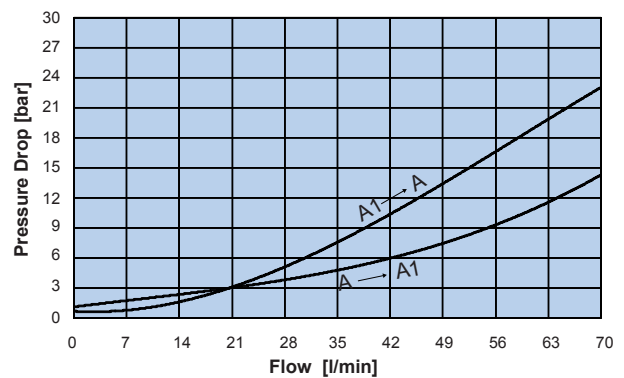
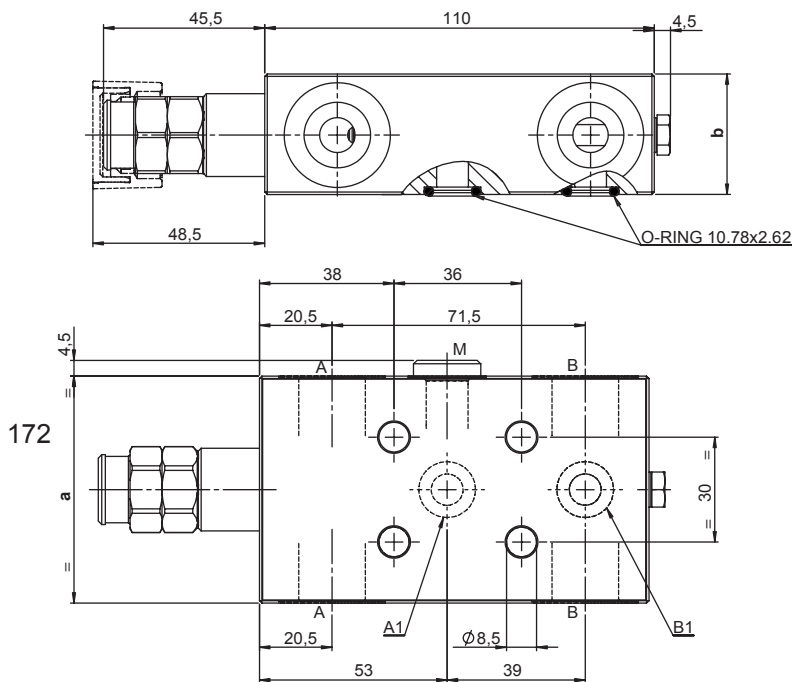
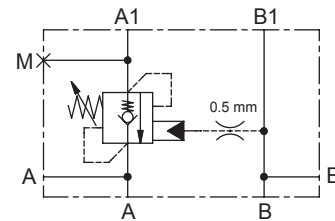
**H 3 0 0 8 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41    100	A1,B1	Ø 6    Ø 6
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"



**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,7 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 0 0 6 N**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

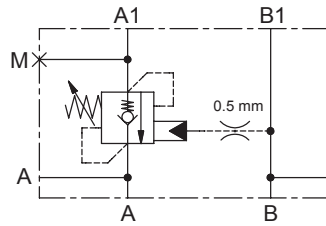
PORTS	03	04
A,B	G 3/8"	G 1/2"
A1,B1	Ø 9	Ø 9
M	G 1/4"	G 1/4"



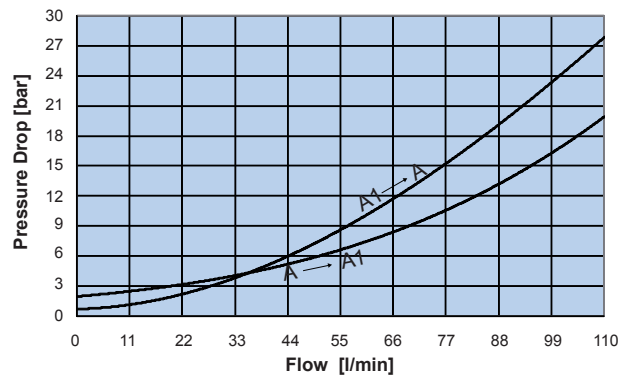
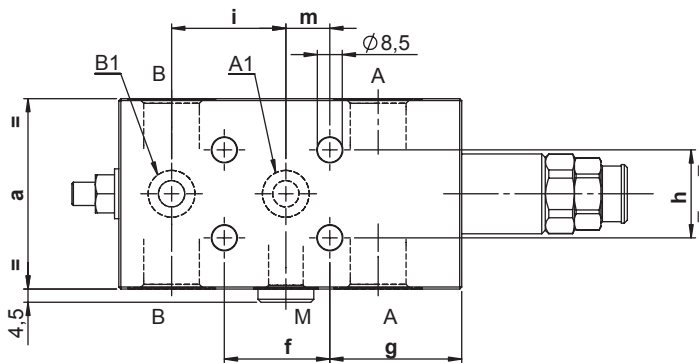
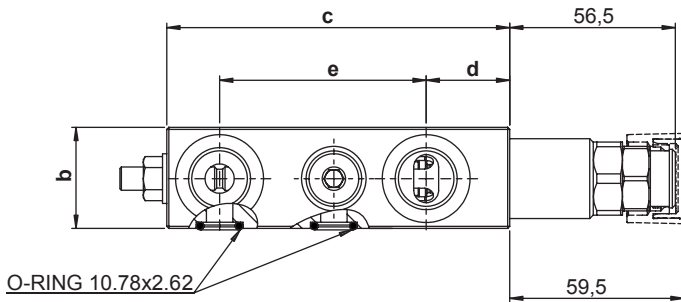
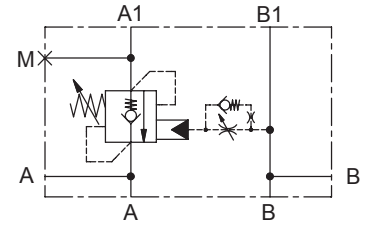
**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 90**



**SCHEME 42 - 92**



	a	b	c	d	e	f	g	h	i	m
<b>04</b>	65	34,5	117	28,5	70,5	36	45	30	39	15
<b>05</b>	80	39,5	130	22	86	40	45	40	43	20

**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 0 0 6 N**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

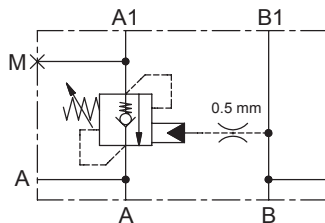
PORTS	<b>04</b>	<b>05</b>
A,B,B1	G 1/2"	G 3/4"
A1,B1	Ø 9	Ø 9
M	G 1/4"	G 1/4"



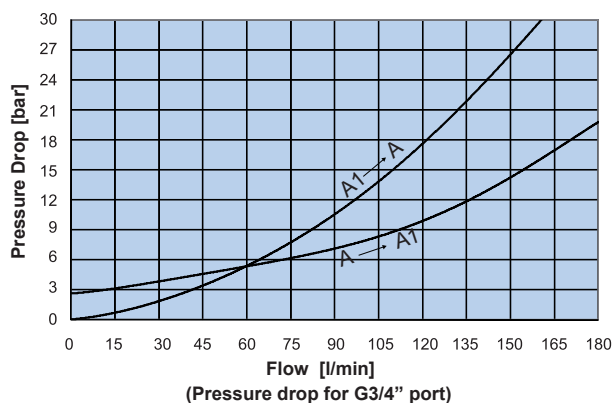
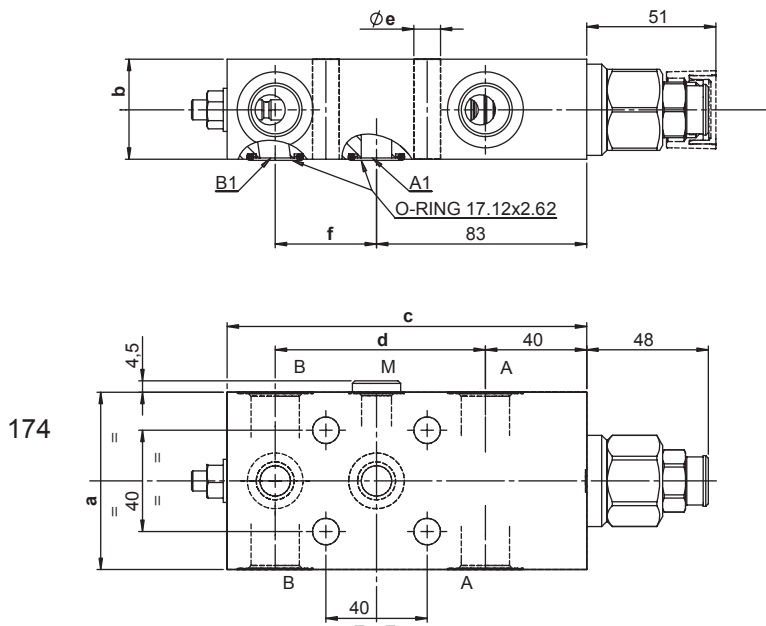
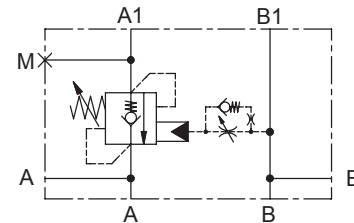
**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3,3 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD15X-C is recommended for circuits with high back pressure)

	a	b	c	d	e	f
<b>04</b>	70	39,5	142	83	10,5	40
<b>05</b>	80	39,5	147	86	10,5	43

**Ordering code**

**H 1 5 0 6 N**     **S**   **0 0**

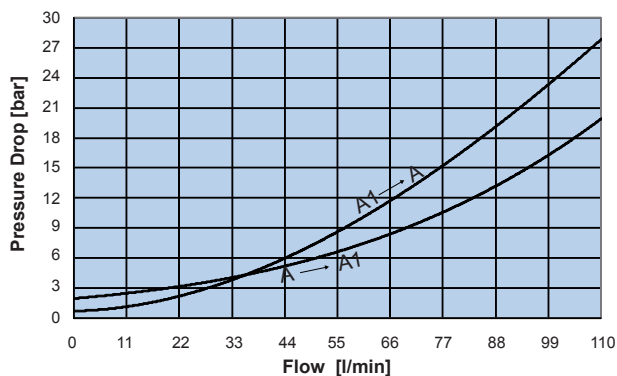
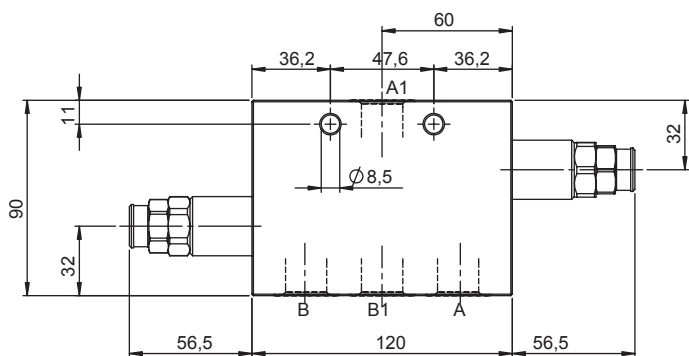
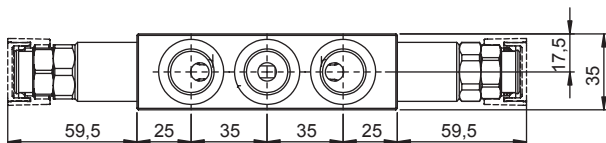
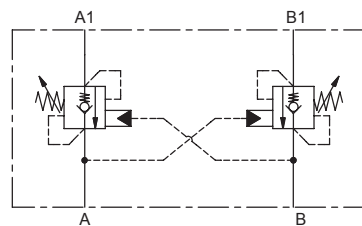
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,B	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"
A1,A2	Ø 12	Ø 12

**DOUBLE ACTING COUNTERBALANCE VALVE**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3 Kg (G 1/2), 4,7 (G 3/4)**
- Tamper proof cap..... **cod.9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 0 3 0 N**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

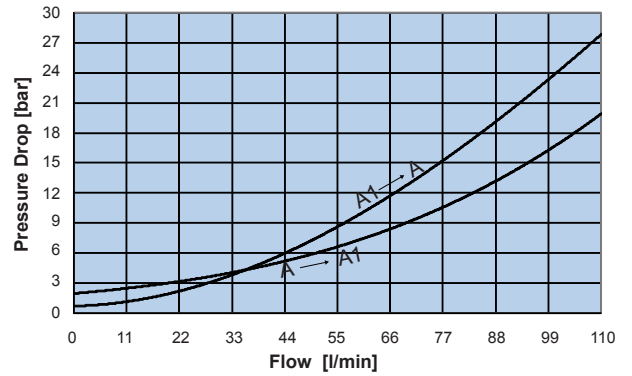
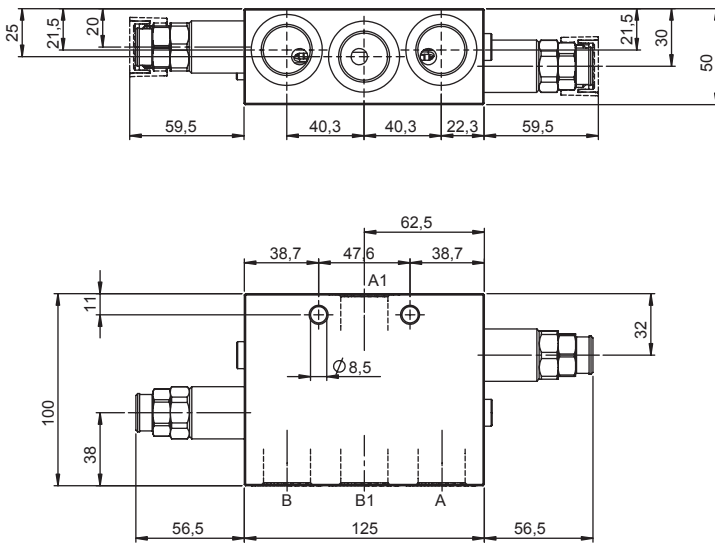
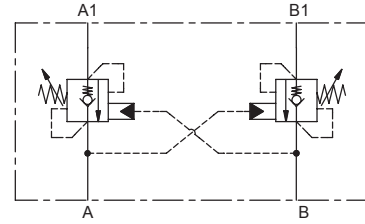
SPRINGS	<b>2</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410
Pressure Increase [bar/turn]	52	85
Standard setting 4 l/min [bar]	200	350

PORTS	<b>04</b>
A,A1,B,B1	G 1/2"



**DOUBLE ACTING COUNTERBALANCE VALVE**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3 Kg (G 1/2), 4,7 (G 3/4)**
- Tamper proof cap..... **cod. 9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

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**Ordering code**

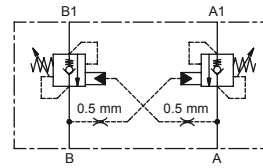
**H 1 0 3 0 N**   **S**  **0 0**

<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>4</b>	<b>05</b>	
		Setting range min.-max. [bar]	60 - 210	120 - 410	A,A1,B,B1
		Pressure Increase [bar/turn]	52	85	G 3/4"
		Standard setting 4 l/min [bar]	200	350	

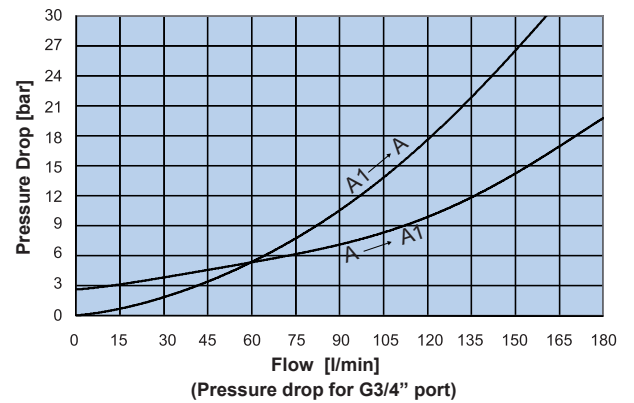
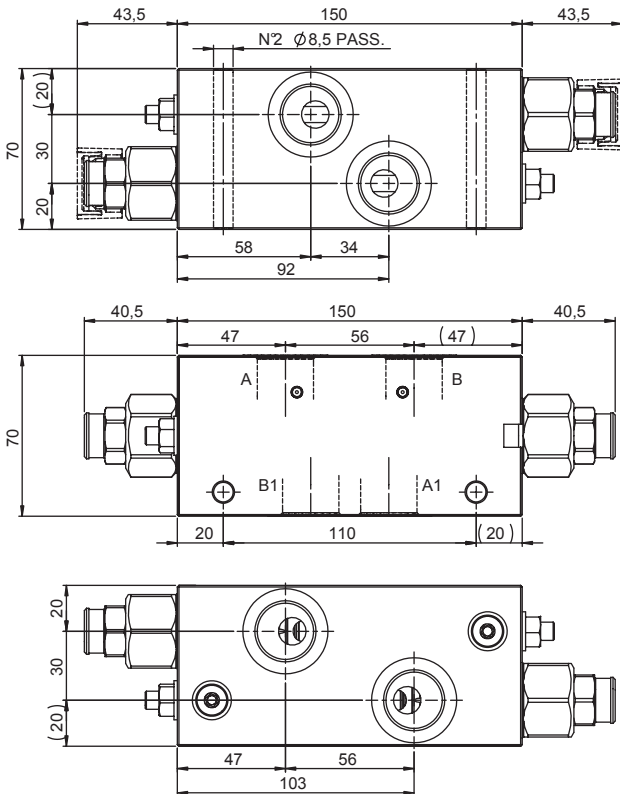
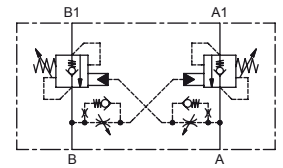
**DOUBLE ACTING COUNTERBALANCE VALVE**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **5,3 Kg**
- Tamper proof cap..... **cod. 9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD15X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 5 3 0 N**       **S**    **0 0**

PILOT RATIO		
<b>40</b>	<b>4:1</b>	
<b>42</b>	<b>4:1</b>	ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>	
<b>82</b>	<b>8:1</b>	ADJUSTABLE DUMP SCREW

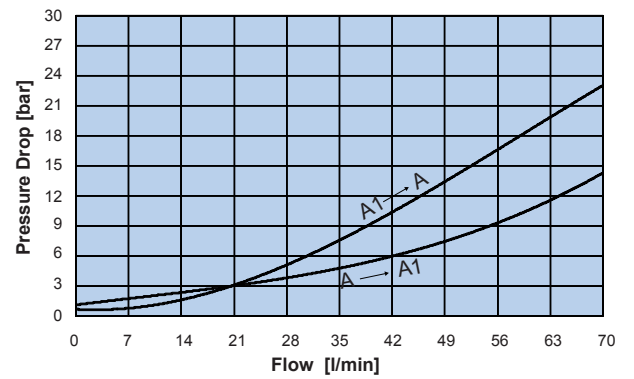
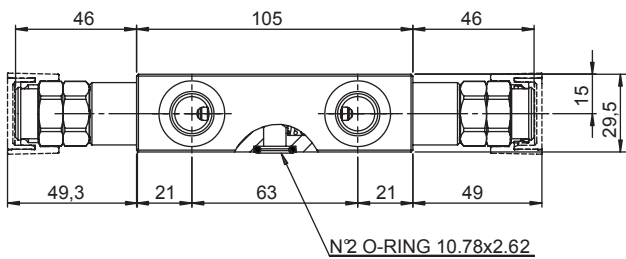
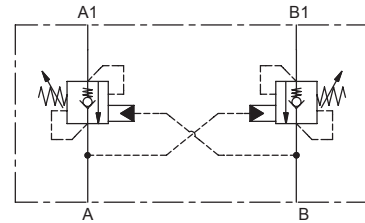
SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>05</b>
A,A1,B,B1	G 3/4"

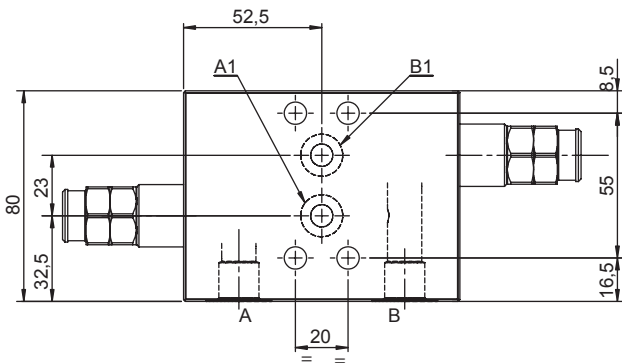


**DOUBLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **72 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 5 0 3 2 N**   **S**  **0 0**

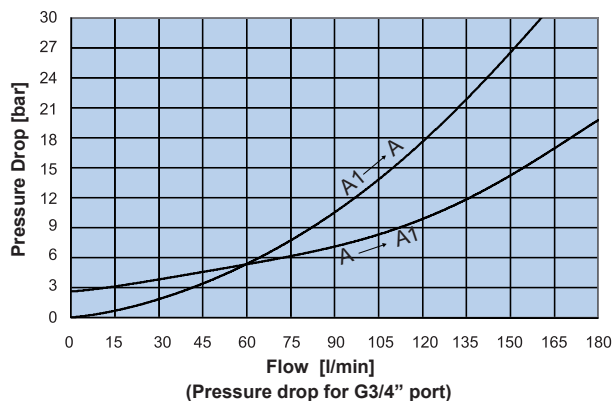
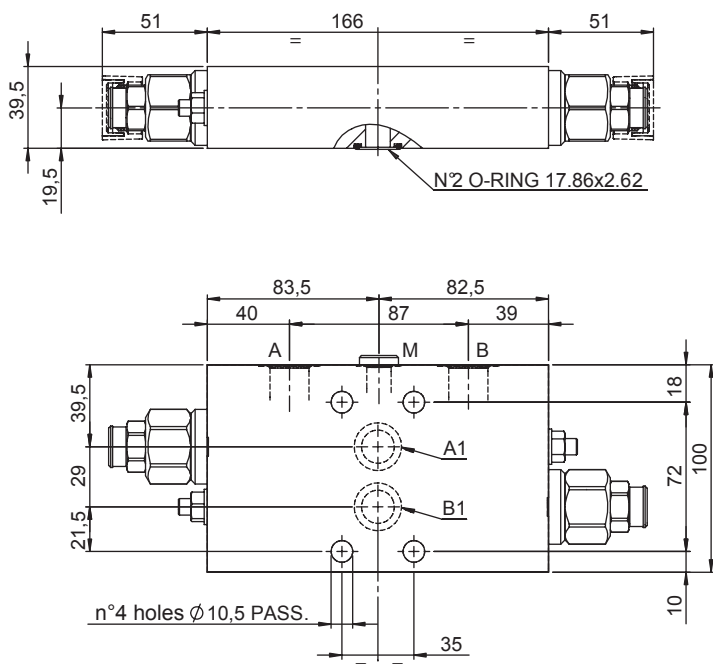
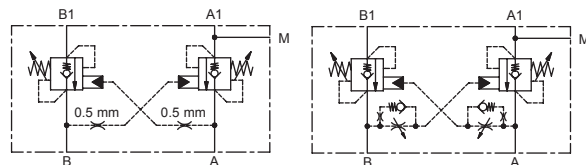
<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>03</b>	
		Setting range min.-max. [bar]	60 - 210    120 - 350	A,B	G 3/8"
		Pressure Increase [bar/turn]	62    114	A1,B1	Ø 9
		Standard setting 4 l/min [bar]	200    350		

**DOUBLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **5 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEMI 40 - 80**

**SCHEMI 42 - 82**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD15X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 5 3 2 N**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

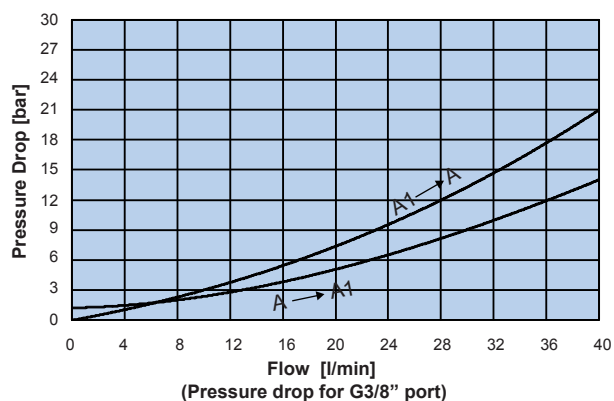
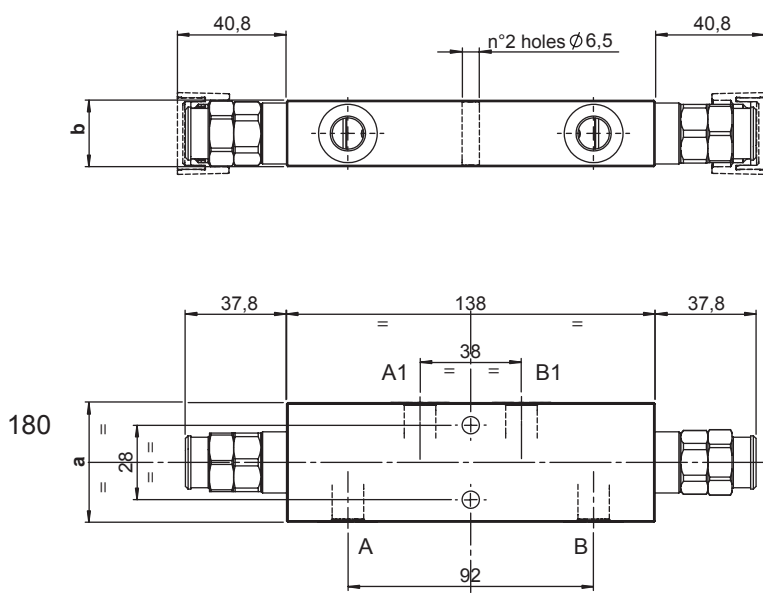
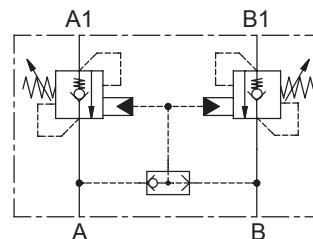
SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,B	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"
A1,A2	Ø 12	Ø 12



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,3 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b
<b>02</b>	45	25
<b>03</b>	50	30

Ordering code

**H 3 0 6 0 N**     **S**   **0 0**

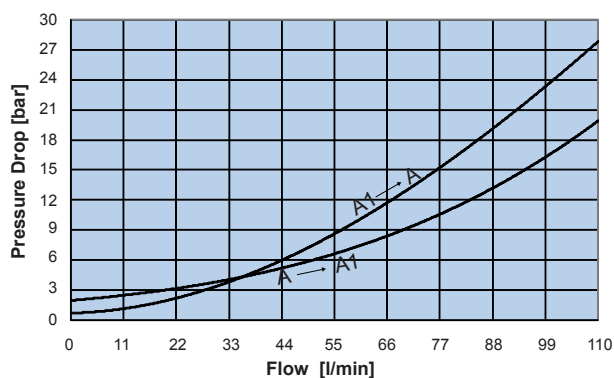
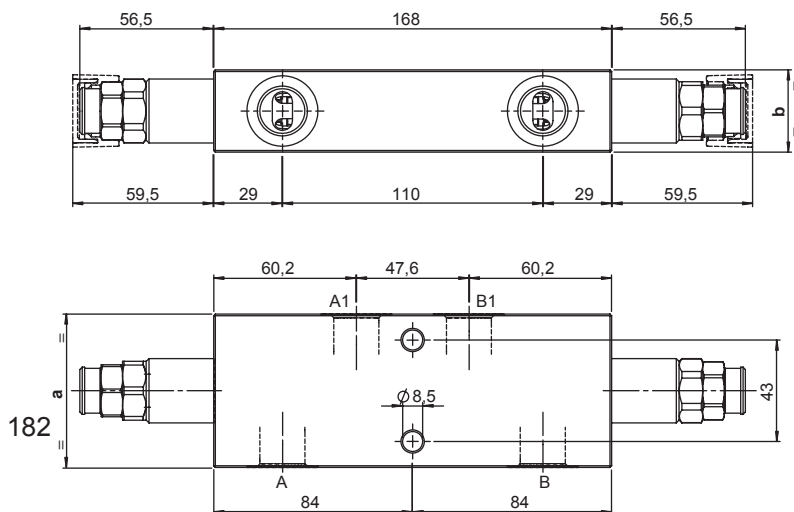
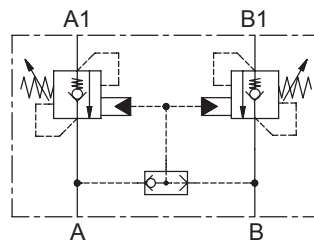
<b>PILOT RATIO</b>		<b>PORTS</b>		
<b>40</b> <b>4:1</b>	<b>SPRINGS</b>	<b>2</b>	<b>3</b>	<b>02</b> <b>03</b>
	Setting range min.-max. [bar]	80 - 210	150 - 350	A,B,A1,B1    G 1/4"    G 3/8"
	Pressure Increase [bar/turn]	41	100	
	Standard setting 4 l/min [bar]	200	350	





**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

	a	b
<b>04</b>	65	35
<b>05</b>	70	40

**Ordering code**

**H 1 0 6 0 N**     **S**   **0 0**

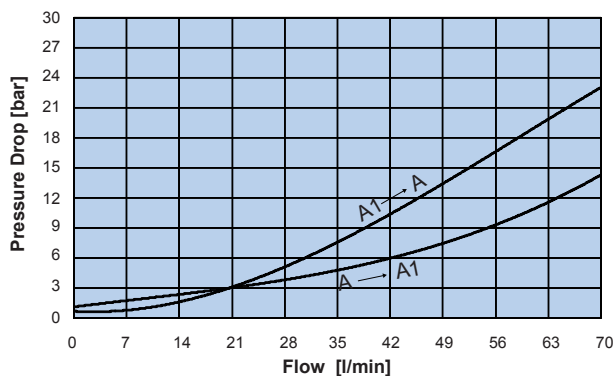
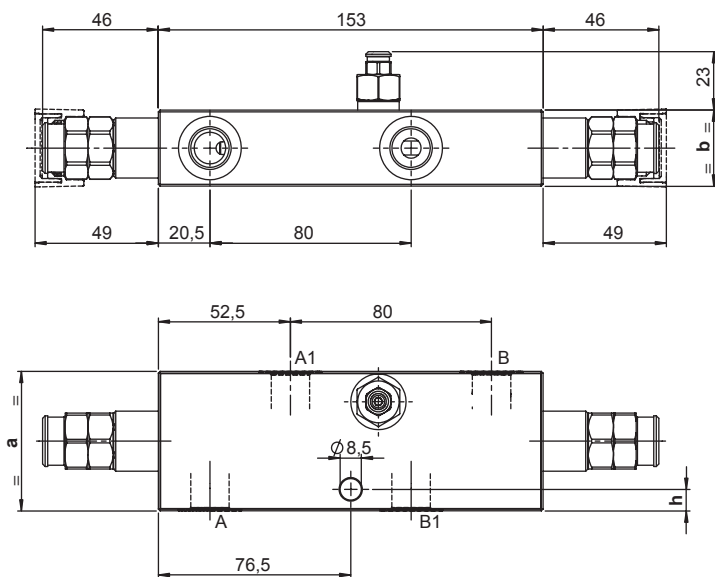
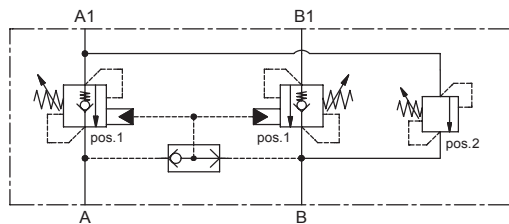
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,A1,B,B1	G 1/2"	G 3/4"

**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY**

- Flow. . . . . **70 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **2,1 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



**Note:**  
 - Antishock valve pos.2 max flow 3 l/min  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b	c	h
<b>03</b>	55	30	38	8,5
<b>04</b>	65	35	43	11

**Ordering code**

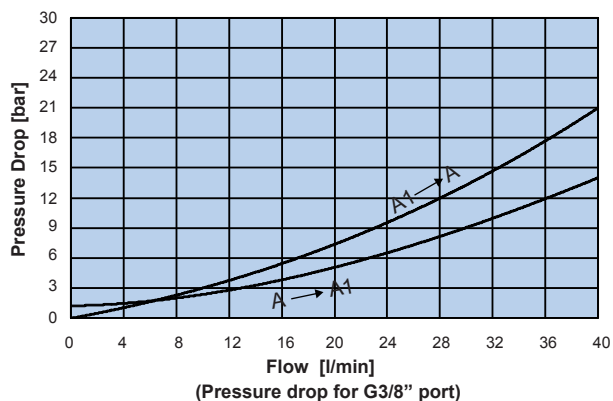
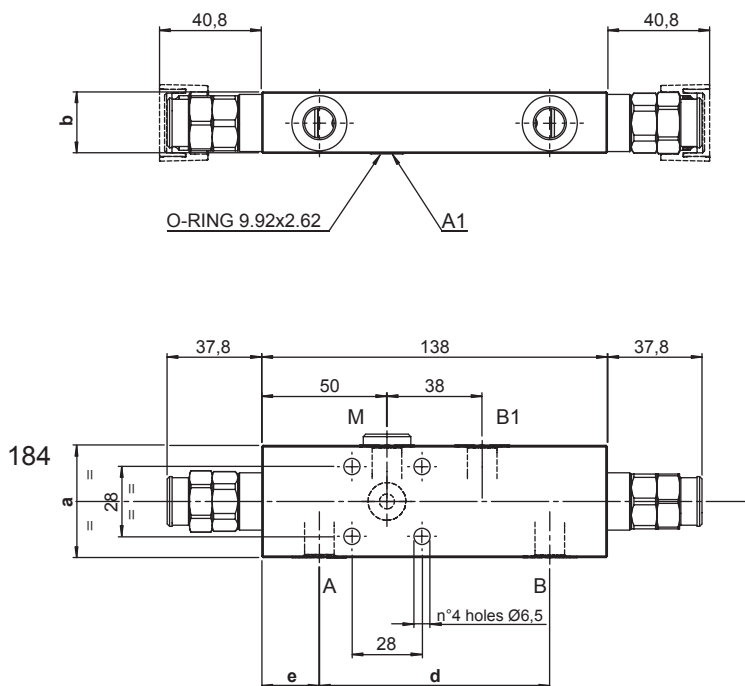
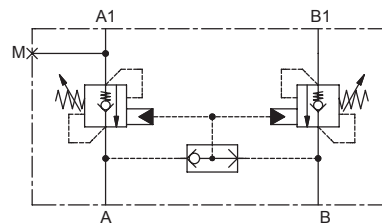
**H 5 0 6 0 N**       **S**    **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>47</b>	<b>4:1+RELIEF A1&gt;B</b>	<b>3</b>		<b>03</b>	<b>04</b>
		pos.1	pos.2	A,B,A1,B1	G 3/8" G 1/2"
		Setting range min.-max. [bar]	120 - 350 250 - 400		
		Pressure Increase [bar/turn]	114 250		
		Standard setting 4 l/min [bar]	350 bar a 4 l/min 300 bar a 20 cc/min		



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1 PORT FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,3 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b	c	d	e
<b>02</b>	45	25	12,5	92	23
<b>03</b>	50	30	15	96	21

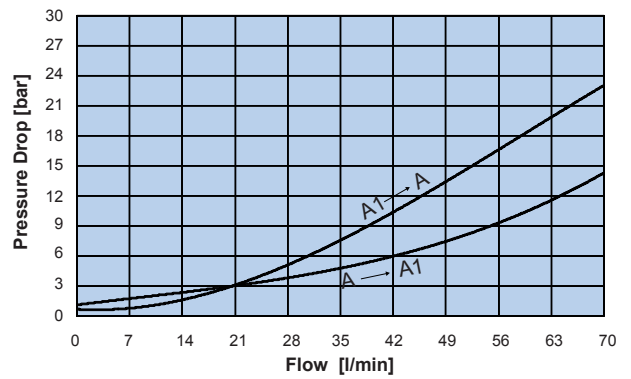
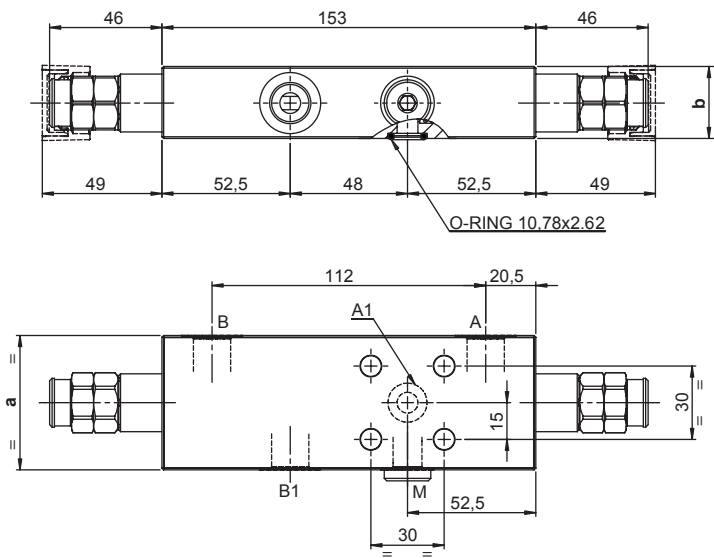
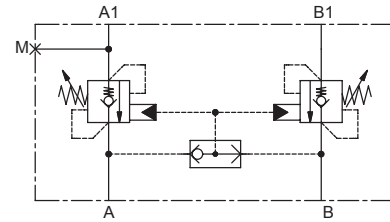
**Ordering code**

**H 3 0 6 1 N**     **S**   **0 0**

<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B,B1	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41    100	A1	Ø 6    Ø 6
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"

**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod. 9021030190**



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**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b
<b>03</b>	55	29,5

**Ordering code**

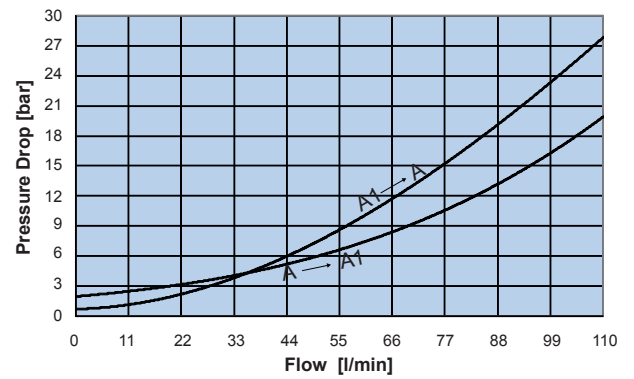
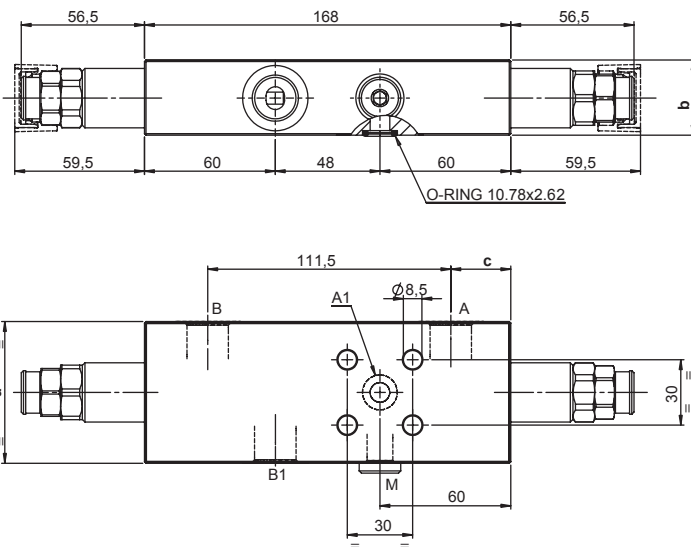
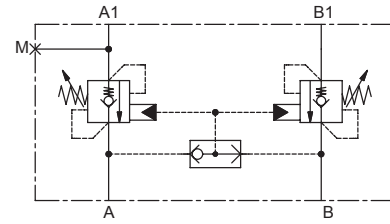
**H 5 0 6 1 N**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>03</b>	<b>04</b>
		Setting range min.-max. [bar]	60 - 210    120 - 350	A,B,B1	G 3/8"    G 1/2"
		Pressure Increase [bar/turn]	62    114	A1	Ø 9    Ø 9
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1 PORT FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **3 Kg**
- Tamper proof cap..... **cod. 9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

	a	b	c
<b>04</b>	65	34,5	27,5
<b>05</b>	70	39,5	24

**Ordering code**

**H 1 0 6 1 N**   **S**  **0 0**

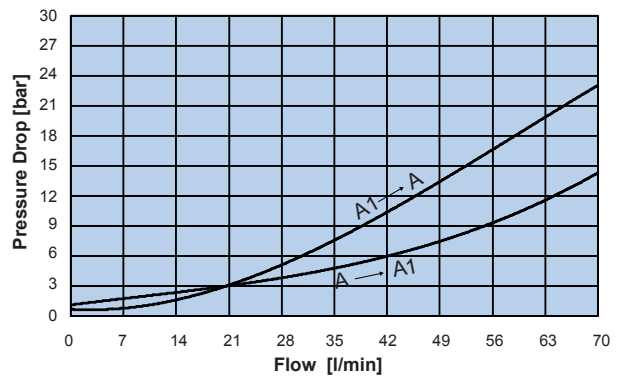
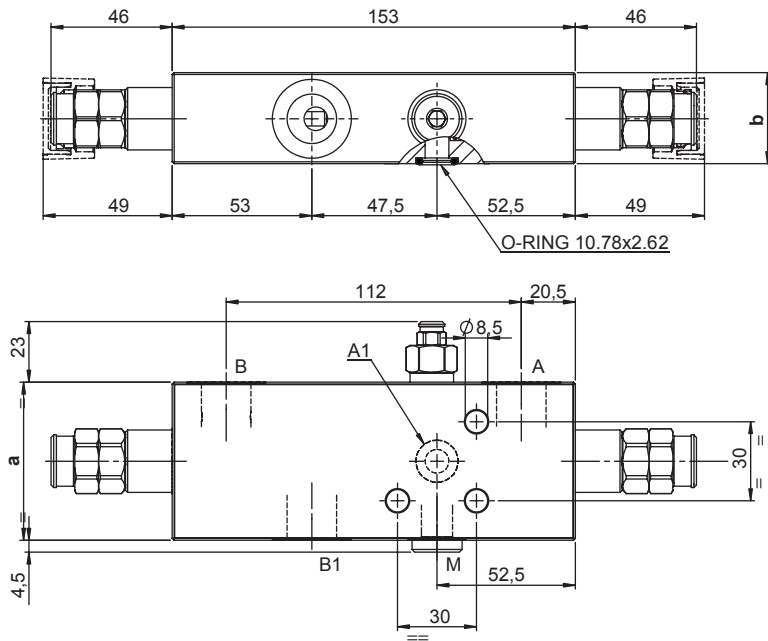
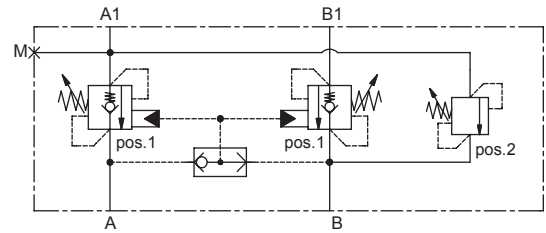
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,B,B1	G 1/2"	G 3/4"
A1	Ø 9	Ø 9
M	G 1/4"	G 1/4"

**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1 PORT FLANGED**

- Flow. . . . . **70 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **1,9 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



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**Note:**  
 - Antishock valve pos.2 max flow 3 l/min  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

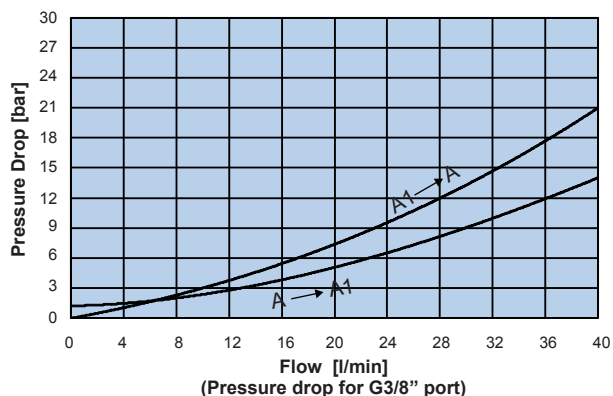
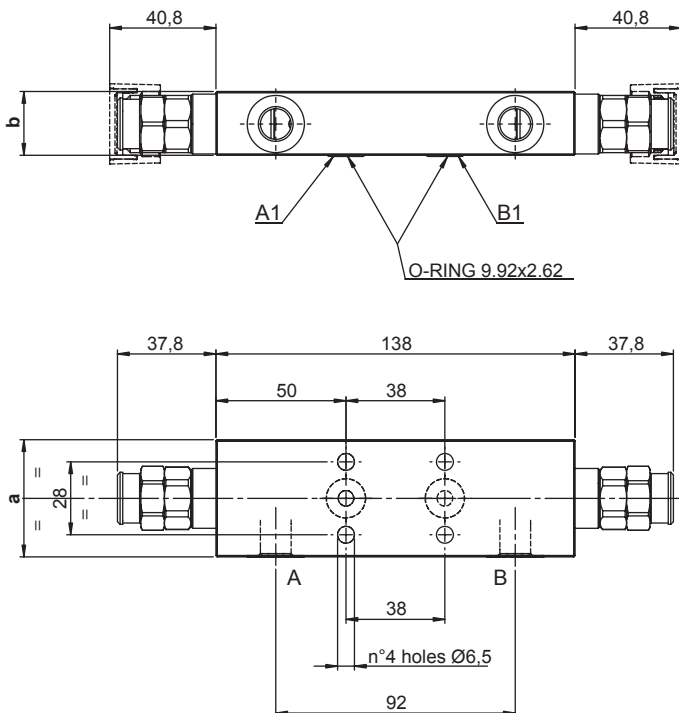
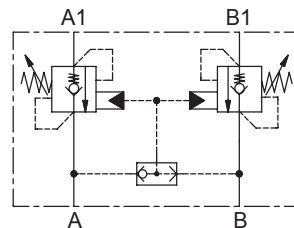
**H 5 0 6 1 N**     **S**   **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>47</b>	<b>4:1+RELIEF A1&gt;B</b>	<b>3</b>		<b>03</b>	<b>04</b>
		pos.1	pos.2	A,B,B1	G 3/8"
				A1	Ø 9
				M	G 1/4"
		Setting range min.-max. [bar]	120 - 350	250 - 400	
		Pressure Increase [bar/turn]	114	250	
		Standard setting 4 l/min [bar]	350 bar a 4 l/min	300 bar a 20 cc/min	



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1/B1 PORT FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **1,3 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD03X-C is recommended for circuits with high back pressure)

	a	b
<b>02</b>	45	25
<b>03</b>	50	30

Ordering code

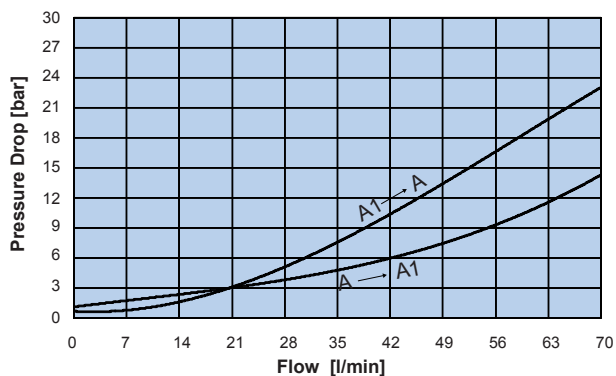
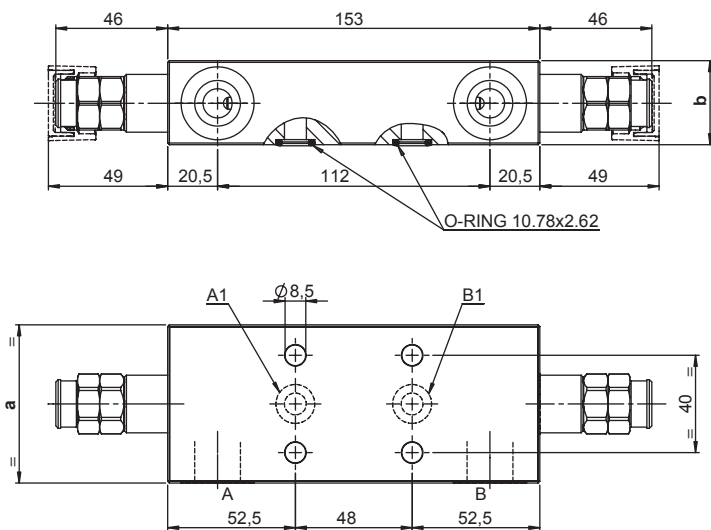
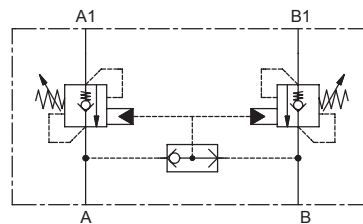
**H 3 0 6 2 N**     **S**   **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41    100	A1,B1	Ø 6    Ø 6
		Standard setting 4 l/min [bar]	200    350		



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1/B1 PORT FLANGED**

- Flow. . . . . **70 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Not Compensated**
- Weight. . . . . **1,5 Kg**
- Tamper proof cap. . . . . **cod. 9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD05X-C is recommended for circuits with high back pressure)

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	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

Ordering code

**H 5 0 6 2 N**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

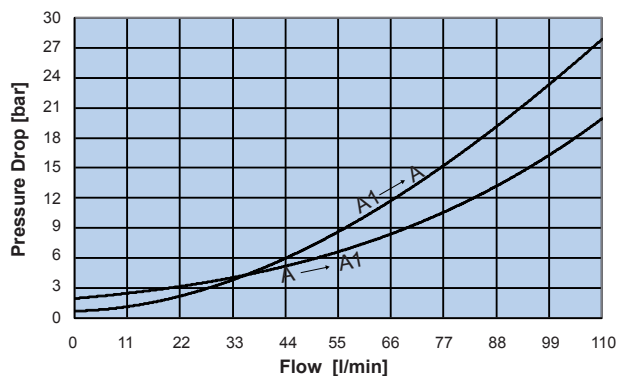
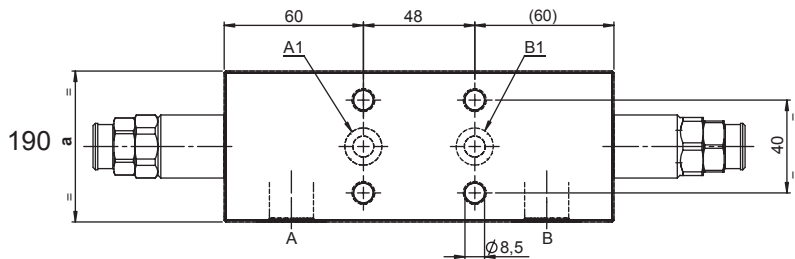
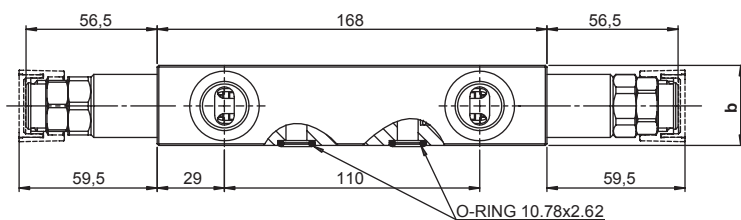
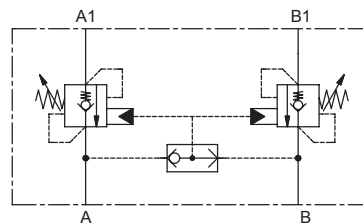
SPRINGS	rp 4:1		rp 9:1	
	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
Setting range min.-max. [bar]	60 - 210	120 - 350	80 - 250	190 - 350
Pressure Increase [bar/turn]	62	114	50	121
Standard setting 4 l/min [bar]	200	350	200	350

PORTS	<b>03</b>	<b>04</b>
A,B	G 3/8"	G 1/2"
A1,B1	Ø 9	Ø 9



**DOUBLE ACTING COUNTERBALANCE VALVE WITH COAXIAL CAVITY - A1/B1 PORT FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Not Compensated**
- Weight..... **.3 Kg**
- Tamper proof cap..... **cod. 9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

	a	b
<b>04</b>	65	34,5
<b>05</b>	70	39,5

Ordering code

**H 1 0 6 2 N**   **S**  **0 0**

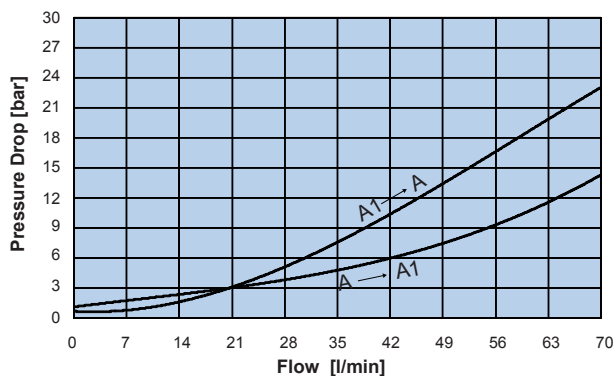
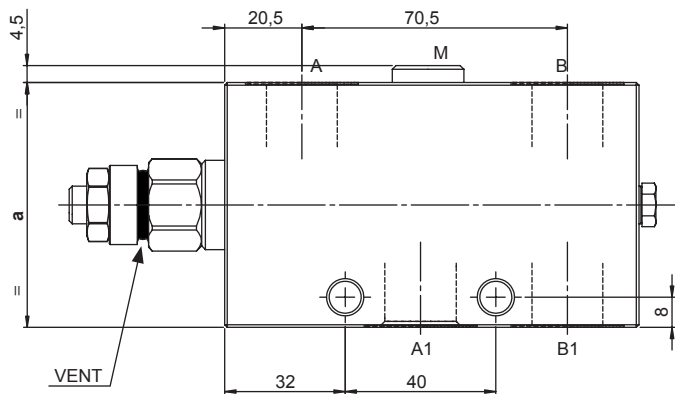
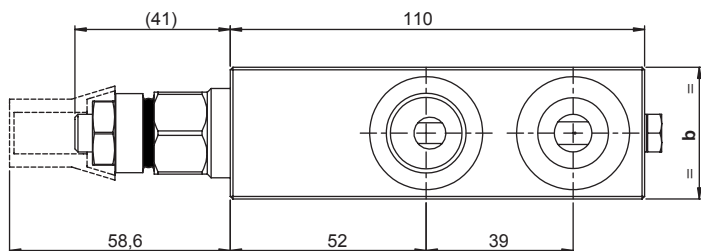
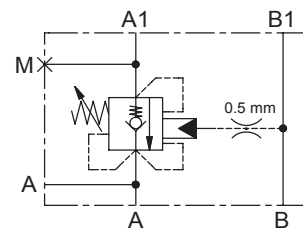
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
	A,B	G 1/2"
A1,B1	Ø 9	Ø 9

**SINGLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod. 4029250280**



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**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	30
<b>04</b>	65	35

**Ordering code**

**H 5 3 0 4 S**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

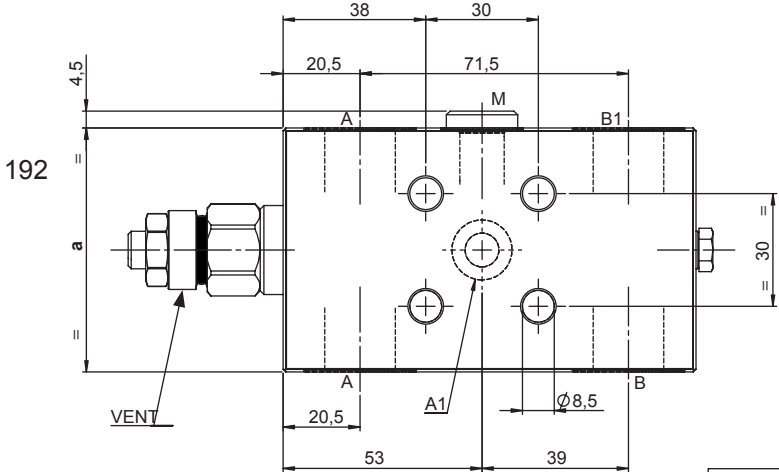
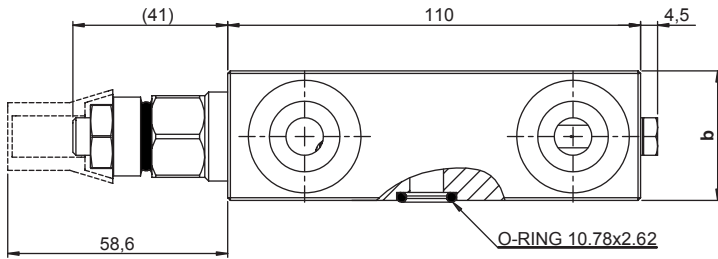
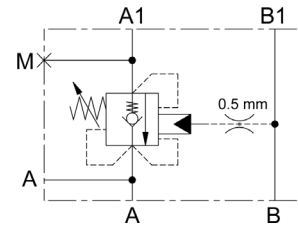
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,A1,B,B1	G 3/8"	G 1/2"
M	G 1/4"	G 1/4"

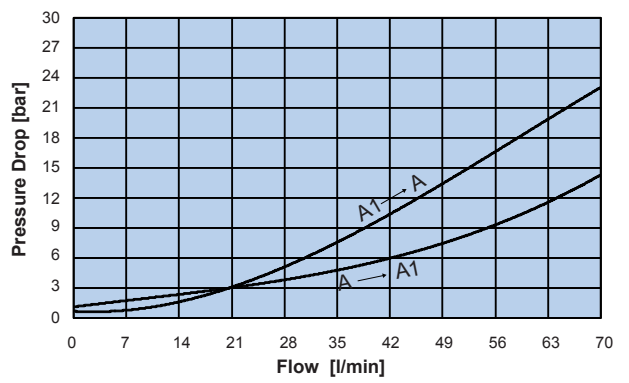


**SINGLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod. 4029250280**



	a	b
<b>03</b>	55	30
<b>04</b>	65	35



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

**Ordering code**

**H 5 3 0 5 S**     **S**   **0 0**

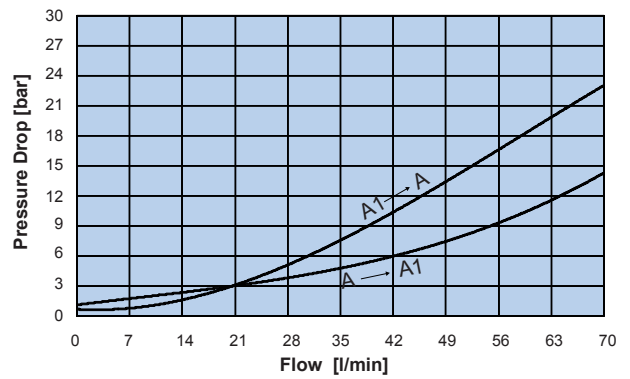
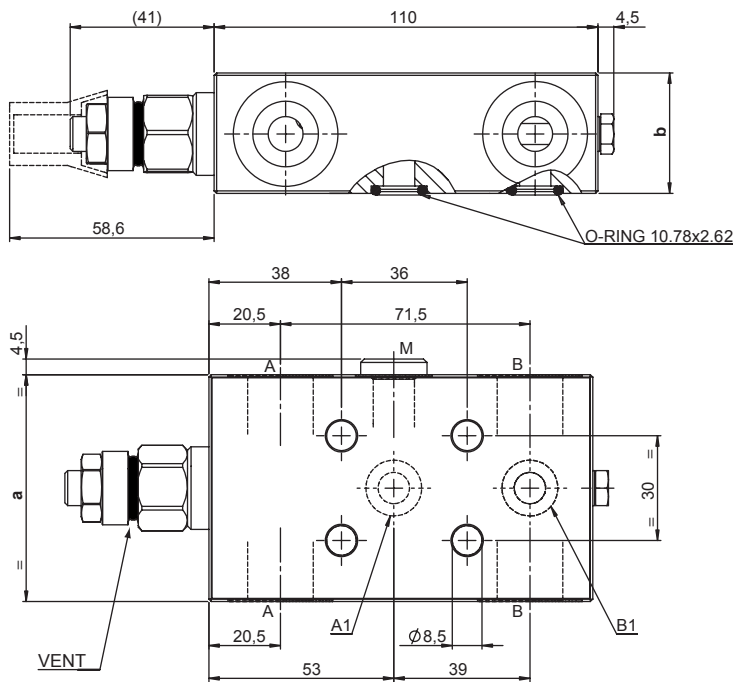
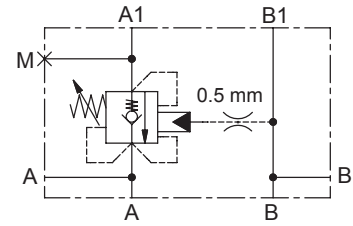
PILOT RATIO	
<b>40</b>	<b>4:1</b>

SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,A1,B,B1	G 3/8"	G 1/2"
A1	Ø 9	Ø 9
M	G 1/4"	G 1/4"

**SINGLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod. 4029250280**



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**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 3 0 6 S**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

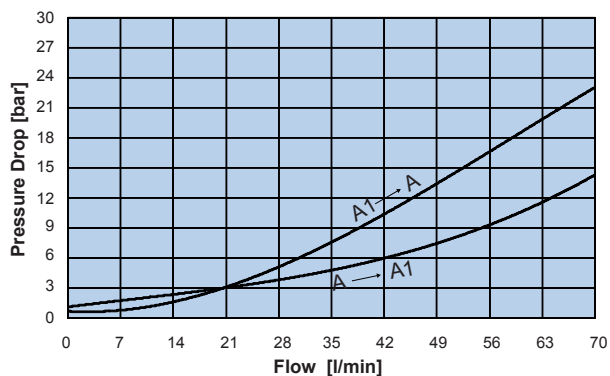
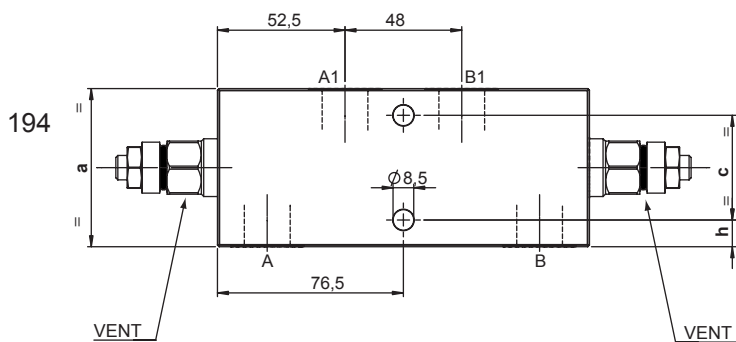
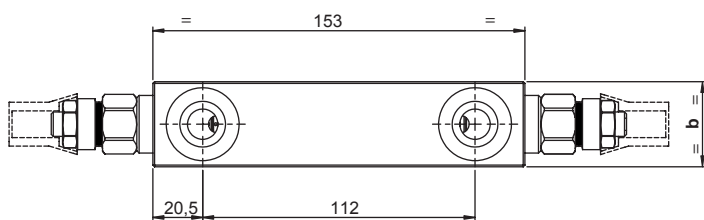
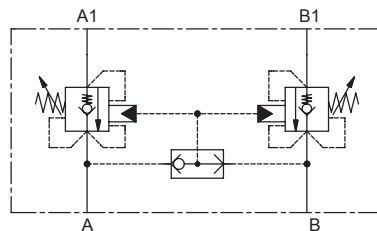
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,B	G 3/8"	G 1/2"
A1,B1	Ø 9	Ø 9
M	G 1/4"	G 1/4"



**DOUBLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod. 4029250280**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	h
<b>03</b>	55	30	38	8,5
<b>04</b>	65	35	43	11

**Ordering code**

**H 5 3 6 0 S**   **S**  **0 0**

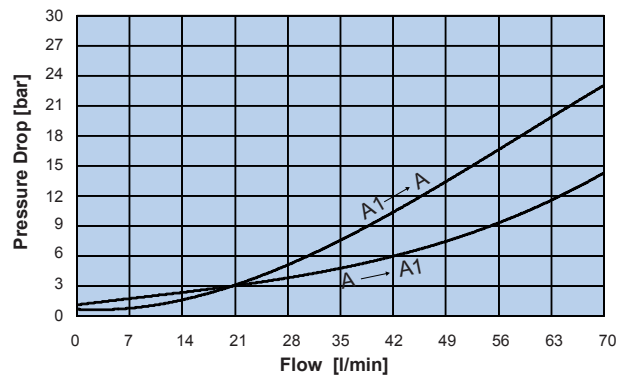
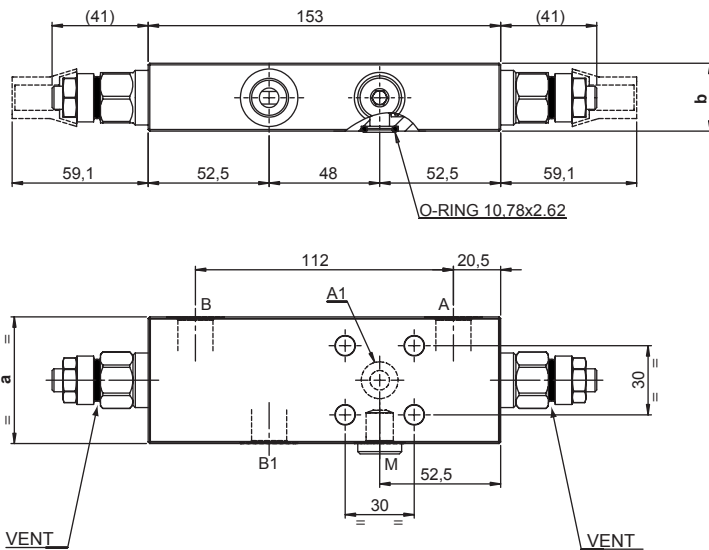
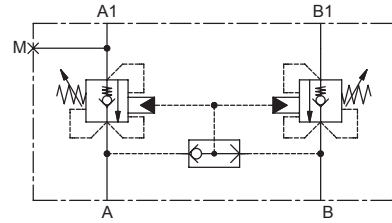
PILOT RATIO	
<b>40</b>	<b>4:1</b>

SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,B,A1,B1	G 3/8"	G 1/2"

**DOUBLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod. 4029250280**



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**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

Ordering code

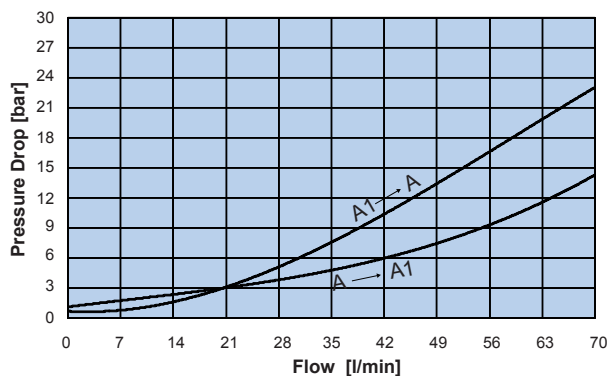
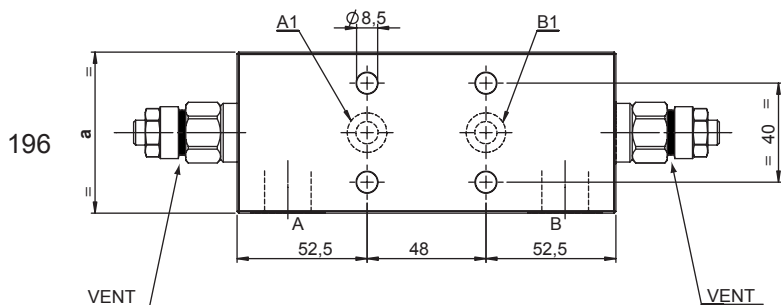
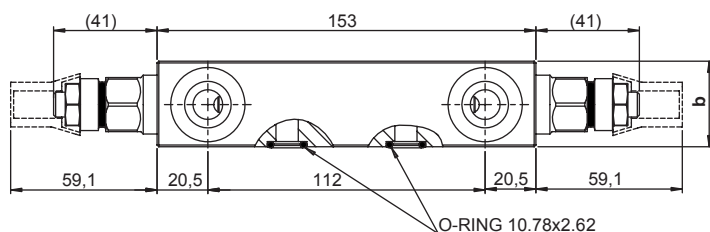
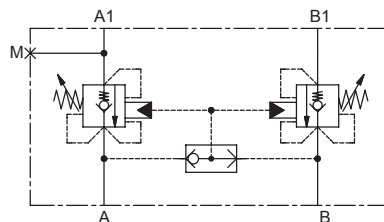
**H 5 3 6 1 S**     **S**   **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>03</b>	<b>04</b>
		Setting range min.-max. [bar]	60 - 210    120 - 350	A,B,B1	G 3/8"    G 1/2"
		Pressure Increase [bar/turn]	62    114	A1	Ø 9    Ø 9
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"



**SINGLE ACTING PARTIALLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Partially Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod. 4029250280**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 3 6 2 S**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

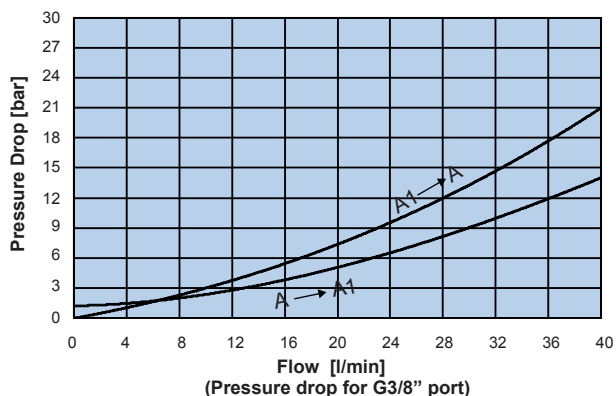
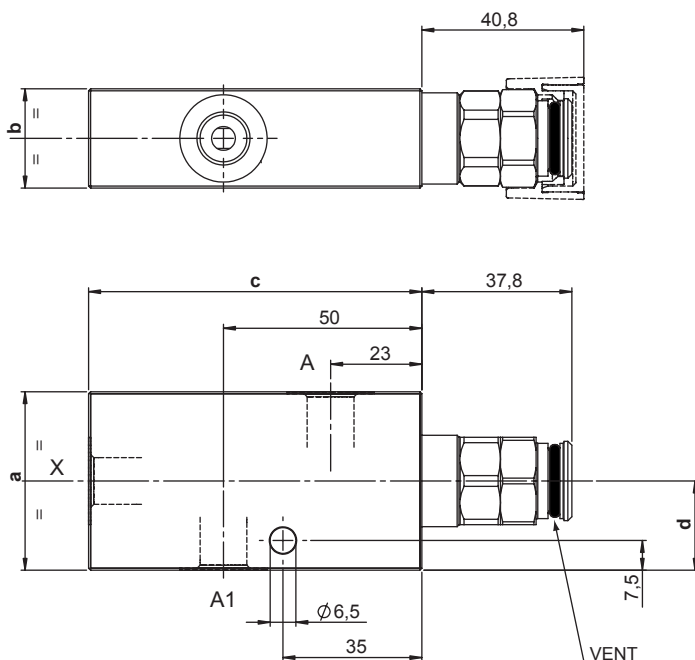
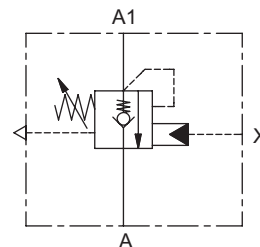
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,B	G 3/8"	G 1/2"
A1,B1	Ø 9	Ø 9



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **0,8 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

197

	a	b	c	d
<b>02</b>	45	25	84	22,5
<b>03</b>	50	30	90	25

**Ordering code**

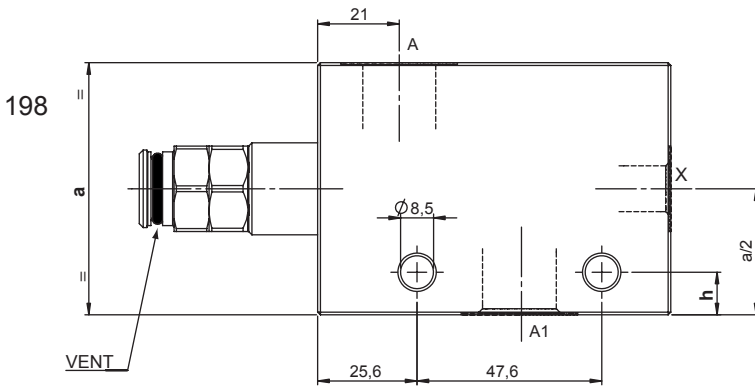
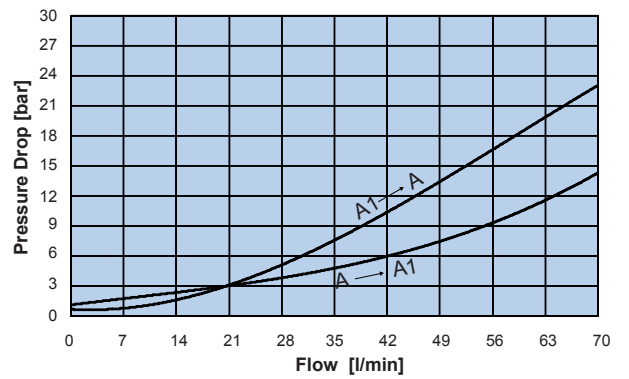
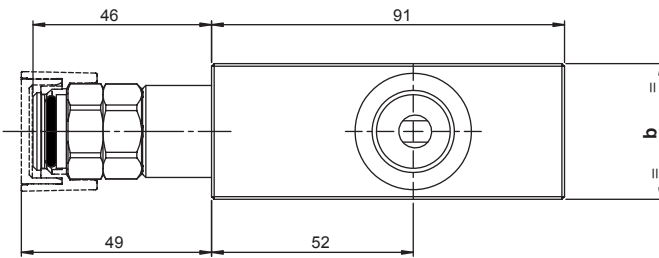
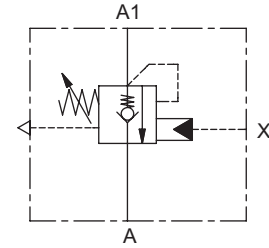
**H 3 0 0 1 C**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210 / 150 - 350	A,A1,X	G 1/4" / G 3/8"
		Pressure Increase [bar/turn]	41 / 100		
		Standard setting 4 l/min [bar]	200 / 350		



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	h
<b>03</b>	55	30	7
<b>04</b>	65	35	11

**Ordering code**

**H 5 0 0 1 C**     **S**   **0 0**

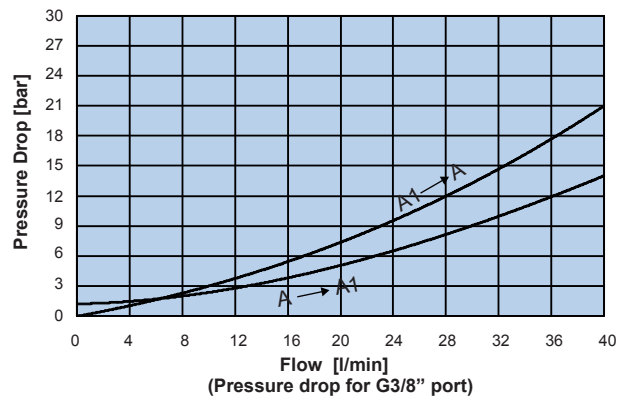
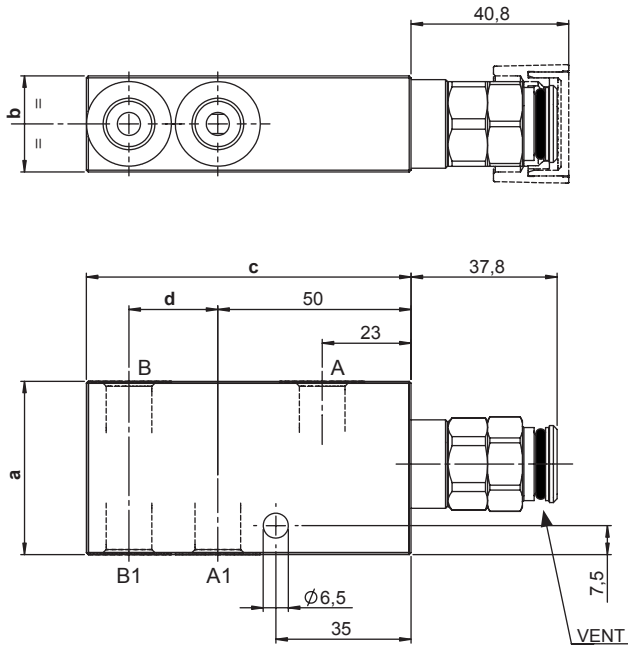
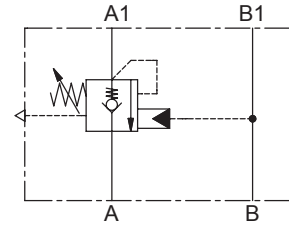
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>90</b>	<b>9:1</b>

SPRINGS	rp 4:1		rp 9:1	
	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>
Setting range min.-max. [bar]	60 - 210	120 - 350	80 - 250	190 - 350
Pressure Increase [bar/turn]	62	114	50	121
Standard setting 4 l/min [bar]	200	350	200	350

PORTS	<b>03</b>	<b>04</b>
A,A1	G 3/8"	G 1/2"
X	G 1/4"	G 1/4"

**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **0,75 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

199

	a	b	c	d
<b>02</b>	45	25	84	23
<b>03</b>	50	30	95	30

**Ordering code**

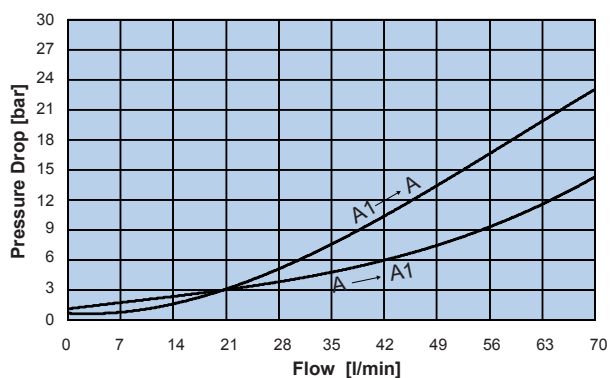
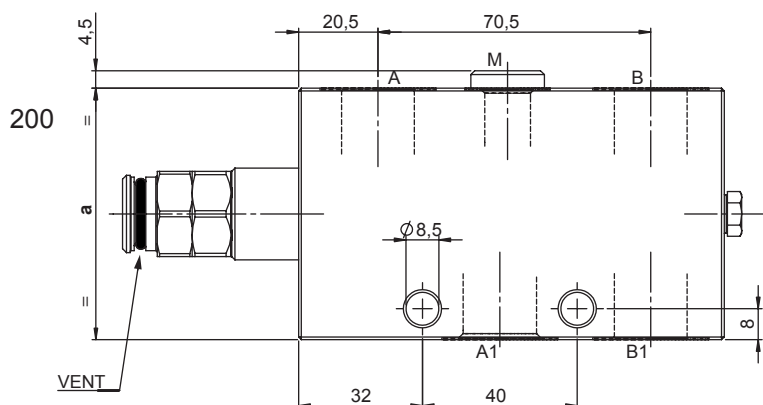
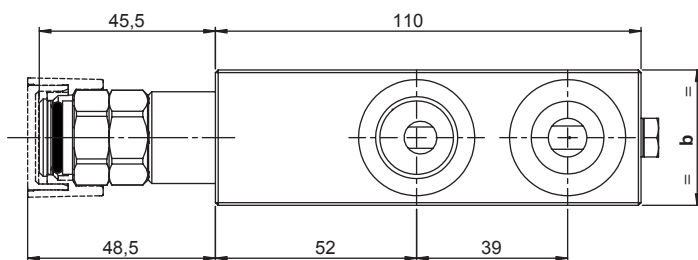
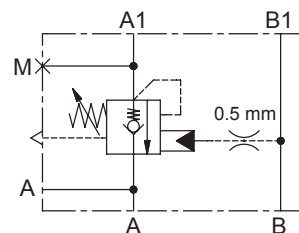
**H 3 0 0 4 C**   **S**  **0 0**

PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210 / 150 - 350	A,B,A1,B1	G 1/4" / G 3/8"
		Pressure Increase [bar/turn]	41 / 100		
		Standard setting 4 l/min [bar]	200 / 350		



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,5 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	30
<b>04</b>	65	35

**Ordering code**

**H 5 0 0 4 C**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

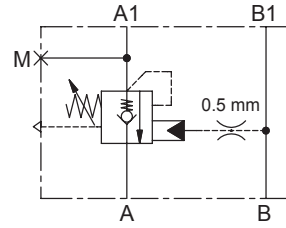
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,A1,B,B1	G 3/8"	G 1/2"
M	G 1/4"	G 1/4"

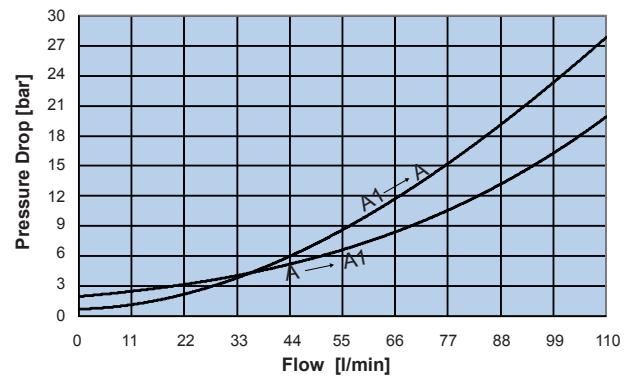
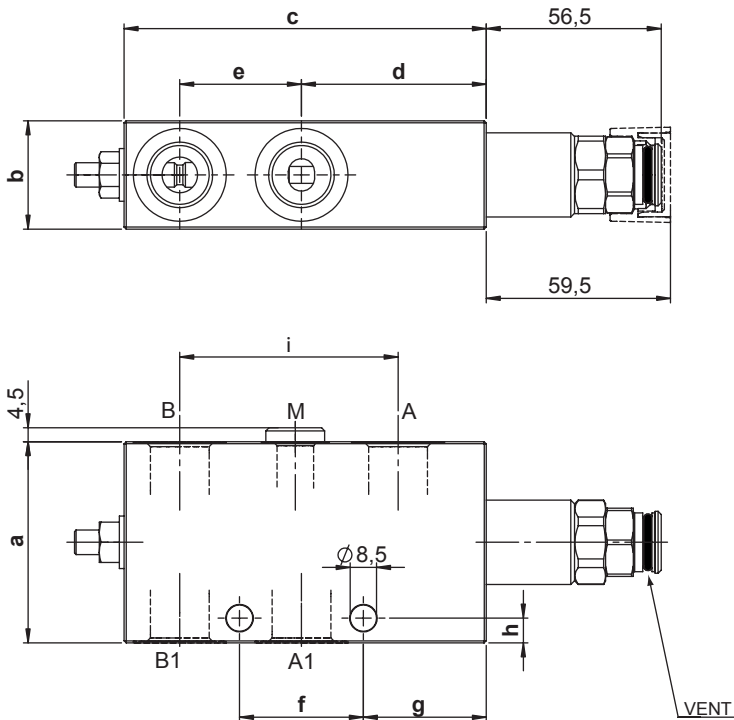
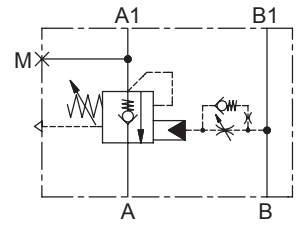
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **2,5 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 90**



**SCHEME 42 - 92**



201

**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e	f	g	h	i
<b>04</b>	65	35	117	59,7	39.3	40	39,7	8	70.5
<b>05</b>	70	40	130	60	47	47.6	36	11	78

**Ordering code**

**H 1 0 0 4 C**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

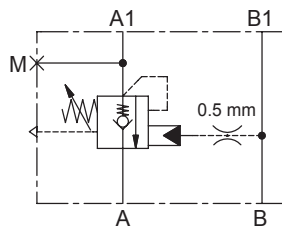
PORTS	<b>04</b>	<b>05</b>
A,A1,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"



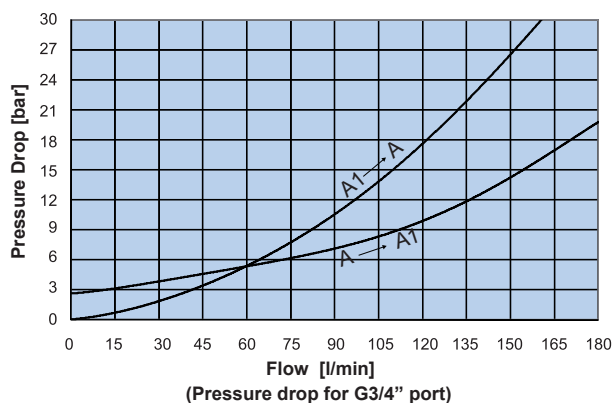
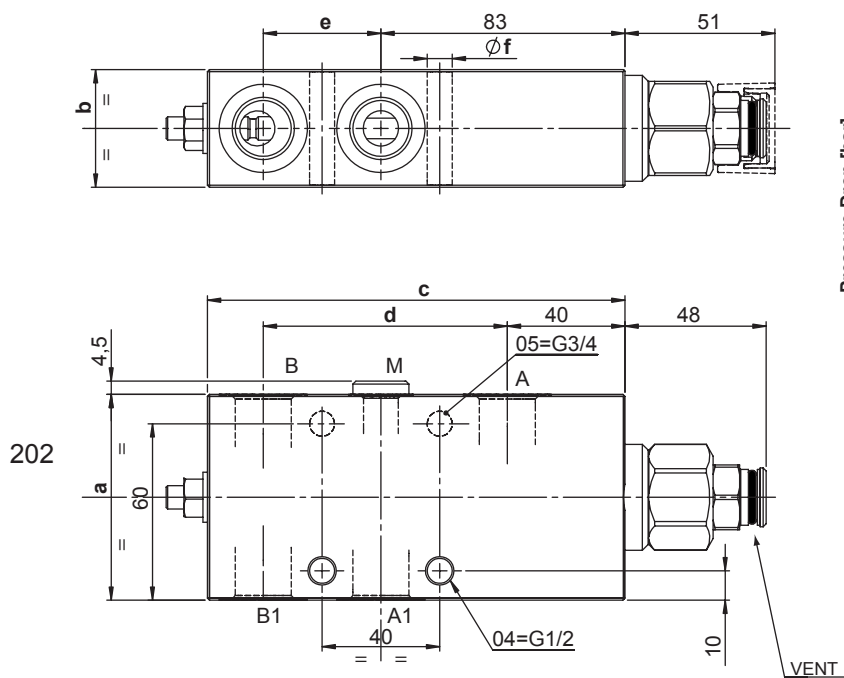
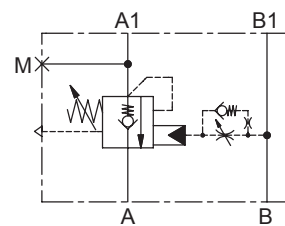
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **3,3 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e	f
<b>04</b>	70	40	142	83	40	8,5
<b>05</b>	80	40	147	86	43	10,5

**Ordering code**

**H 1 5 0 4 C**     **S**   **0 0**

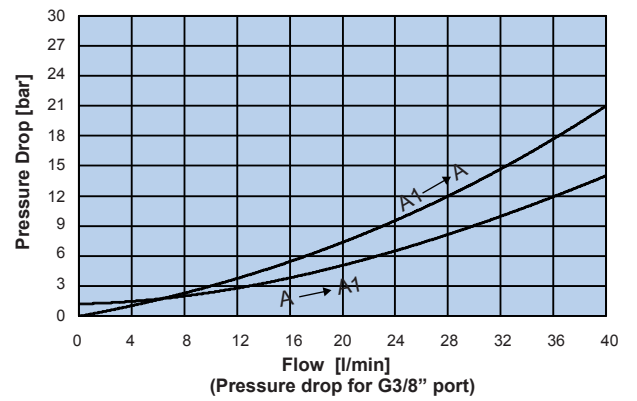
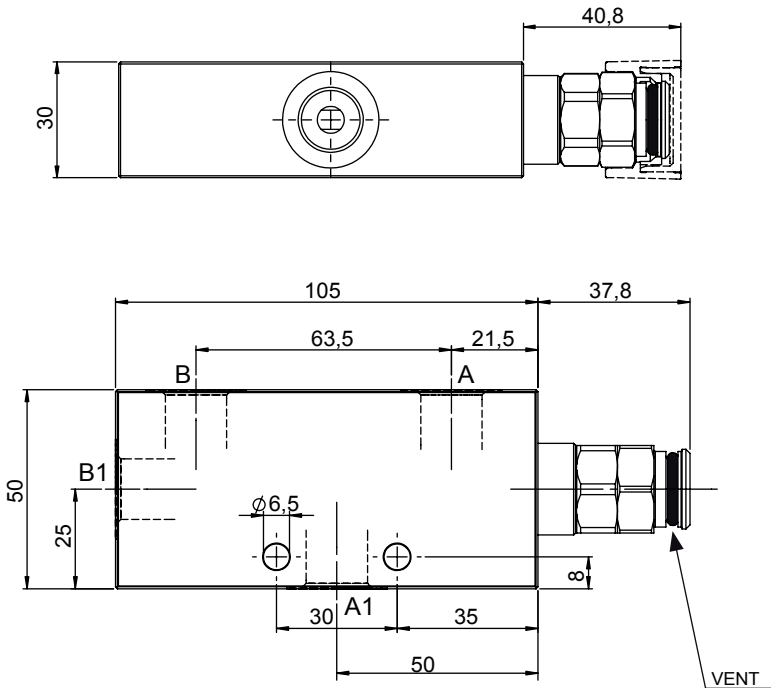
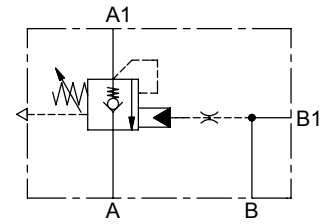
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>04</b>	<b>05</b>
A,A1,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"

**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Fully Compensated**
- Weight. . . . . **0,75 Kg**
- Tamper proof cap. . . . . **cod.9021030190**



203

**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

**Ordering code**

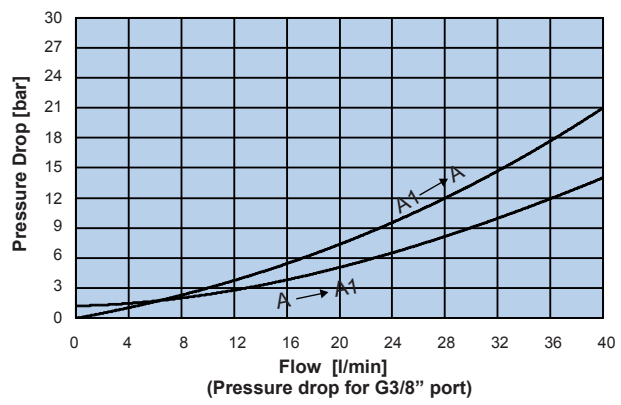
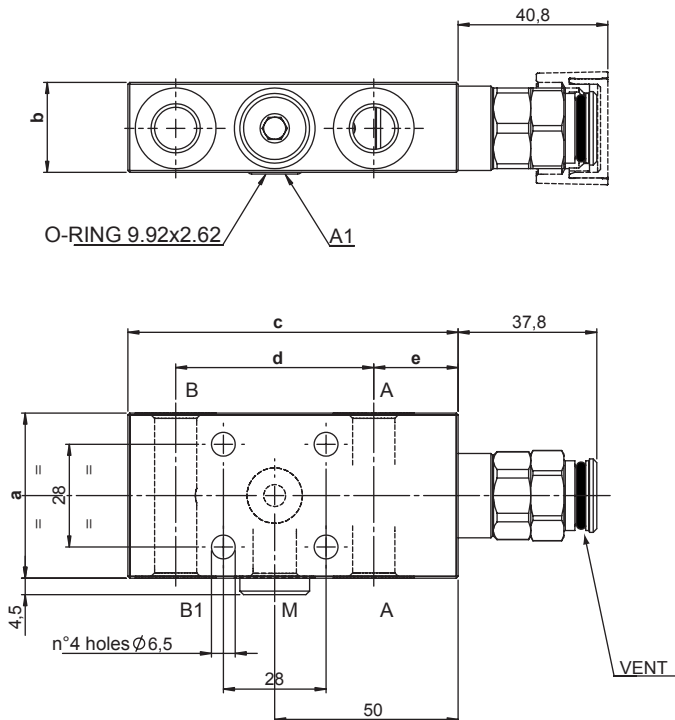
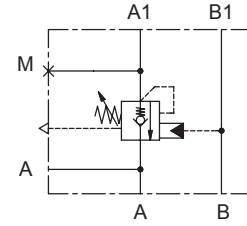
**H 3 0 0 4 C**   **S**  **0 0**

<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>41</b>	<b>4:1+dia.0,5mm</b>	<b>2</b>	<b>3</b>	<b>03</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210	150 - 350	A,B,A1,B1
		Pressure Increase [bar/turn]	41	100	G 3/8"
		Standard setting 4 l/min [bar]	200	350	



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **0,7 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e
<b>02</b>	45	24,5	90	54	23
<b>03</b>	50	29,5	95	59	21

**Ordering code**

**H 3 0 0 5 C**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

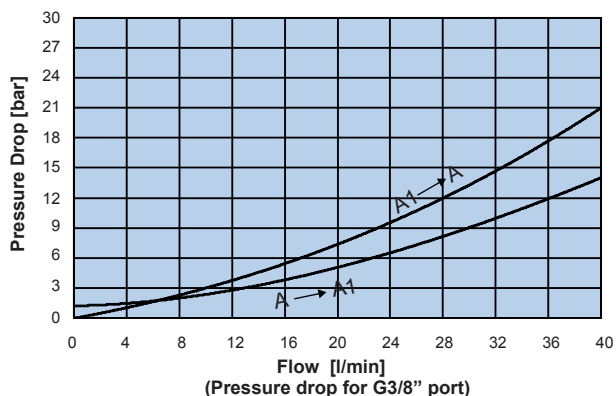
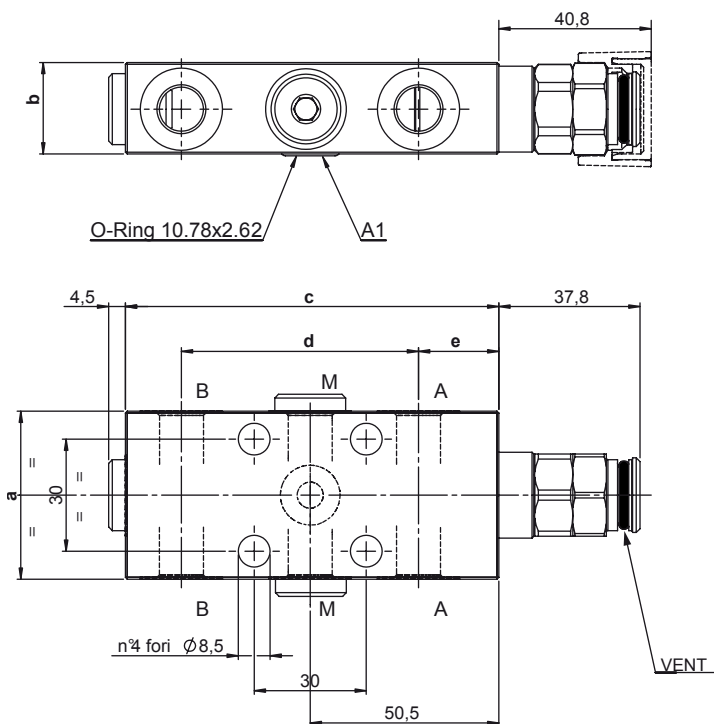
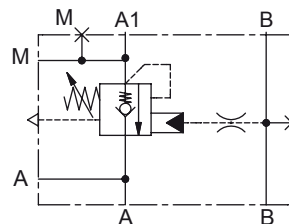
SPRINGS	2	3
Setting range min.-max. [bar]	80 - 210	150 - 350
Pressure Increase [bar/turn]	41	100
Standard setting 4 l/min [bar]	200	350

PORTS	02	03
A,B,B1	G 1/4"	G 3/8"
A1	Ø 6	Ø 6
M	G 1/4"	G 1/4"



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow. . . . . **40 l/min**
- Max working pressure. . . . . **350 bar**
- Compensation. . . . . **Fully Compensated**
- Weight. . . . . **0,85 Kg**
- Tamper proof cap. . . . . **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

205

	a	b	c	d	e
<b>02</b>	45	24,5	100	63,5	21,5
<b>03</b>	50	29,5	100	66	19,5

**Ordering code**

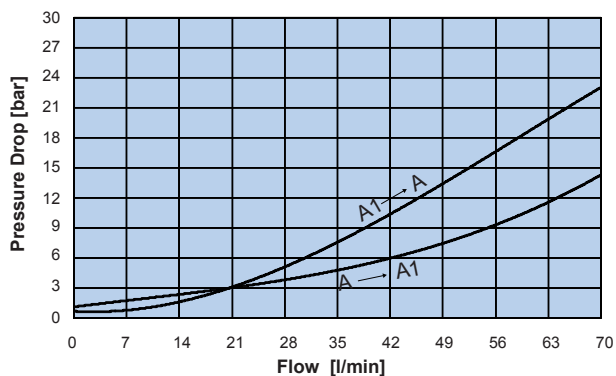
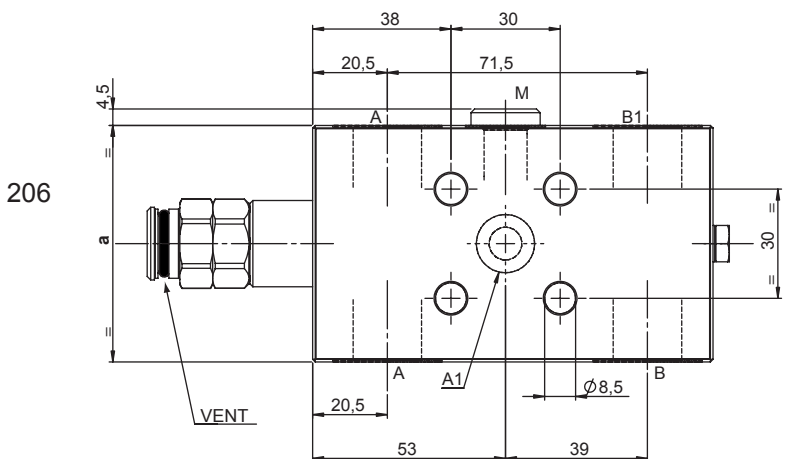
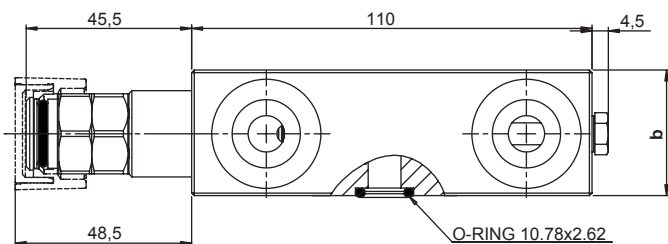
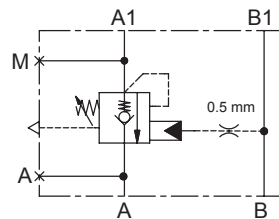
**H 3 0 0 7 C**     **S**   **0 0**

<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>02</b>	<b>03</b>
		Setting range min.-max. [bar]	80 - 210    150 - 350	A,B	G 1/4"    G 3/8"
		Pressure Increase [bar/turn]	41    100	A1	Ø 6    Ø 6
		Standard setting 4 l/min [bar]	200    350	M	G 1/4"    G 1/4"



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod. 9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 0 0 5 C**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

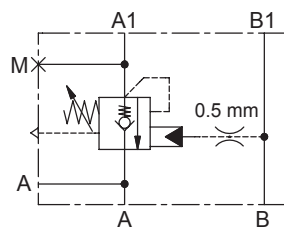
SPRINGS	2	3
Setting range min.-max. [bar]	60 - 210	120 - 350
Pressure Increase [bar/turn]	62	114
Standard setting 4 l/min [bar]	200	350

PORTS	03	04
A,B,B1	G 3/8"	G 1/2"
A1	Ø 9	Ø 9
M	G 1/4"	G 1/4"

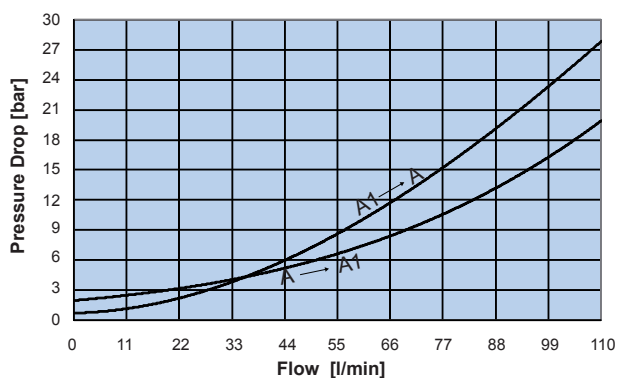
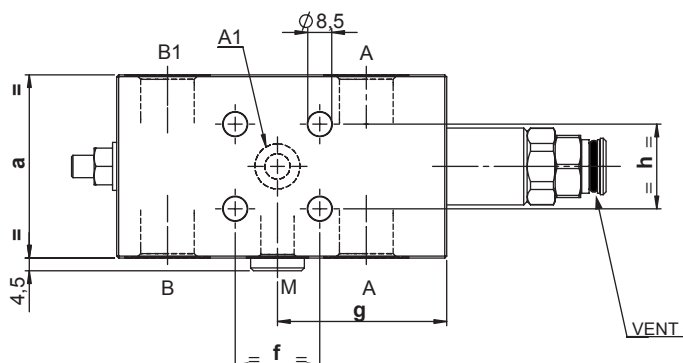
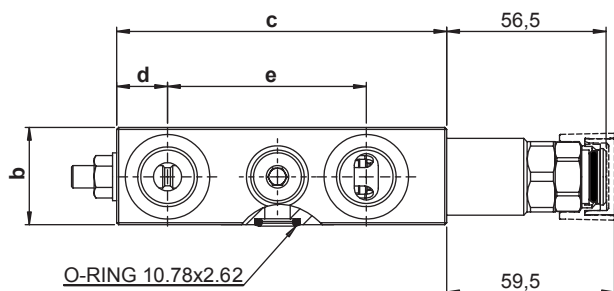
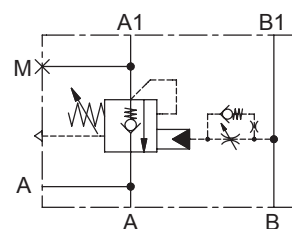
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 90**



**SCHEME 42 - 92**



207

**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e	f	g	h
<b>04</b>	65	34,5	117	28,5	70,5	30	45	30
<b>05</b>	80	39,5	130	22	86	40	45	40

**Ordering code**

**H 1 0 0 5 C**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

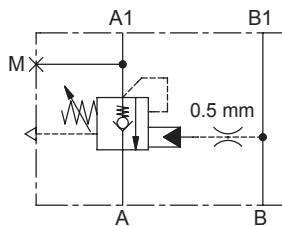
PORTS	<b>04</b>	<b>05</b>
A,B,B1	G 1/2"	G 3/4"
A1	Ø 9	Ø 8,5
M	G 1/4"	G 1/4"



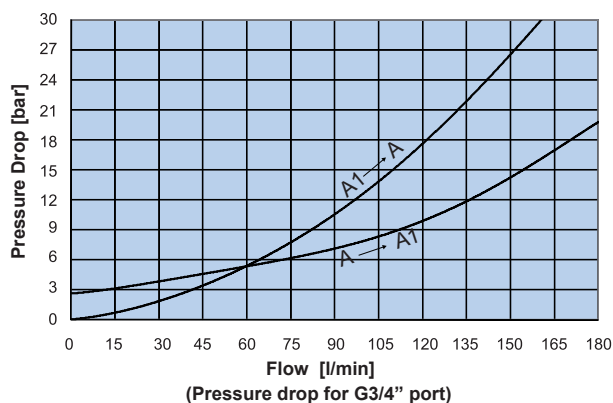
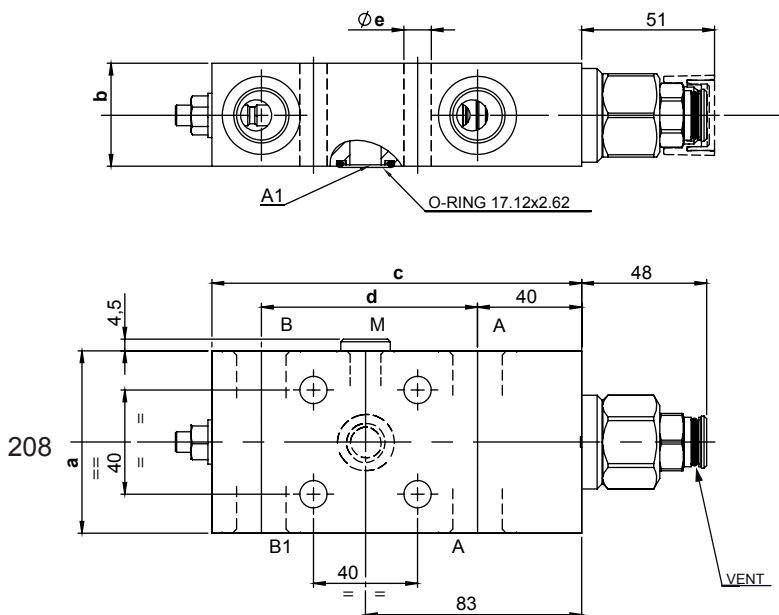
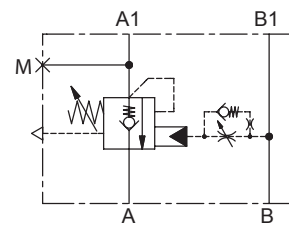
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1 PORT FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **3,2 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e
<b>04</b>	70	39,5	142	83	10,5
<b>05</b>	80	39,5	147	86	10,5

**Ordering code**

**H 1 5 0 5 C**   **S**  **0 0**

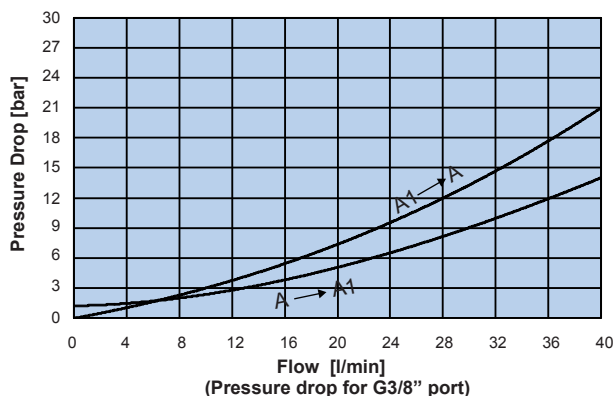
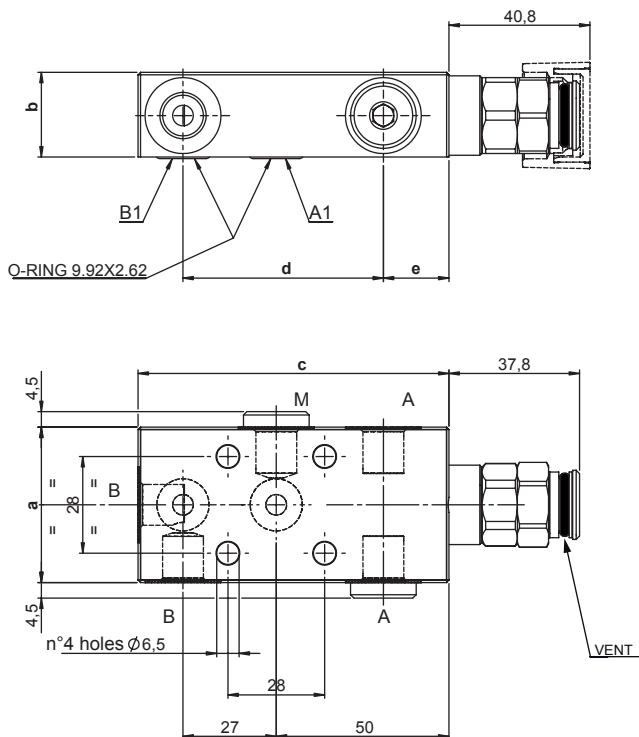
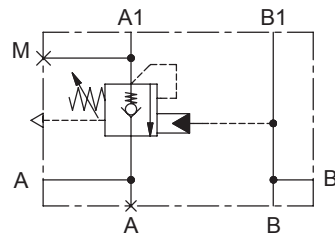
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	2	4	4
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	04	05
A,B,B1	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"
A1	Ø 12	Ø 12

**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **0,8 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

209

	a	b	c	d	e
<b>02</b>	45	24,5	90	58	19
<b>03</b>	50	29,5	95	59	21

**Ordering code**

**H 3 0 0 6 C**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>

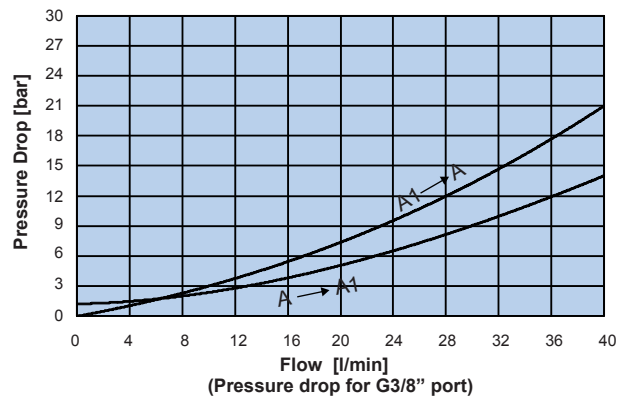
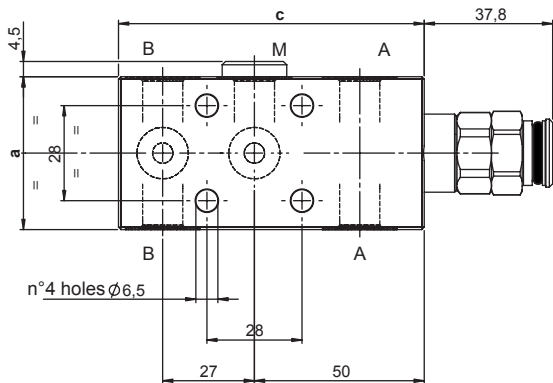
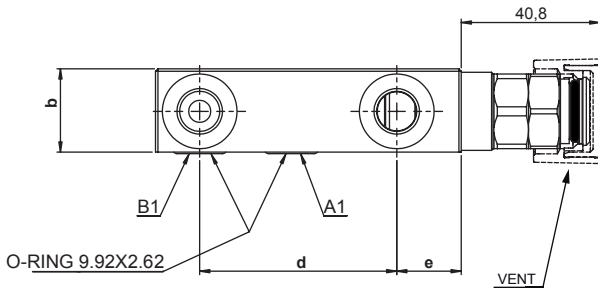
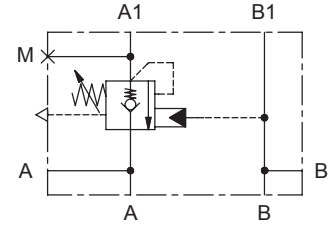
SPRINGS	2	3
Setting range min.-max. [bar]	80 - 210	150 - 350
Pressure Increase [bar/turn]	41	100
Standard setting 4 l/min [bar]	200	350

PORTS	02	03
A,B	G 1/4"	G 3/8"
A1,B1	Ø 6	Ø 6
M	G 1/4"	G 1/4"



**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **40 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **0,8 Kg**
- Tamper proof cap..... **cod.9021030190**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e
<b>02</b>	45	24,5	90	58	19
<b>03</b>	50	29,5	95	59	21

**Ordering code**

**H 3 0 0 8 C**   **S**  **0 0**

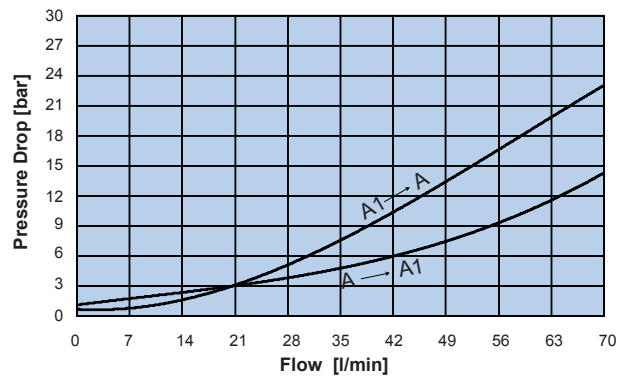
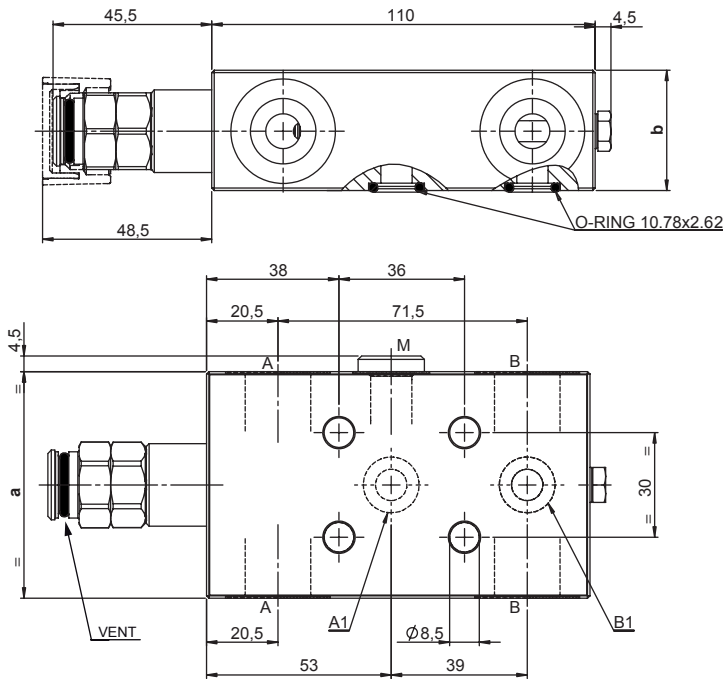
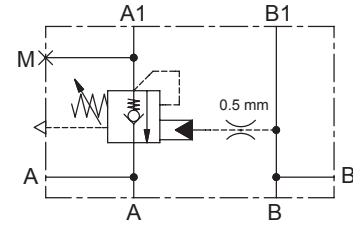
PILOT RATIO	
<b>40</b>	<b>4:1</b>

SPRINGS	2	3
Setting range min.-max. [bar]	80 - 210	150 - 350
Pressure Increase [bar/turn]	41	100
Standard setting 4 l/min [bar]	200	350

PORTS	02	03
A,B	G 1/4"	G 3/8"
A1,B1	Ø 6	Ø 6
M	G 1/4"	G 1/4"

**SINGLE ACTING COUNTERBALANCE VALVE FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,7 Kg**
- Tamper proof cap..... **cod.9021030190**



211

**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b
<b>03</b>	55	29,5
<b>04</b>	65	34,5

**Ordering code**

**H 5 0 0 6 C**     **S**   **0 0**

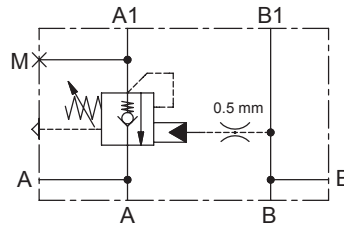
PILOT RATIO		SPRINGS		PORTS	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>03</b>	<b>04</b>
		Setting range min.-max. [bar]	60 - 210 / 120 - 350	A,B	G 3/8" / G 1/2"
		Pressure Increase [bar/turn]	62 / 114	A1,B1	Ø 9 / Ø 9
		Standard setting 4 l/min [bar]	200 / 350	M	G 1/4" / G 1/4"



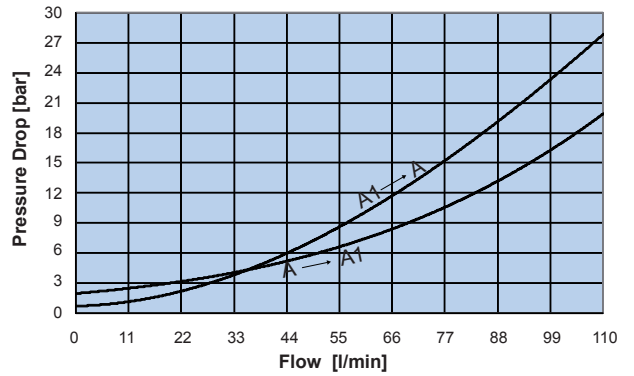
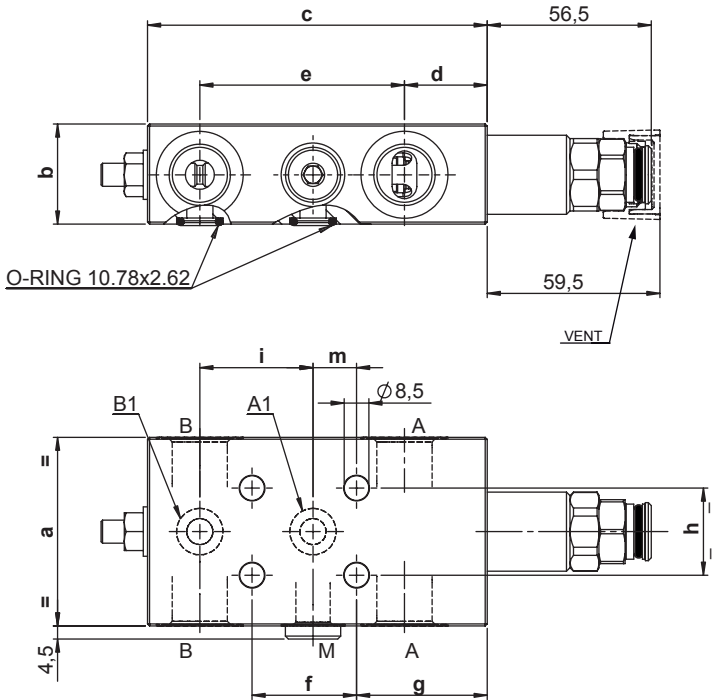
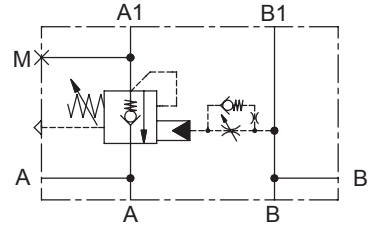
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **110 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 90**



**SCHEME 42 - 92**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

	a	b	c	d	e	f	g	h	i	m
<b>04</b>	65	34,5	117	28,5	70,5	36	45	30	39	15
<b>05</b>	80	39,5	130	22	86	40	45	40	43	20

**Ordering code**

**H 1 0 0 6 C**     **S**   **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>90</b>	<b>9:1</b>
<b>92</b>	<b>9:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 9:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	60 - 210	120 - 410	150 - 410
Pressure Increase [bar/turn]	52	85	100
Standard setting 4 l/min [bar]	200	350	350

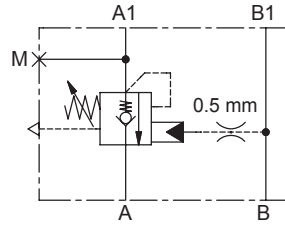
PORTS	<b>04</b>	<b>05</b>
A,B	G 1/2"	G 3/4"
A1,B1	Ø 9	Ø 8,5
M	G 1/4"	G 1/4"



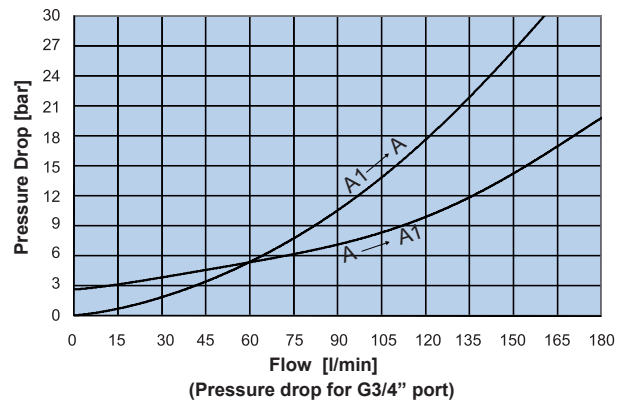
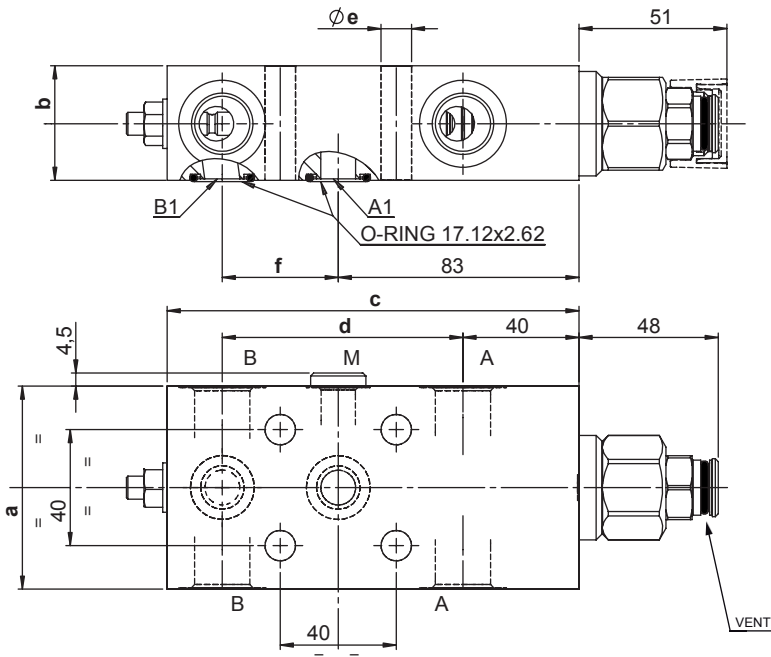
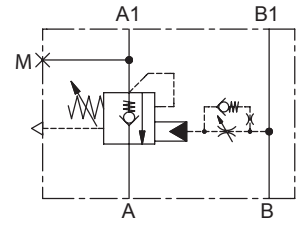
**SINGLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **3,3 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**



**SCHEME 42 - 82**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

213

	a	b	c	d	e	f
<b>04</b>	70	39,5	142	83	10,5	40
<b>05</b>	80	39,5	147	86	10,5	43

**Ordering code**

**H 1 5 0 6 C**       **S**    **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	4:1		8:1
	2	4	4
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	04	05
A,B	G 1/2"	G 3/4"
M	G 1/4"	G 1/4"
A1,A2	Ø 12	Ø 12

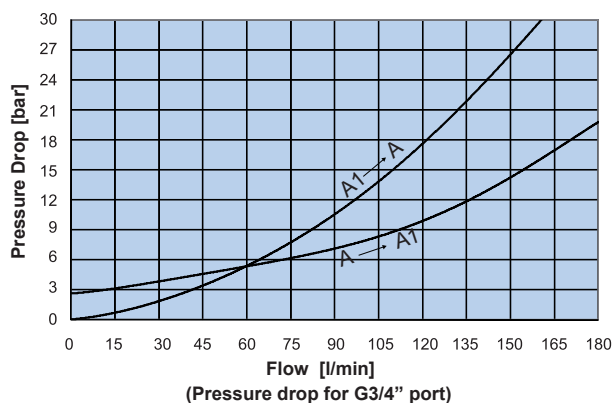
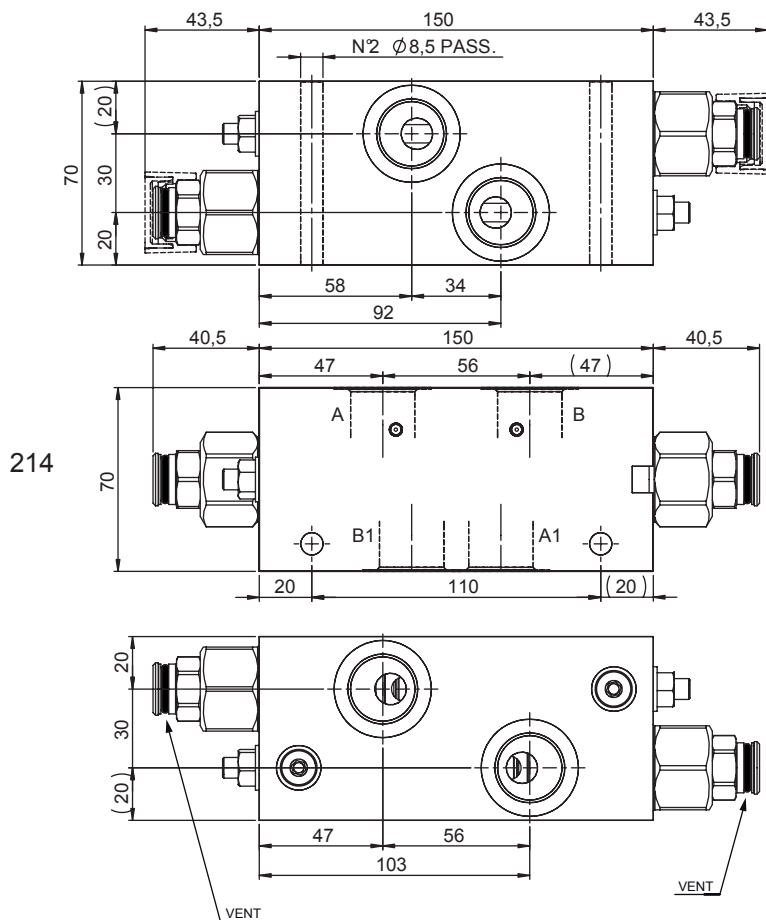
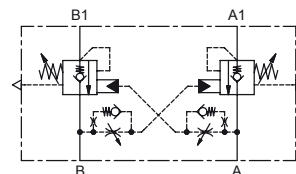
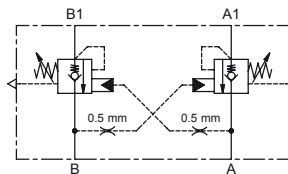


**DOUBLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **5,3 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**

**SCHEME 42 - 82**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

**Ordering code**

**H 1 5 3 0 C**   **S**  **0 0**

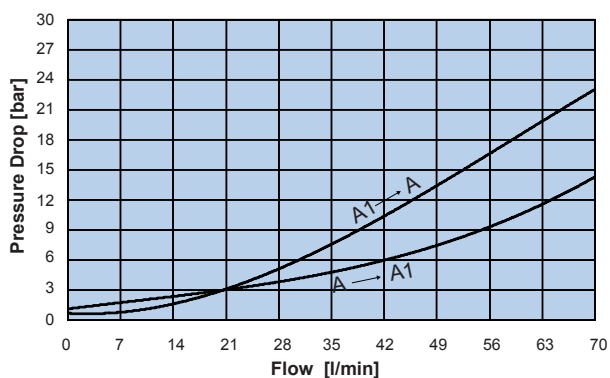
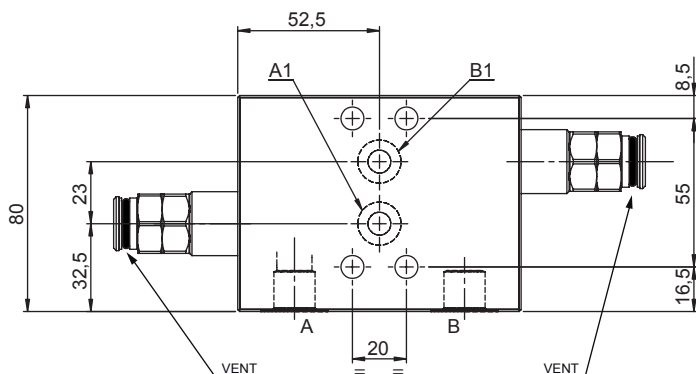
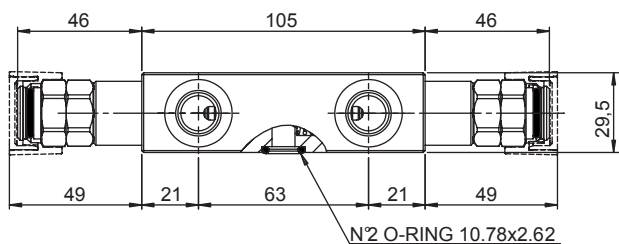
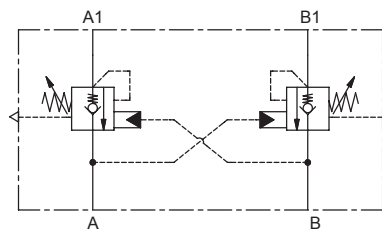
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	<b>05</b>
A,A1,B,B1	G 3/4"

**DOUBLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **70 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Fully Compensated**
- Weight..... **1,9 Kg**
- Tamper proof cap..... **cod.9021030190**



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**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

**Ordering code**

**H 5 0 3 2 C**   **S**  **0 0**

<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1</b>	<b>2</b>	<b>3</b>	<b>03</b>	
		Setting range min.-max. [bar]	60 - 210    120 - 350	A,B	G 3/8"
		Pressure Increase [bar/turn]	62    114	A1,B1	Ø 9
		Standard setting 4 l/min [bar]	200    350		

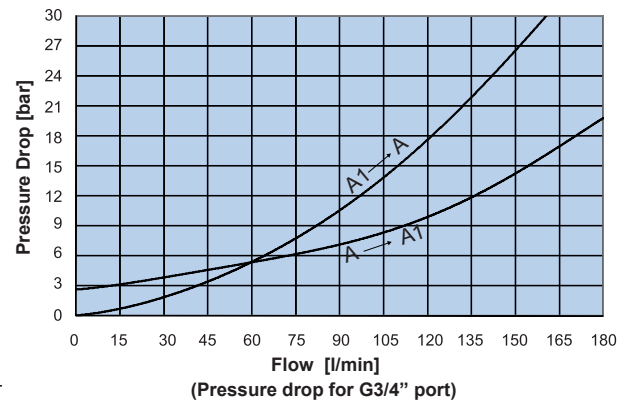
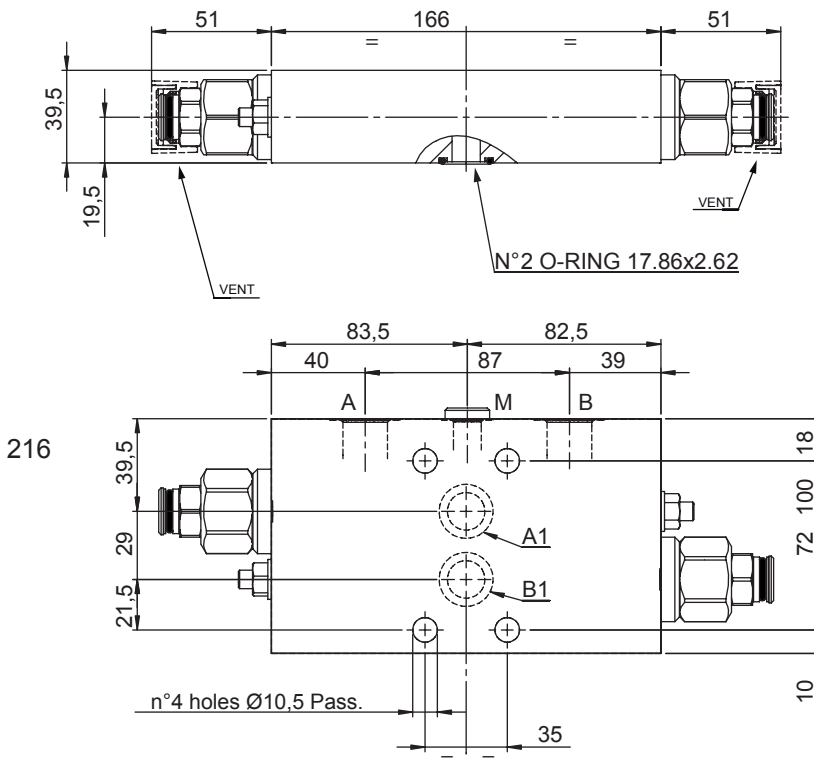
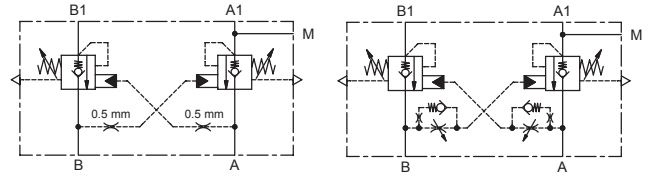


**DOUBLE ACTING FULLY COMPENSATED COUNTERBALANCE VALVE - A1/B1 PORT FLANGED**

- Flow..... **180 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated**
- Weight..... **5 Kg**
- Tamper proof cap..... **cod.9021030190**

**SCHEME 40 - 80**

**SCHEME 42 - 82**



**Note:**  
- Pressure setting must be 30% higher than pressure induced by the load.

**Ordering code**

**H 1 5 3 2 C**   **S**  **0 0**

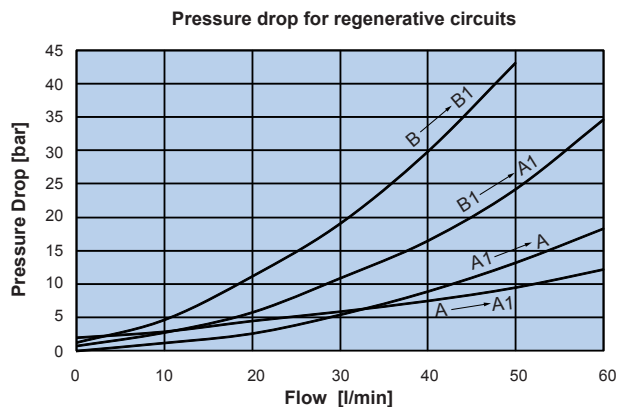
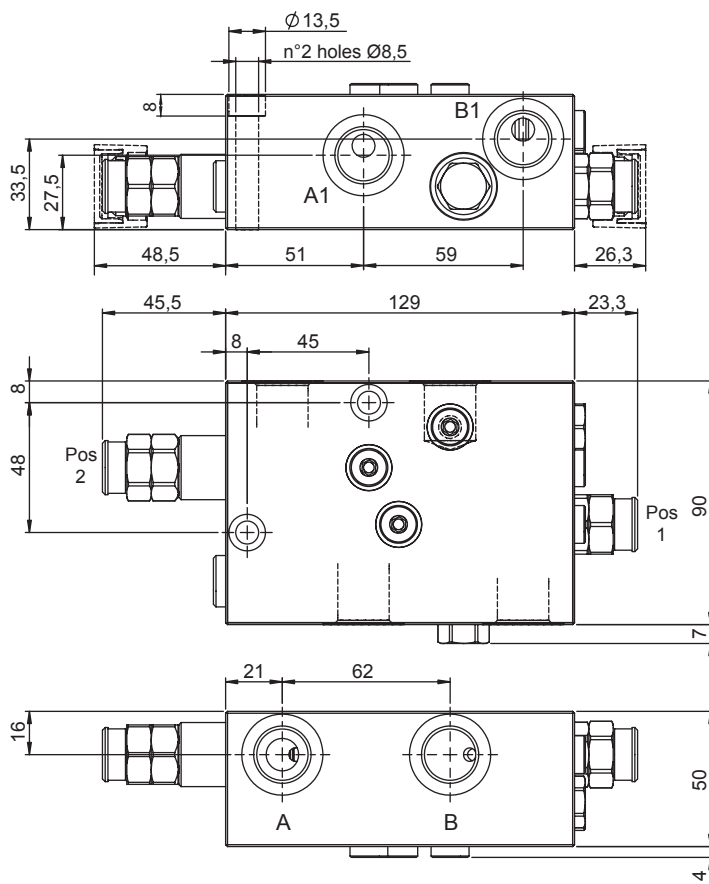
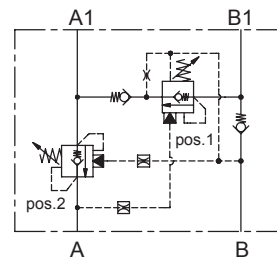
PILOT RATIO	
<b>40</b>	<b>4:1</b>
<b>42</b>	<b>4:1</b> ADJUSTABLE DUMP SCREW
<b>80</b>	<b>8:1</b>
<b>82</b>	<b>8:1</b> ADJUSTABLE DUMP SCREW

SPRINGS	rp 4:1		rp 8:1
	<b>2</b>	<b>4</b>	<b>4</b>
Setting range min.-max. [bar]	80 - 210	80 - 410	140 - 410
Pressure Increase [bar/turn]	40	72	72
Standard setting 4 l/min [bar]	200	350	350

PORTS	04	05
	A,B	G 1/2"
M	G 1/4"	G 1/4"
A1,A2	Ø 12	Ø 12

**DOUBLE ACTING COUNTERBALANCE VALVE FOR REGENERATIVE CIRCUITS**

- Flow on Ports A/A1..... **70 l/min**
- Flow on Ports B1/A1..... **40 l/min**
- Max working pressure..... **350 bar**
- Weight..... **4,3 Kg**
- Tamper proof cap..... **cod.9021030190**



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**Ordering code**

**H 3 0 8 0 N**   **S**  **0 0**

PILOT RATIO	
<b>40</b>	<b>4:1 Pos 1</b>
	<b>4:1 Pos 2</b>

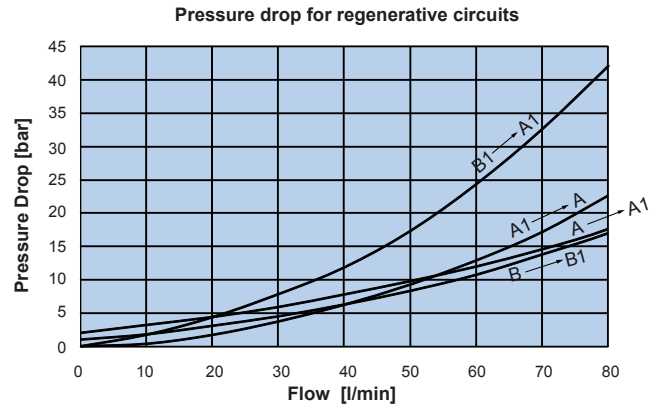
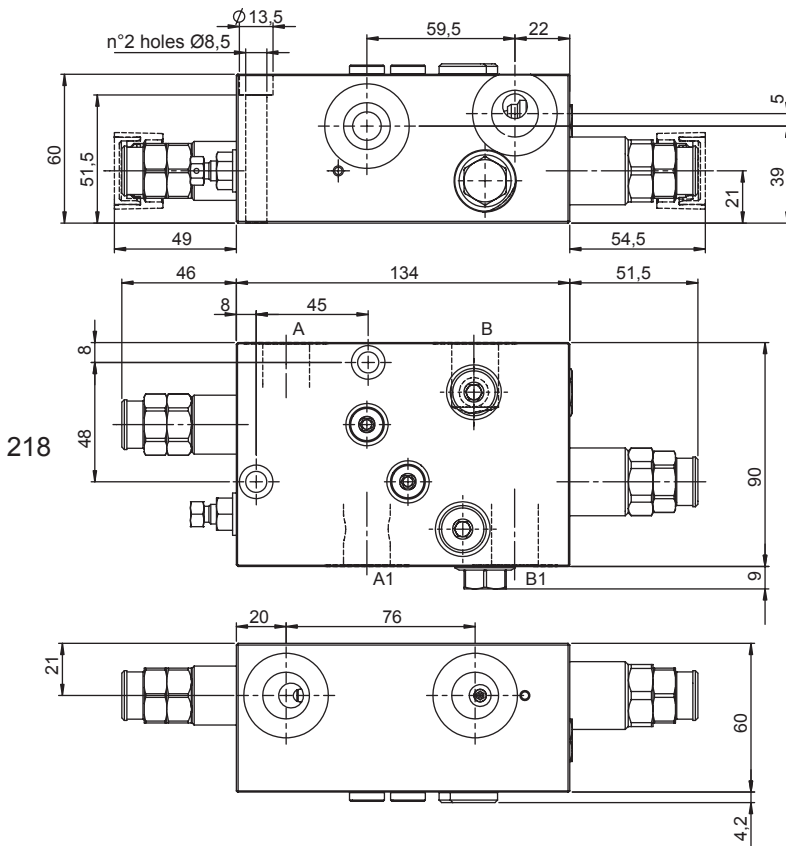
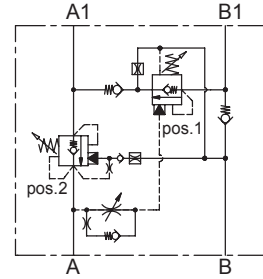
SPRINGS	<b>3</b>	
	pos.1	pos.2
Setting range min.-max. [bar]	150 - 430	120 - 350
Pressure Increase [bar/turn]	100	114
Standard setting 4 l/min [bar]	430	210

PORTS	
<b>04</b>	
A,B,A1,B1	G 1/2"



**DOUBLE ACTING COUNTERBALANCE VALVE FOR REGENERATIVE CIRCUITS**

- Flow on Ports A/A1..... **70 l/min**
- Flow on Ports B1/A1..... **70 l/min**
- Max working pressure..... **350 bar**
- Weight..... **5,3 Kg**
- Tamper proof cap..... **cod.9021030190**



**Ordering code**

**H 1 0 8 0 N**   **S**  **0 0**

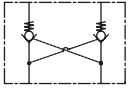
<b>PILOT RATIO</b>		<b>SPRINGS</b>		<b>PORTS</b>	
<b>40</b>	<b>4:1 Pos 1</b>	<b>4</b>		<b>A,B,A1,B1</b>	<b>04</b> G 1/2"
	<b>2:1 Pos 2</b>	Pos.1	Pos.2		
Setting range min.-max. [bar]		120 - 410	60 - 210		
Pressure Increase [bar/turn]		85	52		
Standard setting 4 l/min [bar]		430	210		

**PARTS IN BODY**  
**PILOT OPERATED CHECK VALVES**



**PILOT OPERATED CHECK VALVES**

**INTRODUCTION**



**PILOT OPERATED CHECK VALVES**

They are non modular valves, arranged for in line or flanged mounting. They allow the feeding and locking of hydraulic cylinders.

As the cartridge valves, they are made of 1 or 2 unidirectional check valves, in which pilot pressure opens the sealing poppet.

This type of valve shows an excellent sealing function, while “free flow” is subject to the closing spring load. Cracking pressure is determined by initial opening pressure.

The opening of the sealing poppet by pilot pressure is on/off (from closed to totally open). So that its use is not advised at all for the applications on which modulation and/or control of gravitational load lowering velocity is required. This type of applications requires load holding valves **LHD** series.

Check valves most important parameter is pilot ratio **rp**.

Generally, given a generic load **P**, pilot pressure required for opening the valve is calculated dividing load by pilot ratio:

$$P_{pil} = P_p / r_p$$

When check valves are used on hydraulic actuators (i.e. cylinders), due to areas ratio (**ra**) of the actuator itself, also the effects of inner pressure must be considered.

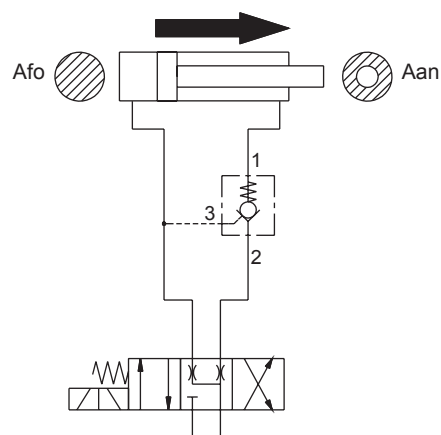
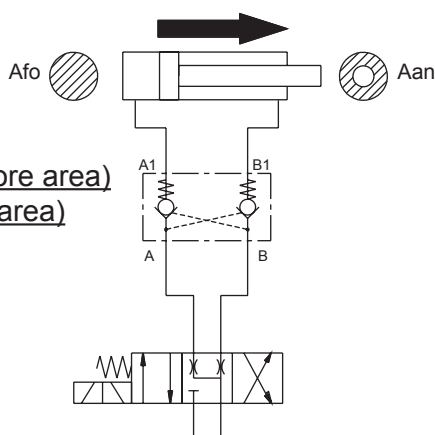
220

$$P_{pil} = P_p / (r_p - r_a)$$

On the hydraulic cylinders, the areas ratio “**ra**” is calculated with reference to the type of movements:

Cylinders Out (Extension)  
 $r_a = A_{fo} / A_{an} (>1)$

Cylinders In  
 $r_a = A_{an} / A_{fo} (<1)$



- Afo (Full boore area)
- Aan (Anular area)

It's very important to remember that, in case of double effect cylinders, pilot ratio must be always higher than areas ratio:

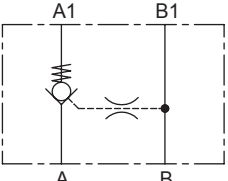
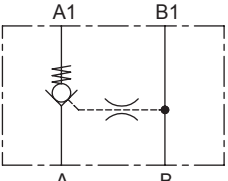
$$r_p > r_a$$

If this rule is not respected, then it is not possible to pilot the check valve during the cylinder extension.

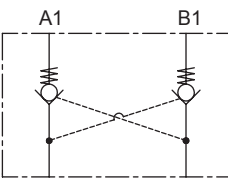
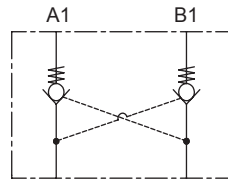


**PILOT OPERATED CHECK VALVES**

**SINGLE ACTING MODELS**

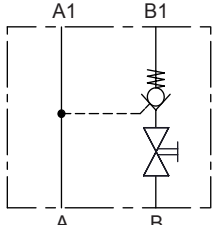
		<b>Q</b> l/min	<b>P</b> bar	<b>PILOT</b> <b>RATIO</b>	<b>PORTS</b>	<b>PAGE</b>
 <p><b>In line</b></p>	D-BSE-L-SAE10	40	350	7 : 1	G 3/8"	9.01.001
 <p><b>A1 port flanged</b></p>	D-BSE-F-SAE10	40	350	7 : 1	G 3/8"	9.01.002

**DOUBLE ACTING MODELS**

 <p><b>In line</b></p>	D-BDE-L-SAE10	40	350	7 : 1	G 3/8" - SAE6	9.01.003	
	D-BDE-L-SAE10	50	350	5 : 1	G 1/2"	9.01.004	
	D-BDE-L-V	30	310	4,6 : 1	G 3/8"	9.01.005	
 <p><b>A1 port flanged</b></p>	D-BDE-F-SAE10	40	350	7 : 1	G 3/8" - SAE6	9.01.006	
	D-BDE-F-SAE10	50	350	5 : 1	G 1/2"	9.01.007	

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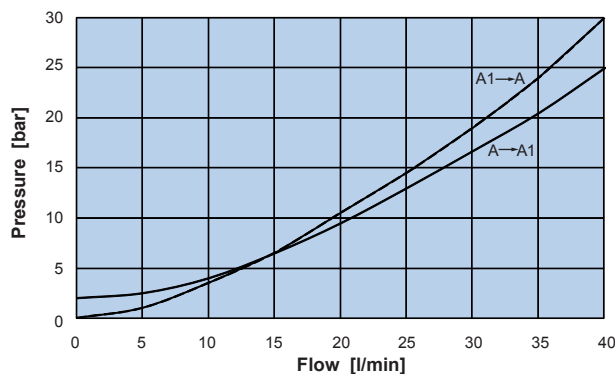
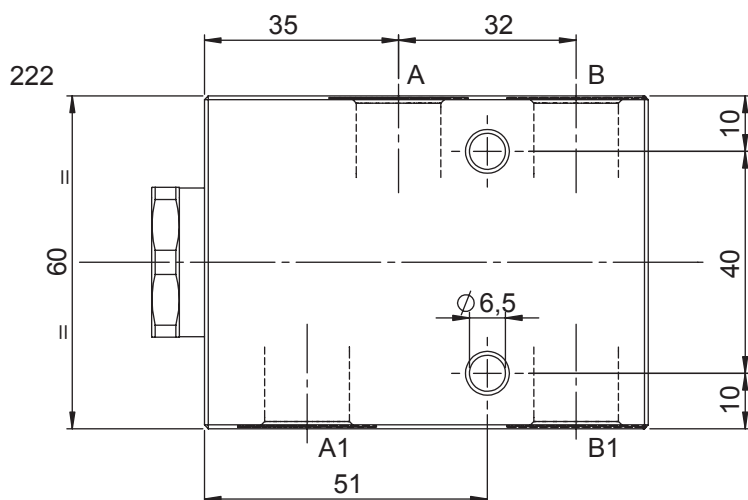
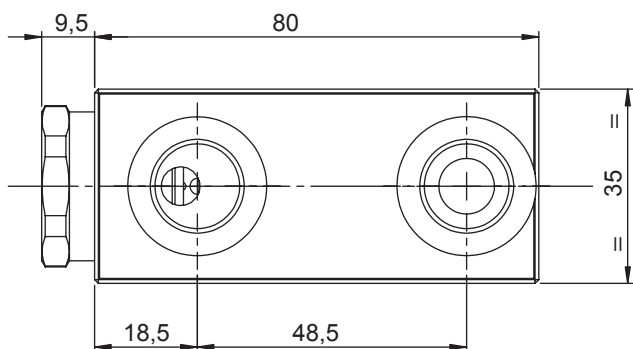
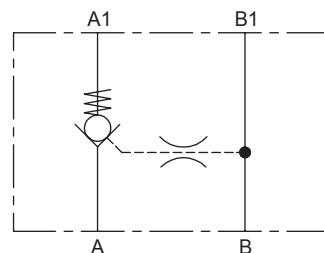
**SINGLE ACTING MODELS WITH 2 POSITIONS MANUAL SHUT OFF**

	D-BSE-RDX-V6 Right	30	350	4,7 : 1	G 3/8"	9.01.008
	D-BSE-RSX-V6 Left	30	350	4,7 : 1	G 3/8"	9.01.009



**SINGLE ACTING PILOT OPERATED CHECK VALVE**

- Flow ..... **30 l/min**
- Max working pressure ..... **350 bar**
- Working pressure ..... **210 bar**
- Weight ..... **0,5 Kg**



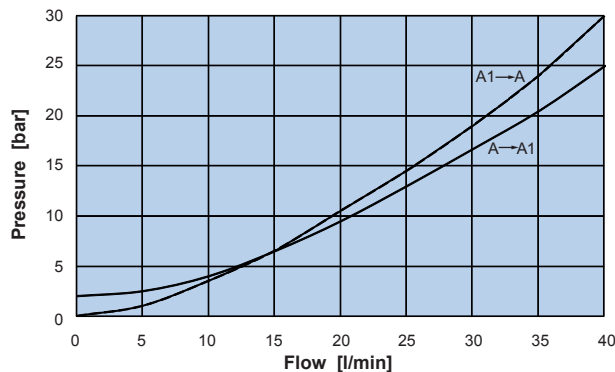
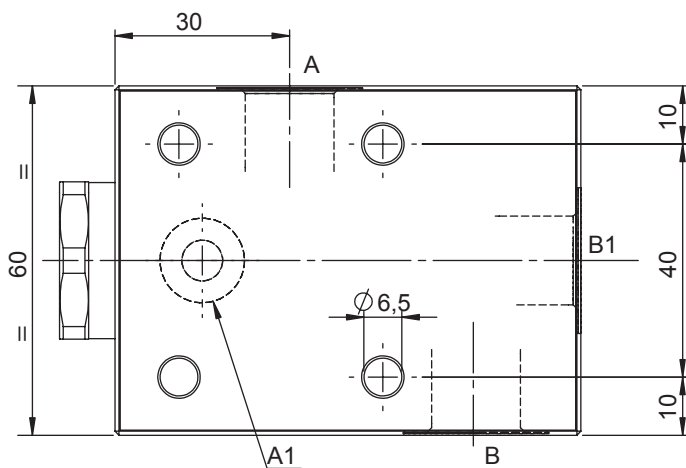
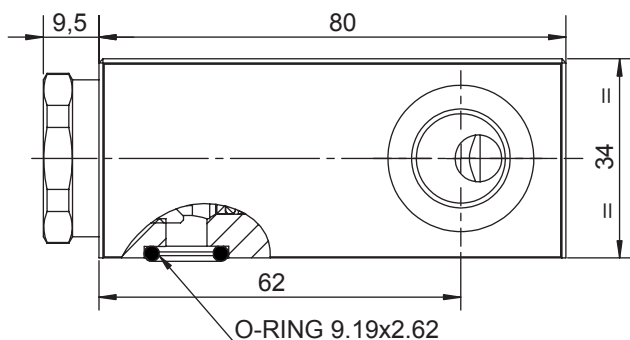
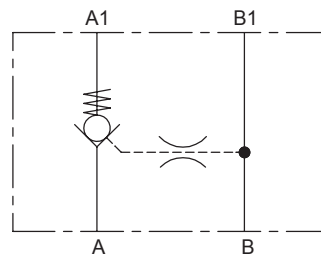
**Ordering code**

**D 0 1 1 0 [ ] [ ] 0 A [ ] 0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>PORTS</b>	
<b>7</b>	<b>7:1</b>	<b>02</b>	<b>02</b>	<b>A,A1,B,B1</b>	<b>03</b>
		Setting	2.0 bar		G 3/8"
		Seals	no seal		

**SINGLE ACTING PILOT OPERATED CHECK VALVE - A1 PORT FLANGED**

- Flow ..... **30 l/min**
- Max working pressure ..... **350 bar**
- Working pressure ..... **210 bar**
- Weight ..... **0,5 Kg**



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**Ordering code**

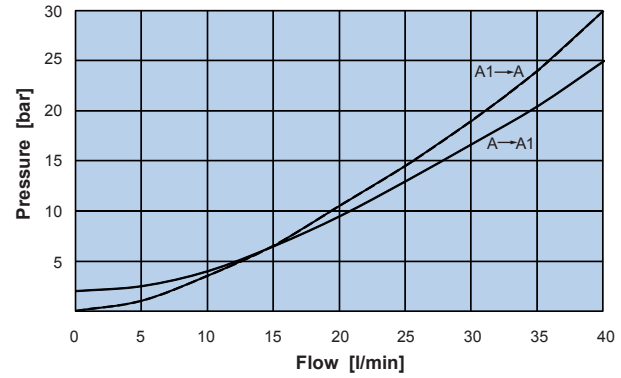
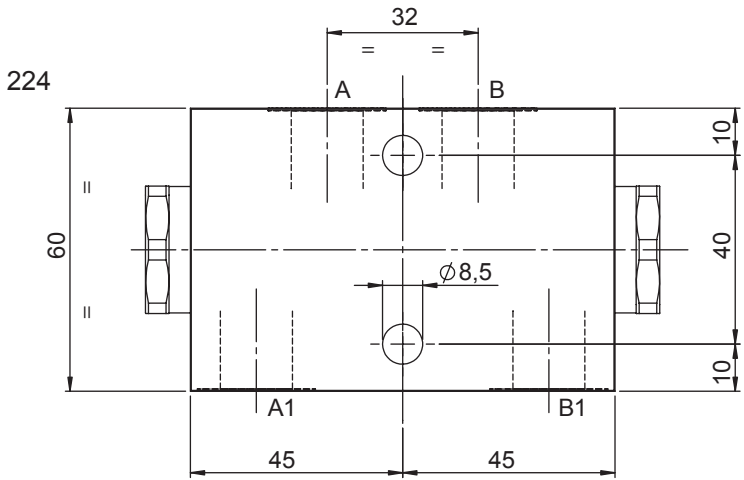
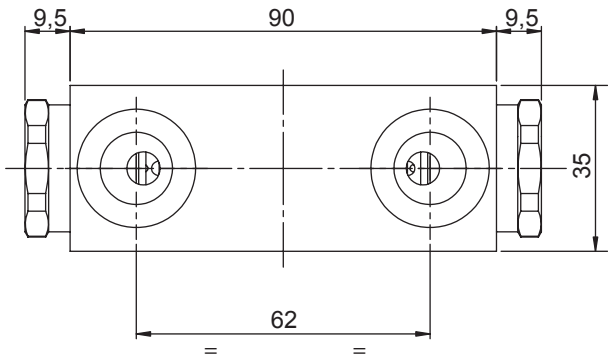
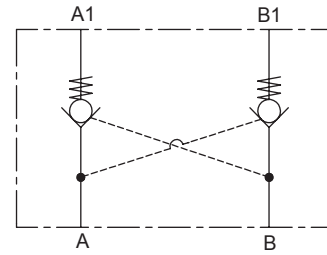
**D 0 2 1 0 [ ] [ ] 0 A [ ] 0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>PORTS</b>	
<b>7</b>	<b>7:1</b>	<b>02</b>	<b>02</b>	<b>A,B,B1</b>	<b>G 3/8"</b>
		Setting	2.0 bar	<b>A1</b>	<b>Ø 7</b>
		Seals	no seal		



**DOUBLE ACTING PILOT OPERATED CHECK VALVE**

- Flow . . . . . **40 l/min**
- Max working pressure . . . . . **350 bar**
- Working pressure . . . . . **210 bar (Aluminium Body)**
- Working pressure . . . . . **350 bar (Steel Body)**
- Weight in steel . . . . . **0,9 Kg**
- Weight in aluminium . . . . . **0,64 Kg**



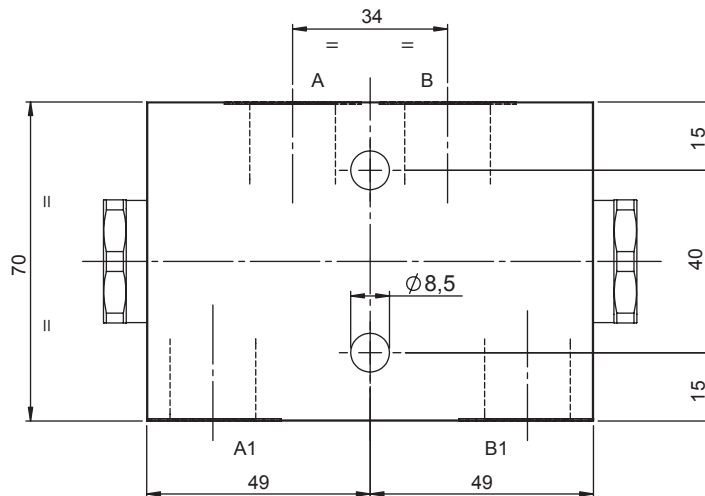
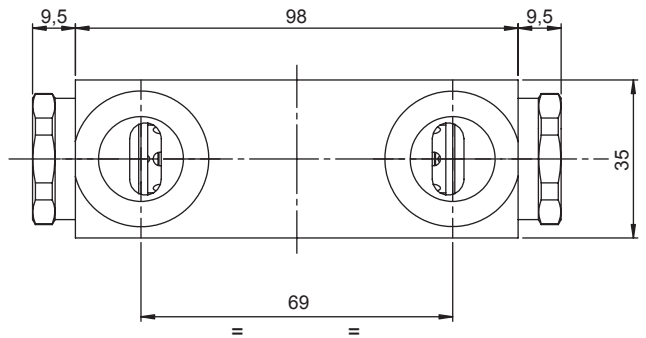
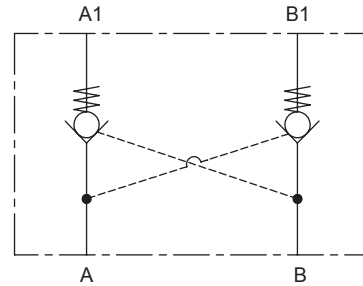
**Ordering code**

**D 0 4 1 0**   **0**   **0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>MATERIALS</b>		<b>PORTS</b>		
<b>7</b>	<b>7:1</b>		<b>02</b>	<b>A</b>	Alluminium	<b>03</b>	<b>52</b>	
		Setting	2.0 bar	<b>S</b>	Steel	A,A1,B,B1	G 3/8"	SAE 6
		Seals	no seal			a	32	31
						b	62	63

**DOUBLE ACTING PILOT OPERATED CHECK VALVE**

- Flow . . . . . **50 l/min**
- Max working pressure . . . . . **350 bar**
- Working pressure . . . . . **210 bar (Aluminium Body)**
- Working pressure . . . . . **350 bar (Steel Body)**
- Weight in steel . . . . . **0,9 Kg**
- Weight in aluminium . . . . . **0,64 Kg**



225

**Ordering code**

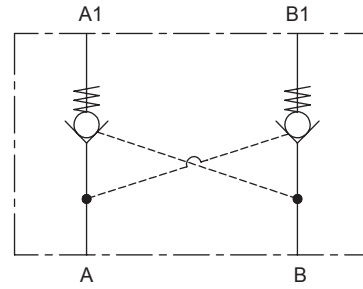
**D 0 4 1 0**   **0**   **0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>MATERIALS</b>		<b>PORTS</b>	
<b>5</b>	<b>5:1</b>		<b>02</b>	<b>A</b>	Alluminium	A,A1,B,B1	<b>04</b>
		Setting	1,5 bar	<b>S</b>	Steel	a	34
		Seals	no seal			b	69

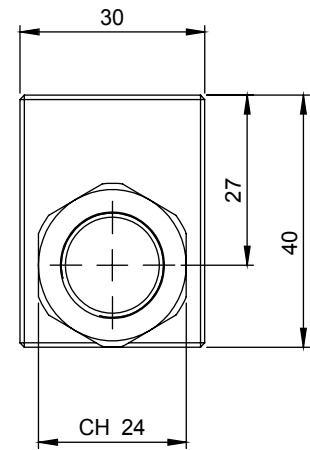
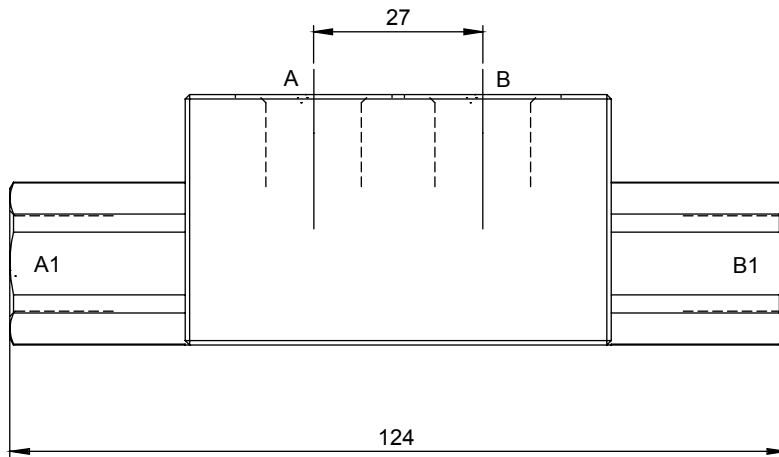


**DOUBLE ACTING PILOT OPERATED CHECK VALVE**

- Flow ..... **30 l/min**
- Max working pressure ..... **310 bar**
- Weight ..... **0,65 Kg**



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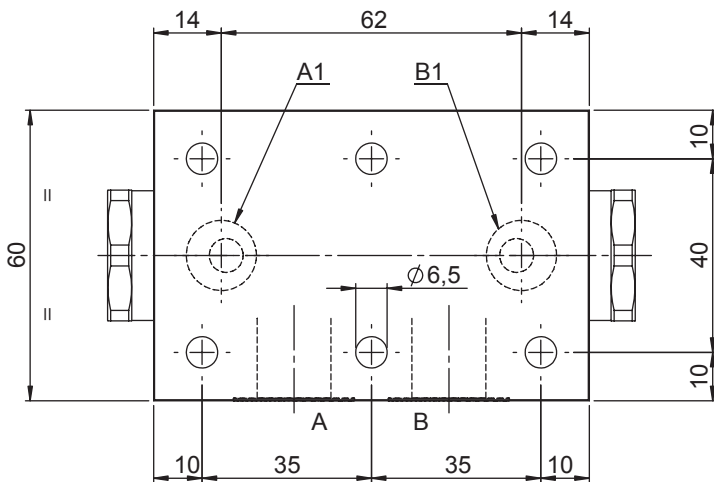
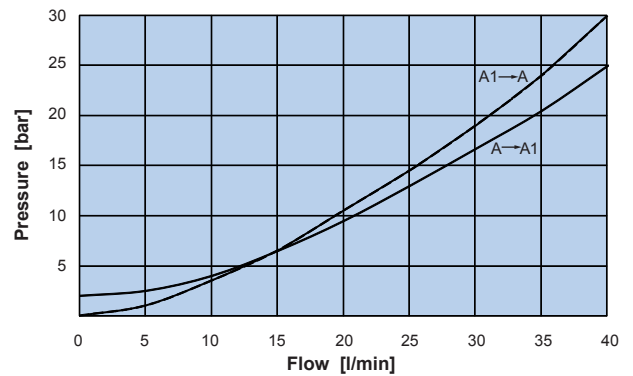
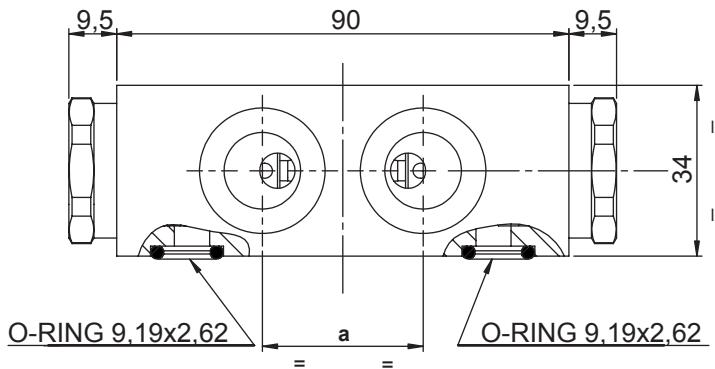
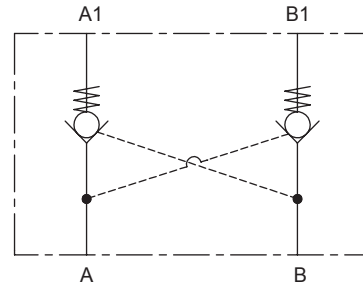
**Ordering code**

**D 0 4 5 0 [ ] [ ] 0 S [ ] 0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>PORTS</b>	
<b>4</b>	<b>4,6:1</b>	<b>01</b>		<b>03</b>	
		Setting	0.5 bar	A,A1,B,B1	G 3/8"
		Seals	no seal		

**DOUBLE ACTING PILOT OPERATED CHECK VALVE - A1/B1 PORT FLANGED**

- Flow . . . . . **40 l/min**
- Max working pressure . . . . . **350 bar**
- Working pressure . . . . . **210 bar (Aluminium Body)**
- Working pressure . . . . . **350 bar (Steel Body)**
- Weight in steel . . . . . **0,9 Kg**
- Weight in aluminium . . . . . **0,64 Kg**



227

**Ordering code**

**D 0 5 1 0**   **0**   **0 0**

PILOT RATIO	
<b>7</b>	<b>7:1</b>

SPRING	<b>02</b>
Setting	2.0 bar
Seals	no seal

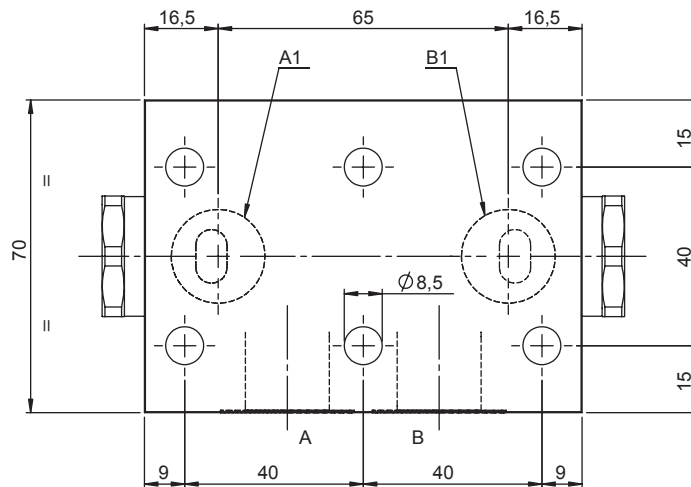
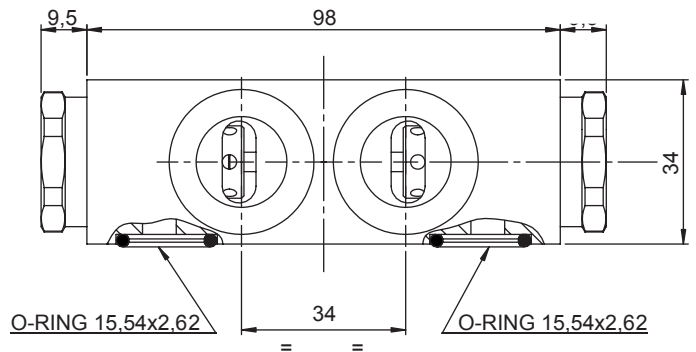
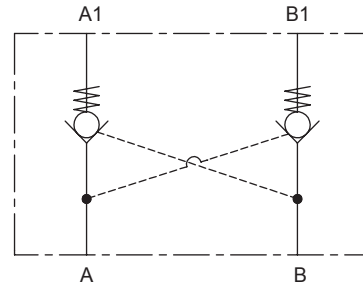
MATERIALS	
<b>A</b>	Aluminium
<b>S</b>	Steel

PORTS	<b>03</b>	<b>02</b>
A,B	G 3/8"	SAE 6
A1,B1	Ø 7	Ø 7
a	32	31



**DOUBLE ACTING PILOT OPERATED CHECK VALVE - A1/B1 PORT FLANGED**

- Flow . . . . . **50 l/min**
- Max working pressure . . . . . **350 bar**
- Working pressure . . . . . **210 bar (Aluminium Body)**
- Working pressure . . . . . **350 bar (Steel Body)**
- Weight in steel . . . . . **0,9 Kg**
- Weight in aluminium . . . . . **0,64 Kg**



228

**Ordering code**

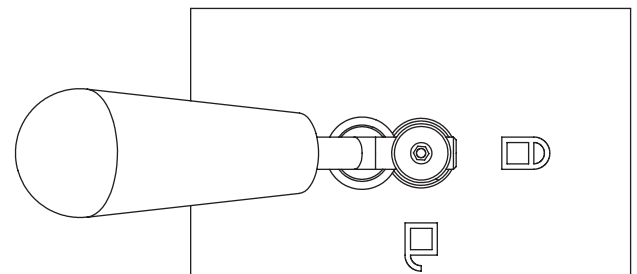
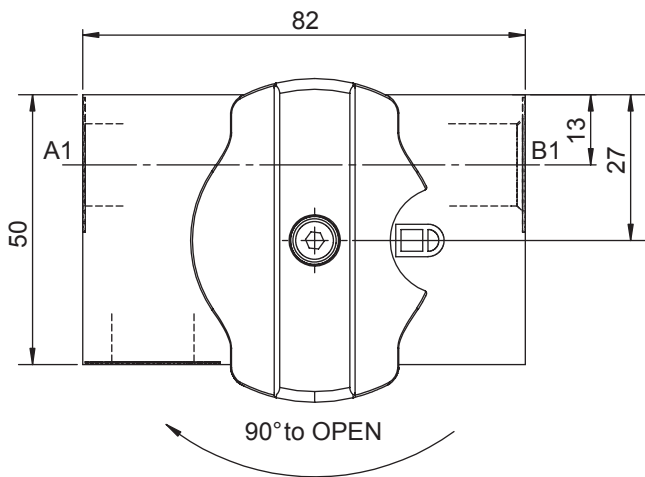
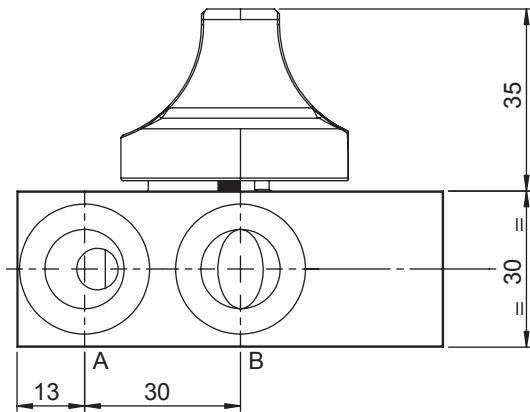
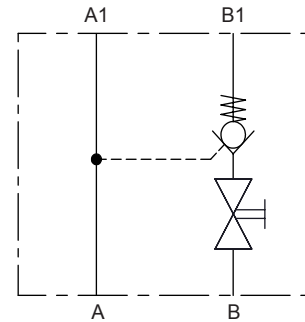
**D 0 5 1 0 [ ] [ ] 0 [ ] [ ] 0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>MATERIALS</b>		<b>PORTS</b>	
<b>3</b>	<b>5:1</b>		<b>02</b>	<b>A</b>	Aluminium	<b>04</b>	<b>G 1/2"</b>
		Setting	1.5 bar	<b>S</b>	Steel	A1,B1	Ø 8
		Seals	no seal				



**SINGLE ACTING PILOT OPERATED CHECK VALVE WITH 2 POSITIONS MANUAL SHUT OF - RIGHT**

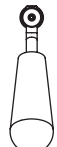

- Flow ..... **30 l/min**
- Max working pressure ..... **350 bar**
- Working pressure ..... **210 bar**
- Weight ..... **0,5 Kg**
- Lever ..... **Lever/Handknob**



229

**Ordering code**

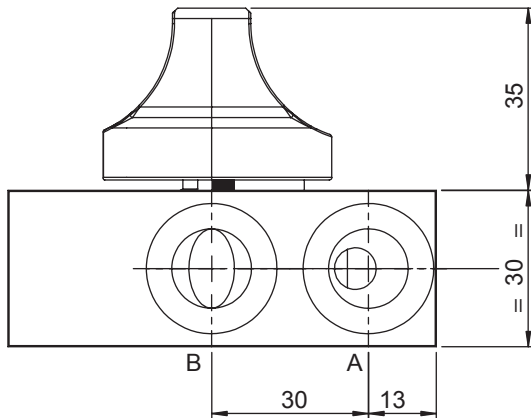
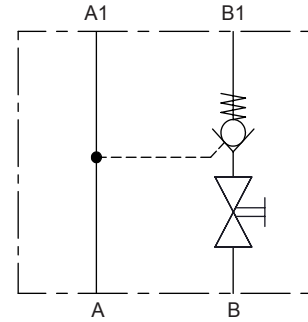
**D 0 8 5 1 [ ] [ ] [ ] A [ ] 0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>LEVER</b>		<b>PORTS</b>	
<b>4</b>	<b>4,7:1</b>	<b>03</b>		<b>L</b>	<b>M</b>	<b>03</b>	
		Setting	2.7 bar	 		A,A1,B,B1	
		Seals	with seal			G 3/8"	
				Lever Handknob			

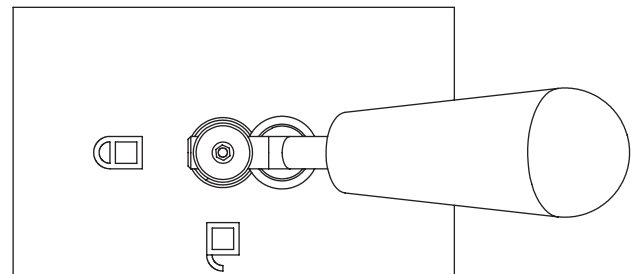
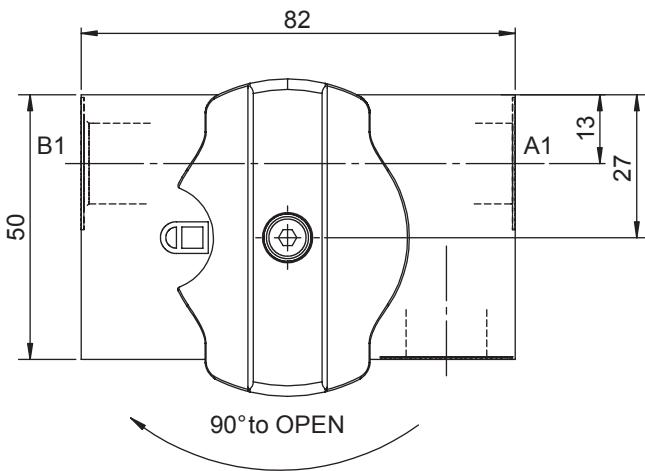


**SINGLE ACTING PILOT OPERATED CHECK VALVE WITH 2 POSITIONS MANUAL SHUT OF - LEFT**

- Flow ..... **30 l/min**
- Max working pressure ..... **350 bar**
- Working pressure ..... **210 bar**
- Weight ..... **0,5 Kg**
- Lever ..... **Lever/Handknob**

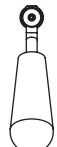



230



**Ordering code**

**D 0 7 5 1**    **A**  **0 0**

<b>PILOT RATIO</b>		<b>SPRING</b>		<b>03</b>	<b>LEVER</b>		<b>PORTS</b>	
<b>4</b>	<b>4,7:1</b>	Setting	2.7 bar		<b>L</b>	<b>M</b>	A,A1,B,B1	<b>03</b>
		Seals	with seal		 		G 3/8"	
					Lever	Handknob		

**PARTS IN BODY**  
**BOOM LOWERING CONTROL DEVICES**



**BOOM LOWERING CONTROL DEVICES**

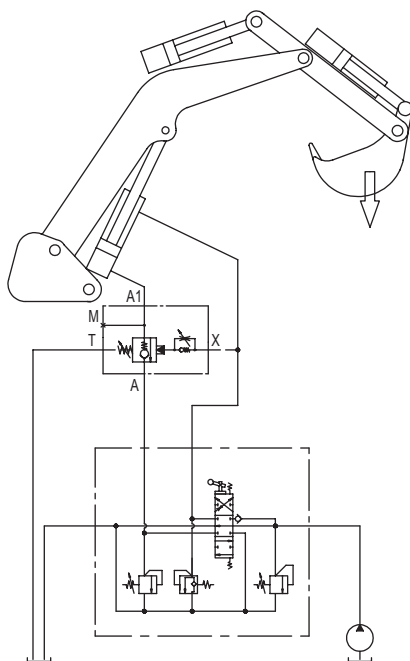
**INTRODUCTION**

According to the European Standard for Earth moving machinery - Safety requirements (EN 474), when an excavator or a backhoe loader is used to handle loads with a mass bigger than 1000 Kg, or with a momentum force above 40.000 Nm, the carrying cylinders have to be equipped with control devices able to prevent the effects of a possible hose failure.

When excavators and backhoes are used to lift heavy weights, in fact, any carrying circuit malfunction or breakdown could be a threat for the operator and generally other people around the machine. This risk can be reduced by installing in the hydraulic circuit boom lowering control devices, these are able to prevent an uncontrolled descent of the load in case of hose failure on carrying circuits.

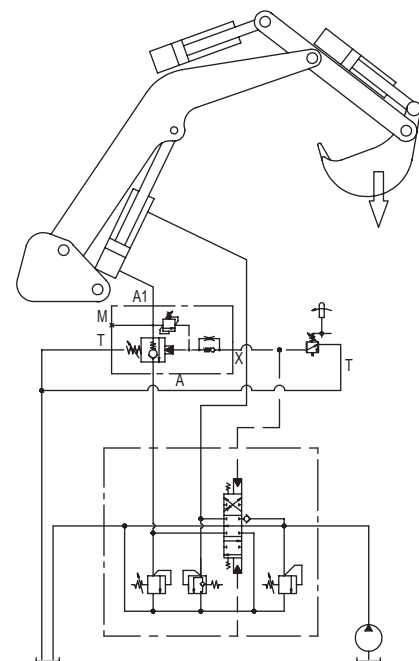
*COUNTERBALANCE VALVES  
INSTALLATION (MANUAL OPERATED D.C.V.)*

(LHD..X)



*BOOM LOWERING VALVES  
INSTALLATION (JOYSTICK OPERATED D.C.V.)*

(LHD..Y)



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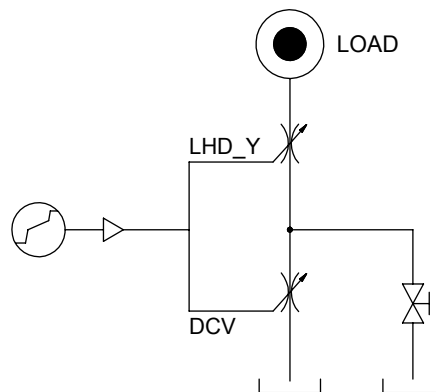
For this kind of application, the suitable valves must be able to withstand the requirements indicated by the international standard **ISO 8643** (Earth-Moving Machinery - Hydraulic Excavator and Backhoe Loader Boom-Lowering Control Device - Requirements and Tests), which states the testing procedures and the evaluation criteria for both excavators and backhoes mounting boom lowering valves.

**ISO8643**

The international standard ISO 8643 describes a series of tests, consisting in simulating the failure of the flexible hoses during the control of a test load.

The failure simulating device consists in a 2 way- 2 position valve, installed in parallel to any connecting line whose failure could cause the boom to lower. In this way it will be possible to reproduce the consequences of a suddenly failure on flexible hoses.

**BOOM LOWERING CONTROL DEVICES**



The main tests described by ISO 8643 standard are 3:

**Holding position Test:** The test is aimed to verify the static load holding capacity of load lowering control valves. It consists of simulating the hose failure after rising approximately the test load 1 m above the ground level, and having set the directional control valve in its neutral position.

The Standard requirement fix a maximum total drop of the load, that shall not exceed the **100 mm** in the first 10 seconds following the opening of the 2 way- 2 position valve installed in the flexible hose.

Thanks to his “poppet style” design, **LHD** valves are able to maintain the actuator still in its position.

**Lifting Movement Test:** in this test the hose failure simulation shall be operated while rising the test load smoothly and continuously to a maximum speed of 200 mm/s. Even in this case the Standard requirement fix a maximum total drop of the load, that shall not exceed the **100 mm** in the first 10 seconds following the opening of the 2 way- 2 position valve installed in the flexible hose.

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As well as in the previous case, thanks to its “poppet style” design, **LHD** valves do not consider any possible lowering of the load.

**Lowering movements test:** in this case the hose failure simulation shall be operated while lowering the test load smoothly and continuously to a maximum speed of 200 mm/s.

The increase in the lowering speed following the opening of the failure simulation device shall be less than 100% of the initial speed (eg.  $V1=200\text{mm/s}$  ,  $V2\text{max}=400\text{ mm/s}$ ).

After having set the directional control valve in its neutral position, the maximum total drop of the load shall not exceed the **100 mm** in the first 10 seconds of test.

**Lowering movement test with counterbalance valves**

Thanks to the connection that characterizes the installation of the **LHD..X** counterbalance valves, the load lowering velocity depends exclusively on the flow rate of the directional control valves (meter-in), consequently it will result independent from the back-pressure generated from the control of the flow in its return line. In these conditions, an hose failure does not generate any effect on the load lowering speed.

**Lowering movement test with boom lowering control valves**

In the case of the boom lowering control valves **LHD..Y**, due to the pilot signal coming from an external source (remote control), the opening of the valve and of the directional control valve must be synchronized. In these conditions, controlling the lowering speed, the ISO8643 Standard specification tends to verify the distribution of the pressure drops. The Standard requirement is satisfied if in the first phase of the lowering speed control the load is withstand mainly by the **LHD..Y** valve.

The above considerations put in evidence the strong relationship between the boom lowering valve design and the main control valve spool metering characteristics. A correct matching of the two opening

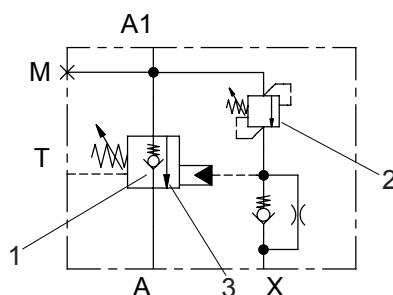


**BOOM LOWERING CONTROL DEVICES**

characteristics will allow to satisfy the ISO 8643 safety requirements and enhance the performances in terms of stability, speed and pump pressurisation.

**BOOM LOWERING CONTROL VALVES LHD\_Y**

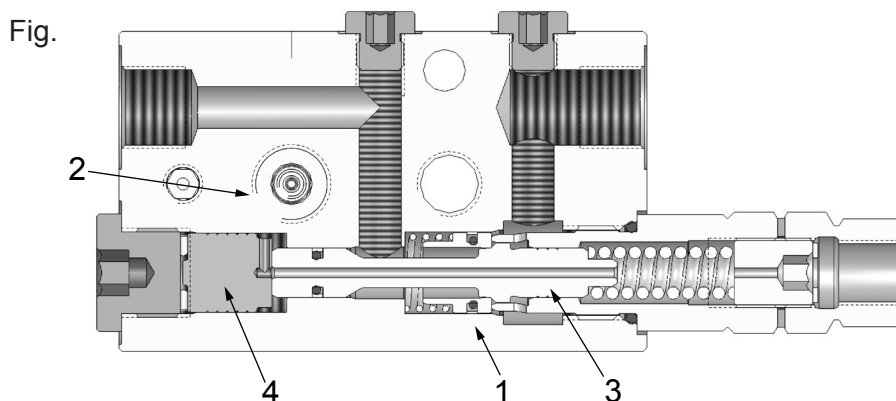
The hydraulic symbol of **LHD\_Y** valves is similar to a micro integrated circuit which includes different components characterizing their structure.



1. Uni-directional check valve guarantees a free feeding to the hydraulic actuator, and the load's block in the desired position.
2. Pressure relief valve, thanks to its specific configuration, can hold external loads, and can limit the actuator's maximum pressure, allowing a control of the pressure bursts, where demanded.
3. The conical poppet guarantees a precise control of the flow during lowering movements, satisfying the ISO8643 requirements and reducing its impact on the machine's capacities during standard excavating movements.
4. The pilot piston, that allows to open the conical poppet using the pilot pressure coming from the joysticks.

234

The LHD\_Y valves are designed by inserting a main subgroup composed of single different elements inside a steel manifold, plus other components.

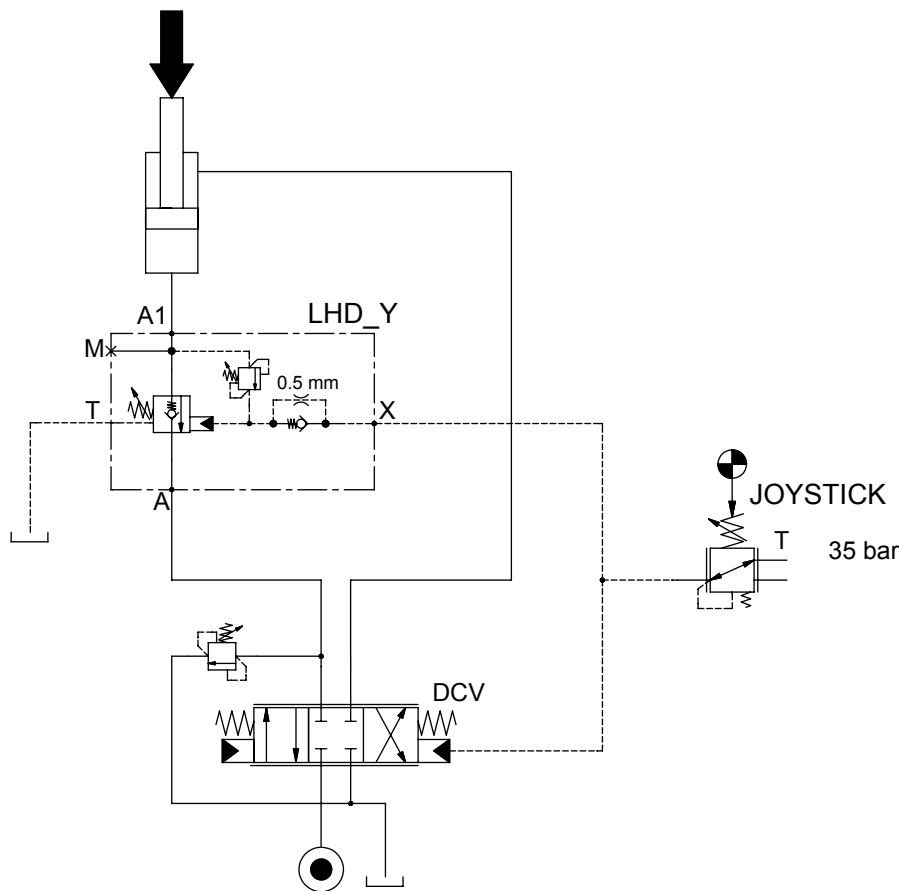


**BOOM LOWERING CONTROL DEVICES**

**INSTALLATION**

**LHD\_Y** boom lowering valves are installed directly on the cylinders which they must control through a SAE flange or rigid jointed pipes.

Having to work together with Closed-Centre directional control valves, **LHD\_Y** boom lowering valves are designed to be insensitive to the back-pressure, both during load lowering movements control and draining pressure peaks generated by bumps, or by sudden interruptions of the lowering movements.



235

The above hydraulic scheme shows an example of typical application involving **LHD\_Y**.

Ports on standard applications:

- Port **A1** to the cylinder
- Port **A** to the flexible hose which connects the cylinder to the directional control valve
- Port **X** to the joystick pilot line of the which controls the lowering movement (connection in parallel)
- Port **T** direct to the tank or to a draining collecting line, like servocontrol line T. Eventual back-pressures on line T would add to setting pressure with factor 1:1.



## BOOM LOWERING CONTROL DEVICES

### WORKING PRINCIPLE

The above LHD\_Y hydraulic schematic shows how the operator is able to move a load, avoiding some risks which are characteristic of these types of movements. Thanks to their design, NEM boom lowering control valves grant to earth moving machinery the following advantages:

The **lifting** of a load or it's joint is made through an unidirectional valve (1), which allows the oil flow – regulated by the directional control valve – to enter in the cylinder with less resistance as possible.

**Load Holding** must be guaranteed, when the directional valve spool is in the neutral position. Thanks to spring (6), the unidirectional valve touches the sealing poppet, hermetically closing the connection between the hydraulic actuator and the directional control valve.

Thanks to fine-grinding of the sealing areas between the check valve and the conical poppet, the valve is perfectly closed, avoiding internal leakage in the directional control valve.

**Load lowering** takes place by opening the conical poppet, and thus using the pressure usually used to pilot the directional control valve's spool. The pilot pressure acting on the pilot piston area (4) generates sufficient pressure to win the force of the adjustable spring (5). Adjusting pilot pressure intensity, the conical poppet between the pilot piston and the adjustable spring will move, thus opening an area section proportional to the intensity of the pilot pressure itself. Pilot pressure modulation through the hydraulic joysticks allows the operator to adjust boom lowering speed.

236 Boom lowering speed through the **LHD\_Y** valves allow to reach a compromise between two requirements which are apparently in conflict:

1. To full fill the requirements of the international standard ISO8643, which establishes how machines must work in case of hose failure, when the booms are used for handling loads at reduced speed ( $V < 200$  mm/s).
2. To minimize the impact on the machine with regards to system's pressures, speeds and metering when machines are used for regular earth moving operations.

### SETTINGS

The **LHD\_Y** boom lowering control valve's settings are characterized by 2 different values:

1. The main poppet setting, which will controls oil flow during boom lowering movements.
2. Relief function pressure setting, which will limit the cylinder pressurisation due by external loads.

**Main poppet setting** corresponds to the pilot pressure ( $P_x$ ) at the initial opening, i.e. pressure on port X, which determines the detachment of conical poppet from its seating.

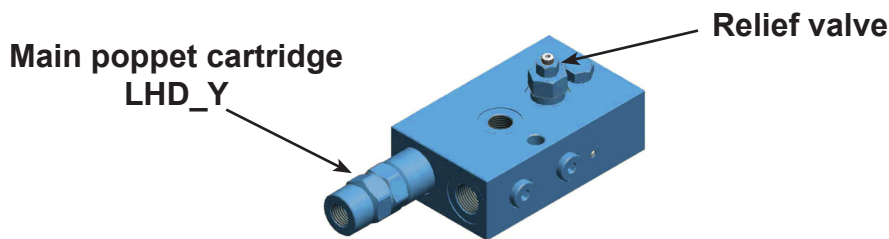
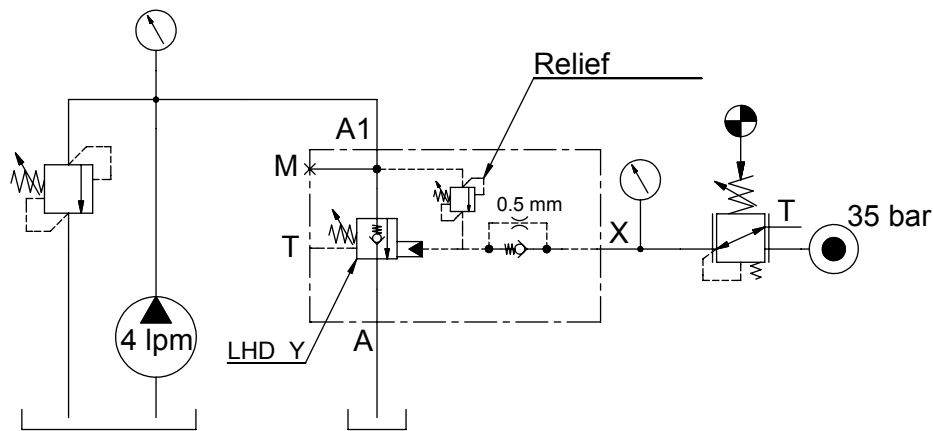
The setting is verified by putting on port A1, 100 Bar of steady pressure. The pilot pressure is increased progressively up to obtaining 20cc/min leakage through port A.

**Relief pressure setting** determines the maximum limit of pressure inside the cylinder, with external forces. This value is regulated working on the relief valve installed above the pilot chamber.

**Standard setting** is obtained regulating the pressure on port A1, with 5 l/min flow.



**BOOM LOWERING CONTROL DEVICES**



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Usually the setting of the main relief valve function must consider the re-closing value. Generally the setting value must be at least 1.3 times the pressure given by the heaviest load:

$$P_t = 1,3 \times P_{\max}$$

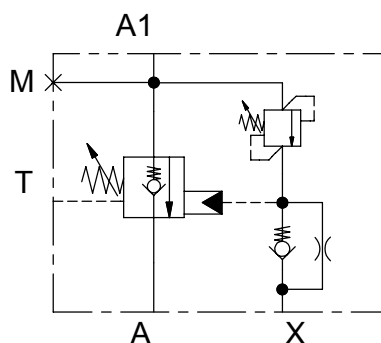
**COMPENSATION**

**LHD\_Y** boom lowering control valves belong to compensated type valves, that means they are insensitive to backpressure on port A.

This characteristic is a precondition relating boom lowering control valves, because they are usually coupled with centre-close directional spools.

Compensation takes place thanks to an independent **LHD\_Y** spring-housing chamber drained directly to tank through port (Y).

An eventual back-pressure on port Y determines 1:1 ratio pilot pressure increasing.



**BOOM LOWERING CONTROL DEVICES**

**BOOM LOWERING VALVES FOR EXCAVATORS**

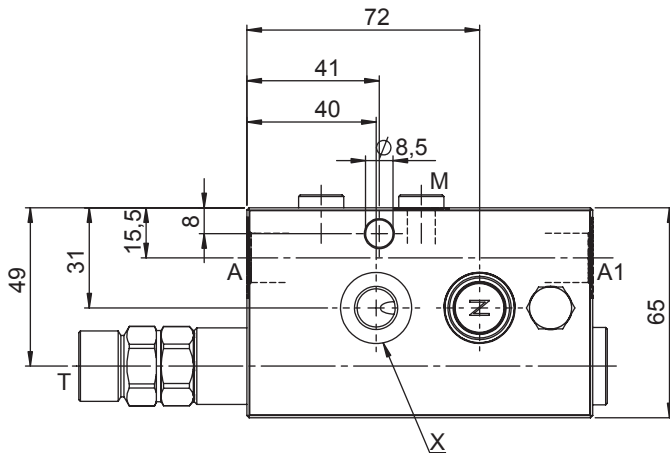
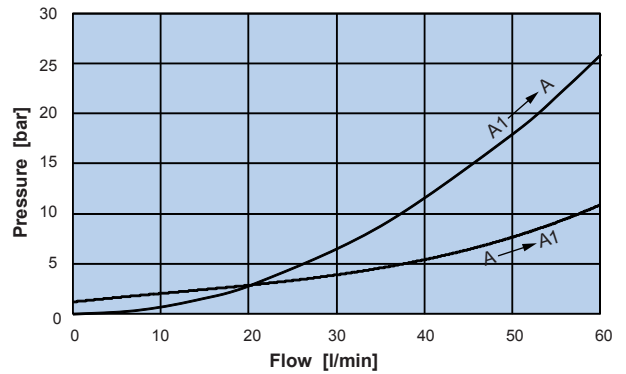
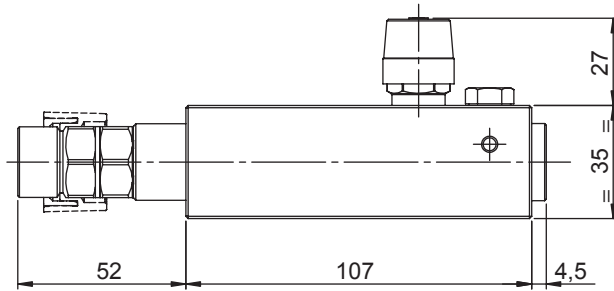
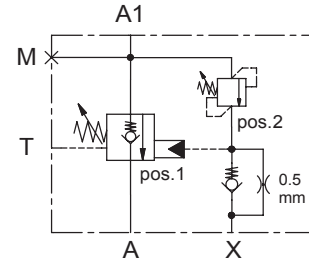
IN LINE		Q l/min	P bar	PILOT RATIO	PORTS	PAGE
	Y0502Y SX	40	350	1 : 0	G 3/8" SAE 8	10.01.001
	Y0501Y DX	40	350	1 : 0	G 3/8" SAE 8	10.01.002
	Y1002Y SX	75	410	1 : 0	G 1/2" SAE 10	10.01.003
	Y1001Y DX	75	410	1 : 0	G 1/2" SAE 10	10.01.004
	Y1502Y SX	150	410	1 : 0	G 3/4" SAE 12	10.01.005
	Y1501Y DX	150	410	1 : 0	G 3/4" SAE 12	10.01.006
<b>FLANGED</b>						
238	Y1013Y	75	410	1 : 0	G 1/2" SAE 10	in development
	Y1513Y	150	410	1 : 0	G 3/4" SAE 12	in development

**BOOM LOWERING VALVES FOR LOADERS**

	H1001N504	110	410	4 : 1	G 1/2" SAE 10	10.01.007
	H1001C424	110	410	4 : 1	G 1/2" SAE 10	10.01.008

**BOOM LOWERING VALVE**

- Flow ..... **40 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **1,9 Kg**
- Tamper proof cap ..... **cod.9021030191**



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**Ordering code**

**Y 5 0 0 2 Y** [ ] [ ] [ ] [ ] **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

PORTS	03	53
A,A1	G 3/8"	SAE8
X,T	G 1/4"	SAE6

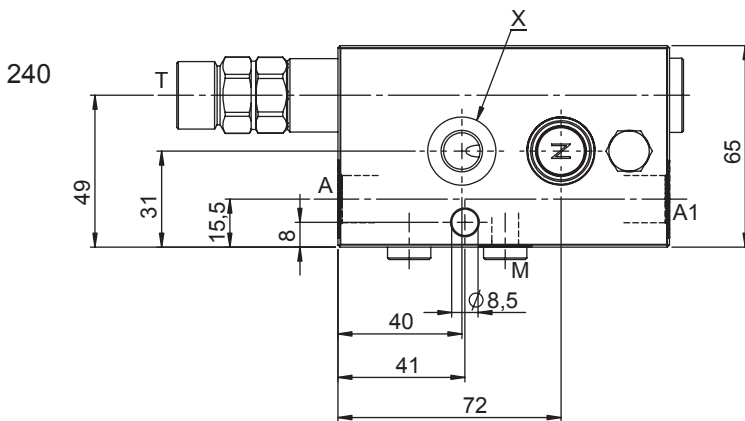
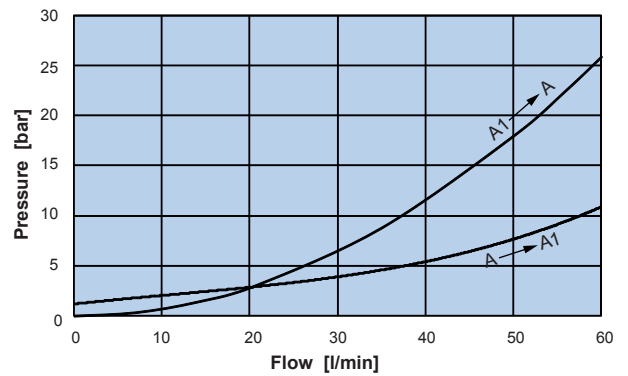
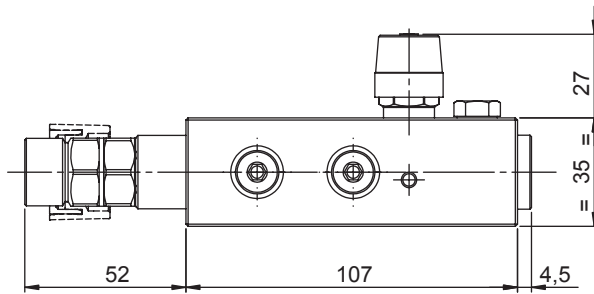
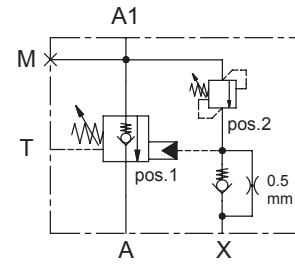
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350



**BOOM LOWERING VALVE**

- Flow ..... **40 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **1,9 Kg**
- Tamper proof cap ..... **cod.9021030191**



**Ordering code**

**Y 5 0 0 1 Y**     **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

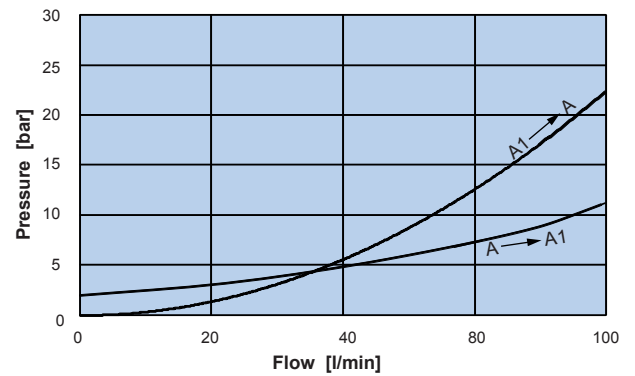
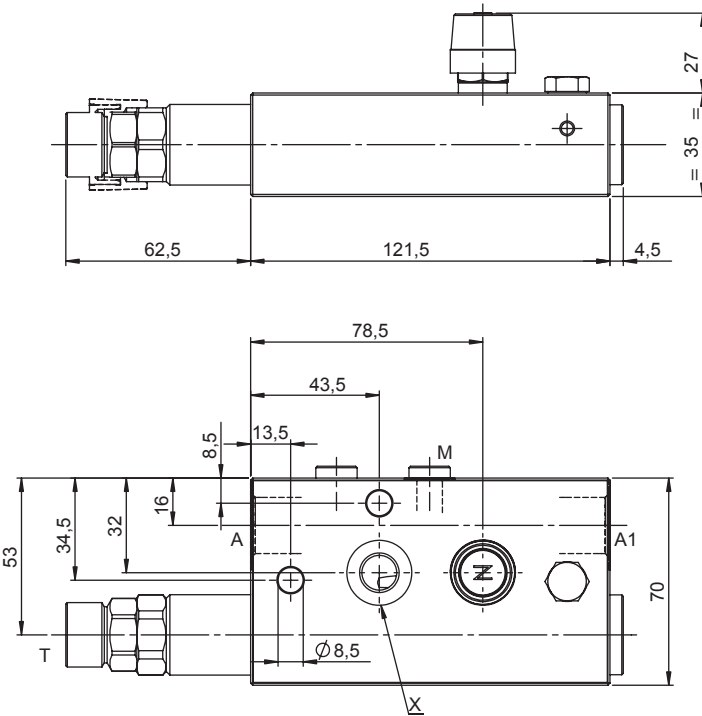
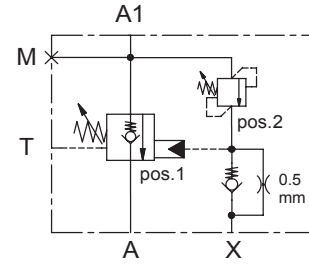
PORTS	03	53
A,A1	G 3/8"	SAE8
X,T	G 1/4"	SAE6

SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350

**BOOM LOWERING VALVE**

- Flow ..... **75 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **2,3 Kg**
- Tamper proof cap ..... **cod.9021030191**



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**Ordering code**

**Y 1 0 0 2 Y**         **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

PORTS	04	54
A,A1	G 1/2"	SAE10
X,T	G 1/4"	SAE6

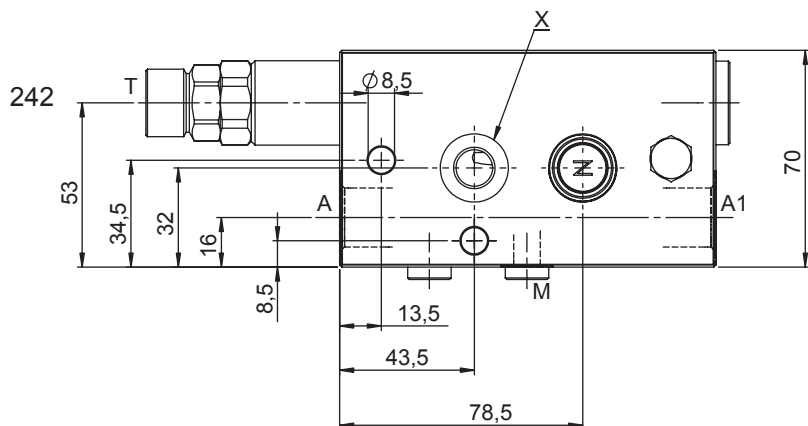
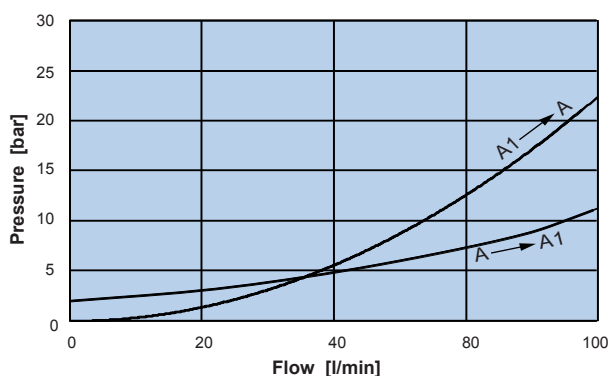
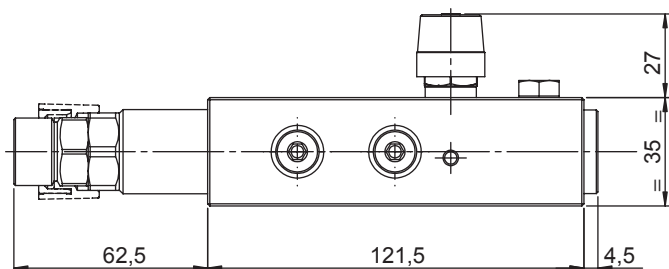
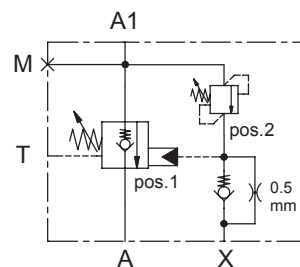
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350



**BOOM LOWERING VALVE**

- Flow ..... **75 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **2,3 Kg**
- Tamper proof cap ..... **cod.9021030191**



**Ordering code**

**Y 1 0 0 1 Y** [ ] [ ] [ ] [ ] **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

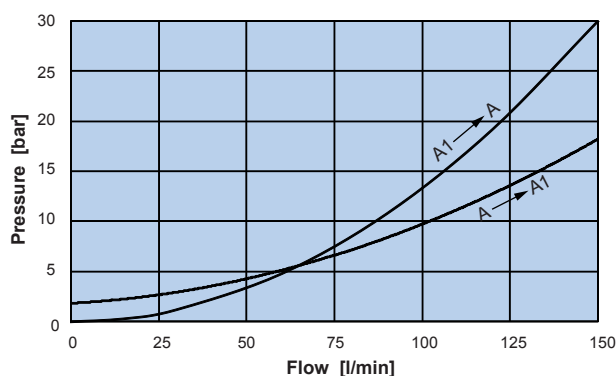
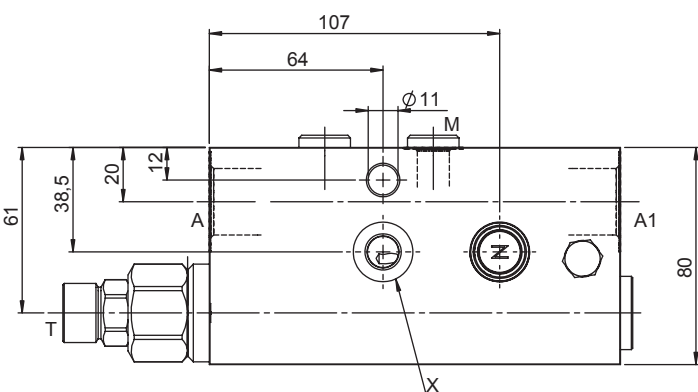
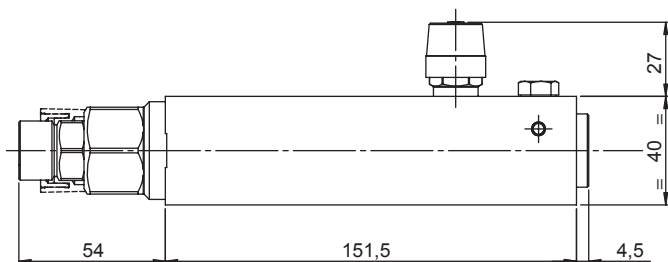
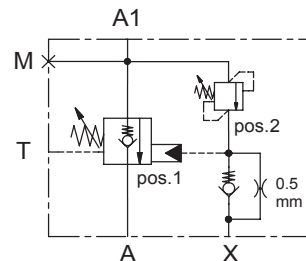
PORTS	04	54
A,A1	G 1/2"	SAE10
X,T	G 1/4"	SAE6

SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350

**BOOM LOWERING VALVE**

- Flow ..... **150 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **3,6 Kg**
- Tamper proof cap ..... **cod.9021030191**



243

**Ordering code**

**Y 1 5 0 2 Y** [ ] [ ] [ ] [ ] **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

PORTS	05	55
A,A1	G 3/4"	SAE12
X,T	G 1/4"	SAE6

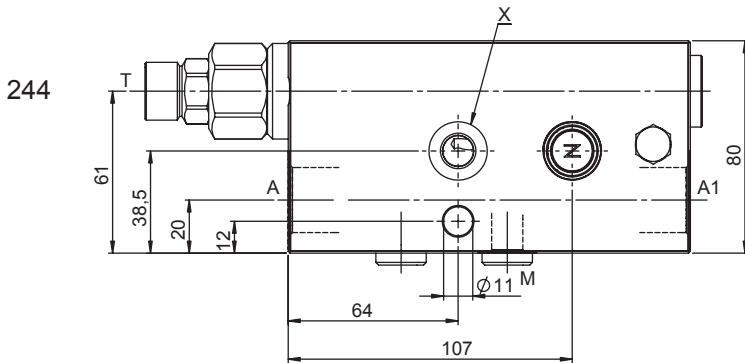
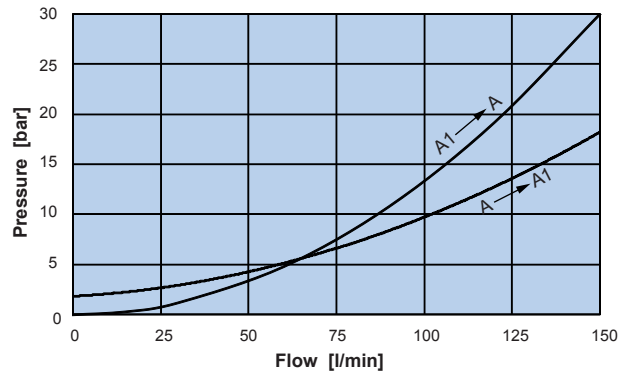
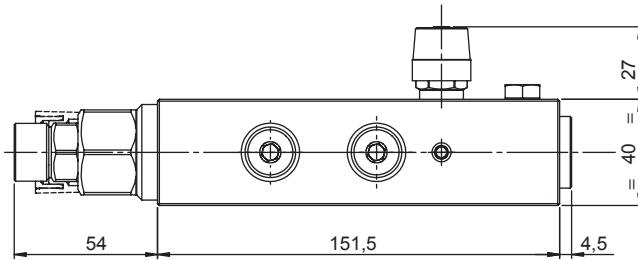
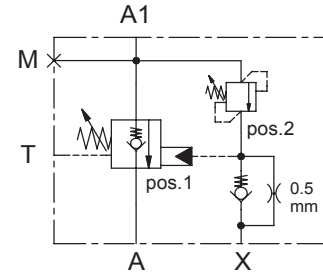
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350



**BOOM LOWERING VALVE**

- Flow ..... **150 l/min**
- Maximum pressure ..... **400 bar**
- Compensation ..... **Fully Compensated with drain line**
- Weight ..... **3,6 Kg**
- Tamper proof cap ..... **cod.9021030191**



**Ordering code**

**Y 1 5 0 1 Y** [ ] [ ] [ ] [ ] **0 0**

PLUNGER	
<b>00</b>	1:0 Standard Plunger

PORTS	<b>05</b>	<b>55</b>
A,A1	G 3/4"	SAE12
X,T	G 1/4"	SAE6

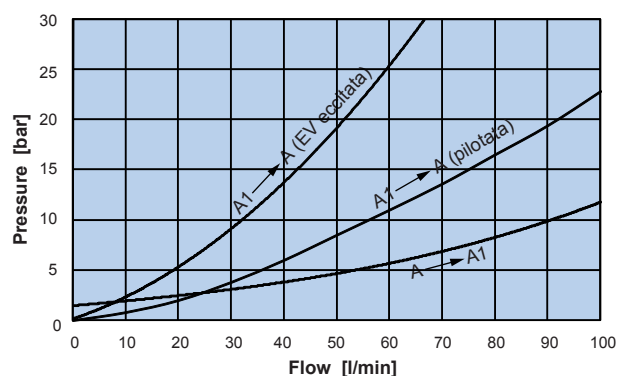
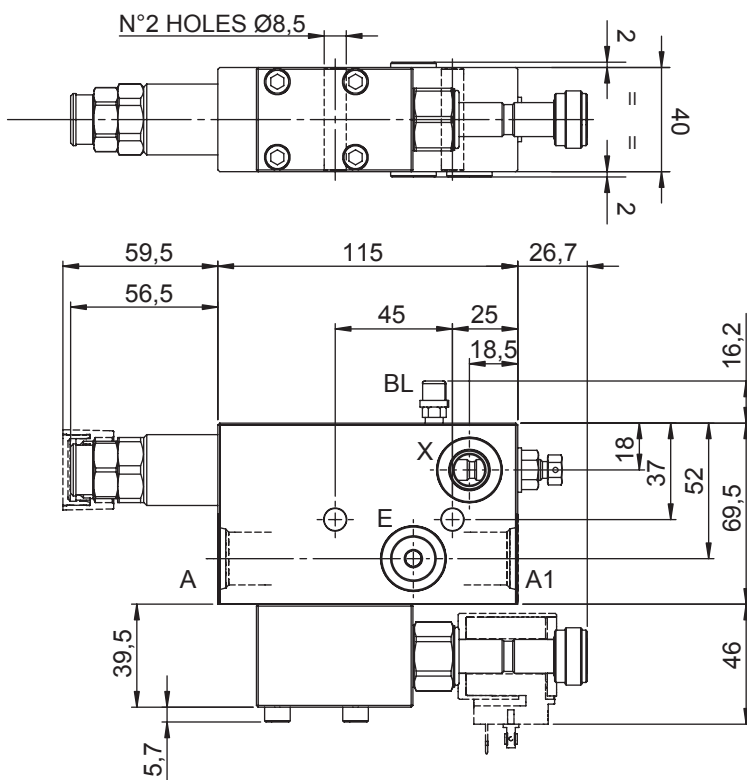
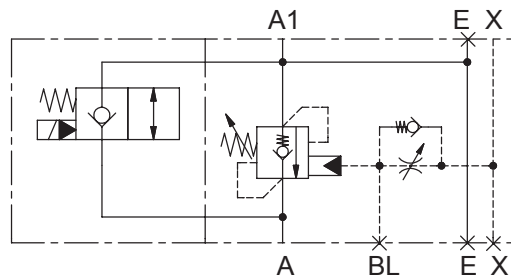
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
<b>2</b>	5 - 14	2,5	7,5

SPRING pos.2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
<b>3</b>	200 - 400	250	350



**SINGLE ACTING COUNTERBALANCE VALVE WITH ELECTRIC BYPASS**

- Flow ..... **110 l/min**
- Maximum pressure ..... **410 bar**
- Compensation ..... **Not Compensated**
- Weight ..... **3,6 Kg**
- Tamper proof cap ..... **cod.9021030190**



245

**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Back pressure can influence the opening pressure (LHD10X-C is recommended for circuits with high back pressure)

**Ordering code**

**H 1 0 0 1 N**     **S**     **0 0**

PILOT RATIO	
<b>50</b>	<b>4:1 + BPE</b>

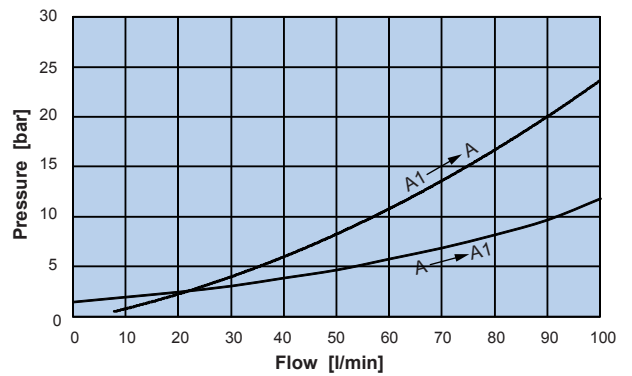
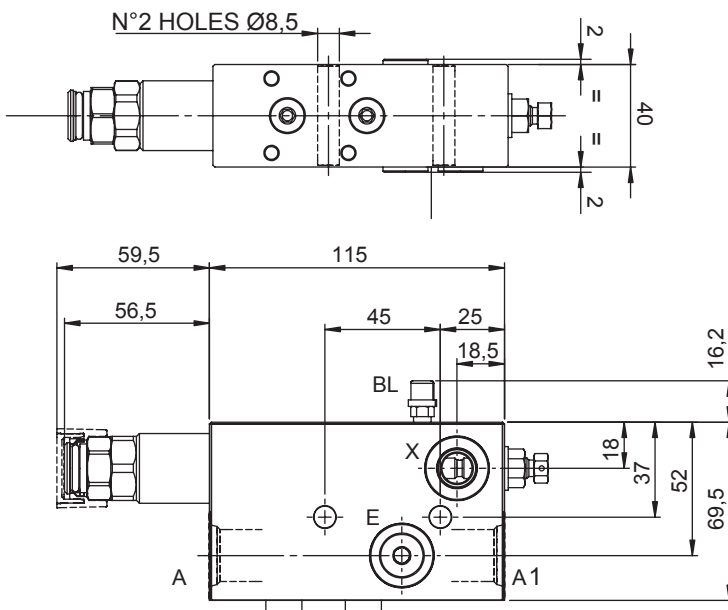
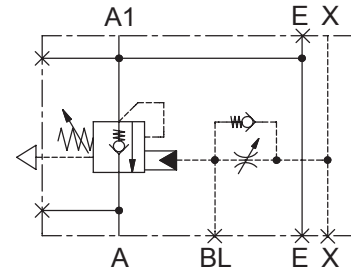
SPRINGS	<b>4</b>
Setting Range min.-max. [bar]	210 - 410
Pressure Increase [bar/turn]	86
Standard Setting 4 l/min [bar]	260

PORTS	<b>04</b>	<b>54</b>
A,A1	G 1/2" SAE 10	
X,E	G 1/4" SAE 6	



**SINGLE ACTING COUNTERBALANCE VALVE**

- Flow ..... **110 l/min**
- Maximum pressure ..... **410 bar**
- Compensation ..... **Fully Compensated**
- Weight ..... **3,5 Kg**
- Tamper proof cap ..... **cod.9021030190**



**Note:**  
 - Pressure setting must be 30% higher than pressure induced by the load.  
 - Valve pre-arranged for electric bypass assembly

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**Ordering code**

**H 1 0 0 1 C**     **S**   **0 0**

PILOT RATIO		SPRINGS		PORTS	
51	4:1	4		04	54
		Setting Range min.-max. [bar]	210 - 410	A,A1	G 1/2" SAE 10
		Pressure Increase [bar/turn]	86	X,E	G 1/4" SAE 6
		Standard Setting 4 l/min [bar]	290		

**PARTS IN BODY**  
**FLOW CONTROL VALVES**



**FLOW CONTROL VALVES**

**INTRODUCTION**

The main characteristic of Flow control valves described in this chapter is that compensator and flow regulator are mounted directly inside the manifold, so that this type of valve is directly installed in the hydraulic circuit.

There are 2 different types of flow control valves, according to the type of adjuster:

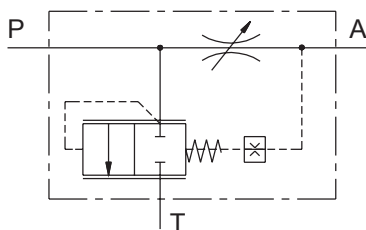
- Electro-proportional flow regulators
- Manual flow regulators

**3 WAYS IN LINE MOUNTED FLOW REGULATORS**

Whatever working pressure is, 3-way flow regulators grant a constant adjustment of oil flow inside an hydraulic line (A), draining excess flow through a third line (T).

Main components are: an flow regulator device and a 2-way NC compensator.

To have an efficient functionality, pressure on third line (T) must be lower than pressure on regulated line (A).

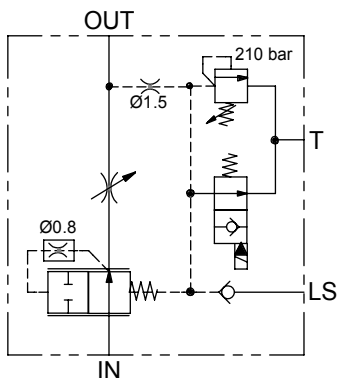


248

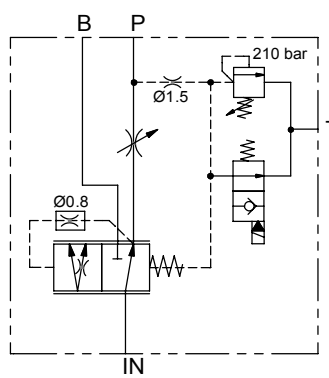
**FLOW REGULATORS FOR EARTH MOVING MACHINES**

Flow regulators for Earth movement machines are hydraulic valves designed to allow the installation of hydraulic hammers, trenchers and/or other hydraulic tools on excavators, backhoes and/or other machines.

Flow regulators for earth moving machines are designed in two different types: 2 way or 3 way valves. They are equipped with: (1) relief valves, to reduce pressure on regulated line; (2) dump electric valves.



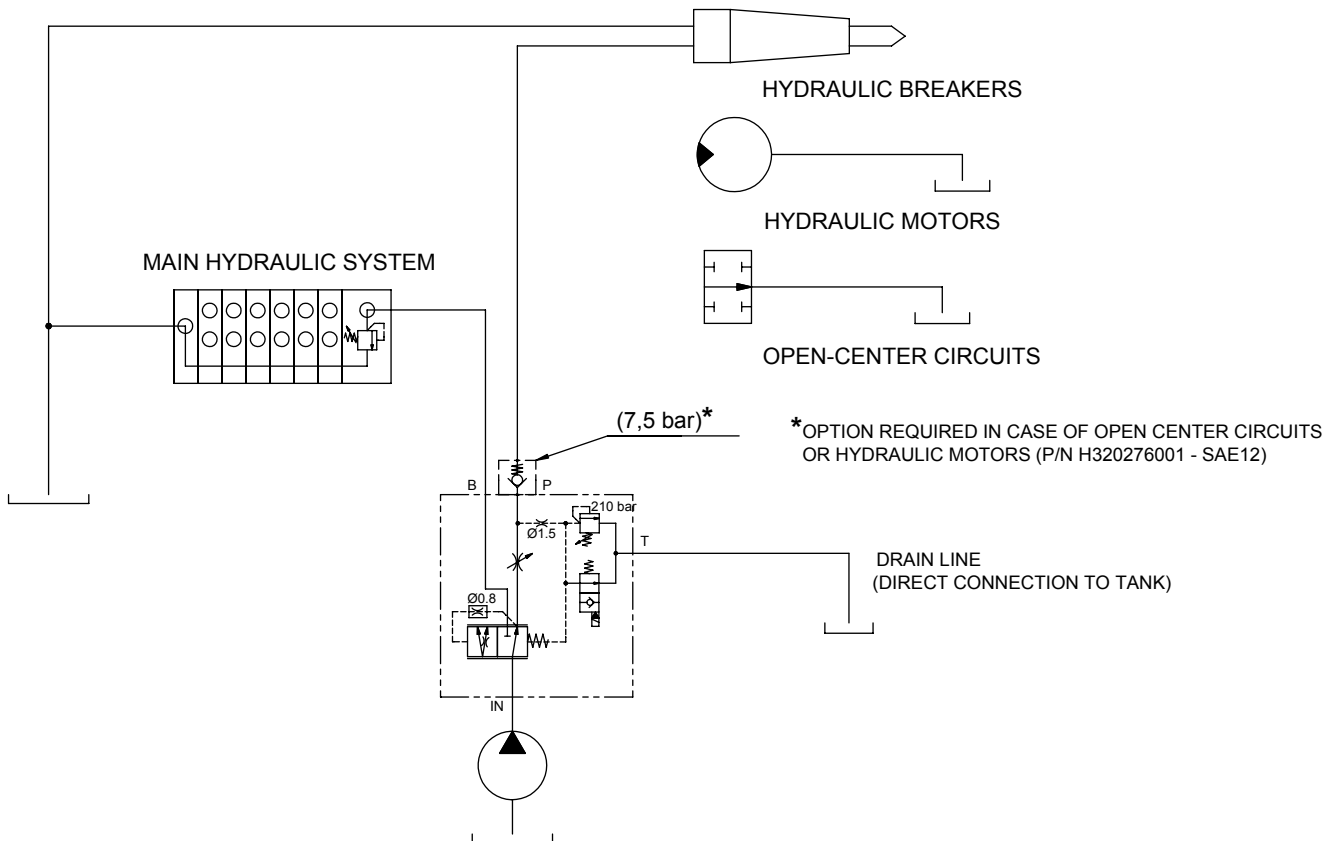
*2 way LS Regulator*



*3 way priority Regulator*

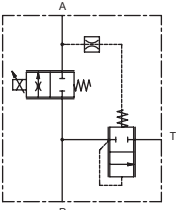
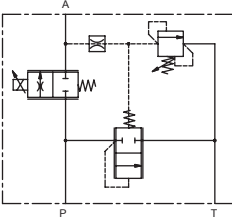
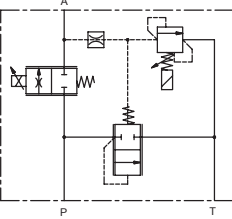
**FLOW CONTROL VALVES**

To have an efficient functionality, when flow control valve is not operating, it is necessary to assure at least 7.5 bar pressure on the regulated port (OUT or P). For applications linked to hydraulic motors or open-centre direct control valves, the installation of a 7.5 bar-pre-loaded uni-directional valve is required.



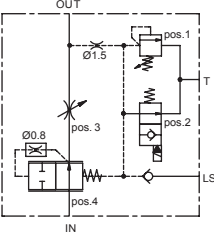
**FLOW CONTROL VALVES**

**FLOW CONTROL VALVES FOR MOBILE APPLICATIONS**

3 WAYS FLOW REGULATORS	Qin l/min	Qreg l/min	Pmax bar	PORTS	PAGE	
 <p>WITH 2/2 ELECTRO-PROPORTIONAL ADJUSTMENT</p>	FR-3C-1-EP G3/8	30	30	250	G 3/8"	11.01.001
	FR-3C-1-EP G1/2	90	50	350	G 1/2"	11.01.002
	FR-3C-1-EP G3/4	150	100	350	G 3/4"	11.01.003
 <p>WITH 2/2 ELECTRO-PROPORTIONAL ADJUSTMENT AND RELIEF VALVE</p>	FR-3C-1-EP-_-VM G3/8	90	50	350	G 3/8"	11.01.004
	FR-3C-1-EP-_-VM G1/2	90	50	350	G 1/2"	11.01.005
	FR-3C-1-EP-_-VM G3/4	150	100	350	G 3/4"	11.01.006
 <p>WITH 2/2 ELECTRO-PROPORTIONAL ADJUSTMENT AND ELECTRO-PROPORTIONAL RELIEF VALVE</p>	FR-3C-1-EP-_-VM EP G3/8	90	50	350	G 3/8"	11.01.007
	FR-3C-1-EP-_-VM EP G1/2	90	50	350	G 1/2"	11.01.008
	FR-3C-1-EP-_-VM EP G3/4	150	100	350	G 3/4"	11.01.009

250

**FLOW CONTROL VALVES FOR EARTH MOVING MACHINE**

2 WAYS FLOW REGULATORS						
 <p>SCHEME 2 - 3</p>	FR2-S		140	350	G 3/4"-SAE12	11.01.010

**FLOW CONTROL VALVES**

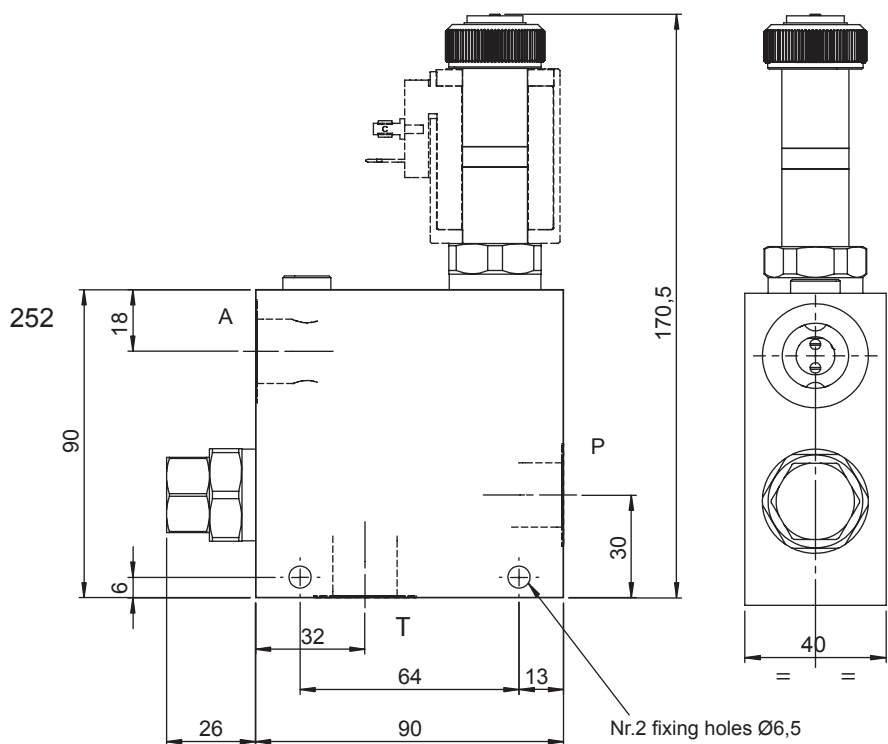
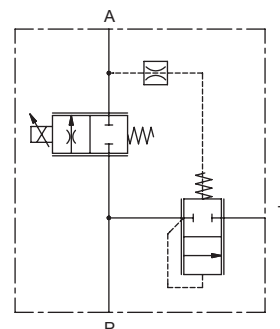
		<b>Q<sub>in</sub></b> l/min	<b>Q<sub>reg</sub></b> l/min	<b>P<sub>max</sub></b> bar	<b>ATTACCHI</b>	<b>PAGINA</b>
<p><b>SCHEMA 4 - 5</b></p>	FR2-S		140	350	G 3/4"-SAE12	11.01.010
<b>3 WAYS FLOW REGULATORS</b>						
<p><b>SCHEMA 0</b></p>	FR3-S	200	140	350	G 3/4"-SAE12	11.01.011
<p><b>SCHEMA 1</b></p>	FR3-S	200	140	350	G 3/4"-SAE12	11.01.011
<b>ACCESSORIES FOR FR-S</b>						
	D-R-M/F-V			350	G 3/4"-SAE12	11.01.012

251



**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **50 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately

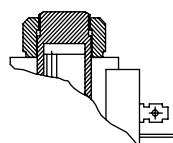


**Ordering code**

**6 3 1 1**    **1**    **5 0 0**

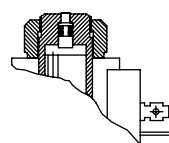
<b>PORTS</b>	<b>2</b>
A,P,T	G 3/8"

**0**



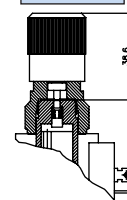
**No emergency**

**1**



**Push pin**

**7**



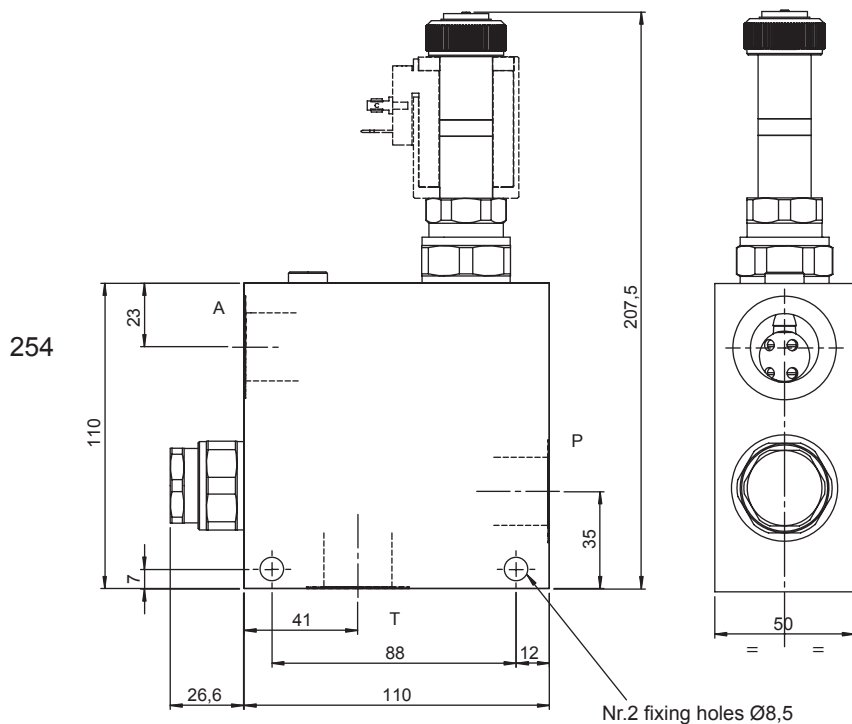
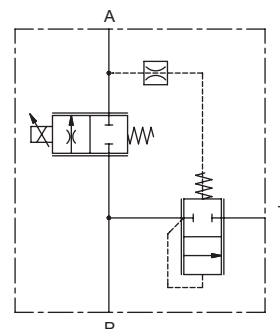
**Handknob**





**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL 2/2 NC**

- Max regulated flow ..... **90 l/min**
- Maximum flow ..... **150 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



**Ordering code**

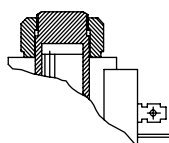
**6 3 1 1 [ ] 1 [ ] 5 0 0**

<b>PORTS</b>	<b>4</b>
A,P,T	G 3/4"

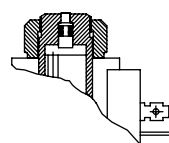
**0**

**1**

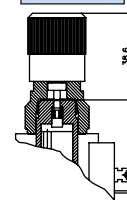
**7**



**No emergency**



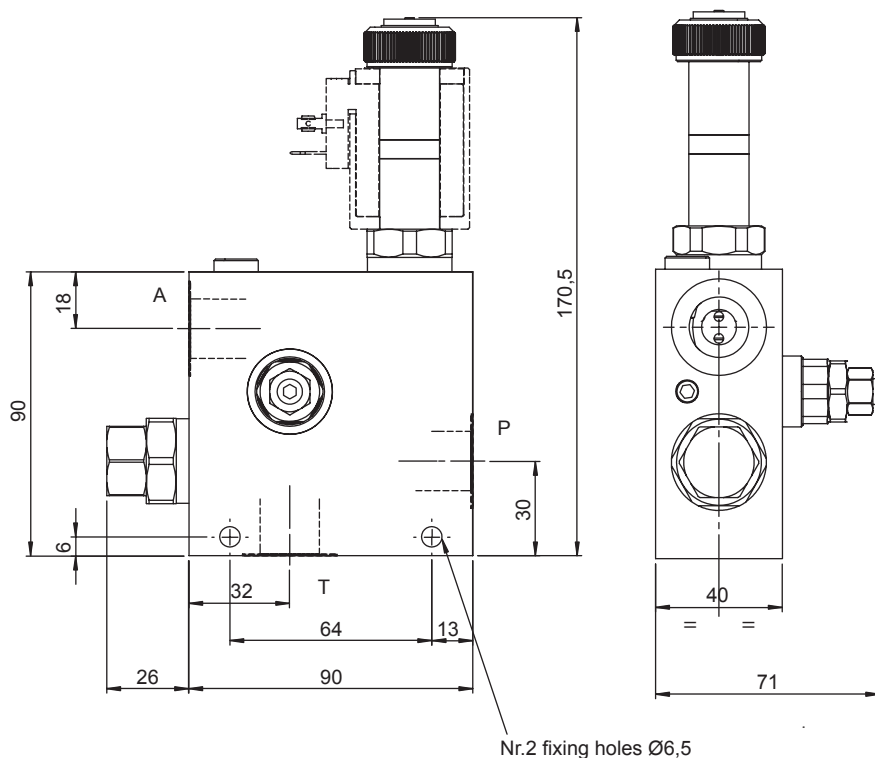
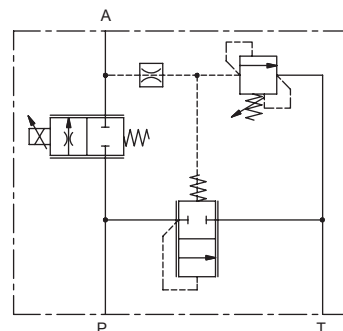
**Push pin**



**Handknob**

**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **50 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



255

**Ordering code**

**6 3 1 1 [ ] 1 [ ] 6 [ ] 0**

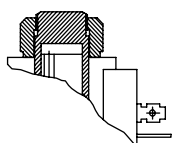
<b>PORTS</b>	<b>2</b>
A,P,T	G 3/8"

**0**

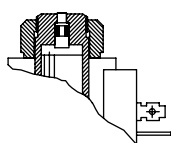
**1**

**7**

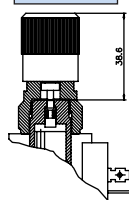
<b>RELIEF VALVE</b>	<b>0</b>
Setting range [bar]	40 - 220
Pressure increase [bar/turn]	84
Standard Setting 4 l/min [bar]	210



**No emergency**



**Push pin**

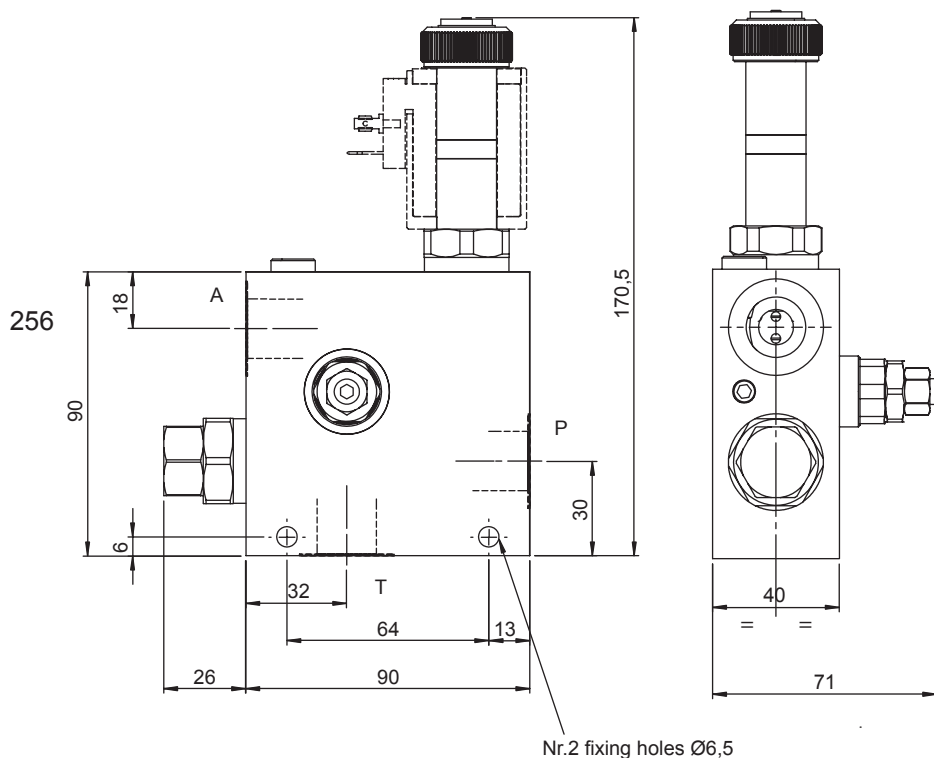
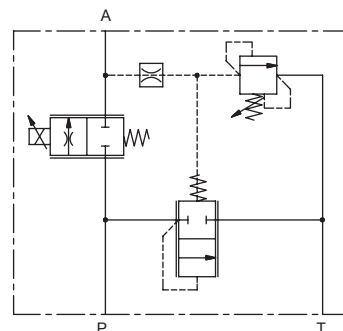


**Handknob**



**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **90 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



**Ordering code**

**6 3 1 1 [ ] 1 [ ] 6 [ ] 0**

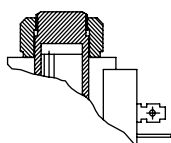
<b>PORTS</b>	<b>3</b>
A,P,T	G 1/2"

**0**

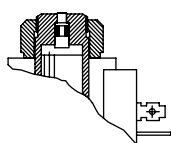
**1**

**7**

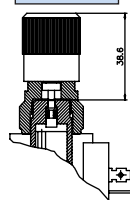
<b>RELIEF VALVE</b>	<b>0</b>
Setting range [bar]	40 - 220
Pressure increase [bar/turn]	84
Standard Setting 4 l/min [bar]	210



**No emergency**



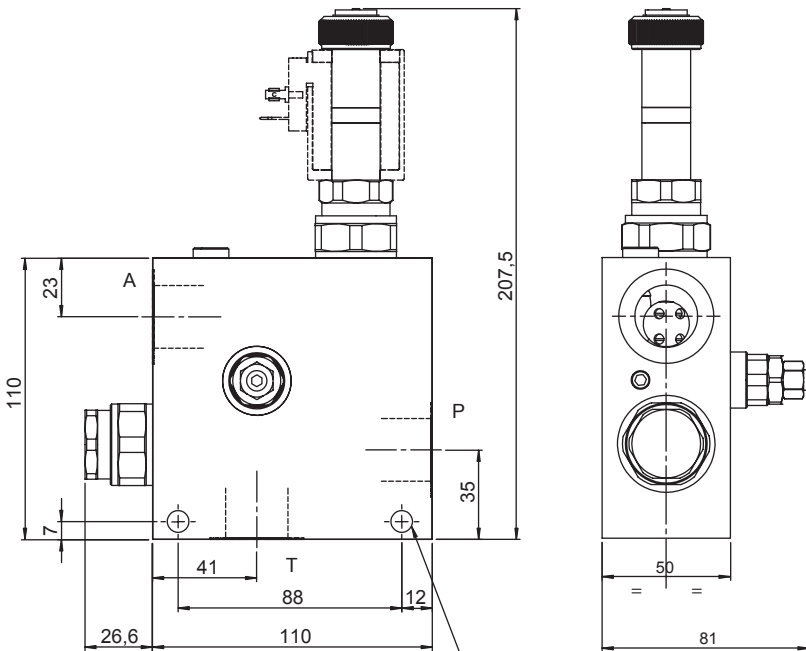
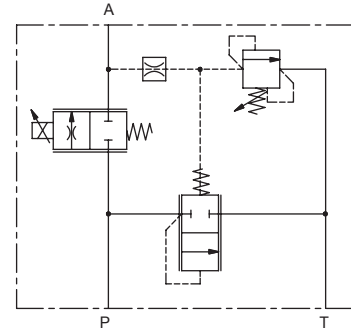
**Push pin**



**Handknob**

**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **90 l/min**
- Maximum flow ..... **150 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



Nr.2 fixing holes Ø8,5

257

**Ordering code**

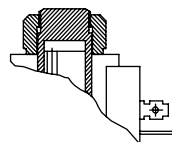
**6 3 1 1 [ ] 1 [ ] 6 [ ] 0**

<b>PORTS</b>	<b>4</b>
A,P,T	G 3/4"

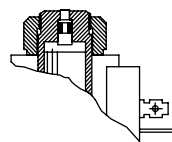
**0**

**1**

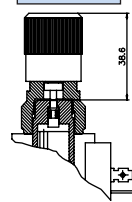
**7**



**No emergency**



**Push pin**



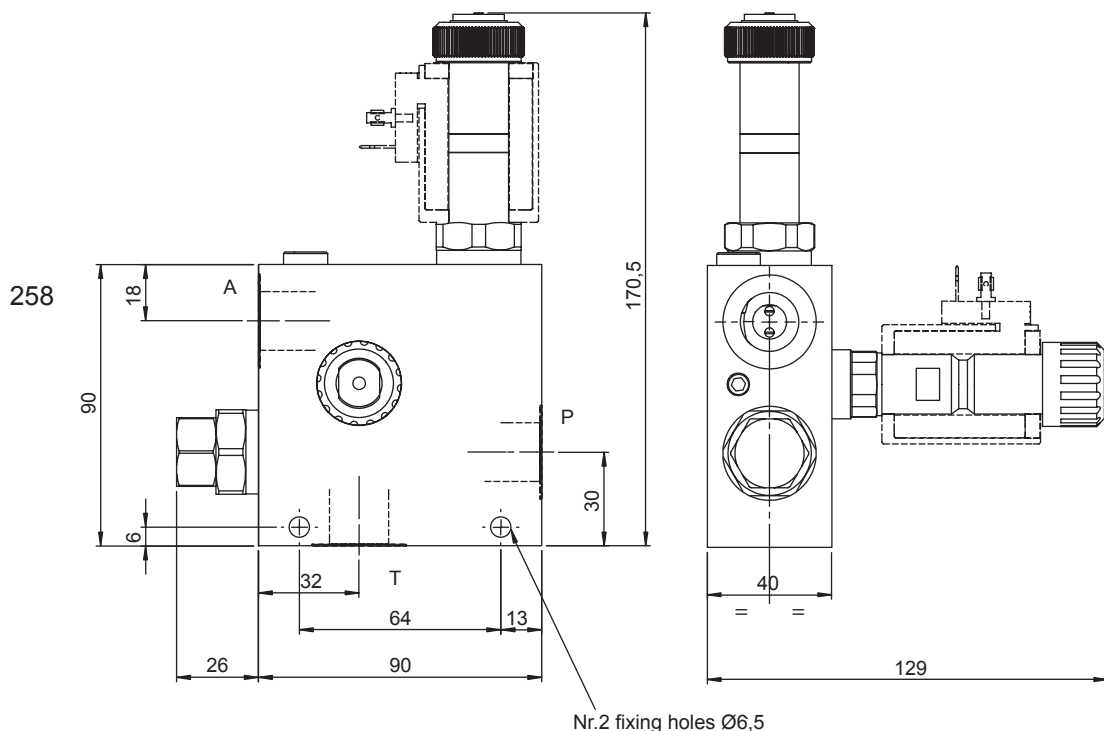
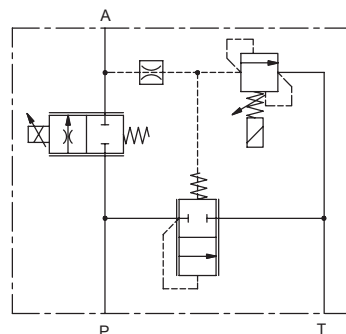
**Handknob**

<b>RELIEF VALVE</b>	<b>0</b>
Setting range [bar]	40 - 220
Pressure increase [bar/turn]	84
Standard Setting 4 l/min [bar]	210



**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **90 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



**Ordering code**

**6 3 1 1**  **1**  **7**  **0**

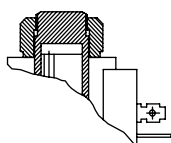
<b>PORTS</b>	<b>2</b>
A,P,T	G 3/8"

**0**

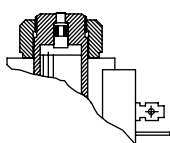
**1**

**7**

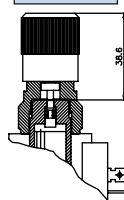
<b>RELIEF VALVE</b>	<b>0</b>
Setting range [bar]	8 - 250



No emergency



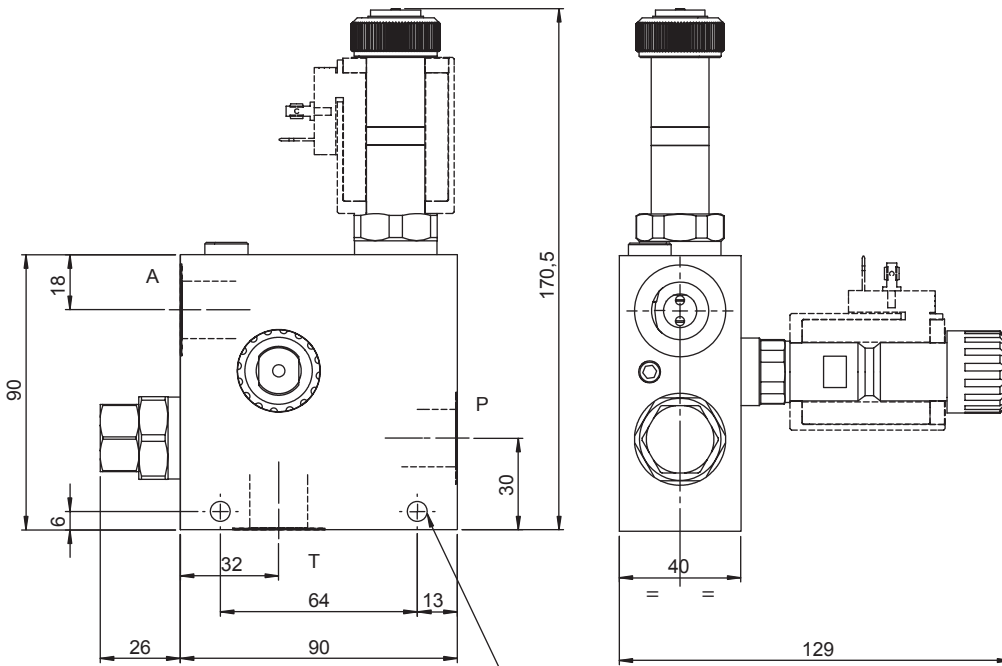
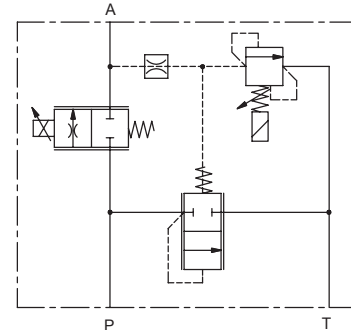
Push pin



Handknob

**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **90 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately



Nr.2 fixing holes Ø6,5

259

**Ordering code**

**6 3 1 1**    **1**    **7**    **0**

<b>PORTS</b>	<b>3</b>
A,P,T	G 1/2"

<b>0</b>
----------

<b>1</b>
----------

<b>7</b>
----------

<b>RELIEF VALVE</b>	<b>0</b>
Setting range [bar]	8 - 250

No emergency

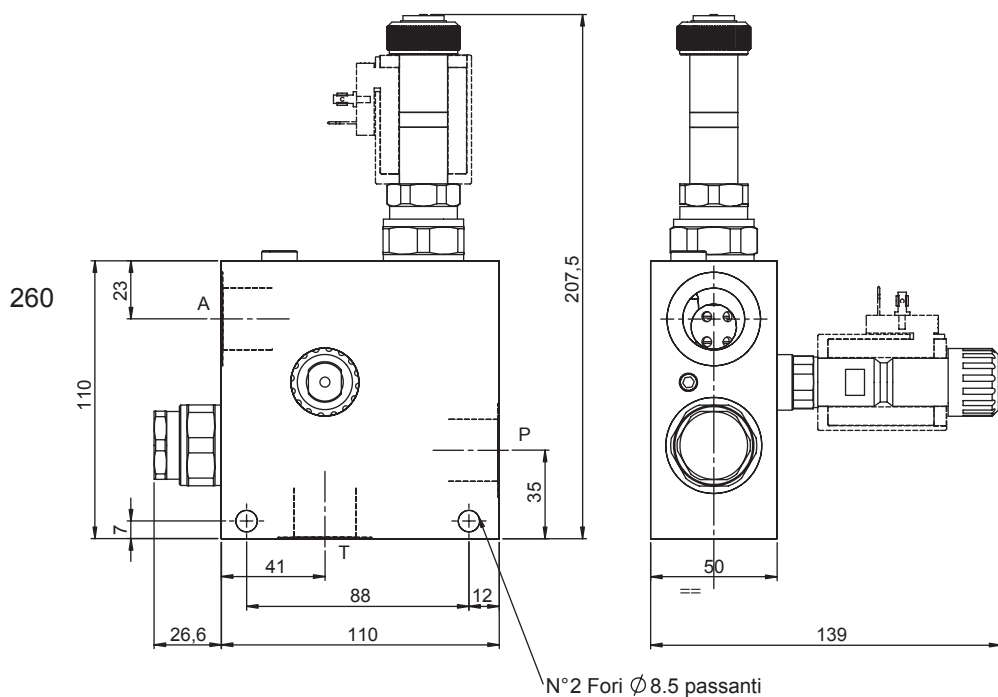
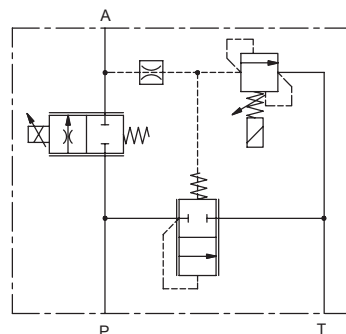
Push pin

Handknob



**3 WAYS FLOW CONTROL VALVE, FULLY COMPENSATED WITH ELECTRIC PROPORTIONAL CONTROL, RELIEF VALVE 2/2 NC**

- Max regulated flow ..... **50 l/min**
- Maximum flow ..... **150 l/min**
- Max pressure T ..... **10 bar**
- Max pressure P:A ..... **350 bar**
- Seals ..... **NBR**
- Max current at 12 Vcc ..... **1800mA**
- Max current at 24 Vcc ..... **900mA**
- PWM ..... **120 Hz**
- Hysteresis ..... **5%**
- Weight (with coil) ..... **1,800 Kg**
- Ring nut tightening torque for coil: ..... **5 Nm**
- Coil **CT-9800** to be ordered separately

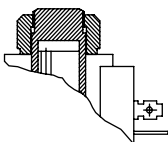


**Ordering code**

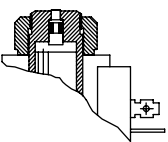
**6 3 1 1 [ ] 1 [ ] 7 [ ] 0**

<b>PORTS</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>RELIEF VALVE</b>	<b>0</b>
A,P,T	G 3/4"				Setting range [bar]	5 - 250

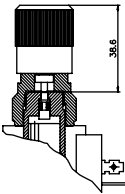
  



**No emergency**



**Push pin**

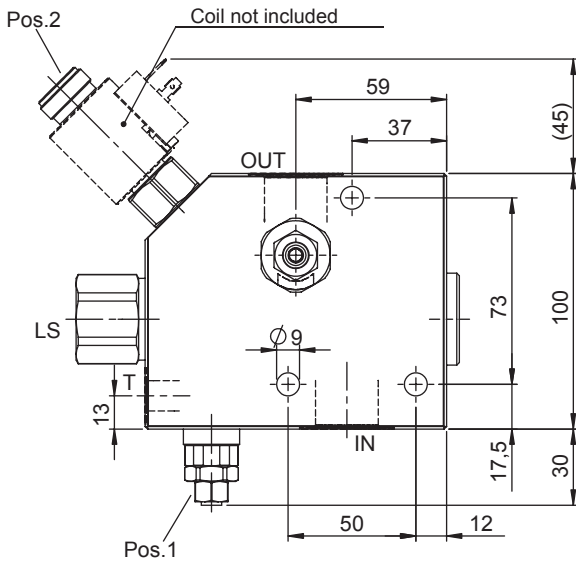
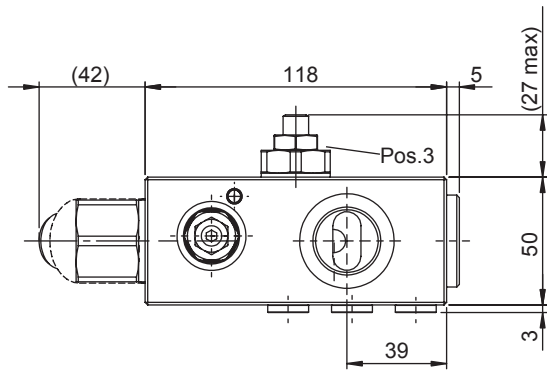


**Handknob**

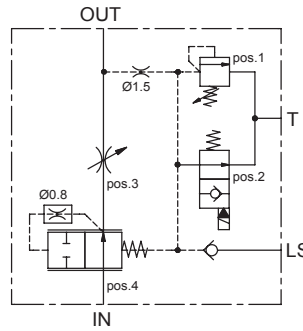


**2 WAYS FLOW REGULATOR G3/4", SAE12**

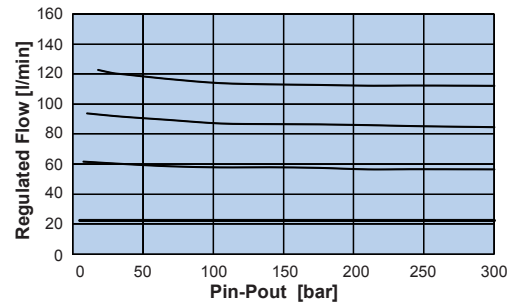
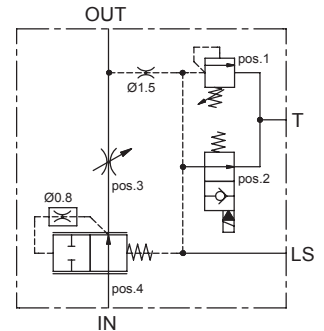
- Max pressure. .... **350 bar**
- Max regulated flow ..... **140 l/min**
- Standard regulated flow. .... **30 l/min**
- Weight ..... **4,6 Kg**
- Coil **CT-9400** to be ordered separately



**SPRING 2-3**



**SPRING 4-5**



**Note:**

- The flow (OUT) can be regulated at the required value, acting on adjustable screw (pos. 3); flow gets increased when the screw is clockwise turned.
- Max leakage in T: 3l/min.
- Max backpressure in T: 1,5 Bar.
- For optimal functionality of the compensator, when the electric valve (pos. 2) is open, it's important to make sure that regulated line OUT is pressurized at 7,5 Bar at least. If not, a unidirectional valve must be installed, to supply the required backpressure (see D-R-M/F-V).
- Check valve on port LS requires dumping of Load Sensing line, through a compensated draining, when electric valve is open (pos. 2).
- For applications which need Post-Compensated directional control valves, refer to schemes 2 and 3, in which there is an LS check valve.
- For applications which need Pre-Compensated directional control valves and direct connections to variable piston pumps, refer to schemes 4 and 5, in which there is no LS check valve.

261

**Ordering code**

**FR2S**          **00**

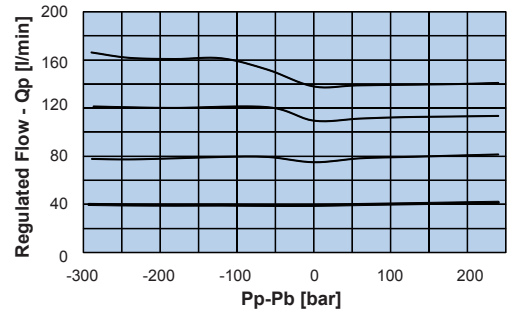
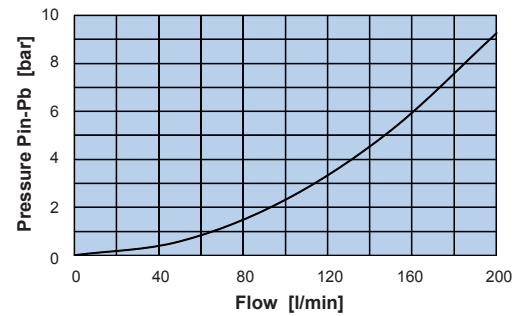
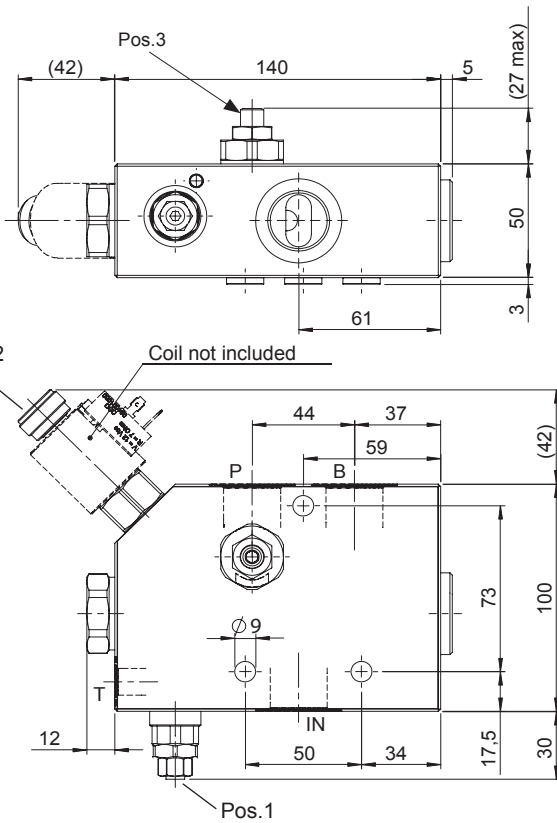
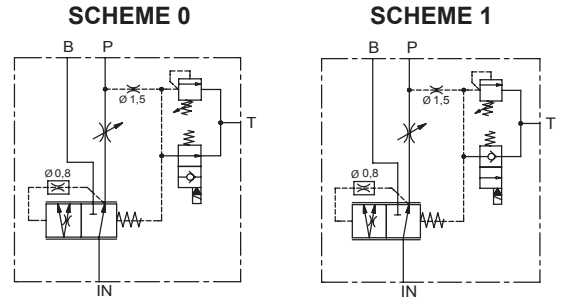
ELECTRIC-VALVE SCHEME		SPRING				PORTS	
		2	3	4	5	05	55
<b>0</b>	Normally open - NO	Setting range [bar]	40 - 220	50 - 350	40 - 220	G 3/4"	SAE12
		Pressure Increase [bar/giro]	84	127	84	T,LS	G 1/4" SAE6
		Standard Setting [bar]	210	350	210		
		Check Valve LS	present	present	not present		

RELIEF VALVE SETTING RANGE



**FLOW REGULATOR - G3/4", SAE12**

- Nominal Flow (IN)..... **200 l/min**
- Max pressure..... **350 bar**
- Max regulated flow (P)..... **140 l/min**
- Standard regulated flow..... **30 l/min**
- Regulated flow variation by turn (Pos.3)..... **15,5 l/min**
- Weight..... **5 Kg**
- Coil **CT-9400** to be ordered separately



**Note:**

- The flow (P) can be regulated at the required value, acting on adjustable screw (pos. 3); flow gets increased when the screw is clockwise turned.
- Max leakage in T: 3l/min.
- Max backpressure in T: 1,5 Bar
- For optimal functionality of the compensator, when the electric valve (pos. 2) is open, it's important to make sure that regulated line OUT is pressurized at 7,5 Bar at least. If not, a unidirectional valve must be installed, to supply the required back-pressure (see **D-R-M/F-V**)

**Ordering code**

**FR3S**          **0**

ELECTRIC-VALVE SCHEME	
<b>0</b>	Normally open - NO
<b>1</b>	Normally closed - NC

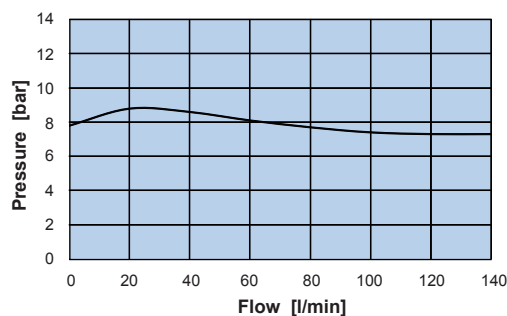
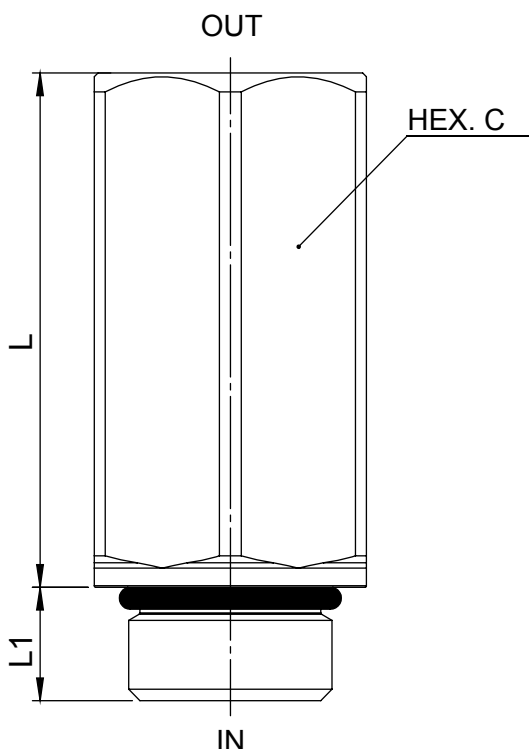
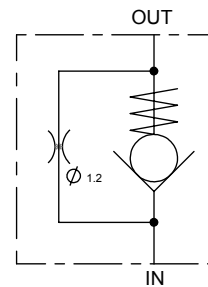
SPRING	2	3
Setting Range [bar]	40 - 220	50 - 350
Pressure Increase [bar/giro]	84	127
Standard Setting [bar]	210	350

PORTS	05	55
IN,P,B	G 3/4"	SAE12
T	G 1/4"	SAE6

RELIEF VALVE SETTING RANGE POS. 1

**IN-LINE UNI-DIRECTIONAL CHECK VALVE**

- Max pressure..... **350 bar**
- Max flow. . . . . **130 l/min**
- Seals..... **NBR**
- Cartridge tightening torque:..... **150 Nm**
- Weight..... **0,45 Kg**



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**Ordering code**

**D 1 0 5 0 0**  **3 S**  **0 0**

SPRING	
<b>08</b>	7.8 bar

PORTS			
	C	L1	L
<b>05</b>	<b>G3/4</b>	36	68
<b>55</b>	<b>SAE12</b>	36	68

