

BOOM LOWERING CONTROL DEVICES



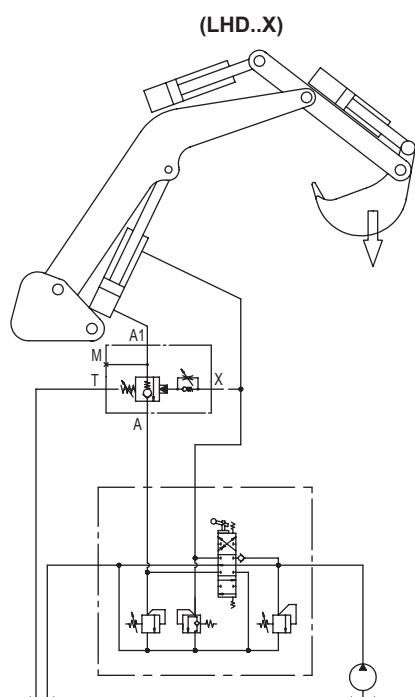
BOOM LOWERING CONTROL DEVICES

INTRODUCTION

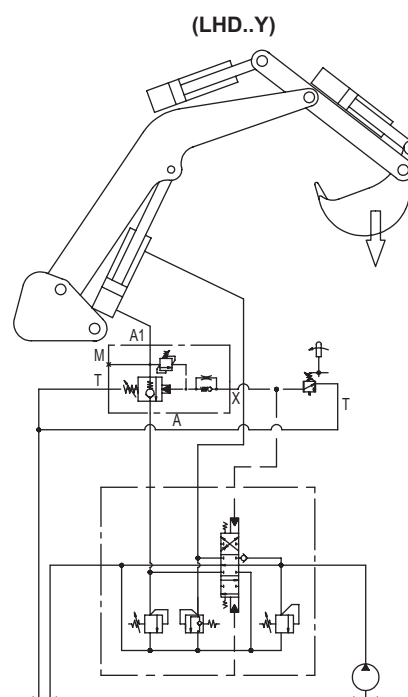
According to the European Standard for Earth moving machinery - Safety requirements (EN 474), when an excavator or a backhoe loader is used to handle loads with a mass bigger than 1000 Kg, or with a momentum force above 40.000 Nm, the carrying cylinders have to be equipped with control devices able to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



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



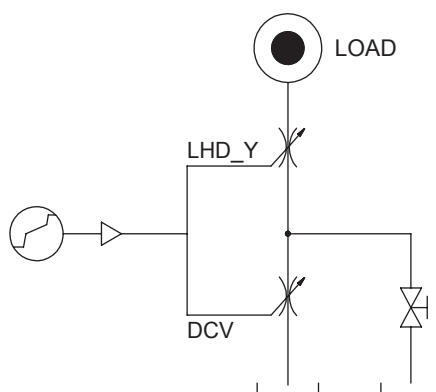
For this kind of application, the suitable valves must be able to withstand the requirements indicated by the international standard **ISO 8643** (Earth-Moving Machinery - Hydraulic Excavator and Backhoe Loader Boom-Lowering Control Device - Requirements and Tests), which states the testing procedures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

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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.

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

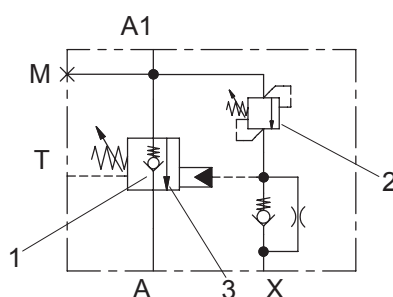


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characteristics will allow to satisfy the ISO 8643 safety requirements and enhance the performances in terms of stability, speed and pump pressurisation.

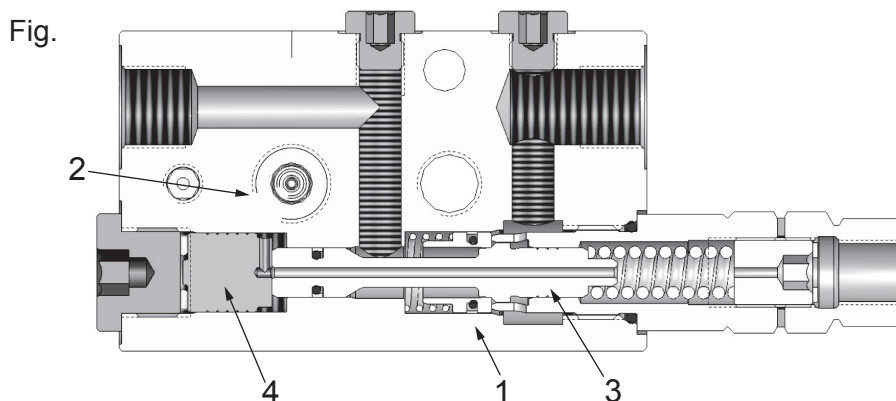
BOOM LOWERING CONTROL VALVES LHD_Y

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.

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

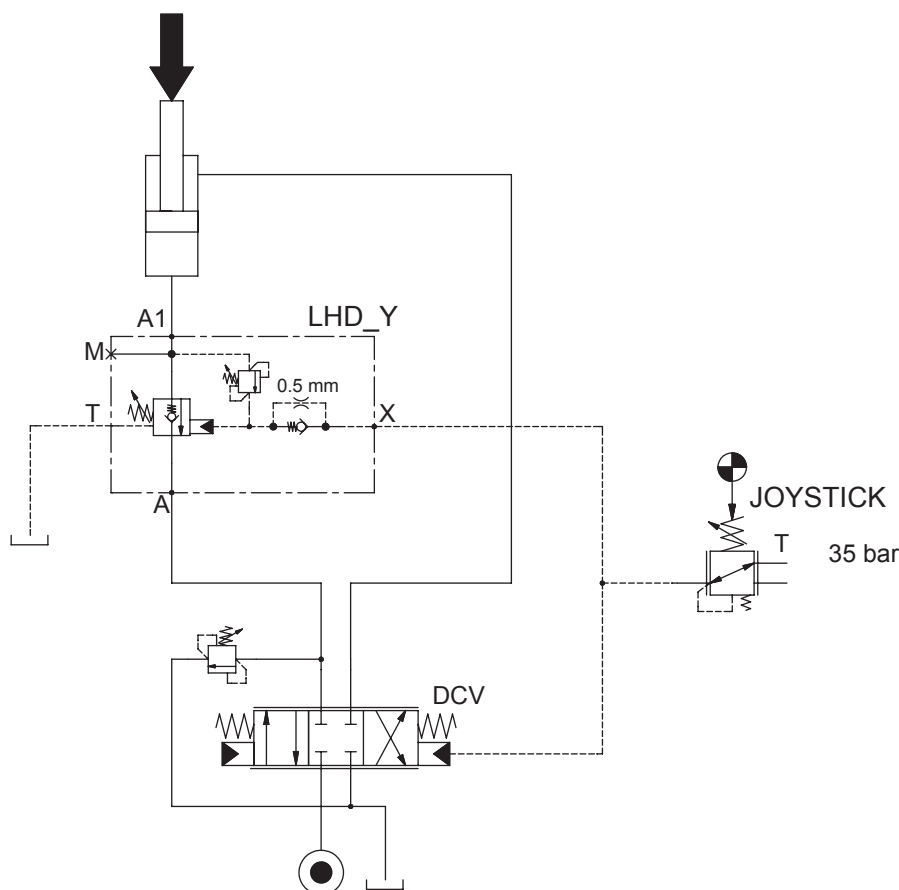


BOOM LOWERING CONTROL DEVICES

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.



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.

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.

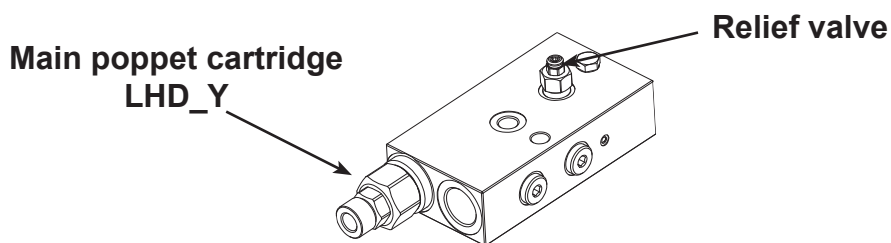
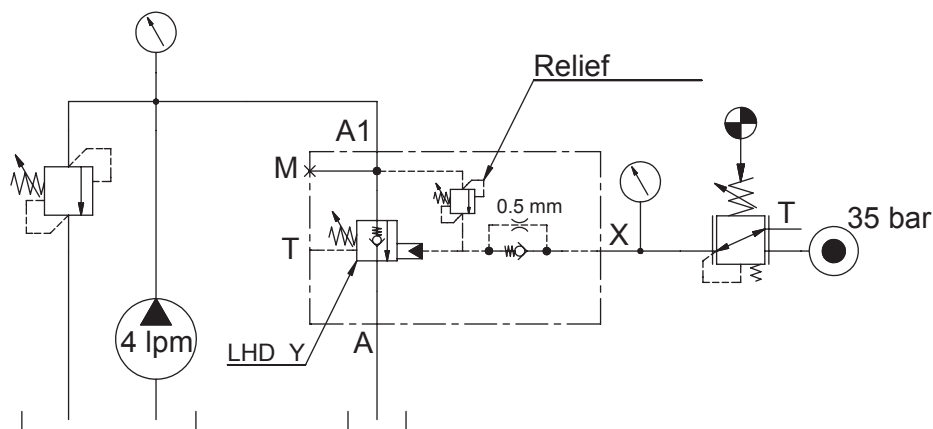
Main poppet setting corresponds to the pilot pressure (P_x) at the initial opening, i.e. pressure on port X, which determines the detachment of conical poppet from its seating.

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.

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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:

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

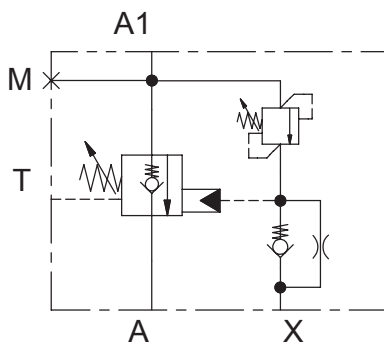
COMPENSATION

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.

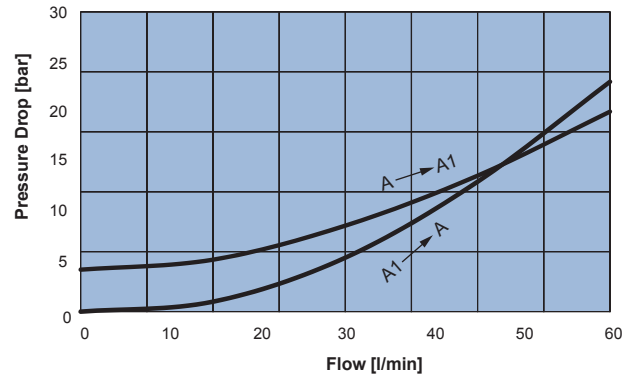
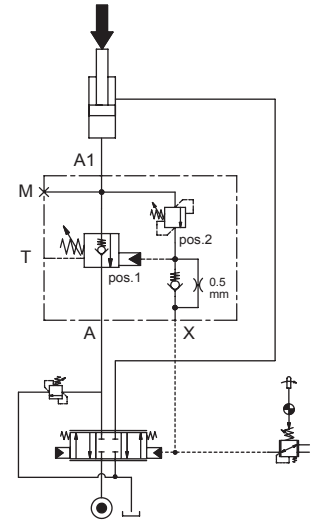
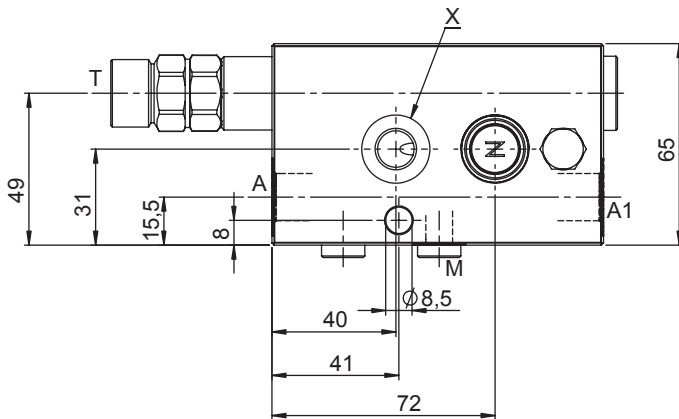
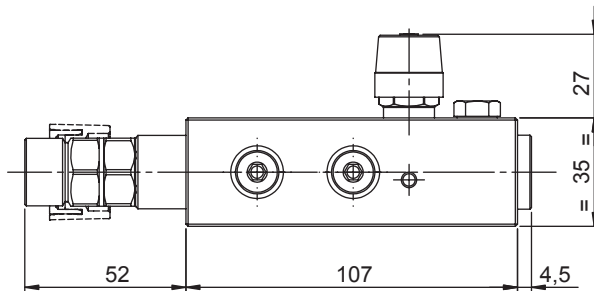
Compensation takes place thanks to an independent **LHD_Y** spring-housing chamber drained directly to tank through port (Y).

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



LOAD LOWERING CONTROL VALVE - LINE MOUNTED / RIGHT HAND

- Flow **40 l/min**
- Max working pressure **410 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**

PILOT RATIO	
11	1:0 - FINE METERING

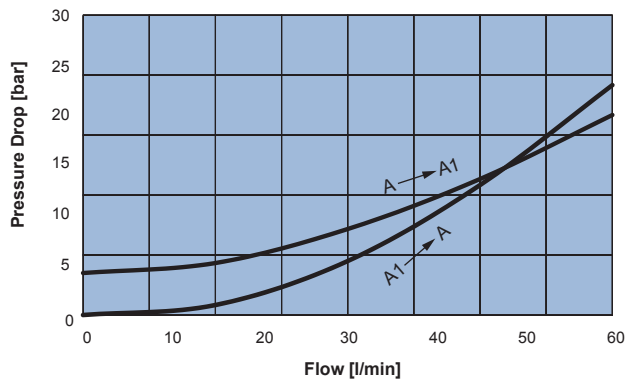
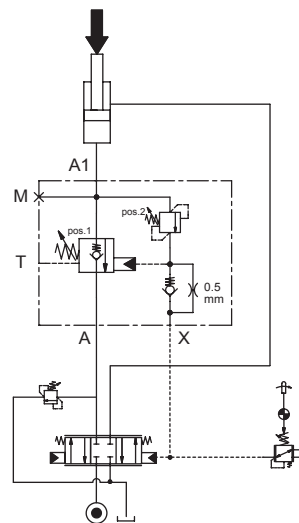
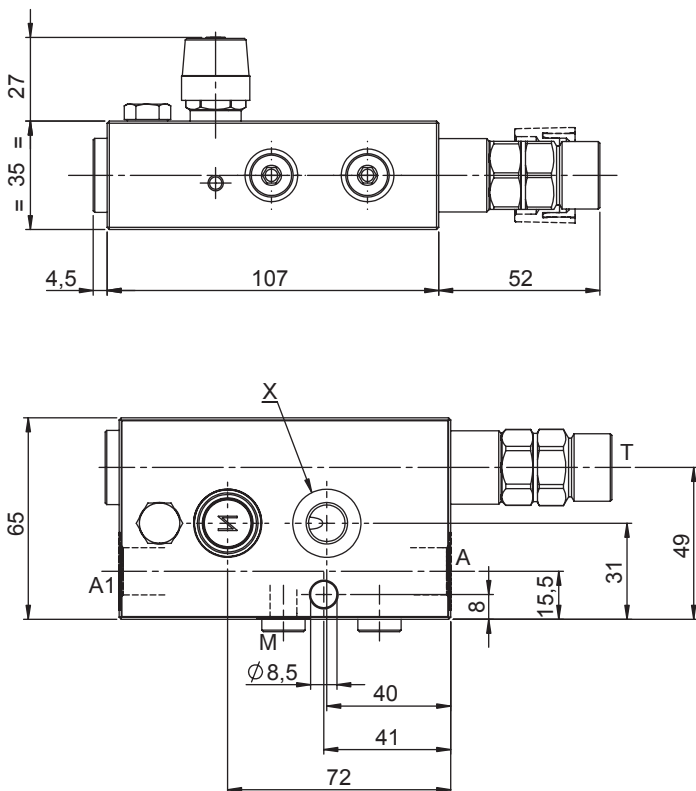
PORTS	03	53
A,A1	G 3/8"	SAE 08
X,T	G 1/4"	SAE 06

SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
2	5 - 14	4,7	7,5

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

LOAD LOWERING CONTROL VALVE - LINE MOUNTED / LEFT HAND

- Flow **40 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **1,9 Kg**
- Tamper proof cap **cod.9021030191**



Ordering code

Y 5 0 0 2 Y **0 0**

PILOT RATIO	
11	1:0 FINE METERING

PORTS	03	53
A,A1	G 3/8"	SAE 08
X,T	G 1/4"	SAE 06

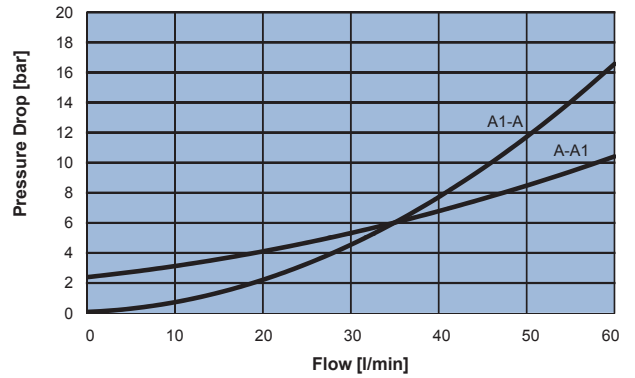
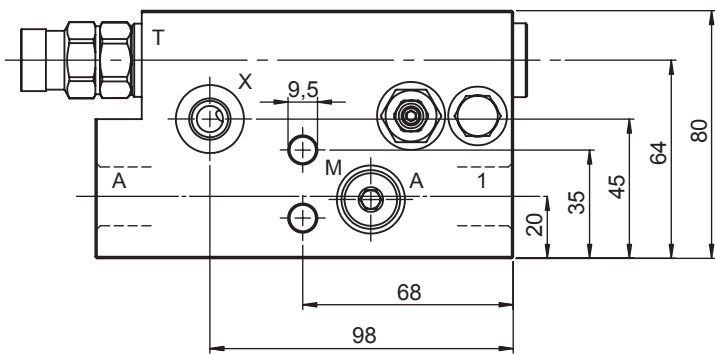
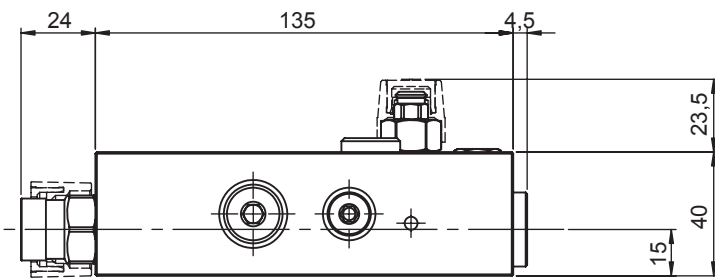
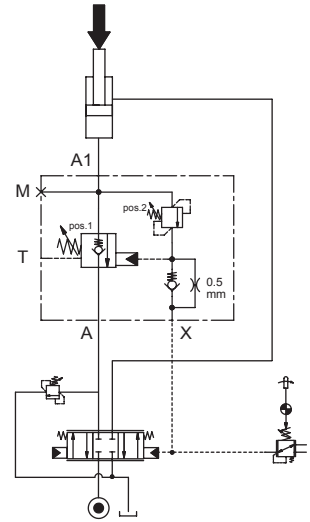
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
2	5 - 14	4,7	7,5

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



LOAD LOWERING CONTROL VALVE - LINE MOUNTED / RIGHT HAND

- Flow **60 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **2,6 Kg**
- Tamper proof cap **cod.9021030191**
cod.9021015101



Ordering code

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

PILOT RATIO	
14	1:0 - FINE METERING

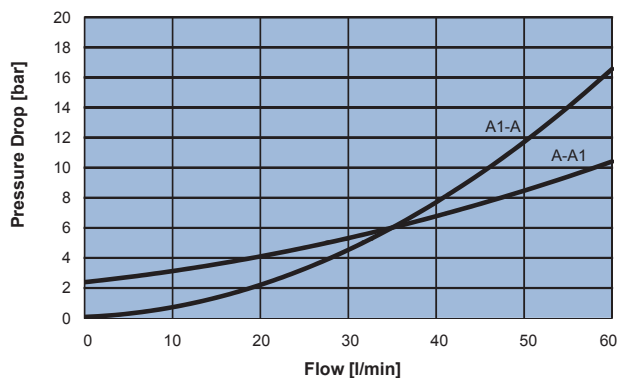
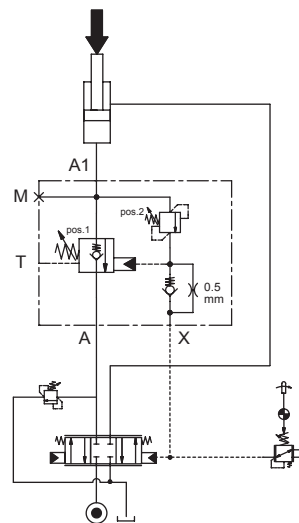
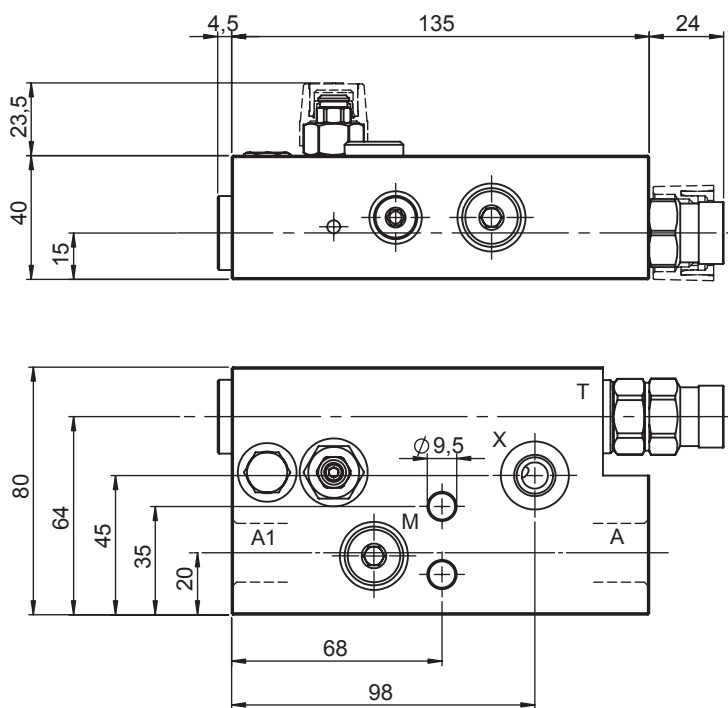
PORTS	04	54
A,A1	G 1/2"	SAE 10
X,T	G 1/4"	SAE 06

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

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

LOAD LOWERING CONTROL VALVE - LINE MOUNTED / LEFT HAND

- Flow. **60 l/min**
- Max working pressure **410 bar**
- Compensation. **Fully Compensated with drain line**
- Weight. **2,6 Kg**
- Tamper proof cap **cod.9021030191**
cod.9021015101



Ordering code

Y 5 0 0 2 Y **0 1**

PILOT RATIO	
14	1:0 FINE METERING

PORTS	04	54
A,A1	G 1/2"	SAE 10
X,T	G 1/4"	SAE 06

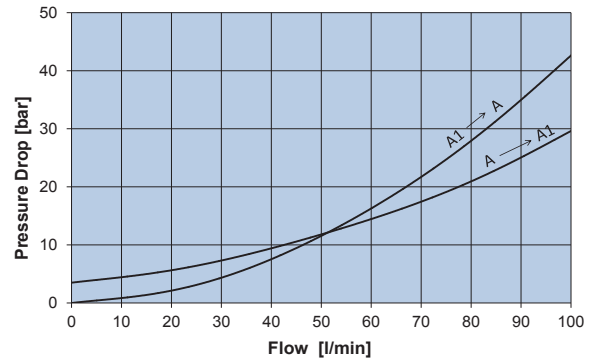
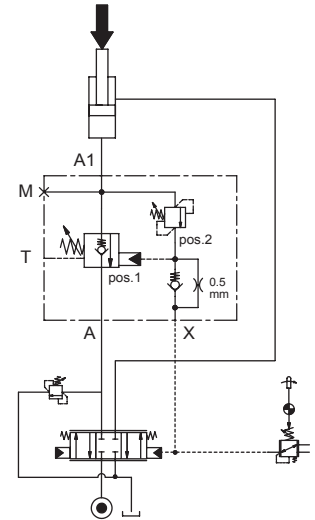
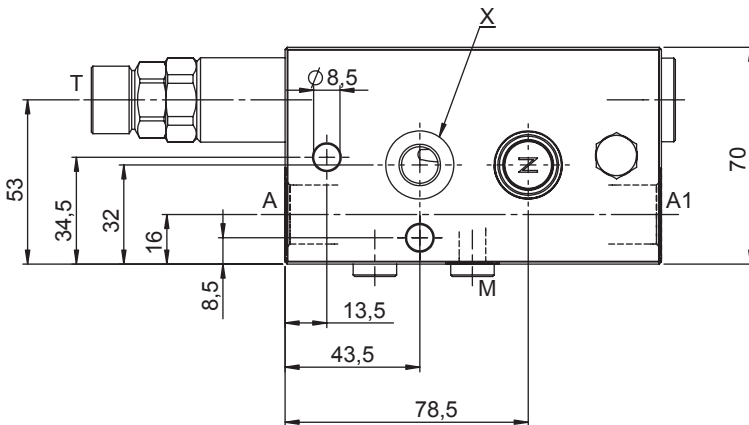
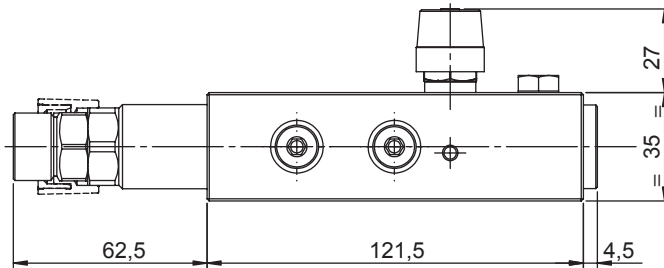
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
2	5 - 14	2,5	7,5

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



LOAD LOWERING CONTROL VALVE - LINE MOUNTED / RIGHT HAND

- Flow **75 l/min**
- Max working pressure **410 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**

PILOT RATIO	
11	1:0 - FINE METERING

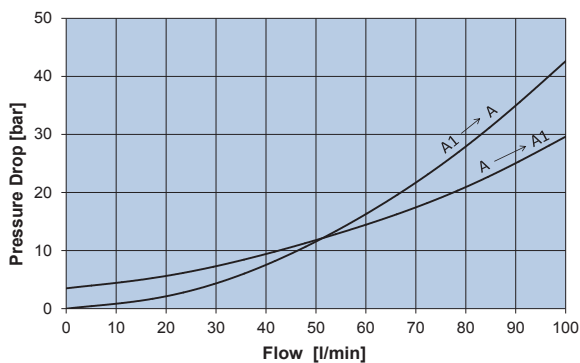
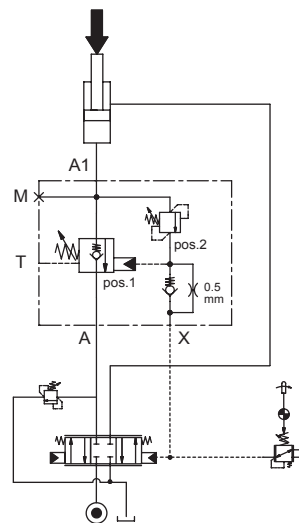
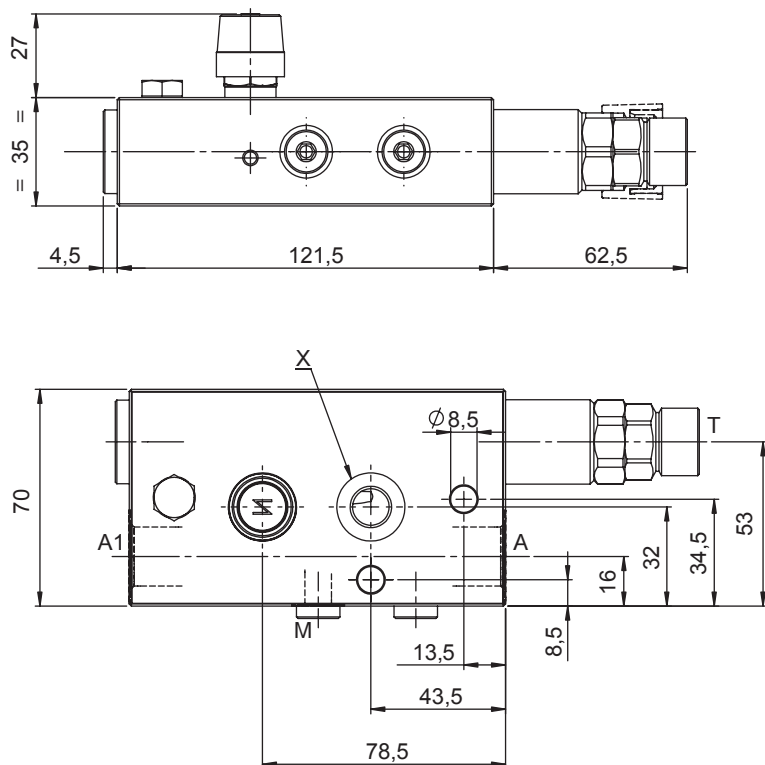
PORTS	04	54
A,A1	G 1/2"	SAE 10
X,T	G 1/4"	SAE 06

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

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

LOAD LOWERING CONTROL VALVE - LINE MOUNTED / LEFT HAND

- Flow **75 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **2,3 Kg**
- Tamper proof cap **cod.9021030191**



Ordering code

Y 1 0 0 2 Y **0 0**

PILOT RATIO	
11	1:0 FINE METERING

PORTS	04	54
A,A1	G 1/2"	SAE 10
X,T	G 1/4"	SAE 06

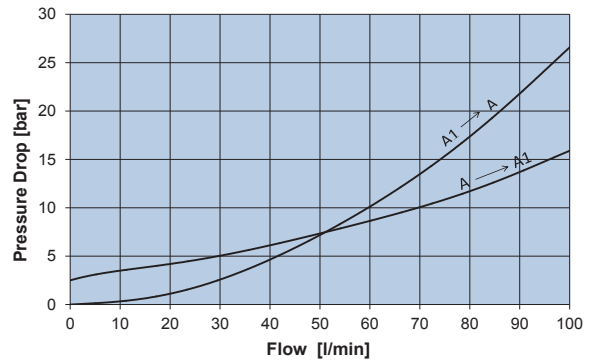
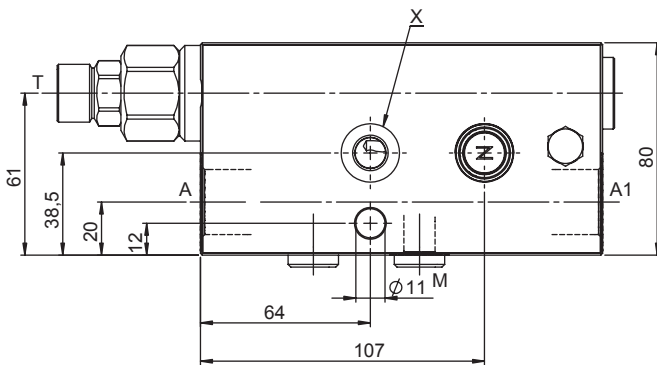
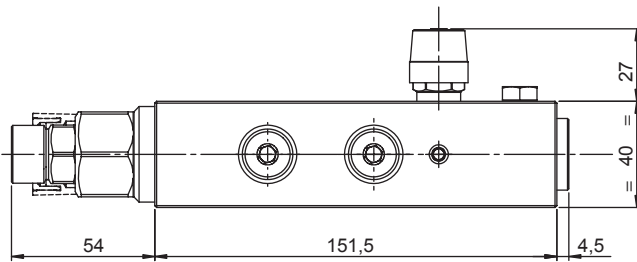
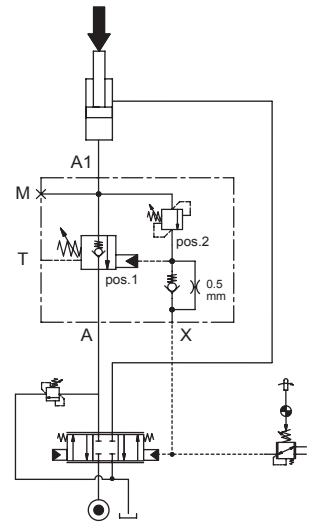
SPRING pos.1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
2	5 - 14	2,5	7,5

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



LOAD LOWERING CONTROL VALVE - LINE MOUNTED / RIGHT HAND

- Flow **100 l/min**
- Max working pressure..... **410 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**

PILOT RATIO	
11	1:0 FINE METERING

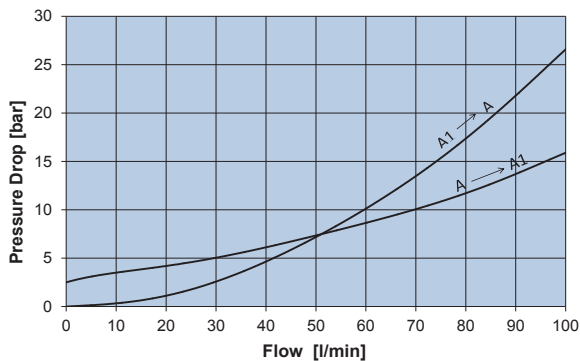
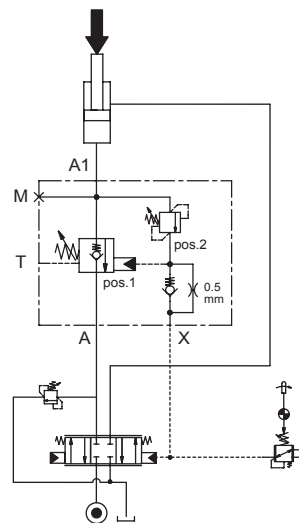
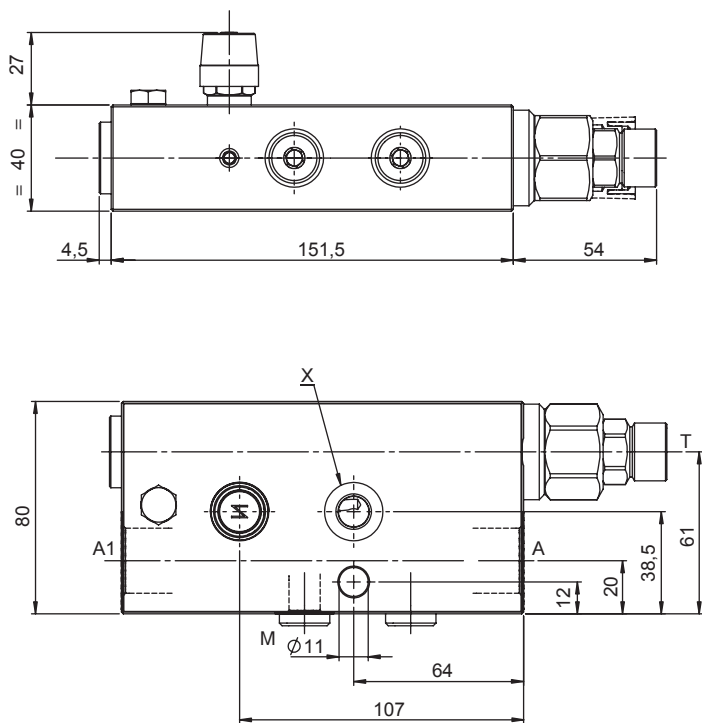
PORTS	05	55
A,A1	G 3/4"	SAE 12
X,T	G 1/4"	SAE 06

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

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

LOAD LOWERING CONTROL VALVE - LINE MOUNTED / LEFT HAND

- Flow **100 l/min**
- Max working pressure..... **410 bar**
- Compensation..... **Fully Compensated with drain line**
- Weight..... **3,6 Kg**
- Tamper proof cap..... **cod.9021030191**



Ordering code

Y 1 5 0 2 Y **0 0**

PILOT RATIO	
11	1:0 - FINE METERING

PORTS	05	55
A,A1	G 3/4"	SAE 12
X,T,M	G 1/4"	SAE 06

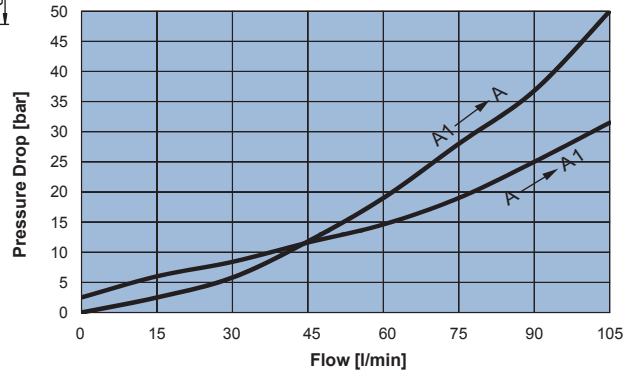
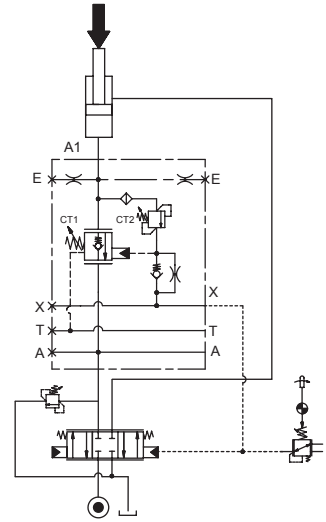
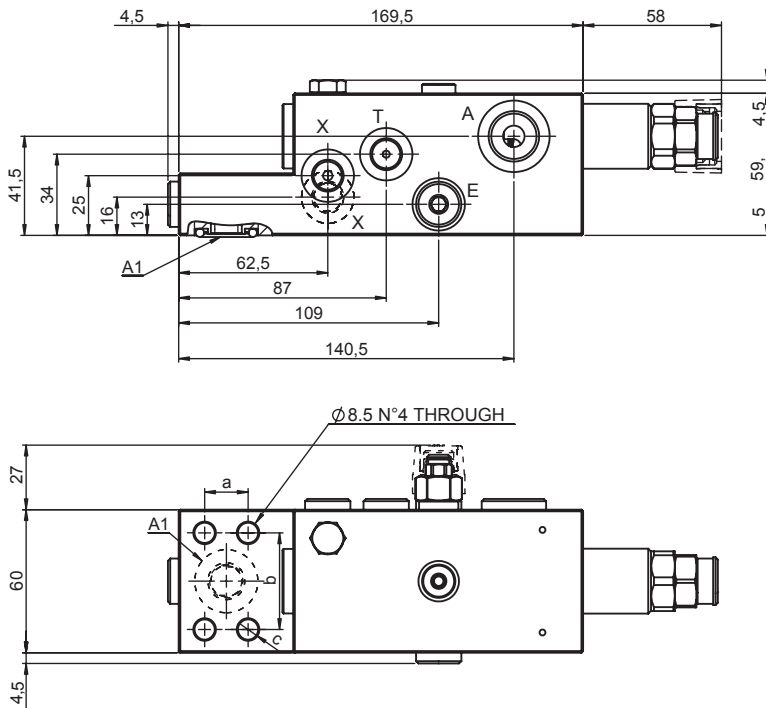
SPRING pos.1		
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]
2	5 - 14	2,5
		Standard Setting @20 cc/min [bar]
		7,5

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



LOAD LOWERING CONTROL VALVE - SAE FLANGED 1/2"-SAE6000

- Max flow. **75 l/min**
- Max working pressure. **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight. **3.9 Kg**
- Tamper proof cap CT1. **cod.9021030191**
- Tamper proof cap CT2. **cod.9021015101**



Flange	a	b	c	O-Ring
1/2"- SAE 6000	18.2	40.5	8.5	18.64x3.53 NBR 70°SH

Ordering code

Y 1 0 1 3 Y **0 0**

PILOT RATIO	
11	1:0 FINE METERING

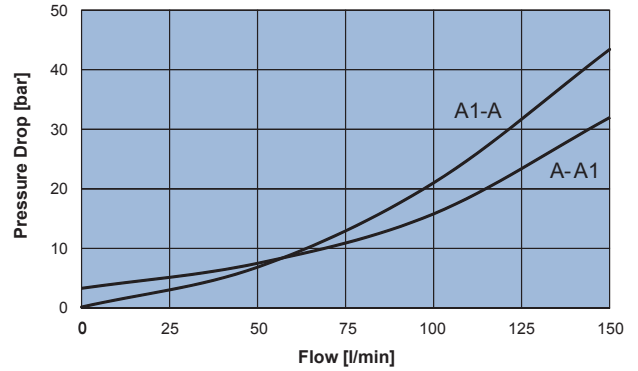
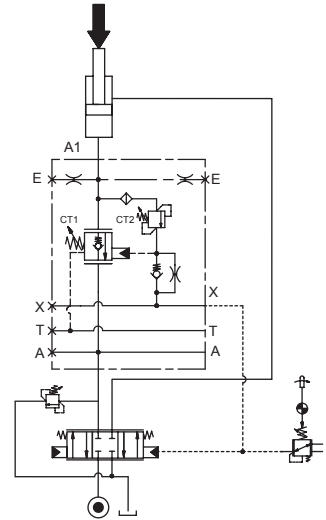
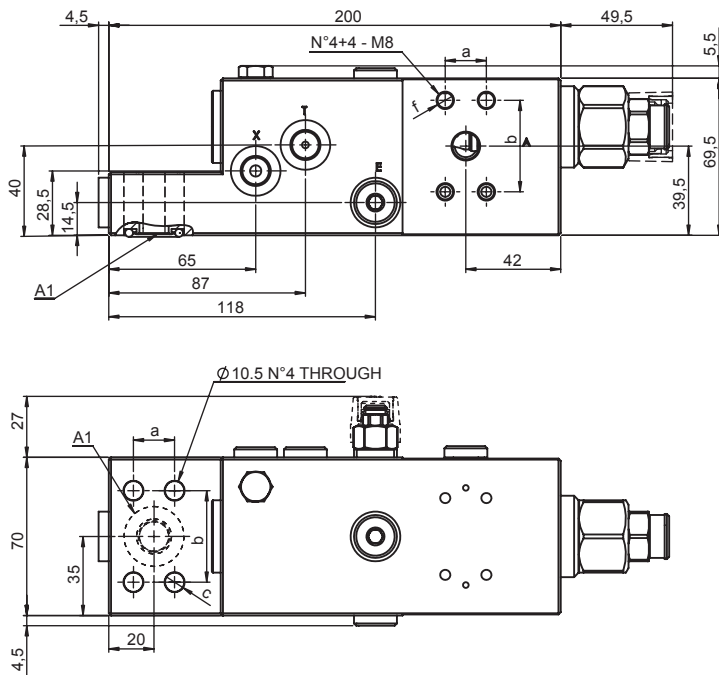
PORTS	
64	
A1	1/2" - SAE 6000
A	G 1/2"
T-E-X	G 1/4"

SPRING CT1			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
2	5 - 14	2,5	7,5
4	7 - 19	4,5	7,5

SPRING CT2			
	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
4	250 - 410	250	350

LOAD LOWERING CONTROL VALVE - SAE FLANGED 1/2"-SAE6000

- Max flow **150 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **6.2 Kg**
- Tamper proof cap CT1 **cod.9021030191**
- Tamper proof cap CT2 **cod.9021015101**



Flange	a	b	c	f	O-Ring
1/2"- SAE 6000	18.2	40.5	8.5	M 8	18.64x3.53 NBR 70°SH

Ordering code

Y 1 5 1 3 Y **0 0**

PILOT RATIO	
11	1:0 - FINE METERING

PORTS	64
A,A1	1/2" - SAE 6000
T-E-X	G 1/4"

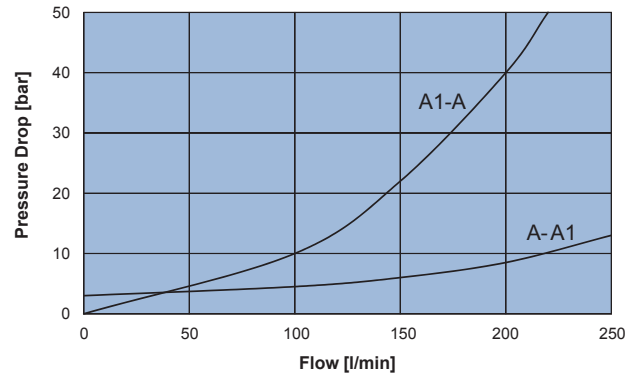
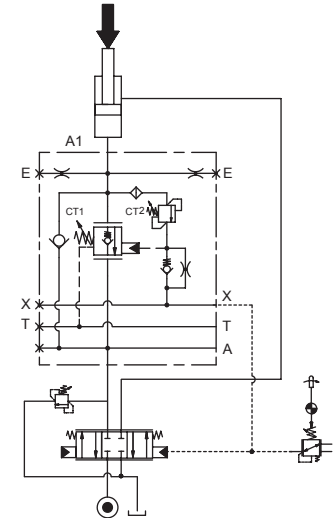
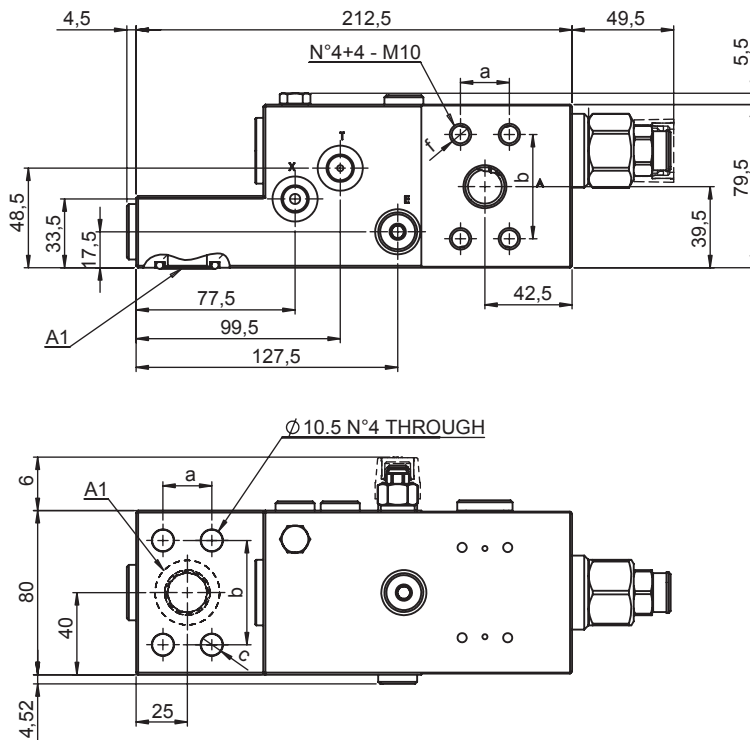
SPRING CT1		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
4 5 - 16	4.5	7.5

SPRING CT2		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
4 200 - 410	250	350



LOAD LOWERING CONTROL VALVE - SAE FLANGED 3/4"-SAE6000

- Max flow. **250 l/min**
- Max working pressure **410 bar**
- Compensation. **Fully Compensated with drain line**
- Weight **8 Kg**
- Tamper proof cap CT1. **cod.9021030191**
- Tamper proof cap CT2 **cod.9021015101**



Flange	a	b	c	f	O-Ring
3/4"- SAE 6000	23.8	50.8	10.5	M 10	23.39x3.53 NBR 70°SH

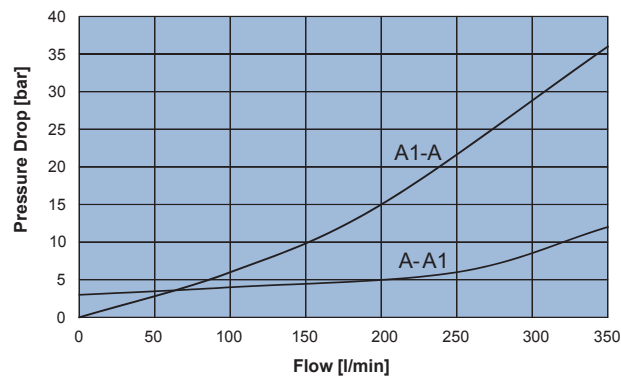
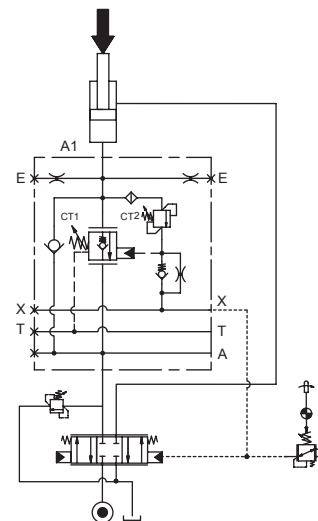
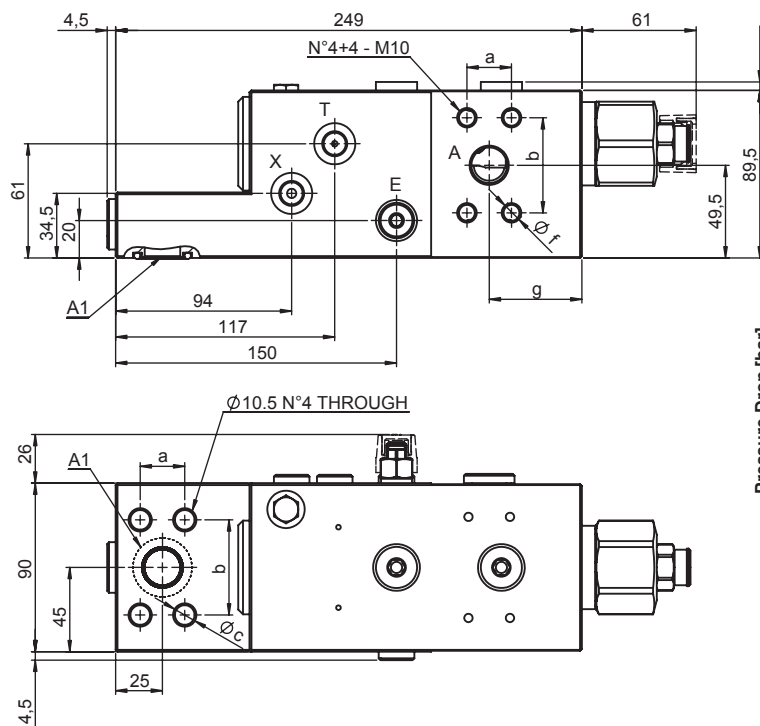
Ordering code

Y 1 5 1 3 Y **0 0**

<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">PILOT RATIO</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">11</td> <td>1:0 FINE METERING</td> </tr> </tbody> </table>	PILOT RATIO		11	1:0 FINE METERING	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">PORTS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">65</td> <td></td> </tr> <tr> <td>A, A1</td> <td>3/4" - SAE 6000</td> </tr> <tr> <td>T-E-X</td> <td>G 1/4"</td> </tr> </tbody> </table>	PORTS		65		A, A1	3/4" - SAE 6000	T-E-X	G 1/4"																		
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SPRING CT1																															
4	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]																													
	5 - 16	4,5																													
		Standard Setting @20 cc/min [bar]																													
		7,5																													
SPRING CT2																															
4	Setting Range min.-max. [bar]	Pressure Increase [bar/turn]																													
	200 - 410	250																													
		Standard Setting @4 l/min [bar]																													
		350																													

LOAD LOWERING CONTROL VALVE - SAE FLANGED 3/4"-SAE6000

- Max flow Y2513Y11446500 **350 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **12 Kg**
- Tamper proof cap CT1 **cod.9021030191**
- Tamper proof cap CT2 **cod.9021015101**



Flange	a	b	c	f	O-Ring
3/4"- SAE 6000	23.8	50.8	10.5	M 10	24.99x3.53 NBR 70°SH

Ordering code

Y 2 5 1 3 Y **0 0**

PILOT RATIO	
11	1:0 - FINE METERING

PORTS	65
A,A1	3/4" - SAE 6000
T,E,X	G 1/4"

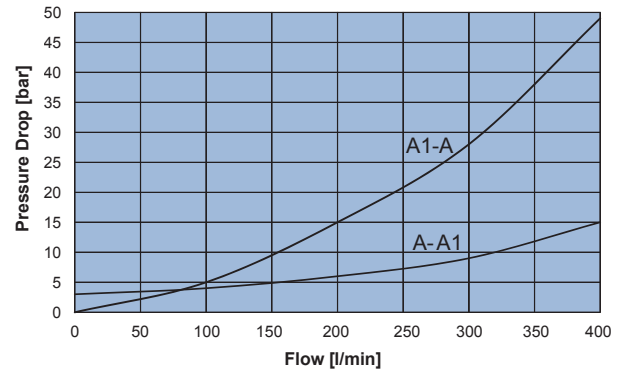
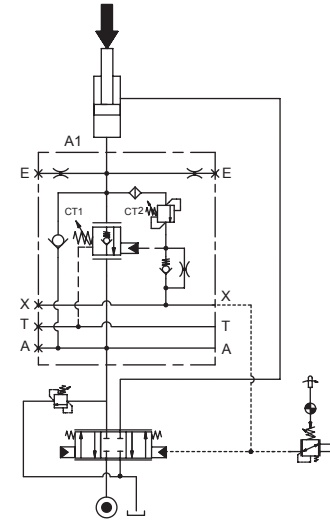
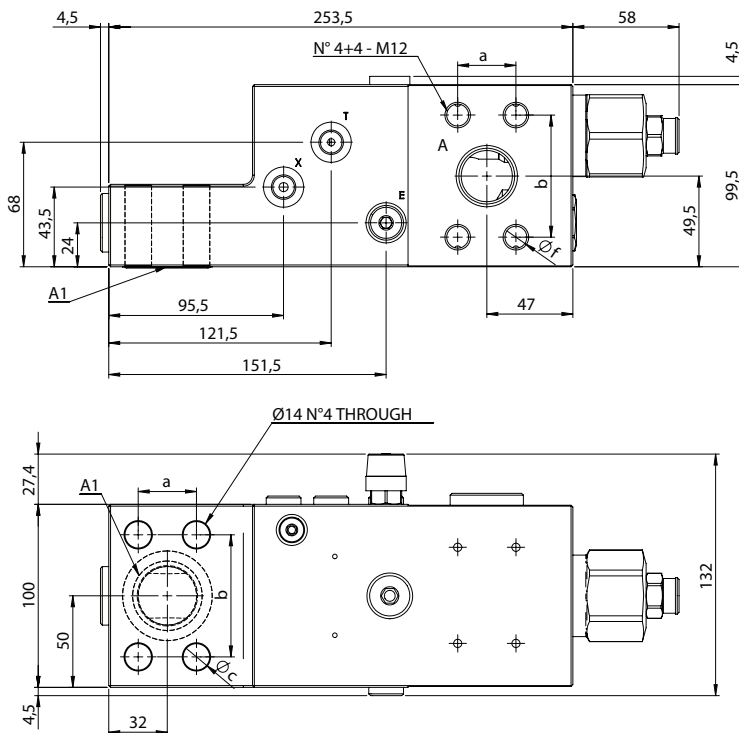
SPRING CT1		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
4 5 - 14	2.3	7.5

SPRING CT2		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
4 200 - 410	250	350



LOAD LOWERING CONTROL VALVE - SAE FLANGED 1"-1/4 - SAE6000

- Max flow Y2513Y11446700 **400 l/min**
- Max working pressure **410 bar**
- Compensation **Fully Compensated with drain line**
- Weight **15 Kg**
- Tamper proof cap CT1 **cod.9021030191**
- Tamper proof cap CT2 **cod.9021015101**



Flange	a	b	c	f	O-Ring
1"-1/4 SAE 6000	31.8	66.7	14.5	M 14	40.87x3.53 NBR 70°SH

Ordering code

Y 2 5 1 3 Y **0 0**

PILOT RATIO	
11	1:0 - FINE METERING

PORTS	67
A,A1	1"-1/4 - SAE 6000
T,E,X	G 1/4"

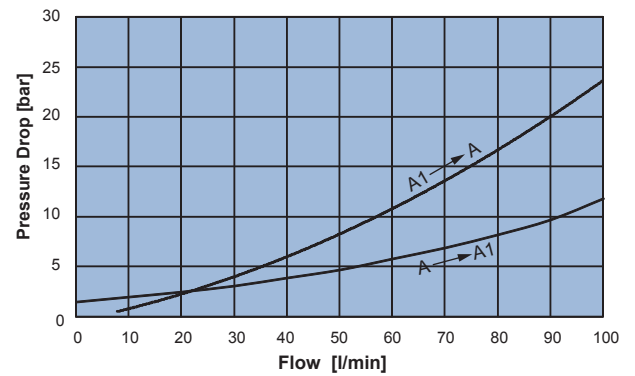
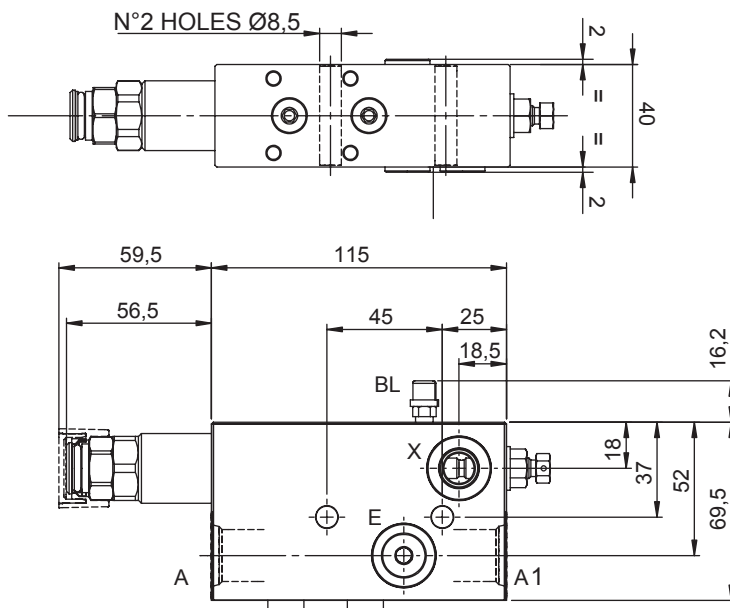
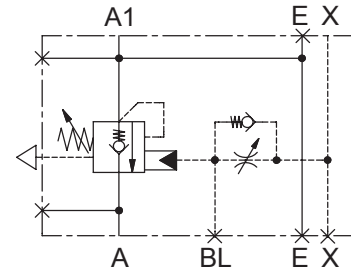
SPRING CT1		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @20 cc/min [bar]
4 5 - 14	2.3	7.5

SPRING CT2		
Setting Range min.-max. [bar]	Pressure Increase [bar/turn]	Standard Setting @4 l/min [bar]
4 200 - 420	250	350



SINGLE ACTING COUNTERBALANCE VALVE - BACK-PRESSURE COMPENSATED

- Flow **110 l/min**
- Max working 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 load.
 - Valve pre-arranged for electric bypass assembly

Ordering code

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

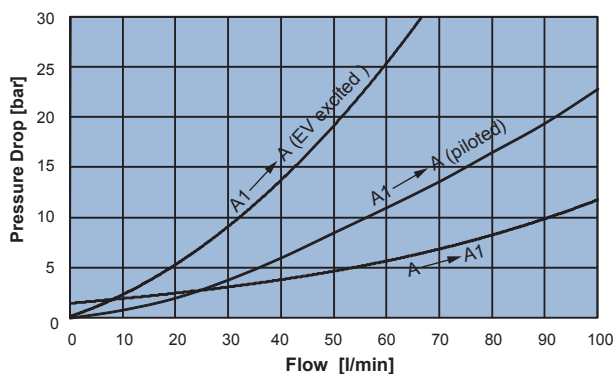
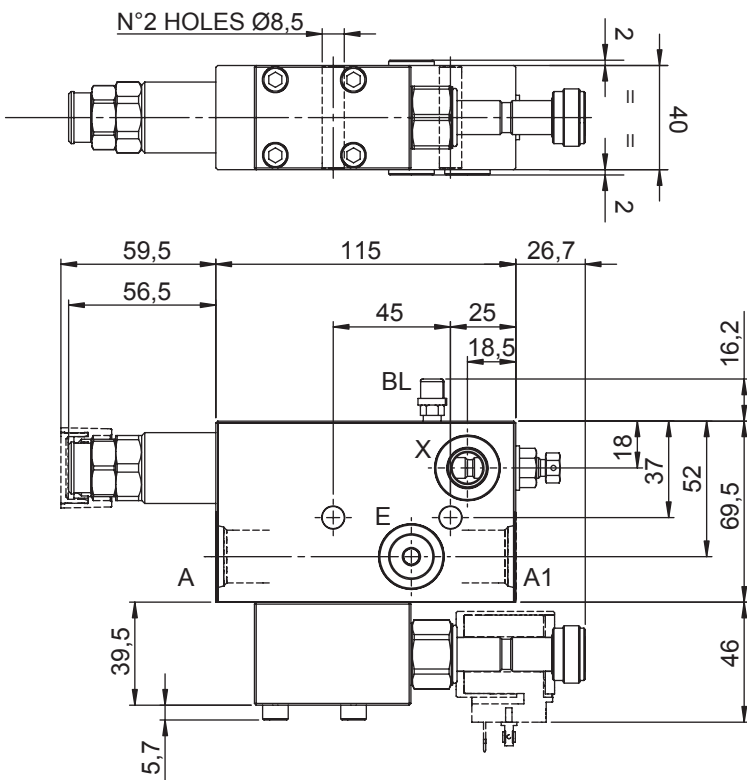
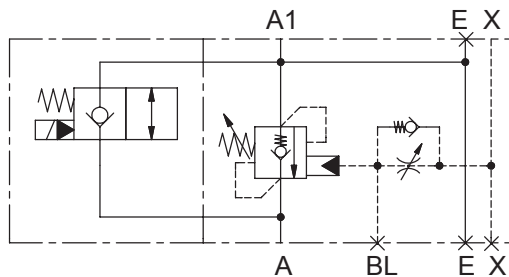
PILOT RATIO	
51	4:1

SPRINGS	4
Setting Range min.-max. [bar]	120 - 410
Pressure Increase [bar/turn]	85
Standard Setting 4 l/min [bar]	290

PORTS	04	54
A,A1	G 1/2"	SAE 10
X,E	G 1/4"	SAE 06

SINGLE ACTING COUNTERBALANCE VALVE WITH ELECTRIC BYPASS

- Flow **110 l/min**
- Max working pressure..... **350 bar**
- Compensation..... **Not Compensated**
- Weight..... **3,6 Kg**
- Tamper proof cap..... **cod.9021030190**
- Coil **09400** to be ordered separately (page 189)



Note:
 - Pressure setting must be 30% higher than pressure induced by 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	
50	4:1 + BPE

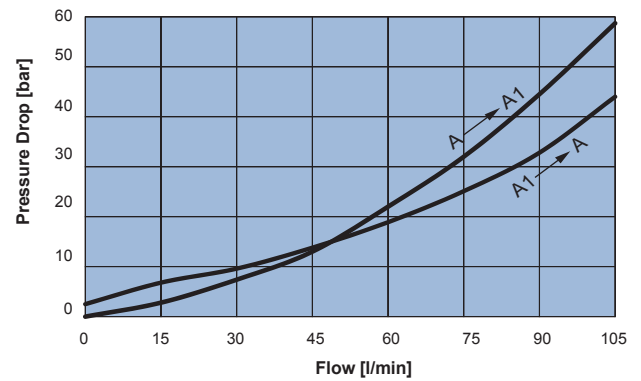
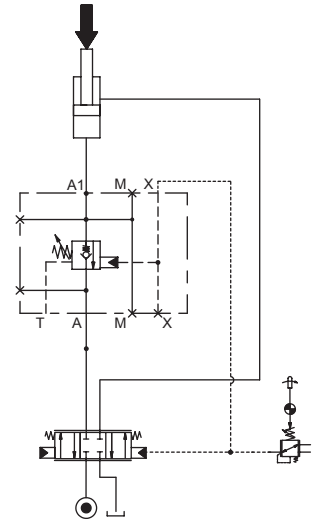
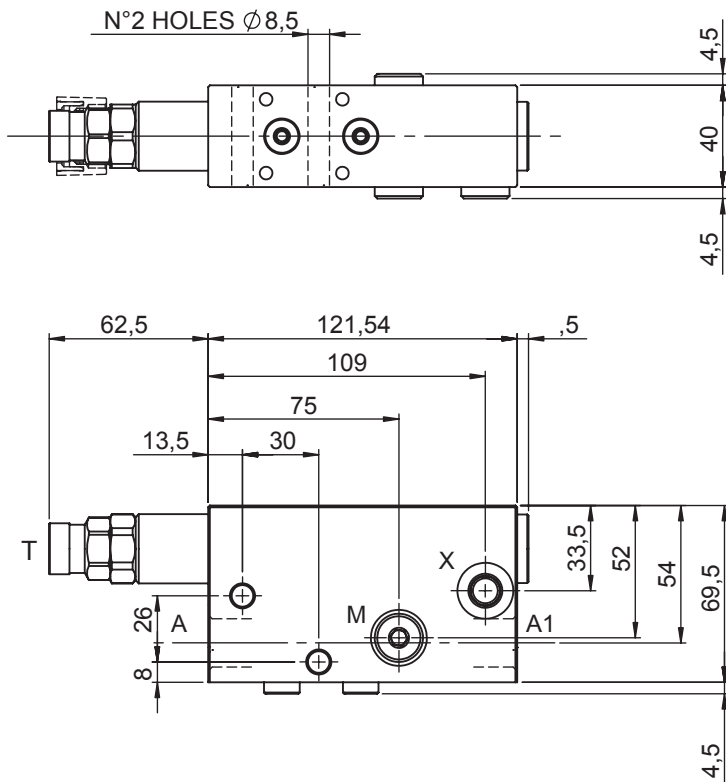
SPRINGS	4
Setting Range min.-max. [bar]	120 - 410
Pressure Increase [bar/turn]	85
Standard Setting 4 l/min [bar]	260

PORTS	04	54
A,A1	G 1/2"	SAE 10
X,E	G 1/4"	SAE 06



BOOM LOWERING CONTROL VALVE FOR FRONT LOADER

- Flow **75 l/min**
- Max working pressure **350 bar**
- Compensation **Fully Compensated with drain line**
- Weight **2.6 Kg**
- Tamper proof cap **cod.9021030191**



Note:
 - Hydraulic joystick operated valve for front loaders.
 - Connect T port direct to tank by a drain line.
 - The valve does not operate for pressure relief.

Ordering code

Y 1 0 2 3 Y **0** **0 0**

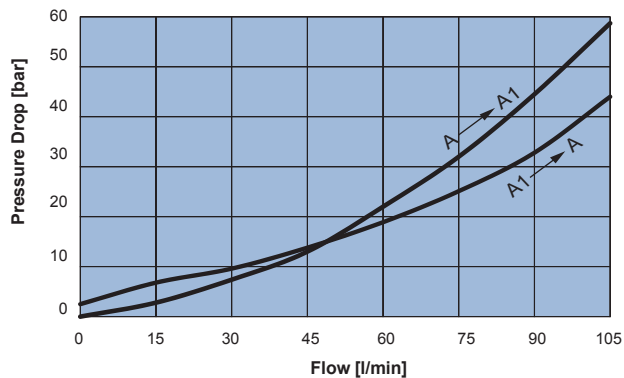
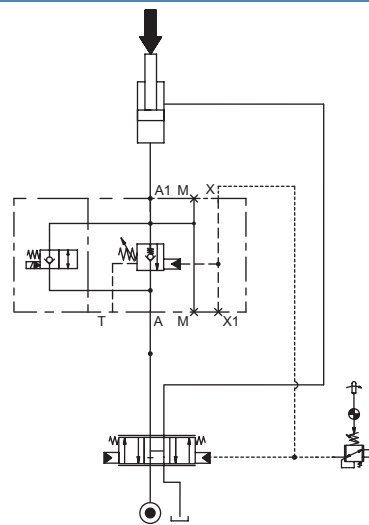
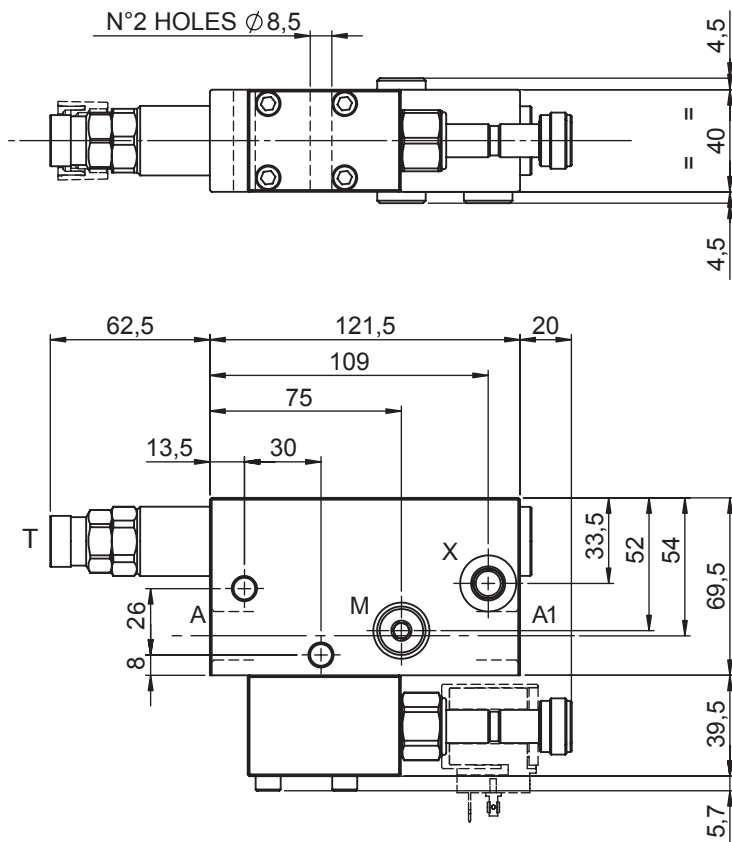
PILOT RATIO	
11	1:0 FINE METERING

SPRING	
2	
Setting Range min.-max. [bar]	5 - 14
Pressure Increase [bar/turn]	2.5
Standard Setting 4 l/min [bar]	7,5/+0,5

PORTS		
04	54	
A,A1	G 1/2"	SAE 10
T,X,X1,M	G 1/4"	SAE 06

BOOM LOWERING CONTROL VALVE FOR FRONT LOADER WITH BY PASS

- Flow **75 l/min**
- Max working pressure **350 bar**
- Compensation **Fully Compensated with drain line**
- Weight **3.6 Kg**
- Tamper proof cap. **cod.9021030191**
- Coil **09400** to be ordered separately (page 189)



Note:
 - Hydraulic joystick operated valve for front loaders equipped with solenoid operated bay-pass for floating function.
 - Connect T port direct to tank by a drain line.
 - The valve does not operate for pressure relief.

Ordering code

Y 1 0 2 3 Y [] [] S [] 0 1

PILOT RATIO	
12	1:0 FINE METERING + BPE

SPRING	
2	
Setting Range min.-max. [bar]	5 - 14
Pressure Increase [bar/turn]	2.5
Standard Setting 4 l/min [bar]	7,5/+0,5

PORTS		
04	54	
A,A1	G 1/2"	SAE 10
T,X,X1	G 1/4"	SAE 06

