



.....  
Controls



Technical Catalogue

**ECS10A**

.....  
Sectional directional control valve



engineering beyond imagination



## HISTORY OF REVISIONS

DATE	PAGE	CHANGED	REV.
November, 2019	-	First edition	00
November, 2020	15-18-32-38-40-43	Hydraulic schema and dimensional drawing replaced. Information added on page 38, drawing and codes replaced on page 43	01

## ABOUT THE MANUAL

This manual contains the technical instructions for the control ESC10A.  
All information given in this manual is current and valid according to the information available at the time of publication.  
The data specified above only serve to describe the product. EBI Motion controls reserves to modify or revise the instructions without prior notice.

EBI Motion controls is not responsible for any damage caused by an incorrect use of the product.  
Please visit [www.ebimc.com](http://www.ebimc.com) for the most recent version of this manual.

## CONTENTS

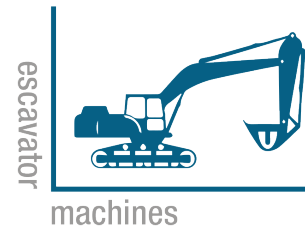
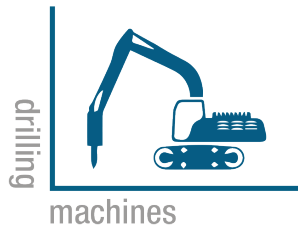
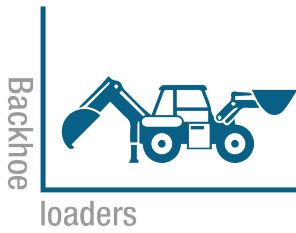
4	<b>INTRODUCTION</b>
5	<b>GENERAL INFORMATION</b>
6	<b>QUICK REFERENCE GUIDE</b>
7	<b>APPLICATION AND SAFETY GUIDELINES</b>
10	<b>HYDRAULIC FLUID</b>
12	<b>PORT DETAILS</b>
13	<b>DIMENSIONS</b>
16	<b>TECHNICAL SPECIFICATIONS</b>
	<b>TECHNICAL DATA</b>
17	<b>TYPICAL CURVES</b>
18	<b>CIRCUITS</b>
19	<b>ORDERING CODES</b>
	ASSEMBLY SECTION
	INLET SECTION
	WORK SECTION
	OUTLET SECTION
	OPTION
	ACCESSORIES
	GENERAL CLAMPING TORQUE



## INTRODUCTION

### CONTROLS

EBI motion controls provides a broad choice of directional control valves expertly developed and tested to meet different market sectors' needs. EBI Control valves are suited for specialized applications for a variety of mobile equipment such as:



## ECS10A

### SECTIONAL DIRECTIONAL CONTROL VALVE

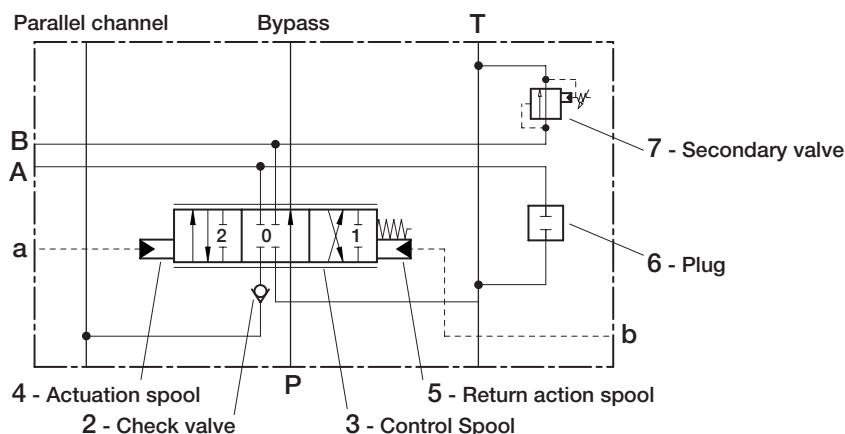
- From 1 to 12 working sections.
- Parallel and tandem circuit available.
- Low internal leakage.
- Compact directional valve with low pressure losses.
- Interchangeable spools.
- Wide range of auxiliary valves on the ports.
- Availability of manual, hydraulic, and electrohydraulic actuations.



## GENERAL INFORMATION

### HYDRAULIC OPERATING PRINCIPLE

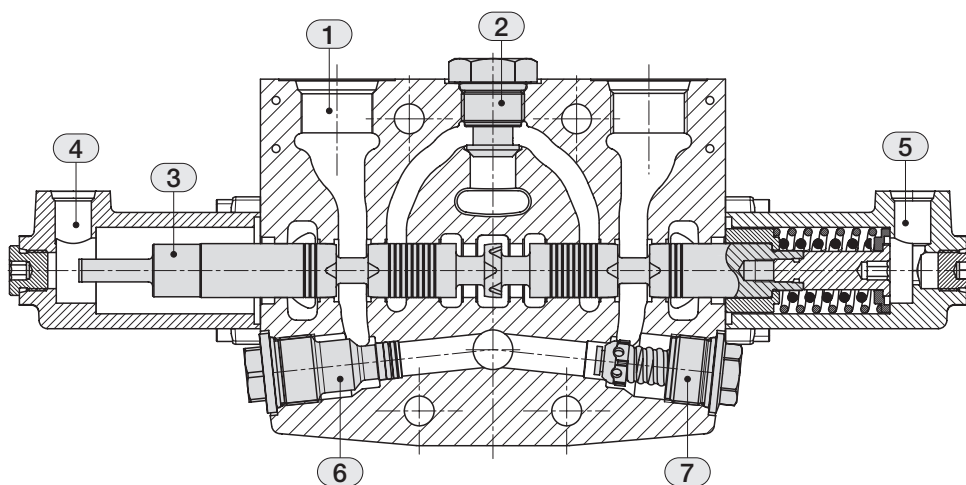
Directional control valve ECS10A basically comprises of an inlet section, directional valve sections and an outlet section. It is designed to the 6-way principle and comprises of an arrangement body (1), control spool (3), load holding check valve (2), actuation spool (4), return action spool (5), cavities for the secondary pressure valves or relief/anti-cavitation valves (6), as well as anti-cavitation valves or plug (7).



With all of the spool axes in their neutral position the flow passes via the bypass channel at zero pressure to tank. If one of the control spools is actuated then the connection from the pump to the actuator is opened via the fine control grooves, whilst the bypass is throttled by fine control grooves. If the pump pressure exceeds the actuator pressure, the pressure fluid starts to flow over the check valve to the actuator.

With further movement of the control spool the volume of fluid is increasingly diverted from the bypass channel to the actuator (fine control). The spool stroke is divided into three phases: overlap (leak-free in the neutral position), fine control range (flow and pressure), residual stroke (fully open).

Due to the large fine control range of the spool stroke it is possible to sensitively control the actuators.



Section ECS10A with hydraulic actuation and fixed setting combined valves.



## QUICK REFERENCE GUIDE

TYPE	ECS08A	ECS10A	ECS12A
Number of sections	1-12	1-12	1-12
Parallel circuit	•	•	•
Tandem circuit	•	•	•
Parallel circuit stroke (mm) - [in]	6 [0.24]	7 [0.28]	8 [0.32]
Float spool extra stroke (mm) - [in]	5 [0.20]	4.5 [0.18]	6 [0.24]
Spool pitch (mm) - [in]	36 [1.42]	41 [1.62]	48 [1.89]
Spool diameter (mm) - [in]	14 [0.55]	16 [0.63]	19 [0.75]
Nominal flow (l/min) - [GPM]	50 [12]	100 [25]	150 [40]
Operating pressure (bar) - [psi]	350 [5000]	350 [5000]	350 [5000]
OPTION CHART	ECS08A	ECS10A	ECS10A
Pilot operated pressure relief valve	•	•	•
Solenoid dump valve 12 VDC	•	•	•
Solenoid dump valve 24 VDC	•	•	•
Main anticavitation check valve	•	•	•
SPOOL ACTUATION	ECS08A	ECS10A	ECS12A
Manual actuation	•	•	•
Hydraulic actuation	•	•	•
Electrohydraulic actuation	•	•	•
SPOOL RETURN ACTION	ECS08A	ECS10A	ECS12A
3 positions spring centered	•	•	•
Pneumatic control	•	•	•
Detent in position 1/2 - 1 - 2	•	•	•
Detent in 4 <sup>th</sup> position	•	•	•
AUXILIARY VALVES	ECS08A	ECS10A	ECS12A
Fixed setting combined valve	•	•	•
Fixed setting anticavitation valve	•	•	•
Adjustable pilot combined valve		•	•

## APPLICATION AND SAFETY GUIDELINES

### INTENDED USE

Directional control valve ECS10A is designed for industrial use.

### WARRANTY

Check the package and the product for transport damage when receiving goods. The package is not meant for long term storage; protect the product appropriately. Do not dismantle the product. The warranty is void if the product has been disassembled. The manufacturer is not responsible for damages resulting from misinterpreted, non compliance, incorrect, or improper use of the product that goes against the instructions given in this document.

### GENERAL SAFETY INSTRUCTIONS

The following instructions apply to all procedures associated with the product. Read these instructions carefully and follow them closely.

- Use necessary personal protective equipment when working with the product.
- Support the product properly; make sure the product cannot fall over or turn around by accident.
- Use only appropriate equipment and attachments for lifting and transferring the product.
- Prevent unintended use of the product during installation and maintenance procedures.
- Never use the Control Valve at a pressure exceeding the rated pressure.
- Use the Control Valve within the rated flow; if not there might be malfunction or a deterioration in heat balance.
- Using low-cleanliness hydraulic fluid might cause seal failure or damage to the seal part, resulting in operation failure, or operation mistake of the machine; the customer is requested to check the cleanliness of the hydraulic fluid.

### WARNING SYMBOL

The following symbols can be used in this manual:



**Note:**  
Useful  
information



**Danger:**  
Danger of death  
or injury



**Attention:**  
May cause damage  
to the product

### STORAGE OF NEW PRODUCT

Encapsulated by a protective wrapping, the control valve ECS10A shall not be exposed to direct sunlight nor to source of heat or ozone and kept in a dry place at a temperature between -20°C +50°C [-4°F +122°F].

Do not store the product in:

- Places where it might be damaged;
- Very hot/humid areas;
- Where it could get wet;
- Where it could come into contact with organic solvents, acids, alkalis and/or dangerous gases;
- In places subject to sudden, significant changes in temperature.

EBI motion control is not responsible for any damages due to a storage not in compliance with our prescriptions; For any doubts, please contact our aftersales office.

### SAFETY GUIDELINES

During any operation on product ECS10A, it is recommended to pay attention to components surfaces temperature. The circuit functions are to be so designed that uncontrolled machine movements, caused by the application, are prevented and that it is possible to switch from one function to another. Take into account all of the application limits, particularly those application limits stated within this technical catalogue.

It is recommended to follow these steps and only trained and competent personnel may carry out any work on ECS10A Control Valve:

- Do not direct the jet of a pressure washing unit directly to the product
- Ensure that all matching surfaces are clean, without contamination.

- Ensure that all seals and back-up rings for the matching surfaces are flawless and correctly placed.
- Do not put any sealing material other than the standard seals.
- During the assembly of the complete Control Valve, refer to the hydraulic scheme and to the name assigned to each port.
- Use gloves in order to avoid accidental injuries during installation or maintenance.
- Do not grab / handle product from moving parts (i.e. cables, levers,...etc.)
- All Control Valve are attributable to pressure vessels. It's always recommended to place the components in a closed but ventilated compartment, able to protect the environment and users in case of accidental ejection of material under pressure (fittings, pipes, plugs, expander,...etc.)
- Before removing or disassembling the complete Control Valve or allowed parts ( as pressure gauge ports, plugs) it is strongly recommended to vent all hydraulic pressure from the system.
- During the first start of the machine, please ensure that the grounding system is connected and stay away from moving parts.

## HANDLING PRECAUTIONS

If the Control Valve doesn't work in the adequate way, we advise you to contact our aftersales Office. However if the disassembly and assembly operations are strictly unavoidable, you must observe the following prescriptions and charge the carrying out of the operations to technicians high qualified in hydraulic field.

- The Control Valve reaches high temperature after operating the machine; start the work only after checking that the temperature is low;
- The valve can hold high internal pressure; release the inside pressure and ensure all machine actuators are in a rest position before removing the piping. In any case safely and carefully unscrew connections and fittings.
- Since hydraulic devices are all machined precisely with very accurate clearances, carry out the disassembly adassembly work at a clean place;
- Before disassembly work, get the assembly instructions by requiring to our aftersales office and prepare all the material needed for the task;
- To disassemble and assemble the valve observe strictly our mounting instructions;
- Since there is the possibility of rust when the disassembled parts are left, apply anticorrosive oil to the parts and seal them;
- Before remounting the Control Valve on the operating machine, ensure that the Control Valve has not been affected by carrying out various hydraulic tests (e.g. Relief Valve setting, Leak test..).



### Attention:

Always bear in mind that "all workers must act responsibly to ensure their own health and safety"; use of personal protection equipment is therefore essential. All the disassembly and assembly operations must observe strictly the procedures listed in the EBI procedures.

EBI motion control is not responsible for any damages due to disassembly and assembly procedures not in compliance with our prescriptions. For any doubts, please contact our aftersales department.

## INSTALLATION PROCEDURES

On receiving the Control Valve make sure you:

- Check if there are some sign of damage of the packaging;
- Check that the dimensions of the product seat are compatible with those of the product itself;
- Remove the plastic caps that protect the service ports and be careful not to introduce any dirt or foreign matters inside the control valve as this could damage it;
- Mount the control valve securely to a flat surface (recommended 3 point fixing); at the time do not use a hammer to positioning by hitting; any distortion in assembly can result in spool sticking and poor control;
- Clean piping materials sufficiently before use;
- Prevent the port openings from being entered with dust or foreign matters;
- tighten the port connectors surely with the recommended fastening torques;
- If possible, install the valve in a protected environment, avoiding direct exposure to weathering, water, salt or any other corrosion substances.

### FITTINGS TIGHTENING TORQUE (Nm)

Do not tighten fittings with torque more than the recommended value; If not there might be strains or damage to Control Valve so as to cause a serious accident.

If the pipings are not connected to the correspondent ports, unintentional movements might cause a serious accident; EBI motion control is not responsible for any damages due to an installation procedure not in compliance with our procedures.

SPECIFICATIONS	PORT (P)		PORT (A-B)	PORT (T)
<b>BSP THREADS ISO 1179-1</b>	<b>G 1/2</b>	<b>G 3/4</b>	<b>G 1/2</b>	<b>G 3/4</b>
<i>with rubber saling (din 3869)</i>	90	120	90	120
<i>with copper or steel and rubber washer</i>	90	120	90	120
<b>UN/UNF THREADS ISO 11926-1</b>	<b>7/8" 14 UNF</b>	<b>1"1/16 12 UNF</b>	<b>7/8" 14 UNF</b>	<b>1"1/16 12 UNF</b>
<i>with o-ring</i>	90	120	90	120

### UNITS OF MEASURE - CONVERSION FACTORS

LENGHT	FLOW RATE	MASS	FORCE WEIGHT	PRESSURE
1 mm = 0,0394 in	1 l = 0,2200 gal UK	1 kg = 2,205 lb	1 Nm = 0,1020 Kgf	1 bar = 100000 Pa
1 in = 25,4 mm	1 l = 0,2642 gal US	1 lb = 0,4536 kg	1 Kgf = 9,8067 Nm	1 bar = 14,5 psi
	1 gal UK = 4,546 l			1 Pa = 0,0001 bar
	1 gal UK = 1,2010 gal US			1 Pa = 0,00014 psi
	1 gal US = 3,785 l			1 psi = 0,0689 bar
	1 gal US = 0,8327 gal UK			1 psi = 6890 Pa

### PRODUCT IDENTIFICATION

The product identification data can be found on the identification plate attached to the EBI product.

#### SERIAL NUMBER

all manufacturing data and all sales data can be found with the serial number

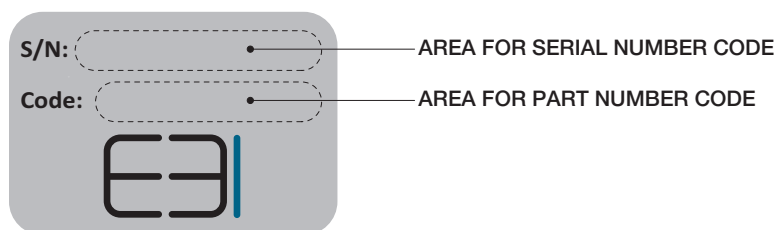
#### PART NUMBER CODE

It is a number univocally identifying the configuration and pressure setting of a valve



**Note:**

Serial number and part number code have 9 characters (letters and numbers).



**Attention:**

These guidelines are not intended to be considered as complete



## HYDRAULIC FLUID

Mineral oil based hydraulic fluids suitable for hydraulic systems can be used; they should have physical lubricating and chemical properties as specified by:

MINERAL OIL BASED HYDRAULIC FLUIDS HL (DIN 51524 part 1)

MINERAL OIL BASED HYDRAULIC FLUIDS HLP (DIN 51524 part 2)

For use of environmentally friendly fluids (vegetable or polyglycol base), or other fluids, please contact EBI.

OIL AND SOLUTIONS - ISO 6743/4	(°C) MIN	(°C) MAX
Mineral Oil HL, HM or HLP	-25	+80
Oil in water emulsion HFA	+5	+55
Oil in water emulsion HFB	+5	+55
Polyglycol-based aqueous solution HFC	-10	+60

Hydraulic fluids are available in different viscosity classes identified by the ISO VG number, which corresponds to the kinematic viscosity at 40°C. Here is a table showing typical viscosity changes between 0°C and 100°C for mineral oil based fluids having various viscosity classes. The fluid should be selected with the aim to achieve an appropriate operating viscosity at the expected working temperature.

VISCOSITY CLASS AND FILTRATION DATA			
Viscosity class	kinematic viscosity (cSt)		
	maximum (0° C)	medium (40° C)	minimum (100° C)
ISO VG 10	90	10	2.4
ISO VG 22	300	22	4.1
ISO VG 32	420	32	5.0
ISO VG 46	780	46	6.1
ISO VG 68	1400	68	7.8
ISO VG 100	2560	100	9.9

### FLUID CLEANLINESS REQUIREMENTS

The cause of malfunctions in hydraulics is often found to be excessive fluid contamination. The hard contaminant particles in the fluid wear the hydraulic components and prevent the poppets from re-seating, with consequent internal leakage and system inefficiency. For the correct operation it is necessary to adopt filtration methods which guarantee for life the specified fluid cleanliness level. It is important to ensure that hydraulic fluids are brought to the appropriate cleanliness level prior filling up the systems, and, when in doubt, also to flush the hydraulic components prior to installation.

#### FILTRATION RATIO $BETA_x$ :

It is the ratio between the number of particles before and after the filter with diameter larger than X micron.

#### ABSOLUTE FILTRATION RATIO ISO 4572:

It is the diameter X of the largest particle with  $BETA_x \geq 75$ .

#### CONTAMINATION CLASS ISO 4406:

It is expressed by 3 scale numbers representing respectively: the number of particles equal to or larger than 4µm, the number of particles equal to or larger than 6µm, the number of particles equal to or larger than 14µm contained in 1 ml of fluid.

#### CONTAMINATION CLASS NAS 1638:

It is expressed by one scale numbers representing the number of particles of different size ranges contained in 1 ml of fluid.

FILTRATION RECOMMENDATION				
Type	Nominal filtration (micron)	Absolute filtration rating ISO 4572 (BETA <sub>X</sub> ≥75)	Contamination class	
			ISO 4406	NAS 1638
System/components operating at <i>HIGH PRESSURE &gt; 250 bar</i> <i>HIGH DUTY CYCLE APPLICATIONS</i> Systems/components with <i>LOW dirt tolerance</i>	10	X = 10... 12	19/17/14	8
System/components operating at <i>MEDIUM HIGH PRESSURE</i> <i>HIGH DUTY CYCLE APPLICATIONS</i> Systems/components with <i>MODERATELY dirt tolerance</i>	15	X = 12... 15	20/18/15	9
System/components operating at <i>LOW PRESSURE &lt; 100 bar</i> <i>LOW DUTY CYCLE APPLICATIONS</i> Systems/components with <i>GOOD dirt tolerance</i>	25	X = 15... 25	21/19/16	10



**Attention:**

If the filtration demands are not met, the valve poppets can jam in the open position, with the result that the valve remains actuated. It is not possible to force back jammed poppets mechanically.



## PORT DETAILS

The connection port size is indicated by an ordering code common for all EBI products. Following tables show all available connections.

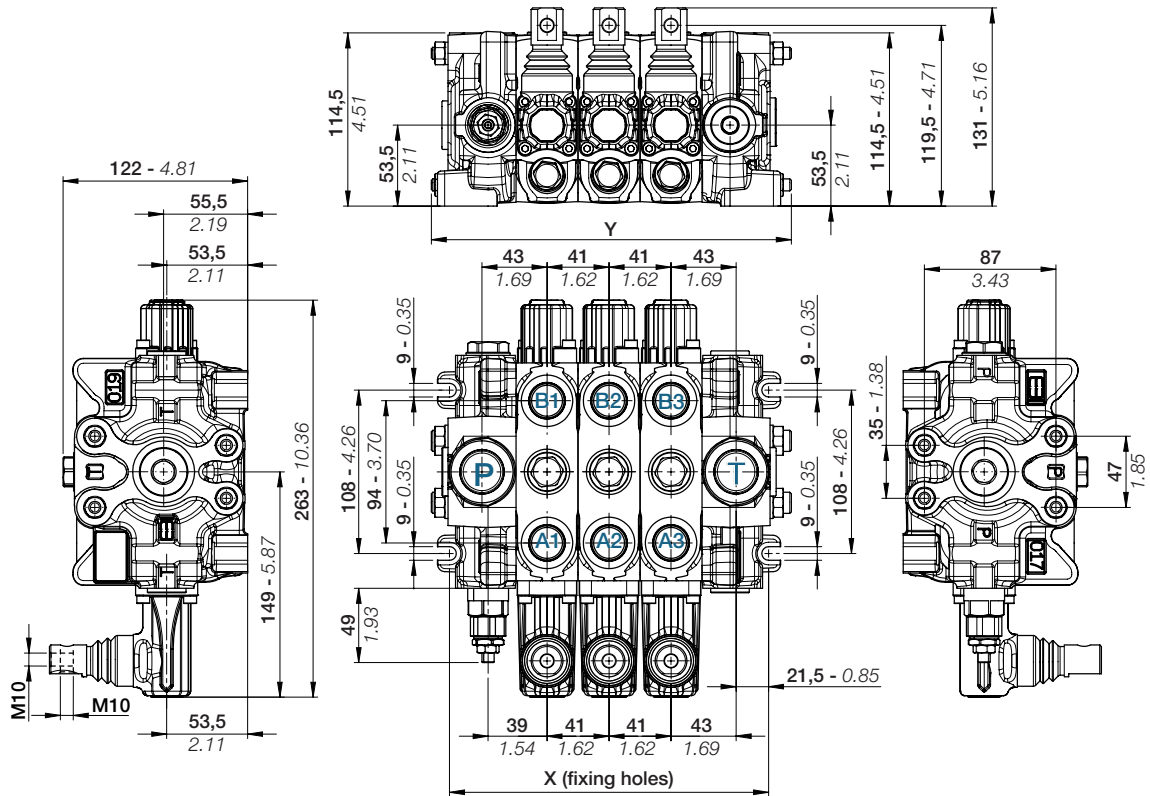
BSP THREADS ISO 1179-1	D	C		B		A		CODE
		mm	in	mm	in	mm	in	
	UNI-ISO 228							
	G 1/4	13	0.51	19	0.75	1	0.094	1B
	G 3/8	13	0.51	25	0.98	1	0.04	2B
	G 1/2	15	0.59	29	1.14	1.5	0.06	3B
	G 3/4	17	0.67	36	1.42	1.5	0.06	4B
	G 1	19	0.75	45	1.77	2	0.08	5B

UN/UNF THREADS ISO 11926-1	D	C		B		L		M		K	A		CODE
		mm	in	mm	in	mm	in	mm	in		mm	in	
	ASA-B1-1												
	9/16-18 UNF (SAE6)	13	0.51	26	1.02	15.6	0.61	2.5	0.098	12°	1	0.04	1S
	3/4-16 UNF (SAE8)	15	0.59	30	1.18	20.6	0.81	2.6	0.102	15°	1.5	0.06	2S
	7/8-14 UNF (SAE10)	17	0.67	34	1.34	23.9	0.94	2.6	0.102	15°	1.5	0.06	3S
	1"1/16-12 UNF (SAE12)	20	0.79	41	1.61	29.2	1.15	3.3	0.13	15°	1.5	0.06	4S
	1"5/16-12 UNF (SAE16)	20	0.79	50	1.97	35.5	1.40	3.3	0.13	15°	2	0.08	5S



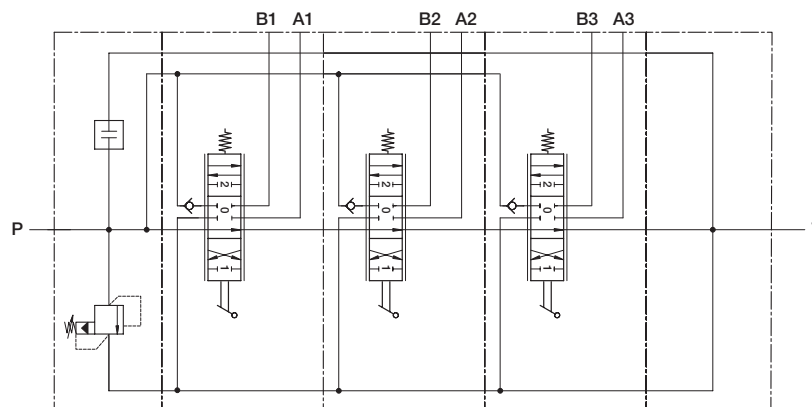
**DIMENSIONS**

**ECS10A MECHANICAL ACTUATION**



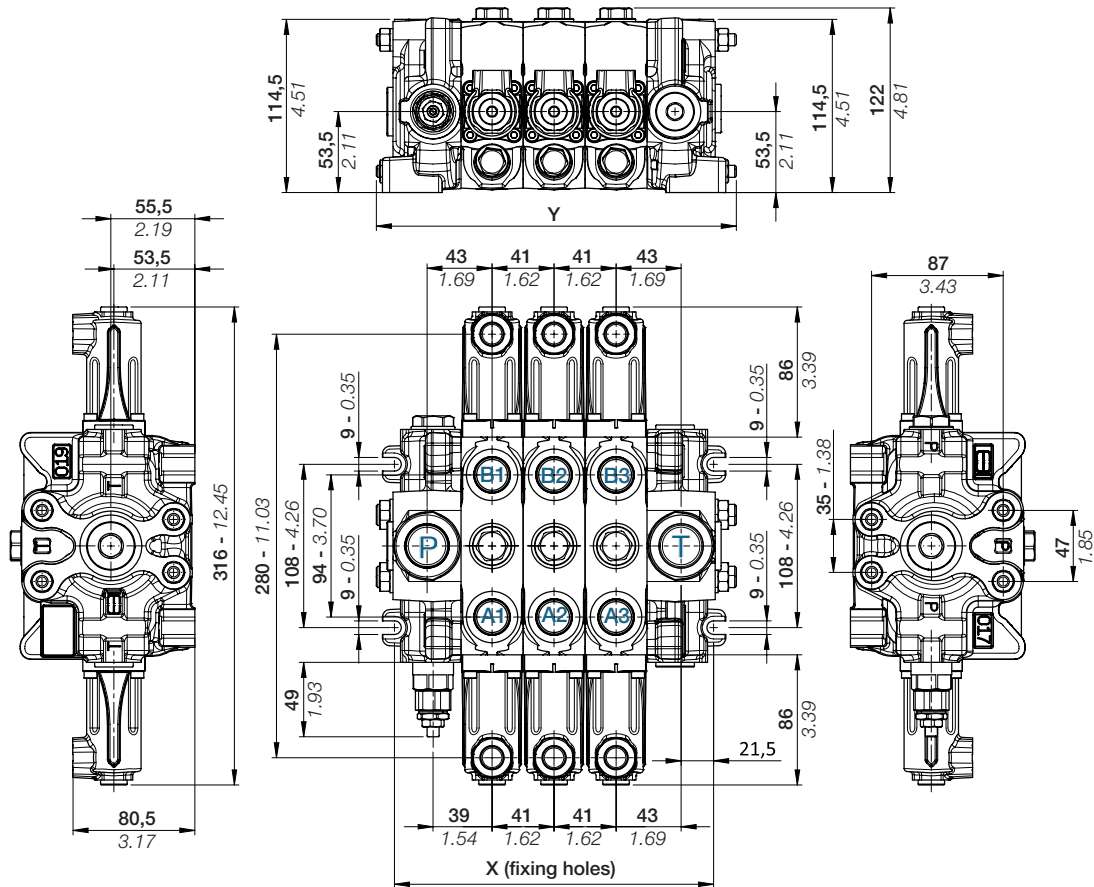
**STANDARD CONNECTIONS**

TYPE	BSP (ISO 1179-1)	UN-UNF (ISO 11926-1)
INLET - P	G 1/2	7/8" - 14 UNF (SAE10)
gauge connection	G 1/4	9/16" - 18 UNF (SAE6)
PORTS - A/B	G 1/2	7/8" - 14 UNF (SAE10)
OUTLET - T/T1	G 3/4	1"1/16-12 UNF (SAE12)
Pneumatic pilot	G 1/8	NPTF 1/8-27



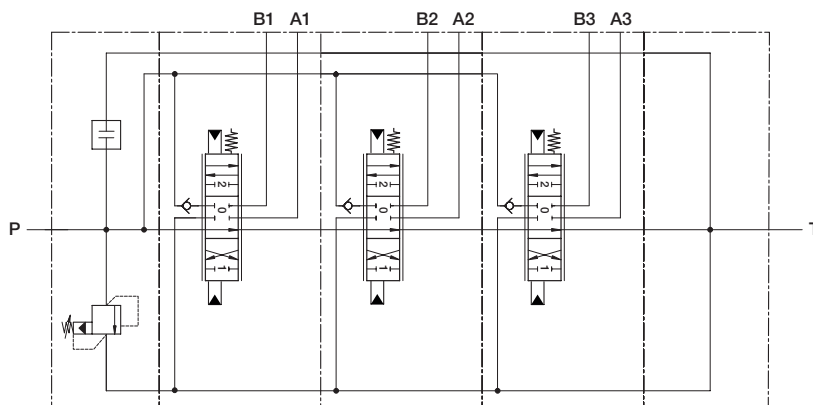
## DIMENSIONS

### ECS10A HYDRAULIC ACTUATION



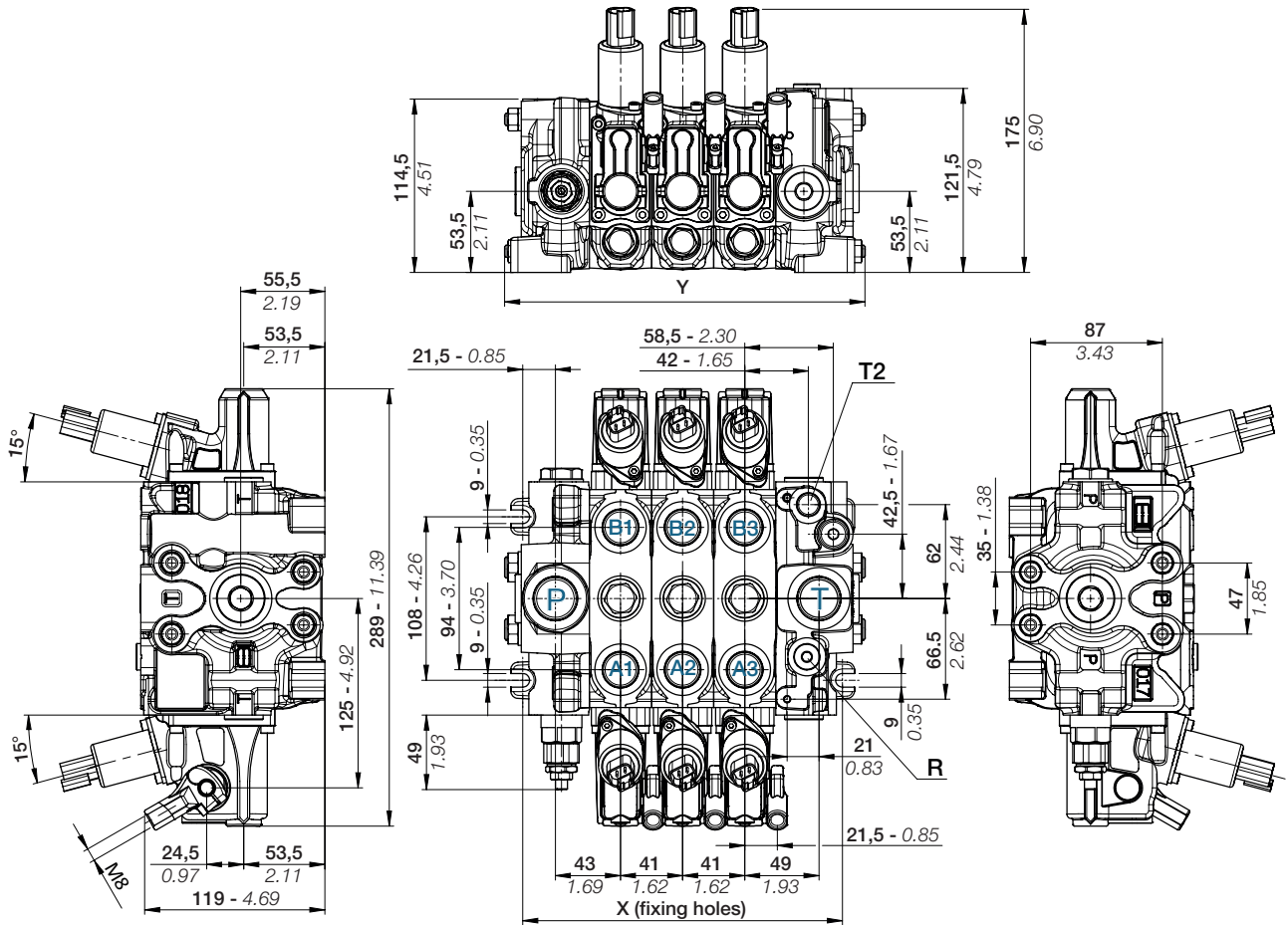
### STANDARD CONNECTIONS

TYPE	BSP (ISO 1179-1)	UN-UNF (ISO 11926-1)
INLET - P	G 1/2	7/8" - 14 UNF (SAE10)
gauge connection	G 1/4	9/16" - 18 UNF (SAE6)
PORTS - A/B	G 1/2	7/8" - 14 UNF (SAE10)
OUTLET - T/T1	G 3/4	1 1/16-12 UNF (SAE12)
hydraulic pilot	G 1/4	9/16" - 18 UNF (SAE6)



**DIMENSIONS**

**ECS10A ELECTROHYDRAULIC ACTUATION**



**STANDARD CONNECTIONS**

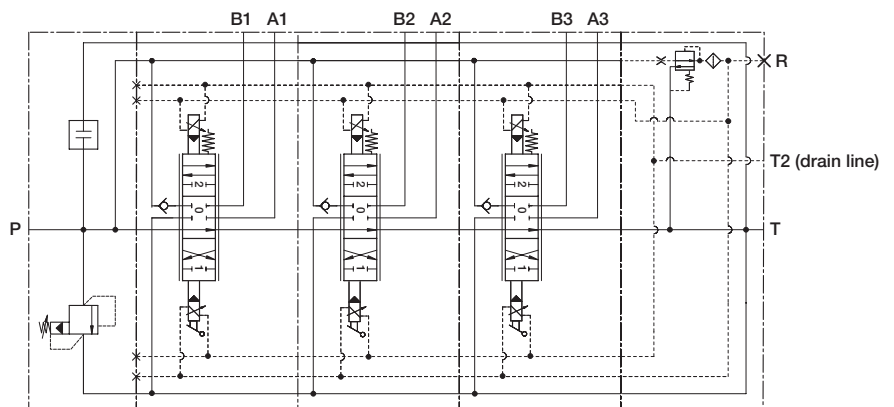
TYPE	BSP (ISO 1179-1)	UN-UNF (ISO 11926-1)
INLET - P	G 1/2	7/8" - 14 UNF (SAE10)
gauge connection	G 1/4	9/16" - 18 UNF (SAE6)
PORTS - A/B	G 1/2	7/8" - 14 UNF (SAE10)
OUTLET - T/T1	G 3/4	1 1/16-12 UNF (SAE12)



**Note:**

All outlet sections ECS10A for electrohydraulic configuration contain a pressure reducing valve (RDP).

We recommend to connect drain port T2 directly to tank, in order to avoid control system damages and inaccurate control.





## TECHNICAL SPECIFICATIONS

TYPE	X	Y	WEIGHT (mechanical version)	WEIGHT (electrohydraulic version)
	mm - [in]	mm - [in]	kg - [lb]	kg - [lb]
ECS10A/1	129 - [5.08]	156 - [6.15]	13,3 - [29.3]	14,7 - [32.4]
ECS10A/2	170 - [6.70]	197 - [7.76]	18,0 - [39.7]	19,4 - [42.8]
ECS10A/3	211 - [8.31]	238 - [9.38]	22,7 - [50.0]	24,1 - [53.1]
ECS10A/4	252 - [9.93]	279 - [10.99]	27,4 - [60.4]	28,8 - [63.5]
ECS10A/5	293 - [11.54]	320 - [12.61]	32,1 - [70.8]	33,5 - [73.9]
ECS10A/6	334 - [13.16]	361 - [14.22]	36,8 - [81.1]	38,2 - [84.2]
ECS10A/7	375 - [14.77]	402 - [15.84]	41,5 - [91.5]	42,9 - [94.6]
ECS10A/8	416 - [16.39]	443 - [17.45]	46,2 - [101.9]	47,6 - [105.0]
ECS10A/9	457 - [18.01]	484 - [19.07]	50,9 - [112.2]	52,3 - [115.3]
ECS10A/10	498 - [19.62]	525 - [20.69]	55,6 - [122.6]	57,0 - [125.7]
ECS10A/11	539 - [21.24]	566 - [22.30]	60,3 - [133.0]	61,7 - [136.1]
ECS10A/12	580 - [22.85]	607 - [23.92]	65,0 - [143.3]	66,4 - [146.4]

## TECHNICAL DATA

All performances in this catalogue are obtained using mineral based hydraulic oil 46 cSt viscosity at 40°C (ISO VG 46 viscosity class). All ECS10A go through functional testing at these conditions before shipment.

### HYDRAULIC STANDARD SPECIFICATIONS

Nominal Flow range .....	<b>100 l/min - [25 GPM]</b>
Nominal pressure .....	<b>350 bar - [5000 psi]</b>
Hysteresis .....	<b>&lt; 1 bar - [14,5 psi]</b>
Hydraulic fluid .....	<b>Mineral Oil HL, HLP (DIN 51524); phosphate ester (HFD-R)</b>
Fluid temperature range .....	<b>-20°C +80°C [-4°F +176°F]</b>
Fluid viscosity range .....	<b>10 ÷ 380 cSt</b>
Max contamination level .....	<b>9 (NAS 1638) - 20/18/15 (ISO 4406:1999)</b>
Recommended filtration .....	<b>B10 &gt; 75 (ISO 16889:20008)</b>

### MECHANICAL STANDARD SPECIFICATIONS

Spool return force (without detent) .....	<b>90 ÷ 125 N (std spring)</b>
Max actuation force on the spool (radial) .....	<b>16 N</b>

### GENERAL STANDARD SPECIFICATIONS

Weight (inlet section) .....	<b>3,7 Kg - [8,2 lb]</b>
Weight (work section) .....	<b>4 Kg - [8,8 lb]</b>
Weight (outlet section) .....	<b>3,5 Kg - [7,7 lb]</b>
Weight (outlet section with reducing valve) .....	<b>4,6 Kg - [10,2 lb]</b>
Max number of sections .....	<b>12</b>

### MATERIAL STANDARD SPECIFICATIONS SEALS

**O-Rings:** **Buna N** (acrylonitrile butadiene), also named **NBR** (according to ASTM), compatible with fluids having mineral oil base, water in oil emulsions, and water glycol fluids.

These seals are standard for temperatures within the range -20°C and +80°C

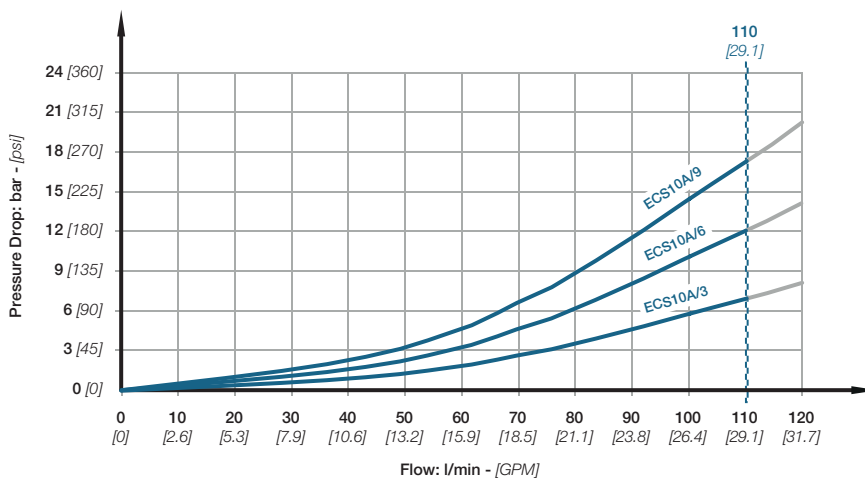
**Back-up rings and Slide rings:** **strengthened PTFE** (Politetrafluoroetilene like Teflon®, Lubriflon®, Ecoflon®, or similar). Special FPM (Viton®) seals are available on request.

**Note:** the seal materials are compatible with the fluids normally used in hydraulic systems; in case of special fluids, if you suspect incompatibility between the fluid used and the standard seals, contact the EBI motion controls service network.

## TYPICAL CURVES

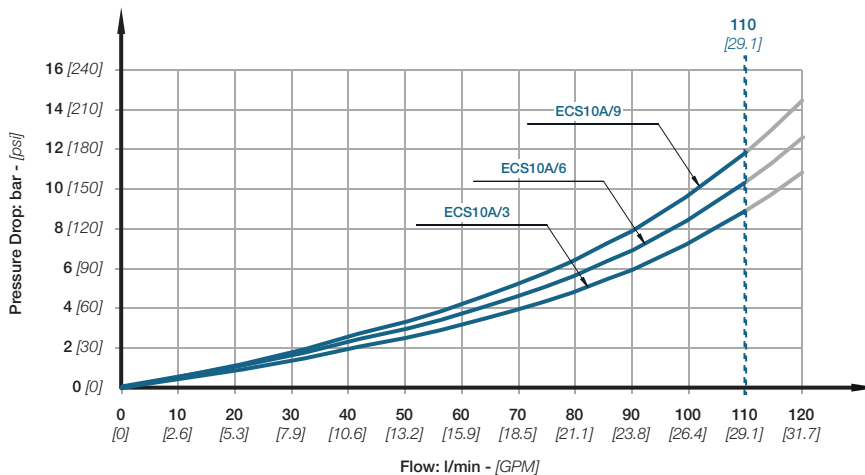
### PERFORMANCE DATA - PRESSURE DROP (P-T)

Pressure characteristic as function of flow



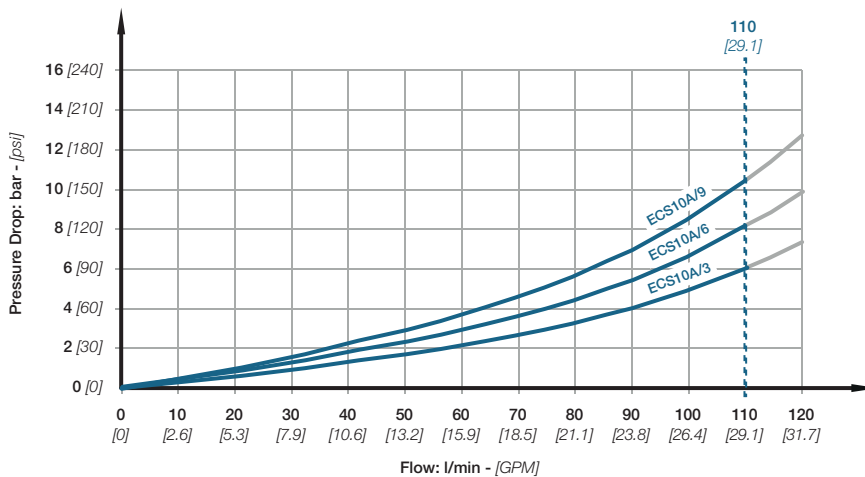
### PERFORMANCE DATA - PRESSURE DROP (P-A/B)

Pressure characteristic as function of flow



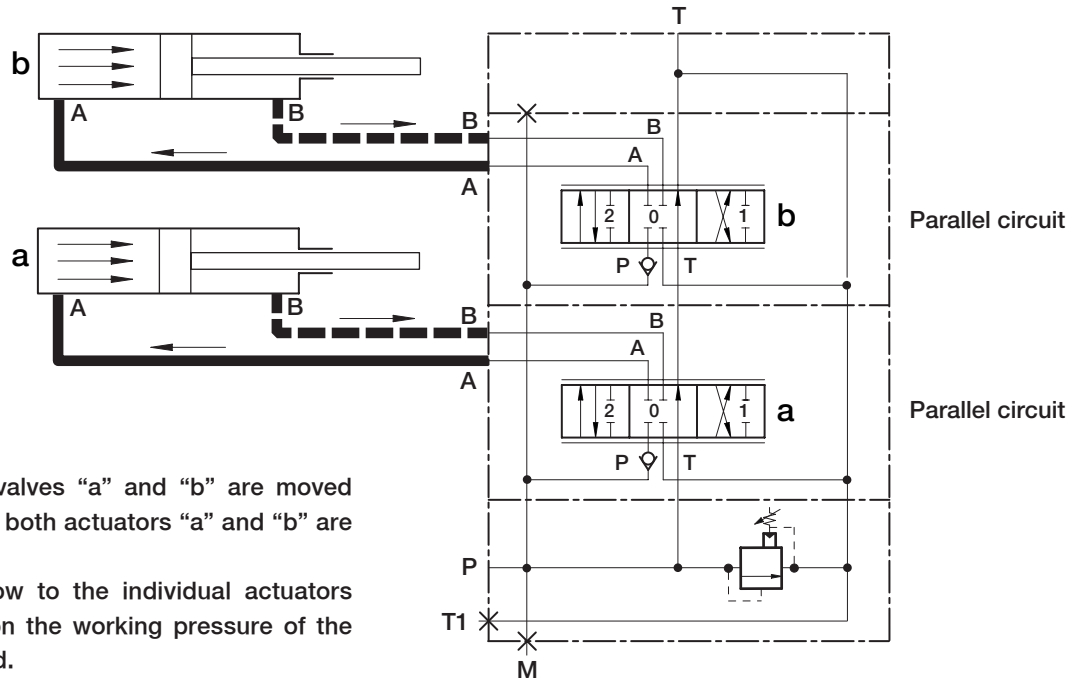
### PERFORMANCE DATA - PRESSURE DROP (A/B-T)

Pressure characteristic as function of flow



## CIRCUITS

**PARALLEL CIRCUIT:** a number of actuators can be operated simultaneously

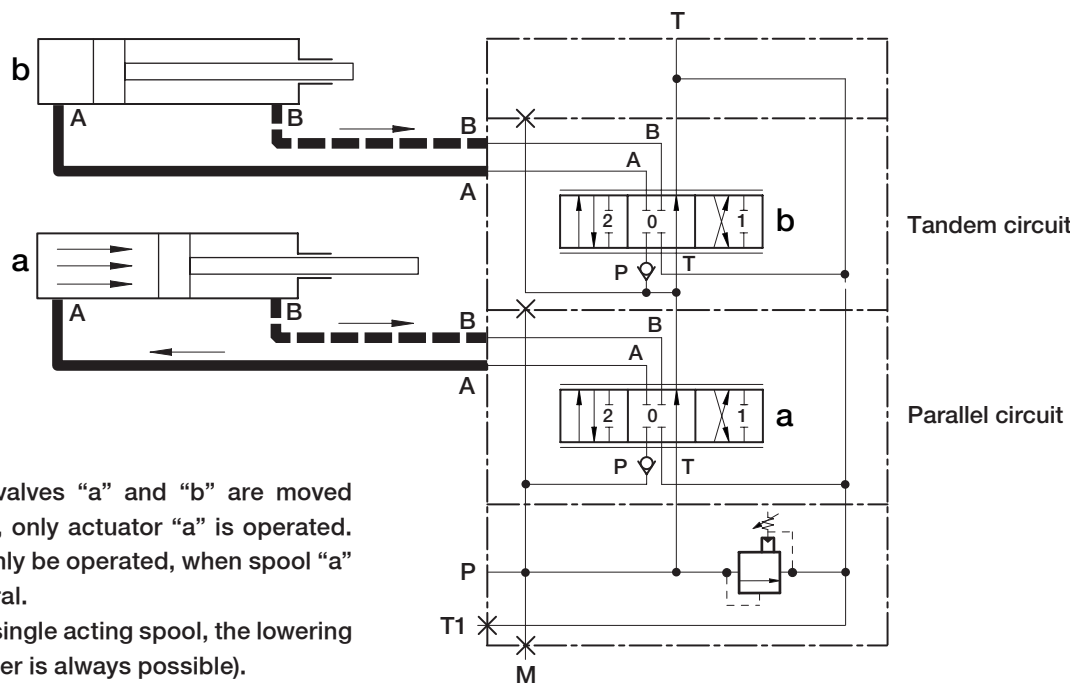


**Example:**

When directional valves “a” and “b” are moved to position 2 (or 1), both actuators “a” and “b” are operated.

The division of flow to the individual actuators is dependent up on the working pressure of the actuator concerned.

**TANDEM CIRCUIT:** only one actuator may be operated.



**Example:**

When directional valves “a” and “b” are moved to position 2 (or 1), only actuator “a” is operated. Actuator “b” can only be operated, when spool “a” is returned to neutral.

(Exception: with a single acting spool, the lowering action of the cylinder is always possible).

## ORDERING CODES

The order code below provides an example of control ECS10A with standard configuration.

This example represents a ECS10A with single electrohydraulic section.

You can configure a ECS10A up to 12 work sections; ordering code in position 6, 7, 8, 9, 10, 11, 12 and 13 must be repeated for every work section.

info	product					1																													
	E	C	S	1	0	A	N	1																											
inlet section	2	3			4				5																										
	L	P	1	3	S	V	0	1	1	5	0	V	0	2																					
Work section	6	7				8				9		10		11		12		13																	
	L	S	1	P	2	E	3	S	V	5	1	1	0	0	V	5	1	1	8	0	S	0	1	N	A	E	0	1	R	E	0	1	K	1	2
outlet section	14	15																																	
	L	T	1	R	4	S																													
options	16																																		
	X	1																																	

	POSITION	CODE	DESCRIPTION	PAGE
info		<b>ECS10A</b>	Product	
	1	<b>N1</b>	Assembly section	22
Inlet section	2	<b>L</b>	Inlet side	23
	3	<b>P13S</b>	Arrangement body inlet	24
	4	<b>V01150</b>	Inlet valve on port 1	25
	5	<b>V02</b>	Inlet valve on port 2	
	6	<b>L</b>	Section side	27
work section	7	<b>S1P2E3S</b>	Arrangement section body	28
	8	<b>V51100</b>	Valve on port A	31
	9	<b>V51180</b>	Valve on port B	
	10	<b>S01N</b>	Spool	32
	11	<b>AE01</b>	Actuation kit	33
	12	<b>RE01</b>	Return action kit	36
	13	<b>K12D</b>	Solenoid kit	38
outlet section	14	<b>L</b>	Outlet side	39
	15	<b>T1R4S</b>	Arrangement outlet body	40
options	16	<b>X1</b>	Painted option	43



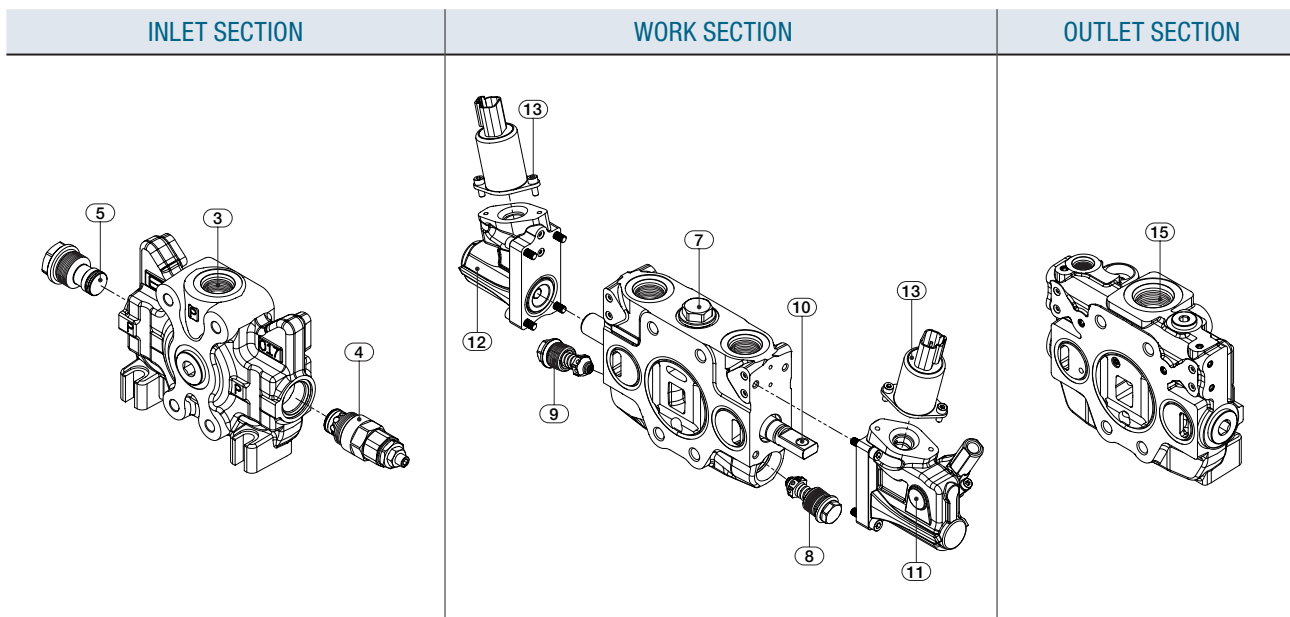
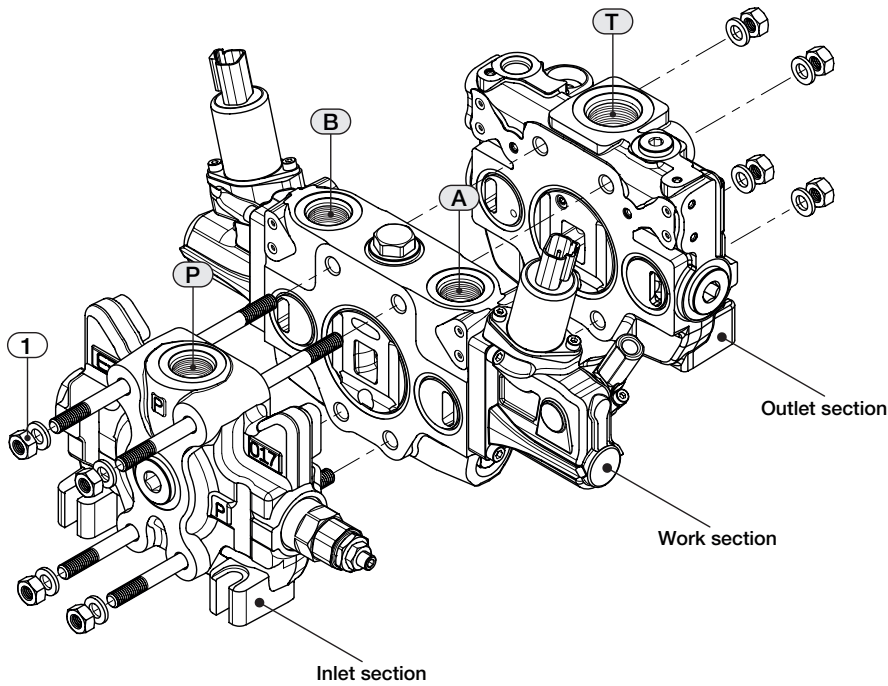
**Note:**

Ordering codes in position 2, 6 and 14 are always the same. Indicate the mounting side of the valve.



All sectional ECS10A valves have symmetric bodies; thanks to this characteristic, it is possible to change the control side, by simply reversing the spool 180°.  
All valves can easily be changed from right inlet (R) to left inlet (L) and vice versa.  
This example represents a valve in left configuration.

COMPLETE SECTIONAL VALVE ECS10A





ASSEMBLY MODALITY FOR DIRECTIONAL CONTROL VALVE

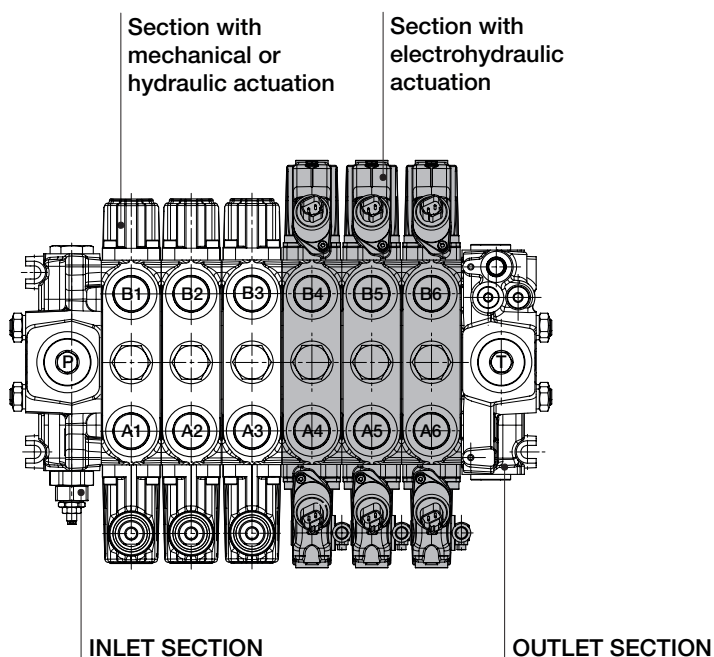


**Attention:**

in the case of mixed configurations (section with electrohydraulic actuation and sections with mechanical or hydraulic actuation) it is mandatory to place all the electrohydraulic sections near to the outlet section. As a consequence all the mechanical or hydraulic sections will be positioned immediately after the inlet section.

**EXAMPLE OF CONFIGURATION:**

ECS10A/6 with 3 mechanical section and 3 electrohydraulic section: directional control valve with left inlet



**Note:**

All mixed configurations are assembly with outlet section with RDP valve. Assembly modality also applies to directional control valve with right inlet.



**Note:**

For mixed configurations different from example, please contact our Sales Office.

## ASSEMBLY SECTION

product					1		
E	C	S	1	0	A	N	1

Tie rod kit allows the correct assembly of directional sectional valves ECS10A.

Tie rod's length depends on the number of sections; each valve is assembled with tie rod kits including a tie rod, two nuts and two washer.

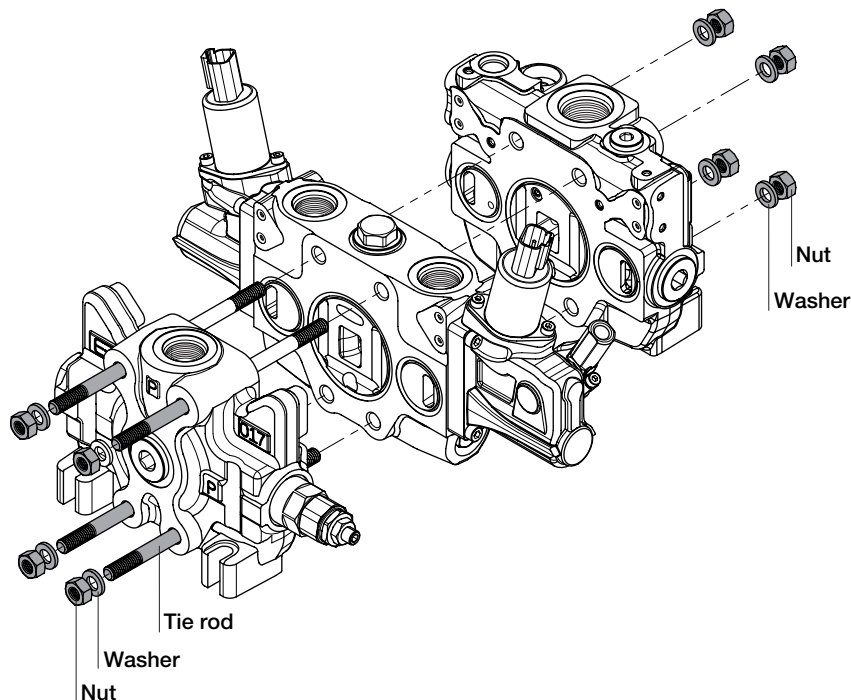
CODE	DESCRIPTION	LENGHT	CLAMPING TORQUE
<b>N1</b>	Assembly tie rod kit for single work section	156 mm - 6.146 in	35 Nm
<b>N2</b>	Assembly tie rod kit for 2 work sections	197 mm - 7.762 in	
<b>N3</b>	Assembly tie rod kit for 3 work sections	238 mm - 9.377 in	
<b>N4</b>	Assembly tie rod kit for 4 work sections	279 mm - 10.993 in	
<b>N5</b>	Assembly tie rod kit for 5 work sections	320 mm - 12.609 in	
<b>N6</b>	Assembly tie rod kit for 6 work sections	361 mm - 14.223 in	
<b>N7</b>	Assembly tie rod kit for 7 work sections	402 mm - 15.839 in	
<b>N8</b>	Assembly tie rod kit for 8 work sections	443 mm - 17.454 in	
<b>N9</b>	Assembly tie rod kit for 9 work sections	484 mm - 19.070 in	
<b>N10</b>	Assembly tie rod kit for 10 work sections	525 mm - 20.685 in	
<b>N11</b>	Assembly tie rod kit for 11 work sections	566 mm - 22.300 in	
<b>N12</b>	Assembly tie rod kit for 12 work sections	607 mm - 23.916 in	

This example represents ECS10A with one single work section; tie rod kit **N1**.



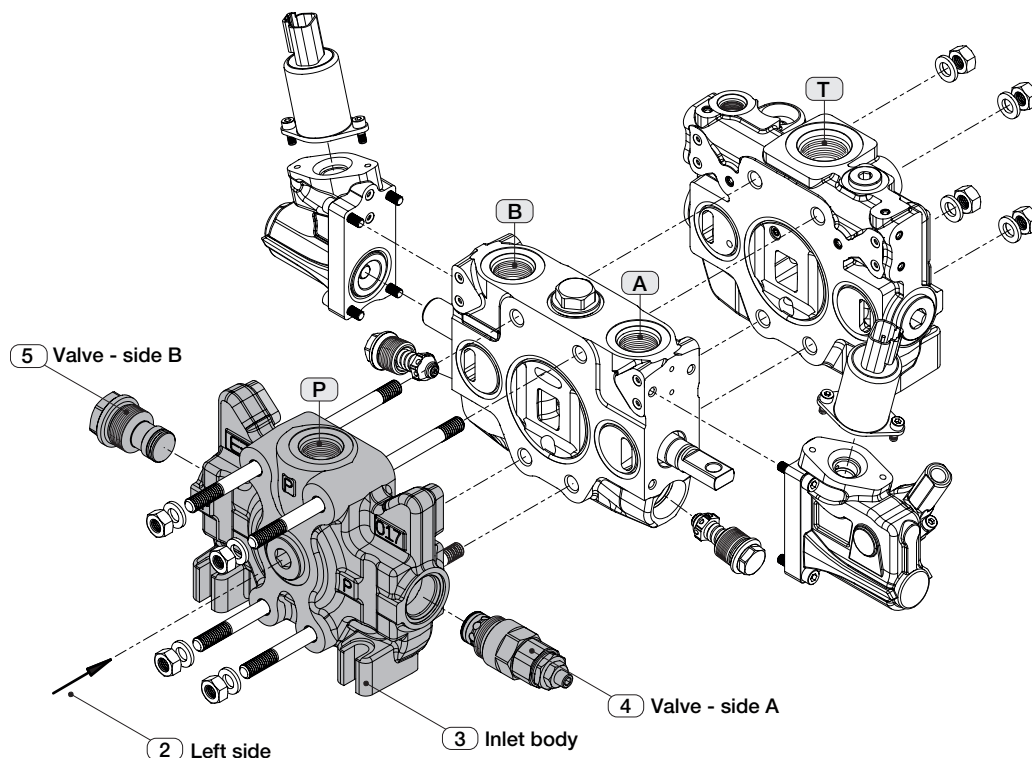
**Note:**

Each ECS10A assembly with n.4 tie rod kit.



INLET SECTION

2	3			4					5				
L	P	1	3	S	V	0	1	1	5	0	V	0	2



This example represents inlet section ECS10A with left configuration.

- L**.....left inlet side
- P13S**.....Upper inlet - 7/8"14 UNF (SAE10)
- V01150**.....Pilot operated pressure relief valve (150 bar) - side A
- V02**.....Relief valve plugged - side B

INLET SIDE

On all sectional ECS10A valves it is possible to choose a RIGHT or LEFT inlet.

CODE	DESCRIPTION	DRAWING	CODE	DESCRIPTION	DRAWING
L	Inlet side LEFT		R	Inlet side RIGHT	

Convention for all ECS10A valves with inlet right (R) or left inlet (L):

- side A = spool actuation side
- side B = spool return action side.

## INLET SECTION

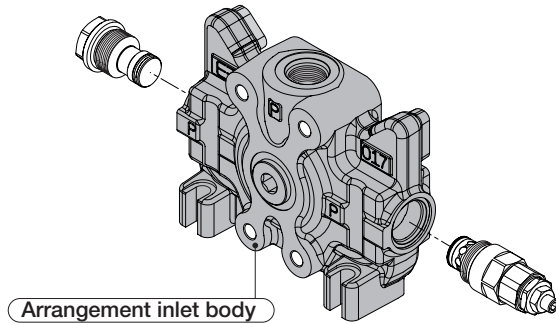
2	3	4	5
L	P 1 3 S	V 0 1 1 5 0	V 0 2

### ARRANGEMENT INLET BODY

ECS10A arrangement body inlet is available in two configurations: SAE thread or BSP thread.

The maximum flexibility of the inlet body configuration is guaranteed by the positioning of the service ports plug.

This table represents arrangement inlet body in left configuration.



CODE	DESCRIPTION	CONFIGURATION
<b>P13S</b>	Upper inlet - 7/8"-14 UNF (SAE10)	
<b>P13B</b>	Upper inlet - G 1/2	
<b>P23S</b>	Central inlet - 7/8"-14 UNF (SAE10)	
<b>P23B</b>	Central inlet - G 1/2	
<b>P33S</b>	Upper inlet - 7/8"-14 UNF (SAE10) with (P1) gauge connection SAE6	<p style="font-size: small;">Gauge connection: port SAE6 or G1/4</p>
<b>P33B</b>	Upper inlet - G 1/2 with (P1) gauge connection G 1/4	
<b>P43S</b>	Central inlet - 7/8"-14 UNF (SAE10) with (P1) gauge connection SAE6	<p style="font-size: small;">Gauge connection: port SAE6 or G1/4</p>
<b>P43B</b>	Central inlet - G 1/2 with (P1) gauge connection G 1/4	

INLET SECTION

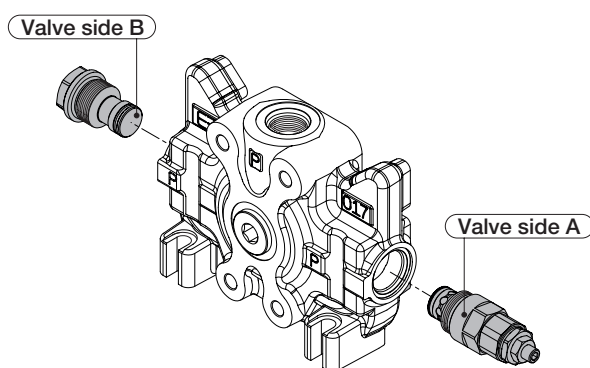
2	3			4					5				
L	P	1	3	S	V	0	1	1	5	0	V	0	2

INLET VALVE CLASSIFICATION

All inlet section require double choice on side A and side B; in the following table the available valves are shown.

- Valve type V01 requires factory setting (V01150); 150 is a value expressed in bar
- Valve type V04 includes coil kit
- 3 coil types are available in 12 and 24 Volt versions: DIN, DEUTSCH DT04 and AMP JUNIOR

CODE	DESCRIPTION	SYMBOL
V01	Pilot operated pressure relief valve	
V02	Relief valve plugged	
V0412A	Solenoid dump valve 12 VDC - AMP Junior	 All solenoids dump valves are fitted with push and twist override
V0424A	Solenoid dump valve 24 VDC - AMP Junior	
V0412D	Solenoid dump valve 12 VDC - DT04 Deutsch	
V0424D	Solenoid dump valve 24 VDC - DT04 Deutsch	
V0412H	Solenoid dump valve 12 VDC - DIN 43650	
V0424H	Solenoid dump valve 24 VDC - DIN 43650	
V06	Main anticavitation check valve	



The example represents inlet section in left configuration; valve V01150 type on side A and valve V02 type on side B

- Valve side A = spool actuation side
- Valve side B = spool return action side

SETTING RANGE

Pilot operate pressure relief valve (V01): 50/350 bar

In the following table the available valve combinations are shown.

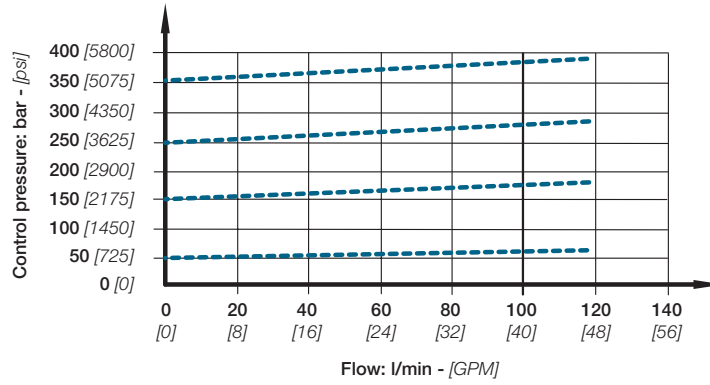
valve combination	VALVE PORT B									
	V01	V02	V0412A	V0424A	V0412D	V0424D	V0412H	V0424H	V06	
VALVE PORT A	V01	•	•	•	•	•	•	•	•	•
	V02	•	•	•	•	•	•	•	•	•
	V0412A	•	•							•
	V0424A	•	•							•
	V0412D	•	•							•
	V0424D	•	•							•
	V0412H	•	•							•
	V0424H	•	•							•
	V06	•	•	•	•	•	•	•	•	•



## INLET SECTION

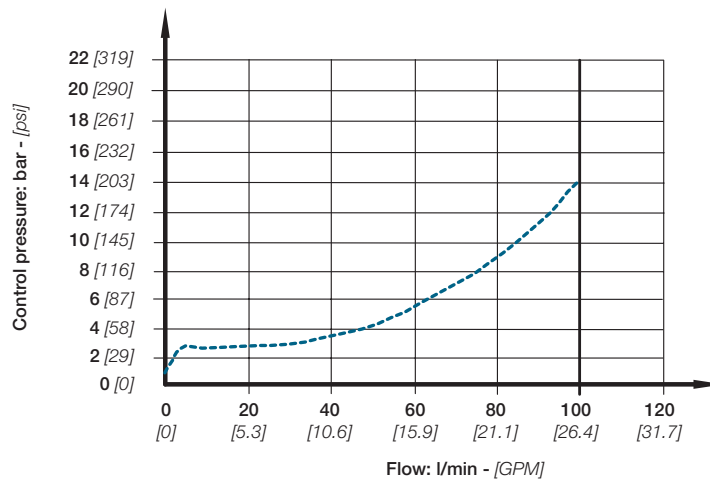
### PERFORMANCE DATA - PILOT OPERATED PRESSURE RELIEF VALVE (V01)

Pressure characteristic as function of flow



### PERFORMANCE DATA - MAIN ANTICAVITATION CHECK VALVE (V06)

Pressure characteristic as function of flow

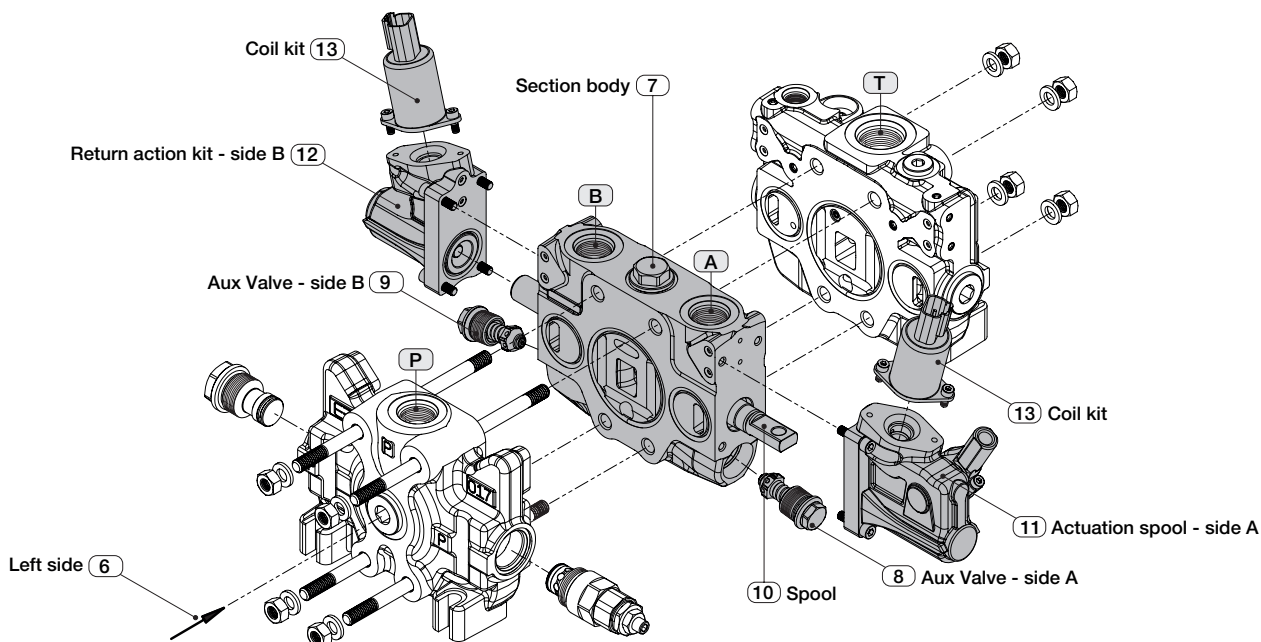


WORK SECTION

6	7			8			9			10			11			12			13																
L	S	1	P	2	E	3	S	V	5	1	1	0	0	V	5	1	1	8	0	S	0	1	N	A	E	0	1	R	E	0	1	K	1	2	D

This code indicates the complete working section set up; arrangement body, auxiliary valves, spool, actuation type and return action type.

- Should you order the working section only, you must specify the entry side: right (R) or left (L)
- Leave out the spool return action code when choosing hydraulic actuation “AH”
- Sections designed to house auxiliary valve option required double choice on work ports A and B
- Connector kit must be ordered separately with all electrohydraulic actuations; 2 coil kit each work section.



This example represents work section ECS10A with left configuration:

- L** .....Left side
- S1P2E3S** .....Parallel section with fixed valves - ports 7/8” 14 UNF (SAE10)
- V51100** .....Fixed setting combined valve (100 bar) - port A
- V51180** .....Fixed setting combined valve (180 bar) - port B
- S01N** .....Spool 3 positions double-acting (150 l/min)
- AE01** .....Electrohydraulic actuation with lever control - side A
- RE01** .....Electrohydraulic control return action - side B
- K12D** .....Connector coil kit - 12 VDC Deutsch DT04

CODE	DESCRIPTION	DRAWING	CODE	DESCRIPTION	DRAWING
L	Inlet side LEFT		R	Inlet side RIGHT	

Convention for all ECS10A valves with inlet right (R) or left inlet (L):

- side A = spool actuation side
- side B = spool return action side.



## WORK SECTION

6	7					8	9	10	11	12	13																								
L	S	1	P	2	E	3	S	V	5	1	1	0	0	V	5	1	1	8	0	S	0	1	N	A	E	0	1	R	E	0	1	K	1	2	D

### ARRANGEMENT SECTION BODY

ECS10A arrangement section is available in two configurations: SAE thread or BSP thread.

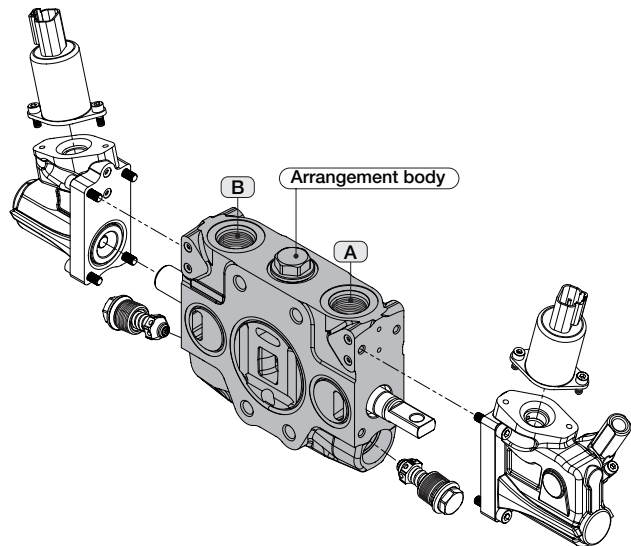
Work section is available with parallel circuit or tandem circuit.

There are two types of arrangement section body:

- Body for electrohydraulic actuation
- Body for mechanical or hydraulic actuation.

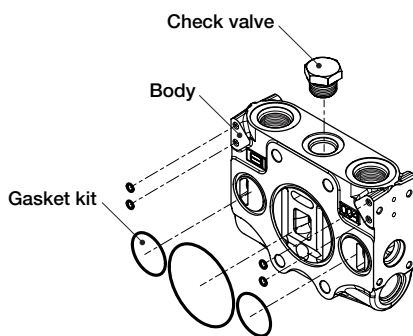
Each arrangement section contains:

- Body
- Check valve
- Gasket kit.

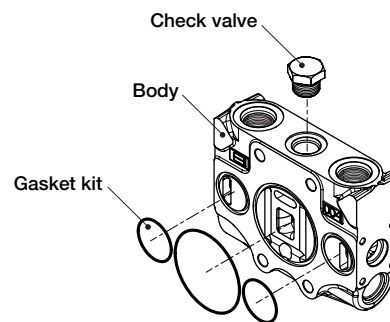


The Gasket kit allows the correct coupling between the surfaces of the working sections. The gasket kit changes according to the type of the working section; the number and type of gaskets is different between a mechanically operated section and a section with an electrohydraulic control (see the following table).

#### GASKET KIT FOR ELECTROHYDRAULIC SECTION

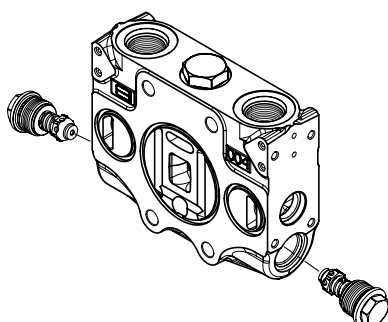


#### GASKET KIT FOR MECHANICAL OR HYDRAULIC SECTION

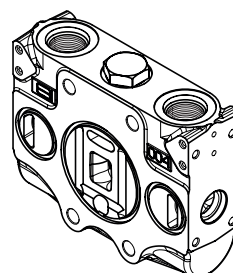


Each work section can be ordered with or without auxiliary valves; in the following table the two different sections are shown.

#### ARRANGEMENT SECTION BODY WITH AUXILIARY VALVES



#### ARRANGEMENT SECTION BODY WITHOUT AUXILIARY VALVES





WORK SECTION

ARRANGEMENT BODY FOR MECHANICAL OR HYDRAULIC ACTUATION (PARALLEL CIRCUIT)

CODE	DESCRIPTION	CONFIGURATION
<b>S1P1M3S</b>	PARALLEL section with adjustable valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V55 - V57)</i>	
<b>S1P1M3B</b>	PARALLEL section with adjustable valves ports G 1/2 <i>(only for valve type: V55 - V57)</i>	
<b>S1P2M3S</b>	PARALLEL section with fixed valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S1P2M3B</b>	PARALLEL section with fixed valves ports G 1/2 <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S2P1M3S</b>	PARALLEL section without valves ports 7/8"-14 UNF (SAE10)	
<b>S2P1M3B</b>	PARALLEL section without valves ports G 1/2	

ARRANGEMENT BODY FOR MECHANICAL OR HYDRAULIC ACTUATION (TANDEM CIRCUIT)

CODE	DESCRIPTION	CONFIGURATION
<b>S1T1M3S</b>	TANDEM section with adjustable valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V55 - V57)</i>	
<b>S1T1M3B</b>	TANDEM section with adjustable valves ports G 1/2 <i>(only for valve type: V55 - V57)</i>	
<b>S1T2M3S</b>	TANDEM section with fixed valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S1T2M3B</b>	TANDEM section with fixed valves ports G 1/2 <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S2T1M3S</b>	TANDEM section without valves ports 7/8"-14 UNF (SAE10)	
<b>S2T1M3B</b>	TANDEM section without valves ports G 1/2	

**WORK SECTION**
**ARRANGEMENT BODY FOR ELECTROHYDRAULIC ACTUATION (PARALLEL CIRCUIT)**

CODE	DESCRIPTION	CONFIGURATION
<b>S1P1E3S</b>	PARALLEL section with adjustable valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V55 - V57)</i>	
<b>S1P1E3B</b>	PARALLEL section with adjustable valves ports G 1/2 <i>(only for valve type: V55 - V57)</i>	
<b>S1P2E3S</b>	PARALLEL section with fixed valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S1P2E3B</b>	PARALLEL section with fixed valves ports G 1/2 <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S2P1E3S</b>	PARALLEL section without valves ports 7/8"-14 UNF (SAE10)	
<b>S2P1E3B</b>	PARALLEL section without valves ports G 1/2	

**ARRANGEMENT BODY FOR ELECTROHYDRAULIC ACTUATION (Tandem circuit)**

CODE	DESCRIPTION	CONFIGURATION
<b>S1T1E3S</b>	TANDEM section with adjustable valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V55 - V57)</i>	
<b>S1T1E3B</b>	TANDEM section with adjustable valves ports G 1/2 <i>(only for valve type: V55 - V57)</i>	
<b>S1T2E3S</b>	TANDEM section with fixed valves ports 7/8"-14 UNF (SAE10) <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S1T2E3B</b>	TANDEM section with fixed valves ports G 1/2 <i>(only for valve type: V51 - V52 - V53)</i>	
<b>S2T1E3S</b>	TANDEM section without valves ports 7/8"-14 UNF (SAE10)	
<b>S2T1E3B</b>	TANDEM section without valves ports G 1/2	

WORK SECTION

6	7					8					9					10			11			12			13										
L	S	1	P	2	E	3	S	V	5	1	1	0	0	V	5	1	1	8	0	S	0	1	N	A	E	0	1	R	E	0	1	K	1	2	D

AUXILIARY VALVES

ECS10A sections with auxiliary valves require double choice on work side A and side B.

The bodies with a fixed setting valve housing are different from bodies with adjustable valves housing.

Valves type V51 and V57 require factory setting:

**FIXED SETTING COMBINED VALVE (V51100):**

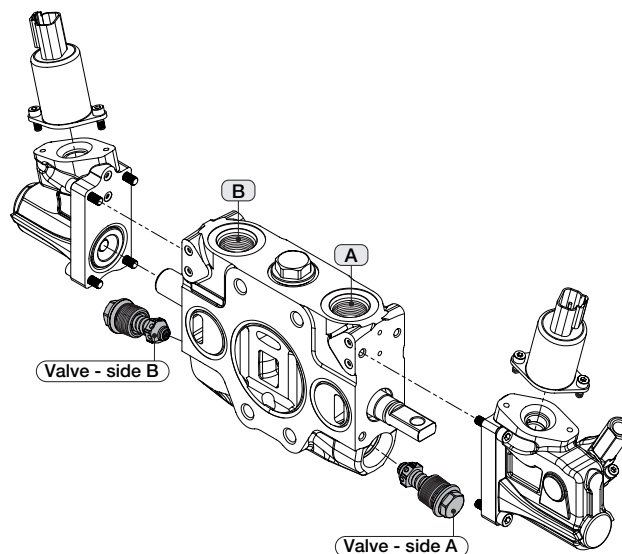
**V51** ..... fixed setting combined valve

**100** ..... value expressed in bar

**ADJUSTABLE PILOT COMBINED VALVE (V57100):**

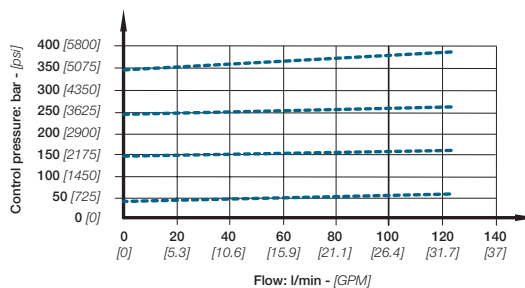
**V57** ..... adjustable pilot combined valve

**100** ..... value expressed in bar

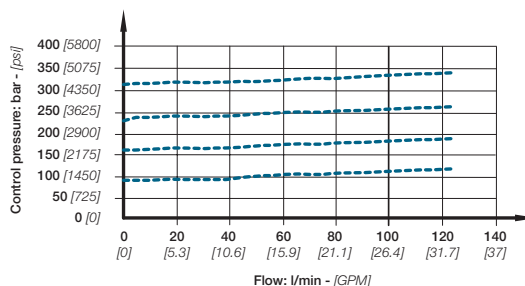


CODE	DESCRIPTION	SYMBOL	SETTING
<b>V51</b>	Fixed setting combined valve		40 - 350 bar
<b>V52</b>	Fixed setting valve plugged		
<b>V53</b>	Fixed setting anticavitation valve		
<b>V55</b>	Adjustable valve plugged		
<b>V57</b>	Adjustable pilot combined valve		50 - 350 bar

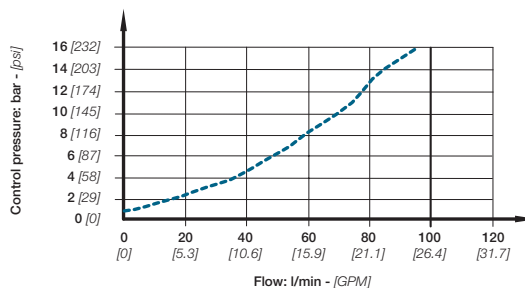
**Adjustable Pilot combined valve (V57)**  
Pressure characteristic as function of flow



**Fixed setting combined valve (V52)**  
Pressure characteristic as function of flow



**Fixed setting anticavitation valve (V53)**  
Pressure characteristic as function of flow



**FIXED SETTING COMBINED VALVE (V51):**  
this valve is not adjustable; factory setting is available from 40 to 350 bar with 10 bar steps.

**PILOT ADJUSTABLE COMBINED VALVE (V57):**  
this valve is adjustable; factory setting is available from 50 to 350 bar with 5 bar steps.

## WORK SECTION

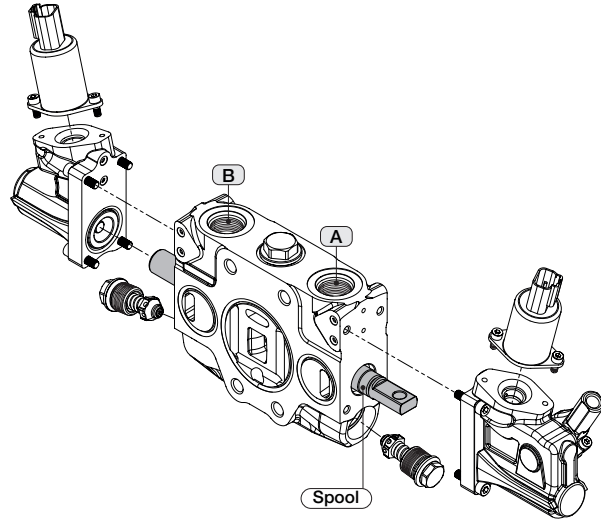
6	7	8	9	10	11	12	13
L	S 1 P 2 E 3 S	V 5 1 1 0 0	V 5 1 1 8 0	S 0 1 N	A E 0 1	R E 0 1	K 1 2 D

## SPOOL CLASSIFICATION

Each ECS10A section contains a spool; each spool is compatible with all actuators.

Example with spool 3 position double acting:

**S01N** ..... Nominal flow (100 l/min)



CODE	DESCRIPTION	SYMBOL
<b>S01</b>	Spool 3 positions double acting	
<b>S02</b>	Spool 3 positions double acting A/B to tank	
<b>S03</b>	Spool 3 positions single acting on A	
<b>S04</b>	Spool 3 positions single acting on B	
<b>S05</b>	Spool 4 positions double acting with float in 4 <sup>th</sup> position	
<b>S11</b>	Spool 3 positions double acting A to tank - B blocked	
<b>S12</b>	Spool 3 positions double acting A blocked - B to tank	


**Note:**

S05 spool needs a special machining on the body and a special detent kit. The spools shown correspond to standard configuration, for different applications contact our Sales Office.

WORK SECTION

6	7	8	9	10	11	12	13
L	S 1 P 2 E 3 S	V 5 1 1 0 0	V 5 1 1 8 0	S 0 1 N	A E 0 1	R E 0 1	K 1 2 D

SPOOL ACTUATION

Spool actuations are classified in three categories:

**MECHANICAL ACTUATION**

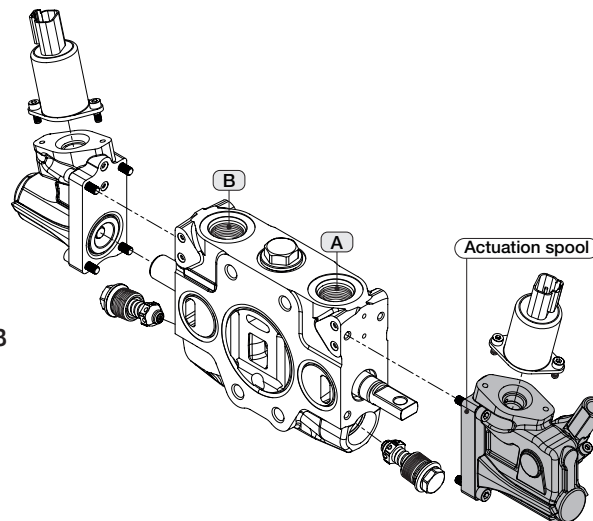
- Requires the choice of spool return action (side B).
- Requires a dedicated body.

**HYDRAULIC ACTUATION**

- Leave out the spool return action code when choosing hydraulic actuation AH01B, AH01S, AH02B, AH02S, AH04B and AH04S.
- Requires a dedicated body.

**ELECTROHYDRAULIC ACTUATION**

- Requires a dedicated body.



SPOOL ACTUATION - SIDE A (MECHANICAL ACTUATION)

CODE	DESCRIPTION	CONFIGURATION	SYMBOL
AM01	Control lever		
AM02	Control lever rotated 180°		
AM05	Control tang spool end Spool end thickness = 8 MM Spool end hole = Ø8 MM		

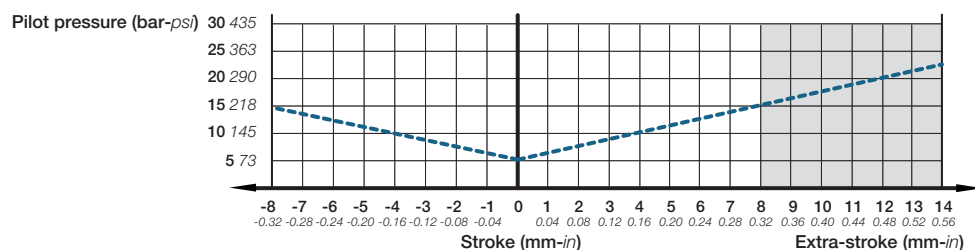
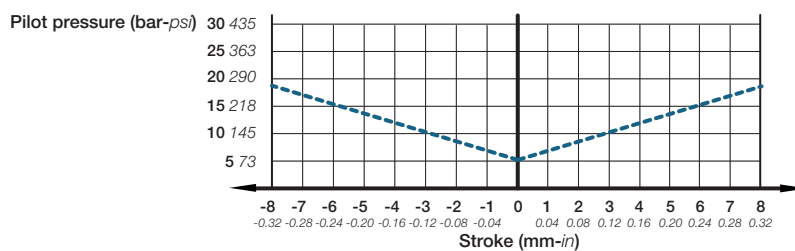
## WORK SECTION

### SPOOL ACTUATION (HYDRAULIC ACTUATION)

CODE	DESCRIPTION	CONFIGURATION	SYMBOL
AH01B	Hydraulic actuation with side ports (G 1/4)		
AH01S	Hydraulic actuation with side ports (SAE6)		
AH02B	Hydraulic actuation with upper ports (G 1/4)		
AH02S	Hydraulic actuation with upper ports (SAE6)		
AH04B	Hydraulic actuation with stroke limiter ports (G 1/4)		
AH04S	Hydraulic actuation with stroke limiter ports (SAE 6)		

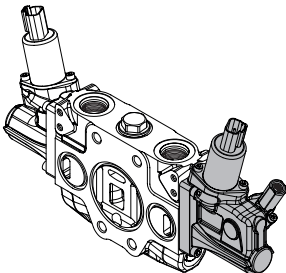
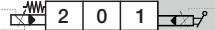
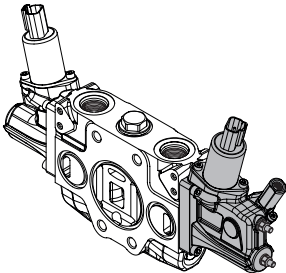

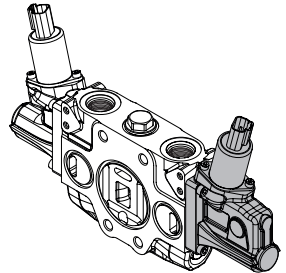
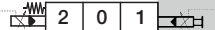
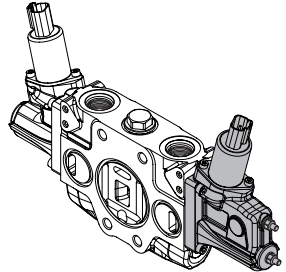

### SPRING CHARACTERISTIC CURVES HYDRAULIC ACTUATION

The graph shows the spool stroke as a function of the pressure operating.



WORK SECTION

SPOOL ACTUATION - SIDE A (ELECTROHYDRAULIC ACTUATION)

CODE	DESCRIPTION	CONFIGURATION	SYMBOL
AE01	Electrohydraulic actuation with lever control		
AE02	Electrohydraulic actuation with lever control and stroke limiter		
AE03	Electrohydraulic actuation without lever control		
AE04	Electrohydraulic actuation without lever control and stroke limiter		

## WORK SECTION

6	7	8	9	10	11	12	13
L	S 1 P 2 E 3 S	V 5 1 1 0 0	V 5 1 1 8 0	S 0 1 N	A E 0 1	R E 0 1	K 1 2 D

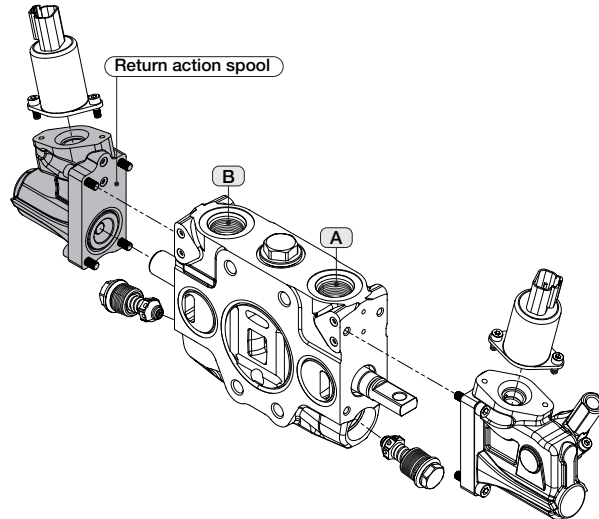
### SPOOL RETURN ACTION

ECS10A spool return action are classified in two categories:

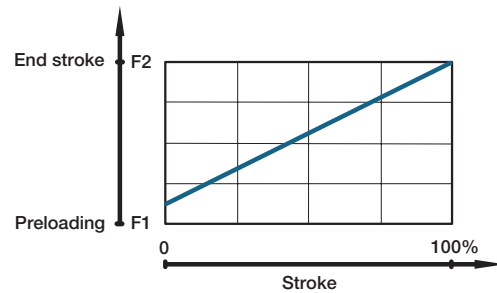
- Mechanical return action spool
- Electrohydraulic return action spool

Spool return action for mechanical actuation have two different spring types:

- **M** (medium spring)
- **S** (soft spring)



SPRING	F1 PRELOADING (N)	F2 END STROKE (N)
<b>M (medium)</b>	120	140
<b>S (soft)</b>	95	115

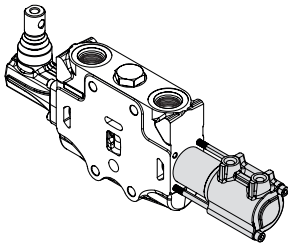
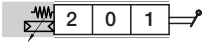


### SPOOL RETURN ACTION - SIDE B (MECHANICAL ACTUATION)

CODE	DESCRIPTION	CONFIGURATION	SYMBOL
<b>RM01M</b>	3 position spring centered spool (MEDIUM spring)		
<b>RM01S</b>	3 position spring centered spool (SOFT spring)		
<b>RM04M</b>	Detent in position 1/2		
<b>RM05M</b>	Detent in position 1		
<b>RM06M</b>	Detent in position 2		
<b>RM11M</b>	Detent in 4 <sup>th</sup> position		
<b>RM12</b>	Detent in position 1/0/2 without spring		

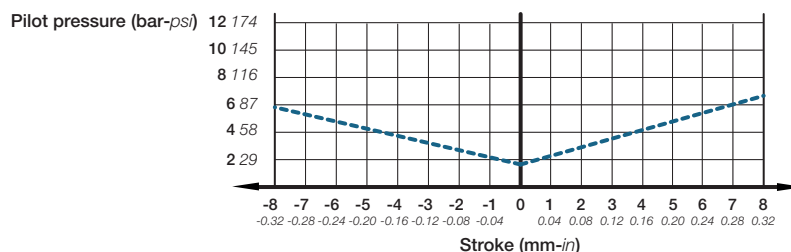


WORK SECTION

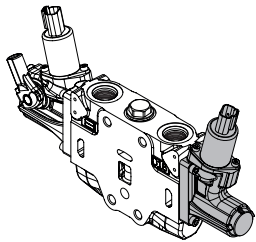
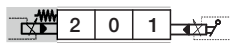
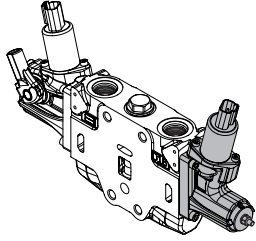
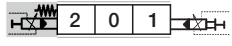
CODE	DESCRIPTION	CONFIGURATION	SYMBOL
RR01	Proportional pneumatic control (connections G 1/8)		
RR03	Proportional pneumatic control (connections NPTF 1/8-27)		

SPRING CHARACTERISTIC CURVE PNEUMATIC CONTROL

The diagram shows the spool stroke as a function of the pneumatic pressure operating.



SPOOL RETURN ACTION - SIDE B (ELECTROHYDRAULIC ACTUATION)

CODE	DESCRIPTION	CONFIGURATION	SYMBOL
RE01	Spool return kit for Electrohydraulic actuation <i>(only for: AE01-AE02-AE03)</i>		
RE02	Spool return kit for Electrohydraulic actuation with stroke limiter <i>(NOT with: AE02)</i>		

## WORK SECTION

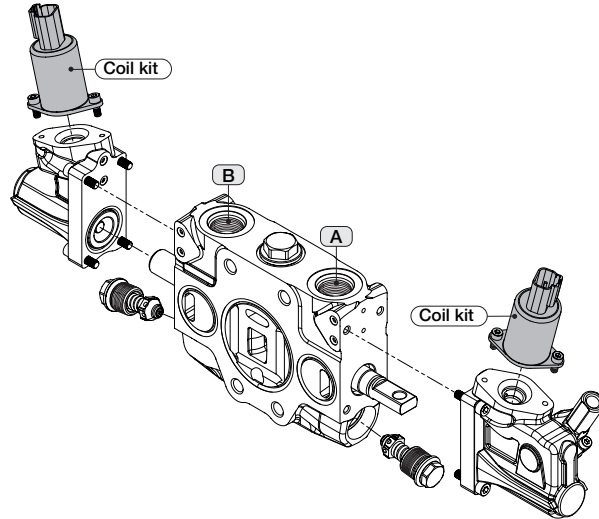
6	7	8	9	10	11	12	13
L	S 1 P 2 E 3 S	V 5 1 1 0 0	V 5 1 1 8 0	S 0 1 N	A E 0 1	R E 0 1	K 1 2 D

### COIL KIT

Coil kit must be ordered separately with all electrohydraulic actuators.

2 coil types are available in 12 and 24 Volt versions:

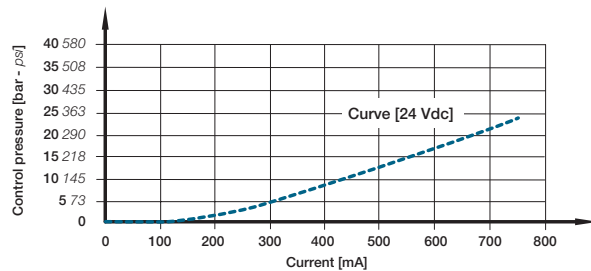
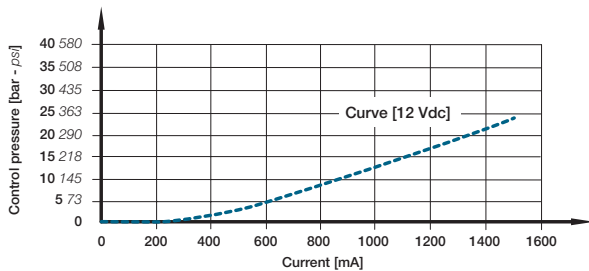
- **DEUTSCH DT04**
- **AMP JUNIOR**



### COIL AND CONNECTOR DATA

SPECIFICATIONS	K12D	K24D	K12A	K24A
Connector type	DEUTSCH DT04-2P		AMP Junior timer (AMP84-9419)	
Supply voltage	12 VDC	24 VDC	12 VDC	24 VDC
Coil resistance	4.7 Ohm ±5%	20.8 Ohm ±5%	4.7 Ohm ±5%	20.8 Ohm ±5%
Maximal current	1500±10 mA	750±10 mA	1500±10 mA	750±10 mA
PWM Frequency recommended	PWM 100 Hz			
Filter screen	125 µm			
Response time	< 50 ms			
Duty cycle	ED 100%			
Degree of protection	Deutsch IP69K		AMP IP65	
Connector color	Black		Mossy-grey	
Feeding reducing pressure	40 bar			
Max pressure on pilot tank line	5 bar			

### CHARACTERISTIC CURVE CURRENT VS. PRESSURE (Less than 2% Hysteresis)



**Note:**

Mating connector for Deutsch DT04 is:  
DT06-2S

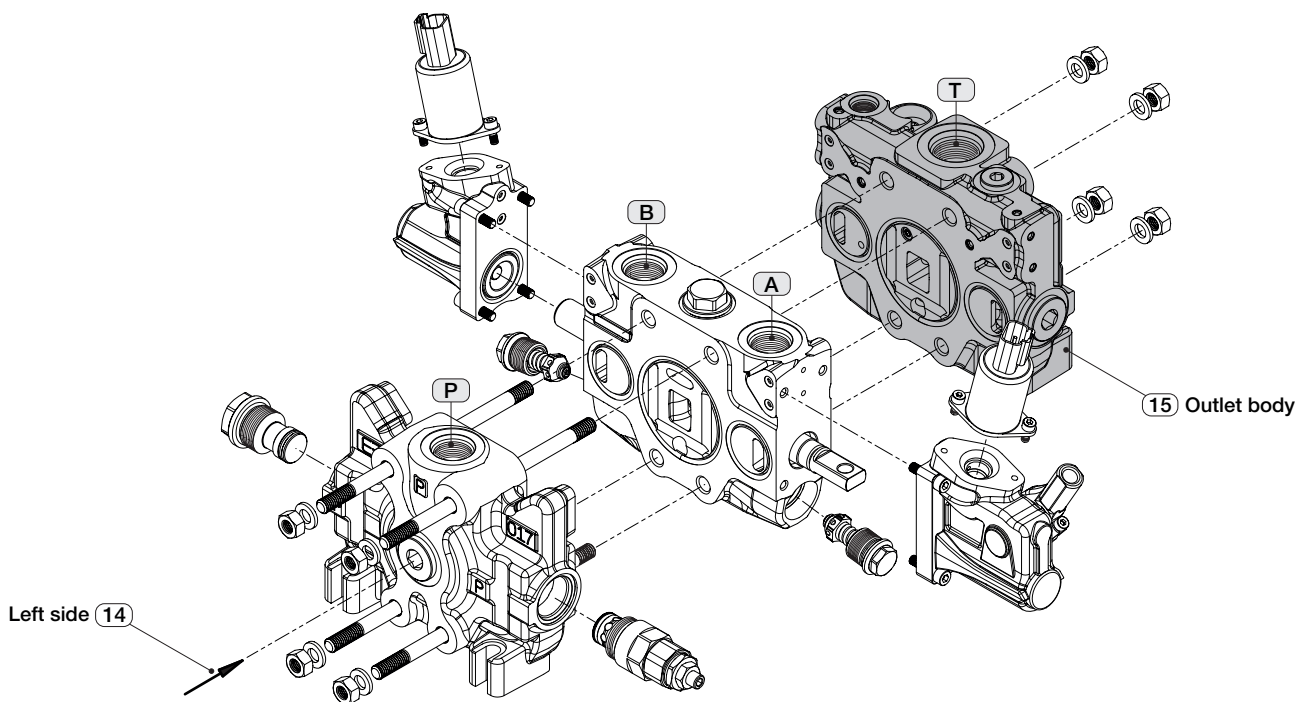


OUTLET SECTION

14	15			
L	T	1	R	4 S

There are two main types of arrangement outlet section:

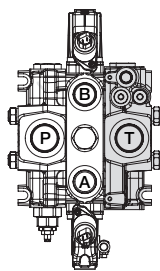
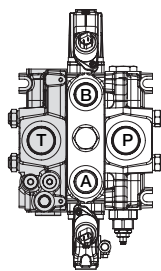
- **Outlet version with RDP**  
to be used when at least one section in the directional valve has electrohydraulic actuation
- **Outlet version without RDP**  
to be used when no electrohydraulic actuations are present in the directional valve



This example represents outlet section ECS10A with left configuration

**L** .....Left outlet side

**T1R4S** .....Upper outlet - 1”1/16-12 UNF (SAE12) with RDP

CODE	DESCRIPTION	DRAWING	DESCRIPTION	DRAWING	
L	Outlet side LEFT		R	Outlet side RIGHT	

Convention for all ECS10A valves with outlet right (R) or outlet left (L):

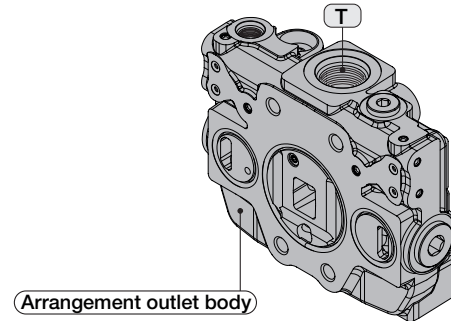
- side A = spool actuation side
- side B = spool return action side.

## OUTLET SECTION

14	15			
L	T	1	R	S

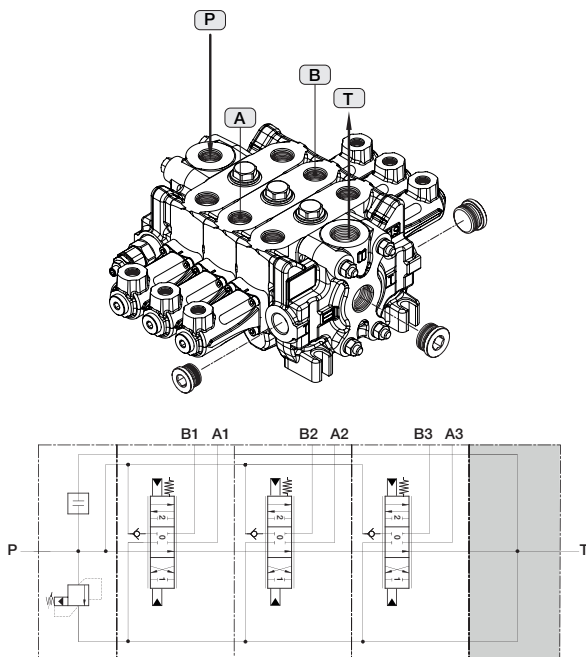
### ARRANGEMENT OUTLET BODY

ECS10A arrangement outlet body is available in two configurations: SAE thread or BSP thread. The maximum flexibility of the outlet body configuration is guaranteed by the positioning of the service ports plug. It is possible to have simple T port or two ports configuration for HPCO connection; HPCO allows to extend the by pass channel and connect a second directional valve.

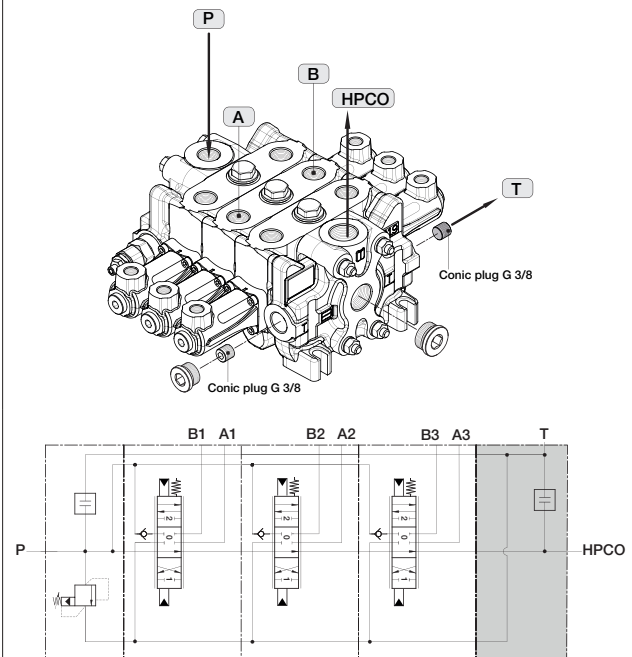


All outlet section ECS10A can be easily transformed from simple T port to HPCO configuration just by installing two conic plugs. These examples represents arrangement outlet body in left configuration for mechanical or hydraulic control.

#### ARRANGEMENT OUTLET SECTION simple T port



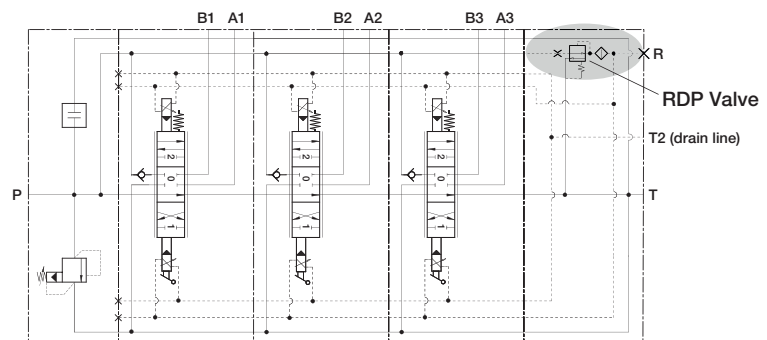
#### ARRANGEMENT OUTLET SECTION HPCO connection



#### Note:

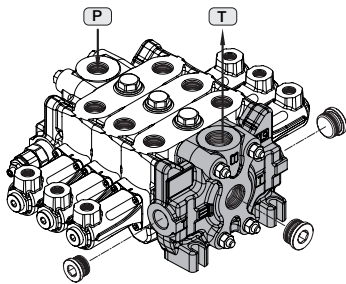
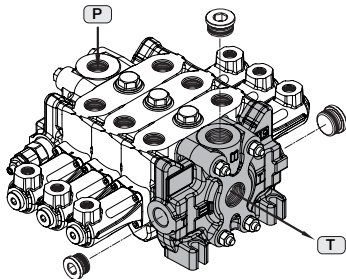
All outlet sections ECS10A for electrohydraulic configuration contain a pressure reducing valve (RDP).

We recommend to connect drain port T2 directly to tank, in order to avoid control system damages and inaccurate control.

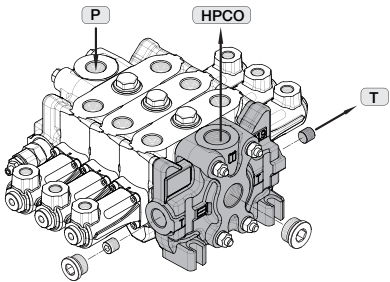
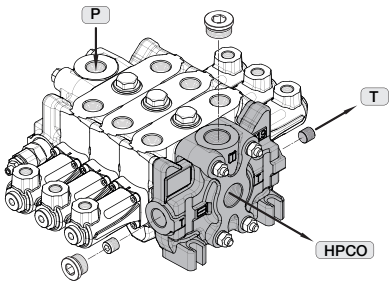


OUTLET SECTION

OUTLET CONFIGURATION FOR MECHANICAL OR HYDRAULIC CONFIGURATION (SIMPLE T PORT)

CODE	DESCRIPTION	CONFIGURATION
<b>T14S</b>	Upper outlet - 1"1/16-12 UNF (SAE12)	
<b>T14B</b>	Upper outlet - G 3/4	
<b>T24S</b>	Central outlet - 1"1/16-12 UNF (SAE12)	
<b>T24B</b>	Central outlet - G 3/4	

OUTLET CONFIGURATION FOR MECHANICAL OR HYDRAULIC CONFIGURATION (HPCO CONNECTION)

CODE	DESCRIPTION	CONFIGURATION
<b>TH14S</b>	HPCO Upper outlet - 1"1/16-12 UNF (SAE12) T side outlet B - 7/8" 14 UNF (SAE10)	
<b>TH14B</b>	HPCO Upper outlet - G 3/4 T side outlet B - G 1/2	
<b>TH24S</b>	HPCO Central outlet - 1"1/16-12 UNF (SAE12) T side outlet B - 7/8" 14 UNF (SAE10)	
<b>TH24B</b>	HPCO Central outlet - G 3/4 T side outlet B - G 1/2	

## OUTLET SECTION

### OUTLET CONFIGURATION FOR ELECTROHYDRAULIC CONFIGURATION (SIMPLE T PORT)

CODE	DESCRIPTION	CONFIGURATION
<b>T1R4S</b>	Upper outlet - 1"1/16-12 UNF (SAE12) with RDP <i>T2 drain: 9/16-18 UNF thread</i>	
<b>T1R4B</b>	Upper outlet - G 3/4 with RDP <i>T2 drain: G 1/4" thread</i>	
<b>T2R4S</b>	Central outlet - 1"1/16-12 UNF (SAE12) with RDP <i>T2 drain: 9/16-18 UNF thread</i>	
<b>T2R4B</b>	Central outlet - G 3/4 with RDP <i>T2 drain: G 1/4" thread</i>	

### OUTLET CONFIGURATION FOR ELECTROHYDRAULIC CONFIGURATION (HPCO CONNECTION)

CODE	DESCRIPTION	CONFIGURATION
<b>TH1R4S</b>	HPCO Upper outlet - 1"1/16-12 UNF (SAE12) T side outlet B - 7/8" 14 UNF (SAE10) with RDP <i>T2 drain: 9/16-18 UNF thread</i>	
<b>TH1R4B</b>	HPCO Upper outlet - G 3/4 T side outlet B - G 1/2 with RDP <i>T2 drain: G 1/4" thread</i>	
<b>TH2R4S</b>	HPCO Central outlet - 1"1/16-12 UNF (SAE12) T side outlet B - 7/8" 14 UNF (SAE10) with RDP <i>T2 drain: 9/16-18 UNF thread</i>	
<b>TH2R4B</b>	HPCO Central outlet - G 3/4 T side outlet B - G 1/2 with RDP <i>T2 drain: G 1/4" thread</i>	

OPTION

PAINTING

On request all ECS10A directional control valves by EBI can be delivered painted (RAL 9005 black primer).

ORDER EXAMPLE OF ECS10A/1 PAINTED:

info	E	C	S	1	0	A	N	1																												
inlet	L	P	1	3	S	V	0	1	1	5	0	V	0	2																						
section	L	S	1	P	2	E	3	S	V	5	1	1	0	0	V	5	1	1	8	0	S	0	1	N	A	E	0	1	R	E	0	1	K	1	2	D
outlet	L	T	1	R	4	S																														
option	X	1																																		

X1 ..... Panted color black

ACCESSORIES

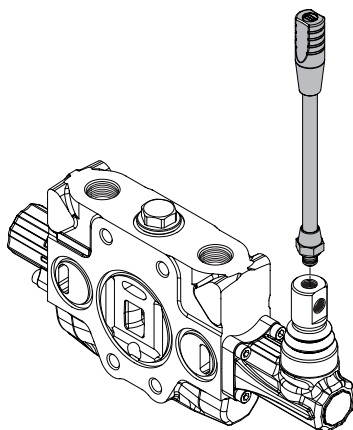
LEVER ROD FOR MANUAL OPERATION

All manually operated control valves are equipped with a lever rod; the following table lists the lever available for the ECS10A control Valve.



**Note:**  
The lever rod must be order separately.

Example of standard rod lever for mechanical actuation AM01:

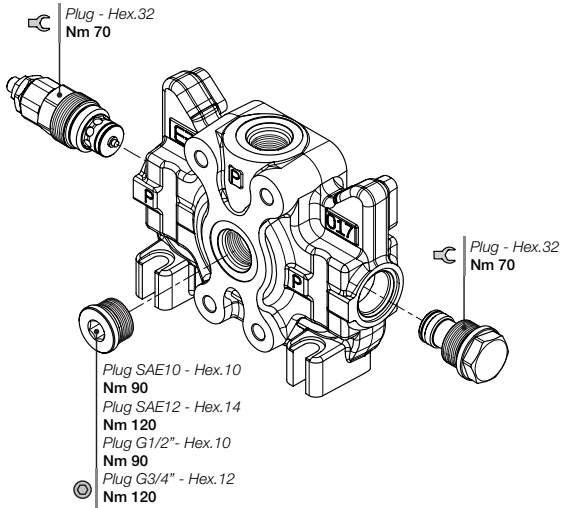


CODE	DESCRIPTION	LENGHT	DRAWING
W10A	Rod lever for electrohydraulic actuation	145 mm	
W10B	Rod lever for mechanical actuation	195 mm	
W10C	Rod lever for mechanical actuation	245 mm	

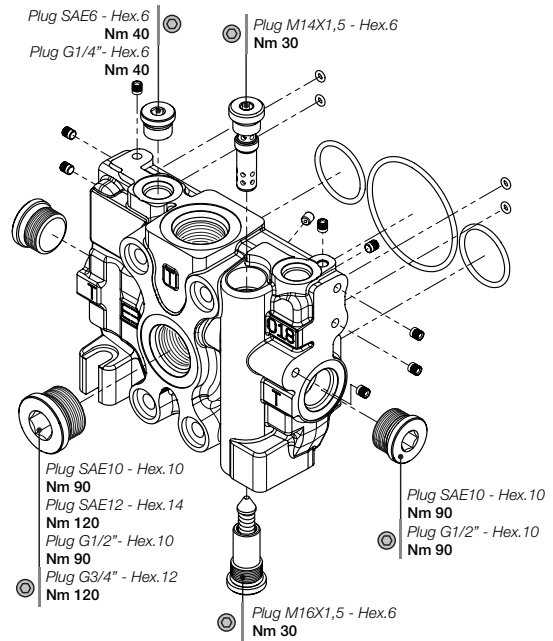


## GENERAL CLAMPING TORQUE

The following design provides the main tightening torques of the **INLET SECTION**

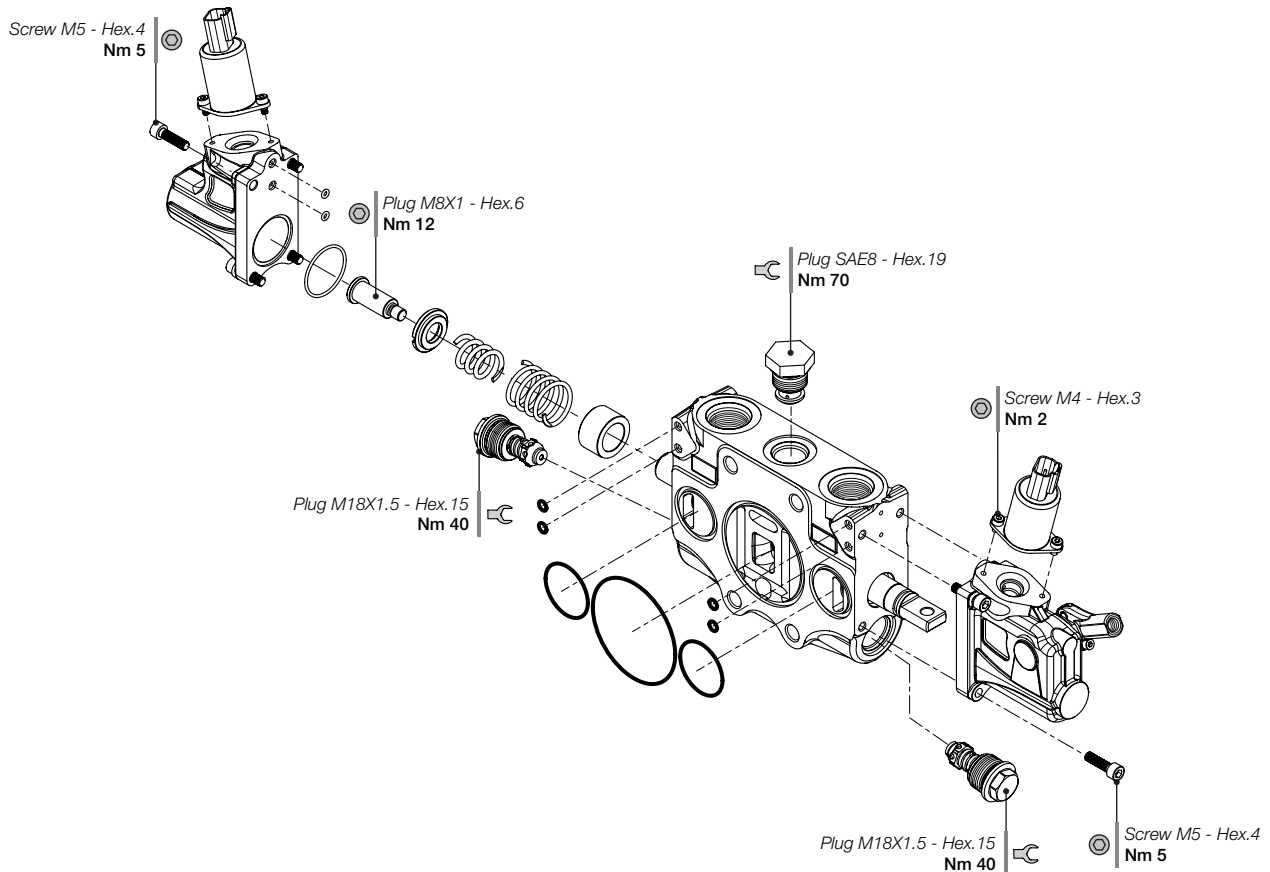


The following design provides the main tightening torques of the **OUTLET SECTION**



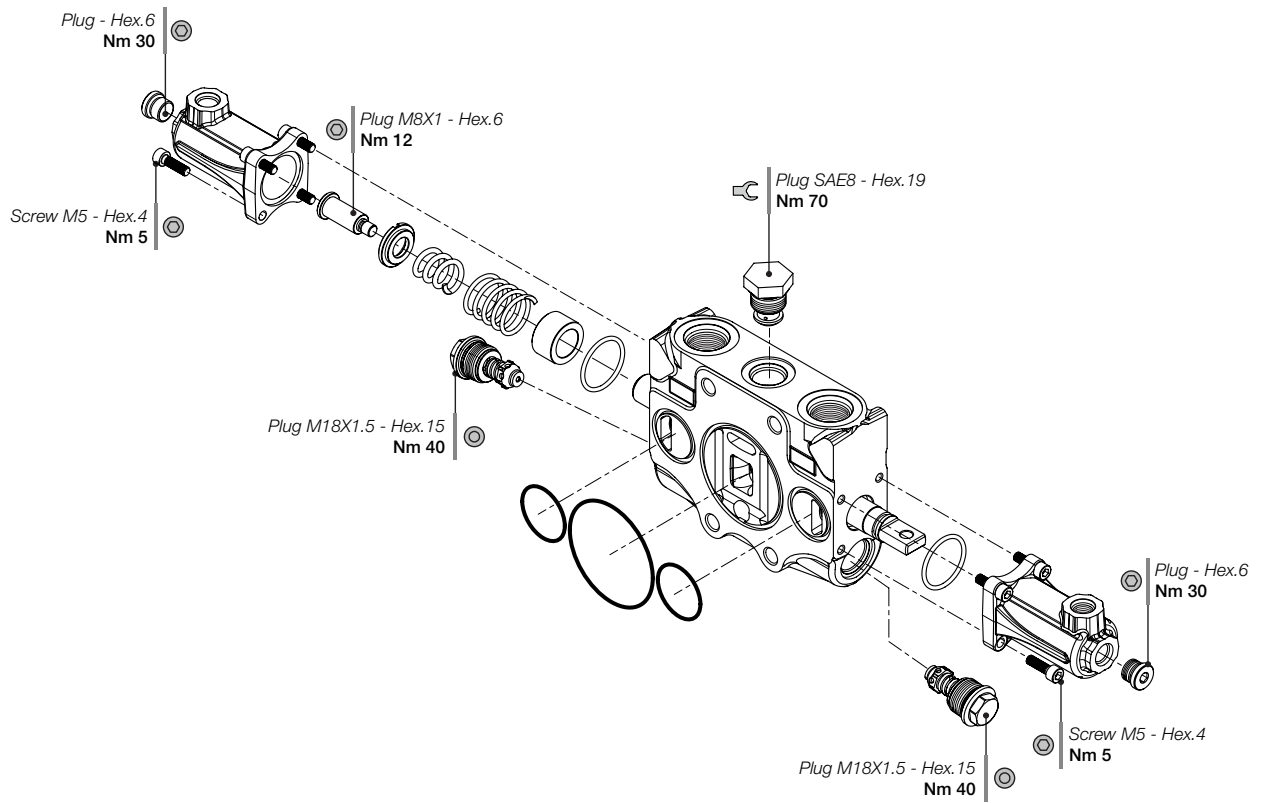
The following design provides the main tightening torques of the **WORK SECTION**

### ELECTROHYDRAULIC ACTUATION

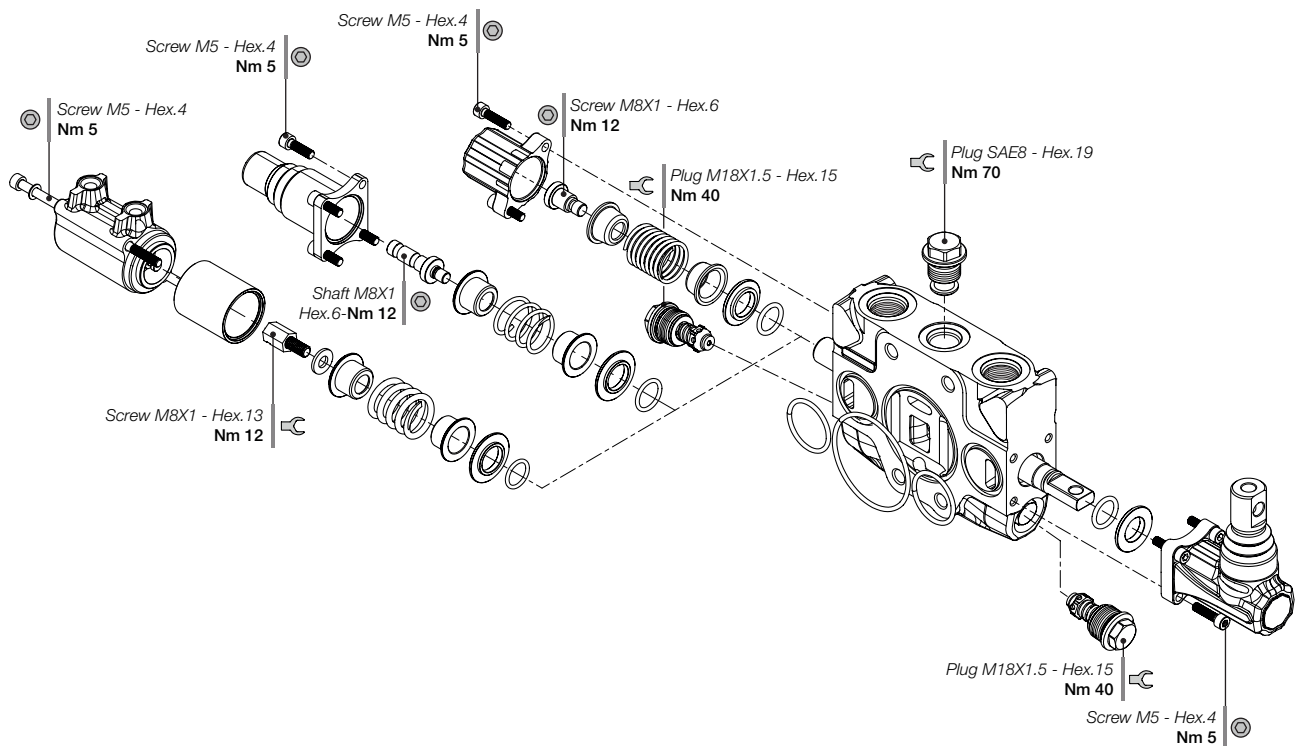




### HYDRAULIC ACTUATION



### MECHANICAL ACTUATION





Rev. 01 - November, 2020

[www.ebimc.com](http://www.ebimc.com)

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