



*Monoblock directional control valve
with auxiliary valves and check valves*

ECM08A

Rev. 00 • July, 2023

TECHNICAL CATALOGUE



.....
Controls



HISTORY OF REVISIONS

DATE	PAGE	CHANGED	REV.
July, 2023	-	First edition	00
September, 2024	37 - 38 - 39	Spare parts list added	01

ABOUT THE MANUAL

This manual contains the technical instructions for the monoblock directional control valve ECM08A. 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 the right 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 for the most recent version of this manual.

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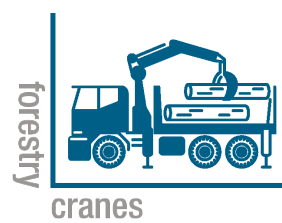
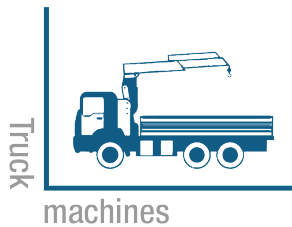
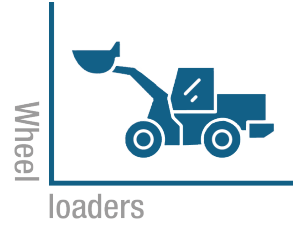
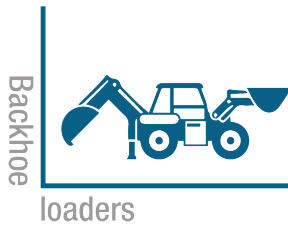
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INTRODUCTION

CONTROLS

EBI motion controls provides a broad choice of directional monoblock control valves expertly developed and tested to meet different market sectors' needs. ECM08A are suited for specialized applications for a variety of mobile equipment such as:



ECM08A

MONOBLOCK DIRECTIONAL CONTROL VALVE

From 2 to 8 working sections.

Compact directional valve with low pressure losses.

Check valves on every spool: good control on multiple actuations.

Interchangeable spools.

Availability of manual, hydraulic, pneumatic, and electric actuations.

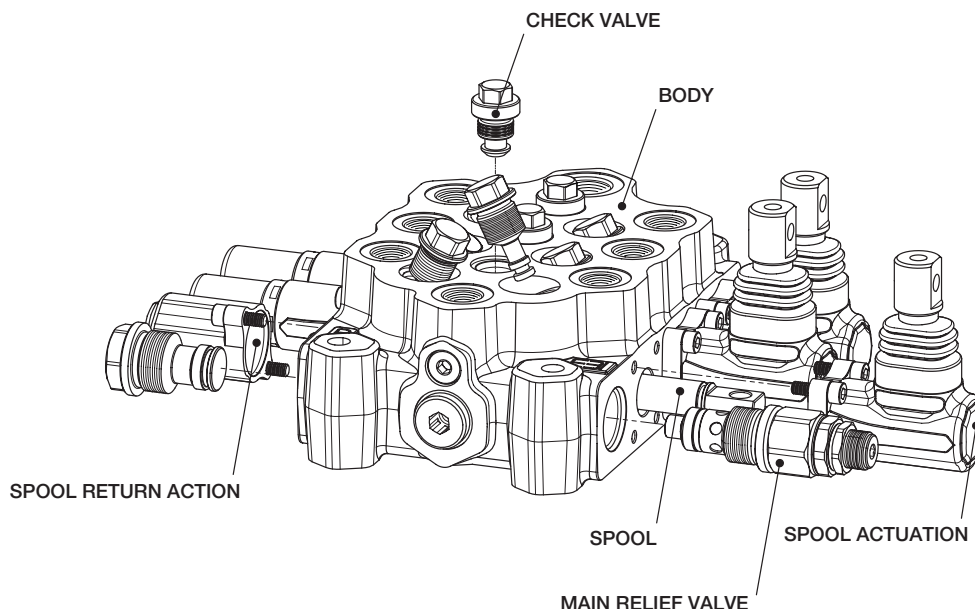
Wide range of auxiliary valves on the ports.

GENERAL INFORMATION

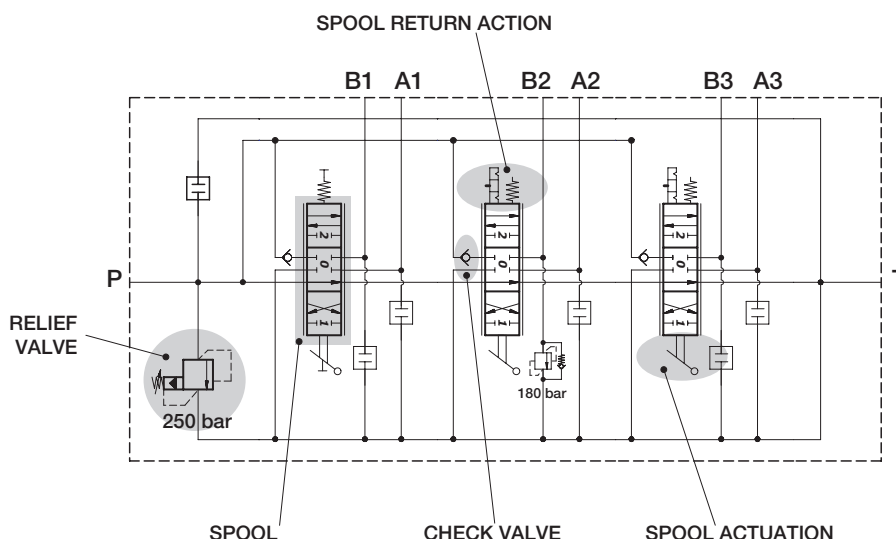
HYDRAULIC OPERATING PRINCIPLE

ECM08A are directional control valves of monoblock design. They give fine control of speed and direction of oil flow. The valve is operated manually, hydraulically or pneumatically, as required.

They basically consist of a body, spool, check valve on every section, spool actuation, spool return action and main relief valve.



In the unoperated condition, the spool is held in starting position by the return spring. In this position the connection from pump to service is closed. When the spool is operated it intercepts the neutral gallery and diverts the oil flow to service ports **A** or **B**. If two or more spools are actuated at the same time, the oil will power the service port which has the lower load by flowing through the path with the least resistance; by throttling the spools, the flow of oil can be divided between two or more service ports (**Parallel circuit**).



ECM08A/3 with manual actuation in standard configuration.

CARRY-OVER CONNECTION (HPCO)

This option allows the neutral gallery to be extended downstream in order to power a second directional control valve in series. A directional control valve configured in this manner requires an unloading circuit (T) for the work ports.

APPLICATION AND SAFETY GUIDELINES

INTENDED USE

Monoblock directional control valve ECM08A 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 ECM08B 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 $+50^{\circ}\text{C}$ [-4°F $+122^{\circ}\text{F}$].

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 ECM08A, 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 ECM08A 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 highly 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 and assembly 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

When 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 object 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 safely 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 higher than the recommended value; otherwise there might be strains or damage to control valve possibly leading to 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)	
	G 3/8	G 1/2	G 3/8	G 1/2	G 3/8	G 1/2
<i>with rubber sealing (din 3869)</i>	40	90	40	90	40	90
<i>with copper or steel and rubber washer</i>	40	90	40	90	40	90
UN/UNF THREADS ISO 11926-1	3/4" 16 UNF	7/8"-14 UNF	3/4" 16 UNF	7/8"-14 UNF	3/4" 16 UNF	7/8"-14 UNF
<i>with o-ring</i>	40	90	40	90	40	90

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

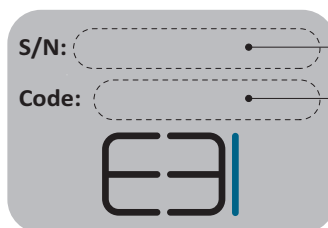
PART NUMBER CODE

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).



S/N: [] AREA FOR SERIAL NUMBER CODE
Code: [] AREA FOR PART NUMBER CODE



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	VISCOSITY CLASS AND FILTRATION DATA		
	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 _x ≥75)	Contamination class	
			ISO 4406	NAS 1638
System/components operating at <i>HIGH PRESSURE > 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 < 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

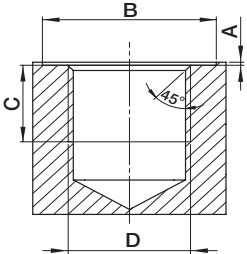
**Attention:**

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.

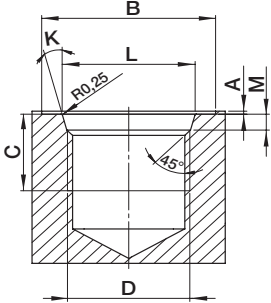
PORT DETAILS

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
	UNI-ISO 228	mm	in	mm	in	mm	in	
	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	

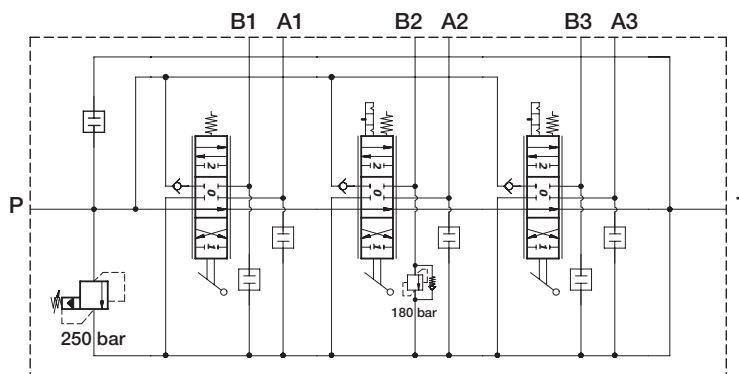
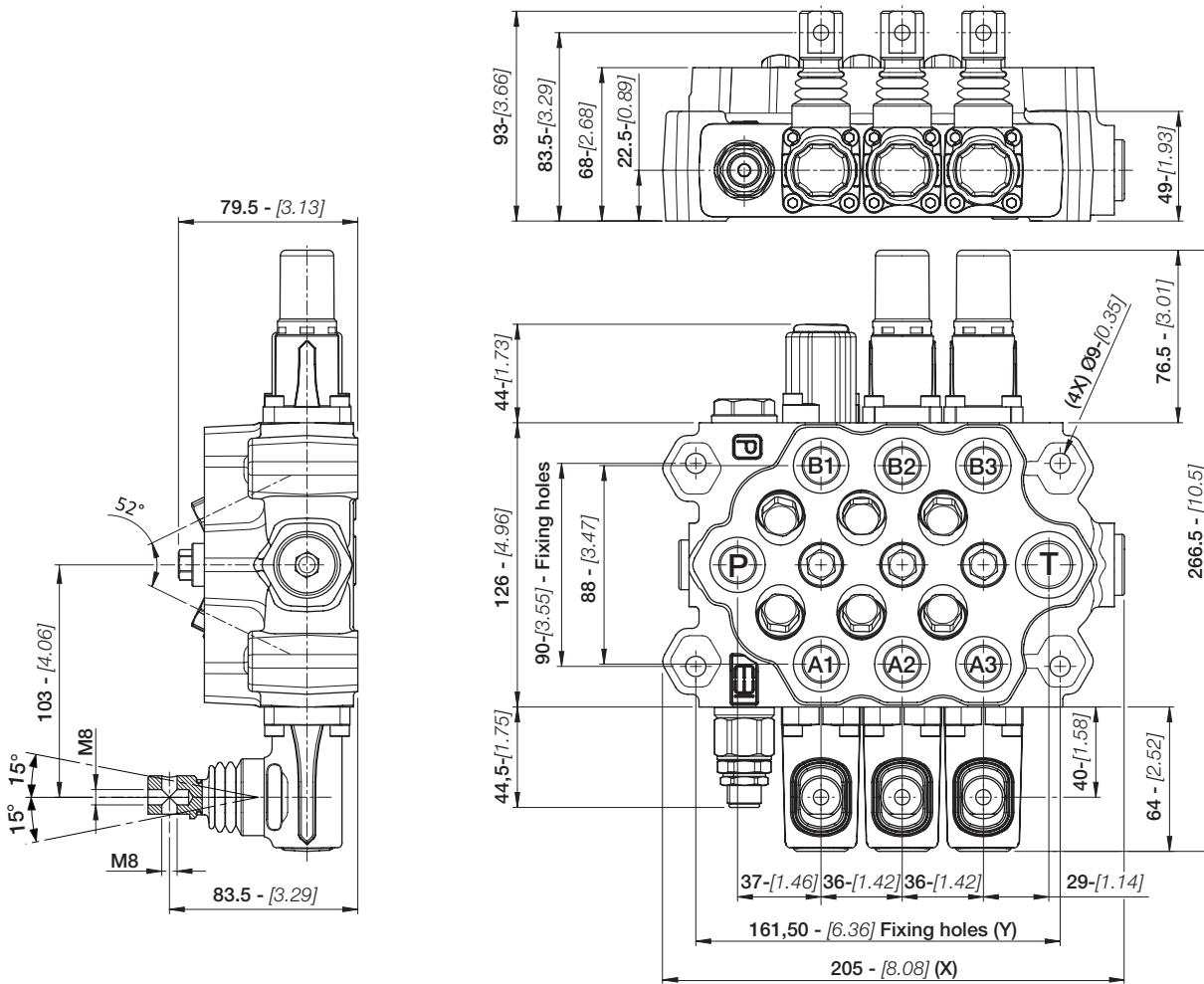


UN/UNF THREADS ISO 11926-1	D	C		B		L		M		K	A		CODE
	ASA-B1-1	mm	in	mm	in	mm	in	mm	in		mm	in	
	9/16-18 UNF (SAE6)	13	0.51	26	1.02	15.6	0.61	2.5	0.098	12°	1	0.04	1S
3/4-16 UNF (SAE8)	15	0.59	30	1.18	20.6	0.81	2.6	0.102	15°	1.5	0.06	2S	
7/8-14 UNF (SAE10)	17	0.67	34	1.34	23.9	0.94	2.6	0.102	15°	1.5	0.06	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



STANDARD CONNECTIONS

TYPE	BSP (ISO 1179-1)	UN-UNF (ISO 11926-1)
INLET - P	G 3/8 (G 1/2)*	3/4" - 16 UNF (7/8" - 14 UNF)*
PORTS - A / B	G 3/8 (G 1/2)*	3/4" - 16 UNF (7/8" - 14 UNF)*
OUTLET - T / T1 / HPCO	G 3/8 (G 1/2)*	3/4" - 16 UNF (7/8" - 14 UNF)*
Pneumatic pilot	G 1/8	NPTF 1/8-27
Hydraulic pilot	G 1/4	9/16" - 18 UNF

Note: (*) for G 1/2 and 7/8"-14 UNF options, please contact our sales dept.

TECHNICAL SPECIFICATIONS

TYPE	X	Y		WEIGHT
		mm - [in]	mm - [in]	
ECM08A/2	169 - [6.66]	125,5 - [4.94]	6,9 - [15.2]	
ECM08A/3	205 - [8.08]	161,5 - [6.36]	8,8 - [19.4]	
ECM08A/4	241 - [9.50]	197,5 - [7.77]	10,7 - [23.6]	
ECM08A/5	277 - [10.91]	233,5 - [9.19]	12,6 - [27.8]	
ECM08A/6	313 - [12.33]	269,5 - [10.61]	14,5 - [32]	
ECM08A/7	349 - [13.75]	305,5 - [12.03]	16,4 - [36.2]	
ECM08A/8	385 - [15.17]	341,5 - [13.44]	18,3 - [40.4]	

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 ECM08A go through functional testing at these conditions before shipment.

HYDRAULIC STANDARD SPECIFICATIONS

Nominal Flow range	50 l/min - [12 GPM]
Nominal pressure	350 bar - [5000 psi]
Hysteresis	< 1 bar - [14,5 psi]
Hydraulic fluid	Mineral Oil HL, HLP (DIN 51524); phosphate ester (HFD-R)
Fluid temperature range	-20°C +80°C [-4°F +176°F]
Fluid viscosity range	10 ÷ 380 cSt
Max contamination level	9 (NAS 1638) - 20/18/15 (ISO 4406:1999)
Recommended filtration	B10 > 75 (ISO 16889:20008)

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.

UNITS OF MEASURE - CONVERSION FACTORS

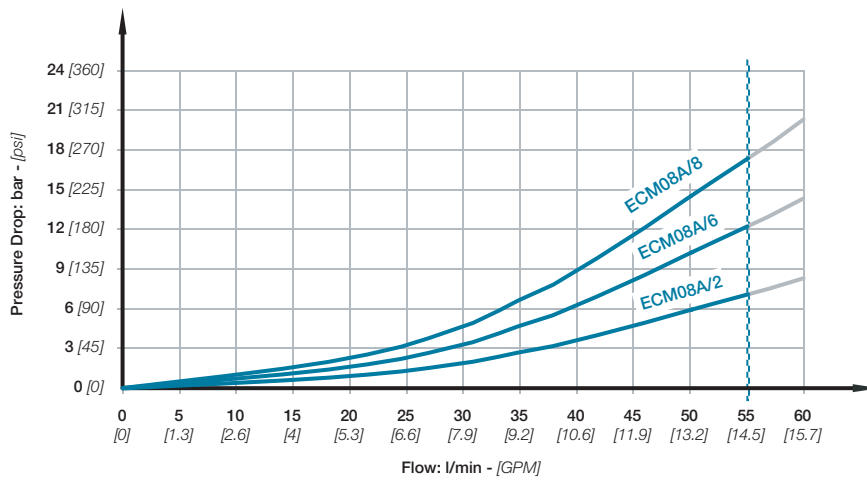
LENGHT	FLOW RATE	MASS	FORCE WEIGHT	PRESSURE
1 mm = 0,0394 in	1 l = 0,2200 gal UK	1 kg = 2,205 lb	1 Nm = 0,1020 Kgf	1 bar = 100000 Pa
1 in = 25,4 mm	1 l = 0,2642 gal US	1 lb = 0,4536 kg	1 Kgf = 9,8067 Nm	1 bar = 14,5 psi
	1 gal UK = 4,546 l			1 Pa = 0,0001 bar
	1 gal UK = 1,2010 gal US			1 Pa = 0,00014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



TYPICAL CURVES

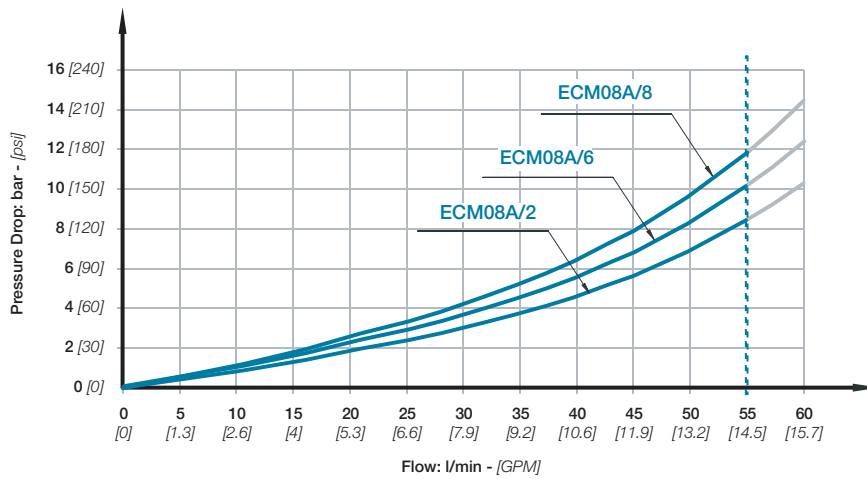
PERFORMANCE DATA - PRESSURE DROP (P-T)

Pressure characteristic as function of flow



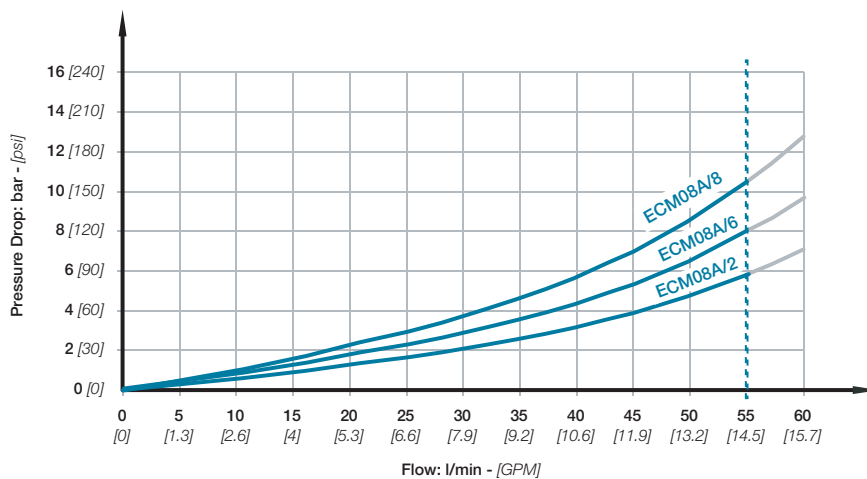
PERFORMANCE DATA - PRESSURE DROP (P-A/B)

Pressure characteristic as function of flow



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

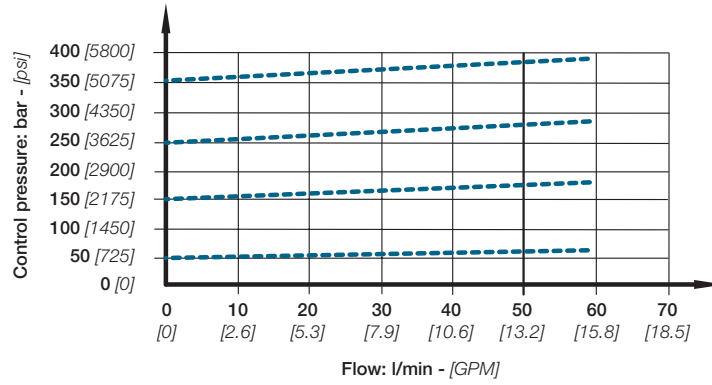
Pressure characteristic as function of flow



TYPICAL CURVES

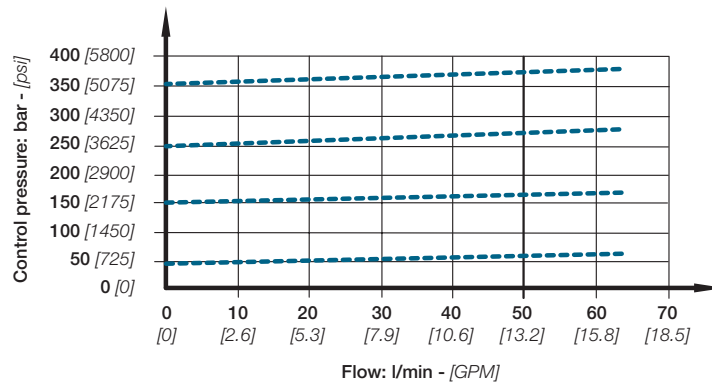
PERFORMANCE DATA - PILOT OPERATED PRESSURE RELIEF VALVE (V01)

Pressure characteristic as function of flow



PERFORMANCE DATA - DIRECT ACTING PRESSURE RELIEF VALVE (V03)

Pressure characteristic as function of flow





ORDERING CODES

The order code below provides an example of control ECM08A with 3 work sections; ordering code in position 6, 7, 8, 9, 10, must be repeated for every work section.

This example represents a monoblock valve in left inlet configuration.

See page 17 - 33 for more information about the different options available.

Info	product	1	2	3	4	5
	E C M 0 8 A	L	N 3	M V A 2 S	V 0 3 2 5 0	V 0 2
First work section	6	7	8	9	10	
	S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2	
Second work section	6	7	8	9	10	
	S 0 1 N	A M 0 1	R M 0 2 M	V 5 1 1 8 0	V 5 2	
Third work section	6	7	8	9	10	
	S 0 1 N	A M 0 1	R M 0 2 M	V 5 2	V 5 2	
Options	11					
	X 3					

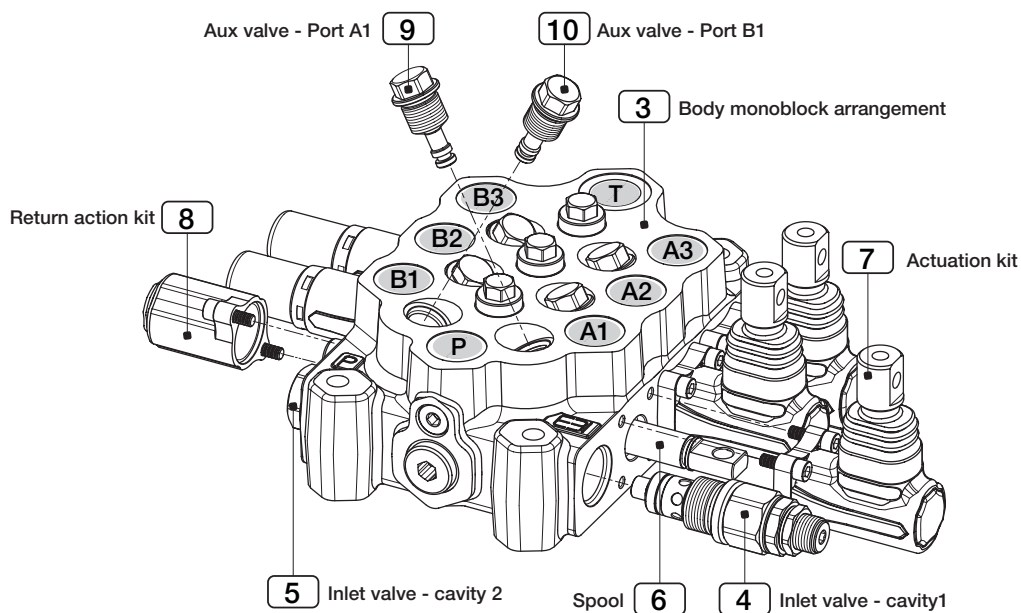
	POSITION	CODE	DESCRIPTION	PAGE
info		ECM08A	Product	
	1	L	Inlet side	17
	2	N3	Section number	17
	3	MVA2S	Arrangement monoblock body	18
	4	V03250	Inlet valve cavity 1	21
First work section	5	V02	Inlet valve cavity 2	21
	6	S01N	Spool	24
	7	AM01	Actuation kit	25
	8	RM01M	Return action kit	31
	9	V52	Aux valve - port A1	33
Second work section	10	V52	Aux valve - port B1	33
	6	S01N	Spool	24
	7	AM01	Actuation kit	25
	8	RM02M	Return action kit	31
	9	V51180	Aux valve - port A2	33
Third work section	10	V52	Aux valve - port B2	33
	6	S01N	Spool	24
	7	AM01	Actuation kit	25
	8	RM02M	Return action kit	31
	9	V52	Aux valve - port A3	33
	10	V52	Aux valve - port B3	33



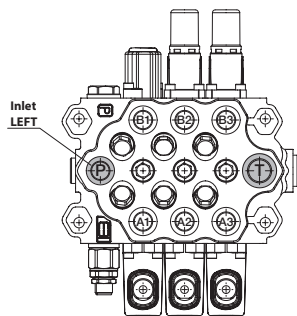
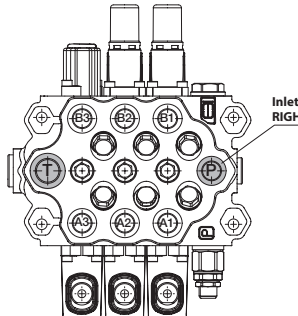
Note:

All monoblock bodies are equipped with one check valve for every spool (o element)
The monoblock ECM08A in standard configuration has the predisposition for the auxiliary valves in all spools (o elements).

Tridimensional drawing of ECM08A with 3 work sections.



On all monoblock ECM08A 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 ECM08A valves with inlet right (R) or left inlet (L):

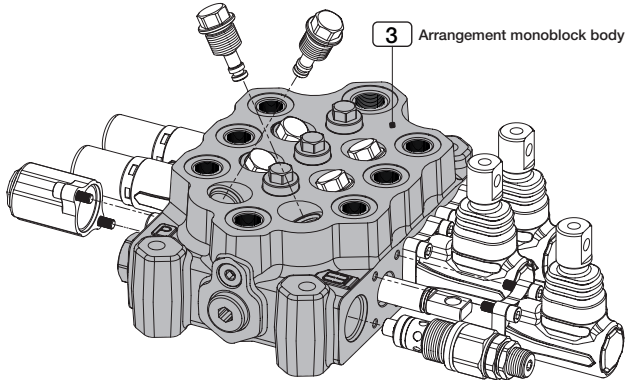
- side A = spool actuation side
- side B = spool return action side.

You can configure a ECM08A from 2 to 8 work sections

CODE	DESCRIPTION
N2	Monoblock with 2 work sections
N3	Monoblock with 3 work sections
N4	Monoblock with 4 work sections
N5	Monoblock with 5 work sections
N6	Monoblock with 6 work sections
N7	Monoblock with 7 work sections
N8	Monoblock with 8 work sections

MONOBLOCK BODY CLASSIFICATION

Info	product	1	2	3	4	5
	E C M 0 8 A	L	N 3	M V A 2 S	V 0 3 2 5 0	V 0 2



Monoblock control valve arrangement body is available in two configurations: SAE thread or BSP thread. All threads present in each body are equal.

It is possible to have two configurations type:

- **simple T port** (standard version)
- **carry-over connection** (HPCO version)

The maximum flexibility of the body configuration is guaranteed by the positioning of the service ports plug. For different applications, contact our Sales Office.

STANDARD VERSION WITH AUXILIARY VALVE

CODE	DESCRIPTION	DRAWING
MVA2S3S	Monoblock body with upper ports P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MVA3S	Monoblock body with upper ports P-T = 7/8"-14 UNF (SAE10)	
MVA2B3B	Monoblock body with upper ports P = G 3/8 T = G 1/2	
MVA3B	Monoblock body with upper ports P-T = G 1/2	
MVB2S3S	Monoblock body with side ports P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MVB3S	Monoblock body with side ports P-T = 7/8"-14 UNF (SAE10)	
MVB2B3B	Monoblock body with side ports P = G 3/8 T = G 1/2	
MVB3B	Monoblock body with side ports P-T = G 1/2	
MVC2S3S	Monoblock body with upper port P and side port T P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MVC3S	Monoblock body with upper port P and side port T P-T = 7/8"-14 UNF (SAE10)	
MVC2B3B	Monoblock body with upper port P and side port T P = G 3/8 T = G 1/2	
MVC3B	Monoblock body with upper port P and side port T P-T = G 1/2	
MVD2S3S	Monoblock body with side port P and upper port T P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MVD3S	Monoblock body with side port P and upper port T P-T = 7/8"-14 UNF (SAE10)	
MVD2B3B	Monoblock body with side port P and upper port T P = G 3/8 T = G 1/2	
MVD3B	Monoblock body with side port P and upper port T P-T = G 1/2	

HPCO VERSION - CARRY-OVER CONNECTION WITH AUXILIARY VALVE

CODE	DESCRIPTION	DRAWING
MVU2S3S	Monoblock body with upper port P and HPCO P = 3/4"-16 UNF (SAE8) T-HPCO = 7/8"-14 UNF (SAE10)	
MVU3S	Monoblock body with upper port P and HPCO P-T-HPCO = 7/8"-14 UNF (SAE10)	
MVU2B3B	Monoblock body with upper port P and HPCO P = G 3/8 T-HPCO = G 1/2	
MVU3B	Monoblock body with upper port P and HPCO P-T-HPCO = G 1/2	
MVS2S3S	Monoblock body with side port P and HPCO P = 3/4"-16 UNF (SAE8) T-HPCO = 7/8"-14 UNF (SAE10)	
MVS3S	Monoblock body with side port P and HPCO P-T-HPCO = 7/8"-14 UNF (SAE10)	
MVS2B3B	Monoblock body with side port P and HPCO P = G 3/8 T-HPCO = G 1/2	
MVS3B	Monoblock body with side port P and HPCO P-T-HPCO = G 1/2	

STANDARD VERSION WITHOUT AUXILIARY VALVE

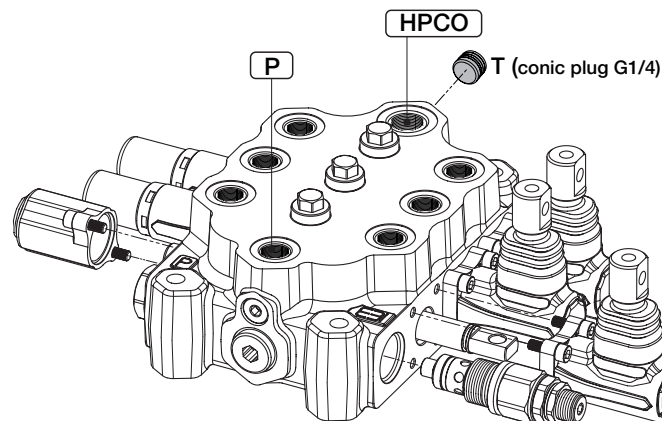
CODE	DESCRIPTION	DRAWING
MWA2S3S	Monoblock body with upper ports P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MWA3S	Monoblock body with upper ports P-T = 7/8"-14 UNF (SAE10)	
MWA2B3B	Monoblock body with upper ports P = G 3/8 T = G 1/2	
MWA3B	Monoblock body with upper ports P-T = G 1/2	
MWB2S3S	Monoblock body with side ports P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MWB3S	Monoblock body with side ports P-T = 7/8"-14 UNF (SAE10)	
MWB2B3B	Monoblock body with side ports P = G 3/8 T = G 1/2	
MWB3B	Monoblock body with side ports P-T = G 1/2	
MWC2S3S	Monoblock body with upper port P and side port T P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MWC3S	Monoblock body with upper port P and side port T P-T = 7/8"-14 UNF (SAE10)	
MWC2B3B	Monoblock body with upper port P and side port T P = G 3/8 T = G 1/2	
MWC3B	Monoblock body with upper port P and side port T P-T = G 1/2	
MWD2S3S	Monoblock body with side port P and upper port T P = 3/4"-16 UNF (SAE8) T = 7/8"-14 UNF (SAE10)	
MWD3S	Monoblock body with side port P and upper port T P-T = 7/8"-14 UNF (SAE10)	
MWD2B3B	Monoblock body with side port P and upper port T P = G 3/8 T = G 1/2	
MWD3B	Monoblock body with side port P and upper port T P-T = G 1/2	

HPCO VERSION - CARRY-OVER CONNECTION WITHOUT AUXILIARY VALVE

CODE	DESCRIPTION	DRAWING
MWU2S3S	Monoblock body with upper port P and HPCO P = 3/4"-16 UNF (SAE8) T-HPCO = 7/8"-14 UNF (SAE10)	
MWU3S	Monoblock body with upper port P and HPCO P-T-HPCO = 7/8"-14 UNF (SAE10)	
MWU2B3B	Monoblock body with upper port P and HPCO P = G 3/8 T-HPCO = G 1/2	
MWU3B	Monoblock body with upper port P and HPCO P-T-HPCO = G 1/2	
MWS2S3S	Monoblock body with side port P and HPCO P = 3/4"-16 UNF (SAE8) T-HPCO = 7/8"-14 UNF (SAE10)	
MWS3S	Monoblock body with side port P and HPCO P-T-HPCO = 7/8"-14 UNF (SAE10)	
MWS2B3B	Monoblock body with side port P and HPCO P = G 3/8 T-HPCO = G 1/2	
MWS3B	Monoblock body with side port P and HPCO P-T-HPCO = G 1/2	


Note:

All ECM08A can be easily transformed from simple T port to HPCO configuration just by installing a conic plug G 1/4 (**ORDER CODE: C03000002**).



INLET VALVE ARRANGEMENT

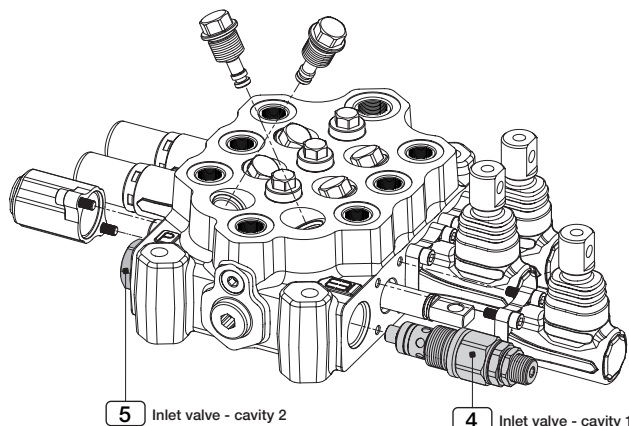
Info	product					1	2	3	4	5												
	E	C	M	0	8	A	L	N	3	M	V	A	2	S	V	0	3	2	5	0	V	0

INLET VALVE CLASSIFICATION

All inlet arrangement require double choice on cavity 1 and cavity 2.

In the following table the available valves are shown.

- Valve type V01 and valve type V03 require factory setting (es. V03250); 250 is a value expressed in bar
- Valve type V04 includes coil kit; all solenoid dump valves are fitted with push and twist override.
- 3 coil types are available in 12 and 24 Volt versions: DIN, DEUTSCH DT04 and AMP JUNIOR



CODE	DESCRIPTION	SYMBOL	SETTING RANGE
V01	Pilot operated pressure relief valve		50 - 350 bar
V02	Relief valve plugged		
V03	Direct acting pressure relief valve		50 - 110 bar 111 - 160 bar 161 - 250 bar 251 - 350 bar
V0412A	Solenoid dump valve 12 VDC - AMP Junior	 All solenoid 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		
V05	Externally piloted dump valve		
V06	Main anticavitation check valve		



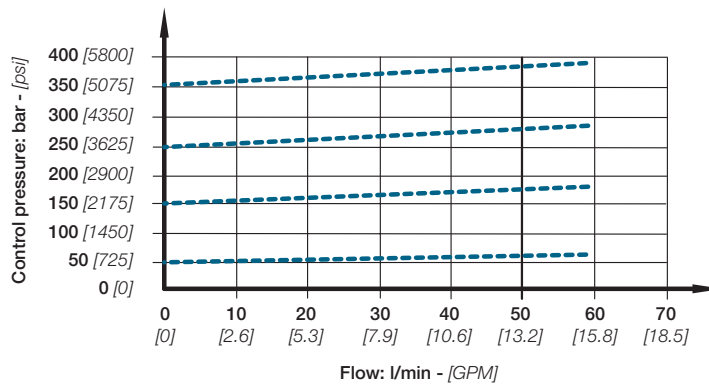
INLET VALVE ARRANGEMENT

In the following table the available valve combinations are shown.

valve combination		VALVE PORT 2										
		V01	V02	V03	V0412A	V0424A	V0412D	V0424D	V0412H	V0424H	V05	V06
VALVE PORT 1	V01		•		•	•	•	•	•	•	•	•
	V02	•	•	•	•	•	•	•	•	•	•	•
	V03		•		•	•	•	•	•	•	•	•
	V0412A	•	•	•								•
	V0424A	•	•	•								•
	V0412D	•	•	•								•
	V0424D	•	•	•								•
	V0412H	•	•	•								•
	V0424H	•	•	•								•
	V05	•	•	•								
	V06	•	•	•	•	•	•	•	•	•	•	

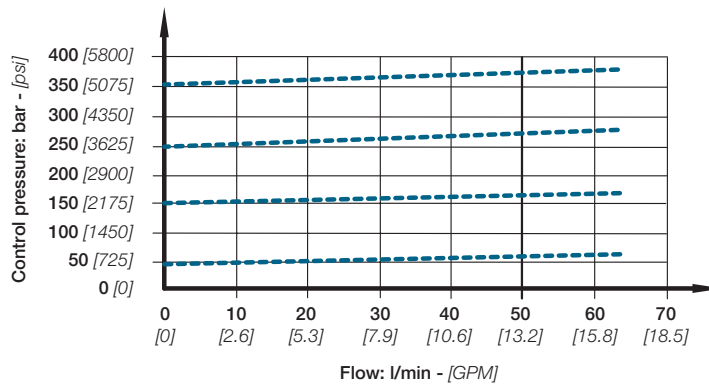
PERFORMANCE DATA - PILOT OPERATED PRESSURE RELIEF VALVE (V01)

Pressure characteristic as function of flow



PERFORMANCE DATA - DIRECT ACTING PRESSURE RELIEF VALVE (V03)

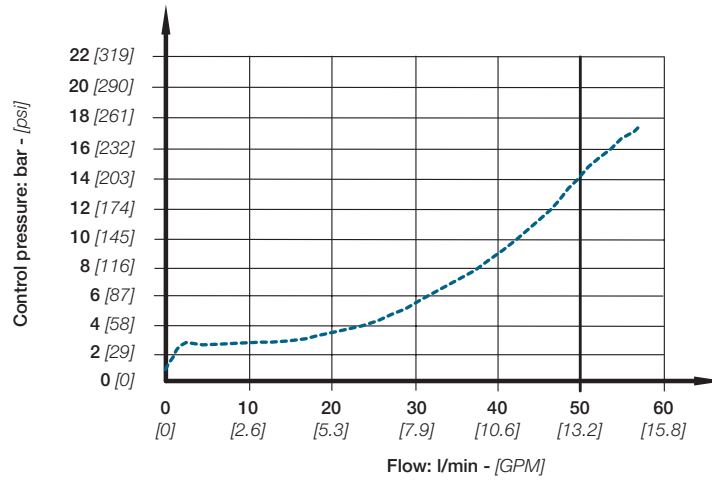
Pressure characteristic as function of flow



INLET VALVE ARRANGEMENT

PERFORMANCE DATA - MAIN ANTICAVITATION CHECK VALVE (V06)

Pressure characteristic as function of flow



WORK SECTION

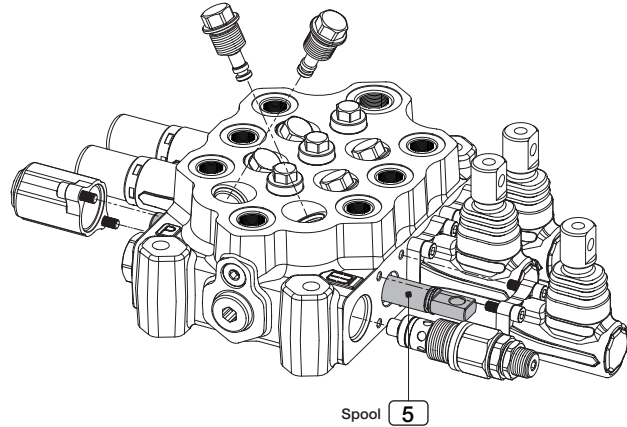
Work section	5	6	7	8	9
	S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2

SPOOL CLASSIFICATION

Each spool is compatible with all actuations.
All spools are perfectly interchangeable.

Example with spool 3 position double acting:

S01N Nominal flow (50 l/min)



CODE	DESCRIPTION	SYMBOL
S01N	Spool 3 positions double acting	
S02N	Spool 3 positions double acting A/B to tank	
S03N	Spool 3 positions single acting on A	
S04N	Spool 3 positions single acting on B	
S05N	Spool 4 positions double acting with float in 4th position	
S11N	Spool 3 positions double acting A to tank - B blocked	
S12N	Spool 3 positions double acting A blocked - B to tank	


Note:

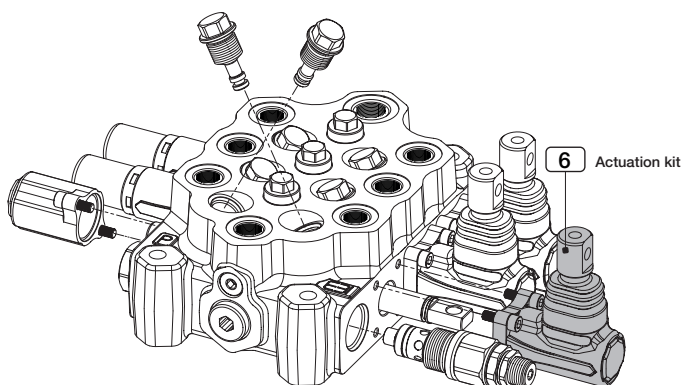
The spools shown correspond to standard configuration; all single acting spools include plug to close the unused port. For different applications, please contact our Sales Office.

WORK SECTION

Work section	5	6	7	8	9
	S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2

SPOOL ACTUATION CLASSIFICATION

Monoblock valve ECM08A is available with manual, hydraulic, pneumatic and electric controls. Each mechanical actuation requires the choice of spool return action (side B).



Note:

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

MANUAL ACTUATION

CODE	DESCRIPTION	SYMBOL
AM01	Control lever	
AM02	Control lever rotated 180°	
AM05	Control tang spool end	
AM06	Control lever with stroke limiter	
AM20	Control lever FLOAT - only with spool S05	

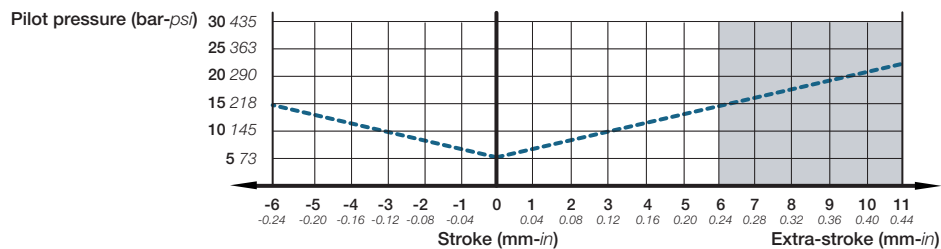
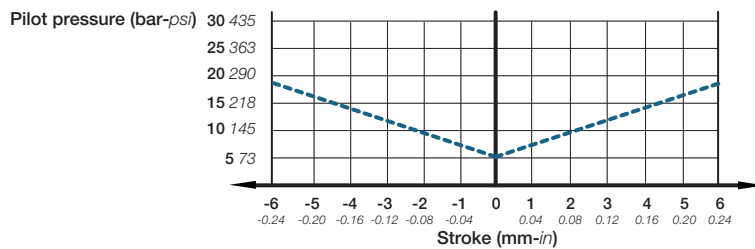
WORK SECTION

HYDRAULIC ACTUATION

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

SPRING CHARACTERISTIC CURVES HYDRAULIC ACTUATION

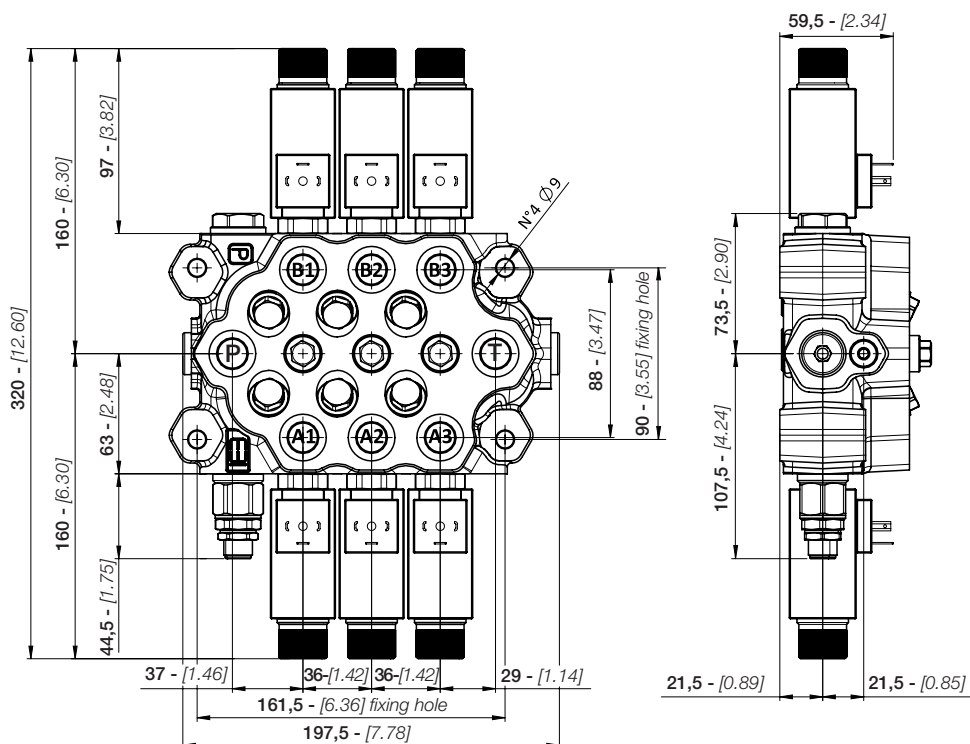
The graph shows the spool stroke as a function of the pressure operating.



WORK SECTION

DIRECT ELECTRIC CONTROL - PUSH PUSH ACTUATION

The electric control for the ECM08A is equipped with two push-push magnets operating the spool. The Push-Push actuation is suitable for all the mobile applications and, in particular, for agriculture machines and gardening machines. This type of actuation is also recommended for earth moving and lifting machinery applications and, in particular, truck mounted crane, forestry cranes and aerial platform stabilizers. It enables the use of remote-control systems. The direct electric control needs a SE type special spool.



CODE	DESCRIPTION	SYMBOL
AR12	PUSH-PUSH 12 VDC	
AR13	PUSH-PUSH 24 VDC	

TECHNICAL SPECIFICATIONS		
Rated voltage	12 VDC	24 VDC
Rated current	3.33 A	1.67 A
Rated power	40 W	
Permitted working voltage	±10% nominal	
Max ambient temperature	40°C	
Max oil temperature	80°C	
Operation time	S1 100%	
Protection degree	IP65	
Insulation degree	H	
Standard connector	DIN 43650	
Spool stroke	3 + 3 mm	



Note:
Leave out the spool return action code when choosing Direct Electric Control push-push actuation AR12 or AR13.

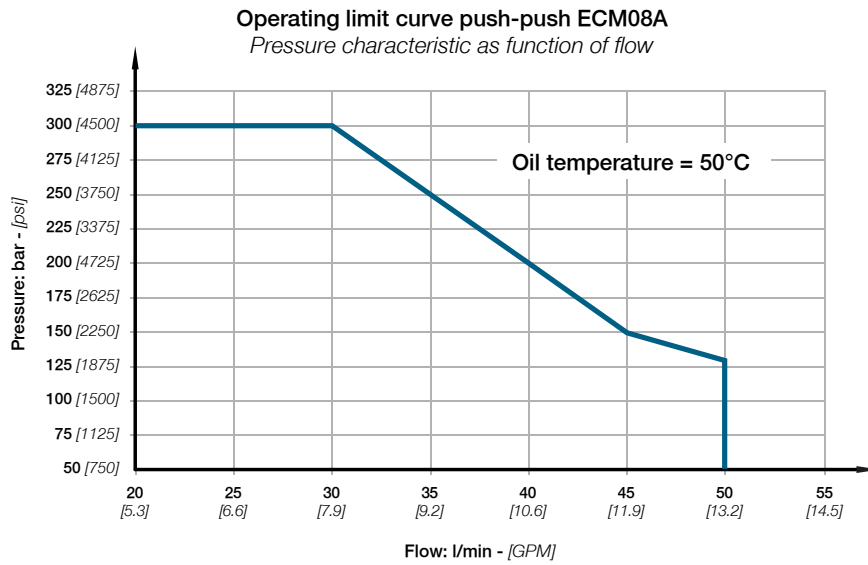


WORK SECTION

OPERATING CURVE

Data detected after amperage decrease equal to 30% of the rated value.

Conditions occurring to coil at stabilization temperature and absorbed voltage decrease equal to 20% of the rated value.



WORK SECTION

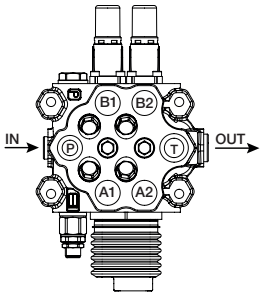
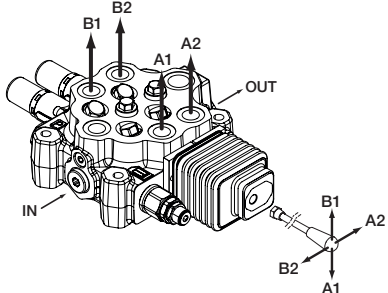
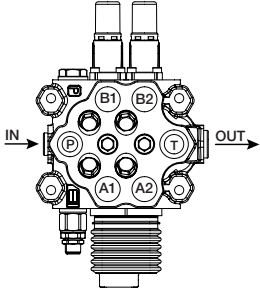
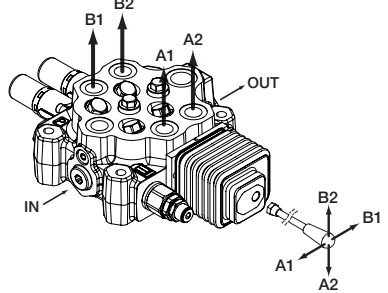
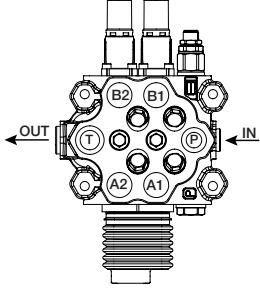
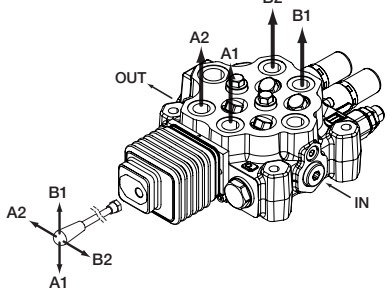
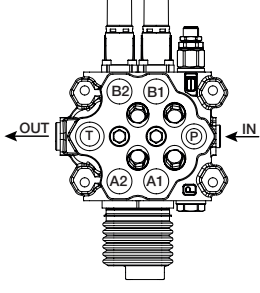
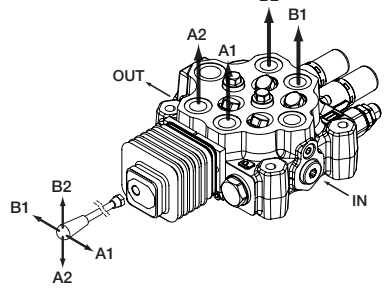
JOYSTICK CONTROL ACTUATION

The Joystick option is made to control 2 spools at the same time with one hand. The way it can manage the flow is based on the fulcrum position so the code.

In the following table you can refer lever actuation against flow on valve ports (A/B).

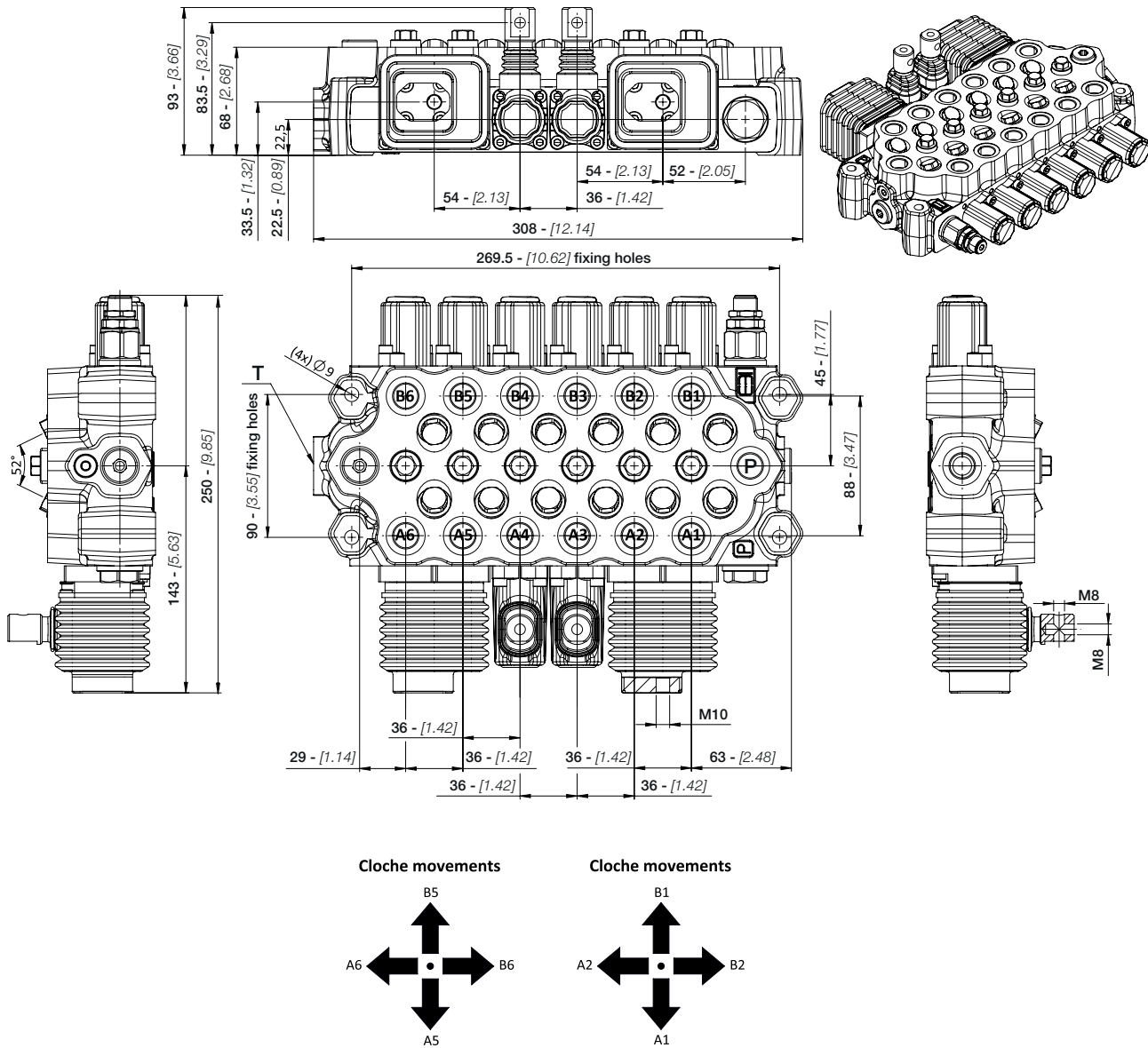
Actuation code for spool without fulcrum is always **AJ00**

Note: Lever for joystick control (M10) has to be ordered separately.

CODE	DESCRIPTION	FULCRUM POSITIONS	DRAWING	ACTUATIONS
AJ1L	Joystick control LEFT SIDE INLET Fulcrum on 1 st section	First section Second section AJ00		
AJ2L	Joystick control LEFT SIDE INLET Fulcrum on 2 nd section	Second section First section AJ00		
AJ1R	Joystick control RIGHT SIDE INLET Fulcrum on 1 st section	First section Second section AJ00		
AJ2R	Joystick control RIGHT SIDE INLET Fulcrum on 2 nd section	Second section First section AJ00		



This dimensional drawing represents a ECM08A/7 monoblock valve with 2 joystick control.



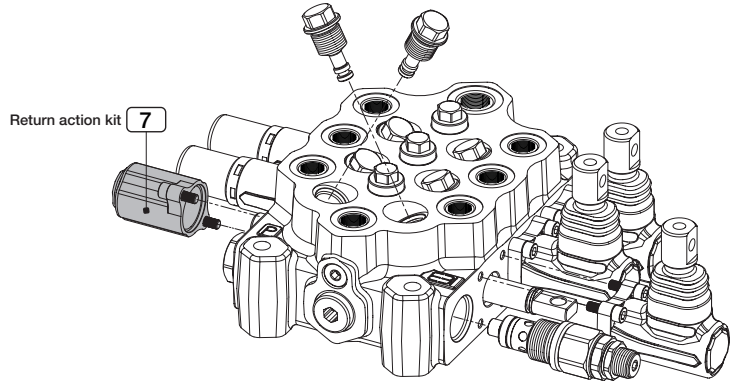
WORK SECTION

Work section	5	6	7	8	9
	S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2

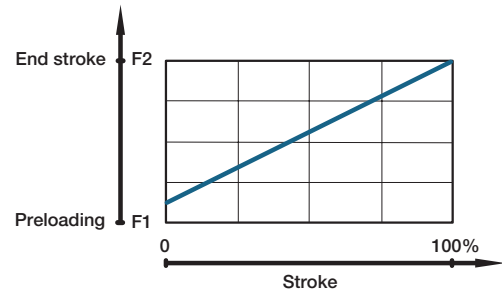
SPOOL RETURN ACTION

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

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



SPRING	F1 PRELOADING (N)	F2 END STROKE (N)
M (MEDIUM)	100	120
S (SOFT)	80	100
H (HEAVY)	130	170

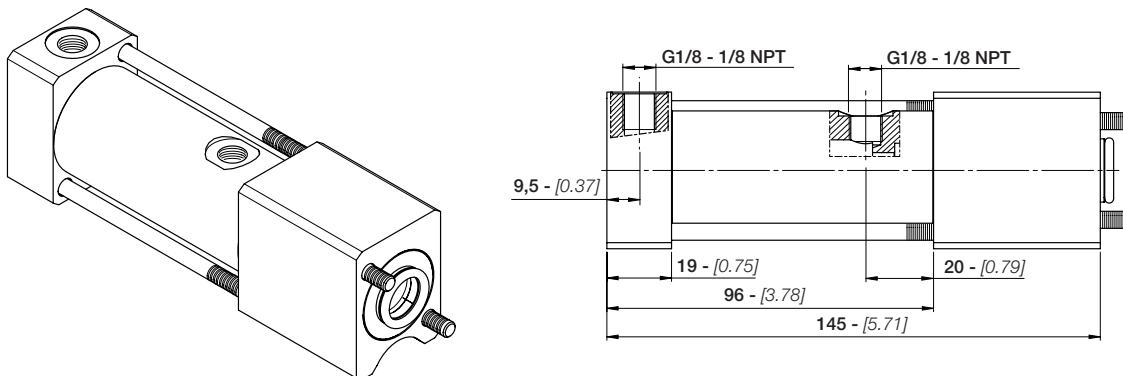


CODE	DESCRIPTION	SYMBOL
RM01M	3 position spring centered spool (MEDIUM spring)	
RM01S	3 position spring centered spool (SOFT spring)	
RM01H	3 position spring centered spool (HEAVY spring)	
RM02M	Dual command 	
RM03M	3 position spring centered spool with stroke limiter	
RM04M	Detent in position 1/2	
RM05M	Detent in position 1	
RM06M	Detent in position 2	

WORK SECTION

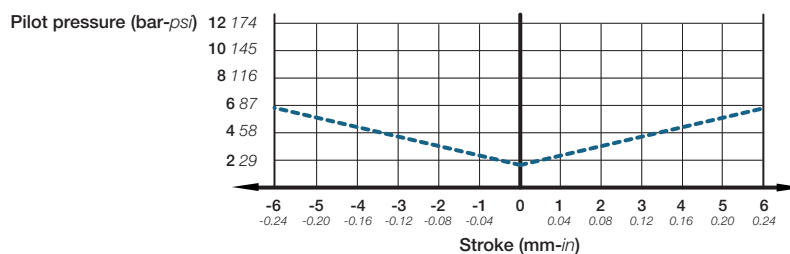
CODE	DESCRIPTION	SYMBOL
RM11M	Detent in 4 th position - only with spool S05	
RM12	Detent in position 1/0/2 without spring	
RM13M	Detent in 1/0/2/4 th position - only with spool S05	
RR01	Proportional pneumatic control (connections G 1/8)	
RR03	Proportional pneumatic control (connections NPTF 1/8-27)	

DIMENSIONAL DRAWING PNEUMATIC CONTROL



SPRING CHARACTERISTIC CURVE PNEUMATIC CONTROL

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



WORK SECTION

Work section	5	6	7	8	9
	S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2

AUXILIARY VALVE

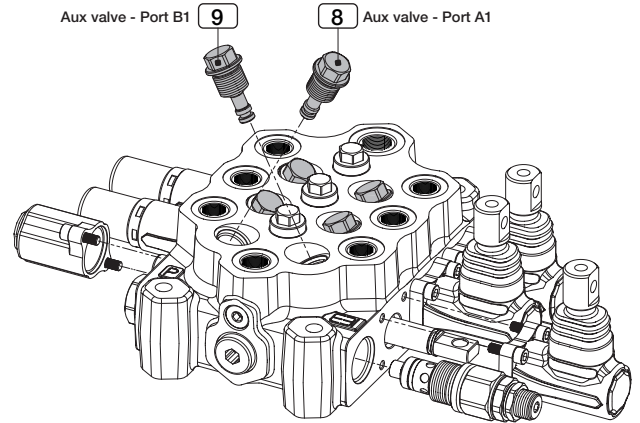
ECM08A monoblock with auxiliary valves require double choice on work side A and side B.

Valves type V51 require factory setting:

FIXED SETTING COMBINED VALVE (V51100):

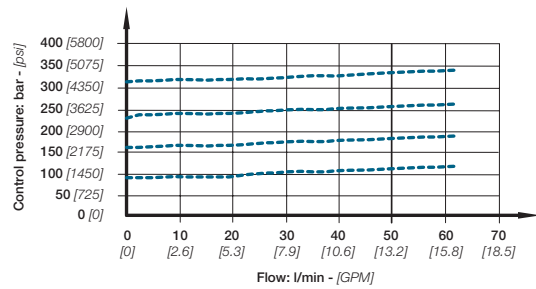
V51 fixed setting combined valve

100 value expressed in bar



CODE	DESCRIPTION	SYMBOL	SETTING
V51	Fixed setting combined valve		50 - 350 bar
V52	Fixed setting valve plugged		
V53	Fixed setting anticavitation valve		

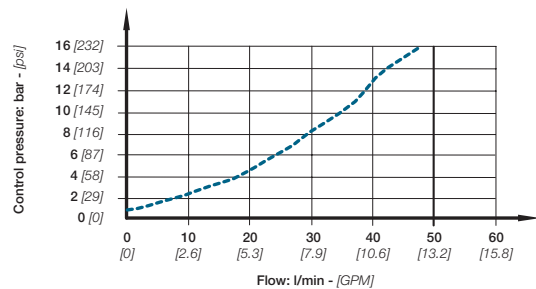
Fixed setting combined valve (V51)
Pressure characteristic as function of flow



FIXED SETTING COMBINED VALVE (V51):

this valve is not adjustable; factory setting is available from 50 to 350 bar with 10 bar steps.

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





OPTION

PAINTING

On request all ECM08A monoblock control valves by EBI can be delivered painted (RAL 9005 black primer).

ORDER EXAMPLE OF ECM08A/3 PAINTED:

E C M 0 8 A	N 3	M V A 2 S	V 0 3 2 5 0	V 0 2
-------------	-----	-----------	-------------	-------

S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2
---------	---------	-----------	-------	-------

S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 1 1 8 0
---------	---------	-----------	-------	-------------

S 0 1 N	A M 0 1	R M 0 1 M	V 5 2	V 5 2
---------	---------	-----------	-------	-------

X 3

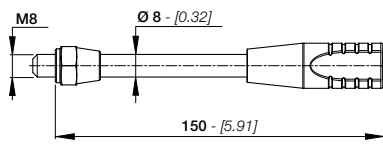
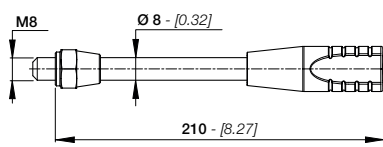
X3 Painted color black

CODE	DESCRIPTION
X2	ECM08A with 2 work sections painted
X3	ECM08A with 3 work sections painted
X4	ECM08A with 4 work sections painted
X5	ECM08A with 5 work sections painted
X6	ECM08A with 6 work sections painted
X7	ECM08A with 7 work sections painted
X8	ECM08A with 8 work sections painted

ACCESSORIES

LEVER ROD FOR MANUAL OPERATION

The following table lists the levers available for the ECM08A monoblock directional control Valve.

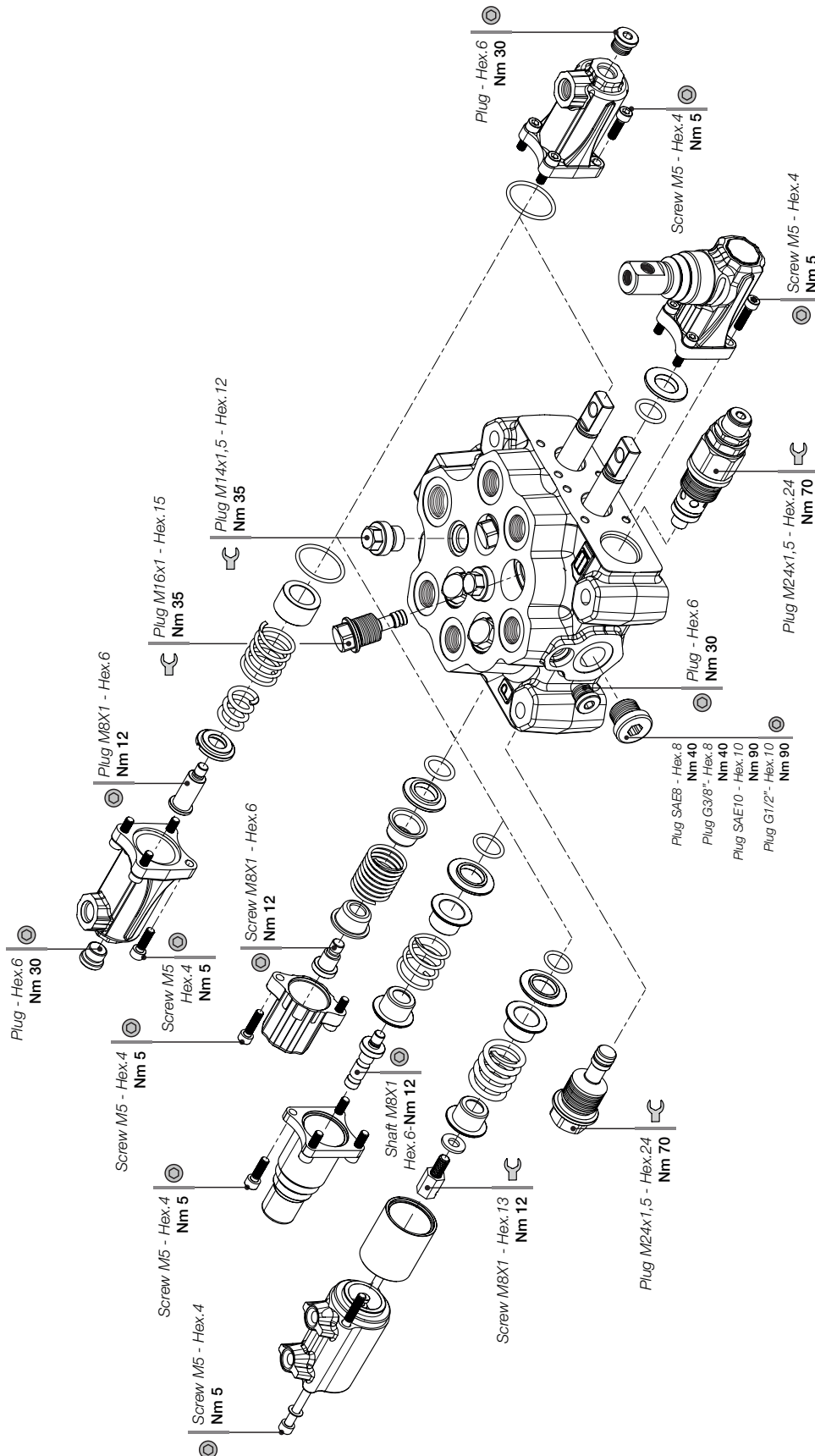
CODE	DESCRIPTION	LENGHT	DRAWING	ORDER CODE
W08B	Lever rod for mechanical actuation	150 mm		A01170010
W08C		210 mm		A01170008



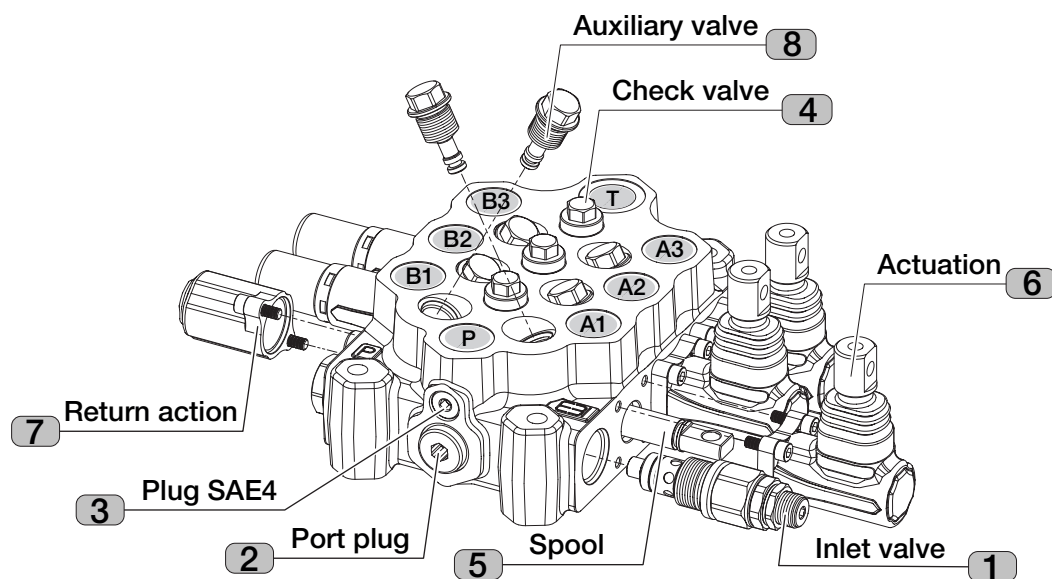
Note:
The levers must be ordered separately.

GENERAL CLAMPING TORQUE

The following drawing provides the main tightening torques of the **monoblock control valve ECM08A**.



SPARE PARTS LIST



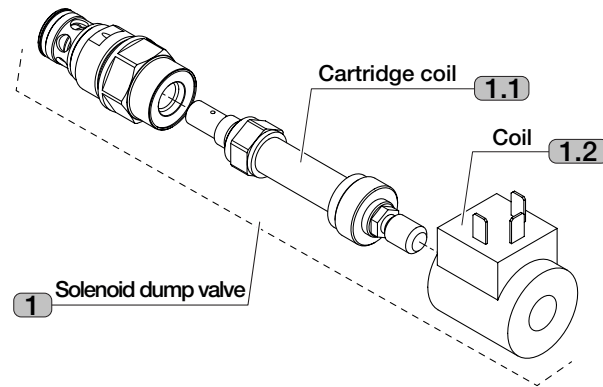
Note:

This example represents a ECM08A/3 with manual actuation.

All monoblock bodies are equipped with one check valve for every spool (o element)

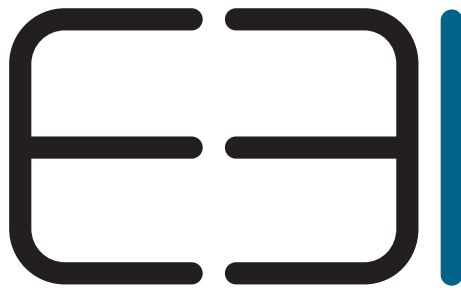
The monoblock ECM08A in standard configuration has the predisposition for the auxiliary valves in all spools (o elements).

REFERENCE	CATALOGUE CODE	ORDER CODE	DESCRIPTION	NOTE
1	V02	VA0300005	Relief valve plugged	
	V01050	VA0205002	Pilot operated pressure relief valve (50 bar)	RANGE available: A) 50 - 350 bar For specific setting contact our sales department
	V01100	VA0210002	Pilot operated pressure relief valve (100 bar)	
	V01150	VA0215002	Pilot operated pressure relief valve (150 bar)	
	V01200	VA0220002	Pilot operated pressure relief valve (200 bar)	
	V01250	VA0225002	Pilot operated pressure relief valve (250 bar)	
	V01300	VA0230002	Pilot operated pressure relief valve (300 bar)	
	V01350	VA0235002	Pilot operated pressure relief valve (350 bar)	
	V03050	VA0105002	Direct acting pressure relief valve (50 bar)	RANGE available: A) 50 - 110 bar B) 111 - 160 bar C) 161 - 250 bar D) 251 - 350 bar For specific setting contact our sales department
	V03100	VA0110002	Direct acting pressure relief valve (100 bar)	
	V03150	VA0115002	Direct acting pressure relief valve (150 bar)	
	V03200	VA0120002	Direct acting pressure relief valve (200 bar)	
	V03250	VA0125003	Direct acting pressure relief valve (250 bar)	
	V03300	VA0130002	Direct acting pressure relief valve (300 bar)	
V03350	VA0135002	Direct acting pressure relief valve (350 bar)		



REFERENCE	CATALOGUE CODE	ORDER CODE	DESCRIPTION	NOTE
1	V0412A	VA0800009	Solenoid dump valve 12 VDC - AMP junior	
	V0424A	VA0800010	Solenoid dump valve 24 VDC - AMP junior	
	V0412D	VA0800011	Solenoid dump valve 12 VDC - DT04	
	V0424D	VA0800012	Solenoid dump valve 24 VDC - DT04	
	V0412H	VA0800002	Solenoid dump valve 12 VDC - DIN 43650	
	V0424H	VA0800007	Solenoid dump valve 24 VDC - DIN 43650	
	V05	VA0700002	Externally piloted dump valve	
	V06	VA0600003	Main anticavitation check valve	
1.1		C04020002	Cartridge coil	
1.2		C04010015	Coil 12 VDC AMP junior	
		C04010016	Coil 24 VDC AMP junior	
		C04010011	Coil 12 VDC DT04	
		C04010012	Coil 24 VDC DT04	
		C04010009	Coil 12 VDC DIN 43650	
		C04010010	Coil 24 VDC DIN 43650	
2		C03010004	Port plug G 3/8	
		C03010006	Port plug G 1/2	
		C03010003	Port plug SAE8	
		C03010005	Port plug SAE10	
3		C03010031	Port plug SAE4	
4		A01020004	Assembly check valve	
5	S01N	A01150024	3 positions double acting	
	S02N	A01150025	3 positions double acting A/B to tank	
	S03N	A01150076	3 positions single acting on A	
	S04N	A01150075	3 positions single acting on B	
	S05N	A01150113	4 positions double acting FLOAT	
	S11N	A01150129	3 positions double acting A blocked - B to tank	
	S12N	A01150130	3 positions double acting A to tank - B blocked	
	SE01	A01150054	3 positions double acting	Spools for Direct electric control
	SE02	A01150137	3 positions double acting A/B to tank	

REFERENCE	CATALOGUE CODE	ORDER CODE	DESCRIPTION	NOTE
6	AM01	A01030005	Control lever	
	AM02	A01030005	Control lever rotated 180°	
	AM05	A01030006	Control tang spool end	
	AM06	A01030015	Control lever with stroke limiter	
	AM20	A01030011	Control lever - FLOAT	only with S05N spool
	AH01B	A01040031	Hydraulic actuation - SIDE ports G 1/4	Hydraulic actuation
	AH01S	A01040030	Hydraulic actuation - SIDE ports SAE6	
	AH02B	A01040029	Hydraulic actuation - UPPER ports G 1/4	
	AH02S	A01040028	Hydraulic actuation - UPPER ports SAE6	
	AH04B	A01040051	Hydraulic actuation - stroke limiter ports G 1/4	
	AH04S	A01040052	Hydraulic actuation - stroke limiter ports SAE6	
	AR12	A01060008	PUSH-PUSH actuation 12 VDC	only with spool SE type
	AR13	A01060013	PUSH-PUSH actuation 24 VDC	
	AJ1L	A01110002	Joystick control - Fulcrum on 1 st section	Only for LEFT inlet (L)
	AJ2L	A01110004	Joystick control - Fulcrum on 2 nd section	
	AJ1R	A01110004	Joystick control - Fulcrum on 1 st section	Only for RIGHT inlet (R)
AJ2R	A01110002	Joystick control - Fulcrum on 2 nd section		
7	RM01M	A01120009	Spring centered spool (spring MEDIUM)	
	RM01S	A01120011	Spring centered spool (spring SOFT)	
	RM01H	A01120010	Spring centered spool (spring HEAVY)	
	RM02M	A01120012	Dual command	
	RM03M	A01120017	Spring centered spool with stroke limiter	
	RM04M	A01130013	Detent in position 1/2	
	RM05M	A01130014	Detent in position 1	
	RM06M	A01130015	Detent in position 2	
	RM11M	A01130016	Detent in 4th position	only with S05N spool
	RM12	A01130007	Detent in position 1/0/2 without spring	
	RM13M	A01130034	Detent in position 1/0/2/FLOAT	only with S05N spool
	RR01	A01050006	Proportional pneumatic (G 1/8)	Pneumatic actuation
	RR03	A01050007	Proportional pneumatic (NPTF 1/8-27)	
8	V51050	VF0305004	Fixed setting combined valve (50 bar)	For specific setting contact our sales department
	V51100	VF0310004	Fixed setting combined valve (100 bar)	
	V51150	VF0315004	Fixed setting combined valve (150 bar)	
	V51200	VF0320004	Fixed setting combined valve (200 bar)	
	V51250	VF0325004	Fixed setting combined valve (250 bar)	
	V51300	VF0330004	Fixed setting combined valve (300 bar)	
	V51350	VF0335004	Fixed setting combined valve (350 bar)	
V52	VF0100004	Fixed setting valve plugged		



engineering beyond imagination

EBI MOTION CONTROLS S.r.l

Via Andrea Costa 11/2 40057
Cadriano Fraz. di Granarolo dell'Emilia (BO)
TEL. +39 051.0188.800
FAX 051.701.093

info@ebimc.com
www.ebimc.com