

Monoblock valves



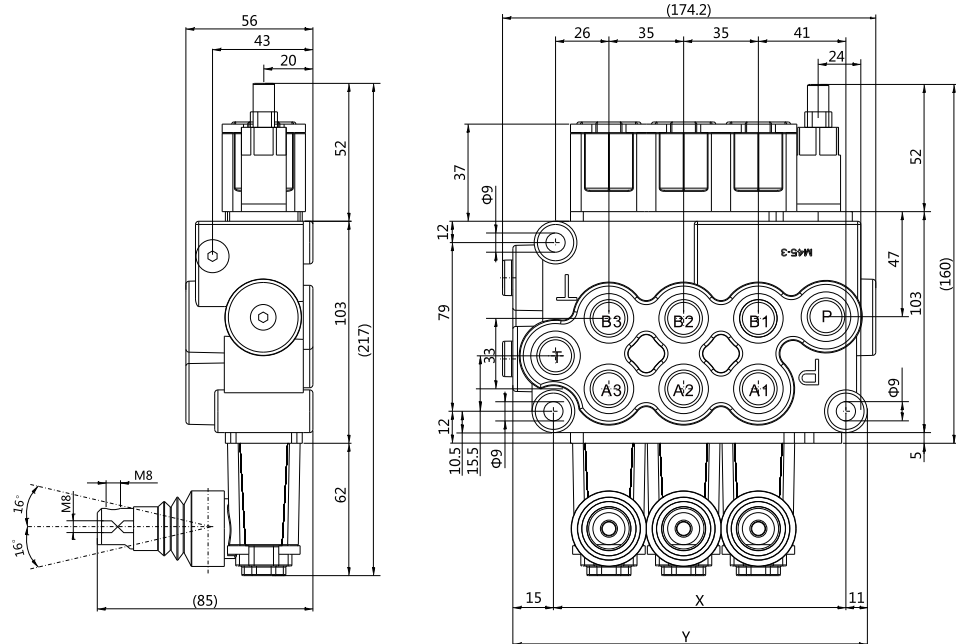
Technical specifications

Working section number	1 - 6
Rated flow	45 L/min
Rated pressure	350 bar
Spool stroke	5 + 5 mm
Spool pitch	35 mm
Circuit type	Parallel

Applications

Cranes and Aerial platforms, Agricultural machines, Mini skid loaders, Mini dumpers, Forklifts

A big number of options and solutions make MA-M45 a very flexible product; it can be easily adapted to many different applications always fitting the specific needs (mobile cranes, agricultural machines, mini skid loaders, mini dumpers, fork lift truck, etc...). The family has a big range of interchangeable spools.



TYPE	M45/1	M45/2	M45/3	M45/4	M45/5	M45/6
X(mm)	67	102	137	172	207	242
Y(mm)	93	128	163	198	233	268
Weights (kg)	2.70	4.10	5.50	6.90	8.30	9.70
PORTS	Inlet (P)	Ports (A-B)		Outlet (T)	Outlet (HPCO)	
BSP Thread (ISO 1179-1)	G 3/8	G 3/8		G 3/8	G 3/8	
UN-UNF Thread (ISO 11926-1)	3/4"-16 UNF	3/4"-16 UNF		3/4"-16 UNF	3/4"-16 UNF	

General specifications

TYPE	MA-M45
Working section number	1 - 6
Parallel	•
Parallel circuit stroke (mm)	5 + 5
Float spool extra stroke (mm)	4
Spool pitch	35
Flow rate (l/min)	45
Flow rate (GPM)	12
Max working pressure (bar)	350
Max working pressure (PSI)	5000

Options chart

TYPE	MA-M45
Direct acting pressure relief valve	•
Externally piloted valve	(•)
Solenoid dump valve (12 Vdc)	(•)
Solenoid dump valve (24 Vdc)	(•)
SPOOL ACTUATION	
Manual control	•
Without lever	•
90° joystick control lever	•
Direct solenoid (12 - 24 Vdc)	•
SPOOL RETURN ACTION	
Return spring	•
Detent in A - in B - in A/B	•
Detent in 4th position	•
Arrangement for dual control	•
Hydraulic load limit	•
Electrical load limit	•
Electrohydraulic control ON-OFF (12 - 24 Vdc)	•
Electrohydraulic control PROP. (12 - 24 Vdc)	•
Pneumatic control ON-OFF	•
Proportional pneumatic control	•
Electropneumatic control (12 - 24 Vdc)	•

(•) = the application requires special machining in the body

Standard working conditions - Monoblock valve

Operating temperature range	-20°C / +80°C
Kinematic viscosity range	10 ÷ 300 cSt
Max contamination level	9 (NAS 1638) - 20/18/15 (ISO 4406:1999) b10 >
Recommended filtration level	75 (ISO 16889:2008)

All information and diagrams in this catalogue refer to a mineral base oil at 50°C temperature (32 cSt kinematic viscosity)

Types of fluid (according to ISO 6743/4) Oil and Solutions	Temperature (°C)		Compatible gasket
	min	max	
Mineral Oil HL, HM (or HLP acc. to DIN 51524)	-25	+80	NBR
Oil in water emulsions HFA	+5	+55	NBR
Water in oil emulsions HFB	+5	+55	NBR
Polyglycol-based aqueous solution HFC	-10	+60	NBR

For special applications and different fluids, please call our Technical Department.

Special body classification - Monoblock valve

The following spools may require bodies with special machining (SPC):
bodies with special machinings are not symmetrical and it is not possible to reverse spools.

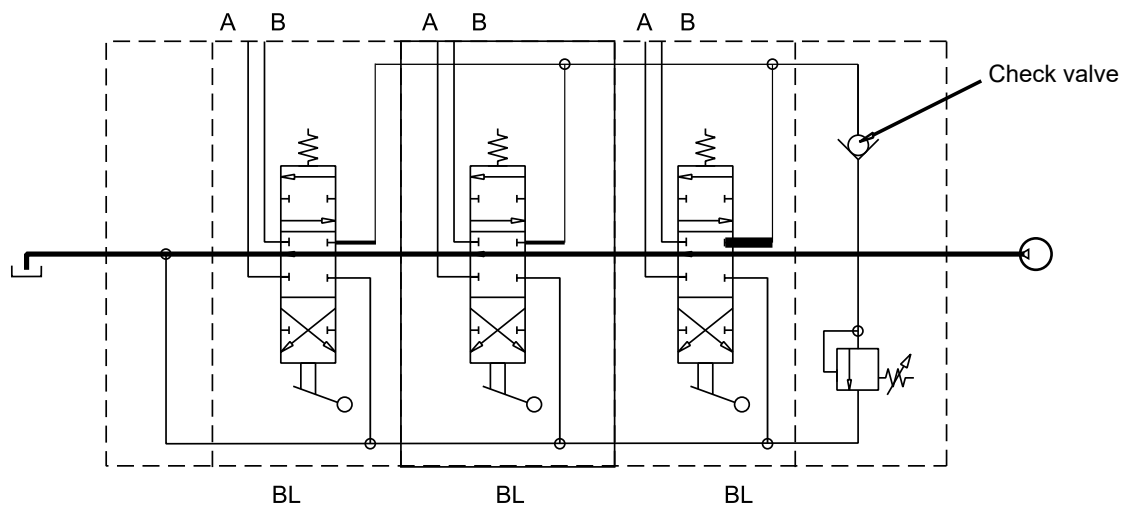
TYPE / SPOOL	MA-M45
S013 (3 positions double-acting regenerative)	SPC
S014 (4 positions double-acting regenerative in 4th position)	SPC

Hydraulic schematic - Monoblock valve

Parallel circuit

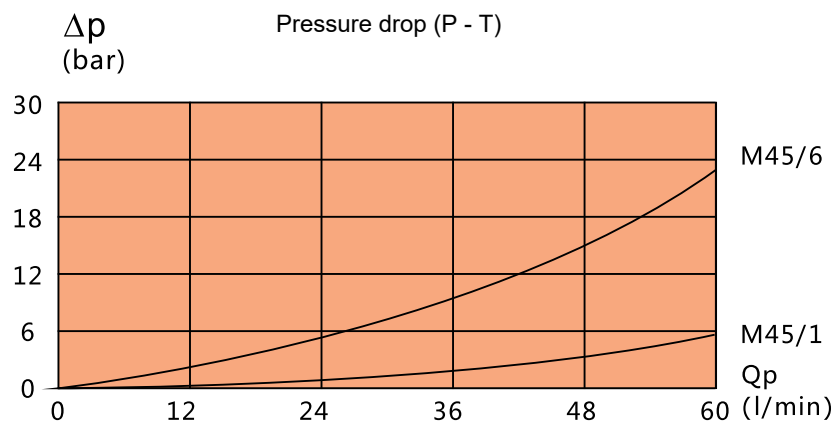
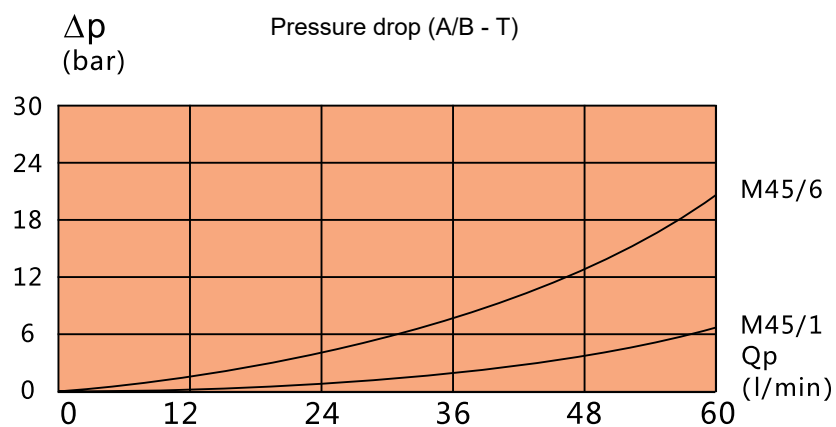
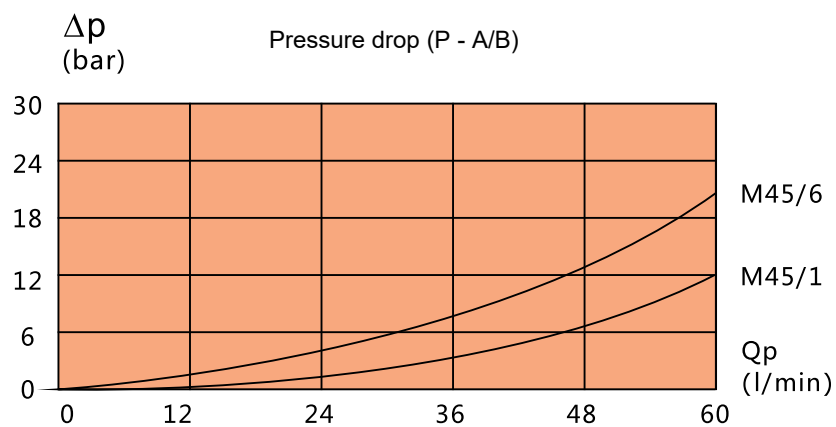
When the spool is operated it intercepts the switch gallery by diverting the flow of oil to service port A or B. If two or more spools are actuated at the same time, the oil will power the service port that has the lower load by selecting the path with the least resistance; by throttling the spools, the flow of oil can be divided between two or more service ports.

Hydraulic schematic for MA-M45



Typical curves

Indicated values have been tested with standard monoblock valve and S001A spools.



Features

The valve is available with manual, cable, direct electric, hydraulic remote, pneumatic, electrohydraulic and electropneumatic controls.

Floating function is possible on standard body.

Regenerative functions are possible with dedicated spools and bodies.

Numerous configurations and solutions are possible.

Order example - Monoblock valve

MA-M45/1: P1 301 150 - S001A C001 F001A - T1 A G06

TYPE:

M45 product type

/1 working section number

1) INLET ARRANGEMENT:

- 1.1 P1 301** inlet side and valve type
(150) setting (bar)

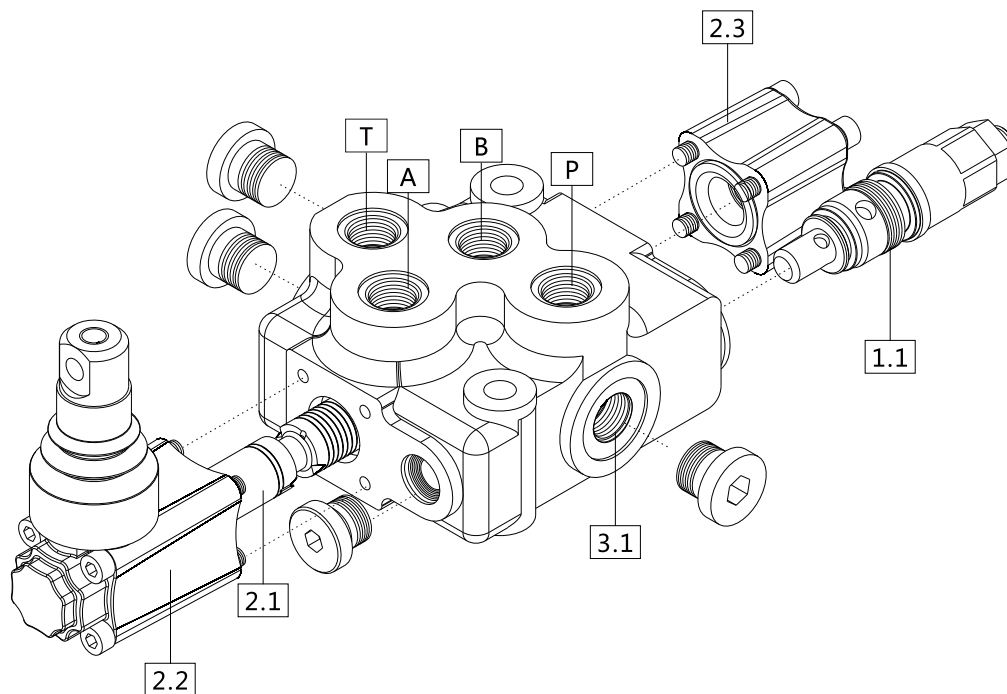
2) WORK SECTION ARRANGEMENT:

- 2.1 S001A** spool type
2.2 C001 spool actuation type
2.3 F001A spool return action type

3) BODY ARRANGEMENT:

- 3.1 T1** outlet type
A G06 outlet position and available thread type

Ordering row 2 must be repeated for every work section.



Features

Lever kits are not included in the valve controls: they must be ordered separately

Inlet arrangement

This code part indicates inlet side, type and thread, and the kind of valves assembled in the monoblock valve.

The P port available threads change according to valve size.

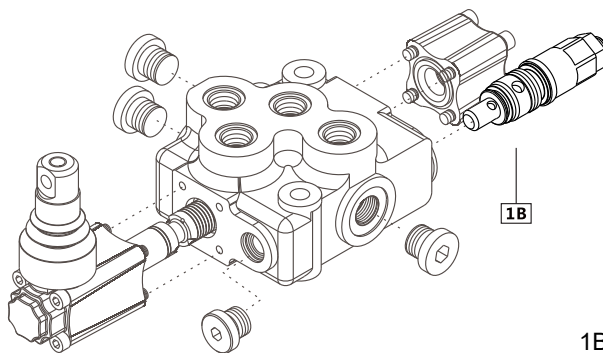
(see table on page 62)

Inlet side classification			
code	description	schema	configuration
P1	Monoblock valve with right inlet section		
P2	Monoblock valve with left inlet section		

valve identification							
type	schema	layout	description	type	schema	layout	description
1			Direct acting pressure relief valve	3			Relief valve plugged

NOTE:

According to different families valves can be differently combined and even assembled on A side (control side) or B side (return spring side). Monoblock valves can be equipped with externally piloted valve, solenoid dump valve (12-24 Vdc), clamping valve. These applications needs a special valve body. Ask our commercial dept. for further informations.



Combination valve example: 301 = 1B

301 Combination valve
1B Pressure relief valve in port B

valves combination		MA-M45	
		P1	P2
1A	201		•
3A	203		•
1B	301	•	
3B	303	•	

The code identifies:

with a number, the type of valve; with a letter its position on the inlet section.

(A) = spool action side (B) = spool return action side

NOTE:

when ordering a main relief valve it is necessary to specify setting (example 150 bar).

Working section arrangement

This code indicates the complete working section set up: spool, control, return spring kit, and auxiliary valves. Elements designed to house auxiliary-valve option require double choice on work ports A-B. When ordering a port relief valve or port antishock and anticavitation valve it is necessary to specify the setting (example 120 bar).

Depending on the inlet flow, it is possible to choose appropriate spool sizes:

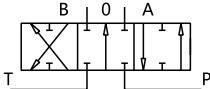
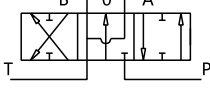
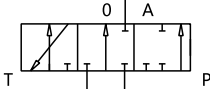
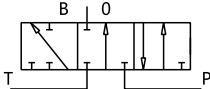
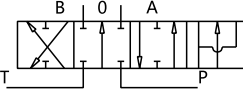
A = spool for 50 l/min inlet flow

B = spool for 30 l/min inlet flow

C = spool for 15 l/min inlet flow

E = solenoid operated spool (available with direct electrical control)

Please contact our sales department for informations about spools with restricted connection to tank.

Spool identification				monoblock
				MA-M45
S001A	50 L/min		3 positions double-acting	•
S001B	30L/min			•
S001C	15 L/min			•
S001E	solenoid operated			•
S002A	50 L/min		3 positions double-acting A and B to tank	•
S002B	30L/min			•
S002C	15 L/min			•
S002E	solenoid operated			•
S005A	standard		3 positions single-acting on A	•
S005B	metered			•
S006A	standard		3 positions single-acting on B	•
S006B	metered			•
S012A	standard		4 positions double-acting with float in the 4th position	•
S012B	metered			

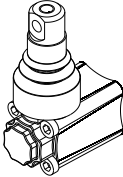
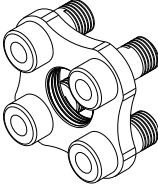
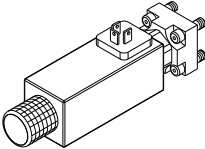
The spools shown correspond to standard configurations; for different applications contact our Commercial Department

NOTE:

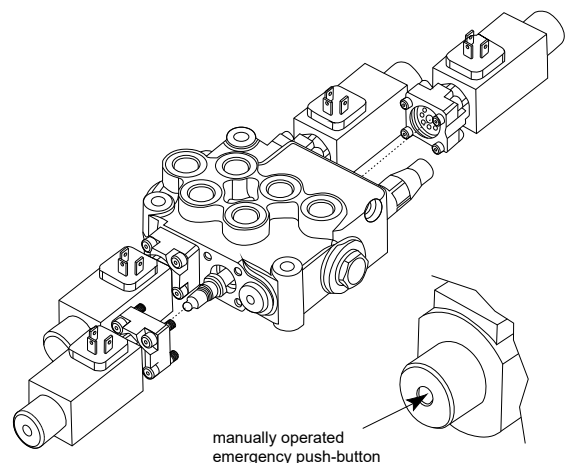
Float spools (S012) need special detent kit (F005).

All section with single acting spool include plug to close the unused port.

Electrical spool (type E) needs special body, special spool actuations and special return action.

Spool actuation identification			monoblock control valve		
code	configuration	description	MA - M45		
C001		protected lever	•		
C002		protected lever rotated 180°	•		
C004		control without lever	•		
C036 leave out the spool return action code		Direct electric control 12 Vdc	•		
C037 leave out the spool return action code		Direct electric control 24 Vdc	•		

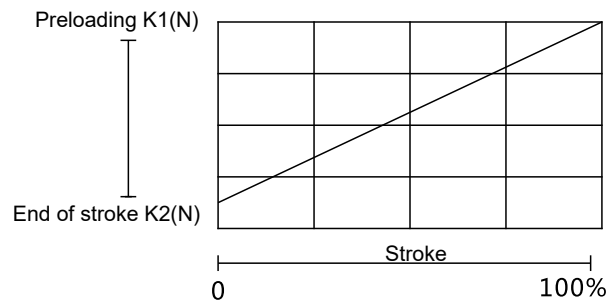
Type	MA-M45	
Rated voltage	12VDC	24VDC
Rated current	3.75A	1.88A
Rated power	45W	
Permitted working voltage	±10% Nominal	
Max ambient temperature	+40°C	
Max oil temperature	+80°C	
Operation time	S1(100%)	
Protection degree	IP 65	
Insulation degree	H	
Standard connector	DIN 43650	
Spool stroke	2.5+2.5mm	



The C036 and C037 direct electric controls come as two kits each including a: spring, solenoid and adapter.
The Direct electric controls use a type E special spool and a type special body.
The ON-OFF Electric Control kit includes a manually operated emergency push-button.

Springs load values

Spool return kits have three different spring types



Spring type			monoblock
code		value	MA-M45
A	standard spring	K1(N)	130
		K2(N)	166
B	soft spring	K1(N)	100
		K2(N)	145
C	heavy spring	K1(N)	140
		K2(N)	195

Spool return action identification			monoblock
code	configuration	description	MA-M45
F001A		return spring	•
F001B			•
F001C			•
F002A		detent in A and B with return spring	•
F149		detent in A and B without return spring	•
F003A		detent in A with return spring	•
F004A		detent in B with return spring	•
F005A		detent in 4th position with return spring	•
F013A		prearrangement dual command	•
F013B			•
F013C			•
F020A		pneumatic control ON-OFF	•
F022A		proportional pneumatic control ON-OFF	•

The spool return action shown correspond to standard configurations; for different applications contact Maxma

Body arrangement

This code indicates characteristics for outlet section: ports position and thread, simple T port or HPCO connection. It is possible to have simple T port or two ports configuration for HPCO connection: HPCO allows to extend by-pass channel and connect to a second valve. T ports dimensions and threads depends on the valve size (see table on page 62)??.

Order example - version 1 outlet

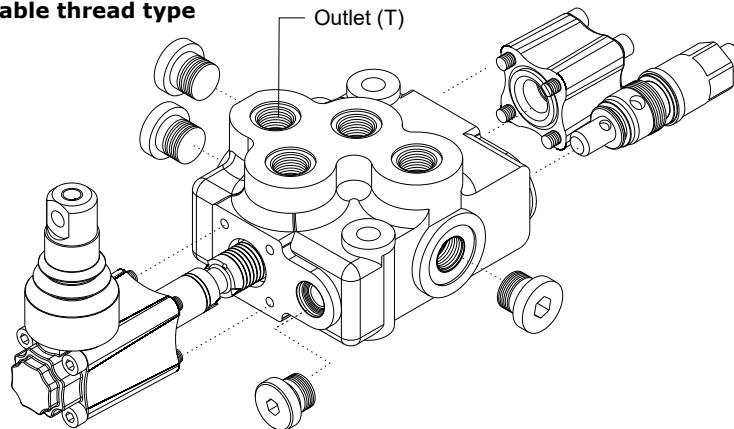
MA-M45/1: P1 301 150 - S001A C001 F001A - T1 A G06

TYPE: _____
 M45 product type
 /1 working section number

1) INLET ARRANGEMENT: _____
 P1 301 inlet side and valve type
 (150) setting (bar)

2) WORK SECTION ARRANGEMENT: _____
 S001A spool type
 C001 spool actuation type
 F001A spool return action type

3) BODY ARRANGEMENT: _____
T1 outlet type
A G06 outlet position and available thread type



Order example - HCPO version outlet

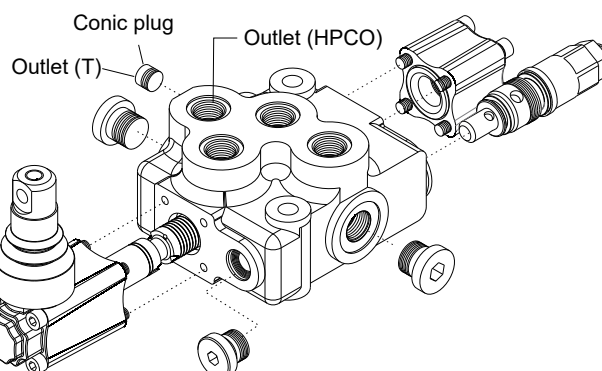
MA-M45/1: P1 301 150 - S001A C001 F001A - T3 U G06

TYPE: _____
 M45 product type
 /1 working section number

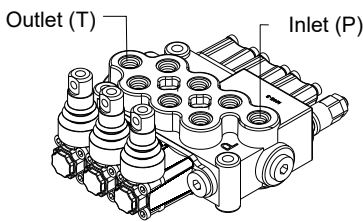
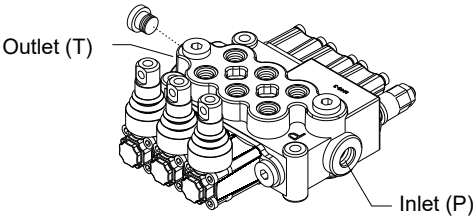
1) INLET ARRANGEMENT: _____
 P1 301 inlet side and valve type
 (150) setting (bar)

2) WORK SECTION ARRANGEMENT: _____
 S001A spool type
 C001 spool actuation type
 F001A spool return action type

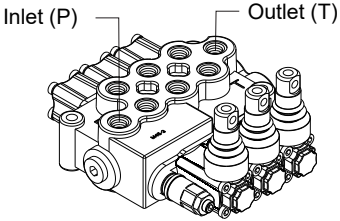
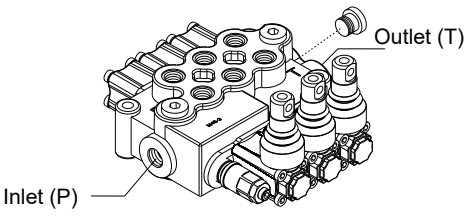
3) BODY ARRANGEMENT: _____
T3 outlet type
U G06 outlet position and available thread type



Single outlet (T) position and type of thread on inlet-ports-outlet “T1”

Outlet and thread position			monoblock
code		configuration	MA-M45
A	Top inlet P and outlet T top ports A - B		G06
			U03
code		configuration	MA-M45
C	Side inlet P outlet T top ports A - B		G06
			U03

Single outlet (T) position and type of thread on inlet-ports-outlet “T2”

Outlet and thread position			
code		configuration	MA-M45
A	Top inlet P and outlet T top ports A - B		G06
			U03
code		configuration	MA-M45
C	Side inlet P outlet T top ports A - B		G06
			U03

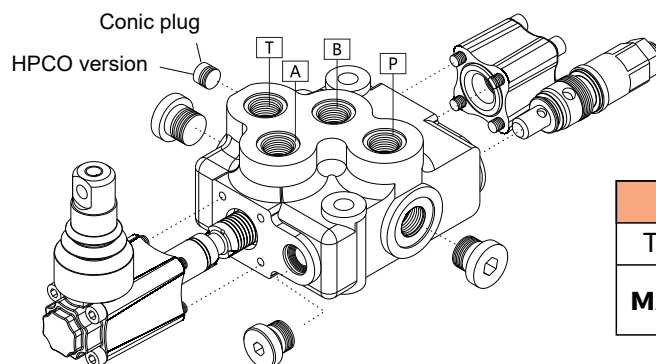
Two outlets position with HPCO and type of thread on inlet-ports-outlet “T3”

Outlet and thread position			
code	configuration		MA-M45
T	P - T - HPCO (on sides)		G06
			U03
code	configuration		MA-M45
U	P - T (on the top) HPCO (on side)		G06
			U03

Two outlets position with HPCO and type of thread on inlet-ports-outlet “T4”

Outlet and thread position			
code	configuration		MA-M45
T	P - T - HPCO (on sides)		G06
			U03
code	configuration		MA-M45
U	P - T (on the top) HPCO (on side)		G06
			U03

All monoblock valves of all product families can be easily transformed from simple T port to HPCO configuration just by screwing a conic plug (see following table).



Conic plug identificationn			
Type	Code	Description	Q.ty
MA-M45	450299210	G 1/4 x 6,5 plug	1