



Caproni



MONOBLOCK DIRECTIONAL CONTROL VALVES

CONTENTS:

Page

RM20... ..	1/19&2/19
RM35... ..	3/19...5/19
RM40P... ..	6/19...10/19
RM80... ..	11/19...15/19
RMD90... ..	16/19&17/19
MRP70	18/19&19/19

GENERAL DESCRIPTION

Document: MDCV-1-Sept 2015

Hydraulic valve RM20 provides change of fluid flow direction, hydro-systems pressure restriction, pump unloading in neutral position of the spools. The valve RM20 is designed to be integrated in hydraulic systems of Mobile and Industrial Machines.

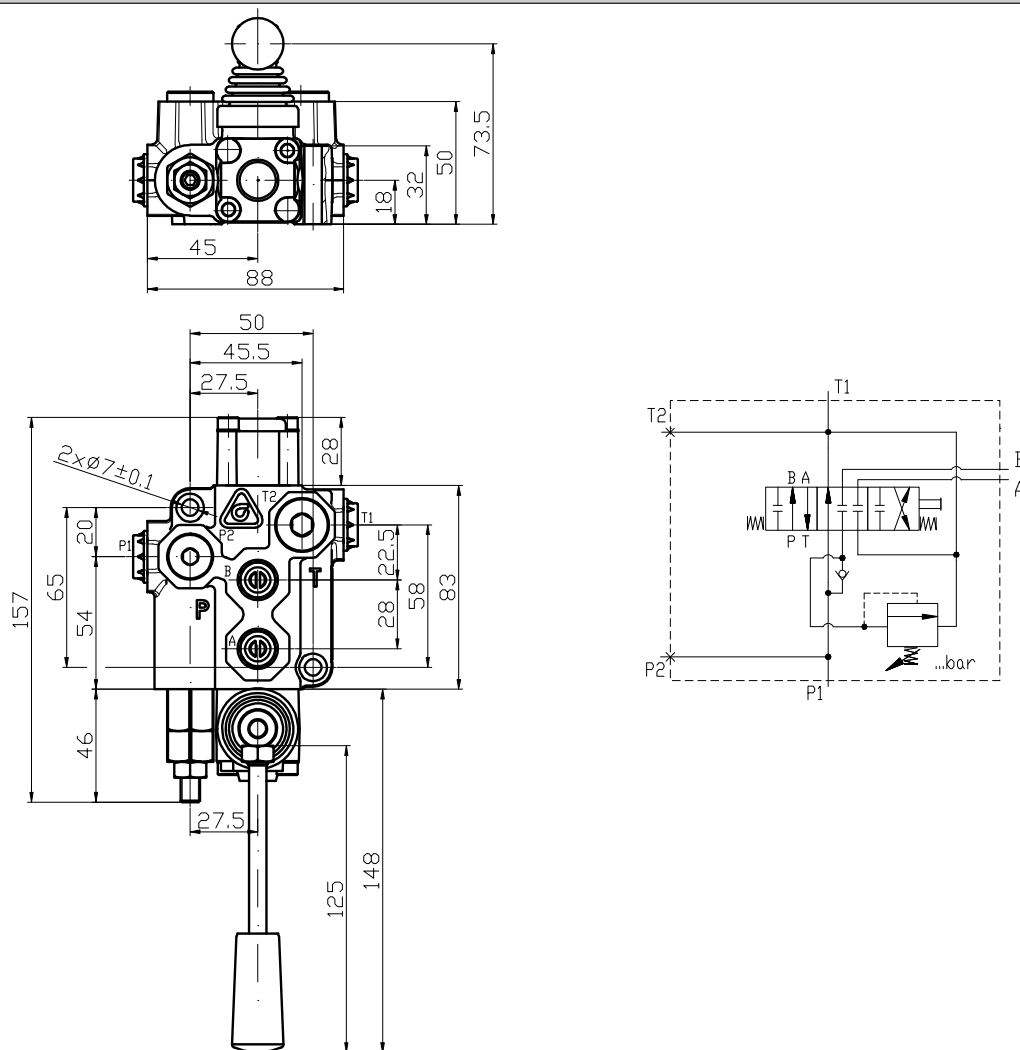
The valve assembly consists of:

A body with integrated relief and check valve, spool, control and spring-centering group of the spool. The valve RM20 provides direct passing of the flow from the pump line to the tank at neutral position (open center).

Options "closed centre" and "carry over" are possible with additional adapters. There are different control options: spring-centering in "neutral" position, detent, automatic kick-out, hydraulic and electro-hydraulic control.

TECHNICAL DATA

Rated flow	20 l/min
Max. pressure	P=250 bar; T=30 bar; A,B= 250 bar
Spool stroke	±3,5 mm
Working temperature range	-15...+80 °C
Working liquid	hydraulic oil HLP DIN51524
Liquid viscosity	15...300cSt
Nominal filtration	ISO4406: 19/16 (recommended filter element - 0,025mm mesh)
Internal leakage at 120 bar , t=40°C and viscosity 46cSt	max. 8cm ³ /min; max 2cm ³ /min (special version)
Actuating force	less than 150N
Weight	1,7kg

DIMENSIONS


ORDERING CODE

RM20 / N / Q / 1 CL A 1 E1 / R / P1T1 / G / N

with check valve - omit
without check valve - N

Code	application
N	normal
T	tropical

standard port threads		
Code	P1, T1, T2	P2, A, B
G	G3/8"-A	G1/4"-A

Code	used connection ports
P1T1	P1 and T1
P1T2	P1 and T2
P2T1	P2 and T1
P2T2	P2 and T2

relief valve	Code
setting range 5...250bar. (example of required settings 180bar.)	Q
shut-off plug installed	K

Code	hydraulic power output
R	open center (port P connected to T - short plug)
W	closed center (port T1 plugged - long plug)
C	carry over (T1 - with power beyond sleeve)

spools	Code
	1
	2
	3
	4
	5*
	6
	7
	8*

* The scheme (spool code 5, 8) needs special body with extra machining and modified cap (C, CL, CLO control) for spool control code 5.

Code	spool control
1	
2	
3	
4	
5	
6	
7	

Code	lever position
A	at port side A (standard)
B	at port side B

Code	micro switch: max. current/voltage - 5A/250V AC protection - IP67 contact configuration
	DIN 43650-A
omit	without microswitch
E1	
E2	
E3	

operation control	Code	operation control	Code	operation control	Code
without standard hand lever 	C	with standard hand lever 	CL	with standard hand lever at 180° 	CLO
with cable control 	H	without lever, with dust-proof plate 	Z		

Cables, single levers and joystick controls - on request

GENERAL DESCRIPTION

Hydraulic valve RM35 provides change of fluid flow direction, hydro-systems pressure restriction, pump unloading in neutral position of the spools. The valve RM35 is designed to be integrated in hydraulic systems of Mobile and Industrial Machines.

The valve assembly consists of:

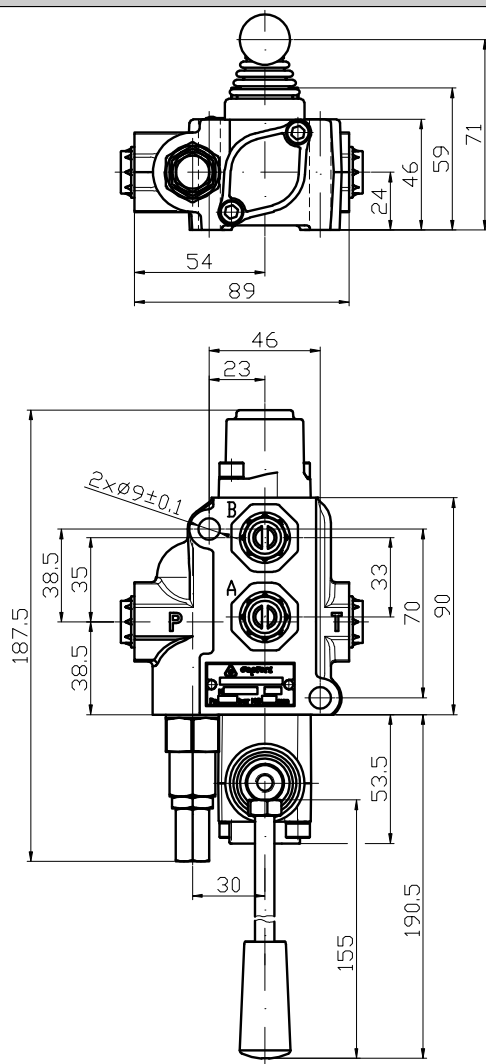
A body with integrated relief and check valve, spool, control and spring-centering group of the spool.

The valve RM35 provides direct passing of the flow from the pump line to the tank at neutral position (open center).

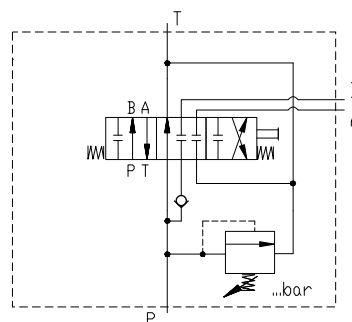
There are different control options: spring-centering in "neutral" position, detent, automatic kick-out, hydraulic and electro-hydraulic control.

TECHNICAL DATA

Rated flow	35 l/min
Max. pressure	P=250 bar; T=50 bar; A,B= 300 bar
Spool stroke	±6 mm
Working temperature range	-15...+80 °C
Working liquid	hydraulic oil HLP DIN51524
Liquid viscosity	15...300cSt
Nominal filtration	ISO4406: 19/16 (recommended filter element - 0,025mm mesh)
Internal leakage at 120 bar , t=40°C and viscosity 46cSt	max. 8cm ³ /min; max 2cm ³ /min (special version)
Actuating force	less than 200N
Weight	2,2kg

DIMENSIONS


RM35/Q/1CLA1/G/N



ORDERING CODE

RM35EHI / N / Q / 1 CL A 1 E1 / G / N

type of control	Code
without control	omit
ON-OFF internal electro-hydraulic	EHI
ON-OFF external electro-hydraulic	EHE
ON-OFF electro-pneumatic	EPC
ON-OFF hydraulic	HC
ON-OFF pneumatic	PC

with check valve - omit
without check valve - N

relief valve	Code
setting range 5...250bar. (example of required settings 180bar.)	Q Q180
shut-off plug installed	K

spools	Code
	1
	2
	3
	4*
	5*
	6
	7
	8*
	9*
	10*

* The scheme (spool code 4, 5, 8, 9 and 10) needs special body with extra machining.

Code	spool control
1	
2	
3	
4	
5	
6	
7	
9	
10	
11*	 Adjustment range of automatic kick-out feature - 60...180bar
12	
13	
14	
15	
16	
17	
SD1	
SD10	

standard port threads	
Code	P, T, A, B
M	M18x1,5-6H
G	G3/8"-A

Code	application
N	normal
T	tropical

Code	<p>micro switch: max. current/voltage - 5A/250V AC protection - IP67 contact configuration</p> <p>DIN 43650-A</p>
omit	without microswitch
E1	
E2	
E3	

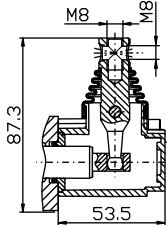
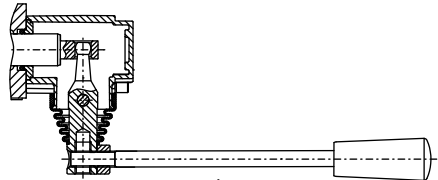
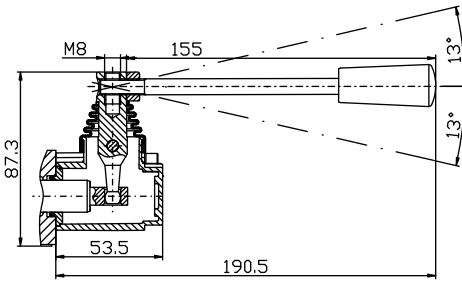
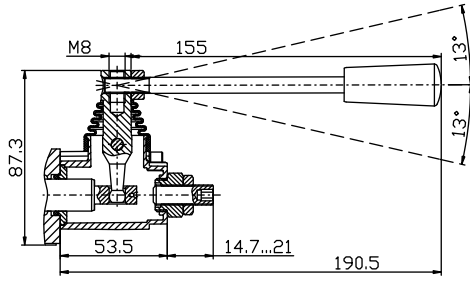
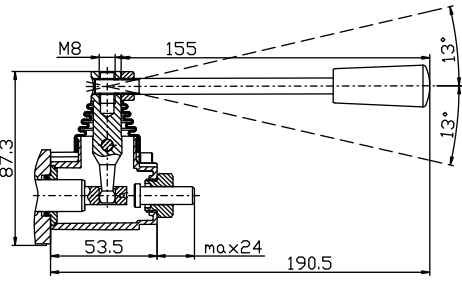
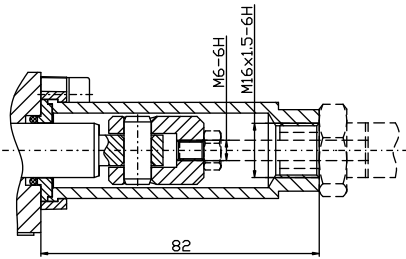
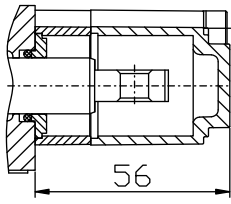
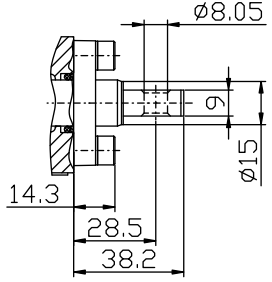
Code	spool control
20-12	12VDC
20-24	24VDC
20-11	110VRAC
20-22	220VRAC
30-12	12VDC
30-24	24VDC
30-11	110VRAC
30-22	220VRAC
32	

* The kit (spool control code 11) needs special spool.

Code	lever position
A	at port side A (standard)
B	at port side B

Code	operation control
C	see page 3/3
CL	
CLO	
CLR	
CLS	
CP	
H	
Z	

OPERATION CONTROL

operation control		operation control	Code
without standard hand lever 	C	with standard hand lever at 180° 	CLO
with standard hand lever 	CL	with stroke (flow) limiter 	CLR
with limit switch 	CLS	with cable control  <p>Cables , single levers and joystick controls - on request</p>	H
with protection cap 	CP	without lever , with dust-proof plate 	Z

GENERAL DESCRIPTION

Hydraulic valve RM40P provides change of fluid flow direction, hydro-systems pressure restriction, pump unloading in neutral position of the spools. The valve RM40P is designed to be integrated in hydraulic systems of Mobile and Industrial Machines.

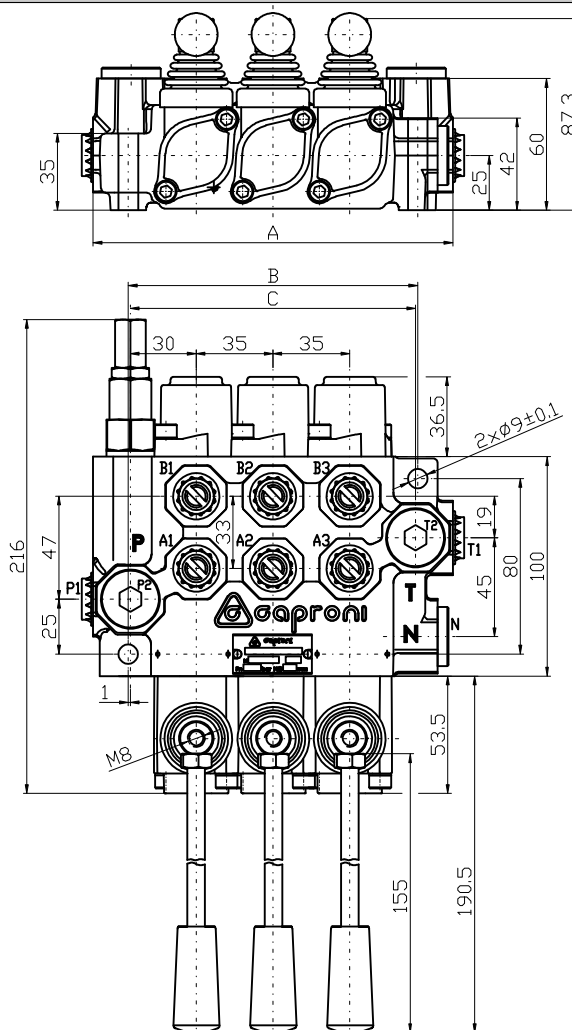
The valve assembly consists of:

A body with integrated relief and check valves, spools, control and spring-centering group of the spools. The valve RM40P provides parallel distribution of the working liquid and direct passing of the flow from the pump line to the tank at neutral position (open center). Options "closed centre" and "carry over" are possible with additional adapters. There are different control options: spring-centering in "neutral" position, detent, automatic kick-out, hydraulic and electro-hydraulic control.

TECHNICAL DATA

Rated flow	40 l/min
Max. pressure	P=250 bar; T=50 bar; A,B= 300 bar
Spool stroke	±6 mm
Working temperature range	-15...+80 °C
Working liquid	hydraulic oil HLP DIN51524
Liquid viscosity	15...300cSt
Nominal filtration	ISO4406: 19/16 (recommended filter element - 0,025mm mesh)
Internal leakage at 120 bar , t=40°C and viscosity 46cSt	max. 8cm ³ /min; max 2cm ³ /min (special version)
Actuating force	less than 200N

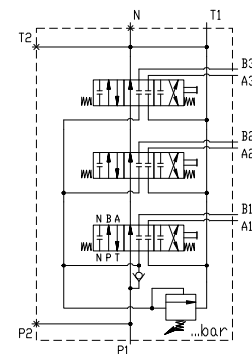
DIMENSIONS



RM40P/03/Q/3x/1CLA1/R/P1T1/G/N

Type	A	B	C	Weight, kg
RM40	87	62	-	2.6
RM40P/02	129	97	95	4.4
RM40P/03	164	132	130	5.9
RM40P/04	199	167	165	7.3
RM40P/05	234	202	200	8.8
RM40P/06	269	237	235	10.3
RM40P/07	304	272	270	11.8

STANDARD PARALLEL CIRCUIT



ORDERING CODE

RM40PEHI / 0 3 / Q / 1 CL A 1 E1^{**} / R / P1T1 / G / N

parallel connection
for RM40 - omit

type of control	Code
without control	omit
On-Off internal electro-hydraulic	EHI
On-Off external electro-hydraulic	EHE
On-Off electro-pneumatic	EPC
On-Off hydraulic	HC
On-Off pneumatic	PC

common check valve	Code
with check valve for RM40 - omit	0
without check valve	N

number of the spools
for RM40 - omit

relief valve	Code
setting range 5...250bar (example of required settings 180bar)	Q Q180
shut-off plug installed	K

spools	Code
	1
	2
	3
	4
	5
	6
	7
	8*
	9
	10*
	11*

* The scheme (spool code 8, 10 and 11) needs special body with extra machining.

standard port threads			
Code	P1, P2	A, B	T1, T2, N
M	M22x1,5-6H	M18x1,5-6H	M22x1,5-6H
G	G1/2"-A	G3/8"-A	G1/2"-A
U	7/8-14UNF-2B	3/4-16UNF-2B	7/8-14UNF-2B
G1/2	G1/2"-A		

Code	application
N	normal
T	tropical

Code	hydraulic power output
R	open center (port N connected to T - short plug)
W	closed center (port N plugged - long plug)
C	carry over (port N - with power beyond sleeve)

Code	used conn. ports
P1T1	P1 and T1
P1T2	P1 and T2
P2T1	P2 and T1
P2T2	P2 and T2

Code	spool control
1	
2	
3	
4	
5	
6	
7	
8	
9	

Code	micro switch: max. current/voltage - 5A/250V AC protection - IP67 contact configuration
	DIN 43650-A
omit	without microswitch
E1	
E2	
E3	

Code	spool control
10	
11*	<div style="display: flex; justify-content: space-between;"> <div> <p>Adjustment range of automatic kick-out feature - 60...180bar</p> </div> <div> <p>Code</p> <p>20-12 12VDC 20-24 24VDC 20-11 110VRAC 20-22 220VRAC</p> <p>ON-OFF EHI & EHE</p> </div> </div>
12	<div style="display: flex; justify-content: space-between;"> <div> <p>30-12 12VDC 30-24 24VDC 30-11 110VRAC 30-22 220VRAC</p> <p>ON-OFF EPC</p> </div> <div> <p>Code</p> <p>32</p> <p>ON-OFF HC & PC</p> </div> </div>
14	
15	
16	SD1
17	SD10

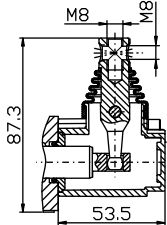
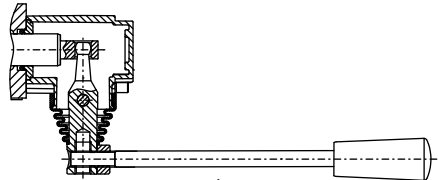
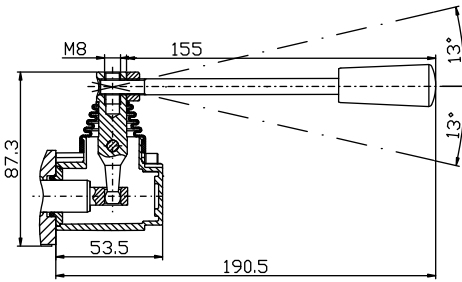
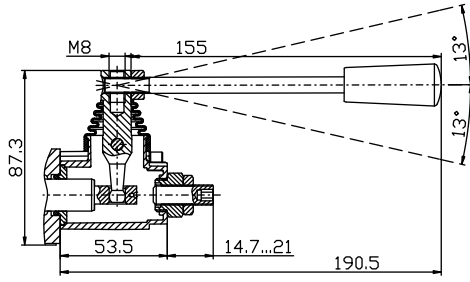
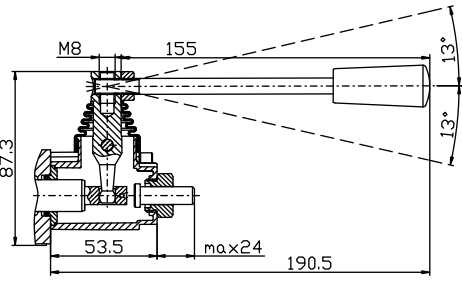
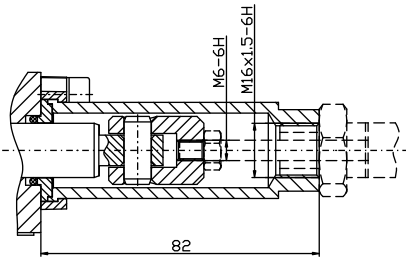
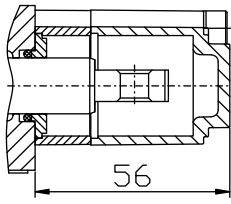
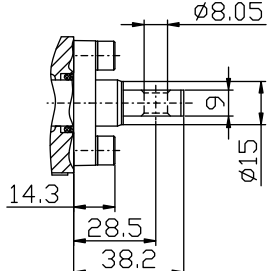
Code	operation control
C	see page 3/5
CL	
CLO	
CLR	
CLS	
CP	
H	
Z	see page 4/5
J...	

Code	lever position
A	at port side A (standard)
B	at port side B

* The kit (spool control code 11) needs special spool.

** Repeat for each spool. In case of identical spools example ordering code is:
RM40P / 03 / Q / 3x / 1CL A1 / R / P1T1 / G / N

OPERATION CONTROL

operation control		operation control	Code
without standard hand lever 	C	with standard hand lever at 180° 	CLO
with standard hand lever 	CL	with stroke (flow) limiter 	CLR
with limit switch 	CLS	with cable control  <p>Cables , single levers and joystick controls - on request</p>	H
with protection cap 	CP	without lever , with dust-proof plate 	Z

OPERATION CONTROL

Working scheme by assembly on the side of threaded ports A (standard)

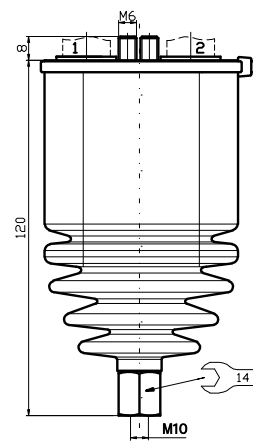
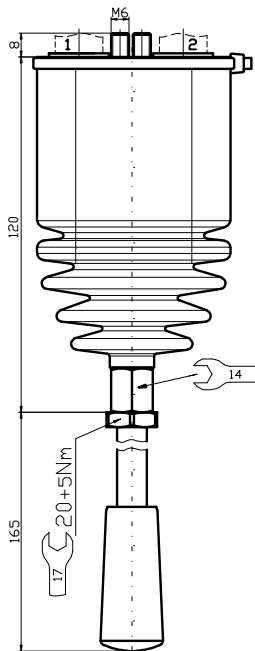
		Code
		J1...
	J3...	J4...

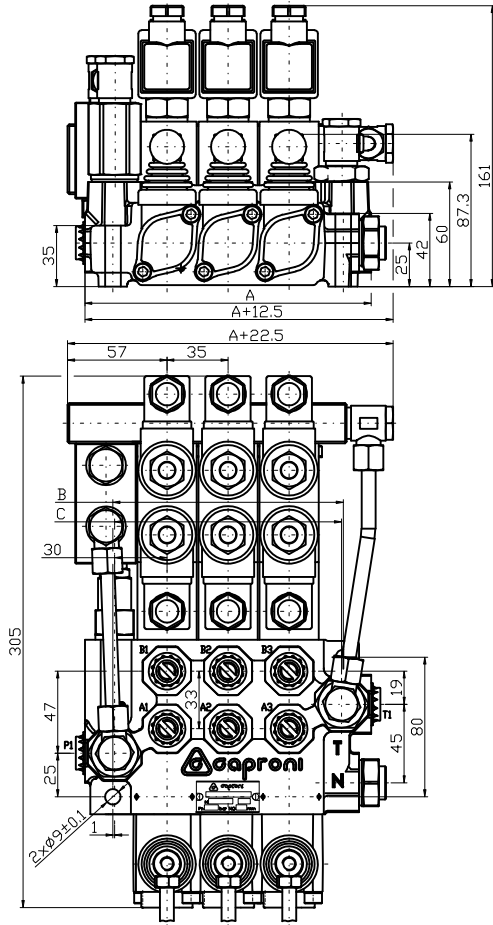
joystick
with standard hand lever

Code: J1L ; J2L ; J3L ; J4L

joystick
without standard hand lever

Code: J1 ; J2 ; J3 ; J4



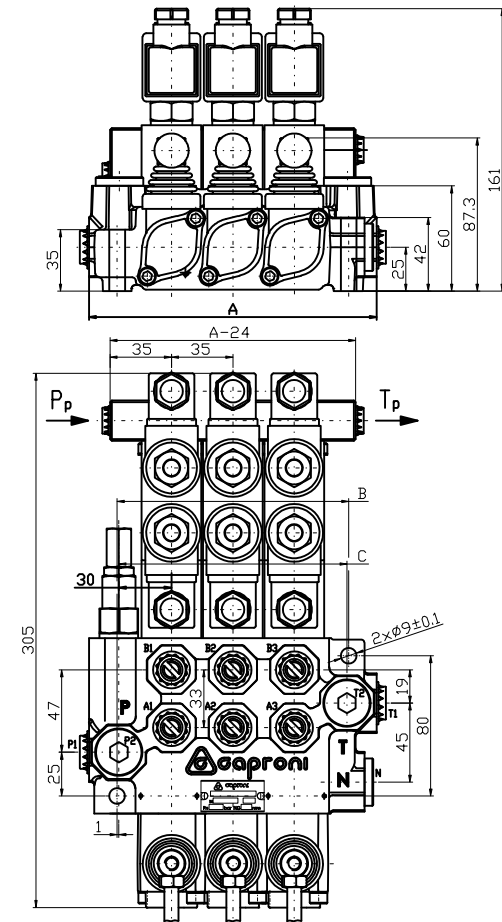
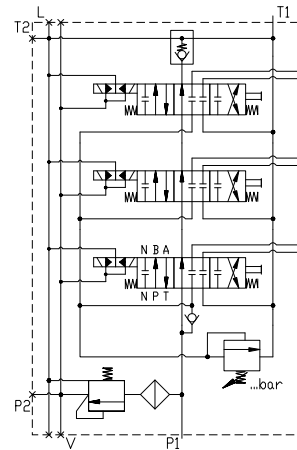


RM40PEHI/03/Q/3x1CLA20-24/R/P1T1/G/N

On/Off electrohydraulic control (internal)
operating features:

- Pilot pressure - 10...50 bar
- Max. pilot flow - 8 l/min
- Filtration - 25 mm
- Coil - 18W , duty cycle ED 100%
- Voltage options - 12V DC , 24V DC , 110V RAC , 220V RAC
- Integrated back pressure valve

Scheme

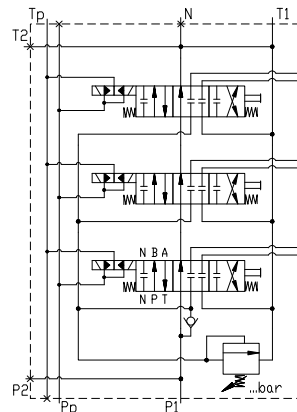


RM40PEHE/03/Q/3x1CLA20-24/R/P1T1/G/N

On/Off electrohydraulic control (external)
operating features:

- Pilot pressure Pp - 10...50 bar
- Max. pilot flow - 8 l/min
- Filtration - 25 mm
- Coil - 18W , duty cycle ED 100%
- Voltage options - 12V DC , 24V DC , 110V RAC , 220V RAC
- Pp , Tp - G1/4

Scheme



GENERAL DESCRIPTION

Hydraulic valve RM80 provides change of fluid flow direction, hydro-systems pressure restriction, pump unloading in neutral position of the spools. The valve RM80 is designed to be integrated in hydraulic systems of Mobile and Industrial Machines.

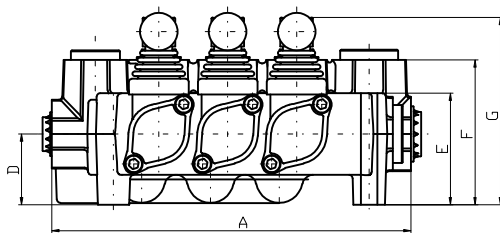
The valve assembly consists of:

A body with integrated relief and check valves, spools, control and spring-centering group of the spools. The valve RM80 provides parallel distribution of the working liquid and direct passing of the flow from the pump line to the tank at neutral position (open center). Options "closed centre" and "carry over" are possible with additional adapters. There are different control options: spring-centering in "neutral" position, detent, automatic kick-out, hydraulic and electro-hydraulic control.

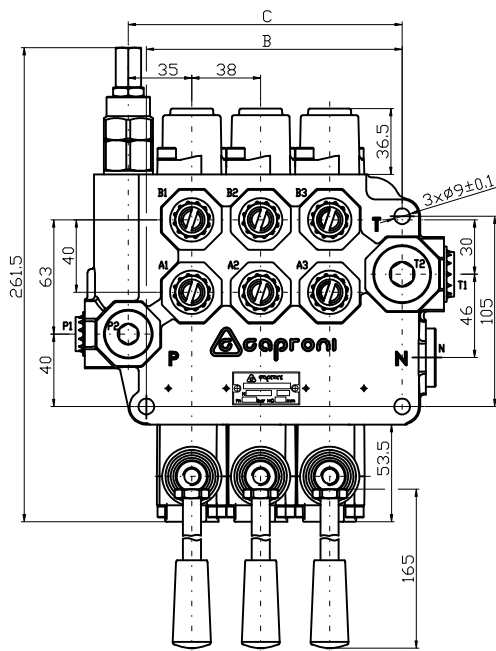
TECHNICAL DATA

Rated flow	80 l/min
Max. pressure	P=250 bar; T=50 bar; A,B= 300 bar
Spool stroke	±7 mm
Working temperature range	-15...+80 °C
Working liquid	hydraulic oil HLP DIN51524
Liquid viscosity	15...300cSt
Nominal filtration	ISO4406: 19/16 (recommended filter element - 0,025mm mesh)
Internal leakage at 120 bar , t=40°C and viscosity 46cSt	max. 8cm ³ /min; max 2cm ³ /min (special version)
Actuating force	less than 280N

DIMENSIONS

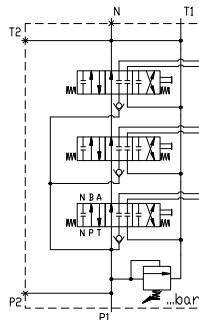


RM80P/3/Q/3x/1CLA1/R/P1T1/G/N

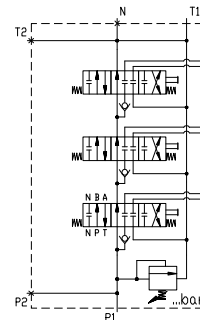


Type	A	B	C	D	E	F	G	Weight, kg
parallel								
serial								
RM80	108	65	-	24	46.5	65	88.3	4.0
RM80P/2	160	103	113					7.4
RM80P/3	198	141	151					9.7
RM80P/4	236	179	189	39	61.5	80	103.3	12.0
RM80P/5	274	217	227					14.3
RM80P/6	312	255	265					16.7

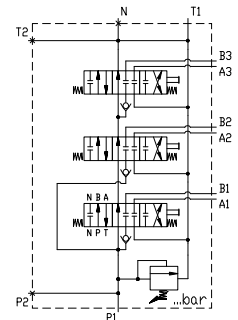
STANDARD PARALLEL CIRCUIT



STANDARD SERIES CIRCUIT



TANDEM CIRCUIT



ORDERING CODE

RM80PEHI / 3 / Q / 1 CL A 1 E1 / R / P1T1 / G / N

type of connection	Code
for RM80	omit
Parallel	P
Series*	S
Tandem (P+S)*	T

* The scheme (connection type S and T) needs special body.

type of control	Code
without control	omit
On-Off internal electro-hydraulic	EHI
On-Off external electro-hydraulic	EHE
On-Off electro-pneumatic	EPC
On-Off hydraulic	HC
On-Off pneumatic	PC

number of the spools for RM80 - omit

relief valve	Code
setting range 20...300bar (example of required settings 180bar)	Q Q180
shut-off plug installed	K

spools	Code
	1
	2
	3
	4
	5
	6
	7
	8*
	9*
	10

* The scheme (spool code 8 and 9) needs special body with extra machining.

standard port threads	
Code	P1, P2, A, B T1, T2, N
M	M22x1,5-6H M26x1,5-6H
G	G1/2"-A G3/4"-A
U	7/8-14UNF-2B 1 1/16-12UN-2B

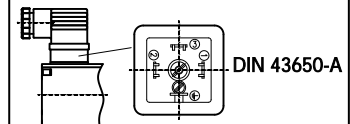
Code	application
N	normal
T	tropical

Code	hydraulic power output
R	open center (port N connected to T - short plug)
W	closed center (port N plugged - long plug)
C	carry over (port N - with power beyond sleeve)

Code	used conn. ports
P1T1	P1 and T1
P1T2	P1 and T2
P2T1	P2 and T1
P2T2	P2 and T2

Code	spool control
1	
2	
3	
4	
5	
6	
7	
9	
11*	 Adjustment range of automatic kick-out feature - 60...180bar

micro switch:
max. current/voltage - 5A/250V AC
protection - IP67
contact configuration



omit without microswitch



Code	spool control
12	20-12 12VDC ON-OFF EHI & EHE 20-24 24VDC 20-11 110VRAC 20-22 220VRAC
13	
14	30-12 12VDC ON-OFF EPC 30-24 24VDC 30-11 110VRAC 30-22 220VRAC
15	
16	32 ON-OFF HC & PC
17	

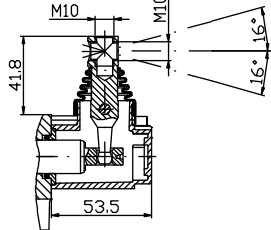
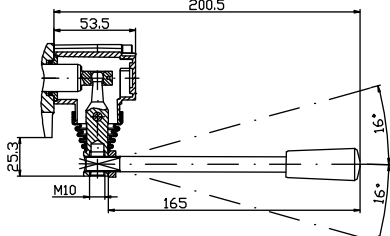
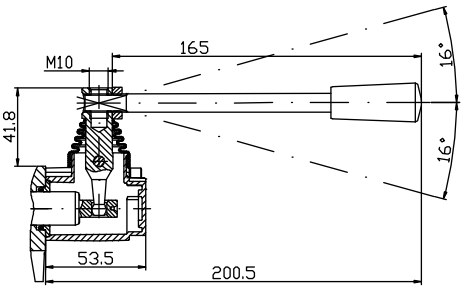
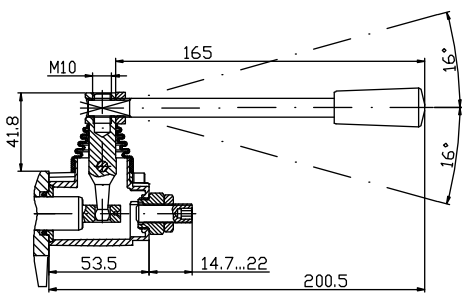
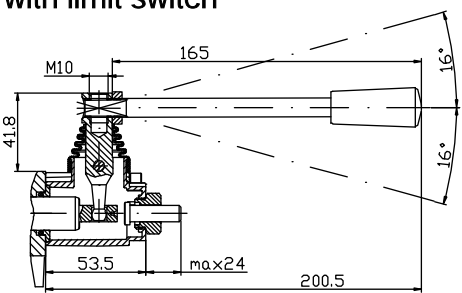
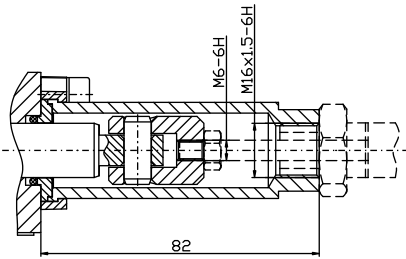
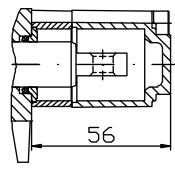
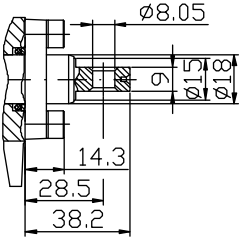
* The kit (spool control code 11) needs special spool.

Code	operation control
C	see page 3/5
CL	
CLO	
CLR	
CLS	
CP	
H	
Z	see page 4/5
J...	

Code	lever position
A	at port side A (standard)
B	at port side B

** Repeat for each spool. In case of identical spools example ordering code is:
RM80 / 3 / Q / 3x / 1CL A1 / R / P1T1 / G / N

OPERATION CONTROL

operation control		operation control	Code
without standard hand lever 	C	with standard hand lever at 180° 	CLO
with standard hand lever 	CL	with stroke (flow) limiter 	CLR
with limit switch 	CLS	with cable control  <p>Cables , single levers and joystick controls - on request</p>	H
with protection cap 	CP	without lever , with dust-proof plate 	Z

OPERATION CONTROL

Working scheme by assembly on the side of threaded ports A (standard)

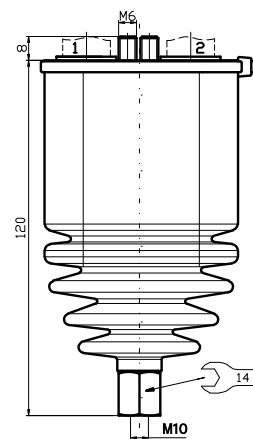
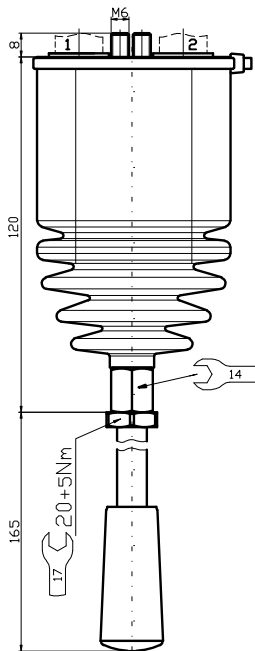
	Code		Code
	J2...		J1...
	J3...		J4...

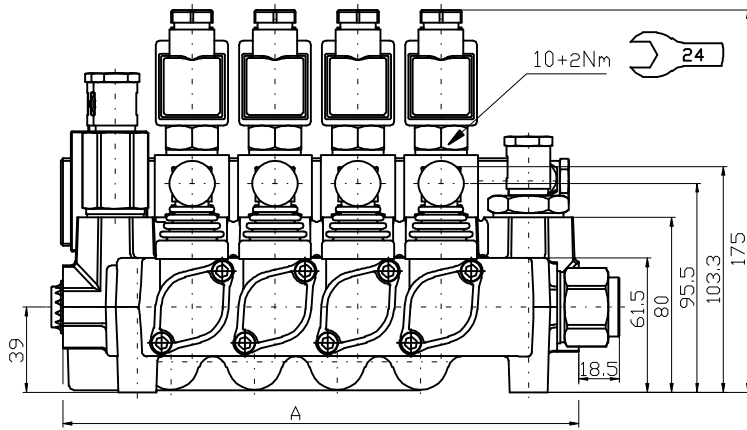
joystick
with standard hand lever

Code: J1L ; J2L ; J3L ; J4L

joystick
without standard hand lever

Code: J1 ; J2 ; J3 ; J4

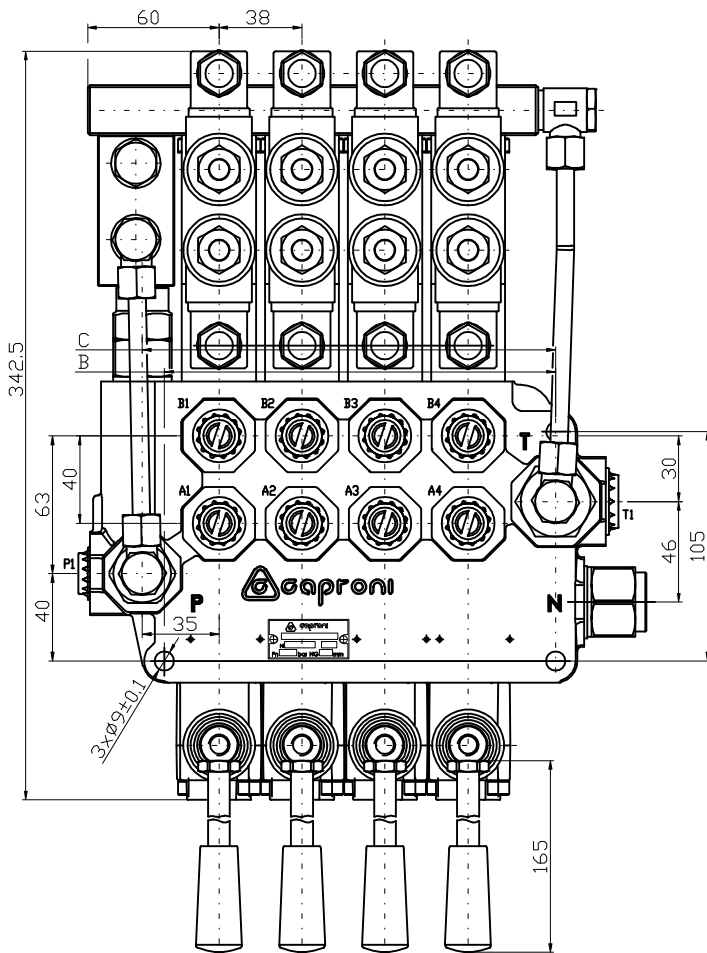




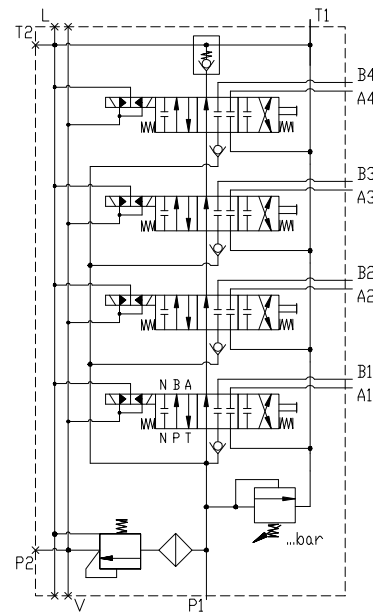
RM80PEHI/4/Q/4x/1CLA20-24/R/P1T1/G/N

On/Off electrohydraulic control (internal)
operating features:

- Pilot pressure - 10...50 bar
- Max. pilot flow - 8 l/min
- Filtration - 25 mm
- Coil - 18W , duty cycle ED 100%
- Voltage options - 12V DC , 24V DC , 110V RAC , 220V RAC
- Integrated back pressure valve



Scheme

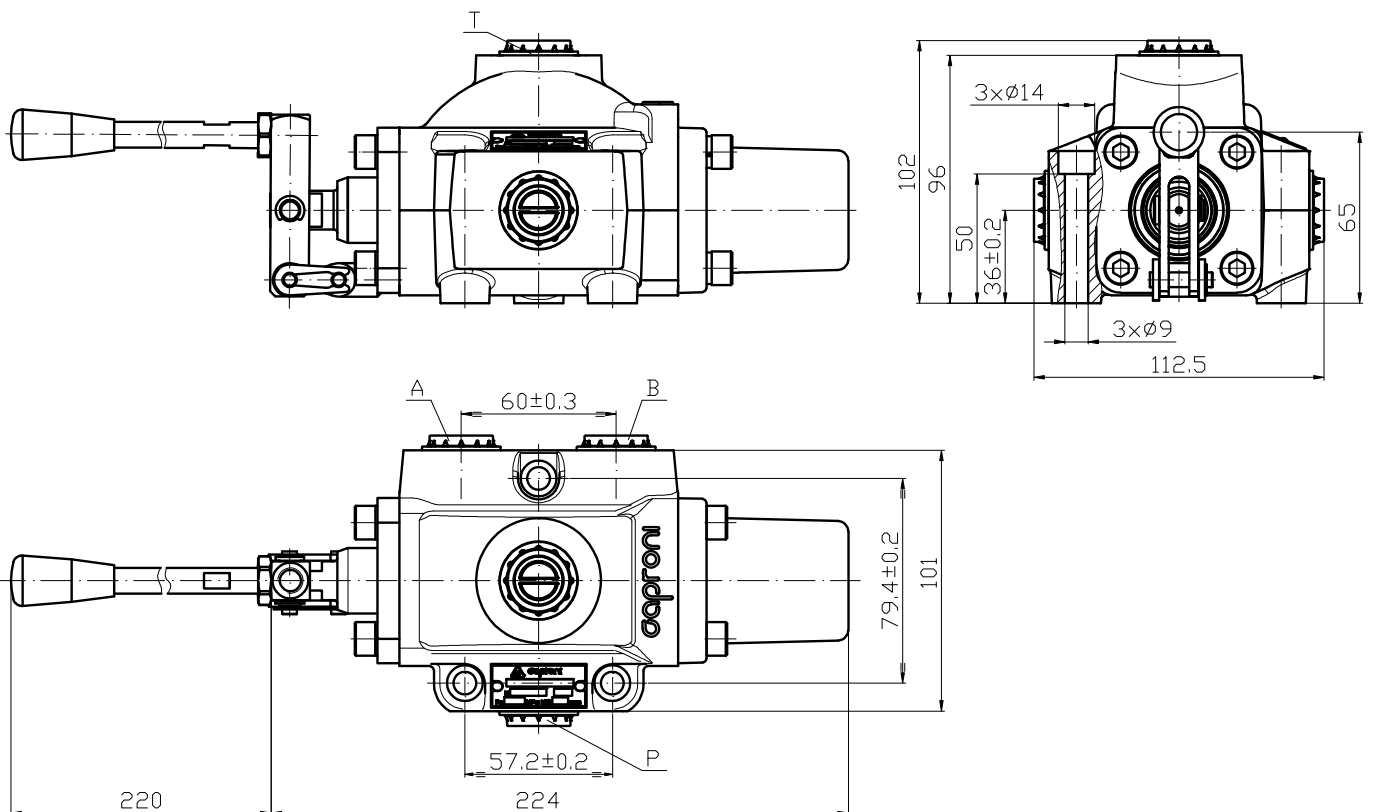


GENERAL DESCRIPTION

The directional control valve RMD90 provides a change of fluid flow direction in the channels of the hydraulic system. Valve RMD90 is designed for mounting in the hydraulic systems of the mobile and industrial machines.

TECHNICAL DATA

Weight	5.7kg
Nominal flow	90 l/min
Maximal flow	150 l/min
Nominal pressure	16 MPa
Maximal pressure	20 MPa
Working stroke of the spool	±8 mm
Spool leakage at p=100bar t=40°C and viscosity 36cSt	25 cm ³ /min
Working fluid-hydraulic oil with parameters:	viscosity - 15...300cSt recommended viscosity - 20...80cSt temperature - -20...+80°C degree of filtration - 0,025mm

DIMENSIONS


ORDERING CODE

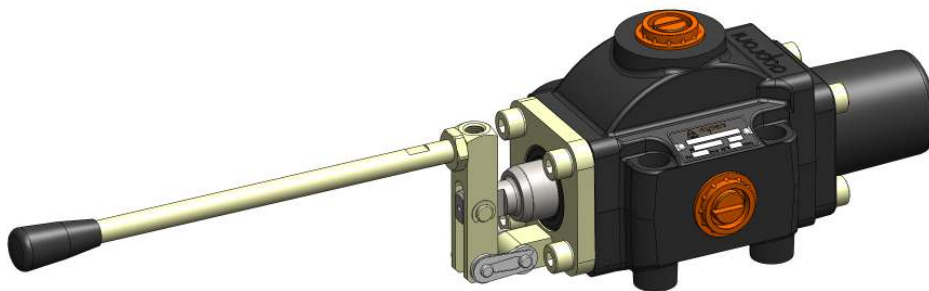
RMD90 - 1 DL 1 G

<p>Double acting , 3 position , 4 way A and B blocked in neutral</p>	Code 1
<p>Double acting , 3 position , 4 way A , B and P to tank in neutral</p>	Code 2
<p>Double acting , 3 position , 4 way A and B to tank in neutral</p>	Code 3

Lever :	with lever without lever	Code DL D
---------	-----------------------------	-----------------

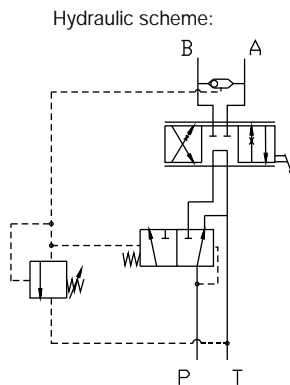
Code	P , T , A , B
G	G3/4"-A
K	K3/4"-14 GOST6111-52 (3/4"-14NPT)

Code 1	Spring return to neutral	
Code 2	Detent in position 1 and 2	
Code 3	Detent in three positions	



GENERAL DESCRIPTION

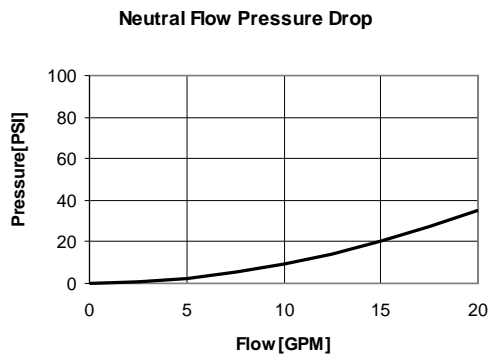
1. The valve type MRP 70 incorporates the features of a 4-way directional control valve , an adjustable full range pressure compensated by-pass type flow control valve and a pilot operated pressure relief valve all in one compact package.
2. Less fittings and plumbing , eliminates leakage points.
3. Fine positive metering is possible in either direction with one manually adjustable , infinitely variable lever controlling both direction and amount of flow. Amount of flow is proportional to movement of the lever.
4. Flow is constant regardless of pressure variations , thus flow out the work port remains smooth and constant regardless of changes in load conditions.
5. An externally adjustable pilot relief is standard.
6. Friction detent (Friction positioner kit).


TECHNICAL DATA

DATA	UNIT	VALUE/RANGE
Rated flow	l/min (US GPM)	70 (18)
Rated pressure	bar (PSI)	210 (3000)
Standard port size: Inlet & outlet work ports A & B	BSP BSP	3/4" 1/2"
Working liquid - hydraulic oils with parameters: -viscosity -recommended viscosity -temperature -degree of filtration Leakage at p=100bar t=40oC ; 36cSt	mm ² /sec (cSt) mm ² /sec (cSt) °C (°F) mm (in) cc/min	15...300 20...80 -20...+80 (-4...+176) 0.025 (9.8 10 ⁻⁴) 15

PERFORMANCE CURVE

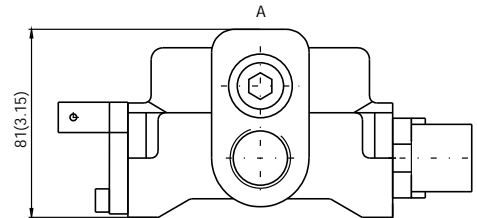
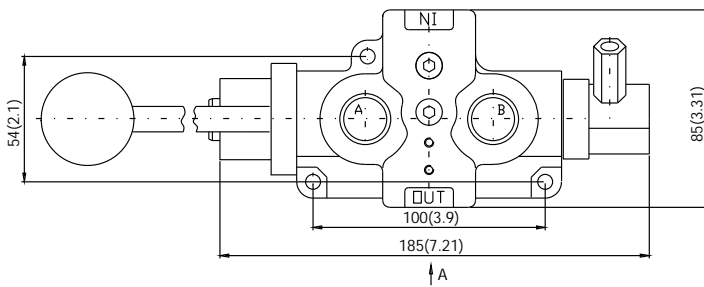
CONDITIONS:
 $\Delta P = f(Q)$
 36 cSt oil viscosity
 $T = 40^{\circ}\text{C} (104^{\circ}\text{F})$



In this curve the pressure difference between the inlet and outlet is shown.

DIMENSIONS

All dimensions are in mm (in).





caproni
BULGARIA JOINT-STOCK COMPANY

BULGARIA , 6100 KAZANLAK , 45 STOLETOV Str.
Tel .: +359/431/62 229 , +359/431/6132 ,
Fax: +359/431/62 230 , +359/431/63 134
E-mail : caproni@caproni.bg , WEB: <http://www.caproni.bg>