

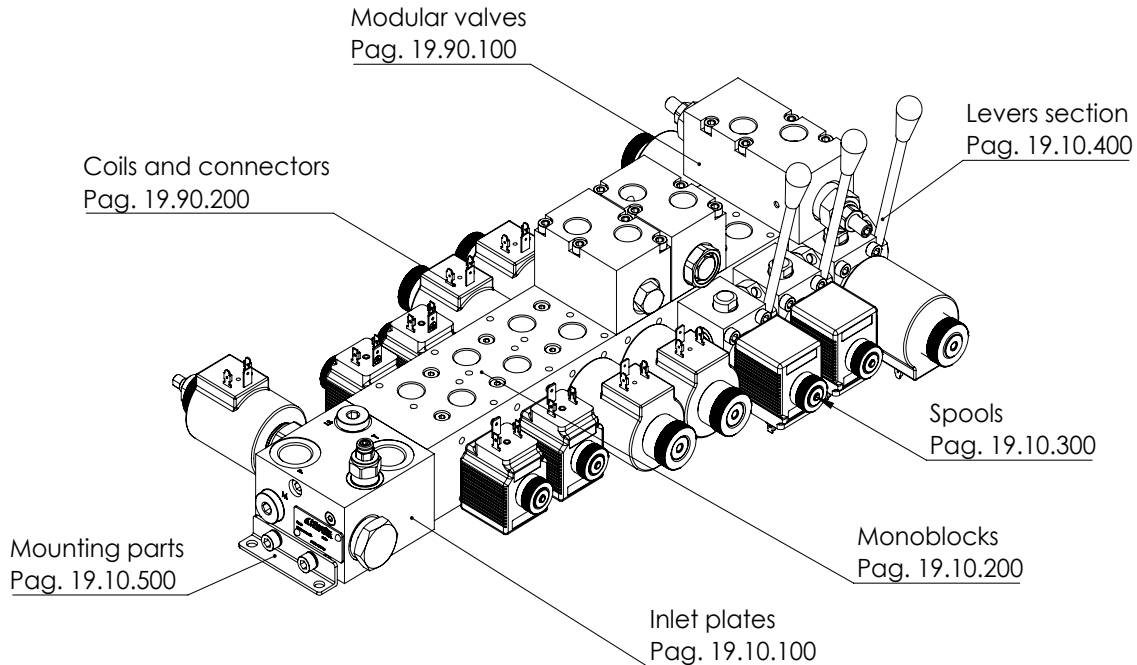
**SECTION 19****DIRECTIONAL VALVES**

Hydraulic scheme	Valve description	Valve type	Rated flow (l/min)	Max. pressure (bar)	Page
	EBN	On-off or proportional	30/60	210/320	19.10.000
	EBL	Load sensing, on-off or proportional	30/60	210/320	19.20.000
	EBP	Precompensated, load sensing, on-off or proportional	30/60	210/320	19.30.000
	Accessories	-	-	-	19.90.000



# EBN series

## MONOBLOCK DIRECTIONAL VALVE ON-OFF OR PROPORTIONAL



### FEATURES

- Compact dimensions
- Low weight
- Custom spools
- Custom inlet blocks
- Sandwich valves for extra functions
- Cast iron monoblock and aluminum inlet block for standard applications
- High resistance cast iron monoblock and steel inlet block for high pressure systems
- Optional levers for manual operation
- No leak risk between sections
- Spools not under rod tension
- Zinc plated/anodized components for corrosion resistance

### SPECIFICATION \ DESCRIPTION

<b>MAXIMUM OPERATING PRESSURE</b>	Steel inlet block: 320 bar (4500 PSI) Aluminium inlet block: 210 bar (3045 PSI)
<b>MAXIMUM TANK PRESSURE</b>	20 bar (290 PSI)
<b>RATED FLOW</b>	030 series: 30 l/min (7.9 GPM) 060 series: 60l/min (15.8 GPM)
<b>COIL POWER</b>	030 series: 26 W 060 series: 33 W
<b>VOLTAGE</b>	12 VDC, 24 VDC, others on request
<b>COIL CONNECTOR</b>	DIN43650, AMP Junior, Deutsch DT04-2P
<b>PORTS</b>	Inlet: G1/2", 1/2 JIS, 7/8-14 UNF-2B (SAE#10) Outlet: G3/8", 3/8 JIS, 3/4-16 UNF-2B (SAE#8)
<b>OPERATING TEMPERATURE</b>	NBR (ISO 1629) seals: -30, + 80 °C FKM (ISO 1629) seals: -20, +110 °C
<b>FILTRATION</b>	ISO 4406:1999: class 19/17/14 NAS 1638: class 8
<b>MOUNTING POSITION</b>	No restrictions
<b>MATERIAL</b>	Spool body: cast iron Spool: hardened and grounded steel Inlet block: Aluminium or steel
<b>SURFACE TREATMENT</b>	Steel: zinc plating Aluminium: anodization

EBN series is a new directional valve that has innovative features in terms of performance, dimension, manufacturing reliability and customization. The valve consists in an inlet block flanged to a monoblock with spools. This construction gives the advantages of high flexibility in inlet block schemes, combined with the reliability and simplicity of monoblock spool valve construction, eliminating the risk of spools blocking due to overtightening of tie rods or the risk of leakage between sections. The spool monoblock is a 2 or 3 position, 4 ways, direct acting solenoid operated type. All sections have threaded ports at the top and removable plugs for tank connections to allow the installation of flanged blocks with additional functions like crossover reliefs, reliefs to tank, relief and anticavitations, counterbalance valves, P.O. checks, flow restrictors and flow regulators. All sections are equipped with standard push button override and they can be equipped with lever for manual use.

### HOW ORDER IT

To order an assembled block, contact AFT sales network specifying the part numbers following page 19.90.900 path.

For special versions please contact AFT sales network.

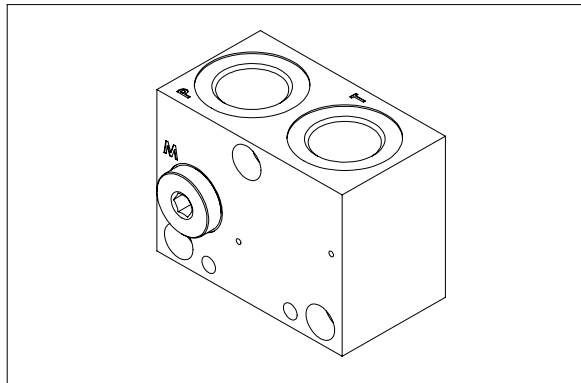
To order the separate parts please refer to each catalogue page.



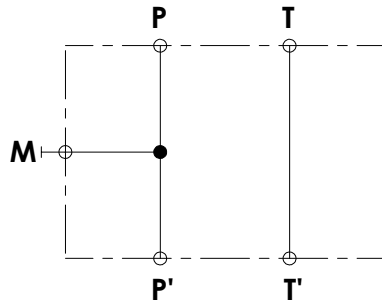
**EBN series - INLET SECTION**

**SFNL-060-ZNNN-01**

**P, T PORTS  
M PORTS**



**HYDRAULIC SCHEME**

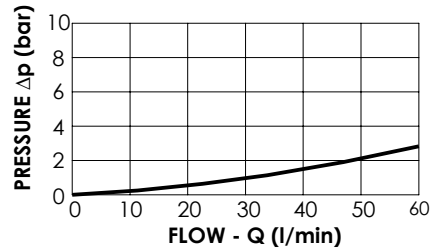


This inlet section is equipped with two thread ports (P, T) available in two different types G 1/2" or 3/4"-16 UNF plus a third threaded port M for pressure measuring available in G 1/4" or 7/16"-20. The manifold material is aluminium for applications up to 210 bar or zinc plated steel for applications up to 320 bar.

**TECHNICAL DATA**

<b>Max pressure</b>	210/320 bar
<b>Rated flow</b>	60 l/min
<b>Hydraulic fluid</b>	Mineral oil DIN 51 524
<b>Fluid viscosity</b>	10-500 mm <sup>2</sup> /s
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight</b>	0,3 Kg

**PRESSURE DROP**



**ORDERING DETAILS: SEPARATE ELEMENTS**

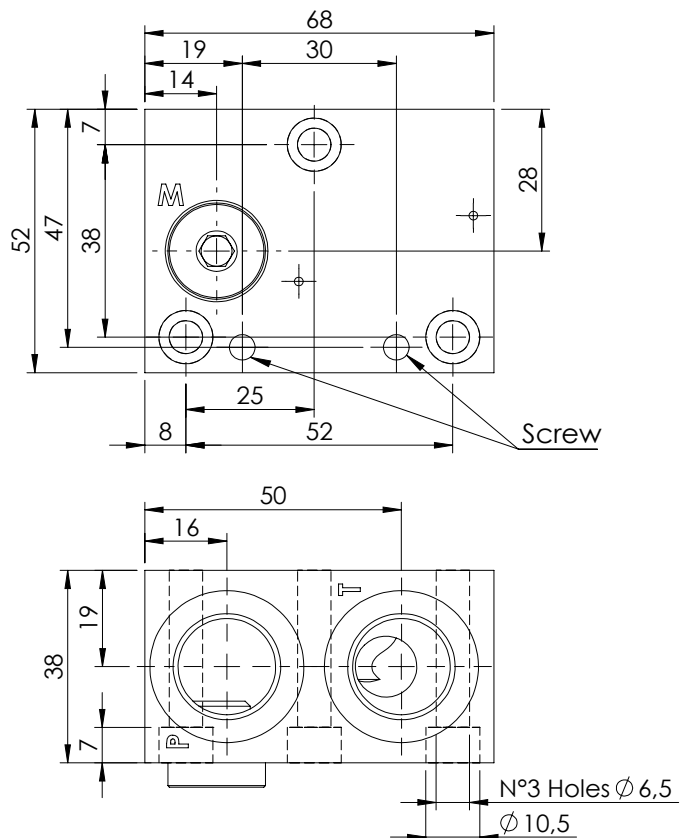
**SFNL-060 - \*NNN-01-\*\*\*-N**

*	MATERIAL TYPE
<b>A</b>	Steel zinc-plated (320 bar)
<b>Z</b>	Aluminium anodized (210 bar)

***	PORTS		
	P line	T line	M
<b>G12</b>	G 1/2"	G 1/2"	G 1/4"
<b>U34</b>	3/4"-16 UNF	3/4"-16 UNF	7/16"-20 UNF

QUICK CODE	
DESCRIPTION	CODE
SFNL-060-ZNNN-01-G12-N	SF000004

**OVERALL DIMENSIONS**

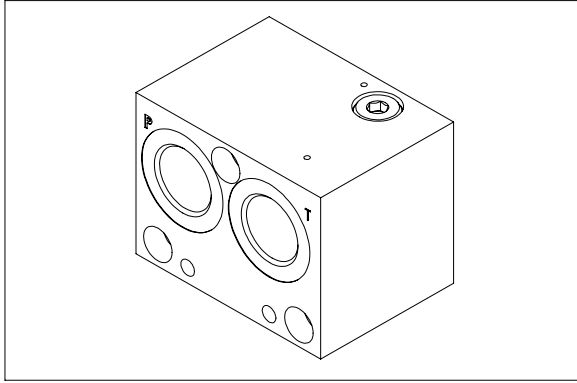


# EBN series - INLET SECTION

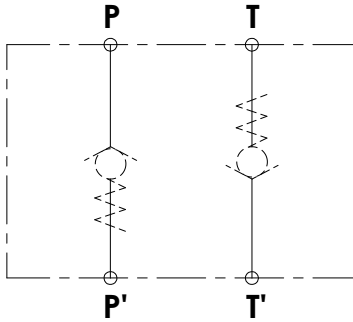


## SFNL-060-ZNNN-02

## CHECK VALVE OPTIONS



### HYDRAULIC SCHEME

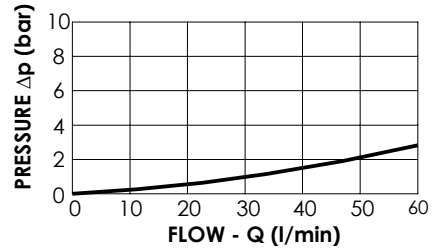


This inlet section is equipped with threaded ports (P, T) available in two different sizes G 1/2" or 3/4"-16 UNF, M ports is not available in this inlet section. The ports have extra threads to allow the installation of check valve on P and T ports. The manifold material is aluminium for applications up to 210 bar or zinc plated steel for applications up to 320 bar.

### TECHNICAL DATA

<b>Max pressure</b>	210/320 bar
<b>Rated flow</b>	60 l/min
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10-500 mm <sup>2</sup> /s
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight</b>	0,4 Kg

### PRESSURE DROP



### ORDERING DETAILS: SEPARATE ELEMENTS

## SFNL-060-**\***NN<sup>\*</sup>-02-**\*\*\***-N

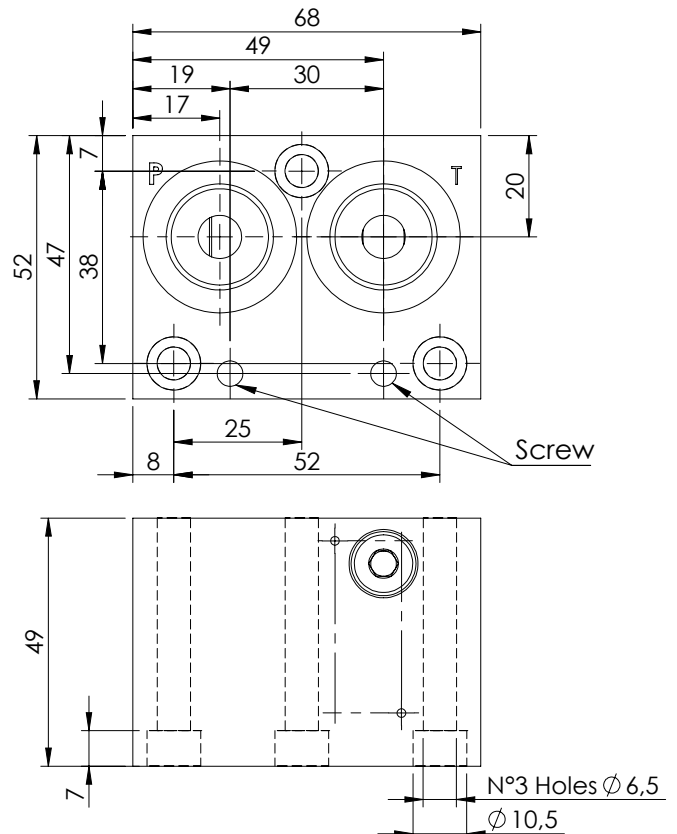
<b>*</b>	<b>MATERIAL TYPE</b>
<b>A</b>	Steel zinc-plated (320 bar)
<b>Z</b>	Aluminium anodized (210 bar)

<b>*</b>	<b>CHECK VALVE OPTION</b>
<b>N</b>	No check valve
<b>D</b>	Check valve on P e T ports
<b>P</b>	Check valve only P port
<b>T</b>	Check valve only T port

<b>***</b>	<b>PORTS</b>		
	<b>P line</b>	<b>T line</b>	<b>M</b>
<b>G12</b>	G 1/2"	G 1/2"	/
<b>U34</b>	3/4"-16 UNF	3/4"-16 UNF	/

<b>QUICK CODE</b>	
DESCRIPTION	CODE
SFNL-060-ZNNN-02-G12-N	SF000008
Check valve on P	CD000181
Check valve on T	CD000175

### OVERALL DIMENSIONS

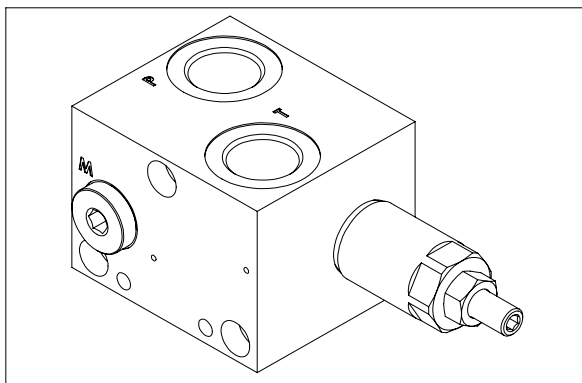


**EBN series - INLET SECTION**

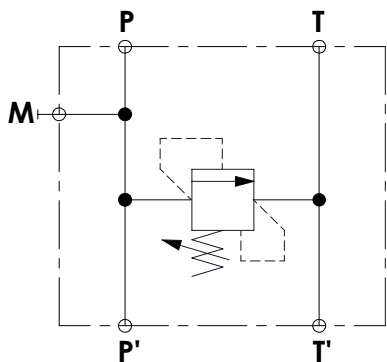


**SFNL-060-ZNNN-03**

**RELIEF VALVE  
M PORT**



**HYDRAULIC SCHEME**

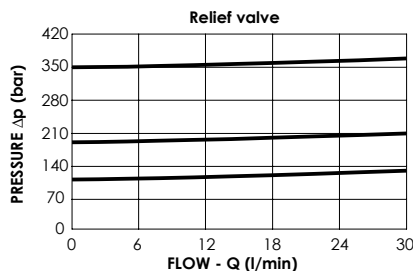


This inlet section is equipped with threaded ports (P, T) available in two different sizes G 1/2" or 3/4"-16 UNF, an M ports is available in sizes G 1/4" or 9/16-18 UNF. It is also present a with relief valve with adjustable setting, the adjustment is made by socket screw; the max flow on the relief valve is 30 l/min. The manifold material is aluminium for applications up to 210 bar or zinc plated steel for applications up to 320 bar.

**TECHNICAL DATA**

<b>Max pressure</b>	210/320 bar
<b>Rated flow</b>	60 l/min
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10-500 mm <sup>2</sup> /s
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight</b>	0,6 Kg

**PRESSURE DROP**



**ORDERING DETAILS: SEPARATE ELEMENTS**

**SFNL-060-[\*N\*]-03-\*\*\*-N**

<b>*</b>	<b>MATERIAL TYPE</b>
<b>A</b>	Steel zinc-plated (320 bar)
<b>Z</b>	Aluminium anodized (210 bar)

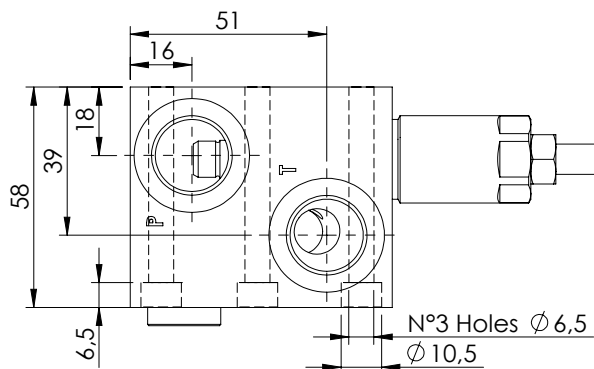
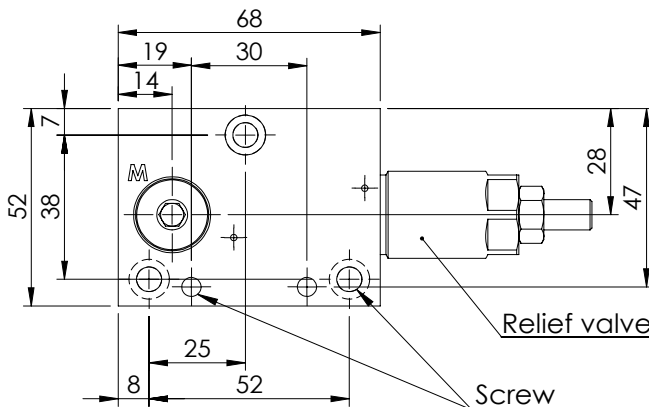
<b>*</b>	<b>SETTING RANGE</b>
<b>N</b>	Max setting 210 bar (CP000083)
<b>A</b>	Max setting 110 bar (CP000084)
<b>B</b>	Max setting 350 bar (CP000082)

<b>*</b>	<b>ADJUSTMENT OPTION</b>
<b>N</b>	Screw adjustment
<b>V</b>	Knob adjustment

<b>***</b>	<b>PORTS</b>		
	<b>P line</b>	<b>T line</b>	<b>M</b>
<b>G12</b>	G 1/2"	G 1/2"	G 1/4"
<b>U34</b>	3/4"-16 UNF	3/4"-16 UNF	7/16"-20 UNF

<b>QUICK CODE</b>	
DESCRIPTION	CODE
SFNL-060-ZNNN-03-G12-N	SF000003

**OVERALL DIMENSIONS**

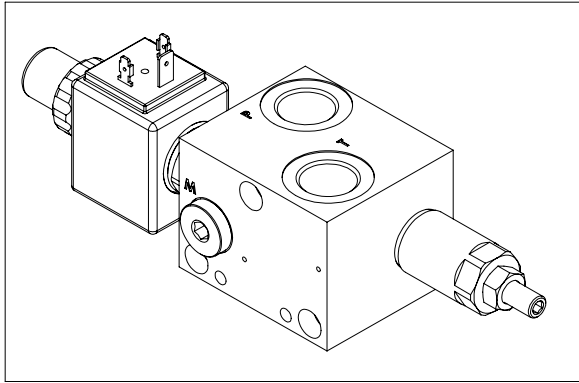


# EBN series - INLET SECTION

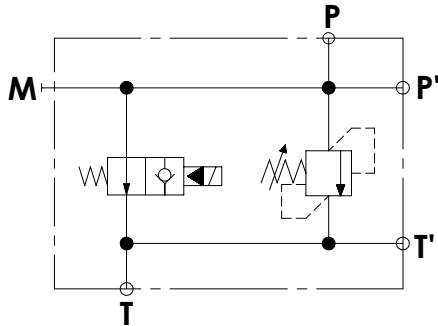


## SFNL-060-ZNNN-05

### RELIEF VALVE UNLOADING VALVE



**HYDRAULIC SCHEME**

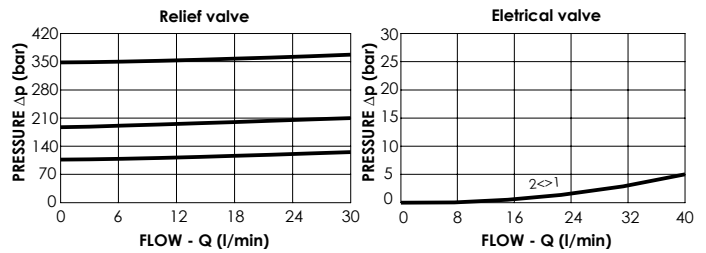


This inlet section is equipped with threaded ports (P, T) available in two different sizes G 1/2" or 3/4"-16 UNF, an M ports is available in sizes G 1/4" or 9/16-18 UNF. A with relief valve with adjustable setting protect from peak pressure; the max flow on the relief valve is 30 l/min. A solenoid valve normally open allow to unload the system and is equipped with manual override, max flow on the solenoid valve is 40 l/min. The manifold material is aluminium for applications up to 210 bar or zinc plated steel for applications up to 320 bar.

### TECHNICAL DATA

<b>Max pressure</b>	210/320 bar
<b>Rated flow</b>	60 l/min
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10-500 mm <sup>2</sup> /s
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight</b>	0,75 Kg

### PRESSURE DROP

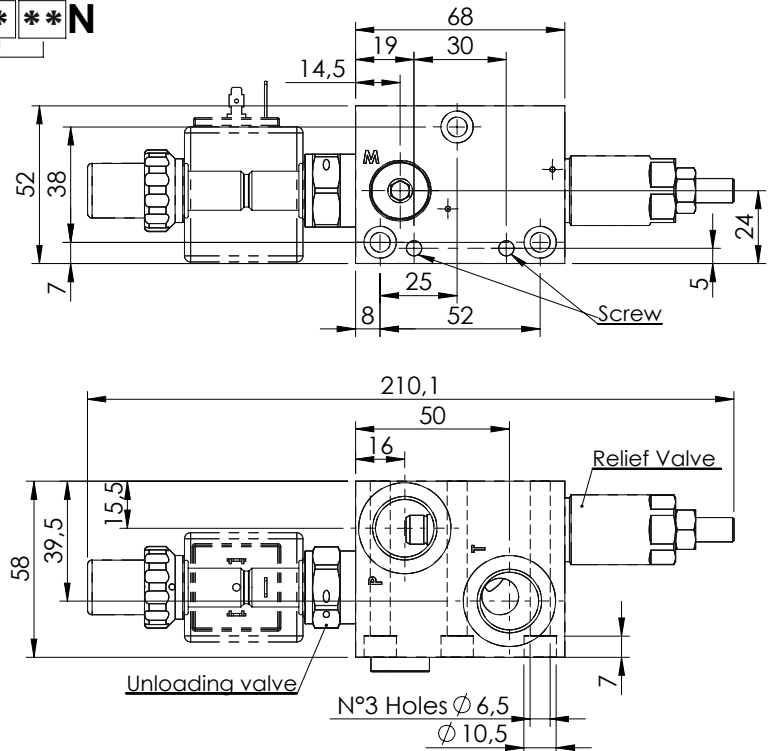


### ORDERING DETAILS: SEPARATE ELEMENTS

SFNL-060-**\*N\*\***-05-**\*\*\***-**\* \*\***N

<b>*</b>	<b>MATERIAL TYPE</b>		
<b>A</b>	Steel zinc-plated	(310 bar)	
<b>Z</b>	Aluminium anodized	(210 bar)	
<b>*</b>	<b>SETTING RANGE</b>		
<b>N</b>	Max setting	210 bar (CP000083)	
<b>A</b>	Max setting	110 bar (CP000084)	
<b>B</b>	Max setting	350 bar (CP000082)	
<b>*</b>	<b>ADJUSTMENT OPTION</b>		
<b>N</b>	Screw adjustment		
<b>V</b>	Knob adjustment		
<b>***</b>	<b>PORTS</b>		
	<b>P line</b>	<b>T line</b>	<b>M</b>
<b>G12</b>	G 1/2"	G 1/2"	G 1/4"
<b>U34</b>	3/4"-16 UNF	3/4"-16 UNF	7/16"-20 UNF
<b>*</b>	<b>VOLTAGE</b>		
	no coils		
<b>A</b>	12 V dc		
<b>B</b>	24 V dc		
<b>**</b>	<b>COILS TYPE</b>		
	no coils		
<b>HR</b>	Hirschmann (ISO 4400 DIN 43650)		
<b>DT</b>	Deutsch (DT04-2P)		
<b>AJ</b>	Amp junior (AJ type)		
	<b>QUICK CODE</b>		
	DESCRIPTION	CODE	
	SFNL-060-ZNNN-05-G12-N	SF000002	
	Unloading valve	CE000868	

### OVERALL DIMENSIONS

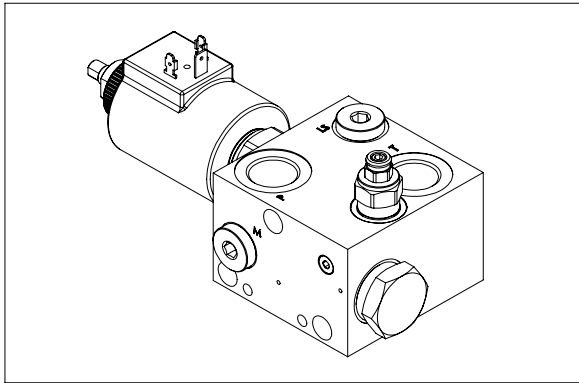




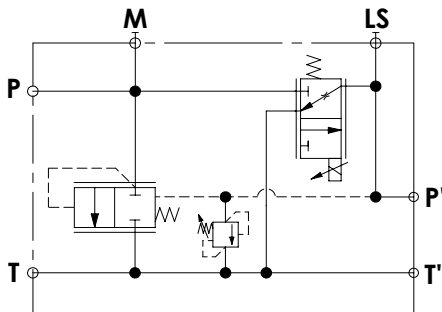
**EBN series - INLET SECTION**

**SFNL-060-ZDNN-07**

**PROPORTIONAL COMPENSATED FLOW REGULATOR**



**HYDRAULIC SCHEME**

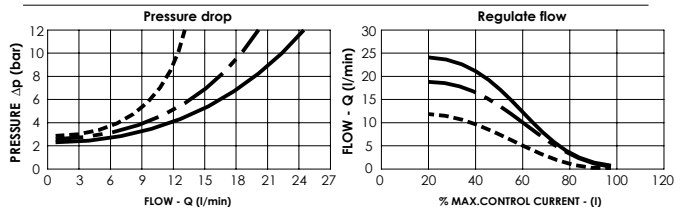


This inlet section is equipped with threaded ports (P, T) available in two different sizes G 1/2" or 3/4"-16 UNF, an M ports is available in sizes G 1/4" or 9/16-18 UNF; an LS port allows to measure of the load pressure.  
 A proportional flow regulator with external flow compensator controls the metering, the maximum flow is 40 l/min; when not energized the compensator is unloading the flow.  
 A relief valve with adjustable setting protect from peak of pressure.  
 The manifold material is aluminium for applications up to 210 bar or zinc plated steel for applications up to 320 bar.

**TECHNICAL DATA**

<b>Max pressure</b>	210/320 bar
<b>Rated flow</b>	60 l/min
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10-500 mm <sup>2</sup> /s
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight</b>	0,75 Kg

**PROPORTIONAL FLOW REGULATOR CURVES**

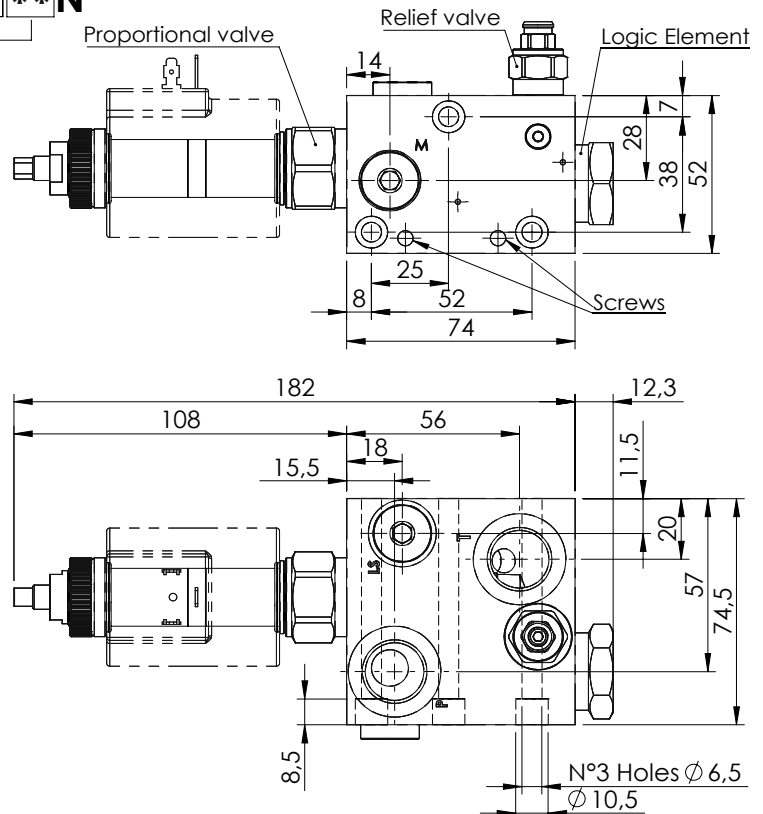


**ORDERING DETAILS: SEPARATE ELEMENTS**

**SFNL-060-\*D\*\* \*-07-\*\*\*-\*\*\*N**

<b>*</b>	<b>MATERIAL TYPE</b>	
<b>A</b>	Steel zinc-plated	(320 bar)
<b>Z</b>	Aluminium anodized	(210 bar)
<b>*</b>	<b>RELIF VALVE SETTING</b>	
<b>N</b>	Max setting	210 bar (CP000029)
<b>A</b>	Max setting	110 bar (CP000030)
<b>B</b>	Max setting	350 bar (CP000002)
<b>*</b>	<b>ADJUSTMENT FLOW</b>	
<b>N</b>	30 l/min	(CE000112)
<b>A</b>	20 l/min	(CE000113)
<b>B</b>	10 l/min	(CE000111)
<b>***</b>	<b>PORTS</b>	
	<b>P line</b>	<b>T line</b> <b>M</b>
<b>G12</b>	G 1/2"	G 1/2"    G 1/4"
<b>U34</b>	3/4"-16 UNF	3/4"-16 UNF    7/16"-20 UNF
<b>*</b>	<b>VOLTAGE</b>	
	no coils	
<b>A</b>	12 V dc	
<b>B</b>	24 V dc	
<b>**</b>	<b>COILS TYPE</b>	
	no coils	
<b>HR</b>	Hirschmann (ISO 4400 DIN 43650)	
<b>DT</b>	Deutsch (DT04-2P)	
<b>AJ</b>	Amp junior (AJ type)	
	<b>QUICK CODE</b>	
	DESCRIPTION	CODE
	SFNL-060-ZNNN-05-G12-N	SF000001

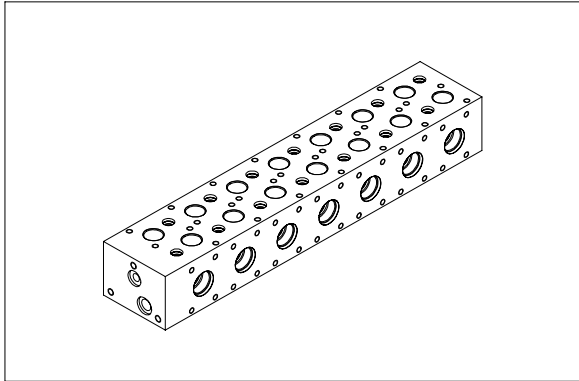
**OVERALL DIMENSIONS**



# LDNP-060-NNNN

## CAST-IRON MANIFOLD

In LDNS/P-030-C plug are included in the manifold



The monoblock valve can be ordered with a number of spool's section from 1 to 7, each section is equipped with side mounting holes for lever option and with treaded holes at the top for flangeable modular valve. There are also two removable plugs connecting to a T line to allow to flange special blocks.

The standard version has G 3/8" ports and can be supplied with top blocks with 9/16"-18 UNF ( SAE 6 ) or M16x1,5.

The manifold it is made with cast-iron and protected from corrosion with zinc-plating surface treatment.

The inlet face has 3 threaded holes to flange an inlet block that can be customized for each application, giving high flexibility to the project.

### TECHNICAL DATA

<b>Max pressure</b>	320 bar
<b>Rated flow</b>	60 l/min
<b>Material</b>	Cast-iron
<b>Surface treatment</b>	Zinc-plated black
<b>Weight for single section</b>	1,6 kg
<b>Wight for additional sections</b>	+ 1 Kg each

### ORDERING DETAILS: SEPARATE ELEMENTS

**LDN \* -060-NNNN - \*\* - \*\*\***

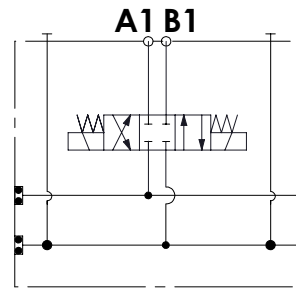
*	TYPE OF MANIFOLD
S	Series connection
P	Parallel connection

**	NUMBER OF SECTION
01	manifold with one section
02	manifold with two sections
03	manifold with three sections
04	manifold with four sections
05	manifold with five sections
06	manifold with six sections
07	manifold with seven sections

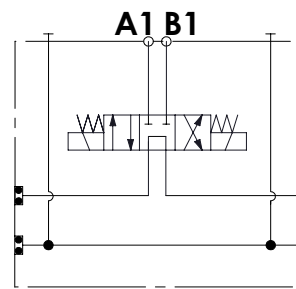
***	PORTS		
	P line	T line	M
G38	G 3/8"	G 3/8"	G 1/4"
U09	9/16"-18 UNF	9/16"-18 UNF	7/16"-20 UNF

QUICK CODE	
DESCRIPTION	CODE
LDNP-060-NNNN-01-G38	LD000156
LDNP-060-NNNN-02-G38	LD000155
LDNP-060-NNNN-03-G38	LD000147
LDNP-060-NNNN-04-G38	LD000146
LDNP-060-NNNN-05-G38	LD000154
LDNP-060-NNNN-06-G38	LD000153
LDNP-060-NNNN-07-G38	LD000157

### MANIFOLD CONFIGURATIONS

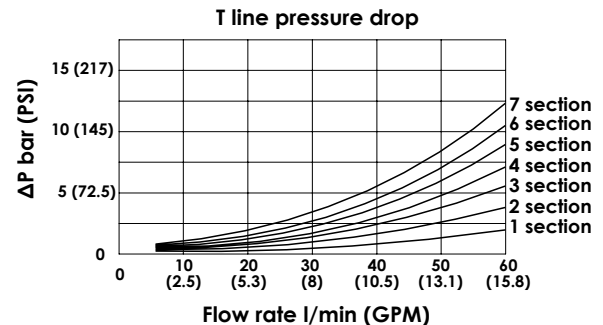
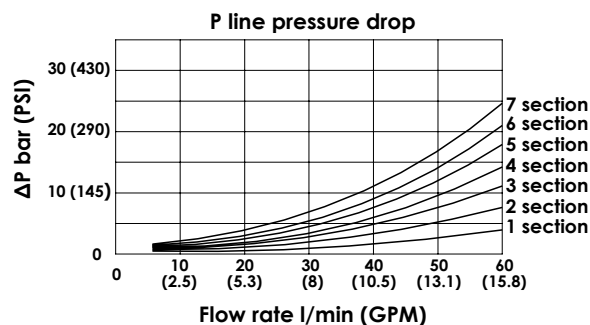


**LDNP-060**



**LDNS-060**

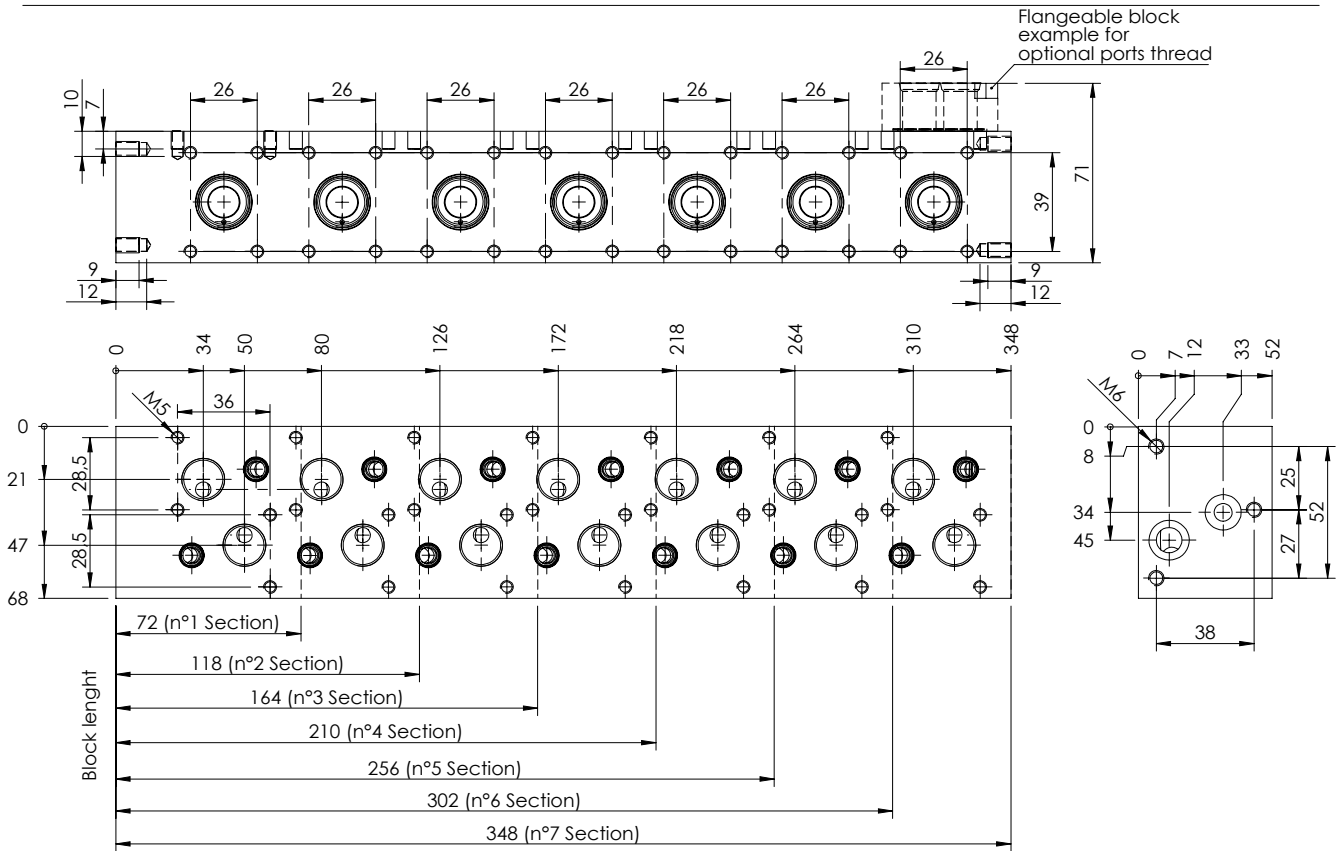
### MONOBLOCK PRESSURE DROP



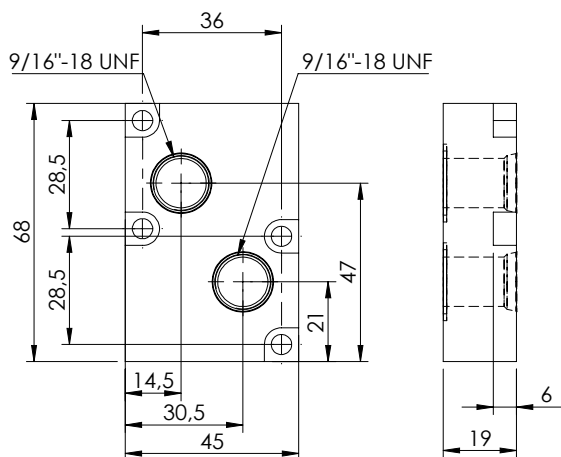
**LDNS-060-NNNN**

**CAST-IRON  
MANIFOLD**

**GAS VERSION**



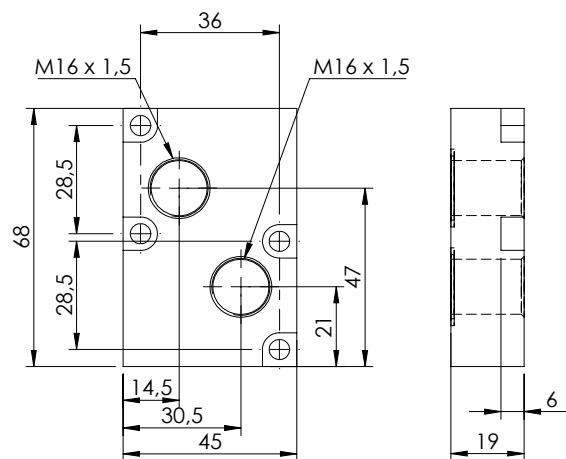
**SAE VERSION**



This top flangeable block transform the monoblock to a UNF version.

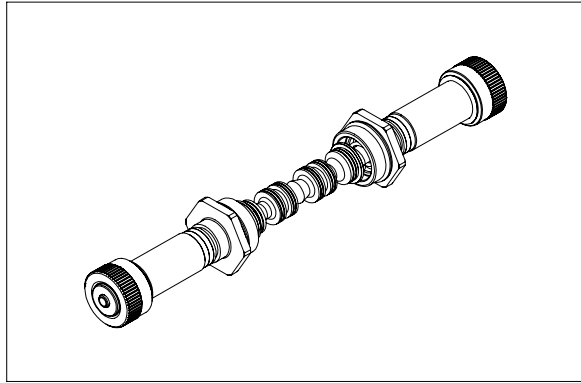
**Quick code: MP000096**

**METRIC VERSION**



This top flangeable block transform the monoblock to a Metric version.

**Quick code: MP000097**



This spool group is rated for 30 lpm and for a maximum pressure of 320 bar; the spool is actuated by on off tubes and can be ordered with different hydraulic schemes. Each spools is interchangeable to give maximum flexibility and can be fit in all monoblock sections, changing spools require adequate training. The group is made by two tubes, one spool, two springs and mounting components.

**TECHNICAL DATA**

Max pressure	320 bar
Rated flow	30 l/min
Duty cycle	100 % ED
Hydraulic fluid	Mineral oil DIN 51 524
Fluid viscosity	10/500 mm <sup>2</sup> /s
Fluid temperature	-25°C/75°C
Enviroment temperature	-25°C/60°C
Weight with one solenoid	0,15 Kg
Weight with two solenoid	0,12 kg

**ORDERING DETAILS: SEPARATE ELEMENTS**

SH\* \*- 030 - NN\*\* - \*\* -321- \* \*\*N

* OVERRIDE TYPE	
N	Standard
P	Push
V	Screw

* SECTION TYPE	
E	Solenoid operated
L	Solenoid operated plus lever operated
M	Lever operated

** ACTUATION TYPE	
ON	On/Off
SS	Soft shift

** SPOOL TYPE	
...	See table n°1

* VOLTAGE	
	no coils
A	12 V dc
B	24 V dc

** COILS TYPE	
	no coils
HR	Hirschmann (ISO 4400 DIN 43650)
DT	Deutsch (DT04-2P)
AJ	Amp junior (AJ type)

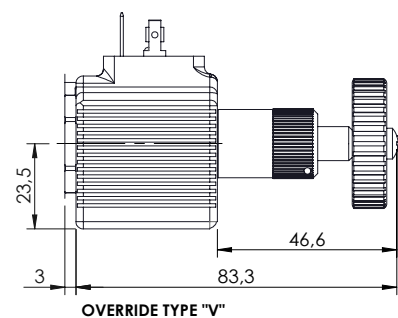
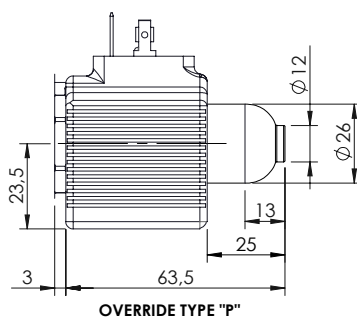
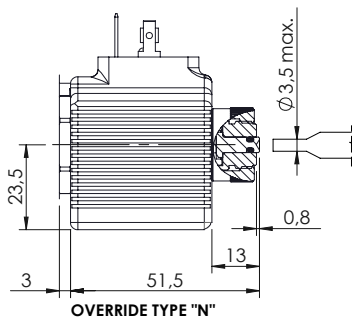
QUICK CODE	
DESCRIPTION	CODE
SHNE-030-NNON-46-321	
SHNE-030-NNON-10-321	
SHNE-030-NNON-07-321	

**HYDRAULIC SYMBOLS**

Table n°1

SPOOL CODE	HYDRAULIC SCHEME	TRANSITORY POSITION	
46			
10			
07			
SPOOL CODE	HYDRAULIC SCHEME	TRANSITORY POSITION	
a	b	a	b
23			
21			
22			
17			
18			

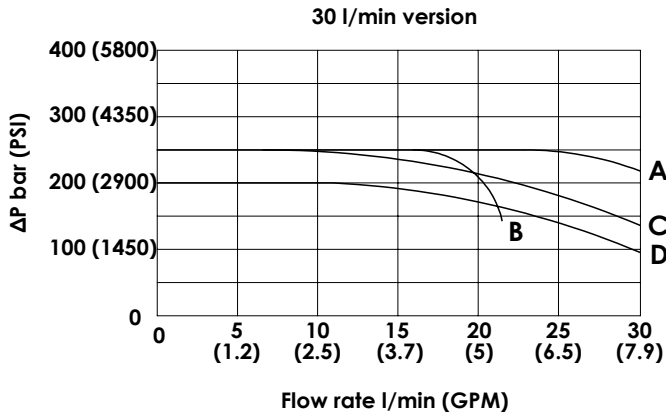
**OVERRIDE TYPE**



# SHNE-030-NNON

30 L/MIN  
SOLENOID VALVE

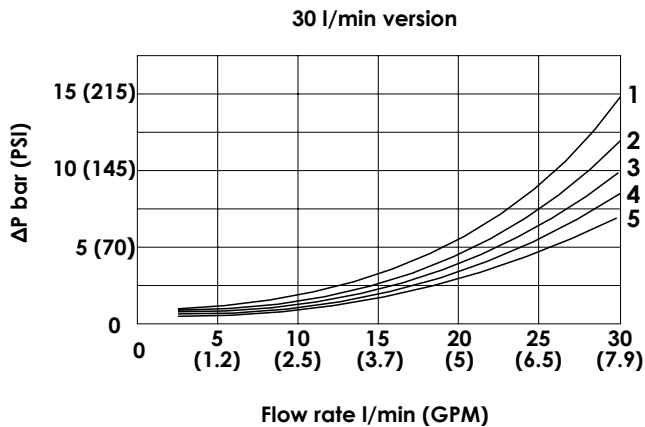
## PERFORMANCE LIMITS CURVES - STANDARD SECTION



Spool type	Performance limits curve
46	A
10	A
07	B
23	A
21	A
22	A
17	C
18	D

The tests are carried out with hot solenoids, powered with 90 % of nominal voltage, with 50 °C fluid temperature. The fluid used is mineral oil having a viscosity of 46 mm<sup>2</sup> / s @ 40 °C. The values in the diagram refer to tests carried out with flow simultaneously in both directions ( P > A, B > T ). In cases of schemes 4/2 or 4/3 used with the flow in one direction only the performance can change.

## PRESSURE DROP CURVES - STANDARD SECTION

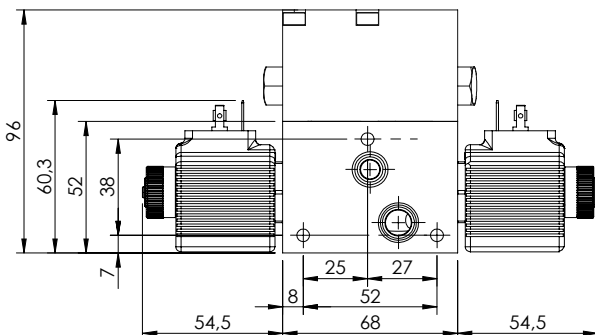


Spool type	Pressure drop curve				
	P>A	P>B	A>T	B>T	P>T
46	3	3	4	4	/
10	3	3	5	5	/
07	2	2	1	1	2
23	/	3	4	/	/
21	/	3	5	/	/
22	2	/	/	1	/
17	/	3	4	/	/
18	/	2	3	/	/

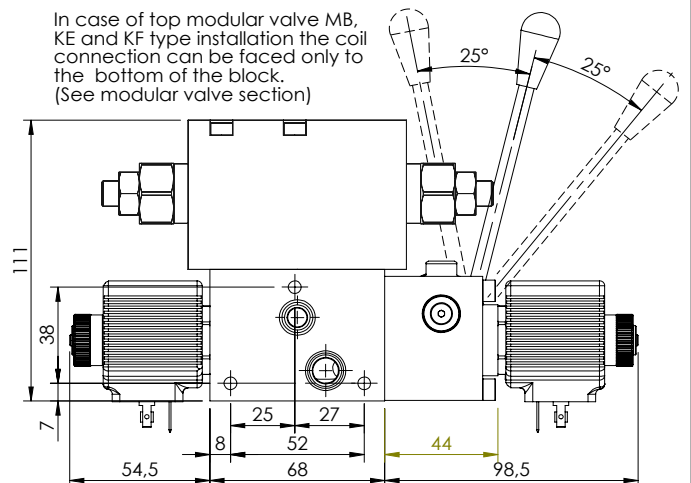
The diagram shows the performance limit curve of standard section. The fluid used is mineral oil viscosity 46 mm<sup>2</sup>/s at 40 °C ; the tests are performed at a 40 °C temperature

## OVERALL DIMENSION - STANDARD SECTION

In case of top modular valve MA or MC type installation the coil connection can be faced to the top or to the bottom of the block. (See modular valve section)

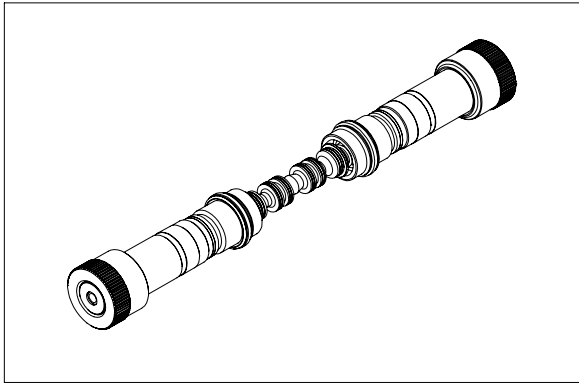


In case of top modular valve MB, KE and KF type installation the coil connection can be faced only to the bottom of the block. (See modular valve section)



# SHNE-060-NNON

60 L/MIN  
SOLENOID VALVE



This spool group is rated for 60 lpm and for a maximum pressure of 320 bar; the spool is actuated by on off tubes and can be ordered with different hydraulic schemes. Each spools is interchangeable to give maximum flexibility and can be fit in all monoblock sections, changing spools require adequate training. The group is made by two tubes, one spool, two springs and mounting components.

## TECHNICAL DATA

Max pressure	320 bar
Rated flow	60 l/min
Duty cycle	100 % ED
Hydraulic fluid	Mineral oil DIN 51524
Fluid viscosity	10/500 mm <sup>2</sup> /s
Fluid temperature	-25°C/75°C
Environment temperature	-25°C/60°C
Weight with one solenoid	0,2 Kg
Weight with two solenoid	0,4 kg

## ORDERING DETAILS: SEPARATE ELEMENTS

SH\*\* - 060 - NN\*\* - \*\* - 321 - \*\* \*\* N

*	VERRIDE TYPE
N	Standard
P	Push
V	Screw

*	SECTION TYPE
E	Solenoid operated
L	Solenoid operated plus lever operated
M	Lever operated

**	ACTUATION TYPE
ON	On/Off
SS	Soft shift

**	SPOOL TYPE
...	See table n°1

*	VOLTAGE
	no coils
A	12 V dc
B	24 V dc

**	COILS TYPE
	no coils
HR	Hirschmann (ISO 4400 DIN 43650)
DT	Deutsch (DT04-2P)
AJ	Amp junior (AJ type)

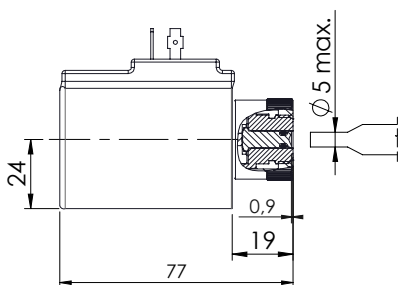
QUICK CODE	
DESCRIPTION	CODE
SHNE-060-NNON-46-321	
SHNE-060-NNON-10-321	
SHNE-060-NNON-07-321	

## HYDRAULIC SYMBOLS

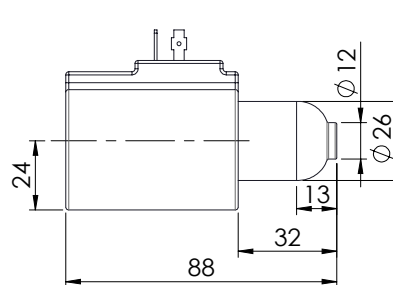
Table n°1

SPOOL CODE	HYDRAULIC SCHEME	TRANSITORY POSITION	
46			
10			
07			
SPOOL CODE	HYDRAULIC SCHEME	TRANSITORY POSITION	
a	b	a	b
23			
21			
22			
17			
18			

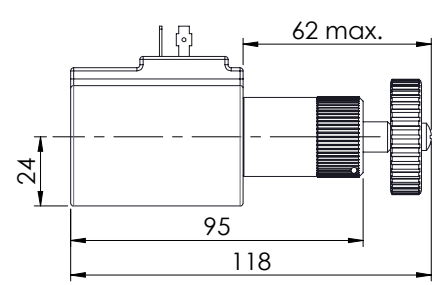
## VERRIDE TYPE



VERRIDE TYPE "N"



VERRIDE TYPE "P"

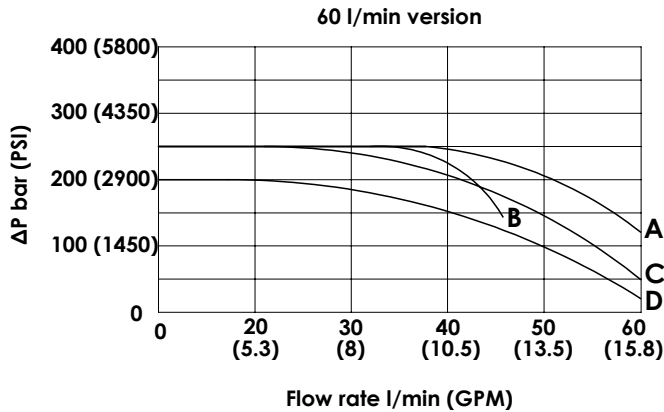


VERRIDE TYPE "V"

# SHNE-060-NNON

60 L/MIN  
SOLENOID VALVE

## PERFORMANCE LIMIT CURVES - STANDARD SECTION



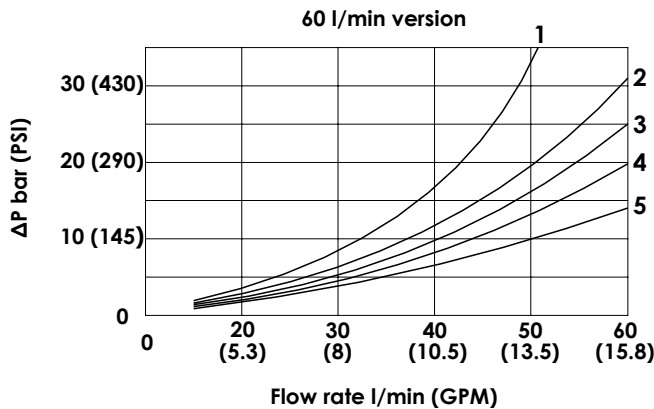
Spool type	Performance limits curve
46	A
10	A
07	B
23	A
21	A
22	A
17	C
18	D

The tests are carried out with hot solenoids , powered with 90 % of nominal voltage, with 50 ° C fluid temperature. The fluid used is mineral oil having a viscosity of 46 mm<sup>2</sup> / s @ 40 ° C .

The values in the diagram refer to tests carried out with flow simultaneously in both directions ( P > A, B > T ).

**In cases of schemes 4/2 or 4/3 used with the flow in one direction only the performance can change.**

## PRESSURE DROP CURVES - STANDARD SECTION

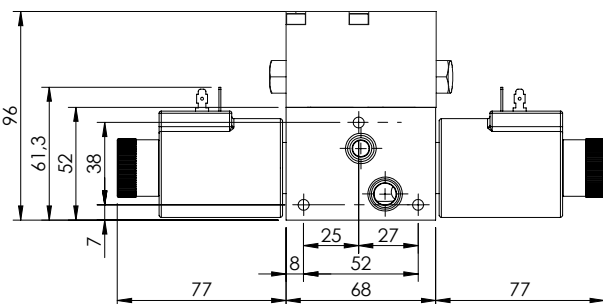


Spool type	Pressure drop curve				
	P>A	P>B	A>T	B>T	P>T
46	3	3	4	4	/
10	3	3	5	5	/
07	2	2	1	1	2
23	/	3	4	/	/
21	/	3	5	/	/
22	2	/	/	1	/
17	/	3	4	/	/
18	/	2	3	/	/

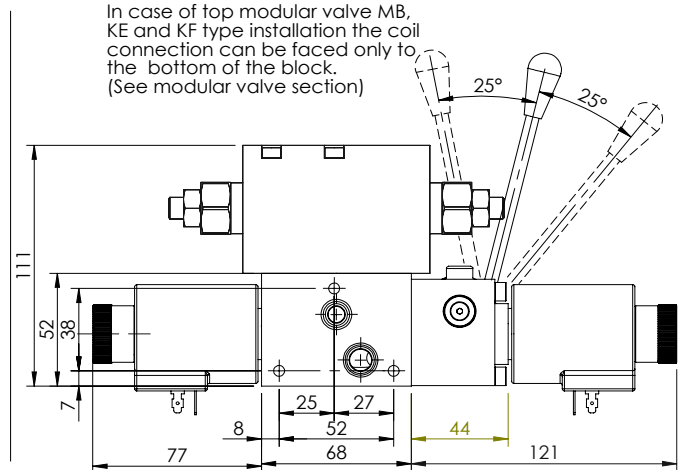
The diagram shows the performance limit curve of standard section. The fluid used is mineral oil viscosity 46 mm<sup>2</sup>/s at 40 ° C ; the tests are performed at a 40 ° C temperature

## OVERALL DIMENSION - STANDARD SECTION

In case of top modular valve MA or MC type installation the coil connection can be faced to the top or to the bottom of the block. (See modular valve section)

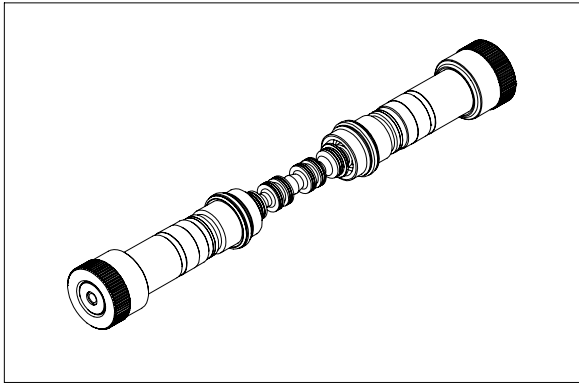


In case of top modular valve MB, KE and KF type installation the coil connection can be faced only to the bottom of the block. (See modular valve section)



**SHNE-050-NNPR**

**50 L/MIN  
PROPORTIONAL  
SOLENOID VALVE**



This spool group is rated for 50 lpm and for a maximum pressure of 320 bar; the spool is actuated by proportional tubes and can be ordered with different hydraulic schemes. Each spools is interchangeable to give maximum flexibility and can be fit in all monoblock sections, changing spools require adequate training. The group is made by two tubes, one spool, two springs and mounting components.

**TECHNICAL DATA**

<b>Max pressure</b>	320 bar
<b>Rated flow</b>	50 l/min
<b>Duty cycle</b>	100 % ED
<b>Max current</b>	1.76A (12 V dc) 0.88A (24 V dc)
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10/500 mm
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight with one solenoid</b>	0,2 Kg
<b>Weight with two solenoid</b>	0,4 kg

**ORDERING DETAILS: SEPARATE ELEMENTS**

**SH\*\* - 0\*\*-NNPR-\*\*-321-\*\*\*N**

<b>*</b>	<b>VERRIDE TYPE</b>
<b>N</b>	Standard
<b>P</b>	Push
<b>V</b>	Screw

<b>*</b>	<b>SECTION TYPE</b>
<b>E</b>	Solenoid operated
<b>L</b>	Solenoid operated plus lever operated
<b>M</b>	Lever operated

<b>*</b>	<b>SPOOL FLOW</b>
<b>20</b>	20 l/min at 12 bar - 10 l/min at 6 bar
<b>35</b>	35 l/min at 12 bar - 20 l/min at 6 bar
<b>50</b>	50 l/min at 12 bar - 30 l/min at 6 bar

<b>**</b>	
...	See table n°1

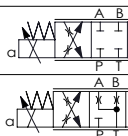
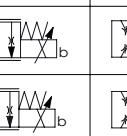
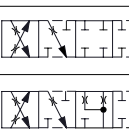
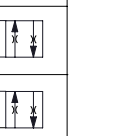
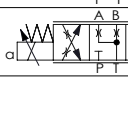
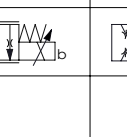
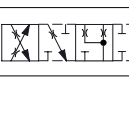
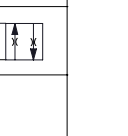
<b>*</b>	<b>VOLTAGE</b>
	no coils
<b>A</b>	12 V dc
<b>B</b>	24 V dc

<b>**</b>	<b>COILS TYPE</b>
	no coils
<b>HR</b>	Hirschmann (ISO 4400 DIN 43650)
<b>DT</b>	Deutsch (DT04-2P)
<b>AJ</b>	Amp junior (AJ type)

<b>QUICK CODE</b>	
DESCRIPTION	CODE
SHNE-030-NNPR-59-321	
SHNE-030-NNPR-55-321	

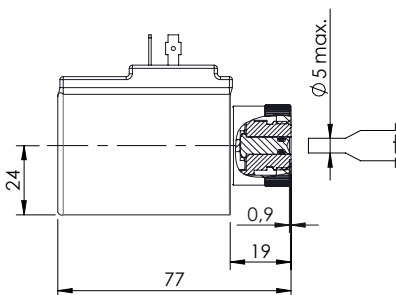
**HYDRAULIC SYMBOLS**

Table n°1

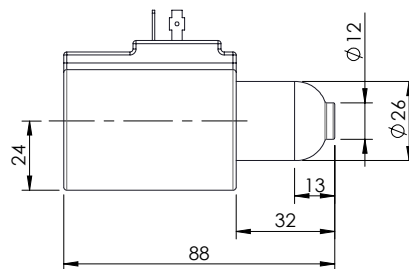
SPOOL CODE	HYDRAULIC SCHEME		TRANSITORY POSITION		
	a	b	a	b	
<b>59</b>					
<b>55</b>					
SPOOL CODE	HYDRAULIC SCHEME		TRANSITORY POSITION		
a	b	a	b	a	b

For single solenoid operation please contact AFT sales network.

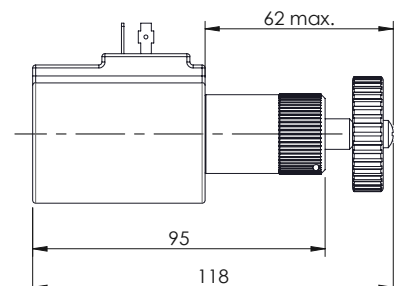
**VERRIDE TYPE**



VERRIDE TYPE "N"



VERRIDE TYPE "P"



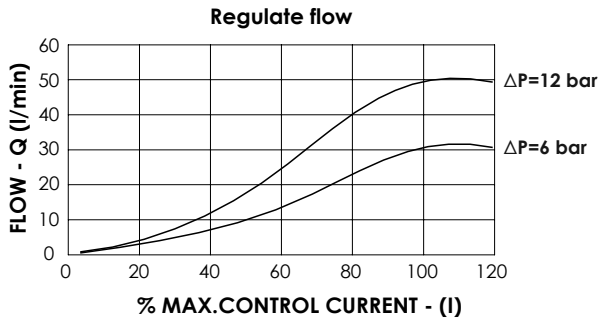
VERRIDE TYPE "V"



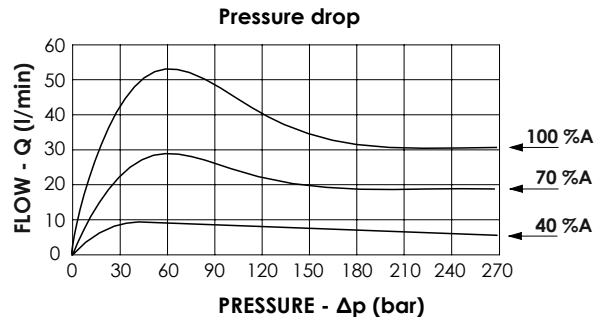
# SHNE-050-NNPR

50 L/MIN  
PROPORTIONAL  
SOLENOID VALVE

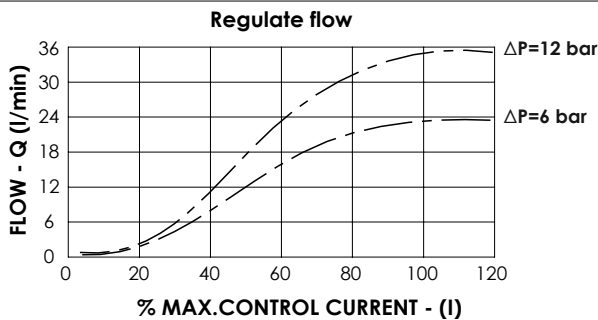
## FLOW DIAGRAM - 050



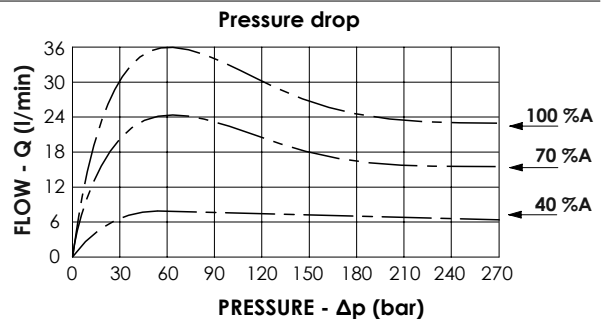
## REGULATION DIAGRAM - 050



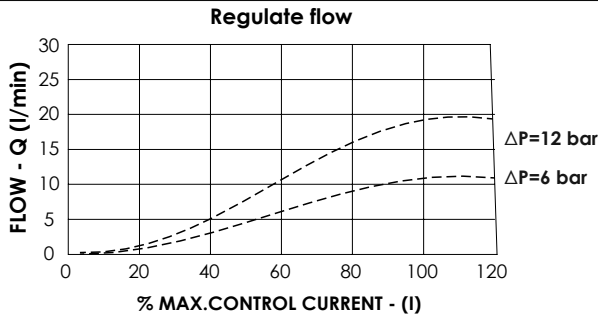
## FLOW DIAGRAM - 035



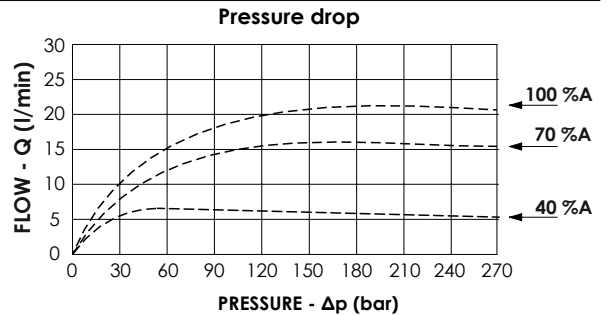
## REGULATION DIAGRAM - 035



## FLOW DIAGRAM - 020



## REGULATION DIAGRAM - 020



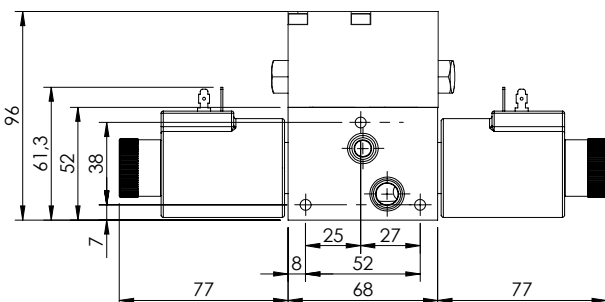
Spool type:

- 10 -----
- 20 -----
- 30 -----

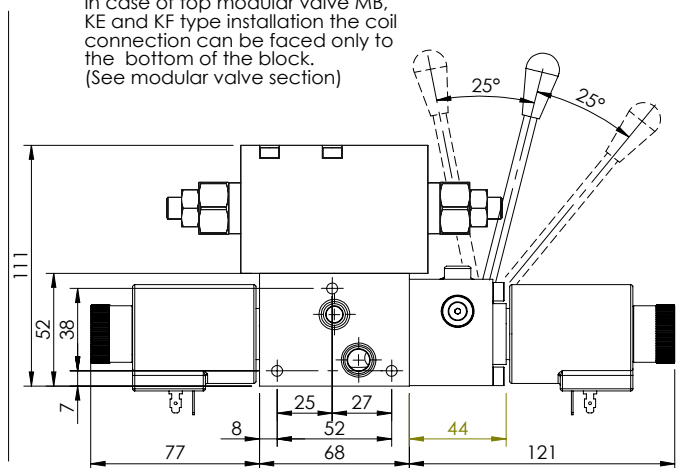
The diagram shows the performance limit curve of a standard section. The fluid used is mineral oil with viscosity of 46 mm<sup>2</sup>/s @ 40 °C ; the tests are performed at a 40 °C temperature.

## OVERALL DIMENSION - STANDARD SECTION

In case of top modular valve MA or MC type installation the coil connection can be faced to the top or to the bottom of the block. (See modular valve section)

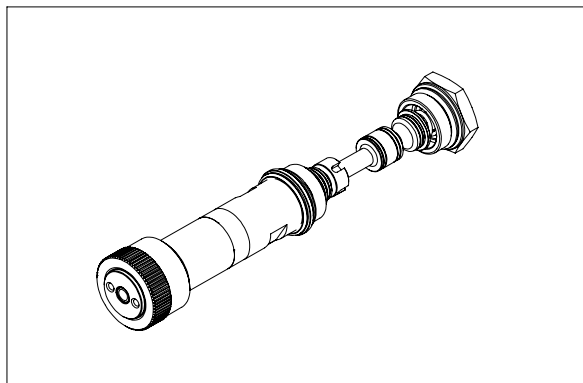


In case of top modular valve MB, KE and KF type installation the coil connection can be faced only to the bottom of the block. (See modular valve section)



# SHNE-030-POPR

**30 L/MIN  
PROPORTIONAL FLOW  
UNLOADING**



The solenoid valve can be ordered with 3 types of ports for connection nipples, G 3/8" 9/16"-18 UNF ( SAE6 ) and M16x1, 5. Spool actuation is electrical and the center position is maintained through centering springs with calibrated length, upon termination of the solenoid action, springs immediately reposition the cursor in the central position. The solenoids are only available in the continuous current (the most common strains); the coil will be supply with terminals DIN 43650 ISO 4400 (for standard versions). The valve have cast iron body with black galvanizing surface treatment with sealant.

## TECHNICAL DATA

<b>Max pressure</b>	320 bar
<b>Rated flow</b>	25 l/min
<b>Duty cycle</b>	100 % ED
<b>Max current</b>	1.76A (12 V dc) 0.88A (24 V dc)
<b>Hydraulic fluid</b>	Mineral oil DIN 51524
<b>Fluid viscosity</b>	10/500 mm
<b>Fluid temperature</b>	-25°C/75°C
<b>Environment temperature</b>	-25°C/60°C
<b>Weight with one solenoid</b>	2 Kg
<b>Weight with two solenoid</b>	2,5 kg

## ORDERING DETAILS: SEPARATE ELEMENTS

**SH\*\* - 0\*\* - POPR - \*\* - 321 - \*\* \*N**

<b>*</b>	<b>VERRIDE TYPE</b>
<b>N</b>	Standard
<b>P</b>	Push
<b>V</b>	Screw

<b>*</b>	<b>SECTION TYPE</b>
<b>E</b>	Solenoid operated
<b>L</b>	Solenoid operated plus lever operated
<b>M</b>	Lever operated

<b>**</b>	<b>SPOOL FLOW</b>
<b>10</b>	12 l/min at 10 bar
<b>20</b>	18 l/min at 10 bar
<b>30</b>	25 l/min at 10 bar

<b>**</b>	<b>PROPORTIONAL TYPE</b>
<b>88</b>	Not compensated

<b>*</b>	<b>VOLTAGE</b>
	no coils
<b>A</b>	12 V dc
<b>B</b>	24 V dc

<b>**</b>	<b>COILS TYPE</b>
	no coils
<b>HR</b>	Hirschmann (ISO 4400 DIN 43650)
<b>DT</b>	Deutsch (DT04-2P)
<b>AJ</b>	Amp junior (AJ type)

<b>QUICK CODE</b>	
DESCRIPTION	CODE
SHNE-030-POPR-88-321	
SHNE-020-POPR-88-321	
SHNE-010-POPR-88-321	

## TECHNICAL FEATURES

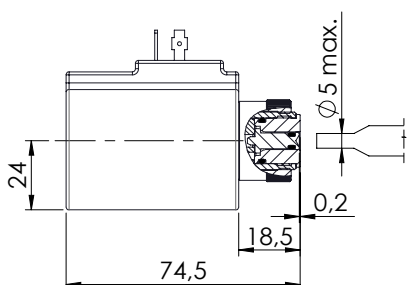
Spool Flow	Rated flow with 10 bar ΔP	Maximum flow	Max. operating pressure
<b>10</b>	10	12	320
<b>20</b>	16	18	320
<b>30</b>	23	28	320

## HYDRAULIC SYMBOLS

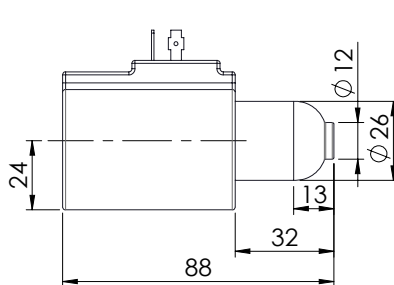
Table n°1

SPOOL CODE	HYDRAULIC SCHEME	TRANSITORY POSITION
<b>88</b>		

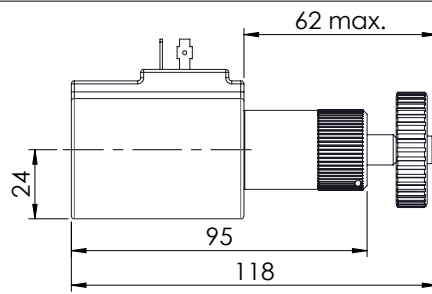
## VERRIDE TYPE



VERRIDE TYPE "N"



VERRIDE TYPE "P"

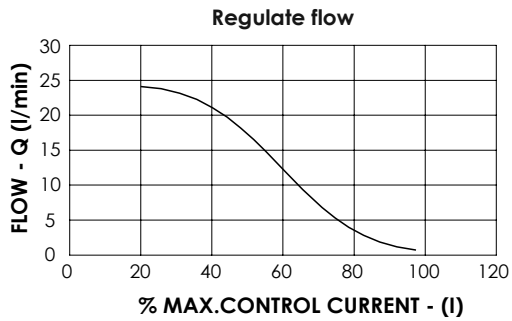


VERRIDE TYPE "V"

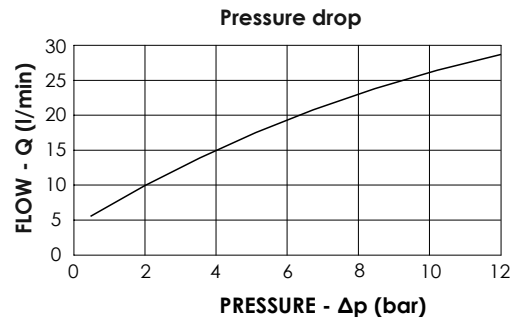
# SHNE-030-PRPO

30 L/MIN  
PROPORTIONAL FLOW  
UNLOADING

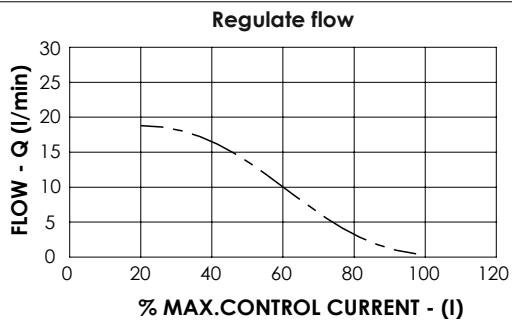
**FLOW DIAGRAM - 030**



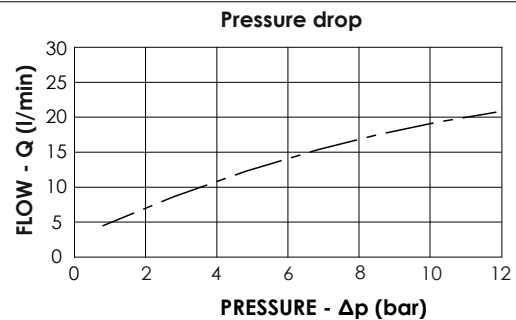
**PRESSURE DROP DIAGRAM - 030**



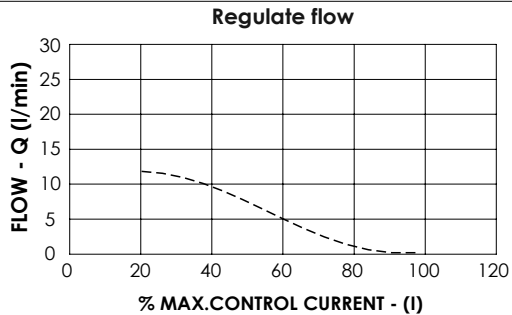
**FLOW DIAGRAM - 020**



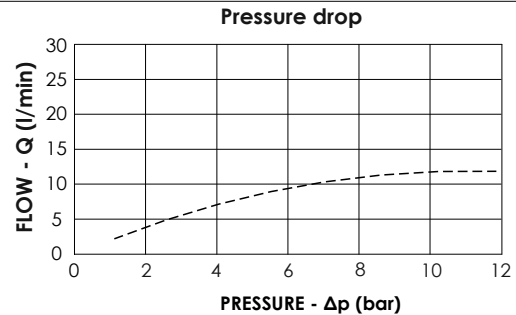
**PRESSURE DROP DIAGRAM - 020**



**FLOW DIAGRAM - 010**



**PRESSURE DROP DIAGRAM - 010**

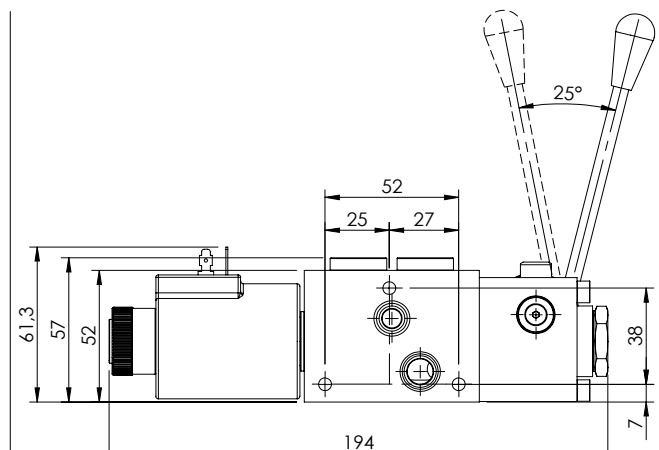
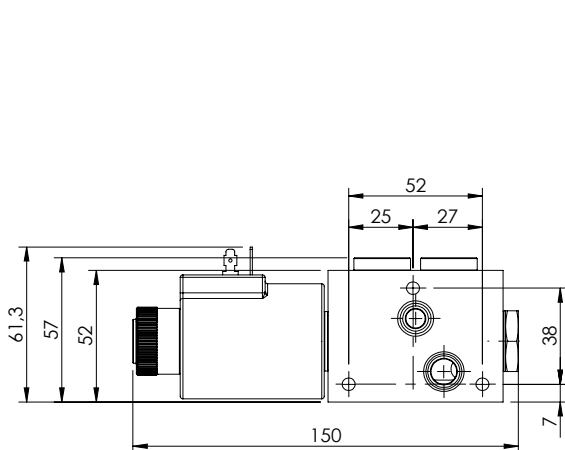


Spool type:

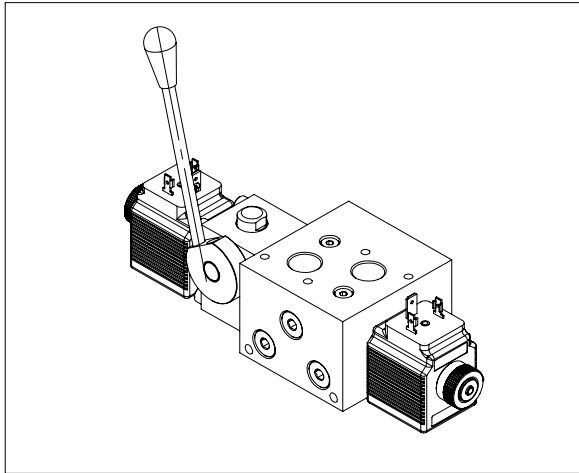
- 10 -----
- 20 -----
- 30 -----

The diagram shows the performance limit curve of a standard section. The fluid used is mineral oil with viscosity of 46 mm<sup>2</sup>/s @ 40 °C ; the tests are performed at a 40 °C temperature.

## OVERALL DIMENSION - STANDARD SECTION



**MANUAL LEVER**



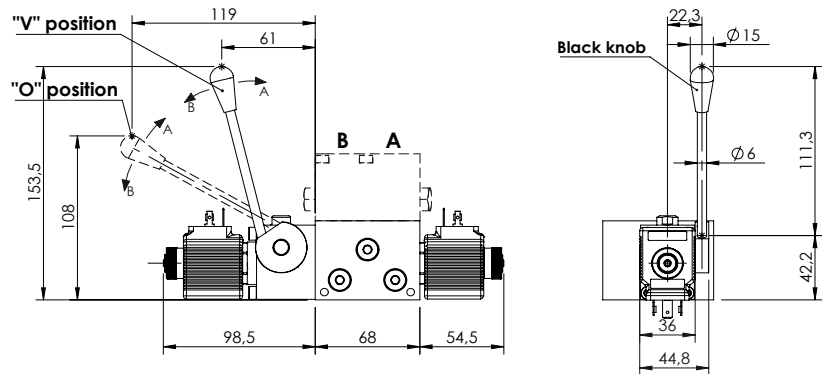
The lever option allow to operate manually the spool and can be ordered for all hydraulic schemes; in the standard version it is installed between monoblock and B port side coil. The lever is normally installed on the monoblock port side but can be installed also rotated of 180°; in each of these two positions the lever can be mounted vertical or horizontal simply removing the lever and reinstalling. The lever is not engaged during solenoid operation and doesn't move when a coil is energized.

**TECHNICAL DATA**

Tabella generale	
<b>Max pressure</b>	210/320 bar
<b>Max pressure series version</b>	210 bar
<b>Rated flow</b>	30/60 l/min
<b>Duty cycle</b>	100 % ED
<b>Weight more than standard</b>	2 Kg
<b>Weight more than standard</b>	2,5 kg

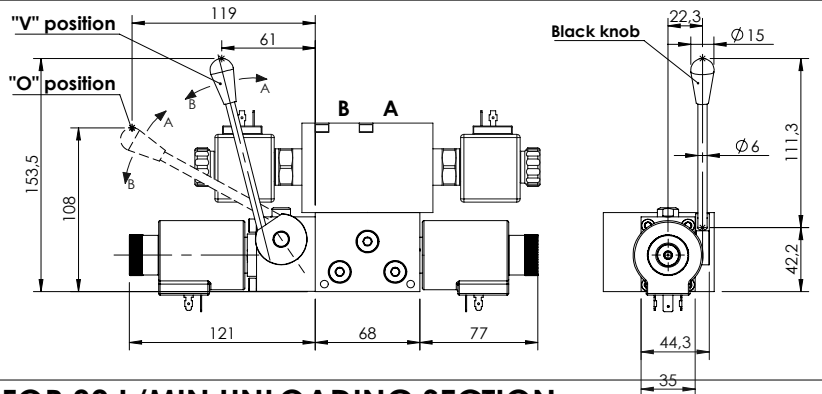
**OVERALL DIMENSIONS/ LEVER FOR 30 L/MIN SECTION**

The lever option is designed to activate the spool manually, when the lever is pulled the flow is delivered from the port close to the lever, when it is pushed the flow is delivered from the port opposite to the lever. The standard operation deliver full flow, in case of override operation it is possible to reduce the maximum stroke and consequently the speed, for this option contact AFT sales network. The lever can be easily positioned vertical or horizontal by unscrewing it from the rotating shaft.



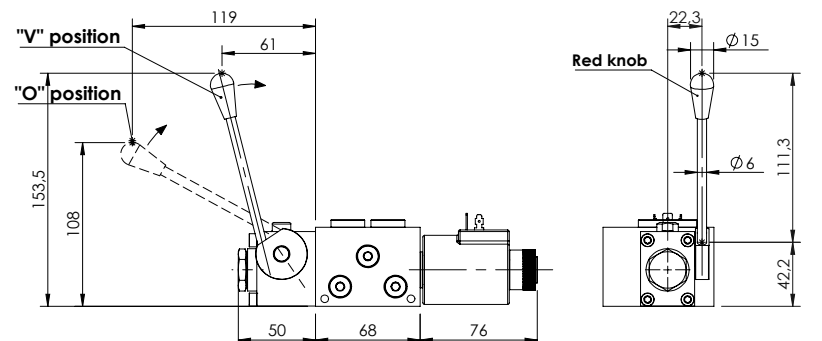
**OVERALL DIMENSIONS/ LEVER FOR 60 L/MIN SECTION**

The lever option is designed to activate the spool manually, when the lever is pulled the flow is delivered from the port close to the lever, when it is pushed the flow is delivered from the port opposite to the lever. The standard operation deliver full flow, in case of override operation it is possible to reduce the maximum stroke and consequently the speed, for this option contact AFT sales network. The lever can be easily positioned vertical or horizontal by unscrewing it from the rotating shaft.

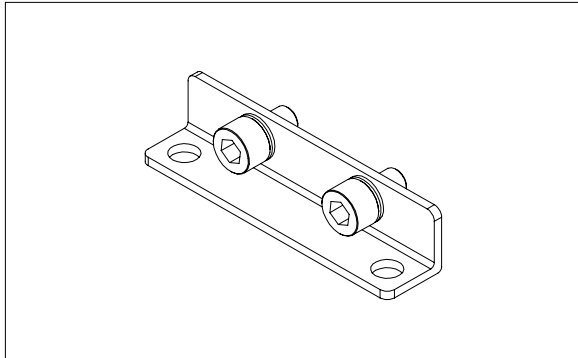


**OVERALL DIMENSION/ LEVER FOR 30 L/MIN UNLOADING SECTION**

The lever option is designed to activate the spool manually, when the lever is pulled the flow is delivered from the port close to the lever, when it is pushed the flow is delivered from the port opposite to the lever. The standard operation deliver full flow, in case of override operation it is possible to reduce the maximum stroke and consequently the speed, for this option contact AFT sales network. The lever can be easily positioned vertical or horizontal by unscrewing it from the rotating shaft.



# MOUNTING ELEMENTS

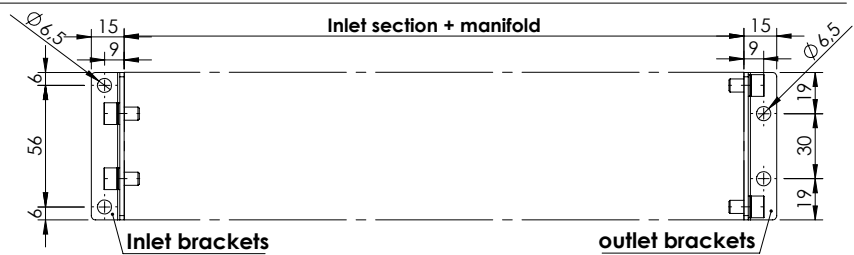
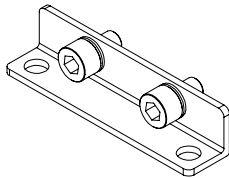


These parts are used to mount the directional valve on the application or to install modular valves and inlet section on the monoblock.

## TECHNICAL DATA

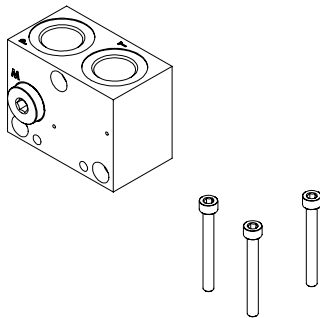
<b>Screw type</b>	ISO 4762
<b>Thread type</b>	coarse thread
<b>Standard screw</b>	resistance class 8.8
<b>High resistance screw</b>	resistance class 12.9
<b>Standard screw treatment</b>	zinc-plated (white)
<b>High res. screw treatment</b>	Anodized (black)

## MOUNTING BRACKETS



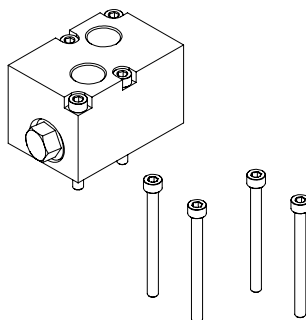
Mounting brackets	Screw length (mm)	Reference	Tightening Torque
PV000371	M6x10	AV000015 + PR000129	6 - 7 N/m

## MOUNTING INLET SECTION



Inlet section	Screw length (mm)	Reference	Tightening Torque
SF000004	M6X40	AV000051	6 - 7 N/m
SF000016	M6X50	PE000100	6 - 7 N/m
SF000003	M6X60	AV000074	6 - 7 N/m
SF000002	M6X60	AV000074	6 - 7 N/m
SF000001	M6X75	PE000418	6 - 7 N/m

## FIXING STACKING MODULES



Flangiabile valve	Screw length (mm)	Reference	Tightening Torque
MP	M5x16	AV000035	3 - 4 N/m
MA, MC and MB	M5x45	PE000148	3 - 4 N/m
KE and MF	M5x60	AV000016	3 - 4 N/m