STACKABLE DIRECTIONAL CONTROL VALVES

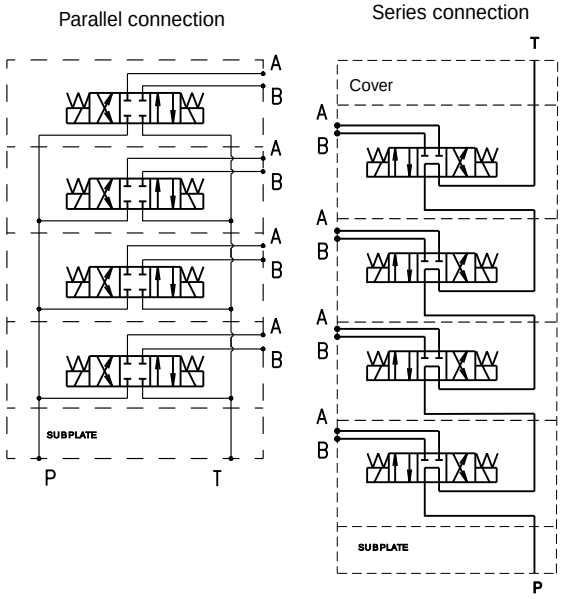
GENERAL DESCRIPTION

✓ 4/3- and 4/2- way directional control valves with solenoid operation

✓ Thread connection of working ports “A” and “B” except for RH06...1-.../...GFS modification

✓ Up to 8 sections for horizontal stacking & up to 4 sections for vertical stacking

Scheme for vertical stacking



The RH06...1-.../...GF... valves consist of a spool , housing , springs and solenoids.

The valves are used for hydraulic power control. These modifications are designed with two-spring centered spool about 4/3- and 4/2- valves. The housing has 5-chambers and a horizontal “T” duct. Working ports “A” and “B” are threaded directly into the valve housing except for RH06...1-.../...GFS modification.

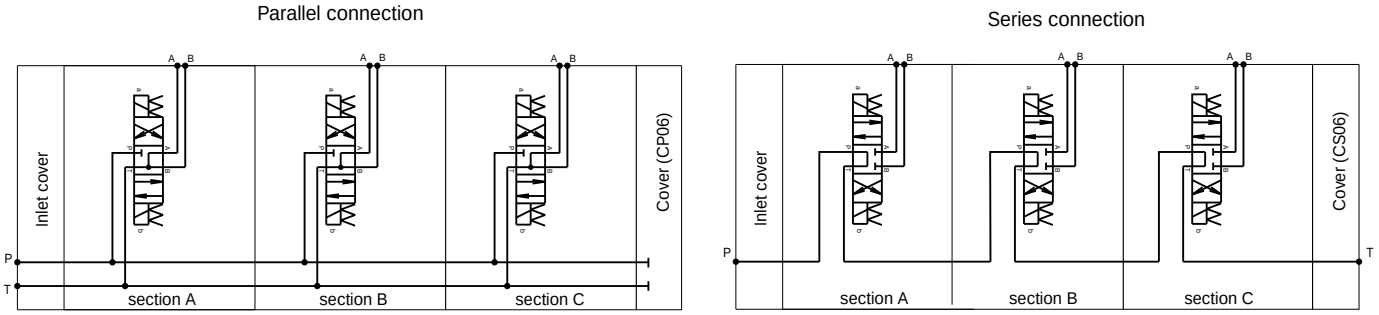
The valve location during assembly is of minor importance , but the horizontal position is generally recommended.

RH06...1-.../...GF... model is designed as an end plate , at modular mounting of directional control valves type RH06...1-.../...GFM... and they are used for vertical stacking - see next page.

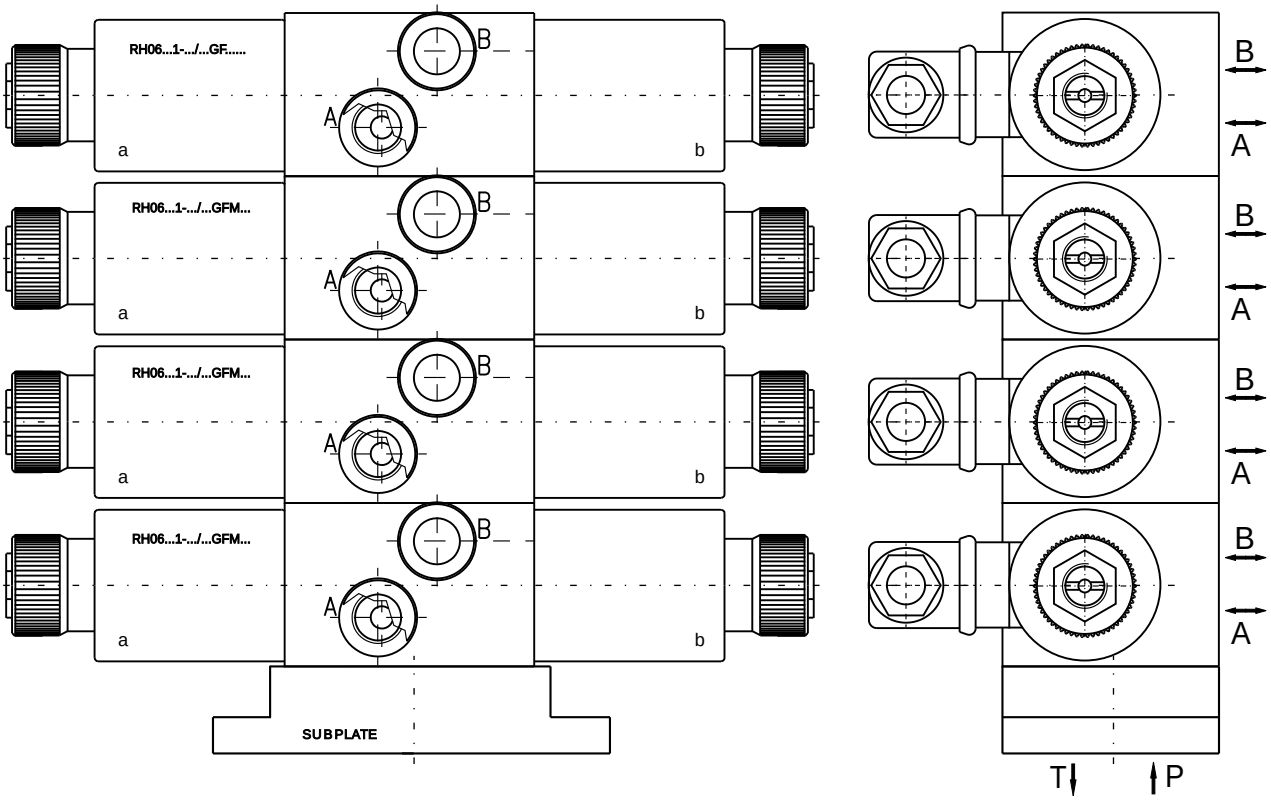
RH06...1-.../...GFS... , RH06...1-.../...GFST... & RH06...1-.../...GFSTS... are designed for horizontal stacking.

All these modifications supersedes completely those with plate , but at lower cost and the maximum flow is reduced - max. flow - 40l/min.

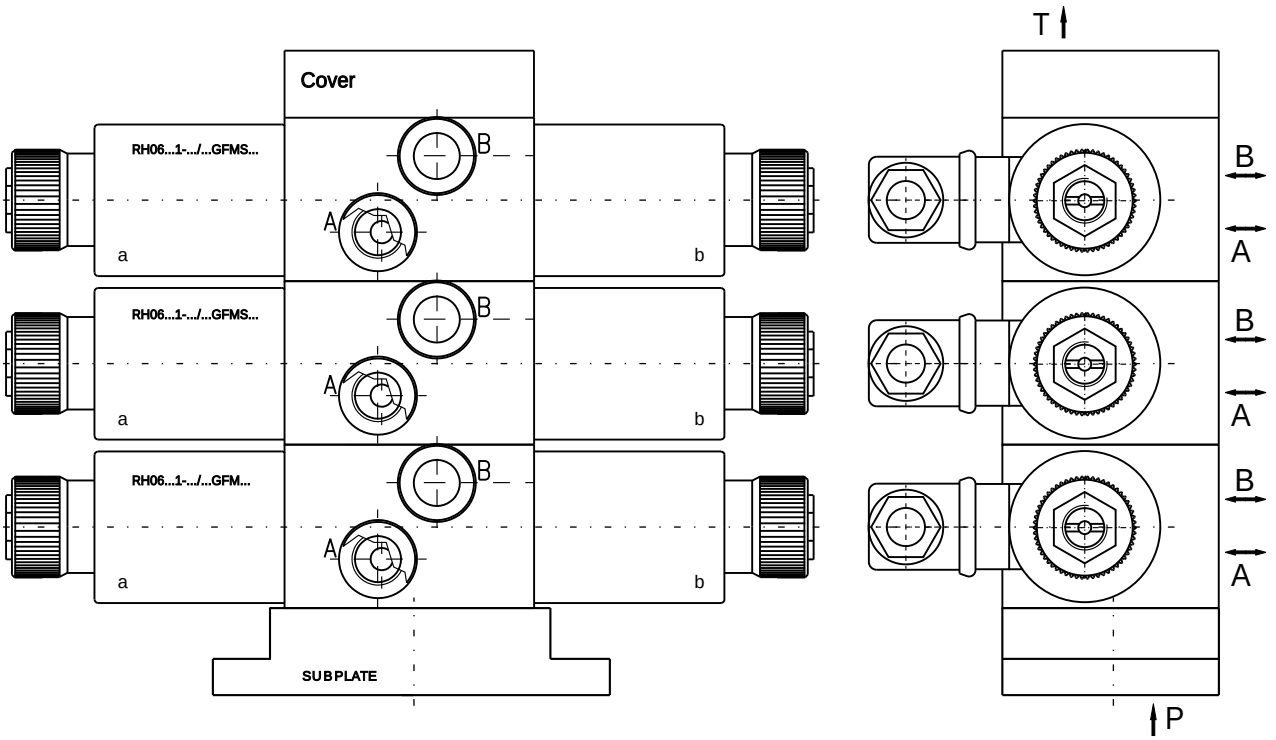
Scheme for horizontal stacking

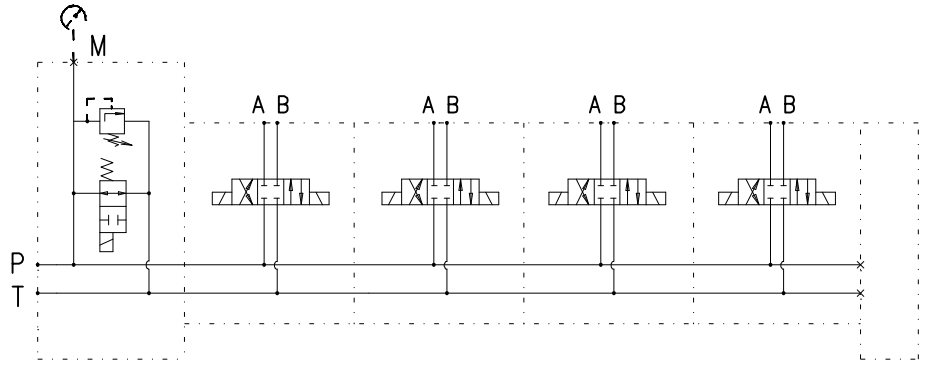


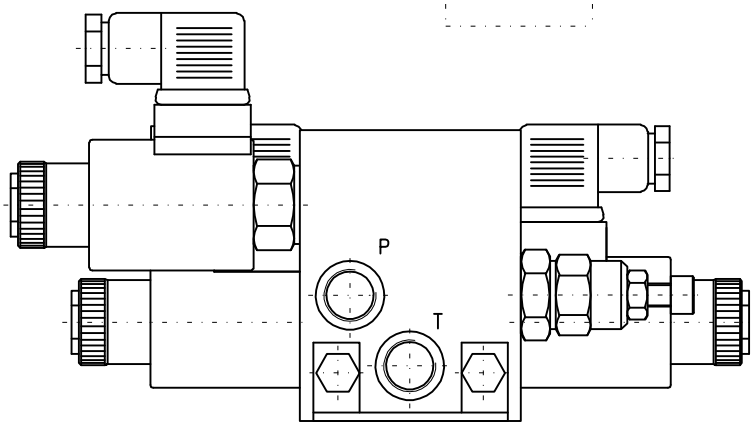
RH06...1-.../...GF.....-parallel connection

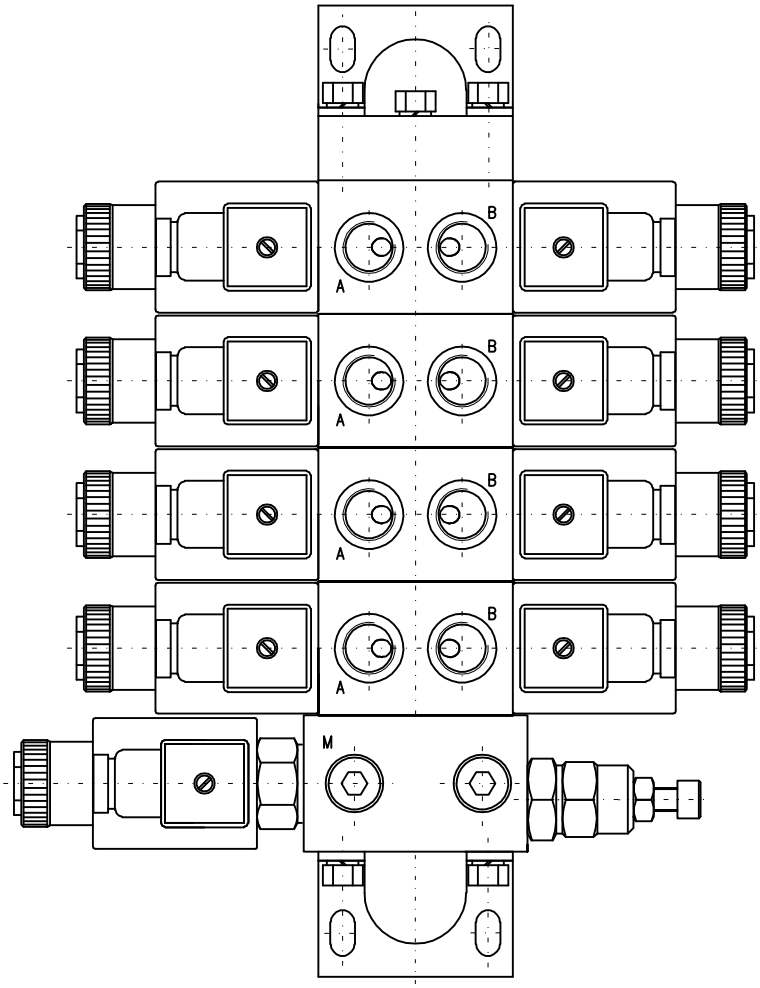


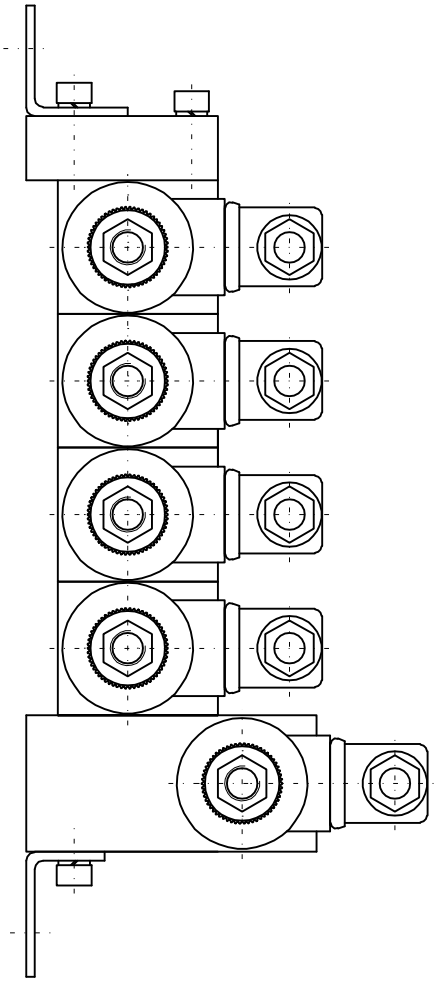
RH06...1-.../...GF.....-series connection




M
A B
A B
A B
A B
P
T


P
T


A
B
M



ORDERING CODE

RH06...1-.../...G.....

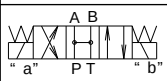
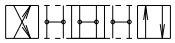
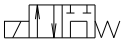
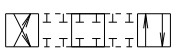
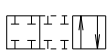
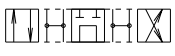
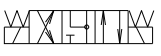
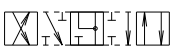
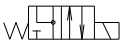
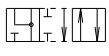
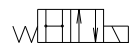
This ordering code is valid only for directional control valves as part of stackable directional control blocks.

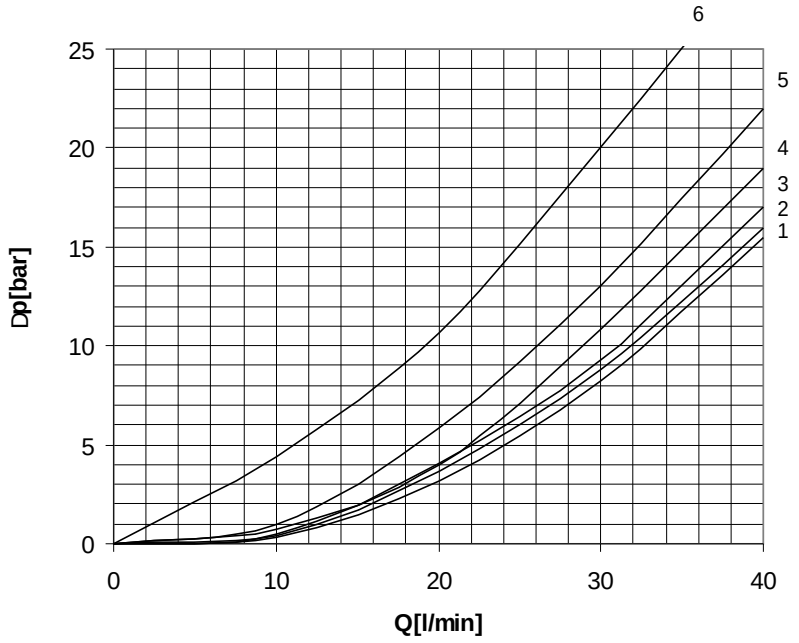
RH	06	...	1	-	.../...	G...	...	...	...	...

- Directional control valve
- Nominal size
- Functional symbol see the page below
- Type of control: -electrical
- Supply voltage/current frequency see page 12/27: **012/00**, **024/00**, **110/50**, **220/50**
- Modification see pages 6/27...11/27: **GF**, **GFM**, **GFMS**, **GFS**, **GFST**, **GFSTS**
- Connectors see page 12/27: **C1**, **C2**, **C3**, **C4**, **C5**
- Backing of the housing: normal - **N**; tropic - **T**
- Threads at A & B ports**: M14x1,5- **Omit**; M16x1,5- **M1**; M18x1,5- **M2***; G3/8"- **G1**; G1/4"- **G2**
- Screw cap: with plastic cap- **Omit**; with metal cap- **M**

* Only for GFST & GFSTS modification
** These options are not valid for GFS modification

FUNCTIONAL SYMBOLS

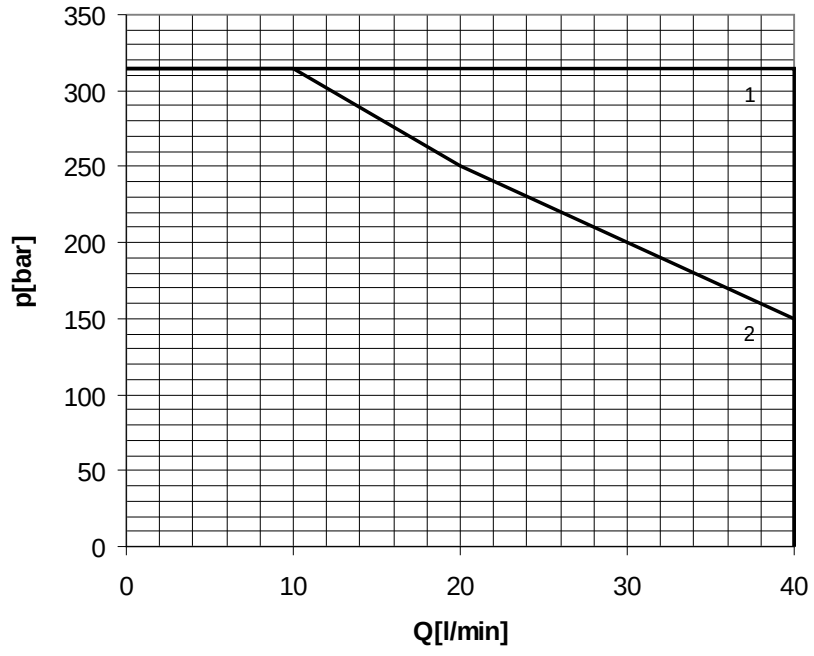
DESIG-NATION	SYMBOL	INTERMEDIATE	DESIG-NATION	SYMBOL	INTERMEDIATE	DESIG-NATION	SYMBOL	INTERMEDIATE
00			14			33		
01			16			35		
02			24			45		
04			28			74		



SYMBOL	CURVE				
	P>A	P>B	A>T	B>T	P>T
00	2	2	1	1	3
01	3	3	2	2	
02	5	5	6	6	4
04	3	3	1	1	
14	5			6	4
16	3			2	
24		3	1		
28	3			1	
33		2	1		3
35		5	6		4
45		3	2		
74	2			1	3

p / Q

The operating limit of hydraulic power shown here is for applications with two directions of flow (e.g. from P to B and simultaneously from A to T). If the valve is with one direction passage only (e.g. from P to B and with blocked port A), the operating limit may considerably be reduced. The performance limits are measured with hydraulic oil 35±5 cSt , temperature 50 °C and supply voltage $0,9U_N$

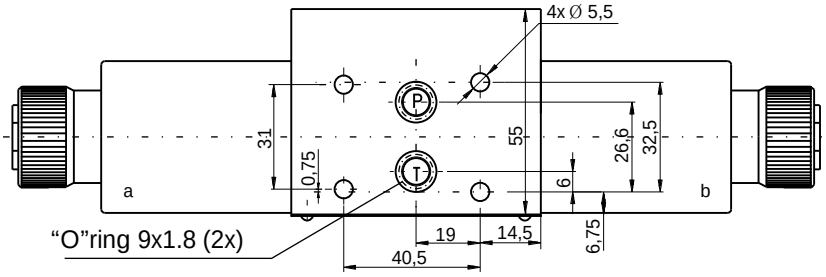


SYMBOL	CURVE
00	1
01	1
02	2
04	1
14	2
16	1
24	1
28	1
33	1
35	2
45	1
74	1

All dimensions are shown in mm.

RH06...1-.../...GF..

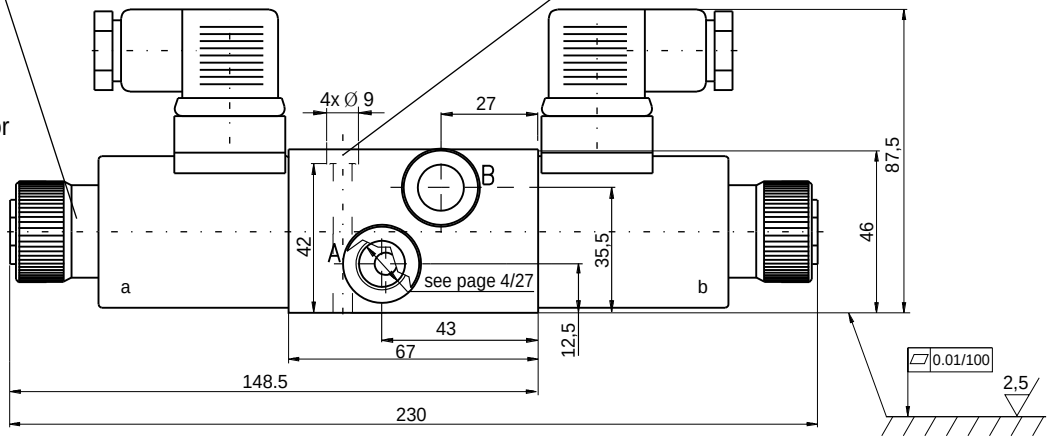
with solenoids ”a” & “b
for symbols: “00” , “01” , “02” , “04” , “05” , “08” and “20”

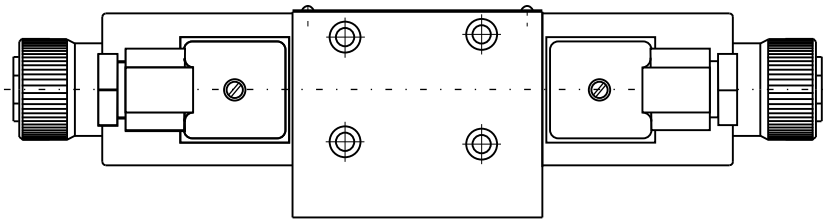


For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

Standard fixing bolts are M5x50 (10,9 class recommended). Torque 6...8 Nm.

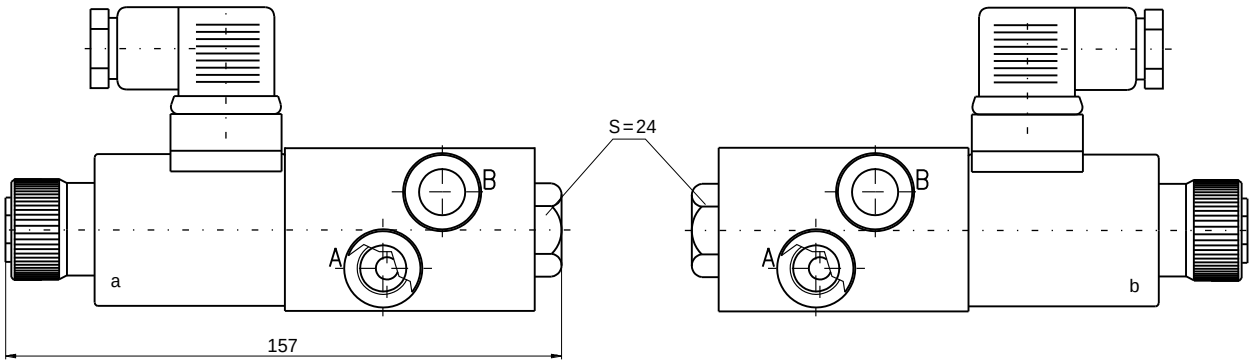
The plug connectors are grey or white for solenoid “a”, black for solenoid “b” and transparent for solenoids with light indicator.





with solenoid “a”
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid “b”
for symbols: 10 , 16 and 28

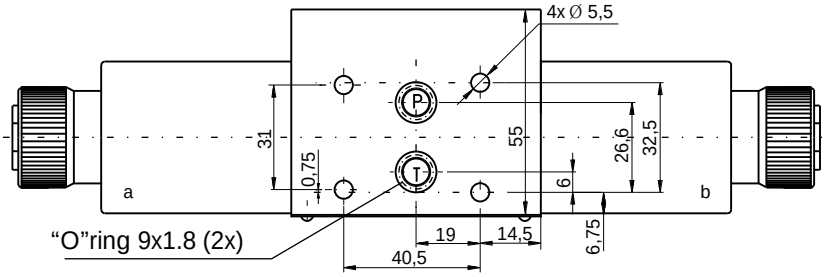


The other dimensions are the same as double solenoid valve.

All dimensions are shown in mm.

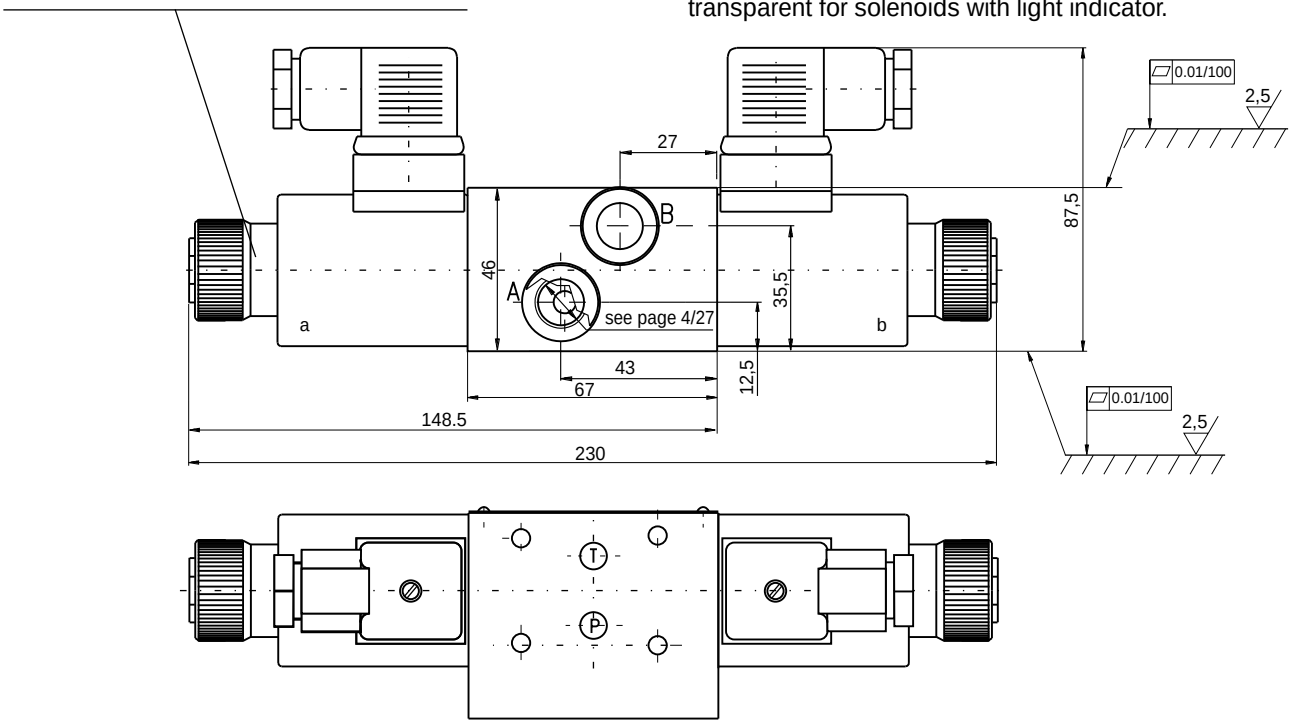
RH06...1-.../...GFM...

with solenoids ”a” & “b”
for symbols: “00” , “01” , “02” , “04” , “05” , “08” and “20”



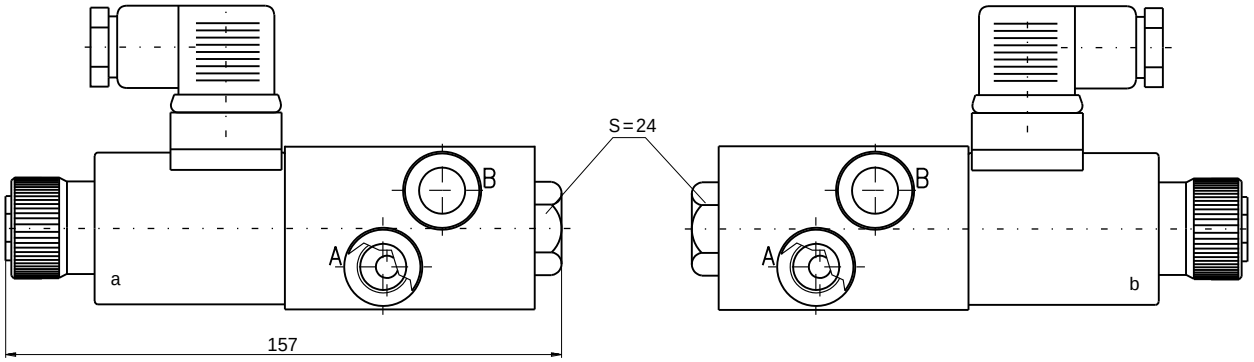
For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

The plug connectors are grey or white for solenoid “a”, black for solenoid “b” and transparent for solenoids with light indicator.



with solenoid “a”
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid “b”
for symbols: 10 , 16 and 28

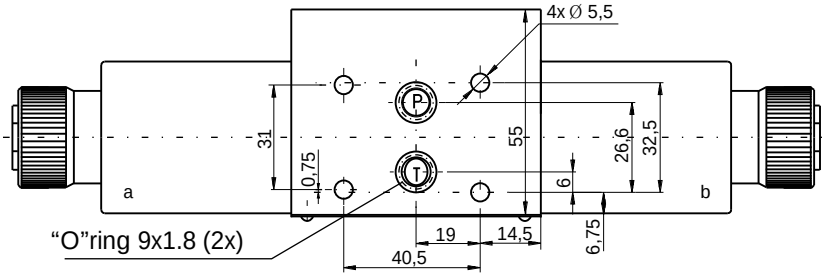


The other dimensions are the same as double solenoid valve.

All dimensions are shown in mm.

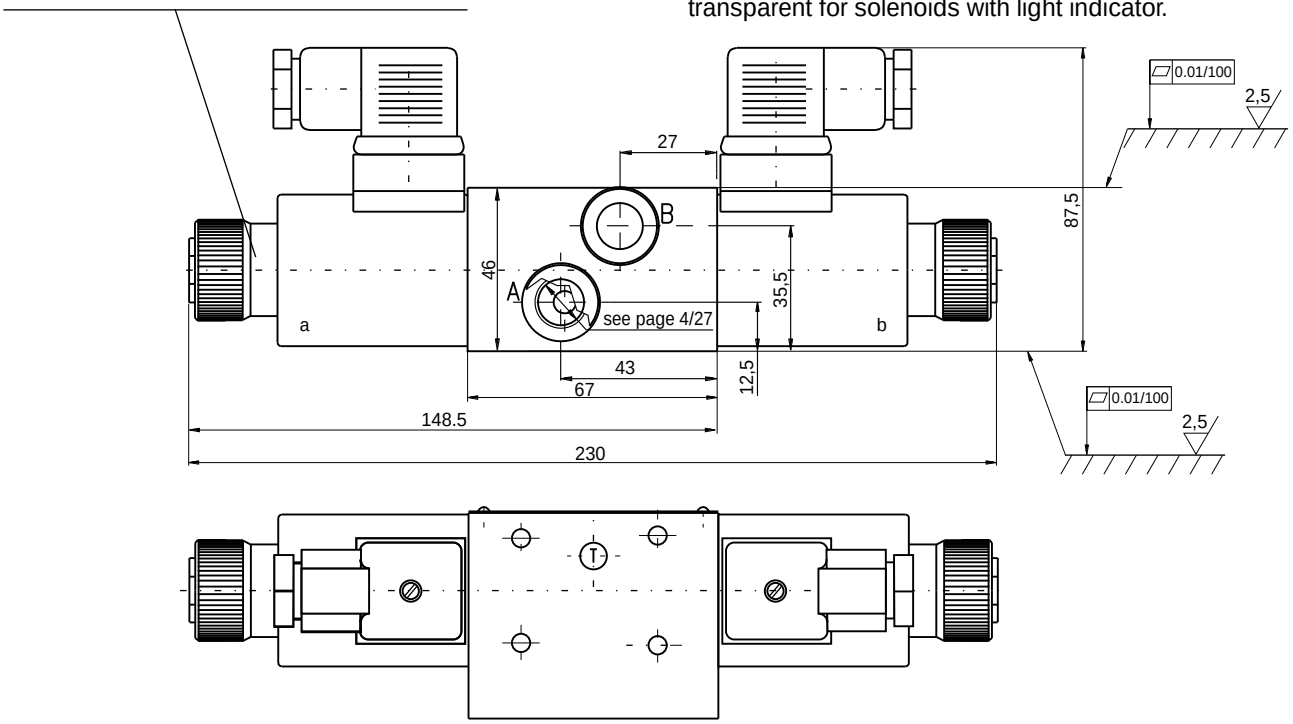
RH06...1-.../...GFMS...

with solenoids ”a” & “b
for symbols: “00” , “01” , “02” , “04” , “05” , “08” and “20”



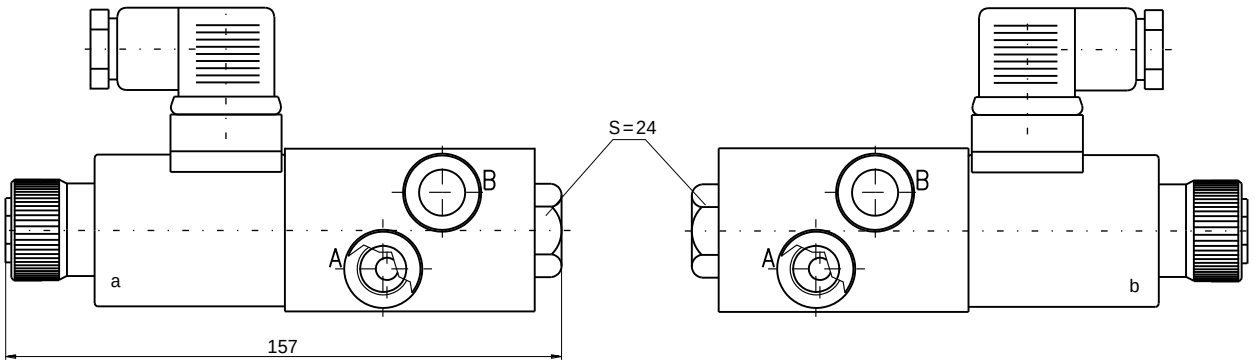
For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

The plug connectors are grey or white for solenoid “a”, black for solenoid “b” and transparent for solenoids with light indicator.



with solenoid “a”
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid “b”
for symbols: 10 , 16 and 28

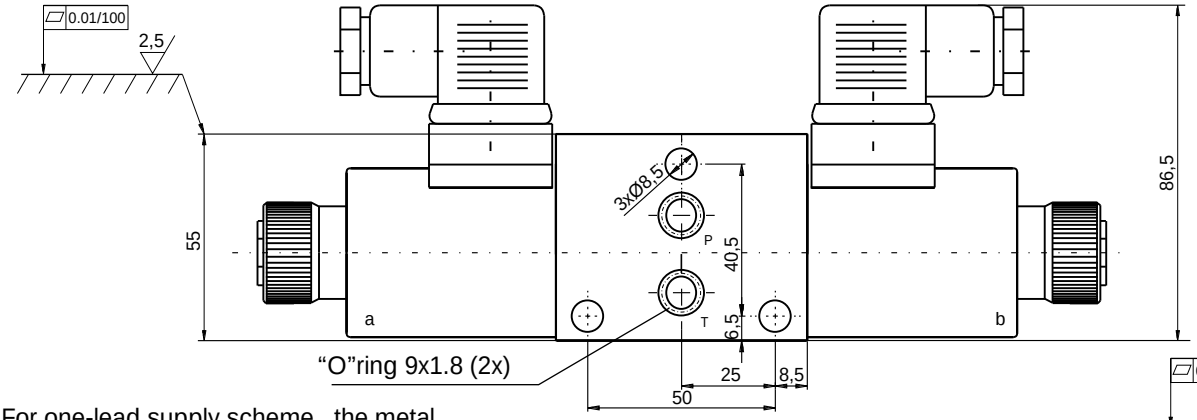


The other dimensions are the same as double solenoid valve.

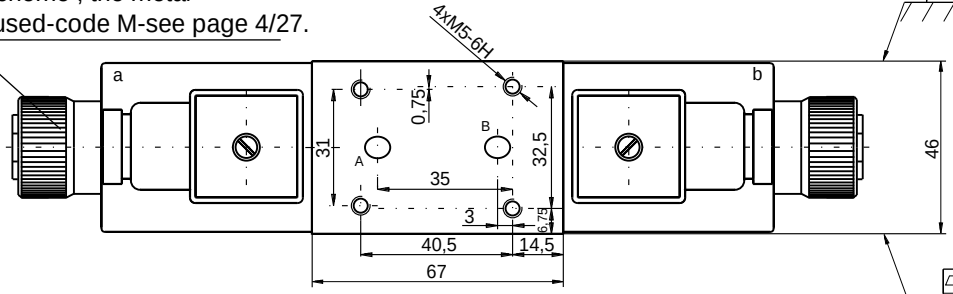
All dimensions are shown in mm.

with solenoids ”a” & “b
for symbols: “00” , “01” , “02” , “04” , “05” , “08” and “20”

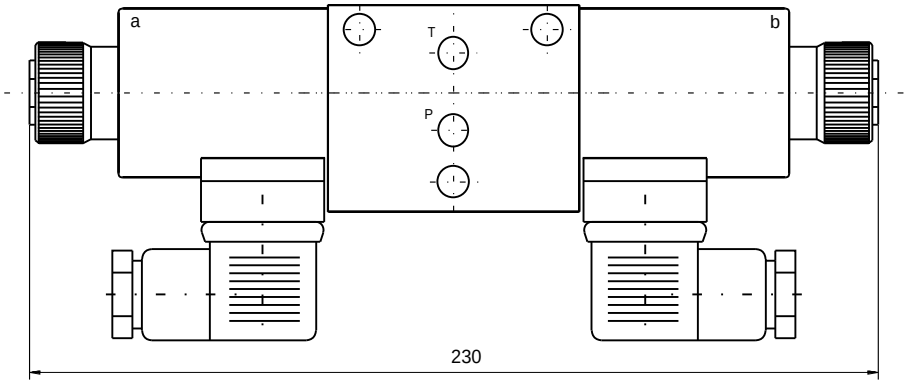
RH06...1-.../...GFS...



For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

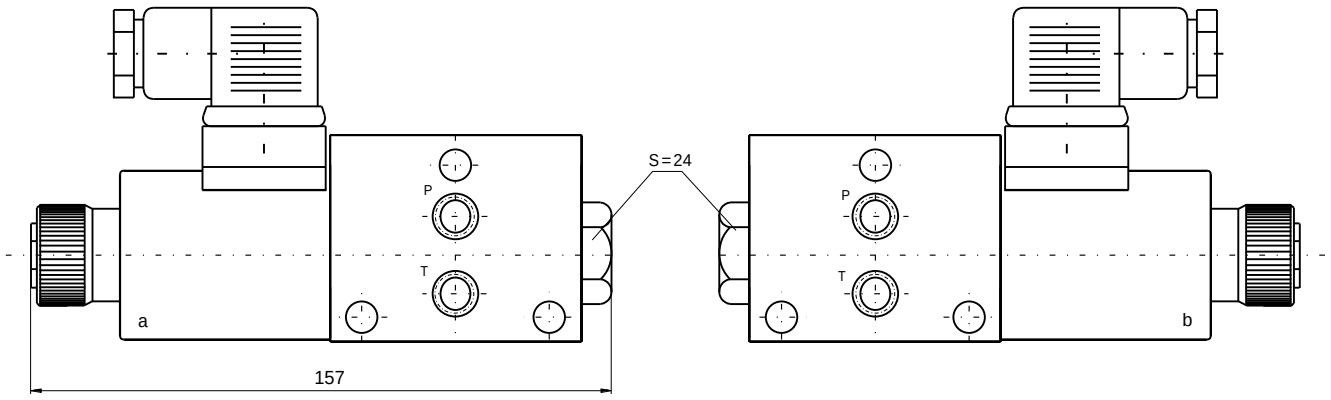


The plug connectors are grey or white for solenoid “a”, black for solenoid “b” and transparent for solenoids with light indicator.



with solenoid “a”
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid “b”
for symbols: 10 , 16 and 28

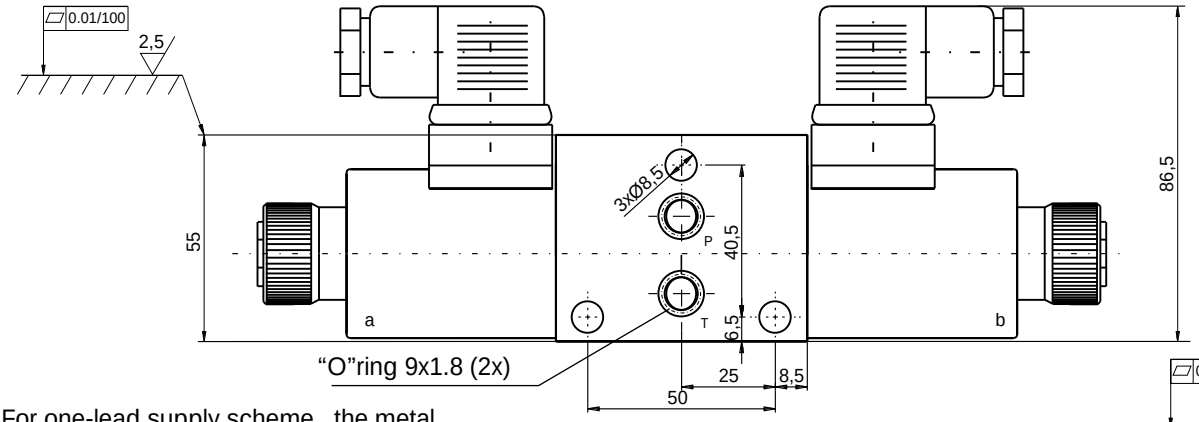


The other dimensions are the same as double solenoid valve.
This valve is useful only for vertical building up SVM06-... see pages 23/27 , 24/27 and 25/27.

All dimensions are shown in mm.

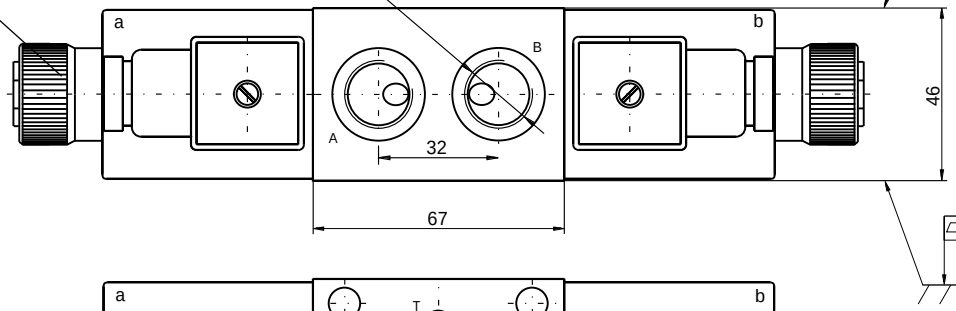
with solenoids "a" & "b"
for symbols: "00" , "01" , "02" , "04" , "05" , "08" and "20"

RH06...1-.../...GFST...

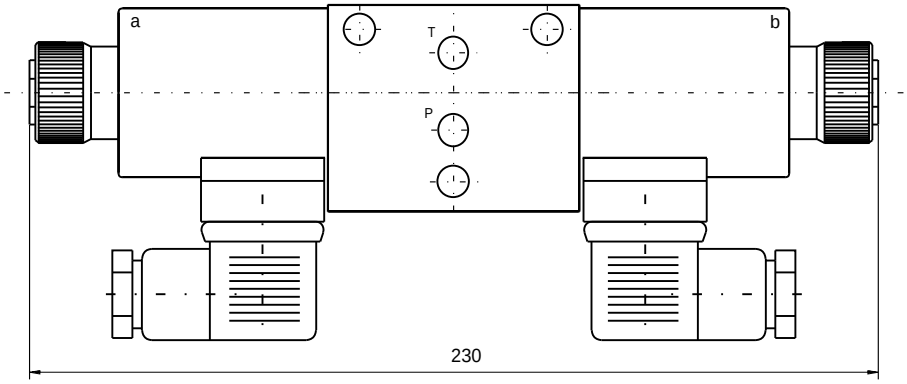


For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

see page 4/27.

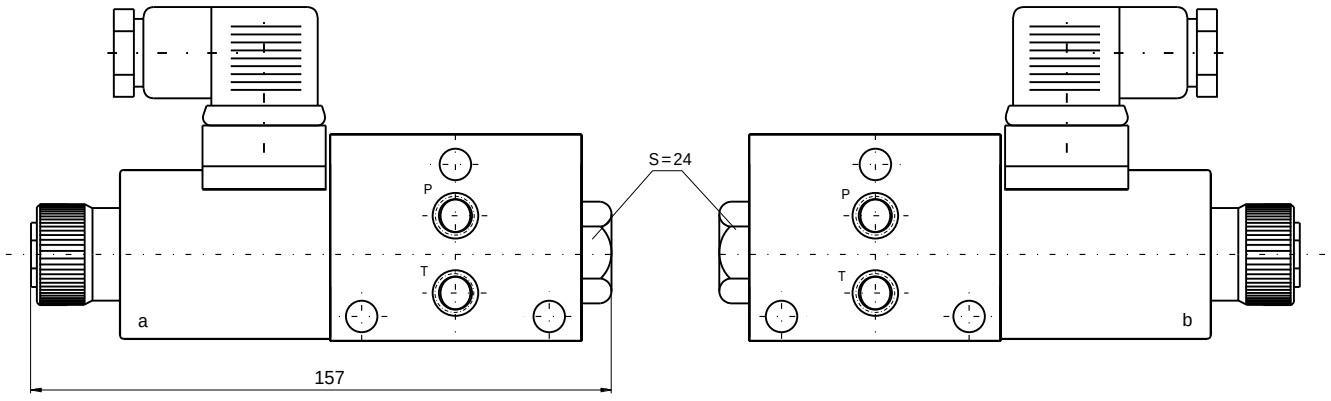


The plug connectors are grey or white for solenoid "a", black for solenoid "b" and transparent for solenoids with light indicator.



with solenoid "a"
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid "b"
for symbols: 10 , 16 and 28

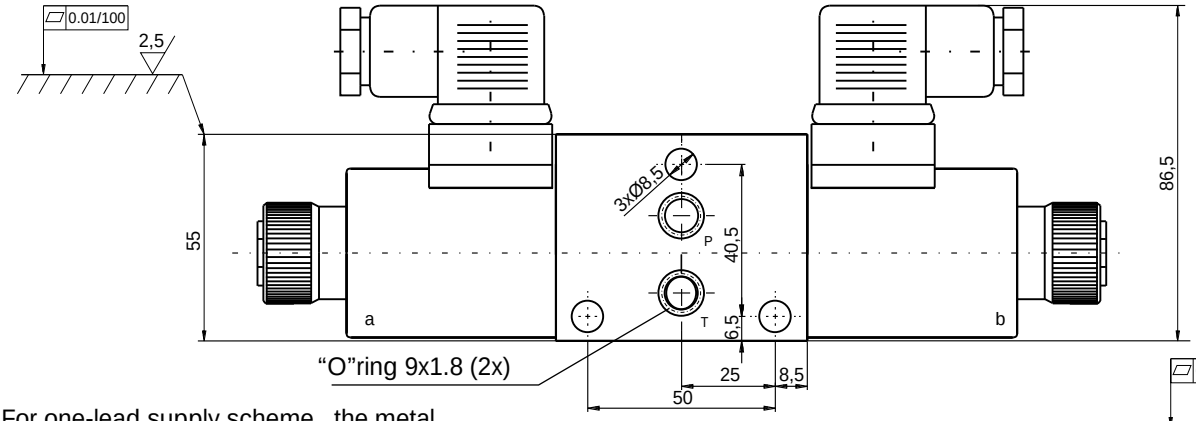


The other dimensions are the same as double solenoid valve.

All dimensions are shown in mm.

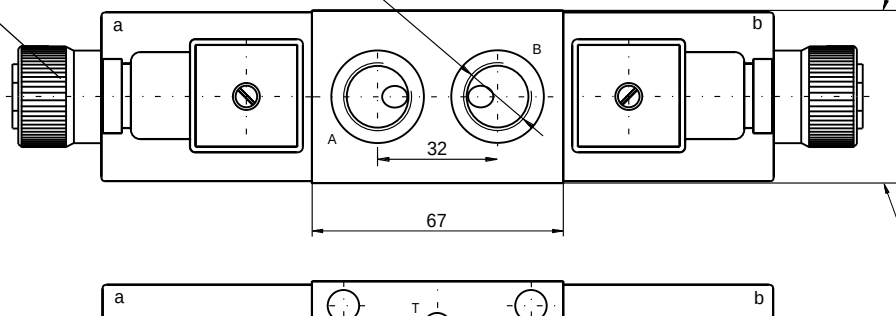
with solenoids ”a” & “b
for symbols: “00” , “01” , “02” , “04” , “05” , “08” and “20”

RH06...1-.../...GFSTS...

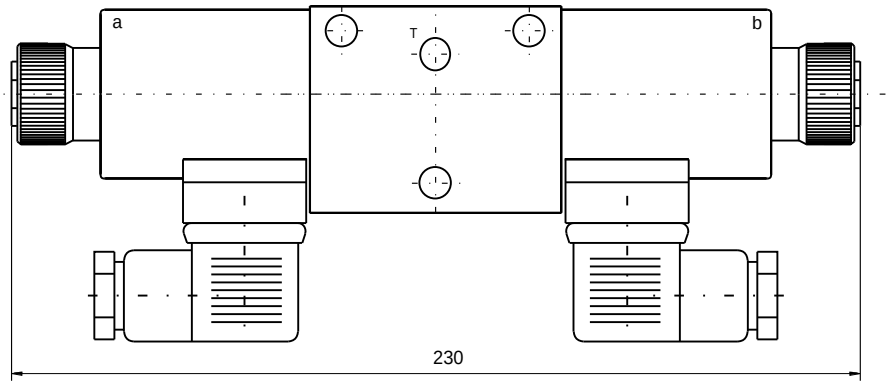


For one-lead supply scheme , the metal screw cap should be used-code M-see page 4/27.

see page 4/27.

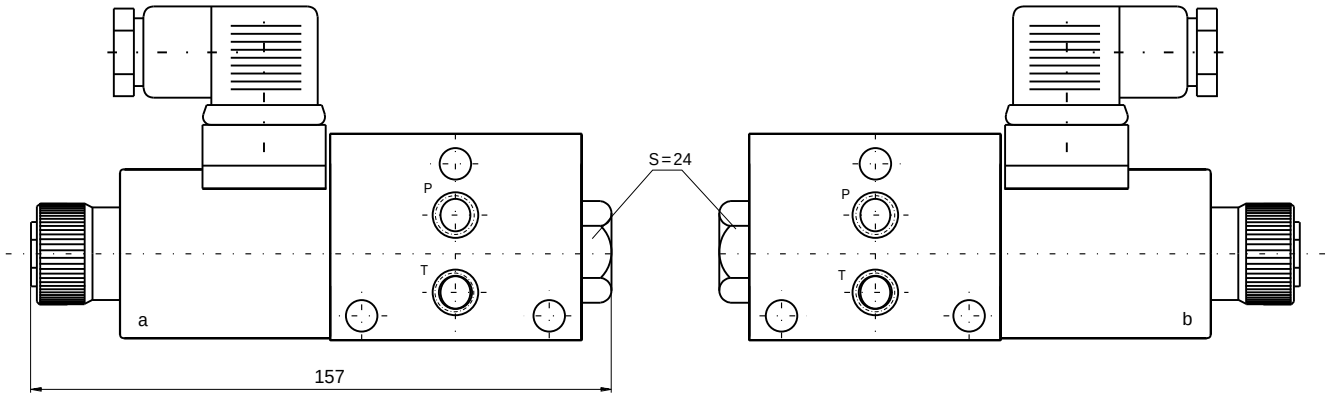


The plug connectors are grey or white for solenoid “a”, black for solenoid “b” and transparent for solenoids with light indicator.



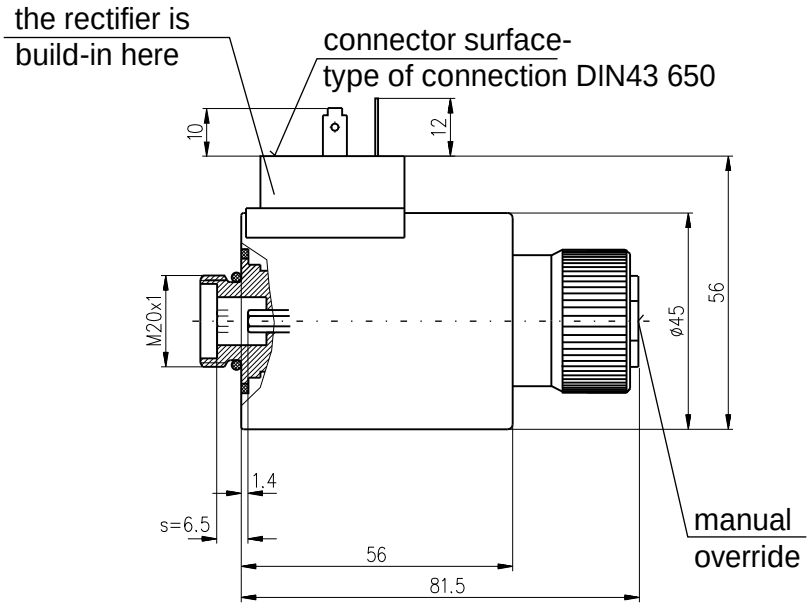
with solenoid “a”
for symbols: 11 , 12 , 14 , 17 , 24 , 33 and 45

with solenoid “b”
for symbols: 10 , 16 and 28

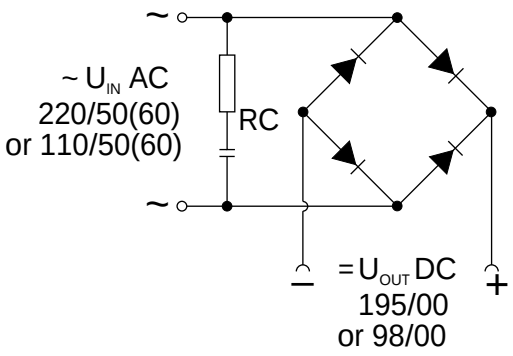


The other dimensions are the same as double solenoid valve.

All dimensions are shown in mm.

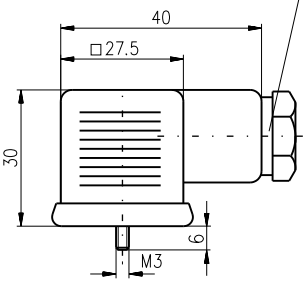
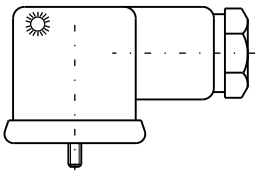
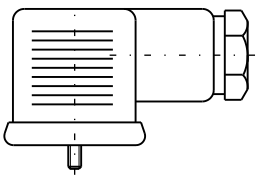
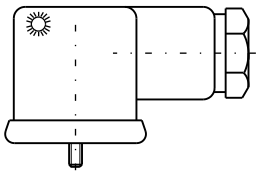


AC and DC solenoids have the same dimensions , connections and characteristics. The difference between AC and DC solenoids is in the integrated rectifier into the AC type. The solenoids can be used for 50Hz and 60Hz. The type of rectifier is shown here.
The supply voltages are as follows: 12V DC , 24V DC , 110V AC/50(60)Hz and 220V AC/50(60)Hz. RC filter is integrated into the connector(see below) and is used only with AC solenoids.



CONNECTORS

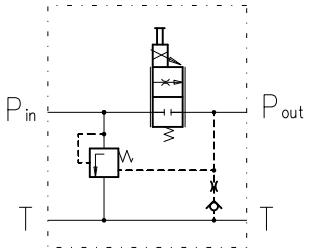
CODE/TYPE

C1	C2 (for DC type) Pg 11	C3 (for DC type)	C4 (for AC type)	C5 (for AC type)
Without connector	 With standard connector - DIN 43 650	 Connector with light indicator (transparent)	 Connector with integrated “RC” filter	 Connector with light indicator and “RC” filter (transparent)

GENERAL DESCRIPTION

The FRTP06... valve is used to control the speed of hydraulic actuators. This valve is designed for assembling with other valves for stackable control blocks.

Symbol



- ✓ 3- way flow regulator with proportional solenoid operation without feedback
- ✓ Removable coils-quick replacement and rotation in any direction without leakage from the system
- ✓ Manual override option (push button)

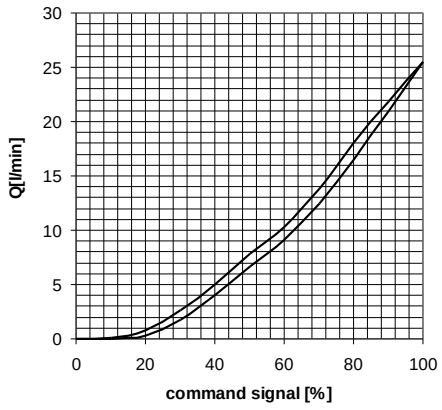
ORDERING CODE

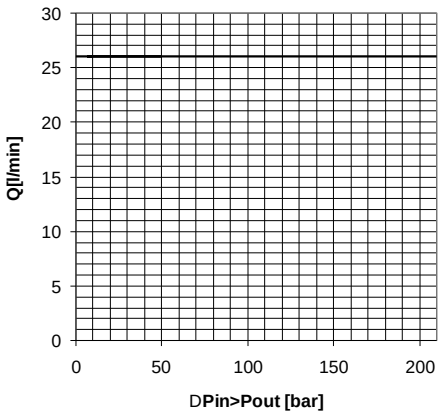
FRTP | 06 | - | 25 | - | GF | ... | ...

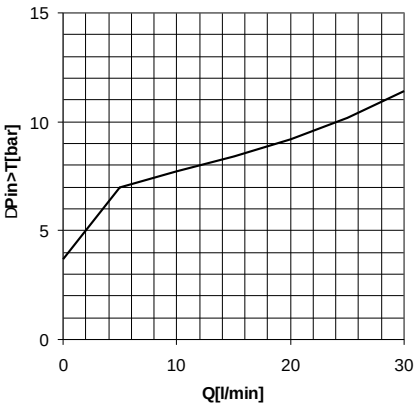
- FRTP — Proportional flow regulator
- 06 — Nominal size
- 25 — Nominal flow: 25l/min
- GF — Modification
- ... — Climatic realization:
  - **N** - normal
  - **T** - tropical
- ... — Connectors:
  - **C1** - without connectors
  - **C2** - with connectors without light indicator
  - **C3** - with connectors with light indicator

CHARACTERISTICS

Measured at: PWM 120Hz. , $I_{max.}$ = 2,5A , $I_{min.}$ = 1A , t = 45°C







TECHNICAL DATA

GENERAL

DATA	UNIT	VALUE/RANGE
Installation position		optional , preferably horizontal
Ambient temperature range	°C	-20... + 50
Weight	kg	1,600
Hysteresis	%	< 6
Repeatability	%	± 1,5

HYDRAULIC

Max. operating pressure	MPa	21
Regulated flow Max. inlet flow	l/min	25 40
Hydraulic fluid-mineral oil: -viscosity -filtration degree acc to ISO 4406 -temperature	 mm^2/s class °C	 10...400 18/16/13 -20...80

ELECTRICAL

Cyclic duration	%	100
Waterproof		IP65
Heat insulation		H
Coil resistance cold warm	W	2,2 3
Max current	A	2,5

AMPLIFIER

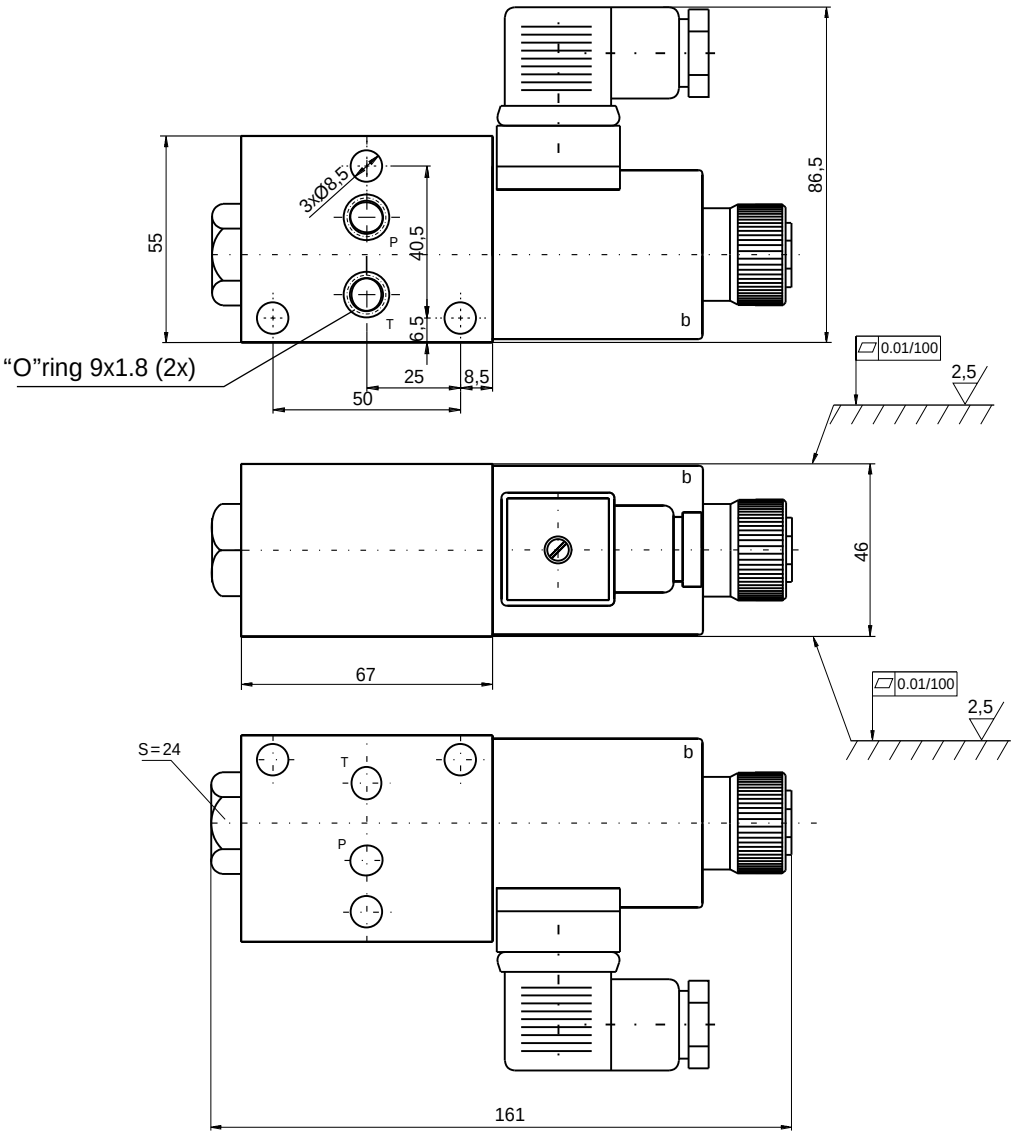
EDAR 1211-1 -25 Order separately

This digital amplifier EDAR 1211-1-25 is designed to control direct operated proportional directional control valves and proportional flow regulators with one solenoid without feedback - see “List: EDAR1211-1-25”.

DIMENSIONS

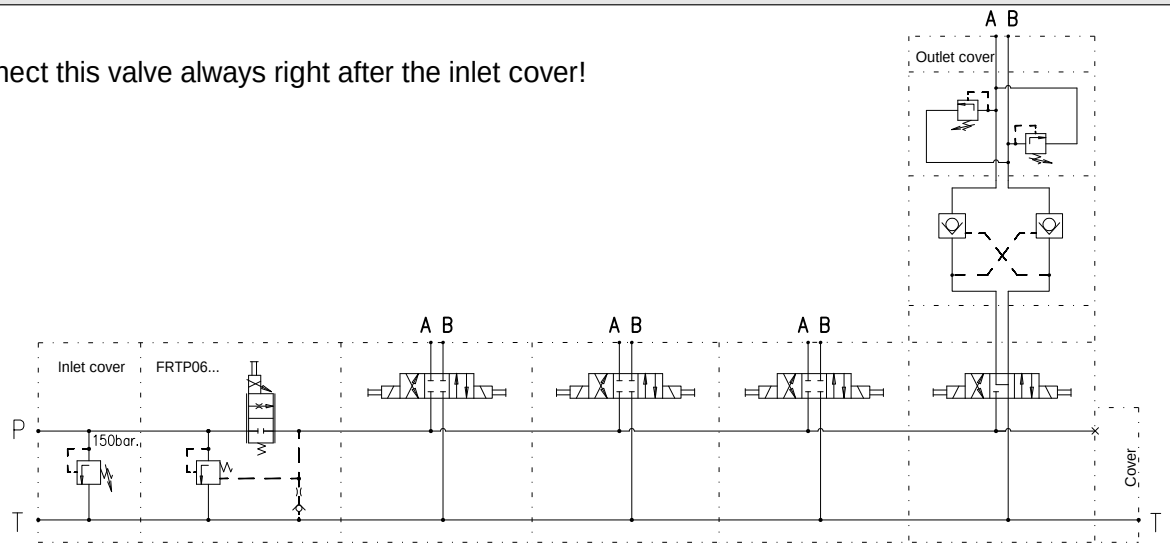
All dimensions are shown in mm.

FRTP06-25-GF..



HOW TO CONNECT

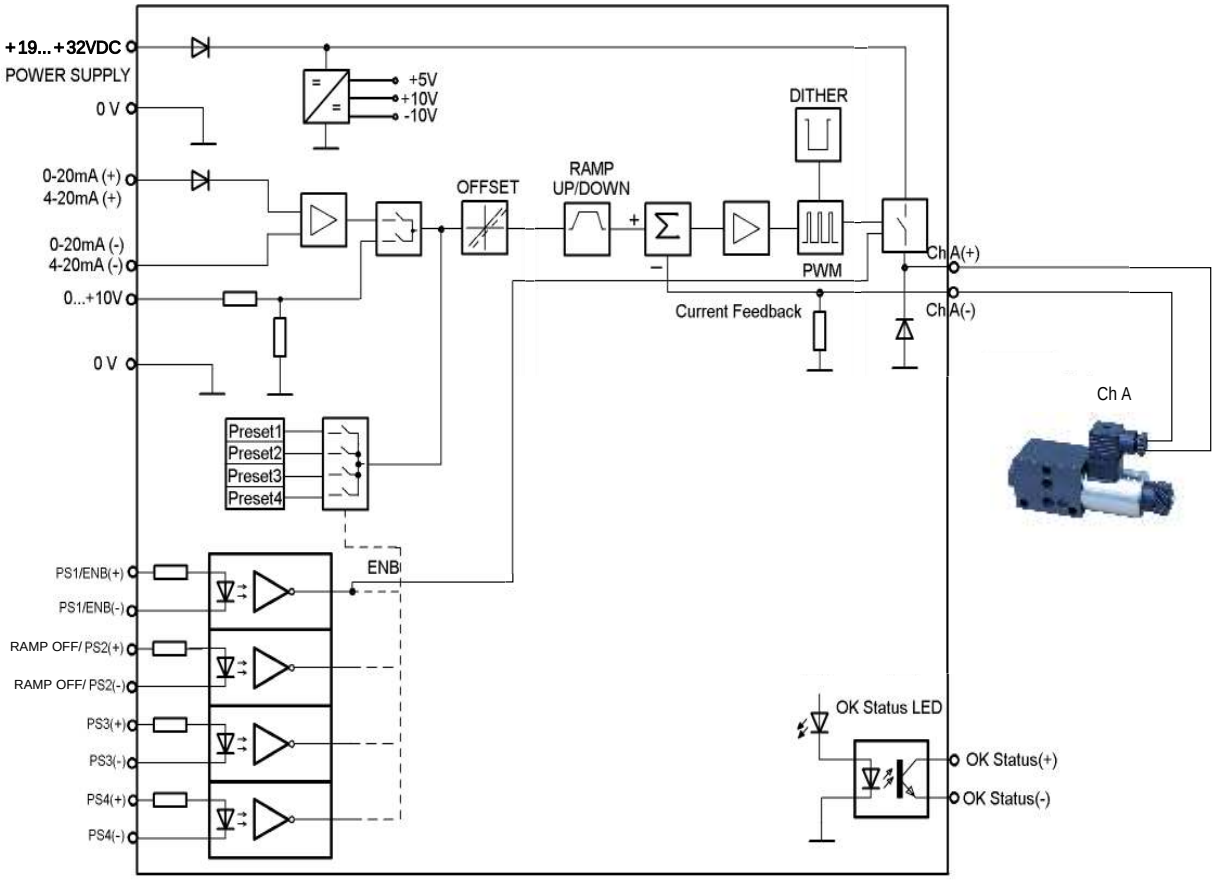
Connect this valve always right after the inlet cover!



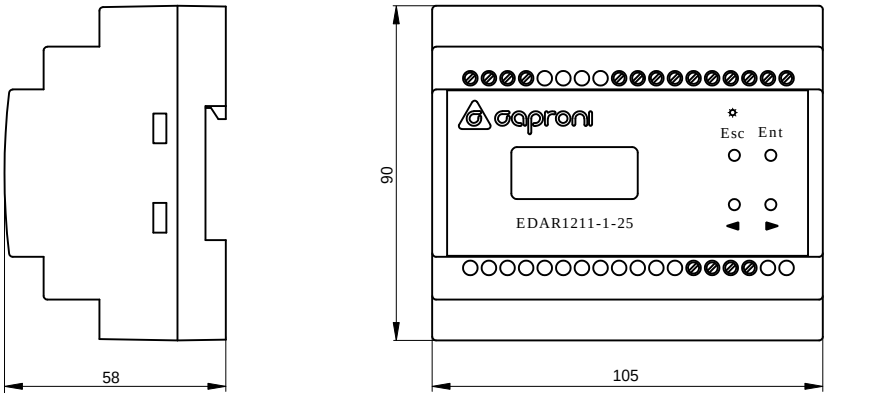
GENERAL DESCRIPTION

This digital amplifier EDAR 1211-1-25 is designed to control direct operated proportional directional control valves and proportional flow regulators with one solenoid without feedback. There are few adjustments for base parameters:
-Imax. to control the maximum current to the solenoid
-Imin. to correct the positive overlap (dead band elimination)
-Ramps to set increasing/decreasing time on channel “a”
-PWM to regulate hysteresis and stability (accuracy) of the valve -
high frequency - high accuracy , high hysteresys
low frequency - low accuracy , low hysteresys.
The adjustments set realized by 4 push buttons on the front cover.
The amplifier is designed for rail mounting type DIN EN 50022.

BLOCK DIAGRAM



DIMENSIONS

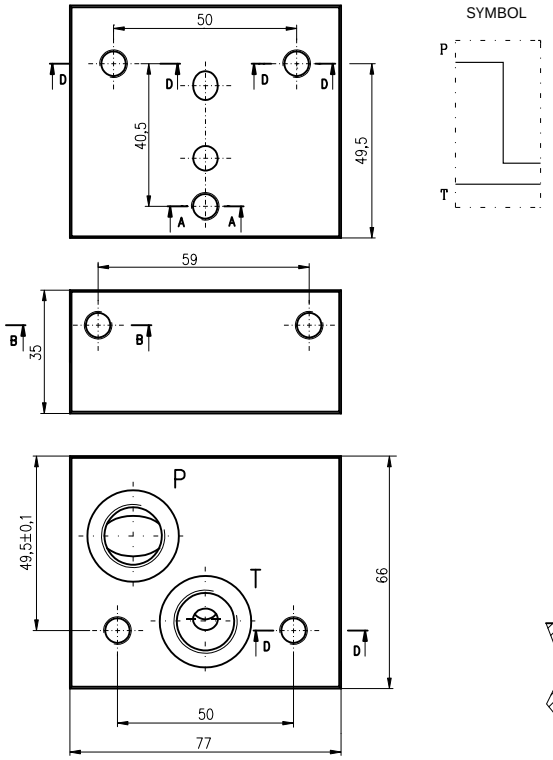


TECHNICAL DATA

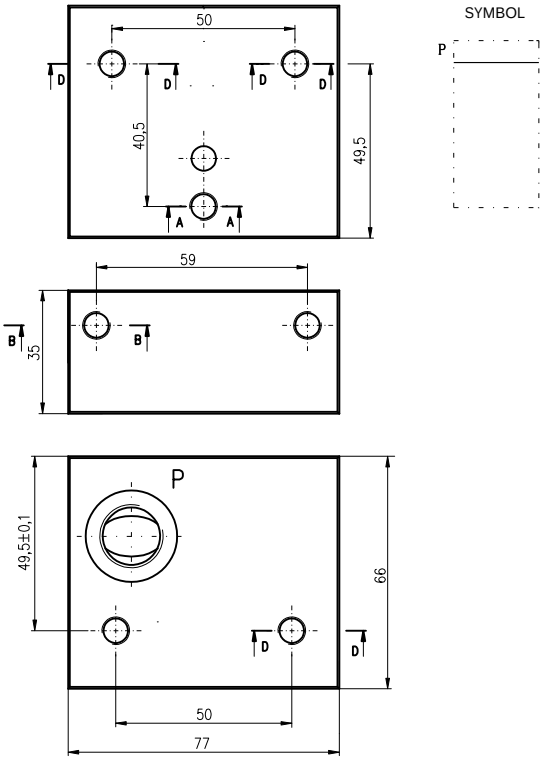
DATA	UNIT	VALUE/RANGE
Power supply	V DC	24 (19...32)
Max. power consumption	W	35
Max. output current	A	2,7
Power supply polarity protection		
Output short-circuit protection		
Available reference signals	V	0...+10
	mA	0...20 4...20
		4 preset values selected by 4 discrete inputs
Ramps		Two ramps according to rising and falling reference signal
Ramps (duration)	sec	0,01...9,99
Opto isulated output signal - “OK”	mA V DC	$I_{max.}$ = 50 $U_{max.}$ = 35
Opto isulated input signal - “ENABLE”	V DC	24
4 opto isulated input signal for preset values selection	V DC	24
PWM frequency	Hz	80...500
Reference signal offset correction	%	-9,99...+9,99
Mounting		Rail type DIN EN 50022
Ambient temperature	°C	0...50
Storage temperature	°C	-20...+50
Dimensions	mm	105x90x60

Inlet covers are available only with GFS , GFST & GFSTS modification (horizontal stackable control blocks).

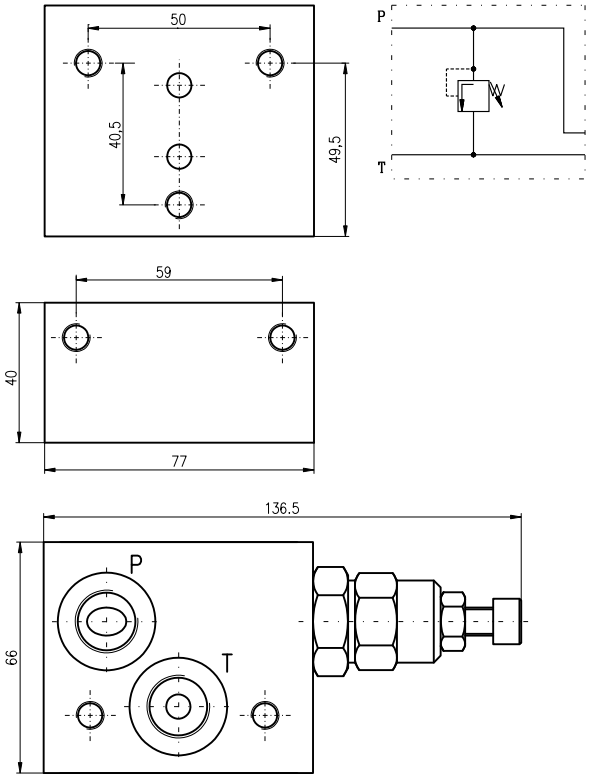
Code ICP06... see page 22&27



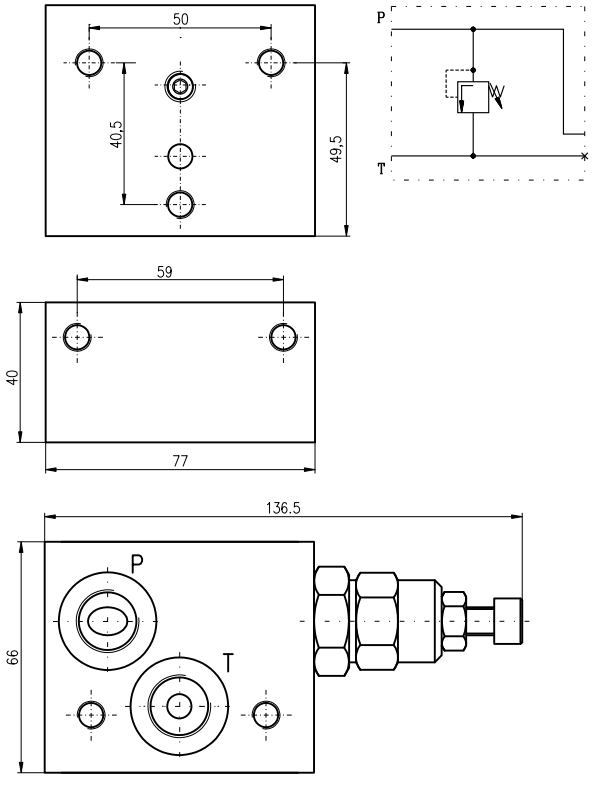
Code ICS06... see page 22/27



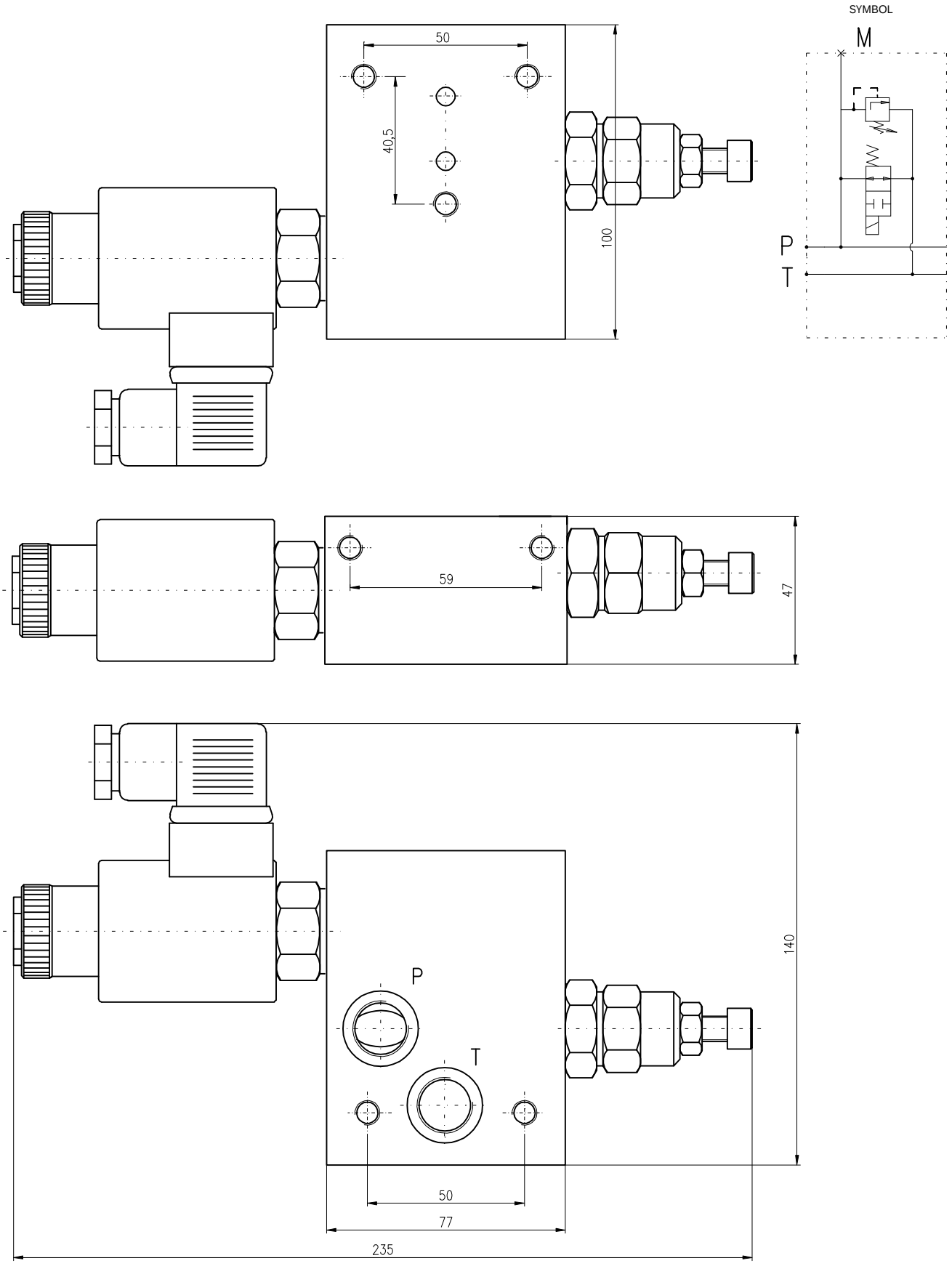
Code ICVP06... see page 22/27



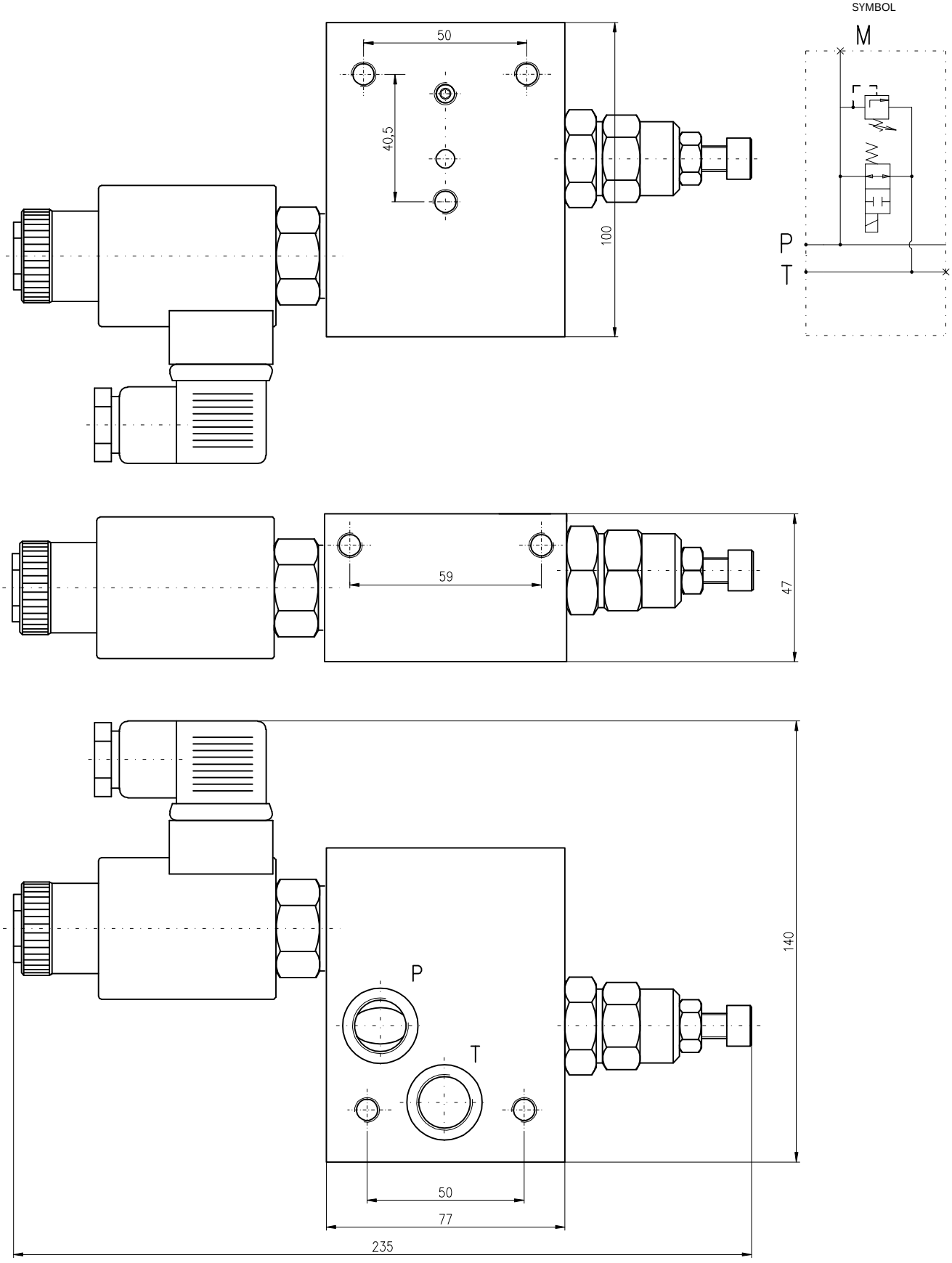
Code ICVS06... see page 22/27



Code ICVUP06...see page 22/27



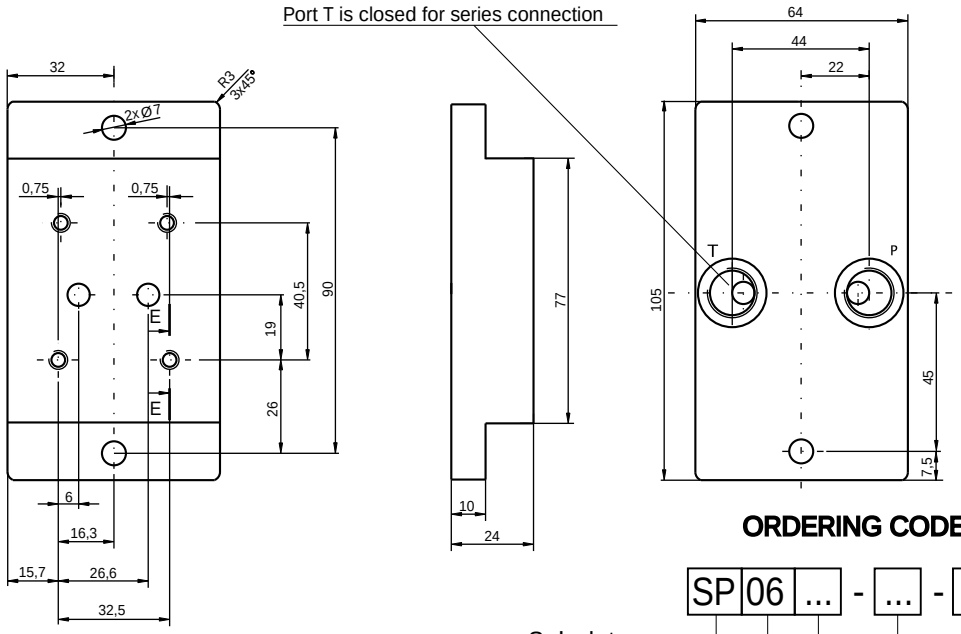
Code ICVUS06...see page 22/27



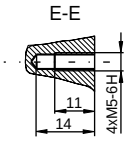
ACCESSORIES

SUBPLATES

All dimensions are shown in mm. Subplates are available with GF , GFM and GFMS modification (vertical stackable control blocks).



CODE	Threaded connections
M14	M14x1,5
G14	G1/4"
G38	G3/8"
M18-06	M18x1,5



ORDERING CODE

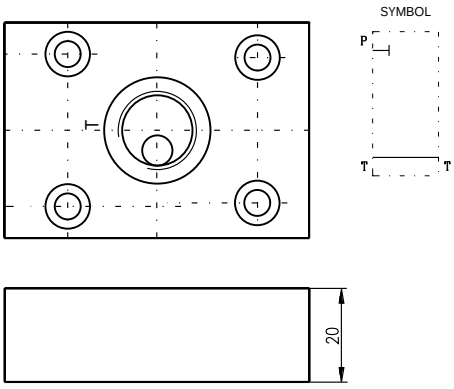
SP | 06 | ... | - | ... | - | G

- SP — Subplate
- 06 — Nominal bore
- ... — Connections: for parallel connection - P; for series connection - S
- ... — Threads: M1 - M16x1,5; M2 - M18x1,5; G1 - G3/8"; G3 - G1/2"
- G — Modification

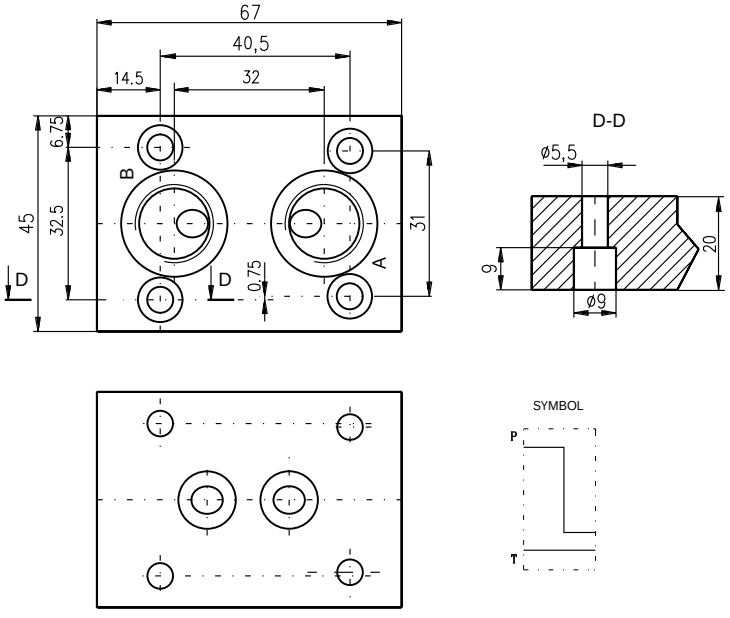
OUTLET COVER

Outlet covers are available with horizontal stackable control blocks with vertical superstructure - OC06... and with vertical stackable control blocks as peak plate when we realize series connection - OCVS06....

Code OCVS06 see page 22/27



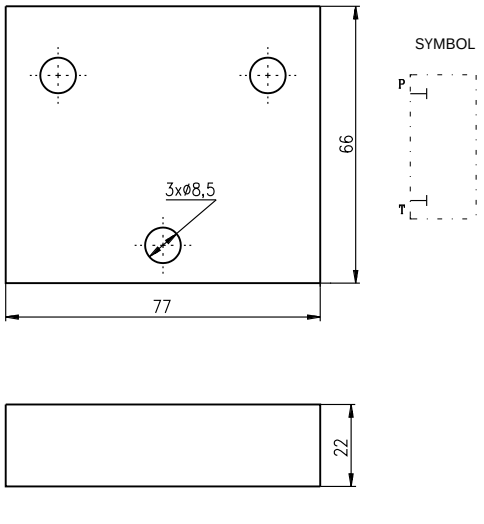
Code OC06... see page 22/27



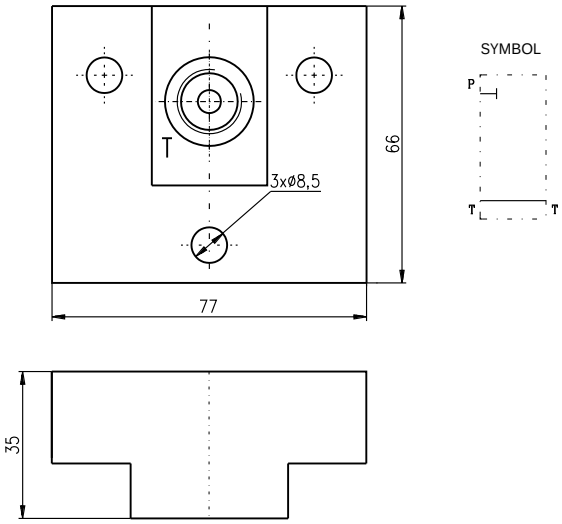
COVERS

Inlet covers are available only with GFS , GFST & GFSTS modification (horizontal stackable control blocks).

Code CP06 see below



Code CS06... see below



ORDERING CODE FOR ALL COVERS

… 06 … - … - …

inlet cover(for horizontal stacking) - without valves for parallel connection **-ICP**
- without valves for series connection **-ICS**
- with relief valve for parallel connection **-ICVP**
- with relief valve for series connection **-ICVS**
- with relief & unloading valves for series connection **-ICVUS**
- with relief & unloading valves for parallel connection **-ICVUP**

outlet cover(for horizontal stacking and vertical superstructure) **-OC**
outlet cover(for vertical stacking and series connection) **-OCVS**
cover(for horizontal stacking) - parallel **-CP**
- series **-CS**

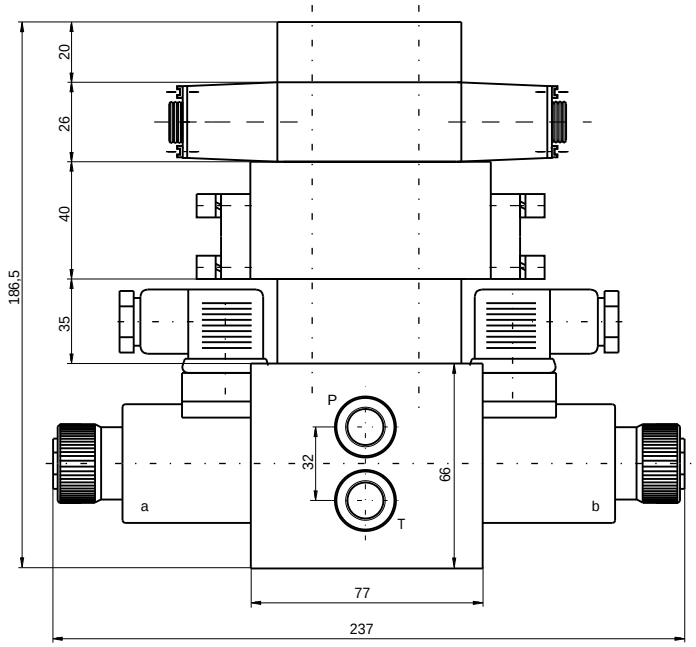
Nominal size

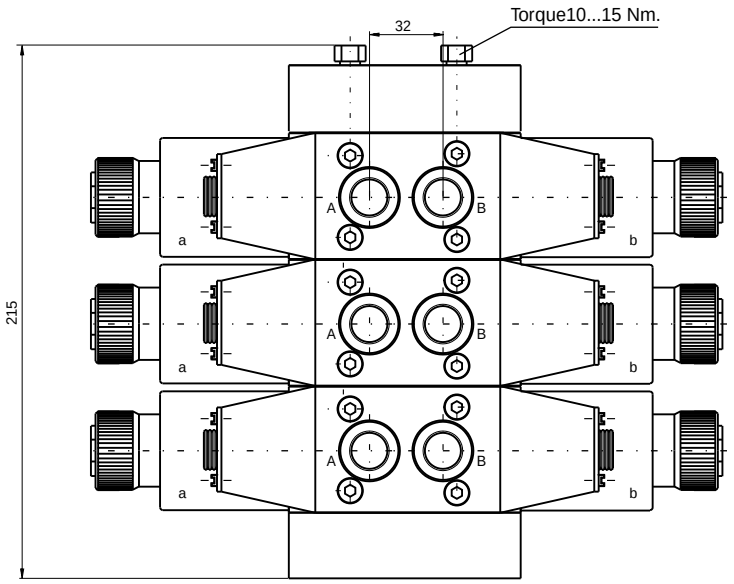
Connection threads:
M16x1,5 - **M1**
M18x1,5 - **M2**
G3/8" - **G1**
G1/2" - **G3**

Supply voltages: (only for ICVUP & ICVUS)
Omit - without unloading valve
12 - 12V DC
24 - 24V DC
11 - 110V RAC
22 - 220V RAC

Pressure adjustment ranges (only for ICVP , ICVS , ICVUS & ICVUP):
Omit without relief valve
10 - 8...100bar
21 - 15...210bar
32 - 108...315bar

GENERAL DESCRIPTION





Valve assembly:
SVM06...-...

✓ 4/2 and 4/3 - way directional control valves with solenoid operation made up with inlet cover , outlet cover and cover.

✓ Thread connection of ports “A” , “B” “P” and “T”.

✓ Possibility of vertical superstructure with pilot operated check valve , throttle check valve or both standard component.

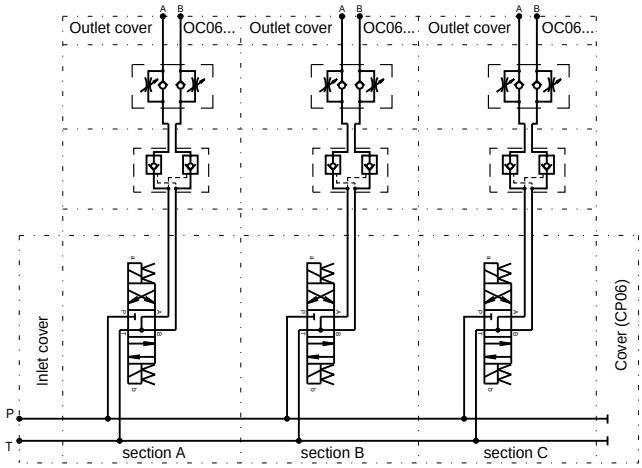
✓ Up to 8 sections without vertical superstructure.
Up to 6 sections with vertical superstructure.

✓ Possibility of parallel and series connection.

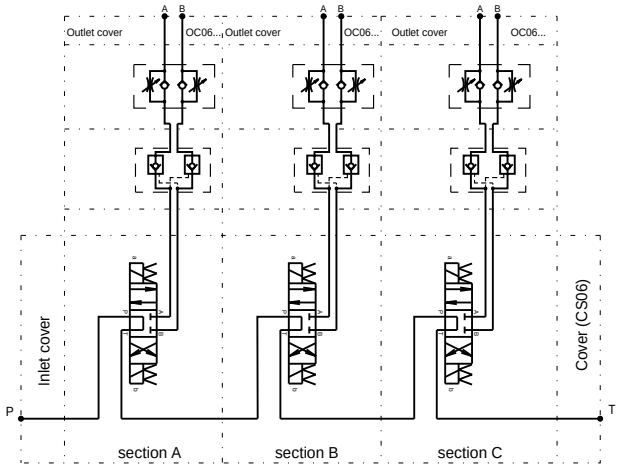
Directional control valves are stackable type RH06...1-.../...GFS...-for vertical superstructure , and RH06...1-.../...GFST...& RH06...1-.../...GFSTS... - for horizontal stacking.

The stackable valves for vertical superstructure are standard version CETOP 3 modular valves.

Parallel connection

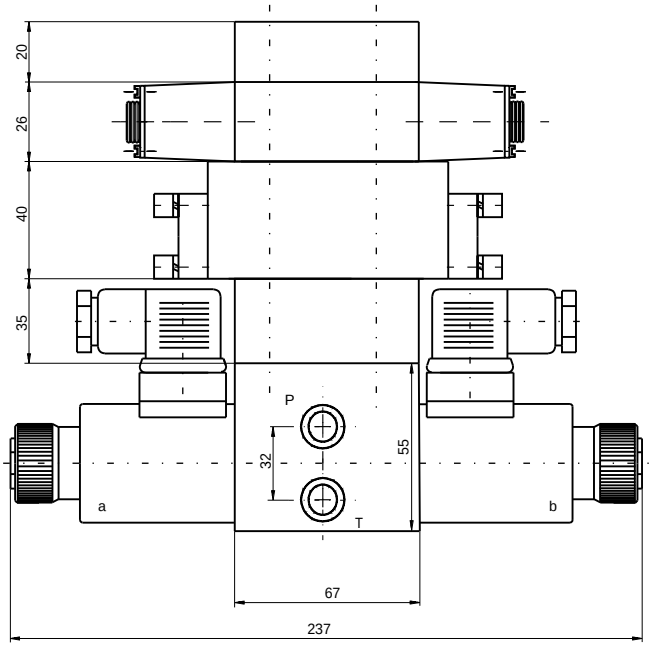


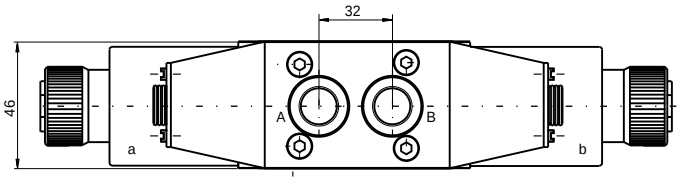
Series connection



GENERAL DESCRIPTION

Valve assembly:
SVM06...-...





Every section can have the following configurations as shown below:

-directional control valve with pilot operated check valve and adjustable throttle check valve ,

-directional control valve with pilot operated check valve ,

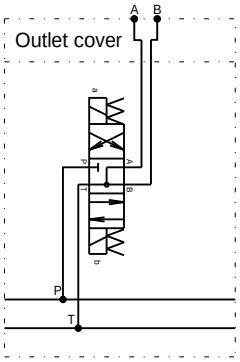
-directional control valve with adjustable throttle check valve.

-directional control valve without valves.

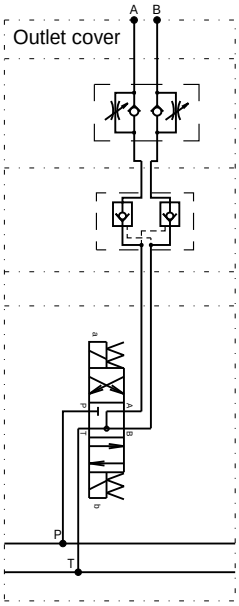
-directional control valves with pilot operated check valve and dual relief valve.

POSSIBLE CONFIGURATIONS*

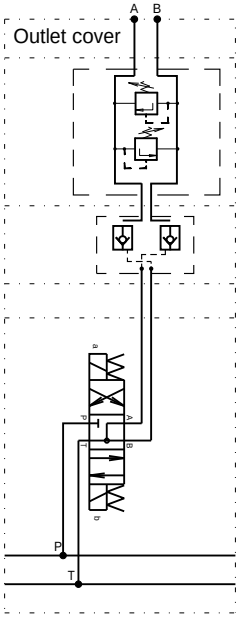
A(B,C,D,E,F,G,H)...- without code



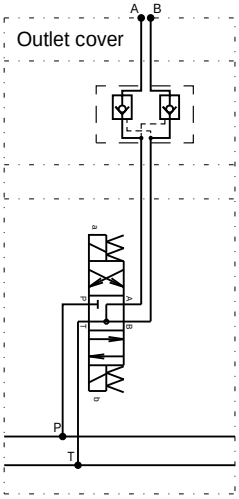
A(B,C,D,E,F,G,H)...- code “KT”



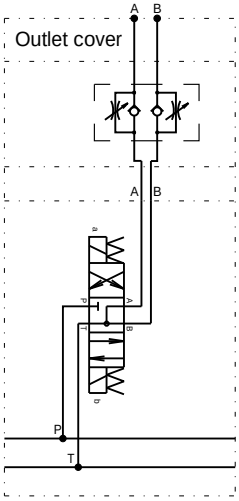
A(B,C,D,E,F,G,H)...- code “KR”



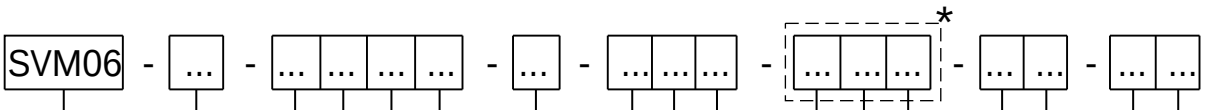
A(B,C,D,E,F,G,H)...- code “K”



A(B,C,D,E,F,G,H)...- code “T”



Codifications-see page 25/27 “ORDERING CODE” marked with.



Stackable valve nominal size 06

Sections:	Code
Number of sections	1...8

Inlet covers - types (see page 22/27):	Code
Without cover	omit
Without valves for parallel connection	ICP06
Without valves for series connection	ICS06
With pressure relief for parallel connection	ICVP06
With pressure relief for series connection	ICVS06
With pressure relief & unloading valves for parallel connection	ICVUP06
With pressure relief & unloading valves for series connection	ICVUS06

Inlet covers - threads (see page 22/27):	Code
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/2”	G3

Inlet covers - relief valve pressure adjustment ranges (see page 22/27):	Code
without relief valve	omit
8...100bar	10
15...210bar	21
108...315bar	32

Inlet covers - unloading valve supply voltages (see page 22/27):	Code
without unloading valve	omit
12V DC	12
24V DC	24
110V RAC	11
220V RAC	22

Proportional flow regulator (see pages 13/27...17/27):	Code
without regulator	omit
with regulator	FR

Directional control valves - modifications (see page 9/27...11/27):	Code
GFS	GFS
GFST	GFST
GFSTS	GFSTS

Directional control valves - supply voltages (see page 12/27):	Code
12V DC	012/00
24V DC	024/00
110V RAC	110/50
220V RAC	220/50

Directional control valves - threads (see page 4/27):	Code
M14x1,5	omit
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/4”	G2

Operating sections:	Code
first section	A
second section	B
third section	C
fourth section	D
fifth section	E
sixth section	F
seventh section	G
eighth section	H

Operating sections - functional symbols (see page 4/27):	Code
functional symbol	00...99

Covers - threads (see page 22/27):	Code
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/2”	G3

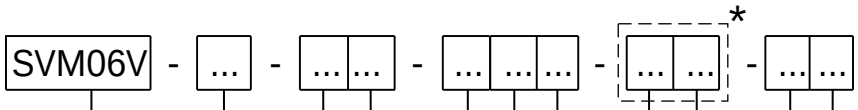
Covers (see page 22/27):	Code
without cover	omit
for horizontal stacking and parallel connection “P” & “T” - blocked	CP06
for horizontal stacking and series connection “P”-blocked and “T”-passage	CS06

Outlet covers - threads (see page 22/27):	Code
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/2”	G3

Outlet covers - types (see page 22/27):	Code
without outlet cover	omit
outlet cover for vertical buildind up	OC06

Operating sections - building up valves (see page 24/27):	Code
without valves	omit
with pilot operated check & throttle check valve	KT
with pilot operated check valve	K
with throttle check valve	T
with pilot operated check & dual pressure relief valve	KR

* Repeat for each sections.



Stackable valve nominal size 06 (vertical stacking)

Sections:	Code
Number of sections	1...4

Subplates - types (see page 21/27):	Code
for parallel connection	SP06P
for series connection	SP06S

Subplates - threads (see page 21/27):	Code
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/2”	G3

Directional control valves - supply voltages (see page 12/27):	Code
12V DC	012/00
24V DC	024/00
110V RAC	110/50
220V RAC	220/50

Directional control valves - modifications (see page 6/27...8/27):	Code
GF	GF
GFM	GFM
GFMS	GFMS

Directional control valves - threads (see page 4/27):	Code
M14x1,5	omit
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/4”	G2

Operating sections:	Code
first section	A
second section	B
third section	C
fourth section	D

Operating sections - functional symbols (see page 4/27):	Code
functional symbol	00...99

Cover (see page 22/27):	Code
without cover	omit
for series connection (“P” - blocked , “T” - passage)	OCVS06

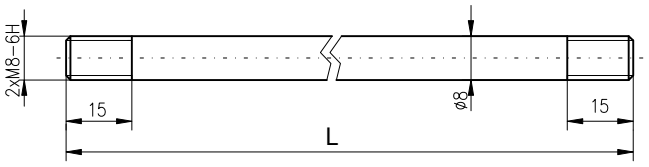
Covers - threads (see page 22/27):	Code
M16x1,5	M1
M18x1,5	M2
G3/8”	G1
G1/2”	G3

* Repeat for each sections.

ACCESSORIES

STUDS

Studs: M8xL (3pcs per block).

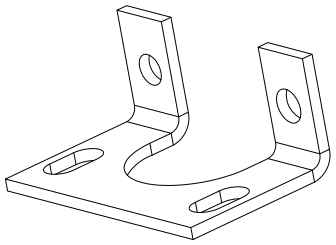


Number of sections	L(mm)
For 1 section	94
For 2 sections	140
For 3 sections	186
For 4 sections	232
For 5 sections	278
For 6 sections	324
For 7 sections	370
For 8 sections	416

BRACKETS

Fixing brackets: (2pcs per block)

Manufacturing code - 217169



NUTS

Nuts: M8 DIN934/8 (3pcs per block). **Tightening torque - 8...10Nm.**

WASHERS

Washers: Ø8 DIN7980 (5pcs per block).

BOLTS

Bolts: M8x16 DIN933 10.9 (2pcs per block). Tightening torque - 40Nm.

SCREWS

Screws: M5x DIN912 10.9 (depend on vertical building up elements). **Tightening torque - 9,5Nm.**

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