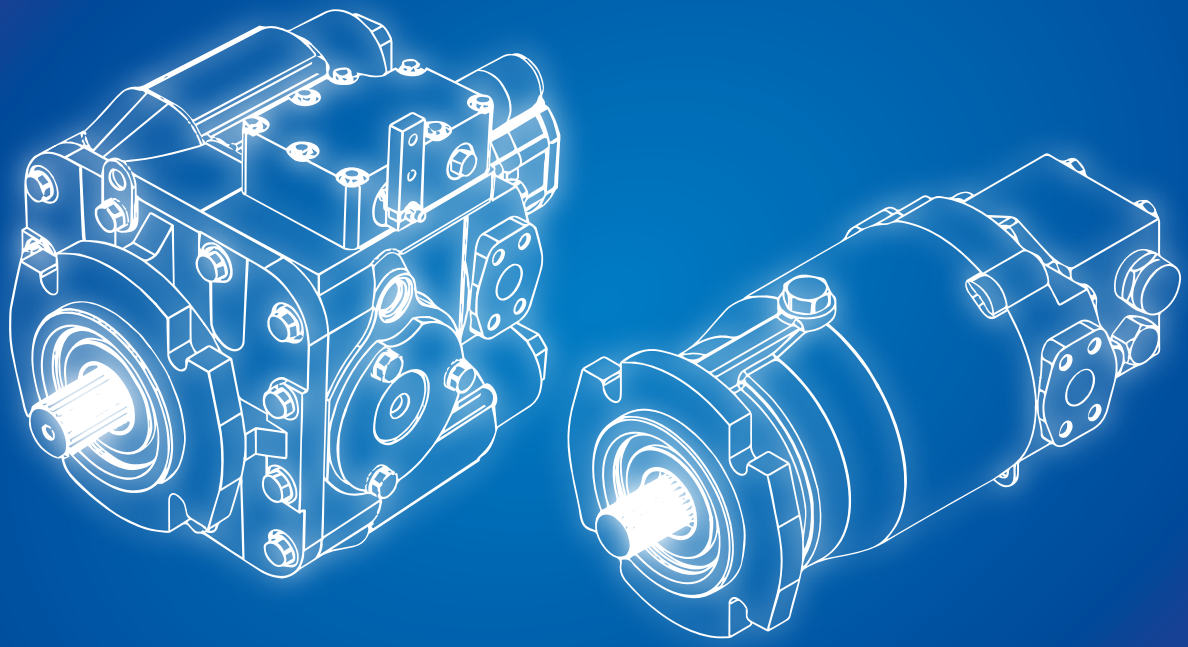
HYDROSILA

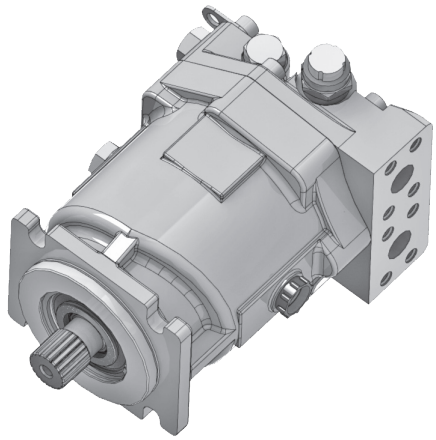


Axial Piston Pumps and Motors for Closed Circuit

series S, H, H2

HS-AC-06/042025

GENERAL INFORMATION



Fixed displacement axial piston motors in swashplate design for closed and open circuits. They are used in hydrostatic transmissions, that consist of a pump and hydraulic motor. The design is based on the Sauer 20 series. Modernization of the MFS series has significantly improved the technical and performance characteristics of the units and retained the famous reliability and durability. These motors meet the requirements of heavy duty applications. Built-in hydraulic equipment optional. The compact version of the motor with integrated valves expands the application range.

Design features:

- Swashplate design.
- Bimetallic bearing plate has a high wear resistant.
- Lightweight plunger provides reliability in operation at high speeds.
- Tapered roller bearings allow the motor shaft to withstand high radial and axial loads.
- Shaft seals (face seal or lip seal) provide reliable external tightness.
- Mounting flanges according to SAE.
- Built-in hydraulic equipment optional.
- Compact version for limited space.

TECHNICAL CHARACTERISTICS

Displacement code		With manifold block					With valves built-in to the end cap		
		33	52	71	90	112	71	90	112
Displacement max	ccm	33,3	51,6	69,8	89	110,8	69,8	89	110,8
Maximum pressure in high pressure line	bar	450							
Rated pressure in high pressure line	bar	420							
Maximum drain pressure	bar	2,5							
Maximum rotating torque	Nm	203	314	425	542	675	425	542	675
Maximum speed	min^{-1}	3590	4160		3720		2900		
Minimum speed	min^{-1}	50							
Rated speed	min^{-1}	2500							
Rated power	kW	46	71,3	96	125,6	156,4	96	125,6	156,4
Weight (without fluid)	kg	30	35	40	47	50	35		35,5

ORDERING EXAMPLE

MF H 90 / 1 D 1 0 C 1 C 35 N ⎵

MF - fixed displacement axial piston motor

H - series H

90 - displacement 89 ccm

1 - shaft seal (lip seal)

D - shaft option (23 teeth, 16/32 pitch, (37,68mm))

1 - purge valve option (manifold block)

0 - purge relief valve setting (10,3 bar - 11,8 bar)

C - relief valve setting on the side 'A'&'B' (350 bar)

1 - working ports (opposite side flange ports)

C - relief valve option (manifold block)

35 - relief valve setting A&B side (350 bar)

N - climatic version

⎵ - special features



ORDER CODE SYSTEM

MF	H		/				

FIXED DISPLACEMENT AXIAL PISTON MOTOR	MF

SERIES	H

DISPLACEMENT, CCM	CODE
33,3	33
51,6	52
69,8	71
89,0	90
110,8	112

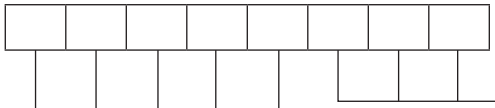
SHAFT SEAL	33	52	71	90	112	CODE
Face seal	●	●	●	●	●	1
Lip seal	○	○	●	●	●	2

DRIVE SHAFT	33	52	71	90	112	CODE
14 tooth, 12/24 pitch, (31,22 mm)	●	●	●	●	●	A
19 tooth, 16/32 pitch, (31,73 mm)	●	●	●	●	●	B
21 tooth, 16/32 pitch, (34,5 mm)	●	●	●	●	●	C
23 tooth, 16/32 pitch, (37,68 mm)	-	-	●	●	●	D
Cone 1:8, SAE J501, (ø35 mm)	●	●	●	●	●	E
20 tooth, 16/32 pitch, (33 mm)	●	●	●	●	●	F
27 tooth, 16/32 pitch, (44,03 mm)	-	-	-	●	●	G
Straight (ø34,93 mm)	●	●	●	-	-	K
Straight (ø44,45 mm)	-	-	-	●	●	L

PURGE RELIEF VALVE LOCATION	33	52	71	90	112	CODE
In manifold block	●	●	●	●	●	1
In end cap	-	-	○	●	●	2

PURGE RELIEF VALVE SETTING	33	52	71	90	112	CODE
10,3 bar - 11,8 bar	●	●	●	●	●	0
15 bar - 16,4 bar	●	●	●	●	●	1
20,5 bar - 22,5 bar	-	-	○	●	●	2

Notes: ● Standard; ○ Optional; **–** Not available.



SPECIAL FEATURES*	CODE
Drain port size 1 1/16-12UN-2B	1

CLIMATIC VERSION	CODE
Temperate	N
Tropical	T

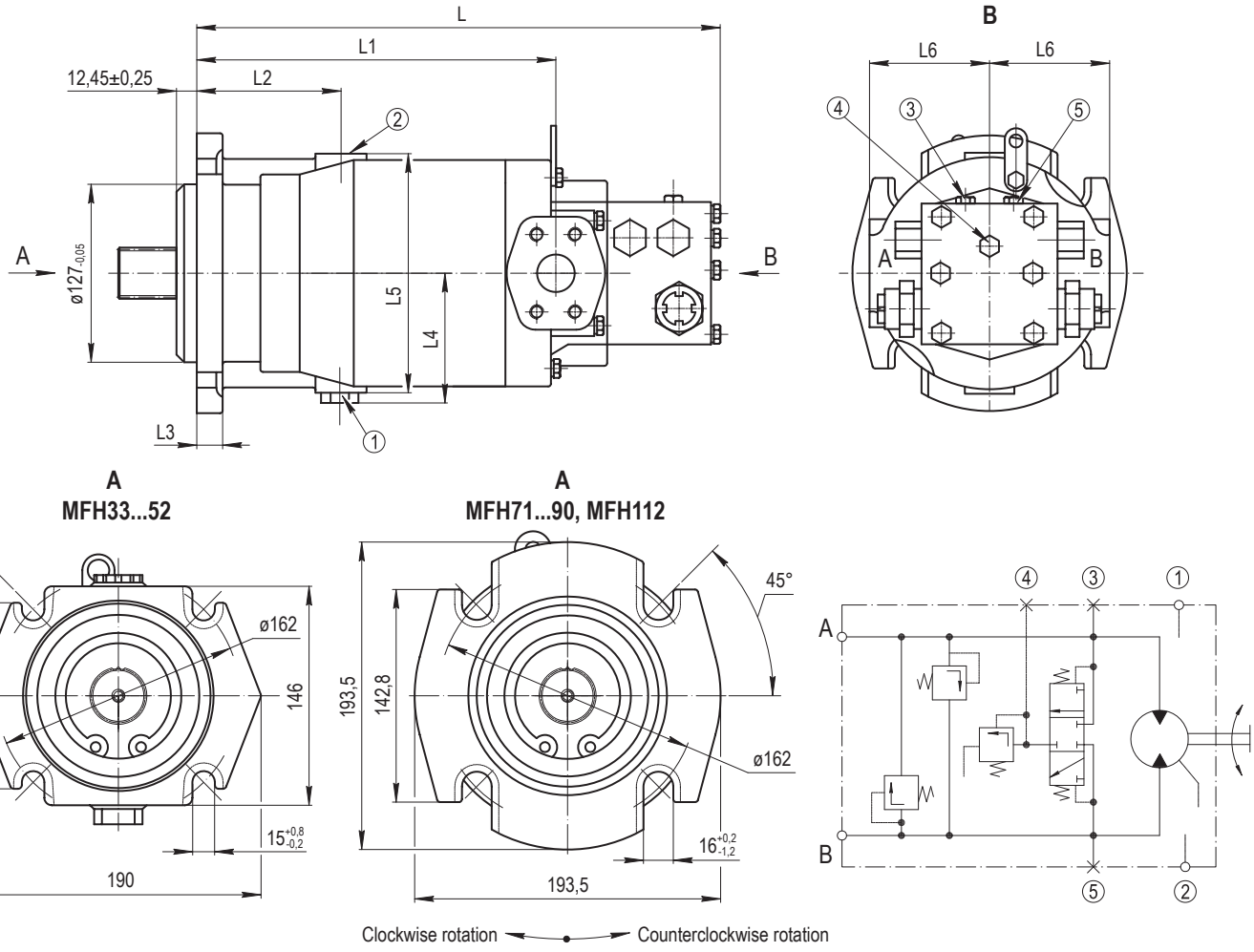
HIGH PRESSURE RELIEF VALVE SETTING - PORT 'A' AND 'B'	33	52	71	90	112	CODE
No manifold block	●	●	●	●	●	00
110 bar - 420 bar	●	●	●	●	●	11-42
450 bar	●	●	●	●	●	45

HIGH PRESSURE RELIEF VALVES	33	52	71	90	112	CODE
in end cap						
No valves	●	●	●	●	●	A
Purge relief valve			●	●	●	B
Purge relief valve and pressure relief valve			●	●	●	C
Purge relief valve, check valve and pressure relief valve			●	●	●	D
in manifold block						
No valves (without manifold block)	●	●	●	●	●	G
Purge relief valve	-	-	-	-	-	E
Purge relief valve and pressure relief valve	●	●	●	●	●	H
Purge relief valve, check valve and pressure relief valve	-	-	-	-	-	F

MAIN PORTS LOCATION	33	52	71	90	112	CODE
Opposite side	●	●	●	●	●	1
One side	-	○	○	●	●	2
Rear	○	○	○	○	○	3

MAIN PORTS 'A' & 'B'	33	52	71	90	112	CODE
M12 for 420...450 bar	●	●	●	●	●	A
SAE J518c 7/16 inches	●	●	●	●	●	B
SAE J518c 3/8 inches	●	●	●	●	●	C

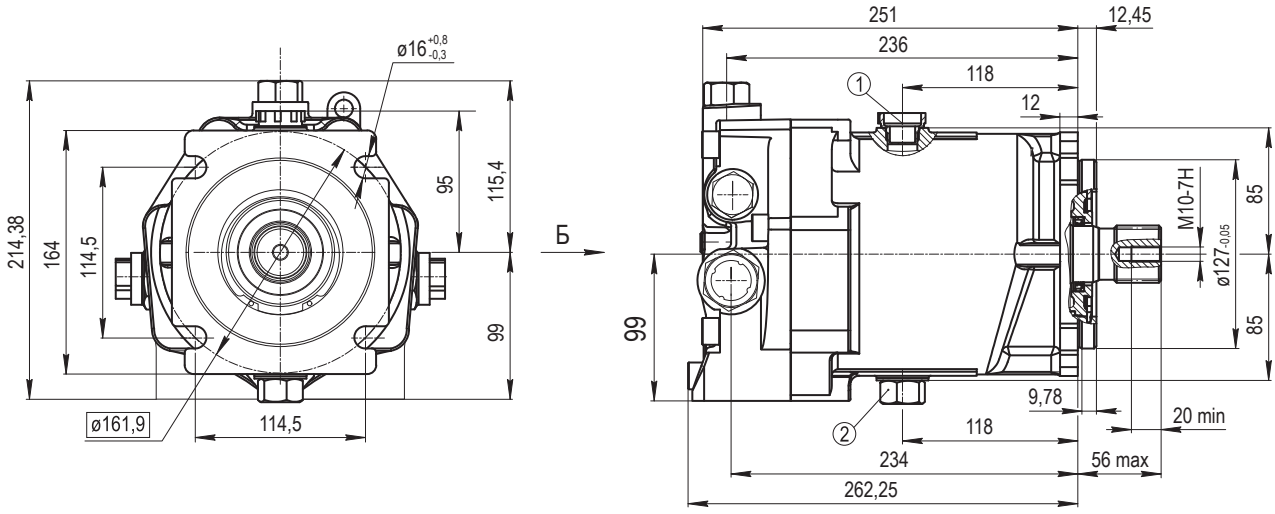
MOTOR WITH HIGH PRESSURE RELIEF VALVES IN MANIFOLD BLOCK



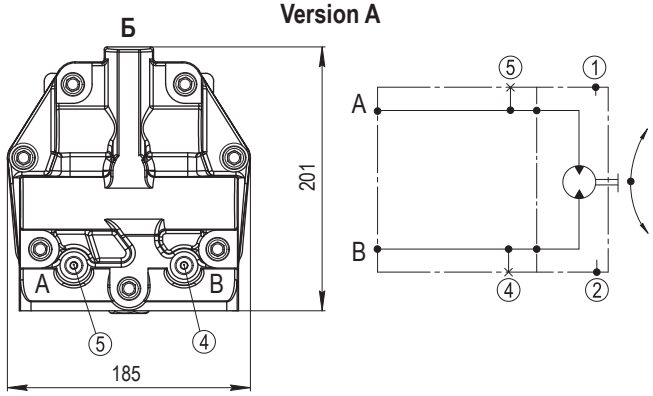
OVERALL DIMENSIONS

Frame size	Dimensions [mm]						
	L	L_1	L_2	L_3	L_4	L_5	L_6
MFH33	340	216	90	16	82	140	81
MFH52	360	235	96		87	152,7	85,8
MFH71	378	255,6	97		98	174	
MFH90	391	270	117,5	17,5	107	192	95,25
MFH112							

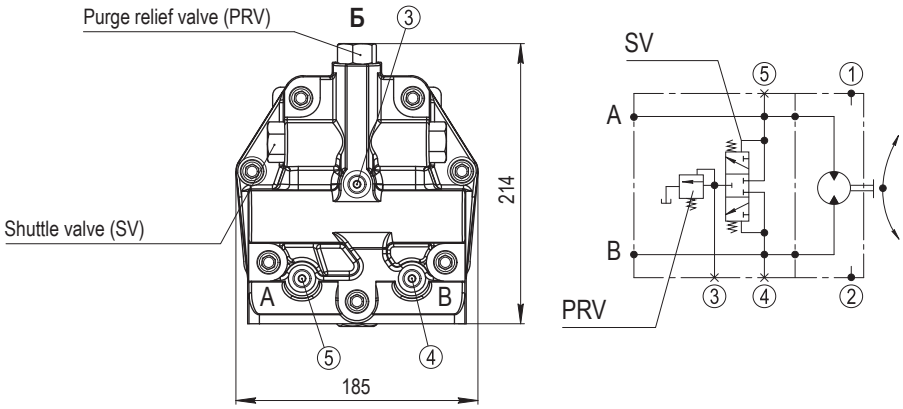
MOTOR WITH HIGH PRESSURE RELIEF VALVES BUILD-IN TO END CAP



Version A

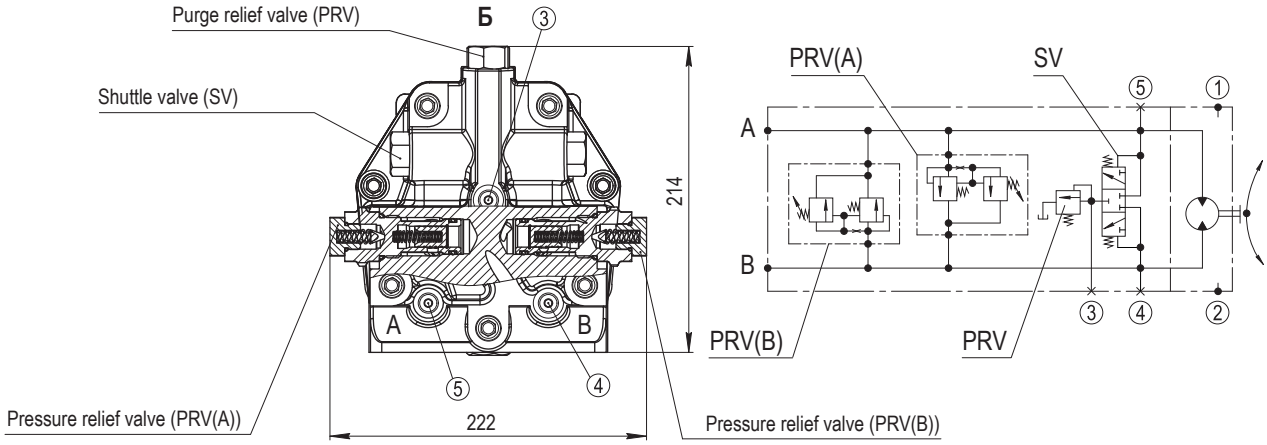


Version B

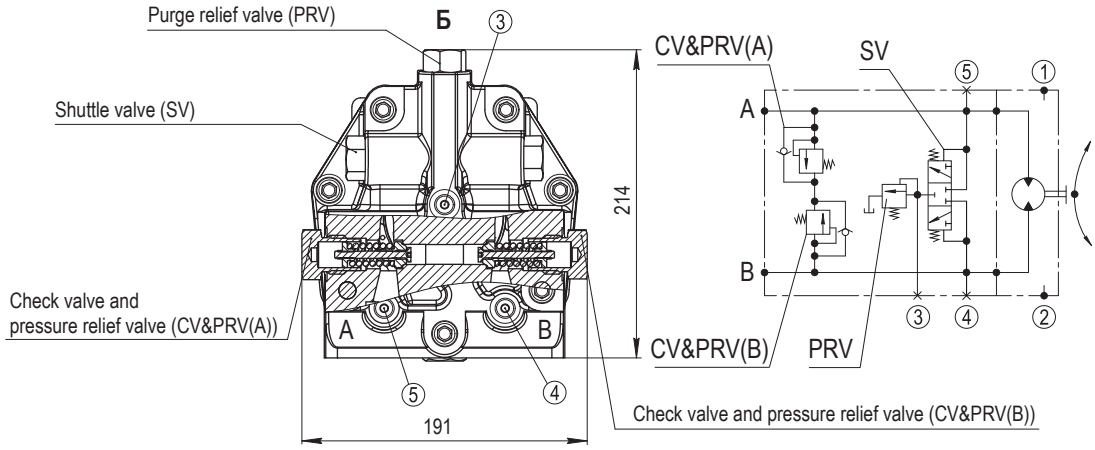


MOTOR WITH HIGH PRESSURE RELIEF VALVES BUILD-IN TO END CAP

Version C



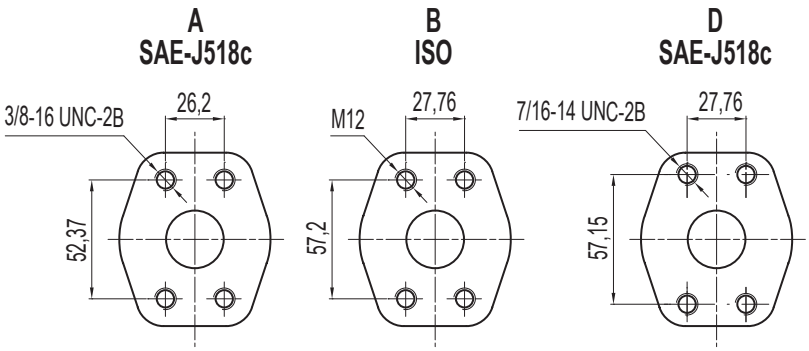
Version D



DRAIN PORTS SIZES

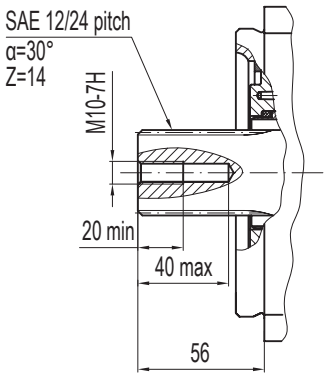
Frame size	Ports	
	«1»; «2»	«3»; «4»; «5»
MFH33	7/8-14 UNF-2B	7/16-20 UNF-2B
MFH52		
MFH71		
MFH90		
MFH112		

PORT OPTIONS 'A' & 'B'

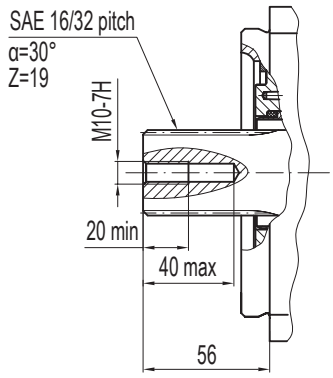


SHAFT OPTIONS

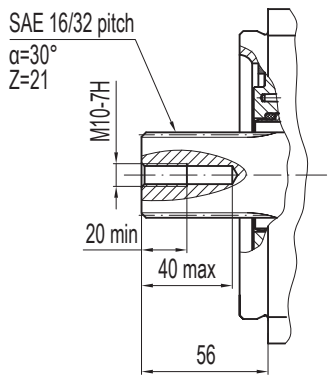
A



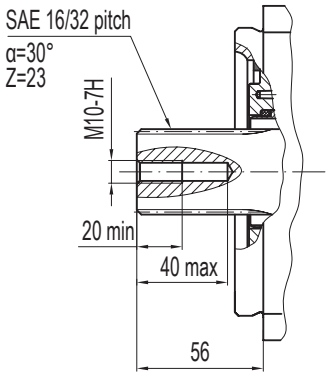
B



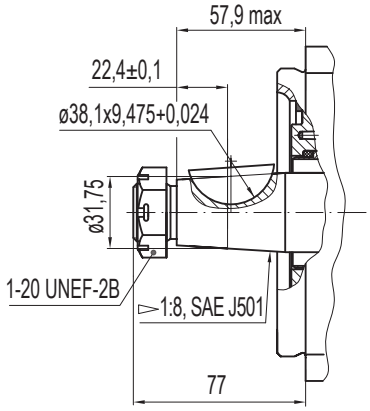
C



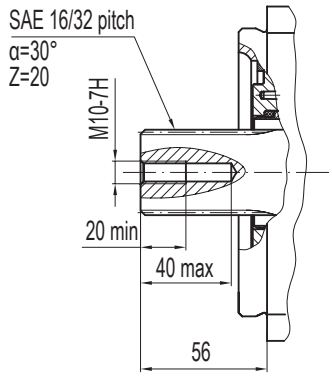
D



E



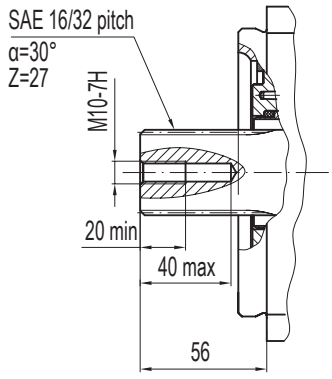
F



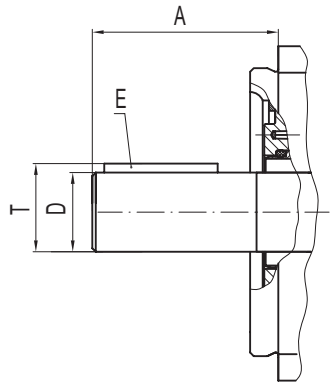
CYLINDRICAL SHAFTS, 'K' DESIGN

Frame size	A	D
MFH33/52/71	77 max	34,93
MFH90/112	77 max	44,45
Frame size	**T**	**E**
MFH33/52/71	38,47	7,976x7,976x50
MFH90/112	48,8	9,576x9,576x50

G



K



MANIFOLD BLOCK

GENERAL INFORMATION

Manifold block consists of control elements providing pressure limiting within the closed hydrostatic circuit and porting heated fluid from the circuit into the reservoir for exchange.
The manifild block can be mounted on variable axial piston motors MVH series and on fixed displacement hydraulic motors MFS, MFH, MFH2 series.

ORDERING INSTRUCTIONS

MFS90	-		/		.		.		.			

MANIFOLD BLOCK MFS90

EXECUTION	CODE
Manifold block	02
Manifold block with rotary bypass valve	05

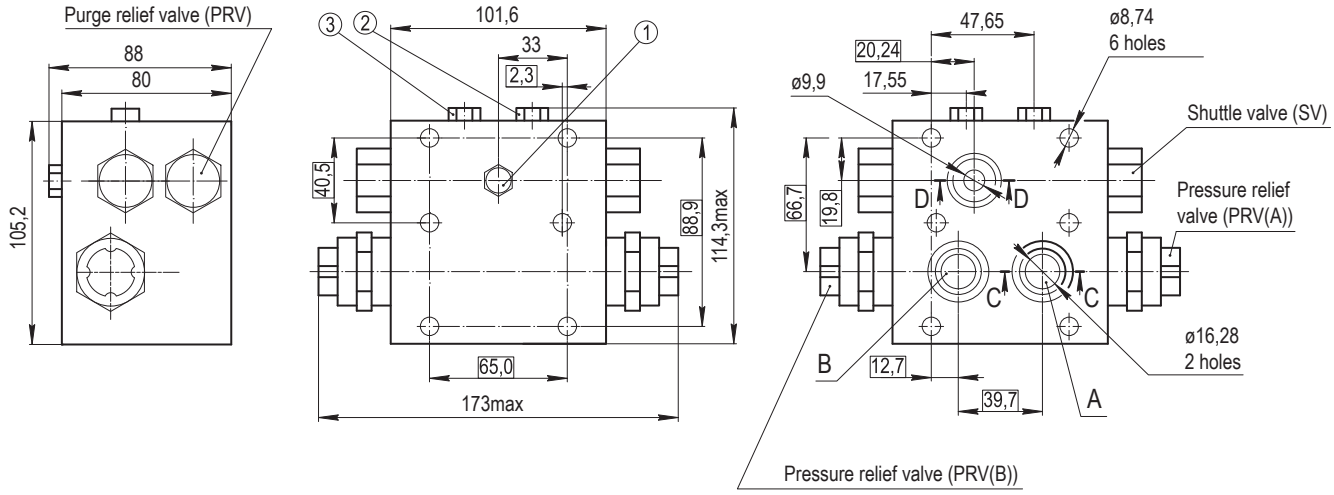
PURGE RELIEF VALVE SETTING	CODE
10,3 bar - 11,8 bar	0
15 bar - 16,4 bar	1
20,5 bar - 22,5 bar	2

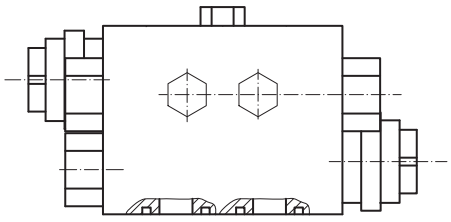
SPECIAL FEATURES	CODE
В комплекте с РТИ	1

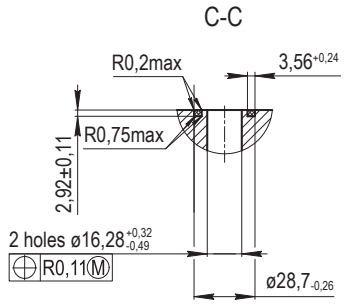
CLIMATIC VERSION	CODE
Temperate	N
Tropical	T

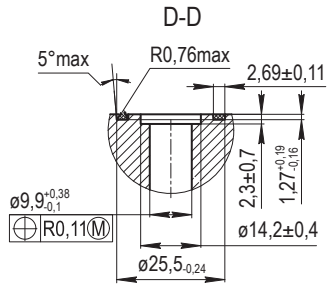
HIGH PRESSURE RELIEF VALVE SETTING PORT 'A' AND 'B'	CODE
110 bar - 420 bar	11-42
450 bar	45

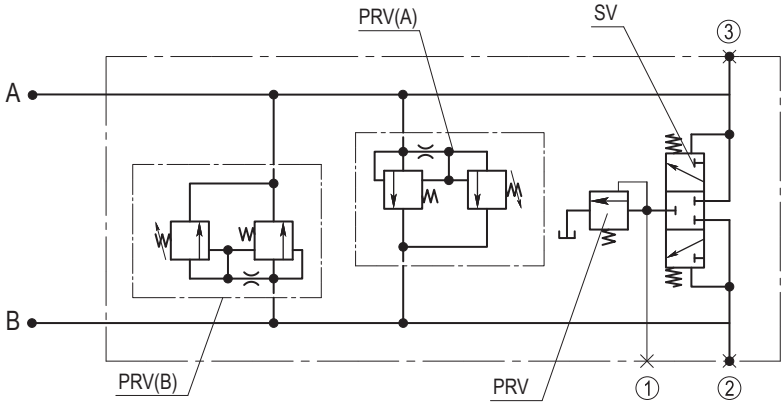
OVERALL DIMENSIONS







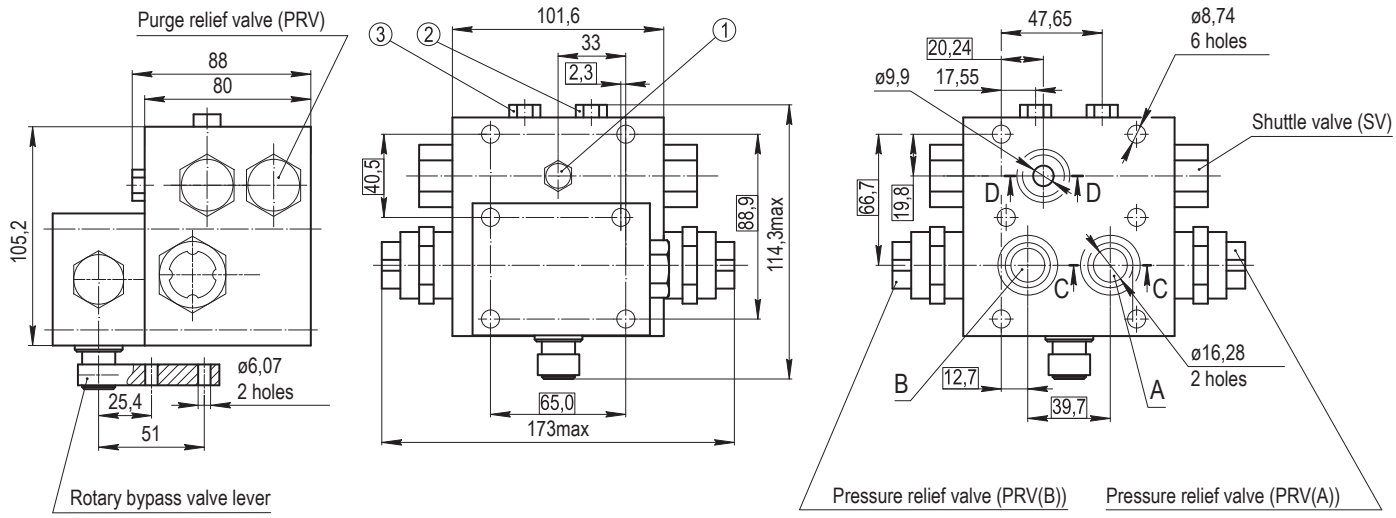


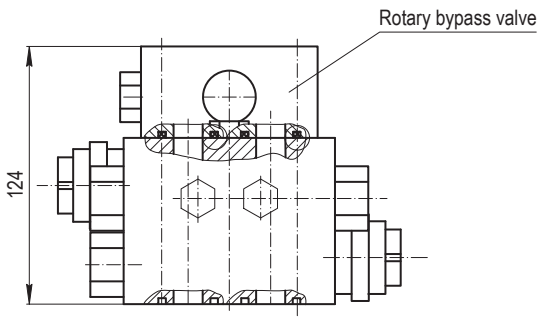


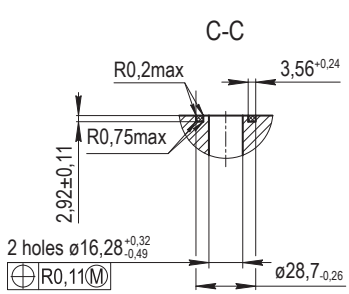
MANIFOLD BLOCK WITH ROTARY BYPASS VALVE

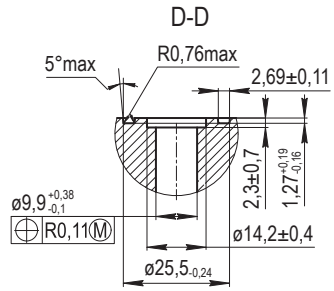
Rotary bypass valve designed to connect the working circuits A and B in the manifold block.

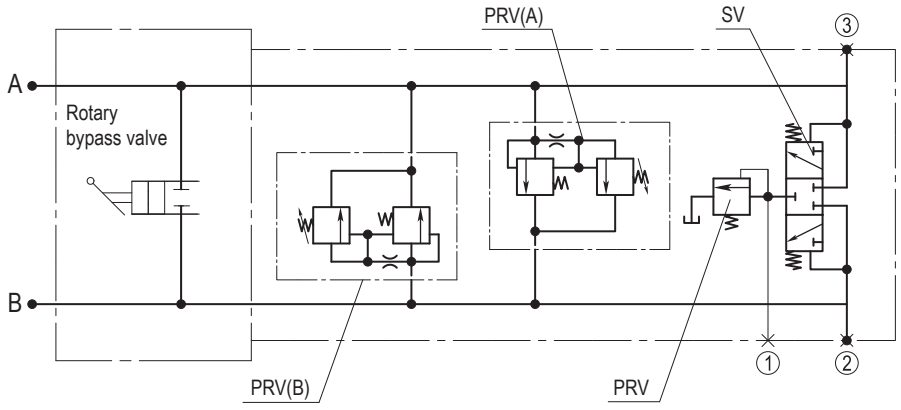
OVERALL DIMENSIONS











HYDRAULIC FLUID

All parameters and characteristics of hydraulic units suggest that hydraulic system uses high quality hydraulic fluids and additives. They should have a number of properties: anticorrosive, antioxidant, anti-foam, and others. These fluids are high-quality turbine oils, API CD SAE J183 engine oil, automatic transmission fluids (ATF) and some specialty fluids.
Never mix different fluids.

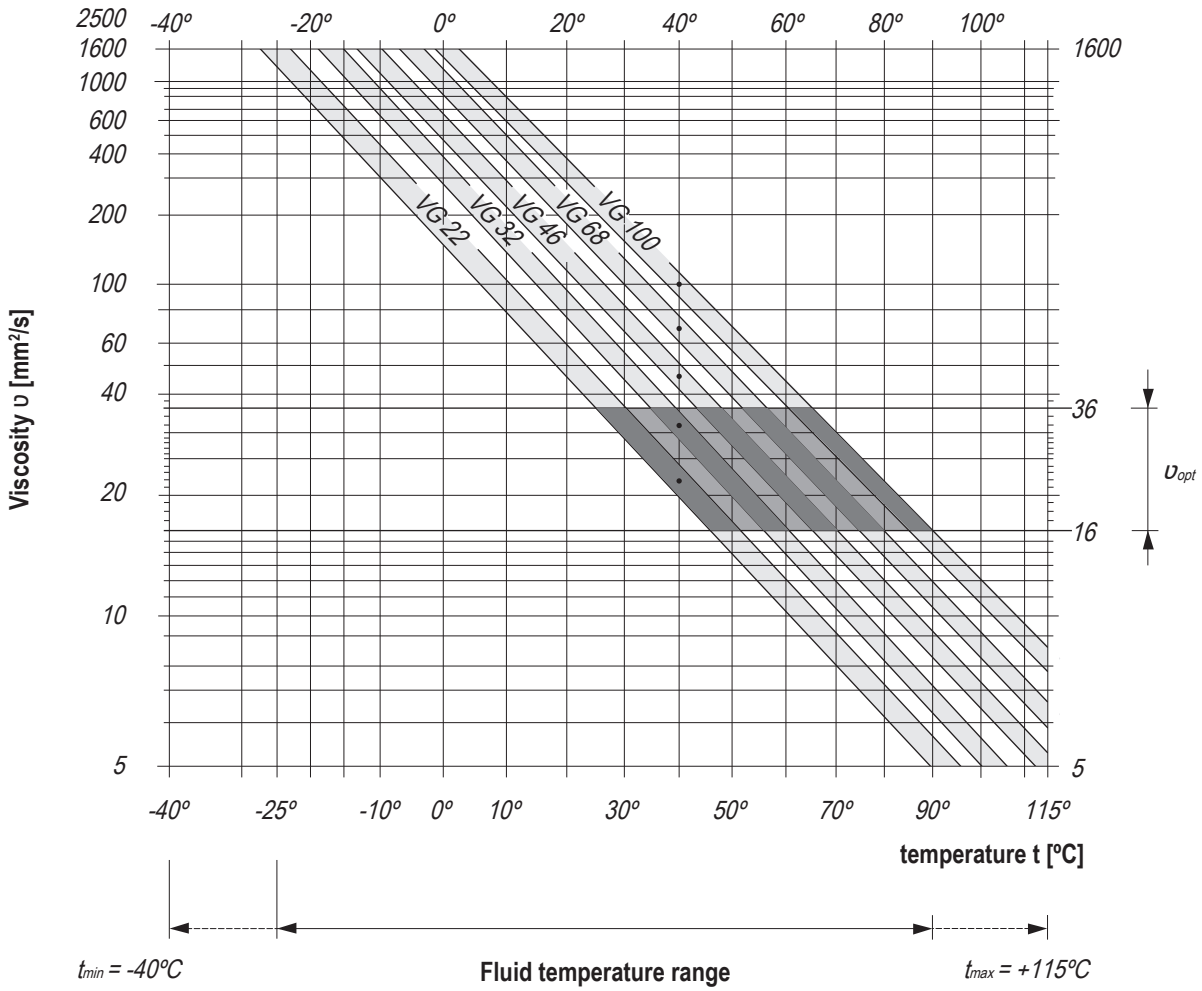
HYDRAULIC FLUID CHOICE

For the correct choice you need to know the working temperature of the fluid in the hydraulic tank (depending on the ambient temperature) and the viscosity of the fluid. The fluid must be selected so that the viscosity be within the allowable range (V_{opt}) at any temperature (t_{min}-t_{max}), (see diagram). It is recommended to select a higher temperature class of the working fluid.

EXAMPLE.

At an ambient temperature of X°C, an operating temperature of 60°C is set. In the optimum working range of (V_{opt}) viscosity, this corresponds to classes VG 46 and VG 68. The right choise is VG 68. The temperature of fluid in the drain channel is always higher than the temperature in the tank. At any point in the hydraulic system fluid temperature should not exceed 90°C.
If it is not possible to comply with temperature conditions, consult for advice.

SELECTION DIAGRAM



HYDRAULIC FLUID FILTRATION

The better filtration provides the higher purity class of the working fluid, which in turn increases the axial piston unit lifetime. To ensure reliable operation of the axial piston unit, it is necessary to determine the working fluid purity according to ISO 4406. At very high temperatures of the working fluid (from 90°C to a maximum of 115°C), a purity class at least 19/17/14 according to ISO 4406 is required. If it is impossible to comply with the purity class, please consult.

VISCOSITY AND TEMPERATURE OF WORKING FLUID

CONDITIONS	VISCOSITY	TEMPERATURE	NOTES
Storage and transportation		$T_{min} \geq -40°C$ $T_{opt} = +5°C…+20°C$	Storage at the factory: Standard - up to 12 months; Long-term - up to 24 months
Cold start	$\upsilon_{max} \leq 1600$ mm²/s	$T \geq -40°C$	$t \leq 3$ min, $n \leq 1000$ min^{-1}, no load $P \leq 50$ bar
Permissible temperature drop		$T \leq 25°C$	The temperature difference between the axial piston pump and the working fluid in the system
Warm-up period	υ = 1600...400 mm²/s	T = -40°C…-25°C	at $P \leq 0.7 \cdot P_{nom}$, $n \leq 0.5 \cdot n_{nom}$ $t \leq 15$ min
Continuous operating mode	υ = 400...10 mm²/s		In case of VG 46 corresponds to a temperature range of + 5°C to + 85°C
		$\Delta T = 12°C$ T = -25°C…+103°C	The temperature difference between the cuff, bearing and drainage Temperature in drain line
	υ_{opt} = 36...16 mm²/s		Optimal viscosity range in operating mode
Short-term operating	$\upsilon_{min} \geq 7$ mm²/s	T = +103°C	$t < 3$ min, $p < 0.3 \cdot P_{nom}$

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HS-AC-06/042025