

## BENT-AXIS PISTON MOTORS

HBM

HBM is a range of rugged bent-axis spherical piston motors, particularly fitting for mobile applications.

The design of HBM motors results in a compact unit with a small number of moving parts and high starting torque, covering a wide displacement range (from 10 to 130 cm<sup>3</sup>/rev), and working at a maximum pressure of 400 bar.

Thanks to their robustly sized double tapered roller bearings, HBM motors can withstand high shaft loads and achieve excellent speed features.

Materials chosen, their treatments as well as the finishing of the parts lead to a high reliability level.

### TECHNICAL DATA

		12	17	25	34	47	56	64	84	108	130
<b>Displacement</b>	cm <sup>3</sup> /rev	12,6	17,0	25,4	34,2	47,1	56,0	63,5	83,6	108,0	130,0
<b>Max. continuous speed</b> <sup>(1)</sup>	rpm	8.000	8.000	6.300	6.300	5.700	5.700	5.700	4.700	4.700	4.700
<b>Max. intermittent speed</b> <sup>(1, 4)</sup>	rpm	8.800	8.800	7.000	7.000	6.300	6.300	6.300	5.200	5.200	5.200
<b>Min. continuous speed</b> <sup>(1)</sup>	rpm	300	300	300	300	300	300	300	300	300	300
<b>Max. continuous pressure</b>	bar	350	350	350	350	350	350	350	350	350	300
<b>Max. intermittent pressure</b> <sup>(4)</sup>	bar	400	400	400	400	400	400	400	400	400	350
<b>Max. continuous power</b> <sup>(2)</sup>	kW	54	74	86	115	145	175	195	215	275	285
<b>Max. intermittent power</b> <sup>(3, 4)</sup>	kW	54	74	86	115	145	175	195	215	275	285
<b>Rotating parts moment of inertia</b>	kg m <sup>2</sup> · 10 <sup>-3</sup>	0,9	0,9	1,1	1,1	2,6	2,6	2,6	7,4	7,4	7,4
<b>Start torque</b>	Nm/bar	0,20	0,27	0,40	0,54	0,75	0,89	1,00	1,33	1,71	2,05
<b>Approx. weight</b>	kg	8,5	8,5	9,5	9,5	16,5	16,5	16,5	28,0	30,5	30,5

#### Notes:

- (1) Stated speed values are based on maximum permitted peripheral velocity for the tapered roller bearings.
- (2) Stated continuous power values are based on maximum output power without external cooling of the motor housing.
- (3) Stated intermittent power values are based on maximum continuous speed and maximum working pressure.
- (4) Intermittent duty is defined as follows: max 6 seconds per minute, e.g.: peak speed when unloading or accelerating.

## BENT-AXIS PISTON MOTORS DRAWINGS

HBM

12

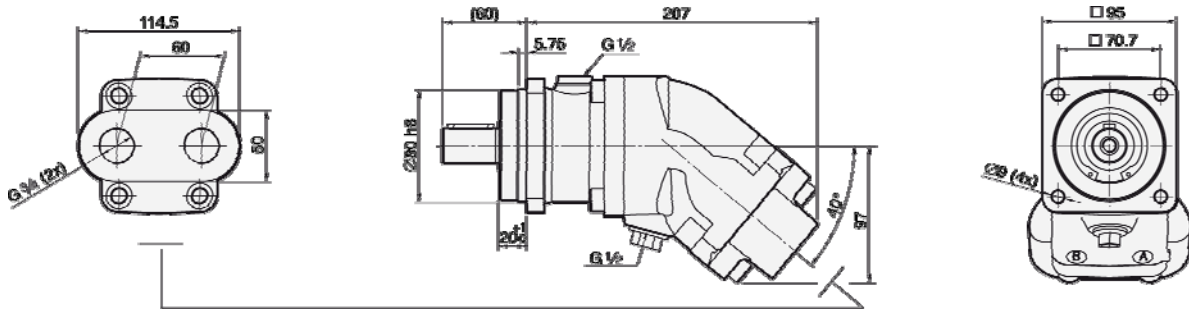
17

ISO 4 bolts (ISO 3019-2) mounting flange

14

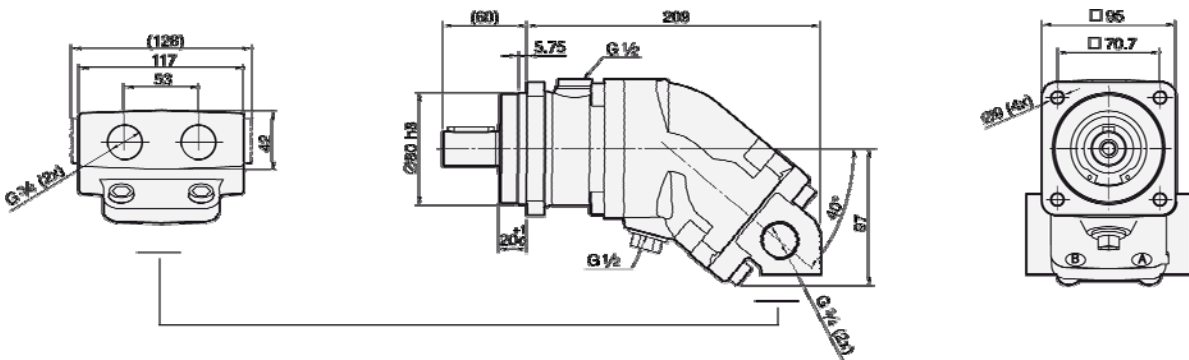
Rear (at a 40° angle to the shaft axis) ports

R



Side and rear ports

SR

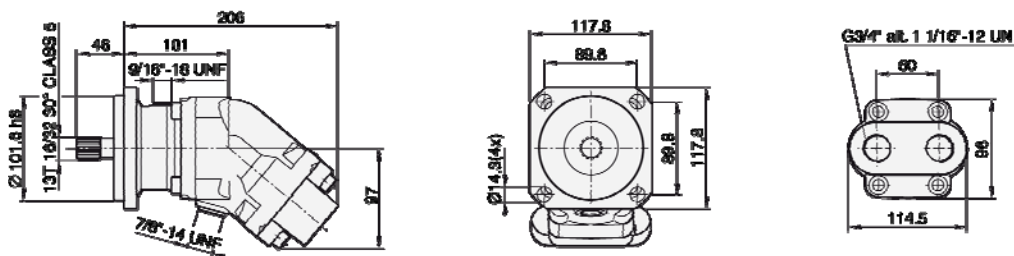


SAE B (SAE J744) mounting flange

SB

Splined shaft 13T 16/32 30° (SAE J498b)

S13



## BENT-AXIS PISTON MOTORS

HBM

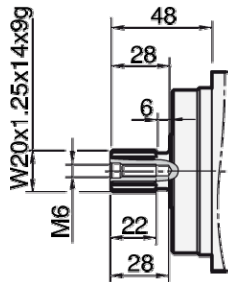
12

### SHAFT ENDS

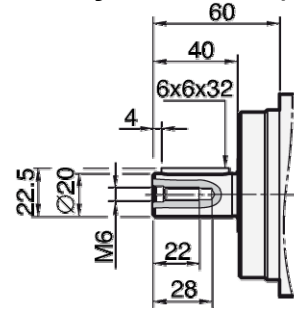
17

14

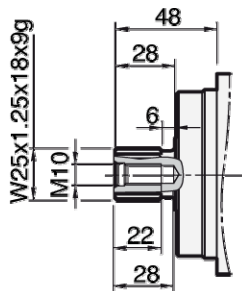
Splined W20x1.25x14x9g (DIN 5480) **S1D**



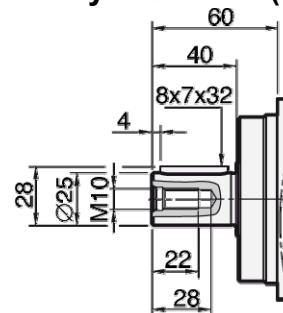
Cylindrical keyed  $\varnothing 20$  k6 (DIN 6885) **C1D**



Splined W25x1.25x18x9g (DIN 5480) **S2D**



Cylindrical keyed  $\varnothing 25$  k6 (DIN 6885) **C2D**

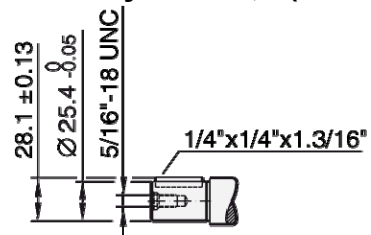


SB

Splined 13T 16/32 30° (SAE J498b) **S13**

see page 2

Cylindrical keyed  $\varnothing 25,4$  (SAE J744) **C25**



## BENT-AXIS PISTON MOTORS DRAWINGS

HBM

25

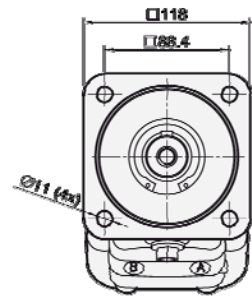
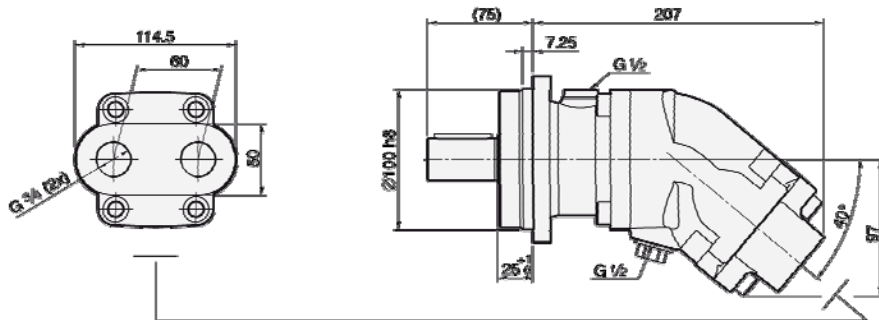
34

ISO 4 bolts (ISO 3019-2) mounting flange

14

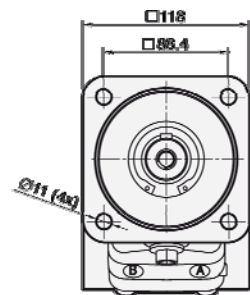
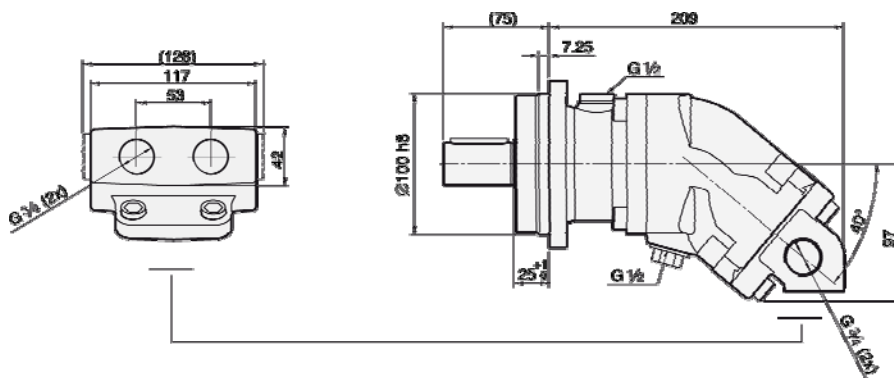
Rear ports

R



Side and rear ports

SR

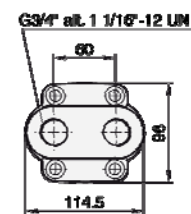
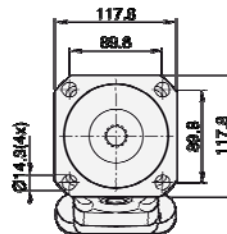
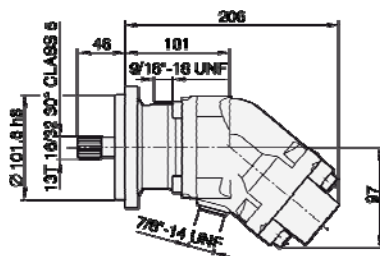


SAE B (SAE J744) mounting flange

SB

Splined shaft 13T 16/32 30° (SAE J498b)

S13



## BENT-AXIS PISTON MOTORS SHAFT ENDS

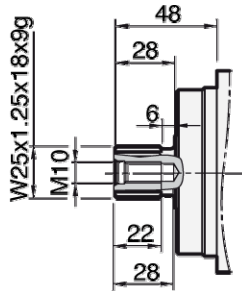
HBM

25

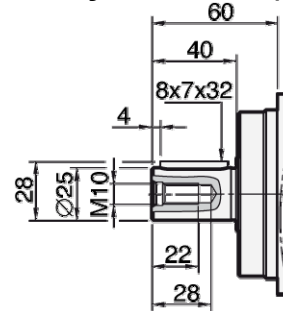
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14

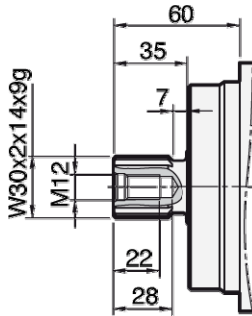
Splined W25x1.25x18x9g (DIN 5480) **S2D**



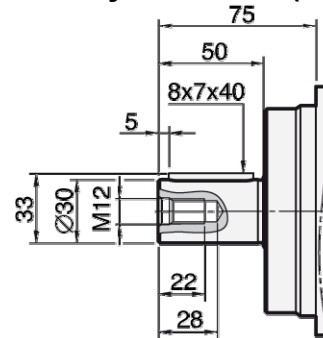
Cylindrical keyed  $\varnothing 25$  k6 (DIN 6885) **C2D**



Splined W30x2x14x9g (DIN 5480) **S3D**



Cylindrical keyed  $\varnothing 30$  k6 (DIN 6885) **C3D**

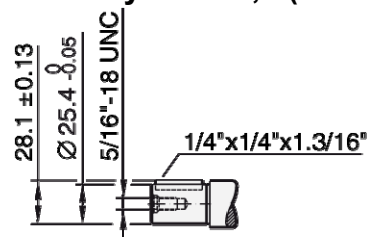


SB

Splined 13T 16/32 30° (SAE J498b) **S13**

see page 4

Cylindrical keyed  $\varnothing 25,4$  (SAE J744) **C25**





## BENT-AXIS PISTON MOTORS DRAWINGS

HBM

47

56

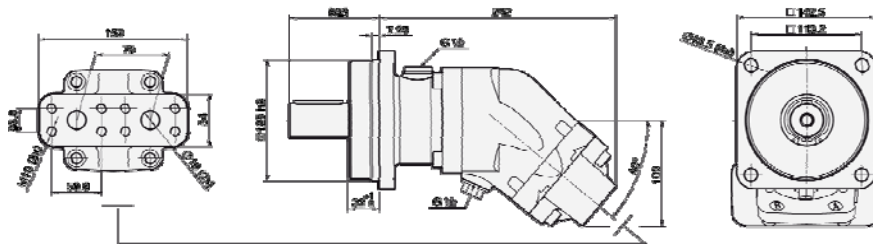
64

ISO 4 bolts (ISO 3019-2) mounting flange

14

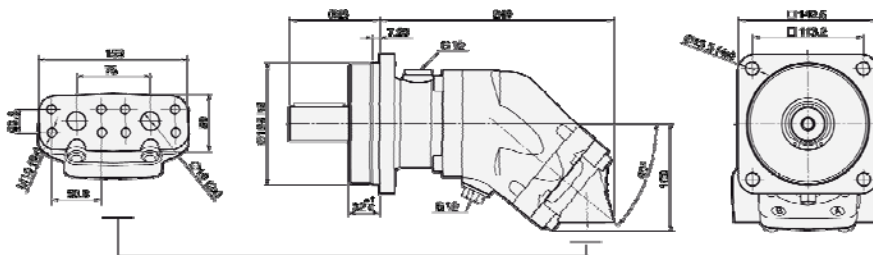
Rear ports (at a 40° angle to the shaft axis)

R



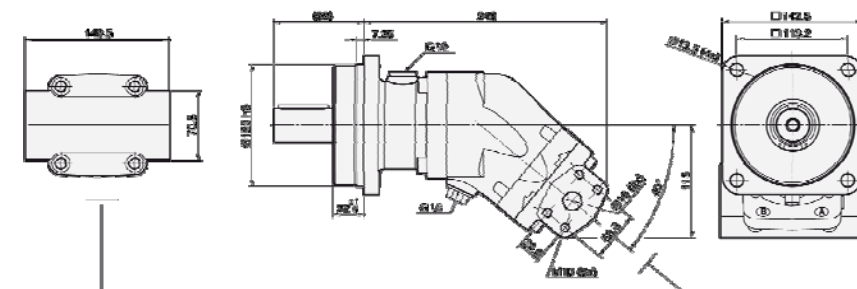
Rear ports (at a 90° angle to the shaft axis)

RA



Side ports

S

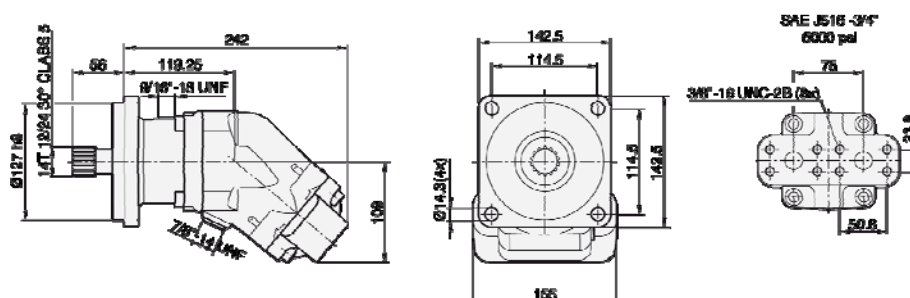


SAE C (SAE J744) mounting flange

SC

Splined shaft 14T 12/24 30° (SAE J498b)

S14



## BENT-AXIS PISTON MOTORS SHAFT ENDS

HBM

47

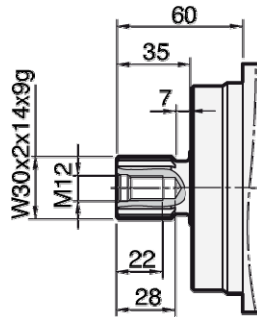
56

64

14

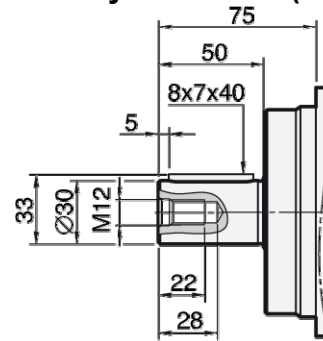
Splined W30x2x14x9g (DIN 5480)

S3D



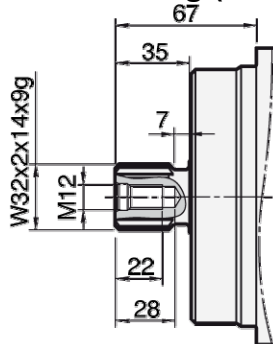
Cylindrical keyed  $\varnothing 30$  k6 (DIN 6885)

C3D



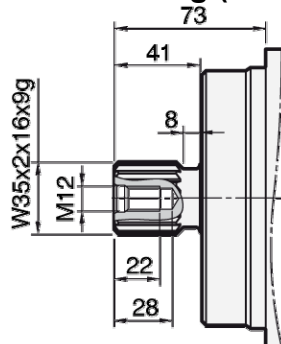
Splined W32x2x14x9g (DIN 5480)

S4D



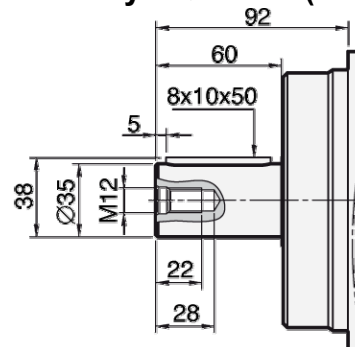
Splined W35x2x16x9g (DIN 5480)

S5D



Cylindrical keyed  $\varnothing 35$  h8 (DIN 6885)

C5D



SB

Splined 14T 12/24 30° (SAE J498b)

S14

see page 6

Cylindrical keyed  $\varnothing 31,7$  (SAE J744)

C31



## BENT-AXIS PISTON MOTORS DRAWINGS

HBM

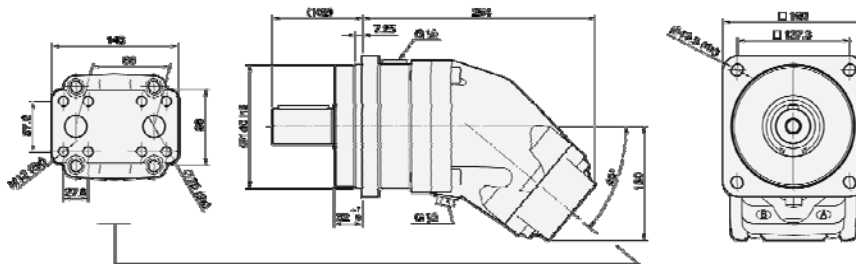
84

ISO 4 bolts (ISO 3019-2) mounting flange

14

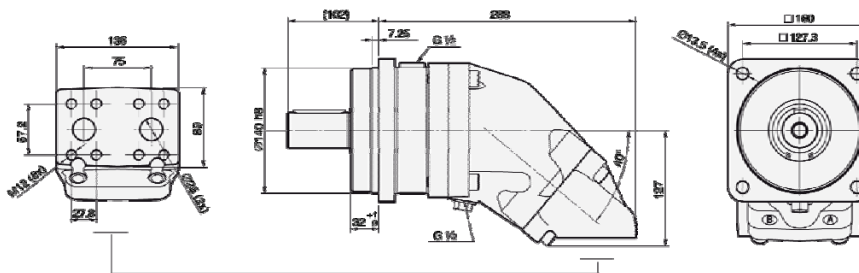
Rear ports (at a 40° angle to the shaft axis)

R



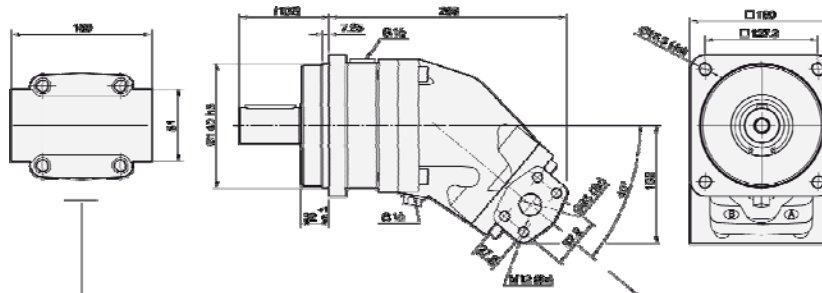
Rear ports (at a 90° angle to the shaft axis)

RA



Side ports

S





## BENT-AXIS PISTON MOTORS

HBM

84

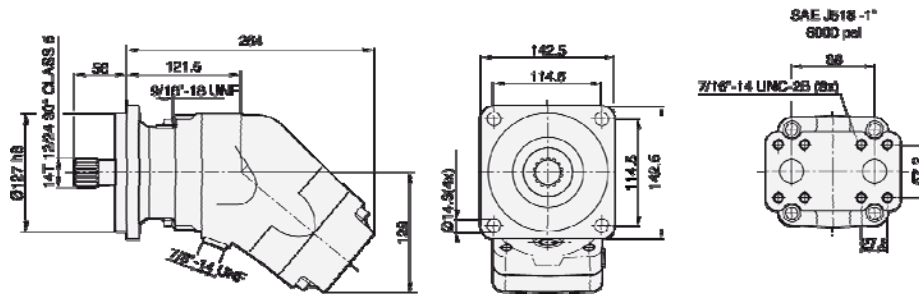
### DRAWINGS

SAE C (SAE J744) mounting flange

SC

Splined shaft 14T 12/24 30° (SAE J498b)

S14

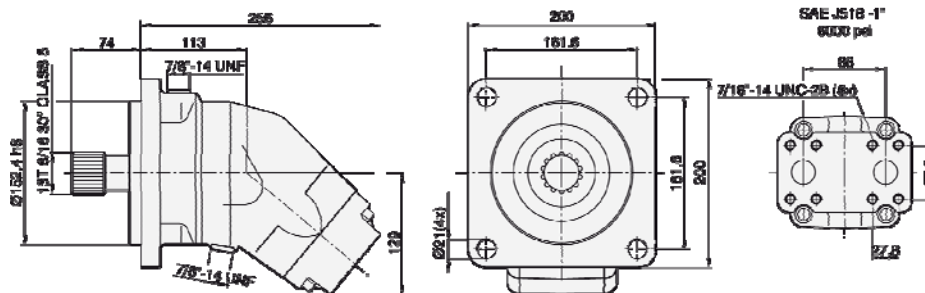


SAE D (SAE J744) mounting flange

SD

Splined shaft 13T 8/16 30° (SAE J498b)

S13A



### SHAFT ENDS

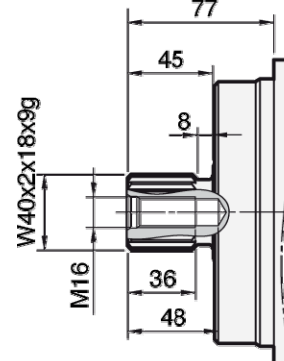
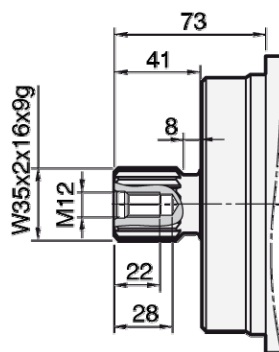
14

Splined W35x2x16x9g (DIN 5480)

S5D

Splined W40x2x18x9g (DIN 5480)

S6D



## BENT-AXIS PISTON MOTORS

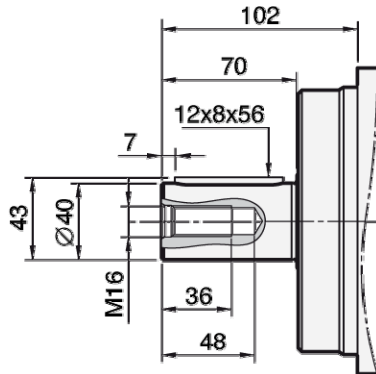
HBM

84

### SHAFT ENDS

I4

Cylindrical keyed  $\varnothing 40$  k6 (DIN 6885) **C6D**

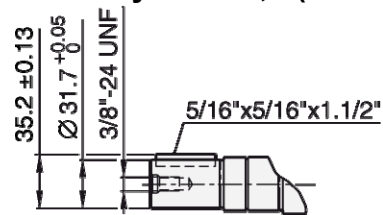


SC

Splined 14T 12/24 30° (SAE J498b) **S14**

see page 9

Cylindrical keyed  $\varnothing 25,4$  (SAE J744) **C31**

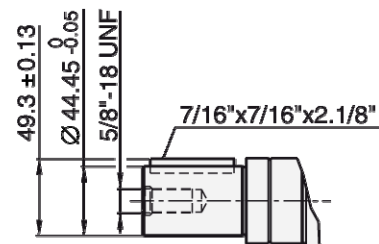


SD

Splined 13T 8/16 30° (SAE J498b) **S13A** Cy

see page 9

Cylindrical keyed  $\varnothing 44,45$  (SAE J744) **C44**



**BENT-AXIS PISTON MOTORS  
DRAWINGS**

HBM

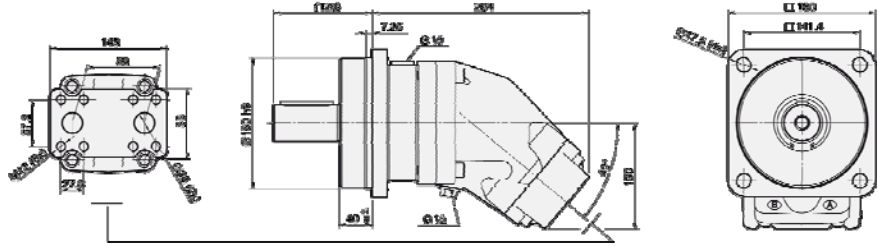
108

ISO 4 bolts (ISO 3019-2) mounting flange

14

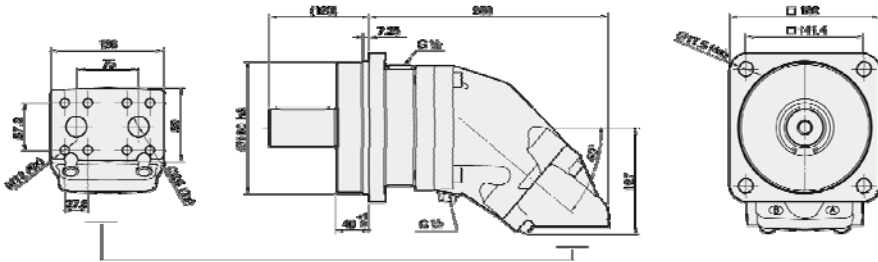
Rear ports (at a 40° angle to the shaft axis)

R



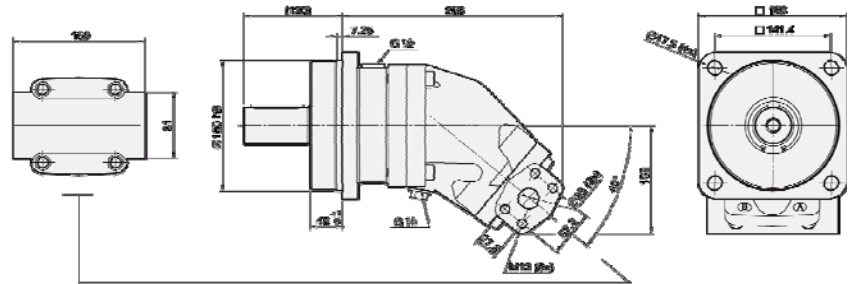
Rear ports (at a 90° angle to the shaft axis)

RA



Side ports

S

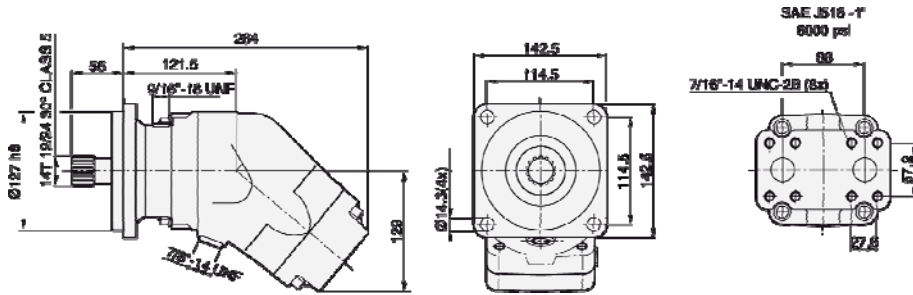


SAE C (SAE J744) mounting flange

SC

Splined 14T 12/24 30° (SAE J498b) shaft

S14



## BENT-AXIS PISTON MOTORS

HBM

108

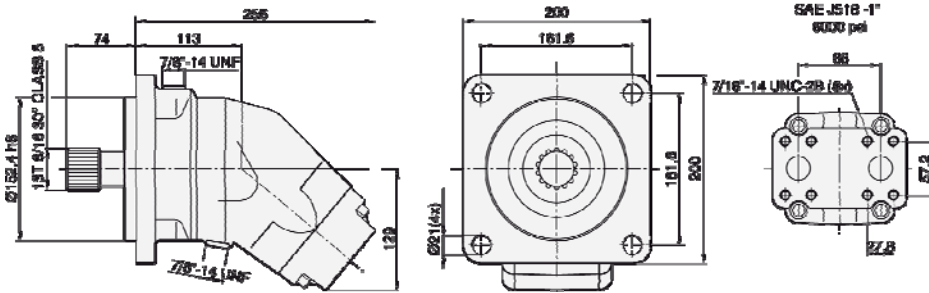
### DRAWINGS

SAE D (SAE J744) mounting flange

SD

Splined 13T 8/16 30° (SAE J498b)

S13A



### SHAFT ENDS

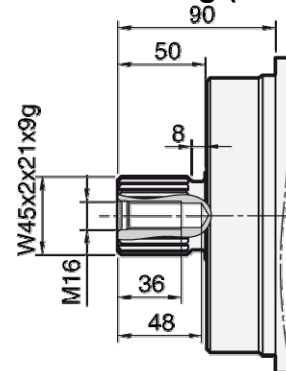
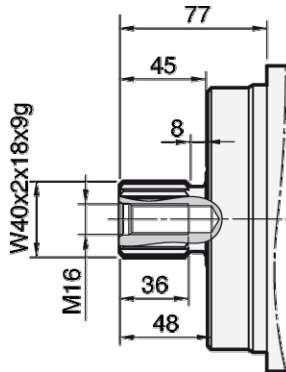
14

Splined W40x2x18x9g (DIN 5480)

S6D

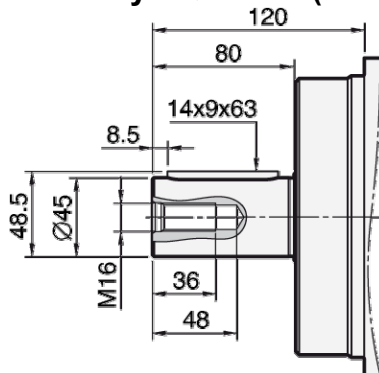
Splined W45x2x21x9g (DIN 5480)

S7D



Cylindrical keyed  $\varnothing 45$  k6 (DIN 6885)

C7D



## BENT-AXIS PISTON MOTORS

HBM

108

### SHAFT ENDS

SC

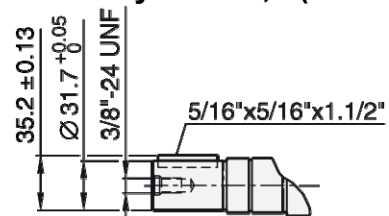
Splined 14T 12/24 30° (SAE J498b)

S14

see page 11

Cylindrical keyed  $\varnothing 31,7$  (SAE J744)

C31



SD

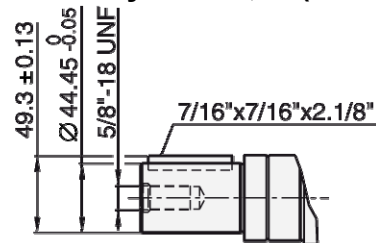
Splined 13T 8/16 30° (SAE J498b)

S13A Cy

see page 12

Cylindrical keyed  $\varnothing 44,45$  (SAE J744)

C44





## BENT-AXIS PISTON MOTORS

HBM

130

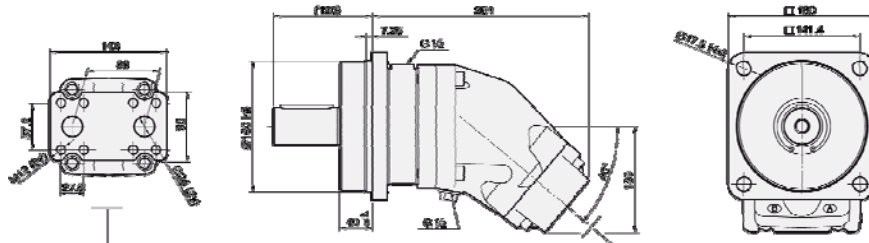
### DRAWINGS

ISO 4 bolts (ISO 3019-2) mounting flange

14

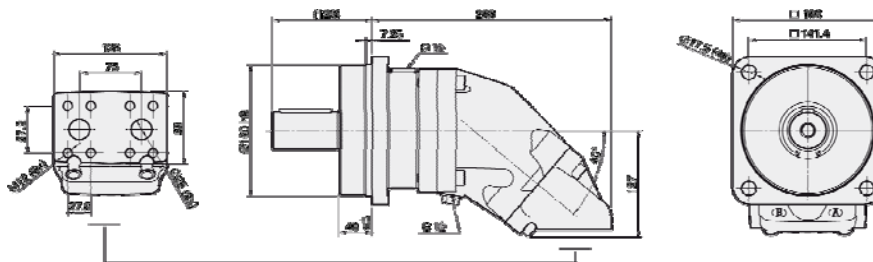
Rear ports (at a 40° angle to the shaft axis)

R



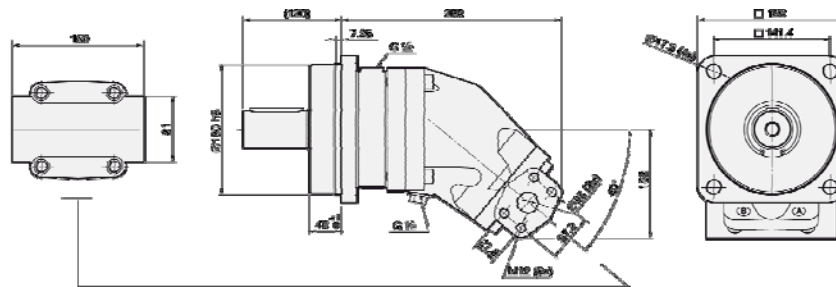
Rear ports (at a 90° angle to the shaft axis)

RA



Side and rear ports

S



## BENT-AXIS PISTON MOTORS

HBM

130

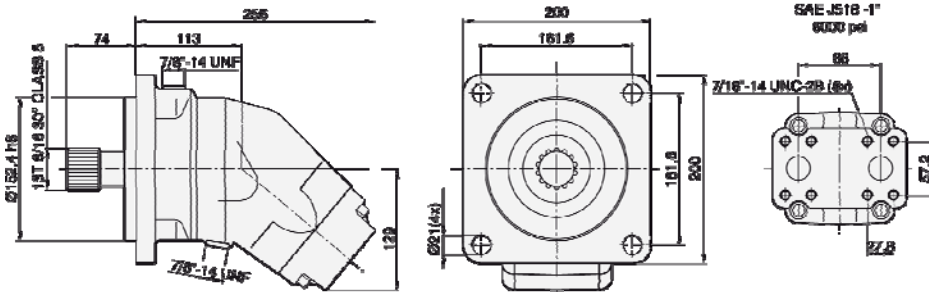
### DRAWINGS

SAE D (SAE J744) mounting flange

SD

Splined 13T 8/16 30° (SAE J498b)

S13A



### SHAFT ENDS

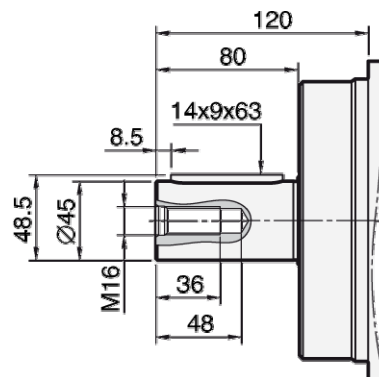
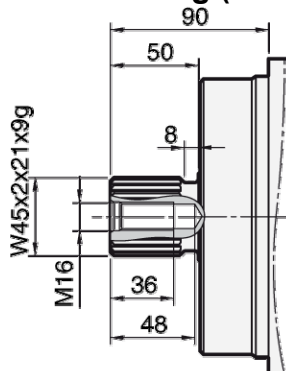
I4

Splined W45x2x21x9g (DIN 5480)

S7D

Cylindrical keyed  $\varnothing 45$  k6 (DIN 6885)

C7D



SD

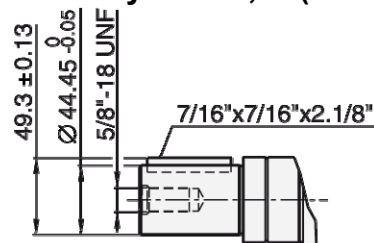
Splined 13T 8/16 30° (SAE J498b)

S13A Cy

Cylindrical keyed  $\varnothing 44,45$  (SAE J744)

C44

see above in this page



## BENT-AXIS PISTON MOTORS

HBM

### MODEL CODE

HBM	--	-	--	---(-)	-(-)	-(-)
1	2	3	4	5	6	7

#### 1. SERIES

Fixed displacement bent-axis piston motor

HBM

#### 2. DISPLACEMENT

	12	17	25	34	47	56	64	84	108	130
Displacement in cm <sup>3</sup> /rev	12,6	17,0	25,4	34,2	47,1	56,0	63,5	83,6	108,0	130,0

#### 3. ROTATION DIRECTION

Bidirectional

B

#### 4. MOUNTING FLANGE

	12	17	25	34	47	56	64	84	108	130	
ISO 4 bolts (ISO 3019-2)	•	•	•	•	•	•	•	•	•	•	I4
SAE B (SAE J744)	•	•	•	•							SB
SAE C (SAE J744)					•	•	•	•	•		SC
SAE D (SAE J744)								•	•	•	SD

#### 5. SHAFT END (ISO)

	12	17	25	34	47	56	64	84	108	130	
Splined W20x1.25x14x9g (DIN 5480)	I4	•	•								S1D
Cylindrical keyed ø 20 k6 (DIN 6885)	I4	•	•								C1D
Splined W25x1.25x18x9g (DIN 5480)	I4	•	•	•							S2D
Cylindrical keyed ø 25 k6 (DIN 6885)	I4	•	•	•							C2D
Splined W30x2x14x9g (DIN 5480)	I4			•	•	•					S3D
Cylindrical keyed ø 30 k6 (DIN 6885)	I4			•	•	•					C3D
Splined W32x2x14x9g (DIN 5480)	I4				•	•					S4D
Splined W35x2x16x9g (DIN 5480)	I4				•	•	•	•			S5D
Cylindrical keyed ø 35 h8 (DIN 6885)	I4				•	•	•				C5D
Splined W40x2x18x9g (DIN 5480)	I4							•	•		S6D
Cylindrical keyed ø 40 k6 (DIN 6885)	I4							•			C6D
Splined W45x2x21x9g (DIN 5480)	I4								•	•	S7D
Cylindrical keyed ø 45 k6 (DIN 6885)	I4								•	•	C7D

## BENT-AXIS PISTON MOTORS

HBM

### MODEL CODE

H	B	M	--	-	--	---(-)	-(-)	-(-)
1	2	3	4	5	6	7		

#### 5. SHAFT END (SAE)

		12	17	25	34	47	56	64	84	108	130	
Splined 13T 16/32 30° (SAE J498b)	SB	•	•	•	•							S13
Cylindrical keyed ø 25,4 (SAE J744)	SB	•	•	•	•							C25
Splined 14T 12/24 30° (SAE J498b)	SC					•	•	•	•	•		S14
Cylindrical keyed ø 31,7 (SAE J744)	SC					•	•	•	•	•		C31
Splined 13T 8/16 30° (SAE J498b)	SD								•	•	•	S13A
Cylindrical keyed ø 44,45 (SAE J744)	SD								•	•	•	C44

#### 6. PORTS TYPE (ISO)

		12	17	25	34	47	56	64	84	108	130	
Threaded ISO G	I4	•	•	•	•							T
Flange (SAE J518 code 62)	I4					•	•	•	•	•	•	F

#### 6. PORTS TYPE (SAE)

		12	17	25	34	47	56	64	84	108	130	
Threaded ISO G	SB	•	•	•	•							T
Threaded UN	SB	•	•	•	•							TU
Flange (SAE J518 code 62)	SC					•	•	•	•	•		F
Flange (SAE J518 code 62)	SD								•	•	•	F

#### 7. PORTS POSITION (ISO)

		12	17	25	34	47	56	64	84	108	130	
Rear (at a 40° angle to the shaft axis)	I4	•	•	•	•	•	•	•	•	•	•	R
Rear (at a 90° angle to the shaft axis)	I4					•	•	•	•	•		RA
Side	I4					•	•	•	•	•		S

#### 7. PORTS POSITION (SAE)

		12	17	25	34	47	56	64	84	108	130	
Rear (at a 40° angle to the shaft axis)	SB	•	•	•	•							R
Rear (at a 40° angle to the shaft axis)	SC					•	•	•	•	•		R
Rear (at a 40° angle to the shaft axis)	SD								•	•	•	R