Pump SVH 062, 092, 112

The **Sunfab** variable displacement pump with its rugged construction is designed for direct mounting at the auxiliary drive (P.T.O.) of commercial vehicles.

With a max. displacement of 112 cm^3/rev. and a peak pressure of 400 bar it is suited for many applications. This is complemented by the high self priming rate and the low noise level. The pump delivery flow is dependent on the present drive speed and geometric displacement. The flow is adjustable in a range between 0 and $Q_{max.}$

Long service life is ensured due to the pressurized lubrication of the swash plate bearing shell.

Sunfab SVH is rotation-direction dependent and should be ordered in either right-hand or left-hand designs.

Other advantages of Sunfab SVH:

- Short reaction time when resetting the flow
- Compact installation dimensions
- High pressure
- Externally drained for best cooling
- Rugged construction and long service life
- Low noise emission
- Low power-to-weight-ratio

Versions, main data

SVH – 092 R DZN – 2 – LSNR/ZL – 2/65 – 350 – C 022

Basic type

Nominal size
062
092
112

Direction of rotation:
L = Left-hand (counter clockwise)
R = Right-hand (clockwise)
always facing the drive shaft

Shaft design:
D = Splined shaft conforming DIN ISO 14 (for trucks)
M = Spline shaft DIN 5480 only SVH 092
S = Spline shaft SAE-C J 744
H = Spline shaft SAE-B J 744 only SVH 062
T = Spline shaft SAE-B-B J 744 only SVH 062
U = Spline shaft SAE-B J 744(short) only SVH 062

Mounting flange design (input side):
Y = Flange ISO 7653-1985 (for trucks)
G = Flange ISO 3019-2, only SVH 092
F = Flange SAE-C-4-Hole J 744 ISO 3019-1
Z = Flange SAE-B-4-Hole J 744 ISO 3019-1, only SVH 062
X = Flange SAE-B-2-Hole-45°offset J 744 ISO 3019-1, only SVH-062

Mounting flange design (output side), see page 5

no coding = Ports conforming ISO 228/1 (BSPP)
UNF = Ports conforming SAE J 514

Pressure specification (bar)

no coding = Without stroke limitation (standard)
2 = With stroke limitation (not available for versions with thru-shaft)
2 /... = Factory set stroke limitation, specification V_g (cm^2/rev.)

Pump controllers / Intermediate plates, see page 3

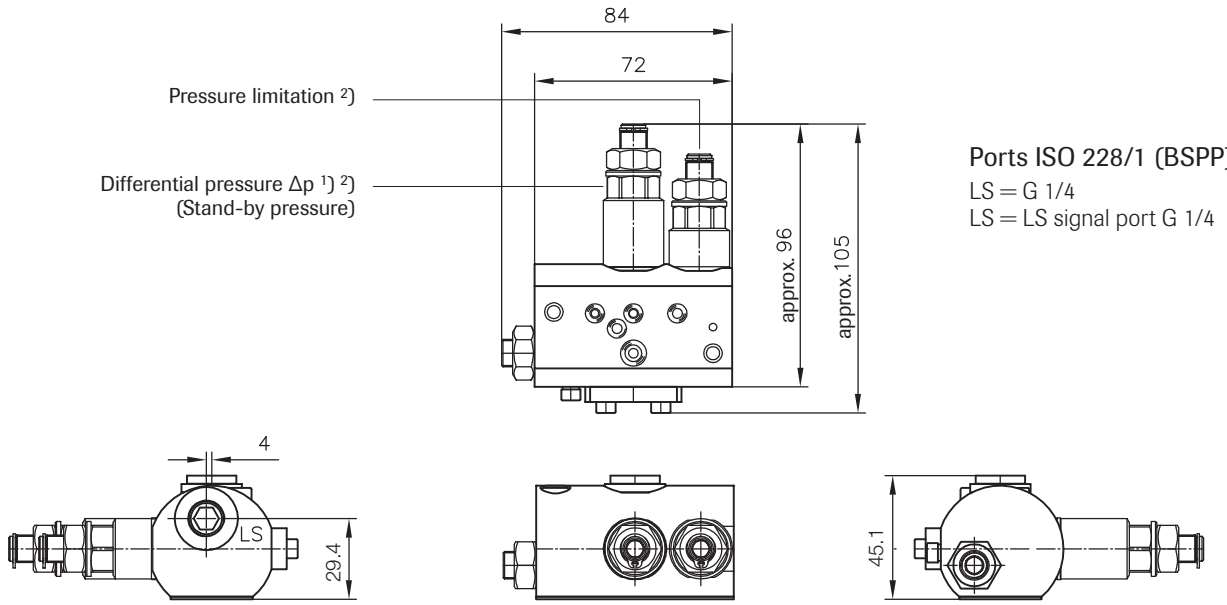
Shaft design/Housing design:
1 = Standard, suction port and pressure outlet axial
2 = Thru-shaft, suction port and pressure outlet radial
3 = Standard, suction port and pressure outlet radial

Seals:
N = NBR (Nitrile rubber) - Standard
V = FKM

Description of the controllers

LSNR	Load-Sensing controller with integrated pressure limitation
NR	Pressure controller, adjustable directly at the pump. The Pressure controller automatically maintains a constant system pressure independant of the required flow. Therefore it is suited for constant pressure systems, where differing flow is required or as efficient pressure limitation of the hydraulic system
Intermediate plates	Intermediate plate only in combination with controllers LSNR or NR
/ZL	Intermediate plate with power controller (torque limitation) Product "Pressure x Displacement" = constant Adjustment range: 25...100% of max. drive torque
/ZW	Angled intermediate plate (45°) mandatory for mounting controllers at pumps with housing design -2, -3

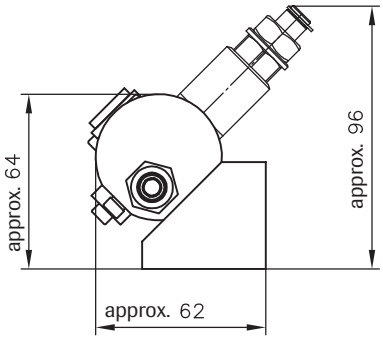
Typ		SVH 062	SVH 092	SVH 112
Geometric displacement V_g	cm^3/rev.	62.4	87.2	110.4
Nom. pressure p_{nom}	bar	350	350	350
Pressure p_{max}	bar	400	400	400
Angle of the swash plate		21.5°	21.5°	21.5°
Required inlet pressure (absolute) for open circuit	bar	0.85	0.85	0.85
Max. permissible drive torque	Nm	430	530	600
Max. permissible torque for the thru-shaft, dep. on flange	Nm	100	530	600
Max. rev. rating when self priming and max. angle of the swash plate at 1 bar absolute inlet pressure	rpm	2500	2300	2200
Min. rev. rating for permanent running	rpm	500	500	500
Required torque at 100 bar	Nm	100	151	184
Drive power for 250 bar and 2000 rpm	kW	53	79,5	97.2
Mass (weight) complete with controller	kg	23.2	27.2	29.9
Weight torque	Nm	30	35.3	40
Inertia moment	kg m^2	0.005	0.008	0.01
Sound level at 250 bar, 1500 rpm and max. swash plate angle (Measured in a sound measuring room DIN ISO 4412, distance 1 m)	dB(A)	75	75	75



Ports ISO 228/1 (BSPP):
LS = G 1/4
LS = LS signal port G 1/4

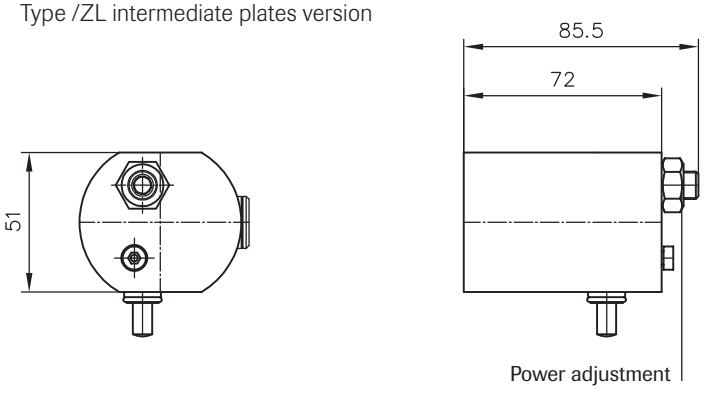
Intermediate plate

Type /ZW version with thru-shaft



Controller

Type /ZL intermediate plates version

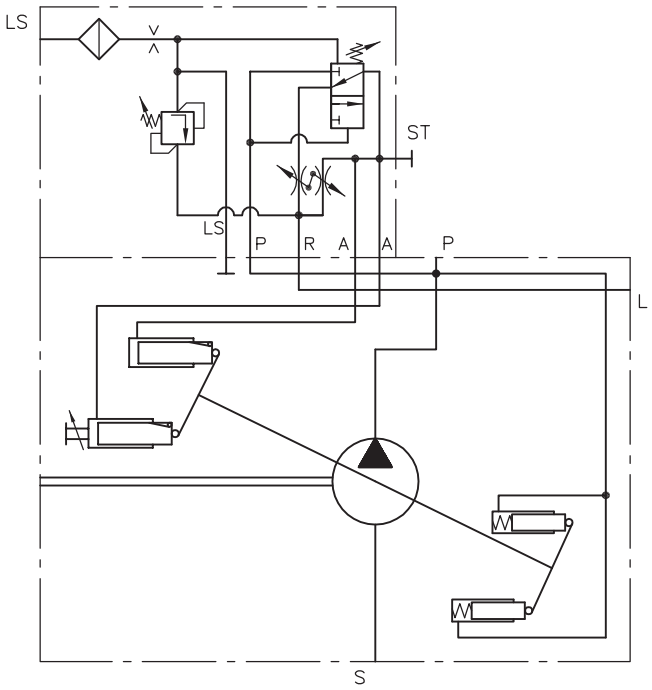


Pressure adjustment	Pressure range (bar)	Δp (bar)/rev.	Pressure setting, factory set (bar)
Pressure limitation	20 ... 400	50	300
Differential pressure Δp	20 ... 55	12.5	27

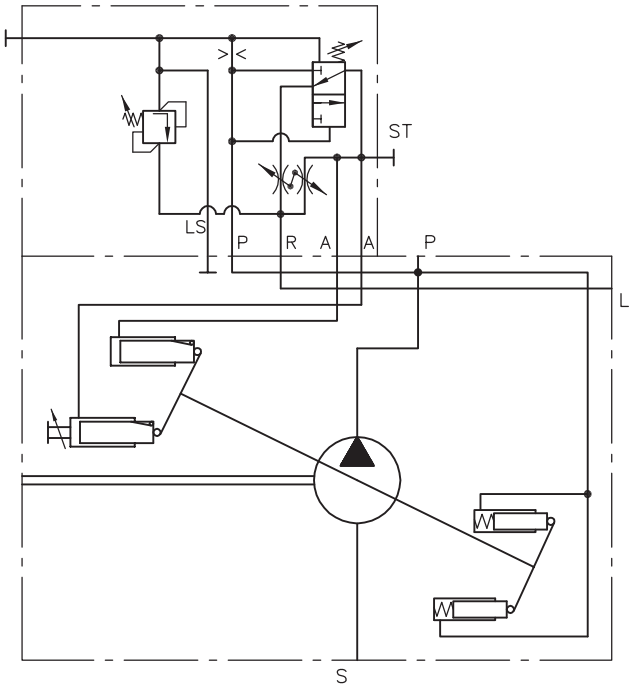
1) Applies only type LSNR. 2) The adjustment range is limited by a mechanical stop. **Attention:** Always use a pressure gauge when changing the pressure setting!

Controller symbols

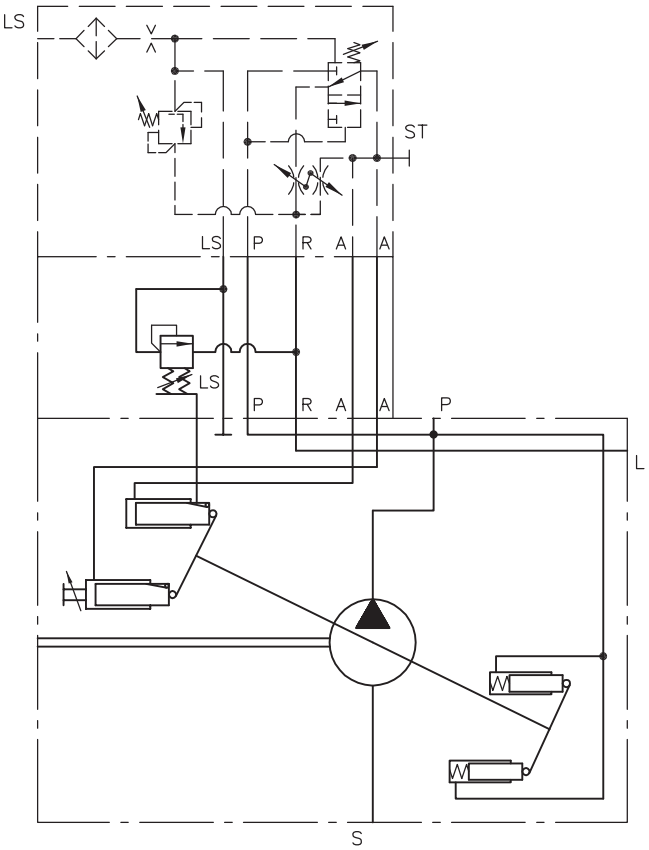
Coding **LSNR**



Coding **NR**



Coding **.../ZL**



Additional parameter, general

Calculation of the nom. sizes:

Flow rate	Torque	Power
$Q = \frac{V_g \times n \times \eta_v}{1000}$ (lpm)	$M = \frac{1{,}59 \times V_g \times \Delta p}{100 \times \eta_{mh}}$ (Nm)	$P = \frac{2\pi \times M \times n}{60000} = \frac{M \times n}{9549} = \frac{Q \times \Delta p}{600 \times \eta_t}$

V_g Displacement (cm³/rev.)
Δ_p Differential pressure (bar)
n Speed (rpm)

η_v = Volumetric efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Total efficiency ($\eta_t = \eta_v \times \eta_{mh}$)

Nomenclature	Axial piston pump according to the swash plate principle
Mounting	At the auxiliary drive of commercial vehicles (flange ISO 7653-1985 for trucks)or flange assembly (flange ISO 3019-2 or SAE/ISO 3019-1)
Surface	Gas nitrocarburized
Direction of rotation	Right or left
Changing the rotation direction	Turn the end plate and change the port plate
Installed position	Any (observe the installation instructions)
Hydraulic fluid	Hydraulic oil acc. to DIN 51524 table 2 and 3; ISO VG 10 to 68 acc. to DIN 51519 Viscosity range: min. approx. 10; max. approx. 1000 mm²/sec Optimal operation range: approx. 10...35 mm²/sec. Also suitable are biologically degradable pressure fluids type HEES (synth. Ester) at operation temperatures up to approx. +70 °C.
Temperature	Ambient: approx. -40...+60 °C Fluid: -25...+80 °C, pay attention to the viscosity range! Start temperature down to -40 °C is allowable (Pay attention to the viscosity range during start!), as long as the operation temperature during subsequent running is at least 20 °C higher.
Filtration	Should conform to ISO standard 4406 code 19/16/13
Max. perm. housing pressure	1 bar

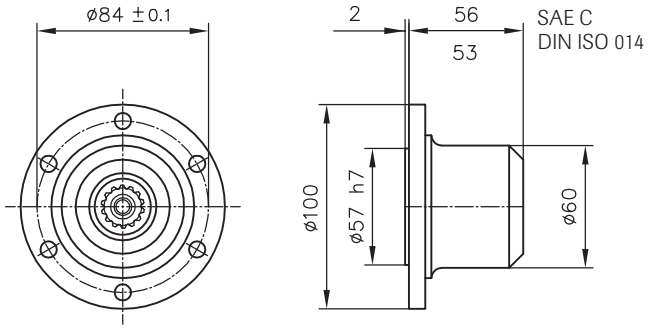
Mounting flange design (output side)

Available, incl. coupling sleeves

Coding, SVH		Flange	Shaft
062	092-112		
C 011	C 021	SAE A-2-Hole	9T 16/32 DP
C 012	C 022	SAE A-2-Hole	9T 16/32 SP [1)]
--	--	SAE A-2-Hole	11T 16/32 DP
C 014	C 024	SAE B-2-Hole	13T 16/32 DP
C 015	C 025	SAE B-4-Hole	13T 16/32 DP
--	--	SAE B-B-2-Hole	15T 16/32 DP
--	C 027	SAE C-2-Hole	14T 12/24 DP
--	C 028	SAE C-4-Hole	14T 12/24 DP
--	--	SAE C-C-2-Hole	23T 16/32 DP

Attention: Observe the max. drive torque rating!
Note: An additional support has to be provided in case of pump combinations. Additional versions on request!
[1)] ANSI B 92.1, FLAT ROOT SIDE FIT
The spline width is not conforming the industrial standard. $s = 2.357_{-0.03}$

Coupling flange for universal joint shafts

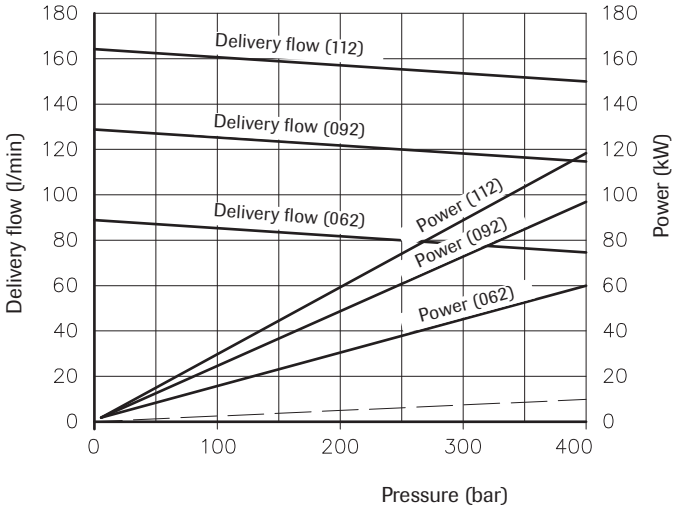


Coding	Spline profile
SAE C	14T 12/24 DP
DIN ISO 014	B8x32x36

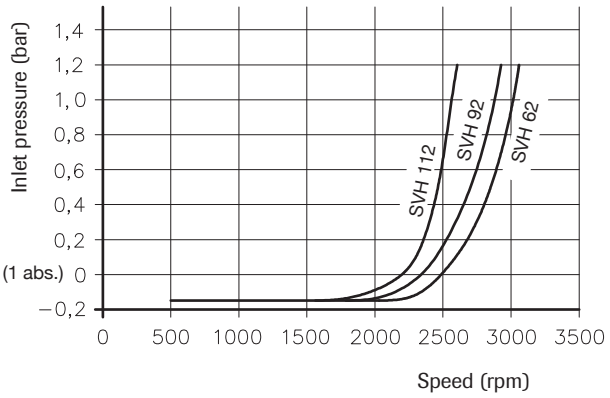
Curves

Flow and Power

Charts show flow/pressure (without controller). Power at max. setting angle and power at min.setting angle and 1500 rpm



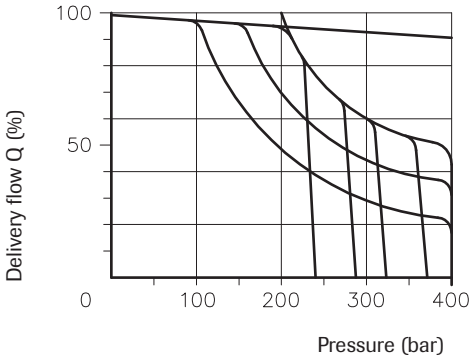
Inlet pressure (LSNR-controller)
Graph valid at viscosity 75 mm²/s at max. setting angle.



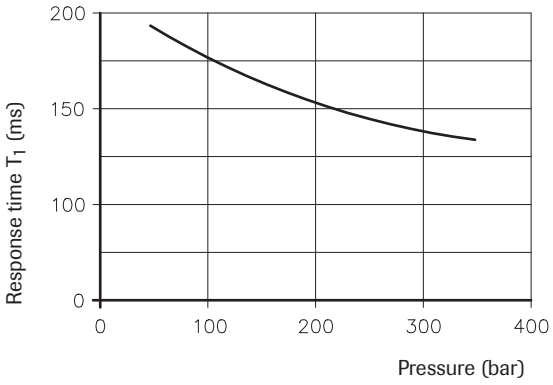
Controller curve

Coding **L**

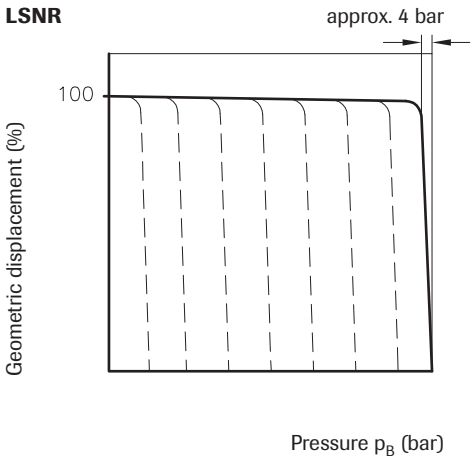
Pressure / Delivery flow



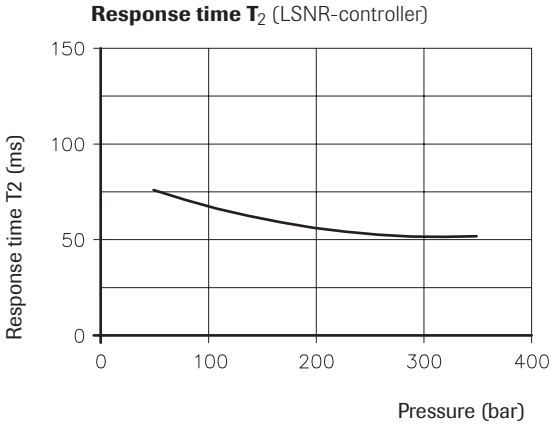
Response time T_1 (LSNR-controller)

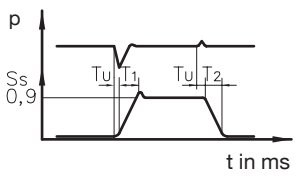


Coding **LSNR**



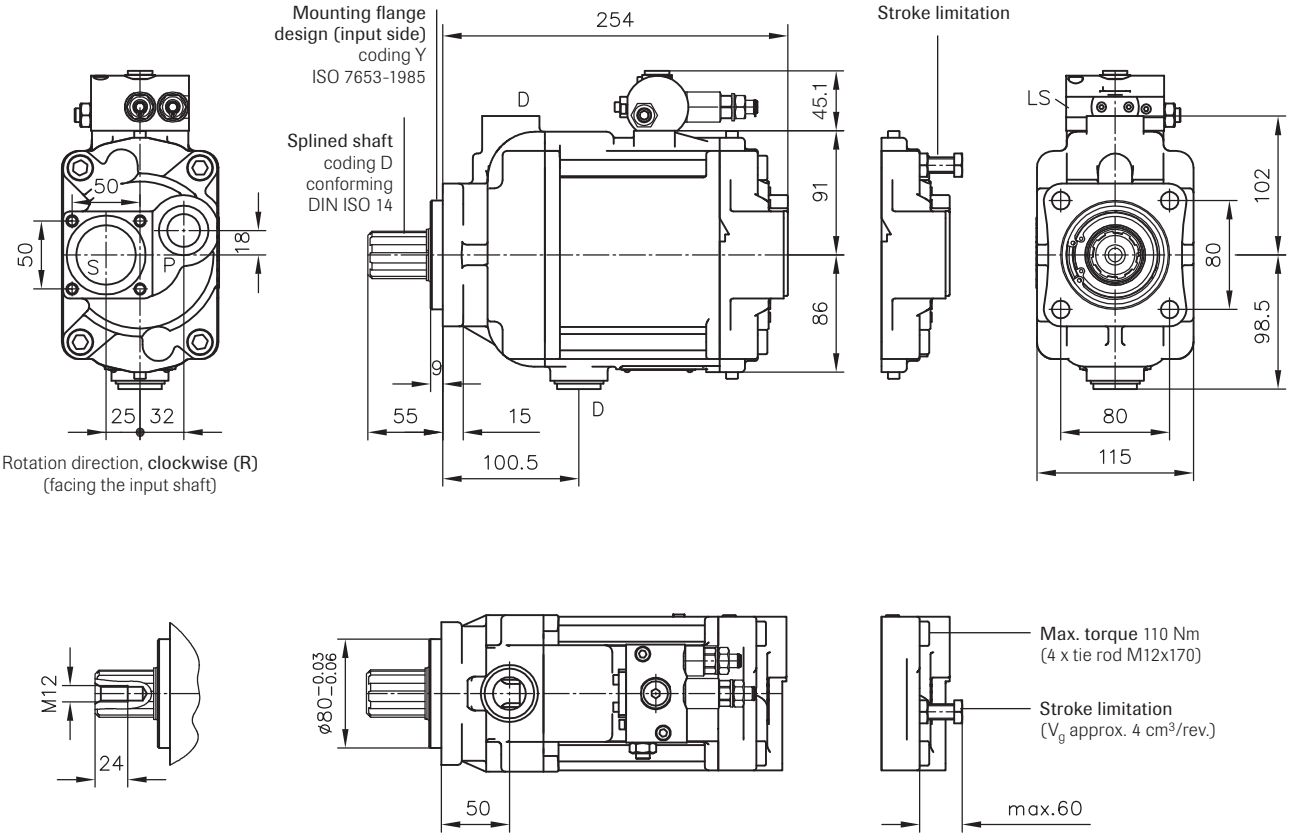
Response time T_2 (LSNR-controller)





Ss = Regulating distance actuator
Tu = Delay < 3 ms
T1 = Response time min to max
T2 = Response time max to min
p = Pressure
LS-line min. length 1.5 m, min. internal diameter 12 mm

Basic pumps: SVH 062



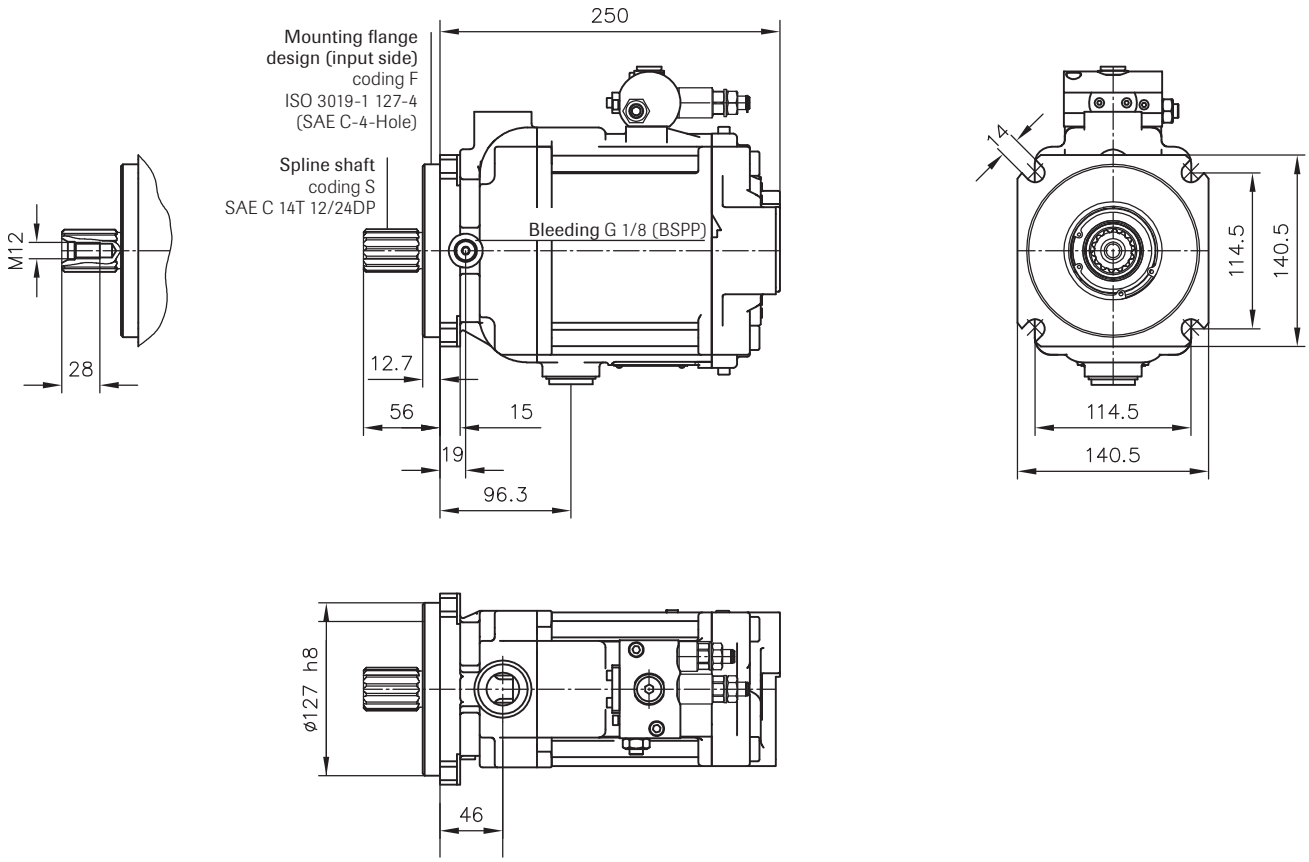
Coding UNF ports conforming SAE J 514:

P = 1 5/16-12 UN-2B
S = Flange, suction port
D = 1 1/16-12 UN-2B
LS = G 1/4 (ISO 228/1 (BSPP)) with adaptor for 7/16-20 (SAE-4)

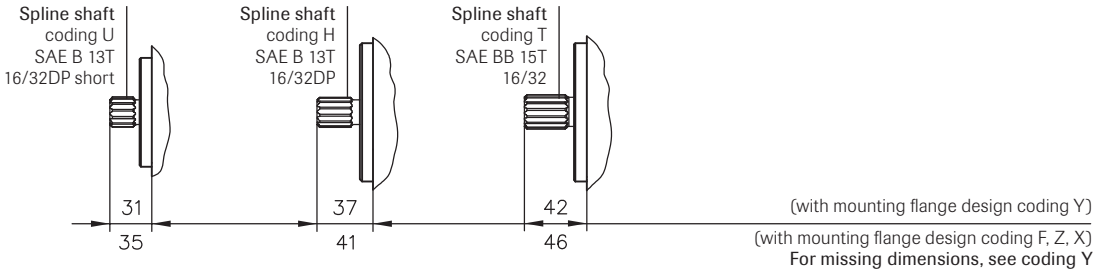
Ports (ISO 228/1 (BSPP)):

P = Pressure outlet G 3/4
S = Flange, suction port
D = Case drain G 3/4

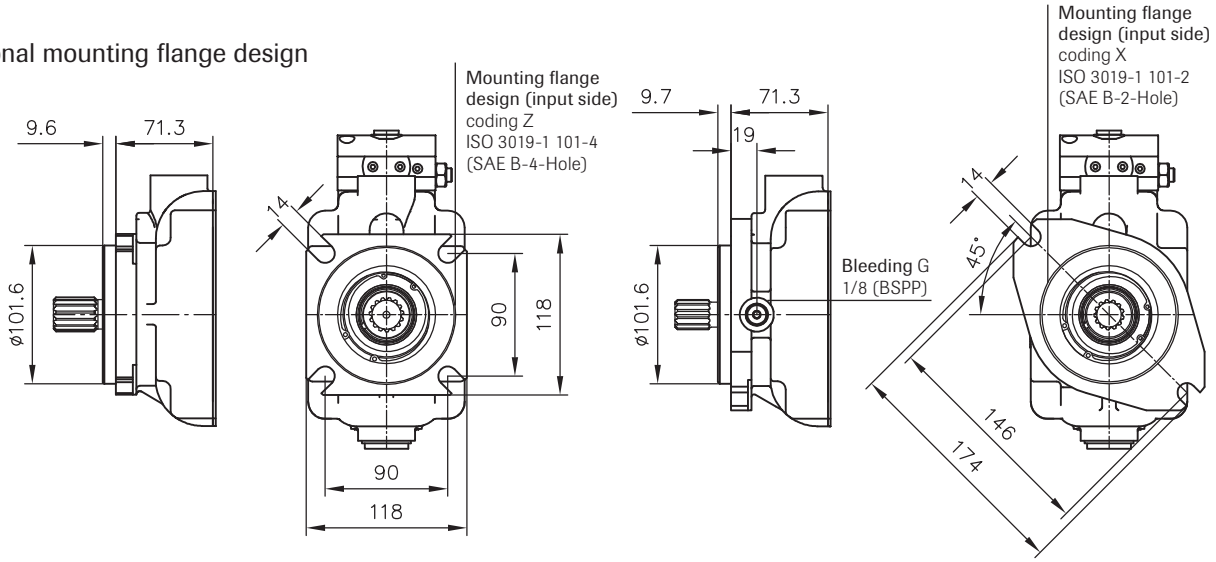
SVH 062 SAE



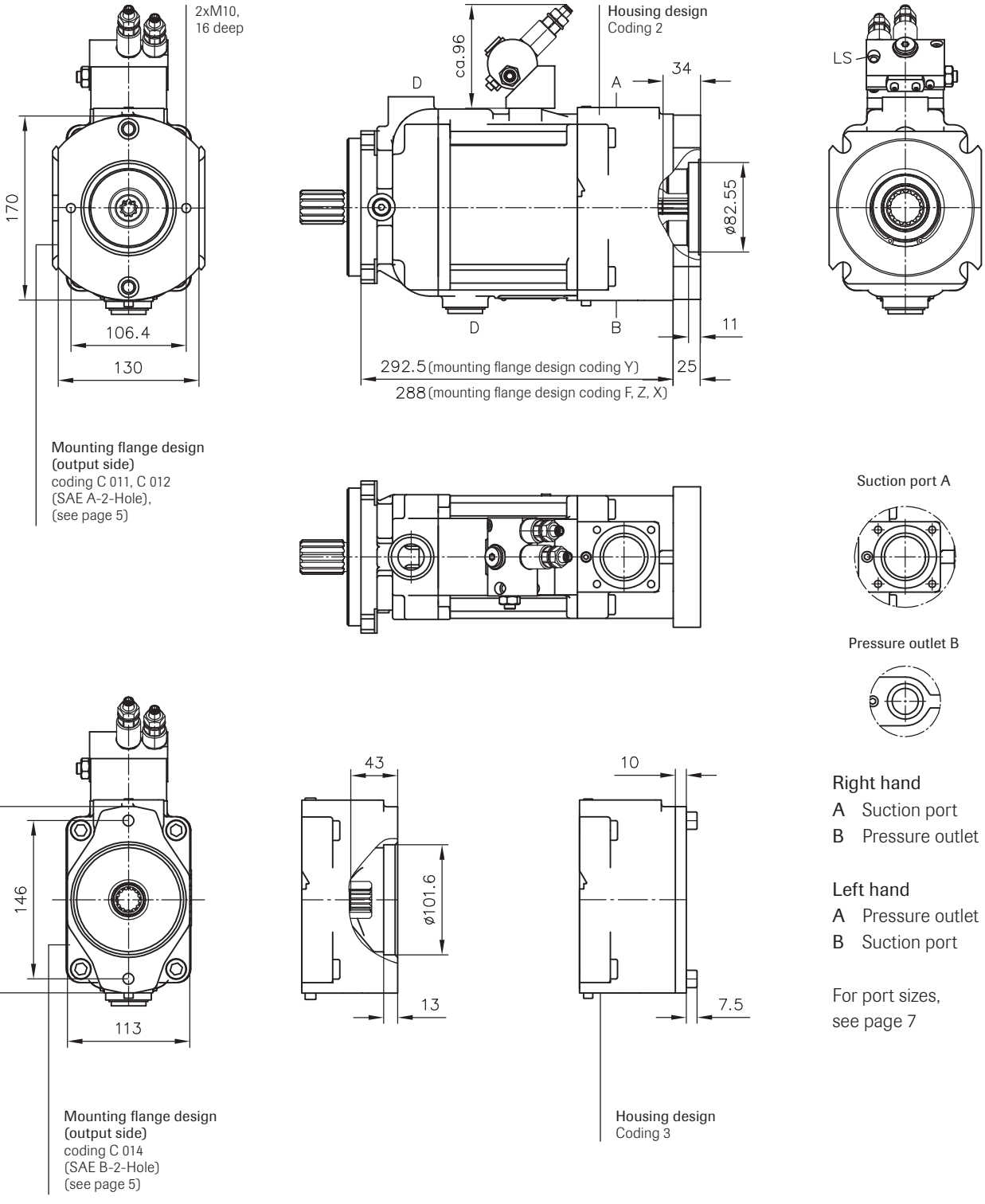
Additional input shaft designs



Additional mounting flange design



SVH 062 with thru-shaft



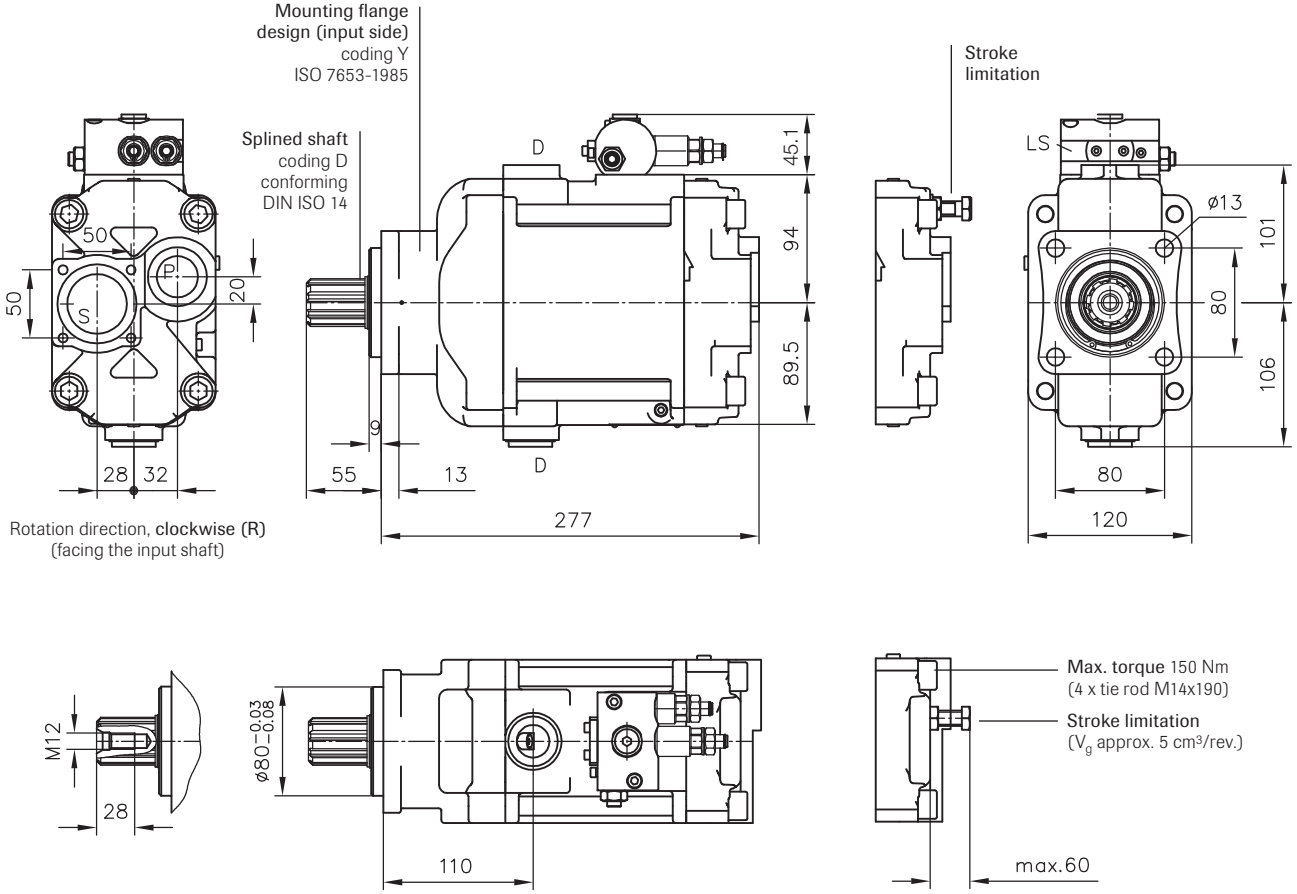
Right hand
A Suction port
B Pressure outlet

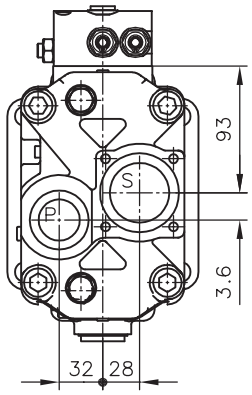
Left hand
A Pressure outlet
B Suction port

For port sizes,
see page 7

For missing dimensions, see coding Y
For available mounting flange designs (output side) and coupling sleeves, see page 5

SVH 092





Rotation direction, counter clockwise (L)
(facing the input shaft)

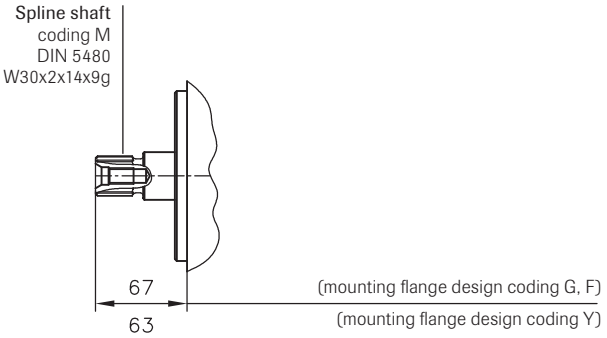
Coding UNF ports conforming SAE J 514:

P = 1 5/16-12 UN-2B
S = Flange, suction port
D = 1 1/16-12 UN-2B
LS = G 1/4 (ISO 228/1 (BSPP)) with adaptor for 7/16-20 (SAE-4)

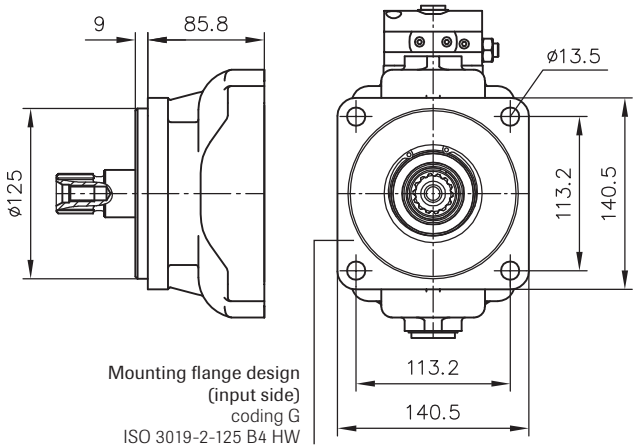
Ports (ISO 228/1 (BSPP)):

P = Pressure outlet G 3/4
S = Flange, suction port
D = Case drain G 3/4

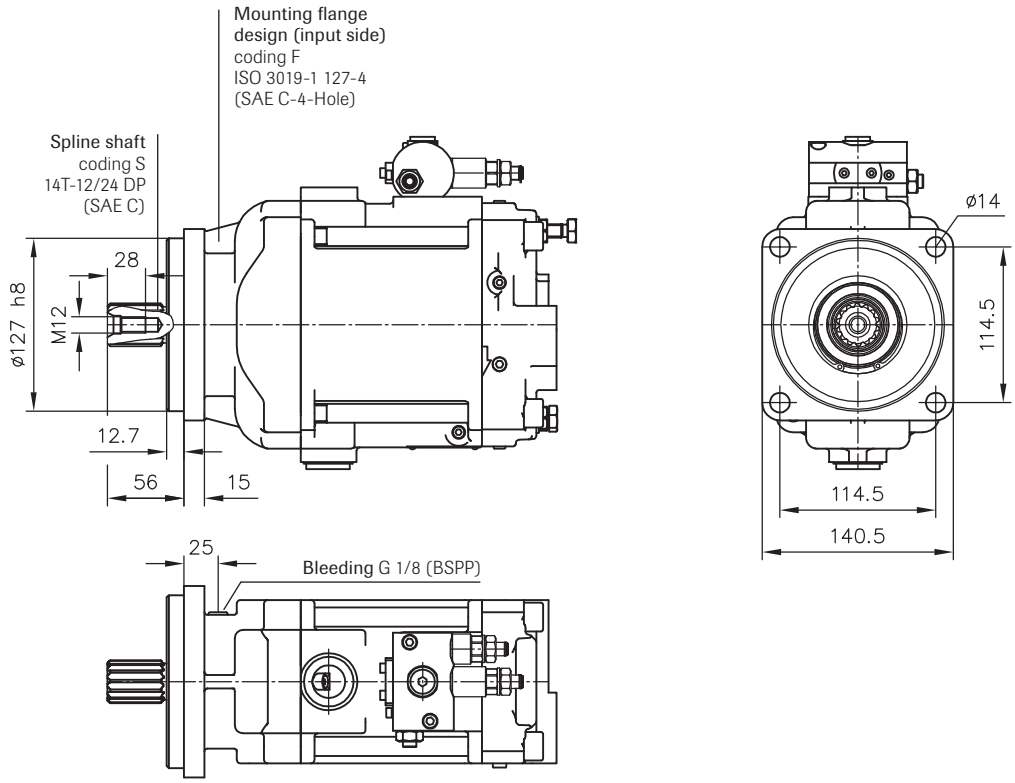
Additional input shaft designs



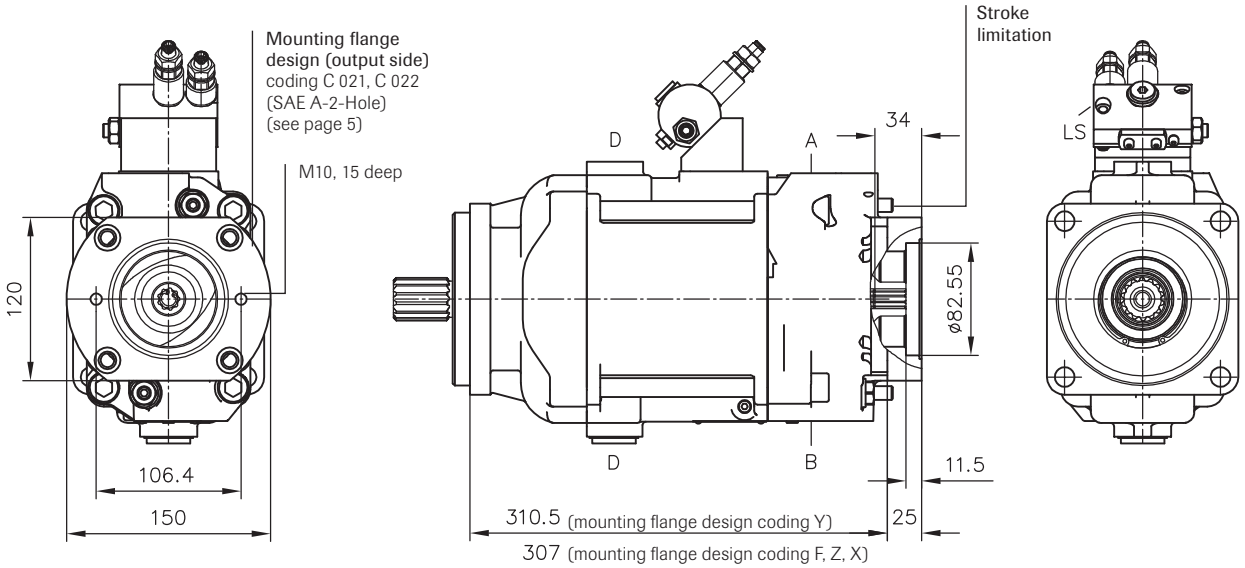
Additional mounting flange design



SVH 092

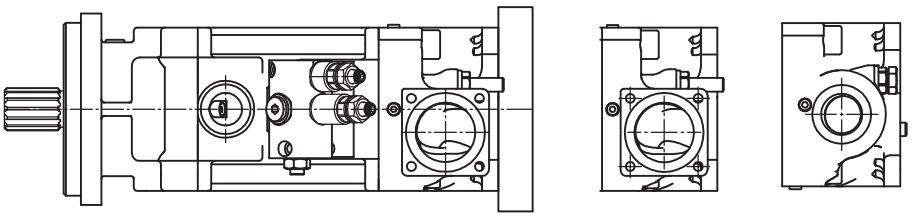


SVH 092 with thru-shaft



Right hand
- A Suction port
- B Pressure outlet

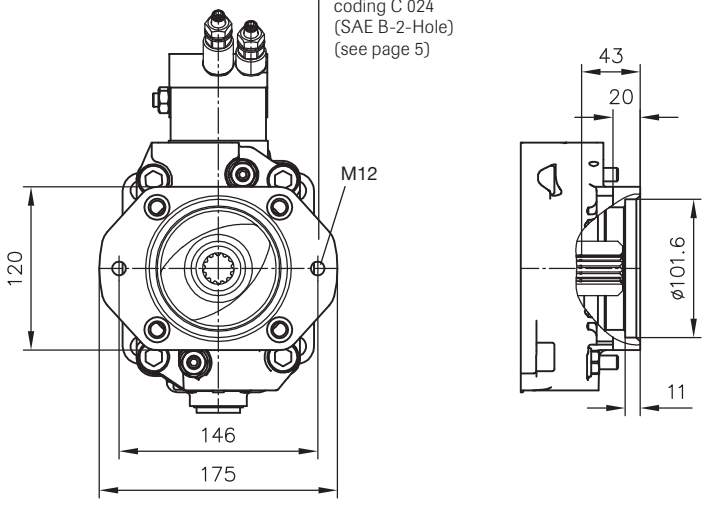
Left hand
- A Pressure outlet
- B Suction port



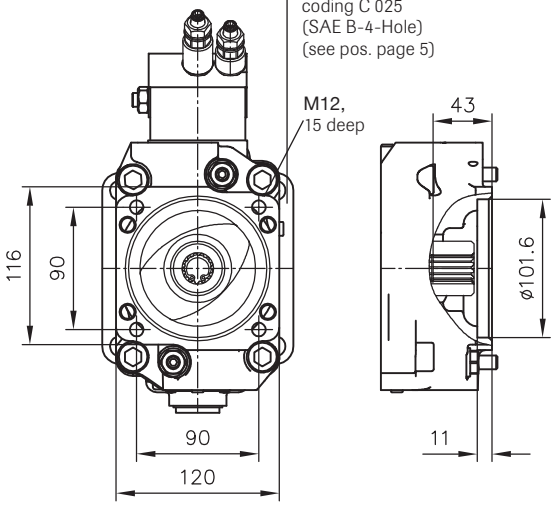
For port sizes, see page 10

SVH 092 SAE

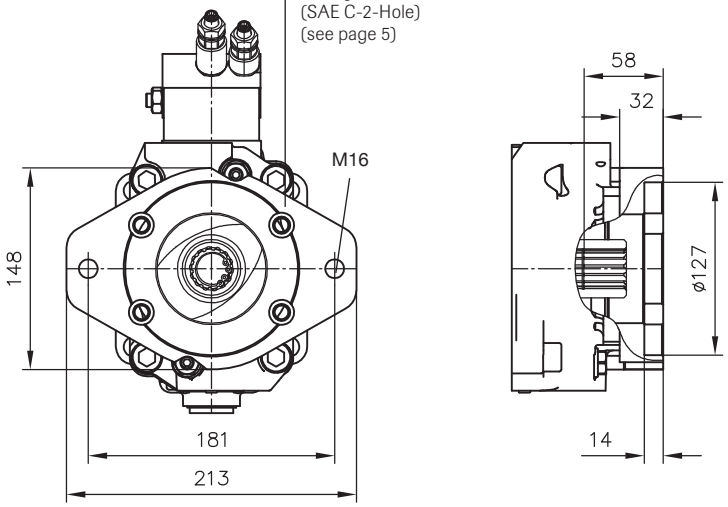
Mounting flange
design (output side)
coding C 024
(SAE B-2-Hole)
(see page 5)



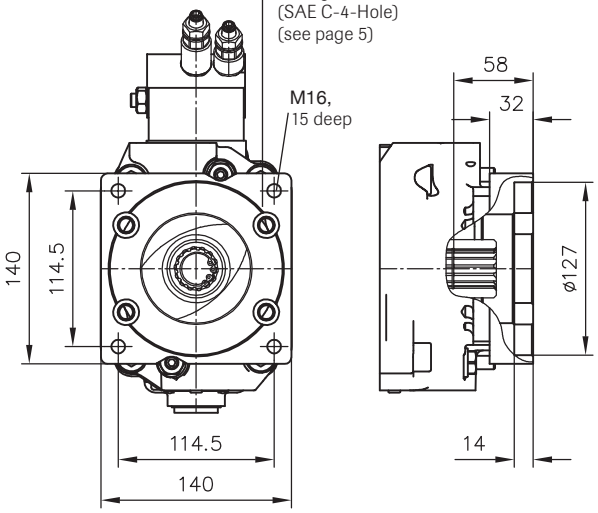
Mounting flange
design (output side)
coding C 025
(SAE B-4-Hole)
(see pos. page 5)



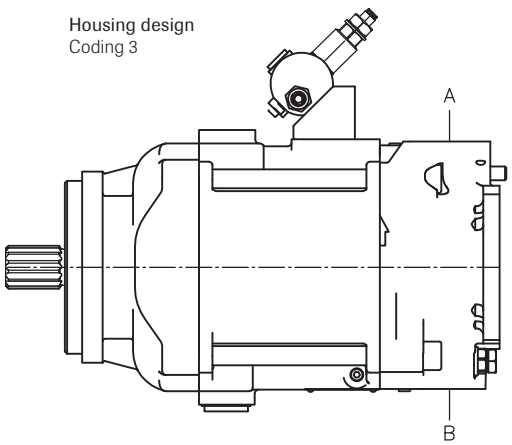
Mounting flange
design (output side)
coding C 027
(SAE C-2-Hole)
(see page 5)



Mounting flange
design (output side)
coding C 028
(SAE C-4-Hole)
(see page 5)

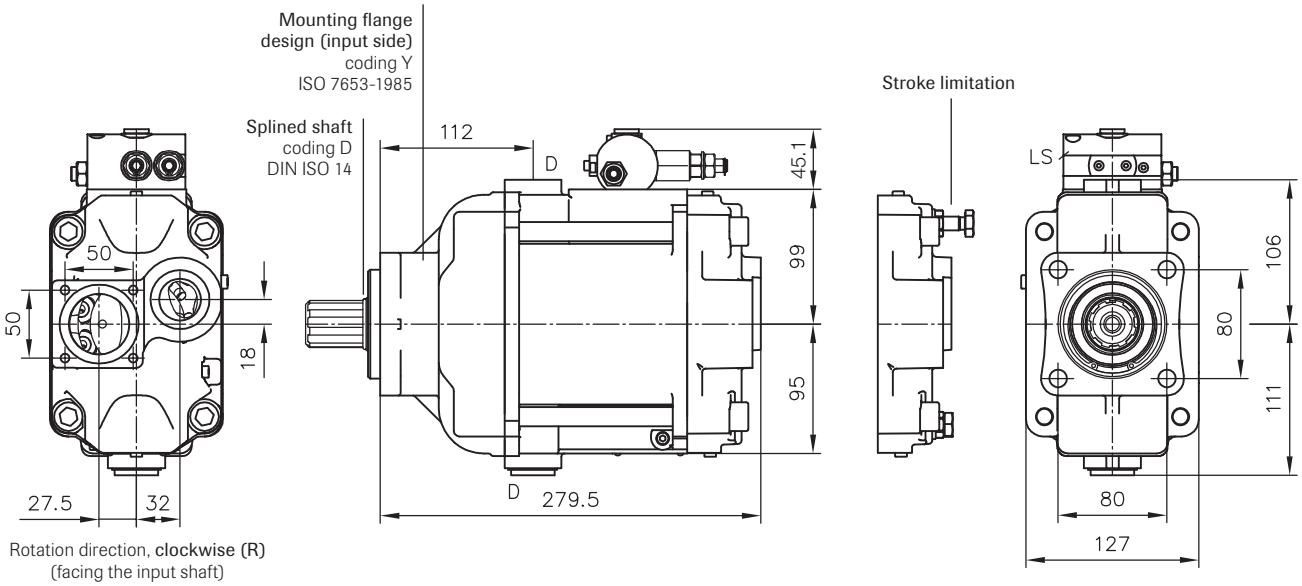


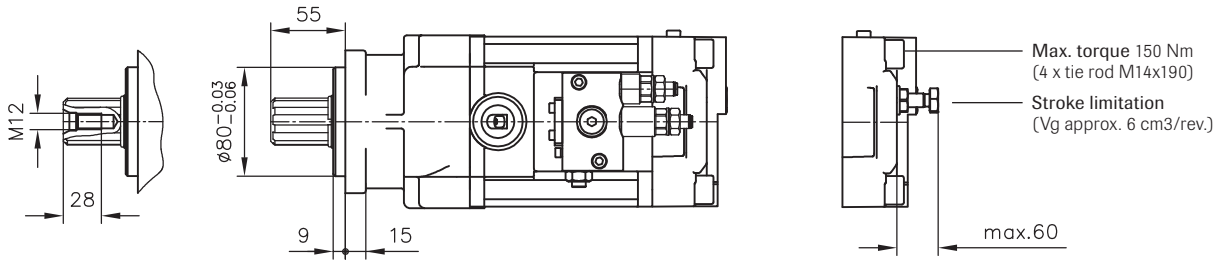
Housing design
Coding 3

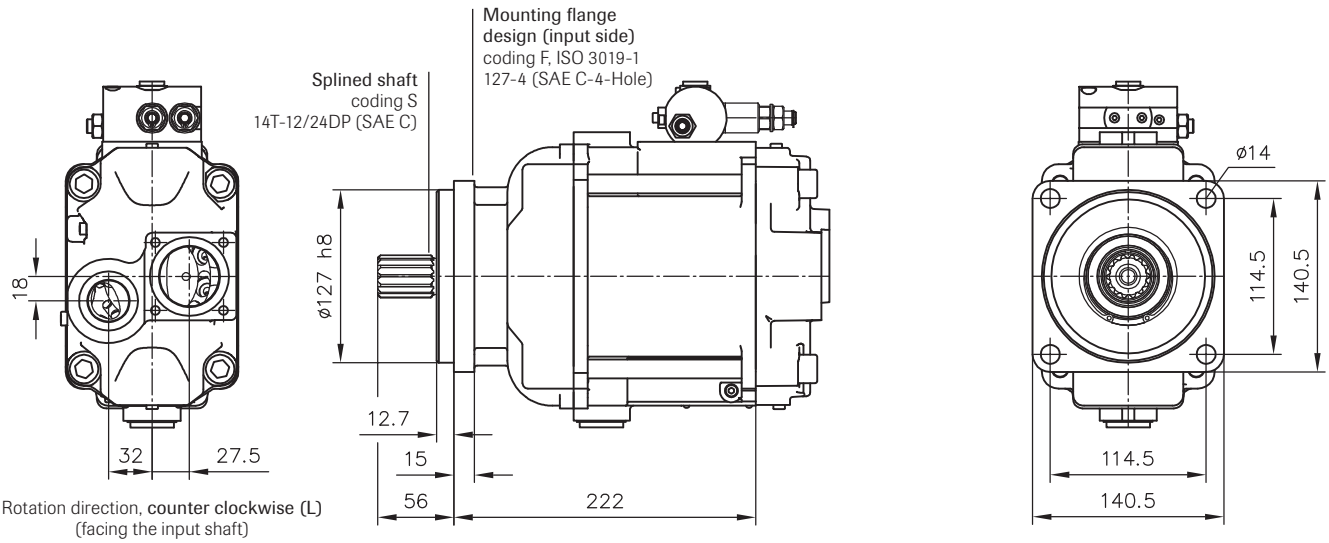


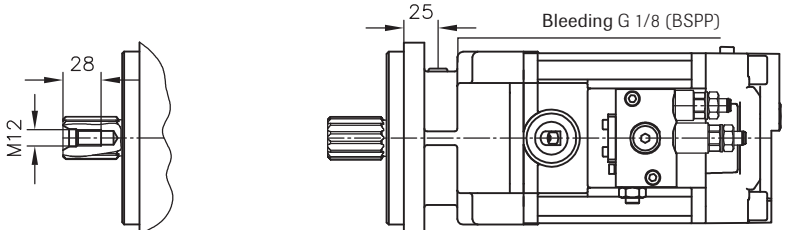
For available mounting flange designs (output side) and coupling sleeves, see page 5

SVH 112





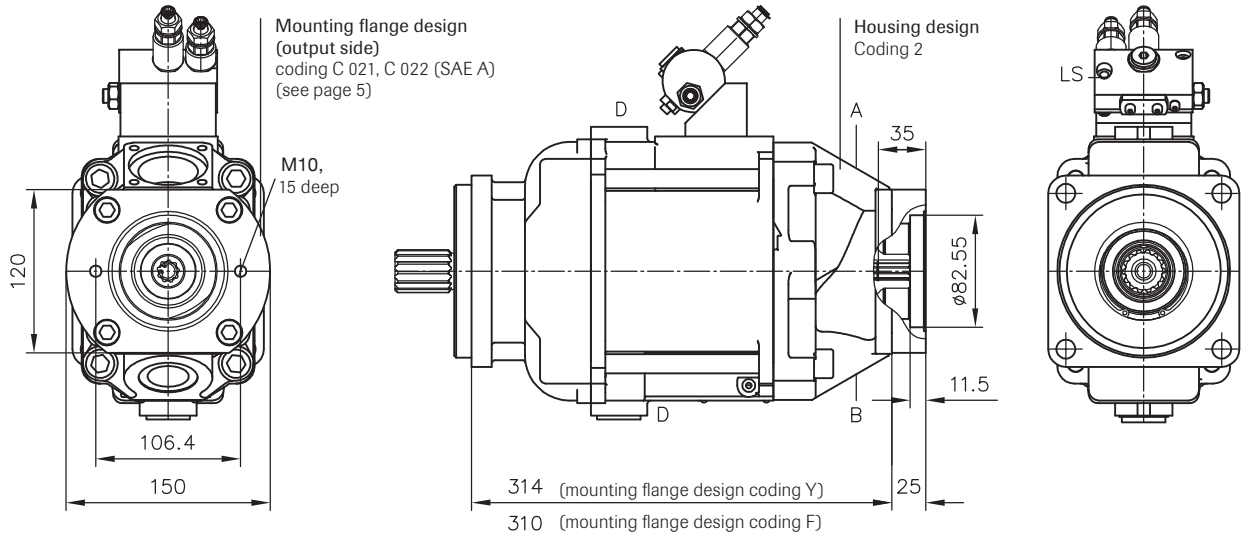




Ports (ISO 228/1 (BSPP)):
P = Pressure outlet G 3/4
S = Flange, suction port
D = Case drain G 3/4

Coding UNF ports conforming SAE J 514:
P = 1 5/16-12 UN-2B
S = Flange, suction port
D = 1 1/16-12 UN-2B
LS = G 1/4 (ISO 228/1 (BSPP))
with adaptor for 7/16-20 (SAE-4)

SVH 112 with thru-shaft

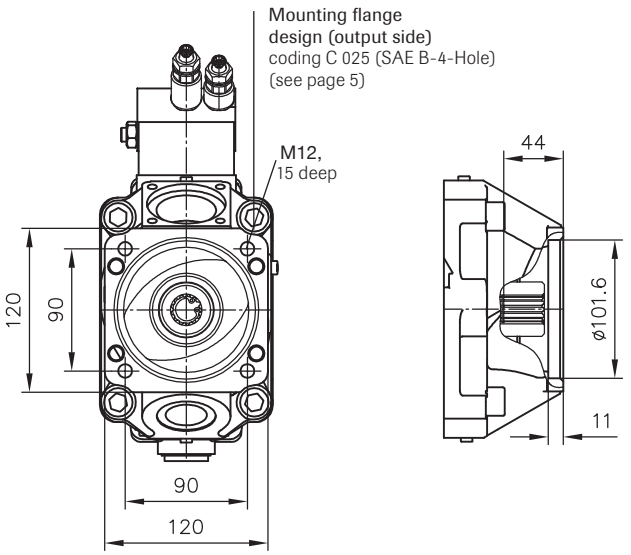


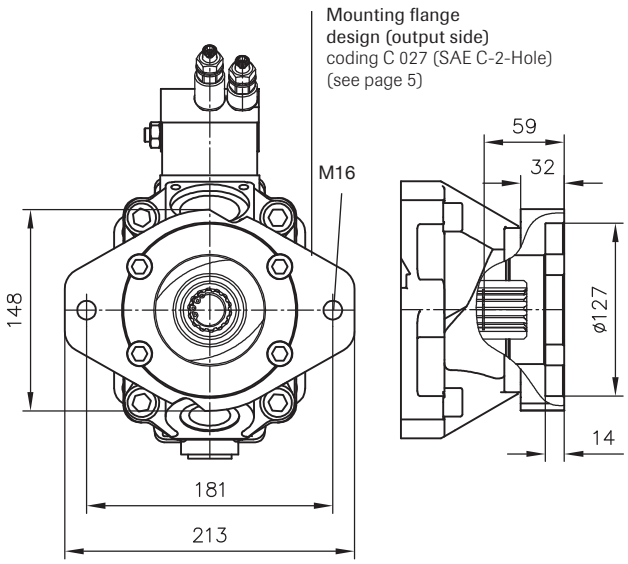
Right hand
A Suction port
B Pressure outlet

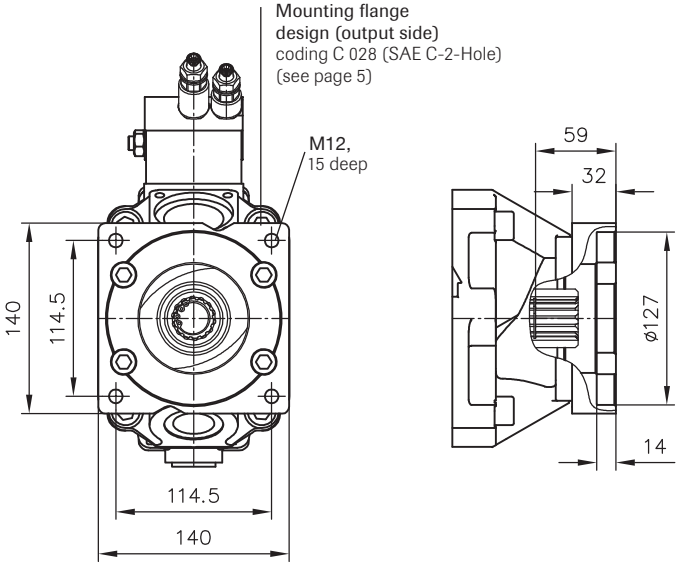
Left hand
A Pressure outlet
B Suction port

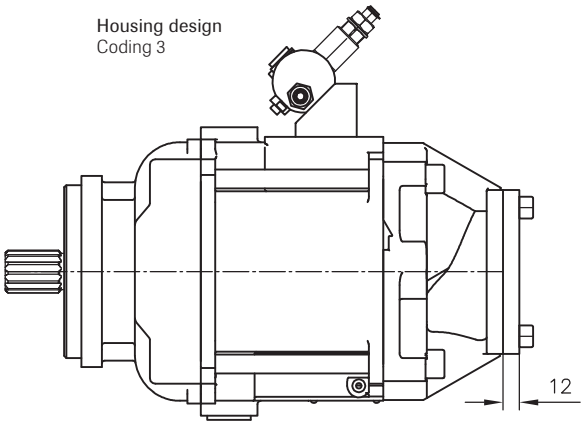
For port sizes, see page 13

SVH 112 SAE


Mounting flange
design (output side)
coding C 025 (SAE B-4-Hole)
(see page 5)
M12,
15 deep
120
90
90
120
44
ø101.6
11


Mounting flange
design (output side)
coding C 027 (SAE C-2-Hole)
(see page 5)
M16
148
181
213
59
32
ø127
14


Mounting flange
design (output side)
coding C 028 (SAE C-2-Hole)
(see page 5)
M12,
15 deep
140
114.5
114.5
140
59
32
ø127
14


Housing design
Coding 3
12

WARNING

When the pump is running:

1. Do not touch the pressure hose
2. Watch out for rotating parts
3. The pump and hoses may be hot

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