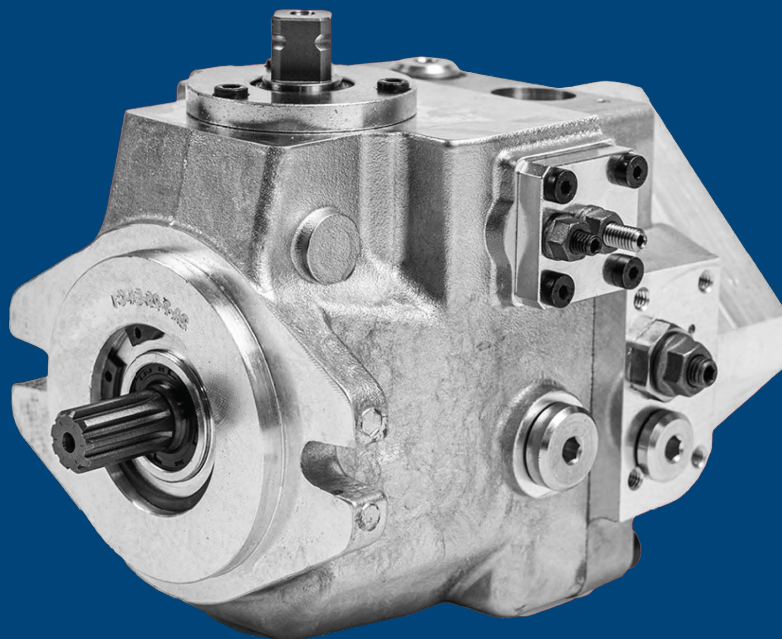




PATRIOT

PHDC1 SERIES

FULL CATALOG



Driven by Innovation
Power Precision Performance
734-479-9641 patriothyd.com





PHDC1 Description

The PHDC1 Series is a high-performance variable displacement axial piston pump designed for closed-loop hydrostatic transmission applications. Utilizing a proven swashplate design, the PHDC1 delivers precise, infinitely variable flow control by adjusting the swashplate angle, with output directly proportional to drive speed.

Engineered for efficiency and durability, the pump features hydrostatically balanced cradle bearings that contribute to low operating noise, excellent suction characteristics, and extended service life. Its compact design offers an outstanding power-to-weight ratio while providing fast dynamic response for demanding mobile and industrial applications.

The PHDC1 Series is available with a wide range of control options to accommodate diverse system requirements. Additional features include dual case drain ports and through-drive capability, enabling multiple pumps of the same nominal size to be mounted in tandem for enhanced system flexibility and power management.

TECHNICAL FEATURES - CONTROLS

C1 14-18 series is a family of variable displacement axial piston pumps for use in closed circuits with housing and distributor cover in aluminium. The displacement is continuously variable by means of a tilting swash plate, and the oil flow direction is reversible.

The following range of controls is available:

- Manual lever with feed-back
- Manual with zeroing
- Manual without zeroing
- Hydraulic proportional without feed-back
- Hydraulic proportional with feed-back
- Electric two position (ON-OFF)
- Electric impulse
- Electric proportional with feed-back
- Electric proportional without feed-back

SERIE		C1
Displacement ⁽¹⁾	cc/rev	14 - 18
Connection flange		SAE "A"
Charge pump displacement	cc/rev	5.4
Max speed ⁽²⁾	rpm	3600
Min speed	rpm	700
Rated pressure	(psi)	(3336)
Peak pressure	(psi)	(3916)
Charge pressure	(psi)	(145÷290) (standard 290)
Max case pressure	(psi)	(29)
Suction pressure	(psi)	(≥ 11.6)
Moment of inertia rotating parts	(lbf ft ²)	(0.033)
Weight (approx) ⁽³⁾	(lb)	(17.64)

Three through drive options for auxiliary pump mounting and two options are available:

- Through drive - Bosch Gr1
- Through drive - Bosch Gr2
- Through drive - SAE "A" 9T - 16/32-DP
- Pressure filter
- Bypass

Peak operations must not exceed 1% of every minute. A simultaneous maximum pressure and maximum speed are not recommended.

Notes: (1) The displacements 14-18 use the same external casing.

(2) The values shown are valid for an absolute pressure (pass) of 1 bar (14.5 psi)

ORDERING CODE

PHDC1 14-18	XX	LRX	3	27
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Series displacement	
C114	14 CC / REV
C118	20 CC / REV

Displacement limitation	
XX	Not Required
00-17	From 0 cm ³ /giro to 19 cm ³ /giro

Controls			
LWX	Manual without zeroing	E24	Electric two positions ON-OFF 24V
LNX	Manual with zeroing	EH2	Electric proportional with feed-back 12V + Hydraulic proportional with feed-back
LRX	Manual lever with feed-back	EH4	Electric proportional with feed-back 24V + Hydraulic proportional with feed-back
IND	Hydraulic proportional without feed-back	ER2	Electric proportional with feed-back 12V
IRX	Hydraulic proportional with feed-back	ER4	Electric proportional with feed-back 24V
EI2	Electric impulse 12V	EP2	Electric proportional without feed-back 12V
EI4	Electric impulse 24V	EP4	Electric proportional without feed-back 24V
E22	Electric 2 posizioni ON-OFF 12V	INP	Hydraulic proportional without feedback

Through Drive		Shaft end
1	Without through drive with charge pump	1 - 4 - 5 - 6
2	Without through drive w/o charge pump	1 - 6
3*	SAE A = Z9 - 16/32 DP with charge pump	1 - 4 - 5 - 6
4*	SAE A = Z9 - 16/32 DP without charge pump	1 - 4 - 5 - 6
5	Pump combination (Short version)	1 - 5 - 6
6	Bosch GR1 with charge pump	2 - 3 - 7
7	Bosch GR2 with charge pump	2 - 3
8	Bosch GR1 without charge pump	2 - 3 - 7
9	Bosch GR2 without charge pump	2 - 3

Note *: Use coupling F Z9 - F Z9

Pressure relief valve 10 multiples		
14	[2031 psi]	MIN
23	[3336 psi]	STD
27	[3916 psi]	MAX

ORDERING CODE

R	3	G	00	00
---	---	---	----	----

Special versions

Option	
00	Without Options
FI	With Filter
FE	Filter with Electric sensor
BP	By Pass

Ports	
G	BSPP Threads
U	SAE (UNF Threads) Upon Request (minimum quantity 50 pieces)

Shaft end		S	1°T	2°T
1	Splined T9-16/32-DP - Splined T9-16/32-DP	•	•	•
2	GR1 Splined T9-16/32- DP - GR1	•		•
3	Internal splined T9-16/32-DP - TANDEM BOSCH			•
4	Internal splined T9-16/32-DP - TANDEM			•
5	Round shaft Ø15.88 - Splined T9-16/32-DP9	•	•	
6	Round shaft Ø24 - Splined T9-16/32-DP	•	•	
7*	Round shaft Ø15 - GR1	•		

Note **: Available on request

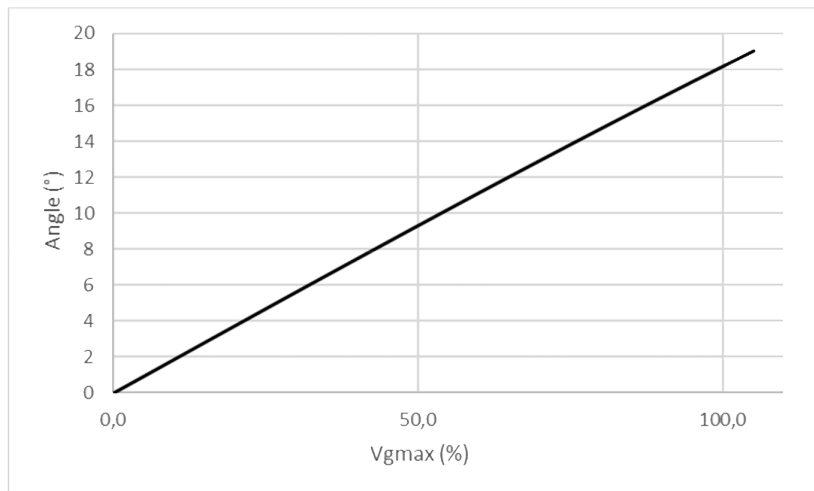
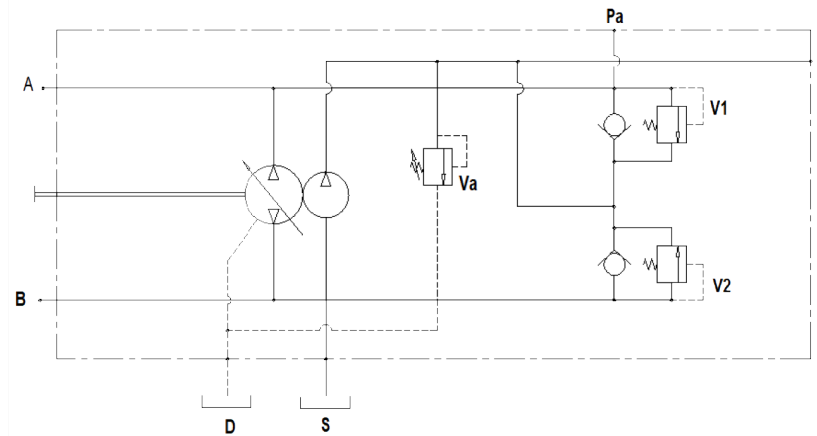
Direction of rotation	
R	CW
L	CCW

MANUAL WITHOUT ZEROING CONTROL

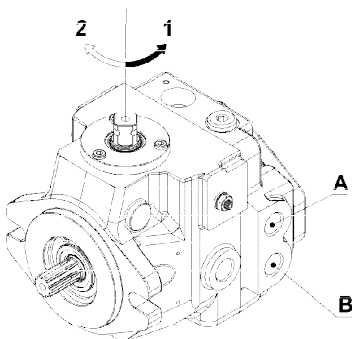
The pump displacement variation of the pump is achieved rotating the control pivot.

The control pivot is built in the swash plate of the pump.

Control lever not included but supplied as optional.

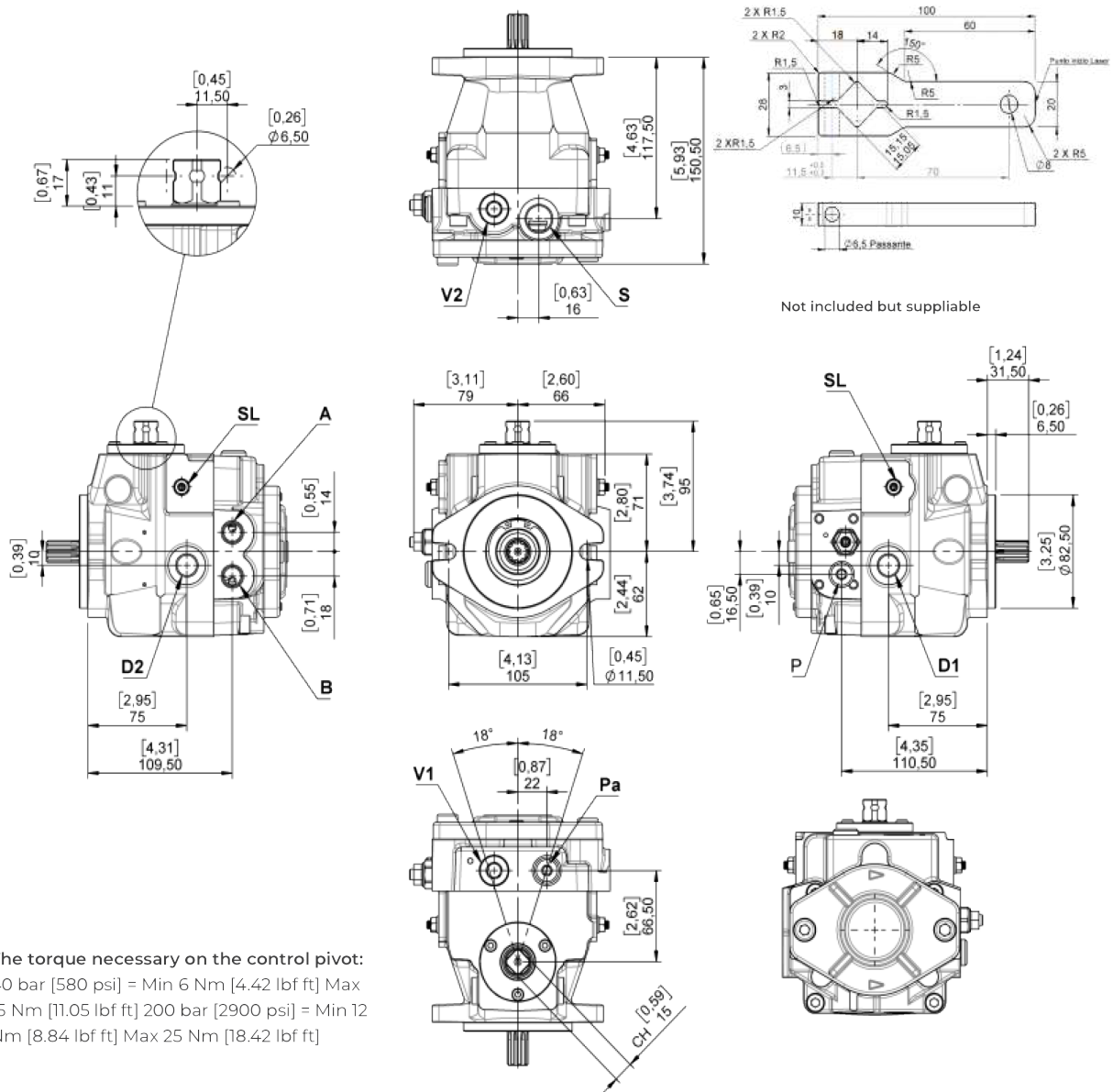


Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Control rotation	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

PUMP AND CONTROL DIMENSIONS



Not included but suppliable

The torque necessary on the control pivot:
 40 bar [580 psi] = Min 6 Nm [4.42 lbf ft] Max 15 Nm [11.05 lbf ft]
 200 bar [2900 psi] = Min 12 Nm [8.84 lbf ft] Max 25 Nm [18.42 lbf ft]

METRIC VERSION

- A – B: Pressure ports – 3/8 G
- D1-D2: Drain port
- S: Suction port – 1/2 G
- P: Charge pressure port – 1/4 G
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- pa: High pressure port - 1/4 C
- ZM: Mechanical zero adjustment screw

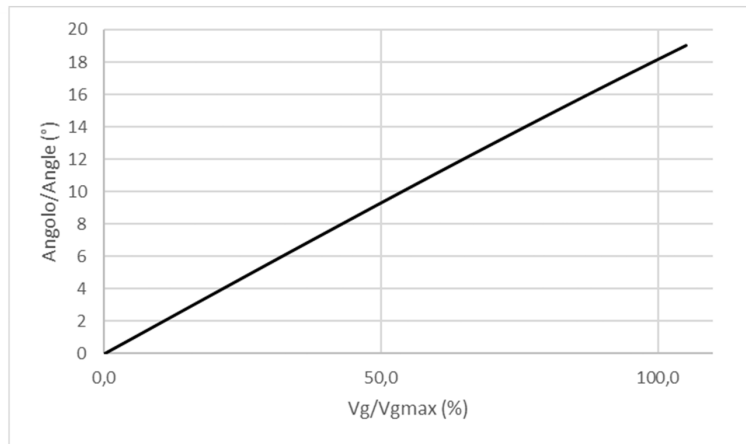
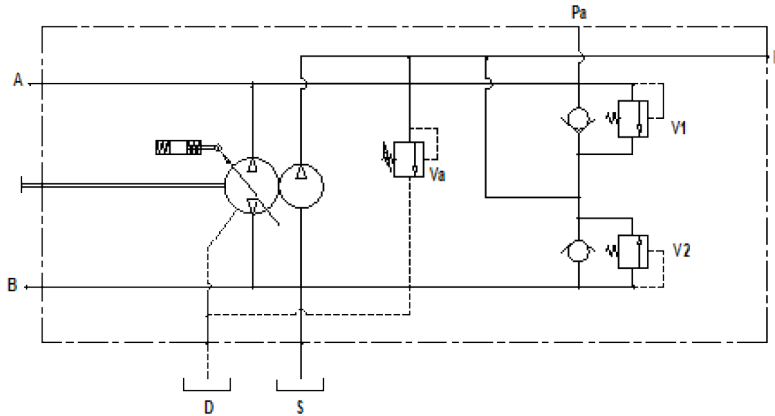
SAE VERSION

- C114: A – B: Pressure ports – 9/16-18 UNF-2B
- C118: A – B: Pressure ports – 3/4-16 UNF-2B
- D1 : Drain port – 9/16-18 UNF-2B
- S: Suction port – 3/4-16 UNF-2B
- P: Charge pressure port – 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw

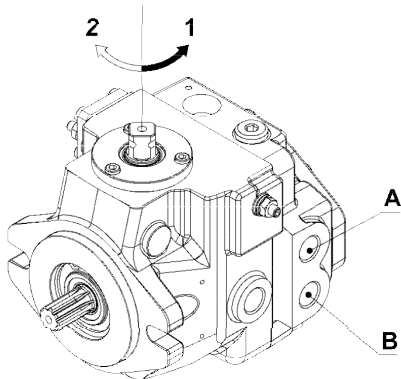
MANUAL WITH ZEROING CONTROL

The pump displacement variation of the pump is achieved rotating the control pivot.

The control pivot is built tin the swash plate of the pump. The return to zero displacement of the pump is guaranteed by an internal spring. Control lever not included but supplied as optional.

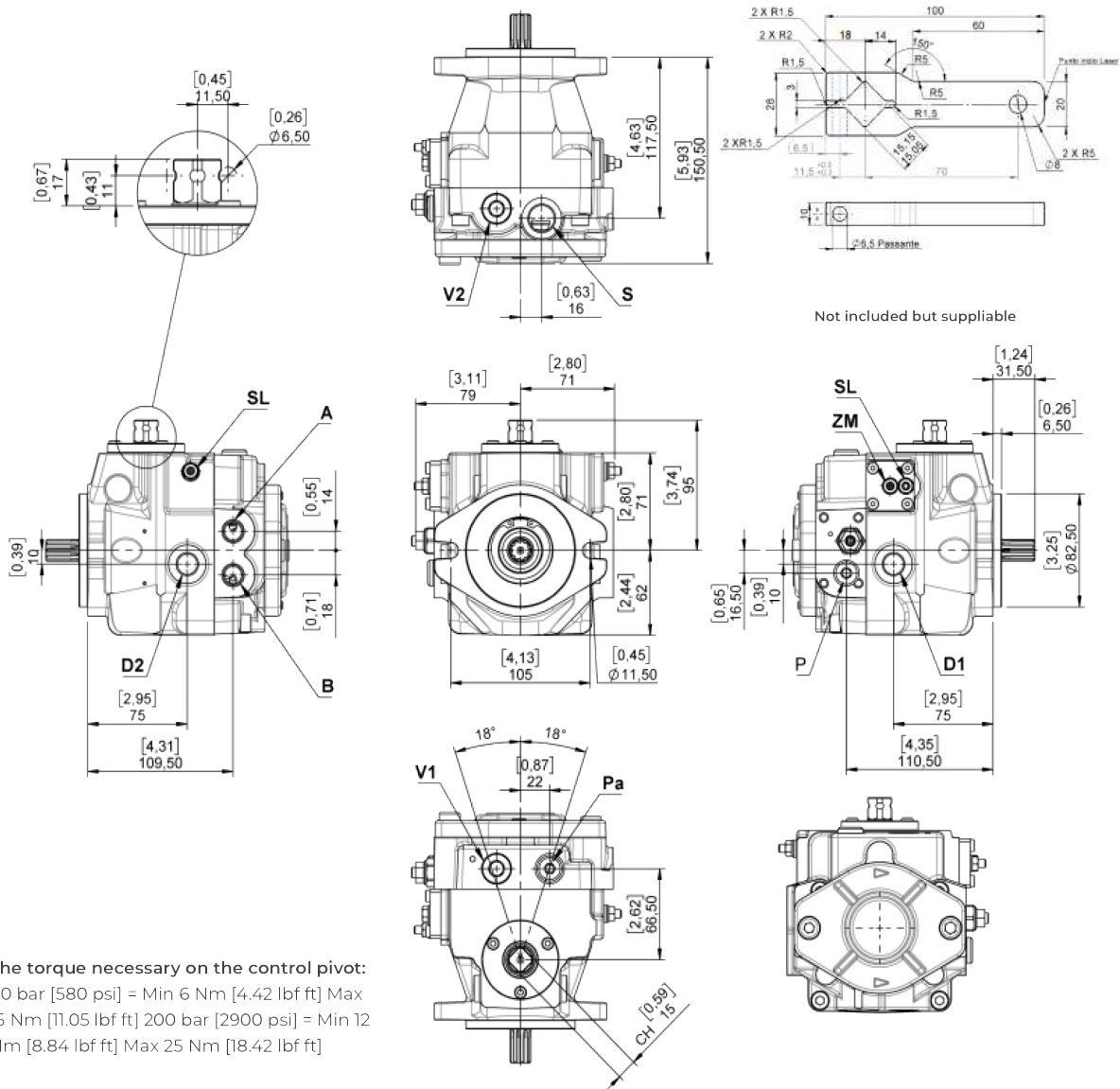


Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



SHAFT ROTATION	PUMP FLOW DIRECTION	
	Control rotation	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

PUMP AND CONTROL DIMENSIONS



The torque necessary on the control pivot:
 40 bar [580 psi] = Min 6 Nm [4.42 lbf ft] Max 15 Nm [11.05 lbf ft]
 200 bar [2900 psi] = Min 12 Nm [8.84 lbf ft] Max 25 Nm [18.42 lbf ft]

METRIC VERSION

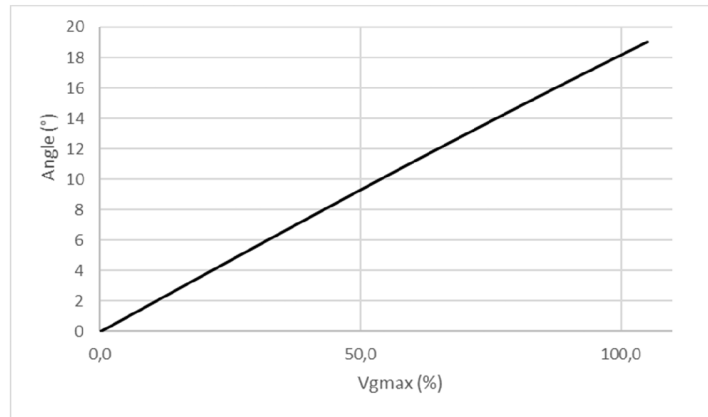
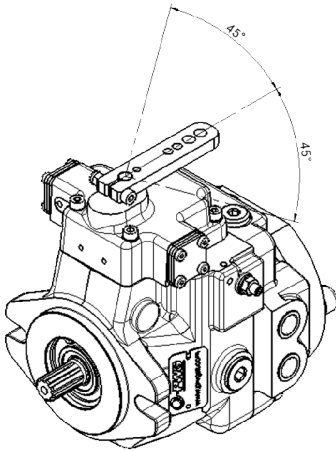
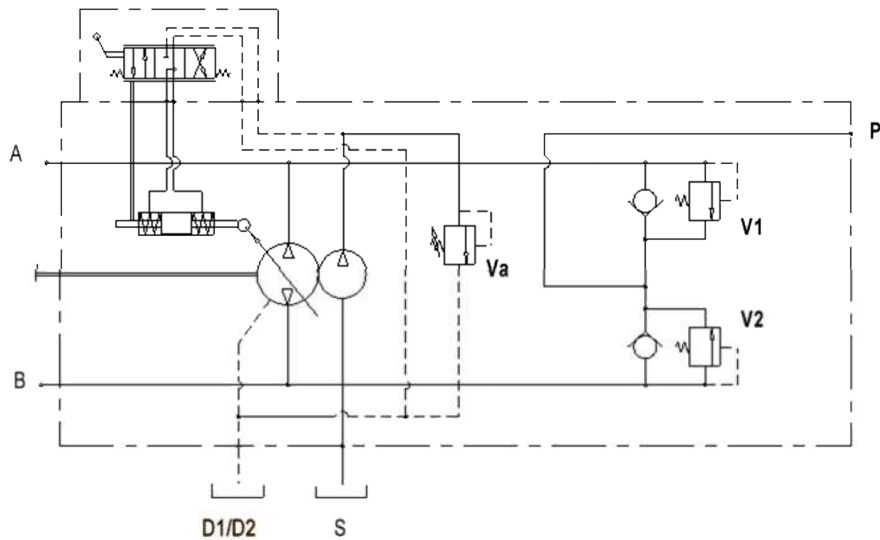
- A - B: Pressure ports - 3/8 G
- D1-D2: Drain port - 3/8 G
- S: Suction port - 1/2 G
- P: Charge pressure port - 1/4 G
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 1/4 G

SAE VERSION

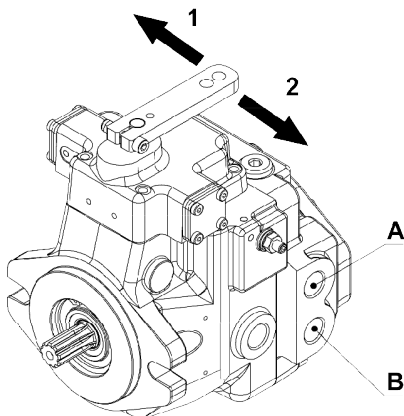
- CT114: A - B: Pressure ports - 9/16-18 UNF-2B
- CT118: A - B: Pressure ports - 3/4-16 UNF-2B
- D1: Drain port - 9/16-18 UNF-2B
- S: Suction port - 3/4-16 UNF-2B
- P: Charge pressure port - 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 7/16-20 UNF-2B

MANUAL LEVER WITH FEED-BACK CONTROL

The displacement of the pump is directly proportional to the angle of the lever.
The diagram below shows the relationship between angle and displacement.

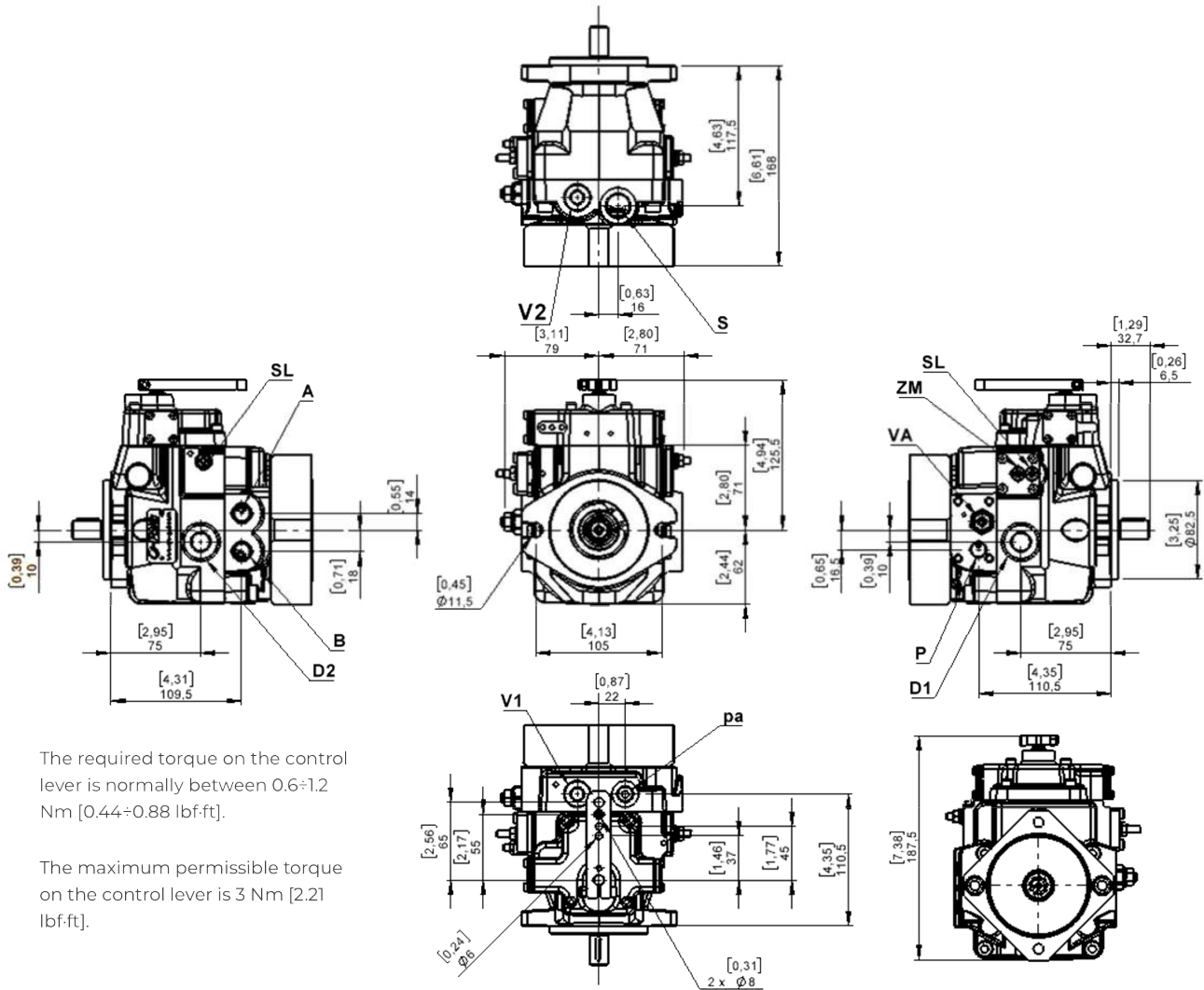


Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



DIREZIONE PORTATA POMPA PUMP FLOW DIRECTION		
ROTAZIONE ALBERO SHAFT ROTATION	Rotazione comando Control rotation	Pressione ramo Pressure port
SINISTRO (L)	1	A
	2	B
DESTRO (R)	1	B
	2	A

PUMP AND CONTROL DIMENSIONS



The required torque on the control lever is normally between 0.6÷1.2 Nm [0.44÷0.88 lbf-ft].

The maximum permissible torque on the control lever is 3 Nm [2.21 lbf-ft].

METRIC VERSION

A – B: Pressure ports – 3/8 G

D1-D2: Drain port – 3/8 G

S: Suction port – 1/2 G

P: Charge pressure port – 1/4 G

VA: Charge pump valve

V1 – V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa: High pressure port - 1/4 G

SAE VERSION

C114: **A – B:** Pressure ports – 9/16-18 UNF-2B

C118: **A – B:** Pressure ports – 3/4-16 UNF-2B

D1 : Drain port – 9/16-18 UNF-2B

S: Suction port – 3/4-16 UNF-2B

P: Charge pressure port – 7/16-20 UNF-2B

VA: Charge pump valve

V1 – V2: Pressure relief valves

SL: Stroke limiter

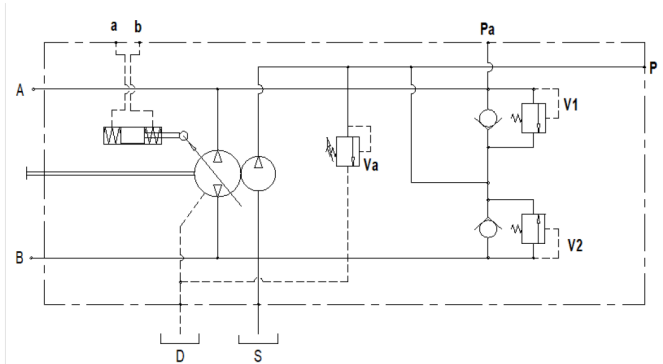
High pressure port - 7/16-20 UNF-2B

ZM: Mechanical zero adjustment screw

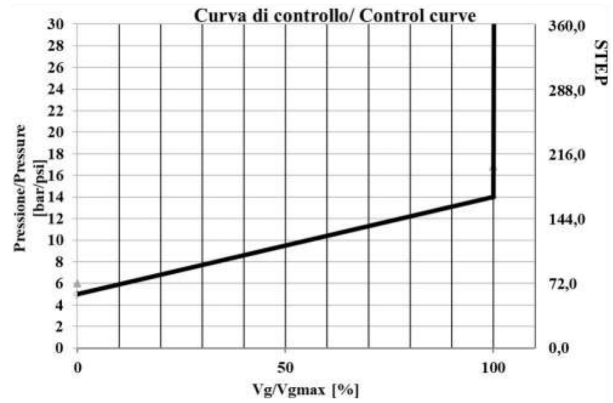
pa: High pressure port - 7/16-20 UNF-2B

HYDRAULIC PROPORTIONAL WITHOUT FEED-BACK CONTROL

The pump displacement is proportional to the pilot pressure on "a" or "b" piloting ports, which also affect flow direction. Feeding pressure to the control joystick can be provided by charge pressure from P port. The piloting pressure must then be controlled by said joystick or by a pressure reducing valve (not supplied).

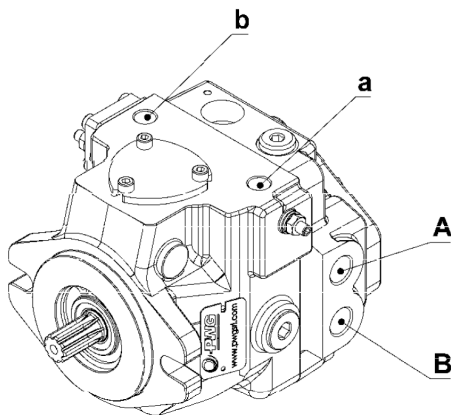


Pressione di pilotaggio = 5÷14 bar [73÷203 psi] (su a, b)
 Inizio regolazione = 5 bar [73 psi]
 Fine regolazione = 14 bar [203 psi] (Massima cilindrata)
 Massima pressione applicabile = 30 bar [435 psi]



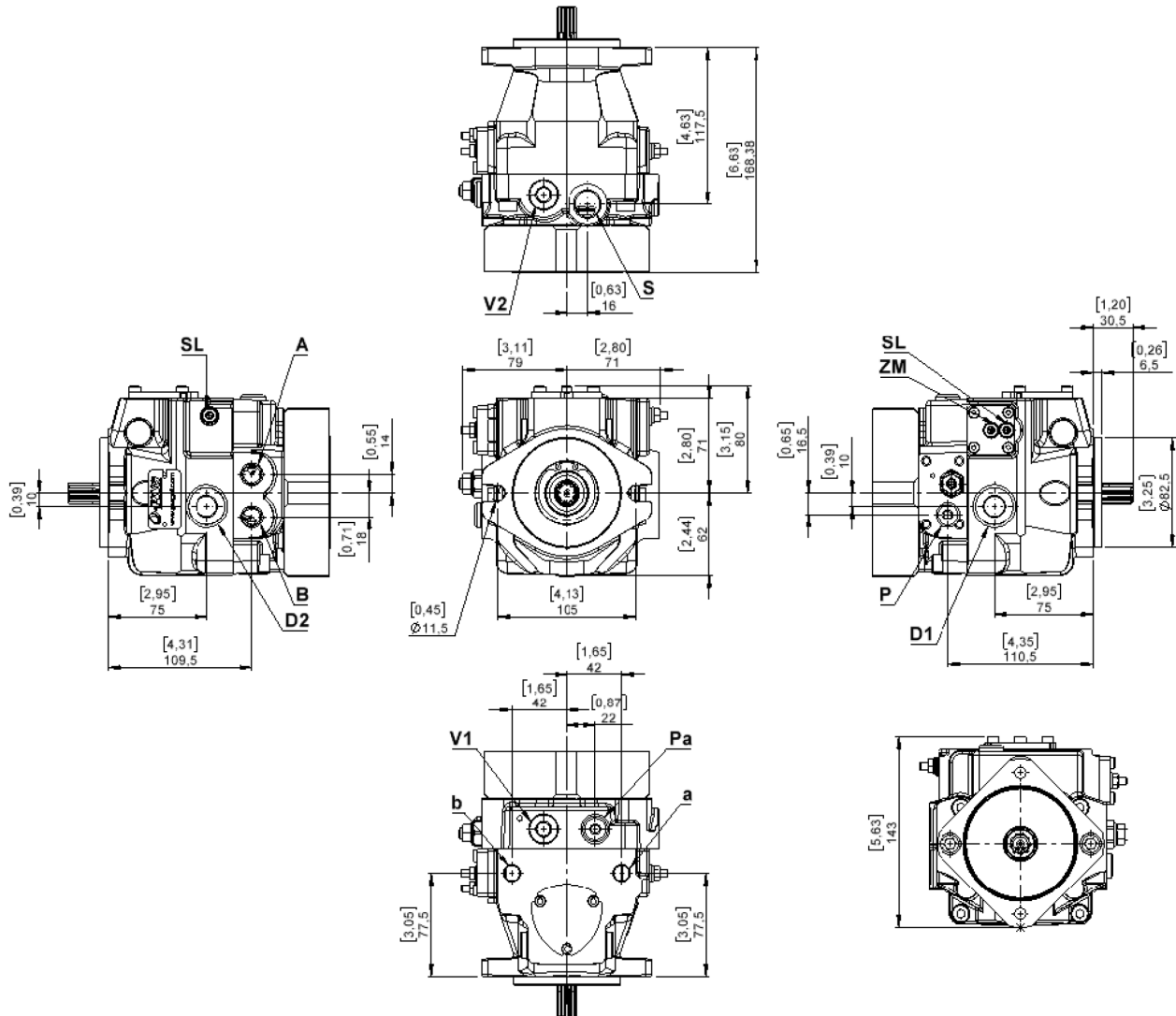
Pilot pressure = 5÷14 bar [73÷203psi] (at ports a, b)
 Start of control = 5 bar [73 psi]
 End of control = 14 bar [203 psi] (Max displacement)
 Max pressure = 30 bar [435 psi]

Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



DIREZIONE PORTATA POMPA PUMP FLOW DIRECTION		
ROTAZIONE ALBERO SHAFT ROTATION	Rotazione comando Control rotation	Pressione ramo Pressure port
SINISTRO (L)	a	B
	b	A
DESTRO (R)	a	A
	b	B

PUMP AND CONTROL DIMENSIONS



VERSIONE METRICA / METRIC VERSION

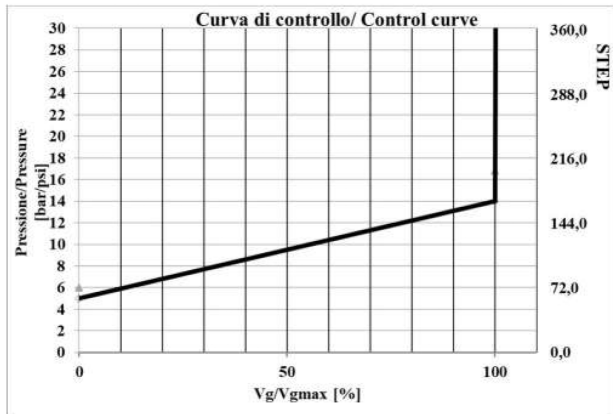
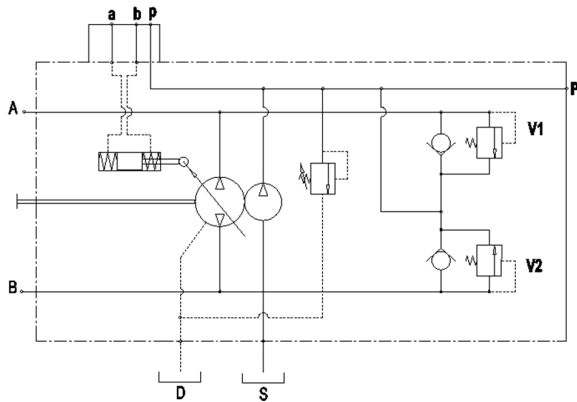
A - B: Pressure ports - 3/8 G
D1-D2: Drain port - 3/8 G
S: Suction port - 1/2 G
P: Charge pressure port - 1/4 G
VA: Charge pump valve
V1 - V2: Pressure relief valves
SL: Stroke limiter
ZM: Mechanical zero adjustment screw
a - b: Control piloting pressure port - 1/4 G
pa: High pressure port - 1/4 G

SAE VERSION

C114: A - B: Pressure ports - 9/16-18 UNF-2B
C118: A - B: Pressure ports - 3/4-16 UNF-2B
D1: Drain port - 9/16-18 UNF-2B
S: Suction port - 3/4-16 UNF-2B
P: Charge pressure port - 7/16-20 UNF-2B
VA: Charge pump valve
V1 - V2: Pressure relief valves
SL: Stroke limiter
a - b: Control piloting pressure port - 7/16-20 UNF-2B
pa: High pressure port - 7/16-20 UNF-2B

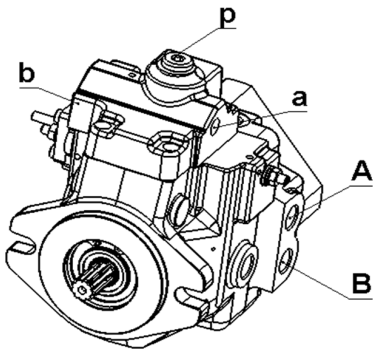
HYDRAULIC PROPORTIONAL WITHOUT FEED-BACK CONTROL

The pump displacement is proportional to the pilot pressure on "a" or "b" piloting ports, which also affect flow direction. Feeding pressure to the control joystick can be provided by charge pressure from P port. The piloting pressure must then be controlled by said joystick or by a pressure reducing valve (not supplied).



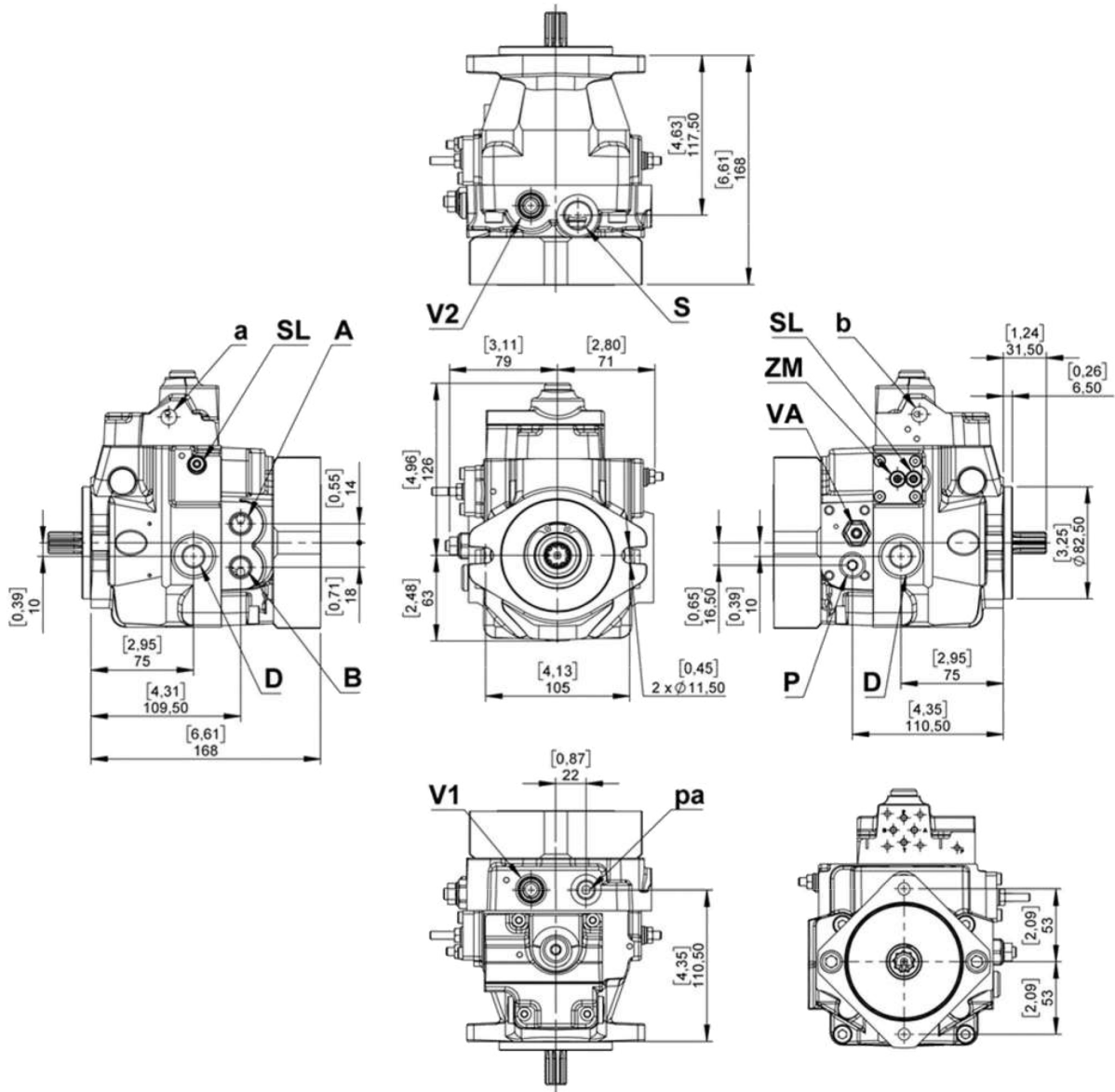
Pilot pressure = 5÷14 bar [73÷203psi](at ports a, b)
 Start of control = 5 bar [73 psi] End of control = 14 bar [203 psi](Max displacement) Max pressure = 30 bar [435 psi]

Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Control rotation	Pressure port
(L)	a	B
	b	A
(R)	a	A
	b	B

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

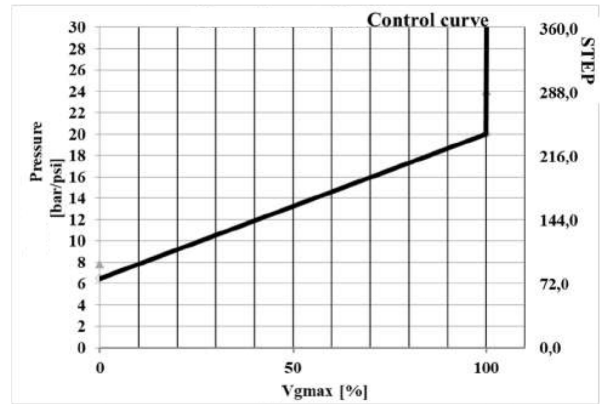
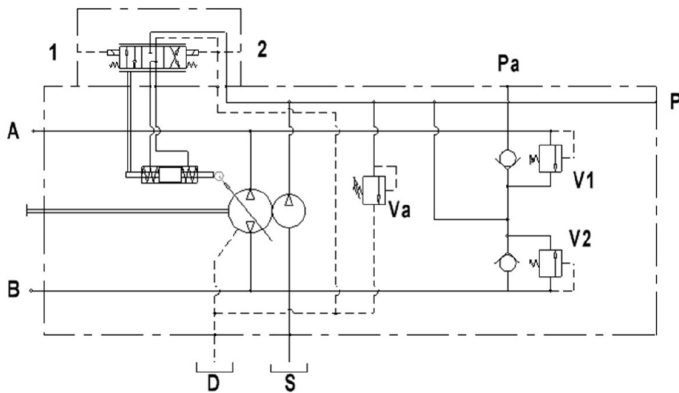
- A – B: Pressure ports – 3/8 G
- D1-D2: Drain port – 3/8 G
- S: Suction port – 1/2 G
- P: Charge pressure port – 1/4 G
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- a – b: Control piloting pressure port - 1/4 G
- pa: High pressure port - 1/4 G

SAE VERSION

- C114:** A – B: Pressure ports – 9/16-18 UNF-2B
- C118:** A – B: Pressure ports – 3/4-16 UNF-2B
- D1: Drain port – 9/16-18 UNF-2B
- S: Suction port – 3/4-16 UNF-2B
- P: Charge pressure port – 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- a – b: Control piloting pressure port - 7/16-20 UNF-2B
- pa: High pressure port - 7/16-20 UNF-2B

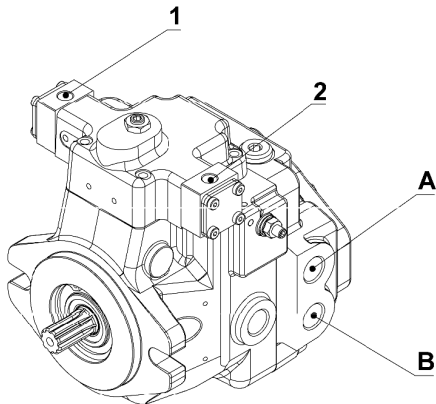
HYDRAULIC PROPORTIONAL WITH FEED-BACK CONTROL

The pump displacement is proportional to the pilot pressure on “a” or “b” ports which also affect flow direction. Piloting can be provided by charge pressure from P port. The piloting pressure will then have to be controlled by a joystick or by a pressure reducing valve (not supplied).



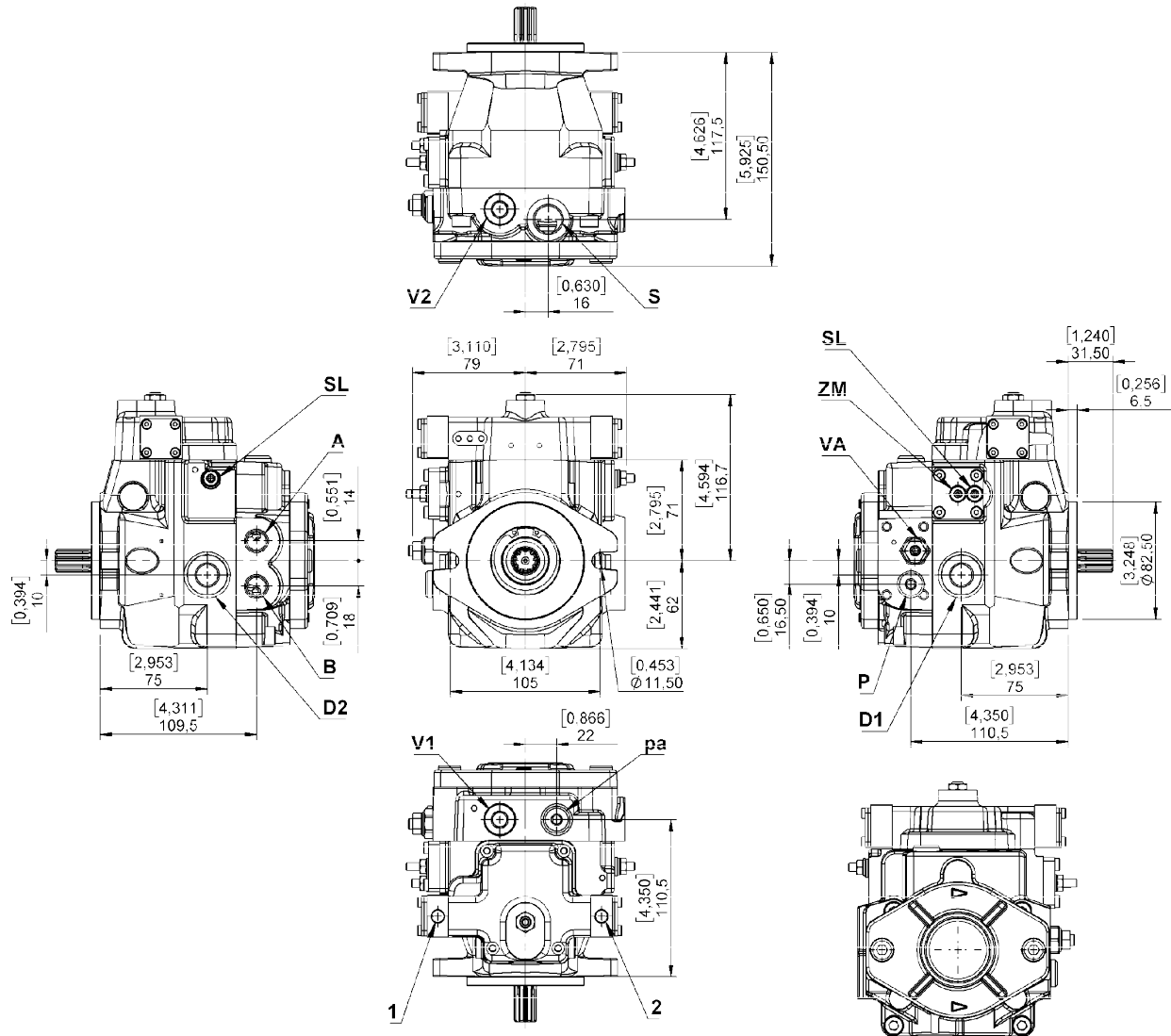
Pilot pressure = 6,5±20 bar [94±290 psi](at ports a, b)
 Start of control = 6,5 bar [94 psi]
 End of control = 20 bar [290 psi](Max displacement)
 Max pressure = 30 bar [435 psi]

Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Piloting Pressure	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

A – B: Pressure ports – 3/8 G

D1-D2: Drain port – 3/8 G S: Suction port – 1/2 G

P: Charge pressure port – 1/4 G

VA: Charge pump valve

V1 – V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

ZI: Hydraulic zero regulation screw

pa: High pressure port - 1/4 G

1-2: pressure port - 1/8 G

SAE VERSION

C114: A – B: Pressure ports – 9/16-18 UNF-2B

C118: A – B: Pressure ports – 3/4-16 UNF-2B

D1: Drain port – 9/16-18 UNF-2B

S: Suction port – 3/4-16 UNF-2B

P: Charge pressure port – 7/16-20 UNF-2B

VA: Charge pump valve

V1 – V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

ZI: Hydraulic zero regulation screw

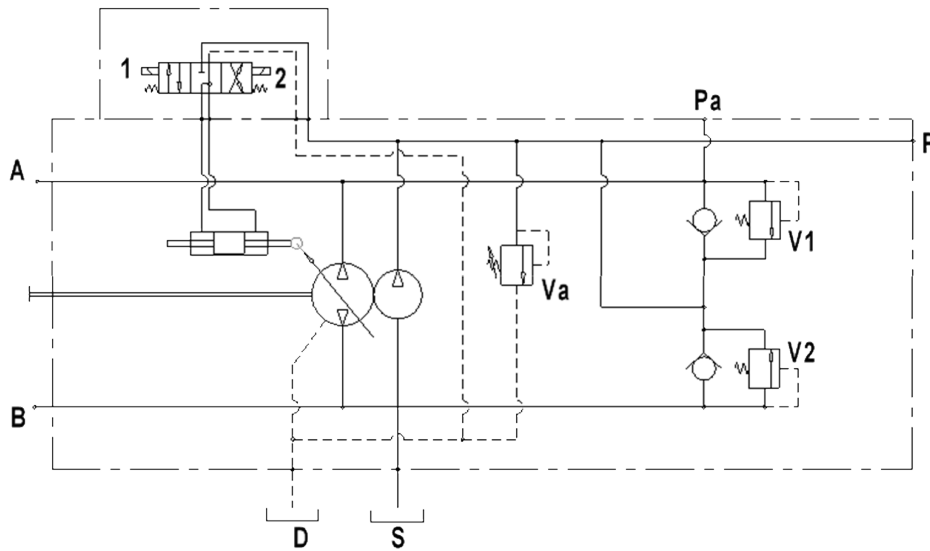
pa: High pressure port - 7/16-20 UNF-2B

1-2: Control piloting pressure port - 7/16-20 UNF-2B

C1 EI2-EI4

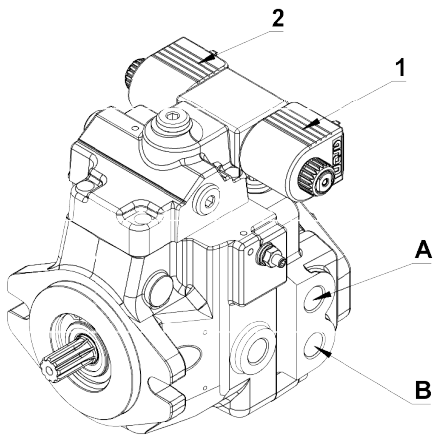
PROPORTIONAL WITH FEED-BACK CONTROL

Impulse control where the displacement of the pump is function of the number of inputs of current to one of the two proportional solenoids. The servocontrol is without zeroing spring, therefore the piston of the servocontrol stays in the position until a new input of current is fed to the solenoids. Flow direction depends on which solenoid is energized.



Standard connector DIN: Please contact sales department for Deutsch connectors

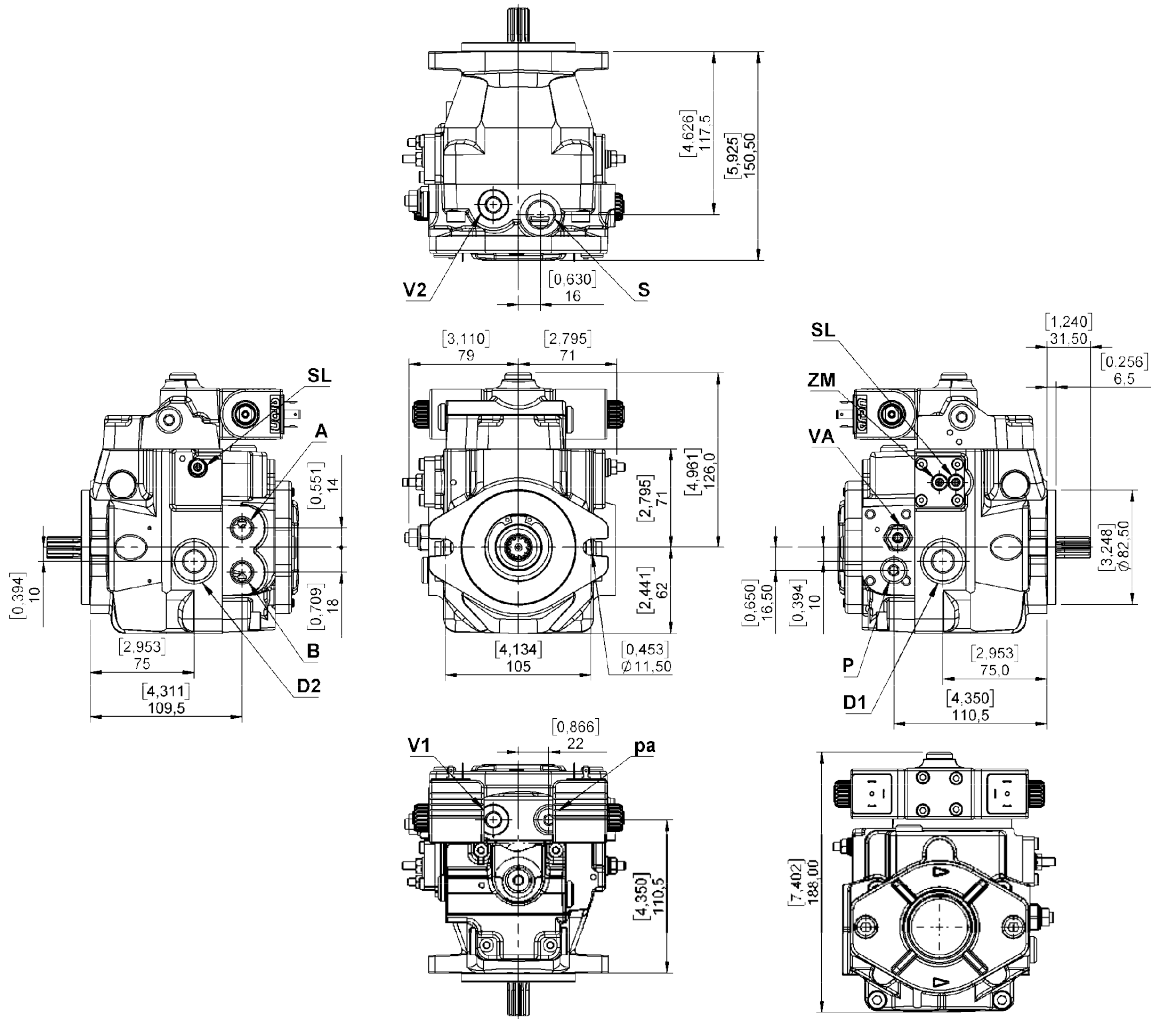
Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Energized Solenoid	Pressure port
(L)	1	A
	2	B
(R)	1	B
	2	A

C1 EI2-EI4

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

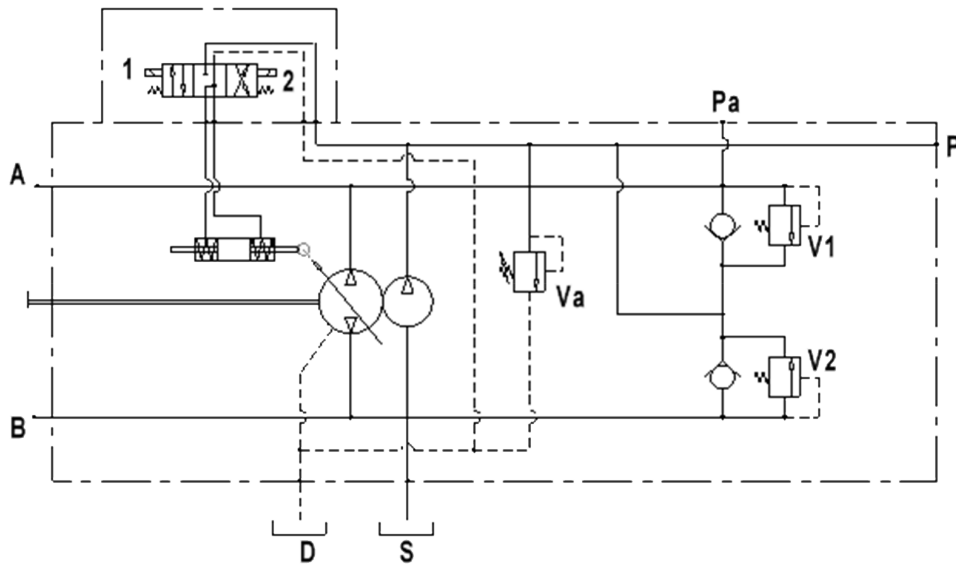
- A - B: Pressure ports - 3/8 G
- D1-D2: Drain port - 3/8 G
- S: Suction port - 1/2 G
- P: Charge pressure port - 1/4 G
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 1/4 G

SAE VERSION

- C114:** A - B: Pressure ports - 9/16-18 UNF-2B
- C118:** A - B: Pressure ports - 3/4-16 UNF-2B
- D1: Drain port - 9/16-18 UNF-2B
- S: Suction port - 3/4-16 UNF-2B
- P: Charge pressure port - 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 7/16-20 UNF-2B

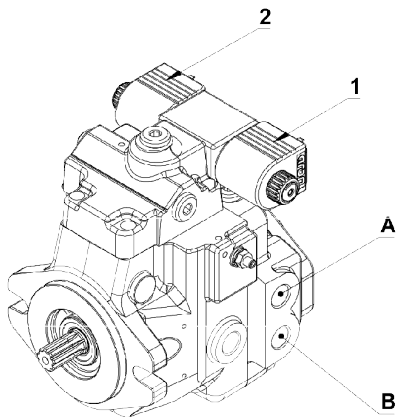
ELECTRIC TWO POSITIONS ON-OFF

By switching on one of the ON-OFF solenoids, the pump swivels to maximum displacement in the corresponding output flow direction of the stated solenoid. Switching off charge pressure, the pump return to zero displacement position.



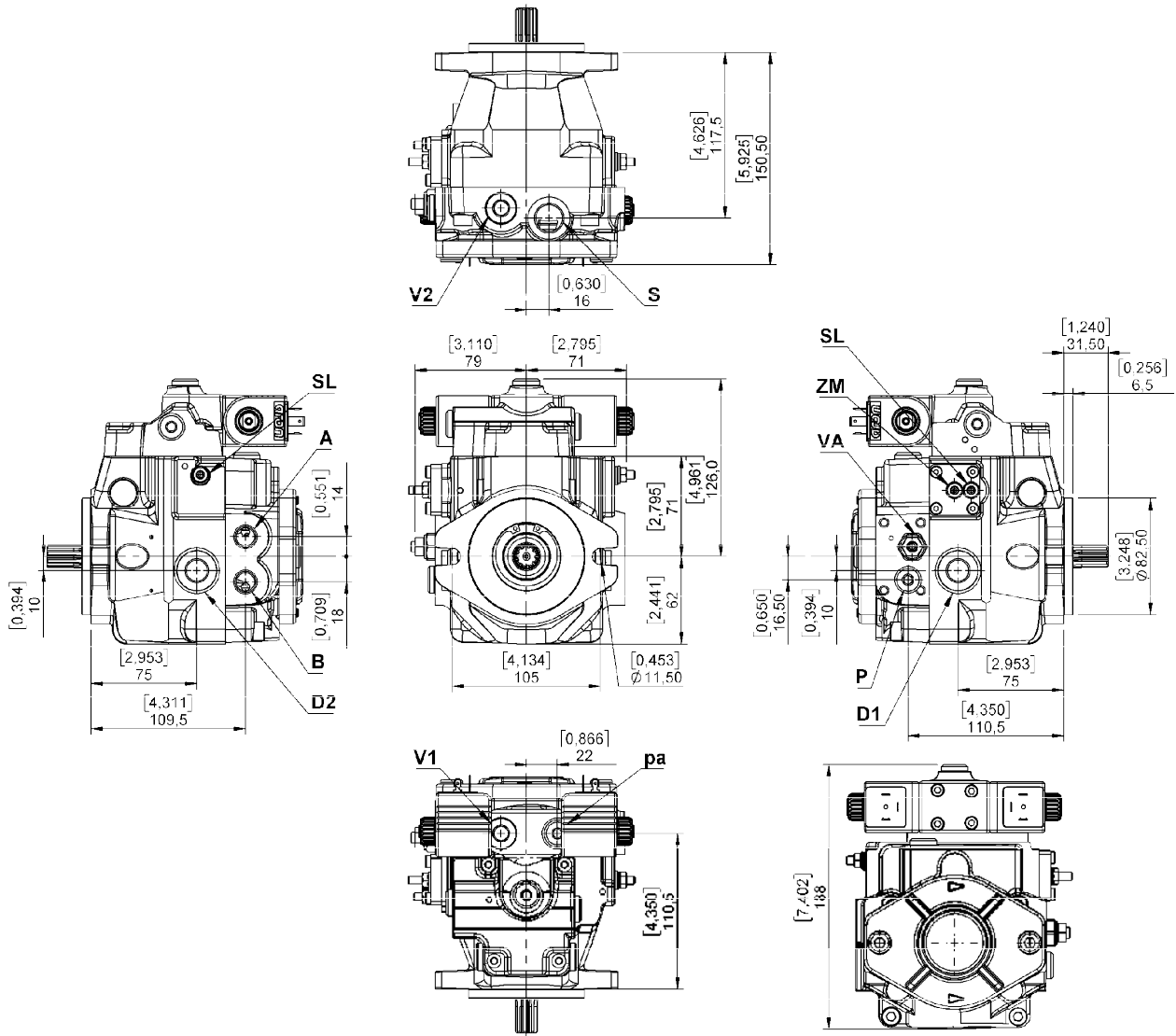
Standard connector DIN: Please contact sales department for Deutsch connectors

Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Energized Solenoid	Pressure port
(L)	1	A
	2	B
(R)	1	B
	2	A

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

A - B: Pressure ports - 3/8 G

D1-D2: Drain port - 3/8 G

S: Suction port - 1/2 G

P: Charge pressure port - 1/4 G

VA: Charge pump valve

V1 - V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa: High pressure port - 1/4 G

SAE VERSION

C114: A - B: Pressure ports - 9/16-18 UNF-2B

C118: A - B: Pressure ports - 3/4-16 UNF-2B

D1: Drain port - 9/16-18 UNF-2B

S: Suction port - 3/4-16 UNF-2B

P: Charge pressure port - 7/16-20 UNF-2B

VA: Charge pump valve

V1 - V2: Pressure relief valves

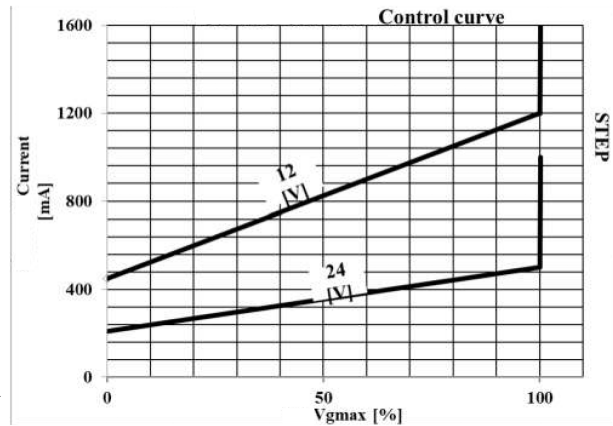
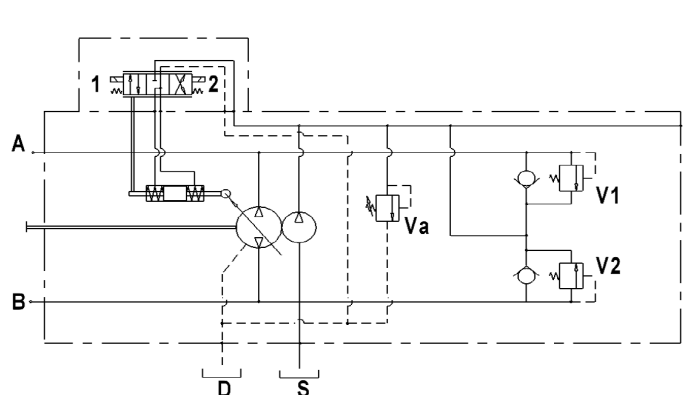
SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa: High pressure port - 7/16-20 UNF-2B

ELECTRIC PROPORTIONAL WITH FEED-BACK CONTROL

The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. Flow direction depends on which solenoid is energized.

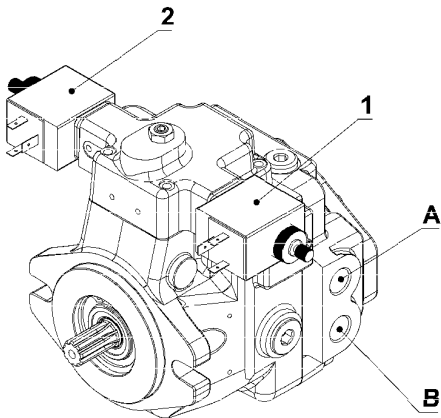


Solenoid 12V: Current min. 450 mA max 1600 mA
Coil resistance 5 Ω

Solenoid 24V: Current min. 210 mA max 1000 mA
Coil resistance 19 Ω

Standard connector DIN: Please contact sales department for Deutsch connectors

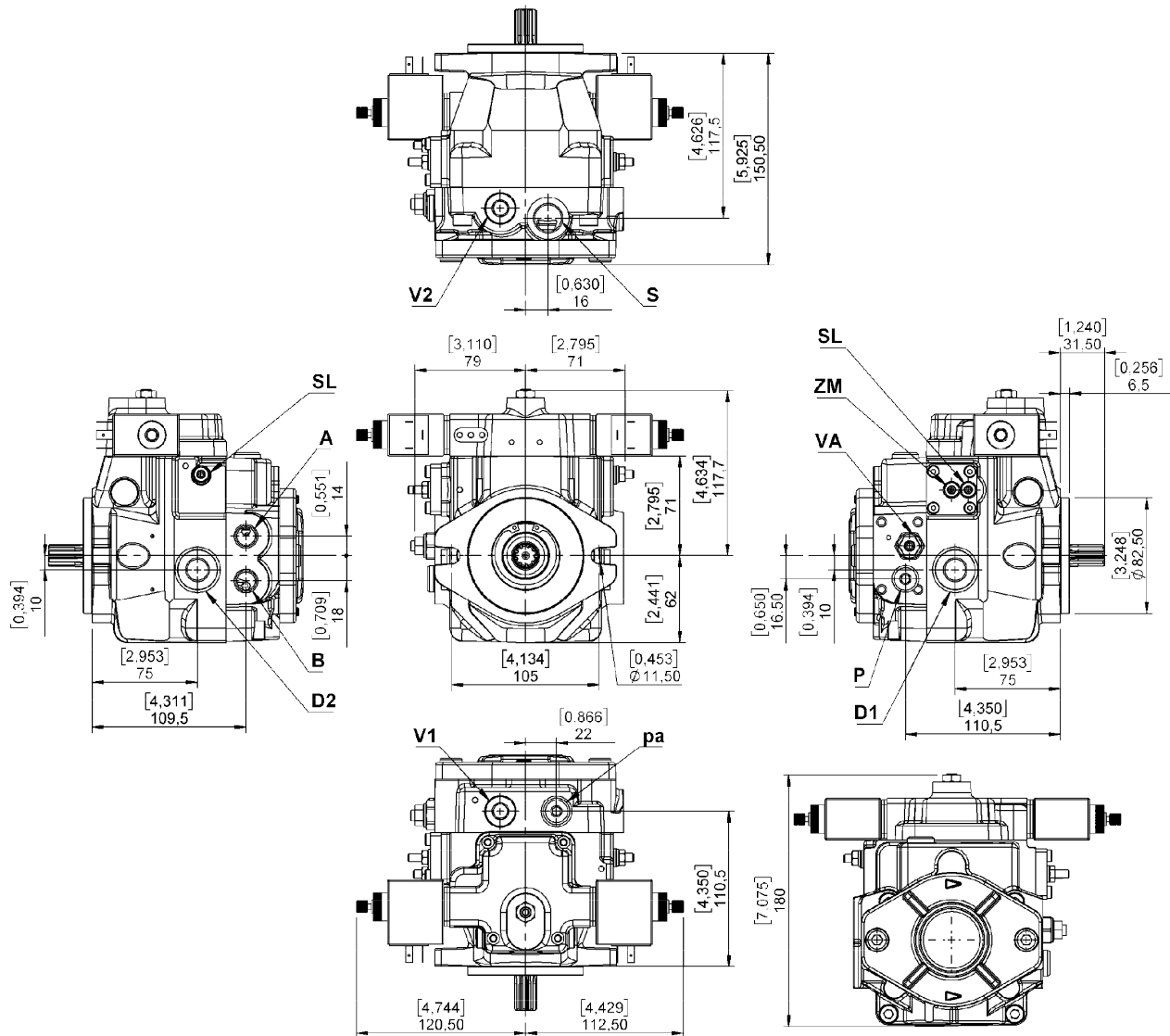
Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Energized Solenoid	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

C1 ER2-ER4

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

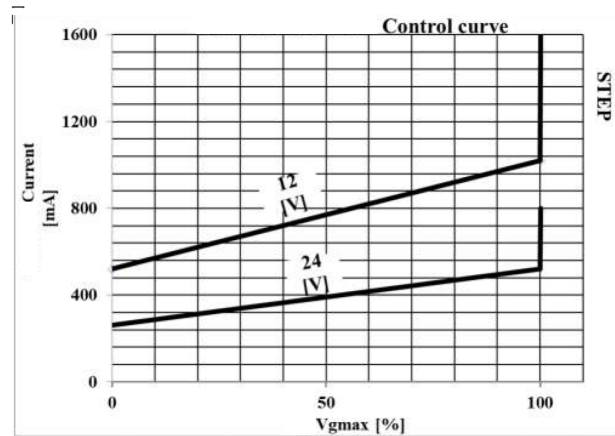
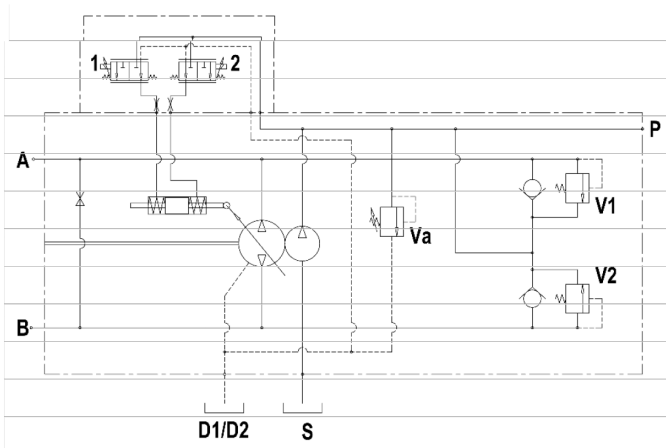
- A – B: Pressure ports – 3/8 G
- D1-D2: Drain port – 3/8 G
- S: Suction port – 1/2 G
- P: Charge pressure port – 1/4 G
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 1/4 G

SAE VERSION

- C114:** A – B: Pressure ports – 9/16-18 UNF-2B
- C118:** A – B: Pressure ports – 3/4-16 UNF-2B
- D1: Drain port – 9/16-18 UNF-2B
- S: Suction port – 3/4-16 UNF-2B
- P: Charge pressure port – 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 7/16-20 UNF-2B

ELECTRIC PROPORTIONAL WITHOUT FEED-BACK CONTROL

The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids. Flow is also influenced by the working pressure. With a given input signal (piloting current) the pump can slightly vary the displacement and the flow when working pressure increases. The input current of the two proportional solenoids must be controlled by an external amplifier card. Flow direction depends on which solenoid is energized.

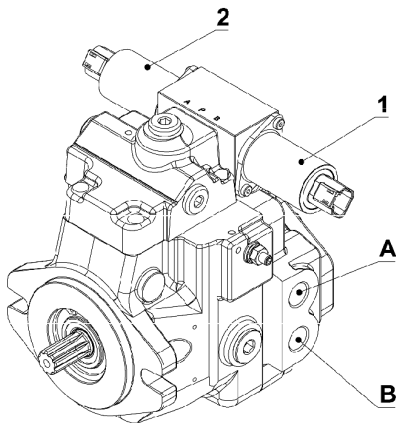


Solenoid 12V: Current min. 500 mA max 1600 mA
Coil resistance 5.4 Ω

Solenoid 24V: Current min. 250 mA max 800 mA
Coil resistance 21 Ω

For proportional valve use connector with this features: "DEUTSCH CONNECTOR - DT04-2P (not included but can be supplied)

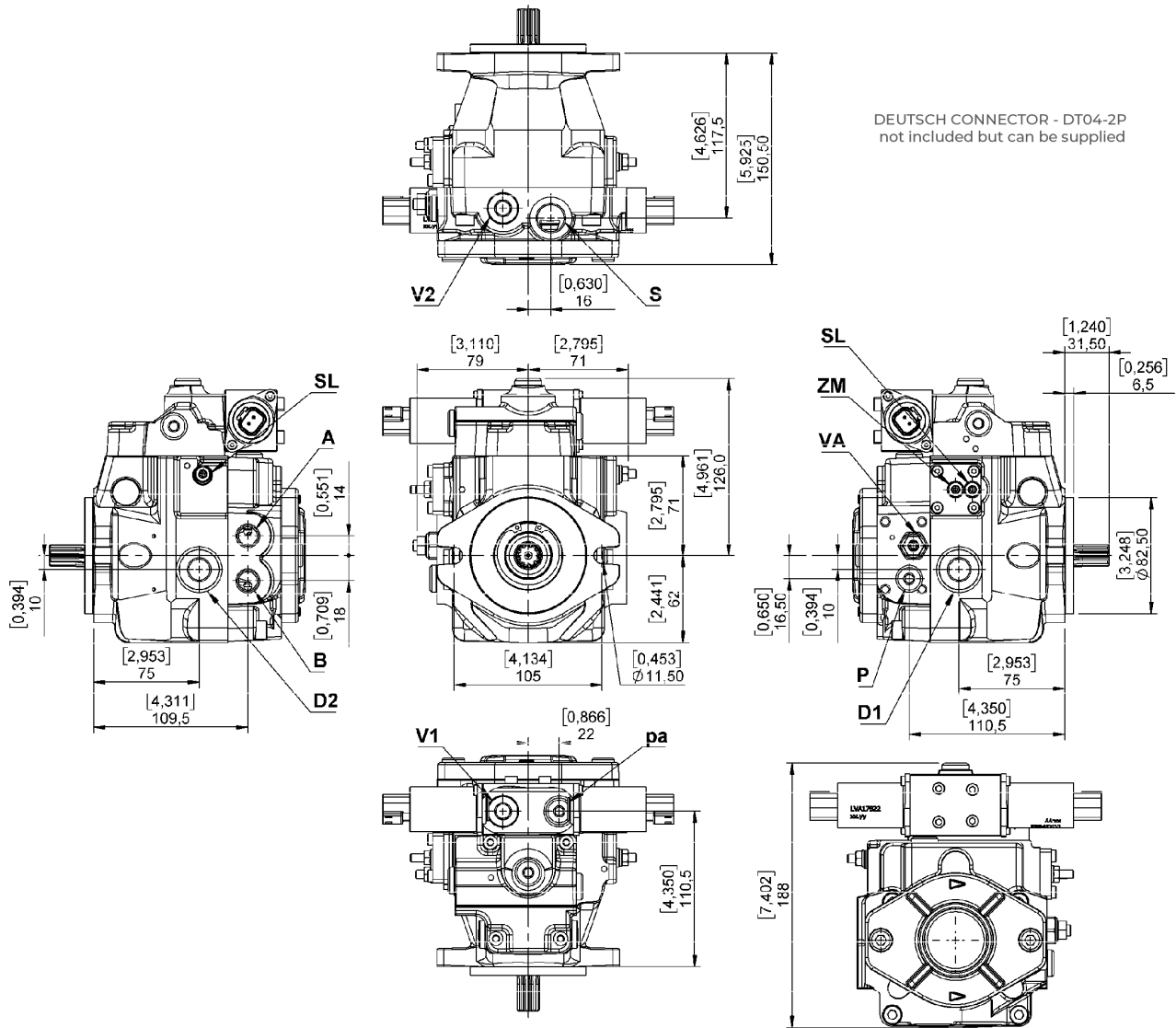
Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Energized Solenoid	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

C1 EP2-EP4

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

A - B: Pressure ports - 3/8 G

D1-D2: Drain port - 3/8 G

S: Suction port - 1/2 G

P: Charge pressure port - 1/4 G

VA: Charge pump valve

V1 - V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa: High pressure port - 1/4 G

SAE VERSION

C114: A - B: Pressure ports - 9/16-18 UNF-2B

C118: A - B: Pressure ports - 3/4-16 UNF-2B

D1: Drain port - 9/16-18 UNF-2B

S: Suction port - 3/4-16 UNF-2B

P: Charge pressure port - 7/16-20 UNF-2B

VA: Charge pump valve

V1 - V2: Pressure relief valves

SL: Stroke limiter

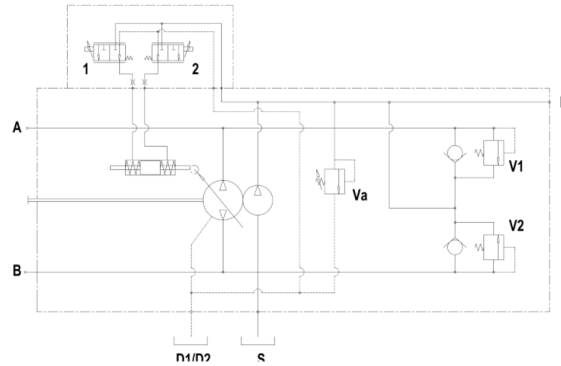
ZM: Mechanical zero adjustment screw

pa: High pressure port - 7/16-20 UNF-2B

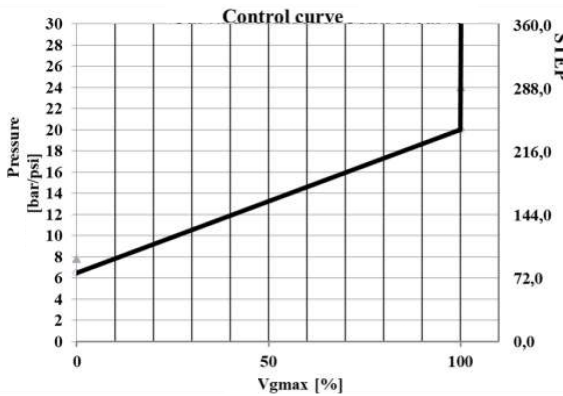
C1 EH2-EH4

HYDRAULIC + ELECTRIC PROPORTIONAL WITH FEED-BACK CONTROL

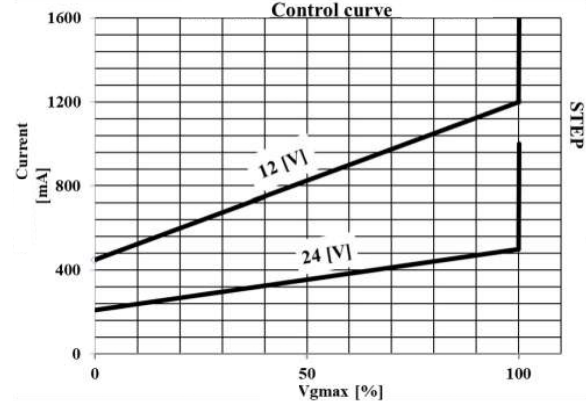
The displacement of the pump is directly proportional to the input current of one of the two proportional solenoids.
Flow direction depends on which solenoid is energized.



Hydraulic control



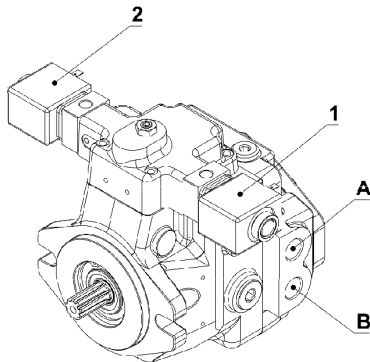
Electric control



Solenoid 12V: Current min. 700 mA max 2000 mA
Coil resistance 5,4 Ω

Solenoid 24V: Current min. 400 mA max 1600 mA
Coil resistance 19 Ω

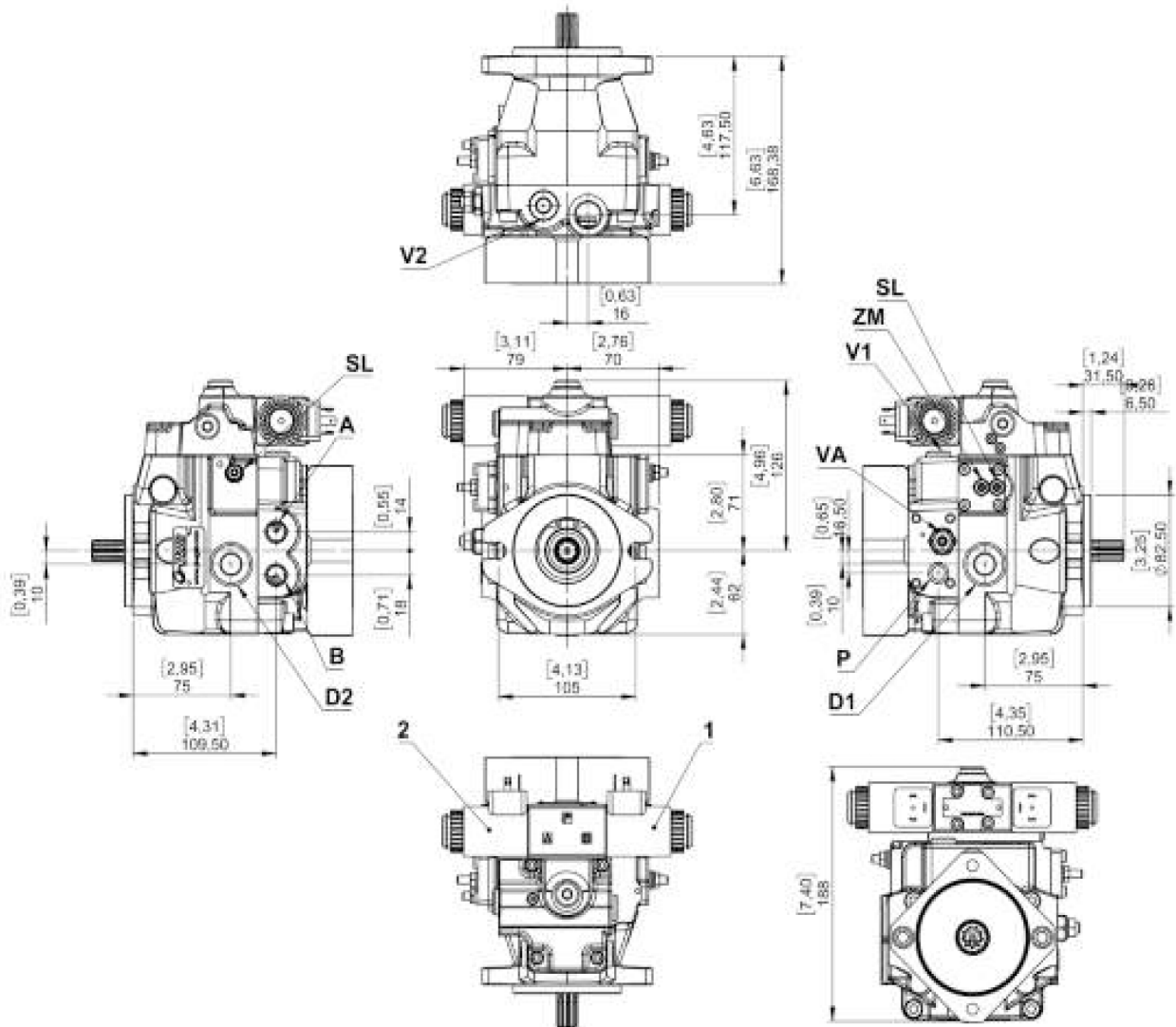
Direction of rotation: Correlation between direction of rotation (shaft view) control and direction of flow.



PUMP FLOW DIRECTION		
SHAFT ROTATION	Energized Solenoid	Pressure port
(L)	1	B
	2	A
(R)	1	A
	2	B

C1 EH2-EH4

PUMP AND CONTROL DIMENSIONS



METRIC VERSION

A - B: Pressure ports - 3/8 G

D1-D2: Drain port - 3/8 G

S: Suction port - 1/2 G

P: Charge pressure port - 1/4 G

VA: Charge pump valve

V1 - V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa: High pressure port - 1/4 G

a - b: Control piloting pressure port - 1/8 G

SAE VERSION

C114: A - B: Pressure ports - 9/16-18 UNF-2B

C118: A - B: Pressure ports - 3/4-16 UNF-2B

D1: Drain port - 9/16-18 UNF-2B

S: Suction port - 3/4-16 UNF-2B

P: Charge pressure port - 7/16-20 UNF-2B

VA: Charge pump valve

V1 - V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

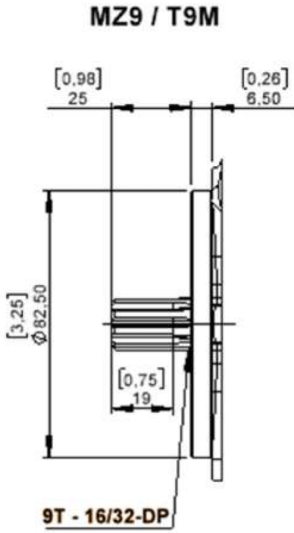
pa: High pressure port - 7/16-20 UNF-2B

a - b: Control piloting pressure port - 7/16-20 UNF-2B

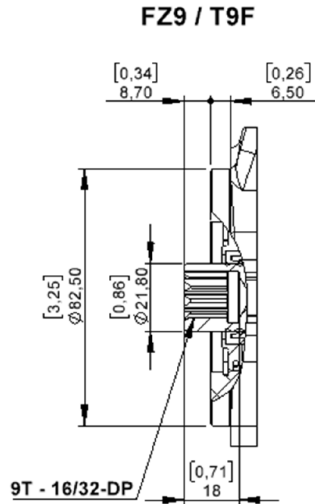
C1 14-18

SHAFTS DIMENSIONS

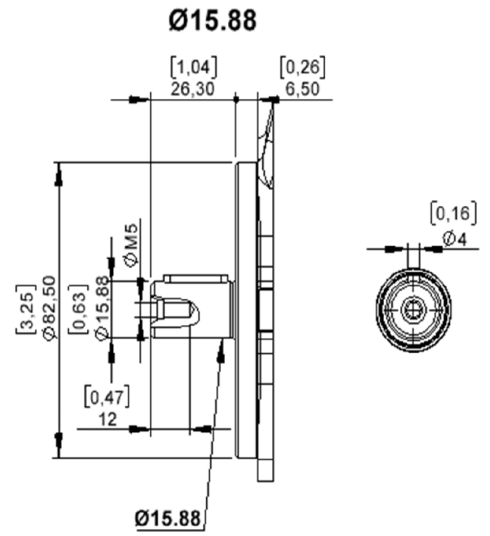
SPLINE SHAFT + ROUND SHAFT



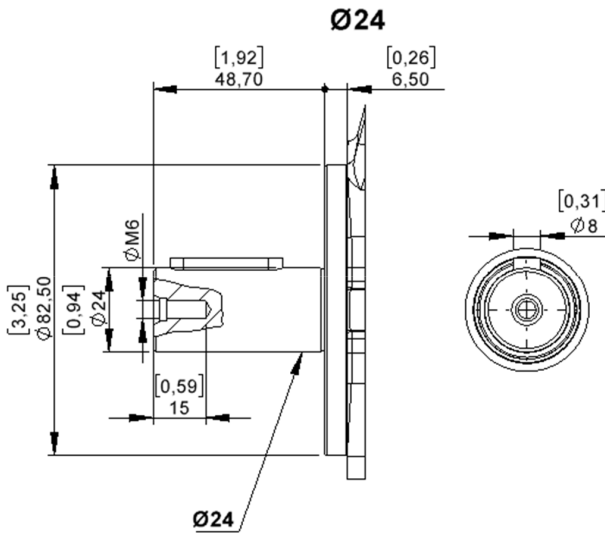
Maximum torque: 193 N m



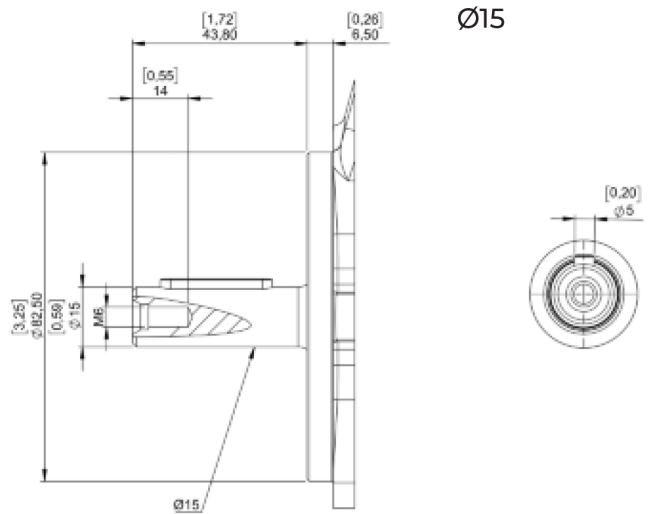
Maximum torque: 185 N m



Maximum torque: 79 N m



Maximum torque: 312 N m



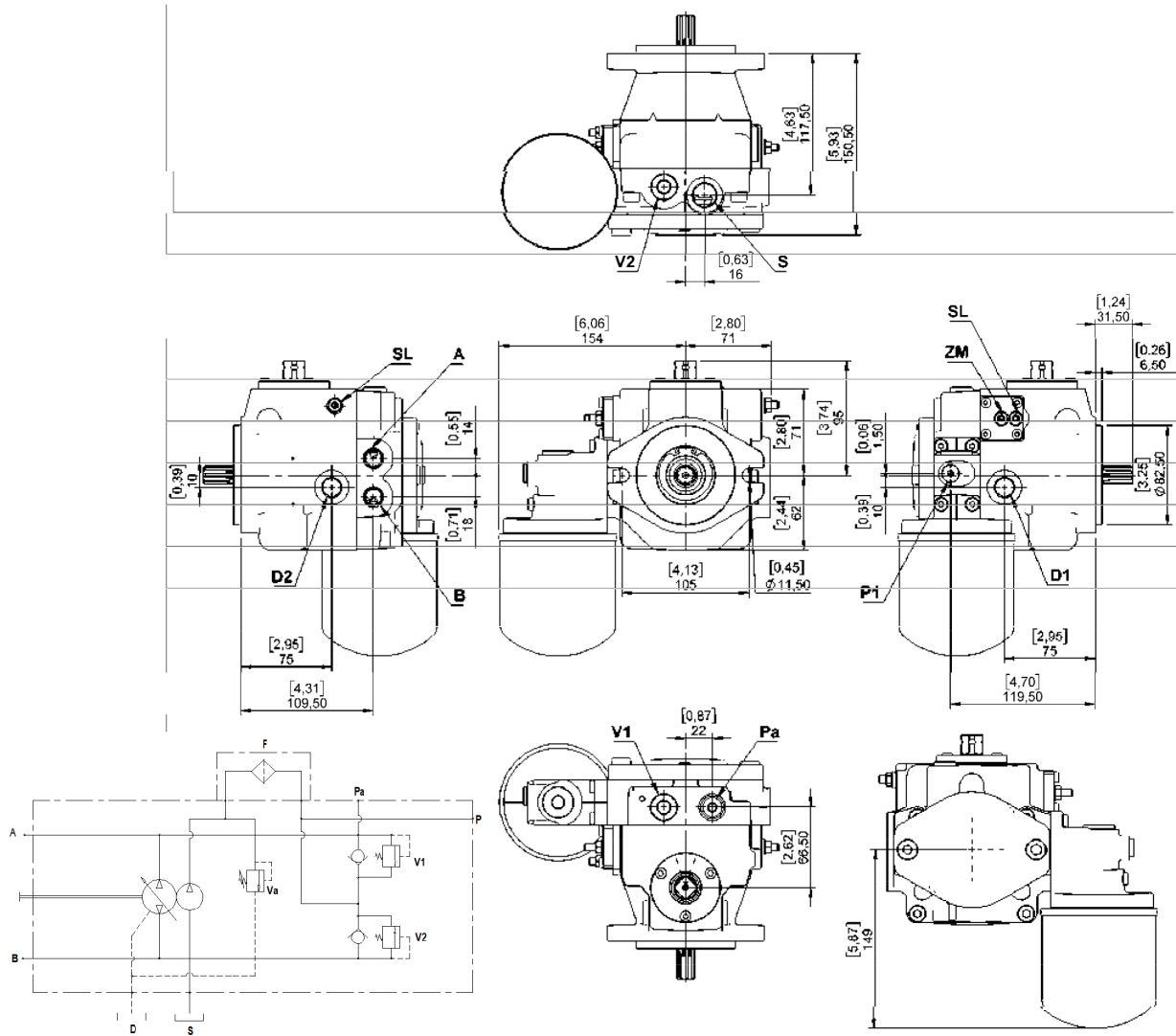
Maximum torque: 134 N m

C1 14-18

ACCESSORIES AND FILTER DIMENSIONS

Filter FI

This option involves mounting the filter cartridge directly on the pump and ensures that the oil directed to the closed circuit is filtered. The oil intended for the command, on the other hand, is not filtered.



METRIC VERSION

- A – B: Pressure ports – 3/8 G
- D1-D2: Drain port – 3/8 G
- S: Suction port – 1/2 G
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port – 1/4 G
- PI: Charge pressure port filtered – 1/8 G

SAE VERSION

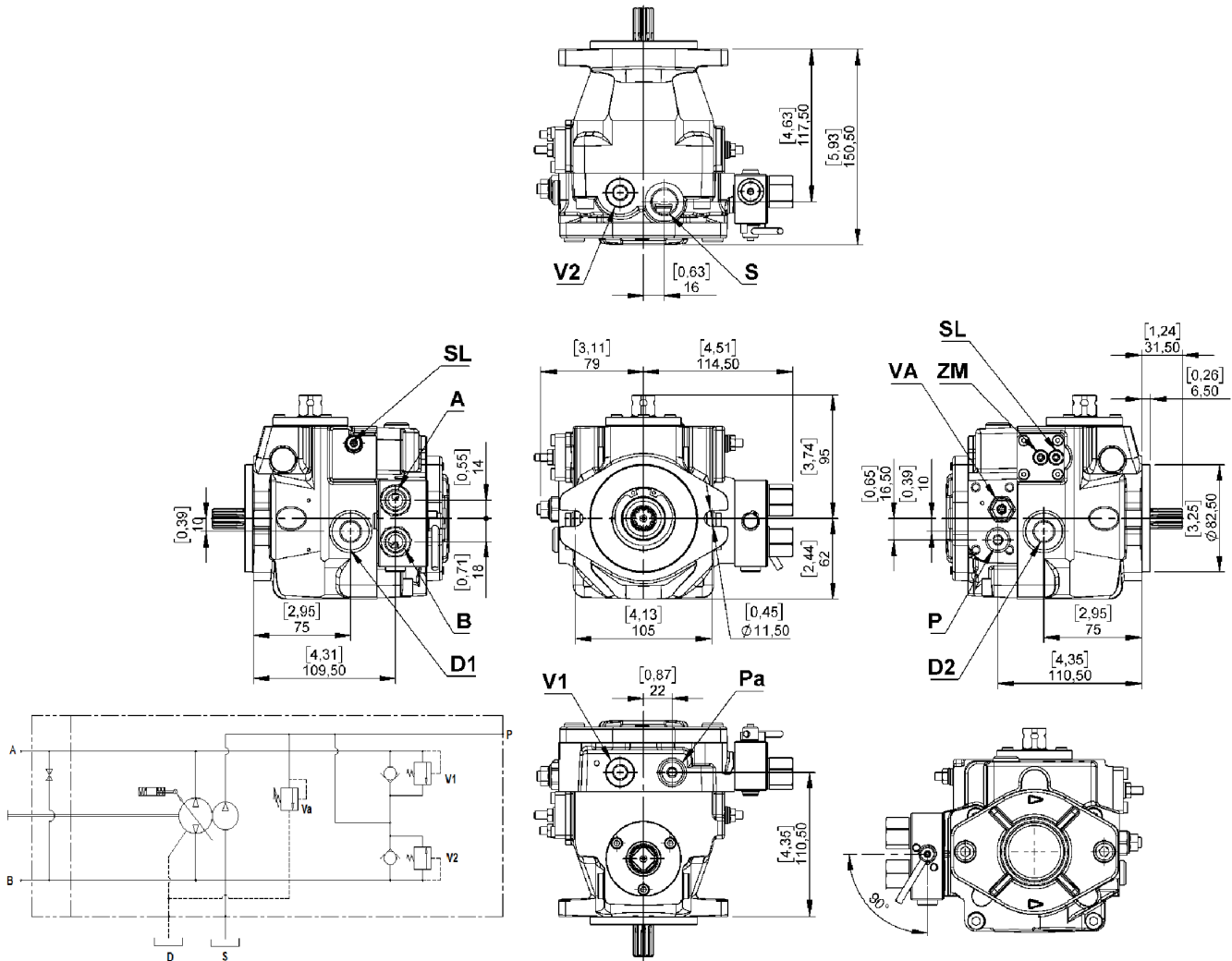
- C114:** A – B: Pressure ports – 9/16-18 UNF-2B
- C118:** A – B: Pressure ports – 3/4-16 UNF-2B
- D1: Drain port – 9/16-18 UNF-2B
- S: Suction port – 3/4-16 UNF-2B
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port – 7/16-20 UNF-2B
- PI: Charge pressure port filtered 7/16-20 UNF-2B

C1 14-18

ACCESSORIES AND FILTER DIMENSIONS

By-Pass

The By-pass valve is a tap inside the pump that allows, if necessary, to connect the pressure port line A and B.



METRIC VERSION

A – B: Pressure ports – 3/8 G

D1-D2: Drain port – 3/8 G

S: Suction port – 1/2 G

P: Charge pressure port – 1/4 G

VA: Charge pump valve

V1 – V2: Pressure relief valves

SL: Stroke limiter

ZM: Mechanical zero adjustment screw

pa:

SAE VERSION

C114: A – B: Pressure ports – 9/16-18 UNF-2B

C118: A – B: Pressure ports – 3/4-16 UNF-2B

D1-D2: Drain port – 9/16-18 UNF-2B

S: Suction port – 3/4-16 UNF-2B

P: Charge pressure port – 7/16-20 UNF-2B

VA: Charge pump valve

V1 – V2: Pressure relief valves

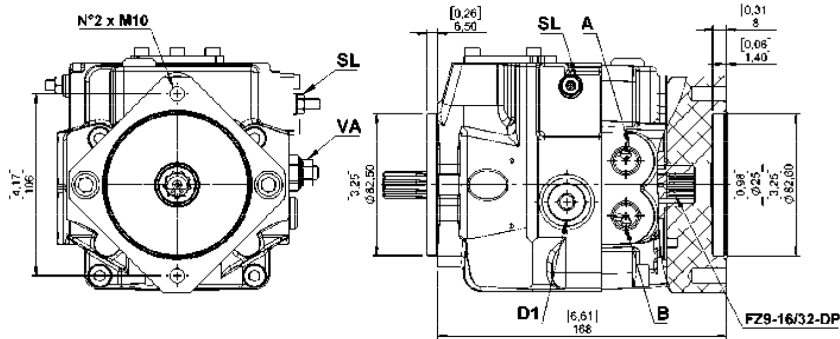
SL: Stroke limiter

ZM: Mechanical zero adjustment screw

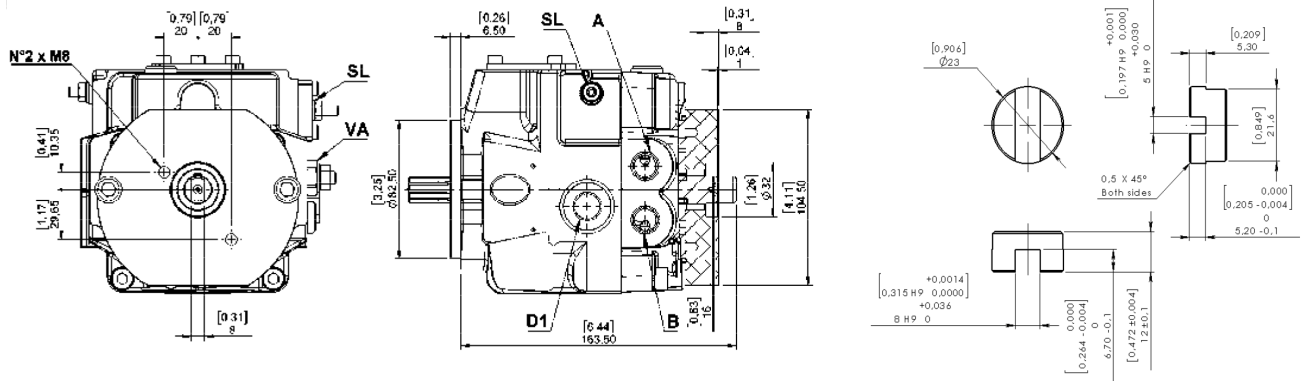
C1 14-18

THROUGH DRIVES DIMENSIONS

SAE-A Flange

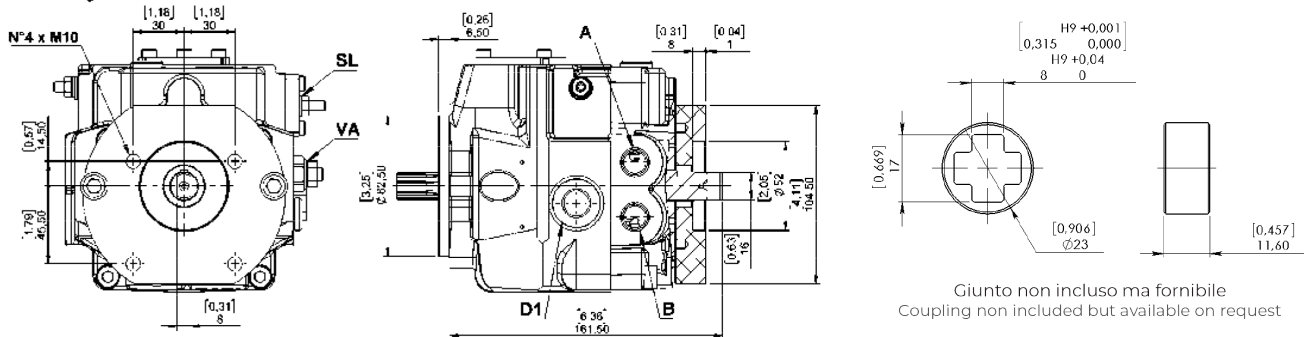


BOSCH GR.1 Flange



Giunto non incluso ma fornibile
Coupling non included but available on request

BOSCH GR.2 Flange

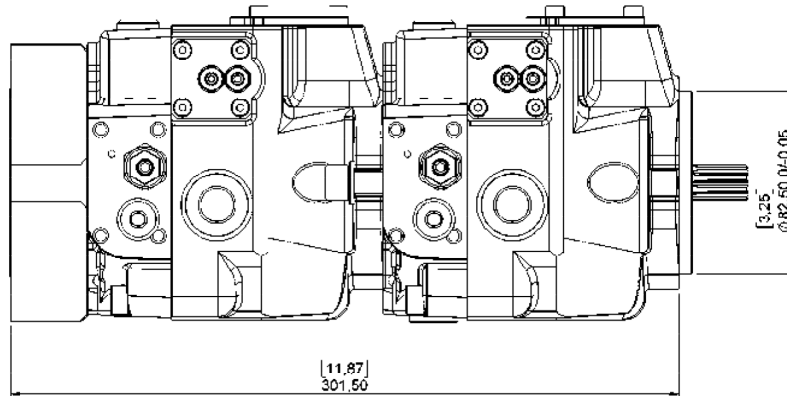


Giunto non incluso ma fornibile
Coupling non included but available on request

C1 14-18

COMBINATION PUMP DIMENSIONS - SHORT VERSION

Tandem C1 14-18 + C1 14-18
Short version



Shaft for combination pumps

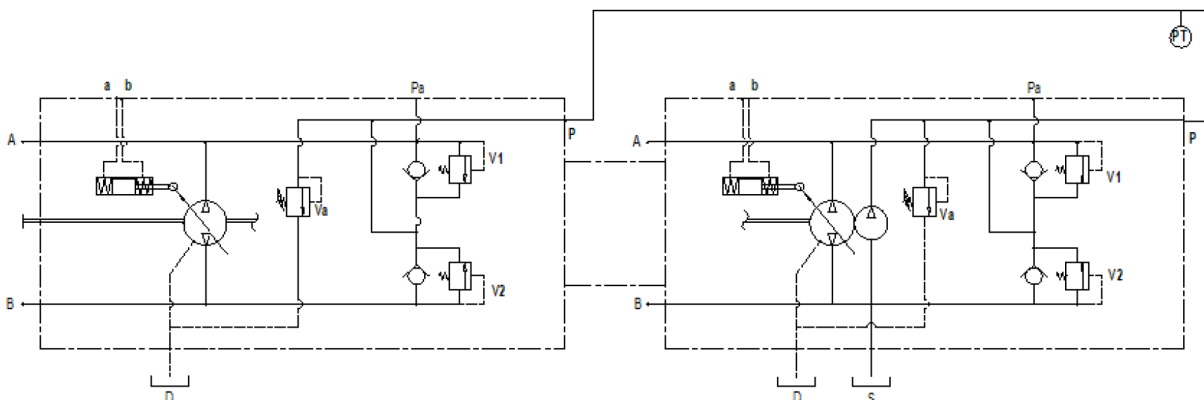
Configuration	C1 14-18 + C1 14-18 Short version	
Pump	1st.	2nd.
Shafts	1 - 5 - 6	3 - 4

With this configuration, both the pumps mount the boost pumps.

- (1) 3 - Splined shaft female 9T - 16/32 - DP (Pred. Bosch)
- (4) - Splined shaft female 9T - 16/32 - DP

Warning: Ordering a tandem pump it is necessary to indicate for each pump the kind of shaft and the through drive option needed

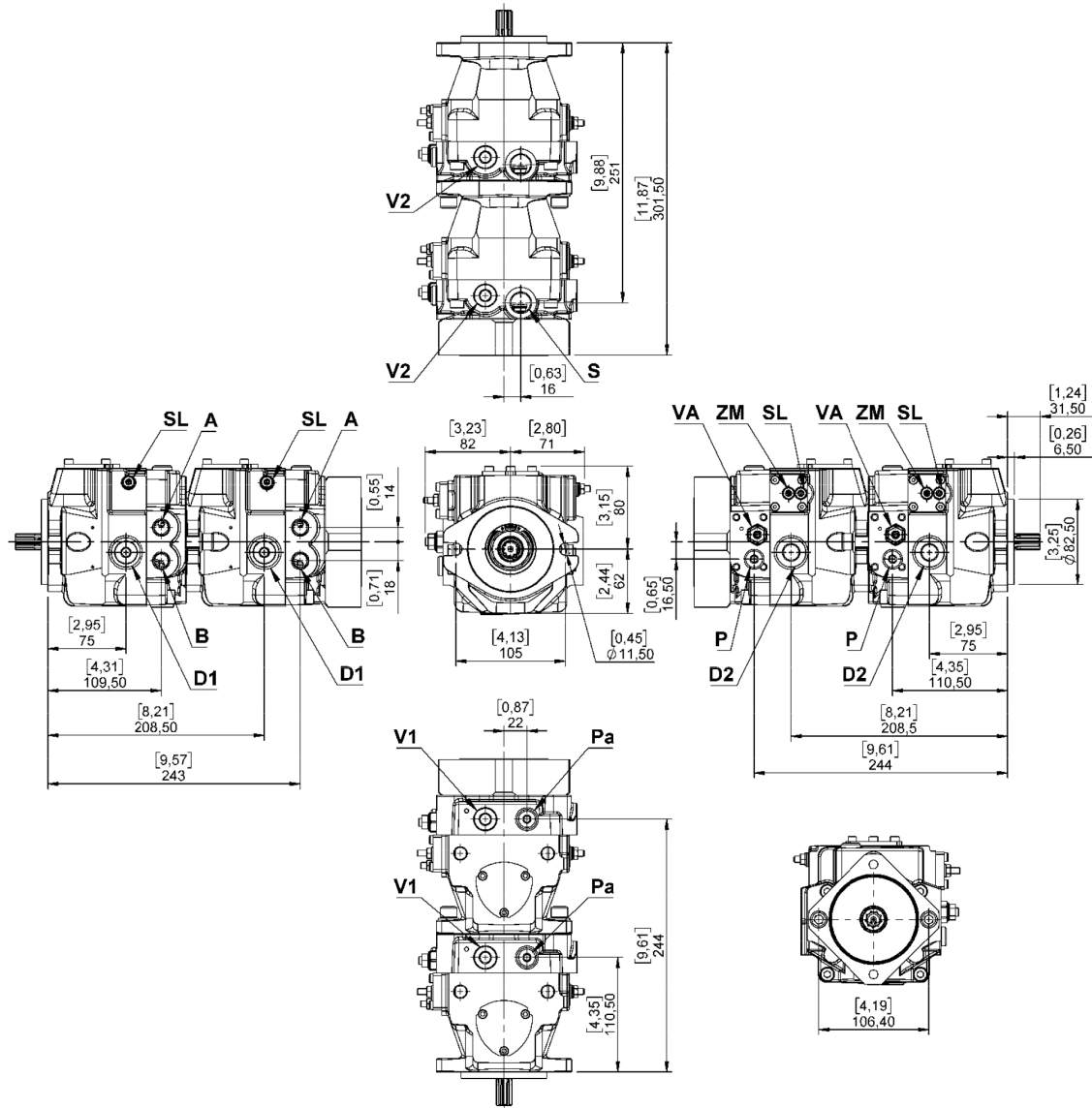
SHORT VERSION TANDEM (TS) HYDRAULIC LAYOUT



The hose (PT) used to connect the charge pressure ports (P) is supplied with the units.
The hoses connecting the drain ports must be relized and mounted by the customer.

C1 14-18

COMBINATION PUMP DIMENSIONS - SHORT VERSION



METRIC VERSION

- A – B: Pressure ports – 3/8 G
- D1-D2: Drain port – 3/8 G
- S: Suction port – 1/2 G
- P: Charge pressure port – 1/4 G
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 1/4 G

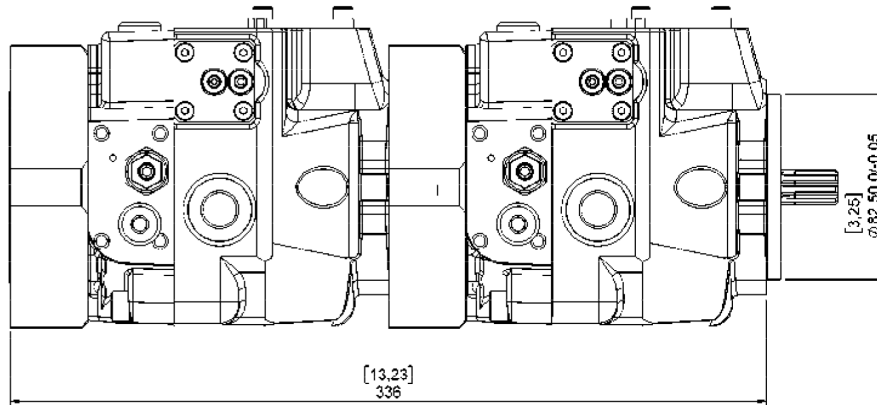
SAE VERSION

- C114:** A – B: Pressure ports – 9/16-18 UNF-2B
- C118:** A – B: Pressure ports – 3/4-16 UNF-2B
- D1: Drain port – 9/16-18 UNF-2B
- S: Suction port – 3/4-16 UNF-2B
- P: Charge pressure port – 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 – V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 7/16-20 UNF-2B

C1 14-18

COMBINATION PUMP DIMENSIONS - LONG VERSION

Tandem C1 14-18 + C1 14-18
Long version

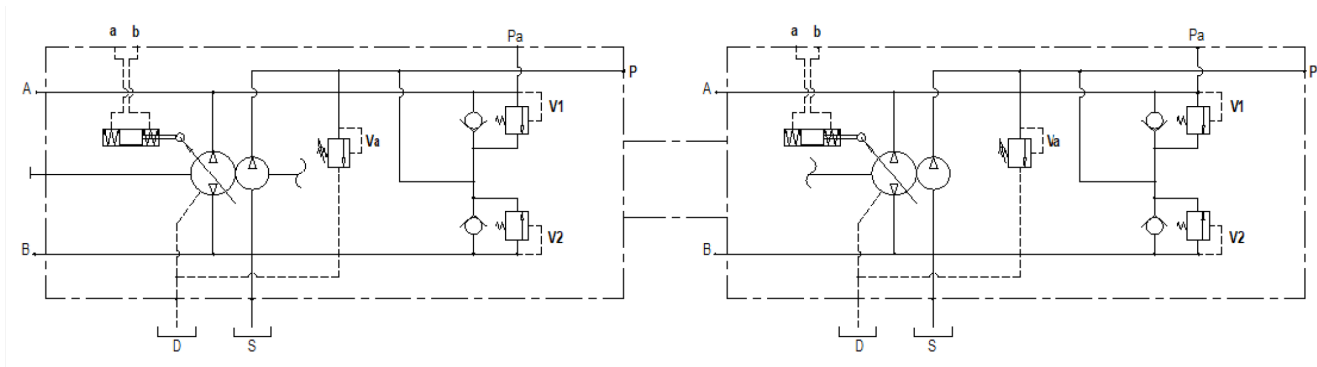


Shaft for combination pumps

Configuration	C1 14-18 + C1 14-18 Long version	
Pump	1 st .	2 nd .
Shafts	1 - 5 - 6	1 - 2

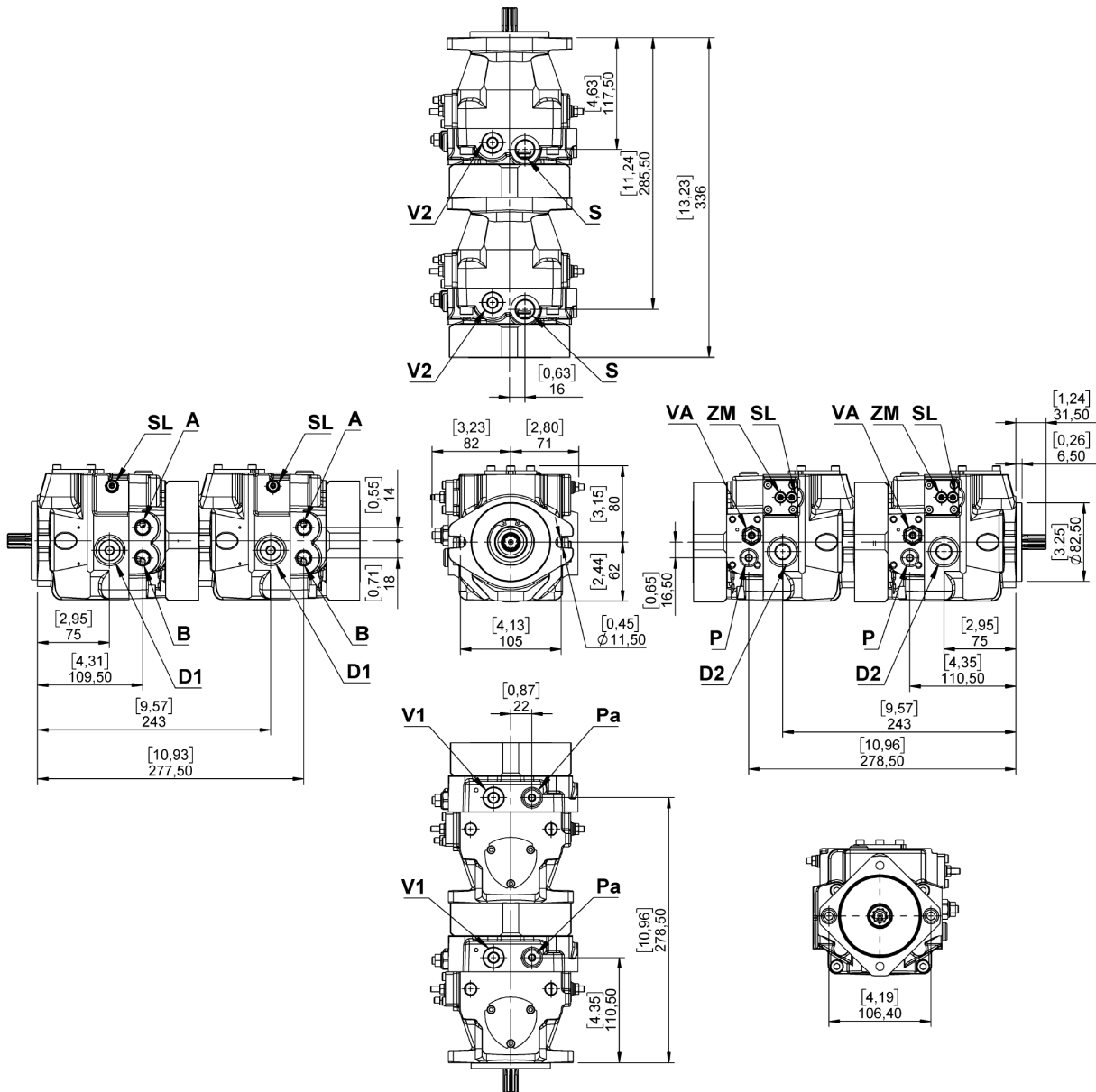
With this configuration, both the pumps mount the boost pumps.

- (1) 3 - Splined shaft female 9T - 16/32 - DP (Through drive SAE-A)
- 4 - Splined shaft female 9T - 16/32 - DP (Through drive BOSCH)



C1 14-18

COMBINATION PUMP DIMENSIONS - LONG VERSION



METRIC VERSION

- A - B: Pressure ports - 3/8 G
- D1-D2: Drain port - 3/8 G
- S: Suction port - 1/2 G
- P: Charge pressure port - 1/4 G
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw
- pa: High pressure port - 1/4 G

SAE VERSION

- C114: A - B: Pressure ports - 9/16-18 UNF-2B
- C118: A - B: Pressure ports - 3/4-16 UNF-2B
- D1: Drain port - 9/16-18 UNF-2B
- S: Suction port - 3/4-16 UNF-2B
- P: Charge pressure port - 7/16-20 UNF-2B
- VA: Charge pump valve
- V1 - V2: Pressure relief valves
- SL: Stroke limiter
- ZM: Mechanical zero adjustment screw