



walvoil
MOTION BY PEOPLE

N E W

PWLS

Variable Displacement Piston Pumps



PWLS VARIABLE DISPLACEMENT PISTON PUMPS

- Heavy duty operation
- Compact tandem design
- Different displacement control solutions
- Sensors installation
- ALS Adaptive control



Walvoil presents PWLS, the new range of Variable Displacement Piston Pumps.
 PWLS series offers all the features needed for a new generation of mobile hydraulic pumps.
 Its compact design allows the installation in narrow spaces, its reactivity and stability grant the maximum comfort for the operator.

The design and production cycle allows heavy duty operation in the medium pressure range, with a nominal service pressure up to 280 bar (4050 psi).
 Additional features, like sensor arrangements, compact tandems and various control manifolds complete the offer of this new generation of Walvoil piston pumps.



WORKING CONDITIONS

Suction pressure (absolute)	from 0.8 to 2 bar from 11.6 to 29 psi	
Drain Pressure	max 2 bar drain-suction <0.5 bar max 29 psi drain-suction <0.034 psi	
Fluid	hydraulic mineral oil-based	
Fluid temperature	With NBR (buna N) seals	from -20 to +80 °C from -4 to +176 °F
Viscosity	Recommended	from 15 to 92 mm ² /s (cSt)
	Permitted for starting	2000 mm ² /s (cSt)
Max level of contamination	Recommended for operating pressure > 150 bar (2150 psi)	20/18/15 ISO 4406 class 9 (NAS 1638)
	Recommended for operating pressure < 150 bar (2150 psi)	21/19/16 ISO 4406 class 10 (NAS 1638)

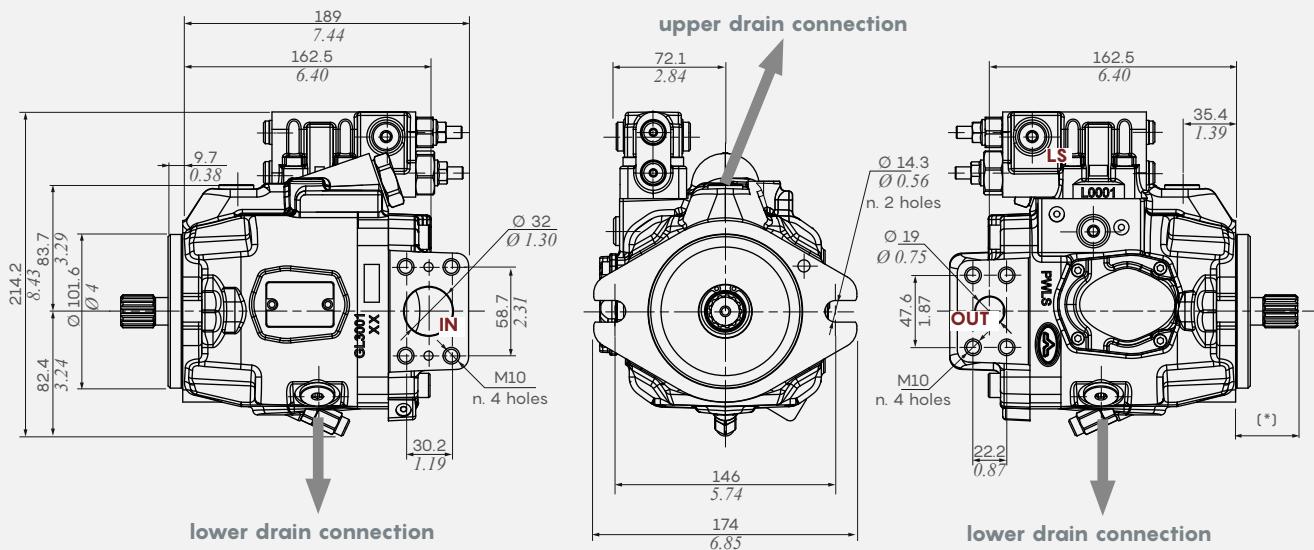
TECHNICAL DATA

PWLS series	Max. displacement		Max working pressure		Max peak pressure		Rotation speed min - max		Weight	
	cm ³ /rev	in ³ /rev	bar	psi	bar	psi	rpm	kg	lb	
PWLS3	min.	23	1.40	280	4050	320	4650	500-3000		
	std.	33	2.01	280	4050	320	4650	500-3000	15.9	35.1
	max.	35.5	2.17	280	4050	320	4650	500-3000		
PWLS5	min.	41	2.50	280	4050	320	4650	500-3000		
	std.	53	3.23	280	4050	320	4650	500-2600	22.5	49.6
	max.	56	3.41	280	4050	320	4650	500-2400		
PWLS7	min.	56	3.41	280	4050	320	4650	500-2900		
	std.	72	4.39	280	4050	320	4650	500-2600	25.9	57.1
	max.	80	4.88	250	3600	300	4350	500-2200		

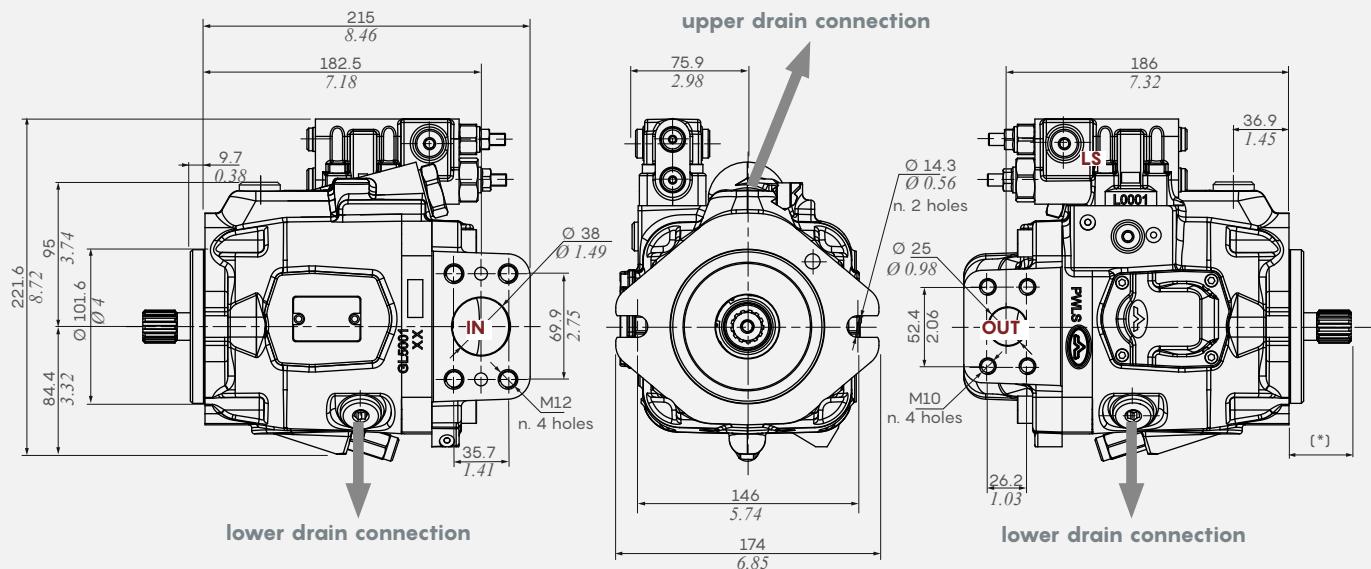
DIMENSIONAL DATA

The dimensional drawings represent the version with **SAEB** flange (for other flanges, please contact our Sales Department).

PWLS3 pump



PWLS5 pump



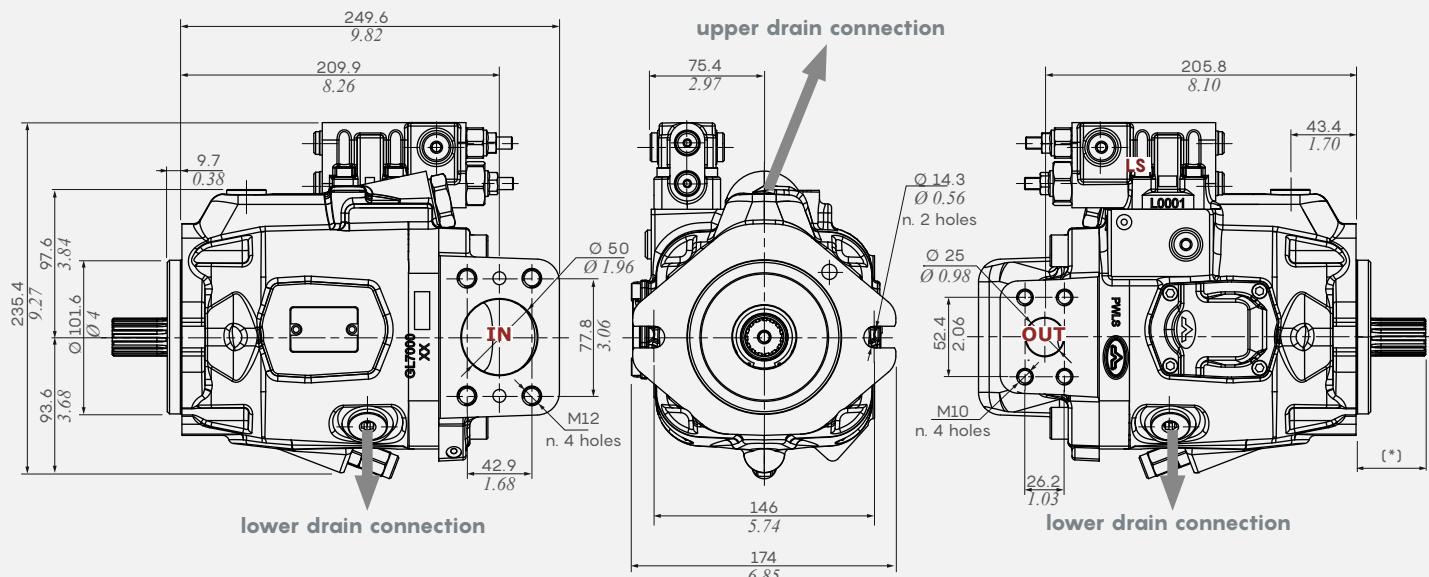
Note: (*) For shaft dimensions see page 11.



DIMENSIONAL DATA

The dimensional drawings represent the version with **SAEB** flange (for other flanges, please contact our Sales Department).

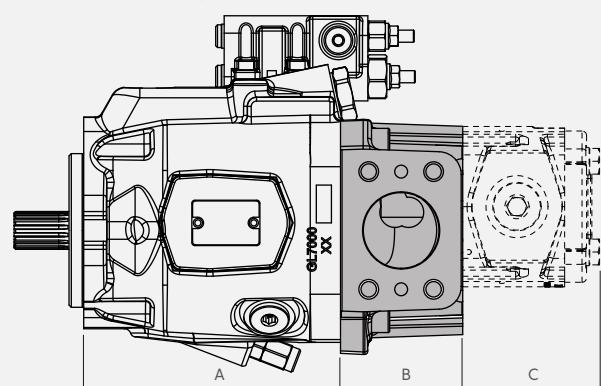
PWLS7 pump



Note: (*) For shaft dimensions see page 11.

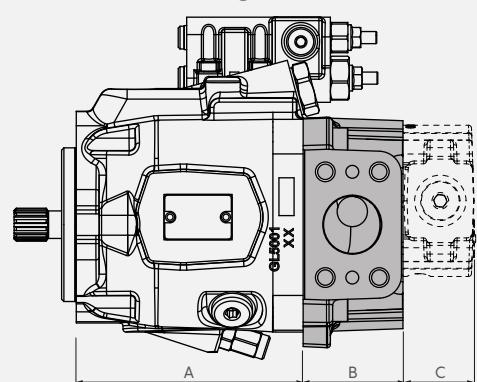
Two stages pump

Configuration with 2XP or 2XPW



PWLS series	A		B	
	mm	in	mm	in
PWLS3	136	5.35	53	2.09
PWLS5	150	5.9	60	2.36
PWLS7	169.8	6.68	80.8	3.18

Configuration with 2TPW



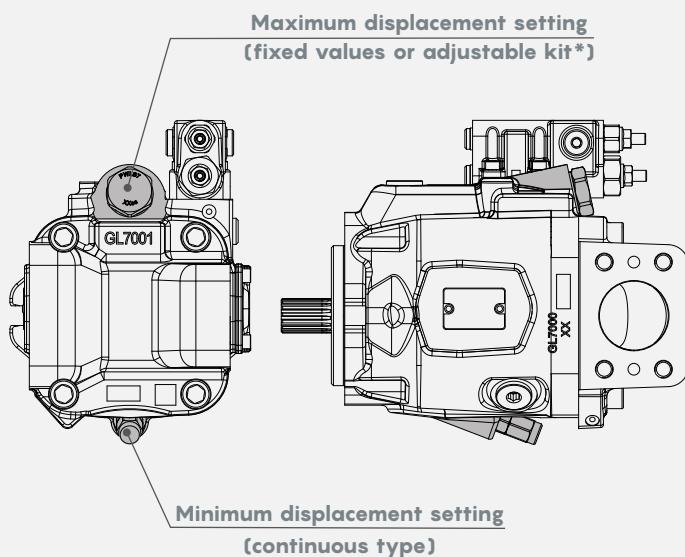
Displacement reference	C					
	2XP		2XPW		2TPW	
mm	in	mm	in	bar	psi	
040	73.9	2.91	-	-	47	1.85
060	77.2	3.04	-	-	50.3	1.98
080	81.4	3.20	-	-	54.5	2.14
110	85.8	3.37	85.8	3.37	58.6	2.31
140	90.5	3.56	90.5	3.56	63.6	2.5
160	94.7	3.73	94.7	3.73	67.8	2.67
190	99.7	3.92	99.7	3.92	72.8	2.87
220	104.7	4.12	104.7	4.12	77.8	3.06
260	110.5	4.35	110.5	4.35	83.6	3.29
290	114.9	4.52	114.9	4.52	-	-
310	118.9	4.68	118.9	4.68	-	-

Note: For other information and dimensions for 2XP and 2XPW pump see the dedicated catalogue.

For version with 2TPW pump please contact our Sales Department.

DISPLACEMENT SET-UP

PWLS7 example



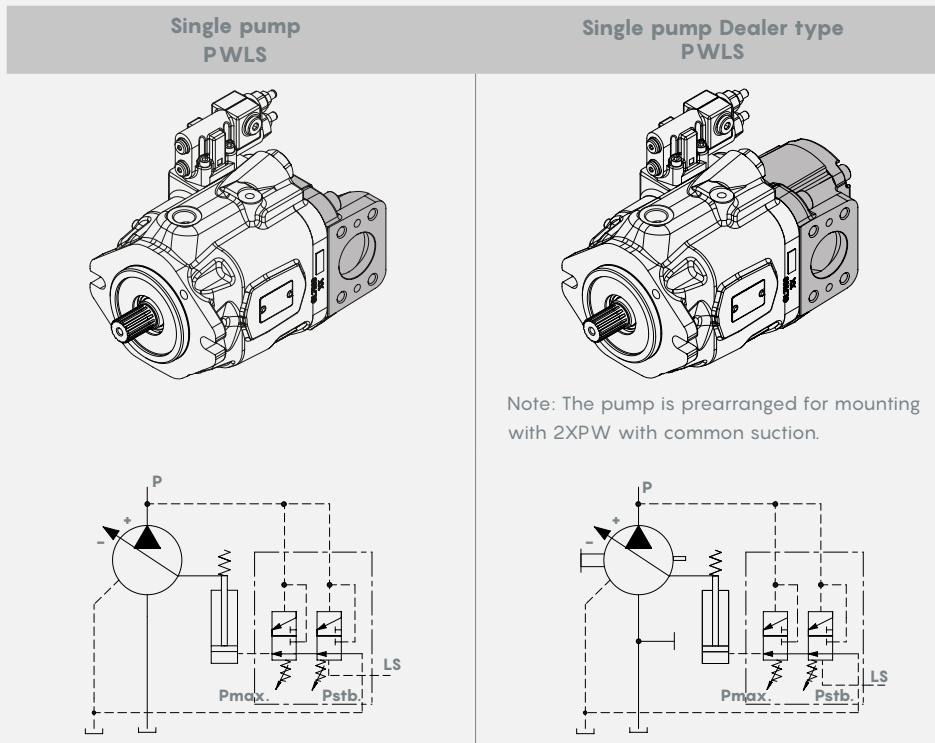
Note: (*) Alternative adjustable kit available on request. Please contact our Sales Department.

PWLS series	Maximum displacement setting		Minimum displacement setting	
	cm ³ /rev	in ³ /rev	cm ³ /rev	in ³ /rev
PWLS3	min.	23	1.40	
		25.5	1.56	
		28	1.71	regulation 2.5 cm ³ /rev
		30.5	1.86	8 cm ³ max
	std.	33	2.01	regulation 0.15 in ³ /rev
	max.	35.5	2.17	0.49 cm ³ max
PWLS5	min.	41	2.50	
		44	2.68	
		47	2.86	regulation 4 cm ³ /rev
		50	3.05	12 cm ³ max
	std.	53	3.23	regulation 0.24 in ³ /rev
	max.	56	3.41	0.73 cm ³ max
PWLS7	min.	56	3.41	
		60	3.66	
		64	3.90	
		68	4.15	regulation 5.2 cm ³ /rev
	std.	72	4.39	16 cm ³ max
		76	4.63	regulation 0.31 in ³ /rev
	max.	80	4.88	0.98 cm ³ max

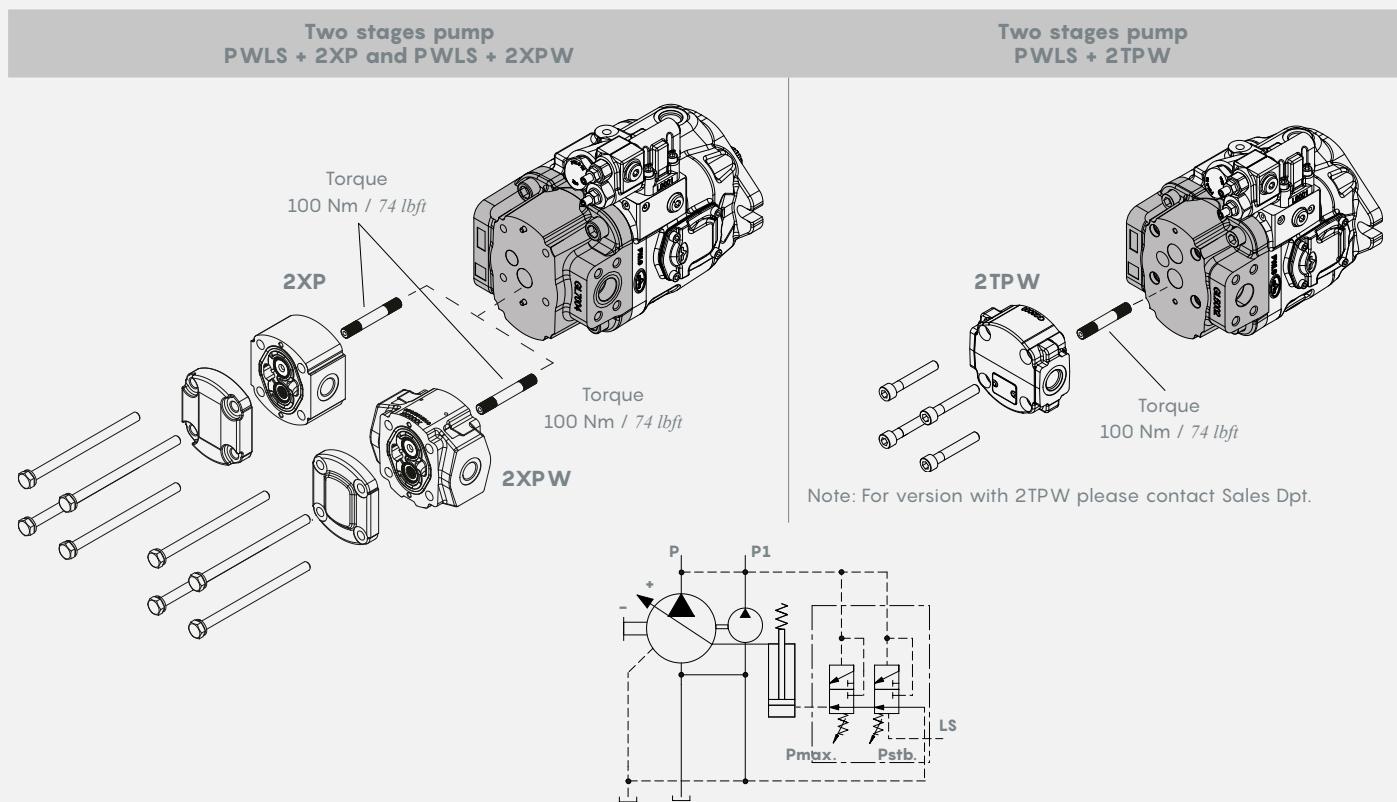
Note: For other displacements, please contact our Sales Department.



SINGLE UNITS



MULTIPLE UNITS

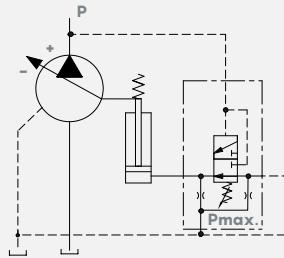
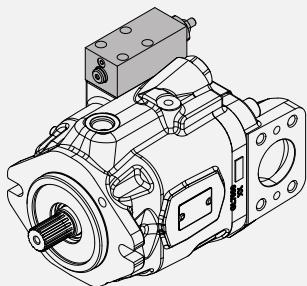


Note: For description example information see page 12.

MECHANICAL CONTROL OPTIONS

PWLS product range with mechanical control is now available with three different types of displacement control.

Option type "P" Pressure control



The pressure control regulates the maximum pressure at the pump outlet within the adjustment range of the variable pump. The pump supplies only the necessary amount of hydraulic fluid to meet consumer demand. If the operating pressure exceeds the set value at the pressure relief valve, the pump displacement is set to minimum.

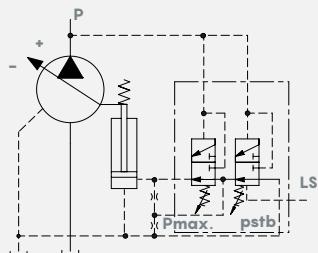
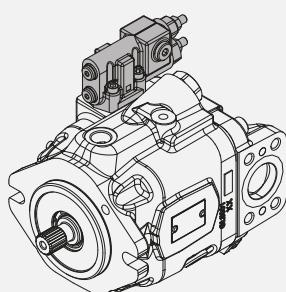
Standard setting: 280 bar (4050 psi)

Description example:

PWLS7 / 80 - D - SAEB - B(V) - N - S15N - O - F2F1 - P(230) - DRENU10

(see page 12 for more information)

Option type "P-LS" Pressure control & Load Sensing



P-LS control is the traditional Load Sensing control, aimed to keep a constant pressure margin through the main control valve.

In this kit a max pressure limiter is also included, able to minimize the displacement in case of setting pressure reached by the actuator.

Standard settings:

- Maximum pressure: 280 bar (4050 psi)
- Standby: 20 bar (290 psi)
- LS port: BSP 1/4" or SAE 6

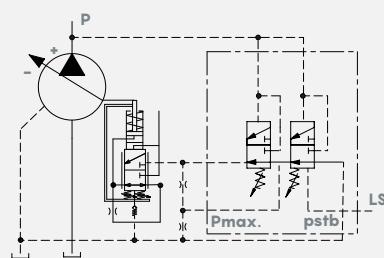
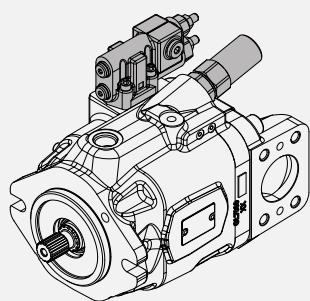
Description example:

PWLS5 / 53 - D - SAEB - B(V) - N - S13 - O - F112F1 - P(280)LS(20)G14 - DRENG12

(see page 12 for more information)

MECHANICAL CONTROL OPTIONS

Option type P-LS-TC
Pressure control, Load Sensing,
Torque Control

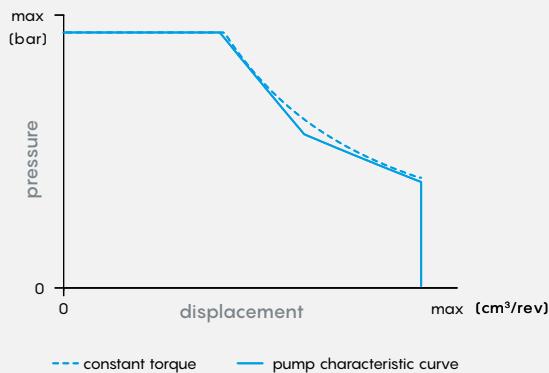


The P-LS-TC adjusts the pump displacement based on pressure to ensure that the absorbed torque does not exceed the set value, protecting the motor from overloads.

If set lower, the Torque Control will limit the maximum operating pressure to a value below the standard pressure control setting (280 bar - 4050 psi).

When ordering the torque limiter, please specify the required torque value (e.g., 100 Nm-73.75 lbf ft) or the required power and speed (e.g., 15 kW at 1300 rpm).

Torque control curve



Conversion of the torque valve

$$T = \frac{P \cdot 60}{2 \cdot \pi \cdot n}$$

T- torque (Nm)

P- power (W)

n- number of pump revolutions (rpm)

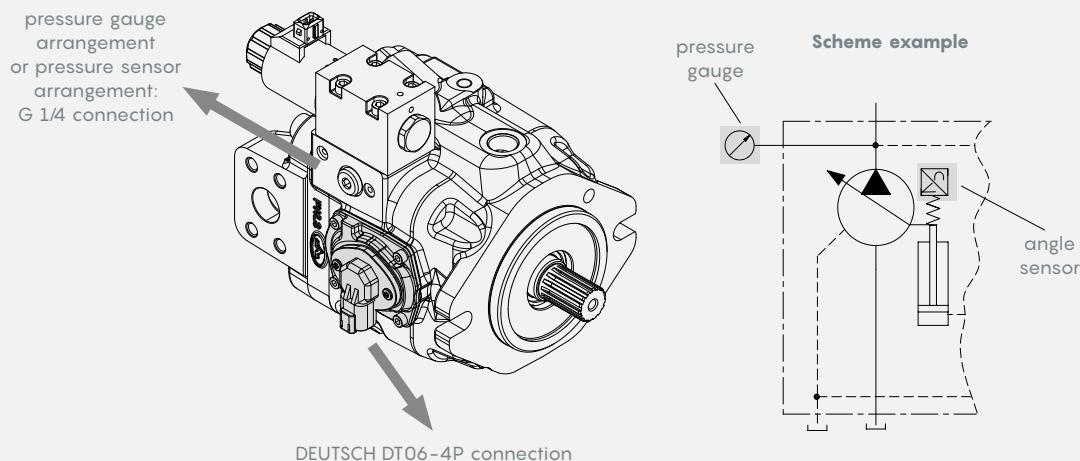
Description example:

PWLS7 / 64 - D - SAEB - B(V) - N - S13 - O - F2F1 - P(250)LS(25)G14 - TC(190) - DRENU10
 (see page 12 for more information)

Torque Control (setting 190 Nm - 140 lbf ft)

S E N S O R S A R R A N G E M E N T S

All PWLS have the arrangement for pressure sensor and angle sensor that are necessary for pumps configured with electronic control. All together these two indicators permit to evaluate the torque and the power request from the implement during operations.



Connector DEUTSCH DT06-4P Features	
nominal voltage	8-32V
output voltage range	0 - 5V
operating temperature	-40/+100°C (-40/+212°F)

P O R T S A N D C O N N E C T I O N S

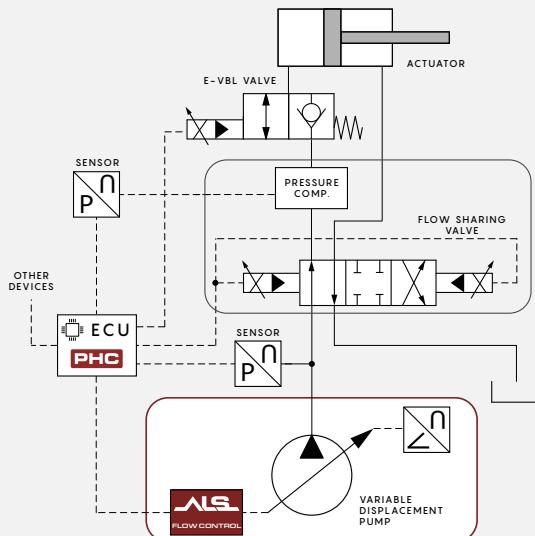
	Type	Suction port (Inlet)	Delivery port (Outlet)	Drain ports standard (x3)	Optional drain ports (x3)
PWLS3	F114F34 DRENU8	1"1/4 (ISO 6162-1) 4 x M10x1.5 (depth 18) Ø 32	3/4" (ISO 6162-1) 4 x M10x1.5 (depth 18) Ø 19	3/4-16 UNF (SAE8) (depth 11)	BSP 1/2" (depth 12)
PWLS5	F112F1 DRENG12	1"1/2 (ISO 6162-1) 4 x M12x1.75 (depth 20) Ø 38	1" (ISO 6162-1) 4 x M10x1.5 (depth 18) Ø 25	BSP 1/2" (depth 12)	7/8-14 UNF (SAE10) (depth 12.5)
PWLS7	F2F1 DRENU10	2" (ISO 6162-1) 4 x M12x1.75 (depth 20) Ø 50	1" (ISO 6162-1) 4 x M10x1.5 (depth 18) Ø 25	7/8-14 UNF (SAE10) (depth 12.5)	BSP 3/4" (depth 14)

Note: (*)For optional drain ports and other connections, please contact our Sales Department

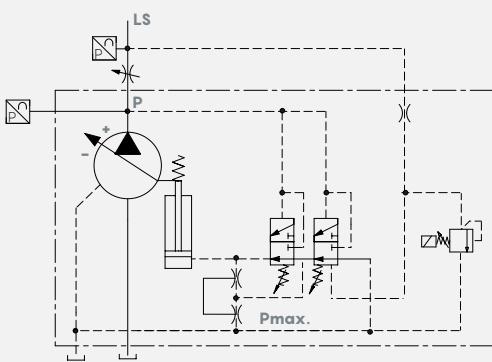
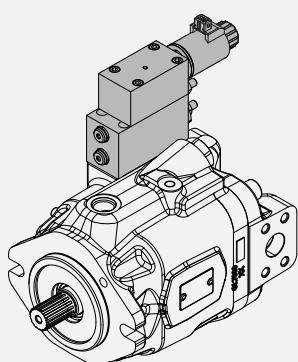
ELECTRONIC CONTROL OPTIONS

PWLS product range with electronic control is now available with two different ALS control types.

ALS architecture example

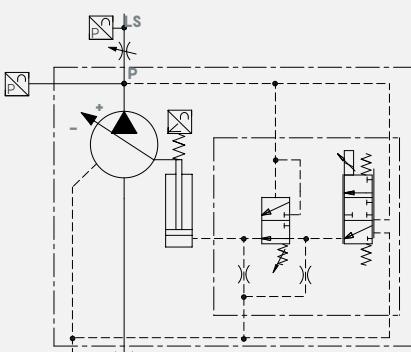
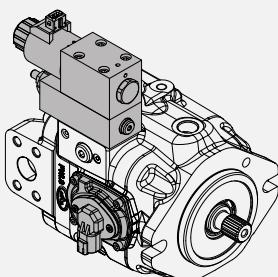


Option type "ALS-MC"
Adaptive Load Sensing Margin Control



ALS-MC control works with P and LS sensor in closed loop with ECU. This control modifies the load pressure signal on the standard LS control: it's possible reduce the operating standby. Additional torque control strategies can be added.

Option type "ALS-FC"
Adaptive Flow Control



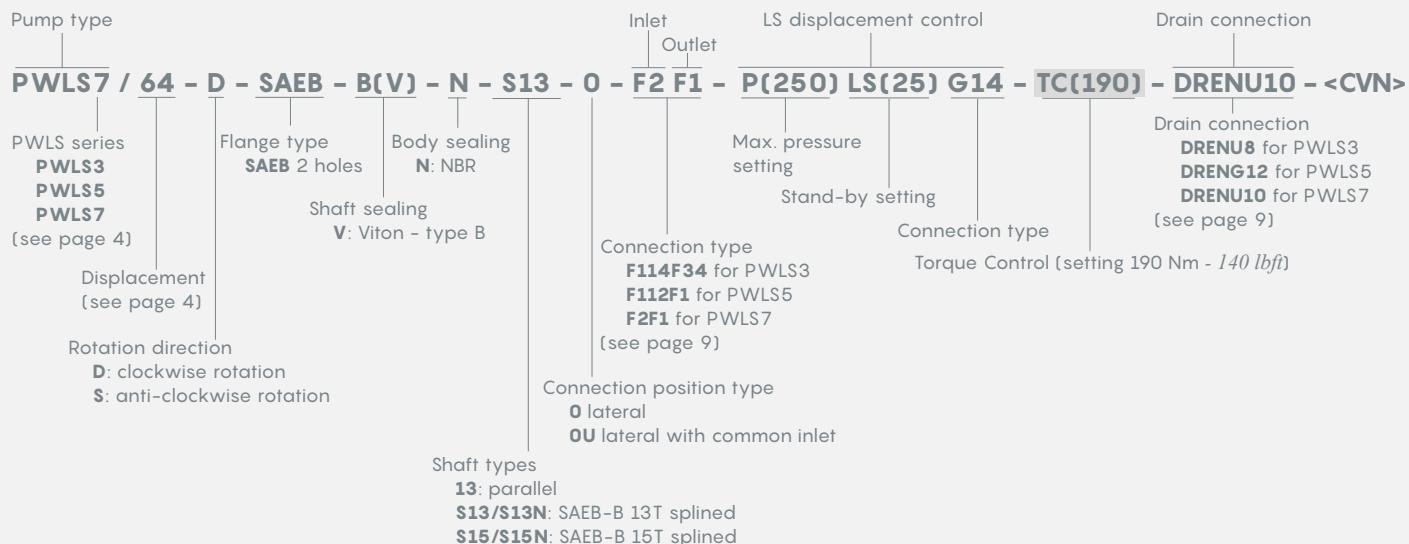
ALS-FC control works with a constant synchronization with P and LS pressure sensors, angle sensor and ECU.

By means of a closed loop control is possible managing the pump displacement and the virtual pump margin obtaining different solutions in terms of not only energy consumption but also operator confort during function actuations such as:

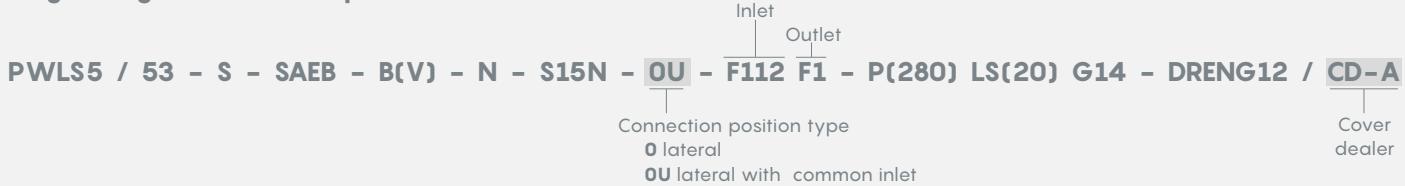
- Flow control
- Torque control
- Pressure and virtual pump margin
- Fast displacement steps

DESCRIPTION COMPOSITION

Single stage with Torque Control setting example



Single stage Dealer example



Two stages example



Note: For more information about description composition please contact our Sales Dpt.

