

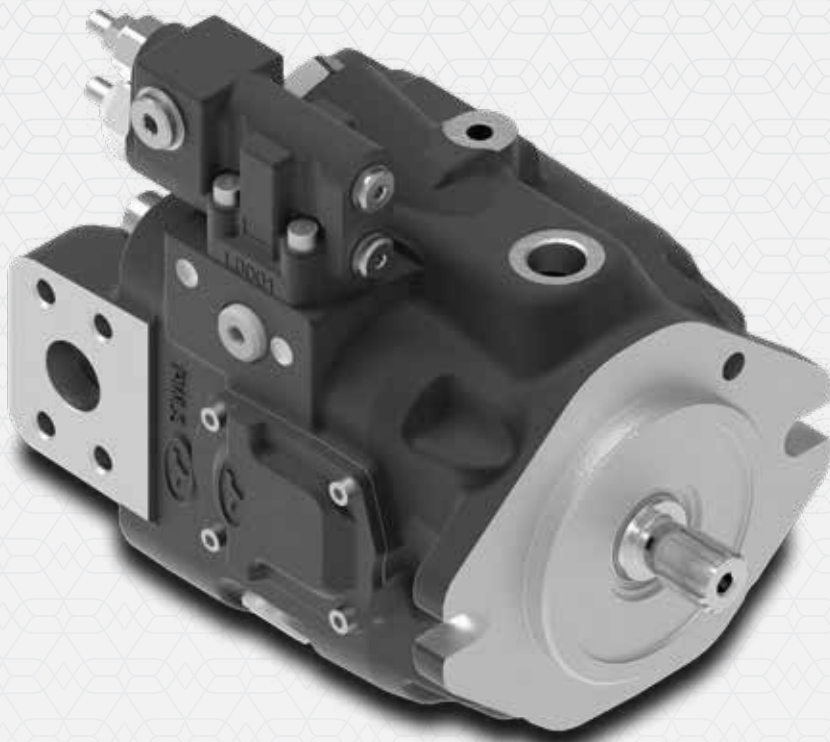


walvoil
MOTION BY PEOPLE

NEW

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 35 mm ² /s (cSt) |
| | Permitted for starting @ -25°C min. (-13°F) | 1500 mm ² /s (cSt) |
| Max level of contamination | Recommended for operating pressure > 150 bar (2150 psi) | 18/16/13 ISO 4406 (class 7 NAS 1638) |
| | Recommended for operating pressure < 150 bar (2150 psi) | 20/18/15 ISO 4406 (class 9 NAS 1638) |

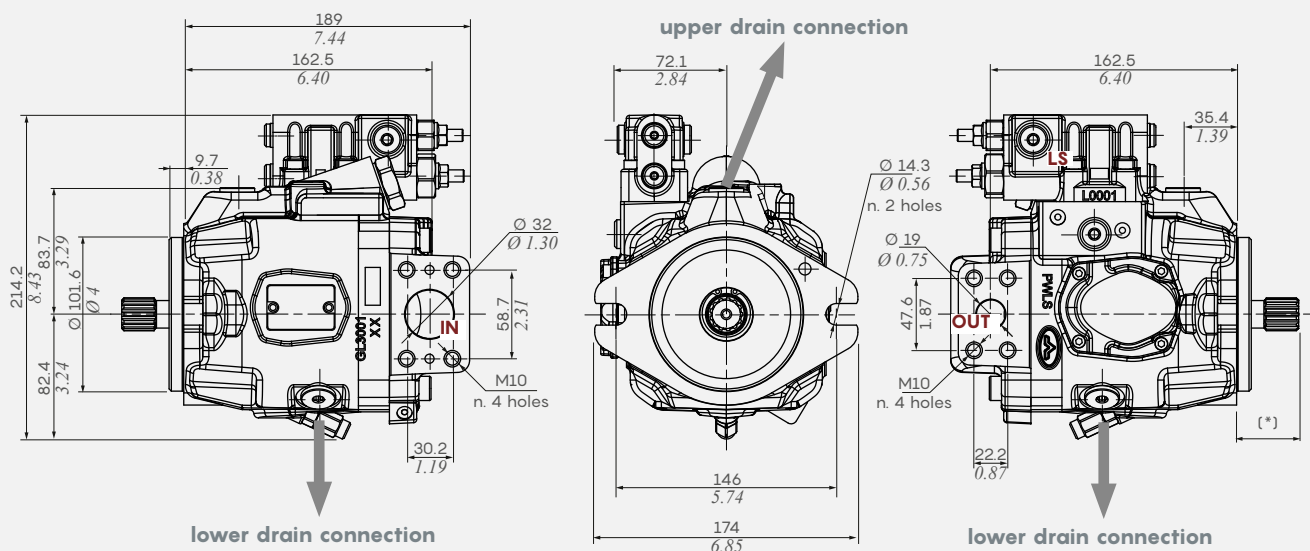
TECHNICAL DATA

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

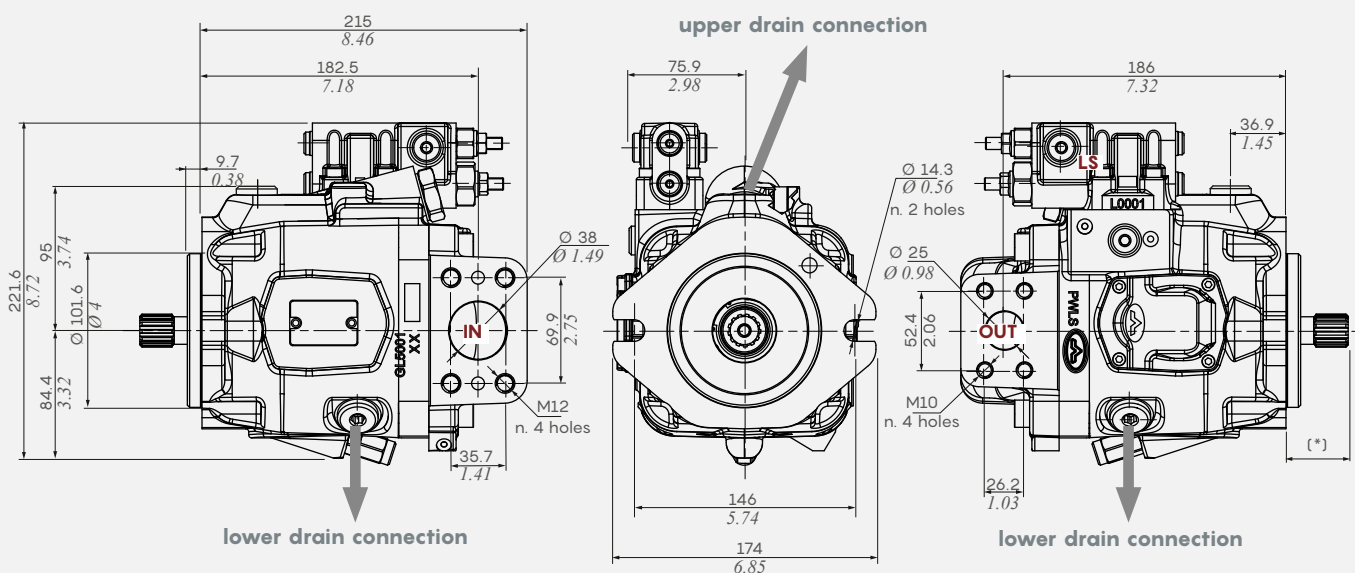
DIMENSIONAL DATA

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

PWLS3 pump



PWLS5 pump

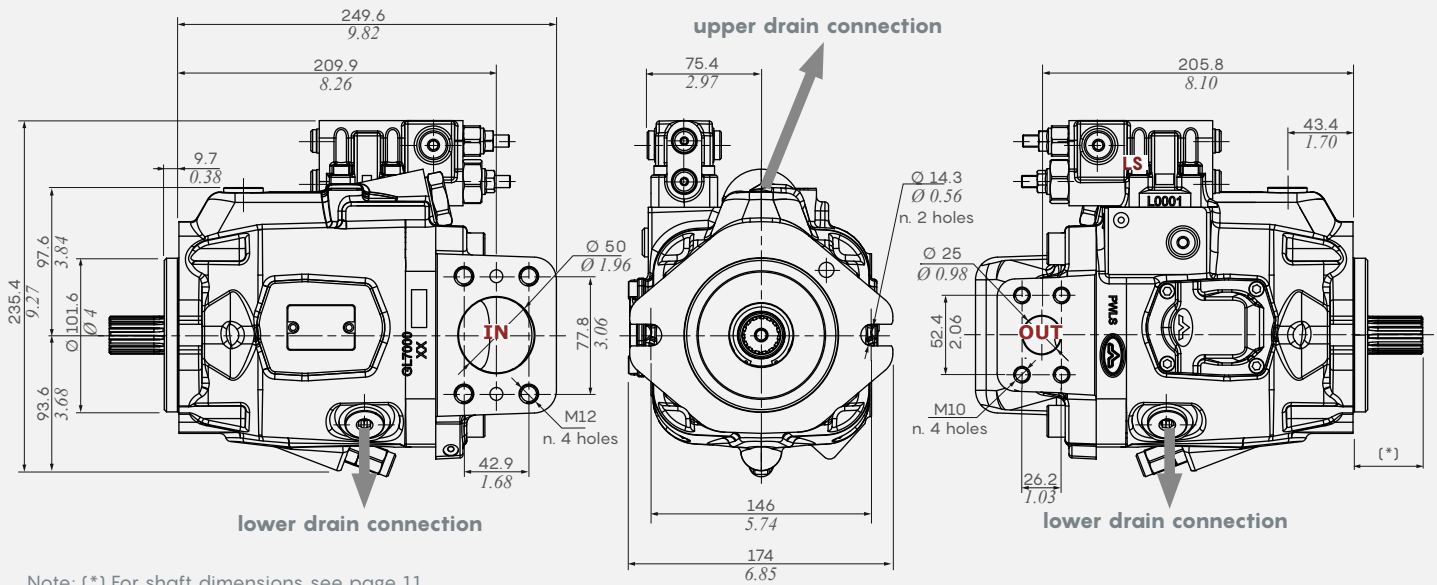


Note: (*) For shaft dimensions see page 11.

DIMENSIONAL DATA

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

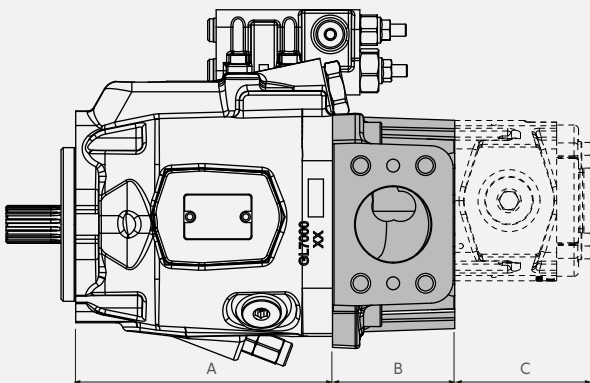
PWLS7 pump



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

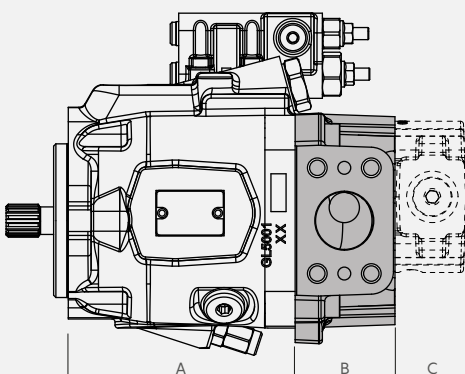
Two stages pump

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



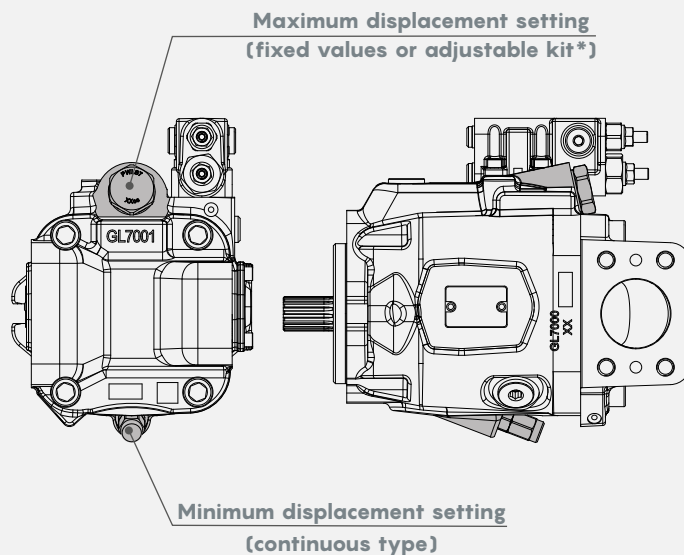
| Displacement reference | C | | | | | |
|------------------------|-------|------|-------|------|------|------|
| | 2XP | | 2XPW | | 2TPW | |
| | mm | in | mm | in | bar | psi |
| 040 | 73.9 | 2.91 | - | - | 47 | 1.85 |
| 060 | 77.2 | 3.04 | - | - | 50.3 | 1.98 |
| 080 | 81.4 | 3.20 | - | - | 54.5 | 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

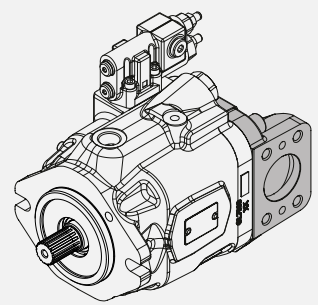
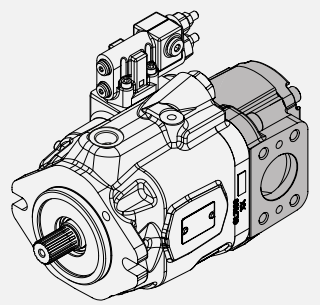
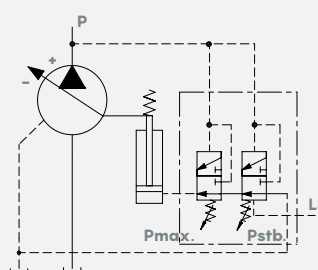
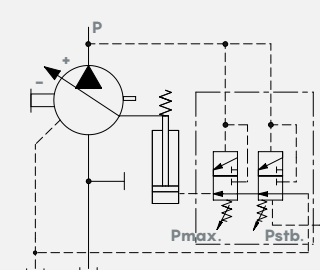


Note: (*) Alternative adjustable kit available on request. Please contact our Sales Department.

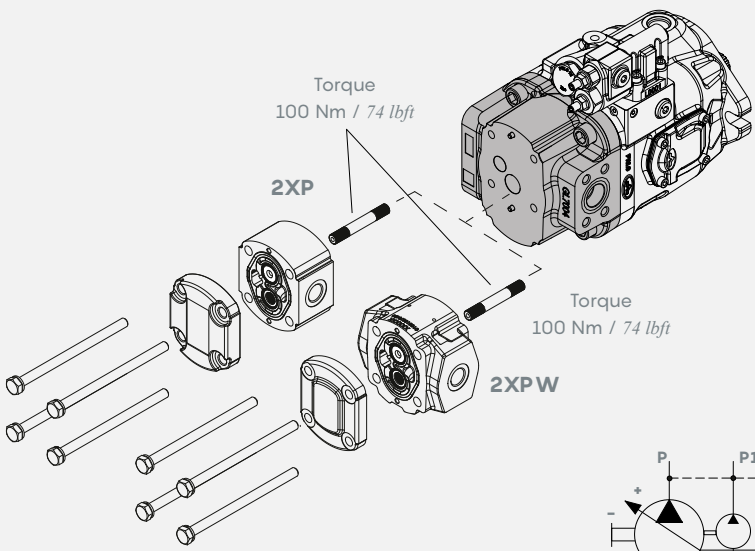
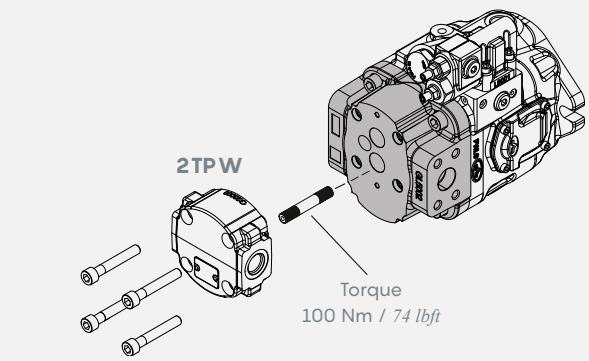
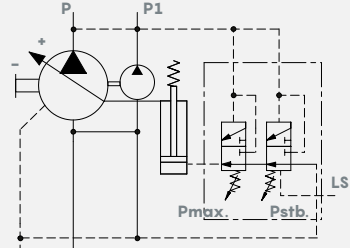
| PWLS series | Maximum displacement setting | | Minimum displacement setting | |
|-------------|------------------------------|----------------------|------------------------------|--|
| | cm ³ /rev | in ³ /rev | cm ³ /rev | in ³ /rev |
| PWLS3 | min. | 23 | 1.40 | regulation 2.5 cm ³ /rev 8 cm ³ max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

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

SINGLE UNITS

| Single pump PWLS | Single pump Dealer type PWLS |
|--|--|
|  |  <p data-bbox="829 795 1244 840">Note: The pump is prearranged for mounting with 2XPW with common suction.</p> |
|  |  |

MULTIPLE UNITS

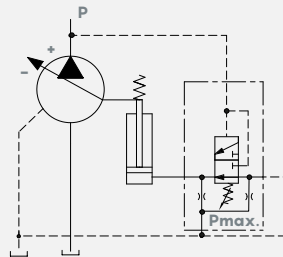
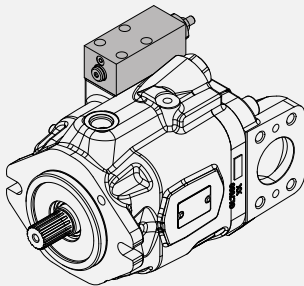
| Two stages pump PWLS + 2XP and PWLS + 2XPW | Two stages pump PWLS + 2TPW |
|--|---|
|  <p data-bbox="367 1422 526 1478">Torque 100 Nm / 74 lbft</p> <p data-bbox="367 1523 414 1556">2XP</p> <p data-bbox="622 1635 782 1691">Torque 100 Nm / 74 lbft</p> <p data-bbox="590 1713 662 1747">2XPW</p> |  <p data-bbox="1053 1523 1133 1556">2TPW</p> <p data-bbox="1181 1646 1340 1702">Torque 100 Nm / 74 lbft</p> <p data-bbox="893 1736 1404 1769">Note: For version with 2TPW please contact Sales Dpt.</p> |
|  | |

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.

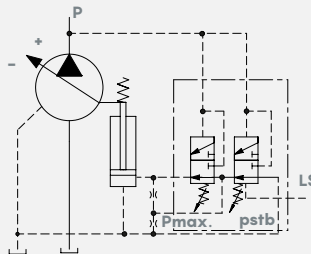
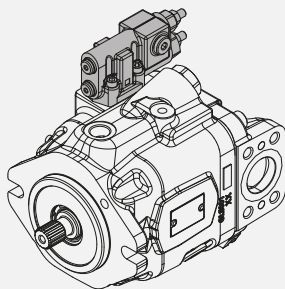
Standard setting: 280 bar (4050 psi)

Description example:

PWLS7 / 80 - D - SAEB - B(V) - N - S15N - 0 - 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

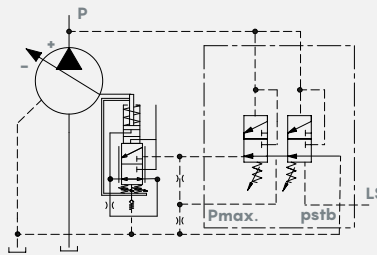
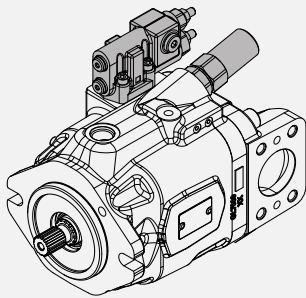
Description example:

PWLS5 / 53 - D - SAEB - B(V) - N - S13 - 0 - 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

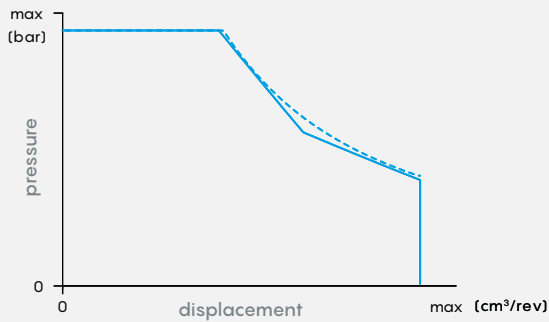


The P-LS-TC adjusts the pump displacement based on pressure to ensure that the absorbed torque does not exceed the set value, protecting the motor from overloads.

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^t) or the required power and speed (e.g., 15 kW at 1300 rpm).

Torque control curve



--- constant torque — pump characteristic 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)

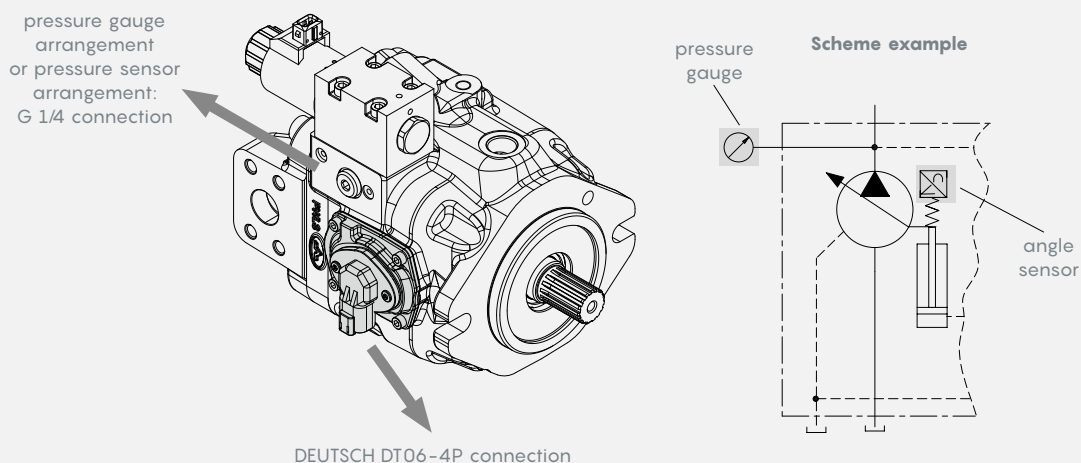
Description example:

PWLS7 / 64 - D - SAEB - B(V) - N - S13 - 0 - F2F1 - P(250)LS(25)G14 - **TC(190)** - DRENU10
(see page 12 for more information)

Torque Control (setting 190 Nm - 140 lbf^t)

SENSORS ARRANGEMENTS

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) |

PORTS AND CONNECTIONS

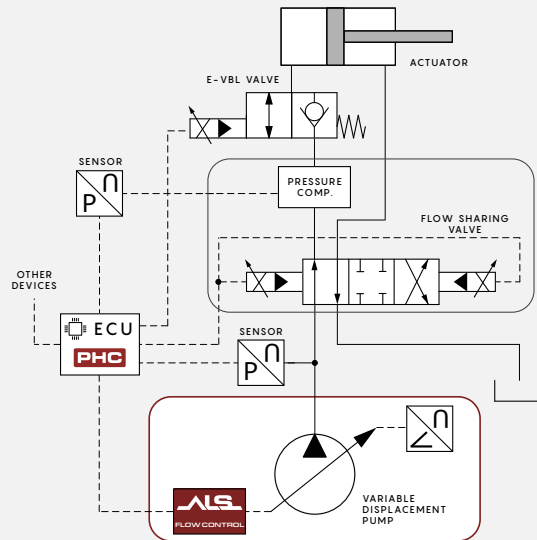
| | Type | Suction port (Inlet) | Delivery port (Outlet) | Drain ports standard (x3) | Optional drain ports (*) (x3) |
|--------------|-----------------------|---|---|------------------------------------|------------------------------------|
| PWLS3 | F114F34 DRENU8 | 1"1/4 (ISO 6162-1) 4 x M10x1.5 (depth 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

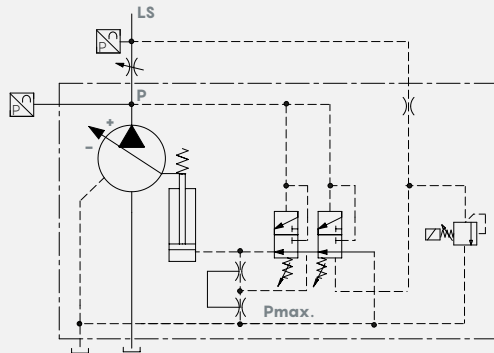
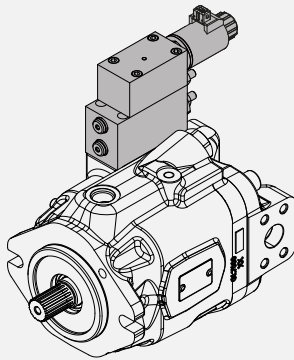
ELECTRONIC CONTROL OPTIONS

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

ALS architecture example

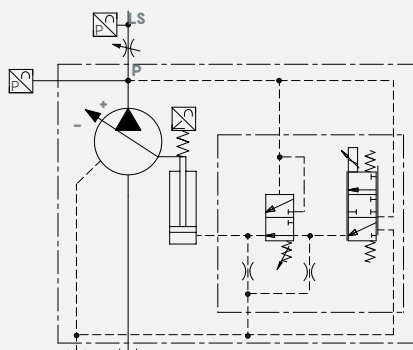
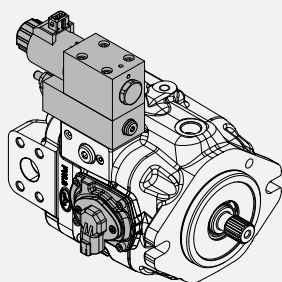


Option type "ALS-MC" Adaptive Load Sensing Margin Control



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

SHAFT TYPES

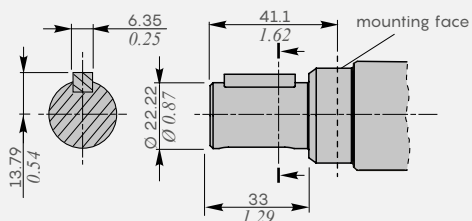
Type 13

(only for PWLS3 and PWLS5)

Torque 240 Nm / 177 lbft

Parallel shaft

ISO 3019-1 - 7/8"



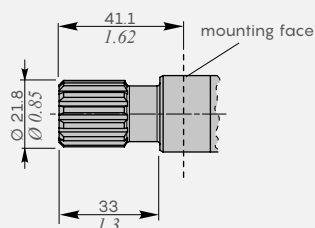
Type S13

(only for PWLS5)

Torque 280 Nm / 206 lbft

Splined profile:

SAE J498B type 13T - 16/32 pitch - 30°



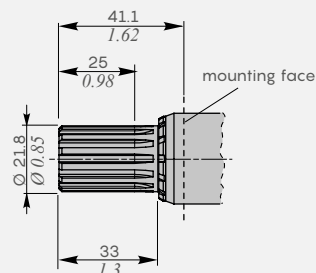
Type S13N

(only for PWLS7)

Torque 300 Nm / 221 lbft

Splined profile:

SAE J498B type 13T - 16/32 pitch - 30°

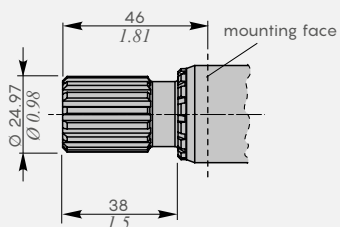


Type S15

Torque 400 Nm / 296 lbft

Splined profile:

SAE J498B type 15T - 16/32 pitch - 30°

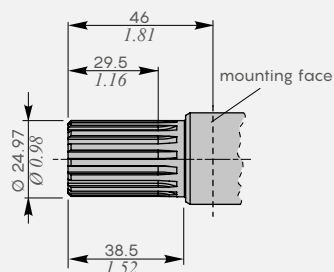


Type S15N

Torque 420 Nm / 309 lbft

Splined profile:

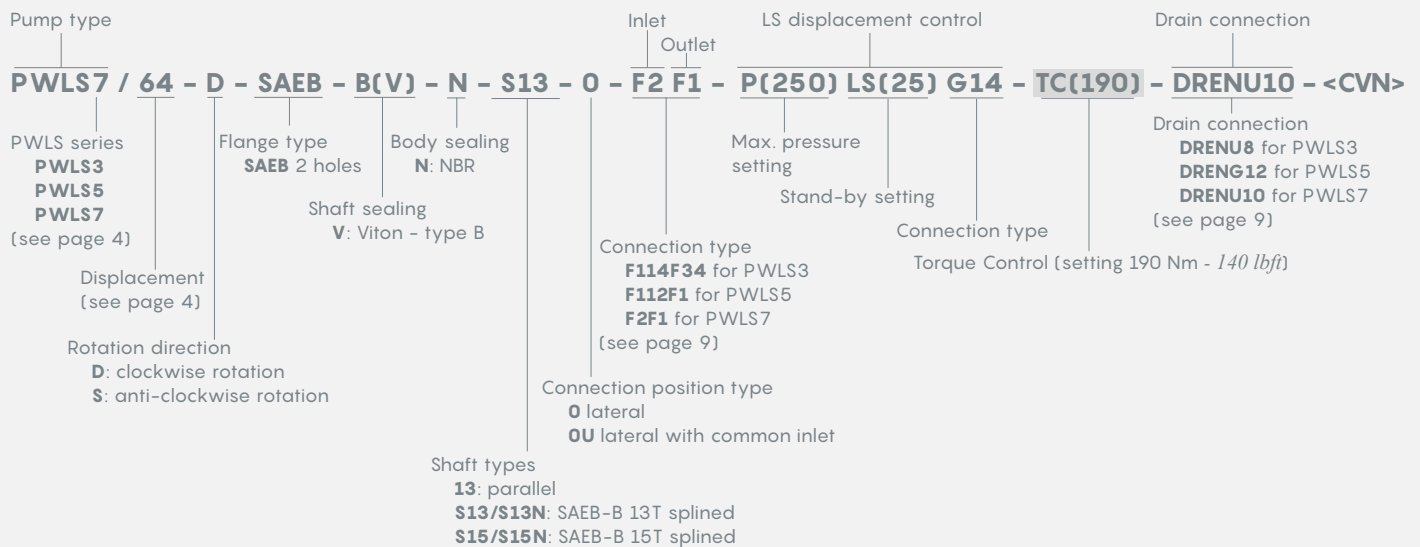
SAE J498B type 15T - 16/32 pitch - 30°



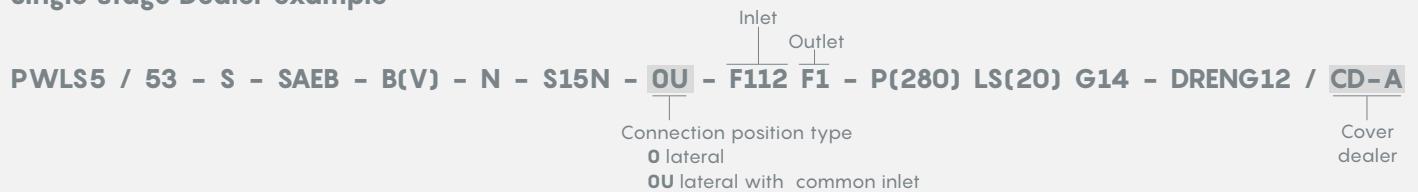
Note: For other shaft options, please contact our Sales Department

DESCRIPTION COMPOSITION

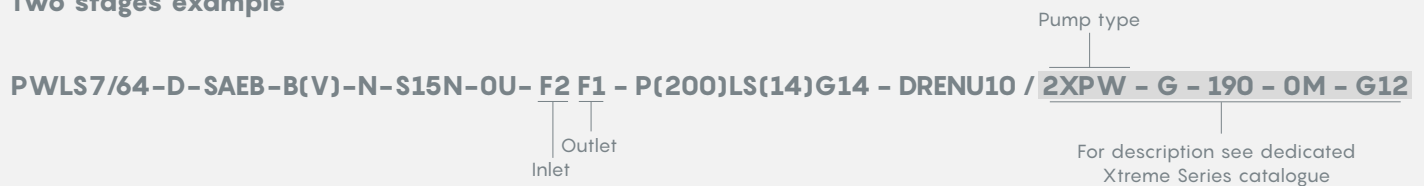
Single stage with Torque Control setting example



Single stage Dealer example



Two stages example



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

