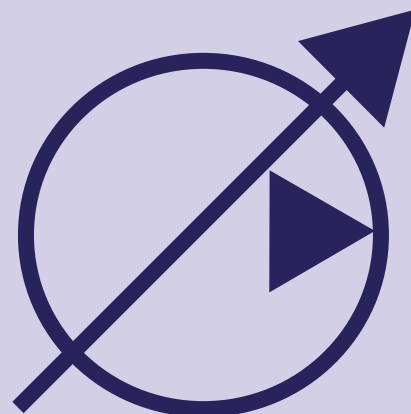


# PISTON PUMPS FOR TRUCKS

**FIXED** DISPLACEMENT

**VARIABLE** DISPLACEMENT



## FIXED DISPLACEMENT PUMPS



### XPi series

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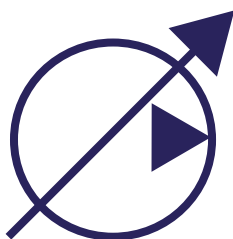
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## VARIABLE DISPLACEMENT PUMPS



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## XPi

- Models from 12 to 130 cc/rev
- 380 bar continuous working pressure
- 420 bar peak pressure
- Automatic adjustment to desired direction of rotation
- For use on DIN-mount PTO



XPi series

## XAi - SAE

- Models from 18 to 63 cc/rev
- SAE version of XPi bent axis piston pumps
- 380 bar continuous working pressure
- 420 bar peak pressure
- Automatic adjustment to desired direction of rotation
- For use on SAE-mount PTO



XAi - SAE series

## PA - PAC

- Single flow models from 25 to 114 cc/rev
- Twin flow models from 2x25 to 2x75 cc/rev
- Model with two different displacements
- 400 bar continuous working pressure
- 500 bar peak pressure
- Dual direction of rotation
- For use on DIN-mount PTO



PA - PAC series

## TXV

- Variable displacement pumps with Load-Sensing control
- Displacement from 40 to 150 cc/rev
- Maximum operating pressure up to 420 bar depending on model
- For use on DIN-mount PTO



TXV series

### TXVA - SAE

- For use on SAE-mount PTO
- Models available : 75 and 92 cc/rev

### TXV

### with Constant Torque

- Models from 40 to 150 cc/rev
- TXV130 with constant torque control - with through shaft version

# XPi series

## the *intelligent* pump

fixed displacement bent axis design



The compact size envelope of XPi pumps, together with their technology, means they can be installed in environments with little space available, and be used at relatively high rotating speeds.

### ADVANTAGES

- ▶ Pump automatically sets to required direction of rotation
- ▶ Mounting and start-up, easier than ever !

### CHARACTERISTICS

- 7 pistons
- Innovative plate - barrel synchronisation
- use of materials with high mechanical resistance
- reinforced sealing



### ■ 10 models :

- from 12 to 130 cc/rev
- 380 bar continuous working pressure
- 420 bar peak pressure
- max. speed from 1750 to 3150 rpm

| Pump reference | Displac.<br>(cc/rev) | Maximum continuous pressure<br>(bar) | Maximum intermittent peak pressure < 5 seconds<br>(bar) | Max speed <sup>(1)</sup><br>(rpm) | Max. torque absorbed at 380 bar <sup>(2)</sup><br>(N.m) | Weight                        |                               | Overhang torque                |                                |
|----------------|----------------------|--------------------------------------|---------------------------------------------------------|-----------------------------------|---------------------------------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
|                |                      |                                      |                                                         |                                   |                                                         | without inlet fitting<br>(kg) | with inlet fitting 2"<br>(kg) | without inlet fitting<br>(N.m) | with inlet fitting 2"<br>(N.m) |
| XPi 12         | 12                   | 380                                  | 420                                                     | 3150                              | 76                                                      | 9.2                           | 9.65                          | 8.74                           | 9.17                           |
| XPi 18         | 18                   | 380                                  | 420                                                     | 2900                              | 114                                                     | 9.25                          | 9.7                           | 8.79                           | 9.21                           |
| XPi 25         | 25                   | 380                                  | 420                                                     | 2750                              | 159                                                     | 9.3                           | 9.75                          | 8.84                           | 9.26                           |
| XPi 32         | 32                   | 380                                  | 420                                                     | 2700                              | 204                                                     | 11.1                          | 11.55                         | 11.1                           | 11.55                          |
| XPi 41         | 41                   | 380                                  | 420                                                     | 2550                              | 261                                                     | 11.15                         | 11.6                          | 11.15                          | 11.6                           |
| XPi 50         | 50.3                 | 380                                  | 420                                                     | 2450                              | 318                                                     | 11.2                          | 11.65                         | 11.76                          | 12.23                          |
| XPi 63         | 63                   | 380                                  | 420                                                     | 2300                              | 401                                                     | 11.25                         | 11.7                          | 11.81                          | 12.28                          |
| XPi 80         | 80.4                 | 380                                  | 420                                                     | 2150                              | 509                                                     | 14.85                         | 15.3                          | 17.82                          | 18.36                          |
| XPi 108        | 108.3                | 380                                  | 420                                                     | 1900                              | 687                                                     | 14.95                         | 15.4                          | 17.94                          | 18.48                          |
| XPi 130        | 129.8                | 380                                  | 420                                                     | 1750                              | 827                                                     | 15.35                         | 15.8                          | 18.73                          | 19.28                          |

(1) At absolute pressure 1 bar, ISO VG46 fluid at 25°C.

(2) Maximum torque given with a mechanical efficiency at 95%.

**DUAL DIRECTION OF ROTATION:**  
this *intelligent* pump can operate in either direction of rotation.

Fit the inlet fitting on required side, depending on the direction of rotation of the PTO, and the pump will set itself accordingly.

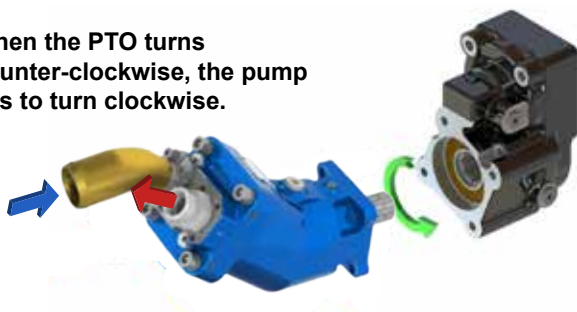


**Clockwise (CW)**

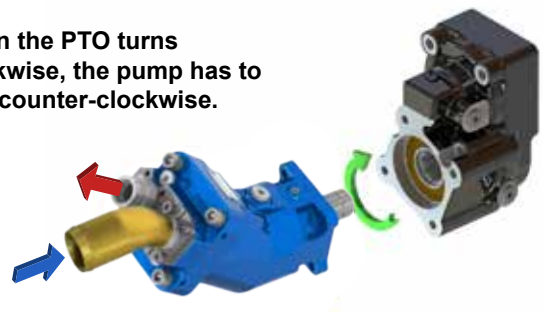
**Counter-clockwise (CCW)**



**When the PTO turns counter-clockwise, the pump has to turn clockwise.**

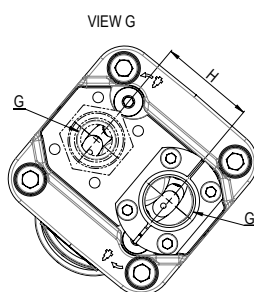
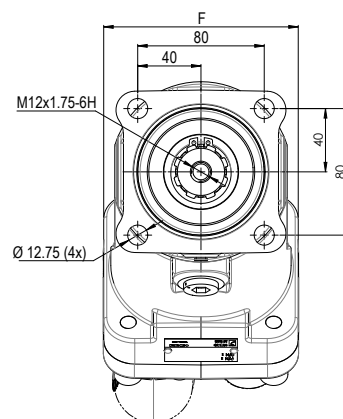
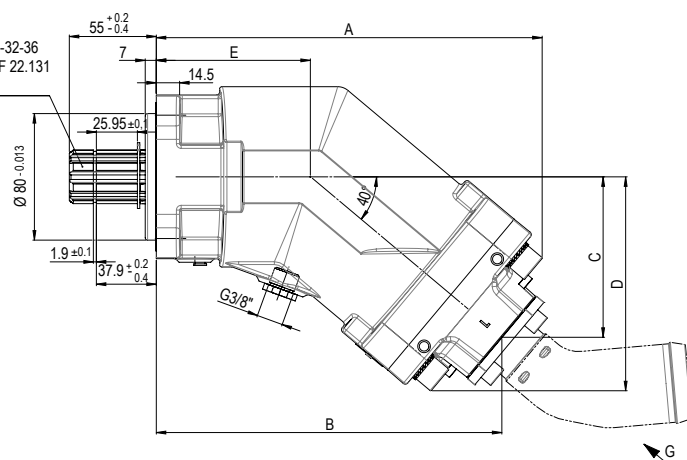


**When the PTO turns clockwise, the pump has to turn counter-clockwise.**





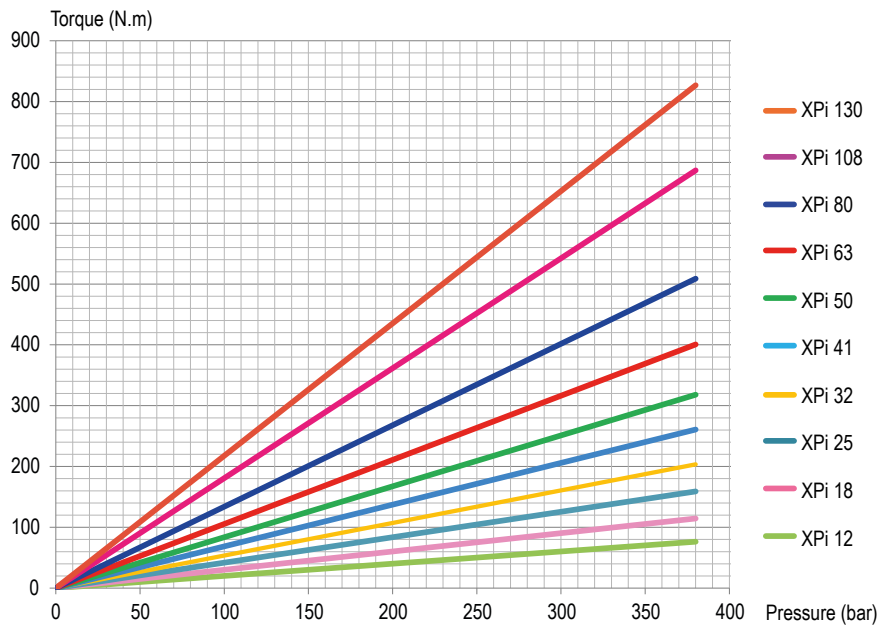
Splined shaft: 8-32-36  
DIN ISO 14 - NF 22.131  
(DIN 5462)



| Pump reference | A     | B     | C     | D     | E    | F   | G      | H  |
|----------------|-------|-------|-------|-------|------|-----|--------|----|
| XPi 12         | 196.7 | 177.8 | 77.1  | 103.9 | 85.7 | 108 | G 3/4" | 54 |
| XPi 18         | 196.7 | 177.8 | 77.1  | 103.9 | 85.7 | 108 | G 3/4" | 54 |
| XPi 25         | 196.7 | 177.8 | 77.1  | 103.9 | 85.7 | 108 | G 3/4" | 54 |
| XPi 32         | 202.8 | 184   | 82.3  | 109.1 | 85.7 | 108 | G 3/4" | 54 |
| XPi 41         | 202.8 | 184   | 82.3  | 109.1 | 85.7 | 108 | G 3/4" | 54 |
| XPi 50         | 214.4 | 195.6 | 92    | 118.9 | 85.7 | 108 | G 3/4" | 54 |
| XPi 63         | 214.4 | 195.6 | 92    | 118.9 | 85.7 | 108 | G 3/4" | 54 |
| XPi 80         | 241.7 | 220.9 | 103.5 | 133.3 | 97.4 | 123 | G 1"   | 60 |
| XPi 108        | 241.7 | 222.5 | 104.8 | 133.3 | 97.4 | 123 | G 1"   | 60 |
| XPi 130        | 244   | 224.8 | 106.7 | 135.2 | 97.4 | 123 | G 1"   | 60 |

Dimensions in mm.

► Torque absorbed as a function of pump output pressure  
(with a mechanical efficiency considered at 95%)

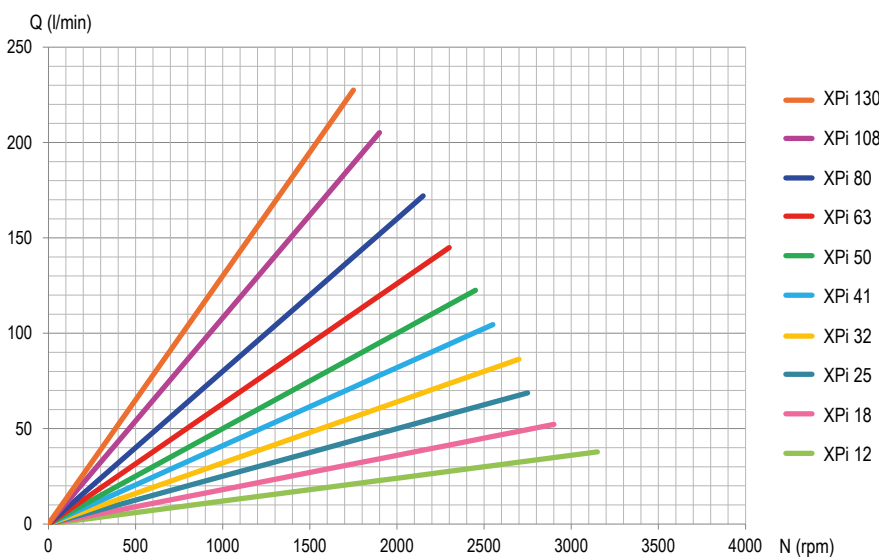


$$C = \frac{\text{Cyl} \times \Delta P}{62.8 \times \eta_{\text{meca}}}$$

With:

|                      |   |                              |
|----------------------|---|------------------------------|
| C                    | = | Torque in N.m                |
| Cyl                  | = | Displacement in cc/rev       |
| $\Delta P$           | = | Differential pressure in bar |
| $\eta_{\text{meca}}$ | = | Mechanical efficiency        |

► Flow as a function of rotating speed



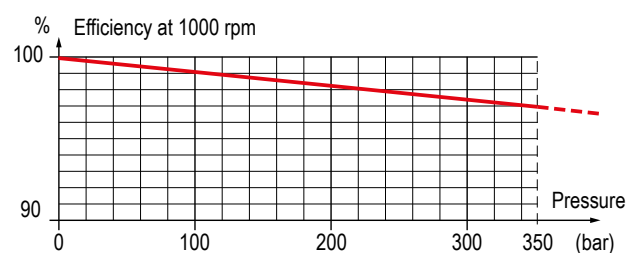
$$Q = \frac{\text{Cyl} \times N \times \eta_{\text{vol}}}{1000}$$

With:

|                     |   |                        |
|---------------------|---|------------------------|
| Q                   | = | Flow in l/min          |
| N                   | = | Speed in rpm           |
| $\eta_{\text{vol}}$ | = | Volumetric efficiency  |
| Cyl                 | = | Displacement in cc/rev |

These graphs are the results of testwork done in HYDRO LEDUC R&D laboratory, on a specific test bench with a mineral hydraulic fluid ISO VG46 at 25°C (~100 cSt) - disregarding the volumetric efficiency.

► Volumetric efficiency



# Order code system of XPi pumps

| XPi                   | ...                                                            | A1    | H1           | P0 | ...   | ... | To define your pump's model code, complete parameters 02, 06 and 07 based on the desired options (refer to the table below). |     |     |     |     |     |     |     |     |
|-----------------------|----------------------------------------------------------------|-------|--------------|----|-------|-----|------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 01                    | 02                                                             | 03    | 04           | 05 | 06    | 07  |                                                                                                                              |     |     |     |     |     |     |     |     |
| Pump                  |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 01                    | XPi bent axis piston pump                                      |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     | XPi |
| Displacement [cc/rev] |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 02                    |                                                                |       |              |    | 012   | 018 | 025                                                                                                                          | 032 | 041 | 050 | 063 | 080 | 108 | 130 | ... |
| Mounting flange       |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 03                    | NF ISO 7653, 4-bolt                                            |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     | A1  |
| Shaft                 |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 04                    | DIN ISO 14 - NF E22-131 / 8-32-36 Spline (without center hole) |       |              |    | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | H1  |
| End cover             |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 05                    | Rear ports                                                     |       |              |    | G3/4" |     |                                                                                                                              |     |     |     | G1" |     |     |     | P0  |
| Shaft seal material   |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
| 06                    | FKM                                                            |       |              |    | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | F   |
|                       | NBR                                                            |       |              |    | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | N   |
| Suction fitting kit   |                                                                |       |              |    |       |     |                                                                                                                              |     |     |     |     |     |     |     |     |
|                       | 45°                                                            | 1"1/2 | Ref. 0519370 | •  | •     | •   | •                                                                                                                            | •   | •   | -   | -   | -   | -   | -   | V1  |
|                       |                                                                | 42mm  | Ref. 0519373 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | -   | -   | -   | V2  |
|                       |                                                                | 1"3/4 | Ref. 0519374 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | -   | -   | V3  |
|                       |                                                                | 2"    | Ref. 0519371 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | V4  |
|                       |                                                                | 2"1/2 | Ref. 0519372 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | V5  |
|                       | 90°                                                            | 1"1/2 | Ref. 0521740 | •  | •     | •   | •                                                                                                                            | •   | •   | -   | -   | -   | -   | -   | J1  |
|                       |                                                                | 2"    | Ref. 0521741 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | J4  |
|                       |                                                                | 2"1/2 | Ref. 0521742 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | J5  |
|                       | 0° (straight)                                                  | 2"    | Ref. P003671 | •  | •     | •   | •                                                                                                                            | •   | •   | •   | •   | •   | •   | •   | I4  |

**Legend:**

• Default option

• Available model

- Not available

## INLET FITTINGS FOR XPi PUMPS

**⚠ See recommendations of the hosing dimensions on page 40.**

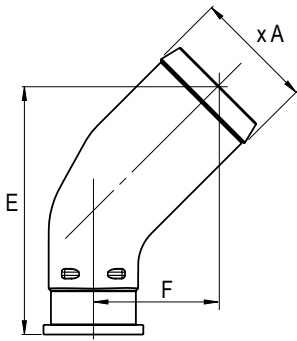
For high speeds, please consult.

All XPi pumps are supplied with their inlet fitting.

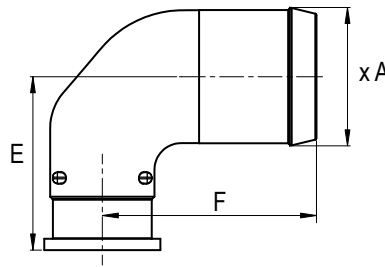
Please specify required fitting from the choice below when ordering.



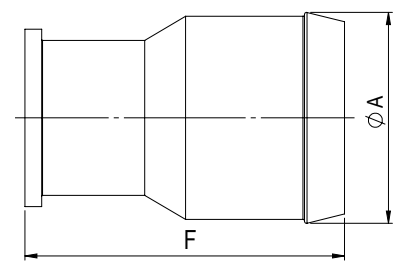
### 45° elbow fittings kit



### 90° elbow fittings kit



### 0° straight fitting kit



| Configurator code | Reference | Ø hose | Ø A  | E     | F    |
|-------------------|-----------|--------|------|-------|------|
| V1                | 0519370   | 1 1/2" | 39,1 | 91,7  | 46,7 |
| V2                | 0519373   | 42     | 43,0 | 91,7  | 46,7 |
| V3                | 0519374   | 1 3/4" | 46,0 | 91,7  | 46,7 |
| V4                | 0519371   | 2"     | 51,8 | 108,4 | 54,4 |
| V5                | 0519372   | 2 1/2" | 64,5 | 125,2 | 62,2 |

Dimensions in mm.

| Configurator code | Reference | Ø hose | Ø A  | E    | F    |
|-------------------|-----------|--------|------|------|------|
| J1                | 0521740   | 1 1/2" | 39,1 | 58,6 | 79,5 |
| J4                | 0521741   | 2"     | 51,8 | 64,9 | 80,2 |
| J5                | 0521742   | 2 1/2" | 64,5 | 71,3 | 87,5 |

Dimensions in mm.

| Configurator code | Reference | Ø hose | Ø A | F  |
|-------------------|-----------|--------|-----|----|
| I4                | P003671   | 2"     | 52  | 80 |

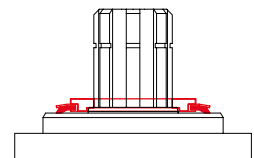
Dimensions in mm.

## DEFLECTOR TO PROTECT SHAFT SEALS

This deflector ensures the protection of the pump shaft seals.

In particular, it protects the pump from projections of dirt from the road in cardan drive installations.

Reference: **DEF 054111**



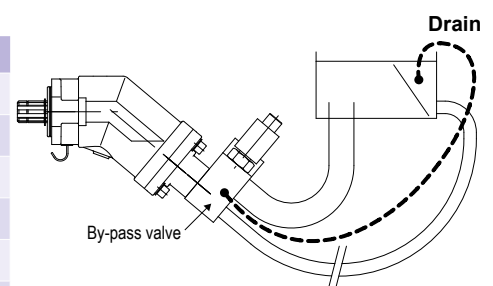
## BY-PASS VALVE FOR XPi PUMPS

For XPi pump applications where the pump is driven by a continuous running PTO (PTO which cannot be disengaged), this solution allows the continuous running of the pump:

- without creating problems of fluid overheating;
- without affecting pump service life;
- with no modifications necessary to the hydraulic circuit of the equipment.

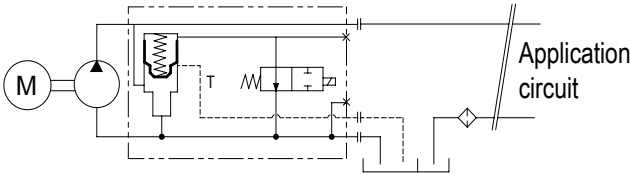
⇒ **By-pass fitted on the back of the XPi pump.**

| Reference    | Pump            | Voltage | Connector       |
|--------------|-----------------|---------|-----------------|
| BP63-0517931 | XPi12 to XPi63  | 24 V    | HIRSCHMANN      |
| BP63-P001835 | XPi12 to XPi63  | 24 V    | DEUTSCH DT04-2P |
| BP80-0522140 | XPi80 to XPi130 | 24 V    | HIRSCHMANN      |
| BP80-P001840 | XPi80 to XPi130 | 24 V    | DEUTSCH DT04-2P |
| BP63-0521180 | XPi12 to XPi63  | 12 V    | HIRSCHMANN      |
| BP80-0522235 | XPi80 to XPi130 | 12 V    | HIRSCHMANN      |



► How does it work ?

The by-pass valve is a 24 Volts solenoid valve.  
When not activated, it enables pump output to link up to pump inlet.  
When it is activated, the pump operates normally (output flow).



A drain line has to be installed between the By-Pass valve and the hydraulic tank of the vehicle to ensure sufficient oil circulation and a good cooling into the pump. In any case, the connection to the tank must be done below the oil level.

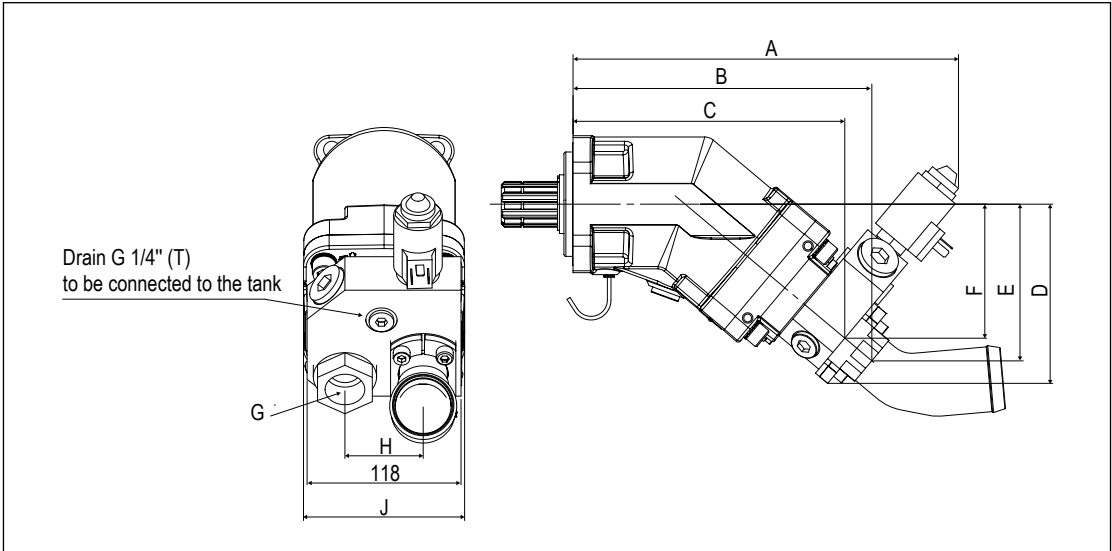
► XPi overhang torque with by-pass

| Pump reference | Weight                        |                               | Overhang torque                |                                |
|----------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
|                | without inlet fitting<br>(kg) | with inlet fitting 2"<br>(kg) | without inlet fitting<br>(N.m) | with inlet fitting 2"<br>(N.m) |
| XPi 12         | 12.8                          | 13.25                         | 16.32                          | 16.90                          |
| XPi 18         | 12.85                         | 13.3                          | 16.39                          | 16.96                          |
| XPi 25         | 12.9                          | 13.35                         | 16.44                          | 17.02                          |
| XPi 32         | 14.7                          | 15.15                         | 18.98                          | 19.56                          |
| XPi 41         | 14.75                         | 15.2                          | 19.04                          | 19.62                          |
| XPi 50         | 14.8                          | 15.25                         | 20.05                          | 20.67                          |
| XPi 63         | 14.85                         | 15.3                          | 20.12                          | 20.73                          |
| XPi 80         | 18.45                         | 18.9                          | 27.16                          | 27.82                          |
| XPi 108        | 18.55                         | 19                            | 27.31                          | 27.97                          |
| XPi 130        | 18.95                         | 19.4                          | 28.16                          | 28.93                          |

► Dimensions with by-pass valve

| Pump reference   | A      | B      | C      | D      | E      | F     | G    | H  | J     |
|------------------|--------|--------|--------|--------|--------|-------|------|----|-------|
| XPi 12 / 18 / 25 | 289.35 | 223.04 | 202.19 | 132.20 | 114.72 | 97.58 | 3/4" | 54 | 108   |
| XPi 32 / 41      | 295.5  | 229    | 208.3  | 137.3  | 120.1  | 102.7 | 3/4" | 54 | 108   |
| XPi 50 / 63      | 307.1  | 240.4  | 220    | 147.1  | 129.7  | 112.5 | 3/4" | 54 | 108   |
| XPi 80 / 108     | 334    | 269    | 246.7  | 157.8  | 143.9  | 124.8 | 1"   | 60 | 123   |
| XPi 130          | 336.3  | 271.3  | 249    | 159.7  | 145.8  | 126.7 | 1"   | 60 | 123.5 |

Dimensions in mm.



# XAi series

## the *intelligent* pump - SAE version

fixed displacement bent axis design



The compact size envelope of XAi pumps, together with their technology, means they can be installed in environments with little space available, and be used at relatively high rotating speeds.

### ADVANTAGES

- ▶ Pump automatically sets to required direction of rotation
- ▶ Mounting and start-up, easier than ever !

### CHARACTERISTICS

- 7 pistons
- original idea for plate - barrel synchronisation
- use of materials with high mechanical resistance
- reinforced sealing

#### ■ 12 models :

- from 12 to 63 cc/rev (0.74 to 3.84 cu.in/rev)
- 380 bar (5511 psi) continuous working pressure
- 420 bar (6092 psi) peak pressure
- maximum speed from 2300 to 2950 rpm



4 bolt  
flange models

2 bolt  
flange models

## ► 2 bolt flange - SAE J744

| Pump reference | Displac.<br>Cu.in/rev<br>(cc/rev) | Maximum continuous pressure<br>psi (bar) | Maximum peak pressure < 5 seconds<br>psi (bar) | Max speed <sup>(1)</sup><br>rpm | Max. torque absorbed at 5511 psi (380 bar) <sup>(2)</sup><br>lbf ft (N.m) | Weight                            |                                   | Overhang torque                       |                                       |
|----------------|-----------------------------------|------------------------------------------|------------------------------------------------|---------------------------------|---------------------------------------------------------------------------|-----------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|
|                |                                   |                                          |                                                |                                 |                                                                           | without inlet fitting<br>lbs (kg) | with inlet fitting 2"<br>lbs (kg) | without inlet fitting<br>lbf ft (N.m) | with inlet fitting 2"<br>lbf ft (N.m) |
| XAi 12         | 0.74 (12)                         | 5511 (380)                               | 6092 (420)                                     | 2950                            | 54 (73)                                                                   | 21.8 (9.9)                        | 23 (10.5)                         | 6 (8.1)                               | 6.9 (9.4)                             |
| XAi 18         | 1.1 (18)                          | 5511 (380)                               | 6092 (420)                                     | 2400                            | 84 (114)                                                                  | 22.15 (10.5)                      | 23.14 (10.5)                      | 7.04 (9.54)                           | 7.35 (9.97)                           |
| XAi 25         | 1.52 (25)                         | 5511 (380)                               | 6092 (420)                                     | 2650                            | 117 (159)                                                                 | 22.38 (10.15)                     | 23.36 (10.6)                      | 7.11 (9.64)                           | 7.43 (10.07)                          |
| XAi 32         | 1.95 (32)                         | 5511 (380)                               | 6092 (420)                                     | 2600                            | 150 (204)                                                                 | 26.34 (11.95)                     | 27.67 (12.4)                      | 8.81 (11.95)                          | 9.15 (12.4)                           |
| XAi 41         | 2.5 (41)                          | 5511 (380)                               | 6092 (420)                                     | 2550                            | 192 (261)                                                                 | 26.45 (12)                        | 27.45 (12.45)                     | 8.85 (12)                             | 9.18 (12.45)                          |

(1) At absolute pressure 14,50 psi (1 bar), ISO VG46 fluid at 25°C.

(2) Maximum torque given with a mechanical efficiency at 95%.

## ► 4 bolt flange - SAE J744

| Pump reference | Displac.<br>Cu.in/rev<br>(cc/rev) | Maximum continuous pressure<br>psi (bar) | Maximum peak pressure < 5 seconds<br>psi (bar) | Max speed <sup>(1)</sup><br>rpm | Max. torque absorbed at 5511 psi (380 bar) <sup>(2)</sup><br>lbf ft (N.m) | Weight                            |                                | Overhang torque                       |                                    |
|----------------|-----------------------------------|------------------------------------------|------------------------------------------------|---------------------------------|---------------------------------------------------------------------------|-----------------------------------|--------------------------------|---------------------------------------|------------------------------------|
|                |                                   |                                          |                                                |                                 |                                                                           | without inlet fitting<br>lbs (kg) | with inlet fitting<br>lbs (kg) | without inlet fitting<br>lbf ft (N.m) | with inlet fitting<br>lbf ft (N.m) |
| XAi 12         | 0.74 (12)                         | 5511 (380)                               | 6092 (420)                                     | 2950                            | 54 (73)                                                                   | 21.8 (9.9)                        | 23 (10.5)                      | 6.1 (8.23)                            | 7 (9.52)                           |
| XAi 18         | 1.1 (18)                          | 5511 (380)                               | 6092 (420)                                     | 2400                            | 84 (114)                                                                  | 22.59 (10.25)                     | 23.59 (10.7)                   | 7.18 (9.73)                           | 7.49 (10.16)                       |
| XAi 25         | 1.52 (25)                         | 5511 (380)                               | 6092 (420)                                     | 2650                            | 117 (159)                                                                 | 22.71 (10.3)                      | 23.70 (10.75)                  | 7.19 (9.75)                           | 7.53 (10.21)                       |
| XAi 32         | 1.95 (32)                         | 5511 (380)                               | 6092 (420)                                     | 2600                            | 150 (204)                                                                 | 26.68 (12.1)                      | 27.67 (12.55)                  | 8.92 (12.1)                           | 9.26 (12.55)                       |
| XAi 41         | 2.5 (41)                          | 5511 (380)                               | 6092 (420)                                     | 2550                            | 192 (261)                                                                 | 26.78 (12.15)                     | 27.78 (12.6)                   | 8.96 (12.15)                          | 9.29 (12.6)                        |
| XAi 50         | 3.07 (50.3)                       | 5511 (380)                               | 6092 (420)                                     | 2450                            | 234 (318)                                                                 | 26.89 (12.2)                      | 27.89 (12.65)                  | 9.45 (12.81)                          | 9.80 (13.28)                       |
| XAi 63         | 3.84 (63)                         | 5511 (380)                               | 6092 (420)                                     | 2300                            | 295 (401)                                                                 | 27.01 (12.25)                     | 28 (12.7)                      | 9.49 (12.86)                          | 9.83 (13.33)                       |

(1) At absolute pressure 14,50 psi (1 bar), ISO VG46 fluid at 25°C.

(2) Maximum torque given with a mechanical efficiency at 95%.

**DUAL DIRECTION OF ROTATION:**  
this *intelligent* pump can operate in either direction of rotation.

Fit the inlet fitting on required side, depending on the direction of rotation of the PTO, and the pump will set itself accordingly.

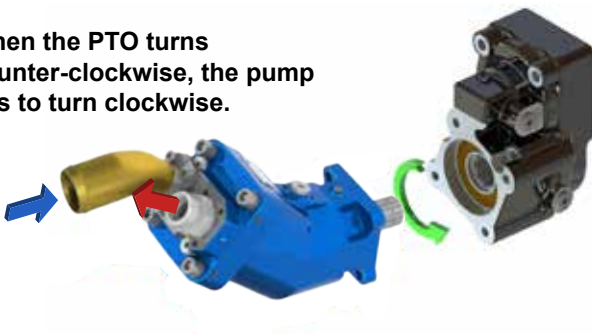


**Clockwise (CW)**

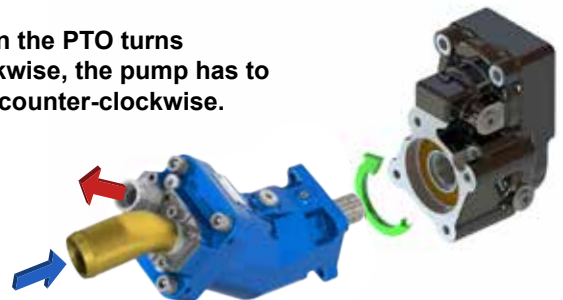
**Counter-clockwise (CCW)**

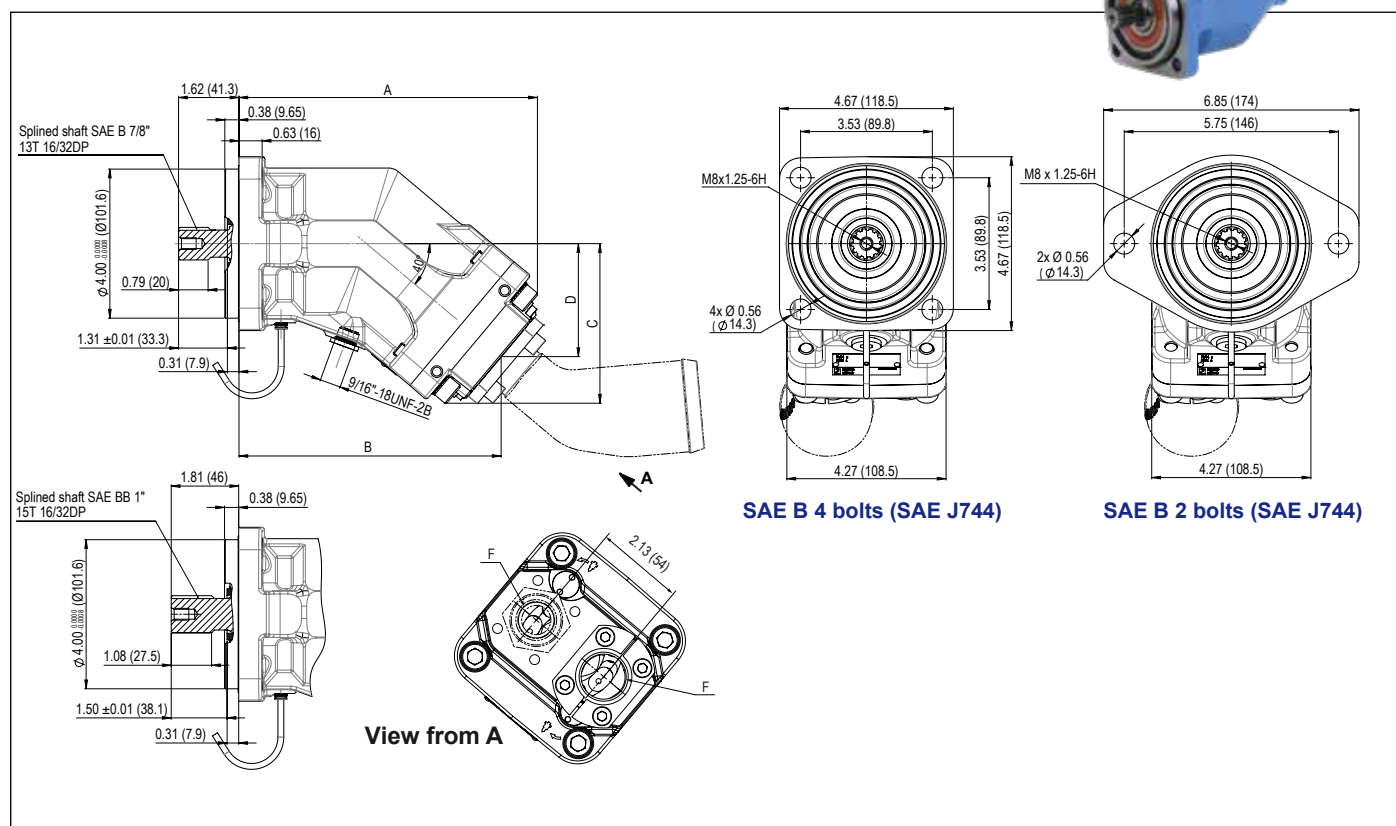


**When the PTO turns counter-clockwise, the pump has to turn clockwise.**



**When the PTO turns clockwise, the pump has to turn counter-clockwise.**





### ► SAE B - 2 bolt mounting configurations (SAE J744)

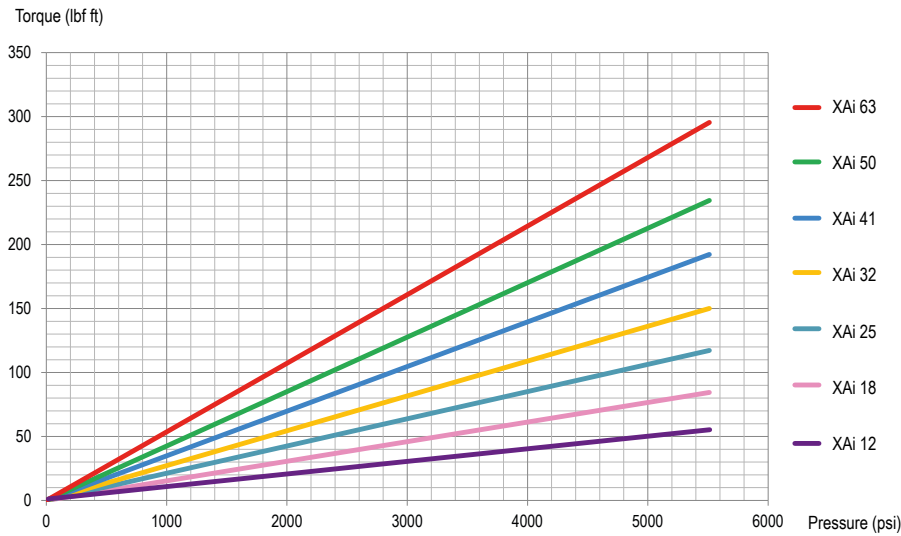
| Pump type | A            | B            | C            | D         | F                | Shaft                  |
|-----------|--------------|--------------|--------------|-----------|------------------|------------------------|
| XAi 12    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 18    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 25    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 32    | 8 (203.2)    | 7.03 (178.5) | 4.28 (108.7) | 3.03 (77) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 41    | 8 (203.2)    | 7.03 (178.5) | 4.28 (108.7) | 3.03 (77) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |

### ► SAE B - 4 bolt mounting configurations (SAE J744)

| Pump type | A            | B            | C            | D          | F                | Shaft                  |
|-----------|--------------|--------------|--------------|------------|------------------|------------------------|
| XAi 12    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73)  | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 18    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73)  | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 25    | 7.76 (197.2) | 6.79 (172.5) | 4.08 (103.7) | 2.87 (73)  | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 32    | 8 (203.2)    | 7.02 (178.5) | 4.28 (108.7) | 3.03 (77)  | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 41    | 8 (203.2)    | 7.02 (178.5) | 4.28 (108.7) | 3.03 (77)  | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 50    | 8.45 (214.7) | 7.48 (190)   | 4.65 (118.2) | 3.4 (86.5) | 1 1/16"-12 UN-2B | SAE B 7/8" 13T-16/32DP |
| XAi 50    | 8.45 (214.7) | 7.48 (190)   | 4.65 (118.2) | 3.4 (86.5) | 1 1/16"-12 UN-2B | SAE BB 1" 15T-16/32DP  |
| XAi 63    | 8.45 (214.7) | 7.48 (190)   | 4.65 (118.2) | 3.4 (86.5) | 1 1/16"-12 UN-2B | SAE BB 1" 15T-16/32DP  |

Dimensions in inches (mm).

► Torque absorbed as a function of pump output pressure  
(with a mechanical efficiency considered at 95%)

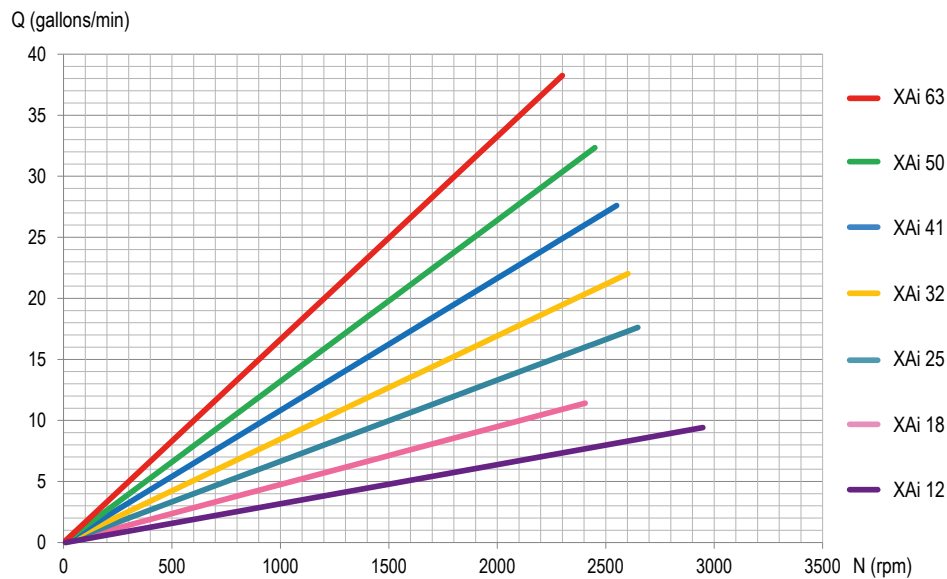


$$C = \frac{\text{Cyl} \times \Delta P}{62.8 \times \eta_{\text{meca}}}$$

With:

- C = Torque in N.m
- Cyl = Displacement in cc/rev
- $\Delta P$  = Differential pressure in bar
- $\eta_{\text{meca}}$  = Mechanical efficiency

► Flow as a function of rotating speed



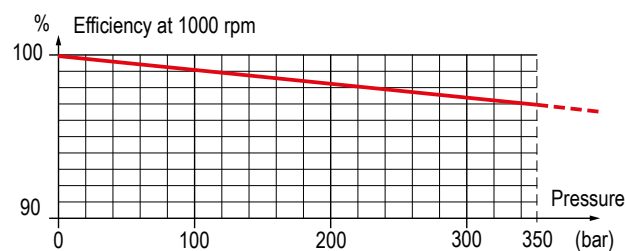
$$Q = \frac{\text{Cyl} \times N \times \eta_{\text{vol}}}{1000}$$

With:

- Q = Flow in l/min
- N = Speed in rpm
- $\eta_{\text{vol}}$  = Volumetric efficiency
- Cyl = Displacement in cc/rev

These graphs are the results of testwork done in HYDRO LEDUC R&D laboratory, on a specific test bench with a mineral hydraulic fluid ISO VG46 at 25°C (~100 cSt) - disregarding the volumetric efficiency.

► Volumetric efficiency



| XAi                   | ...                       | ...   | ...          | P0            | ... | ... | To define your pump's model code, complete parameters 02, 03, 04, 06 and 07 based on the desired options (refer to the table below). |                 |     |                |     |     |     |
|-----------------------|---------------------------|-------|--------------|---------------|-----|-----|--------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----|----------------|-----|-----|-----|
| 01                    | 02                        | 03    | 04           | 05            | 06  | 07  |                                                                                                                                      |                 |     |                |     |     |     |
| Pump                  |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 01                    | XAi Bent axis piston pump |       |              |               |     |     |                                                                                                                                      |                 |     |                | XAi |     |     |
| Displacement [cc/rev] |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 02                    |                           |       |              |               |     | 012 | 018                                                                                                                                  | 025             | 032 | 041            | 050 | 063 | ... |
| Mounting flange       |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 03                    | NF ISO 7653, 4-bolt       |       | 2-bolt       | •             | •   | •   | •                                                                                                                                    | •               | •   | -              | -   | B1  |     |
|                       |                           |       | 4-bolt       | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | B2  |     |     |
| Shaft                 |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 04                    | SAE B 7/8" 13T- 16/32DP   |       |              | •             | •   | •   | •                                                                                                                                    | •               | •   | • <sup>1</sup> | S1  |     |     |
|                       | SAE BB 1" 15T- 16/32DP    |       |              | -             | -   | -   | -                                                                                                                                    | -               | •   | •              | S2  |     |     |
| Rear cover            |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 05                    | Rear ports                |       |              | 3/4"-16UNF-2B |     |     |                                                                                                                                      | 1"1/16-12UNF-2B |     |                | P0  |     |     |
| Shaft seal material   |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 06                    | FKM                       |       |              | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | F   |     |     |
|                       | NBR                       |       |              | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | N   |     |     |
| Suction fitting kit   |                           |       |              |               |     |     |                                                                                                                                      |                 |     |                |     |     |     |
| 07                    | 45°                       | 1"1/2 | Ref. 0519370 | •             | •   | •   | •                                                                                                                                    | •               | •   | -              | V1  |     |     |
|                       |                           | 42mm  | Ref. 0519373 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | V2  |     |     |
|                       |                           | 1"3/4 | Ref. 0519374 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | V3  |     |     |
|                       |                           | 2"    | Ref. 0519371 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | V4  |     |     |
|                       |                           | 2"1/2 | Ref. 0519372 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | V5  |     |     |
|                       | 90°                       | 1"1/2 | Ref. 0521740 | •             | •   | •   | •                                                                                                                                    | •               | •   | -              | J1  |     |     |
|                       |                           | 2"    | Ref. 0521741 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | J4  |     |     |
|                       |                           | 2"1/2 | Ref. 0521742 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | J5  |     |     |
|                       | 0° (straight)             | 2"    | Ref. P003671 | •             | •   | •   | •                                                                                                                                    | •               | •   | •              | I4  |     |     |

Legend:

• Default option

• Available model

- Not available

<sup>1</sup> Maximum permissible pressure: 290 bar.



## INLET FITTINGS FOR XAi PUMPS

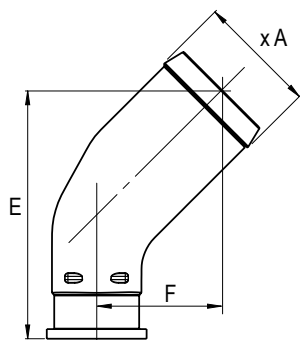
**⚠ See recommendations of the hosing dimensions on page 40.**

For high speeds, please consult.

All XAi pumps are supplied with their inlet fitting.

Please specify required fitting from the choice below when ordering.

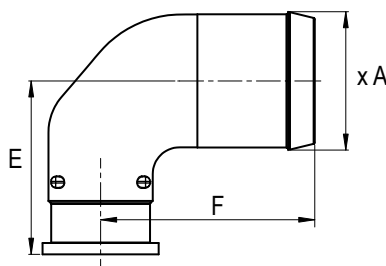
### 45° elbow fittings kit



| Configurator code | Reference | Ø hose | Ø A         | E            | F           |
|-------------------|-----------|--------|-------------|--------------|-------------|
| V1                | 0519370   | 1 1/2" | 1.54 (39,1) | 3.61 (91,7)  | 1.84 (46,7) |
| V2                | 0519373   | 42     | 1.69 (43,0) | 3.61 (91,7)  | 1.84 (46,7) |
| V3                | 0519374   | 1 3/4" | 1.81 (46,0) | 3.61 (91,7)  | 1.84 (46,7) |
| V4                | 0519371   | 2"     | 2.04 (51,8) | 4.27 (108,4) | 2.14 (54,4) |
| V5                | 0519372   | 2 1/2" | 2.54 (64,5) | 4.93 (125,2) | 2.45 (62,2) |

Dimensions in inches (mm).

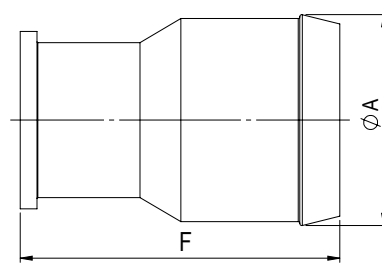
### 90° elbow fittings kit



| Configurator code | Reference | Ø hose | Ø A         | E           | F           |
|-------------------|-----------|--------|-------------|-------------|-------------|
| J1                | 0521740   | 1 1/2" | 1.54 (39,1) | 2.31 (58,6) | 3.13 (79,5) |
| J4                | 0521741   | 2"     | 2.04 (51,8) | 2.56 (64,9) | 3.16 (80,2) |
| J5                | 0521742   | 2 1/2" | 5.54 (64,5) | 2.81 (71,3) | 3.44 (87,5) |

Dimensions in inches (mm).

### 0° straight fitting kit



| Configurator code | Reference | Ø hose | Ø A       | F         |
|-------------------|-----------|--------|-----------|-----------|
| I4                | P003671   | 2"     | 2.05 (52) | 3.15 (80) |

Dimensions in inches (mm).

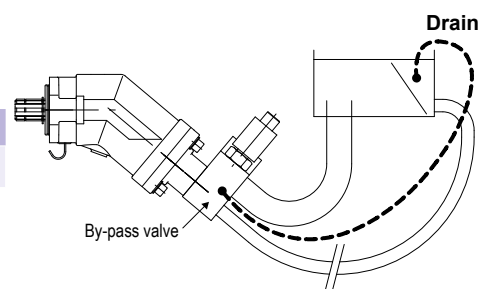
## BY-PASS VALVE FOR XAi PUMPS

For XAi pump applications where the pump is driven by a continuous running PTO (PTO which cannot be disengaged), this solution allows the continuous running of the pump:

- without creating problems of fluid overheating;
- without affecting pump service life;
- with no modifications necessary to the hydraulic circuit of the equipment.

⇒ **By-pass fitted on the back of the XAi pump.**

| Part number   | Pump             | Voltage | Connector  |
|---------------|------------------|---------|------------|
| BPA63-0521715 | XAi 12 to XAi 63 | 24 V    | HIRSCHMANN |

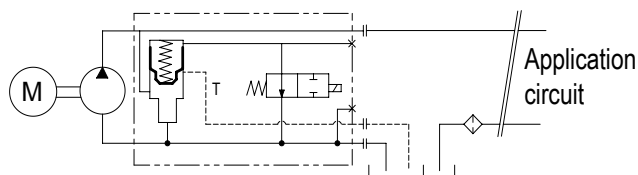


### ► How does it work ?

The by-pass valve is a solenoid valve (12 or 24 Volts).

When not activated, it enables pump output to link up to pump inlet.

When it is activated, the pump operates normally (output flow).



A drain line has to be installed between the By-Pass valve and the hydraulic tank of the vehicle to ensure sufficient oil circulation and a good cooling into the pump. In any case, the connection to the tank must be done below the oil level.

## ► XAi overhang torque with by-pass

## 2 bolt flange - SAE J744

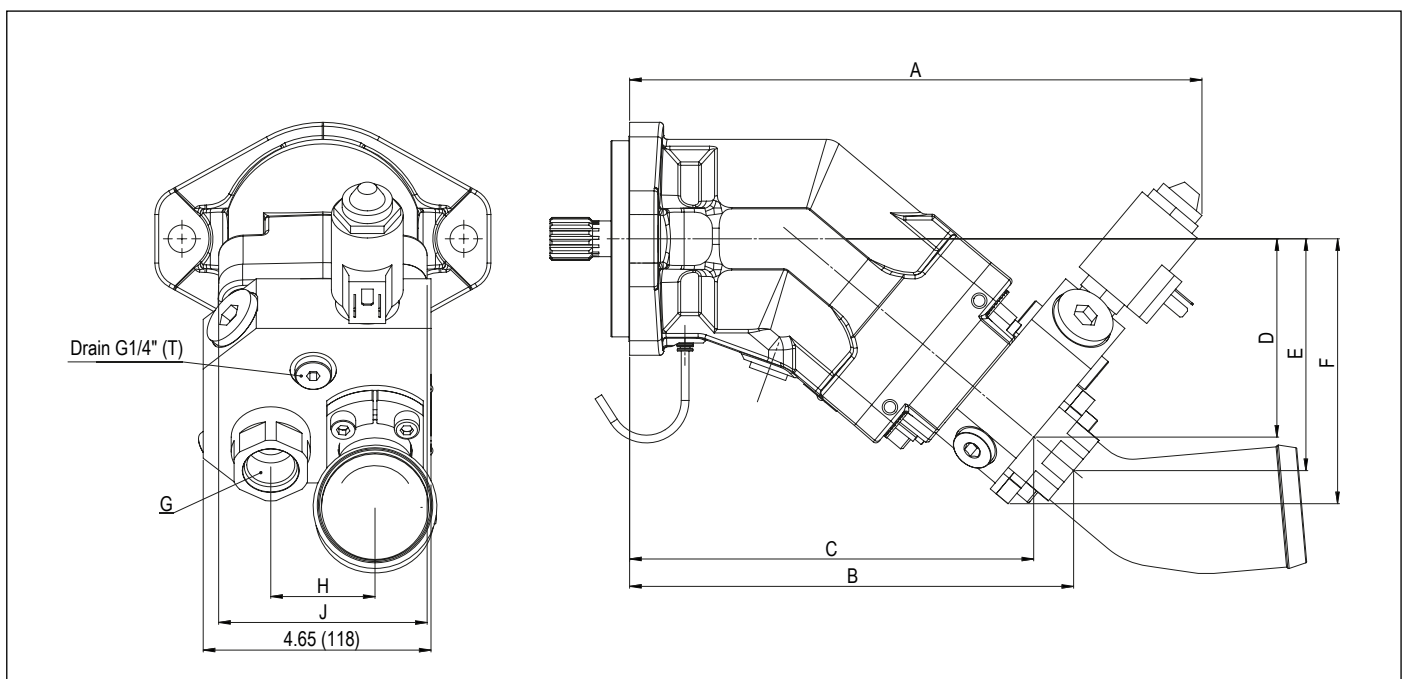
| Pump reference   | Weight                            |                                   | Overhang torque                       |                                       |
|------------------|-----------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|
|                  | without inlet fitting<br>lbs (kg) | with inlet fitting 2"<br>lbs (kg) | without inlet fitting<br>lbf ft (N.m) | with inlet fitting 2"<br>lbf ft (N.m) |
| XAi 12 - 2 bolts | 30 (13,6)                         | 31 (14,1)                         | 11.8 (15,9)                           | 12.7 (17,2)                           |
| XAi 18 - 2 bolts | 28.33 (12.85)                     | 29.32 (13.30)                     | 9.87 (13.38)                          | 12.51 (16.96)                         |
| XAi 25 - 2 bolts | 28.44 (12.90)                     | 29.43 (13.35)                     | 12.13 (16.45)                         | 12.55 (17.02)                         |
| XAi 32 - 2 bolts | 32.41 (14.70)                     | 33.40 (15.15)                     | 14 (18.98)                            | 14.43 (19.56)                         |
| XAi 41 - 2 bolts | 32.52 (14.75)                     | 33.51 (15.20)                     | 10.36 (14.04)                         | 14.47 (19.62)                         |

## 4 bolt flange - SAE J744

| Pump reference   | Weight                            |                                   | Overhang torque                       |                                       |
|------------------|-----------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|
|                  | without inlet fitting<br>lbs (kg) | with inlet fitting 2"<br>lbs (kg) | without inlet fitting<br>lbf ft (N.m) | with inlet fitting 2"<br>lbf ft (N.m) |
| XAi 12 - 4 bolts | 30 (13,6)                         | 31 (14,1)                         | 11.9 (16,12)                          | 12.8 (17,36)                          |
| XAi 18 - 4 bolts | 28.77 (13.05)                     | 29.76 (13.50)                     | 12.27 (16.64)                         | 12.69 (17.21)                         |
| XAi 25 - 4 bolts | 28.77 (13.05)                     | 29.76 (13.50)                     | 12.27 (16.64)                         | 12.69 (17.21)                         |
| XAi 32 - 4 bolts | 32.74 (14.85)                     | 33.73 (15.30)                     | 14.14 (19.17)                         | 14.57 (19.75)                         |
| XAi 41 - 4 bolts | 32.85 (14.90)                     | 33.84 (15.35)                     | 14.19 (19.24)                         | 14.62 (19.82)                         |
| XAi 50 - 4 bolts | 32.63 (14.80)                     | 33.62 (15.25)                     | 14.79 (20.05)                         | 15.24 (20.66)                         |
| XAi 63 - 4 bolts | 32.74 (14.85)                     | 33.73 (15.30)                     | 14.84 (20.12)                         | 15.29 (20.73)                         |

## ► Dimensions with by-pass valve

| Pump reference   | A             | B            | C            | D            | E            | F            | G                   | H         | J          |
|------------------|---------------|--------------|--------------|--------------|--------------|--------------|---------------------|-----------|------------|
| XAi 12 / 18 / 25 | 11.43 (290.4) | 8.81 (223.9) | 8.00 (203.2) | 5.20 (132.1) | 4.53 (115)   | 3.84 (97.6)  | 1 1/16"- 16UNF - 2B | 2.13 (54) | 4.25 (108) |
| XAi 32 / 41      | 11.67 (296.5) | 9.06 (230)   | 8.24 (209.2) | 5.41 (137.3) | 4.73 (120.1) | 4.04 (102.7) | 1 1/16"- 16UNF - 2B | 2.13 (54) | 4.25 (108) |
| XAi 50 / 63      | 12.13 (308.2) | 9.52 (241.7) | 8.70 (221)   | 5.79 (147)   | 5.11 (129.9) | 4.43 (112.5) | 1 1/16"- 16UNF - 2B | 2.13 (54) | 4.25 (108) |



Dimensions in inches (mm).



# PA | PAC series

## piston pumps

fixed displacement in-line design

### ADVANTAGES

- ▶ Of unique design, the PA and PAC pumps offer a robust solution with **long service life** for high pressure requirements in truck hydraulics.
- ▶ Relatively insensitive to contamination, these pumps are particularly **well suited to the harshest environments**.
- ▶ The design means the pumps can rotate either clockwise or counter-clockwise **without any user intervention**.
- ▶ Like all truck pumps designed by HYDRO LEDUC, this range is fitted with the **latest innovation in terms of sealing**:
  - Front of pump fitted with two shaft seals: externally, a seal capable of resisting the high temperatures of the gearbox, and internally, a seal adapted to the hydraulic requirements.
  - A transparent flexible tube fitted between the two seals, to protect these seals from dirt from the road, and from high pressure water jet during washing of vehicle etc...



*The PA, PAC pump series comprises two ranges, all designed for truck applications at working pressures up to 5800 psi (400 bar) continuous and 7252 psi (500 bar) peak.*



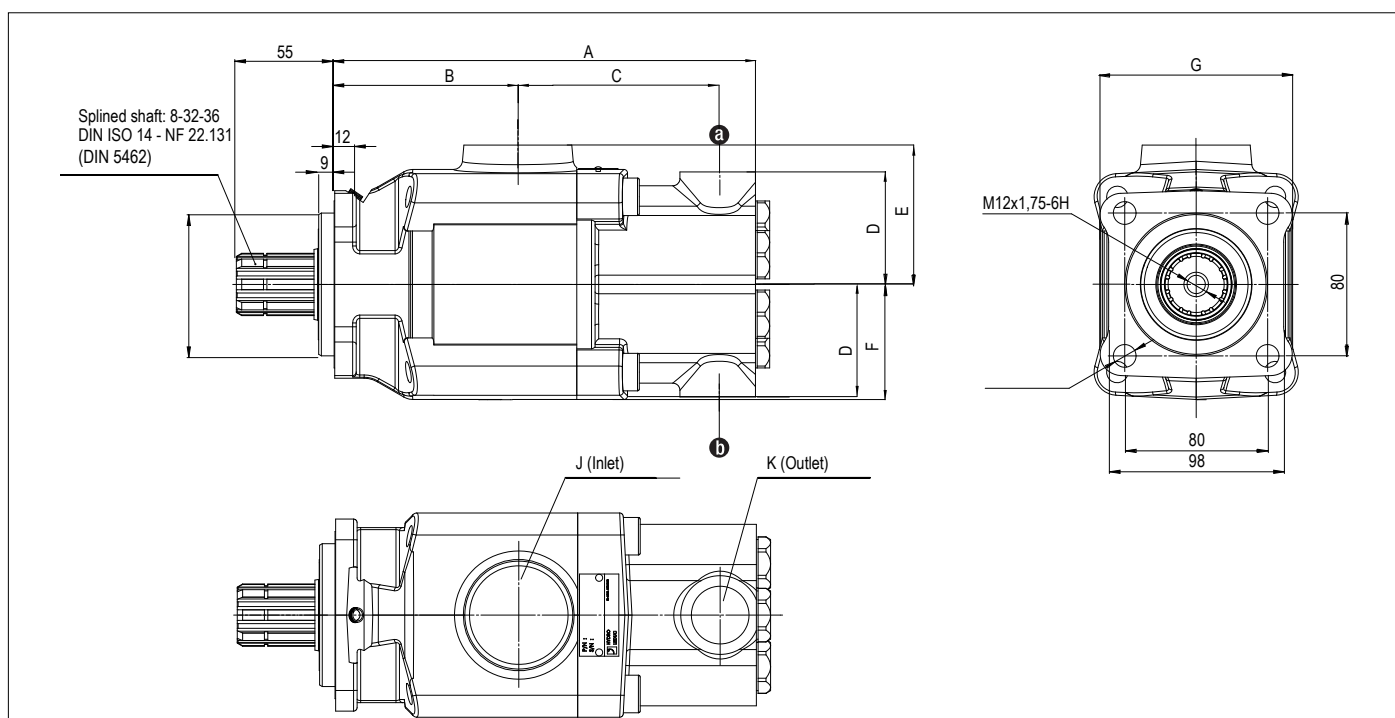
## ► PA pumps

- single flow from 25 to 114 cc/rev
- twin-flow from 2x50 to 2x75 cc/rev
- two different flows: 75-40 cc/rev

## ► PAC pumps

Series offering the most compact size envelope :

- single flow from 40 to 80 cc/rev
- twin-flow from 2x25 to 2x40 cc/rev



| Pump reference | Displacement (cc/rev) |   | A | B | C | D | E | F | G | J | K | Weight (kg) | Overhang torque (N.m) | Max. speed (rpm) | Max. torque absorbed at 400 bar <sup>(1)</sup> (N.m) |
|----------------|-----------------------|---|---|---|---|---|---|---|---|---|---|-------------|-----------------------|------------------|------------------------------------------------------|
|                | a                     | b |   |   |   |   |   |   |   |   |   |             |                       |                  |                                                      |

#### ► Single flow

|        |         |     |   |     |       |       |    |      |    |     |          |        |      |      |      |     |
|--------|---------|-----|---|-----|-------|-------|----|------|----|-----|----------|--------|------|------|------|-----|
| PA 25  | 0511510 | 25  | - | 261 | 102   | 126   | 47 | 78   | 64 | 107 | G 1 1/2" | G 3/4" | 15   | 17   | 2200 | 177 |
| PA 32  | 0511515 | 34  | - | 261 | 102   | 126   | 47 | 78   | 64 | 107 | G 1 1/2" | G 3/4" | 15   | 17   | 2000 | 240 |
| PA 40  | 0511520 | 43  | - | 261 | 102   | 126   | 47 | 78   | 64 | 107 | G 1 1/2" | G 3/4" | 15   | 17   | 1750 | 304 |
| PA 50  | 0511525 | 50  | - | 261 | 102   | 126   | 47 | 78   | 64 | 107 | G 1 1/2" | G 3/4" | 15   | 17   | 1650 | 354 |
| PA 100 | 0511565 | 104 | - | 290 | 123   | 138.8 | 69 | 90   | 69 | 124 | G 2"     | G 3/4" | 23.5 | 31.5 | 1400 | 736 |
| PA 114 | 0511570 | 114 | - | 290 | 123   | 138.8 | 69 | 90   | 69 | 124 | G 2"     | G 3/4" | 23.5 | 31.5 | 1350 | 807 |
| PAC 40 | 0511460 | 40  | - | 226 | 94.9  | 103.3 | 62 | 73.2 | 54 | 98  | G 1 1/2" | G 3/4" | 12.5 | 12.6 | 1800 | 283 |
| PAC 50 | 0511465 | 50  | - | 226 | 94.9  | 103.3 | 62 | 73.2 | 54 | 98  | G 1 1/2" | G 3/4" | 12.5 | 12.6 | 1650 | 354 |
| PAC 65 | 0511490 | 65  | - | 243 | 102.5 | 112.8 | 63 | 78   | 65 | 107 | G 1 1/2" | G 3/4" | 16   | 17.6 | 1500 | 460 |
| PAC 80 | 0511705 | 78  | - | 247 | 102.5 | 116.3 | 63 | 78   | 65 | 107 | G 1 1/2" | G 3/4" | 17   | 21.3 | 1350 | 552 |

#### ► Twin-flow - 2 x 3 pistons

|            |         |    |    |     |       |       |      |    |      |     |          |        |      |      |      |                     |
|------------|---------|----|----|-----|-------|-------|------|----|------|-----|----------|--------|------|------|------|---------------------|
| PA 2 x 50  | 0511555 | 52 | 52 | 290 | 123   | 138.8 | 69   | 90 | 69   | 124 | G 2"     | G 3/4" | 23.5 | 31.5 | 1400 | 736 <sup>(2)</sup>  |
| PA 2 x 57  | 0511560 | 57 | 57 | 290 | 123   | 138.8 | 69   | 90 | 69   | 124 | G 2"     | G 3/4" | 23.5 | 31.5 | 1350 | 807 <sup>(2)</sup>  |
| PA 2 x 75  | 0516100 | 75 | 75 | 302 | 126   | 147.8 | 72.5 | 90 | 72.5 | 135 | G 2"     | G 3/4" | 26.8 | 38.7 | 1350 | 1062 <sup>(2)</sup> |
| PA 75-40   | 0516810 | 75 | 40 | 302 | 126   | 147.8 | 72.5 | 90 | 72.5 | 135 | G 2"     | G 3/4" | 27.4 | 38.7 | 1350 | 807 <sup>(2)</sup>  |
| PAC 2 x 25 | 0511480 | 25 | 25 | 243 | 102.5 | 112.8 | 63   | 78 | 65   | 107 | G 1 1/2" | G 3/4" | 16   | 17.6 | 1750 | 354 <sup>(2)</sup>  |
| PAC 2 x 32 | 0511485 | 32 | 32 | 243 | 102.5 | 112.8 | 63   | 78 | 65   | 107 | G 1 1/2" | G 3/4" | 16   | 17.6 | 1500 | 460 <sup>(2)</sup>  |
| PAC 2 x 40 | 0511710 | 39 | 39 | 247 | 102.5 | 116.3 | 63   | 78 | 65   | 107 | G 1 1/2" | G 3/4" | 17   | 21.3 | 1350 | 552 <sup>(2)</sup>  |

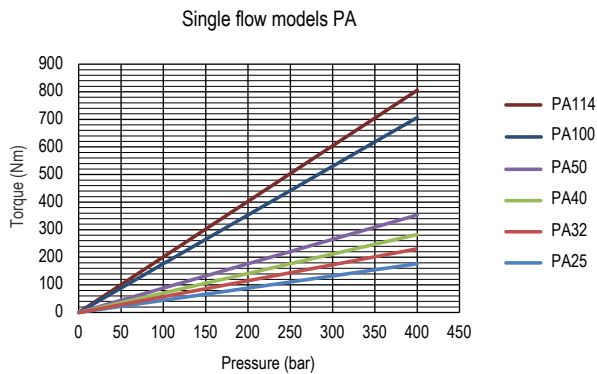
(1) Maximum torque given with a mechanical efficiency at 90%.

(2) Maximum torque for the two pressure ports at 400 bar.

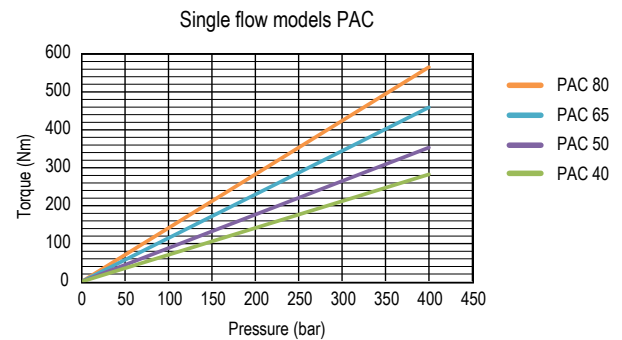
► Torque absorbed as a function of pump output pressure  
(with a mechanical efficiency considered at 90%)

### Single flow models

#### PA series

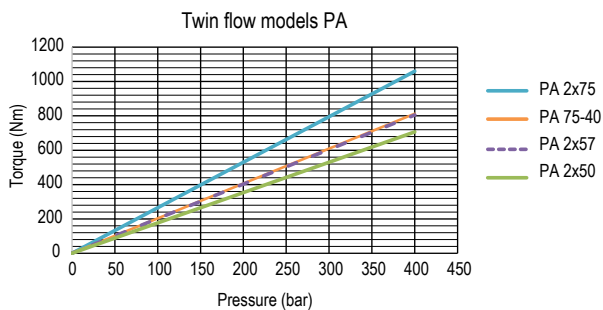


#### PAC series

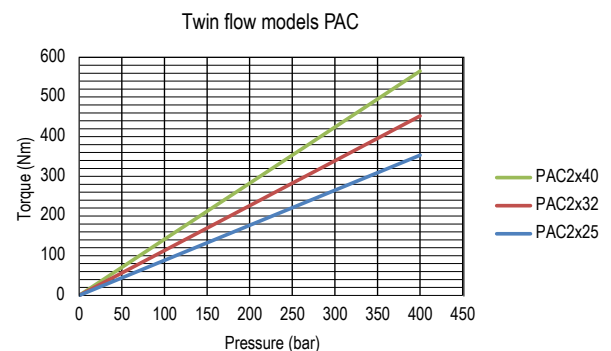


### Twin-flow models

#### PA series



#### PAC series



► Calculation of power to be supplied to the shaft as a function of flow and pressure

$$P = \frac{\Delta P \times Q}{600 \times \eta_{\text{global}}}$$

Calculation of torque to determine PTO,  
as a function of the displacement and the pressure

$$C = \frac{Cyl \times \Delta P}{62.8 \times \eta_{\text{meca}}}$$

$P$  = Hydraulic power in kW

$Q$  = Flow in l/min

$\eta_{\text{global}}$  = Volumetric efficiency + mechanical efficiency

$C$  = Torque in N.m

$Cyl$  = Displacement in cc/rev

$\Delta P$  = Differential pressure at the pump terminals, in bar

$\eta_{\text{meca}}$  = Mechanical efficiency

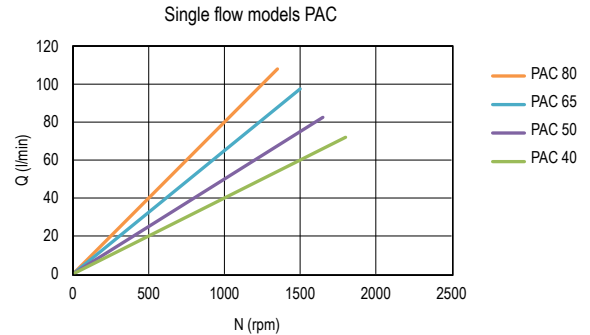
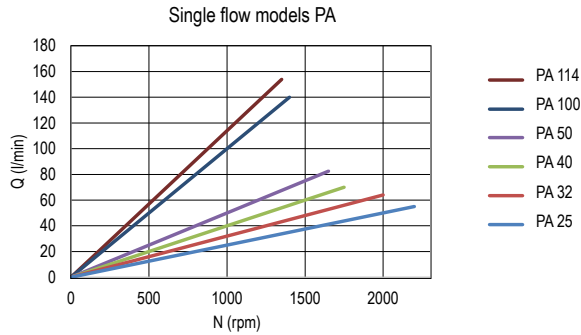


## ► Flow as a function of rotating speed

### Single flow models

#### PA series

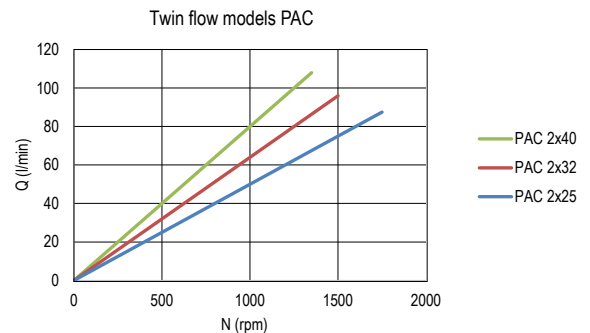
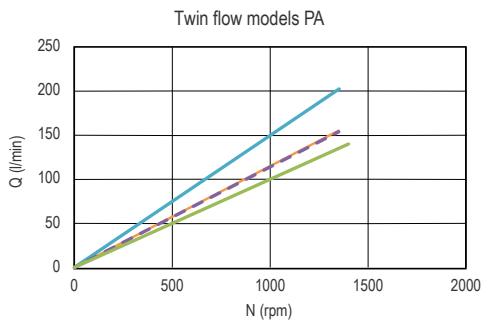
#### PAC series



### Twin-flow models

#### PA series

#### PAC series



## ► Calculation of the flow

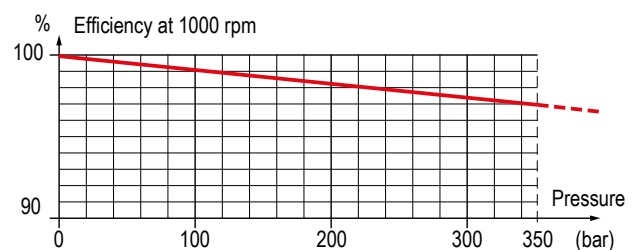
$$Q = \frac{Cyl \times N \times \eta_{vol}}{1000}$$

Avec :

|              |   |                        |
|--------------|---|------------------------|
| Q            | = | Flow in l/min          |
| Cyl          | = | Displacement in cc/rev |
| N            | = | Speed in rpm           |
| $\eta_{vol}$ | = | Volumetric efficiency  |

These graphs are the results of testwork done in HYDRO LEDUC R&D laboratory, on a specific test bench with a mineral hydraulic fluid ISO VG46 at 25°C (~100 cSt) - disregarding the volumetric efficiency.

## ► Volumetric efficiency



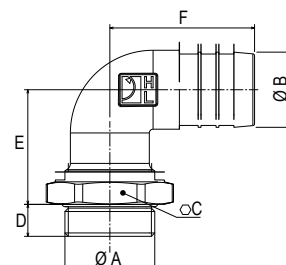
## INLET FITTINGS FOR PA | PAC PUMPS

 **See recommendations of the hosing dimensions on page 40.**  
For high speeds, please consult.

### 90° elbow fittings, swivel

| Reference | A        | Ø B | C  | D  | E  | F  |
|-----------|----------|-----|----|----|----|----|
| 240131    | G 1 1/2" | 40  | 60 | 17 | 61 | 77 |
| 240133    | G 1 1/2" | 50  | 60 | 17 | 65 | 82 |
| 240135    | G 2"     | 50  | 70 | 17 | 65 | 82 |

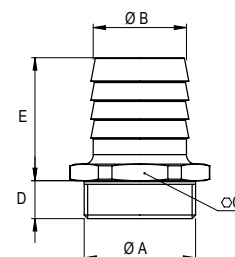
Dimensions in mm.



### Straight fittings

| Reference | A        | Ø B  | C  | D  | E  |
|-----------|----------|------|----|----|----|
| 240182    | G 1 1/2" | 40   | 55 | 16 | 52 |
| 240067    | G 1 1/2" | 48   | 55 | 16 | 64 |
| 240066    | G 1 1/2" | 60   | 65 | 16 | 67 |
| 240186    | G 1 1/2" | 63.5 | 65 | 16 | 67 |
| 240183    | G 2"     | 50   | 65 | 16 | 52 |
| 240170    | G 2"     | 60   | 65 | 16 | 70 |
| 240201    | G 1 1/2" | 76.2 | 80 | 16 | 87 |

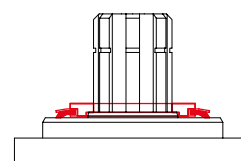
Dimensions in mm.



## DEFLECTOR TO PROTECT SHAFT SEALS

This deflector ensures the protection of the pump shaft seals.  
In particular, it protects the pump from projections of dirt from the road in cardan drive installations.

Reference: **DEF 054111**

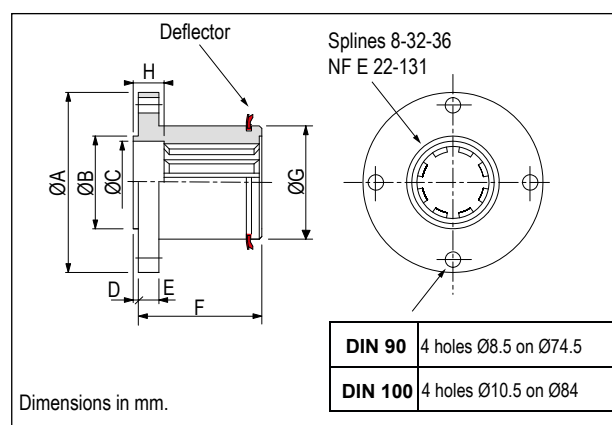


## CARDAN PLATE- DIN 90 and DIN 100

The cardan plate enables the pump shaft to be connected to a cardan shaft with interface as on drawing on the right.

Note: the maximum admissible torque is limited by the drive shaft.  
The deflector is supplied with the cardan plate.

| Type           | LEDUC code     | ØA  | ØB | C  | D | E  | F  | ØG | H  |
|----------------|----------------|-----|----|----|---|----|----|----|----|
| <b>DIN 90</b>  | <b>056315</b>  | 90  | 47 | 43 | 2 | 10 | 62 | 55 | 15 |
| <b>DIN 100</b> | <b>0519040</b> | 100 | 57 | 43 | 2 | 10 | 64 | 55 | 15 |





# TXV series

pumps with

*Load Sensing* control

variable displacement piston pumps

## ADVANTAGES

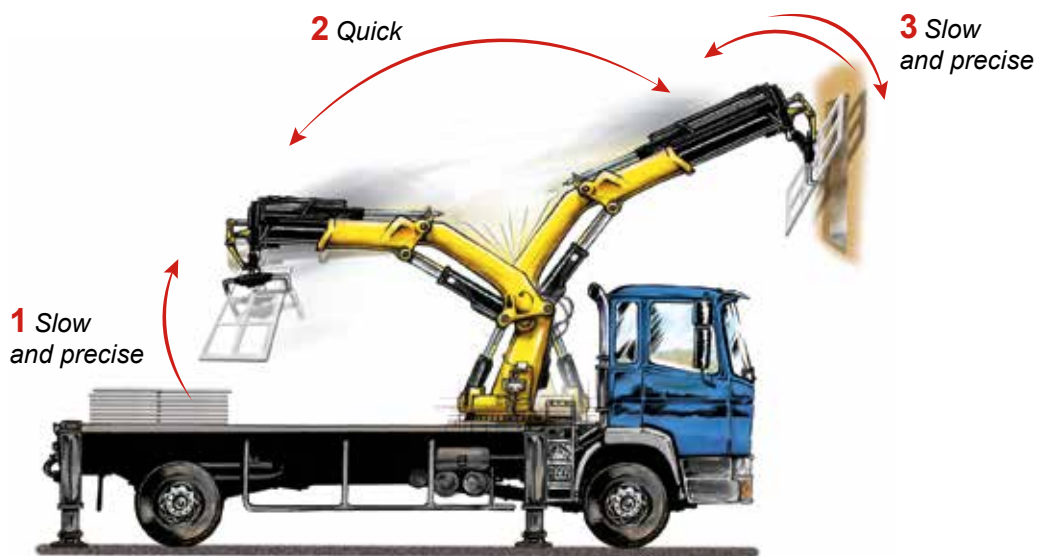
- ▶ TXV series pumps are variable displacement with pressure-flow control – called **Load Sensing**. They **self-regulate to give just the flow required for each movement**.
- ▶ Specifically designed for the needs of the *truck hydraulics market*, TXV pumps are particularly well adapted for applications in:
  - loader cranes,
  - forestry cranes,
  - refuse vehicles,
  - salt spreaders, snow and ice equipment,
  - construction equipment vehicles.
- ▶ Extremely compact in size to allow direct flange-mounting on vehicle engine or gearbox PTOs.
- ▶ TXV pumps are available in 11 models with maximum displacement from 40 to 150 cc/rev.

Maximum pressure is up to 420 bar depending on model.



## Why use a variable displacement pump?

- ▶ *Installing a TXV variable displacement pump will transform your hydraulic equipment. Slow or rapid movements are done with precision, due to the constant adjustment of pump flow rate.*
- ▶ *The pump incorporates a load sensing device to control flow and maximum pressure. This control device is piloted by a proportional valve which informs the pump of the flow needed for the different circuits supplied by the pump, independently of pressure.*



### 1 & 3

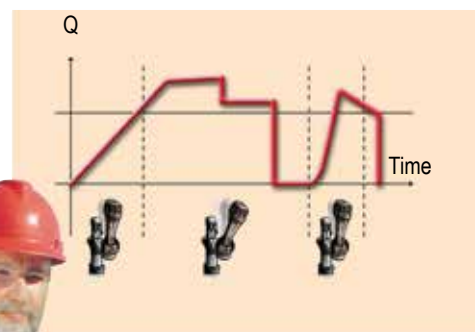
For slow and precise movements, the pump adjusts its flow to whatever the user needs, whilst also controlling maximum circuit pressure. Oil heating and lamination, and noise level, are considerably reduced compared to a fixed displacement pump.

The motor driving the pump only provides the power actually needed by the equipment, thus ensuring:

- longer service life of that equipment;
- significant gains in energy consumption;
- and overall a more environmentally friendly solution.

### 2

For rapid movements, the pump supplies the required flow virtually instantaneously.



The proportional movement of the control lever is perfectly reproduced by the pump.

## TXV - How does it work ?

- ▶ TXV variable displacement pumps are of axial piston design with 11 pistons, thus ensuring optimal regularity of flow and a low noise level.
- ▶ The displacement of the pump is proportional to the stroke of the pistons. Displacement – and thus flow - is varied by changing the angle  $\alpha$  of the swashplate (Fig. 1).
- ▶ To change displacement from maximum to zero (complete flow cancellation), the swashplate angle goes from  $\alpha$  max (Fig. 1) to  $\alpha$  min (=0) (Fig. 2).

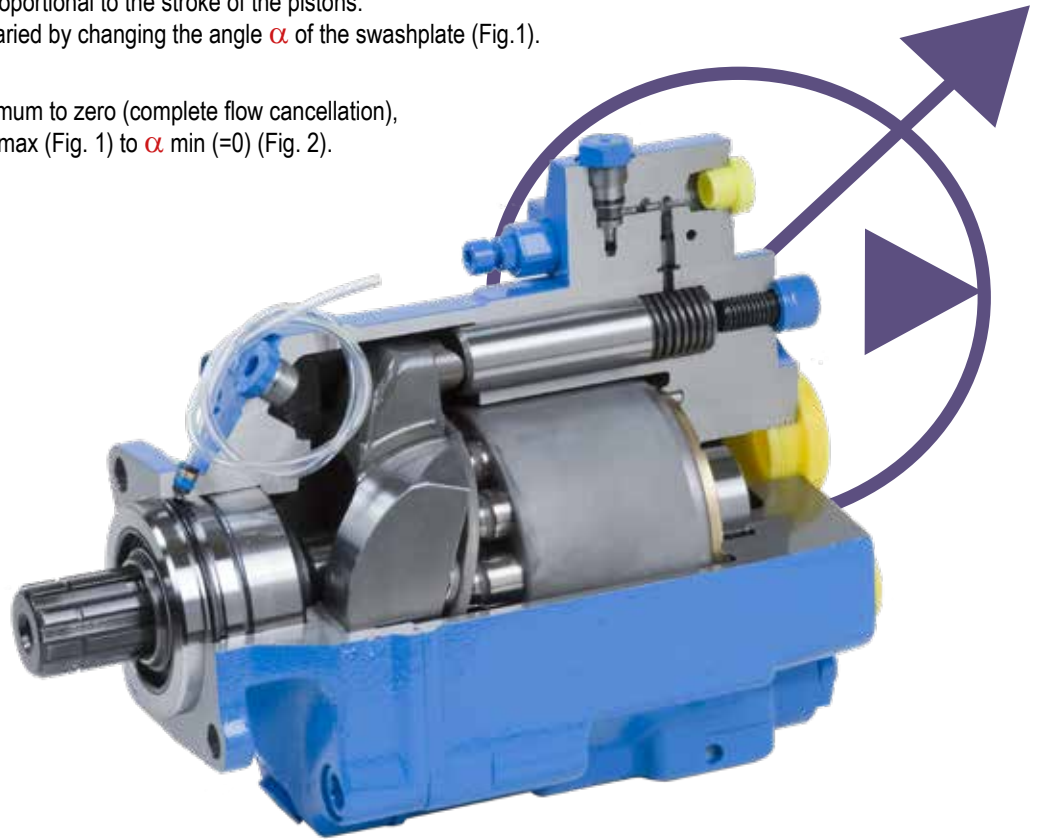


Figure 1 - Maximum displacement

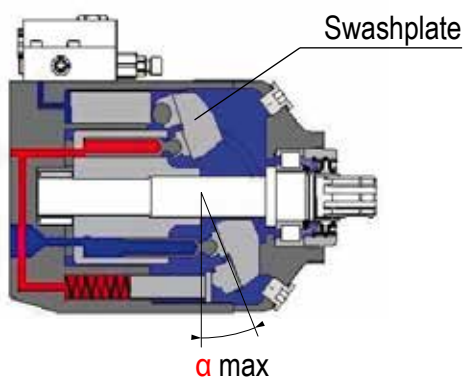
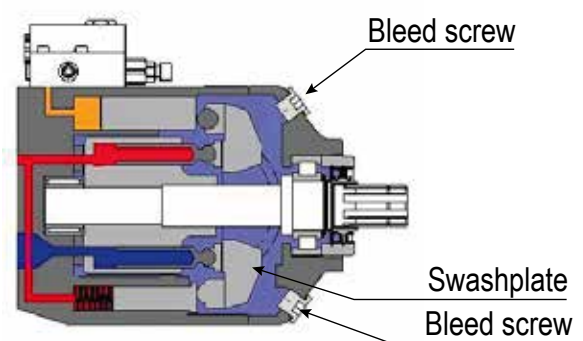
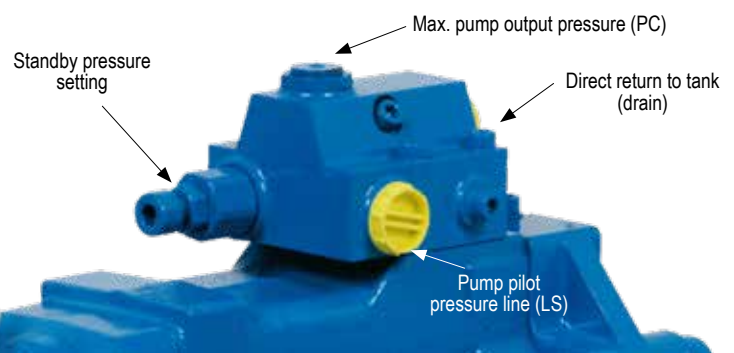
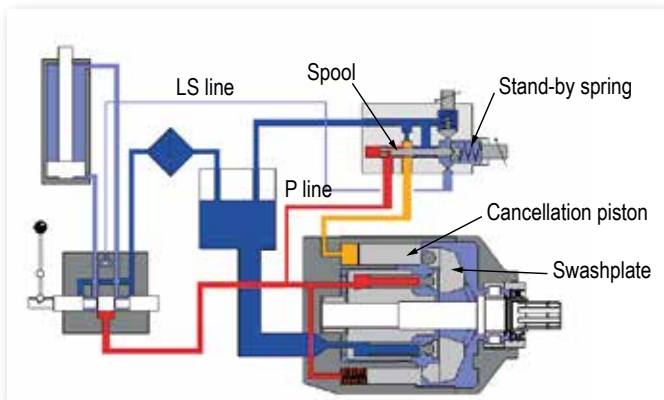


Figure 2 - zero displacement



- ▶ Setting the servo pump.



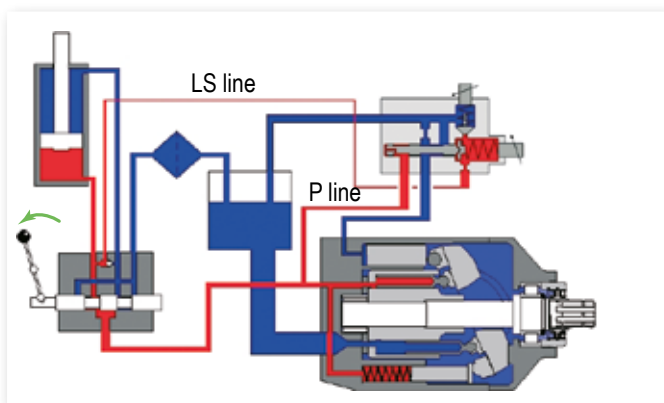


## ► Zero flow (standby)

The proportional valve is closed.

The pressure in the P line increases until it reaches the value at which the standby spring is set.

Under the pressure in the P line, the spool moves and oil flow supplies the setting piston which moves the swashplate into vertical position (angle  $\alpha = 0$ ): no flow, but standby pressure is maintained. The pump stays in standby mode.



## ► Full flow

The proportional valve is fully open, allowing passage of pump flow.

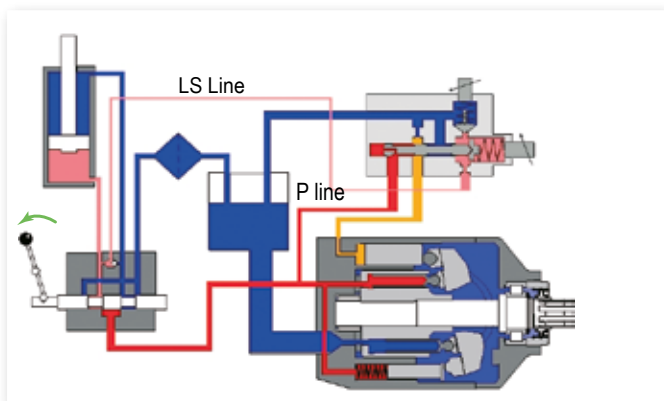
The pressure in the LS line is the same as in the P line.

Hydraulic pressure is the same on either side of the spool.

The standby spring holds the spool in its closed position.

The cancellation piston is not supplied with oil.

The swashplate is at maximum angle  $\alpha$ : the pump is at full displacement.

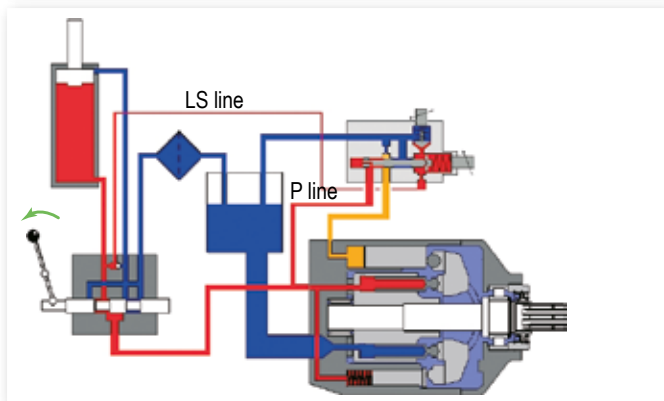


## ► Flow control

As soon as the proportional valve tends to reduce the flow

requested by the user, the pressure drop created allows the pump displacement setting piston to be piloted.

This setting piston automatically adjusts pump displacement to match the order given by the proportional valve.



## ► Zero flow (maximum pressure)

This is the case for example of a cylinder which arrives at a mechanical stop. The proportional valve is still open.

The pressure of the cylinder at a mechanical stop is sensed by the pump pressure relief valve which opens at the set pressure (PC).

This allows the pump displacement setting piston to be supplied and the pump sets itself to a displacement just sufficient to maintain the circuit pressure.



TXV pumps are available in 11 models from 40 to 150 cc/rev maximum displacement.

| Pump reference | Direction of rotation | Maximum displac. <sup>(1)</sup><br>(cc/rev) | Max. operating pressure<br>(bar) | Max. peak pressure<br>(intermittent: 5%)<br>(bar) | Torque at 300 bar <sup>(2)</sup><br>(N.m) | Max. speed at full displacement <sup>(3)</sup><br>rpm | Max. speed in stand-by<br>rpm | Weight<br>(kg) | Overhang torque <sup>(4)</sup><br>(N.m) |
|----------------|-----------------------|---------------------------------------------|----------------------------------|---------------------------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------------|----------------|-----------------------------------------|
|----------------|-----------------------|---------------------------------------------|----------------------------------|---------------------------------------------------|-------------------------------------------|-------------------------------------------------------|-------------------------------|----------------|-----------------------------------------|

#### ► Standard pump range

|         |                    |           |     |     |     |     |      |      |      |      |
|---------|--------------------|-----------|-----|-----|-----|-----|------|------|------|------|
| TXV 40  | 0512950<br>0512955 | CW<br>CCW | 40  | 400 | 420 | 225 | 3000 | 3000 | 26   | 34   |
| TXV 60  | 0512500<br>0512505 | CW<br>CCW | 60  | 400 | 420 | 335 | 2600 | 3000 | 26   | 34   |
| TXV 75  | 0512510<br>0512515 | CW<br>CCW | 75  | 400 | 420 | 420 | 2000 | 3000 | 26   | 34   |
| TXV 92  | 0512520<br>0512525 | CW<br>CCW | 92  | 400 | 420 | 515 | 1900 | 3000 | 26   | 34   |
| TXV 120 | 0515700<br>0515705 | CW<br>CCW | 120 | 380 | 400 | 675 | 2100 | 3000 | 26   | 34   |
| TXV 130 | 0515300<br>0515515 | CW<br>CCW | 130 | 365 | 380 | 730 | 2100 | 3000 | 28,2 | 38,6 |
| TXV 150 | 0518600<br>0518605 | CW<br>CCW | 150 | 310 | 330 | 840 | 2000 | 3000 | 28,2 | 38,6 |

#### ► With through shaft\*

|         |                    |           |     |     |     |     |      |      |      |      |
|---------|--------------------|-----------|-----|-----|-----|-----|------|------|------|------|
| TXV 130 | 0518700<br>0518705 | CW<br>CCW | 130 | 365 | 380 | 730 | 1900 | 3000 | 31,1 | 47,4 |
|---------|--------------------|-----------|-----|-----|-----|-----|------|------|------|------|

\* For TXV 130 through shaft available with max displacement set at : 60-65-75-85-95-100-110 - other specific set (on request)

(1) TXV pumps can be set for smaller maximum displacements (see page 41).

(2) For a mechanical efficiency at 85%.

(3) Higher speed - at full displacement - possible depending on flow required : please contact us.

Viscosity affects maximum possible rotating speed. If viscosity > 400 cSt, please contact us to obtain corresponding speed possibilities.

(4) Value of the overhang torque of the only pump.

#### ► Calculation of power to be supplied to the shaft as a function of flow and pressure

$$P = \frac{\Delta P \times Q}{600 \times \eta_{\text{global}}}$$

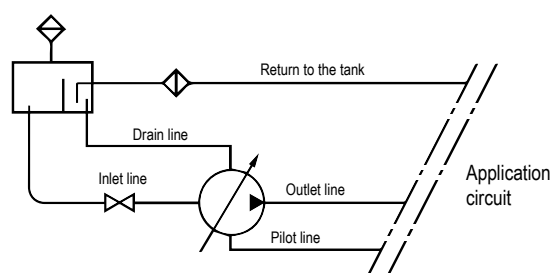
Calculation of torque to determine PTO,  
as a function of the displacement and the pressure

$$C = \frac{Cyl \times \Delta P}{62.8 \times \eta_{\text{meca}}}$$

With:

|                        |   |                                               |
|------------------------|---|-----------------------------------------------|
| $P$                    | = | Hydraulic power in kW                         |
| $\Delta P$             | = | Differential pressure in bar                  |
| $Q$                    | = | Flow in l/min                                 |
| $C$                    | = | Torque in N.m                                 |
| $Cyl$                  | = | Displacement in cc/rev                        |
| $\eta_{\text{meca}}$   | = | Mechanical efficiency                         |
| $\eta_{\text{global}}$ | = | Mechanical efficiency + volumetric efficiency |

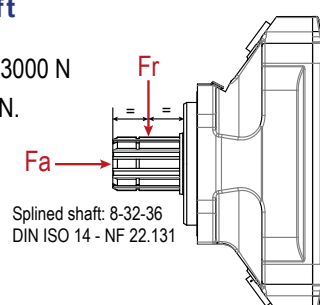
#### ► Ideal installation



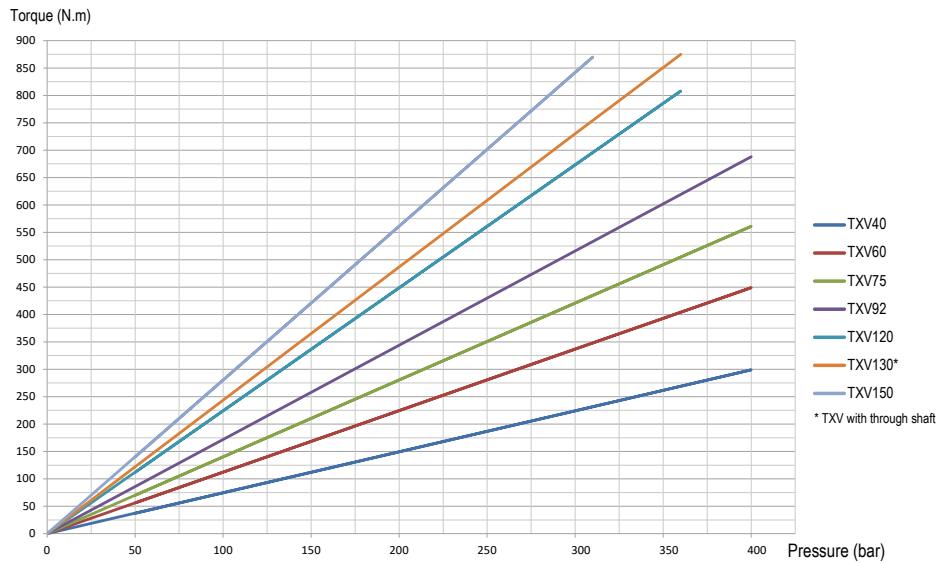
#### ► Force on pump shaft

Fr : Acceptable max. radial force = 3000 N

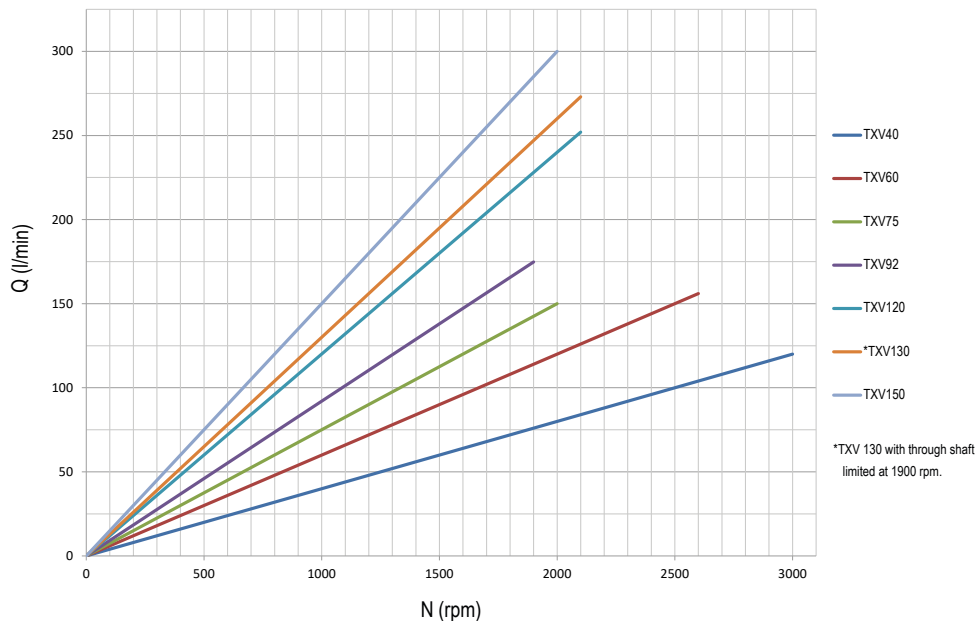
Fa : Acceptable axial force = 1600 N.



► Torque absorbed as a function of pump output pressure (with a mechanical efficiency considered at 85%)



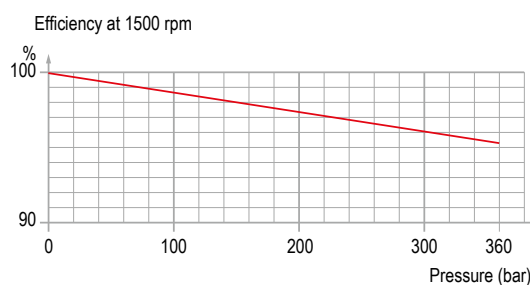
► Flow as a function of rotating speed



Flow as a function of speed, with pump in maximum displacement position and oil level in tank above the pump.

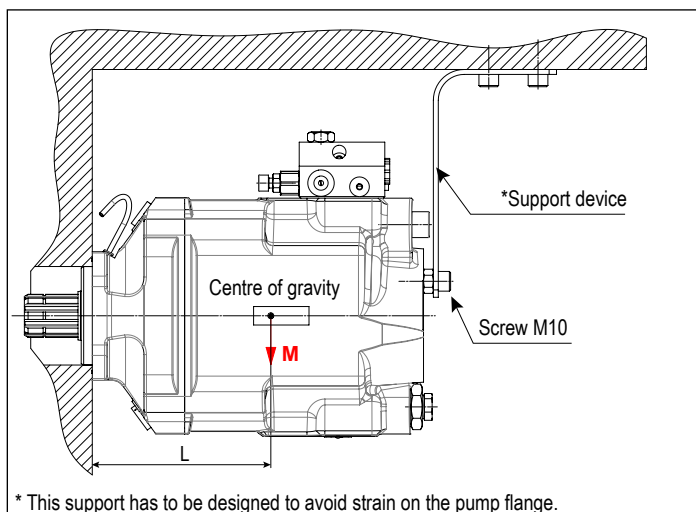
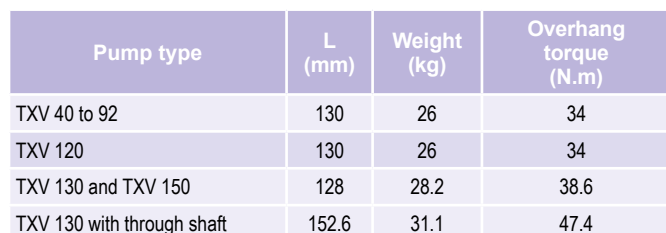
These graphs are the results of testwork done in HYDRO LEDUC R&D laboratory, on a specific test bench with a mineral hydraulic fluid ISO VG46 at 25°C (~100 cSt) - disregarding the volumetric efficiency.

► Volumetric efficiency





| Pump<br>reference | Outlet | Inlet   | A    | B     |
|-------------------|--------|---------|------|-------|
|                   | (Ø)    | (Ø)     | (mm) | (mm)  |
| TXV 40 to 92      | G 3/4" | G 1"1/2 | 15   | 19    |
| TXV 120           | G 1"   |         | 6    | 23.57 |







## TXV 130 THROUGH SHAFT PUMP

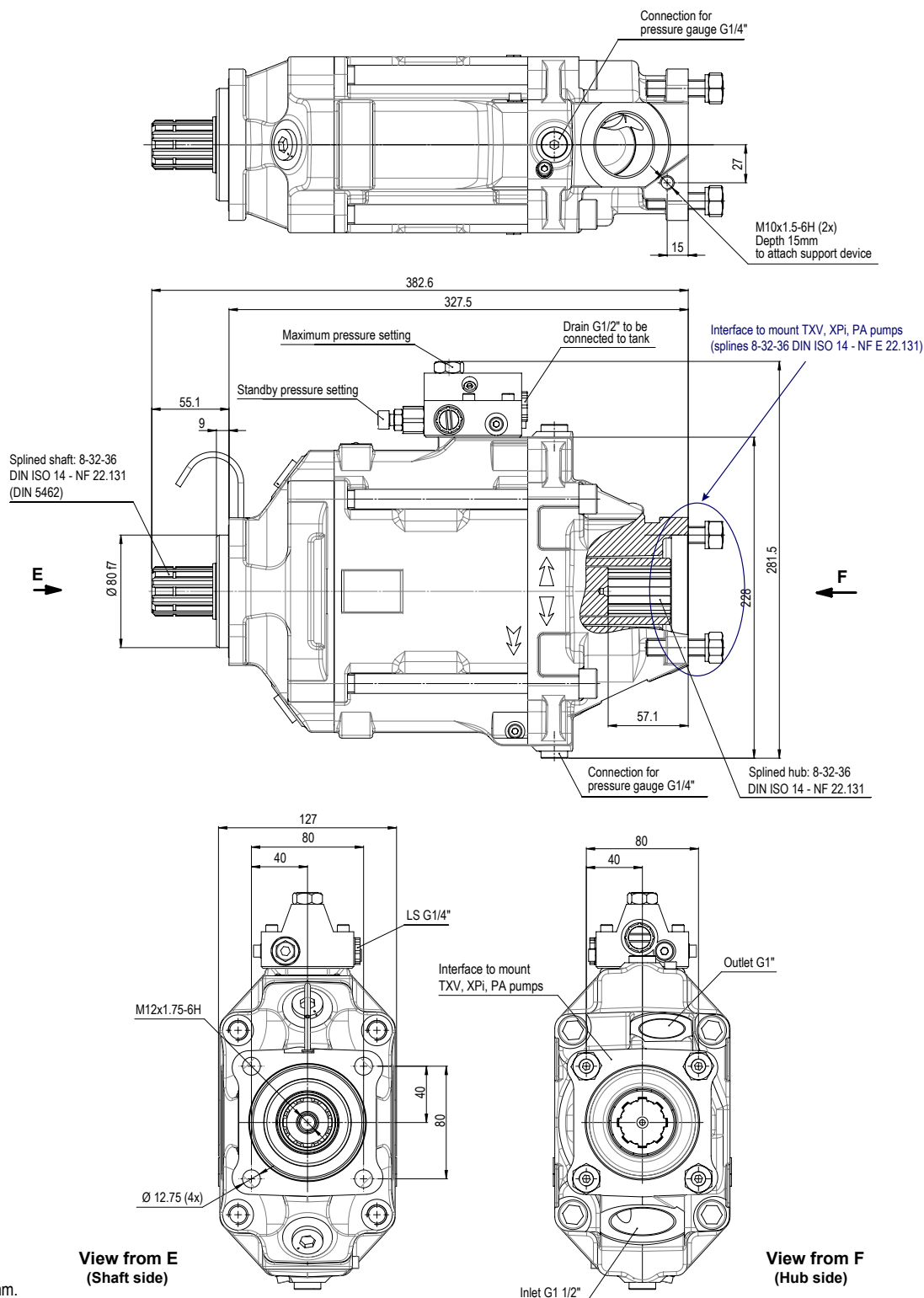
The TXV 130 pump exists in a "through shaft" version.

With side porting for inlet and output, this "through shaft" TXV 130 configuration means any LEDUC TXV pump, or fixed displacement XPI or PA pump, can be mounted on the back.

The maximum displacement of the "through shaft" TXV 130 can be factory set, on request, between 60 and 110 cc/rev on request.

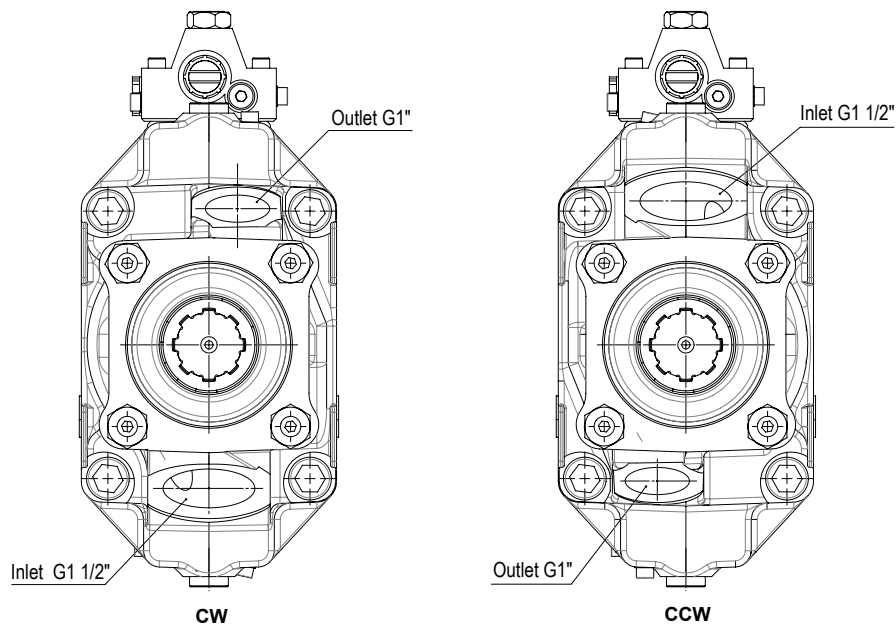
It is important to check that maximum torque to be transmitted by the shaft of the "through shaft" TXV 130 does not exceed 900 N.m.

A closing plate must be used when using the pump alone (see page 39).



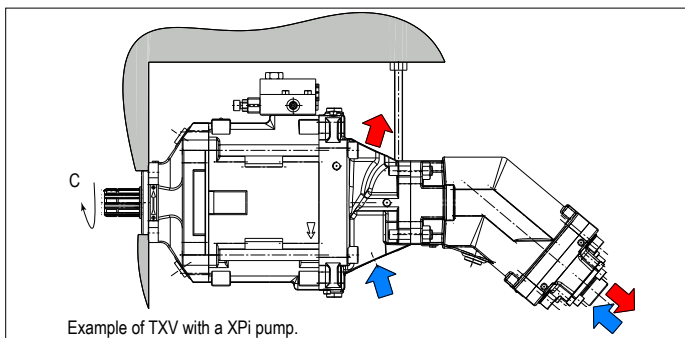
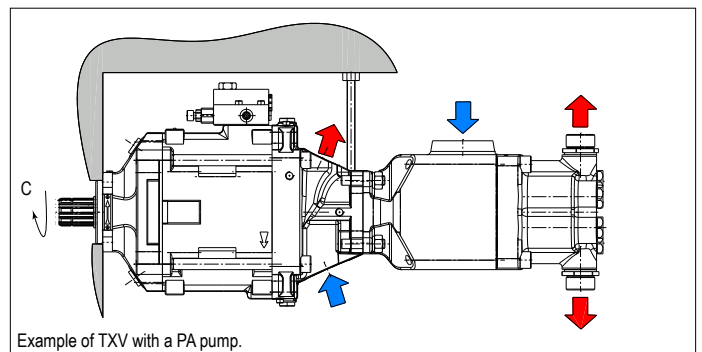
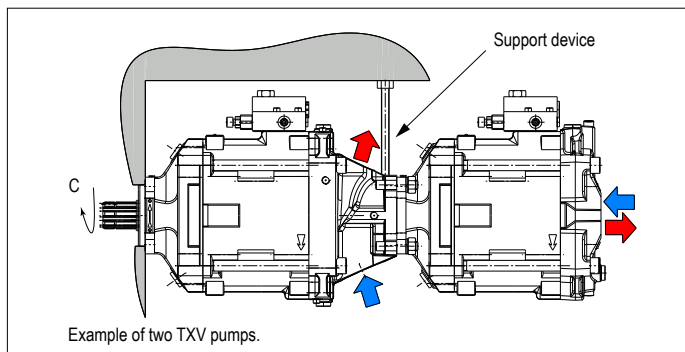
## TXV 130 THROUGH SHAFT PUMP

View from F (see p.30)



### ► Support device

The support device for the pump must be fixed to the same part which the pump is mounted on (see diagram below) and has to be designed to avoid strain on the pump flange.

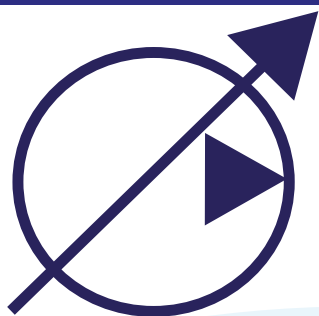


**Maximum torque transferable by the shaft  
of the pump driven by the PTO:**

$$C = 900 \text{ N.m}$$

That is, the sum of torque for both pumps must be < 900 N.m.

Please consult our Technical Department for advice regarding your installations.



# TXVA series

variable displacement  
piston pumps  
SAE version

## ► Characteristics

| Pump ref.      | Direction of rotation | Max. displacement <sup>(1)</sup> |          | Maximum operating pressure |       | Max. peak pressure (intermittent: 5%) |       | Torque at 300 bar (4350 psi) <sup>(2)</sup> |       | Max. speed at full displacement <sup>(3)</sup> | Max. speed in stand-by | Weight |      | Overhang torque <sup>(4)</sup> |        |
|----------------|-----------------------|----------------------------------|----------|----------------------------|-------|---------------------------------------|-------|---------------------------------------------|-------|------------------------------------------------|------------------------|--------|------|--------------------------------|--------|
|                |                       | cu.in/rev                        | (cc/rev) | psi                        | (bar) | psi                                   | (bar) | lbf ft                                      | (N.m) | rpm                                            | rpm                    | lbs    | (kg) | lbf ft                         | (N.m)  |
| <b>TXVA 75</b> | CC<br>CCW             | 4.60                             | (75)     | 5800                       | (400) | 6090                                  | (420) | 310                                         | (420) | 2000                                           | 3000                   | 64     | (29) | 26                             | (35.2) |
| <b>TXVA 92</b> | CC<br>CCW             | 5.60                             | (92)     | 5500                       | (380) | 5800                                  | (400) | 380                                         | (515) | 1900                                           | 3000                   | 64     | (29) | 26                             | (35.2) |

(1) TXV pumps can be set for smaller maximum displacements (see page 39).

(2) For a mechanical efficiency at 85%.

(3) Higher speed - at full displacement - possible depending on flow required : please contact us.

(4) Value of the overhang torque of the only pump.

## ► Configurator for TXVA pumps

To obtain order code for your pump, fill in the parameters (2, 3, 4, 5, 6, 7) depending on the options required, using the table below.

|             |          |          |          |          |          |          |
|-------------|----------|----------|----------|----------|----------|----------|
| <b>TXVA</b> | ...      | ...      | ...      | ...      | ...      | ...      |
| <b>1</b>    | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> |

|          |                              |                                 |                          |     |
|----------|------------------------------|---------------------------------|--------------------------|-----|
| <b>1</b> | <b>TXVA pump</b>             |                                 |                          |     |
| <b>2</b> | <b>Displacement</b>          | <b>75</b>                       | <b>92</b>                | ... |
| <b>3</b> | <b>Direction of rotation</b> | Clockwise rotation (CW)         |                          | R   |
|          |                              | Counterclockwise rotation (CCW) |                          | L   |
| <b>4</b> | <b>Flange</b>                | SAE C - 2 bolts                 |                          | C1  |
|          |                              | SAE C - 4 bolts                 |                          | C2  |
| <b>5</b> | <b>Shaft end</b>             | Splined SAE J744                | 14T 12/24 DP - SAE C     | S1  |
|          |                              | Keyed SAE J744                  | Ø1 1/4" UNF 2A - SAE C   | K1  |
| <b>6</b> | <b>Ports</b>                 | UNF Threaded                    | Inlet : 1 7/8" 12UN 2B   | U1  |
|          |                              |                                 | Outlet : 1 1/16" 12UN 2B |     |
|          |                              | BSP Threaded                    | Inlet : G1 1/2"          | G1  |
|          |                              |                                 | Outlet : G 3/4"          |     |
| <b>7</b> | <b>Control types</b>         | Constant Pressure               |                          | PC  |
|          |                              | Flow-Pressure Regulator         |                          | LS  |
|          |                              | Closure Plate                   |                          | PF  |





## PC | Constant Pressure

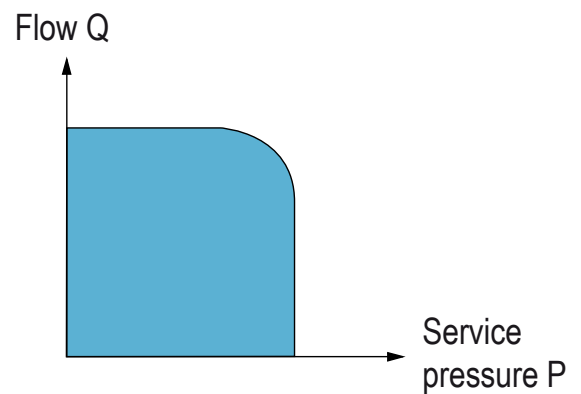
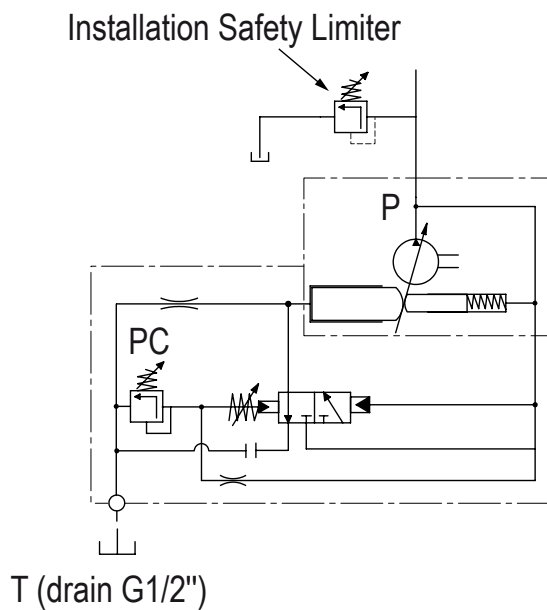
The constant pressure regulator maintains the pressure within a hydraulic receiver. As soon as the set pressure is reached, the pump's flow adjusts automatically to match the receiver's consumption. This arrangement prevents overheating and power consumption for all pressure maintenance applications.

### Examples:

- Hydraulic press
- Compression molds
- Manufacturing of bonded composites

### IMPORTANT:

Without further specifications in the order:  
PC set at 100 bar.



## LS | Flow-Pressure Regulator

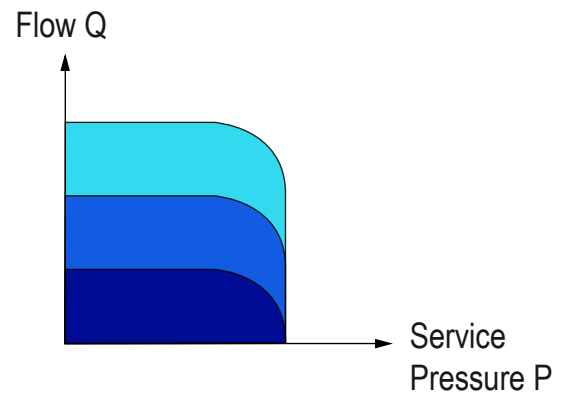
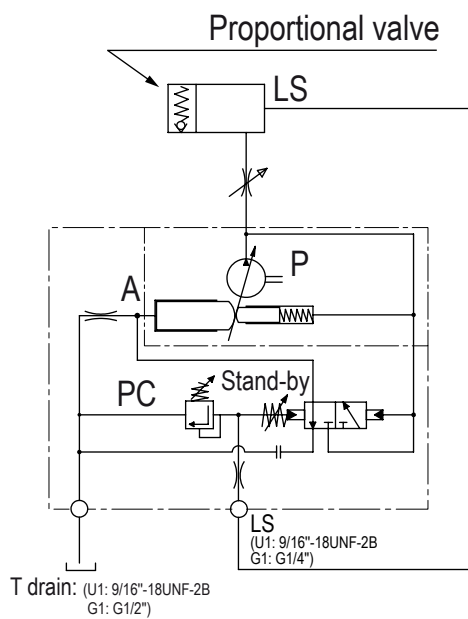
### ► Control of Q and P (LS: "Load-Sensing")

This regulation (LS) allows continuous control of the flow and maximum discharge pressure of the pump. With this arrangement, it is easy to envision all possible combinations:

- High flow and low pressure,
- High pressure and low flow.

#### IMPORTANT:

Without further specifications in the order:  
PC set at 100 bar, Stand-by at 30 bar.





## ADVANTAGES OF THE CONSTANT TORQUE REGULATION

- ▶ TXV pumps with constant torque control which ensures regulation to maintain Pressure X Flow = Constant
- ▶ Control device available for the entire range of TXV pumps from 40 to 150 cc/rev., including the TXV130 model with through shaft
- ▶ Maximum torque between 90 and 700 Nm depending on models
- ▶ Torque/power adjustment screw

### ► Characteristics

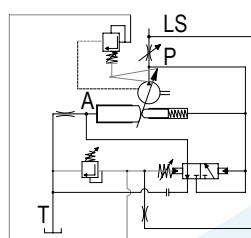
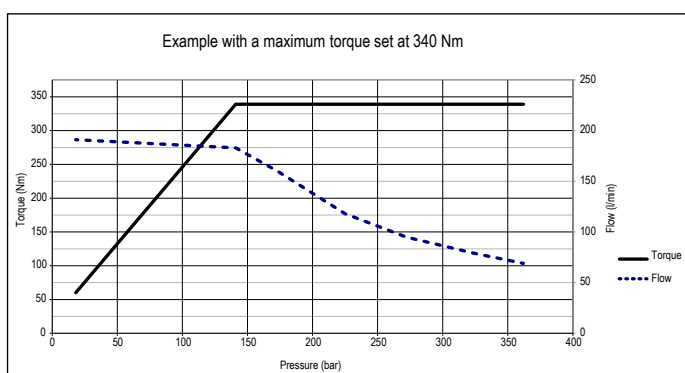
| Pump                               | Reference | Direction of rotation | Max. displacement <sup>(1)</sup><br>(cc) | Max. operating pressure<br>(bar) | Max. peak pressure<br>(intermittent 5%)<br>(bar) | Max. torque range <sup>(3)</sup><br>(daN.m) | Max. speed at full displacement <sup>(2)</sup><br>(rpm) | Max. speed in stand-by mode<br>(rpm) | Weight<br>(kg) | Overhang torque<br>(N.m) |
|------------------------------------|-----------|-----------------------|------------------------------------------|----------------------------------|--------------------------------------------------|---------------------------------------------|---------------------------------------------------------|--------------------------------------|----------------|--------------------------|
| TXV 40                             | P002685   | CW                    | 40                                       | 400                              | 420                                              | 9 to 43.5                                   | 3000                                                    | 3000                                 | 25.8           | 34                       |
|                                    | P002686   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 60                             | P002673   | CW                    | 60                                       | 400                              | 420                                              | 9 to 43.5                                   | 2600                                                    | 3000                                 | 25.8           | 34                       |
|                                    | P002674   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 75                             | P002683   | CW                    | 75                                       | 400                              | 420                                              | 9 to 43.5                                   | 2000                                                    | 3000                                 | 25.8           | 34                       |
|                                    | P002684   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 92                             | P002681   | CW                    | 92                                       | 400                              | 420                                              | 9 to 43.5                                   | 1900                                                    | 3000                                 | 25.8           | 34                       |
|                                    | P002682   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 120                            | P002441   | CW                    | 120                                      | 380                              | 400                                              | 12 to 56.5                                  | 2100                                                    | 3000                                 | 25.8           | 34                       |
|                                    | P002442   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 130                            | P002763   | CW                    | 130                                      | 365                              | 380                                              | 13 to 60.5                                  | 2100                                                    | 3000                                 | 28             | 38.6                     |
|                                    | P002764   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 150                            | P002765   | CW                    | 150                                      | 310                              | 330                                              | 15 to 70                                    | 2000                                                    | 3000                                 | 28.2           | 38.6                     |
|                                    | P002766   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |
| TXV 130<br>(through shaft version) | P002741   | CW                    | 130                                      | 365                              | 380                                              | 13 to 60.5                                  | 1900                                                    | 3000                                 | 31.1           | 47.4                     |
|                                    | P002743   | CCW                   |                                          |                                  |                                                  |                                             |                                                         |                                      |                |                          |

(1) The pumps can be set for a lower maximum displacement.

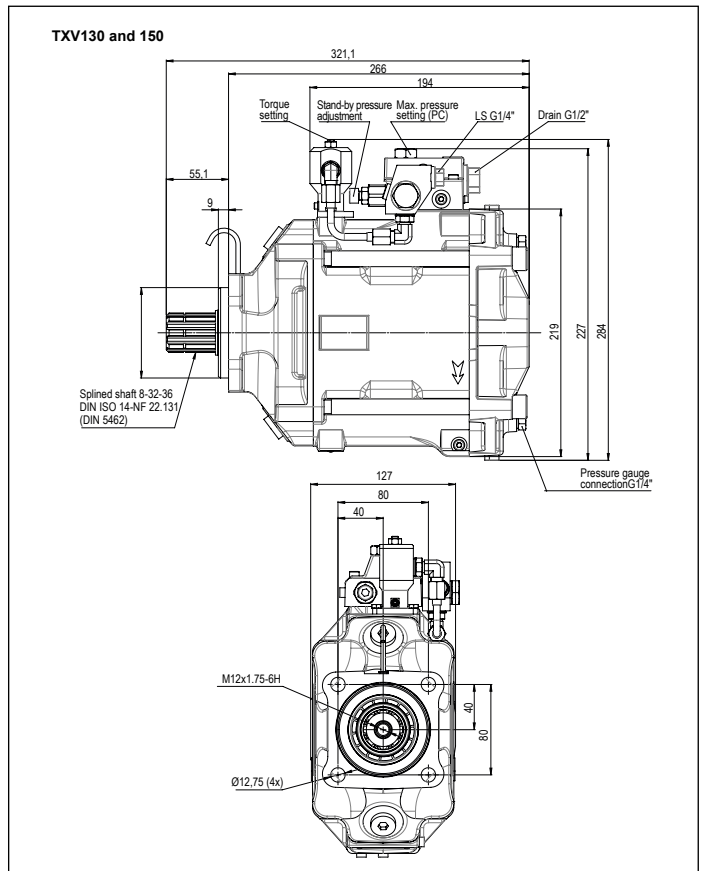
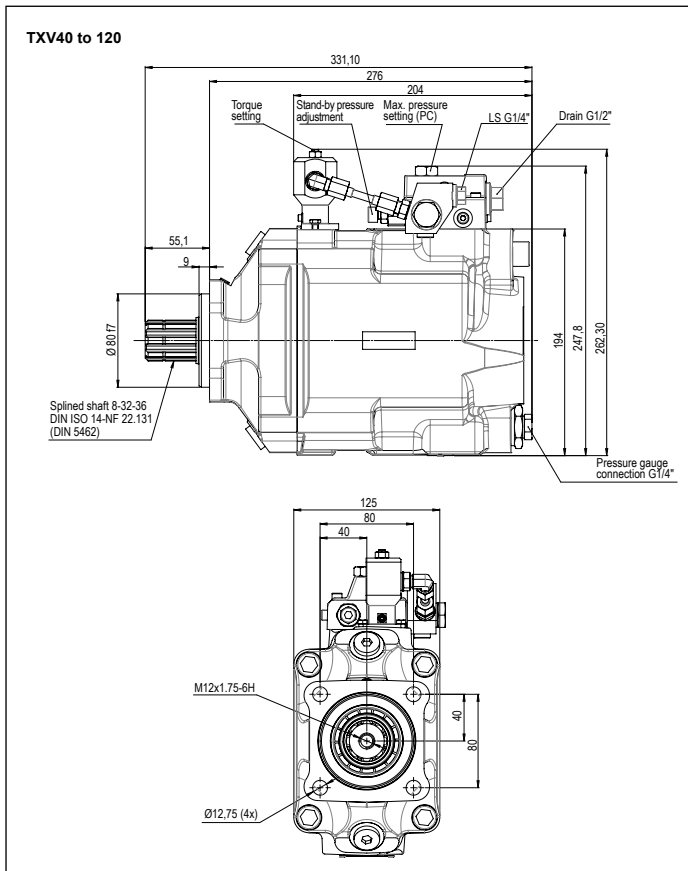
(2) Higher speed possible - at full displacement - depending on flow required : please contact Customer Service.

(3) Required torque setting to be specified on order.

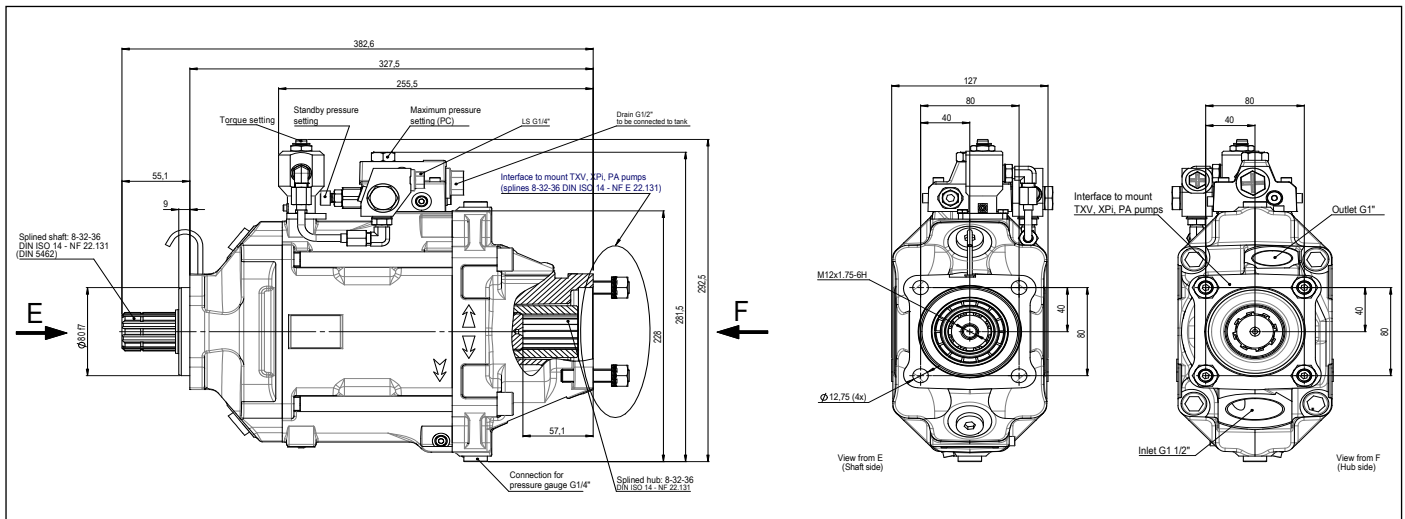
### ► Torque and flow as a function of pressure : ► Constant torque control device :



## ► Standard pumps dimensions :



## ► TXV130 model with through shaft :

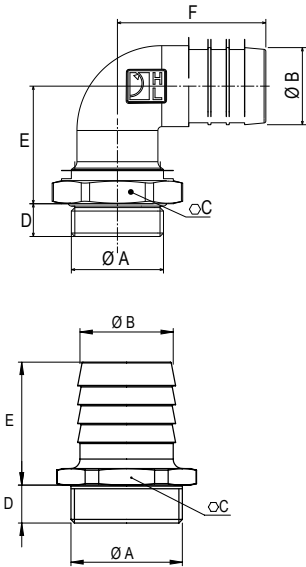


INLET FITTINGS FOR TXV PUMPS (optional)

 **See recommendations of the hosing dimensions on page 40.**  
For high speeds, please consult.

90° elbow fittings, swivel

| Reference | A        | Ø B | C  | D  | E  | F  | Pump type |
|-----------|----------|-----|----|----|----|----|-----------|
| 240131    | G 1 1/2" | 40  | 60 | 17 | 61 | 77 | TXV       |
| 240133    | G 1 1/2" | 50  | 60 | 17 | 65 | 82 | TXV       |



Straight fittings

| Reference | A        | Ø B  | C  | D  | E  | Pump type |
|-----------|----------|------|----|----|----|-----------|
| 240182    | G 1 1/2" | 40   | 55 | 16 | 52 | TXV       |
| 240067    | G 1 1/2" | 48   | 55 | 16 | 64 | TXV       |
| 240066    | G 1 1/2" | 60   | 65 | 16 | 67 | TXV       |
| 240186    | G 1 1/2" | 63.5 | 65 | 16 | 67 | TXV       |
| 240201*   | G 1 1/2" | 76.2 | 80 | 16 | 87 | TXV       |

\*Except for TXV130 model with through shaft.

Dimensions in mm.

## LS adapter with integrated filter | LEDUC CODE

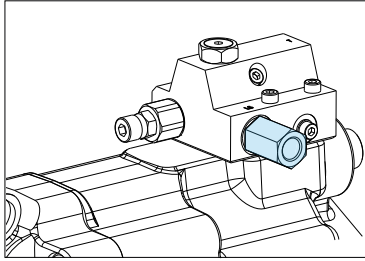
Filter fitting for LS line connection

| Kit reference | LS dimension | Type of pump |
|---------------|--------------|--------------|
| 0525567       | G1/4"        | TXV          |
| C001144       | 9/16-18 UNF  | TXVA (SAE)   |

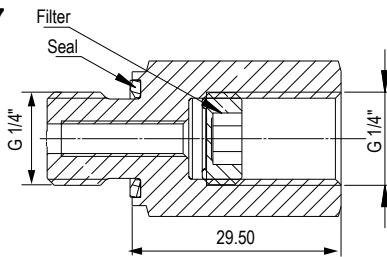
### ► Technical characteristics

- It protects the LS regulator against contamination coming from the circuit.
- Filter can be removed for maintenance.
- Filtration: 150 microns.

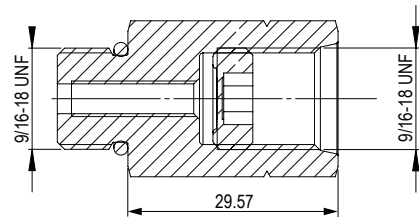
### ► Drawings for both versions of the kit ( dimensions in mm):



**0525567**



**C001144**



## SEAL + FILTER | LEDUC CODE K000028

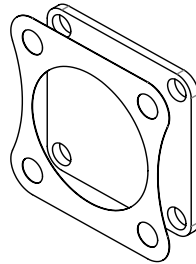
The LS filter protects the TXV's Load Sensing valve against contaminations coming from the hydraulic circuit.

**Mounted as standard on all TXV pumps.**



## KIT CLOSING PLATE + SEAL | LEDUC CODE P001512

**FOR TXV 130 THROUGH SHAFT**



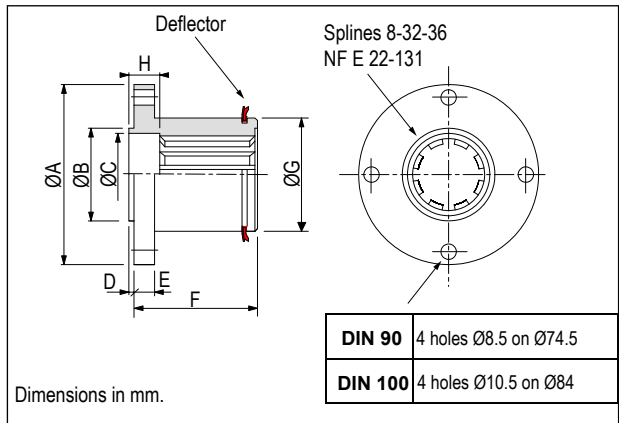
## CARDAN PLATE - DIN 90 and DIN 100

The cardan plate enables the pump shaft to be connected to a cardan shaft with interface as on drawing on the right.

Note: the maximum admissible torque is limited by the drive shaft.

The deflector is supplied with the cardan plate.

| Type           | LEDUC code     | ØA  | ØB | C  | D | E  | F  | ØG | H  |
|----------------|----------------|-----|----|----|---|----|----|----|----|
| <b>DIN 90</b>  | <b>056315</b>  | 90  | 47 | 43 | 2 | 10 | 62 | 55 | 15 |
| <b>DIN 100</b> | <b>0519040</b> | 100 | 57 | 43 | 2 | 10 | 64 | 55 | 15 |



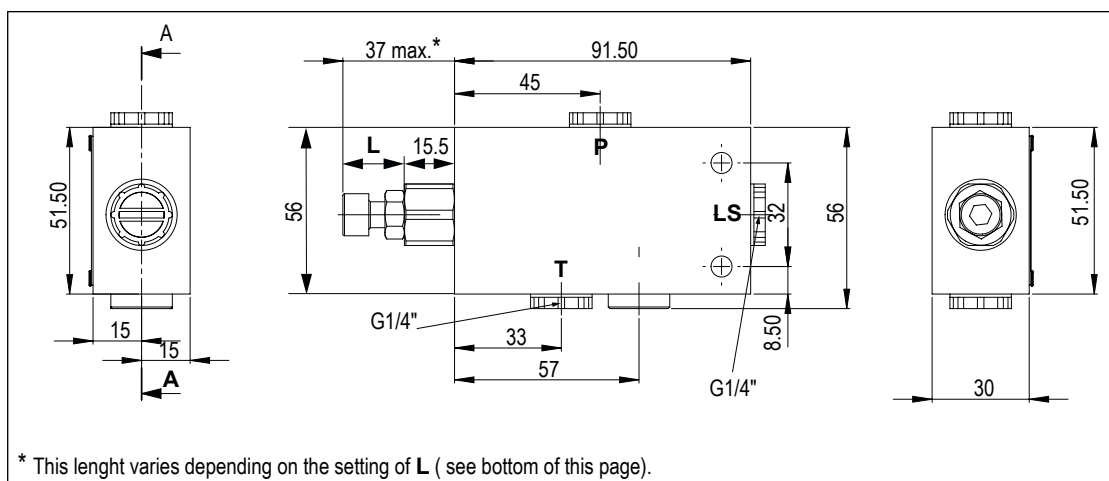
## FCV - FLUID CIRCULATION VALVE | LEDUC CODE: 0524940

The fluid circulation valve (FCV) is designed for applications where the hydraulic variable displacement pump is used in standby mode for a long period of time, for example engine PTO, to protect the pump against overheating.

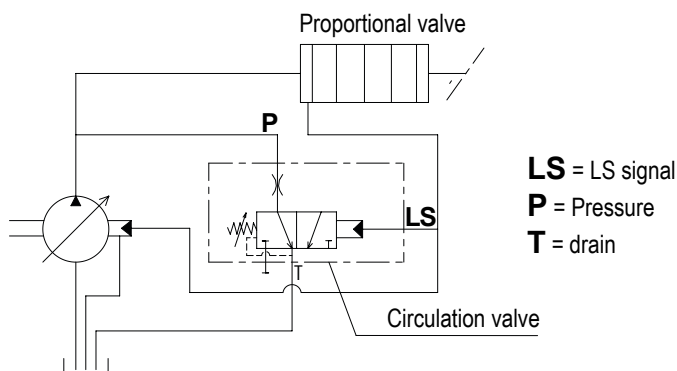
### ► Technical characteristics

- The valve flow varies between 20 and 22 l/min for a  $\Delta P$  at 30 bar.
- Maximum pressure is 420 bar.
- The closing pressure is 2 bar min. and 7 bar max.

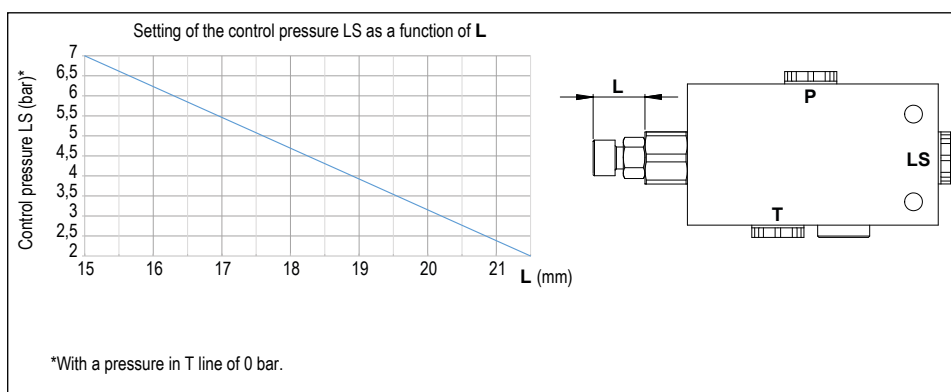
### ► Dimensions



### ► Schematics



### ► Setting of the control pressure



## MAXIMUM DISPLACEMENT SETTING SCREW

The TXV pumps from 40 to 150 cc/rev are made as standard to be able to use a setting screw:

- Reference : **0518386** for TXV 40 to 120 pumps
- Reference : **0523899** for the TXV 130\* and TXV 150\*

\*Except TXV through shaft.

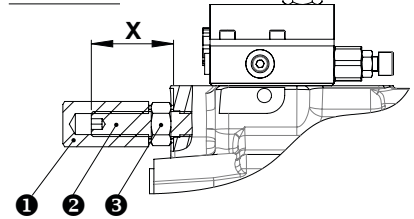
The pump displacement can thus be adjusted to exactly what is needed.

### ► How to set maximum displacement

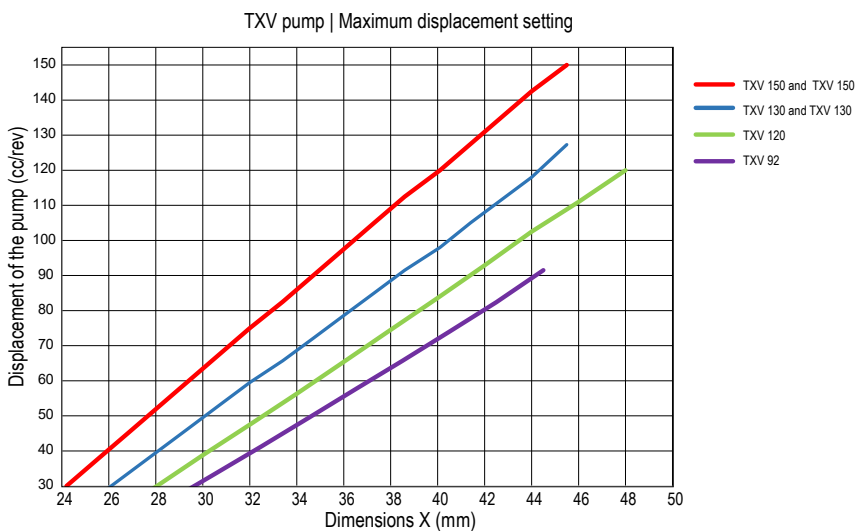
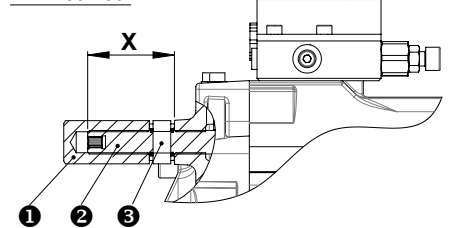
Unscrew **1** completely, loosen nut **3** and screw **2** to obtain dimension **X** on graph below, and the corresponding displacement (see figure).

- For TXV 150 : 1 turn of the screw changes the displacement by 7.5 cc.
- For TXV 130 : 1 turn of the screw changes the displacement by 6.5 cc.
- For TXV 120: 1 turn of the screw changes the displacement by 9 cc.
- For TXV 92 to TXV 40: 1 turn of the screw changes the displacement by 8 cc.

TXV 40-120



TXV 130-150



## SETTING OF THE REGULATION

### ► Stand-by

TXV pumps are supplied as standard with standby pressure set at 30 bar.  
On request, this standby pressure can be set between 25 and 60 bar.

### ► Maximum pressure

Cancellation pressure PC of the pump must be the same as the maximum working pressure of your installation. This PC pressure should be specified in the order. If no PC setting is specified, pumps will be supplied with PC set at 100 bar.

### ► Relief valve in the entry plate of proportional valve

Must be set 25 to 30 bar higher than the chosen PC pressure.

### ► Response time

Response time of TXV pumps, from zero flow up to full flow, can be adapted.

*For further information or advice, please contact our Customer Service Department.*

# OPTIMIZE THE SERVICE LIFE OF YOUR LEDUC PUMP

## ► Tank

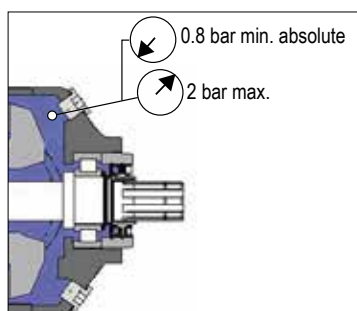
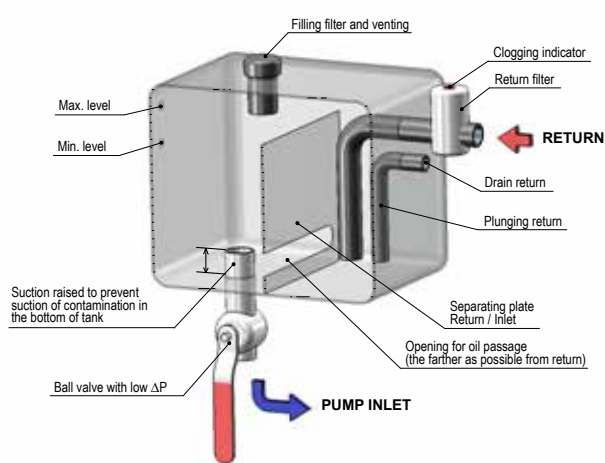
Generally, hydraulic pumps perform better when the tank is above the pump. LEDUC pumps can also operate with oil level beneath the pump.

For further information on such installations, please contact our Technical Department.

Correct inlet conditions are between 0.8 to 2 bar absolute pressure.

The tank should preferably have a separation between inlet side and return. This avoids fluid emulsion and the introduction of air into the hydraulic circuit.

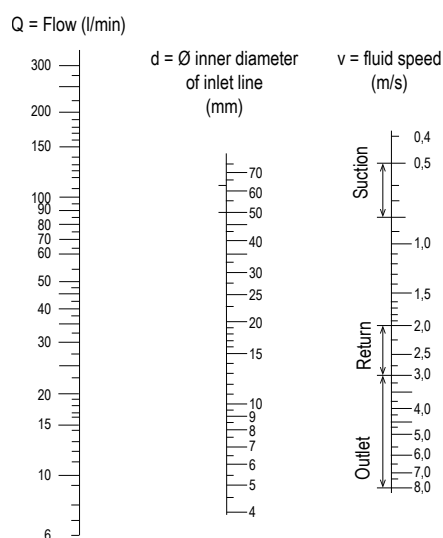
Ensure also that the suction is not from the very bottom of the tank, so as to protect the pump from any deposits (particles).



## ► Hosing

The supply line should be dimensioned to ensure fluid speed between 0.5 and 0.8 m/second.

Choose as direct a supply line as possible, avoiding sharp bends.



## ► Filtration

The service life of the pumps is highly dependent on the quality of the hydraulic fluid and level of cleanliness.

We recommend the following minimum cleanliness:

- Cleanliness class 9 according to NAS1638;
- Cleanliness class 6 according to SAE;
- Cleanliness class 20/18/15 according to ISO/DIS 4406.

We recommend using of a return filter of 20 µm absolute maximum.

## ► Drain pressure

It is essential to drain the pump, to avoid excessive pressures on the shaft seal. Maximum acceptable internal pressure depends on pump rotating speed.

Ensure that the working pressure in the housing does not exceed 2 bar, whatever the pump rotation speed and the viscosity of the fluid. Other operating may be possible; please consult our Technical Department.

## ► Preparation of the pump

Before start-up, the pumps should be filled with clean hydraulic oil. (minimum 50%).



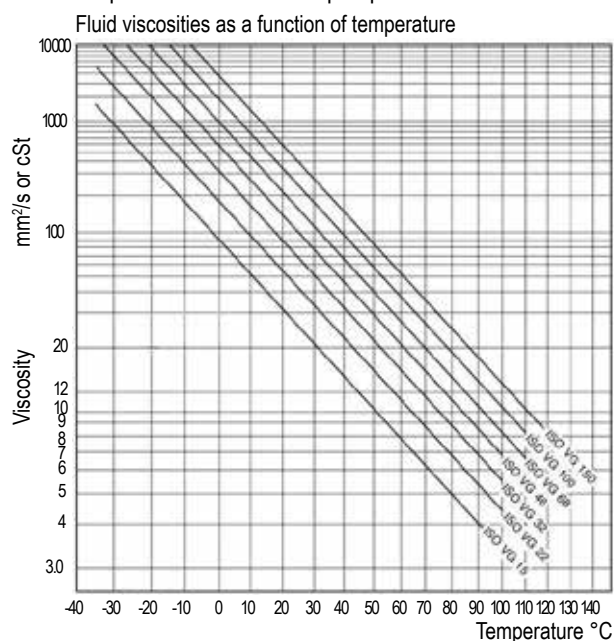
## ► Fluid

Use a mineral hydraulic oil type HLVP according to DIN 51502 (or HV according to ISO 11158) with viscosity between 10 and 400 cSt. It is in this viscosity range that the pump keeps its volumetric characteristics.

The optimal viscosity range is between 20 and 30 cSt. A maximum viscosity of 1000 cSt is accepted when starting up at low speed and without pressure.

If you wish to use other fluids, please consult our Customer Service Department.

Maximum temperature of fluid in the pump should not exceed 80°C.



## ► Drive and assembly recommendations

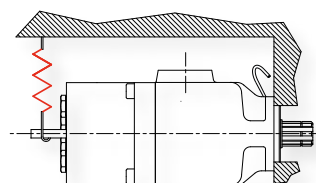
If cardan shaft drive: check the quality and correct installation of the cardan shaft.

For PTO mount applications, be careful to respect the tightening recommendations in terms of pump onto PTO and PTO onto vehicle gearbox. (according to the PTO manufacturer's specifications). If the mounting on the PTO is not lubricated, grease the splines with graphite grease (example Molycote G rapide).

LEDUC pumps are not designed to withstand any axial or radial load on the pump shaft. Check your installation conforms to this requirement.

## ► Elastic support device

For pumps with a greater overhang torque than that accepted by the PTO, it is recommended to use an elastic support device to support the weight of the pump.



This support has to be designed to avoid strain on the pump flange.

*We do not sell the elastic support.  
It must be suitable for the environment of the pump assembly.*

## ► Start-up

- Open the supply valve if there is one.
- Check the valve is in "back to tank" position.
- Start up at low speed, or by successive starts/stops.
- Let the pump run for one to two minutes, and check that the flow is regular.
- Check the pump is running correctly, with neither vibrations nor a normal noise.
- After several hours of operation, check the tightening torque of the pump on the PTO according to the PTO manufacturer's specifications.

## ► Maintenance

Some regular checks are necessary, namely:

- tightening of pump to PTO;
- cleanliness of fluid;
- state of filter.

LEDUC pumps designed for truck hydraulics are all fitted with reinforced sealing comprising:

► **two radial seals :**

- an outer seal adapted to the needs of PTOs and gearboxes;
- an inner seal adapted to the hydraulic requirement.

► **an original protection of the pump shaft seals :**

This is a flexible transparent tube which avoids any entry of contaminants between the two seals, and guarantees high pressure water jet cleaning of vehicle will not damage the sealing area. It also allows air vent of the chamber between the two seals.



**WARNING :** if you notice any trace of oil in the tube, the tightness of PTO-pump should be checked immediately.

## RECOMMENDATIONS FOR ATTACHING THE PROTECTIVE TUBE

✓ Make a siphon with the tube so as to avoid any introduction of dirt from road, and water or damp from high pressure washing of vehicle.



✓ Put the end of the tube downwards, or in a place sheltered from any projections.

✓ Fix the tube in place using a collar/clip.

✗ Avoid attaching the tube to any parts which may move, this could lead to it being damaged or torn off.

✗ Avoid any pinching or folds in the tube when fixing it in place.

✗ Make sure the end of the tube is not blocked.



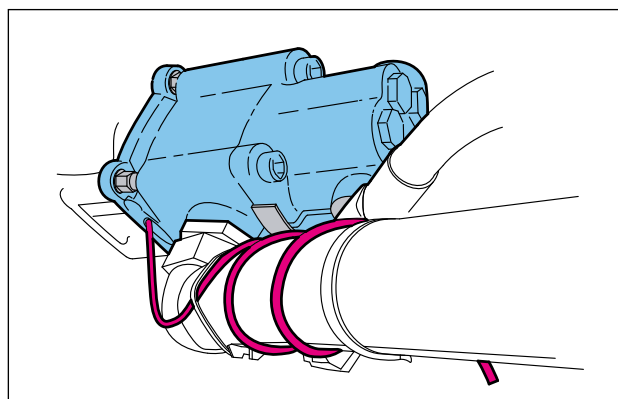
## INFORMATION

HYDRO LEDUC stresses that on non-sealed PTO installations it is the hydraulic pump which ensures the sealing of the vehicle gearbox.

This is why HYDRO LEDUC offers tried and tested solutions approved by vehicle manufacturers.

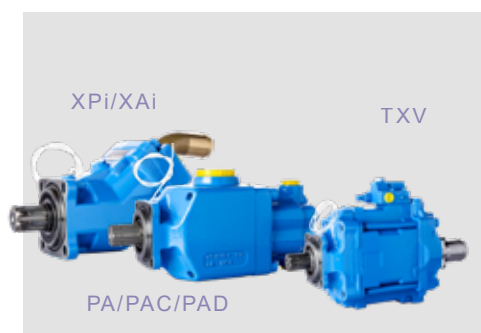
Note in particular the pump - PTO sealing has to be done via the seal C002510 supplied with the pump.

## Example of tube attachment



[illegible]

## PISTON PUMPS FOR TRUCKS



HYDRO LEDUC offers 3 ranges of piston pumps perfectly suited for truck applications, mountable on power take-off.

- Fixed displacement from 12 to 130 cm<sup>3</sup>/rev
- Fixed displacement, dual flow, from 2x25 to 2x75 cm<sup>3</sup>/rev
- Variable displacement, with LS (load sensing) control, from 40 to 150 cm<sup>3</sup>/rev.

## PUMPS FOR MOBILE & INDUSTRIAL APPLICATIONS



The W series consists of fixed displacement pumps, and the TXVA series consists of variable displacement pumps. These pumps are capable of operating at high pressures while occupying minimal space.

### ► W Series (ISO) and WA Series (SAE)\*

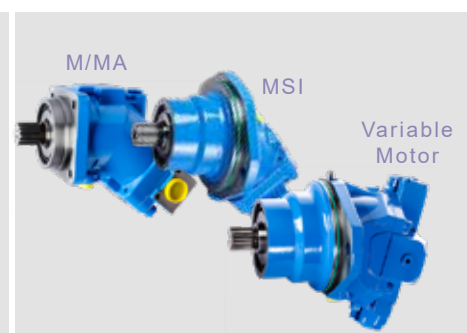
- Fixed displacements from 5 to 180 cm<sup>3</sup>/rev
- Flanges according to ISO 3019/2 or SAE standards
- Shafts according to DIN or SAE standards

### ► TXVA Series

- Variable displacements up to 92 cm<sup>3</sup>/rev
- SAE shafts and flanges

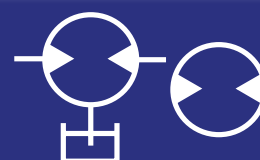
\* For the SAE version, please contact our Customer Service.

## HYDRAULIC MOTORS



Axial Piston Motors with Constant and Variable Displacement

- Models from 5 to 180 cc/rev
- DIN and SAE Versions
- Constant Displacement, Motors without Leak Oil Connection Special Version.



*Complete catalog: [www.hydroleduc.com](http://www.hydroleduc.com)*

## HYDROPNEUMATIC ACCUMULATORS



Diaphragm, Bladder, Bladder-Diaphragm, and Piston Accumulators in spherical and cylindrical designs.

- Storage capacities from 0.02 to 50 liters
- Operating pressures up to 400 bar
- Accessories for operating hydraulic pressure accumulators.

## MICROHYDRAULIC



A specific field of application for Hydro Leduc's expertise.

- Axial and radial piston pumps with constant and variable displacement.
- Axial piston micro-hydraulic motors.
- Micro-hydraulic components (electric drives, valves, control devices, etc).
- HYDRO LEDUC offers a comprehensive range of reliable solutions for extreme applications and compact spaces.

Our development team takes care of your individual requirements.

In close collaboration with the decision-makers in your organization, we work together with you to develop solutions according to your specifications.



A passion for hydraulics

**HYDRO LEDUC SAS**

Head Office & Factory  
BP 9 F-54122 AZERAILLES  
FRANCE  
Tel. +33 (0)3 83 76 77 40

**HYDRO LEDUC GmbH**

Am Ziegelplatz 20  
D-77746 SCHUTTERWALD  
DEUTSCHLAND  
Tel. +49 (0) 781-9482590  
Fax + 49 (0) 781-9482592

**HYDRO LEDUC AB**

Betongvägen 11  
461 38 TROLLHÄTTAN  
SWEDEN  
Tel. + 46 (0) 520 10 820

**HYDRO LEDUC BV**

Ericssonstraat 2  
5121 ML RIJEN  
THE NETHERLANDS  
Tel. +31 161 747816

**HYDRO LEDUC N.A. Inc.**

Grand Parkway Industrial Park  
23549 Clay Road  
KATY, TX 77493  
USA  
Tel. +1 281 679 9654



[www.hydroleduc.com](http://www.hydroleduc.com)



HYDRO LEDUC  
SAS with capital of 4 065 000 €  
EORI FR31902742100019  
RC Nancy B 319 027 421  
[contact@hydroleduc.com](mailto:contact@hydroleduc.com)

EN\_TRUCK PUMPS\_20260728