



PA | PAC | PAD series

piston pumps

fixed displacement in-line design

ADVANTAGES

- ▶ *Of unique design, the PA, PAC and PAD 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, PAD pump series comprises three 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 1.53 to 6.95 cu.in/rev (25 to 114 cc/rev)
- twin-flow from 2x3.05 to 2x4.6 cu.in/rev (2x50 to 2x75 cc/rev)
- two different flows: 4.6-2.4 cu.in/rev (75 - 40 cc/rev)

> PAC pumps

Series offering the most compact size envelope:

- single flow from 2.62 to 4.9 cu.in/rev (40 to 80 cc/rev)
- twin-flow from 2x1.5 to 2x2.4 cu.in/rev (2x25 to 2x40 cc/rev)

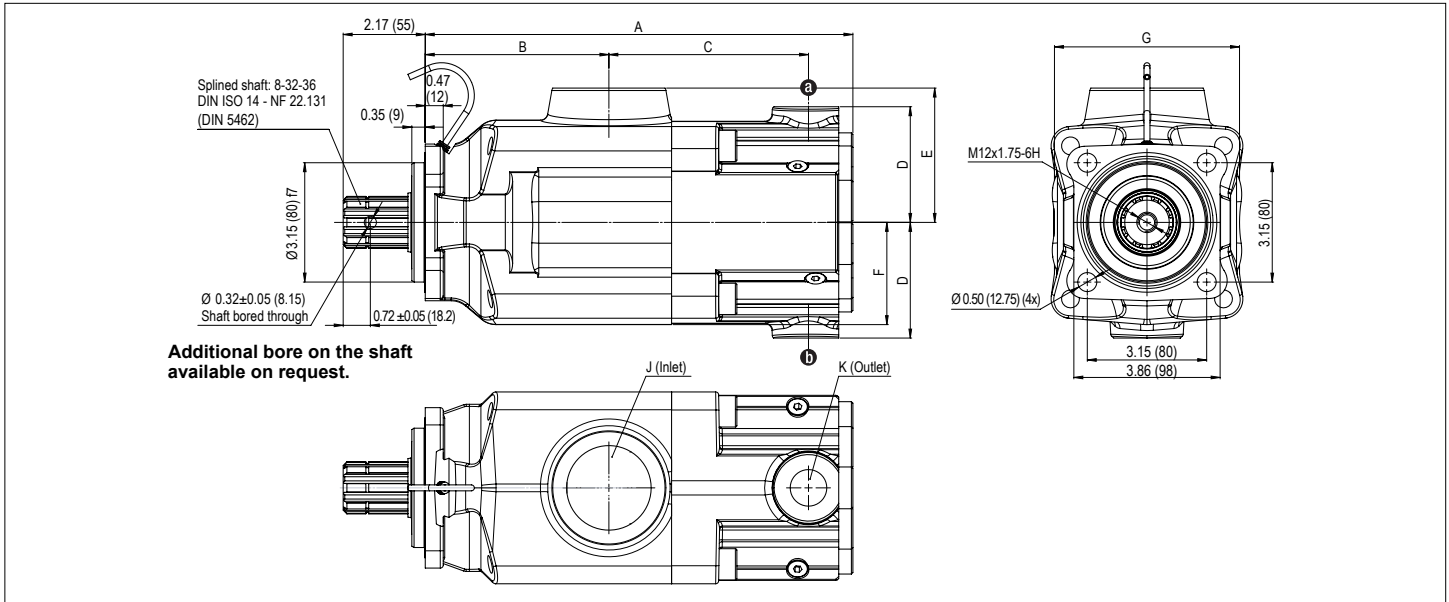


> PAD pumps

Two-flow pumps, with 10 pistons, thus offering optimal flow regularity within reduced size envelope:

- twin-flow: 2x3.36 and 2x 4.09 cu.in/rev (2x55 and 2x67 cc/rev)

PA | PAC | PAD - Dimensions



Pump reference	Displacement		A	B	C	D	E	F	G	J	K	Weight	Overhang torque	Max. speed	Max. torque absorbed at 5800 psi (400 bar) ⁽¹⁾	
	a	b														
		cu.in/rev (cc/rev)														

► Single flow

PA25	0511510	1.53 (25)	-	-	10.28 (261)	4.02 (102)	4.96 (126)	1.85 (47)	3.07 (78)	2.52 (64)	4.21 (107)	G 1/2"	G 3/4"	33.07 (15)	12.54 (17)	2200	131 (177)
PA32	0511515	2.07 (34)	-	-	10.28 (261)	4.02 (102)	4.96 (126)	1.85 (47)	3.07 (78)	2.52 (64)	4.21 (107)	G 1/2"	G 3/4"	33.07 (15)	12.54 (17)	2000	177 (240)
PA40	0511520	2.62 (43)	-	-	10.28 (261)	4.02 (102)	4.96 (126)	1.85 (47)	3.07 (78)	2.52 (64)	4.21 (107)	G 1/2"	G 3/4"	33.07 (15)	12.54 (17)	1750	224 (304)
PA50	0511525	3.05 (50)	-	-	10.28 (261)	4.02 (102)	4.96 (126)	1.85 (47)	3.07 (78)	2.52 (64)	4.21 (107)	G 1/2"	G 3/4"	33.07 (15)	12.54 (17)	1650	261 (354)
PA100	0511565	6.35 (104)	-	-	11.42 (290)	4.84 (123)	5.46 (138.8)	2.72 (69)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	51.81 (23.5)	23.23 (31.5)	1400	543 (736)
PA114	0511570	6.95 (114)	-	-	11.42 (290)	4.84 (123)	5.46 (138.8)	2.72 (69)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	51.81 (23.5)	23.23 (31.5)	1350	595 (807)
PAC40	0511460	2.44 (40)	-	-	8.90 (226)	3.74 (94.9)	4.07 (103.3)	2.44 (62)	2.88 (73.2)	2.13 (54)	3.86 (98)	G 1/2"	G 3/4"	27.56 (12.5)	9.29 (12.6)	1800	209 (283)
PAC50	0511465	3.05 (50)	-	-	8.90 (226)	3.74 (94.9)	4.07 (103.3)	2.44 (62)	2.88 (73.2)	2.13 (54)	3.86 (98)	G 1/2"	G 3/4"	27.56 (12.5)	9.29 (12.6)	1650	261 (354)
PAC65	0511490	3.96 (65)	-	-	9.57 (243)	4.03 (102.5)	4.44 (112.8)	2.48 (63)	3.07 (78)	2.56 (65)	4.21 (107)	G 1/2"	G 3/4"	35.27 (16)	9.29 (12.6)	1500	339 (460)
PAC80	0511705	4.76 (78)	-	-	9.72 (247)	4.03 (102.5)	4.58 (116.3)	2.48 (63)	3.07 (78)	2.56 (65)	4.21 (107)	G 1/2"	G 3/4"	37.48 (17)	15.71 (21.3)	1350	407 (552)

► Twin-flow - 2 x 3 pistons

PA2x50	0511555	3.17 (52)	3.17 (52)	11.42 (290)	4.84 (123)	5.46 (138.8)	2.72 (69)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	51.81 (23.5)	23.23 (31.5)	1400	543 (736) ⁽²⁾
PA2x57	0511560	3.48 (57)	3.48 (57)	11.42 (290)	4.84 (123)	5.46 (138.8)	2.72 (69)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	51.81 (23.5)	23.23 (31.5)	1350	595 (807) ⁽²⁾
PA2x75	0516100	4.58 (75)	4.58 (75)	11.89 (302)	4.96 (126)	5.82 (147.8)	2.85 (72.5)	3.54 (90)	2.85 (72.5)	5.31 (135)	G 2"	G 3/4"	59.08 (26.8)	28.54 (38.7)	1350	783 (1062) ⁽²⁾
PA75-40	0516810	4.58 (75)	2.44 (40)	11.89 (302)	4.96 (126)	5.82 (147.8)	2.85 (72.5)	3.54 (90)	2.85 (72.5)	5.31 (135)	G 2"	G 3/4"	60.41 (27.4)	28.54 (38.7)	1350	595 (807) ⁽²⁾
PAC2x25	0511480	1.53 (25)	1.53 (25)	9.57 (243)	4.03 (102.5)	4.44 (112.8)	2.48 (63)	3.07 (78)	2.56 (65)	4.21 (107)	G 1/2"	G 3/4"	35.27 (16)	12.98 (17.6)	1750	261 (354) ⁽²⁾
PAC2x32	0511485	1.95 (32)	1.95 (32)	9.57 (243)	4.03 (102.5)	4.44 (112.8)	2.48 (63)	3.07 (78)	2.56 (65)	4.21 (107)	G 1/2"	G 3/4"	35.27 (16)	12.98 (17.6)	1500	339 (460) ⁽²⁾
PAC2x40	0511710	2.38 (39)	2.38 (39)	9.72 (247)	4.03 (102.5)	4.58 (116.3)	2.48 (63)	3.07 (78)	2.56 (65)	4.21 (107)	G 1/2"	G 3/4"	37.48 (17)	15.71 (21.3)	1350	407 (552) ⁽²⁾

► Twin-flow - 2 x 5 pistons

PAD2x55	0521210	3.36 (55)	3.36 (55)	11.30 (287)	4.84 (123)	5.27 (133.8)	3.05 (77.5)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	54.23 (24.6)	25.37 (34.4)	1550	574 (778) ⁽²⁾
PAD2x67	0518270	4.09 (67)	4.09 (67)	11.30 (287)	4.84 (123)	5.27 (133.8)	3.05 (77.5)	3.54 (90)	2.72 (69)	4.88 (124)	G 2"	G 3/4"	54.23 (24.6)	25.37 (34.4)	1400	699 (948) ⁽²⁾

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

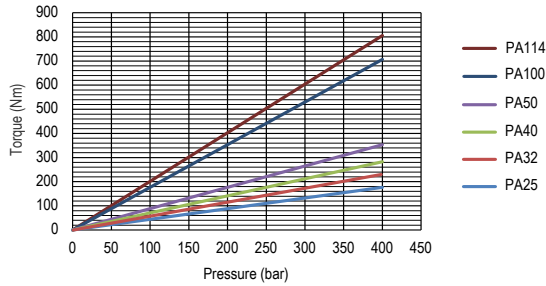
(2) Maximum torque for the two pressure ports at 5800 psi (400 bar).

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

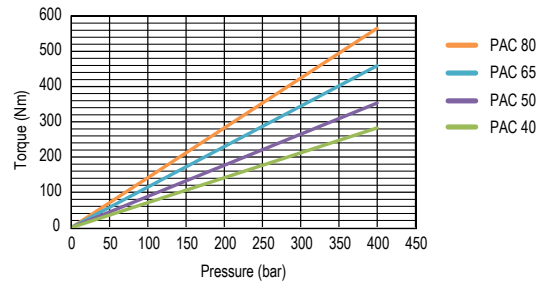
Single flow models

PA series

Single flow models PA



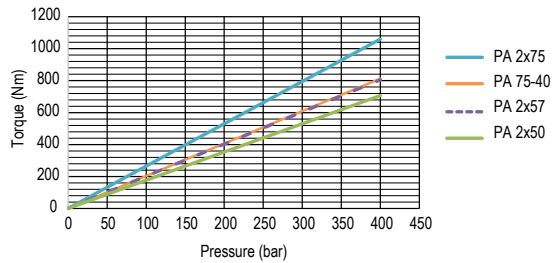
Single flow models PAC



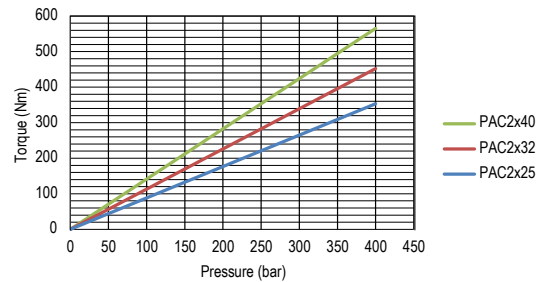
Twin-flow models

PA series

Twin flow models PA

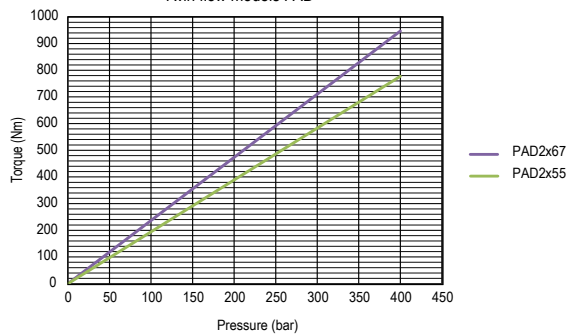


Twin flow models PAC



PAD series

Twin flow models PAD



PA - PAC - PAD series

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

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

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

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

- \mathcal{P} = Hydraulic power in kW
- Q = Flow in l/min
- η_{global} = Volumetric efficiency + mechanical efficiency
- C = Torque in N.m
- Cyl = Displacement in cu.in/rev
- ΔP = Differential pressure at the pump terminals, in bar
- η_{meca} = Mechanical efficiency

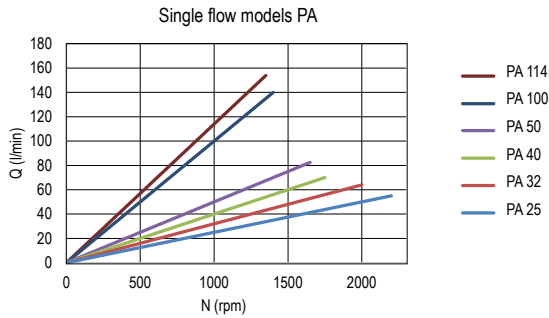
PA | PAC | PAD - Performance



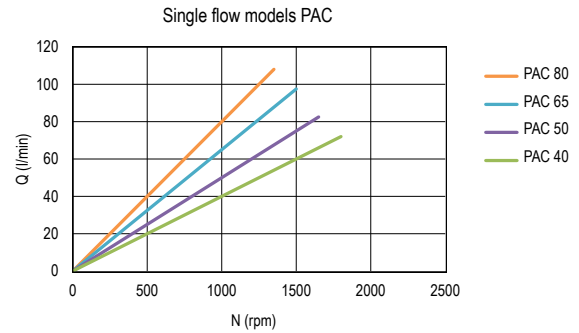
► Flow as a function of rotating speed

Single flow models

PA series

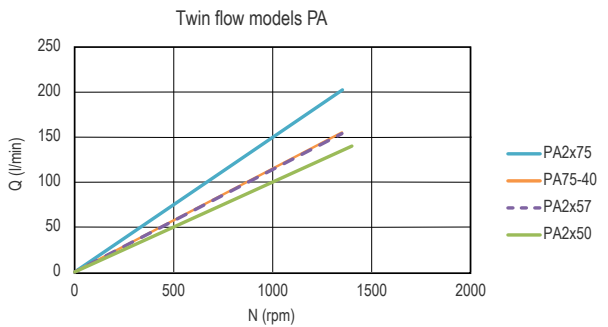


PAC series

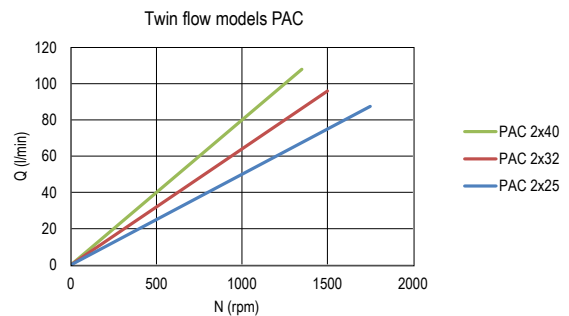


Twin-flow models

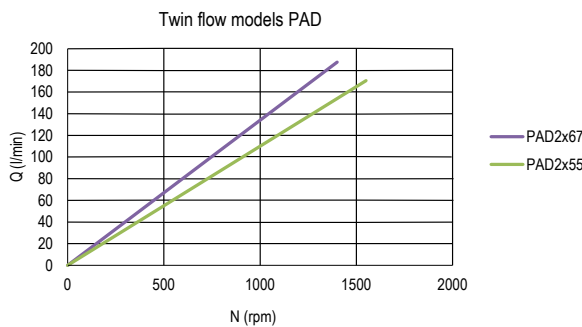
PA series



PAC series



PAD series



► Calculation of the flow

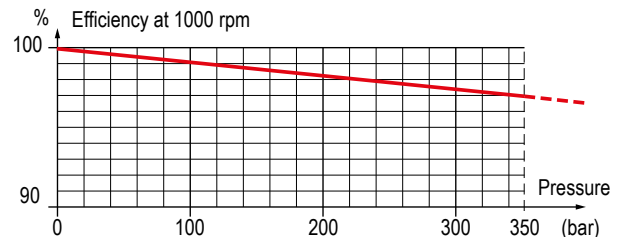
$$Q = \frac{\text{Cyl} \times N \times \eta_{\text{vol}}}{1000}$$

Avec :

- Q = Flow in l/min
- Cyl = Displacement in cu.in/rev
- N = Speed in rpm
- η_{vol} = Volumetric efficiency

► 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 77°F (25°C) (~100 cSt) - disregarding the volumetric efficiency.



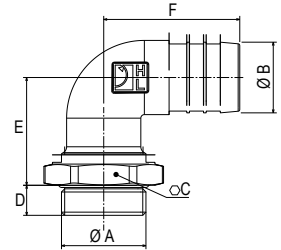
INLET FITTINGS FOR PA | PAC | PAD PUMPS

 **See recommendations of the hosing dimensions on page 42.**
For high speeds, please consult.

90° elbow fittings, swivel

Reference	Ø A	Ø B	C	D	E	F
240131	G 1 1/2"	1.57 (40)	2.36 (60)	0.67 (17)	2.40 (61)	3.03 (77)
240133	G 1 1/2"	1.97 (50)	2.36 (60)	0.67 (17)	2.56 (65)	3.23 (82)
240135	G 2"	1.97 (50)	2.76 (70)	0.67 (17)	2.56 (65)	3.23 (82)

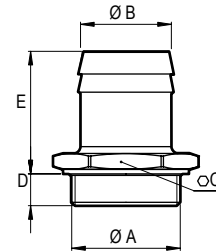
Dimensions in inches (mm).



Straight fittings

Reference	Ø A	Ø B	C	D	E
240182	G 1 1/2"	1.57 (40)	2.20 (56)	0.55 (14)	2.13 (54)
240067	G 1 1/2"	1.97 (50)	2.05 (52)	0.55 (14)	2.60 (66)
240066	G 1 1/2"	2.36 (60)	2.52 (64)	0.55 (14)	2.72 (69)
240186	G 1 1/2"	2.50 (63.5)	2.52 (64)	0.55 (14)	2.72 (69)
240183	G 2"	1.97 (50)	2.60 (66)	0.55 (14)	2.13 (54)
240170	G 2"	2.36 (60)	2.60 (66)	0.55 (14)	2.83 (72)
240201	G 1 1/2"	3.00 (76.2)	3.15 (80)	0.55 (14)	3.50 (89)

Dimensions in inches (mm).



DEFLECTOR TO PROTECT SHAFT SEALS

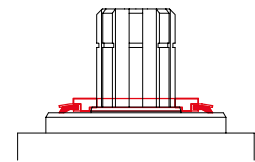
This deflector ensures the protection of the pump shaft seals.
In particular, it protects the pump from projections of dirt from the road in cardan drive installations.

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.



Type	LEDUC code	ØA	ØB	C	D	E	F	ØG	H
DIN 90	056315	3.54 (90)	1.85 (47)	1.69 (43)	0.08 (2)	0.39 (10)	2.44 (62)	2.16 (55)	0.59 (15)
DIN 100	0519040	3.94 (100)	2.24 (57)	1.69 (43)	0.08 (2)	0.39 (10)	2.52 (64)	2.16 (55)	0.59 (15)

Dimensions in inches (mm).

