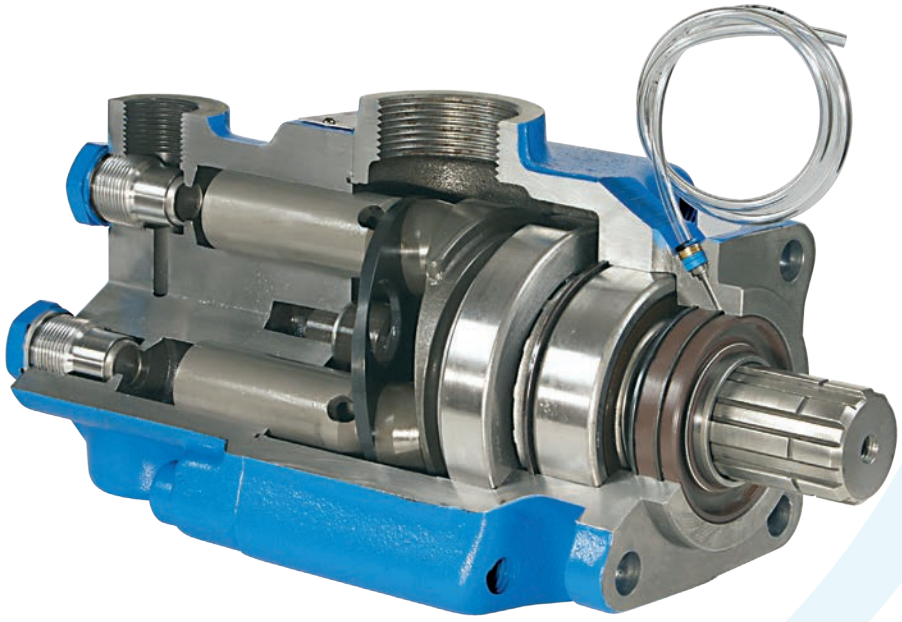
PA | PAC series

piston pumps

fixed displacement in-line design

ADVANTAGES

- *Of unique design, the PA, PAC and 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

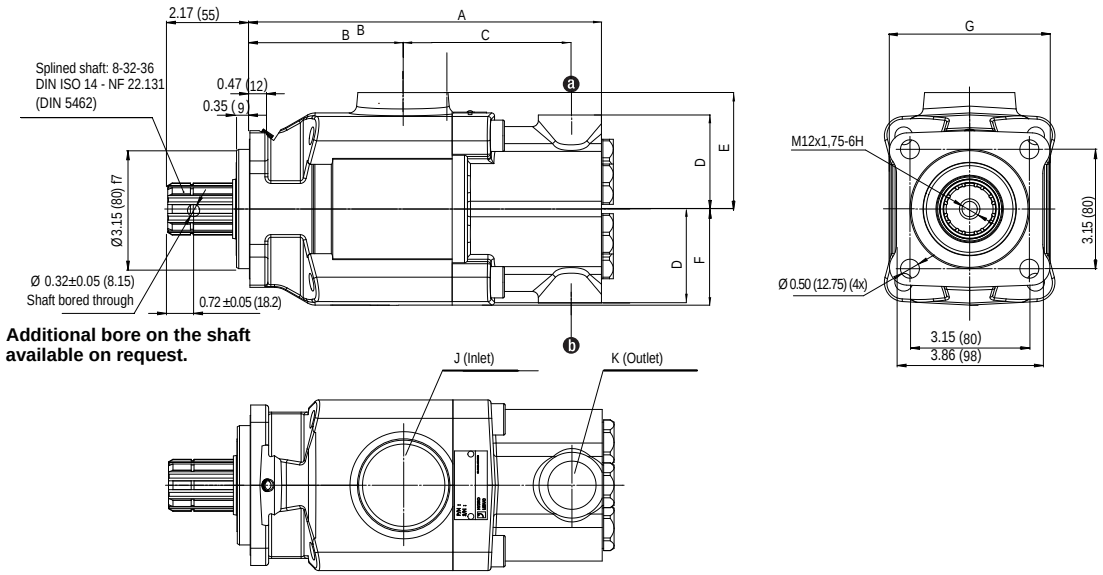
- single flow from 1.53 to 6.95 cu.in/rev (25 to 114 cc/rev)
- twin-flow from 2x3.05 to 2x4.6 cu.in/rev (2x50 to 2x75 cc/rev)
- two different flows: 4.6-2.4 cu.in/rev (75 - 40 cc/rev)

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)

PA | PAC - Dimensions



Pump reference		Displacement ⓐ cu.in/rev (cc/rev)		Displacement ⓑ cu.in/rev (cc/rev)		A	B	C	D	E	F	G	J	K	Weight lbs (kg)	Overhang torque lfb ft (N.m)	Max. speed (rpm)	Max. torque absorbed at 5800 psi (400 bar) [1] lfb ft (N.m)
► 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 1½"	G ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 ¾"	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 ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 ¾"	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 ¾"	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 ¾"	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 ¾"	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 1½"	G ¾"	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 1½"	G ¾"	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 1½"	G ¾"	37.48 (17)	15.71 (21.3)	1350	407 (552)[2]

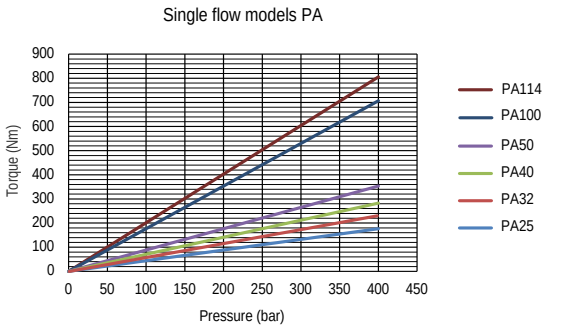
(1) Maximum torque given with a mechanical efficiency at 90%.
(2) Maximum torque for the two pressure ports at 5800 psi (400 bar).

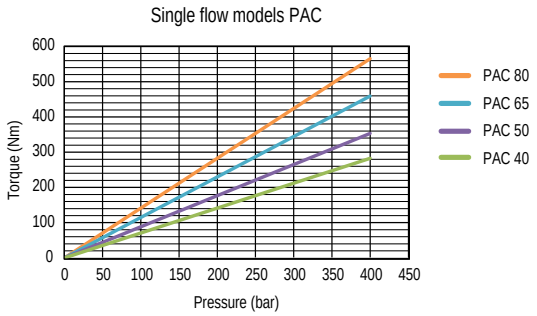
Dimensions in inches (mm).

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

Single flow models

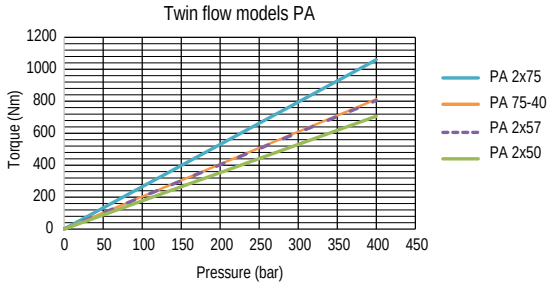
PA series

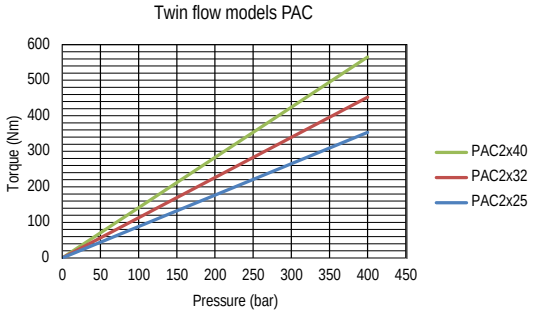




Twin-flow models

PA series





PA - PAC series

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

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

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

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

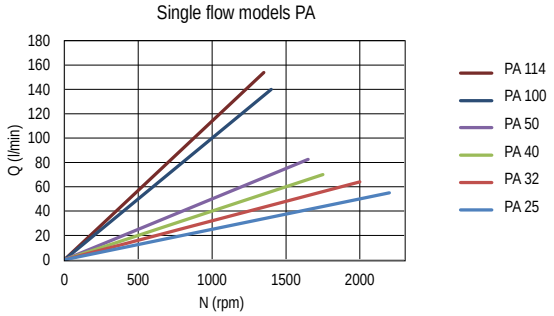
$\mathcal{P}$	=	Hydraulic power in kW
Q	=	Flow in l/min
η_{global}	=	Volumetric efficiency + mechanical efficiency
C	=	Torque in N.m
Cyl	=	Displacement in cu.in/rev
ΔP	=	Differential pressure at the pump terminals, in bar
η_{meca}	=	Mechanical efficiency

PA | PAC - Performance

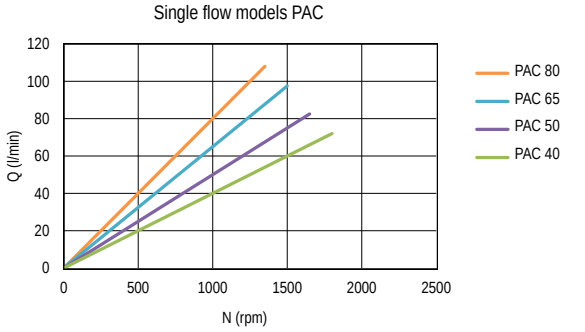
► Flow as a function of rotating speed

Single flow models

PA series

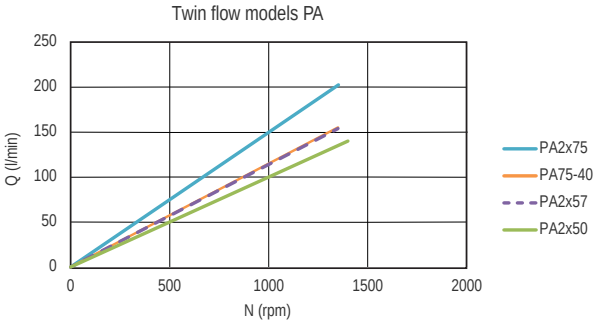


PAC series

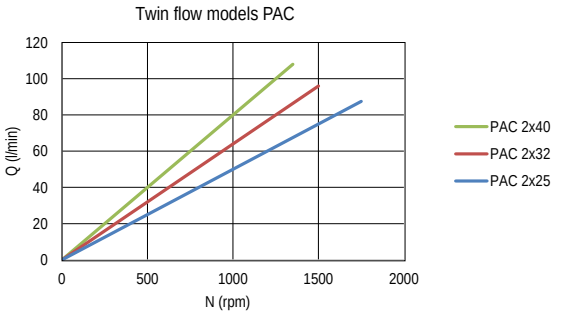


Twin-flow models

PA series



PAC series



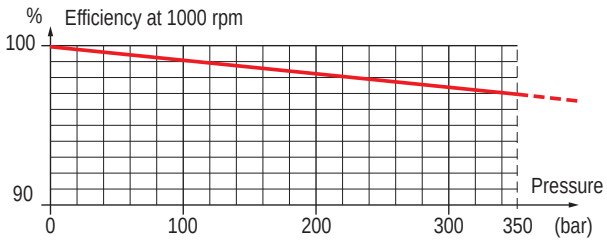
► Calculation of the flow

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

Avec :

Q	=	Flow in l/min
Cyl	=	Displacement in 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.

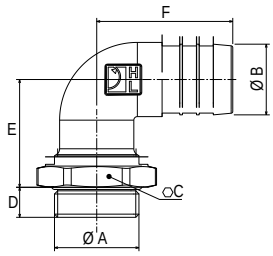
INLET FITTINGS FOR PA | PAC PUMPS

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)

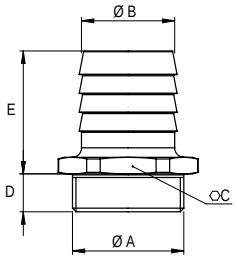
Dimensions in inches (mm).



Straight fittings

Reference	Ø A	Ø B		C		D		E	
240182	G 1 1/2"	1.57	(40)	2.17	(55)	0.63	(16)	2.05	(52)
240067	G 1 1/2"	1.89	(48)	2.17	(55)	0.63	(16)	2.52	(64)
240066	G 1 1/2"	2.36	(60)	2.56	(65)	0.63	(16)	2.64	(67)
240186	G 1 1/2"	2.50	(63.5)	2.56	(65)	0.63	(16)	2.64	(67)
240183	G 2"	1.97	(50)	2.56	(65)	0.63	(16)	2.05	(52)
240170	G 2"	2.36	(60)	2.56	(65)	0.63	(16)	2.76	(70)
240201	G 1 1/2"	3.00	(76.2)	3.15	(80)	0.63	(16)	3.43	(87)

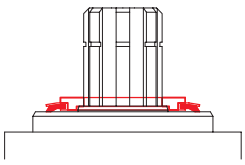
Dimensions in inches (mm).



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**

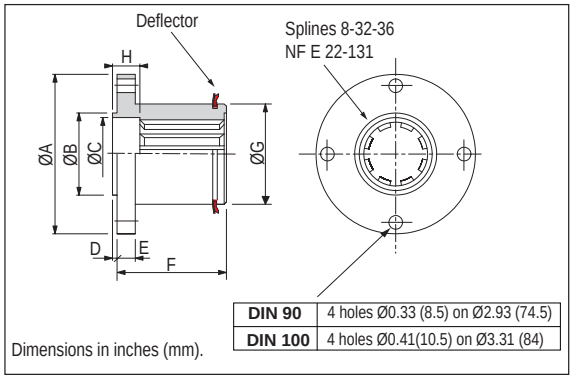


CARDAN PLATE- DIN 90 and DIN 100

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).



A passion for hydraulics

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