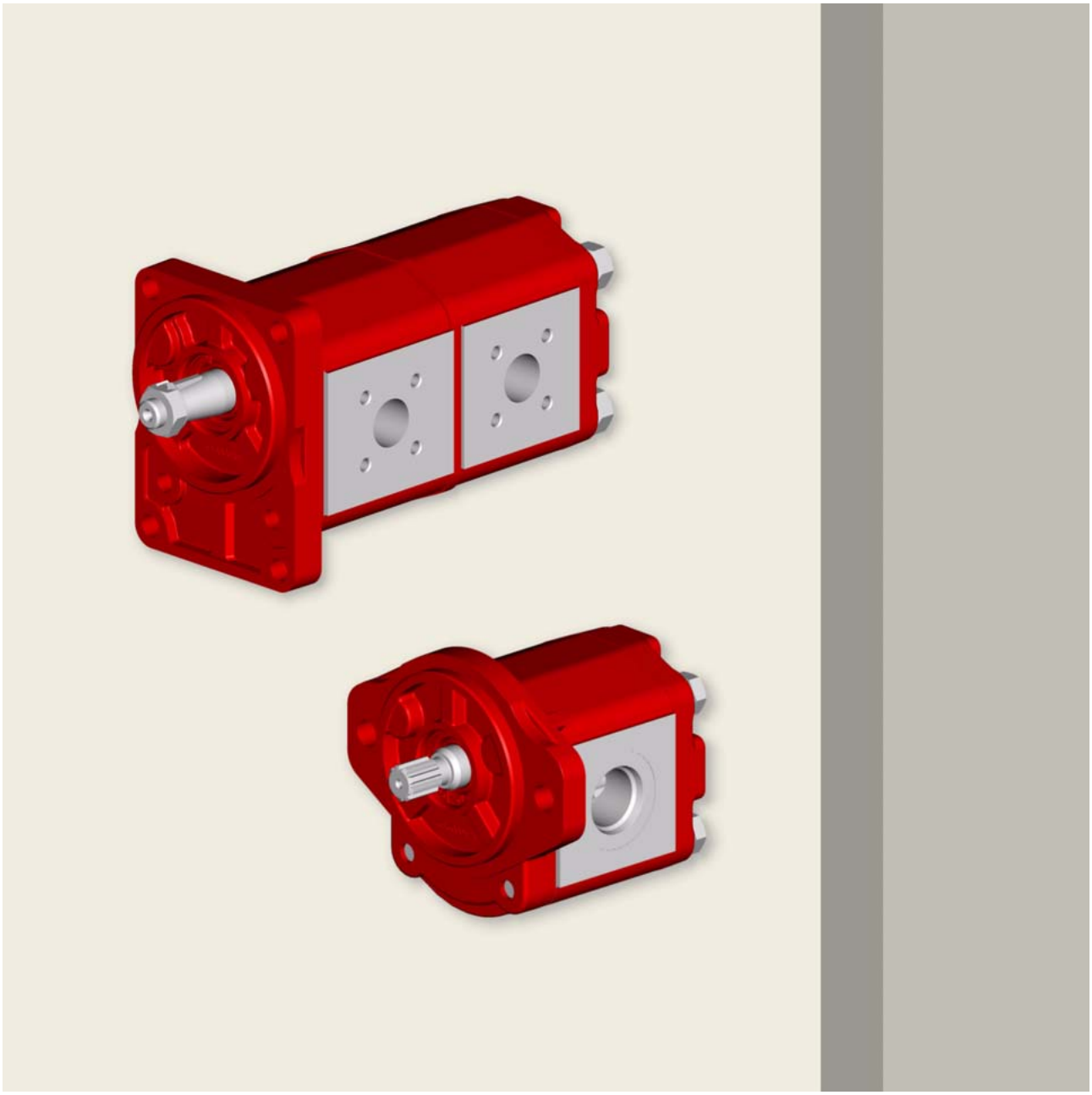
BUCHER HYDRAULICS

AP212 Gear Pumps

Standard and Low Noise series



motion and progress

Reference: 200-P-991230-E-00

BUCHER HYDRAULICS

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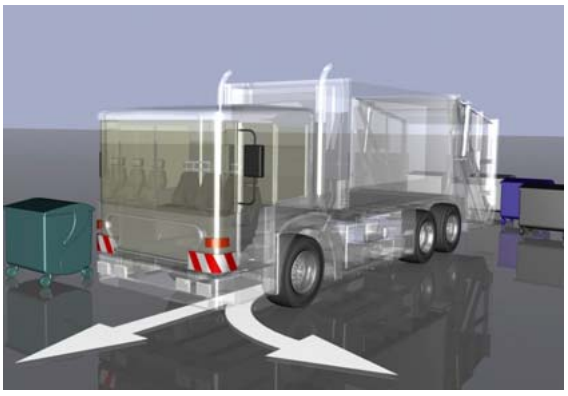
1 General information

The product range of Bucher Hydraulics SpA includes single pumps 05-100-212-300 (corresponding with the common group denominations: 05-1-2-3) and several combinations of double pumps, triple pumps, and so on, that can be assembled together according to versions of displacement, flanging, and auxiliary valves .

External gear pumps are widely used in modern hydraulic systems due to their high performance, long service life and low purchase and maintenance costs.

Here following we introduce you the new AP212 family range.



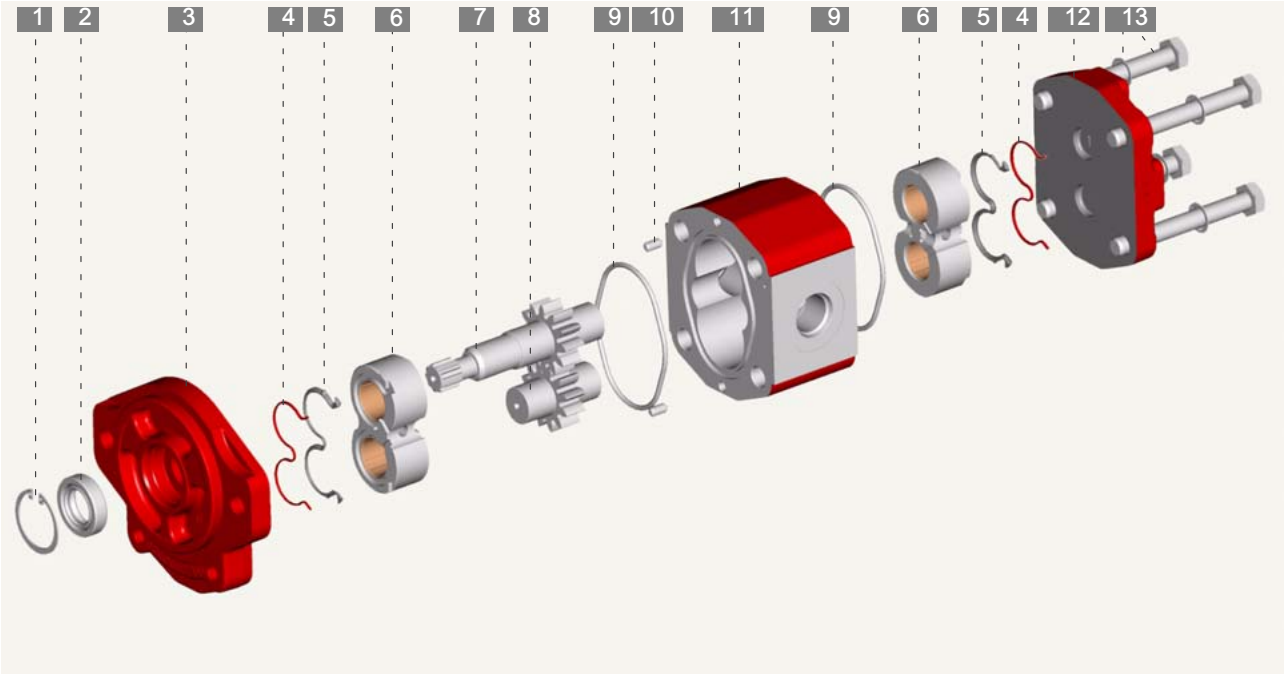
Product development of the new AP212 family has made it possible to achieve high operating pressures, excellent volumetric and mechanical efficiency and on specially developed units (LN – Low Noise) even lower noise levels.

This has been possible by means of:

- new design of gear teeth and balancing areas
- use of high-performance materials
- carefully controlled heat treatments
- increasingly tight coupling tolerances and a high standard of surface finish
- continuous development in our semi-anechoic room

Bucher Hydraulics has so achieved these results by constantly improving its design, control and manufacturing techniques inline with the latest technological developments, while simultaneously enhancing our Quality Control System which ensures that every single product offers the same high standards.

1.1 External gear pumps components



24. Retaining ring
25. Shaft seal
26. Front cover
27. Balancing seal
28. Back up seal
29. Balancing block
30. Drive gear
31. Driven gear
32. Oil seal
33. Centering pin
34. Pump body
35. Back cover
36. Fixing screw and washer

1.1.1 Improvements (New AP212 vs AP200)

Front covers :

In addition to aluminium versions, complete new range of cast iron front covers

Balancing blocks :

New generation optimised and standardised balancing blocks

Gears :

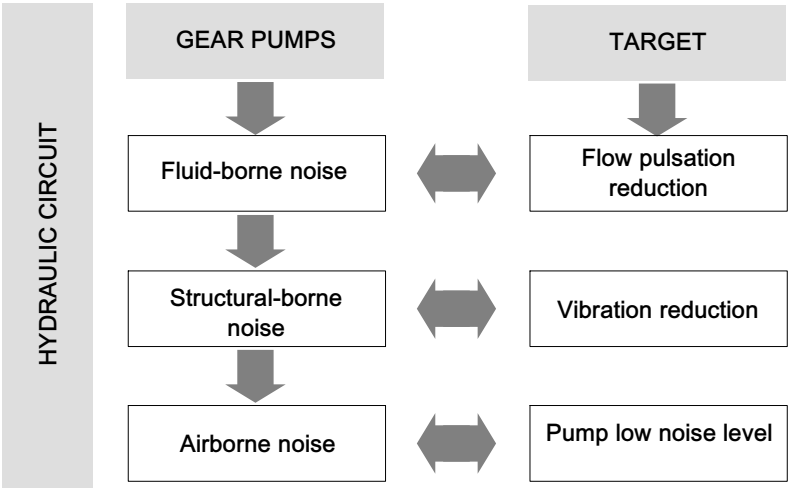
New gears profile (12 teeth) with increased transmissible torque

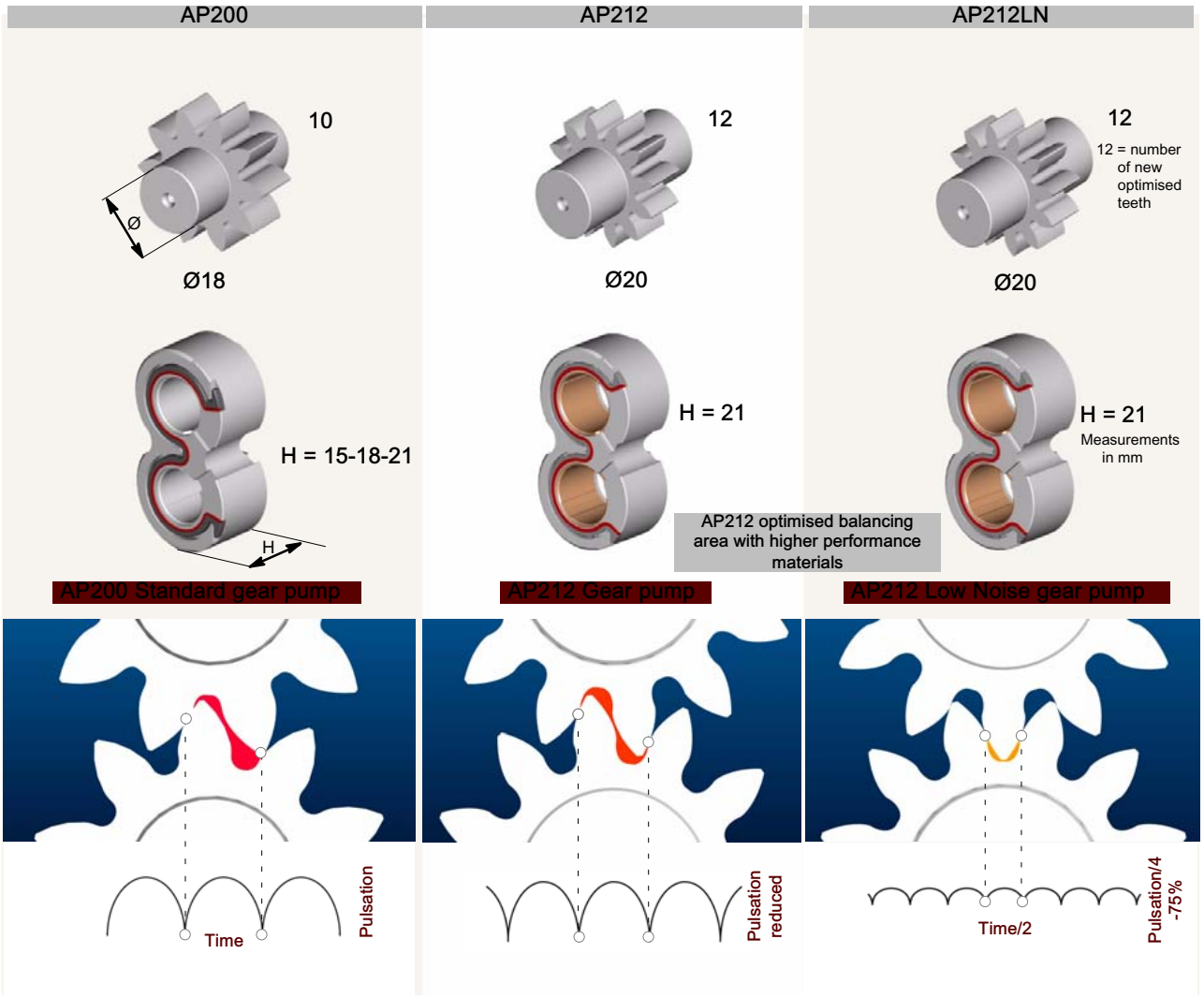
Bodies:

New design pump bodies

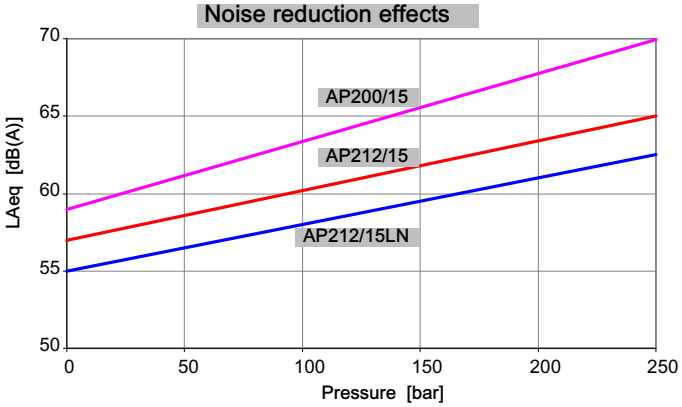
Back covers:

Wide range of aluminium and cast iron back covers with/ without integrated cartridge valves





1.2 Example of typical sound pressure level recorded in a semi-anechoic testing room



Oil temperature: 40°C - Oil viscosity: 32 mm2/s
Distance between pump and sensor: 1 m

1.3 Technical data

Features		
Fluid temperature range (mineral oil)	NBR HNBR FPM (VITON)	-15 / +80 °C (peak: -20 / +90 °C) -15 / +100 °C (peak: -20 / +110 °C) -5 / +100 °C (peak: -10 / +110 °C)
Recommended fluids		hydraulic mineral oil-based
Viscosity range:	Recommended Permitted Permitted for starting	20-120 mm^2/s (cSt) up to 700 mm^2/s (cSt) 2000 mm^2/s (cSt)
Cleanliness: recommended for operating pressure > 170 bar recommended for operating pressure < 170 bar		21/18/15 ISO 4406 22/19/16 ISO 4406
Standard seals material (valves not included)		NBR + HNBR standard (ISO1629)

Type	AP/APR212 Displacement		AP/APR212LN Displacement		Max. pressure* P1 (continuous)		P2 (intermittent)		P3 (peak)		n min. P2 < 100 bar	n min. 100<n< 180 bar	n min. 180<n< P2	n max.
	cm^3/rev	Cu.In. P.R.	cm^3/rev	Cu.In. P.R.	bar	P.S.I.	bar	P.S.I.	bar	P.S.I.	rpm	rpm	rpm	rpm
4.5	4.4	.269	4.5	.275	250	3600	280	4000	300	4300	600	1200	1400	4000
6.5	6.4	.391	6.6	.403	250	3600	280	4000	300	4300	600	1200	1400	4000
8.5	8.4	.513	8.7	.531	250	3600	280	4000	300	4300	600	1000	1400	4000
11	11.1	.677	11.5	.702	250	3600	280	4000	300	4300	500	900	1200	3500
15	15.1	.921	15.7	.958	250	3600	280	4000	300	4300	500	750	1000	3500
19	19.2	1.172	19.8	1.208	210	3000	240	3500	260	3700	500	750	1000	3000
22	22.2	1.355	23	1.404	180	2600	210	3000	230	3300	500	750	900	3000
26	26.2	1.599	27.1	1.654	170	2500	200	2850	220	3150	500	750	1000	2800
22**	22.2	1.355	23	1.404	220	3150	240	3450	260	3700	500	750	900	3000
26**	26.2	1.599	27.1	1.654	200	2850	230	3300	250	3600	500	750	1000	2800

* Referred to pumps and motors with flanged ports. Utilising threaded ports, please to consider a significantly de-rated performances.
The mechanical stress localised on threaded ports cause a reduced pump life performances

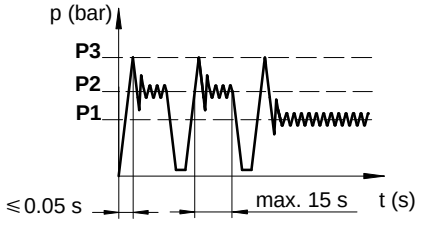
** obtained with a specific balancing plate, please contact our Sales Center

1.4 Pressure

Pressure levels:
P1 = continuous pressure
P2 = intermittent pressure
P3 = peak pressure

The recommended oil speed in the pressure pipes is:

v = 2 to 5 m/s



1.5 Suction

The absolute suction pressure must be $P_{in} \geq 0.75$ bar (11 PSI); therefore, the following must be avoided:

- large height differences between pump and tank
- long stretches of piping
- special features such as:
  - bends
  - reductions in diameter
  - quick couplings
  - etc.

It is also advisable to choose a filter of a suitable size to minimise any pressure drop and to take measures to prevent gradual clogging over time.

(Example 1)

In certain cases, the suction pressure can exceed 1 bar (14.3 PSI), or atmospheric pressure.

Please contact our Sales Department, solution for

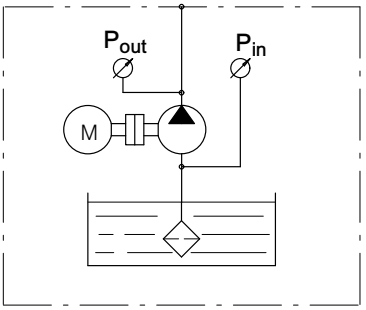
$P_{in} \leq 3.5$ bar (50 PSI) , are available.

If in a particular application the P_{in} pressure is higher than the recommended value, contact our Sales Office.

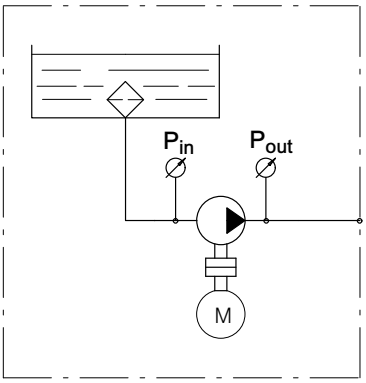
The diameter of the suction pipe should ensure that the oil speed will fall within the range: v = 0.6 - 1.2 m/s.

(Example 2)

(Example 1)



(Example 2)



1.6 General precaution

In addition to the recommendations regarding fluids, filtration, coupling, etc., we suggest the following:

- Always check the rotation direction of the pump's drive shaft; it must be compatible with the rotation direction of the pump itself.
- Be particularly careful in cleaning and make sure, when connecting the suction and pressure piping, that no chips, rag threads, teflon tape, etc. get into the pump circulation system.
- Check the tightness of the suction and pressure fittings, the correct positioning of the O-Ring, and make sure there is no dirt between the flange and the pump body.
- The first pump start-up can be facilitated by manually filling the suction piping and the pump itself with oil. To facilitate air bleeding, start the pump with the circuit not pressurised.
- To ensure the best heat distribution inside the tank, make sure the return pipe is not too close to the pump's suction piping. The pipings themselves should be below oil tank level to prevent the formation of foam.
- Do not subject the pumps to operating conditions different from those indicated on section 1.3 ; for extreme operations, always contact our Technical Department.
- Never use fluids different from those indicated in section 1.3 and do not use fluids incompatible with the pump seals (i.e. HNBR)
- In the event of pump painting, do not use solvents or paints that are incompatible with the material of the seals. Do not bake paint with excessively high temperatures. Do not paint over the product identification plate.

1.6.1 Directives and standards

Atex

Attention: The equipment and protective systems of these catalogue ARE NOT intended for use in potentially explosive atmospheres that is to say where there is an explosive atmosphere referred to in Article 2 of the Directive 99/92/EC and referred to Article 1.3 of the Directive 94/9/EC

Machinery safety

Hydraulic pumps are excluded by Directive 98/37/EC

ISO 9001: 2000

Bucher Hydraulics S.p.A. is certified for research, development and production of directional control valves, gear pumps and motors, power units, electro pumps, cartridge valves and integrated manifolds for hydraulic applications.

1.7 Identifying the rotation direction

The rotation direction of a gear pump is identified by looking at the pump from the front and with the drive gear turned upwards (see figures below).

Pumps with clockwise rotation (**D**) have a drive gear which turns clockwise, with the suction port on the left and the pressure port on the right.

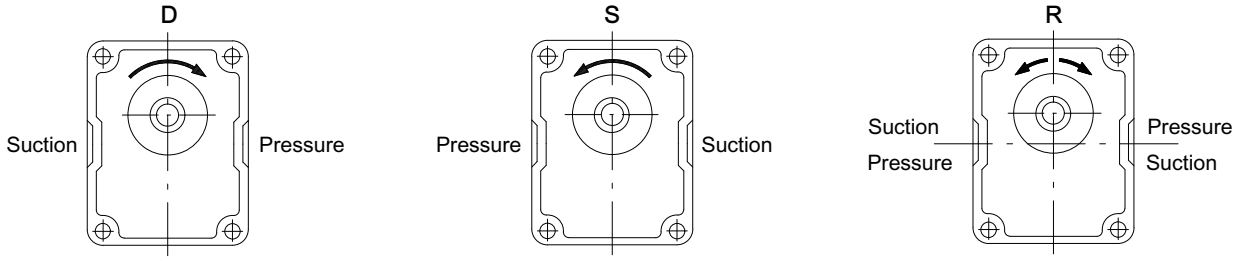
Pumps with counterclockwise rotation (**S**) have a drive gear which turns counterclockwise, with the suction port on the right and the pressure port on the left. The figure also shows the pressure flow inside the pumps as the oil is transferred from the suction port to the pressure port.

As regards reversible pumps (**R**), the ports are alternatively for suction and pressure.

Pumps with a unidirectional rotation (D or S) have the denomination AP.

Pumps with reversible rotation have the denomination APR.

Pumps with “Low Noise” components have the denomination LN.



Right-hand rotation | Left-hand rotation | Reversible rotation

1.8 Motor-pump coupling

Absolutely no radial or axial forces should be transmitted to the drive shaft in the motor-pump coupling.

Such forces cause rapid and irregular wear on the balancing surface of the bushings and gear support, with a consequent worsening in pump performance.

The coupling joint must be able to absorb any discrepancies in the coaxial alignment of the motor-pump shafts without placing any load on the pump shaft.

In the couplings between splined shafts, the connecting sleeve must be free to move along its axis.

The length of the sleeve must be sufficient to cover the splined sections of the motor-pump shafts completely in any position.

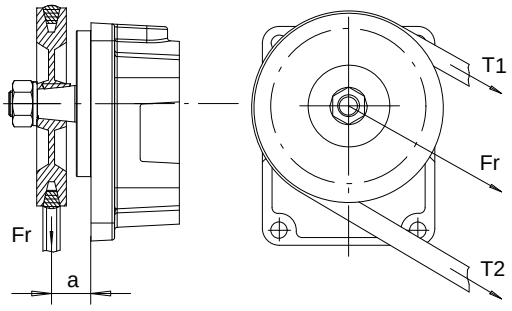
A clearance between shaft ends it is necessary.

Make sure that the splined coupling is suitably lubricated to protect it against rapid deterioration.

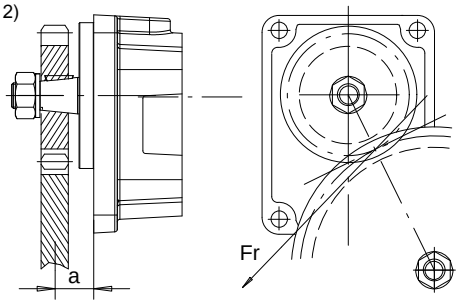
If there are radial and/or axial loads on the drive shaft, such as when it is driven by a V-belt and pulley or pair of gear wheels, it should be fitted with a front cover with supporting bearings. (See examples 1 and 2)

Depending on the pump model concerned, these supports can replace the front cover of the pump or can be fitted in addition to and over the front cover.

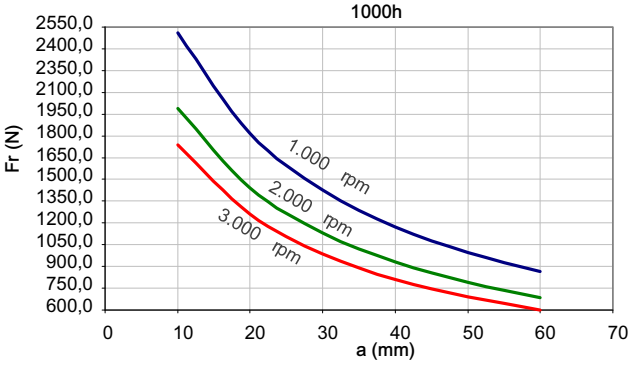
(Example 1)



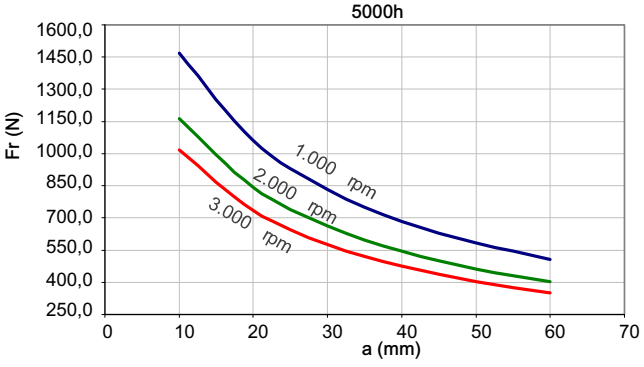
(Example 2)



Maximum radial force admitted
1000h

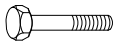


Maximum radial force admitted
5000h



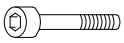
1.9 Non-standard symbols used in the text


Check nut

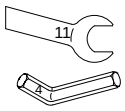

Hexagonal-head screw (TE screw)


O-Ring

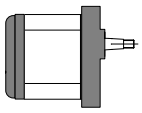

Lock washer


Socket head screw (TCE screw)


Woodruff key



Dynamometric spanners


Gear pump standard configuration: materials indication


Square key

1.10 Calculating the specification of a gear pump

The following parameters are defined:

Vc = (cm^3/rev) pump displacement;

n = (rev/min) no. of rpms of the drive shaft;

Q = (l/min) flow rate;

p = (bar) operating pressure;

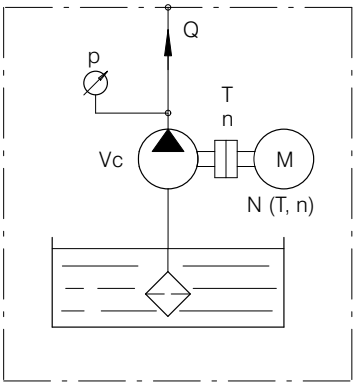
T = (Nm) drive torque;

N = (kW) Absorbed power;

η_v = (%) volumetric efficiency;

η_m = (%) mechanical efficiency;

η_t = (%) total efficiency



$$Q = \frac{Vc \cdot n}{100000} \cdot \eta_v$$

$$T = 1.59 \cdot \frac{p \cdot Vc}{\eta_m}$$

$$N = \frac{Q \cdot p}{6.12 \cdot \eta_t}$$

Example

AP212/11 Vc= 11.1 cm^3/r n= 1500 r/min p=200 bar η_v= 94% η_m= 90% η_t= 84.6%

$$Q = \frac{11.1 \cdot 1500}{100000} \cdot 94 = 15.65 \text{ l/min.}$$

$$T = 1.59 \cdot \frac{200 \cdot 11.1}{90} = 39.2 \text{ Nm}$$

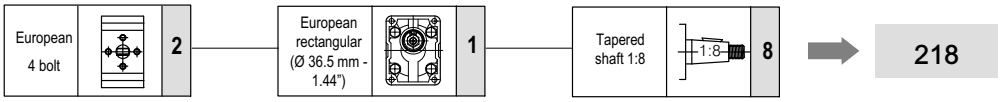
$$N = \frac{15.65 \cdot 200}{6.12 \cdot 84.6} = 6.05 \text{ kW}$$

2 Overview standard types

This pumps configuration are considered as “standard”.

218	818	225	227	235	245	237	247
259	887S	880	887S-NPTF	880-NPTF	287S-B	280-B	287S-SAEB

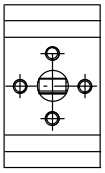
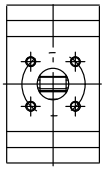
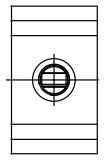
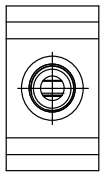
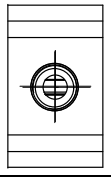
Example

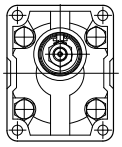
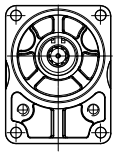
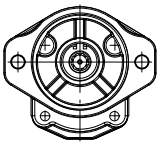
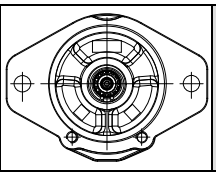


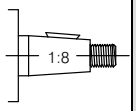
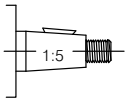
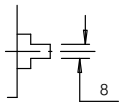
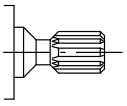
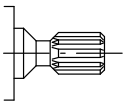
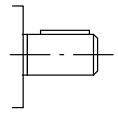
In the next pages, front, rear cover, and seals materials are listed for each pump series. For ordering purposes, it is enough to outline the complete pump description (for example: AP212/4.5 D 218).

In case of a different configuration request (or a combination of different features, such as port threads, front flange materials, etc.), the description configurator shown in section 3.1 can be easily used.

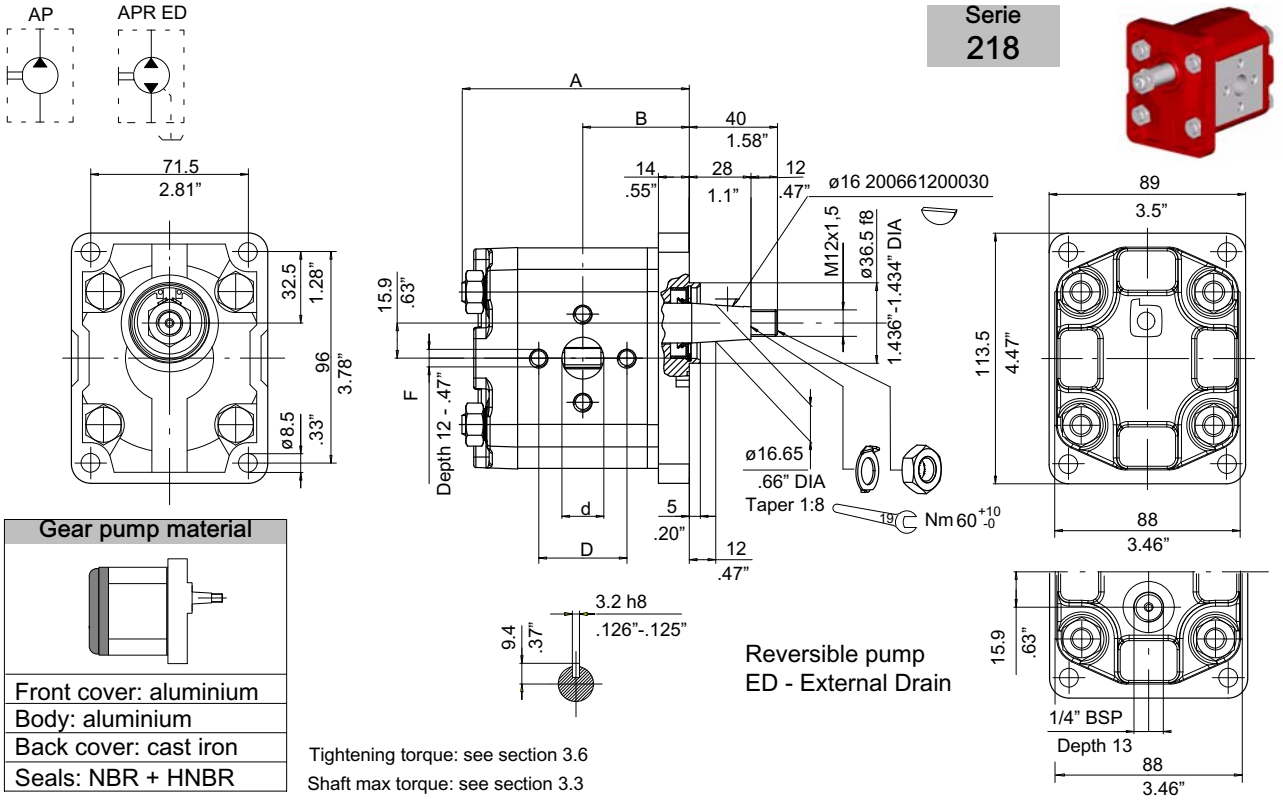
2.1 Standard configuration

Port type		
European 4 bolt flanged		2
German 4 bolt flanged		2
BSPP Threaded ports		8
SAE Threaded ports		8
NPTF Threaded ports		8

Aluminium front cover type		
European rectangular (Ø 36.5 mm - 1.44”)		1
German rectangular (Ø 80 mm - 3.15 inches)		2
Through 2 bolts (Ø 50 mm - 1.97”)		3
Through 2 bolts (Ø 50 mm - 1.97”)		4
Through 2 bolts (Ø 52 mm - 2.045”)		5
SAE-A 2 bolts (Ø 82.55 mm - 3.25 inches)		8
Cast iron front cover type		
SAE-B 2 bolts (Ø 101,6 mm - 4 inches)		8

Drive shaft		
Tapered shaft 1:8		8
Tapered shaft 1:5		5
Tang drive 8 mm - 0.32 inches		9
9 Teeth external spline B17X14 DIN5482		7
9 teeth external spline SAE J 498-9T 16/32 DP		7S
Straight keyed Ø 15,85 mm - 0.62 inches		0

For reversible pumps alternative inlet and outlet ports have the same sizes as per inlet unidirectional rotation.

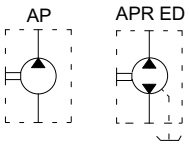


Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.6
Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	94	3.70	43.3	1.70	13.5	.53	30	1.18	M6X1	13.5	.53	30	1.18	M6X1
6.5	6.4	6.6	97	3.82	44.8	1.76										
8.5	8.4	8.7	100	3.94	46.3	1.82										
11	11.1	11.5	104	4.09	48.3	1.90	19	.75	40	1.58	M8X1.25	19	.75	40	1.58	M8X1.25
15	15.1	15.7	110	4.33	51.3	2.02										
19	19.2	19.8	114	4.49	54.3	2.14										
22	22.2	23	118	4.65	56.5	2.22										
26	26.2	27.1	124	4.88	59.5	2.34										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 218	AP212/4.5LN D 218	AP212/4.5 S 218	AP212/4.5LN S 218	APR212/4.5 ED 218	APR212/4.5LN ED 218
AP212/6.5 D 218	AP212/6.5LN D 218	AP212/6.5 S 218	AP212/6.5LN S 218	APR212/6.5 ED 218	APR212/6.5LN ED 218
AP212/8.5 D 218	AP212/8.5LN D 218	AP212/8.5 S 218	AP212/8.5LN S 218	APR212/8.5 ED 218	APR212/8.5LN ED 218
AP212/11 D 218	AP212/11LN D 218	AP212/11 S 218	AP212/11LN S 218	APR212/11 ED 218	APR212/11LN ED 218
AP212/15 D 218	AP212/15LN D 218	AP212/15 S 218	AP212/15LN S 218	APR212/15 ED 218	APR212/15LN ED 218
AP212/19 D 218	AP212/19LN D 218	AP212/19 S 218	AP212/19LN S 218	APR212/19 ED 218	APR212/19LN ED 218
AP212/22 D 218	AP212/22LN D 218	AP212/22 S 218	AP212/22LN S 218	APR212/22 ED 218	APR212/22LN ED 218
AP212/26 D 218	AP212/26LN D 218	AP212/26 S 218	AP212/26LN S 218	APR212/26 ED 218	APR212/26LN ED 218



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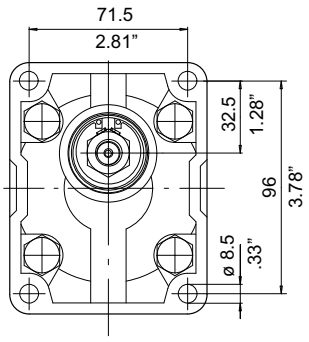
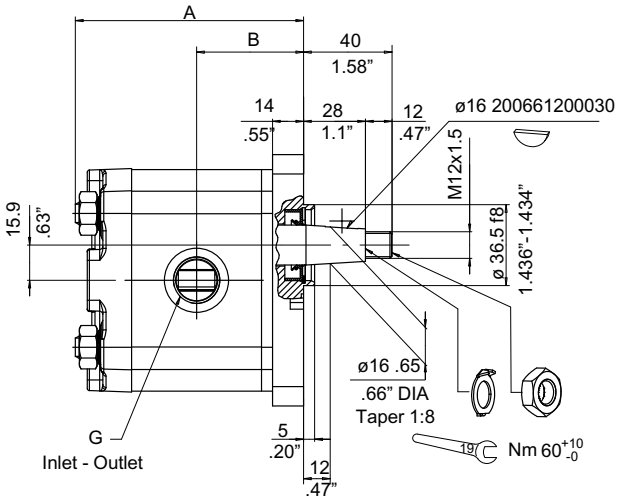
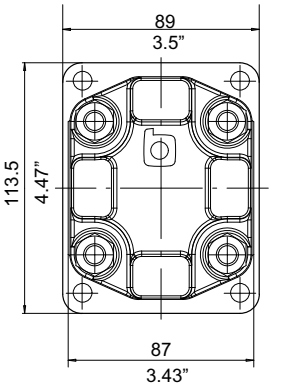
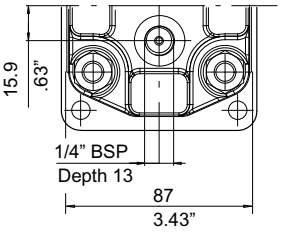
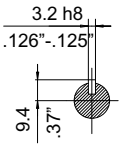


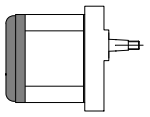








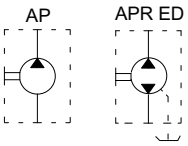
Reversible pump
ED - External Drain

Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.5 -3.6
Shaft max torque: see section 3.3

Type	Displacement cm^3/rev		Dimensions A		Dimensions B		Suction G	Pressure G
	AP212	AP212LN	mm	inch	mm	inch	BSPP	BSPP
4.5	4.4	4.5	94	3.70	43.3	1.70	3/8”	3/8”
6.5	6.4	6.6	97	3.82	44.8	1.76		
8.5	8.4	8.7	100	3.94	46.3	1.82		
11	11.1	11.5	104	4.09	48.3	1.90	1/2”	
15	15.1	15.7	110	4.33	51.3	2.02		
19	19.2	19.8	114	4.49	54.3	2.14	3/4”	1/2”
22	22.2	23	118	4.65	56.5	2.22		
26	26.2	27.1	124	4.88	59.5	2.34		

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 818	AP212/4.5LN D 818	AP212/4.5 S 818	AP212/4.5LN S 818	APR212/4.5 ED 818	APR212/4.5LN ED 818
AP212/6.5 D 818	AP212/6.5LN D 818	AP212/6.5 S 818	AP212/6.5LN S 818	APR212/6.5 ED 818	APR212/6.5LN ED 818
AP212/8.5 D 818	AP212/8.5LN D 818	AP212/8.5 S 818	AP212/8.5LN S 818	APR212/8.5 ED 818	APR212/8.5LN ED 818
AP212/11 D 818	AP212/11LN D 818	AP212/11 S 818	AP212/11LN S 818	APR212/11 ED 818	APR212/11LN ED 818
AP212/15 D 818	AP212/15LN D 818	AP212/15 S 818	AP212/15LN S 818	APR212/15 ED 818	APR212/15LN ED 818
AP212/19 D 818	AP212/19LN D 818	AP212/19 S 818	AP212/19LN S 818	APR212/19 ED 818	APR212/19LN ED 818
AP212/22 D 818	AP212/22LN D 818	AP212/22 S 818	AP212/22LN S 818	APR212/22 ED 818	APR212/22LN ED 818
AP212/26 D 818	AP212/26LN D 818	AP212/26 S 818	AP212/26LN S 818	APR212/26 ED 818	APR212/26LN ED 818



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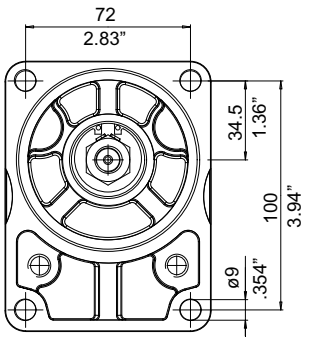
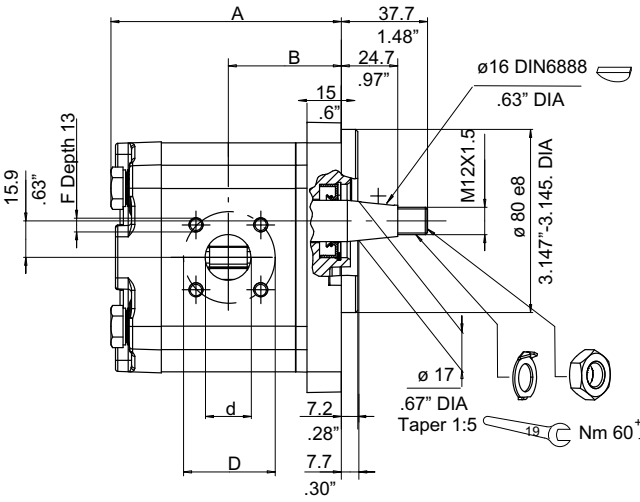
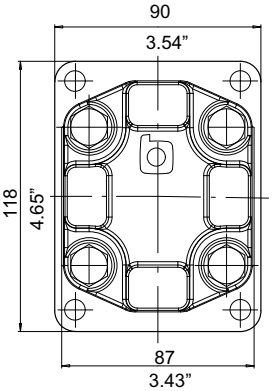
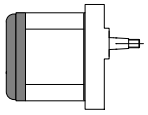


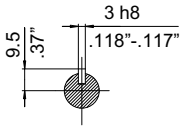




Gear pump material



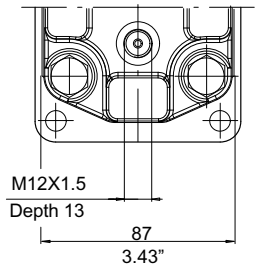
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR



Tightening torque: see section 3.6

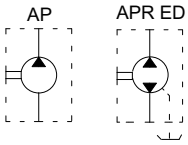
Shaft max torque: see section 3.3

Reversible pump
ED - External Drain



Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction d		Suction D		Suction F	Pressure d		Pressure D		Pressure F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	91	3.85	44.3	1.74	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	94	3.70	45.8	1.80										
8.5	8.4	8.7	97	3.82	47.3	1.86										
11	11.1	11.5	101	3.98	49.3	1.94	20	.79								
15	15.1	15.7	107	4.21	52.3	2.06										
19	19.2	19.8	113	4.45	55.3	2.18										
22	22.2	23	117	4.61	57.5	2.26										
26	26.2	27.1	123	4.84	60.5	2.38										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 225	AP212/4.5LN D 225	AP212/4.5 S 225	AP212/4.5LN S 225	APR212/4.5 ED 225	APR212/4.5LN ED 225
AP212/6.5 D 225	AP212/6.5LN D 225	AP212/6.5 S 225	AP212/6.5LN S 225	APR212/6.5 ED 225	APR212/6.5LN ED 225
AP212/8.5 D 225	AP212/8.5LN D 225	AP212/8.5 S 225	AP212/8.5LN S 225	APR212/8.5 ED 225	APR212/8.5LN ED 225
AP212/11 D 225	AP212/11LN D 225	AP212/11 S 225	AP212/11LN S 225	APR212/11 ED 225	APR212/11LN ED 225
AP212/15 D 225	AP212/15LN D 225	AP212/15 S 225	AP212/15LN S 225	APR212/15 ED 225	APR212/15LN ED 225
AP212/19 D 225	AP212/19LN D 225	AP212/19 S 225	AP212/19LN S 225	APR212/19 ED 225	APR212/19LN ED 225
AP212/22 D 225	AP212/22LN D 225	AP212/22 S 225	AP212/22LN S 225	APR212/22 ED 225	APR212/22LN ED 225
AP212/26 D 225	AP212/26LN D 225	AP212/26 S 225	AP212/26LN S 225	APR212/26 ED 225	APR212/26LN ED 225



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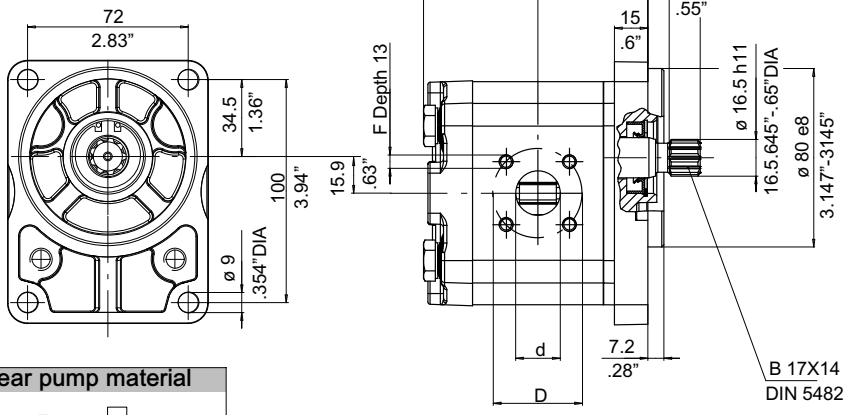
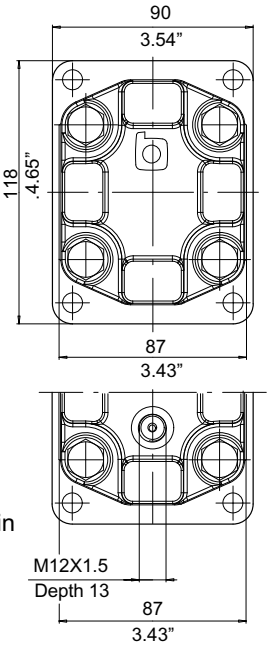
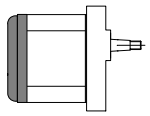




Reversible pump
ED - External Drain

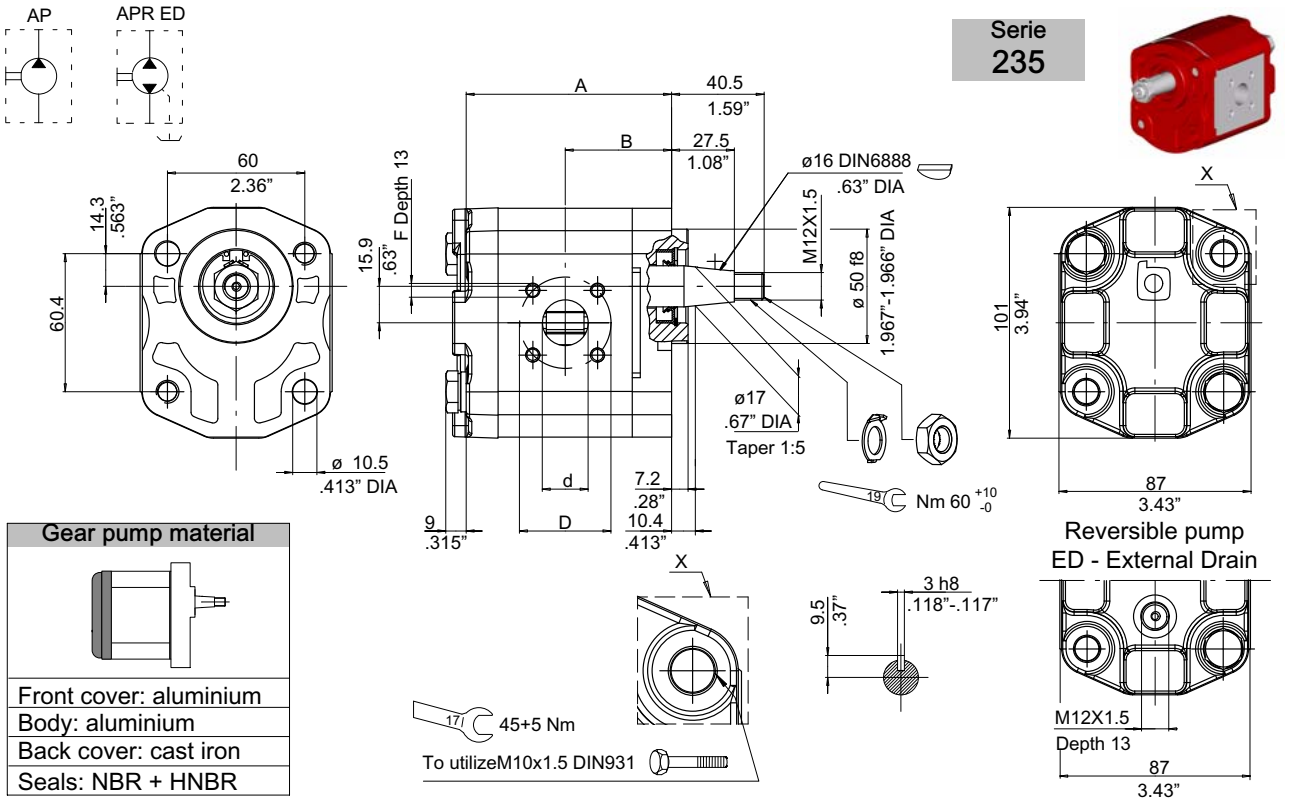
Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.6

Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	91	3.85	44.3	1.74	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	94	3.70	45.8	1.80										
8.5	8.4	8.7	97	3.82	47.3	1.86										
11	11.1	11.5	101	3.98	49.3	1.94	20	.79								
15	15.1	15.7	107	4.21	52.3	2.06										
19	19.2	19.8	113	4.45	55.3	2.18										
22	22.2	23	117	4.61	57.5	2.26										
26	26.2	27.1	123	4.84	60.5	2.38										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 227	AP212/4.5LN D 227	AP212/4.5 S 227	AP212/4.5LN S 227	APR212/4.5 ED 227	APR212/4.5LN ED 227
AP212/6.5 D 227	AP212/6.5LN D 227	AP212/6.5 S 227	AP212/6.5LN S 227	APR212/6.5 ED 227	APR212/6.5LN ED 227
AP212/8.5 D 227	AP212/8.5LN D 227	AP212/8.5 S 227	AP212/8.5LN S 227	APR212/8.5 ED 227	APR212/8.5LN ED 227
AP212/11 D 227	AP212/11LN D 227	AP212/11 S 227	AP212/11LN S 227	APR212/11 ED 227	APR212/11LN ED 227
AP212/15 D 227	AP212/15LN D 227	AP212/15 S 227	AP212/15LN S 227	APR212/15 ED 227	APR212/15LN ED 227
AP212/19 D 227	AP212/19LN D 227	AP212/19 S 227	AP212/19LN S 227	APR212/19 ED 227	APR212/19LN ED 227
AP212/22 D 227	AP212/22LN D 227	AP212/22 S 227	AP212/22LN S 227	APR212/22 ED 227	APR212/22LN ED 227
AP212/26 D 227	AP212/26LN D 227	AP212/26 S 227	AP212/26LN S 227	APR212/26 ED 227	APR212/26LN ED 227



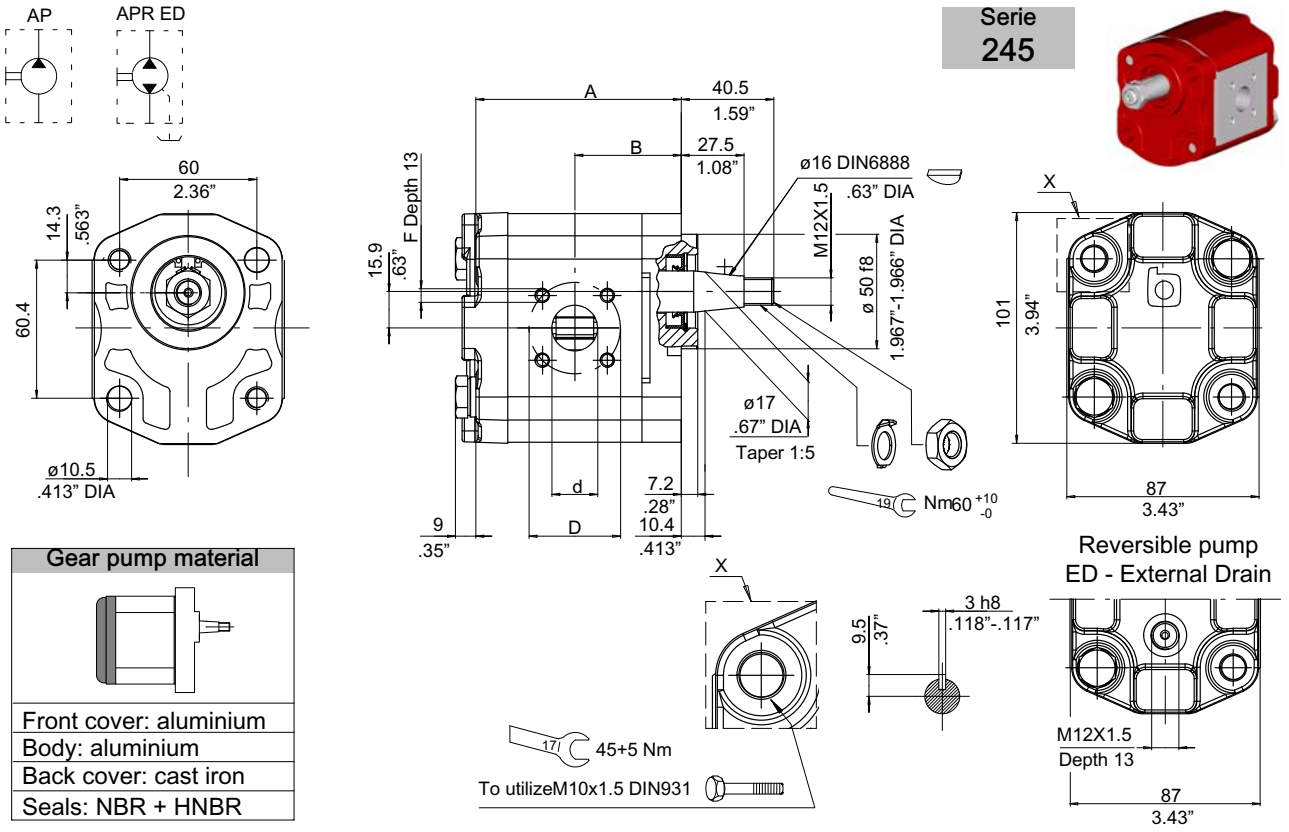
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Shaft max torque: see section 3.3

Tightening torque: see section 3.6

Type	Displacement cm³/rev		Dimensions A		B		Suction d		D		F	Pressure d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79								
15	15.1	15.7	96	3.78	49.5	1.95										
19	19.2	19.8	102	4.02	52.5	2.07										
22	22.2	23	106	4.17	54.8	2.16										
26	26.2	27.1	112	4.41	57.8	2.28										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 235	AP212/4.5LN D 235	AP212/4.5 S 235	AP212/4.5LN S 235	APR212/4.5 ED 235	APR212/4.5LN ED 235
AP212/6.5 D 235	AP212/6.5LN D 235	AP212/6.5 S 235	AP212/6.5LN S 235	APR212/6.5 ED 235	APR212/4.5LN ED 235
AP212/8.5 D 235	AP212/8.5LN D 235	AP212/8.5 S 235	AP212/8.5LN S 235	APR212/8.5 ED 235	APR212/8.5LN ED 235
AP212/11 D 235	AP212/11LN D 235	AP212/11 S 235	AP212/11LN S 235	APR212/11 ED 235	APR212/11LN ED 235
AP212/15 D 235	AP212/15LN D 235	AP212/15 S 235	AP212/15LN S 235	APR212/15 ED 235	APR212/15LN ED 235
AP212/19 D 235	AP212/19LN D 235	AP212/19 S 235	AP212/19LN S 235	APR212/19 ED 235	APR212/19LN ED 235
AP212/22 D 235	AP212/22LN D 235	AP212/22 S 235	AP212/22LN S 235	APR212/22 ED 235	APR212/22LN ED 235
AP212/26 D 235	AP212/22LN D 235	AP212/26 S 235	AP212/26LN S 235	APR212/26 ED 235	APR212/26LN ED 235



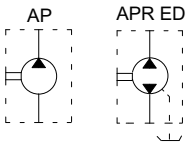
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Shaft max torque: see section 3.3

Tightening torque: see section 3.6

Type	Displacement cm³/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79								
15	15.1	15.7	96	3.78	49.5	1.95										
19	19.2	19.8	102	4.02	52.5	2.07										
22	22.2	23	106	4.17	54.8	2.16										
26	26.2	27.1	112	4.41	57.8	2.28										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 245	AP212/4.5LN D 245	AP212/4.5 S 245	AP212/4.5LN S 245	APR212/4.5 ED 245	APR212/4.5LN ED 245
AP212/6.5 D 245	AP212/6.5LN D 245	AP212/6.5 S 245	AP212/6.5LN S 245	APR212/6.5 ED 245	APR212/6.5LN ED 245
AP212/8.5 D 245	AP212/8.5LN D 245	AP212/8.5 S 245	AP212/8.5LN S 245	APR212/8.5 ED 245	APR212/8.5LN ED 245
AP212/11 D 245	AP212/11LN D 245	AP212/11 S 245	AP212/11LN S 245	APR212/11 ED 245	APR212/11LN ED 245
AP212/15 D 245	AP212/15LN D 245	AP212/15 S 245	AP212/15LN S 245	APR212/15 ED 245	APR212/15LN ED 245
AP212/19 D 245	AP212/19LN D 245	AP212/19 S 245	AP212/19LN S 245	APR212/19 ED 245	APR212/19LN ED 245
AP212/22 D 245	AP212/22LN D 245	AP212/22 S 245	AP212/22LN S 245	APR212/22 ED 245	APR212/22LN ED 245



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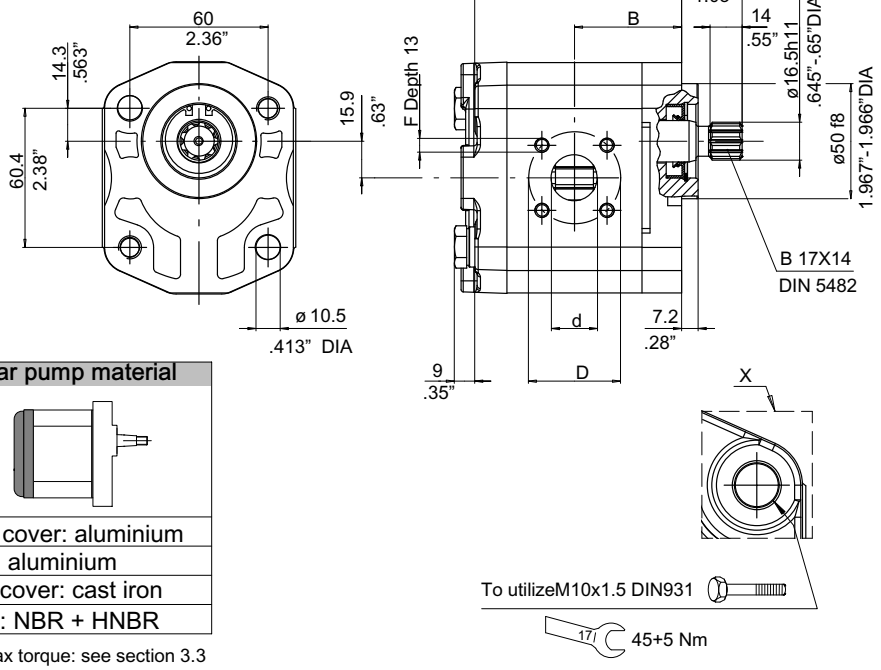


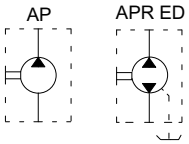
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Shaft max torque: see section 3.3

Tightening torque: see section 3.6

Type	Displacement cm^3/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79								
15	15.1	15.7	96	3.78	49.5	1.95										
19	19.2	19.8	102	4.02	52.5	2.07										
22	22.2	23	106	4.17	54.8	2.16										
26	26.2	27.1	112	4.41	57.8	2.28										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 237	AP212/4.5LN D 237	AP212/4.5 S 237	AP212/4.5LN S 237	APR212/4.5 ED 237	APR212/4.5LN ED 237
AP212/6.5 D 237	AP212/6.5LN D 237	AP212/6.5 S 237	AP212/6.5LN S 237	APR212/6.5 ED 237	APR212/6.5LN ED 237
AP212/8.5 D 237	AP212/8.5LN D 237	AP212/8.5 S 237	AP212/8.5LN S 237	APR212/8.5 ED 237	APR212/8.5LN ED 237
AP212/11 D 237	AP212/11LN D 237	AP212/11 S 237	AP212/11LN S 237	APR212/11 ED 237	APR212/11LN ED 237
AP212/15 D 237	AP212/15LN D 237	AP212/15 S 237	AP212/15LN S 237	APR212/15 ED 237	APR212/15LN ED 237
AP212/19 D 237	AP212/19LN D 237	AP212/19 S 237	AP212/19LN S 237	APR212/19 ED 237	APR212/19LN ED 237
AP212/22 D 237	AP212/22LN D 237	AP212/22 S 237	AP212/22LN S 237	APR212/22 ED 237	APR212/22LN ED 237
AP212/26 D 237	AP212/26LN D 237	AP212/26 S 237	AP212/26LN S 237	APR212/26 ED 237	APR212/26LN ED 237



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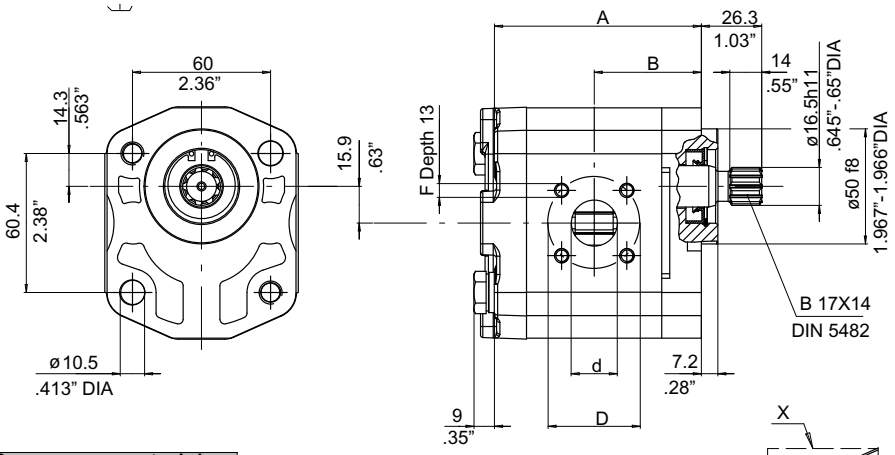
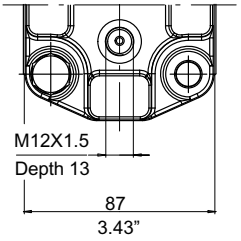
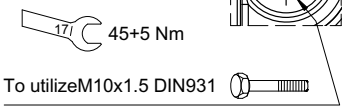
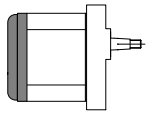


Reversible pump
ED - External Drain





Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.6
Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79								
15	15.1	15.7	96	3.78	49.5	1.95										
19	19.2	19.8	102	4.02	52.5	2.07										
22	22.2	23	106	4.17	54.8	2.16										
26	26.2	27.1	112	4.41	57.8	2.28										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 247	AP212/4.5LN D 247	AP212/4.5 S 247	AP212/4.5LN S 247	APR212/4.5 ED 247	APR212/4.5LN ED 247
AP212/6.5 D 247	AP212/6.5LN D 247	AP212/6.5 S 247	AP212/6.5LN S 247	APR212/6.5 ED 247	APR212/6.5LN ED 247
AP212/8.5 D 247	AP212/8.5LN D 247	AP212/8.5 S 247	AP212/8.5LN S 247	APR212/8.5 ED 247	APR212/8.5LN ED 247
AP212/11 D 247	AP212/11LN D 247	AP212/11 S 247	AP212/11LN S 247	APR212/11 ED 247	APR212/11LN ED 247
AP212/15 D 247	AP212/15LN D 247	AP212/15 S 247	AP212/15LN S 247	APR212/15 ED 247	APR212/15LN ED 247
AP212/19 D 247	AP212/19LN D 247	AP212/19 S 247	AP212/19LN S 247	APR212/19 ED 247	APR212/19LN ED 247
AP212/22 D 247	AP212/22LN D 247	AP212/22 S 247	AP212/22LN S 247	APR212/22 ED 247	APR212/22LN ED 247
AP212/26 D 247	AP212/26LN D 247	AP212/26 S 247	AP212/26LN S 247	APR212/26 ED 247	APR212/26LN ED 247

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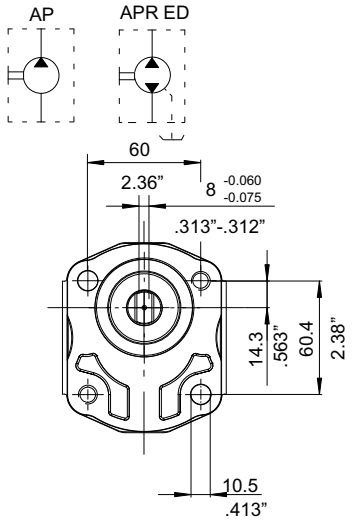
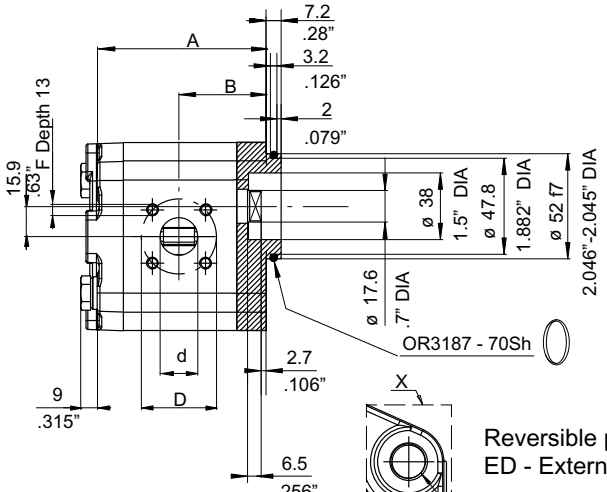
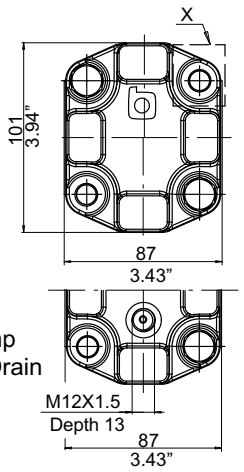






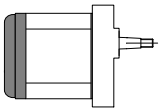
Reversible pump
ED - External Drain

To utilize
M10x1.5 DIN931

45+5 Nm

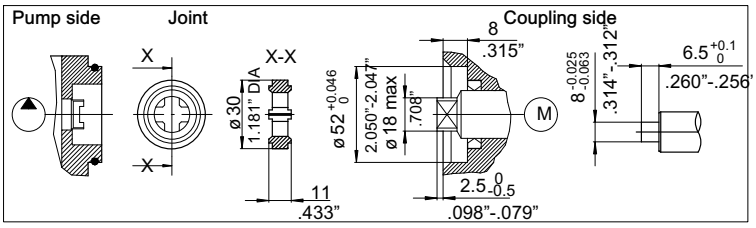
Tightening torque: see section 3.6
Shaft max torque: see section 3.3

Gear pump material



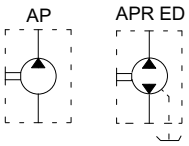
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Max pressure (T max= 65 Nm)			
Pump	bar (PSI)		
	P1	P2	P3
AP212/15	180 (2600)	210 (3000)	230 (3300)
AP212/19	140 (2000)	165 (2400)	185 (2650)
AP212/22	120 (1700)	145 (2050)	165 (2350)
AP212/26	100 (1450)	120 (1750)	140 (2000)



Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction d		Suction D		Suction F	Pressure d		Pressure D		Pressure F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79								
15	15.1	15.7	96	3.78	49.5	1.95										
19	19.2	19.8	102	4.02	52.5	2.07										
22	22.2	23	106	4.17	54.8	2.16										
26	26.2	27.1	112	4.41	57.8	2.28										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 259	AP212/4.5LN D 259	AP212/4.5 S 259	AP212/4.5LN S 259	APR212/4.5 ED 259	APR212/4.5LN ED 259
AP212/6.5 D 259	AP21LN2/6.5 D 259	AP212/6.5 S 259	AP212/6.5LN S 259	APR212/6.5 ED 259	APR212/6.5LN ED 259
AP212/8.5 D 259	AP212/8.5LN D 259	AP212/8.5 S 259	AP212/8.5LN S 259	APR212/8.5 ED 259	APR212/8.5LN ED 259
AP212/11 D 259	AP212/11LN D 259	AP212/11 S 259	AP212/11LN S 259	APR212/11 ED 259	APR212/11LN ED 259
AP212/15 D 259	AP212/15LN D 259	AP212/15 S 259	AP212/15LN S 259	APR212/15 ED 259	APR212/15LN ED 259
AP212/19 D 259	AP212/19LN D 259	AP212/19 S 259	AP212/19LN S 259	APR212/19 ED 259	APR212/19LN ED 259
AP212/22 D 259	AP212/22LN D 259	AP212/22 S 259	AP212/22LN S 259	APR212/22 ED 259	APR212/22LN ED 259
AP212/26 D 259	AP212/26LN D 259	AP212/26 S 259	AP212/26LN S 259	APR212/26 ED 259	APR212/26LN ED 259



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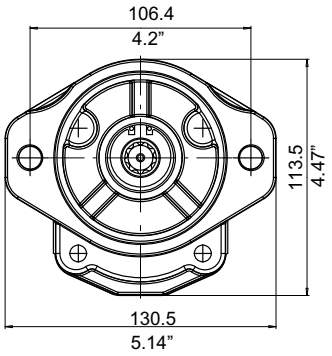
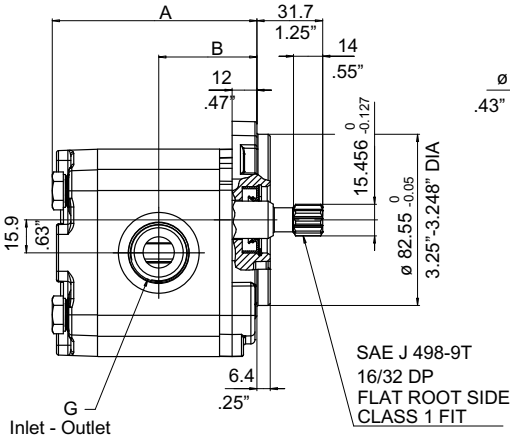
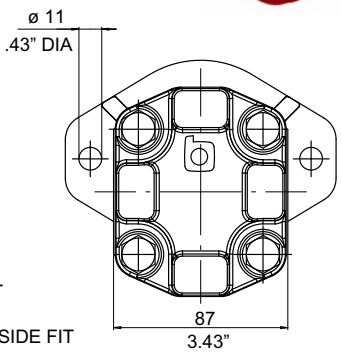
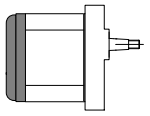




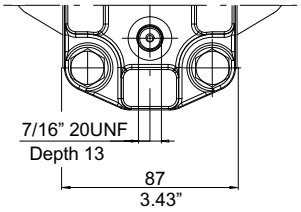


Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.5 - 3.6

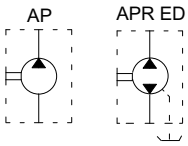
Shaft max torque: see section 3.3

Reversible pump
ED - External Drain

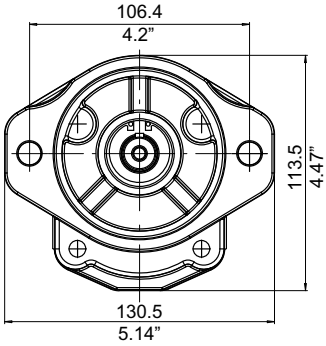


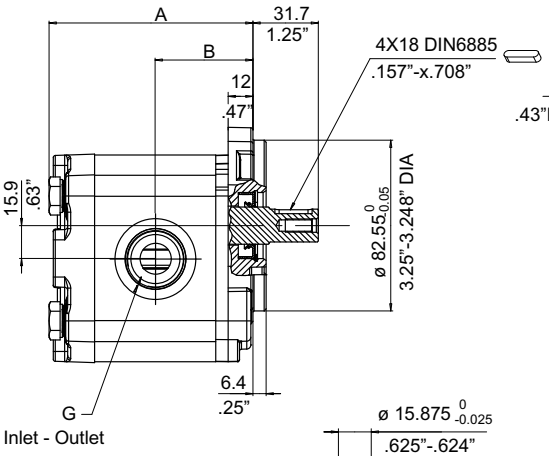
Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction G	Pressure G
	AP212	AP212LN	mm	inch	mm	inch	UNF	UNF
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1-1/16" 12 (SAE12)	7/8" 14 (SAE10)
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87		
15	15.1	15.7	104.5	4.11	50.5	1.99		
19	19.2	19.8	110.5	4.35	53.5	2.11		
22	22.2	23	115	4.52	55.5	2.18		
26	26.2	27.1	121	4.76	58.5	2.30		

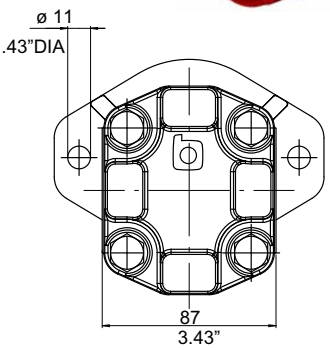
Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 887S	AP212/4.5LN D 887S	AP212/4.5 S 887S	AP212/4.5LN S 887S	APR212/4.5 ED 887S	APR212/4.5LN ED 887S
AP212/6.5 D 887S	AP212/6.5LN D 887S	AP212/6.5 S 887S	AP212/6.5LN S 887S	APR212/6.5 ED 887S	APR212/6.5LN ED 887S
AP212/8.5 D 887S	AP212/8.5LN D 887S	AP212/8.5 S 887S	AP212/8.5LN S 887S	APR212/8.5 ED 887S	APR212/8.5LN ED 887S
AP212/11 D 887S	AP212/11LN D 887S	AP212/11 S 887S	AP212/11LN S 887S	APR212/11 ED 887S	APR212/11LN ED 887S
AP212/15 D 887S	AP212/15LN D 887S	AP212/15 S 887S	AP212/15LN S 887S	APR212/15 ED 887S	APR212/15LN ED 887S
AP212/19 D 887S	AP212/19LN D 887S	AP212/19 S 887S	AP212/19LN S 887S	APR212/19 ED 887S	APR212/19LN ED 887S
AP212/22 D 887S	AP212/22LN D 887S	AP212/22 S 887S	AP212/22LN S 887S	APR212/22 ED 887S	APR212/22LN ED 887S
AP212/26 D 887S	AP212/26LN D 887S	AP212/26 S 887S	AP212/26LN S 887S	APR212/26 ED 887S	APR212/26LN ED 887S

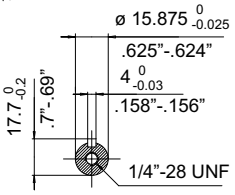


Serie
880

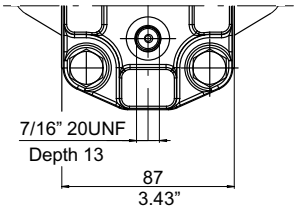


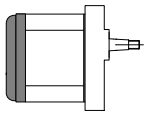






Reversible pump
ED - External Drain

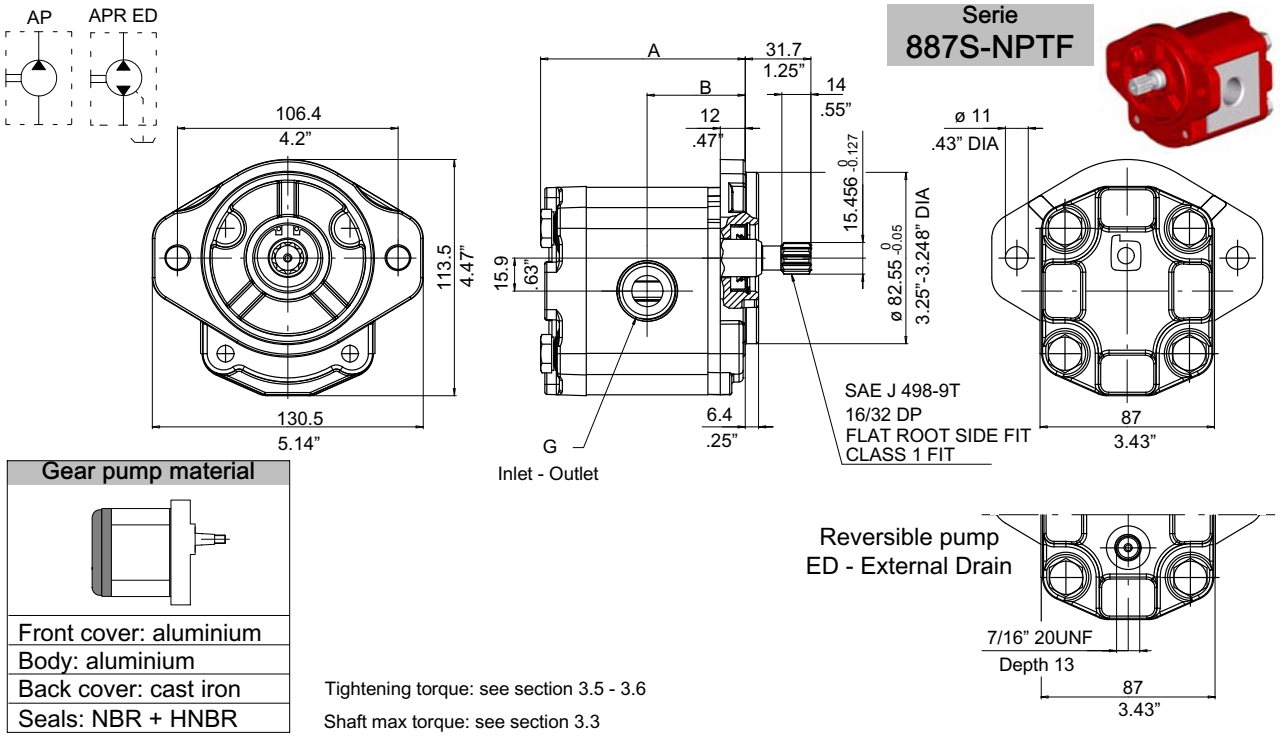


Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.5 - 3.6
Shaft max torque: see section 3.3

Type	Displacement cm^3/rev		Dimensions				Suction	Pressure
			A		B		G	G
	AP212	AP212LN	mm	inch	mm	inch	UNF	UNF
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1-1/16" 12 (SAE12)	7/8" 14 (SAE10)
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87		
15	15.1	15.7	104.5	4.11	50.5	1.99		
19	19.2	19.8	110.5	4.35	53.5	2.11		
22	22.2	23	115	4.52	55.5	2.18		
26	26.2	27.1	121	4.76	58.5	2.30		

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 880	AP212/4.5LN D 880	AP212/4.5 S 880	AP212/4.5LN S 880	APR212/4.5 ED 880	APR212/4.5LN ED 880
AP212/6.5 D 880	AP212/6.5LN D 880	AP212/6.5 S 880	AP212/6.5LN S 880	APR212/6.5 ED 880	APR212/6.5LN ED 880
AP212/8.5 D 880	AP212/8.5LN D 880	AP212/8.5 S 880	AP212/8.5LN S 880	APR212/8.5 ED 880	APR212/8.5LN ED 880
AP212/11 D 880	AP212/11LN D 880	AP212/11 S 880	AP212/11LN S 880	APR212/11 ED 880	APR212/11LN ED 880
AP212/15 D 880	AP212/15LN D 880	AP212/15 S 880	AP212/15LN S 880	APR212/15 ED 880	APR212/15LN ED 880
AP212/19 D 880	AP212/19LN D 880	AP212/19 S 880	AP212/19LN S 880	APR212/19 ED 880	APR212/19LN ED 880
AP212/22 D 880	AP212/22LN D 880	AP212/22 S 880	AP212/22LN S 880	APR212/22 ED 880	APR212/22LN ED 880
AP212/26 D 880	AP212/26LN D 880	AP212/26 S 880	AP212/26LN S 880	APR212/26 ED 880	APR212/26LN ED 880



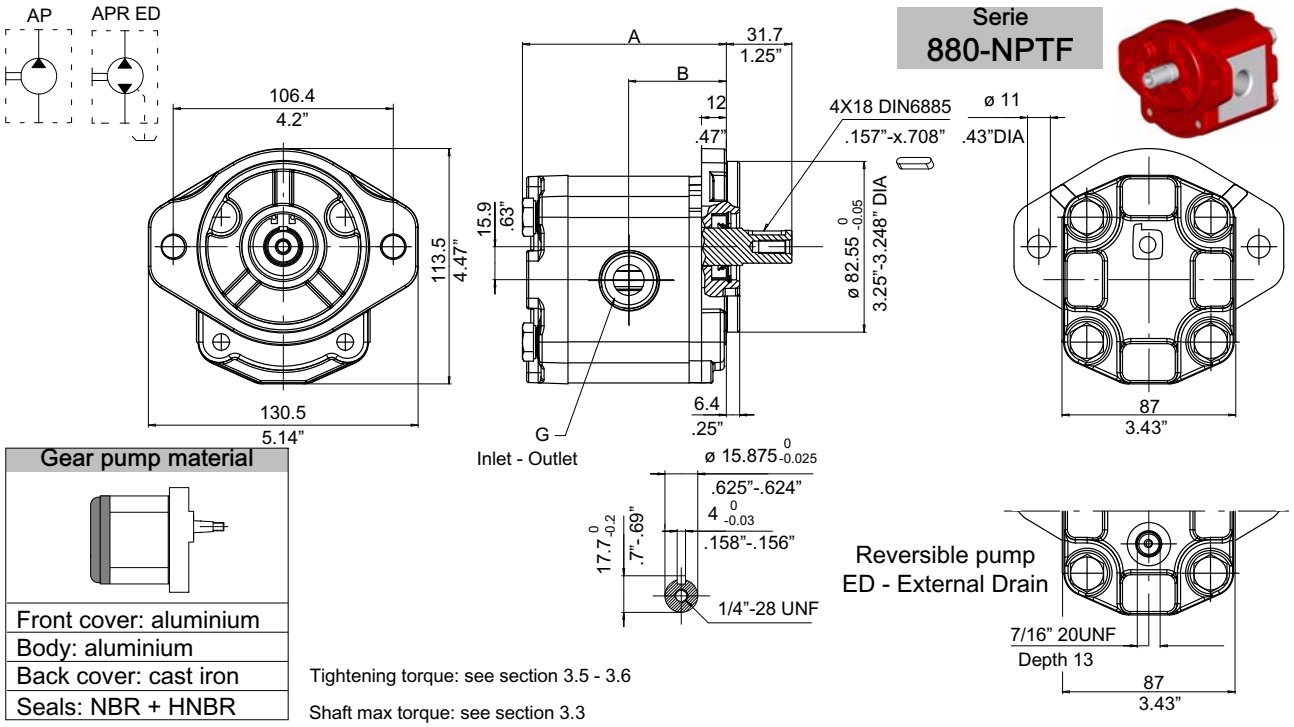
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.5 - 3.6

Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction G	Pressure G
	AP212	AP212LN	mm	inch	mm	inch	NPTF	NPTF
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1/2"	1/2"
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87	3/4"	1/2"
15	15.1	15.7	104.5	4.11	50.5	1.99		
19	19.2	19.8	110.5	4.35	53.5	2.11		
22	22.2	23	115	4.52	55.5	2.18		
26	26.2	27.1	121	4.76	58.5	2.30		

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 887S-NPTF	AP212/4.5LN D 887S-NPTF	AP212/4.5 S 887S-NPTF	AP212/4.5LN S 887S-NPTF	APR212/4.5 ED 887S-NPTF	APR212/4.5LN ED 887S-NPTF
AP212/6.5 D 887S-NPTF	AP212/6.5LN D 887S-NPTF	AP212/6.5 S 887S-NPTF	AP212/6.5LN S 887S-NPTF	APR212/6.5 ED 887S-NPTF	APR212/6.5LN ED 887S-NPTF
AP212/8.5 D 887S-NPTF	AP212/8.5LN D 887S-NPTF	AP212/8.5 S 887S-NPTF	AP212/8.5LN S 887S-NPTF	APR212/8.5 ED 887S-NPTF	APR212/8.5LN ED 887S-NPTF
AP212/11 D 887S-NPTF	AP212/11LN D 887S-NPTF	AP212/11 S 887S-NPTF	AP212/11LN S 887S-NPTF	APR212/11 ED 887S-NPTF	APR212/11LN ED 887S-NPTF
AP212/15 D 887S-NPTF	AP212/15LN D 887S-NPTF	AP212/15 S 887S-NPTF	AP212/15LN S 887S-NPTF	APR212/15 ED 887S-NPTF	APR212/15LN ED 887S-NPTF
AP212/19 D 887S-NPTF	AP212/19LN D 887S-NPTF	AP212/19 S 887S-NPTF	AP212/19LN S 887S-NPTF	APR212/19 ED 887S-NPTF	APR212/19LN ED 887S-NPTF
AP212/22 D 887S-NPTF	AP212/22LN D 887S-NPTF	AP212/22 S 887S-NPTF	AP212/22LN S 887S-NPTF	APR212/22 ED 887S-NPTF	APR212/22LN ED 887S-NPTF
AP212/26 D 887S-NPTF	AP212/26LN D 887S-NPTF	AP212/26 S 887S-NPTF	AP212/26LN S 887S-NPTF	APR212/26 ED 887S-NPTF	APR212/26LN ED 887S-NPTF



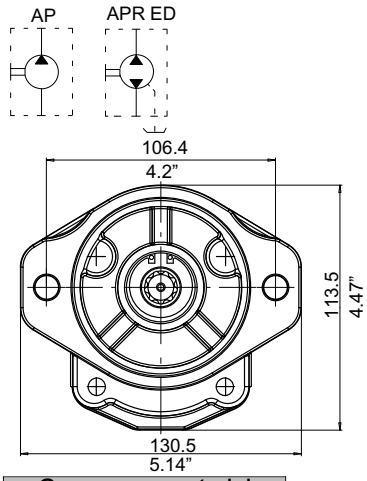
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

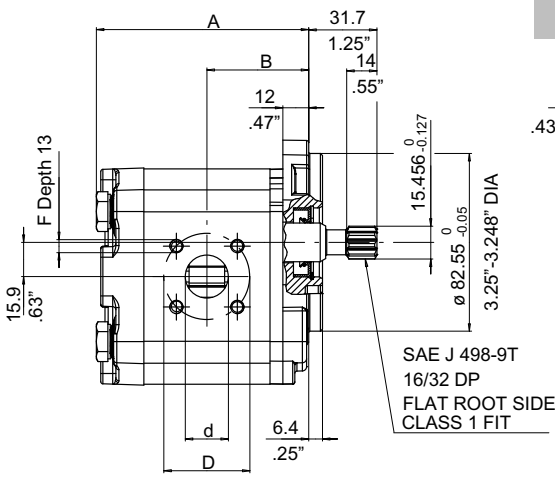
Tightening torque: see section 3.5 - 3.6

Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction G	Pressure G
	AP212	AP212LN	mm	inch	mm	inch	NPTF	NPTF
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1/2"	1/2"
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87	3/4"	1/2"
15	15.1	15.7	104.5	4.11	50.5	1.99		
19	19.2	19.8	110.5	4.35	53.5	2.11		
22	22.2	23	115	4.52	55.5	2.18		
26	26.2	27.1	121	4.76	58.5	2.30		

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 880-NPTF	AP212/4.5LN D 880-NPTF	AP212/4.5 S 880-NPTF	AP212/4.5LN S 880-NPTF	APR212/4.5 ED 880-NPTF	APR212/4.5LN ED 880-NPTF
AP212/6.5 D 880-NPTF	AP212/6.5LN D 880-NPTF	AP212/6.5 S 880-NPTF	AP212/6.5LN S 880-NPTF	APR212/6.5 ED 880-NPTF	APR212/6.5LN ED 880-NPTF
AP212/8.5 D 880-NPTF	AP212/8.5LN D 880-NPTF	AP212/8.5 S 880-NPTF	AP212/8.5LN S 880-NPTF	APR212/8.5 ED 880-NPTF	APR212/8.5LN ED 880-NPTF
AP212/11 D 880-NPTF	AP212/11LN D 880-NPTF	AP212/11 S 880-NPTF	AP212/11LN S 880-NPTF	APR212/11 ED 880-NPTF	APR212/11LN ED 880-NPTF
AP212/15 D 880-NPTF	AP212/15LN D 880-NPTF	AP212/15 S 880-NPTF	AP212/15LN S 880-NPTF	APR212/15 ED 880-NPTF	APR212/15LN ED 880-NPTF
AP212/19 D 880-NPTF	AP212/19LN D 880-NPTF	AP212/19 S 880-NPTF	AP212/19LN S 880-NPTF	APR212/19 ED 880-NPTF	APR212/19LN ED 880-NPTF
AP212/22 D 880-NPTF	AP212/22LN D 880-NPTF	AP212/22 S 880-NPTF	AP212/22LN S 880-NPTF	APR212/22 ED 880-NPTF	APR212/22LN ED 880-NPTF
AP212/26 D 880-NPTF	AP212/26LN D 880-NPTF	AP212/26 S 880-NPTF	AP212/26LN S 880-NPTF	APR212/26 ED 880-NPTF	APR212/26LN ED 880-NPTF





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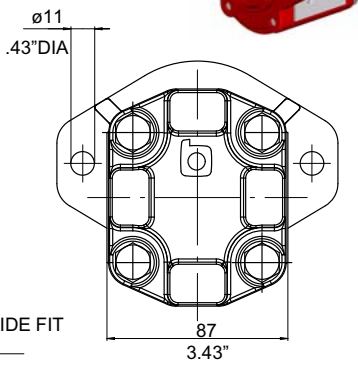
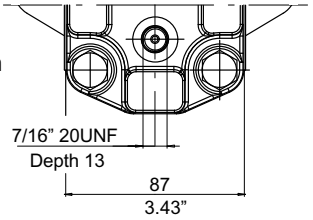
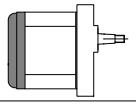


Reversible pump
ED - External Drain



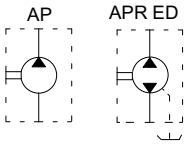
Gear pump material

Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

Tightening torque: see section 3.6

Shaft max torque: see section 3.3

Type	Displacement cm^3/rev		Dimensions				Suction					Pressure				
			A		B		d		D		F	d		D		F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	88.5	3.48	42.5	1.67	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	91.5	3.60	44	1.73										
8.5	8.4	8.7	94.5	3.72	45.5	1.79										
11	11.1	11.5	98.5	3.88	47.5	1.87	20	.79								
15	15.1	15.7	104.5	4.11	50.5	1.99										
19	19.2	19.8	110.5	4.35	53.5	2.11										
22	22.2	23	115	4.52	55.5	2.18										
26	26.2	27.1	121	4.76	58.5	2.30										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 287S-B	AP212/4.5LN D 287S-B	AP212/4.5 S 287S-B	AP212/4.5LN S 287S-B	APR212/4.5 ED 287S-B	APR212/4.5LN ED 287S-B
AP212/6.5 D 287S-B	AP212/6.5LN D 287S-B	AP212/6.5 S 287S-B	AP212/6.5LN S 287S-B	APR212/6.5 ED 287S-B	APR212/6.5LN ED 287S-B
AP212/8.5 D 287S-B	AP212/8.5LN D 287S-B	AP212/8.5 S 287S-B	AP212/8.5LN S 287S-B	APR212/8.5 ED 287S-B	APR212/8.5LN ED 287S-B
AP212/11 D 287S-B	AP212/11LN D 287S-B	AP212/11 S 287S-B	AP212/11LN S 287S-B	APR212/11 ED 287S-B	APR212/11LN ED 287S-B
AP212/15 D287S-B	AP212/15LN D 287S-B	AP212/15 S 287S-B	AP212/15LN S 287S-B	APR212/15 ED 287S-B	APR212/15LN ED 287S-B
AP212/19 D 287S-B	AP212/19LN D 287S-B	AP212/19 S 287S-B	AP212/19LN S 287S-B	APR212/19 ED 287S-B	APR212/19LN ED 287S-B
AP212/22 D 287S-B	AP212/22LN D 287S-B	AP212/22 S 287S-B	AP212/22LN S 287S-B	APR212/22 ED 287S-B	APR212/22LN ED 287S-B
AP212/26 D 287S-B	AP212/26LN D 287S-B	AP212/26 S 287S-B	AP212/26LN S 287S-B	APR212/26 ED 287S-B	APR212/26LN ED 287S-B



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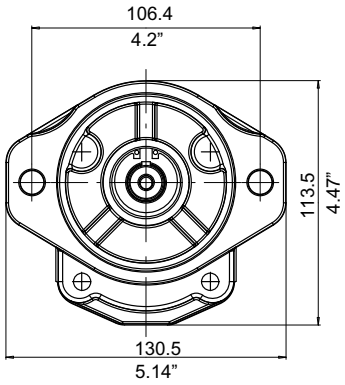
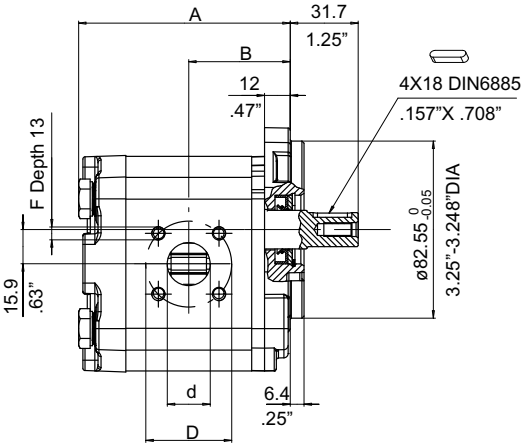
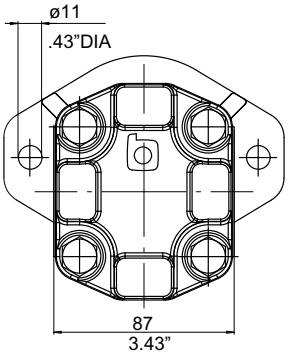
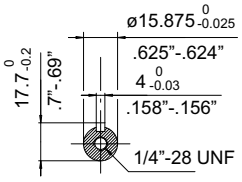






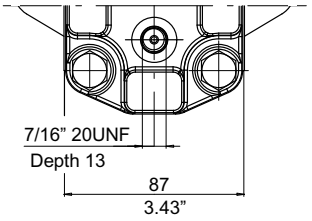
Gear pump material
Front cover: aluminium
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR



Tightening torque: see section 3.6

Shaft max torque: see section 3.3

Reversible pump
ED - External Drain



Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction d		Suction D		Suction F	Pressure d		Pressure D		Pressure F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	88.5	3.48	42.5	1.67	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	91.5	3.60	44	1.73										
8.5	8.4	8.7	94.5	3.72	45.5	1.79										
11	11.1	11.5	98.5	3.88	47.5	1.87	20	.79								
15	15.1	15.7	104.5	4.11	50.5	1.99										
19	19.2	19.8	110.5	4.35	53.5	2.11										
22	22.2	23	115	4.52	55.5	2.18										
26	26.2	27.1	121	4.76	58.5	2.30										

Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 280-B	AP212/4.5LN D 280-B	AP212/4.5 S 280-B	AP212/4.5LN S 280-B	APR212/4.5 ED 280-B	APR212/4.5LN ED 280-B
AP212/6.5 D 280-B	AP212/6.5LN D 280-B	AP212/6.5 S 280-B	AP212/6.5LN S 280-B	APR212/6.5 ED 280-B	APR212/6.5LN ED 280-B
AP212/8.5 D 280-B	AP212/8.5LN D 280-B	AP212/8.5 S 280-B	AP212/8.5LN S 280-B	APR212/8.5 ED 280-B	APR212/8.5LN ED 280-B
AP212/11 D 280-B	AP212/11LN D 280-B	AP212/11 S 280-B	AP212/11LN S 280-B	APR212/11 ED 280-B	APR212/11LN ED 280-B
AP212/15 D 280-B	AP212/15LN D 280-B	AP212/15 S 280-B	AP212/15LN S 280-B	APR212/15 ED 280-B	APR212/15LN ED 280-B
AP212/19 D 280-B	AP212/19LN D 280-B	AP212/19 S 280-B	AP212/19LN S 280-B	APR212/19 ED 280-B	APR212/19LN ED 280-B
AP212/22 D 280-B	AP212/22LN D 280-B	AP212/22 S 280-B	AP212/22LN S 280-B	APR212/22 ED 280-B	APR212/22LN ED 280-B
AP212/26 D 280-B	AP212/26LN D 280-B	AP212/26 S 280-B	AP212/26LN S 280-B	APR212/26 ED 280-B	APR212/26LN ED 280-B

AP

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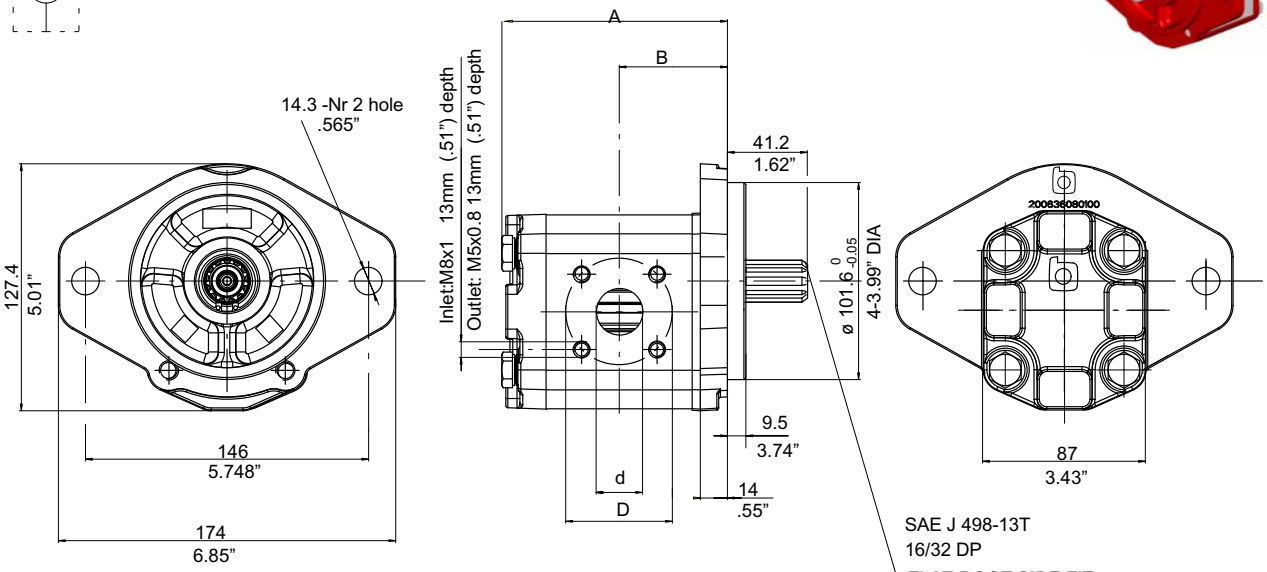
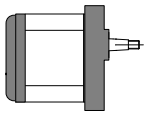


Gear pump material

Front cover: cast iron
Body: aluminium
Back cover: cast iron
Seals: NBR + HNBR

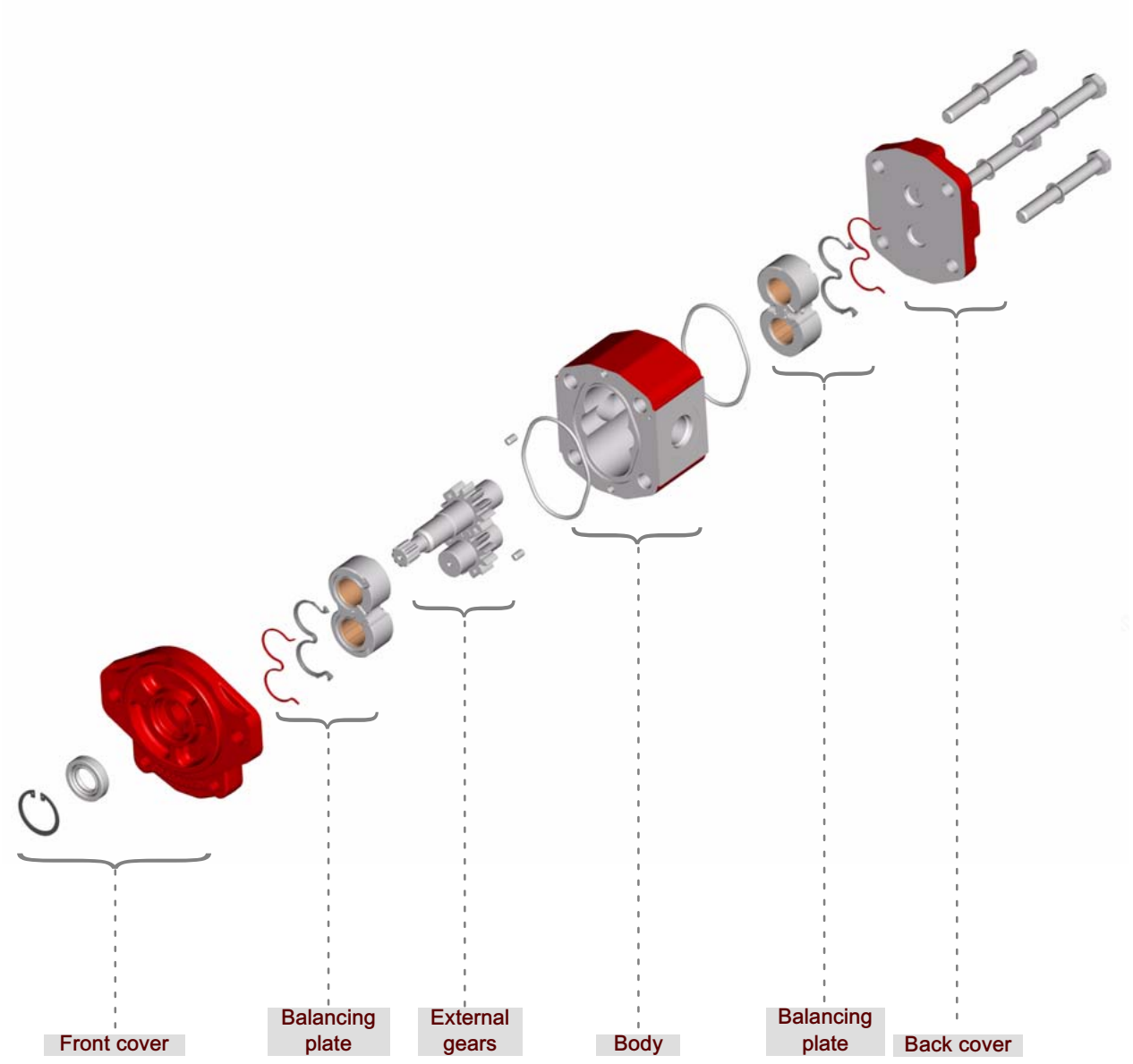
Shaft max torque: see section 3.3

Type	Displacement cm³/rev		Dimensions A		Dimensions B		Suction d		Suction D		Suction F	Pressure d		Pressure D		Pressure F
	AP212	AP212LN	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
19	19.2	19.8	110.5	4.35	53.5	2.11										
22	22.2	23	115	4.53	55.5	2.18	24	.95	55	2.17	M8x1	15	.59	35	1.38	M5x0.8
26	26.2	27.1	121	4.76	58.5	2.30										

Clockwise rotation: D		Counter-clockwise rotation: S	
Standard	Low Noise	Standard	Low Noise
AP212/19 D 287S-SAEB	AP212/19LN D 287S-SAEB	AP212/19 S 287S-SAEB	AP212/19LN S 287S-SAEB
AP212/22 D 287S-SAEB	AP212/22LN D 287S-SAEB	AP212/22 S 287S-SAEB	AP212/22LN S 287S-SAEB
AP212/26 D 287S-SAEB	AP212/26LN D 287S-SAEB	AP212/26 S 287S-SAEB	AP212/26LN S 287S-SAEB

For availability of other displacements bodies please contact our Sales Center

3 AP212 Single pump customised versions



In this section, a single AP212 pump can be configured and customized.

AP212 wide availability of covers, bodies, gears and seals sets provides great flexibility to AP212 pump range and allows several different pump configurations.

In order to simplify the selection of the desired pump combination, a 'configurator form' is available and, by filling it out, it will guide you in the pump creation process.

3.1 Single pump customised versions order example

A	P	R	2	1	2	/	4	.	5	L	N	-		-	A	0	S	-	1	C	N	-	G	H	1		-	A	*

Function
AP= single gear pump - unidirectional
APR = single gear pump - reversible

Series
212

Displacement
4.5= 4.4 cm^3/rev
6.5= 6.4 cm^3/rev
8.5= 8.4 cm^3/rev
11= 11.1 cm^3/rev
15= 15.1 cm^3/rev
19= 19.2 cm^3/rev
22= 22.2 cm^3/rev
26= 26.2 cm^3/rev

Version
Omitted if 12 teeth standard
LN= 12 teeth Low Noise version

Rotation
S = left-hand rotation
D = Right-hand rotation
Omitted if reversible version

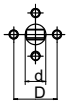
Shaft end code
see section 3.3

Shaft seal material type code
see section 3.4.1

Front cover series/material with/without bearing code
see section 3.4.2 and 3.4.3

Type of ports code
see section 3.5

Inlet/outlet port size code combination
see section 3.5

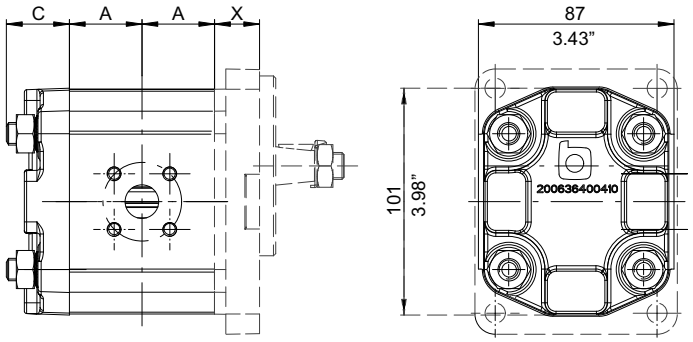


Body material + seal material code
see section 3.5.1

Back cover type
see section 3.6

BHRE section :
Version - Progressive number (omitted)

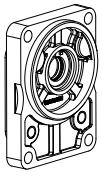
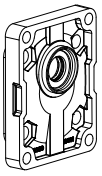
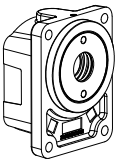
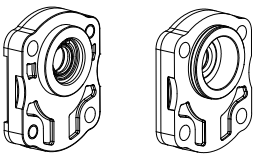
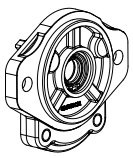
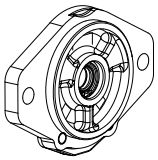
3.2 Single pump dimensions



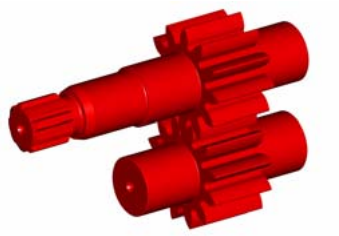
Pump size	A		C*	
	mm	*inches*	mm	*inches*
AP212/4.5	24.3	*0.96*	28	*1.10*
AP212/6.5	25.8	*1.02*		
AP212/8.5	27.3	*1.08*		
AP212/11	29.3	*1.54*		
AP212/15	32.3	*1.27*		
AP212/19	35.3	*1.39*		
AP212/22	37.6	*1.48*		
AP212/26	40.6	*1.60*		

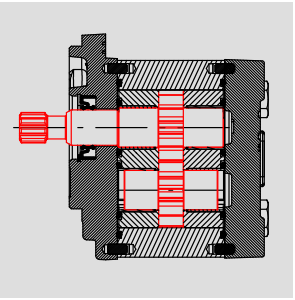
C*: dimensions with standard back cover in cast iron .
For other back covers dimension see section 3.6

3.2.1 Front cover dimensions

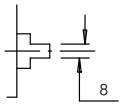
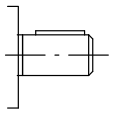
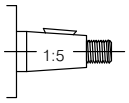
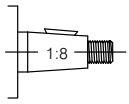
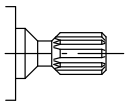
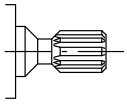
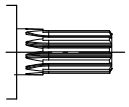
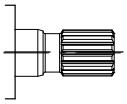
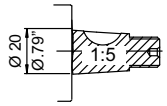
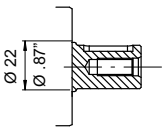
Front cover type	x		Front cover type	x	
	mm	*inches*		mm	*inches*
German rectangular 	20	*0.79*	European rectangular 	19	*0.75*
Bearing support German version 	48.5	*1.91*	Through 2 bolts 	17.2	*0.68*
SAE-A 2 bolts 	18	*0.71*	SAE-B 2 bolts 	18.2	*0.72*

3.3 Shaft end code



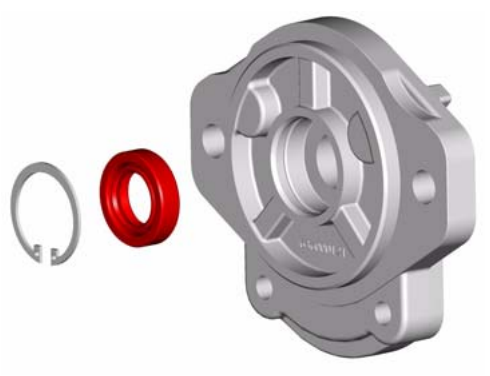


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	E	1	6	-	A	

Shaft end shape		Shaft end ordering code	Max torque
	Tang drive 8 mm - 0.32 inches	M	T max = 65 Nm
	Straight keyed Ø 15,85 mm - 0.62 inches	S	T max = 65 Nm
	Tapered shaft 1:5	G	T max = 135 Nm
	Tapered shaft 1:8	E	T max = 135 Nm
	9 Teeth external spline B17X14 DIN5482	D	T max = 110 Nm
	9 teeth external spline SAE J 498-9T 16/32 DP	A	T max = 90 Nm
	11 teeth external spline SAE J 498-9T 16/32 DP	T	T max = 140 Nm
	13 teeth external spline SAE J 498-9T 16/32 DP	B	T max = 270 Nm
	Bearing application 1:5	See section 3.4.3	T max = 100 Nm
	Bearing application Straight 22 mm - 0.87 inches	See section 3.4.3	T max = 100 Nm

3.4 Front cover

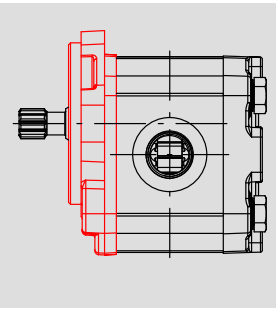
3.4.1 Shaft seal material



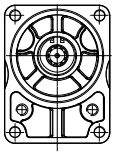
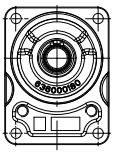
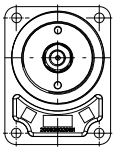
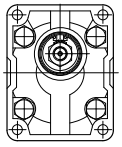
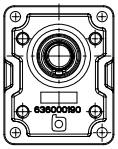
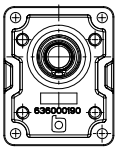
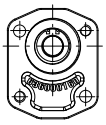
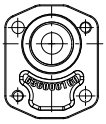
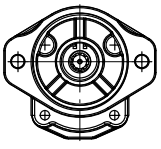
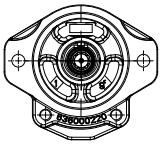
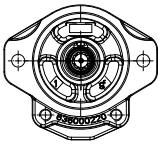
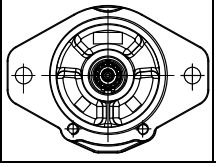
A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	E	1	6	-	A	

Shaft seal Type/material	Ordering code
Shaft seal pump NBR (standard)	0
Shaft seal pump HNBR	1
FPM (VITON)	2
Shaft seal front bearing application	see section 3.4.3

3.4.2 Front cover type



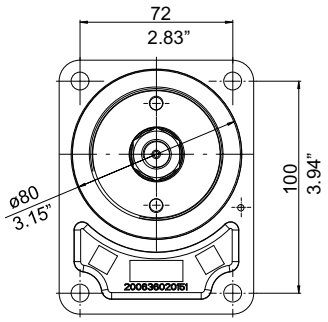
A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	E	1	6	-	A	

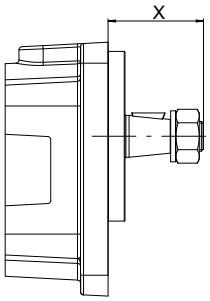
Type	Alluminium		Cast iron		Cast iron + bearing	
	Shape	Ordering code	Shape	Ordering code	Shape	Ordering code
German rectangular (Ø 80 mm - 3.15 inches)		A		B		see section 3.4.3
European rectangular (Ø 36.5 mm - 1.44”)		D		E		*
Through 2 bolts (Ø 50 mm - 1.97”)		G		H		*
Through 2 bolts (Ø 50 mm - 1.97”)		L		M		*
Through 2 bolts (Ø 52 mm - 2.045”)		O		P		
SAE-A 2 bolts (Ø 82.55 mm - 3.25 inches)		R		S		*
SAE-B 2 bolts (Ø 101,6 mm - 4 inches)				V		

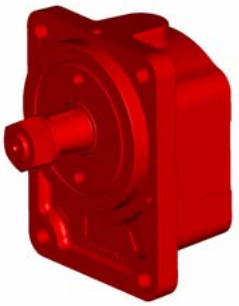
Aluminium and cast iron front cover dimensions: see standard pumps data sheet

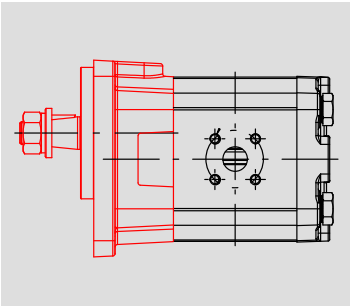
* Please contact our Sales Department

3.4.3 Front bearing application

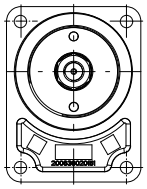
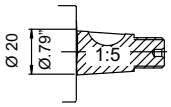
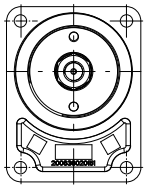
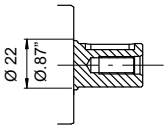




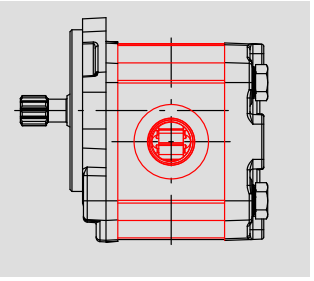




A	P	2	1	2	/	8	.	5	-	S	-	P	1		-	1	C	N	-	V	E	1	6	-	A	

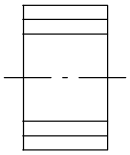
	+	 T max = 100 Nm X = 45 mm (1.77 inches)	+	Shaft seal material: HNBR	=	P1
	+	 Straight 22 mm - 0.87 inches X = 48.5 mm (1.91 inches)	+	Shaft seal material: HNBR	=	C1

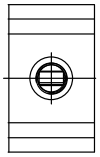
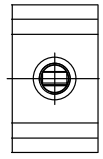
3.5 Body



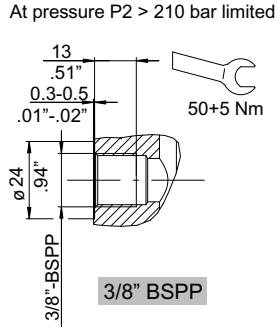
For reversible pumps alternative inlet and outlet ports have the same sizes as per inlet unidirectional rotation.

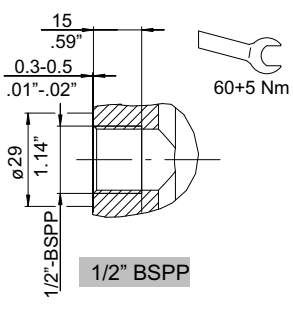
A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	E	1	6	-	A	

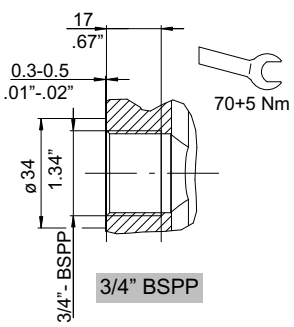
Port type		Ordering code	Displacement	Dimension (mm - *inch*) Suction	Dimension (mm - *inch*) Pressure	Ordering code
	without	0	All			0
			19**-22**-26**			D

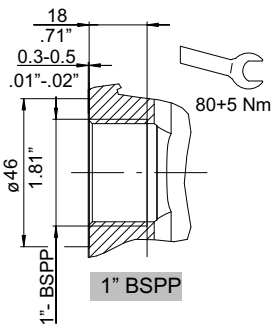
Port type		Ordering code	Displacement	Dimension (mm - *inch*) Suction	Dimension (mm - *inch*) Pressure	Ordering code
	metric	1	4.5-6.5-8.5	On demand		A
			11-15			B
			19-22-26			C
			19**-22**-26**			D
	BSPP threaded ports	4	4.5-6.5-8.5	3/8”	3/8”	A
			11-15	1/2”	3/8”	B
			19-22-26	3/4”	1/2”	C
			19**-22**-26**	3/4”	1/2”	D

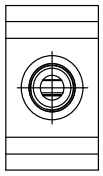
At pressure P2 > 210 bar limited service life



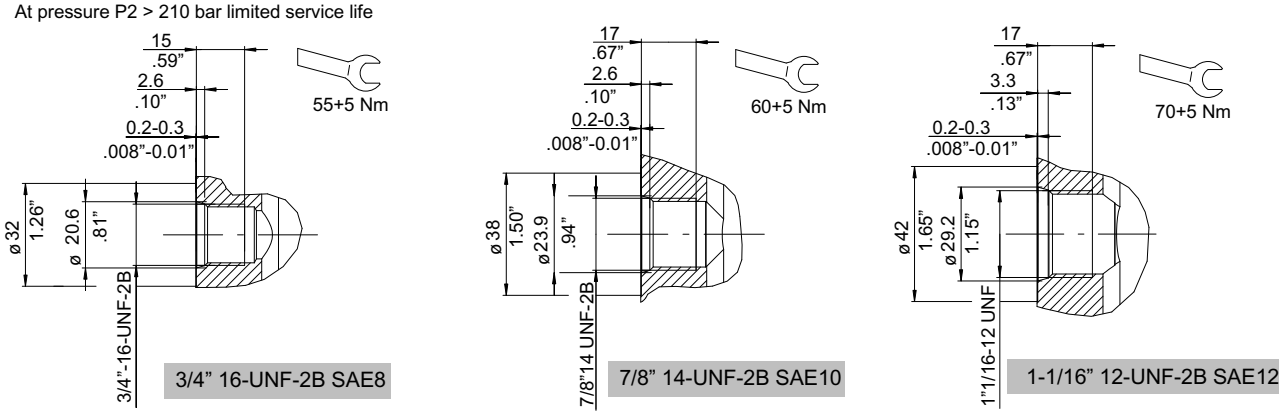


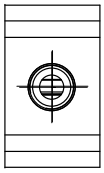




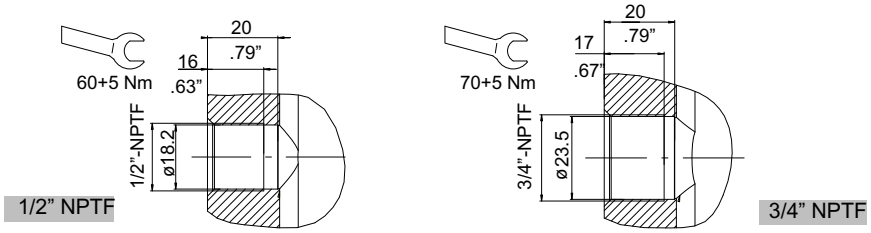
Port type		Ordering code	Displacement	Dimension (mm - *inch*) Suction	Dimension (mm - *inch*) Pressure	Ordering code
	SAE threaded ports	8	all	1-1/16” 12UNF (SAE12)	7/8” 14UNF (SAE10)	A
			4.5-6.5-8.5	3/4” 16UNF (SAE8)	3/4” 16UNF (SAE8)	B
			19**-22**-26**	1-1/16” 12UNF (SAE12)	7/8” 14UNF (SAE10)	D

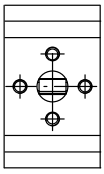
At pressure P2 > 210 bar limited service life

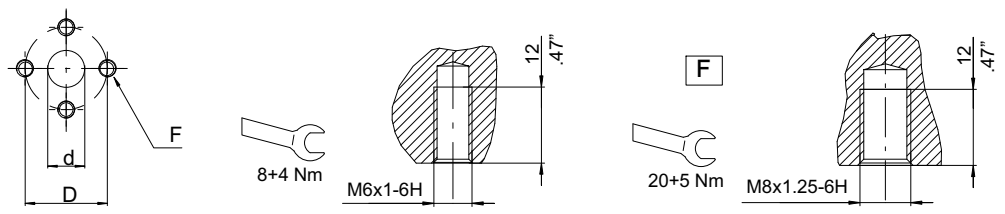


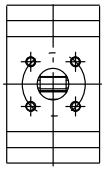
	NPTF threaded ports	6	4.5-6.5-8.5	1/2”	1/2”	A
			11-15-19-22-26	3/4”	1/2”	B
			19**-22**-26**	3/4”	1/2”	D

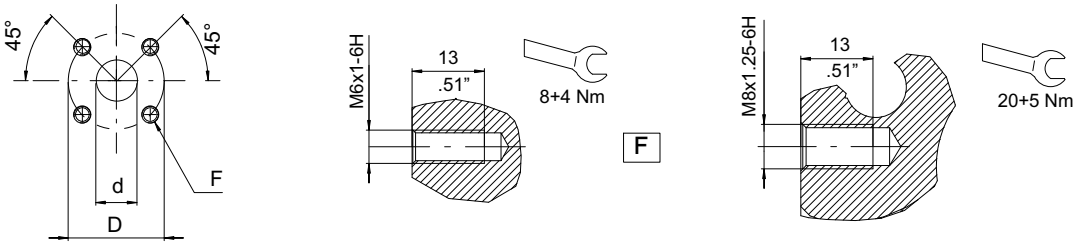
At pressure P2 > 210 bar limited service life



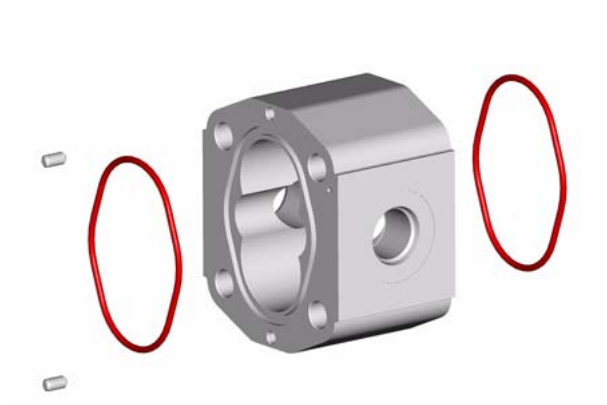
	European 4 bolt	3	4.5-6.5-8.5	13.5 - *.53* (d) 30 - *1.18* (D) M6 (F)	13.5 - *.53* (d) 30 - *1.18* (D) M6 (F)	A
			11-15	19 - *.75* (d) 40 - *1.58* (D) M8 (F)	13.5 - *.53* (d) 30 - *1.18* (D) M6 (F)	B
			19-22-26	19 - *.75* (d) 40 - *1.58* (D) M8 (F)	19 - *.75* (d) 40 - *1.58* (D) M8 (F)	C

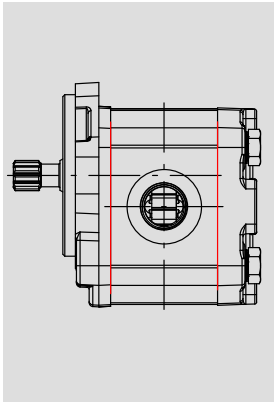


Type		Ordering code	Displacement	Dimension (mm - *inch*) Suction	Dimension (mm - *inch*) Pressure	Ordering code
	German 4 bolt flanged	2	4.5-6.5-8.5	15 - .59 (d) 40 - *1.58* (D) M6 (F)	15 - .59 (d) 35 - 1.38 (D) M6 (F) 287-S SAEB: M5 (F)	A
			11-15-19-22-26	20 - *.79* (d) 40 - *1.58* (D) M6 (F)		B
			19-22-26 (287-S SAEB)	24 - *.95* (d) 55 - *2.17* (D) M8 (F) (287-S SAEB)		C
			19**-22**-26**	20 - *.79* (d) 40 - *1.58* (D) M6 (F)		D
	Other ports	9	If the requested port type is not included in the previous versions, please indicate number “9” and specify the details in the request note			



3.5.1 Body and seal materials

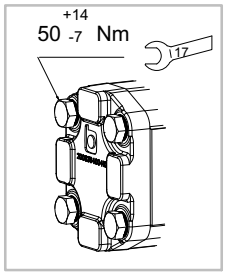


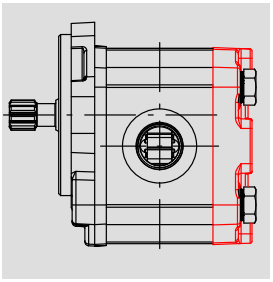


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	E	1	6	-	A	

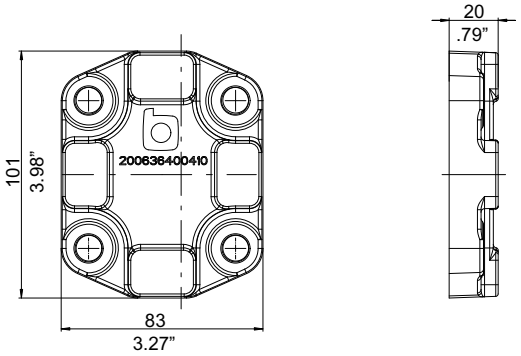
Body material	Seal material	Ordering code
Aluminium alloy	NBR (standard)	N
Aluminium alloy	HNBR	H

3.6 Back covers





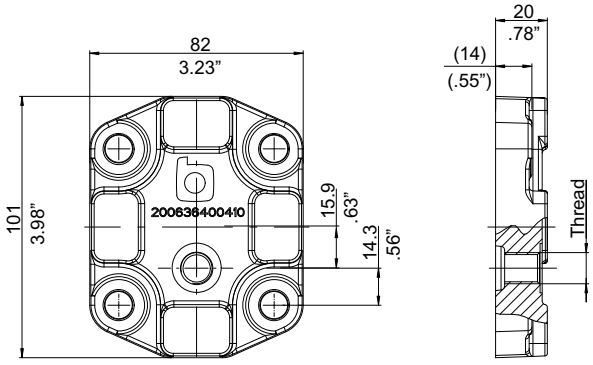
3.6.1 Cast iron back cover - Standard version for unidirectional pump



A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	G	H	-	-	-	A	

Type	Ordering code
Back cover, standard version, cast iron material	GH

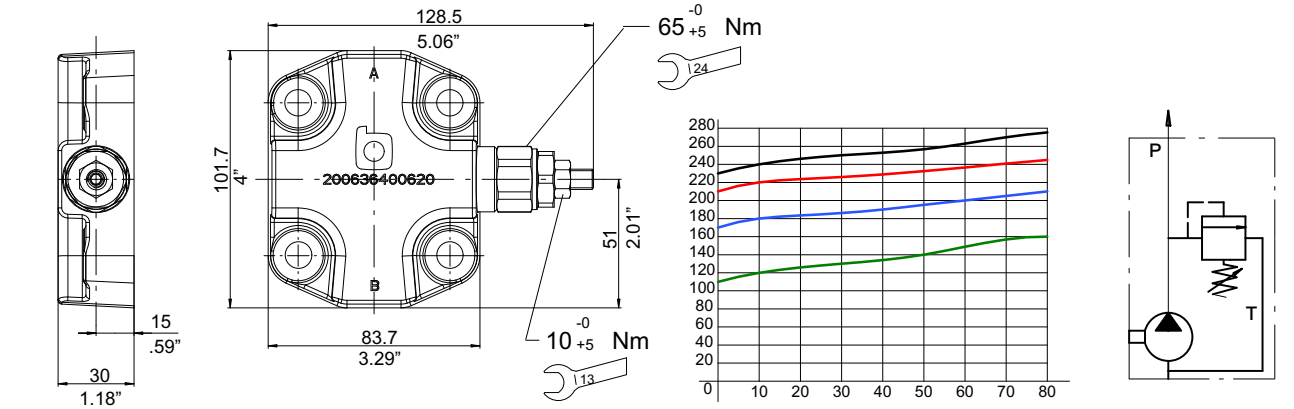
3.6.2 Cast iron back cover with drain port - Standard version for bidirectional pump



A	P	2	1	2	/	8	.	5	-	A	0	S	-	1	C	N	-	G	H	1	-	-	A	

Type	Thread	Tightening torque	Ordering code
Back cover with external drain line, cast iron material for reversible pump	1/4" BSP	30^{-6}_{+7} Nm	GH1 (Standard)
	SAE4	20^{-5}_{+5} Nm	GH2
	M12x1.5	30^{-6}_{+7} Nm	GH3

3.6.3 Cast iron back cover with relief valve VI



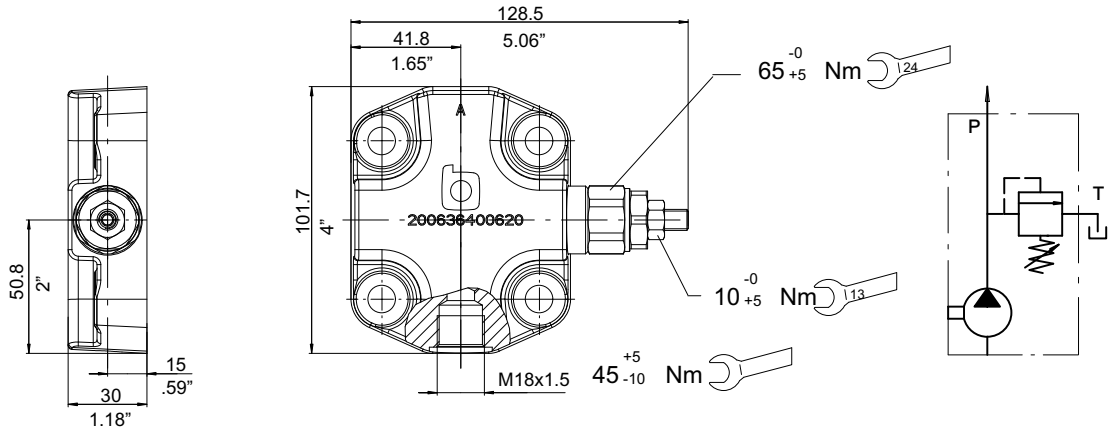
A	P	2	1	2	/	8	.	5	-	S	-	A	1	S	-	1	C	A	-	V	I	*	*	-	A	

Type	Ordering code
Cast iron back cover with relief valve. Return to internal pump suction	VI**

** pressure set value (bar) - in example: VI15 = 150 bar

Attention: * Please take care that when the relief valve open, oil temperature increase quickly. These conditions have effect in the pump performances and life

3.6.4 Cast iron back cover with relief valve VE



A	P	2	1	2	/	8	.	5	-	S	-	A	1	S	-	1	C	A	-	V	E	*	*	-	A	

Type	Ordering code
Cast iron back cover with relief valve. Return to external pump tank	VE**

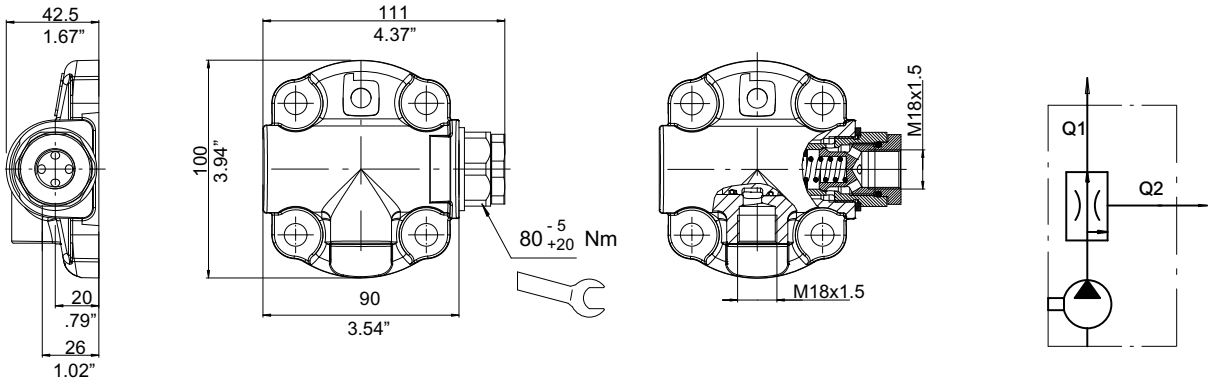
** pressure set value (bar) - in example: VE06 = 60 bar

VI and VE** pressure setting range**

Setting range (bar)	Spring code	Relief valve only code
5 ÷ 95	200662403080	200787403480
95 ÷ 200	200662403050	200787403420
201 ÷ 250	200662403070	200787403470

Pressure setting valve referred to 5 l/min

3.6.5 Cast iron back cover with priority valve VP

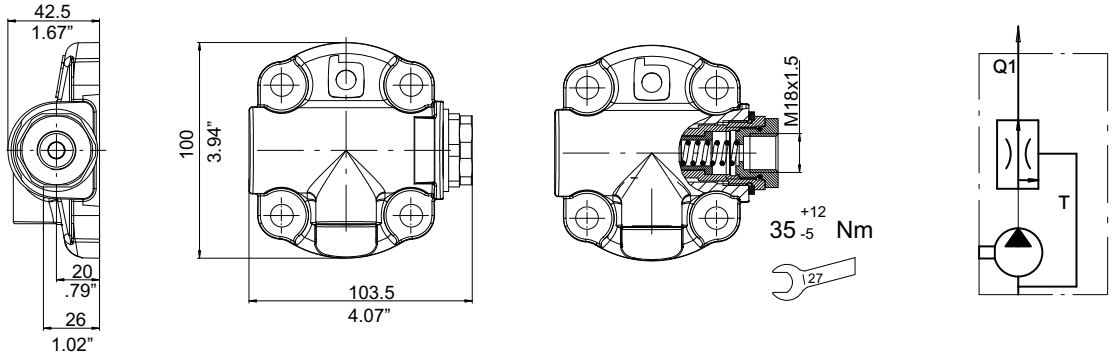


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	V	P	*	*	-	A	

Type	Ordering code	Standard setting value +15% / -10% (l/min)									
		02	03	05	06	08	10	13	16	20	24
Cast iron back cover with with priority valve	VP**	2.5	3.5	5	6	8.5	10.5	13	16	20	24

** flow set value (l/min) - in example: VP02= 2.5 l/min

3.6.6 Aluminium back cover with flow regulator valve QI

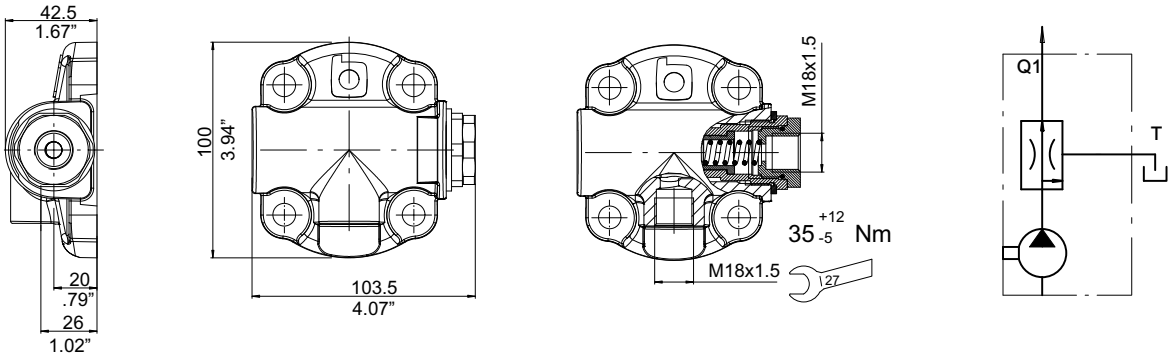


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	Q	I	*	*	-	A	

Type	Ordering code	Standard setting value -10% (l/min)									
		02	03	05	06	08	09	12	16	19	23
Aluminium back cover with flow regulator valve, internal drain	QI**	2	3.5	5	6	7.5	9	12	16	19	23

** flow set value (l/min) - in example: QI02= 2 l/min

3.6.7 Aluminium back cover with flow regulator valve QE



A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	N	-	Q	E	*	*	-	A	

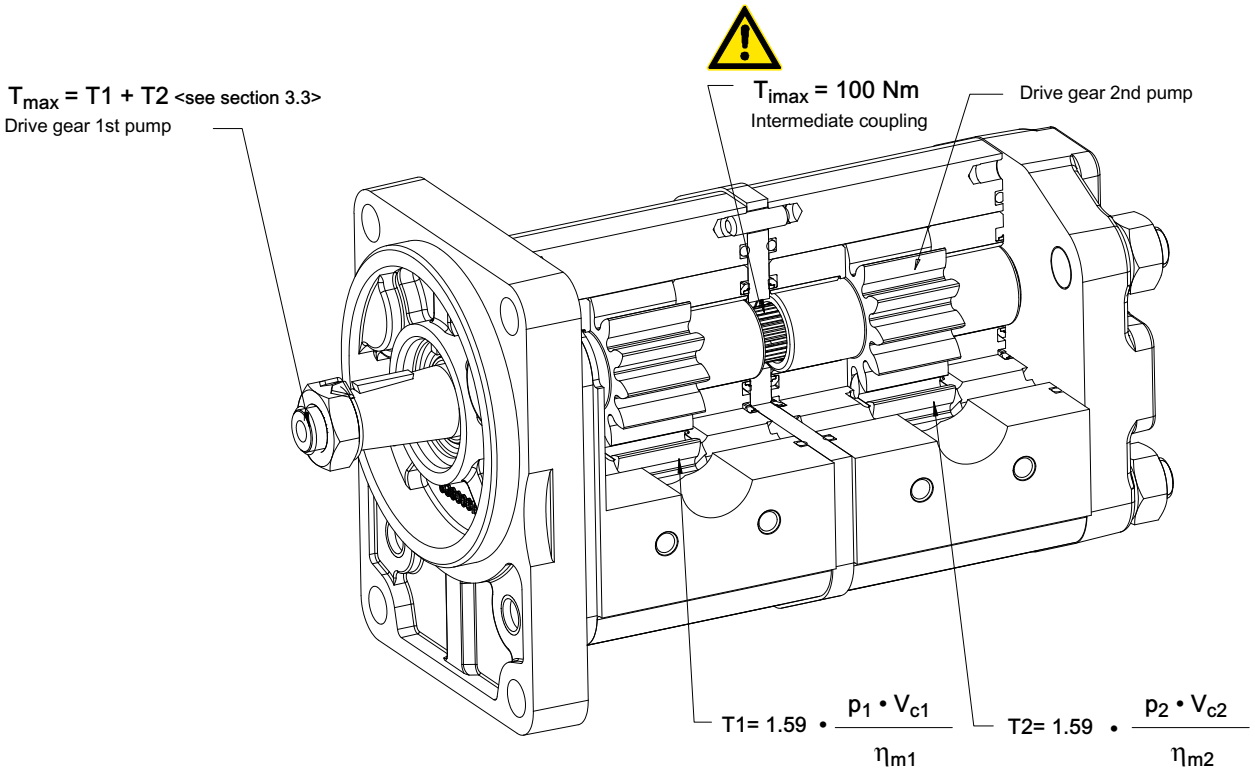
Type	Ordering code	Standard setting value +15% (l/min)									
		02	03	05	06	08	09	12	16	19	23
Aluminium back cover with flow regulator valve, external drain	QE**	2	3.5	5	6	7.5	9	12	16	19	23

** flow set value (l/min) - in example: QE06= 6 l/min

4 Multiple gear pumps

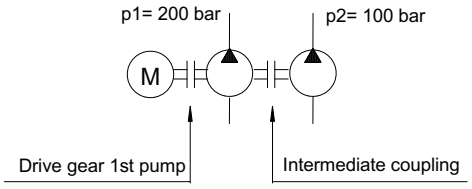
The multiple external gear pumps standard version includes an intermediate cover without shaft seal between the pumps. If needed, it is possible to order a customised version with intermediate seal, see section 4.3.

4.1 Drive torque



$$T_{max} = 1.59 \cdot \frac{p_1 \cdot V_{c1}}{\eta_{m1}} + 1.59 \cdot \frac{p_2 \cdot V_{c2}}{\eta_{m2}}$$

Example: AP212/19 + AP212/15

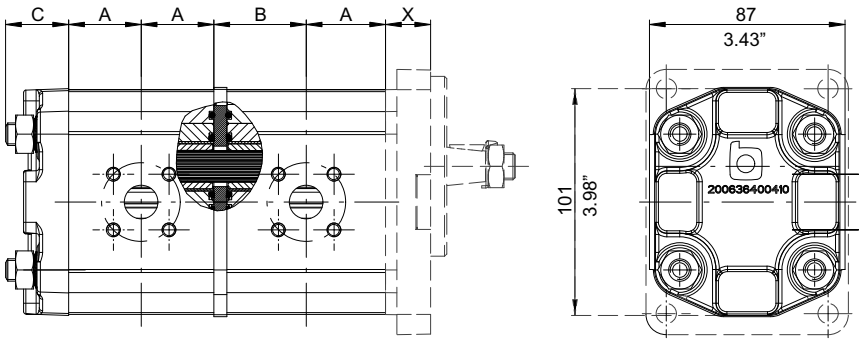


$$T_{max} = 1.59 \cdot \frac{19.2 \cdot 200}{90} + 1.59 \cdot \frac{15.1 \cdot 100}{90} = 68 + 26.7 = 94.7 \text{ Nm}$$

$T_{max} = 94.7 \leq 130$ Nm
(taper 1:8)

$T_2 = 26.7 \leq M_{imax}$ 100 Nm

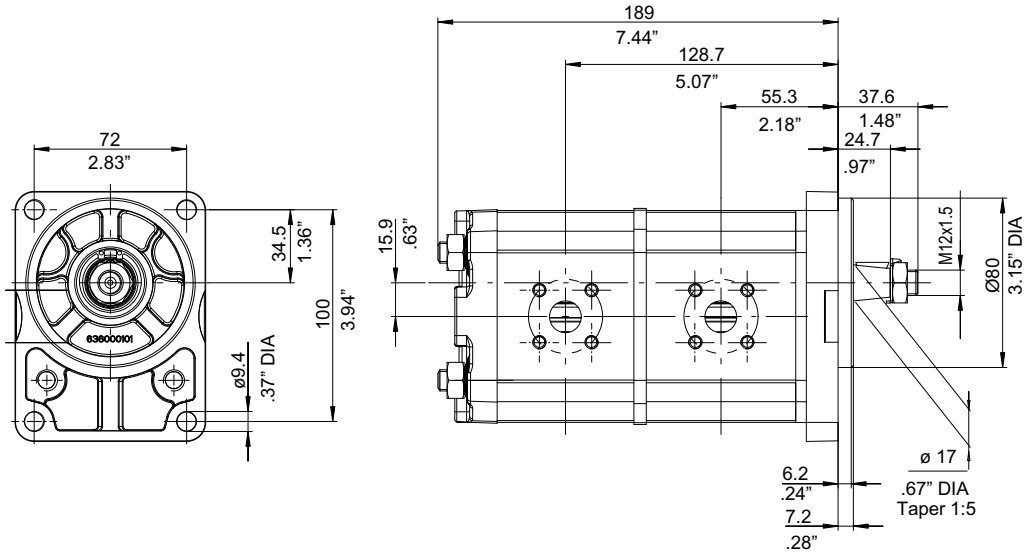
4.2 Tandem pumps dimensions (standard version without shaft seal between the pumps)



Pump size	A		B		C*	
	mm	*inches*	mm	*inches*	mm	*inches*
AP212/4.5	24.3	*0.96*	30.1	*1.19*	28	*1.10*
AP212/6.5	25.8	*1.02*	31.6	*1.24*		
AP212/8.5	27.3	*1.08*	33.1	*1.30*		
AP212/11	29.3	*1.54*	35.1	*1.38*		
AP212/15	32.3	*1.27*	38.1	*1.50*		
AP212/19	35.3	*1.39*	41.1	*1.62*		
AP212/22	37.6	*1.48*	43.4	*1.71*		
AP212/26	40.6	*1.60*	46.4	*1.83*		

C*: dimensions with standard back cover in cast iron .
For other back covers dimension see section 3.6

4.2.1 Standard versions, dimensions example



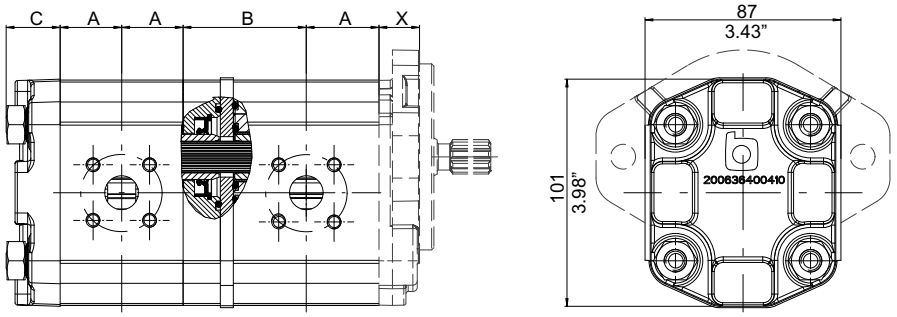
Example

Total length: 189 mm = 20 + 35.3 + 41.1 + 32.3 + 32.3 + 28 (X + A + B + A + A + C)

Port position: 128.7 mm = 20 + 35.3 + 41.1 + 32.3 (X + A + B + A)

55.3 mm = 20 + 35.3 (X + A)

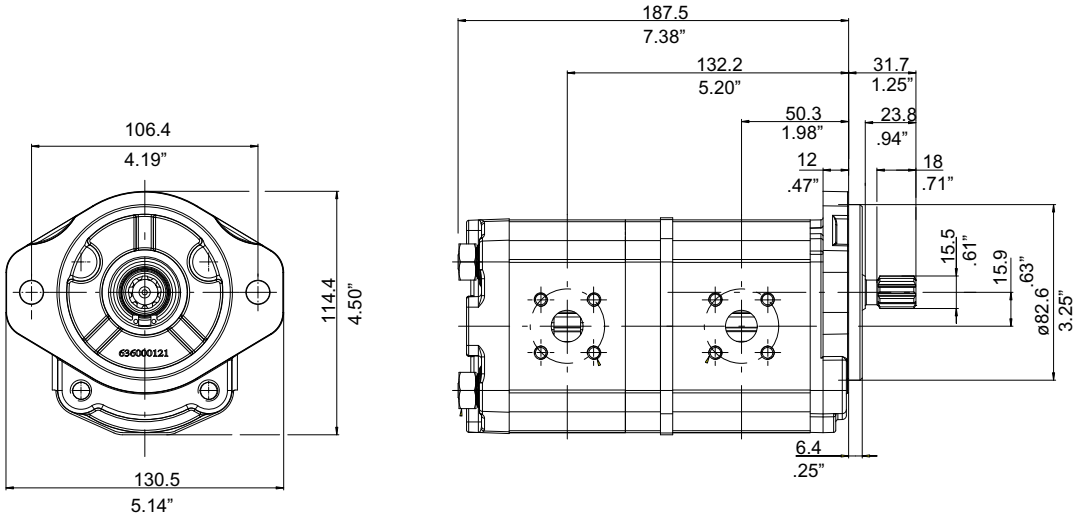
4.3 Tandem pumps dimensions (special version with shaft seal between the pumps)



Pump size	A		B		C*	
	mm	*inches*	mm	*inches*	mm	*inches*
AP212/4.5	24.3	*0.96*	46.6	*1.83*	28	*1.10*
AP212/6.5	25.8	*1.02*	48.1	*1.89*		
AP212/8.5	27.3	*1.08*	49.6	*1.95*		
AP212/11	29.3	*1.54*	51.6	*2.03*		
AP212/15	32.3	*1.27*	54.6	*2.15*		
AP212/19	35.3	*1.39*	57.6	*2.27*		
AP212/22	37.6	*1.48*	59.9	*2.36*		
AP212/26	40.6	*1.60*	62.9	*2.48*		

C*: dimensions with standard back cover in cast iron .
For other back covers dimension see section 3.6

4.3.1 Special version, dimensions example



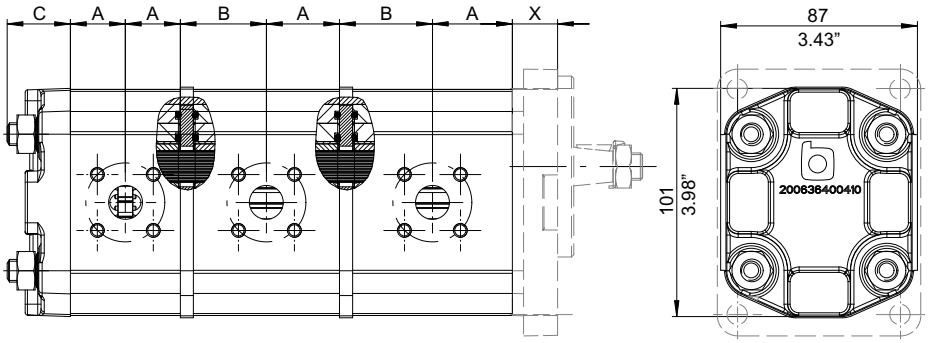
Example

Total length: 183.5 mm = 18 + 32.3 + 54.6 + 27.3 + 27.3 + 28 (X + A + B + A + A + C)

Port position: 132.2 mm = 18 + 32.3 + 54.6 + 27.3 (X + A + B + A)

50.3 mm = 18 + 32.3 (X + A)

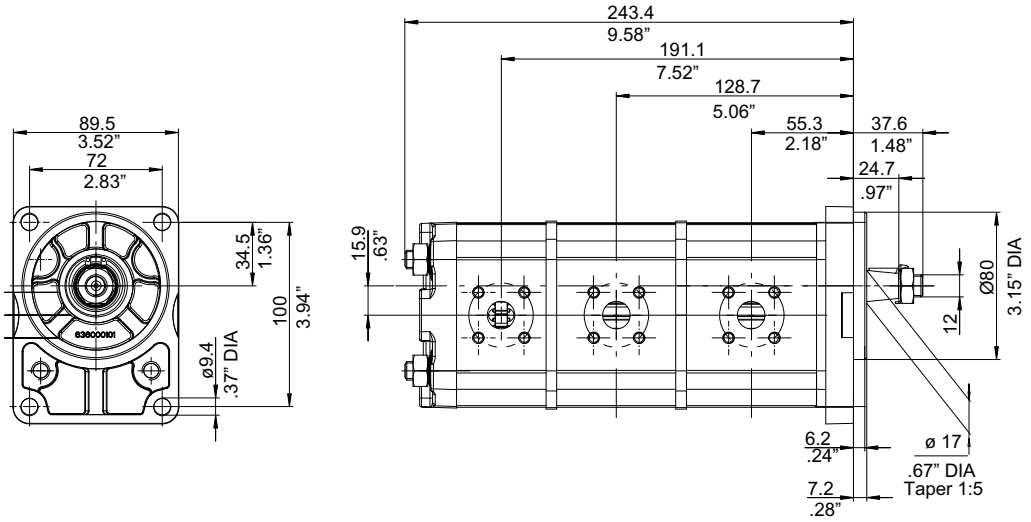
4.4 Triple pumps dimensions (standard version without shaft seal between the pumps)



Pump size	A		B		C*	
	mm	*inches*	mm	*inches*	mm	*inches*
AP212/4.5	24.3	*0.96*	30.1	*1.19*	28	*1.10*
AP212/6.5	25.8	*1.02*	31.6	*1.24*		
AP212/8.5	27.3	*1.08*	33.1	*1.30*		
AP212/11	29.3	*1.54*	35.1	*1.38*		
AP212/15	32.3	*1.27*	38.1	*1.50*		
AP212/19	35.3	*1.39*	41.1	*1.62*		
AP212/22	37.6	*1.48*	43.4	*1.71*		
AP212/26	40.6	*1.60*	46.4	*1.83*		

C*: dimensions with standard back cover in cast iron .
For other back covers dimension see section 3.6

4.4.1 Standard versions, dimensions example

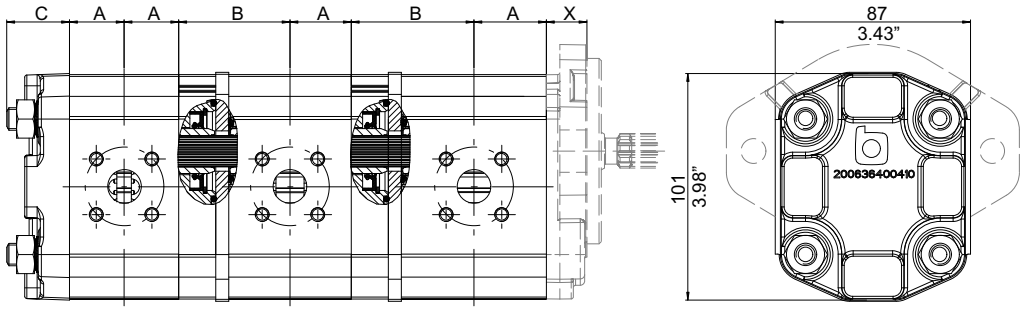


Example

Total length: 243.4 mm = 20 + 35.3 + 41.1 + 32.3 + 38.1 + 24.3 + 24.3 + 28 (X + A + B + A + B +A + A + C)

Port position: 191.1 mm = 20 + 35.3 + 41.1 + 32.3 + 38.1 + 24.3 (X + A + B + A + B +A)
128.7 mm = 20 + 35.3 + 41.1 + 32.3 (X + A + B +A)
55.3 mm = 20 + 35.3 (X + A)

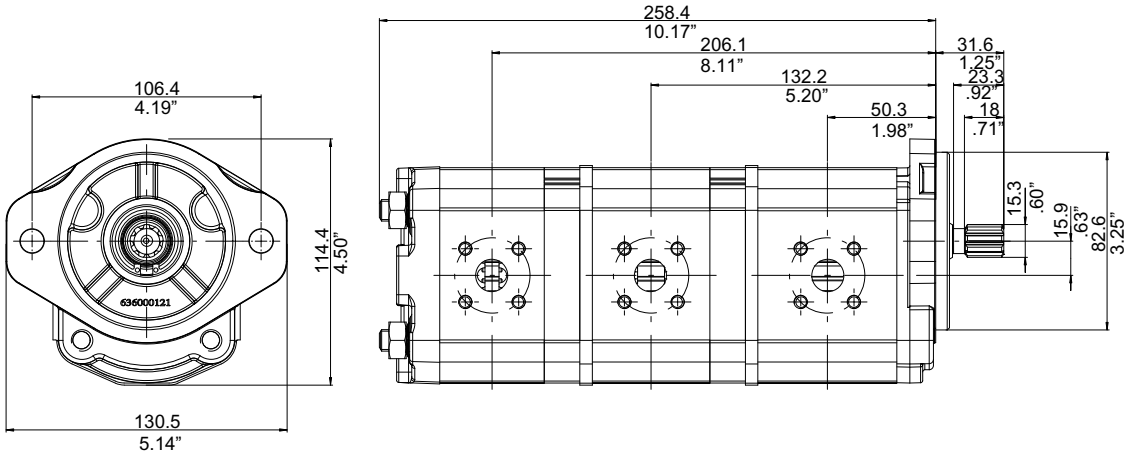
4.5 Triple pumps dimensions (special version with shaft seal between the pumps)



Pump size	A		B		C*	
	mm	*inches*	mm	*inches*	mm	*inches*
AP212/4.5	24.3	*0.96*	46.6	*1.83*	28	*1.10*
AP212/6.5	25.8	*1.02*	48.1	*1.89*		
AP212/8.5	27.3	*1.08*	49.6	*1.95*		
AP212/11	29.3	*1.54*	51.6	*2.03*		
AP212/15	32.3	*1.27*	54.6	*2.15*		
AP212/19	35.3	*1.39*	57.6	*2.27*		
AP212/22	37.6	*1.48*	59.9	*2.36*		
AP212/26	40.6	*1.60*	62.9	*2.48*		

C*: dimensions with standard back cover in cast iron .
For other back covers dimension see section 3.6

4.5.1 Special version, dimensions example



Example

Total length: 258.4 mm = 18 + 32.3 + 54.6 + 27.3 + 49.6 + 24.3 + +24.3 + 28 (X + A + B + A + B + A + A + C)

Port position: 206.1 mm = 18 + 32.3 + 54.6 + 27.3 + 49.6 + 24.3 (X + A + B + A + B + A)
132.2 mm = 18 + 32.3 + 54.6 + 27.3 (X + A + B + A)
50.3 mm = 18 + 32.3 (X + A)

4.6 How to order tandem pumps (with or without shaft seal between the pumps)

	1st PUMP										2nd PUMP										1st BODY			2nd BODY					
1	2			3	4						2			3	4		5		6	7	8		9	10	11		9	10	11		12		13
A	P	2	1	2	/	1	1	L	N	-	2	1	2	/	8	.	5	L	N	-	S	-	A	0	S	-	1	C	N	-	1	C	A	-	V	E	1	6	P

4.7 How to order triple pumps (with or without shaft seal between the pumps)

	1st PUMP									2nd PUMP										3rd PUMP										1st BODY			2nd BODY						3rd BODY								
1	2			3	4					2			3	4						2			3	4						5		6	7	8		9	10	11		9	10	11		9	10	11		12		13
A	P	2	1	2	/	1	9	L	N	-	2	1	2	/	1	5	L	N	-	2	1	2	/	1	1	L	N	-	S	-	A	0	S	-	1	C	N	-	1	C	A	-	1	C	A	-	V	E	1	6	-

1 Function

AP= single gear pump - unidirectional
APR = single gear pump - reversible

2 Series

212

3 Displacement

4.5= 4.4 cm^3/rev
6.5= 6.4 cm^3/rev
8.5= 8.4 cm^3/rev
11= 11.1 cm^3/rev
15= 15.1 cm^3/rev
19= 19.2 cm^3/rev
22= 22.2 cm^3/rev
26= 26.2 cm^3/rev

4 Version

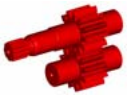
Omitted if 12 teeth standard
LN= 12 teeth Low Noise version

5 Rotation

S = left-hand rotation
D = Right-hand rotation
Omitted if reversible version

6 Shaft end code

see page section 3.3



7 Shaft seal material type code

see page section 3.4.1

8 Front cover series/material with/without bearing code

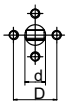
see page section 3.4.2 and 3.4.3

9 Type of ports code

see page section 3.5

10 Inlet/outlet port size code combination

see page section 3.5



11 Body material + seal material code

A= Aluminium
GH= Cast Iron
see section 3.5.1

12 Back cover type / Valve setting value

see section 3.6

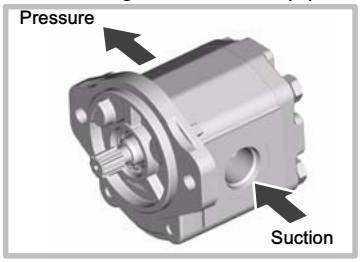
13 For Tandem or multiple pumps with or without shaft seal between the pumps

Omitted if without shaft seal between the pumps (standard versions)
P= with shaft seal between the pumps (special versions)

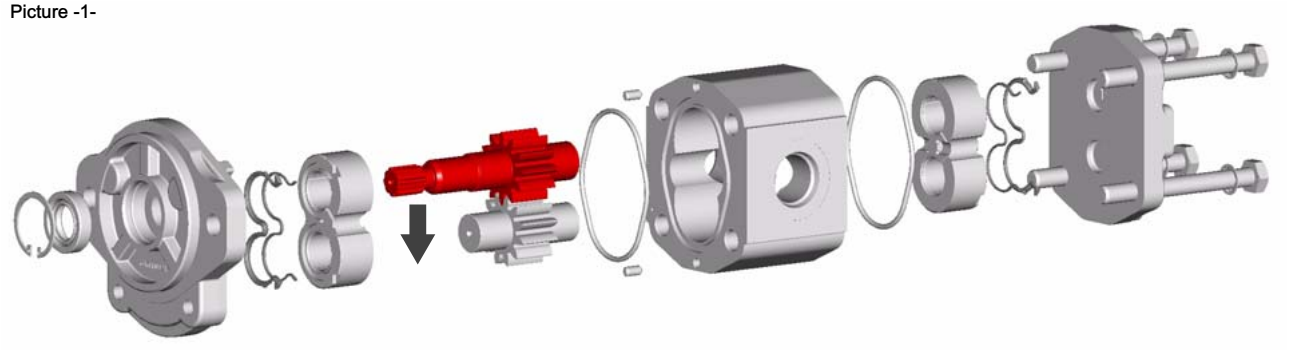
5 Rotation changing instructions

For the AP212 pumps with unidirectional rotation (D or S) it is possible to change the rotation direction of the entire range without having to replace any component. To ensure a good technical result, we recommended in any case that such inversion should be carried out at our factory.
Following we represented a procedure for the pump rotation inversion, here in example a counter-clockwise rotation pump (S). To obtain an clockwise-rotation (D) see the following pictures/instructions.

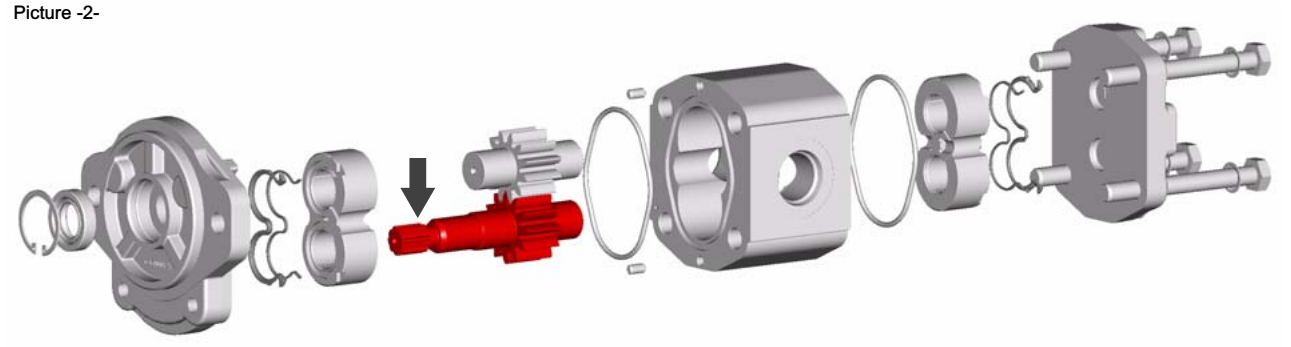
Initial configuration " Left" (S)



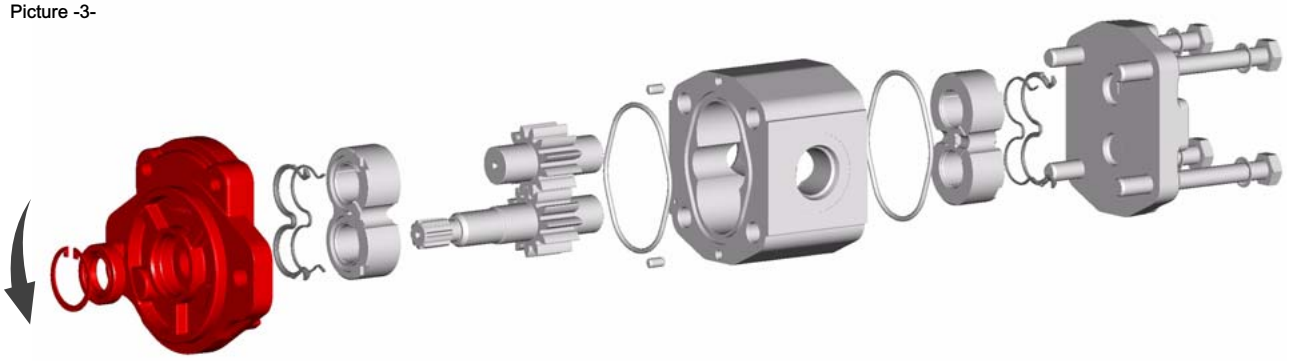
Picture -1-



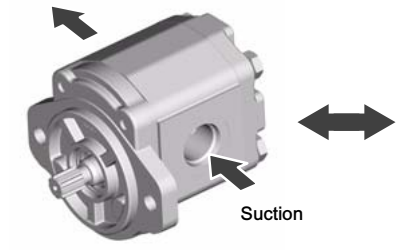
Picture -2-



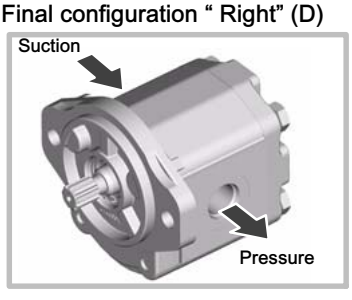
Picture -3-

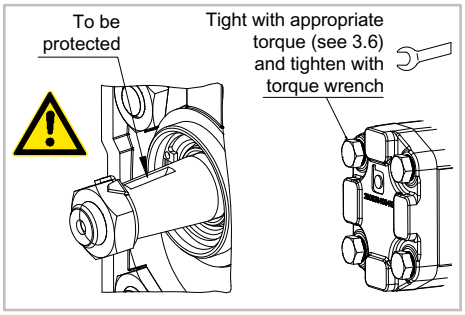


Pressure



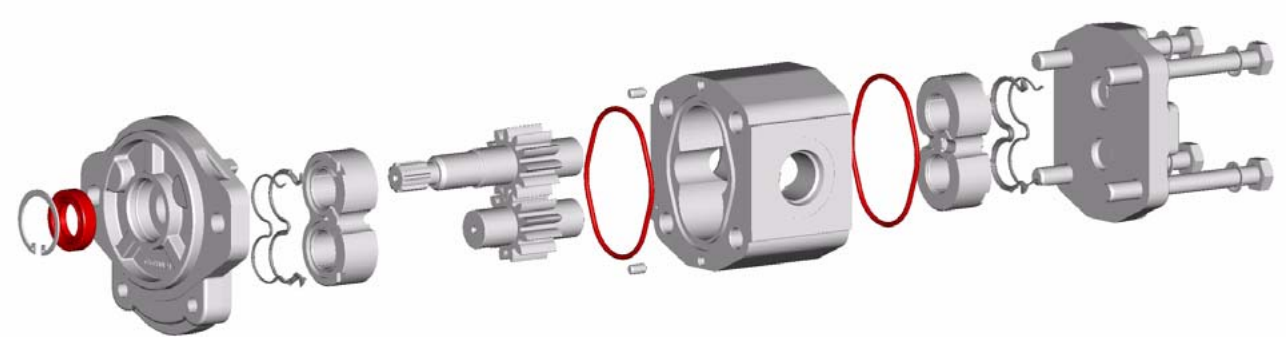
Final configuration " Right" (D)





6 Pumps seal kit NBR standard type

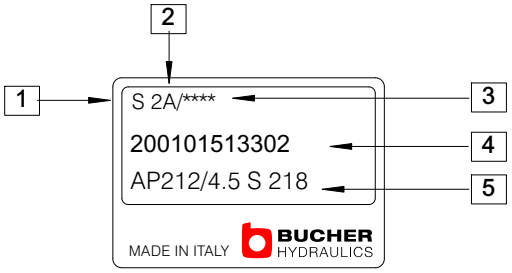
The seal Kit code includes:
OR and shaft seal



Type	Code
AP/APR212	200974001570
Tandem AP212 + AP212 NBR (without shaft seal between the pumps)	200974001580
Tandem AP212 + AP212 + PAR NBR (with shaft seal between the pumps)	200974001590

Minimum kit order quantity is requested: please contact our Sales Center

7 Product identification plate



1 : Rotation (D= Clockwise rotation - S= Counterclockwise rotation)

2 : Manufacturing year and month

3 : Progressive identification no. (optional)

4 : Bucher Hydraulics S.p.A. product code

5 : Description

Single pumps approximate weights

Pump	Weight Kg
AP-APR212/4.5	2.5
AP-APR212/6.5	2.6
AP-APR212/8.5	2.7
AP-APR212/11	2.8
AP-APR212/15	3.0
AP-APR212/19	3.2
AP-APR212/22	3.3
AP-APR212/26	3.4

N.B.: The weight refers to pumps with aluminium front cover and standard cast iron back cover.

Manufacturing month	Manufacturing year							
	2010	2011	2012	2013	2014	2015	2016	2017
January	0A	1A	2A	3A	4A	5A	6A	7A
February	0B	1B	2B	3B	4B	5B	6B	7B
March	0C	1C	2C	3C	4C	5C	6C	7C
April	0D	1D	2D	3D	4D	5D	6D	7D
May	0E	1E	2E	3E	4E	5E	6E	7E
June	0F	1F	2F	3F	4F	5F	6F	7F
July	0G	1G	2G	3G	4G	5G	6G	7G
August	0H	1H	2H	3H	4H	5H	6H	7H
September	0I	1I	2I	3I	4I	5I	6I	7I
October	0J	1J	2J	3J	4J	5J	6J	7J
November	0K	1K	2K	3K	4K	5K	6K	7K
December	0L	1L	2L	3L	4L	5L	6L	7L

8 Application form

Date:			
Contact:			
Customer:			
Location:			
Overall quantity per year:			
Minimum batch size:			
Delivery time requested:	Feasibility:	Prototypes:	Series:
Target price:			
Type of application:			

External gear pump general data					
Rotation	S	D	R	Speed range	
Displacement: Single pump (cm^3/rev)				Continuous work pressure (bar)	1st / 2nd / 3rd
Double pump (cm^3/rev)	1st	2nd		Peak work pressure (bar)	1st / 2nd / 3rd
Multiple pump (cm^3/rev)	1st	2nd	3rd	Oil type	
Drive shaft				Oil temperature (°C)	min / max
Port type				Oil viscosity (cSt)	min / max
Front cover type				Suction line pressure	
Bearing support				Voltage	
Front cover material				Drain case pressure	
Intermediate cover (with or without shaft seal)	with	without		Radial load (N)	
Back cover type/circuit				Axial load (N)	
Back cover material	aluminium	cast iron		Working hours per year	
Valves				Cycles per year	

Additional notes:

info.it@bucherhydraulics.com www.bucherhydraulics.com

Classification: 410.110.000