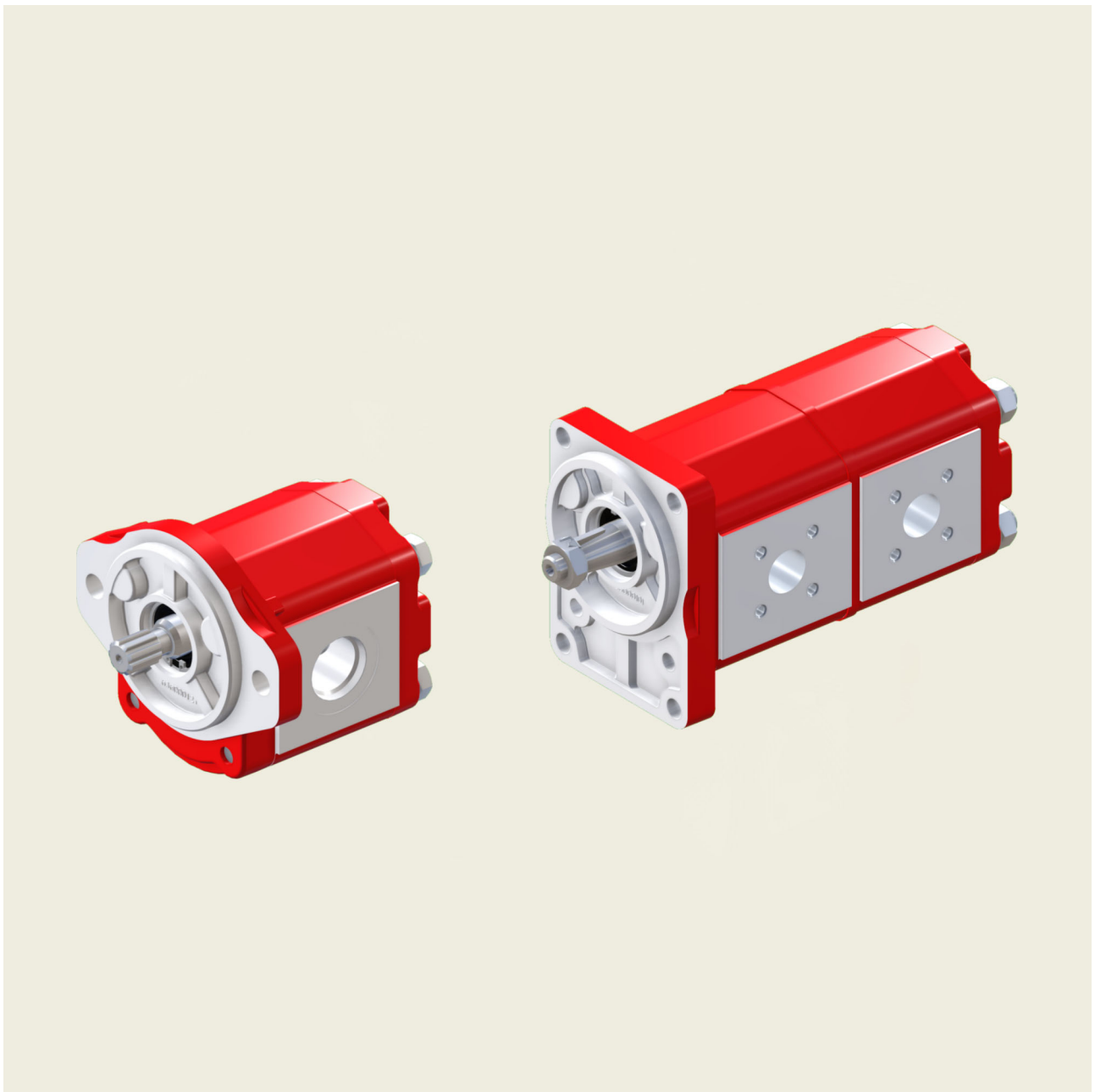


## AP212 Gear Pumps

Standard and Low Noise series



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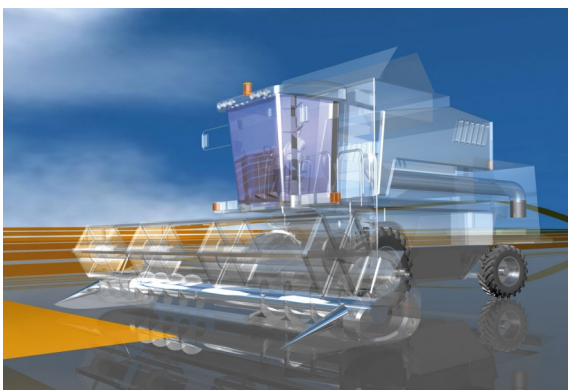
## 1 General information

The product range of Bucher Hydraulics SpA includes single pumps 05-100-212-212HP-250-300 (corresponding with the common group denominations: 05-1-2-2.5-3) 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:

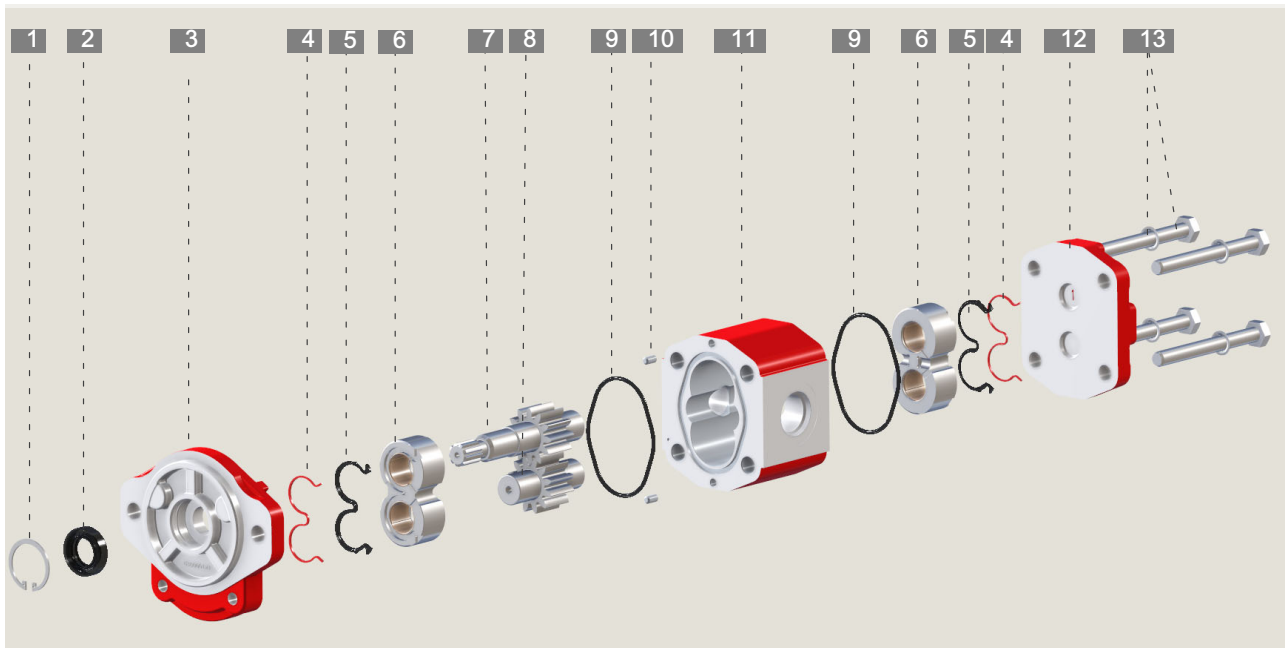
- new design of gear teeth and balancing areas
- use of high-performance materials
- carefully controlled heat treatments

- 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



- |                    |                             |
|--------------------|-----------------------------|
| 1. Retaining ring  | 8. Driven gear              |
| 2. Shaft seal      | 9. Oil seal                 |
| 3. Front cover     | 10. Centering pin           |
| 4. Balancing seal  | 11. Pump body               |
| 5. Back up seal    | 12. Back cover              |
| 6. Balancing block | 13. Fixing screw and washer |
| 7. Drive gear      |                             |

### 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 :

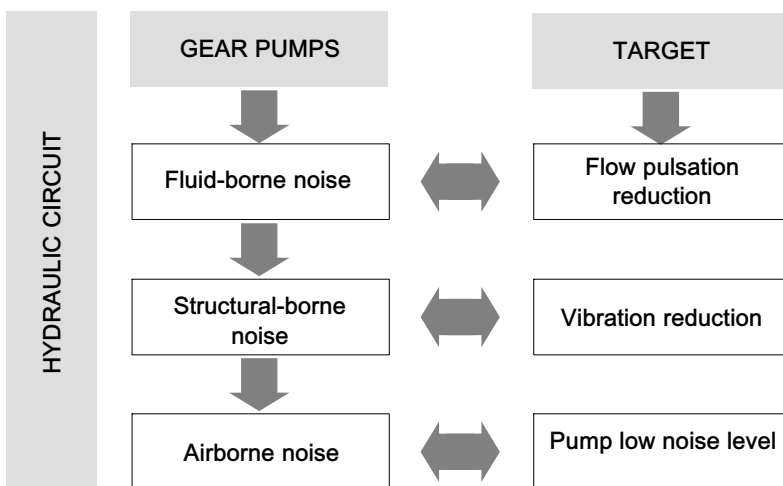
New gears profile (12 teeth) with increased transmissible torque

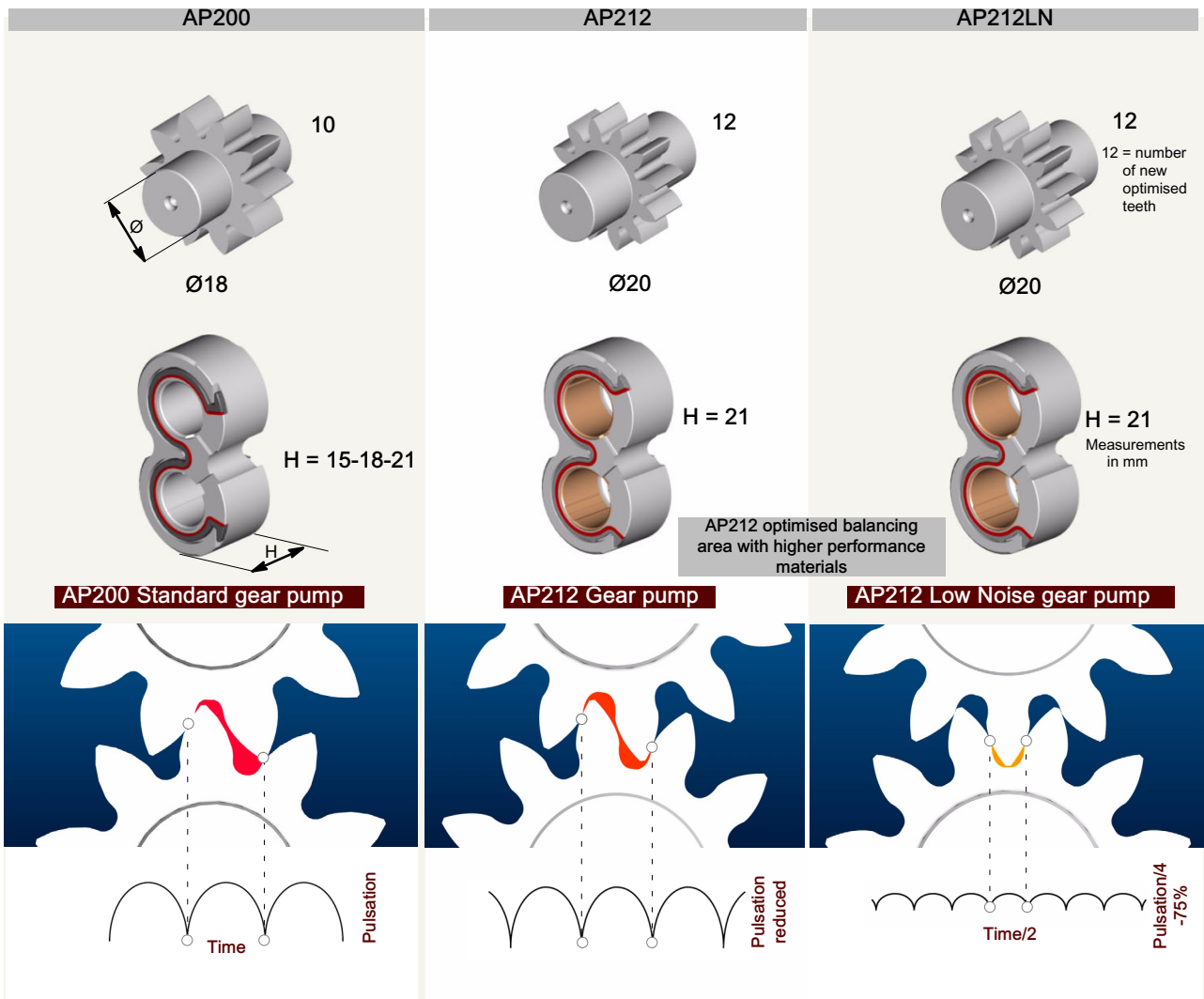
#### Bodies:

New design pump bodies

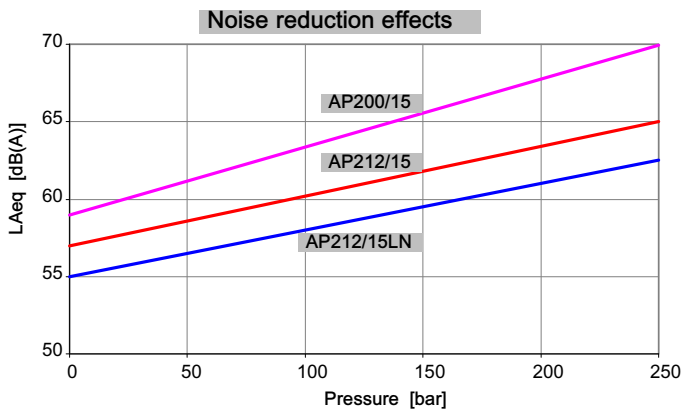
#### Back covers:

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

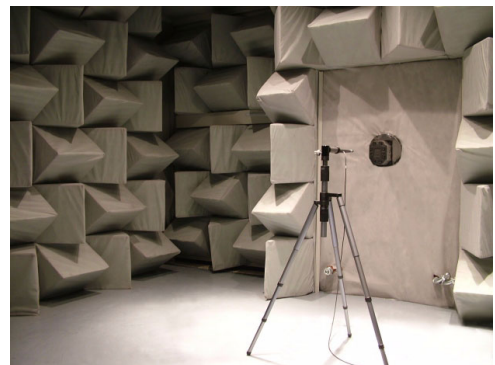




1.2 Example of typical sound pressure level recorded in a semi-anechoic testing room



Oil temperature: 40°C - Oil viscosity: 32 mm<sup>2</sup>/s  
Distance between pump and sensor: 1 m  
Speed: 1500 rpm



### 1.3 Technical data

Features	
Operating fluid temperature range (mineral oil):	NBR: -15 / +80 °C (peak: -20 / +90 °C) HNBR: -20 / +90 °C (peak: -30 / +110 °C)
Recommended fluids	hydraulic mineral oil-based
Viscosity range:	Recommended: 20-120 mm <sup>2</sup> /s (cSt) Permitted: 12- 700 mm <sup>2</sup> /s (cSt) Permitted for starting: 2000 mm <sup>2</sup> /s (cSt)
Cleanliness:	recommended up to 140 bar (2000 PSI): 20/18/15 ISO 4406 recommended up to 210 bar (3000 PSI): 19/17/14 ISO 4406 recommended up to 275 bar (4000 PSI): 17/15/12 ISO 4406
Minimum storage temperature:	NBR: -25 °C HNBR: -35 °C
Standard seals material (valves not included)	NBR + HNBR standard ( ISO1629)

Type	AP/APR212 Displacement		AP/APR212LN Displacement		Max. pressure*						n min. P2 < 100 bar	n min. 100<n< 180 bar	n min. 180<n< P2	n max.
	cm <sup>3</sup> /rev	Cu.In. P.R.	cm <sup>3</sup> /rev	Cu.In. P.R.	P1 (continuous)		P2 (intermittent)		P3 (peak)		rpm	rpm	rpm	rpm
					bar	P.S.I.	bar	P.S.I.	bar	P.S.I.				
4.5	4.4	.269	4.5	.275	250	3630	280	4060	300	4350	600	1200	1400	4000
6.5	6.4	.391	6.6	.403	250	3630	280	4060	300	4350	600	1200	1400	4000
8.5	8.4	.513	8.7	.531	250	3630	280	4060	300	4350	600	1000	1400	4000
11	11.1	.677	11.5	.702	250	3630	280	4060	300	4350	500	900	1200	3500
15	15.1	.921	15.7	.958	250	3630	280	4060	300	4350	500	750	1000	3500
19	19.2	1.172	19.8	1.208	210	3040	240	3480	260	3770	500	750	1000	3000
22	22.2	1.355	23	1.404	180	2610	210	3040	230	3330	500	750	900	3000
26	26.2	1.599	27.1	1.654	170	2460	200	2900	220	3190	500	750	1000	2800
22**	22.2	1.355	23	1.404	220	3190	240	3480	260	3770	500	750	900	3000
26**	26.2	1.599	27.1	1.654	200	2900	230	3330	250	3630	500	750	1000	2800

\* Referred to pumps 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



**IMPORTANT!** Please consult Bucher Hydraulics if even one of the operating limits indicated in the table (temperature, pressure, rpm) is exceeded, as well as in the case of two or more maximum values at the same time, or for applications with particularly heavy-duty cycles

### 1.4 Pressure

Pressure levels:

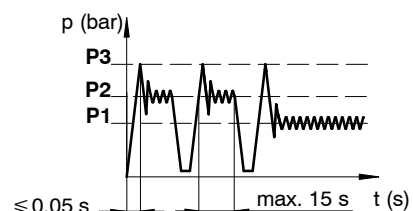
P1 = continuous pressure

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  $P_{in} \geq 0.75 \text{ bar}$  (11 PSI); therefore, the following conditions 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.

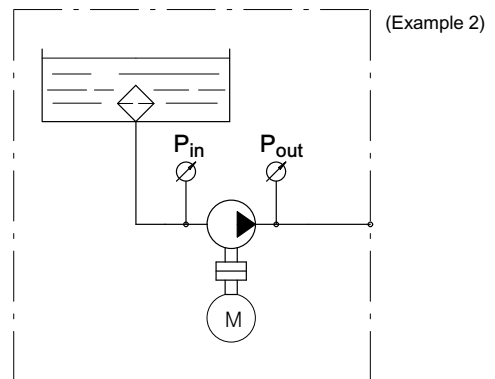
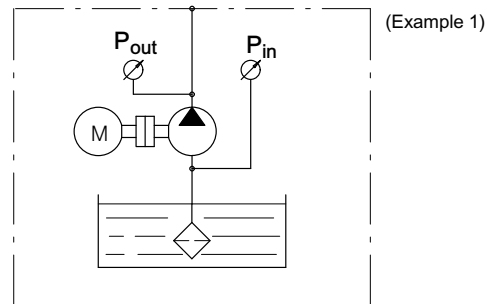
Please contact our Sales Department, solution for

$P_{in} \leq 3.5 \text{ bar}$  (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:  $v = 0.6 - 1.2 \text{ m/s}$ .

(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.

Ref.: the Directive 99/92/EC and Directive 2014/34/EU.

- ISO 9001:2015 / ISO 14001:2015

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.

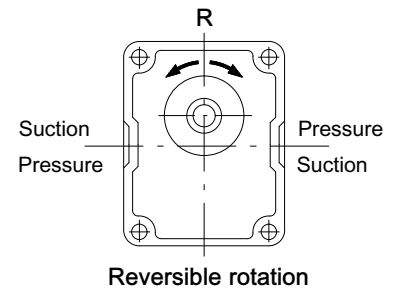
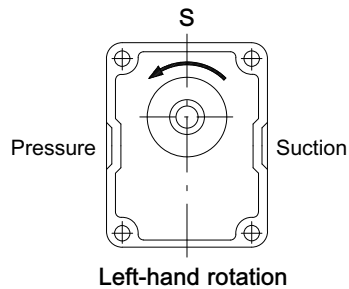
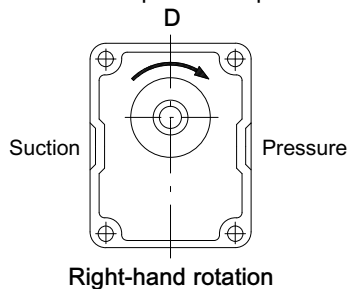
Pumps with counterclockwise rotation (**S**) have a drive gear which turns counterclockwise, with the suction port on the right and the pressure port on the left. The figure also shows the pressure flow inside the pumps as the oil is transferred from the suction port to the pressure port.

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**.



## 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.

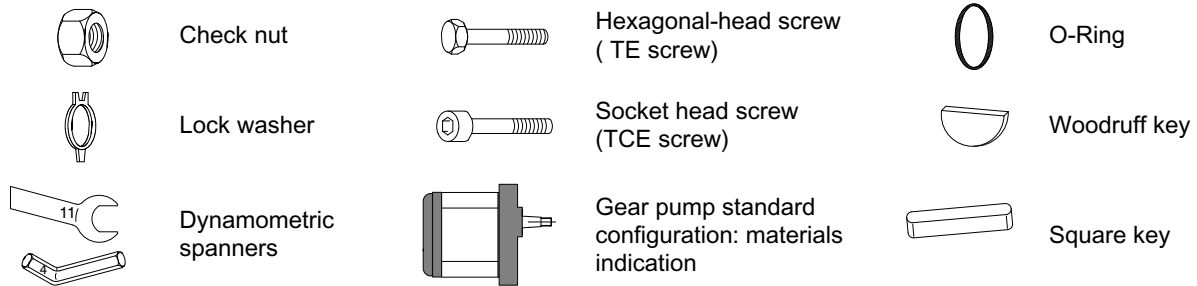
A clearance between shaft ends it is necessary.

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 in section 3.4.3 )

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.

### 1.9 Non-standard symbols used in the text



### 1.10 Calculating the specification of a gear pump

The following parameters are defined:

$V_c$  = (cm<sup>3</sup>/rev) pump displacement;

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

$Q$  = (l/min) flow rate;

$p$  = (bar) operating pressure;

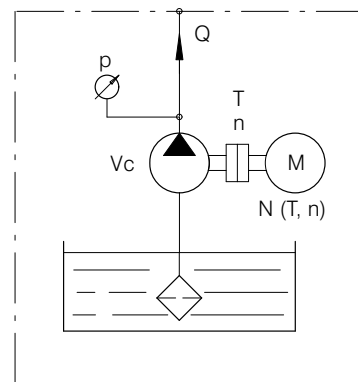
$T$  = (Nm) drive torque;

$N$  = (kW) Absorbed power;

$\eta_v$  = (%) volumetric efficiency;

$\eta_m$  = (%) mechanical efficiency;

$\eta_t$  = (%) total efficiency



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

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

$$N = \frac{Q \cdot p}{6 \cdot \eta_t}$$

#### Example

AP212/11  $V_c = 11.1 \text{ cm}^3/\text{r}$   $n = 1500 \text{ r/min}$   $p = 200 \text{ bar}$   $\eta_v = 94\%$   $\eta_m = 90\%$   $\eta_t = 84.6\%$

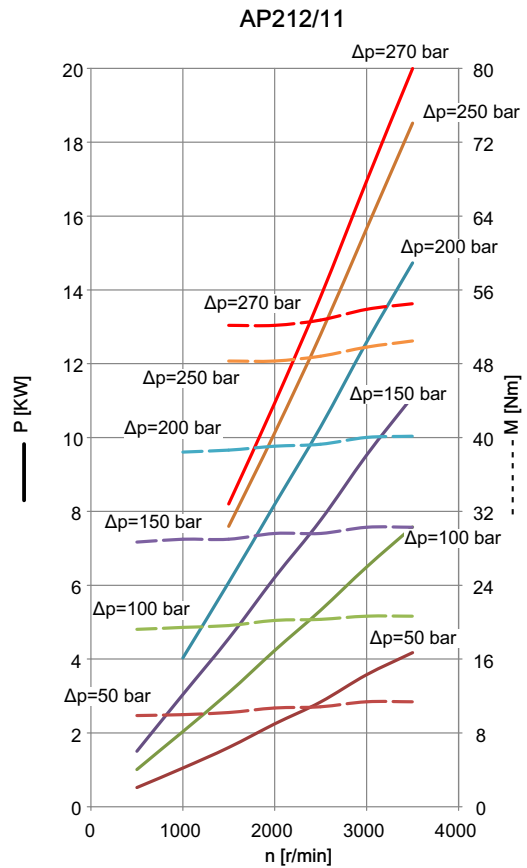
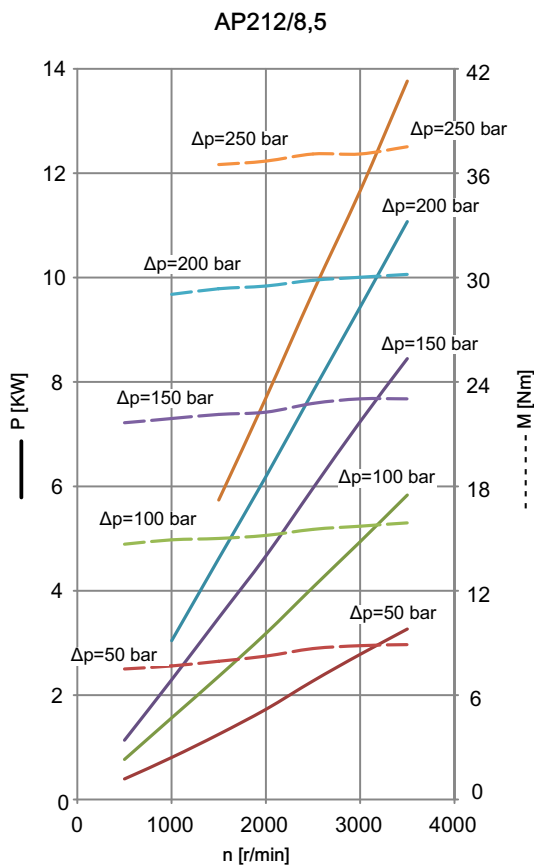
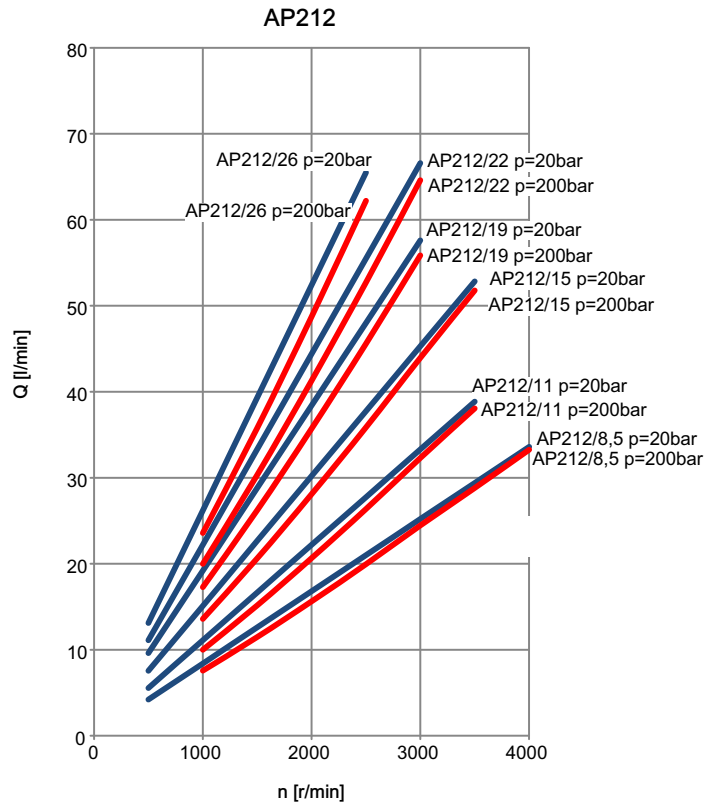
$$Q = \frac{11.1 \cdot 1500}{100000} \cdot 94 = 15.65 \text{ l/min.}$$

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

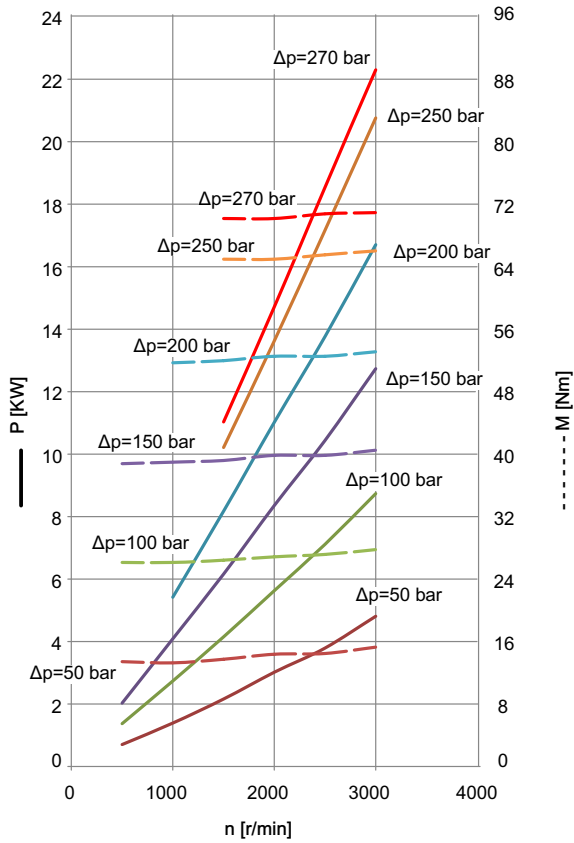
$$N = \frac{15.65 \cdot 200}{6 \cdot 84.6} = 6.56 \text{ kW}$$

## 1.11 Diagrams AP212

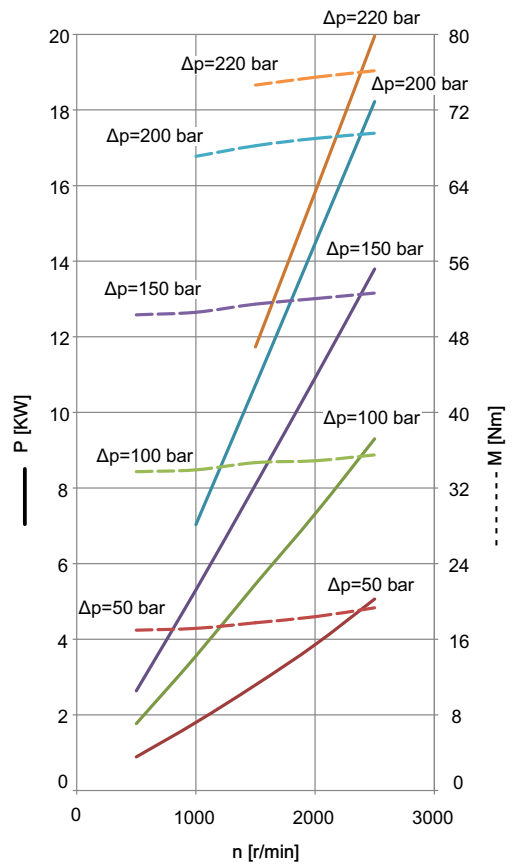
Oil viscosity: 37 mm<sup>2</sup>/s  
 Oil temperature: 40°C



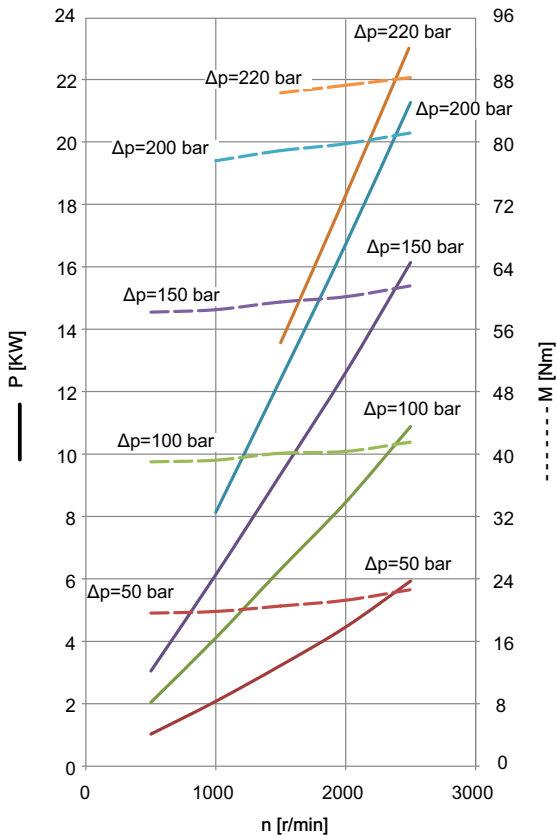
AP212/15



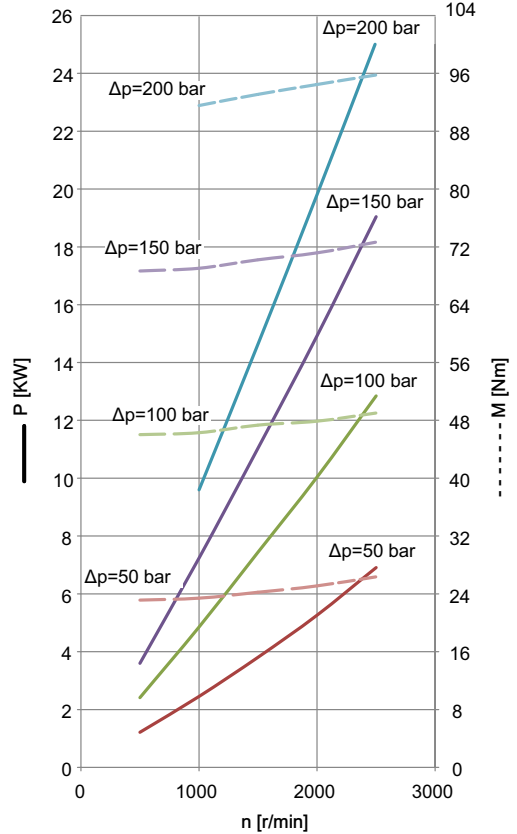
AP212/19



AP212/22



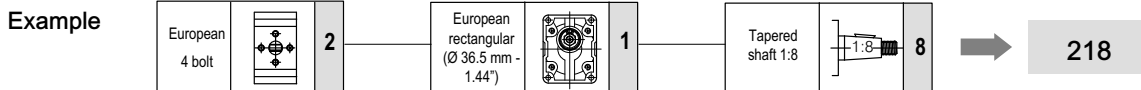
AP212/26



## 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




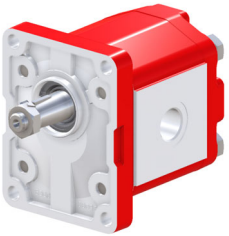
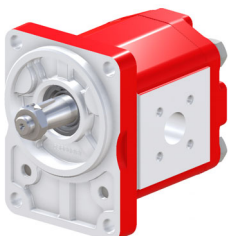

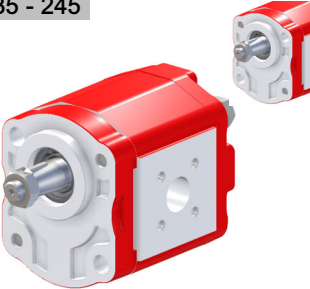
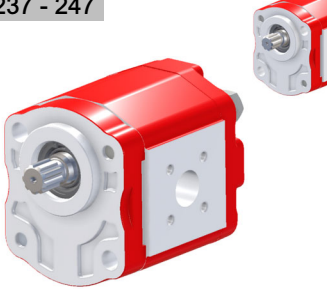

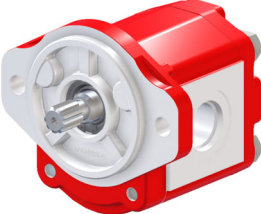
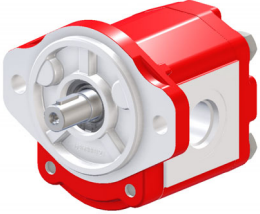

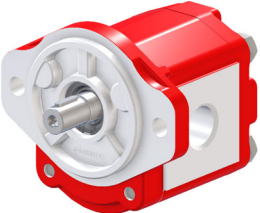
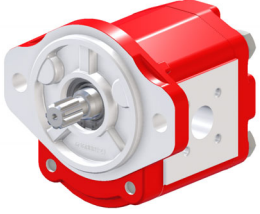
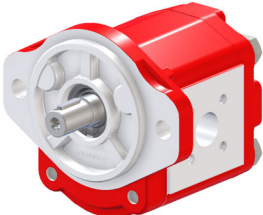

In the next pages, front, rear cover, and seals materials are listed for each pump series.

For ordering purposes, it is enough to outline the complete pump description (for example: AP212/4.5 D 218).

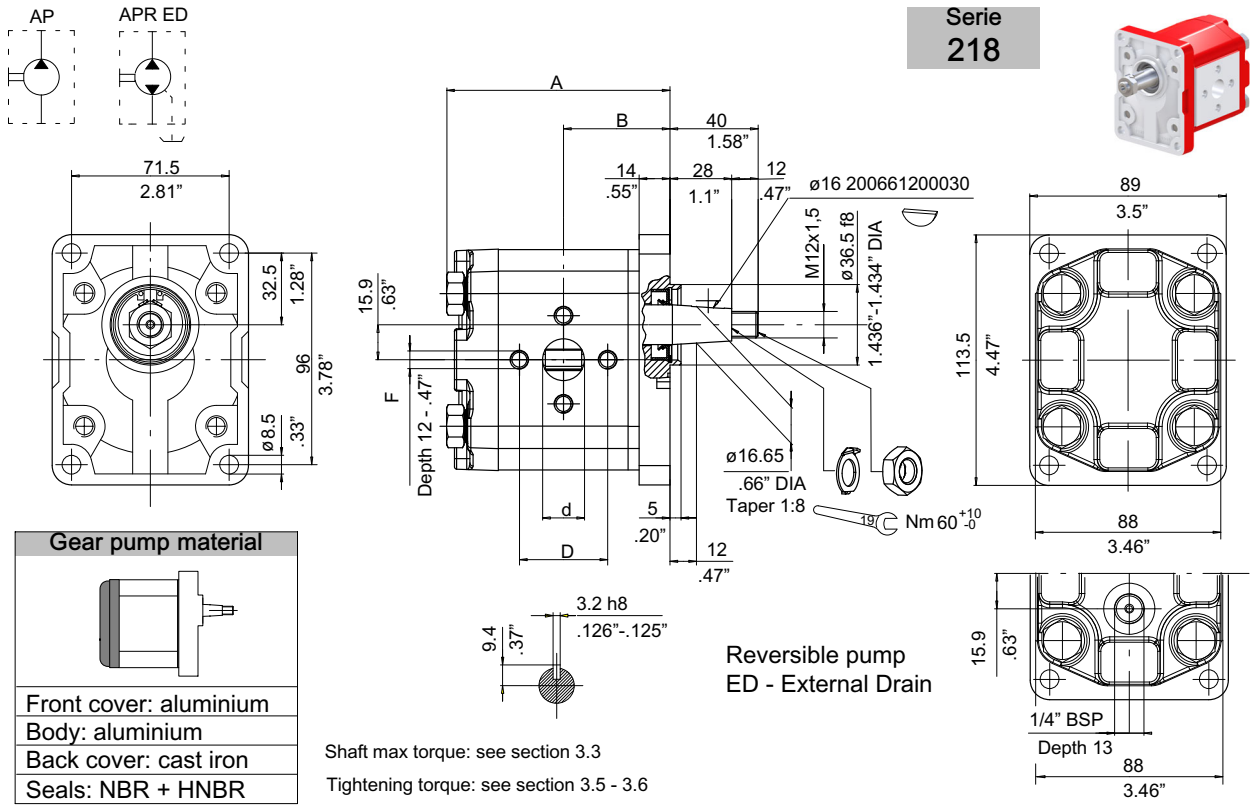
In case of a different configuration request (or a combination of different features, such as port threads, front flange materials, etc.), the description configurator shown in section 3.1 can be easily used.

### 2.1 Standard configuration

Port type			Aluminium front cover type			Drive shaft		
European 4 bolts flanged		2	European rectangular (Ø 36.5 mm - 1.44")		1	Tapered shaft 1:8		8
German 4 bolts flanged		2	German rectangular (Ø 80 mm - 3.15 inches)		2	Tapered shaft 1:5		5
BSPB Threaded ports		8	Through 2 bolts (Ø 50 mm - 1.97")		3	Tang drive 8 mm - 0.32 inches		9
SAE Threaded ports		8	Through 2 bolts (Ø 50 mm - 1.97")		4	9 Teeth external spline B17X14 DIN5482		7
NPTF Threaded ports		8	Through 2 bolts (Ø 52 mm - 2.045")		5	9 teeth external spline SAE J 498-9T 16/32 DP		7S
			SAE-A 2 bolts (Ø 82.55 mm - 3.25 inches)		8	Straight keyed Ø 15,85 mm - 0.62 inches		0
			Cast iron front cover type					
			SAE-B 2 bolts (Ø 101,6 mm - 4 inches)		8			

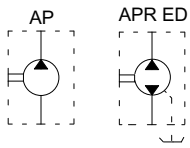
Serie	page	Serie	page	Serie	page
<b>218</b>	15	<b>818</b>	16	<b>225</b>	17
					
<b>227</b>	18	<b>235 - 245</b>	19 20	<b>237 - 247</b>	21 22
					
<b>259</b>	23	<b>887S</b>	24	<b>880</b>	25
					
<b>887S-NPTF</b>	26	<b>880-NPTF</b>	27	<b>287S-B</b>	28
					
<b>280-B</b>	29	<b>287S-SAEB</b>	30		
					

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

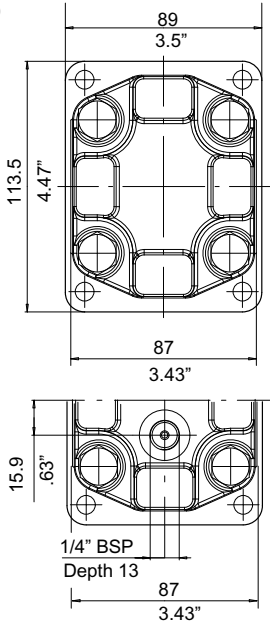
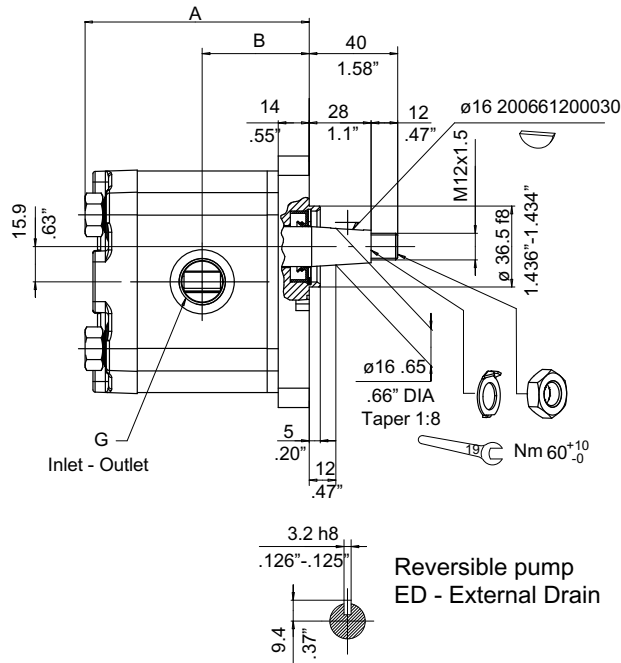
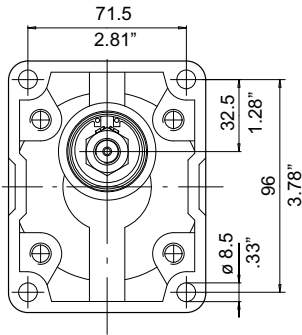
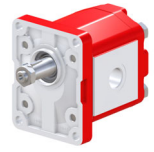


Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction					Pressure				
	AP212	AP212LN	A mm	inch	B mm	inch	d mm	inch	D mm	inch	F mm	d mm	inch	D mm	inch	F mm
4.5	4.4	4.5	89	3.50	43.3	1.70	13.5	.53	30	1.18	M6X1	13.5	.53	30	1.18	M6X1
6.5	6.4	6.6	92	3.62	44.8	1.76										
8.5	8.4	8.7	95	3.74	46.3	1.82										
11	11.1	11.5	99	3.90	48.3	1.90										
15	15.1	15.7	105	4.13	51.3	2.02	19	.75	40	1.58	M8X1.25	19	.75	40	1.58	M8X1.25
19	19.2	19.8	111	4.37	54.3	2.14										
22	22.2	23	116	4.57	56.5	2.22										
26	26.2	27.1	122	4.80	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



Serie  
**818**



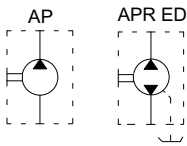
Gear pump material	
Front cover:	aluminium
Body:	aluminium
Back cover:	cast iron
Seals:	NBR + HNBR

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

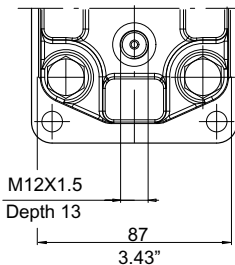
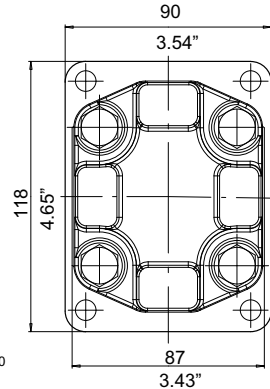
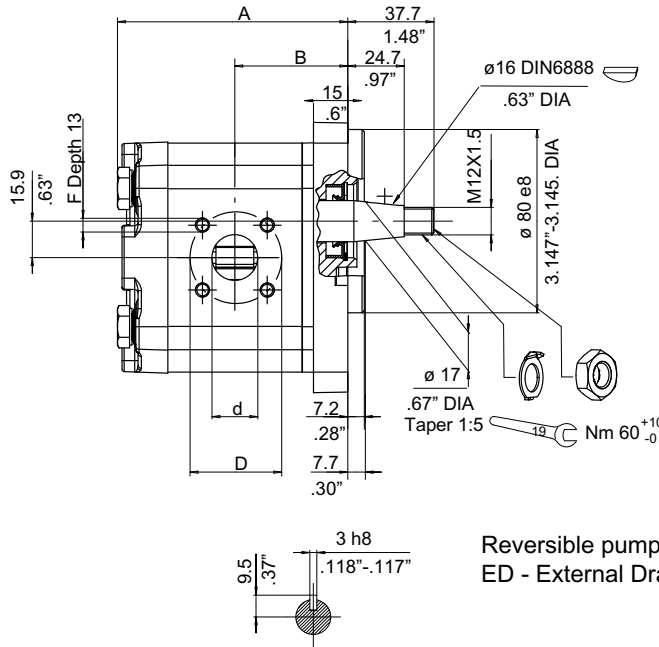
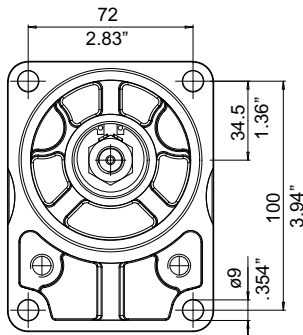
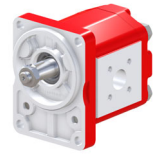
Type	Displacement cm <sup>3</sup> /rev		Dimensions					Suction	Pressure
	AP212	AP212LN	mm	inch	inch	mm	inch	G BSPP	G BSPP
4.5	4.4	4.5	89	3.50	3.70	43.3	1.70	3/8"	3/8"
6.5	6.4	6.6	92	3.62	3.82	44.8	1.76		
8.5	8.4	8.7	95	3.74	3.94	46.3	1.82		
11	11.1	11.5	99	3.90	4.09	48.3	1.90	1/2"	
15	15.1	15.7	105	4.13	4.33	51.3	2.02		
19	19.2	19.8	111	4.37	4.49	54.3	2.14	3/4"	1/2"
22	22.2	23	116	4.57	4.65	56.5	2.22		
26	26.2	27.1	122	4.80	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





Serie  
225

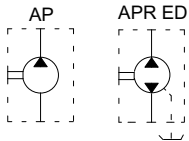


Gear pump material	
Front cover: aluminium	
Body: aluminium	
Back cover: cast iron	
Seals: NBR + HNBR	

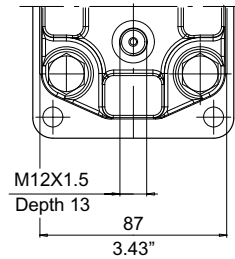
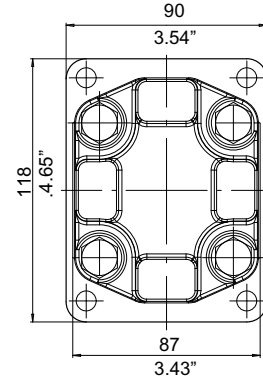
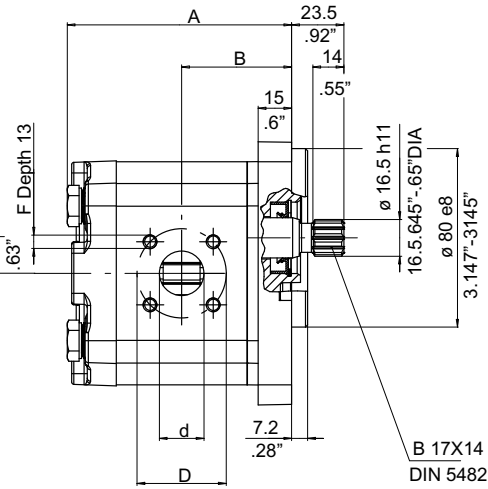
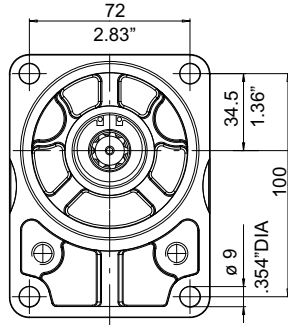
Shaft max torque: see section 3.3  
Tightening torque: see section 3.5 - 3.6

Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction				Pressure					
	AP212	AP212LN	A mm	inch	B mm	inch	d mm	inch	D mm	inch	F mm	d mm	inch	D mm	inch	F 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	40	1.58	M6X1	15	.59	35	1.38	M6X1
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



Serie  
227



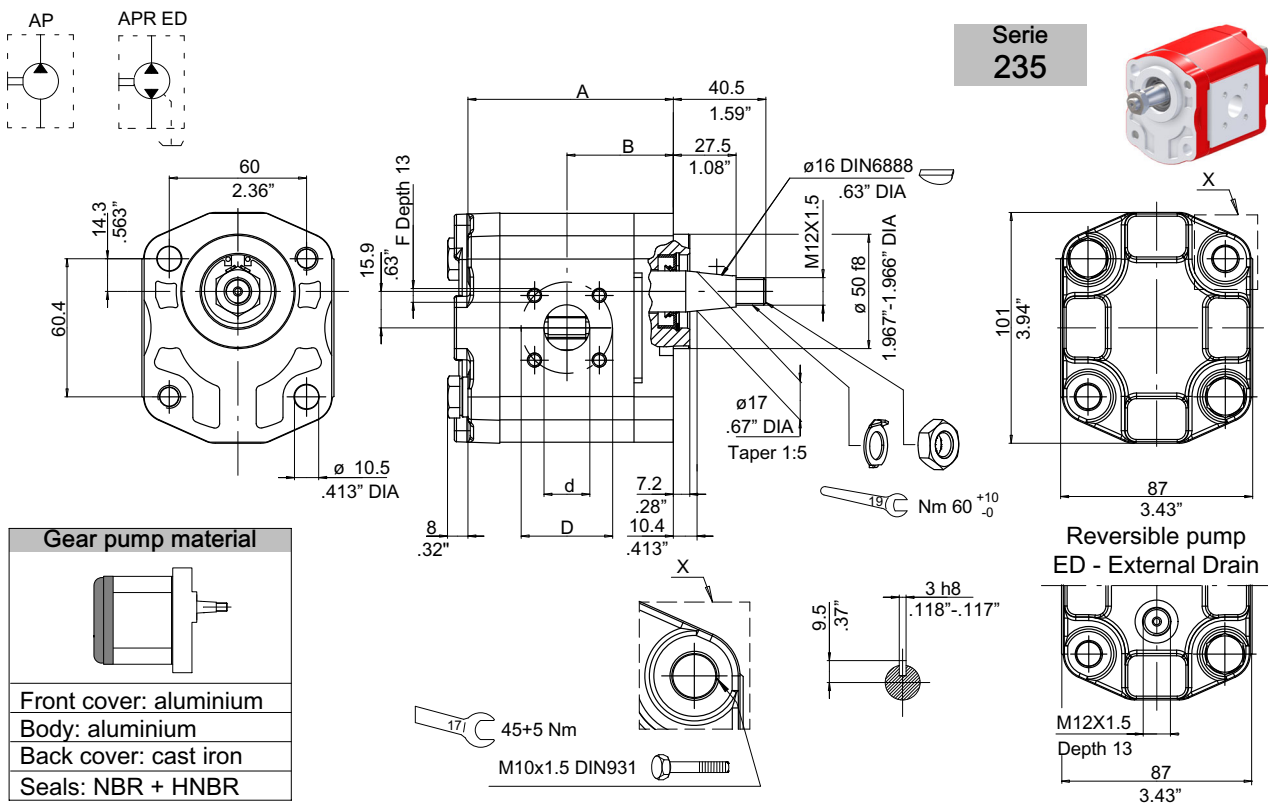
Gear pump material	
Front cover: aluminium	
Body: aluminium	
Back cover: cast iron	
Seals: NBR + HNBR	

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

Reversible pump  
ED - External Drain

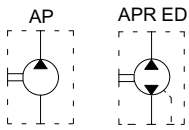
Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction					Pressure				
	AP212	AP212LN	A		B		d		D		F	d		D		F
			mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
4.5	4.4	4.5	91	3.85	44.3	1.74	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	94	3.70	45.8	1.80										
8.5	8.4	8.7	97	3.82	47.3	1.86										
11	11.1	11.5	101	3.98	49.3	1.94	20	.79	40	1.58	M6X1	15	.59	35	1.38	M6X1
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

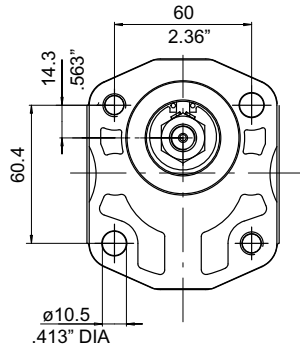
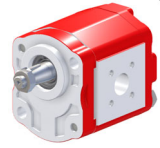


Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction					Pressure				
	AP212	AP212LN	A mm	inch	B mm	inch	d mm	inch	D mm	inch	F mm	d mm	inch	D mm	inch	F mm
4.5	4.4	4.5	80	3.15	41.5	1.63	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	83	3.27	43	1.69										
8.5	8.4	8.7	86	3.39	44.5	1.75										
11	11.1	11.5	90	3.54	46.5	1.83	20	.79	40	1.58	M6X1	15	.59	35	1.38	M6X1
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	APR212/6.5LN 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	AP212/26LN D 235	AP212/26 S 235	AP212/26LN S 235	APR212/26 ED 235	APR212/26LN ED 235

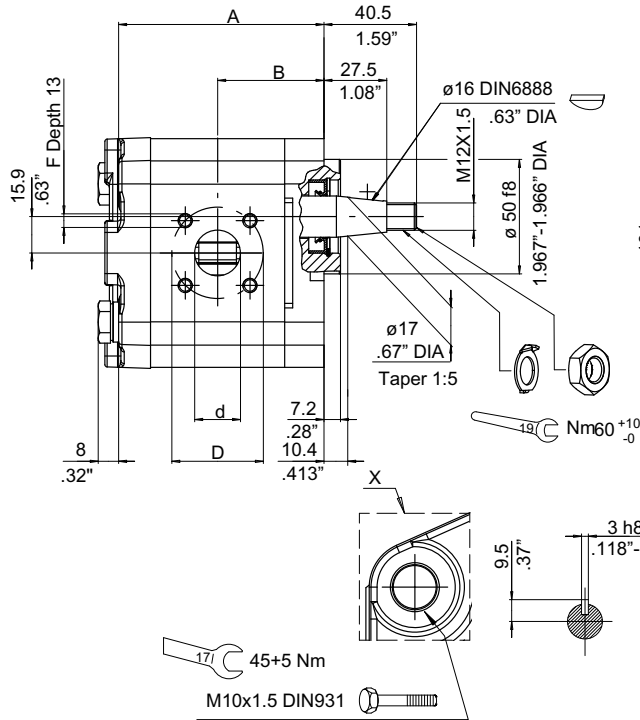


Serie  
**245**

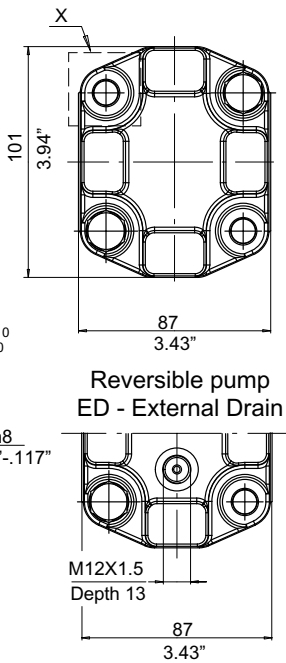


Gear pump material	
	Front cover: aluminium
	Body: aluminium
	Back cover: cast iron
	Seals: NBR + HNBR

Shaft max torque: see section 3.3



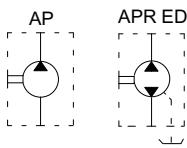
Tightening torque: see section 3.5 - 3.6



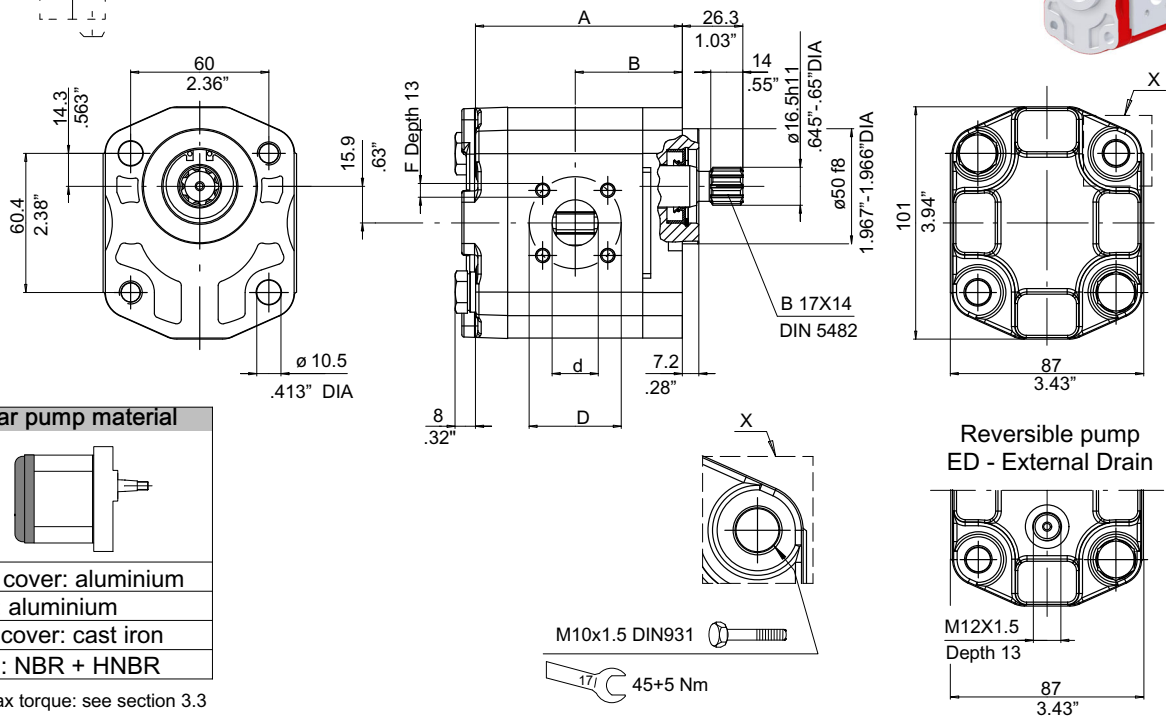
Reversible pump  
ED - External Drain

Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction				Pressure					
	AP212	AP212LN	mm	inch	mm	inch	d	D	F	d	D	F	d	D	F	
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	40	1.58	M6X1	15	.59	35	1.38	M6X1
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
AP212/26 D 245	AP212/26LN D 245	AP212/26 S 245	AP212/26LN S 245	APR212/26 ED 245	APR212/26LN ED 245



Serie  
**237**



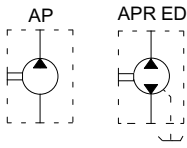
Gear pump material	
Front cover: aluminium	
Body: aluminium	
Back cover: cast iron	
Seals: NBR + HNBR	

Shaft max torque: see section 3.3

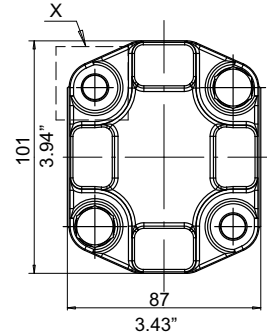
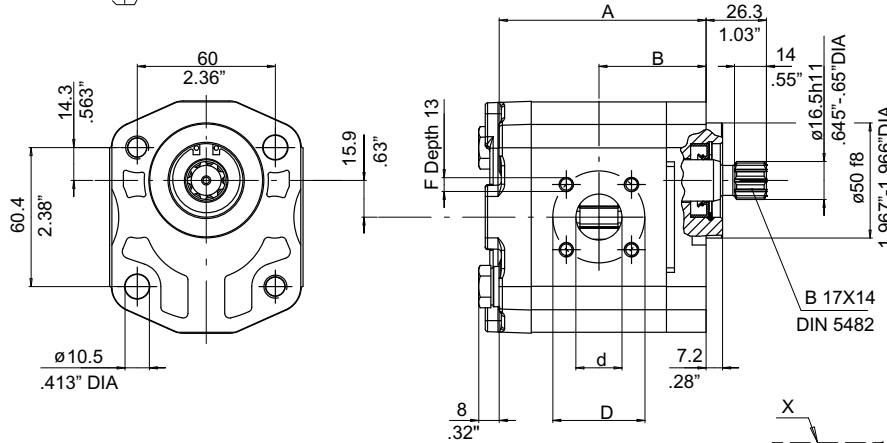
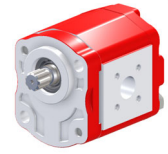
Tightening torque: see section 3.5 - 3.6

Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction			Pressure						
	AP212	AP212LN	A		B		d		D		F	d		D		F
			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	40	1.58	M6X1	15	.59	35	1.38	M6X1
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										

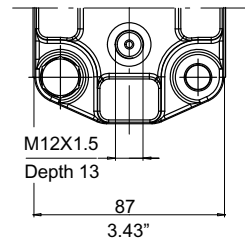
Clockwise rotation: D		Counter-clockwise rotation: S		Reversible pump External Drain	
Standard	Low Noise	Standard	Low Noise	Standard	Low Noise
AP212/4.5 D 237	AP212/4.5LN D 237	AP212/4.5 S 237	AP212/4.5LN S 237	APR212/4.5 ED 237	APR212/4.5LN ED 237
AP212/6.5 D 237	AP212/6.5LN D 237	AP212/6.5 S 237	AP212/6.5LN 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



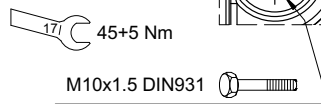
Serie  
247



Reversible pump  
ED - External Drain



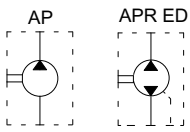
Gear pump material	
Front cover: aluminium	
Body: aluminium	
Back cover: cast iron	
Seals: NBR + HNBR	



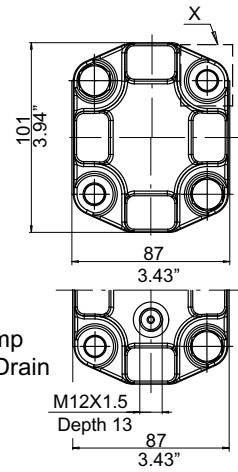
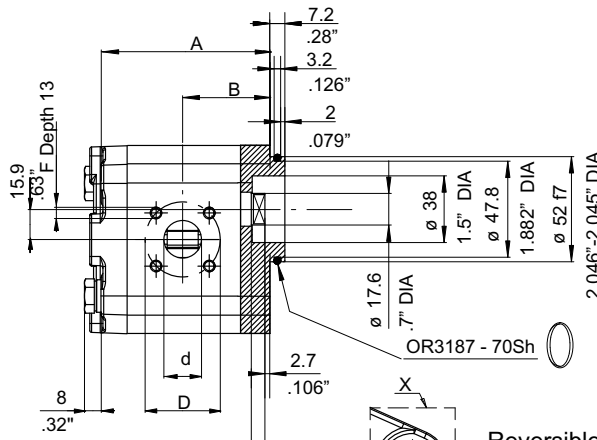
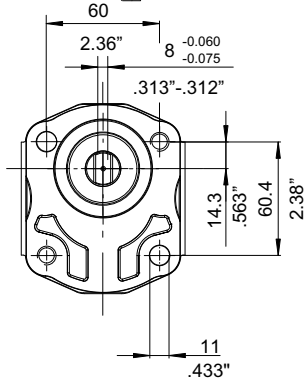
Shaft max torque: see section 3.3  
Tightening torque: see section 3.5 - 3.6

Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction			Pressure						
	AP212	AP212LN	A mm	A inch	B mm	B inch	d mm	d inch	D mm	D inch	F mm	d mm	d inch	D mm	D inch	F 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	40	1.58	M6X1	15	.59	35	1.38	M6X1
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



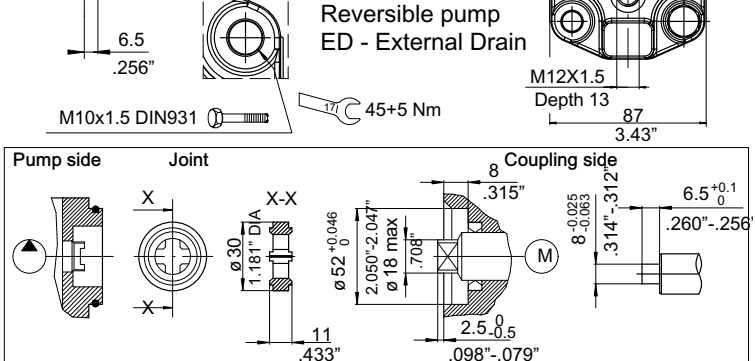
Serie  
**259**



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

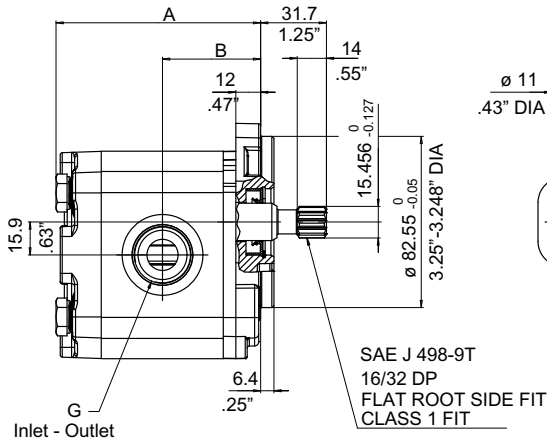
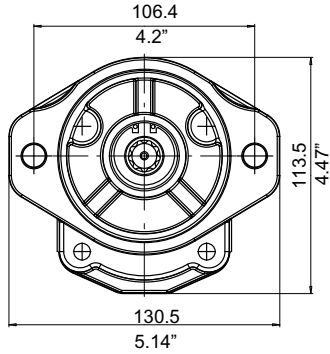
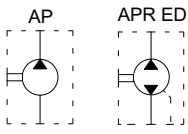
Gear pump material	
Front cover: aluminium	
Body: aluminium	
Back cover: cast iron	
Seals: NBR + HNBR	

Pump	Max pressure (T max= 65 Nm)		
	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)

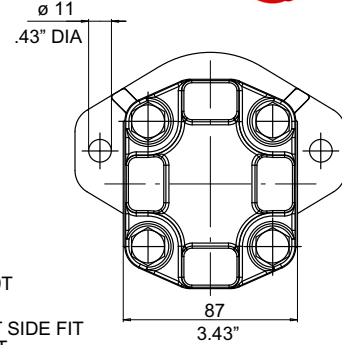


Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction			Pressure									
	AP212	AP212LN	A		B		d		D		F		d		D		F		
			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.5	4.4	4.5	80	3.15	41.5	1.63													
6.5	6.4	6.6	83	3.27	43	1.69	15	.59											
8.5	8.4	8.7	86	3.39	44.5	1.75													
11	11.1	11.5	90	3.54	46.5	1.83			40	1.58	M6X1	15	.59	35	1.38			M6X1	
15	15.1	15.7	96	3.78	49.5	1.95													
19	19.2	19.8	102	4.02	52.5	2.07	20	.79											
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	AP212/6.5LN 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



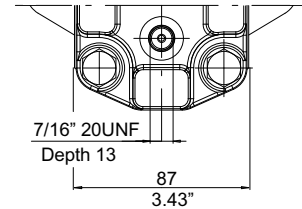
Serie 887S



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 3.5 - 3.6

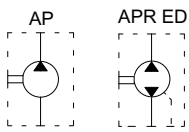
Reversible pump  
ED - External Drain



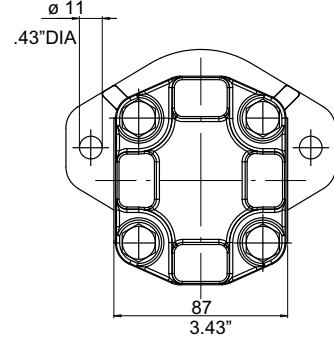
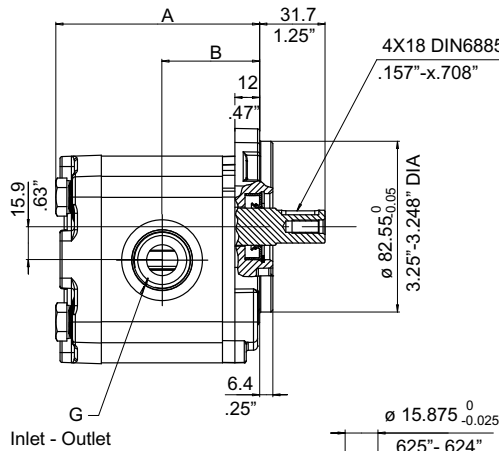
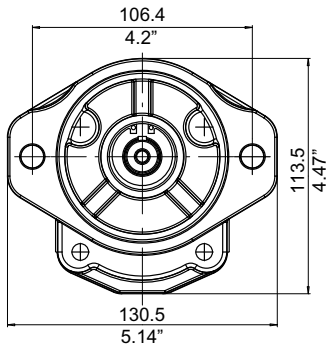
Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction G UNF	Pressure G UNF
	AP212	AP212LN	A		B			
			mm	inch	mm	inch		
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1-1/16" 12 (SAE12)	7/8" 14 (SAE10)
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87		
15	15.1	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





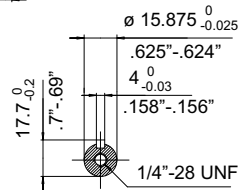
Serie  
880



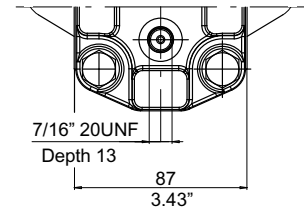
**Gear pump material**

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

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

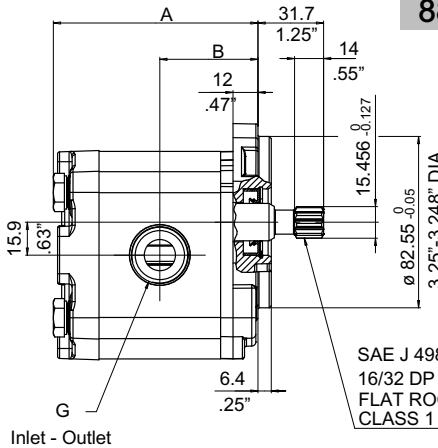
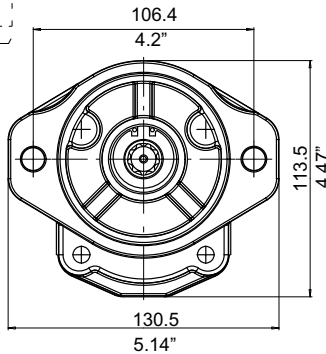
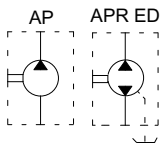


Reversible pump  
ED - External Drain

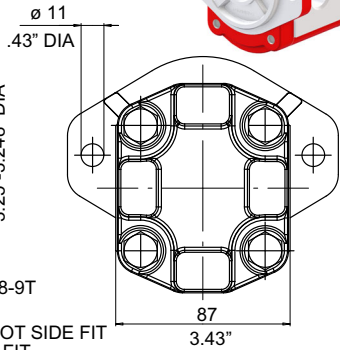


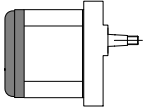
Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction G UNF	Pressure G UNF
	AP212	AP212LN	A		B			
			mm	inch	mm	inch		
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1-1/16" 12 (SAE12)	7/8" 14 (SAE10)
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87		
15	15.1	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



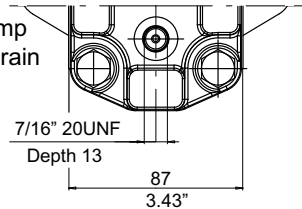
Serie  
**887S-NPTF**



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

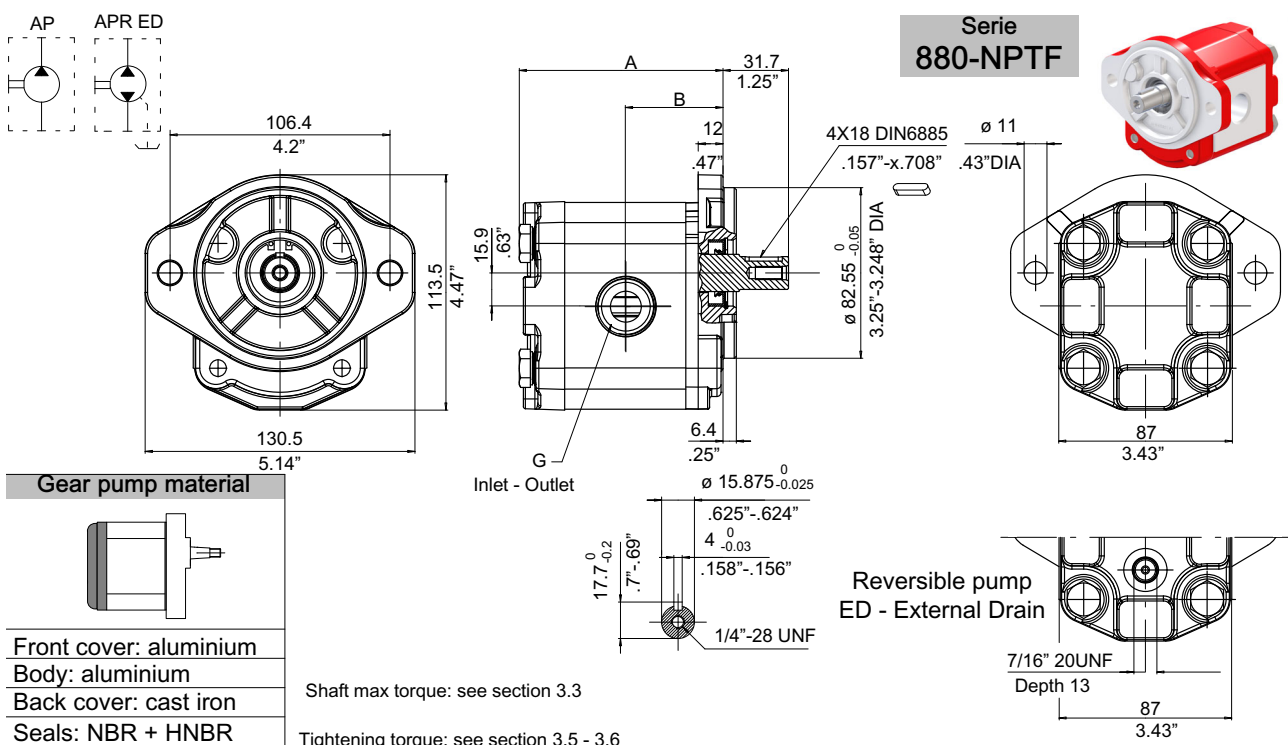
Shaft max torque: see section 3.3  
Tightening torque: see section 3.5 - 3.6

Reversible pump  
ED - External Drain



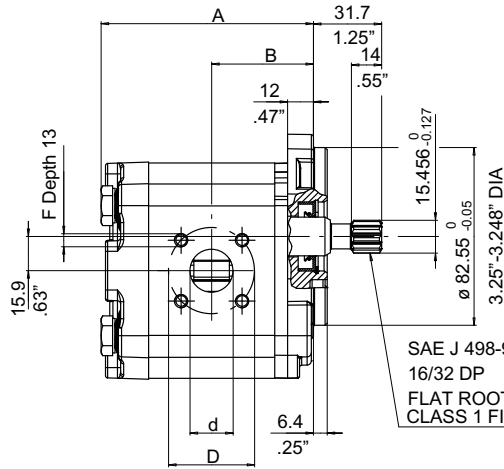
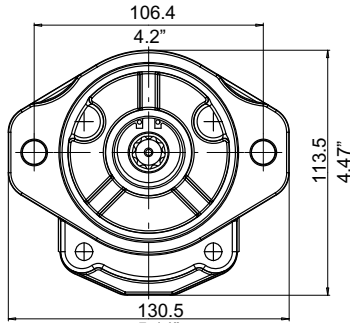
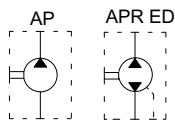
Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction G NPTF	Pressure G NPTF
	AP212	AP212LN	A		B			
			mm	inch	mm	inch		
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1/2"	1/2"
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87	3/4"	1/2"
15	15.1	15.7	104.5	4.11	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

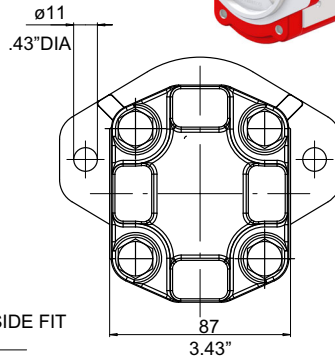
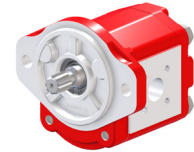


Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction G NPTF	Pressure G NPTF
	AP212	AP212LN	A		B			
			mm	inch	mm	inch		
4.5	4.4	4.5	88.5	3.48	42.5	1.67	1/2"	1/2"
6.5	6.4	6.6	91.5	3.60	44	1.73		
8.5	8.4	8.7	94.5	3.72	45.5	1.79		
11	11.1	11.5	98.5	3.88	47.5	1.87	3/4"	1/2"
15	15.1	15.7	104.5	4.11	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



**Series  
287S-B**



Reversible pump  
ED - External Drain

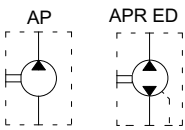
**Gear pump material**

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

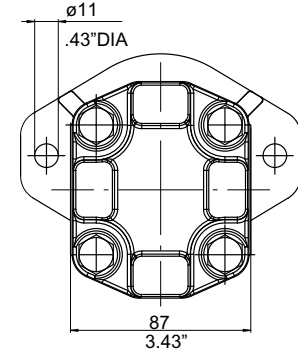
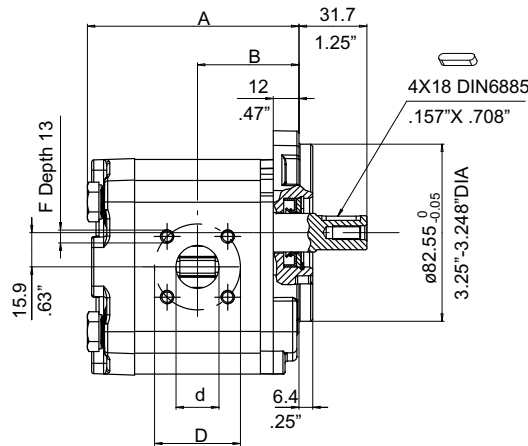
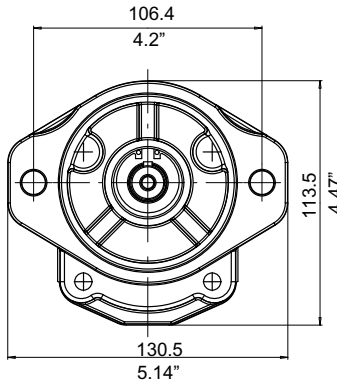
Shaft max torque: see section 3.3  
Tightening torque: see section 3.5 - 3.6

Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction			Pressure						
	AP212	AP212LN	A mm	A inch	B mm	B inch	d mm	d inch	D mm	D inch	F mm	d mm	d inch	D mm	D inch	F 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	40	1.58	M6X1	15	.59	35	1.38	M6X1
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 D 287S-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



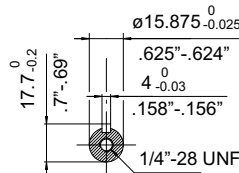
Serie  
280-B



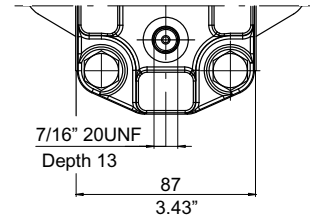
**Gear pump material**

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

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

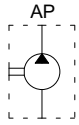


Reversible pump  
ED - External Drain

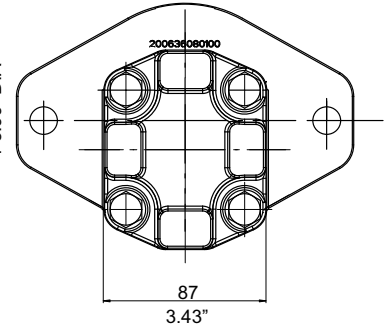
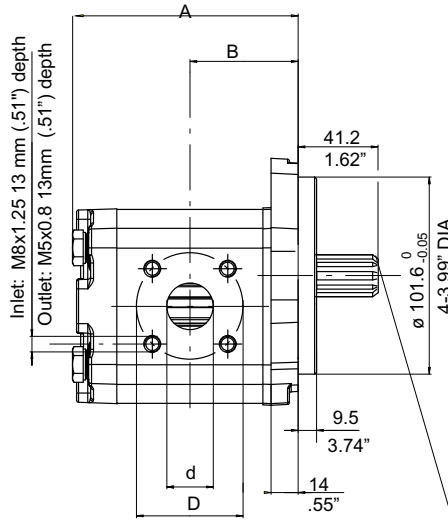
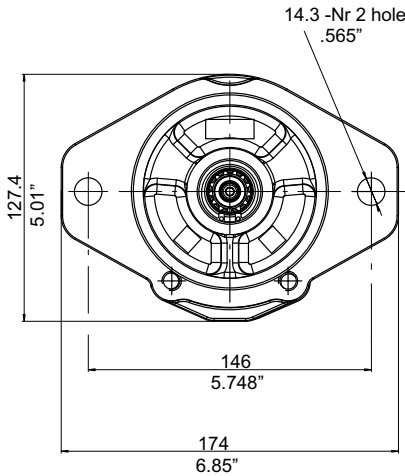


Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction			Pressure						
	AP212	AP212LN	A mm	inch	B mm	inch	d mm	inch	D mm	inch	F mm	d mm	inch	D mm	inch	F mm
4.5	4.4	4.5	88.5	3.48	42.5	1.67	15	.59	40	1.58	M6X1	15	.59	35	1.38	M6X1
6.5	6.4	6.6	91.5	3.60	44	1.73										
8.5	8.4	8.7	94.5	3.72	45.5	1.79										
11	11.1	11.5	98.5	3.88	47.5	1.87	20	.79	40	1.58	M6X1	15	.59	35	1.38	M6X1
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



Serie  
**287S-SAEB**



SAE J 498-13T  
16/32 DP  
FLAT ROOT SIDE FIT  
CLASS 1 FIT.

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

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



Attention! It is not possible to change the rotation direction. Please order always with the right code

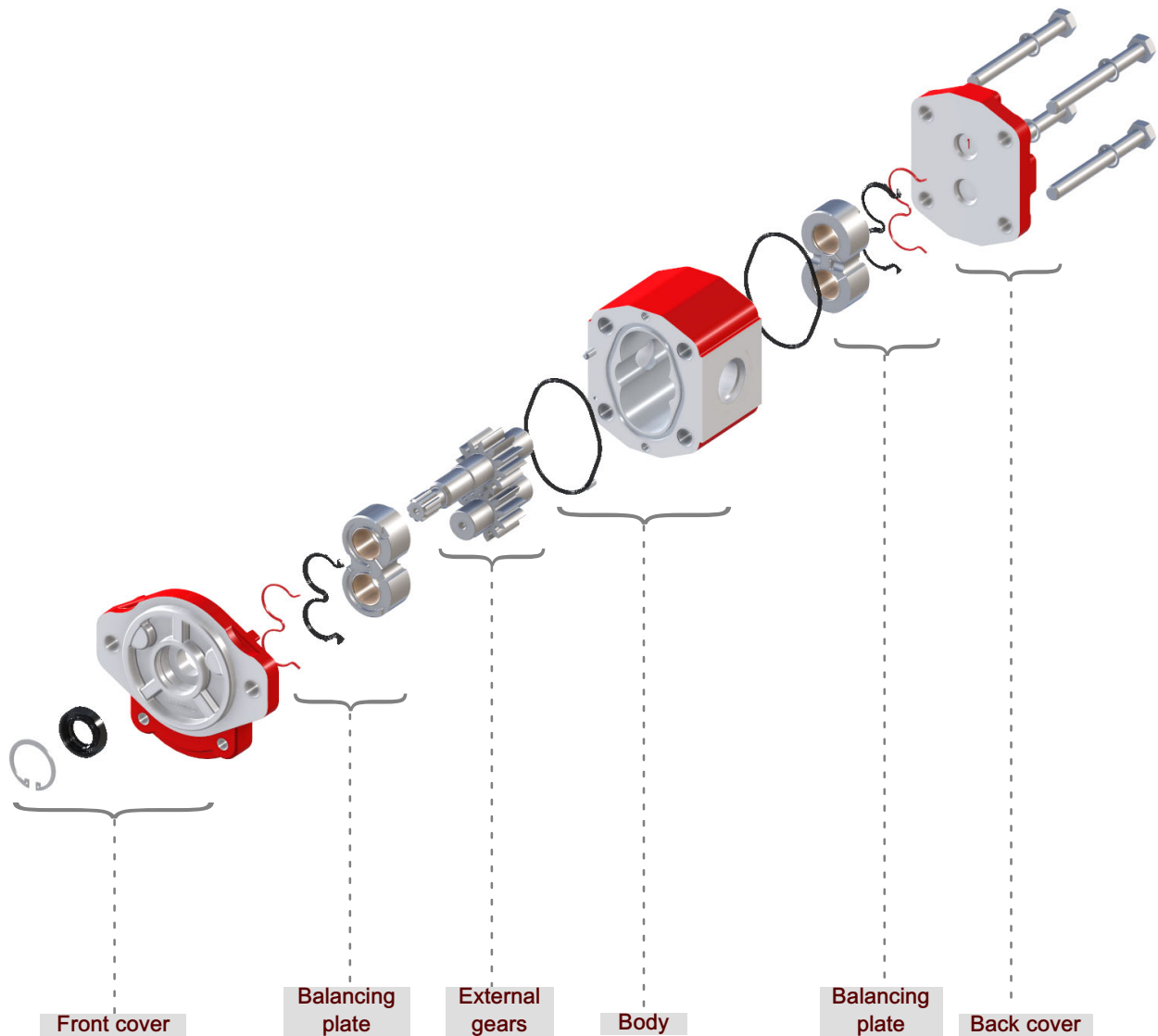
Type	Displacement cm <sup>3</sup> /rev		Dimensions				Suction					Pressure				
	AP212	AP212LN	A		B		d		D		F	d		D		F
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	mm	inch	mm	inch	mm
19	19.2	19.8	110.5	4.35	53.5	2.11	24	.95	55	2.17	M8x1	15	.59	35	1.38	M5x0.8
22	22.2	23	115	4.53	55.5	2.18										
26	26.2	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

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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.

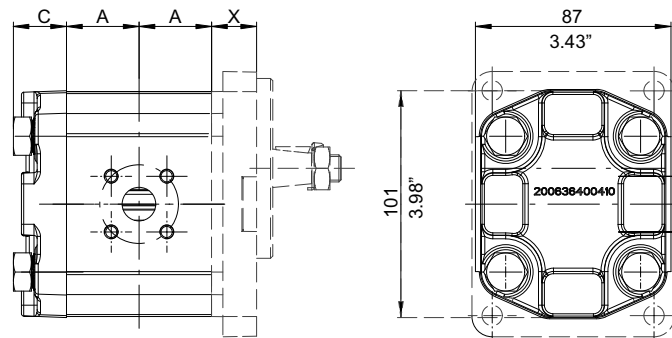
### 3.1 Single pump customised versions order example

A	P	R	2	1	2	/	4	.	5	L	N	-	-	A	0	S	-	1	C	-	G	H	-	A	*
<div style="border: 1px solid black; padding: 5px;"> <p><b>Function</b>            AP= single gear pump - unidirectional            APR = single gear pump - reversible</p> <p><b>Series</b>            212</p> <p><b>Displacement</b>            4.5= 4.4 cm<sup>3</sup>/rev            6.5= 6.4 cm<sup>3</sup>/rev            8.5= 8.4 cm<sup>3</sup>/rev            11= 11.1 cm<sup>3</sup>/rev            15= 15.1 cm<sup>3</sup>/rev            19= 19.2 cm<sup>3</sup>/rev            22= 22.2 cm<sup>3</sup>/rev            26= 26.2 cm<sup>3</sup>/rev</p> <p><b>Version</b>            Omitted if 12 teeth standard            LN= 12 teeth Low Noise version</p> <p><b>Rotation</b>            S = left-hand rotation            D = Right-hand rotation            Omitted if reversible version</p> <p><b>Shaft end code</b>            see section 3.3</p> <p><b>Shaft seal material type code</b>            see section 3.4.1</p> <p><b>Front cover series/material with/without bearing code</b>            see section 3.4.2 and 3.4.3</p> <p><b>Type of ports code</b>            see section 3.5</p> <p><b>Inlet/outlet port size code combination</b>            see section 3.5</p> <p><b>Back cover type</b>            see section 3.6</p> <p><b>BHRE section :</b>            Version - Progressive number (omitted)</p> </div>																									






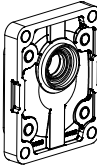
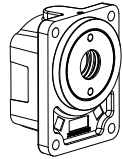
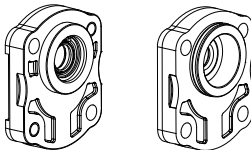
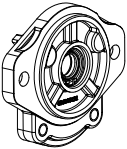
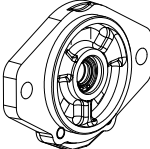
### 3.2 Single pump dimensions



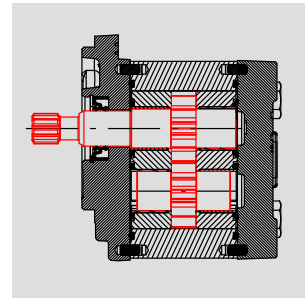
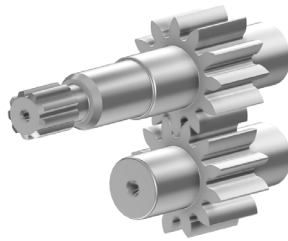
Pump size	A		C*	
	mm	inches	mm	inches
AP212/4.5	24.3	0.96	22	0.87
AP212/6.5	25.8	1.02		
AP212/8.5	27.3	1.08		
AP212/11	29.3	1.54		
AP212/15	32.3	1.27		
AP212/19	35.3	1.39		
AP212/22	37.6	1.48		
AP212/26	40.6	1.60		

C\*: dimensions with standard cast iron back cover with tie rod + nut.  
For other back covers dimension see section 3.6.

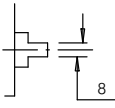
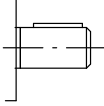
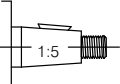
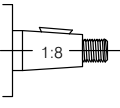
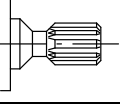
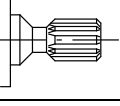
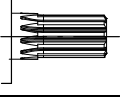
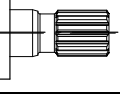
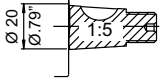
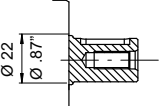
#### 3.2.1 Front cover dimensions

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 - V E 1 6 - A

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

### 3.4 Front cover

#### 3.4.1 Shaft seal material

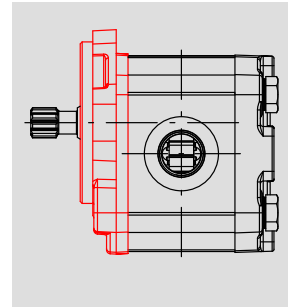


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	-	V	E	1	6	-	A	
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--



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



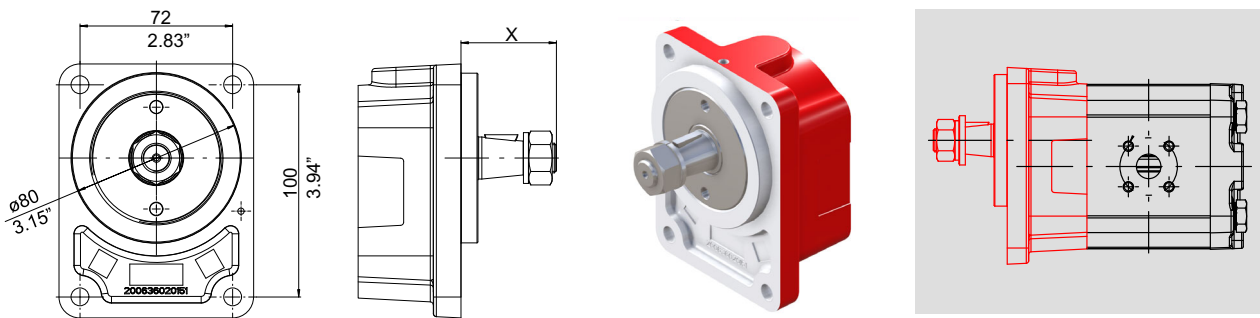
A P 2 1 2 / 8 . 5 - S - A 0 S - 1 C - V E 1 6 - A

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

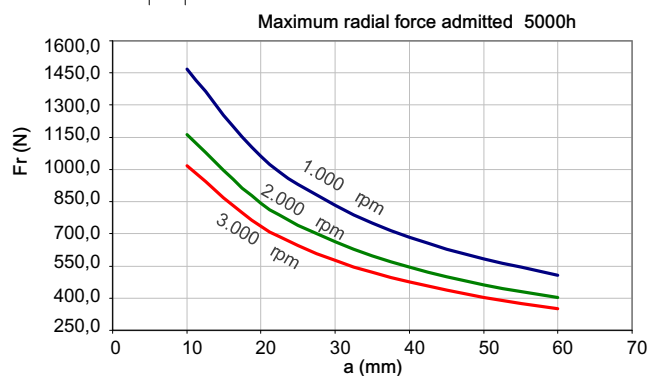
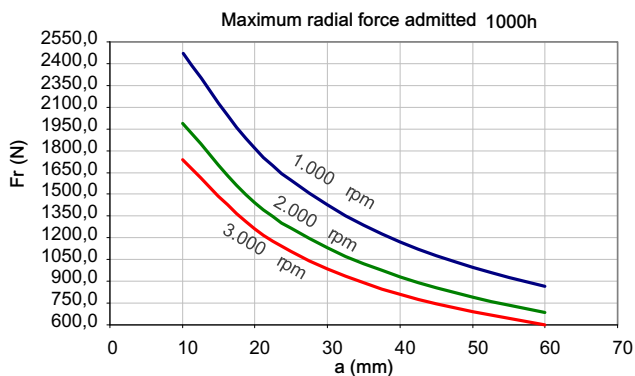
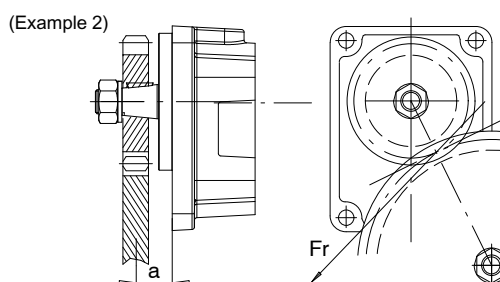
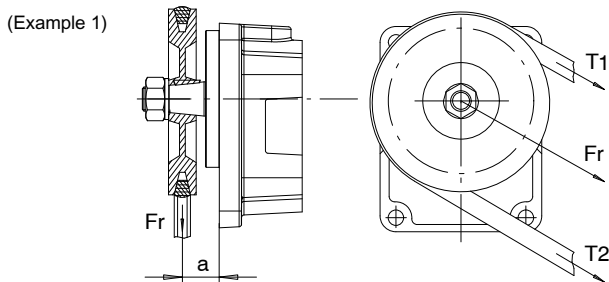


A	P	2	1	2	/	8	.	5	-	S	-	P	1	-	1	C	-	V	E	1	6	-	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

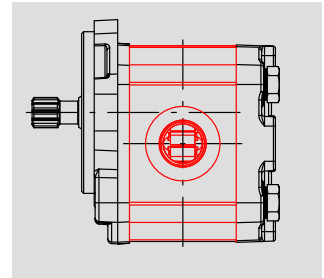
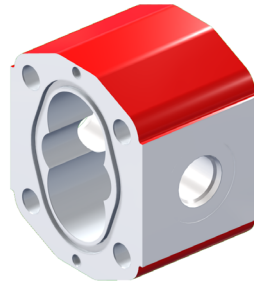
	+	 T max = 100 Nm X = 45 mm (1.77 inches)	+	Shaft seal material: HNBR	=	P1
	+	 T max = 100 Nm Straight 22 mm - 0.87 inches X = 48.5 mm (1.91 inches)	+	Shaft seal material: HNBR	=	C1

Front bearing should be utilized in presence of radial and/or axial load. 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 example 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.

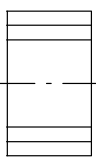


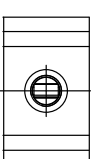
## 3.5 Body

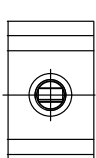


For reversible pumps alternative inlet and outlet ports have the same sizes as per inlet unidirectional rotation.

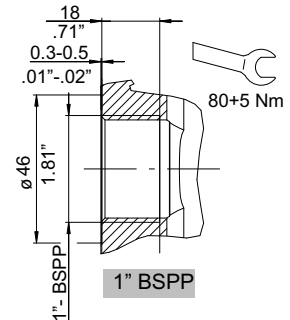
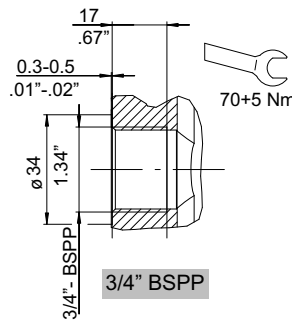
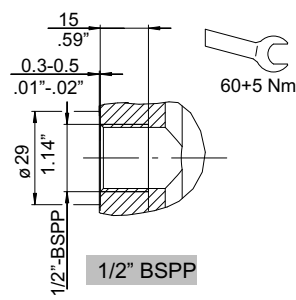
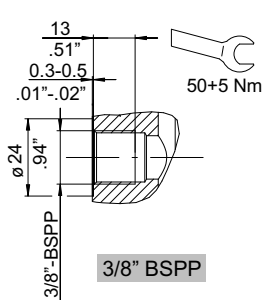
A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	-	V	E	1	6	-	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---


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

Port type	Ordering code	Displacement	Dimension (mm - inch)		Ordering code
			Suction	Pressure	
	metric	1	4.5-6.5-8.5	On demand	A
			11-15		B
			19-22-26		C
			19**-22**-26**		D

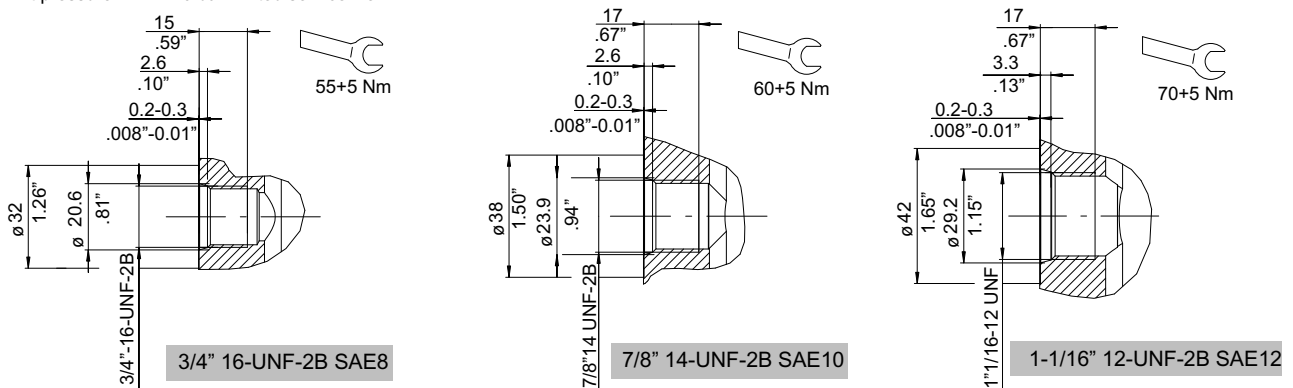
Port type	Ordering code	Displacement	Dimension (mm - inch)		Ordering code	
			Suction	Pressure		
	BSPP threaded ports	4	4.5-6.5-8.5	3/8"	3/8"	A
			11-15	1/2"	3/8"	B
			19-22-26	3/4"	1/2"	C
			19**-22**-26**	3/4"	1/2"	D

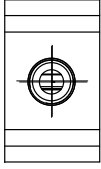
At pressure P2 > 210 bar limited service life



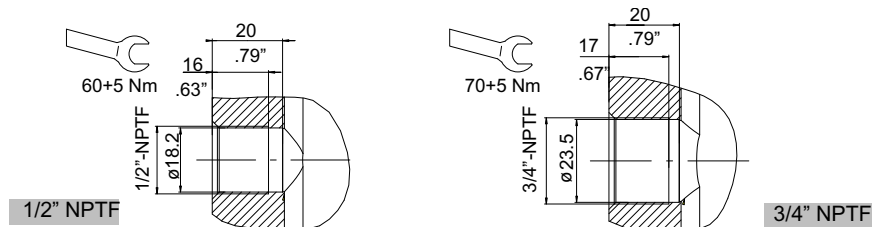
Port type	Ordering code	Displacement	Dimension (mm - inch)		Ordering code
			Suction	Pressure	
 SAE threaded ports	8	all	1-1/16" 12UNF (SAE12)	7/8" 14UNF (SAE10)	A
		4.5-6.5-8.5	3/4" 16UNF (SAE8)	3/4" 16UNF (SAE8)	B
		19** -22** -26**	1-1/16" 12UNF (SAE12)	7/8" 14UNF (SAE10)	D

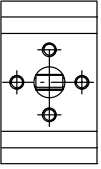
At pressure P2 > 210 bar limited service life

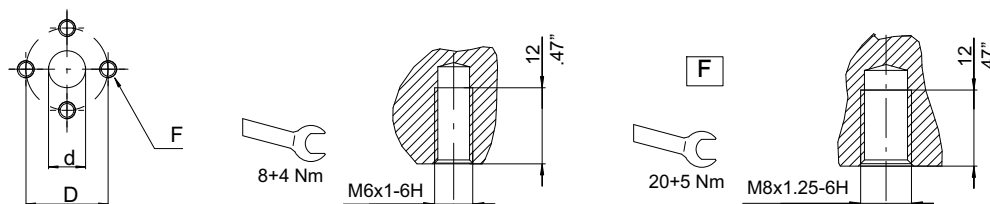



 NPTF threaded ports	6	4.5-6.5-8.5	1/2"	1/2"	A
		11-15-19-22-26	3/4"	1/2"	B
		19** -22** -26**	3/4"	1/2"	D

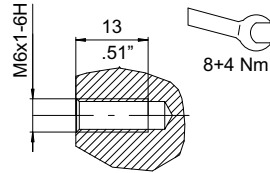
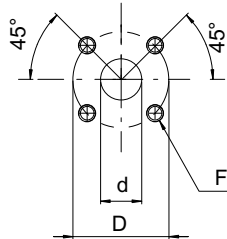
At pressure P2 > 210 bar limited service life



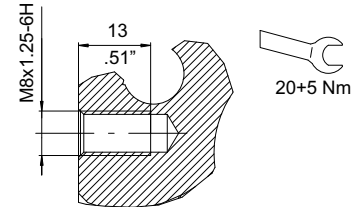
 European 4 bolt	3	4.5-6.5-8.5	13.5 - .53 (d) 30 - 1.18 (D) M6 (F)	13.5 - .53 (d) 30 - 1.18 (D) M6 (F)	A
		11-15	19 - .75 (d) 40 - 1.58 (D) M8 (F)	13.5 - .53 (d) 30 - 1.18 (D) M6 (F)	B
		19-22-26	19 - .75 (d) 40 - 1.58 (D) M8 (F)	19 - .75 (d) 40 - 1.58 (D) M8 (F)	C



Type	Ordering code	Displacement	Dimension (mm - inch)		Ordering code
			Suction	Pressure	
 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

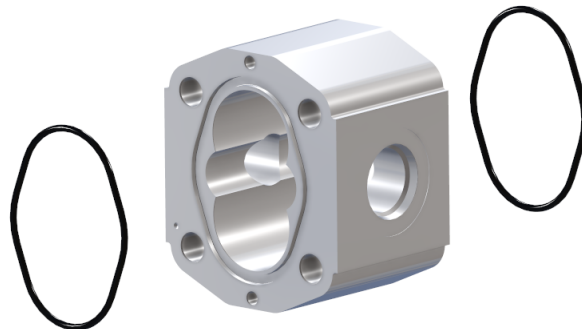


F



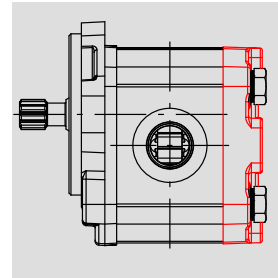
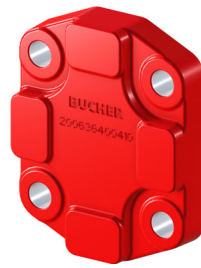
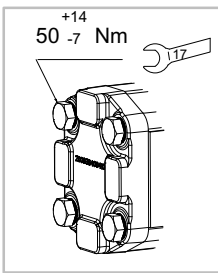
Other ports	9	If the requested port type is not included in the previous versions, please indicate number "9" and specify the details in the request note
-------------	---	---

### 3.5.1 Body seals material: HNBR (standard)

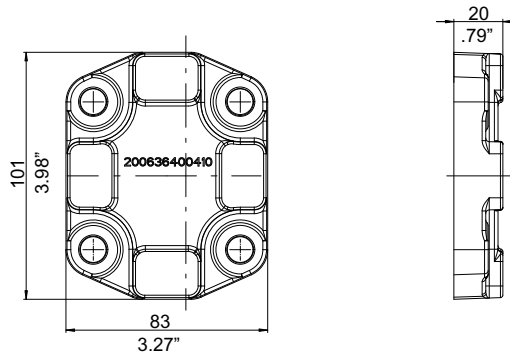




### 3.6 Back covers



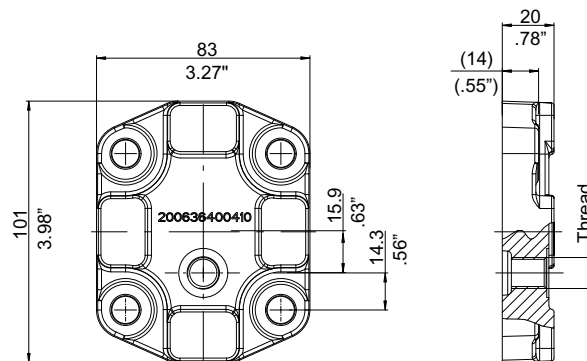
#### 3.6.1 Cast iron back cover - Standard version for unidirectional pump



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

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

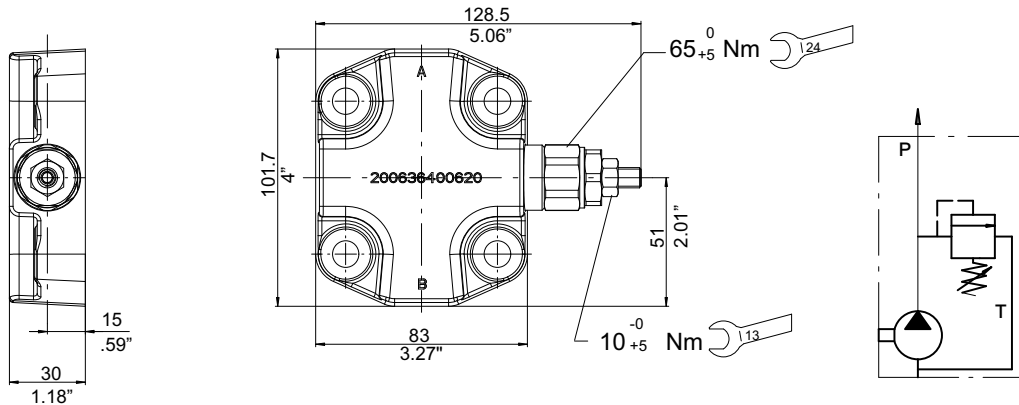
#### 3.6.2 Cast iron back cover with drain port - Standard version for bidirectional pump



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

Type	Thread	Tightening torque	Ordering code
Back cover with external drain line, cast iron material for reversible pump	1/4" BSP	30 <sup>-6</sup> <sub>+7</sub> Nm	G1 (Standard)
	SAE4	20 <sup>-5</sup> <sub>+5</sub> Nm	G2
	M12x1.5	30 <sup>-6</sup> <sub>+7</sub> Nm	G3

## 3.6.3 Cast iron back cover with relief valve VI



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

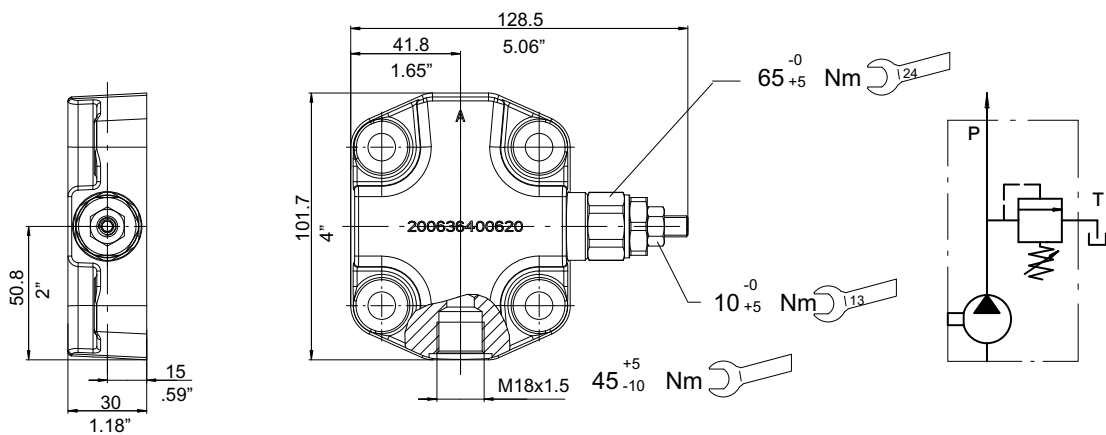
Type	Ordering code
Cast iron back cover with relief valve. Return to internal pump suction	VI**

\*\* 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	-	V	E	*	*	-	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

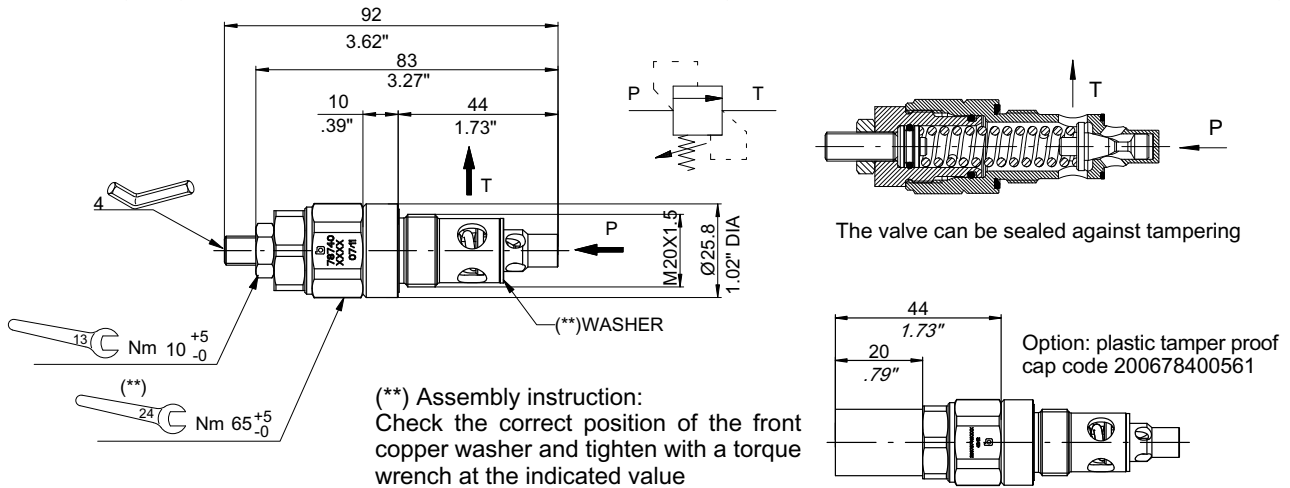
Type	Ordering code
Cast iron back cover with relief valve. Return to external pump tank	VE**

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

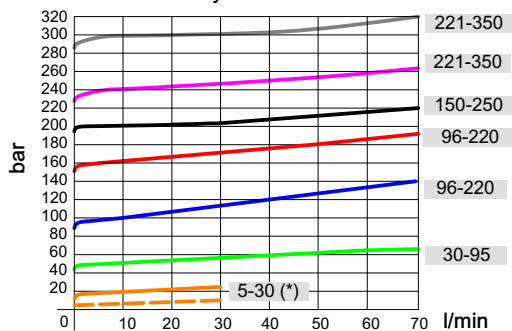
## 3.6.5 Pressure relief valve : \*\*VM01C VI\*\* and VE\*\* pressure setting range

Direct acting  
Balanced piston  
Adjustable setting  
Four setting ranges

Max. Pressure ..... 350 bar \*\*\*  
Max flow rate ..... 60 l/min.  
Temperature range ..... -20/+100 °C  
Weight: ..... 0.155 Kg.



Pressure viscosity characteristic 46 cSt at 40°C



(\*) see performances trace/minimum pressure setting (---)

The purpose of a relief valve is to keep the maximum system pressure at a safe level. When the external gear pump is supplied with pressure relief valves, the correct calibration is provided by Bucher Hydraulics S.p.A. and there are no reasons to change this value. When ordering, state in full the sheath part number, and, if the valve is to be supplied with sheath already fitted, the relief pressure setting required.

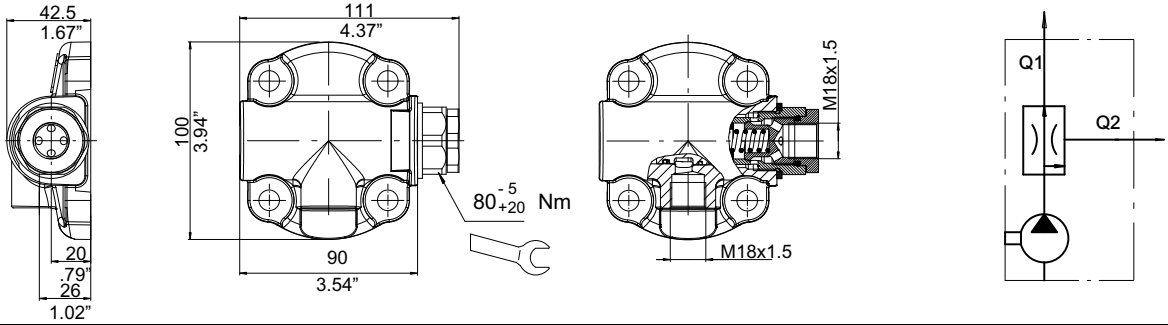
\*\*\* Maximum admitted pressure value: referred to valve only. For max admitted values see pump limits.

Performances	
Max. flow	60 l/min.
Pressure setting flow	5 l/min
Max internal leakage	200 cm <sup>3</sup> /min at 80% of nominal pressure setting
Oil viscosity	12 to 400 cSt
Oil temperature	-20 to 100 °C
Recommended filtration	21/19/16 (10 NAS 1638)
Marking info:	Printed code and date

Spring	Spring code	Setting range	Standard setting	Q max (l/min)	Type	Relief valve only code
00	-	Plugged	Without valve	-	00VC00	200978400140
02	200662403160	5 - 30 bar	20 bar	30 (*)	02VM01C	200787403600
05	200662403080	30 - 95 bar	50 bar	60	05VM01C	200787403480
12	200662403050	96 - 220 bar	120 bar	60	12VM01C	200787403420
15	200662403070	150 - 250 bar	150 bar	60	15VM01C	200787403470
23	200662403060	221 - 350 bar	230 bar	60	23VM01C	200787403430

Pressure setting valve referred to 5 l/min

### 3.6.6 Aluminium back cover with priority valve VP

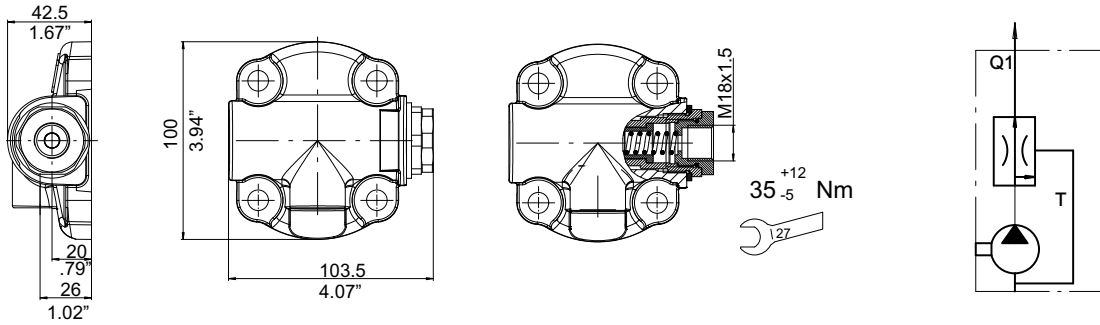


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	-	V	P	*	*	-	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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

Type (Pmax= 210 bar)	Ordering code	Standard setting value +15% / -10% (l/min)									
		02	03	05	06	08	10	13	16	20	24
Aluminium back cover with with priority valve	VP**	2.5	3.5	5	6	8.5	10.5	13	16	20	24

### 3.6.7 Aluminium back cover with flow regulator valve QI

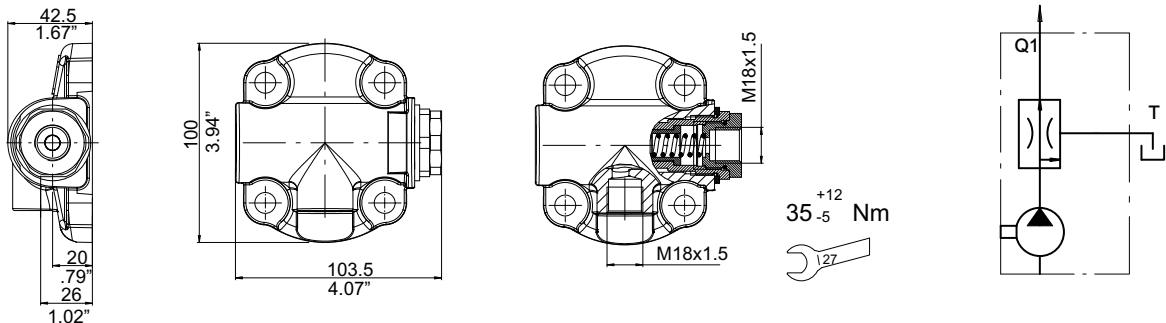


A	P	2	1	2	/	8	.	5	-	S	-	A	0	S	-	1	C	-	Q	I	*	*	-	A
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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

Type (Pmax= 210 bar)	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

### 3.6.8 Aluminium back cover with flow regulator valve QE



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

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

Type (Pmax= 210 bar)	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

## 4 Multiple gear pumps

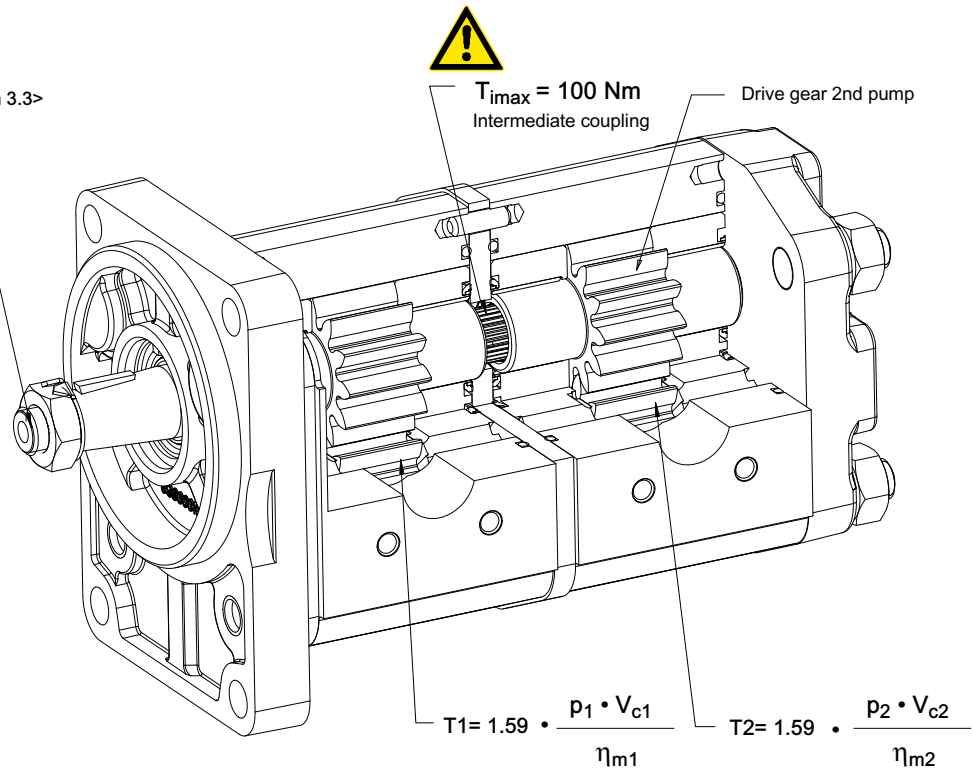
The multiple external gear pumps standard version includes an intermediate cover without shaft seal between the pumps.

If needed, it is possible to order a customised version with intermediate seal, see section 4.3.

### 4.1 Drive torque

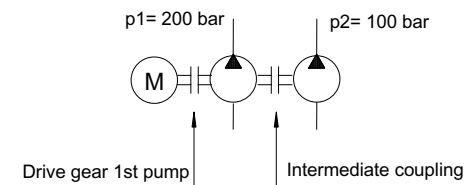
$$T_{\max} = T_1 + T_2 \text{ <see section 3.3>}$$

Drive gear 1st pump



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

Example: AP212/19 + AP212/15



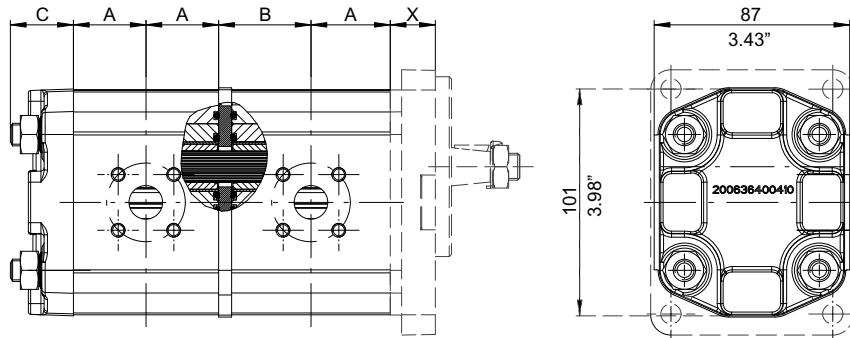
$$T_{\max} = 1.59 \cdot \frac{19.2 \cdot 200}{90} + 1.59 \cdot \frac{15.1 \cdot 100}{90} = 68 + 26.7 = 94.7 \text{ Nm}$$

$$T_{\max} = 94.7 \leq 130 \text{ Nm}$$

(taper 1:8)

$$T_2 = 26.7 \leq T_{\max} 100 \text{ Nm}$$

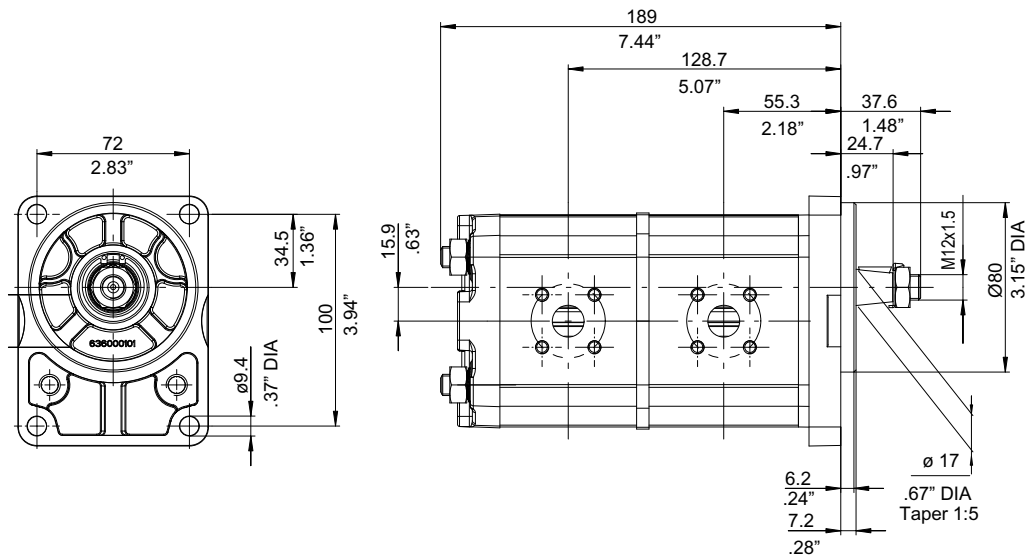
## 4.2 Tandem pumps dimensions (standard version without shaft seal between the pumps)



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 cast iron back cover with tie rod + nut.  
For other back covers dimension see section 3.6.

### 4.2.1 Standard versions, dimensions example



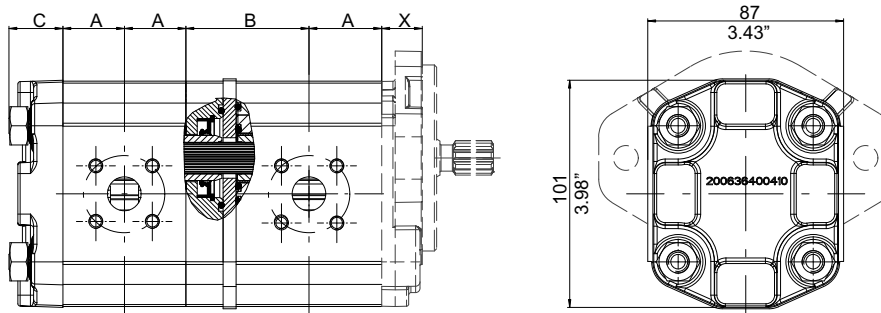
#### Example

Total length:  $189 \text{ mm} = 20 + 35.3 + 41.1 + 32.3 + 32.3 + 28 (X + A + B + A + A + C)$

Port position:  $128.7 \text{ mm} = 20 + 35.3 + 41.1 + 32.3 (X + A + B + A)$

$55.3 \text{ mm} = 20 + 35.3 (X + A)$

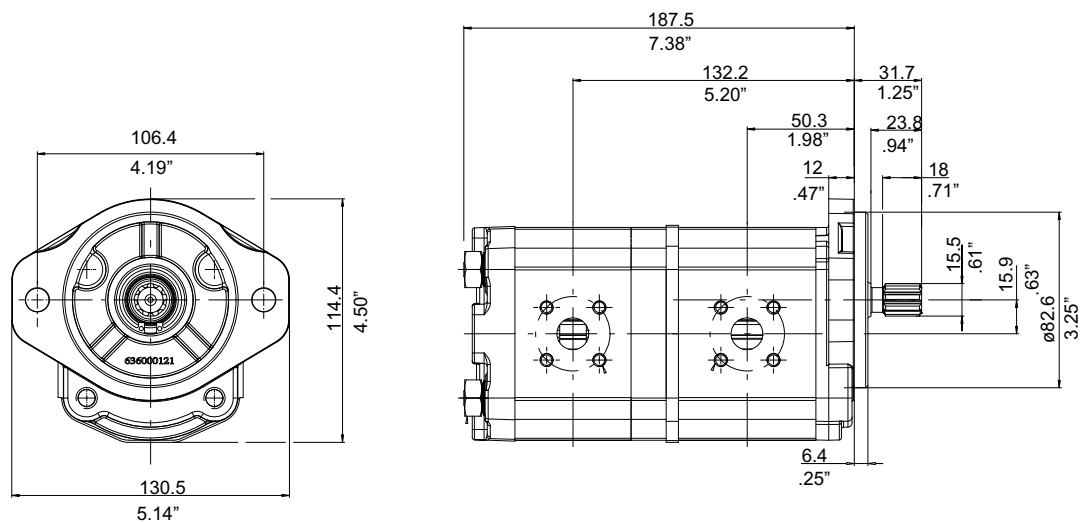
### 4.3 Tandem pumps dimensions (special version with shaft seal between the pumps)



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 cast iron back cover with tie rod + nut.  
For other back covers dimension see section 3.6.

#### 4.3.1 Special version, dimensions example



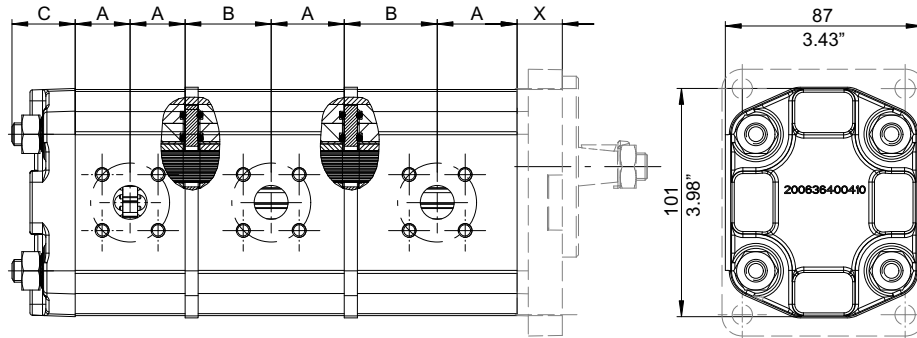
#### Example

Total length: 187.5 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)

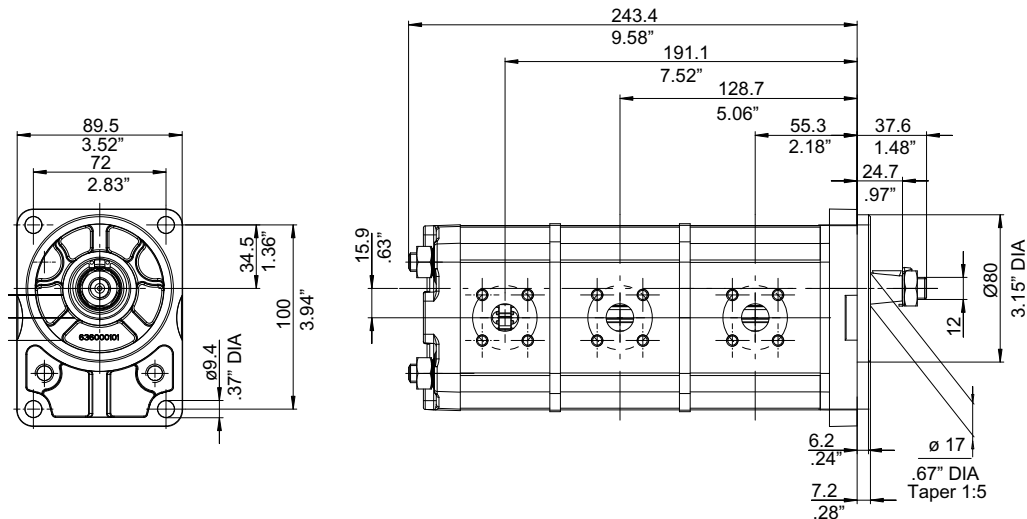
## 4.4 Triple pumps dimensions (standard version without shaft seal between the pumps)



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 cast iron back cover with tie rod + nut.  
For other back covers dimension see section 3.6.

### 4.4.1 Standard versions, dimensions example



#### Example

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

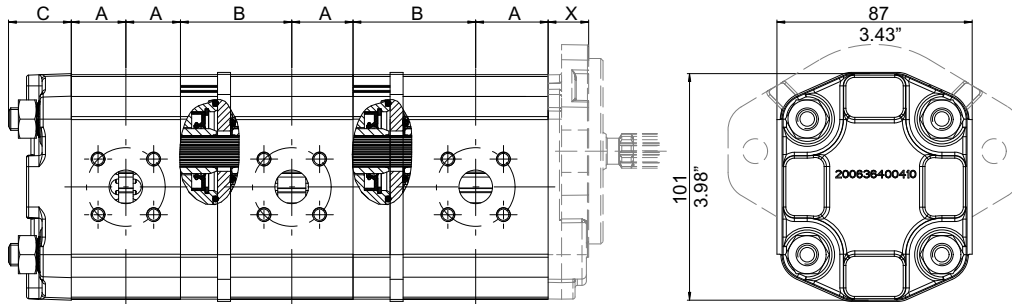
Port position:  $191.1 \text{ mm} = 20 + 35.3 + 41.1 + 32.3 + 38.1 + 24.3 \text{ (X + A + B + A + B + A)}$

$128.7 \text{ mm} = 20 + 35.3 + 41.1 + 32.3 \text{ (X + A + B + A)}$

$55.3 \text{ mm} = 20 + 35.3 \text{ (X + A)}$



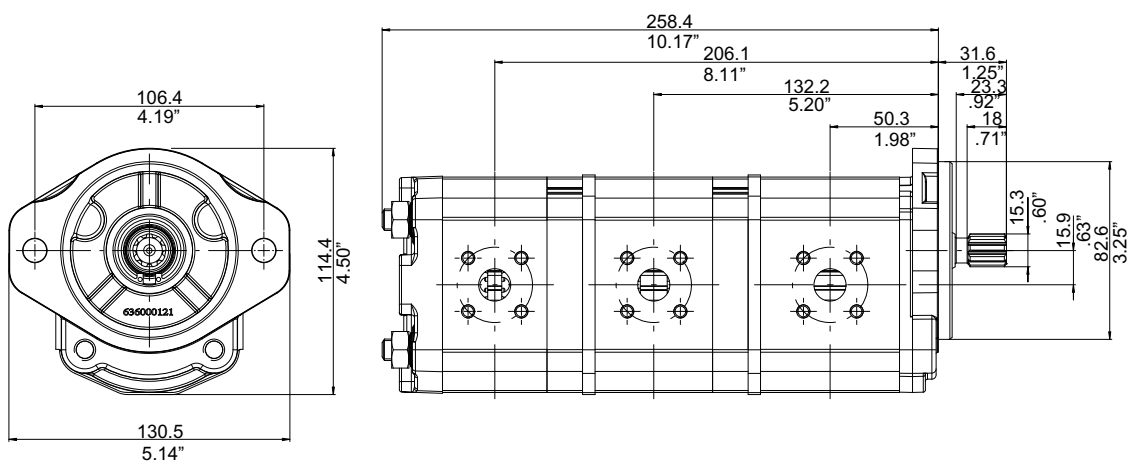
#### 4.5 Triple pumps dimensions (special version with shaft seal between the pumps)



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 cast iron back cover with tie rod + nut.  
For other back covers dimension see section 3.6.

#### 4.5.1 Special version, dimensions example



#### Example

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

Port position:  $206.1 \text{ mm} = 18 + 32.3 + 54.6 + 27.3 + 49.6 + 24.3 (X + A + B + A + B + A)$

$132.2 \text{ mm} = 18 + 32.3 + 54.6 + 27.3 (X + A + B + A)$

$50.3 \text{ mm} = 18 + 32.3 (X + A)$

### 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	9	10	11	12																					
A	P	2	1	2	/	1	1	L	N	-	2	1	2	/	8	.	5	L	N	-	S	-	A	0	S	-	1	C	-	1	C	-	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	5	6	7	8	9	10	9	10	9	10	9	10	11	12																												
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	-	1	C	-	1	C	-	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<sup>3</sup>/rev  
6.5= 6.4 cm<sup>3</sup>/rev  
8.5= 8.4 cm<sup>3</sup>/rev  
11= 11.1 cm<sup>3</sup>/rev  
15= 15.1 cm<sup>3</sup>/rev  
19= 19.2 cm<sup>3</sup>/rev  
22= 22.2 cm<sup>3</sup>/rev  
26= 26.2 cm<sup>3</sup>/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 section 3.3



#### 7 Shaft seal material type code

see section 3.4.1



#### 8 Front cover series/material with/without bearing code

see section 3.4.2 and 3.4.3



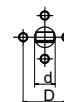
#### 9 Type of ports code

see section 3.5



#### 10 Inlet/outlet port size code combination

see section 3.5



#### 11 Back cover type / Valve setting value

see section 3.6

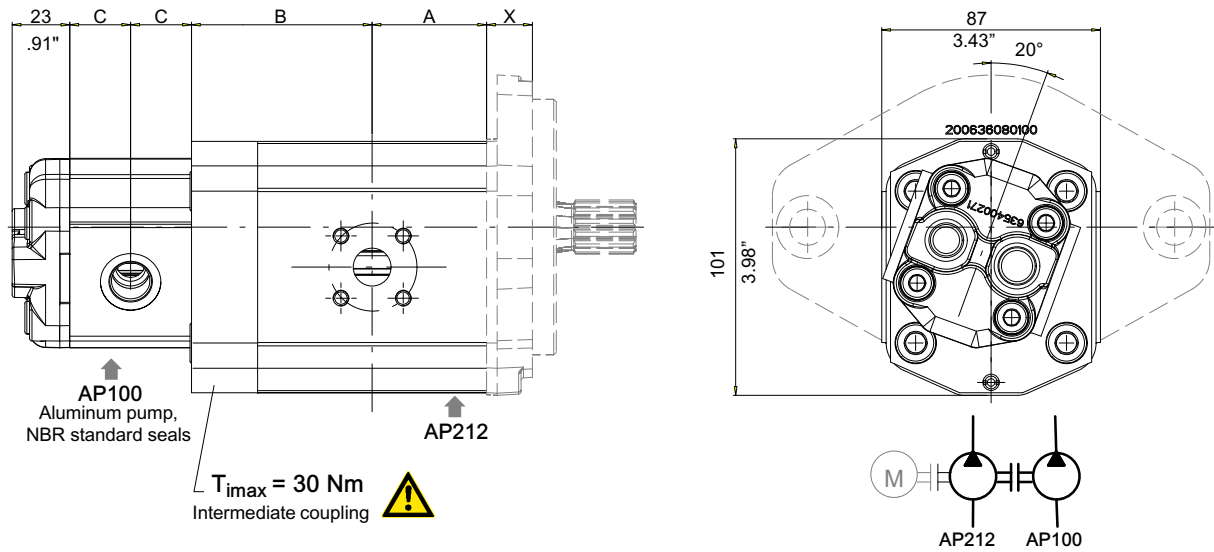


#### 12 For Tandem or multiple pumps with or without shaft seal between the pumps

Omitted if without shaft seal between the pumps (standard versions)

P= with shaft seal between the pumps (special versions)

## 4.8 Tandem pumps dimensions AP212 + AP100 (with shaft seal between the pumps)



AP212 Pump size	A		B	
	mm	inches	mm	inches
AP212/4.5	24.3	0.96	50.6	1.99
AP212/6.5	25.8	1.02	52.1	2.05
AP212/8.5	27.3	1.08	53.6	2.11
AP212/11	29.3	1.54	55.6	2.19
AP212/15	32.3	1.27	58.6	2.31
AP212/19	35.3	1.39	61.6	2.43
AP212/22	37.6	1.48	63.9	2.52
AP212/26	40.6	1.60	66.9	2.63

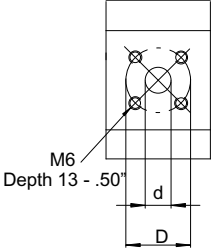
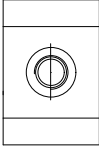


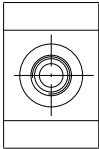


AP100 Pump size	Displacement		C		Max. Pressure (*)					
	cm <sup>3</sup> /rev	Cu. In. P. R.			P1		P2		P3	
			mm	inches	bar	P.S.I.	bar	P.S.I.	bar	P.S.I.
AP100/1.2	1.2	.073	21.6	0.85	210	3000	250	3600	280	4000
AP100/1.7	1.7	.103	22.6	0.89	210	3000	250	3600	280	4000
AP100/2.5	2.5	.152	24.2	0.95	210	3000	250	3600	280	4000
AP100/3.5	3.5	.213	26.4	1.04	210	3000	230	3300	250	3600
AP100/4.3	4.3	.262	28.2	1.11	210	3000	230	3300	250	3600
AP100/5	5.0	.305	29.6	1.17	210	3000	230	3300	250	3600
AP100/6.5	6.5	.396	32.1	1.26	190	2700	220	3150	240	3400
AP100/8	7.8	.476	34.9	1.37	180	2600	210	3000	230	3300
AP100/10	10.0	.610	39.4	1.55	150	2150	180	2600	200	2900

**IMPORTANT!:** Common suction not available



Attention: (\*) The max pressure is function of max admitted intermediate torque

### 4.8.1 AP100 port types available

Port type	Ordering code	Ø Diameter	Dimension (mm - inch)	
			Suction	Pressure
	2	d	12 - .47"	12 - .47"
		D	30 - 1.18"	30 - 1.18"
	4		3/8" (Depth 13-.50")	3/8" (Depth 13-.50")
			 50+5 Nm	 50+5 Nm
	8		3/4" - 16 UNF-2B (SAE8)	9/16" - 18 UNF-2B (SAE6)
			 55+10 Nm	 30+10 Nm

### 4.9 How to order tandem pumps AP212 + AP100 (with shaft seal between the pumps)

1st PUMP				2nd PUMP				1st BODY		2nd BODY						
1	2	3	4	2	3	5	6	7	8	9	10	9				
A	P	2	1 2 / 1 1 L N	-	1 0 0 / 6 . 5	-	S	-	A	0	S	-	4	B	-	4

#### 1 Function

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

#### 2 Series

212 and 100

#### 3 Displacement

<b>AP212</b>	<b>AP100</b>
4.5= 4.4 cm <sup>3</sup> /rev	1.2= 1.2 cm <sup>3</sup> /rev
6.5= 6.4 cm <sup>3</sup> /rev	1.7= 1.7 cm <sup>3</sup> /rev
8.5= 8.4 cm <sup>3</sup> /rev	2.5= 2.5 cm <sup>3</sup> /rev
11= 11.1 cm <sup>3</sup> /rev	3.5= 3.5 cm <sup>3</sup> /rev
15= 15.1 cm <sup>3</sup> /rev	4.3= 4.3 cm <sup>3</sup> /rev
19= 19.2 cm <sup>3</sup> /rev	5 = 5.0 cm <sup>3</sup> /rev
22= 22.2 cm <sup>3</sup> /rev	6.5= 6.5 cm <sup>3</sup> /rev
26= 26.2 cm <sup>3</sup> /rev	8 = 7.8 cm <sup>3</sup> /rev
	10= 10.0 cm <sup>3</sup> /rev

#### 4 AP212 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 AP212 shaft end code

see section 3.3



#### 7 AP212 shaft seal material type code

see section 3.4.1



#### 8 AP212 front cover series/material with/without bearing code

see section 3.4.2 and 3.4.3



#### 9 AP212 type of ports code

see section 3.5



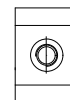
#### 10 AP212 inlet/outlet port size code combination

see section 3.5



#### 11 AP100 type of ports code

see section 4.8.1

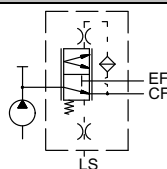
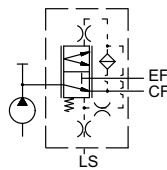
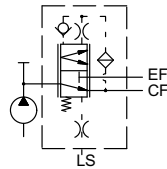
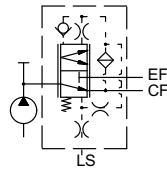
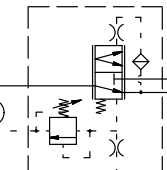
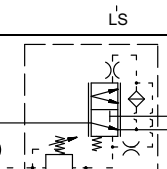
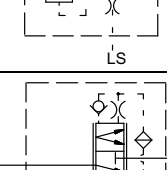
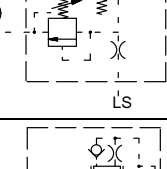


## 5 Circuits/valves option

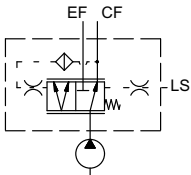
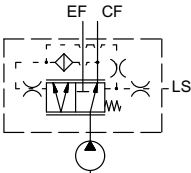
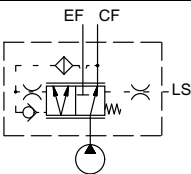
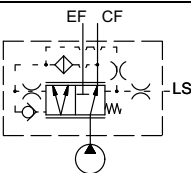
For Technical features and availability please contact our Sales Department

### 5.1 Load sensing circuits

#### 5.1.1 Load sensing valve rear cover assembly position

Hydraulic scheme	Family	Description	Code
	STATIC	Static LS signal	LSB01
	DYNAMIC	Dynamic LS signal	LDB01
	STATIC	Static LS signal + check valve on CF line	LSB02
	DYNAMIC	Dynamic LS signal + check valve on CF line	LDB02
	STATIC	Static LS signal + relief valve on LS signal	LSB03
	DYNAMIC	Dynamic LS signal + relief valve on LS signal	LDB03
	STATIC	Static LS signal + check valve on CF line and relief valve on LS signal	LSB04
	DYNAMIC	Dynamic LS signal + check valve on CF line and relief valve on LS signal	LDB04

### 5.1.2 Load sensing valve lateral assembly position

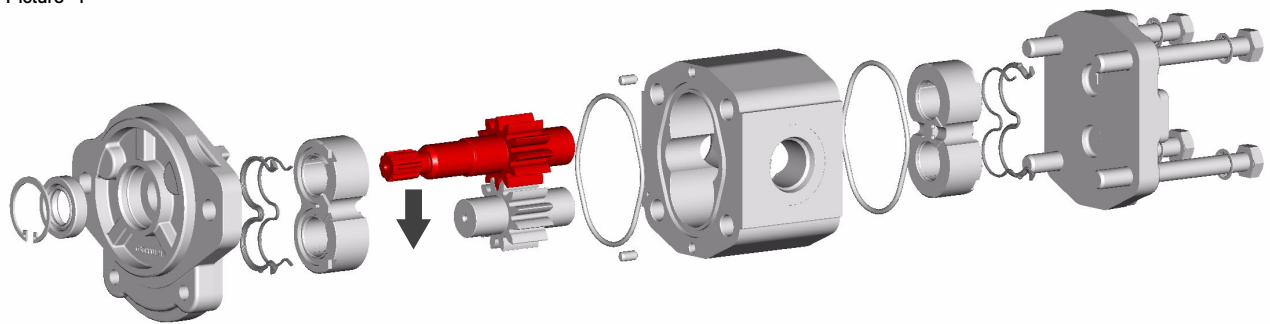
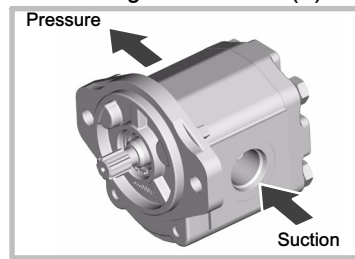
Hydraulic scheme	Family	Description	Code
	STATIC	Static LS signal	LSS01
	DYNAMIC	Dynamic LS signal	LDS01
	STATIC	Static LS signal + check valve on CF line	LSS02
	DYNAMIC	Dynamic LS signal + check valve on CF line	LDB02

## 6 Rotation changing instructions

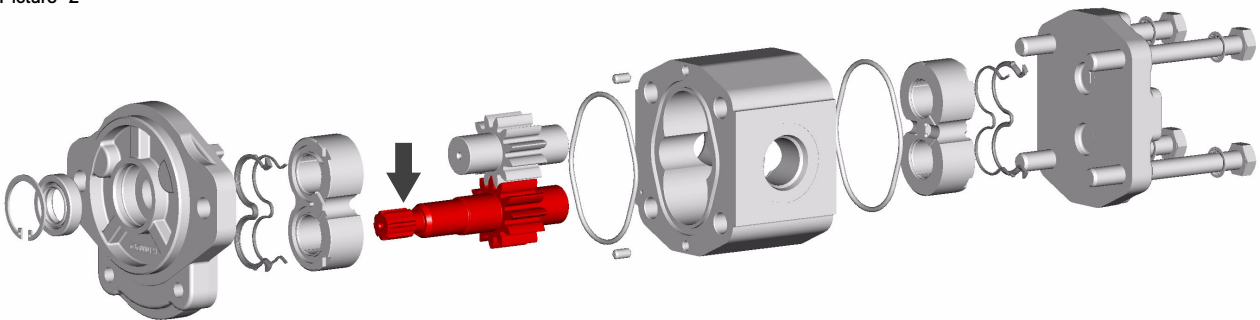
For the AP212 pumps with unidirectional left (S) or right (D) rotation (not for 287S-SAEB pump) it is possible to change the rotation direction of the entire range without having to replace any component. To ensure a good technical result, we recommended in any case that such inversion should be carried 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.

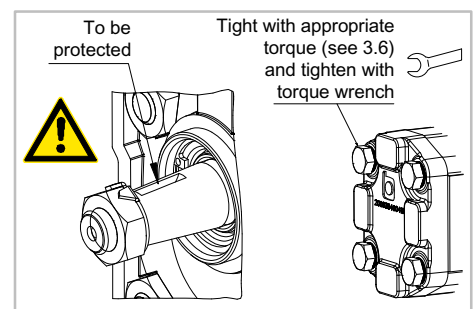
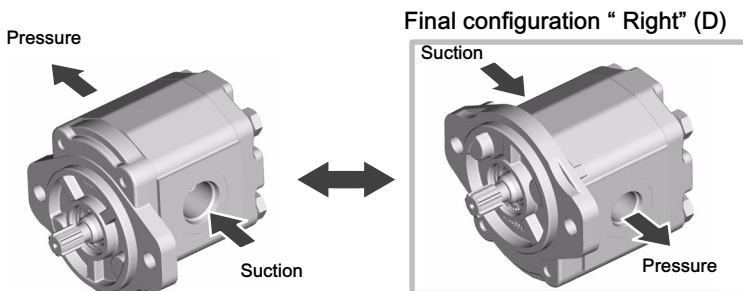
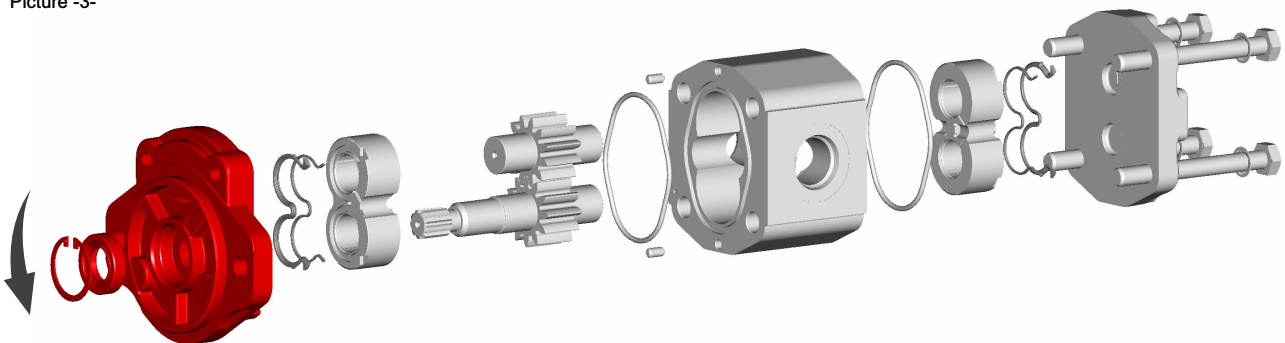
Initial configuration "Left" (S)



Picture -2-

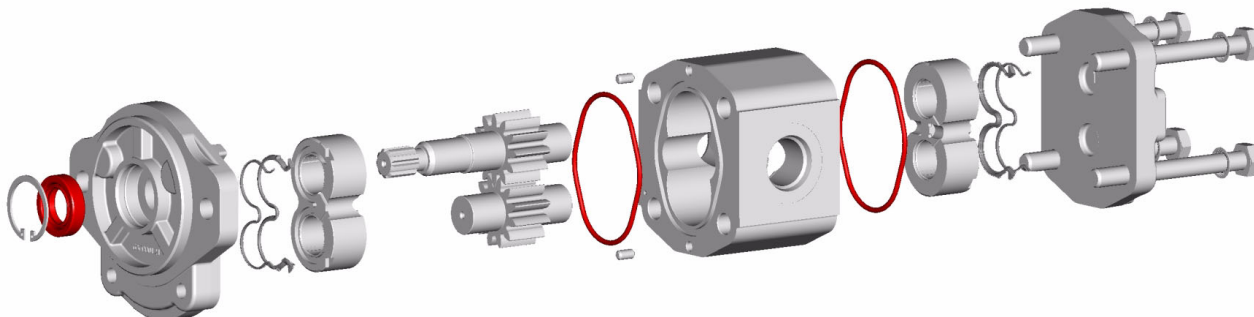


Picture -3-



## 7 Pumps seal kit NBR + HNBR standard type

The seal Kit code includes:  
OR and shaft seal

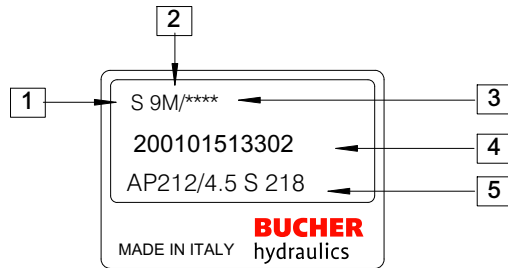


Type	Code
AP/APR212	200974001570
Tandem AP212 + AP212 NBR + HNBR (without shaft seal between the pumps)	200974001580
Tandem AP212 + AP212 + PAR NBR + HNBR (with shaft seal between the pumps)	200974001590

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



## 8 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						
	2017	2018	2019	2020	2021	2022	2023
January	7A	8M	9M	0M	1M	2M	3M
February	7B	8N	9N	0N	1N	2N	3N
March	7C	8P	9P	0P	1P	2P	3P
April	7D	8Q	9Q	0Q	1Q	2Q	3Q
May	7E	8R	9R	0R	1R	2R	3R
June	7F	8S	9S	0S	1S	2S	3S
July	7G	8T	9T	0T	1T	2T	3T
August	7H	8U	9U	0U	1U	2U	3U
September	7I	8V	9V	0V	1V	2V	3V
October	7J	8Z	9Z	0Z	1Z	2Z	3Z
November	7K	8X	9X	0X	1X	2X	3X
December	7L	8Y	9Y	0Y	1Y	2Y	3Y

### 9 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 <sup>3</sup> /rev)				Continuous work pressure (bar)	1st 2nd 3rd
Double pump (cm <sup>3</sup> /rev)	1st	2nd		Peak work pressure (bar)	1st 2nd 3rd
Multiple pump (cm <sup>3</sup> /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](mailto:info.it@bucherhydraulics.com)

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

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Classification: 410.110.000