

HY2-LN

External Gear Pumps

4.5 to 31.7 cc/rev, Up to 260 bar

► DESCRIPTION:

Hydreco is pleased to introduce a brand new range of low noise gear pumps. Based on the experience and knowledge acquired over many years of engineering and manufacturing, the HY-LN Series is provided with an aluminium alloy housing, two gear wheels with inclined teeth supported by sleeve bearings and cast iron flange and cover.

The HY-LN series, available as pumps and motors, offers high efficiency, low noise level and can be applied in standard and heavy duty application, thanks to the high reliability and the accuracy of design and production. The pumps can be supplied as single, or as multiple units with a huge variety of options on flanges, shafts and ports, providing the right setup on each application. Feel free to contact your Hydreco representative to find out more and to get proper support in your selection.

- High performance hydraulic pumps
- Super Quite
- 5000 psi rated



HY2-LN
Triple Pump/Motor

HY2 SAE A
Aluminium Tandem
with cast iron
adaptor and cover



► PERFORMANCE:

Max outlet port pressures	350 rated - 360 peak	
Inlet port pressures	0.7 - 3 bar abs	
Speed Range	All models	450 - 3500 rev/min
Temperature	Minimum at start-up	-40°C (-40°F)
	Maximum continuous	+80°C (+176°F)
	Maximum intermittent	+100°C (+212°F)
Viscosity	Maximum at start-up	2000 mm ² /sec (9,000 SSU)
	Maximum continuous	250 mm ² /sec (1150 SSU)
	Minimum continuous	10 mm ² /sec (60 SSU)
	Optimum	15-25 mm ² /sec (78-124 SSU)
Fluid Cleanliness	To ISO4406 solid contaminant	
	Start-up period	21/17
	Maximum in service	19/15
	Optimum	16/11
	Maximum water	0.1%
Fluid Velocity	Maximum in INLET line	2.5 m/sec (8 ft/sec)
	Recommended in INLET line	1.5 m/sec (5 ft/sec)
Shaft Loads	Maximum axial load	250 N (56 lb)
	Maximum radial load	500 N (112 lb)
Fluids	All data is quoted for mineral oils HM and HV. For fire resistant and environmentally aware fluids please contact your Continental/Hydreco Hydraulics representative.	
Rotation	Clockwise or Anti-clockwise viewed from shaft end (not reversible).	

► FEATURES:

- 3 Piece design
- Cast iron body option
- Helical as standard
- Flange and cover in cast iron
- Multiple units (ready to assemble)

Displacements

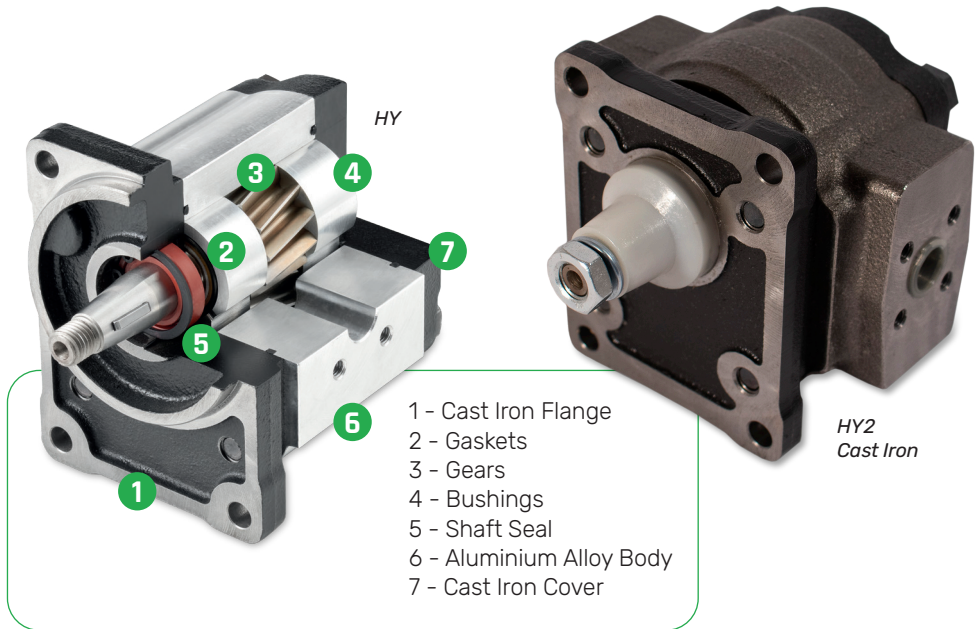
From 4.5 cm³/rev to 31.7 cm³/rev
From 0.27 in³/rev to 1.93 in³/rev:

Pressures

Max continuous 260 bar (3770 psi)
Max intermittent 290 bar (4200 psi)
Max peak 310 bar (4500 psi)

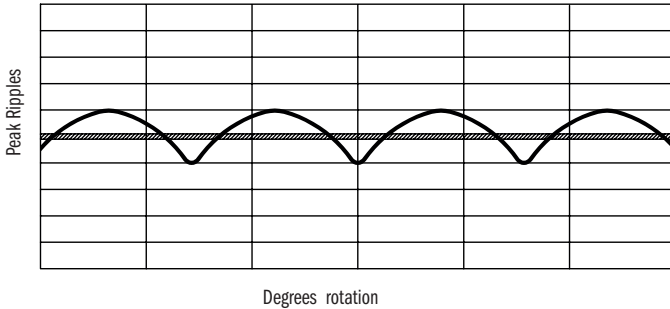
Max Speed

4000 rpm

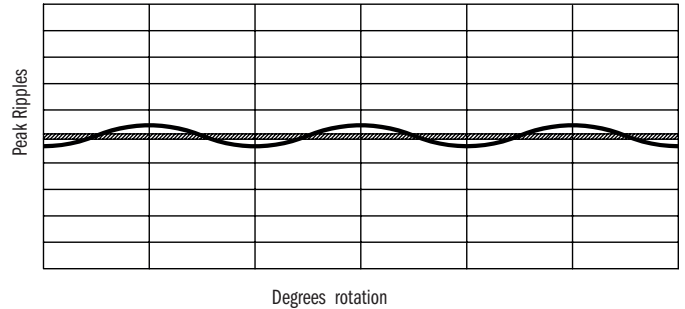


The HY2-LN Series thanks to helical gears offer a reduction of pulsations:

HY2 - STANDARD SERIES



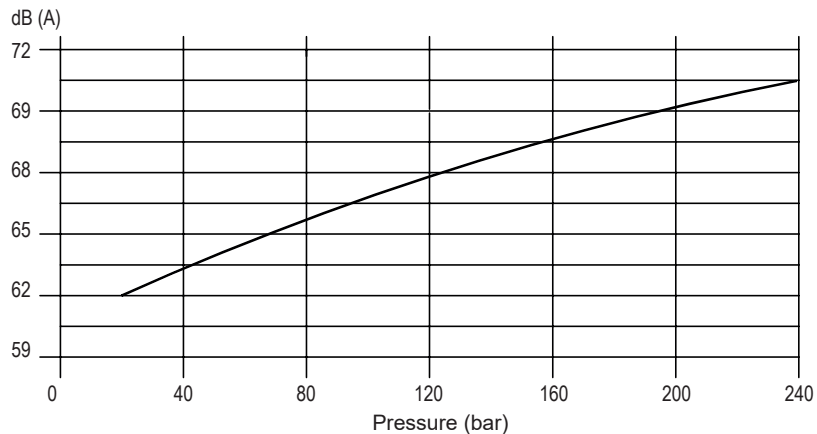
HY2 - LN SERIES



Also the HY2-LN gear pumps offer a noise level reduction from 2 to 8 dB(A), compared with the standard gear pumps.

TEST:

- Pump Displacement
14.6 cc
0.89 (in³/rev)
- Rotation speed
1800 r.p.m.



► **FEATURES:**

Displacement Range

GROUP	SIZE	DISPLACEMENT cm ³ /rev (in ³ /rev)	MAX PRESSURE bar (psi)			SPEED rpm	
			P1	P2	P3	min	max
HY2-LN	04	4.5 (0.27)	240 (3480)	270 (3910)	290 (4200)	600	4000
	06	6.5 (0.4)	240 (3480)	270 (3910)	290 (4200)	600	4000
	08	8.2 (0.5)	240 (3480)	270 (3910)	290 (4200)	600	4000
	11	11.3 (0.67)	240 (3480)	270 (3910)	290 (4200)	600	4000
	14	14.6 (0.89)	240 (3480)	270 (3910)	290 (4200)	500	3500
	16	16.9 (1.03)	240 (3480)	270 (3910)	290 (4200)	500	3200
	20	20.1 (1.23)	210 (3040)	240 (3480)	260 (3770)	500	3000
	22	22 (1.34)	200 (2900)	230 (3330)	250 (3620)	500	2700
	25	25.2 (1.54)	180 (2610)	210 (3040)	230 (3330)	500	2500
	28	28 (1.72)	160 (2320)	190 (2750)	210 (3040)	500	2200
	31	31.7 (1.93)	150 (2170)	180 (2610)	200 (2900)	500	2000

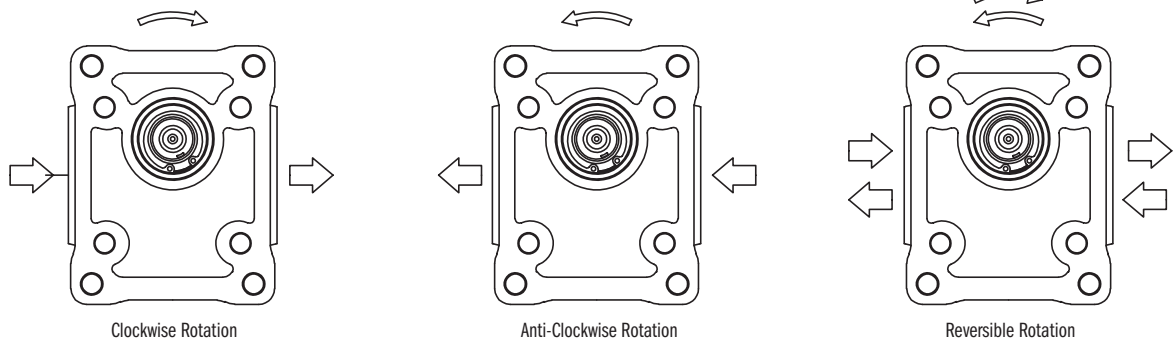
The data in the table refer to unidirectional pumps and motors.

The maximum pressures of reversible pumps and motors are 15% lower than unidirectional ones.

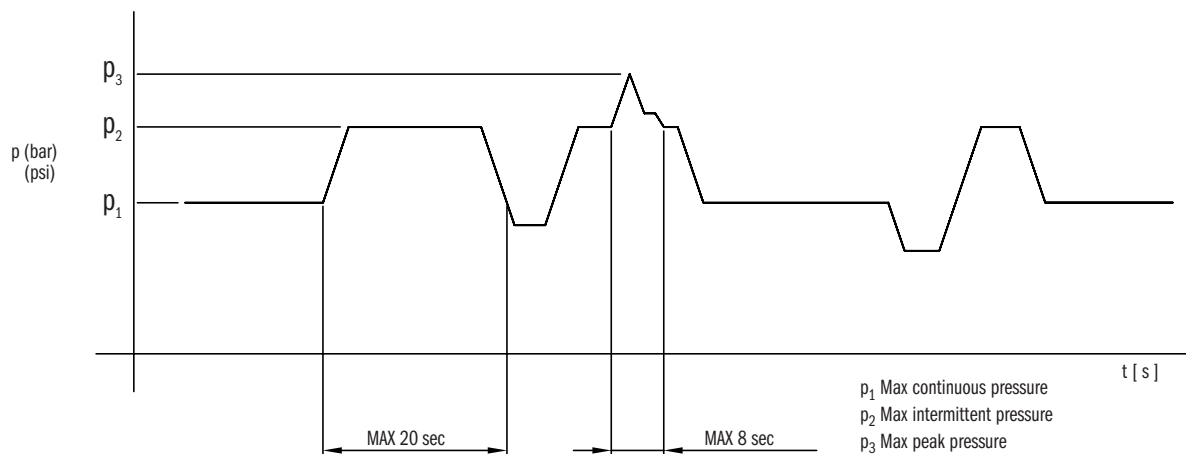
For different working conditions please contact Continental Hydraulics/Hydreco technical support.

General Characteristics:

Rotation Direction

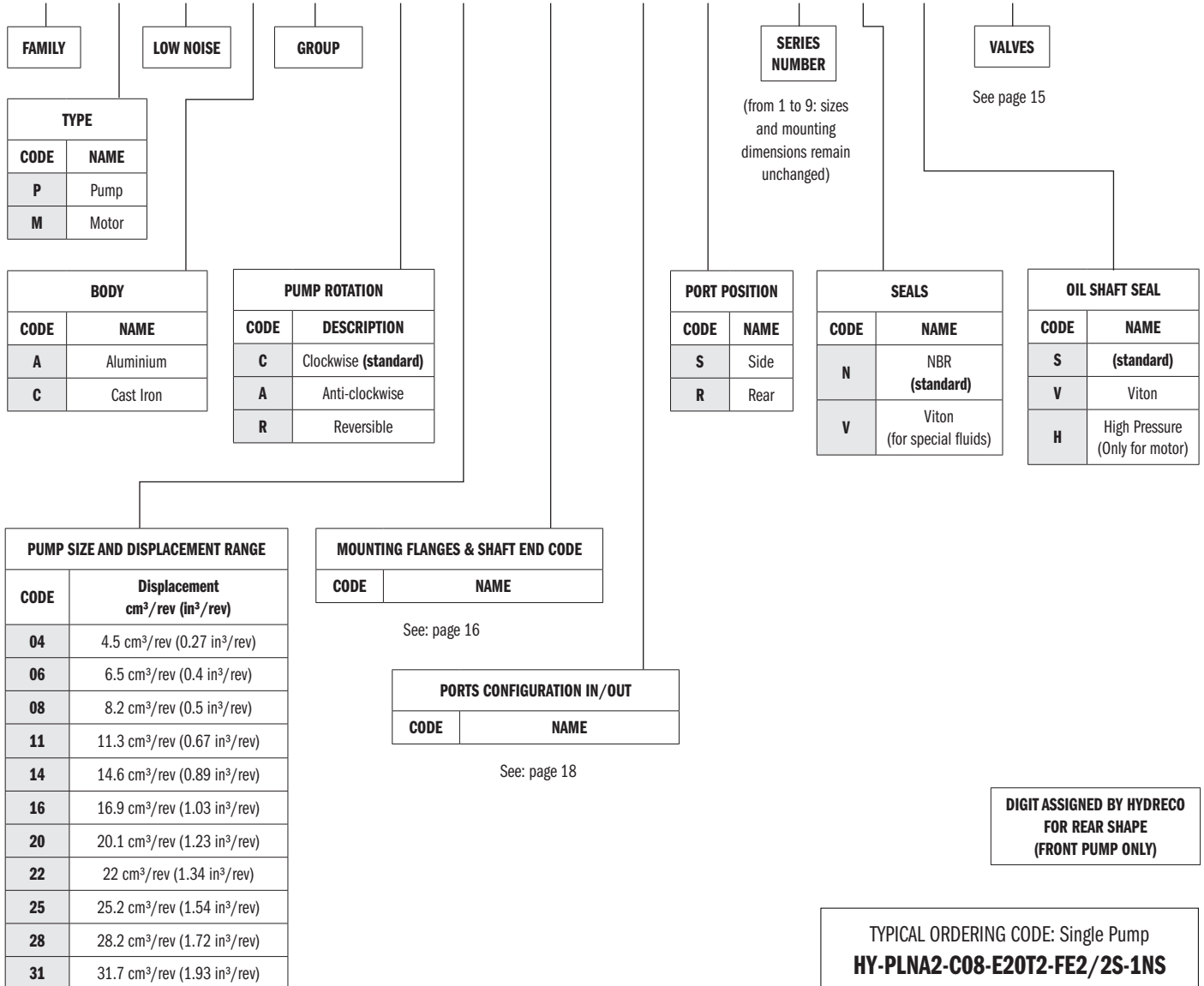


Definition of Pressures



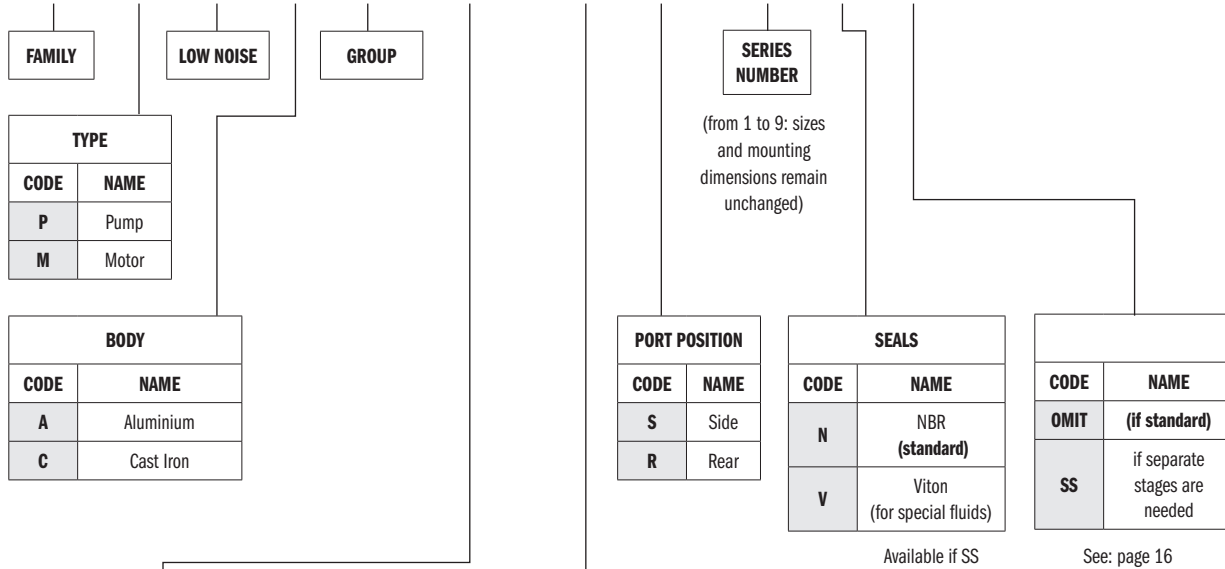
► **IDENTIFICATION CODE: Single and Front Pump**

HY- **LN** **2** - - - - -



► **IDENTIFICATION CODE: Intermediate Pump (for Multiple Pumps)**

HY- **LN** **2** - - -



PUMP SIZE AND DISPLACEMENT RANGE

CODE	Displacement cm ³ /rev (in ³ /rev)
04	4.5 cm ³ /rev (0.27 in ³ /rev)
06	6.5 cm ³ /rev (0.4 in ³ /rev)
08	8.2 cm ³ /rev (0.5 in ³ /rev)
11	11.3 cm ³ /rev (0.67 in ³ /rev)
14	14.6 cm ³ /rev (0.89 in ³ /rev)
16	16.9 cm ³ /rev (1.03 in ³ /rev)
20	20.1 cm ³ /rev (1.23 in ³ /rev)
22	22 cm ³ /rev (1.34 in ³ /rev)
25	25.2 cm ³ /rev (1.54 in ³ /rev)
28	28.2 cm ³ /rev (1.72 in ³ /rev)
31	31.7 cm ³ /rev (1.93 in ³ /rev)

PORTS CONFIGURATION IN/OUT

CODE	NAME
------	------

See: page 18

Identification code for double pumps - Tandem

Identification Code Front Pump + Identification Code Rear Pump

Example: HY-PLNA2-C08-E20T2-FE2/2S-1NS + LNA2-06-FE2/2S-1N

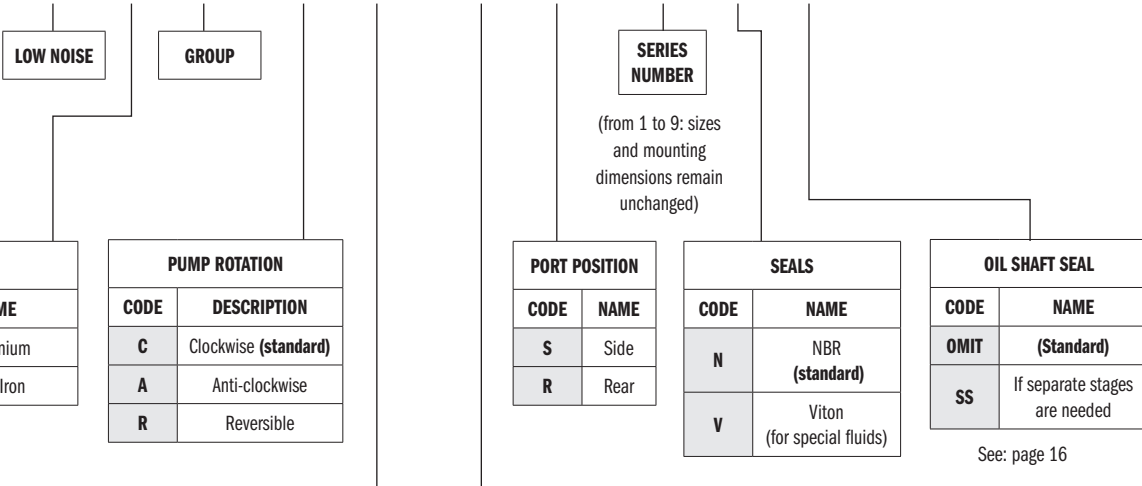
Identification code for triple pumps

Identification Code Front Pump + Identification Code Intermediate Pump + Identification Code Rear Pump

Example: HY-PLNA2-C08-E20T2-FE2/2S-1NS + LNA2-06-FE2/2S-1N + LNA2-06-FE2/2S-1N

► **IDENTIFICATION CODE: For Isolated intermediate Pumps**

LN □ **2** - □ □ - □ □ - □ □ □



PUMP SIZE AND DISPLACEMENT RANGE	
CODE	Displacement cm ³ /rev (in ³ /rev)
04	4.5 cm ³ /rev (0.27 in ³ /rev)
06	6.5 cm ³ /rev (0.4 in ³ /rev)
08	8.2 cm ³ /rev (0.5 in ³ /rev)
11	11.3 cm ³ /rev (0.67 in ³ /rev)
14	14.6 cm ³ /rev (0.89 in ³ /rev)
16	16.9 cm ³ /rev (1.03 in ³ /rev)
20	20.1 cm ³ /rev (1.23 in ³ /rev)
22	22 cm ³ /rev (1.34 in ³ /rev)
25	25.2 cm ³ /rev (1.54 in ³ /rev)
28	28.2 cm ³ /rev (1.72 in ³ /rev)
31	31.7 cm ³ /rev (1.93 in ³ /rev)

PORTS CONFIGURATION IN/OUT	
CODE	NAME

See: page 18

TYPICAL ORDERING CODE:
LNA2-C06-FE2/2S-1N

► **PERFORMANCE DATA:**

General Characteristics

It is essential that pumps are installed so that they can always fill with fluid. 'HY' Series pumps inlet porting is designed to facilitate full volume fill but the following machine design recommendations should be followed.

Direction Rotation (Viewed from shaft end)	Clockwork (C)
	Anti-clockwise (A)
	Reversible (R)
Range inlet pressure - pump	0.7 ÷ 3 bar (10 ÷ 43 psi)
Max back pressure on the unidirectional motors and reversible with internal drainage	P ₁ (continue) max 5 bar (72 psi)
	P ₂ (for 20 sec) max 8 bar (115 psi)
	P ₃ (for 5 sec) max 15 bar (215 psi)
Reversible Motor Max pressure in drain	5 bar
Temperature fluid (MIN, MAX, PEAK) °C	-25, 80, 100 NBR
	-25, 110, 125 VITON
Range of viscosity	From 10 to 100 mm ² /s (cSt) IDEAL
	Up to 750 mm ² /s (cSt) RECOMMENDED
	Up to 1000 mm ² /s (cSt) START
Fluid type	Mineral oil

Recommended Filtration

Working pressure bar (psi)	$\Delta p < 140$ (2030)	140 (2030) < $\Delta p < 210$ (3040)	$\Delta p > 210$ (3040)
Class contamination NAS 1638	10	9	8
Class contamination ISO 4406:1999	21/19/16	20/18/15	19/17/14

- Q = flow rate (L/min)
- V = displacement (cm³/rev)
- n = speed (min⁻¹)
- M = torque (Nm)
- P = power (kW)
- Δp = pressure (bar)

PERFORMANCE	PUMPS	MOTORS
η_v = Volumetric efficiency	≈ 0.96	≈ 0.95
η_{hm} = hydro-mechanical efficiency	≈ 0.88	≈ 0.85
η_t = total efficiency	≈ 0.84	≈ 0.81

► PERFORMANCE DATA:

DETERMINATION OF A PUMP

$$Q_{\text{theor}} = \frac{V \times n}{1000} \quad (\text{l/min}) \quad Q_{\text{real}} = Q_{\text{theor}} \times \eta_v$$

$$M_{\text{real}} = \frac{M_{\text{theor}}}{\eta_{hm}} \quad (\text{Nm}) \quad M_{\text{theor}} = \frac{\Delta p \times V}{62.8} \quad (\text{Nm})$$

$$P_{\text{OUT}} = \frac{\Delta p \times Q}{600} \quad (\text{kW}) \quad P_{\text{IN}} = \frac{P_{\text{OUT}}}{\eta_t}$$

DETERMINATION OF A MOTOR

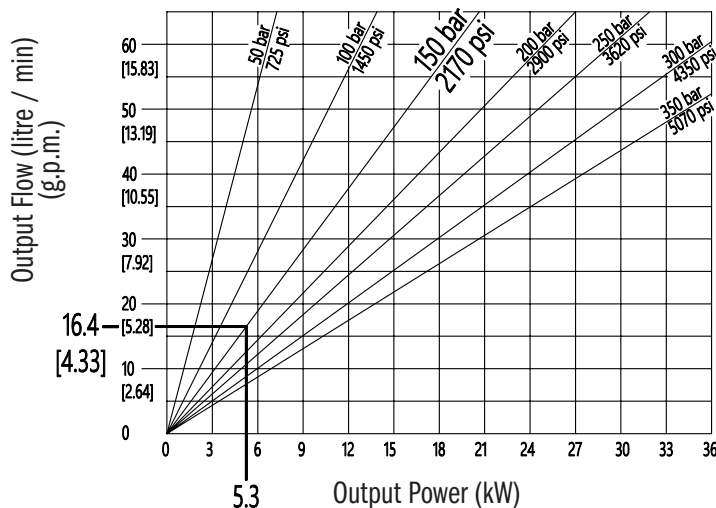
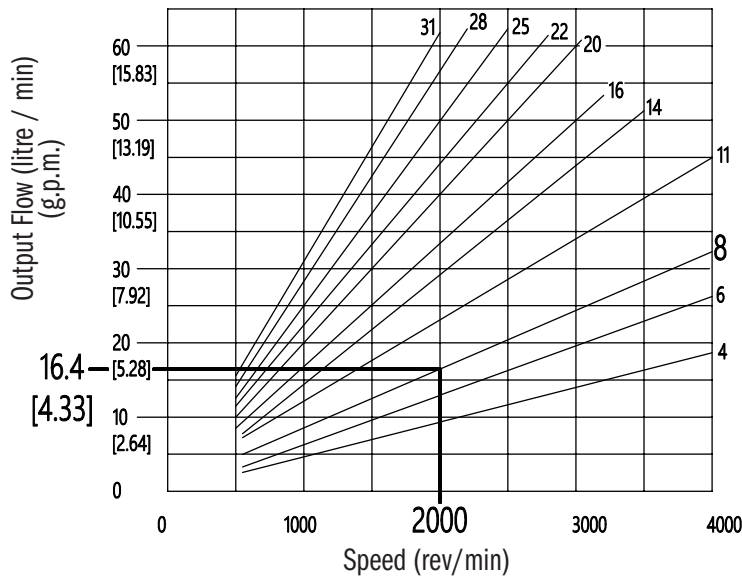
$$Q_{\text{theor}} = \frac{V \times n}{1000} \quad (\text{l/min}) \quad Q_{\text{real}} = \frac{Q_{\text{theor}}}{\eta_v}$$

$$M_{\text{theor}} = \frac{\Delta p \times V}{62.8} \quad (\text{Nm}) \quad M_{\text{real}} = M_{\text{theor}} \times \eta_{hm}$$

$$P_{\text{OUT}} = \frac{\Delta p \times Q}{600} \quad (\text{kW}) \quad P_{\text{IN}} = P_{\text{OUT}} \times \eta_t$$

PUMP SELECTION

Curves at 40 °C - Fluid viscosity 46 mm²/sec



Example

Working conditions:
Pump 8.2cc
Speed 2000 r.p.m.
Pressure: 150 bar [2170 psi]
Motor: 5.3 kW

OUTPUT FLOWS are theoretical. Generally volumetric efficiencies are in excess of 95%. Please contact your Continental Hydraulics/Hydreco representative for specific working conditions. INPUT POWERS are theoretical taking into account average efficiencies.

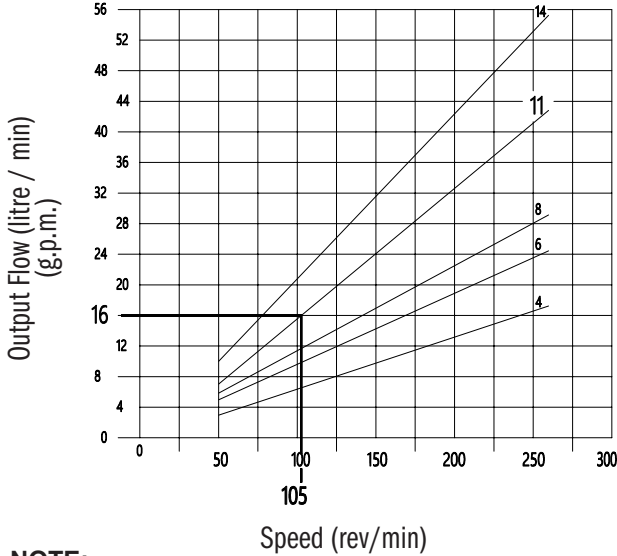
NOTE:

Diagrams provide approximate selection data

► PERFORMANCE DATA:

PUMP SELECTION

Curves at 40°C - Fluid viscosity 46 mm²/sec

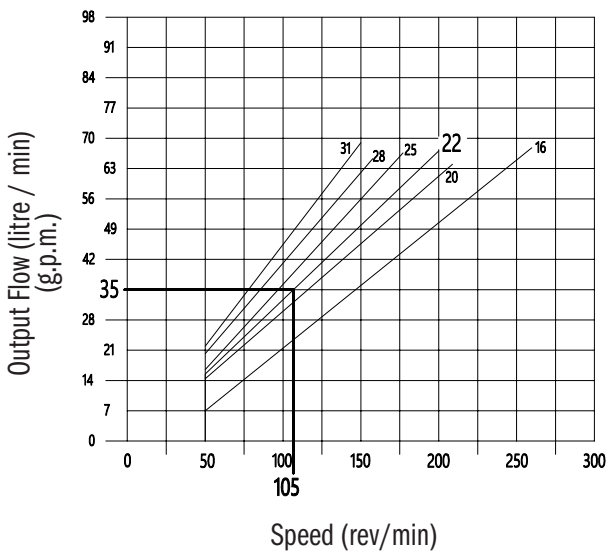


NOTE:

Diagrams provide approximate selection data

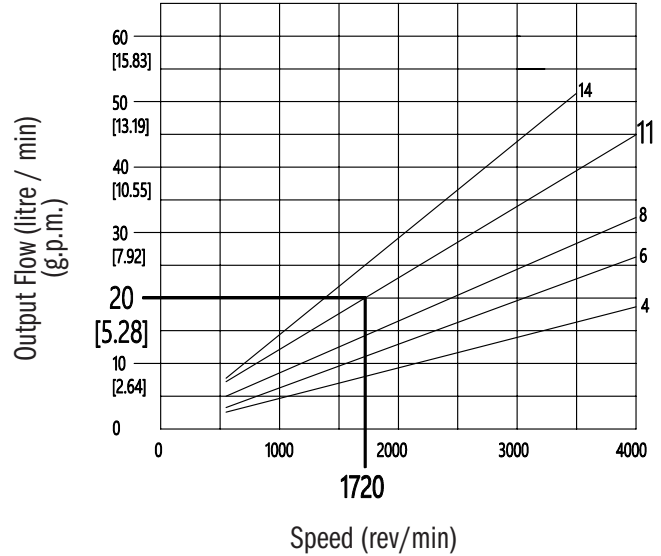
PUMP SELECTION

Curves at 40°C - Fluid viscosity 46 mm²/sec



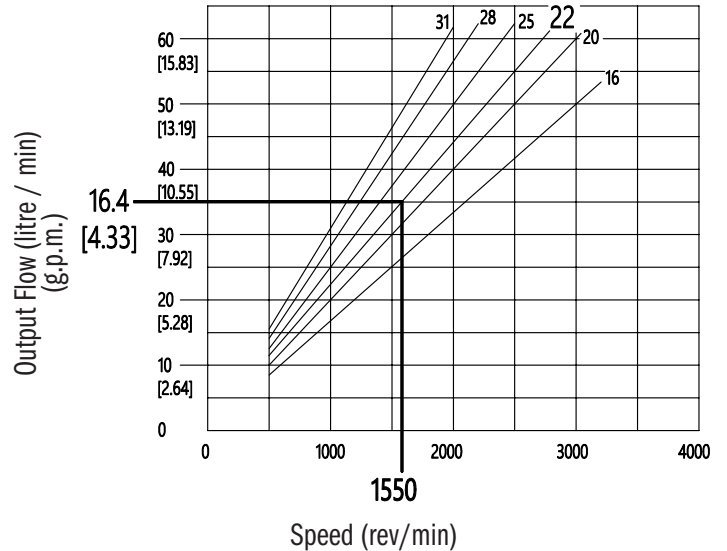
NOTE:

Diagrams provide approximate selection data



Example

Working conditions:
Pump 8.2cc
Speed 2000 r.p.m.
Pressure: 150 bar [2170 psi]
Motor: 5.3 kW

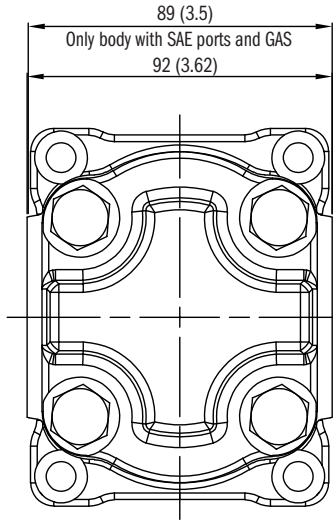


Example

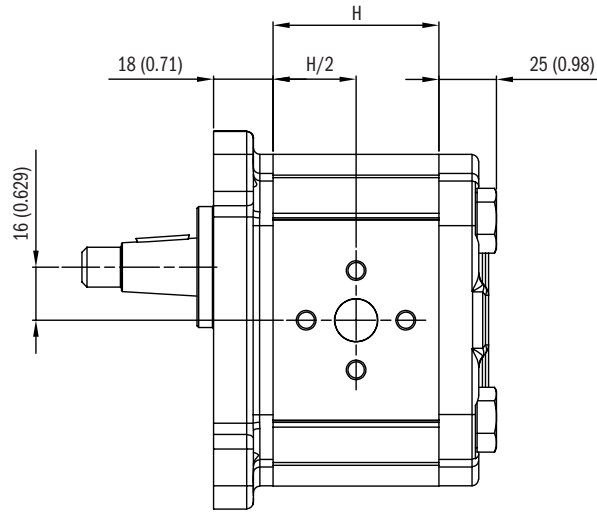
Working conditions:
Pump 8.2cc
Speed 2000 r.p.m.
Pressure: 150 bar [2170 psi]
Motor: 5.3 kW

► INSTALLATION DATA:

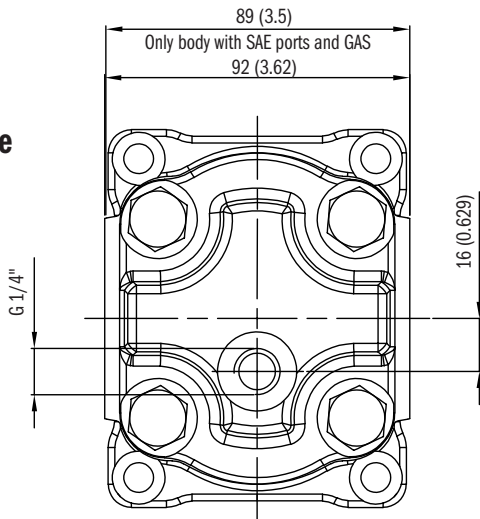
Single Pumps



Unidirectional Cover

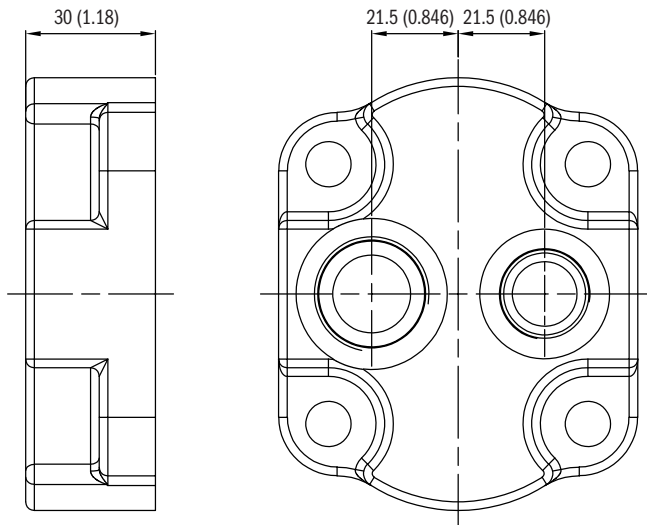


Reversible Cover



Pump/Motor Size	H mm (inches)	Weight (Kg)
04	48.6 (1.913)	3.4
06	51.5 (2.027)	3.4
08	54.0 (2.125)	3.5
11	58.4 (2.299)	3.5
14	63.2 (2.488)	3.6
16	66.6 (2.622)	3.6
20	71.3 (2.807)	3.8
22	82.0 (3.228)	4.2
25	86.6 (3.409)	4.2
28	91.0 (3.582)	4.2
31	96.1 (3.783)	4.2

Indicative weights - European flange and 1:8 tapered shaft

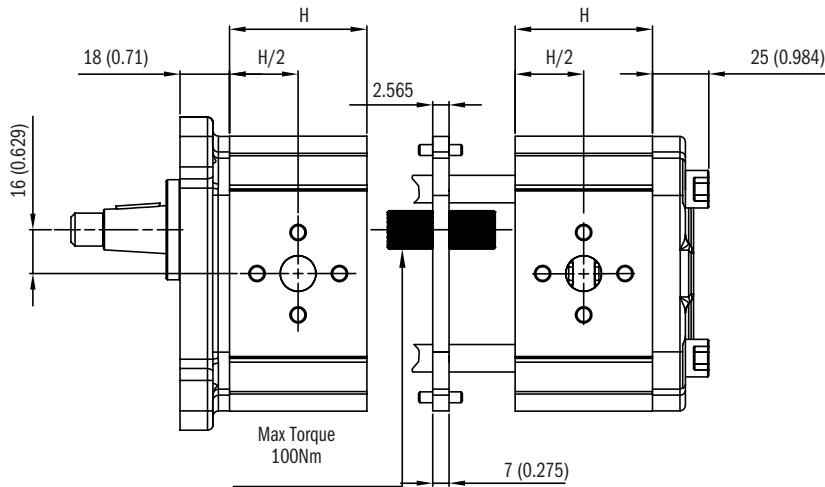
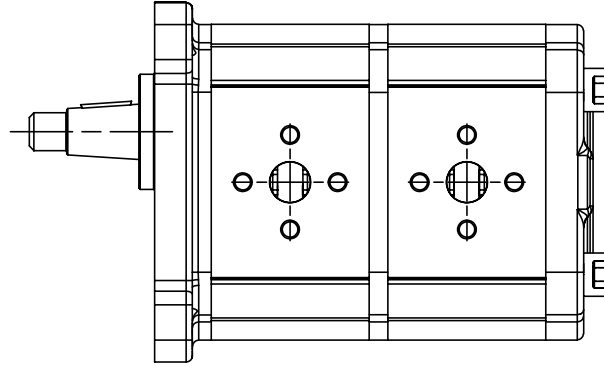


Available rear ports:
SAE

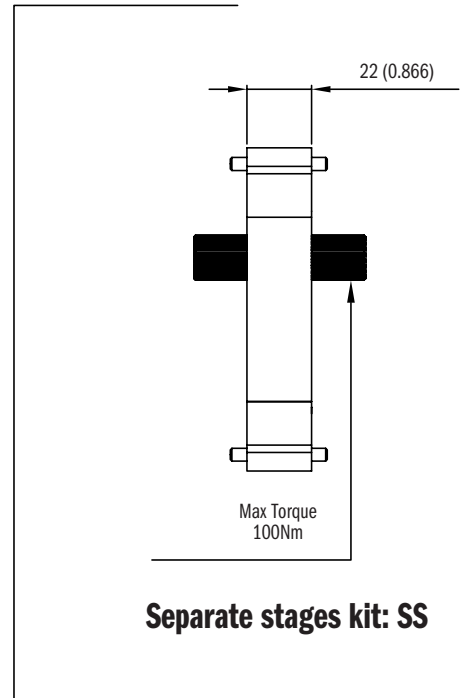
See page 18

► **INSTALLATION DATA:**

Side View



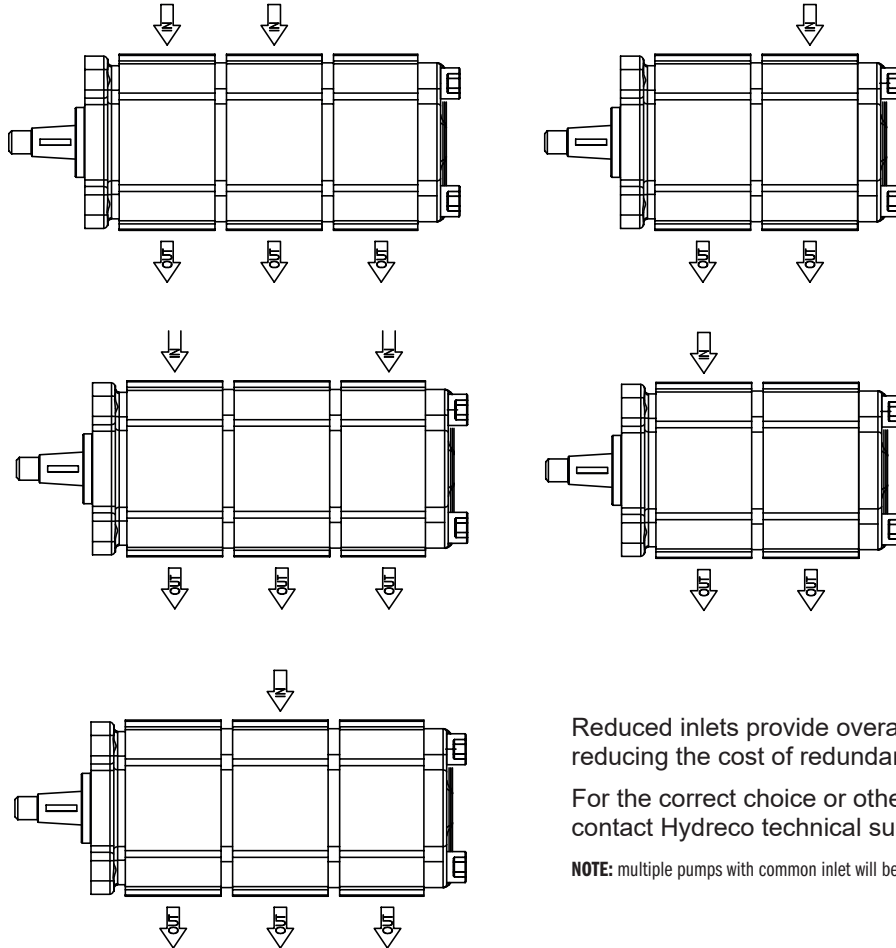
STANDARD
Configuration tandem pumps



Separate stages kit: SS

► **INSTALLATION DATA:**

Examples with Common inlet (top view)



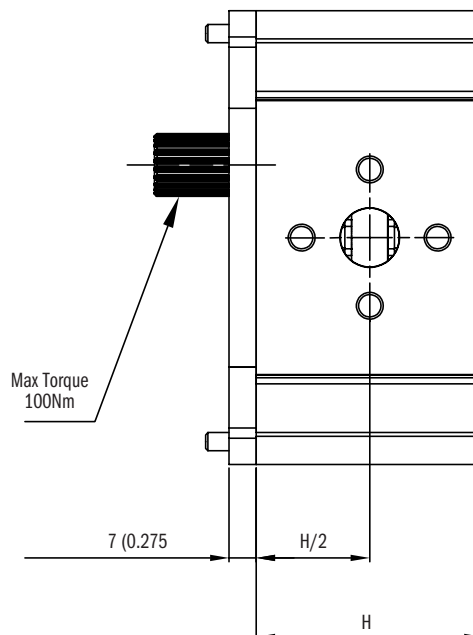
Reduced inlets provide overall systems savings by reducing the cost of redundant inlet hose and fittings.

For the correct choice or other combinations please contact Hydreco technical support.

NOTE: multiple pumps with common inlet will be provided with a special body.

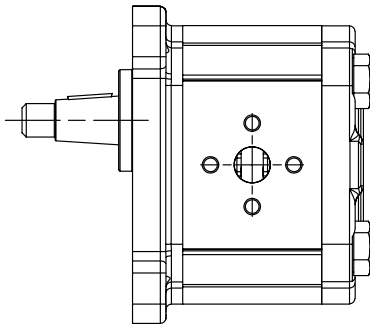
Dimensions (side view)

The HY2-LN intermediate pumps include the intermediate flange and coupling to easily assemble tandem or multiple pumps.

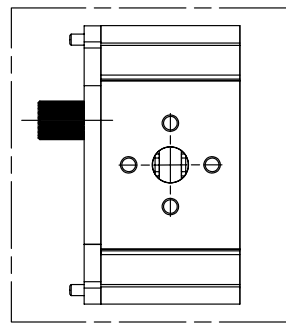


► **INSTALLATION DATA:**

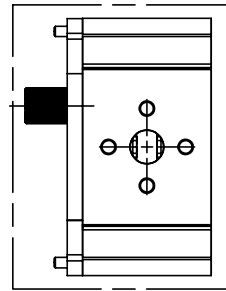
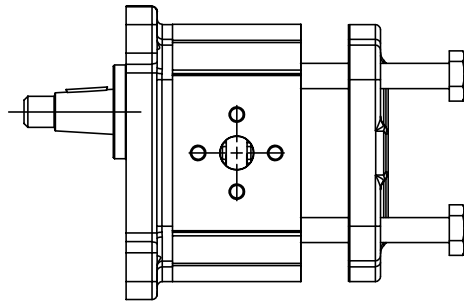
How to make Tandem pumps using an intermediate pump (side view)



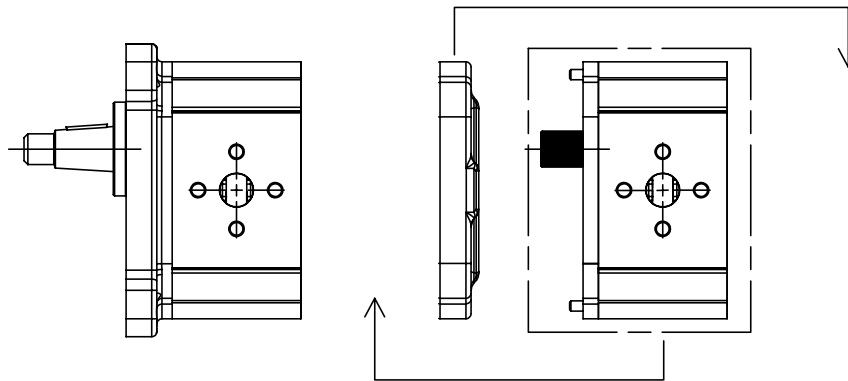
STANDARD PUMP



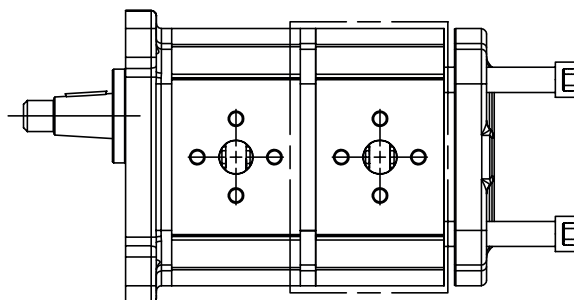
INTERMEDIATE PUMP



A. Loosen, and remove, the clamp screws and remove the cover.



B. Connect the intermediate pump.



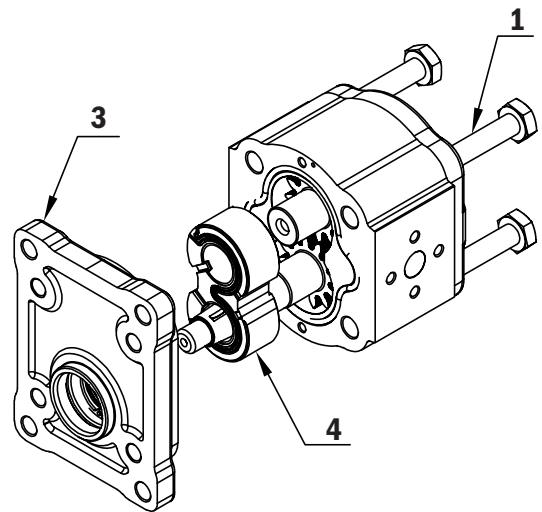
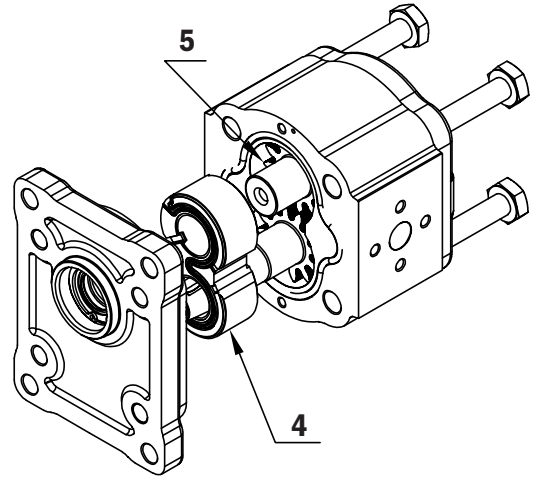
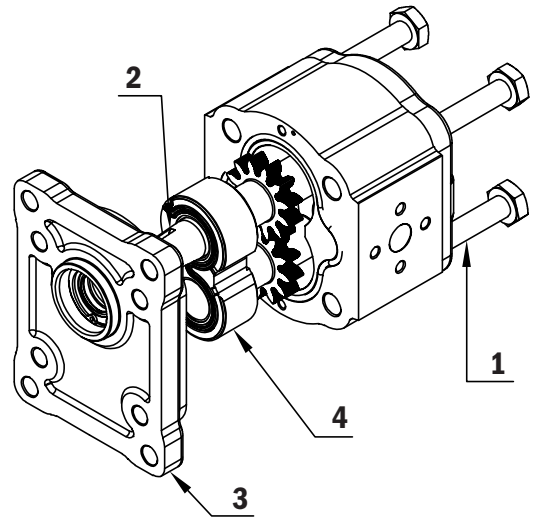
C. Assembling the tandem pump. Refit the clamp screws.

SCREWS TIGHTENING TORQUE = $60 \pm 2 \text{Nm}$
For length of closure screws = see page 18

► **INSTALLATION DATA:**

Units Rotating Changing Instructions

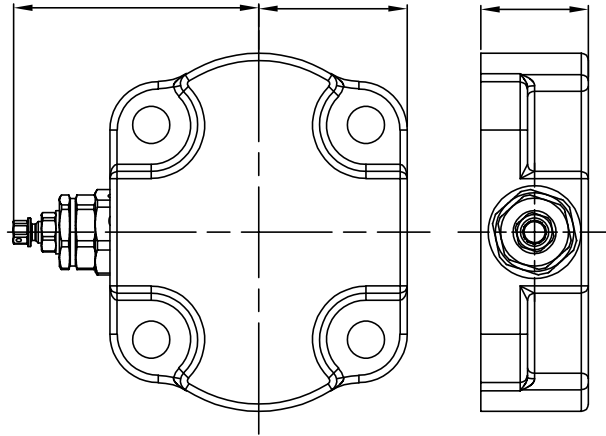
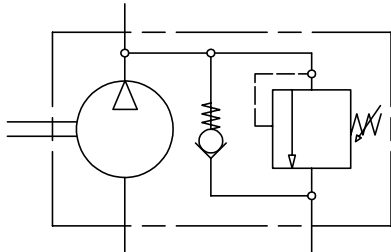
- A. Clean the pump externally with care
- B. Coat the sharp edges of the drive shaft (2) with adhesive tape and smear a layer of clean grease on the shaft and extension to avoid damaging the lip of the shaft seal when removing the mounting
- C. Lay the pump on the working area in order to
- D. Loosen, and remove, the clamp screws (1).
- E. Remove the mounting flange (3), taking care to keep the flange as straight as possible during removal.
- F. Ensure that while removing the front mounting remain in position.
- G. Ease the drive gear (2) up to facilitate removal of bearings (4), taking care that the precision ground surfaces do not become damaged, and removed the drive gear
- H. Remove the driven gear (2) without overturning.
- I. Re-locate the driven gear in the position previously occupied by the drive gear (2).
- J. Re-locate the drive gear (2) in the position previously occupied by the driven gear (5).
- K. Re-locate the bushing (4) without rotating. Refit the front mounting flange (3) turned by 180°.
- L. Refit the clamp screws (1).
SCREW TIGHTENING TORQUE = 60±2NM
- M. Check that the pump rotates freely when the drive shaft (2) is turned by hand.
- N. If not a pressure plate seal may be pinched.
- O. The pump is ready for installation with the new direction of rotation.



► **INSTALLATION DATA:**

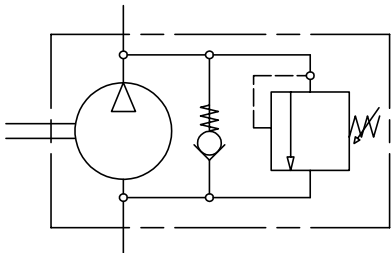
REV

Relief Valve with External Drain
(adjustable setting)



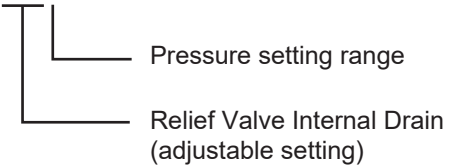
RIV

Relief Valve with Internal Drain
(adjustable setting)



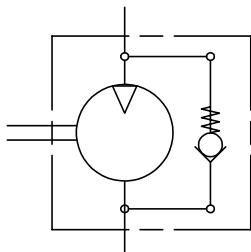
Spring CODE	Pressure setting range bar (psi)
N	51 - 90 (740 - 1300)
B	91 - 130 (1320 - 1880)
G	131 - 205 (1900 - 2970)

Ordering example (add at the end of the pump or motor code) : **RIVB**



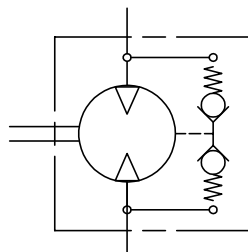
AV

Anticavitation Valve



ID

Internal Drain



► **FLANGE & SHAFT:**

Dimensions mm (inch)

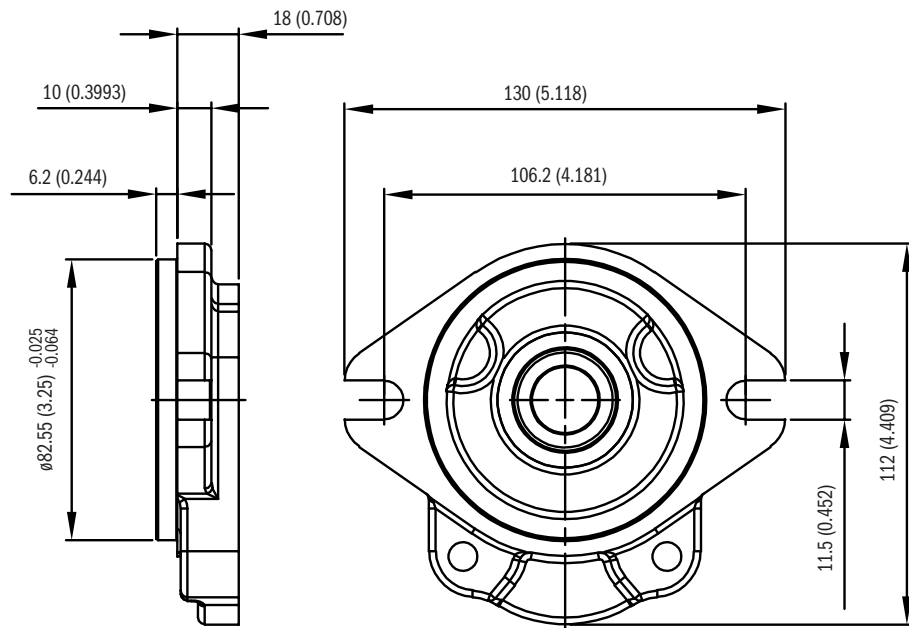
STANDARD CODES	FLANGE	SHAFT	AVAILABLE DISPLACEMENT
A09T	A = SAE A flange ø82	09T = Splined shaft 9T 16/32	4.5 to 28 cc
A11T	A = SAE A flange ø82	11T = Splined shaft 11T 16/32	16 - 20 - 25 -28
A058P	A = SAE A flange ø82	058P = Parallel shaft ø15.85	4.5 to 28 cc

* For other configurations than those indicated, please contact Hydreco technical support. Other displacements can be evaluated on request.

► **FLANGE:**

CODE [A]

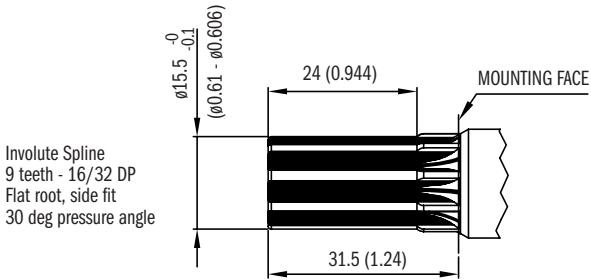
SAE (A) - 2 BOLTS



► **SHAFT:**

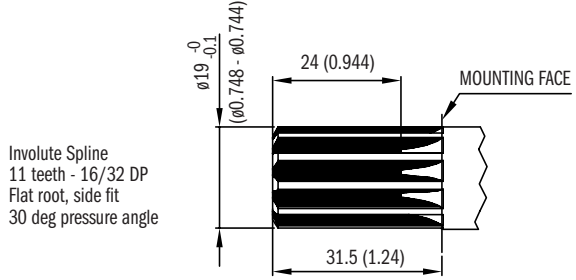
Dimensions mm (inch)

CODE [09T] SAE (A) 5/8" SPLINE



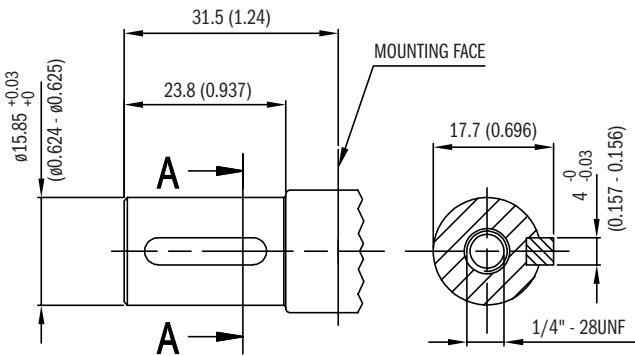
Max Torque = 100 Nm (885 lbf in)

CODE [11T] SAE (A) 3/4" SPLINE



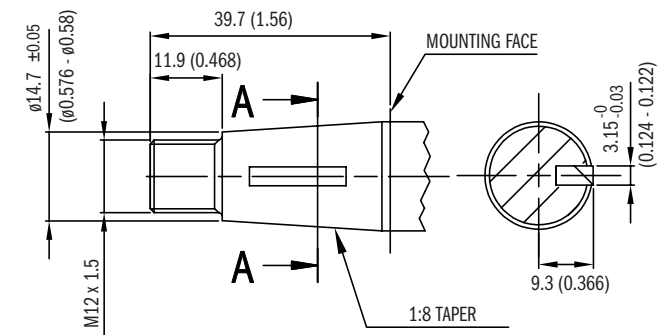
Max Torque = 170 Nm (1505 lbf in)

CODE [058P] SAE (A) 5/8" PARALLEL



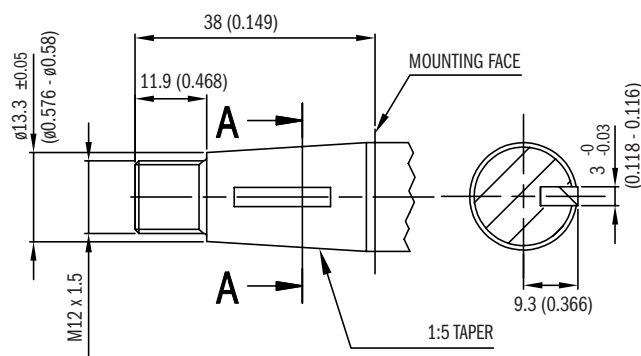
Max Torque = 70 Nm (620 lbf in)

CODE [T2] EUROPEAN TAPERED 1:8



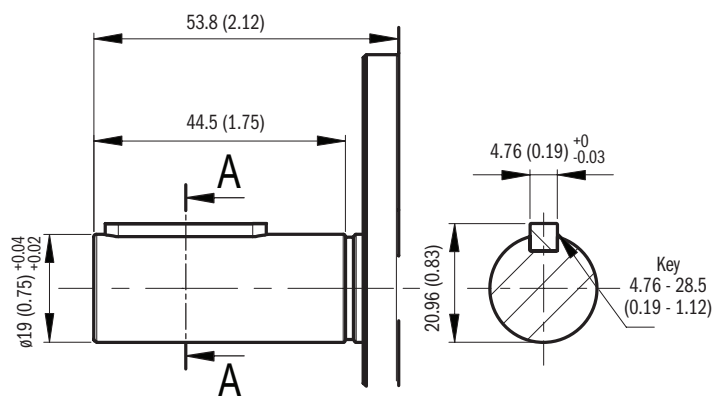
Max Torque = 140 Nm (1240 lbf in)

CODE [T6] GERMAN TAPERED 1:5

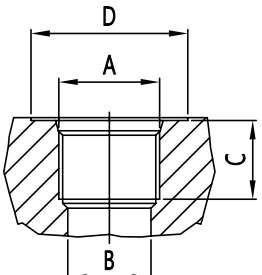


Max Torque = 140 Nm (1240 lbf in)

CODE [075P] SAE (A) 3/4" PARALLEL



► PORT DETAILS:

SAE THREADED PORTS (U) Compliant with SAE J514	Ordering Code	Dimensions mm (inches)				Tightening Torque Nm [lbf in]	
		A	B	C	D	Low Pressure	High Pressure
	25	7/8" - 14 UNF	20 (0.787)	17 (0.669)	35 (1.377)	30 [265]	70 [620]
	3	1 1/16" - 12 UNF	24 (0.944)	17 (0.669)	42 (1.653)	40 [355]	120 [1060]

STANDARD PORTS CONFIGURATION				
CODE	SUCTION	PRESSURE	POSITION	SIZE
U25/25S	25 = 7/8" 14 UNF	25 = 7/8" 14 UNF	S = SIDE	4 to 11
U3/25S	3 = 1 1/16" 12 UNF	25 = 7/8" 14 UNF	S = SIDE	14 to 31
U25/25R	25 = 7/8" 14 UNF	25 = 7/8" 14 UNF	R = REAR	4 to 11
U3/25R	3 = 1 1/16" 12 UNF	25 = 7/8" 14 UNF	R = REAR	14 to 31

INLET PORTS = For multiple pumps with single inlet please contact Hydreco technical support

Standard Ports

Ports Type	PUMP/MOTOR UNI-DIRECTIONAL	PUMP/MOTOR REVERSIBLE
	U	U
04	25/25	25/25
06	25/25	25/25
08	25/25	25/25
11	25/25	25/25
14	3/25	3/25
16	3/25	3/25
20	3/25	3/25
22	3/25	3/25
25	3/25	3/25
28	3/25	3/25
31	3/25	3/25

Tandem Pumps Screw Lengths

Size cc Gr.2	04	06	08	11	14	16	20	22	25	28	31
04	135	140	140	145	150	155	160	170	175	180	185
06		145	145	150	155	155	160	175	175	180	185
08			145	150	155	160	165	175	180	185	190
11				155	160	165	170	180	185	190	195
14					165	170	175	185	190	195	200
16						170	175	190	190	200	200
20							180	190	200	200	205
22								200	200	210	215
25									210	215	220
28										220	225
31											230

TANDEM PUMPS HY2+HY2

M10 screws size

10.9 screws class

Screws Tightening Torque = 60 +/- 2 Nm

Length expressed in millimeters



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