HY2-LN

External Gear Pumps

4.5 to 31.7 cc/rev, Up to 240 bar continuous

HY2 SAE A
Aluminium Tandem with cast iron adaptor and cover

► 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 HY2-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 HY2-LN series, available as pumps and motors, offers a high efficiency, low noise level and can be applied in standard and heavy duty applications, 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 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 quiet
- 4200 psi rated

HY2-LN
Single Pump/Motor

► PERFORMANCE:

Max outlet port pressures		240 rated - 290 peak
Inlet port pressures		0.7 - 3 bar abs
Speed Range	All models	500 - 4000 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 mm²/sec (9,000 SSU)
	Maximum continuous	250 mm²/sec (1150 SSU)
	Minimum continuous	10 mm²/sec (60 SSU)
	Optimum	15-25 mm²/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 (or reversible).	

HY2-LN

► FEATURES:

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

Displacements

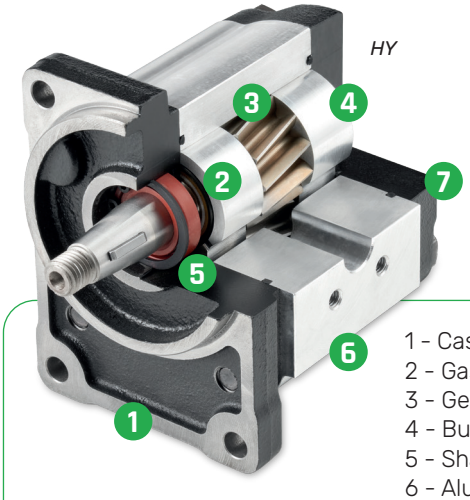
From 4.5 cm³/rev to 31.7 cm³/rev
From 0.27 in³/rev to 1.93 in³/rev:

Pressures

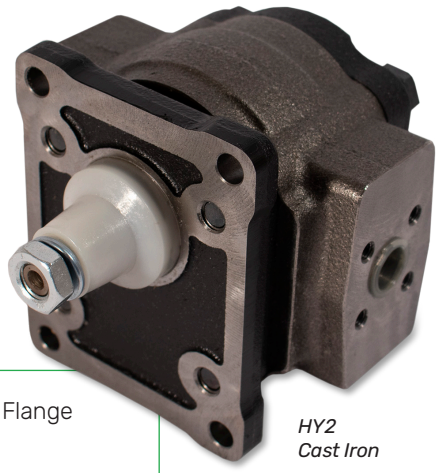
Max continuous 240 bar (3480 psi)
Max intermittent 270 bar (3910 psi)
Max peak 290 bar (4200 psi)

Max Speed

4000 RPG



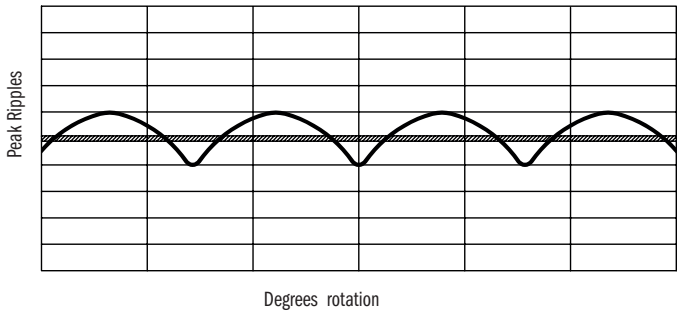
1 - Cast Iron Flange
2 - Gaskets
3 - Gears
4 - Bushings
5 - Shaft Seal
6 - Aluminium Alloy Body
7 - Cast Iron Cover



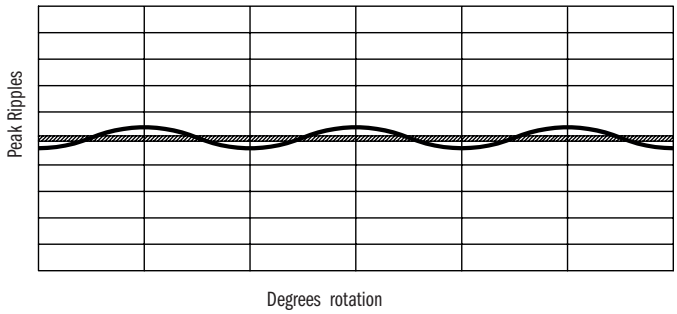
HY2
Cast Iron

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

HY2 - STANDARD SERIES



HY2 - LN SERIES

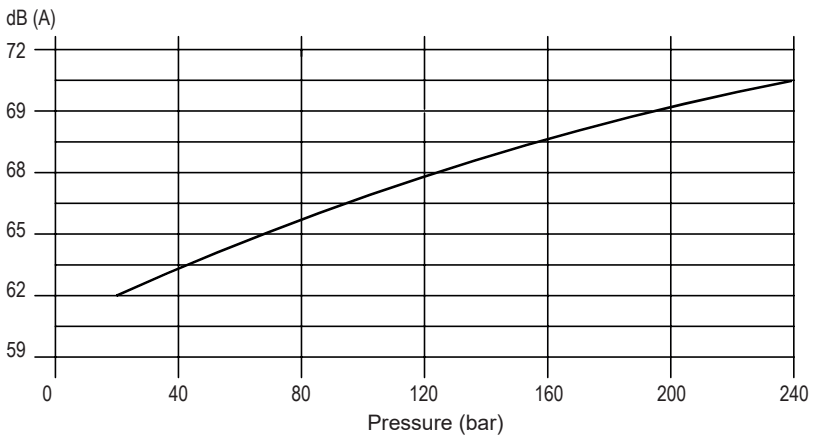


Also the HY2-LN gear pumps offer a noise level reduction from 2 to 8 dB(A), compared with the standard gear pumps.

TEST:

- Pump Displacement
  14.6 cc
  0.89 (in³/rev)

- Rotation speed
  1800 r.p.m.



► FEATURES:

Displacement Range

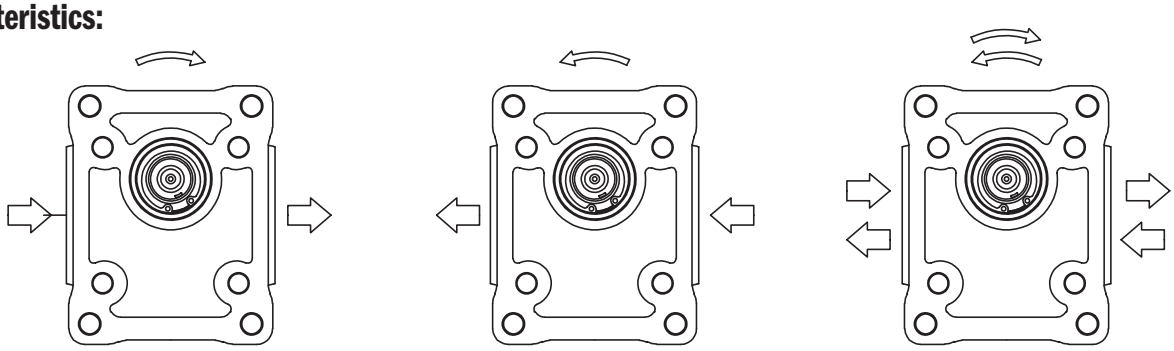
GROUP	SIZE	DISPLACEMENT cm³/rev (in³/rev)	MAX PRESSURE bar (psi)			SPEED rpm	
			P1	P2	P3	min	max
HY2-LN	04	4.5 (0.27)	240 (3480)	270 (3910)	290 (4200)	600	4000
	06	6.5 (0.4)	240 (3480)	270 (3910)	290 (4200)	600	4000
	08	8.2 (0.5)	240 (3480)	270 (3910)	290 (4200)	600	4000
	11	11.3 (0.67)	240 (3480)	270 (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.

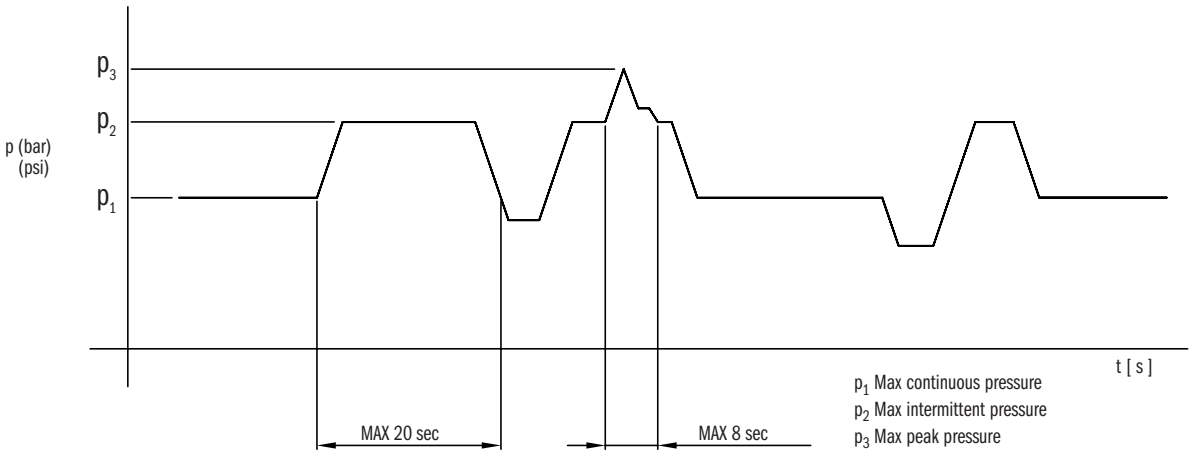
General Characteristics:

Rotation Direction



Clockwise Rotation | Anti-Clockwise Rotation | Reversible Rotation

Definition of Pressures



HY2-LN

► IDENTIFICATION CODE: Single and Front Pump

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

FAMILY | **LOW NOISE** | **GROUP** | **SERIES NUMBER** | **VALVES**

(from 1 to 9: sizes and mounting dimensions remain unchanged)

See page 15

TYPE	
CODE	**NAME**
P	Pump
M	Motor

BODY	
CODE	**NAME**
A	Aluminium
C	Cast Iron

PUMP ROTATION	
CODE	**DESCRIPTION**
C	Clockwise **(Standard)**
A	Anti-clockwise
R	Reversible

PORT POSITION	
CODE	**NAME**
S	Side
R	Rear

SEALS	
CODE	**NAME**
N	NBR **(Standard)**
V	Viton (for special fluids)

OIL SHAFT SEAL	
CODE	**NAME**
S	**(Standard)**
V	Viton
H	High Pressure (Only for motor)

PUMP SIZE AND DISPLACEMENT RANGE	
CODE	**Displacement cm³/rev (in³/rev)**
04	4.5 cm³/rev (0.27 in³/rev)
06	6.5 cm³/rev (0.4 in³/rev)
08	8.2 cm³/rev (0.5 in³/rev)
11	11.3 cm³/rev (0.67 in³/rev)
14	14.6 cm³/rev (0.89 in³/rev)
16	16.9 cm³/rev (1.03 in³/rev)
20	20.1 cm³/rev (1.23 in³/rev)
22	22 cm³/rev (1.34 in³/rev)
25	25.2 cm³/rev (1.54 in³/rev)
28	28.2 cm³/rev (1.72 in³/rev)
31	31.7 cm³/rev (1.93 in³/rev)

MOUNTING FLANGES & SHAFT END CODE	
CODE	**NAME**

See: page 16

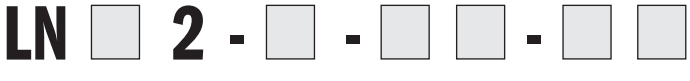
PORTS CONFIGURATION IN/OUT	
CODE	**NAME**

See: page 18

DIGIT ASSIGNED BY HYDRECO FOR REAR SHAPE (FRONT PUMP ONLY)

TYPICAL ORDERING CODE: Single Pump
HY-PLNA2-C08-A11T-U3/25S-1NS

► IDENTIFICATION CODE: Intermediate Pump (for Multiple Pumps)



LOW NOISE

GROUP

SERIES NUMBER

(from 1 to 9: sizes and mounting dimensions remain unchanged)

BODY	
CODE	**NAME**
A	Aluminium
C	Cast Iron

PORT POSITION	
CODE	**NAME**
S	Side
R	Rear

SEALS	
CODE	**NAME**
N	NBR **(Standard)**
V	Viton (for special fluids)

Available if SS

PUMP SIZE AND DISPLACEMENT RANGE	
CODE	**Displacement cm³/rev (in³/rev)**
04	4.5 cm³/rev (0.27 in³/rev)
06	6.5 cm³/rev (0.4 in³/rev)
08	8.2 cm³/rev (0.5 in³/rev)
11	11.3 cm³/rev (0.67 in³/rev)
14	14.6 cm³/rev (0.89 in³/rev)
16	16.9 cm³/rev (1.03 in³/rev)
20	20.1 cm³/rev (1.23 in³/rev)
22	22 cm³/rev (1.34 in³/rev)
25	25.2 cm³/rev (1.54 in³/rev)
28	28.2 cm³/rev (1.72 in³/rev)
31	31.7 cm³/rev (1.93 in³/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-A11T-U3/25S + LNA2-06-U25/25S-1N

Identification code for triple pumps

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

Example: HY-PLNA2-C08-A11T-U3/25S-INS + LNA2-06-U25/25S-IN + LNA2-06-U25/25S-1N

► IDENTIFICATION CODE: For Isolated intermediate Pumps

LN □ 2 - □ □ - □ □ - □ □ □

- LN: LOW NOISE
- 2: GROUP
- SERIES NUMBER: (from 1 to 9: sizes and mounting dimensions remain unchanged)

BODY	
CODE	NAME
A	Aluminium
C	Cast Iron

PUMP ROTATION	
CODE	DESCRIPTION
C	Clockwise **(Standard)**
A	Anti-clockwise
R	Reversible

PORT POSITION	
CODE	NAME
S	Side
R	Rear

SEALS	
CODE	NAME
N	NBR **(Standard)**
V	Viton (for special fluids)

OIL SHAFT SEAL	
CODE	NAME
OMIT	**(Standard)**
SS	If separate stages are needed

See: page 16

PUMP SIZE AND DISPLACEMENT RANGE	
CODE	Displacement cm³/rev (in³/rev)
04	4.5 cm³/rev (0.27 in³/rev)
06	6.5 cm³/rev (0.4 in³/rev)
08	8.2 cm³/rev (0.5 in³/rev)
11	11.3 cm³/rev (0.67 in³/rev)
14	14.6 cm³/rev (0.89 in³/rev)
16	16.9 cm³/rev (1.03 in³/rev)
20	20.1 cm³/rev (1.23 in³/rev)
22	22 cm³/rev (1.34 in³/rev)
25	25.2 cm³/rev (1.54 in³/rev)
28	28.2 cm³/rev (1.72 in³/rev)
31	31.7 cm³/rev (1.93 in³/rev)

PORTS CONFIGURATION IN/OUT	
CODE	NAME

See: page 18

TYPICAL ORDERING CODE:
LNA2-C06-U25/25S-1NSS

▶ 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)	Clockwise (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 (72 psi)
Temperature fluid (MIN, MAX, PEAK) ˚C	-25, 80, 100 NBR
	-25, 110, 125 VITON
Range of viscosity	From 10 to 100 mm²/s (cSt) IDEAL
	Up to 750 mm²/s (cSt) RECOMMENDED
	Up to 1000 mm²/s (cSt) START
Fluid type	Mineral oil

Recommended Filtration

Working pressure bar (psi)	Δp < 140 (2030)	140 (2030) < Δp < 210 (3040)	Δp > 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 (cm^3/rev)
n = speed (min^{-1})
M = torque (Nm)
P = power (kW)
^p = 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

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

$M_{real} = \frac{Mtheor}{\eta hm}$ (Nm) $M_{theor} = \frac{\Delta p \times V}{62.8}$ (Nm)

$P_{OUT} = \frac{\Delta p \times Q}{600}$ (kW) $P_{IN} = \frac{POUT}{\eta t}$

DETERMINATION OF A MOTOR

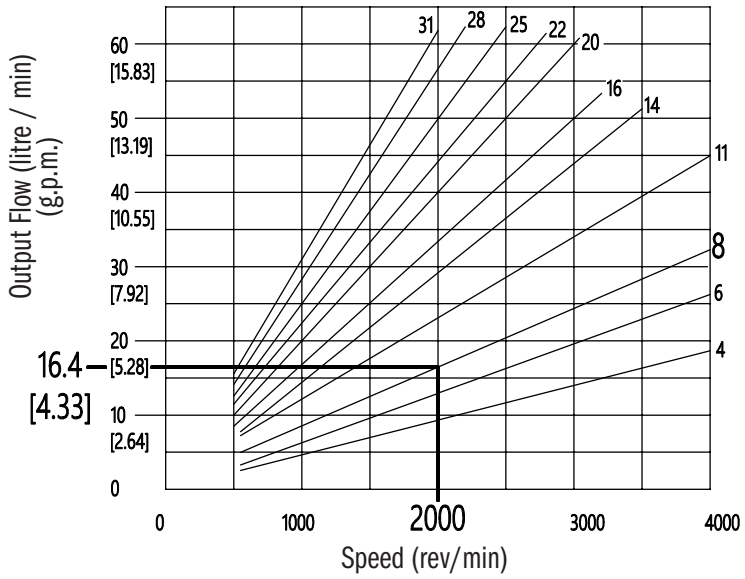
$Q_{theor} = \frac{V \times n}{1000}$ (l/min) $Q_{real} = \frac{Qtheor}{\eta v}$

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

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

PUMP SELECTION

Curves at 40˚C (104˚F) - Fluid viscosity 46 mm²/sec (cSt)

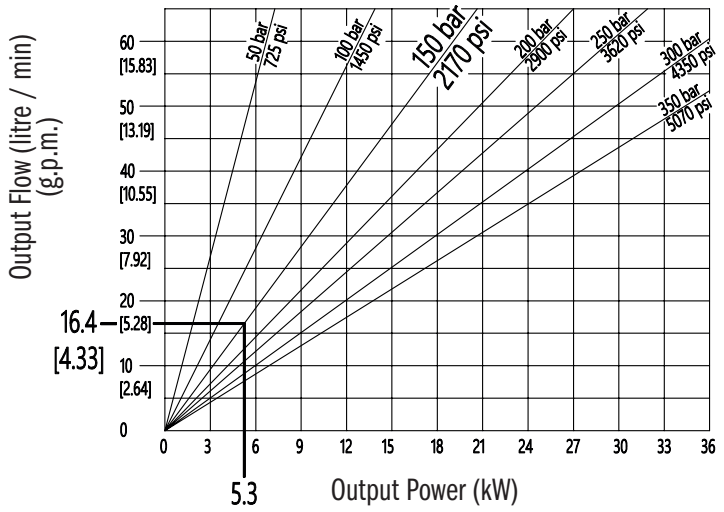


Example

Working conditions:
Pump 8.2cc
Speed 2000 r.p.m.

Pressure: 150 bar [2170 psi]

Motor: 5.3 kW (7.1 HP)



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.

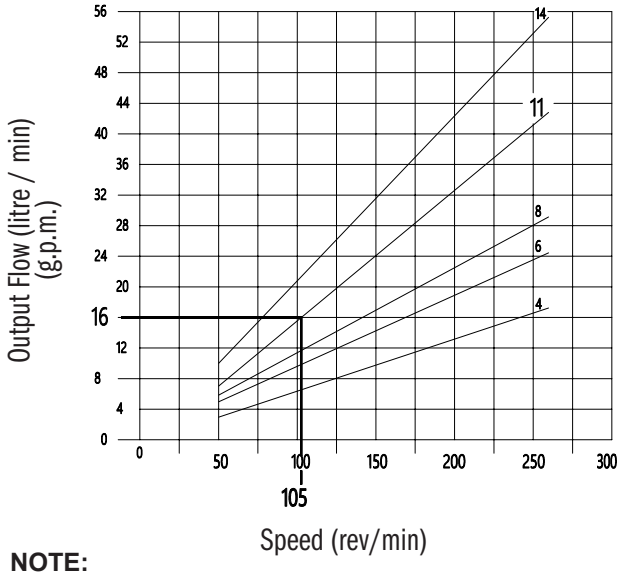
NOTE:

Diagrams provide approximate selection data

▶ PERFORMANCE DATA:

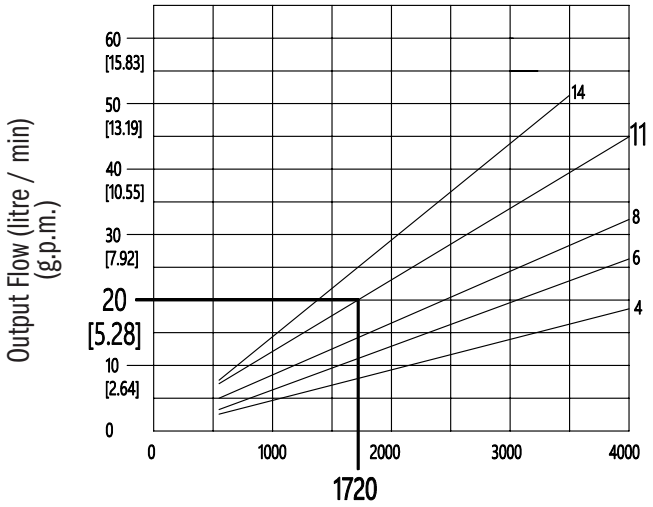
PUMP SELECTION

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



NOTE:

Diagrams provide
approximate selection data



Example

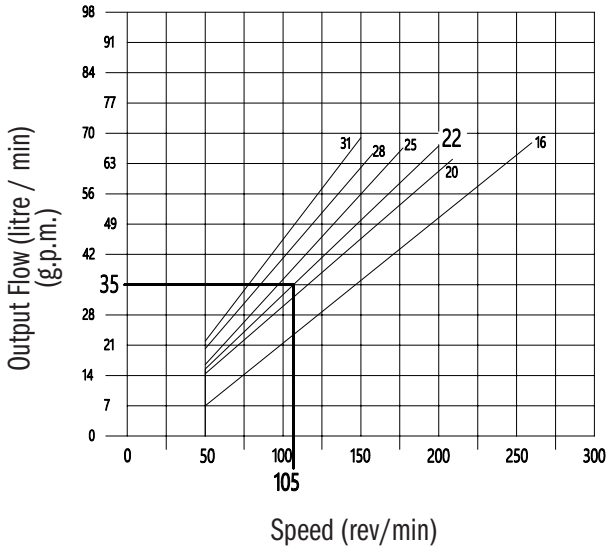
Working conditions:
Pump 8.2cc
Speed 2000 r.p.m.

Pressure: 150 bar [2170 psi]

Motor: 5.3 kW (7.1 HP)

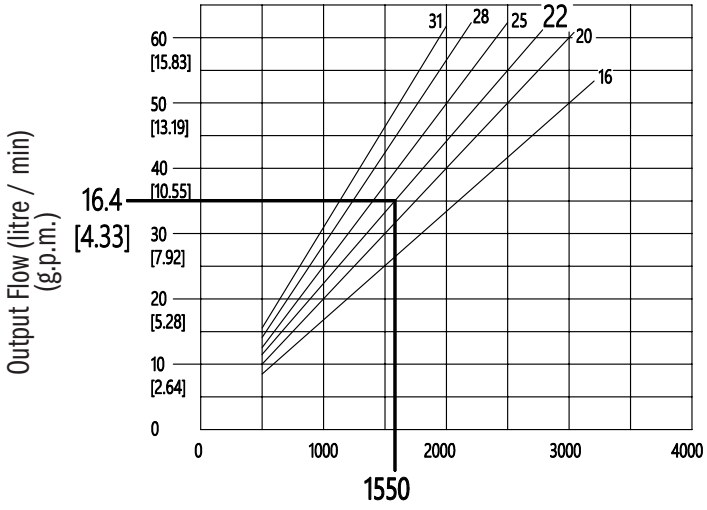
PUMP SELECTION

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]

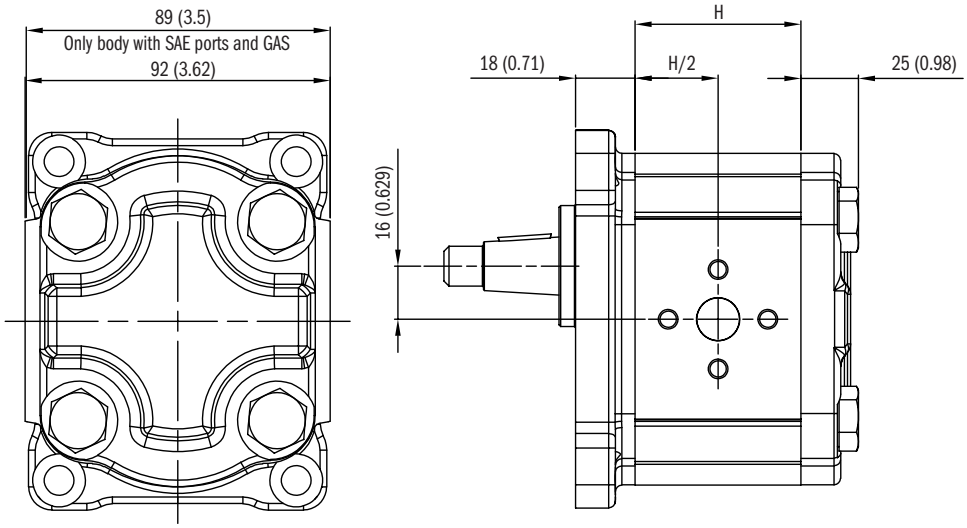
Motor: 5.3 kW (7.1 HP)

► INSTALLATION DATA:

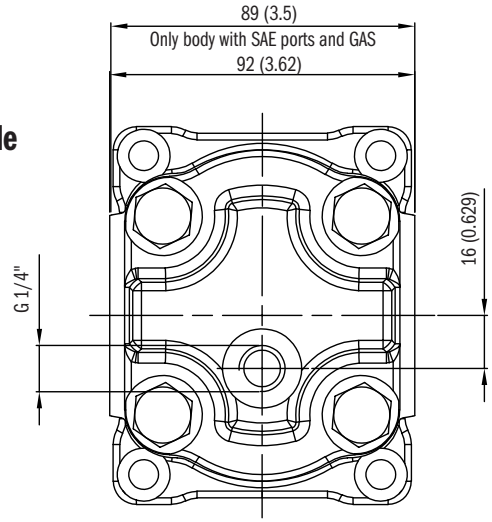
Dimensions mm (inch)

Single Pumps

Unidirectional Cover

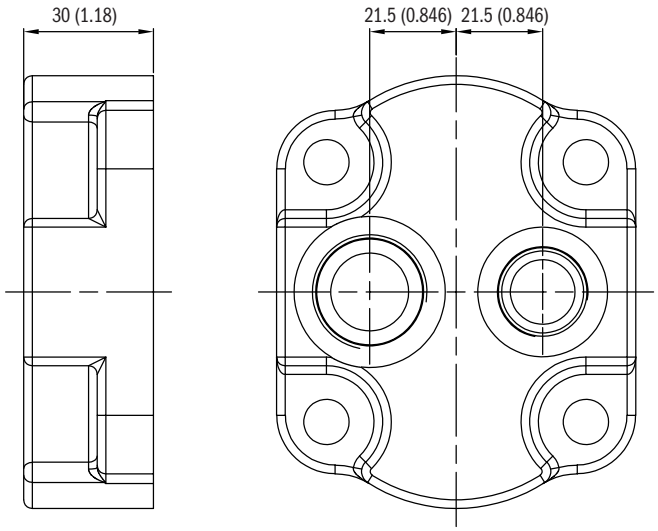


Reversible Cover



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



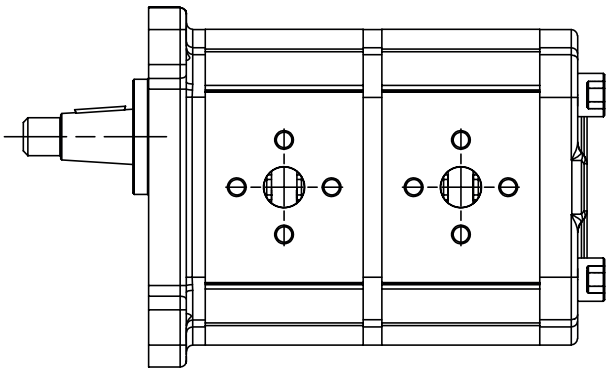
Available rear ports:
SAE

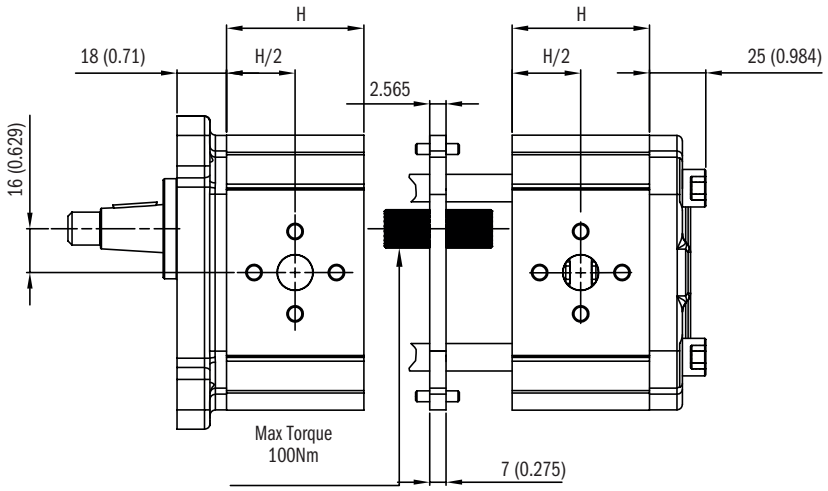
See page 18

► INSTALLATION DATA:

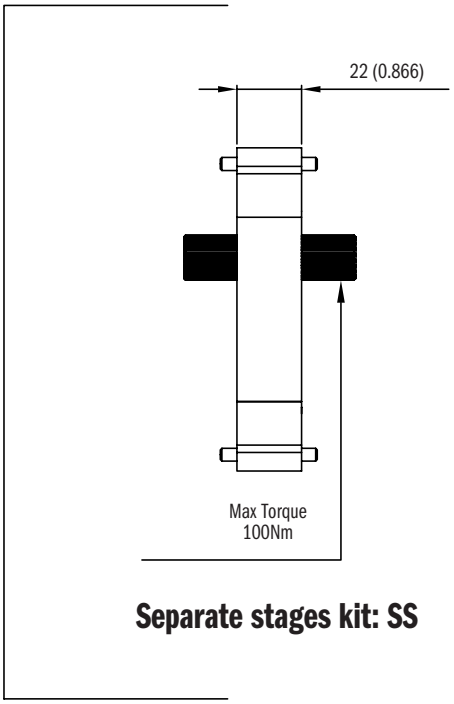
Dimensions mm (inch)

Side View





STANDARD
Configuration tandem pumps



Separate stages kit: SS

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
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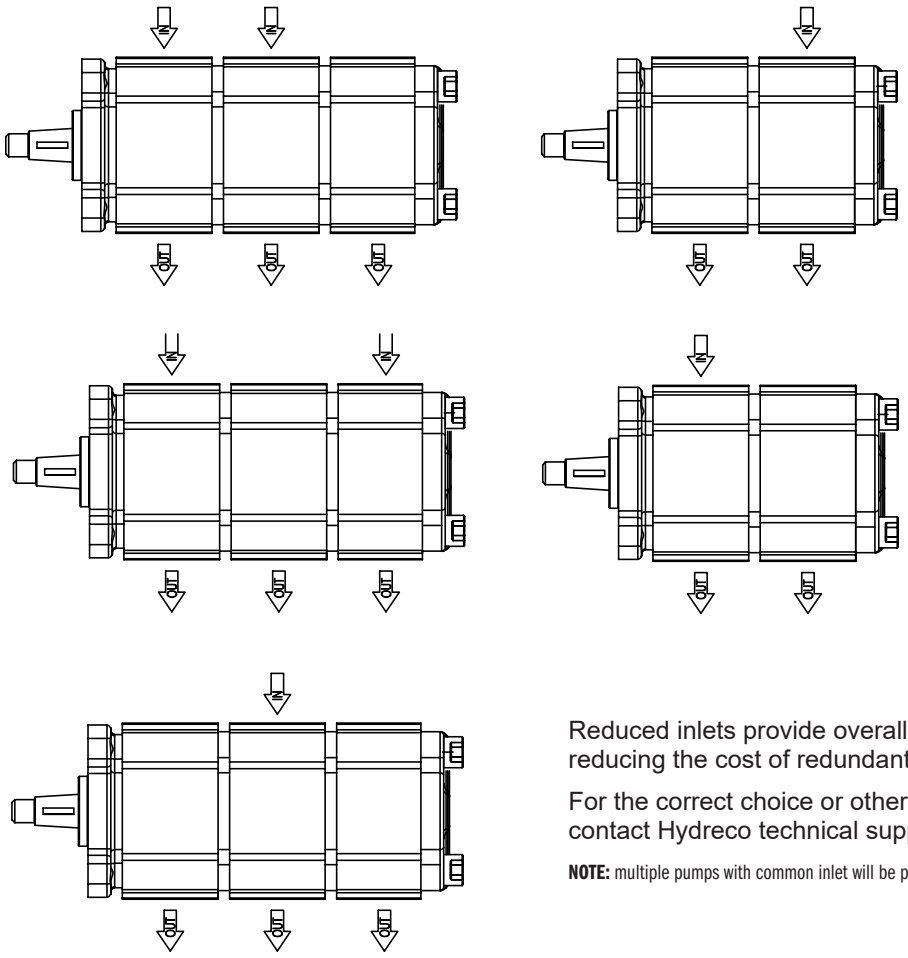
31	96.1 (3.783)	4.2

Indicative weights - European flange and 1:8 tapered shaft

► INSTALLATION DATA:

Dimensions mm (inch)

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.

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
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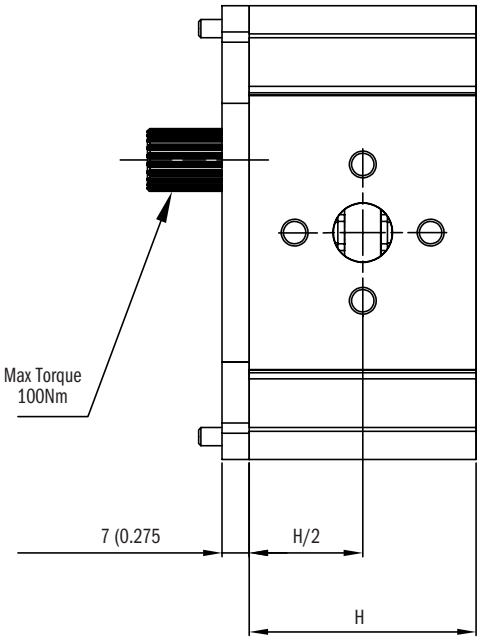
28	91.0 (3.582)	4.2
31	96.1 (3.783)	4.2

Indicative weights - European flange and 1:8 tapered shaft

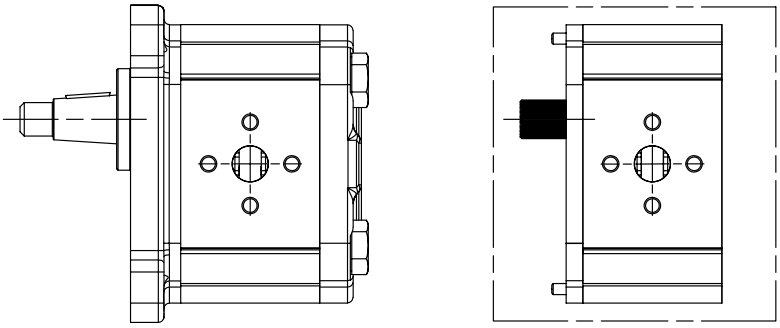


► INSTALLATION DATA:

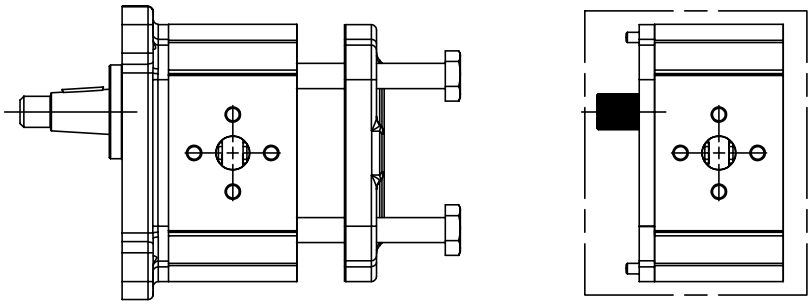
Dimensions mm (inch)

How to make Tandem pumps using an intermediate pump

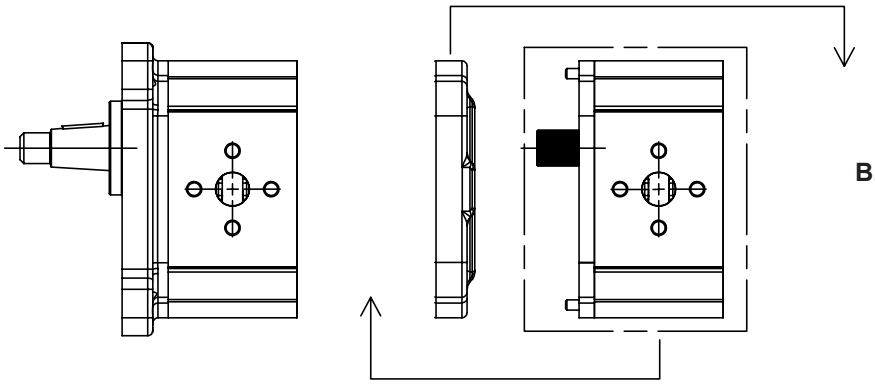
(side view)



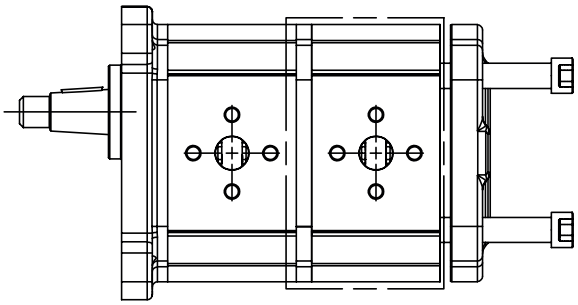
STANDARD PUMP **INTERMEDIATE PUMP**



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±2Nm (44 lb-ft)
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 have the mounted flange turned upside.

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).

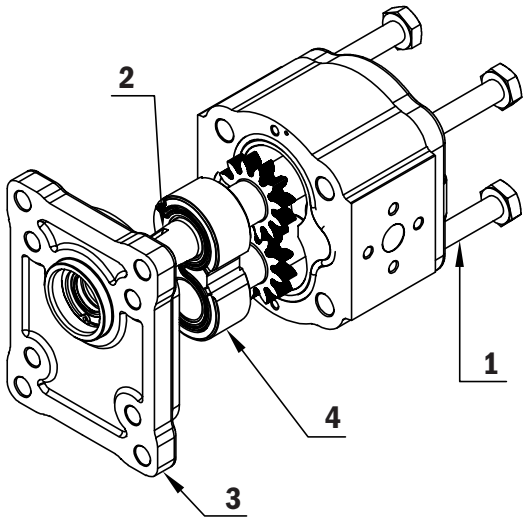
K. Re-locate the bushing (4) without rotating. Refit the front mounting flange (3) turned by 180°.

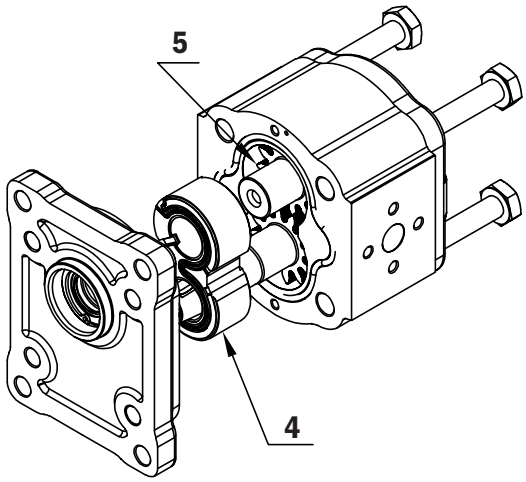
L. Refit the clamp screws (1).
SCREW TIGHTENING TORQUE = 60±2NM (44lb-Ft)

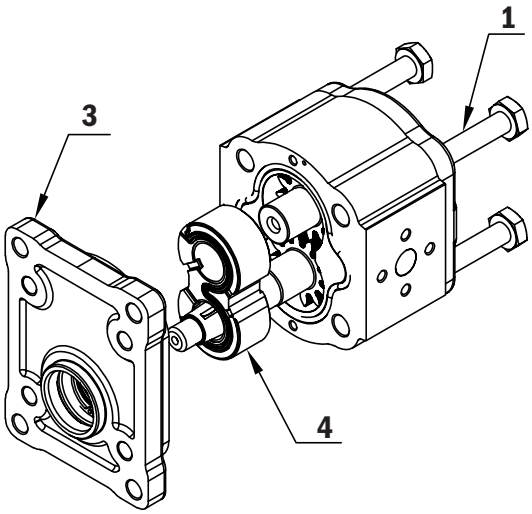
M. Check that the pump rotates freely when the drive shaft (2) is turned by hand.

N. If not a pressure plate seal may be pinched.

O. The pump is ready for installation with the new direction of rotation.



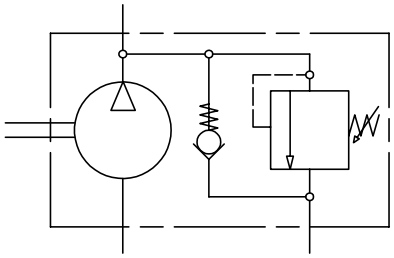


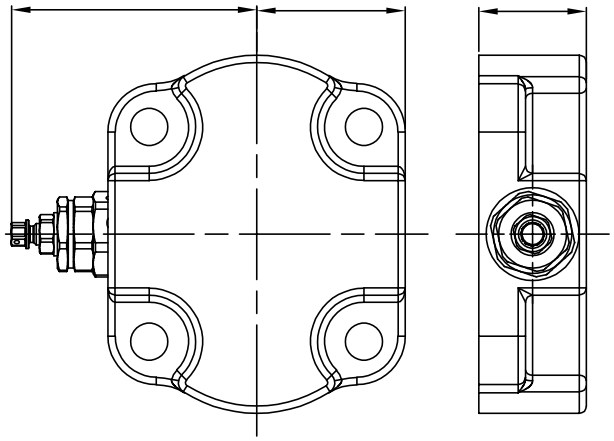


► INSTALLATION DATA:

REV

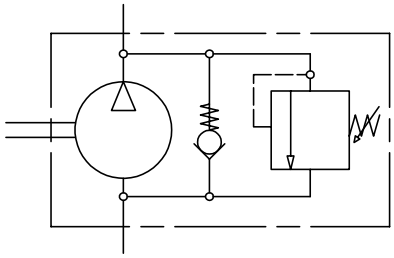
Relief Valve with External Drain
(adjustable setting)





RIV

Relief Valve with Internal Drain
(adjustable setting)



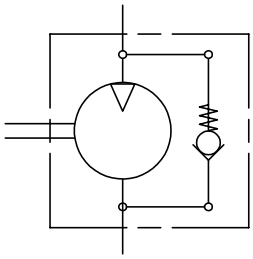
Spring CODE	Pressure setting range bar (psi)
N	51 - 90 (740 - 1300)
B	91 - 130 (1320 - 1880)
G	131 - 205 (1900 - 2970)

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

- **R** — Pressure setting range
- **IV** — Relief Valve Internal Drain (adjustable setting)

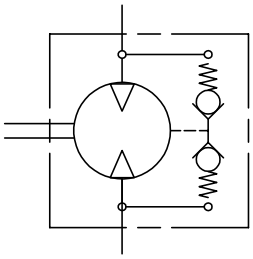
AV

Anticavitation Valve



ID

Internal Drain



▶ FLANGE & SHAFT:

Dimensions mm (inch)

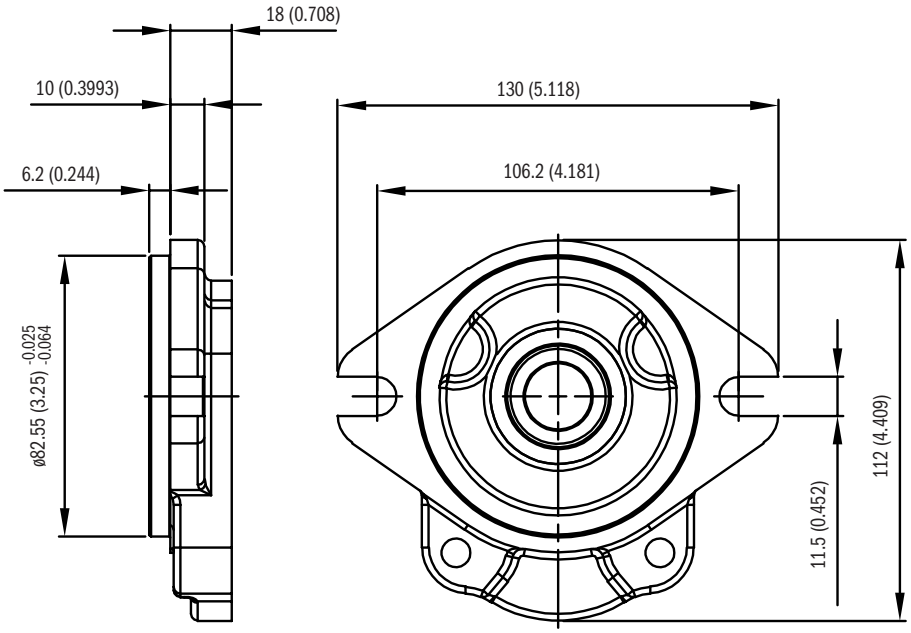
STANDARD CODES	FLANGE	SHAFT	AVAILABLE DISPLACEMENT
A09T	A = SAE A flange ø82	09T = Splined shaft 9T 16/32	4.5 to 28 cc
A11T	A = SAE A flange ø82	11T = Splined shaft 11T 16/32	16 - 20 - 25 -28
A058P	A = SAE A flange ø82	058P = Parallel shaft ø15.85	4.5 to 28 cc
A034P	A = SAE A flange ø82	034P = Parallel shaft ø19.05	11 to 28 cc

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

▶ FLANGE:

CODE [A]

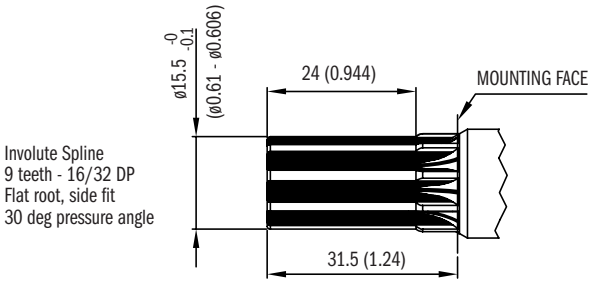
SAE (A) - 2 BOLTS)



► SHAFT:

Dimensions mm (inch)

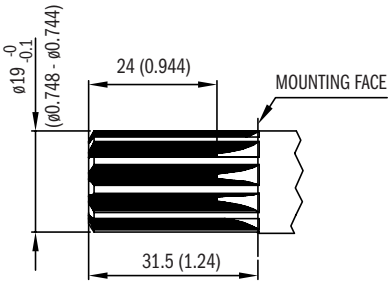
CODE [09T] SAE (A) 5/8" SPLINE



Involute Spline
9 teeth - 16/32 DP
Flat root, side fit
30 deg pressure angle

Max Torque = 100 Nm (885 lbf in)

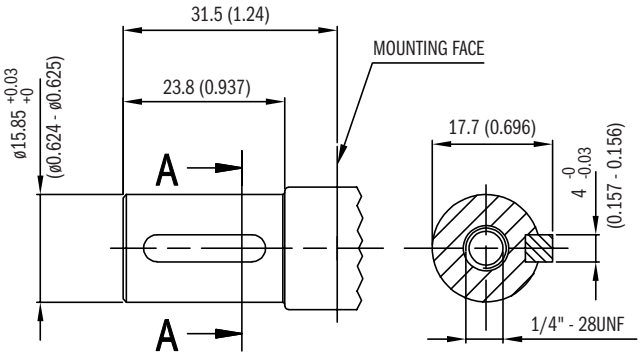
CODE [11T] SAE (A) 3/4" SPLINE



Involute Spline
11 teeth - 16/32 DP
Flat root, side fit
30 deg pressure angle

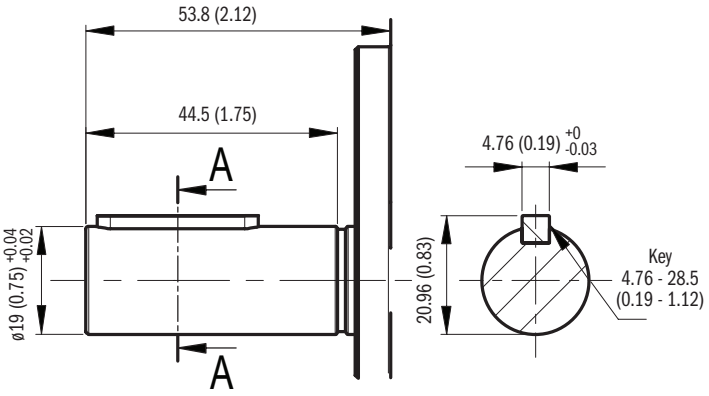
Max Torque = 170 Nm (1505 lbf in)

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

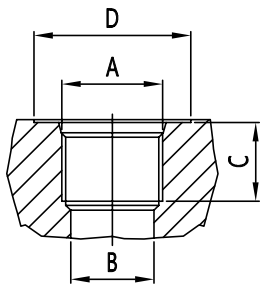


Max Torque = 70 Nm (620 lbf in)

CODE [034P] 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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