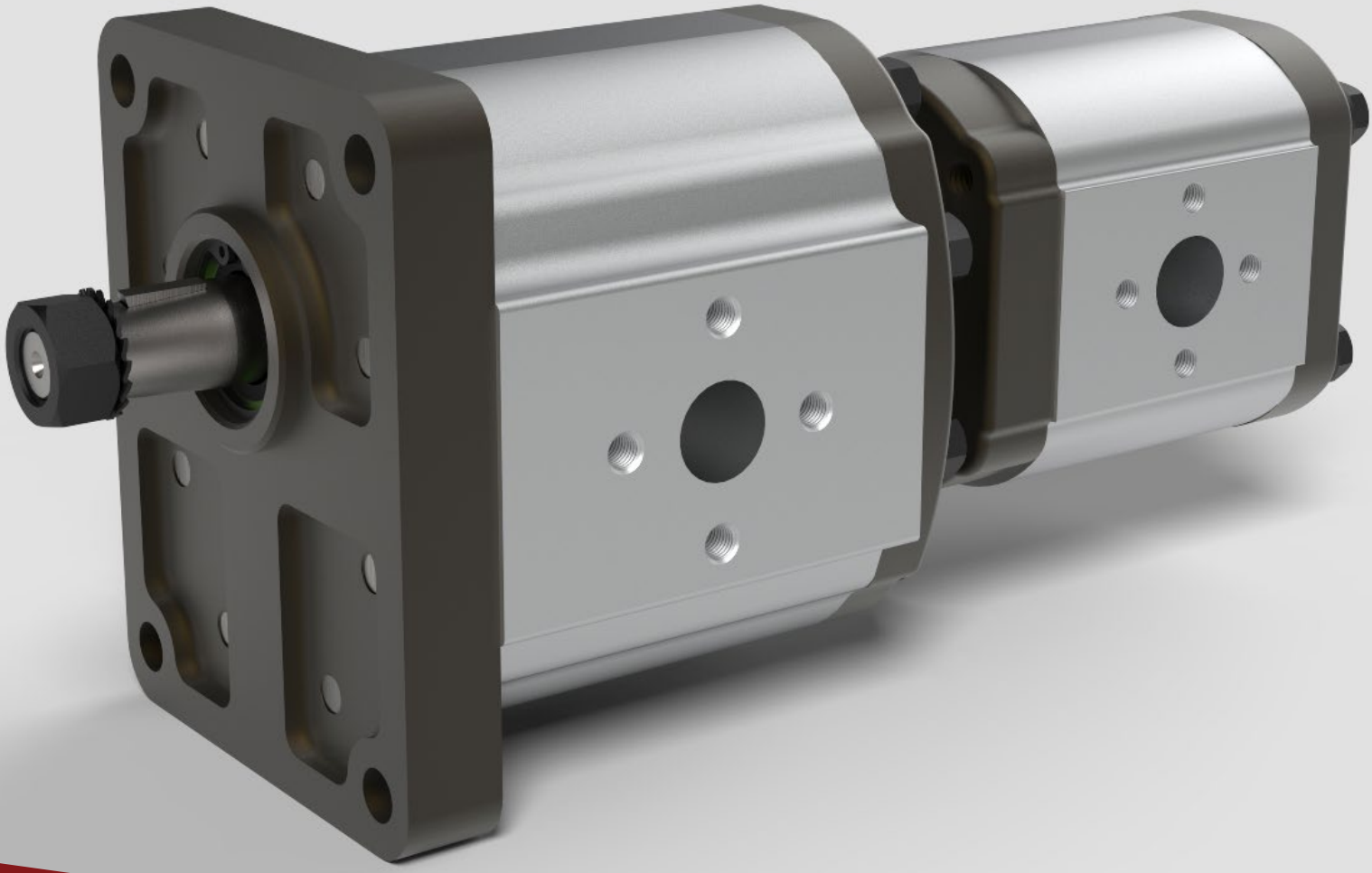
HYDRAULIC
ENERGY
THAT MOVES THE WORD

Oilpower
Swedish Technology



HYDRAULIC
GEAR PUMP

TABLE OF CONTENTS

GENERAL

Gear type pump is the most widely used design in hydraulic systems. It is simple in construction, reliable in operation and the most cost-effective.

OILPOWER has been involved with the design, development and manufacture of gear pumps for many years. Well proven designs, the use of specially developed materials, constant testing and sophisticated mass production techniques ensure products of the very high quality.

OILPOWER gear pumps are available with different of 0P, H1P, 2P, 3P with different displacements from range of 0.8 cm^3/rev to 151 cm^3/rev and variety.

All pumps are available as multiple units either of the same or different series.

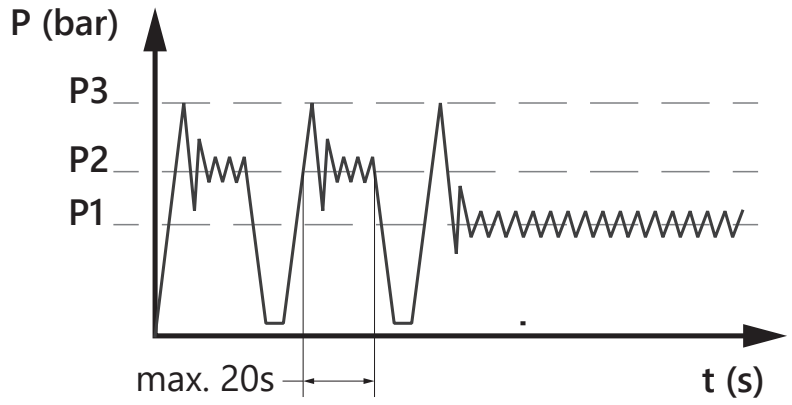
With all sizes of pumps there are options of shafts, flanges and ports as per European, German and American standards.

OILPOWER gear pumps offer:

- High volumetric efficiency by innovative design and accurate control of machining tolerances.
- Axial compensation achieved by the use of floating bushes that allow high volumetric efficiency throughout the working pressure range.
- DU bearings ensure high pressure capability.
- Shaved teeth integral gear to the control of gear tip leakage and shaft.
- Extruded alluminum body.
- Die cast alluminum cover and flange - cast iron rear cover.
- Double shaft seals.
- Nitrile seals as standard and viton seals in high temperature applications.

All pumps are hydraulic tested after assembly to ensure the high standard performance required by OILPOWER'S engineering.

DEFINATION OF PRESSURE



P1 = Continuous operating pressure,

P2 = Intermittent operating pressure,

P3 = Peak Pressure.

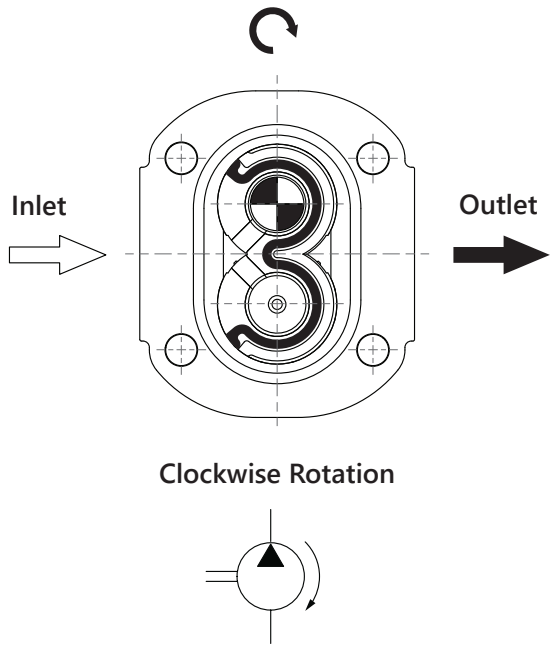
PUMP WORKING CONDITION

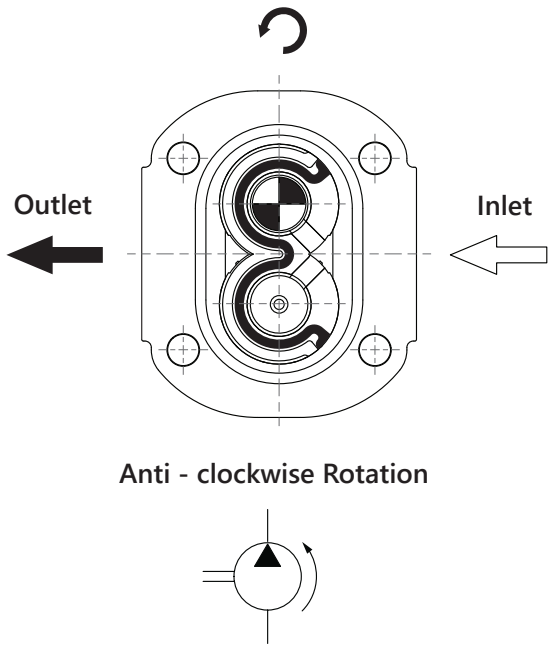
Pump inlet pressure (absolute pressure)	0,7 to 2,5 bar
Minimum operating fluid viscosity	12 mm^2 / sec
Max starting viscosity	800 mm^2 / sec
Suggested fluid viscosity range	17 - 65 mm^2 / sec
Fluid operating temperature range	-15 to 85 °C
Fluid operating temperature range with FPM seals(Viton)	-20 to 110 °C

DRIVE SHAFT

For drive to pump radial and axial loads on the shaft must be avoided since they reduce the life of the Unit. Pumps driven by power take-off on engines must always be connected by placing "Oldham" coupling or coupling having convex toothed hub. There should not be misalignment during assembly.

PUMP ROTATION DIRECTION VIEWED AT THE DRIVE SHAFT





PUMP SUCTION AND DELIVERY LINES

To ensure favorable suction conditions it is important to keep pressure drop in suction pipe line . It should be free from sharp bends to prevent excessive suction head. The system should be design to prevent entry of air. Positive head of oil should be maintained whenever possible. To calculate hydraulic pipe line size, the designers can use, as an approximate fluid speed from 1 to 2 m/sec on suction pipe length upto 2 meters and from 6 to 10 m/sec on pressure pipe line.

RECOMMENDED FILTRATION

The Fluid should be filtered during top-up and continuosly operation, to achieve and maintain a cleanliness level as below.

Working Condition	> 160 bar	< 160 bar
Contamination class NAS 1638	9	10
Contamination class ISO 4406	18/15	19/16
Achieved with filter ßx =75	15 µm	25 µm

COMMON FORMULAS

Input Torque = $C = \frac{q \cdot \Delta p}{62.8 \cdot \eta_m}$ (Nm)

Input Power = $P = \frac{q \cdot n \cdot \Delta p \ 10^{-3}}{600 \ \eta_m}$ (Kw)

Outlet Flow = $Q = \frac{q \cdot n \cdot \eta_v}{1000}$ (l/min)

LEGENDA

Δp = Working Pressure (bar)

q = Displacement (cm3/rev)

n = Speed (min-1)

η_m = Mechanical eff. (0.92)

η_v = Volumetric eff. (0.95)

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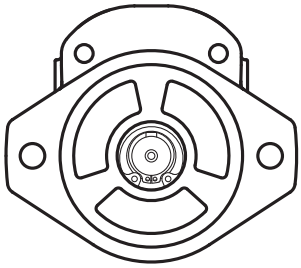
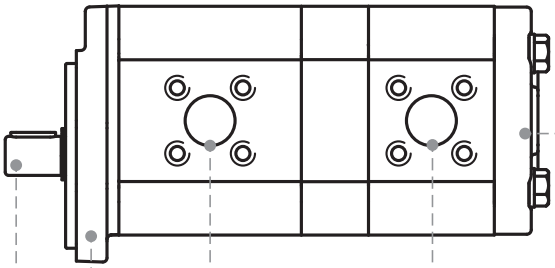
PUMP CODIFICATION CHART





PUMP SIZE (Ref. Performance Data)		ROTATION CODE	SHAFT CODE	FLANGE CODE	BODY PORT CODE (Ref. Installation Data)		COVER CODE	SHAFT SEAL CODE
Front Section	Rear Section	A - Anticlockwise C - Clockwise	Refer Installation Data	Refer Installation Data	Front Section	Rear Section	Refer Installation Data	

	Front Section	Rear Section
0P Group	OP - 03	OP - 03
	OP - 04	OP - 04
	OP - 06	OP - 06
	OP - 08	OP - 08
	OP - 11	OP - 11
	OP - 13	OP - 13
	OP - 15	OP - 15
1P Group	OPH - 13	OPH - 13
	OPH - 18	OPH - 18
	OPH - 26	OPH - 26
	OPH - 36	OPH - 36
	OPH - 46	OPH - 46
	OPH - 53	OPH - 53
	OPH - 63	OPH - 63
	OPH - 74	OPH - 74
	OPH - 83	OPH - 83
	OPH - 90	OPH - 90
2P Group	OP - 50	OP - 50
	OP - 70	OP - 70
	OP - 90	OP - 90
	OP - 105	OP - 105
	OP - 120	OP - 120
	OP - 146	OP - 146
	OP - 158	OP - 158
	OP - 220	OP - 220
3P Group	OP - 150	OP - 150
	OP - 180	OP - 180
	OP - 210	OP - 210
	OP - 250	OP - 250
	OP - 300	OP - 300
	OP - 330	OP - 330
	OP - 380	OP - 380
	OP - 500	OP - 500

P - Parallel
T - Tapered 1:8
K - Tapered 1:5
S - SAE Spline
G - Spline 11 Teeth
Q - Quill Drive
L - Parallel 5/8
C - Tang Drive
For other contact us

D - 4 Bolts 36.5 Spigot
S - SAE 2 Bolts
C - SAE 4 Bolts
X - SAE A-2 Bolts Quill Drive
H - 6 Bolts
E - SAE B-2 Bolts Quill Drive
B - 4 Bolts 80 Spigot
K - 2 Bolts 50 Spigot
For other contact us

D - DT Ports
S - SAE Ports
T - Threaded Ports
U - UNF Threaded Ports
B - German Flange Ports
E - European Flange Ports
For other contact us

B - STANDARD
R - WITH RELIEF VALVE

N - Single Nitrile
V - Single Viton
E - Double Nitrile
W - Double Viton

2P	2P	OPH - 90	OPH - 36	C	P	S	B	B	B	N
PUMP GROUP		FRONT PUMP	REAR PUMP				FRONT PORT	REAR PORT		

PUMP PARTS & HOW TO INVERT THE PUMP ROTATION

FIGURE - 1
ANTICLOCKWISE ROTATION

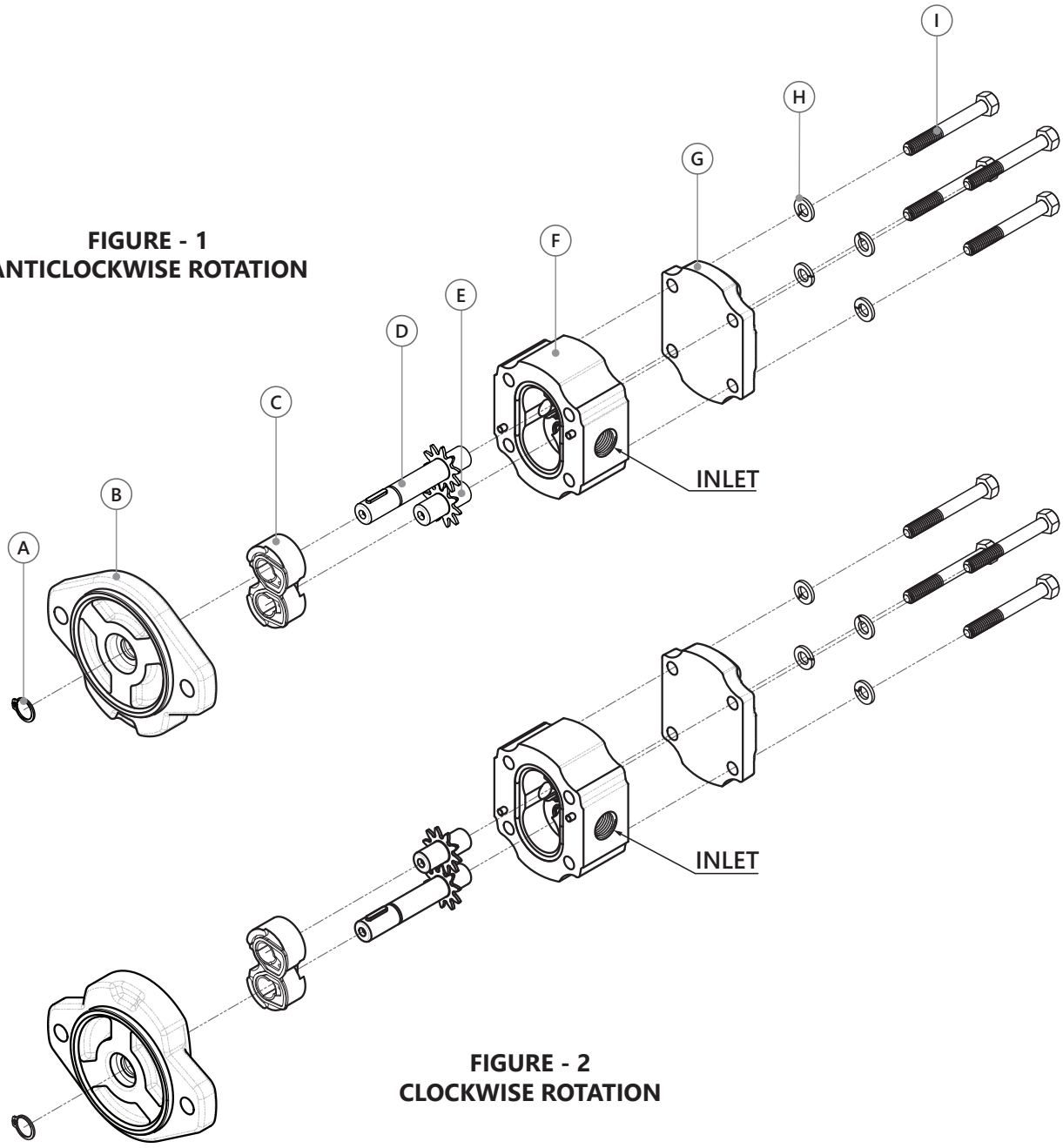


FIGURE - 2
CLOCKWISE ROTATION

Steps to Invert the Rotation of Pump.

Step 1 : Disassemble bolt (I), washer (H) & End cover (G) as shown in figure 1.

Step 2 : Disassemble circlip (A), flange (B) & Bushing (C) as shown in figure 1.

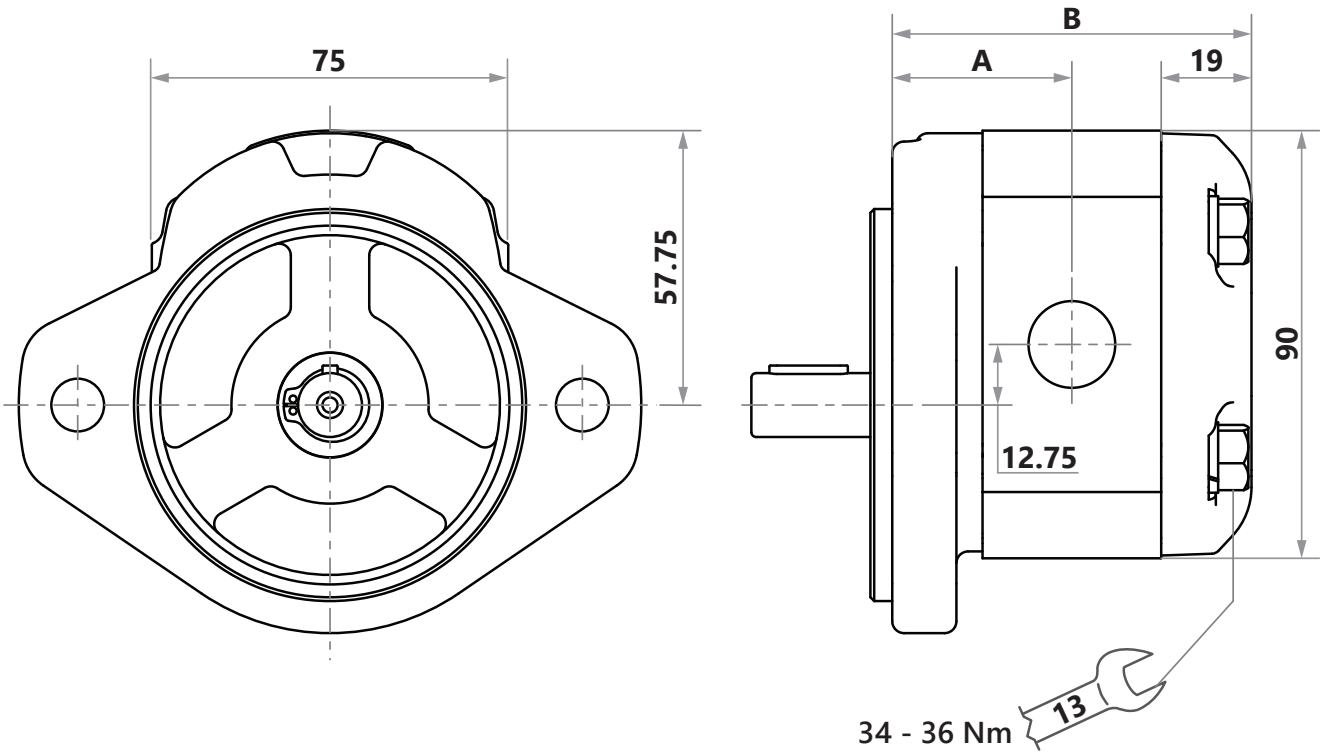
Step 3 : Pull off gear (D, E) and reassemble according to figure 2.

Step 4 : Reassemble bushing (C) as before.

Step 5 : Reverse the flange (B) and reassemble the pump.

Step 6 : Tightening the screw by dynamometric wrench.

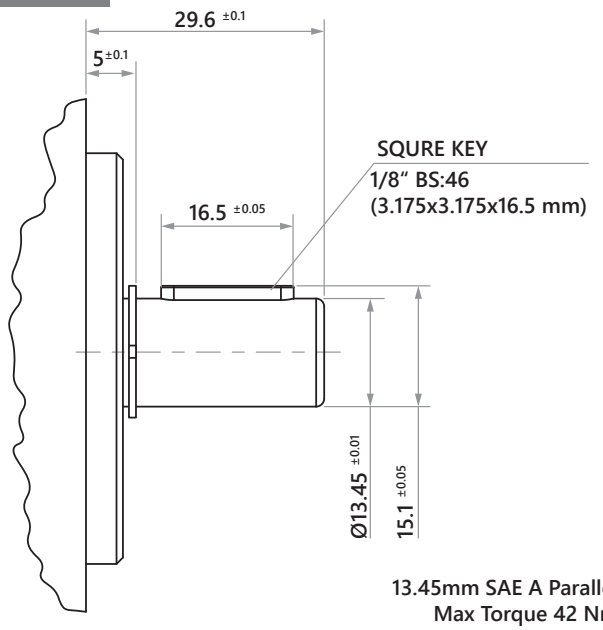
INSTALLING DIMENSIONS & VALUES OF PRESSURE AND SPEED



Pump Type		OP-03	OP-04	OP-06	OP-08	OP-11	OP-13	OP-15
Displacement in CC/REV		0.8	1.2	1.67	2.27	3.2	3.87	4.53
Delivery in Liter/Min at 1500 RPM		1.2	1.8	2.5	3.4	4.8	5.8	6.8
Max. Continuous pressure p1		230	230	230	230	230	230	230
Max. intermittent pressure p2		240	240	240	240	240	240	240
Max. peak pressure p3		250	250	250	250	250	250	250
Max. speed at p2		4000	4000	4000	4000	4000	4000	4000
Min. speed at p1		500	500	500	500	500	500	600
Dimensions	A	37.8	38.25	38.9	39.45	40.45	41.2	41.85
	B	75.6	76.5	77.8	78.9	80.9	82.4	83.7

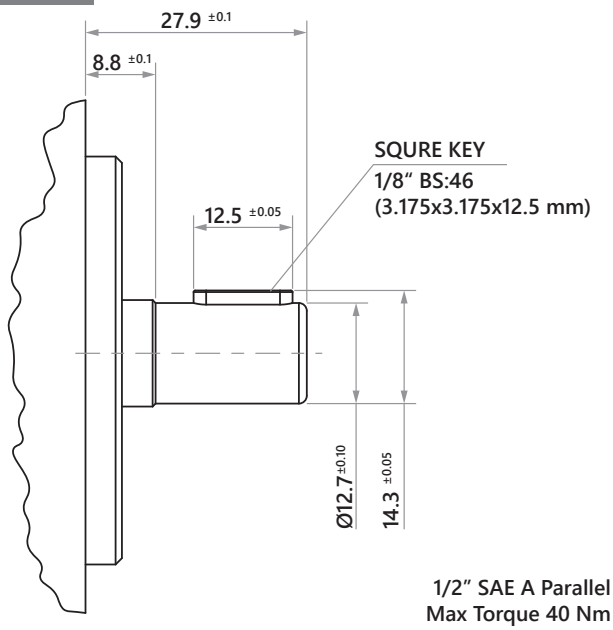
DRIVE SHAFT

CODE P



13.45mm SAE A Parallel
Max Torque 42 Nm

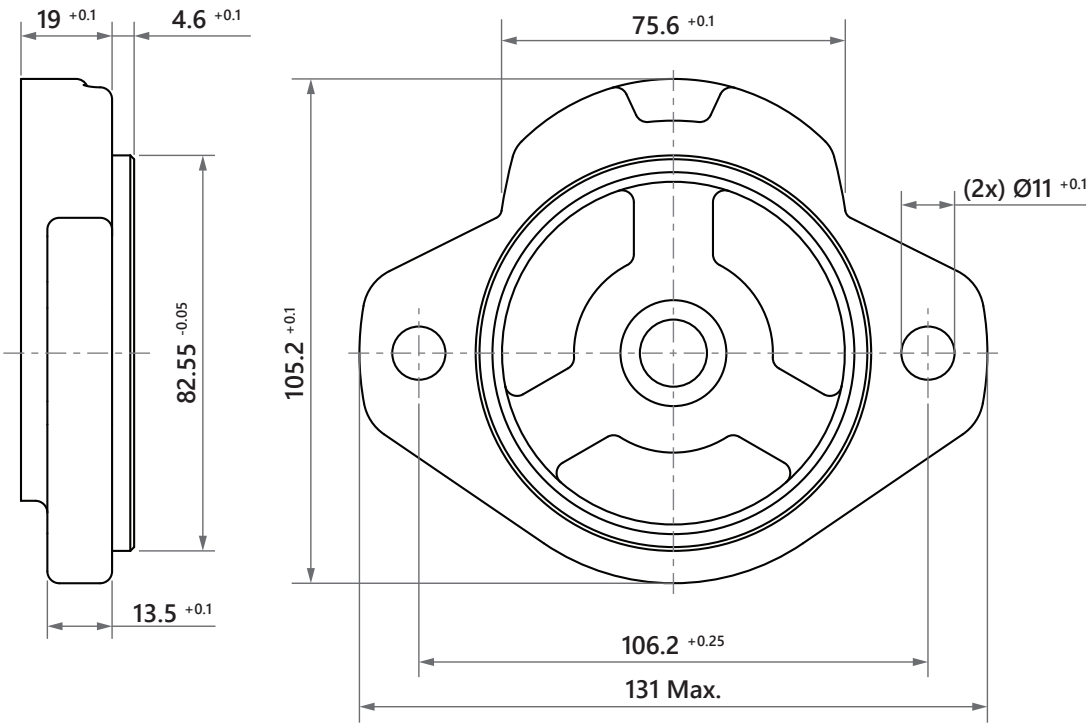
CODE L



1/2" SAE A Parallel
Max Torque 40 Nm

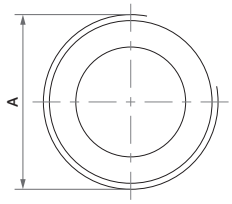
MOUNTING FLANGE

CODE S



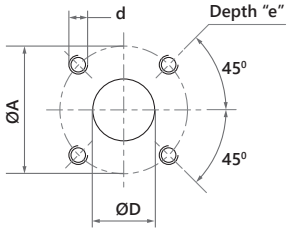
PORTS

CODE T



TYPE	INLET	OUTLET
	A	A
OP-03 TO 0P-11	G 3/8"	G 3/8"
OP-13 TO 0P-15	G 1/2"	G 3/8"

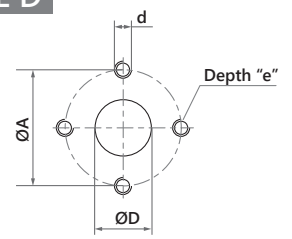
CODE B



TYPE	INLET			OUTLET		
	A	B	d	A	B	d
OP-03 TO 0P-15	30	12	M6	30	12	M6

Depth "e" = 16

CODE D

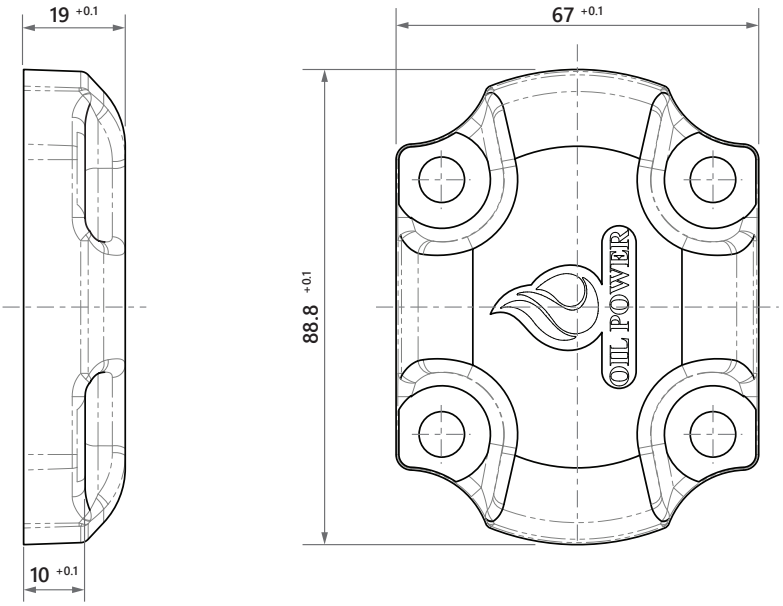


TYPE	INLET			OUTLET		
	A	B	d	A	B	d
OP-03 TO 0P-15	30	12	M6	30	12	M6

Depth "e" = 16

END COVER

CODE B



PUMP PARTS & HOW TO INVERT THE PUMP ROTATION

FIGURE - 1
ANTICLOCKWISE ROTATION

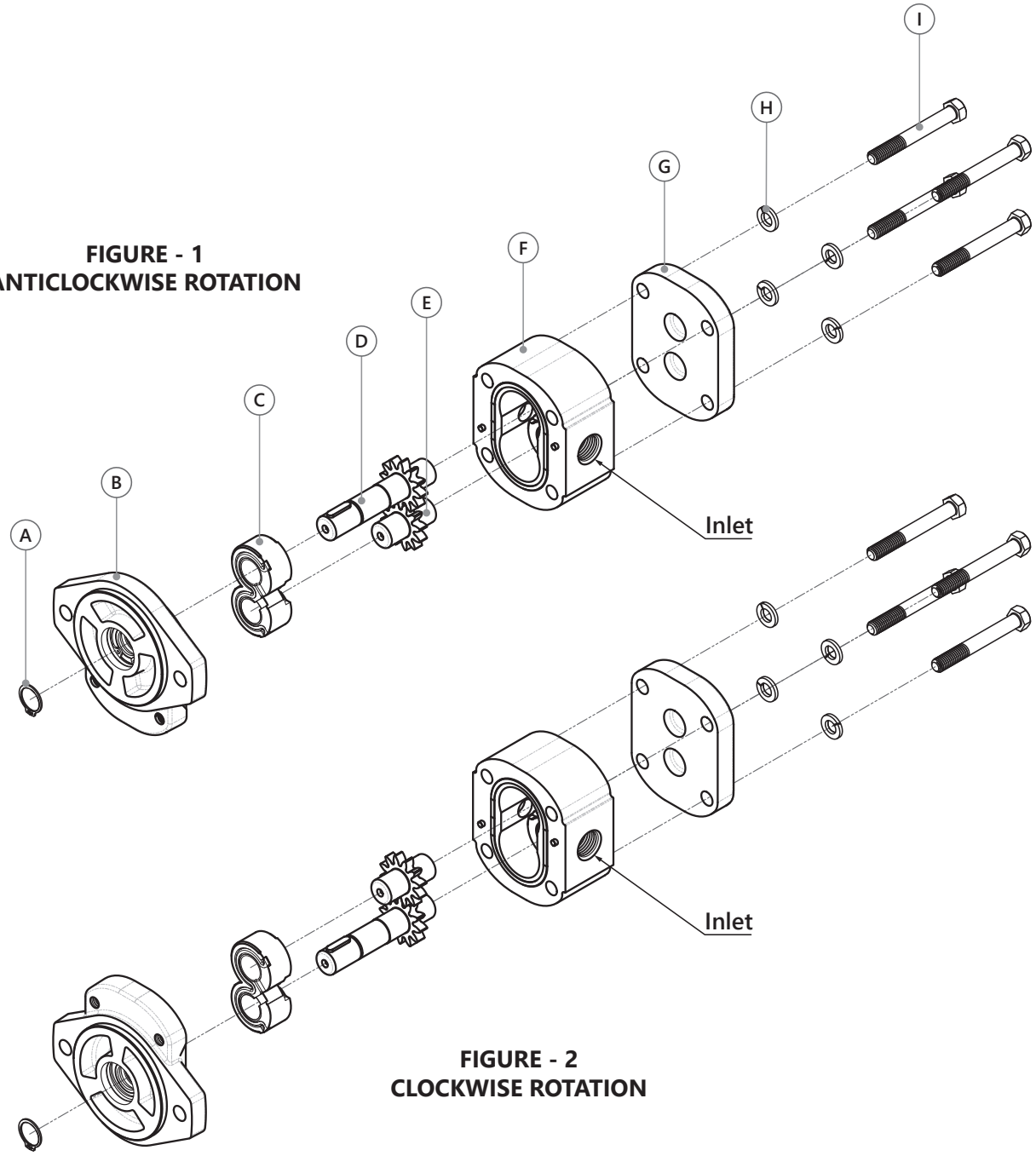


FIGURE - 2
CLOCKWISE ROTATION

Steps to Invert the Rotation of Pump.

Step 1 : Disassemble bolt (I), washer (H) & End cover (G) as shown in figure 1.

Step 2 : Disassemble circlip (A), flange (B) & Bushing (C) as shown in figure 1.

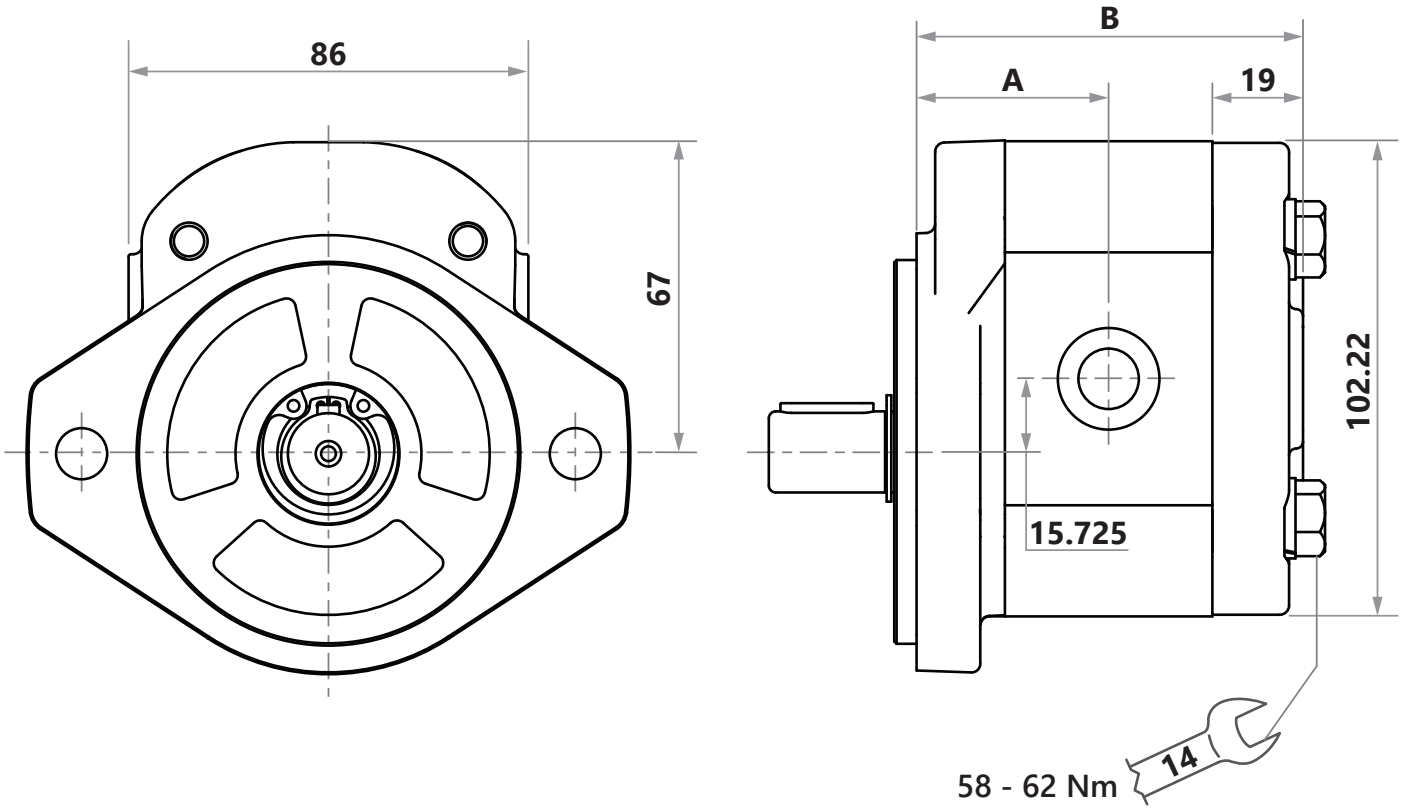
Step 3 : Pull off gear (D, E) and reassemble according to figure 2.

Step 4 : Reassemble bushing (C) as before.

Step 5 : Reverse the flange (B) and reassemble the pump.

Step 6 : Tightening the screw by dynamometric wrench.

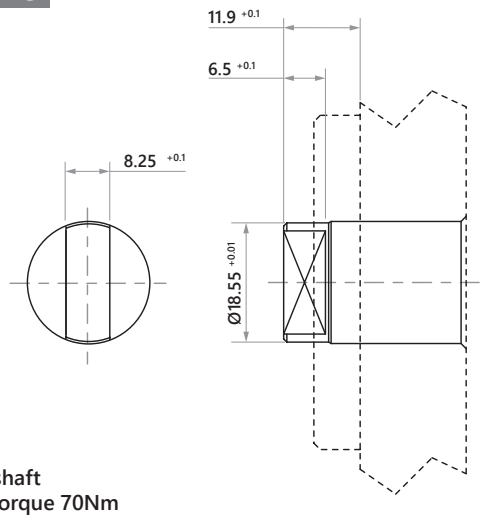
INSTALLING DIMENSIONS & VALUES OF PRESSURE AND SPEED



Pump Type		OPH-13	OPH-18	OPH-26	OPH-36	OPH-46	OPH-53	OPH-63	OPH-74	OPH-83	OPH-90
Displacement in CC/ REV		4.0	5.5	8.0	11	14	16	19	22.5	25	28
Delivery in Liter/Min at 1500 RPM		6	8.3	12	16.5	21	24	28.5	33.7	37.5	41
Max. Continuous pressure p1		250	250	250	250	250	250	220	200	180	180
Max. intermittent pressure p2		280	280	280	280	280	280	240	220	200	200
Max. peak pressure p3		300	300	300	300	300	300	260	240	220	220
Max. speed at p2		4000	4000	4000	3500	3000	3000	3000	2500	3000	3000
Min. speed at p1		600	600	600	500	500	500	500	500	500	500
Dimensions	A	41.315	42.565	44.615	47.115	49.625	51.325	53.825	56.525	58.75	59.77
	B	82.63	85.13	89.23	94.23	99.25	102.65	107.65	113.05	117.5	119.54

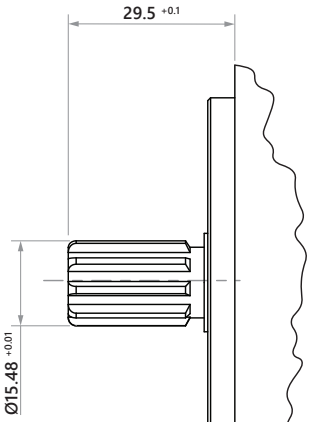
DRIVE SHAFT

CODE C



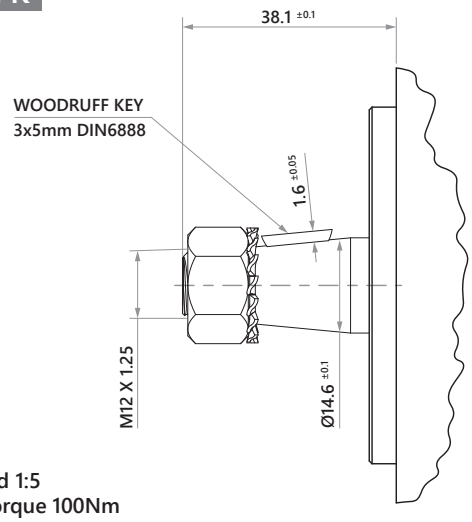
Tang shaft
Max Torque 70Nm

CODE S



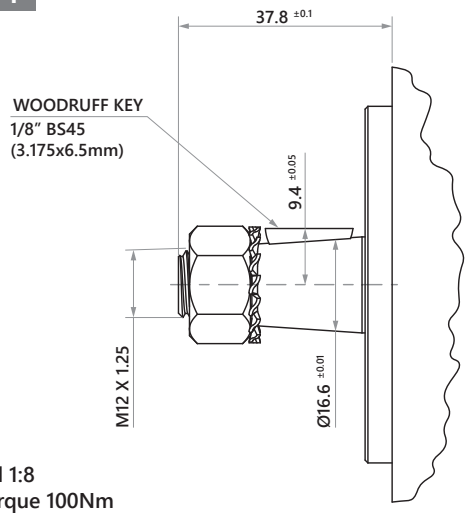
SAE A 5/8" 9T-16/32DP
ANSI B92 1a 1976
Max Torque 100Nm

CODE K



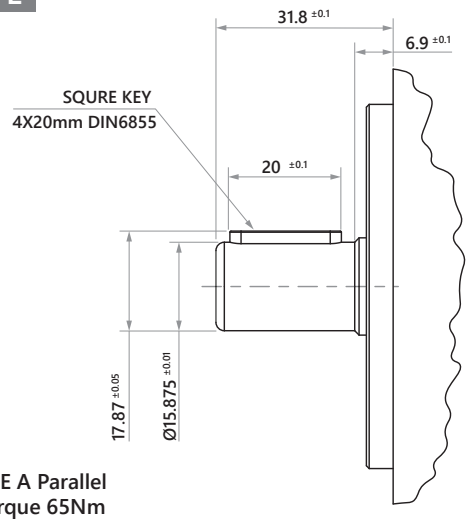
Tapered 1:5
Max Torque 100Nm

CODE T



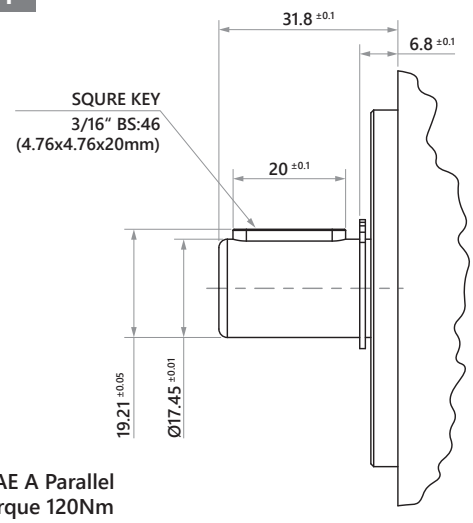
Tapered 1:8
Max Torque 100Nm

CODE L



5/8" SAE A Parallel
Max Torque 65Nm

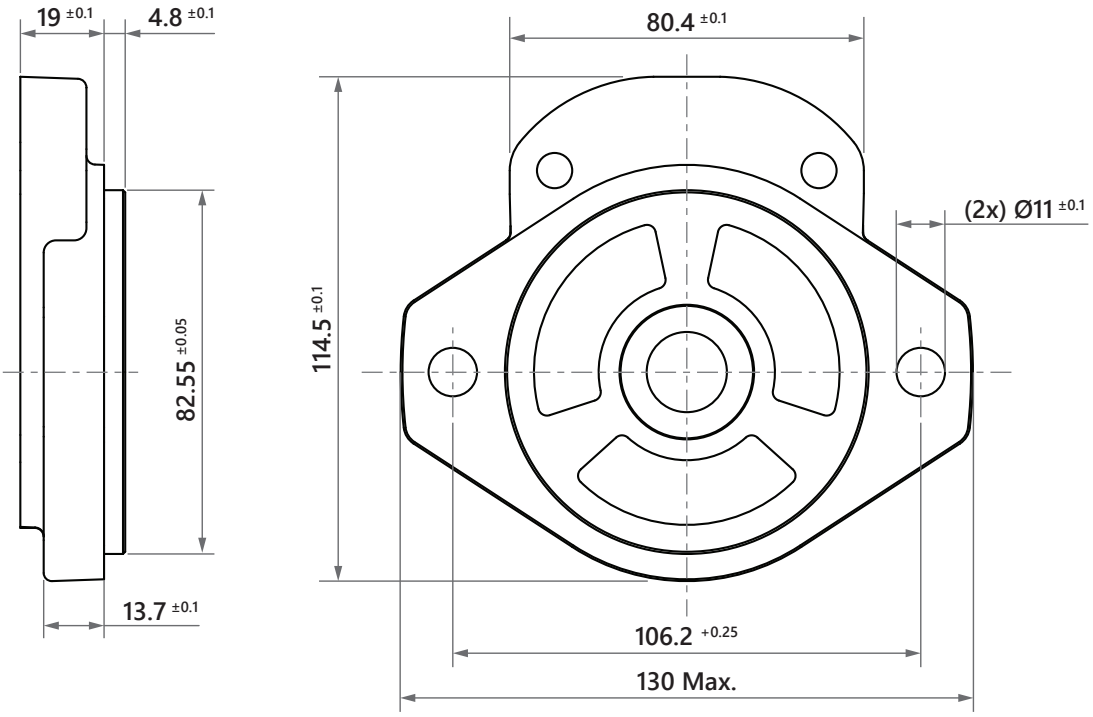
CODE P



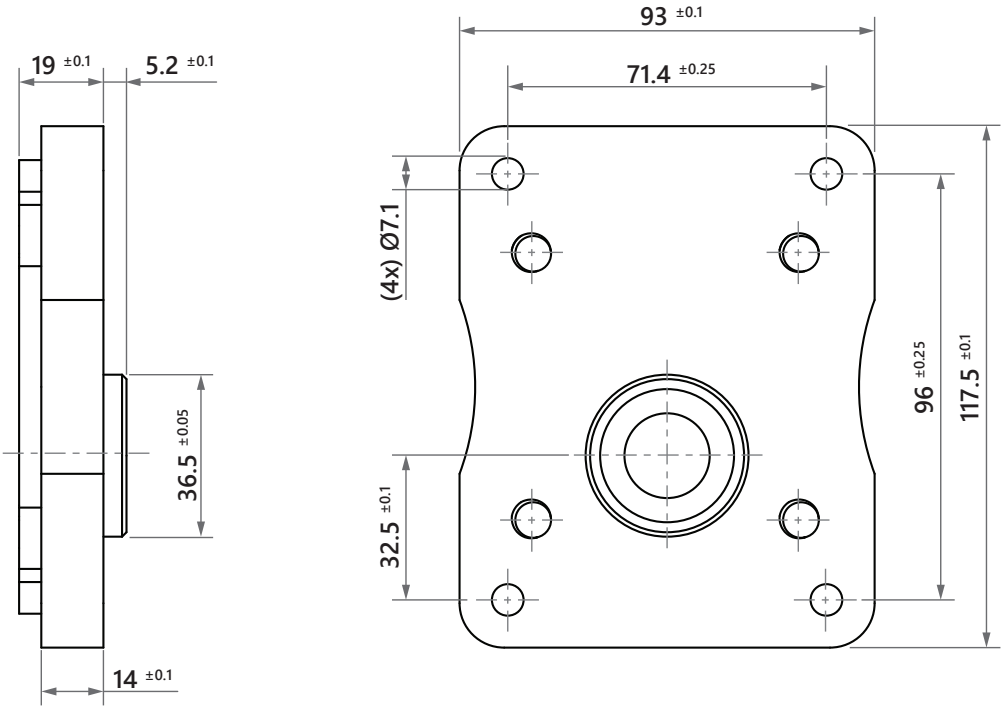
17.45 SAE A Parallel
Max Torque 120Nm

MOUNTING FLANGE

CODE S



CODE D



MOUNTING FLANGE

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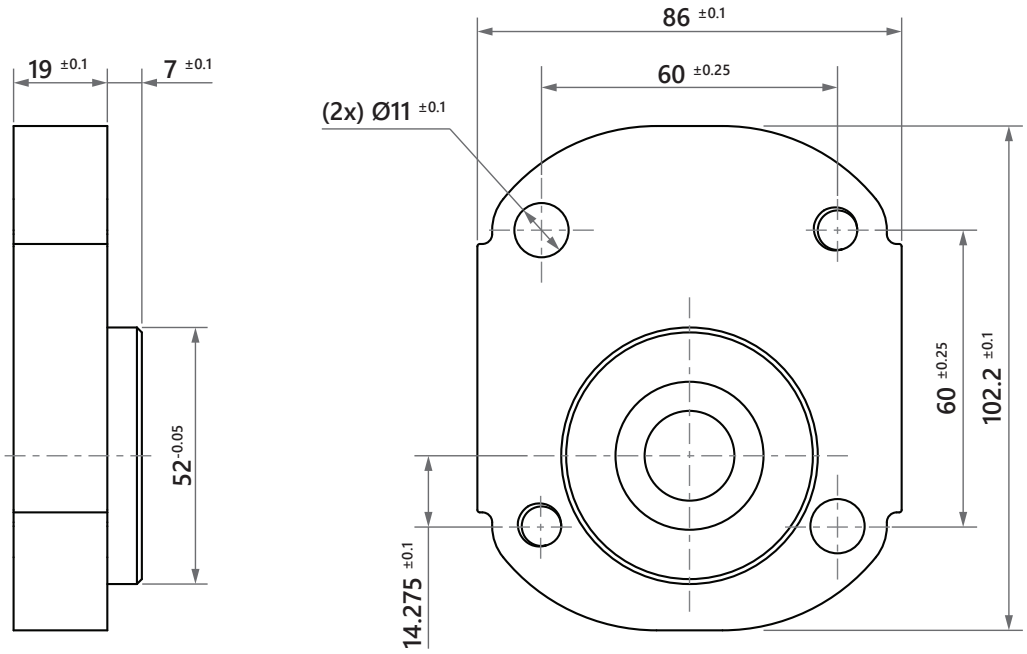

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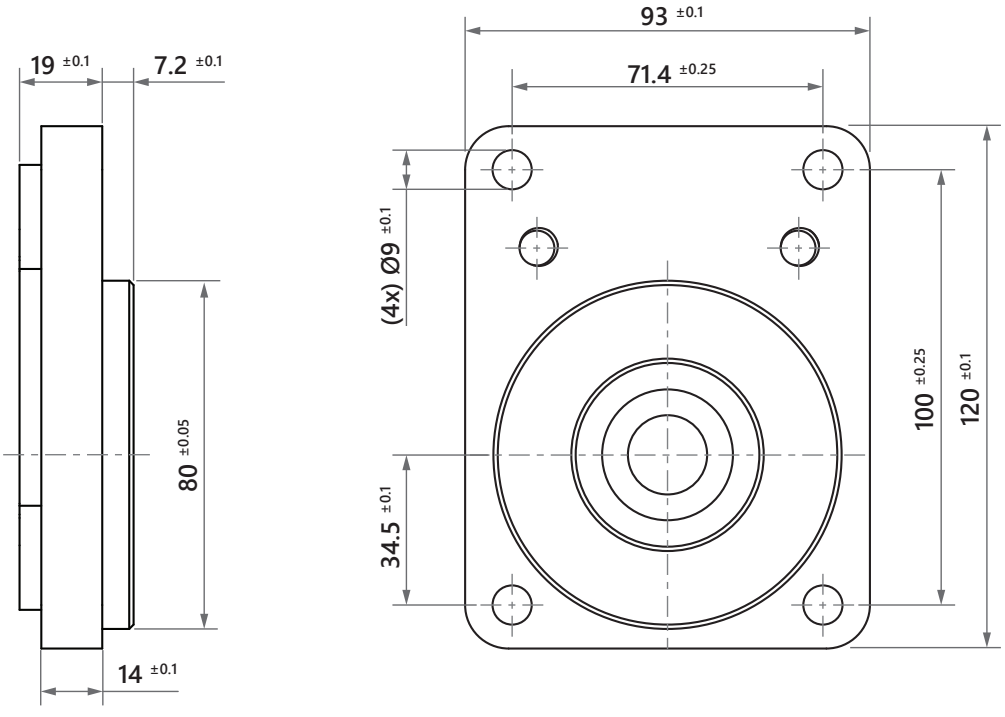
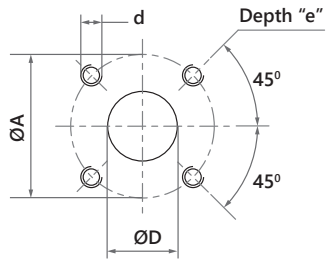


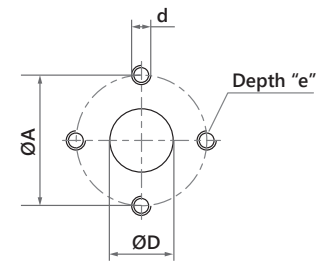
PORTS

CODE B



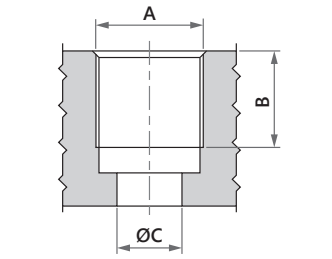
TYPE	INLET				OUTLET			
	ØD	ØA	d	e	ØD	ØA	d	e
OPH-13 TO OPH-26	13	30	M6	13	13	30	M6	13
OPH-36 TO OPH-74	20	40	M8					
OPH-83 TO OPH-90	22							

CODE D



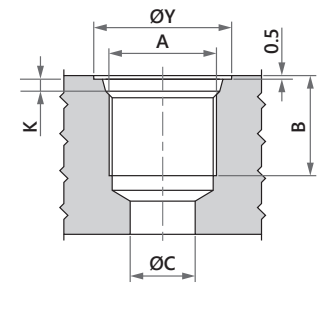
TYPE	INLET				OUTLET			
	ØD	ØA	d	e	ØD	ØA	d	e
OPH-13 TO OPH-74	20	40	M8	13	15	35	M6	13
OPH-83 TO OPH-90	22							

CODE T



TYPE	INLET			OUTLET		
	A	B	ØC	A	B	ØC
OPH-13 TO OPH-26	G1/2	14	13	G1/2	14	13
OPH36	G3/4	16	20			
OPH-46 TO OPH-90				G3/4	16	20

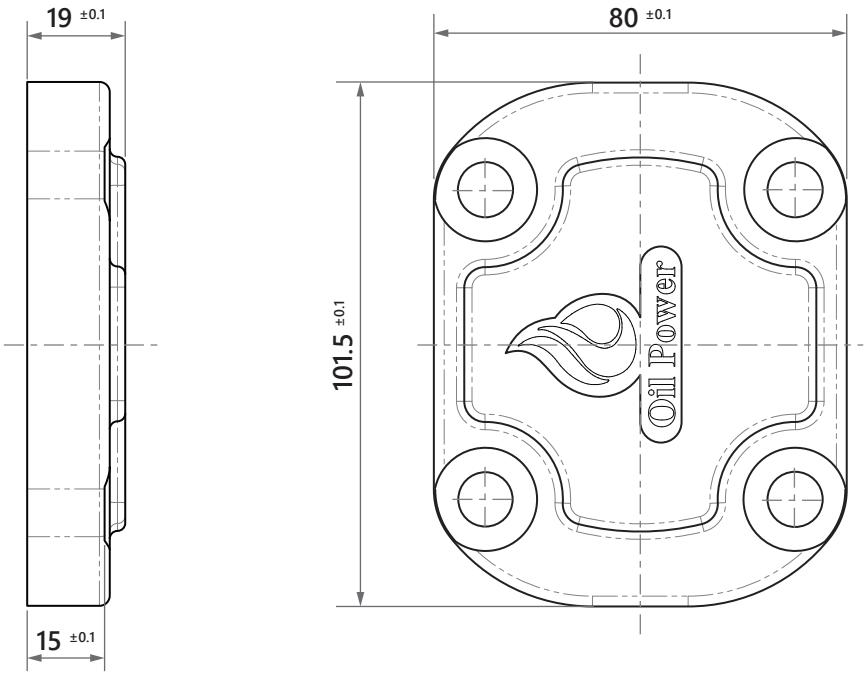
CODE U



TYPE	INLET					OUTLET				
	A	B	ØC	ØY	K	A	B	ØC	ØY	K
OPH-13 TO OPH-90	1-1/16 UNF (SAE12)	16	20	41	3.3	7/8-14 UNF (SAE10)	14	13	34	2.5

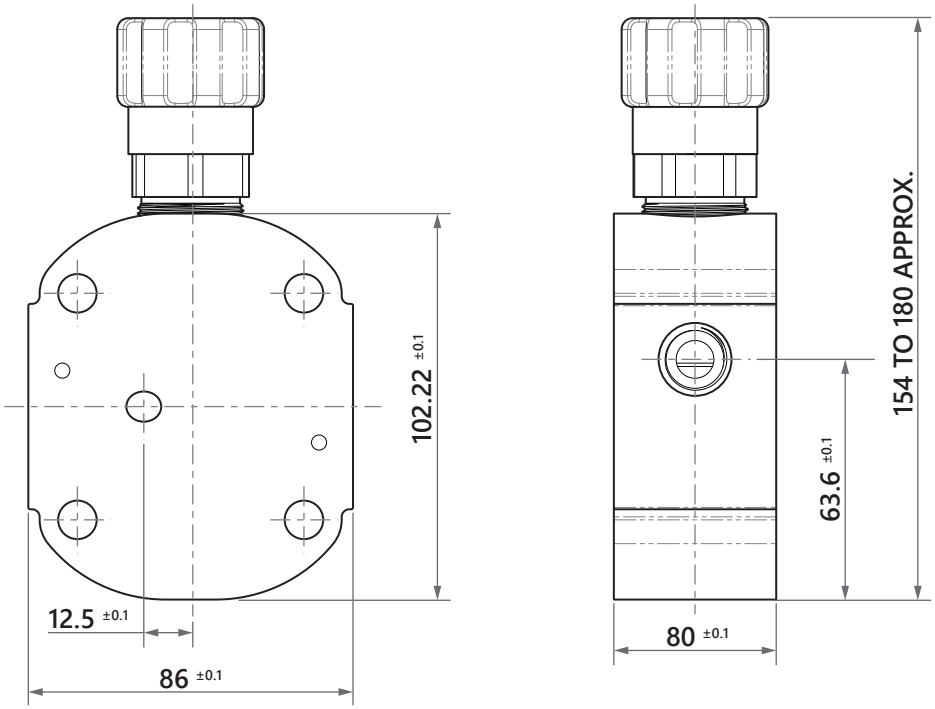
END COVER

CODE B



Standard End Cover

CODE R



End Cover with Relief Valve

PUMP PARTS & HOW TO INVERT THE PUMP ROTATION

FIGURE - 1
ANTICLOCKWISE ROTATION

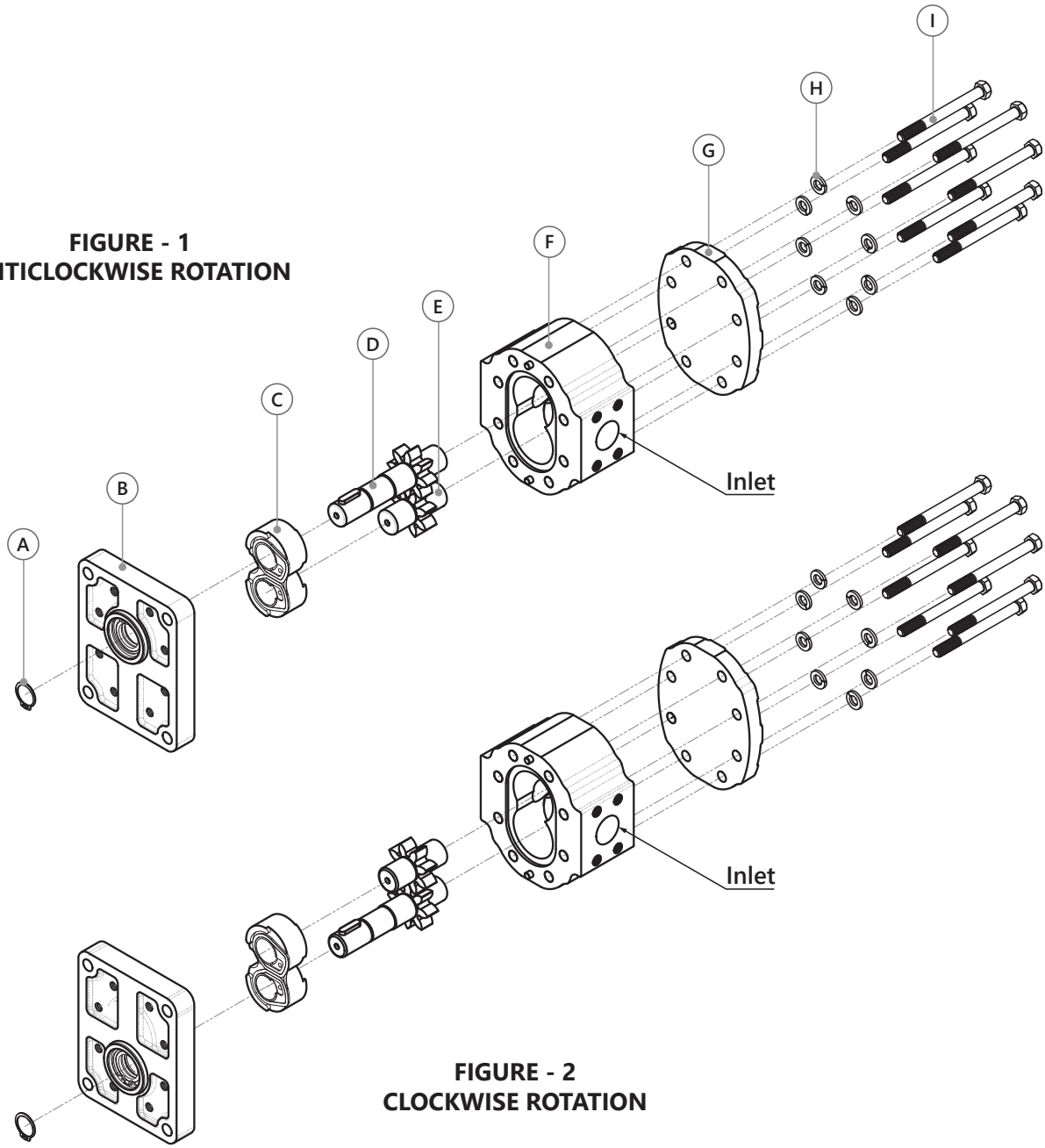


FIGURE - 2
CLOCKWISE ROTATION

Steps to Invert the Rotation of Pump.

Step 1 : Disassemble bolt (I), washer (H) & End cover (G) as shown in figure 1.

Step 2 : Disassemble circlip (A), flange (B) & Bushing (C) as shown in figure 1.

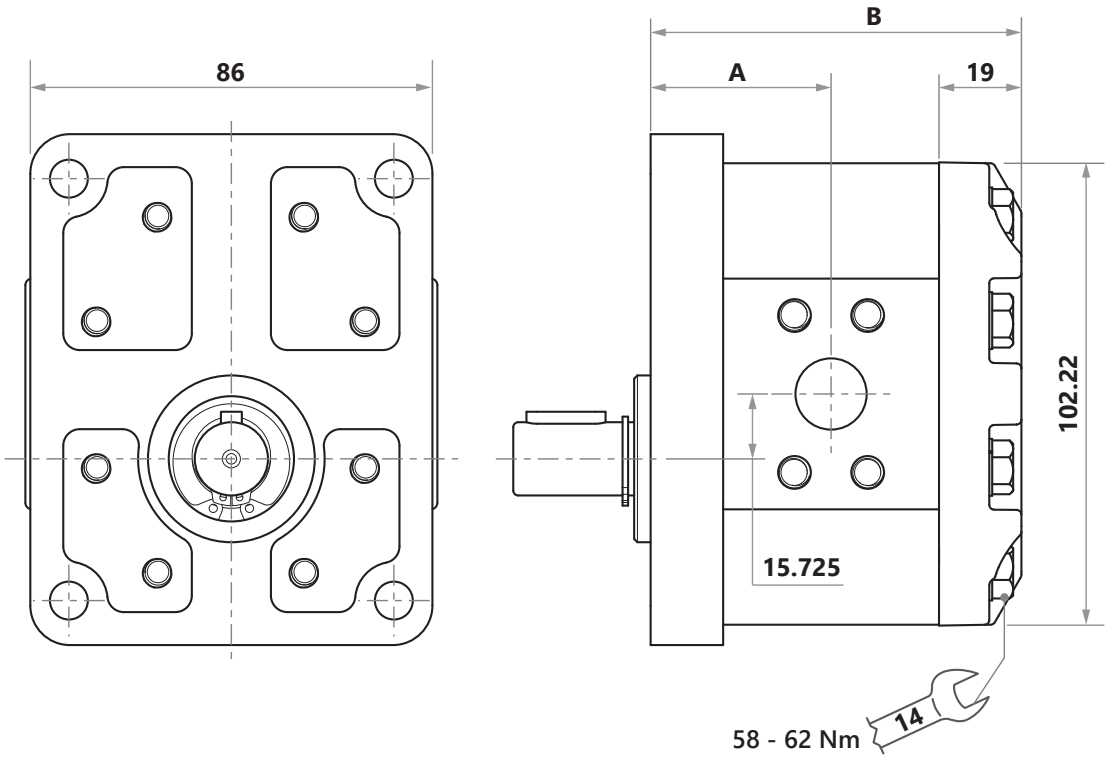
Step 3 : Pull off gear (D, E) and reassemble according to figure 2.

Step 4 : Reassemble bushing (C) as before.

Step 5 : Reverse the flange (B) and reassemble the pump.

Step 6 : Tightening the screw by dynamometric wrench.

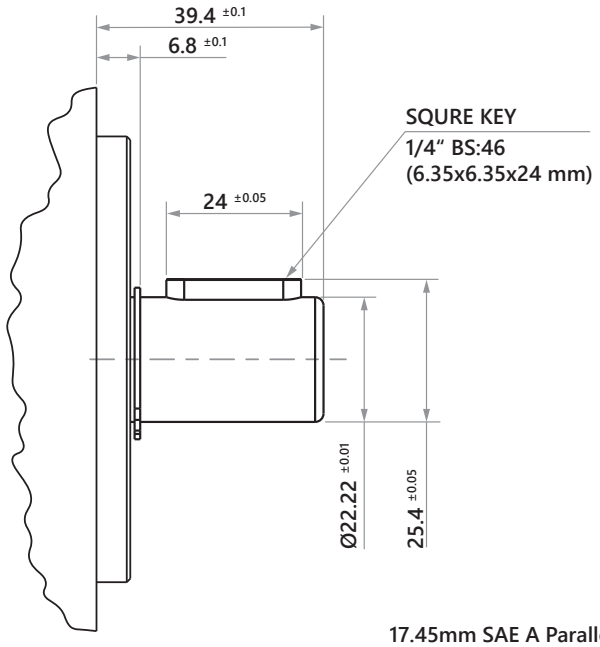
INSTALLING DIMENSIONS & VALUES OF PRESSURE AND SPEED



Pump Type		OP-50	OP-70	OP-90	OP-105	OP-120	OP-146	OP-158	OP-220
Displacement in CC/REV		15.13	21.33	27.33	31.8	36.33	44.33	47.87	66.67
Delivery in Liter/Min at 1500 RPM		22.7	32	41	47.7	54.5	66.5	71.8	100
Max. Continuous pressure p1		220	220	220	220	200	180	180	180
Max. intermittent pressure p2		230	230	230	230	220	200	200	180
Max. peak pressure p3		250	250	250	250	240	220	220	200
Max. speed at p2		3000	3000	3000	3000	3000	3000	2500	2500
Min. speed at p1		550	550	600	600	650	650	650	650
Dimensions	A	55.45	57.85	60.25	69.05	70.85	74.275	75.45	75.85
	B	113.2	118	122.8	140.4	144	150.85	153.2	154

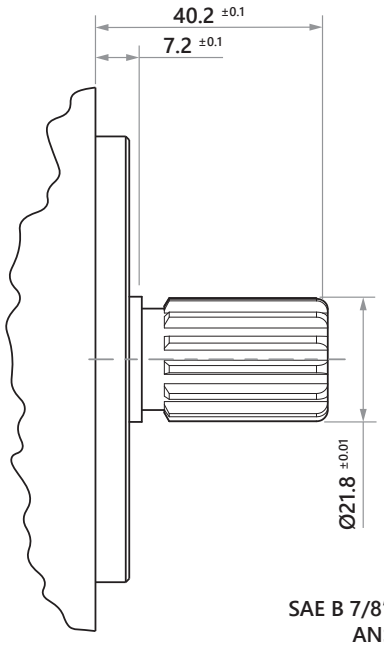
DRIVE SHAFT

CODE P



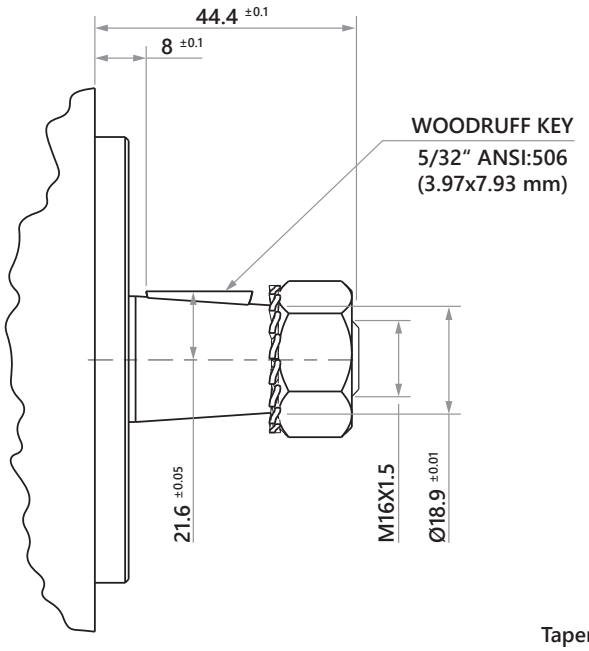
17.45mm SAE A Parallel
Max Torque 220 Nm

CODE S



SAE B 7/8" 13T-16/32DP
ANSI B92 1a 1976
Max Torque 330 Nm

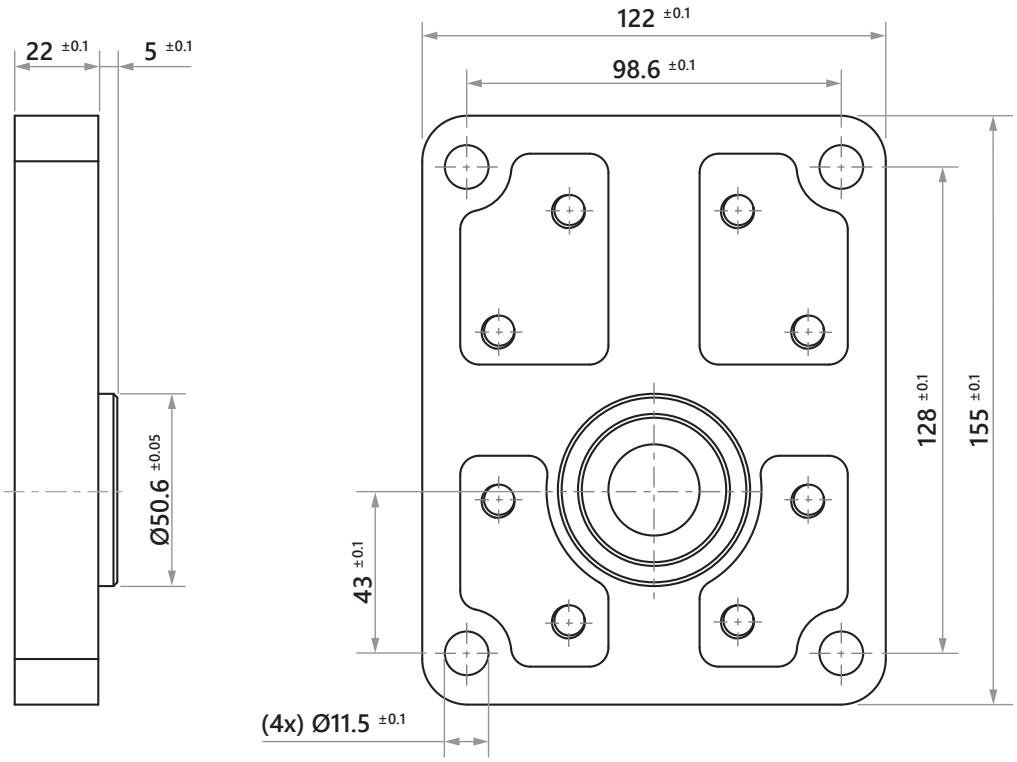
CODE T



Tapered 1:8
Max Torque 250 Nm

MOUNTING FLANGE

CODE D



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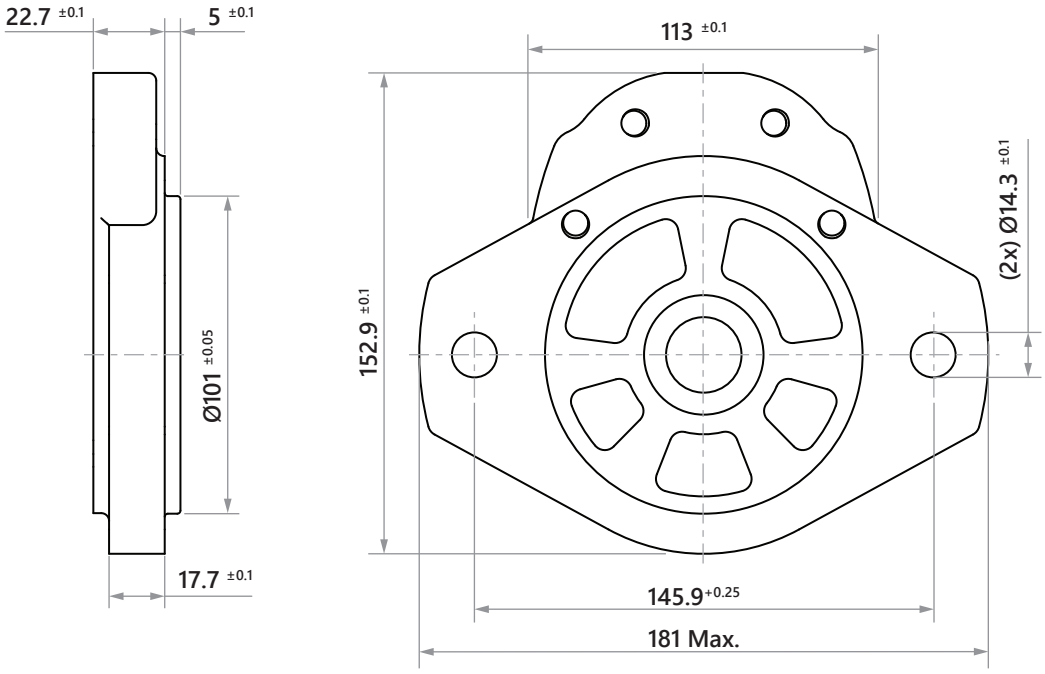
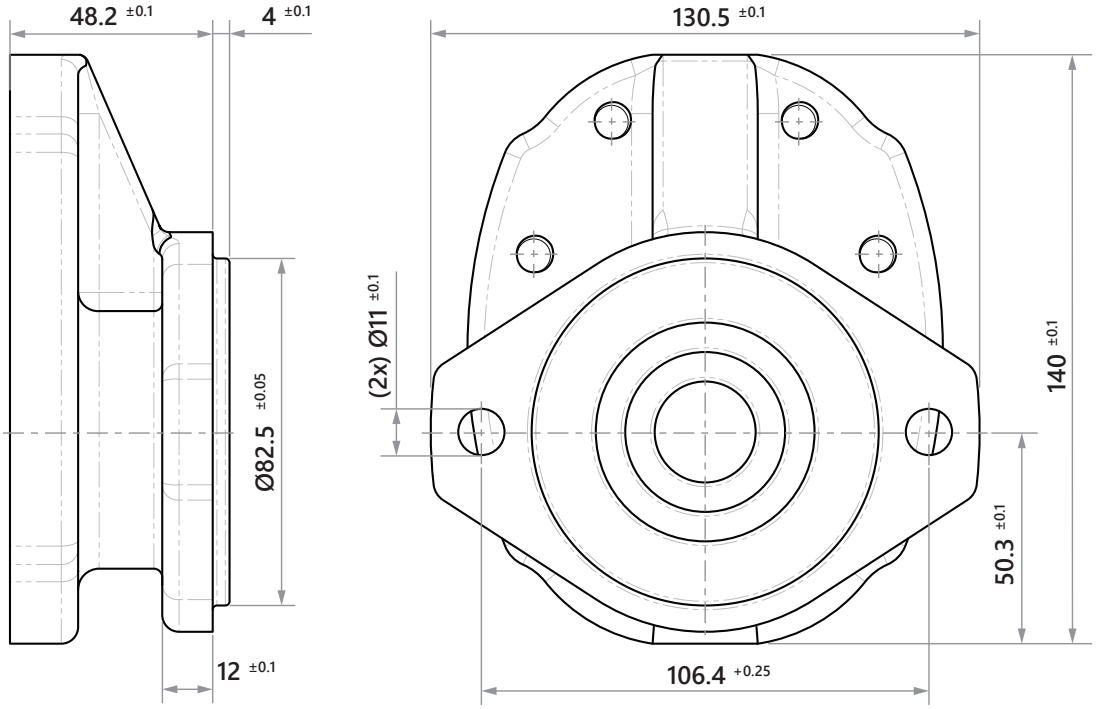


Mounting flange with bearing support is available.

MOUNTING FLANGE

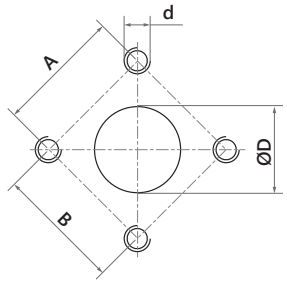
CODE X



Mounting flange with bearing support is available.

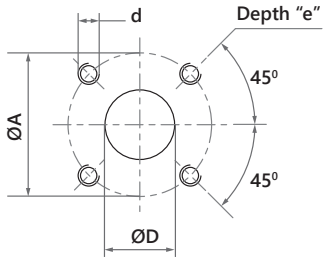
PORTS

CODE F



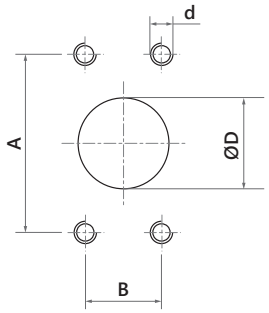
TYPE	INLET				OUTLET			
	ØD	A	B	d	ØD	A	B	d
OP-50 TO OP-220	22	34	34	M8	21.6	34	34	M8

CODE B



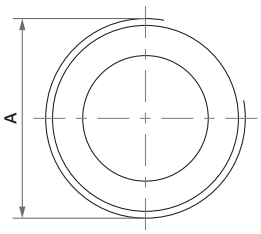
TYPE	INLET				OUTLET			
	ØD	ØA	d	e	ØD	ØA	d	e
OP-50 TO OP-90	19	40	M8		19	40	M8	
OP-105 TO OP-220		55			27	55		

CODE S



TYPE	INLET				OUTLET			
	ØD	A	B	d	ØD	A	B	d
OP-50 TO OP-220	28	54.4	26.2	3/8" UNC	21.6	47.6	22.2	3/8" UNC

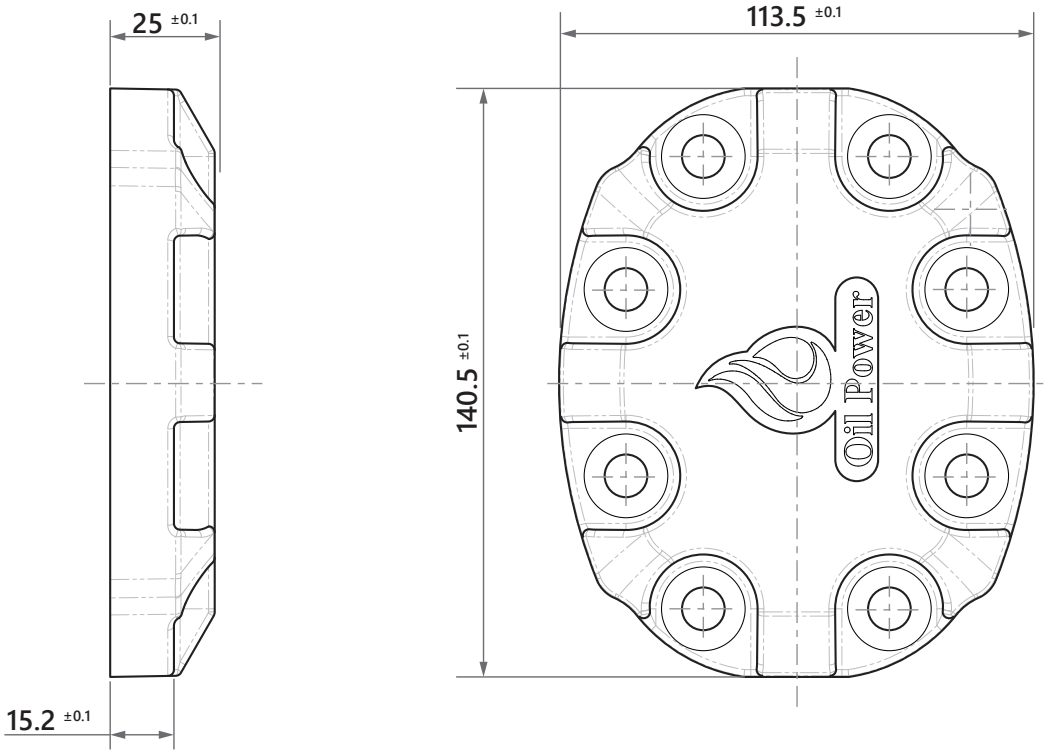
CODE T



TYPE	INLET	OUTLET
	A	A
OP-50 TO OP-105	G 3/4"	G 3/4"
OP-120 TO OP-146	G 3/4"	G 14"
OP-158 TO OP-220	G 1"	G 1-1/2"

END COVER

CODE B



PUMP PARTS & HOW TO INVERT THE PUMP ROTATION

FIGURE - 1
ANTICLOCKWISE ROTATION

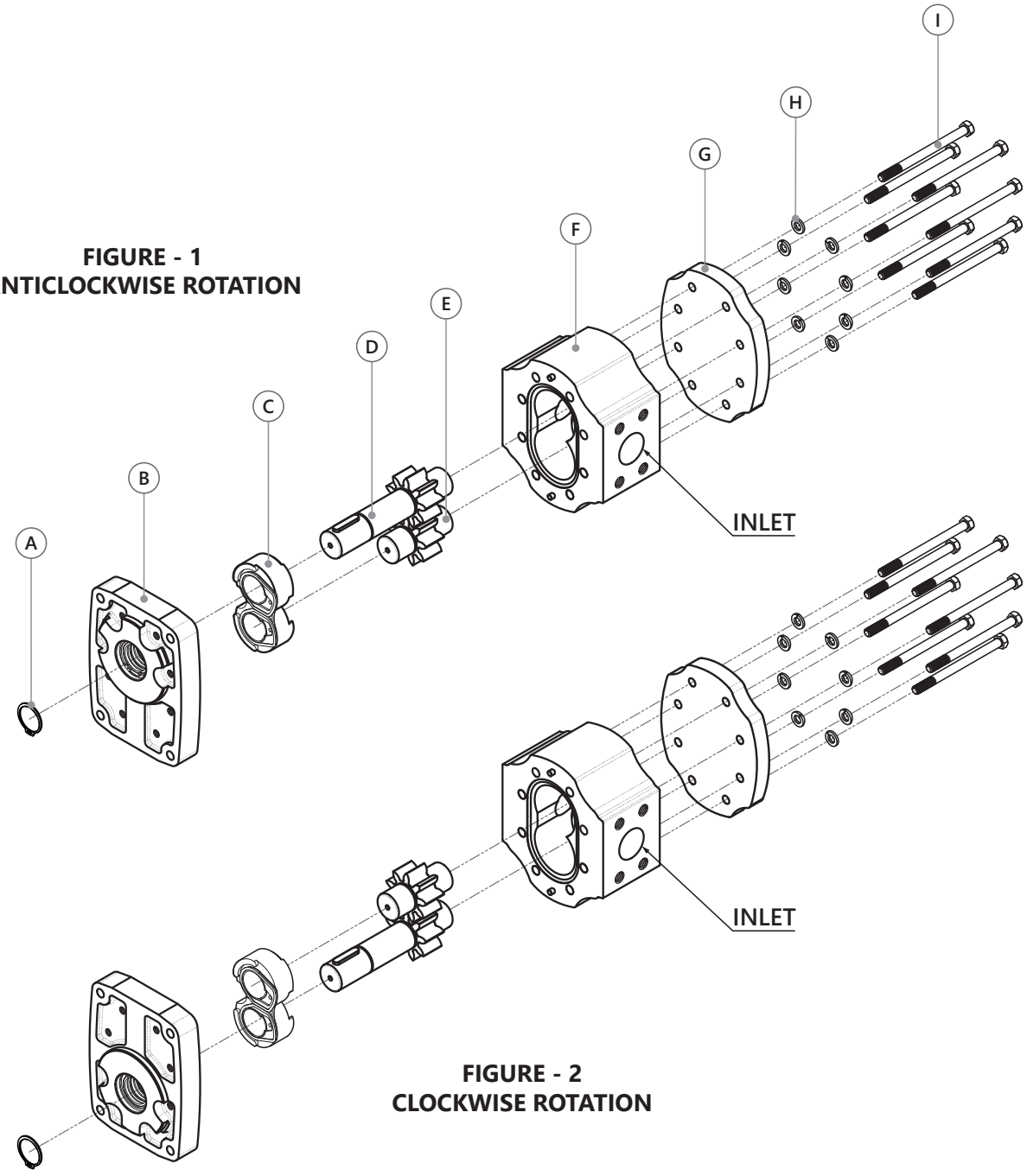


FIGURE - 2
CLOCKWISE ROTATION

Steps to Invert the Rotation of Pump.

Step 1 : Disassemble bolt (I), washer (H) & End cover (G) as shown in figure 1.

Step 2 : Disassemble circlip (A), flange (B) & Bushing (C) as shown in figure 1.

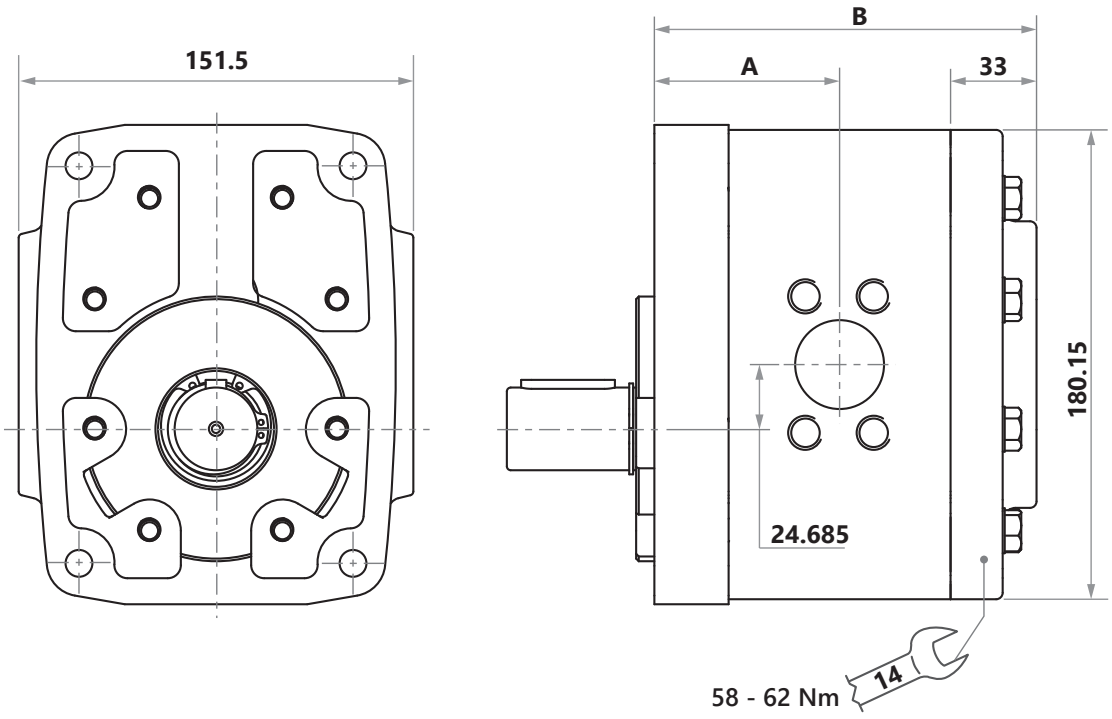
Step 3 : Pull off gear (D, E) and reassemble according to figure 2.

Step 4 : Reassemble bushing (C) as before.

Step 5 : Reverse the flange (B) and reassemble the pump.

Step 6 : Tightening the screw by dynamometric wrench.

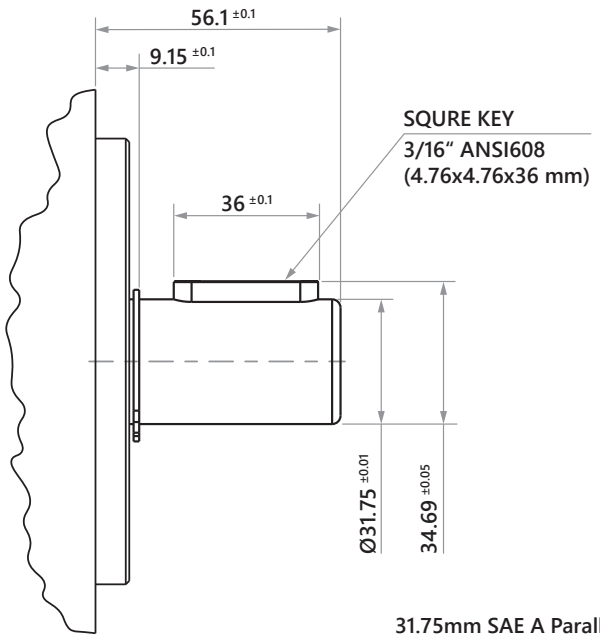
INSTALLING DIMENSIONS & VALUES OF PRESSURE AND SPEED



Pump Type		OP-150	OP-180	OP-210	OP-250	OP-300	OP-330	OP-380	OP-500
Displacement in CC/REV		45.33	54.33	63.67	75.67	90.67	100	115.33	151.33
Delivery in Liter/Min at 1500 RPM		68	81.5	95.5	113.5	136	150	173	227
Max. Continuous pressure p1		210	210	210	210	170	160	140	140
Max. intermittent pressure p2		220	220	220	220	190	180	160	160
Max. peak pressure p3		240	240	240	240	210	200	180	180
Max. speed at p2		2500	2500	2500	2500	2500	2500	2500	2500
Min. speed at p1		550	600	700	700	700	700	700	700
Dimensions	A	71.6	74	76.4	79.6	83.55	86.15	90.15	100.075
	B	134.2	139	143.8	150.2	158.1	163.3	171.3	191.15

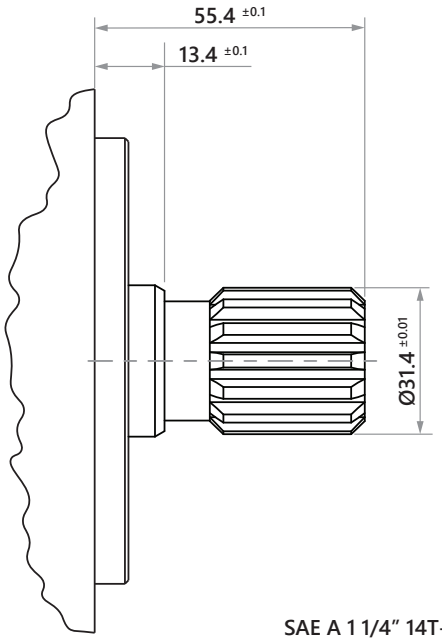
DRIVE SHAFT

CODE P



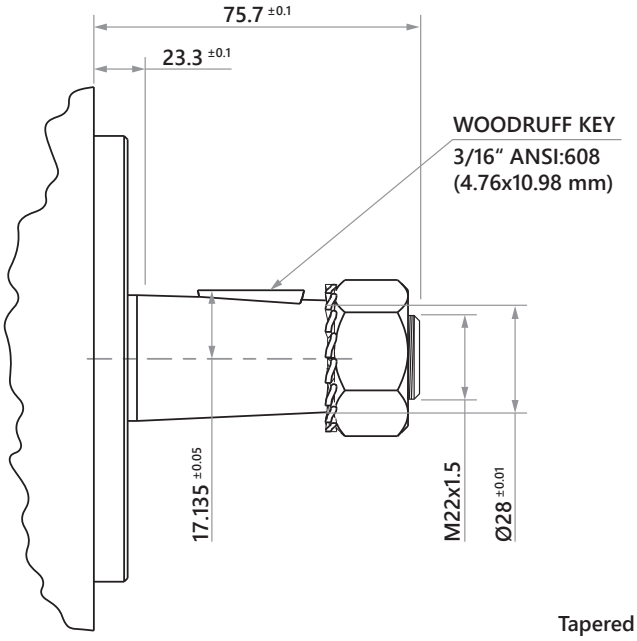
31.75mm SAE A Parallel
Max Torque 120Nm

CODE S



SAE A 1 1/4" 14T-12/24DP
Max Torque 100Nm

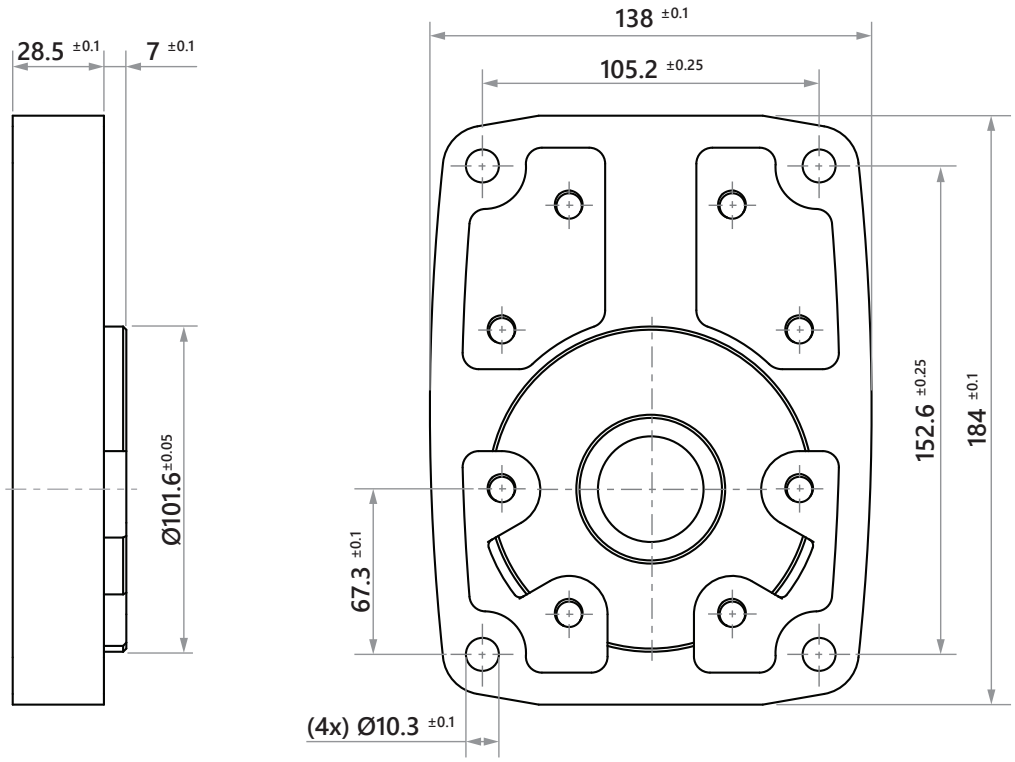
CODE T



Tapered 1:8
Max Torque 120Nm

MOUNTING FLANGE

CODE D



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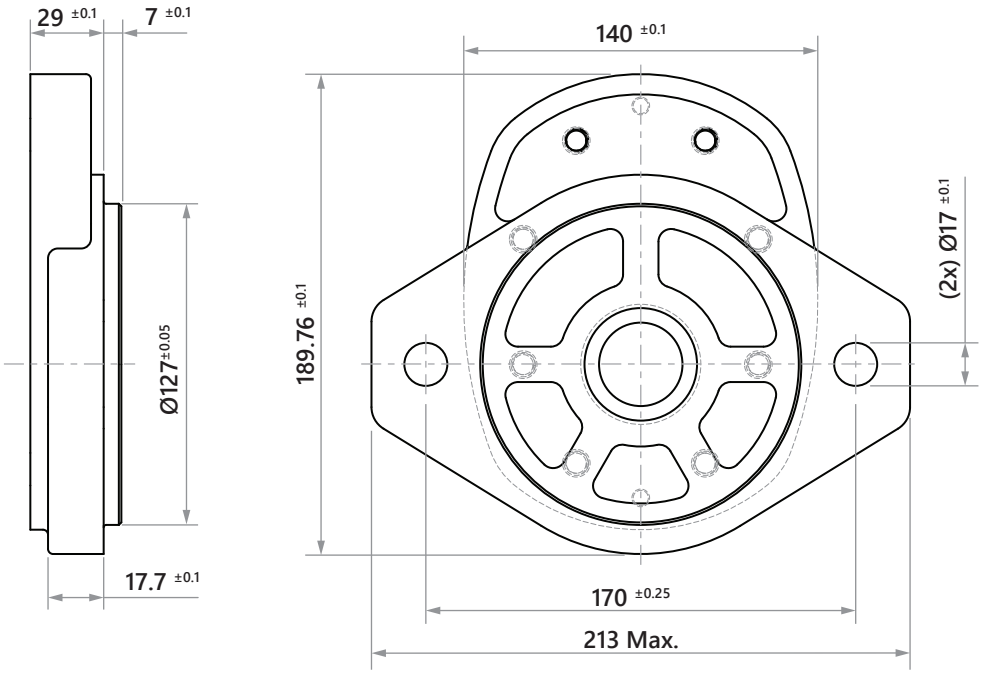
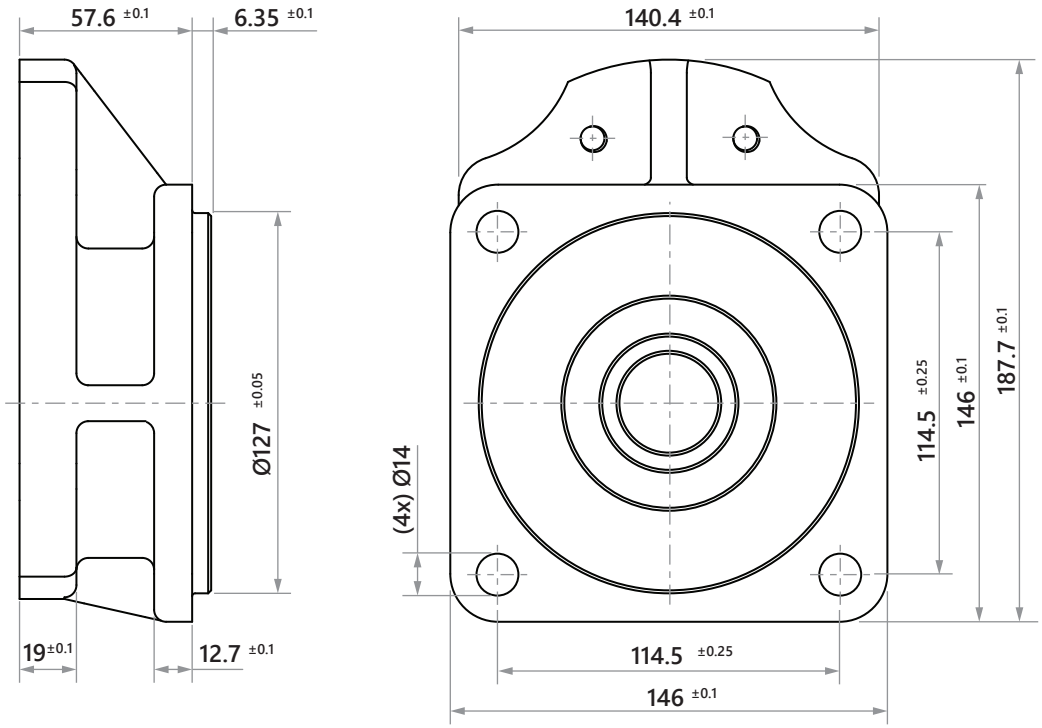


Mounting flange with bearing support is available.

MOUNTING FLANGE

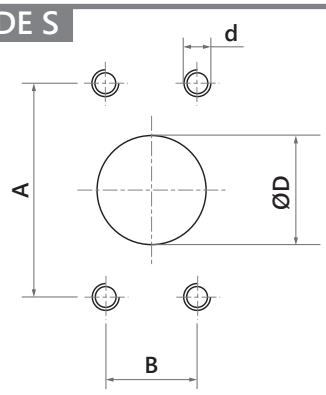
CODE C



Mounting flange with bearing support is available.

PORTS

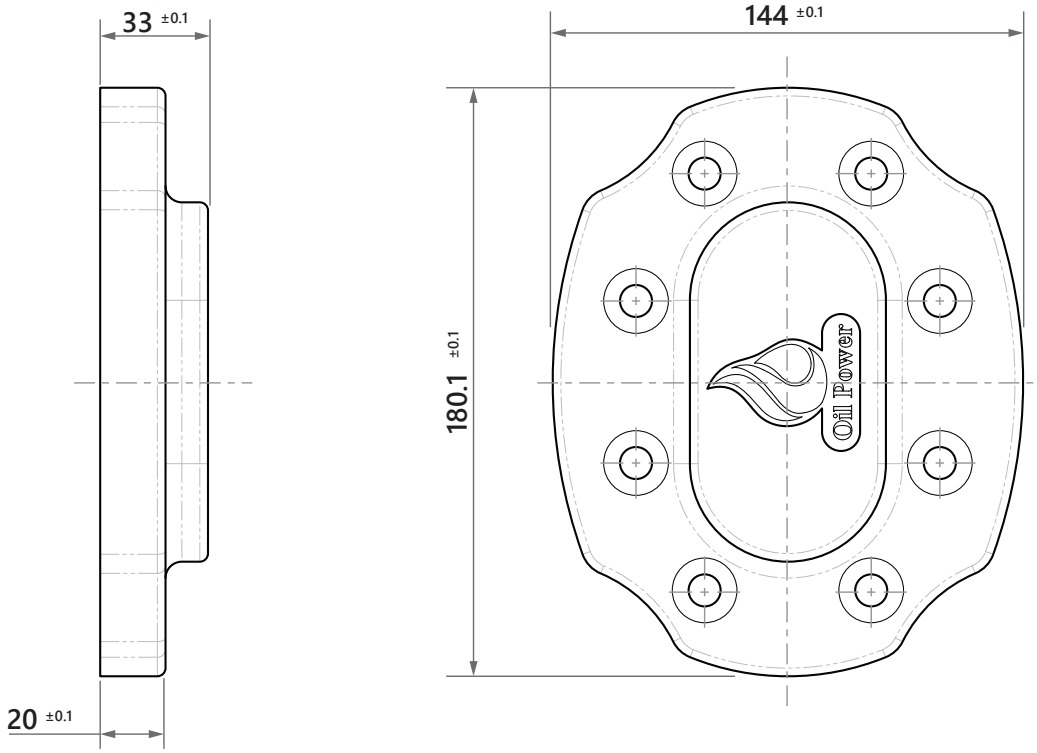
CODE S



TYPE	INLET				OUTLET			
	ØD	A	B	d	ØD	A	B	d
OP-180 TO OP-300	36	69.85	35.71	1/2" UNC	25.4	52.37	26.19	3/8" UNC
OP-330 TO OP-380					31.8	30.18	58.72	
OP-500	SLOT 36X88	80	88		31.8	52.4	26.2	

END COVER

CODE B



DESCRIPTION

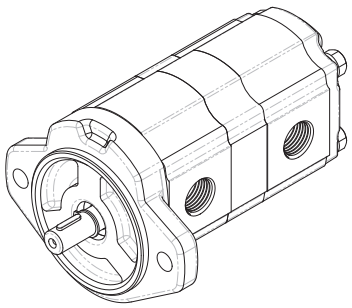
The OILPOWER pumps can be easily combined into Tandem Pump with different displacement groups. The versatility of our pump permits the assembling of a Tandem Pump using a single pump and making only a simply operation of assembly/ disassemblly. All our standard pumps are capable to engage another pump. A two accesories gives a small stock value and mainly a rapid assiastance to final users.

TECHNICAL FEATURES

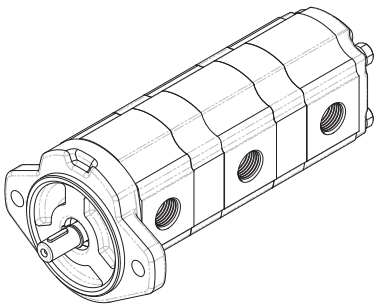
- Different pump must be assembled from biggest to the smallest in terms of required power and torque.
- Performance of units composing multiple pumps are the same as these of the corresponding single pumps.
- Maximum rotation speed of multiple pump is given by slower pump.
- Maximum torque absorbed by each single unit to grant a working limit at maximum working pressure should be calculated. (For calculation see page number 5)
- The total of the torque absorbed by each pump shall be not in excess of the maximum followed torque on main shaft.
- The maximum torque absorbed by the follow pump shall be not in excess of the torque transmitted by the rear draft gear.
- The power absorbed by the multiple pump is determined from total powers that each pump absorbed. (For calculation see page number 5)

POSSIBLE MULTIPLE GROUP COMBINATION

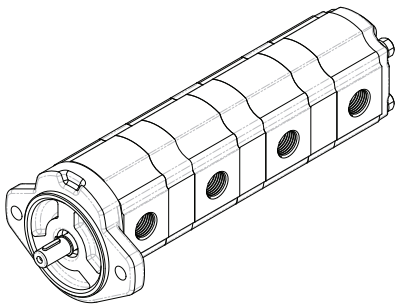
0P+0P



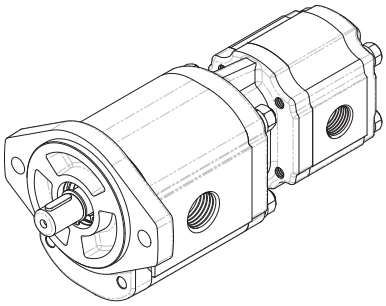
0P+0P+0P



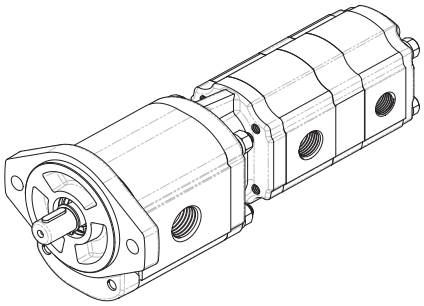
0P+0P+0P+0P



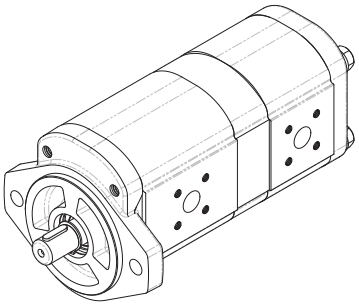
1P+0P



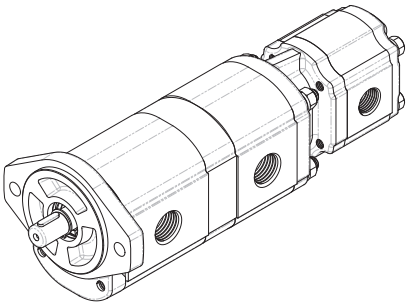
1P+0P+0P



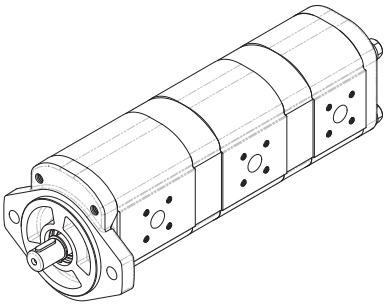
1P+1P



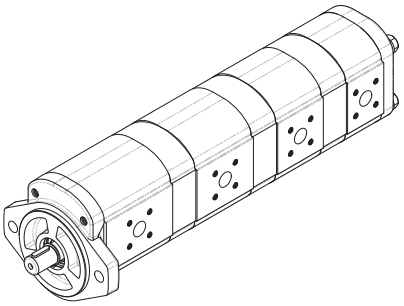
1P+1P+0P



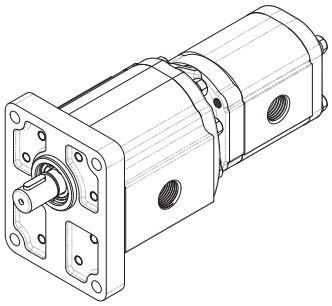
1P+1P+1P



1P+1P+1P+1P



2P+1P



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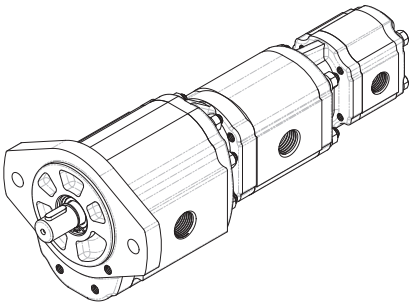
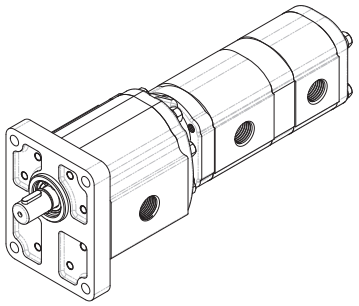
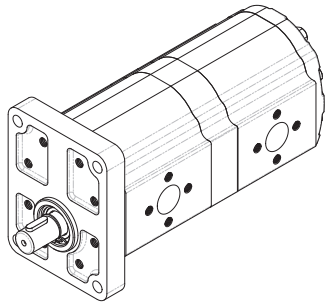


2P+1P+1P

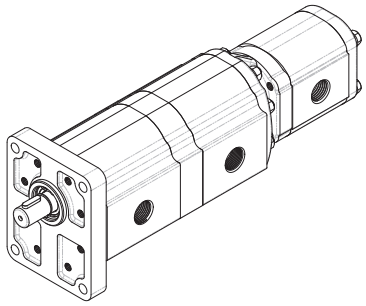


POSSIBLE MULTIPLE GROUP COMBINATION

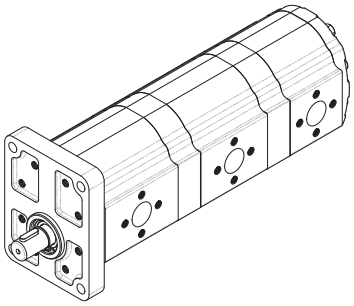
2P+2P



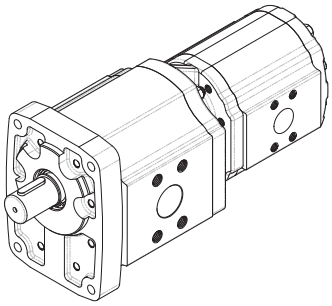
2P+2P+1P



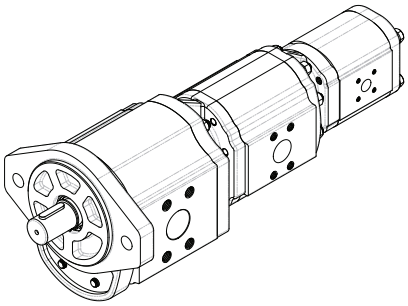
2P+2P+2P



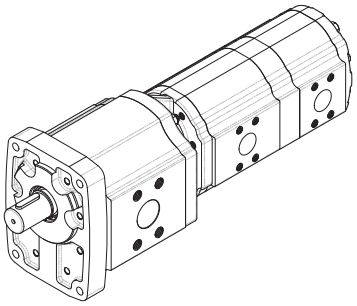
3P+2P



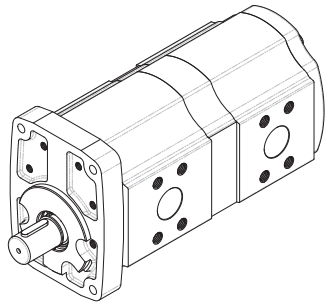
3P+2P+1P



3P+2P+2P



3P+3P



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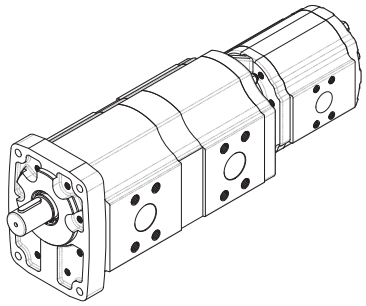
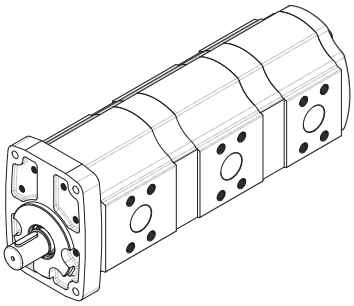


3P+3P+3P



Oilpower
Swedish Technology

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Email: info@oilpower.net; vshekhavat@yahoo.com