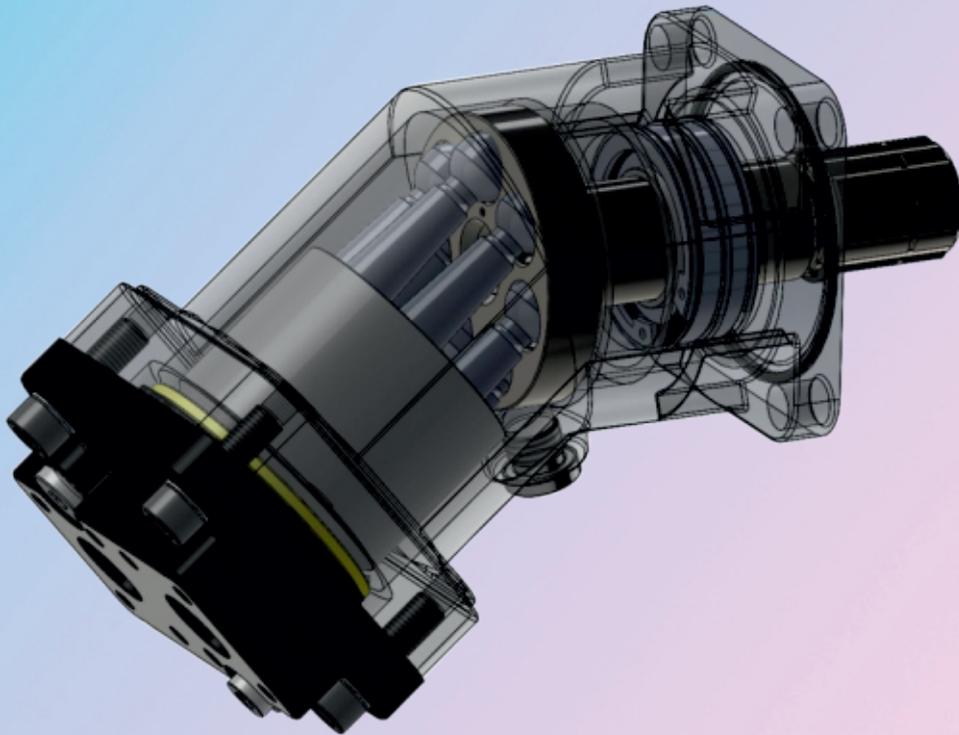# K3FH (HYBRID) Bent Axis Motors -2022-

HYBRID® High Pressure Hydraulic Bent Axis Piston Motors, High Pressure, 450/500 BAR Working Pressure. High Rotational Speed, High Efficiency, Slim Design, Cast Iron Motor Body, Re-Designed in 2022.

Designation;

5cc, 10cc, 12cc, 18cc, 25cc, 32cc, 41cc, 50cc, 56cc, 63cc, 80cc, 108cc, 126cc

Hidrapac Store
www.HIDRAPAC.com.tr

Bi-Directional
Bent Axis Pump
380-420 Bar Working Pressure
2200 RPM Working Speed...

+

External
MotoKit
Easy Installation, 10 min.
Upgrade Pump to Motor

=

Bi-Directional
Bent Axis Motor
450 Bar Working Pressure
High Rotational Speed...

HYBRID®
Convertible Edition

Ordering Code; K3FH - (HYBRID) DIN Flange Bent Axis Motors

Model Code	Displacement	Shaft Type	Flange Type	Version	Sealing
K3FH	**108**	**S**	**B4**	**HM**	**V**

K3FH HYBRID
Bent Axis Hydraulic Motor

DIN Flange

Displacement:
5
10
12
18
25
32
41
50
56
63
80
108
126

Shaft Type:

S
Splined Shaft (default)
8x32x36
DIN ISO 14NF

K
Parallel Keyed Shaft (special)
DIN 6885

Flange Type:

B4
ISO 7653
Ø80
4 Bolt Flange

Version:

HM
HYBRID Motor Version

HP
HYBRID Pump Version

Sealing:

V
Viton High Pressure Seal

N
Nitrile Seal 5/10 Bar

Formulas

Pump Output Flow	GPM	GPM = (Speed (rpm) × disp. (cu. in.)) / 231	GPM = (n ×d) / 231
Pump Input Horsepower	HP	HP = GPM × Pressure (psi) / 1714 × Efficiency	HP = (Q ×P) / 1714 × E
Pump Efficiency	E	Overall Efficiency = Output HP / Input HP	Eoverall = HPOut / HPIn X 100
		Overall Efficiency = Volumetric Eff. × Mechanical Eff.	EOverall = EffVol. × EffMech.
Pump Volumetric Efficiency	E	Volumetric Efficiency = Actual Flow Rate Output (GPM) / Theoretical Flow Rate Output (GPM) × 100	EffVol. = QAct. / QTheo. X 100
Pump Mechanical Efficiency	E	Mechanical Efficiency = Theoretical Torque to Drive / Actual Torque to Drive × 100	EffMech = TTheo. / TAct. × 100
Pump Displacement	CIPR	Dsplcmnt (In.3 / rev.) = Flow Rate (GPM) × 231 / Pump RPM	CIPR = GPM × 231 / RPM
Pump Torque	T	Torque = Horsepower × 63025 / RPM	T = 63025 × HP / RPM
		Torque = Pressure (PSIG) × Pump Displacement (CIPR) / 2π	T = P × CIPR / 6.28

Horsepower for driving a pump : For every 1 hp of drive, the equivalent of 1 gpm @ 1500 psi can be produced.

Horsepower for idling a pump : To idle a pump when it is unloaded will require about 5% of it's full rated power

Wattage for heating hydraulic oil : Each watt will raise the temperature of 1 gallon of oil by 1° F. per hour.

Flow velocity in hydraulic lines : Pump suction lines 2 to 4 feet per second, pressure lines up to 500 psi - 10 to 15 ft./sec., pressure lines 500 to 3000 psi - 15 / 20 ft./sec.; all oil lines in air-over-oil systems; 4 ft./sec.

Splines 8-32-36
DIN ISO 14 NF E 22.131

drain G3/8"

2 x G

View from F

Splined Shaft : 8x32x36 DIN ISO 14 NF

Parallel Keyed Shaft: DIN 6885 12x8x63

Key width 12

MOTOR MODEL	DISPL. (cc)	A	B	C	D	E	F	G	WEIGHT (kg)
5 cc	5.1	171.5	71.9	103.9	197.9	108.5	54	G 3/4"	9.3
10 cc	10.2	171.5	71.9	103.9	197.9	108.5	54	G 3/4"	9.3
12 cc	12.0	171.5	71.9	103.9	197.9	108.5	54	G 3/4"	9.3
18 cc	18.0	171.5	71.9	103.9	197.9	108.5	54	G 3/4"	9.3
25 cc	25.0	171.5	71.9	103.9	197.7	108.5	54	G 3/4"	9.3
32 cc	32.0	177.7	77.0	109.1	203.8	108.5	54	G 3/4"	10.3
41 cc	41.0	177.7	77.0	109.1	203.8	108.5	54	G 3/4"	10.3
50 cc	50,3	189.3	86.8	118.9	215.4	108.5	54	G 3/4"	11.5
56 cc	56,0	189.3	86.8	118.9	215.4	108.5	54	G 3/4"	11.5
63 cc	63.0	189.3	86.8	118.9	215.4	108.5	54	G 3/4"	11.5
80 cc	80,4	216.2	99.5	133.3	241.7	123.5	60	G 1"	14.5
108 cc	108	216.2	99.5	133.3	241.7	123.5	60	G 1"	14.5
126 cc	126	218.5	101.4	135.2	244	123.5	60	G 1"	14.5

Characteristics of the K3FH - DIN Flange Bent Axis Motors

| MOTOR MODEL	DISPL. (cc)	CONTINOUS MAX. SPEED (rpm)	INTERMITTED MAX. SPEED (rpm)	MAX. FLOW ABSORBED (l/mn)	TORQUE BAR (m.N/bar)	TORQUE AT 350 BAR (m.N)	MOTOR MAX./MIN. TEMP. (celsius)	MAX. ALLOW PRESSURE CONTN./PEAK (bar)
5 cc	5.1	8800	9600	45	0.09	46	-25 / 110	400 / 450
10 cc	10.2	8600	9400	88	0.14	58	-25 / 110	400 / 450
12 cc	12.0	8000	8800	96	0.19	66	-25 / 110	400 / 450
18 cc	18.0	8000	8800	144	0.28	98	-25 / 110	400 / 450
25 cc	25.0	6300	6900	158	0.40	140	-25 / 110	400 / 450
32 cc	32.0	6300	6900	202	0.50	175	-25 / 110	400 / 450
41 cc	41.0	5600	6200	230	0.65	227	-25 / 110	400 / 450
50 cc	50,3	5000	5500	252	0.80	280	-25 / 110	400 / 450
56 cc	56,0	5000	5500	280	0.90	320	-25 / 110	400 / 450
63 cc	63.0	5000	5500	315	1.00	350	-25 / 110	400 / 450
80 cc	80,4	4500	5000	362	1.27	445	-25 / 110	400 / 450
108 cc	108	4000	4400	435	1.70	595	-25 / 110	400 / 450
126 cc	126	3400	4400	428	2.0	700	-25 / 110	400 / 450

Direction of Rotation; Reversible

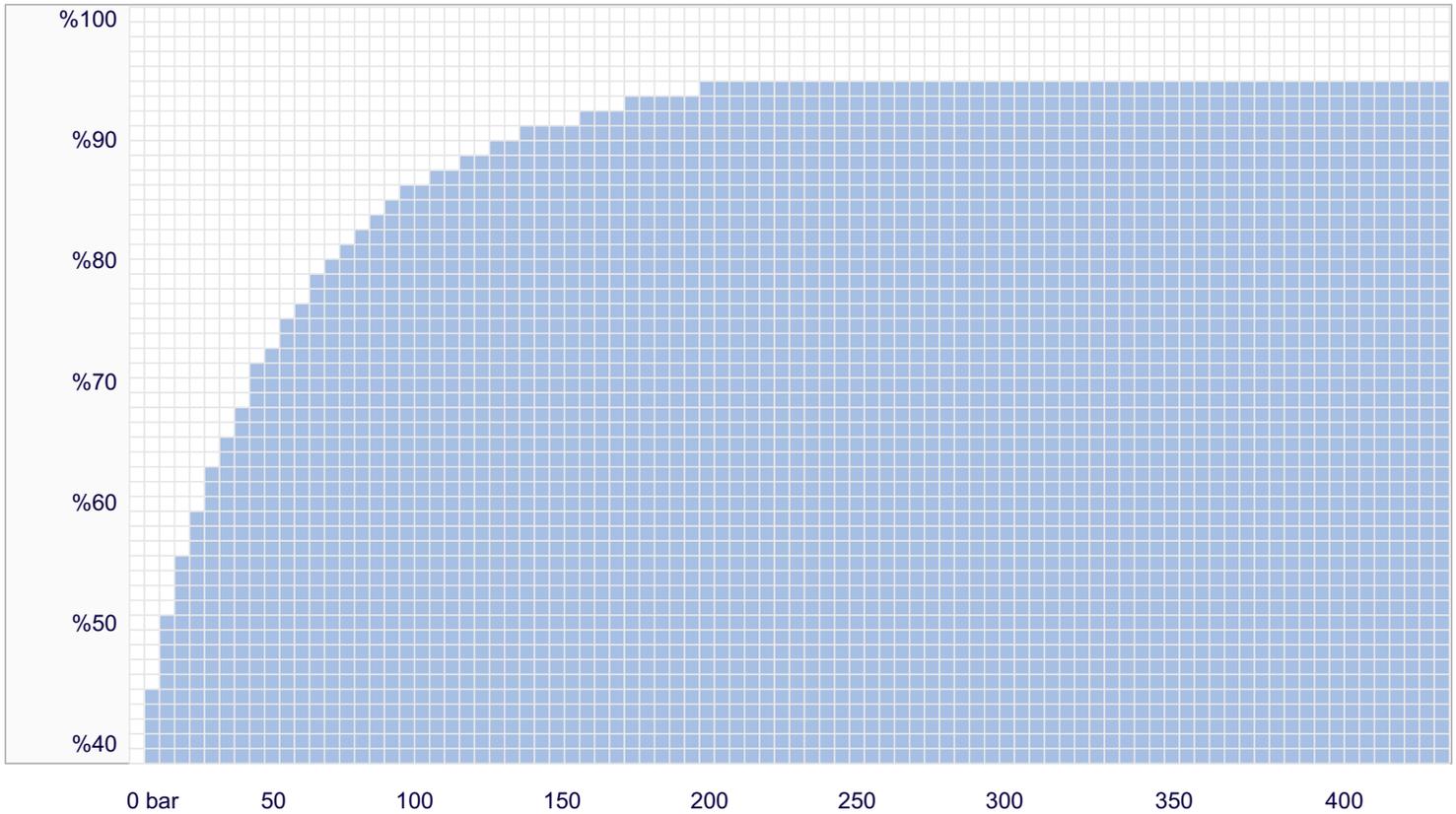The motors rotate clockwise or counter-clockwise depending on the direction of hydraulic flow entering the motor.

ROTATION CCW

T1

B ↓ ↑ A

ROTATION CW

T1

B ↑ ↓ A
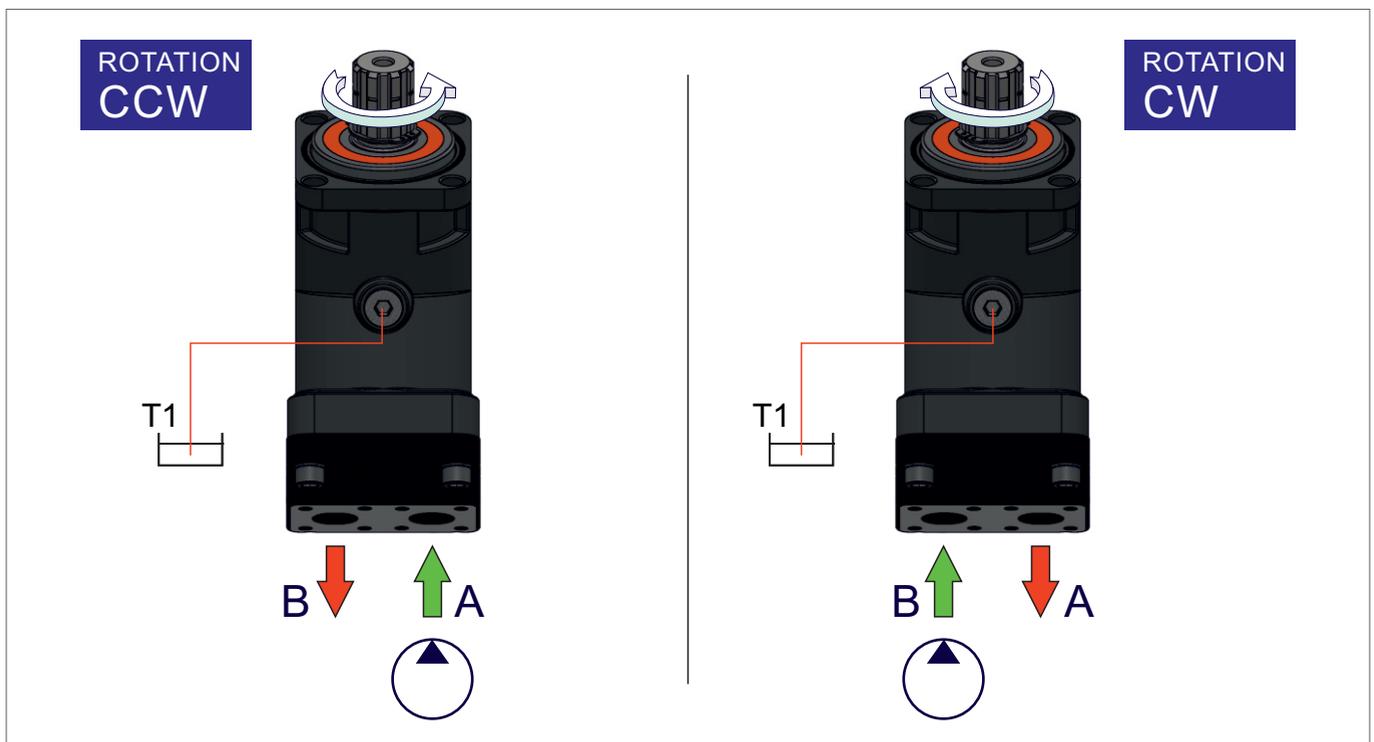
Performance, Torque, Speed and Pressure Charts

Compare Table of Torque
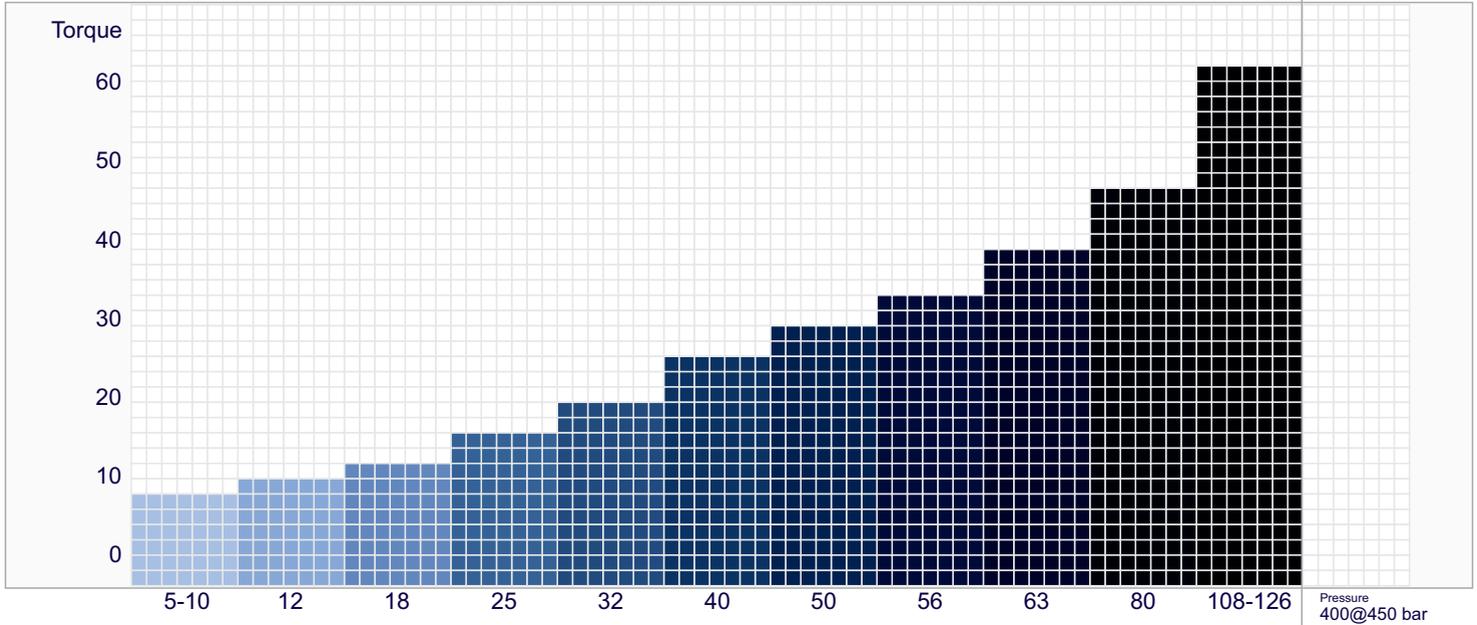
Efficiency of Bent Axis Motors (1000 rpm)

Installation & Assemble Informations for Bent Axis Motors

POSITION
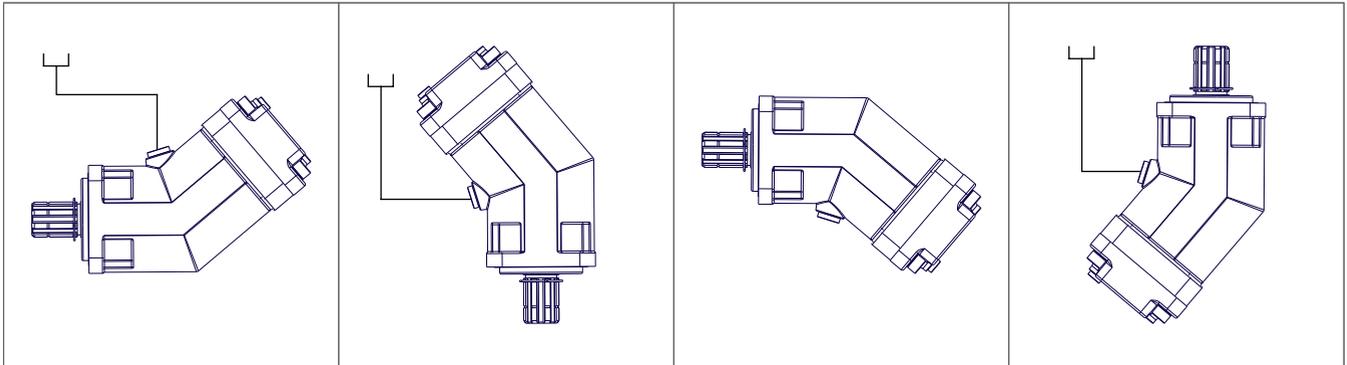DIN Flange Bent Axis Motors can be operate any position.

DIRECTION OF ROTATION
DIN Flange Bent Axis Motors can be operate in both directions of rotation.

Before of Installation operation, the motor must be filled with hydraulic fluid and air bled.
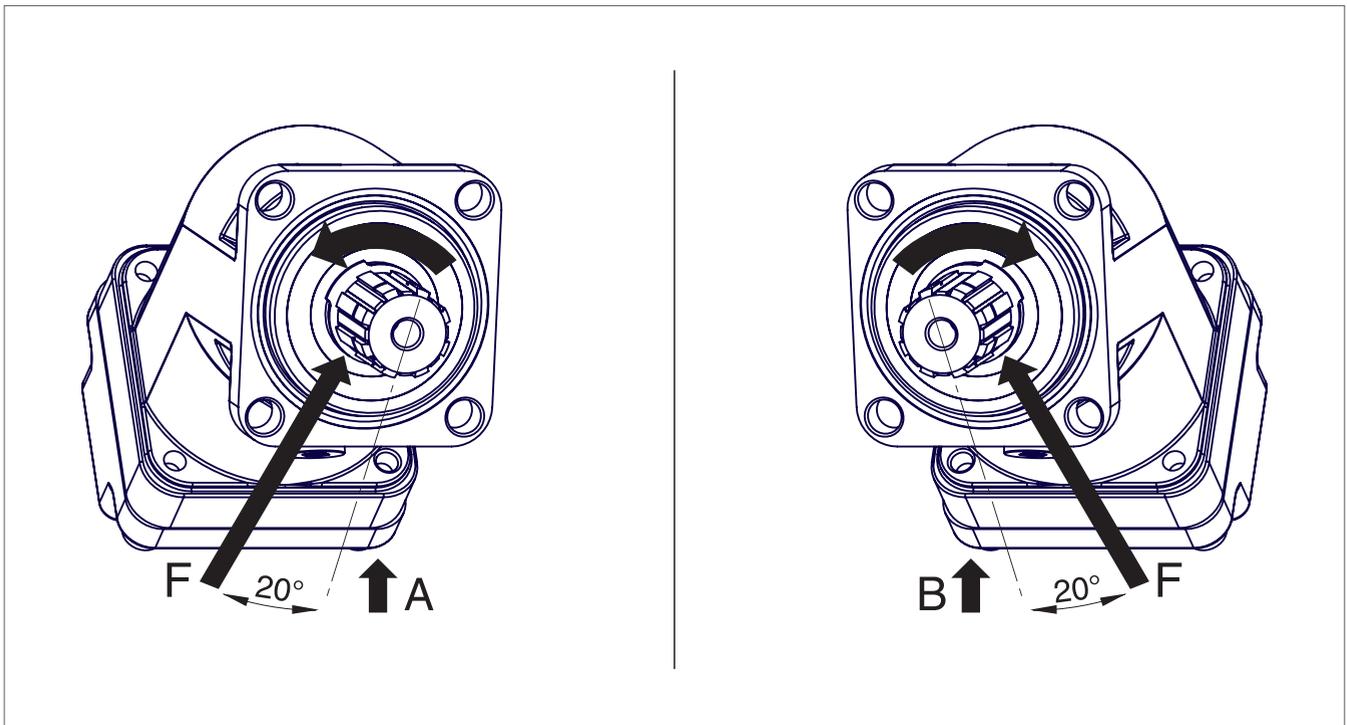
INSTALLATION POSITION
See following examples.

HYDRAULIC FLUID
Recommended ;
Generally : between 15 and 200 cSt.
Maximum : between 5 and 1600 cSt.

FOR USE;
Available via e-mail on request or each motor is supplied via Starting datasheet.

Formulas, Calculations, Installation Guide

Quick Calculation

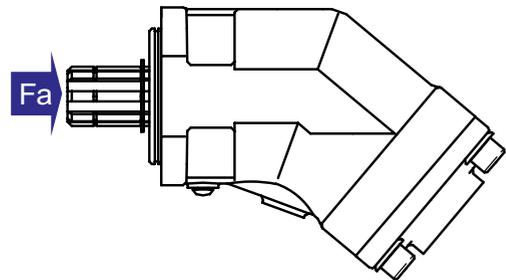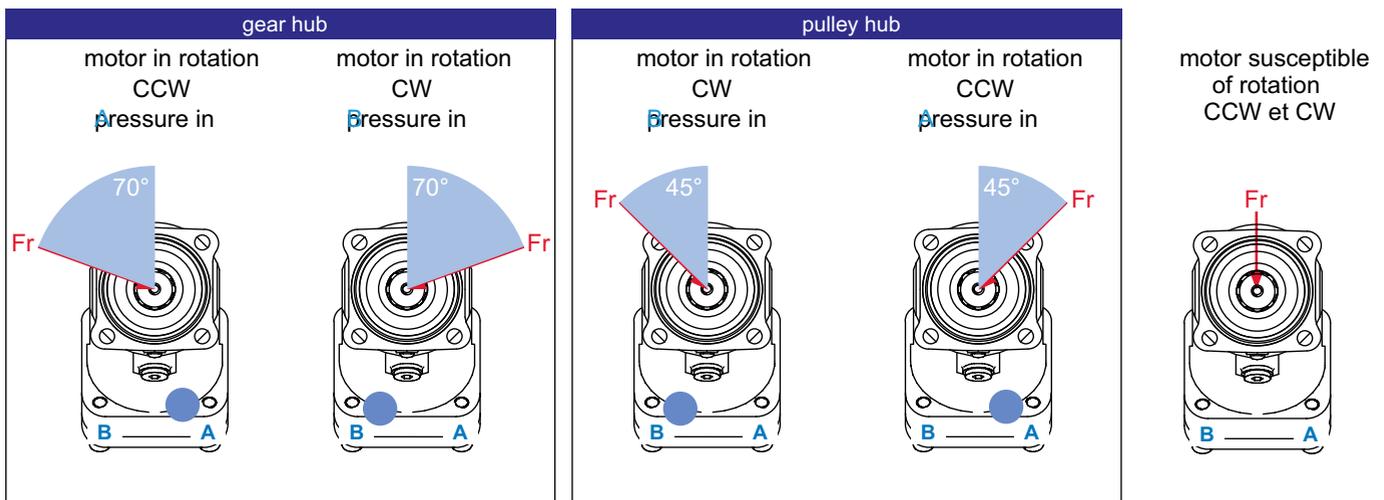| Flow rate	Torque	Power	Speed
$Q = \dfrac{V_S \cdot n}{1000\eta_v}$ (lpm)	$M = \dfrac{V_S \cdot \Delta p \cdot \eta_{mh}}{63}$ (Nm)	$P = \dfrac{2\pi \cdot M \cdot n}{60000} = \dfrac{M \cdot n}{9549} = \dfrac{Q \cdot \Delta p \cdot \eta_t}{600}$ (kw)	$n = \dfrac{1000 \cdot Q \cdot \eta_v}{V_S}$ (lpm)

V_S = Displacement (ccm/rev.)
$|p$ = Diff. pressure (bar)
n = Speed (rpm)
Q = Flow (lpm)
η_v = Volumetric efficiency
η_{mh} = Mechanical-hydraulic efficiency
η_t = Total efficiency ($\eta_t = \eta_v \times \eta_{mh}$)

Fa

Motor model	5, 10, 12	18 cc	25 cc	32 cc	41 cc	50 cc	56, 63cc	80 cc	108 cc	126 cc
Fa (N/bar)	15	20	30	30	40	40	50	60	80	90

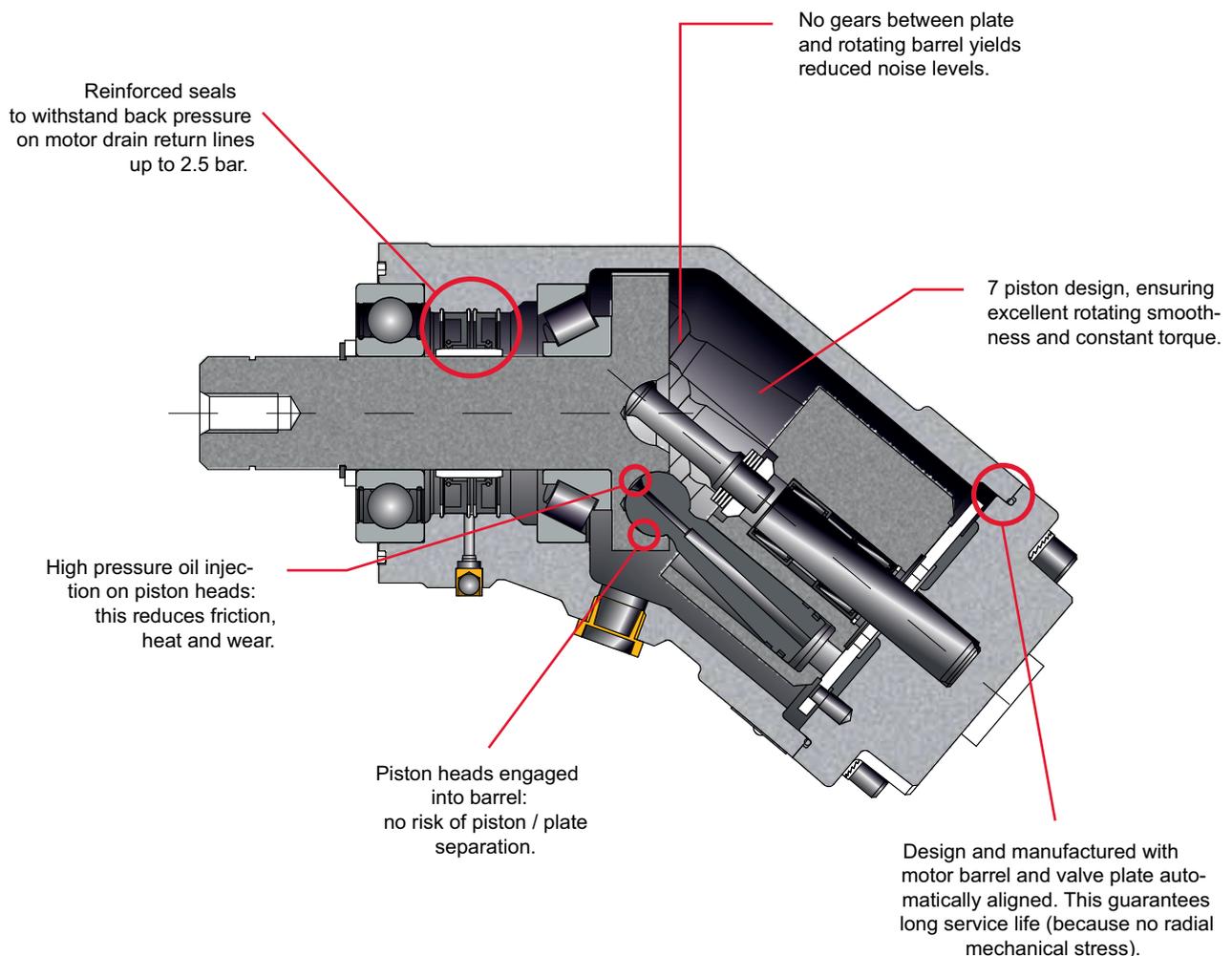| gear hub		pulley hub		
motor in rotation CCW pressure in	motor in rotation CW pressure in	motor in rotation CW pressure in	motor in rotation CCW pressure in	motor susceptible of rotation CCW et CW
70° Fr	70° Fr	Fr 45°	45° Fr	Fr
B ____ A	B ____ A	B ____ A	B ____ A	B ____ A

Other Advantages of DIN Flange Bent Axis Motors

Interchangeable and Compatible with other DIN Bent Axis Motors,
Special Designed Pistons,
One-Piece Piston with Piston Rings,
For use in stationary and mobile applications,
Compact motor design and extra durable parts,
High Operational Reliability and High Starting Torque
Extra Warranty with Wide Service

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PIONEER HYDRAULIC TECHNOLOGIES

Bent Axis Hydraulic Piston Motors

40° bent axis design giving high power, small overall dimensions, optimum efficiency and economic design. Flange and shaft designed for direct mounting on the equipments. The fixed displacement bent axis motors generates a hydraulic fluid flow. It is designed for use in trucks, commercial vehicles, construction type equipments and all stationary hydraulic applications. The DIN Flange is a motor with rotary group in bent-axis design. Flow is proportional to drive speed and displacement.

For axial piston units with bent-axis design, the Pistons are arranged diagonally with respect to the drive shaft. The motor covers the whole displacement range 5 to 126 cm3/rev. The motor has been developed with modern styling and design to satisfy market demand as to designed new generation plate, extra parts and pistons with give high flow performance, high pressures with high efficiency and very small dimensions.

The motor is available both to DIN and SAE world standards and can be mounted either directly at the gear box or via a drive shaft. Other brand bent axis motors compatible and interchangeable with DIN Fl. bent axis motors. Refer to the data sheet and order confirmation for the technical data, operating conditions and operating limits of the bent axis piston motors.

No gears between plate and rotating barrel yields reduced noise levels.

Reinforced seals to withstand back pressure on motor drain return lines up to 2.5 bar.

7 piston design, ensuring excellent rotating smoothness and constant torque.

High pressure oil injection on piston heads: this reduces friction, heat and wear.

Piston heads engaged into barrel: no risk of piston / plate separation.

Design and manufactured with motor barrel and valve plate automatically aligned. This guarantees long service life (because no radial mechanical stress).

Complete Product Range

Bent Axis Piston Motors
K2FM (DIN) Bent Axis Motor
K3FH (HYBRID) Bent Axis Motor
A2MS (SAE) Bent Axis Motor
A3MS (SAE2) Bent Axis Motor
A2FM (ISO) Bent Axis Motor
A2FE (Fixed Plugin) Bent Axis Motor
A2FE (Two Speed) Bent Axis Motor
A2FT 45 (Inline) Bent Axis Motor

Bent Axis Piston Pumps
K2FA (DIN) Bent Axis Pump
K2FH (HYBRID) Bent Axis Pump
K2FL (Aluminum) Bent Axis Pump
A2FS (SAE) Bent Axis Pump
A3FS (SAE2) Bent Axis Pump
A2FO (ISO) Bent Axis Pump
A3FO (ISO2) Bent Axis Pump
A2FP (Fixed Plugin) Bent Axis Pump

Variable Displacement Motors
AXMV Variable Piston Motor
AXMA Variable Piston Motor
AXMI Variable Piston Motor

Variable Displacement Pumps
AXVP Variable Piston Motor
AXVA Variable Piston Motor
AXVI Variable Piston Motor

Dual Flow Piston Pumps
A2FD (DIN) Dual Flow Pumps
A2FD (SAE) Dual Flow Pumps
A2PD Axial Dual Output Pumps

Axial Piston & Gear Pumps
A3PP Axial Piston Pumps
A3PH High Pressure Pumps
A2GP Gear Pumps
A2GPT Tandem Gear Pumps
A2GM Gear Motors
A2GMT Tandem Gear Motors

Valve (ByPass) (Flushing) (Cavitation)
Circulation Valve
ByPass Valve
Anti-Cavitation Valve
Flushing Valve
LS Valve
AntiShock Valve
Speed Sensor

Hydraulic Spare Parts
Suction Fittings
Couplars
Adapters
Flanges
Power Take Off
Monoblock Valve
Section Valve

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PIONEER HYDRAULIC TECHNOLOGIES

Hydraulic Pumps, Motors

Bent Axis Hydraulic Piston Motors, Bent Axis Hydraulic Piston Pumps, Bent Axis Motors, Variable Displacement Piston Pumps, Variable Displacement Piston Motors, Axial Piston Pumps, High Pressure Piston Pumps, Gear Pumps, Gear Motors, Hydraulic Valve.

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