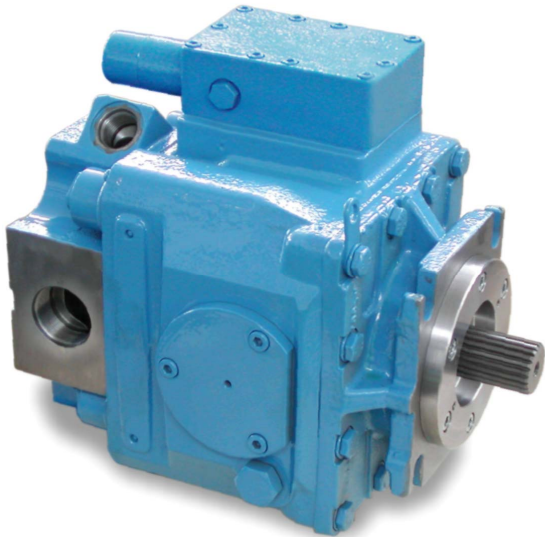
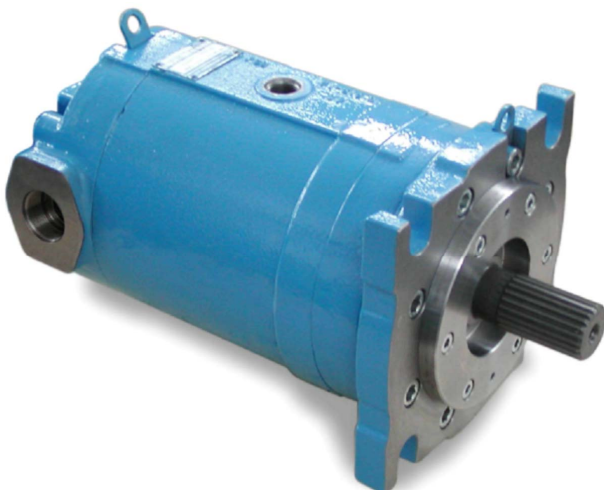


# AHP HYDRAULIKA

HEART OF YOUR MOTION



**AXIAL PISTON PUMP**  
**PV 3K-20**  
WITH VARIABLE DISPLACEMENT



**AXIAL PISTON PUMP**  
**PF 3K-20**  
WITH FIXED DISPLACEMENT



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## VARIABLE DISPLACEMENT PUMPS SERIES 3K-20

- 33 cm<sup>3</sup>
- 52 cm<sup>3</sup>
- 70 cm<sup>3</sup>
- 90 cm<sup>3</sup>
- 119 cm<sup>3</sup>

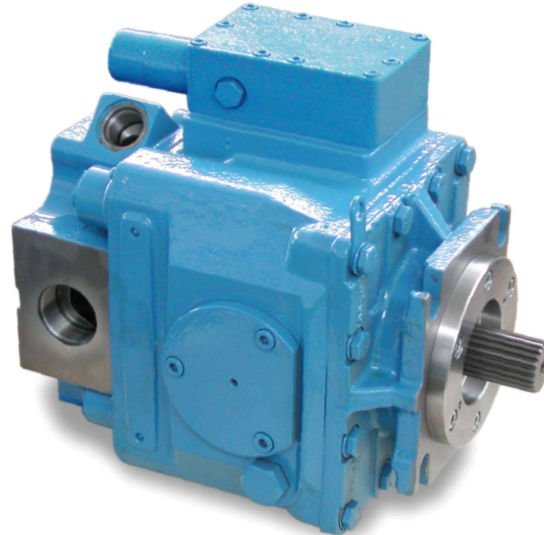


Fig. 1: Variable

Variable displacement axial piston pumps of swash plate design series 3K-20 are designed for various applications in open hydrostatic circuit.

Fluid flow is in proportional relation with speed and displacement of pump, which can be increased with changes of swash plate angle from zero to maximum. Standard pump is equipped with internal charge pump of gerotor type, manifold assembly with block of flushing and two pressure relief valves on the high-pressure ports. Relief valves protect the hydrostatic transmission from overloads. Standard pump is also equipped with mechanical - hydraulic servo valve with mechanical feedback. Tightness of the case around the exiting part of the shaft is protected by the shaft seal for max. pressure 0,25 MPa (intermittent 0,5 MPa).

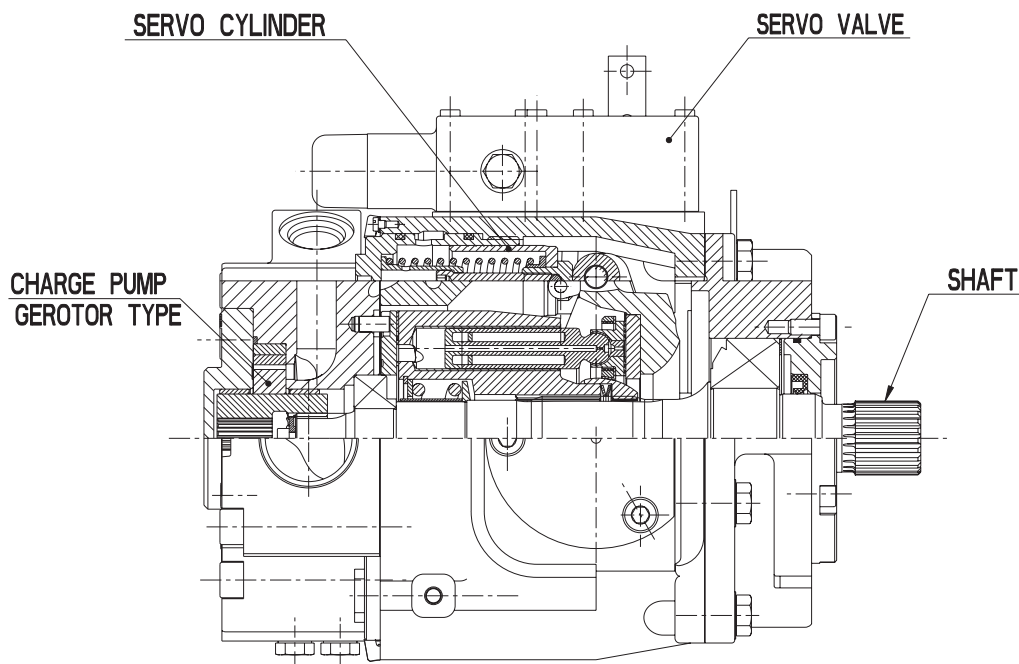


Fig. 2: Cross sectional view of variable displacement pump



## TECHNICAL PARAMETERS

DESCRIPTION		DIMENSION	FRAME SIZE				
			33	52	70	90	119
Displacement	nominal, max	cm <sup>3</sup>	33,33	51,6	69,8	89	118,7
	min.		0	0	0	0	0
Speed	nominal	min <sup>-1</sup>	1500	1500	1500	1500	1500
	max. in 100 kPa abs. pressure		1900	1900	1850	1700	1600
	max. in 173 kPa abs. pressure		2900	2800	2650	2500	2300
	min.		500	500	500	500	500
Rate of flow *	nominal	dm <sup>3</sup> . min <sup>-1</sup>	50	77,4	104,7	133,5	178
	max.		96,5	144,5	185	222,5	273
Output pressure	nominal	MPa	25				
	per. work		28				
	max. **		35				
	peak **		42				
	min.		1,3				
Input pressure	max. ***	MPa	0,173 abs.				
	min. ***		0,083 abs.				
Torque moment	max. ( $\Delta p = 35\text{MPa}$ )	Nm	185,3	287,2	388,4	495,2	660,5
	relat. coefficient	Nm/MPa	5,3	8,21	11,1	14,16	18,89
Output *	max.	kW	56,4	84,3	107,9	129,8	159,3
Swash plate angle	var. - max.	Degrees	18				
	var. - min.		0				
Torque for auxiliary output	continuous SAE A	Nm	75				
	continuous SAE B		175				
	continuous SAE B-B		225				
	continuous SAE C		225				
	maximal SAE A		107				
	maximal SAE B		250				
	maximal SAE B-B		320				
	maximal SAE C		320				
Torque for 2nd section of tandem pump	continuous	Nm	225				500
	maximal		320				700
Direction of shaft rotation			clockwise or counterclockwise				
Case pressure		MPa	continuous 0,25, intermittent 0,5				
Control pressure		MPa	1,3 - 3,5				
Weight		kg	43,1	52,5	59,5	76	105,5

\* theoretical values without efficiency values \*\* pressure definition acc. to DIN 24312 \*\*\* values at viscosity 35.mm<sup>2</sup> s<sup>-1</sup>

## OPERATING CONDITIONS

Ambient temperature range: from - 40 °C to + 55 °C

Fluid operating temperature: from - 18 °C to + 80 °C

Temperature can be higher, but viscosity of the oil must be minimally 7.mm<sup>2</sup>.s<sup>-1</sup>.

Please consult with the producer.

Recommended hydraulic fluids: for comprehensive information see prescription GTN N-005

Recommended Fluids

Operating viscosity range: optimal (12-60).mm<sup>2</sup>.s<sup>-1</sup>

minimal 7.mm<sup>2</sup>.s<sup>-1</sup>

at cold starting 400.mm<sup>2</sup>.s<sup>-1</sup>

Working position: arbitrary

Fluid filtration: fluid cleanliness class must be maintained at least at level

18/13 accord ISO 4406

Degree of separation:  $\beta_{10} = 1,5$  to 2  $\beta_{25} \geq 75$

(at cleanliness ability 10  $\mu\text{m}$  of filter elements)



## AXIAL PISTON PUMPS SERIES 3K-20 OPEN CIRCUIT

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### PV 3K - 20 DIMENSIONS

SOURCE GTN K - 0103

SIZE	TYPE					SIZE	TYPE				
	033	052	070	090	119		033	052	070	090	119
∅ X	127 -0,05	127 -0,05	127 -0,05	127 -0,05	152,4-0,05	X46	45°	45°	45°	30°	20°
1) X1	34,5-0,15	34,5-0,15	34,5-0,15	37,68 -0,18	44,03-0,17	X47	88	106,5	114,5	109,5	132
1) X2	56	56	56	56	75	X48	40	40	40	45	50
X3						X49	15,5	14	14	14	14
X4	95	98	89	109	126	X50	271,5	288	312,6	318	349,6
X5	252,5	267,5	289,6	297,5	328,6	X51	274,5	291,5	316	321,5	353
X6						X52	277,5	294,5	319	324,5	356
X7						X53	490	523	562,6	575	633,6
X8						X54	372,5	392,5	406,6	433,5	482,6
X9						X55	492	525	566,6	579	637,6
X10						X56	555	586	630,2	646	708,2
X11	11.5					X57	2) 1/2" – 13UNC-2B Depth 18		3) M12 Depth 18		
X12	180	200	210	208	256	RX58	50.8				
X13	82	89,5	103	94	131	RX59	25.4				
X14						X60	9.3 ± 0.2				
X15	214,5	230,5	249	254,5	281						
X16											
X17											
X18											
X19	See page 18										
X20	82	92	96	102,5	115	β°	22,5	25	24	30	26
∅X21	15+0,8	15+0,8	15+0,8	15+0,8	22+0,8						
X22	88	94	98	100	99	<b>CONNECTION</b>  <b>A , B</b>	<b>TYPE</b>  See page 17,18				
X23	107	113	117	119	118						
X24	100	105	125	115	140						
X25	120,5	125,5	145,5	135,4	160,5						
X26	150	155	175	165	190						
∅X27	162	162	162	162	228,6						
X28	176	199	220	222	248						
X29	212,5	228,5	245	250,5	277						
X30	12,7	12,7	12,7	12,7	12,7						
X31	76	82,5	82,5	85	95						
X32	91,5	96	96	85	95	<b>T</b>	2) 7/8"-14UNF-2B 3) M 22 x 1,5	2) 1 1/16"-12UN-2B 3) M27x2			
X33						L <sub>1</sub> ;L <sub>2</sub>	2) 7/8"-14UNF-2B	3) M 22 x 1,5			
X34						M <sub>A</sub> ;M <sub>B</sub> ;M <sub>P</sub>	M 12 x 1,5				
X35						M <sub>1</sub> ; M <sub>2</sub> ;	M 12 x 1,5				
X36											
X37	88	100	108	104	104						
X38	7	13,5	14	9	6						
X39	62	70	70	78	82						
X40	62	70	70	78	82						
X41											
X42											
X43											
X44											
X45											

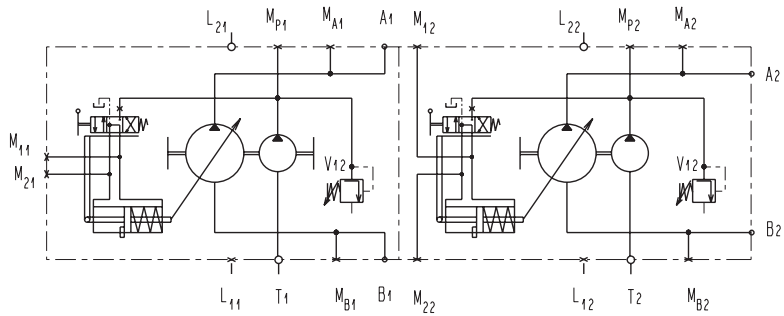
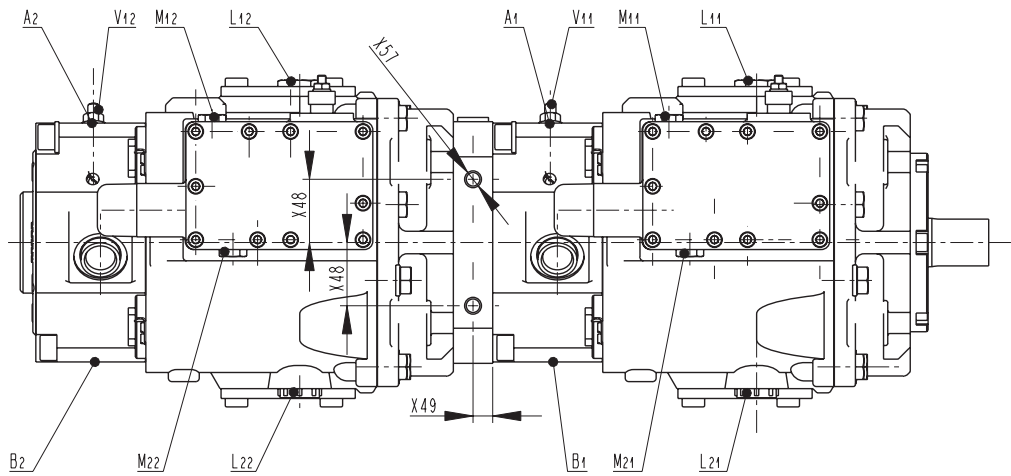
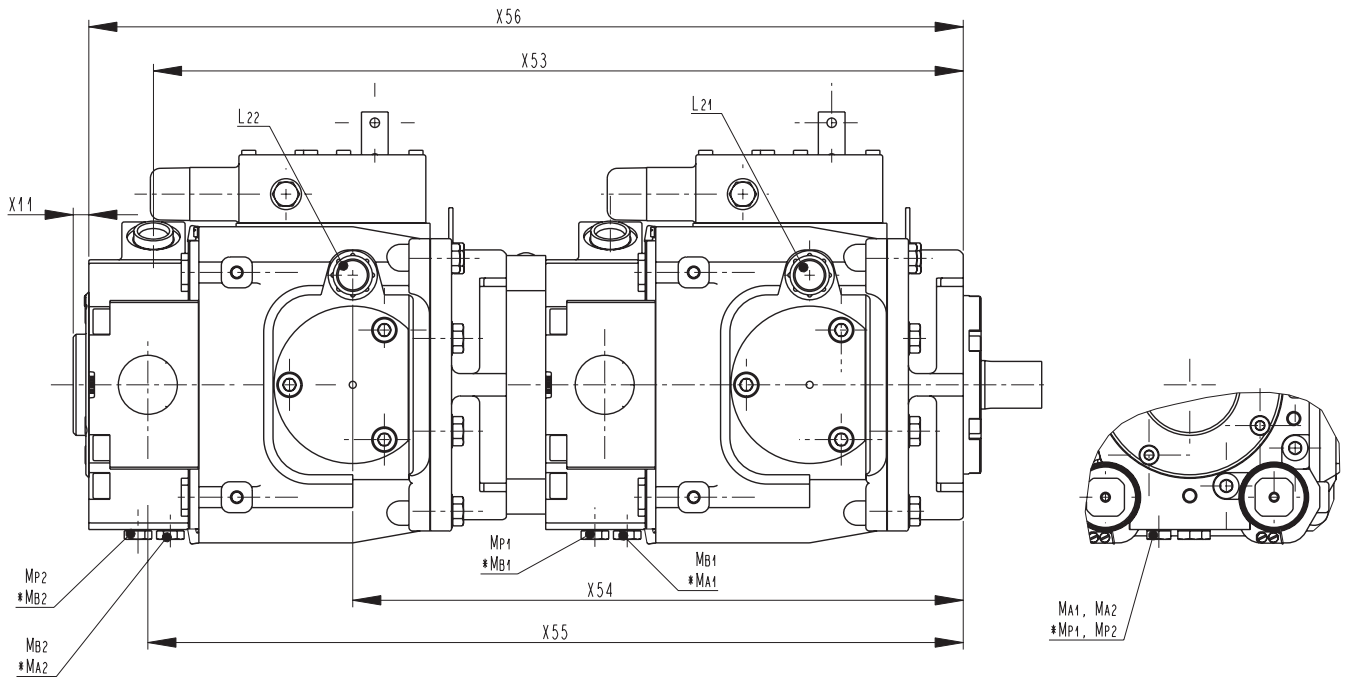
- 1.) Valid for standard design
- 2.) Valid for design of pressure ports A,B ( SAE )
- 3.) Valid for design of pressure ports C ( ISO )

Dimensions are in mm unless noted otherwise.





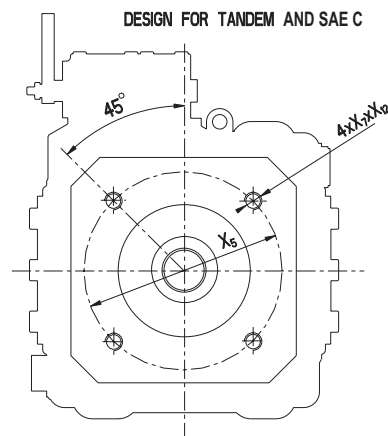
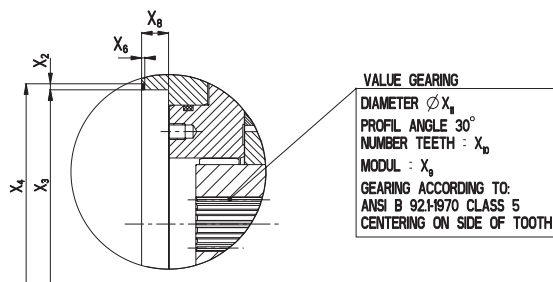
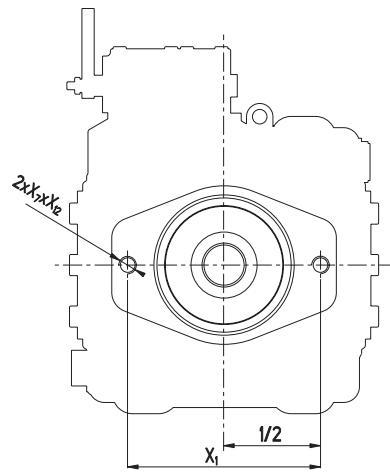
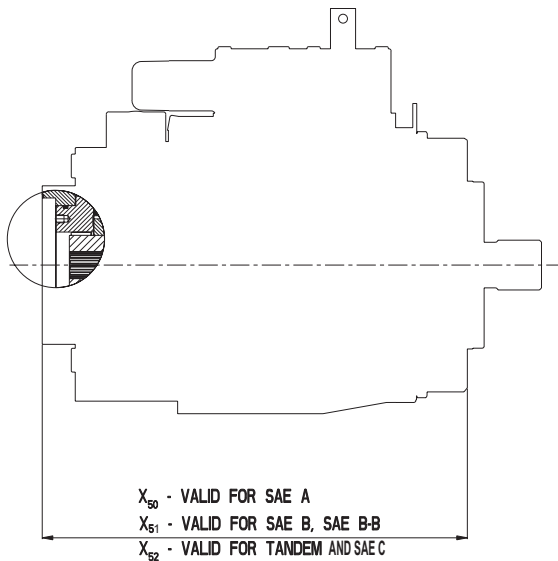
TANDEM PUMP PV 3K-20



\* For size 033, 052, 070



CONNECTING FOR AUXILIARY OUTPUT



	TYPE	X1	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
SAE A	033	106,4	82,55 <sup>+0,05</sup> <sub>0</sub>	87,12 <sup>+/-0,13</sup>		1,2 <sup>+0,1</sup> <sub>0</sub>	1) 3/8"-16UNC-2B	7,7	16/32	9	14,2875	18
	052 to 119						2) M10	6,9				
SAE B	033	146	101,6 <sup>+0,05</sup> <sub>0</sub>	106,17 <sup>+/-0,13</sup>		1,2 <sup>+0,1</sup> <sub>0</sub>	1) 1/2"-13UNC-2B	10,5	16/32	13	20,6375	22
	052 to 119						2) M12	10,2				
SAE B - B	033	146	101,6 <sup>+0,05</sup> <sub>0</sub>	106,17 <sup>+/-0,13</sup>		1,2 <sup>+0,1</sup> <sub>0</sub>	1) 1/2"-13UNC-2B	10,5	16/32	15	23,8125	22
	052 to 119						2) M12	10,2				
SAE C	052	127 H8	131,8 H11	161,92	1,2 <sup>+0,1</sup> <sub>0</sub>	1,2 <sup>+0,1</sup> <sub>0</sub>	1) 1/2"-13UNC-2B	13,2	12/24	14	29,633	25
	070											
	090						2) M12					
	119											
FOR TANDEM	033	127 H8	112 H8	116,6 H11	161,92	1,2 <sup>+0,1</sup> <sub>0</sub>	1) 1/2"-13UNC-2B	13,2	16/32	15	23,8125	22
	052		131,8 H11									
	070		131,8 H11									
	090		134 H11									
	119		142 H8	149 H11			228,6					
				2) M20								

Dimension X50, X51, X52 and not mentioned data are in GTN K-0103 (PV 3K-20 dimensions)

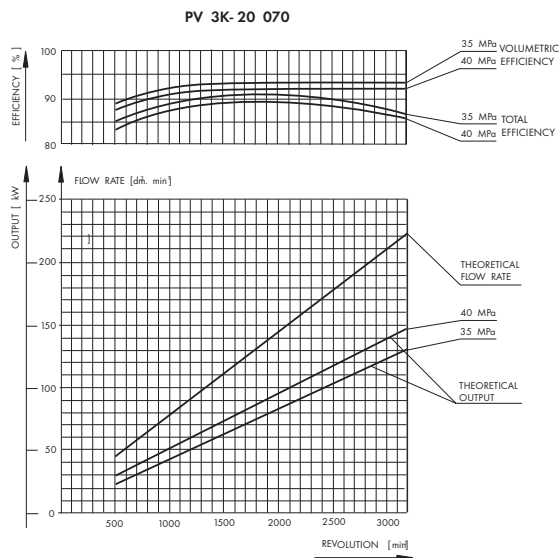
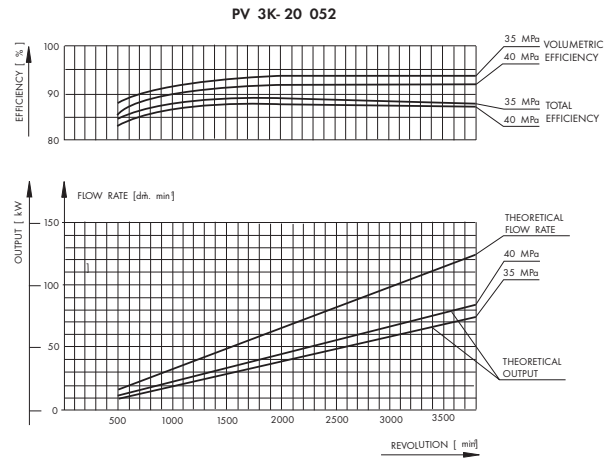
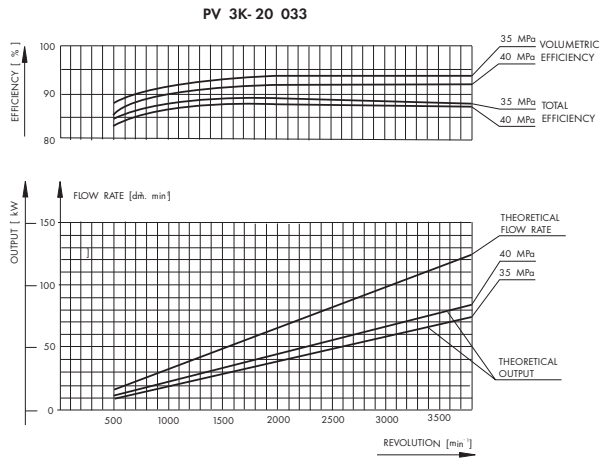
1) Valid for high - pressure ports, design "A" and "B"

2) Valid for high pressure ports, design "C"

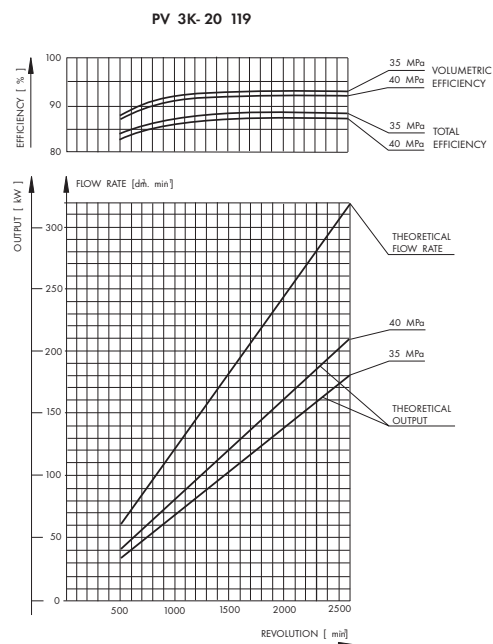
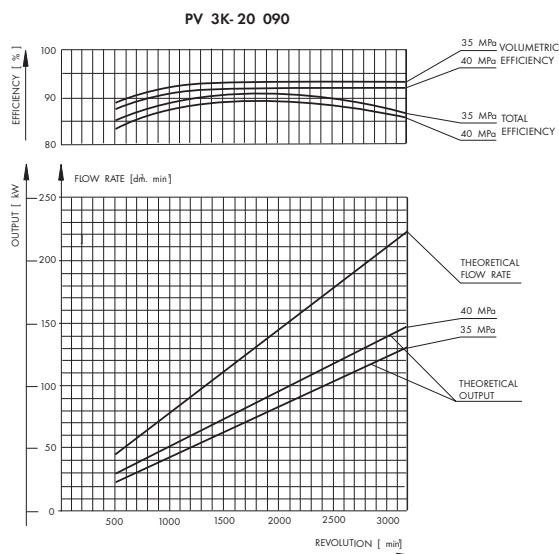


## POWER CHARACTERISTICS

(Dependencies of efficiency, flow rate and output on revolutions)

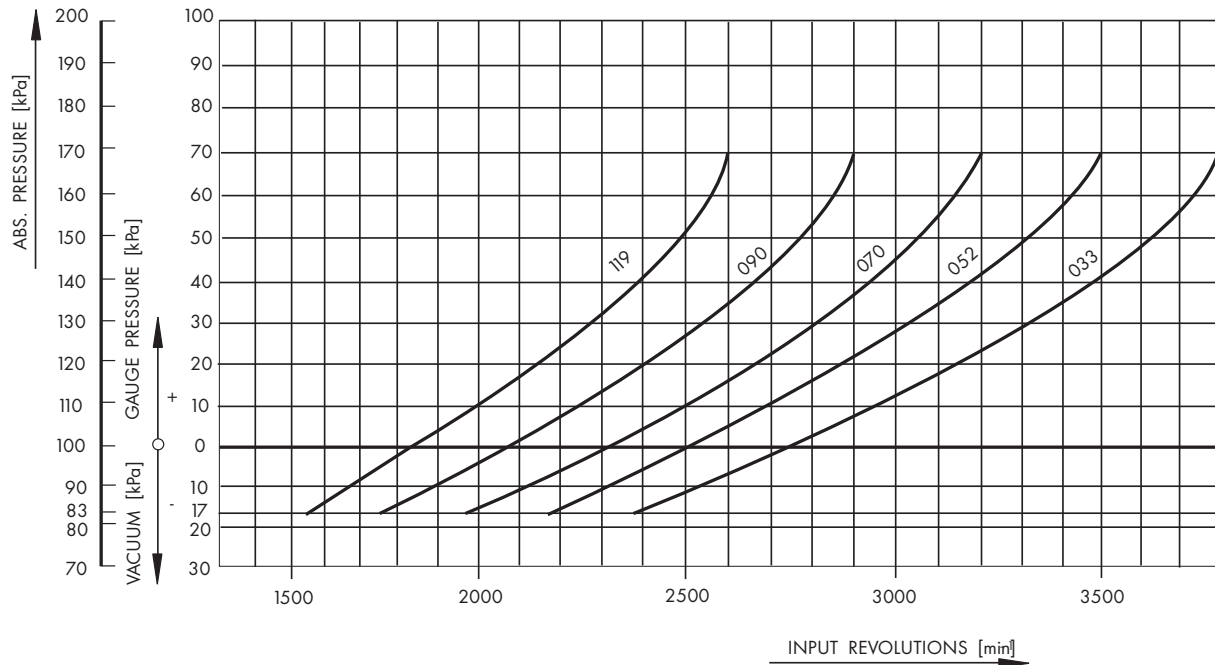


Dependencies refer to viscosity of oil  $35 \text{ mm}^2 \text{ s}^{-1}$  and max. swash plate angle is  $18^\circ$ . They don't include either output of charge pump (G-rotor) or pump for auxiliary output. Theoretical values are necessary to be corrected by efficiency.





## DEPENDENCE OF REVOLUTIONS ON INPUT PRESSURE



Recommended working rate between input pressure and revolutions for the best service life of axial piston pump.

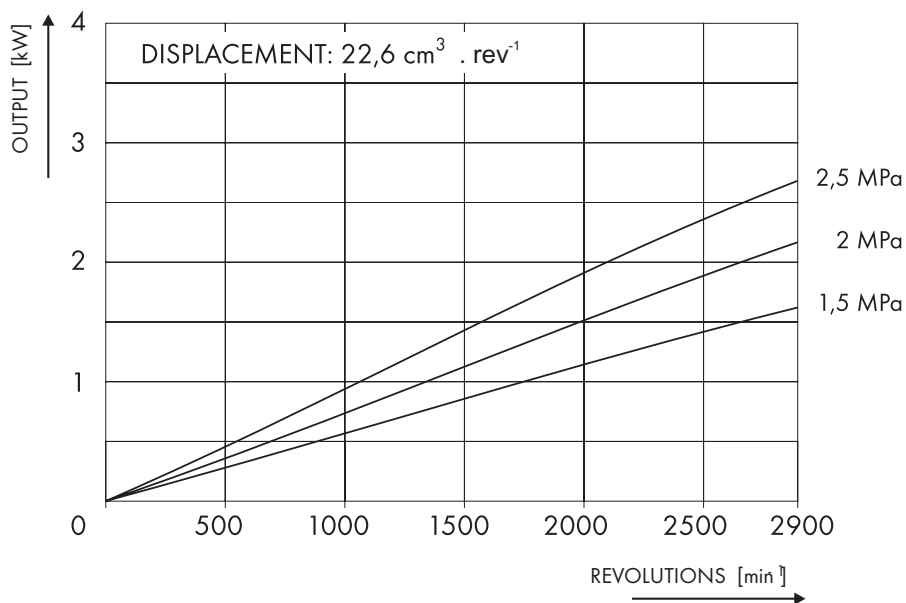
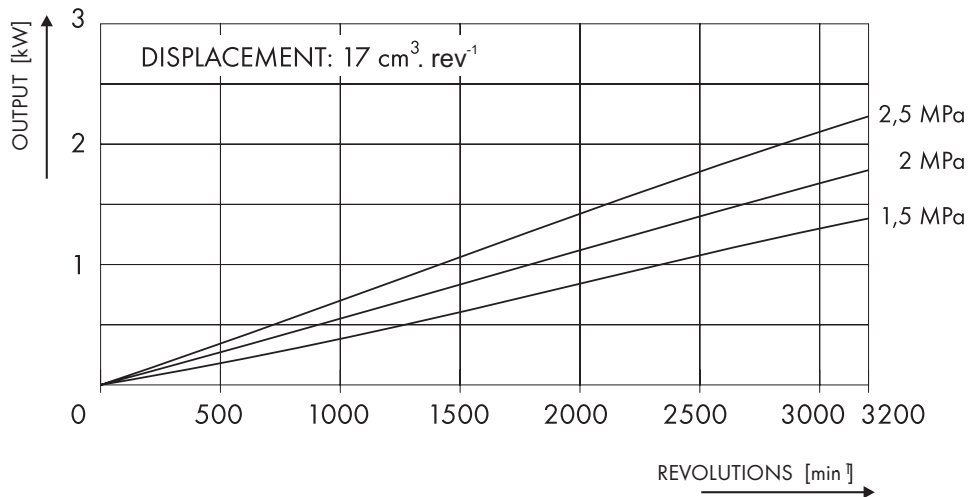
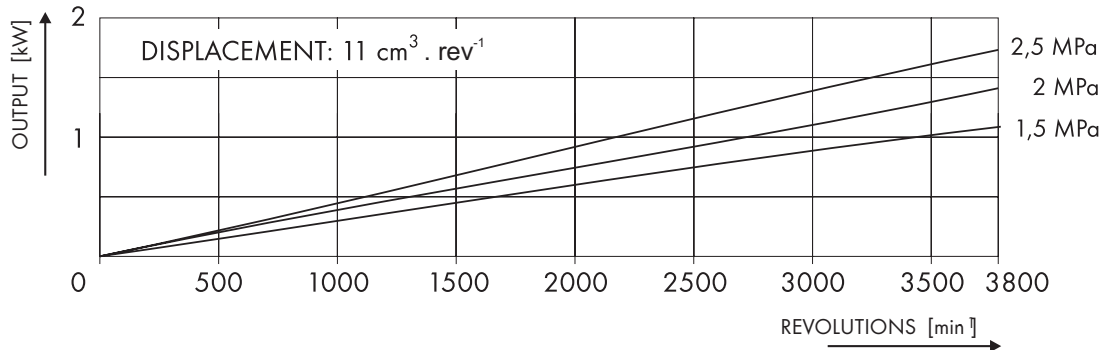
Swash plate angle 18°.

Viscosity of the oil 35cSt ( $\cdot 10^{-6} \text{ m}^2 \cdot \text{s}^{-1}$ ) - 67°C



## CHARGE PUMP

(Dependence of output on pressure and revolutions)





# AXIAL PISTON PUMPS SERIES 3K-20 OPEN CIRCUIT

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## TYPE DESIGNATION

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	PV	3K-20	XXX	XXX	X	x	x	x	xx	x	xx	x	xx	xx	xxx
1.	PV Pump Variable														15. 000 Standard xxx Special production number
2.	3K - 20	Series 3K for open circuit													
3.	Displacement $v_{gmax}$ [cm <sup>3</sup> ]														
4.	033	052	070	090	119										
5.	XXX	TYPE OF CONTROL - see next page													
6.	R Clockwise	Direction of shaft rotation													
	L Counter clockwise														
6.	Dimension of the input shaft					033	052	070	090	119					
	A	14 teeth, 12/24 PITCH, Ø31,20	o	o	o	o	-								
	B	19 teeth, 16/32 PITCH, Ø31,75	o	o	o	o	o+								
	C	21 teeth, 16/32 PITCH, Ø34,50	•	•	•	o	o								
	D	23 teeth, 16/32 PITCH, Ø37,68	-	-	-	•	o								
	E	27 teeth, 16/32 PITCH, Ø44,03	-	-	-	o	•								
	F	13 teeth, 16/32 PITCH, Ø21,805	o	-	-	-	-								
	G	13 teeth, 8/16 PITCH, Ø43,71	-	-	-	o	o								
	I	20 teeth, 16/32 PITCH, Ø32,91	o	o	o	o	-								
	J	cone 1:8, SAE J501, Ø41,27	-	-	-	o	o								
	K	cone 1:8, SAE J501, Ø31,75	o	o	o	o	-								
	L	cylindrical with key Ø34,925	o	o	o	-	-								
	M	cylindrical with key Ø44,45	-	-	-	o	o								
	P	15 teeth, 16/32 PITCH, Ø25,40	o	o	o	o	-								
	T	2 <sup>nd</sup> section of tandem system	o+	o+	o+	o+	o+								
	X	special design on request	o	o	o	o	o								
	+ loading of shaft is limited, please contact producer														
7.	Dimension of high-pressure ports					Thread		033	052	070	090	119			
	A	SAE J518c, code 62, size 1", 6000 PSI	7/16"-14 UNC-2B		o	o	o	o	o	o	o				
	B	SAE J518c, code 61, size 1", 5000 PSI	3/8"-16 UNC-2B		o	o	o	o	o	o	o				
	C	ISO 6162, DN25, type II, 40 MPa	M12		o	o	o	o	o	o	o				
8.	Charge pump					Frame size									
	vg					033	052	070	090	119					
	A	8,2 cm <sup>3</sup>	-	-	-	-	-								
	B	11 cm <sup>3</sup>	•	•	•	•	•								
	C	17 cm <sup>3</sup>	-	-	o	o	o								
	D	22,6 cm <sup>3</sup>	-	-	-	-	o								
	H	11+5 cm <sup>3</sup>	o	o	o	o	o								
	K	17+5 cm <sup>3</sup>	o	o	o	o	o								
	L	22,6+5 cm <sup>3</sup>	o	o	o	o	o								
	N	without charge pump													
9.	Pressure setting of charge pump $\Delta p$														
	13	1,3 MPa (1,3 +/- 0,05 MPa at 3,8 dm <sup>3</sup> .min <sup>-1</sup> )	•												
	15	1,5 MPa (1,5 +/- 0,05 MPa at 3,8 dm <sup>3</sup> .min <sup>-1</sup> )	o												
	18	1,8 MPa (1,8 +/- 0,05 MPa at 3,8 dm <sup>3</sup> .min <sup>-1</sup> )	o												
	00	without charge pump	o												
	Other values according to mutual agreement, max 3,5 MPa														
10.	Connection for through drive														
			Flange		Input hole for trough drive		033	052	070	090	119				
	A	SAE A J74 4c	2 x M10		9 teeth, 16/32 PITCH		o	o	o	o	o				
	B	SAE B J74 4c	2 x M12		13 teeth, 16/32 PITCH		o	o	o	o	o				
	C	SAE B-B J744c	2 x M12		15 teeth, 16/32 PITCH		o	o	o	o	o				
	D	ISO 3019/2-100A2HW	2 x M12		17x1,25-11H; STN 014953		o	o	o	o	o				
	E	ISO 3019/2-125A2HW	2 x M16		15 teeth, 16/32 PITCH		o	o	o	o	o				
	F	SAE A J74 4c	2 x 3/8"-16 UNC-2B		9 teeth, 16/32 PITCH		o	o	o	o	o				
	G	SAE B J74 4c	2 x 1/2"-13 UNC-2B		13 teeth, 16/32 PITCH		o	o	o	o	o				
	H	SAE B-B J744c	2 x 1/2"-13 UNC-2B		15 teeth, 16/32 PITCH		o	o	o	o	o				
	J	SAE C	4xM12		14 teeth, 12/24 PITCH		o+	o+	o+	o+	o+				
	N	Without trough drive					•	•	•	•	•				
	T	Tandem design	4 x M12		15 teeth, 16/32 PITCH		o	o	o	o	o				
			4 x M20		19 teeth, 16/32 PITCH		-	-	-	-	o				
	+ loading of shaft is limited, please contact producer														
12.	Dimension of suction ports					Thread		033	052	070	090	119			
	A	M42x2 - 6H	-		o	o	-	-	-	-	-				
	B	M48x2 - 6H	-		-	-	o	o	o	o	o				
	C	SAE J51 8c, code 61, size 1 1/2", 3000 PSI	7/16"-14 UNC-2B		o	o	-	-	-	-	-				
	D	SAE J51 8c, code 61, size 1 1/2", 3000 PSI	1/2"-13 UNC-2B		o	o	o	o	o	o	o				
	E	SAE J51 8c, code 61, size 2", 3000 PSI	1/2"-13 UNC-2B		-	-	-	-	-	-	o				
	F	SAE J51 8c, code 61, size 2 1/2", 3000 PSI	1/2"-13 UNC-2B		-	-	-	-	-	-	o				
	G	1 5/8" - 12 UN -2B	-		•	•	-	-	-	-	-				
	H	1 7/8" - 12 UN -2B	-		-	-	•	•	•	•	•				
13.	00	Empty													
11.	00	Empty													

• - standard design  
o - available



## TYPES OF CONTROLS

### WITHOUT CONTROL DEVICE

<b>AAA</b>	- without the mechanical-hydraulic servo valve, with top cover only
<b>BBB</b>	- without the mechanical-hydraulic servo valve, with joining piece and cover

### MECHANICAL - HYDRAULIC

<b>MHx</b>	- mechanical-hydraulic servo valve
<b>0</b>	- standard
<b>MBx</b>	- mechanical-hydraulic servo valve with a zero-position switch
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC
<b>2</b>	- electric control; voltage 24 V DC
<b>MCx</b>	- mechanical-hydraulic servo valve with a short-circuit valve
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC
<b>2</b>	- electric control; voltage 24 V DC
<b>3</b>	- empty
<b>5</b>	- hydraulic automatic control
<b>MDx</b>	- MB + MC
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC
<b>2</b>	- electric control; voltage 24 V DC
<b>3</b>	- empty
<b>5</b>	- MB1 + MC5

### ELECTRICAL- HYDRAULIC

<b>EVx</b>	- three-positional distributor + pressure reducing valve (proportional)
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC
<b>2</b>	- electric control; voltage 24 V DC
<b>ERx</b>	- two-positional distributor (jump control)
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 6 mm
<b>2</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 6 mm
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 4 mm
<b>9</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 4 mm
<b>ESx</b>	- one pressure reducing valves ( proportional)
<b>0</b>	- empty
<b>1</b>	- reducing valves POWER HYDRAULICS
<b>2</b>	
<b>3</b>	
<b>4</b>	
<b>5</b>	

### HYDRAULIC

<b>PHx</b>	- hydraulic
<b>0</b>	- direct

### AUTOMATIC

<b>PRx</b>	- automatic direct regulation - constant power
<b>H</b>	- hydraulic control
<b>1</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 6 mm
<b>2</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 6 mm
<b>3</b>	- electric control; voltage 220 V AC , D <sub>n</sub> 6 mm
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 4 mm
<b>9</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 4 mm
<b>V</b>	- pneumatic control
Values of output, pressure and speed are stated on page 14	
<b>Rx x</b>	- automatic control - constant pressure
<b>M</b>	- mechanical-hydraulic servo valve
<b>H</b>	- hydraulic control
<b>0</b>	- empty
<b>1</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 6 mm
<b>2</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 6 mm
<b>3</b>	
<b>4</b>	
<b>5</b>	
<b>6</b>	
<b>7</b>	
<b>8</b>	- electric control; voltage 12 V DC , D <sub>n</sub> 4 mm
<b>9</b>	- electric control; voltage 24 V DC , D <sub>n</sub> 4 mm
<b>1</b>	- pressure value 5 MPa
<b>2</b>	- pressure value 10 MPa
<b>3</b>	- pressure value 15 MPa
<b>4</b>	- pressure value 20 MPa
<b>5</b>	- pressure value 25 MPa
<b>6</b>	- pressure value 30 MPa
<b>7</b>	- pressure value 35 MPa
<b>8</b>	- pressure value 40 MPa
<b>9</b>	- on request
<b>Dx x</b>	- pressure compensator
<b>R</b>	- mechanical compensator
<b>E</b>	- mechanical compensator with electrical pressure reducing valves (proportional)
<b>1</b>	- pressure value 21 MPa
<b>2</b>	- pressure value 28 MPa
<b>3</b>	- pressure value 32 MPa
<b>4</b>	- pressure value 35 MPa
<b>5</b>	- pressure value 38 MPa
<b>6</b>	
<b>7</b>	
<b>8</b>	- on request



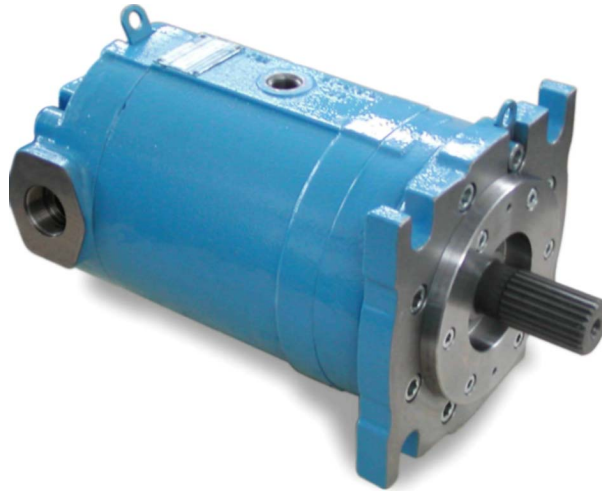
### SPECIAL NUMBER OF UNIT WITH CONTROL PRX

Output P[kW]		Speed n [RPM]		Control pressure $\Delta p_r$ [MPa]	
A	15,0	A	1500	A	1,5
B	20,0	B	1600	B	1,6
C	25,0	C	1700	C	1,7
D	30,0	D	1800	D	1,8
E	35,0	E	1900	E	1,9
F	40,0	F	2000	F	2,0
G	45,0	G	2100	G	2,1
H	50,0	H	2200	H	2,2
K	60,0	K	2300	K	2,3
L	70,0	L	2400	L	2,4
M	80,0	M	2500	M	2,5
N	90,0	N	2600	N	2,6
O	100,0	O	2700	O	2,7
P	110,0	P	2800	P	2,8
R	125,0	R	2900	R	3,0
S	140,0	S		S	3,2
T	155,0	T		T	3,4
U	170,0	U		U	3,6
V		V		V	3,8
Z		Z		Z	4,0
X	empty	X	empty	X	empty



## FIXED DISPLACEMENT PUMPS SERIES 3K-20

- 33 cm<sup>3</sup>
- 52 cm<sup>3</sup>
- 70 cm<sup>3</sup>
- 90 cm<sup>3</sup>
- 119 cm<sup>3</sup>

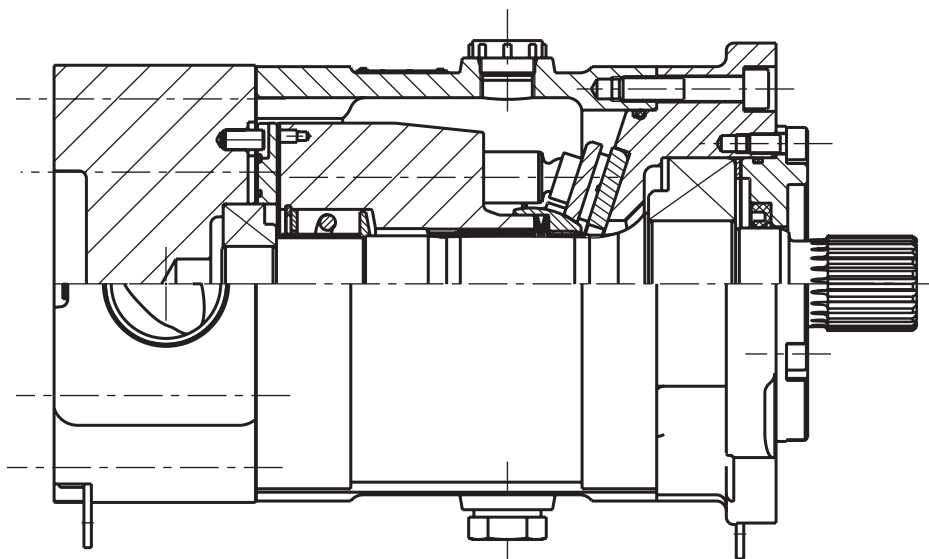


**Fig. 1:** Pump fixed PF 3K-20

The axial piston fixed pump PF 3K - 20 is designed for various applications in open hydraulic circuits. At the figure No. 2 is drawn cross sectional view of the piston pump. The shaft is supported by two tapered roller bearing. Design of the end of input shaft you can find on the page 16 of this catalogue. Hydraulic pump is closed by the front and rear cover. The rear cover also serves for connection of the high-pressure and suction ports. The angle of the swash plate is fixed on 18°.

Fig. 2: Cross sectional view of fixed pump.

Flange with centering diameter according to the standard SAE is bolted to the front cover. Tightness of the case around the exiting part of the shaft is protected by the shaft seal for max. pressure 0,25 MPa (intermittent 0,5 MPa).



**Fig. 2:** Cross sectional view of fixed pump



## TECHNICAL PARAMETERS

DESCRIPTION		DIMENSION	FRAME SIZE				
			033	052	070	090	119
Displacement	nominal, max	cm <sup>3</sup>	33,33	51,6	69,8	89,0	118,7
Speed	nominal	min <sup>-1</sup>	1500	1500	1500	1500	1500
	max. in 100 kPa abs. pressure		1900	1900	1850	1700	1600
	max. in 173 kPa abs. pressure		2900	2800	2650	2500	2300
	min.		500	500	500	500	500
Rate of flow *	nominal	dm <sup>3</sup> . min <sup>-1</sup>	50,0	77,4	104,7	133,5	178,0
	max.		96,5	144,5	185	222,5	273
Output pressure	nominal	MPa	25				
	per. work		28				
	max. **		35				
	peak **		42				
	min.		1,3				
Input pressure	max. ***	MPa	0,173 abs.				
	min. ***		0,083 abs.				
Torque moment	max. ( $\Delta p = 35\text{MPa}$ )	Nm	185,3	287,2	388,4	495,2	660,5
	relat. coefficient	Nm/MPa	5,30	8,21	11,10	14,16	18,89
Output *	Fixed max.	kW	56,4	84,3	107,9	129,8	159,3
Swash plate angle	var. - max.	Degrees	+18°				
Direction of shaft rotation			clockwise or counterclockwise				
Case pressure		MPa	continuous 0,25, intermittent 0,5				
Control pressure		MPa	1,3 - 3,5				
Weight		kg	30,0	35,0	40,0	47,0	51,0

\* theoretical values without efficiency values \*\* pressure definition acc. to DIN 24312 \*\*\* values at viscosity 35.mm<sup>2</sup> s<sup>-1</sup>

## OPERATING CONDITIONS

Ambient temperature range: from - 40 °C to + 55 °C  
 Fluid operating temperature: from - 18 °C to + 80 °C

Temperature can be higher, but viscosity of the oil must be minimally 7.mm<sup>2</sup>.s<sup>-1</sup>  
 Please consult with the producer.

Recommended hydraulic fluids: for comprehensive information see prescription GTN N-005  
 Recommended Fluids

Operating viscosity range: optimal (12-60).mm<sup>2</sup>.s<sup>-1</sup>  
 minimal 7.mm<sup>2</sup>.s<sup>-1</sup>  
 at cold starting 400.mm<sup>2</sup>.s<sup>-1</sup>

Working position: arbitrary  
 Fluid filtration: fluid cleanliness class must be maintained at least at level  
 18/13 in accord ISO 4406

Degree of separation:  $\beta_{10} = 1,5$  to 2  $\beta_{25} \geq 75$   
 (using 10  $\mu\text{m}$  filter )



## AXIAL PISTON PUMPS SERIES 3K-20 OPEN CIRCUIT

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### PF 3K-20 DIMENSIONS

SOURCE GTN K-0248

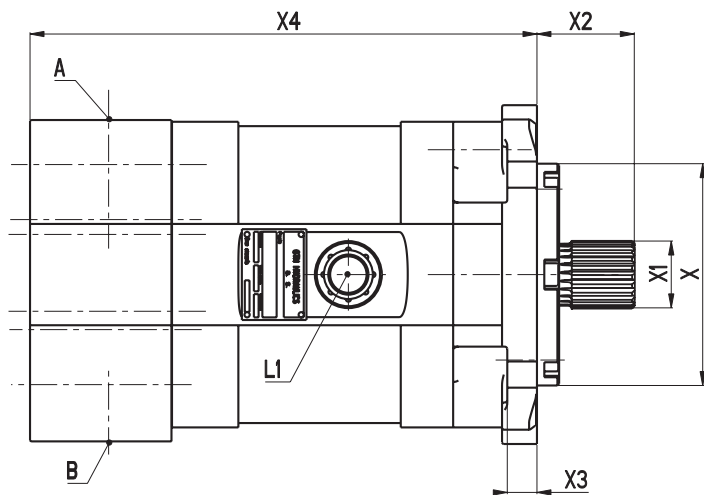
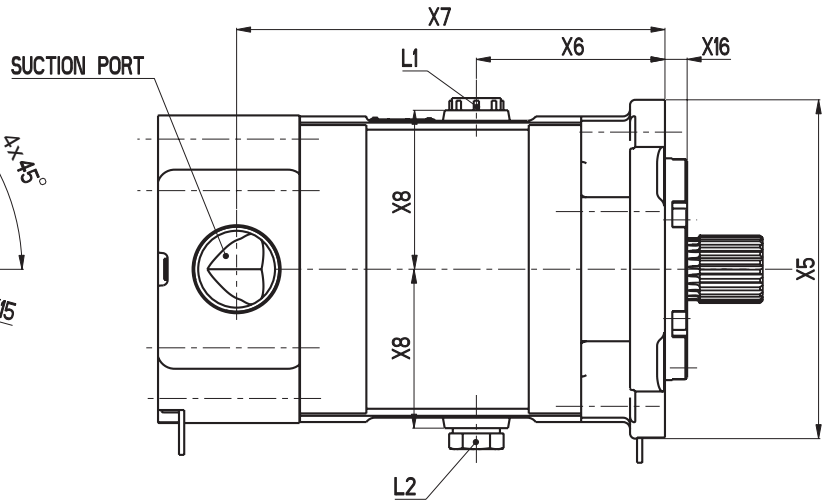
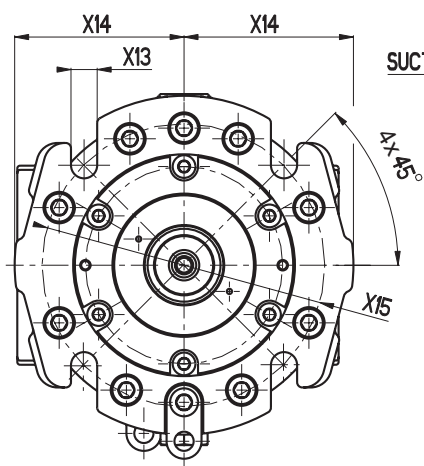
SIZE	TYPE					SIZE	TYPE				
	033	052	070	090	119		033	052	070	090	119
ØX	127-0,05					152,4-0,05	X46				
1) ØX1	34,5-0,15			37,68-0,18	44,03-0,17	X47					
1)X2	56				75	X48					
X3	18	16	17	17	22	X49					
X4	233	264	292	289	333	X50					
X5	155	170	175	194	208	X51					
X6	96	95	134	108	158	X52					
X7	194	225	249	245	283	X53					
X8	74,5	80	86	91	96,5						
X9											
X10											
X11											
ØX12											
ØX13	15+0,8				22+0,8						
X14	78	85	87,5	97	108						
ØX15	162				228,6						
X16	12,7										
X17											
X18											
X19											
X20											
X21											
X22											
X23											
X24											
X25											
X26						<b>CONNE- CTION</b>	<b>TYPE</b>				
X27							033	052	070	090	119
X28						<b>A, B</b>	see page 17, 18				
X29											
X30						<b>L<sub>1</sub>, L<sub>2</sub></b>	2) 7/8"-14UNF-2B 3) M22x1,5				
X31											
X32											
X33											
X34											
X35											
X36											
X37											
X38											
X39											
X40											
X41											
X42											
X43											
X44											
X45											

- 1) Valid for splined shaft standard design
- 2) Valid for design of pressure ports (SAE)
- 3) Valid for design of pressure ports (ISO)

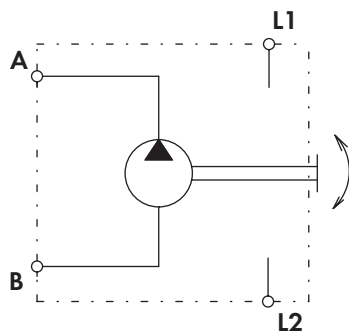
Dimensions are in mm unless noted otherwise.



PF 3K-20 SIZE 033, 052, 070, 090, 119



HYDRAULIC SCHEME



Dimension data see table GTN K-0248  
Changes of dimensions are reserved!



# AXIAL PISTON PUMPS SERIES 3K-20 OPEN CIRCUIT

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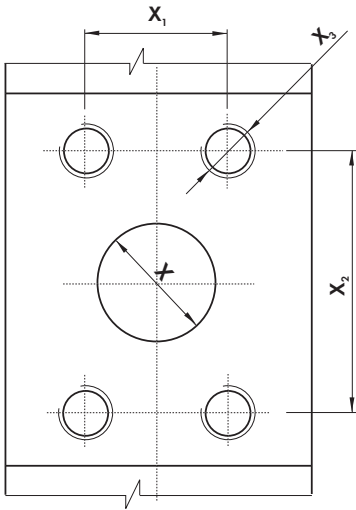
## TYPE DESIGNATION

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
		PF	3K-20	XXX	XXX	X	x	x	x	xx	x	xx	x	xx	xx	xxx			
1.	PF Pump Fixed														15.	000 Standard xxx Special production number			
2.	3K 20 Series 3K for open circuit																		
3.	Displacement $v_{gmax}$ [cm <sup>3</sup> ]															14.	00 Empty		
4.	033 052 070 090 119																		
5.	000 Empty																		
		R Clockwise L Counter clockwise	Direction of shaft rotation																
6.	Dimension of the input shaft		033	052	070	090	119												
A	14 teeth, 12/24 PITCH, Ø31,20	o	o	o	o	-													
B	19 teeth, 16/32 PITCH, Ø31,75	o	o	o	o	o+													
C	21 teeth, 16/32 PITCH, Ø34,50	•	•	•	o	o													
D	23 teeth, 16/32 PITCH, Ø37,68	-	-	-	•	o													
E	27 teeth, 16/32 PITCH, Ø44,03	-	-	-	o	•													
F	13 teeth, 16/32 PITCH, Ø21,805	o	-	-	-	-													
G	13 teeth, 8/16 PITCH, Ø43,71	-	-	-	o	o													
I	20 teeth, 16/32 PITCH, Ø32,91	o	o	o	o	-													
J	cone1:8, SAE J501, Ø41,27	-	-	-	o	o													
K	cone1:8, SAE J501, Ø31,75	o	o	o	o	o													
L	cylindrical with key Ø34,925	o	o	o	-	-													
M	cylindrical with key Ø44,45	-	-	-	o	o													
P	15 teeth, 16/32 PITCH, Ø25,40	o	o	o	o	-													
T	II. section of tandem system	o+	o+	o+	o+	o+													
X	special design on request	o	o	o	o	o													
+ loading of shaft is limited, please contact producer																			
7.	Dimension of high-pressure ports		Thread		033	052	070	090	119										
A	SAE J518c, code 62, size 1", 6000 PSI	7/16"-14 UNC-2B		•	•	•	•	•											
B	SAE J518c, code 61, size 1", 5000 PSI	3/8"-16 UNC-2B		o	o	o	o	o											
C	ISO 6162, DN25, type II, 40 MPa	M12		o	o	o	o	o											
8.	0 Empty																		
9.	00 Empty																		
10.	Connection for through drive																		
		Flange		Input hole for trough drive		033	052	070	090	119									
A	SAE A J74 4c	2 x M10		9 teeth, 16/32 PITCH		o	o	o	o	-									
B	SAE B J74 4c	2 x M12		13 teeth, 16/32 PITCH		o	o	o	o	o									
C	SAE B-B J744c	2 x M12		15 teeth, 16/32 PITCH		o	o	o	o	o									
D	ISO 3019/2-100A2HW	2 x M12		17x1,25-11H; STN 014953															
E	ISO 3019/2-125A2HW	2 x M16		15 teeth, 16/32 PITCH															
F	SAE A J744c	2 x 3/8"-16 UNC-2B		9 teeth, 16/32 PITCH		o	o	o	o	o									
G	SAE B J744c	2 x 1/2"-13 UNC-2B		13 teeth, 16/32 PITCH		o	o	o	o	o									
H	SAE B-B J744c	2 x 1/2"-13 UNC-2B		15 teeth, 16/32 PITCH		o	o	o	o	o									
J	SAE C	4xM12		14 teeth, 12/24 PITCH		o+	o+	o+	o+	o+									
N	Without trough drive						•	•	•	•	•								
T	Tandem design		4 x M12		15 teeth, 16/32 PITCH		o	o	o	o	-								
		4 x M20		19 teeth, 16/32 PITCH		-	-	-	-	o									
+ loading of shaft is limited, please contact producer																			
11.	00 Empty																		
12.	Dimension of suction ports												Thread		033	052	070	090	119
A	M42x2 - 6H						o	o	-	-	-								
B	M48x2 - 6H						-	-	o	o	o								
C	SAE J51 8c, code 61, size 1 V-I*, 3000 PSI		7/16"-14 UNC-2B				o	o	-	-	-								
D	SAE J51 8c, code 61, size 1 1/2", 3000 PSI		1/2"- 13 UNC-2B				o	o	o	o									
E	SAE J51 8c, code 61, size 2", 3000 PSI		1/2"- 13 UNC-2B				-	-	-	o	o								
F	SAE J51 8c, code 61, size 2 1/2", 3000 PSI		1/2"- 13 UNC-2B				-	-	-	-	o								
G	1 5/8" - 12 UN -2B						•	•	-	-	-								
H	1 7/8" - 12 UN -2B						-	-	•	•	•								
I	ISO 6162, DN51, type II, 31,5 MPa		M12 - 6H				-	o	o	o	o								
K	SAE J518c, code 61, size 1 1/4", 3000 PSI		M10 - 6H				o	-	-	-	-								
L	ISO 6162, DN51, type II, 40 MPa		M12 - 6H				-	o	o	o	o								
13.	00 Empty																		

• - standard design  
o - available

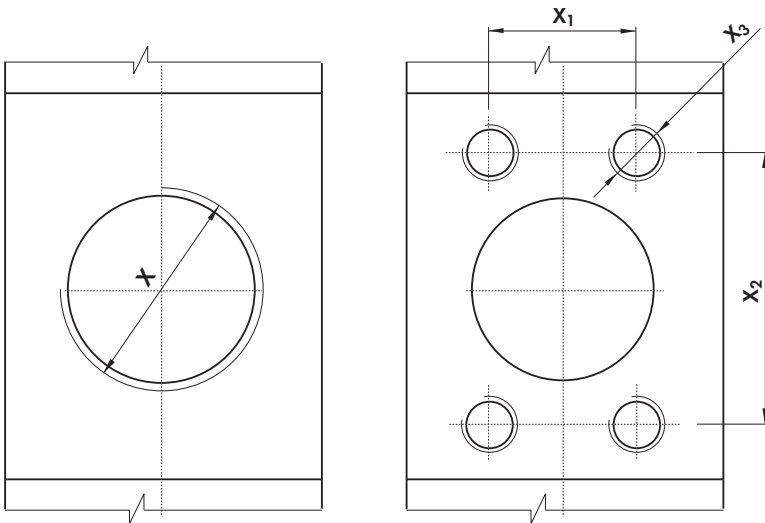


## DIMENSIONS OF HIGH PRESSURE PORTS



TYPE DESIGNATION		DIMENSION			
		X	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>
<b>A</b>	SAE J 518c, code 62 size 1", 6000 PSI	25,4	27,8	57,2	7/16"-14UNC-2B
<b>B</b>	SAE J 518c, code 61 size 1", 5000 PSI		26,2	52,4	3/8"-16UNC-2B
<b>C</b>	ISO 6162 Dn 25, type II, 40 MPa		27,8	57,2	M12 - 6H

## DIMENSIONS OF SUCTION PORTS



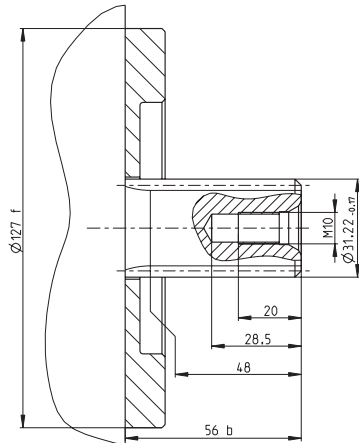
	DIMENSION			
	X	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>
<b>A</b>	M42 x 2 - 6H	-	-	-
<b>B</b>	M48 x 2 - 6H	-	-	-
<b>C</b>	SAE J 518c, code 61 size 1 <sup>1</sup> / <sub>4</sub> ", 3000 PSI	30,1	58,7	7/16"-14UNC-2B
<b>D</b>	SAE J 518c, code 61 size 1 <sup>1</sup> / <sub>2</sub> ", 3000 PSI	35,7	69,8	1/2"-13UNC-2B
<b>E</b>	SAE J 518c, code 61 size 2", 3000 PSI	42,8	77,8	1/2"-13UNC-2B
<b>F</b>	SAE J 518c, code 61 size 2 <sup>1</sup> / <sub>2</sub> ", 3000 PSI	50,8	88,9	1/2"-13UNC-2B
<b>G</b>	1 5/8"-12UN-2B	-	-	-
<b>H</b>	1 7/8"-12UN-2B	-	-	-
<b>I</b>	ISO 6162 Dn 61, type II, 40 MPa	50,8	88,9	M12 - 6H
<b>K</b>	ISO 6162 Dn 32, type II, 40 MPa	30,1	58,7	M10 - 6H
<b>L</b>	ISO 6162 Dn 51, type II, 40 MPa	42,8	77,8	M12 - 6H



## DESIGN OF THE INPUT SHAFT

Design – A

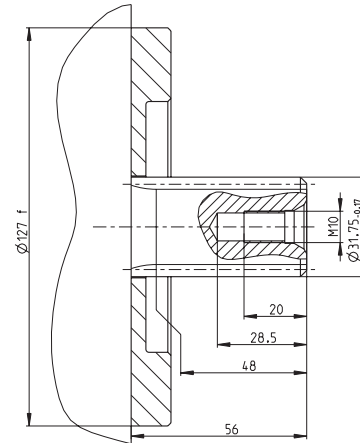
SHAFT END: A	
INVOLUTE SPLINING	
PITCH DIAMETER	Ø29,634
PROFILE ANGLE	30°
NUMBER OF TEETH	14
PITCH	12/24
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



b 65 FOR SIZE 119  
f Ø152,4 FOR SIZE 119

Design – B

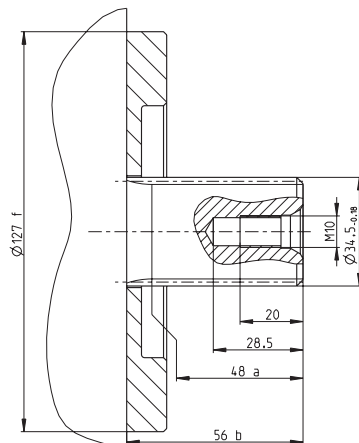
SHAFT END: B	
INVOLUTE SPLINING	
PITCH DIAMETER	Ø 30,163
PROFILE ANGLE	30°
NUMBER OF TEETH	19
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



f Ø152,4 FOR SIZE 119

Design – C

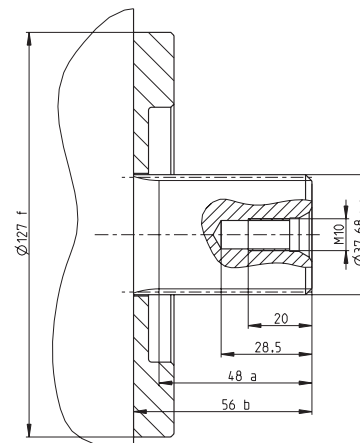
SHAFT END: C	
INVOLUTE SPLINING	
PITCH DIAMETER	Ø33,338
PROFILE ANGLE	30°
NUMBER OF TEETH	21
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



a 67 FOR SIZE 119  
b 75 FOR SIZE 119  
f Ø152,4 FOR SIZE 119

Design - D

SHAFT END: D	
INVOLUTE SPLINING	
PITCH DIAMETER	Ø36,5125
PROFILE ANGLE	30°
NUMBER OF TEETH	23
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



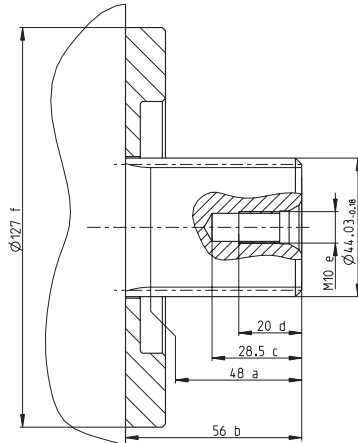
a 67 FOR SIZE 119  
b 75 FOR SIZE 119  
f Ø152,4 FOR SIZE 119



## DESIGN OF THE INPUT SHAFT

**Design – E**

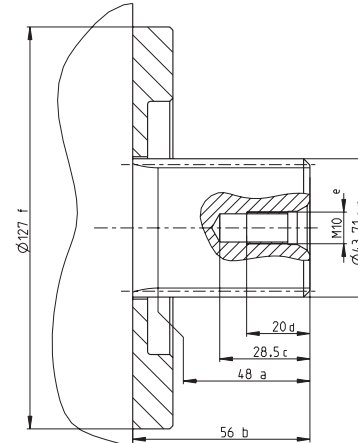
SHAFT END: E INVOLUTE SPLINING	
PITCH DIAMETER	Ø42,863
PROFILE ANGLE	30°
NUMBER OF TEETH	27
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



a 67 FOR SIZE 119  
b 75 FOR SIZE 119  
c 40 FOR SIZE 119  
d 30 FOR SIZE 119  
e M14 FOR SIZE 119  
f Ø 152,4 FOR SIZE 119

**Design - G**

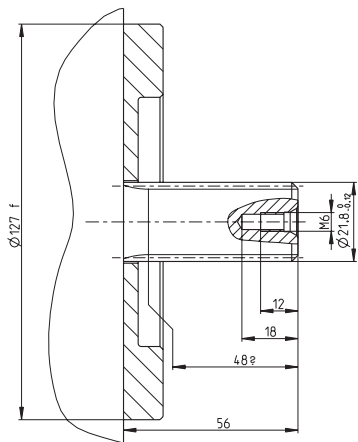
SHAFT END: G INVOLUTE SPLINING	
PITCH DIAMETER	Ø41,275
PROFILE ANGLE	30°
NUMBER OF TEETH	13
PITCH	8/16
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



a 67 FOR SIZE E 119  
b 75 FOR SIZE 119  
c 40 FOR SIZE 119  
d 30 FOR SIZE 119  
e M14 FOR SIZE 119  
f Ø152,4 FOR SIZE 119

**Design – F**

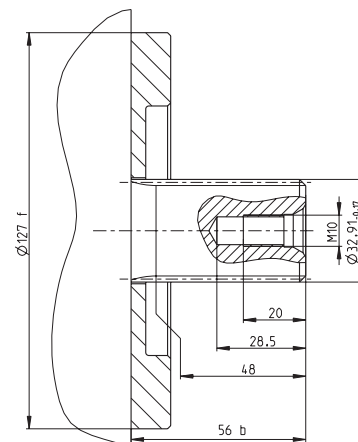
SHAFT END: F INVOLUTE SPLINING	
PITCH DIAMETER	Ø20,638
PROFILE ANGLE	30°
NUMBER OF TEETH	13
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	



a 35 FOR SIZE 033

**Design – I**

SHAFT END: I INVOLUTE SPLINING	
PITCH DIAMETER	Ø31,75
PROFILE ANGLE	30°
NUMBER OF TEETH	20
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	

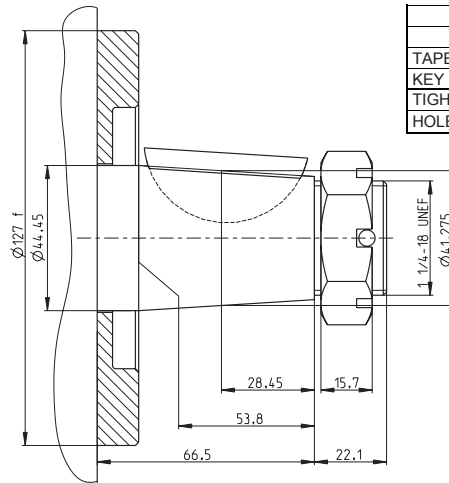


b 65 FOR SIZE 119



DESIGN OF THE INPUT SHAFT

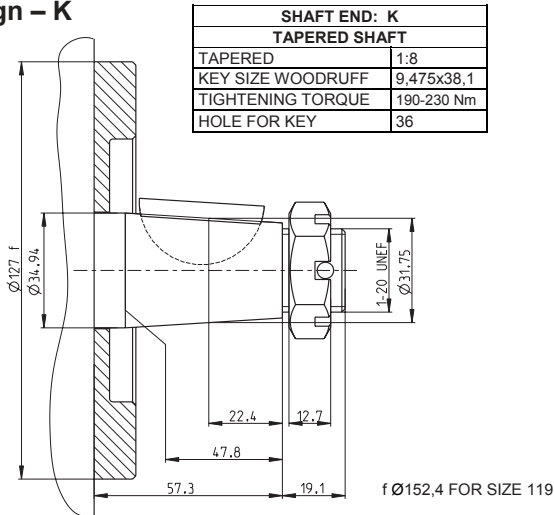
Design – J



SHAFT END: J	
TAPERED SHAFT	
TAPERED	1:8
KEY SIZE WOODRUFF	11,11
TIGHTENING TORQUE	370-430 Nm
HOLE FOR KEY	46

f Ø152,4 FOR SIZE 119

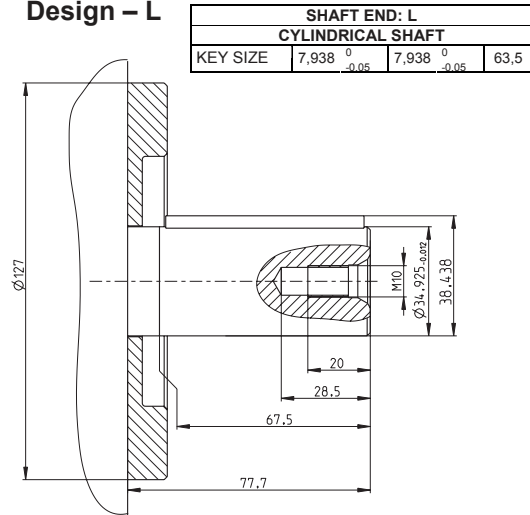
Design – K



SHAFT END: K	
TAPERED SHAFT	
TAPERED	1:8
KEY SIZE WOODRUFF	9,475x38,1
TIGHTENING TORQUE	190-230 Nm
HOLE FOR KEY	36

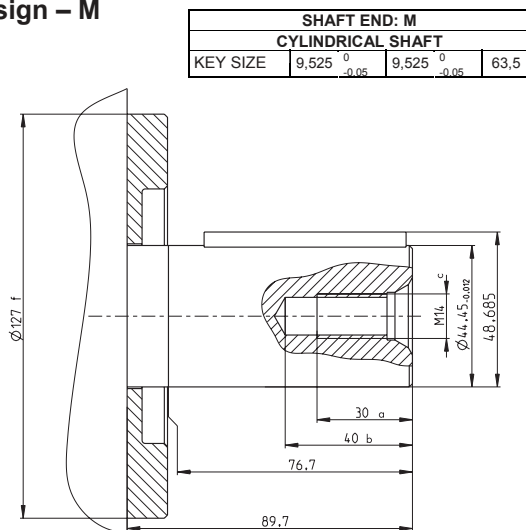
f Ø152,4 FOR SIZE 119

Design – L



SHAFT END: L		
CYLINDRICAL SHAFT		
KEY SIZE	7,938 <sup>0</sup> <sub>-0.05</sub>	7,938 <sup>0</sup> <sub>-0.05</sub> 63,5

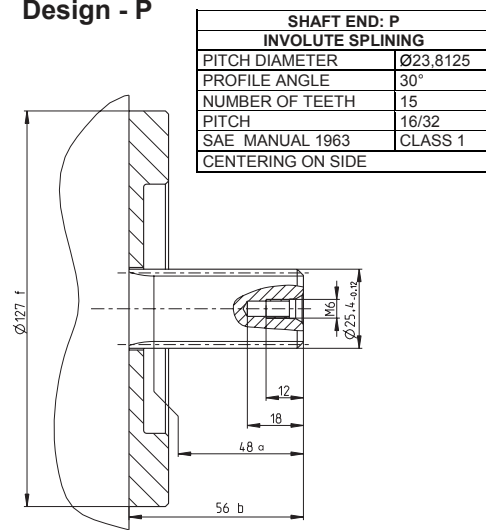
Design – M



SHAFT END: M		
CYLINDRICAL SHAFT		
KEY SIZE	9,525 <sup>0</sup> <sub>-0.05</sub>	9,525 <sup>0</sup> <sub>-0.05</sub> 63,5

f Ø152,4 FOR SIZE 119  
a 20 FOR SIZE 090  
b 285 FOR SIZE 090  
c M10 FOR SIZE 090

Design – P



SHAFT END: P	
INVOLUTE SPLINE	
PITCH DIAMETER	Ø23.8125
PROFILE ANGLE	30°
NUMBER OF TEETH	15
PITCH	16/32
SAE MANUAL 1963	CLASS 1
CENTERING ON SIDE	

a 35 FOR SIZE 033  
b 43 FOR SIZE 033  
f 101.6



**AXIAL PISTON PUMPS SERIES 3K-20  
OPEN CIRCUIT**

Version.: 11/2005

Page: 24/24

Producer:

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