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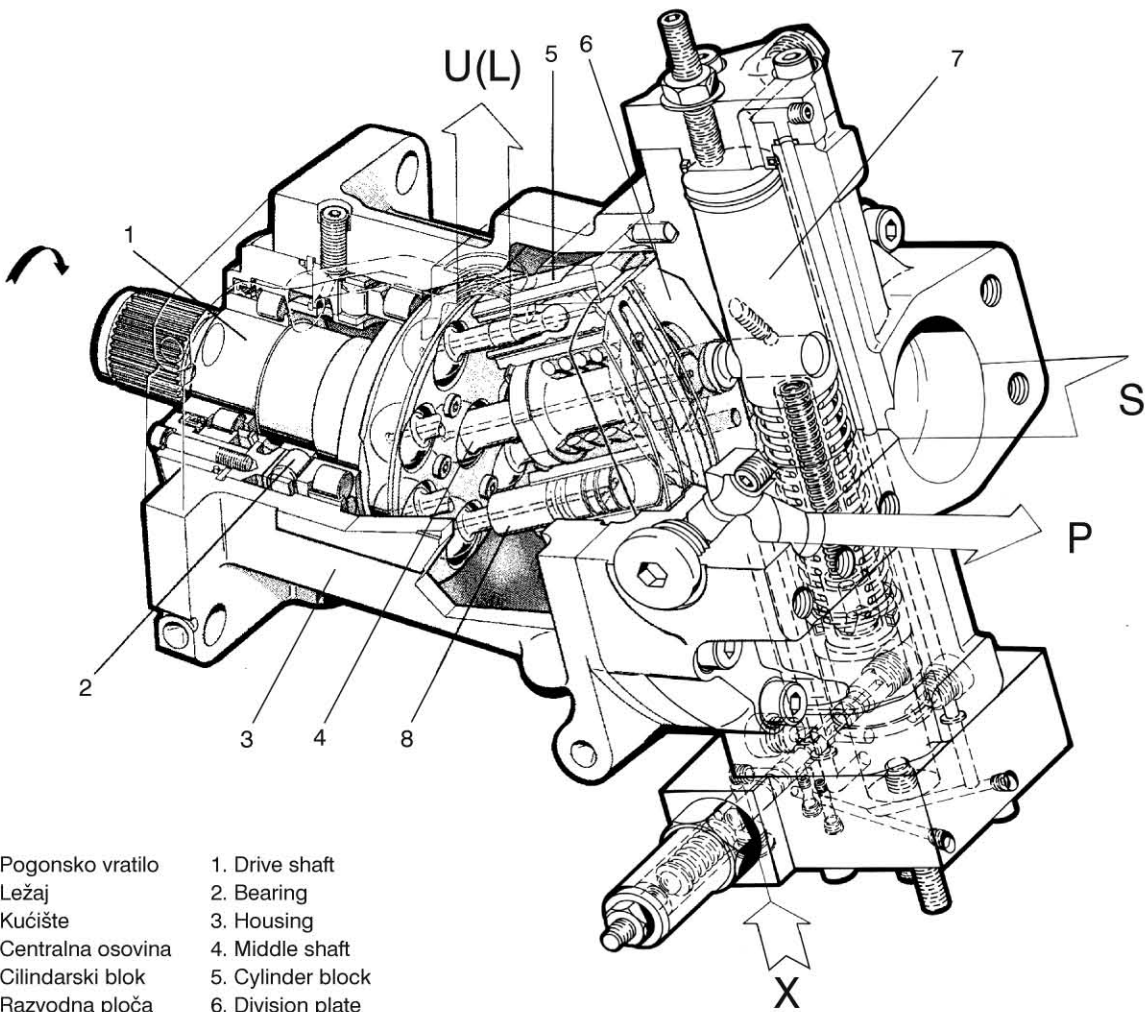
Aksijalno - klipne pumpe APR Axial - piston pumps APR

VISOKOG PRITISKA; PROMENLJIVE RADNE ZAPREME
 HIGH PRESSURE; VARIABLE DISPLACEMENT

- Konstrukcija sa nagibnim blokom
 - Namijenjena za otvorena hidraulička kola u svim oblastima primene
 - Jednostavna korekcija regulisanih parametara naknadnim podešavanjem bez specijalnih alata
 - Robusni radni elementi pumpe neosetljivi na promenu opterećenja i pogonsko vratilo koje prima radijalno opterećenje
 - Ekstremno sažeta konstrukcija (kratko izvođenje) tako da su ugradne mere neznatno veće od aksijalnih pumpi
 - konstantnog protoka APF
- Bent axis design
 - For open circuit in all ranges of the application
 - Simplified re-adjustment of the control curve without special tooling
 - Very robust and rugged rotating assembly with drive shaft capable of accepting side loads
 - Extremely compact design, so mounting space only slightly larger than that of the fixed displacement axial piston pump



PRESEK - PRINCIP RADA (PUMPA SA LOAD SENSING REGULATOROM)
SECTION - MODE OF OPERATION (PUMP WITH LOAD SENSING TYPE)



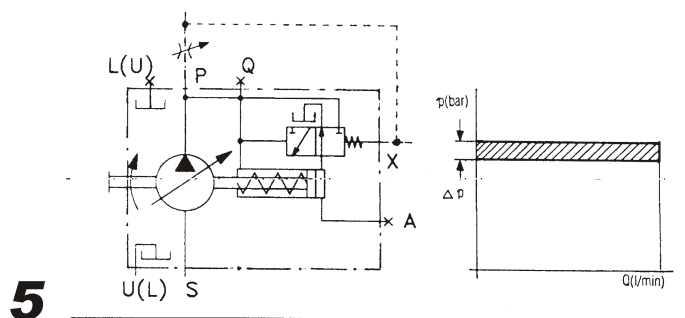
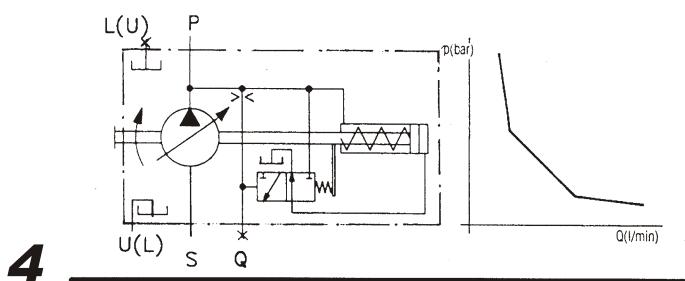
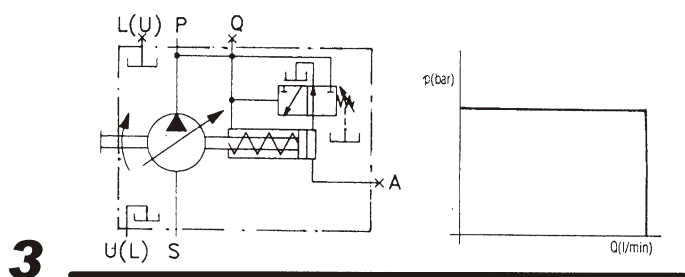
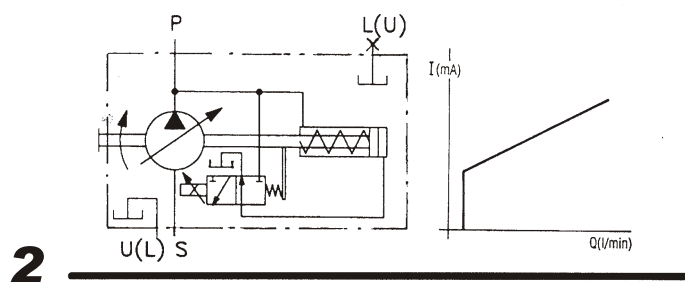
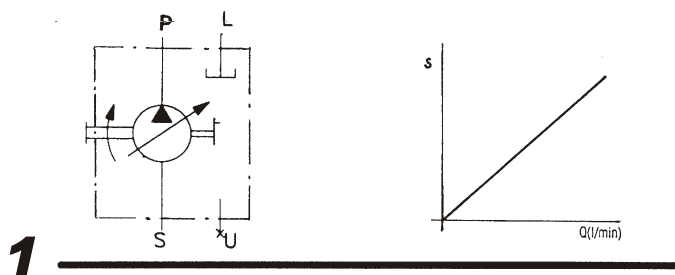
- | | |
|----------------------|-------------------|
| 1. Pogonsko vratilo | 1. Drive shaft |
| 2. Ležaj | 2. Bearing |
| 3. Kućište | 3. Housing |
| 4. Centralna osovina | 4. Middle shaft |
| 5. Cilindarski blok | 5. Cylinder block |
| 6. Razvodna ploča | 6. Division plate |
| 7. Regulator | 7. Regulator |
| 8. Klip (7 kom.) | 8. Piston (7 pcs) |

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- 1** K - ručno (okretanjem točkica regulatora od $s = 0$ do $s = \max$ menja se protok od $Q = 0$ do $Q = \max$)
- 2** EH - elektrohidrauličko (promenom jačine struje elektromagneta menja se protok od $Q = \min$ do $Q = \max$)
- 3** DR - sa regulatorom pritiska (pri dostizanju max podešenog pritiska, protok pada na vrednost blisku nuli uz zadržavanje podešenog pritiska)
- 4** LR - sa regulatorom snage (promenom pritiska protok se tako menja da snaga ostaje konstantna)
- 5** LS - sa load sensing regulatorom (upravljačkim pritiskom, koji je samo $p=20$ bar viši od radnog, obezbeđuje se promena

- K - With hand wheel is swash angle respectively flow selected
- EH - Electro-hydraulic regulator (electric signals select via the proportional solenoid the pump swash angle. Flow is changed $Q = \min$ to $Q = \max$)
- DR - Pressure compensator (system - pressure activated. At preset pressure automatically returns to the position necessary to maintain the selected pressure)
- LR - Constant power regulator (depending on the working pressure at any stage of operation the flow is so regulated that a pre - set input power is not exceeded)
- LS - Load sensing regulator (the pump pressure always $p = 20$ bar above system pressure, and the pump flow adjust to the

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TEHNIČKE KARAKTERISTIKE / TECHNICAL DATA

OPŠTE / GENERAL

ND	50	75	105
Smer obrtanja/rotation direction	levi ili desni/anticlockwise or clockwise		
Položaj ugradnje/mounting position	proizvoljan, drenaž na najvišem nivou/optional, with drain hole up		
Mass (kg)	27	36	44

HIDRAULIČKE / HYDRAULIC

Pritisak / Pressure (bar)											
- max (kratkotrajno)*	400										
- peak (short time)*											
- max radni	350										
- max working											
- trajni**	200										
- continuous**											
Radna zapremina / Displacement (cm ³ /o)	50,2	74,9	104,9								
Broj obrtaja (min-1) / Speed (r.p.m.)											
max sa prednaponom***	2400	2200	2000								
max											
bez prednapona	2200	2000	1800								
continuous											
Radna tečnost - mineralno hidrauličko ulje Working fluid - mineral hydraulic oil											
viskozitet (mm ² /s) viscosity	10...80	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> PREPORUKA RECOMMENDATION </div> <table border="1" style="margin-top: 10px;"> <tr> <td>Radna temperatura ulja Oil working temperature</td> <td>Viskozitet Viscosity</td> </tr> <tr> <td>30...40°C</td> <td>22 mm²/s - 40°C</td> </tr> <tr> <td>60...70°C</td> <td>68 mm²/s - 40°C</td> </tr> <tr> <td>80...90°C</td> <td>100 mm²/s - 40°C</td> </tr> </table>		Radna temperatura ulja Oil working temperature	Viskozitet Viscosity	30...40°C	22 mm ² /s - 40°C	60...70°C	68 mm ² /s - 40°C	80...90°C	100 mm ² /s - 40°C
Radna temperatura ulja Oil working temperature	Viskozitet Viscosity										
30...40°C	22 mm ² /s - 40°C										
60...70°C	68 mm ² /s - 40°C										
80...90°C	100 mm ² /s - 40°C										
optimalni viskozitet (mm ² /s) optimal viscosity range	15...20										
max viskozitet - kratko pri startu (mm ² /s) max viscosity - intermittent for starting	1000										
temperatura (°C) temperature	-20...+90										
FILTRIRANJE: Preporučuje se finoća filtriranja 10 µm. Može se primeniti i grublje 25 - 40 µm, ali se povećava istrošenje delova FILTRATION: The fineness of filtering of 10 µm is recommended. Filtering of 25 to 40 µm can be also applied. But wearing of the unit parts will be increased.											

* Kratkotrajni pritisak iznad max radnog (=nazivni pritisak) pri kome je pumpa funkcionalno sposobna

Transient pressure over the max working pressure at which the unit will still function.

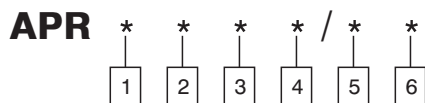
** Pritisak pri kome su svi delovi pumpe izdržljivi.

*** Nadpritisak u rezervoaru 0,6 bar

Continuous pressure at which all parts of the unit are able to endure.

Tank pressurization 0,6 bar

OZNAČAVANJE / DESIGNATION



1 Nazivna veličina ND:
Nominal size ND:
50
75
105

2 Smer obrtanja:
Rotation direction:

L = levi
anticlockwise



R = desni
clockwise



3 Regulacija:
Pump control:
K = ručna
with hand wheel
EH = elektrohidraulička
electro-hydraulic regulator
DR = sa regulatorom pritiska
pressure compensator
LR = sa regulatorom snage
constant power regulator
LS = sa load-sensing regulatorom
load sensing regulator

4 Ostali podaci:
Other data:

- = bez fabričkog podešavanja
without factory's adjustment

*) ... = pritisak početka regulacije, za LR tip
starting point of the regulation, for LR type

... = pritisak ograničenja, za DR tip
limit pressure, for DR type

12, 24 V DC = napon elektromagneta, za EH tip
solenoid voltage for EH type

5 Pogonsko vratilo:
Drive shaft:
- = DIN 5482 standard; 2 = SAE standard
1 = DIN 5480 standard; 3 = cylindrical

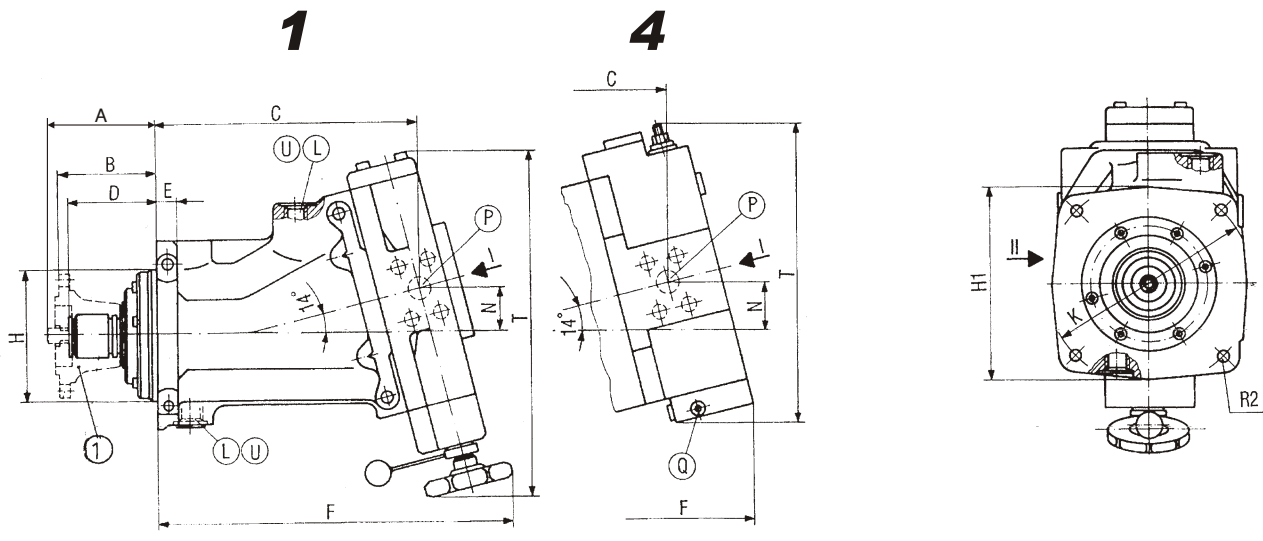
6 Spojnica:
Coupling:
P = isporuka sa spojnicom
delivery, with coupling

*) Navesti sledeće podatke: - pogonsku snagu (kW) i br. obrtaja (min⁻¹)
We need the following data: - drive power (kW) and speed by this power (min⁻¹)

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UGRADNI CRTEŽ (mere u mm)
MOUNTING DRAWING (dimensions in mm)

PUMPE SA POGONSKIM VRATILOM - DIN standard
 PUMPS WITH DRIVE SHAFT - DIN standard



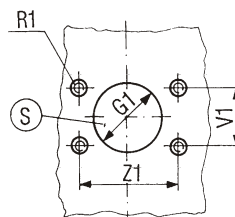
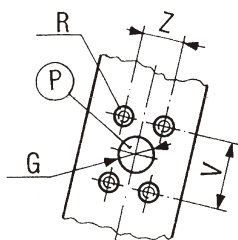
S = usisni otvor/ outlet port: priрубnica / flange SAE 2" (ND 50)
 priруб. / flange SAE 2. 1/2" (ND 75, 105)
 P = potisni otvor/ inlet port: priрубnica / flange SAE 1"

(U)L = drenažni otvor/ drain port M 22x1,5
 (L)U = otvor za ispuст ulja / oil draining port M 22x1,5
 Q = merno mesto / working press. test port M 14x1,5
 ① = spojница/ coupling

POGLED II / VIEW II

Za desni smer obrtanja (kod levog smera - na suprotnoj strani)
 For pump with clockwise rotation (by anticlockwise - on the opposite side)

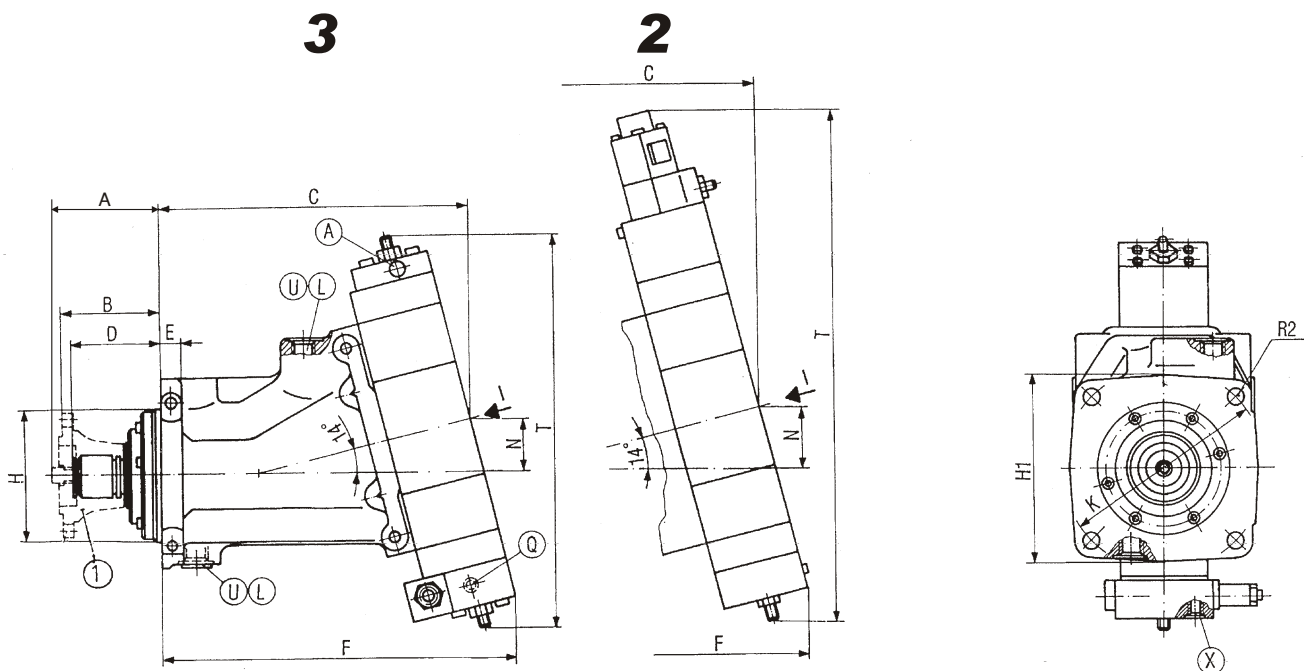
POGLED I / VIEW I



ND	A	B	C		D	E	F		G	G1		H	H1	K	N
			1	4			1	4		1	4				
50	85,5	81,5	201	219	74	18	286	297	19	48	50	Ø100	□150	160	32
75	92,5	87,5	242	253,5	77,5	18	353	302	25	63	63	Ø115	□172	182	38,7
105	103,5	95,5	261	273	86,5	20	354	360	25	63	75	Ø124,5	□184	200	41

ND	R	R1		R2	T		V	V1		Z	Z1	
		1	4		1	4		1	4		1	4
50	M 10/16	M 12/16	M 12/17	Ø12	297	270	50,8	42,9	42,9	23,9	77,8	77,8
75	M 12/17	M 12/17	M 12/17	Ø14	341	295	57,2	50,8	50,8	27,8	88,9	88,9
105	M 12/17	M 12/17	M 16/20	Ø18	243	295	57,2	50,8	61,9	27,8	88,9	106,4

PUMPE SA POGONSKIM VRATILOM - DIN standard
 PUMPS WITH DRIVE SHAFT - DIN standard

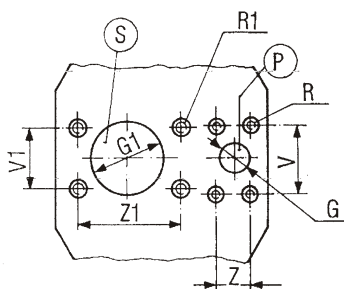


- S = usisni otvor/ outlet port: prirubnica / flange SAE 2" (ND 50)
 prirub. / flange SAE 2. 1/2" (ND 75, 105)
- P = potisni otvor/ inlet port: prirubnica / flange SAE 1"
- (U)L = drenažni otvor/ drain port M 22x1,5

- (L)U = otvor za ispušt ulja / oil draining port M 22x1,5
- A, Q = merna mesta / working press. test ports M 14x1,5
- X = priključ. upravljačkog voda / control port M 14x1,5
- (1) = spojnica/ coupling

POGLED I/ VIEW I

Za desni smer obrtanja (kod levog smera - otvori menjaju mesta)
 For pump with clockwise rotation (by anticlockwise ports changed)



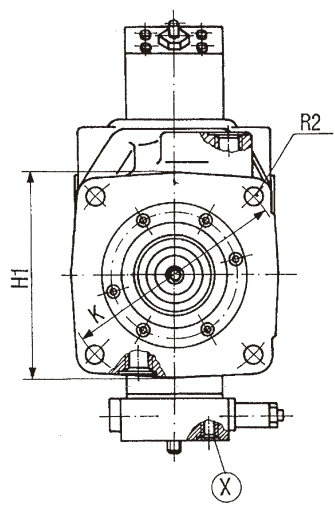
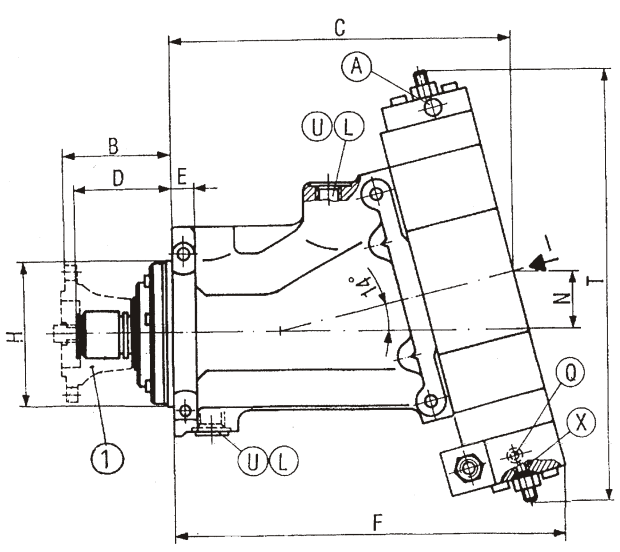
ND	A	B	C		D	E	F	G	G1	H	H1	K	N
			2	3									
50	85,5	81,5		252	74	18	290	19	48	Ø100	□150	160	35
75	92,5	87,5		283,5	77,5	18	329	25	63	Ø115	□172	182	49
105	103,5	95,5	302	305	86,5	20	350	25	63	Ø124,5	□184	200	53

ND	R	R1	R2	T		V	V1	Z	Z1
				2	3				
50	M 10/16	M 12/16	Ø12		364	50,8	42,9	23,9	79,8
75	M 12/17	M 12/17	Ø14		356	57,2	50,8	27,8	88,9
105	M 12/17	M 12/17	Ø18	510	390	57,2	50,8	27,8	88,9

A

PUMPE SA POGONSKIM VRATILOM - DIN standard
 PUMPS WITH DRIVE SHAFT - DIN standard

5

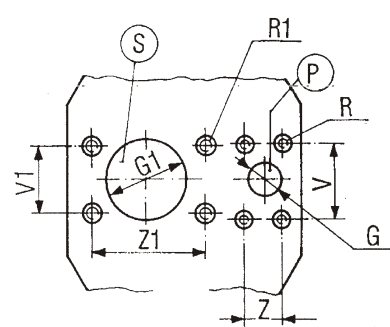


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S = usisni otvor/ outlet port: prirubnica / flange SAE 2" (ND 50)
 prirub. / flange SAE 2. 1/2" (ND 75, 105)
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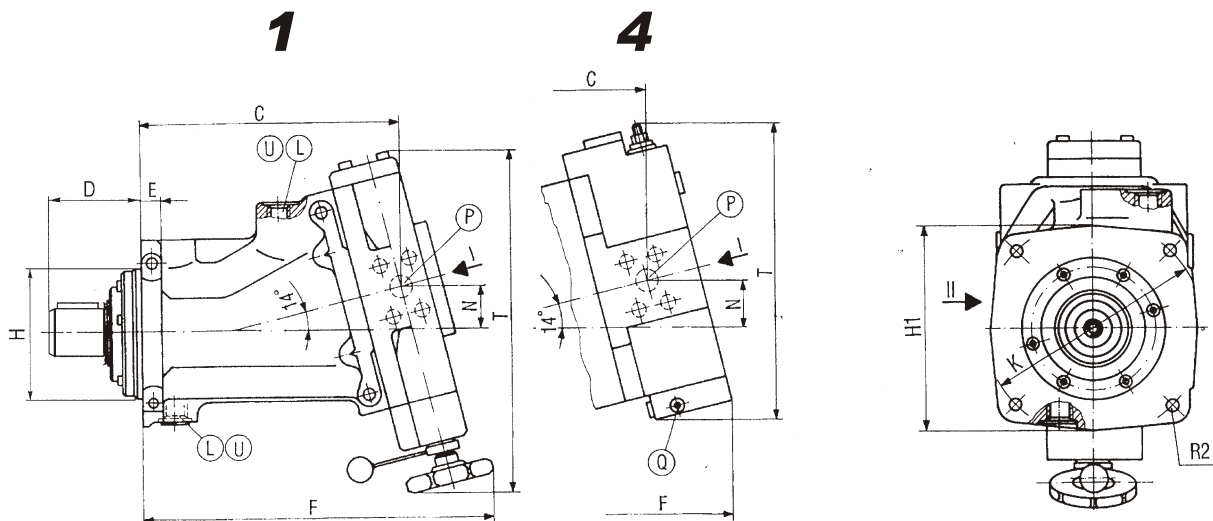
(L)U = otvor za ispust ulja / oil draining port M 22x1,5
 A, Q = merna mesta / working press. test ports M 14x1,5
 X = priključ. upravljačkog voda / control port M 14x1,5
 ① = spojnica/ coupling

POGLED I/ VIEW I
 Za desni smer obrtanja (kod levog smera - otvori menjaju mesta)
 For pump with clockwise rotation (by anticlockwise ports changed)



ND	B	C	D	E	F	G	G ₁	H	H ₁	K	N	R	R ₁	R ₂	T	V	V ₁	Z	Z ₁
50	81,5		74	18	290	19	48	Ø100	□150	160	35	M10/16	M12/16	Ø12	364	50,8	42,9	23,9	77,8
75	87,5		77,5	18	329	25	63	Ø115	□172	180	49	M12/17	M12/17	Ø14	356	57,2	50,8	27,8	88,9
105	95,5	305	86,5	20	350	25	63	Ø124,5	□184	200	53	M12/17	M12/17	Ø18	390	57,2	50,8	27,8	88,9

PUMPE SA POGONSKIM VRATILOM - cilindrični tip
PUMPS WITH DRIVE SHAFT - cylindrical type

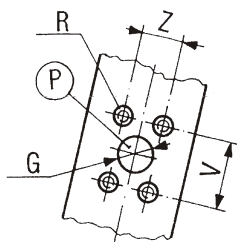


S = usisni otvor/ outlet port: priрубnica / flange SAE 2" (ND 50)
priруб. / flange SAE 2. 1/2" (ND 75, 105)
P = potisni otvor/ inlet port: priрубnica / flange SAE 1"

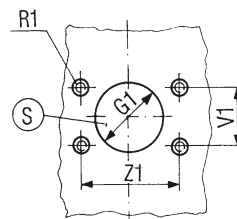
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POGLED II/ VIEW II

Za desni smer obrtanja (kod levog smera - na suprotnoj strani)
For pump with clockwise rotation (by anticlockwise - on the opposite side)



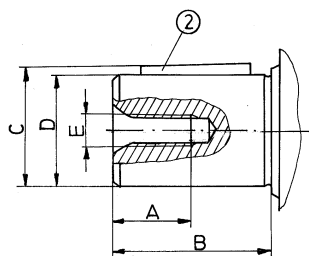
POGLED I/ VIEW I



ND	C		D	E	F		G	G1		H	H1	K	N
	1	4			1	4		1	4				
50	201	219	92	18	286	297	19	48	50	∅125h6	□150	160	32
75	242	253,5	102	18	353	302	25	63	63	∅140h6	□172	182	38,7
105	261	273	120	20	354	360	25	63	75	∅160h6	□184	200	41

ND	R	R1		R2	T		V	V1		Z	Z1	
		1	4		1	4		1	4		1	4
50	M 10/16	M 12/16	M 12/17	∅12	297	270	50,8	42,9	42,9	23,9	77,8	77,8
75	M 12/17	M 12/17	M 12/17	∅14	341	295	57,2	50,8	50,8	27,8	88,9	88,9
105	M 12/17	M 12/17	M 16/20	∅18	243	295	57,2	50,8	61,9	27,8	88,9	106,4

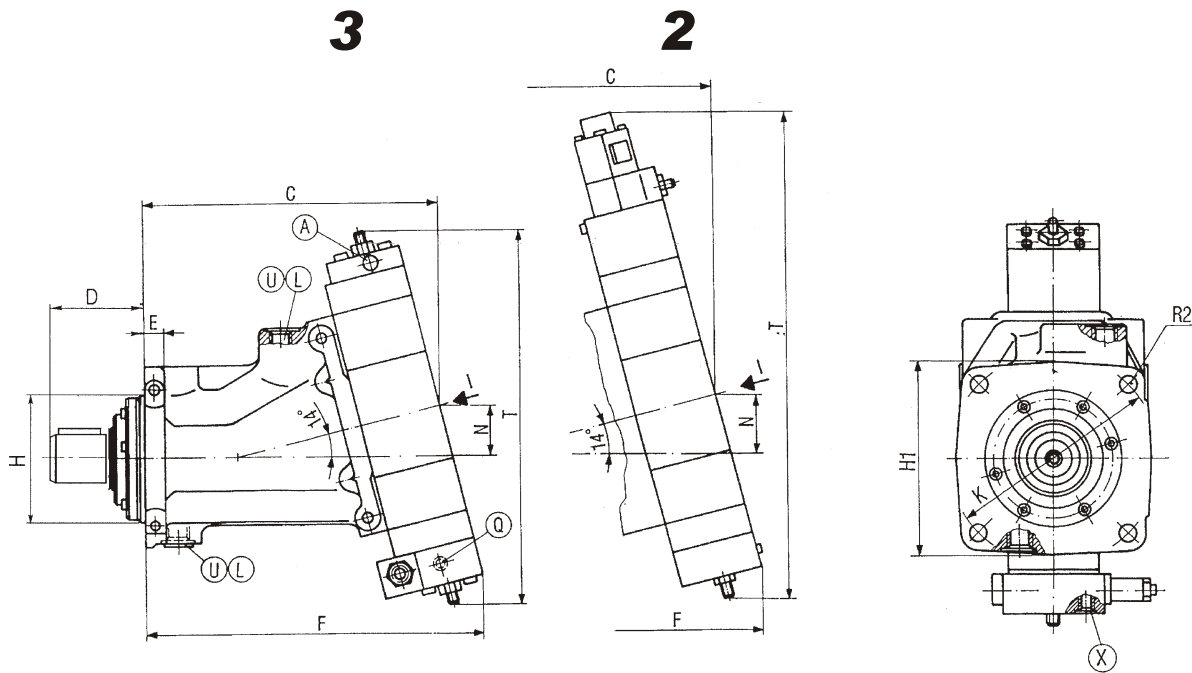
POGONSKO VRATILO - cilindrični tip
DRIVE SHAFT - cylindrical type



ND	A	B	C	D	E	②
						klin/ key DIN 6885
50	28	60	33	∅30k6	M12	AS 8x7x50
75	28	70	38	∅35k6	M12	AS 10x8x56
105	28	80	43	∅40k6	M12	AS 12x8x63

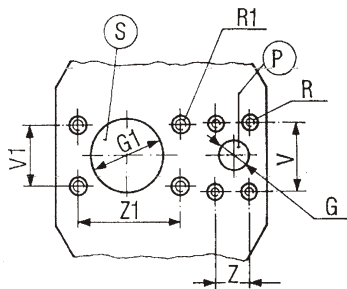
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PUMPE SA POGONSKIM VRATILOM - cilindrični tip
PUMPS WITH DRIVE SHAFT - cylindrical type



POGLED I/ VIEW I

Za desni smer obrtanja (kod levog smera - otvori menjaju mesta)
For pump with clockwise rotation (by anticlockwise ports changed)



S = usisni otvor/ outlet port: prirubnica / flange SAE 2" (ND 50)
prirub. / flange SAE 2. 1/2" (ND 75, 105)

P = potisni otvor/ inlet port: prirubnica / flange SAE 1"

(U)L = drenažni otvor/ drain port M 22x1,5

(L)U = otvor za ispušt ulja / oil draining port M 22x1,5

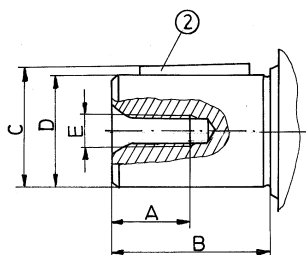
A,Q = merna mesta / working press. test ports M 14x1,5

X = priključ. upravljačkog voda / control port M 14x1,5

ND	C		D	E	F	G	G ₁	H	H ₁	K	N
	2	3									
50		252	92	18	290	19	48	Ø125h6	□150	160	35
75		283,5	102	18	329	25	63	Ø140h6	□172	182	49
105	302	305	120	20	350	25	63	Ø160h6	□184	200	53

ND	R	R ₁	R ₂	T		V	V ₁	Z	Z ₁
				2	3				
50	M 10/16	M 12/16	Ø12		364	50,8	42,9	23,9	77,8
75	M 12/17	M 12/17	Ø14		356	57,2	50,8	27,8	88,9
105	M 12/17	M 12/17	Ø18	510	390	57,2	50,8	27,8	88,9

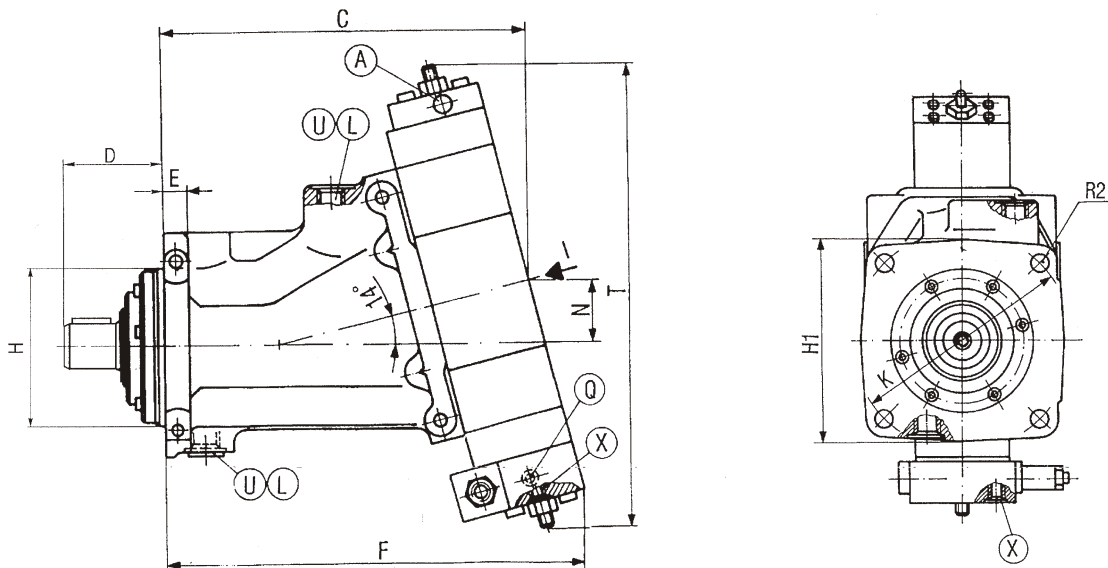
POGONSKO VRATILO - cilindrični tip
DRIVE SHAFT - cylindrical type



ND	A	B	C	D	E	(2)
						klin/ key DIN 6885
50	28	60	33	Ø30k6	M12	AS 8x7x50
75	28	70	38	Ø35k6	M12	AS 10x8x56
105	28	80	43	Ø40k6	M12	AS 12x8x63

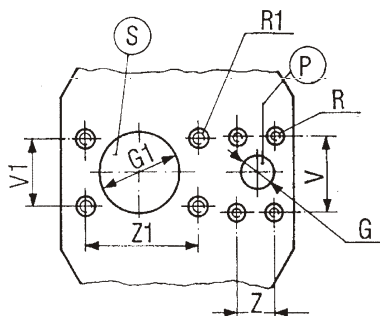
PUMPE SA POGONSKIM VRATILOM - cilindrični tip
 PUMPS WITH DRIVE SHAFT - cylindrical type

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POGLED I / VIEW I

Za desni smer obrtanja (kod levog smera - otvori menjaju mesta)
 For pump with clockwise rotation (by anticlockwise ports changed)



S = usisni otvor/ outlet port: prirubnica / flange SAE 2" (ND 50)
 prirub. / flange SAE 2. 1/2" (ND 75, 105)

P = potisni otvor/ inlet port: prirubnica / flange SAE 1"

(U)L = drenažni otvor/ drain port M 22x1,5

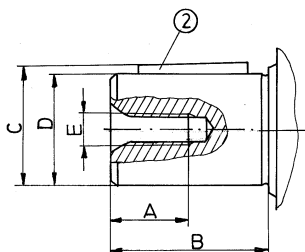
(L)U = otvor za ispuštanje ulja / oil draining port M 22x1,5

A,Q = merna mesta / working press. test ports M 14x1,5

X = priključ. upravljačkog voda / control port M 14x1,5

ND	C	D	E	F	G	G1	H	H1	K	N	R	R1	R2	T	V	V1	Z	Z1
50		92	18	290	19	48	Ø125h6	□150	160	35	M10/16	M12/16	Ø12	364	50,8	42,9	23,9	77,8
75		102	18	329	25	63	Ø140h6	□172	180	49	M12/17	M12/17	Ø14	356	57,2	50,8	27,8	88,9
105	305	120	20	350	25	63	Ø160h6	□184	200	53	M12/17	M12/17	Ø18	390	57,2	50,8	27,8	88,9

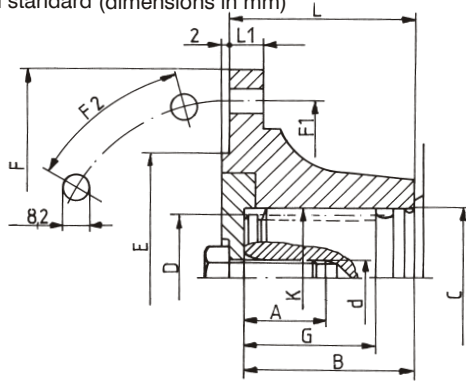
POGONSKO VRATILO - cilindrični tip
 DRIVE SHAFT - cylindrical type



ND	A	B	C	D	E	②
						klin/ key DIN 6885
50	28	60	33	Ø30k6	M12	AS 8x7x50
75	28	70	38	Ø35k6	M12	AS 10x8x56
105	28	80	43	Ø40k6	M12	AS 12x8x63

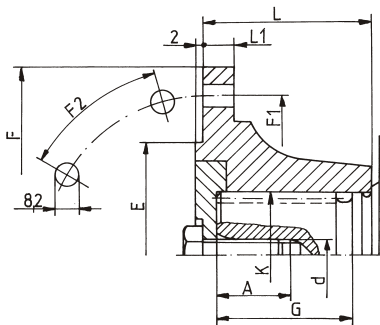
A

POGONSKO VRATILO SA SPOJNICOM - DIN standard (mere u mm)
 DRIVE SHAFT WITH COUPLING - DIN standard (dimensions in mm)



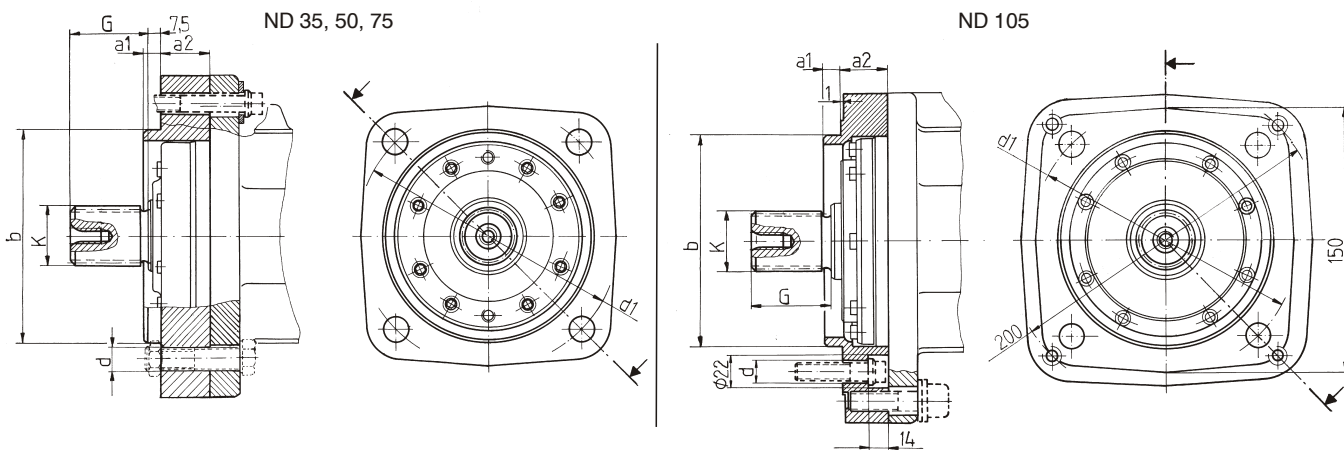
ND	K		A	B	C	D	d	E	F	F1	F2	G	L	L1
	DIN 5480g9	DIN 5482e9												
50	W30x2	B30x27	21	42,5	30,5g6	25g6	M8	57h8	99,5	84	6x60°	33	50	10
75	W35x2	B35x31	23	45,5	35,5g6	30g6	M10	75h8	114,5	101,5	8x45°	36	55,5	12
105	W40x2	B40x36	26,5	50	40,5g6	35g6	M12	75h8	114,5	101,5	8x45°	40	59	12

POGONSKO VRATILO SA SPOJNICOM - SAE standard (mere u mm)
 DRIVE SHAFT WITH COUPLING - SAE standard (dimensions in mm)



ND	K		A	G	d	E	F	F1	F2	L	L1
	SAE J498										
50	12/24; z=14		23	48	M10	57h8	99,5	84	6x60°	50	10
75	12/24; z=14		23	48	M10	75h8	114,5	101,5	8x45°	55,5	12
105	16/32; z=23		26,5	48	M12	75h8	120	101,5	8x45°	59	12

MEĐUPRIRUBNICA - SAE standard (mere u mm)
 MEDFLANGE - SAE standard (dimensions in mm)



ND	K		G	a1	a2	d	d1	b
	SAE J498							
50	12/24; z=14		48	12,5	24	14	162	127h8
75	12/24; z=14		48	12,5	24,5	14	162	127h8
105	16/32; z=23		48	10	29	15	162	127h8