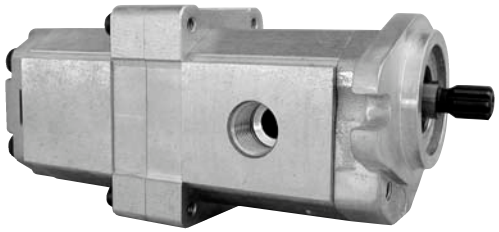
General Aluminum Gear Pumps and Motors
Technical Information
Multi-Stage Pumps

Overview

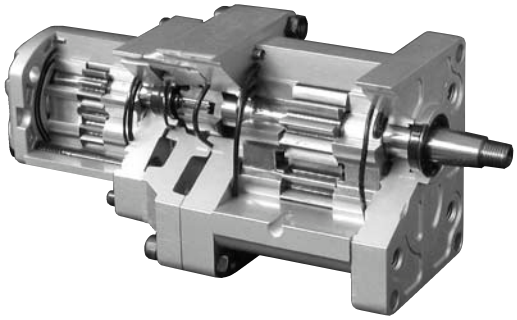
TurollaOCG multi-stage pumps can be combined of group 1, 2, and 3. In addition to the standard range (presented in the following), first stage can be supplied with a splined, a tapered or a parallel shaft. Also versions with suction connection and other hydraulic connections and flange assembly or centralized threads are available.

The representatives of TurollaOCG multi-stage pumps are shown below:

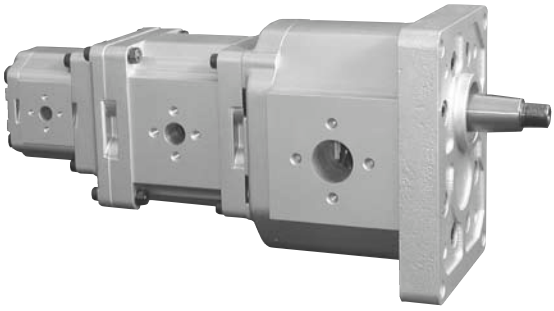
Tandem pump PTT conf. 06SM



Tandem pump PNT conf. 01BQ (cut-away)



Triple pump PFRN conf. 31BD



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Multi-Stage Pumps

Multi-stage pump model code *Example: PRRNN-022/022/...*

A	B	C	D	E		F		G		*		**		H	I		J			K		L		M		N		O		P		R		S	T		U			V	W
P	R	R	N	N	–	0	2	2	/	0	2	2	/	0	1	7	/	4	,	0	L	0	0	7	S	L	P	3	B	B	B	A	N	N	B	B	B	A	N	N	N	N	/	N	N	N	N	N

A *Product = Pump*

B *1st stage group*

C *2nd stage group*

D *3rd stage group*

E *4th stage group*

Code	Stage group
T	Group 1 - series N
Y	Group 1 - series K
N	Group 2 - series N
L	Group 2 - series K
R	Group 3 - series N
F	Group 4 - series TA

F *Displacement of the 1st stage pump*

G *Displacement of the 2nd stage pump*

* *Displacement of the 3rd stage pump (optional)*

** *Displacement of the 4th stage pump (optional)*

H *Direction of rotation*

Code	Description
R	Right (clockwise)
L	Left (counterclockwise)

I *Version*

Code	Description
N	Standard (w/o interm.flange)
0	Interm. flange btw different group stages
1	Interm. flange all stages
2	SAE intem. flange btw different group stages
S	SAE intem. flange all stages

J *Mounting flange and gear shaft –* ***Group 1 as the first stage***

Code	Description
01BT	European 4 bolt flange/Tapered shaft 1:8
01DM	European 4 bolt flange/DIN splined shaft 15T

J *Mounting flange and gear shaft –* ***Group 2 as the first stage***

Code	Description
01BQ	European 4 bolt flange/Tapered shaft 1:8
02AG	German 4 bolt PTO flange/1:5 taper shaft
04AG	German 2 bolt PTO flange (Deutz)/1:5 taper shaft
05AG	German 2 bolt PTO flange (Deutz)/1:5 taper shaft
09BY	Perkins 4.236 timing case flange/1:8 taper shaft
06GE	SAE „A" flange/15.875mm [0.625 in] parallel shaft
01DM	European 4-bolt flange/DIN splined shaft 9T
02DO	German 4-bolt PTO flange/DIN splined shaft 9T
04DO	German 2-bolt PTO flange (Deutz)/DIN splined shaft 9T
05DO	German 2-bolt PTO flange (Deutz)/DIN splined shaft 9T
06SM	SAE A flange/SAE splined shaft 9T
06SS	SAE A flange/SAE splined shaft 11T

J *Mounting flange and gear shaft –* ***Group 3 as the first stage***

Code	Description
01BL	European 01 4-bolt flange/Tapered shaft 1:8
02BL	European 02 4-bolt flange/Tapered shaft 1:8
03BM	European 03 4-bolt flange/Tapered shaft 1:8
06AG	German 4-bolt flange/1:5 Tapered shaft
07GD	SAE B flange/Parallel shaft 22.225 mm [0.875 in]
01DL	European 01 4-bolt flange/DIN splined shaft 13T
06DO	German 4-bolt flange/SAE splined shaft 15T
07SL	SAE B flange/SAE splined shaft 13T

J *Mounting flange and gear shaft –* ***Group 4 as the first stage***

Code	Description
31BD	European 4-bolt flange/Tapered shaft 1:8
02RD	SAE C 2-bolt flange/SAE splined shaft 14T

For further information about options of single units, see *Model Code,* pages 8 ÷ 11 of the catalogue.

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Multi-stage pump model code (continued) *Example: PRRNN-022/022/...*

A	B	C	D	E		F		G		*		**	H	I	J		K	L	M	N	O	P	R		S	T		U		V	W
P	R	R	N	N	–	0	2	2	/	0	2	2	/	0	1	7	/	4	,	0	L	0	0	7	S	L	P	3	B	B	B	A	N	N	B	B	B	A	N	N		N	N	/	N	N	N	N	N

B	7	B	5	N	N

3rd stage group (optional)
B7 = Inlet
B5 = Outlet
NN = Ports Position

B	6	B	5	N	N

4th stage group (optional)
B6 = Inlet
B5 = Outlet
NN = Ports Position

K *Rear cover*

L/M *Inlet/Outlet of the 1st stage pump*

N *Ports position of the 1st stage pump*

O/P *Inlet/Outlet of the 2nd stage pump*

R *Ports position of the 2nd stage pump*

Inlet/Outlet/Ports position of the 3rd stage pump

Inlet/Outlet/Ports position of the 4th stage pump

S *Seals*

Code	Description
N	Buna seals

T *Screws*

Code	Description
N	Standard screws

U *Set RV*

Code	Description
NNN	No Valve
V**	Integr. RV valve

V *Mark*

Code	Description
N	Standard Mark

W *Mark position*

Code	Description
N	Standard position

For further information about options of single units, see *Model Code,* pages 8 ÷ 11 of the catalogue.

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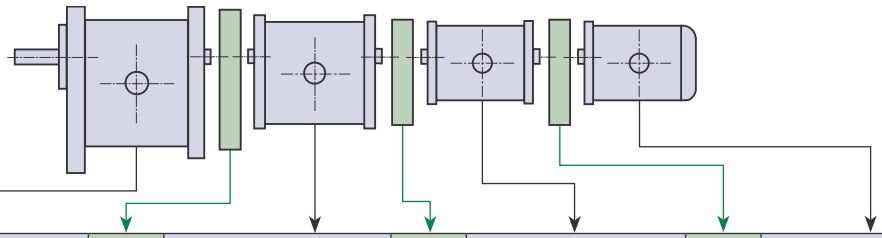
Multi-stage pump model code (continued)

Market codes for composition of multi-stage pumps



Family	Vers.	Front stage Flange + shaft	Kit type	Middle stage Flange + shaft	Kit type	Middle stage Flange + shaft	Kit type	Rear stage Flange + shaft
PTT	1	SNW1NN/.....01BT..	HU	–	–	–	–	SNP1NN/.....01DA..
PTT	N	SNW1NN/.....01BT..	HT	–	–	–	–	SNQ1NN/.....11DE
PNT	N	SNW2NN/.....01BQ..	HN	–	–	–	–	SNQ1NN/.....21DE
PNT	1	SNW2NN/.....01BQ..	CC	–	–	–	–	SNP1NN/.....01DA
PNN	N	SNW2NN/.....01BQ..	–	–	–	–	–	SNP2NN/.....03CA
PLN	N	SKW2NN/.....01BQ..	–	–	–	–	–	SNP2NN/.....03CA
PRT	N	SNW3NN/.....01BL..	HR	–	–	–	–	SNQ1NN/.....31DE
PRT	1	SNW3NN/.....01BL..	Q	–	–	–	–	SNP1NN/.....01DA..
PRN	1	SNW3NN/.....01BL..	H	–	–	–	–	SNP2NN/.....01DA..
PRR	N	SNW3NN/.....01BL..	G	–	–	–	–	SNQ3NN/.....11DB..
PFN	1	TAW4NN/.....31BD..	S	–	–	–	–	SNP2NN/.....01DA..
PFR	1	TAW4NN/.....31BD..	E	–	–	–	–	SNQ3NN/.....11DB..
PFF	N	TAW4NN/.....31BD..	F	–	–	–	–	TAQ4NN/.....31DB..
PTTT	N	SNW1NN/.....01BT..	HT	SNO1NN/.....11BP..	HT	–	–	SNQ1NN/.....11DE..
PTTT	1	SNW1NN/.....01BT..	HU	SNW1NN/.....01DM..	HU	–	–	SNP1NN/.....01DA..
PNTT	N	SNW2NN/.....01BQ..	HN	SNO1NN/.....21DP..	HT	–	–	SNQ1NN/.....11DE..
PNTT	1	SNW2NN/.....01BQ..	CC	SNW1NN/.....01DM..	HU	–	–	SNP1NN/.....01DA..
PNNT	0	SNW2NN/.....01BQ..	–	SNO2NN/.....03CH..	CC	–	–	SNP1NN/.....01DA..
PNNN	N	SNW2NN/.....01BQ..	–	SNO2NN/.....03CH..	–	–	–	SNP2NN/.....01CA..
PRNT	1	SNW3NN/.....01BL..	H	SNW2NN/.....01DM..	CC	–	–	SNP1NN/.....01DA..
PRNN	0	SNW3NN/.....01BL..	H	SNW2NN/.....01DM..	–	–	–	SNP2NN/.....03CA..
PRRT	0	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	Q	–	–	SNP1NN/.....01DA..
PRRN	0	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	H	–	–	SNP2NN/.....03CA..
PRRR	N	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	G	–	–	SNQ3NN/.....11DB..
PFNN	0	TAW4NN/.....31BD..	S	SNW2NN/.....01DM..	–	–	–	SNP2NN/.....03CA..
PFRN	1	TAW4NN/.....31BD..	E	SNO3NN/.....11DM..	H	–	–	SNP2NN/.....01DA..
PFRR	0	TAW4NN/.....31BD..	E	SNO3NN/.....11DM..	G	–	–	SNQ3NN/.....11DB..
PFFR	0	TAW4NN/.....31BD..	F	TAO4NN/.....31DE..	E	–	–	SNQ3NN/.....11DB..
PNNNT	0	SNW2NN/.....01BQ..	–	SNO2NN/.....03CH..	–	SNO2NN/.....03CH..	V	SNP1NN/.....01DA..
PNNNN	N	SNW2NN/.....01BQ..	–	SNO2NN/.....03CH..	–	SNO2NN/.....03CH..	–	SNP2NN/.....03CA..
PRNTT	1	SNW3NN/.....01BL..	H	SNW2NN/.....01DM..	CC	SNW1NN/.....01DM..	HU	SNP1NN/.....01DA..
PRNNN	0	SNW3NN/.....01BL..	H	SNW2NN/.....01DM..	–	SNO2NN/.....03CH..	–	SNP2NN/.....03CA..
PRRNN	0	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	H	SNW2NN/.....01DM..	–	SNP2NN/.....03CA..
PRRRN	0	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	G	SNO3NN/.....11DM..	HU	SNP2NN/.....03CA..
PRRRR	N	SNW3NN/.....01BL..	G	SNO3NN/.....11DM..	G	SNO3NN/.....11DM..	G	SNQ3NN/.....11DB..
PFRNN	0	TAW4NN/.....31BD..	E	SNO3NN/.....11DM..	H	SNW2NN/.....01DM..	–	SNP2NN/.....03CA..
PFRRN	0	TAW4NN/.....31BD..	E	SNO3NN/.....11DM..	G	SNO3NN/.....11DM..	HU	SNP2NN/.....03CA..
PFRRR	0	TAW4NN/.....31BD..	E	SNO3NN/.....11DM..	G	SNO3NN/.....11DM..	G	SNQ3NN/.....11DB..

To assemble tandem pumps , consider first and rear stage; for triple pumps consider first, middle and rear stage; for quadruple pumps consider all stages. Above table shows the 1:8 taper shaft in combination with 01 flange standard design only, corresponding to 1:8 taper shaft of single pump. For different configurations of shaft and front flange see the pages regarding single pumps.

General Aluminum Gear Pumps and Motors
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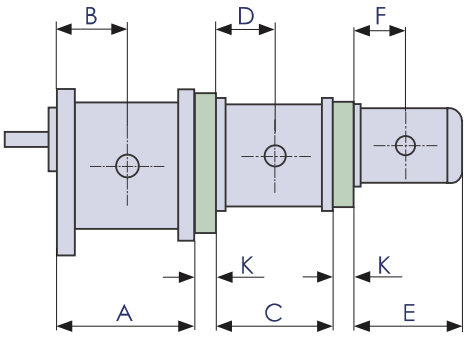
Multi-Stage Pumps

Multi-stage pumps with European standard front flange (01)



Coupling kit width – K mm [in]	
SNP1NN + SNP1NN	0
SNP2NN + SNP1NN	0
SNP2NN + SNP2NN	0
SNP3NN + SNP1NN	0
SNP3NN + SNP2NN	25 [0.984]
SNP3NN + SNP3NN	0
TAP4NN + SNP1NN	23.5 [0.925]
TAP4NN + SNP2NN	25 [0.984]
TAP4NN + SNP3NN	0
TAP4NN + TAP4NN	0

All groups – dimensions (mm) [in]

Product type, size			A	B	C	D	E	F
Group 1	SNP1NN SKP1NN	1,2	75.75 [2.982]	37.75 [1.486]	76.00 [2.992]	38.00 [1.496]	79.75 [3.140]	38.00 [1.496]
		1,7	77.25 [3.041]	38.50 [1.515]	77.50 [3.051]	38.75 [1.525]	81.25 [3.199]	38.75 [1.525]
		2,2	79.25 [3.120]	39.50 [1.555]	79.50 [3.130]	39.75 [1.565]	83.25 [3.278]	39.75 [1.565]
		2,6	81.25 [3.199]	40.50 [1.594]	81.50 [3.208]	40.75 [1.604]	85.25 [3.356]	40.75 [1.604]
		3,2	83.25 [3.278]	41.50 [1.634]	83.50 [3.287]	41.75 [1.644]	87.25 [3.435]	41.75 [1.644]
		3,8	85.25 [3.356]	42.50 [1.673]	85.50 [3.366]	42.75 [1.683]	89.25 [3.514]	42.75 [1.683]
		4,3	87.25 [3.435]	43.50 [1.712]	87.50 [3.445]	43.75 [1.722]	91.25 [3.592]	43.75 [1.722]
		6,0	93.75 [3.691]	46.75 [1.840]	94.00 [3.701]	47.00 [1.850]	97.75 [3.848]	47.00 [1.850]
		7,8	100.25 [3.947]	50.0 [1.968]	100.5 [3.956]	50.25 [1.978]	104.25 [4.104]	50.25 [1.978]
		010	109.25 [4.301]	54.50 [2.145]	109.5 [4.311]	54.75 [2.155]	113.25 [4.458]	54.75 [2.155]
		012	117.25 [4.616]	58.50 [2.303]	117.5 [4.626]	58.75 [2.313]	121.25 [4.773]	58.75 [2.313]
Group 2	SNP2NN SKP2NN	4,0	87.50 [3.445]	43.3 [1.705]	87.50 [3.445]	43.3 [1.705]	93.0 [3.661]	43.3 [1.705]
		6,0	91.0 [3.582]	45.0 [1.771]	91.00 [3.582]	45.0 [1.771]	96.5 [3.799]	45.0 [1.771]
		8,0	95.0 [3.740]	45.0 [1.771]	95.00 [3.740]	45.0 [1.771]	100.5 [3.956]	45.0 [1.771]
		011	99.0 [3.897]	49.0 [1.929]	99.00 [3.897]	49.0 [1.929]	104.5 [4.114]	49.0 [1.929]
		014	105.0 [4.134]	52.0 [2.047]	105.0 [4.134]	52.0 [2.047]	110.5 [4.350]	52.0 [2.047]
		017	109.0 [4.291]	52.0 [2.047]	109.0 [4.291]	52.0 [2.047]	114.5 [4.508]	52.0 [2.047]
		019	113.0 [4.449]	56.0 [2.205]	113.0 [4.449]	56.0 [2.205]	118.5 [4.665]	56.0 [2.205]
		022	119.0 [4.685]	59.0 [2.323]	119.0 [4.685]	59.0 [2.323]	124.5 [4.902]	59.0 [2.323]
		025	123.0 [4.843]	59.0 [2.323]	123.0 [4.843]	59.0 [2.323]	128.5 [5.059]	59.0 [2.323]
Group 3	SNP3NN	022	126.0 [4.960]	63.0 [2.480]	126.0 [4.960]	63.0 [2.480]	132.5 [5.216]	63.0 [2.480]
		026	129.0 [5.078]	64.5 [2.539]	129.0 [5.078]	64.5 [2.539]	135.5 [5.334]	64.5 [2.539]
		033	134.0 [5.275]	67.0 [2.637]	134.0 [5.275]	67.0 [2.637]	140.5 [5.531]	67.0 [2.637]
		038	137.5 [5.413]	68.8 [2.708]	137.5 [5.413]	68.8 [2.708]	144.0 [5.669]	68.8 [2.708]
		044	142.0 [5.590]	71.0 [2.795]	142.0 [5.590]	71.0 [2.795]	148.5 [5.846]	71.0 [2.795]
		048	145.0 [5.708]	72.5 [2.854]	145.0 [5.708]	72.5 [2.854]	151.5 [5.964]	72.5 [2.854]
		055	150.0 [5.905]	75.0 [2.952]	150.0 [5.905]	75.0 [2.952]	156.5 [6.161]	75.0 [2.952]
		063	156.0 [6.141]	78.0 [3.071]	156.0 [6.141]	78.0 [3.071]	162.5 [6.397]	78.0 [3.071]
		075	164.0 [6.456]	82.0 [3.228]	164.0 [6.456]	82.0 [3.228]	170.5 [6.712]	82.0 [3.228]
		090	174.0 [6.850]	87.0 [3.425]	174.0 [6.850]	87.0 [3.425]	180.5 [7.106]	87.0 [3.425]
Group 4	TAP4NN	060	176.0 [6.929]	88.0 [3.464]	176.0 [6.929]	88.0 [3.464]	174.5 [6.870]	88.0 [3.464]
		085	186.0 [7.323]	93.0 [3.661]	186.0 [7.323]	93.0 [3.661]	184.5 [7.264]	93.0 [3.661]
		106	194.0 [7.637]	97.0 [3.819]	194.0 [7.637]	97.0 [3.819]	192.5 [7.578]	97.0 [3.819]
		130	203.0 [7.992]	101.5 [3.996]	203.0 [7.992]	101.5 [3.996]	201.5 [7.933]	101.5 [3.996]
		148	210.0 [8.267]	105.0 [4.134]	210.0 [8.267]	105.0 [4.134]	208.5 [8.208]	105.0 [4.134]
		180	222.0 [8.740]	111.0 [4.370]	222.0 [8.740]	111.0 [4.370]	220.5 [8.681]	111.0 [4.370]
		200	230.0 [9.055]	115.0 [4.527]	230.0 [9.055]	115.0 [4.527]	228.5 [8.996]	115.0 [4.527]

Multi-stage pumps with European standard front flange (01) (continued)

Examples of overall lenght calculation:

2-stage pump: SNP3NN/044 + SNP1NN/3,2

A = 142 mm
K = 0
E = 87.25 mm
L_{tot} = 142 + 0 + 87.25 = 229.25 mm

4-stage pump: SNP3NN/055 + SNP2NN/017 + SNP2NN/8,0 + SNP1NN/2,2

A = 150 mm
K = 25 mm (1° kit – 1st kit)
C = 109 mm (2nd stage)
K = 0 mm (2° kit – 2nd kit)
C = 95 mm (3rd stage)
K = 0 mm (3° kit – 3rd kit)
E = 83.25 mm (4th stage)
L_{tot} = 150 + 25 + 109 + 0 + 95 + 0 + 83.25 = 413.25 mm