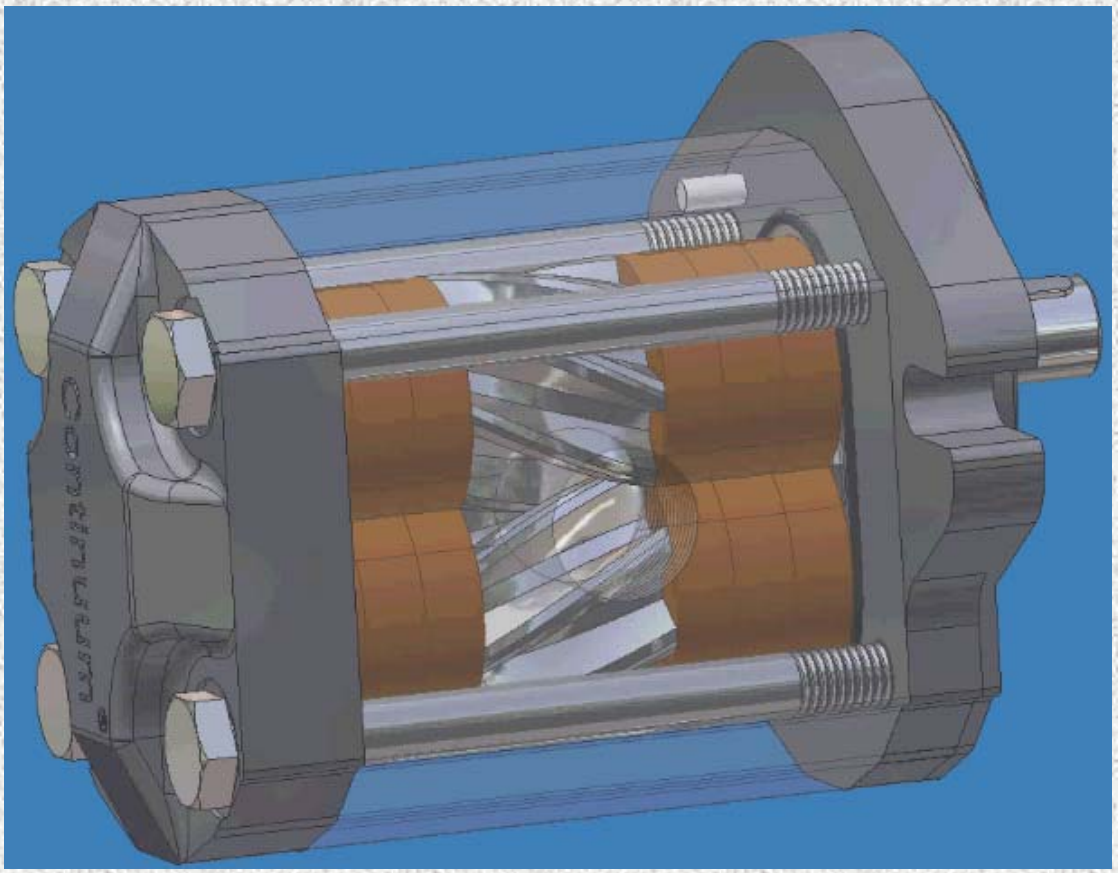
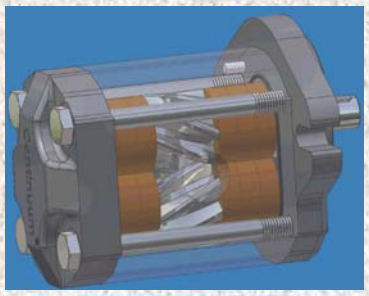
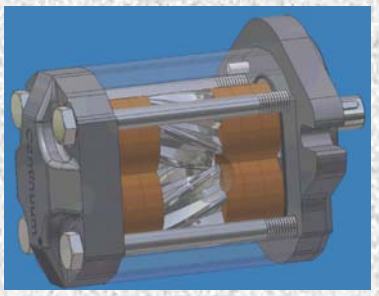
Continuum ® pumps

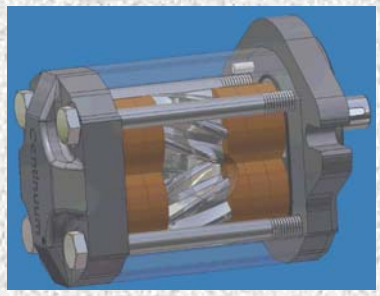
Helical rotor pumps for high pressure low noise industrial application

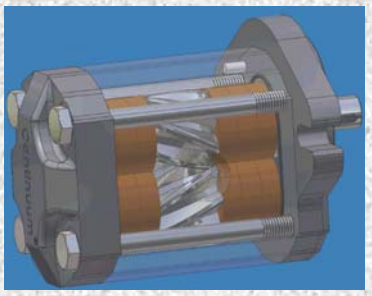
Patents Pending







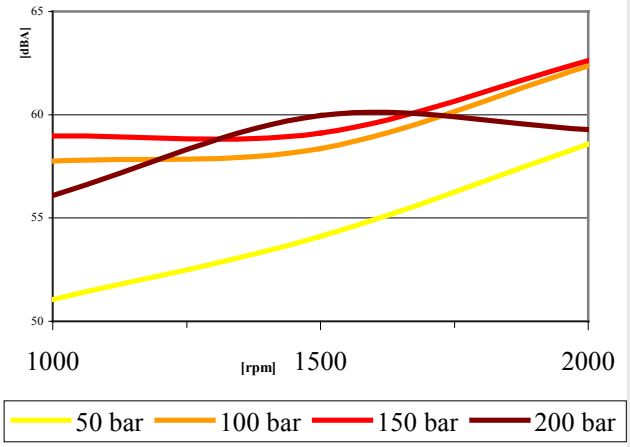




SETTIMA flow mechanisms

Sustainable Power

In a ever increasing demand for power, designers and manufacturers of hydraulic devices have explored all opportunities to contain noise and reduce ripple.
When System Life Cycle, Environmental Conditions, Energy Consumption, Performances are paramount the ultimate solution is to cut the problem at its root.



Noise is Expensive

From the small steering system to the large municipal equipment, from the lubrication system to the forklift.
Noise not only is generated by the pumps but in most cases the systems generated noise by amplifying the ripple. Consequent pressure drops are a noticeable energy consumption and reducing overall efficiency.
Even in the most demanding condition Continuum enables the system designer to focus on functions and features, not only on reducing customer frustration by mean of expensive enclosures, hoses and attenuators. Noise is relieved at the root.

Power of Silence

Endowed with the form factor of the most used hydraulic devices such as gear pumps, Continuum is set to transform the way end users are perceiving hydraulic devices.
The ultimate solution for preserving the experience of silence.
Settima FM, introducing its new Continuum Product Line, is paving the way for Sustainable Fluid Power.

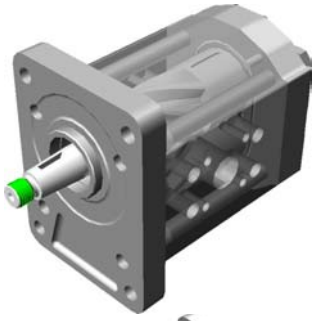
The Human Factor

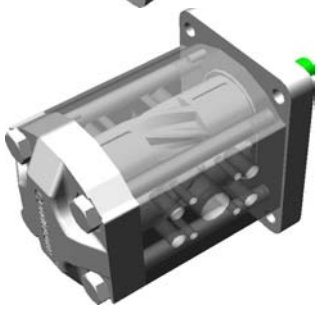
Behind investing in the most advanced design and manufacturing capability, Settima Flow Mechanisms and all its third party manufacturers base the quality of their value chain on the human factor.
Encouraging the innovation and the personal responsibility, Settima FM has reached an high standard of quality and a extremely flexible manufacturing.

The Continuum® Principle

Investing in innovation is about empowering impressive and revolutionary ideas. Such as the one embraced by Continuum, a new pumps with continuous intermeshing, no-leaking rotors.

Technological innovation for HIGH pressure, LOW noise and LOW pulsations





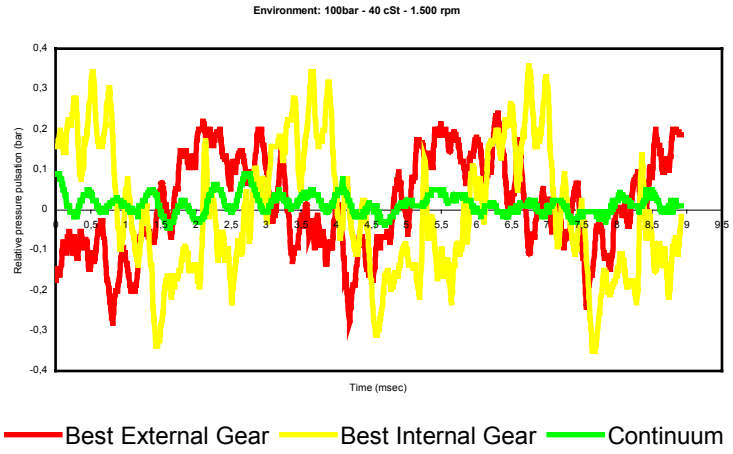
The Continuum ® concept is based on three patented breakthroughs:

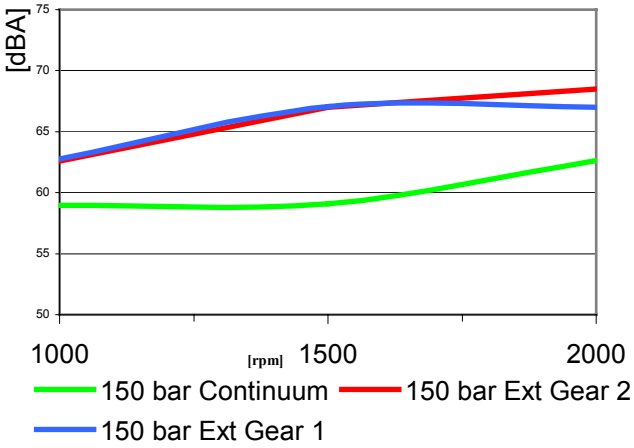
- the **rotors profile**;
- the **screw step**;
- the inner **force balancing**.

Pressure Ripple and Noise Analysis

The **present structure** of high pressure gear pumps typically implies **rooms** of compressed fluid between gear teeth.
As consequence:

- sharp changes in pressure growth
- noise (starting from 1.500 rpm)





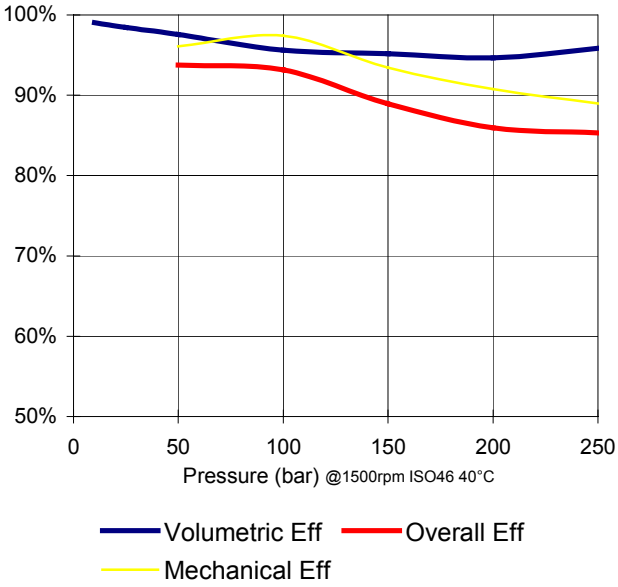
The **continuum** design concept achieves one main design objective:

- Total absence of high pressure **rooms** of compressed oil between gears;
- No trade-offs on material selection and treatments.

The above implies:

- **smooth changes** in the pressure growth
- HIGH Performances
- **LOW** noise (up to 5.000 rpm)

The **pressure ripple** laboratory test shows the impressive improvement of the pulsation in a **Continuum®** designed pump (pressure sampling at 100 KHz) while maintaining excellent efficiency.
The **noise** laboratory test shows the impressive improvement of the noise curve in a **Continuum®** designed pump.



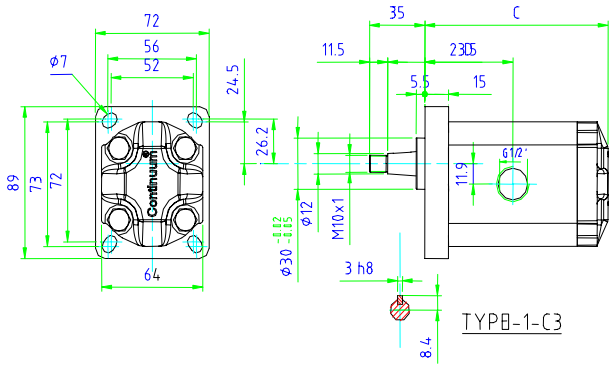
Detailed technical information

Models available	GR28 – GR33 – GR38 – GR47 – GR55 – GR72
Flanges	Group 1 – Group 2 (European, German, BKT, SAE-A) – Group 3 (European, SAE-B)
Connections	GAS – SAE ¾' 5000 PSI FL 4 HOLES M6 SU Ø40 DN20 (***)
Installation position	External
Shaft rotation	Clockwise
Shaft speed	Up to 3.600 rpm
Displacements – Flows	From 6 up to 184 cm^3 From 9L/min up to 264L/min (at 1.500 rpm)
Operating pressure (*)	See specific model descriptions.
Inlet pressure	0,8 – 2 bar (****)
Fluids	Mineral oil HLP e HLVP Ecologic fluids HETG-HEPG-HEE Synthetic fluid or emulsion: (**) HFA oil-water emulsion – oil minimum 20% HFB water-oil emulsion – oil minimum 20% HFDR phosphate ester Lubrication oils high viscosity (**) Special synthetic fluid: MIL-H, SKYDROL, special on request
Viscosity	Permissible (**): from 20 up to 800 mm^2/s [cSt] Recommended:from 24 up to 150 mm^2/s [cSt] Starting conditions (**): up to 3.000 mm^2/s [cSt]
Environment temperature	From -15° up to +60°C
Hydraulic temperature	From -15° up to +80°C
Contamination Level	From 10 NAS (21/9/15 ISO4406) to 8 NAS (18/17/14 ISO4406) for heavy duty operations (*****)
Filtration	Inlet Port: from 50 to 30 µm for heavy duty operations (*****) Outlet Port: from 25 to 10 µm for heavy duty operations (*****)
Seals	NBR, VITON, FPM, EPDM – Special on request
Noise	from 52 up to 68 dB(A) at 2.750 rpm Value based on ISO 4412 test procedure
Pump body (standard)	Extruded aluminium alloy
Screw	Case hardened grinded steel
Maintenance	No

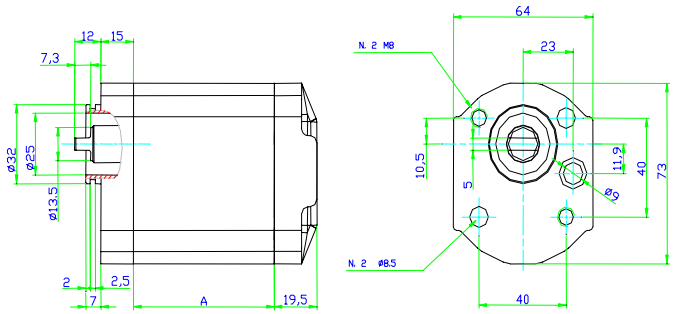
(*) Test executed with Oil ISO VG46 (40°C) – 10µm filtration
(**) Please contact the company to have further details
(***) Available on certain models upon customer request
(****) Up to 10 bar Shaft Seal available on certain models upon request
(*****) Heavy Duty operation are defined as above 150bar , more than 4h/day, more than 100 cycle/day, oil ISO 46.

Dimensional drawing – GR28

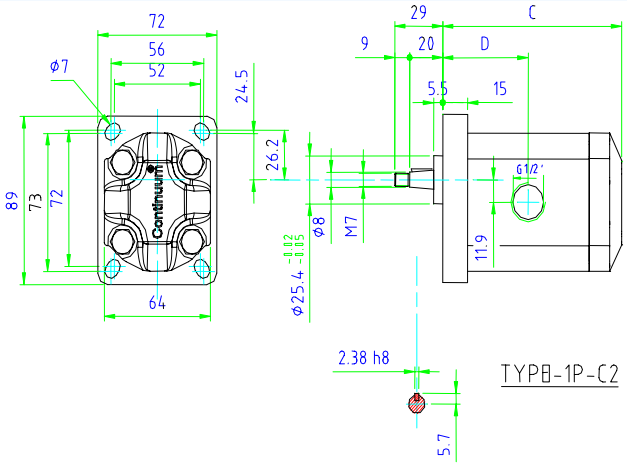
Shaft types & dimensions



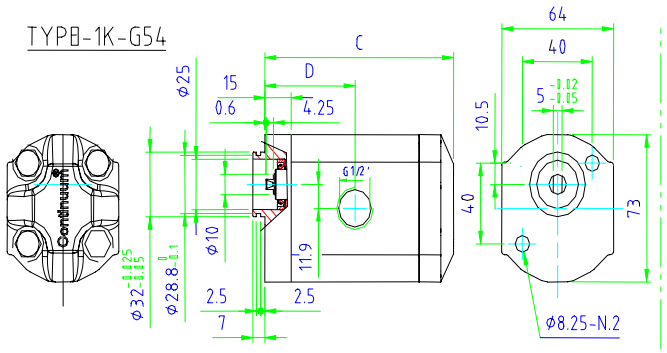
TYPE 1-C3								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
6	6,4	9,2	100	47,25	275	280	300	55
8	8,3	12,0	105	49,75	246	260	300	55
10	10,2	14,7	110	52,25	222	250	300	55
12	12,9	18,6	117	55,7	176	230	280	55
			mm	mm	bar	bar	bar	dB(A)



TYPE 1L-GL54							
Type	CC	L/min	Dim A	Cont Pres	Interm Press (*)	Peak Press	Noise Level
6	6,4	9,2	64,4	275	280	300	55
8	8,3	12,0	69,6	246	260	300	55
10	10,2	14,7	74,6	222	250	300	55
12	12,9	18,6	81,5	176	230	280	55
			mm	bar	bar	bar	dB(A)



TYPE 1P-C2								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
6	6,4	9,2	100	47,25	275	280	300	55
8	8,3	12,0	105	49,75	246	260	300	55
10	10,2	14,7	110	52,25	222	250	300	55
12	12,9	18,6	117	55,7	176	230	280	55
			mm	mm	bar	bar	bar	dB(A)

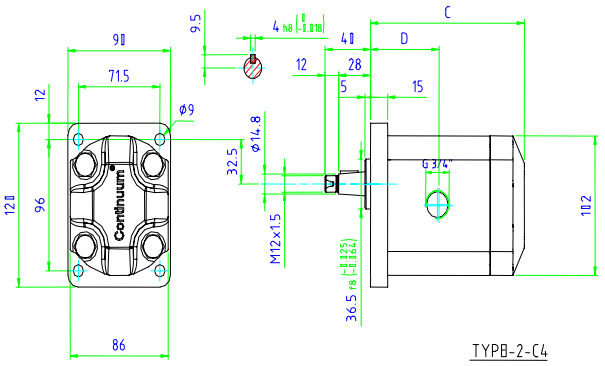


TYPE 1K-G54								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
6	6,4	9,2	100	47,25	200	230	280	55
8	8,3	12,0	105	49,75	153	195	260	55
10	10,2	14,7	110	52,25	126	170	250	55
12	12,9	18,6	117	55,7	99	140	230	55
			mm	mm	bar	bar	bar	dB(A)

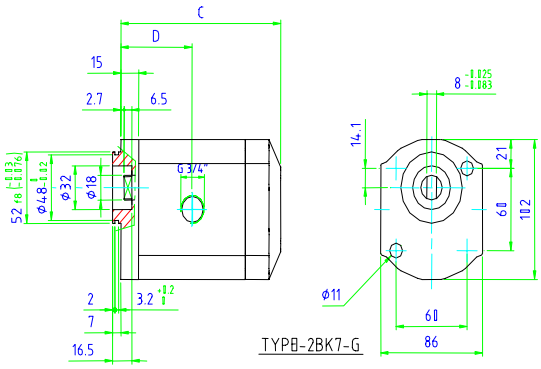
(*) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF

Dimensional drawing – GR33

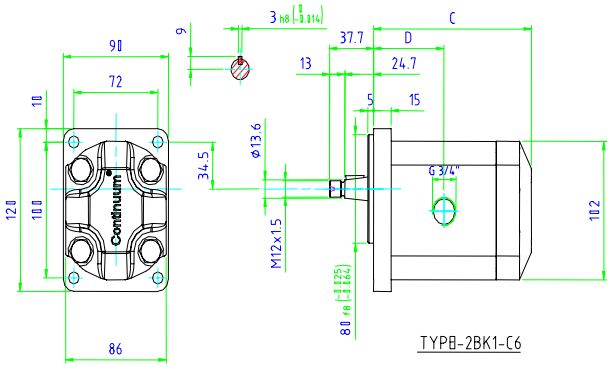
Shaft types & dimensions



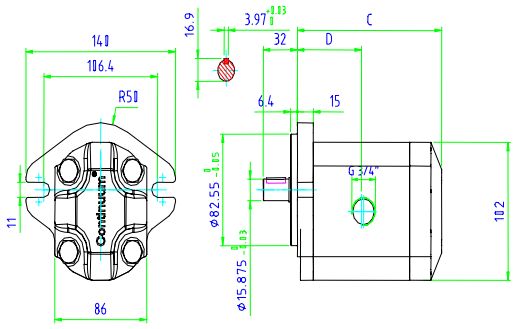
TYPE 2-C4								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
10	10,1	14,5	123	53,8	275	280	300	55
13	12,6	18,1	128	56,25	265	270	300	55
15	15,2	21,8	133	58,75	241	250	300	55
18	18,2	26,1	139	61,65	206	250	300	55
			mm	mm	bar	bar	bar	dB(A)



TYPE 2BK7-G54								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
10	10,1	14,5	123	53,8	275	280	300	55
13	12,6	18,1	128	56,25	265	270	300	55
15	15,2	21,8	133	58,75	241	250	300	55
18	18,2	26,1	139	61,65	206	250	300	55
			mm	mm	bar	bar	bar	dB(A)



TYPE 2BK1-C6								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
10	10,1	14,5	123	53,8	275	280	300	55
13	12,6	18,1	128	56,25	265	270	300	55
15	15,2	21,8	133	58,75	241	250	300	55
18	18,2	26,1	139	61,65	206	250	300	55
			mm	mm	bar	bar	bar	dB(A)

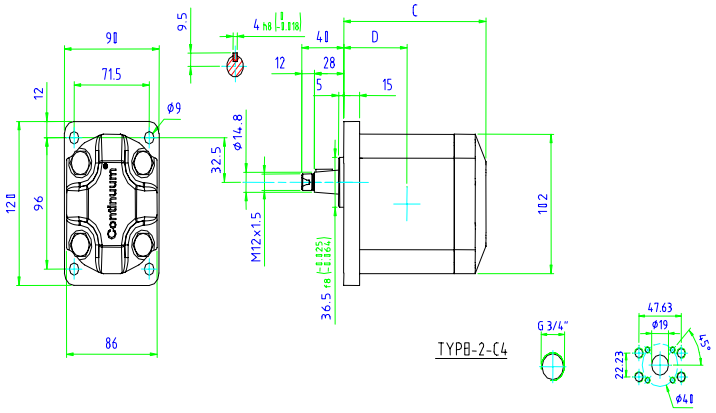


TYPE SAE-A-AC								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
10	10,1	14,5	123	53,8	275	280	300	55
13	12,6	18,1	128	56,25	265	270	300	55
15	15,2	21,8	133	58,75	241	250	300	55
18	18,2	26,1	139	61,65	206	250	300	55
			mm	mm	bar	bar	bar	dB(A)

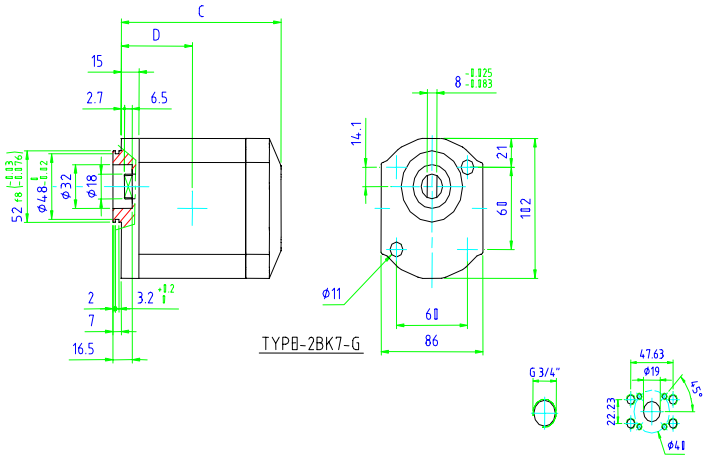
(*) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF

Dimensional drawing – GR38

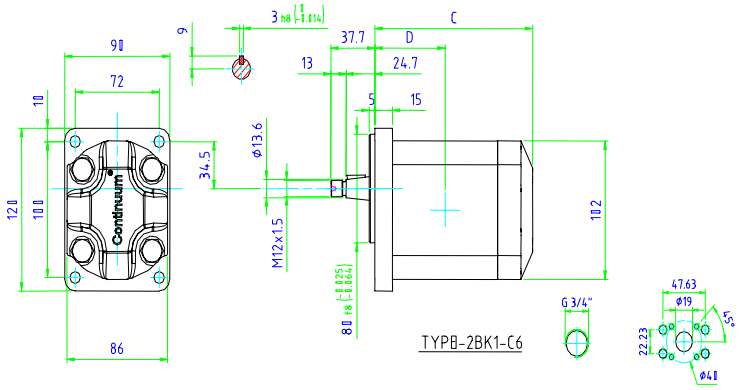
Shaft types & dimensions



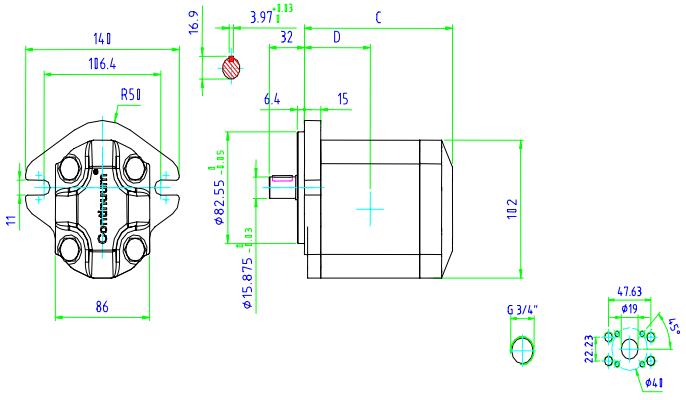
TYPE 2-C4								
Type	CC	L/min	Dim C	Dim D	Cont Pres (*)	Interm Press (*)	Peak Press	Noise Level
16	15,9	22,8	127	55,55	265	280	300	55
18	17,9	25,8	130	57,15	247	260	300	55
20	20	28,8	133	58,55	230	250	300	55
22	22,1	31,8	136	60,05	222	250	300	55
25	25,2	36,2	140	62,3	208	250	300	55
28	28,3	40,7	145	64,55	197	250	300	55
			mm	mm	bar	bar	bar	dB(A)



TYPE 2BK7-G								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
16	15,9	22,8	127	55,55	265	280	300	55
18	17,9	25,8	130	57,15	247	260	300	55
20	20	28,8	133	58,55	230	250	300	55
22	22,1	31,8	136	60,05	222	250	300	55
25	25,2	36,2	140	62,3	208	250	300	55
28	28,3	40,7	145	64,55	197	250	300	55
			mm	mm	bar	bar	bar	dB(A)



TYPE 2BK1-C6								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
16	15,9	22,8	127	55,55	265	280	300	55
18	17,9	25,8	130	57,15	247	260	300	55
20	20	28,8	133	58,55	230	250	300	55
22	22,1	31,8	136	60,05	222	250	300	55
25	25,2	36,2	140	62,3	208	250	300	55
28	28,3	40,7	145	64,55	197	250	300	55
			mm	mm	bar	bar	bar	dB(A)

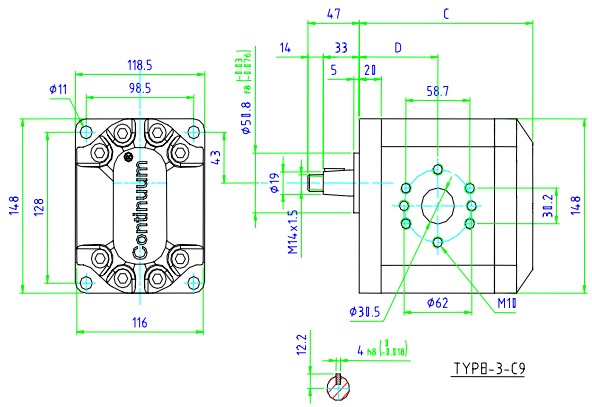


TYPE SAE-A-AC								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
16	15,9	22,8	127	55,55	265	280	300	55
18	17,9	25,8	130	57,15	247	260	300	55
20	20	28,8	133	58,55	230	250	300	55
22	22,1	31,8	136	60,05	222	250	300	55
25	25,2	36,2	140	62,3	208	250	300	55
28	28,3	40,7	145	64,55	197	250	300	55
			mm	mm	bar	bar	bar	dB(A)

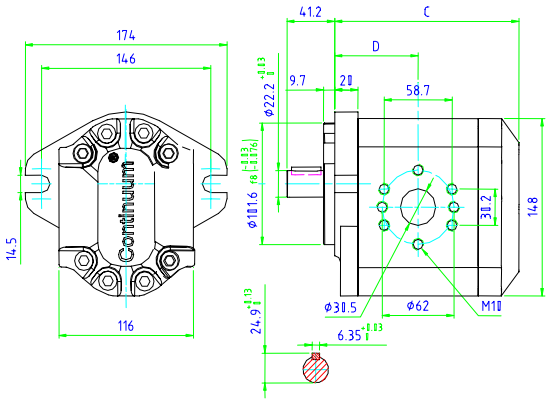
(*) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF

Dimensional drawing – GR47

Shaft types & dimensions



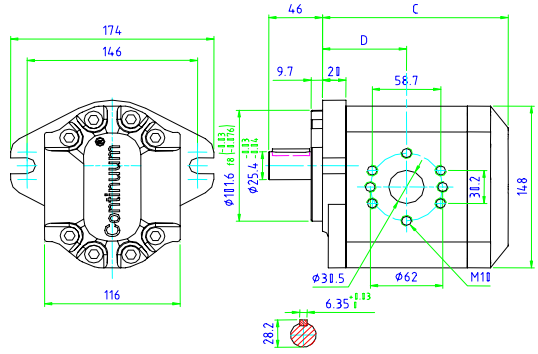
TYPE 3-C9								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
28	28	40,3	151	67,55	270	280	300	57
32	32,2	46,3	155	69,55	252	270	300	57
36	36,3	52,3	159	71,55	239	250	300	57
40	40,5	58,3	163	73,55	225	250	300	57
45	45,1	65,0	167	75,8	213	250	300	57
50	50,3	72,4	172	78,3	202	250	300	57
			mm	mm	bar	bar	bar	dB(A)



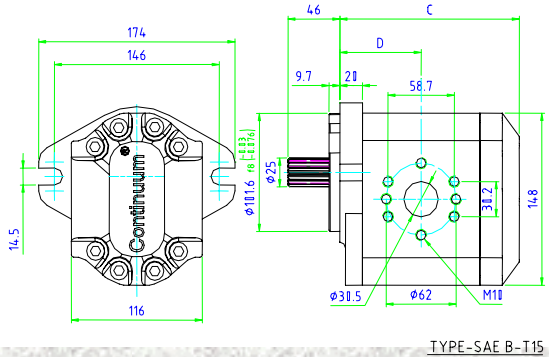
TYPE SAEB-AC								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
28	28	40,3	151	67,55	270	280	300	57
32	32,2	46,3	155	69,55	252	270	300	57
36	36,3	52,3	159	71,55	239	250	300	57
40	40,5	58,3	163	73,55	225	250	300	57
45	45,1	65,0	167	75,8	213	250	300	57
50	50,3	72,4	172	78,3	202	250	300	57
			mm	mm	bar	bar	bar	dB(A)

Dimensional drawing – GR55

Shaft types & dimensions



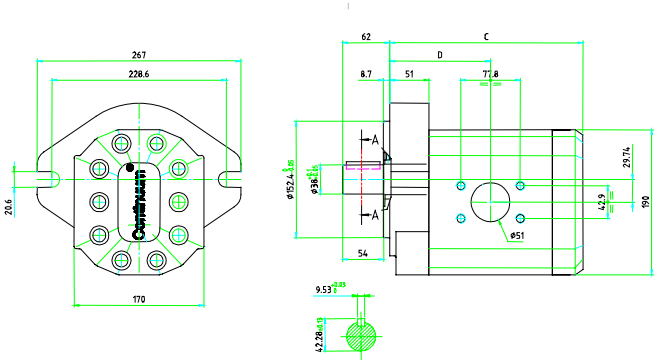
TYPE SAEB-AC								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
50	50,5	72,7	179	81,55	275	280	300	57
63	63,5	91,4	188	86,05	249	260	300	57
75	75	108,1	196	90,05	229	250	290	57
90	90,9	130,9	207	95,55	178	240	280	57
			mm	mm	bar	bar	bar	dB(A)



TYPE SAEB-T15								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
50	50,5	72,7	179	81,55	275	280	300	57
63	63,5	91,4	188	86,05	249	260	300	57
75	75	108,1	196	90,05	229	250	290	57
90	90,9	130,9	207	95,55	178	240	280	57
			mm	mm	bar	bar	bar	dB(A)

(*) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF

Dimensional drawing – GR72

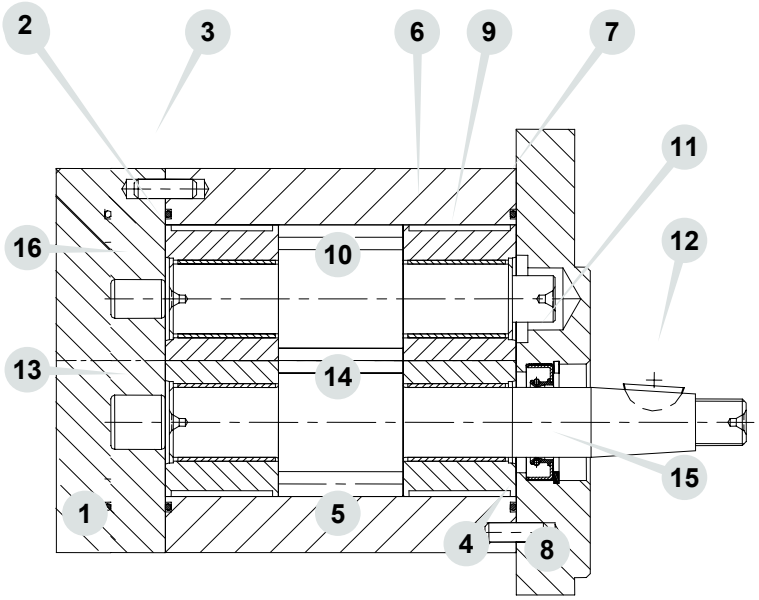


Shaft types & dimensions

TYPE SAED-AAC								
Type	CC	L/min	Dim C	Dim D	Cont Pres	Interm Press (*)	Peak Press	Noise Level
94	**94,1**	**136**	**240**	**125,5**	**270**	**280**	300	57
101	**101,45**	**147**	**243**	**127**	**252**	**270**	300	57
125	**125,5**	**181**	**253**	**132**	**239**	**250**	300	57
150	**150,9**	**218**	**263**	**137,2**	**225**	**250**	275	57
175	**175,0**	**253**	**273,5**	**142,5**	**213**	**250**	275	57
200	**200,4**	**290**	**284**	**147,5**	**202**	**250**	275	57
			mm	mm	bar	bar	Bar	dB(A)

(*) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF

Component description



1	Flange	9	Bushings
2	O-ring seal	10	Continuum® rotor
3	Centring key	11	Seal
4	Centring key	12	Shaft key
5	Body	13	Piston
6	Bushings	14	Continuum® rotor
7	O-ring seal	15	Seeger
8	Motor flange	16	Piston

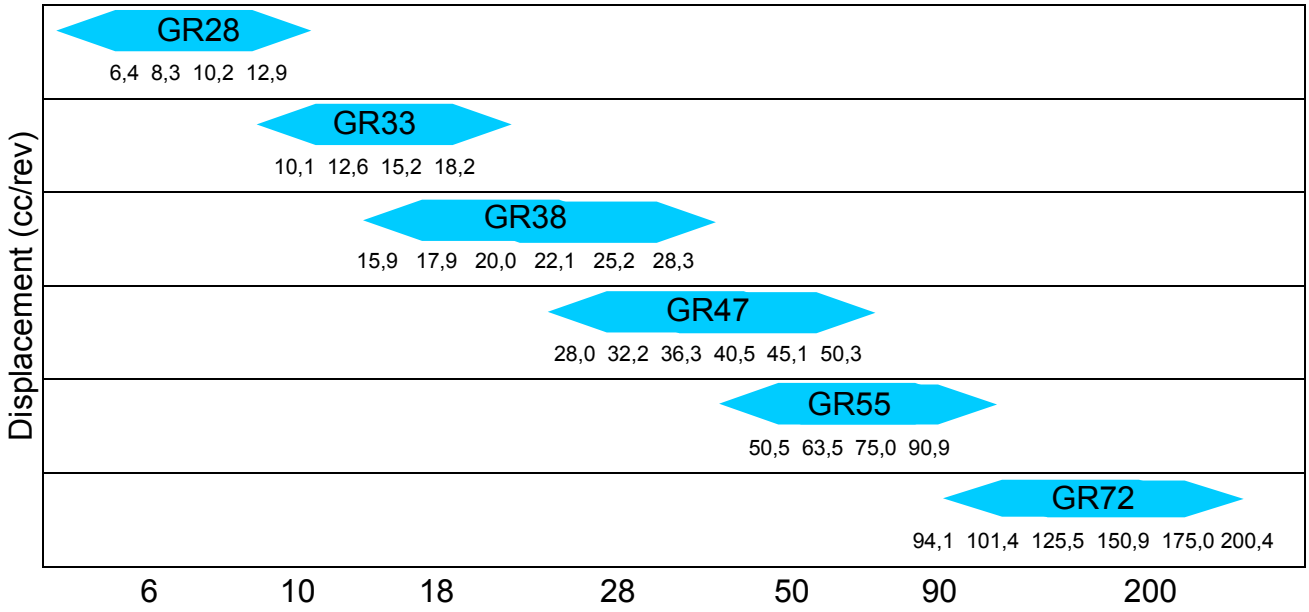
Performances in a Nutshell

Models available

Type	Model	Displacement (cm^3 / rev)	Flow (*) (L/min)	Pressures available (**)			Noise Level db(A) at 150 bar
				Continuous (bar)	Intermittent (bar)	Peak (bar)	
GR28	6	6,4	9,2	275	280	300	55
	8	8,3	12,0	246	260	300	55
	10	10,2	14,7	222	250	300	55
	13	12,9	18,6	176	230	280	55
GR33	10	10,1	14,5	275	280	300	55
	13	12,6	18,1	265	270	300	55
	15	15,2	21,8	241	250	300	55
	18	18,2	26,1	206	250	300	55
GR38	16	15,9	22,8	265	280	300	55
	18	17,9	25,8	247	260	300	55
	20	20,0	28,8	230	250	300	55
	22	22,1	31,8	222	250	300	55
	25	25,2	36,2	208	250	300	55
	28	28,3	40,7	197	250	300	55
GR47	28	28,0	40,3	270	280	300	57
	32	32,2	46,3	252	270	300	57
	36	36,3	52,3	239	250	300	57
	40	40,5	58,3	225	250	300	57
	45	45,1	65,0	213	250	300	57
	50	50,3	72,4	202	250	300	57
GR55	50	50,5	72,7	275	280	300	57
	63	63,5	91,4	249	260	300	57
	75	75,0	108,1	229	250	300	57
	90	90,9	130,9	178	250	300	57
GR72	94	94,1	136	270	280	300	57
	101	101,45	147	252	270	300	57
	125	125,5	181	239	250	300	57
	150	150,9	218	225	240	300	57
	175	175,0	253	213	250	300	57
	200	200,4	290	202	250	300	57

(*) the flow is computed assuming a volumetric efficiency equal to 96% and 1.500 rpm
(**) Intermittent: cycle 20 sec. ON & 3 sec. OFF – Peak: cycle 1 sec. ON & 3 sec. OFF ; Refer to Dimensional Drawing tables for Exact Pressure supported

Product Range



Ordering code

Type			Size						Flange				Ports		Shaft Seal	Rot.
													G (G3.4)	M (SAE)		
G R	28	2 V	006	008	010	013			F1-AC3	F1P-AC2	F1L-AGL54	F1K-AG54			***None*** NBR	**DX** Destra **SX** Sinistra
	33		010	013	015	018			F2-AC4	F2BK1-AC6	F2BK7-AG	FSAEA-AAC				
	38		016	018	020	022	025	028	F2-AC4	F2BK1-AC6	F2BK7-AG	FSAEA-AAC	G			
	47		028	032	036	040	045	050	F3-AC9		FSAEB-AAC		M		**V** Viton FPM	
	55		050	063	075	090			FSAEB-AAC		FSAEB-AT15					
	72		094	101	125	150	175	200	FSAED-AAC							

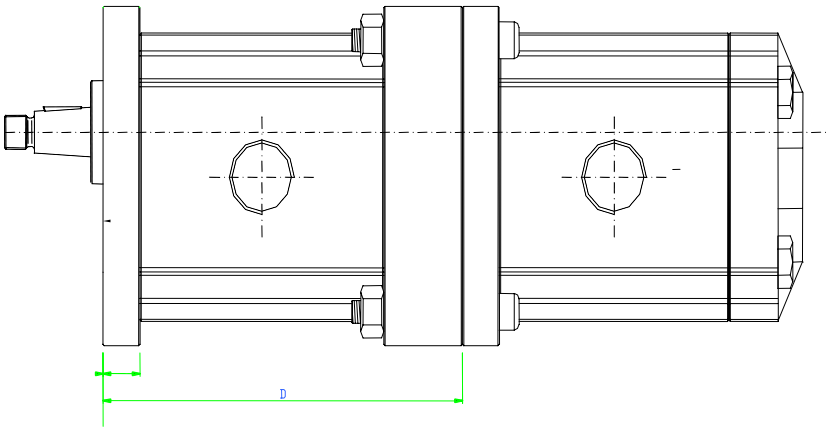
The data shown in the catalogue can change without notice.
For special applications – please contact the main office.

GR28 2V 006CC F1AC3 G DX: 6CC pump Reinforced Conic Tapered 1:8 Shaft with Threaded port Clockwise

GR55 2V 063CC FSAEB-AAC V SX: 63CC pump Parallel Keyed Shaft with Dual Flange connection CounterClockwise

Dimensional drawing – Tandem Group 2 + Group 2

For Unit dimensions please refer to GR33 and GR38 Dimensional Drawings



Front Pump	CC	Dim D	Cont Pres (*)	Interm Press	Peak Press	Noise Level
GR33	010	124,1	275	280	300	55
	013	129,1	265	270	300	55
	015	134,2	241	250	300	55
	018	141,2	206	250	300	55
GR38	016	128,1	265	280	300	55
	018	131,1	247	260	300	55
	020	134,1	230	250	300	55
	022	137,1	222	250	300	55
	025	141,6	208	250	300	55
	028	146,1	197	250	300	55
		mm	bar	bar	bar	dB(A)

Ordering code Multiple Pumps

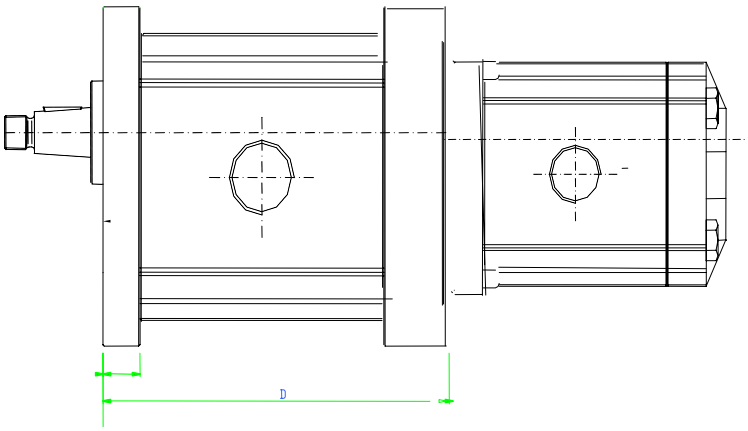
Type of Frontal Pump			Size First Stage	Other Stage Pump	Flange Frontal Pump		Oil Ports G (G3.4) M (SAE)	Shaft Seal	Rot.
DG	33	2V	Any Displacement GR33	Any Group 2 Displacement	F2-AC4	FSAEA-AAC	G M	N (NBR) V (FKM)	DX
	38		Any Displacement GR38		F2-AC4	FSAEA-AAC	G M	N (NBR) V (FKM)	

DG38 2V 016CC+018CC F2AC4 G N DX: Tandem Pump of 16CC Frontal Pump and 18CC Second Stage with European Standard 1:8 Tapered Cone, Threaded ¾" Oil Ports, NBR Seals, Clockwise rotation.

For Dimensions use the table in this stage for the "D" Dimension and table in the previous pages for the other dimensions and information.

Dimensional drawing – Tandem Group 2 + Group 1

For Unit dimensions please refer to GR33 and GR38 Dimensional Drawings



Front Pump	CC	Dim D	Cont Pres (*)	Interm Press	Peak Press	Noise Level
GR33	010	115,93	275	280	300	55
	013	120,60	265	270	300	55
	015	125,36	241	250	300	55
	018	131,90	206	250	300	55
GR38	016	119,67	265	280	300	55
	018	122,47	247	260	300	55
	020	125,27	230	250	300	55
	022	128,07	222	250	300	55
	025	132,28	208	250	300	55
	028	136,48	197	250	300	55
		mm	bar	bar	bar	dB(A)

Ordering code Multiple Pumps

Type of Frontal Pump			Size First Stage	Other Stage Pump		Flange Frontal Pump		Oil Ports G (G3.4) M (SAE)	Shaft Seal	Rot.
DG	33	2V	Any Displacement GR33	GR28	Any displacement GR28	F2-AC4	FSAEA-AAC	G M	N (NBR) V (FKM)	DX
	38		Any Displacement GR38			F2-AC4	FSAEA-AAC	G M	N (NBR) V (FKM)	

DG38 2V 016CC+ GR28 010CC F2AC4 G N DX: Tandem Pump of 16CC Frontal Pump and 10CC Second Stage with European Standard 1:8 Tapered Cone Threaded Oil Ports ¾” on first stage and ½” on second stage, NBR Seals, Clockwise rotation.

For Dimensions use the table in this stage for the “D” Dimension and table in the previous pages for the other dimensions and information.

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