



▶ GCL SERIES ROBOTIC CYCLOIDAL GEARBOXES



Robotic Cycloidal Gearboxes

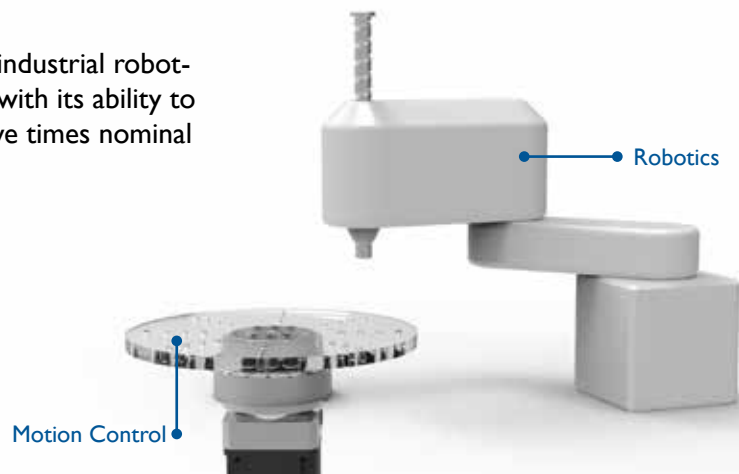
GAM's **GCL Series Robotic Cycloidal Gearboxes** provide low backlash and high rigidity for horizontal and vertical **robotic** and **motion control** applications.

- Backlash of ≤ 1 arcmin with lost motion of ≤ 1 arcmin
- Withstands the frequent start-stop impact loads of industrial robots with impact resistance 5x nominal torque
- Multi-tooth meshing for torsional rigidity
- Planetary gear for input speed reduction
- Flange output in 7 sizes with nominal output torque of 167 to 4410 Nm and ratios of 57:1 to 192.4:1
- Flanged hollow output in 6 sizes (up to 138 mm through hole) with nominal output torque of 490 to 4900 Nm
- Drops in for many competitors' products
- Integrated motor adapter plate ready to mount your motor

Applications

The GCL is well suited to high-end industrial robotics and motion control applications with its ability to withstand start-stop impact loads five times nominal torque.

- Robotics
- Tool changers
- Positioning
- Turntables
- Pick & Place



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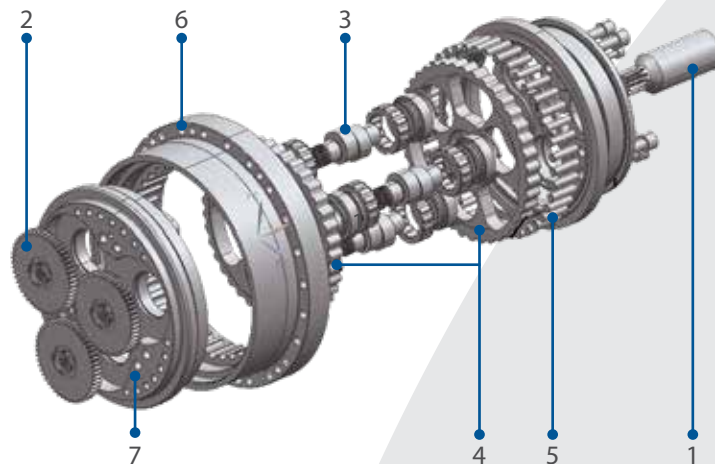
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Drive Sequence



1. Input shaft/pinion
2. Planetary gear
3. Eccentric gearshaft
4. Cycloid gear
5. Pins
6. Pin Housing
7. Output

GCL Series Models

GCLC

Component Gearbox



GCLC-F
Solid Flange



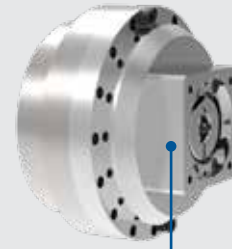
GCLC-H
Hollow Flange

GCL

Gearbox with cover & integrated input



GCL-F
Solid Flange



Integrated
Motor Mount

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GCLC-F / GCL-F



GCLC-F / GCL-F	Nominal	020		040		080		110		160		320*		450*	
Ratio Moment of Inertia	kgcm ²	57:1	0.0966	57:1	0.325	57:1	0.816	81:1	0.988	81:1	1.77	81:1	4.83	81:1	8.75
		81:1	0.0607	81:1	0.220	81:1	0.600	111:1	0.696	101:1	1.40	101:1	3.79	101:1	6.91
		105:1	0.0432	105:1	0.163	111:1	0.482	161:1	0.436	129:1	1.06	118.5:1	3.15	129:1	5.20
		121:1	0.0356	121:1	0.137	161:1	0.396	175.28:1	0.389	145:1	0.87	129:1	2.84	153	4.12
		141:1	0.0288	153:1	0.101	175.28:1	0.298			171:1	0.74	141:1	2.54	171:1	3.61
		161:1	0.0239									153:1	2.20	192.4:1	3.07
												171:1	1.97	201	2.90
												185:1	1.77	210.23	2.71
										201:1	1.60	257.84	2.03		
Nominal Output Torque	Nm	167		412		784		1078		1568		3136		4410	
Acceleration Torque	Nm	412		1029		1960		2695		3920		7840		11,025	
Momentary Maximum Allowable Torque (Impact)	Nm	883		2058		3920		5390		7840		15,680		22,050	
Maximum Output Speed	rpm	75		70		70		50		45		35		25	
Allowable Bending Moment	Nm	882		1666		2156		2940		3920		7056		8820	
Momentary Allowable Bending Moment	Nm	1764		3332		4312		5880		7840		14,112		17,640	
Tilting Rigidity	Nm/arcmin	372		931		1176		1470		2940		4900		7448	
Torsion Stiffness	Nm/arcmin	49		108		196		294		392		980		1176	
Power Density	Nm/kg	33.4		45.8		60.3		63.4		60.3		71.3		66.8	
Weight (GCLC-F)	kg	4.7		9.3		13.1		17.4		26.4		44.3		66.4	
Weight (GCL-F)	kg	6.3		11.8		17.3		23.8		34.2		-		-	
Backlash Lost Motion		≤1.0 arcmin ≤1.0 arcmin													
Angular Transmission Accuracy		1.0 arcmin													
Service Life		6000 hours													
Lubrication		Molywhite RE00													

Speed/Torque Capacity

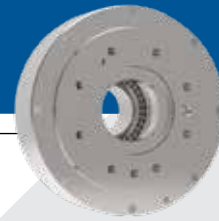
GCLC-F / GCL-F	Output Speed	020		040		080		110		160		320*		450*	
		RPM	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm
Output Torque / Input Power	5	231	0.16	572	0.4	1088	0.76	1499	1.05	2176	11.52	4361	3.04	6135	4.28
	10	188	0.26	465	0.65	885	1.24	1215	1.7	1774	2.48	3538	4.94	4978	6.95
	15	167	0.35	412	0.86	784	1.64	1078	2.26	1568	3.28	3136	6.57	4410	9.24
	20	153	0.43	377	1.05	719	2.01	990	2.76	1441	4.02	2881	8.05	4047	11.3
	25	143	0.50	353	1.23	672	2.35	925	3.23	1343	4.69	2695	9.41	3783	13.2
	30	135	0.57	334	1.40	637	2.67	875	3.67	1274	5.34	2548	10.7		
	40	124	0.70	307	1.71	584	3.26	804	4.49						
	50	115	0.81	287	2.00	546	3.84								
	60	110	0.92	271	2.27	517	4.33								

*GCLC-F Only

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GCLC-H	Nominal	050	120	200	320	400	500
Base Ratio *		32.54:1	36.75:1	34.86:1	35.61:1	35.61:1	37.34:1
Exact Base Ratio*		1985/61	36.75/1	1499/43	2778/78	2778/78	3099/38
Moment of Inertia (at Center Drive Gear)	kgcm ²	0.3812	1.0037	2.079	4.568	4.611	11.136
Nominal Output Torque	Nm	490	1176	1961	3136	3920	4900
Acceleration Torque	Nm	1225	3675	4900	7840	9800	12250
Momentary Maximum Allowable Torque (Impact)	Nm	2450	7350	9800	15680	19600	24500
Maximum Output Speed	rpm	50	40	30	25	20	20
Allowable Bending Moment	Nm	1764	3920	8820	20580	26460	34300
Momentary Allowable Bending Moment	Nm	3528	7840	17640	39200	52920	78400
Tilting Rigidity	Nm/arcmin	1960	4263	9800	12740	17640	24500
Torsion Stiffness	Nm/arcmin	255	588	980	1960	2548	3430
Power Density	Nm/kg	32.7	56.0	35.0	39.2	35.6	31.8
Weight	kg	14.6	19.5	55.6	79.5	106	154
Backlash Lost Motion		≤1.0 arcmin ≤1.0 arcmin					
Angular Transmission Accuracy		1.0 arcmin					
Service Life		6000 hours					

Note: Calculations based on output speed n2 = 15 rpm

* Base ratio of gearbox, overall ratio determined by input pinion as specified by customer

Speed/Torque Capacity

GCLC-H	Output Speed	050		120		200		320		400		500	
		Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
Output Torque / Input Power	5	681	0.48	1634	1.14	2724	1.90	4361	3.04	5449	3.79	6811	4.75
	10	554	0.77	1328	1.85	2215	3.09	3538	4.94	4430	6.17	5537	7.73
	15	490	1.03	1176	2.46	1961	4.11	3136	6.57	3920	8.19	4900	10.26
	20	450	1.26	1079	3.00	1803	5.04	2881	8.05	3598	10.02	4489	12.56
	25	420	1.47	1009	3.51	1686	5.88	2690	9.41				
	30	398	1.67	955	3.99	1597	6.69						
	40	366	2.04	846	4.88								
	50	341	2.38										

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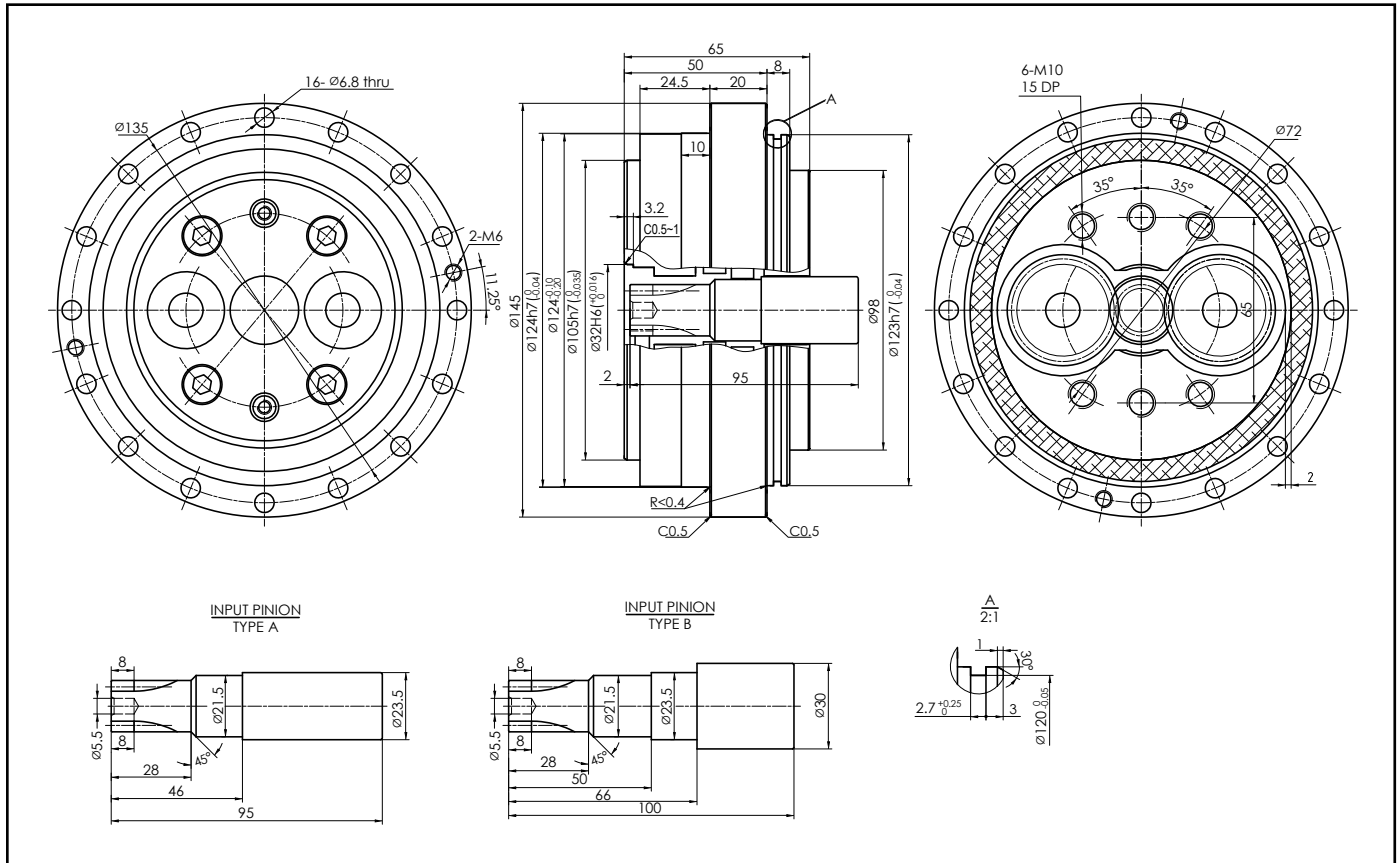
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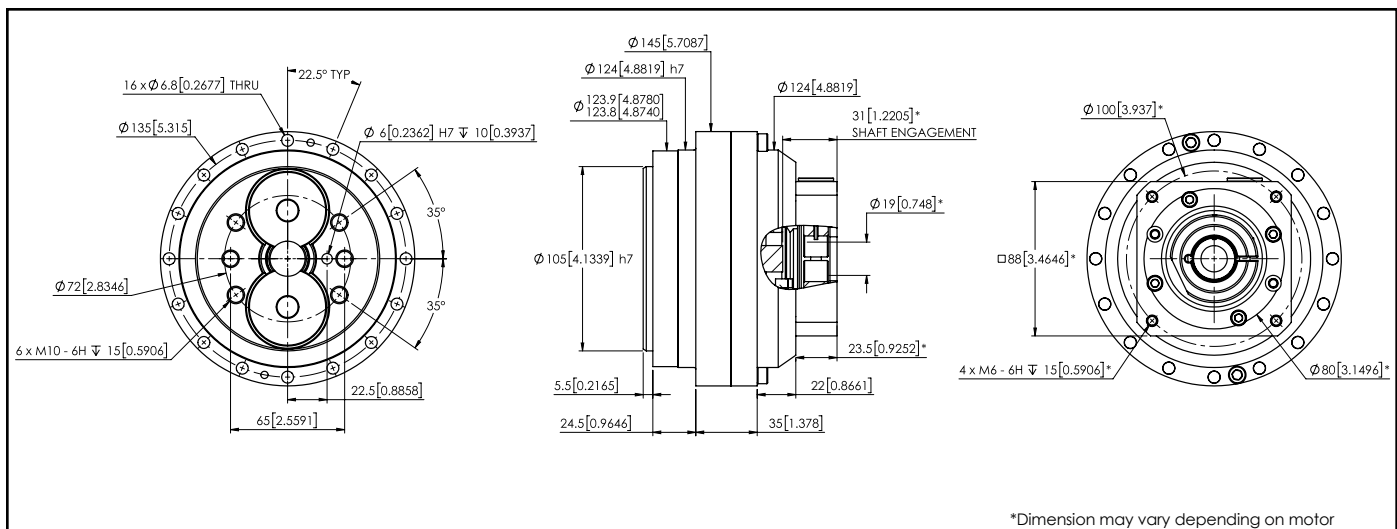
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GCLC-F-020



GCL-F-020



*Dimension may vary depending on motor

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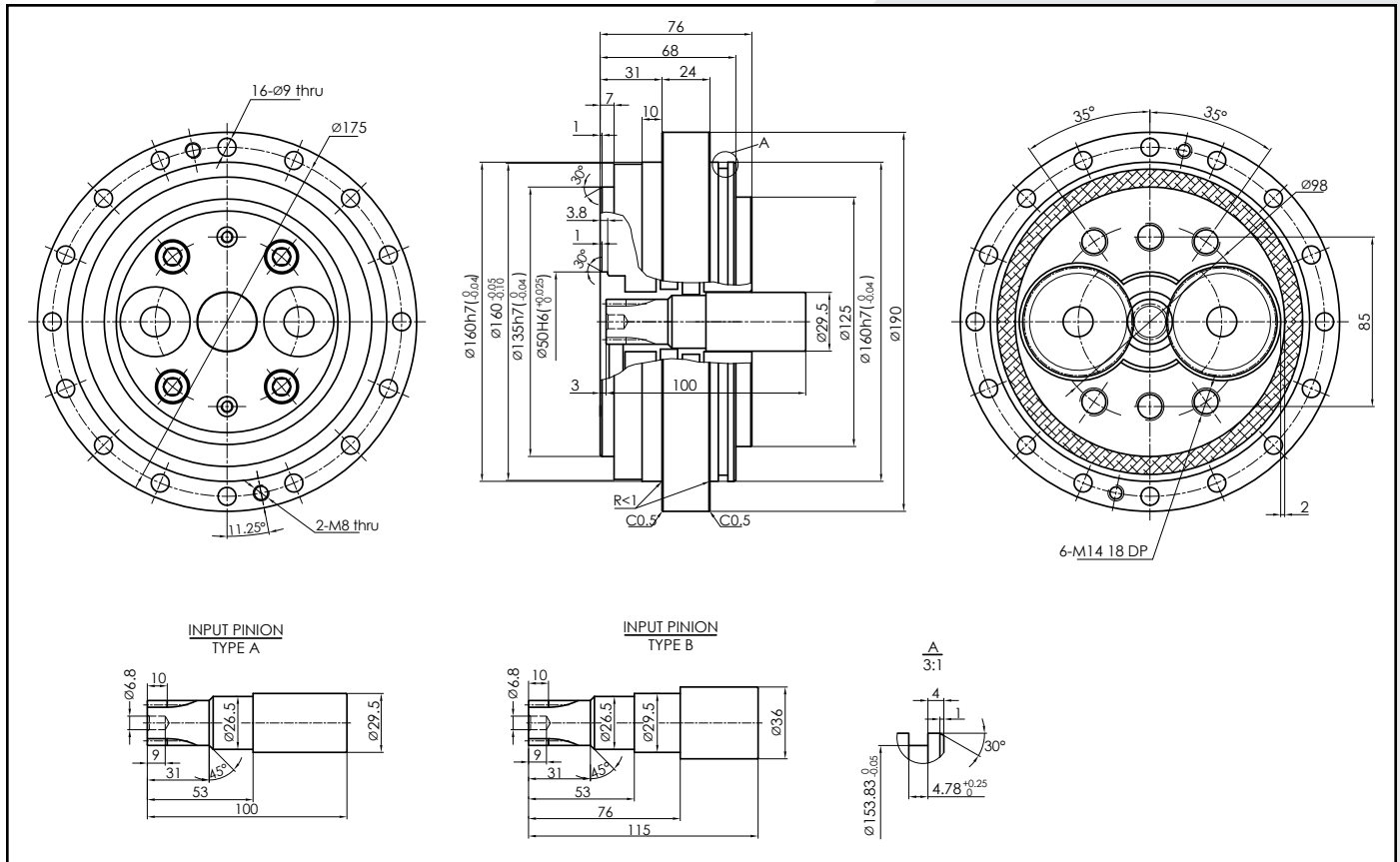
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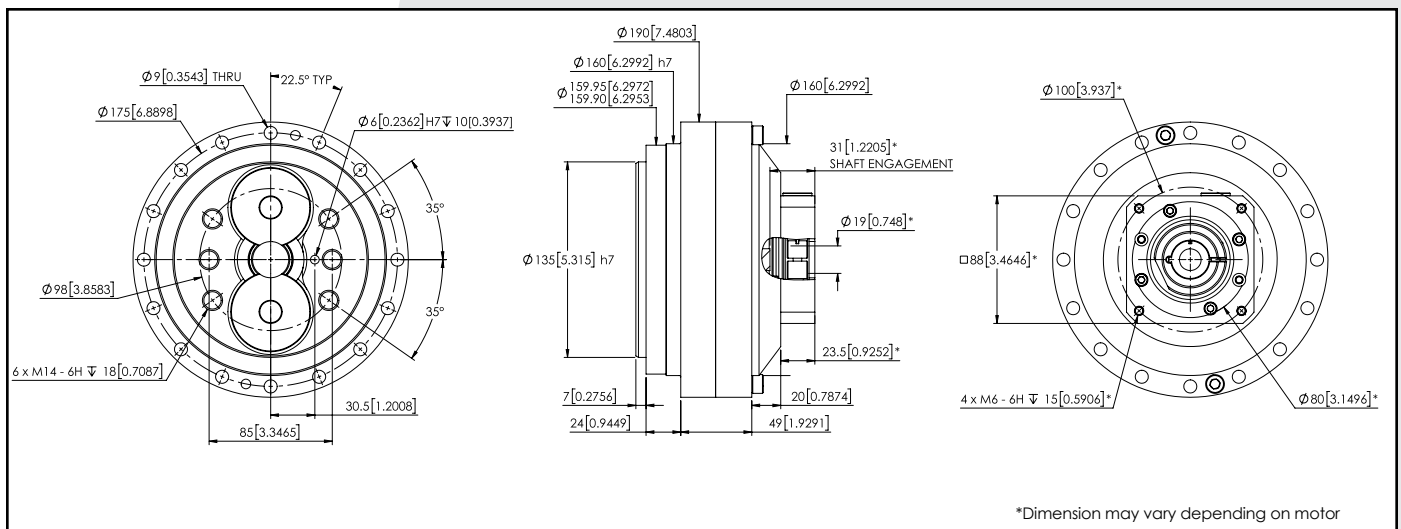
GCLC-F / GCL-F GEARBOX DIMENSIONS



GCLC-F-040



GCL-F-040



*Dimension may vary depending on motor

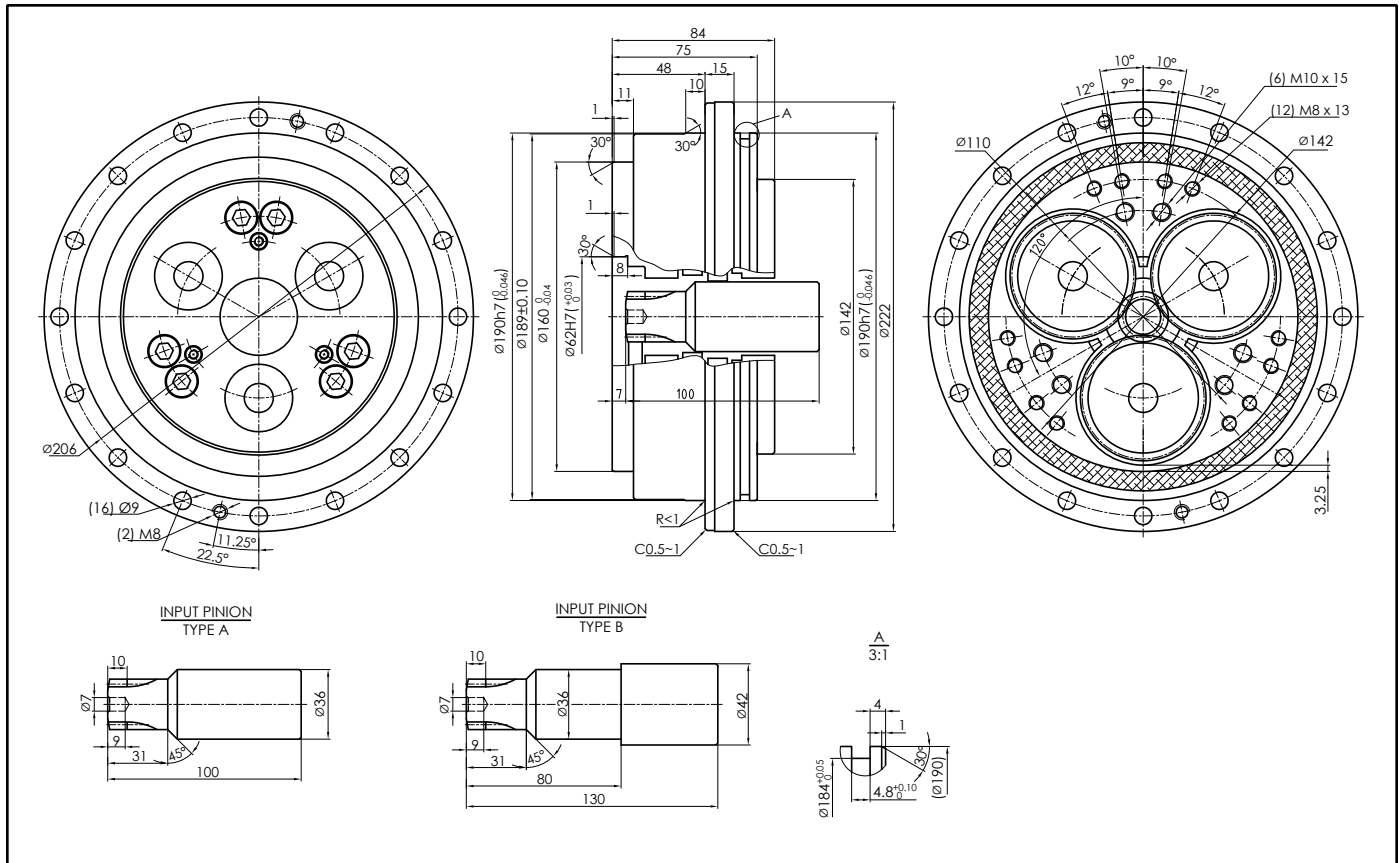
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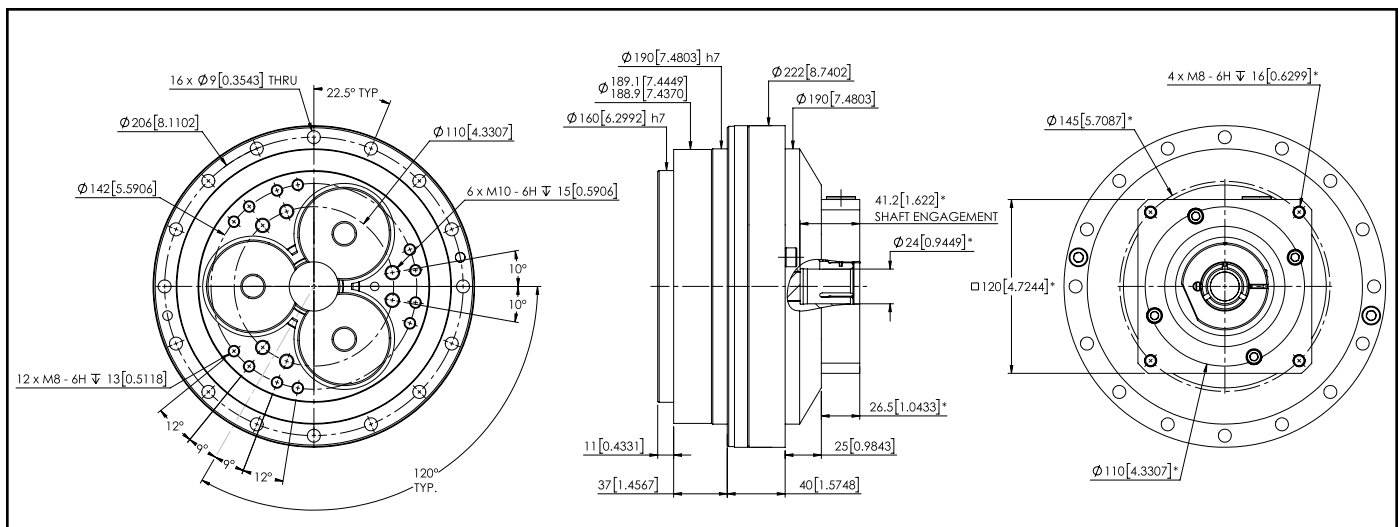


GCLC-F / GCL-F GEARBOX DIMENSIONS

GCLC-F-080



GCL-F-080



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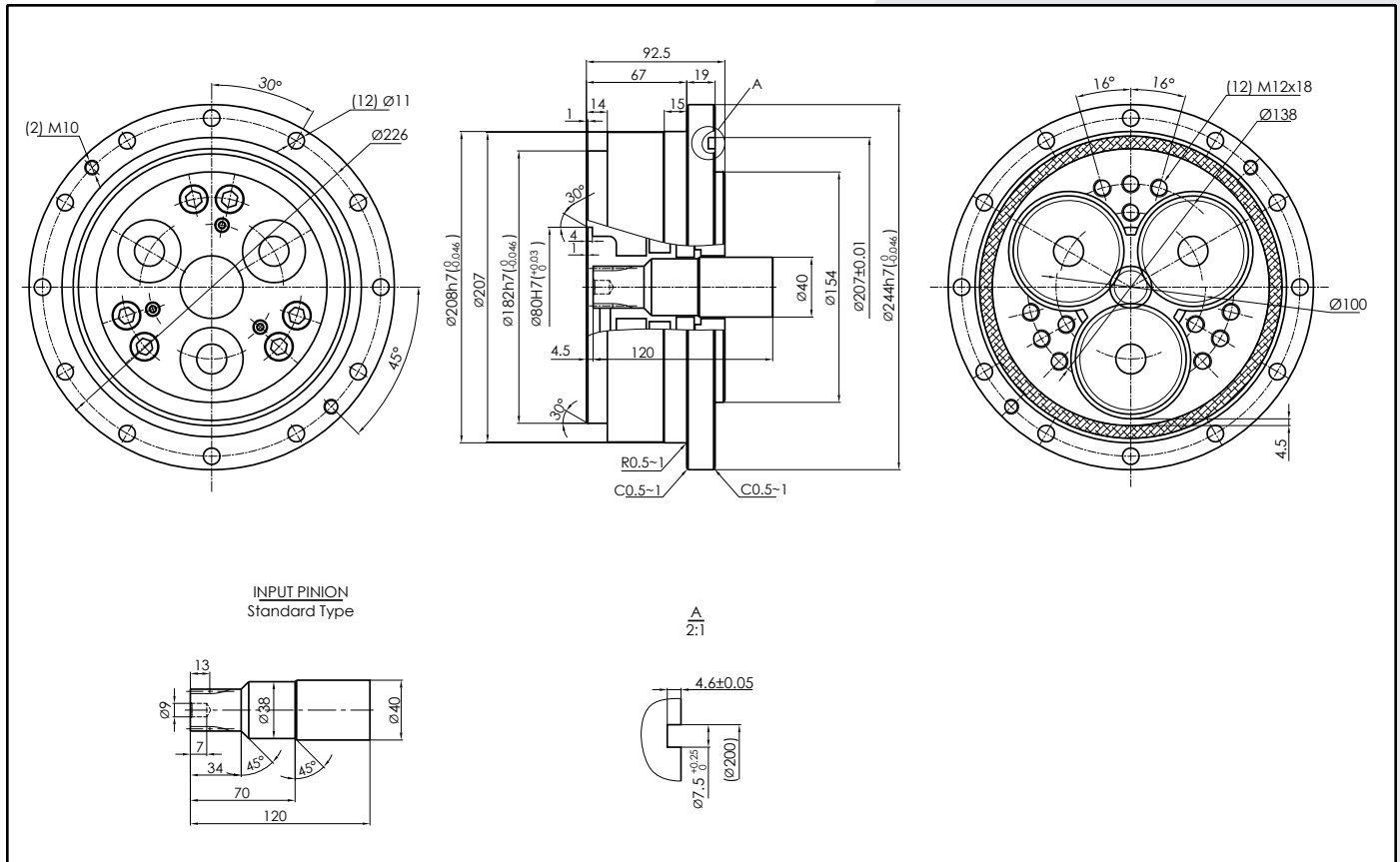
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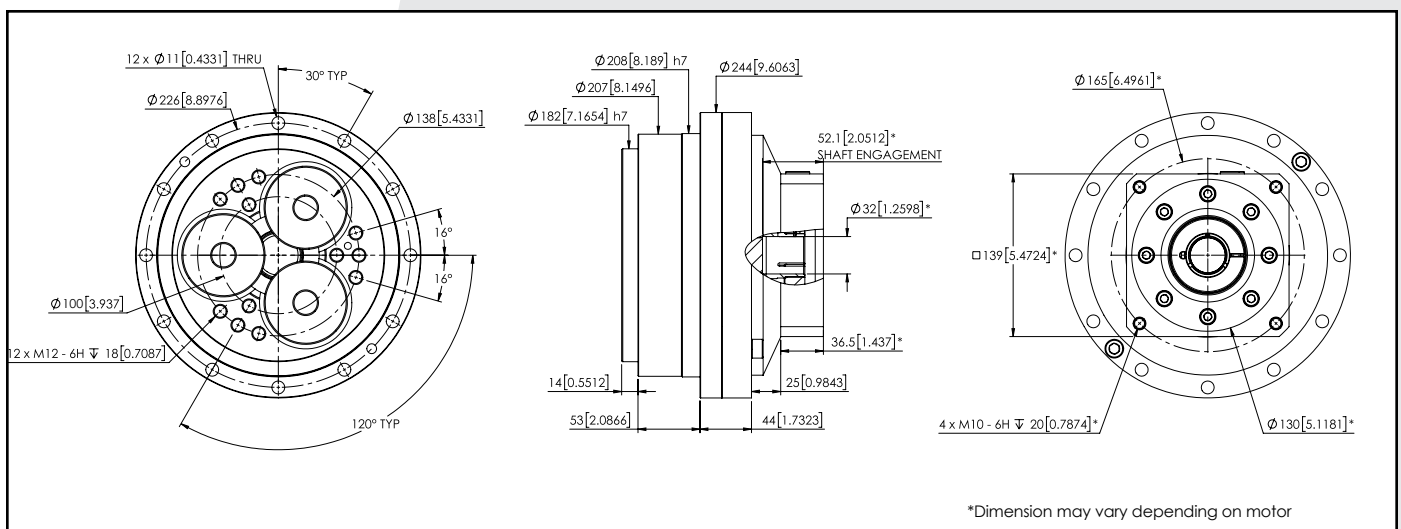
► GCLC-F / GCL-F GEARBOX DIMENSIONS



GCLC-F-110



GCL-F-110



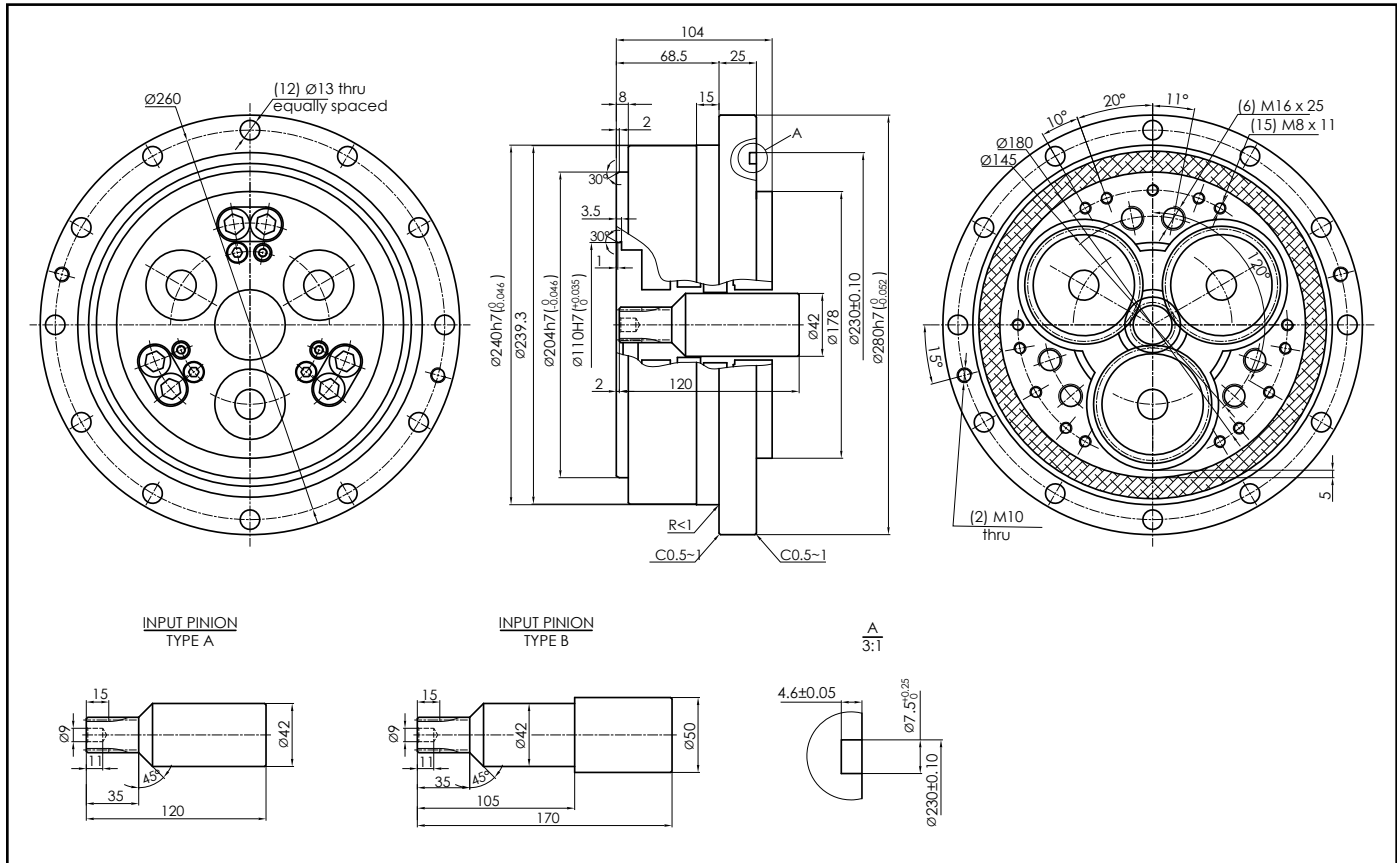
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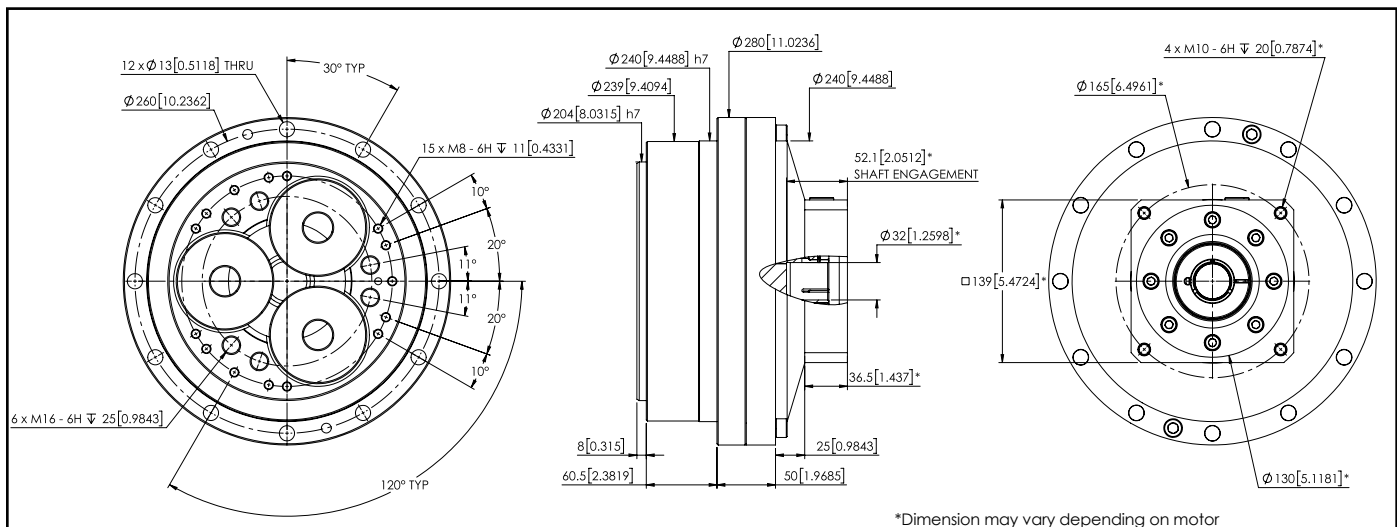


▶ GCLC-F / GCL-F GEARBOX DIMENSIONS

GCLC-F-160



GCL-F-160



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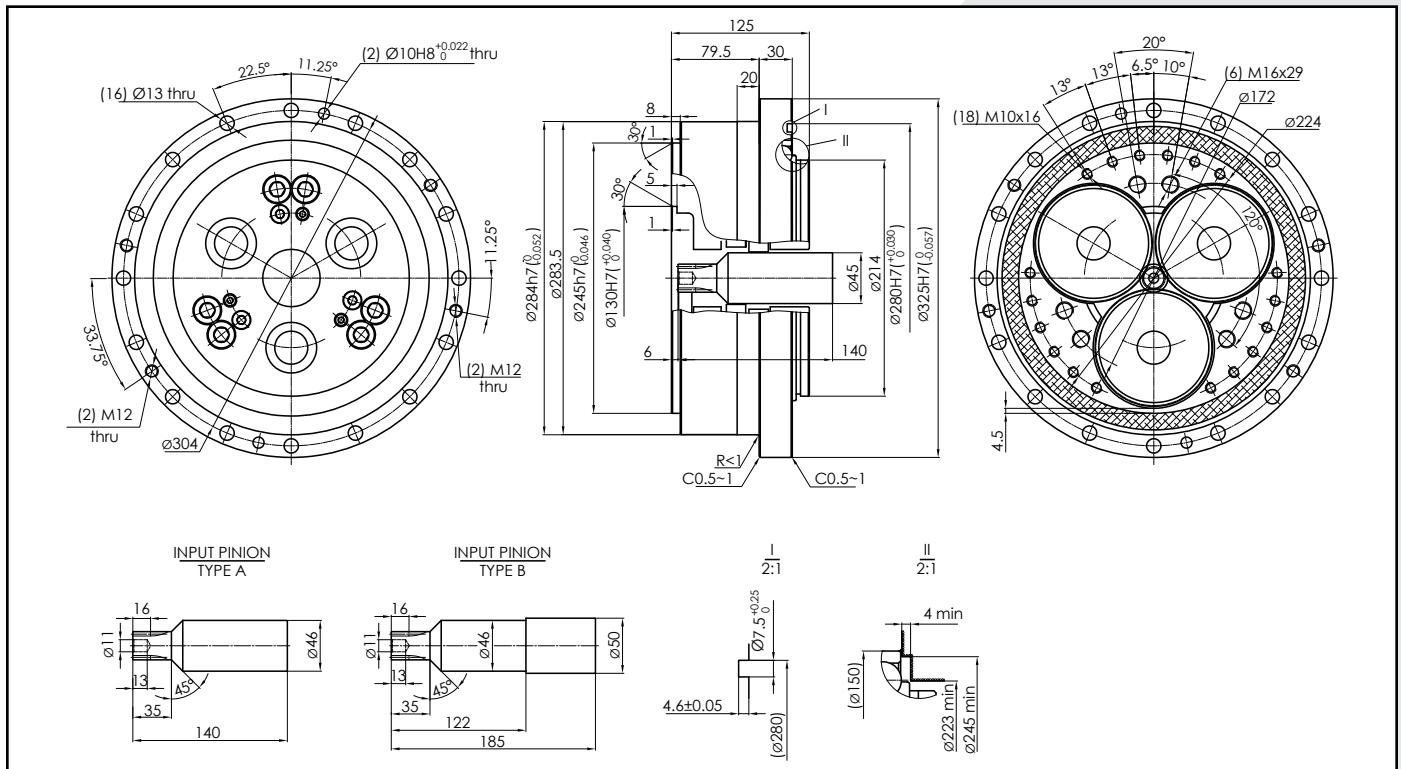
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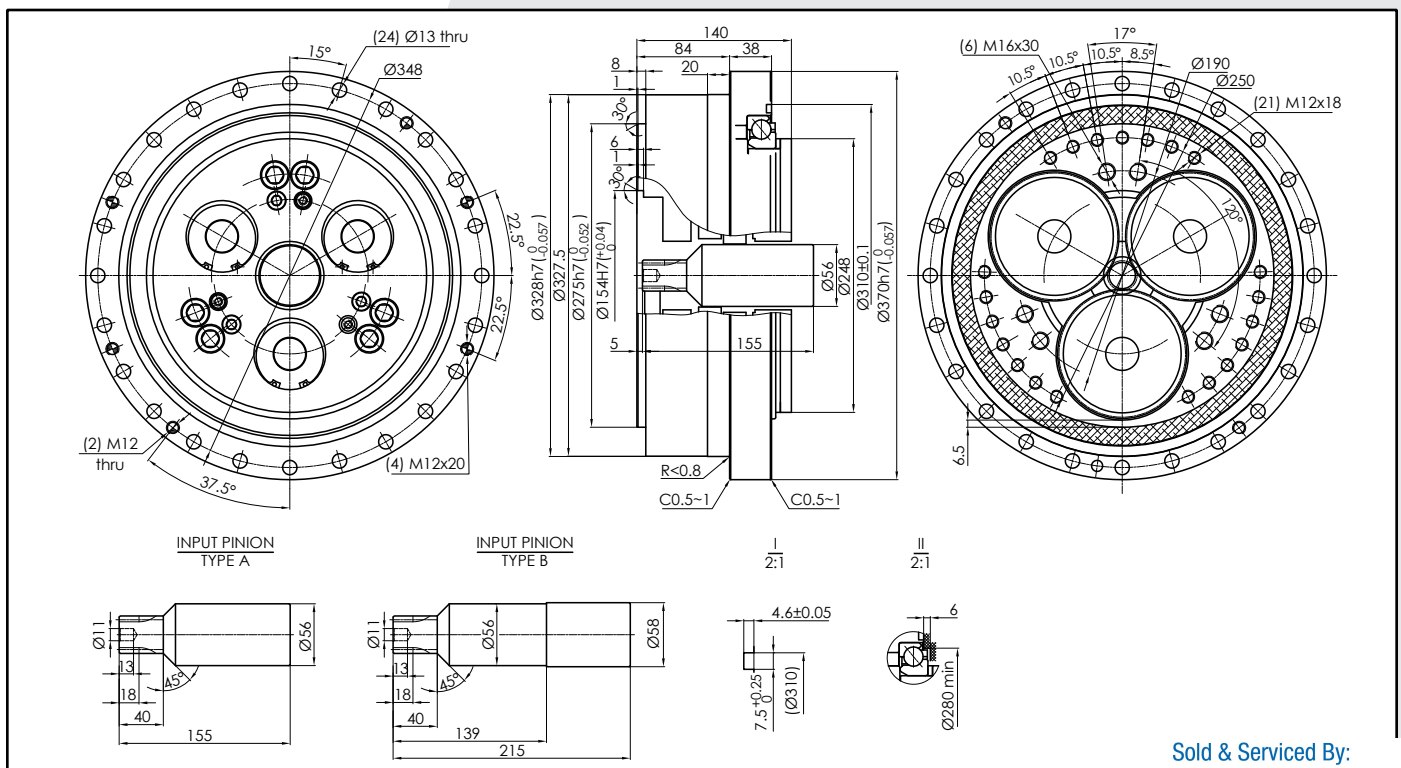
▶ GCLC-F / GCL-F GEARBOX DIMENSIONS



GCLC-F-320



GCLC-F-450

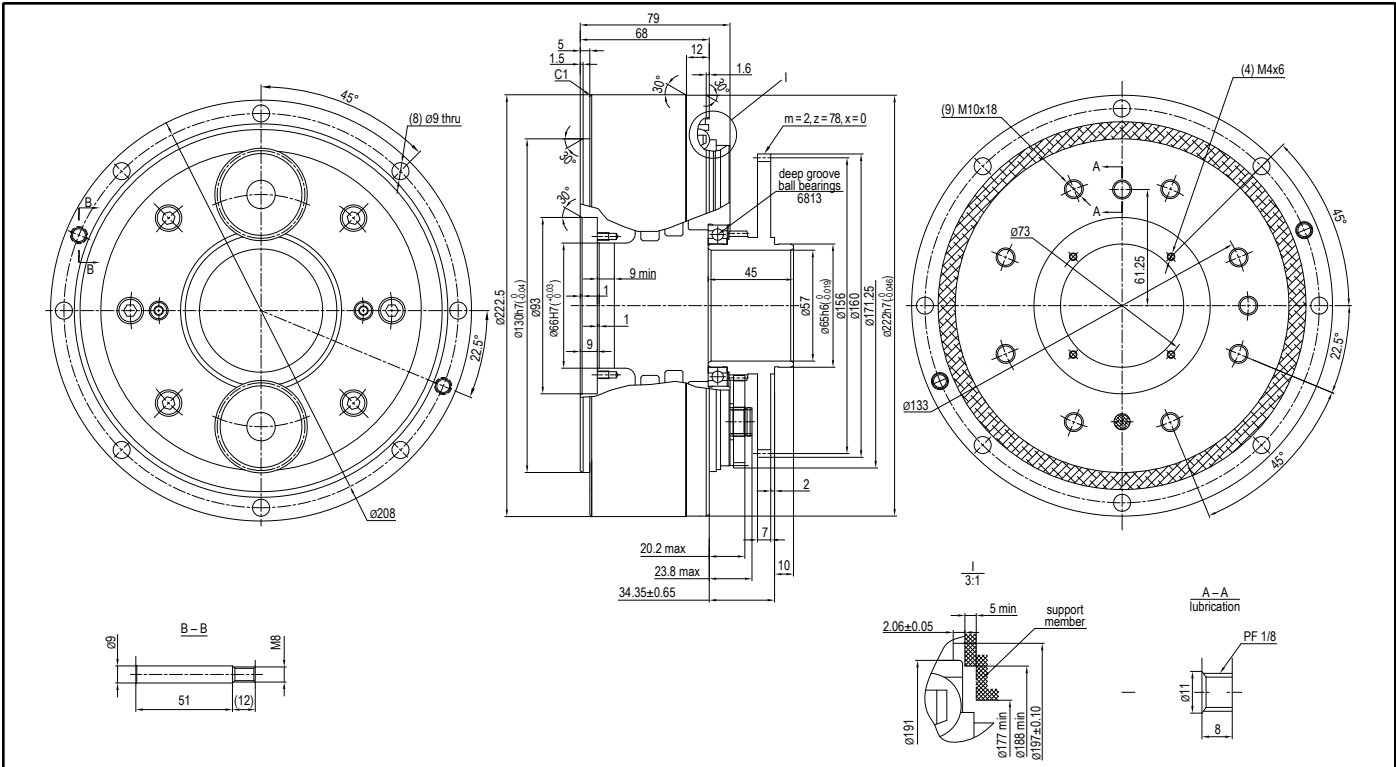




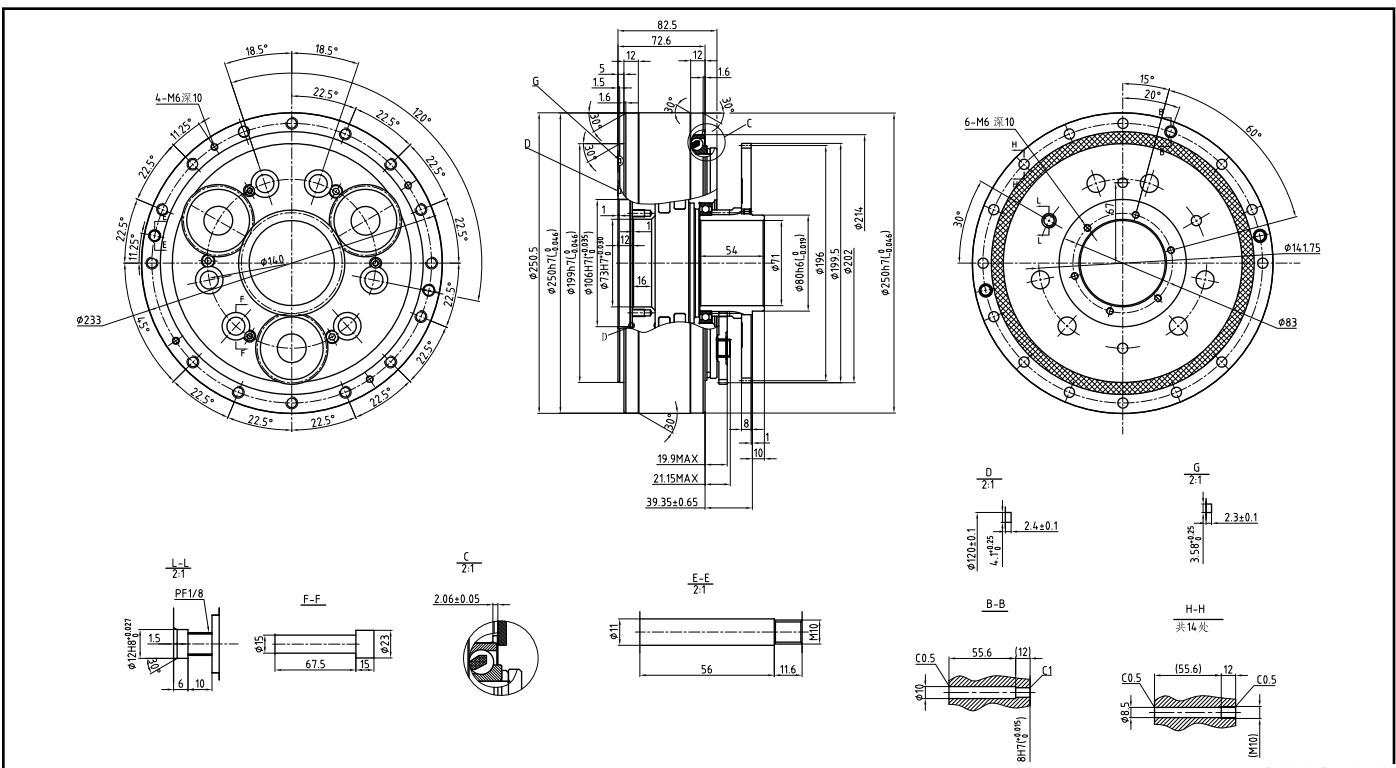
GCL-H GEARBOX DIMENSIONS

GAM

GCLC-H-050



GCLC-H-120



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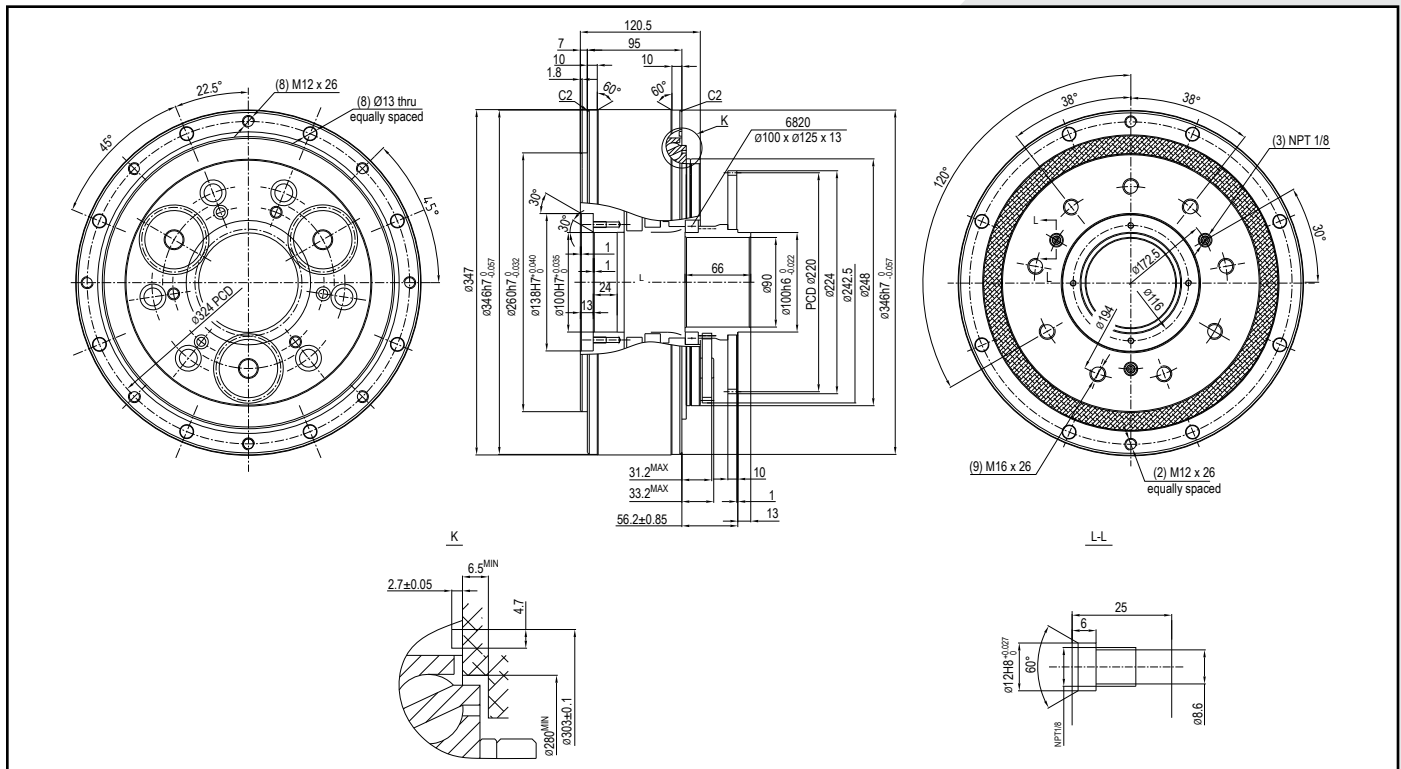
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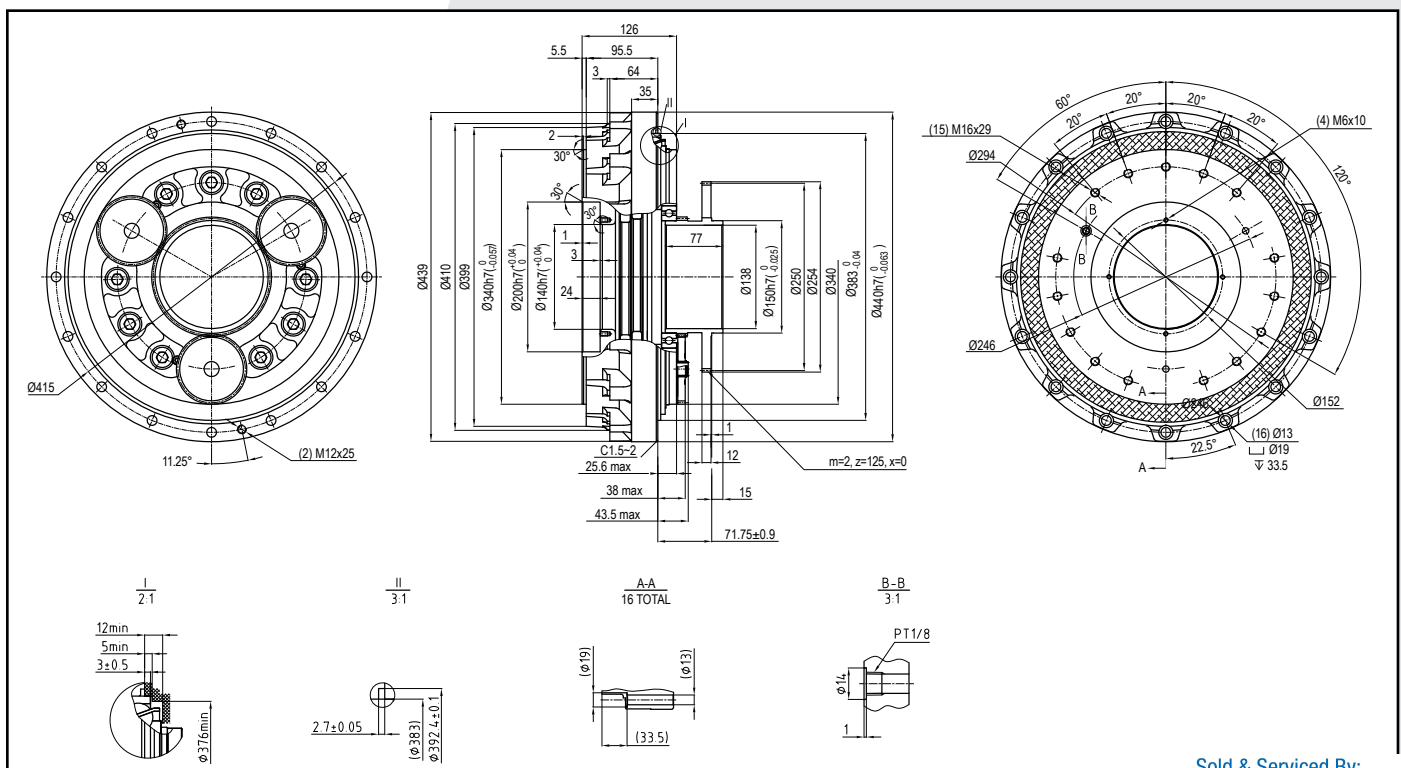
GCL-H GEARBOX DIMENSIONS



GCLC-H-200



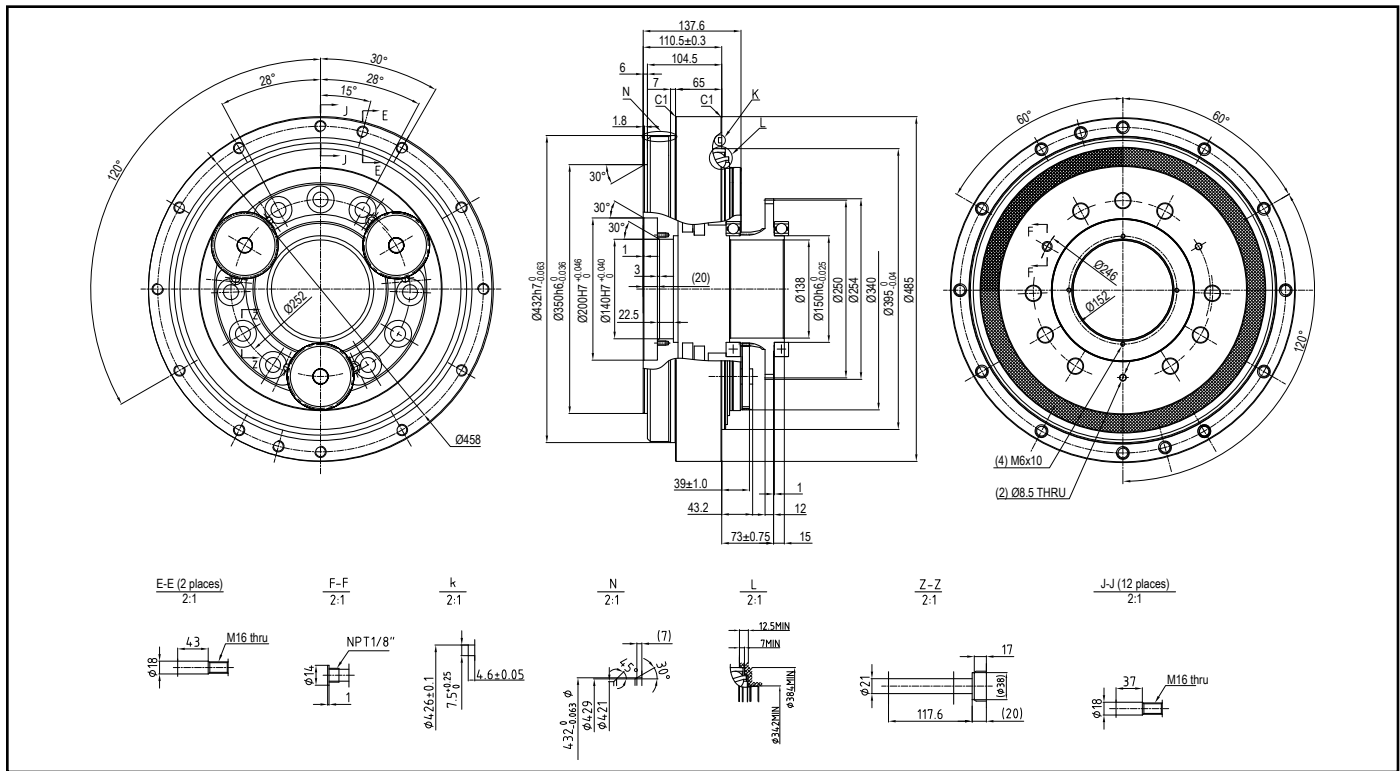
GCLC-H-320



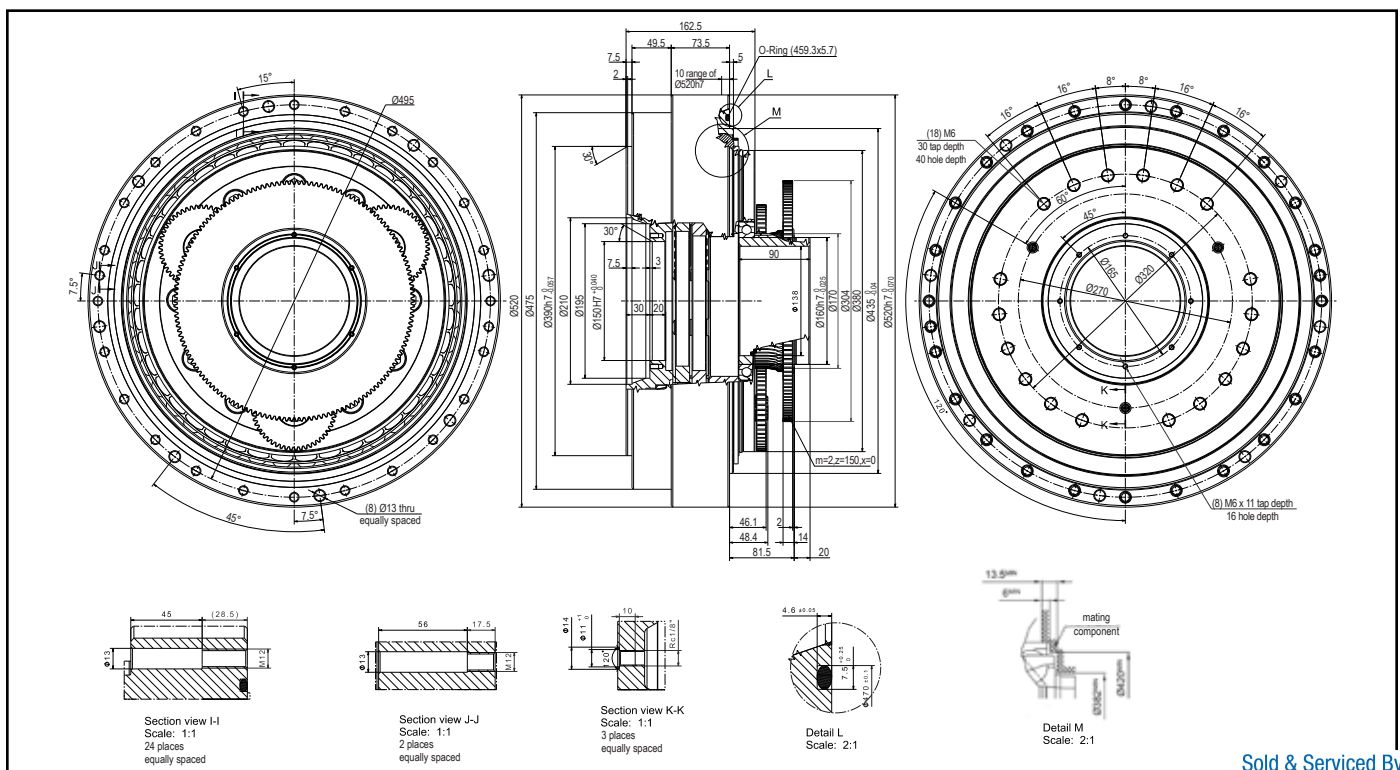


GCL-H GEARBOX DIMENSIONS

GCLC-H-400



GCLC-H-500



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▶ GCL SERIES TYPE CODE & MOUNTING OPTIONS



TYPE CODES FOR GCL SERIES

Example: GCL - F - 080 - 121C - M0000 - H0000 - C0000

Gearbox Series

GCL = Inline with cover & integrated input (-F only)
 GCLC = Inline component with loose input pinion

Gearbox Style

F = Solid Flange Output
 H = Hollow Flange Output

Gearbox Size

F: 020, 040, 080, 110, 160, 320, 450
 H: 050, 120, 200, 320, 400, 500

Ratio

See tables below for available ratios and associated type code values

Configuration Code

Assigned by GAM

Output Code

Assigned by GAM

Motor Code

Assigned by GAM

Input Option (GCL-F Only)

C = Clamp

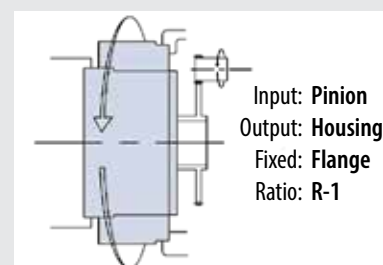
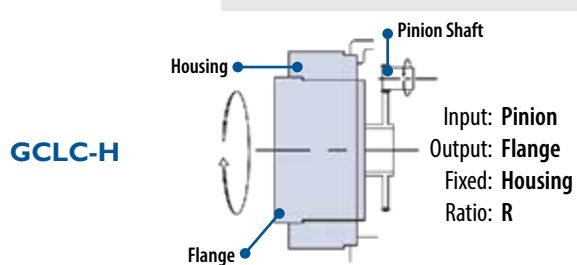
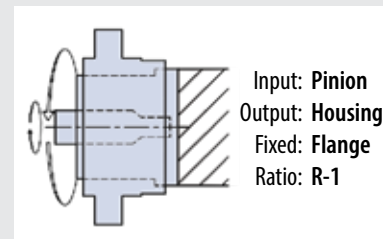
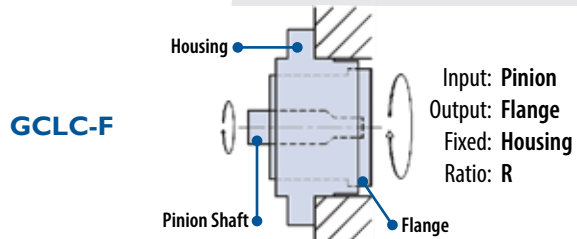
GCL-F Ratios (R:1)

020		040		080		110		160		320		450	
Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code
57:1	057	57:1	057	57:1	057	81:1	081	81:1	081	81:1	081	81:1	081
81:1	081	81:1	081	81:1	081	111:1	111	101:1	101	101:1	101	101:1	101
105:1	105	105:1	105	101:1	101	161:1	161	129:1	129	118.5:1	119	129:1	129
121:1	121	121:1	121	121:1	121	175.28:1	175	145:1	145	129:1	129	153:1	153
141:1	141	153:1	153	153:1	153			171:1	171	141:1	141	171:1	171
161:1	161									153:1	153	192.4:1	192
										171:1	171	201:1	201
										185:1	185	210.23:1	210
										201:1	201	257.84:1	258

GCL-H Ratios (R:1)

050		120		200		320		320A		400		500	
Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code	Ratio	Type Code
32.54	033	36.75	037	34.86	035	35.61	036			35.61	036	37.34	037

Mounting Options



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