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Every Turn Tailored to Your Needs

Planetary Gearbox

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AB

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PX PXF

PXR PXFR

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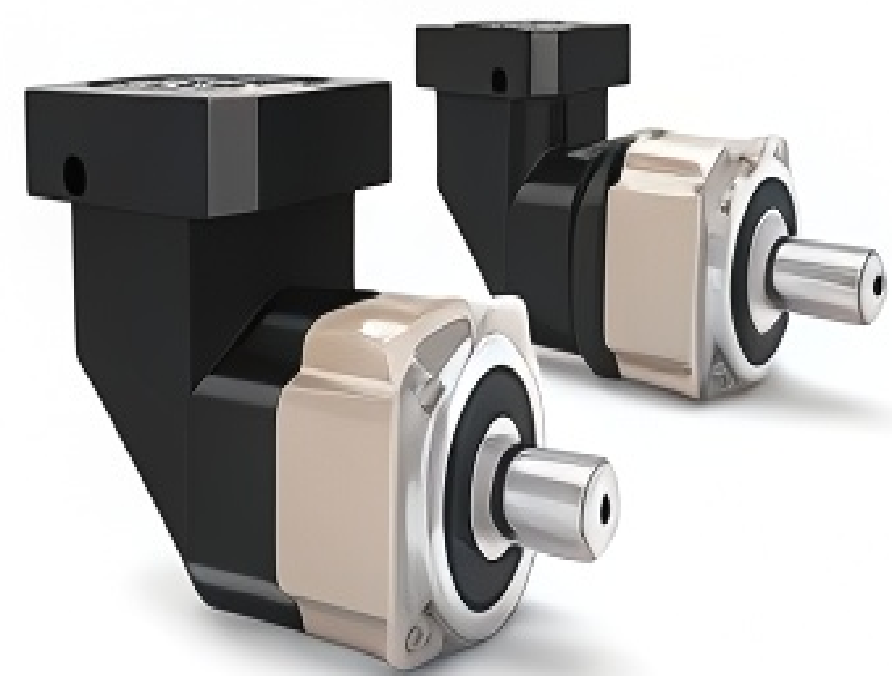
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PRODUCT SERIES INTRODUCTION



Size	43mm-220mm	
Nornal outout torque	14Nm-2000Nm	
Ratio	L1	3/4/5/6/7/8/10
	L2	12/15/20/25/30/35/40/50/60/70/80/100
Backlash	L1	≤1, ≤3, ≤6 arcmin
	L2	≤2, ≤5, ≤7 arcmin

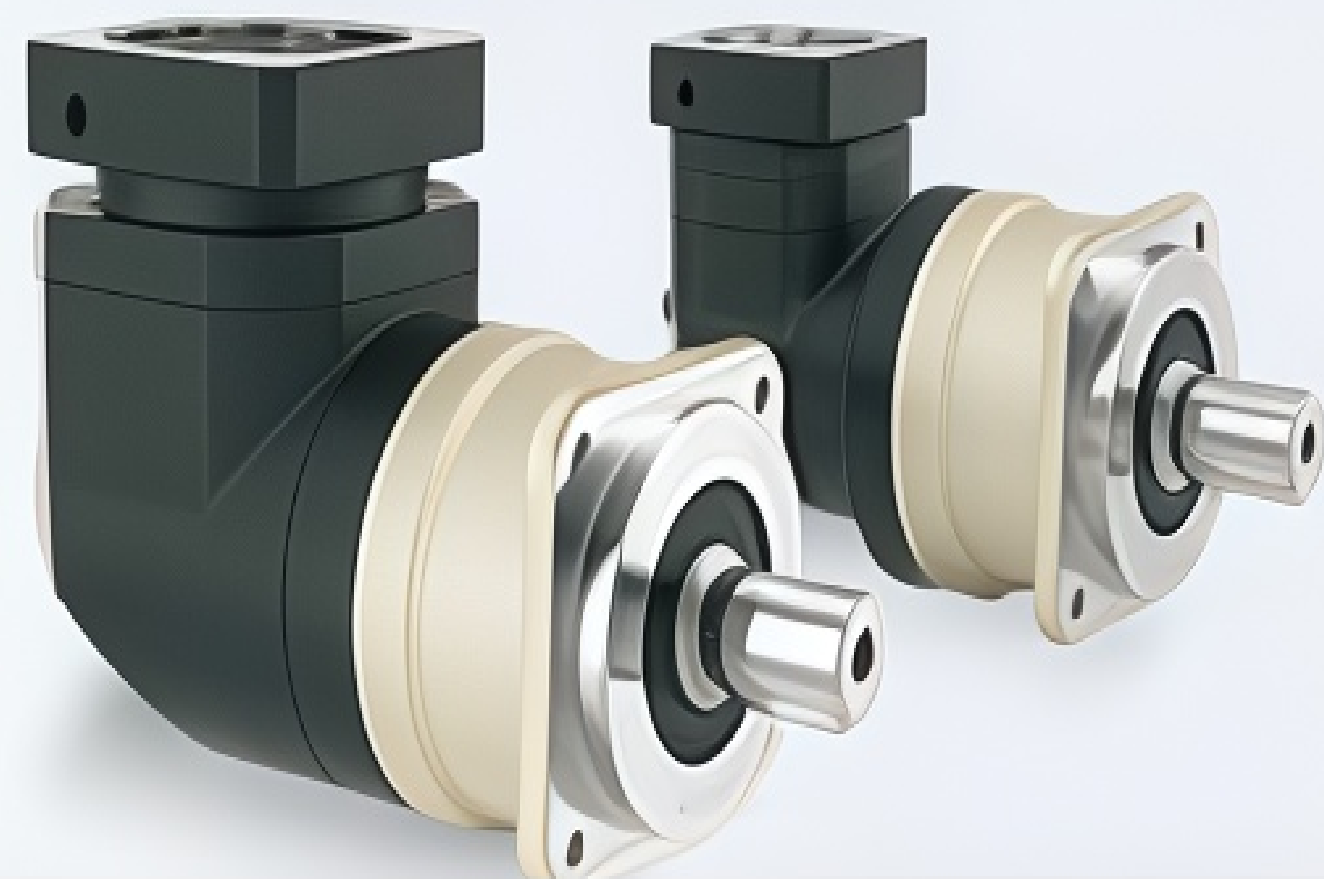
Size	42mm-220mm	
Nornal output torque	14Nm-2000Nm	
Ratio	L1	3/4/5/6/7/8/10/14/30
	L2	12/15/20/25/30/35/40/50/60/70/80/100/120/140/160/200
Backlash	L1	≤2, ≤4, ≤6 arcmin
	L2	≤3, ≤7, ≤9 arcmin



Size	47mm-255mm	
Nornal output torque	14Nm-2000Nm	
Ratio	L1	4/5/6/7/8/10
	L2	20/25/35/40/50/60/70/80/100
Backlash	L1	≤1, ≤3, ≤5 arcmin
	L2	≤2, ≤5, ≤7 arcmin

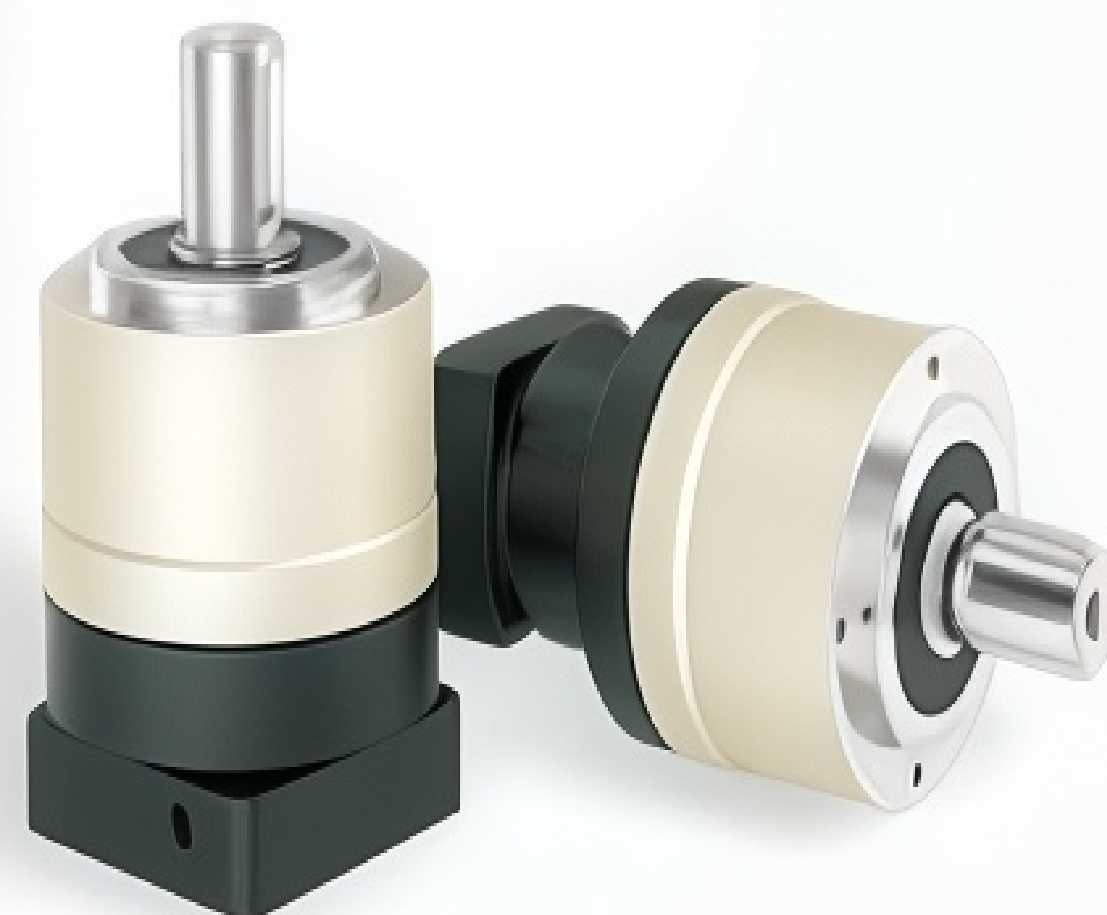
Size	47mm-255mm	
Nornal output torque	14Nm-2000Nm	
Ratio	L1	4/5/6/7/8/10/14/20
	L2	20/25/35/40/50/60/70/80/100/120/140/160/200
Backlash	L1	≤2, ≤4, ≤6 arcmin
	L2	≤3, ≤7, ≤9 arcmin

PRODUCT SERIES INTRODUCTION



Size	42mm-220mm	
Nornal output torque	14Nm-2000Nm	
Ratio	L1	3/4/5/6/7/8/10
	L2	12/15/20/25/30/35/40/50/60/70/80/100
Backlash	L1	≤5 arcmin
	L2	≤7 arcmin

Size	60mm-142mm	
Nornal output torque	40Nm-650Nm	
Ratio	L1	3/4/5/6/7/8/10/14/20
	L2	12/15/20/25/30/35/40/50/60/70/80/100/120/140/160/200
Backlash	L1	10 arcmin
	L2	12 arcmin



Size	70mm-235mm	
Nornal output torque	40Nm-2000Nm	
Ratio	L1	3/4/5/6/7/8/10
	L2	12/15/20/25/30/35/40/50/60/70/80/100
Backlash	L1	≤5 arcmin
	L2	≤7 arcmin

Size	70mm-155mm	
Nornal output torque	40Nm-650Nm	
Ratio	L1	3/4/5/6/7/8/10/14/20
	L2	12/15/20/25/30/35/40/50/60/70/80/100/120/140/160/200
Backlash	L1	10 arcmin
	L2	12 arcmin

PRODUCTS FEATURES



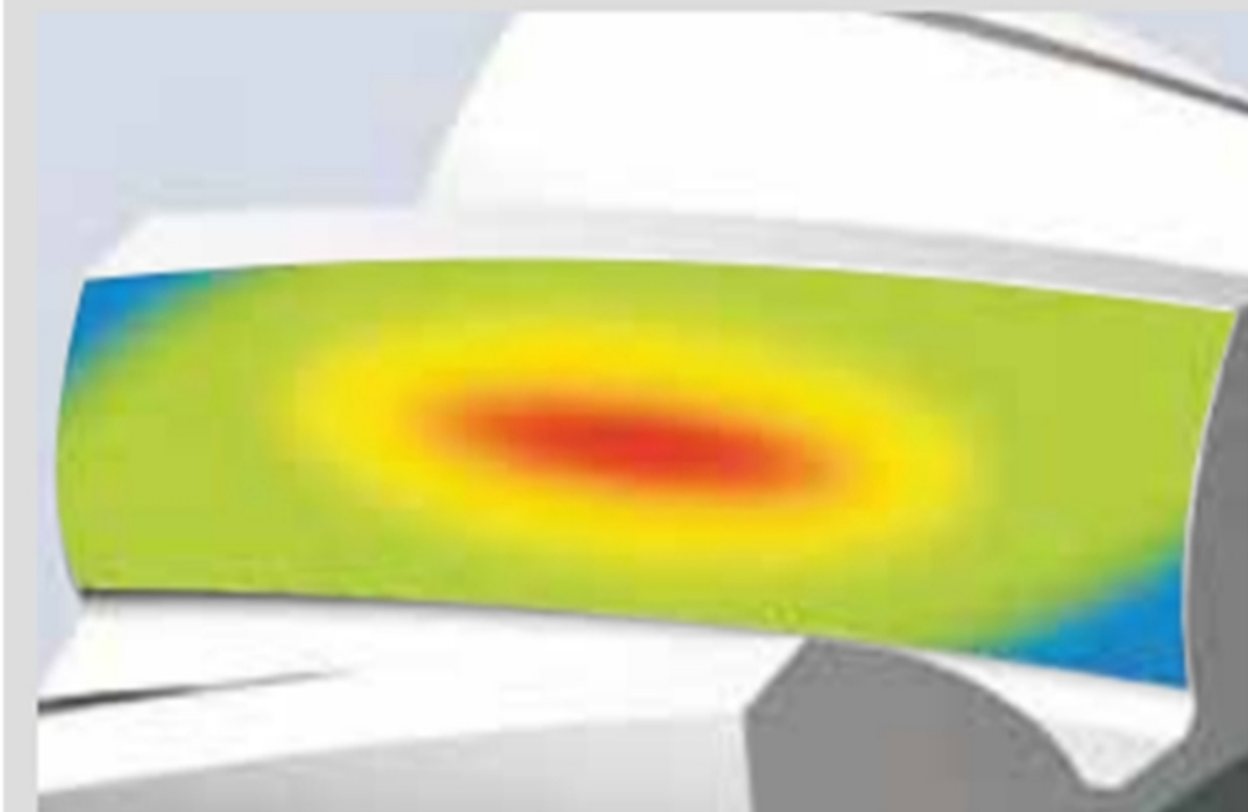
The transmission interface of the planetary gear adopts a full needle roller design without a cage, which increases the contact area to improve structural rigidity and output torque.



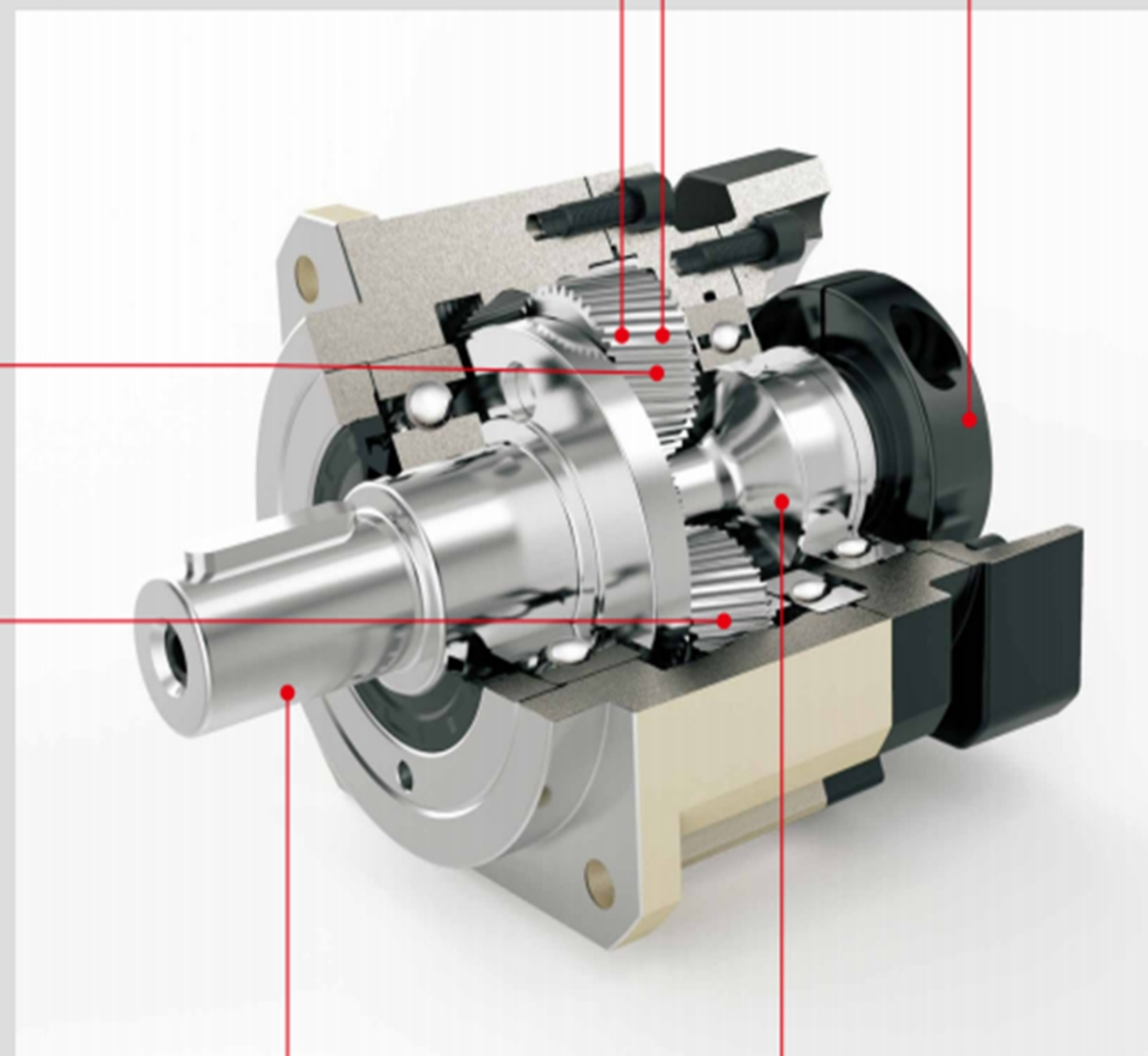
The reduction mechanism adopts a helical gear design, and its tooth meshing rate is more than twice that of general spur gears. It has the characteristics of smooth operation, low noise, high output torque and low backlash.



The connection between the input shaft and the motor adopts a collet-type locking mechanism and undergoes dynamic balancing analysis to ensure the concentricity of the interface and zero-backlash power transmission at high input speeds.



ANSYS technology is used to perform finite element analysis on gear strength, and the tooth profile and lead are modified on the tooth surface to reduce the impact and noise of gear meshing and increase the service life of the gear system.



The gear material is made of high-quality alloy steel and is treated with carbon-nitrogen co-diffusion to obtain the best wear resistance and impact toughness.

The planet carrier and output shaft adopt an integrated double-support structure design to ensure maximum torsional rigidity.



The sun gear and input shaft adopt an integrated structural design to ensure maximum torsional rigidity and zero

PRODUCTS OVERVIEW

Products features

- 1.Low Noise: Under 58 db.
- 2.Low Backlash : Single-stage precision within 1 arcmin, two-stage within 2 arcmin.
- 3.High Efficiency: Single-stage drive efficiency over 97%, two-stage over 94%.
- 4.High Input Speed: Max input speed up to 8000rpm.
- 5.High output torque : Max output torque up to 3 times rated output torque .
- 6.High Stability: High-strength alloy steel adopted. Integral gear hardening guarantees durable service and consistent high precision.
- 7.High reduction ratio: Modular design adopted. Planetary gearboxes are connectable, with ratio up to over 1000.

Application industry

Precision Planetary Gear Reducer is widely used in the following domain:

1. Aerospace, military industry.
2. Medical health, electronic information industry.
3. Industrial robots, Production automation, CNC machine tool manufacturing industry.
4. Motor, textile, printing, food, metallurgical, environmental protection engineering, warehouse logistics industry.

Planetary Gearbox Selection Procedure

The selection of planetary gearbox should prioritize both applicability and cost-effectiveness. Important internal factors to consider include the structural type, load capacity, reduction ratio, output speed, axial and radial forces, torsional rigidity, and backlash. External factors, such as installation method, operating conditions, and environmental conditions, should also be carefully evaluated. The following steps provide a practical guide for achieving a fast and accurate selection.

Step 1: Determination of planetary gearbox model

1	Equipment usage parameters	f ₁	Loading classification	Running per hour	Using f _s				
					Running per day(h)				
			Uniform	Z<10	h<4	4<h<8	8<h<12	12<h<16	16<h<24
				10<Z<30	0.85	0.95	1.00	1.20	1.60
			Medium shock	30<Z<100	0.90	1.10	1.15	1.40	1.80
				Z<10	1.00	1.20	1.30	1.60	2.00
				10<Z<30	1.00	1.20	1.30	1.60	2.00
			Heavy shock	30<Z<100	1.10	1.35	1.45	1.80	2.20
				Z<10	1.20	1.45	1.60	2.00	2.40
				10<Z<30	1.20	1.45	1.60	2.00	2.40
				30<Z<100	1.30	1.55	1.75	2.20	2.50
					1.40	1.65	1.90	2.40	2.80
2	Determination of torque	T _{2N}	T _{2N} >T _{C2} T _{2C} =T _{r2} *f _s						
3	Rated input speed	n ₁	Please refer to the reducer performance data						
4	Determination of reduction ratio	i	i=n ₁ /n ₂						
5	Reducer efficiency	η	L1≥95%, L2≥92%						
6	Calculation of reducer input power	P ₁	P ₁ = (T ₂ ×n ₁) / (9550×i×η) or P ₁ =P ₂ ÷η						
7	Determine the model number.	T _{2N} , P _{1N}	T _{2N} ≥T ₃ ×f ₁ ×f ₂ P _{1N} ≥P ₁ ×f ₁ ×f ₂						
8	Output shaft radial force, axial force	Fr, Fa	Please refer to the reducer performance data						
9	Confirmation of use environment		Protection level, operating temperature, chemical environment, etc.						
10	Confirmation of installation method		Coaxial installation, 90 degree right angle installation						
11	Confirmation of reducer model		Determine the reducer model based on the performance data sheet, input and output methods						

Note: n2 and P2 are the speed and power of the driven equipment; P1 and P2 are the power and torque required by the driven equipment; P1N and T2N are the power and torque required by the actual reducer.

Step2:Determine the brand and specifications of the motor.

Notice for ordering

Motor Model: JCB546

Output	0.75	kw
Rated Torque	2.4	NM
Max.Torque	7.1	NM
Rated Speed	3000	RPM
Max.Speed	4500	RPM
Inertia	6.6Kg/cm2	
Shaft Dia	Ø19	mm
Diameter	Ø80	mm
	Ø70	mm
	Ø90	mm

Motor's type & measurement

Planetary gearbox's type:

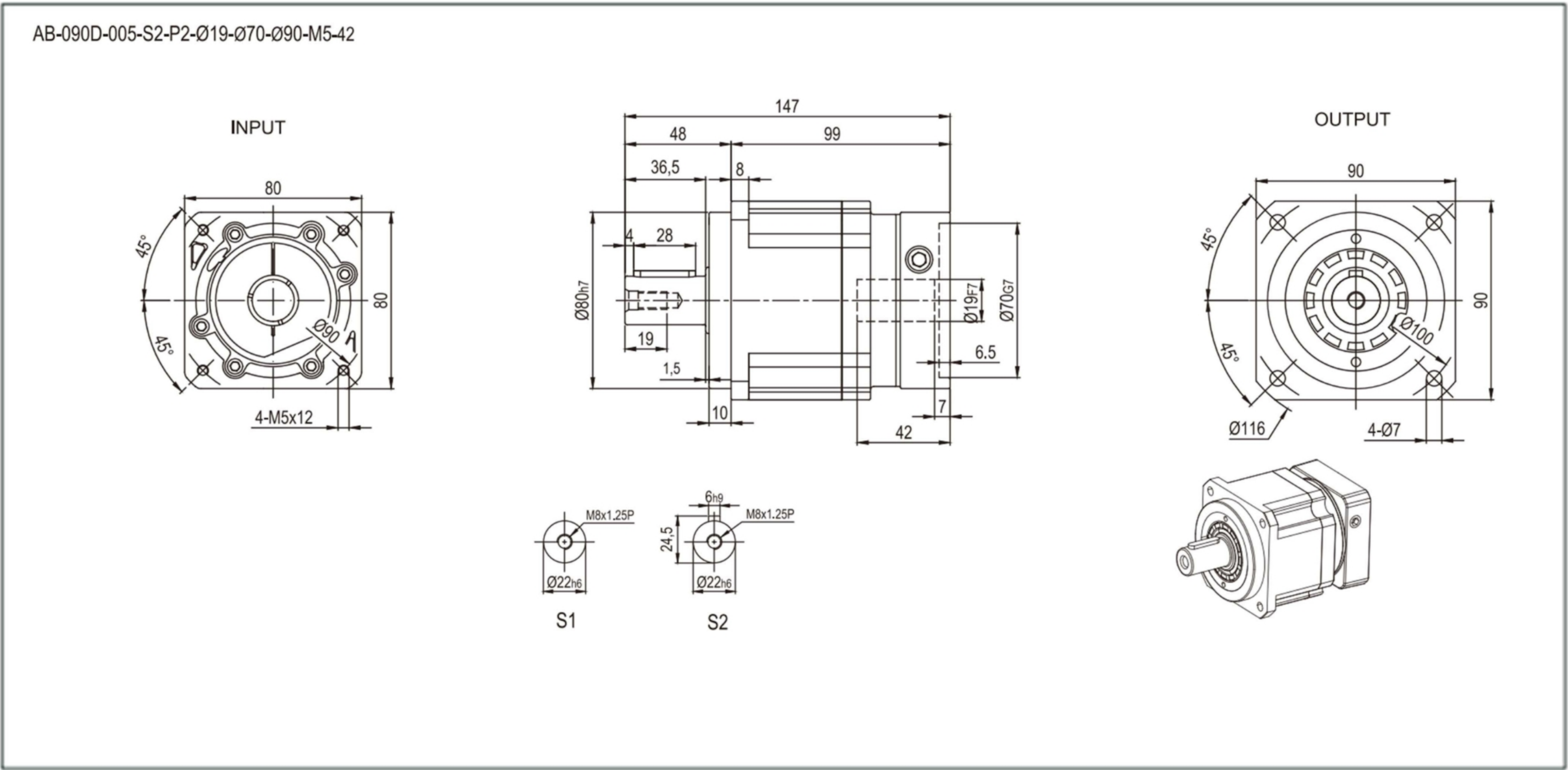
Torque:

Ratio:

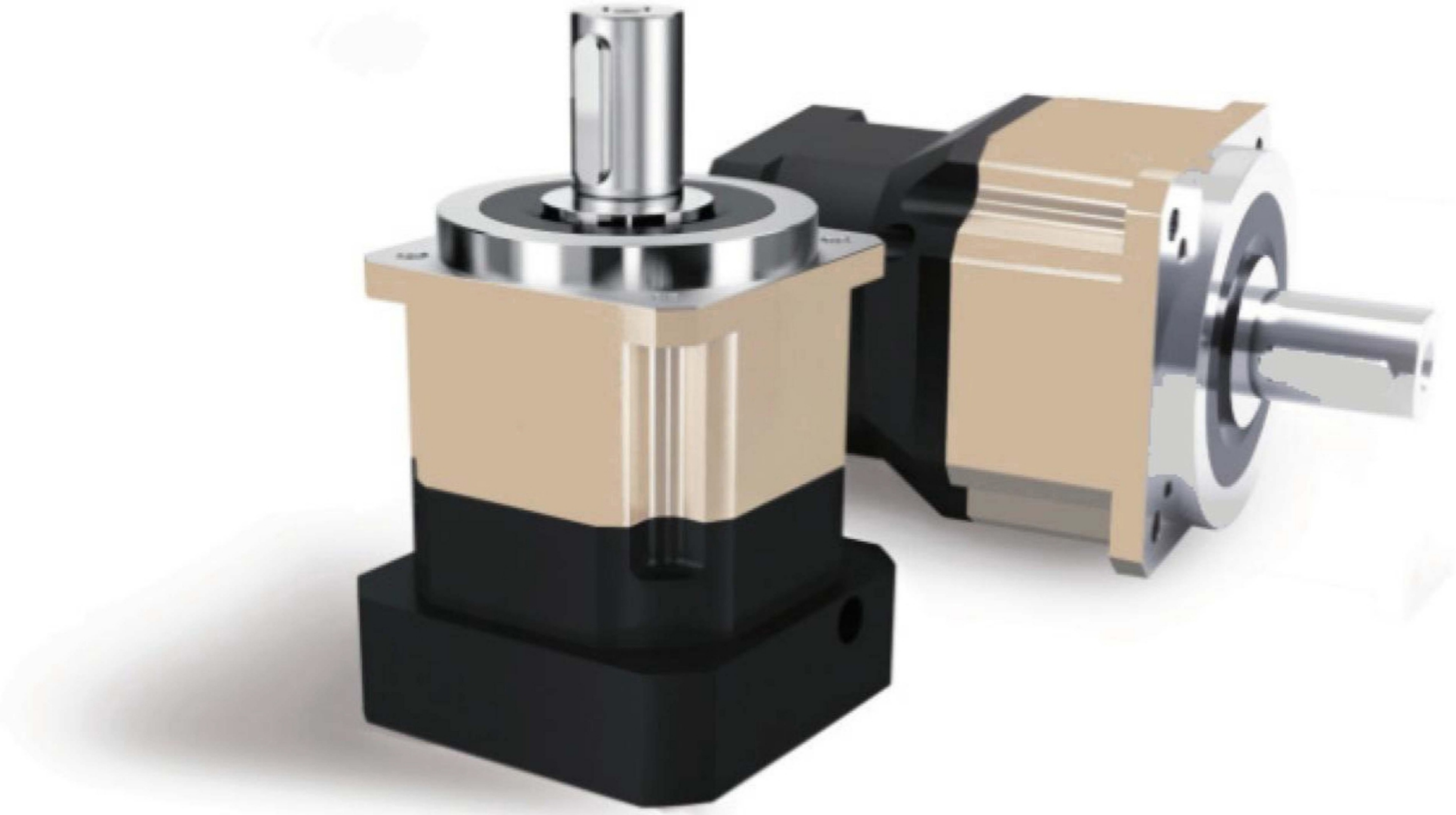
Backlash:

Mounting position&others requir:

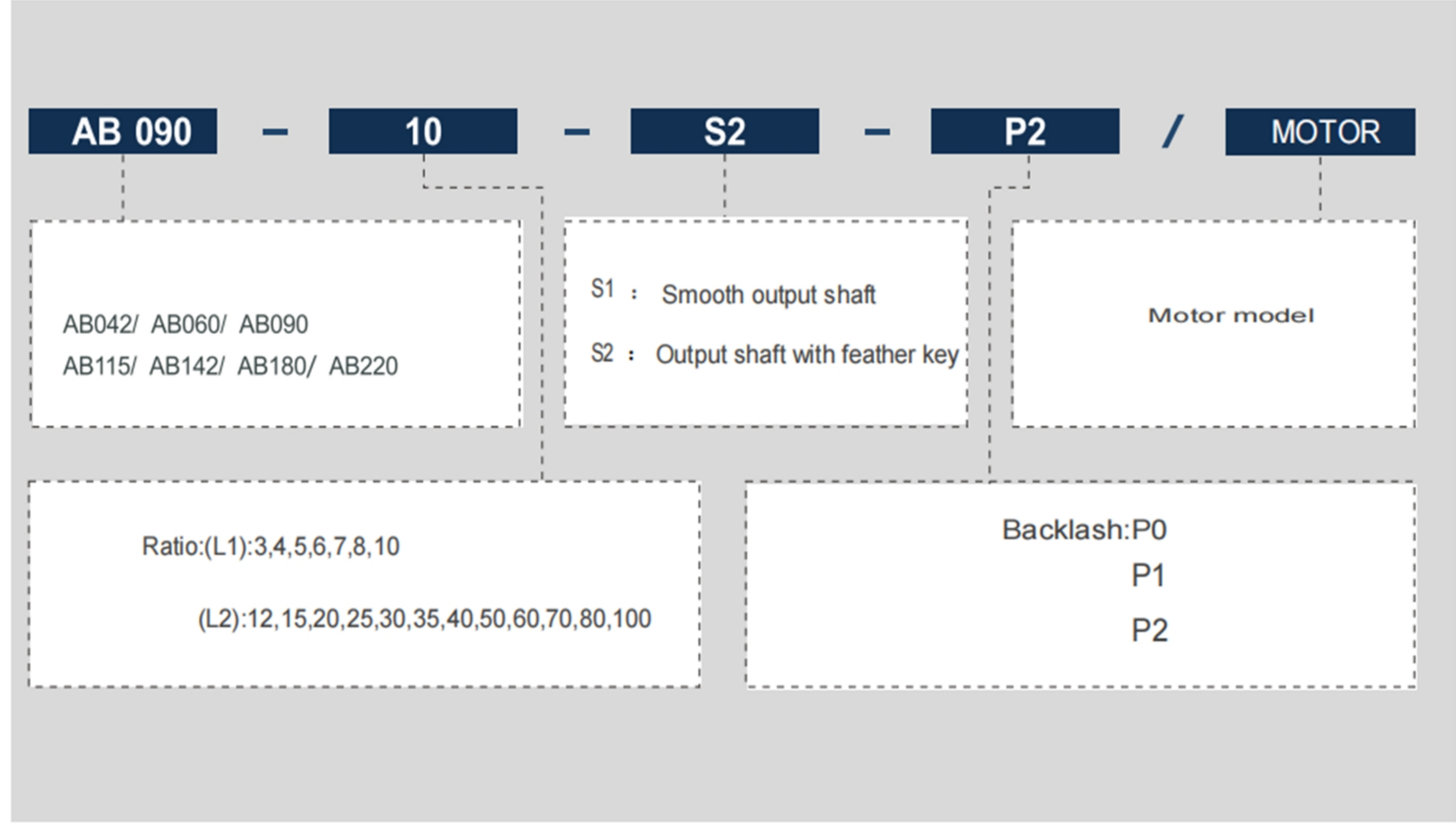
Step3:Confirm the ordered planetary gearbox model and dimensional drawings.



AB
SERIES



MODEL ILLUMINATE

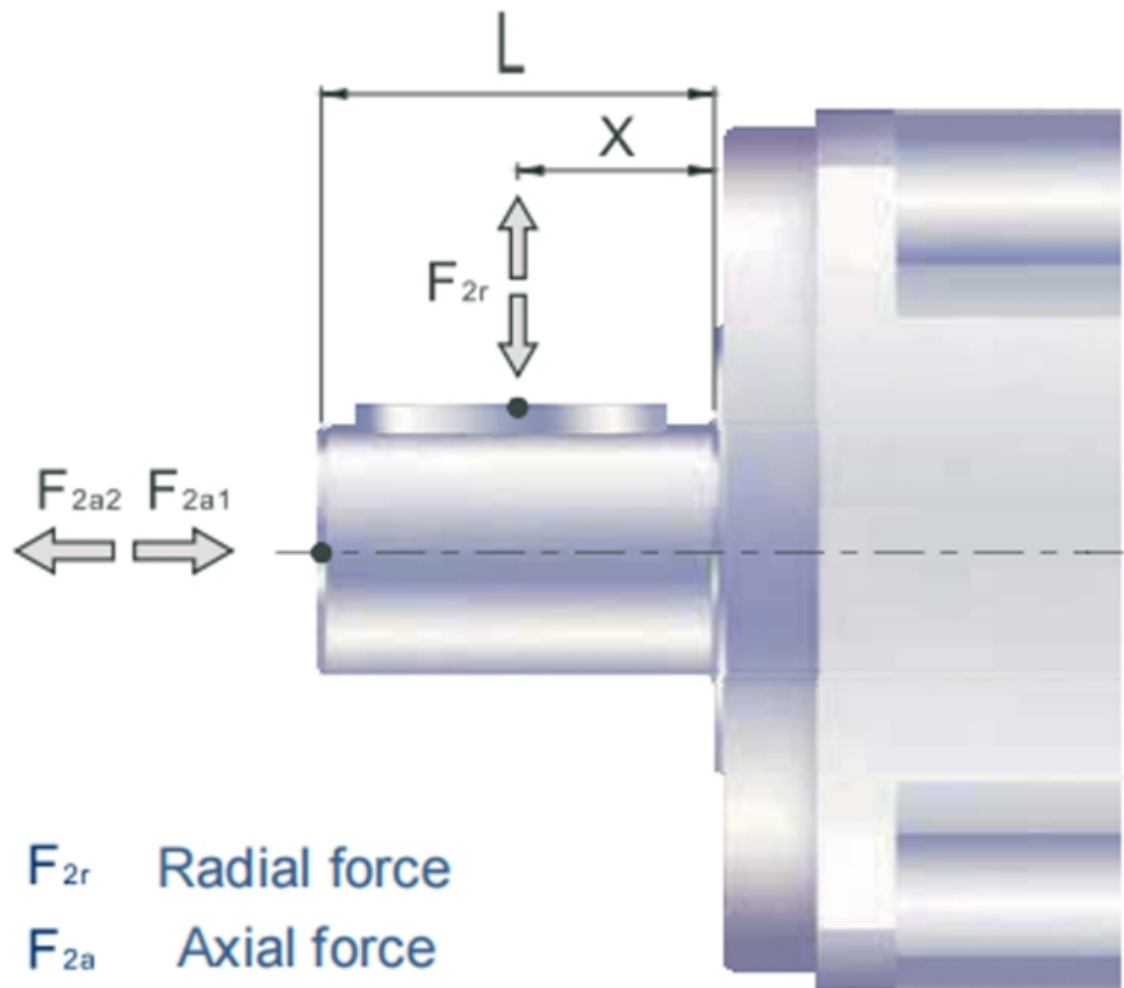


GEAR BOX PERFORMANCE INFORMATION

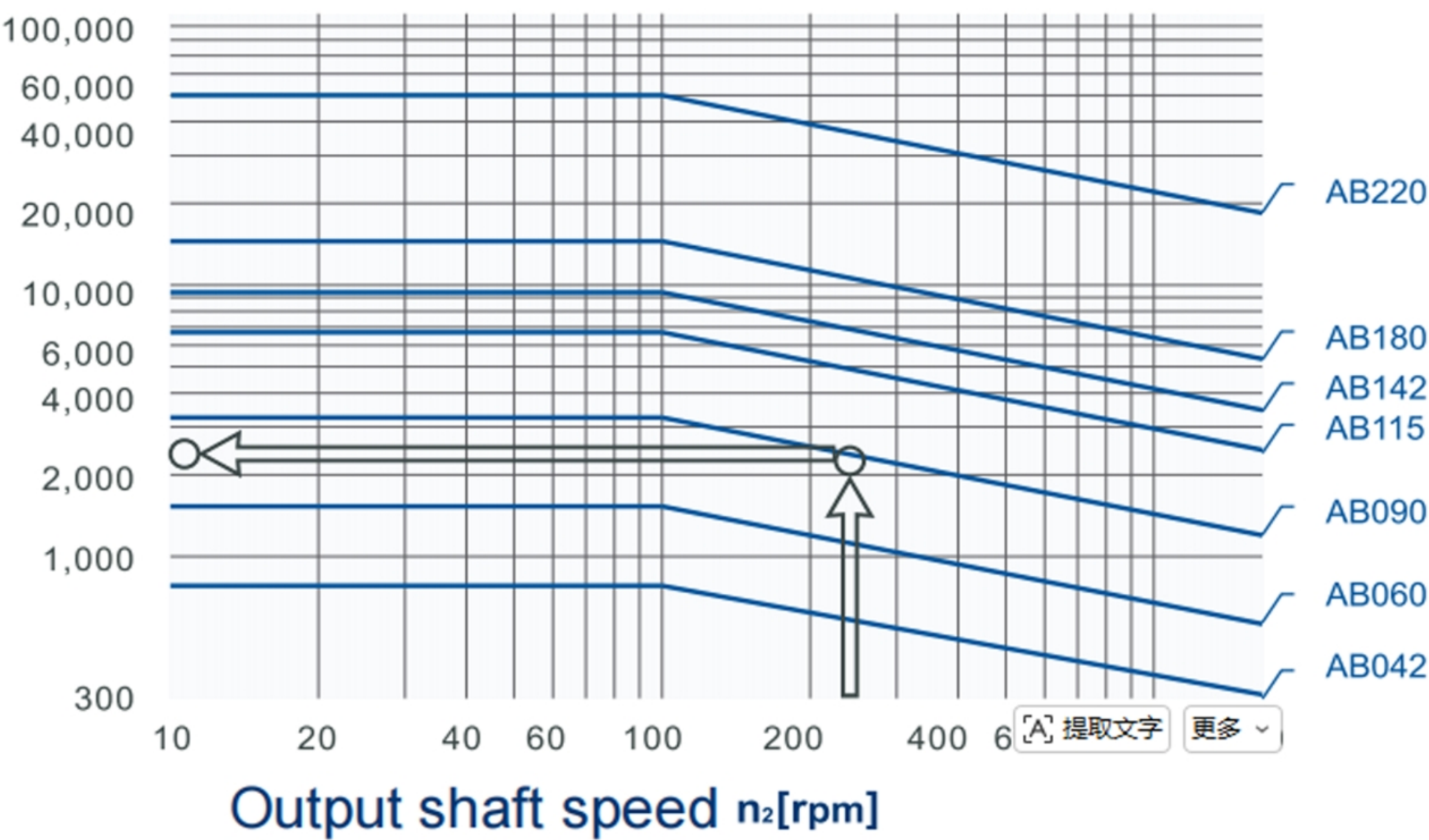
		Stage	Ratio ¹	AB042	AB060	AB090	AB115	AB142	AB180	AB220
Normal output torque	Nm	1	3	20	55	130	208	342	588	1,140
			4	19	50	140	290	542	1,050	1,700
			5	22	60	160	330	650	1,200	2,000
			6	20	55	150	310	600	1,100	1,900
			7	19	50	140	300	550	1,100	1,800
			8	17	45	120	260	500	1,000	1,600
		2	10	14	40	100	230	450	520	1,220
			12	20	55	130	208	342	588	1,140
			15	20	55	130	208	342	588	1,140
			20	19	50	140	290	542	1,050	1,700
			25	22	60	160	330	650	1,200	2,000
			30	22	55	130	208	342	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	50	140	290	542	1,200	2,000
			50	22	60	160	330	650	1,200	2,000
			60	20	55	150	310	600	1,100	1,900
			70	19	50	140	300	550	1,100	1,800
			80	17	45	120	260	500	1,000	1,600
			100	14	40	100	230	450	520	1,220
Maximum output torque	Nm	1,2	3~100	3 times nominal output torque						
Normal input speed	rpm	1,2	3~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Maximum input speed	rpm	1,2	3~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Backlash P0	arcmin	1	3~10	—	≤1	≤1	≤1	≤1	≤1	≤1
		2	3~100	—	≤2	≤2	≤2	≤2	≤2	≤2
Backlash P1	arcmin	1	3~10	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	12~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Backlash P2	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional stiffness	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
Maximum radial force F _{2a18} ²	N	1,2	3~100	780	1,530	3,250	6,700	9,400	14,500	50,000
Maximum axial force F _{2a18} ²	N	1,2	3~100	350	630	1,300	3,000	4,000	6,200	35,000
Maximum axial force F _{2a28} ²	N	1,2	3~100	390	765	1,625	3,350	4,700	7,250	25,000
Service life	hr	1,2	3~100	20,000*						
Efficiency at full load	%	1	3~10	≥97%						
		2	12~100	≥94%						
Gearbox weight	kg	1	3~10	0.5	1.3	3.7	7.8	14.5	29	48
		2	12~100	0.8	1.9	4.1	9	17.5	33	60
Operating temperature	°C	1,2	3~100	-10°C~+90°C						
Standard lubrication		1,2	3~100	Synthetic grease						
Protection class		1,2	3~100	IP65						
Installation position		1,2	3~100	Any						
Running noise(n=3000rpm)	dB	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

		Stage	Ratio ¹	AB042	AB060	AB090	AB115	AB142	AB180	AB220
Mass moment of inertia	kg-cm ²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
		2	10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
			12	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			15	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			20	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			25	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			30	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			35	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			60	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			70	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			80	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

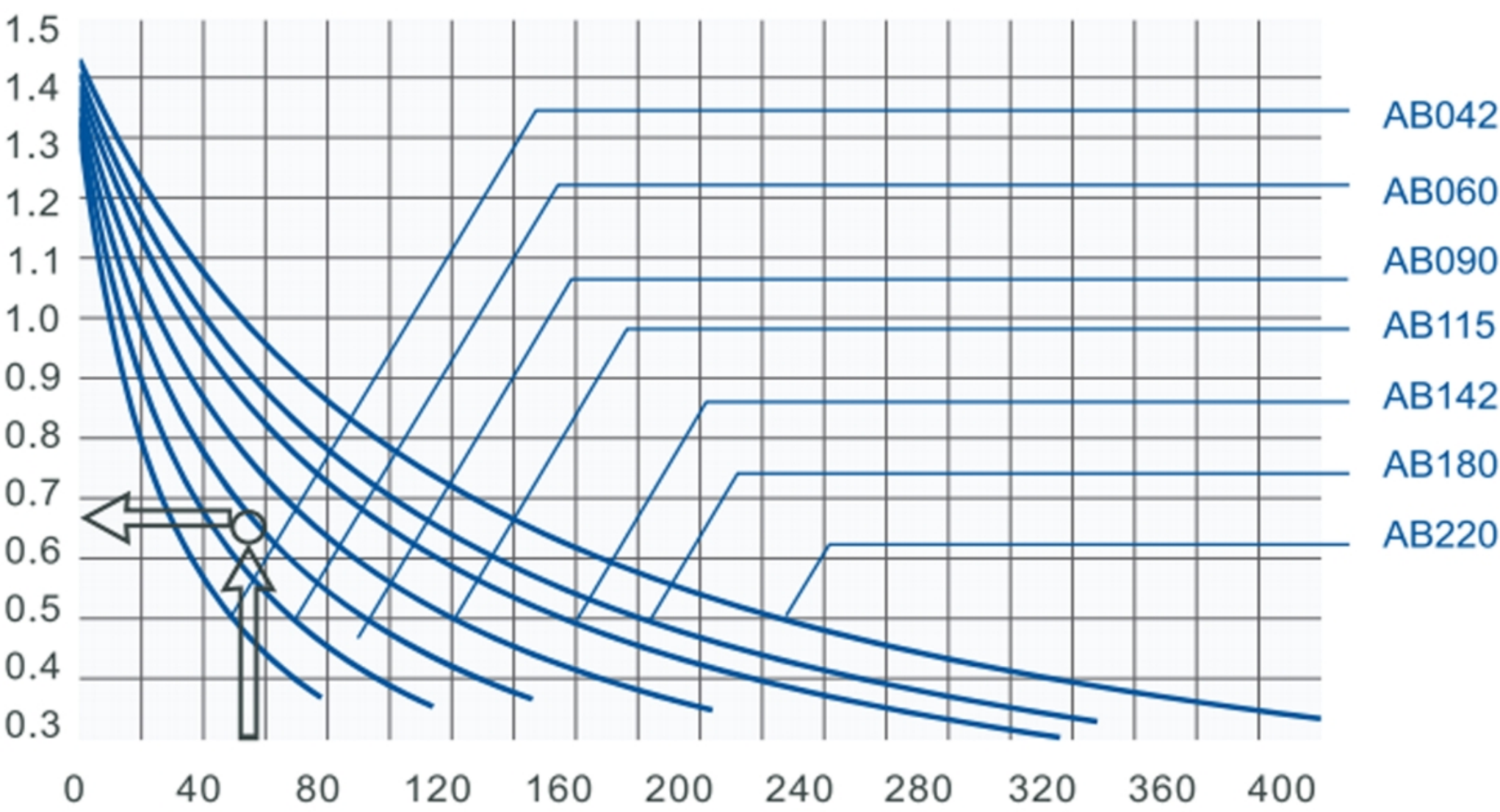
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND AXIAL FORCE



The radial force $F_{2rB}[N]$ is allowed to be applied at the center of the shaft.



Load factor at different locations k_b



Location of radial force application $X[mm]$

When the radial force F_{2r} is applied at the center of the shaft, $X = 1/2 \times L$, the allowable radial force F_{2rB} for different gearbox models at different output speeds can be found in the left diagram. The allowable axial force F_{2aB} is given by the following formulas:

$$F_{2a1B} = 0.2 \times F_{2rB}$$
$$F_{2a2B} = 0.1 \times F_{2rB}$$

When the radial force F_{2r} is applied off-center from the shaft, the allowable radial force that can be withstood increases as the point of application gets closer to the gearbox ($X < 1/2 \times L$), and decreases as it moves further away from the gearbox ($X > 1/2 \times L$).

Radial force

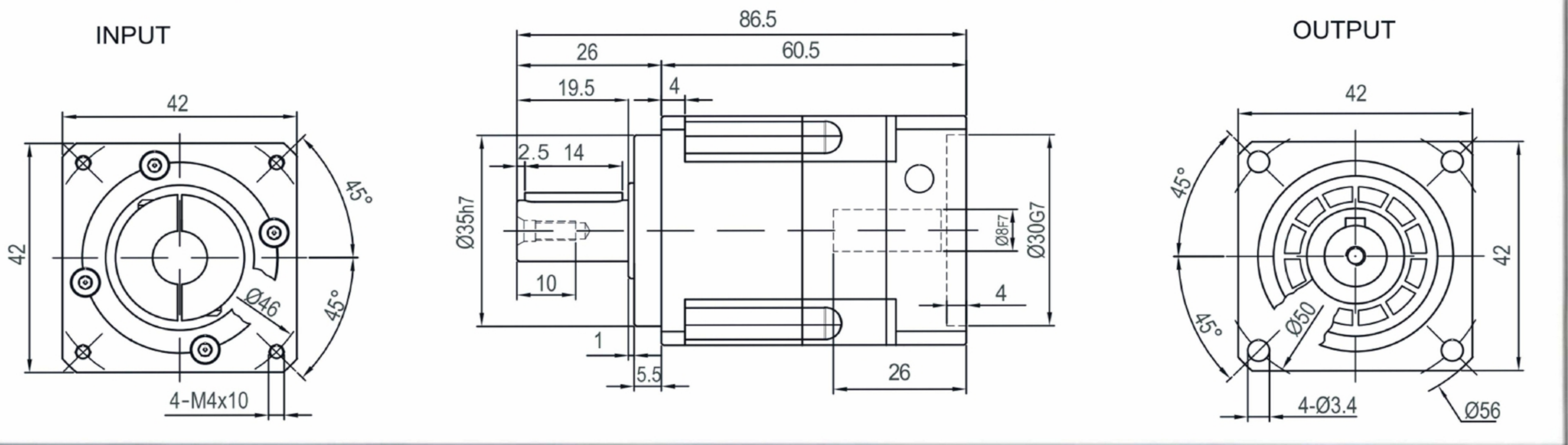
$$F'_{2rB} = K_b \times F_{2rB}$$

Axial force

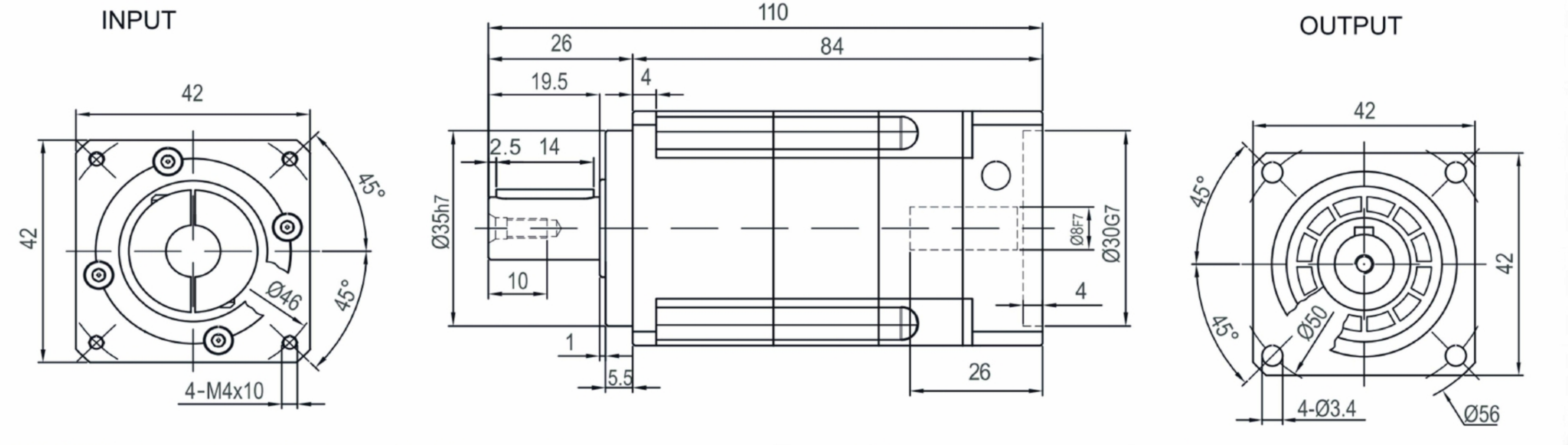
$$F'_{2a1B} = 0.2 \times F'_{2rB}$$
$$F'_{2a2B} = 0.1 \times F'_{2rB}$$

OUTLINE DIMENSION SHEET

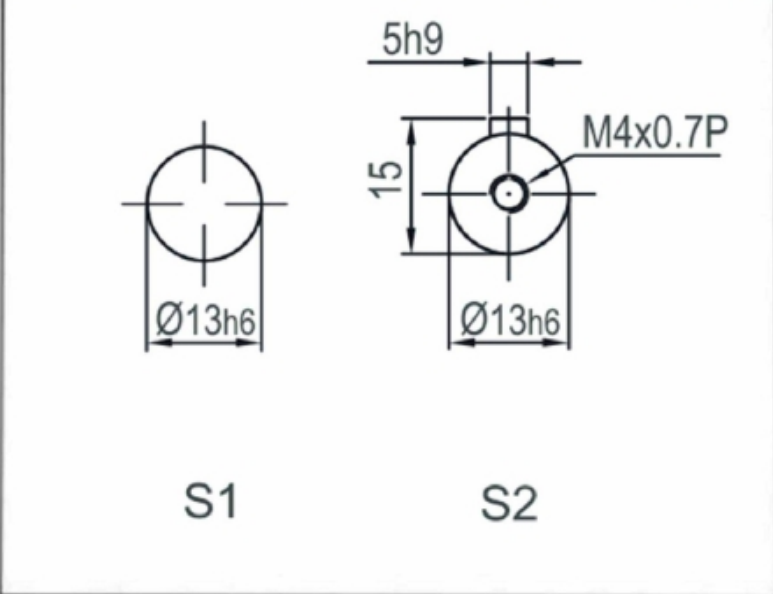
AB-042-L1



AB-042-L2

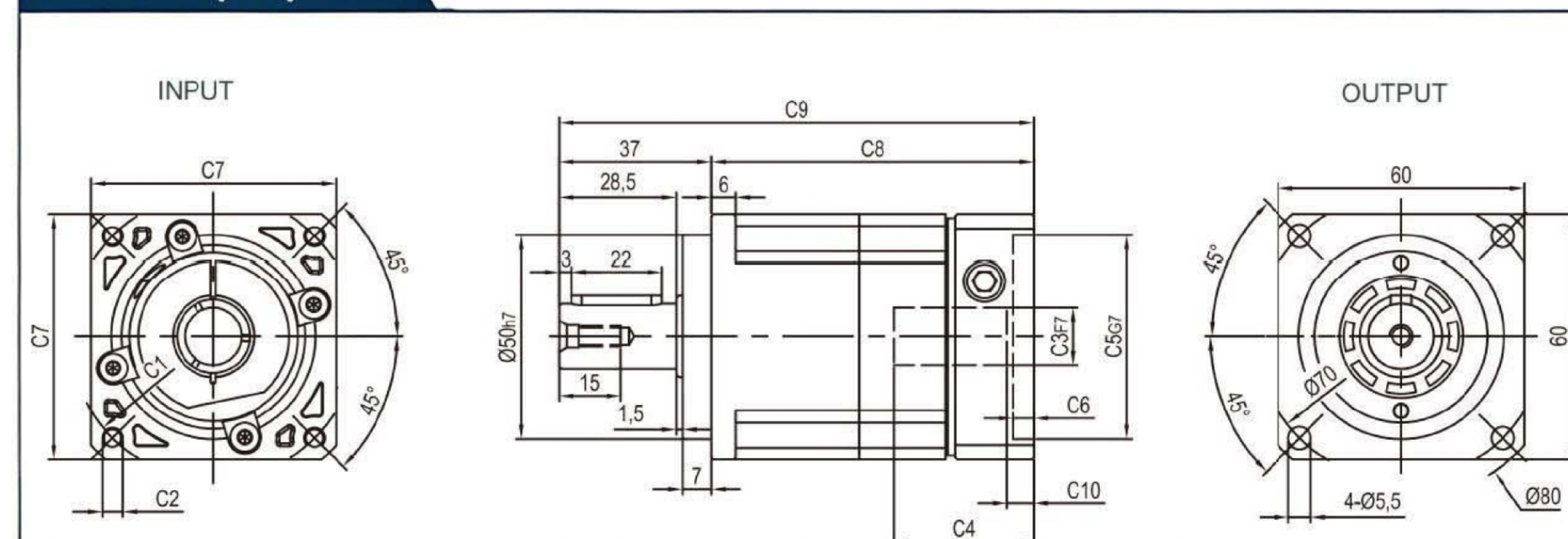


OUTPUT DIAMETER

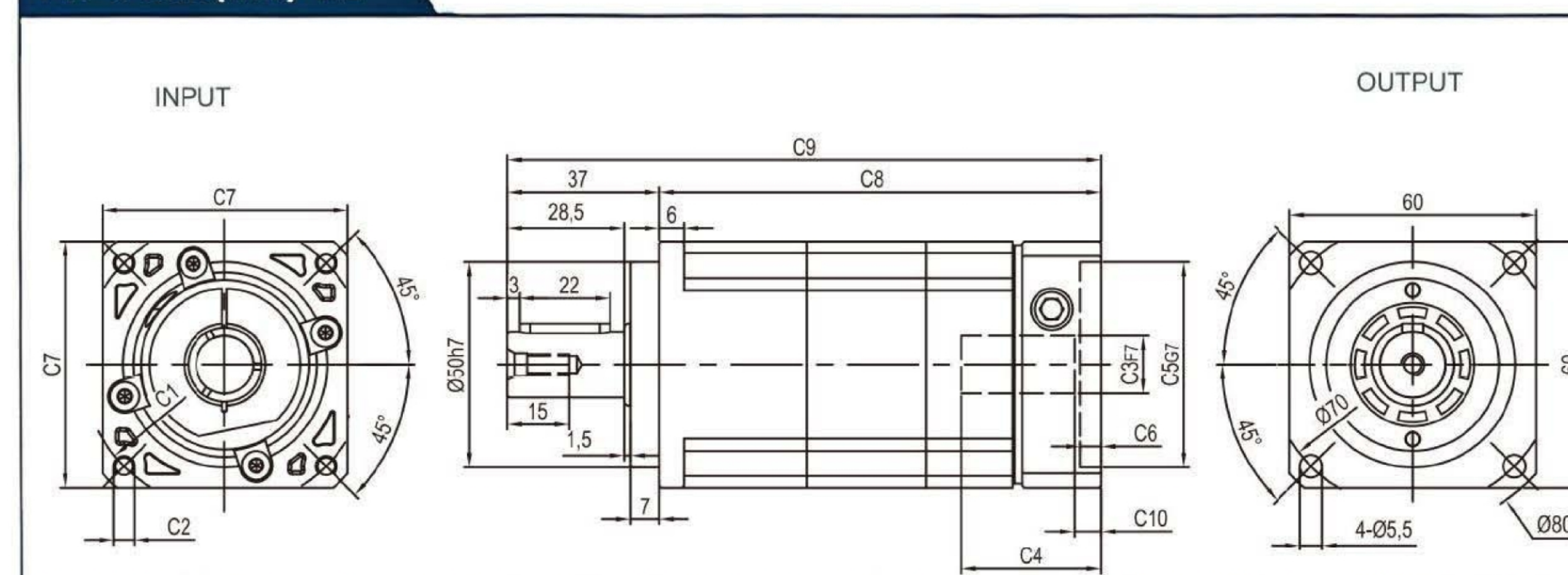


OUTLINE DIMENSION SHEET

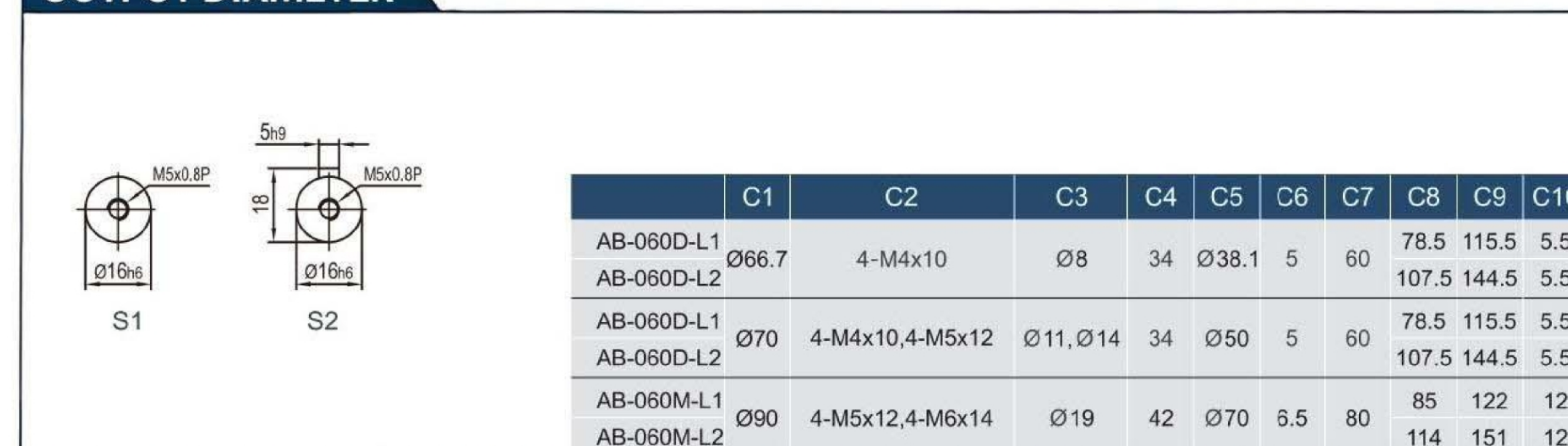
AB-060D(M1)-L1



AB-060D(M1)-L2

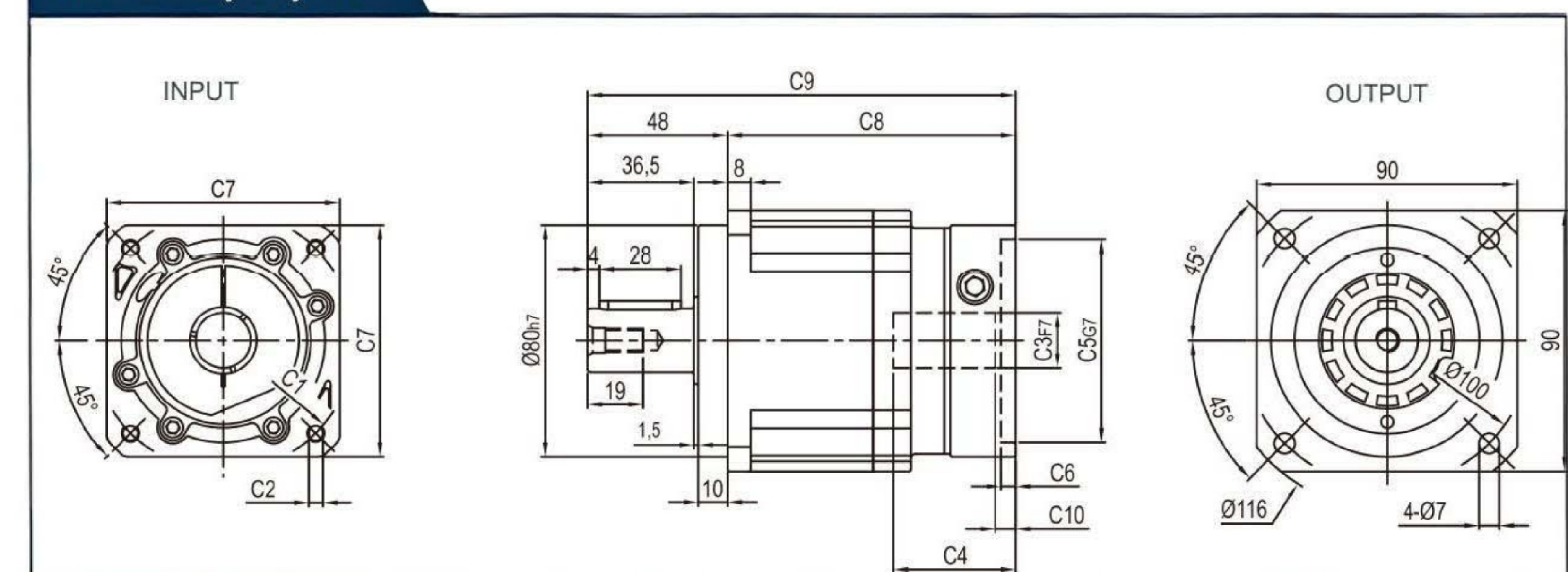


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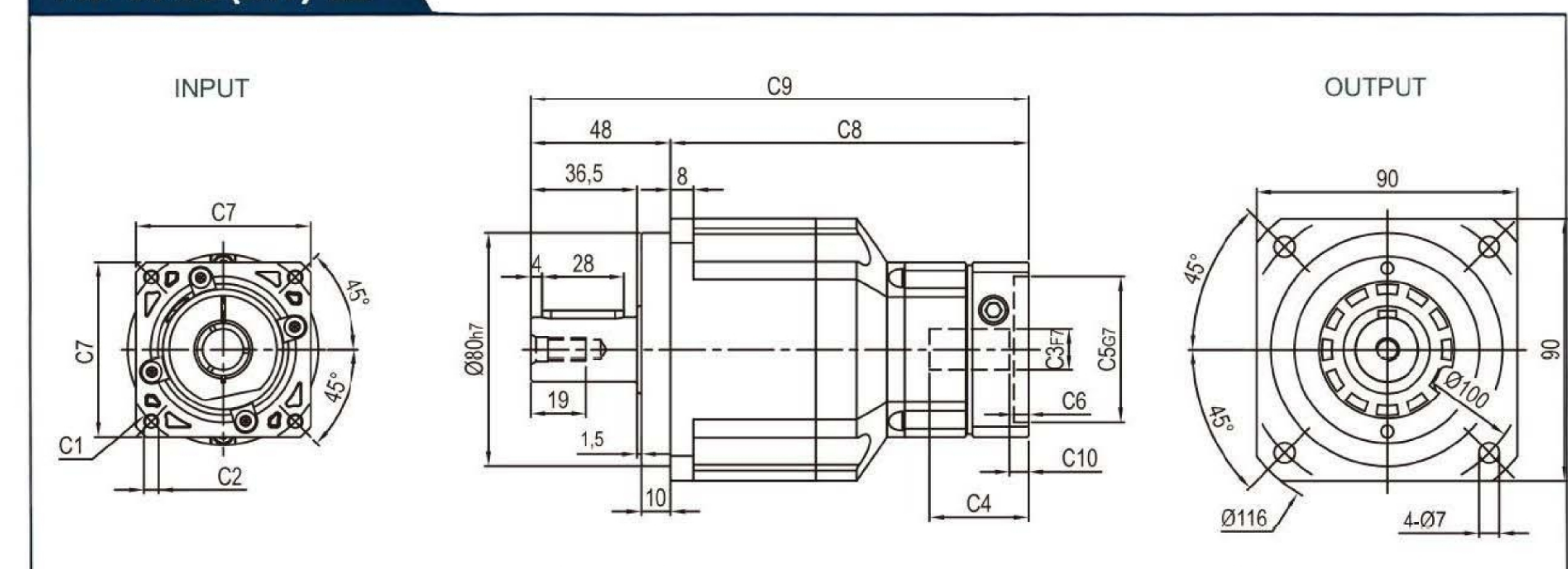


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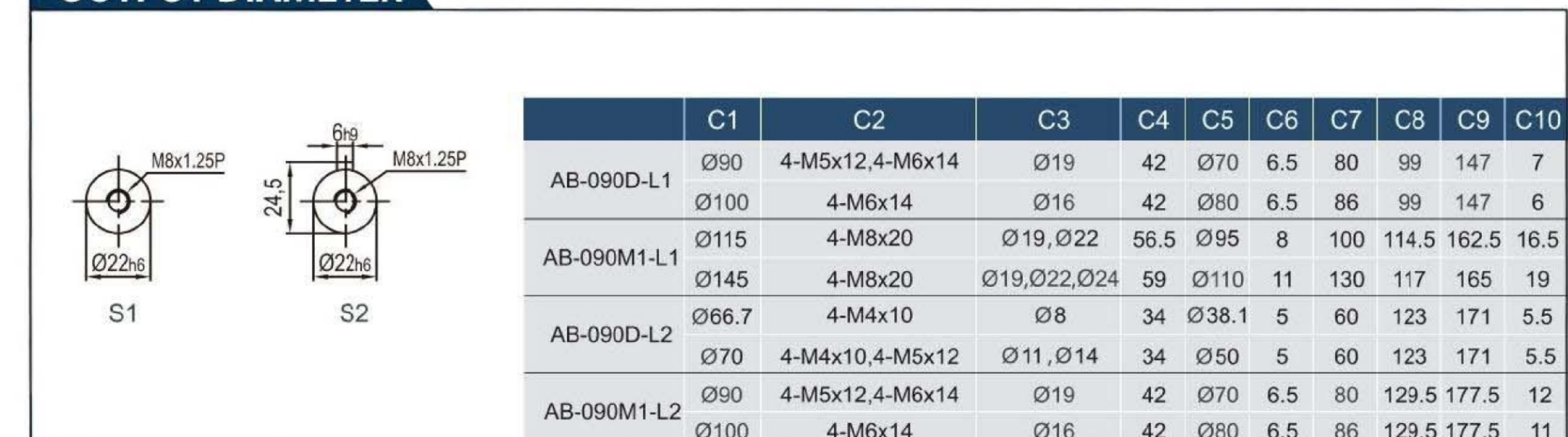
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AB-090D(M1)-L2

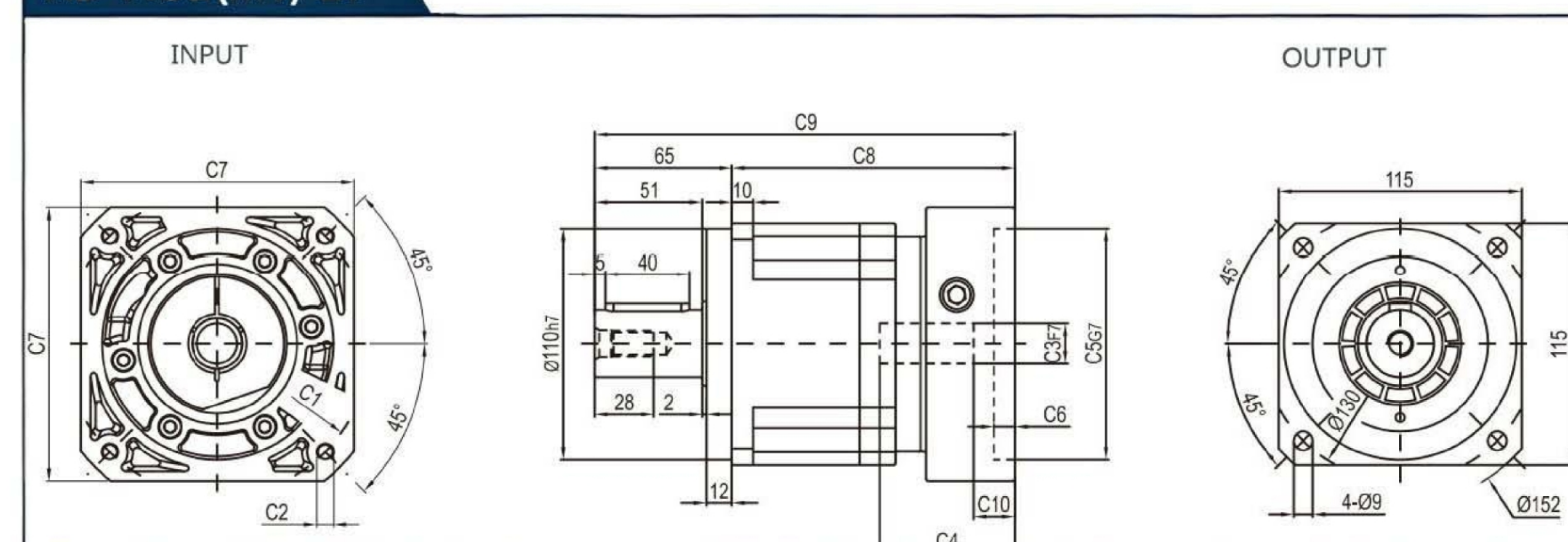


OUTPUT DIAMETER

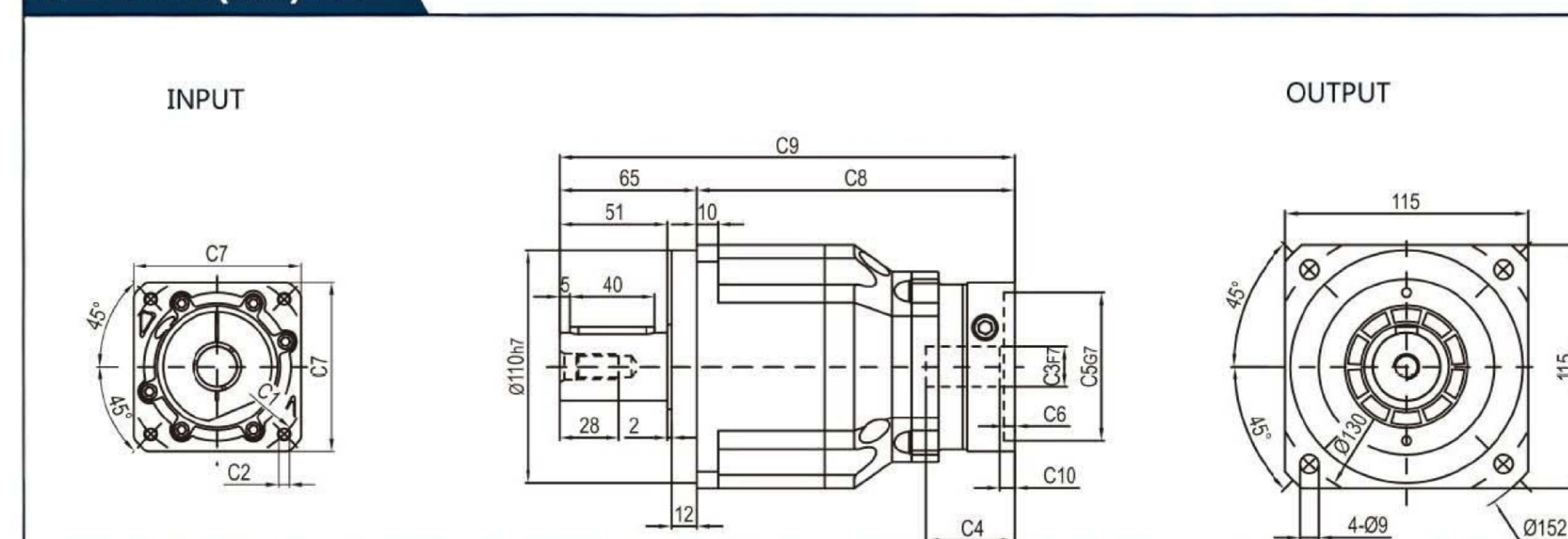


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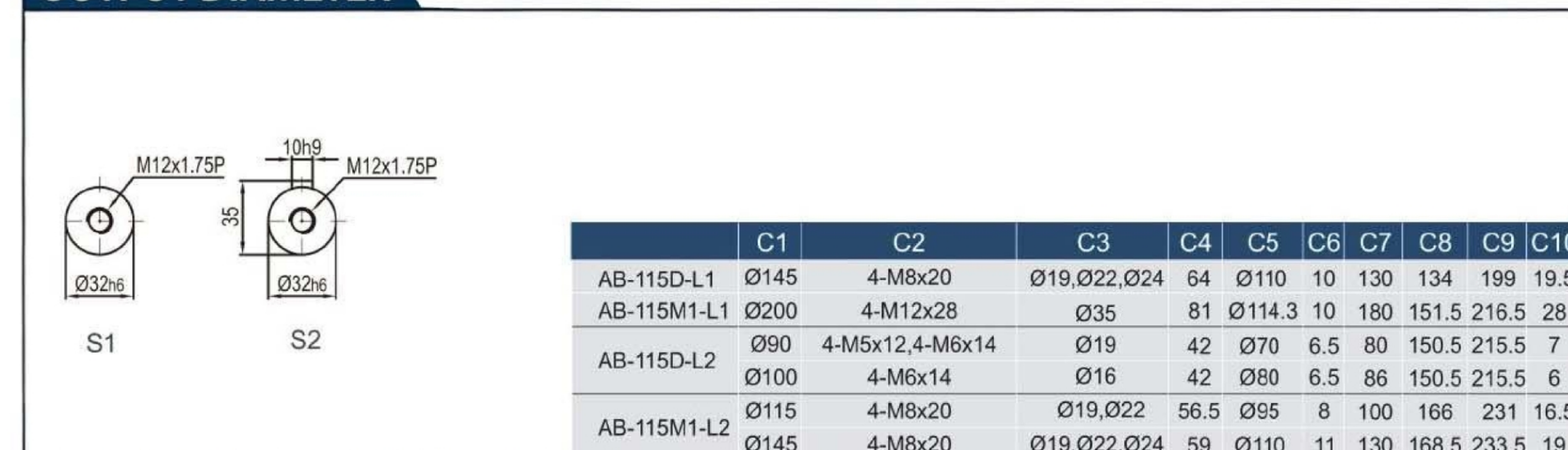
AB-115D(M1)-L1



AB-115D(M1)-L2

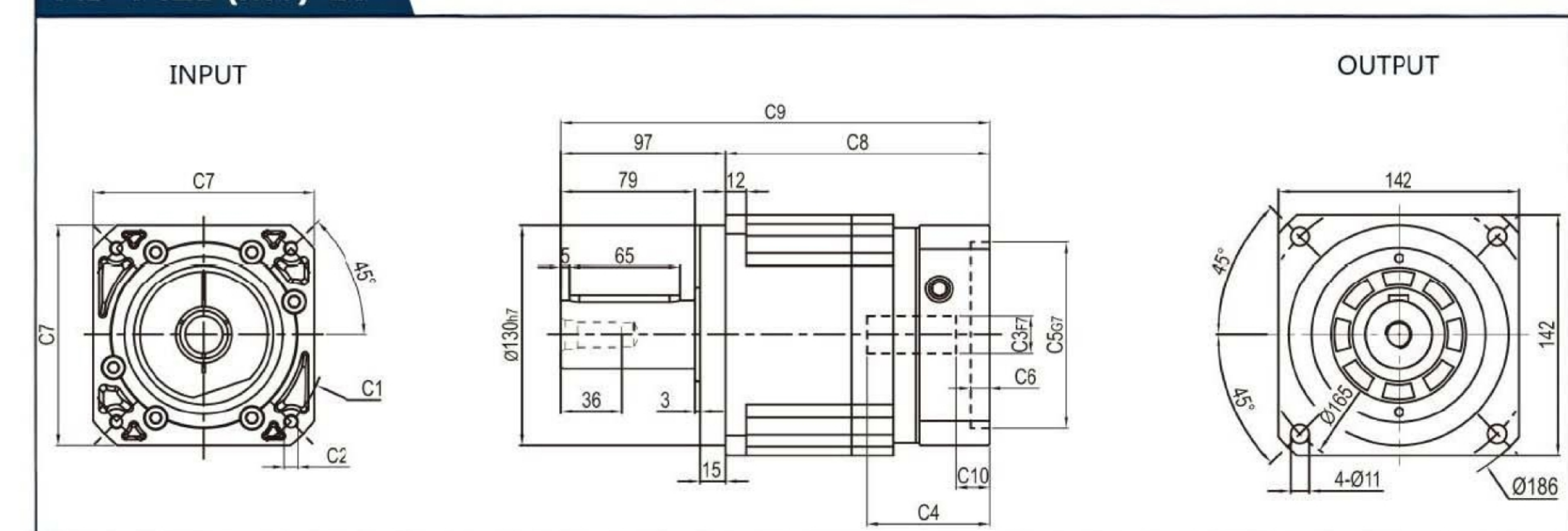


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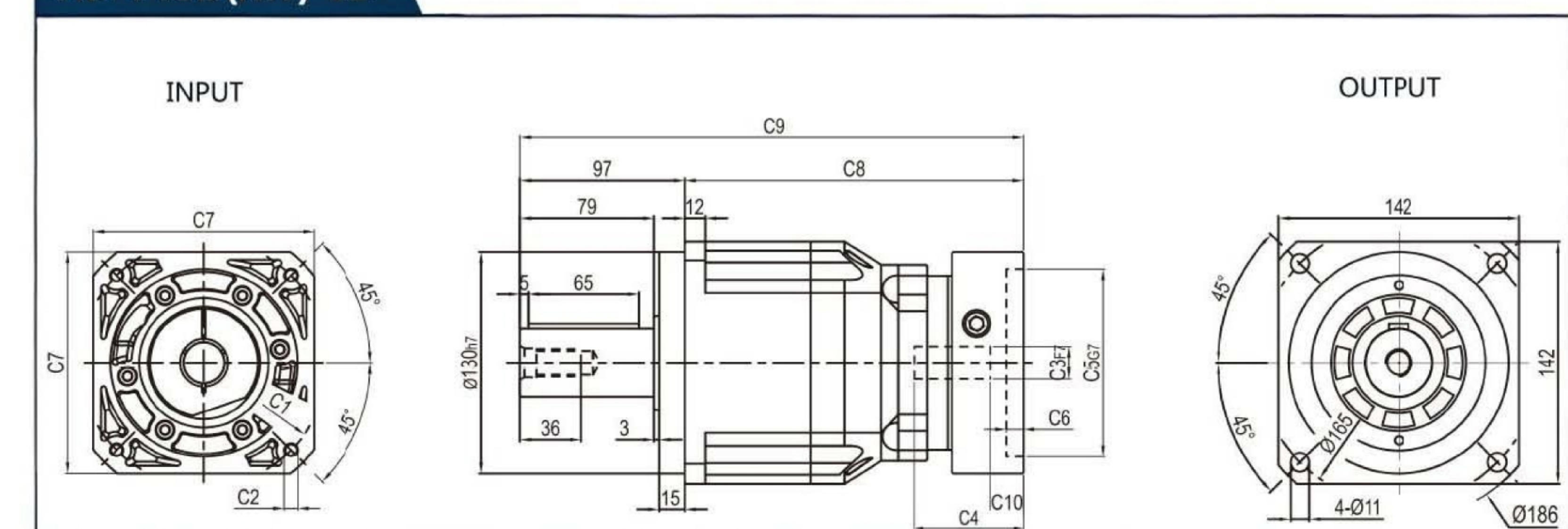


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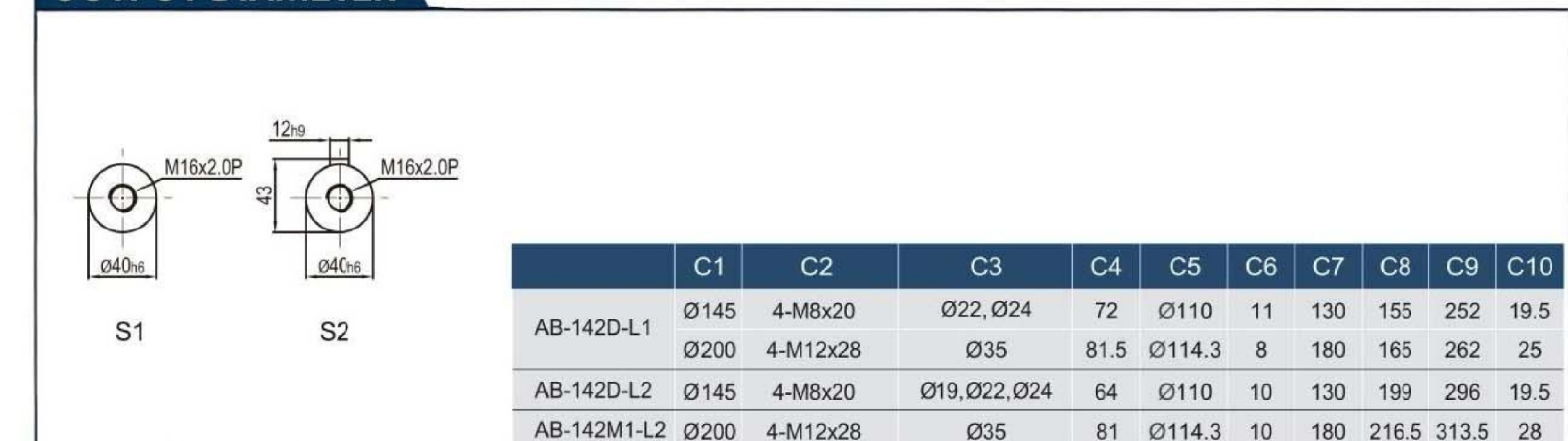
AB-142D(M1)-L1



AB-142D(M1)-L2

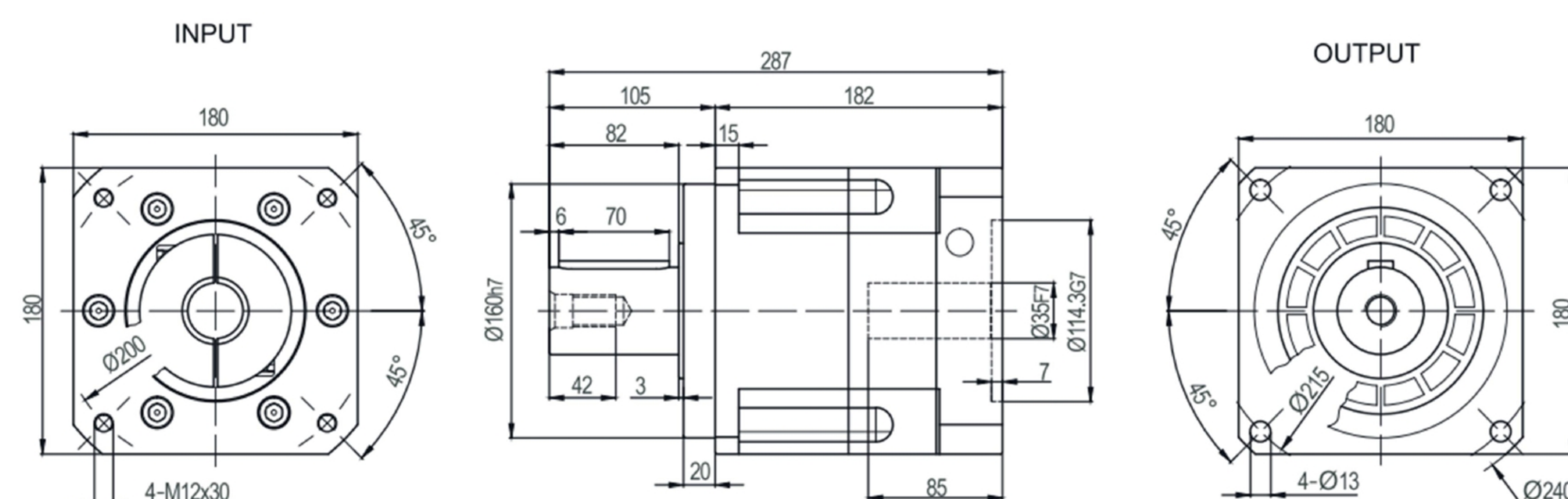


OUTPUT DIAMETER

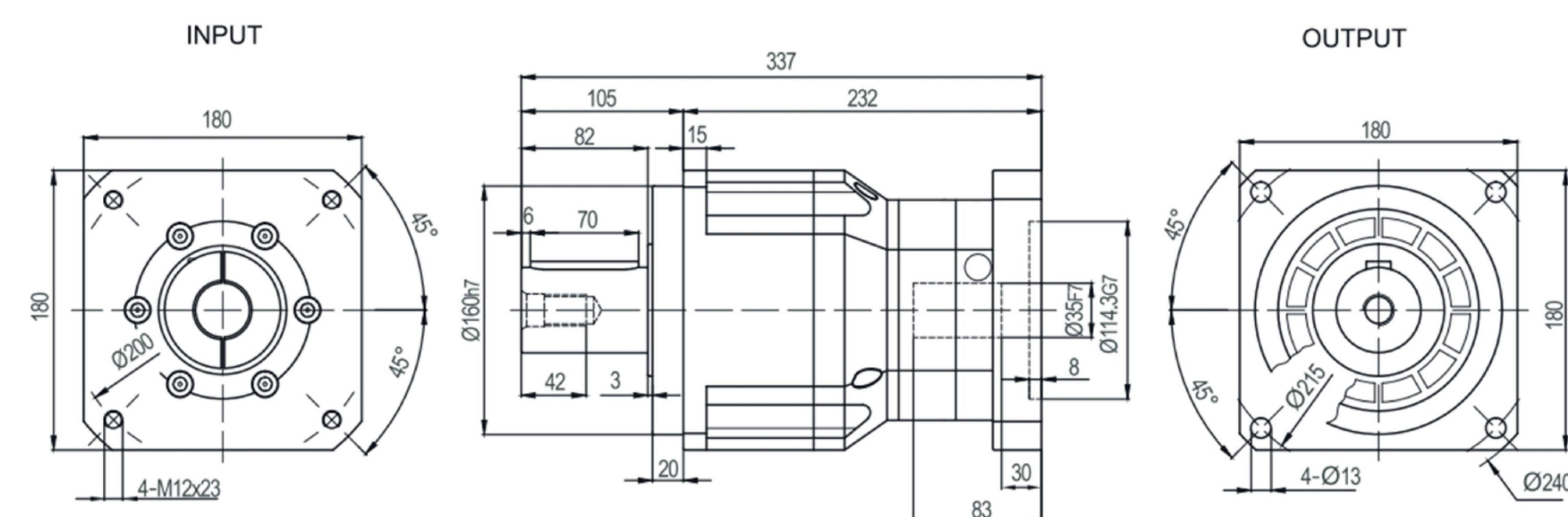


OUTLINE DIMENSION SHEET

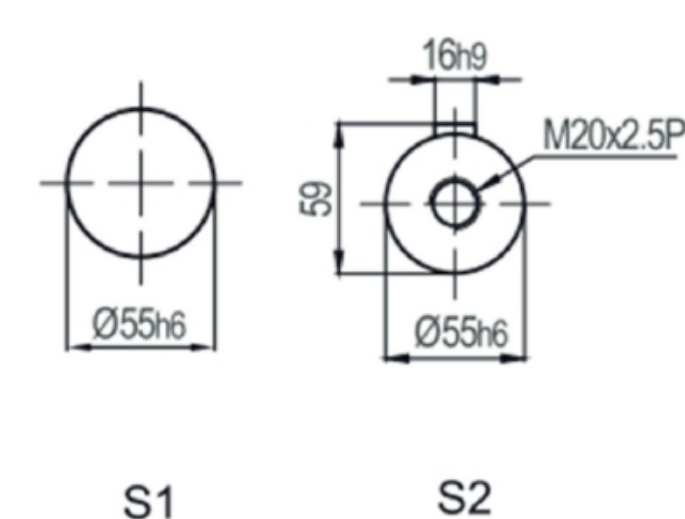
AB-180-L1



AB-180-L2

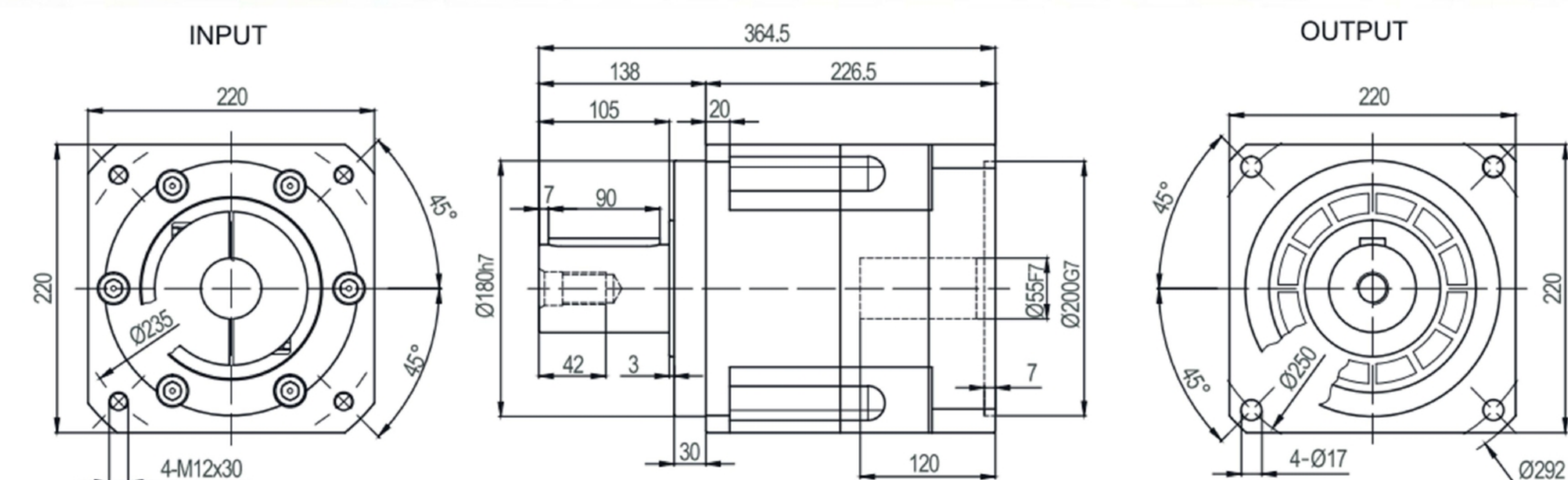


OUTPUT DIAMETER

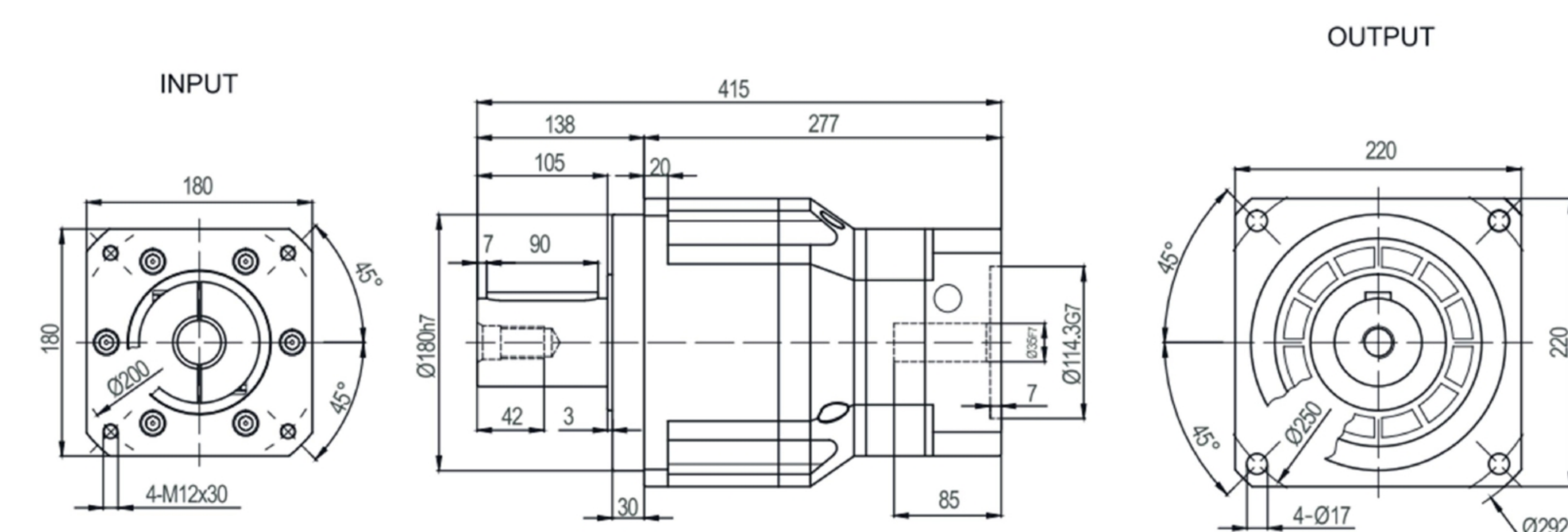


OUTLINE DIMENSION SHEET

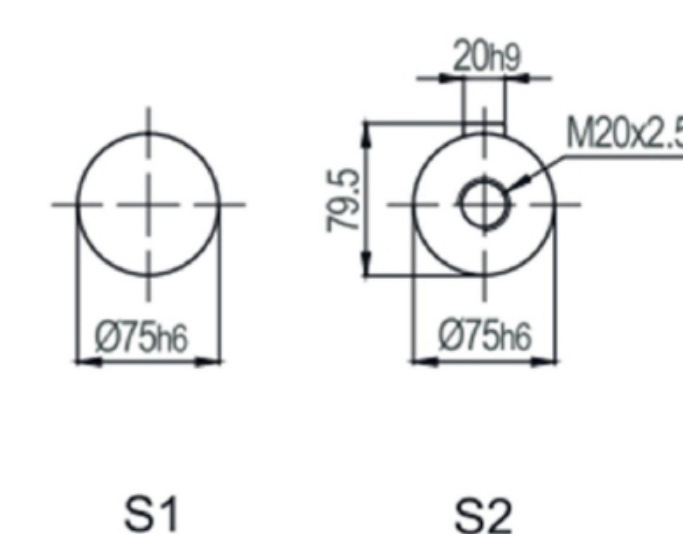
AB-220-L1



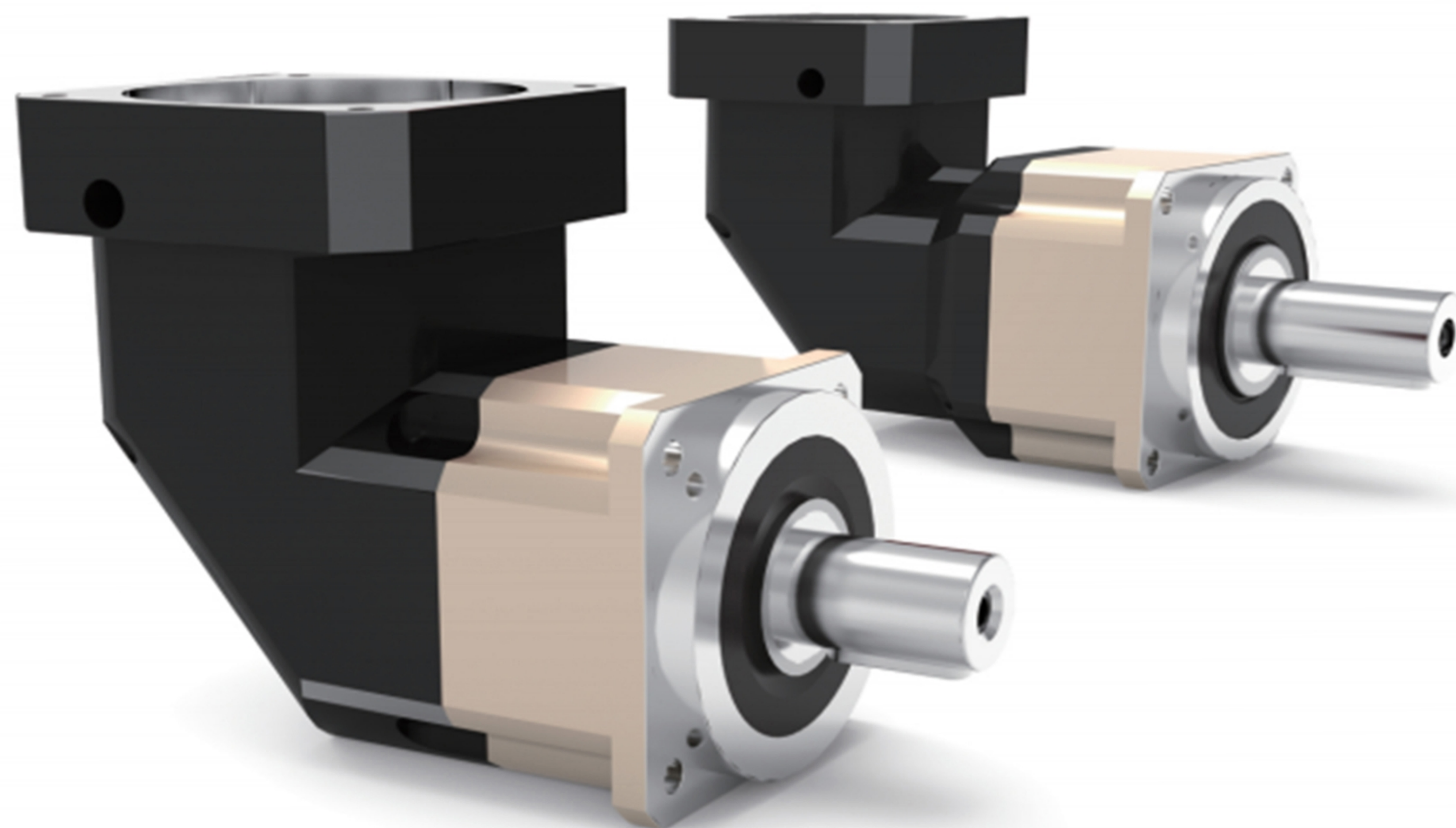
AB-220-L2



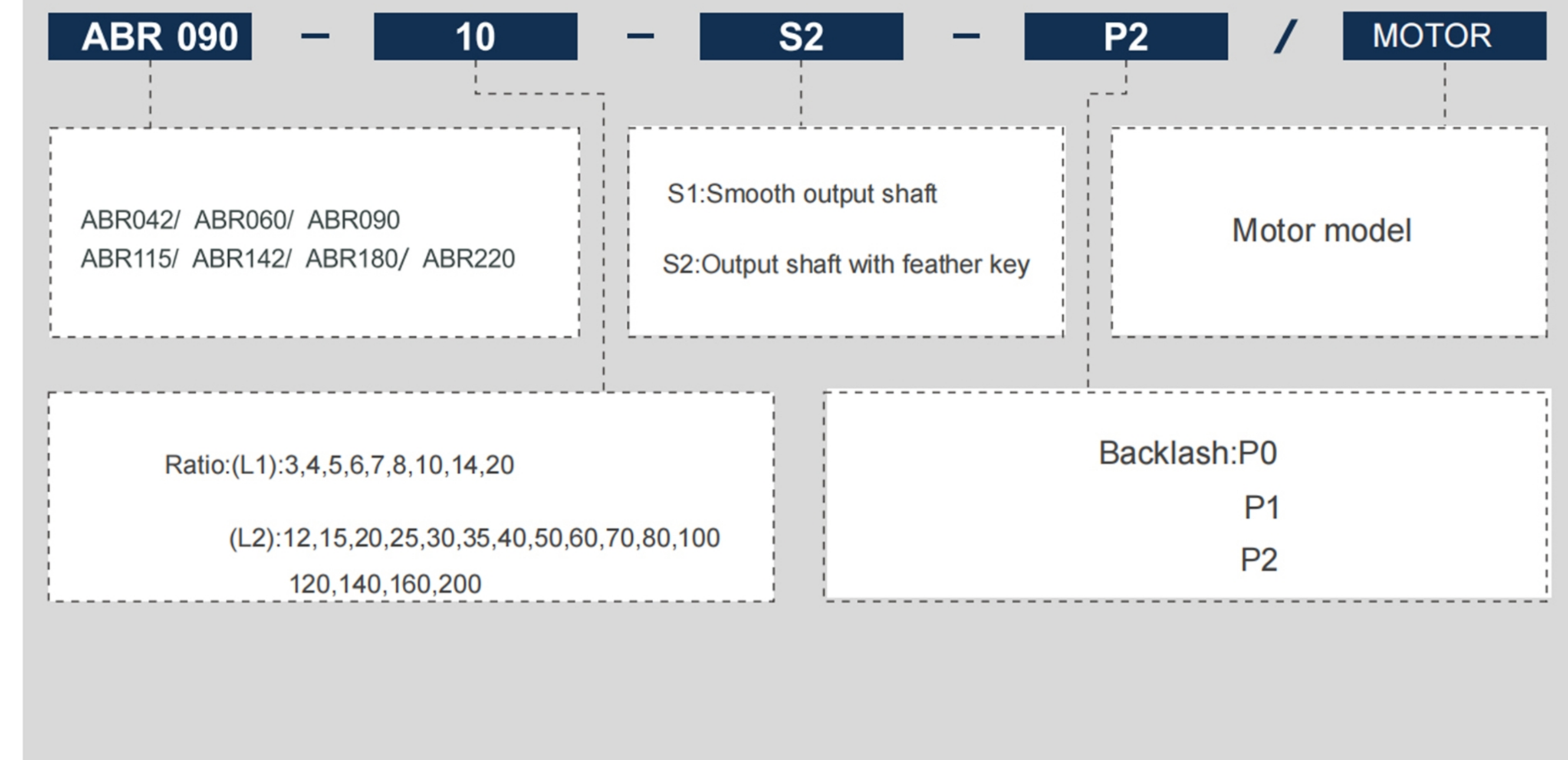
OUTPUT DIAMETER



ABR SERIES



MODEL ILLUMINATE

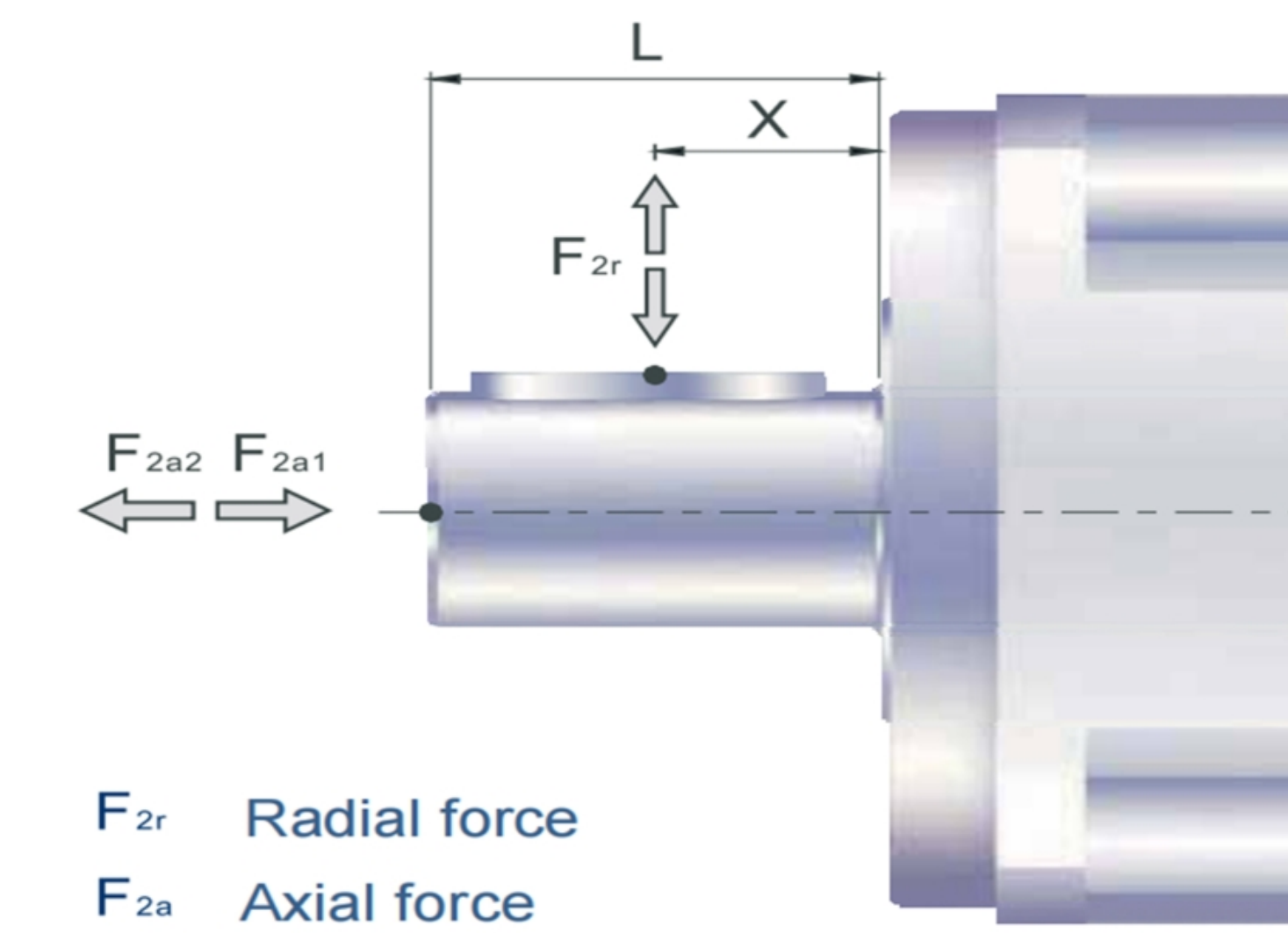


GEAR BOX PERFORMANCE INFORMATION

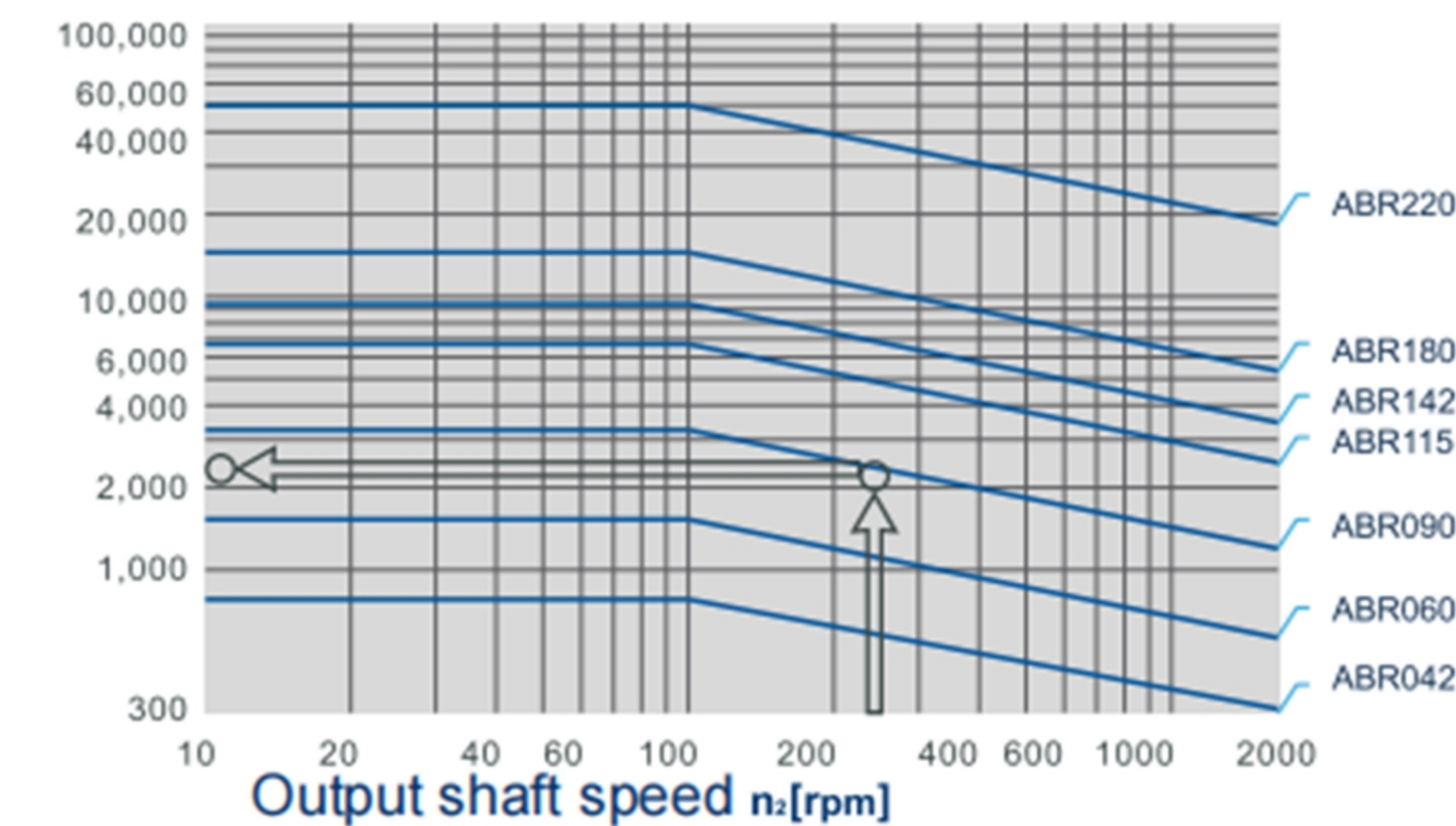
		Stage	Ratio ¹	ABR042	ABR060	ABR090	ABR115	ABR142	ABR180	ABR220
Normal output torque	Nm	1	3	20	55	130	208	342	588	1,140
			4	19	50	140	290	542	1,050	1,700
			5	22	60	160	330	650	1,200	2,000
			6	20	55	150	310	600	1,100	1,900
			7	19	50	140	300	550	1,100	1,800
			8	17	50	140	290	542	1,000	1,600
			10	14	60	160	330	650	520	1,220
			14	–	50	140	300	550	1,100	1,800
			20	–	40	100	230	450	520	1,220
		2	12	–	55	130	208	342	588	1,140
			15	20	55	130	208	342	588	1,140
			20	19	50	140	290	542	1,050	1,700
			25	22	60	160	330	650	1,200	2,000
			30	22	55	130	208	342	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	50	140	290	542	1,200	2,000
			50	22	60	160	330	650	1,200	2,000
			60	22	55	150	310	600	1,200	2,000
			70	22	60	160	330	650	1,200	2,000
			80	22	50	140	290	542	1,200	2,000
			100	22	60	160	330	650	1,200	2,000
			120	–	–	150	310	600	1,100	1,900
			140	–	–	140	300	550	1,100	1,800
			160	–	–	120	260	500	1,000	1,600
			200	–	–	100	230	450	520	1,220
Maximum output torque	Nm	1,2	3~200	3 times nominal output torque						
Normal input speed	rpm	1,2	3~200	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Maximum input speed	rpm	1,2	3~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Backlash P0	arcmin	1	3~20	–	≤2	≤2	≤2	≤2	≤2	≤2
		2	12~200	–	≤4	≤4	≤4	≤4	≤4	≤4
Backlash P1	arcmin	1	3~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	12~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Backlash P2	arcmin	1	3~20	≤6	≤6	≤6	≤6	≤6	≤6	≤4
		2	12~200	≤9	≤9	≤9	≤9	≤9	≤9	≤7
Torsional stiffness	Nm/arcmin	1,2	3~200	3	7	14	25	50	145	225
Maximum radial force F_{2rB}^{*2}	N	1,2	3~200	780	1,530	3,250	6,700	9,400	14,500	50,000
Maximum axial force F_{2a1B}^{*2}	N	1,2	3~200	350	630	1,300	3,000	4,000	6,200	35,000
Maximum axial force F_{2a2B}^{*2}	N	1,2	3~200	390	765	1,625	3,350	4,700	7,250	25,000
Service life	hr	1,2	3~200	20,000*						
Efficiency at full load	%	1	3~20	≤95%						
		2	12~200	≤92%						
Gearbox weight	kg	1	3~20	0.9	2.1	6.4	13	24.5	51	83
		2	12~200	1.2	2.5	7.8	14.2	27.5	54	95
Operating temperature	°C	1,2	3~200	-10°C~+90°C						
Standard lubrication		1,2	3~200	Synthetic grease						
Protection class		1,2	3~200	IP65						
Installation position		1,2	3~200	Any						
Running noise(n=3000rpm)	dB	1,2	3~200	≤61	≤63	≤65	≤68	≤70	≤72	≤74

		Stage	Ratio ¹	ABR042	ABR060	ABR090	ABR115	ABR142	ABR180	ABR220
Mass moment of inertia J_1	kg · cm ²	1	3~7	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			8~10	0.09	0.07	1.87	6.25	21.8	65.6	119.8
			14~20	–	0.07	1.87	6.25	21.8	65.6	119.8
		2	12~40	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			50	0.09	0.09	0.31	1.87	6.25	21.8	65.6
			60	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			70~100	0.09	0.09	0.31	1.87	6.25	21.8	65.6
			120~200	–	–	0.31	1.87	6.25	21.8	65.6

REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND AXIAL FORCE



The radial force F_{2rB} [N] is allowed to be applied at the center of the shaft.

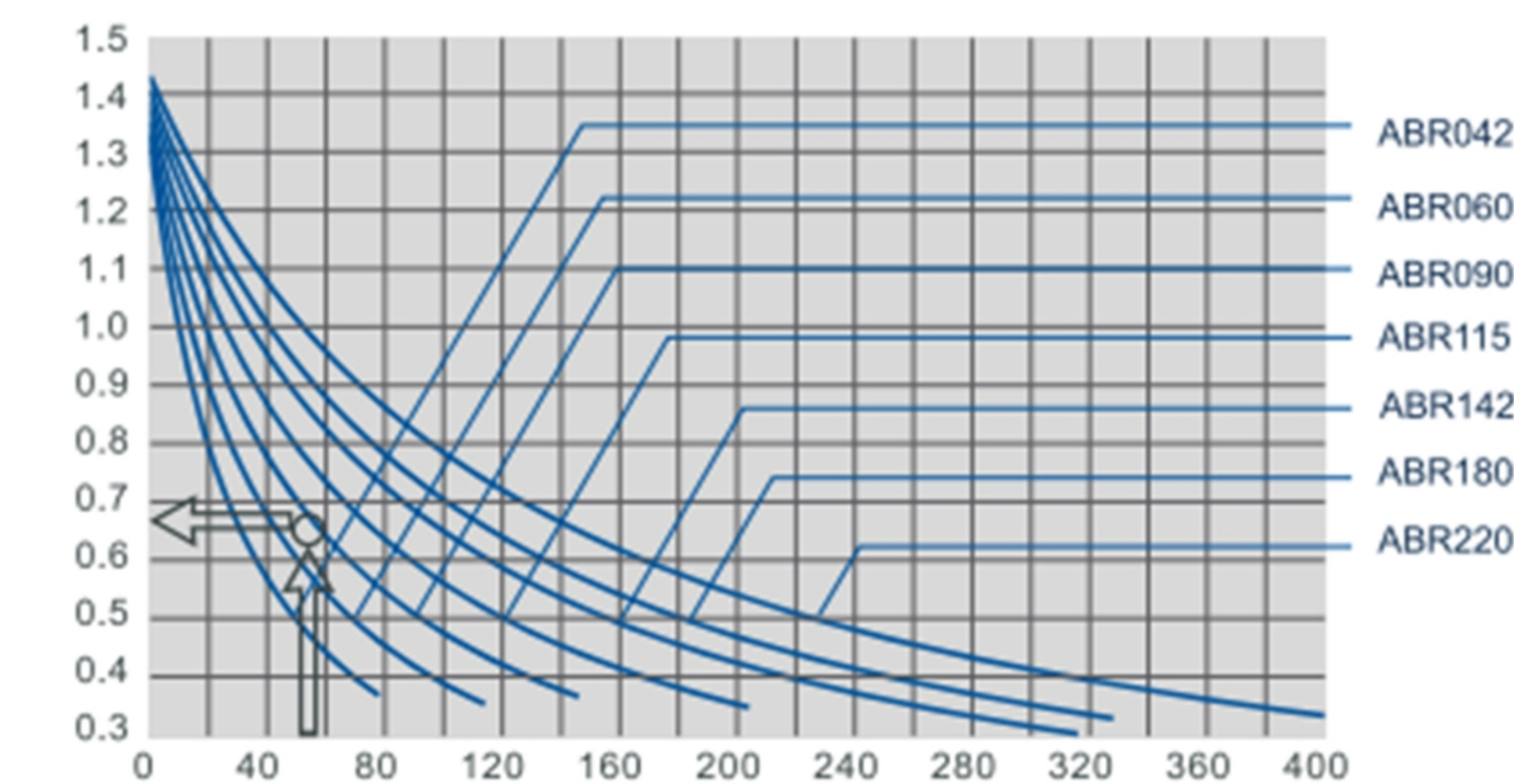


When the radial force F_{2r} is applied at the center of the shaft, $X = 1/2xL$, the allowable radial force F_{2rB} for different gearbox models at different output speeds can be found in the left diagram. The allowable axial force F_{2aB} is given by the following formulas:

$$F_{2a1B} = 0.2 \times F_{2rB}$$

$$F_{2a2B} = 0.1 \times F_{2rB}$$

Load factor at different locations k_x



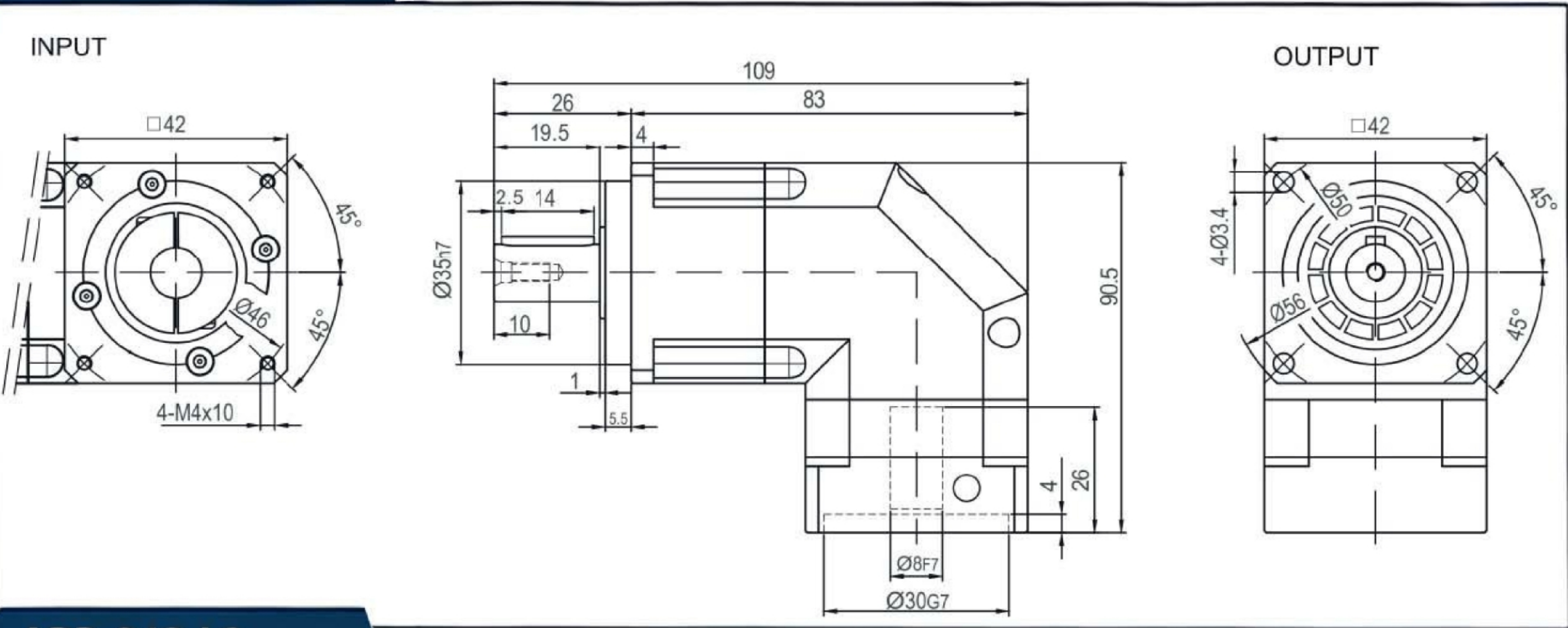
Location of radial force application x [mm]

When the radial force F_{2r} is applied off-center from the shaft, the allowable radial force that can be withstood increases as the point of application gets closer to the gearbox ($X < 1/2xL$), and decreases as it moves further away from the gearbox ($X > 1/2xL$).

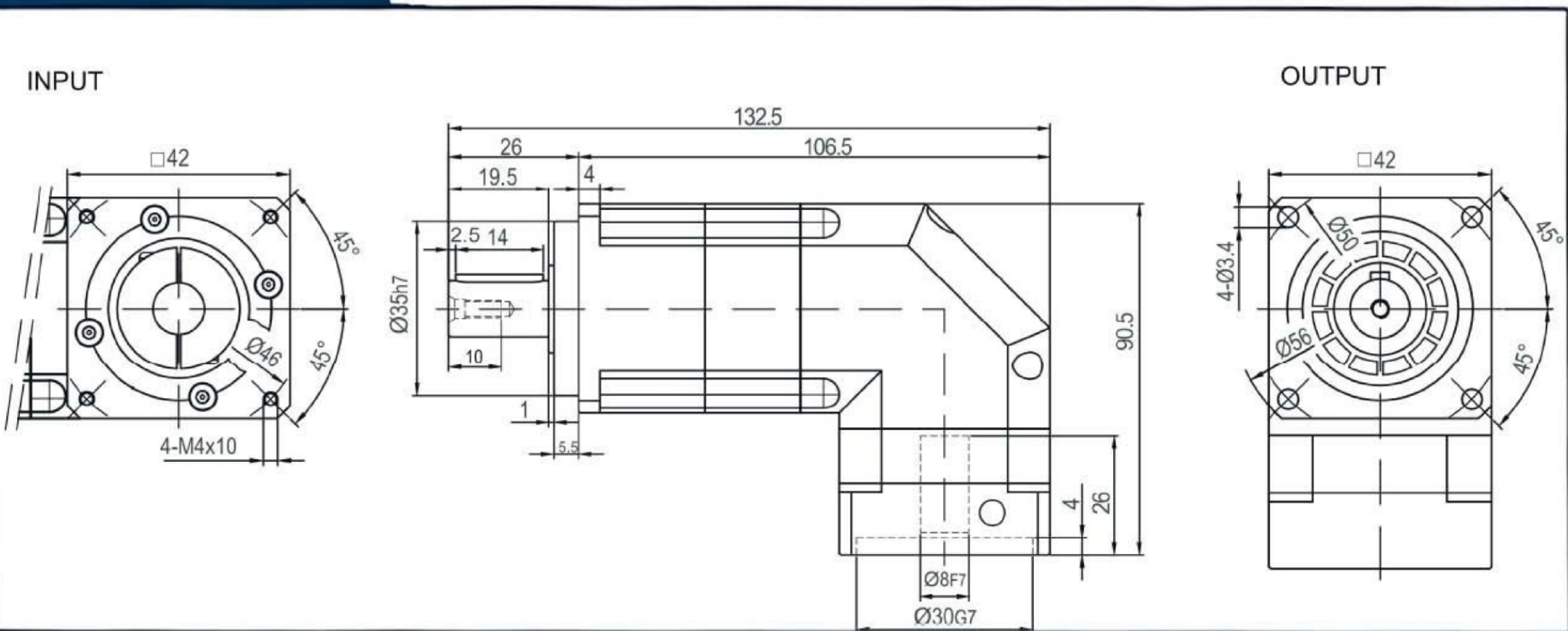
Radial force
 $F'_{2rB} = K_b \times F_{2rB}$
Axial force
 $F'_{2a1B} = 0.2 \times F'_{2rB}$
 $F'_{2a2B} = 0.1 \times F'_{2rB}$

OUTLINE DIMENSION SHEET

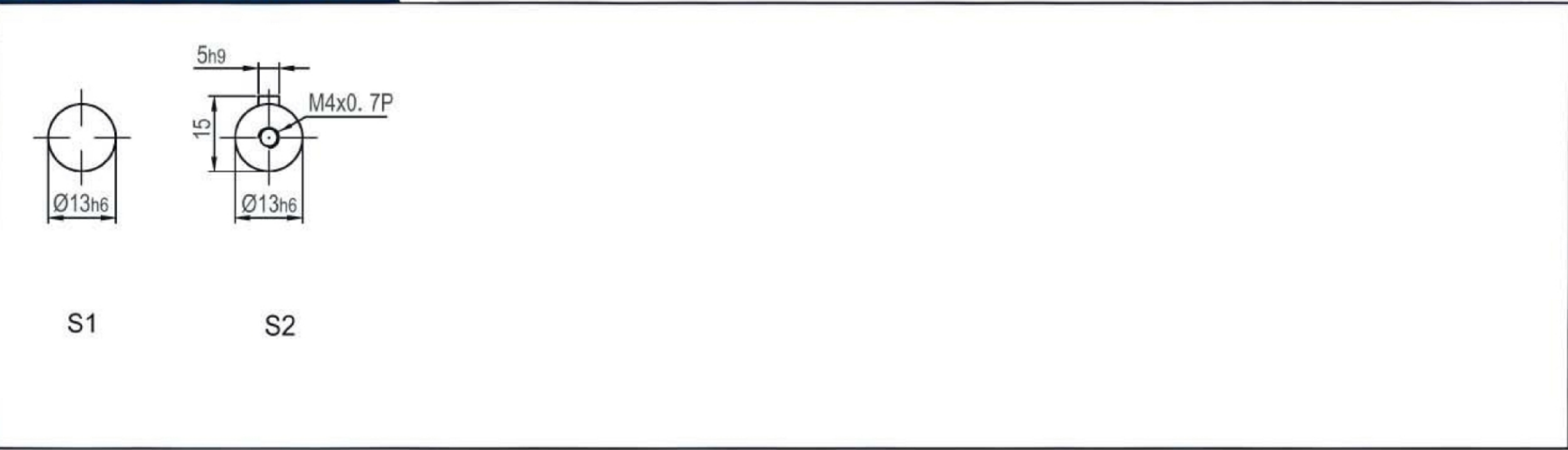
ABR-042-L1



ABR-042-L2

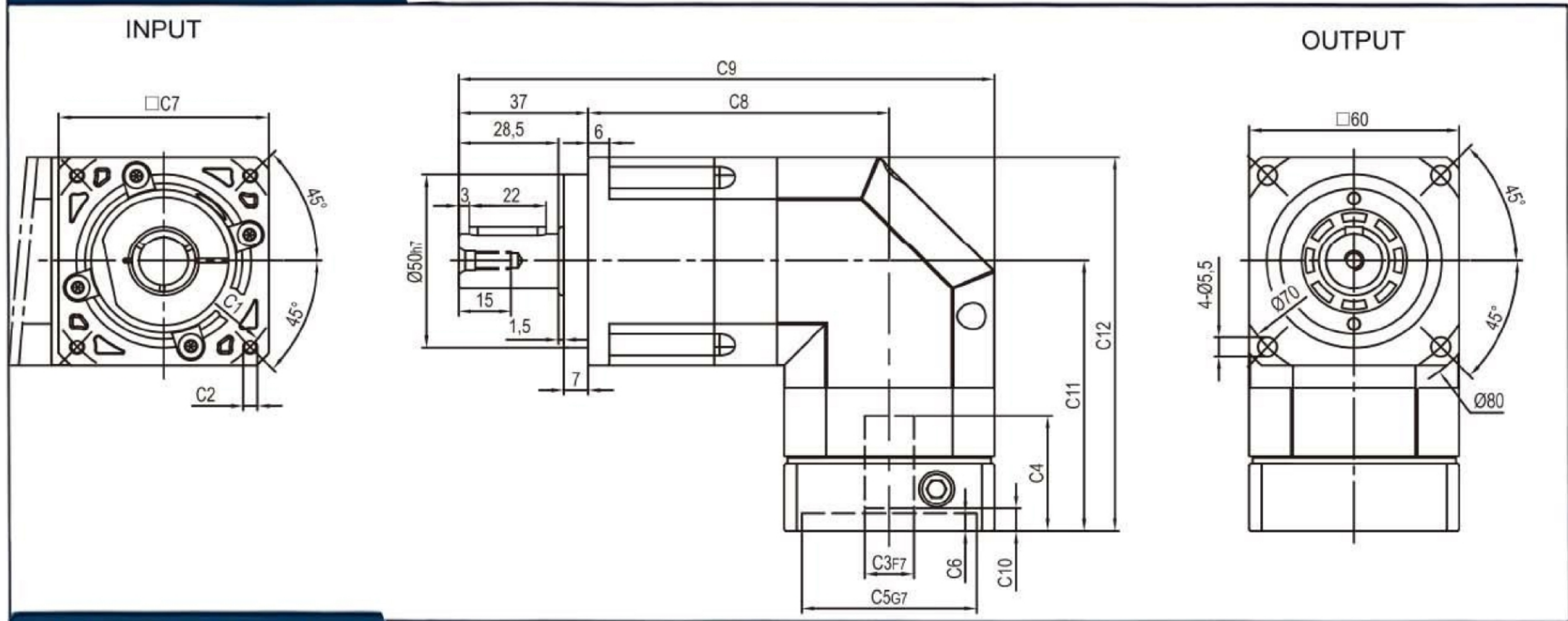


OUTPUT DIAMETER

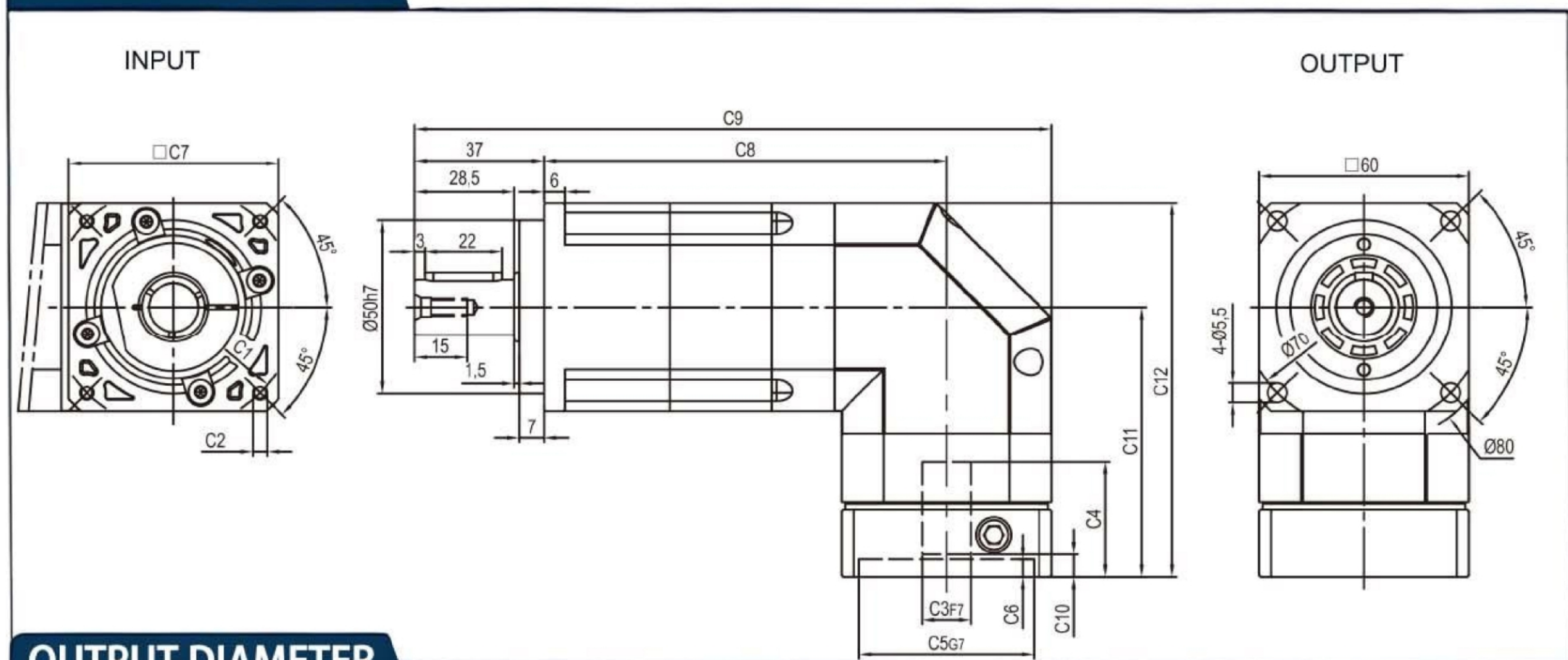


OUTLINE DIMENSION SHEET

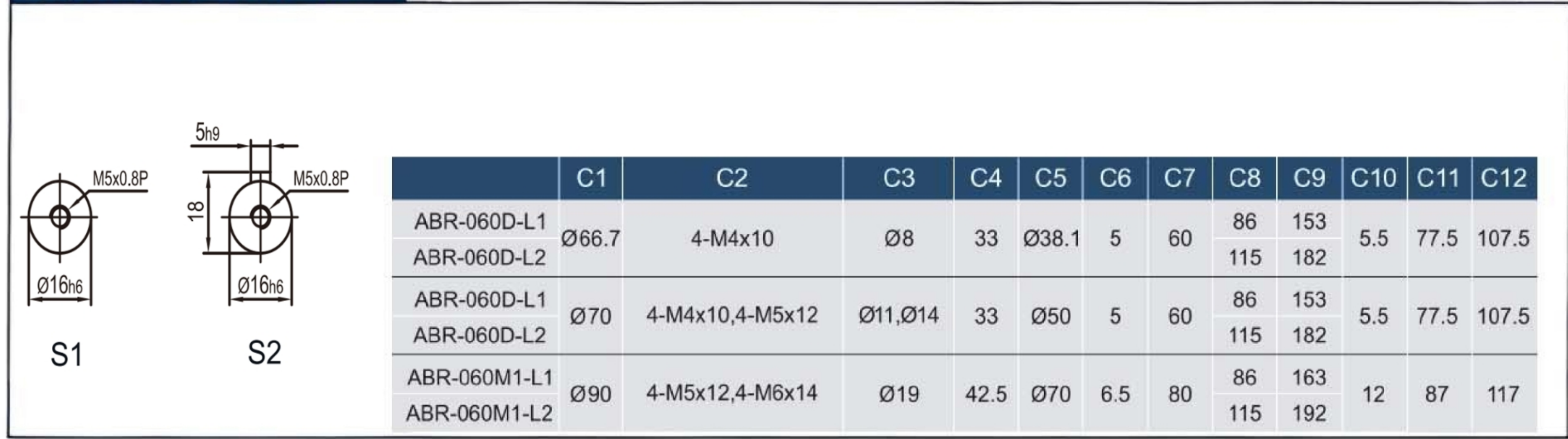
ABR-060D(M1)-L1



ABR-060D(M1)-L2



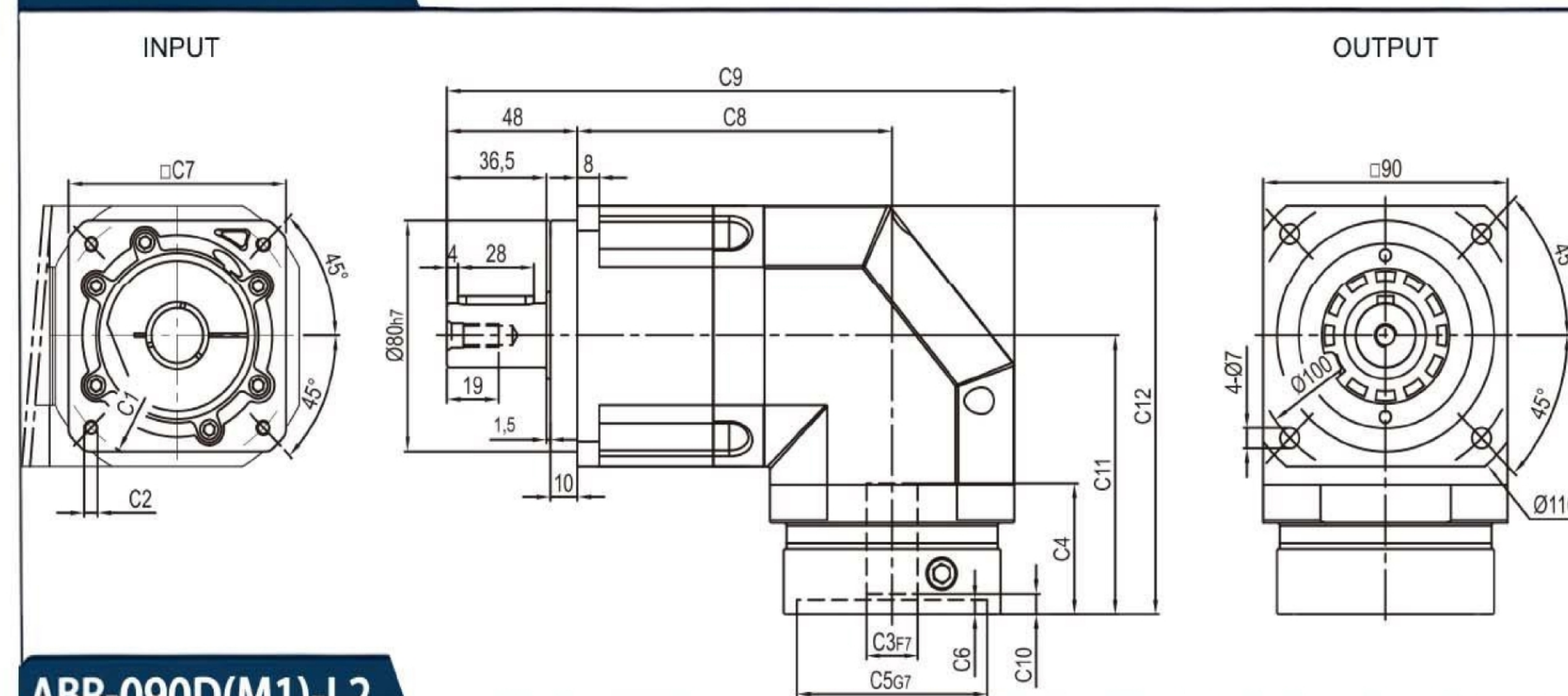
OUTPUT DIAMETER



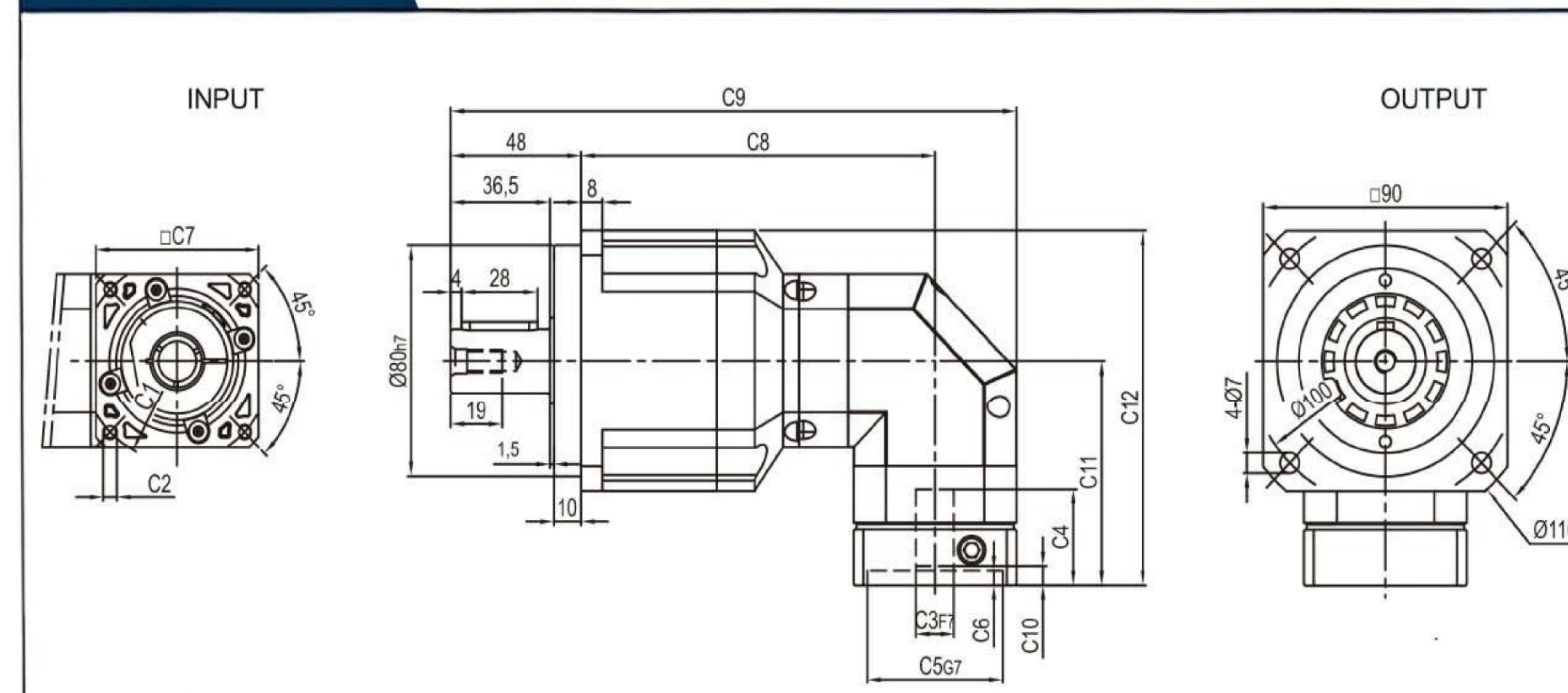
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
ABR-060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	107.5
ABR-060D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	107.5
ABR-060M1-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	107.5
ABR-060M1-L2	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	107.5
ABR-060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	117
ABR-060M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	117

OUTLINE DIMENSION SHEET

ABR-090D(M1)-L1



ABR-090D(M1)-L2

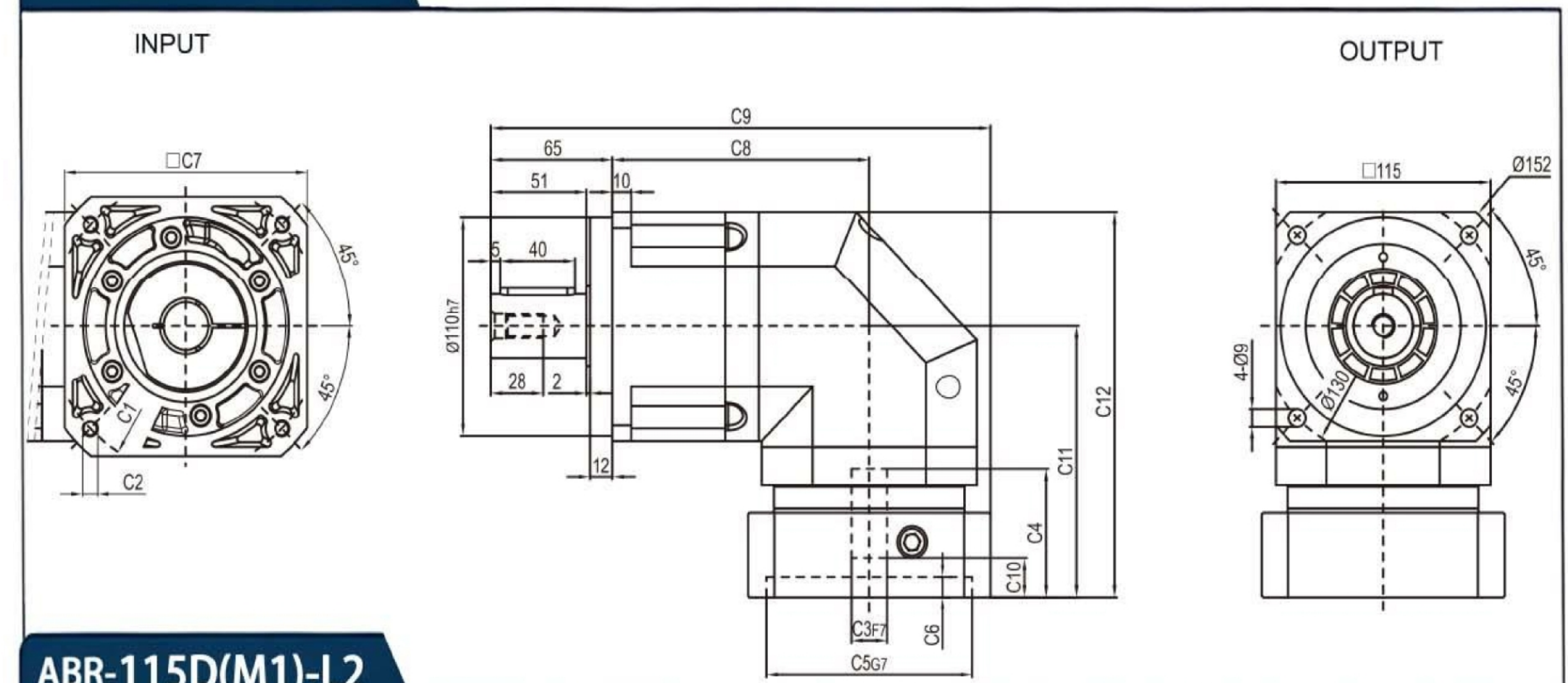


OUTPUT DIAMETER

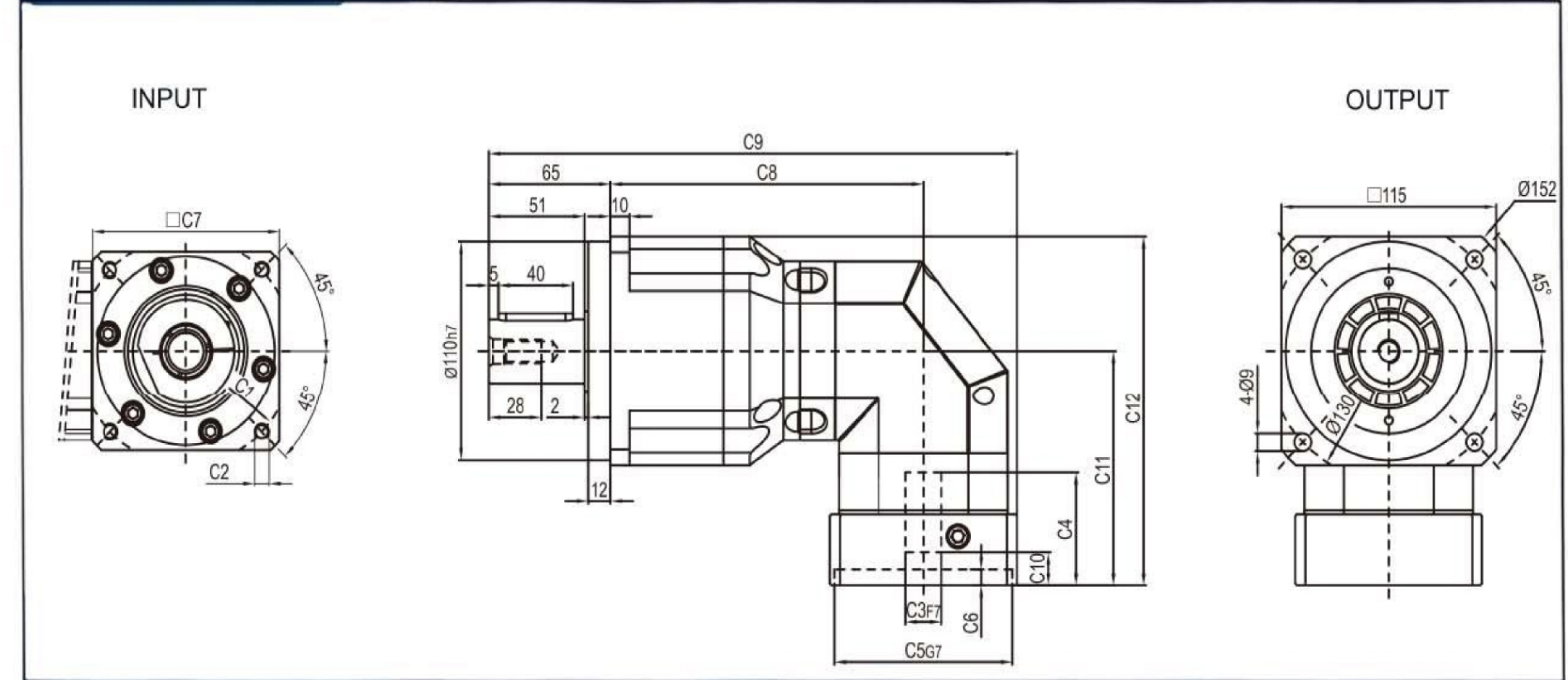
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
ABR-090D-L1	$\varnothing 90$	4-M5x12,4-M6x14	$\varnothing 19$	45	$\varnothing 70$	6.5	80	116	209	7	96	141
ABR-090M1-L1	$\varnothing 115$	4-M8x20	$\varnothing 19, \varnothing 22$	56.5	$\varnothing 95$	8	100	116	214	16.5	117.5	162.5
ABR-090D-L2	$\varnothing 66.7$	4-M4x10	$\varnothing 8$	33	$\varnothing 38.1$	5	60	130.5	208.5	5.5	77.5	122.5
ABR-090M1-L2	$\varnothing 90$	4-M5x12,4-M6x14	$\varnothing 19$	42.5	$\varnothing 70$	6.5	80	130.5	218.5	12	87	132
ABR-090M1-L2	$\varnothing 100$	4-M6x14	$\varnothing 16$	42.5	$\varnothing 80$	6.5	86	130.5	221.5	11	87	132

OUTLINE DIMENSION SHEET

ABR-115D(M1)-L1



ABR-115D(M1)-L2

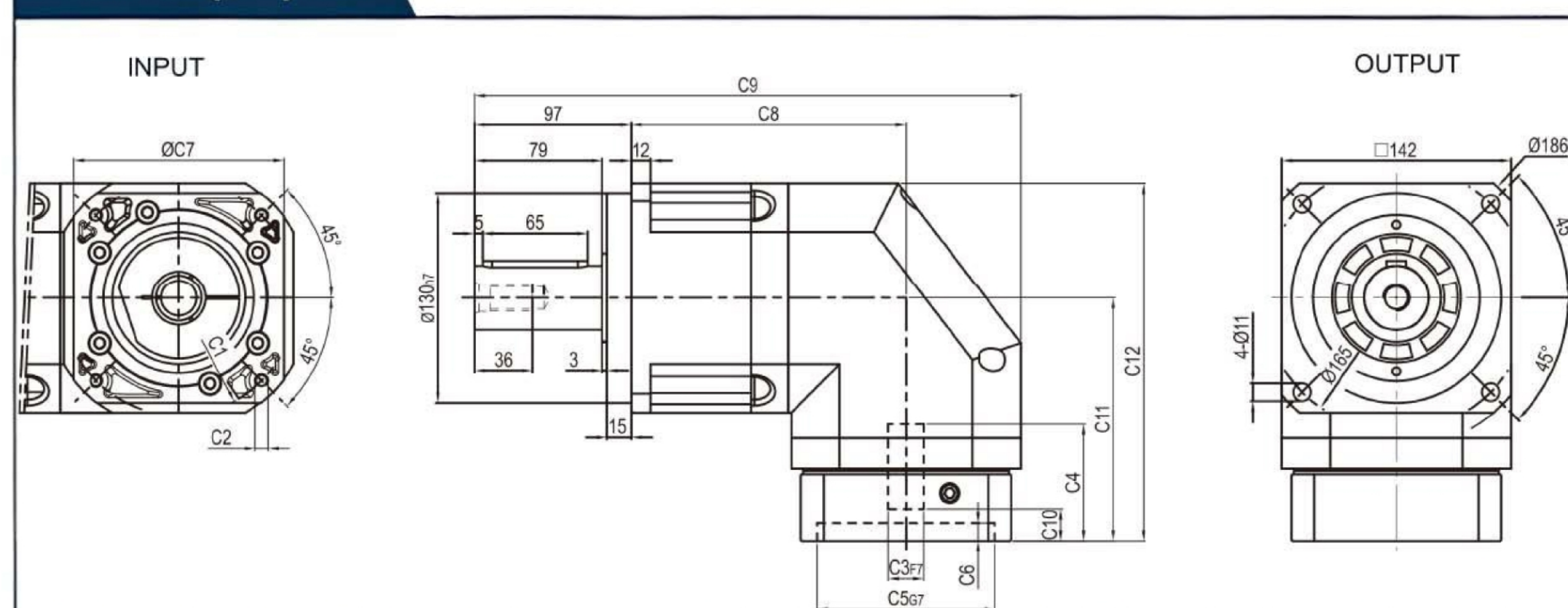


OUTPUT DIAMETER

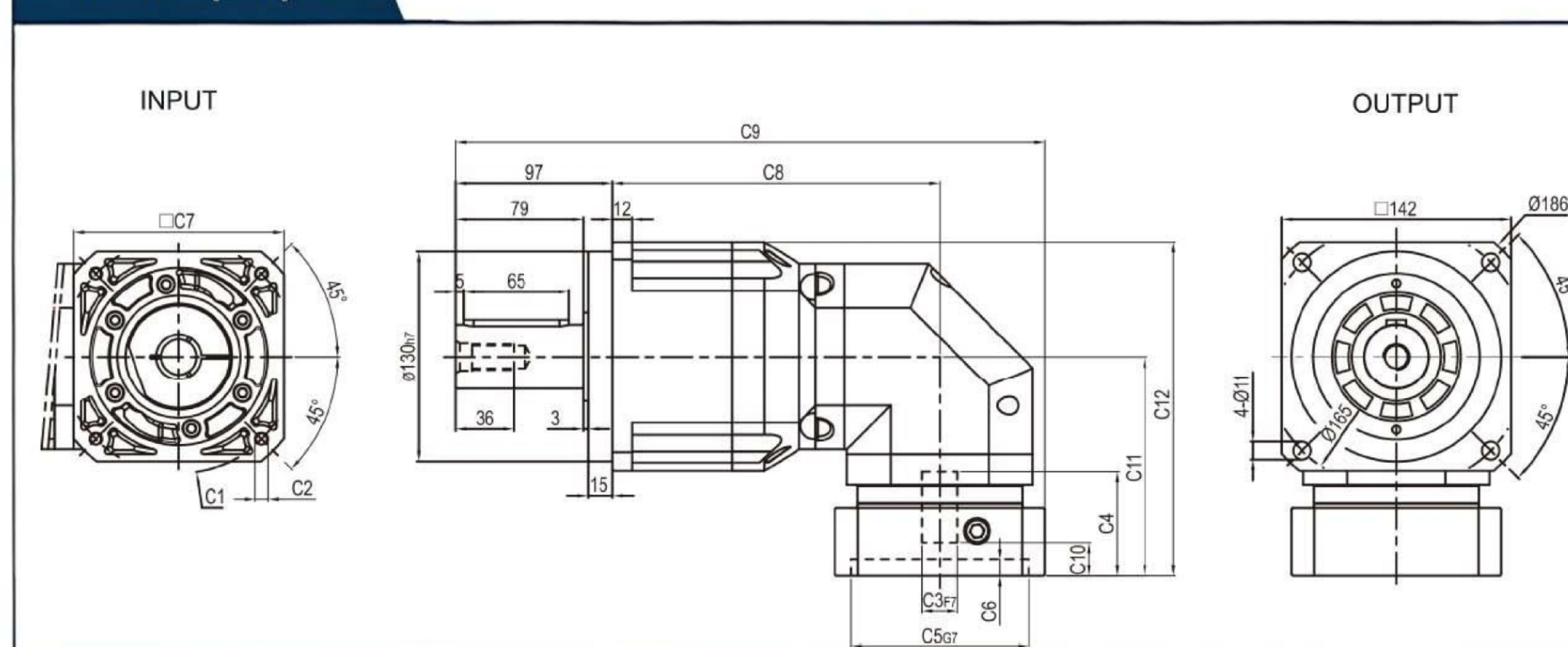
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
ABR-115D-L1	$\varnothing 145$	4-M8x20	$\varnothing 19, \varnothing 22, \varnothing 24$	64	$\varnothing 110$	10	130	137.5	267.5	19.5	135.5	193
ABR-115M1-L1	$\varnothing 200$	4-M12x28	$\varnothing 35$	81	$\varnothing 114.3$	10	180	137.5	292.5	28	152.5	210
ABR-115D-L2	$\varnothing 90$	4-M5x12,4-M6x14	$\varnothing 19$	45	$\varnothing 70$	6.5	80	167.5	277.5	7	96	153.5
ABR-115M1-L2	$\varnothing 115$	4-M8x20	$\varnothing 19, \varnothing 22$	56.5	$\varnothing 95$	8	100	167.5	282.5	16.5	117.5	175
ABR-115M1-L2	$\varnothing 145$	4-M8x20	$\varnothing 19, \varnothing 22, \varnothing 24$	59	$\varnothing 110$	11	130	167.5	297.5	19	120	177.5

OUTLINE DIMENSION SHEET

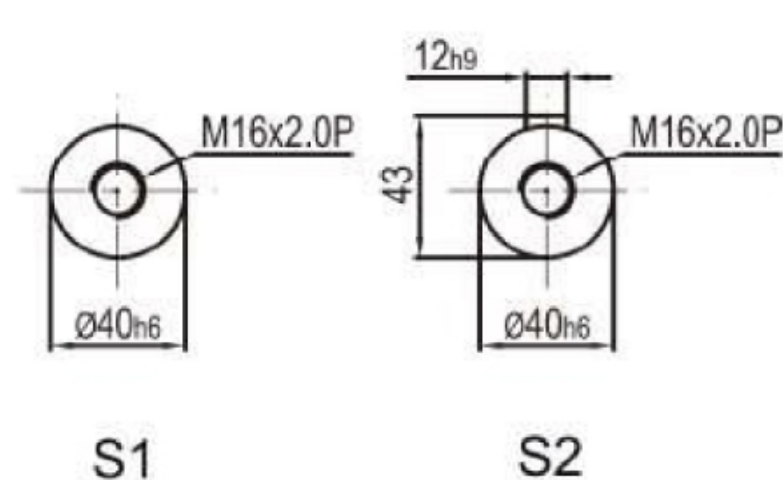
ABR-142D(M1)-L1



ABR-I 42D(M1)-L2



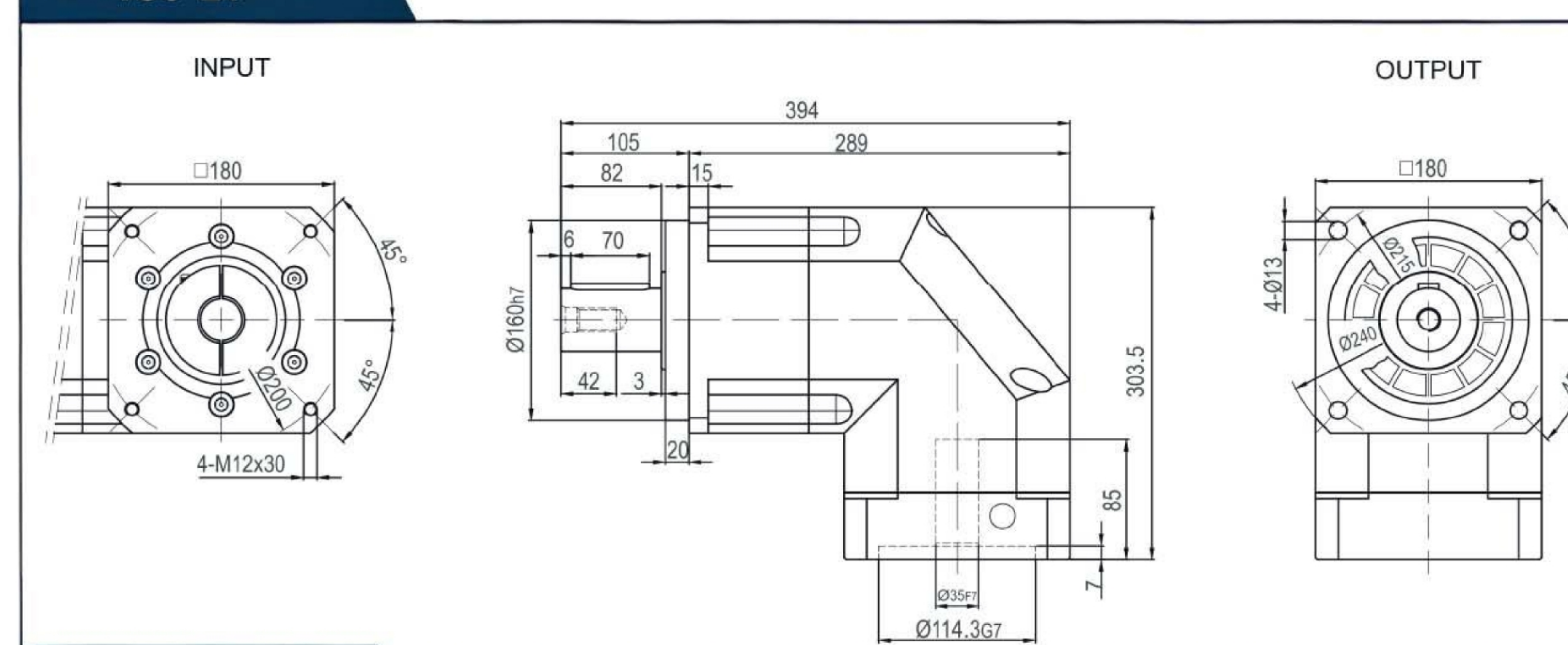
OUTPUT DIAMETER



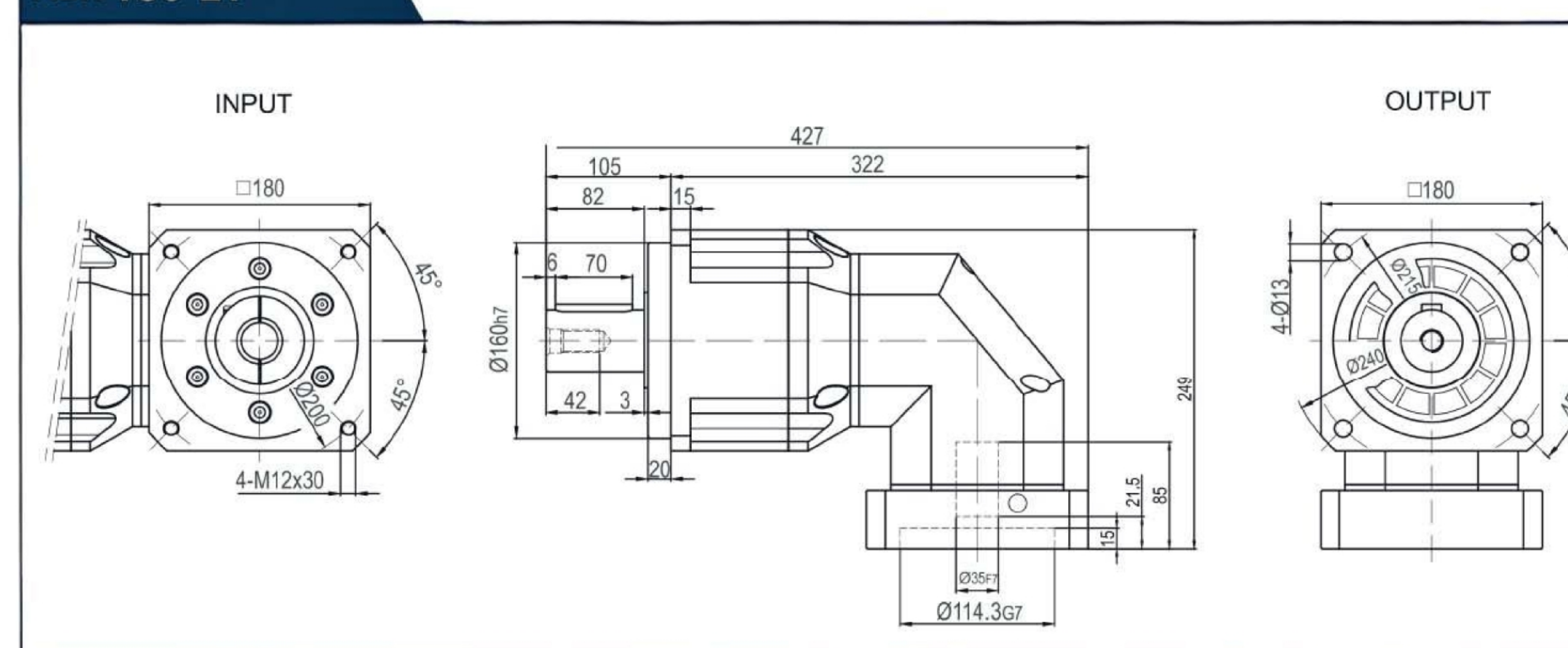
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
ABR-142D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	170	338	19.5	150	221
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	170	357	25	160	231
ABR-142D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	202.5	364.5	19.5	135.5	206.5
ABR-142M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	202.5	389.5	28	152.5	223.5

OUTLINE DIMENSION SHEET

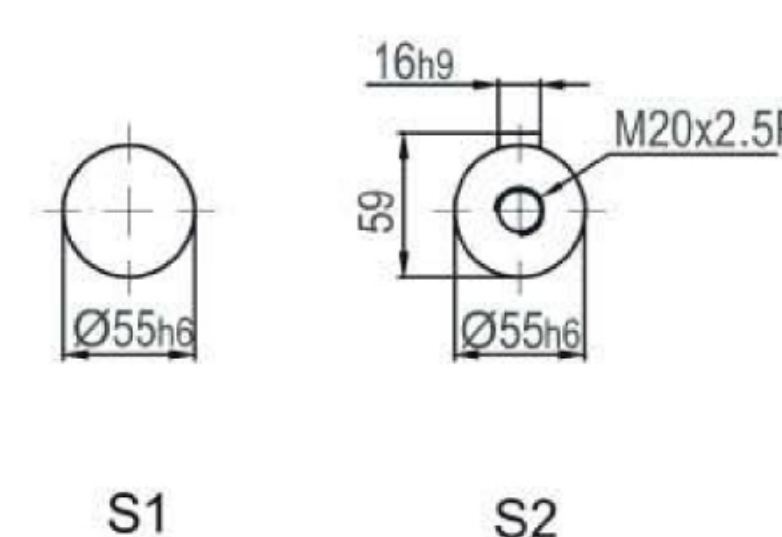
ABR-180-L1



ABR-180-L1

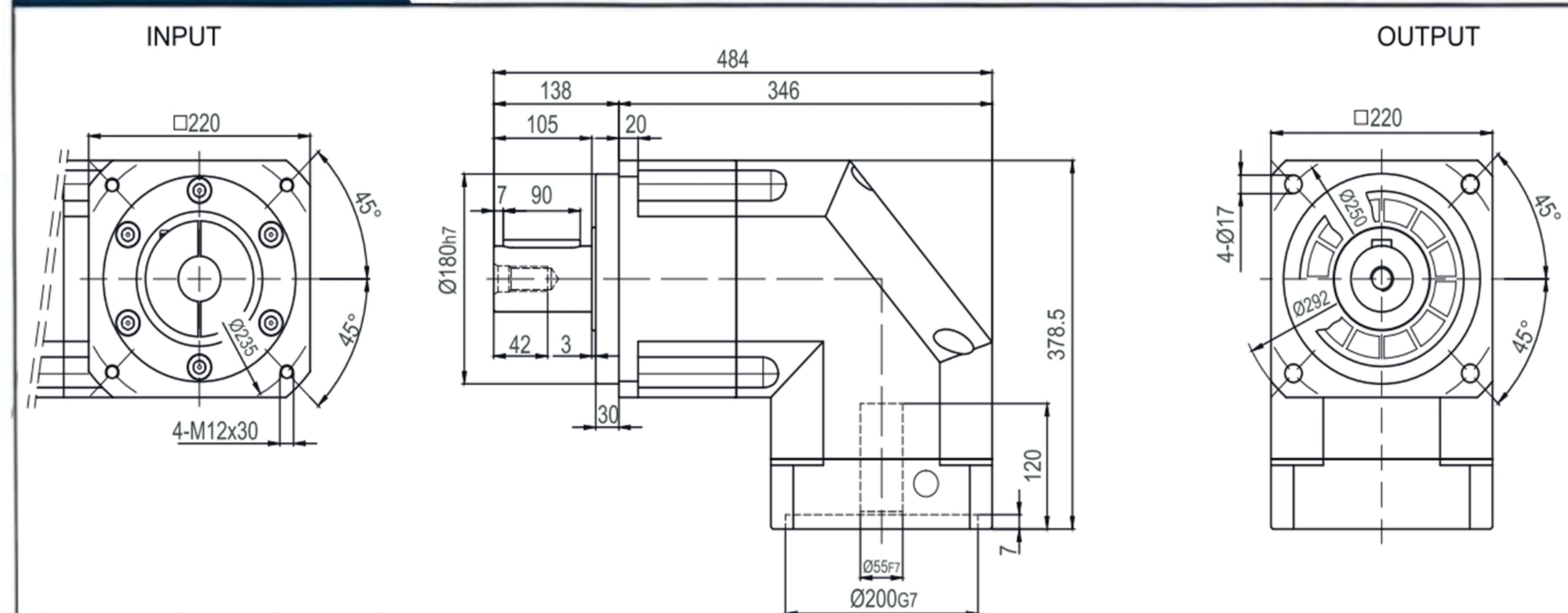


OUTPUT DIAMETER

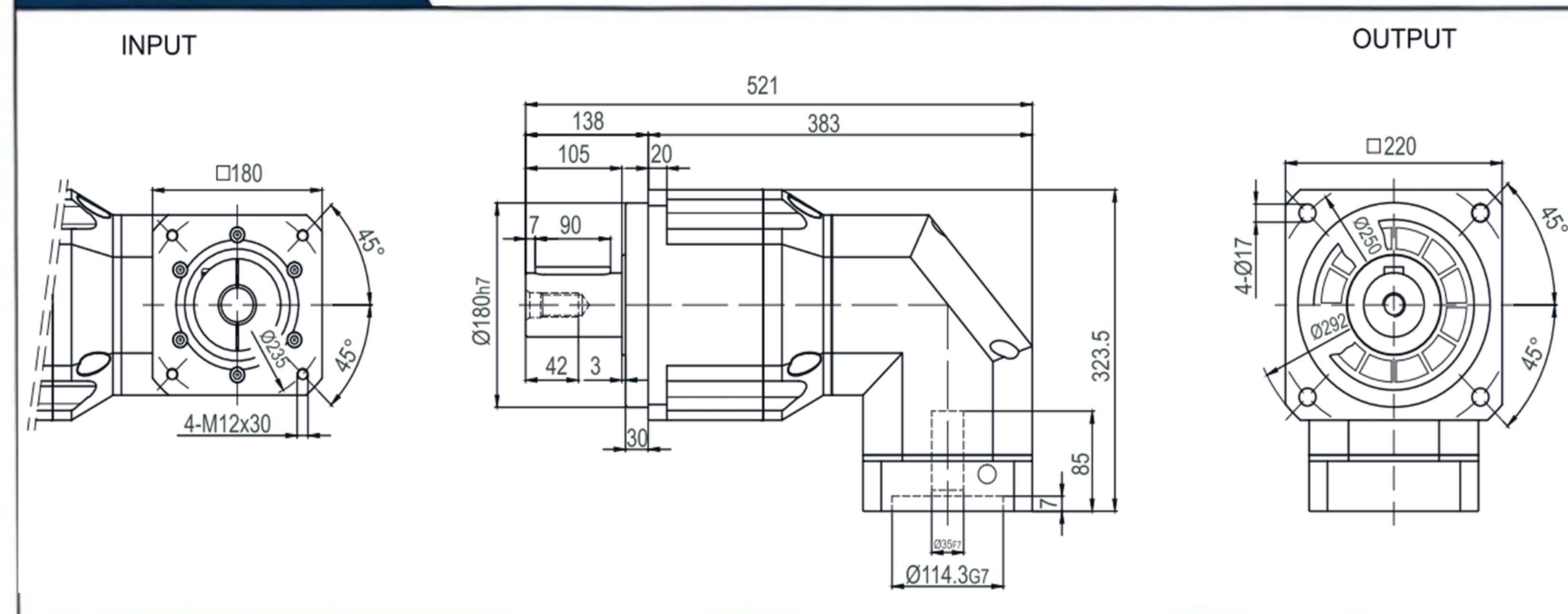


OUTLINE DIMENSION SHEET

ABR-220-L1



ABR-220-L2



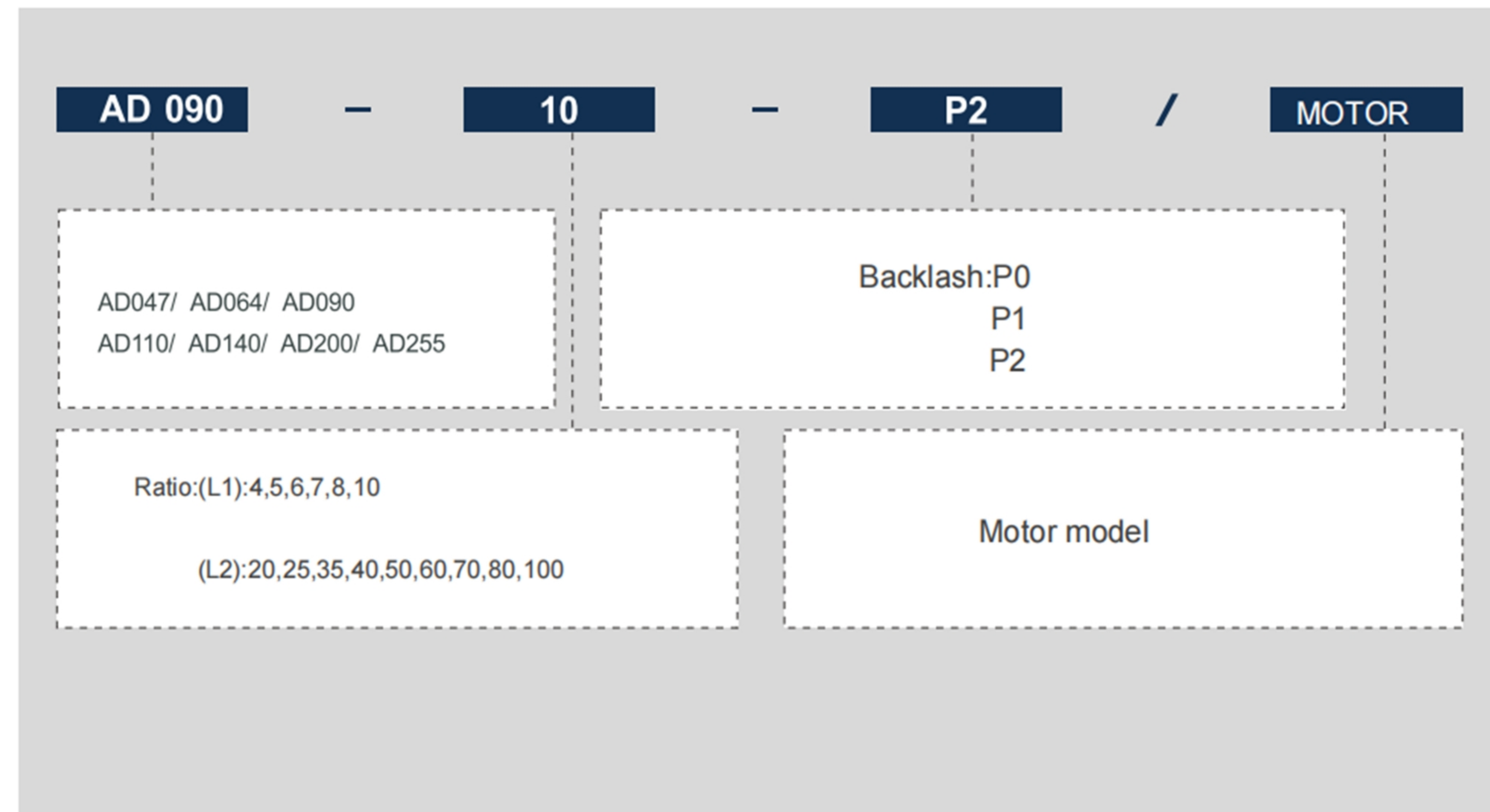
OUTPUT DIAMETER



AD
SERIES



MODEL ILLUMINATE



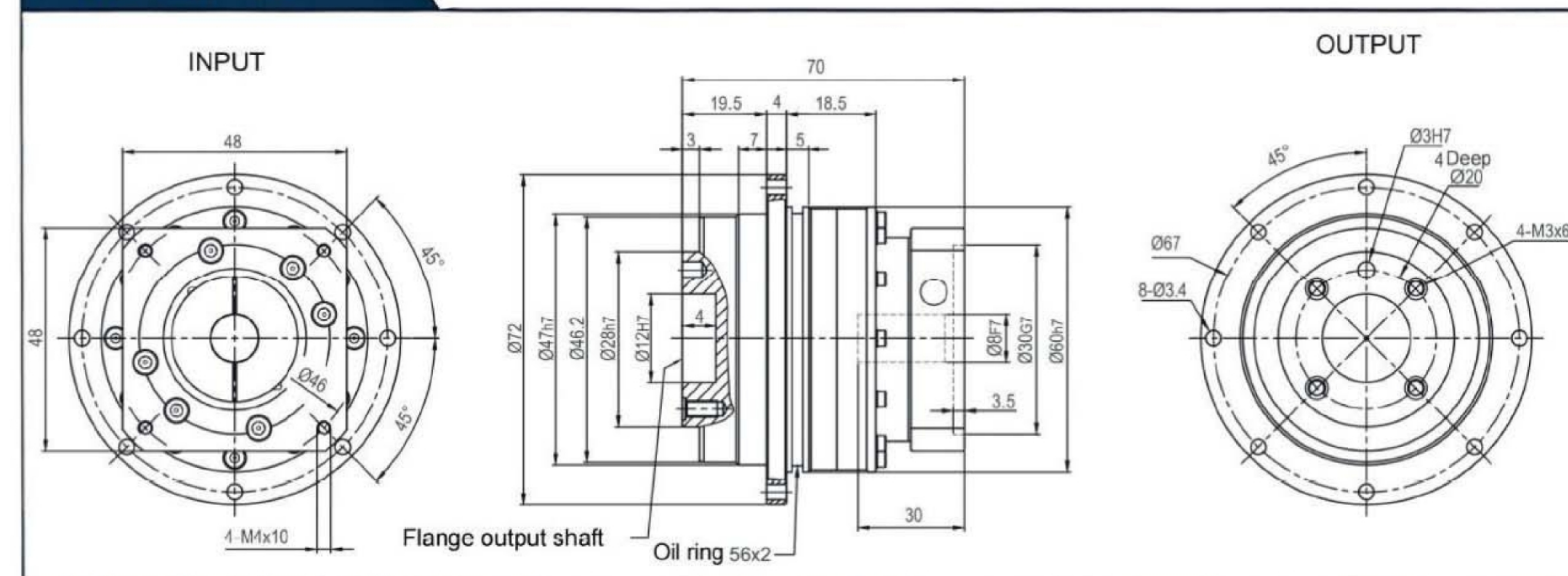
GEAR BOX PERFORMANCE INFORMATION

		Stage	Ratio ¹	AD047	AD064	AD090	AD110	AD140	AD200	AD255
Normal output torque	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			6	-	55	150	310	600	-	-
			7	19	50	140	300	550	1,100	1,800
			8	17	45	120	260	500	1,000	1,600
			10	14	40	100	230	450	520	1,220
		2	20	19	48	130	270	560	1,100	1,700
			25	22	60	160	330	650	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	48	130	270	560	1,200	2,000
			50	22	60	160	330	650	1,200	2,000
			60	-	55	150	310	600	-	-
			70	19	50	140	300	550	1,100	1,800
			80	-	45	120	260	500	-	-
			100	14	40	100	230	450	520	1,220
Maximum output torque	Nm	1,2	4~100	3 times nominal output torque						
Normal input speed	rpm	1,2	4~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Maximum input speed	rpm	1,2	4~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Backlash P0	arcmin	1	4~100	-	≤1	≤1	≤1	≤1	≤1	≤1
		2	4~10	-	≤2	≤2	≤2	≤2	≤2	≤2
Backlash P1	arcmin	1	20~100	≤3	≤3	≤3	≤3	≤3	≤3	≤3
		2	4~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
Backlash P2	arcmin	1	20~100	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	4~10	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional stiffness	Nm/arcmin	1,2	20~100	7	13	31	82	151	440	1,006
Maximum tilting moment M_{2KB}^2	Nm	1,2	4~100	42.5	125	235	430	1,300	3,064	5,900
Maximum radial force F_{2B}^2	N	1,2	4~100	1,080	2,110	2,310	4,800	6,200	5,450	10,600
Service life	hr	1,2	4~100	20,000 *						
Efficiency at full load	%	1	4~10	≥97%						
		2	20~100	≥94%						
Gearbox weight	kg	1	4~10	0.7	1.2	3.0	5.6	11.9	31.6	56.1
		2	20~100	1.0	1.6	3.7	7.3	15.9	36.9	70.4
Operating temperature	°C	1,2	4~100	-10°C~+90°C						
Standard lubrication		1,2	4~100	Synthetic grease						
Protection class		1,2	4~100	IP65						
Installation position		1,2	4~100	Any						
Running noise(n=3000rpm)	dB	1,2	4~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

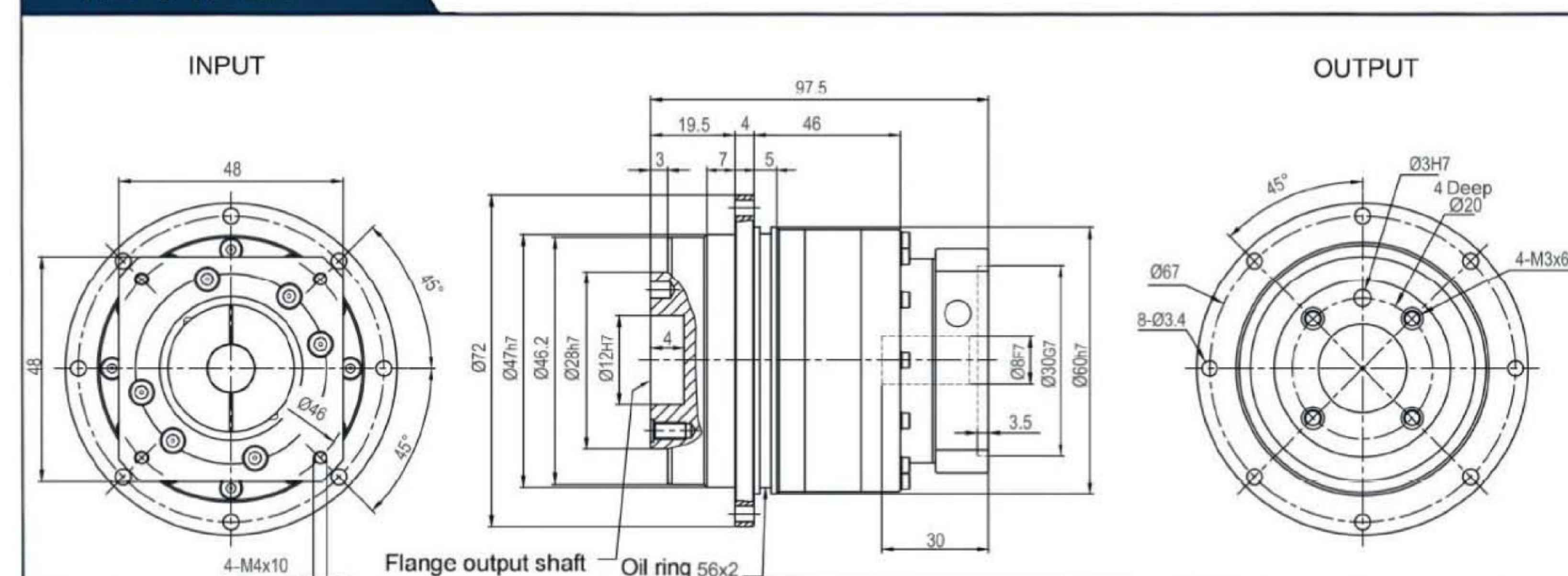
		Stage	Ratio ¹	AD047	AD064	AD090	AD110	AD140	AD200	AD255
Mass moment of inertia J_1	kg·cm ²	1	4	0.03	0.14	0.51	2.87	7.54	25.03	58.31
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	-	0.13	0.45	2.65	7.25	-	-
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.45	2.58	7.07	22.48	50.97
			10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
		2	20	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			25	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			35	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			40	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			50	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			60	-	0.03	0.13	0.44	2.57	-	-
			70	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			80	-	0.03	0.13	0.44	2.57	-	-
			100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

OUTLINE DIMENSION SHEET

AD-047-L1

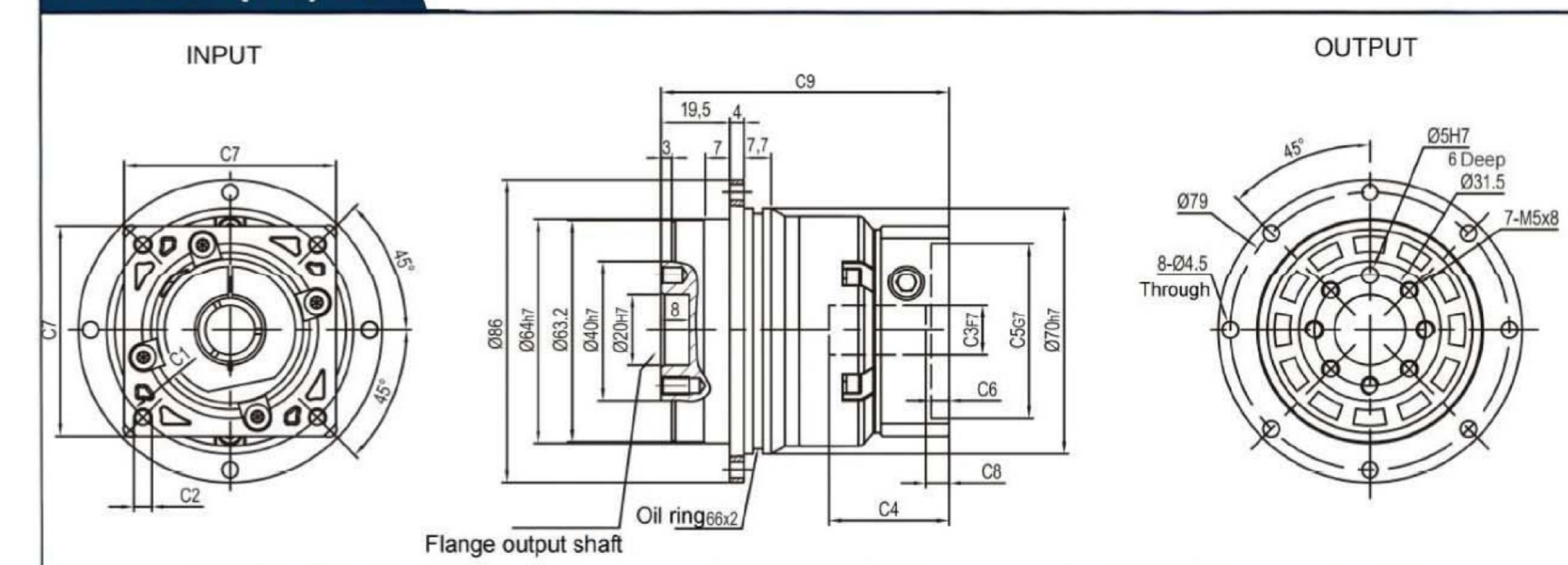


AD-047-L2

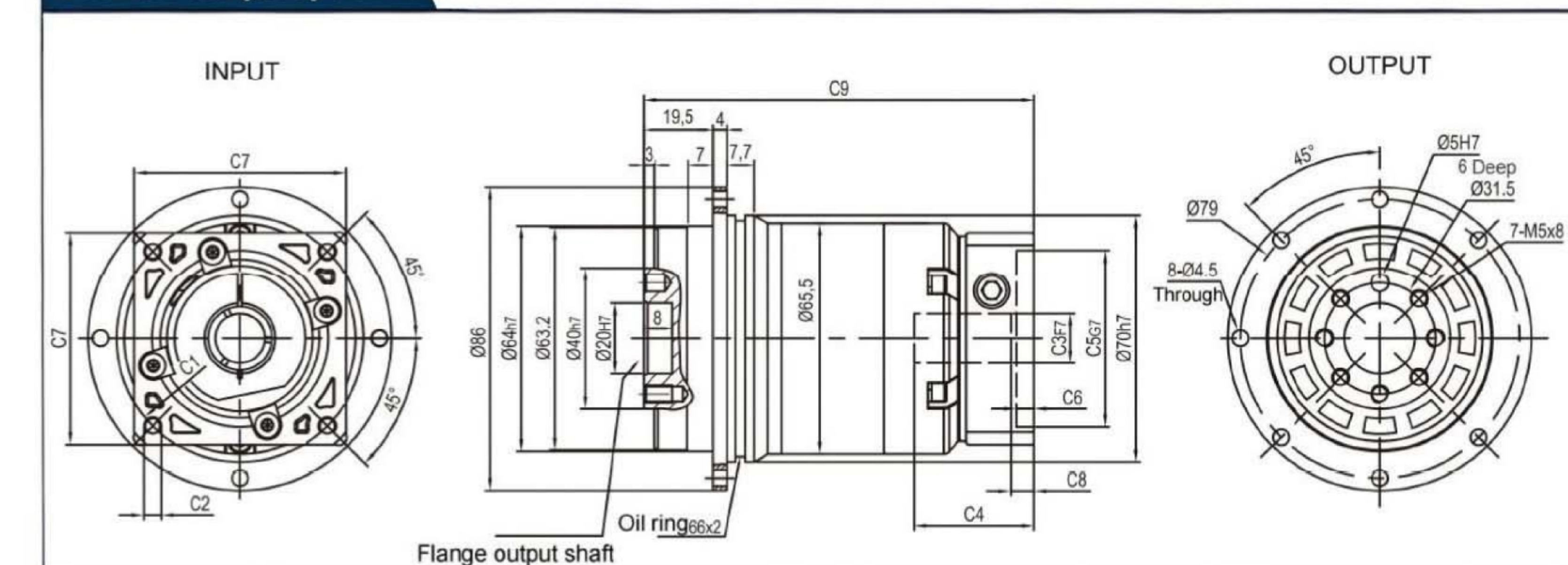


OUTLINE DIMENSION SHEET

AD-064D(M1)-L1



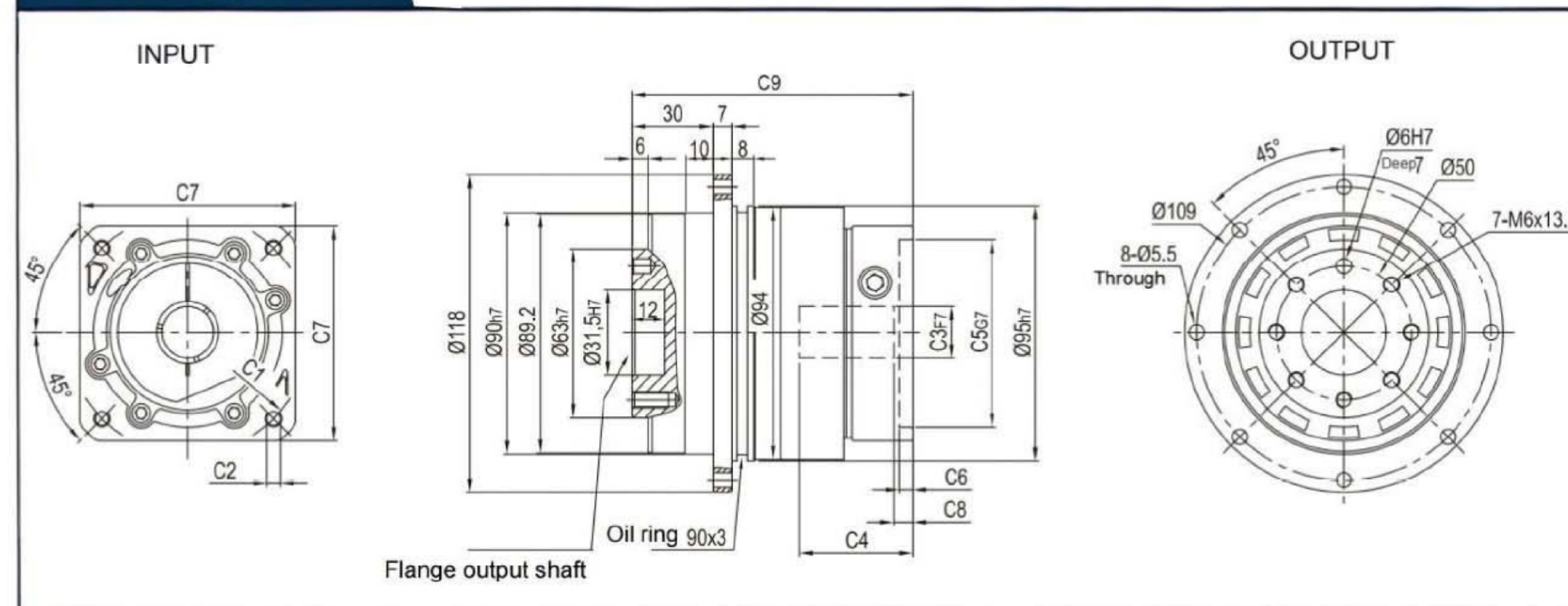
AD-064D(M1)-L2



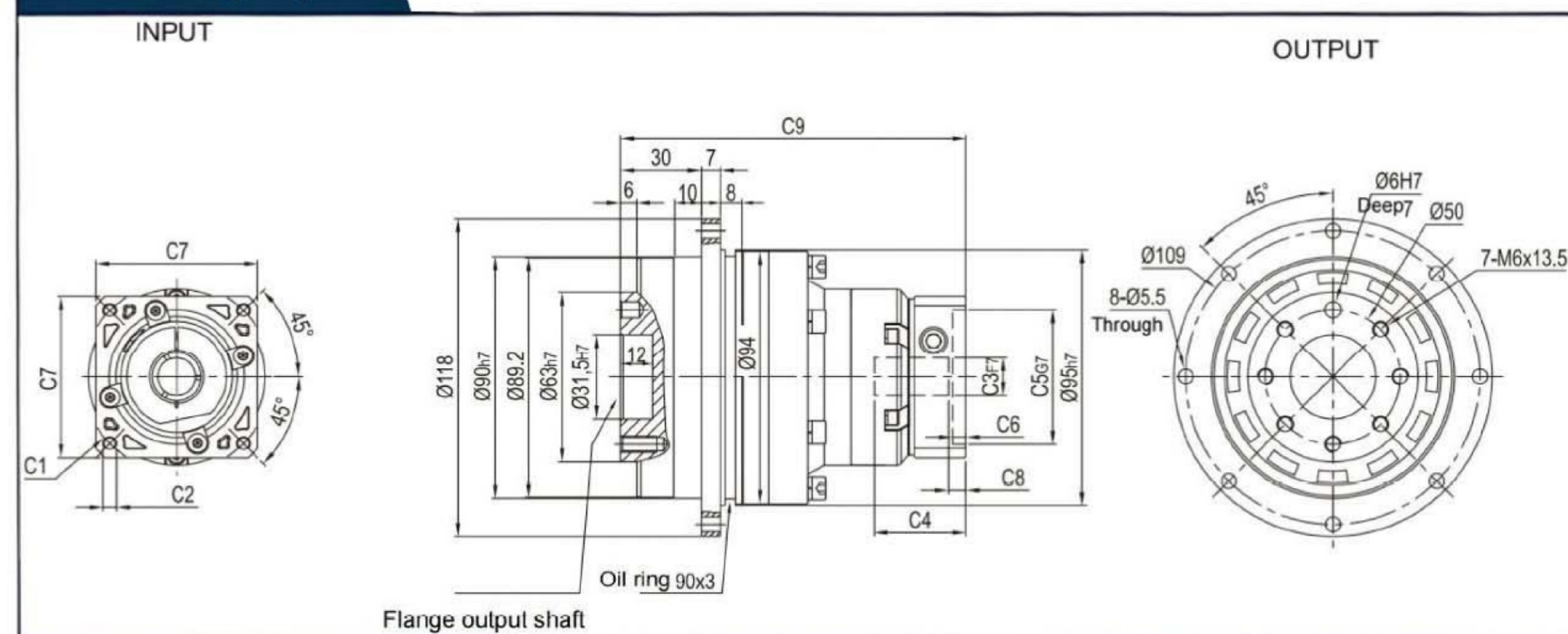
	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-064D-L1	ø66.7	4-M4x10	ø8	34	ø38.1	5	60	5.5	81.5
AD-064D-L2									110.5
AD-064D-L1	ø70	4-M4x10,4-M5x12	ø11,ø14	34	ø50	5	60	5.5	81.5
AD-064D-L2									110.5
AD-064M1-L1	ø90	4-M5x12,4-M6x14	ø19	42	ø70	6.5	80	12	88
AD-064M1-L2									117

OUTLINE DIMENSION SHEET

AD-090D(M1)-L1



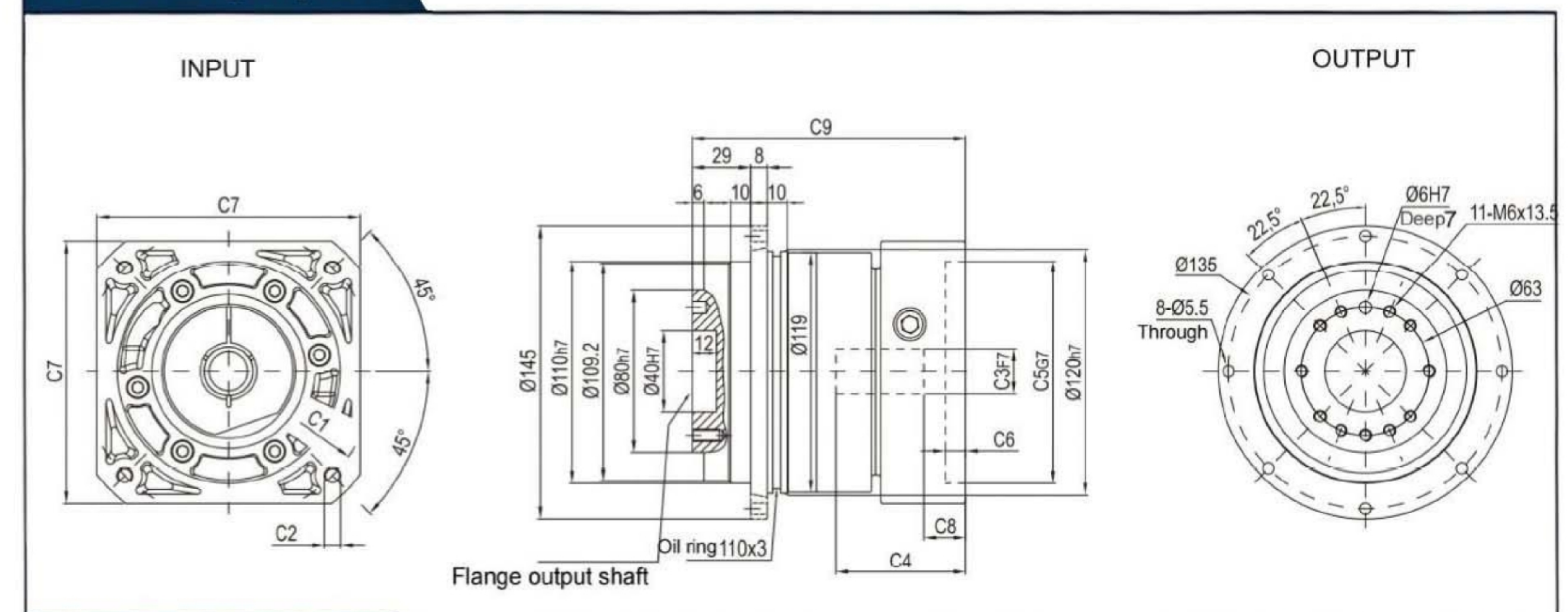
AD-090D(M1)-L2



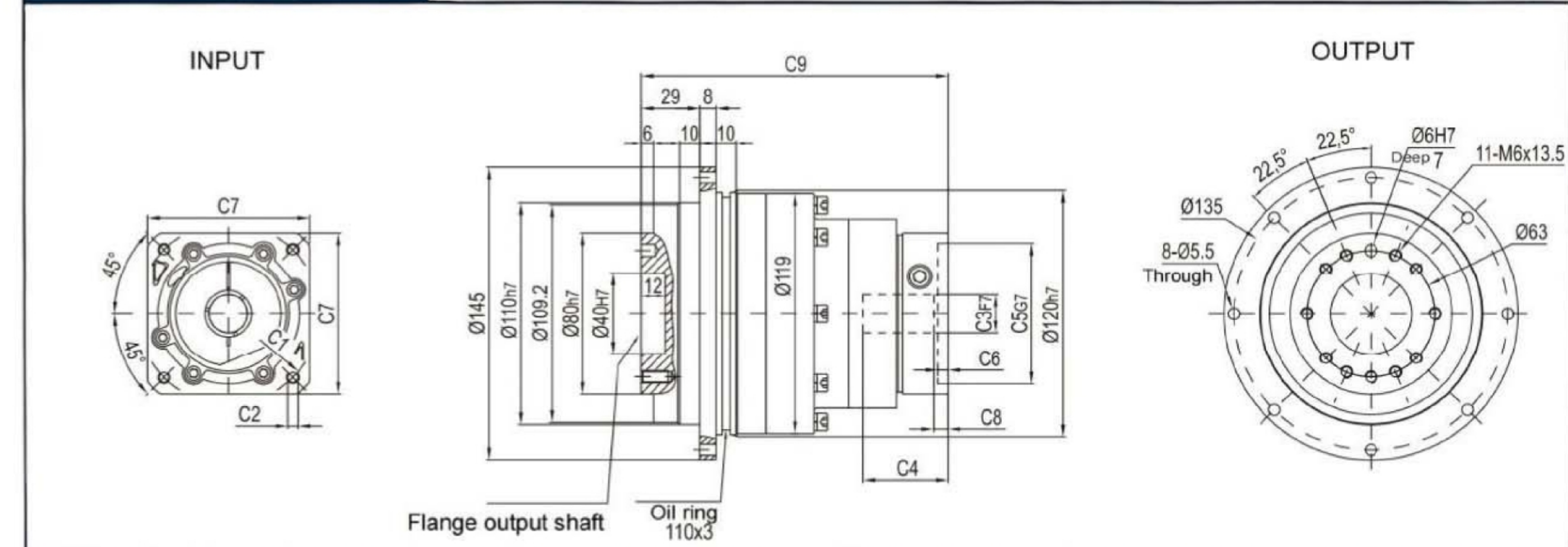
	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-090D-L1	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	7	104
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	104
AD-090M1-L1	Ø115	4-M8x20	Ø19, Ø22	56.5	Ø95	8	100	16.5	119.5
	Ø145	4-M8x20	Ø19, Ø22, Ø24	59	Ø110	11	130	19	122
AD-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	5.5	128
	Ø70	4-M4x10, 4-M5x12	Ø11, Ø14	34	Ø50	5	60	5.5	128
AD-090M1-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	12	134.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	11	134.5

OUTLINE DIMENSION SHEET

AD-110D(M1)-L1



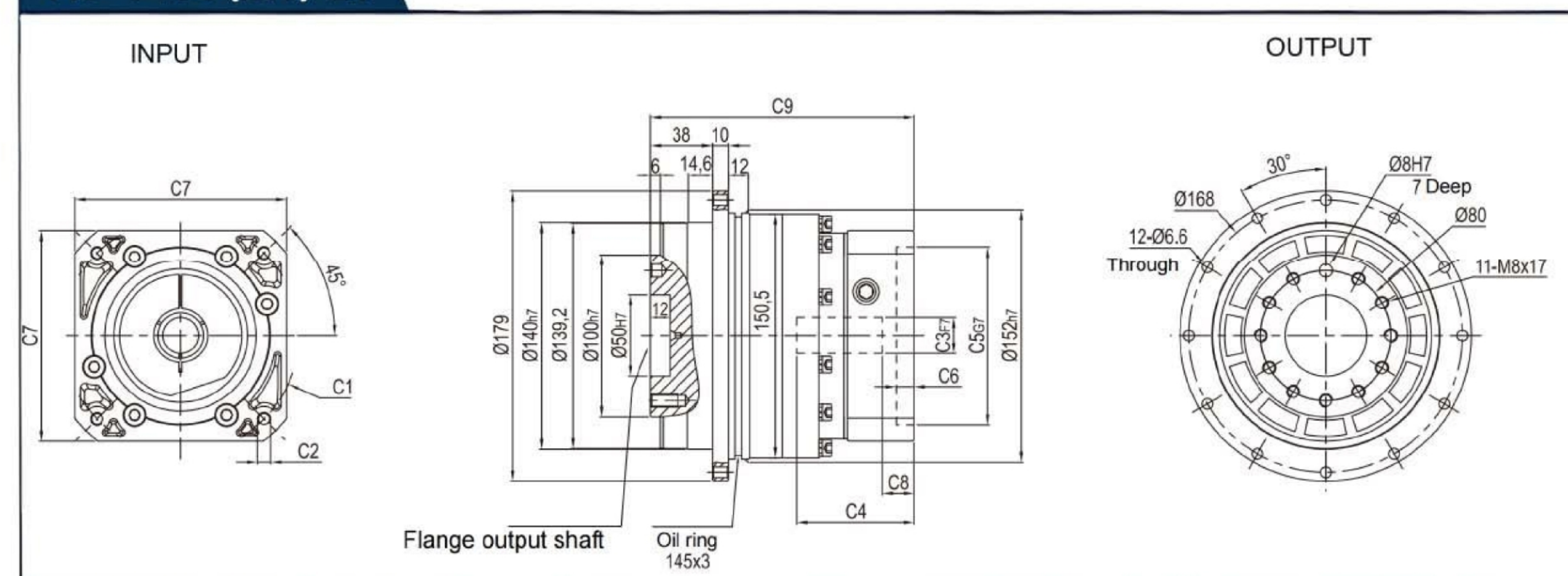
AD-110D(M1)-L2



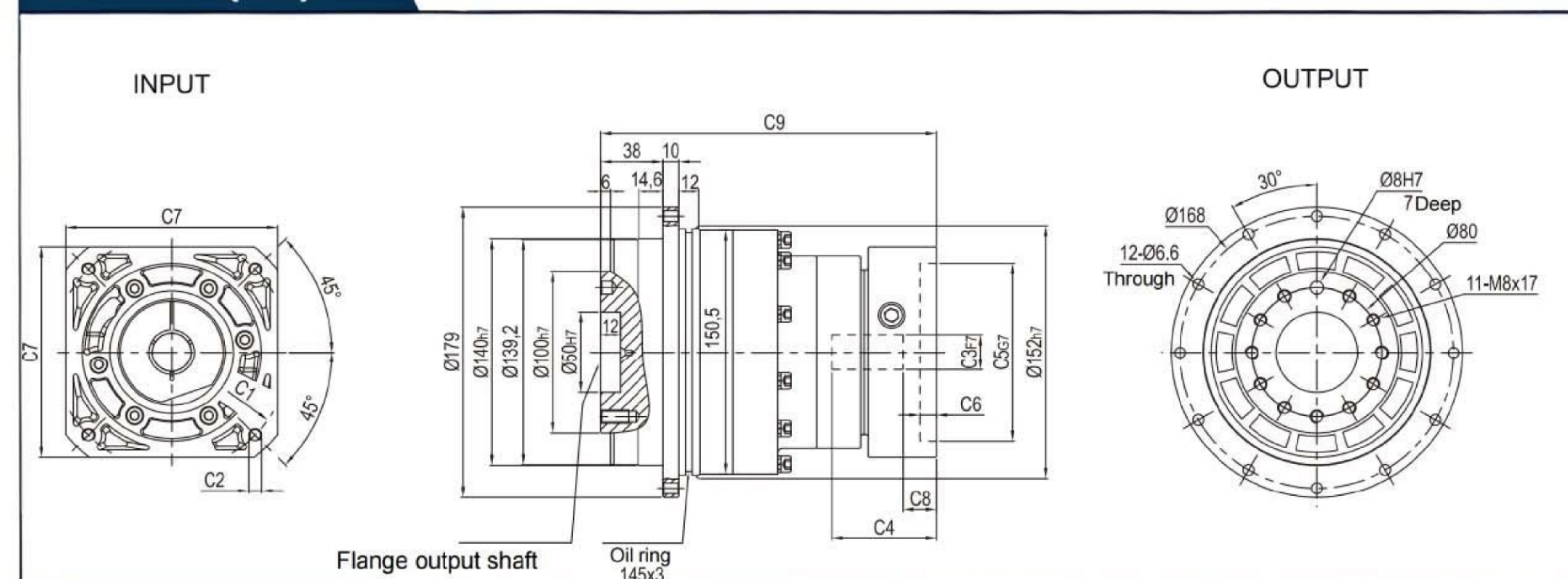
	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-110D-L1	Ø145	4-M8x20	Ø19, Ø22, Ø24	64	Ø110	10	130	19.5	135
AD-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	152.5
AD-110D-L2	Ø90	4-M5x12, 4-M6x14	Ø19	42	Ø70	6.5	80	7	151.5
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	6	151.5
AD-110M1-L2	Ø115	4-M8x20	Ø19, Ø22	56.5	Ø95	8	100	16.5	167
	Ø145	4-M8x20	Ø19, Ø22, Ø24	59	Ø110	11	130	19	169.5

OUTLINE DIMENSION SHEET

AD-140D(M1)-L1



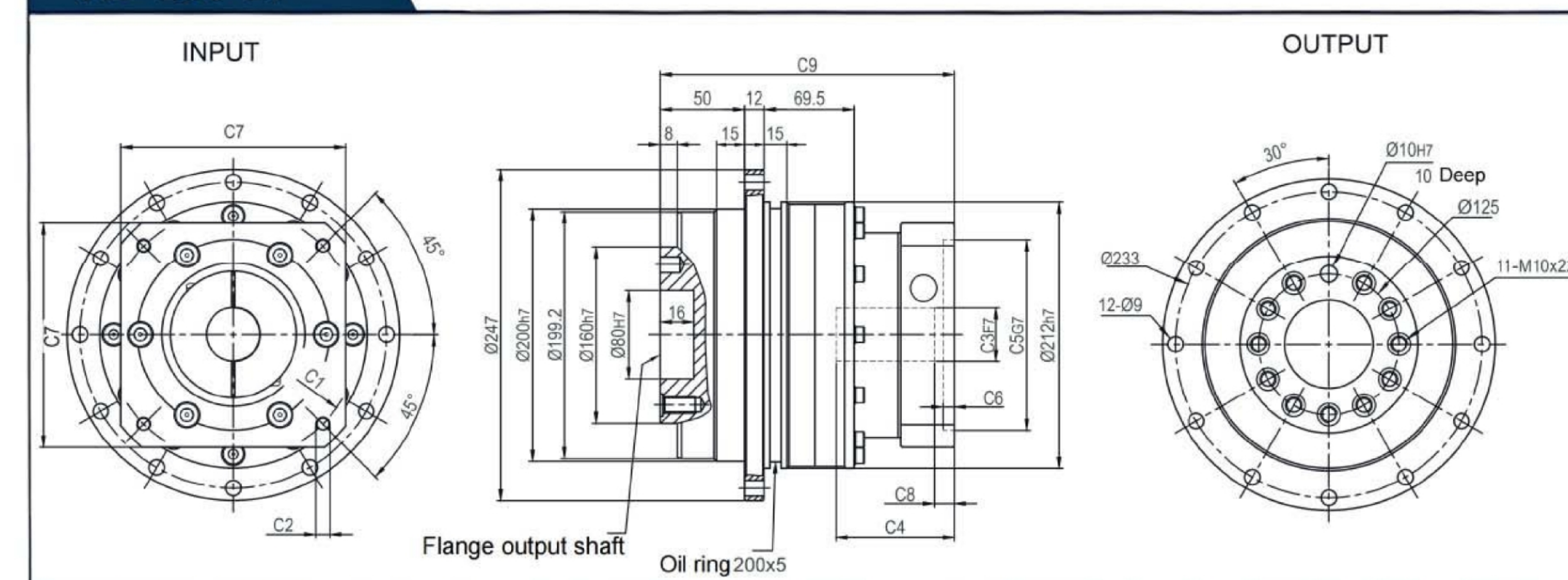
AD-140D(M1)-L2



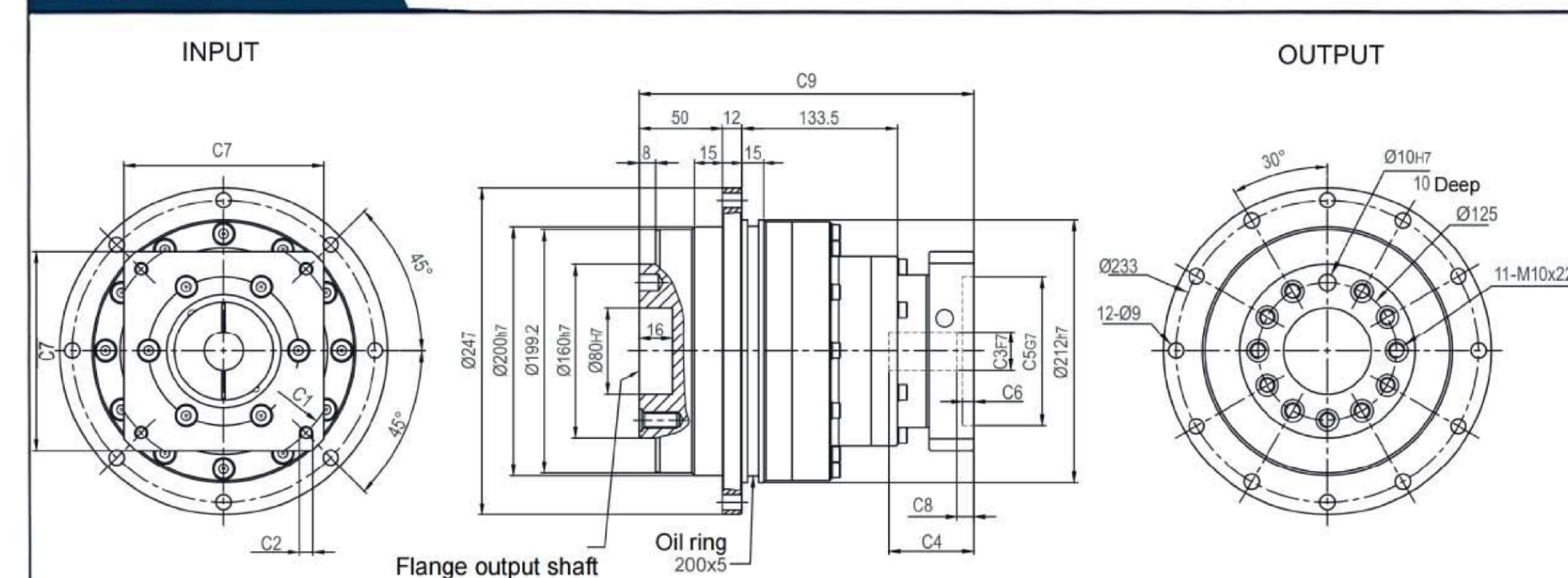
	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-140D-L1	Ø145	4-M8x20	Ø22,Ø24	72	Ø110	11	130	19.5	162
	Ø200	4-M12x28	Ø35	81.5	Ø114.3	8	180	25	172
AD-140D-L2	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	19.5	206
AD-140M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	28	223.5

OUTLINE DIMENSION SHEET

AD-200-L1



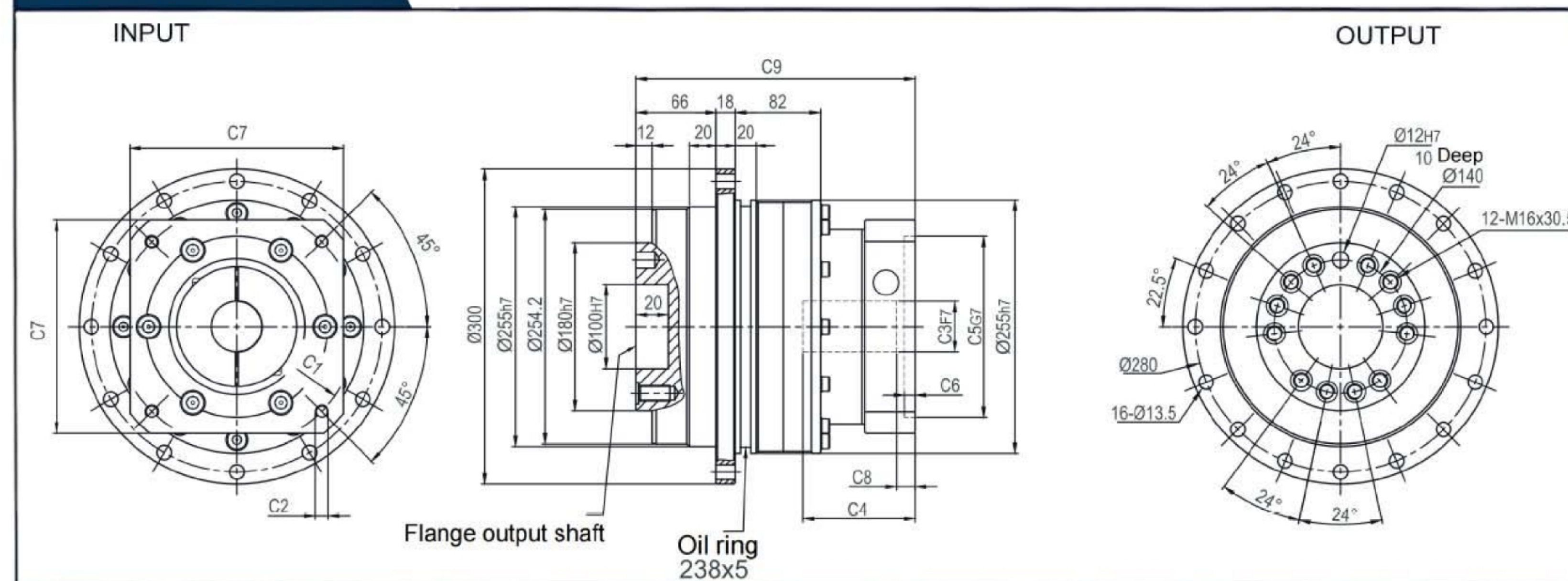
AD-200-L2



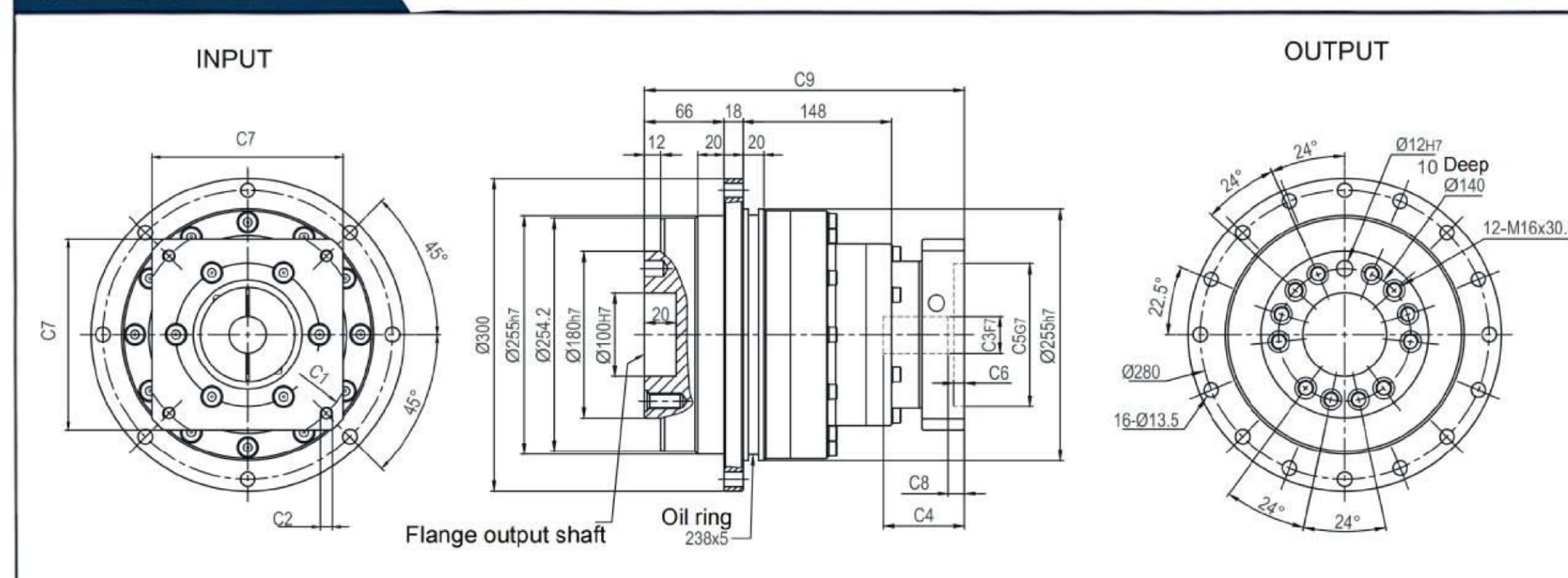
	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-200-L1	Ø165	4-M10x25	Ø32	86	Ø130	6	168	8.5	199.5
	Ø200	4-M12x28	Ø35	86	Ø114.3	6	180	8.5	199.5
AD-200-L2	Ø145	4-M8x25	Ø22, Ø24	75	Ø110	11	130	19	249.5
	Ø200	4-M12x30	Ø35	83	Ø114.3	8	180	28	257.5

OUTLINE DIMENSION SHEET

AD-255-L1



AD-255-L2

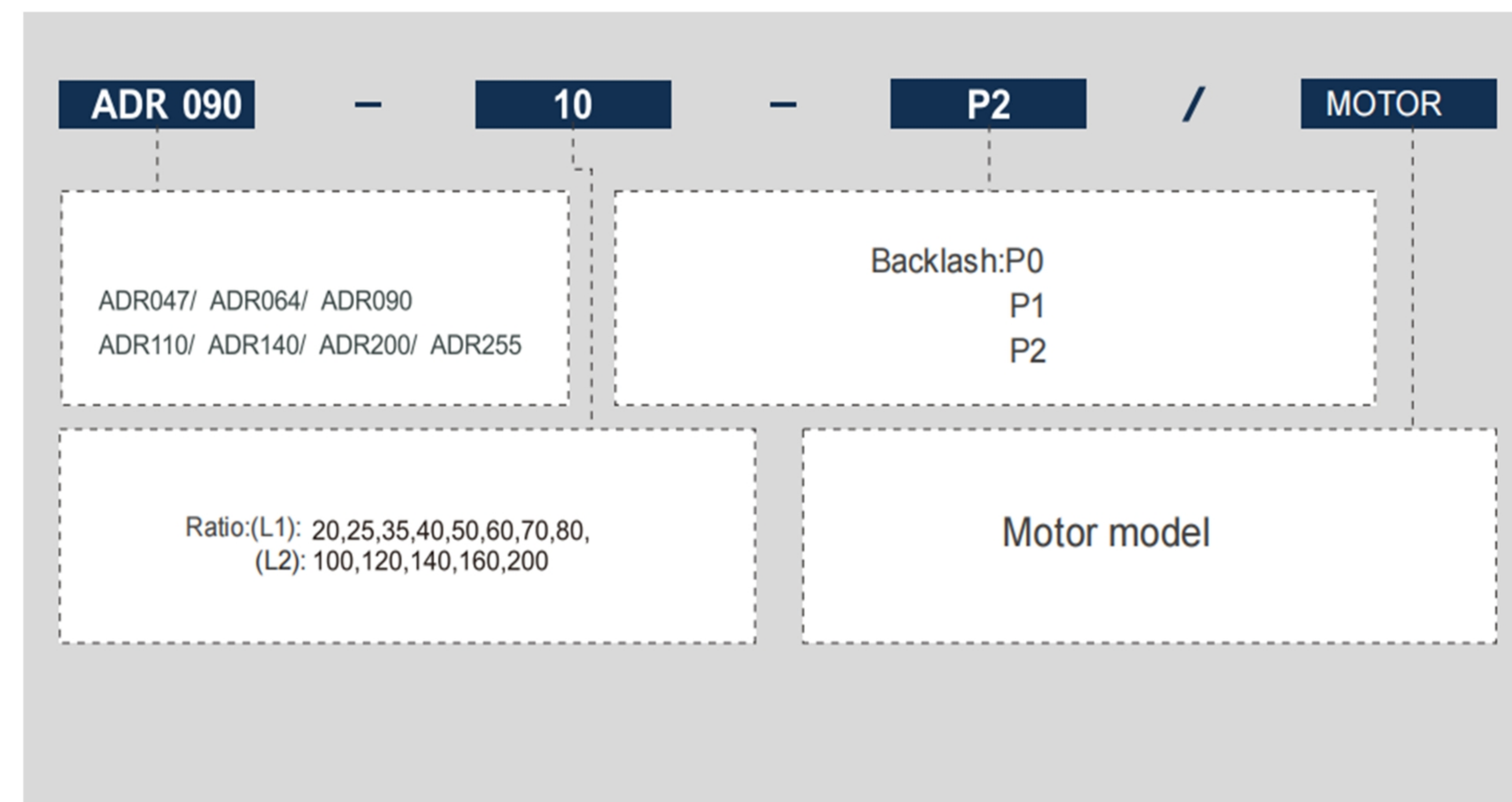


	C1	C2	C3	C4	C5	C6	C7	C8	C9
AD-255-L1	Ø235	4-M12x28	Ø38,Ø42	116	Ø200	6	220	10	256.5
AD-255-L2	Ø200	4-M12x28	Ø35	85	Ø114.3	6	180	10	311.5
	Ø215	4-M12x28	Ø38	85	Ø180	6	190	19	311.5

ADR
SERIES



MODEL ILLUMINATE



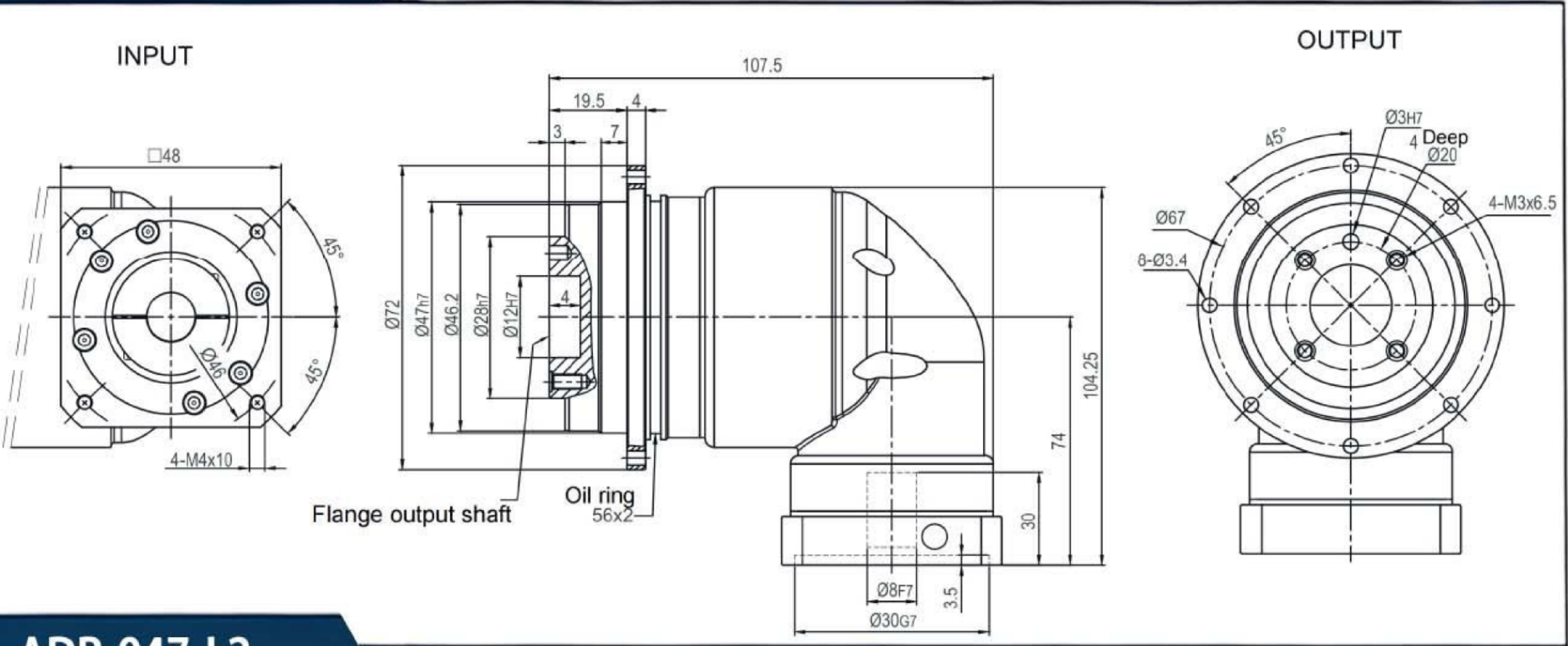
PERFORMANCE INFORMATION

		Stage	Ratio ¹	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
Normal output torque	Nm	1	4	19	48	130	270	560	1,100	1,700
			5	22	60	160	330	650	1,200	2,000
			6	-	55	150	310	600	-	-
			7	19	50	140	300	550	1,100	1,800
			8	17	48	130	270	560	1,000	1,600
			10	14	60	160	330	650	520	1,220
			14	-	50	140	300	550	1,100	1,800
			20	-	40	100	230	450	520	1,220
		2	20	19	48	130	270	560	1,100	1,700
			25	22	60	160	330	650	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	48	130	270	560	1,200	2,000
			50	22	60	160	330	650	1,200	2,000
			60	-	55	150	310	600	-	-
			70	22	60	160	330	650	1,200	2,000
			80	-	48	130	270	560	-	-
			100	22	60	160	330	650	1,200	2,000
			120	-	-	150	310	600	-	-
			140	-	-	140	300	550	1,100	1,800
			160	-	-	120	260	500	-	-
			200	-	-	100	230	450	520	1,220
Maximum output torque	Nm	1,2	3 times nominal output torque							
Normal input speed	rpm	1,2	4~200	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Maximum input speed	rpm	1,2	4~200	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Backlash P0	arcmin	1	4~20	-	≤2	≤2	≤2	≤2	≤2	≤2
		2	20~200	-	≤4	≤4	≤4	≤4	≤4	≤4
Backlash P1	arcmin	1	4~20	≤4	≤4	≤4	≤4	≤4	≤4	≤4
		2	20~200	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Backlash P2	arcmin	1	4~20	≤6	≤6	≤6	≤6	≤6	≤6	≤6
		2	20~200	≤9	≤9	≤9	≤9	≤9	≤9	≤9
Torsional stiffness	Nm/arcmin	1,2	4~200	7	13	31	82	151	440	1,006
Maximum tilting moment M _{2KB} ²	Nm	1,2	4~200	42.5	125	235	430	1,300	3,064	5,900
Maximum radial force M _{2KB} ²	N	1,2	4~200	1,080	2,110	2,310	4,800	6,200	5,450	10,600
Service life	hr	1,2	4~200	20,000 *						
Efficiency at full load	%	1	4~20	≥95%						
		2	20~200	≥92%						
Gearbox weight	kg	1	4~20	1.1	2.1	5.9	10.5	21.9	50.9	85.4
		2	20~200	1.4	1.9	4.5	9.8	20.1	45.4	85.9
Operating temperature	°C	1,2	4~200	-10°C~+90°C						
Standard lubrication		1,2	4~200	Synthetic grease						
Protection class		1,2	4~200	IP65						
Installation position		1,2	4~200	Any						
Running noise(n=3000rpm)	dB	1,2	4~200	≤61	≤63	≤65	≤68	≤70	≤72	≤74

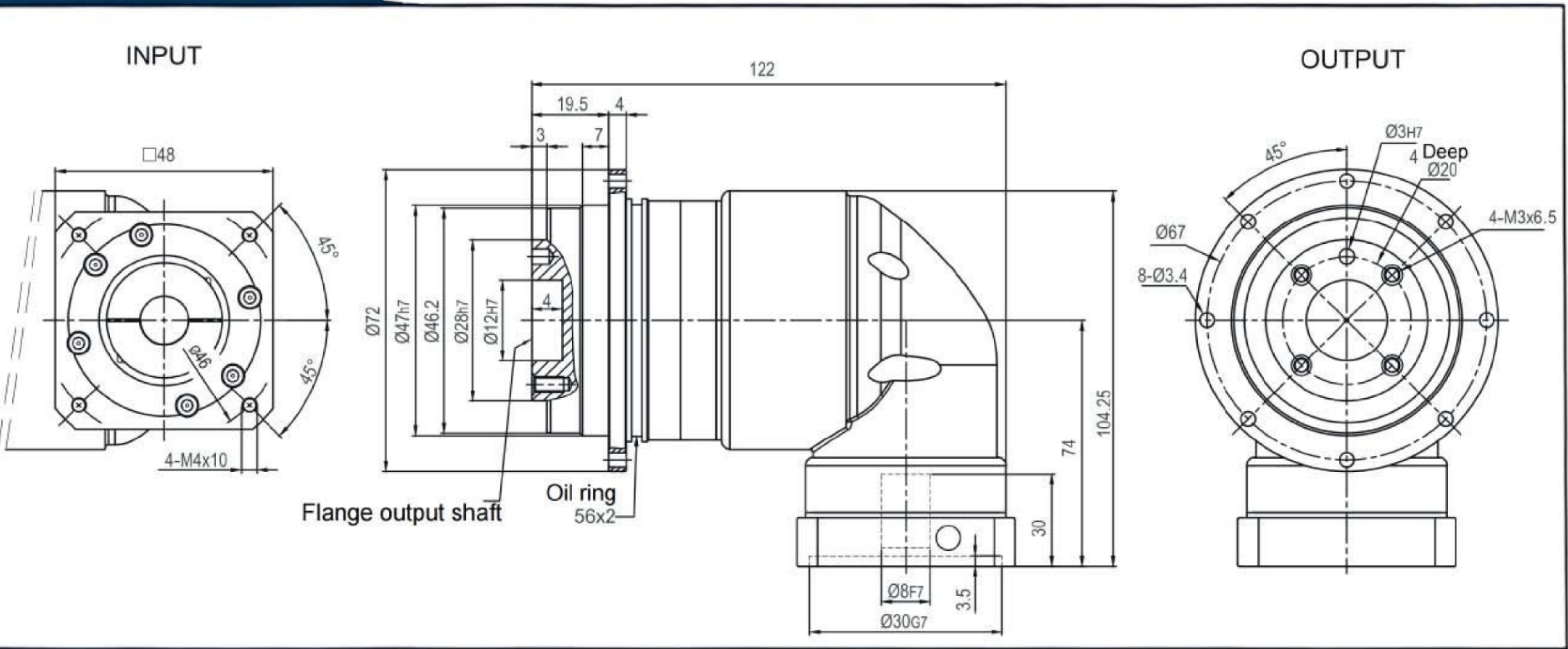
		Stage	Ratio ¹	ADR047	ADR064	ADR090	ADR110	ADR140	ADR200	ADR255
Mass moment of inertia J ₁	kg·cm ²	1	4~7	0.09	0.35	2.25	6.84	23.4	68.9	135.4
			8~10	0.09	0.07	1.87	6.25	21.8	65.6	119.8
			14~20	-	0.07	1.87	6.25	21.8	65.6	119.8
		2	20~40	0.09	0.09	0.35	2.25	6.84	23.4	68.9
			50	-	0.09	0.31	1.87	6.25	21.8	65.6
			60	-	0.09	0.35	2.25	6.84	-	-
			70~100	-	0.09	0.31	1.87	6.25	21.8	65.6
			120~200	-	-	0.31	1.87	6.25	21.8	65.6

OUTLINE DIMENSION SHEET

ADR-047-L1

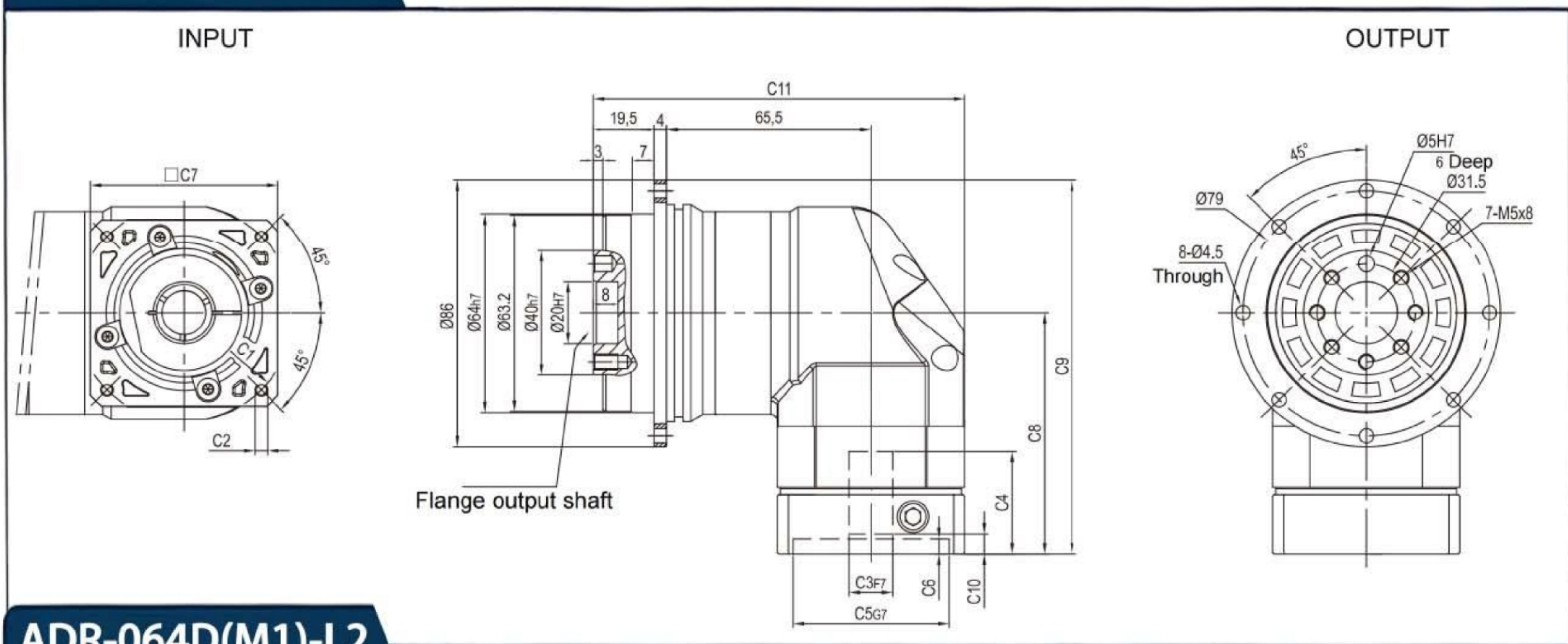


ADR-047-L2

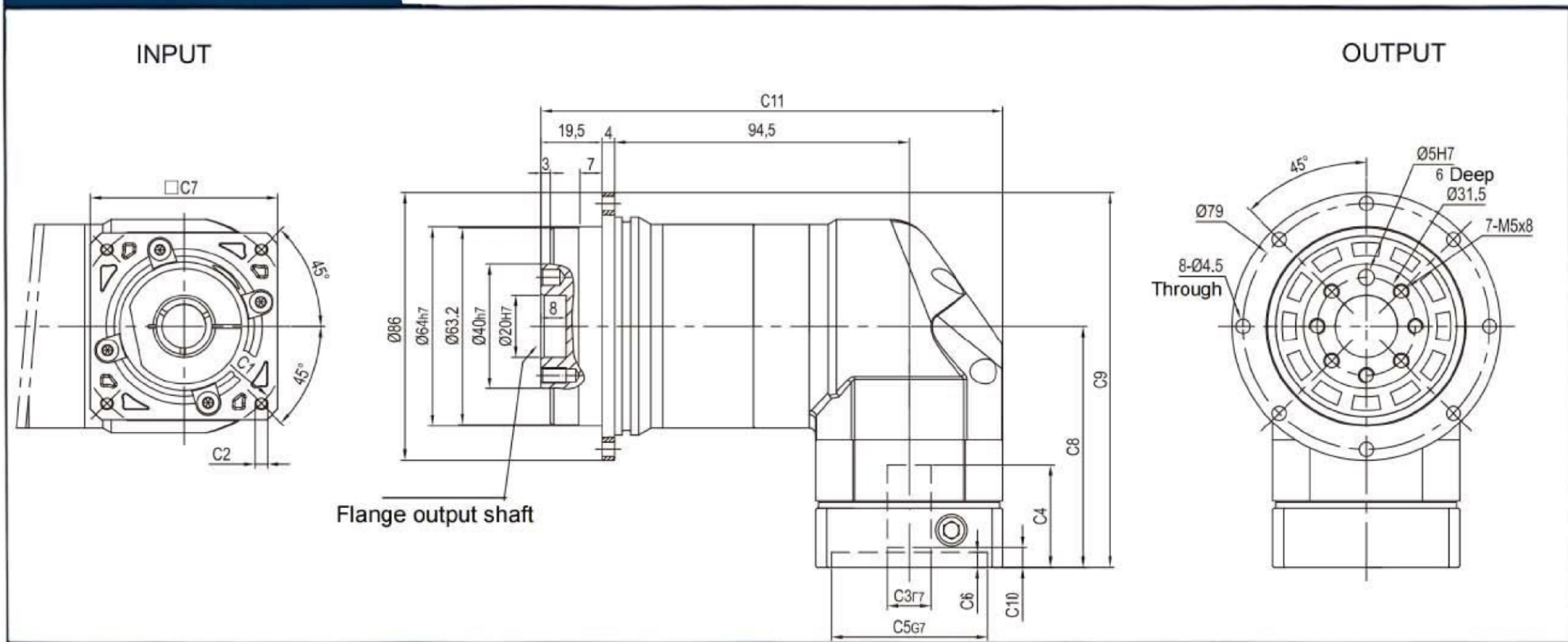


OUTLINE DIMENSION SHEET

ADR-064D(M1)-L1



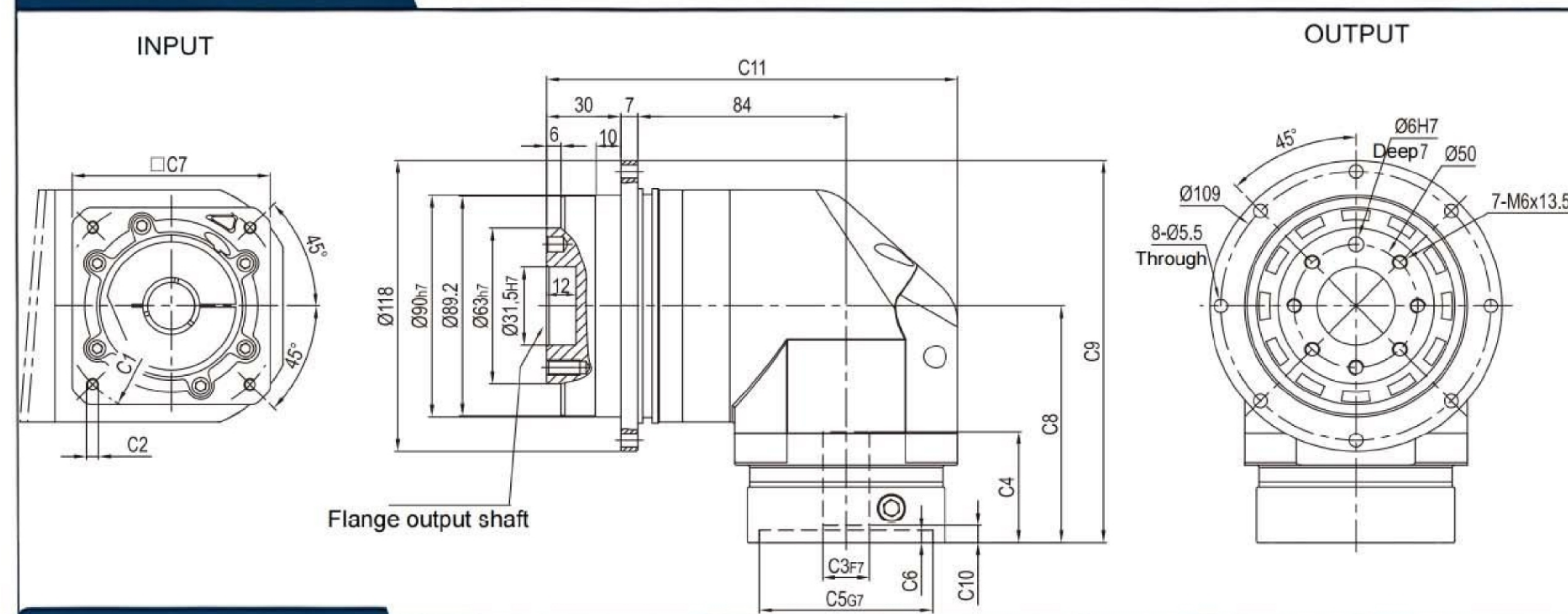
ADR-064D(M1)-L2



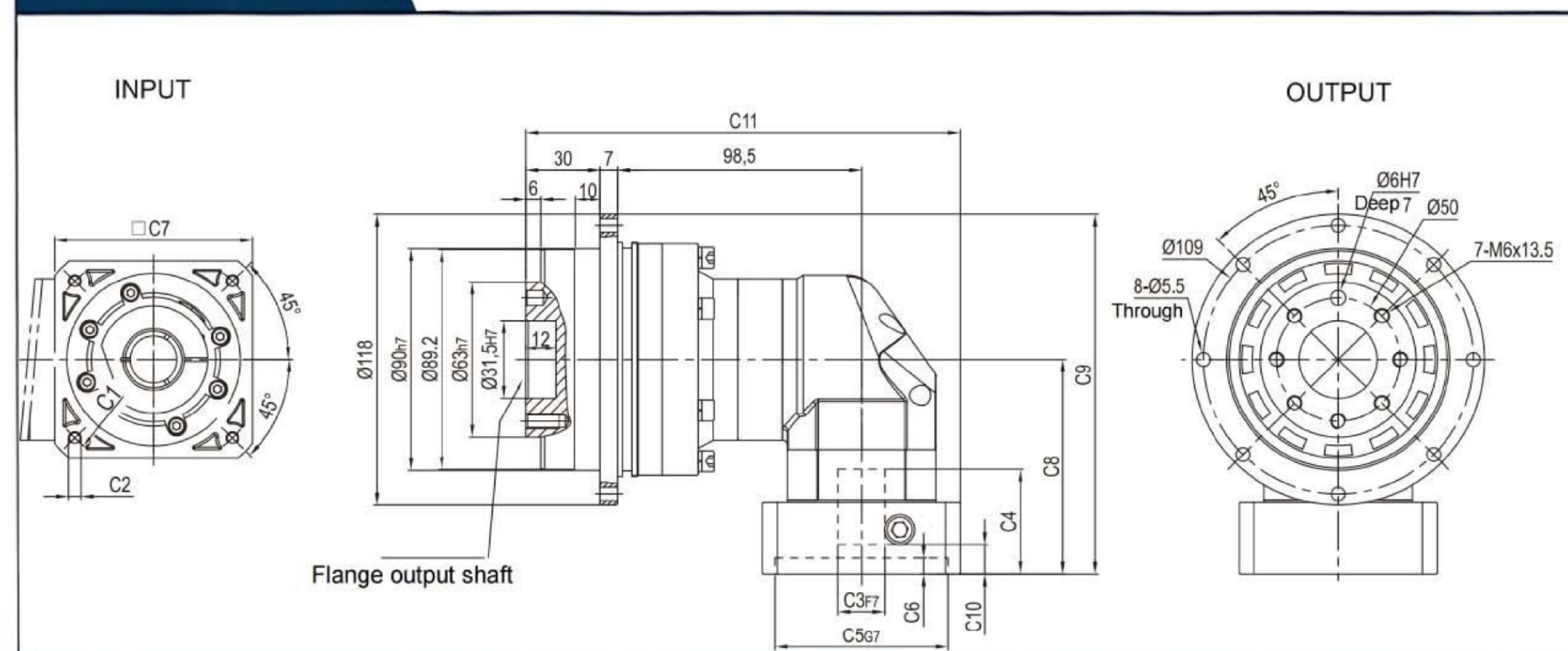
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
ADR-064D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	77.5	120.5	5.5	119
ADR-064D-L2	Ø70	4-M4x10, 4-M5x12	Ø11, Ø14	33	Ø50	5	60	77.5	120.5	5.5	148
ADR-064M1-L1	Ø90	4-M5x12, 4-M6x14	Ø19	42.5	Ø70	6.5	80	87	130	12	129
ADR-064M1-L2											158

OUTLINE DIMENSION SHEET

ADR-090D(M1)-L1



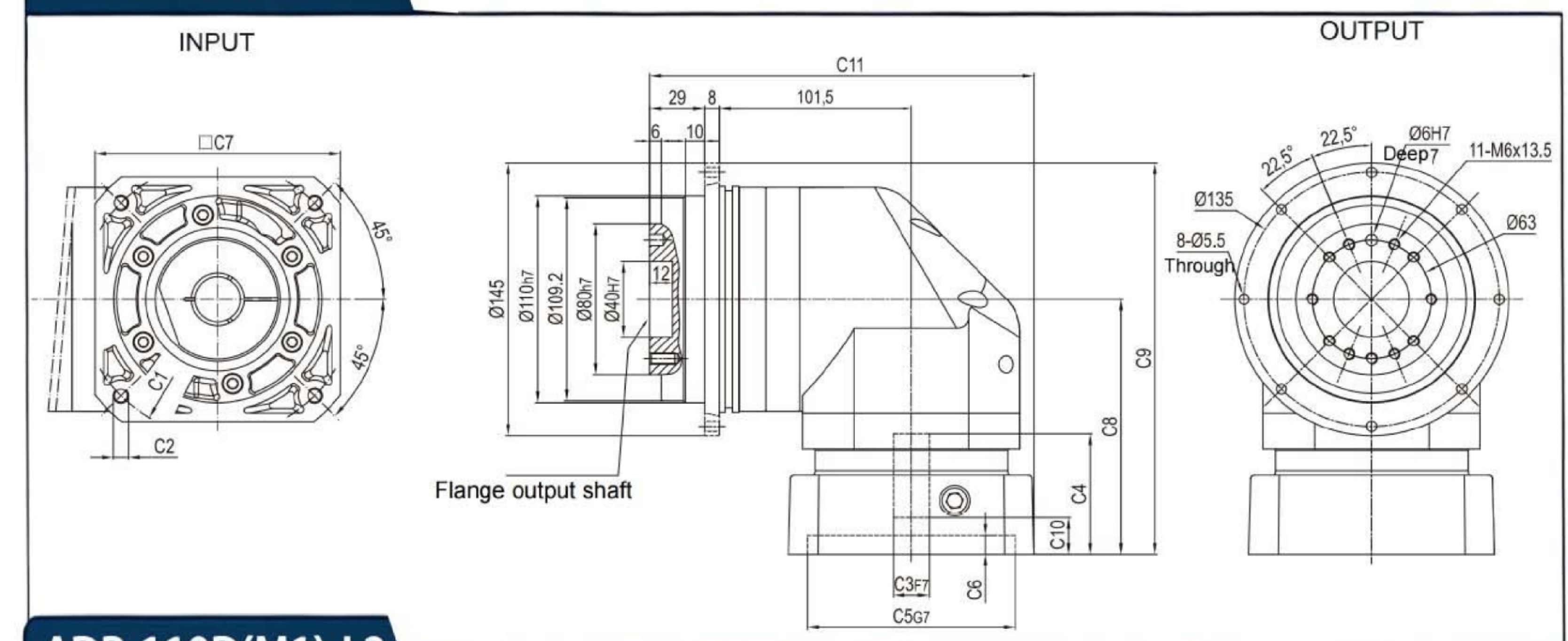
ADR-090D(M1)-L2



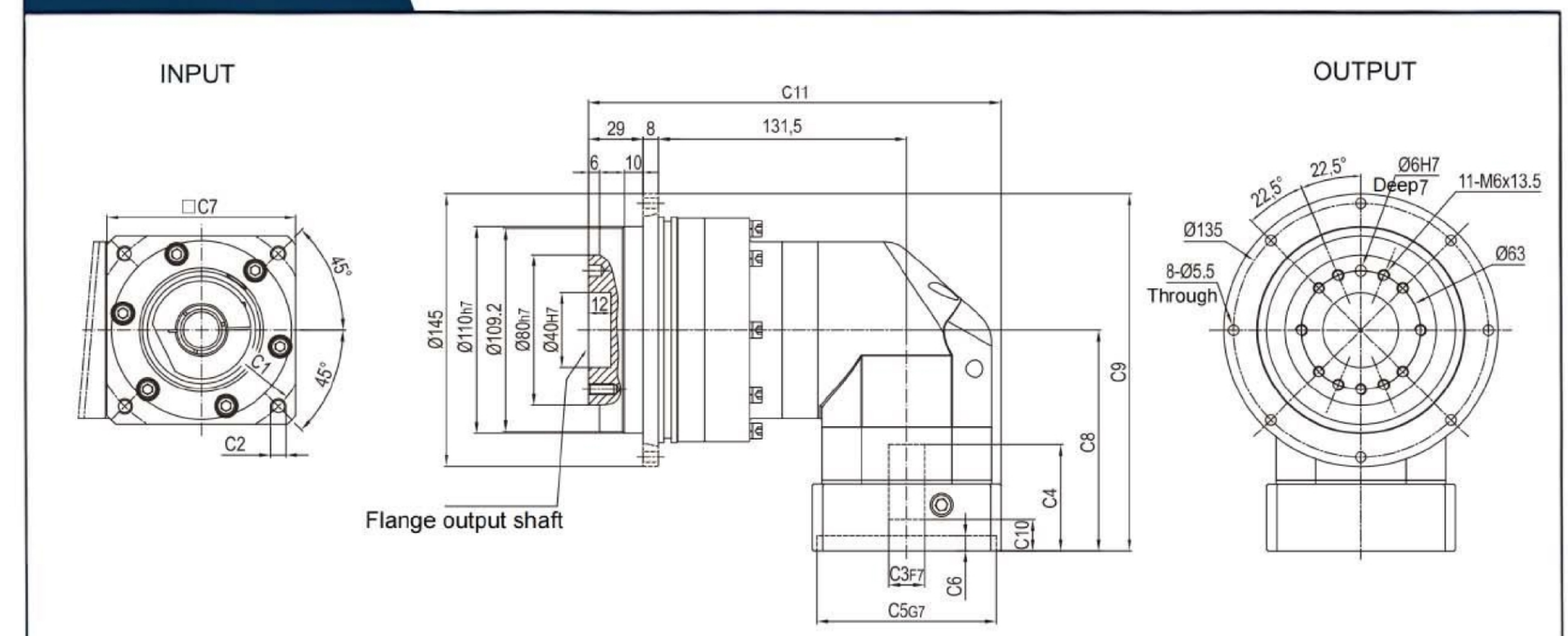
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
ADR-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	155	7	166
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	155	6	166
ADR-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	117.5	176.5	16.5	171
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	179	19	186
ADR-090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	77.5	136.5	5.5	165.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	77.5	136.5	5.5	165.5
ADR-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	87	146	12	175.5
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	87	146	11	175.5

OUTLINE DIMENSION SHEET

ADR-110D(M1)-L1



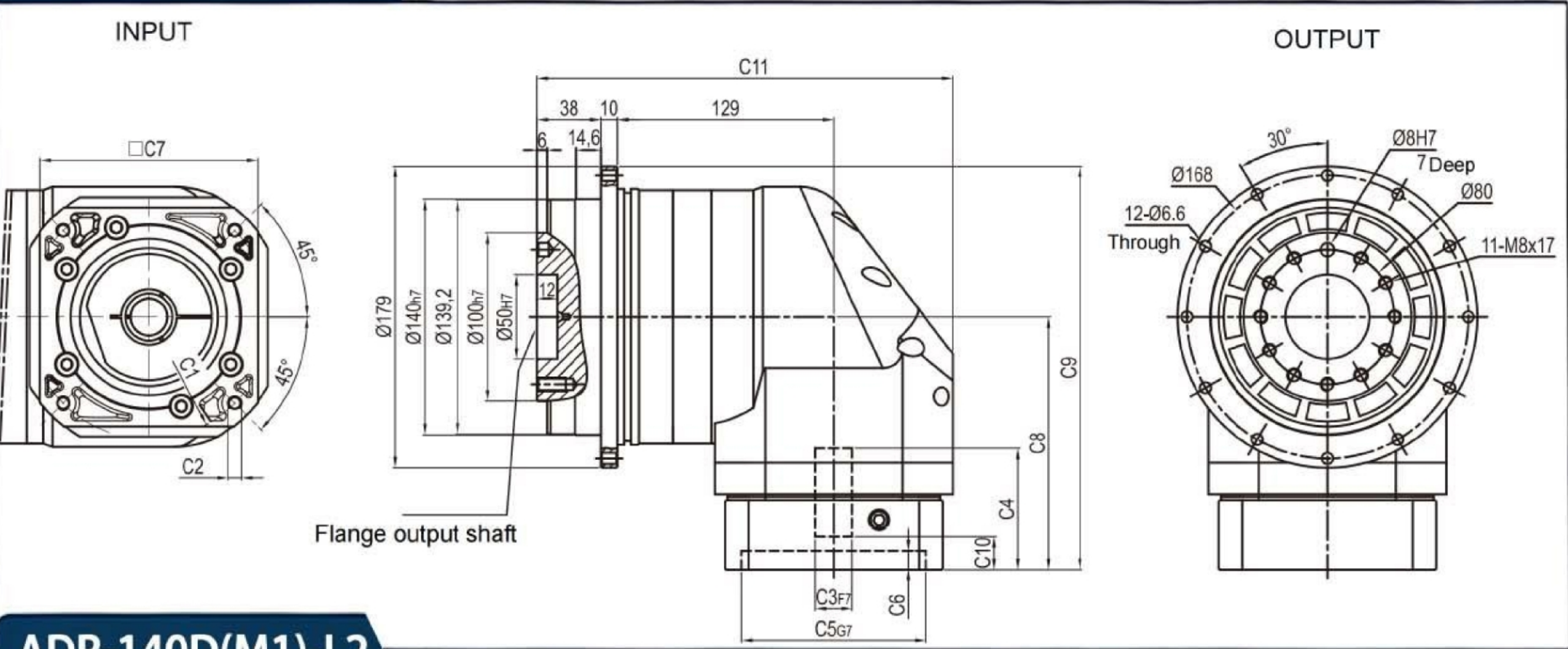
ADR-110D(M1)-L2



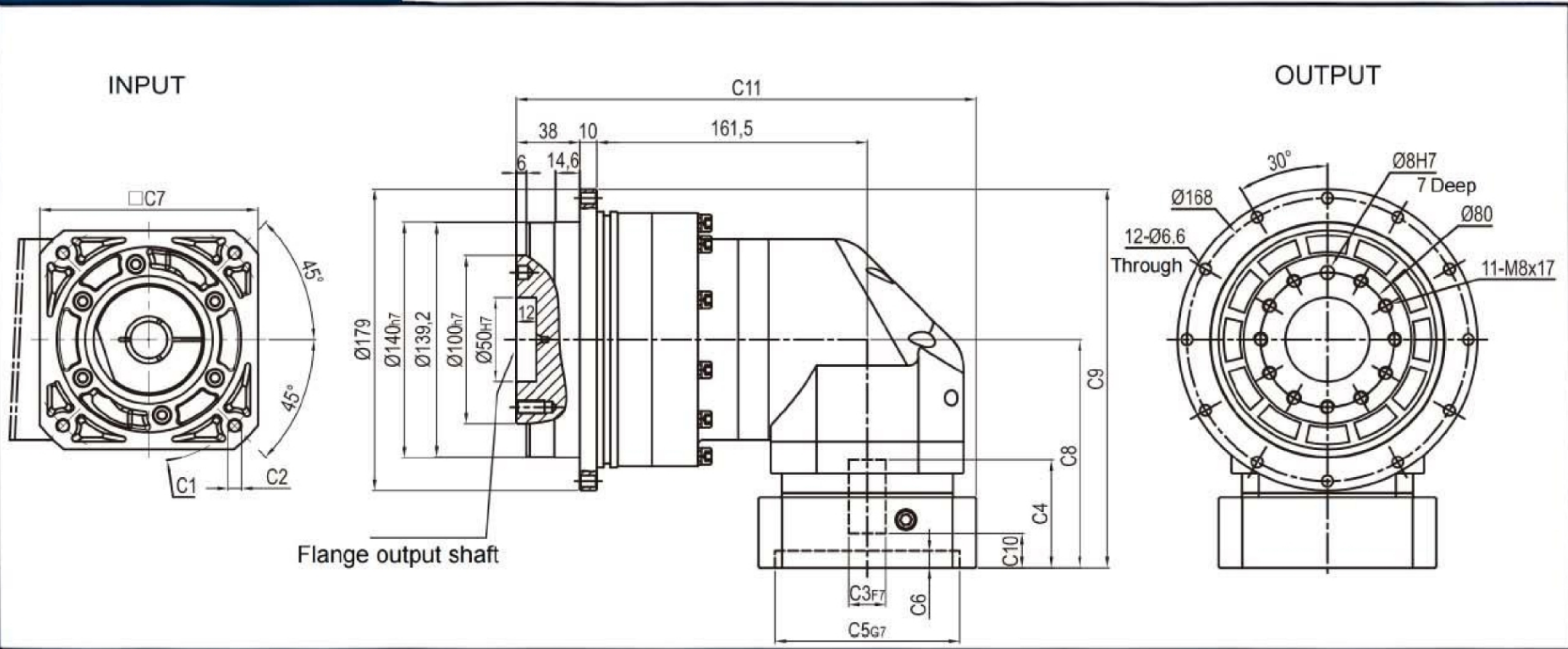
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
ADR-110D-L1	Ø145	4-M8x20	Ø19,Ø22,Ø24	64	Ø110	10	130	135.5	208	19.5	203.5
ADR-110M1-L1	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	225	28	228.5
ADR-110D-L2	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	96	168.5	7	213.5
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	96	168.5	6	213.5
ADR-110M1-L2	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	117.5	190	16.5	218.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	192.5	19	233.5

OUTLINE DIMENSION SHEET

ADR-140D(M1)-L1



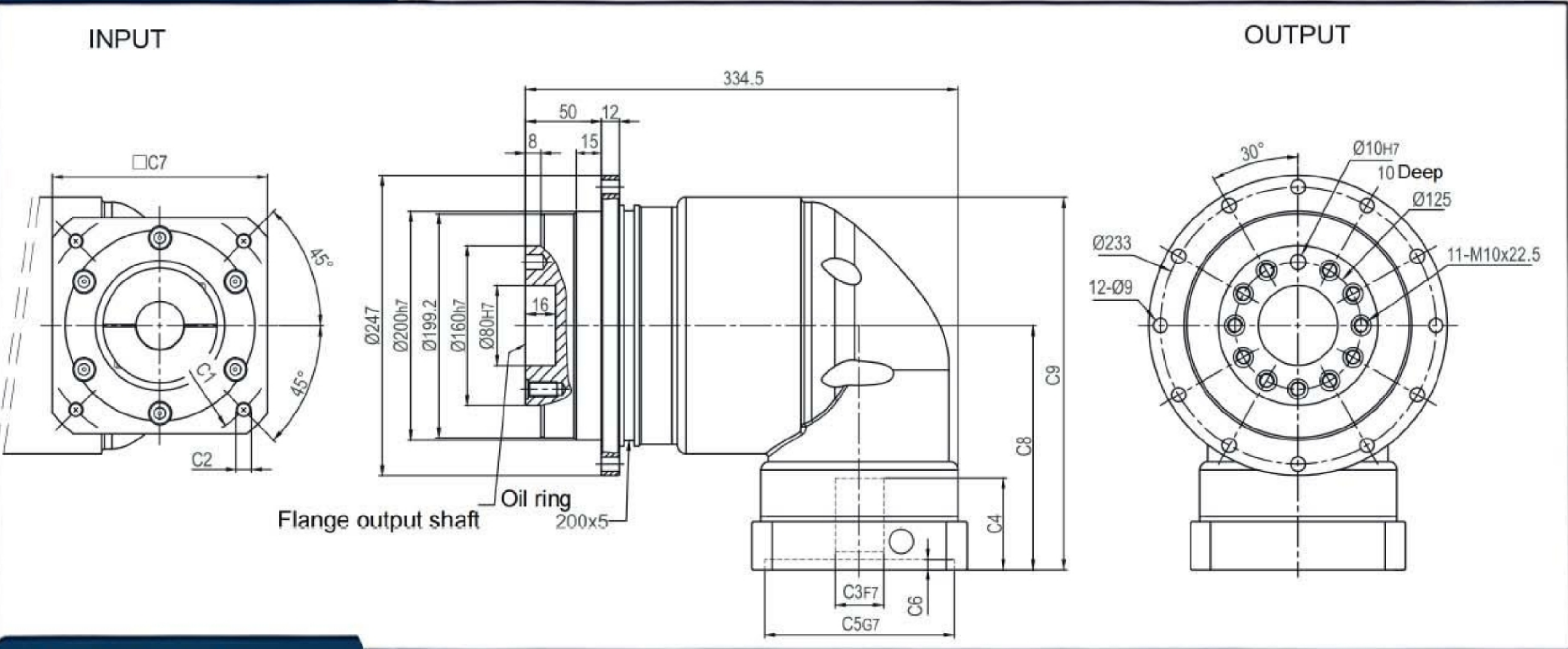
ADR-140D(M1)-L2



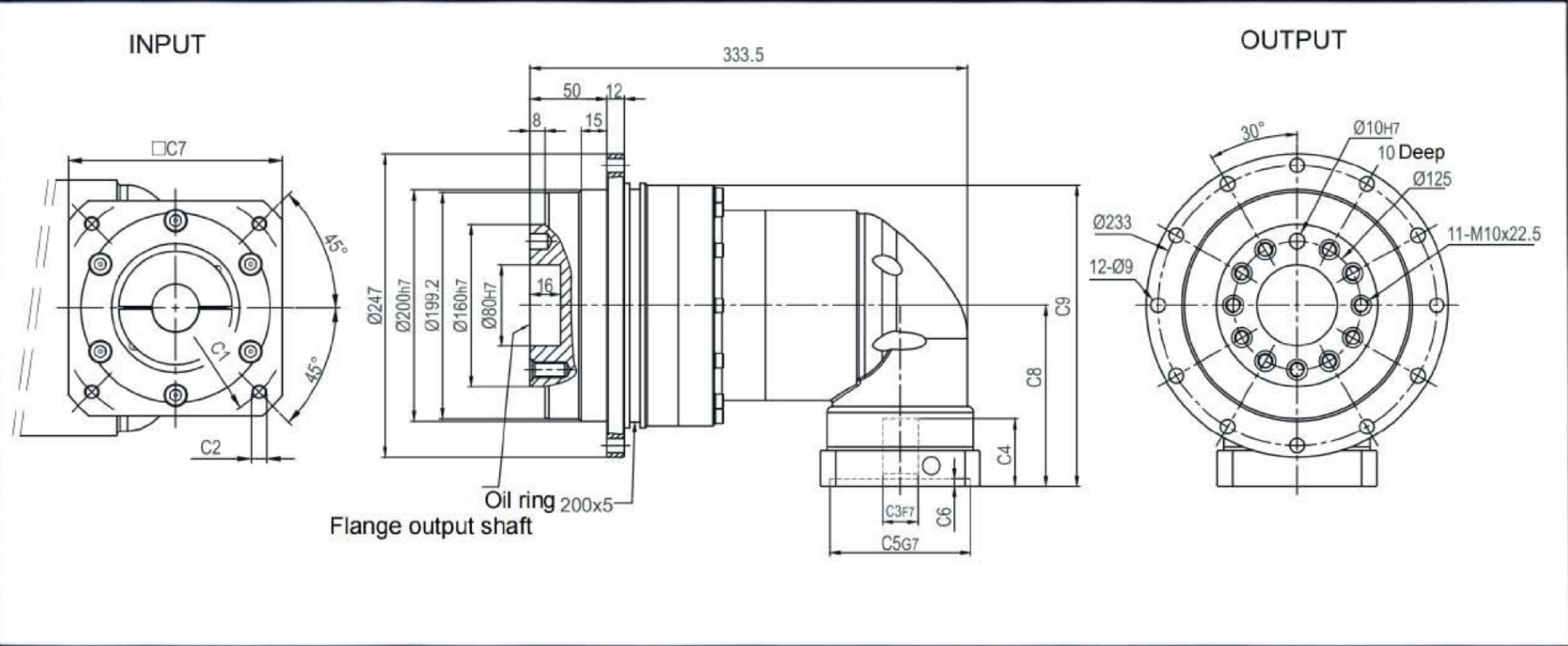
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
ADR-140D-L1	Ø145	4-M8x20	Ø22, Ø24	72	Ø110	11	130	150	239.5	19.5	248
	Ø200	4-M12x28	Ø35	82	Ø114.3	8	180	160	249.5	25	267
ADR-140D-L2	Ø145	4-M8x20	Ø19, Ø22, Ø24	64	Ø110	10	130	135.5	225	19.5	274.5
ADR-140M1-L2	Ø200	4-M12x28	Ø35	81	Ø114.3	10	180	152.5	242	28	299.5

OUTLINE DIMENSION SHEET

ADR-200-L1



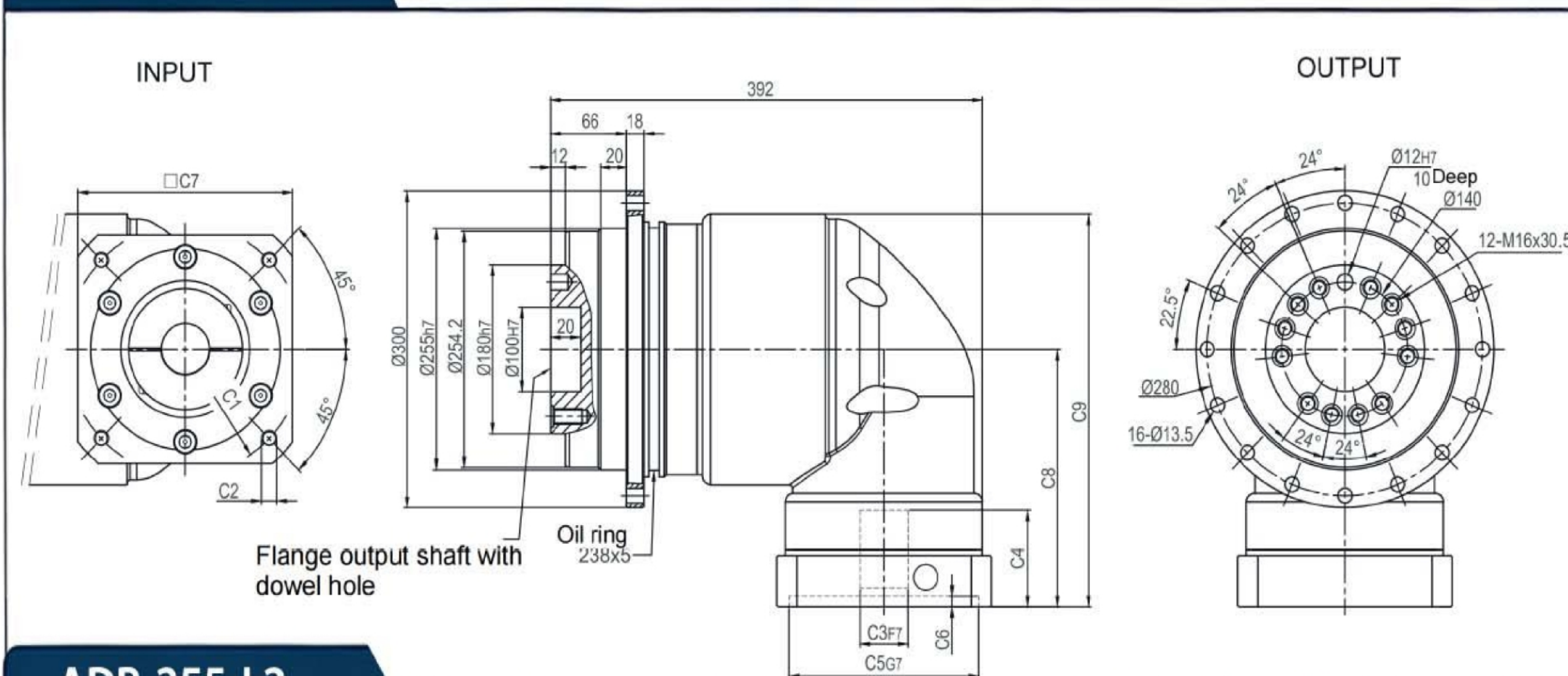
ADR-200-L2



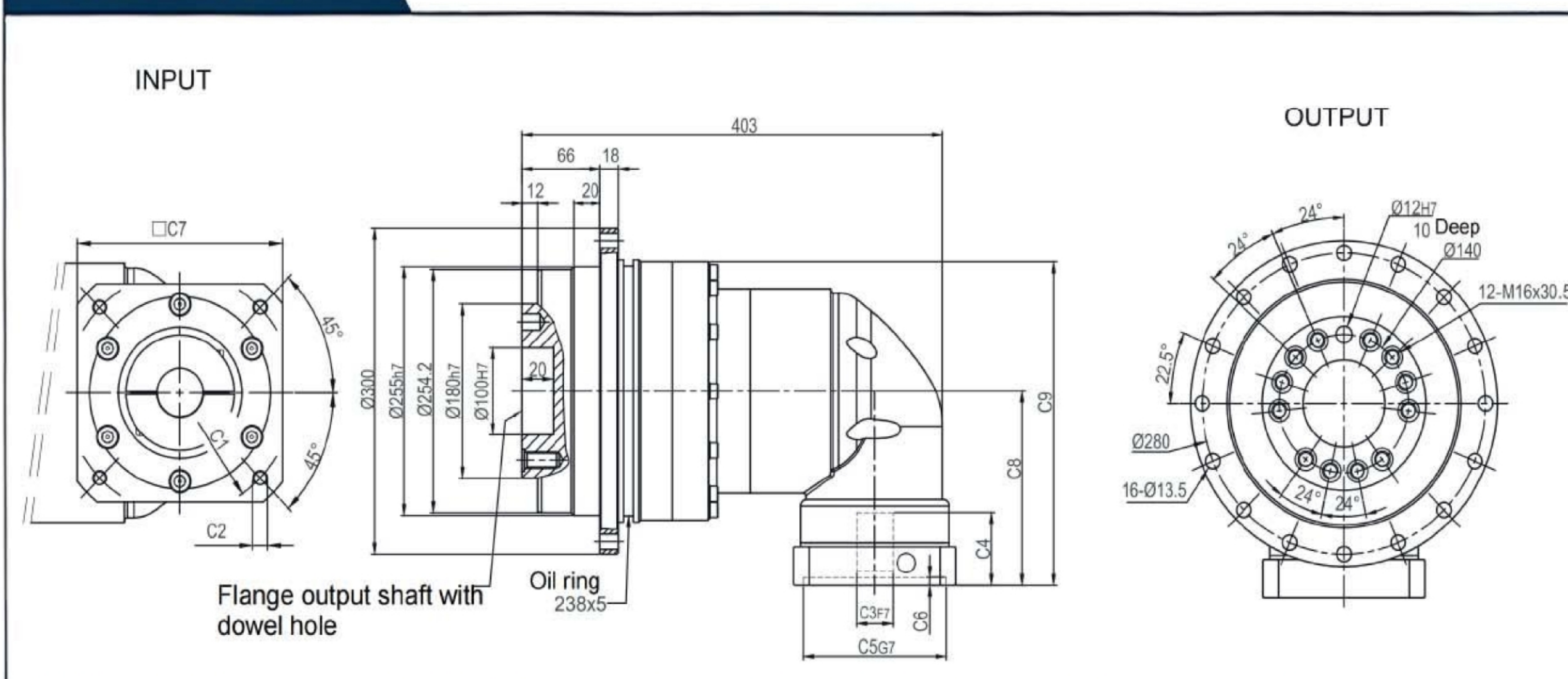
	C1	C2	C3	C4	C5	C6	C7	C8	C9
ADR-200-L1	Ø200	4-M12x28	Ø35	85	Ø114.3	6	180	213.5	316
	Ø215	4-M12x28	Ø38	85	Ø180	6	190	213.5	316
ADR-200-L2	Ø165	4-M10x25	Ø28	60	Ø130	6	142	164.5	269.5
	Ø200	4-M12x28	Ø35	85	Ø114.3	6	180	189.5	294.5

OUTLINE DIMENSION SHEET

ADR-255-L1



ADR-255-L2



	C1	C2	C3	C4	C5	C6	C7	C8	C9
ADR-255-L1	Ø235	4-M12x28	Ø38,Ø42	116	Ø200	6	220	268.5	398.5
ADR-255-L2	Ø200	4-M12x28	Ø35	85	Ø114.3	6	180	213.5	340
	Ø215	4-M12x28	Ø38	85	Ø180	6	190	213.5	340

PXF/PX

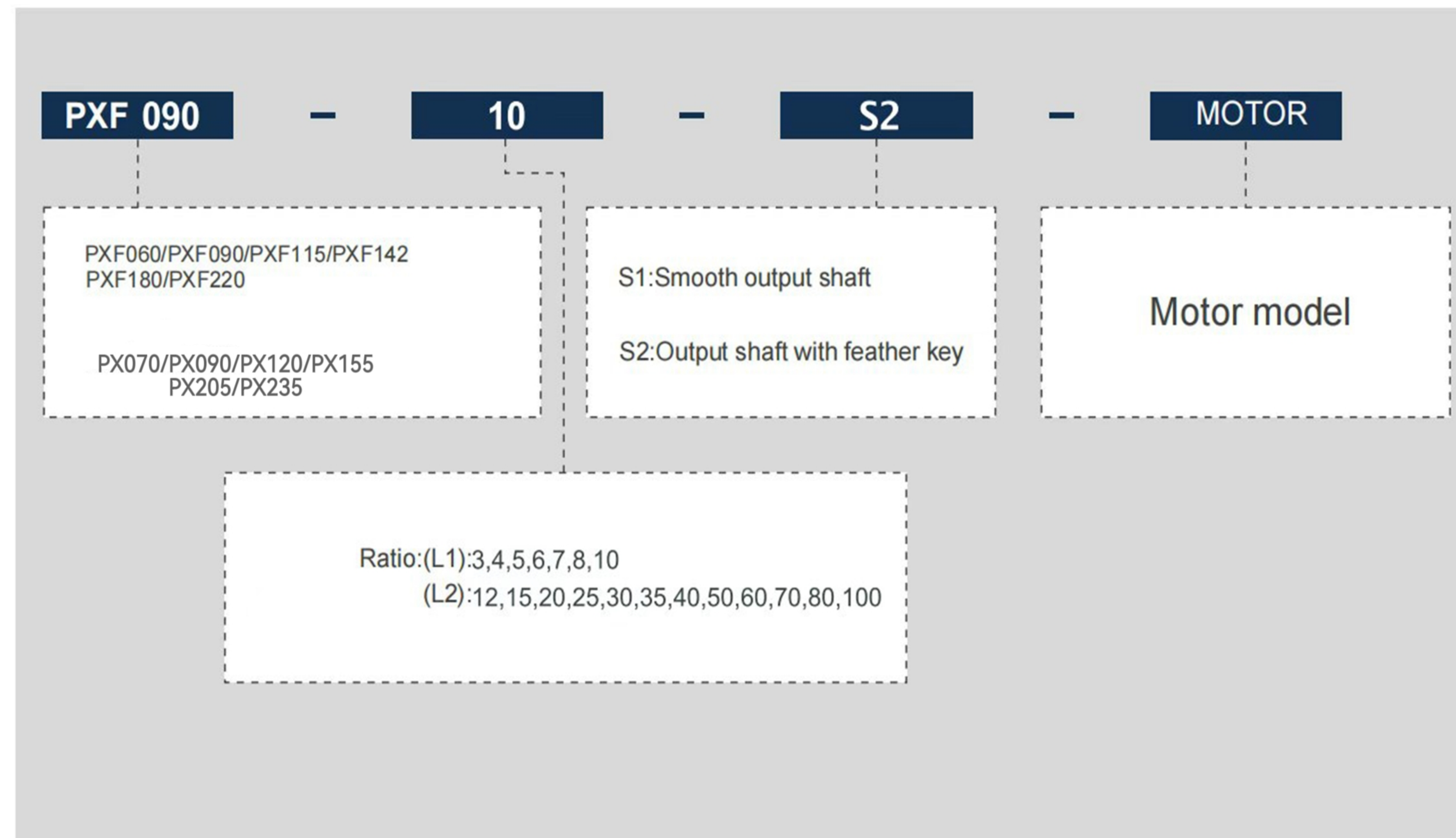
SERIES



DYMAZEE

Every Turn Tailored to Your Needs

MODEL ILLUMINATE



DYMAZEE

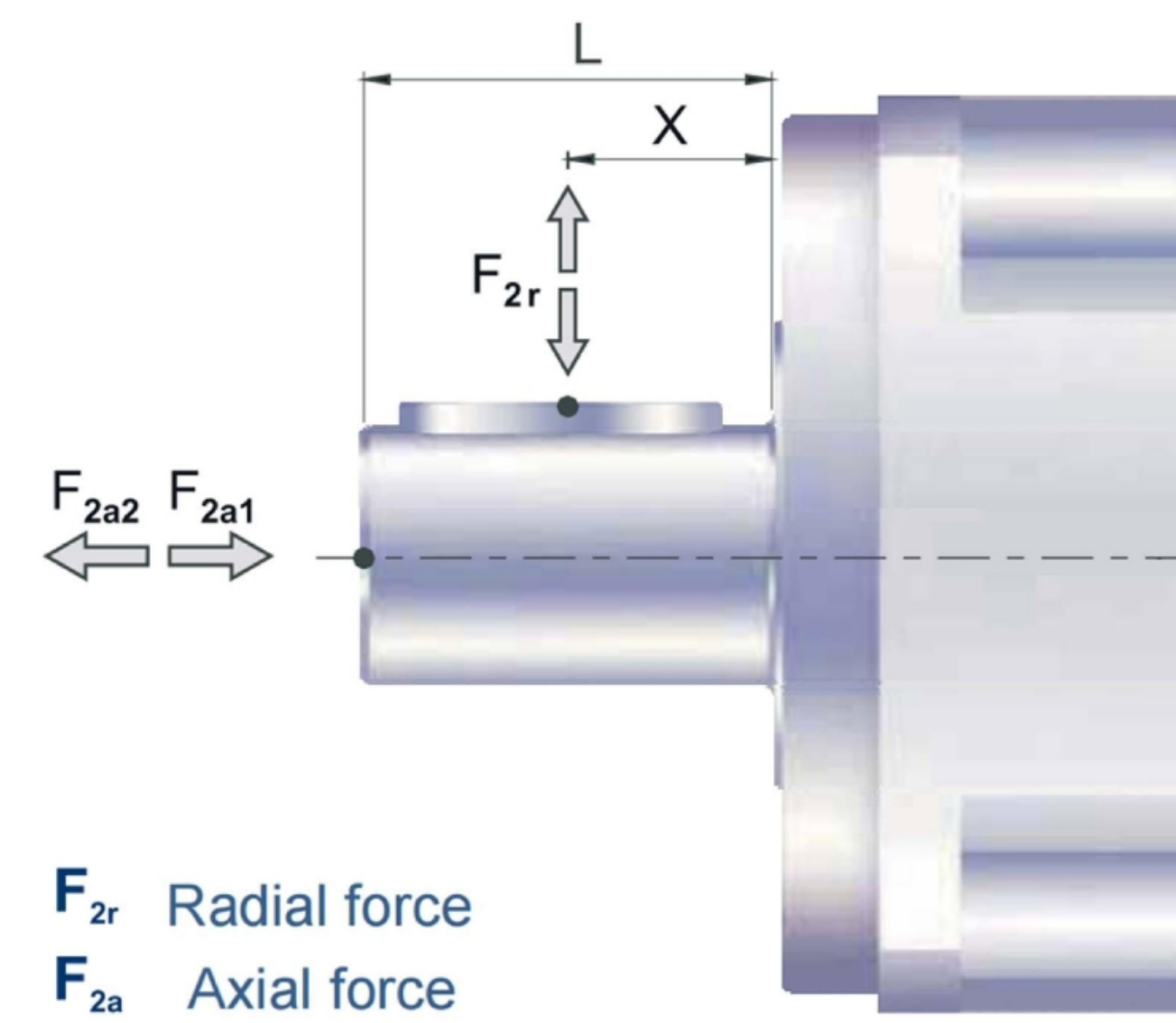
Every Turn Tailored to Your Needs

GEAR BOX PERFORMANCE INFORMATION

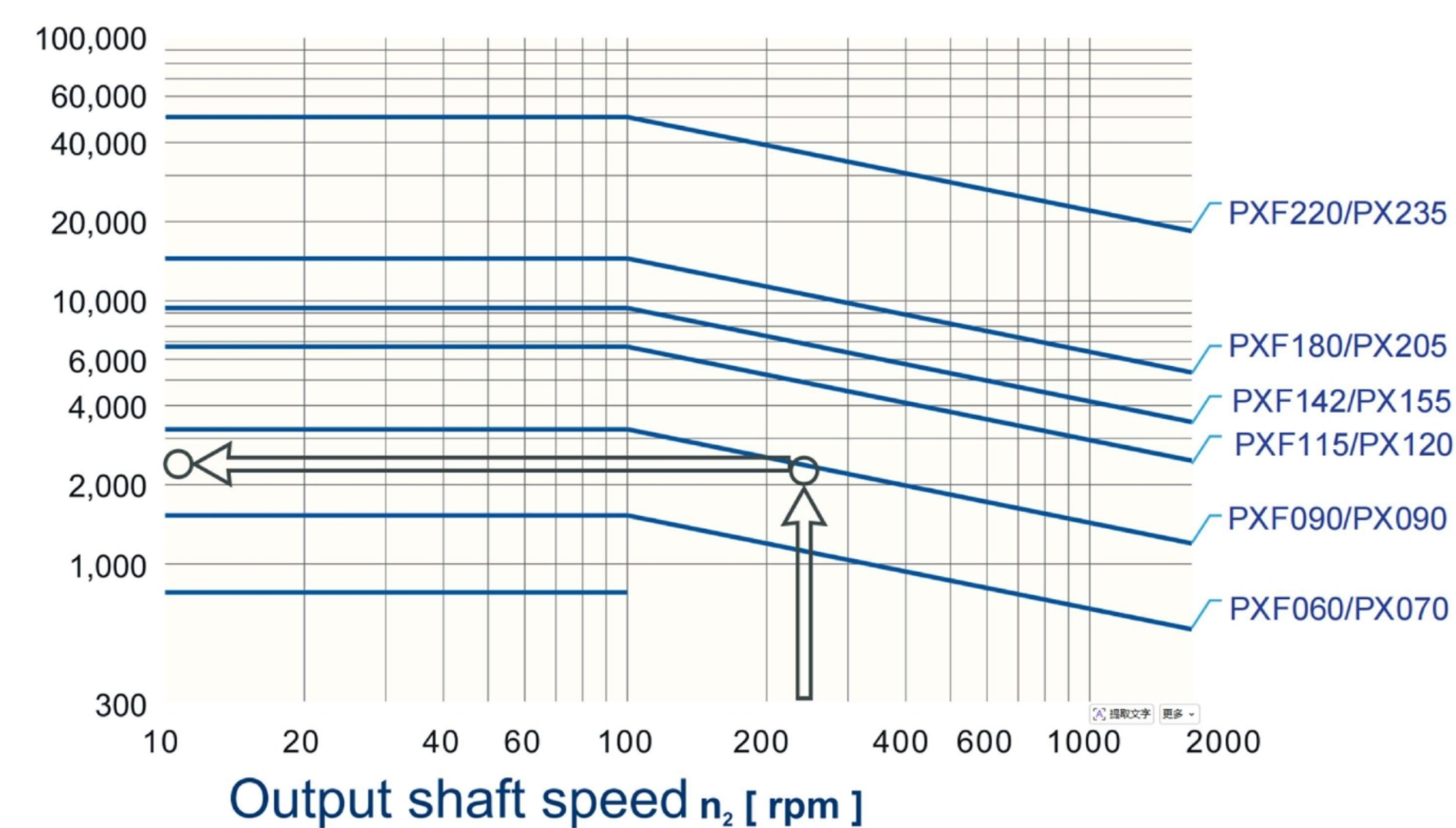
		Stage	Ratio ¹	PXF042	PXF 060 PX 070	PXF 090 PX 090	PXF 115 PX 120	PXF 142 PX 155	PXF 180 PX 205	PXF 220 PX 235
Normal output torque	Nm	1	3	20	55	130	208	342	588	1,140
			4	19	50	140	290	542	1,050	1,700
			5	22	60	160	330	650	1,200	2,000
			6	20	55	150	310	600	-	-
			7	19	50	140	300	550	1,100	1,800
			8	17	45	120	260	500	1,000	1,600
		2	10	14	40	100	230	450	520	1,220
			12	20	55	130	208	342	-	-
			15	20	55	130	208	342	588	1,140
			20	19	50	140	290	542	1,050	1,700
			25	22	60	160	330	650	1,200	2,000
			30	22	50	130	208	342	1,200	2,000
			35	22	60	160	330	650	1,200	2,000
			40	22	50	140	290	542	1,200	2,000
			50	22	60	160	330	650	1,200	2,000
			60	20	55	150	310	600	-	-
			70	19	50	140	300	550	1,100	1,800
			80	17	45	120	260	500	1,000	1,600
			100	14	40	100	230	450	520	1,220
Maximum output torque	Nm	1,2	3~100	3 times nominal output torque						
Normal input speed	rpm	1,2	3~100	5,000	5,000	4,000	4,000	3,000	3,000	2,000
Maximum input speed	rpm	1,2	3~100	10,000	10,000	8,000	8,000	6,000	6,000	4,000
Backlash	arcmin	1	3~10	≤5	≤5	≤5	≤5	≤5	≤5	≤5
		2	12~100	≤7	≤7	≤7	≤7	≤7	≤7	≤7
Torsional stiffness $F_{2\theta}$	Nm/arcmin	1,2	3~100	3	7	14	25	50	145	225
Maximum radial force $F_{2a1\theta}$	N	1,2	3~100	780	1,530	3,250	6,700	9,400	14,500	50,000
Maximum axial force $F_{2a2\theta}$	N	1,2	3~100	350	630	1,300	3,000	4,000	6,200	35,000
Maximum axial force $F_{2a2\theta}$	N	1,2	3~100	390	765	1,625	3,350	4,700	7,250	25,000
Service life	hr	1,2	3~100	20,000*						
Efficiency at full load	%	1	3~10	≥97%						
		2	12~100	≥94%						
Gearbox weight	kg	1	3~10	0.5	1.3	3.7	7.8	14.5	29	48
		2	12~100	0.8	1.9	4.1	9	17.5	33	60
Operating temperature	°C	1,2	3~100	-10°C~+90°C						
Standard lubrication		1,2	3~100	Synthetic grease						
Protection class		1,2	3~100	IP65						
Installation position		1,2	3~100	Any						
Running noise(n=3000rpm)	dB	1,2	3~100	≤56	≤58	≤60	≤63	≤65	≤67	≤70

		Stage	Ratio ¹	PXF 042	PXF 060 PX 070	PXF 090 PX 090	PXF 115 PX 120	PXF 142 PX 155	PXF 180 PX 205	PXF 220 PX 235
Mass moment of inertia J	kg·cm ²	1	3	0.03	0.16	0.61	3.25	9.21	28.98	69.61
			4	0.03	0.14	0.48	2.74	7.54	23.67	54.37
			5	0.03	0.13	0.47	2.71	7.42	23.29	53.27
			6	0.03	0.13	0.45	2.65	7.25	22.75	51.72
			7	0.03	0.13	0.45	2.62	7.14	22.48	50.97
			8	0.03	0.13	0.44	2.58	7.07	22.59	50.84
		2	10	0.03	0.13	0.44	2.57	7.03	22.51	50.56
			12	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			15	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			20	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			25	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			30	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			35	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			40	0.03	0.03	0.13	0.47	2.71	7.42	23.29
			50	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			60	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			70	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			80	0.03	0.03	0.13	0.44	2.57	7.03	22.51
			100	0.03	0.03	0.13	0.44	2.57	7.03	22.51

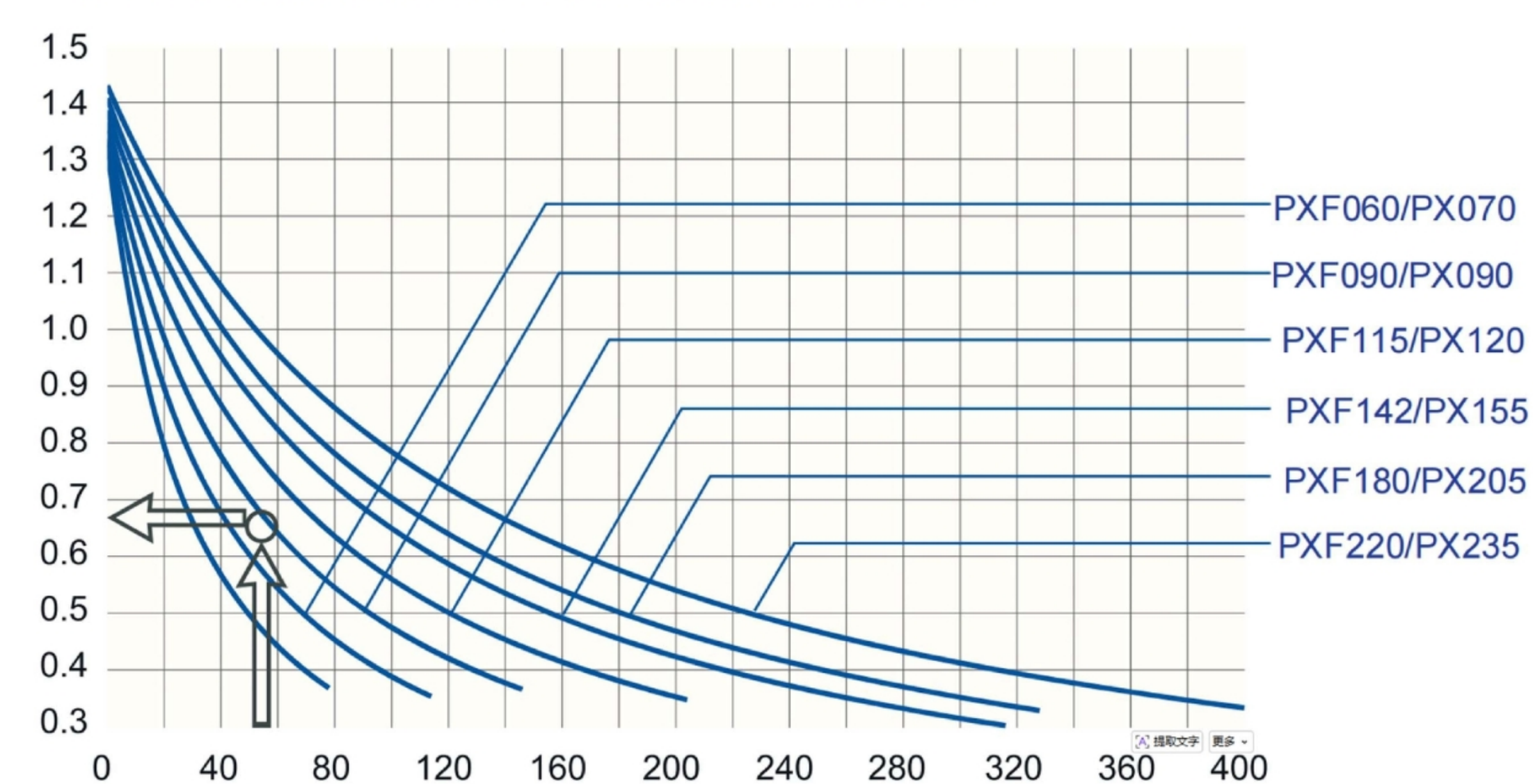
REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND AXIAL FORCE



The radial force $F_{2rB}[N]$ is allowed to be applied at the center of the shaft.



Load factor at different locations k_x



When the radial force F_{2r} is applied at the center of the shaft, $X = 1/2xL$, the allowable radial force F_{2rB} for different gearbox models at different output speeds can be found in the left diagram. The allowable axial force F_{2aB} is given by the following formulas:

$$F_{2a1B} = 0.2 \times F_{2rB}$$

$$F_{2a2B} = 0.1 \times F_{2rB}$$

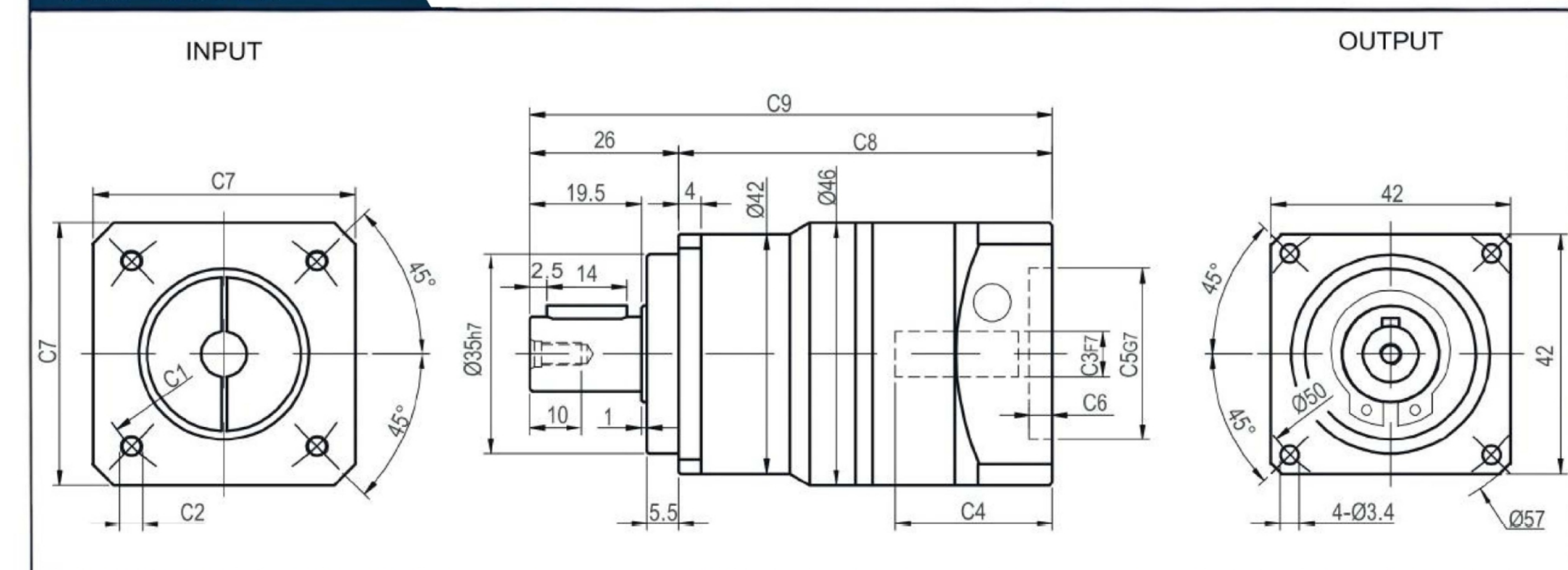
When the radial force F_{2r} is applied off-center from the shaft, the allowable radial force that can be withstood increases as the point of application gets closer to the gearbox ($X < 1/2xL$), and decreases as it moves further away from the gearbox ($X > 1/2xL$).

Radial force
 $F'_{2rB} = K \times F_{2rB}$

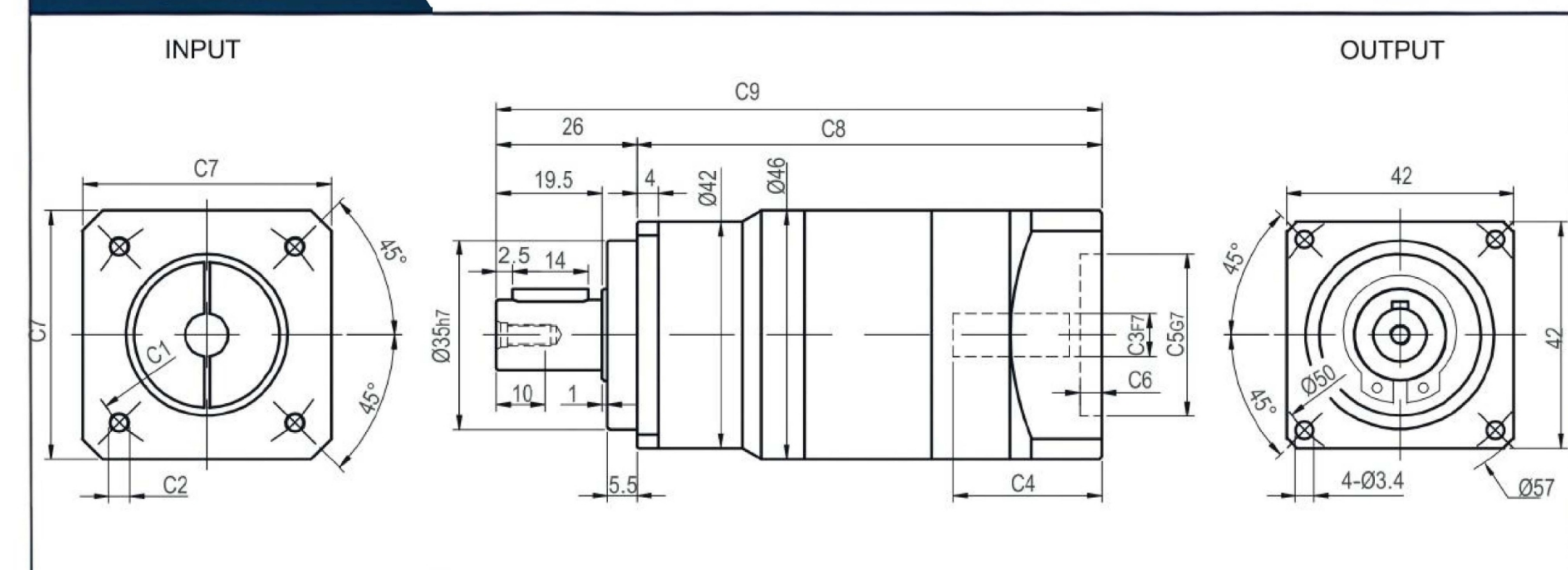
Axial force
 $F'_{2a1B} = 0.2 \times F'_{2rB}$
 $F'_{2a2B} = 0.1 \times F'_{2rB}$

OUTLINE DIMENSION SHEET

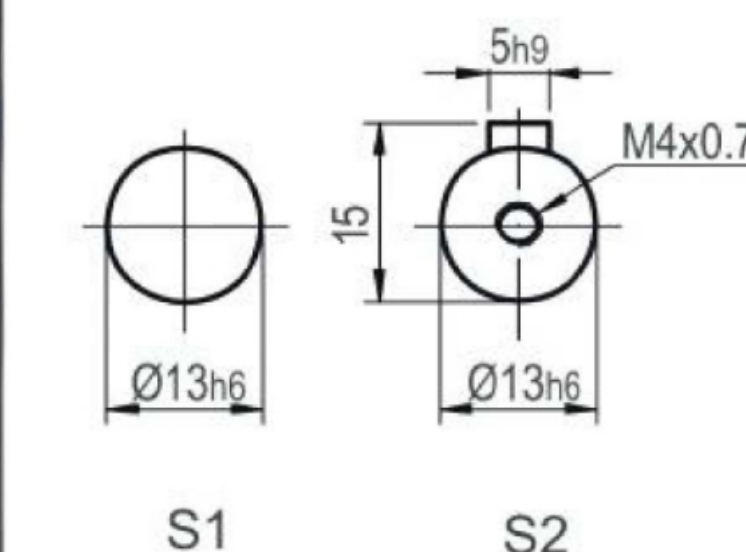
PXF-042-L1



PXF-042-L2



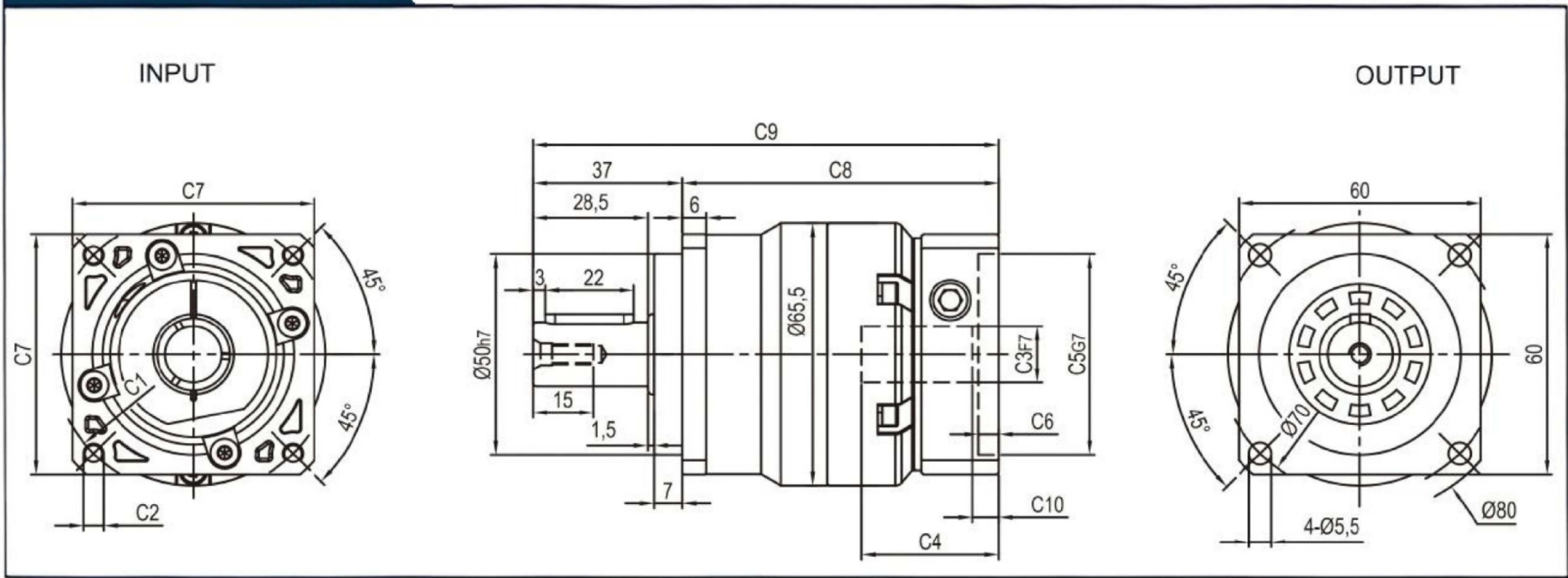
OUTPUT DIAMETER



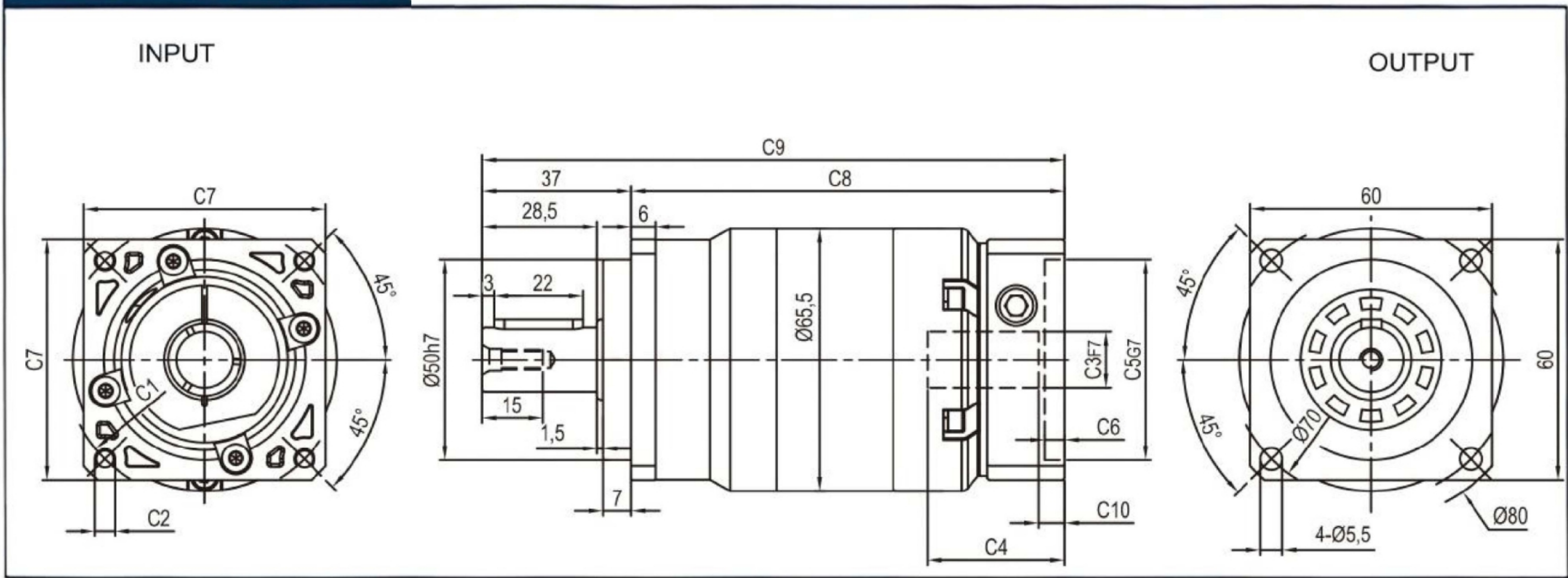
	C1	C2	C3	C4	C5	C6	C7	C8	C9
PXF-042-L1	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	65.5	91.5
	Ø66.67	4-M4x10	Ø6.35, Ø8	27.5	Ø38.1	5	57	65.5	91.5
	Ø70	4-M4x10, 4-M5x12	Ø11	32	Ø50	5	60	70	96
PXF-042-L2	Ø45	4-M3x8	Ø8	27.5	Ø30	5	46	86	112
	Ø46	4-M4x10	Ø8	27.5	Ø30	5	46	86	112
	Ø66.67	4-M4x10	Ø6.35, Ø8	27.5	Ø38.1	5	57	86	112

OUTLINE DIMENSION SHEET

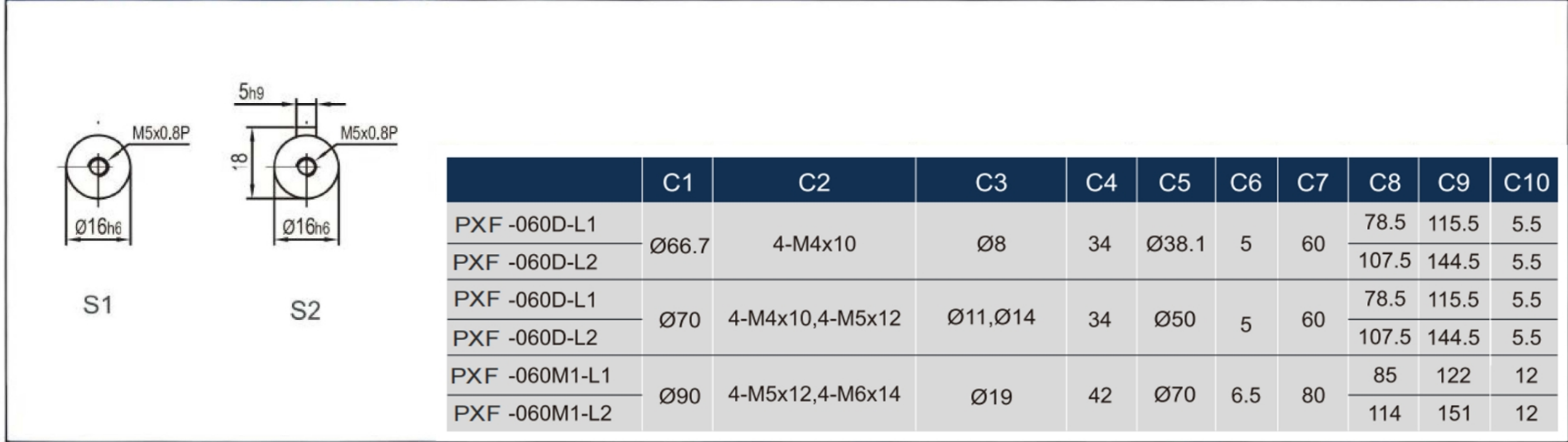
PXF-060D(M1)-L1



PXF-060D(M1)-L2

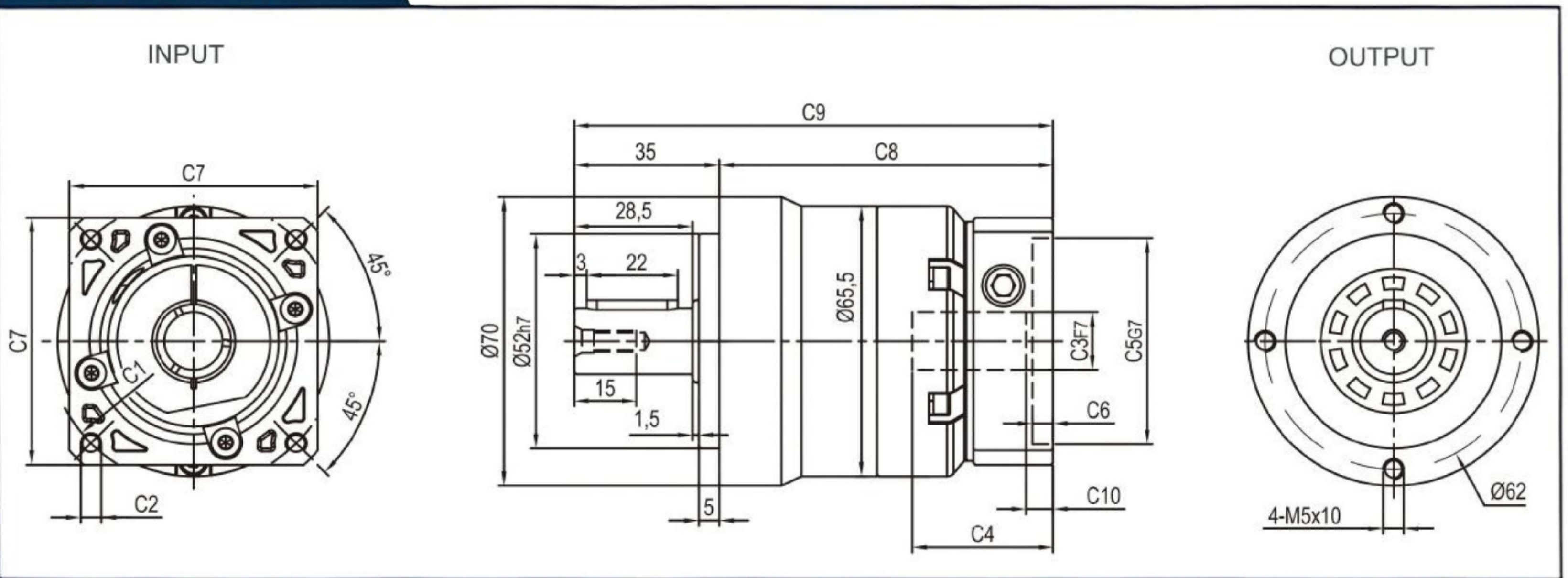


OUTPUT DIAMETER

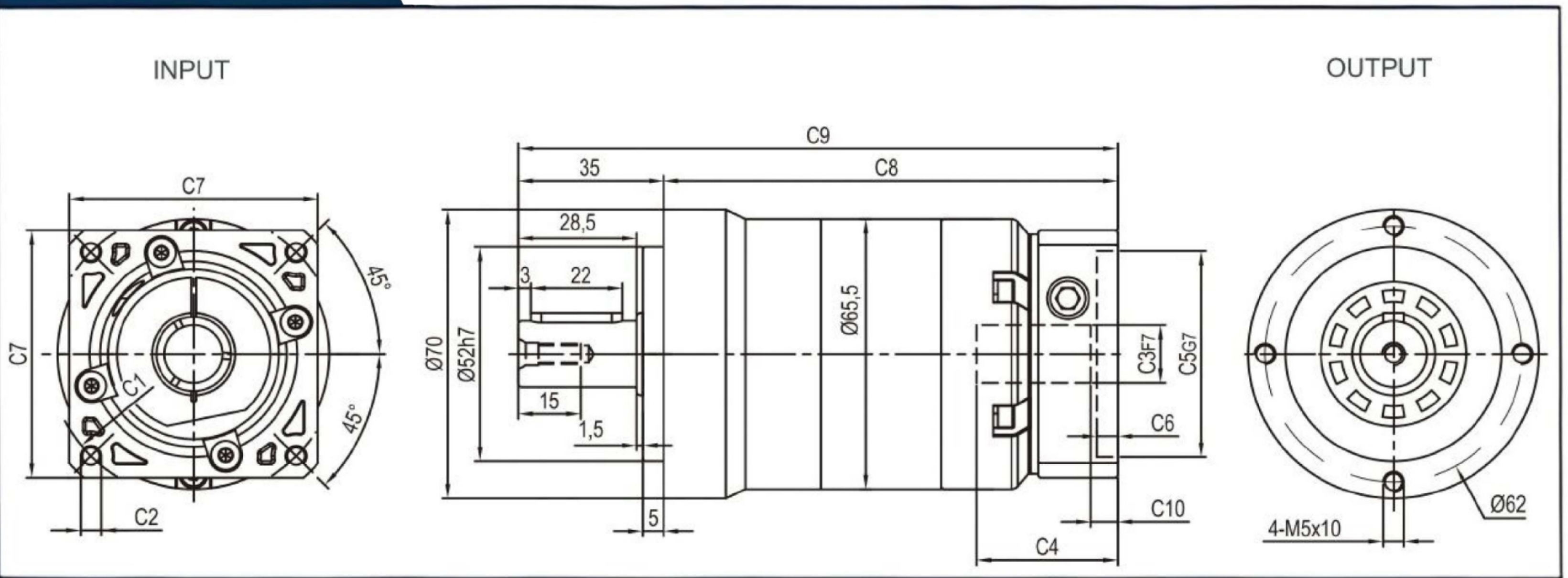


OUTLINE DIMENSION SHEET

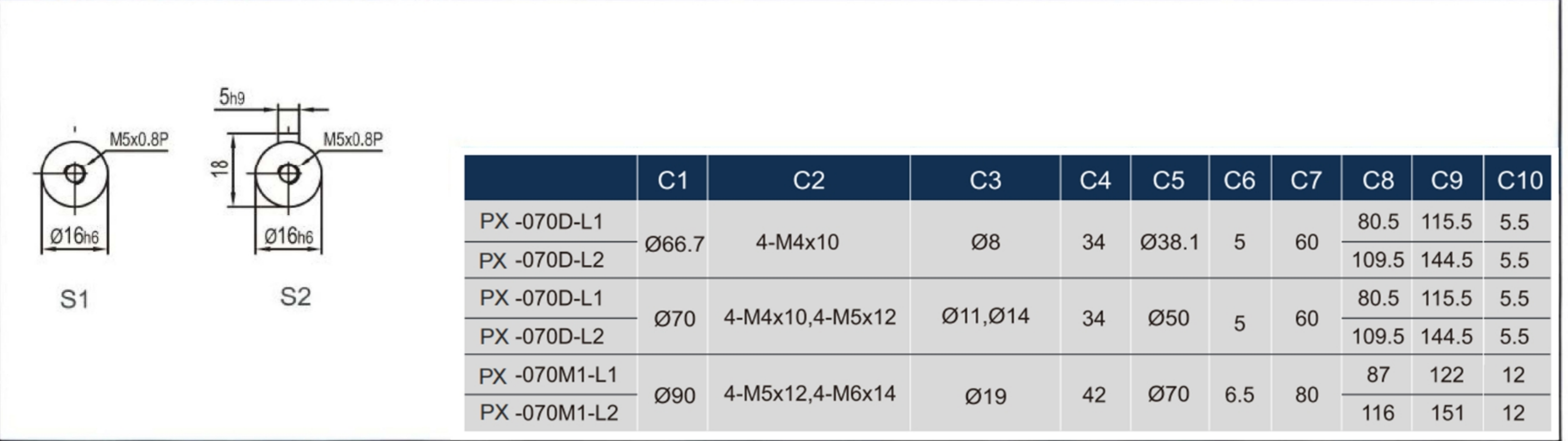
PX-070D(M1)-L1



PX-070D(M1)-L2

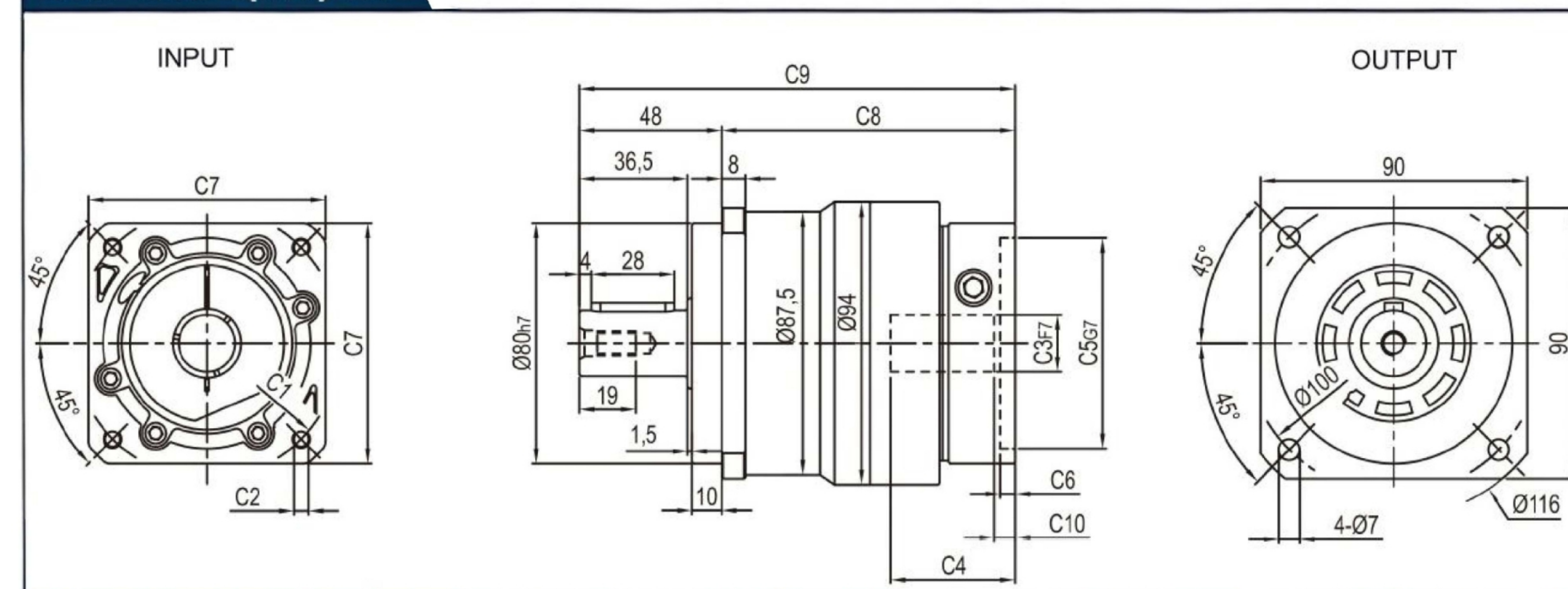


OUTPUT DIAMETER

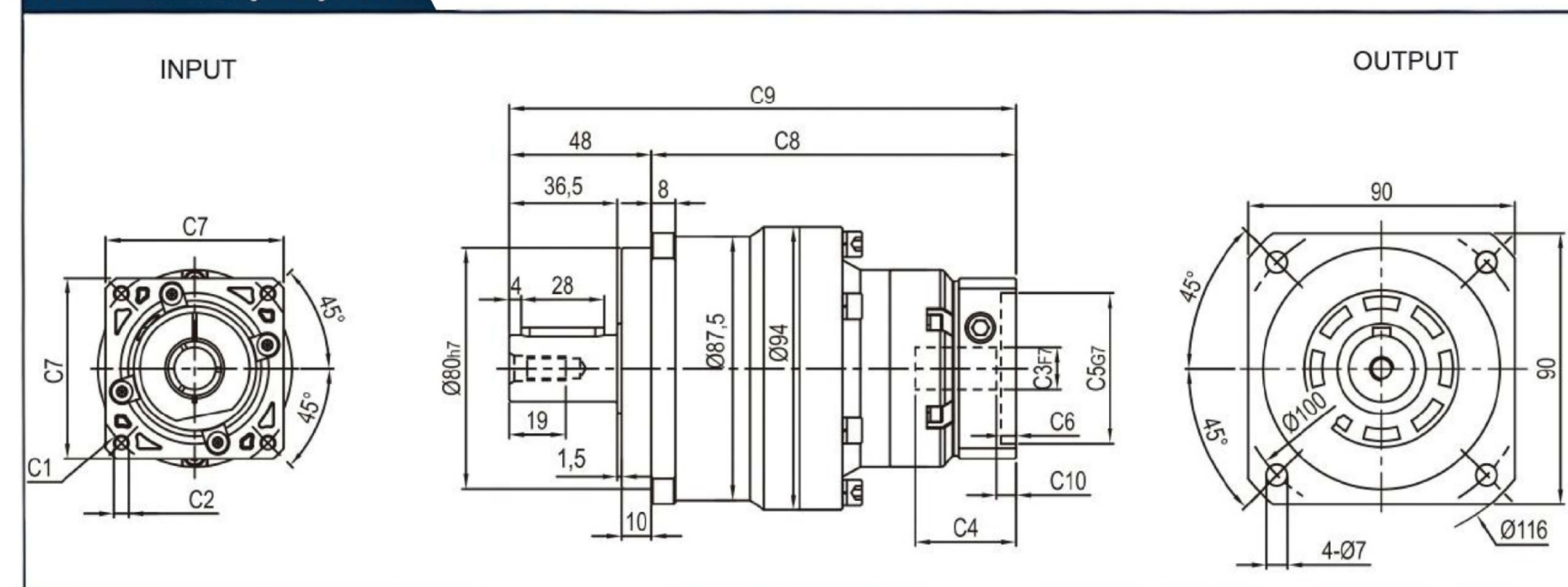


OUTLINE DIMENSION SHEET

PXF-090D(M1)-L1



PXF-090D(M1)-L2

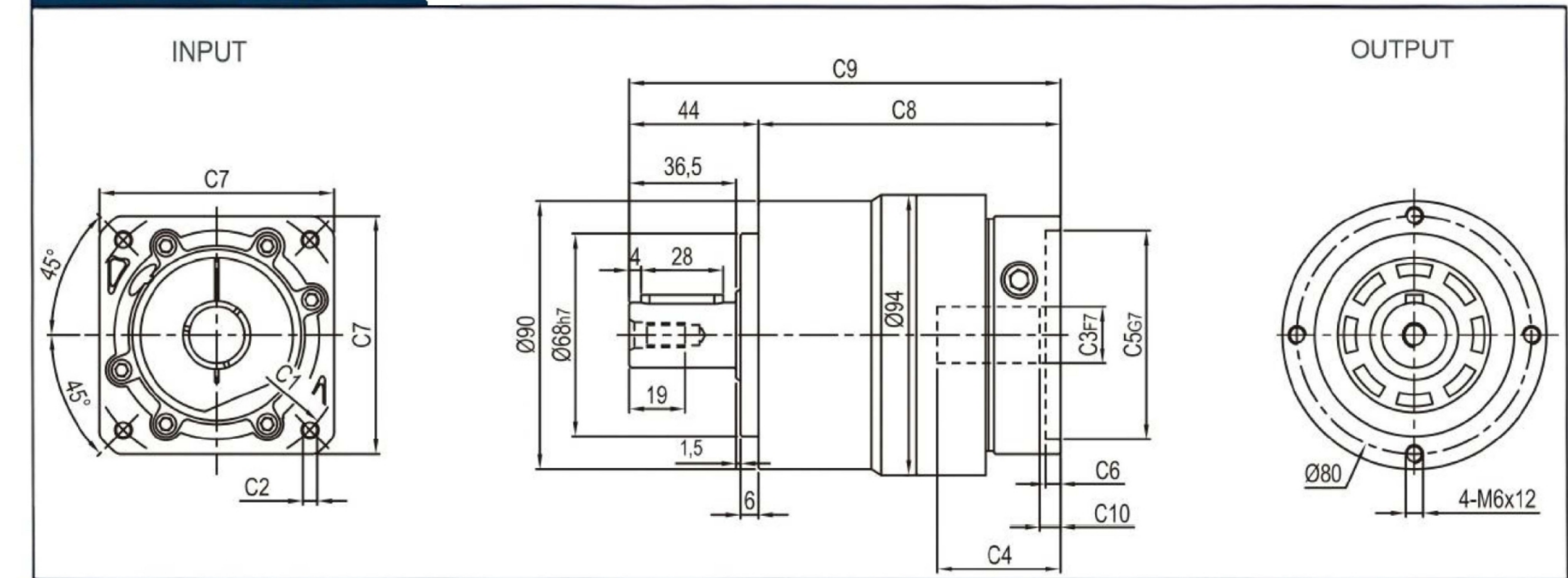


OUTPUT DIAMETER

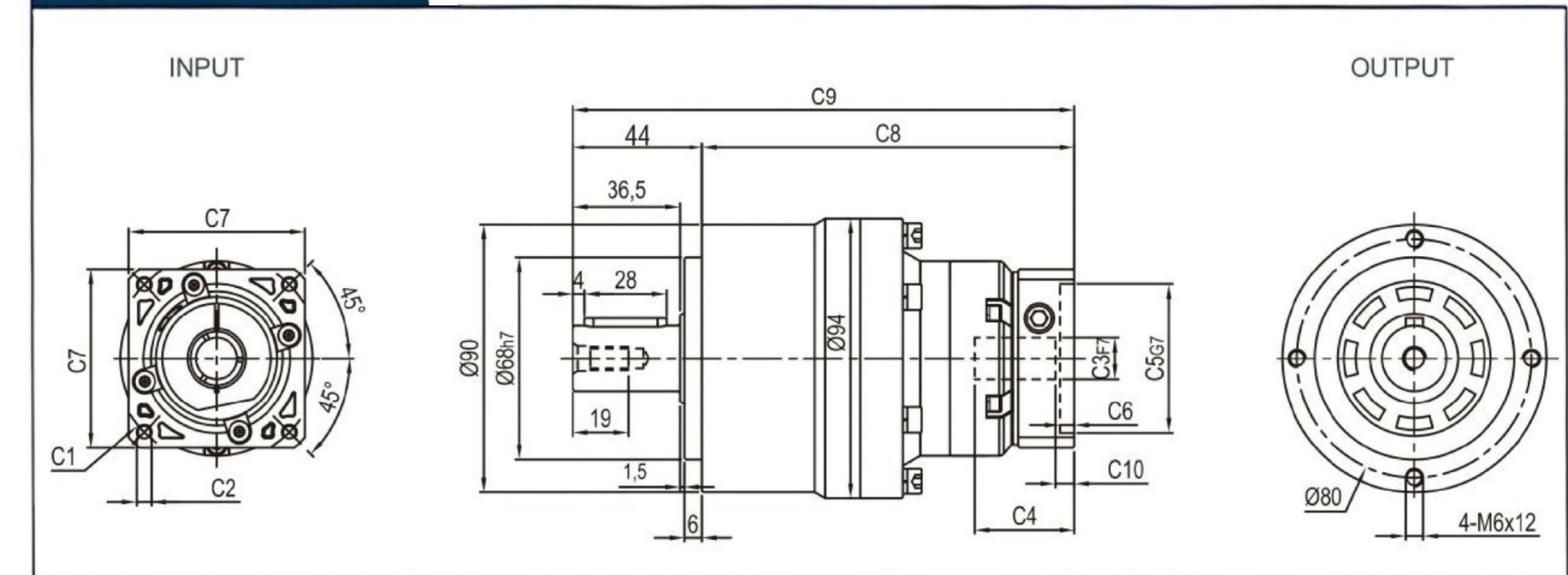
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
PXF-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	99	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	99	147	6
PXF-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	114.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	117	165	19
PXF-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	123	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	123	171	5.5
PXF-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	129.5	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	129.5	177.5	11

OUTLINE DIMENSION SHEET

PX-090D(M1)-L1



PX-090D(M1)-L2

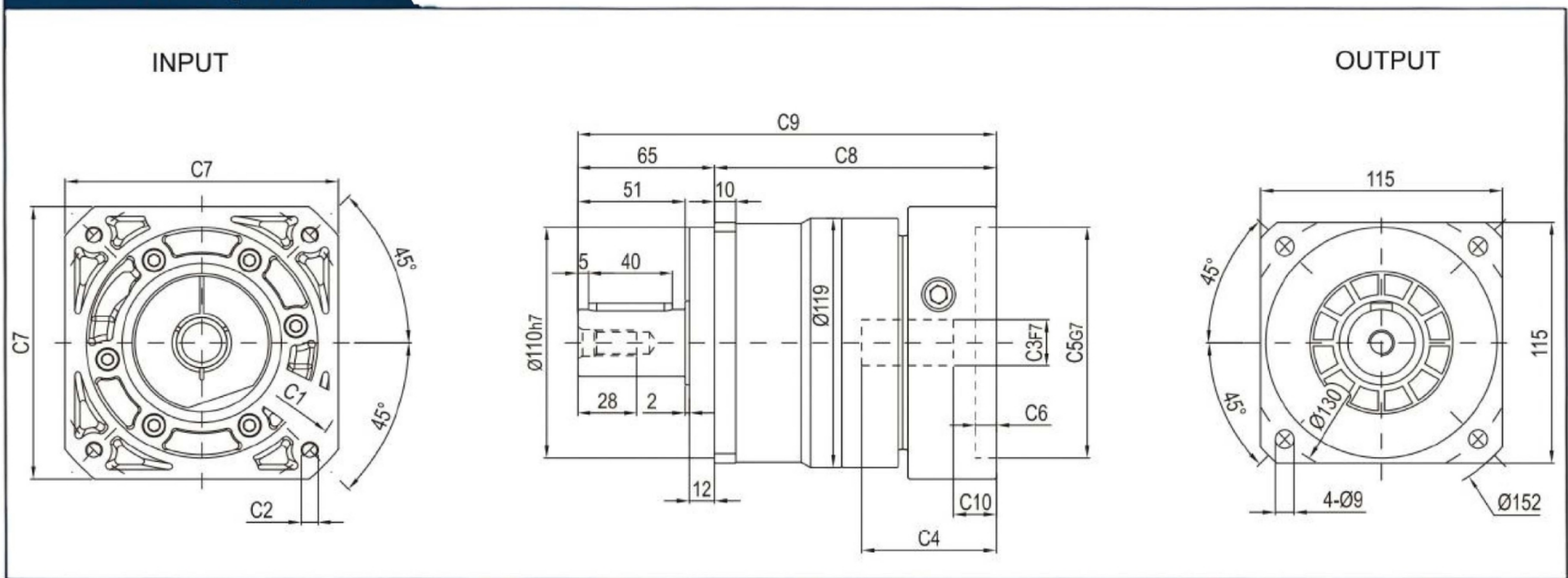


OUTPUT DIAMETER

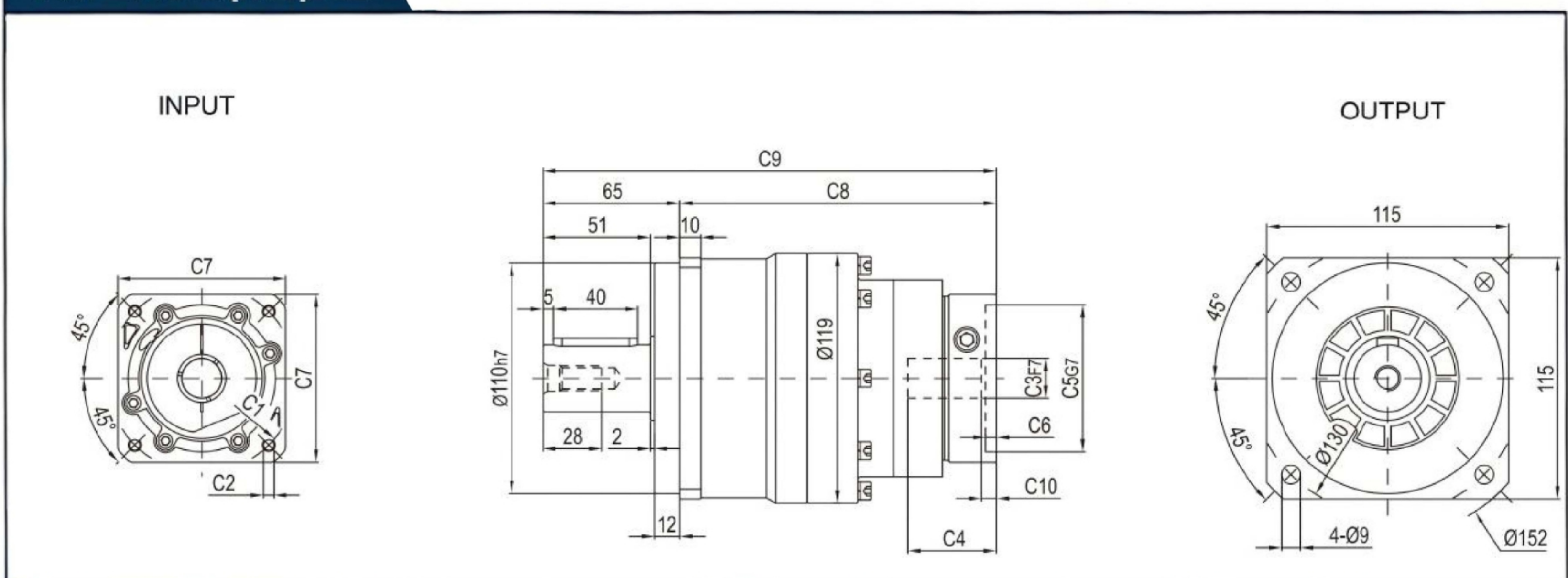
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
PX-090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	103	147	7
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	103	147	6
PX-090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	118.5	162.5	16.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	121	165	19
PX-090D-L2	Ø66.7	4-M4x10	Ø8	34	Ø38.1	5	60	127	171	5.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	34	Ø50	5	60	127	171	5.5
PX-090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42	Ø70	6.5	80	133.5	177.5	12
	Ø100	4-M6x14	Ø16	42	Ø80	6.5	86	133.5	177.5	11

OUTLINE DIMENSION SHEET

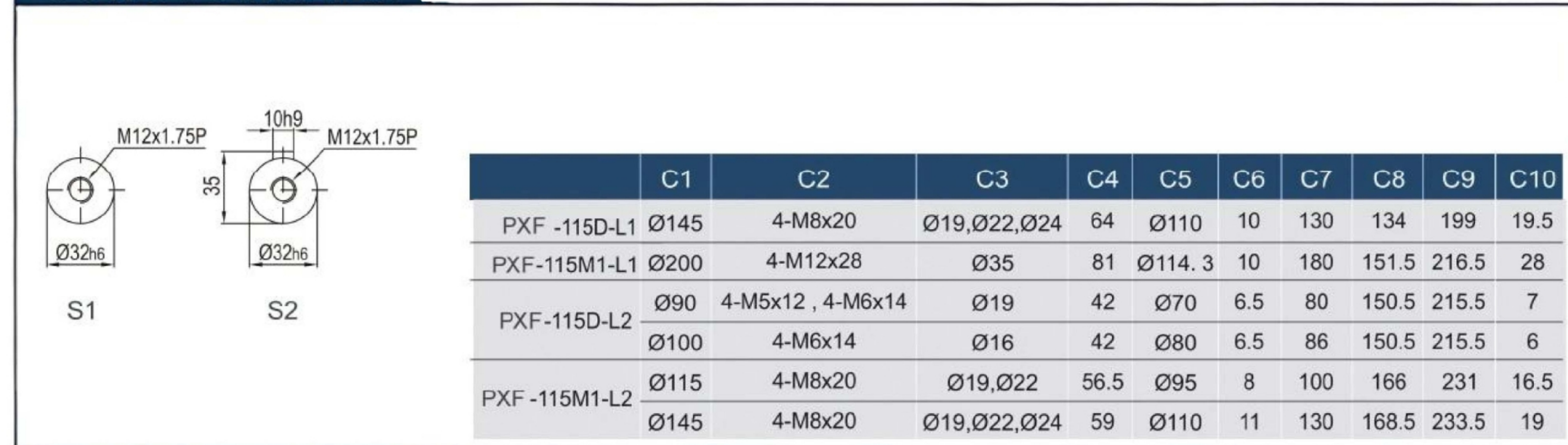
PXF-115D(M1)-L1



PXF-115D(M1)-L2

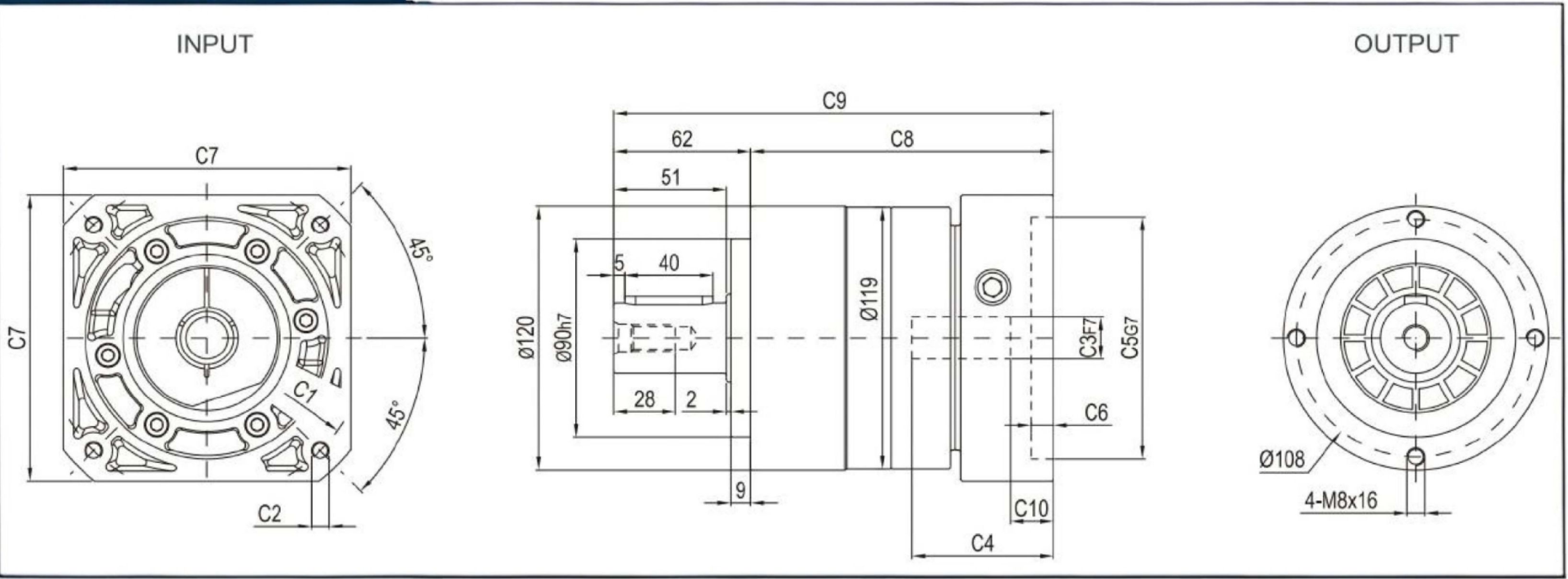


OUTPUT DIAMETER

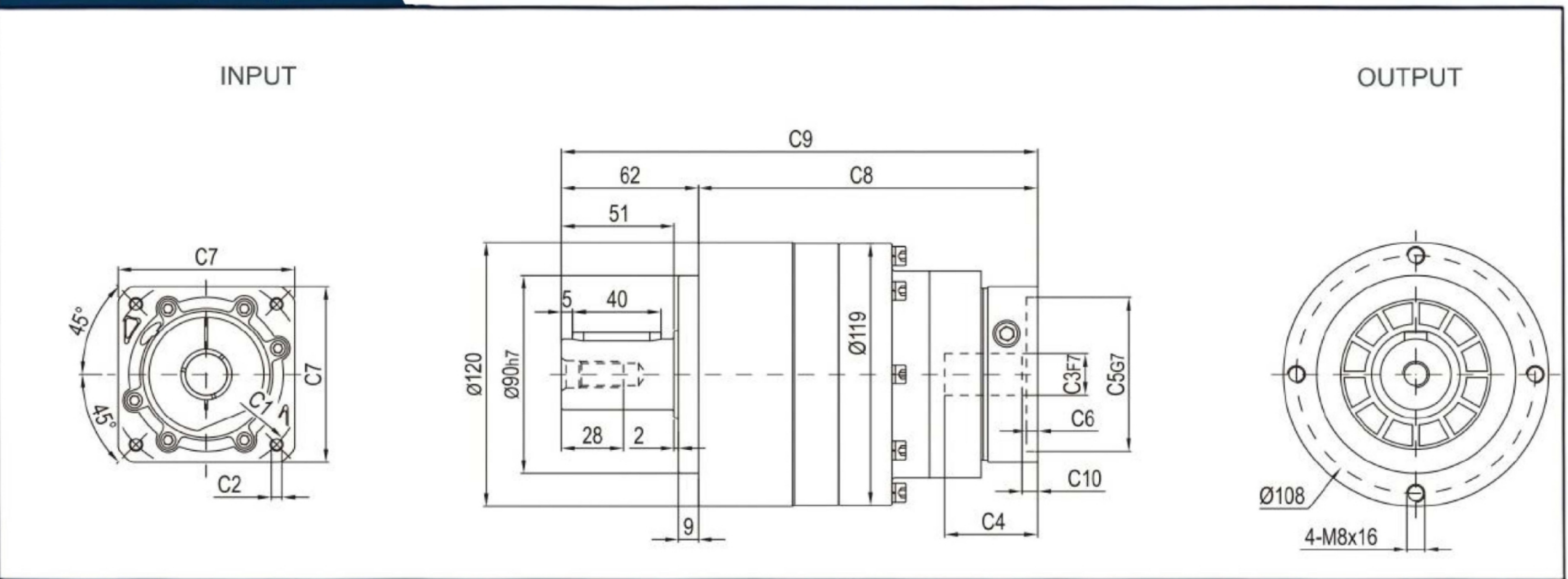


OUTLINE DIMENSION SHEET

PX-120D(M1)-L1



PX-120D(M1)-L2

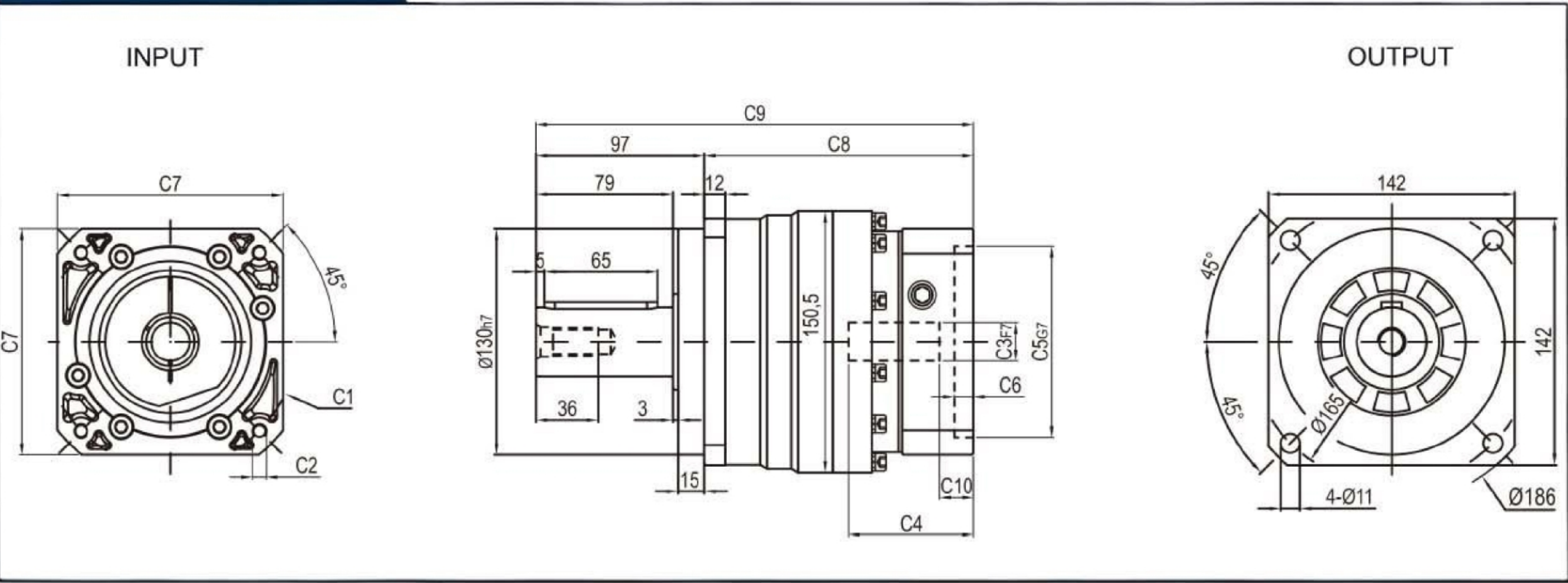


OUTPUT DIAMETER

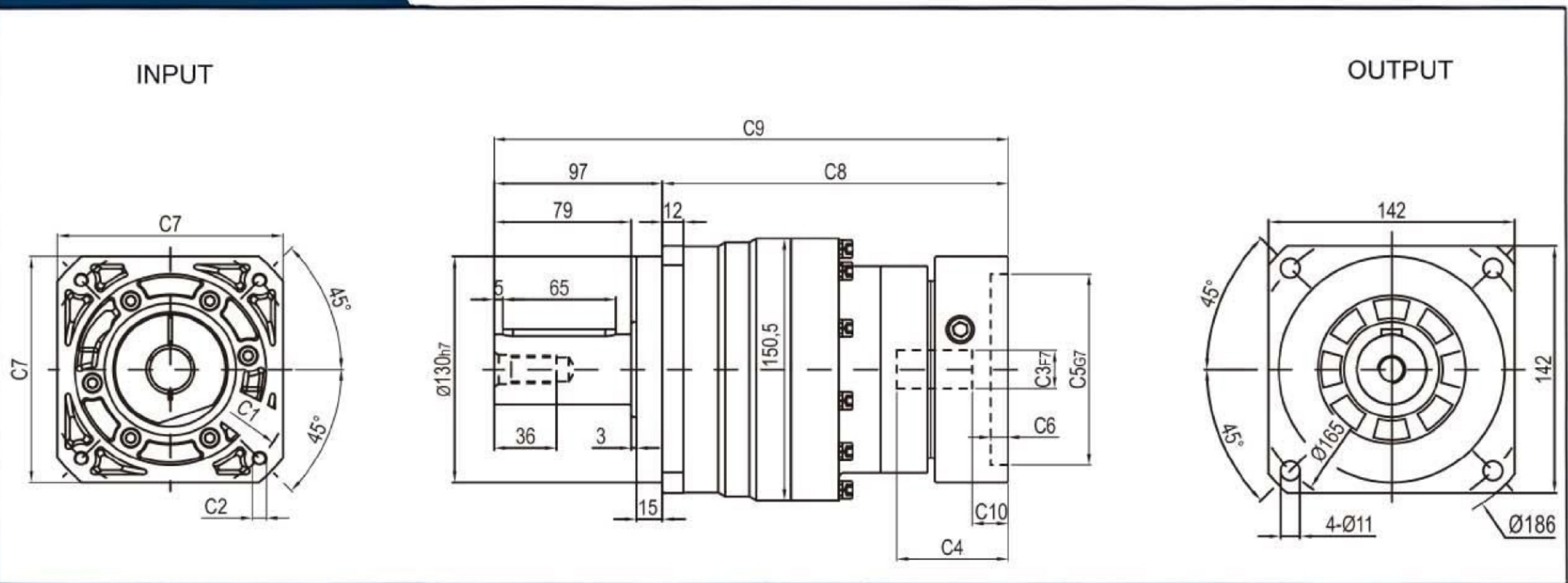


OUTLINE DIMENSION SHEET

PXF-142D(M1)-L1



PXF-142D(M1)-L2

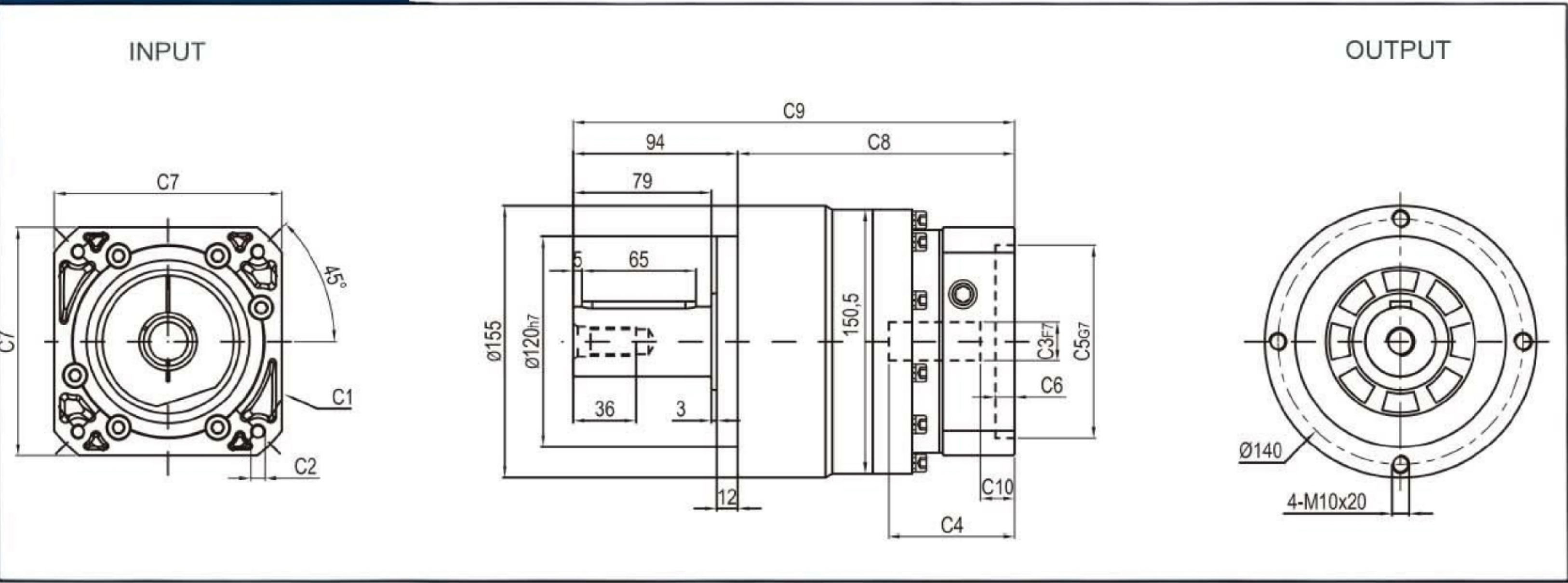


OUTPUT DIAMETER

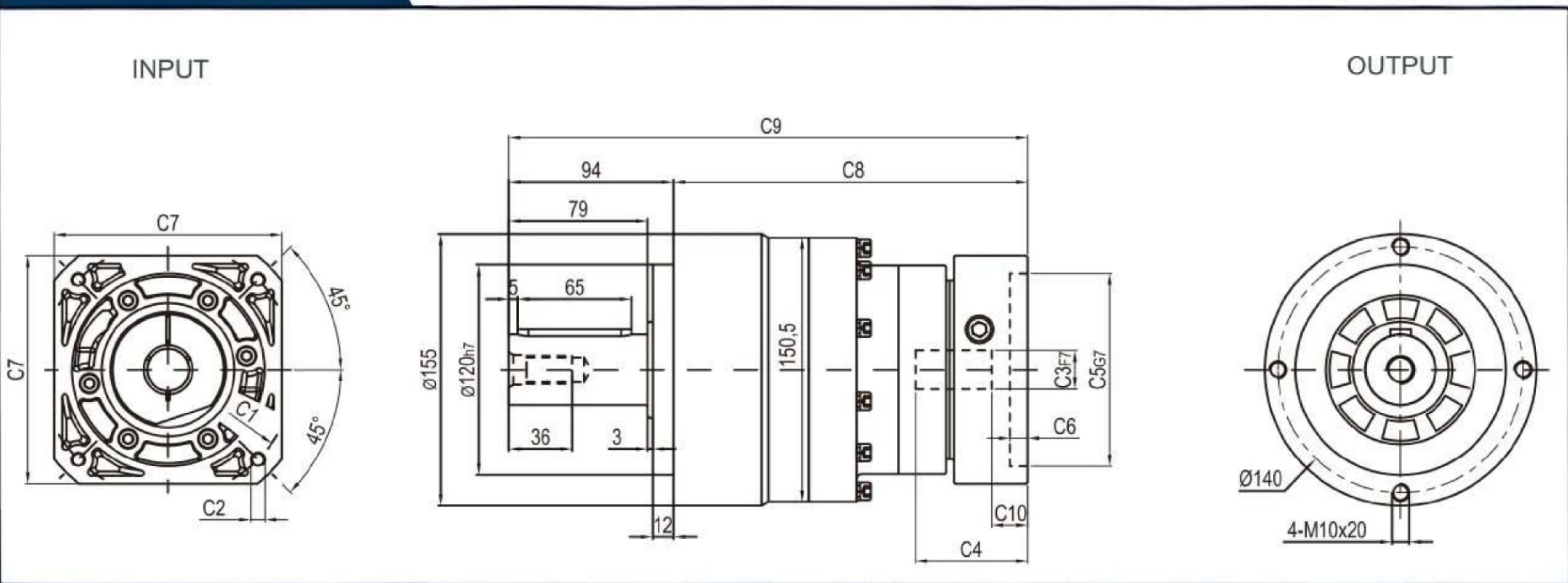


OUTLINE DIMENSION SHEET

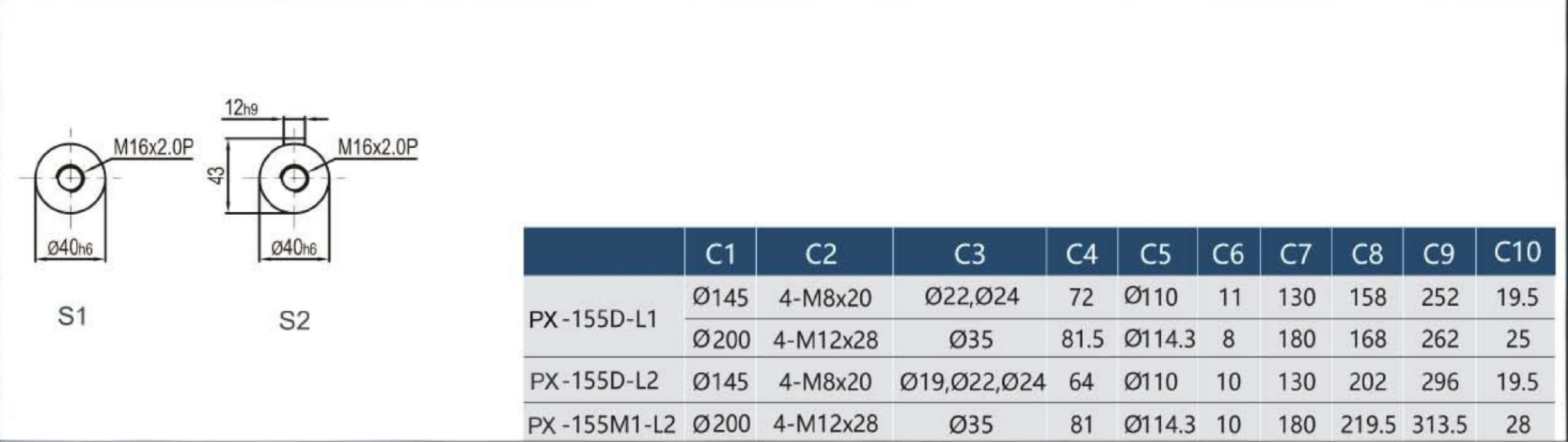
PX-155D(M1)-L1



PX-155D(M1)-L2

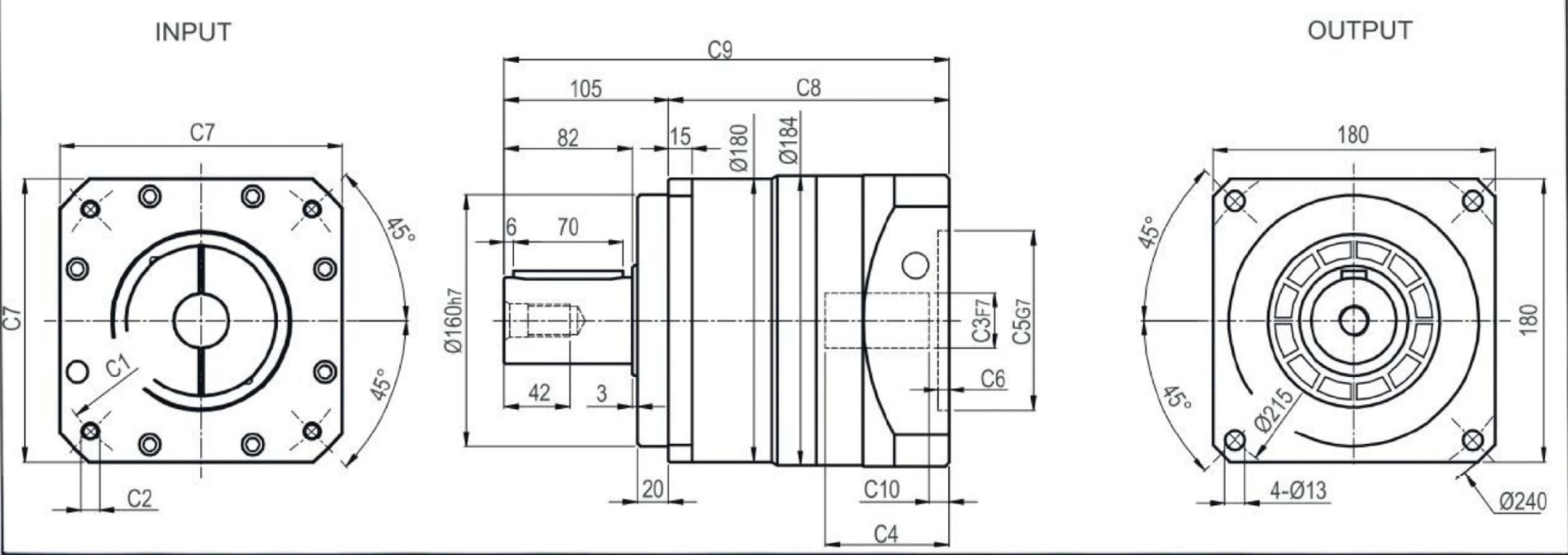


OUTPUT DIAMETER

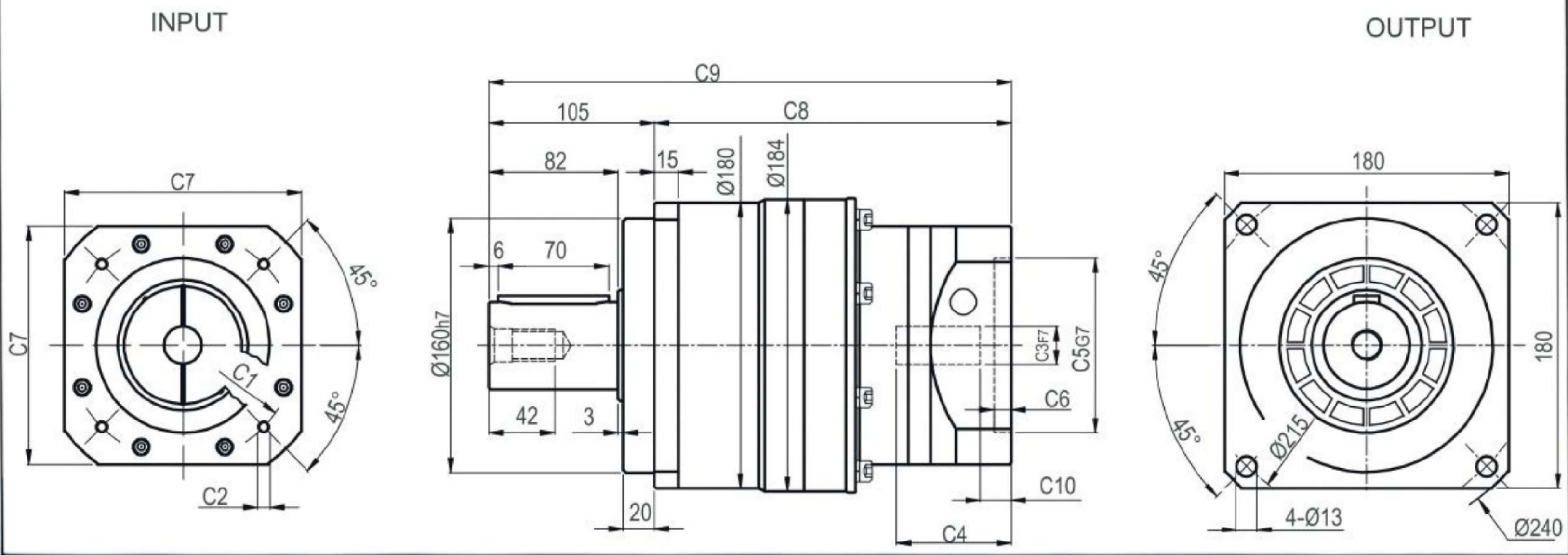


OUTLINE DIMENSION SHEET

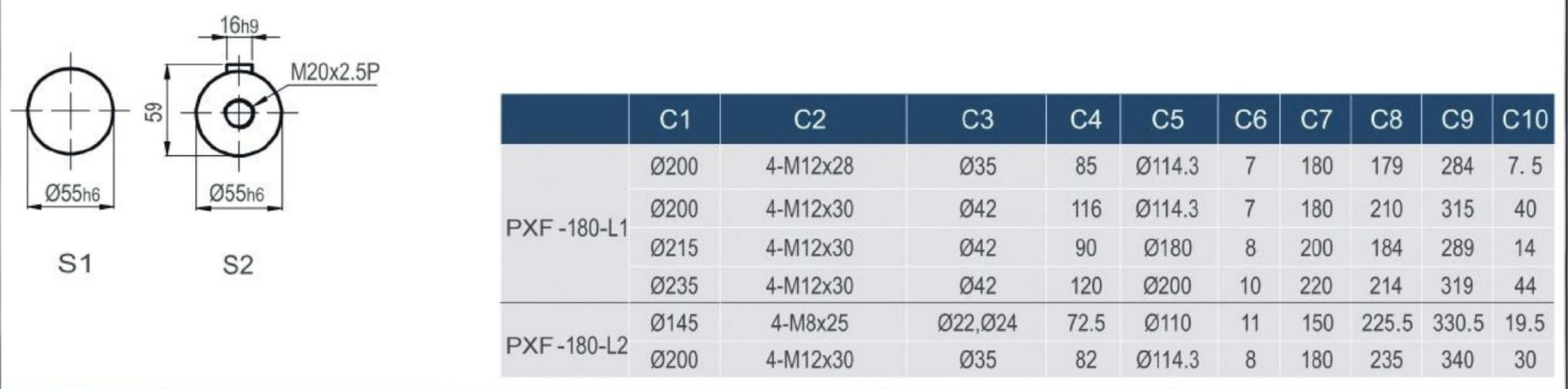
PXF-180-L1



PXF-180-L2

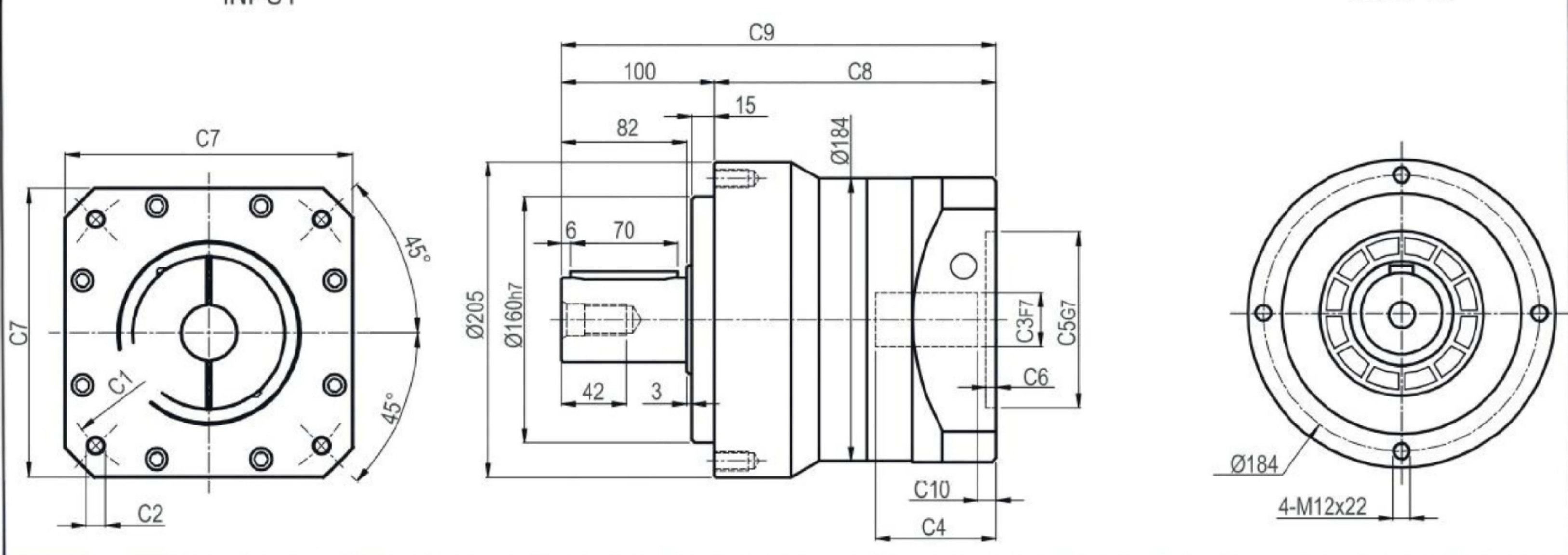


OUTPUT DIAMETER

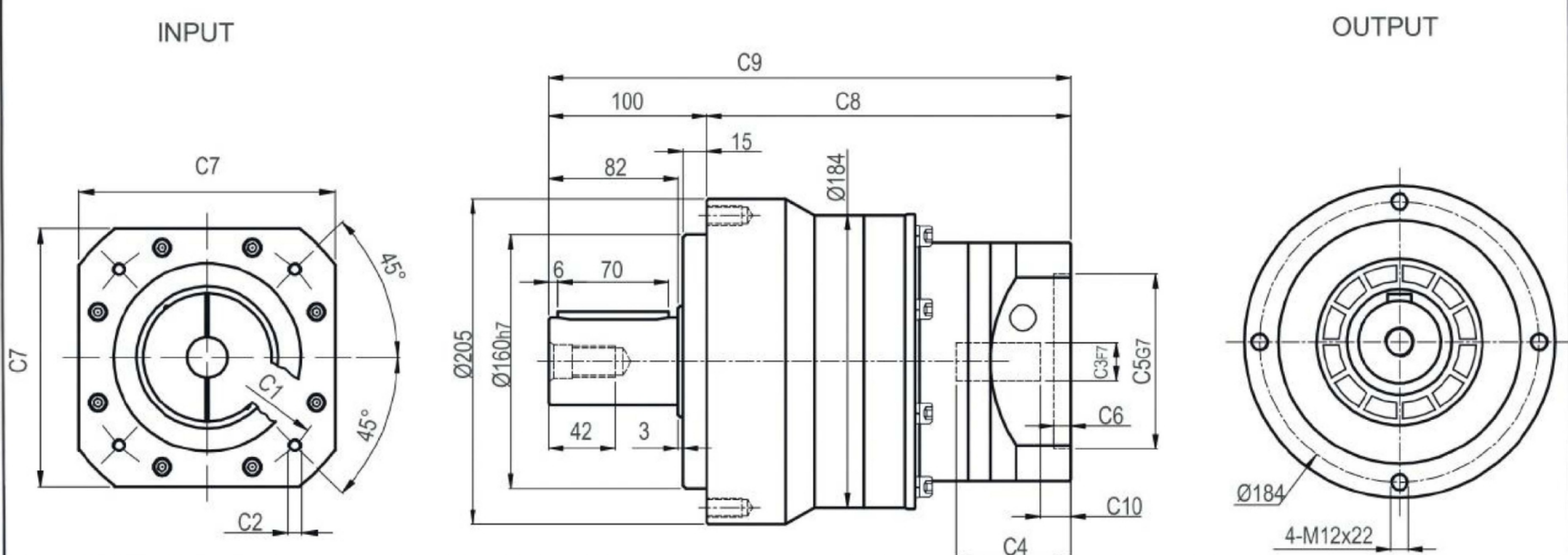


OUTLINE DIMENSION SHEET

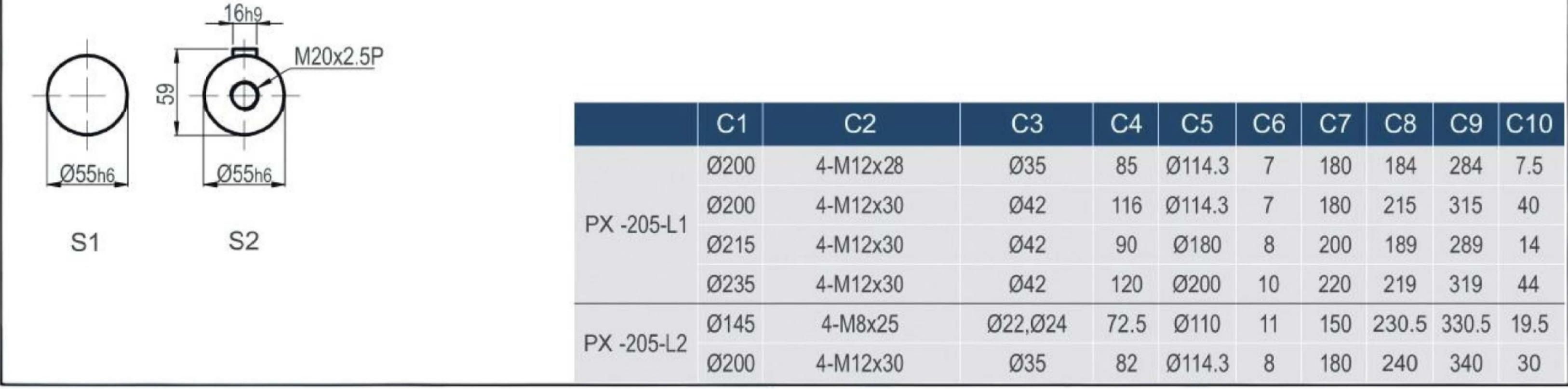
PX-205-L1



PX-205-L2

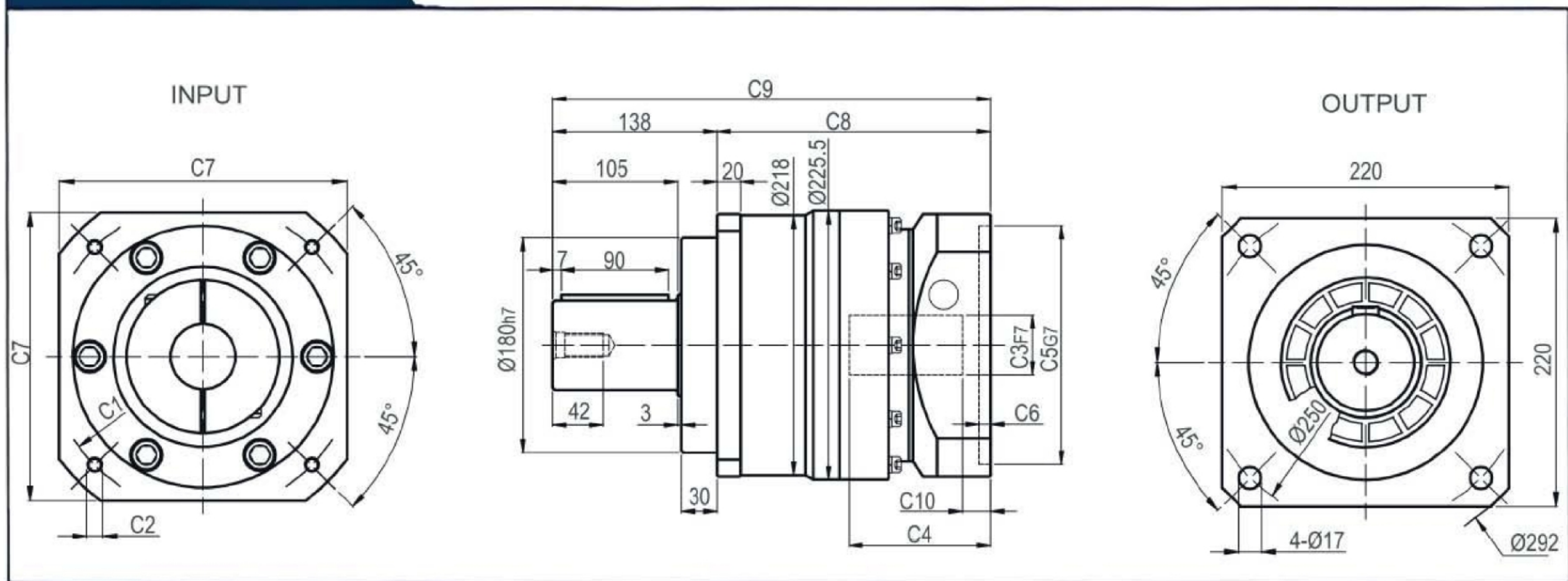


OUTPUT DIAMETER

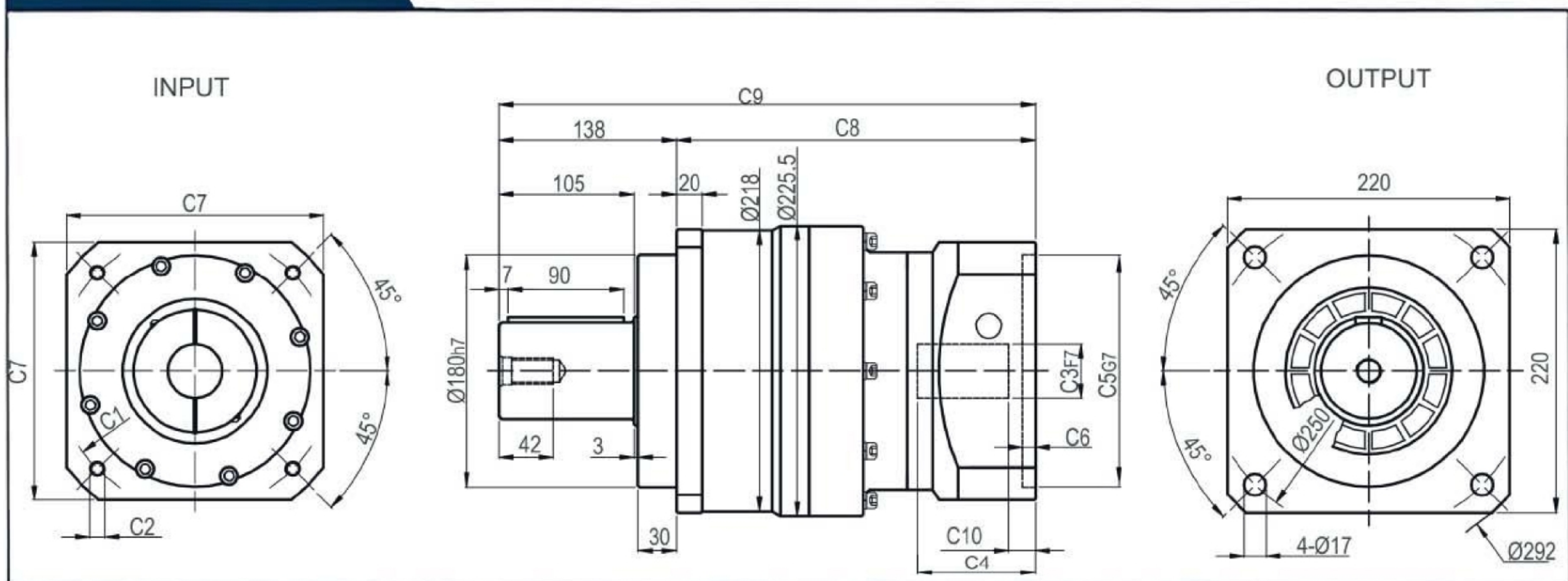


OUTLINE DIMENSION SHEET

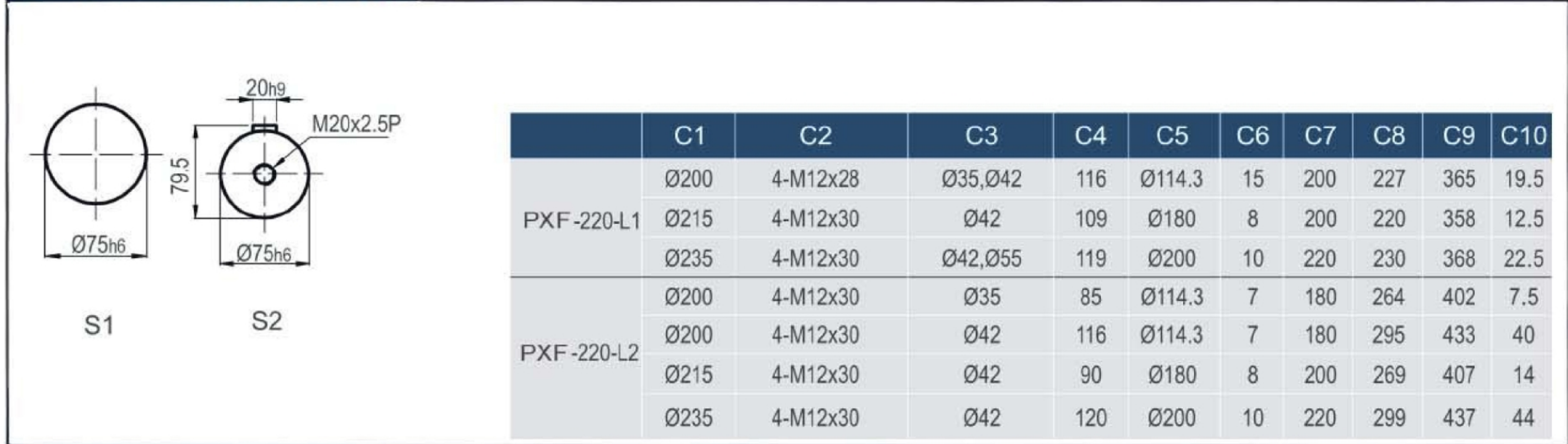
PXF-220-L1



PXF-220-L2

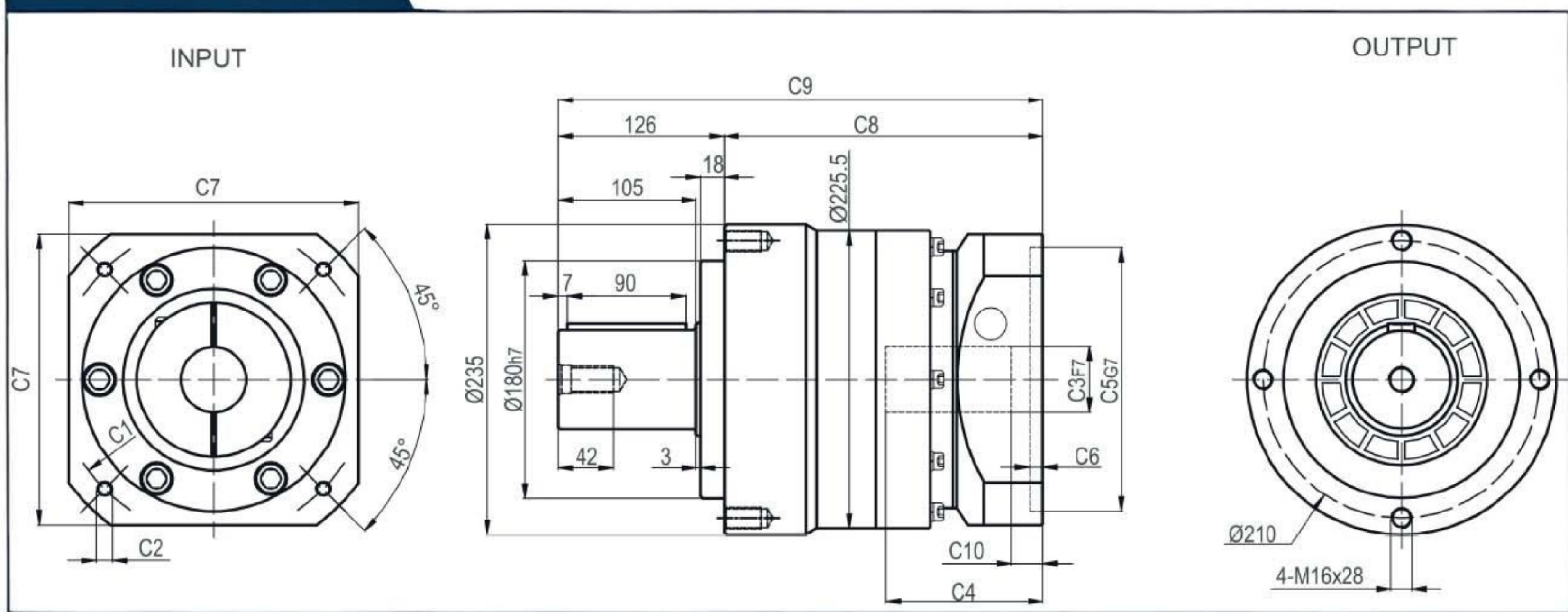


OUTPUT DIAMETER

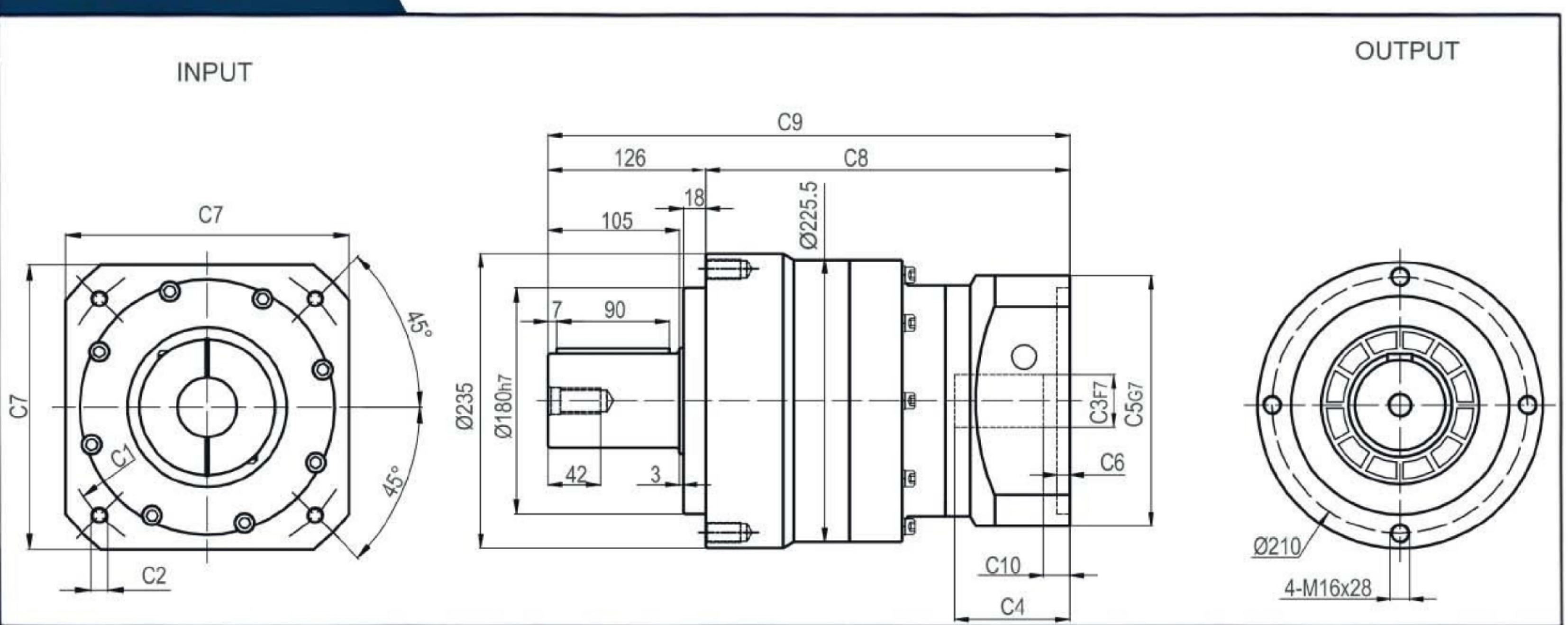


OUTLINE DIMENSION SHEET

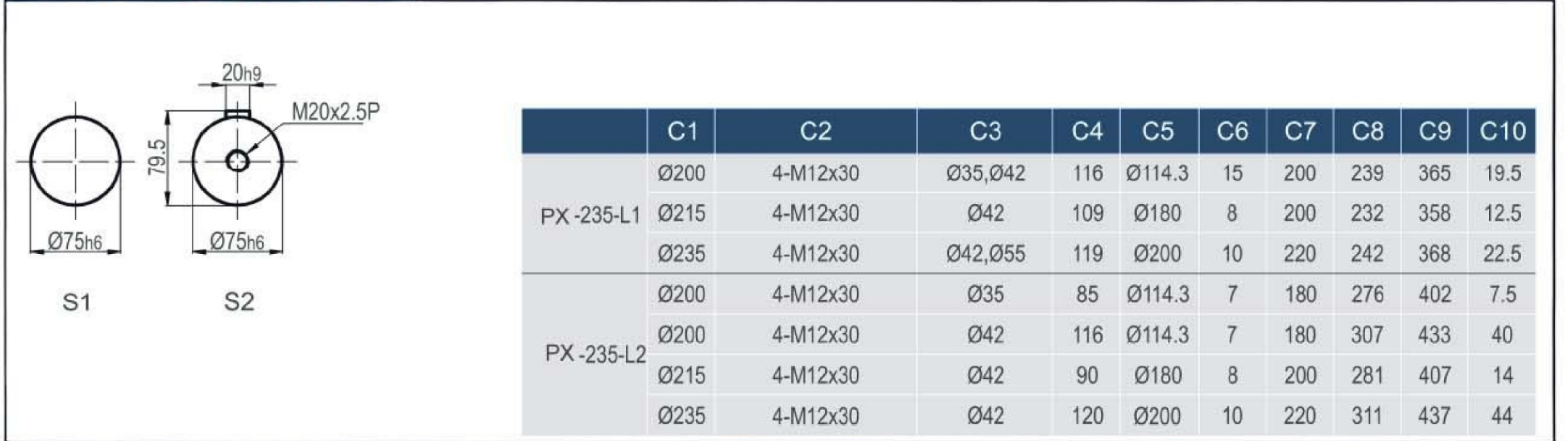
PX-235-L1



PX-235-L2



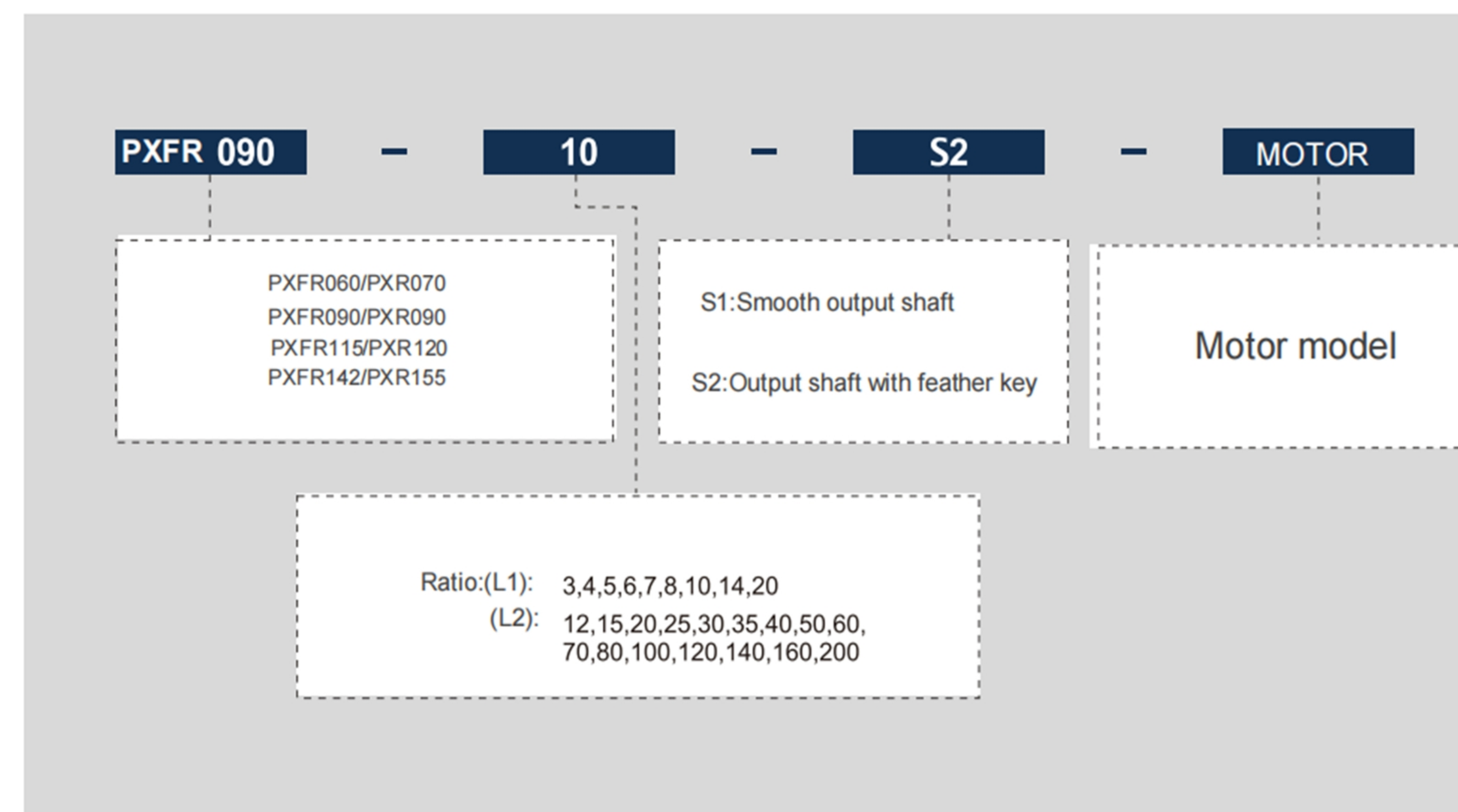
OUTPUT DIAMETER



PXFR/PXR SERIES



MODEL ILLUMINATION

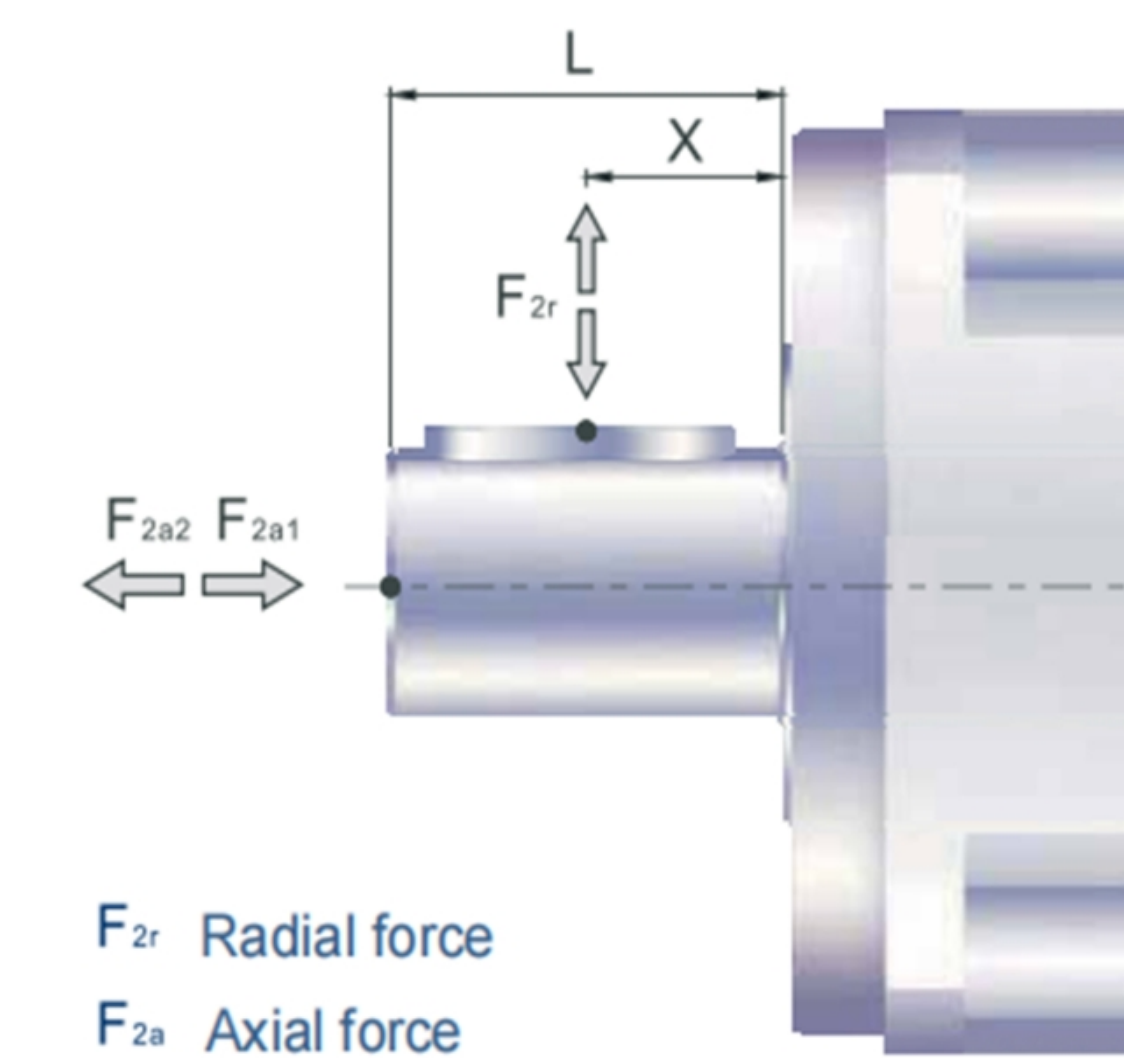


GEAR BOX PERFORMANCE INFORMATION

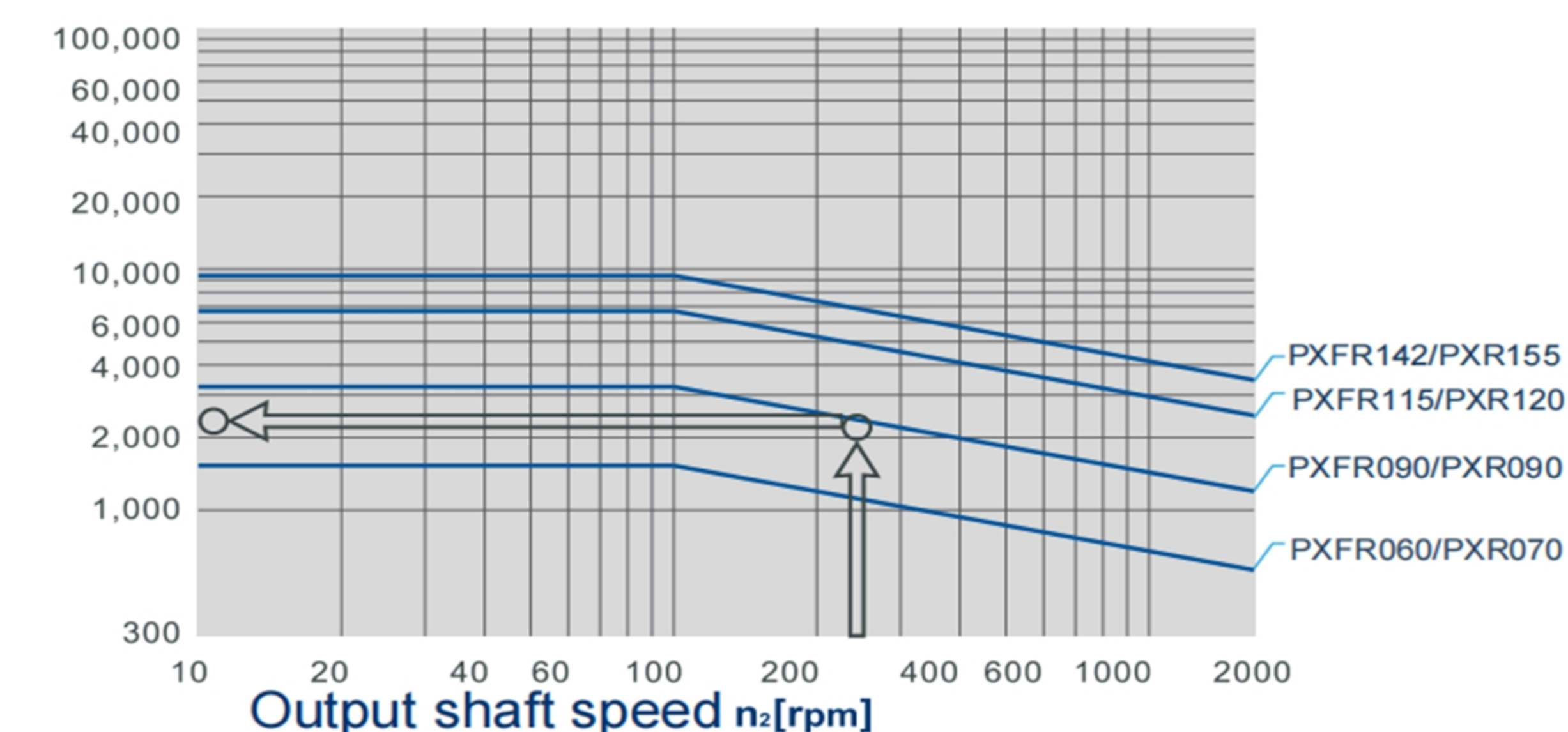
		Stage	Ratio ¹	PXFR 060 PXR 070	PXFR 090 PXR 090	PXFR115 PXR 120	PXFR 142 PXR 155
Normal output torque	Nm	1	3	55	130	208	342
			4	50	140	290	542
			5	60	160	330	650
			6	55	150	310	600
			7	50	140	300	550
			8	50	140	290	542
			10	60	160	330	650
			14	50	140	300	550
			20	40	100	230	450
		2	12	55	130	208	342
			15	55	130	208	342
			20	50	140	290	542
			25	60	160	330	650
			30	55	130	208	342
			35	60	160	330	650
			40	50	140	290	542
			50	60	160	330	650
			60	55	150	310	600
			70	60	160	330	650
			80	50	140	290	542
			100	60	160	330	650
			120	—	150	310	600
			140	—	140	300	550
			160	—	120	260	500
			200	—	100	230	450
Maximum output torque	Nm	1,2	3~200	3 times nominal output torque			
Normal input speed	rpm	1,2	3~200	5,000	4,000	4,000	3,000
Maximum input speed	rpm	1,2	3~200	10,000	8,000	8,000	6,000
Backlash	arcmin	1	3~20	≤10	≤10	≤10	≤10
		2	12~200	≤12	≤12	≤12	≤12
Torsional stiffness	Nm/arcmin	1,2	3~200	7	14	25	50
Maximum radial force F_{2rB}^2	N	1,2	3~200	1,530	3,250	6,700	9,400
Maximum axial force F_{2aB}^2	N	1,2	3~200	630	1,300	3,000	4,000
Maximum axial force F_{2aB}^2	N	1,2	3~200	765	1,625	3,350	4,700
Service life	hr	1,2	3~200	20,000*			
Efficiency at full load	%	1	3~20	≤95%			
		2	12~200	≤92%			
Gearbox weight	kg	1	3~20	2.1	6.4	13	24.5
		2	12~200	2.5	7.8	14.2	27.5
Operating temperature	°C	1,2	3~200	-10°C~+90°C			
Standard lubrication		1,2	3~200	Synthetic grease			
Protection class		1,2	3~200	IP65			
Installation position		1,2	3~200	Any			
Running noise(n=3000rpm)	dB	1,2	3~200	≤63	≤65	≤68	≤70

		Stage	Ratio ¹	PXFR 060 PXR 070	PXFR 090 PXR 090	PXFR 115 PXR 120	PXFR 142 PXR 155
Mass moment of inertia J_1	kg · cm ²	1	3~7	0.35	2.25	6.84	23.4
			8~10	0.07	1.87	6.25	21.8
			14~20	0.07	1.87	6.25	21.8
		2	12~40	0.09	0.35	2.25	6.84
			50	0.09	0.31	1.87	6.25
			60	0.09	0.35	2.25	6.84
			70~100	0.09	0.31	1.87	6.25
			120~200	—	0.31	1.87	6.25

REDUCER OUTPUT SHAFT OF THE PERMISSIBLE RADIAL FORCE AND AXIAL FORCE



The radial force F_{2rB} [N] is allowed to be applied at the center of the shaft.

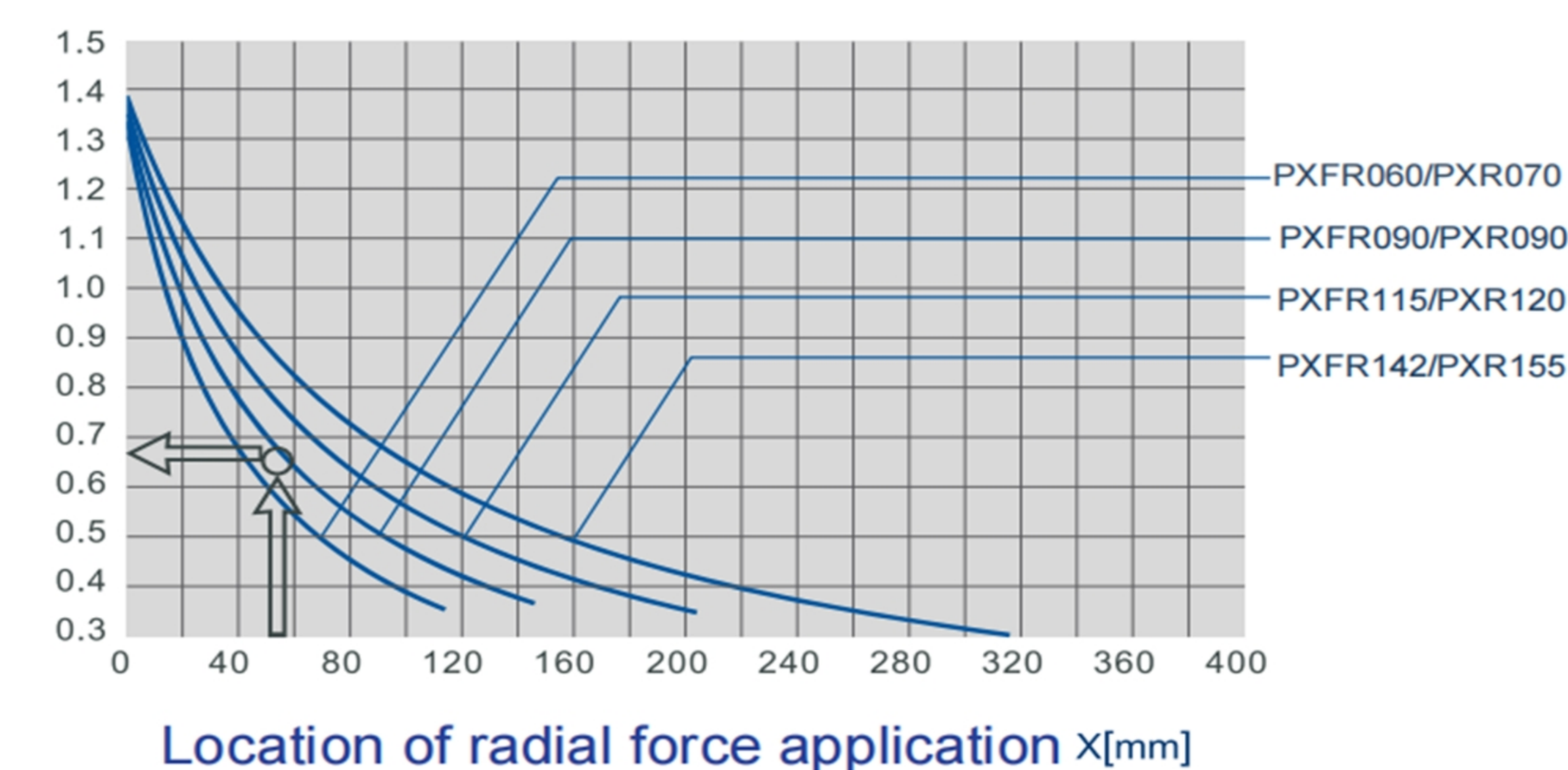


When the radial force F_{2r} is applied at the center of the shaft, $X = 1/2 \times L$, the allowable radial force F_{2rB} for different gearbox models at different output speeds can be found in the left diagram. The allowable axial force F_{2aB} is given by the following formulas:

$$F_{2a1B} = 0.2 \times F_{2rB}$$

$$F_{2a2B} = 0.1 \times F_{2rB}$$

Load factor at different locations k_b



When the radial force F_{2r} is applied off-center from the shaft, the allowable radial force that can be withstood increases as the point of application gets closer to the gearbox ($X < 1/2 \times L$), and decreases as it moves further away from the gearbox ($X > 1/2 \times L$).

Radial force

$$F'_{2rB} = K_b \times F_{2rB}$$

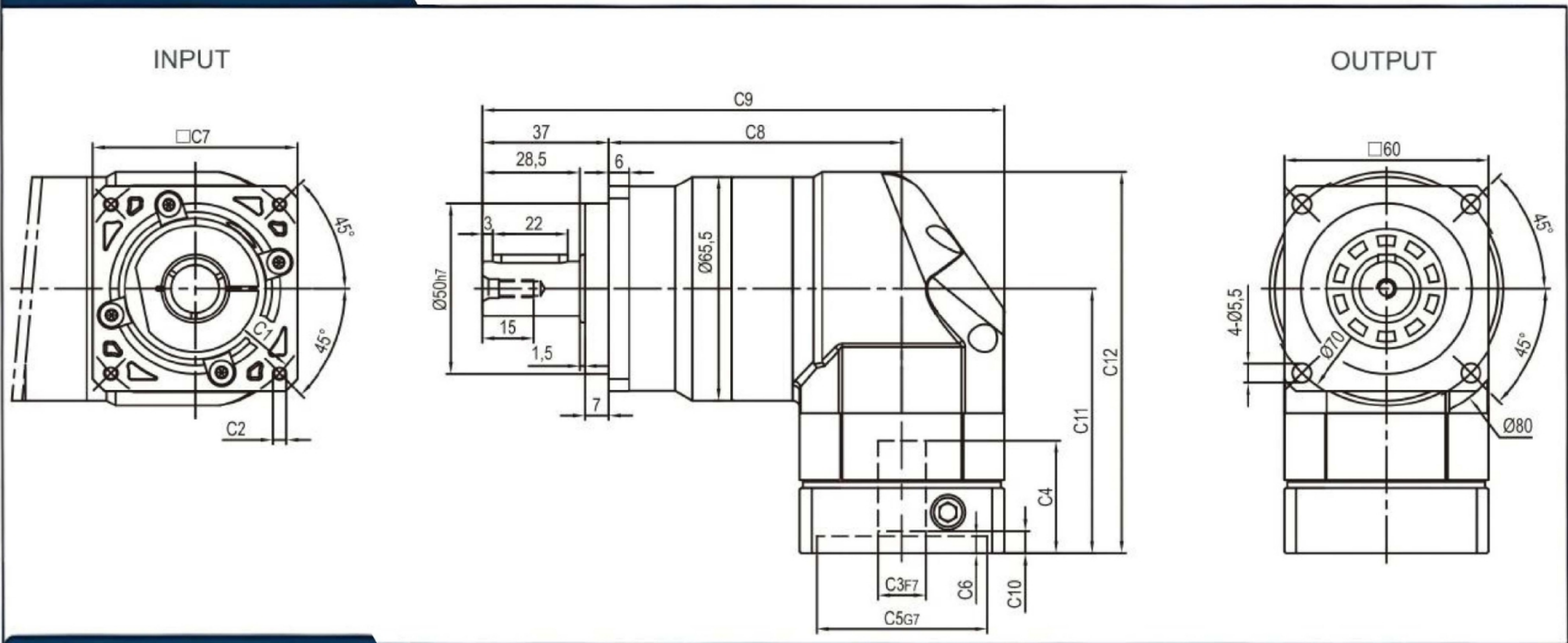
Axial force

$$F'_{2a1B} = 0.2 \times F'_{2rB}$$

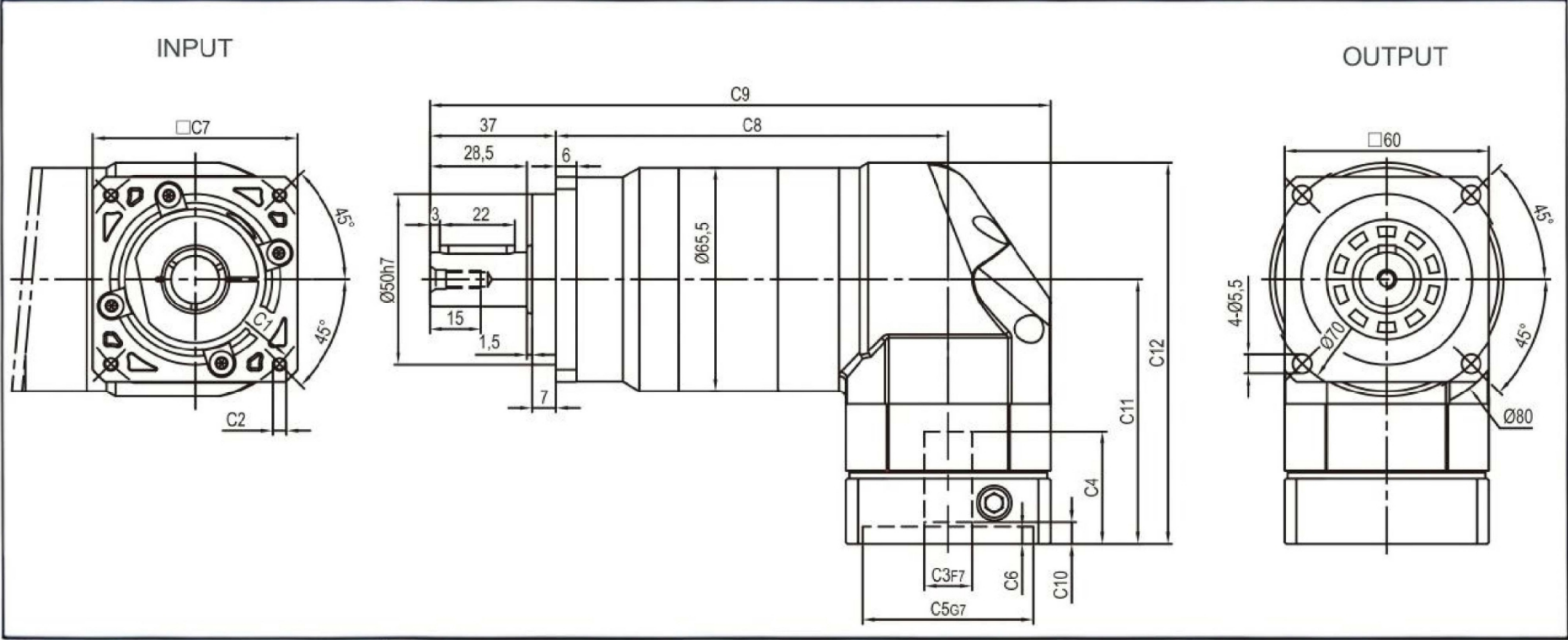
$$F'_{2a2B} = 0.1 \times F'_{2rB}$$

OUTLINE DIMENSION SHEET

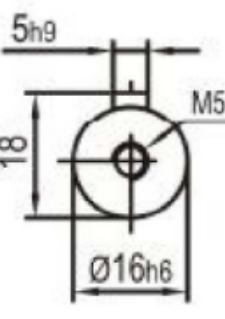
PXFR-060D(M1)-L1



PXFR-060D(M1)-L2

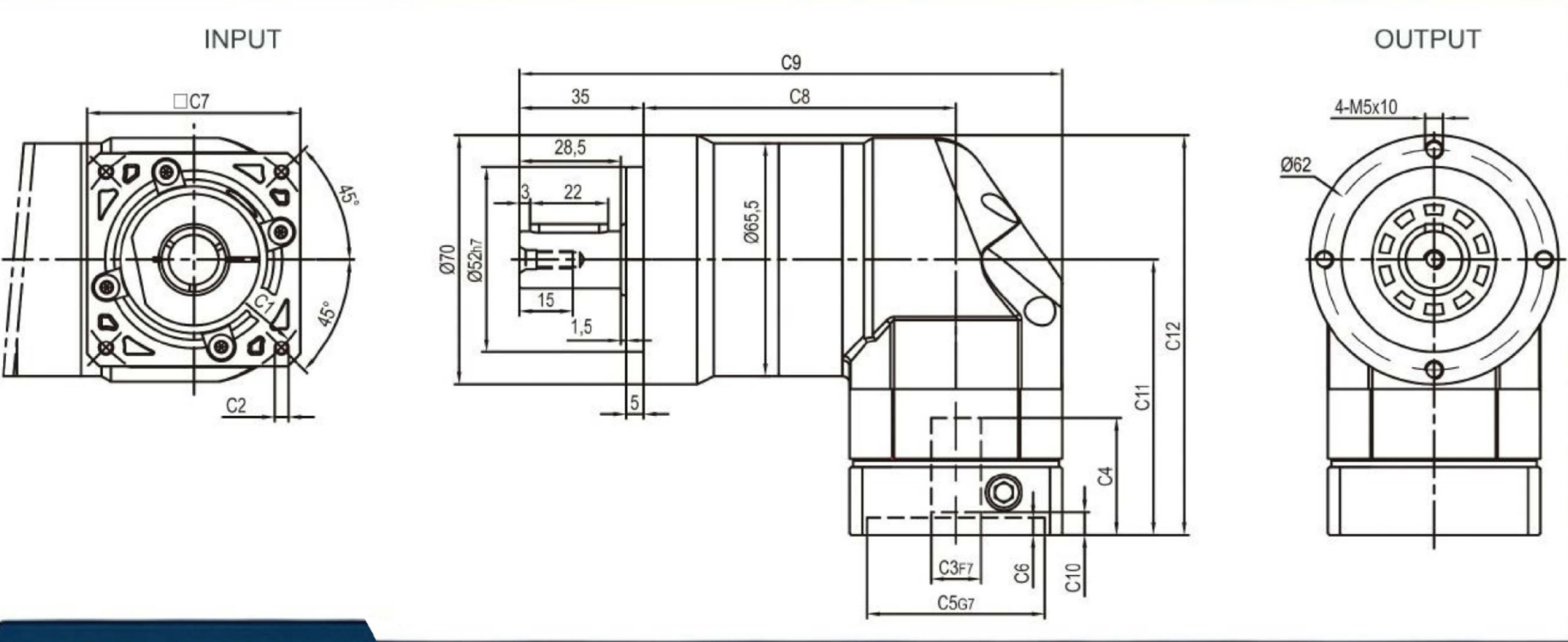


OUTPUT DIAMETER

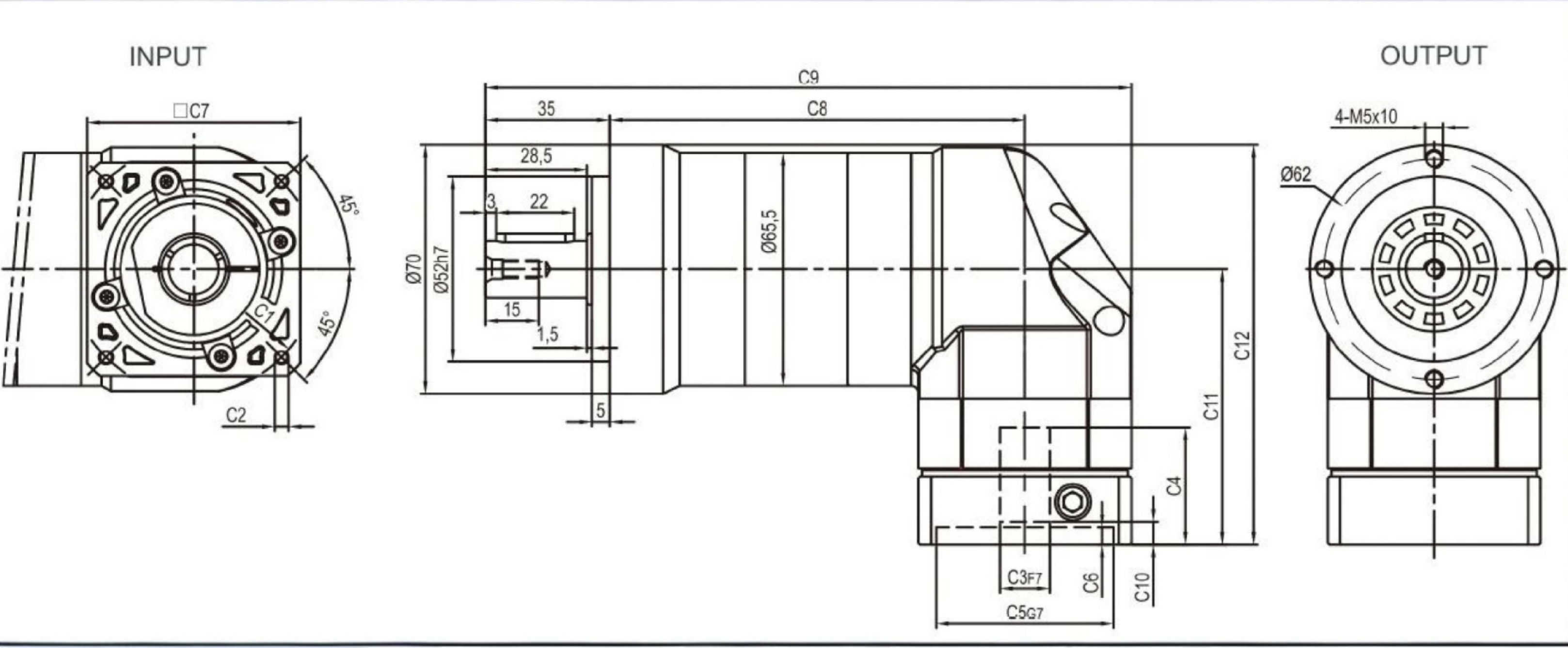
			C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
S1	S2	PXFR -060D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	86	153	5.5	77.5	111.75
		PXFR -060D-L2								115	182			
		PXFR -060D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	86	153	5.5	77.5	111.75
		PXFR -060D-L2								115	182			
		PXFR -060M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	86	163	12	87	121.25
		PXFR -060M1-L2								115	192			

OUTLINE DIMENSION SHEET

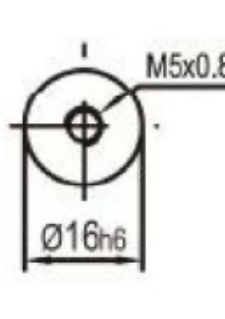
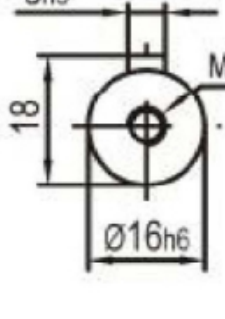
PXR-070D(M1)-L1



PXR-070D(M1)-L2

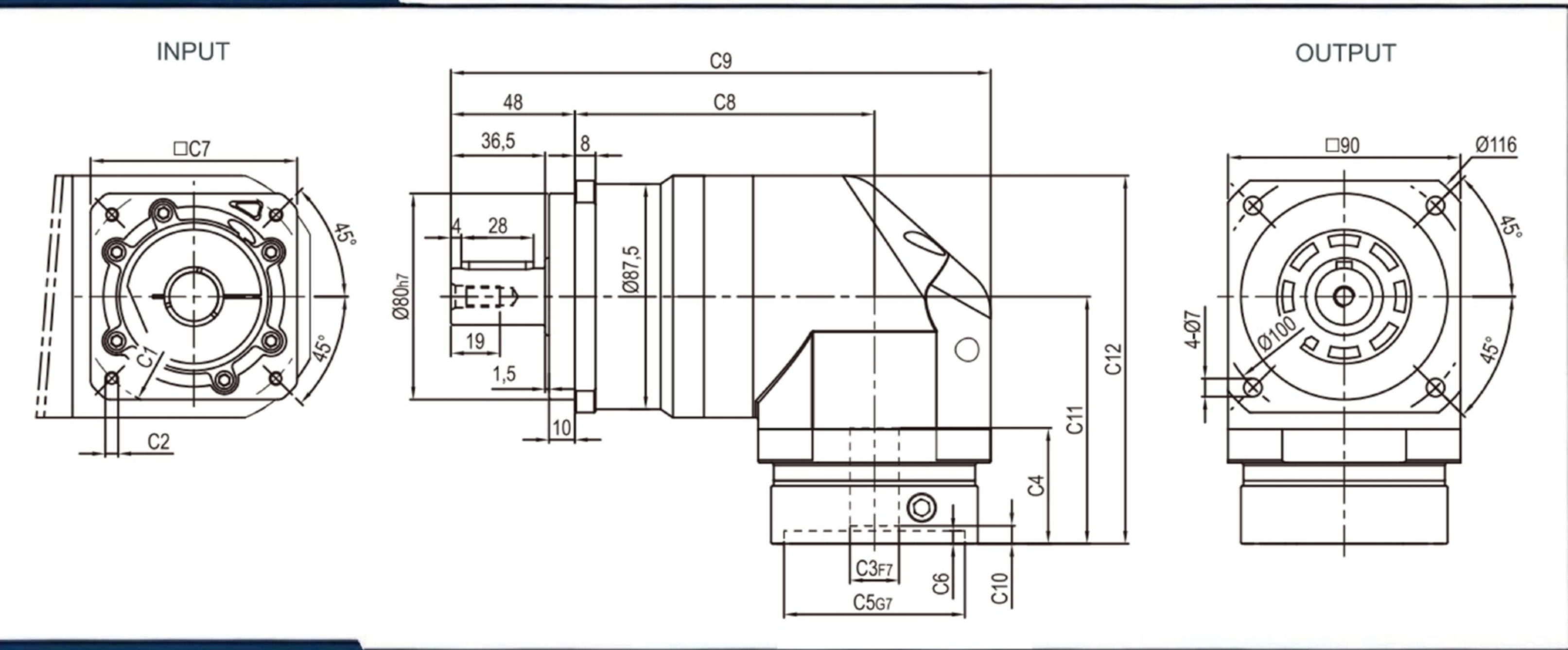


OUTPUT DIAMETER

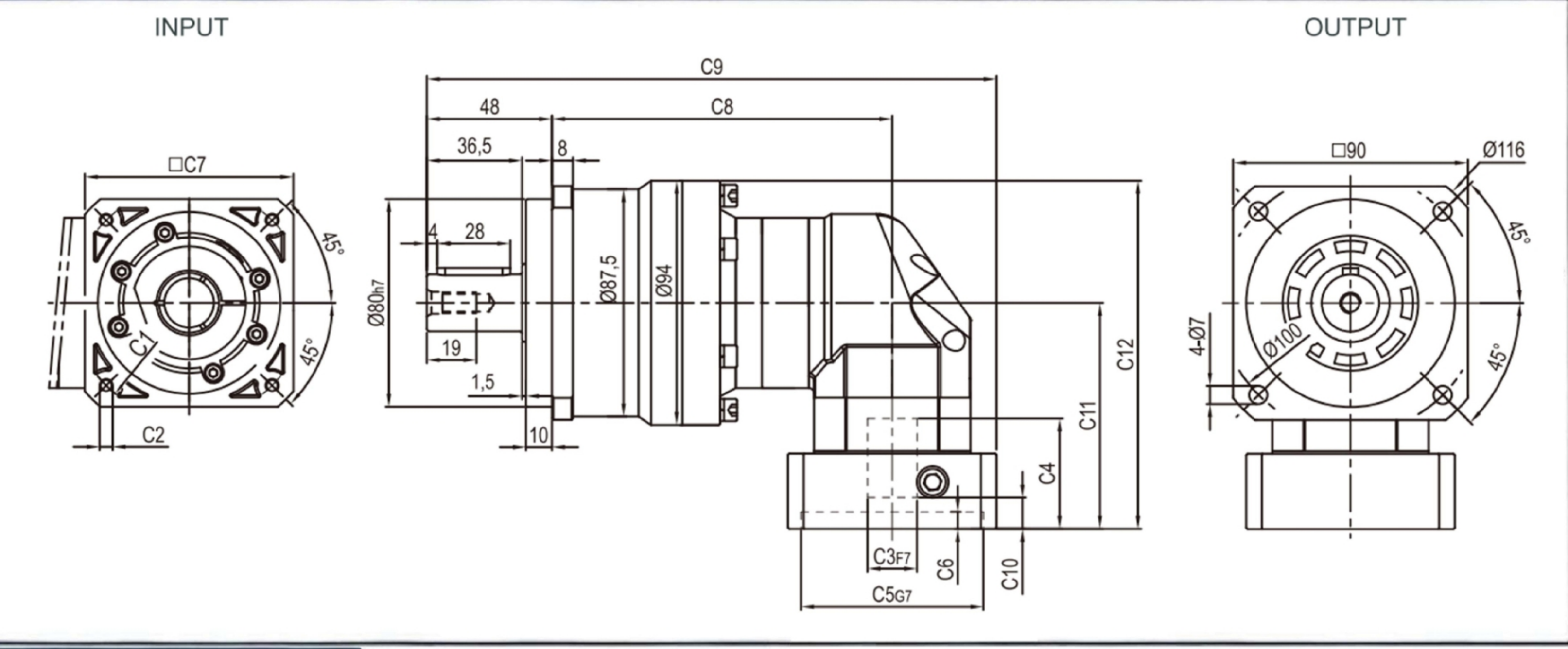
			C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
S1	S2	PXR -070D-L1	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	88	153	5.5	77.5	112.5
		PXR -070D-L2								117	182			
		PXR -070D-L1	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	88	153	5.5	77.5	112.5
		PXR -070D-L2								117	182			
		PXR -070M1-L1	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	88	163	12	87	122
		PXR -070M1-L2								117	192			

OUTLINE DIMENSION SHEET

PXFR-090D(M1)-L1



PXFR-090D(M1)-L2

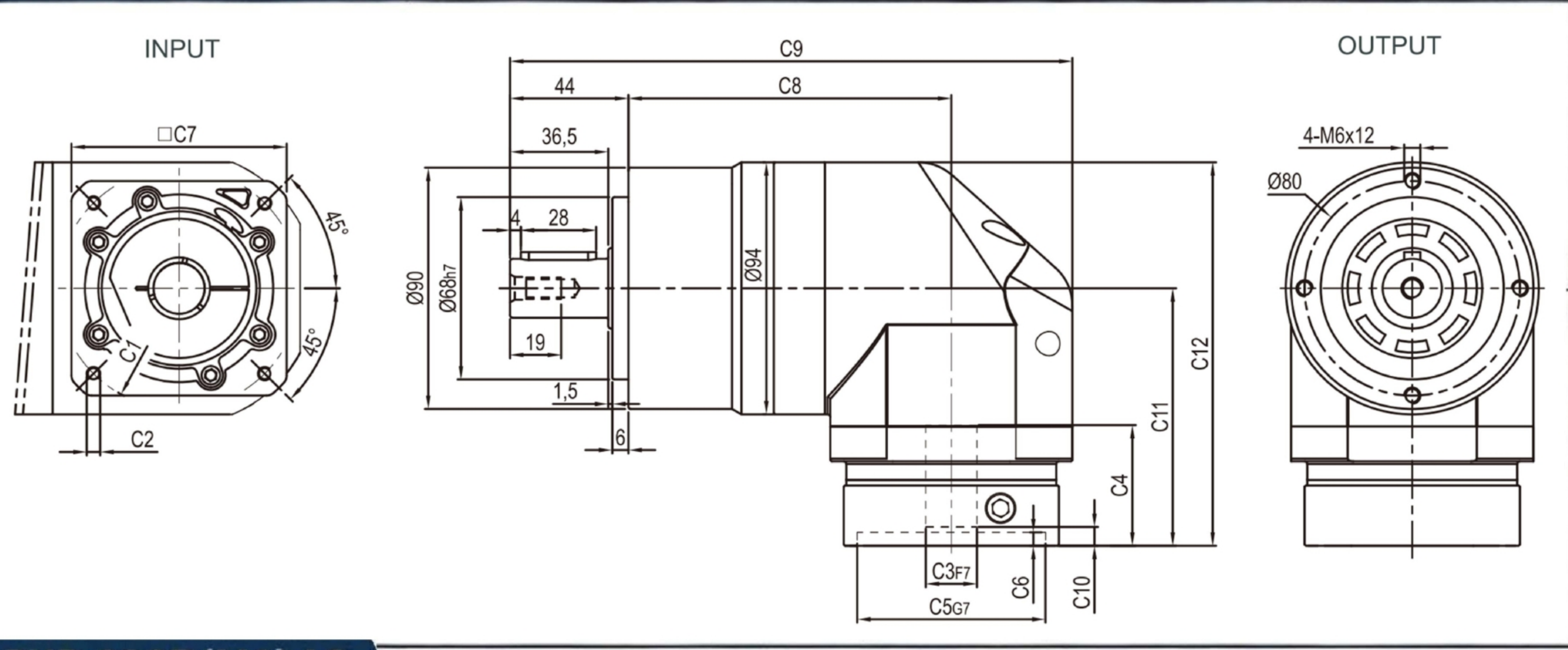


OUTPUT DIAMETER

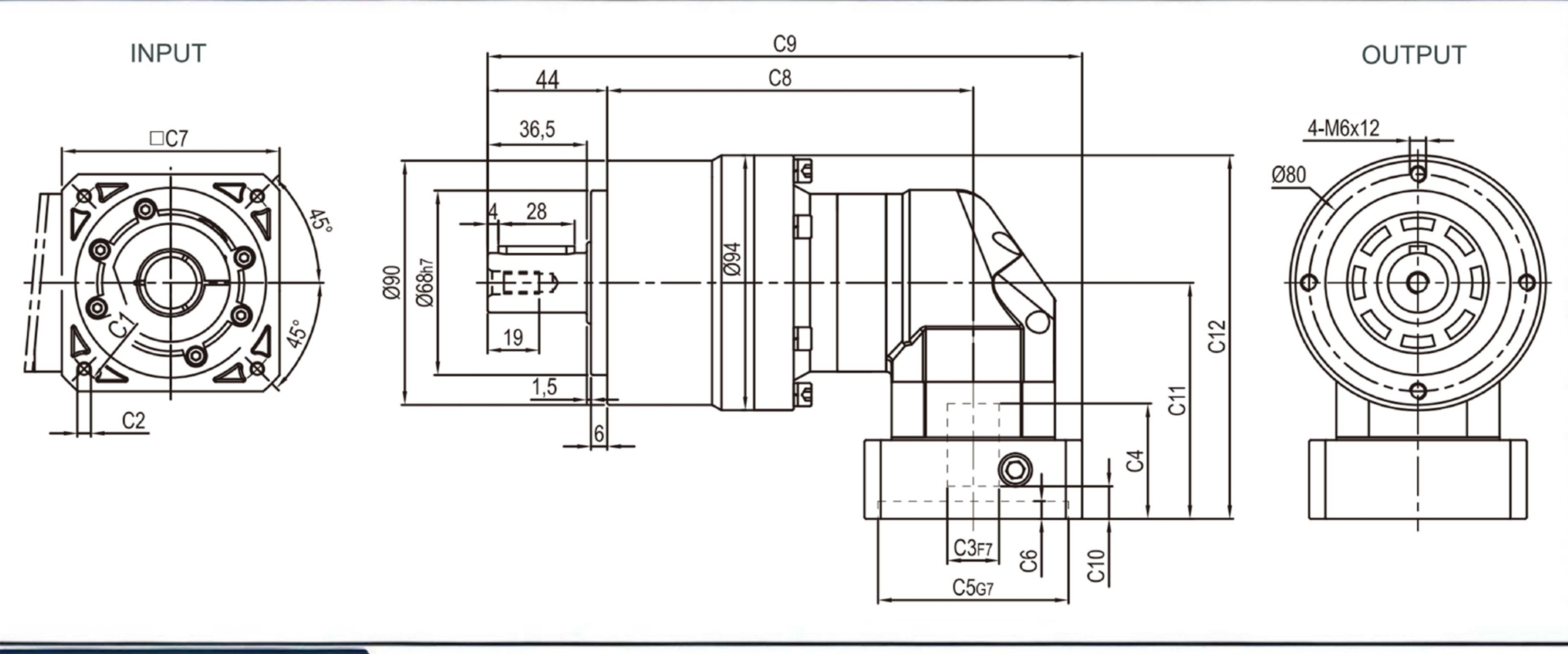
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
PXFR -090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	116	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	116	209	6	96	143
PXFR -090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	116	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	116	229	19	120	167
PXFR -090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	130.5	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	130.5	208.5	5.5	77.5	124.5
PXFR -090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	130.5	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	130.5	221.5	11	87	134

OUTLINE DIMENSION SHEET

PXR-090D(M1)-L1



PXR-090D(M1)-L2

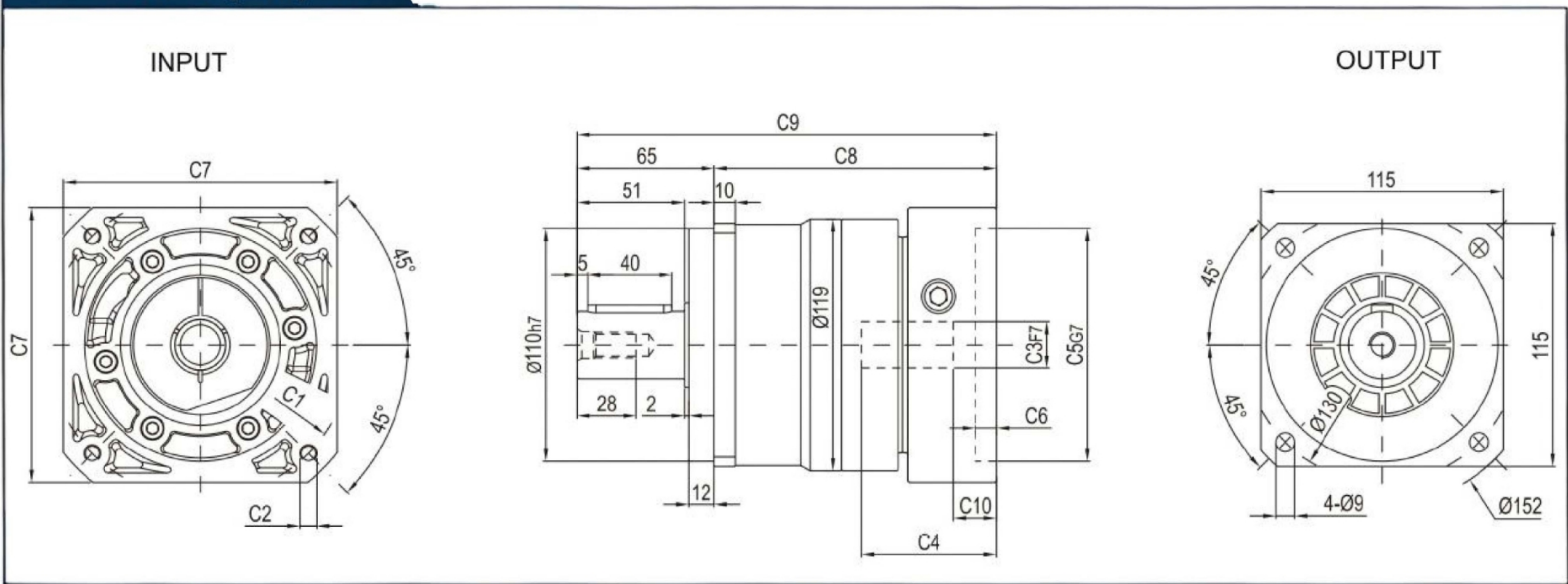


OUTPUT DIAMETER

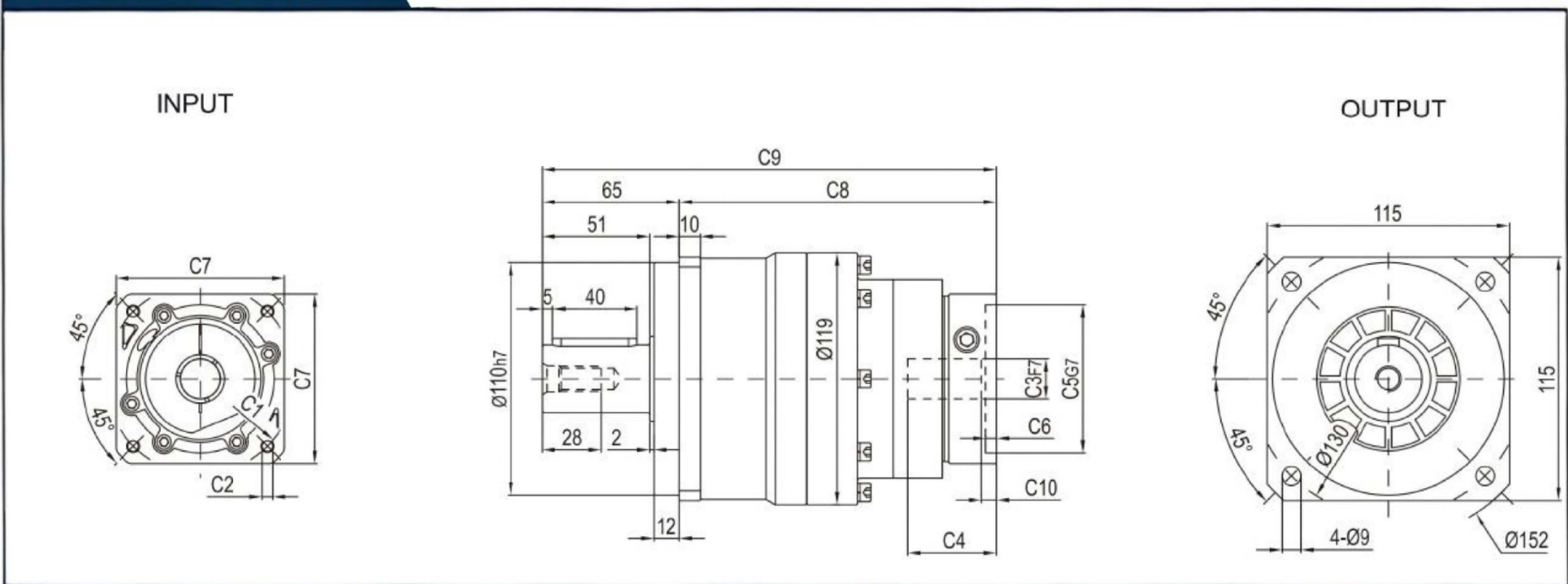
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
PXR -090D-L1	Ø90	4-M5x12,4-M6x14	Ø19	45	Ø70	6.5	80	120	209	7	96	143
	Ø100	4-M6x14	Ø16	45	Ø80	6.5	86	120	209	6	96	143
PXR -090M1-L1	Ø115	4-M8x20	Ø19,Ø22	56.5	Ø95	8	100	120	214	16.5	117.5	164.5
	Ø145	4-M8x20	Ø19,Ø22,Ø24	59	Ø110	11	130	120	229	19	120	167
PXR -090D-L2	Ø66.7	4-M4x10	Ø8	33	Ø38.1	5	60	134.5	208.5	5.5	77.5	124.5
	Ø70	4-M4x10,4-M5x12	Ø11,Ø14	33	Ø50	5	60	134.5	208.5	5.5	77.5	124.5
PXR -090M1-L2	Ø90	4-M5x12,4-M6x14	Ø19	42.5	Ø70	6.5	80	134.5	218.5	12	87	134
	Ø100	4-M6x14	Ø16	42.5	Ø80	6.5	86	134.5	221.5	11	87	134

OUTLINE DIMENSION SHEET

PXF-115D(M1)-L1



PXF-115D(M1)-L2

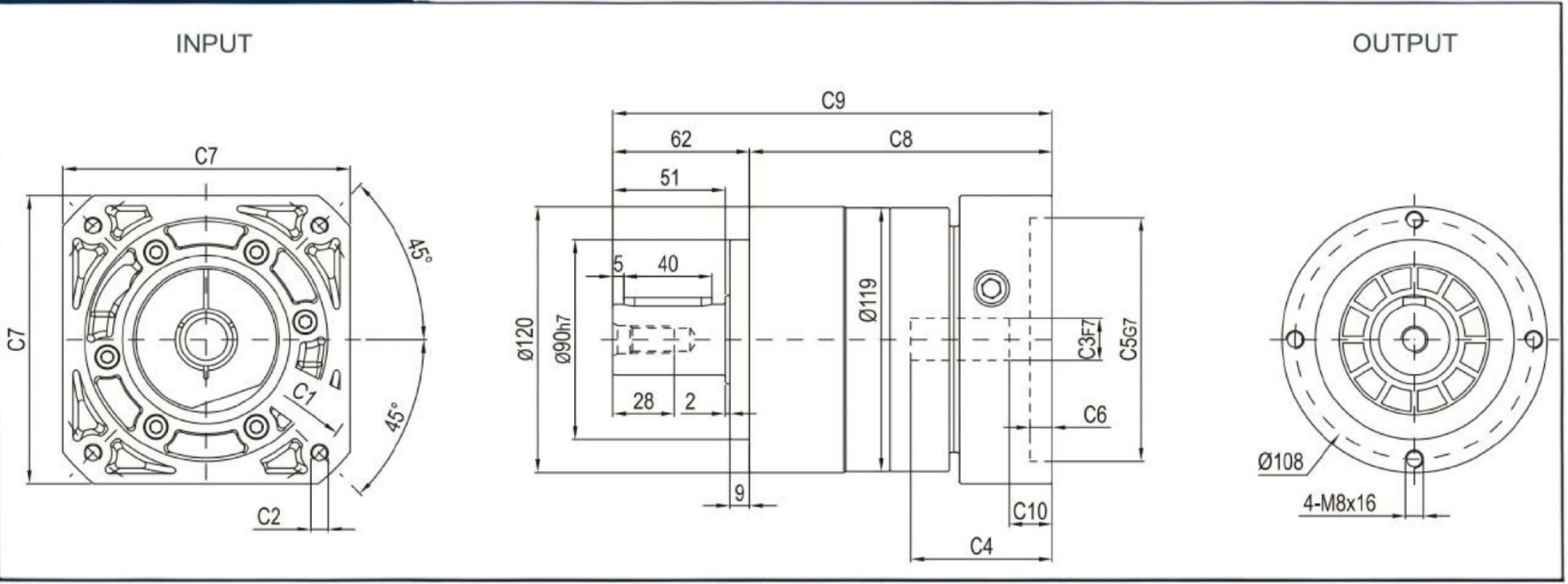


OUTPUT DIAMETER

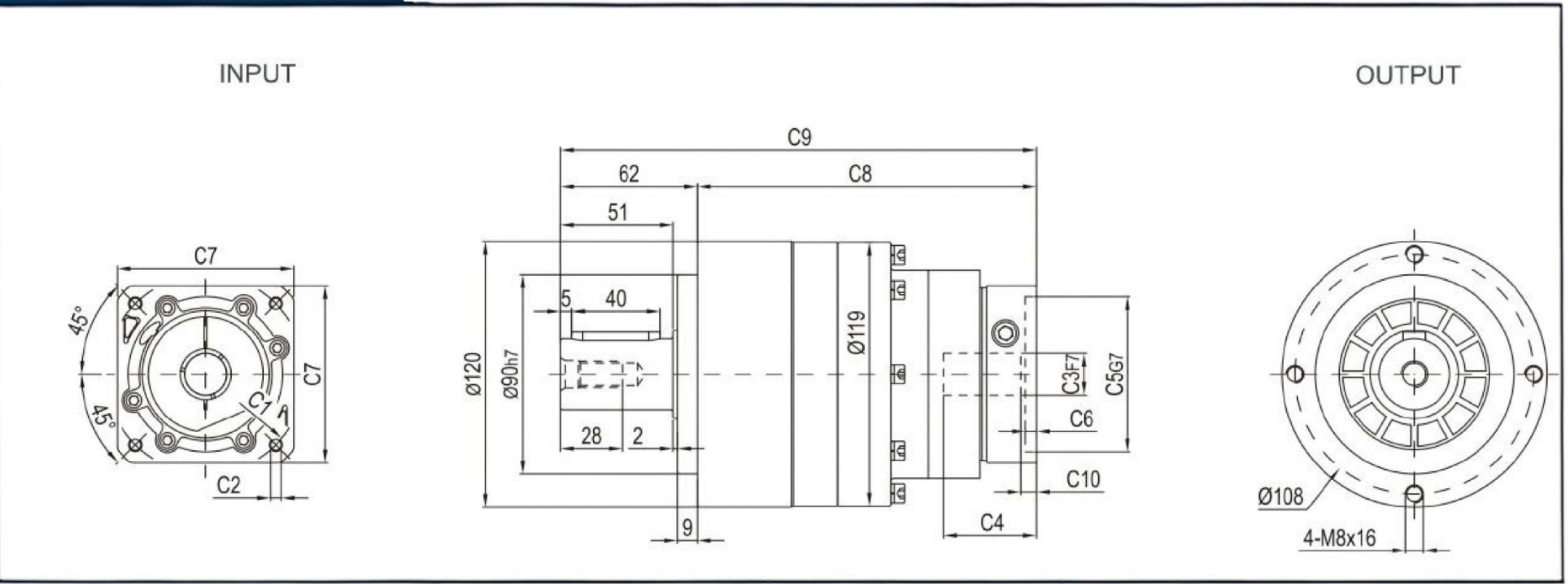


OUTLINE DIMENSION SHEET

PX-120D(M1)-L1



PX-120D(M1)-L2

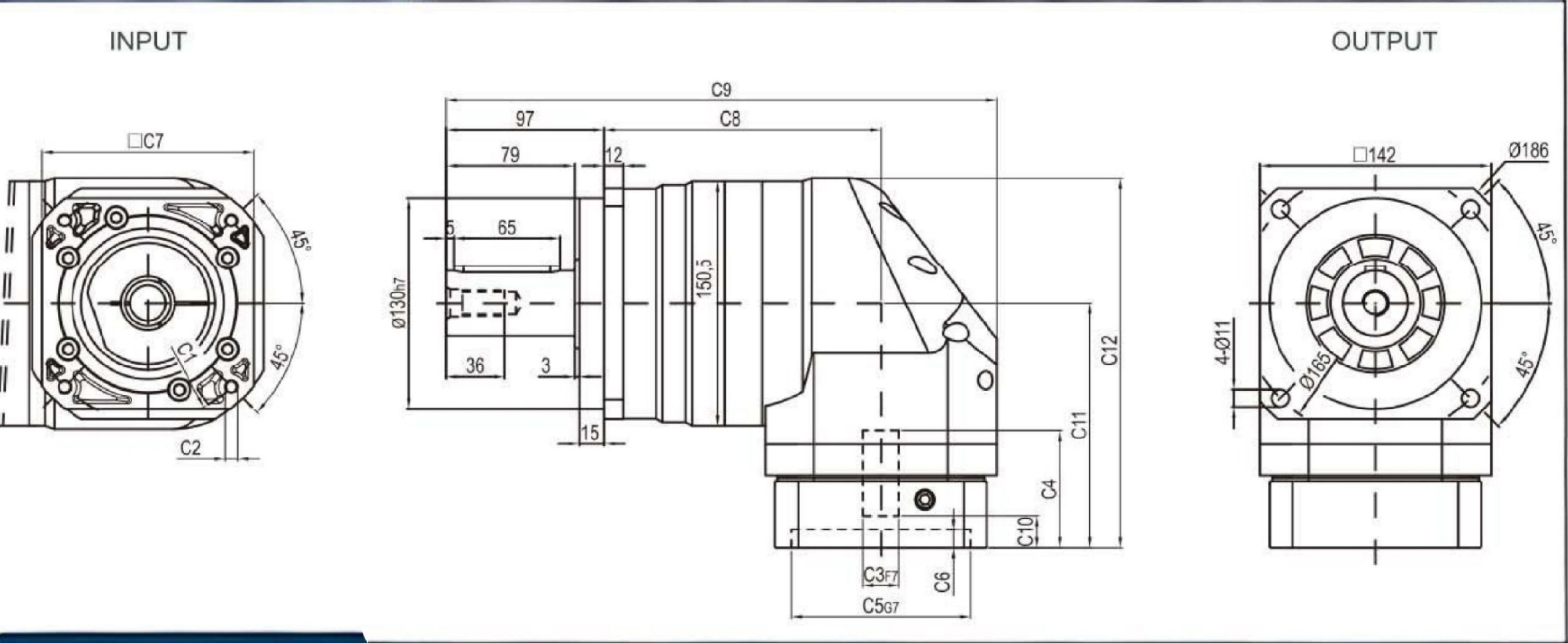


OUTPUT DIAMETER

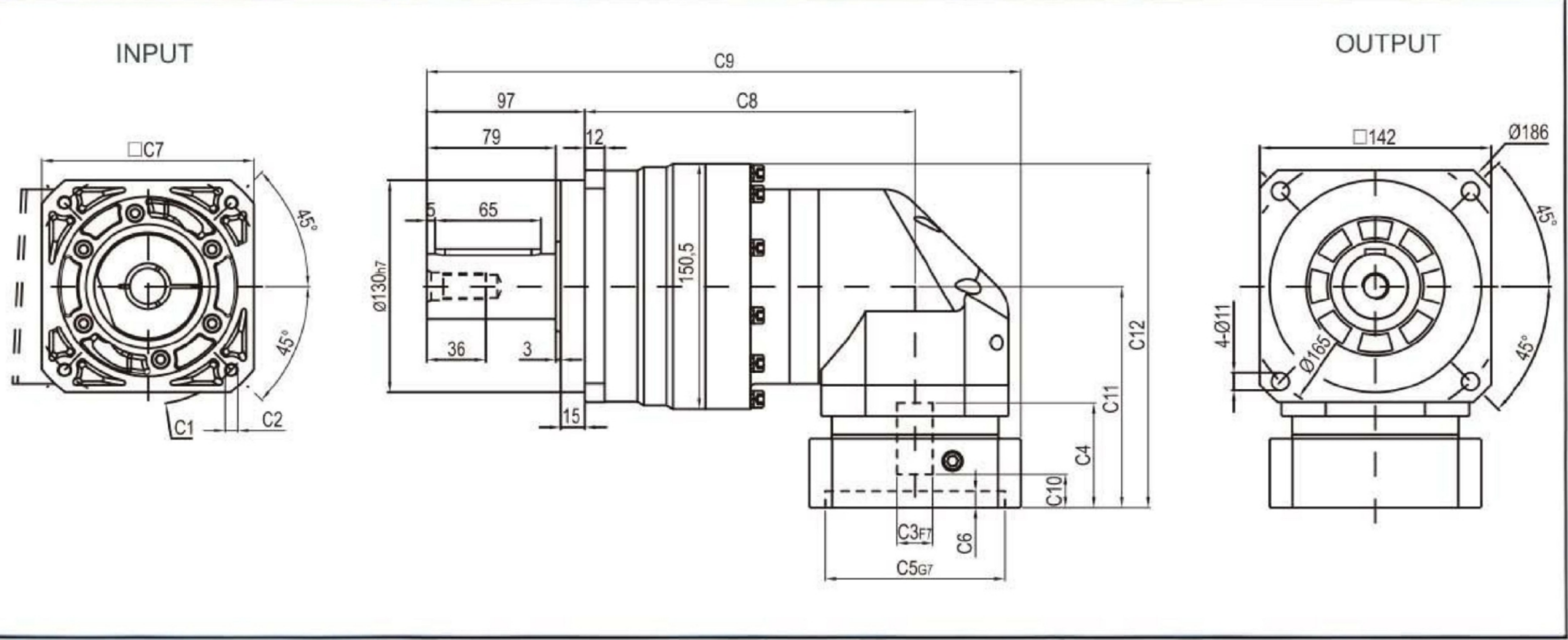


OUTLINE DIMENSION SHEET

PXFR-142D(M1)-L1



PXFR-142D(M1)-L2

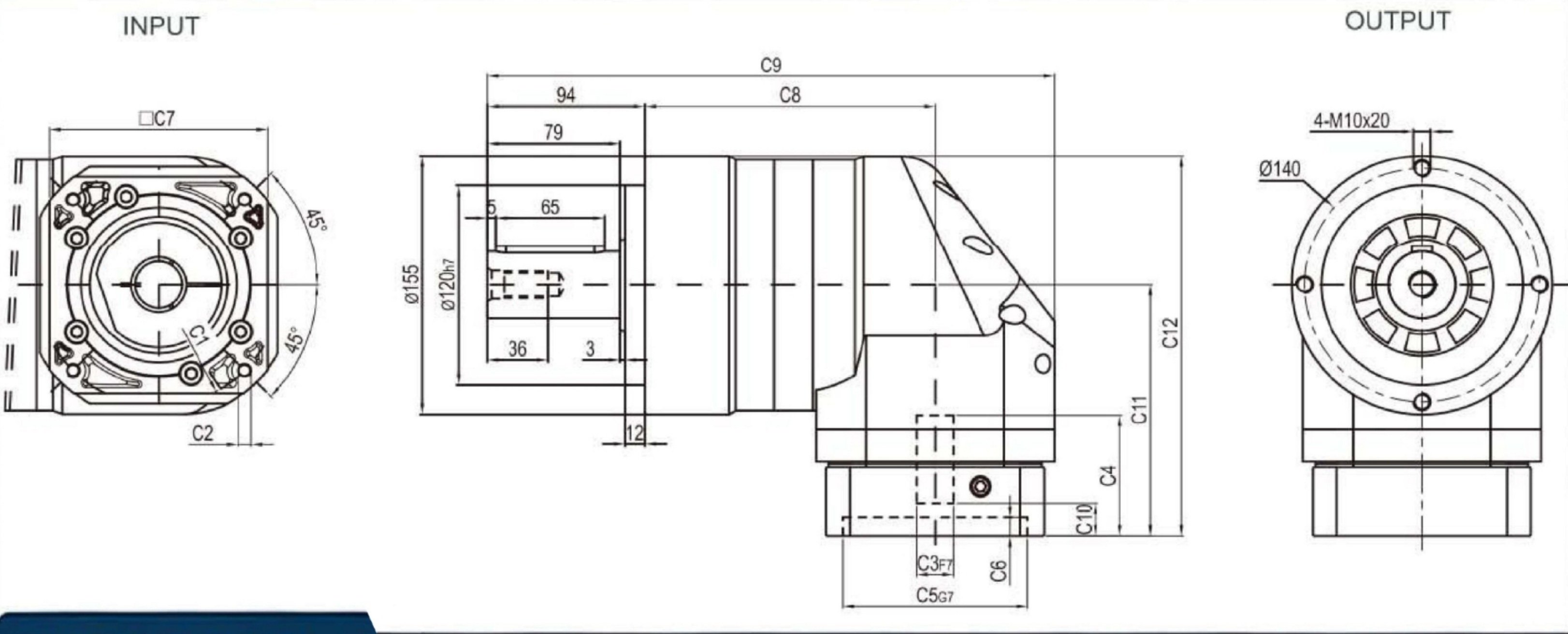


OUTPUT DIAMETER

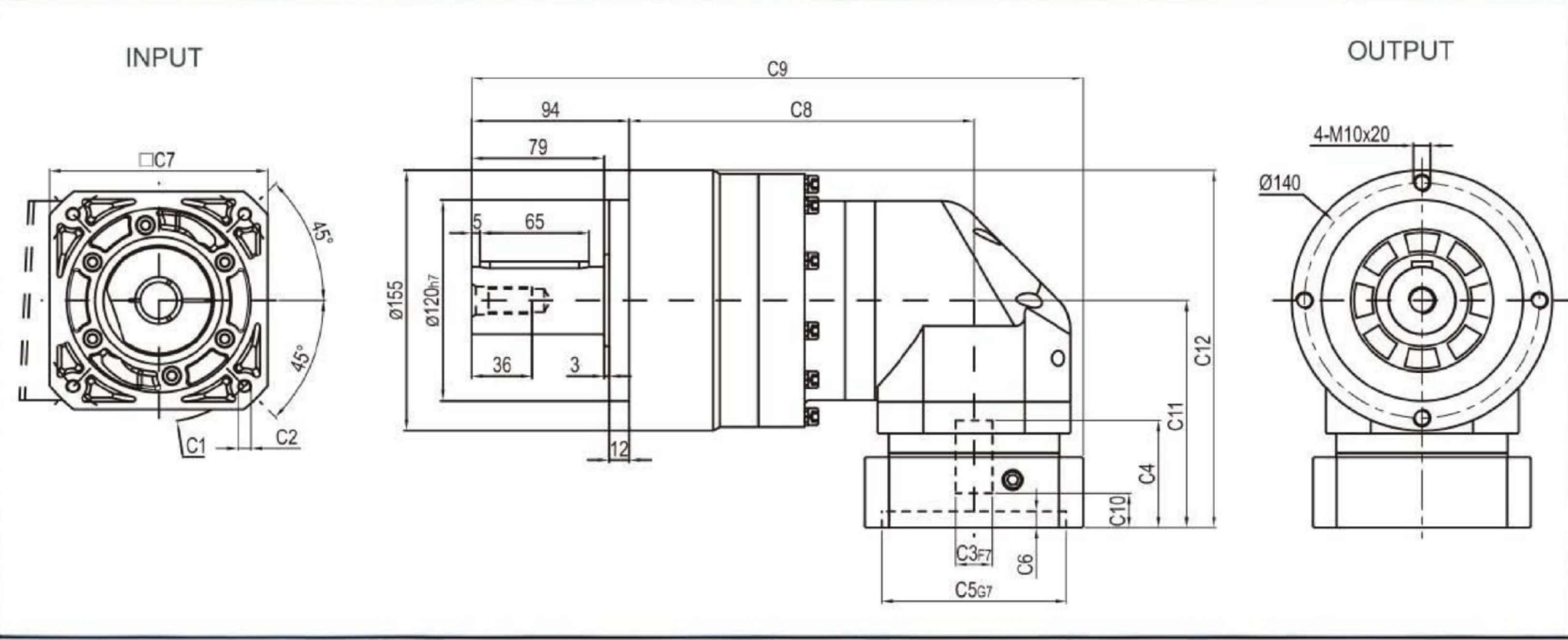


OUTLINE DIMENSION SHEET

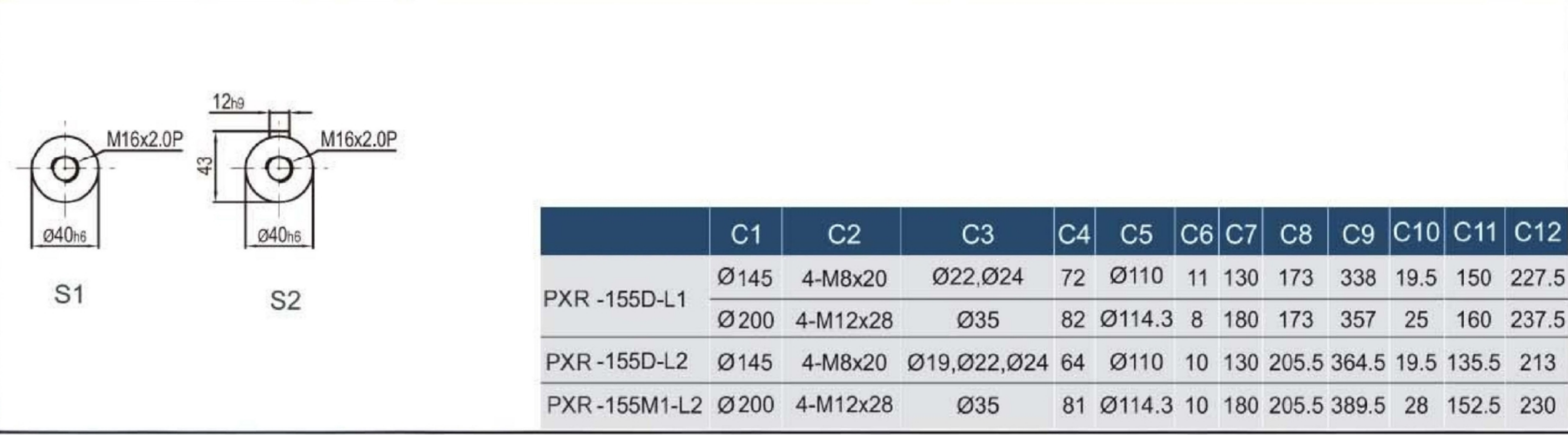
PXR-155D(M1)-L1



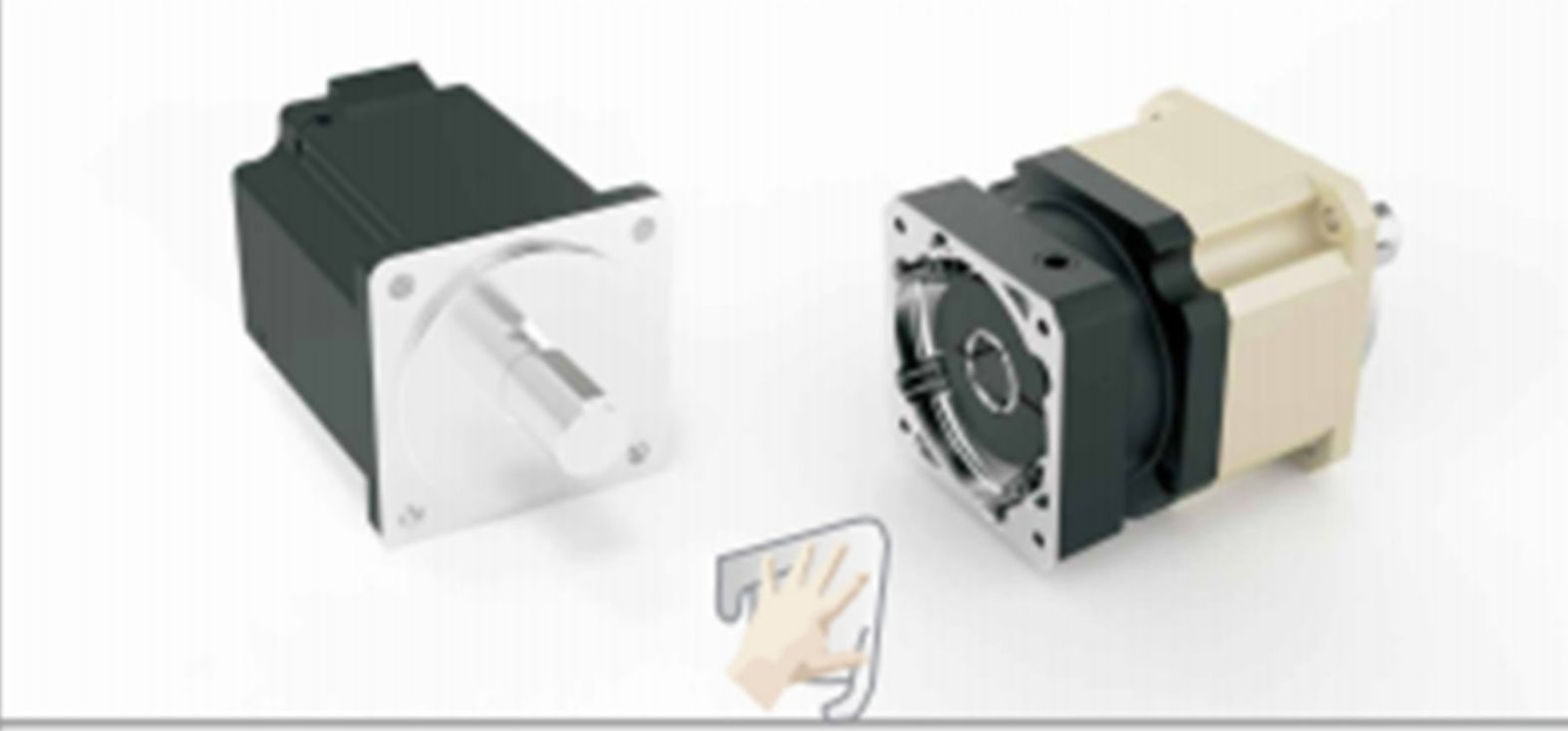
PXR-155D(M1)-L2



OUTPUT DIAMETER



MOTOR INSTALLATION INSTRUCTIONS



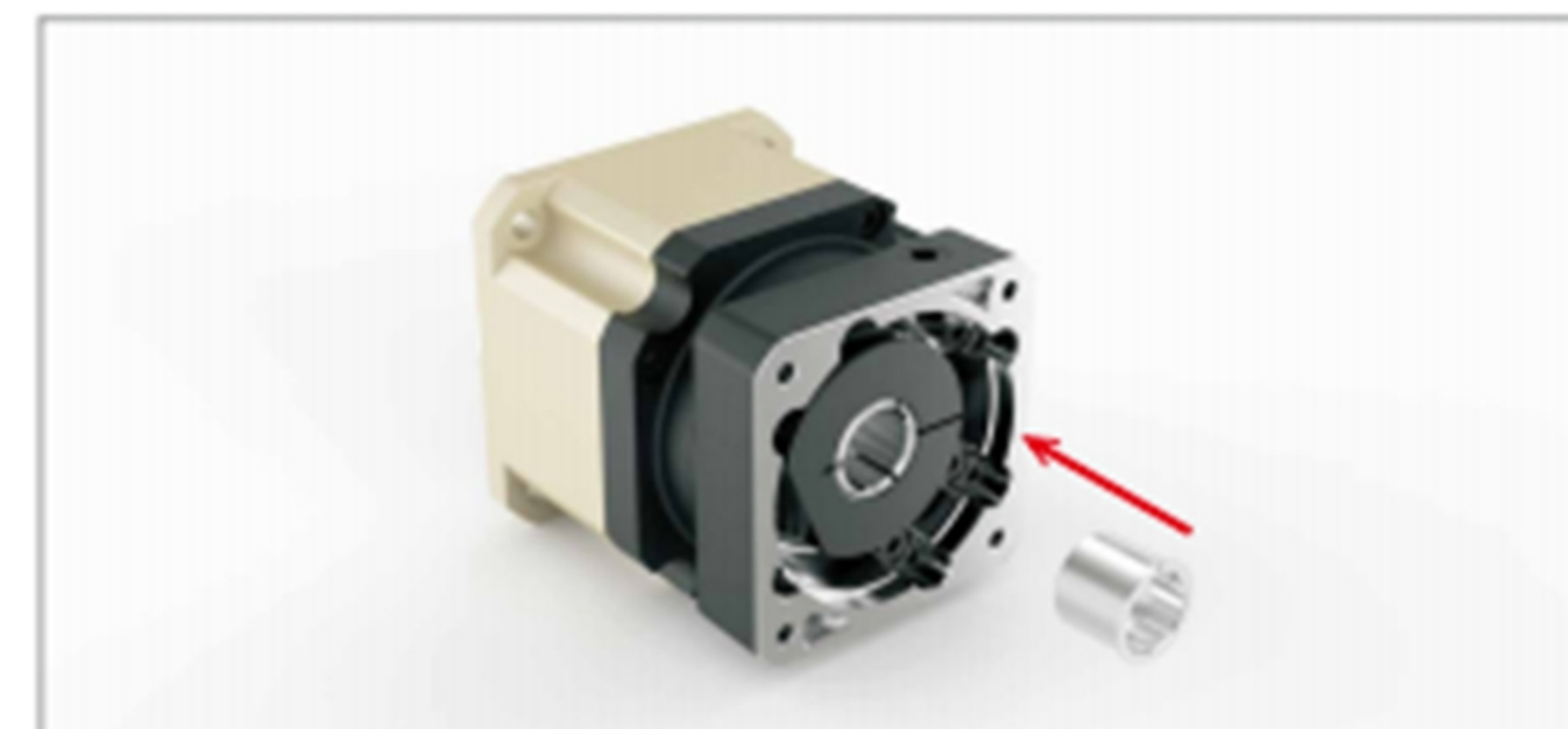
① Confirm the specifications of the motor and reducer, and clean the mounting surfaces of the motor and reducer.



② Remove the screw from the side hole of the input flange, and rotate the input shaft locking ring until the side hole of the locking ring aligns with the side hole of the input flange.



③ Remove the original balance key from the motor; if necessary, install a balance key.



④ Confirm the motor output shaft diameter; if necessary, install the bushing.



⑤ First, tighten the screws to 5% of the torque value on the torque chart. Then, using a wrench, gently tighten the screws with washers in sequence from 1 to 4.



⑥ Tighten the screws using a torque wrench according to the torque values in the screw torque chart, following the sequence from 1 to 4.



⑦ Referring to the torque values in Table 2, use a torque wrench to tighten the bolts in the side hole of the motor output flange.



⑧ Tighten the bolts on the side hole of the input flange of the reducer.

MOTOR INSTALLATION INSTRUCTIONS

Motor Locking Screw Torque Recommendation Table							
Screw size	Hex bolt size	The tightening torque for 8.8 grade screws.		The tightening torque for 10.9 grade screws.		Tightening torque for 12.9 grade screws	
	[mm]	[Nm]	[In-lbs]	[Nm]	[In-lbs]	[Nm]	[In-lbs]
M3x0.5P	2.5	1.3	12	1.8	16	2.1	19
M4x0.7P	3	3	27	4.1	37	4.9	44
M5x0.8P	4	6.1	55	8.2	73	9.8	87
M6x1P	5	11	98	14	124	17	151
M8x1.25P	6	25	222	34	302	41	364
M10x1.5P	8	49	434	67	594	80	709
M12x1.75P	10	85	753	116	1028	139	1232
M14x2P	12	137	1214	186	1648	223	1976
M16x2P	14	210	1860	286	2534	343	3038

Motor Locking Screw Torque Recommendation Table							
MODEL		Motor shaft diameter	Screw size	Hex bolt size	Tightening torque		
		[mm]	[mm]	[mm]	[Nm]	[In-lbs]	
AB042 ABR042 AD047 ADR047	L1	≤12	M3x0.5Px10L	2.5	2.1	19	
	L2	≤12	M3x0.5Px10L	2.5	2.1	19	
AB060 ABR060 AD064 ADR064 PXF060 PXFR060 PX060 PXR060	L1	≤19	M5x0.8Px14L	4	9.8	87	
	L2	≤19	M5x0.8Px14L	4	9.8	87	
AB090 ABR090 AD090 ADR090 PXF090 PXFR090 PX090 PXR090	L1	≤24	M6x1Px20L	5	17	151	
	L2	≤19	M5x0.8Px14L	4	9.8	87	
AB115 ABR115 AD110 ADR110 PXF115 PXFR115 PX120 PXR120	L1	≤35	M8x1.25Px25L	6	41	364	
	L2	≤24	M6x1Px20L	5	17	151	
AB142 ABR142 AD140 ADR140 PXF142 PXFR142 PX155 PXR155	L1	≤38	M10x1.5Px30L	8	80	709	
	L2	≤35	M8x1.25Px25L	6	41	364	
AB180 ABR180 AD200 ADR200 PXF180 PX205	L1	≤50	M12x1.75Px35L	10	139	1232	
	L2	≤38	M10x1.5Px30L	8	80	709	
AB220 ABR220 AD255 ADR255 PXF220 PX235	L1	≤55	M16x2Px40L	14	343	3038	
	L2	≤50	M12x1.75Px35L	10	139	1232	