

IG9190 Geared Servo Actuator



Ultra-Compact Precision Geared Servo Actuator

IG9190 Comprising ...

- Precision Dual-Stage Planetary Gear
- Integrated Low-Voltage DC Brushless Pancake Motor
- High Resolution Encoder Plus Halls

Actuator Options ...

- Gearbox Ratio Options: 16:1, 20:1, 25:1, 50:1 & 100:1
- Motor Voltage Options: 24 VDC, 48 VDC & 72 VDC
- Motor Rated Power Options: 0.5 kW, 1.0 kW & 1.5 kW
- Backlash Specification Options: ≤ 3 Arc Min, ≤ 5 Arc Min & ≤ 8 Arc Min
- IP Rating Options: IP54 or IP65
- Output Bearing Configuration Options: Ball Bearing or High-Capacity Roller Bearing
- Holding Brake Option: 24VDC
- Low Temperature Grease Option



Part Number Nomenclature

IG9190	-	XXX	-	XXX	-	XXX	-	XXX	-	XXX	-	XXX	-	XXX
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Configuration Options

Actuator OD	110	-	Nominal Actuator Diameter (mm)
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Actuator Gear Type	SPT ULT	-	SPT - Backlash <8 Arc Min - IP54 - Ball Output Bearing - Straight Gears ULT - Backlash <5 Arc Min - IP65 - Standard Ball Output Bearing - Option for Roller Bearing - Helical Gears
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Actuator Gear Configuration	STD CPT HTQ	-	Standard - Available for SPT only Compact - Future Option for ULT only - Not Currently Available High Torque - Available for ULT only
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Actuator Output Bearing	OBB ORB	-	Output Ball Bearing Output Roller Bearing - Option available for ULT only
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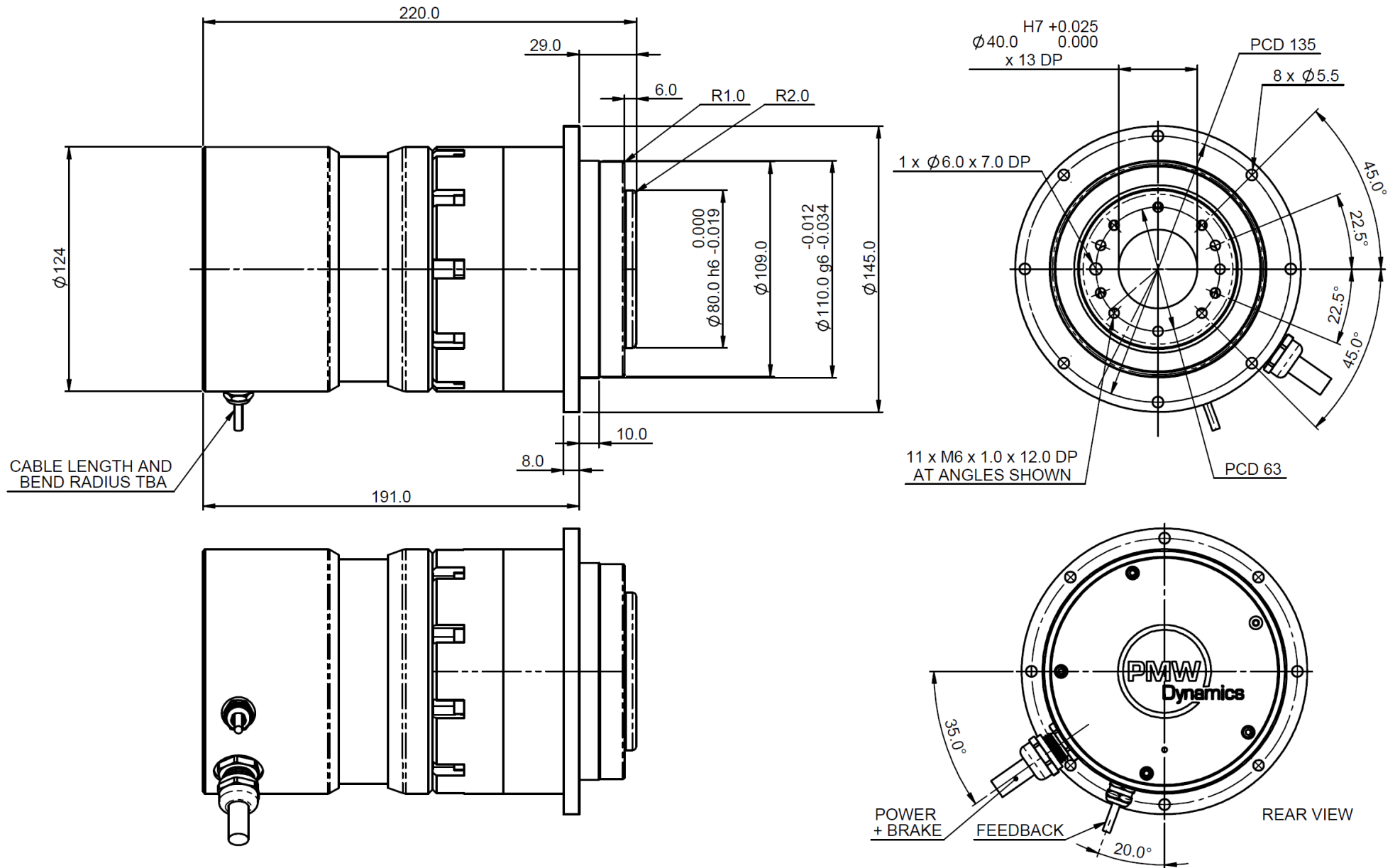
Actuator Gear Ratio	016 020 025 050 100	-	16:1 (SPT & ULT) 20:1 (SPT & ULT) 25:1 (SPT & ULT) 50:1 (SPT & ULT) 100:1 (SPT & ULT)
Additional Ratio Options Available on Request			

Motor Rated Power	050 100 150	-	500W - 24V, 48V & 72V 1,000W - 48V & 72V Only 1,500W - 72V Only
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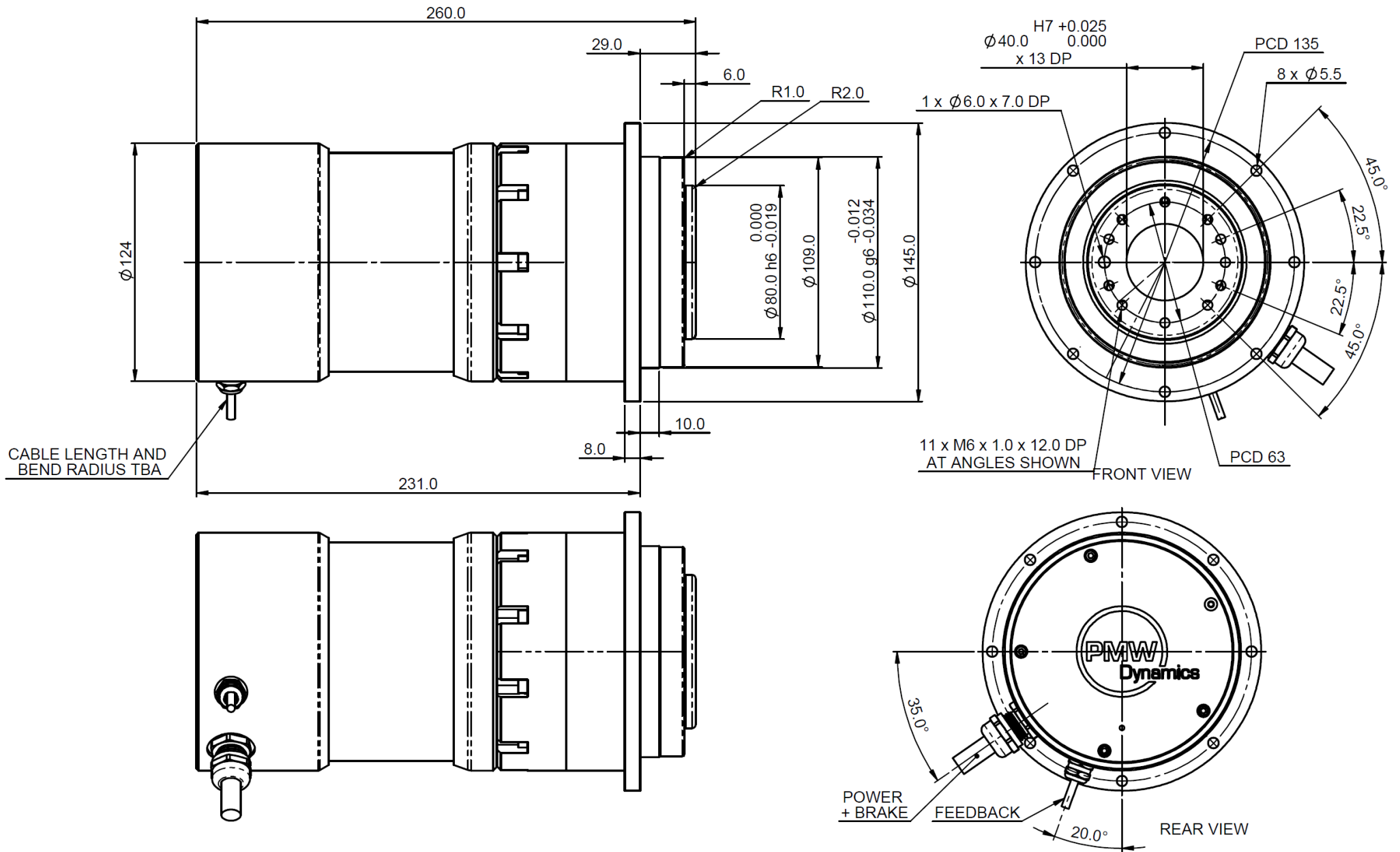
Motor Nominal Voltage	024 048 072	-	24V 48V 72V
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Holding Brake	No Holding Brake Holding Brake 24V	-	NBK BK2
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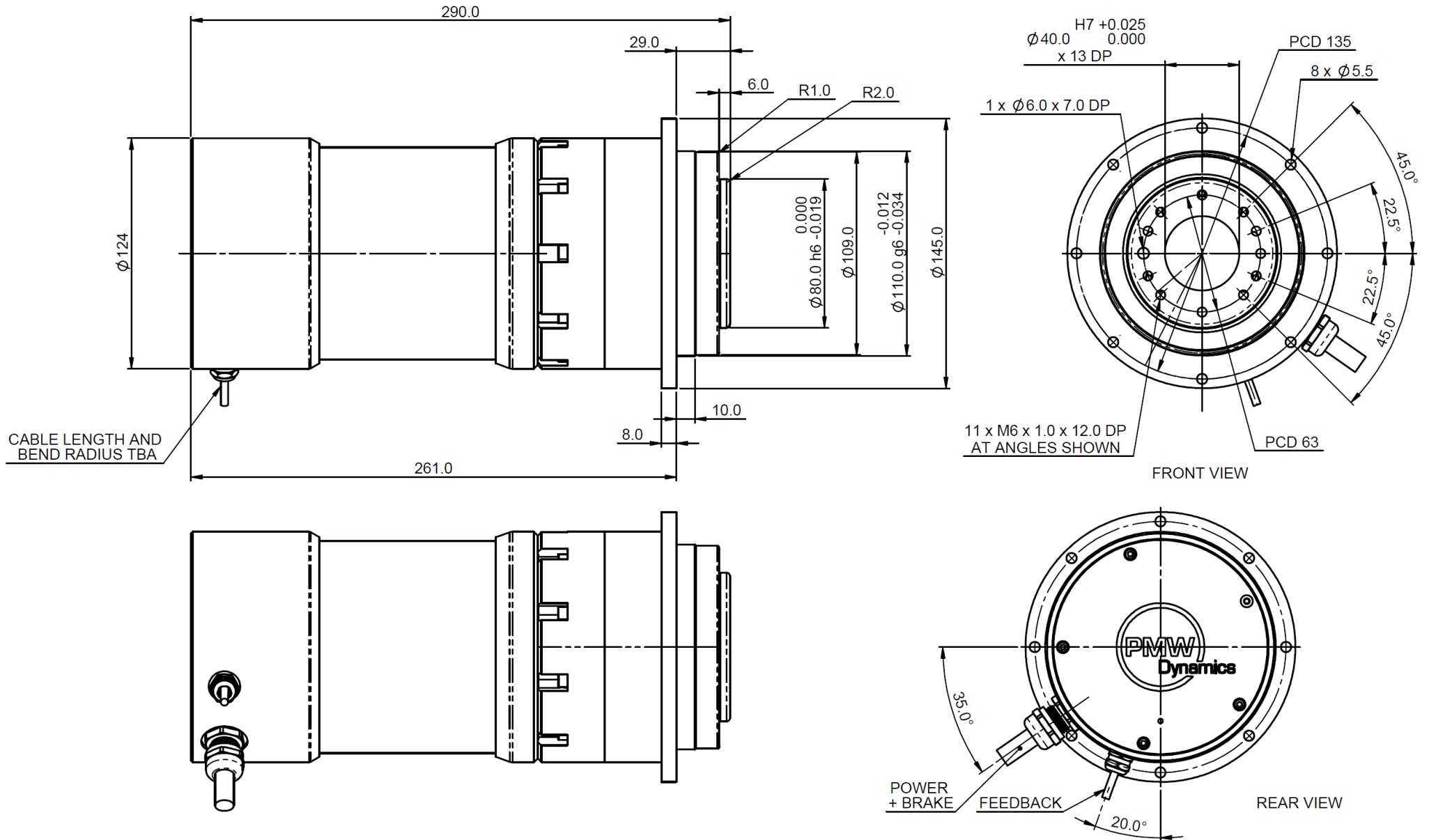
Outline Drawing High Performance ULT - HTQ Gearbox Variant - 500W Motor



Outline Drawing High Performance ULT - HTQ Gearbox Variant - 1,000W Motor



Outline Drawing High Performance ULT - HTQ Gearbox Variant - 1,500W Motor



Standard SPT Gearbox Variant

Gearbox Type	SPT							
Actuator Ratio	016	020	025	050	100		:1	
Motor Rated Power	0.5							kW
Rated Output Torque ⁷	23.0	28.8	36.0	72.0	85.0 ¹		Nm ²	
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM	
Peak Output Torque ⁷	46.1	57.6	72.0	144.0	207.0 ¹		Nm	
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM	
Motor Ke/Kt - 24V Rated Voltage Winding (+/- 10%)	Ke 0.0610 VS/Rad Kt 0.0520 Nm/Arms							
Motor Ke/Kt - 48V Rated Voltage Winding (+/- 10%)	Ke 0.1220 VS/Rad Kt 0.1040 Nm/Arms							
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1830 VS/Rad Kt 0.1560 Nm/Arms							
24V Motor Inductance (mH) & Resistance (+/- 10%)	0.082 mH 0.028 Ω							
48V Motor Inductance (mH) & Resistance (+/- 10%)	0.327 mH 0.110 Ω							
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.736 mH 0.248 Ω							
Motor Rated Power	1.0							kW
Rated Output Torque ⁷	46.1	57.6	72.0	144.0	85.0 ¹		Nm ²	
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM	
Peak Output Torque ⁷	92.2	115.2	144.0	241.0 ¹	207.0 ¹		Nm	
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM	
Motor Ke/Kt - 48V Rated Voltage Winding (+/- 10%)	Ke 0.1169 VS/Rad Kt 0.0997 Nm/Arms							
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1880 VS/Rad Kt 0.1595 Nm/Arms							
48V Motor Inductance (mH) & Resistance (+/- 10%)	0.137 mH 0.035 Ω							
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.342 mH 0.089 Ω							
Motor Rated Power	1.5							kW
Rated Output Torque ⁷	69.0	86.2	107.8	160.0 ¹	85.0 ¹		Nm ²	
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM	
Peak Output Torque ⁷	138.0	172.4	215.6	241.0 ¹	207.0 ¹		Nm	
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM	
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1720 VS/Rad Kt 0.1470 Nm/Arms							
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.179 mH 0.047 Ω							
Electrical Properties								
Motor Pole Pairs	5							
Encoder	1,024 PPR - Differential Output							PPR
Thermistor	NTC							
Brake Voltage	24.0							VDC
Brake Current	TBA							A
Mechanical Properties								
Max. Backlash	≤8 (Standard)							Arc Minutes
Torsional Stiffness	75.0							Nm/m
Tilting Moment	110 ³							Nm
Max Axial Load	2,880							N
Max Radial Load	Consult Factory							N
Brake Holding Torque	4.0							Nm
Operating Life	20,000 ⁴							Hours
Operating Temperature	-10 to +50							Degs C
Protection Class	IP54							
Efficiency	> 94% @ Full Rated Gearbox Torque							
Lubrication	Lifetime lubrication (Grease)							

High Performance ULT - HTQ Gearbox Variant

Gearbox Type	ULT						
Actuator Ratio	016	020	025	050	100		:1
Motor Rated Power	0.5						kW
Rated Output Torque ⁷	23.0	28.8	36.0	72.0	144.0		Nm ²
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM
Peak Output Torque ⁷	46.1	57.6	72.0	144.0	288.0		Nm
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM
Motor Ke/Kt - 24V Rated Voltage Winding (+/- 10%)	Ke 0.0610 VS/Rad Kt 0.0520 Nm/Arms						
Motor Ke/Kt - 48V Rated Voltage Winding (+/- 10%)	Ke 0.1220 VS/Rad Kt 0.1040 Nm/Arms						
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1830 VS/Rad Kt 0.1560 Nm/Arms						
24V Motor Inductance (mH) & Resistance (+/- 10%)	0.082 mH 0.028 Ω						
48V Motor Inductance (mH) & Resistance (+/- 10%)	0.327 mH 0.110 Ω						
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.736 mH 0.248 Ω						
Motor Rated Power	1.0						kW
Rated Output Torque ⁷	46.1	57.6	72.0	144.0	147.0 ¹		Nm
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM
Peak Output Torque ⁷	92.2	115.0	144.0	288.0	353.0 ¹		Nm
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM
Motor Ke/Kt - 48V Rated Voltage Winding (+/- 10%)	Ke 0.1169 VS/Rad Kt 0.0997 Nm/Arms						
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1880 VS/Rad Kt 0.1595 Nm/Arms						
48V Motor Inductance (mH) & Resistance (+/- 10%)	0.137 mH 0.035 Ω						
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.342 mH 0.089 Ω						
Motor Rated Power	1.5						kW
Rated Output Torque ⁷	69.0	86.2	107.8	190.0 ¹	147.0 ¹		Nm
Rated Output Speed	187.5	150.0	120.0	60.0	30.0		RPM
Peak Output Torque ⁷	138.0	172.4	215.6	380.0 ¹	353.0 ¹		Nm
Speed at Peak Torque	175.0	140.0	112.0	56.0	28.0		RPM
Motor Ke/Kt - 72V Rated Voltage Winding (+/- 10%)	Ke 0.1720 VS/Rad Kt 0.1470 Nm/Arms						
72V Motor Inductance (mH) & Resistance (+/- 10%)	0.179 mH 0.047 Ω						
Electrical Properties							
Motor Pole Pairs	5						
Encoder	1,024 PPR - Differential Output						PPR
Thermistor	NTC						
Brake Voltage	24.0						VDC
Brake Current	TBA						mA
Mechanical Properties							
Max. Backlash	≤5 (Standard) ≤3 (Option)						Arc Minutes
Torsional Stiffness	82.0						Nm/m
Tilting Moment	335 (Standard Output Ball Bearing) 675 (Option Output Tapered Roller Bearing)						Nm
Max Axial Load	5,700 (Standard Output Ball Bearing) 6,210 (Option Output Tapered Roller Bearing)						N
Max Radial Load	3,960 (Standard Output Ball Bearing) 7,850 (Option Output Tapered Roller Bearing)						N
Brake Holding Torque	4.0						Nm
Operating Life	20,000 ⁴						Hours
Operating Temperature	-10 to +50						Degs C
Protection Class	IP65						
Efficiency	> 94% @ Full Rated Gearbox Torque						
Lubrication	Lifetime lubrication (Grease)						

Engineering Notes

1. Torque limited by gearbox capacity. Drive electronics should be de-rated accordingly
2. Rated output torque calculated at 90% gearbox efficiency
3. Applied to middle of output shaft at 100 RPM
4. Life calculated at nominal rated gearbox torque & speed
5. Rating based upon minimum continuous heatsinking capacity of 22W for 0.5kW, 44W for 1.0kW & 71W for 1.5kW
6. Output flange is precision steel hub for accurate alignment. Flange should be protected to avoid corrosion
7. Torque ratings valid if less than 10% of the radial load is applied to output flange

Motor Performance

500 Watt Motor | Rated Torque 1.6 Nm | Rated Speed 3,000 RPM | Peak Torque 3.2 Nm | Speed at Peak Torque 2,800 RPM

1,000 Watt Motor | Rated Torque 3.2 Nm | Rated Speed 3,000 RPM | Peak Torque 6.4 Nm | Speed at Peak Torque 2,800 RPM

1,500 Watt Motor | Rated Torque 4.79 Nm | Rated Speed 3,000 RPM | Peak Torque 9.58 Nm | Speed at Peak Torque 2,800 RPM

Please note that motors are available without gearhead and as frameless component sets. Please ask our Application Team for further details

Important Notice

Provisional Datasheet:

IG9190 Electrical Connections

Motor	
Phase U	RED
Phase V	BLUE
Phase W	BLACK
EARTH	GREEN

Encoder	
+5V	RED
Gnd	BLUE
A+	PINK
!A	GREY
B	GREEN
!B	YELLOW
Z	WHITE
!Z	BROWN
HALL U	BLACK
HALL V	PURPLE
HALL W	PINK & GREY
Zero Reset	WHITE
Reset Gnd	WHITE

Thermistor	
NTC +	YELLOW
NTC -	BROWN

Brake	
+24V	?
Gnd	?