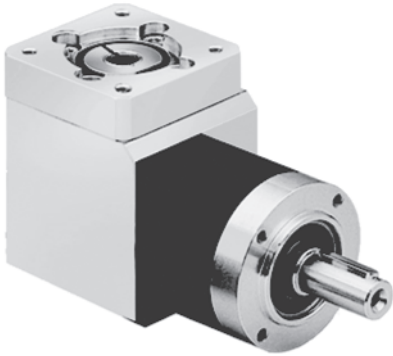


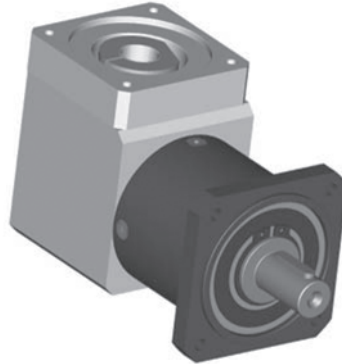


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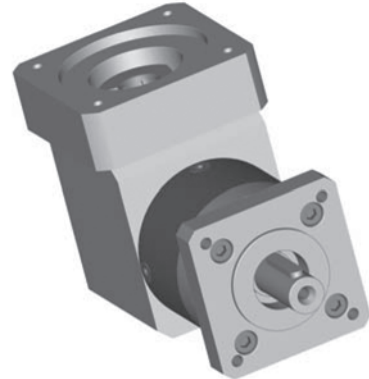
Right-Angle Bevel-Planetary Servo Gearhead
Main configurations, Torque Rating



WPLE 40, 60, 80, 120
round output flange with drilled and tapped holes (B14 C-face); keyed output shaft; motor mount via PCS clamping arrangement



WPLE 60/70, 80/90, 120/115
Integrated “B5” square output flange; increased output shaft-bearing load ability, keyed output shaft; flexible motor mount



WPLE 40, 60, 80, 120,
with bolt-on NEMA output flange; keyed output shaft; flexible motor mount via PCS clamping arrangement

Nominal-Rated Torque ⁽¹⁾ ◇ Torque up to 30000 output shaft rotations. ⁽²⁾				Nm (lbin)	Ratio	(3) Stages
WPLE 40	WPLE 60 WPLE 60/70	WPLE 80 WPLE 80/90	WPLE 120 WPLE 120/115			
4.5 (40) ◇ 7 (150)	14 (124) ◇ 22 (195)	40 (354) ◇ 64 (566)	80 (708) ◇ 128 (1132)		3	1
6 (53) ◇ 10 (88)	19 (168) ◇ 30 (265)	53 (469) ◇ 85 (752)	105 (929) ◇ 168 (1487)		4	1
7.5 (66) ◇ 12 (106)	24 (212) ◇ 38 (336)	67 (592) ◇ 107 (946)	130(1150) ◇ 208(1840)		5	1
6 (53) ◇ 10 (88)	18 (160) ◇ 29 (256)	50 (442) ◇ 80 (708)	120 (1062) ◇ 192 (1699)		8	1
16.5 (146) ◇ 26 (230) ⁽⁴⁾	44 (389) ◇ 70 (619) ⁽⁴⁾	130 (1150) ◇ 208 (1840) ⁽⁴⁾	210 (1858) ◇ 336 (2973) ⁽⁴⁾		9	2
20 (177) ◇ 32 (283) ⁽⁴⁾	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699) ⁽⁴⁾	260 (2301) ◇ 416 (3681) ⁽⁴⁾		12	2
18 (159) ◇ 29 (256) ⁽⁴⁾	44 (389) ◇ 70 (619)	110 (973) ◇ 176 (1558)	230 (2035) ◇ 368 (3257)		15	2
20 (177) ◇ 32 (283) ⁽⁴⁾	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		16	2
20 (177) ◇ 32 (283) ⁽⁴⁾	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		20	2
18 (159) ◇ 29 (256)	40 (354) ◇ 64 (566)	110 (973) ◇ 176 (1558)	230 (2035) ◇ 368 (3257)		25	2
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		32	2
18 (159) ◇ 29 (256)	40 (354) ◇ 64 (566)	110 (973) ◇ 176 (1558)	230 (2035) ◇ 368 (3257)		40	2
7.5 (66) ◇ 12 (106)	18 (159) ◇ 29 (256)	50 (442) ◇ 80 (708)	120 (1062) ◇ 192 (1699)		64	2
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	110 (973) ◇ 176 (1558)	260 (2301) ◇ 416 (3681)		60	3
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		80	3
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		100	3
18 (159) ◇ 29 (256)	44 (389) ◇ 70 (619)	110 (973) ◇ 176 (1558)	230 (2035) ◇ 368 (3257)		120	3
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		160	3
18 (159) ◇ 29 (256)	40 (354) ◇ 64 (566)	110 (973) ◇ 176 (1558)	230 (2035) ◇ 368 (3257)		200	3
20 (177) ◇ 32 (283)	44 (389) ◇ 70 (619)	120 (1062) ◇ 192 (1699)	260 (2301) ◇ 416 (3681)		256	3
18 (159) ◇ 29 (256)	40 (354) ◇ 64 (566)	110 (973) ◇ 176 (1558)	230 (1035) ◇ 368 (3257)		320	3
7.5 (66) ◇ 12 (106)	18 (159) ◇ 29 (256)	50 (442) ◇ 80 (708)	120 (1062) ◇ 192 (1699)		512	3

(1) Continuous duty-rated torque, at uniform load, 30000 hrs L10 design life, at 100 rpm output shaft speed

(2) Maximum torque allowable for 30000 for output shaft rotations

(3) Number of planetary reduction stages

(4) L10 Life 10000 hrs at continuous duty (rated nominal torque)



WPLE

Right-Angle Bevel-Planetary Servo Gearhead

Design life, Emergency Stop (Peak) Torque, IP Class
Efficiency, Backlash, Stiffness, Gearhead Weight, Max Unsupported
Motor Weight, OP-Temperature, Lubricant, Mounting Positions



Design life • Emergency peak torque • IP class • Efficiency • Backlash •					
		WPLE 40	WPLE 60 WPLE 60/70	WPLE 80 WPLE 80/90	WPLE 120 WPLE 120/115
Design Life (L10 Life)		20000 hrs			
Emergency Stop Peak Torque		200% of the continuous duty-rated torque. The gearbox will withstand this torque only a very limited time (about 500 to 1000 times during the life of the gearbox). -Torques at this magnitude should not be part of the standard operating cycle!			
IP protection class		IP 54 / 55			
Full Load Efficiency	1-stage	94 %			
	2-stage	92 %			
	3-stage	88%			
Rotational Backlash ⁽¹⁾ (arc.min)	1-stage	<30	<22	<15	<12
	2-stage	<34	<26	<19	<16
	3-stage	<36	<28	<21	<18

(1) Maximum value of the rotational backlash measured at the output in arc minutes (1 arc min = 1 angular min).
Average backlash is approximately 25% smaller than the listed worst-case value.

Torsional (Rotational) Stiffness • Gearhead Weight • Recommended Maximum Unsupported Motor Weight • Operating Temperatures • Lubrication • Mounting Positions •					
		WPLE 40	WPLE 60 WPLE 60/70	WPLE 80 WPLE 80/90	WPLE 120 WPLE 120/115
Torsional (Rotational) Stiffness ⁽¹⁾ Nm/arc.min (lbin /arc.min)	1-stage	0.7 (6.2)	1.5 (13.3)	4.5 (40)	10 (88)
	2-stage	1.1 (9.7)	2.5 (22)	6.5 (57)	13 (115)
	3-stage	1.0 (8.85)	2.5 (22)	6.3 (55)	12 (106)
Gearhead Weight kg (lb)	1-stage	0.51 (1.12)	1.7 (3.75) 1.9 (4.2)	4.4 (9.7) 5.5 (12)	12 (26.5) 12.6 (27.7)
	2-stage	0.61 (1.35)	1.9 (4.2) 2.1 (4.6)	5.0 (11.2) 6.1 (13.4)	14 (17.6) 14.6 (30.9)
	3-stage	0.71 (1.6)	2.1 (4.6) 2.3 (5)	5.5 (12.1) 6.6 (5.8)	16 (35.3) 16.6 (36.6)
Max. Unsupported Motor Weight ⁽²⁾	kg (lb)	2 (4.4)	3.5 (7.7)	9 (19.8)	16 (35.2)
Operating Temperature ⁽³⁾ °C (°F)	Minimum	-25 (-13)			
	Maximum	+90 (194)			
Lubrication		Lubricated for life with semi-fluid synthetic grease <i>Klüberplex BEM 34-132</i> (Klüber Lubrication LP, - www.kluber.com)			
Mounting Positions		Any mounting position permissible without change of lubrication.			

(1) Measured at the output shaft
(2) Motor support recommended if motor weight exceeds the given value
(3) Measured at the middle of the gearbox main body



WPLE

Right-Angle Bevel-Planetary Servo Gearhead
Radial / Axial Loads, Input Speeds, Noise Level, Inertias



Output Shaft Radial and Axial Loads • Input Speeds • Noise Level •

		WPLE 40	WPLE 60 WPLE 60/70	WPLE 80 WPLE 80/90	WPLE 120 WPLE 120/115
Output shaft radial load ⁽¹⁾ (at 10000 hrs L10 and 100 output shaft rpm)	<i>N (lb)</i>	200 (44)	500 (112) 1000 (224)	950 (213) 2500 (562)	2000 (449) 3500 (786)
Output shaft axial load (at 10000 hrs L10 and 100 output shaft rpm)	<i>N (lb)</i>	200 (44)	600 (134) 1200	1200 (269) 2800 (629)	2800 (629) 2800 (629)
Output shaft radial load ⁽¹⁾ (at 30000 hrs L10 and 100 output shaft rpm)	<i>N (lb)</i>	160 (36)	340 (77) 700 (158)	650 (146) 1700 (383)	1500 (338) 2400 (540)
Output shaft axial load (at 30000 hrs L10 and 100 output shaft rpm)	<i>N (lb)</i>	160 (36)	450 (101) 800 (180)	900 (203) 2000 (450)	2100 (473) 2100 (473)
Max input speed	<i>rpm</i>	18000	13000	7000	6500
Continuous / average input speed	<i>rpm</i>	any rpm as long as the gearbox temperature does not exceed +90 °C (194 °F)			
Noise level ⁽²⁾	<i>dB(A)</i>	68	70	73	75

(1) Radial load at shaft midpoint.

(Detailed bearing life calculation utility is available at www.neugartusa.com or contact Neugart USA with the application data.)

(2) Sound pressure level measured at 3000 rpm, no load, 1m distance from the gearbox.

Standard Motor Mount WPLE Gearhead Moment of Inertia (at the input)

kgcm² (lbin.sec² 10⁻⁴)

WPLE 40	WPLE 60 & 60/70	WPLE 80 & 80/90	WPLE 120 & 120/115	Ratio	Stages
0.044 (0.35)	0.246 (2.17)	1.189 (10.52)	5.75 (50.8)	3	1
0.035 (0.31)	0.204 (1.80)	0.939 (8.31)	3.91 (34.6)	4	1
0.032 (0.28)	0.189 (1.67)	0.869 (7.69)	3.35 (29.6)	5	1
0.03 (0.26)	0.176 (1.55)	0.809 (7.15)	2.89 (25.5)	8	1
0.043 (0.38)	0.242 (2.14)	1.159 (10.22)	5.73 (50.7)	9	2
0.042 (0.37)	0.238 (2.1)	1.139 (10.0)	5.60 (49.5)	12	2
0.036 (0.32)	0.188 (1.66)	1.129 (9.99)	5.53 (48.9)	15	2
0.035 (0.31)	0.199 (1.76)	0.919 (8.13)	3.83 (33.8)	16	2
0.032 (0.28)	0.186 (1.64)	0.859 (7.6)	3.28 (29.0)	20	2
0.032 (0.28)	0.186 (1.64)	0.859 (7.6)	3.26 (28.8)	25	2
0.03 (0.26)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	32	2
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84(25.1)	40	2
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	64	2
0.042 (0.37)	0.187 (1.65)	0.929 (8.22)	5.62 (49.7)	60	3
0.032 (0.28)	0.186 (1.64)	0.919 (8.13)	3.28 (29.0)	80	3
0.032 (0.28)	0.186 (1.64)	0.859 (7.6)	3.26 (28.8)	100	3
0.042 (0.37)	0.175 (1.54)	1.119 (9.9)	5.47 (48.4)	120	3
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	160	3
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	200	3
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	256	3
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	320	3
0.029 (0.25)	0.175 (1.54)	0.809 (7.15)	2.84 (25.1)	512	3



WPLE

Right-Angle Bevel-Planetary Servo Gearhead
Ordering (Type) Code



- Ordering (Type) Code -

WPLE 120 - 08 / MOTOR - OP8

Gearbox Type - **WPLE**
Size:
40
60
60/70
80
80/90
120
120/115

Reduction Ratio
3, 4, 5, 8, 9, 12,
15, 16, 20, 25, 32,
40, 64, 60, 80,
100, 120, 160, 200,
256, 320, 512

MOTOR description
Manufacturer, Type and
Size
or
Motor shaft diameter/
Motor shaft length/
Pilot diameter/
Bolt circle diameter/
Bolt hole diameter

Requested Options
OP8 -Custom shaft
OP12 -ATEX explosion
proof certificate
LS -Food-grade grease
EP -Epoxy paint

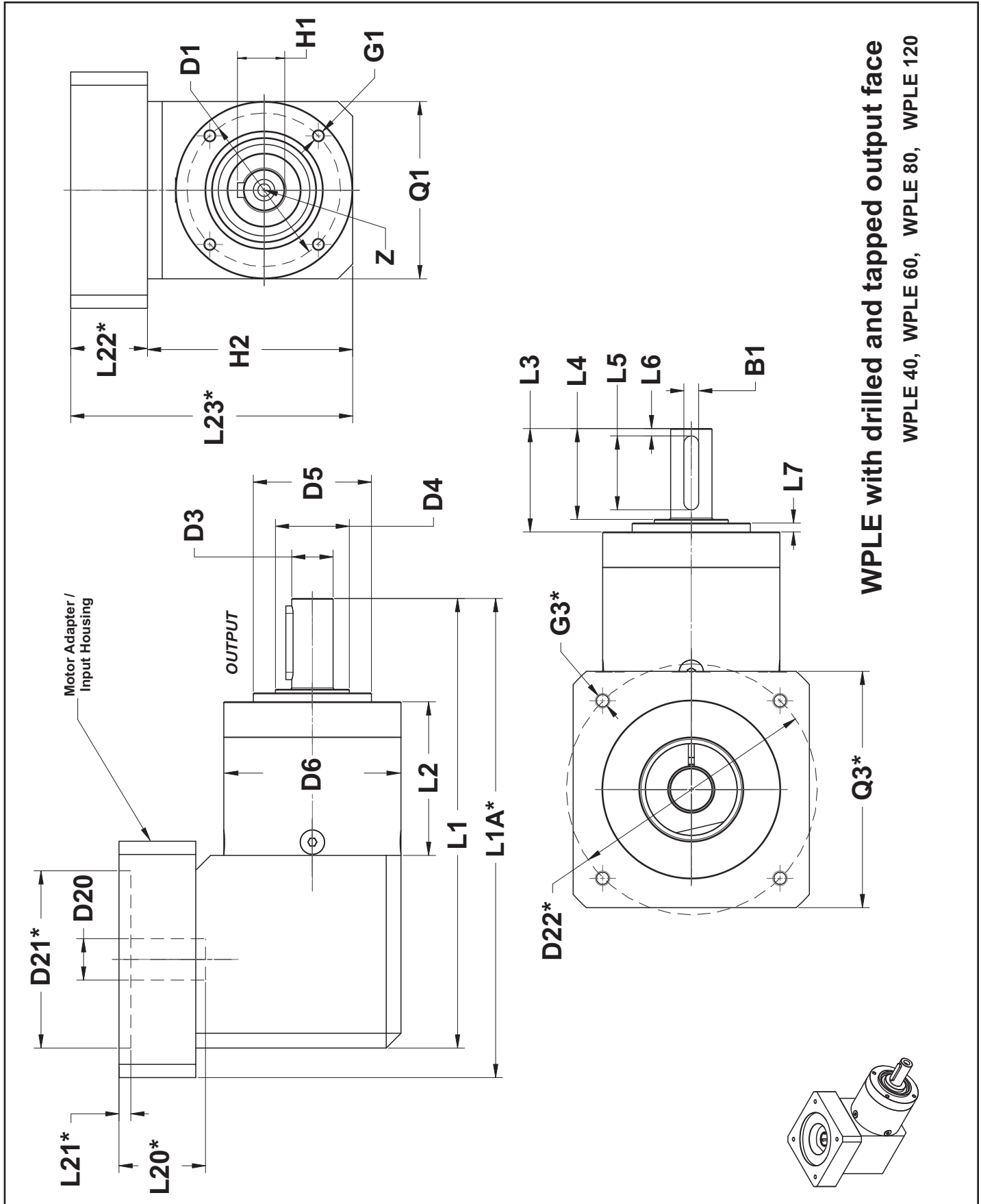
Example: **WPLE 120-08 / AC Servo Motor XYZ- OP8**

NOTE: In case motor description (Manufacturer, Type, Size) In case motor description (Manufacturer, Type, Size)
Motor Shaft Diameter / Motor Shaft Length / Motor Flange Pilot (Centering) Diameter /
Motor Flange Pilot Length / Motor Flange Bolt Circle Diameter / Motor Flange Bolt Hole Diameter



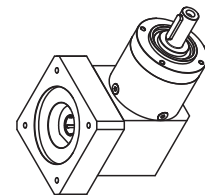
WPLE

Right-Angle Bevel-Planetary Servo Gearhead
With Tapped Mounting Holes



WPLE with drilled and tapped output face

WPLE 40, WPLE 60, WPLE 80, WPLE 120





WPLE

Right-Angle Bevel-Planetary Servo Gearhead

With Tapped Mounting Holes

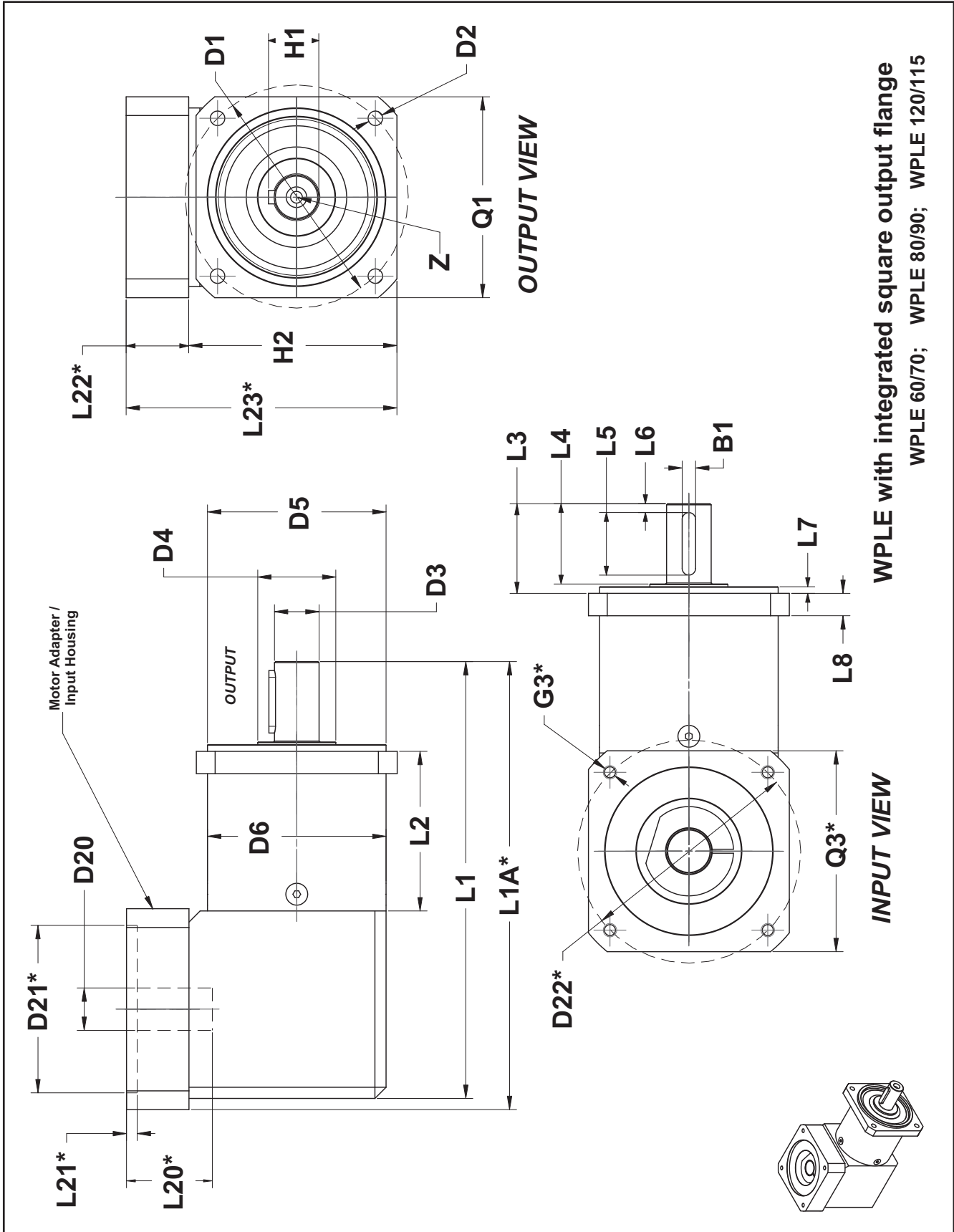


DIMENSIONS mm (in.)		Tol. / #	WPLE 40	WPLE 60	WPLE 80	WPLE 120
D1	Output flange bolt circle		34 (1.338)	52 (2.047)	70 (2.755)	100 (3.937)
D3	Shaft diameter	h7	10 (0.393)	14 (0.551)	20 (0.787)	25 (0.984)
D4	Shaft collar diameter		12 (0.472)	17 (0.669)	25 (0.984)	35 (1.377)
D5	Pilot diameter	h7	26 (1.023)	40 (1.574)	60 (2.362)	80 (3.149)
D6	Planetary housing diameter		40 (1.574)	60 (2.362)	80 (3.149)	115 (4.527)
G1	Output flange M thread x depth	4	M4 x 6	M5 x 8	M6 x 10	M10 x 16
L1	Unit min. overall length	1-Stage	110 (4.330)	147.5 (5.807)	184 (7.244)	249.5 (9.822)
		2-Stage	123 (4.842)	159.5 (6.279)	201.5 (7.933)	276.5 (10.885)
		3-Stage	135 (5.315)	172.5 (6.791)	219 (8.622)	303.5 (11.948)
L2	Planetary housing length.	1-Stage	39 (1.535)	47 (1.850)	60.5 (2.381)	74 (2.913)
		2-Stage	52 (2.040)	59 (2.322)	77.5 (3.051)	101 (3.976)
		3-Stage	64 (2.519)	72 (2.834)	95 (3.740)	128 (5.039)
L3	Shaft length (from mounting face)		26 (1.023)	35 (1.377)	40 (1.574)	55 (2.165)
L4	Shaft length (from the collar)		23 (0.905)	30 (1.181)	36 (1.417)	50 (1.968)
L5	Key length		18 (0.708)	25 (0.984)	28 (1.102)	40 (1.574)
L6	Key location (from shaft end)		2.5 (0.098)	2.5 (0.098)	4 (0.157)	5 (0.196)
L7	Pilot length		2 (0.078)	3 (0.118)	3 (0.118)	4 (0.157)
B1	Key width		3 (0.118)	5 (0.196)	6 (0.236)	8 (0.314)
H1	Shaft + key height		11.2 (20.440)	16 (0.629)	22.5 (0.885)	28 (1.102)
H2	Right-angle housing height		49 (1.929)	69.5 (2.736)	88.3 (3.476)	123.7 (4.870)
Q1	Right-angle housing width		40 (1.574)	60 (2.362)	80 (3.149)	115 (4.527)
D20	Maximum input pinion bore ⁽¹⁾		8 (0.314)	14 (0.551)	19 (0.748)	24 (0.944)
Available standard bushings ⁽¹⁾		mm	4; 5; 6; 6.35	6; 6.35; 7; 8; 9; 9.525; 10; 11; 12; 12.7	9.525; 10; 11; 12; 12.7; 14; 15.875; 16	11; 12.7; 14; 15.875; 16; 19; 19.05; 22; 22.22
⁽¹⁾ For motor shaft smaller than D20, a precision standard bushing is supplied.		Inch	.157; .196; .236; .250	.236; .250; .276; .315; .354; .375; .394; .433; .472; .500	.375; .394; .433; .472; .500; .551; .625; .630	.433; .500; .551; .625; .630; .748; .750; .866; .875
Motor-dependent dimensions: D21*, D22*, L1A*, L20*, L21*, L22*, L23*, G3*, Q3*			Adapter / Input housing dimensions and unit overall length depend on motor output geometry. A motor-specific adapter / Input housing is supplied with every gearhead.			
L22* - dimension calculation			Determine L22* calc = motor shaft length + Δ L , if L22* calc ≤ L22* minimum → L22* = L22* minimum + Tolerance if L22* calc > L22* minimum → L22* = L22* calc + Tolerance			
L22* Tolerance: +5 / - 0.0 (+ 0.196 / - 0.0)						
Δ L			6 (0.236)	7 (0.276)	8.8 (0.346)	18.2 (0.741)
L22* minimum			19 (0.748)	16 (0.63)	21.2 (0.835)	21.8 (0.858)



WPLE

Right-Angle Bevel-Planetary Servo Gearhead
With Integrated Square Output Flange



WPLE with integrated square output flange
WPLE 60/70; WPLE 80/90; WPLE 120/115



WPLE

Right-Angle Bevel-Planetary Servo Gearhead With Integrated Square Output Flange

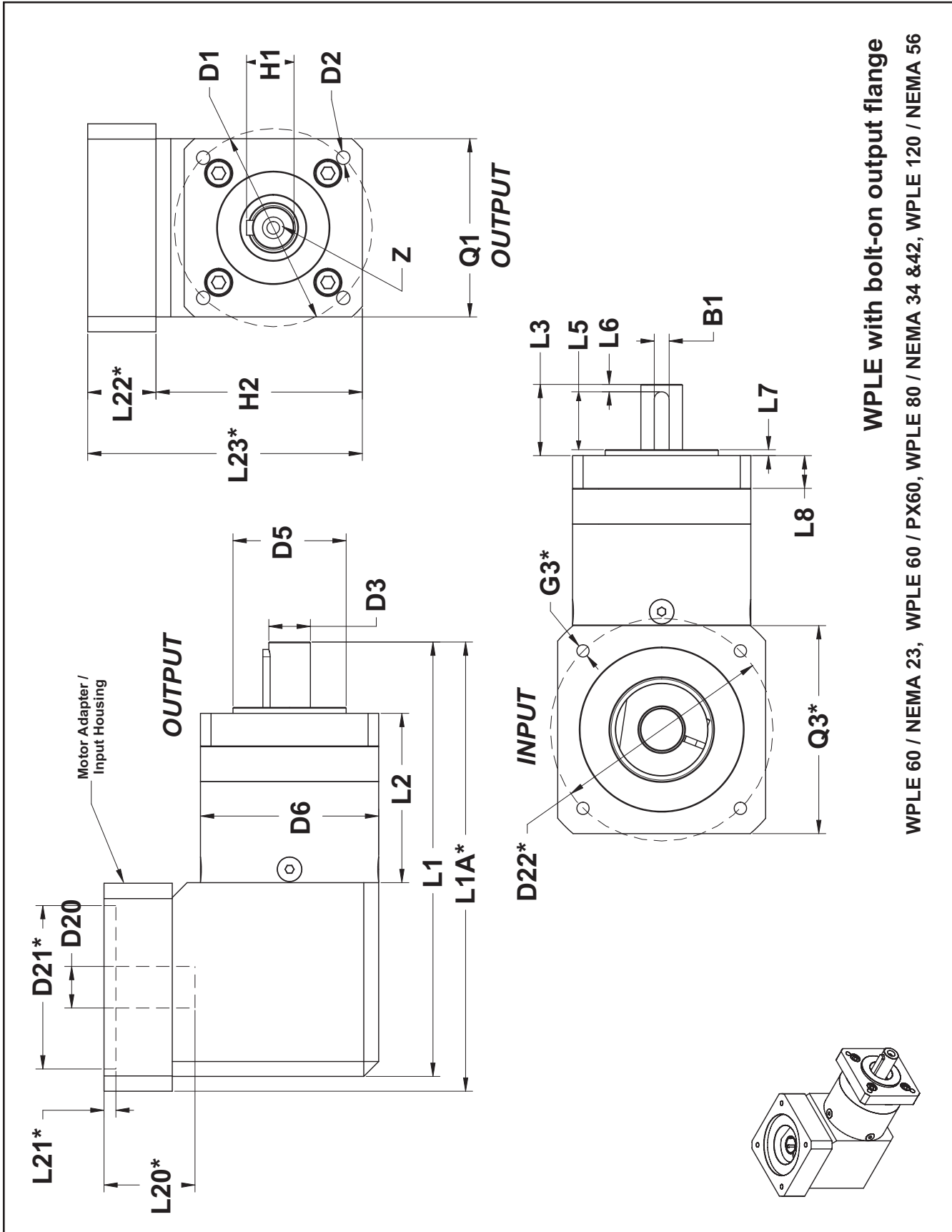


DIMENSIONS mm (in.)		Tol. / #	WPLE 60/70	WPLE 80/90	WPLE 120/115
D1	Output flange bolt circle		75 (2.953)	100 (3.937)	130 (5.118)
D2	Flange mounting hole diameter	4	5.5 (0.217)	6.5 (0.256)	8.5 (0.335)
D3	Output shaft diameter	h7	14 (0.551)	20 (0.787)	25 (0.984)
D4	Shaft collar diameter		20 (0.787)	35 (1.378)	35 (1.378)
D5	Output flange plot diameter	h7	60 (2.362)	80 (3.150)	110 (4.330)
D6	Planetary housing diameter		60 (2.362)	80 (3.150)	115 (4.528)
Q1	Output Flange - square		70 (2.756)	90 (3.543)	115 (4.528)
L1	Unit min. overall length	1-Stage	152.5 (6.003)	195.5 (7.696)	274.5 (10.807)
		2-Stage	165 (6.496)	212.5 (8.366)	301.5 (11.870)
		3-Stage	177.5 (6.988)	230 (9.055)	328.5 (12.933)
L2	Main housing length	1-Stage	55 (2.165)	71.5 (2.814)	99 (3.897)
		2-Stage	67.5 (2.657)	88.5 (3.484)	126 (4.960)
		3-Stage	80 (3.150)	106 (4.173)	153 (6.023)
L3	Shaft length (from mounting face)		32 (1.260)	40 (1.574)	55 (2.165)
L4	Shaft length (from the collar)		28 (1.102)	36 (1.417)	50 (1.968)
L5	Key length		25 (0.984)	28 (1.102)	40 (1.574)
L6	Key location from shaft end		2.5 (0.098)	4 (0.157)	5 (0.196)
L7	Pilot length		3 (0.118)	3 (0.118)	4 (0.157)
L8	Flange thickness		10 (0.394)	10 (0.393)	15 (0.590)
B1	Key width		5 (0.197)	6 (0.236)	8 (0.314)
H1	Key + shaft height		16 (0.630)	22.5 (0.885)	28 (1.102)
H2	Right-angle housing height		69.5 (2.736)	88.3 (3.476)	123.7 (4.870)
D20	Maximum input pinion bore ⁽¹⁾		14 (0.551)	19 (0.748)	24 (0.944)
Z	Shaft M thread x depth		M5 x 12	M6 x 16	M10 x 22
Available standard bushings ⁽¹⁾		mm	6; 6.35; 7; 8; 9; 9.525; 10; 11; 12; 12.7	9.525; 10; 11; 12; 12.7; 14; 15.87; 16	11; 12.7; 14; 15.875; 16; 19; 19.05; 22; 22.22
⁽¹⁾ For motor shaft diameter smaller than D20 , a precision standard bushing is supplied.			inch	.236; .250; .276; .315; .354; .375; .394; .433; .472; .500	.375; .394; .433; .472; .500; .551; .625; .630;
Motor-Dependent Dimensions: D21*, D22*, L1A*, L20*, L21*, L22*, L23*, G3*, Q3*			Adapter / Input Housing dimensions and unit overall length depend on motor output geometry. A motor-specific adapter / input housing is supplied with every gearhead.		
L22* - dimension calculation			Determine L22* calc = motor shaft length + Δ L , if L22* calc ≤ L22* minimum → L22* = L22* minimum + Tolerance if L22* calc > L22* minimum → L22* = L22* calc + Tolerance		
L22* Tolerance: + 5 / - 0.0 (+ 0.196 / - 0.0)					
Δ L			7 (0.276)	8.8 (0.346)	18.2 (0.741)
L22* minimum			16 (0.63)	21.2 (0.835)	21.8 (0.858)



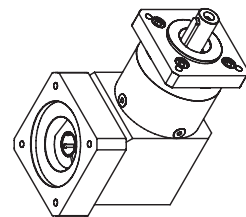
WPLE

Right-Angle Bevel-Planetary Servo Gearhead
With Bolt-On Square Output Flange



WPLE with bolt-on output flange

WPLE 60 / NEMA 23, WPLE 60 / PX60, WPLE 80 / NEMA 34 & 42, WPLE 120 / NEMA 56





WPLE

Right-Angle Bevel-Planetary Servo Gearhead With Bolt-On Square Output Flange



DIMENSIONS mm (in.)	Tol. / #	WPLE 60 NEMA 23	WPLE 60 PX60	WPLE 80 NEMA 34	WPLE 80 NEMA 42	WPLE 120 NEMA 56
D1 Output flange bolt circle		66.7 (2.625)	70 (2.756)	98.4 (3.874)	125.7 (4.950)	177.8 (7.0) ⁽²⁾
D2 Flange mounting hole diameter	4	4.5 (0.177)	5.5 (0.277)	5.5 (0.216)	7.3 (0.287)	10 (0.394)
D3 Output shaft diameter	k6	14 (0.551)	14 (0.551)	20 (0.787)	20 (0.787)	25 (0.984)
D5 Output flange pilot diameter	h7	38.1 (1.5)	50 (1.969)	73 (2.874)	56 (2.204)	114.3 (4.500)
D6 Gearhead body diameter		60 (2.362)	60 (2.362)	80 (3.150)	80 (3.150)	115 (4.528)
Q1 Output Flange - square		60 (2.362)	60 (2.362)	83 (3.267)	110 (4.330)	145 (5.709)
L1 Minimum overall unit length		Refer to Page 19	Refer to Page 19	Refer to Page 19	Refer to Page 19	Refer to Page 19
L2 Main housing length	1-Stage	58 (2.283)	58 (2.283)	72.5 (2.854)	73.9 (2.909)	90 (3.543)
	2-Stage	70 (2.755)	70 (2.755)	89.5 (3.523)	90.9 (3.579)	117 (4.606)
	3-Stage	83 (3.267)	83 (3.267)	107 (4.212)	108.4 (4.268)	144 (5.669)
L3 Shaft length (to mounting face)		24 (0.944)	25 (0.984)	28 (1.102)	26.6 (1.047)	39 (1.496)
L5 Key length (to pilot face)		19.5 (0.768)	21 (0.827)	21 (0.827)	21(0.827)	29 (1.142)
L6 Key location from shaft end		2.5 (0.098)	2.5 (0.098)	4 (0.157)	4 (0.157)	5 (0.197)
L7 Output pilot length		2 (0.078)	1.5 (0.059)	3 (0.118)	1.6 (0.062)	5 (0.197)
L8 Flange thickness		11 (0.433)	10 (0.394)	12 (0.472)	13.4 (0.527)	16 (0.630)
B1 Key width (DIN 6885)		5 (0.196)	5 (0.196)	6 (0.236)	6 (0.236)	8 (0.314)
H1 Shaft + key height		16 (0.629)	16 (0.629)	22.5 (0.885)	22.5 (0.885)	28 (1.102)
H2 Right-angle housing height		69.5 (2.763)	69.5 (2.763)	88.3 (3.476)	88.3 (3.476)	123.7 (4.870)
Z Output shaft tapped hole (DIN 332)		M5 x 12	M5 x 12	M6 x 16	M6 x 16	M10 x 22
D20 Maximum input pinion bore ⁽²⁾		14 (0.551)	14 (0.551)	19 (0.748)	19 (0.748)	24 (0.945)
Available standard bushings ⁽¹⁾ mm		6; 6.35; 7; 8; 9; 9.525; 10; 11; 12; 12.7	9.525; 10; 11; 12; 12.7; 14; 15.87; 16			11; 12.7; 14; 15.87; 16; 19; 19.05; 22; 22.22
	inch	.236; .250; .276; .315; .354; .375; .394; .433; .472; .500	.375; .394; .433; .472; .500; .551; .625; .630			.433; .500; .551; .625; .630; .748; .750; .866; .875
Motor-dependent dimensions: D21*, D22*, L20*, L21*, L1A*, L22*, L23*, G3*, Q3*	Adapter / Input Housing dimensions and unit overall length depend on motor output geometry. A motor-specific adapter / input housing is supplied with every gearhead. ⁽²⁾ NEMA 56 has more than one bolt circle size.					
L22* - dimension calculation L22* Tolerance: + 5 / - 0.0 (+ 0.196 / - 0.0)	Determine L22* calc = motor shaft length + Δ L , if L22* calc < or L22* calc = L22* minimum → L22* = L22* minimum + Tolerance if L22* calc > L22* minimum → L22* = L22* calc + Tolerance					
Δ L		7 (0.276)	8.8 (0.346)			18.2 (0.741)
L22* minimum		16 (0.63)	21.2 (0.835)			21.8 (0.858)