

Kollmorgen Stainless Steel Washdown Motor Selection Guide



KOLLMORGEN

Because Motion Matters™

Kollmorgen.

Every solution comes from a real understanding of the challenges facing machine designers and users.

The ever-escalating demands of the marketplace mean increased pressure on machine designers and users at every turn. Time constraints. Demands for better performance. Having to think about the next-generation machine even before the current one is built. While expectations are enormous, budgets are not. Kollmorgen's innovative motion solutions and broad range of quality products help engineers not only overcome these challenges but also build truly differentiated machines.

Because motion matters, it's our focus. Motion can distinctly differentiate a machine and deliver a marketplace advantage by improving its performance. This translates to overall increased efficiency on the factory floor. Perfectly deployed machine motion can make your customer's machine more reliable and efficient, enhance accuracy and improve operator safety. Motion also represents endless possibilities for innovation. We've always understood this potential, and thus have kept motion at our core, relentlessly developing products that offer precision control of speed, accuracy and position in machines that rely on complex motion.

Removing the Barriers of Design, Sourcing, and Time

At Kollmorgen, we know that OEM engineers can achieve a lot more when obstacles aren't in the way. So, we knock them down in three important ways:

Integrating Standard and Custom Products

The optimal solution is often not clear-cut. Our application expertise allows us to modify standard products or develop totally custom solutions across our whole product portfolio so that designs can take flight.

Providing Motion Solutions, Not Just Components

As companies reduce their supplier base and have less engineering manpower, they need a total system supplier with a wide range of integrated solutions. Kollmorgen is in full response mode with complete solutions that combine programming software, engineering services and best-in-class motion components.

Global Footprint

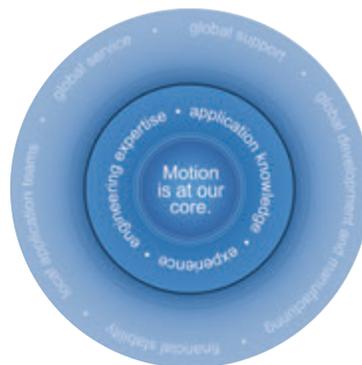
With direct sales, engineering support, manufacturing facilities, and distributors spanning the Americas, Europe, Middle East, and Asia, we're close to OEMs worldwide. Our proximity helps speed delivery and lend support where and when they're needed.

Financial and Operational Stability

Kollmorgen is part of Danaher Corporation. A key driver in the growth of all Danaher divisions is the Danaher Business System, which relies on the principle of "kaizen" – or continuous improvement. Using world-class tools, cross-disciplinary teams of exceptional people evaluate processes and develop plans that result in superior performance.

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Stainless Steel Washdown Motors

Kollmorgen has leveraged over 30 years of custom motors designed for the most challenging of environments. The most notable were the motors used in Jason Jr., the ROV that was used to discover the Titanic. The culmination of these experiences has resulted in our Stainless Steel Washdown series of motors. These motors are designed to meet the toughest hygienic requirements in the industry.

The features of the Stainless Steel Washdown series of motors meet the highly regulated specifications of the food, beverage and pharmaceutical industries. Our stainless steel motors are designed for high pressure, high temperature, and caustic washdown applications. The round motor reduces square edges that could allow for the build-up of foreign material and bacteria. Standard features include feedback and power cables that allow for the easy venting of the motor to prevent internal condensation. Our standard configurations give us the broadest stainless steel motor offering specifically constructed for use in sterile environments.

If you have strict aseptic requirements, or if your machine design requires the highest standards with respect to hygiene, the all Stainless Steel Washdown series was designed with you in mind. These motors combine years' worth of experience in tough environments, with an easy to clean design. Our motors are perfect for the applications that are found in food, beverage and pharmaceutical industries. Kollmorgen's Stainless Steel Washdown motors help you to maintain the highest standard of cleanliness in your machine.

The Benefits Of Stainless Steel Washdown Motors

- Your machine not only looks more appealing and sanitary it actually is: clean and smooth surfaces help your customer prevent food trapping and helps prevent bacteria and other contaminates
 - Aseptic motor helps you exceed tough regulation requirements
 - High grade stainless steel used for all external and internal metal components
 - Round housing for easing cleaning
 - Food grade grease
 - Food grade shaft seal
 - Aesthetically pleasing
 - Laser etched nameplate
-
- We will help you select what level of imperviousness you need to eliminate downtime and reduce cost of maintenance
 - IP69K sealing
 - Precision balanced
 - Low cogging motor design
 - Air purge port standard
 - Innovative cable design that allows for venting of motor
 - Motor designed to eliminate the need for addition housings
-
- Our customizable fit will meet your needs. You spend less time tweaking your machine's mechanicals.
 - 16 Frame/stack length combinations
 - Continuous torques to 80 Nm
 - Peak torques to 390 Nm
 - Multiple popular connector and cable options standard
 - Windings designed to optimize the performance of your machine
 - Flying lead cable option designed to eliminate the need for intermediate cables
 - Rated speeds to 7500 rpm

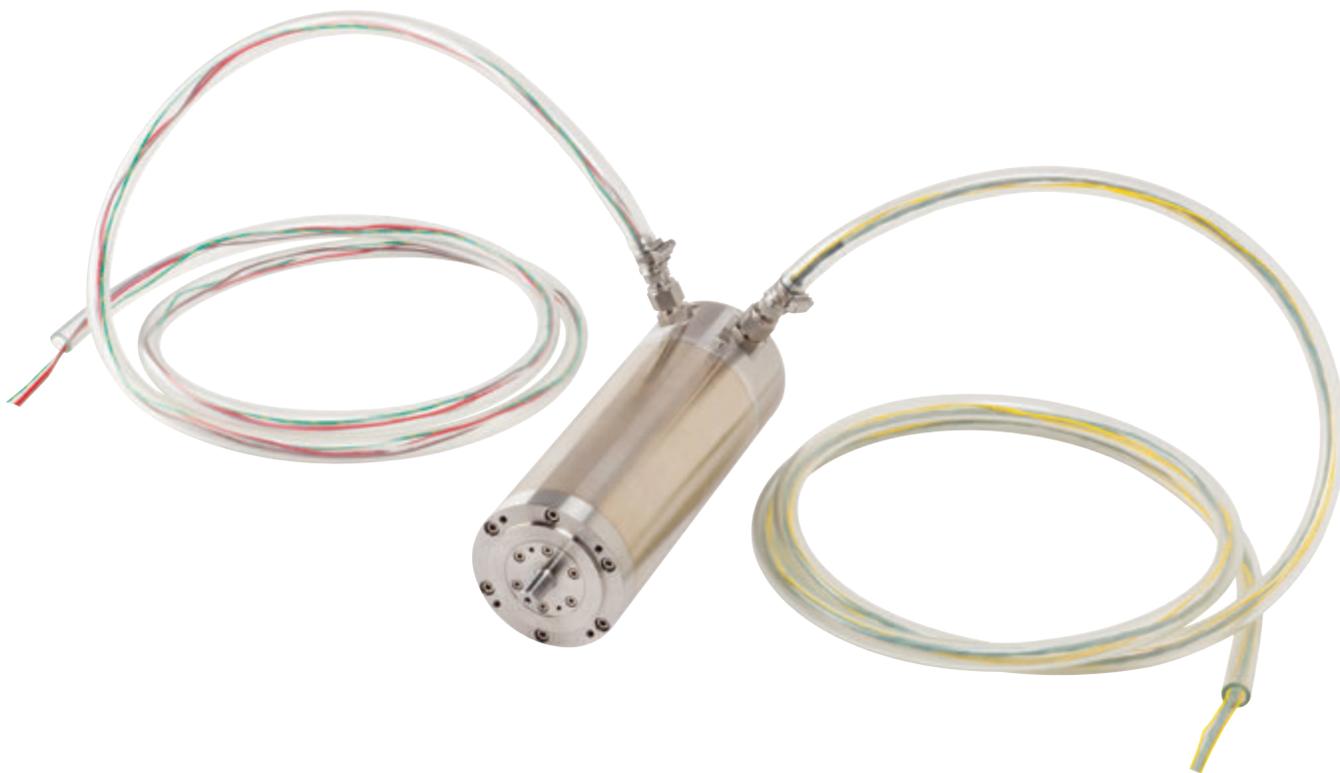
Stainless Steel Washdown Motor Overview



- 5 Frame Sizes
- 16 Frame/Stack Length Combinations
- Rated Speeds to 7500 rpm
- Up to 80 Nm of Continuous Torque
- Up to 390 Nm of Peak Torque
- IP69K Protection
- 3M and 6M Standard Cable Options
- Food Grade Grease
- Food Grade Shaft Seal
- Aseptic Design



- Precision Balanced Rotor
- Air Purge Port Standard
- Round Housing for Easy Cleaning
- Housing Made from 300 Series Stainless Steel
- Shaft Made from 17-4Ph Stainless Steel
- Standard Flying Lead Cable Option that Aides in Venting Motor
- Manufactured to be Highly Customizable



Stainless Steel W(H)10x Series Motors

STAINLESS STEEL W(H)10x SERIES MOTORS

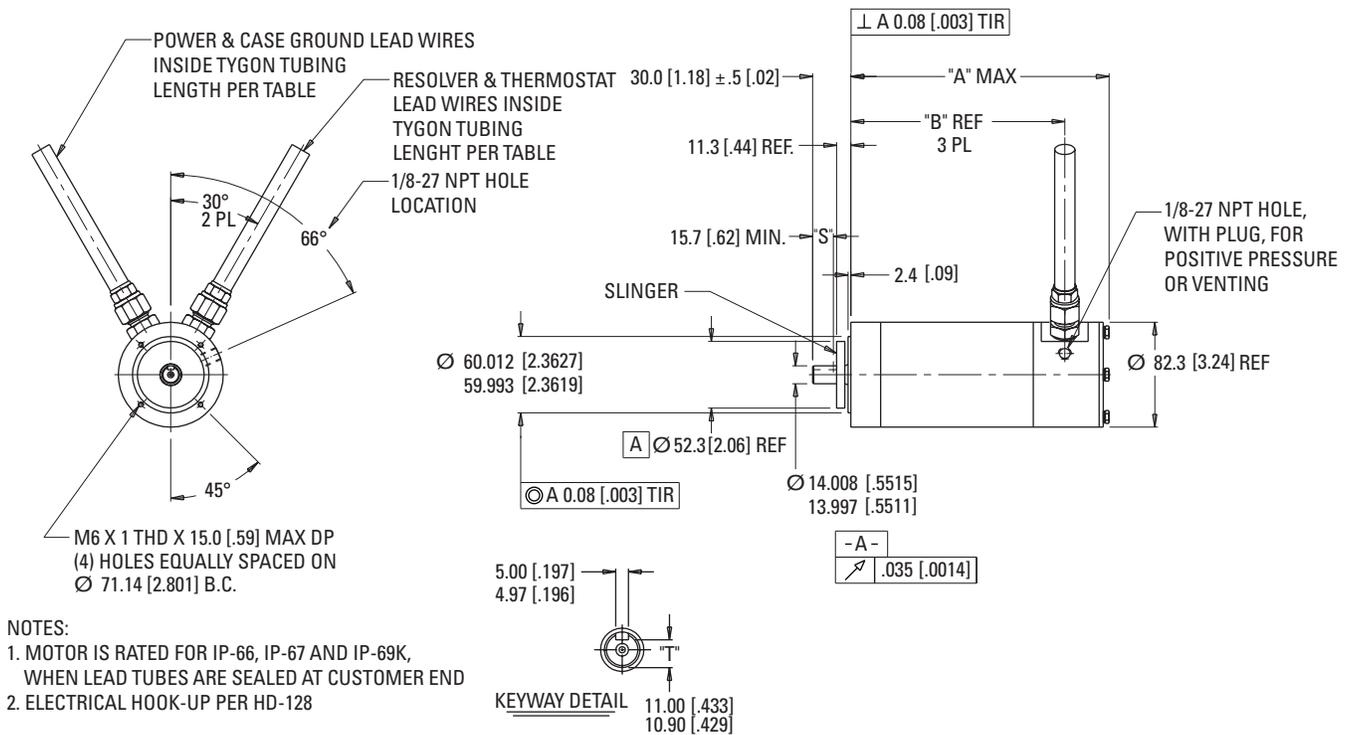
W(H)10x Family Dimensional Data

Shaft Mount Option	Units	Shaft Diameter	Shaft Length	Pilot Diameter	Mtg Hole B.C.	Mtg Hole	Keyway Width	"S" Keyway Length	"T" Shaft Diameter Over Keyway	Shaft Feature
AK	mm	14 ^{+0.008} / _{-0.003}	30 ± 0.5	60 ^{+0.012} / _{-0.007}	71.14	M6 X 1 THD	5 ⁰ / _{-0.03}	15.7	11 ^{+0.00} / _{-0.10}	Keyway 5 x 5 x 15
AN	mm	14 ^{+0.008} / _{-0.003}	30 ± 0.5	60 ^{+0.012} / _{-0.007}	71.14	M6 X 1 THD	-	-	-	Smooth

MODEL	Units	A MAX	"B"
W(H)106	mm	267.5	226.3
W(H)104	mm	237.0	195.8
W(H)102	mm	208.9	167.7

Note: Contact customer support for length of motor with brake.

W(H)10x Family Outline Drawings



Dimensions in mm [in]

W(H)10x Family Performance Data

				W-102	W-104		W-106		WH-102	WH-104	WH-106
Parameter	Tol	Symbol	Units	B	A	B	A	B	A	B	A
Max Rated DC Bus Voltage	Max	Vbus	Vdc	320	320		320		640	640	640
Continuous Torque (Stall) for ΔT winding = 100°C	Nom	TCS	Nm	0.50	1.06	1.06	1.49	1.49	0.44	0.92	1.2
			lb-ft	0.40	0.78	0.78	1.10	1.10	0.33	0.68	0.91
Continuous Current (Stall) for ΔT winding = 100°C	Nom	TCS	Arms	2.8	2.10	2.86	2.10	4.00	0.63	1.20	1.70
Max Mechanical Speed	Nom	NMAX	rpm	7500	6000	7500	5000	7500	7500	7500	7500
Peak Torque	Nom	TP	Nm	2.2	4.4	4.4	6.2	6.4	2.4	4.4	6.3
			lb-ft	1.6	3.2	3.3	4.6	4.7	1.8	3.3	4.7
Peak Current	Nom	IP	Arms	10.5	9.0	12.6	9.0	18.0	3.6	6.3	9.0
Rated Torque (speed)		Trtd	Nm	0.50	1.0	0.98	1.4	1.3			
			lb-ft	0.40	0.76	0.72	1.0	0.94			
Rated Speed		Nrdt	rpm	7500	5600	7500	4200	7500			
Rated Power (speed)		Prtd	kW	0.39	0.60	0.77	0.61	1.0			
			hp	0.53	0.81	1.0	0.82	1.3			
Rated Torque (speed)		Trtd	Nm						0.34	0.8	1.0
			lb-ft						0.25	0.55	0.7
Rated Speed		Nrdt	rpm						7500	7500	7500
Rated Power (speed)		Prtd	kW						0.26	0.59	0.76
			hp						0.35	0.79	1.0
Torque Constant	$\pm 10\%$	Kt	Nm/Arms	0.21	0.51	0.37	0.72	0.37	0.71	0.74	0.74
			lb-ft/Arms	0.15	0.38	0.27	0.53	0.27	0.52	0.55	0.55
Back EMF Constant	$\pm 10\%$	Ke	Vrms/Krpm	12.5	31.0	22.5	43.7	22.5	42.6	44.9	44.9
Resistance (line-line)	$\pm 10\%$	RM	ohm	2.7	5.3	2.7	6.5	1.6	35	12.4	8.21
Inductance		L	mH	7.2	28	14	38	9.4	120	58	37.6
Inertia (includes resolver feedback)		JM	kg-m ²	3.10E-5	4.61E-5		7.65E-5		3.10E-5	4.61E-5	7.65E-5
			lb-ft-sec ²	2.28E-5	3.40E-5		5.64E-5		2.28E-5	3.40E-5	5.64E-5
Pole Pairs				2	2		2		2	2	2

Stainless Steel W(H)20x Series Motors

STAINLESS STEEL W(H)20x SERIES MOTORS

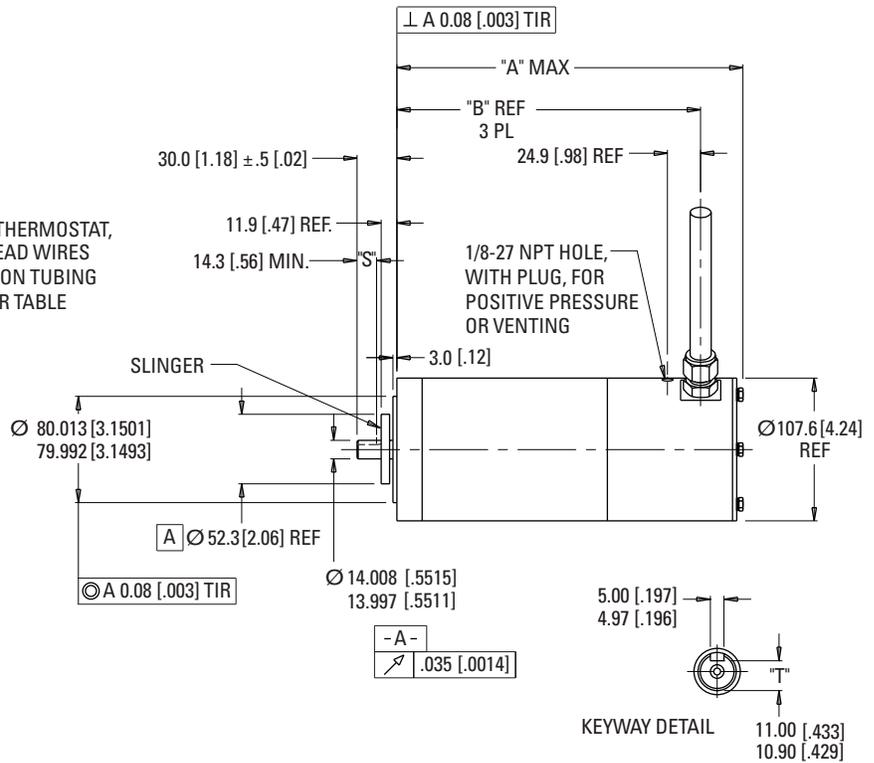
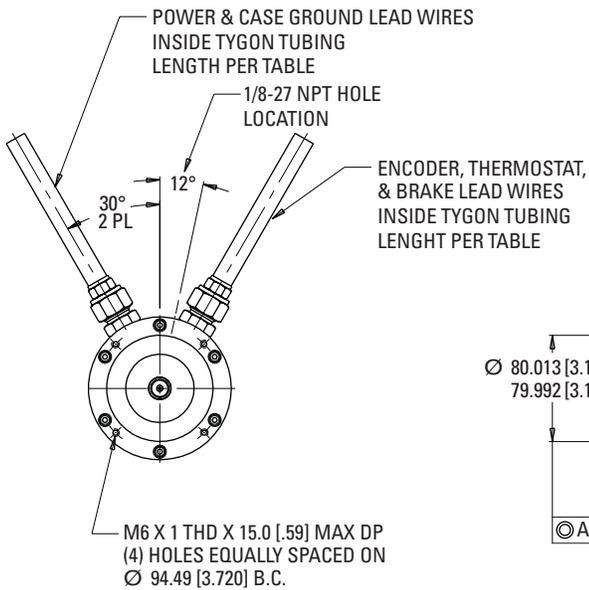
W(H)20x Family Dimensional Data

Shaft Mount Option	Units	Shaft Diameter	Shaft Length	Pilot Diameter	Mtg Hole B.C.	Mtg Hole	Keyway Width	"S" Keyway Length	"T" Shaft Diameter Over Keyway	Shaft Feature
AK	mm	14 ^{+0.008} / _{-0.003}	30 ± 0.5	80 ^{+0.013} / _{-0.008}	94.49	M6 X 1 THD	5 ⁰ / _{-0.03}	14.3	11 ^{+0.00} / _{-0.10}	Keyway 5 x 5 x 14
AN	mm	14 ^{+0.008} / _{-0.003}	30 ± 0.5	80 ^{+0.013} / _{-0.008}	94.49	M6 X 1 THD	-	-	-	-

MODEL	Units	A MAX	"B"
W(H)206	mm	308.0	277.8
W(H)204	mm	268.4	238.2
W(H)202	mm	228.8	198.6

Note: Contact customer support for length of motor with brake.

W(H)20x Family Outline Drawings



NOTES:

- MOTOR IS RATED FOR IP-66, IP-67 AND IP-69K, WHEN LEAD TUBES ARE SEALED AT CUSTOMER END
- ELECTRICAL HOOK-UP PER HD-128
- MOTOR WITH 24 VDC FAIL-SAFE BRAKE

Dimensions in mm [in]

W(H)20x Family Performance Data

				W-202		W-204		W-206		WH-202		WH-204		WH-206	
Parameter	Tol	Symbol	Units	A	C	A	B	A	B	B	E	A	B	D	E
Max Rated DC Bus Voltage	Max	Vbus	Vdc	320		320		320		640		640		640	
Continuous Torque (Stall) for ΔT winding = 100°C	Nom	TCS	Nm	1.46	1.49	3.00	3.00	4.40	4.20	1.4	1.5	2.5	2.6	3.6	3.6
			lb-ft	1.08	1.10	2.20	2.20	3.26	3.10	1.0	1.1	1.8	1.9	2.7	2.7
Continuous Current (Stall) for ΔT winding = 100°C	Nom	TCS	Arms	1.11	3.07	1.80	3.60	2.10	3.90	0.87	3.1	0.75	1.5	6.4	2.0
Max Mechanical Speed	Nom	NMAX	rpm	2800	6000	2000	4000	1800	3000	4500	7000	2400	4500	7500	4000
Peak Torque	Nom	TP	Nm	7.49	7.67	13.7	13.8	20.5	19.9	7.1	7.7	13.6	12.9	19.9	20.2
			lb-ft	5.53	5.65	10.1	10.2	15.1	14.7	5.2	5.7	10.0	9.5	14.7	14.9
Peak Current	Nom	IP	Arms	6.0	16.6	8.7	17.2	10.0	19.5	4.6	16.6	4.3	8.0	24.3	11.5
Rated Torque (speed)		Trtd	Nm	1.5	1.5	2.8	2.8	4.4	4.2						
			lb-ft	1.1	1.1	2.0	2.0	3.3	3.1						
Rated Speed		Nrtd	rpm	2500	6000	1900	3600	1400	2800						
Rated Power (speed)		Prtd	kW	0.37	0.97	0.55	1.0	0.65	1.3						
			hp	0.50	1.3	0.74	1.4	0.87	1.7						
Rated Torque (speed)		Trtd	Nm							1.3	1.5	2.0	2.2	2.6	3.3
			lb-ft							1.0	1.1	1.5	1.6	2.0	2.4
Rated Speed		Nrtd	rpm							3800	6200	1900	3600	7000	3200
Rated Power (speed)		Prtd	kW							0.51	0.97	0.41	0.82	1.9	1.1
			hp							0.68	1.3	0.55	1.1	2.6	1.5
Torque Constant	±10%	Kt	Nm/Arms	1.31	0.49	1.67	0.85	2.15	1.08	1.62	0.49	3.32	1.70	0.87	1.86
			lb-ft/Arms	0.97	0.36	1.23	0.62	1.59	0.79	1.19	0.36	2.45	1.25	0.64	1.37
Back EMF Constant	±10%	Ke	Vrms/Krpm	79.5	29.4	101	51.2	130	65.1	97.9	29.4	201	103	52.5	112
Resistance (line-line)	±10%	RM	ohm	17.7	2.3	9.5	2.5	8.8	2.3	35.4	2.3	49.2	12.5	1.9	8.5
Inductance		L	mH	185	25	133	38	130	32	272	25	532	152	21	92
Inertia (includes resolver feedback)		JM	kg-m2	9.97E-05		1.73E-04		2.51E-04		9.97E-05		1.73E-04		2.51E-04	
			lb-ft-sec2	7.35E-05		1.28E-04		1.85E-04		7.35E-05		1.28E-04		1.85E-04	
Pole Pairs				2		2		2		2		2		2	

Stainless Steel W(H)40x Series Motors

STAINLESS STEEL W(H)40X SERIES MOTORS

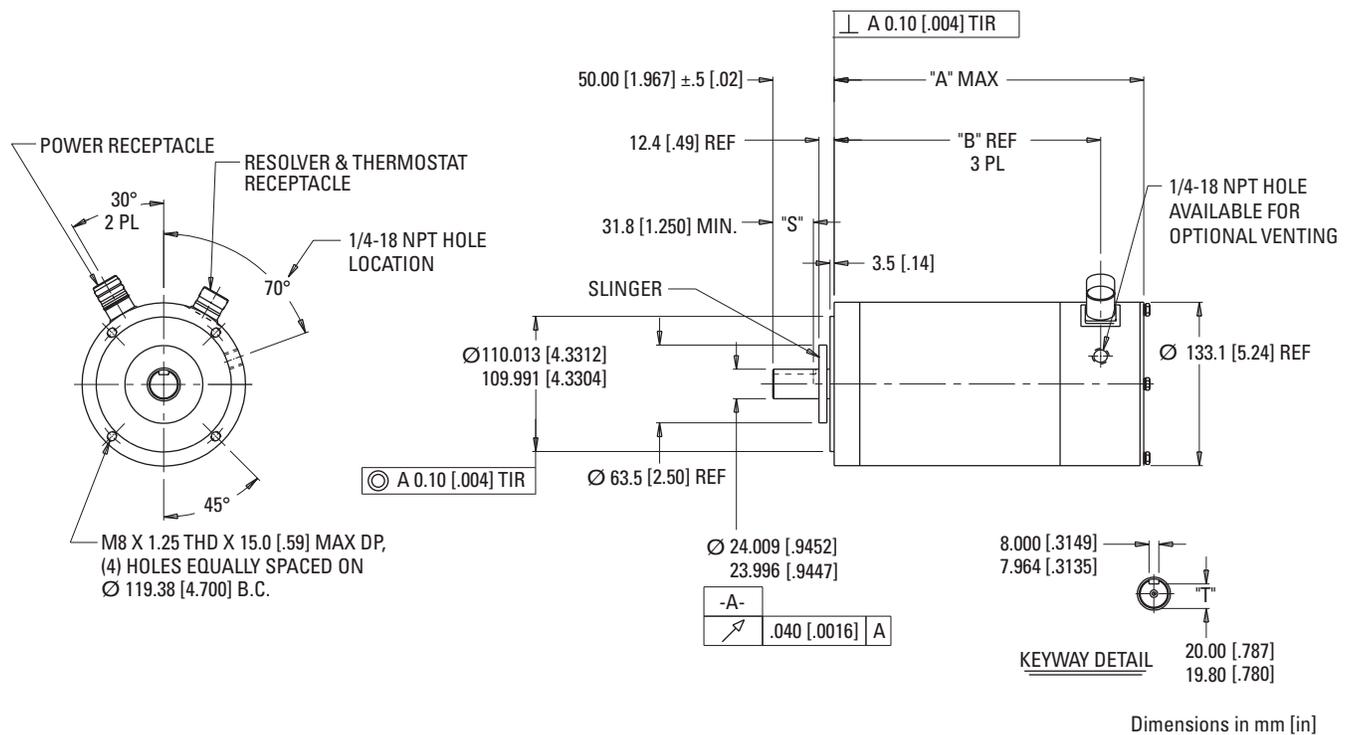
W(H)40x Family Dimensional Data

Shaft Mount Option	Units	Shaft Diameter	Shaft Length	Pilot Diameter	Mtg Hole B.C.	Mtg Hole	Keyway Width	"S" Keyway Length	"T" Shaft Diameter Over Keyway	Shaft Feature
AK	mm	24 ^{+0.009} _{-0.004}	50 ± 0.5	110 ^{+0.013} _{-0.009}	119.38	M8 X 1.25 THD	8 ^{+0.00} _{-0.036}	31.8	20 ^{+0.00} _{-0.20}	Keyway 8 x 8 x 30
AN	mm	24 ^{+0.009} _{-0.004}	50 ± 0.5	110 ^{+0.013} _{-0.009}	119.38	M8 X 1.25 THD	-	-	-	smooth

MODEL	Units	A MAX	"B"
W(H)406	mm	365.2	323.5
W(H)404	mm	311.9	270.2
W(H)402	mm	258.6	216.9

Note: Contact customer support for length of motor with brake.

W(H)40x Family Outline Drawings



W(H)40x Family Performance Data

				W-402		W-404		W-406		WH-402	WH-404		WH-406	
Parameter	Tol	Symbol	Units	A	B	A	B	A	B	D	A	D	B	C
Max Rated DC Bus Voltage	Max	Vbus	Vdc	320		320		320		640	640		640	
Continuous Torque (Stall) for ΔT winding = 100°C	Nom	TCS	Nm	4.6	4.8	8.8	9.0	11.4	12.1	3.8	7.2	7.2	10.3	10.0
			lb-ft	3.4	3.5	6.5	6.7	8.4	8.9	2.8	5.3	5.3	7.6	7.4
Continuous Current (Stall) for ΔT winding = 100°C	Nom	TCS	Arms	2.0	4.3	3.8	6.7	1.6	12.4	2.6	1.6	4.1	5.3	8.0
Max Mechanical Speed	Nom	NMAX	rpm	1800	3600	1800	3000	2000	4000	5000	1650	4200	3800	6000
Peak Torque	Nom	TP	Nm	19.9	19.8	35.9	36.7	48.5	49.2	19.8	35.9	37.5	49.5	48.2
			lb-ft	14.7	14.6	26.5	27.1	35.8	36.3	14.6	26.5	27.7	36.5	35.6
Peak Current	Nom	IP	Arms	9.3	18.8	16.4	28.8	27.3	53.3	14.4	8.2	22.5	26.7	40.7
Rated Torque (speed)		Trtd	Nm	4.2	4.6	8.8	8.6	10.6	10.6					
			lb-ft	3.1	3.4	6.5	6.4	7.8	7.8					
Rated Speed		Nrtd	rpm	1500	3000	1500	2500	1700	3200					
Rated Power (speed)		Prtd	kW	0.66	1.5	1.3	2.2	1.9	3.5					
			hp	0.88	1.9	1.8	3.0	2.5	4.7					
Rated Torque (speed)		Trtd	Nm							2.8	6.0	5.6	8.1	7.3
			lb-ft							2.1	4.4	4.1	6.0	5.4
Rated Speed		Nrtd	rpm							4600	1500	3700	3200	5000
Rated Power (speed)		Prtd	kW							1.4	0.97	2.2	2.8	3.8
			hp							1.8	1.3	2.9	3.7	5.1
Torque Constant	$\pm 10\%$	Kt	Nm/Arms	2.25	1.11	2.31	1.34	1.87	0.97	1.45	4.61	1.75	1.95	1.25
			lb-ft/Arms	1.66	0.82	1.70	0.99	1.38	0.72	1.07	3.40	1.29	1.44	0.92
Back EMF Constant	$\pm 10\%$	Ke	Vrms/Krpm	136	67	139	81	113	59	87	279	106	118	75
Resistance (line-line)	$\pm 10\%$	RM	ohm	10.5	2.6	4.1	1.3	1.7	0.44	6.1	19.5	3.3	2.3	0.9
Inductance		L	mH	220	50	102	34	42	12	89	408	60	48	19
Inertia (includes resolver feedback)		JM	kg-m2	3.23E-4		6.56E-4		9.29E-4		3.23E-4	6.56E-4		9.29E-4	
			lb-ft-sec2	2.38E-4		4.84E-4		6.85E-4		2.38E-4	4.84E-4		6.85E-4	
Pole Pairs				2		2		2		2	2		2	

Stainless Steel W(H)60x Series Motors

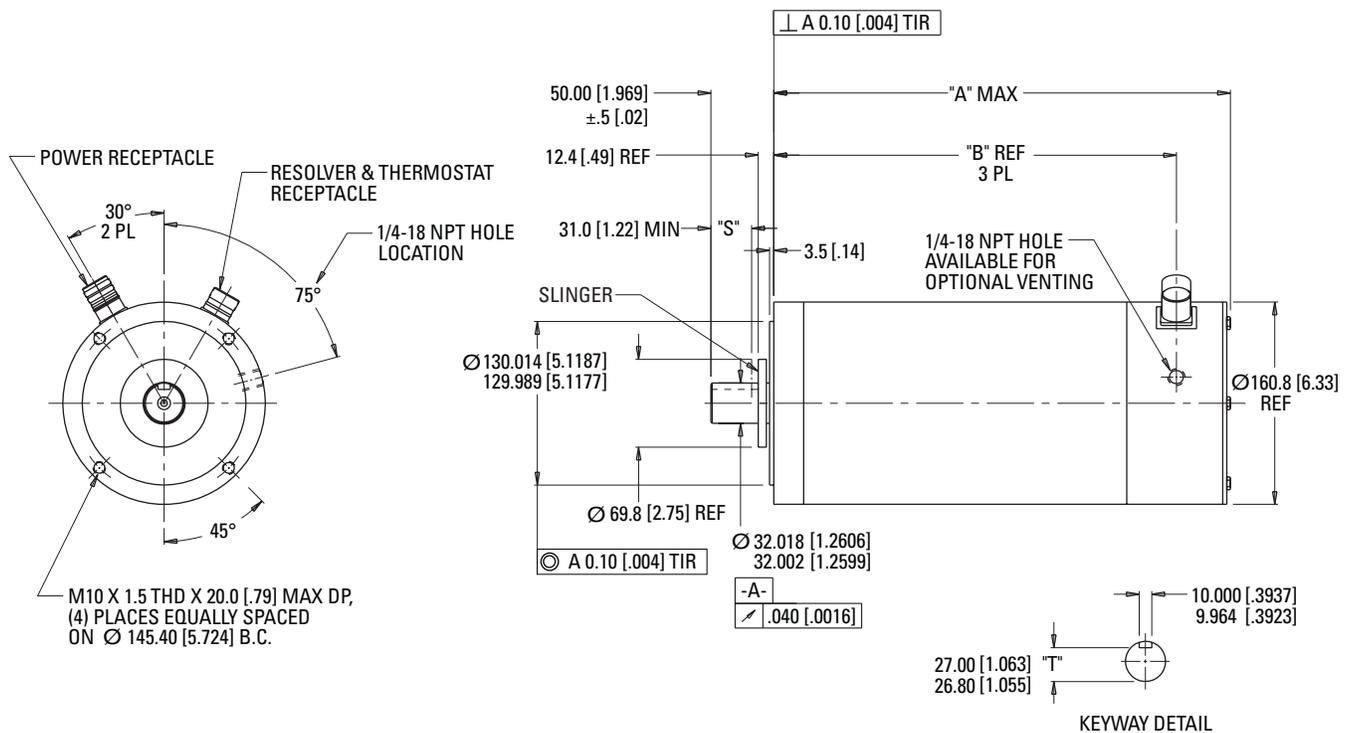
W(H)60x Family Dimensional Data

Shaft Mount Option	Units	Shaft Diameter	Shaft Length	Pilot Diameter	Mtg Hole B.C.	Mtg Hole	Keyway Width	"S" Keyway Length	"T" Shaft Diameter Over Keyway	Shaft Feature
AK	mm	32 ^{+0.018} / _{+0.002}	50 ± 0.5	130 ^{+0.014} / _{-0.011}	145.4	M10 X 1.5 THD	10 ^{+0.00} / _{-0.036}	31.0	27 ^{+0.00} / _{-0.20}	Keyway 10 x 10 x 31
AN	mm	32 ^{+0.018} / _{+0.002}	50 ± 0.5	130 ^{+0.014} / _{-0.011}	145.4	M10 X 1.5 THD	-	-	-	smooth

MODEL	Units	A MAX	"B"
W(H)606	mm	433.3	388.2
W(H)604	mm	364.7	319.6
W(H)602	mm	296.1	251.0

Note: Contact customer support for length of motor with brake.

W(H)60x Family Outline Drawings



W(H)60x Family Performance Data

				W-602		W-604		W-606		WH-602		WH-604			WH-606
Parameter	Tol	Symbol	Units	A	B	A	B	A	B	A	B	A	C	J	A
Max Rated DC Bus Voltage	Max	Vbus	Vdc	320		320		320		640		640			640
Continuous Torque (Stall) for ΔT winding = 100°C	Nom	TCS	Nm	11.5	11.2	19.6	19.6	29.0	27.2	9.5	9.7	16.1	16.1	16.0	23.0
			lb-ft	8.50	8.30	14.4	14.4	21.4	20.0	7.0	7.1	11.9	11.9	11.8	16.9
Continuous Current (Stall) for ΔT winding = 100°C	Nom	TCS	Arms	6.5	11.2	12.4	18.0	13.0	24.3	2.7	5.5	2.8	10.9	6.0	11.4
Max Mechanical Speed	Nom	NMAX	rpm	2300	4500	2500	3650	1800	3500	2200	4500	1300	5000	2450	4000
Peak Torque	Nom	TP	Nm	51.2	49.8	86.4	87.7	132	126	50.8	51.2	90.4	87.2	88.5	126
			lb-ft	37.7	36.7	63.7	64.7	97.2	93.0	37.5	37.7	66.7	64.4	65.3	92.8
Peak Current	Nom	IP	Arms	30.5	61.4	57.4	84.8	62.0	119	15.3	30.5	16.4	62.2	35.0	59.0
Rated Torque (speed)		Trtd	Nm	10.2	8.9	17.2	17.6	26.2	21.7						
			lb-ft	7.5	6.5	12.7	13.0	19.3	16.0						
Rated Speed		Nrtd	rpm	2000	4000	2150	3150	1550	3050						
Rated Power (speed)		Prtd	kW	2.1	3.7	3.90	5.8	4.3	6.90						
			hp	2.9	5.0	5.2	7.8	5.7	9.3						
Rated Torque (speed)		Trtd	Nm							7.7	6.8	13.3	9.8	11.5	16.1
			lb-ft							5.6	5.0	9.8	7.2	8.5	12.0
Rated Speed		Nrtd	rpm							2000	4000	1200	4500	2450	3300
Rated Power (speed)		Prtd	kW							1.6	2.8	1.6	4.6	3.0	5.6
			hp								2.1	3.8	2.2	6.2	4.0
Torque Constant	$\pm 10\%$	Kt	Nm/Arms	1.77	0.85	1.58	1.09	2.24	1.12	3.51	1.77	5.80	1.48	2.66	2.02
			lb-ft/Arms	1.30	0.63	1.17	0.80	1.65	0.83	2.59	1.30	4.28	1.09	1.96	1.49
Back EMF Constant	$\pm 10\%$	Ke	Vrms/Krpm	107	52	96	66	135	68	212	107	351	89.3	161	122
Resistance (line-line)	$\pm 10\%$	RM	ohm	1.55	0.38	0.51	0.23	0.50	0.14	7.8	1.9	7.8	0.50	1.0	0.50
Inductance		L	mH	32	9	13	6	16	3.8	128	32	168	12	36	14
Inertia (includes resolver feedback)		JM	kg-m2	1.03E-03		2.03E-03		3.04E-03		1.03E-03		2.03E-03			3.04E-03
			lb-ft-sec2	7.58E-04		1.50E-03		2.24E-03		7.58E-04		1.50E-03			2.24E-03
Pole Pairs				3		3		3		3		3			3

Stainless Steel W(H)80x Series Motors

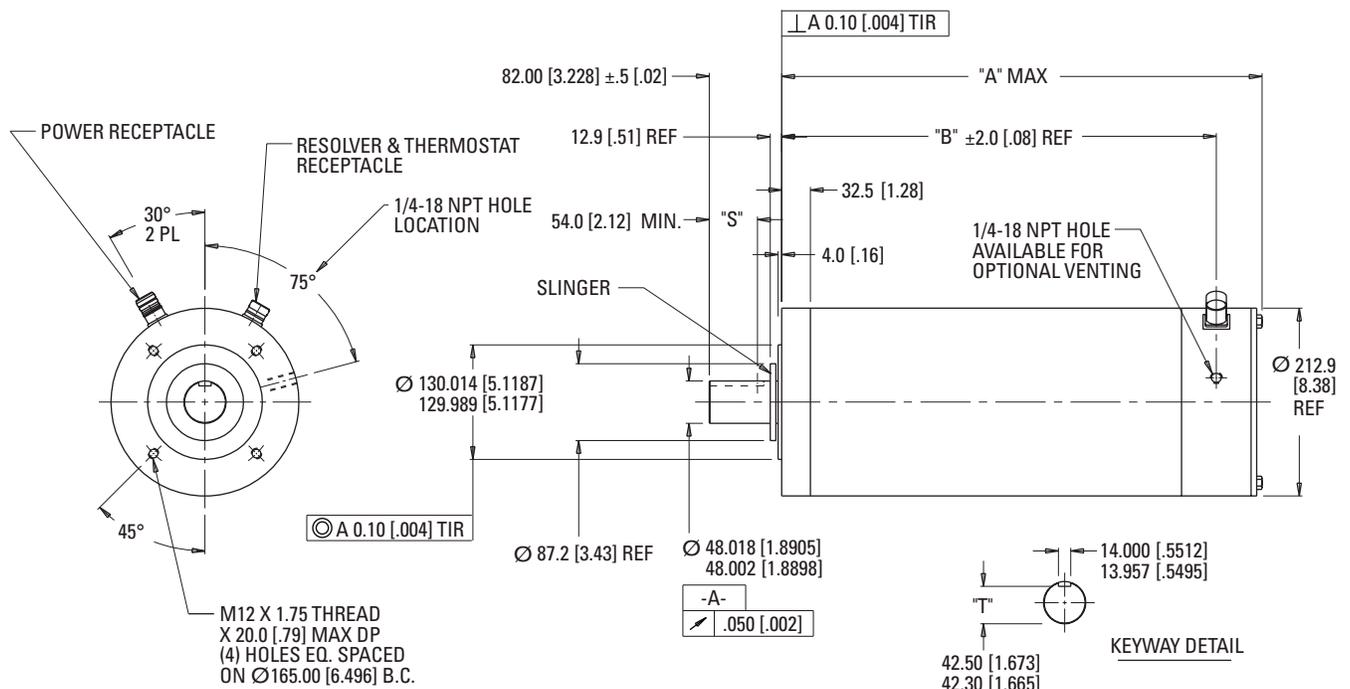
W(H)80x Family Dimensional Data

Shaft Mount Option	Units	Shaft Diameter	Shaft Length	Pilot Diameter	Mtg Hole B.C.	Mtg Hole	Keyway Width	"S" Keyway Length	"T" Shaft Diameter Over Keyway	Shaft Feature
AK	mm	48 ^{+0.018} / _{+0.002}	82 ± 0.5	130 ^{+0.014} / _{-0.011}	165.00	M12 X 1.75 THD	14 ^{+0.00} / _{-0.043}	54.0	42.50 ^{+0.00} / _{-0.20}	Keyway 14 x 14 x 54
AN	mm	48 ^{+0.018} / _{+0.002}	82 ± 0.5	130 ^{+0.014} / _{-0.011}	165.00	M12 X 1.75 THD	-	-	-	smooth

MODEL	Units	A MAX	"B"
WH808	mm	634.4	581.8
W(H)806	mm	544.9	492.3
W(H)804	mm	455.4	402.8
W(H)802	mm	365.9	313.3

Note: Contact customer support for length of motor with brake.

W(H)80x Family Outline Drawings



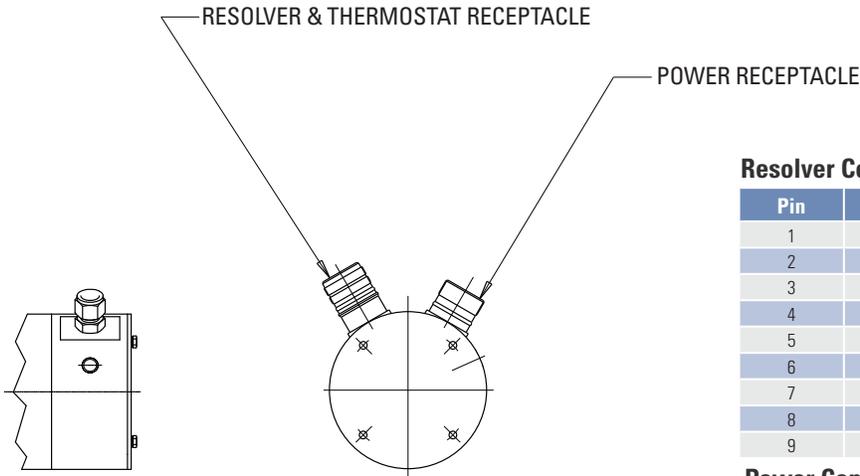
Dimensions in mm [in]

W(H)80x Family Performance Data

				W-802	W-804		W-806		WH-802		WH-804		WH-806		WH-808
Parameter	Tol	Symbol	Units	A	A	B	A	B	A	D	A	B	A	C	B
Max Rated DC Bus Voltage	Max	Vbus	Vdc	320	320		320		640		640		640		640
Continuous Torque (Stall) for ΔT winding = 100°C	Nom	TCS	Nm	27.1	51.1	51.1	67.8	69.1	22.9	22.4	42.8	43.8	60.8	60.4	80.8
			lb-ft	20.0	37.7	37.7	50.0	51.0	16.9	16.5	31.6	32.3	44.9	44.5	59.6
Continuous Current (Stall) for ΔT winding = 100°C	Nom	TCS	Arms	16.0	22.7	31.0	30.7	58.0	4.7	11.7	25.1	13.0	14.2	25.8	34.4
Max Mechanical Speed	Nom	NMAX	rpm	2400	1800	2500	1800	3200	1600	4000	3500	2300	1800	4000	3000
Peak Torque	Nom	TP	Nm	130	232	230	323	327	123	117	232	231	323	322	390
			lb-ft	96	171	170	238	241.0	90.7	85.9	171	170	238	238	288
Peak Current	Nom	IP	Arms	81.0	109	147	154	291	26.6	64.0	143	72.0	79.2	145	175
Rated Torque (speed)		Trtd	Nm	24.6	44.7	43.0	58.3	36.2							
			lb-ft	18.1	33.0	31.7	43.0	26.7							
Rated Speed		Nrdt	rpm	2000	1500	2000	1550	3000							
Rated Power (speed)		Prtd	kW	5.1	7.0	9.0	9.5	11.3							
			hp	6.9	9.4	12.1	12.7	15.2							
Rated Torque (speed)		Trtd	Nm						17.5	17.5	24.5	34.6	47.2	24.8	42.9
			lb-ft						12.9	12.9	18.1	25.5	34.8	18.3	31.7
Rated Speed		Nrdt	rpm						1200	3000	3000	2000	1500	3000	3000
Rated Power (speed)		Prtd	kW						2.2	5.5	7.7	7.2	7.4	7.8	13.5
			hp						2.9	7.4	10.3	9.7	9.9	10.4	18.1
Torque Constant	±10%	Kt	Nm/Arms	1.69	2.25	1.65	2.21	1.18	4.87	1.92	1.71	3.37	4.29	2.34	2.35
			lb-ft/Arms	1.25	1.66	1.21	1.63	0.87	3.59	1.41	1.26	2.49	3.16	1.73	1.73
Back EMF Constant	±10%	Ke	Vrms/Krpm	102	136	100	134	71	294	116	103	204	260	142	142
Resistance (line-line)	±10%	RM	ohm	0.36	0.23	0.13	0.13	0.034	1.5	0.6	0.2	0.6	0.6	0.2	0.1
Inductance		L	mH	16	13	7	8	2.1	134	21	8	29	30	9	5
Inertia (includes resolver feedback)		JM	kg-m2	4.88E-3	8.40E-3		1.26E-2		4.88E-3		8.41E-3		1.26E-2		1.68E-2
			lb-ft-sec2	3.60E-3	6.20E-3		9.30E-3		3.60E-3		6.20E-3		9.30E-3		1.24E-2
Pole Pairs				3	3		3		3		3		3		3

Connector Options

“B” - Motor Mounted Connectors Option



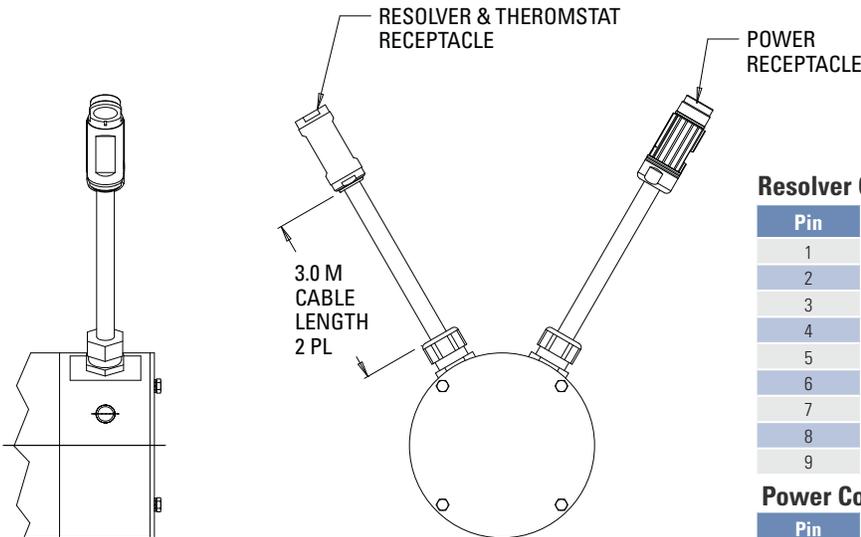
Resolver Connector Pin Out

Pin	Function	Color
1	S3 (SIN HI)	Yellow/Black
2	S1 (SIN LO)-	Yellow
3	S2 (COS HI)	Green/Black
4	S4 (COS LO)	Green
5	R2 (REF HI)	White/Black
6	R1 (REF LO)	White
7	N/C	
8	Thermostat	Violet
9	Thermostat	Violet/White

Power Connector Pin Out

Pin	Function	Color
1	Phase C	White
2	Case Ground	Green/Yellow
3	Phase A	Brown
4	Phase B	Red

“C” - Three-Meter Cables with Connectors Option



Resolver Connector Pin Out

Pin	Function	Color
1	S3 (SIN HI)	Yellow/Black
2	S1 (SIN LO)-	Yellow
3	S2 (COS HI)	Green/Black
4	S4 (COS LO)	Green
5	R2 (REF HI)	White/Black
6	R1 (REF LO)	White
7	N/C	
8	Thermostat	Violet
9	Thermostat	Violet/White

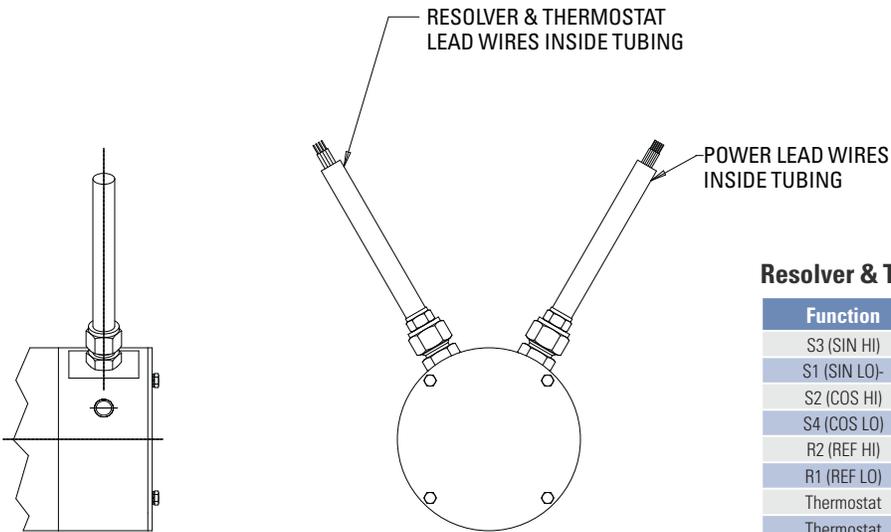
Power Connector Pin Out

Pin	Function	Color
1	Phase C	White
2	Case Ground	Green/Yellow
3	Phase A	Brown
4	Phase B	Red

Note: Cables meet IP69 at the motor end and IP67 at the connector end.

Connector Options

"L3 or L6" - Tubing Covered Flying Leads



Resolver & Thermostat Leads

Function	Wire Color
S3 (SIN HI)	Black
S1 (SIN LO)-	Red
S2 (COS HI)	Yellow
S4 (COS LO)	Blue
R2 (REF HI)	Yellow/White
R1 (REF LO)	Red/White
Thermostat	Yellow
Thermostat	Yellow

Power Leads

Function	Wire Color
Phase C	White
Case Ground	Green/Yellow
Phase A	Brown
Phase B	Red

Model Nomenclature

Stainless Steel Washdown Motor Series

W 4 02 A - AN L3 N R - 00

W Series

W = 230 AC Motor
WH = 480 AC Motor

Motor Frame Size

1 = 3.24 Inch Round Frame
2 = 4.24 Inch Round Frame
4 = 5.24 Inch Round Frame
6 = 6.33 Inch Round Frame
8 = 8.33 Inch Round Frame

Rotor Stack Length

02
04
06
08

Winding Type

A, B, C, D...

Shaft / Mount

AK = Standard Mount, Open Keyway
AN = Standard Mount, Smooth Shaft

Special Options

00 = Standard

Feedback Device

R = Resolver
AA = Single-turn absolute Biss Sine Encoder (2048 LPR)
AB = Multi-turn absolute Sine Encoder (2048 LPR)
DA = Single-turn EnDat sine encoder
DB = Multi-turn EnDat sine encoder

Brake

N = No Brake
2 = 24 Vdc Brake

Connection

L3 = Tubing Covered 3 Meter Leads
L6 = Tubing Covered 6 Meter Leads
C = 3 Meter Cables w/ Connectors
B = Motor Mounted Connectors

The Stainless Steel Washdown Series is one family of many motors offered by Kollmorgen. If you seek higher-performance, greater torque in a smaller package, or options not listed above, contact Kollmorgen to discuss the AKM and Goldline servo motor families.

AquaTRUE Hygienic IP96K Gearhead

The perfect gearhead to mate to the Stainless Steel W Series...

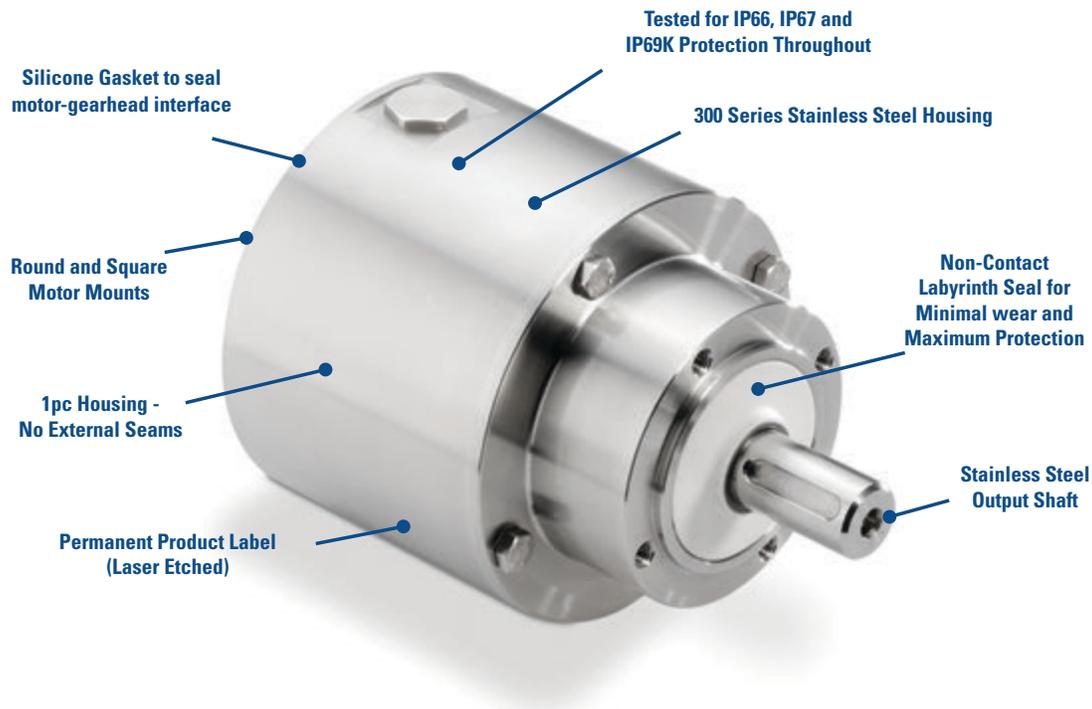
Micron's new AquaTRUE gearhead combines the high performance and torque capacity of Micron's True Planetary gearheads with features specifically designed to meet the strict requirements of applications such as food and beverage handling, packaging and dispensing. The AquaTRUE's IP66/IP67 and IP69K protection is able to handle caustic cleaning chemicals as well as high pressure washdown. Until now, manufacturers have been unable to use gearheads in many applications involving harsh environments because there was not a product available that met those needs. The AquaTRUE is engineered to be placed anywhere in the application's design, regardless of environmental factors. This eliminates the cost of additional components such as enclosers, shielding or mechanical transmissions.

The gearhead's 304 stainless steel housing eliminates the concern for rust or any type of corrosion. The AquaTRUE has a laser etched permanent product label and a smooth, round external housing that is designed without any external seams or corners for bacteria to collect. This makes the AquaTRUE very easy to clean and a perfect fit in any washdown environment.

- Frame Sizes: 60mm, 80mm, 120mm, 160mm
- Precision: 13 arc-min max
- Torque Capacity: up to 876 Nm
- Ratio Availability: 3:1 to 10:1 (single stage)

Features and Benefits

- Round Housing
- No External Seams
- 300 Series Stainless Steel
- IP66/IP67 and IP69K Protection on both the input and output
- NSF/ANSI 169 Certification
- No corners or areas for bacteria to collect
- No areas of ingress
- Corrosion Resistance
- Can handle high pressure washdown



Kollmorgen Offers Solutions for Food, Beverage and Pharmaceutical Industries

The Perfect Mix of Performance and Hygiene for Any Industry or Washdown Application.

Kollmorgen's family of high torque density servomotors provides the widest range of features and options in the industry. Our robust selection allows you to select exactly the right motor for your application, without having to over spec and over pay.

Industry regulations place numerous and often stringent demands on system manufacturers. However, depending on your application, the specific requirements for your motion components can range from simple to complex.

It costs too much money to put an over specified motor in a washdown application. And it takes up too much time and effort to modify a housing for a hygienic application. Why pay for this approach or any other motor that doesn't perform the way you need it to. With Kollmorgen's diverse selection, you don't have to settle for just any motor. You can select the exact motor for your application and get the job done right, achieving optimal results.

Whether you're looking to put your motor near a wet area or plan to expose it to high pressure washdown, the Kollmorgen family of servomotors provides a right fit for your specific application. You can select from the robust line-up of AKM™, including the exclusive AKM™ Washdown, AKM™ Food Grade models and Stainless Steel W series - all with a proven track record for dependability, superior functionality and high-performance.

- Industry-leading performance
- Certifications ranging from basic IP65 up to IP69K and FDA
- Thousands of model options, STANDARD!
- Severe washdown options
- All stainless options (up to 300 and 17-4PH grade)
- Mounts seamlessly with Micron® AquaTrue™ wash-down planetary gearbox



IP69K
All Stainless, Round

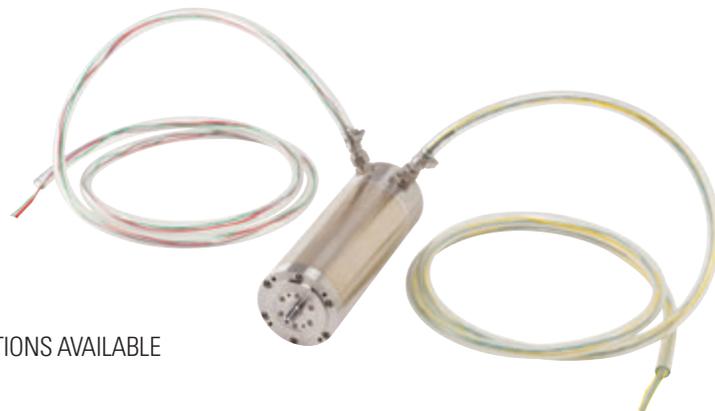


IP67
Washdown & Food Versions Available

Kollmorgen Has The Solution To Meet Your Specific Application Needs

KOLLMORGEN HAS THE SOLUTION TO MEET YOUR SPECIFIC APPLICATION NEEDS

Specifications and Options	AKM	AKM Washdown	AKM Food	AKMH	Stainless Steel S
Stainless Steel Housing				X	X
Stainless Steel Shaft	X	X	X	X	X
Food Grade Epoxy Paint			X		
Needle Printed Nameplate		X	X		
Laser Etched Nameplate					X
Laser Annealed Nameplate				X	
Coated Laminations					X
Encapsulated Windings	X	X	X	X	
Pressure Compensation Diaphragm					X
Food Grade Bearing Grease			X	X	
Oil Filled					X
Round Housing				X	X
Ingress Protection (IP)	IP65	IP67	IP67	IP69K	Submersible To Depths Of 20,000 Ft
Agency Approvals	UL,CE	UL, CE	UL, CE	UL, CE	
Continuous Stall Torque (Nm)	.19-140	.48-24.5	.48-24.5	.4-22	1-80
Feedback Types	Multiple	Multiple	Multiple	Multiple	Multiple
Optional Holding Brake	X	X	X	X	X
Relative Price	\$	\$+	\$++	\$\$	\$\$\$\$



CO-ENGINEERED SOLUTIONS AVAILABLE

About Kollmorgen

Kollmorgen is a leading provider of motion systems and components for machine builders. Through world-class knowledge in motion, industry-leading quality and deep expertise in linking and integrating standard and custom products, Kollmorgen delivers breakthrough solutions that are unmatched in performance, reliability and ease-of-use, giving machine builders an irrefutable marketplace advantage.

For assistance with your application needs in North America, contact us at: 540-633-3545, support@kollmorgen.com or visit www.kollmorgen.com for a global contact list.

- Application Centers
- Global Design & Manufacturing
- Global Manufacturing



KOLLMORGEN®

Because Motion Matters™

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