Tolomatic™
EXCELLENCE *IN MOTION*

ServoWeld™ Actuators

GSWA MODELS

FOR RESISTANCE SPOT WELDING

ServoWeld GSWA

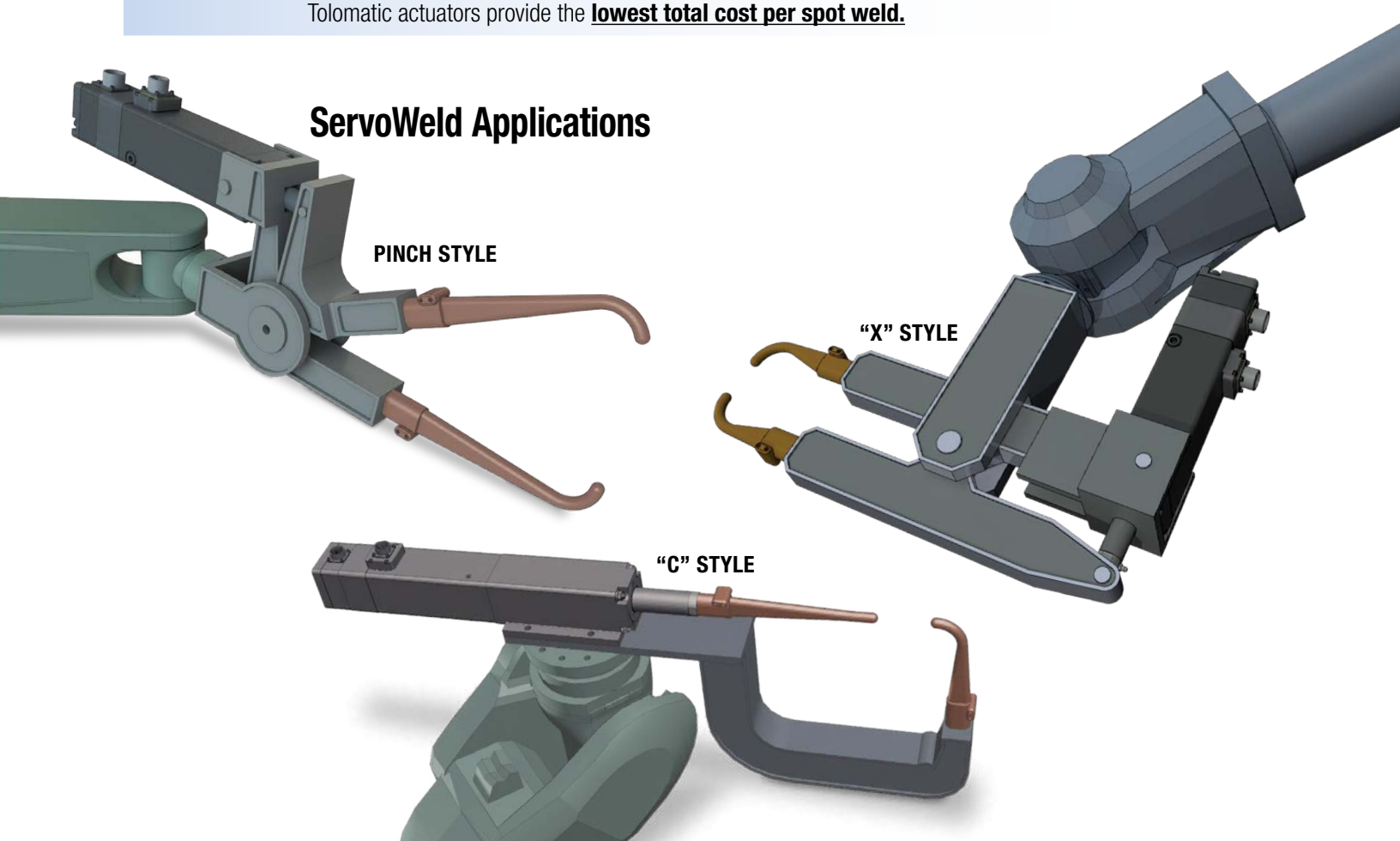
Tolomatic is the world's leading manufacturer of integrated servo actuators for resistance spot welding used by the world's top weld gun OEM's and numerous global vehicle manufacturers.

Superior Integrated Servo Motor Actuators

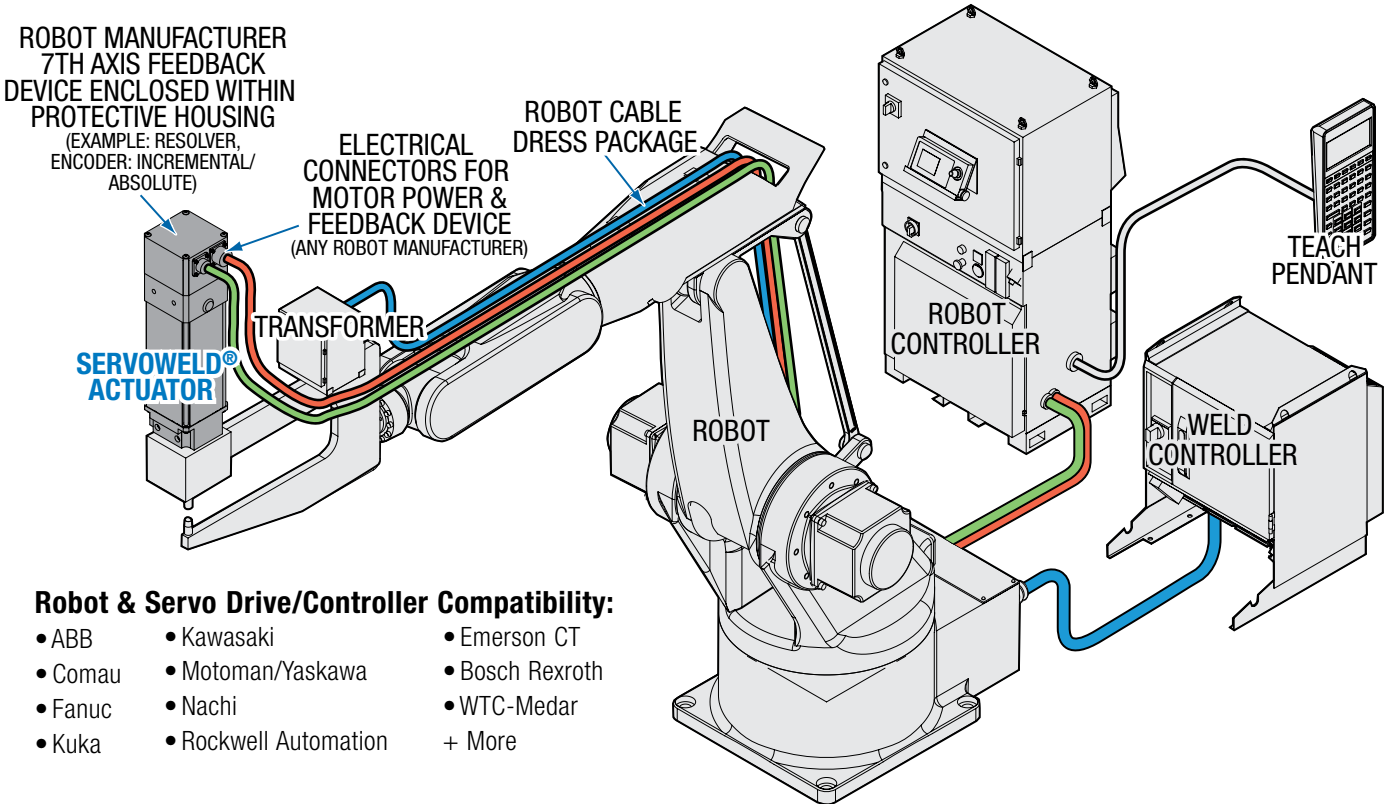
Tolomatic's ServoWeld family of integrated servo actuators are designed for best-in-class performance with the factors that are most important for resistance spot welding gun applications.

NUMBER OF WELDS/ PRODUCT LIFE	Tolomatic's superior roller screw design has the **highest dynamic load rating for more welds** than any competitive technology (other roller screws, ball screw, pneumatic).
FORCE REPEATABILITY	Skewed winding designed for welding minimizes motor cogging and **provides industry best actuator force repeatability:** • ±3 % Over the Lifetime of the Actuator
EFFICIENCY	All elements of actuator (winding, screw, rod scraper, bearings) are designed to optimize the efficiency of the actuator system and provide the **most energy efficient solution on the market.**
WELDS/ MINUTE	All elements of the actuator (winding, screw, rod scraper, bearings) are designed to last and run as cool as possible in welding applications, with the ability to add water cooling as an option. This means **more welds per minute than any competitive technology** (other roller screws, ball screw, pneumatic).
WEIGHT	Tolomatic integrated servo actuators minimize weight when designed into the weldgun. Additionally, Tolomatic can customize actuators for a specific weldgun applications to provide **industry leading light weight designs.**
LIFETIME COST	By building the longest lasting, most efficient and highest weld per minute actuators on the market, Tolomatic actuators provide the **lowest total cost per spot weld.**

ServoWeld Applications



Typical Robotic ServoWeld Installation

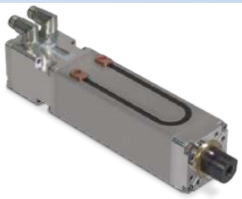


Robot & Servo Drive/Controller Compatibility:

- ABB
- Comau
- Fanuc
- Kuka
- Kawasaki
- Motoman/Yaskawa
- Nachi
- Rockwell Automation
- Emerson CT
- Bosch Rexroth
- WTC-Medar

+ More

Tolomatic Offers the Broadest, Most Capable Family of Integrated Servo Actuators for Resistance Spot Welding

Model:	GSWA	SWA/SWB	CSWX
			
Number of Welds[1] (millions):	20+	20+ *(10+ SWB)*	30+ *(20+ CSW)*
Re-lubrication without Disassembly:	Yes[4]	Yes	Yes
Peak Force:	24.5 kN *[5,500 lbf]*	24.0 kN *[5,395 lbf] SWA* 22.0 kN *[4,950 lbf] SWB*	18.0 kN *[4,047 lbf] CSWX* 15.6 kN *[3,500 lbf] CSW*
Actuator Output Force[2] **(Lifetime)** Repeatability:	±3%	±3% *(±5% SWB)*	±3%
Weight (size 33, 3)[3] **(size 44, 4)**[3]:	8.3 kg *[18.3 lb]* 13.8 kg *[30.4 lb]*	7.2 kg *[15.9 lb]* 14.2 kg *[31.2 lb]*	min: 10.2 kg *[22.6 lb]*
Water Cooling:	Optional	Optional	Optional
Manual Override:	Optional	No	Optional
Full Force Direction:	Push and Pull	Push	Push and Pull

[1] Based on properly lubricated ServoWeld unit used as recommended in user manual. Weld schedule, tip force, environment and lubrication are factors in the total number of welds achievable with ServoWeld actuators.

[2] At weld force [3] Weight varies with choice of feedback device and mounting options [4] Some exceptions, see GSWA user manual

GSWA33 INTEGRATED MOTOR ACTUATOR

ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

Endurance Technology features are designed for maximum durability to provide extended service life.

ADVANCED SCREW TECHNOLOGY

- Roller screws provide the highest thrust and life ratings available

SKEWED MOTOR WINDINGS

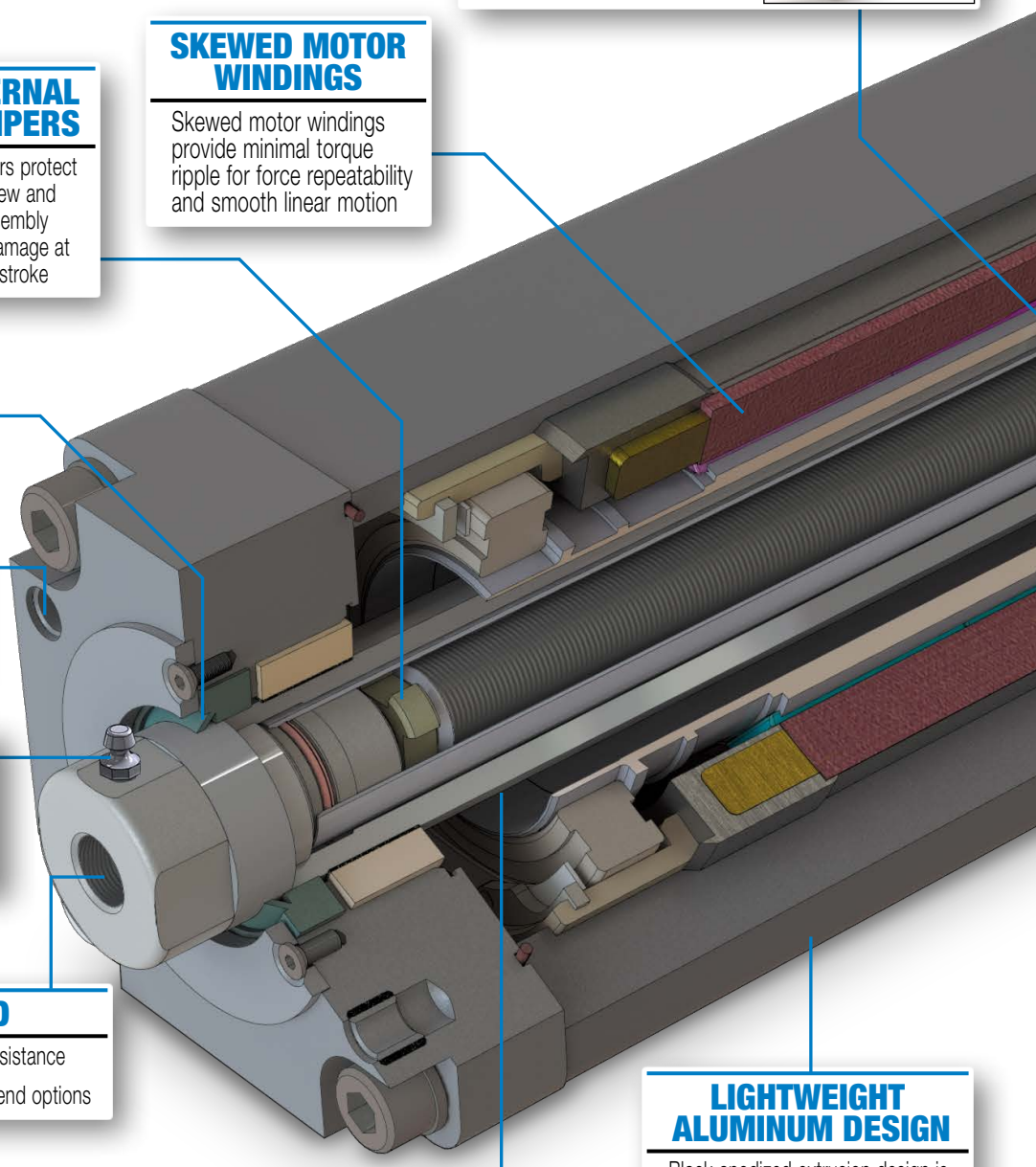
Skewed motor windings provide minimal torque ripple for force repeatability and smooth linear motion

INTERNAL BUMPERS

Bumpers protect the screw and nut assembly from damage at end of stroke

ROD WIPER WITH SCRAPER

Prevents contaminants from entering the actuator for extended life



INTEGRAL MOUNTING

Four threaded holes on front face are available for direct mounting or addition of customized options°

GREASE PORT

- Patented screw re-lubrication system provides extended screw life
- Convenient lubrication without disassembly

THREADED ROD END

- Zinc plated steel construction for corrosion resistance
- Provides a common interface to multiple rod end options

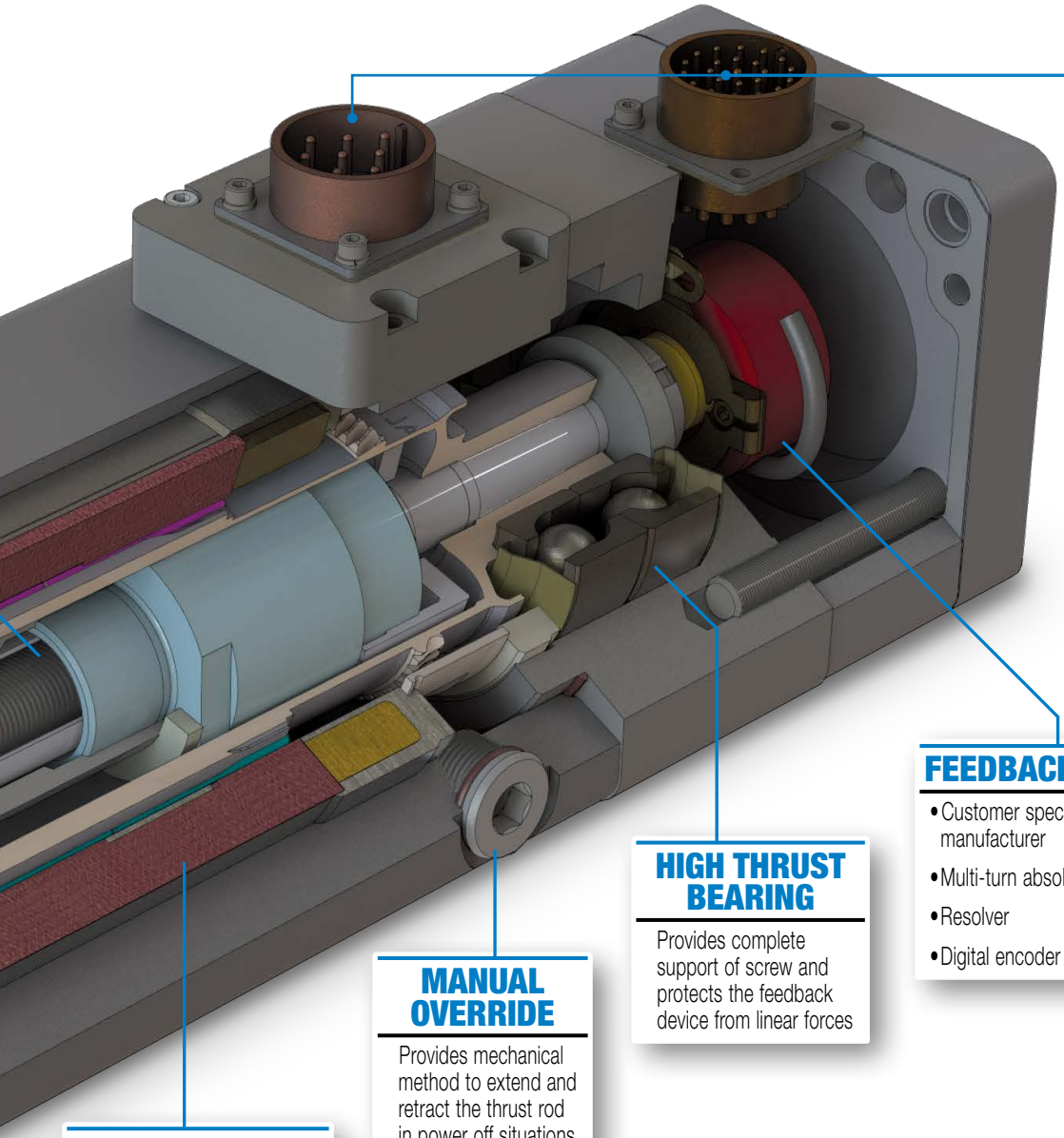
LIGHTWEIGHT ALUMINUM DESIGN

Black anodized extrusion design is optimized for rigidity and strength

THRUST TUBE

- Steel thrust tube supports extremely high force capabilities
- Salt bath nitride treatment provides excellent corrosion resistance, surface hardness and is very resistant to adherence of weld slag, water and other potential contaminants

...MAXIMUM DURABILITY



ROBOT & DRIVE/ CONTROLLER COMPATIBILITY

Compatible feedback, connector(s) and wiring to match the following robot & drive/controller manufacturers' cable dress packages

YOUR CHOICE:

+ ABB
+ Comau
+ Fanuc
+ Kawasaki
+ Kuka
+ Motoman/Yaskawa
+ Nachi
+ Rockwell Automation
+ Bosch-Rexroth
+ Emerson CT
+ WTC-Medar
& more

FEEDBACK CHOICES

- Customer specified to robot manufacturer
- Multi-turn absolute encoder
- Resolver
- Digital encoder

HIGH THRUST BEARING

Provides complete support of screw and protects the feedback device from linear forces

MANUAL OVERRIDE

Provides mechanical method to extend and retract the thrust rod in power off situations

MULTIPLE MOTOR WINDINGS

YOU CAN CHOOSE:

- 460VAC or 230VAC rated windings potted directly into actuator housing
- Integral thermal switch for over temperature protection

IP65

IP65 rating protects actuator from ingress of water, weld slag and other debris (static)

OPTIONS

BRAKE • Spring held / 24V electrically released
WATER COOLING
MANUAL OVERRIDE
LIGHT WEIGHT
REAR TRUNNION MOUNTING

GSWA33, GUIDED INTEGRATED MOTOR ACTUATOR

ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

Endurance Technology features are designed for maximum durability to provide extended service life.

ANTI-ROTATE ASSEMBLY

- Fully enclosed to protect components from harsh environments
- Provides additional side loading support

ROBUST BUSHINGS

- Large bushings provide additional side loading support for the thrust tube protecting the screw assembly
- Eliminates external guide on RSW chassis
- Protects guided mechanism in RSW environment

THRUST TUBE

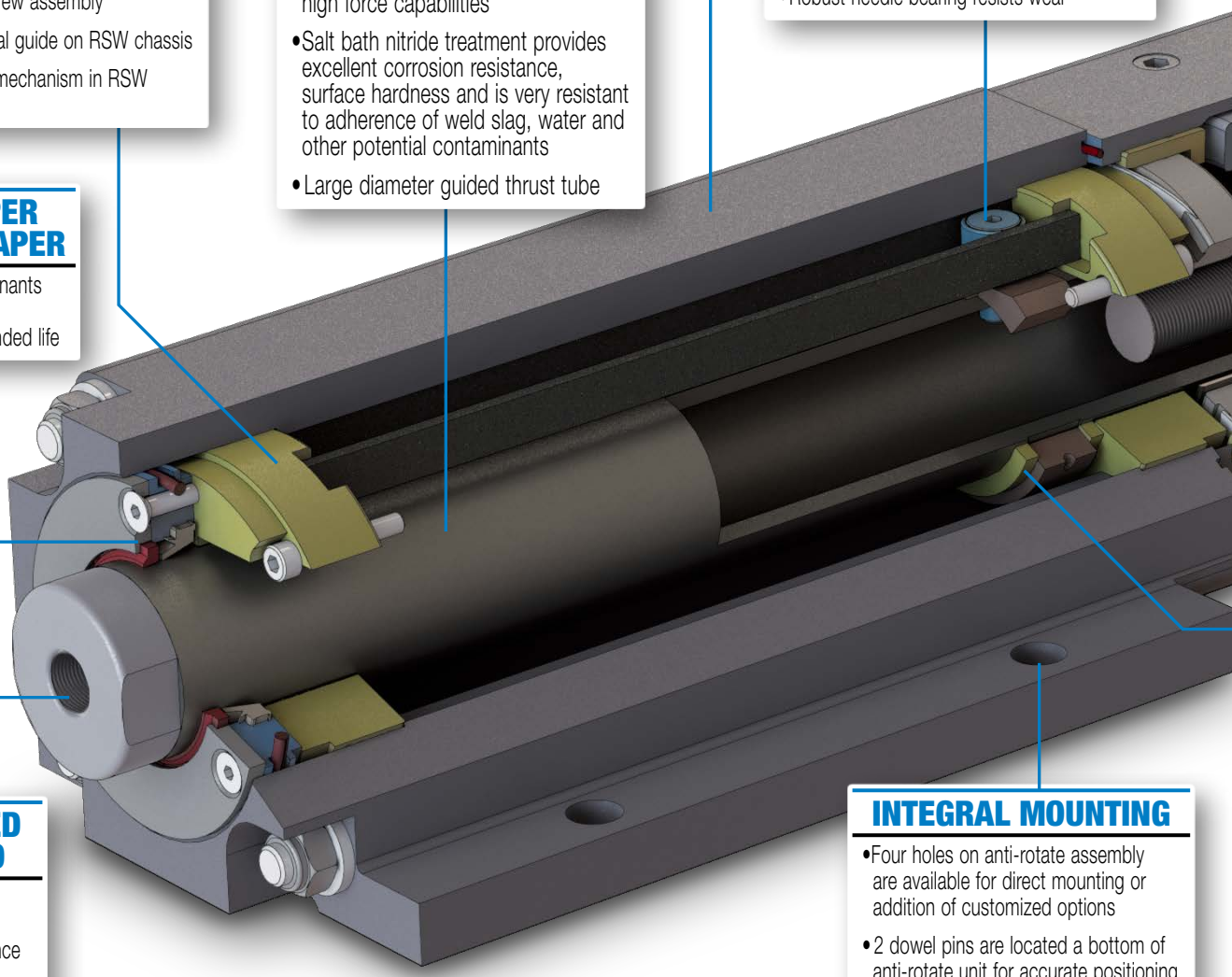
- Steel thrust tube supports extremely high force capabilities
- Salt bath nitride treatment provides excellent corrosion resistance, surface hardness and is very resistant to adherence of weld slag, water and other potential contaminants
- Large diameter guided thrust tube

ANTI-ROTATE MECHANISM

- Far more efficient than sliding designs
- Robust needle bearing resists wear

ROD WIPER WITH SCRAPER

Prevents contaminants from entering the actuator for extended life



THREADED ROD END

- Zinc plated steel construction for corrosion resistance
- Provides a common interface to multiple rod end options

INTEGRAL MOUNTING

- Four holes on anti-rotate assembly are available for direct mounting or addition of customized options
- 2 dowel pins are located a bottom of anti-rotate unit for accurate positioning

MULTIPLE MOTOR WINDINGS

YOU CAN CHOOSE:

- 460VAC or 230VAC rated windings potted directly into actuator housing
- Integral thermal switch for over temperature protection

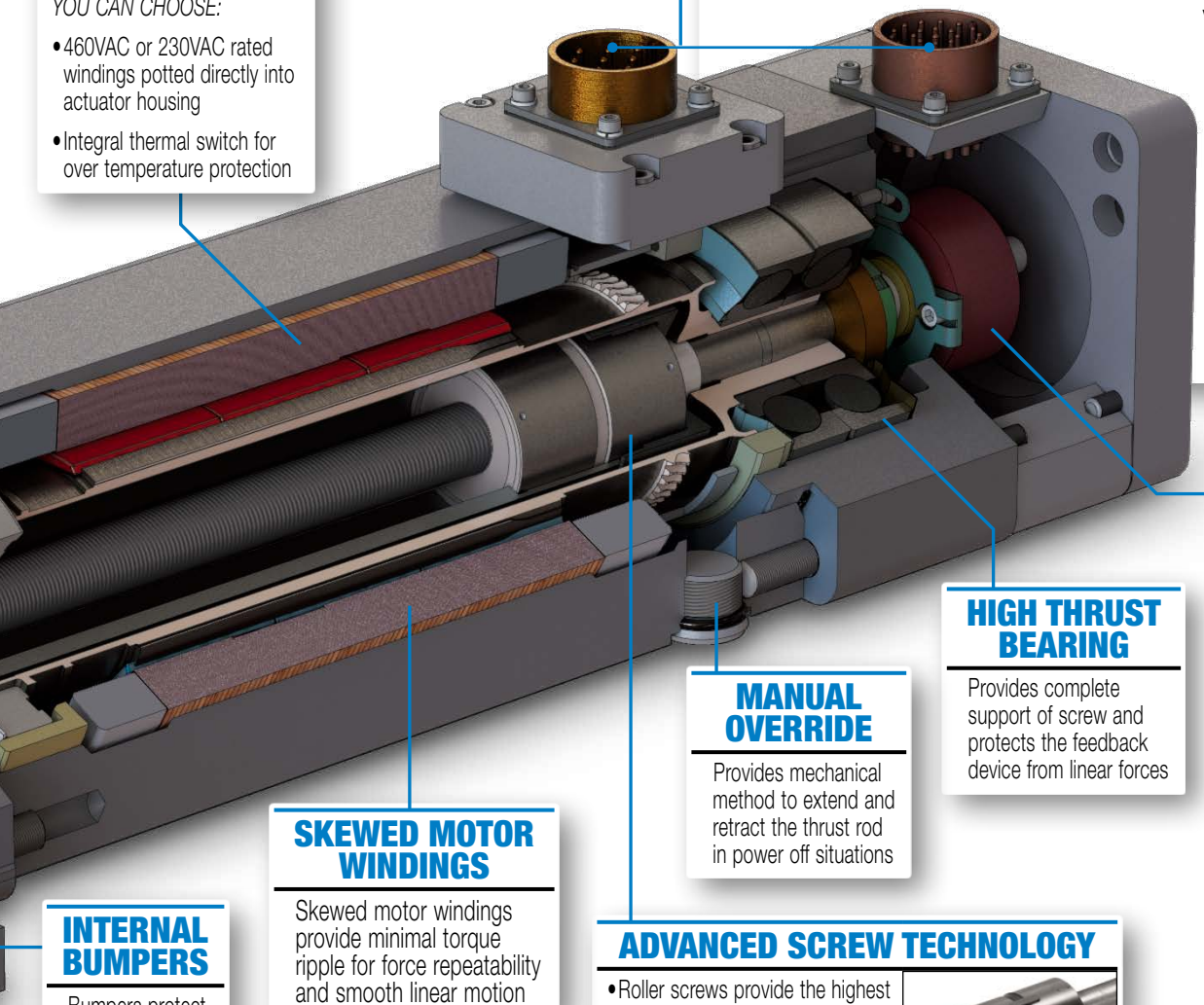
ROBOT & DRIVE/CONTROLLER COMPATIBILITY

Compatible feedback, connector(s) and wiring to match the following robot & drive/controller manufacturers' cable dress packages

YOUR CHOICE:

+ ABB
+ Comau
+ Fanuc
+ Kawasaki
+ Kuka
+ Motoman/Yaskawa
+ Nachi
+ Rockwell Automation
+ Bosch-Rexroth
+ Emerson CT
+ WTC-Medar

& more



FEEDBACK CHOICES

- Customer specified to robot manufacturer
- Multi-turn absolute encoder
- Resolver
- Digital encoder

HIGH THRUST BEARING

Provides complete support of screw and protects the feedback device from linear forces

MANUAL OVERRIDE

Provides mechanical method to extend and retract the thrust rod in power off situations

SKEWED MOTOR WINDINGS

Skewed motor windings provide minimal torque ripple for force repeatability and smooth linear motion

INTERNAL BUMPERS

Bumpers protect the screw and nut assembly from damage at end of stroke

ADVANCED SCREW TECHNOLOGY

- Roller screws provide the highest thrust and life ratings available

IP65

IP65 rating protects actuator from ingress of water, weld slag and other debris (static)

OPTIONS

BRAKE • Spring held / 24V electrically released

WATER COOLING

REAR TRUNNION MOUNTING

GSWA 04 & 44 INTEGRATED MOTOR ACTUATOR

ENDURANCE TECHNOLOGY℠

A Tolomatic Design Principle

Endurance Technology features are designed for maximum durability to provide extended service life.

Pictured below is the GSWA04. The GSWA44 has similar operating characteristics to the GSWA04, except the GSWA44 can be used on longer stroke applications and applications requiring weld force on retract. The GSWA44 does not have the manual override feature.

MULTIPLE MOTOR WINDINGS

YOU CAN CHOOSE:

- 460VAC or 230VAC rated windings potted directly into actuator housing
- Integral thermal switch for over temperature protection

LIGHTWEIGHT ALUMINUM DESIGN

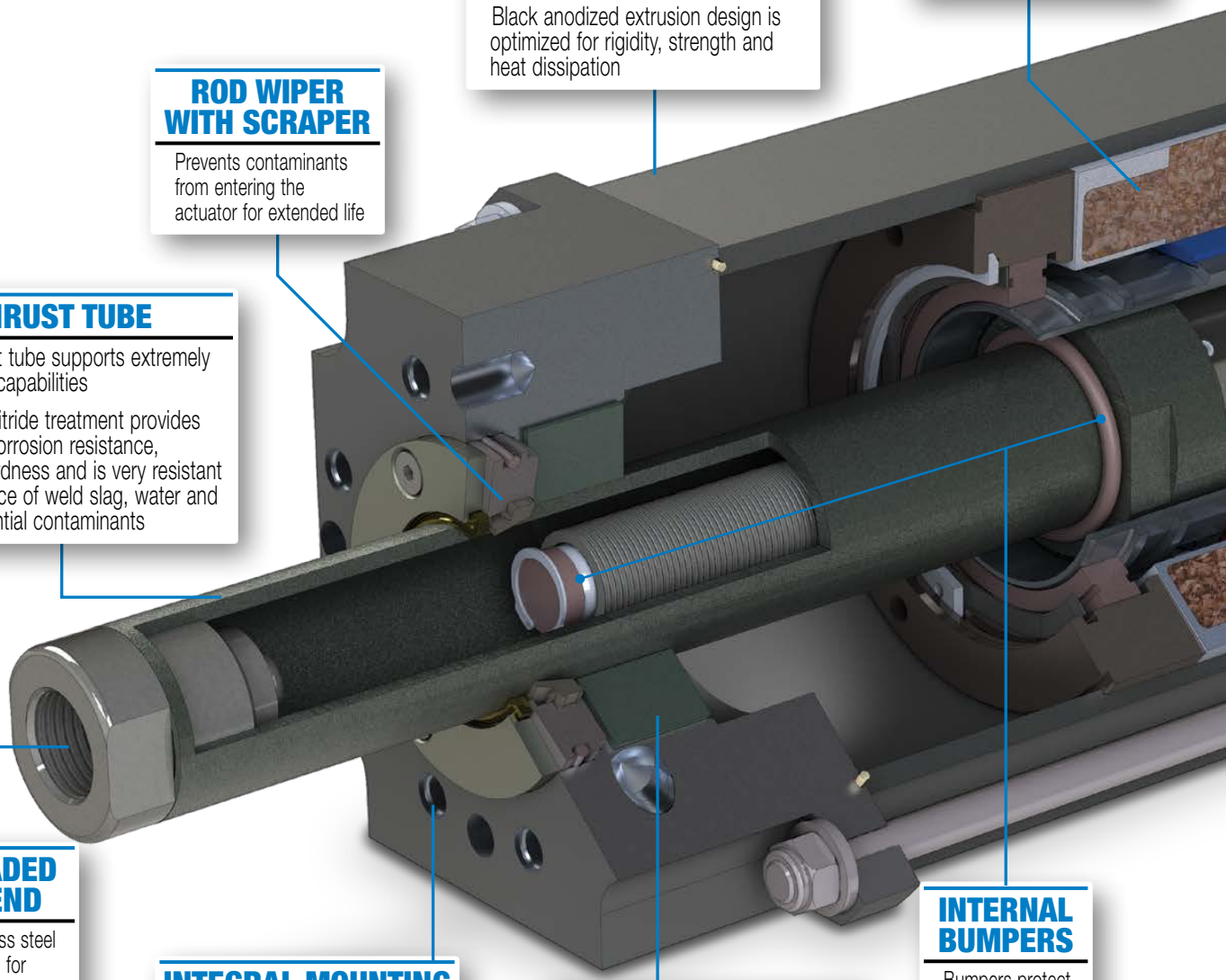
Black anodized extrusion design is optimized for rigidity, strength and heat dissipation

ROD WIPER WITH SCRAPER

Prevents contaminants from entering the actuator for extended life

THRUST TUBE

- Steel thrust tube supports extremely high force capabilities
- Salt bath nitride treatment provides excellent corrosion resistance, surface hardness and is very resistant to adherence of weld slag, water and other potential contaminants



THREADED ROD END

- Solid stainless steel construction for corrosion resistance
- Provides a common interface to multiple rod end options

INTEGRAL MOUNTING

Threaded holes on front face are available for direct mounting or addition of customized options

ROBUST BUSHINGS

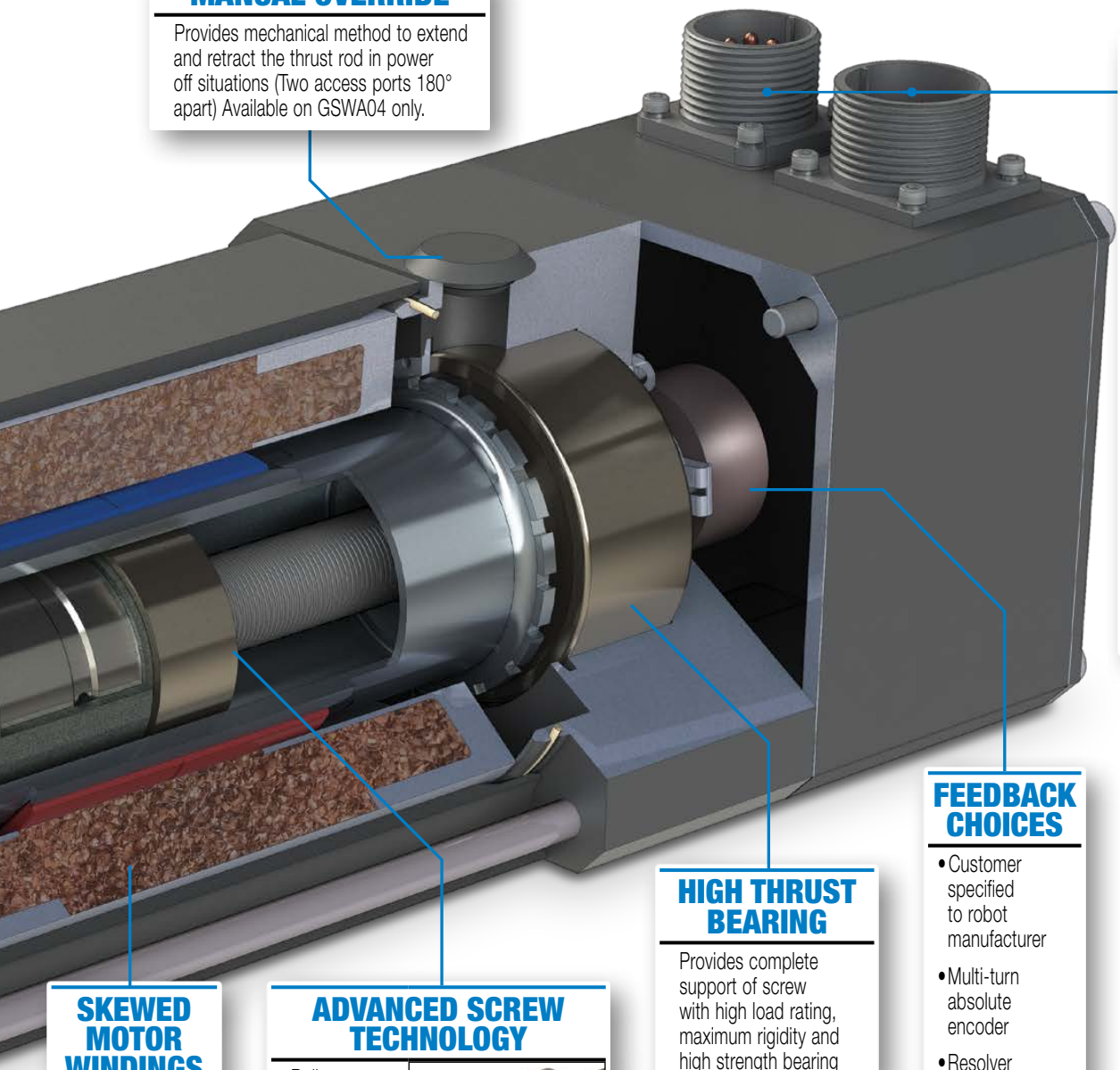
Supports the thrust tube and nut assembly through entire stroke length

INTERNAL BUMPERS

Bumpers protect the screw and nut assembly from damage at end of stroke

MANUAL OVERRIDE

Provides mechanical method to extend and retract the thrust rod in power off situations (Two access ports 180° apart) Available on GSWA04 only.



ROBOT & DRIVE/ CONTROLLER COMPATIBILITY

Compatible feedback, connector(s) and wiring to match the following robot & drive/controller manufacturers' cable dress packages

YOUR CHOICE:

+ ABB
+ Comau
+ Fanuc
+ Kawasaki
+ Kuka
+ Motoman/Yaskawa
+ Nachi
+ Rockwell Automation
+ Bosch-Rexroth
+ Emerson CT
+ WTC-Medar
& more

FEEDBACK CHOICES

- Customer specified to robot manufacturer
- Multi-turn absolute encoder
- Resolver
- Digital encoder

HIGH THRUST BEARING

Provides complete support of screw with high load rating, maximum rigidity and high strength bearing

SKEWED MOTOR WINDINGS

Skewed motor windings provide minimal torque ripple for force repeatability and smooth linear motion

ADVANCED SCREW TECHNOLOGY

- Roller screws provide the highest thrust and life ratings available

IP65

IP65 rating protects actuator from ingress of water, weld slag and other debris (static)

OPTIONS

WATER COOLING
REAR TRUNNION MOUNTING

ServoWeld - Integrated Motor Actuator

Table 1: Performance & Mechanical Specifications:

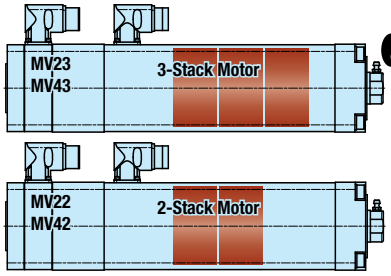
		GSWA33, GSWA33-GUIDED			GSWA44, GSWA04						GSWA55	
		MV23/43			MV22/42		MV23/43					
SIZE	in	3.3			4.4						5.6	
	mm	*83.0*			*111*						*142*	
NUT/ SCREW		**RN04**	**RN05**	**RN10**	**RN05**	**RN10**	**RN04**	**RN05**	**RN05 XR**	**RN10**	**RN05**	**RN10**
SCREW LEAD	in	0.157	0.197	0.397	0.197	0.397	0.157	0.197	0.197	0.397	0.197	0.397
	mm	*4.0*	*5.0*	*10.0*	*5.0*	*10.0*	*4.0*	*5.0*	*5.0*	*10.0*	*5.0*	*10.0*
PEAK FORCE	lbf	2500	2500	1306	3261 / 2882	1630 / 1441	4000	3300	4000	2500	8243	4121
	kN	*11.1*	*11.1*	*5.8*	*14.5 / 12.8*	*7.3 / 6.4*	*17.8*	*14.7*	*17.8*	*11.1*	*36.7*	*18.3*
MAX. VELOCITY	in/sec	9.2	11.5	23.0	11.5	23.0	9.2	11.5	11.5	23.0	7.9	15.7
	mm/sec	*234*	*292*	*584*	*292*	*584*	*234*	*292*	*292*	*584*	*201*	*399*
SCREW DYNAMIC LOAD RATING	lbf	9240	12050	10611	16479	17175	15107	16479	20623	17175	21716	36149
	kN	*41.10*	*53.60*	*47.20*	*73.30*	*76.40*	*67.2*	*73.30*	*91.74*	*76.40*	*96.60*	*160.80*
NOMINAL BACK DRIVE FORCE	lbf	98	78	39	91	46	114	91	91	46	152	76
	N	*436*	*347*	*173*	*405*	*205*	*507*	*405*	*405*	*205*	*676*	*338*
AMBIENT TEMP RANGE	°F	50 to 122										
	°C	*10 to 50*										
IP RATING	Standard IP65 (static)											
AGENCY LISTINGS	CE cULus IP65											

Table 2:

		GSWA33	GSWA33-GUIDED	GSWA04		GSWA44	GSWA55
		MV23,43	MV23,43	MV22,42	MV23,43	MV23,43	MV23,43
WEIGHT (with 6 in / 152 mm stroke)	lb	18.1	28.5	29.8	32.0	35.2	67.2
	kg	*8.2*	*12.9*	*13.5*	*14.5*	*16.0*	*30.5*
STROKE	in	6.0 to 18.0	6.0 to 9.0	6.0	6.0	6.0 to 18.0	
	mm	*152.4 to 451.2*	*152.4 to 228.6*	*152.4*	*152.4*	*152.4 to 451.2*	
WEIGHT PER UNIT OF STROKE	lb/in	0.6603	0.6603	1.1035	1.1035	1.1035	2.1115
	kg/mm	*0.0118*	*0.0118*	*0.0197*	*0.0197*	*0.0197*	*0.03771*
BASE INERTIA	lb/in	1.6723	1.6723	2.7716	3.3442	3.3442	3.3442
	kg-cm²	*4.8997*	*4.8997*	*8.1108*	*9.7864*	*9.7864*	*9.7864*
INERTIA PER UNIT OF STROKE	lb-in²/in	0.00358	0.00358	0.00984	0.00984	0.00984	0.00984
	kg-cm²/mm	*0.00041*	*0.00041*	*0.00113*	*0.00113*	*0.00113*	*0.00113*

MV23,43 = 3 Stack Motor

MV22,42 = 2 Stack Motor



RoHS COMPLIANT RoHs Compliant Components,

CE Approved

ServoWeld - Integrated Motor Actuator

Table 3: Motor Specifications:

			GSWA33				GSWA44			
			GSWA33, GUIDED		GSWA04		GSWA04		GSWA55	
			MV23	MV43	MV22	MV42	MV23	MV43	MV23	MV43
BUS VOLTAGE		V_{RMS}	230	460	230	460	230	460	230	460
TORQUE CONSTANT (KT)		in-lb/A Peak	5.5	10.7	4.6	8.0	5.4	10.6	6.7	13.4
		N-m/A Peak	*0.62*	*1.21*	*0.52*	*0.90*	*0.61*	*1.2*	*0.76*	*1.51*
VOLTAGE CONSTANT (KE)		V/Krpm Peak	79.8	154	66.1	107.2	78.1	153.1	100	201
CONTINUOUS STALL TORQUE	No Water Cooling	in-lb	39	38	48.8	43.0	74	75	112	112
		N-m	*4.4*	*4.3*	*5.5*	*4.9*	*8.4*	*8.5*	*12.7*	*12.7*
	With Water Cooling	in-lb	78	76	97.6	86	148	150	NA	NA
		N-m	*8.8*	*8.6*	*11.0*	*9.7*	*16.7*	*17.0*	*NA*	*NA*
CONTINUOUS STALL CURRENT	No Water Cooling	A_{RMS}	5.0	2.5	7.5	3.8	9.7	5.0	11.8	5.9
	With Water Cooling	A_{RMS}	10.0	5.0	15.0	7.6	19.4	10.0	NA	NA
PEAK TORQUE		in-lb	117	114	146	129	222	225	335	335
		N-m	*13.2*	*12.9*	*16.5*	*14.6*	*25.1*	*25.4*	*37.8*	*37.8*
PEAK CURRENT		A_{RMS}	15	7.5	22.5	11.4	29.1	15.0	35.4	17.7
RESISTANCE		Ohms	2.07	8.3	0.9	4.2	0.58	2.32	0.57	2.93
INDUCTANCE		mH	3.8	15.0	3.65	15.7	2.75	11.5	1.4	5.8
SPEED @ RATED V		RPM	3,500						2,400	
NO. OF POLES			8							

BRAKE CONSIDERATIONS

In all vertical application an un-powered ServoWeld actautor will require a brake to maintain position. Tolomatic recommends that the nominal back drive force specification (listed in Table 1) be used for reference only. Back drive force is subject to change throughout the life of the actuator, due to mechanical break in, ambient temperature, and duty cycle variation.

Brake will increase actuator length and weight

A brake can be used with the actuator to keep it from back-driving, typically in vertical applications. A brake may be used for safety reasons or for energy savings allowing the actuator to hold position when un-powered.

NOTE: The optional Spring-Applied / Electronically-Released Brake requires 24V power.

Table 4: Brake Specifications:

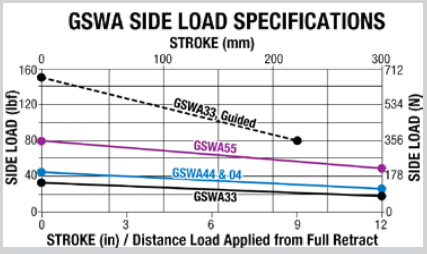
	SERIES	GSWA33	GSWA44 & GSWA04	GSWA55
ROTOR INERTIA	oz-in²	0.400	1.307	1.171
	gm-cm²	73	239	214
CURRENT	Amp	0.43	0.67	0.66
HOLDING TORQUE	in-lb	35	89	145
	N-m	4.0	9.0	16.4
ENGAGE TIME	mSec	40	25	15
DISENGAGE TIME	mSec	50	35	25
VOLTAGE	Vdc	24		

SIDE LOADING

Some weld gun designs may subject the actuator to excessive side loading reducing overall service life. The GSWA33, GUIDED actuator (page 8) will accommodate side loading. For other ServoWeld configurations measures are required, especially in "C" style designs, to limit side loading. For life optimization Tolomatic recommends side loads of less than 5% of axial load (thrust rod output force) for all roller screw configurations and less than 1% of axial load for all ball screw configurations.

DISTANCE TRAVELED UNDER LOAD

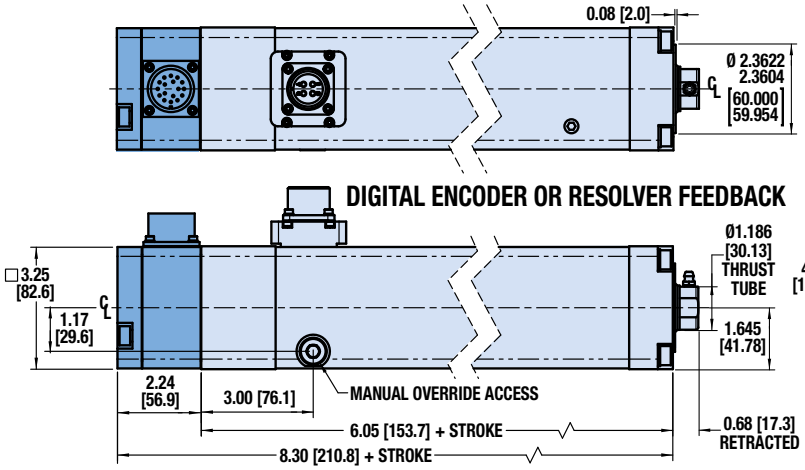
Distance traveled under load is a derivative of weld gun deflection/spring rate. Tests demonstrate the overall service life of actuators is extended when travel distance under load is minimized.

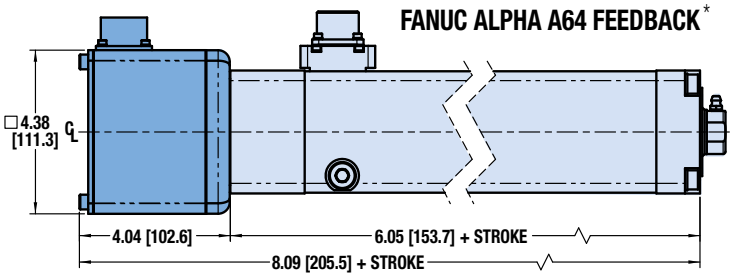


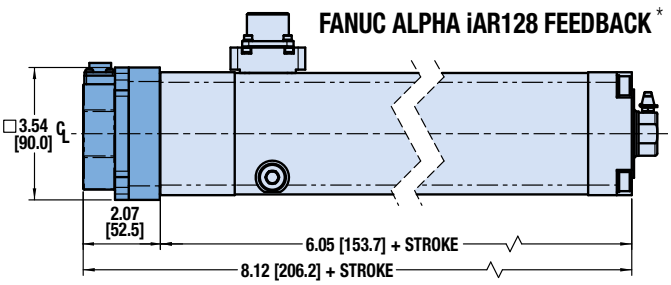
When these service life factors are considered at the design phase, millions of trouble free cycles are possible. Please contact Tolomatic for more information.

GSWA Dimensions

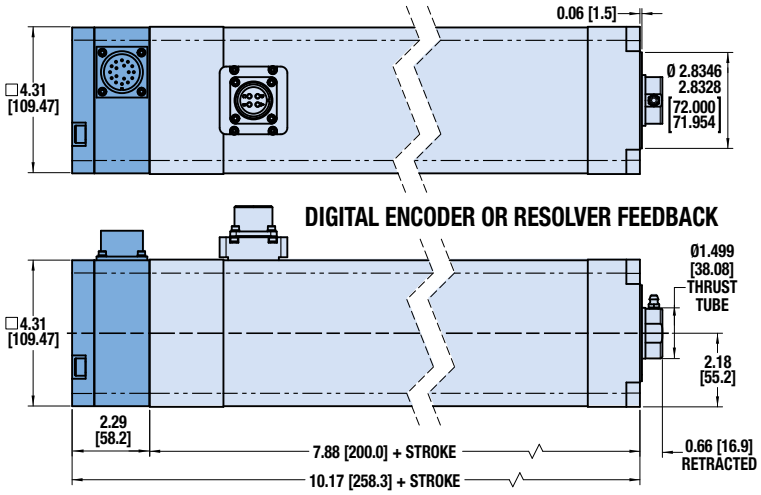
Dimensions: GSWA33

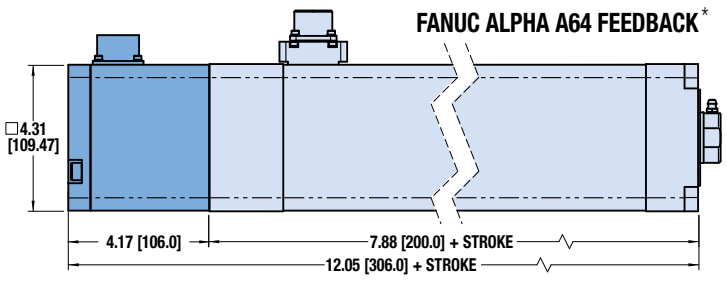


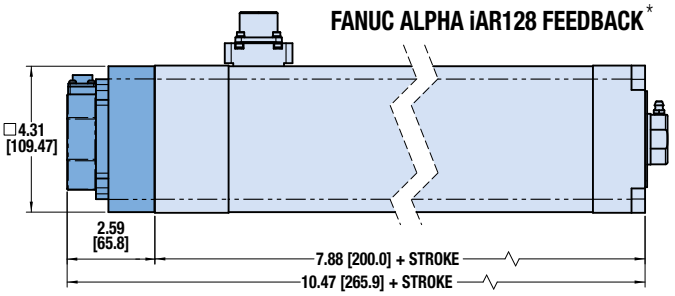




Dimensions: GSWA44



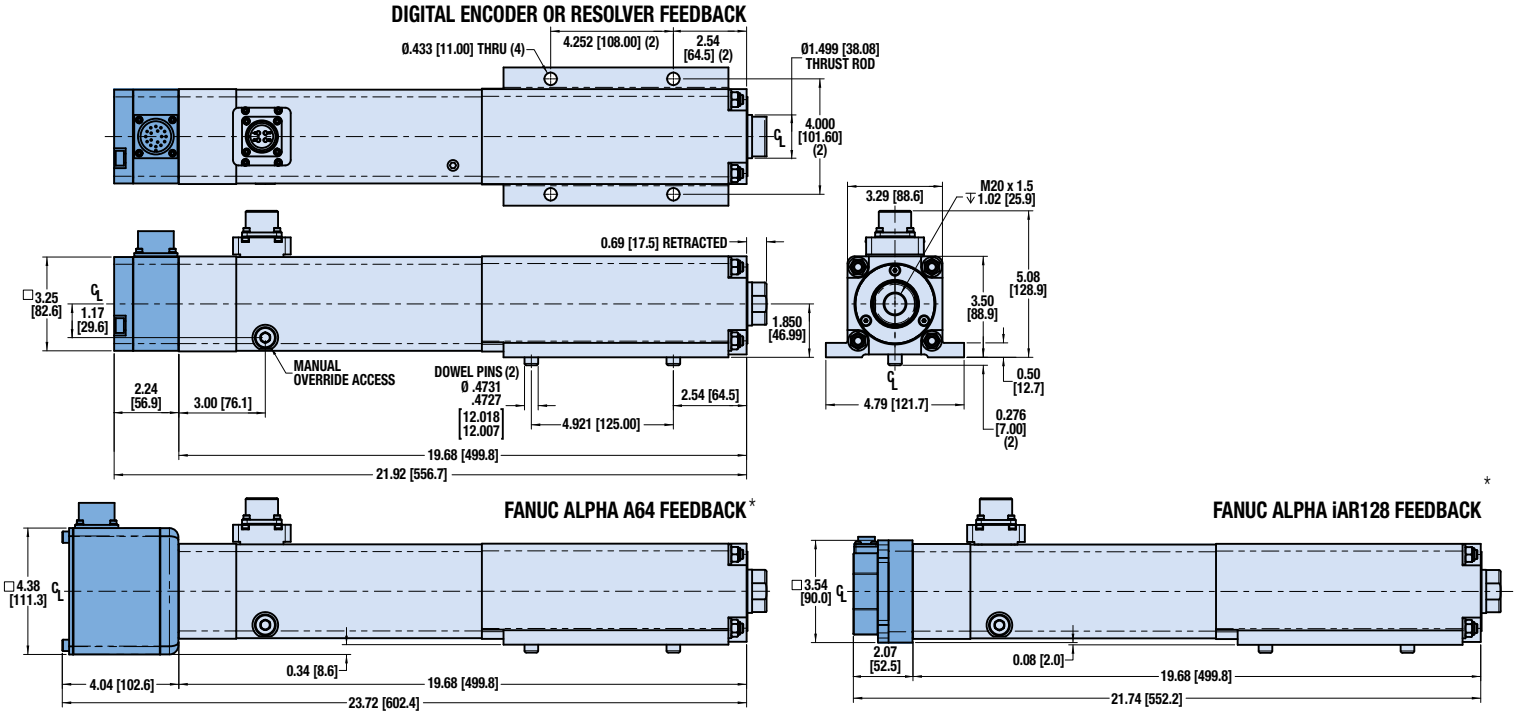




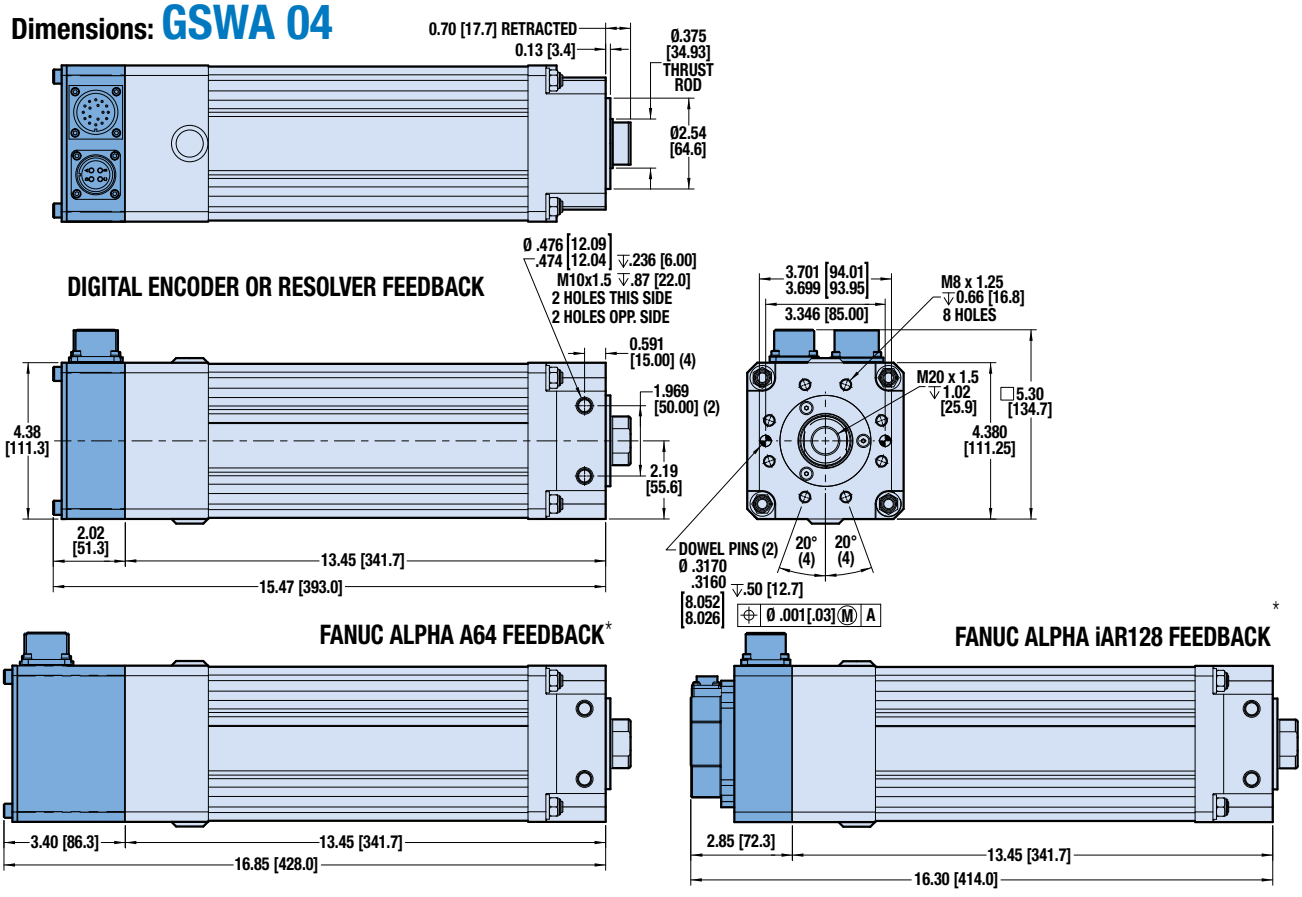
*Shown fully assembled with customer supplied feedback

GSWA - Dimensions

Dimensions: GSWA33, Guided



Dimensions: GSWA 04



*Shown fully assembled with customer supplied feedback

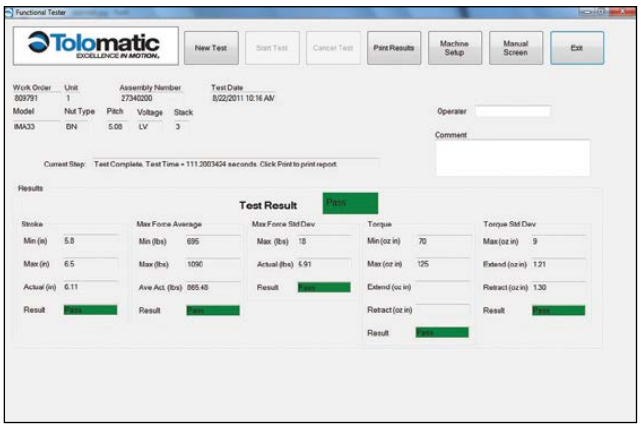
Contact Tolomatic for GSWA55 dimensions

Complete Verification Testing is Performed on Every Actuator

Every ServoWeld actuator has to pass rigorous testing at our factory. With this extra quality step we provide peace of mind to our customers and enable them to start their production faster, worry free!

We verify the performance of each individual unit before delivery to ensure they conform to Tolomatic's high standard of performance.

Functional unit testing for hundreds of cycles quantifies stroke, length, torque under no load, input current vs force standard deviation.



Testing parameter results in progress for the Functional Test procedure.

Final system test ensures the feedback device is properly aligned with the ServoWeld motor poles.

1. High POT (High Potential/High Voltage Test)
This standard electric motor test procedure is a 3-part test that checks the insulation system of the assembly to verify proper armature and thermal wire insulation.

2. Electronic phasing of ServoWeld® and feedback device (Encoder, Resolver, Feedback Device)
Using a fixed current and a specially designed fixture the feedback device is physically and electronically aligned relative to the phasing of the ServoWeld motor.

3. Functional Testing
Performed with Tolomatic motion control components and dedicated data acquisition equipment. Operated for hundred of cycles, this test quantifies these parameters - stroke length, torque under no load, input current vs force average, input current vs force standard deviation - using an electronic load cell in conjunction with data acquisition equipment.

4. Tolomatic System Test
Using a single-axis control unit the test ensures that the feedback device is properly aligned with the poles of the ServoWeld motor.

ServoWeld Application Guidelines

SIDE LOADING: Some weld gun designs may subject the actuator to excessive side loading, reducing overall service life. The GSWA33, GUIDED actuator will accommodate side loading. For other ServoWeld configurations, measures are required, especially in "C" style designs, to limit side loading. For life optimization Tolomatic recommends side loads of less than 5% of axial load (thrust rod output force) for all roller screw configurations and less than 1% of axial load for all ball screw configurations.

For maximum service life, external guiding is recommended to minimize side loading to the thrust rod and provide consist weld gun movable tip/fixed tip alignment throughout service life.

THRUST ROD WIPER/SCRAPER: The thrust rod wiper/scraper assembly is field replaceable. For maximum service life, measures should be taken to reduce/eliminate contamination, weld slag, and water in the thrust rod wiper/scraper interface area. Implementation of industrial thrust rod boot and/or deflective device can be effectively utilized in this area.

CABLES: Shielded power & feedback cables are recommended to minimize electrical noise/grounding issues. Electrical noise or inadequate grounding can corrupt the feedback device signal.

RSW SERVO SYSTEM CALIBRATION: RSW weld gun servo system consists of robot 7th axis amplifier, robot feedback device, robot RSW software, weld gun chassis, & ServoWeld.

For optimal RSW weld gun servo system performance the calibration process should include maximum weld tip force from the production weld schedule, tip dress force, and multiple weld tip forces in-between. Utilizing all the available robot manufacturer force table inputs will provide best RSW weld gun servo system performance. The same weld tip part contact speed should be used for both RSW weld gun servo system calibration and production weld schedule.

WELD TIP/PART CONTACT SPEED: Tolomatic testing confirms the highest ServoWeld repeatability (**INPUT CURRENT** verses **OUTPUT FORCE**) at a weld tip part contact speed of 25mm/second or less. Speeds greater than 25mm/second can create "impact contribution" to the weld force. This impact contribution to the weld force deteriorates prior to completion of the weld cycle.

ROBOT CARRIED APPLICATIONS: Robot carried RSW gun applications have reduced exposure to water pooling/water ingression by virtue of the continuous robot movement and various RSW gun positions. In addition, in robot carried applications positioning of the RSW gun can be programmed as part of the weld cap change program/routine to eliminate ServoWeld exposure to water. (ServoWeld above weld caps)

ROBOT MANUFACTURER SERVO FILE: Robot manufacturer servo parameter files for operation of ServoWeld are available only from the robot manufacturer. Each robot manufacturer creates 3rd party motor servo parameter files, validates operation of ServoWeld via their 7th axis, and maintains servo motor parameter file for operation of ServoWeld.

TOOL CHANGER APPLICATIONS: Weld gun storage fixture in cell should position weld gun so movable electrode is not loading ServoWeld thrust rod - back driving the ServoWeld. Weld gun tips should be positioned to weld gun closed at low force prior to disconnect from robot/tool changer. Consider ServoWeld configured with integral brake option.

FIXED/PEDESTAL APPLICATIONS: One of the more challenging RSW applications is a pedestal RSW gun, ServoWeld mounted vertical – thrust rod up. Measures should be taken to reduce and/or eliminate the ServoWeld to water exposure, water pooling/spray in the access areas of the ServoWeld unit to maximize overall service life.

- Pedestal RSW guns that can be mounted with the ServoWeld vertical – thrust rod down should be considered.
- Pedestal RSW guns that must be mounted with the ServoWeld vertical – thrust rod up should be mounted at an angle of a least 10 – 15° to minimize water pooling.
- Water channels on interfacing mounting components of the ServoWeld/RSW Gun to minimize water pooling
- Any RSW gun applications that are suspect for water exposure should utilize an external deflector (bib) or a thrust rod boot to keep the water away from the thrust rod wiper/scraper interface area.
- Any RSW gun application that is suspect for water exposure should consider utilizing a manual shut-off valve in the water saver circuit at the RSW gun. Shutting off the water prior to weld cap change can significantly reduce water exposure issues in the RSW gun environment.
- Pedestal RSW gun applications should have the mating electrical connectors (90 degree) on the cable dress package facing down with the cable dress cables looped to reduce water ingression via the electrical connectors (power/feedback).
- Allow adequate cable length so the cables are not in tension.
- Molded mating electrical connectors on the cable dress package for pedestal RSW gun applications
- Confirming full engagement of the cable dress connector to the appropriate mating receptacle on ServoWeld.

The Tolomatic Difference Expect More From the Industry Leader:

INNOVATIVE PRODUCTS

Unique linear actuator solutions with Endurance Technology℠ to solve your challenging application requirements.

FAST DELIVERY

The fastest delivery of catalog products... Built-to-order with configurable stroke lengths and flexible mounting options.

ACTUATOR SIZING

Online sizing that is easy to use, accurate and always up-to-date. Find a Tolomatic electric actuator to meet your requirements.

YOUR MOTOR HERE

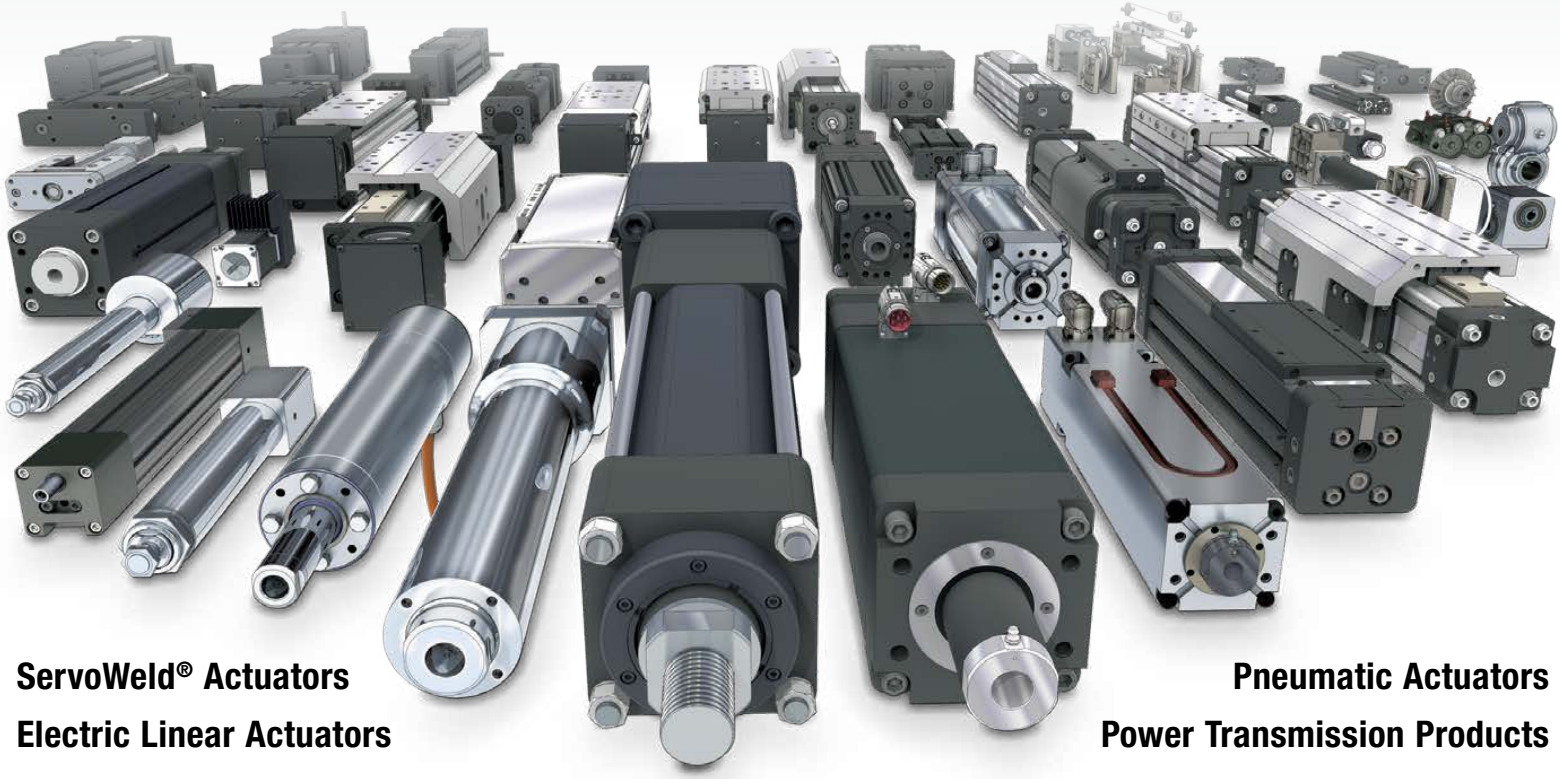
Match your motor with compatible mounting plates that ship with any Tolomatic electric actuator.

LIBRARY

Easy to access CAD files available in the most popular formats to place directly into your assembly.

TECHNICAL SUPPORT

Extensive motion control knowledge: Expect prompt, courteous replies to any application and product questions from Tolomatic's industry experts.



ServoWeld® Actuators

Electric Linear Actuators

Pneumatic Actuators

Power Transmission Products

Tolomatic™

EXCELLENCE *IN MOTION*

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV GL = ISO 9001 = Certified site: Hamel, MN

USA - Headquarters
Tolomatic Inc.
3800 County Road 116
Hamel, MN 55340, USA
Phone: (763) 478-8000
Toll-Free: **1-800-328-2174**
sales@tolomatic.com
www.tolomatic.com

MEXICO
Centro de Servicio
Parque Tecnológico Innovación
Int. 23, Lateral Estatal 431,
Santiago de Querétaro,
El Marqués, México, C.P. 76246
Phone: +1 (763) 478-8000
help@tolomatic.com

EUROPE
Tolomatic Europe GmbH
Elisabethenstr. 20
65428 Rüsselsheim
Germany
Phone: +49 6142 17604-0
help@tolomatic.eu

CHINA
Tolomatic Automation Products (Suzhou) Co. Ltd.
No. 60 Chuangye Street, Building 2
Huqiu District, SND Suzhou
Jiangsu 215011 - P.R. China
Phone: +86 (512) 6750-8506
TolomaticChina@tolomatic.com

Visit www.tolomatic.com for the most up-to-date technical information

202110190743

LITERATURE NUMBER: **2750-4002_06**