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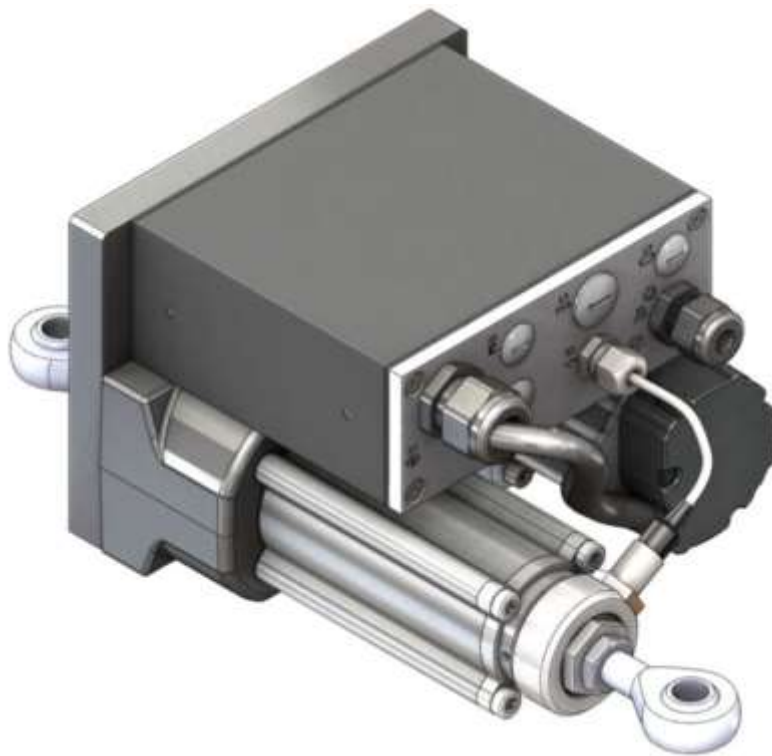
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TIDLAND

Fife GMA-BL Actuator Controller

Installation and Service Manual



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About these operating instructions

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These actuator controller devices must not be installed or used in a machine or system which does not comply with the machinery directive 2006/42/EC.

These actuator controller devices were designed and manufactured to be installed as Partly Completed Machinery into a machine or partly completed machine.

The instructions must be read and used by all persons who have the responsibility of installing and maintaining these actuator controller devices.

These instructions must be retained and incorporated in the technical documentation for the machine or partly completed machinery into which the actuator controller device is installed.

CE marking

The GMA-BL Actuator Controller complies with the 2006/42/EC Machinery directive and the 2004/108/EC Electromagnetic Compatibility directive.

Product overview

The GMA-BL Actuator Controller consists of a linear actuator and motor control electronics attached to the actuator. The actuator moves loads in a translational fashion. The rotational movement of the brushless DC motor is reduced by a synchronous belt pulley and gears and then transmitted to a ball screw which transforms the rotational movement into linear movement.

The actuator controller is designed for continuous use. The actuator controller has two sensor inputs, a remote operator interface, and parallel inputs and outputs for remote control and alarms. The actuator controller is designed to mount into a web guiding structure and control the position of the web by monitoring the web position with sensors mounted on the web path.

The actuator controller is available in a wide variety of reduction ratios and strokes and has coupling connection options with flanges, clevis head, or rod end heads to easily adapt to the customer's system. In addition to the controller mounted to the actuator, the controller can be remote mounted from the actuator within a few centimeters to allow fitting in applications with tight spaces. Each actuator controller comes with an integrated servo center transducer.

The actuator controller works with most Fife sensors.

Product Overview

(continued)

An example center guiding application is shown in Figure 1. The sensors (2) sense the edges of the web material (5) and determine the actual position of the web. The GMA-BL Actuator Controller (1) receives this information and guides the pivot carrier (6) of the offset pivot guide (3) by means of the linear actuator so the web material is always in the desired target position. The operator interface (4) provides a means of controlling and configuring the GMA-BL Actuator Controller using a color LCD display and touchscreen.

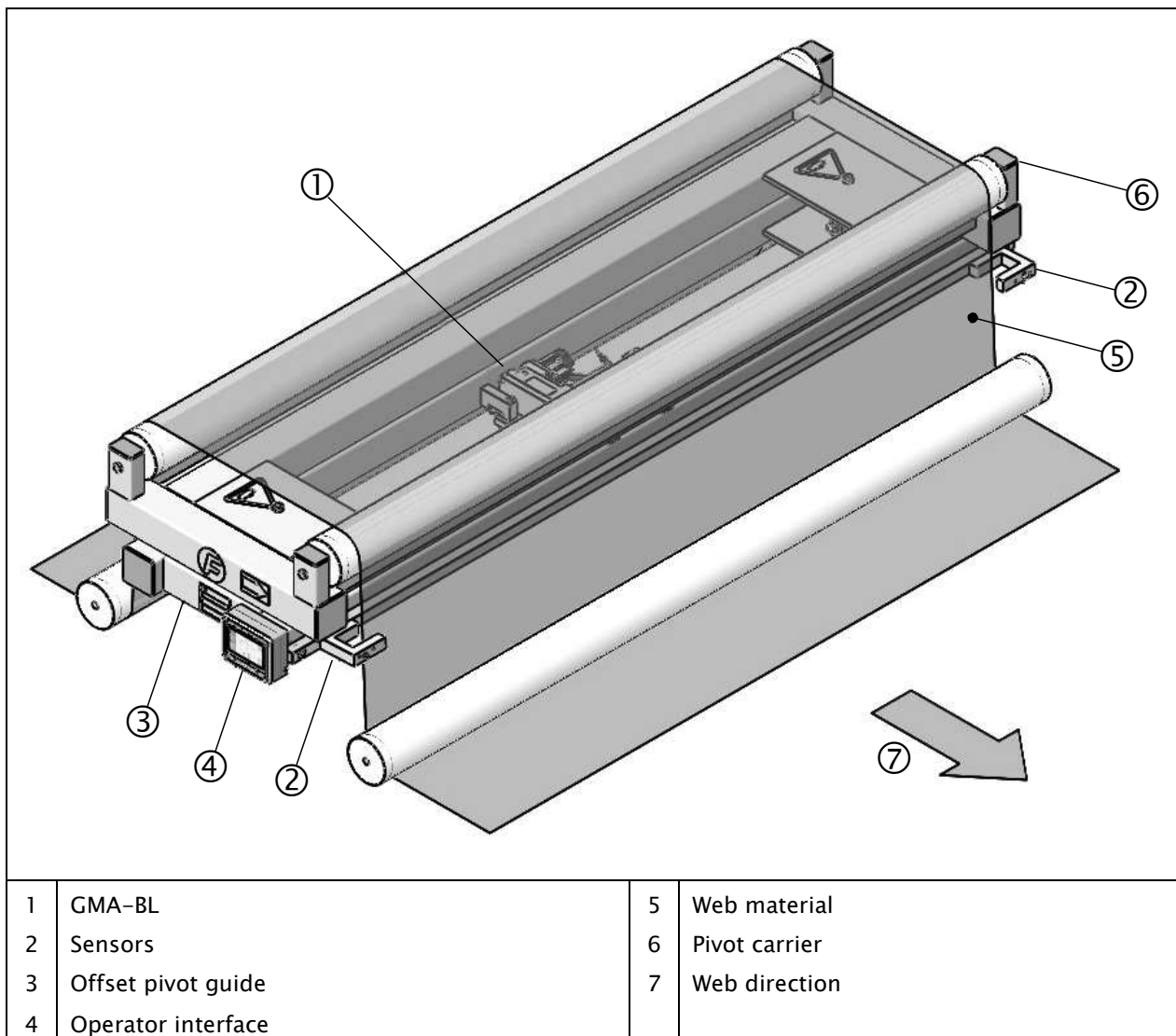


Figure 1. Application Example for the GMA-BL Actuator Controller

Controller mounting and actuator coupling options

Figure 2. Z12 – Rod end coupling connection

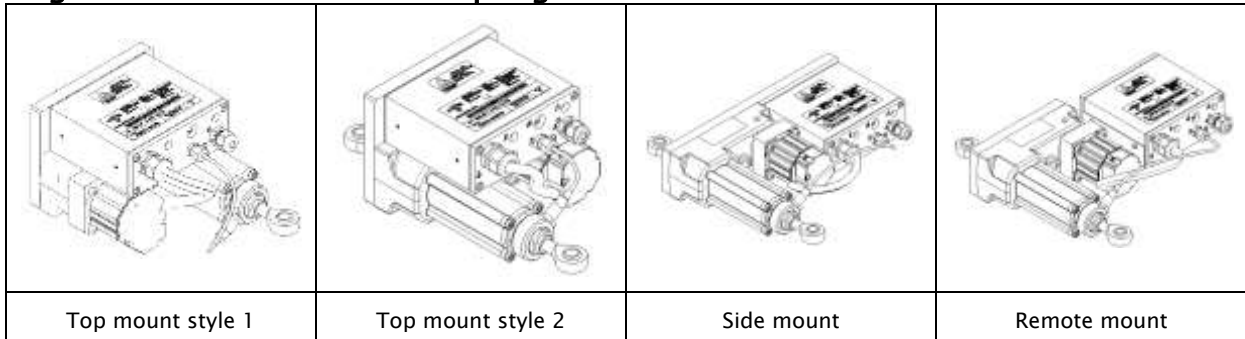


Figure 3. A-Clevis coupling connection

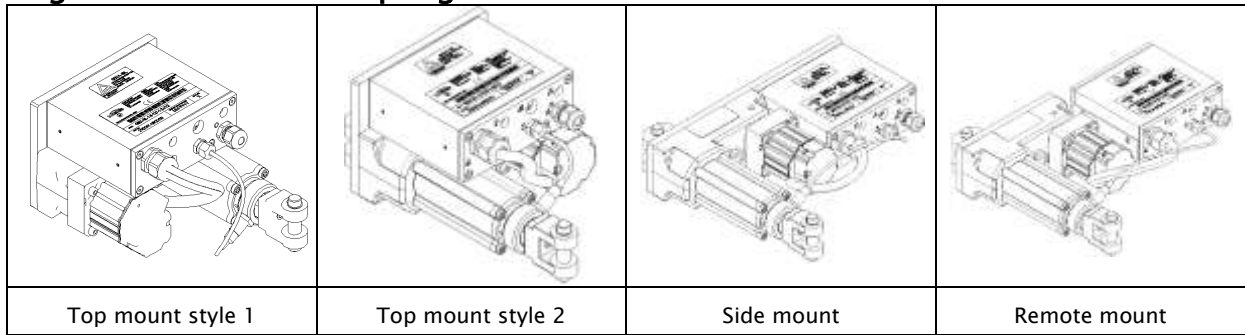
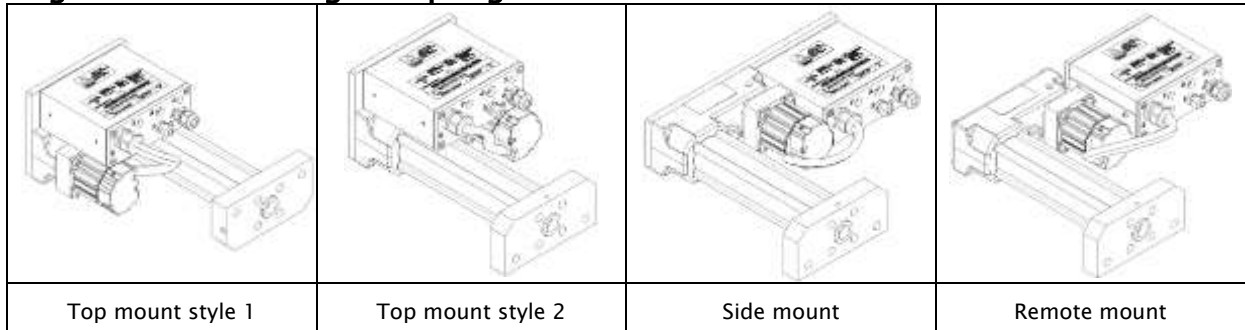


Figure 4. KR – Flange coupling connection



Controller mounting and actuator coupling options (continued)

Figure 5. KLB – Flange coupling connection

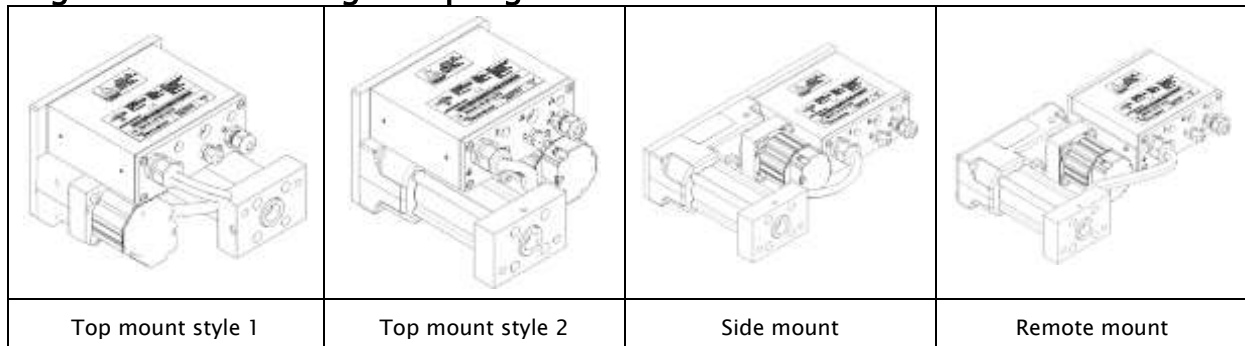
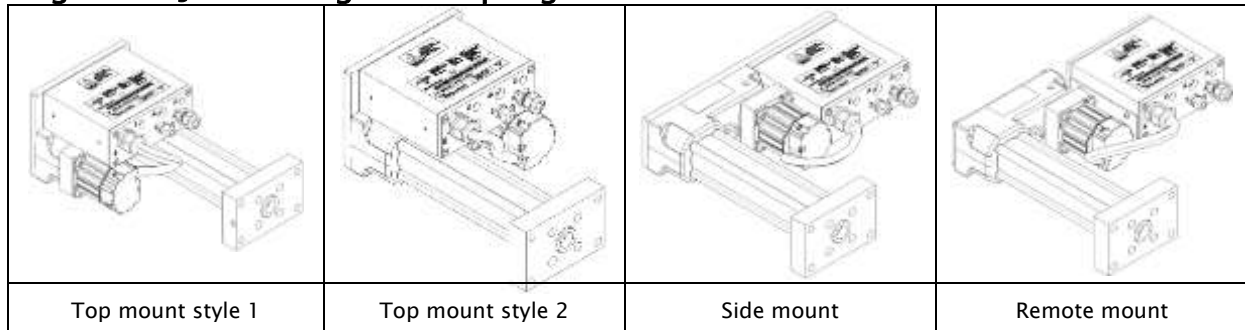


Figure 6. J – Rectangular coupling connections



Instructions for use

To ensure safe and problem free installation of the GMA-BL Actuator Controller, the actuator controller must be properly transported and stored, professionally installed, and placed in operation. Proper operation and maintenance will ensure a long service life of the device. Only persons who are acquainted with the installation, commissioning, operation, and maintenance of the system and who possess the necessary qualifications for their activities may work on the actuator controller. **Note:** The safety information may not be comprehensive.

Please note the following:

- The content of these operating instructions
- Any safety instructions on the device
- The machine manufacturer's specifications
- All national, state, and local requirements for installation, accident prevention and environmental protection

Safety symbols

Information about safety instructions

The safety instructions and symbols described in this section are used in these operating instructions. They are used to avoid possible dangers for users and to prevent material damage.



SIGNAL WORD

Source of danger and its results

Avoiding dangers

The signal word **DANGER** refers to the danger of death or serious bodily injuries.

The signal word **WARNING** refers to the danger of moderate to severe bodily injuries.

The signal word **CAUTION** refers to the danger of slight to moderate bodily injuries or material damage.

The signal word **NOTICE** refers to the possibility of damage to equipment.

Symbols used

The following safety identification symbols are used in these operating instructions.



WARNING/CAUTION – General danger or important note
Reference to general hazards that may result in bodily injuries or damage to device or material.



WARNING/CAUTION – Danger due to crushing
Reference to danger of injury caused by crushing.



WARNING/CAUTION – Danger due to cutting
Reference to danger of injury caused by cutting.



WARNING/CAUTION – Danger due to voltage, electric shock
Reference to danger of injury caused by electric shock due to voltage.



WARNING/CAUTION – Danger due to hot surfaces
Reference to risk of injury caused by burning.

Basic safety information

Proper use

The GMA-BL Actuator Controller may be used to provide controlling and guiding functions for

- Steering and offset pivot guide control
- Positioning and slave guidance

Other applications include the control and positioning of

- Unwind/rewind rolls
- Blades/cutter bars
- Cutting tables
- Turn bars, etc.

The GMA-BL Actuator Controllers must be used only for their intended purpose.

The GMA-BL Actuator Controllers must be used indoors. See environmental specifications in Section 6-1.

Use of the GMA-BL Actuator Controller should not present any hazards as defined by EU Directive 2006/42/EC.

Improper Use

Do not operate the GMA-BL Actuator Controller outside the technical specifications.

Do not operate the GMA-BL Actuator Controller in an Ex-area or hazardous area.

Do not use the GMA-BL Actuator Controller as a safety component. The actuator does not hold the position if power fails.

The GMA-BL Actuator Controller must not be used to raise and lower loads.

Do not use the GMA-BL Actuator Controller outdoors.

Any other use than the proper use shall be deemed inappropriate.

Basic safety information

(Continued)

Installation and commissioning

Any GMA-BL Actuator Controller which is damaged must not be installed or put into service.

Only perform installation, maintenance or repair tasks on the GMA-BL Actuator Controller when the machine has been stopped and is secured from being turned on.

Only perform installation, maintenance or repair tasks on the GMA-BL Actuator Controller when there is no electrical power in the system.

The GMA-BL Actuator Controller must be securely assembled into the customer application before being placed in operation.

Only replacement parts obtained from Fife may be used.

No modifications may be made to the GMA-BL Actuator Controller.

Do not place electrical cables under mechanical strain.

The ball screw nut must not be removed from the ball screw.



WARNING - Death or injury can result from static electric shocks. Moving webs of material can produce large static voltage potentials. Protect against electric shocks by installing a conductive connection between the PE conductor of the GMA-BL Actuator Controller and the PE circuit of the building or machine.



WARNING - Danger of injury from crushing. The GMA-BL Actuator Controller contains moving parts which could cause injury due to crushing. Appropriate protective guards must be installed by the user according to his use of this product.



WARNING - Death or injury can result from unexpected movement. Protect against unexpected movement by removing electrical power from the GMA-BL Actuator Controller and the machine into which the GMA-BL Actuator Controller is being installed.

**Basic safety
information**

(Continued)

Operation

WARNING - Danger of injury from crushing.

The GMA-BL Actuator Controller contains moving parts which could cause injury due to crushing. Do not touch anything on or in the vicinity of the moving parts. Appropriate protective guards must be installed by the user according to his use of this product.

Maintenance and repair

WARNING - Death or injury can result from unexpected movement.

Protect against unexpected movement by removing electrical power from the GMA-BL Actuator Controller and the machine into which the GMA-BL Actuator Controller is installed.



WARNING - Danger of injury from crushing.

Maintenance and repair tasks on the GMA-BL Actuator Controller must be performed only when the machine has been stopped and has been secured from being turned on again.

Decommissioning

The GMA-BL Actuator Controller must be disposed of in accordance with all the applicable national, state and local regulations.

Mechanical and electrical installation

Use Table 1 to determine the installation drawing you will need for your coupling and mounting style.

Table 1. Outline dimension drawings

Actuator coupling	Controller mounting		
	Top mount Style 1 and Style 2	Side mount	Remote mount
Z12 Rod End	216650	216655	216660
A Clevis	216651	216656	216661
KR Flange	216652	216657	216662
KLB Flange	216653	216658	216663
J Rectangular	216654	216659	216664

The linear actuator and connecting rod must be secured from rotating about the axis of the actuator to ensure precision operation. The fastening connections to the machine must be securely mounted to avoid excessive movement.

Route all cables away from moving or rotating parts.



WARNING - Death or injury can result from unexpected movement.

Protect against unexpected movement by removing electrical power from the GMA-BL Actuator Controller and the machine into which the GMA-BL Actuator Controller is installed.



WARNING - Danger of injury from crushing.

Maintenance and repair tasks on the GMA-BL Actuator Controller must be performed only when the machine has been stopped and has been secured from being turned on again.

Mechanical and electrical installation

(continued)

The inductive servo center transducer (ISCT) orientation can be changed on the Z12 Rod End and A Clevis models by loosening two set screws and rotating the ring holding the transducer. The set screws should be tightened to 0.5 Nm (4.4 lb-in). See Figure 7.

Install the sensors in the web path. Install the air lines on sensors with air sweep.

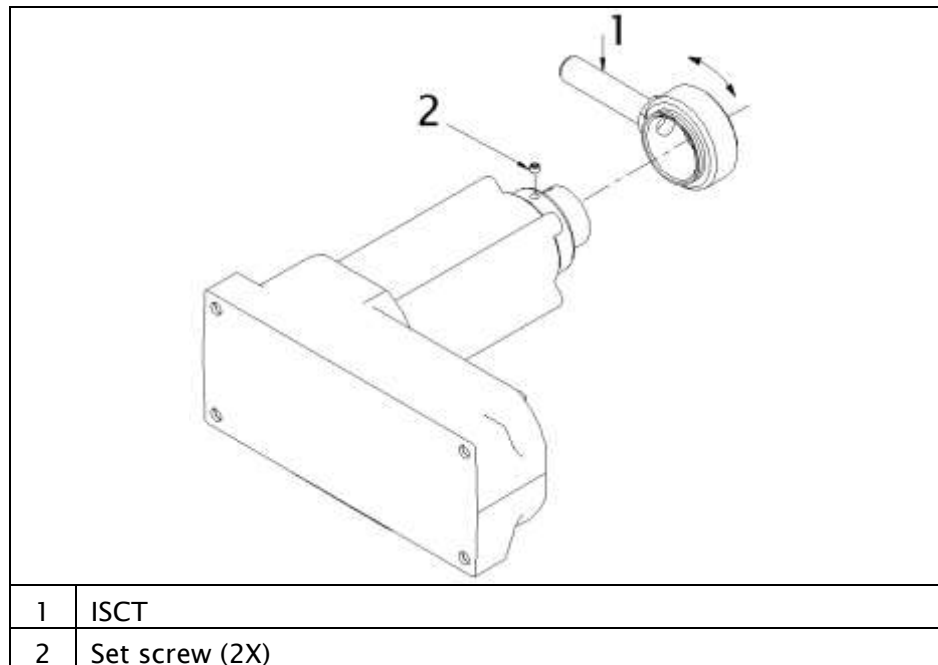


Figure 7.
ISCT Orientation adjustment for Z12-Rod end and A-Clevis models

Installing the operator interface

Wall mount model

Units are in millimeters [inches].

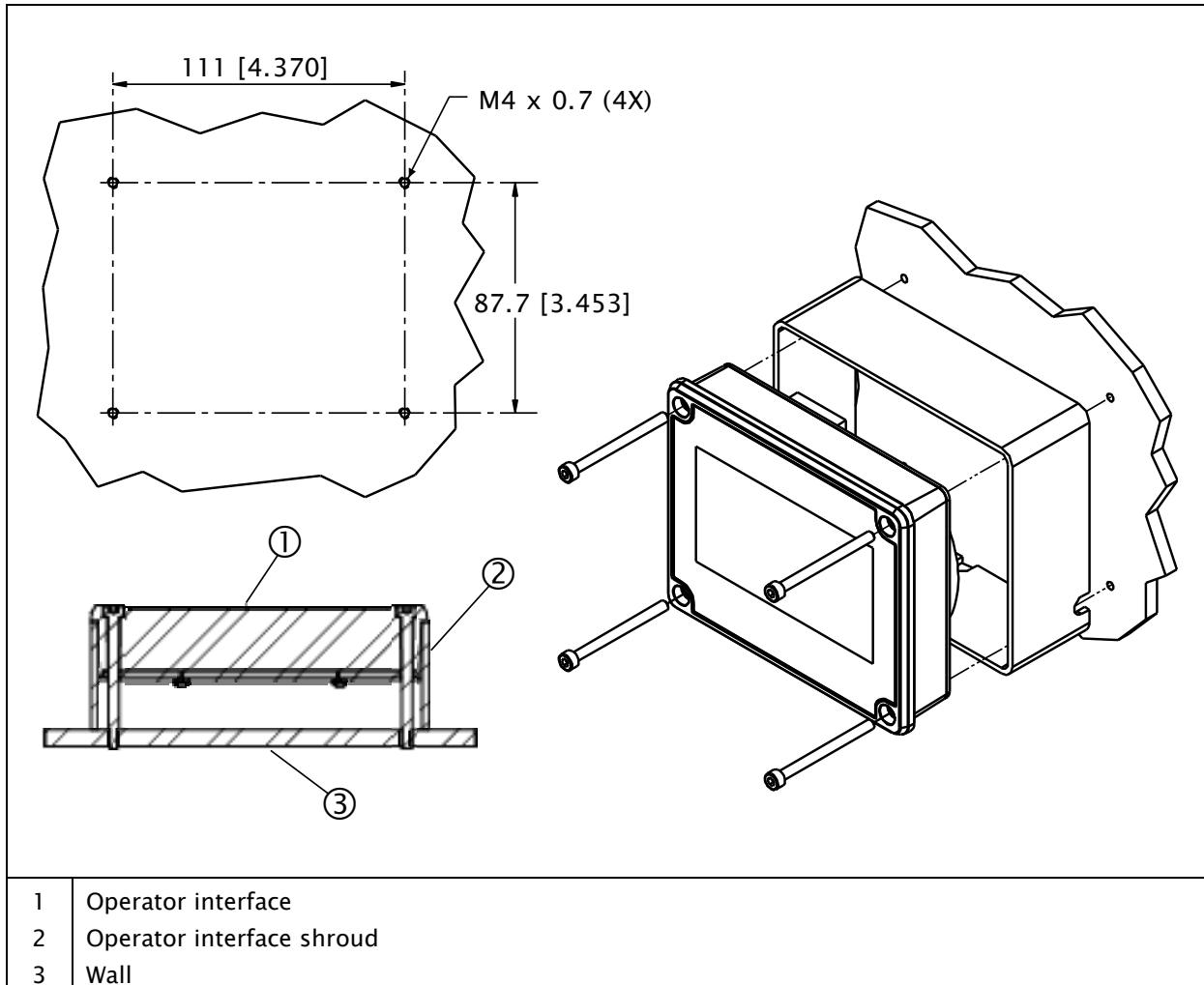


Figure 8. Operator interface wall mount kit installation

Installing the operator interface

Panel mount model

Units are in millimeters [inches].

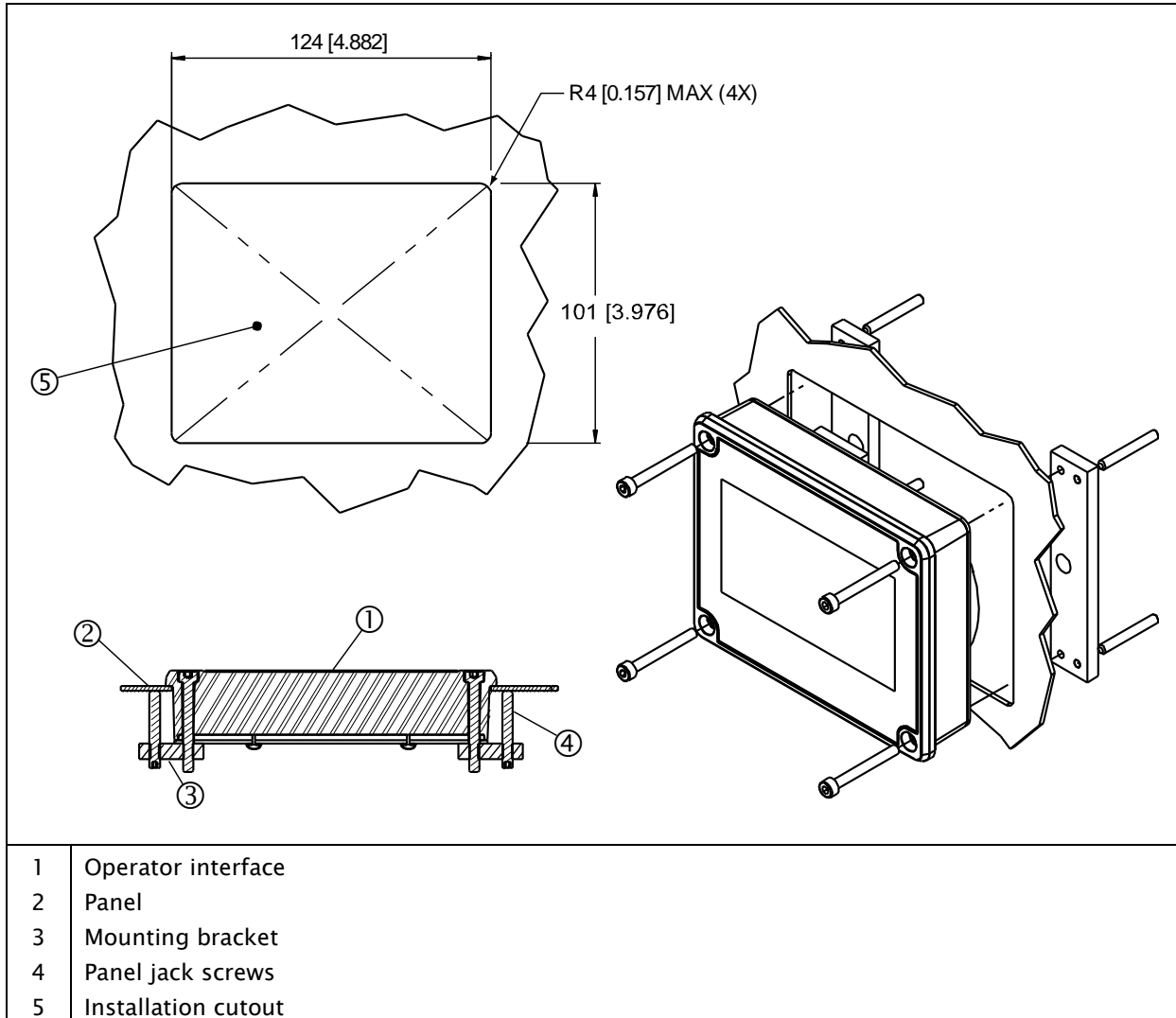


Figure 9. Operator interface panel mount kit installation

Wiring

Operating voltage range and current rating are listed in Section 6-1, Specifications and shown on the label on the controller housing.

All wiring must comply with the essential requirements of the appropriate standard(s) and is the responsibility of the installer. Wiring to the web guiding system must be insulated copper wire with a temperature rating of at least 80°C. The wire size should be 0.82 mm² (18 AWG).

1. Connect a 24 VDC +/-25% power supply to the power cable. The WHITE wire is positive and the BLACK wire is negative.
2. Connect the PE of the building or machine to the power cable GREEN wire.

Note: The negative power connection, BLACK wire, is internally connected to the PE connection, GREEN wire. This connection is only used for EMC compliance.



WARNING - Death or injury can result from static electric shocks. Moving webs of material can produce large static voltage potentials. Protect against electric shocks by installing a conductive connection between the power cable GREEN wire and the PE circuit of the building or machine.



CAUTION - Never place electrical cables under mechanical strain. Always provide mechanical support of wiring with either clamps or flexible or rigid conduit.

Digital inputs and outputs are available for remote control and signaling functions. There are 6 digital inputs allowing control of the following modes: External Lock, Automatic, Manual, Servo-Center, Jog, RGPC, and sensor selection. There are 4 digital outputs that are initially configured as alarms for Loss of Null, Centered, Motor Blocked, and Power OK. See Tables 2 and 3 for the default configurations.

Refer to the wiring diagram of the GMA-BL Actuator Controller drawing number 216282.

Table 2. Digital input matrix default configuration

0 = LOW
 1 = HIGH
 - = IGNORE

Note: To ensure that a command is properly executed, all pertinent inputs for each command must be switched high or low within 20 ms of each other and maintained for at least 30 ms.

MODE	INPUTS					
	5	4	3	2	1	0
EXTERNAL LOCK	-	-	-	-	-	1
AUTOMATIC	-	-	0	0	1	-
MANUAL	-	-	0	1	0	-
SERVO-CENTER	-	-	1	0	0	-
JOG Minus *	0	1	-	-	-	-
JOG Plus *	1	0	-	-	-	-
RGPC Minus *	0	1	-	-	-	-
RGPC Plus *	1	0	-	-	-	-
RGPC RESET *	1	1	-	-	-	-
Sensor S1 (Single Edge Guiding) **	-	-	0	1	1	-
Sensor S2 (Single Edge Guiding) **	-	-	1	1	0	-
Sensor S1 - S2 (Center-guiding) **	-	-	1	1	1	-

* Inputs 4 & 5 are used to provide Jogs while in Manual and Servo Center modes, and RGPC functions while in Automatic mode.

** Sensor selection is allowed in Manual and Servo Center modes, only. Sensor selection must be momentary commands.



WARNING - Death or injury can result from unexpected movement.

If the timing requirements of the digital inputs are not met, unexpected motion of the guide could result when a sensor selection is misinterpreted as a mode change to Servo Center or Auto.

Table 3. Digital output matrix default configuration

1 = ACTIVE

- = IGNORE

STATUS	OUTPUTS*			
	D	C	B	A
LOSS OF NULL (AUTOMATIC MODE)	-	-	-	1
CENTERED (SERVO-CENTER MODE)	-	-	1	-
MOTOR BLOCKED	-	1	-	-
POWER OK	1	-	-	-

* Digital outputs are active low

Maintenance



WARNING – Death or injury can result from unexpected movement. Protect against unexpected movement by removing electrical power from the GMA-BL Actuator Controller and the machine into which the GMA-BL Actuator Controller is installed.



WARNING – Danger of injury from crushing. Maintenance and repair tasks on the GMA-BL Actuator Controller must be performed only when the machine has been stopped and has been secured from being turned on again.



WARNING – To prevent death or injury, always use standard Lockout/Tagout procedures.

- Maintenance schedules are recommended intervals only. Ambient conditions can influence intervals considerably. Therefore, adjustments to the recommendations must be made accordingly.
- The GMA-BL Actuator Controller has a protection class rating of IP 52. The “5” defines limited ingress of dust permitted, while the “2” defines protection against vertically falling drops of water with enclosure tilted 15° from the vertical. Adhere to protection class rating IP 52 during all maintenance procedures.
- The motor of the GMA-BL Actuator Controller requires no maintenance.
- Use Parker 0-Lube to lubricate the external actuator rod every 2 months to keep the seal (item 31) lubricated. See Figure 16 in the Replacement Parts section.
- Sensors shall be cleaned as necessary in order to ensure lenses, transmitters, and/or receivers have a clear path to detect the web. Cleaning shall consist of wiping down components as necessary with a clean and dry cloth. Compressed air or a shop vacuum may also be used as necessary.
- Operator Interface (touchscreen) should be cleaned as necessary in order to ensure clear visibility of the menus. Cleaning shall consist of wiping down components as necessary with a clean and dry cloth. Commercial liquid cleaner may be used if necessary, but ensure that a small amount of liquid is placed on the cloth before wiping down the screen. Do not directly spray the screen. Compressed air or a shop vacuum may also be used as necessary.

Replacing the inductive servo center transducer (ISCT)

Z12 Rod End and A Clevis models

The order number for the ISCT sensor is 573117-021.

1. Install the ISCT sensor into the Z12 or A model. (See Figure 10.)
2. Screw the ISCT sensor into the ISCT holder all the way until it contacts with the actuator rod.
3. Then unscrew the ISCT sensor one full turn and tighten the mounting nut to 2 Nm (17.7 lb-in).
4. Connect the ISCT cable to the ISCT sensor.

KR, KLB, and J Flange models

The order number for the ISCT sensor is 216665-002.

1. Install the ISCT sensor into the KR, KLB, or J model. (See Figure 11.)
3. Push the ISCT sensor into the retaining hole until it contacts the actuator rod.
4. Then pull back the ISCT sensor approximately 1 mm (0.040 in) and tighten the set screw to 0.5 Nm (4.4 lb-in).
5. Connect the ISCT cable from the GMA-BL to the ISCT sensor connector.
6. Test servo center operation. If actuator does not stop at center position of the ISCT sensor position inward or outward as needed.

Figure 10. Z12 and A model ISCT installation.

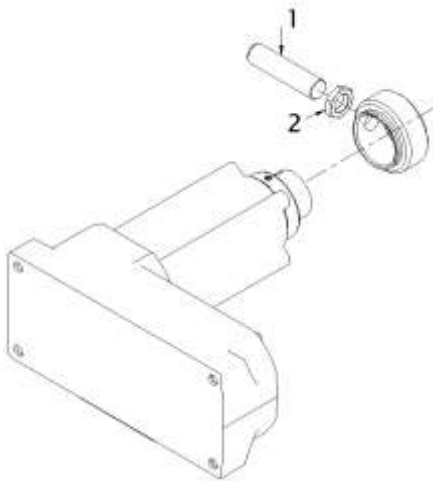
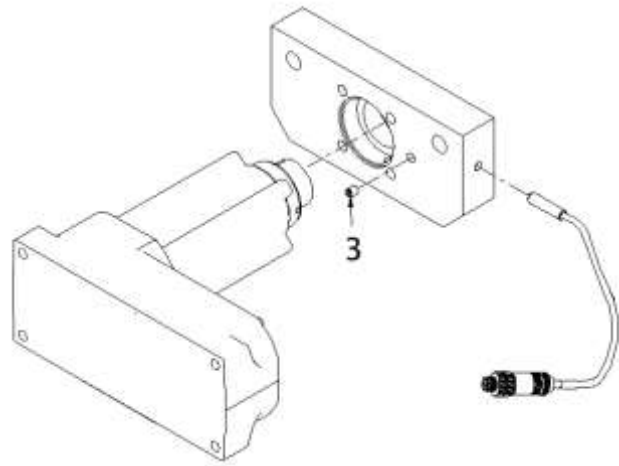


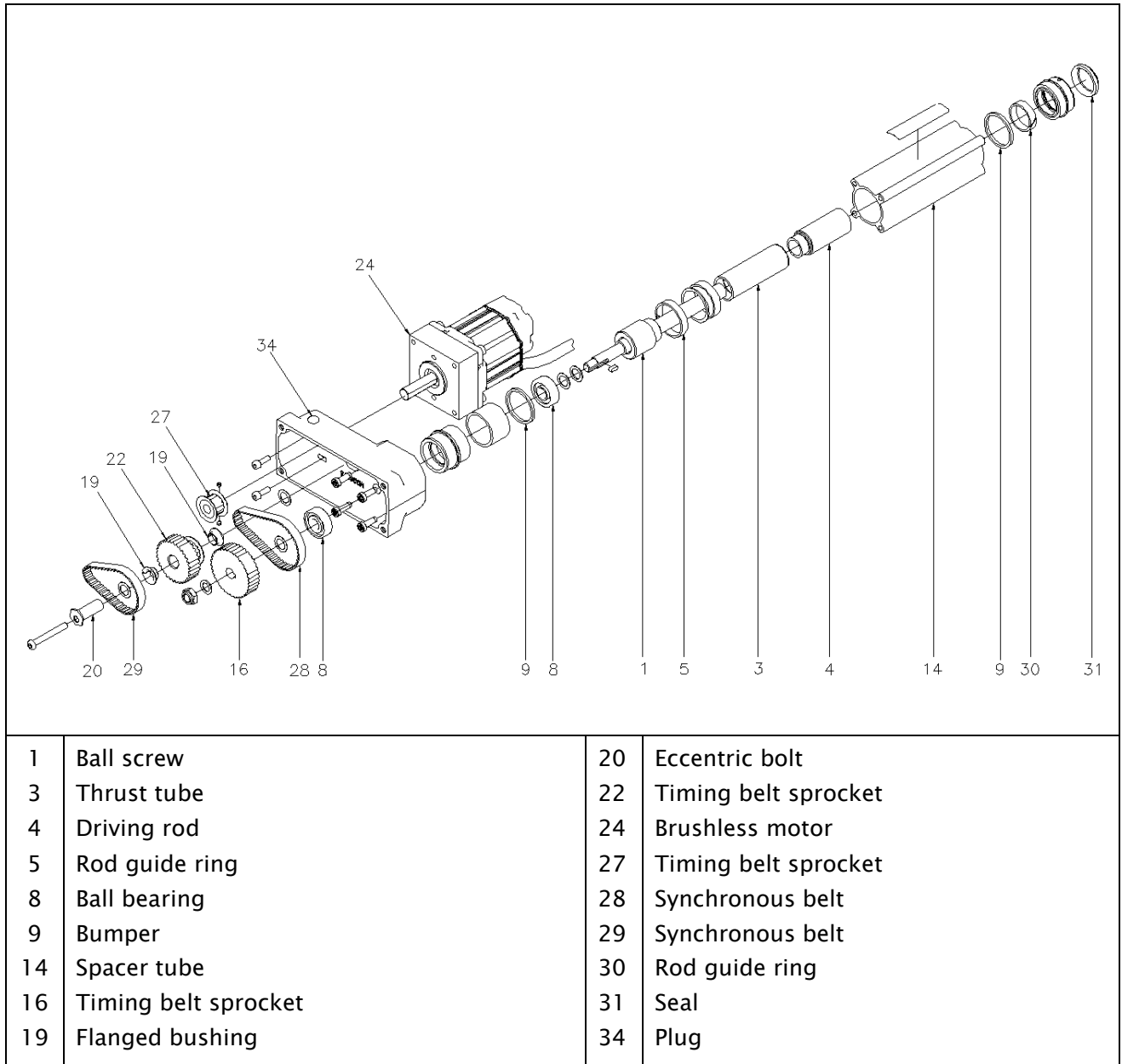
Figure 11. KR, KLB, and J model ISCT installation.



1	ISCT
2	ISCT nut
3	Set screw

Replacement parts

Figure 12. Layout of the GMA-BL linear actuator assembly



Replacement parts (continued)

Table 4. Replacement part list (GR = Gear ratio)

Item	GR = 1	GR = 2	GR = 3	GR = 4	GR = 5	GR = 6	GR = 8
1, 3, 4	Dependent on stroke, seek advice from service department						
5	M159575						
8	M133800						
9	M161621						
14	Dependent on stroke, seek advice from service department						
16	M133392	M133391	M133391	M133391	M133391	M133391	M133391
19	-	-	-	M134044	M134044	M134044	M134044
20	-	-	-	M326645	M326645	M326645	M326645
22	-	-	-	M330400	M330400	M330400	M328023
24	See Motor Table (table 5)						
27	M133389	M133389	M328022	M159745	M159743	M328022	M328022
28	M153834	M133390	M133390	M134051	M134051	M134051	M134051
29	-	-	-	M134067	M153831	M153831	M327611
30	M159574						
31	M133384						
34	79093-001						

Table 5. Motor table

Motor Type	Motor Designation	Motor Part Number
1	M2310P	93030-001
2	M2311P	93030-002

Model number key

GMA-BL-a-b-ccc-d-e-ISCT-f

a = Motor Type

1 = Size 1, 0.28 Nm (39 oz-in), 2100 RPM

2 = Size 2, 0.36 Nm (51 oz-in), 1800 RPM

b = Gear Ratio

1 = 1.00 5 = 5.14

2 = 2.25 6 = 6.00

3 = 3.00 8 = 7.71

4 = 3.60

ccc = Stroke

050 = 50 mm (1.97 in) 178 = 178 mm (7.01 in)

076 = 76 mm (2.99 in) 203 = 203 mm (7.99 in)

100 = 100 mm (3.94 in) 229 = 229 mm (9.02 in)

127 = 127 mm (5.00 in) 254 = 254 mm (10.00 in)

152 = 152 mm (5.98 in) 279 = 279 mm (10.98 in)

160 = 160 mm (6.30 in) 305 = 305 mm (12.01 in)

d = Controller Orientation

0 = Not Applicable (for Side and Remote mount versions)

1 = Style 1 (Top Mount only)

2 = Style 2 (Top Mount only)

e = Controller Mounting Type

1 = Top Mount

2 = Side Mount

3 = Remote Mount

f = Guide Coupling Connection

Z12 = Rod End

A = Clevis

KR = Flange

KLB = Flange

J = Rectangular Flange

ISCT specifies the inductive servo center transducer (ISCT) is always present.

Refer to Figures 2 through 6 for Controller Orientation, Controller Mounting Type, and Guide Coupling Connection options.

English units

Table 6. GMA-BL Thrust and speed selection table, English units

Specification	Model													
	GMA-BL-1-1	GMA-BL-1-2	GMA-BL-1-3	GMA-BL-1-4	GMA-BL-1-5	GMA-BL-1-6	GMA-BL-1-8	GMA-BL-2-1	GMA-BL-2-2	GMA-BL-2-3	GMA-BL-2-4	GMA-BL-2-5	GMA-BL-2-6	GMA-BL-2-8
Gear Ratio	1	2.25	3	3.6	5.14	6	7.71	1	2.25	3	3.6	5.14	6	7.71
Max Motor Speed (rpm)	2100	2100	2100	2100	2100	2100	2100	1800	1800	1800	1800	1800	1800	1800
Max Motor Torque (oz-in)	38.9	38.9	38.9	38.9	38.9	38.9	38.9	50.7	50.7	50.7	50.7	50.7	50.7	50.7
Efficiency	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Stall Thrust (LB)	64	144	192	230	328	383	493	81	183	244	293	418	488	627
Thrust Factor Note 3	0.72	0.72	0.72	0.69	0.69	0.69	0.69	0.72	0.72	0.72	0.69	0.69	0.69	0.69
Design Thrust (LB)	46	104	138	159	227	265	340	59	132	176	202	288	337	433
Max Load @ Friction =0.06 (LB) Note 1	767	1726	2301	2646	3778	4410	5666	976	2195	2927	3366	4806	5610	7209
Max Load @ Friction =0.10 (LB) Note 2	460	1035	1380	1587	2267	2646	3400	585	1317	1756	2020	2884	3366	4323
Max Load @ Friction =0.25 (LB) Note 1	184	414	552	635	907	1058	1360	234	527	703	808	1153	1346	1730
Max Actuator Speed (in/sec)	7.03	3.12	2.34	1.95	1.37	1.17	0.91	6.02	2.68	2.01	1.67	1.17	1.00	0.78
Max Line Speed (ft/min) Note 4	6000	6000	6000	4750	2750	2100	1250	6000	6000	4900	3750	2100	1600	900
Max Stroke (in)	12	12	12	12	12	12	12	12	12	12	12	12	12	12

Notes:

- 1) The standard coefficient of friction is 0.06 for rolling bearings and 0.25 for sliding.
- 2) Rolling coefficient of friction of 0.1 can be used for improved performance and life.
- 3) Thrust factor based on belt drive versus gear drive, number of belts or gears and size.
- 4) When guiding edge trimmed or previously guided rolls, use 2 times maximum line speed.

Metric units

Table 7. GMA-BL Thrust and speed selection table, Metric units

Specification	Model													
	GMA-BL-1-1	GMA-BL-1-2	GMA-BL-1-3	GMA-BL-1-4	GMA-BL-1-5	GMA-BL-1-6	GMA-BL-1-8	GMA-BL-2-1	GMA-BL-2-2	GMA-BL-2-3	GMA-BL-2-4	GMA-BL-2-5	GMA-BL-2-6	GMA-BL-2-8
Gear Ratio	1	2.25	3	3.6	5.14	6	7.71	1	2.25	3	3.6	5.14	6	7.71
Max Motor Speed (rpm)	2100	2100	2100	2100	2100	2100	2100	1800	1800	1800	1800	1800	1800	1800
Max Motor Torque (oz-in)	278	278	278	278	278	278	278	358	358	358	358	358	358	358
Efficiency	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Stall Thrust (N)	284	640	853	1023	1461	1706	2192	362	814	1085	1302	1859	2170	2789
Thrust Factor Note 3	0.72	0.72	0.72	0.69	0.69	0.69	0.69	0.72	0.72	0.72	0.69	0.69	0.69	0.69
Design Thrust (N)	205	461	614	706	1008	1177	1512	260	586	781	898	1283	1497	1924
Max Load @ Friction =0.06 (kg) Note 1	348	782	1043	1200	1713	1999	2569	442	995	1327	1526	2179	2544	3269
Max Load @ Friction =0.10 (kg) Note 2	209	469	626	720	1028	1200	1542	265	597	796	916	1308	1526	1961
Max Load @ Friction =0.25 (kg) Note 1	83	188	250	288	411	480	617	106	239	319	366	523	611	785
Max Actuator Speed (mm/sec)	178.5	79.3	59.5	49.6	34.7	29.8	23.2	153.0	68.0	51.0	42.5	29.8	25.5	19.8
Max Line Speed (m/min) Note 4	1829	1829	1829	1448	838	640	381	1829	1829	1494	1143	640	488	274
Max Stroke (mm)	305	305	305	305	305	305	305	305	305	305	305	305	305	305

Notes:

1. The standard coefficient of friction is 0.06 for rolling bearings and 0.25 for sliding.
2. Rolling coefficient of friction of 0.1 can be used for improved performance and life.
3. Thrust factor based on belt drive versus gear drive, number of belts or gears and size.
4. When guiding edge trimmed or previously guided rolls, use 2 times maximum line speed.

General

Input voltage range	-	24 VDC nominal 18–30 VDC min/max Proper earth grounding is required. Note that the negative supply and housing ground are interconnected. The power supply must have an SELV output, such as Puls CS10.241-S1, or equivalent.
Current	-	7.3 A, max.
Internal fuse	-	10 A, slow-blow
Operating ambient	-	0° to 50°C (32° to 122°F)
Dimensions	-	See Outline Dimension drawings.
Approximate weight	-	5.9 kg (13 lbs)
Motor	-	24 VDC Brushless

Certifications and environmental compatibility

Product certifications	-	CE TUV Rheinland of North America to UL61010-1 and CAN/CSA-C22.2 No. 61010-1 and CB Certificate to IEC61010-1
Protection class	-	IP 52 (applies only when all connectors are mated)

Inputs and outputs

Sensor input (2)	- Max Input ± 20 mA
Individually programmable	- 0 to 10 mA (Preferred)
digital port	- Six Digital Inputs, active high Low level: 0 to 0.9 V High level: 3.6 to 24 V
	- Four Outputs, open collector 55 mA at 1.6 V saturation Maximum +30 VDC applied to output +12 V available to port for input reference
Supply to accessories	- +12 V $\pm 5\%$, 600 mA - -12 V $\pm 5\%$, 80 mA

Maximum cable lengths

Power cable (18 AWG)	- 15 m (50 ft) suggested. (Longer cables may be used if the voltage at the GMA-BL is verified to be within the required 18-30 VDC input range). The suggested maximum length is 20 m (65 ft).
Sensors	- 50 m (165 ft)
Digital input/Output port	- 50 m (165 ft)
RGPC-50/F	- 100 m (330 ft)
Operator interface	- 30 m (98 ft)

Service requests and replacement parts

To request service or to get replacement parts, contact one of the following addresses:

Fife Corporation

222 West Memorial Rd.
Oklahoma City, OK, 73114, USA
Phone: 1.405.755.1600
Fax: 1.405.755.8425
Web: www.maxcessintl.com

Fife-Tidland GmbH

Max-Planck-Strasse 8
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