

Solicitation: F1700-120203
Hatchery Section Intake Screen Modification

The following changes in the tender documents are effective immediately. This addendum will form part of the Contract Documents.

Addendum No. 1

1. The dwgs on Merx are formatted to be printed to scale on 11x17 sheets but the scales don't work at that format. Could you provide a scalable version to print on 11x17.

The attached 11 x 17 drawings are a true half size so they should be scalable.

2. At the site meeting it was said that cleaning the sand out of the intake area was going to be issued as a change order but on dwg 03 detail 1 it states to remove the sand and sediment. Please clarify.

Detail 1 on Drawing 03 is correct. The removal of the sand from the intake area is part of the contract.

3. Who is FishPro Inc as stated in section 05 50 01 item 2.6.6?

The strong-back shall become the property of the Department of Fisheries and Oceans Canada.

4. On dwg 03 detail A asks for PW-6 to be PVC. What/Where is the PVC spec?

See Specification Section 33 65 16.

5. Are all the s.s flex hoses to be the ones specified in section 22 15 00 2.15.1, as it is the only one I could find in the specifications?

Yes.

6. On dwg 03 section B it states for when it goes to the underground that it should transition to steel. The steel piping cannot be coated as per the spec due to the bends that aren't going to allow coating around the corners or 20ft down the pipe. Should it be socket welded s.s or would you like to keep the 4" coated steel and have flanges every 20ft?

At the Contractor's option, flanged steel pipe can be used coated per the specs or socket weld schedule 10 SS may be used.

7. On dwg 03 it shows the valve extension to be s.s in detail C but steel in A. Is this correct that some are going to be coated steel and some stainless steel?

All to be Stainless Steel.

8. On dwg 03 it shows the penetrations of pipe through existing walls and gives you a detail of 3 on dwg 13 that would only work on new walls. How would you like penetrations done on the existing walls?

The detail calls for core drilled holes for existing concrete penetrations.

9. On dwg 04 PW6" has a valve before the NC butterfly valve that is not shown on drawings 03. What is that valve going to or for?

The drawing on sheet 04 shows the ball valve in the wrong location. The valve should actually be downstream of the isolation butterfly valve as shown on section B on sheet 03.

10. On dwg 14 it states that galvanized piping can be used for PW and CA but in the specs section 22 15 00 it doesn't specify any galvanized pipe or joint methods. Are we allowed to use galvanized if the detail shows s.s like on dwg 03 or underground?

The pipe schedule is in error. Pipe should either be coated steel or SS piping as specified and clarified under question 6 above.

11. On dwg 14 detail 2 shows the plate to be 1/4 but in section B it shows it to be 3/8 what should it read?

The plate should be 1/4".

12. Is there a geo tech report on this project or do we just work off of the footings being on hardpan at 3ft and receiving an extra for any addition excavation?

There is no geo-tech report available, so the Contractor needs to work off of what is shown on the drawings.

13. Do you have as-built drawings for the existing grating and structural supports so we know what supports exist that we can reuse.

Please see drawings 4 and 5.

14. How far from the base of the tank to the top of the new 3/16 diamond plate? Is it same as the existing height?

The Contractor is to field verify this height for exact dimensions, but for the area just behind the new screens the height from top of slab to the top of the diamond plate is approximately 9 feet. The top of the diamond plate should match the top of the existing grating. In the area where the water supply gate will be replaced the height from top of slab to top of the diamond plate is approximately 12'-6".

15. For the bubbler tubing they ask for 3/8 sch 10 s.s pipe. We are having problems finding it in the country could we just use 1/2 type K copper?

Ridged type K copper would be acceptable; however the tubing inside bubbler tubing inside the intake structure to be 1/2" schedule 40 SS pipe as shown on details 4 and 6 on Drawing 13.

16. The fish screen specs in section 05 50 01 item 2.6.4 asked for the manufacturer shall provide a calculation for maximum head loss through the screens with an approach velocity of 0.4 fps. Has this been accounted for in the design details?

Yes – The normal providers of these types of screens have given us the calculations that they use to calculate the head loss, but we want to make sure that if another vender is to be used the head loss associated with their products are also acceptable.

17. Can the bulk head gages go into the existing channels or do they require baffle guide slots as per detail 5 on dwg 13?

The existing guide slots are being used for the air manifolds, so new guide slots are needed for the potential installation baffles.

- 18 I read the spec but it has the sch 40 and sch 80 specs but it doesn't state what one is used above ground and below ground. What do we use above ground and what do we use below ground? (Relating to Question 4)

All underground PVC piping can be schedule 40, inside the pump sump piping should be either coated and lined schedule 40 steel pipe or schedule 10 SS pipe. The transition should take place outside of the structure such that steel or SS pipe is penetrating the wall.

- 19 I was asking regarding the bulk head gates that aren't used where the bubblers are installed. They are adjacent to the bubblers. Are we allowed to re use the existing rails or do we have to build new ones as per detail 5 on dwg 13? (Relating to Question 17)

You will have to build new ones as per detail 5 on Drawing 13.

- 20 Note 1 for Partial Plan 1 on Drawing 3 calls for 3/16 stainless steel diamond plate to cover existing grating. 3/16 aluminum diamond plate can be substituted for stainless steel.

- 21 The Contractor is responsible for moving and relocating stockpiled hatchery materials located where the new mechanical building is to be constructed. Relocate material to new location per hatchery manager's direction.

- 22 Contractor bids are not to include costs associated with sand bagging in front of intake structure.

- 23 See attached cut sheets for owner supplied gate and actuator.

End of Addendum No. 1

**Northcoast Valve & Gate, Inc.
Submittal Manual
QUINSAM RIVER HATCHERY**

Product: STAINLESS STEEL SLIDE GATE

Operator Type(s): Motor

NCVG Drawing Number(s): NVG-3922

QUINSAM RIVER HATCHERY
MOTOR OPERATOR DATA

Actuator Features

Motor Voltage (230VAC/1Ph/60Hz)
* Full load Amps = 3.5 Locked Rotor Amps = 13
Space Heater – Actuator Enclosure
15 Minute Duty Motor
2 Gear Train Limit Switches – 8 Contacts
Open and Close Torque Switches
Reduction Gearing
RWG Position Transmitter (4-20mA DC Output)
Side Mounted Hand Wheel
Plug and Socket Terminals

Actuator Enclosure

IP68 Extended Submersible Service (20 Feet for 72 Hours)
Double Sealed Terminal Compartment (SA Actuator)
Type "A" Drive Nut – Rising Stem

Actuator Controls

AM AUMA Matic
110 VAC or 24 VDC Interface (Must specify when ordering)
Three (3) Pushbutton (OSC) / Selector Switch (LOR) / Three (3) Indicating Lights
IP68 Submersible Service (20 Feet for 72 Hours)
Wall Bracket for Remote Mounting AUMA Matic with Plug and Socket

Note: Cabling between the remote mounted AUMA Controls and Actuator are not included and must be furnished by others.

Model

SA 10.1-26A

Technical data Multi-turn actuators for modulating duty with 1-phase AC motors										SAR 07.1 – SAR 14.5 AUMA NORM				
Type	Speed rpm		Torque range ¹⁾		Modulating torque ²⁾ max. Nm	Number of starts ³⁾ max. c/h	Duration of impulse ⁴⁾ min. ms	Back-lash max. ms	Valve attachment		Valve stem diameter for a rising valve stem ⁵⁾ max. mm	Handwheel		Weight approx. kg ⁶⁾
	50 Hz	60 Hz	min. Nm	S4-25% max. Nm					Standard EN ISO 5210	Option DIN 3210		Ø mm	Reduction ratio	
SAR 07.1	4	4.8	15	30	15	600	50	275	F07 F10	G0	26	160	11:1	25
	5.6	6.7						220					8:1	
	8	9.6						155					11:1	
	11	13						130					8:1	
	16	19						90					11:1	
	22	26						80					8:1	
	32	38						75					11:1	
	45	54						70					8:1	
SAR 07.5	4	4.8	30	60	30	600	50	275	F07 F10	G0	26	160	11:1	25
	5.6	6.7						220					8:1	
	8	9.6						155					11:1	
	11	13						130					8:1	
	16	19						90					11:1	
	22	26						80					8:1	
	32	38						75					11:1	
	45	54						70					8:1	
SAR 10.1	4	4.8	60	120	60	600	50	275	F10	G0	40	200	11:1	29
	5.6	6.7						220					8:1	
	8	9.6						155					11:1	
	11	13						130					8:1	
	16	19						90					11:1	
	22	26						80					8:1	
SAR 14.1	4	4.8	120	250	120	600	50	275	F14	G1/2	57	315	11:1	62
	5.6	6.7						220					8:1	
	8	9.6						155					11:1	
	11	13						130					8:1	
SAR 14.5	4	4.8	250	500	200	600	50	275	F14	G1/2	57	400	11:1	66
	5.6	6.7						220					8:1	

General information							
Multi-turn actuators AUMA NORM require electric controls. AUMA offers actuator controls AUMA MATIC AM or AUMATIC AC. These can also easily be mounted to the actuator at a later date.							
Features and functions							
Type of duty ⁷⁾	Intermittent duty S4 - 25 %						
Motors	1-ph AC motor, type IM B14 according to IEC 34						
Power supply, mains frequency, and current consumption	Standard voltages: 1-ph AC voltages/frequencies <table border="1"> <tr> <td>Volt</td> <td>115</td> <td>230</td> </tr> <tr> <td>Hz</td> <td>60</td> <td>50</td> </tr> </table> Permissible variation of the mains voltage: ± 10 % Permissible variation of the mains frequency: ± 5 %	Volt	115	230	Hz	60	50
Volt	115	230					
Hz	60	50					
Overvoltage category	Category III according to IEC 60634-4-443						
Insulation class	Standard: F, tropicalized Option: H, tropicalized						
Motor protection	Thermoswitches (NC)						
Self-locking	Output speeds up to 90 rpm (50 Hz) or 108 rpm (60 Hz) NOT self-locking: Output speeds from 125 rpm (50 Hz) or 150 rpm (60 Hz) Multi-turn actuators are self-locking, if the valve position cannot be changed from standstill while torque acts upon the output drive.						
Limit switching	Counter gear mechanism for end positions CLOSED and OPEN for 1 to 500 turns per stroke (optional for 1 to 5,000 turns per stroke) Standard: Single switch (1 NC and 1 NO) for each end position, not galvanically isolated Options: Tandem switches (2 NC and 2 NO) for each end position, switches galvanically isolated Triple switches (3 NC and 3 NO) for each end position, switches galvanically isolated Intermediate position switch (DUO limit switching), adjustable for any position						

1) Tripping torque adjustable for both directions.
2) Permissible, average torque for modulating duty
3) When reversing a pause of at least 100 ms is required.
4) For identical direction of rotation.
5) For output drives types A and B1
6) Weight for multi-turn actuator AUMA NORM with 1-phase AC motor, standard electrical connection, output drive type B1 and handwheel
7) For nominal voltage and 20 °C ambient temperature and at average modulating torque load

We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document.	
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SAR 07.1 – SAR 14.5 AUMA NORM		Technical data Multi-turn actuators for modulating duty with 1-phase AC motors	
Torque switching	Adjustable torque switching for directions OPEN and CLOSE Standard: Single switch (1 NC and 1 NO) for each direction, not galvanically isolated Options: Tandem switches (2 NC and 2 NO) for each direction, switches galvanically isolated		
Non-intrusive setting (option)	Magnetic limit and torque transmitter MWG (only possible in combination with actuator controls AUMATIC AC) for 1 to 500 turns per stroke or for 10 to 5,000 turns per stroke		
Position feedback signal, analogue (options)	Potentiometer or 0/4 – 20 mA (RWG)		
Torque feedback signal, analogue (option)	Only in combination with magnetic limit and torque transmitter MWG and controls AUMATIC		
Mechanical position indicator (option)	Continuous indication, adjustable indicator disc with symbols OPEN and CLOSED		
Running indication (Option)	Blinker transmitter		
Heater in switch compartment	Standard: Self-regulating PTC heater, 5 – 20 W, 110 – 250 V AC/DC Options: 24 – 48 V AC/DC or 380 – 400 V AC A resistance type heater (5 W, 24 V DC) is installed within the actuator in combination with the actuator controls AM or AC.		
Manual operation	Manual drive for setting and emergency operation, handwheel does not rotate during electrical operation. Option: Handwheel lockable		
Electrical connection	Plug/socket connector with screw-type connection		
Threads for cable entries	Standard: Metric threads Options: Pg-threads, NPT-threads, G-threads		
Terminal plan	KMS 60TP 100/001 (basic version)		
Valve attachment	Standard: B1 according to EN ISO 5210 Options: A, B1, B3, B4 according to EN ISO 5210 A, B, D, E according to DIN 3210 C according to DIN 3338 Special output drive types: AF, AK, AG, B3D, ED, DD, IB1, IB3 A prepared for permanent lubrication of stem		
Service conditions			
Application	Indoor and outdoor use permissible		
Mounting position	Any position		
Installation altitude	Standard: ≤ 2,000 m above sea level Option: > 2,000 m above sea level, please contact AUMA		
Ambient temperature	Standard: –40 °C to +60 °C Options: –50 °C to +60 °C –60 °C to +60 °C		
Enclosure protection according to EN 60529 ⁸⁾	Standard: IP 67 Options: IP 68 IP 67-DS (Double Sealed) IP 68-DS (Double Sealed) (Double Sealed = terminal compartment additionally sealed against interior)		
Pollution degree	Within multi-turn actuator: Pollution degree 2 Outside multi-turn actuator: Pollution degree 4		
Corrosion protection	Standard: KN Suitable for installation in industrial units, in water or power plants with a low pollutant concentration Options: KS Suitable for installation in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. in wastewater treatment plants, chemical industry) KX Suitable for installation in extremely aggressive atmospheres with high humidity and high pollutant concentration		
Finish coating	Standard: Two-component iron-mica combination/powder coating		
Colour	Standard: AUMA silver-grey (similar to RAL 7037) Option: Other colours possible on request		
Lifetime ⁹⁾	SAR 07.1 – SAR 10.1: 5.0 million modulating steps SAR 14.5: 3.5 million modulating steps		
⁸⁾ For version in enclosure protection IP 68, higher corrosion protection KS or KX is strongly recommended. Additionally, for enclosure protection IP 68, we recommend to use the double sealed terminal compartment DS. ⁹⁾ The lifetime in operation hours (h) depends on the load and the number of starts. A high starting frequency will rarely improve the modulating accuracy. To reach the longest possible maintenance and fault-free operating time, the number of starts per hour chosen should be as low as possible for the process.			
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Technical data Multi-turn actuators for modulating duty with 1-phase AC motors		SAR 07.1 – SAR 14.5 AUMA NORM
Further information		
EU Directives	Electromagnetic Compatibility (EMC): (2004/108/EC) Low Voltage Directive: (2006/95/EC) Machinery Directive: (2006/42/EC)	
Reference documents	Product description "Electric multi-turn actuators SA" Dimensions SAR Electrical data SAR Technical data Switches Technical data Electronic position transmitter/potentiometer	
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Information sheet Enclosure protection IP 68 (submersible)	Actuators/ controls
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This sheet is valid for the types: Multi-turn actuators SA, SAR, SAEx, SAREx, SAExC, SARExC, in the versions AUMA NORM, AUMA MATIC, AUMATIC, AUMA SEMIPACT
 Part-turn actuators SG, SGR, SGExC, in the versions AUMA NORM, AUMA MATIC, AUMATIC, AUMA SEMIPACT

Definition
 According to EN 60 529, the conditions for meeting the requirements of enclosure protection IP 68 are to be agreed between manufacturer and user.

- AUMA actuators and controls in enclosure protection IP 68 meet the following requirements according to AUMA:
- Duration of submersion in water max. 72 hours
 - Head of water max. 6 m
 - Up to 10 operations during submersion
 - Modulating duty is not possible during submersion

Enclosure protection IP 68 refers to the interior of the actuators (motor, gearing, switch compartment, controls, and terminal compartment).

- Cable glands**
- For the entries of the motor and control cables, appropriate cable glands in enclosure protection IP 68 must be used. The size of the cable glands must be suitable for the outside diameter of the cables, refer to recommendations of the cable gland manufacturers.
 - As standard, actuators and controls are delivered without cable glands. For delivery, the threads are sealed with plugs in the factory.
 - When ordered, cable glands can also be supplied by AUMA at an additional charge. For this, it is necessary to state the outside diameter of the cables.
 - The cable glands must be sealed against the housing at the thread with an O-ring.
 - It is recommended to additionally apply a liquid sealing material (Loctite or similar).

- Commissioning**
 When commissioning, the following should be observed:
- Sealing faces of housing and covers must be clean.
 - O-rings of the covers must not be damaged.
 - A thin film of non-acidic grease should be applied to sealing faces.
 - Covers should be tightened evenly and firmly.

- After submersion**
- Check actuator.
 - In case of ingress of water, dry actuator correctly and check for proper function.

Further notes for multi-turn actuators:
 When using output drive types A and AF (stem nut), it cannot be prevented that water enters the hollow shaft along the valve stem during submersion. This leads to corrosion. The water also enters the thrust bearings of output drive type A, causing corrosion and damage to the bearings. The output drive types A and AF should therefore not be used during submersion.

Further notes for part-turn actuators:

- Use suitable sealing material between valve flange and part-turn actuator.
- Water can enter into the coupling compartment along the valve shaft. This would lead to corrosion of hub and coupling. Therefore a suitable anticorrosive (or sticky grease) must be applied to the hub and coupling of the part-turn actuators before mounting.

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Technical data Actuator controls AUMA MATIC	AM 01.1 AM 02.1
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Actuator controls AUMA MATIC AM 01.1/AM 02.1 for controlling multi-turn actuators of the SA/SAR type range and part-turn actuators of the SG/SGR type range. For versions with fieldbus interfaces see separate documents.

Features and functions

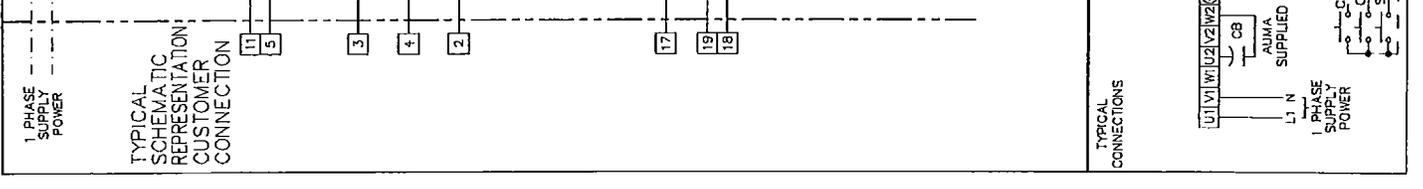
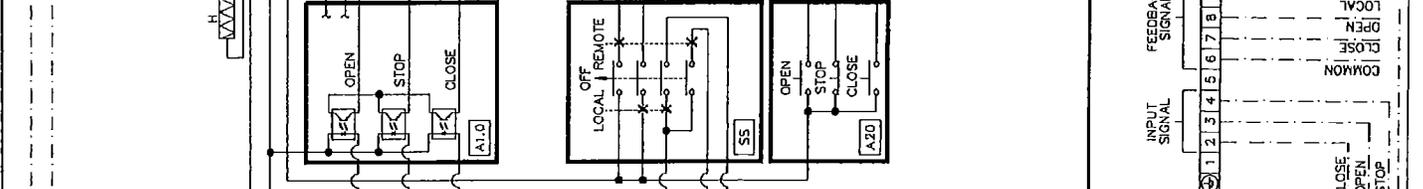
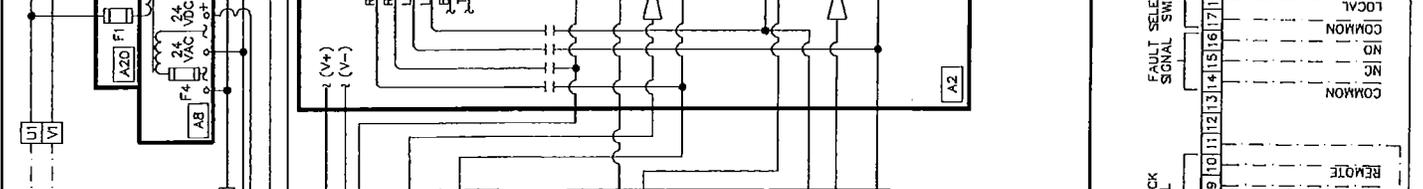
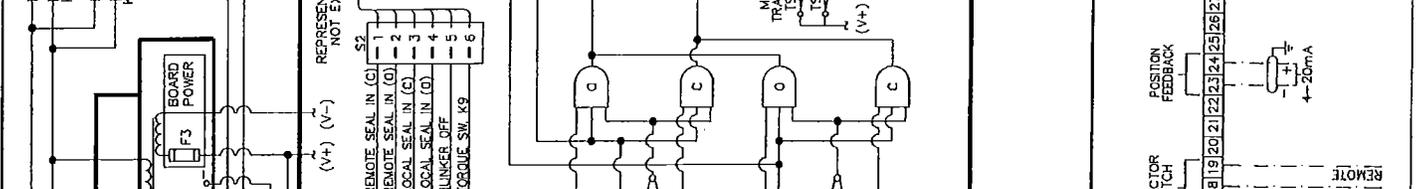
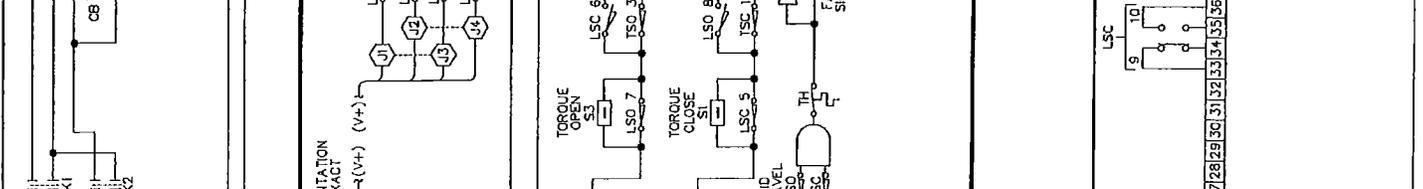
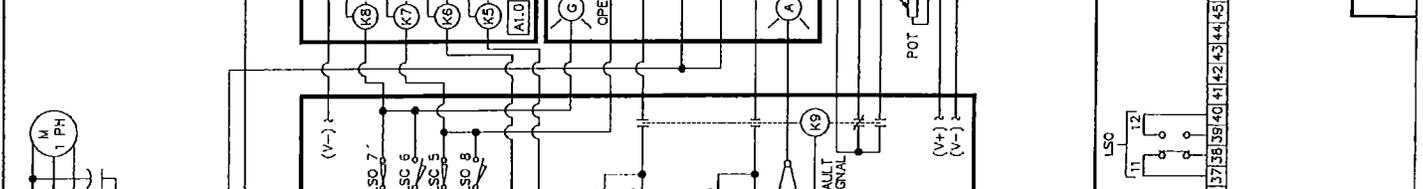
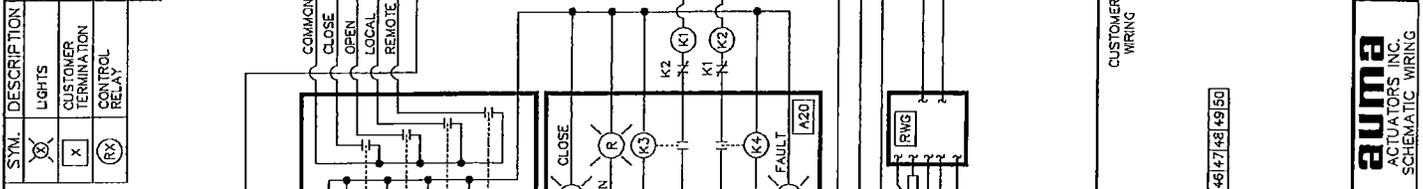
Voltage supply	<p>Standard voltages:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="11" style="text-align: center;">3-ph AC voltages/frequencies</td> <td colspan="3" style="text-align: center;">1-ph AC voltages/frequencies</td> </tr> <tr> <td style="text-align: center;">Volt</td> <td style="text-align: center;">220</td> <td style="text-align: center;">230</td> <td style="text-align: center;">240</td> <td style="text-align: center;">380</td> <td style="text-align: center;">400</td> <td style="text-align: center;">415</td> <td style="text-align: center;">440</td> <td style="text-align: center;">460</td> <td style="text-align: center;">480</td> <td style="text-align: center;">500</td> <td style="text-align: center;">Volt</td> <td style="text-align: center;">110,115,120</td> <td style="text-align: center;">220,230,240</td> </tr> <tr> <td style="text-align: center;">Hz</td> <td style="text-align: center;">50</td> <td style="text-align: center;">60</td> <td style="text-align: center;">60</td> <td style="text-align: center;">60</td> <td style="text-align: center;">50</td> <td style="text-align: center;">Hz</td> <td style="text-align: center;">60</td> <td style="text-align: center;">50</td> </tr> </table> <p>Special voltages:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="5" style="text-align: center;">3-ph AC voltages/frequencies</td> <td colspan="3" style="text-align: center;">1-ph AC voltages/frequencies</td> </tr> <tr> <td style="text-align: center;">Volt</td> <td style="text-align: center;">525</td> <td style="text-align: center;">575</td> <td style="text-align: center;">660</td> <td style="text-align: center;">690</td> <td style="text-align: center;">Volt</td> <td colspan="2" style="text-align: center;">208</td> </tr> <tr> <td style="text-align: center;">Hz</td> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> <td style="text-align: center;">Hz</td> <td colspan="2" style="text-align: center;">60</td> </tr> </table> <p>Permissible variation of the nominal voltage: $\pm 10\%$ Permissible variation of the mains frequency: $\pm 5\%$ Current consumption with controls depending on mains voltage: 100 to 120 V AC = max. 575 mA 208 to 240 V AC = max. 275 mA 380 to 690 V AC = max. 160 mA</p>	3-ph AC voltages/frequencies											1-ph AC voltages/frequencies			Volt	220	230	240	380	400	415	440	460	480	500	Volt	110,115,120	220,230,240	Hz	50	50	50	50	50	50	60	60	60	50	Hz	60	50	3-ph AC voltages/frequencies					1-ph AC voltages/frequencies			Volt	525	575	660	690	Volt	208		Hz	50	50	50	50	Hz	60	
3-ph AC voltages/frequencies											1-ph AC voltages/frequencies																																																								
Volt	220	230	240	380	400	415	440	460	480	500	Volt	110,115,120	220,230,240																																																						
Hz	50	50	50	50	50	50	60	60	60	50	Hz	60	50																																																						
3-ph AC voltages/frequencies					1-ph AC voltages/frequencies																																																														
Volt	525	575	660	690	Volt	208																																																													
Hz	50	50	50	50	Hz	60																																																													
External supply of the electronics (option)	24 V DC + 20 %/- 15 %, Current consumption: Basic version approx. 200 mA, with options up to 500 mA																																																																		
Switchgear	<p>Standard: Reversing contactors¹⁾ (mechanically and electrically interlocked) For motor power up to 1.5 kW, nominal motor current up to 9 A (OPEN - CLOSE duty) or 5.2 A (modulating duty)</p> <p>Options: Reversing contactors¹⁾ (mechanically and electrically interlocked) For motor power up to 7.5 kW, nominal motor current up to 20 A (OPEN - CLOSE duty) or 18 A (modulating duty) Thyristor unit (recommended for modulating actuators) For motor power up to 1.5 kW, 500 V AC with internal fuses For motor power up to 3.0 kW, 500 V AC with internal fuses For motor power up to 5,5 kW, 500 V AC, external fuses required</p>																																																																		
Control	<p>Standard: Control inputs 24 V DC, OPEN - STOP - CLOSE (via opto-isolator, with one common), current consumption: approx. 10 mA per input Observe min. duration of impulse for modulating actuators</p> <p>Option: Control inputs 115 V AC, OPEN - STOP - CLOSE (via opto-isolator, with one common), current consumption: approx. 15 mA per input</p>																																																																		
Output signals	<p>Standard: 5 output relays with gold-plated contacts: 4 NO contacts with one common, max. 250 V AC, 0.5 A (resistive load) Standard configuration: End position CLOSED, end position OPEN, selector switch REMOTE, selector switch LOCAL 1 potential-free change-over contact, max. 250 V AC, 0.5 A (resistive load) for collective fault signal: Torque fault, phase failure, motor protection tripped</p> <p>Option: Signals in combination with positioner (refer to page 2): End position OPEN, end position CLOSED (requires tandem switch within actuator) Selector switch REMOTE, selector switch LOCAL via selector switch 2nd level 1 potential-free change-over contact, max. 250 V AC, 0.5 A (resistive load) For collective fault signal: torque fault, phase failure, motor protection tripped</p>																																																																		
Voltage output	<p>Standard: Auxiliary voltage 24 V DC, max. 50 mA to supply the control inputs, galvanically isolated from internal voltage supply</p> <p>Option: Auxiliary voltage 115 V AC, max. 30 mA to supply the control inputs²⁾, galvanically isolated from internal voltage supply</p>																																																																		
Local controls	<p>Standard: Selector switch LOCAL - OFF - REMOTE (lockable in all three positions) Push buttons OPEN - STOP - CLOSE 3 indication lights: End position CLOSED (yellow), collective fault signal (red), end position OPEN (green)</p> <p>Option: Protection cover, lockable</p>																																																																		

1) The reversing contactors are designed for a lifetime of 2 million starts. For applications requiring a high number of starts, we recommend the use of thyristor units.
 2) Not possible in combination with PTC tripping device

AM 01.1 AM 02.1	Technical data Actuator controls AUMA MATIC	
Functions	Standard:	Switch-off mode adjustable limit or torque seating for end position OPEN and end position CLOSED Overload protection against excessive torques over the whole travel Excessive torque (torque fault) can be excluded from collective fault signal Phase failure monitoring with automatic phase correction Push-to-run operation or self-retaining in REMOTE Push-to-run operation or self-retaining in LOCAL Blinker transmitter signal of actuator can be switched on or off (option)
	Options:	Positioner ³⁾ : Nominal position value via analogue input E1 = 0/4 – 20 mA Galvanic isolation for position nominal value (0/4 – 20 mA) and position feedback (0/4 – 20 mA) Adjustable behaviour on loss of signal Adjustable sensitivity (dead band) and pause time Positioner for Split Range operation ³⁾
Motor protection evaluation	Standard:	Monitoring of the motor temperature in connection with thermostiches in the actuator motor
	Options:	Additional thermal overload relay in the controls in combination with thermostiches within the actuator motor PTC tripping device in combination with PTC thermistors in the actuator motor
Electrical connection	Standard:	AUMA plug/socket connector with screw type connection: Threads for cable glands: M-threads: 1 x M20 x 1.5; 2 x M25 x 1.5 Pg-threads: 1 x Pg13.5; 2 x Pg21 NPT-threads: 1 x ½" NPT; 2 x ¾" NPT
	Options:	M-threads: 1 x M20 x 1.5; 2 x M25 x 1.5; 1 x M32 x 1.5 1 x M20 x 1.5; 1 x M25 x 1.5; 1 x M32 x 1.5 Pg-threads: 1 x Pg13.5; 2 x Pg21; 1 x Pg29 1 x Pg13.5; 1 x Pg21; 1 x Pg29 NPT-threads: 2 x ¾" NPT; 1 x 1 ¼" NPT G-threads: 2 x G¾"; 1 x G1"; 1 x G1 ¼" 2 x G¾"; 1 x G1 ¼"
		Special threads, other than standard mentioned above, possible Gold-plated control plug (pins and sockets) Parking frame for wall mounting of the disconnected plug Protection cover for plug compartment (when plug is removed)
Wiring diagram (basic version)	MSP 1110KC3--F18E1 KMS TP110/001	
Further options for version with RWG in the actuator		
Position feedback (option)	Analogue output E2 = 0/4 – 20 mA (load max. 500 Ω)	
Service conditions		
Enclosure protection according to EN 60 529	Standard:	IP 67 (when mounted)
	Options:	IP 68 ⁴⁾ Terminal compartment additionally sealed against interior (double sealed)
Corrosion protection	Standard:	KN Suitable for installation in industrial units, in water or power plants with a low pollutant concentration
	Options:	KS Suitable for installations in occasionally or permanently aggressive atmosphere with a moderate pollutant concentration (e.g. wastewater treatment plants, chemical industry) KX Suitable for installation in extremely aggressive atmosphere with high humidity and high pollutant concentration KX-G same as KX, however aluminium-free version (outer parts)
Finish coating	Standard:	Two-component iron-mica combination
	Option:	Special primer/special finish coat (customer's choice)
Colour	Standard:	AUMA silver-grey (similar to RAL 7037)
	Option:	Other colours than standard colour are possible on request
3) Requires position transmitter in actuator 4) For version in enclosure protection IP 68, higher corrosion protection KS or KX is strongly recommended.		
We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document.		
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Technical data Actuator controls AUMA MATIC		AM 01.1 AM 02.1
Ambient temperature	Standard: - 25 °C to + 70 °C Options: - 40 °C to + 70 °C, low temperature version - 50 °C to + 70 °C, extreme low temperature version incl. heating system - 60 °C to + 70 °C, extreme low temperature version incl. heating system Low temperature versions incl. heating system for connection to external power supply 230 V AC or 115 V AC.	
Vibration resistance ⁵⁾ according to IEC 60 068-2-6	1 g, from 10 Hz to 200 Hz	
Weight	Approx. 7 kg (with AUMA plug/socket connector)	
Accessories		
Wall bracket ⁶⁾	AUMA MATIC mounted separately from the actuator, including plug/socket connector. Connecting cables on request. Recommended for high ambient temperatures, difficult access, or in case of heavy vibrations during service.	
Further information		
EU Directives	Electromagnetic Compatibility (EMC): (89/336/EEC) Low Voltage Directive: (73/23/EEC) Machinery Directive: (98/37/EC)	
Reference documents	Product description, "Actuator controls AUMA MATIC" Dimension sheets "Multi-turn actuators/part-turn actuators with integral controls AUMA MATIC"	
5) Resistant to vibrations during start-up or for failures of the plant. However, a fatigue strength may not be derived from this. 6) Cable length between actuator and AUMA MATIC max. 100 m. Not suitable for version with potentiometer in the actuator. Instead of the potentiometer, an RWG has to be used in the actuator		
We reserve the right to alter data according to improvements made. Previous documents become invalid with the issue of this document.		
auma [®]		Page 3 of 3 Issue 1.08 Y001.280/002/en

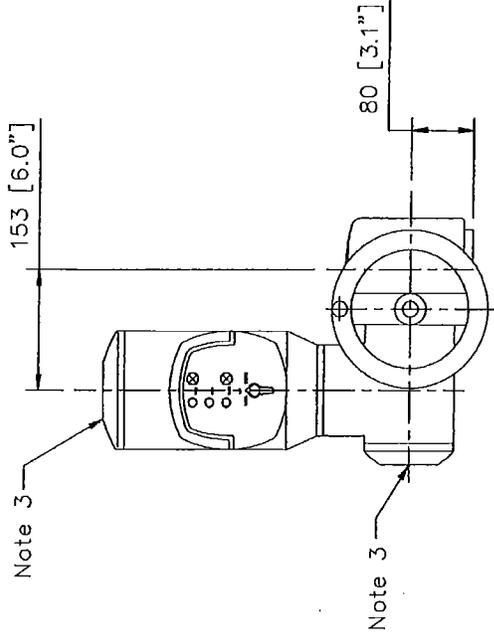
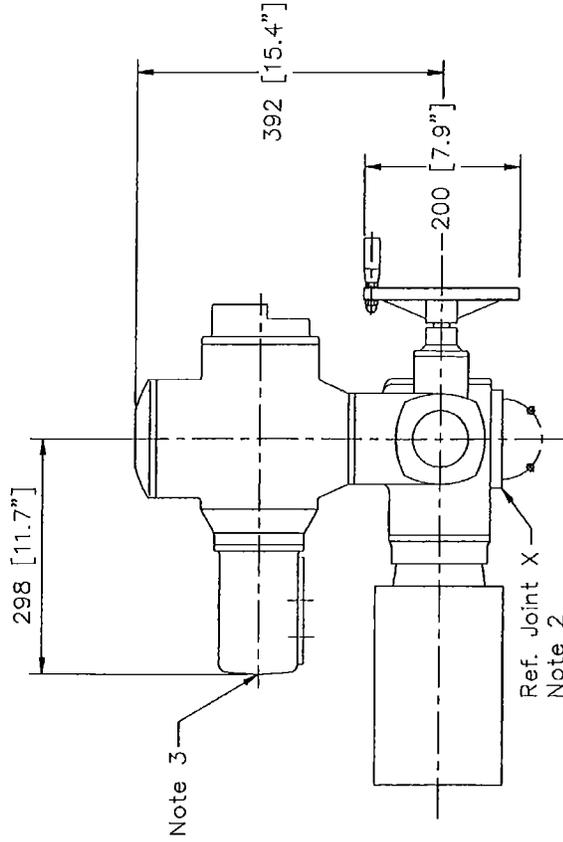
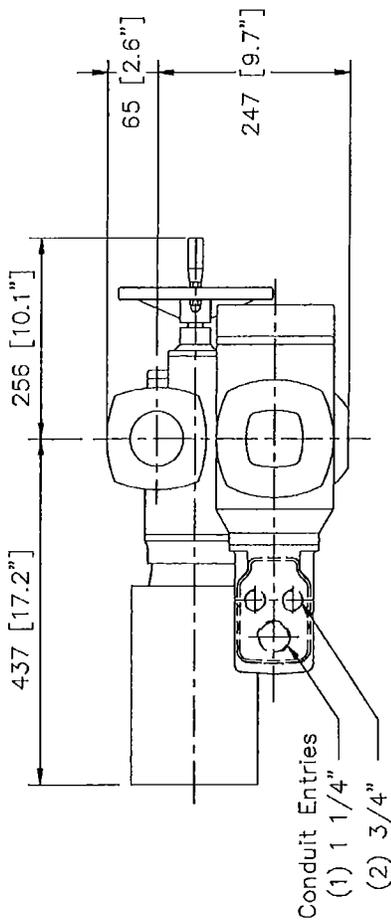
SYM.	DESCRIPTION	SYM.	DESCRIPTION	LEGEND
(X)	LIGHTS	A1.0	INVERTER	INTERFACE BOARD
(X)	CUSTOMER TERMINATION	A2	AND GATE	LOGIC BOARD
(R)	CONTROL RELAY	A20	SOLDER LINKS	POWER SUPPLY
		F1-F2	INTEGRAL CAPACITORS	MONITOR/CONTROL BOARD
		F3-F4	SECONDARY FUSE	INTEGRAL CAPACITORS
		K1-K2	REVERSING CONTACTOR	PRIMARY FUSE
		K3-K4	INTERPOSING RELAYS	
		K5-K8	STATUS RELAY	
		K9	FAULT SIGNAL RELAY	
		LSC (NSR)	LIMIT SWITCH CLOSE	
		LSD (NOL)	LIMIT SWITCH OPEN	
		M	MOTOR	
		PC	PHASE CORRECTION	
		POT	POTENTIOMETER	
		RWG	POSITION TRANSMITTER	
		S1	SW - TORQUE SEATING, OPEN	
		S2	SW - SEAL-IN, BUNKER, TORQUE FAULT	
		S3	SWITCH - TORQUE SEATING, CLOSE	
		SS	SELECTOR SWITCH	
		TH	MOTOR THERMAL SW. (AUTO-RESET)	
		TSC (DSR)	TORQUE SWITCH CLOSE	
		TSD (OOL)	TORQUE SWITCH OPEN	
		CONTACT		() CLOSE CONTACTS (---) OPEN CONTACTS VALUE POSITION OPEN INTERMEDIATE CLOSE
		TSC		
		TSD		
		LSC		
		LSD		
		LSC		
		LSD		
		LSC		
		LSD		



- NOTES:
1. --- FIELD WIRING BY OTHERS
 2. PAIRED SWITCHES WITHIN BRACKETS MUST HAVE SAME VOLTAGE
 3. ACTUATOR DRAWING SHOWS THE UNIT AS THE MID-POSITION
 4. FAULT SIGNAL K9 SHOWN IN FAULT CONDITION.
 - * FAULT SIGNAL INCLUDES: (COLLECTIVE)
 - THERMAL OVERLOAD
 - LOSS OF POWER
 - TORQUE SW. TRIP (MID-TRAVEL)
 - LOSS OF PHASE
 5. J1-J3 SOLDER LINKS FOR LIGHTS ON IN MID TRAVEL OR
 - J2-J4 SOLDER LINKS FOR LIGHTS ON AT END OF TRAVEL

1	PHASE SA	11/04/2004	REV. 1	11/04/2004
2	MATIC INTERFACE	11/04/2004	REV. 2	11/04/2004
3	WIRING DWG.	11/04/2004	REV. 3	11/04/2004
4	BY DATE	11/04/2004	REV. 4	11/04/2004
5	APP. DATE	11/04/2004	REV. 5	11/04/2004
6	REV. DATE	11/04/2004	REV. 6	11/04/2004
7	BY DATE	11/04/2004	REV. 7	11/04/2004
8	APP. DATE	11/04/2004	REV. 8	11/04/2004
9	REV. DATE	11/04/2004	REV. 9	11/04/2004
10	BY DATE	11/04/2004	REV. 10	11/04/2004
11	APP. DATE	11/04/2004	REV. 11	11/04/2004
12	REV. DATE	11/04/2004	REV. 12	11/04/2004
13	BY DATE	11/04/2004	REV. 13	11/04/2004
14	APP. DATE	11/04/2004	REV. 14	11/04/2004
15	REV. DATE	11/04/2004	REV. 15	11/04/2004
16	BY DATE	11/04/2004	REV. 16	11/04/2004
17	APP. DATE	11/04/2004	REV. 17	11/04/2004
18	REV. DATE	11/04/2004	REV. 18	11/04/2004
19	BY DATE	11/04/2004	REV. 19	11/04/2004
20	APP. DATE	11/04/2004	REV. 20	11/04/2004
21	REV. DATE	11/04/2004	REV. 21	11/04/2004
22	BY DATE	11/04/2004	REV. 22	11/04/2004
23	APP. DATE	11/04/2004	REV. 23	11/04/2004
24	REV. DATE	11/04/2004	REV. 24	11/04/2004
25	BY DATE	11/04/2004	REV. 25	11/04/2004
26	APP. DATE	11/04/2004	REV. 26	11/04/2004
27	REV. DATE	11/04/2004	REV. 27	11/04/2004
28	BY DATE	11/04/2004	REV. 28	11/04/2004
29	APP. DATE	11/04/2004	REV. 29	11/04/2004
30	REV. DATE	11/04/2004	REV. 30	11/04/2004
31	BY DATE	11/04/2004	REV. 31	11/04/2004
32	APP. DATE	11/04/2004	REV. 32	11/04/2004
33	REV. DATE	11/04/2004	REV. 33	11/04/2004
34	BY DATE	11/04/2004	REV. 34	11/04/2004
35	APP. DATE	11/04/2004	REV. 35	11/04/2004
36	REV. DATE	11/04/2004	REV. 36	11/04/2004
37	BY DATE	11/04/2004	REV. 37	11/04/2004
38	APP. DATE	11/04/2004	REV. 38	11/04/2004
39	REV. DATE	11/04/2004	REV. 39	11/04/2004
40	BY DATE	11/04/2004	REV. 40	11/04/2004
41	APP. DATE	11/04/2004	REV. 41	11/04/2004
42	REV. DATE	11/04/2004	REV. 42	11/04/2004
43	BY DATE	11/04/2004	REV. 43	11/04/2004
44	APP. DATE	11/04/2004	REV. 44	11/04/2004
45	REV. DATE	11/04/2004	REV. 45	11/04/2004
46	BY DATE	11/04/2004	REV. 46	11/04/2004
47	APP. DATE	11/04/2004	REV. 47	11/04/2004
48	REV. DATE	11/04/2004	REV. 48	11/04/2004
49	BY DATE	11/04/2004	REV. 49	11/04/2004
50	APP. DATE	11/04/2004	REV. 50	11/04/2004

AUMA
ACTUATORS INC.
SCHEMATIC WIRING

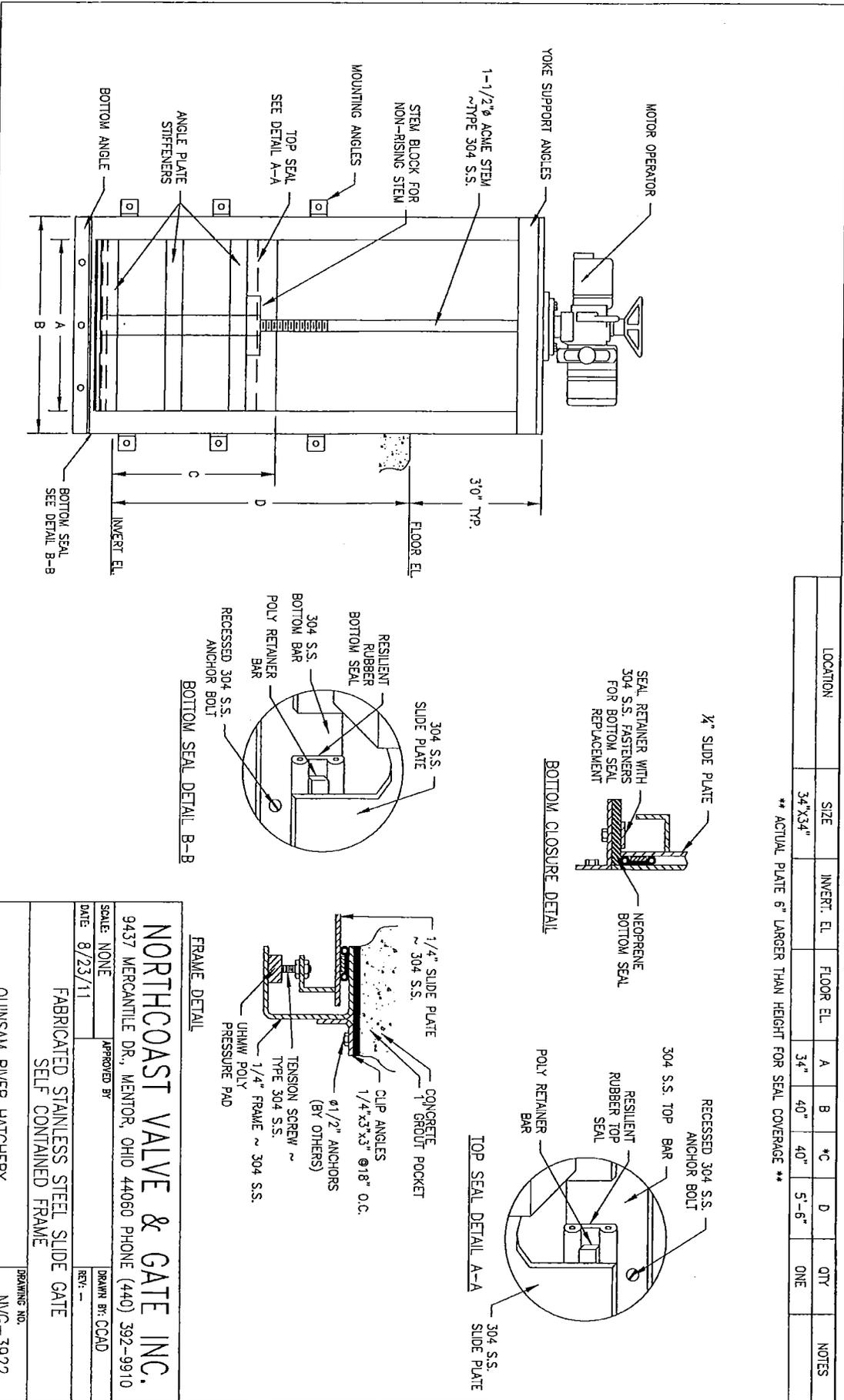


Notes:

1. Metric tolerance per ISO 2768-m. Dimensions in brackets [] are in inches and rounded to one decimal place.
2. See appropriate drive drawing.
3. Seven inch minimum clearance recommended for removal of access cover and equipment adjustment.
4. Consult factory for more detailed dimensionals.
5. Actuator dimensions will not exceed drawing dimensions.

LOCATION	SIZE	INVERT. EL.	FLOOR EL.	A	B	*C	D	QTY	NOTES
	34"X34"			34"	40"	40"	5'-6"	ONE	

** ACTUAL PLATE 6" LARGER THAN HEIGHT FOR SEAL COVERAGE **



NORTHCOAST VALVE & GATE INC.
 9437 MERCANTILE DR., MENTOR, OHIO 44060 PHONE (440) 392-9910
 SCALE: NONE
 DATE: 8/23/11
 APPROVED BY: [Signature]
 DRAWN BY: CCAD
 REV: -
 FABRICATED STAINLESS STEEL SLIDE GATE
 SELF CONTAINED FRAME
 QUINSAM RIVER HATCHERY
 DRAWING NO. NVG-3922