

Milling Equipment Electrical Control Panel
USER REQUIREMENT SPECIFICATIONS

Dakota Bioproducts Innovation Institute
1414 Research Park Way
Brookings, SD, 57006

Revision No.: 0

APPROVED

1 TABLE OF CONTENTS

1	TABLE OF CONTENTS.....	1
---	------------------------	---

2 SCOPE.....	2
3 BACKGROUND.....	3
4 PROCESS DESCRIPTION	3
5 BASIS OF DESIGN	3
5.1 CAPACITIES	3
5.2 CONSTRUCTION.....	3
5.3 HEALTH, SAFETY AND ENVIRONMENT (HSE)	3
5.4 OPERATION, PERSONNEL AND AUTOMATION	4
5.5 MATERIALS OF CONSTRUCTION	4
5.6 RELIABILITY & MAINTENANCE.....	4
6 ABBREVIATIONS, ACRONYMS & DEFINITIONS	4
7 USER REQUIREMENT SPECIFICATIONS	5
8 SELECTION CRITERIA	6
9 RETURN BIDS TO	7
10 OTHER PROVISIONS	7

2 SCOPE

The project will include the installation of a new Hammer Mill and Hammer Mill Plenum system. This document defines the requirements and deliverables for this system. It describes overall requirements that must be met to produce the specific equipment requested. Equipment procurement, delivery, and start-up support are included. No installation is required.

This URS is the input document for the:

- Equipment procurement purposes.
- Equipment sizing
- Functional and technical specifications.

3 BACKGROUND

The Dakota Bioproducts Innovation Institute is a research facility for the development of high-quality bioproducts. A hammer mill has been identified as one of the size reduction technologies that will be available for customer use. For ease of operation the milling equipment will be controlled from an electrical panel inside of the milling room.

4 PROCESS DESCRIPTION

The Hammer Mill will be used to grind a variety of products. It will be mounted on a steel structure that will position the hammer mill over a plenum and collection screw. An air assist filter and fan will provide a negative air draw to the Hammer Mill system. Dust collected from the air assist filter will join with the ground Hammer Mill product via a collection screw conveyor that will convey the sized material to a collection vessel or supersack. The control panel will be configured to start the milling equipment starting with the equipment at the end of the flow first, then starting sequentially towards the front of the process. Interlocks will be integrated so that if a piece of equipment trips out the upstream equipment feeding that device will be shut down as well.

5 BASIS OF DESIGN

5.1 Capacities

The milling equipment control panel will be powered from a breaker in the common MCC room. The panel itself will be placed in the milling room and will allow for stopping/starting of the mill feeder, mill, air assist fan, discharge screw and airlock, and transfer screw conveyor.

5.2 Construction

The milling equipment control panel shall be a two-door enclosure, Type 12 suitable for wall mounting. The control panel will house all transformers, relays, starters, VFD's, control buttons, etc. to control all devices. Potentiometers and start/stop buttons will be installed in the panel doors.

5.3 Health, Safety and Environment (HSE)

The milling equipment control panel will satisfy appropriate conformity assessment procedures and be UL508A compliant. The panel will have a disconnect switch on the door for lock out procedures as well as an E-stop configured to shut down all equipment.

Milling Equipment Electrical Control Panel

Revision No.: 0
Effective Date: 12-07-23

5.4 Operation, personnel and automation

The milling equipment control panel will be set up to be operated by a single operator. Safety devices such as rotation switches, explosion vent switches, door switches, etc. will be wired to stop equipment when activated. Main equipment motors will be wired such that when a device trips out the upstream equipment also stops.

5.5 Materials of Construction

Materials of construction for the control panel will be carbon steel sheet.

5.6 Reliability & maintenance

The control panel will be designed to operate routinely during 8-12-hour per day milling operations.

6 ABBREVIATIONS, ACRONYMS & DEFINITIONS

Acronyms	Description
BEA	Business Essential Attribute
BMS	Building Management System
ASME-BPE	American Society of Mechanical Engineers BioProcessing Equipment
BSL-1	Bio-Safety Level 1
C&Q	Commissioning & Qualification
CIP	Clean In Place
QCA	Quality Critical Attribute
cGMP	current Good Manufacturing Practices
HVAC	Heating Ventilation & Air Conditioning
OA	Optional Attribute

Milling Equipment Electrical Control Panel**Revision No.: 0**
Effective Date: 12-07-23

PLC	Programable Logic Controller
SCADA	Supervisory Control and Data Acquisition
SOP	Standard Operating Procedures
URS	User Requirements Specification

7 USER REQUIREMENT SPECIFICATIONS

URS TABLE – Milling Equipment Control Panel		
Designation	Description	Type
URS-F1	The control panel will be constructed of carbon steel sheet. The panel will be two-door arrangement suitable for wall hanging.	BEA
URS-F2	The control panel will include a disconnect switch with rotary handle suitable for lockout.	BEA
URS-F3	The control panel will be fed from a main breaker in the MCC room.	

Milling Equipment Electrical Control Panel

Revision No.: 0
Effective Date: 12-07-23

URS-F4	<p>The control panel will include fuse blocks, relays, push buttons (illuminated green), starters, VFD's with potentiometers, and E-stop to control the following devices:</p> <ol style="list-style-type: none"> 1. Discharge transfer conveyor ¾ HP (would be started first) 2. Discharge Airlock and Plenum Screw Conveyor 1 HP 3. Baghouse Fan 3 HP 4. Hammer Mill 25 HP with VFD for reversing and speed control. 5. Mill Feeder ½ HP with VFD for speed control (would be started last) 	BEA
URS-F5	Hammer mill circuit to have an amp meter and non-resettable hour meter mounted in the panel	
URS-F6	Control panel will have 120V AC control voltage and transformer. Motor voltage will be three phase 480VAC.	BEA
URS-F7	FVNR starters preferred, NEMA style contactors	BEA
URS-F8	Push buttons to illuminate green when the motors are started.	BEA
URS-F9	VFD's on the control panel will need Hand/Off/Auto switches and speed pots as well as door mounted keypads.	BEA
URS-F10	Control panel to have interlocks so that first started motor must run before next motor in sequence can be started. If downstream motors in the process shut off the upstream motors will drop out as well. Starting sequence is #1 thru #5 above with #1 being last in the process flow but first to start.	BEA
URS-F11	Control system documentation shall be provided, including specifications, wiring overview, circuit diagram, arrangement drawing, terminal connection diagram.	
URS-F12	Control panel will include labor to assemble, wire and test prior to shipment. Labor for design and drawings will also be included.	BEA

END OF SPECIFICATION**8 SELECTION CRITERIA**

Vendors will be evaluated based on the following criteria:

Evaluation Criteria			
Description	Ranking	Weight	

Milling Equipment Electrical Control Panel

Revision No.: 0
Effective Date: 12-07-23

Mandatory Technical Requirements A review of your proposal to determine adherence with the REQ specifications and technical requirements.	1-10	30%
Proposal Pricing Review of your proposal in relation to the services offered in the proposal. Proposals will be evaluated against competing proposals for cost effectiveness. Proposals will be evaluated to be reasonable and appropriate.	1-10	20%
Technical Response The technical response in your proposal portrays knowledge, experience, and professionalism. Relevant product features and/or specifications are available with your equipment other than those mandatory specifications allotted above.	1-10	10%
Lead Time A review of your product's lead time to meet business objectives.	1-10	15%
Product Warranty The available warranty, in scope, duration, and value, proposed with your product.	1-10	5%
Experience and Demonstrated Results Our evaluation will include a review of your history, your experience as it relates to the requirements within this RFP, evidence of past performance, quality and relevance of past work, references, and related items.	1-10	20%

9 RETURN BIDS TO

Craig Arnold craig@dbii.org

Bobby Markham Bobby.Markham@sdstate.edu

10 OTHER PROVISIONS

Must meet 200 CFR buy America Provision□ Title 49 Subtitle B Chapter VI [Part 661](#)

Federal Participation Disclosure – “This project will be partially funded with Federal funds from the United States Department of Commerce, Economic Development Administration and therefore is subject to the Federal laws and regulations associated with that program.”

Must meet Federal Contract provision 200 CFR Title 2 subtitle A Chapter II [Part 200](#)

Certification Relating to Prohibited Entity

For contractors, vendors, suppliers, or subcontractors who enter into a contract with the State of South Dakota by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, is not an entity, regardless of its principal place of business, that is ultimately owned or controlled, directly or indirectly, by a foreign national, a foreign parent entity, or foreign government from China, Iran, North Korea, Russia, Cuba, or Venezuela, as defined by South Dakota Executive Order 2023-02. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.

RESTRICTION OF BOYCOTT OF ISRAEL

For contractors, vendors, suppliers, or subcontractors with five (5) or more employees who enter into a contract with the State of South Dakota that involves the expenditure of one hundred thousand dollars (\$100,000) or more, by submitting a response to this solicitation or agreeing to contract with the State, the bidder or offeror certifies and agrees that the following information is correct:

The bidder or offeror, in preparing its response or offer or in considering proposals submitted from qualified, potential vendors, suppliers, and subcontractors, or in the solicitation, selection, or commercial treatment of any vendor, supplier, or subcontractor, has not refused to transact business activities, has not terminated business activities, and has not taken other similar actions intended to limit its commercial relations, related to the subject matter of the bid or offer, with a person or entity on the basis of Israeli national origin, or residence or incorporation in Israel or its territories, with the specific intent to accomplish a boycott or divestment of Israel in a discriminatory manner. It is understood and agreed that, if this certification is false, such false certification will constitute grounds for the State to reject the bid or response submitted by the bidder or offeror on this project and terminate any contract awarded based on the bid or response. The successful bidder or offeror further agrees to provide immediate written notice to the contracting executive branch agency if during

Milling Equipment Electrical Control Panel

Revision No.: 0
Effective Date: 12-07-23

the term of the contract it no longer complies with this certification and agrees such noncompliance may be grounds for contract termination.

CERTIFICATION OF NO STATE LEGISLATOR INTEREST

Offeror (i) understands neither a state legislator nor a business in which a state legislator has an ownership interest may be directly or indirectly interested in any contract with the State that was authorized by any law passed during the term for which that legislator was elected, or within one year thereafter, and (ii) has read South Dakota Constitution Article 3, Section 12 and has had the opportunity to seek independent legal advice on the applicability of that provision to any Agreement entered into as a result of this RFP. By signing an Agreement pursuant to this RFP, Offeror hereby certifies that the Agreement is not made in violation of the South Dakota Constitution Article 3, Section 12