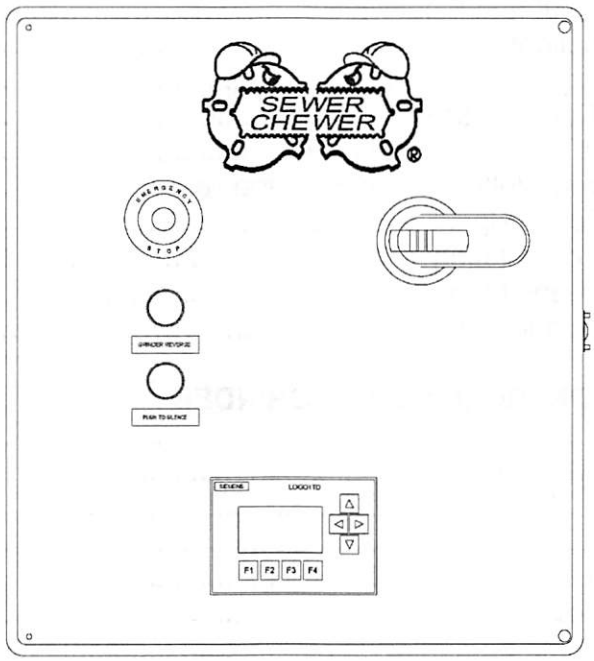
Yeomans Chicago Corporation
3905 Enterprise Ct.
Aurora, IL 60504 USA

Digital Controller
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS



SEWER CHEWER®

Wastewater / Sludge Grinder CE

Yeomans Chicago Corporation
3905 Enterprise Court
P.O. Box 6620
Aurora, IL 60598-0620
Phone: 630-236-5500
Fax: 630-236-5511
www.yccpump.com

Important: *Save this Manual for future reference.*

YEOMANS CHICAGO CORPORATION
Yeomans Chicago Corporation
3905 Enterprise Ct.
Aurora, IL 60504 USA

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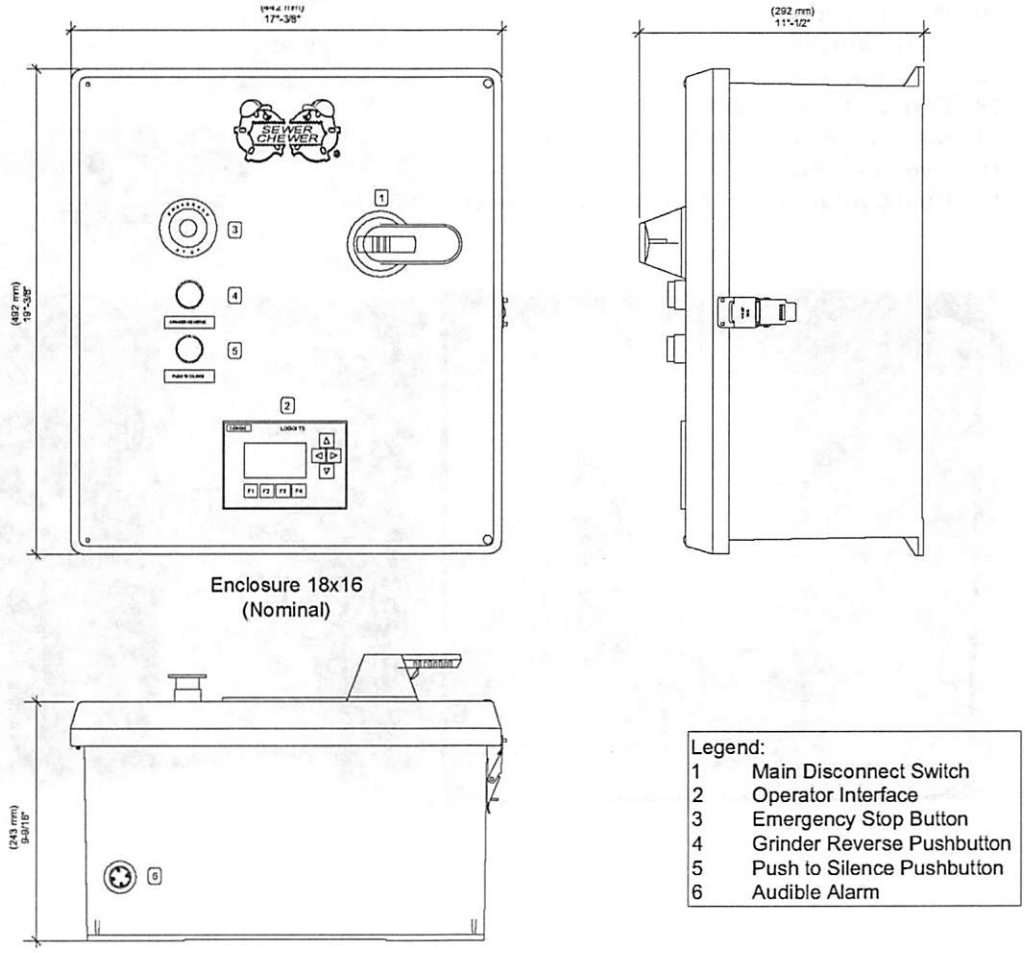
Introduction:

The digital controller packaged with this SEWER CHEWER unit provides an easy interface for the user to control the grinder whether locally at the digital control panel or remotely with external start/stop signals. The condition of the grinder motor is continuously monitored by the Programmable Logic Controller (PLC) and associated devices to react to extraneous conditions which could do harm to the grinder and/or motor. Motor overload and grinder jam alarms are displayed on the Operator Interface Device (OID) along with instructions the user can follow to reset the grinder if needed. To assist in keeping up a regular maintenance schedule, the controller will display messages periodically to remind the user when preventative and full maintenance on the SEWER CHEWER is needed.

To assist in the tracking of SEWER CHEWER activity over time, the digital controller keeps a running tally of total power on time, motor elapsed running time, total grinder overloads, and total motor overloads. Resettable interval tallies of the above provide a means to tracking activity between inspections or time periods.

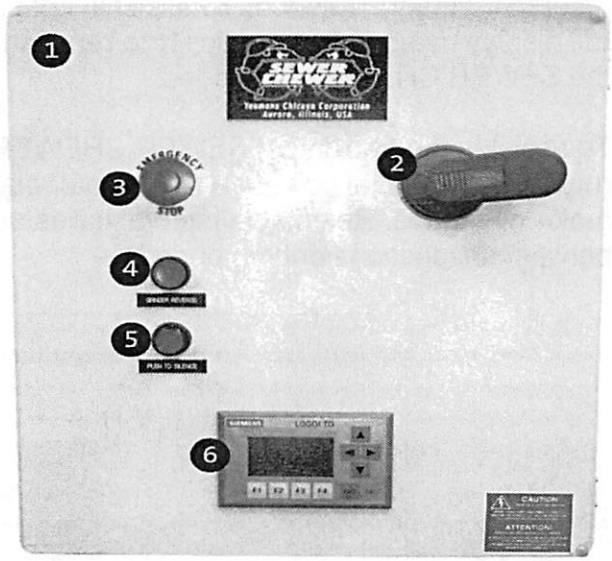


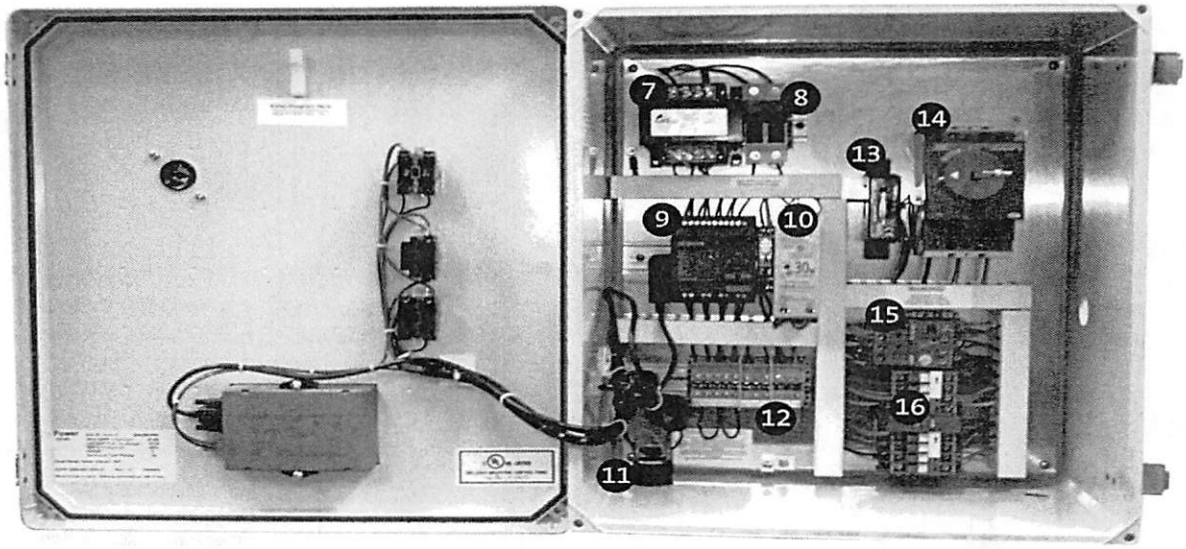
Enclosure 18x16
(Nominal)

Legend:	
1	Main Disconnect Switch
2	Operator Interface
3	Emergency Stop Button
4	Grinder Reverse Pushbutton
5	Push to Silence Pushbutton
6	Audible Alarm

Sewer Chewer Panel - As-Built Layout
Note: Door location of components is approximate.

1 - NEMA 4X FRP Enclosure
2 - Disconnect Switch Lever
3 - Emergency Stop Push-Button
4 - Grinder Reverse Push-Button
5 - Alarm Indicator & Silence Push-Button
6 - Digital Keypad Operator Interface
7 - Control Power Transformer
8 - Circuit Breakers
9 - Digital Controller
10 - Power Supply
11 - Alarm Buzzer
12 - Terminal Blocks
13 - Current Transducer
14 - Main Breaker w/ Disconnect Switch
15 - Overload Relay
16 - Dual Contactors w/ Mechanical Interlock





Once started, whether locally or remotely, the digital controller is designed to run the grinder continuously and unmanned even after power outages and the occasional grinder jam (exceptions being motor overloads and grinder overloads which need to be manually reset by a machine operator). When a jam occurs, the grinder will attempt to clear the jam by stopping, then reversing briefly to kick out the jamming object, and then try to resume forward operation. For stubborn objects which get entangled in the grinder, the REVERSE GRINDER pushbutton can be used to reverse the grinder to aid in object removal. In the event power should be lost to the SEWER CHEWER and subsequently restored, the digital controller will issue a power up warning sequence and will resume grinder operation exactly as it was before the power was lost. The sections which follow in this manual explain how to operate the grinder using the OID, how to reset and interpret alarms, and how to access and reset certain operating information parameters.

The figure above shows the layout of the devices accessible on the door of the control panel. Before trying to gain access to the inside of the control panel, always turn the circuit breaker/disconnect switch to the off position to de-energize the unit. To ensure safety, all grinder operation can instantly be stopped by pressing of the Emergency Stop button.

Installation

Before Installing Panel

1. *Read all instructions before proceeding with the installation. Improper installation may void warranties.*

2. Inspect your order for completeness and inspect each component for shipment damage. If something is missing or damaged, you will need to contact your supplier to obtain replacements.

3. Check to be sure the instructions and items supplied comply with state and local regulations.

4. A qualified electrician must be employed to install and service the panel and ancillary wiring. The equipment must be installed in compliance with the National Electric Code, as well as state and local codes.

Placement of the Control Panel

5. Install the electrical control or alarm panel within view of the grinder. The panel should be attached to a post or an exterior wall. Panels that contain motor contactors make a thumping sound, each time the grinder is started or stopped. Therefore, these panels should not be mounted to a wall where this will be an issue. If possible, position the panel in the shade to protect it from weather. Extreme temperatures can cause inconsistent performance of the electrical components. Locate the panel at a convenient height (usually about four to five feet above the ground) and where it will be accessible for maintenance.

Install Grinder

6. Install the electrical splice boxes for motors before installing the actual grinder equipment.

7. Run the wires from the control panel to the splice box. The wires can be brought through a conduit, or can be buried using suitable direct-burial wire. Conduit that enters the splice box must be sealed, even if the wires are direct-buried, to prevent the infiltration of water into the splice box. Use an electrically approved sealant to plug the wires coming in through the conduit hub. The number of wires required depends on the control panel and the number of switches used.

8. Wires should be color coded or otherwise marked to aid in wiring the control panel. Colors may refer to either the color of the wire's insulation, the color of a tag, or the color of an electrical tape marker.

9. All splices made in the splice box should use waterproof wire nuts or butt connectors and heat shrink tubing. The splices must be waterproof! Splices that are not waterproof may cause a malfunction of the pump controls if water should leak into the splice box.

Connect Control Panel

10. Connect the wires coming from the grinder to the terminals. Refer to the panel wiring diagram for the correct terminal connections.

11. Connect the incoming power to the panel. Power to the panel must be appropriate to the control panel and grinder motor (i.e. 380VAC, three phase 50hz for a 380 VAC motor, 460 VAC three phase 60hz for a 460 VAC motor, etc.) Insure that the panel is properly grounded and that the fuse or breaker and wire size, from the main power panel and to the motor, are sized correctly. Prior to energizing the panel, the control power transformer must be connected to match the incoming power supply. There are multiple connections to the transformer to allow the same panel to be utilized for multiple voltages, and the enclosed wiring diagram identifies the proper wiring for each voltage. This cannot be done at the factory and must be completed at installation time.

12. Use 60° minimum CU conductors only. Torque the terminal blocks to 15 LB-IN and the ground lugs to 45 LB-IN. Torque the circuit breakers to 20 LB-IN for 14-10 AWG wire, 25 LB-IN for 8 AWG wire, and 27 LB-IN for 6-4 AWG wire.

13. When power is applied to the control panel, the wires to the grinder may be energized. Do not service the grinder or any electrical wiring in the grinder vault without disconnecting the power at the circuit breaker and the fuse. The grinder area is a hazardous area, and may contain explosive gases. Take appropriate precautions before working in the vault. To reverse the direction of rotation of the grinder motor, disconnect all power to the panel and swap any 2 of the 3 wires coming from the grinder motor to terminals 9, 10, 11.

14. If you have any questions please contact Yeoman Chicago Corporation.

Startup Settings

The Sewer Chewer line of control panels includes an easy-to-use programmable logic unit that incorporates many timing and logic functions. The panel's default mode of

operation is Local Control; Remote Control can be activated by pressing the function key F2. Some operational parameters may need changing for your particular application.

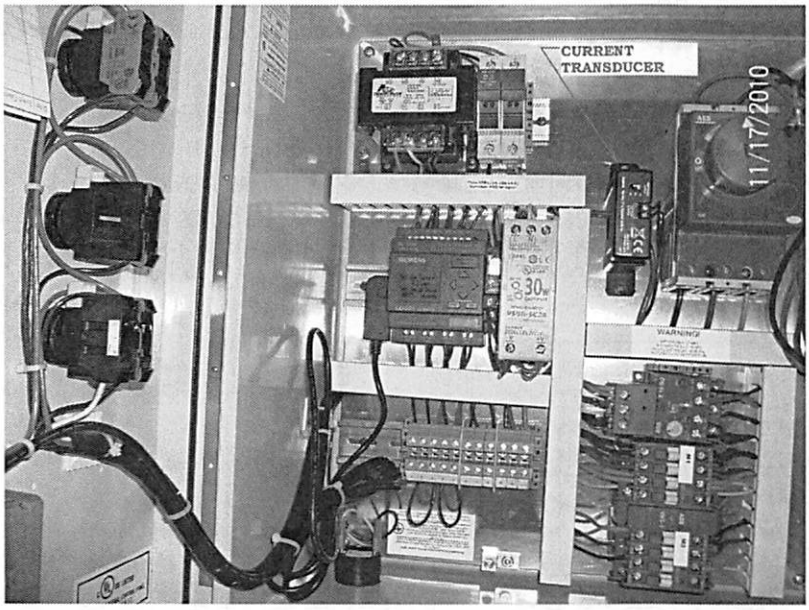
The adjustable parameters of the Sewer Chewer are found on the inside/rear screen of the controller (the screen on the controller base). The settings have to do with the Jam Monitoring part of the controller; there are several parameters that should be set for proper Jam Monitoring operation. They are on the chart below (all the defaults may be utilized with the exception of the Jam Current, which must match the Full Load Amps – FLA – of the actual motor used):

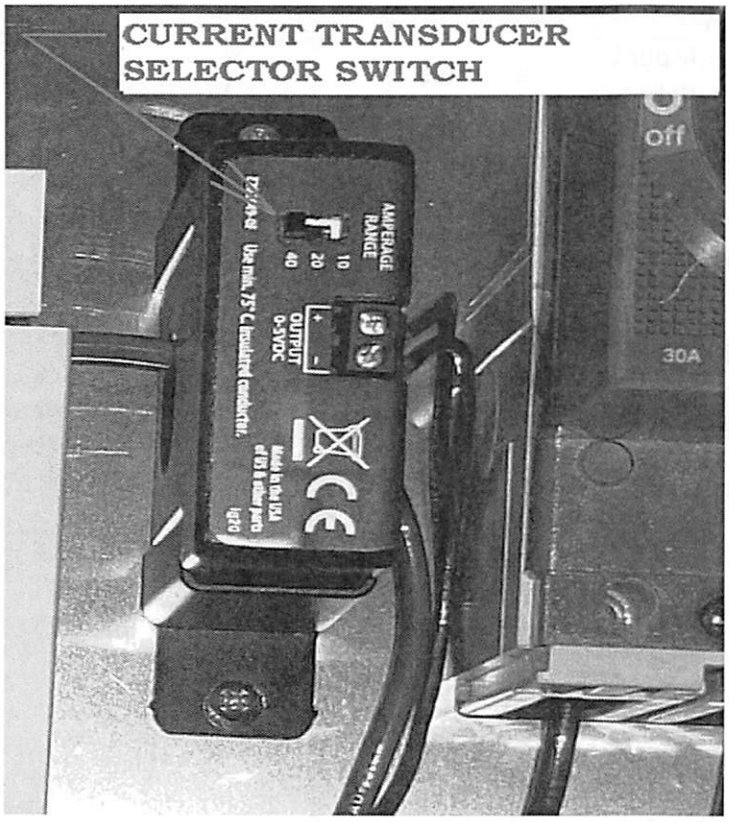
Parameter	Description	Units	Default
Jam Current	**Current level that reveals a motor jam**	**amps**	**16.0**
Jam Start Delay	**Amount of time the current must be at/above Jam Current**	**seconds**	**1.25**
Jam Fwd Rest Time	**Amount of time from normal motor operation to reverse operation**	**seconds**	**1**
Jam Rev Run Time	**Amount of time grinder is run in reverse in jam mode**	**seconds**	**1**
Jam Rev Rest Time	**Rest period from reverse to normal operation**	**seconds**	**1**
Jam Cycles	**Number of Jam Mode cycles before an alarm/shutdown***	**quantity**	**3**
Overload Auto-Reset	**ON = Unit will reset automatically, OFF = Requires a manual reset***	**On/Off**	**N/A**
Overtemp Auto-Reset	**ON = Unit will reset automatically, OFF = Requires a manual reset***	**On/Off**	**N/A**

*Resetting of an overload or overtemp alarm when set in Manual mode, or resetting a jam shutdown is by pressing the Push to Silence/Reset button for 5 seconds.

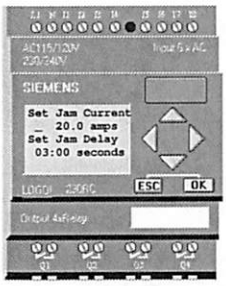
See the below example of the Jam Current and Jam Delay settings to show how to navigate through the window:

Current Transducer Setting Selection



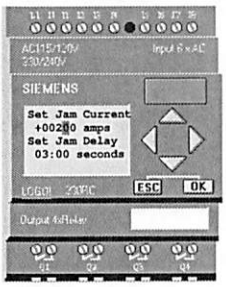


The current transducer has three separate amperage range selections available for use. Please note that the selector switch must be set to the 40 setting in order to display accurate amp draw readings on the operator interface panel.

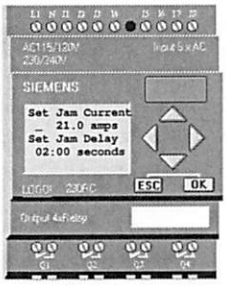


Changing Adjustable Parameters:

Step 1: Hold the "**ESC**" key down until the blinking underscore appears. Then press the "**OK**" key; the underscore will turn into a blinking cursor.



Step 2: Press ◀ or ▶ on the unit to move the cursor to the digit(s) that need to be changed; note that on the Jam Current settings the decimal goes away but the tenths spot is still active. To change the value, use the ▲ and ▼ keys. Once the new value is entered, hit "**OK**". The cursor will change back into an underscore.



Step 3: At this point, the blinking underscore should still be present; by pressing ▼ you can scroll down to the lower value and repeat steps 1-2 to change its value. Once finished, hit "**OK**" and the cursor will turn into an underscore. Hitting "**ESC**" will take the screen out of the Adjust Parameter mode.

Operation Settings

This Sewer Chewer panel will run in either Local or Remote operation while auditing the incoming current and safety inputs. This document describes each mode of operation.

Alarm and Data Screens:

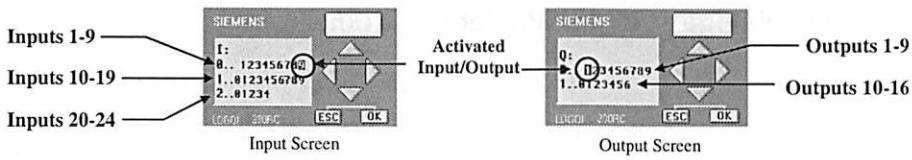
Alarm and data screens have been programmed into the screens to assist with panel mode, monitoring, and troubleshooting. The following alarm and data screens have been included in your panel, look for the √ to determine if the screen will be displayed on the front screen (mounted on the panel door) or the rear screen (mounted inside the enclosure). Navigation between the screens is accomplished by using the up and down arrow keys. See **"Screen Navigation"** section for more details.

Screen	Description	Front Screen	Rear Screen	Settings
	Alarm Screens†			
1	**Emergency Stop Activated**	√		
2	**Thermistor Trip (Motor Overtemp)**	√		
3	**Overload Trip (Over Amperage)**	√		
	Data/Informational Screens			
4	**Remote Mode/Run**	√		
5	**Remote Mode/Stop**	√		
6	**Local Mode/Run**	√		
7	**Local Mode/Stop**	√		
8	**Reverse Mode**	√		
9	**Jam Mode/Ready**	√		
10	**Jam Mode/FWD**	√		
11	**Jam Mode/REV**	√		
12	**Jam Mode/Rest**	√		
13	**Motor Cycles**		√	
14	**Motor Elapsed Time Meter**		√	
15	**Overload/Overtemp Cycles**		√	
16	**Power Cycles/Hours of Operation**		√	
17	**Jam Current/Delay Time**		√	√
18	**Jam Run/Rest Times**		√	√
19	**Jam Cycles**		√	√
20	**(Reminder) Preventative Maintenance is now due.****	√		
21	**(Reminder) Full Maintenance is now due.****	√		

† Alarm screens will only be displayed when alarms are active and include a date and time stamp of when the alarm started.

**Maintenance screens are flashed for a few seconds every minute. Once the maintenance has been performed, the reminder can be reset by pressing the Push to Silence/Reset button 10 times within a 15 second period. It is critical that the maintenance outlined in the Service Instructions is performed. If the tightness of the cutter stack and other checks are not performed, the life of the equipment will be reduced and damage to the cutters and spacers will occur.

Digital Input and Digital Output Screens:
The unit will activate various inputs and outputs as it operates (see below).



Knowing what conditions cause the inputs and outputs to activate can be a helpful installation and troubleshooting tool. The input functions will vary based on the mode of operation of the panel. The following inputs and outputs have been used with your panel:

#	Functions:	Activation Conditions:
Inputs (Discharge On-Demand Mode)		
1	**Remote Start**	**Switch is closed**
2	**Remote Stop**	**Switch is opened**
3	**Emergency Stop**	**Switch is opened**
4	**Grinder Reverse**	**Pushbutton is pressed**
5	**Overload**	**Overload is tripped**
6	**Motor Thermal**	**Thermal is tripped**
7	**Current Reading (analog)**	**0-40A**
8	**Push To Silence/Reset**	**Pushbutton is pressed**
Outputs		
1	**Motor Contactor/Forward**	**Motor runs, forward**
2	**Motor Contactor/Reverse**	**Motor runs, reverse**
3	**Alarm Light**	**Alarm condition exists**
4	**Audible Alarm**	**Audible Alarm is activated**

Controller Setting Screen Navigation:
The controller settings screens, available on the rear screen, are arranged in the order shown in Figure 3 below. To move between screens, use the four arrow keys. The screens of interest are shown in bold. Additional built-in screens will be present, but do not contain useful information.

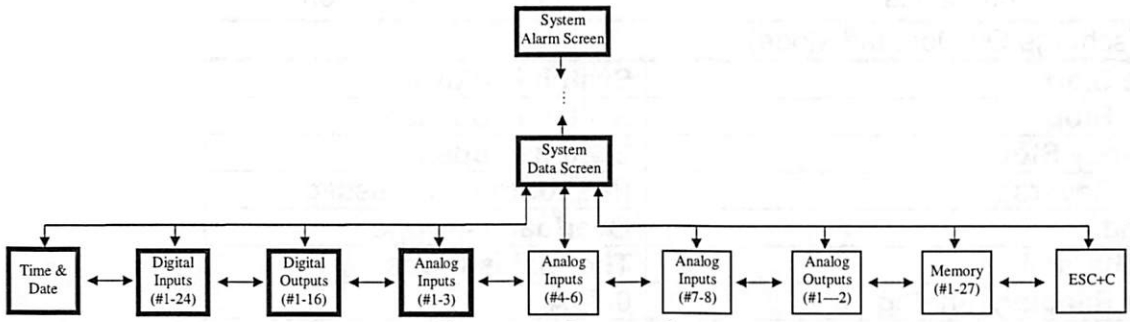


Figure 3. Screen Layout

Panel Operation:
The Sewer Chewer control panel's function is to operate the motor based upon its directed operation from a local setting or remote setting. The motor runs in forward continuous operation unless interrupted by user input, emergency override, grinder overload, or motor overtemp. There are two modes of operation; local and remote. You can switch between modes by pressing the Function (F) keys; F1 will activate Local Mode, and F2 will activate Remote Mode.

In Local Mode, the motor operation is controlled by the Function (F) keys on the front screen; F3 activates the motor to run, and F4 tells the motor to stop. Note these keys are not active when the panel is in Remote Mode. The grinder can also be stopped by using the Emergency Stop button.

In Remote Mode, the system is watching digital inputs I1 and I2 to determine the unit's run status. Input I1 is the Run command, and input I2 is the Stop command. A switch closure on I1 will activate the motor provided the switch wired to Input I2 is also closed; if I2 is open, the motor will not run. If I2 is closed, the motor will run and remain in run as long as the switch to input I1 is closed. *If the Remote Stop input (I2) is not to be used, the input should be jumpered or the unit will not operate.*

If the unit is to be run in reverse, the Grinder Reverse button can be pressed. Note that the reverse action initiates as soon as the button is pressed; there is no delay to its action.

The system will operate as commanded unless one of the four conditions happens:

1) Emergency Stop
2) Grinder Overload
3) Motor Overtemp
4) Chewer Jam

If the Emergency Stop switch is pushed, all motor operation will cease and the front screen will note the time and date of the stop. The system will continue to stay in this state until the Emergency Stop switch is reset by pulling it out of the depressed position.

If the overload relay trips, the system will cease all motor operation, just as the Emergency Switch does. The overload relay has two settings—either a Manual Reset or an Automatic Reset. If Manual is chosen, the system will sit and wait until the relay is manual reset; if Auto is chosen, the relay will reset itself after a short delay. Note this trip will also initiate an Overload Trip alarm screen on the front screen with a time and date stamp of the alarm initiation. Within the controller, there is also a choice of reset; the controller can be reset to either reset automatically or manually; if set to Manual, the overload alarm is reset by pushing the Push to Silence/Reset button for 5 seconds.

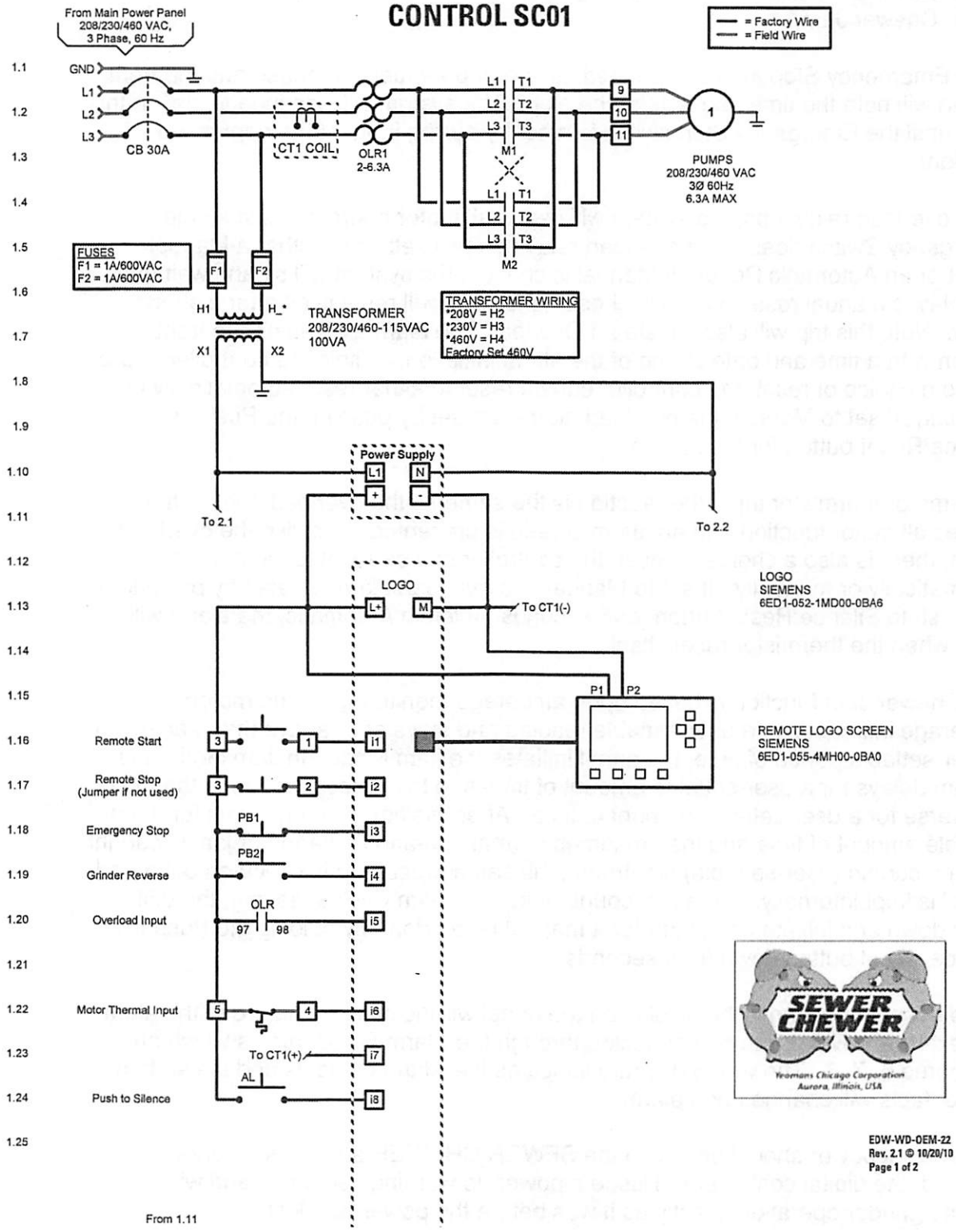
If the motor thermistor trips, the reaction is the same as the overload; the system ceases all motor function and an alarm screen is presented. Just like the overload alarm, there is also a choice of reset; the controller can be reset to either reset automatically or manually. If set to Manual, the overload alarm is reset by pushing the Push to Silence/Reset button for 5 seconds. If left in Automatic, the alarm will reset when the thermistor resets itself.

The Chewer Jam function is based upon amperage monitoring. If the motors' amperage increases to a user-settable reading and stays at or above that reading for a user-settable period of time, the panel initiates the Jam Mode. In Jam Mode, the system delays for a user-settable amount of time and then proceeds to run the motor in reverse for a user-settable amount of time. After this time, the unit rests for a user-settable amount of time and then resumes normal operation. If another jam is caught within a certain (user-settable) timeframe, the same procedure is executed but a "jam count" is kept internally. If the jam count meets the "Jam Cycles" setting, the unit shuts down and initiates an alarm for a manual reset, done by holding the Push to Silence/Reset button down for 5 seconds.

In the event of an alarm, the display on the panel will indicate the nature of the alarm and external devices can be connected through the Alarm Dry Contacts which are numbered 6, 7, 8. The wiring diagram indicates the Alarm contacts and the state of the contacts will change upon alarm.

In the event power should be lost to the SEWER CHEWER and subsequently restored, the digital controller will issue a power up warning sequence and will resume grinder operation exactly as it was before the power was lost.

Sewer Chewer Panel Wiring Diagram
CONTROL SC01



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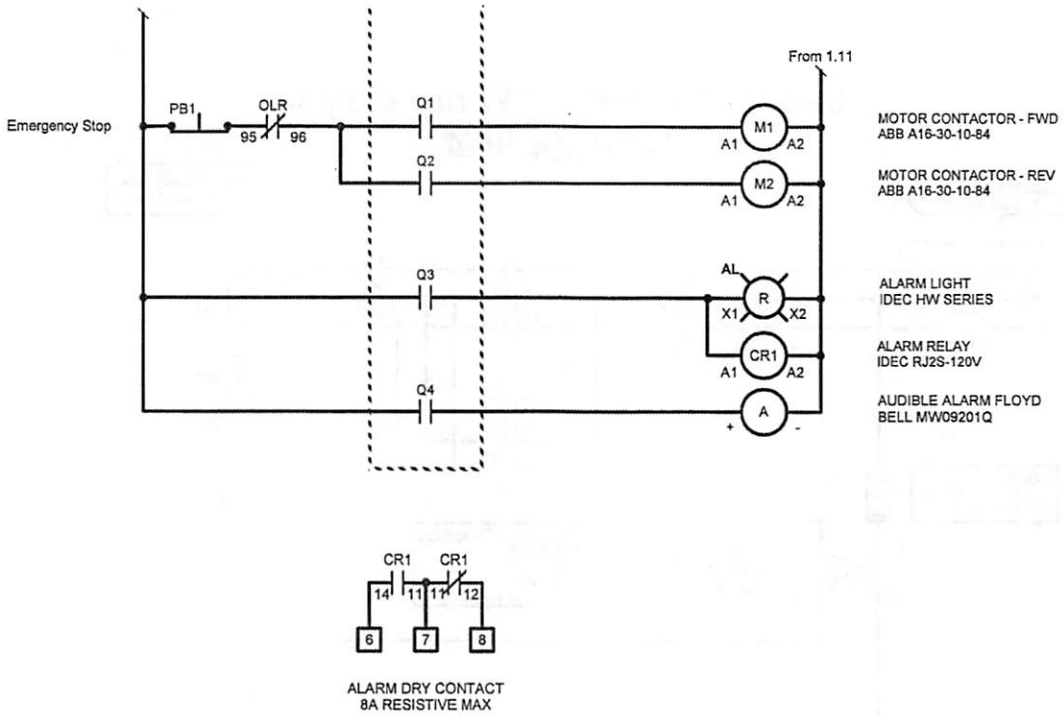
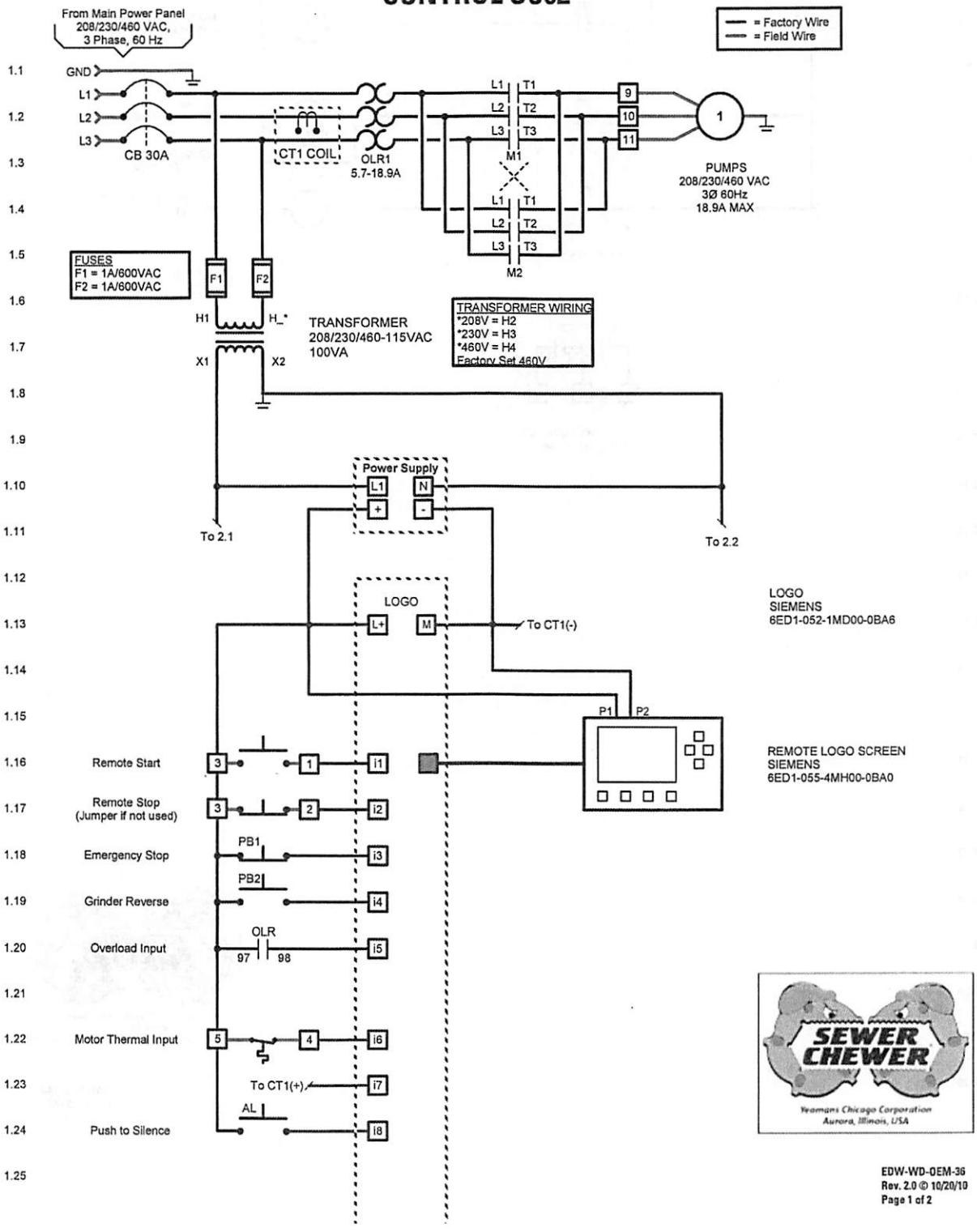


ALARM DRY CONTACT
8A RESISTIVE MAX

Sewer Chewer Panel Wiring Diagram
CONTROL SC02



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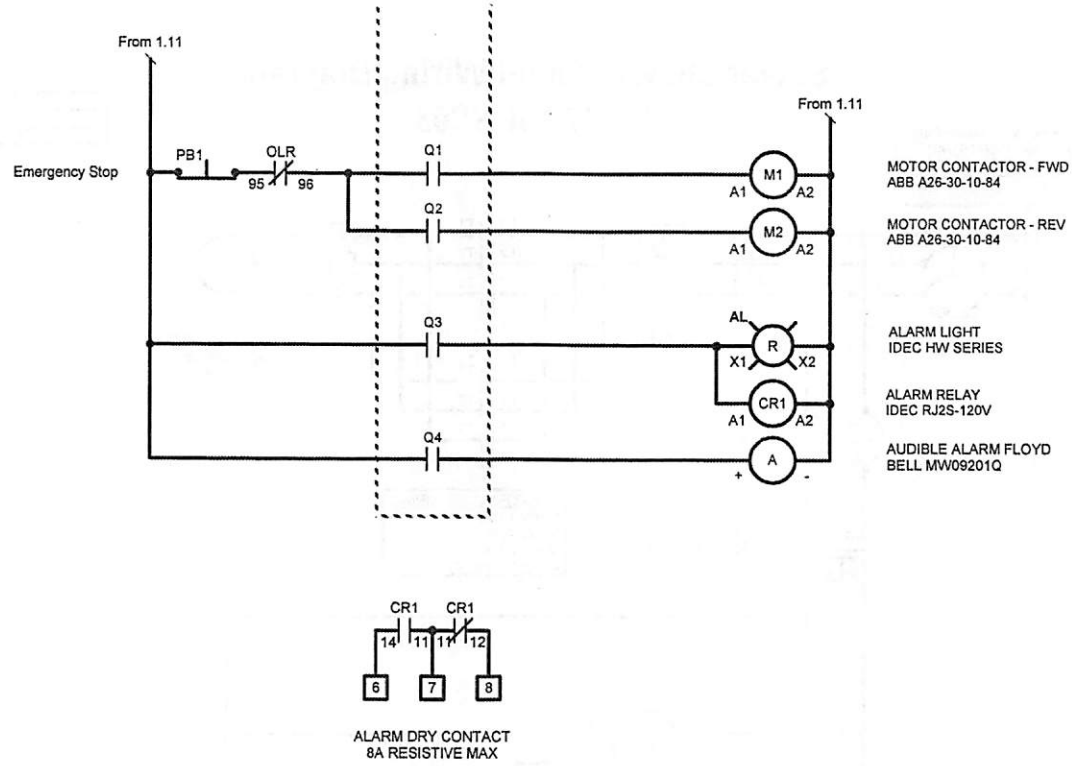
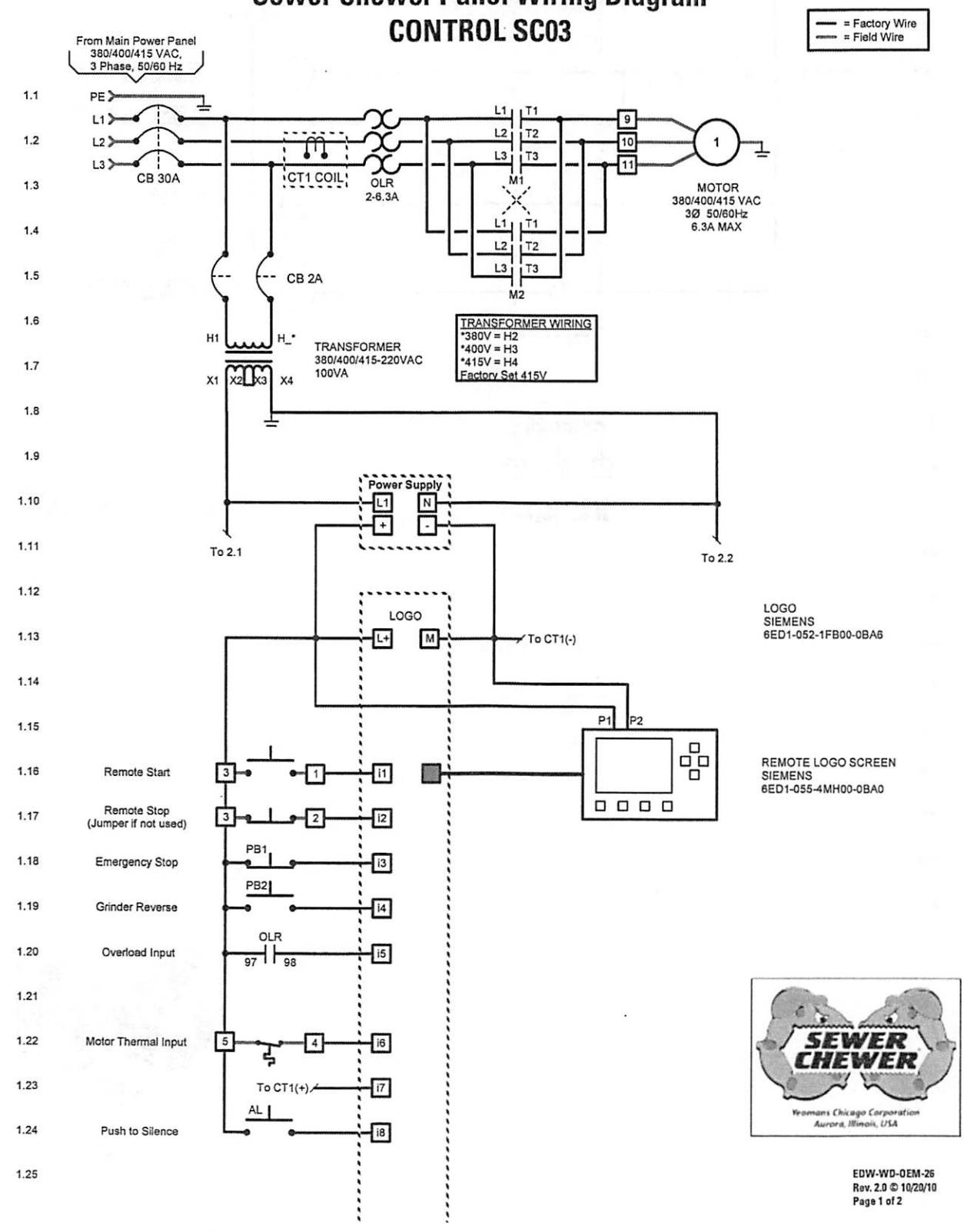


ALARM DRY CONTACT
8A RESISTIVE MAX

Sewer Chewer Panel Wiring Diagram
CONTROL SC03



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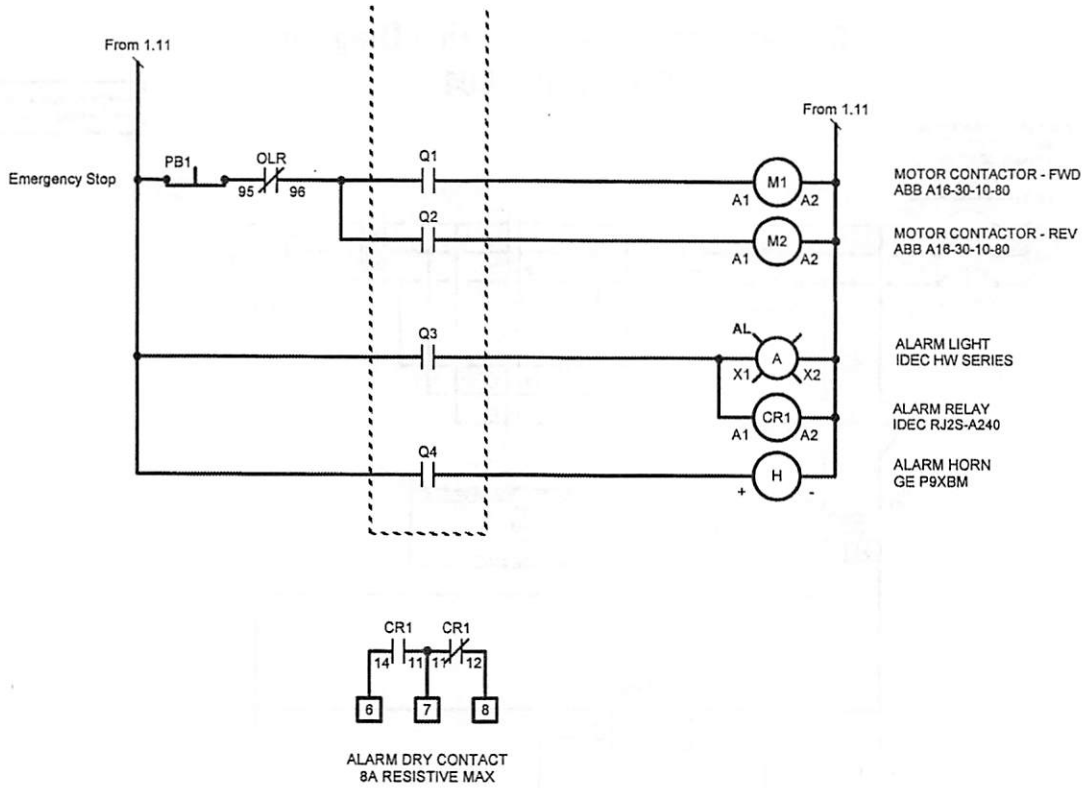
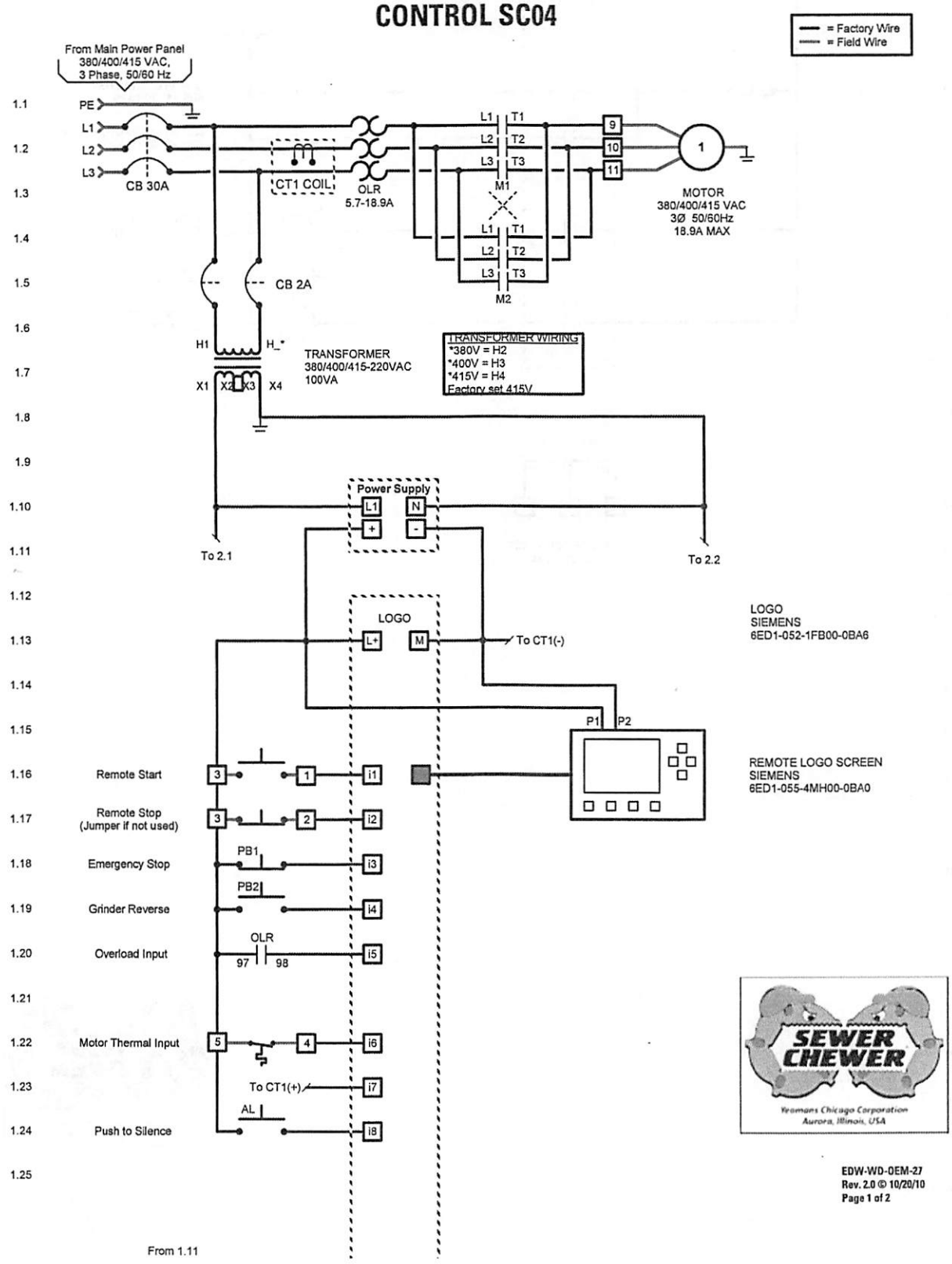


ALARM DRY CONTACT
8A RESISTIVE MAX

Sewer Chewer Panel Wiring Diagram
CONTROL SC04



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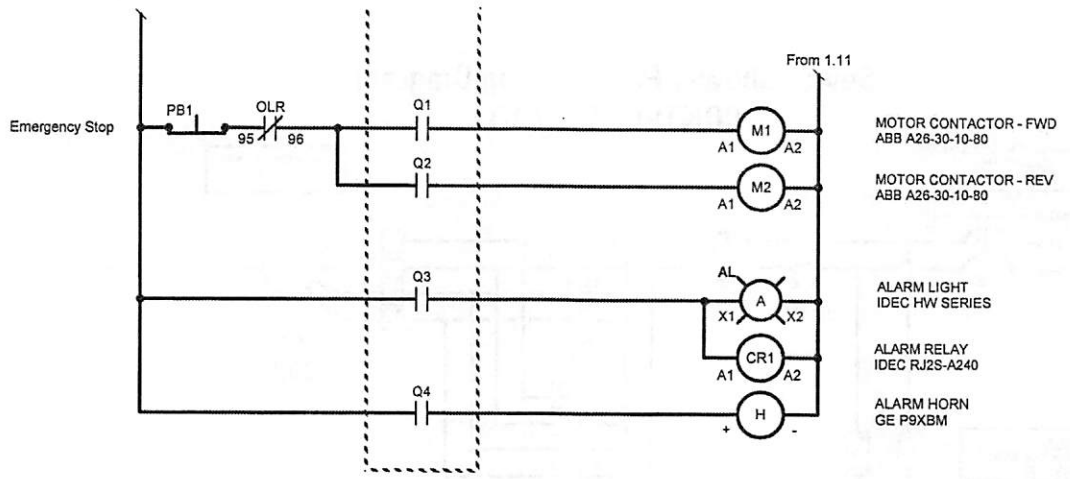
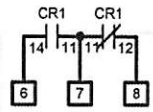
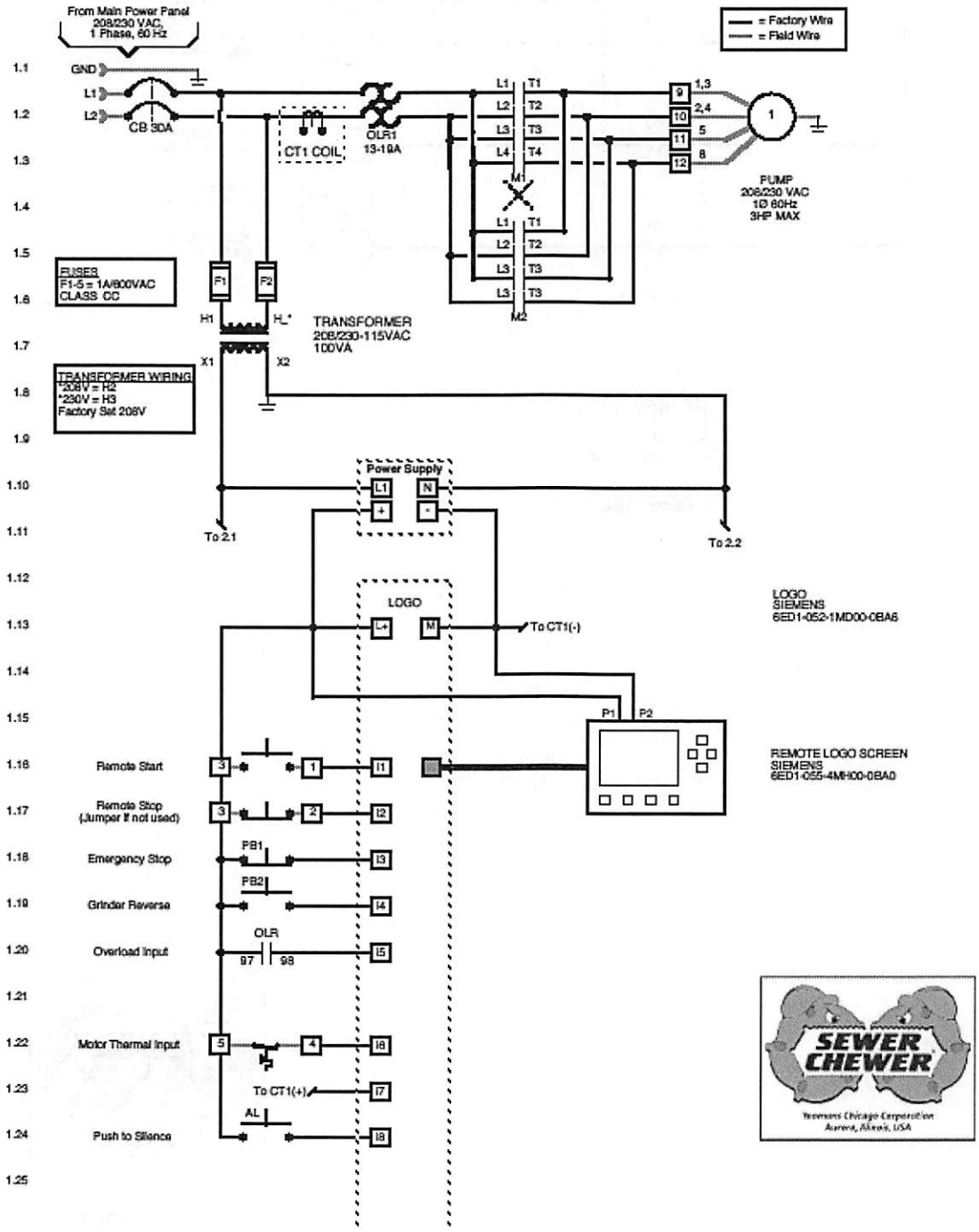




ALARM DRY CONTACT
8A RESISTIVE MAX

Sewer Chewer Panel Wiring Diagram
CONTROL SC02 1Ø



Motor Electrical Data (60 Hz)

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MOTOR		3 HP HI-EFF TEFC (IP55)	3 HP EXPL. PROOF*	3 HP PREM EFF TEFC	5 HP HI-EFF TEFC (IP55)	5 HP EXPL. PROOF*	5 HP PREM EFF TEFC	5 HP SUBMERSIBLE TENV (IP68)
FULL LOAD RPM		1730	1725	1758	1720	1750	1748	1750
PHASE		3						
HZ		60						
FRAME SIZE		F-100L	182TC	L182TC	F-112M	184TC	L184TC	180G
EFFICIENCY %		84.9	78.5	88.5	86.8	85.5	89	80
POWER FACTOR		78.9	76.3	83.9	84.9	82.5	83.4	72
FULL LOAD AMPS	230V	8.2	9.2	7.6	12.6	13.2	12.2	15
	460V	4.1	4.6	3.8	6.3	6.6	6.1	7.5
	200V	8.5	10.1	8.4	13.6	14.5	13.4	18
KVA CODE		J	K	K	J	J	J	K
SERVICE FACTOR		1.15	1.0	1.15	1.15	1.0	1.15	1.0
TEMP RATING		40° C AMBIENT						
NEMA DESIGN		B						
CERTIFICATION		N/A	UL & CSA	N/A	N/A	UL & CSA	N/A	FM
STANDARD		ALUMINUM	CAST IRON	VARIES	ALUMINUM	CAST IRON	VARIES	CAST IRON

* TOTALLY ENCLOSED EXPLOSION PROOF (TEXP), CLS. 1, DIV. 1, GRP. D

SINGLE PHASE DATA FURNISHED ON REQUEST

SPEED REDUCER	FOR 3 HP UNITS	FOR 5 HP UNITS
CLASS	III HEAVY SHOCK	
S.F. (AGMA)	2	
OVERHUNG LOAD	3600	5170
RATIO	29:1	
OUTPUT RPM	60.3	
LUBRICATION	GREASE FILLED	

THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: STANDARD ARRANGEMENT CONSISTS OF AN INTERGRATED TEFC MOTOR AND SPEED REDUCER

Motor Electrical Data (50 Hz)

YEOMANS CHICAGO CORPORATION

Yeomans Chicago Corporation
3905 Enterprise Ct.
Aurora, IL 60504 USA

MOTOR		3 HP HI-EFF TEFC	3 HP EXPL. PROOF*	3 HP PREM EFF TEFC	5 HP HI-EFF TEFC	5 HP EXPL. PROOF*	5 HP PREM EFF TEFC	5 HP SUBMERSIBLE TENV (IP68)
FULL LOAD RPM		1450	1430	1455	1450	1450	1455	1450
PHASE		3						
HZ		50						
FRAME SIZE		U-L100	182	182	U-112M	184	184	180G
EFFICIENCY %		81.7	84.0	86.5	83.8	87.5	82.5	80.0
POWER FACTOR		82.2	83.5	83.8	86.1	82.6	86.8	82.0
FULL LOAD AMPS	220V	8.6	8.6	8.1	13.5	13.5	13.6	14.0
	380V	5.0	4.8	4.7	7.8	7.8	7.9	8.1
	415V	4.6	4.4	4.3	7.1	7.1	7.2	8.4
KVA CODE		F	G	H	G	H	F	J
SERVICE FACTOR		1.15	1.15	1.00	1.15	1.15	1.00	1.00
TEMP RATING		40° C AMBIENT						
NEMA DESIGN		N/A	B	B	N/A	B	N/A	B
CERTIFICATION		N/A	UL & CSA	N/A	N/A	UL & CSA	N/A	F.M.
STANDARD		ALUMINUM	CAST IRON	VARIES	ALUMINUM	CAST IRON	VARIES	CAST IRON

* TOTALLY ENCLOSED EXPLOSION PROOF (TEXP), CLS. 1, DIV. 1, GRP. D

SINGLE PHASE DATA FURNISHED ON REQUEST

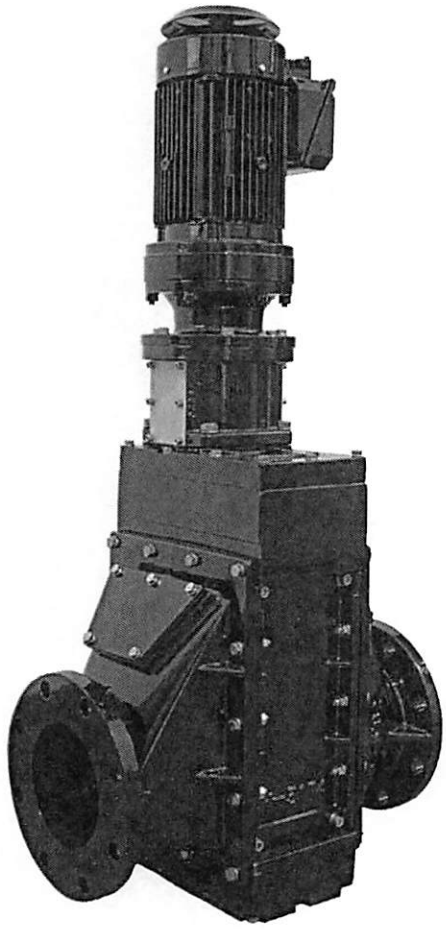
SPEED REDUCER	FOR 3 HP UNITS	FOR 5 HP UNITS
CLASS	III HEAVY SHOCK	
S.F. (AGMA)	1.5	1.3
OVERHUNG LOAD	3600	5170
RATIO	29:1	
OUTPUT RPM	50	
LUBRICATION	GREASE FILLED	

THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

NOTE: STANDARD ARRANGEMENT CONSISTS OF AN INTERGRATED TEFC MOTOR AND SPEED REDUCER

Sewer Chewer Version 7671A

Installation and operating instructions



be
think
innovate

GRUNDFOS

Original installation and operating instructions.
Save this manual for future reference.

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Warning

Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

1. Symbols used in this document

Warning

If these safety instructions are not observed, it may result in personal injury.

Warning

If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.

Warning

These instructions must be observed for explosion-proof pumps. It is advisable also to follow these instructions for Grinders.

Note ***Notes or instructions that make the job easier and ensure safe operation.***

Caution ***If these safety instructions are not observed, it may result in malfunction or damage to the equipment.***

2. Standard warranty

For a period of fifteen (15) months from the date of shipment or twelve (12) months from start-up whichever occurs first, Yeomans Chicago Corporation gives a limited warranty that its Manufactured Equipment covered by this order shall be free of defects in material and workmanship under normal use and service, and when properly installed. Yeomans Chicago Corporation agrees to repair or replace F.O.B. shipping point, such equipment, or any part thereof, previously furnished by Yeomans Chicago Corporation as actually found by Yeomans Chicago Corporation after inspection as defective, provided: (a) Start up of said equipment was conducted by an Authorized Representative of Yeomans Chicago Corporation. Start up shall only occur after ninety percent (90%) of the invoice price of said equipment has been paid to Yeomans Chicago Corporation. Start up of equipment by any unauthorized personnel shall nullify the warranty. (b) Said equipment has been properly installed, operated, and maintained by Buyer in accordance with Yeomans Chicago Corporation recommendations and specifications. (C) Buyer notifies Yeomans Chicago Corporation, Aurora, Illinois in writing as soon as any such defect becomes apparent. Any claim by Buyer with reference to the equipment sold hereunder for any cause shall be deemed waived by Buyer unless submitted to Yeomans Chicago Corporation in writing within (30) days from the date Buyer discovered, or should have discovered, any claimed breach within the limited warranty period. Unless agreed to the contrary by Yeomans Chicago Corporation in writing, any work done, material furnished, repairs or designs made by others, shall void the warranty.

Yeomans Chicago Corporation does not warrant accessories or components not manufactured by Yeomans Chicago Corporation. However, to the extent possible, Yeomans Chicago Corporation agrees to assign to Buyer its rights under the original manufacturers warranty, without recourse to Yeomans Chicago Corporation.

Yeomans Chicago Corporation makes no representation or inference within this warranty that it has reviewed the buyer's and/or end user's system design to which the equipment supplied by Yeomans Chicago Corporation will become a component of such a system. Overall system compatibility of all components within such a system shall be the responsibility of others. Yeomans Chicago Corporation shall not be liable for any damage caused by abrasive materials, chemicals, scale deposits, corrosion, lightning, improper electrical supply, mishandling, or other similar conditions.

Yeomans Chicago Corporation shall not be liable for incidental or consequential losses, damages or expenses, directly or indirectly arising from the sale, handling or use of the equipment, or from any other cause relating thereto, and Yeomans Chicago Corporation liability hereunder in any case is expressly limited to the replacement (in the original form shipped) of equipment or any part thereof, not complying with this order, or, at Yeomans Chicago Corporation's election, to the repayment of or crediting Buyer with an amount equal to the purchase price of such equipment, whether such claims are for breach or warranty or negligence.

THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS.

3. Introduction

This booklet includes instructions for installation, operation and maintenance of Sewer Chewer Model CC, SC, and CCGR grinders.

The Sewer Chewer® is a twin shafted sewage/sludge grinding machine which effectively reduces solids that are commonly found in raw sewage or sludge.

The low speed and high torque operation provides efficient operation and requires lower energy requirements than many alternative methods.

This effective solids reduction has two benefits. The first is that solids are reduced to a particle size that is more acceptable to pumps and other sewage treatment equipment, thereby reducing the need for bar screens and minimizing the cost of disposal of its screenings.

The second advantage to grinding solids is that decreased particle size means that your process becomes more efficient. Whether in a heat exchanger, digester, or belt filter press, conditioned sludge means better process.

Channel and wet-well mounted units are available in 8", 12", 18", 24", 32" and 40" nominal cutting zone sizes. These units may be used individually or in groups to provide coverage in varying channel widths, depths and flows.

In-line mounted units, Sewer Chewer grinders, are available to accommodate standard pipe flange mounting for 4", 6", 8" 10" and 12" pipeline applications.

3.1 Safety precautions

Warning

High voltage and rotating parts can cause serious or fatal injury. Installation, operation, and maintenance of electrical machinery should be performed by qualified personnel only.

Warning

Failure to properly ground the frame of this machine can cause serious injury to personnel. Grounding should be in accordance with the National Electrical Code and consistent with pertinent local codes and practices.

Warning

Danger: Severe injury may result if body parts, clothing, etc. come in contact with the cutting elements or other rotating parts of this machine. Disconnect power to grinder controller and use proper lockout device before maintenance or operator adjustment to machine.

Warning

Avoid by-passing or rendering inoperative any safe guards or protective devices.

Avoid use of automatic reset devices. Automatic restarting may be hazardous to the safety of personnel. (When used with automatic restarting or remote starting capability, disconnect power to grinder controller and use lockout device before maintenance or operator adjustment to machine).

Make sure that the shaft key is fully captive before the motor is energized.

Do not lift both the motor and the driven equipment with the motor lifting provisions. Motor lifting provisions are adequate for lifting the motors only, unless it is the submersible gearmotor with lifting bail.

Disconnect main machine windings and all accessory devices from the power source before disassembly of gear motor.

Familiarization with NEMA publication MG-2, Safety Standard for Construction and Guide for Selection, Installation and Use of Electrical Motor and Generators, The National Electrical Code and local codes and practices is recommended.

Caution ***For the European market: Familiarization with the Low Voltage Directive (2006/95/Ec) Standard EN60034-1 is recommended, and the motors must not be put into service until the Machinery in which they are to be incorporated has been declared in conformity with the relevant directives.***

4. Delivery and handling

4.1 Delivery

Depending on the model the Sewer Chewer will be transported in either a vertical or horizontal position. The unit will be protected by a tri-walled corrugated cardboard container and secured to a skid.

Upon receiving shipment, make sure that no damage occurred in transit and that it complies with the bill-of-lading. Make note of damage or shortage on both receipt and freight bill. Claims should be made to the transportation company immediately. Any shortages should be noted, and Yeomans Chicago Corporation must be notified of the shortage within 5 days of delivery.

As shipped, the grinder and its accompanying equipment has adequate protection for shipment in covered trucks and covered storage at the job site.

4.2 Handling

When installing or removing a grinder from its installation, do not lift the machine using the motor or the motor's lifting lugs or cables. We recommend the use of a sling wrapped around the reducer pedestal for lifting.

Warning

All lifting equipment must be rated for the intended purpose and checked for damage before any attempts to lift the equipment. The lifting equipment rating must under no circumstances be exceeded.

Weights lbs. [kg]		
Model	**3 hp**	**5 hp**
SC-04	281 [127]	284 [128]
SC-06	345 [156]	348 [157]
SC-08	371 [168]	374 [169]
SC-10	472 [214]	475 [215]
SC-12	596 [270]	600 [272]
CC-08	210 [95]	213 [96]
CC-12	243 [110]	246 [111]
CC-18	287 [130]	291 [131]
CC-24	333 [151]	337 [152]
CC-32	N/A	391 [177]
CC-40	N/A	449 [203]

* Weight does not include the gearmotor.

Warning

Always lift the Grinder by its lifting bracket or by means of a forklift truck if the Grinder is fixed on a pallet. Never lift the Grinder by means of the motor cable.

Warning

Do not lift both the motor and the driven equipment with the motor lifting provisions. Motor lifting provisions are adequate for lifting the motor only.

Warning

Disconnect main machine windings and all accessory devices from the power source before disassembly of gear motor.

4.3 Storage

The standard packaging is also suitable for limited storage between installation and start-up.

4.3.1 Extended storage

If anticipated that the equipment will be exposed to extreme or extended storage conditions prior to installation, Yeomans Chicago Corporation should be notified so that shipment can be given special packaging and protection.

4.3.2 Storage and warranty

If extended or long-term storage is anticipated, refer to notify Yeomans Chicago Corporation so that precautions can be made to preserve warranty. Any damage to the equipment due to improper storage conditions shall void the warranty. In addition, refer to Digital Controller Installation Operation and Maintenance Instruction.

4.3.3 Storage temperatures

Equipment is safe for storage in temperatures between -22 °F to 140 °F (-30 °C to 60 °C).

5. Applications

The Sewer Chewer is designed for grinding sewerage debris in a wide variety of applications and configurations including: sewage lift stations, influent, sludge, dewatering, industrial processes, food processing, airports, marinas, recreational areas, correctional facilities, hospitals, restaurants, animal waste, and more.

6. Operating conditions

The Sewer Chewer is suitable for the following operating conditions.

6.1 Liquid levels

Proper Channel Chewer selection should be considered to avoid the risk of over-flowing the channel. Liquid level consideration for in-line and wet-well mounted models is not typically a concern.

6.2 pH Value

The Sewer Chewer can be used in liquids containing a pH of 4 to 10.

6.3 Liquid temperature

The Sewer Chewer can be used in liquids with a temperature between 32 °F to 104 °F (0 °C to 40 °C).

6.4 Ambient temperature

The Sewer Chewer can be safely operated with an ambient temperature between 32 °F to 104 °F (0 °C to 40 °C).

6.5 Liquid density and viscosity

When utilizing the Sewer Chewer in applications where the density and/or kinematic viscosity is higher than that of water, proper consideration must be given to the sizing of the motor.

6.6 Flow velocity

Velocity should be established to prevent the sedimentation of solids in the system. Likewise, the flow rate should be properly assessed to ensure adequate Sewer Chewer sizing and the prevention of excessive head-rise on the up-stream side of the Sewer Chewer.

6.7 Installation depth (submersible motors)

Sewer Chewers configured with a submersible motor may be operated to a submerged depth of 20 feet (6.1 m).

6.8 Maximum solid size

Solid size is limited to the practical limitations to what can be carried in either the pipe of channel and can easily enter the cutting mechanisms. Debris that enters the unit must of a consistency that it capable of being reduced through a tearing and grinding action (i.e. no rocks, metal, etc.)

6.9 Duty cycle

Sewer Chewers are generally intended for continuous operation over long periods of time. They are limited to a maximum of 15 starts per hour.

6.10 Potentially explosive environment

FM

Warning

Grinders must under no circumstances operate in combustible liquids.

FM

Warning

The classification of the installation site must be approved by the local fire fighting authorities in each individual case.

Warning

Special conditions for safe use of Grinders with explosion-proof motors:

1. Make sure the thermal switches are connected in the same circuit but have separate alarm outputs (motor stop) in case of high humidity or high temperature in the motor.

2. Bolts used for replacement must be class A2-70 or better according to EN/ISO 3506-1. or similar.

FM

3. Contact the manufacturer for information on the dimensions of the flameproof joints.

4. Make sure the permanently attached cable is suitably mechanically protected and terminated in a suitable terminal board placed outside the potentially explosive area.

5. The submersible motor of the grinder have an ambient temperature range of -4 °F to +104 °F (-20 °C to +40 °C) and a maximum process temperature of +104 °F (+40 °C).

6.The thermal protection in the stator windings has a nominal switch temperature of 302 °F (150 °C) and must guarantee the disconnection of the power supply; the power supply must be reset manually.

6.11 Cartridge Assembly

Cartridge seal assembly is designed to accommodate a pressure rating in excess of 90 psi [6.2 bar].

7. Features and benefits

7.1 Design

Each Sewer Chewer is constructed from materials selected for the optimal combination of strength, corrosion resistance and extended life.

Shafting is machined from two inch hex bar, A.I.S.I. 4140 heat treated alloy steel as a standard.

Cutters are precision cut from 4140 alloy steel to provide consistent high quality components. The hardened cutters feature a patented design that provides additional cutting surfaces on the mating faces of the cutters to provide an improved cutting and shearing action.

The Sewer Chewer brand grinders feature a unique bearing/ mechanical seal arrangement that provides long lasting and economical bearing protection and machine life. The bearings are double-sealed, oversize, grease-lubricated Conrad type ball bearings. The bearings are protected by tungsten carbide mechanical seals.

7.2 Gearmotors

A variety of drive options allow flexible operation and protection from flooding, and provide flexibility to meet your demanding applications and environments.

7.3 Control and monitoring

Both the Sewer Chewer (Model SC) and Channel Chewer (Model CC) and Channel Chewer guide rail (Model CCGR) systems feature our innovative controller devices.

Standard digital controllers feature a programmable logic controlled (PLC) operation that is designed for maximum efficiency and reliability with automatic unattended operation.

They also feature simple operation and many inherent safety features that minimize the dangers of this type of equipment.

There are a variety of options available for the enclosure, as well as for monitoring and alarm annunciation.

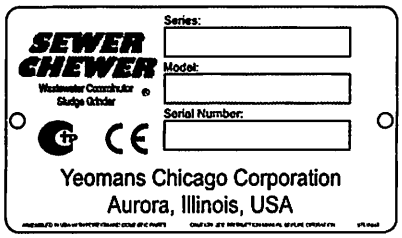
Analog and other custom control systems are also available to meet project specifications and individual requirements.

8. Identification

8.1 Nameplate

The nameplate on the pump gives the following details:

- model
- serial number.



TM05 6094 4512

Fig. 1 Example of Sewer Chewer nameplate

8.2 Approvals

9. Installation

The Sewer Chewer grinding machine is an accurately made, precision adjusted cutting device. Proper handling during installation and proper care in its maintenance will assure optimal operation and long life.

Warning

Before beginning installation procedures, carry out these checks:

- ***Does the Grinder correspond to order?***
- ***Is the Grinder suitable for the supply voltage and frequency available at the installation site?***
- ***Are accessories and other equipment undamaged?***

All safety regulations must be observed at the installation site, e.g. the use of blowers for fresh-air supply to the tank or channel.

Warning

During installation, always support the Grinder by means of lifting chains or place it in horizontal position to secure stability.

Warning

Before beginning the installation, switch off the power supply and lock the main disconnect switch in position OFF.

Any external voltage connected to the Grinder must be switched off before working on the Grinder.

Note ***Further details concerning accessories can be found in the Sewer Chewer catalogue on www.grundfos.us.***

Warning

Do not put your hands or any tool into the Grinder while the Grinder is connected to the power supply, unless the Grinder has been switched off by removing the fuses or switching off the main disconnect switch to position OFF. It must be ensured that the power supply cannot be accidentally switched on.

Caution ***We recommend to always use original Yeomans Chicago Corporation accessories to avoid malfunctions due to incorrect installation.***

Warning

Only use the lifting bail (submersible motor) or sling around the reducer pedestal for lifting the grinder.

9.1 Preparation

The minimum clear opening required to pass a standard channel type Channel Chewer is 14" x 14" (355 mm x 355 mm).

Note

This requirement may be greater if a non-standard motor/drive configuration in used. Channel frame may be substantially larger. Refer to appropriate channel frame installation drawing for dimensions.

9.1.1 CC Type Channel Chewer

Set channel frame assembly in accordance with installation drawings as furnished. Use proper anchor bolts (to be furnished by others).

When possible, it is recommended to recess the lower bearing housing, so that more of the cutting elements are submerged in the waste stream. This will maximize flow through the unit. Solids that drop out of suspension will also tend to be swept toward the grinder to be comminuted.

Remove all projections and obstructions in the channel which disturb the flow of the channel, or that allows rags or other fibrous materials to catch or "hang up".

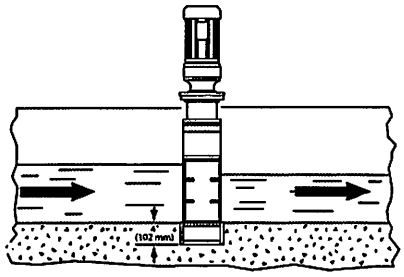


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Fig. 2 Recessed channel mounting

9.1.2 CC Type Wet-Well Channel Chewer

Set wet-well basket frame so overflow screen sits directly above the influent pipe. Use proper anchor bolts (to be furnished by others).

Align upper and intermediate dual rail guide brackets. Use proper anchor bolts (to be furnished by others). Guide brackets should be spaced no more than 10 ft. apart. Use 2" diameter schedule 40 pipe.

To avoid solids from by passing the grinder, seal the basket frame to the wet-well.

9.1.3 SC Type In-Line Sewer Chewer

Verify flange to flange and centerline to bottom measurements.

Allow for sufficient clearance beneath the lower bearing housing so that cutter stack adjustments may be made without removing the grinder from the pipeline.

9.2 Installing CC Type Channel Chewer and Wet-Well Channel Chewer

1. Verify that the channel/wet-well frame assembly is securely and properly installed.
2. Lift the machine and set it over the frame. Lower into place. Make sure to set the unit according to the direction of the cutters. The unit has a flow direction arrow, use that or confirm with fig. 3 and fig. 4:

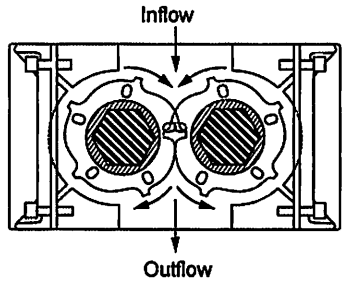

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Fig. 3 Inflow and outflow viewed from bottom of machine

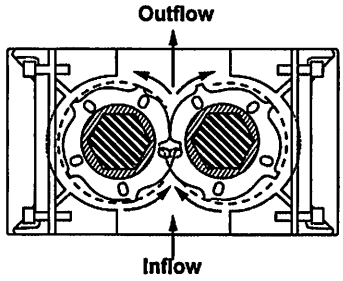

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Fig. 4 Inflow and outflow viewed from top of machine

3. Level the machine according to a level placed on a horizontal machined surface on top of the machine, or against the side rails. Place shims if required under the bearing housing and be certain that the base is very solidly supported adjacent to the frame.
4. Remove motor pedestal and rotate the unit by hand (or with additional moderate leverage), using the coupling. Observe carefully whether or not the cutters strike each other causing the unit to bind. Do not operate the machine if any cutter is loose.
5. (Optional) Seal the space between the base of the machine and the channel floor with a little grout or bitumastic cement (roofing cement). Put a one-inch bead of grout around the bottom edge of the base with a trowel if desired.
6. While a disconnect switch is provided with the controller, local regulations may require an additional main disconnect switch. It should be installed upstream from the control panel. Fusing should be suitable provided based on the Motor Electrical Data provided in the controller manual. Check motor nameplate for actual AMP ratings and other voltages.
7. If the control panel is to be installed any considerable distance from the Sewer Chewer, provide wiring of a size that will minimize the voltage drop between the panel and the Sewer Chewer.

9.3 Gearmotor (standard configuration)

When gearmotors are shipped loose proceed as follows:

1. Place the motor so that the projecting jaws of its three jaw coupling are inside the coupling insert that rests on top of the machine coupling.
2. Slowly turn the unit by hand to see whether or not any of the cutters are loose or binding. Do not operate the machine if any rotating parts are loose.

9.3.1 Install motor/reducer pedestal assembly

Depending on your order, your unit may be shipped with the motor/reducer pedestal assembled, or unassembled, to the grinder unit. For 3 hp installation details please refer

Fig. 7, and Fig. 8. For 5 hp installation details please refer to

, Fig. 10, and Fig. 11,

9.4 Extension shaft, support pipe and gear motor

1. With the spline-end up, bolt the lower flange of the extension shaft to the flanged coupling. Lower the support pipe (match holes) over the extension shaft and bolt it to the machine.

Caution ***Do not allow the extension shaft to fall sideways when only the lower end is bolted in place. To do so may damage the universal joints.***

2. Bolt the motor to the top flange of the support pipe.
3. Through opening in motor pedestal, raise the top extension shaft flange to the motor flange and bolt it in place.

9.5 Extension shaft, protection pipe, motor pedestal and gear motor

1. If there is sufficient head room above the motor floor and if the shaft hole in the motor floor is large enough to pass the protection pipe, it is possible to install the extension shaft and bolt its lower flange to the flanged motor coupling before lowering the protection pipe over the extension shaft. If not, place the extension shaft in the protection pipe before installing. Then put the extension shaft and the protection pipe in place at the same time.
2. When the machine is to be installed below a floor, the floor should be provided with a rectangular or square opening large enough to permit the machine as assembled at the factory to be lowered through it. The minimum size opening required to pass this machine is 14" X 14" (0.35 m x 0.35 m).
3. With the spline end up, bolt the lower flange of the extension shaft to the flanged motor coupling. Put one rubber gasket under the flange of the protection pipe and bolt the pipe to the machine.

Caution ***Do not allow the extension shaft to fall sideways when only the lower end is bolted in place. To do so may damage the universal joints.***

4. Remount the top universal joint on the spline.
5. Set the gear motor, motor pedestal and floor plate in place.
6. Raise the top extension shaft flange to the motor coupling flange and bolt it in place.
7. If the top of the protection pipe is not aligned with the extension shaft, it can be aligned by tightening the bolts in one sector of the pipe flange, thus compressing the gasket below that sector of the flange.
8. Do not connect any braces to the protection pipe.

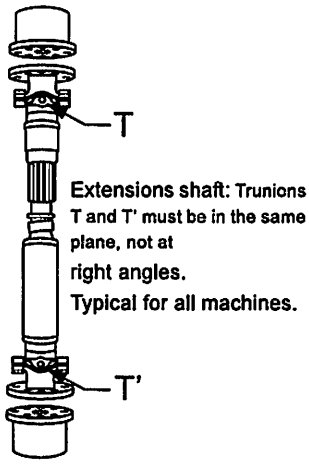


Fig. 5 Flexible shaft arrangement

9.6 SC Type in-line Sewer Chewer

9.6.1 Mounting and installation

Engage the inlet and outlet of the machine with the respective connecting pipes. Level the machine such that there is no strain on the flanges of the machine.

9.6.2 Proper support of sewer chewer and piping layout

It is recommended that proper levels and supports be used to support the machine and its connected piping.

Caution ***Damage to the machine and/or the existing piping may occur if pipes on both sides of the machine are not properly supported.***

9.6.3 Access to lower bearing housing

Allow sufficient access clearance from the floor to the bottom of this lower bearing housing for periodic maintenance and inspection.

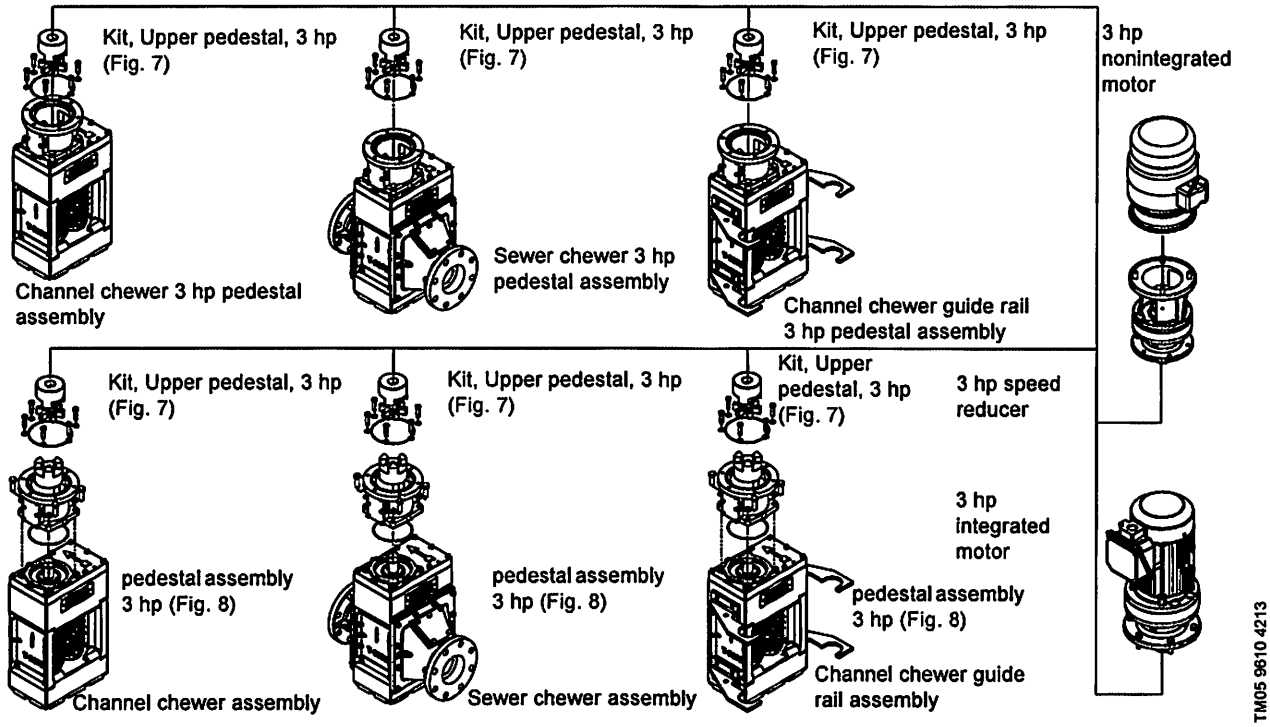


Fig. 6

Channel chewer / 3hp pedestal assembly *			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
CC-08 (shown)	98284764	A-113523	210.249[95.37]
CC-12	98284765		243.602[110.50]
CC-18	98284766		287.852[130.57]
CC-24	98284768		333.902[151.46]

Sewer chewer (ANSI) / 3hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
SC-04 (shown)	98284794	A-113525	281.151[127.53]
SC-06	98284795		345.195[156.58]
SC-08	98284796		371.107[168.33]
SC-10	98284797		472.148[214.16]
SC-12	98284798		596.431[270.54]

Sewer chewer (DIN) / 3hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
SC-04(shown)	98284805	A-113526	281.151[127.53]
SC-06	98284806		345.195[156.58]
SC-08	98284807		371.107[168.33]
SC-10	98284808		472.148[214.16]
SC-12	98284809		596.431[270.54]

Channel chewer guide rail/ 3hp pedestal assembly **			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
CCGR-08 (shown)	98284777	A-113558	225.193[109.05]
CCGR-12	98284779		258.546[124.18]
CCGR-18	98284780		302.796[144.25]
CCGR-24	98284782		348.846[165.14]

3hp speed reducer			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
3hp speed reducer	98285578	A-113554	71.450[26.60]

* CC-32 & CC-40 are not offered with 3hp configuration

** CCGR-32 and CCGR-40 are not offered with 3 hp configuration

Channel chewer assembly *			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
Pedestal assembly, 3hp	98247181	A-113521	26.845[12.18]
CC-08 (shown)	98256811	A-113339	189.95[86.16]
CC-12	98256812	A-113343	224.710[101.93]
CC-18	98256813	A-113344	268.960[122.00]
CC-24	98259814	A-113345	315.010[142.89]

Sewer chewer assembly (ANSI)			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
Pedestal assembly, 3hp	98247181	A-113521	26.845[12.18]
SC-04 (shown)	98163561	A-113359	261.252[118.50]
SC-06	98163562	A-113360	324.897[147.37]
SC-08	98163563	A-113361	350.809[159.12]
SC-10	98163564	A-113362	451.850[204.96]
SC-12	98163565	A-113363	575.054[260.84]

Sewer chewer assembly (DIN)			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
Pedestal assembly, 3hp	98247181	A-113521	26.845[12.18]
SC-04 (shown)	98163566	A-113364	261.252[118.50]
SC-06	98163567	A-113365	324.897[147.37]
SC-08	98163568	A-113366	350.809[159.12]
SC-10	98163569	A-113367	451.850[204.96]
SC-12	98163570	A-113368	575.054[260.84]

Channel chewer guide rail assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 3hp	98244478	A-113556	11.547[5.24]
Pedestal assembly, 3hp	98247181	A-113521	26.845[12.18]
CCGR-08 (shown)	98163553	A-113374	203.572[92.34]
CCGR-12	98163554	A-113375	224.710[101.93]
CCGR-18	98163555	A-113376	281.175[127.54]
CCGR-24	98163558	A-113377	326.396[148.05]

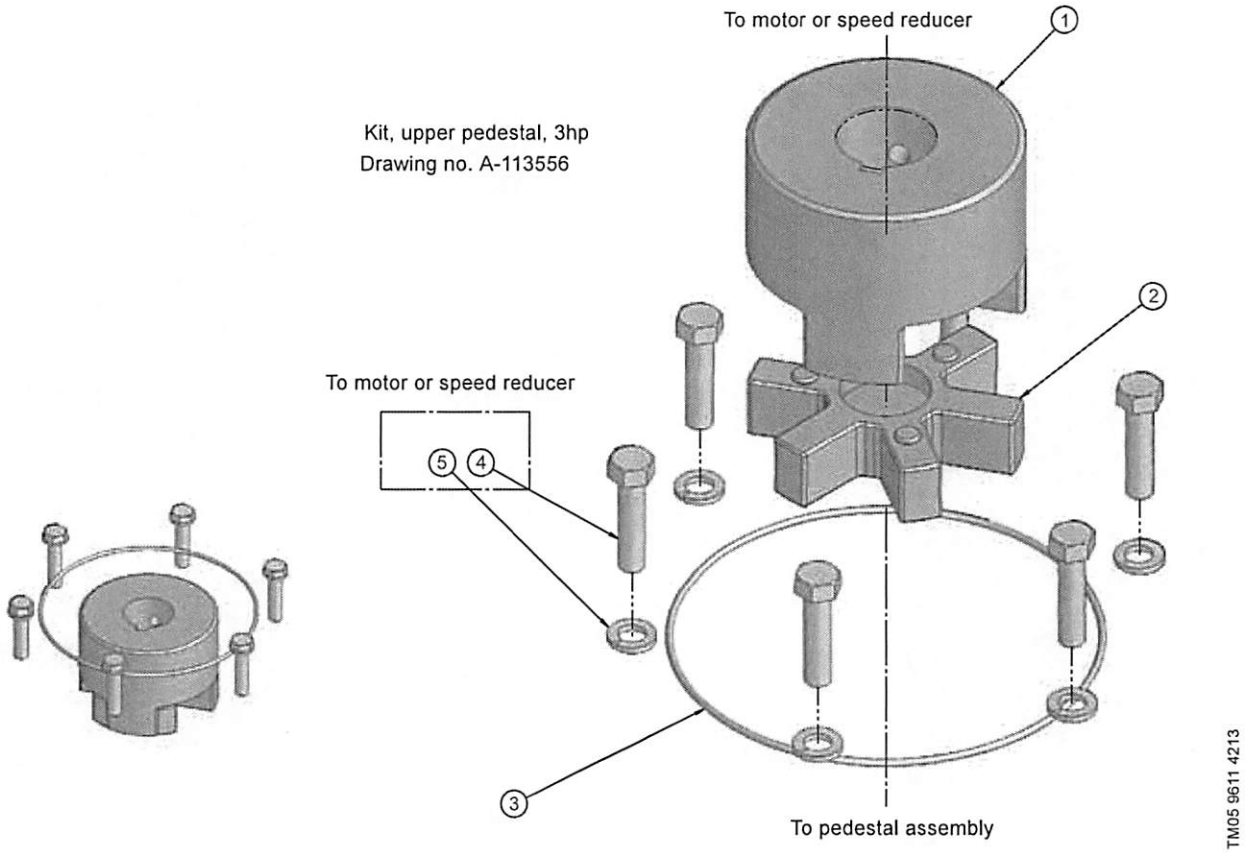
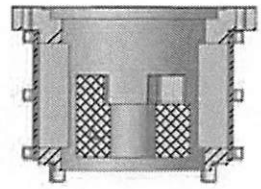


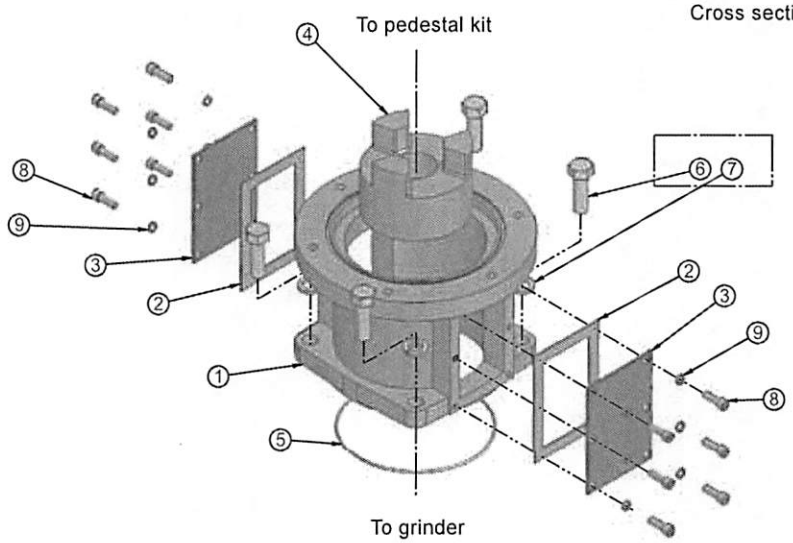
Fig. 7

Item no.	Description	Qty	Sap material no.	Visual part no.
1	Coupling half, l-150, 1-1/2"b, 3/8" kw (motor side)	1	97808703	c11-10-33
2	Cplg insert, l-150, hytrel	1	97821214	05004592-000
3	O-ring,5.737" id x 5.943" od x 0.103" cs, buna-n (motor side)	1	98182108	c49-1-107
4	Hhcs, 3/8"-16 x 1-1/2", 316 ss	6	97813867	c1-45-7
5	Lwshr, 3/8", 316ss	6	97809387	c33-7-8

Pedestal assembly, 3hp
Drawing no. A-113521



Cross section view



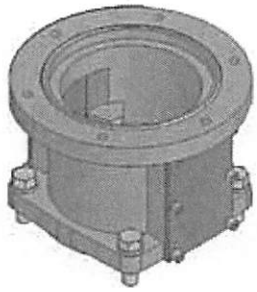


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Fig. 8

Item no.	Description	Qty	Sap material no.	Drawing no.	Visual part no.
1	Pedestal, 7671a, gearmotor, 3hp	1	98145898	m-113265	-
2	Gasket, 7671a, pedestal	2	98145279	m-113267	-
3	Cover, cpl.	2	98144123	m-113266	-
4	Cplg half, l-150,1-3/8" b, 5/16" kw (grinder side)	1	97808702	-	c11-10-31
5	O-ring, 5.237" id x 5.443" od, .103" cs, buna-n (grinder side)	1	98381077	-	-
6	Hhcs, 1/2"-13 x 1-1/2", 316ss	4	97808461	-	c1-47-5
7	Lwshr, 1/2", 316ss	4	97809388	-	c33-7-9
8	Shcs, 1/4"-20 x 3/4", 316ss	12	97809475	-	c44-28-4
9	Lwshr, 1/4" hi-collar, 18-8ss	12	98247171	-	-

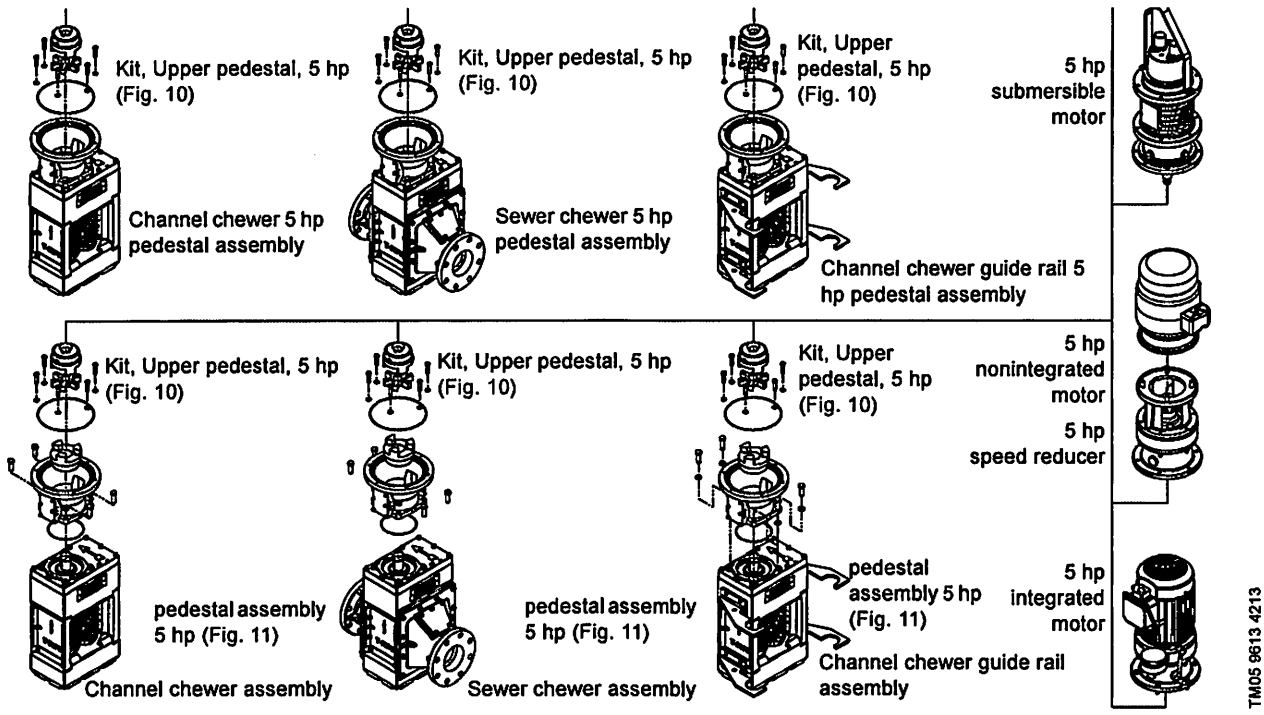


Fig. 9

Channel chewer 5hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
CC-08 (SHOWN)	98284771	A-113524	210.249[95.37]
CC-12	98284772		259.374[117.65]
CC-18	98284773		291.176[132.08]
CC-24	98284774		337.226[152.96]
CC-32	98284775		391.596[177.63]
CC-40	98284776		449.305[203.80]

Sewer chewer (ANSI) 5hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
SC-04 (shown)	98284799	A-113527	295.896[134.22]
SC-06	98284801		359.541[163.09]
SC-08	98284802		385.453[174.84]
SC-10	98284803		486.494[220.67]
SC-12	98284804		609.698[276.55]

Sewer chewer (DIN) 5hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]

Sewer chewer (DIN) 5hp pedestal assembly			
SC-04 (shown)	98284810	A-113528	295.896[134.22]
SC-06	98284811		359.541[163.09]
SC-08	98284812		385.453[174.84]
SC-10	98284813		486.494[220.67]
SC-12	98284814		609.698[276.55]

Channel chewer guide rail 5hp pedestal assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
CCGR-08 (shown)	98284785	A-113559	228.917[110.74]
CCGR-12	98284786		262.270[125.87]
CCGR-18	98284787		306.520[145.94]
CCGR-24	98284788		348.846[166.83]
CCGR-32	98284789		406.940[191.49]
CCGR-40	98284791		464.649[217.66]
5 hp speed reducer	98285602	A-113555	124.000 [56.70]

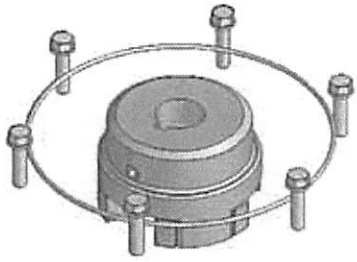
5 hp speed reducer			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
5 hp speed reducer	98285602	A-113555	124.000 [56.25]

Channel chewer assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
Pedestal assembly, 5hp	98247188	A-113522	34.644[15.71]
CC-08 (shown)	98256811	A-113339	189.95[86.16]
CC-12	98256812	A-113343	224.710[101.93]
CC-18	98256813	A-113344	268.960[122.00]
CC-24	98256814	A-113345	315.010[142.89]
CC-32	98256815	A-113346	369.380[167.55]
CC-40	98256816	A-113347	427.089[193.72]

Sewer chewer assembly (ANSI)			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
Pedestal assembly, 5hp	98247188	A-113522	34.644[15.71]
SC-04 (shown)	98163561	A-113359	261.252[118.50]
SC-06	98163562	A-113360	324.897[147.37]
SC-08	98163563	A-113361	350.809[159.12]
SC-10	98163564	A-113362	451.850[204.96]
SC-12	98163565	A-113363	575.054[260.84]

Sewer chewer assembly (DIN)			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
Pedestal assembly, 5hp	98247188	A-113522	34.644[15.71]
SC-04 (shown)	98163566	A-113364	261.252[118.50]
SC-06	98163567	A-113365	324.897[147.37]
SC-08	98163568	A-113366	350.809[159.12]
SC-10	98163569	A-113367	451.850[204.96]
SC-12	98163570	A-113368	575.054[260.84]

Channel chewer guide rail assembly			
Description	**Sap material no.**	**Drawing no.**	**Weight lbs.[kgs.]**
Kit, upper pedestal 5hp	98244474	A-113557	8.197[3.72]
Pedestal assembly, 5hp	98247188	A-113522	34.644[15.71]
CCGR-08 (shown)	98163553	A-113374	203.572[92.34]
CCGR-12	98163554	A-113375	224.710[101.93]
CCGR-18	98163555	A-113376	281.175[127.54]
CCGR-24	98163558	A-113377	326.396[148.05]
CCGR-32	98163559	A-113378	381.595[173.09]
CCGR-40	98163560	A-113379	439.305[199.27]



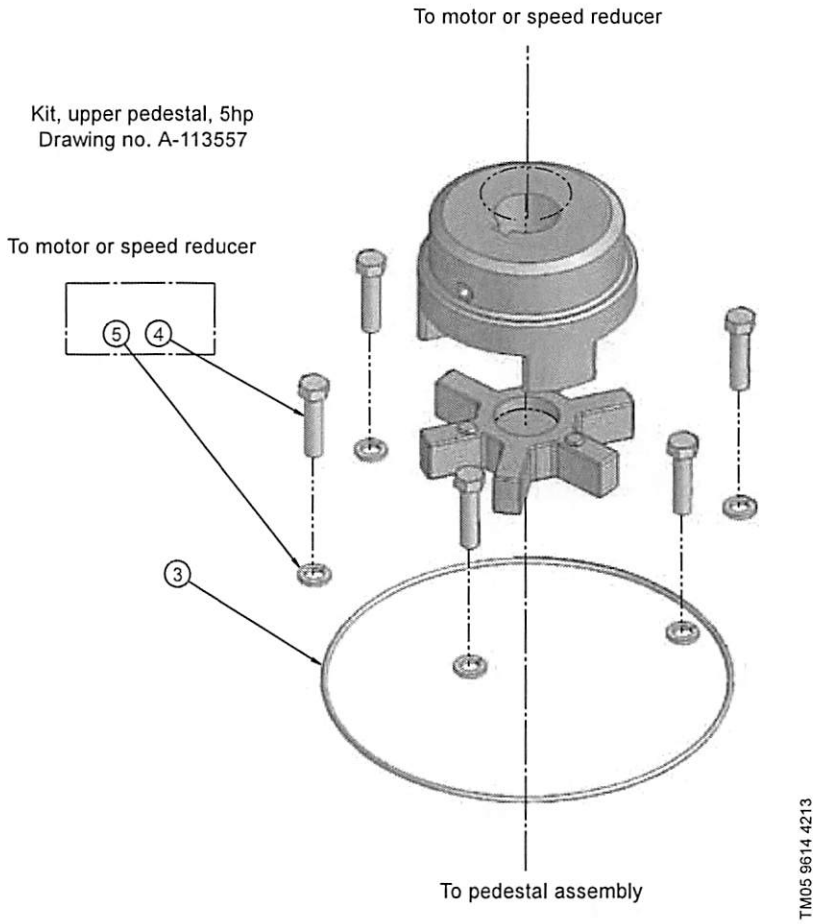


Fig. 10

Item no.	Description	Qty.	Sap part no.	Visual part no.
1	Cplg half,l-190,1-7/8"b,1/2"kw (motor side)	1	97808708	C11-10-45
2	Cplg insert,l-190	1	97821050	C11-1-8
3	O-ring,8.234" id x 8.512" od x 0.139" cs. buna-n (motor side)	1	97820267	C49-1-172
4	Hhcs, 3/8"-16 x 1-1/2", 316ss	6	97813867	C1-45-7
5	Lwshr, 3/8", 316ss	6	97809387	C33-7-8

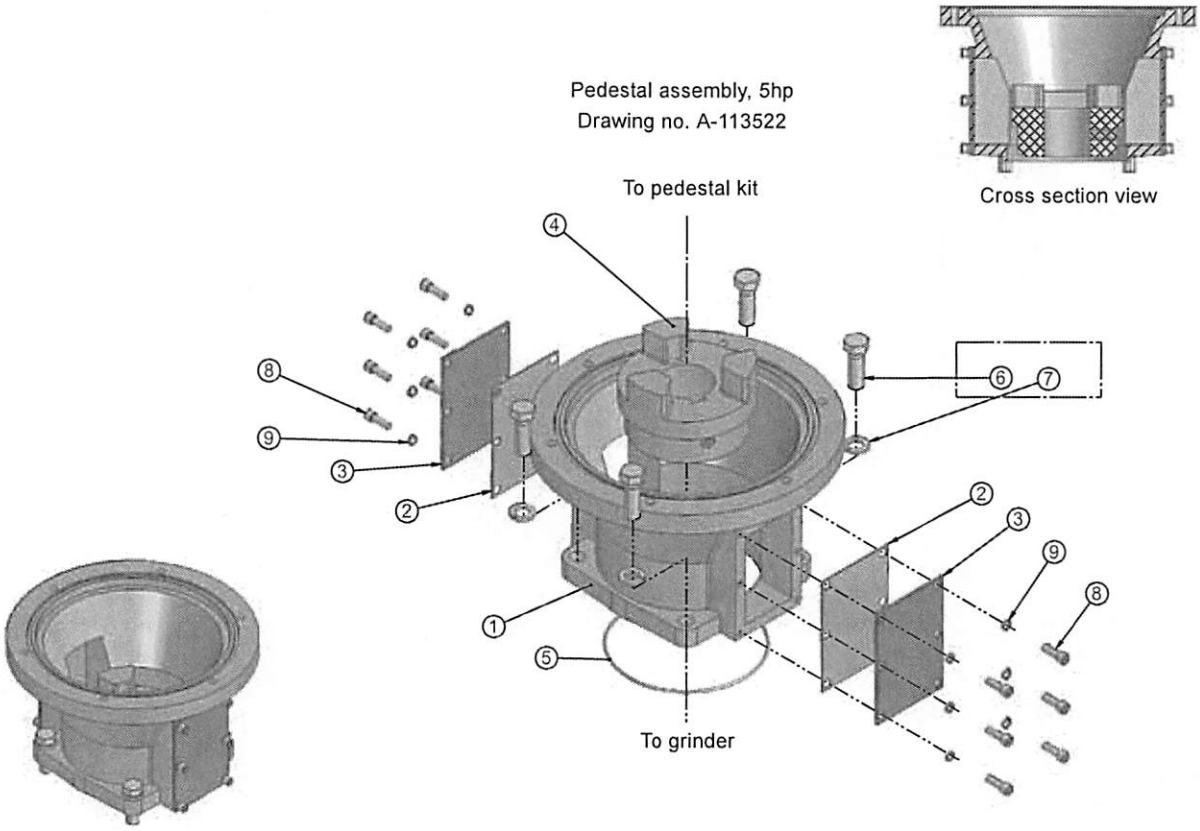


Fig. 11

Item no.	Description	Qty.	Sap part no.	Drawing no.	Visual part no.
1	Pedestal, 7671a, gearmotor, 5hp	1	98145935	M-113263	-
2	Gasket, 7671a, pedestal	2	98145279	M-113267	-
3	Cover, cpl.	2	98144123	M-113266	-
4	Cplg half, l-190,1-3/8" b, 5/16" kw (grinder side)	1	97808707	-	C11-10-40
5	O-ring, 5.237" id x 5.443" od, .103" cs, buna-n (grinder side)	1	98381077	-	-
6	Hhcs, 1/2"-13 x 1-1/2", 316ss	4	97808461	-	C1-47-5
7	Lwshr, 1/2", 316ss	4	97809388	-	C33-7-9
8	Shcs, 1/4"-20 x 3/4", 316ss	12	97809475	-	C44-28-4
9	Lwshr, 1/4" high-collar, 18-8ss	12	98247171	-	-

10. Electrical connections

10.1 Power requirements

Warning

Connect the Grinder to an external disconnect switch which ensures all-pole disconnection with a contact separation according to National Electrical Code and all local codes.

It must be possible to lock the disconnect switch in position OFF. Type and requirements as specified in National Electrical Code and all local codes. The electrical connection must be carried out in accordance with local regulations.

Warning

The Grinder must be connected to a controller with a motor protection relay with IEC trip class 10 or 15.

Warning

Grinders for hazardous locations must be connected to a control box with a motor protection relay with IEC trip class 10. See "Motor protection wiring diagram".

Warning

Do not install the Yeomans Chicago Corporation controller and the free end of the power cable in potentially explosive environments.

The classification of the installation site must be approved by the local fire-fighting authorities in each individual case. On explosion-proof motors, make sure that an external earth lead is connected to the external earth terminal on the pump using a secure cable clamp. Clean the surface of the external earth connection and mount the cable clamp. The earth lead must be minimum AWG 12 type RHH, RHW, RHW-2 or similar, rated for 600 V and min. 194 °F (90 °C), yellow/green. Make sure that the earth connection is protected from corrosion. Make sure that all protective equipment has been connected correctly.

Warning

If the supply cable is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons. Set the motor-protective circuit breaker to the rated current of the Grinder +15 % Service factor.

The rated current is stated on the motor nameplate.

If the Grinder has an Ex mark on the nameplate, make sure that the Grinder is connected in accordance with the instructions given in this booklet.

Due to the low speed-high torque operation of this equipment, the use of a high speed, low horsepower motor driven through a speed reducer provides very low power draw during normal operation.

AC Induction motors shall operate successfully under running conditions at rated load with a variation in the voltage or the frequency up the following:

- Plus or minus 10 percent (+ / - 10 %) of rated voltage, with rated frequency.
- Plus or minus 5 percent (+ / - 5 %) of rated frequency, with rated voltage.
- A combined variation in voltage and frequency of 10 percent (10 %) (sum of absolute values) of rated values, provided the frequency variation does not exceed plus or minus 5 percent (+ / - 5 %) of the rated frequency.

Performance within these voltage and frequency variations will not necessarily be in accordance with the standards established for operation at rated voltage and frequency.

10.2 Wiring diagrams

Refer to the appropriate Digital Controller Installation Operation and Maintenance Instruction.

10.3 Controller

Refer to the appropriate Digital Controller Installation Operation and Maintenance Instruction.

1. For appropriate line voltage connections and to prevent electrical damage to the control panel, refer to the instructions and wiring schematic for the controller.
2. Wire the Sewer Chewer drive motor for proper supply voltage per motor nameplate.
3. Wire the motor leads to terminals T1, T2 and T3 on Input/ Output terminal blocks in the control panel. Refer to the shop drawing wiring schematic for details.
4. Wire the supply line leads to terminals L1, L2 and L3 on Input/ Output terminal blocks in the control panel. Refer to the shop drawing wiring schematic for details.

Confirm that fuses, circuit breaker/disconnect, and transformer are properly sized and configured for your power supply.

11. Startup

Warning

Before starting work on the Grinder, make sure that the fuses have been removed or the mains switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

Make sure that all protective equipment has been connected correctly.

Warning

The Grinder must not be started if the atmosphere in the tank is potentially explosive.

11.1 Preparation & inspection

Warning

Severe injury may result if body parts, clothing, etc. come in contact with the cutting elements or other rotating parts of this machine. Disconnect power to grinder controller and use lockout device before maintenance or any operator adjustment to machine.

11.1.1 Mechanical

Warning

The Grinder can have sharp edges - wear protective gloves.

- Inspect and verify that the cutters are correctly stacked.
- Inspect and verify that unit installation has the correct relative position. Refer to flow direction arrow located on the top bearing housing.
- Inspect and verify that unit is properly secured and supported.

Channel and Wet-Well Units

- Check that frame assembly is properly secured.
- Check that grinder unit properly fits into frame assembly.

In-Line units

- Check that bolts on flange connections are properly secured.
- Check that grinder unit and/or connecting pipe is properly supported.

Electrical

- Inspect and verify the power supply matches panel & motor ratings.
- Inspect and verify motor leads are properly connected and secure.
- Inspect and verify that all other electrical connections are properly made and are secure.
- If remote starting feature is used, inspect and verify that leads are properly connected and secure.

11.2 Direction of rotation

- When looking down on the top of the Sewer Chewer as in fig. 4, the drive shaft (left shaft) will turn in a counter-clockwise direction. Depending on the model, verification can be determined by looking at the shaft or coupling.
- If the direction of rotation is incorrect, disconnect and re-wire any two (2) motor leads.

11.3 Start-up

1. Inspect and verify that all electrical connections are properly connected and secure.
2. Inspect and verify that controller internal circuit breaker/ disconnect (if applicable) is open (OFF).
3. Inspect and verify that disconnect switch is in the OFF position.
4. Verify that controller door is closed and secured.

Warning

Electrical shock hazard exists if panel door is opened when the circuit breaker/disconnect is in the closed (on) position. Do not override the "through the door" circuit breaker handle.

5. Complete circuit to controller (connect the main power line) so that there is power to the "circuit breaker/disconnect"
6. Set the circuit breaker/disconnect switch to the ON position.
7. Pull OUT the emergency stop bottom and refer to the Digital Controller Installation Operation and Maintenance Instruction.
8. When first operating the grinder, observe rotation of the shaft. Shaft rotation in normal forward operation will cause cutters to rotate into each other on the inlet side of the grinder; see fig. 3 and fig. 4.
9. If grinder operation rotation is opposite of the described operation:
   - Switch "through the door" circuit breaker handle to OFF position.
   - Switch the main power line to OPEN or OFF.
   - Lock out and tag main power line.
   - Switch any two of the motor power leads to allow opposite motor rotation. (Three phase motors only. Refer to motor wiring diagram for single phase motors.)
   - Return to section *11.3 Start-up* to verify correct grinder operation rotation.

11.4 Changing grinder operation characteristics on control panels

Many of the operating parameters of your Sewer Chewer grinding equipment may be changed to optimize system performance. See Digital Controller Installation Operation and Maintenance Instruction.

11.5 Startup form

Complete the Start-Up Form and send to Yeomans Chicago Corporation. Included in this information packet is a form that describes the equipment, owner and other important installation information. Upon completion of the start-up procedure, it is required that the Start-Up Form be completed. Failure to complete this form may result in complications in obtaining proper warranty service or coverage.Upon completion of this form, a copy should be sent to:

Yeomans Chicago Corporation
ATTN: Warranty & Service Dept.
3905 Enterprise Court
P.O. Box 6620
Aurora, IL 60598-0620
Warranty-YCC@grundfos.com

12. Operation

After your Sewer Chewer Grinder has been through its proper start-up procedure, it is ready for standard operation. The grinder will operate continuously under normal operating conditions.

Warning

This unit is designed for unattended operation, and will continue operation until power is shut down, the panel controls are stopped, or the unit has completed its reversal cycle (resulting in a grinder overload).

1. Switch "through the door" circuit breaker handle to the ON position.
2. Set for local or remote mode; refer to the Digital Controller Installation Operation and Maintenance Instruction.
3. Grinder will continue normal operation until either the STOP pushbutton is depressed or the grinder encounters a condition that runs the grinder through its complete reversal cycle. If the grinder completes a reversal cycle without clearing the obstruction, grinder operation will be stopped, and a GRINDER JAM alarm will display on the control panel face. To restore normal operation, the unit must be cleared of obstruction. Make sure to power down control panel, and use appropriate lockout procedures before any inspection or maintenance is made on the unit. After the obstruction has been cleared, refer to your the Digital Controller Installation Operation and Maintenance Instruction for power up sequence.
4. If a MOTOR OVERLOAD alarm occurs, this may be a sign that the motor has been pulling higher loads than normal. This may be a sign of other problems such as excessive cutter wear, bearing or shaft failure, or even that the contactor has become damaged. To reset the motor overload, use the following procedure:
   - Switch "through the door" circuit breaker handle to the OFF position.
   - Switch the main power line to OPEN or OFF.
   - Lock out and tag main power line.
   - Inspect to see if the motor overload has tripped.
   - Reset the motor overload switch. (This may require moderate to heavy pressure to reset)
   - Return to section *11.3 Start-up* to verify correct grinder operation.

If the MOTOR OVERLOAD alarm occurs at any frequent interval, the adjustable current sensing relay may be set too low. This level may be raised slightly so that operation will reverse at a higher amp draw.

13. Maintenance and service

Warning

During maintenance and service, including transportation to service workshop, always support the Grinder by means of lifting chains or place it in horizontal position to secure stability.

Warning

Maintenance work on explosion-proof motors must be carried out by FM approved service centers.

Note

Before carrying out any maintenance, it must be ensured that the grinder has been thoroughly flushed with clean water. Rinse the components in water after dismantling.

Warning

The cable must only be replaced by Yeomans Chicago Corporation or a service workshop authorized by Yeomans Chicago Corporation.

Warning

Before starting work on the Grinder, make sure that the fuses have been removed or the disconnect switch has been switched off. It must be ensured that the power supply cannot be accidentally switched on.

Make sure that all protective equipment has been connected correctly.

Warning

Before starting work on the Grinder, make sure that the disconnect switch has been locked in position OFF.

All rotating parts must have stopped moving.

13.1 Inspection & preventive maintenance

After 180 days of control panel power on or 2400 hours of grinder operation, a PREVENTATIVE MAINTENANCE reminder message will be flashed on the OID display periodically. This message provides a reminder in keeping with the grinder maintenance schedule. See maintenance schedule in the Service Instruction.

If severe wear is observed, see Service Instruction.

The displaying of this message does not affect the grinder run status. If the grinder was running before the displaying of this message, it will continue to run. If the grinder was started locally, the [F2] key will still stop the grinder with this message being displayed. To reset this screen, an operator needs to enter the Setup/Information screens by pressing [F3], then needs to scroll to the Maintenance Reminder screen where the [F4] key can be pressed to clear the reminder message. See Digital Controller Installation Operation and Maintenance Instruction.

14. Service

See Service Instruction.

14.1 Lubrication

See Service Instruction.

14.2 Contaminated equipment

Note

Before the unit is disassembled or shipped off-site for service, properly clean and sanitize unit to protect against any contaminants.

If the unit is to be shipped to the factory for repair or refurbishing, you may be subject to a sanitizing charge if the unit has not been satisfactorily cleaned and sanitized.

15. Technical data

15.1 Supply voltage

A properly selected Sewer Chewer will operate successfully under running conditions at rated load based on the following supply voltage:

3 phase, 60 Hz, 240 volts	3 phase, 50 Hz, 380 volts
3 phase, 60 Hz, 480 volts	3 phase, 50 Hz, 415 volts
3 phase, 60 Hz, 208 volts	3 phase, 50 Hz, 220 volts
1 phase, 60 Hz, 120/240 volt	1 phase, 50 Hz, 100 volts

- + / - 10 % of rated voltage, with rated frequency.
- + / - 5% of rated frequency, with rated voltage.
- A combined variation in voltage and frequency of 10 % (sum of absolute values) of rated values, provided the frequency variation does not exceed + / - 5 % of the rated frequency.

15.2 Enclosure class (gearmotor)

The Sewer Chewer is offered in a variety of enclosure types including:

IP 55 TEFC
TEXP - FM, Class 1, Division 1, Groups C and D
IP 68 TENV/Submersible

15.3 Insulation Class

IP 55 TEFC – 3 Phase	Class F	311 °F (155 °C)
IP 55 TEFC – 1 Phase	Class B	266 °F (130 °C)
IP 55 TEFC – 3 Phase	(Prem. Efficient) Class F	311°F (155 °C)
TEXP - FM, Class 1, Division 1, Group D	Class B (min)	266 °F (130 °C)
IP 68 TENV / Submersible	Class F	311°F (155 °C)

15.4 Operating pressure

In-line units are suitable for operation to 90 psi.

15.5 Dimensions

SC models are available in nominal ANSI flange sizes 4", 6", 8", 10" and 12" and DIN flange sizes DN100, DN150, DN200, DN250 and DN300.

15.6 Performance curves

Performance curves are located in the sewer chewer data booklet version 7671A.

16. Disposal

This product or parts of it must be disposed of in an environmentally sound way:

- Use the public or private waste collection service
- If this is not possible, contact the nearest Grundfos company or service workshop.
- If this is not possible, contact your local SEWER CHEWER representative or Yeomans Chicago Corporation Customer Service.

17. Fault finding (Troubleshooting)

Warning

Before attempting to diagnose any fault, make sure that the fuses have been removed or the disconnect switch has been switched to OFF position. It must be ensured that the power supply cannot be accidentally switched on.

All rotating parts must have stopped moving.

Warning

FM

All regulations applying to Grinders installed in potentially explosive environments must be observed.

It must be ensured that no work is carried out in potentially explosive atmosphere.

Your Sewer Chewer grinding machine has been designed and manufactured to provide you with long lasting and trouble free operation. If you do encounter abnormal operation or symptoms, this guide will provide you probable cause and solutions to remedy the problem.

Warning

Severe injury may result if body parts, clothing, etc. come in contact with the cutting elements or other rotating parts of this machine. Disconnect power to grinder controller and use lockout device before maintenance or any operator adjustment to machine.

Problem	Possible cause	Possible remedy
Grinder will not run.	**Electrical:**	
	a) Improper wiring.	Check wiring.
	b) Low voltage.	Check voltage at contactor, starter or motor. Make certain it coincides with nameplate voltage.
	c) Blown fuse.	Check fuses.
	d) Loose connections.	Check connections.
	e) Power cord may be grounded.	Resistance between hot leads should be zero. Resistance between hot lead and ground (green) should be infinite.
	f) Grinder shaft may be locked.	Check amps drawn at the motor.
	g) If reading is significantly more than the max amps listed on the nameplate, check:	Motor bearings may be frozen. Current transducer selector switch, located in the control panel, is incorrectly set. Selector switch must be set to the 40 setting.
		Material may be lodged in cutters
		Shaft may be bent
	Mechanical:	
	a) Broken or removed shaft key.	Check key, replace as required.
	b) Broken or removed gear key.	Check key, replace as required.
	c) Broken or removed coupling.	Check coupling, replace as required.
	d) Broken or bent grinder shaft.	Check shaft, replace as required.
	e) Broken or bent reducer shaft.	Check reducer shaft, replace as required.
	f) Broken speed reducer.	Inspect speed reduce for broken pins, shafts, discs or bearings. Replace as required.
Speed reducer makes noise.	a) Reducer needs lubrication.	Lubricate reducer per Service Instruction.
	b) Improper lubrication.	Lubricate reducer per Service Instruction
	c) Speed reducer has become damaged.	Check speed reducer for damage. Replace or repair as required.
Grinder makes noise.	a) Material being processed creates noise as it is being ground	No correction required.
	b) Cutters have burrs.	Inspect for burrs. Repair as required.
	c) Cutters may be loose.	Inspect cutters for play. Tighten shaft locknut in lower bearing. If cutter slack is not eliminated, inspect cutters for wear or damage.
	d) Broken cutter or spacer.	Inspect for broken cutter or spacer. Inspect other cutters and spacers for obvious signs of wear or damage. Replace as required.
	e) Material may be lodged in cutting zone.	Inspect cutting zone for lodged material in the cutting zone. Remove obstruction.
	f) Seal contamination or failure.	Inspect seal for contamination or failure. Inspect seals and bearings for obvious signs of wear or damage. Replace as required.
	g) Bearing contamination or failure.	Inspect seal for contamination or failure. Inspect seals and bearings for obvious signs of wear or damage. Replace as required.
	h) Broken or bent grinder shaft.	Check shaft, replace as required.
	i) Gears may require lubrication.	Lubricate grinder gears per Service Instruction.

Fault	Cause	Remedy
Play in shafts.	a) Cutter stack has become loose.	Inspect cutter stack for play. Torque shaft nut in lower bearing housing. If cutter slack is not eliminated, inspect cutters for wear or damage.
	b) Broken or missing retaining snap rings.	Inspect and repair or replace as required.
	c) Bearing contamination or failure.	Inspect bearings for contamination and wear. Replace bearings and seals as required.
Grinder will not reverse.	a) Jam setting not properly adjusted.	Electric drive: adjust current overload sensor.
Grinder is leaking.	a) Improper gasketing of side rails or flanged hoppers.	Inspect gasketing of flanged hoppers or side rails. Replace gasketing per Service Instruction.
	b) Seal failure.	See below or Service Instruction for proper installation procedure for replacing bearings & seals.
Seal failure.	a) Seal failure	Inspect seal for contamination or failure. Inspect seals and bearings for obvious signs of wear or damage. Replace as required. It is recommended to completely inspect cutters, spacers and other critical parts for wear or damage and replace as required at the same time.
Grinder is reversing frequently.	a) Jam setting not properly adjusted.	Electric drive: adjust current overload sensor.
	b) Cutter stack has become loose.	Inspect cutter stack for play. Torque shaft nut in lower bearing housing. If cutter slack is not eliminated, inspect cutters for wear or damage.

17.0.1 Other troubleshooting

For other trouble shooting questions contact your local SEWER CHEWER representative OR YCC Customer Service at:

Yeomans Chicago Corporation
3905 Enterprise Court
P.O. Box 6620
Aurora, IL 60598-0620
Phone: 630-236-5500
Warranty-YCC@grundfos.com

18. Startup data sheet

SEWER CHEWER® Wastewater / Sludge Grinder

Return copy to:	**Yeomans Chicago Corporation** **Attn: Customer Service** **P.O. Box 6620** **Aurora, IL 60598-0620** **Warranty-YCC@grundfos.com**

Start-up date:

S.O. number:

Project information (please print or type all information)

Plant/project name:	Plant phone:	
Address:	State:	
City:	State:	Zip:
Chief operator:		
Maint. supervisor:		
Other key personnel:	Title:	

Owner information

Owner:	Phone:	
Address:		
City:	State:	Zip:
Owner contact:	Title:	

Contractor information

Contractor:	Phone:	
Address:		
City:	State:	Zip:
Contact:	Title:	

Rep. information

Rep. number:	Rep. name:	
	Salesperson:	
Sales order #:	Ship date:	Quantity of units:

Start-up information

Startup OK (Y/N) _____

If no, explain:

Grinder model:	
Control panel model:	Motor model:
Control panel S/N:	Motor S/N:

Plant information (Briefly describe the application and location where this Sewer Chewer is used.)

Plant info:

Please note: This form must be completed and returned to Yeomans Chicago Corporation in order to validate warranty.
Please use separate sheet if other notes and comments are added.

98469422 1113
ECM: 1125244

ISO 9001:2000 Certified
For further information please contact your local distributor.