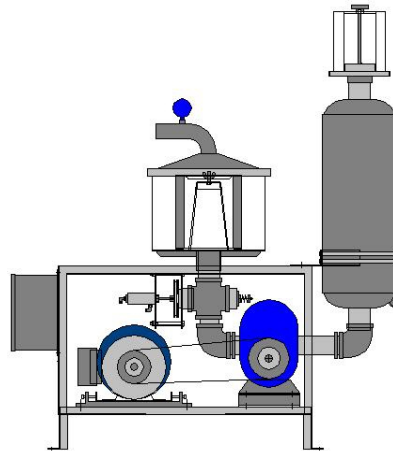


Thoreson-McCosh Inc

PROTEK LOADING SYSTEM



INSTRUCTION MANUAL IB201503

Thoreson-McCosh Inc.
1885 Thunderbird Street, Troy, Mi. 48084
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Thoreson-McCosh Inc

FORWARD

Installation, Operation and Maintenance manual for your
Thoreson-McCosh Inc. equipment.

Please complete the information below. When calling the Thoreson-McCosh Inc.
Service department, this information will be needed.

Model Name _____

Serial Number _____

Wiring Diagram _____

Insert _____

Program _____

Layout _____

Additional information can be found at:

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Troy, MI. 48084

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**** SECTION 1 ****

THORESON-MCCOSH INC. PRODUCT WARRANTY

Thoreson-McCosh warrants each product of its manufacture to be free from defects in material and workmanship for a period of 12 months from the date of delivery to the original purchaser. Thoreson-McCosh's obligation under this warranty is limited to repairing or replacing any part returned to the Thoreson- McCosh factory with transportation charges prepaid, and which, on examination by Thoreson-McCosh, shall disclose to Thoreson-McCosh's satisfaction to have been defective.

The purchaser must notify Thoreson-McCosh of such defects and promptly deliver the defective part(s) in accordance with Thoreson-McCosh's shipping instructions, delivery prepaid. Parts will be replaced F.O.B. Thoreson-McCosh factory, by Thoreson-McCosh, and will be invoiced to the purchaser with "credit on return of defective part", if the part is returned within fifteen (15) days after shipment of replacement part. Thoreson-McCosh is not liable for installation or cost to install the replacement part or removal of the defective part.

Thoreson-McCosh is not responsible for any failure of its product due to improper use, installation, or operation. Thoreson-McCosh shall not assume any expense or liability for repairs made to any Thoreson-McCosh unit or equipment outside Thoreson-McCosh's own factory unless specifically agreed to in writing by Thoreson-McCosh.

Equipment and accessories furnished by us, but manufactured by others, are guaranteed to the extent of the original manufacturer's guarantee to Thoreson-McCosh, if that guarantee exceeds one (1) year.

It is expressly understood that Thoreson-McCosh is not responsible for damage and/or injury caused to buildings, contents, products, or persons by reason of installation or use of any of our products. Thoreson-McCosh shall not be liable for loss, damage or expenses arising directly or indirectly from, or being consequential or incidental to, the use of its products or from any other cause.

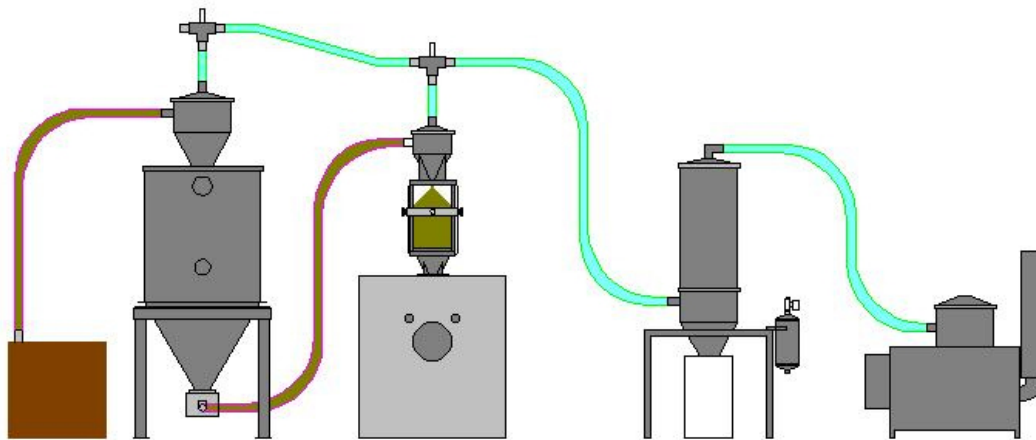
The above warranty supersedes, and is in lieu of all other warranties expressed or implied; and no person, agent, representative or dealer is authorized to give any warranties on behalf of Thoreson-McCosh, not to assume for Thoreson-McCosh any other liability in connection with Thoreson-McCosh products.

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**** SECTION 2 ****

LOADER METHOD OF OPERATION

The operation of the vacuum loading system is quite simple. The positive displacement air pump creates a "vacuum effect" when the pump is driven. This vacuum creates airflow through the vacuum hose, creating a reduced pressure in the vacuum receiver, which causes the discharge valve on the material outlet of the receiver to close, causing a further reduction in pressure within the receiver. The reduced pressure within the receiver results in airflow through the pick-up tube or material take-off, then through the material delivery tube and into the vacuum receiver. The high velocity of this air flow results in material pickup, and the consequent delivery of a mixture of material and air into the receiver. Once this mixture is delivered to the receiver, the material and air must be separated, and the air pumped out of the receiver to maintain the reduced pressure necessary for conveying. A filter screen in the receiver accomplishes the separation of the air from the material.



LOADER AIR FLOW SCHEMATIC

INSTALLATION AND SETUP

The loading system will perform best when the material and vacuum lines are hooked up in the most direct manner possible with a minimum of bends. Care should be taken to insure that all the couplings are tight in order to minimize air leakage. The material and vacuum lines should be properly grounded to the building.

The vacuum receiver should be mounted on the lid of the machine hopper over a circular hole and secured to the lid of the machine hopper by bolting through the mounting holes in the receiver flange.

The vacuum line is to be connected from the top of the receiver to the central vacuum line or the inlet on the filter housing. The material line is to be connected from the inlet on the side of the receiver to a central material line or a material pick-up tube. The Sequencing (Tee valves), Ratio, Conical dump, and Purging valves, require compressed air to operate. The pressure of the air should be regulated between 60 psi and 90 psi in order to obtain maximum valve operation durability. This regulated air supply should be connected directly to the solenoid valve.

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**** SECTION 3 ****

QUICK START

1. Uncrate Loading System.
2. Mount receivers on machines and hoppers.
3. Mount T-valves above receivers.
4. Mount all external ratio and purge valves.
5. Connect vacuum and material lines (see plant layout if applicable).
6. Connect compressed air to system.
7. Wire the loading system, running all inputs and outputs back to the central loading system control panel (see wiring diagram).
8. Connect 3-phase high power to the pump(s).
9. Check pump motor phasing; change any two wires (L1, L2, L3) if phase is incorrect.
10. Setup the timing set points for all stations, ratios, and purging valves.

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**** SECTION 4****

OPERATING INSTRUCTIONS

HMI TOUCH PANEL

The Human Machine Interface (HMI) Touch panel is used to modify and monitor the entire loading system with a series of easy to follow screens. A simple touch with your finger or a clean blunt object actuates the push buttons.

TITLE SCREEN

After the HMI has initialized, the Title screen will be displayed for about 5 seconds. This shows the program number that is installed in the PLC. The HMI should have the same Program number.



TITLE SCREEN

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SYSTEM STATUS

The System Select screen consists of several navigation buttons and several indicator lights

- SYS SETUP:** Press this button to display the *SYSTEM SETUP* screen.
- SYSTEM STATUS:** Displays whether the system is **OFF** or **ON**.
- PUMP STATUS:** Displays if the pump is **Off** or **On**.
- BLOW BACK:** Displays when the central filter solenoid is **Off** or **On**
- CURRENT STATION:** Displays the name or number of the current station that is loading.
- LOAD TIME:** Displays the load time remaining for the current station loading.

SYSTEM STATUS		
System Number	Sys 1 Setup	Sys 2 Setup
System Status	On	On
Pump Status	On	On
Blow Back	Off	On
Current Station	STA1.1	STA2.5
Load Time	15	0
Title Screen	Alarm Silence	Alarm Screen

SYSTEM STATUS SCREEN

At the bottom of the screen, there is a Alarm Silence button and two Navigation buttons.

- TITLE SCREEN:** Press this button to return to the Title Screen.
- ALARM SILENCE:** Press this button to temporarily disable the audible alarm.
- ALARM SCREEN:** Press this button to display the *ALARM* screen.

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SYSTEM SETUP

The System Setup screen consists of two sections. *SYSTEM MODE* & *SCREEN SELECTION*.

SYSTEM MODE: This indicates the *MODE* that has been selected.

AUTO: Press this button to put the system in the *AUTO* mode.

OFF: Press this button to turn the system *OFF*.

SCREEN SELECTION: This section has four navigation, and one *MASTER RESET* buttons.

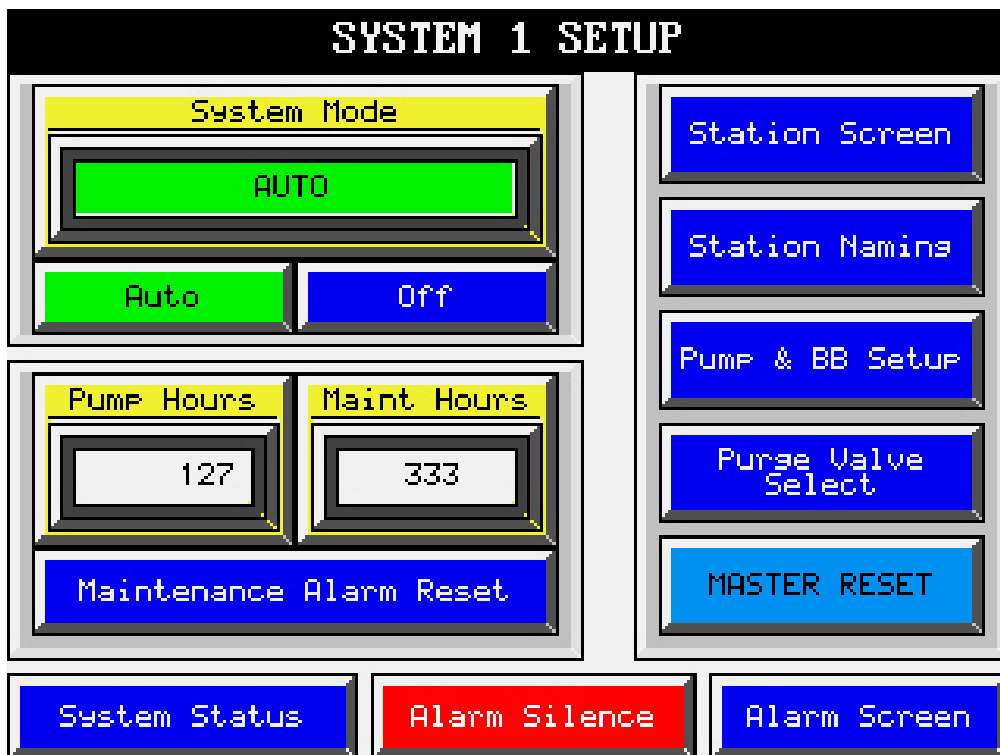
STATION SCREEN: Press this button to display *STATION SCREEN* where you can select the station that you want to monitor or modify set points.

STATION NAMING: Press this button to display a screen to give the station a unique name.

PUMP & BB SETUP: Press this button to display the *SYSTEM PUMP & FILTER* screen where the settings for the pump and central filter can be monitored and modified.

PURGE VALVE SELECT: Press this button to display a screen to assign a Purge Valve to a Station.

MASTER RESET: Press and hold this button for 5 seconds to reset all system timers.



SYSTEM SETUP SCREEN

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SYSTEM STATION SETUP

The System Station Setup screen displays the set points for a group of stations. After making changes, use the Prev and Next navigation buttons to scroll from one group of stations to another.

- STA NAME:** This indicator light displays a stations unique name.
- ENABLE:** Press this button to toggle the station *OFF* and *ON*.
- LOAD REQEST:** Shows the status of the Lower limit switch.
- LOAD SETPT:** This will set the amount of load time needed to fill the receiver.
“WARNING!” Do not over fill the receiver. This can cause damage to the popits and seals, and can plug the material line.
- LOAD TIME:** This displays the amount of load time remaining.
- DUMP SETPT:** This sets the amount of time needed to dump all the material out of the receiver before it can load again. In normal cycles, this does not matter, but if only one station is loading, this prevents the station from trying to load before it has completely emptied the material.
- NOLD SETPT:** This sets the amount of loads a station can try to load without pulling material before it turns on a *NO LOAD* alarm. This is adjustable from 1 to 10. Set this value to **0** to turn off the alarm for this station.
- REGRIND %:** This sets the percentage of load time that *REGRIND* material will load. Re grind material will always load first.
- PURGE SETPT:** This sets how long the material line will purge after the load time has finished.
- PBLOW DLY:** Use this button to delay the station blow back after the load cycle. Some buttons will only be displayed if that station is using that option.

SYSTEM 1: STATION 1-4 SETUP				
Sta Name	STA1.1	STA1.2	BLEN3	MACH4
Enable	On	On	Off	On
Load Reqest	Empty	Full	Empty	Empty
Load Setpt	15	10	12	25
Load Time	0	0	0	7
Dump Setpt	10	5	5	5
NoLd Setpt	3	4	3	3
Regrind %		20		25
Purge Setpt	15			
PBlow Dly				2
Sys Status	Sys1 Setup	Previous	Next	

SYSTEM STATION SETUP

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SYSTEM PUMP & FILTER SETTINGS

The Pump & Filter settings screen displays the following:

OF LOADS BEFORE BLOW BACK CYCLE: This is the amount of stations that you would like to load before the central filter goes into a blowback (cleaning) cycle. It could be 10 separate stations, or 1 station loading 10 times, or any combination.

AIR RECHARGE TIME: The blowback solenoid normally has a small recharge tank that needs time to recharge. This varies from facility to facility depending on the size of the compressor and the volume of usage.

PUMP OFF DELAY TIMER: For pumps equipped with a Vacuum Break valve (VB), the pump will run continuously and the VB solenoid cycles on and off to cause the system to load, but if no stations call for a load cycle after a period of time, this timer will turn the pump off. Set this value to zero to disable the VB.

VACUUM RELIEF TIME: For pumps equipped with a Vacuum Break valve (VB), the VB will remain open for a few seconds to help reduce vacuum in the receiver.

PUMP MAINTENANCE ALARM SET POINT: Press this button to adjust the Maintenance Alarm Set point. The set point is adjustable to 1000 hours.

SYSTEM 1: PUMP & FILTER SETTINGS		
# Loads before blow back cycle	10	
Air recharge time	2	Sec
Pump Off delay time	7	Min
Vacuum Relief time	2	Sec
Pump Maintenance Alarm setpt	450	Hrs
System Status	System 1 Setup	Pump Selection

SYSTEM PUMP & FILTER SETTINGS

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SYSTEM ALARMS SCREEN

The System Alarms screen displays the following:

This screen has two Navigation buttons, and two function buttons.

PRESS TO SEE ALARM HISTORY: Press to see the Alarm History. Press EXIT to return to the System Alarms screen.

SYSTEM STATUS: Press this button to return to the System Status screen.

ALARM SILENCE: Press this button to temporarily disable the audible alarm.

CLEAR ALARMS: Press this button to clear all current System alarms.



Alarms



Alarm History

ALARM SCREENS

NO-LOAD ALARM: A STATION HAS EXCEEDED THE NO-LOAD ALARM SET POINT.

Material supply is empty, or there is a problem with the Vacuum or Material line.

PUMP OVERLOAD TRIPPED: THE OVERLOAD RELAY IS OPEN

Check the pump motor for visual problems.

Check the system for clogged lines or filters.

Check for proper power to the system.

Reset the overload relay, and then check the motor that it is not exceeding the rated FLA on the motor tag.

PUMP MAINT ALARM: THE PUMP MAINTENANCE RUN TIME HAS BEEN EXCEEDED

Pull the maintenance that is required, then reset the alarm.

All alarms need to be cleared by pressing the **CLEAR ALARMS** button.

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**** SECTION 5 ****

MAINTENANCE INSTRUCTIONS

FILTER MAINTENANCE

- It is recommended that filters be checked periodically for material residue accumulation, and cleaned before the loader's performance is reduced.
- Inspect and clean the filter screen in the receiver hopper at least once a month (more often if dusty materials are being conveyed).
- If a central filter is being used, inspect the filters in the unit at least once a month.
- Inspect the filter on the pump weekly. These are cartridge type filter elements and may be cleaned with compressed air several times before a new element must be installed. When filter material becomes worn, a new filter should be installed. Replacement filters are available from **Thoreson-McCosh, Inc.**

PUMP MAINTENANCE

- Add fresh oil to the pump as required to maintain proper oil level. (See pump maintenance manual for correct procedure).
- The gear case of the pump should be drained, flushed and refilled with fresh oil after the first 100 hours of run time, then every 1000 hours after that. Use a ISO 100 grade oil or equivalent.
- The grease fittings on the shaft end of the pump should be charged with a medium type bearing grease weekly.
- Check the belt periodically for tension and wear. Replace as needed.

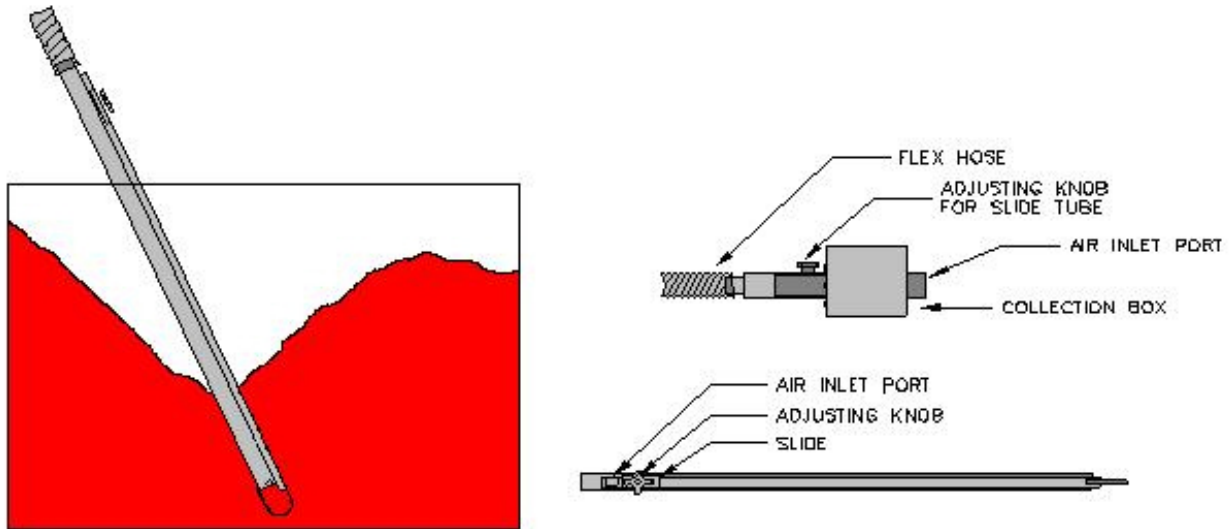
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MATERIAL PICK-UP TUBE/ TAKE-OFF

The material pick-up tube/vacuum take-off, has an adjustable slide to regulate the material conveying air. The material is aerated at the bottom of the tube so that various densities of materials can be handled with one pick-up tube/vacuum take off.

The pick-up tube should be positioned at or near the bottom of the container. The loading rate should have a continuous noise of material passing through the conveying pipe as long as the loader is in operation.

If slugging occurs, the slide is incorrectly adjusted. To correct the problem, adjust the slide to let more air pass through the air inlet port.



MATERIAL PICK-UP / TAKE-OFF

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**** PASSWORD PROTECTION ****

Some items may be password protected. Press the Log ON button to display the Log ON screen. The buttons that are protected on this screen are in the light blue color.

The General password is **1885**.

The Maintenance password is ##### (last 4 digits of the program number).

Enter the security code. This will allow you to make adjustments for about 5 minutes.

Other items that are protected are the pumps and station names.

SYSTEM 2: STATION 1-3 SETUP			
Sta Name	STA2.1	STA2.2	HOP 312
Enable	On	On	On
Load Reest	Empty	Empty	Full
Load Setpt	10	45	25
Load Time	8	0	0
Dump Setpt	10	10	10
NoLd Setpt	3	4	0
Purge Setpt	10	30	18
PBlow Dly		1	1
			Log ON
Sys Status	Sys2 Setup		

STATION SETUP SCREEN LOG ON BUTTON

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STANDARD PARTS LIST FOR LOADING SYSTEM & RECEIVERS							
MODEL NUMBER	VACUUM FILTER	SNUBBER FILTER	RECEIVER FILTER	LID SEAL	DOOR SEAL	FINES FILTER	LID CLAMPS
MARK 3	404662	404661		409401			
MARK 4	404662	404661		409401			
MARK 5	404662	404661		409401			
MARK 7	404662	404661		409401			
MARK 7XP	404662	404661		409401			
MARK 10	405897	404365		409401			
7" DIA RECEIVER			413001	412257	412265		411402
10" DIA RECEIVER			407095	409402	413091		405824
15" DIA RECEIVER			409002	409401	413091		407409
RB-1 FILTER	408433			409402	413091	407402	
RB-4 FILTER	407009			409401	413091	407402	
RB-6 FILTER	405895			409401	413091	407402	
CB-1 FILTER	408433			409402	413091	407402	
CB-4 FILTER	407009			409401	413091	407402	
CB-6 FILTER	405895			409401	413091	407402	