INSTRUCTION MANUAL

Serial No.

Model No.

LSSC – DIESEL
LOW SUCTION SHUTDOWM CONTROLLER

Modification Code

Part Number – Issue

MASTER CONTROL SYSTEMS, INC.
P.O. BOX 276 • 910 NORTH SHORE DRIVE, LAKE BLUFF, ILLINOIS 60044, U.S.A.
TELEPHONE: 847-295-1010 • FAX: 847-295-0704

A3-081-4

MODEL LSSC

LOW SUCTION SHUTDOWN CONTROLLER

Table of Contents

MODEL LSSC

LOW SUCTION SHUTDOWN CONTROLLER

GENERAL: The model LSSC shutdown control has been designed to shutdown a Master Diesel or Electric fire pump controller from either an optional pressure switch or an external form 'C' contact supplied by others. The LSSC control will shutdown the fire pump controller regardless of any fire demand or remote start signals which would ordinarily cause the fire pump to run.

INSTALLATION INSTRUCTIONS

MOUNTING: The LSSC panel must be mounted in the vertical position, and in an area free from dripping and spraying water.

SAFETY PRECAUTION: Before any electrical connections are made to panel, make sure the panel fuses are removed.

POWER SUPPLY: Use branch circuit protection on the incoming power source(s).

SEQUENCE OF OPERATION

MODEL 'LSSC' SHUTDOWN CONTROL PANEL

(For Diesel Fire Pump Controller Application)

The model 'LSSC' Shutdown Control Panel provides: a) isolated S.P.DT. contacts wired to terminals for Fire Pump Controller shutdown circuit and alarms; b) signal lamps to indicate Low Suction Pressure and panel Power On; c) audible alarm; and d) toggles switches for alarm off and manual reset.

In addition, the following optional features may be furnished:

Option '1' --	Shutdown pressure switch mounted on control panel.
Option '2' --	Dual Input Power sensing to provide automatic transfer of input voltage from Fire Pump Controller Battery #1 to Fire Pump Controller Battery #2 on power failure. This option also provides indicating lamps for "Supply Power Normal" (SL-2) and "Supervisory Power Normal" (SL-4).
Option '3' --	Repetitive Alarm Signals.
Option '4' --	Automatic Reset Delay.

SEQUENCE OF OPERATION

----- NO OPTIONS -----

Low Suction Pressure Shutdown:

Customer's shutdown signal contacts wired between terminals 16 & 17 close to energize Low Suction Pressure signal lamp (SL-3) and timer TD1. After timer TD1 completes its timing cycle, contacts TD1-A close to seal-in TD1 electrically. Contacts TD1-C close to energize relay K3 thru closed K8A contacts and the audible alarm. (Relay K8 became energized, to close its K8A contacts, on Fire Pump Controller's automatic startup). Contacts K3A close to seal-in relay K3 electrically. Contacts K3C & K3D transfer to initiate Fire Pump Controller shutdown. Contacts K3E & K3F transfer to provide shutdown alarm signal. Relay K8 becomes de-energized upon Fire Pump Controller shutdown. Contacts K8D close to energize relay K4. Contacts K4B open to de-energize relay K3 and contacts K3A open.

Alarm Off:

Actuating the "Alarm Off" toggle switch (SW-1) energizes relay K6. Contacts K6C close to seal-in K6 and contacts K6B open to silence the audible alarm.

Manual Reset:

Actuating the "Manual Reset" toggle switch (SW-2) de-energizes timer TD1 to restore the Shutdown Control Panel to normal shutdown readiness.

(For Diesel Fire Pump Controller Application)

SEQUENCE OF OPERATION

OPTION '1' - PRESSURE SWITCH SHUTDOWN (Factory Installed)

Low Suction Pressure Shutdown:

Option 1 provides a pressure switch mounted on the control panel.

Upon sensing low pressure, the pressure switch closes its contacts (PS) to energize timer TD1 to initiate shutdown in identical sequence as previously described in paragraph "Low Suction Shutdown -- No Options".

Alarm Off & Manual Reset:

Identical to sequence previously described.

SEQUENCE OF OPERATION

OPTION '2' - DUAL INPUT POWER

Dual Input Power:

A failure of Battery #1 power received from the Fire Pump Controller will de-energize relay K1. Contacts K1A & K1B and K1C & K1D transfer to provide panel power from the Fire Pump Controller Battery #2 source. Contacts K1F close to energize the audible alarm. Contacts K1E open to de-energize the "Supply Power Normal" signal lamp (SL-2).

If the Fire Pump Controller Battery #2 source fails, relay K2 becomes de-energized. Contacts K2A open to de-energize the "Supervisory Power Normal" signal lamp (SL-4). Contacts K2B close to energize the audible alarm.

Low Suction Shutdown Alarm Off & Manual Reset:

Identical to sequence previously described.

(For Diesel Fire Pump Controller Application)

SEQUENCE OF OPERATION

OPTION '3' - REPETITIVE ALARMS

Low Suction Pressure Shutdown:

Identical to sequence previously described.

Alarm Off:

Actuating the "Alarm Off" switch (SW-1) energizes relay K5 thru closed contacts TD1-C. Contacts K5C close to seal-in relay K5 electrically. Contacts K5B open to de-energize the audible alarm.

If the Battery #1 power supply being received from the Fire Pump Controller fails, then relay K1 becomes de-energized. Contacts K1F close to energize the audible alarm. Actuating the "Alarm Off" switch under this condition will energize relay K6. Contacts K6C close to seal-in relay K6 electrically and contacts K6B open to de-energize the audible alarm.

If Option '2' is provided and Battery #2 Power failure occurs, then relay K2 becomes de-energized. Contacts K2B close to energize the audible alarm. Actuating the "Alarm Off" switch under this condition energizes relay K7. Contacts K7C close to electrically seal-in relay K7. Contacts K7B open to de-energize the audible alarm.

Manual Reset:

Identical to sequence previously described.

(For Diesel Fire Pump Controller Application)

SEQUENCE OF OPERATION

OPTION '4' - AUTOMATIC RESET DELAY

Low Suction Pressure Shutdown:

Customer's shutdown signal contacts (S.P.DT.) or, if Option '1' is provided, factory installed pressure switch (S.P.DT.) wired between terminals 16 & 17 and 16 & 15 transfer to energize timer TD1 & "Low Suction Pressure" signal lamp (SL-3) and de-energize timer TD2. Contacts TD1-A & TD2-B close to seal-in timer TD1. Shutdown & alarm circuits are now energized in the same sequence as previously described.

Alarm Off & Manual Reset:

Identical to sequences previously described.

Automatic Reset Delay:

Upon the return of normal system pressure, customer's signal contacts (S.P.DT.) or, if Option '1' is provided, factory installed pressure (S.P.DT.) contacts transfer to energize timer TD2. After timer TD2 completes its timing cycle, contacts TD2-B open to de-energize timer TD1 to restore the Shutdown Control Panel to normal shutdown readiness.

REPLACEMENT PARTS LIST

MODEL 'LSSC' SHUTDOWN CONTROL PANEL (12 VDC or 24 VDC)

(For Diesel Fire Pump Controller Application)

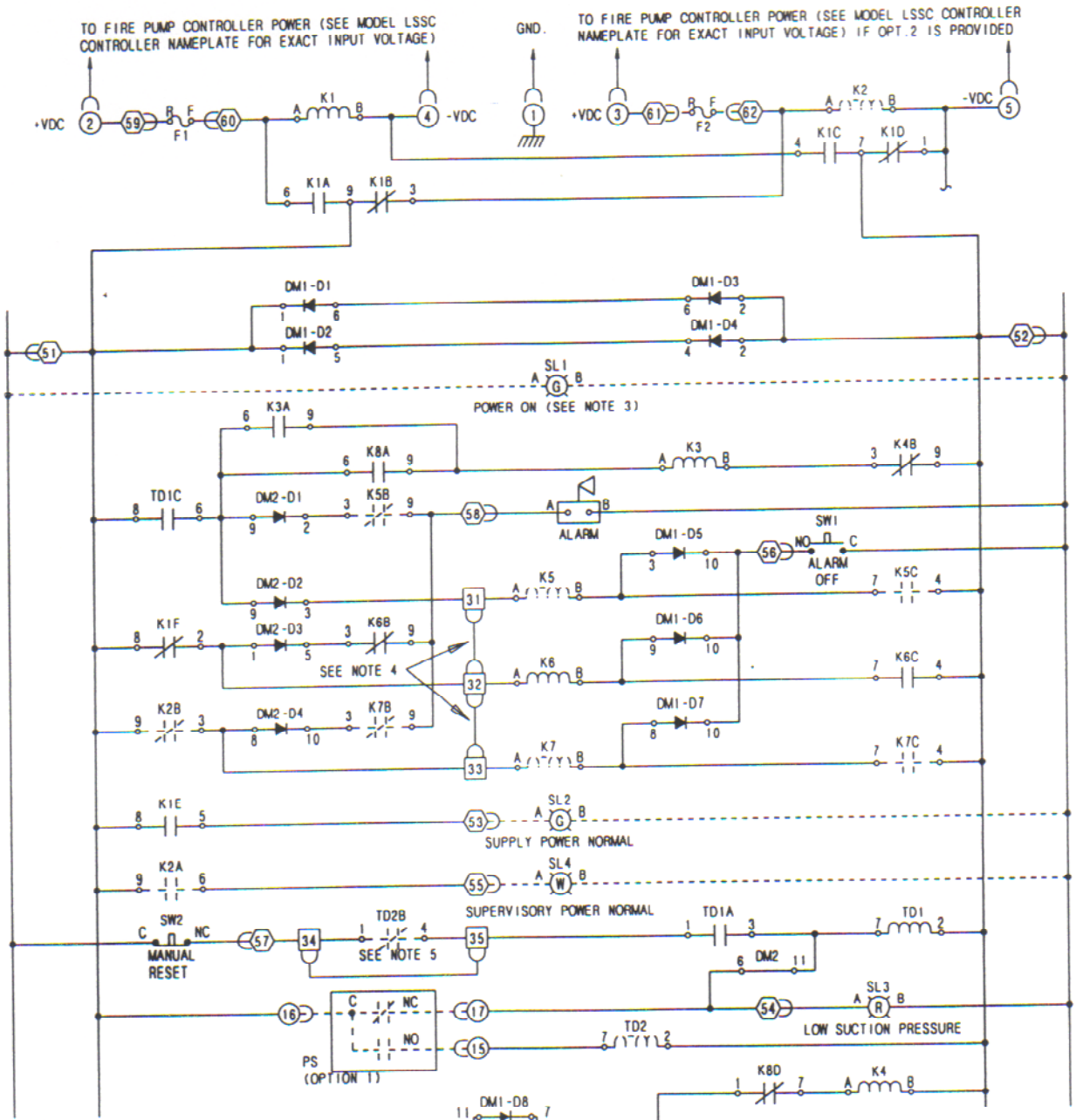
MCS PART NO.	DESCRIPTION
800431	12 VDC Relay - 3P.DT. (K1, K3)
800432	24 VDC Relay - 3P.DT. (K1, K3)
800421	12 VDC Relay - 2P.DT. (K2, K4-K8)
800422	24 VDC Relay - 2P.DT. (K2, K4-K8)
304760	12 VDC Time Delay Relay (TD1, TD2)
304761	24 VDC Time Delay Relay (TD1, TD2)
609410	Diode Module (DM1-NEG. Ground)
609411	Diode Module (DM2-NEG. Ground)
609412	Diode Module (DM1-POS. Ground)
609413	Diode Module (DM2-POS. Ground)
400268	Toggle Switch - DP.DT. Mom. (SW1, SW2)
400013	3AG Fuseholder (F1,F2)
400458	Sonalert Alarm
305340	Lamp Lens - Red (SL3)
305431	Lamp Lens - Grn (SL1 & SL2)
305433	Lamp Lens - Wht (SL4)
401696	Lamp Socket
400699	Pressure Switch (PS)

SYMBOL LIST FOR MODEL 'LSSC'

(For Diesel Fire Pump Controller Application)

SYMBOL	DESCRIPTION
RELAYS	
K1	Input (Normal Supply) Power Monitor
K2 (Option 2)	Supervisory Power Monitor Alarm
K3	Shutdown
K5 (Option 3)	Shutdown Alarm Silence
K6	Normal Power Fail Alarm Silence
K7 (Option 3)	Supervisory Power Fail Alarm Silence
A to F	Relay Contacts. Each contact carrier the relay coil designation as its prefix.
TIMERS	
TD1	Shutdown Delay
TD2	Automatic Reset Delay
SIGNAL LIGHTS	
SL-1 (Not provided with Option 2)	Power ON - Grn
SL-2 (Option 2)	Supply Power Normal - Grn
SL-3	Low Suction Pressure - Red
SL-4 (Option 2)	Supervisory Power Normal - Wht
MISC. CONTROL COMPONENTS	
F1	F. P. Controller Power Input Protection Fuse
F2	Supervisory Power Input Protection Fuse
P.S. (Option 1)	Pressure Switch
SW-1	Alarm Off Switch
SW-2	Manual Reset Switch
DM1, DM2	Diode Modules
31 to 36	Factory Wiring Terminals (Option Jumpers)
51 to 64	Factory Wiring Terminals (Door Wiring)
1 to 17	Field Wiring Terminals

ISSUE	SUMMARY	
1	RELEASE	KWM 4 SEPT 98



NOTES

1. ALL RELAY CONTACTS ARE SHOWN IN THE DE-ENERGIZED (RELEASED) POSITION
2. WHEN "PRESSURE SWITCH SHUTDOWN" (OPTION 1) IS FURNISHED, THE PRESSURE SWITCH IS PROVIDED.
3. WHEN "DUAL INPUT POWER" (OPTION 2) IS FURNISHED, F2, RELAY K2 & SIGNAL LAMPS SL2 & SL4 ARE PROVIDED. LAMP SL1 IS REMOVED.
4. WHEN "REPETITIVE ALARM SIGNALS" (OPTION 3) IS FURNISHED, JUMPERS ON TERMINALS 31-32 & 32-33 ARE REMOVED AND RELAYS K5 & K7 ARE PROVIDED.
5. WHEN "AUTOMATIC RESET DELAY" (OPTION 4) IS FURNISHED, JUMPER ON TERMINALS 34-35 IS REMOVED AND TIMER TD2 IS PROVIDED.

THIS DRAWING APPLIES TO LSSC CONTROLS WITH ANY OR ALL OF THE FOLLOWING OPTIONS:

1. PRESSURE SWITCH SHUTDOWN
2. DUAL INPUT POWER
3. REPETITIVE ALARM SIGNALS
4. AUTOMATIC RESET DELAY

LISTED

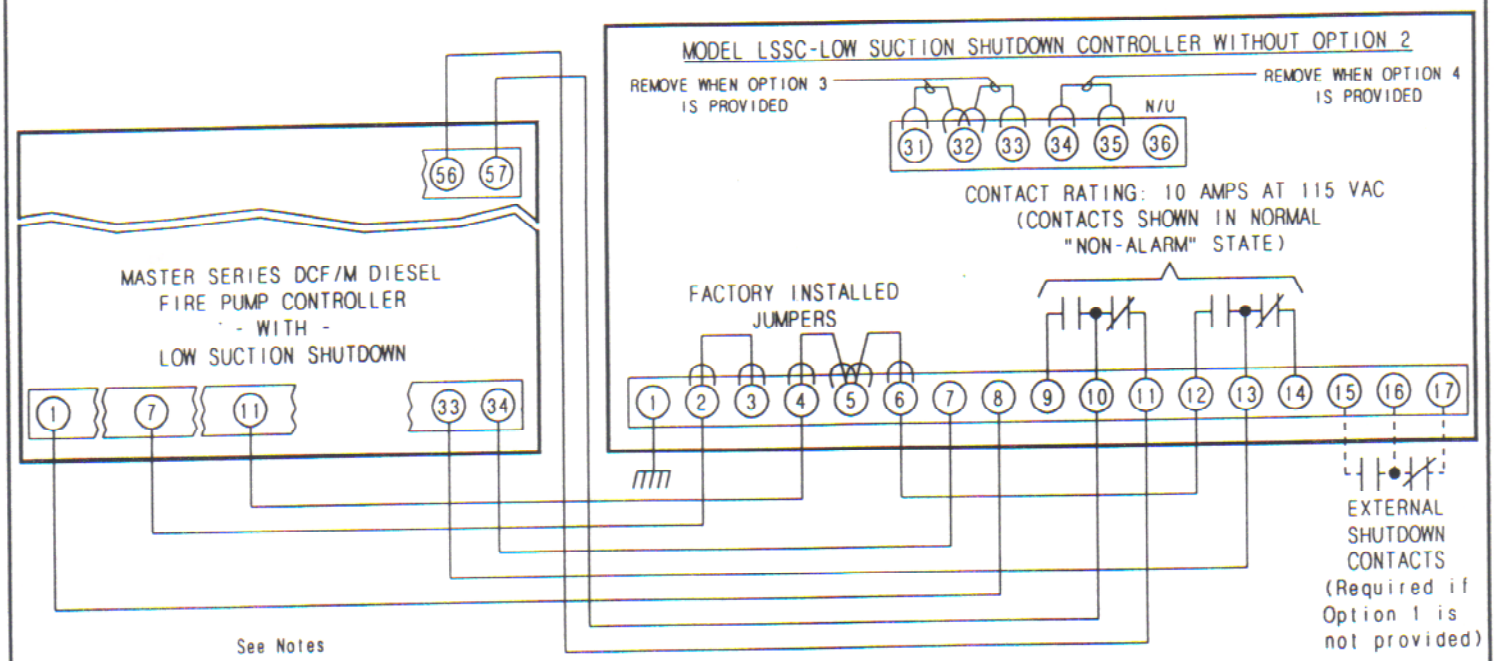
SCHEMATIC DIAGRAM
LSSC SHUTDOWN CONTROL
FOR DIESEL CONTROLLERS

MASTER CONTROL SYSTEMS INC.
LAKE BLUFF, ILLINOIS U.S.A.

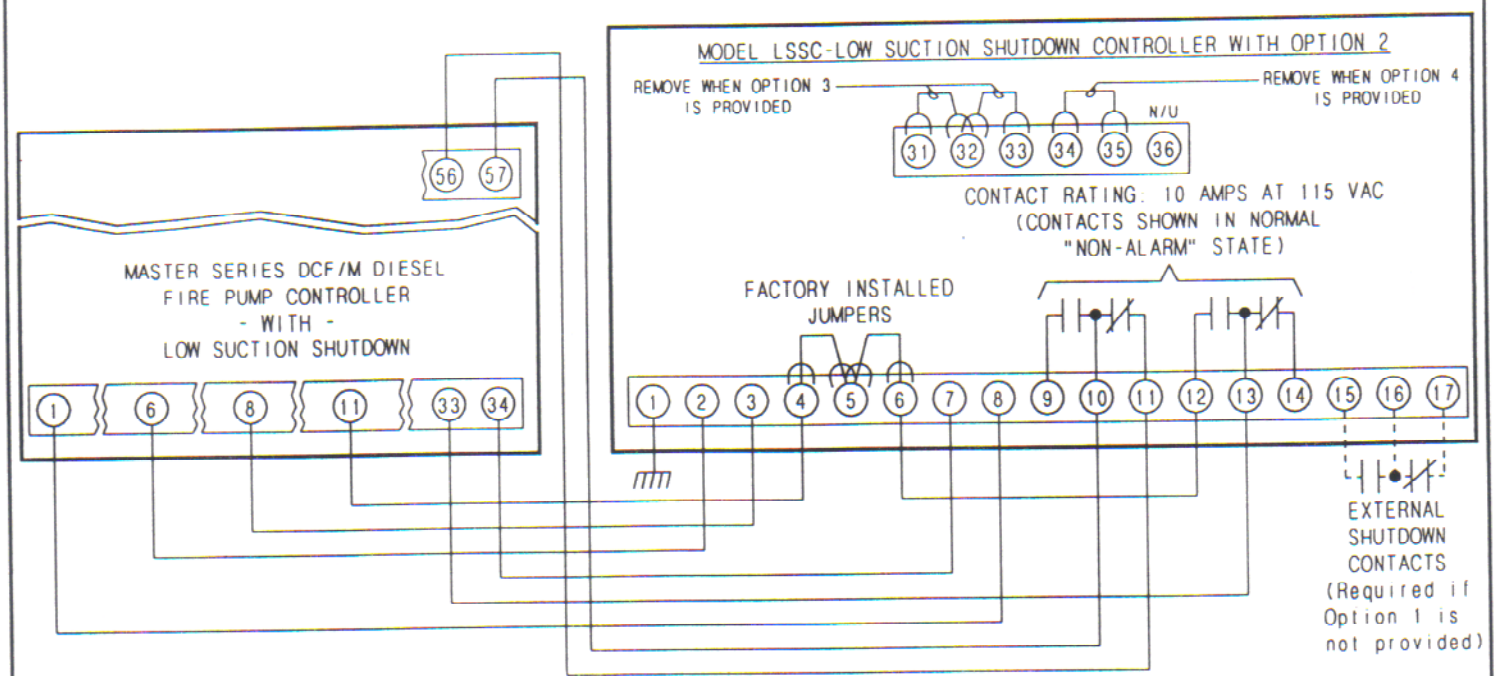
USED ON		RE-PLOT	21 JAN 99
DRN.	KWM	DES.	
APP.	J. Nasby	DATE	4 SEPT 98
DWG.	7760	ISS. 1	SHEET 1 OF 1

ISSUE	SUMMARY
1	RELEASE KWM 13 OCT 98

EXTERNAL WIRING-MODEL LSSC W/O OPTION 2



EXTERNAL WIRING-MODEL LSSC WITH OPTION 2



UL LISTED

This drawing applies to series 'LSSC' Low Suction Shutdown Controller with any or all of the following optional features:

1. PRESSURE SWITCH SHUTDOWN
2. DUAL INPUT POWER
3. REPETITIVE ALARM SIGNAL
4. AUTOMATIC RESET RELAY

NOTES:

1 Only ONE controller may be wired to the LSSC at any one time

2 Diesel controller must be equipped with Option 'O' Low Suction Shutdown

EXTERNAL WIRING FOR MODEL LSSC LOW SUCTION SHUTDOWN CONTROLLER FOR DIESEL CONTROLLERS

MASTER CONTROL SYSTEMS INC.
LAKE BLUFF, ILLINOIS U.S.A.

DRN.	KWM	REPLOT	22 JAN 99
APP.	J. Healy	DATE	13 OCT 98
DWG.	7761	ISS. 1	SHEET 1 OF 1