

Dry Safety System (DSS)

Product Description/Equipment Specifications

General Description:

Often, water treatment systems can rely on Service Exchange treatment (DI and Carbon), supported by a FLEXX™ Partner organization. Lower capitol costs, site drainage restrictions, and limited site resources can be factors that attract clients to this service exchange offering over more complex water treatment operations. There have always been concerns associated with an exchangeable product such as unforeseen bottle damage and the potential for hose and/or hose connection failure.

The challenge of offering a Service Exchange business while striving to minimize the risk or exposure of a catastrophic component failure has highlighted the importance of a safety shut down feature. With this in mind, FLEXX™ has developed the Dry Safety System (DSS), specifically designed to protect a client's facility in the event a catastrophic failure occurs in an exchange hose or bottle connection used to support the service exchange treatment process.

The DSS product integrates any service exchange configuration such as Pre-treatment Carbon Exchange, Exchange Deionization, or Stand-alone distribution systems incorporating Polish Deionization. Any configuration that utilizes a maximum of two service exchange processes in the installation can benefit from the advantage of equipping the system with a Dry Safety System.

The system is designed to sense a low-pressure condition downstream of a service exchange treatment process, close an electric solenoid valve (supplied with the kit) installed on the inlet feed water piping, and simultaneously shut down the service pump and an associated Ultraviolet Sterilizer. The panel will show an alarm condition (red light). Once the cause of the low-pressure condition has been resolved, the system may be turned back "on" and the panel will display run condition (green light).

Two separate models are offered in the DSS product line as described below:

- DSS Direct Model – used when an installation uses a 120V pump and UV in the system and there is no existing control panel. The Pump and UV will plug "directly" into the DSS Control Panel; the DSS Control Panel will plug directly into a Client's wall outlet. The total load on this design cannot exceed 20 Amps.
- DSS With Interlock Model – used for a wider variety of applications where there is either an existing control panel or the pump has a starter that dry contacts can be run to. The Interlock feature interrupts power to the starter and the pump is shut "off". In these applications it is presumed that the Pump and UV are already interlocked and that turning the pump "off" will also shutdown the UV. The DSS Control Panel will plug directly into a Client's wall outlet.

Mechanical Description:

Mechanical installation of the DSS requires that the solenoid valve supplied with the kit be incorporated into the operating system at the feedwater inlet. Additionally, the two pressure switches provided with the kit also need to be incorporated into the operating system: one switch is required to be located downstream of the first set of service exchange bottles, the second switch will need to be located downstream of the second set of service exchange bottles. Installation of the pressure switches will be dependent upon the type of switch ordered (NPT or Tri-clamp) and the appropriate mating piping connection to provide for the incorporation of the switches into the existing operating system.

The DSS Control Panel needs to be securely mounted to a wall or structure as close to the system as possible to facilitate electrical interconnect of the components provided as well as integration of the existing Pump and UV for the DSS Direct Model.

Electrical & Operational Description:

- **DSS Direct:**

The function of this system is to prevent catastrophic flooding due to failed hose connections on service DI or carbon pre-treatment bottles. An electric solenoid valve (provided with the system) is installed on the feed water inlet side of the operating system to be protected. Pressure switches (2 provided with the system) are installed on the outlet side (downstream) of the last hose connection for the applicable train of service exchange bottles. The solenoid valve and pressure switches are then wired to the DSS Control Panel; the Panel is provided with a 10' power cord that will need to be plugged into a Client's standard 110VAC receptacle.

A 110VAC GFCI duplex receptacle is provided on the DSS Panel to power one 110VAC distribution pump and one UV light (maximum combined load 20A).

Once installed and tested, the system will detect a loss of pressure at either pressure switch, close the electric solenoid valve, and disable the distribution pump and UV light. A 60-second time delay is built into the system to prevent nuisance shutdowns. Upon shutdown, the system locks out requiring manual restart.

- **DSS With Interlock:**

The function of this system is to prevent catastrophic flooding due to failed hose connections on service DI or carbon pre-treatment bottles. An electric solenoid valve (provided with the system) is installed on the feed water inlet side of the operating system to be protected. Pressure switches (2 provided with the system) are installed on the outlet side (downstream) of the last hose connection for the applicable train of service exchange bottles. The solenoid valve and pressure switches are then wired to the DSS Control Panel; the Panel is provided with a 10' power cord that will need to be plugged into a Client's standard 110VAC receptacle.

Once installed and tested, the system will detect a loss of pressure at either pressure switch, close the electric solenoid valve, and disable the distribution pump and UV light. A 60-second time delay is built into the system to prevent nuisance shutdowns. Upon shutdown, the system locks out requiring manual restart. A dry contact interlock (pilot duty) is provided to enable or disable external components upon shutdown.

Product Overview:

Part Number	Application
DSSD	Dry Safety System, Direct Power Control
DSSI	Dry Safety System, Dry Contact Interlock

Design Parameters:

Configuration	System is supplied in a "kit" form.
Temperature	33°F - 185°F

General Specifications:

Pressure Sensors (2)	Standard: Stainless Steel Threaded Optional: Stainless Steel Sanitary (1 for product water piping)
Electric Solenoid Valve	3/4", 1", or 1-1/2" FPT Brass

Electric Solenoid Valve Specifications:

3/4" Brass	Burkert 290 Series, or equal
1" Brass	Burkert 290 Series, or equal
1-1/2" Brass	Burkert 290 Series, or equal

Instrumentation Specifications:

Instrument:	
Pressure Sensors (TD) Threaded Connection	United Electric 10-F10M511, or equal
Pressure Sensors (TC) Tri-Clamp Connection	Ashcroft LPS-N4-G-V-25-15/PSI-1.5"TC, or equal

Controls Specifications:

Controller Type	Relay Logic
Enclosure type	Nema 12
Voltage	110 V, 15 Amps.
Valve operation	Automatic Electric, fail closed

Operating Parameters:

Minimum feed pressure	4 PSIG (failure point)
Maximum feed pressure	100 PSIG
Minimum feed temperature	33° F
Maximum feed temperature	185°F

Factory Procedures:

Assembly	Fully assembled at the factory
Wiring	Panel fully wired at the factory
Testing	Factory functional test
Shipping	Boxed in kit form

Regulations and Standards:

Quality System	Factory procedures
Electrical and Controls	Underwriters' Laboratory (UL), National Electrical Code (NEC) panel only
NEMA rating	NEMA 4
Seismic rating	Not Required

Documentation Package (Included with standard Operation and Maintenance Manual):

Documents	Installation procedures, start-up procedures, operation procedures, functional description, specifications, spare parts list, technical service and support
Drawings	Process and Instrument Diagram (P&ID), Electrical Schematics
Quality Documents	Quality Assurance data reports

Pipe Connection Specifications:

Solenoid Valve	3/4 " & 1-1/2" FPT-Brass
Pressure Switch	1/4" MPT; <i>Optional</i> 1-1/2" Tri-Clamp (for Product Water Piping)

Utility Requirements:

	DSSD (Direct Model)	DSSI (Interlock Model)
Low voltage service	110VAC	110VAC
Full Load Amps	20 Amps	N/A
Breaker Req. Per Code	20 Amps	15 AMP

Physical Dimension Specifications:

Dimensions	Control Panel
Length, in (cm)	10 (26)
Width, in (cm)	8 (21)
Depth, in (cm)	6 (16)
Operating weight, lbs (kg)	6 (3)

DSS Systems Part Number Selection Matrix

Select	Select	Select	Select
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EXAMPLE PART NUMBER

DSS	I	TD	075
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FIELD 1	DSS System	
	Code	Code Description
	DSS	Dry Safety System

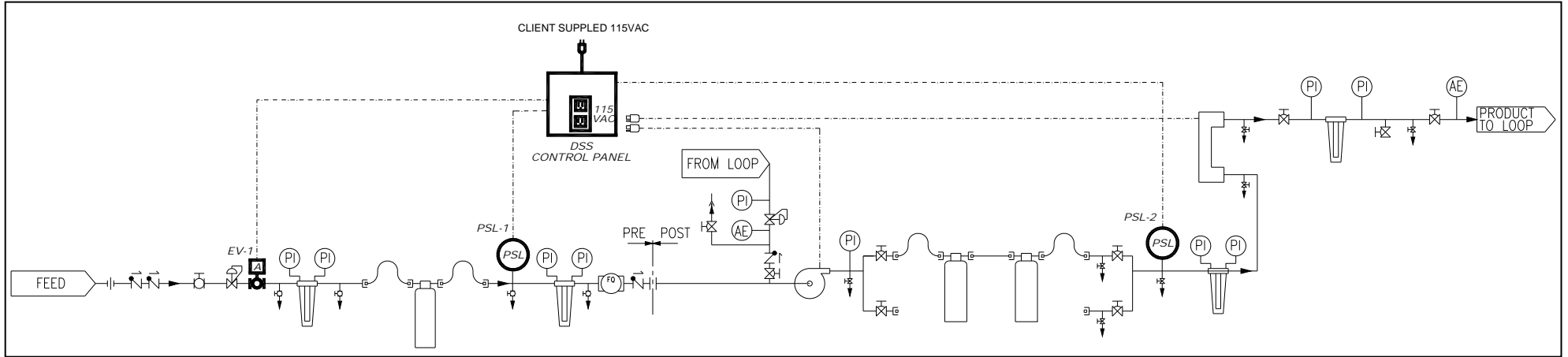
FIELD 2	Panel Configuration:	
	Enter the code for the desired panel configuration.	
	Code	Code Description
	I	Interlocked Dry Contacts
	D	Direct 115Volt Control

FIELD 3	Pressure Sensor Connection:	
	Enter the code for the desired pressure sensor.	
	Code	Code Description
	TD	1/4" Male Pipe Connection
	TC	1-1/2" Tri-Clamp Connection

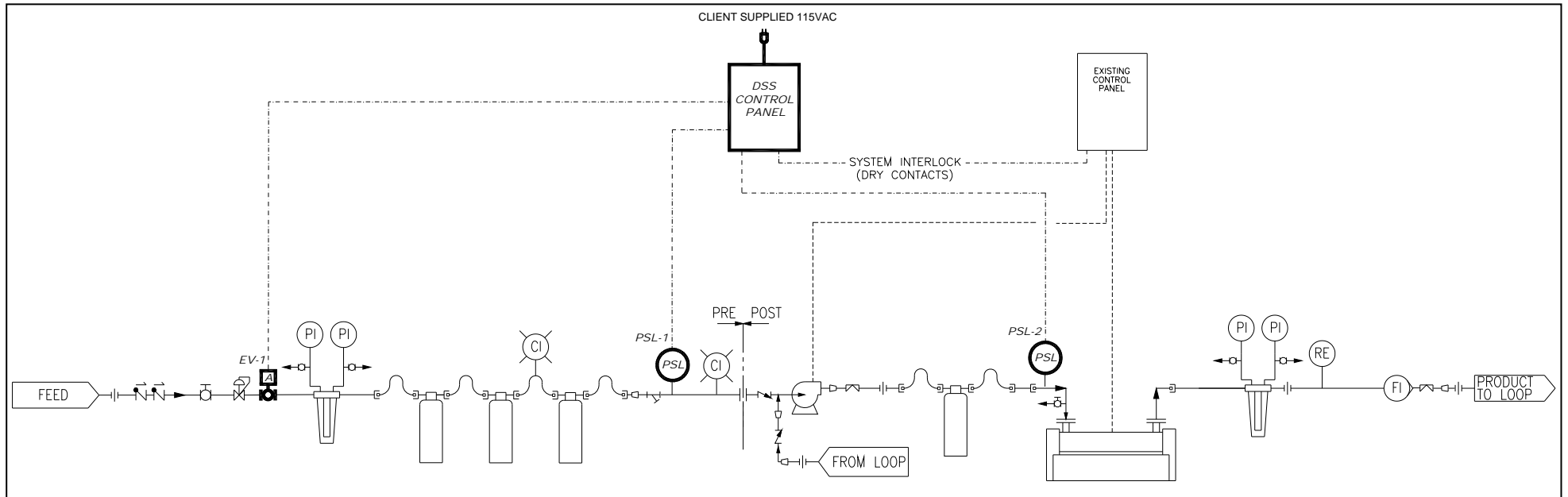
FIELD 4	Valve Size:	
	Enter the code for the desired valve size.	
	Code	Code Description
	075	3/4" Female Pipe Connection
	100	1" Female Pipe Connection
	150	1-1/2" Female Pipe Connection

Process & Instrumentation Diagrams:

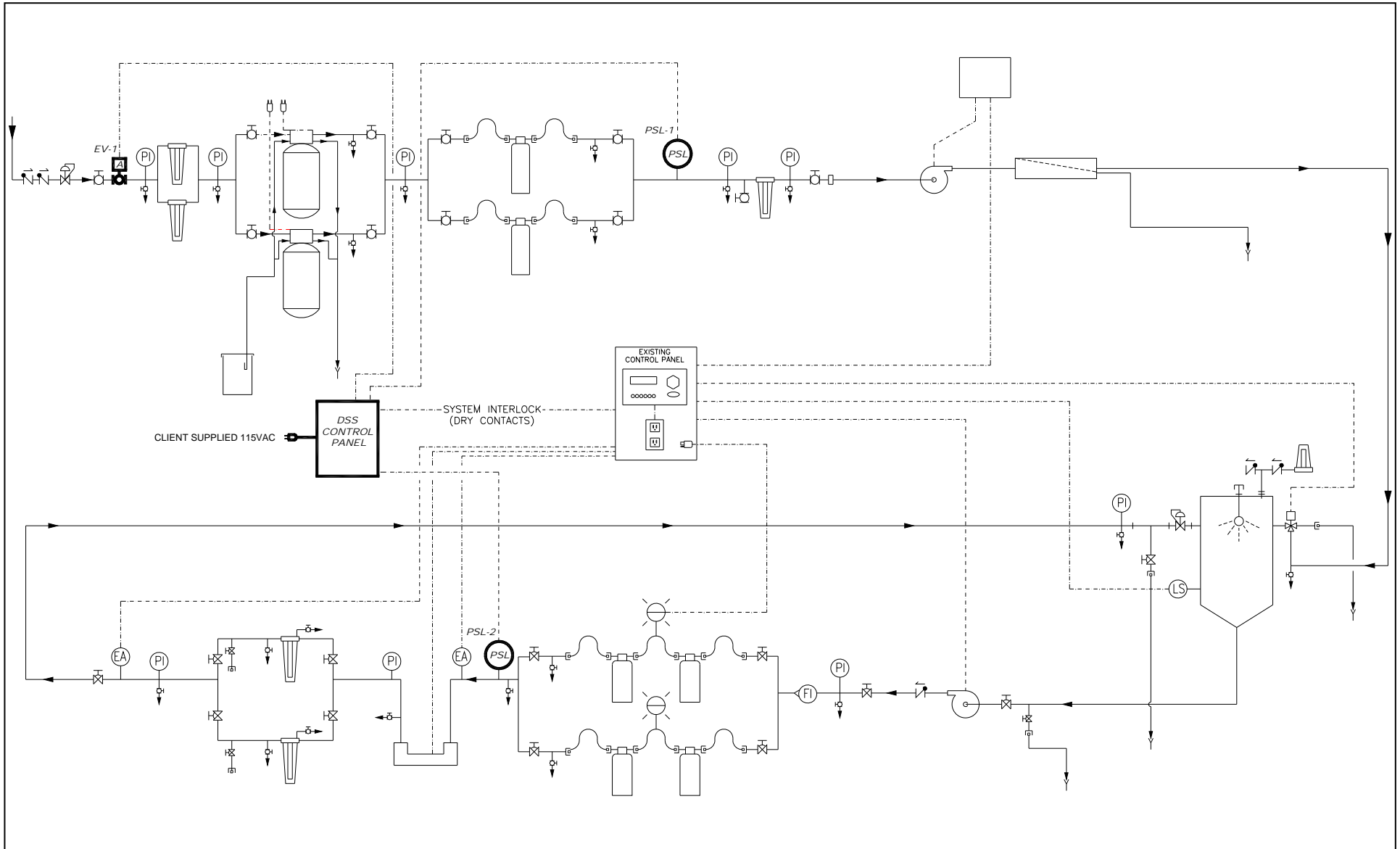
- DSS Direct Model Applied to Recirculating DI**
(Components shown in **BOLD** line type supplied with DSS Kit / All other components Client supplied)



- DSS Interlock Model Applied to Recirculating DI**
(Components shown in **BOLD** line type supplied with DSS Kit / All other components Client supplied)



3. DSS Interlock Model Applied to Pre-treatment/Distribution
(Components shown in BOLD line type supplied with DSS Kit / All other components Client supplied)



Electrical Schematics:

1. DSS Direct Model

NOTE:
TOTAL COMBINED LOAD NOT TO EXCEED 20A.

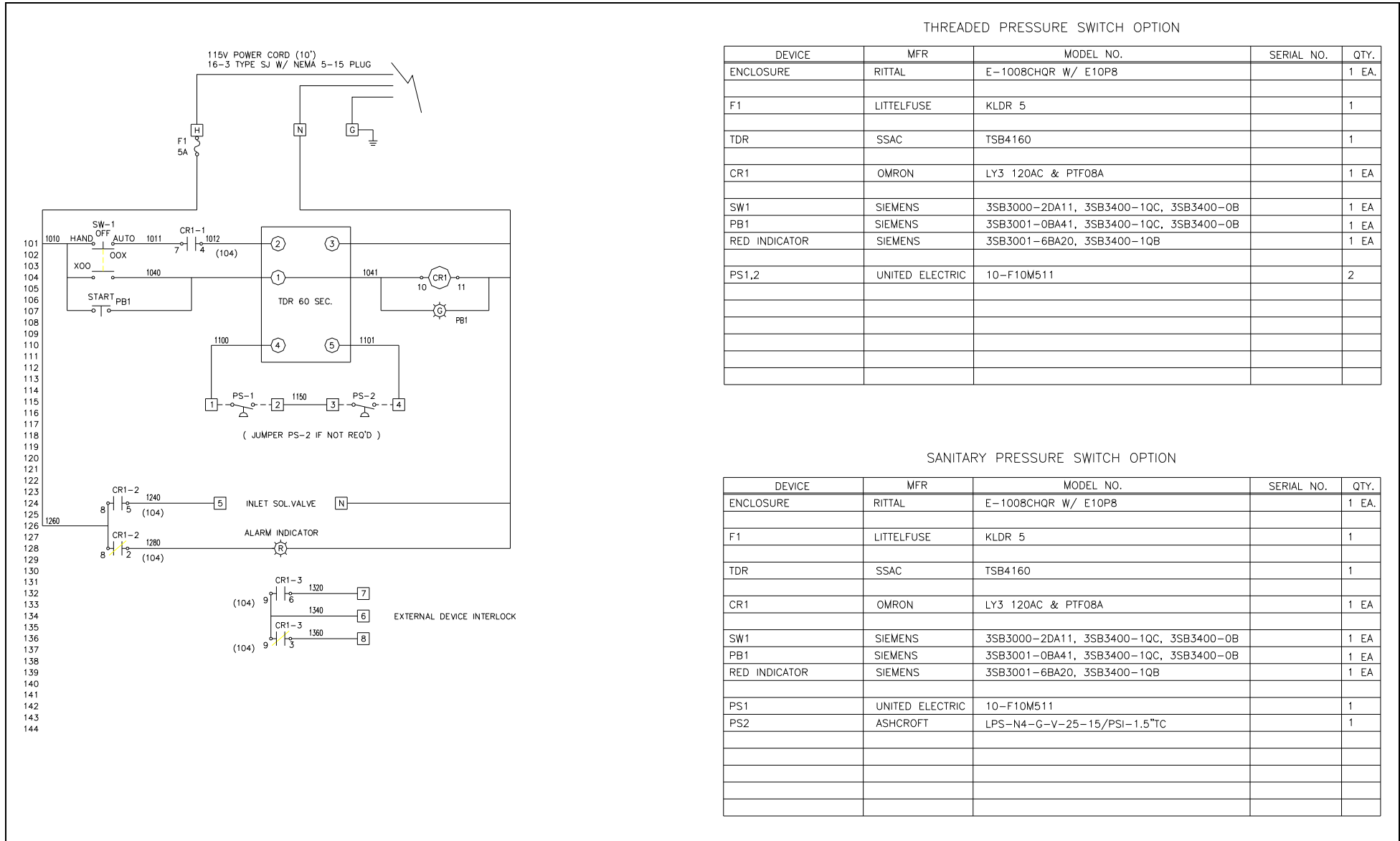
THREADED PRESSURE SWITCH OPTION

DEVICE	MFR	MODEL NO.	SERIAL NO.	QTY.
ENCLOSURE	RITTAL	E-1008CHQR W/ E10P08		1 EA.
F1	LITTELFUSE	KLDR 20		1
TDR	SSAC	TSB4160		1
CR1	OMRON	G7J-3A1B-B-W1-AC120		1
SW1	SIEMENS	3SB3000-2DA11, 3SB3400-1QC, 3SB3400-0B		1 EA
PB1	SIEMENS	3SB3001-0BA41, 3SB3400-1QC, 3SB3400-0B		1 EA
RED INDICATOR	SIEMENS	3SB3001-6BA20, 3SB3400-1QB		1 EA
PS1,2	UNITED ELECTRIC	10-F10M511		2
GFCI RECEPT.	HUBBELL	GF5352		1

SANITARY PRESSURE SWITCH OPTION

DEVICE	MFR	MODEL NO.	SERIAL NO.	QTY.
ENCLOSURE	RITTAL	E-1008CHQR W/ E10P08		1 EA.
F1	LITTELFUSE	KLDR 20		1
TDR	SSAC	TSB4160		1
CR1	OMRON	G7J-3A1B-B-W1-AC120		1
SW1	SIEMENS	3SB3000-2DA11, 3SB3400-1QC, 3SB3400-0B		1 EA
PB1	SIEMENS	3SB3001-0BA41, 3SB3400-1QC, 3SB3400-0B		1 EA
RED INDICATOR	SIEMENS	3SB3001-6BA20, 3SB3400-1QB		1 EA
PS1	UNITED ELECTRIC	10-F10M511		1
PS2	ASHCROFT	LPS-N4-G-V-25-15/PSI-1.5"TC		1
GFCI RECEPT.	HUBBELL	GF5352		1

2. DSS with Interlock Model



THREADED PRESSURE SWITCH OPTION

DEVICE	MFR	MODEL NO.	SERIAL NO.	QTY.
ENCLOSURE	RITTAL	E-1008CHQR W/ E10P8		1 EA.
F1	LITTELFUSE	KLDR 5		1
TDR	SSAC	TSB4160		1
CR1	OMRON	LY3 120AC & PTF08A		1 EA
SW1	SIEMENS	3SB3000-2DA11, 3SB3400-1QC, 3SB3400-0B		1 EA
PB1	SIEMENS	3SB3001-0BA41, 3SB3400-1QC, 3SB3400-0B		1 EA
RED INDICATOR	SIEMENS	3SB3001-6BA20, 3SB3400-1QB		1 EA
PS1,2	UNITED ELECTRIC	10-F10M511		2

SANITARY PRESSURE SWITCH OPTION

DEVICE	MFR	MODEL NO.	SERIAL NO.	QTY.
ENCLOSURE	RITTAL	E-1008CHQR W/ E10P8		1 EA.
F1	LITTELFUSE	KLDR 5		1
TDR	SSAC	TSB4160		1
CR1	OMRON	LY3 120AC & PTF08A		1 EA
SW1	SIEMENS	3SB3000-2DA11, 3SB3400-1QC, 3SB3400-0B		1 EA
PB1	SIEMENS	3SB3001-0BA41, 3SB3400-1QC, 3SB3400-0B		1 EA
RED INDICATOR	SIEMENS	3SB3001-6BA20, 3SB3400-1QB		1 EA
PS1	UNITED ELECTRIC	10-F10M511		1
PS2	ASHCROFT	LPS-N4-G-V-25-15/PSI-1.5"TC		1