

# Universal Tank Switcher

Liquid Nitrogen Supply Management System



- A universal power supply for operation anywhere in the world.
- A modular design for easy maintenance.
- Connectivity to the ciSmart Cloud platform provides global real time status on the LN<sub>2</sub> supply and error conditions.

The system utilizes a hybrid sensing technology, which provides accurate information on the liquid nitrogen supply while at the same time optimizing the use of the liquid nitrogen.

The TSH-2 Series also has the capability for easy expansion. Multiple tank switchers can be connected together through the Cryowire communications channel, allowing for the management of a large number of supply cylinders.

The ciSmart Cloud platform allows notifications by email, text or a voice call to lab personnel or gas suppliers when the Liquid Nitrogen supply gets low.

The TSH-2 Series Universal Tank Switcher provides advanced new features for the management of LN<sub>2</sub> Supply Cylinders.

These features include:

- Pre-configured modes for supplying cryogenic freezers and environmental chambers.
- Pre-configured mode for managed fill applications.
- 2,3 or 4 Valve configurations.
- A Defog feature allows the switcher to operate in coordination with a freezer, optimizing efficiency.
- A Vacuum Fluorescent Display indicates the status of supply cylinders, the manifold pressure and the sensor state.
- A menu system provides for easy adjustment of parameters.
- A drip tray prevents moisture from creating hazardous conditions.
- 12 VDC Solenoid Valves provide good flow and quiet operation.



# SPECIFICATIONS

## TSH2 Series

<b>Control Type:</b>	Low Pressure LN <sub>2</sub> Supply Switchover System.	<b>Data Collection</b>
<b>Configuration</b>		LN2 Supply Information: Yes Alarms: Yes Memory: 4 Mb Date/Time Stamp: Yes
Control Capability:	2, 3, 4 valves per manifold.	
System Pressure:	22 -35 psig	
Compatibility:	Works with all brands of Cryogenic Freezers.	
Expandability:	Yes - Manifolds can be added using CryoWire Secure™ Communications.	
<b>LN<sub>2</sub> Detection</b>		
Sensor Type:	1-Thermistor Fixed	
Range:	Liquid N <sub>2</sub> / N <sub>2</sub> Gas	
<b>Pressure Measurement</b>		
Range:	0 - 100 psig	Supply Pressure Correction: Yes
Accuracy:	< +/- .5% BFSL	ciSmart Cloud Access: Yes
Over Range Protection:	200 psi	Notification Capability: Yes
Burst Pressure:	500 psi	Gas Bypass Capability: Optional
<b>Electrical</b>		"Smart" Fill Capability: Future
Power Supply Input Voltage, Power:	100-240 VAC, 60W	Preset configurations: Future
Power Consumption (max):	50 W	Coordinated Fill Management: Future
Power Consumption (continuous):	25 - 50 W	
Input Frequency:	50/60 Hz	
Output Voltage:	12 VDC	
Control Input Voltage:	12 VDC	
Power Cord:	Available for all countries	
<b>Solenoid Valve</b>		
Input Voltage:	12 VDC	Manifold Width 32" (813mm)
Power:	40.6W	Manifold Height - 2 valve 24" (610 mm)
Flow:	1/2" orifice: 3.5 Cv Flow Rate	Manifold Height - 4 valve 32" (813 mm)
<b>Communications</b>		Manifold Depth 4.25" (108 mm)
Protocol:	CryoWire Secure™	Manifold Weight - 2 valve 47 lbs (18.1 kg)
Number of communication ports:	1	Manifold Weight - 4 valve 57 lbs (25.9 kg)
<b>User Interface</b>		Control Width 4.75" (121 mm)
Display Type:	Vacuum Fluorescent Display (VFD)	Control Height 7.25" (184 mm)
Buttons:	9	Control Depth 2.00" (51 mm)
<b>Control Tests</b>		Control Weight 1.0 lbs (.45 kg)
Power Up Self Tests:	Control System Check	
Flow Sensor Status:	Yes	
Pressure Transducer Status:	Yes	
Valve Status:	Yes	
<b>Alarms</b>		
Supply Cylinder(s) Empty	Audible Alarm Retrigger	<b>Part Numbers</b>
Flow Sensor Error Alarm	Visual Alarm Indicator	TSH21 2 Valve Manifold
High Pressure Alarm	Remote Alarm Delay	TSH22 3 Valve Manifold
Audible Alarm	Communications Alarm	TSH23 4 Valve manifold
Power Failure (Remote Only)		

