Conforms to: IS / ISO 7396 - 1 : 2016, HTM 02-01 Part A, IS / ISO IEC 60601 – 1 : 2015 + A1 : 2020
ISO 18082 : 2014 + A1 : 2017

Certifications: ISO 13485:2016 – Medical devices – Quality Management Systems
ISO 9001:2015 - Quality Management Systems
Pressure Equipment Directive 2014/68/EU

CE

Introduction

SHIELD is a modular Area Valve Service Unit (AVSU) with integrated Local Area Alarm. It is manufactured under ISO 13485 : 2016 Medical Devices: Quality Management Systems. It is designed to provide minimum 2 gas and maximum 6 gas service and vacuum.

Features

- PLC based HM1 LCD touch screen display
- Highly accurate pressure transducer
- Suitable for all medical Gases & Vacuum
- Digital & illuminated digital display of "Normal", "High" & "Low"
- Digital pressure unit display options - psi / bar or kg/cm^2
- Adjustment & parameter setting by touch button
- Operational parameters can be set in-situ
- Audio mute option
- Reusable lock assembly
- Powder coated aesthetically designed enclosure
- Enclosure separable from the base for ease of installation
- Front door opens up vertically for comfortable access
- PED: 2014/68/EU certified full port Ball Valve (PN 30)
- Long extension copper pipes to connect MGPS network
- Protocol Modbus TCP/IP2 RS485
- B.M.S. Connectivity

Working Principle

Ball Valves are used to start or stop a flow. In Medical Gas Pipeline System (MGPS), the valves are normally kept open i.e. allow the gas to flow unless it is required to shut-off the gas supply for scheduled maintenance or emergency situation.

The importance of full bore ball valves is to reduce pressure drop to almost negligible in the pipeline distribution system so that the designed pressure is available at the outlet point.

Integrated pressure monitoring with audio visual alarm make the unit a 24 x 7 surveillance system to care givers.
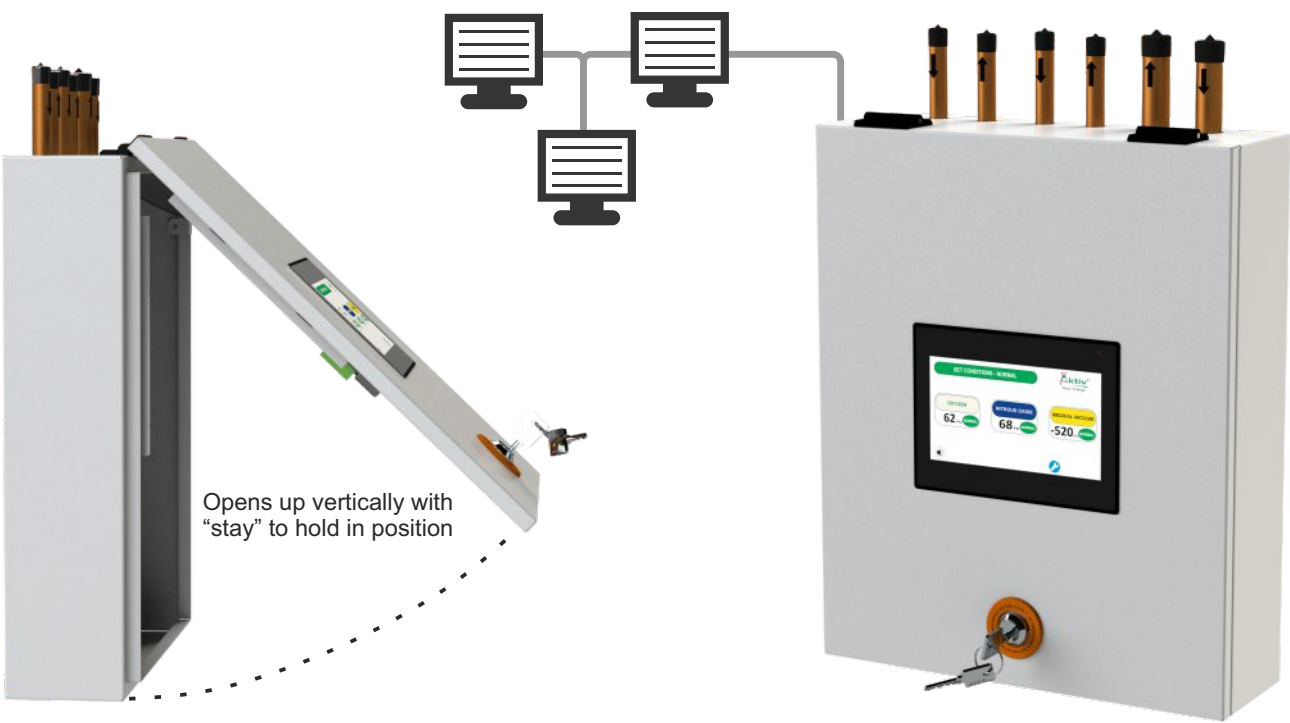
Intended Use

To isolate specific medical gas / gases or vacuum supplies to a section, area or a zone of Medical Gas Pipeline System (MGPS) network. AVSUs are installed in a convenient, accessible location to facilitate local isolation of individual service of medical gas and vacuum required for installation, maintenance or in the event of an emergency. It is also used to monitor and digitally display gas or vacuum pressure at the installed zone or area.

Valves are "Normally Open" during operation and is accessed via a key. However in case of emergency, quick access to shut-off the valve is ensured by hard punch on the re-useable lock on the door.

Shield has been designed to service Oxygen, Nitrous Oxide, Medical Air (AR 4), surgical Air (AR 7) & Vacuum.

Dimensions

Opens up vertically with "stay" to hold in position

Device Description	H	W	D
2/3 Gas including Vacuum	450 mm	370 mm	125 mm
4 Gas including Vacuum	450 mm	470 mm	125 mm
5 Gas including Vacuum	450 mm	570 mm	125 mm
6 Gas including Vacuum	450 mm	670 mm	125 mm

Overview

Composite Unit – Three Functions	a. Warning - Local Area Alarm
	b. Quick Line Isolation
	c. Provision for Emergency off-line supply
Audio-visual Alarm	a. Highly Sensitive Sensors
	b. Digital Display
	c. Audible Alert
	d. Coloured Visual Caution
Emergency Shut-off	a. Quarter turn valve to break supply
Supply Continuity	a. External source through NIST
	b. Non-return Valve except on Vacuum

Technical Specifications

Conforms to	IS / ISO 7396 - 1 : 2016, HTM 02-01 Part A, IS / ISO IEC 60601 – 1 : 2015 + A1 : 2020 ISO 18082 : 2014 + A1 : 2017
Body	Fire retardant dust-proof CRCA 18 SWG steel enclosure
Finish	Powder coating - Enclosure RAL 7035 grain finish
Mounting type	Horizontal - Surface mountable (Cover opens up vertically)

Gas services (W × H × T in mm)	2 & 3 Gas module	4 Gas module	5 Gas module	6 Gas module
	370 × 450 × 115	470 × 450 × 115	570 × 450 × 115	670 × 450 × 115

Gas & Vacuum connections	Pre-piped "K" type medical grade Copper extension pipe 125mm long on the top (Riser) for connecting network gas services
Extension pipe size	15 mm dia for Gases & 22 mm dia for Vacuum with laser engraved direction signage
Off-line connection	Gas specific NIST connections with NRV provided for external medical gas supply
Flow through NIST	Emergency/maintenance inlet flow rate of 500 lpm at 4 bar
Shut-off Valve	Full port ball valves (PN 30) with quarter turn (90°) through butterfly knob
Power connection	External 220V AC (50 Hz) to 12V DC adapter for audio visual display
Warning system	Microprocessor based warning module adjustable in-situ to set operational parameters and digital pressure unit in psi / bar or kg/cm^2
Display & Audio signal	Digital & illuminated digital display for "Normal", "High" & "Low" with High/low alarm set-points for each gas (Low only for Vacuum) service
	Flashing digital display coupled with audio warning in case of preset deviation with the provision to "Mute" audio signal for 15 minutes max
	Minimum size of 20 x 14 mm bright LED signals for clear visibility from distance
Sensors	Fully calibrated and temperature compensated Application Specific Integrated Circuit signal conditioning (in a Brass housing) Pressure Sensors a. Total Error Band: ±1.0% FSS (Full Scale Span) from -20 °C to 85 °C [-4 °F to 185 °F] b. Sensing pressure span: 60 mbar to 10 bar [1 psi to 150 psi] Digital Output c. Temperature span: -30 °C to 50 °C [-22 °F to 122 °F]
Information & Control	The information of alarm, current status & test conditions through "Touch button"
Display & Audio blocker	Provision to block display & audio signal of a particular supply line for long service period is built-in
Valve access	Re-useable lock assembly after breaking lock by hand push to gain access
Earthing	Protective earth
Protection	Class II & IP54
Certifications	ISO 13485:2016 – Medical devices – Quality management systems ISO 9001:2015 - Quality management systems Pressure Equipment Directive 2014/68/EU

Ordering Code

Device Name	Device Model	Device Description	Device Code
SHIELD EXCEL	Surface Mount	2 Gas including Vacuum	6084220
		3 Gas including Vacuum	6084320
		4 Gas including Vacuum	6084420
		5 Gas including Vacuum	6084520
		6 Gas including Vacuum	6084620

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