



Expo Technologies Hazardous Area Specialists

Purge + Pressurization Consultancy Certified Enclosures Customized Design





Indholdsfortegnelse

ATEX certified SmartPurge (microprocessor controlled) systems	
Universal SmartPurge Controller	3
X purge systems for ClassI Division 1, and IECEx and ATEX G & D NEW! MiniPurge Type X size 1 using Continuous Flow NEW! MiniPurge Type X size 1, 2 and 3 NEW! MiniPurge Type X size 4, 5 and 6	5 7 9
Z purge Systems for Class I Division 2, and IECEx and ATEX G & D NEW! Mini Z Purge Continuous Flow Systems NEW! Mini Z Purge Leakage Compensation Systems Size 1, 2 and 3	11 13
Systems for Large Motors NEW!Type D758 System Ex p IECEx & ATEX NEW!Type D771 System Ex p IECEx & ATEX, Class I Div 1 (IS outputs) NEW!Type D779 System Ex p IECEx & ATEX Type 4PP and 6PP PreStart Purge for Ex n and Ex e - Zone 2 Cat 3	15 15 17 19
Dust Purge SystemsNEW! Type XDP for Class II Division 1, and IECEx and ATEX Ex pDNEW! Type ZDP for Class II Division 2, and IECEx and ATEX Ex pD	21 23
Systems for Pressurizing Rooms Room Pressurization System	25
Complementary Products for Purge Applications MiniPurge Interface Units- for power and data switching MiniPurge Systems Accessories Operator Interface Adapter Unit Cabinet (Vortex) Cooler Assembly Datex Intrinsically Safe Keyboard Pressurized Keyboards	27 29 32 34 36 36
Pneumatic Solenoid Valves Friction Free Valves, High reliability, Intrinsically Safe	38
Enclosures for Hazardous Areas ATEX Pressurized Enclosures and Certification Increased Safety Enclosures (EEx e) Non Incendive Restricted Breathing Enclosures (Ex nR)	42 52
Information Sheets Hazardous Area Engineering and Expertise Purge and pressurization overview Consulting Services for Hazardous Locations	46 50 52





SmartPurge

ATEX Certified Intelligent Purge and Pressurize System

SPC-UV

Enclosure sizes up to 3.6m³ Zone 1, II 2G T4 EEx p II





FEATURES

- + Purges enclosures up to 3.6 m3 (127 cu ft) in under 30 minutes purge time.
- + High maximum air flow capacity of 600 NI/min.
- + Compact and easy to install.
- + Mounting position: side, top, external or internal to pressurized enclosure.
- + ATEX certified [EEx p] to EN 50016 and IEC 61508.
- + A single control system for Leakage Compensation or Continuous Flow using either a digital or proportional valve.
- + Easy to program for maximum flexibility. User selectable over three purge flow ranges.
- + Universal power supply: 85-254V AC.
- + Accessible front Panel Keypad enables set-up in the hazardous location.
- + Clear Matrix Display for status indication and set-up.
- + 2 selectable Alarms incorporated.
- + Auxiliary inputs for Override Keyswitch, Door Switch or Intermediate Pressure Switch.
- + Optional Remote Keypad and Display duplicates ALL functions of front panel.
- + Patented magnetic Relief Valves.

The SmartPurge Control System allows general-purpose electrical apparatus to be located safely in a Hazardous Location. A Hazardous Location is where there is a presence of ignitable gases, liquids or dusts and has been classified as hazardous/explosive. The SmartPurge ensures effective purging of the enclosure and contents before power can be applied. Compressed air or inert gas can be used as the purge medium. The microprocessor based unit incorporates multi language menu (En, D, F, I, N, E)

Accessories:

The SmartPurge can be combined with the accessories shown overleaf to give a fully functional purge and pressurization system.



Technical Specification SmartPurge

SmartPurg	e System Speci	fication	S
Order Cod	e: SPC-UV		
Purge Flov	v Range		
100 NI/min	to 600 NI/min		
(Below 100	NI/min for CF sy	stems o	nly to special order)
Maximum I	Purge Time		
99 minutes	-		
Power Swi	tching		
2 pole 6A A	C1, 250V 5A dc1	I, 30V	
Supply Vol	tage		
85 to 254V	AC. 50 to 60 Hz	(10VA).	
Factory opt	ion: (11-28V DC)	Order C	Code: SPC-LV
Low Press	ure Trip Options	S	
Immediate t	trip. Alarm only.	Delay tri	p
(Maximum)	delav time: 99 m	inutes)	•
Status/Ala	rm Function	,	
Choice of tw	vo (SPNO) for Al	arm: Ge	neral Alarm.
Pressure co	prrect/Not correct	t. Low P	ressure Pre-Alarm.
Purge in Pr	ogress. Ready to	Purae	,
Alarm/Stat	us	5	
Two single	pole 3A. 250V		
Certificatio	n		
DMT 01ATE	EXE 139. CE 05	18 (Ex)	2 G
ATEX II 2 G	EEx em [ib] [p]	IIC T4	
Enclosure	Pressure		
0.8 to 7 mb	arg after purge.		
Relief Valv	e Opening Pres	ssure	
10 mbarg (-	+0/-2). Test Pres	sure 18	mbarg
Control Va	lve Outputs		
IS digital so	lenoid valve, nor	n-IS pror	ortional EEx valve
Purge Ove	rride		
Password c	or IS Keyswitch		
External C	ontrol Input		
IS Volt Free	Contact (Overri	de Kevs	witch Door Switch
Pressure S	witch Start Purg	e switch	
Environme	ntal Protection	o omiton	/
IP65 alumir	num enclosure ic	olor [.] RA	1 7001 (grav)
Mounting F	Position	010111101	21001 (glay)
Side or top.	external or inter	nal	
Control Un	it Dimensions		
200 x 120 x	90mm (7.9" x 4	7" x 3.5'	') 20mm
clearance for	or air exit and sp	ark arres	stor
Temperatu	re Range		
-10 to +40°	C		
Weight	SmartPurge	3.0 ka	6.5lb approx
U I	Remote Panel	0.5 kg	1.0lb approx
		5	

STATUS INDICATION LAMP

Intrinsically Safe device giving simple remote indication of the purge system status. Red: Pressure Fault Flashing: Low Purge Flow Amber: Purge in Progress Green: Purge Complete Stainless steel bezel mounts in 22mm diameter hole. 2 meter attached I.S. cable Order Code: SRL-1

AIR SUPPLY one of the following needs to be chosen



Air Supply for Leakage Compensation Systems Intrinsically Safe Digital Valve for the control of Leakage Compensation and Continuous Flow systems. It is independent of the SmartPurge supply voltage and therefore ideally suited for use on products supplied to global markets.

Supply Pressure	Flow Rate	Order Code
2-7 bar	100-600 NI/min	SDV-1



Proportional Control Valve for the automatic control of the flow rate, both during purge and Leakage Compensation. Choose the appropriate valve for the desired flow rate, and then choose the appropriate supply voltage.

Supply Pressure	1-4 bar	1-7 bar
Flow Rate	Up to 300 NI/min	Up to 600 NI/min
24V	SPV-1-24	SPV-2-24
110V	SPV-1-110	SPV-2-110
230V	SPV-1-230	SPV-2-230

Air Supply for Continuous Flow Systems

When high purge and Continuous Flow (CF) is required, the above Leakage Compensation options should be used. For CF systems, when the air flow rate is the same both during and after purging, a simple air supply set can be used.

Order Code: SCF-225

ACCESSORIES

Remote Panel

Duplicates the operation and status of the SmartPurge system. It is Intrinsically Safe and can operate up to 50 meters from the main Control Unit. The Remote Panel has an LCD and 4 menu navigation buttons, and duplicates all the functions of the Control Unit. This includes a 'Password' override function. **Order Code: SRP-1**

Override Switch

Intrinsically Safe Key operated override switch for panel mounting. Order Code: SMO-1

SmartPurge Interface Unit

For switching higher loads or additional signals, Interface Units are available.

Expo Technology is the leading manufacturer of Purge and Pressurization equipment conforming to International Standards. The range includes systems for Small Electronic Enclosures, Large Electrical Cabinets, Analytical Instruments and full Ex p for Large Electric Machines. Expo Technology also manufacture Intrinsically Safe, Increased Safety, Flameproof and Non Incendive equipment for hazardous areas. With full design, and consultancy facilities Expo can undertake special projects and backs up it manufacture with qualified specialists who can undertake installation, maintenance and commissioning. Please contact one of our sales offices to discuss your hazardous area protection projects.

04





Mini-X-Purge

Control System for Continuous Flow For enclosures up to

1XCF/__/__ 17 cu ft, 0.39 m³

Ex [px] Zone 1 (21) IECEx Category 2 GD ATEX X-Purge Class I Division 1 FM cULus



OPERATION

The MiniPurge system provides a full purge and pressurize system for Class I Division 1 Gp A-D, Zone 1 (21) IIC applications. When fitted to a suitable enclosure the system enables regular electrical equipment to be operated safely in a hazardous location.

Certified in compliance with IEC, European and American standards, the system controls purge and pressurization process. The initial purge flow removes the gas, which may be present in the area when the enclosure is closed. After the purge cycle has been completed it continues to maintain pressure and flow preventing flammable gas entering the enclosure. Whilst this safe condition is maintained the system output enables power to be applied to the equipment, either directly or via a separate interface unit.

For enclosures with an internal source of flammable gas release, the continuous flow can be set to reduce the gas concentration to below 25% of the LFL (LEL). Reference must be made to the codes and standards for this application.

For dust applications [Ex pD] see certificate for "conditions for safe use".

COMPONENTS

The system consists of three components. The Control Unit CU controls the supply, measurement and flow of the protective gas, and provides the outputs to indicate status.

The Spark Arrestor Unit SAU allows the flow of purge gas, and provides the measurement of the flow through the enclosure. The Relief Valve RLV provides overpressure protection.

FEATURES

- + One Model number: includes the Control Unit (CU), the Spark Arrestor Unit (SAU) and the Relief Valve (RLV.)
- + Direct Mount: no interconnecting pipe work. Reduced material and labor cost.
- + Size: Compact Control Unit, Relief Valve and Spark Arrestor Unit (No real-estate wastage around the purged enclosure.)
- + 316L Stainless steel housings and fittings for use in harsh environments.
- + Purge Flow: measured at the Spark Arrestor outlet. Gives full compliance with standards. See IEC / EN 60079-2, NFPA 496 Chapter 3-4. "have passed through the purge enclosure".
- + Multiple enclosures may be purged in series.
- + Independent of supply voltage
- + Global approvals so ideal for the OEM.

The system provides outputs for power interlock and alarm. The power output interlocks the power to the enclosure, and the alarm indicates if there is a failure of pressurization. The outputs can be either a pneumatic signal to operate a suitable interface unit, model /PO, or dry contacts for connection to Intrinsically Safe, model /IS, or (IECEx & ATEX only) flameproof circuits model /PA.

ACCESSORIES

Expo manufactures a range of interface units which will provide additional isolation either from the pneumatic output, or from the electric contacts.The most popular is the MIU dA (Ex d IIC T5) which provides 4 pole 12 Amp (UL) or 16 Amp (IEC) contacts for power, and a SPCO contact for alarm, operated from the pneumatic outputs.

Expo also supplies enclosure cooling, operator interfaces, custom built and standard enclosures and a full technical support facility.



Technical Specification MiniPurge

1XCF/ /



Dimensions/Spe	C.	1XCF/ss	/
Width	w	9.4"	240mm
Height	h	7.1"	180mm
Depth	d	6.0"	150mm
T- Box (PA only)	а	4.0"	102mm
RLV Width	х	2.4"	62mm
RLV Height	У	5.2"	133mm
RLV Depth	z	1.3"	33mm
Fitting ¹ /2" NPT	b	1.3"	33mm
Signals ¹ /8" PT0	C c	0.3"	8mm
SAU Ext Diam.	Ø	2.2"	55mm
SAU Ext Depth	t	1"	25mm
SAU Int Diam.	Øi	1.2"	32mm
SAU Int Depth	ti	1.4"	36mm
Weight		12.1lb	6.1kg

Selection of Orifice Plate

Orifice	Purge	Flow	Enclosure	Volume
Plate #	scfm	NI/min	ft ³ (4 VC*)	m ³ (5 VC*)
1	0.4	10	3.0	0.06
2	0.9	25	8.3	0.15
3	1.4	40	10.5	0.24
4	2.3	65	17.2	0.39
5	3.2	90	24	0.54
6	4.8	135	36	0.81
7	6.4	180	48	1.08
8	8.0	225	60	1.35

*VC = Volume Changes (based on 30 minute purge time)

COMMON SPECIFICATION

Purge	Supply medium	Instrument quality compressed air or	
Purge Supply pressure		Regulated pressure between Min 4 bar	
Purge	supply capacity	At least 1.5 times certified flow rate.	
Low p	ressure / Flow sensor	250 Pa, 2.5 mbar, 1.0"wc	
Tempe	erature	-20°C, -4°F to 55°C, 131°F	
Materials of construction		CU, SAU and RLV enclosures, 316L stainless steel	
Relief Openi Spark	Valve (RLV) ng pressure arrestor	Magnetic operation (patented) 1kPa, 10 mbar, 4" wc Integral to RLV and SAU, 316 Stainless Steel mesh.	
/PO	"Power Output" 2	2 bar (30 psi) when power enabled	
	"Alarm Output"	No output for inputseonneet No output pressure = Alarm	
/IS	IS Dry contacts for switching intrinsically safe circuits "Power"		
/PA	(IECEx & ATEX Only Integral Ex d IIC T5, switches 6A AC1, 4A	(<i>i)</i> Exe IIC T5 Junction Box and Power (DPNO) and Alarm (SPCO) AC15	
	PERATION	Tune Number (evenue	



WM Wall Mounting bars

06

1

Х

IS





Mini-X-Purge

Control System for Leakage Compensation For enclosures up to

1XLC/__/__ 60 cu ft, 1.35 m³ 2XLC/__/__ 120 cu ft, 2.7 m³ 3XLC/__/__240 cu ft, 5.4 m³

Ex [px] Zone 1 (21) IECEx Category 2 GD ATEX X-Purge Class I Division 1 FM cULus



OPERATION

The MiniPurge system provides a full purge and pressurize system for Class I Division 1 Gp A-D, Zone 1 (21) IIC applications. When fitted to a suitable enclosure the system enables regular electrical equipment to be operated safely in a hazardous location.

Certified in compliance with IEC, European and American standards and codes, the system controls purge and pressurization process. Initially the system provides a high flow of protective gas, usually compressed air. The flow through the enclosure is verified by measuring where it exits at the Relief Valve. Provided the flow is sufficient the indicator shows yellow and the purge timing proceeds. At the end of the purge time the purge flow is switched off and only a small air flow is used to compensate for any leaks in the enclosure. This keeps the pressure inside the enclosure slightly higher than the outside pressure, preventing flammable gas entering the enclosure. Whilst this safe condition is maintained the system output enables power to be applied to the equipment, either directly or via a separate interface unit.

For dust applications [Ex pD] see certificate for "conditions for safe use".

COMPONENTS

The system consists of two components: the Control Unit (CU) and the Relief Valve (RLV) . The CU controls the supply, measurement and flow of the protective gas, and provides the outputs to indicate status. The RLV allows the flow of purge gas, and provides the measurement of the flow through the enclosure then closes the outlet at the end of purging.

FEATURES

- + One Model number: includes the Control Unit (CU) and Relief Valve (RLV).
- + Direct Mount: no interconnecting pipe work. Reduced material and labor cost.
- + Size: Compact Control Unit and Relief Valve (No real-estate wastage around the purged enclosure).
- + 316L Stainless steel housings and fittings for use in harsh environments.
- + Purge Flow: measured at the Relief Valve, outlet. Gives full compliance with standards. See IEC / EN 60079-2, NFPA 496 Chapter 3-4. "have passed through the purge enclosure".
- + Multiple enclosures may be purged in series.
- + Independent of supply voltage.
- + Global approvals so ideal for the OEM.

The system provides outputs for power interlock and alarm. The power output interlocks the power to the enclosure, and the alarm indicates if there is a failure of pressurization. The outputs can be either a pneumatic signal to operate a suitable interface unit, model /PO, or dry contacts for connection to Intrinsically Safe, model /IS or (IECEx & ATEX only) flameproof circuits, model /PA.

ACCESSORIES

Expo manufactures a range of interface units which will provide additional isolation either from the pneumatic output, or from the electric contacts. The most popular is the MIU dA (Ex d IIC T5) which provides 4 pole 12 Amp (UL) or 16 Amp (IEC) contacts for power, and a SPCO contact for alarm, operated from the pneumatic outputs.

Expo also supplies enclosure cooling, operator interfaces, custom built and standard enclosures and a full technical support facility.





Technical Specification MiniPurge



Dimension: Spec	s/	1XLC/ss/		2XLC/ss/		3XLC/ss/	
Width	w	9.5"	240mm	9.5"	240mm	14.2"	360mm
Height	h	7.1"	180mm	9.5"	240mm	14.2"	360mm
Depth	d	6.0"	150mm	6.0"	150mm	6.0"	150mm
RLV Width	x	2.5"	62mm	3.5"	88mm	4.3"	110mm
RLV Height	у	5.2"	133mm	6.7"	170mm	7.3"	185mm
RLV Ext Depth	z	1.3"	33mm	1.5"	38mm	1.7"	42mm
RLV Int Depth	zz	0.67"	17mm	0.67"	17mm	0.67"	17mm
T-box PA only	a	4.0"	102mm	4.0"	102mm	4.0"	102mm
Fitting ½" NPT	b	1.3"	33mm	1.3"	33mm	1.3"	33mm
Signals 1/8" NPT	с	0.3"	8mm	0.3"	8mm	0.3"	8mm
Weight		12.1lb	5.5kg	13.3lb	6.1kg	33lb	15kg

COMMON SPECIFICATION

Purge	Supply medium		Instrument quality compressed air or Inert
Purge	Supply pressure		Regulated pressure between Min 4 bar
Purge	supply capacity		At least 1.5 times certified flow rate.
Low p	ressure sensor settir	ng	50 Pa, 0.5 mbar, 0.2"wc
Temp	erature		-20°C, -4°F to 55°C, 131°F
Mater	ials of construction		CU and RLV enclosures , 316L st. steel
Relief Openi Spark	Valve (RLV) ing pressure arrestor		Magnetic operation (patented) 1kPa, 10 mbar, 4" wc Integral to RLV, 316 Stainless Steel mesh
/PO	"Power Output"	2 b	ar 30 psi when power enabled
	"Alarm Output"	No 2 b	output for appointeer output pressure = Alarm ar 30 psi when pressure OK
/IS	Dry contacts for sw	itchin	g intrinsically safe circuits "Power " contact
/PA	(IECEX & ATEX Or	ower, 1ly)	contact open for trip disconnect. Ex e IIC Junction Box and Integral Ex d IIC

T5 Power (DPNO) and Alarm (SPCO) switches 6A AC1, 4A AC15

OPERATION

	Type Numb 07 1 X L	er C/s	(ex s/P	am 0/	ple) -
Size 1 2 3	Purge flow rate 8 scfm, 225 NI/min Purge flow rate 16 scfm, 450 NI/min Purge flow rate 32 scfm, 900 NI/min				
Certi	ification / Approval				
X	IECEx SIR 07.0027X Ex [px] Ex pD Europe, ATEX category 2 GD Cert no SIRA 01 ATEX 1295X USA/Canada NFPA496(2003) CII Div 1 cUL E190061, FM 1X8a4AE				
Pres	surization method				
LC	Leakage Compensation after initial purge				
Hou: ss	sing Stainless Steel				
Outp PO IS PA	out see above ◀ Pneumatic Output Intrinsically Safe Output Power and Alarm Output (IECEx & ATEX on	ly)			

Options -

WM Wall Mounting bars





Mini-X-Purge

Control System for Leakage Compensation For very large enclosures or large motors

4XLC/__/__ 5XLC/ /



Ex [px] Zone 1 (21) and 2 (22) IECEx, Category 2 G D ATEX X-Purge Class I Division 1 FM



OPERATION

The MiniPurge system provides a full purge and pressurization system for Class I Division 1, Zone 1 (21) or Zone 2 (22) applications. When fitted to a suitable enclosure the system enables regular electrical equipment to be operated safely in a hazardous area or hazardous location.

Certified in compliance with IEC, European and American standards and codes, the system controls purge and pressurization process. Initially the system provides a large flow of protective gas- usually compressed air. The flow through the enclosure is verified by measuring where it exits at the relief valve. Provided the flow is sufficient the indicator shows yellow and the purge timing proceeds. At the end of the purge time the purge flow is switched off and only a small air flow is used to compensate for any leaks in the enclosure. This keeps the pressure inside the enclosure slightly higher than the outside pressure, preventing flammable gas coming in to the enclosure. Whilst this safe condition is maintained the system output enables power to be applied to the equipment, either directly or via a separate interface unit.

For dust applications [Ex pD] see certificate for "conditions for safe use".

COMPONENTS

The system consists of two components- the Control Unit (CU) and the Relief Valve (RLV). The CU controls the supply, measurement and flow of the protective gas, and provides the outputs to indicate status. The RLV allows the flow of purge gas, and provides the measurement of the flow through the enclosure then closes the outlet at the end of purging.

FEATURES

- + **Stainless steel housings and fittings** for use in harsh environments.
- + **Purge Flow:** measured at the Relief Valve, outlet. Gives full compliance with standards. See IEC/EN60079-2 and NFPA 496 Chapter 3-4. "have passed through the purge enclosure".
- + Independent of supply voltage.
- + Global approvals so ideal for the OEM.
- + Flange mounted Relief Valve range.
- + For motors where pressure profile is static.

The system provides outputs for power interlock and alarm.

The power output interlocks the power to the enclosure, and the alarm indicates if there is a failure of pressurization. The outputs can be either a pneumatic signal to operate a suitable interface unit, or dry contacts for connection to Intrinsically safe or flameproof circuits, or (for IECEx/ATEX only) increased safety terminals, model /PA.

APPLICATION NOTES

These larger systems may be used on large motors only when the air pressure in the motor has little or no variation between running and static. Expo's D758, D771 and D779 with Closed Loop Automatic Pressurization (CLAPS) and powered Relief Valves are the preferred systems for large motors.

Great care must be taken to match the required purge flow with the expected enclosure pressure during purge, motor static and motor running.





Technical Specification MiniPurge

4XLC/_/__, 5XLC/_/__, 6XLC/_/__



Dimensio Spec	ns/	4XLC/ss/		IS/ 4XLC/ss/ 5XLC/ss/		6XLC/ss/	
Width	w	14.2"	360mm	18.9"	480mm	18.9"	480mm
Height	h	14.2"	360mm	14.2"	360mm	18.9"	480mm
Depth	d	5.9"	150mm	5.9"	150mm	5.9"	150mm
T-box PA only	а	4.0"	102mm	4.0"	102mm	4.0"	102mm
Fitting	b	³ /4" NPT		1"	NPT	1"	NPT
Weight		12.1lb	5.5kg	17.6lb	8.0kg	40.7lb	18.5kg
Purge Flow rate		32-56 scfm	900-1580 NI/min	98-126 scfm	2775-3580 Ni/min	159-225 scfm	4500-6370 NI/min



Relief Valve

COMMON SPECIFICATION

Purge Supply medium Purge Supply pressure Purge supply capacity	Instrument quality compressed air. Regulated pressure between 4 Bar, 60 psi Min 8 Bar, 115 psi Max At least 1.5 times certified flow rate.
Low pressure sensor range	0.5 - 5mbar, 0.2 - 2"wc
Temperature	-20°C, -4°F to 55°C, 131°F
Materials of construction	CU and RLV enclosures , 316L stainless steel.
Relief valve (RLV) Opening pressure range Spark arrestor	Magnetic operation (patented) 20 - 30mbar, 8 - 12" wc Integral to RLV, Nickel Chrome
/PO "Power Output" 2	bar 30 psi when power enabled

"Power Output"

"Alarm Output" 2 bar 30 psi when pressure OK Dry contacts for switching intrinsically safe circuits. "Power "

/IS contact closed to enable power, contact open for trip disconnect. /PA (IECEx/ATEX Only) Exe IIC Junction Box and Integral Exd IIC

T5 Power (DPNO) and Alarm (SPCO) switches 6A AC1, 4A AC15

OPERATION

Type Number (example) 07 4 X LC/ss/PO

Size 🗲

- Purge flow rate 32-56.2 scfm 4
- 5 Purge flow rate 98.4-126.5 scfm
- Purge flow rate 126.5-225 scfm 6

Certification / Approval

IECEx SIR 07.0027X Ex [px] Ex pD Х Europe, ATEX Category 2 G D USA/Canada NFPA496 C I, Div 1 IEC 61241-4 ATEX Cat 2

Pressurization method

LC Leakage Compensation after initial purge

Housing **4**

ss Stainless steel 316L

- Output see above 4-
- PO Pneumatic output
- **IS** Intrinsically safe output
- PA IECEX/ATEX only Power and Alarm output

RLV	5	52	75	low	75	high	1	04	RLV T	YPE				
Width X	4.57"	116mm	6.30"	160mm	6.30"	160mm	8.66"	220mm						
Height Y	7.28"	185mm	10.55"	268mm	10.55"	268mm	14.57"	370mm	104111			4500	8	000 85
Depth Z	6.14"	156mm	6.57"	167mm	8.70"	221mm	10.35"	263mm	75HF -		35	00 4	500	
Flow rate range	32-71 scfm	900-2000 NI/min	71-124 scfm	2000-3500 NI/min	124-159 scfm	3500-4500 NI/min	159-282 scfm	4500-8000 NI/min	751 E		12	5 1	60	
Flange Opt A	2" ANS	l 150#	-		4" ANS	l 150#	4" ANS	SI 150#	7 OLI		2000 71	350 125	D	
Weight	12.1lb	5.5kg	-		27.6lb	12.5kg	35.3lb	16.0kg	52 -	900	200	0		
Product code	RLV52/ss	/2"ANSI			RLV75/ss/4	4"ANSI/HF	RLV104/	ss/4"ANSI		32	71			
Flange Opt B	3" ANS	150#	3" ANS	l 150#	3" ANS	SI 150#			Ő	900	1800	3600	720) NI/min
Weight	16.5lb	7.5kg	22.5lb	10.2kg	24.3lb	11.0kg			0	32 PUR	64 GE EL O	128 NRA	256 FF	scim
Product code	RLV52/s	s/3"ANSI	RLV75/ss/	3"ANSI/LF	RLV75/ss/	3"ANSI/HF				. 011	02.20		. –	





Mini-Z-Purge

Control System for Continuous Flow For enclosures up to 1ZCF/__/__ 17 cu ft, 0.39 m³

Z-Purge Class I Division 2 Ex [pz] Zone 2(22) IECEx Category 3 G D ATEX

Mini-Y- Purge 1YCF/__/__ 17 cu ft, 0.39 m³ Y-Purge Class I Division 1 Groups A, B, C & D Ex [py] Zone 2(22) IECEx Category 3 GD ATEX



MiniPurge CF back plate

OPERATION

For purged enclosures in Class I Division 2 Gp A-D or Zone 2 IIC Ex [pz] or Ex [py] and Zone 22 Ex pD.

The initial purge flow removes the gasses, which may be present in the area when the enclosure is closed. After the purge cycle has been completed it continues to maintain pressurization. For enclosures with an internal source of flammable gas or vapor release, the continuous flow can be set to reduce the concentration below 25% of the LFL (LEL). Reference must be made to IEC/EN 60079-2 or NFPA 496 Standards before applying.

The Continuous Flow (CF) Pressurizing system is designed for small to medium size purged enclosures. Typical Enclosure Size: 17 cu ft (0.39 m3) @ 3.2 scfm = 90 Nl/min Note: Enclosure sizes are based on 30-minute purge period. There is no restriction on this purge period.

COMPONENTS

The system has three components. The Control Unit controls air flow and monitors flow and pressure. The Spark Arrestor Unit (SAU) provides a protected fixed measuring orifice to measure flow through the enclosure. The Relief Valve (RLV) provides over-pressure protection for the enclosure. Preferred options are Panel Mount and Back Plate option. Panel Mount fits directly on the enclosure with minimum external space. Back Plate mounts either directly onto the outside of or remote from the enclosure.

FEATURES

- + One Model number: includes Control Unit, Spark Arrestor Unit and Relief Valve.
- + Simple integrated mounting with little or no piping needed.
- + IECEx, ATEX, FM and cULus approvals covering IEC/EN 60079-2 and NFPA 496.
- + Clear visual status indication.
- + Remote Alarm contacts.

COMMON SPECIFICATION

The Control Unit:

Purge Medium: Compressed Air or Inert Gas, clean, dry & free of flammable gasses. Supply Pressure: 60 psi (4 bar) Maximum working pressure: 115 psi (8 bar) Temperature range: -20°C, -4°F to 55°C, 131°F Supply Inlet 1/4 NPT(F): Connected with 1/2" (12mm) O/D [Min. ³/₈" (10mm) I/D] pipe. 33ft (10 meter) Max Length

Relief Valve RLV25 (Full 1" bore)

Magnetic operation (patented) with integral spark arrestor. Opening pressure 1kPa, 10 mbar, 4" wc

Spark Arrestor Unit - SAU25

User Selectable: supplied with 8 orifice plates for Purge Flows of: **0.4, 0.9, 1.4, 2.3, 3.2, 4.8, 6.4 or 8.0 scfm** (Nl/min: 10, 25, 40, 65, 90, 135, 180, or 225)

Alarm Indicators: "Alarm" Red Indicates Low Pressure. Green Indicates Pressure OK Low Pressure Sensor "Alarm": setting 1" WC (2.5 mbar)

Permissible Enclosure Leakage: 2 scfm (60 Nl/min) Materials of Construction Control Unit: 316L stainless steel mounting plate.

Spark Arrestor Unit: 316L stainless steel Relief Valve: 316L stainless steel.

Weight: 5 lb (2.4kg) approx





Technical Specification Mini-Z-Purge Mini-Y-Purge

1ZCF/__/__ 17 cu ft, 0.39 m³ 1YCF/ / 17 cu ft, 0.39 m³



Dimensions/S	pec.	1ZCF/p 1YCF/p	om/ om/	1ZCF/ 1YCF/	bp/ bp/
Width	w	7.9"	200mm	7.8"	197mm
Height	h	7.9"	200mm	5.0"	127mm
Depth	d	2.4"	62mm	3.1"	79mm
RLV Width	х	2.4"	62mm	2.4"	62mm
RLV Height	у	5.2"	133mm	5.2"	133mm
RLV Depth	z	1.3"	33mm	1.3"	33mm
Fitting Length	а	1.0"	25mm	0.4"	11mm
Fitting NPT	b	¹ / ₄ "		1/ ₄ "	
Signals NPT	С	1/ ₈ "		1/ ₈ "	
SAU Diameter	Ø	2.2"	55mm	2.2"	55mm
SAU Depth	t	1.4"	35mm	1.4"	35mm

Selection of Orifice Plate

Orifice	Purge	Flow	Enclosure Volume		
Plate #	scfm	NI/min	ft ³ (4 VC*)	m ³ (5 VC*)	
1	0.4	10	3.0	0.06	
2	0.9	25	8.3	0.15	
3	1.4	40	10.5	0.24	
4	2.3	65	17.2	0.39	
5	3.2	90	24	0.54	
6	4.8	135	36	0.81	
7	6.4	180	48	1.08	
8	8.0	225	60	1.35	

*VC = Volume Changes (based on 30 minute purge time)

COMMON SPECIFICATION

Panel Mount

Model No. 1ZCF/**pm**/IS or /PO Model No. 1YCF/**pm**/IS or /PO Control Unit Location: Side or Front of purge enclosure

Back Plate

Model No. 1ZCF/bp/IS or /PO Model No. 1YCF/bp/IS or /PO Control Unit Location: Top, Side or Bottom of purge enclosure

Warning Label (loose) for User's calibration details, for mounting to purged enclosure.

"Alarm" Remote Output options:

/PO Pneumatic output"

"Alarm Output" Main supply 60 psi / 4 bar Pressure Output "Pressure OK". No output "Alarm".

/IS Dry contacts for switching non-incendive or intrinsically safe circuits. "Alarm" open on loss of pressure.

■ Note on IS Output (Type Z and Ex pz Only)

IS output can be connected to Intrinsically Safe or nonincendive circuits, with the panel mount PM option, it can also be connected to general purpose (GP) circuit powered from inside the enclosure.

OPERATION

Type Number (example) 07 1 Z CF/bp/IS

Size ◀ 1 Purge flow rate 8scfm, 225 NI/min

Certification / Approval

- Z North America Class I Division 2 FM 1X8a4AE, cUL E190061 IECEx SIR 07.0027X Ex [pz] Ex pD Europe ATEX Category 3 GD SIRA 01ATEX1295X Ex [pz] Ex pD
- Y North America Class I Division 1 For protecting Class I Division 2 equipment FM 1X8a4AE, cUL E190061 IECEx SIR 07.0027X Ex [py] Ex pD Europe ATEX Category 3 GD SIRA 01ATEX1295X Ex [py] Ex pD

Pressurization method

CF Continuous flow

Housing 4

bp Back Plate
pm Panel Mount

Output 🗲

IS Intrinsically Safe Output

PO Pneumatic Output





(Mini-Y-Purge) Mini-Z-Purge

Control System for Leakage Compensation For enclosures up to

1ZLC/__/__ (1YLC/__/__) 60 cu ft, 1.35 m³ 2ZLC/__/__ (2YLC/__/__) 120 cu ft, 2.7 m³ 3ZLC/__/__ (3YLC/__/__) 240 cu ft, 5.4 m³

Z-Purge Class I Division 2 Grp A to D, Y-Purge Class I Division 1 Grp A to D Ex [pz] Ex [py] Ex pD Zone 2 (22) Category 3 GD ATEX



MiniPurge LC Back Plate

OPERATION

For purged enclosures in Class I Division 2 Gp A-D or Zone 2 IIC Ex [pz] or Ex [py] and Zone 22 Ex pD.

The Leakage Compensation (LC) Pressurizing system has an initial High Purge Flow rate to remove the gasses which may be present when the purged enclosure is initially closed. The high purge rate is initiated manually.

When the purge is turned off a small amount of air flow maintains the enclosure pressure. This compensates for leaks, conserving compressed air.

Typical Enclosure Size:

60 ft³ (1.35 m³) @ 8 scfm = 225 Nl/min 120 ft³ (2.70 m³) @ 16 scfm = 450 Nl/min 240 ft³ (5.40 m³) @ 32 scfm = 900 Nl/min

Note: Enclosure sizes are based on 30-minute purge period. There is no restriction on this purge period.

COMPONENTS

The system has two components. The Control Unit controls air flow and monitors flow and pressure. The Relief Valve (RLV) allows the flow of purge gas and provides the measurement of the flow through the enclosure then closes at the end of purging. Preferred options are Panel Mount and Back Plate option. Panel Mount fits directly on the enclosure with minimum external space. Back Plate mounts either directly onto the outside of or remote from the enclosure.

FEATURES

- + One Model number includes the Control Unit (CU) and Relief Valve (RLV)
- + Simple integrated mounting with little or no piping needed.
- + IECEx, ATEX, FM and cULus approvals covering IEC/EN 60079-2 & NFPA 496.
- + Clear visual status indication.
- + Remote Alarm contacts.

FEATURES

The Control Unit: Purge Medium: Compressed Air or Inert Gas, clean, dry & free of flammable gasses. Supply Pressure: 60 psi (4 bar) Maximum Working Pressure: 115 psi (8 bar) Supply Pipe: Model # 1 & 2 - 1/2" (15mm) O/D, Model # 3 - 3/4" (20mm). Max. Length: 20ft (6 meters). Temperature: -4°F, -20°C to 131°F, 55°C Manual Purge flow On/off Lever

Relief Valve (RLV):

Magnetic operation (patented) with integral spark arrestor.

Opening pressure 4" WC, 1kPa, 10 mbar.

Purge Flow Sensor: 8 scfm (225 Nl/min), 16 scfm (450 NI/min), 32 scfm (900 NI/min). 1/4" (6mm) pipe required between Control Unit and RLV, to be installed internal to the purged enclosure.

Alarm Indicators: "Alarm" Red Indicates Low Pressure. Green Indicates Pressure OK

Low Pressure Sensor "Alarm": setting 0.2" wc (0.5 mbar)

"Purge Flow" Yellow indicates purge flow through the enclosure.

Permissible enclosure leakage: 2 scfm (60 Nl/min)

Materials of construction: Control Unit: 316L stainless steel mounting plate. Relief Valve: 316L stainless steel.



13



Technical Specification

Mini-Z-Purge Mini-Y-Purge

1ZLC/__/__, 2ZLC/__/__, 3ZLC/__/__ 1YLC/__/__, 2YLC/__/__, 3YLC/__/__



Dimension Control Un	s it		ZLC/ YLC/	pm/_ om/_			_ZLC/bp/ _YLC/bp/			/ /
Width	w	7.9	7.9" 200		00mm		10.1	" 257		57mm
Height	h	10.9	9"	27	275mm		5.0"		127mm	
Depth	d	3.9)"	9	8mm 3.1"		" 78mm		'8mm	
Signals		1	/8" N	IPT(F)		1/8	" NF	РΤ	(F)
Purge fit. len	gth	1.0)"	2	5mm		0.4" 11		11mm	
Purge Inlet	а	1/	2" N	PT(F	-)		3/8" NPT(F)			
Dimensions Relief Valve	5	1ZL 1ZL RL	C/pn C/bp V25	n/ o/	2ZL 2ZI RL	_C _C	C/pm/ C/bp/ '36	3Z 3Z F	ZLO ZLO RLV	C/pm/ C/bp/ /52
RLV Width	x	2.4"	62r	mm	3.5"	8	88mm	4.3	"	110mm
RLV Height	у	5.2"	133r	mm	6.7"	1	70mm	7.3	"	185mm
RLV Depth	z	1.3"	33m	nm	1.5"	3	38mm	1.7	"	42mm
Weight		7lb	Зkę	g	9lb		4kg	11lk)	5kg

Note on IS Output (Type Z and Ex pz Only)

IS output can be connected to Intrinsically Safe or nonincendive circuits, with the panel mount PM option, it can also be connected to general purpose (GP) circuit powered from inside the enclosure.

COMMON SPECIFICATION

Control Unit:

Panel Mount:

Model No. 1, 2 or 3ZLC/pm/IS or /PO Model No. 1, 2 or 3YLC/pm/IS or /PO Control Unit Location: Side or Front of purge enclosure.

Back Plate:

Model No. 1, 2 or 3ZLC/bp/IS or /PO Model No. 1, 2 or 3YLC/bp/IS or /PO

Control Unit Location: Top, Side or Bottom of purge enclosure.

Warning Label: (loose) for User's calibration details, for mounting to purged enclosure.

"Alarm" Remote options:-

/IS Dry contacts for switching non-incendive or intrinsically safe circuits. "Alarm" open on loss of pressure.

/PO "Pneumatic Output" "Alarm Outpu" Main supply 60 psi / 4 bar

Pressure Output "Pressure OK". No output "Alarm".

OPERATION



IS Intrinsically Safe Output **PO** Pneumatic Output





Motor Pressurization System

IECEX & ATEX Certified Purging and Pressurization System for Large Electrical Machines. D758 / D771 MOTOR SYSTEMS

Hazardous Area classification IECEx Zone 1 (21), Group IIC T6 ATEX Category 2 G D, Zone 1 (21), Group IIC T6 **D771** Provides Intrinsically Safe Outputs



OPERATION

The Motor Purging & Pressurization control system has been specifically designed for use on large electrical machines to be located in a hazardous location.

The system has a High Purge rate to remove the gasses that may be present within the machine prior to start-up. The purge flow rate and duration is normally established by the manufacturer & Notified Body during the machine testing. On completion of High Purge the system switches to Closed Loop Automatic Leakage Compensation. This automatically compensates for pressure variations in the machine which are typically caused during start-up or due to temperature fluctuations. The machine will then continuously operate at a constant pressure offering the Manufacturer considerable savings in time on the test bed & the Plant Operator ease of Commissioning & Operation.

COMPONENTS

The system has two components. The Control Unit controls air flow and monitors flow & pressure. It also contains the pneumatic logic controlling the purge timer circuits & volt free / dry system status contacts. The Relief Valve (RLV) provides over-pressure protection for the machine enclosure, the purge flow measurement on the outlet and provides the outlet path for the purge airflow via an integral spark arrestor.

FEATURES

- + Entirely pneumatic operation using the same compressed air supply for Purging, Pressurization and Control Logic.
- + Air regulation & filtration provided.
- + IECEx & ATEX certified Ex [px] to IEC / EN 60079-0 & IEC / EN 60079-2, IECEx & ATEX certified Ex pD to IEC / EN 61241-0 & IEC / EN 61241-4
- + User selectable purge flow rates with 5 pre set ranges from 2,000 NI/min to 6,000 NI/min.
- + User selectable purge time purge time increments up to a maximum of 45-minutes.
- + One design of system may be fitted to a variety of machine frame sizes due to the user selectable options.
- + Closed Loop Automatic Pressurization System (CLAPS) for fully automatic control of the pressure in the machine during start-up and normal operation.
- + Simple installation on to the side of the machine with minimal pipework required between the Control Unit & RLV.
- + Clear visual status indication.
- + Remote alarm contacts.
- + Patented magnetic Relief Valve.





Technical Specification Motor Pressurization system

D758 / D771 Motor System



Relief Valve (RLV)

Dimensions/Sp	ec.	D758 / D771			
Width	w	18.9"	480mm		
Height	h	16.7"	425mm		
Height + SJB	h1	24.5"	622mm		
Depth	d	7.0"	177mm		
Fitting	f	1" NPT	1" NPT		
RLV Width	x	13.0"	330mm		
RLV Height	у	11.0"	280mm		
RLV Depth	z	6.0"	153mm		

OPERATION

- Intrinsically safe alarm & interlock volt free / dry contacts. The Ex e junction box & terminals are substituted for Ex i equivalents. Order Code: D771MOTORSYSTEM
- Air Inlet 1" Ball Valve for local isolation of the system. To suit the D758 & D771 systems.

Order Code: D758BALLVV Air Inlet "Ex" approved 1" Solenoid Valve for remote isolation of

- All filler Ex approved 1 Solehold valve for remote isolation of the system. To suit the D758 & D771 systems.
 Order Code: D758SOLVV
- Extended timer option for additional 60 minute timer. Order Code: KGM-PR00-008
- External manual override switch, supplied loose. Order Code: /MO (BOX)

CONTROL UNIT SPECIFICATI

Model Number

5XLC/ss/OV/PA/PC/D758 Type of Operation Automatic Purging & Leakage Compensation **Action on Pressure Failure** Alarm and Trip / Disconnect of machine interlocks (Alarm Only operation user adjustable) Certification IEC Zone1 (21) Ex [px] II T6 ATEX II 2 (2) G D Ex [px] II T6 Purge Time Increments: 10, 15 and 20 minutes, giving a maximum available period of 45-minutes (60min timer optional) Leakage Compensation (LC) Capacity Up to 1500 NI/min @ 5 barg inlet pressure Automatic LC Over Capacity +40% of the normal enclosure leakage flow rate **Compressed Air Supply** Clean Dry Oil free Air or Inert Gas. Min supply pressure 5 barg, Max 16 barg Supply inlet filter 40µ and regulator fitted **Process Connections** Purge supply: 1" NPT female, recommended supply pipe: 1" I.D min. Purge outlet to machine: 1" NPT female Reference points & signals: 1/8" NPT female **Motor Interlock Contacts** 2 pole normally open (DPNO), 4A 250V AC15 ATEX Ex d II T6 or IS Alarm Contact, Pressure Correct / Not Correct 1 pole changeover (SPCO), 4A 250V AC15 ATEX Ex d II T6 or IS Intermediate Pressure / Pre-alarm Contact 1 pole changeover (SPCO), 4A 250V AC15 ATEX Ex d II T6 or IS Signal Junction Box (SJB) 316L Stainless steel, ATEX II 2 G D [Ex e] II T5 certified, c/w terminals, front access cover & lower removable gland plate **Enclosure & Mounting** Housing & external process connections 316L stainless steel Wall mounting lugs & spaces provided for fitting to machine Weight D758 Motor System 27 kg 59.4 lb Temperature Range -20°C, -4°F to 55°C, 131°F

System Sensors

Minimum pressure sensor range: 0.5 to 5 mbarg (Default 1.5 mbarg) Intermediate sensor/pre-alarm range: 2 to 10 mbarg (Default 5 mbarg) Purging flow sensor set at 8.5 mbarg

Normal working pressure in machine: 10 mbarg maintained by the Closed Loop Automatic Pressure System (CLAPS) sensor

RELIEF VALVE SPECIFICATION

Model Number

RLV104/ss/FS/D758 **Purge Flow Ranges:** 2000, 3000, 4000, 5000 & 6000 Nl/min User adjustable by fitting the appropriate orifice plate **Enclosure & Mounting** Housing & external process connections 316L stainless steel Rectangular flat flange mounting to machine **Weight** Relief Valve 7kg 15.4lb **Relief Valve** Lift-off range 20 to 50 mbarg (Default 30 mbarg)





Motor Pressurization System

IECEX & ATEX Certified Purging and Pressurization System for Electrical Machines.

D779 MOTOR SYSTEM

Hazardous Area classification IECEx Zone 1 (21), Group II T6 ATEX Category 2 G D, Zone 1 (21), Group II T6



OPERATION

The Motor Purging & Pressurization control system has been specifically designed for use on large electrical machines to be located in a hazardous location.

The system has a High Purge rate to remove the gasses that may be present within the machine prior to start-up. The purge flow rate and duration is normally established by the manufacturer & Notified Body during the machine testing. On completion of High Purge the system switches to Closed Loop Automatic Leakage Compensation. This automatically compensates for pressure variations in the machine which are typically caused during start-up or due to temperature fluctuations. The machine will then continuously operate at a constant pressure offering the Manufacturer considerable savings in time on the test bed & the Plant Operator ease of Commissioning & Operation.

COMPONENTS

The system has two components. The Control Unit controls air flow and monitors flow & pressure. It also contains the pneumatic logic controlling the purge timer circuits & volt free / dry system status contacts. The Relief Valve (RLV) provides over-pressure protection for the machine enclosure, the purge flow measurement on the outlet and provides the outlet path for the purge airflow via an integral spark arrestor.

FEATURES

- + Entirely pneumatic operation using the same compressed air supply for Purging, Pressurization and Control Logic.
- + Air regulation & filtration provided.
- + IECEx & ATEX certified Ex [px] to IEC / EN 60079-0 & IEC / EN 60079-2, IECEx & ATEX certified Ex pD to IEC / EN 61241-0 & IEC / EN 61241-4
- + User selectable purge flow rates of 1,000 NI/min and 1,500 NI/min.
- + User selectable purge time purge time increments up to a maximum of 45 minutes.
- + One design of system may be fitted to a variety of machine frame sizes due to the user selectable options.
- + Closed Loop Automatic Pressurization System (CLAPS) for fully automatic control of the pressure in the machine during start-up and normal operation.
- + Simple installation on to the side of the machine with minimal pipework required between the Control Unit & RLV.
- + Clear visual status indication.
- + Remote alarm contacts.
- + Patented magnetic Relief Valve.





Technical Specification Motor Pressurization system

D779 Motor System



Dimensions/Sp	bec.	D779			
Width	w	15.7"	400mm		
Height	h	15.7"	400mm		
Depth	d	6.9"	174mm		
Fitting	f	1/2" NPT	1/2" NPT		
RLV Width	x	9.1"	230mm		
RLV Height	у	7.9"	200mm		
RLV Depth	z	5.1"	129mm		

OPERATION

- Air Inlet $\ensuremath{{}^{1\!\!/}_2}"$ Ball Valve for local isolation of the system. To suit the D779 system.

Order Code: D779BALLVV

 Air Inlet "Ex" approved ½" Solenoid Valve for remote isolation of the system. To suit the D779 system.
 Order code: D779SOLVV

CONTROL UNIT SPECIFICATION

Model Number

3XLC/ss/OV/PA/PC/D779 Type of Operation Automatic Purging & Leakage Compensation Action on Pressure Failure Alarm and Trip / Disconnect of machine interlocks (Alarm Only operation user adjustable) Certification IEC Zone 1 (21) Ex [px] II T6 ATEX II 2 (2) G D Ex [px] II T6 Purge Time Increments: 10, 15 and 20 minutes, giving a maximum available period of 45-minutes Leakage Compensation (LC) Capacity Up to 500 NI/min @ 4 barg inlet pressure Automatic LC Over Capacity +40% of the normal enclosure leakage flow rate **Compressed Air Supply** Clean Dry Oil free Air or Inert Gas. Min pressure 4 barg, Max 16 barg Supply inlet filter 40µ and regulator fitted **Process Connections** Purge supply: 1/2" NPT female, recommended supply pipe: 1" I.D min. Purge outlet to machine: 1/2" NPT female Reference points & signals: 1/8" NPT female **Motor Interlock Contacts** 2 pole normally open (DPNO), 4A 250V AC15 ATEX Ex d II T6 Alarm Contact, Pressure Correct / Not Correct 1 pole changeover (SPCO), 4A 250V AC15 ATEX Ex d II T6 Signal Junction Box (SJB) 316 St.St, ATEX II 2 G D [Ex e] II T5, c/w terminals, M20 cable glands **Enclosure & Mounting** Housing & external process connections 316 stainless steel Wall mounting lugs & spaces provided for fitting to machine Weight D779 Motor System 16 kg 35.2 lb **Temperature Range** -20°C, -4°F to 55°C, 131°F System Sensors Minimum pressure sensor range: 0.5 to 5 mbarg (Default 1.5 mbar) Purging flow sensor set at 8.5 mbarg Normal working pressure in machine: 10 mbarg maintained by the Closed Loop Automatic Pressure System (CLAPS) sensor

RELIEF VALVE SPECIFICATION

Model Number RLV52/ss/FS/D779 Purge Flow Ranges: 1000 & 1500 NI/min User adjustable by fitting the appropriate orifice plate Enclosure & Mounting Housing & external process connections 316L stainless steel Rectangular flat flange mounting to machine Weight Relief Valve 4 kg 8.8 lb Relief Valve Lift-off range 20 to 50 mbarg (Default 30 mbarg)





Pre-Start Purge

For purging Ex n and Ex e HV Electric Motors in Zone 2, Class I Div 2 Prior to starting

4PP/SS/PA 6PP/SS/PA



OVERVIEW

The Pre-Start Purge system is designed to enable purging of Ex e and Ex n or Non Incendive electric motors prior to starting. This is designed to ensure that the machine is gas free prior to starting when the risks of ignition may be greatest.

COMPONENTS

The equipment consists of two units, a Control Unit and Relief Valve. The Control Unit controls the compressed air supply to the machine, validates the purge flow and times the purge period. The Relief Valve provides a path for the purge air to exit the machine, and provides a means to verify that the required volume of air is flowing through the machine. The Relief Valve also incorporates a spark arrestor.

OPERATION

The system measures the flow through the machine, rather than the flow into the machine. This ensures effective purging by the method recognized in international standards EN50016, IEC 60079-2, and NFPA496. The system is intended for use in Zone 2 or Class I Division 2 hazardous locations.

The purging can be initiated either remotely or by local control. The system indicates purging in process and purge complete by means of volt free / dry contacts. Preset purge times of 10,15,20,25,30,35 or 45 minutes can be selected.

FEATURES

- + Pre-Start Purging system for large and HV Electric Motors.
- + ATEX Category 3 certified for Zone 2 II operation.
- + Complies with UK Health and Safety Executive Safety notices.
- + Simple fitting and operation
- + Manual or Remote Start Purge

Remote Start Purge operation

The appropriate Remote Start control option must be selected and factory fitted to the Control Unit. For Remote Start operation, the system is initiated by means of a signal to the solenoid valve in the control unit. This will initiate a purge cycle. When the required purge flow level has been attained, a visual indicator and a volt free / dry contact will indicate purge in progress. The purging will continue for the pre determined purge time. At the end of the purge time the system will indicate purge complete by means of another visual indicator and volt free / dry contacts. The remote purge initiation is controlled by solenoid valve, the preferred option is using a 24V dc signal to Ex n ATEX Category G3 solenoid valve. CSA/FM/UL Class I Division 2 or ATEX EEx d options are also available upon request.

Local Operation

Local operation of the Purge Start is by the use of a toggle switch located on the Control Unit, operate for 3 seconds and this will initate a purge cycle.

Indication and controls

The system status is indicated locally by visual indicators on the control unit. The status is indicated remotely by volt free / dry contacts. These contacts are flameproof switches and therefore are suitable for connection in hazardous location to flameproof, increased safety, non-incendive or intrinsically safe monitoring circuits.



Technical Specification Pre-Start Purge

4PP/ss/PA 6PP/ss/PA



Control Unit

Dimensions/Spec.		4PP/S	S/PA	6PP/SS/PA		
Width	w	14.2"	360mm	18.9"	480mm	
Height	h	16.7"	425mm	16.7"	425mm	
Height + SJB	h1	5.2"	132mm	7.3"	186mm	
Depth	d	6.3"	160mm	7.1"	180mm	
Fitting	f	3/4" NPT		1" NPT		
RLV Width	х	9.1"	230mm	13.0"	330mm	
RLV Height	у	7.9"	200mm	11.0"	280mm	
RLV Depth	z	5.1"	135mm	6.0"	156mm	
Weight Control	Unit	36.3lb	16.5kg	52.8lb	24.0kg	
Weight RLV		8.8lb	4.0kg	15.4lb	7.0kg	

Expo Technologies is the leading manufacturer of Purge and Pressurize equipment conforming to International Standards. The range includes systems for Small Electronic Enclosures, Large Electrical Cabinets, Analytical instruments and full Ex p of Large / HV Electric Machines. Expo Technologies also manufacture Intrinsically Safe, Increased Safety, Flameproof and Non Incendive equipment for hazardous areas. With full design, and consultancy facilities. Expo can undertake special projects and backs up its manufacture with qualified specialists who can undertake installation, maintenance and commissioning. Please contact one of our sales offices to discuss your hazardous location protection projects.

COMMON SPECIFICATION Equipment sizes

There are two sizes of Control Unit and with matching Relief Valves as summarized in the Table below. The RLV is configured with user selectable orifice plates for the required flow rate.

Control Unit	Relief Valve	Flow Rate Range			
4PP/SS/PA	RLV52/SS/PP	700 NI/min 42 m ³			
		1000 NI/min	60 m ³ /hr		
		1500 NI/min	90 m ³ /hr		
6PP/SS/PA	RLV104/SS/PP	2000 NI/min	120 m ³ /hr		
		3000 NI/min	180 m ³ /hr		
		4000 NI/min	240 m ³ /hr		
		5000 NI/min	300 m ³ /hr		
		6000 NI/min	360 m ³ /hr		

■ OPTIONS

Remote Start Purge option must then be selected for factory fitting to the Control Unit.

- Remote Start EEx n 24V dc Category G D3 ATEX 24 V dc
- Remote Start EEx d II T4 Category 2 ATEX 24 V dc
- Remote Start Class I Division 2 CSA/ UL 24V dc

Air Inlet, Manual Isolation Valve option is also available.

/PO (Pneumatic Outputs) alternative to /PA

Both the 4PP/SS/PA and the 6PP/SS/PA include the /PO (Pneumatic Outputs) option, for those applications where EEx e or EEx i volt free / dry contacts are non-preferred options.

These pneumatic outputs (1/8" NPT) can be piped to suitably approved / certified, Ex n, Non Incendive, Ex d, Explosionproof pressure switch. These pressure switches can be supplied by the manufacturer or Expo. Expo can also supply the Model: MIU/ dA dual approved / certified interface unit for connection to the /PO.

/PO (Pneumatic Output) & Indicators

"Purge in Progress" / "Yellow" 2 barg output (setting of pressure switch 1.5 barg) "Purge Complete" / "Green" 2 barg output (setting of pressure switch 1.5 barg)





Mini-X-Dust Protection

Control System for Dust Protection For enclosures

1XDP/__/__

X-Pressurizing Class II Division 1 Group E, F & G Ex pD Pressurizing Zone 21 IECEx Category 2 D ATEX



OPERATION

If combustible dust has accumulated within the protected enclosure, the protected enclosure shall be opened and the dust removed before pressurization is applied.

With the protected enclosure door closed the compressed air or inert gas can be applied to the MiniPurge Dust Protection system. By adjusting the flow control valve a positive pressure is then obtained within the enclosure.

Red (Alarm) Green (Pressurized). At this stage power to the protected enclosure can be automatically applied via the MIU.

COMPONENTS

The Dust Protection system has two components. The Control Unit controls the air flow and monitors the pressure.

The Relief Valve (RLV) provides the over-protection for the enclosure. Preferred options are the Panel Mount or the Back Plate designs. Panel Mount fits directly into the wall of the enclosure with minimum external space. Back Plate mounts either directly onto the outside of or remote from the enclosure.

FEATURES

- + One Model number: includes Control Unit, Spark Arrestor Unit and Relief Valve.
- + Simple integrated mounting with little or no piping needed.
- + IECEx, ATEX, FM and cULus approvals covering IEC/EN 60079-2 and NFPA 496.
- + Clear visual status indication.
- + Remote Alarm contacts.

COMMON SPECIFICATION

The Control Unit:

Purge Medium: Compressed air or Inert Gas, clean and dry. Supply Pressure: 60 psi (4 bar) Maximum Working Pressure: 115 psi (8 bar) Temperature Range: -20°C, -4°F to 55°C, 131°F Supply Inlet: ¼" NPT(F) Connected with ½" (12mm) O/D [Min. 3/8" (10mm) I/D] pipe. 33ft (10 meter) max. length.

Relief Valve RLV25 (Full 1" bore)

Magnetic operation (patented) with integral spark arrestor. Opening pressure 1 kPa, 10 mbar, 4" WC

Alarm Indicators: "Alarm" Red Indicates Low Pressure. Green Indicates Pressure OK Low Pressure Sensor "Alarm": setting 1" WC (2.5 mbar)

Permissible Enclosure Leakage: 2 scfm (60 NI/min)

Materials of Construction

Control Unit: 316L stainless steel mounting plate. Relief Valve: 316L stainless steel.

Weight: 5 lb (2.4kg) approx





Technical Specification Mini-Z-Purge

1XDP/_/_





Dimensions/Spec.		1XDP/p	m/	1XDP/bp/			
Width	w	7.9"	200mm	7.8"	197mm		
Height	h	7.9"	200mm	5.0"	127mm		
Depth	d	2.4"	62mm	3.1"	79mm		
RLV Width	x	2.4"	62mm	2.4"	62mm		
RLV Height	у	5.2"	133mm	5.2"	133mm		
RLV Depth	z	1.3"	33mm	1.3"	33mm		
Fitting Length	а	1.0"	25mm	0.4"	11mm		
Fitting NPT	b	¹ / ₄ "		1/4"			
Signals NPT	С	1/ ₈ "		1/ ₈ "			

COMMON SPECIFICATION

Location of Control Unit.

Panel Mount Model No. 1XDP/pm/PO or /IS

Control Unit Location: Side or Front of pressurized enclosure

Back Plate

Model No. 1XDP/bp/PO or /IS

Control Unit Location: Top, Side or Bottom of pressurized enclosure

Warning Label (Loose) for User's calibration details, for mounting the pressurized enclosure.

"Alarm" Remote / Power Outputs:-

- /PO "Pneumatic Outputs" Single output for Pressurize OK and Power On. Main supply 60 psi (4 bar) No output "Alarm" & Power disconnect.
- /IS Dry contacts for switching intrinsically safe circuits. "Alarm" & Power disconnect. contacts open. "Pressurized" & "Power On". Contacts closed.

NOTE:

MIU (MiniPurge Interface Unit) when used with a 1XDP/_/PO When using the 1XDP/_/PO option the MIU (Data Sheet MPIFU) can be used for the Remote Alarm and Power Disconnect. The single pneumatic output from the Control Unit should be piped via a 'T' piece to the "Alarm"/"Pressurized" actuator and the Power Disconnect actuator on the MIU.

OPERATION







Mini-Z-Dust Protection

Mini-Y-Dust Protection Control System for Dust Protection for enclosures

1ZDP/__/_

Ex pD Zone 22 IECEx Category 3 D ATEX Z-Pressurizing Class II Division 2 Group F & G

1YDP/__/_

Y-Pressurizing Class II Division 1 Group F & G



OPERATION

If combustible dust has accumulated within the protected enclosure, the protected enclosure shall be opened and the dust removed before pressurization is applied.

With the protected enclosure door closed the compressed air or inert gas can be applied to the MiniPurge Dust Protection system. By adjusting the flow control valve a positive pressure is then obtained within the enclosure. Red (Alarm) Green (Pressurized). At this stage power to the protected enclosure can be manually applied.

COMPONENTS

The Dust Protection system has two components. The Control Unit controls the air flow and monitors the pressure.

The Relief Valve (RLV) provides the over-protection for the enclosure. Preferred options are the Panel Mount or the Back Plate designs. Panel Mount fits directly into the wall of the enclosure with minimum external space. Back Plate mounts either directly onto the outside of or remote from the enclosure.

FEATURES

- + One Model number: includes Control Unit and Relief Valve
- + Simple integrated mounting with no piping or labor
- + IECEx & ATEX approved to IEC 61241-4 and FM approved to NFPA 496
- + Clear visual local status indicator
- + Remote Alarm contacts

COMMON SPECIFICATION

The Control Unit:

Purge Medium: Compressed Air or Inert Gas, Clean and dry. Supply Pressure: 60 psi (4 bar) Maximum Working Pressure: 115 psi (8 bar) Temperature Range: -20°C, -4°F to 55°C, 131°F Supply Inlet ¼" NPT(F):- Connected with ½" (12mm) O/D [Min. ³/₈" (10mm) I/D] pipe. 33ft (10 meter) max. length.

Relief Valve RLV25 (Full 1" bore)

Magnetic operation (patented) with integral spark arrestor. Opening pressure: 1 kPa, 10 mbar, 4" WC

Alarm Indicators: "Alarm" Red Indicates Low Pressure. Green Indicates Pressure OK Low Pressure Sensor "Alarm": setting 1" WC (2.5 mbar)

Permissible Enclosure Leakage: 1-8 scfm (30-225 NI/min)

Materials of Construction

Control Unit: 316L stainless steel mounting plate. Relief Valve: 316L stainless steel.

Weight: 5 lb (2.4kg) approx.





Technical Specification

Mini-Z-Purge Mini-Y-Purge

1ZDP/_/__ 1YDP/ /





DP	bp

Dimensions/ Spec.		1ZDP/p 1YDP/p	om/ om/	1ZDP/bp/ 1YDP/bp/		
Width	w	7.9"	200mm	7.8"	197mm	
Height	h	7.9"	200mm	5.0"	127mm	
Depth	d	2.4"	62mm	3.1"	79mm	
RLV Width	х	2.4"	62mm	2.4"	62mm	
RLV Height	у	5.2"	133mm	5.2"	133mm	
RLV Depth	z	1.3"	33mm	1.3"	33mm	
Fitting Length	а	1.0"	25mm	0.4"	11mm	
Fitting NPT	b	¹ / ₄ "		¹ / ₄ "		
Signals NPT	С	1/ ₈ "		1/ ₈ "		

Note on IS output ('Z' Systems)

I.S. outputs can be connected to Intrinsically Safe or nonincendive circuits, with the panel mount PM option, it can also be connected to general purpose (GP) circuits powered from inside the enclosure.

COMMON SPECIFICATION

Location of Control Unit. **Panel Mount** Model No. 1ZDP/pm/IS or /PO Model No. 1YDP/pm/IS or /PO

Control Unit Location: Side or Front of pressurized enclosure

Back Plate

Model No. 1ZDP/bp/IS or /PO Model No. 1YDP/bp/IS or /PO

Control Unit Location: Top, Side or Bottom of pressurized enclosure

Warning Label (loose) for User's calibration details, for mounting to pressurized enclosure.

"Alarm" Remote Output Options:

- /IS Dry contacts for switching non-incendive or intrinsically safe circuits. "Alarm" open on loss of pressure.
- /PO "Pneumatic Output" "Alarm Output" Main supply 60 psi / 4 bar Pressure Output "Pressure OK". No Output "Alarm".

Type Number (example)

OPERATION



pm Panel Mount

Output 🗲

- IS Intrinsically Safe Output **PO** Pneumatic Output





RP-Max-Z

Room Pressurization System Z-Purge Class I, Division 2 Gp C&D Ex pz Zone 2 IIB T3 Cat. 3 G ATEX



OPERATION

The Expo Technologies RP-Max-Z range of room pressurizing units are designed for Type Z (Ex pz) pressurization of rooms in accordance with NFPA 496 2008 and ATEX IEC/EN 60079-13 Draft. At the heart of each system is Expo's control logic which provides for pressure monitoring and air inlet fan control.

The RP-Max-Z room pressurization systems are designed to be used in Class I Div 2 or Zone 2 locations making the interior of the room a general purpose location. The RP-Max-Z can adequately pressurize and ventilate rooms with 1 door (1800 cfm) or 2 doors (3000 cfm). For additional ventilation capacities consult the factory.

CORE FUNCTIONS

- Room pressure monitoring and display
- Fan speed control to reach minimum pressure for compensation of leakages
- Fan control to provide high rate ventilation [up to 60 fpm (0.3 m/sec) velocity across open doors] for door open conditions
- Alarm contacts for low pressure and fan failure indication

ADDITIONAL FUNCTIONS

- External input to shut down fan
- External input to force system into high flow

Features

- + Designed to NFPA496 and ATEX EN 60079-13 (Draft) Room Standards
- + Compact Design for Harsh Environments
- + -20°C (-4°F) to +40°C (+104°F) on request +60°C (140°F)
- + Easy Access User Controls
- + Fresh Air Inlet Connection
- + Replaceable Inlet Air Filter
- + Ventilation Capacities of 1800 to 3000 cfm (3000 to 5000m³/hr)

ELECTRICAL

- Electrical configuration includes required circuit protection for motors and control circuitry
- Configured for single phase 230V 50/60Hz. Other supplies upon request

MECHANICAL

- Preferred mounting arrangements:
 - Through Wall Mounting
 - In Room Wall Mounting
 - Custom design can be engineered to meet specific room requirements

- Simple filter and additional filtration devices
- Sand trap box can be specified for high dust environments such as desert locations
- Inlet stacks can be provided to suit
- Optional Stainless Steel or Corrosion Resistant Materials
- Additional Options Available Consult the Factory

Technical Specification Room Pressurization System RP - -







MiniPurge Interface Units

Mains power and small signal isolation for Class I, II, Division 1, Grp B thru G for USA Ex d IIC T5, Ex tD A21 IP6X T80°C Zone 1 (21) IECEx Category 2 GD ATEX



OVERVIEW

The MiniPurge Interface Unit (MIU) provides switching of power to the pressurized enclosure, utilizing the pneumatic or IS output from the MiniPurge. The range of units allows up to 3ph (phase) current and power to be switched. For purged enclosures in a Zone 1 (21) or Class I, II Div 1 hazardous location, it is necessary to isolate all sources of power into the enclosure. This may also include signals or data such as 10/100 Ethernet connections. There are also contacts for a remote alarm / pressurized signal.

PRODUCT RANGE

Expo offers three standard MIU's which cover the most common applications. In addition we can offer customized units if a standard is not available for your particular application. The standard MIU range is designed to work with the Pneumatic Output version of the MiniPurge product range. The pneumatic output form the Power and the Alarm outputs drives a pneumatic actuator which operates the switches inside the flameproof / explosion-proof enclosure. In common with the MiniPurge range, the units carry IECEx, European and North American approvals, making them ideal for the OEM offering product to a global market. The range is detailed in the technical specifications overleaf.

FEATURES

- + Cost effective installation and maintenance.
- + Local Power Isolation for purged enclosures.
- + Isolates small incoming signals 4-20mA, RS232, CAT 5 and others.
- + Alarm switch/status output: 3A/250Vac SPCO.
- + Ex d IIC T5, Category 2 GD Ex tD A21 IP6X T80°C Class I, II Division 1 Group B, C, D & E, F, G



MANUAL OVERRIDE

In some cases it is desirable to have a manual override facility. The Expo Mechanical Manual Override option provides a key operated override facility which can turn on the power even if a pneumatic signal for purge complete is not available. This facility is for use in controlled conditions such as maintenance under 'gas free' certificates or Hot Work permits. This option must be ordered with the MIU.

DIRECT CONNECTION KIT

A direct connection kit (KMP-2600-000) is available to connect a size 1 MiniPurge directly to a 4PNO MIU/dA. This saves both space and installation time. If this kit is selected the Mechanical manual override cannot be used.

EXTERNAL CONNECTION

The MIU is based on a range of flameproof / explosion-proof enclosures. The electrical connections to these units must be made with approved connection devices, such as cable glands or poured seals, according to the local regulations for use and the cable or conduit system used. Due to the wide variety of connection systems and cables used, these are not supplied with the units. Expo representatives can offer advice on appropriate devices.





Technical Specification MiniPurge Interface Units



Dimensions	s/Spec.	d	Α	c	X		dT
Width	w *	6 ³ / ₁₆ "	157mm	6 ³ / ₄ "	171mm	7 ³ / ₄ "	197mm
Height	h **	5 ¹ / ₈ "	130mm	5 ¹ / ₂ "	140mm	6 ⁷ / ₁₀ "	170mm
Length	L *	3 ³ / ₄ "	95mm	4 ³ / ₄ "	121mm	6.0"	152mm
Fittings len	igth a	3.5"	88mm	3.5"	88mm	3.5"	88mm
Fittings len	igth c	1.8"	45mm	1.8"	45mm	1.8"	45mm
Weight (app	prox)	6.5 lb	3.0 kg	8.0 lb	3.6 kg	15.0lb	6.7 kg
Fitting Thr	ead	10/3	2 UNC,	M5			

* Distance between fixing points

- ** **h** includes lid
- 'a' Manual Override Model No: AGM-GM00-016
- 'b' Depends on fittings used
- Ø 1.2["] 30mm

COMMON SPECIFICATION

- A) Standards & Certificates: IEC / EN 60079-1 & 61241-1, European ATEX II G D 2, American UL, Class I, II Div 1 Grp B thru G. Requirements of the 'Low Voltage' Directives & CE marking.
- B) Protection Class: II 2 G D Ex d IIC T5 -20°C(-4°F)<Tamb<+55°C(131°F) or T6 -20°C(-4°F)<Tamb<+40°C(104°F) (Zone 1) Ex tD A21 IP6X T80°C (Zone 21) Class I Div 1 Group B, C & D.
- C) Box features: Aluminum, natural, round screw lid construction, mounting lugs, earth screw.
- D) Pneumatic 'power & alarm' switch actuators. Operated by 2-bar / 30-psi supply signal from /PO output on Minipurge.
- E) Alarm switch: 3A/250Vac SPCO wired to terminals CPA.

dA	dX	dT
Power switch:	Power switch:	Power switch:
4PNO/12A/300Vac(UL)	4PNO/12A/300Vac(UL)	4PNO/35A/600Vac(UL)
4PNO/20A/440Vac(IEC) for T6 (-20°C <tamb<+40°c)< td=""><td>4PNO/20A/440Vac(IEC) for T6 (-20°C<tamb<+40°c)< td=""><td>4PNO/35A/600Vac(IEC)</td></tamb<+40°c)<></td></tamb<+40°c)<>	4PNO/20A/440Vac(IEC) for T6 (-20°C <tamb<+40°c)< td=""><td>4PNO/35A/600Vac(IEC)</td></tamb<+40°c)<>	4PNO/35A/600Vac(IEC)
4PNO/16A/440Vac(IEC) for T5 (-20°C <tamb<+55°c)< td=""><td>4PNO/16A/440Vac(IEC) for T5 (-20°C<tamb<+55°c)< td=""><td></td></tamb<+55°c)<></td></tamb<+55°c)<>	4PNO/16A/440Vac(IEC) for T5 (-20°C <tamb<+55°c)< td=""><td></td></tamb<+55°c)<>	
	Signal:	Signal:
	4PNO/5A/250Vac	4PNO/5A/250Vac
Entries: 3 x ¹ / ₂ " NPT	Entries: 3 x ¹ / ₂ " NPT	Entries: 2 x ¹ / ₂ " NPT 1 x ³ / ₄ " NPT
P/N: AMU-9AA1-510 110V	P/N: AMU-AAA1-610	P/N: AMU-BAA1-610
P/N: AMU-9AA1-511 230V		







MiniPurge Accessories

Customize Your Expo MiniPurge System with our cost effective and installation time saving accessories. Consult factory for additional details.

Panel Mount Flange



Designed for Size 1X MiniPurge Models. Flange is factory fitted. 316L Material. Specify p/n KMP-4000-000 (Size 2X MiniPurge also available in Panel Mount)

Top Mounting Kit

Wall Mounting Bars



Allows for Size 1X MiniPurge Models to be remote mounted on walls. Uses rear mounting holes of control unit enclosure. 316L Material. Specify p/n WM(1). Also available for Size 2X [p/n WM(2)] & Size 3X [p/n WM(3)].



Engineered for the Integral Mounting of Size 1X MiniPurge Models with Standard dA Type MIU (MiniPurge Interface Unit). Designed for ease of installation. Supplied with Fittings as shown. Specify p/n KMP-2600-000.

Stainless Steel Fittings Kit



For connecting the Outputs of MiniPurge Control Units to any MIU (MiniPurge Interface Unit). Qty 4-316S/S fittings for 1/8" OD Tubing (<u>Note</u> : Tubing pictured above is supplied by others). Specify p/n STSKIT.







CE





MiniPurge Accessories

Override Switch for MIU



Mechanical / Pneumatic Override Switch with Key available for all sizes of MIU (MiniPurge Interface Unit). Switch is factory installed on the MIU. Specify p/n AGM-GM00-016

Pneumatic Override Switch



Mechanical / Pneumatic Override Switch with Key available for all sizes of Mini-X-Purge Systems. Switch is supplied loose with instructions for panel mount. Specify p/n MO(PNEU).

Override Switch, Class I & II, Div 1



Mechanical / Electrical Override Switch with Key mounted in an Explosion Proof enclosure. Designed for use with all sizes of Mini-X-Purge System UL Approved. Supplied loose. Specify p/n MO(UL).

Override Switch, EEx de IIC



Manual / Electrical Override Switch with Key mounted on an Increased Safety enclosure. Supplied loose. Specify p/n MO(BOX).

Mini-X-Purge Hook-Up Kit



Designed for the convenient connection of the Relief Valve / SAU & Control Unit (Flow Sensor) on all Mini-X-Purge Models. 5 ft (1.5 m) Length. Specify p/n RLVHOOKUPKIT.





Mini-X-Purge CF "Alarm Only" Module



Designed for Mini-X-Purge Continuos Flow (CF) Systems only, the "Alarm Only" function alerts the user when pressure is lost while still supplying power to the protected enclosure. Factory fitted. Specify p/n AO.

Universal Mounting Bracket



For use on 1ZCF / Continuous Flow Systems, this option conveniently provides for mounting the Relief Valve (RLV25) & Spark Arrestor (SAU25) in one location. It is also designed for remote mount off the purged enclosure. 316LS/S material. Specify p/n S0024/219.

Extended Pushbutton



The miniature Extended Pushbutton is designed for operating the keys of programmable controllers and displays within purged enclosures. Specify p/n S0030/278.

Filter & Regulator



Inline Auto-Drain Filter / Regulator Air Set, 40 Micron, 1/2" NPT connections (also available 3/4" NPT connections). Specify p/n B74G-4AK-AD3-RGM, 1/2" p/n B74G-6AK-AD3-RGM, 3/4"





Operator Interface Adapters

Class I or II, Div 1 or 2 ATEX Zone 1 or 2 (21 or 22)



A typical Expo Technologies Adapter installation - here used by a manufacturer of gas separators - employs a NEMA 4 enclosure and Allen-Bradley's Panel-View[®] interface.

OVERVIEW

The Expo Technologies Operator Interface Adapters is used to allow regular operator interfaces to be used in hazardous locations.

It is used with Expo Technologies purging systems and suitable pressurized enclosures. The Adapter increases the Classification of operator interfaces from Non-Classified or Div. 2 to Class I, II. Div. 1, 2. Group A through G. / ATEX Zone 1, 2 (21 or 22) IIC.

The Adapters provide water and dust protection, enable full functionality of operator interfaces/ keyboards, and allow viewing of enclosed monitor screens.

Adapters can be manufactured by Expo Technologies, for any operator interface, including Allen-Bradley's Panel View[®] series. Consult factory regarding use with other manufacturers' models.

FEATURES

- + Mounts into the wall of standard pressurized panel.
- + Comes complete with its own gasket.
- + When used with an approved Expo purge system (see Application Details below), the design complies with the requirements of the NFPA 496 Standard and is included within the ATEX EN 50016 certificate for pressurized enclosures issued to Expo Technologies by SCS (Sira Certification Services UK).



An Expo Technologies MiniPurge[®] unit provides purging and pressurization between the Adapter and the third-party panel interface.



NFPA 496







Technical Specification Operator Interface Adapters: General Information

OPERATING PRINCIPLE

The design provides mechanical protection and pressurization containment, but still enables viewing and operation from the hazardous location. The other membrane mimics the artwork of the original operator interface.

Hazardous Location





Application Details	
For NEC Div. 1 / Zone 1 and ATEX Zone 1 / 2 (21/22):	Purge with MiniPurge® (NFPA X purge / ATEX dual-approved Control System).
For NEC Div. 2 / Zone 2:	Purge with Mini-Z-Purge.
For NEC Div. 1 / Zone 1 using Div. 2 Operator Interface and Equipment:	Purge with Mini-Y-Purge.

Enclosure pressure max.	10mbar	4"WC
Mounting distance min	13mm	¹ /2"
from Operator interface		
Operator Travel	up to 0.5mm	
Use with Touchscreen	not compatible -	
	consult factory	

Allen Bradley 900 complete with the Expo Operator Interface Adapter installed in a Pressurized Enclosure. Class I Division 1 or for a Zone 1 & 2 (21 & 22) area.



Allen Bradley 900 complete with the Expo Operator Interface Adapter installed in a Pressurized Enclosure. Class I Division 1 or for a Zone 1 & 2 (21 & 22) area.





Cabinet Cooler For pressurized enclosures

AVC-0000-001 AVC-0000-003



Expo Technologies Cabinet Cooler provides cooling for pressurized enclosures using compressed air. Cooling is required either to remove heat generated by the contents of the enclosure, or to compensate for high ambient temperatures.

SPECIFICATION

GENERAL LAYOUT OF CABINET COOLER

Power Supply:	AVC-0000-001 110-230 Vac. 50/60) Hz
	AVC-0000-003 24 Vdc.	
Air Supply:	60 - 100 psi 25 scfm, 708 NI/m,	4 - 7 barg at 100 psi 7 barg
Cooling Capacity:	440 W at 100 psi 7 1700 Btu/hr	barg
Temperature Control:	Electronic = +/- 2°C	;
Maximum Air Outlet Temperature:	130°C / 266°F	

Approximate Weight: 1.5 kg (4 pounds)

Suitable for T4 at 40° C / 104° F ambient. Cooler control must be housed in an IP40 enclosure or better.

COMPONENTS

- + One complete assembly, quick and easy to install.
- + Specifically designed to cool pressurized enclosures.
- + Unique one-way valve prevents leakage from the vortex exhaust when the cabinet cooler is not in operation.
- + For mounting in any wall of the pressurized enclosure.
- + The Cabinet Cooler has a remote electronic temperature sensor. This can be positioned as required to achieve maximum customer control.
- + Operates on 110-230 V AC after the purge has been completed and power has been applied to the enclosure. Option 24 Vdc.
- + Hot air exhaust is temperature limited. (T4)
- + No moving parts, giving high reliability.

SPECIFICATION NOTE:

The Vortex Cooler assembly will operate in all orientations. However, the cold air out check valve must be rotated to the vertical position using an extension pipe if required.

Temperature sensor, 35mm (1 3/8") long by 10mm (13/32") Dia.

is supplied and should be mounted at the top of the enclosure or the clients preferred position, using a 'P' clip.







34









Datex Intrinsically Safe Data Terminal



OVERVIEW

The Datex intrinsically safe keyboard has been designed to meet a wide range of requirements for full function keyboards in hazardous areas. The unit can be supplied as a stand alone system or as components for the OEM to incorporate into his own equipment.

OPTIONAL EXTRAS

Force sensitive mouse button LCD display 4 x 40 characters 5mm high, 4 x 20 characters 9.8mm high Panel mount for the OEM

APPLICATIONS

Data input in hazardous areas Process control Batch control Packaging Maintenance schedules and reporting Experimental data recording

Dimensions	н	w	D	CUT OUT
Desk Mount	62	400	245	
Panel Mount	195	405	26	361 x 150
Panel Mount & Mouse	195	490	26	446 x 150
Power Supply, PDU	45	162	108	



Model No AGE-DAT0-006

FEATURES

- + Full function compact QWERTY 96 key.
- + Sealed membrane construction for harsh environments.
- + 316L stainless steel housing (IP65).
- + INTRINSICALLY SAFE, galvanically isolated does not need IS earth.
- + Multiple protocols PC/AT, RS232.
- + Twin twisted pair connection over distances up to 400m.

Desk Mount Model

Model No	Description
AGE-DAT0-001	KEYBOARD ONLY
AGE-DAT0-004	KEYBOARD & MOUSE BUTTON
AGE-DAT0-008	KEYBOARD & DISPLAY
AGE-DAT0-010	KEYBOARD & DISPLAY & MOUSE BUTTON

Panel Mount Model

Model No	Description
AGE-DAT0-006	KEYBOARD ONLY
AGE-DAT0-012	KEYBOARD & MOUSE BUTTON



Model No AGE-DAT0-019 (AGE-DAT0-004 ADAPTED TO FOLD AWAY TRAY)





36



Technical Specification Datex Intrinsically Safe Data Terminals

SAFE AREA

The safe area interface unit (PDU) is a single card, which provides an intrinsically safe interface for power and data to the hazardous area. It handles the communication with the host computer.

TECHNICAL DESCRIPTION

The Datex intrinsically safe data terminal system provides a means to input data in a hazardous area and gives the operator feedback from the host computer via a text display.

The system can interface with various types of computer in the safe area and provide a range of devices in the hazardous area.

HAZARDOUS AREA

The field data terminal is intrinsically safe and may be located and operated in a hazardous area. It can combine keyboard, pointing device or text display functions to suit a variety of applications. It receives the power and data from the safe area via the PDU.







Pneumatic Valves

Friction Free

High Performance and Intrinsically Safe Solenoid Valves



The FFV "Friction Free Valve" offers exceptionally low power operation with high reliability in all service applications. From either non stop cycling to low use applications the FFV gives wear free and frictionless operation.

The Friction Free Valve provides freedom from sticking even over long "intrinsically safe" and other low power wire loops.

■ CERTIFICATION

Europe

ATEX to EN 50020. II 1 GD EEx ia IIC T6. PTB to VDE 0171 Ex is (Zone 1 & 2) G4, G5. ATEX to EN 50021. II 3G EEx n A IIC T6 or T4.

North America

FM/USA Class I, Div 1, Groups A, B, C, D (dependent on barriers used).

Specifying Information

(F

The FFV consists of 3 basic sections: The Electrical Parts:- Solenoid Operator Cap and Connector. The main pneumatic parts: Valve Module section. The pneumatic connection block: Port block or manifold. The main part number consisting of 10 digits defines the valve. Select from the blocks below or speak with your technical sales representative for further advice.

KEY PERFORMANCE NOTES

- + Fast and positive control of equipment assured by high flow capacity.
- + Low power output controls can be used on large sites or long control loops with the FFV's extremely low power needs.
- + No sticking. Eliminate one of the most common plant valve problems with the FFV's friction free operation.
- + Up to 4 solenoids can be operated via one I.S. interface.
- + Minimize piping and simplify site installation using direct NAMUR actuator mounting options.
- + All common valve functions available to match virtually all process and control applications.
- + Manual "latch on" and L.E.D. "energized" indicator options valuable for process set-up and local plant control. Easier circuit "proving" and visual indication on "sequential" process control.
- + Certified to all major National and International standards.
- + A product manufactured by a leader in hazardous area technology, expert advice and application support is part of the service.











note: subject to change without any notice, JDA pay no responsibility

38



Technical Specification Pneumatic Valves Friction Free













Double 3 Port / 2 Position, in one module

Outline Performance Data

Range of pneumatic functions

2 port 2 position normally closed. 3 port 2 position normally closed. 3 port 2 position normally open.

4 port 2 position.

4 port 3 position. Double 3 port 2 position in one valve module.

Manual reset

Option for when operator reset after valve "trip" is required. May be located on the valve or remotely piped.

Manifolds

Options for materials and function, common exhaust and supply options plus integrated individual stop valve options.

Port Blocks:

NAMUR adapter plates for direct mounting to valve actuators are a standard option.

Operating Speed (typical) 70mS (3 port 2 position) 110mS (4 port 2 position).

Environment Suitability

-10°C to +65°C (+14°F to +150°F) -20°C to +65°C (-4°F to +150°F) Low temperature seals.

Nominal Voltage AC/DC	**14-24	12-24	50	110	220/240
Operating voltage range	13-26.4	10.8-26.4	45-55	99-121	*198-264
Nominal current mA	9.5-16	8-16	11	11	10
Power consumption Watt	0.15-0.4	0.1-0.4	0.6	1.3	2.4
Total resistance 0hm	1.5k	1.5k	4.5k	9.7k	25.0k
Rating	Continuous				

The built in bridge rectifier, as well as permitting AC or DC operation, effectively eliminates back e.m.f. spikes when the valve de-energizes. *216V for type N approved valves **Low energy type

Flow capacity

With 4 bar (58 psi) inlet pressure and unrestricted outlet:- 821 liters/min (29 scfm). With 6 bar (87 psi) inlet and unrestricted outlet: 1175 liters/min (41.5 scfm). Please consult Expo Technology for more details flow data.

Expected life Better than 100 million cycles under standard conditions.

Air quality

Filtration to better than 50 micron particle size and dew point below expected ambient temperature. Lubricated air is not required but is not detrimental.

Pressure limits

3/2 n/c & 2/2 n/c, 2-9 bar (30-130 psi). 4/2 and 3/2 n/o, 4-7 bar (60-100 psi). 4/3, 2-7 bar (30-100 psi). Separate pilot supply and other low pressure valves are available. Outside this range consult Expo Technologies for options.

39



Specifying Information

The FFV consists of 3 basic sections:

The Electrical Parts Solenoid Operator Cap and Connector.

The main pneumatic parts Valve Module section.

The pneumatic connection **block** Port block or manifold.

The main part number consisting of 10 digits defines the valve. Select from the blocks below or speak with your technical sales representative for further advice.



Standard materials

Solenoid Cap Maranyl housing with metal electrical parts.

Valve modules Kematal with metal springs and nitrile seals (optional seal materials)

Port Blocks Aluminium alloy LM6 anodized optional materials.

The intrinsically safe FFV's operate with suitable barriers available from all major suppliers. Further technical information is available covering other aspects of the solenoid valve range including dimensional information, installation data, manifolding options, materials, electrical criteria etc.

	EX	AMPLE	
	1 2 3 4	5 6 7 8 9 0	
	V 2 4 5	0 2 1 L 0 0	
BOX 1			BOX 10 MANIFOLD VALVES
V VALUE + STANDARD PORT BLOCK B VALUE + BRASS PORT BLOCK S VALUE + ST/ST PORT BLOCK M MODULE ONLY C VALVE + ALUMINUM MANIFOLD WITH STOP VALVES R NAMUR ADAPTER PLATE H VALVE + STEEL MANIFOLD			NOT APPLICABLE SUPPLY COMMON EXHAUST COMMON COMMON SUPPLY ONLY COMMON EXHAUST ONLY Z
BOX 2 PORT SIZE			BOX 9 MODULE
0 NOT APPLICABLE 2 1/4" BSP (G1/4) 3 1/4" BSP EPOXY PAINTED (G 1/4) 4 1/4" NPT EPOXY PAINTED 5 1/4" NPT/API 6 3/8" BSP (G3/8) 7 3/8" BSP EPOXY PAINTED (G3/8) 8 3/8" NPT EPOXY PAINTED 9 3/8" NPT			STANDARD SEALS AND STANDARD PILOT SUPPLY0STANDARD SEALS AND SEPARATE PILOT SUPPLY2LOW TEMPERATURE SEALS AND STANDARD9PILOT SUPPLY3LOW TEMPERATURE SEALS AND SEPARATE9PILOT SUPPLY4VITON SEALS AND STANDARD PILOT SUPPLY5VITON SEALS AND SEPARATE PILOT SUPPLY6
BOX 3 VALVE FUNCTION			BOX 8 APPROVAL REFERENCE
 NOT APPLICABLE 2 PORT 2 POSITION NORMALLY CLOSED 3 PORT 2 POSITION NORMALLY CLOSED 3 PORT 2 POSITION NORMALLY OPEN 4 PORT 2 POSITION 5 4 PORT 3 POSITION 			NOT APPLICABLE O BASEEFA (GB) I.S. (SFA3012) (SUPERSEDED BY "L") A ATEX CAT 3 ZONE 2 Ex nA C PTB (D) I.S. (SUPERSEDED BY "L") E ATEX CAT I I.S. (EN 50 020) L FM (USA) I.S. (J & K) J
BOX 4 OPERATOR			BOX 7 SOLENOID CONNECTOR
PILOT AIR 2 SOLENOID MANUAL RESET + MANUAL OPERATOR 3 SOLENOID MANUAL RESET 4 SOLENOID + MANUAL OPERATOR 5 SOLENOID + MOMENTARY OPERATOR 6 LOW ENERGY SOLENOID + MANUAL OPERATOR 7 LOW ENERGY SOLENOID + MOMENTARY OPERATOR 8 LOW ENERGY SOLENOID RESET + MANUAL OPERATOR 9 LOW ENERGY SOLENOID RESET + MANUAL OPERAT	OR :RATOR		NOT APPLICABLE0PLUG-IN CONNECTOR (PGA. DIN43650)1FLYING LEAD (1 METER LENGTH)2M20 FEMALE PLUG CONNECTOR3FLYING LEAD (2 METER LENGTH)4FLYING LEAD (4 METER LENGTH)5PLUG-IN CONNECTOR6
BOX 5 SECONDARY OPERATOR			BOX 6 SOLENOID VOLTAGE
0 SPRING RETURN 1 PILOT AIR 4 SOLENOID + MANUAL OPERATOR 5 SOLENOID + MOMENTARY OPERATOR 6 LOW ENERGY SOLENOID + MANUAL OPERATOR 7 LOW ENERGY SOLENOID + MOMENTARY OPERATOR			NOT APPLICABLE 0 12-24V AC/DC 1 14-24V AC/DC 2 50V AC/DC 3 110V AC/DC 4 200-240V AC/DC 5



BARRIERS AND DRIVERS FOR INTRINSICALLY SAFE SOLENOID VALVES

ZENER BARRIERS

Units shown are for 24 V systems with earthed return. Units are also available for 18 V and 15 V systems and for floating returns. Units are certified [EEx ia] IIC (CENELEC) and for Class I Div 1 Grp A, B, C, D (USA).

CEAG-Crouse Hinds

GHG 111 9140 V 0728 GHG 114 9140 V 0779 Single Channel **Dual Channel**

MTL

This is a selection of suitable barriers. Other units from these or other manufacturers may also be suitable. A complete file is kept and further advice and guidance can be given. The inclusion or exclusion of any manufacturer does not imply any recommendation, but is provided only for the guidance of our users.

7708+ Overvolt protected	Single Channel	3021 Loop powered	
7728+	Single Channel	20 - 35 V dc	Single Channel
7779+	Dual Channel	4021(/S)	
4787+	Dual Channel	With failsafe override	Single Channel
4787P+	Dual Channel	2241	
7028+	Single Channel	240,110 Vac 24 Vdc	Single Channel
7128+	Single Channel	2242	
7208+	Single Channel	240,110 Vac 24 Vdc	Four Channel
Note: The "Line Fail Detection	n" feature is	5021	
NOT compatible with the FF	/ Solenoid.	Loop powered 20-35V 5024	dc Single Channel
		20-35V dc Logic driver	Single Channel
Pepperl & Fuchs		Pepperl & Fuchs	
Z129/Ex	Single Channel	EGA-135	Dual Channel Eurocard
Z229/Ex	Dual Channel	ED2-VM-Ex 4.35	4 Channel Eurocard
Z728/Ex	Single Channel	KFD2-SD-Ex 1.48	Single Channel loop
Z779/Ex	Dual Channel		powered
		KFD2-SL-Ex 1.48	Single Channel logic input
Stahl		Stahl	
9001/01-280-085-10	Single Channel	9351/10-16-10	Single Channel
9002/11-280-186-00	Dual Channel	9451/12-02-10	4 Channel Eurocard
9004/01-280-025-00	Single Channel	9451/12-04-10	4 Channel Eurocard
Electr	onic current limit		loop powered
The FFV Low Energy	Solenoid Cap		
REC		REC	
× *	RL1 1500	RL2	
XX			

(1) (3) (2) 3 wire circuit is shown as broken line and is used when this plug-in connector is supplied. Pin connections are shown in brackets. Single solenoid uses pins 3 and 2.

I.S. SUPPLY AC/DC

41

I.S. SUPPLY AC/DO

note: subject to change without any notice, JDA pay no responsibility

GALVANICALLY ISOLATED DRIVERS

Units shown are for 24 V systems unless

C, D (USA).

Loop powered

MTL

CEAG-Crouse Hinds

GHG 138 331 A 7008

GHG 138 331 B 7008

otherwise stated. Units are certified [EEx ia]

IIC (CENELEC) and for Class I Div 1 Grp A, B,

Single Channel

Single Channel





PE Certification Ex p

ATEX Pressurized Enclosures Ex [px] Zone 1 (Category 2) Ex [pz] Zone 2 (Category 3)



Photo: ATEX Zone 1 IIC T4 Category 2

Expo PE2, 316L stainless steel Ex [px] certified Pressurized Enclosure

including 1XLC/ss/PO +MIU/dA MiniPurge™ Ex [px] Purge & Pressurized System

Zone 1 Certification of YOUR Equipment

The Expo MiniPurge[™] Ex [px] systems and Pressurized Enclosures (PE2) [max. 2.1m x 0.9m x 0.9m] are certified to EN 60079-2 & ATEX Directive 94/9/EC for Zone 1 IIC T4 applications. Expo also holds a certificate for the completed assembly including your instrumentation and electrical equipment.

Common Pressurized Enclosures Options:

- + 316L Stainless Steel or Mild (Carbon) Steel
- + Windows up to 1m²
- + Control Devices (Lamps, Push Buttons, etc)
- + Sub-panel (Chassis) Rear, Sides, Door
- + 19" Rack
- + Gland Plates & more

Contents of the Pressurized Enclosure

All internal components and details of the PE must be reviewed by Expo Technologies to determine compliance with the ATEX Certificate, Schedule of Limitations (SoL), thereby ensuring effective purging, compliance with Temperature Rating and Safe Operation. Batteries need to be reviewed. Enclosures with internal source of gas release. Please contact Expo. Please ask Expo for a copy of the "PE2 Schedule of Limitations". Obtain ATEX Zone 1 Certification with YOUR Equipment

ATEX Certified, Cat 2, Expo Pressurized Enclosure Type PE2

+

ATEX Certified Expo Pressurize & Purge System

+

YOUR Equipment - within agreed limits Expo "Schedule of Limitations" (SoL)

+

Expo Verify the installation is compliant with the SoL

ATEX Zone 1 Certification to EN60079-2 & -0 Ex [px]

Advantages:

- + No need for a Notified Body as the Certificate has been issued to Expo
- + Hazardous Area Engineering
- + Includes "Pressure Leakage Test" Report
- + Reduced Certification costs
- + Reduced time to market
- + Where equipment does not comply with the SoL certification may be possible

"The Purge + Pressurization Specialists"







Photo: ATEX Zone 2 IIC T4 Category 3

Expo PE3 mild (carbon) steel painted Ex [pz] certified Pressurized Enclosure

including a panel mount 1ZLC/pm/IS MiniPurge™ Ex [pz] Purge & Pressurized system

Zone 2 Certification of YOUR Equipment

The Expo MiniPurge[™] Ex [pz] systems and Pressurized Enclosures (PE3) are certified to EN 60079-2 & ATEX Directive 94/9/EC for Zone 2 IIC T4 applications. Expo also holds a certificate for the completed assembly including your instrumentation and electrical equipment. PE's >2.1m x 0.9m x 0.9m will include for an Expo, ATEX Category 3 Certificate

Common Pressurized Enclosures Options:

- + 316L Stainless Steel or Mild (Carbon) Steel
- + Windows up to 1m²
- + Control Devices (Lamps, Push Buttons, etc)
- + Sub-panel (Chassis) Rear, Sides, Door
- + 19" Rack
- + Gland Plates & more

Contents of the Pressurized Enclosure

All internal components and details of the PE must be reviewed by Expo Technologies to determine compliance with the ATEX Certificate, Schedule of Limitations (SoL), thereby ensuring effective purging, compliance with Temperature Rating and Safe Operation.

Batteries need to be reviewed. Enclosures with internal source of gas release. Please contact Expo. Please ask Expo for a copy of the "PE3 Schedule of Limitations".

Obtain ATEX Zone 2 Certification with YOUR Equipment

ATEX Certified. Cat 3, Expo Pressurized Enclosure Type PE3

+

ATEX Certified Expo Pressurize & Purge System

+

YOUR Equipment - within agreed limits Expo "Schedule of Limitation" (SoL)

+

Expo Verify the installation is compliant with the SoL

ATEX Zone 2 Certification to EN60079-2 & -0 Ex [pz]

Advantages:

- + No need for a Notified Body as the Certificate will be issued by Expo
- + Hazardous Area Engineering
- + Includes "Pressure Leakage Test" Report
- + Reduced Certification costs
- + Reduced time to market
- + Where equipment does not comply with the SoL certification may be possible

"The Purge + Pressurization Specialists"



note: subject to change without any notice, JDA pay no responsibility

Can I use my own enclosure

Where there is an existing enclosure it may be suitable for pressurization (Ex pz) and may be certified for Zone 2, ATEX, Category 3 hazardous locations. The enclosure should be fully welded, have sufficient hinges, fasteners around the door to hold the internal pressure with leakages < 60 NI/min, components, windows mounted in the walls of the enclosure will need to comply with the relevant standards such as EN 60079-0, impact tests, UV, Optical Radiation, etc., contents to comply with the SoL. Expo Consultancy Service will advise on these requirements and recommend solutions for your equipment for compliance with the EN standards and supply an ATEX Category 3 certificate for the complete package.

If you have an application for Hazardous Area (Location) IECEx – ATEX - NEC please feel free to ASK!

43





Restricted Breathing Enclosures

Custom designed and built enclosures for Zone 2 applications

CE 0518 $\langle \xi_X \rangle$ II 3 G EEx nR II T6



OVERVIEW

Restricted Breathing is a method of construction of enclosure such that the possibility of entry of a surrounding explosive gas atmosphere is reduced to a low level. This protection technique may be used in a Zone 2 classified location where explosive atmospheres are present in abnormal conditions only for short periods (typically less than 10 hours per year).

RESTRICTED BREATHING CONCEPT

The principle of the restricted breathing concept is that the Expo Enclosure is manufactured to include a very high level of sealing. This limits the possible entry of flammable gas or vapor. The technique ensures the cumulative concentration within the enclosure does not exceed the Lower Explosive Limit for the gas or vapor concentration. This is the case even over a long period of time compared with the possible duration of the presence of gas or vapor in the external atmosphere.

FEATURES

- + Unlimited enclosure size & configuration
- + 316L Stainless steel construction (Painted mild (carbon) steel optional)
- + All external fasteners in stainless steel
- + Access plates
- + Viewing windows
- + Operator interfaces: keyboards, pointing devices, pushbuttons, lamps
- + Passive operation, no external electrical control system or air supply required
- + ATEX Category 3 certified with your equipment installed inside.

APPLICATION OF THE TECHNIQUE

The technique can be used to protect equipment which may spark in normal operation or which has localized high temperature components. However, the equipment installed within the enclosure must not be capable of changing the internal temperature in the enclosure by more than 10 °C. The Expo EEx nR Enclosure is appropriately sized to ensure that this cannot occur based on the electrical and operational characteristics of the installed apparatus and the thermal characteristics of the enclosure design. Tests are performed on the completed assembly to verify the conditions so that the certification may be completed.

The EEx nR enclosure design parameters have been approved by a Notified Body and meet the requirements of the harmonized European Standards EN 50 014 and EN 50 021.

Expo designs and manufactures the enclosures to suit the equipment being housed, and can include practical features such as windows, access plates, and operating devices. In order to ensure continued high integrity of the equipment, connections are normally made through factory sealed cables or cable bushes.



Technical Specification EEx nR Restricted Breathing Enclosures



ENCLOSURE DESIGN OPTIONS

- Access plates on any face of the enclosure.
- Polycarbonate viewing windows.
- Pushbuttons, lamps, indicators.
- Operator keyboards, full function QWERTY or numeric input only.
- Operator force mouse RS232 / PS2 compatible.
- External electrical EEx e junction boxes for site connections. These are utilized so that the integrity of the restricted breathing enclosure is not impaired.
- Internal equipment mounting: chassis plates, mounting bosses, 19"rack mounts.
- External enclosure mounting: free standing, wall lugs, plinths, lifting eyes.

TYPICAL INSTALLED APPARATUS

- Displays: CRT's, TFT's, LCD's, HMI's
- Electronic control modules, computers, PLC's
- Measurement instruments
- Cameras
- Radio / Telecommunication devices

COMMON SPECIFICATION & OPTIONS

Housing material & finish

Stainless Steel 316L, non-reflective orbital brush finish.

Dimensions

Unlimited. The minimum size will be determined by the power dissipation of the equipment to be installed within the enclosure and the ability of the enclosure to maintain a maximum 10°C temperature rise.

Configuration

Custom designed & built to suit each individual application. Sloping desk sections, access plates, windows, control devices, internal & external mounting methods may all be included to suit both the installed equipment and the site conditions.

Standards

BS EN 50021:1999 (EEx nR) Electrical apparatus for potentially explosive atmospheres -

Type of protection "n"

ATEX Directive 94/9/EC (ATEX 100A)

Approval

Expo Technologies offer a Restricted Breathing enclosure fitted with your apparatus that conforms to the requirements of the above referenced standards and protection techniques. The Expo Technologies enclosure will have the specific approval code:

CE 0518 (Ex) II 3G EEx nR II T6

Temperature

-20 to +40°C Environmental protection Minimum IP65

Examples:

Height mm	450	800	1800
Width mm	450	500	1200
Depth mm	150	300	800
Maximum power W	30	75	440
Approximate weight empty kg	11.00	27.00	148.00
Typical application	Remote TFT monitor	PC workstation	Switchgear rack





HAZARDOUS AREA ENGINEERING **AND EXPERTISE - WORLDWIDE**



Expo Technologies applies more than 50 years experience to provide solutions for a customer base spanning major end users. OEMs and process industries. Expo enables operating electrical equipment and instrumentation in Hazardous Locations, harsh environments, hygienic conditions and other challenging applications.













PHARMACEUTICAL MANUFACTURE





CHEMICAL PROCESSES



PETROLEUM INDUSTRY



PAINT USER & MANUFACTURE



MANUFACTURER

46



Expo Purge & Pressurizing

Expo Technologies provides solutions for electrical equipment in Hazardous Locations. Purge & Pressurizing Control Systems allow

general-purpose electrical apparatus to be located safely in a Hazardous Location. A Hazardous Location is where there is a presence of ignitable gases, liquids or dusts and has been classified as hazardous/explosive.

Hazardous Locations are defined in International IEC Standards, European Standards (Zone 0, 1 & 2) and in the USA, NEC Standards, (where Division 1 & 2 are mainly used).

HAZARDOUS LOCATION



PRINCIPLE OF PURGING

Purge Exhaust

PRESSURIZATION CONTROL SYSTEMS

- + X Y Z Pressurization systems. For potentially explosive Gas and also Dust.
- + Approvals IECEx Global, European and N. American, with one design of system.
- + A complete range of systems is available to suit the smallest enclosure to >100m3 (3500 ft3).
- + Applications General purpose enclosures, electri cal panels, analyzers, computers, HV motors, etc.



Pressurization Control Systems



OPTIONS

Expo Technologies Pressurized Enclosures:

- + Certified to the European Standards to include generalpurpose electrical apparatus.
- + Alternatively a range of NEMA 4 and 4X and IP rated pressurized enclosures to meet other national standards.
- + All Pressurized Enclosures are subject to an over-pressure / leakage test to give long term reliability.
- + Stainless steel and Carbon (Mild) steel.



ENCLOSURE ACCESSORIES

- + Keyboards, Keypads, Pointing Devices.
- + PLC Operator Interface Adapters.
- + Enclosure Cooler Systems.
- + Power isolation / disconnect and remote alarm units
- (MIU's). + Push Buttons, Lamps and Switches etc.



Pressurized Enclosure Accessories

- PRESSURIZED ROOMS
 + Purge and Pressurize Control Systems fitted to Room and Analyzer Houses for people to work within.
- + There are several standards that cover this type of installation.

Expo Technologies control systems are designed to fulfil these



Intrinsic Safety (I.S.)

Intrinsic Safety is an internationally recognised means of protection for electrical apparatus in Hazardous Locations. The principle is to reduce the electrical energy to a level insufficient to cause ignition of the explosive gas. An intrinsically safe protection device, barrier, isolator must be included in the I.S. circuit/loop and can reduce the installation and wiring costs for the operator.

SOLENOID VALVES

- + Low power solenoids are ideal for I.S. (Intrinsically Safe) circuits.
- + High reliability due to the Friction Free (FFV) design.
- + Eliminates problems of sticking and wear associated with traditional spool valves.
- + FFV (Friction Free Valve) Approvals North America, and Europe.



I.S. Solenoid Valves FFVs

KEYBOARDS AND DATA TERMINALS

- + Certified in Europe.
- + Full function keyboards for a wide range of applications.
- + Force Sensitive Mouse option.
- + Rugged design.
- + Industrial Standard interfaces.
- + The Datex Terminal can include LCD Text Display to input data in a Hazardous Location.



Datex I.S. Keyboard and interface



Hazardous Area Enclosures

Flameproof (Explosion-proof) prevents an internal explosion propagating to the external atmosphere. An internal explosion can escape from the enclosure via flanges or threads that 'cool' the explosive gases before they enter the Hazardous Location, thus preventing an external explosion. Generally used for small switchgear and instrumentation.

■ RESTRICTED BREATHING Ex nR

- + For Zone 2 Areas to ATEX for Gas of Dust hazards
- + Passive protection manufactured from Stainless steel
- + Can house sparking contacts
- + Unlimited size and custom designs
- + Can incorporated windows, push buttons and other operators



Enclosure

■ NON INCENDIVE EQUIPMENT Ex nA

- + For Zone 2 Areas to ATEX for Gas of Dust hazards
- + Assessment of contents to ensure no sparking or high temperature incendive hazards
- + Modification of contents to meet requirements for temperature rise, creepage and clearance

■ cGMP ENCLOSURES FOR PHARMA AND FOOD MANUFACTURING

- + Stainless steel construction
- + Crevice free or minimised construction
- + Food safe seals suitable for chemical cleaning regimes
- + Custom designs including thermal management



NIR Spectrometer



Expo Technologies Support

Expo Technologies has an experiences workforce that is trained in the techniques of hazardous area electrical protection. This support is available from offices in England, United States and a network of Representatives / Distributors throughout the world.

SERVICE SUPPORT

- + Expo Technologies has service personnel to support the products and solutions supplied. Annual Service Contracts are available to meet the requirement of client-planned maintenance and ISO 9001 quality programmes.
- + The Service Engineers are certified for Offshore installations working.

UNLOCK THE SECRETS OF EXPLOSION-PROOF APPROVALS

- + Expo Technologies Consultancy provides specialised consultation for those clients who are seeking Hazardous Location approval / certification.
- + Consultancy includes advice on the design, preparation of submission document and supervising the testing, through to final Approval / Certification.
- + This service will enable the client to bring their product to the market place quickly and efficiently.
 Expertise covers North American, European and IEC standards as well as requirements for ATEX and CE marking for the European market.
- + For existing installations or a special design that has not been approved / certified, Expo Technologies can produce a 'Third Party Report' (TPR), ATEX European Declaration (AED) or 'Manufacturers Declaration of Conformity' (MDoC) IEC after inspection of the equipment. This checking by an independent organisation with specific industry expertise can be a very cost-effective way to demonstrate compliance, either to the end user or appropriate authorities.

TRAINING COURSES

+ Training courses on the standards, application, servicing and maintenance of electrical apparatus in Hazardous Locations areas can be tailored to the client's specific requirements.





Expo Technologies main engineering and manufacturing facility







Introduction to Purge and Pressurization



OVERVIEW

Purge and Pressurization is a method of protection used in hazardous locations to ensure that the interior of an electrical enclosure is free of flammable gas. Pressurization is generally used for electrical equipment that cannot be protected by other means, either because it is too large to be made explosion-proof, or too high powered to use intrinsic safety.

A vast range of electrical equipment is regularly protected by this very flexible technique.

Using a suitable purge control system and pressurized enclosure, purge and pressurization, provides an equivalent degree of safety to Flameproof (Explosion-proof) or Intrinsic Safety techniques. It also offers significant advantages of safety and durability.

PRESSURIZATION PROCESS

The pressurization process is very simple. Purge gas, normally compressed air, keeps the internal pressure of an enclosure above the pressure outside. External flammable gas cannot enter the enclosure while it is pressurized.

Before power can be switched on, the enclosure must be purged to remove any flammable gas that may have entered the enclosure before it was pressurized. Purging is the action of replacing the air inside an enclosure with air known to be free of flammable gas.

FEATURES

- + Internationally recognized.
- + Flexible method protects a wide range of equipment.
- + Suitable for one-off equipment or volume production.
- + More than one enclosure can be pressurized in series.

■ INTERNATIONAL RECOGNITION

Purge and pressurization is an Internationally recognized method of protection for electrical equipment in hazardous locations. Expo products carry certifications and approvals from internationally recognized test laboratories. These confirm compliance with the appropriate standards. For IEC countries IECEx certification has been obtained. In Europe, conformity to the ATEX directive EC94/9 is compulsory. In North America the National Electrical Code or Canadian Electrical Code seeks conformance with NFPA496. The use of purge and pressurization systems approved to the appropriate standard ensures conformance with local requirements. Expo products carry multiple approvals making them truly global products.

TYPICAL APPLICATIONS

Computers Monitors Printers Barcode systems Data recorders Condition monitoring systems Instrumentation and electrical panels Electric motors Analyzers Motor control centers.





EXPO INFORMATION Purge and Pressurization

PRACTICAL IMPLEMENTATION

Expo manufactures purge control systems and pressurized enclosures. These meet the needs of both local regulations and of the Global OEM who is serving several markets. This is complemented by a range of accessories which enable a full solution to be offered.

The main product ranges are :

Mini-X-Purge

MiniPurgeTM is a range of purge and pressurization systems which cover enclosure sizes from small to very large.

Carrying IECEx, ATEX (European) and FM and UL approvals, this flexible range meets the needs of the local installation and the global OEM. It employs pneumatic logic, thus remaining independent of electrical supply voltage, ensuring the simplest installation.



Mini-Z-Purge systems offer economic protection for Class I Division 2 or Zone 2 applications in accordance with NFPA 496 and IEC/EN60079-15. It offers the ease of use, clear indication and flexibility expected of Expo products.



Mini-Z-Purge CF Panel Mount



SmartPurgeTM is a flexible microprocessor controlled system. It is ATEX certified, covering a wide range of applications. The programmable flexibility of this product ensures minimum design effort for the integrator. Clear LCD display gives useful status indication, and universal input voltage suits the Global OEM.





PRODUCT RANGE

To use purge and pressurization to protect equipment in a hazardous location the equipment must be housed in a suitable enclosure. The correct purge system can then be installed. In some cases, such as large electric motors, the equipment is already in a suitable enclosure. In most cases the enclosure is not leak tight and will not have the strength required to stay sealed under pressure. Expo designs and manufactures standard or customized enclosures specially suited to pressurization. To select a purge system, the Expo Purge System Selection Wizard can be used. This determines the classification of the hazardous location , and the size of the enclosure, and then selects a list of purge systems which may be suitable. This is refined based on the power and signals of the equipment and the acceptable purge time. Different sets of regulations have different methods to decide the purge time required. In general between 4 and 7 volume changes will meet the requirements. These requirements are summarized below.

	Purge Type	Purge Volume
North America Class I Division 1	Type X Automatic	4 x enclosure
Class I Division 2	Type Z Manual	4 x enclosure
IEC/Europe Zone 1	Type px Automatic	5x enclosure
Zone 2	Type pz Manual	5x enclosure
Zone 2	Type Ex nZ	5 x enclosure

There are also different methods of purging. Most purging is done using compressed air, but in certain cases inert gas is used. Fan generated air can also be used. When using compressed air either Leakage Compensation or Continuous Flow can be used. Continuous Flow passes the same flow rate during purge and afterwards. Leakage Compensation provides an initial high flow of air to purge , then reduces the flow to a small amount, just enough to compensate for leakage from the enclosure. With all but the smallest enclosures, Leakage Compensation systems are preferred, as they minimize the consumption of compressed air, and yet can have quite short purge times.

Where equipment is housed in more than one enclosure, enclosures can be purged in series using one purge system. Interconnection tubes must be of adequate size and other precautions taken. Expo can advise on this if required. The final consideration must be thermal management, as, in order to pressurize an enclosure, free ventilation is usually not possible. Expo can offer advice and solutions for thermal management of pressurized enclosures. Expo has decades of experience and can discuss and advise on specific application problems.



Consulting Service for Hazardous Locations

SCOPE OF CONSULTATION SERVICE

Expo Technologies provides specialized consultation services for technology in the application of electrical apparatus in flammable atmospheres to North American, European and International (IEC) Standards and Codes.

These services cover the following areas:

- Assistance in obtaining approval/certification from authorized Notified Bodies for electrical apparatus intended for operation in flammable atmospheres (Gas and Dust).
- The design of electrical equipment for use in flammable atmospheres (Gas and Dust).
- · Installation practices in classified locations.
- · The provision of testing services.
- The validation of CE Marking for electrical apparatus for use in flammable atmospheres.

CERTIFICATION / APPROVAL CONSULTANCY SERVICE

Expo Technologies has been involved in the manufacture of hazardous area equipment since the late 1960's and interacting with "Notified Bodies" such as IECEx, European, UL, FM, CSA, etc., since this time. Several employees of the company are members of National and International Standard Committees, which are responsible for the writing of Standards for Hazardous Area Equipment. In the early 1980's this knowledge was first used to help manufacturers and users to gain certification/approval for their products with the help of Expo Technologies "Consultancy Team".

The Expo Technologies Consultants are highly experienced practical engineers, with extensive knowledge of the design, manufacture, approval/ certification process and the application of explosion-protected apparatus/standards.

Benefits to Manufacturers

By taking advantage of these Expo Technologies Consultation Service, manufacturers and end-users will benefit in the following ways:

- + Reduced time to market.
- + Freedom from the need to learn and apply unfamiliar technologies, enabling the manufacturer to concentrate on its own specialities.
- + Elimination of design restrictions which may otherwise be introduced through unfamiliarity with the approval process.
- + An approval formulated to allow the maximum flexibility in applicable options in the approved design, within the limits allowed by the type of protection chosen.
- + Reduction of direct and indirect approval costs through efficient preparation and presentation of data.









CASE HISTORY 1.

Approval Assistance

A major manufacturer of oilfield drilling equipment engaged Expo Technologies for assist in obtaining CENELEC approval program for its pressurized Top Drive Drilling System. The objective was to secure approval in the shortest feasible time to facilitate prompt entry to the market.

Expo Technologies supervised the preparation of application drawings and documentation, as well as the specification of performance parameters within the desired approval. Expo Technologies also acted as liaison between the Notified Body and the manufacturer while participating in the approval tests.

By presenting the correct information in an immediately acceptable form, the need to rework the drawings was largely eliminated, allowing the Notified Body to complete testing and issue the approval promptly. This, in turn, reduced both direct and indirect costs to the manufacturer.

CASE HISTORY 2.

Design for Explosion Protection

An international LNG tanker operator had problems with corrosion and short service life with the Pressurized Fluorescent Lamps installed in the bilges of one of its ships, an area where the atmosphere is frequently



flammable. Expo Technologies was approached to identify and procure more durable lamp replacements. The specification included a number of special features, including the use of captive fasteners throughout.

Using their extensive knowledge of available products, Expo Technologies was quickly able to locate a suitable unit and modify it for EEx p pressurization. Large numbers of these lamps have now been supplied, and they are operating to the customer's satisfaction.

CASE HISTORY 3.

Installation Practice for Flammable Atmospheres A pharmaceutical plant in Ireland encountered

problems with flammable atmospheres for the first time following changes to their production processes. The plant personnel lacked experience in the explosion-proofing technologies involved and turned to Expo Technologies for advice. Following a survey of the areas, Expo Technologies produced a report that recommended the



optimum methods of protection as well as a schedule of materials for fulfill the requirements of the installation practice standards governing the site. The customer was then able to bring the plant up to a "safe" condition with minimum delay.

■ CASE HISTORY 4. Purge Tests, Pressure & Leakage Tests

CENELEC EN50016 requires apparatus protected by Purge and Pressurization to be tested for effective purging as a "type test," as well as for structural integrity and leakage as a "routine test." This is also recommended for pressurized equipment built to IEC 60079-2 & North American regulations.

When a major Finnish manufacturer of large electric motors presented a pressurized machine to a National Notified Body (NB) for approval, the NB did not possess the equipment necessary for the test. Expo Technologies provided its own test equipment, as well as an experienced engineer to perform the tests at the manufacturer's factory.

A detailed report was produced which subsequently formed part of the documentation associated with the approval. Expo Technologies subsequently became the regular consultant and test equipment supplier for the company.

CASE HISTORY 5. CE Marking

A major North American manufacturer of petrochemical process analyzers was repackaging one of its instruments for sale in the European market. A significant requirement was compliance with all relevant European Directives leading to the application of the CE Mark.

Expo Technologies was retained to provide its expertise in expediting the application for explosion-proof approval. In addition to preparing documentation and monitoring the progress of the application, Expo Technologies offered guidance on the tests and documentation necessary to achieve compliance with other regulations included within the CE Marking requirements. The most significant of these concerned EMC compliance.

Expo Technologies provided the confidence necessary to allow the adoption of the manufacturer's Technical File which forms the basis of valid CE Marking.













www.jdauspice.com

