Pressurized Enclosure system

FS840

Ex pzc- system for zones 2 and 22
ATEX / IECEx

Properties of the Ex pzc- System

- Very compact Ex pzc- system, mounting in hazardous area (zones 2 and 22) or inside Ex pzc- housing
- Approvals
  - BVS 15 ATEX E 048 X
  - IECEx BVS 15.0037 X
- Ex- protection:
  - II 3G Ex ec nC ic [pzc] IIC T5/T6 Gc
  - II 3D Ex tc ic [pzc] IIIB/IIIC T85°C Dc
- Programmable automatic pre- purging, output for solenoid valve
- Two free programmable output relay contacts (250V / 5A)
- Proportional working pressure measurement, high overpressure safety (no membrane switch)
- Visualisation of status, pressure, remaining purge time and failure report via integrated Display
- Available languages: German, English, French, Spanish, Dutch
- Solenoid valve fuse easy exchangeable inside of FS840
- Integrated spark and particle barrier
- User is able to build up pressurized enclosure system on his own regarding the operation manual (no additional test report of notified body necessary)

Description

The use of pressurized enclosures allows the operation of ‘non explosion protected’ devices in hazardous areas inside zone 2. The protection type ‘pressurisation’ is based on the principle of maintaining a constant pressure using air or a protective gas to prevent an explosive mixture forming near the apparatus inside the pressurized enclosure.

Generally before start-up, the pressurized enclosure must be purged with air or protective gas to remove any explosive mixture that may be inside the enclosure. This automatic procedure is called purging process.

A pressurized enclosure system consists of two components and the enclosure.

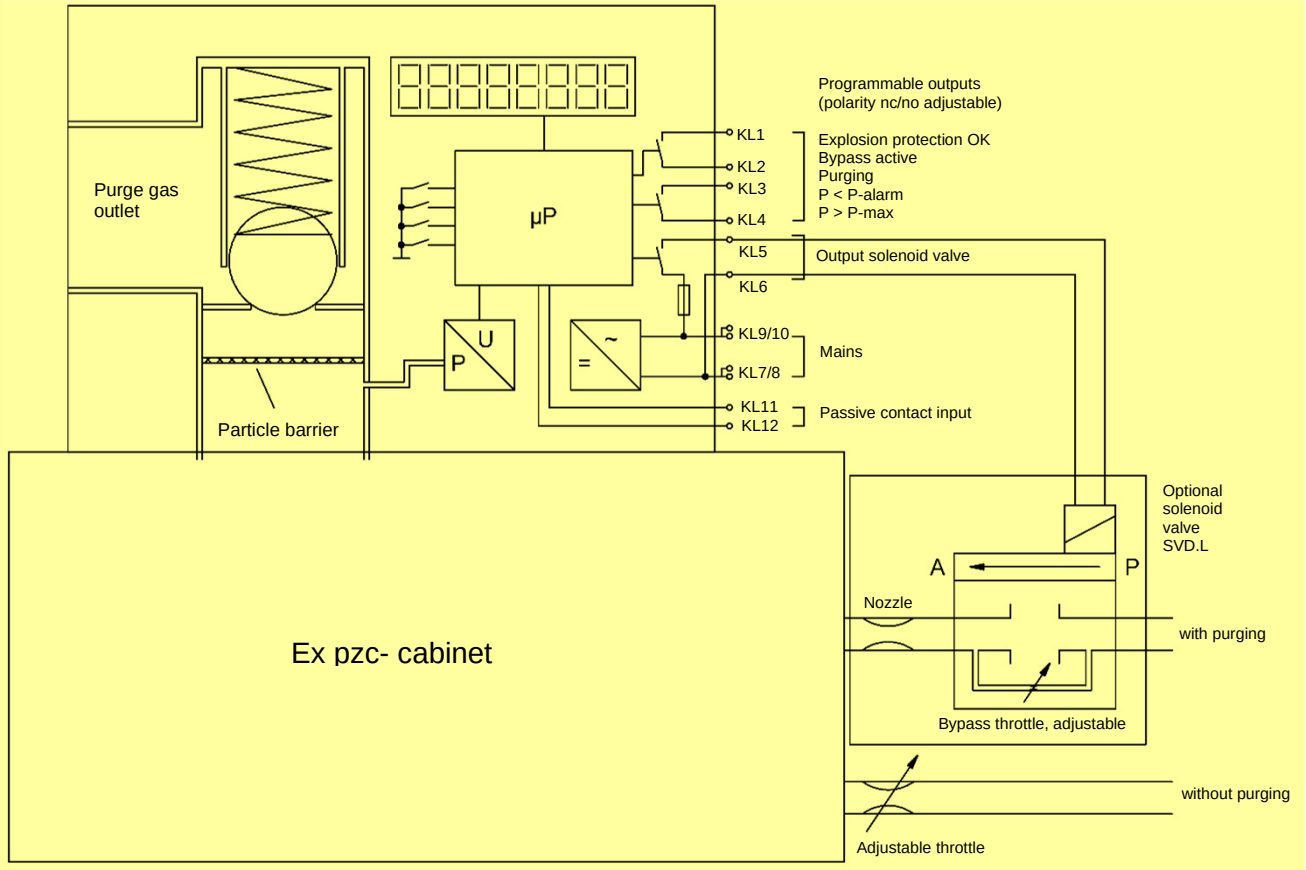
1. control unit FS840 for process control and monitoring
2. Sinter metal throttle SD840 to control air input fed by pressured air network

See manual FS840 for requirements of pressurized enclosure and integrated ignition capable apparatus.

If the operator is not sure, that the atmosphere inside the enclosure and the appropriate pipe infrastructure is below 25% of the lower explosive limit (LEL) (EN 60079 – 14 chapter 13.4), the enclosure must be purged to achieve a safe atmosphere inside the enclosure.

The FS840 system can purge the enclosure automatically using the solenoid valve SVD.L In this case the SVD.L replaces the sinter metal throttle.

Application



Technical Details

		Control unit FS840
General	Mounting	inside hazardous area
	Ex-protection class	II 3G Ex ec nC ic [pzc] IIC T6 Gc II 3G Ex ec nC ic [pzc] IIC T5 Gc II 3D Ex tc ic [pzc] IIIB T85°C Dc II 3D Ex tc ic [pzc] IIIC T85°C Dc
	Certificates	BVS 15 ATEX E 048 X, IECEX BVS 15.0037 X
	Ambient temperature	-20°C ...+40°C at T6 -20°C ...+60°C at T5
Housing	Dimensions	H x W x D: 120 mm x 122 mm x 90 mm
	Protection	IP65 (Remark: without regard of outlet opening)
	Material	Aluminium, painted / Ral 7035
	Tightening torque for cable glands and cap nut	M16x1,5 (5-10 mm) – 3 Nm
Electrical specifications	Supply voltage [V]	AC: 100 – 230V; 48 ..62 Hz +/- 10% DC: 24V +/- 10%
	Power consumption	ca. 2 VA, without solenoid valve
	Signal contacts terminals 1-4 (potential free)	U_m = 250V AC, I_m = 5 A at AC1, P_m = 1500VA U_m = 250V AC, I_m = 1,2 A at AC15, P_m = 300VA U_m = 30V DC; I_m = 4 A at DC1, P_m = 150W
	Solenoid valve terminals 5/6	Output voltage is equal to supply voltage, protected by internal fuse
Ex terminals	Min. and Max. clamping torque	min. 0,4 Nm max. 0,5 Nm
	Min. and Max. wire cross-section	stiff: 0,2 – 2,5 mm² flexible: 0,2 – 2,5 mm²
Pneumatic	Pressure range	standard: 0 ... 22 mbar, extended: 0 ... 27 mbar

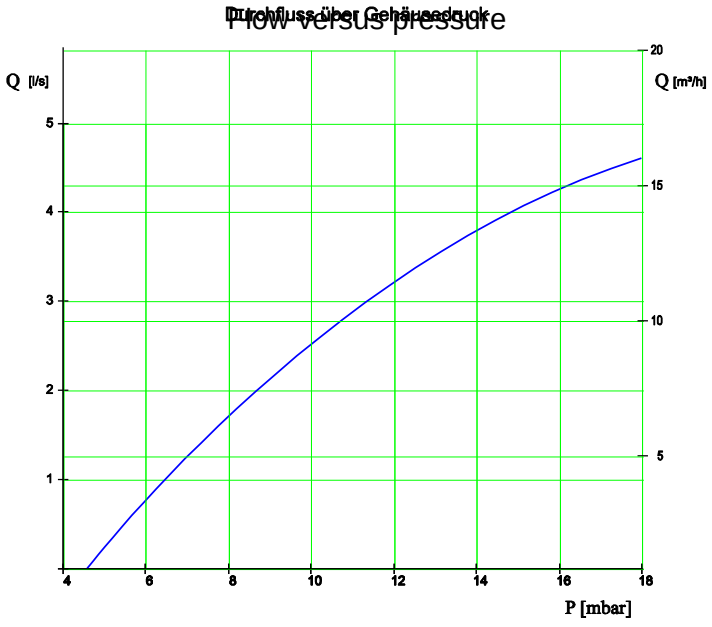
Flow rate table, dependent on pressure and nozzle diameter

The table below shows flow rate depending on pre- pressure and nozzle diameter

Pre pressure [bar] [10^5Pa]	Flow [l/s] ρ air = 1,293 kg/m3									
	Nozzle diameter [mm]									
	0,3	0,5	0,7	1	1,5	2	3	4	5	6
1,5	0,027	0,076	0,149	0,305	0,686	1,220	2,745	4,880	7,625	10,98
2	0,034	0,094	0,184	0,375	0,844	1,501	3,376	6,002	9,378	13,50
2,5	0,039	0,109	0,213	0,434	0,977	1,736	3,907	6,945	10,85	15,62
3	0,044	0,121	0,238	0,486	1,093	1,944	4,373	7,775	12,14	17,49
3,5	0,048	0,133	0,261	0,533	1,199	2,131	4,795	8,524	13,31	19,18
4	0,052	0,144	0,282	0,576	1,296	2,303	5,182	9,213	14,3	20,72
4,5	0,055	0,154	0,302	0,616	1,386	2,463	5,542	9,853	15,396	22,17

Flow chart

The diagram shows the relationship between pressure inside of enclosure and the output flow. The diagram is only valid, without reducing input or output diameters as well as flow reducing pipes.



Type code

- Control unit FS840

Control unit	**FS840**	.	.	.
Mains voltage:				
24 V DC	**.6**			
100-230V AC	**.8**			
Pressure measurement range:				
Standard 0 - 22 mbar.....		**.0**		
Extended 0 - 27 mbar		**.1**		
Housing material:				
Aluminium.....			**.0**	
Polyester			**.1**	

We can offer you the complete Solution: System F 840 with Ex p- housing and mounting of your apparatus inclusive system test and ATEX report

- Solenoid valve SVD.L.x

Solenoid valve:	**SVD.L**	**.**	**AI**		**0**
Inner diameter / nozzle:					
2 mm.....		**.2**			
3 mm.....		**.3**			
4 mm.....		**.4**			
n mm.....		**.n**			
Scope					
ATEX / IECEx.....			**-AI**		
Mains voltage:					
230 V AC				**0**	
110-120 V AC				**3**	
24 V DC				**6**	

- Adjustable Sinter metal throttle **SD840**

Dimensions

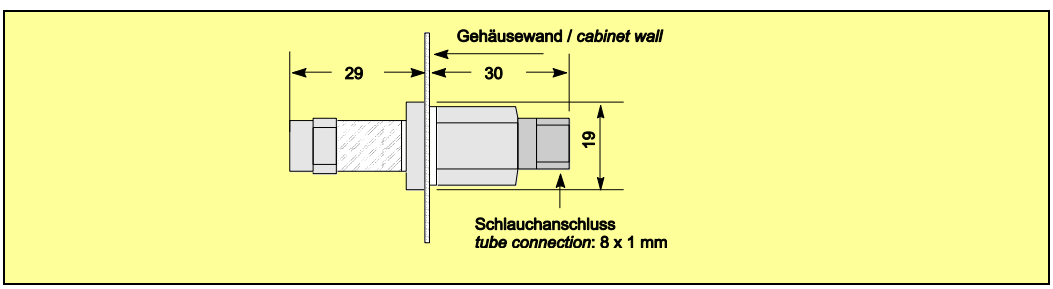


Figure 1:
Sinter metal throttle SD840

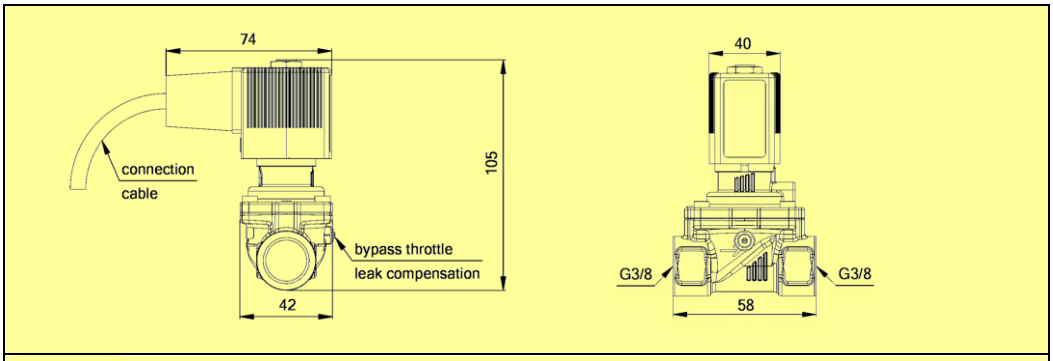


Figure 2:
solenoid valve
SVD.L.x

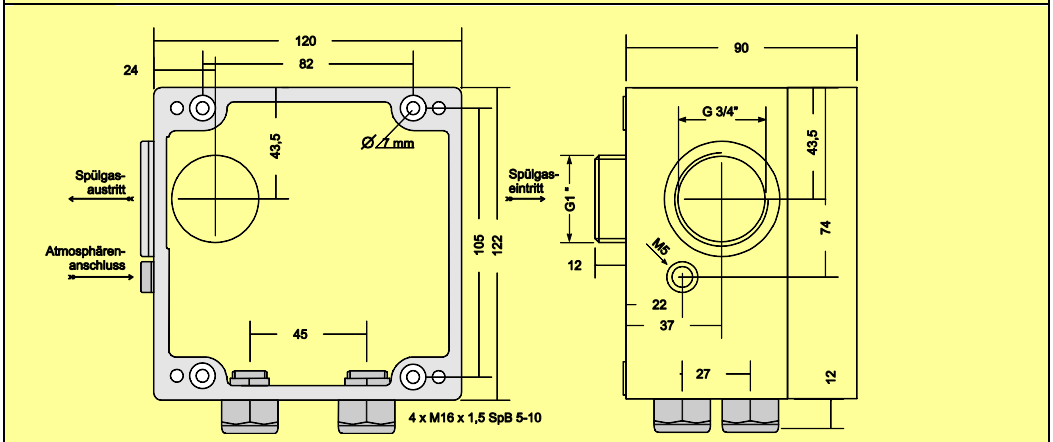


Figure 3:
Dimension FS840

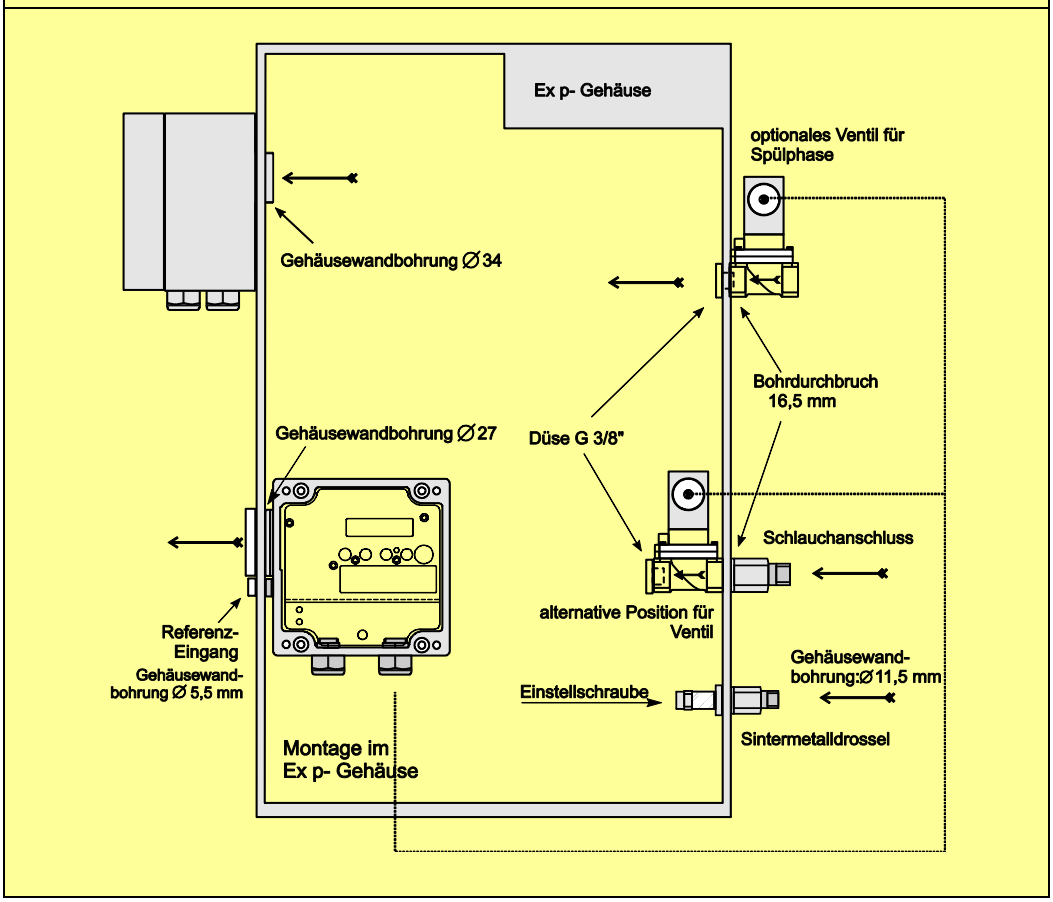


Figure 4:
Mounting examples

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