

# ODORANT INJECTION SYSTEM

**Model Dosaodor-D**  
with standard electronic Control Unit



Europe, Middle East, and Africa Only

# Dosaodor-D

## Description

Dosaodor-D is a computerized odorant injection system for natural gas that uses patented solenoid injector technology that eliminates the need for plunger pumps.

The solenoid injectors permit odorant injection accuracy to be maintained over the entire range of the system, approaching infinite turn down.

Automatic calibration during operation adjusts for any changes in mechanical components and detects failures for report by exception alarming.

The system can also be configured to use two solenoid injection valves and/or an emergency backup absorption system.

The system can be configured and operation data viewed using an integrated push button panel and display.

A printer option is also available for local hard copy documentation of system operations (gas flow rates, injection rates, configuration changes and alarms).

Dosaodor-D has standard modbus registers for real-time data and archiving history.

This data can be read locally by a laptop computer or remotely using third party SCADA products.

DosaLink mini-SCADA software is available for local or remote configuration and operation of the system including: automatic polling and display of real time and historical data, monitoring for report by exception alarming and relational data base archival of historical data.

The historical data can be exported in ODBC format for analysis and reports using commercially available relational data base software products.



## Benefits

- *Consistent odorization proportional to entire range of gas flow rate that can result in reduced nuisance leak calls and a reduction in odorant consumption.*
- *Significantly reduced maintenance as compared to plunger pump odorant systems.*
- *Variety of redundancy options for odorization.*
- *Documentation of operations and report by exception alarming obtained through local hard copy, on-site RTU or flow computer, DosaLink mini-SCADA or third party SCADA using modbus.*
- *User friendly local or remote configuration.*
- *Injection system automatic calibration during operation.*



# Dosaodor-D

## Operation

Dosaodor-D uses the up stream pressure, at a pressure reducing station, to inject odorant into the down stream gas flow. A differential pressure of 1 bar / 14.5 psi is required for injection.

If adequate differential pressure is not available please contact our commercial department for the evaluation of any possible customizations.

Gas flow rate is obtained through either corrected gas volume pulse input (low frequency) or an instantaneous flow rate analog input (4-20 mA).

The gas flow rate can also be configured manually to be a fixed value. Odorant injection rate is then calculated using accumulated flow in order to reduce variability.

In cases where the station does not have a flow computer, the Dosaodor-D can be connected directly to a low frequency pulse output from the turbine, or an analog output from a differential pressure transmitter (3051, 3095 etc.).

A calibration cylinder is used to monitor the actual use of odorant. Variability between the calculated injection volume and actual is used to automatically adjust various parameters for any changes in the system and to detect alarm conditions or system failure.

The electronic control unit contains intrinsic safety barriers and provides power for all components of the system.

In the event of power failure, configuration information and archived historical data is maintained with on board battery back up. Also, a digital relay is available that can initiate operation of an emergency stand-by absorption odorizing system.

Dosaodor-D is designed for purging of the odorant loop in the event that mechanical maintenance is required.

Depending on the gas flow rate and on odorant type (concentration) will be defined the correct Maximum injection rate.

Example tables:

International standard unit

Maximum injection rate l/h	Maximum gas volume Sm <sup>3</sup> /h	
	40 mg/Sm <sup>3</sup> (THT)	10 mg/Sm <sup>3</sup> (Mercaptan)
0,5	12.500	50.000
1,0	25.500	100.000
2,0	50.000	200.000
4,0	100.000	400.000
6,0	150.000	600.000
8,0	200.000	800.000
10,0	250.000	1.000.000
12,0	300.000	1.200.000
14,0	350.000	1.400.000

U.S. standard unit

Maximum injection rate lbs/h (at 6.75 lbs/gal)	Maximum gas volume MSCF/h	
	1.0 lbs/MMSCF (THT)	0.5 lbs/MMSCF (Mercaptan)
0.89	892	1,783
1.78	1,783	3,567
3.57	3,567	7,133
7.13	7,133	14,267
10.68	10,698	21,400
14.27	14,267	28,534
17.83	17,834	35,667
21.40	21,400	42,800
24.97	24,967	49,934

## Electronic control unit



### Technical specifications

- Construction material : 10/10 mm steel plate
- Finish : RAL 7032 grey epoxy powder coat
- Door : Lockable with window
- Installation : Wall mount
- Weight : 22 Kg/49 lbs (medium complexity configuration)
- Power supply options : 12Vdc+/-15%  
: 115 Vac 60Hz  
: 230 Vac 50Hz
- Electromagnetic interference : Consistent with 89/336/CE standard
- Humidity : 10% – 90% non-condensing
- Electrical protection : Explosion proof/Intrinsically safe

## Electronic control unit

### Input signals

- Calibration cylinder high level : Discrete (EExi)
- Calibration cylinder low level : Discrete (EExi)
- Flow Computer alarm signal : Discrete
- Flow Computer instantaneous flow rate : Pulse (max 1 Hz)
- Flow Computer instantaneous flow rate : Analog (4-20 mA)

### Output signals

- Injection solenoid valve control (Primary) : Discrete (12 Vdc EExe)
- Injection solenoid valve control (Secondary, B.2 only) : Discrete (12 Vdc EExe)
- Calibration cylinder refill valve : Discrete (12 Vdc EExe)
- Emergency circuit control : Discrete (12 Vdc EExe)
- Injected odorant : Pulse (1 Hz)
- Distributed gas volume : Pulse (1 Hz)
- Injector failure (Primary) : Discrete
- Injector failure (Secondary, B.2 only) : Discrete
- Emergency circuit enabled : Discrete  
(Also indicates that the Dosaodor-D unit is in disabled mode)
- Odorant tank level : Discrete
- Instantaneous odorant concentration : Analog (4-20 mA)
- Daily odorant concentration : Analog (4-20 mA)

### Communication ports

One RS-232 serial port is available for local configuration or connected to an GSM modem.

### Display

Back-lit alphanumeric 4 line by 40 character LCD.

### Operative modes

OFF – MANUAL – AUTOMATIC – WASHING all selectable by appropriate function keys.  
Operation INJECTOR 1 - INJECTOR 2 - INJECTOR 1-2 (with B.2 option only).

### Configuration protection

Keyed switch for configuration mode selection and battery backed memory to maintain internal configuration data in the event of power failure.

### Optional integrated printer

Dot matrix, 42 characters/line, allows for a local hard copy of alarms, operating history and reports.



## Pneumatic panel

### Technical specifications

- Material : 20/10 mm stainless steel plate
- Installation : Wall mount
- Weight : 25 – 45 Kg (55 - 100 lbs)  
(based on configuration)
- Overpressure relief valve : Stainless steel with following rating options  
14 bar (203 psi)  
38 bar (551 psi)  
60 bar (870 psi)
- Electrical protection : Explosion proof and intrinsically safe
- Material electrical protection : Available for European and  
North American standards
- Mechanical connections : Odorant inlet and discharge  
DN 1/4" double ferrule fitting for DN 6x1 pipe  
Gas inlet and discharge  
DN 1/4" single ferrule fitting for DN 8x1 pipe
- Maximum working pressure : Supply 100 bar (1450 psi)  
Injection 14 bar (203 psi)  
38 bar (551 psi)  
60 bar (870 psi)
- Odorant flow rate : 0,5 – 14,0 l/h (0.89 – 24.97 Pound/h at 6.75 lbs/gal)
- Temperature : Working -10 °C +60 °C



### Calibration cylinder specifications

- Body material : Stainless steel
- Maximum working pressure : 14 bar (203 psi)  
38 bar (551 psi)  
60 bar (870 psi)
- Maximum design pressure : 100 bar (1450 psi)

### Solenoid valves specifications

- Body material : Stainless steel
- Gasket material : FKM
- Valve operation : Electromagnetic
- Maximum working pressure : 14 bar (203 psi)  
38 bar (551 psi)  
60 bar (870 psi)
- Power requirements : 12 Vdc

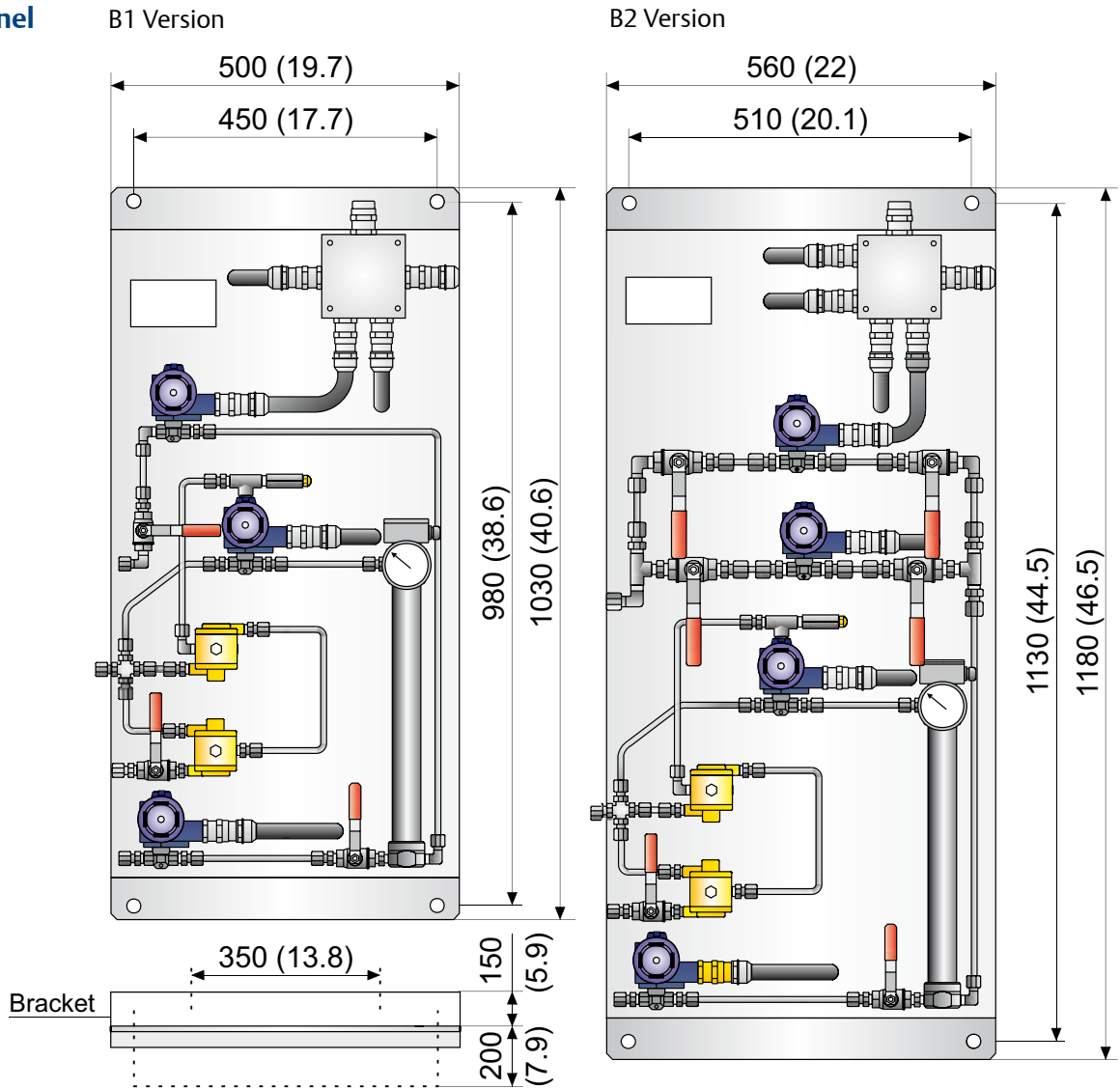
### Stabilizer filter SA/2 specifications

- Body material : Steel
- Maximum working pressure : 100 bar (1450 psi)
- Gasket material : Nitrile (NBR) rubber

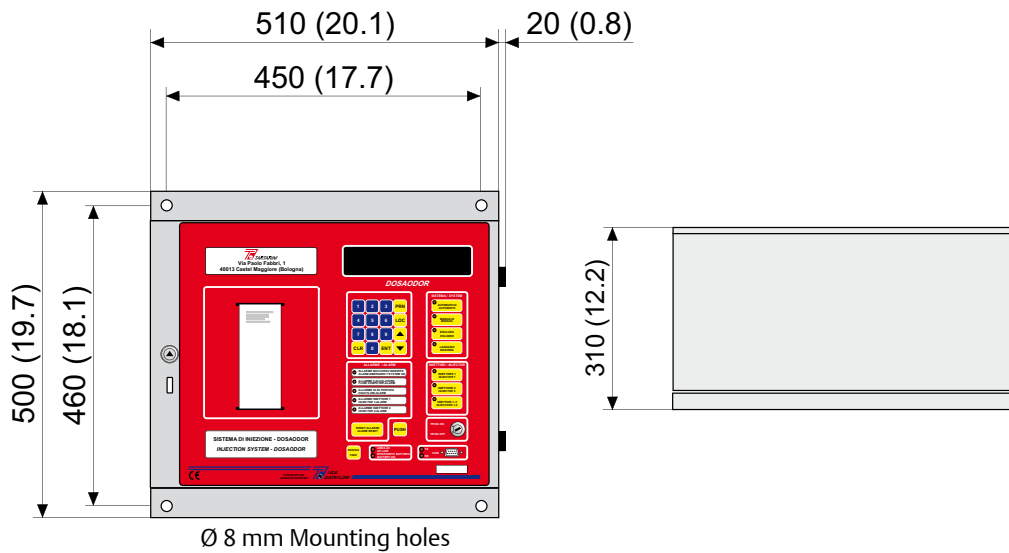
# Dosaodor-D

## Overall dimensions mm (inch)

### Pneumatic panel



### Electronic control unit



Europe, Middle East, and Africa Only



## DosaLink software

DosaLink software enables complete configuration, whether local or remote, of the odorizing system, measurement of data in real time, management of historical data and control of alarm events. Connection is via serial port or modem (dial-up or GSM).

The main specifications of the DosaLink software are as follows:

- MS Windows interface
- Single configuration point for each part of the equipment
- Complete configuration for each part of the equipment
- Periodic consultation of real time data, historical data and alarms
- Display of real time data, historical data and alarms
- Telealarm enabled with DosaLink software in progress
- Automatic archiving of historical data in relational database
- Export of historical data in ODBC format for relational databases (Access) or in Excel format

## Minimum software and hardware requirements

- Windows XP, Windows 7 operating system
- Necessary disk space 30 MB
- Screen resolution 1024 x 768 min.



# Dosaodor-D

## Order Form

### Base unit (check one)

<input type="checkbox"/> <b>A1</b>	Dosaodor-D odorant injection system completed with: ELECTRONIC CONTROL UNIT <ul style="list-style-type: none"> <li>• Steel cabinet for non hazardous locations</li> <li>• Display LCD (4X40)</li> <li>• Membrane Keyboard 26 keys</li> <li>• Memory Lithium battery for data retain</li> </ul> PNEUMATIC PANEL <ul style="list-style-type: none"> <li>• Stainless steel panel</li> <li>• Installation kit (bracket, pipe connection, injector, valves, ecc.)</li> <li>• EEx element certificate for installation in hazardous area zone 1 according to EN 60079 -10</li> </ul>
<input type="checkbox"/> <b>A4</b>	Dosaodor-D odorant injection system completed with: ELECTRONIC CONTROL UNIT <ul style="list-style-type: none"> <li>• Steel cabinet for non hazardous locations</li> <li>• Display LCD (4X40)</li> <li>• Membrane Keyboard 26 keys</li> <li>• Memory Lithium battery for data retain</li> </ul> PNEUMATIC PANEL <ul style="list-style-type: none"> <li>• Stainless steel panel</li> <li>• Installation kit (bracket, pipe connection, injector, valves, ecc.)</li> <li>• EEx element certificate for installation in hazardous area zone 1 according to EN 60079 -10 (Junction box &amp; cable glands Elcon). According to Polish market requirements.</li> </ul>

### Model (check one)

<input type="checkbox"/> <b>B1</b>	Single injector
<input type="checkbox"/> <b>B2</b>	Dual injector

### Odorant flow rate (check one)

<input type="checkbox"/> <b>C1</b>	0,5 l/h (0.89 pounds/hour)
<input type="checkbox"/> <b>C2</b>	1,0 l/h (1.78 pounds/hour)
<input type="checkbox"/> <b>C3</b>	2,0 l/h (3.57 pounds/hour)
<input type="checkbox"/> <b>C4</b>	4,0 l/h (7.13 pounds/hour)
<input type="checkbox"/> <b>C5*</b>	6,0 l/h (10.68 pounds/hour)
<input type="checkbox"/> <b>C6*</b>	8,0 l/h (14.27 pounds/hour)
<input type="checkbox"/> <b>C7*</b>	10,0 l/h (17.83 pounds/hour)
<input type="checkbox"/> <b>C8*</b>	12,0 l/h (21.40 pounds/hour)
<input type="checkbox"/> <b>C9*</b>	14,0 l/h (24.97 pounds/hour)

\* Note: Options C5, C6, C7, C8 and C9 are not available with I1 option

### Options (check one, none or more options)

<input type="checkbox"/> <b>D1</b>	Printer (1)
<input type="checkbox"/> <b>D2</b>	6 Ampere/hour (Ah) UPS (Uninterruptible Power Supply)
<input type="checkbox"/> <b>D3</b>	18 Ampere/hour (Ah) UPS (Uninterruptible Power Supply)
<input type="checkbox"/> <b>D4</b>	Accessory Kit for Emergence Absorption System with Injection Pressure ≤ 6 bar (tanks not included)
<input type="checkbox"/> <b>D5</b>	Accessory Kit for Emergence Absorption System with Injection Pressure 6 to 14 bar (tanks not included)
<input type="checkbox"/> <b>D6</b>	Accessory Kit for Emergence Absorption System with Injection Pressure > 14 bar (tanks not included)

## Main power supply (check one or more options)

<input type="checkbox"/> E1	230 V – 50 Hz, 12 Vcc
<input type="checkbox"/> E2	115 V – 60 Hz, 12 Vcc

## Front panel language (check one)

<input type="checkbox"/> F1	Italian / English
<input type="checkbox"/> F2	Byelorussian / English
<input type="checkbox"/> F3	English

## Display and printer language (check one)

<input type="checkbox"/> G1	Italian
<input type="checkbox"/> G2	Byelorussian
<input type="checkbox"/> G3	Spanish
<input type="checkbox"/> G4	Polish
<input type="checkbox"/> G5	English I.S. Units - International System
<input type="checkbox"/> G6	English Imperial U.S. Units – Imperial System
<input type="checkbox"/> G7	French
<input type="checkbox"/> G8	Ukraine

## Communication (check one or more options)

<input type="checkbox"/> H2	Dial-up modem for Electronic control unit
<input type="checkbox"/> H3	GSM Modem for Electronic control unit
<input type="checkbox"/> H6	Telealarm and warning messaging Available with DosaLink software - DSL Available for Italian market only For other markets please ask for availability

## Maximum working pressure (check one)

<input type="checkbox"/> I1	14 bar (203 psig) (odorant SG $\geq$ 0.7)
<input type="checkbox"/> I2	38 bar (551 psig) (odorant SG $\geq$ 0.55)
<input type="checkbox"/> I3	60 bar (870 psig) (odorant SG $\geq$ 0.7)

## Special versions (check one, both or none options)

<input type="checkbox"/> L1	Skid mounted
<input type="checkbox"/> L2	Low temperature

## Installation options - Injector (check one)

<input type="checkbox"/> M1	DN 3/4" long injector (for downstream size $\geq$ DN 250 mm (DN10"))
<input type="checkbox"/> M2	DN 3/4" short injector (for downstream size $<$ DN 250 mm (DN10"))
<input type="checkbox"/> M3	DN 1/2" long injector (for downstream size $\geq$ DN 250 mm (DN10"))
<input type="checkbox"/> M4	DN 1/2" short injector (for downstream size $<$ DN 250 mm (DN10"))

**Installation options - Emergency absorption system valve (check one, or none options)**  
**(Standard: Pneumatic Valve (normally open) - Threaded 1" NPT-F PN 16)**

<input type="checkbox"/> <b>N0</b>	Pneumatic Valve (normally open) - Threaded 1 1/2" NPT-F - Max operating pressure 64 bar
<input type="checkbox"/> <b>N1*</b>	Valve + Pneumatic Actuator (normally open) - Flanged DN 65 ANSI 150 (2 1/2" ANSI 150)
<input type="checkbox"/> <b>N2*</b>	Valve + Pneumatic Actuator (normally open) - Flanged DN 40 ANSI 150 (1 1/2" ANSI 150)
<input type="checkbox"/> <b>N3</b>	Valve + Pneumatic Actuator (normally open) - Flanged DN 40 PN 63 (1 1/2" PN 63)
<input type="checkbox"/> <b>N4</b>	Valve + Pneumatic Actuator (normally open) - Threaded 1" NPT-F - Max operating pressure 64 bar
<input type="checkbox"/> <b>N5*</b>	Pneumatic Valve (normally open) - Flanged DN 20 PN 16 (3/4" PN 16)
<input type="checkbox"/> <b>N6*</b>	Pneumatic Valve (normally open) - Flanged DN 25 PN 16 (1" PN 16)
<input type="checkbox"/> <b>N7*</b>	Pneumatic Valve (normally open) - Flanged DN 32 PN 16 (1 1/4" PN 16)
<input type="checkbox"/> <b>N8*</b>	Pneumatic Valve (normally open) - Flanged DN 40 PN 16 (1 1/2" PN 16)
<input type="checkbox"/> <b>N9*</b>	Pneumatic Valve (normally open) - Flanged DN 50 PN 16 (2" PN 16)

\* Note: Options N1, N2, N5, N6, N7, N8 and N9 can not be ordered if the D6 option is selected

## Optional components

### Containing tank

<input type="checkbox"/> <b>VASC</b>	Stainless steel containing tank, installed under the pneumatic panel, to collect eventual odorant liquid loss
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### Remote control center components

#### Software for management and programming

<input type="checkbox"/> <b>DSL</b>	DosaLink mini-SCADA Software
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#### External modem for personal computer (check one or more options)

<input type="checkbox"/> <b>DUP</b>	External dial-up modem for Personal Computer, to be used with DosaLink software - DSL
<input type="checkbox"/> <b>GSM</b>	External GSM modem for Personal Computer, to be used with DosaLink software - DSL Necessary in presence of telealarm - H6

## Services

### Training

<input type="checkbox"/> <b>S.D.</b>	Dosaodor-D start-up and trouble shooting training
<input type="checkbox"/> <b>D.D.</b>	Software DosaLink training

### Example of configuration with containing tank, telealarm and remote control center

	Code	Q
Dosaodor-D System	A1 B1 C1 D1 D2 E1 F1 G1 H3 H6 I1 M2	3
Containing tank	VASC	1
Remote control center	DSL	1
	DUP	1
	GSM	1

## Configuration guide for order form

The aim of this guide is to make the choice of alternatives proposed by the Order Form easier, by indicating functionality, limits of use and their advantages. The minimum requirements for product installation are as follows:

1. The product must be installed in a 1<sup>st</sup> stage station.
2. There must be a differential pressure greater than or equal to 1 Bar between upstream and downstream of the regulation station.
3. The tank containing the odorant fluid must be pressurized to downstream pressure.
4. There must be a difference of level of at least 400 mm between the base of the tank containing the odorant and the base of the pneumatic panel (placed in a lower position).
5. Downstream pressure must be maintained as constant as possible in order to guarantee accuracy of odorant dosage.

If these conditions are not fulfilled, please contact our commercial department in order to determine the best technical solution.

### A) Base unit (check one)

This entry defines the product type according to geographic market and installation conditions.

#### A1 option

- Configuration is destined for the European market and the markets which observe European standards.
- The electronic control unit must be installed in a (covered) non hazardous place in accordance with the EN60079-10 standard.

#### A4 option

- Configuration is destined for the Polish market. Some of the components differ from the standard ones (A1).
- The electronic control unit must be installed in a (covered) non hazardous place in accordance with the EN60079-10 standard.

### B) Model (check one)

#### B1 option – single injector

This option detects the presence of a single solenoid valve for injection management.

#### B2 option – dual injector

This option detects the presence of two solenoid valves for injection management.

Notes:

- The two solenoid valves do not operate contemporaneously. It is therefore not possible to use the B2 configuration in order to serve two gas transport lines at the same time.
- The two solenoid valves can operate in alternation. Redundancy guarantees the possibility of maintaining functionality of the system in the event of malfunctioning of an injector solenoid valve.
- The two solenoid valves can work in exchange mode. When the desired quantity of odorant (determined by a parameter accessible by the user) is injected, the solenoid valve that has just operated will go into rest mode leaving the task of guaranteeing injection to the other solenoid valve.
- The two solenoid valves can be used to serve the line in different operating conditions (of flow). Gas flow usually varies considerably from summer to winter. The two solenoid valves may be calibrated with different values in order to serve the line in an optimum manner in the two conditions specified.

## C) Odorant flow rate (check one)

This option allows the system to be proportioned according to maximum line flow and odorant concentration used. It is necessary to determine the odorant flow introduced into the network under the maximum capacity conditions.

From a theoretical viewpoint, this takes into account the following:

### International standard unit

C = concentration of odorant (in mg/Sm<sup>3</sup>)

Qg = maximum gas flow rate (in Sm<sup>3</sup>/h)

ρ = specific weight of liquid odorant (in kg/dm<sup>3</sup>)

Qo = maximum odorant flow rate (in l/h)

$Qo = C * Qg / (1.000.000 * \rho)$

For the purposes of proportioning, we may consider the odorant density as  $\rho = 1 \text{ kg/dm}^3$ .

For example if the maximum line flow is 90,000 Sm<sup>3</sup>/h and the odorant used is THT (with a desired concentration of 40 mg/ Sm<sup>3</sup>) then the appropriate option is C4.

Thus:

$Qo = 40 * 90.000 / 1.000.000 = 3.6 \text{ (l/h)}$

The third column of the following table shows the first value exceeding the calculated value which will suggest which configuration to choose (in the specific case of C4).

If different odorant concentrations from those specified in the table are used (40 and 10 mg/Sm<sup>3</sup>) it is advisable to use the given formula to determine the correct configuration.

In the event that odorant concentrations do not diverge excessively from those specified, then the following table may be used:

Maximum gas volume Sm <sup>3</sup> /h		Maximum injection rate l/h	Order form configuration
40 mg/Sm <sup>3</sup> (THT)	10 mg/Sm <sup>3</sup> (Mercaptani)		
12.500	50.000	0,5	C1
25.500	100.000	1,0	C2
50.000	200.000	2,0	C3
100.000	400.000	4,0	C4
150.000	600.000	6,0	C5
200.000	800.000	8,0	C6
250.000	1.000.000	10,0	C7
300.000	1.200.000	12,0	C8
350.000	1.400.000	14,0	C9

For example:

If the maximum Gas flow corresponds to 200,000 Sm<sup>3</sup>/h and the odorant used is THT (with a concentration of approximately 40 mg/Sm<sup>3</sup>), the sixth row of the first column (relative to THT) is identified (relative to the gas flow considered) therefore determining option C6.



## U.S. standard unit

C = concentration of odorant (in lbs/MMSCF)

Qg = maximum gas flow rate (in MSCF/h)

Po = maximum odorant weight rate (in lbs\h)

$$Po = C * Qg / 1.000$$

For example if the maximum line flow is 7,000 MSCF/h and the odorant used is THT (with a desired concentration of 1.0 lbs/MMSCF) then the appropriate option is C4.

Thus:

$$Po = 1 * 7,000 / 1,000 = 7 \text{ (lbs\h)}$$

The third column of the following table shows the first value exceeding the calculated value which will suggest which configuration to choose (in the specific case of C4).

If different odorant concentrations from those specified in the table are used (1.0 and 0.5 lbs/MMSCF) it is advisable to use the given formula to determine the correct configuration.

In the event that odorant concentrations do not diverge excessively from those specified, then the following table may be used:

Maximum gas volume MSCF/h		Maximum injection rate lbs/h (at 6.75 lbs/gal)	Order form configuration
1.0 lbs/MMSCF (THT)	0.5 lbs/MMSCF (Mercaptan)		
892	1,783	0.89	C1
1,783	3,567	1.78	C2
3,567	7,133	3.57	C3
7,133	14,267	7.13	C4
10,698	21,400	10.68	C5
14,267	28,534	14.27	C6
17,834	35,667	17.83	C7
21,400	42,800	21.40	C8
24,967	49,934	24.97	C9

For example:

If the maximum Gas flow corresponds to 14,000 lbs/MMSCF and the odorant used is THT (with a concentration of approximately 1.0 lbs/MMSCF), the sixth row of the first column (relative to THT) is identified (relative to the gas flow considered) therefore determining option C6.

## D) Options (check one, none or more options)

This group of options shows the various additional aspects of product performance.

### D1 option – printer

The printer is located on the front panel of the electronic control unit and performs print outs of programmed data, daily reports and reports of events. It is also possible to set a periodical data printout with a programmable frequency.

### D2 option – 6 Ampere/hour (Ah) UPS (Uninterruptible Power Supply)

The UPS (Uninterruptible Power Supply) system guarantees functioning of the system even during a (temporary) absence of power supply. There are two different versions for this functionality. The D2 option guarantees system autonomy for approximately 6 hours. The autonomy of the UPS system depends on different factors such as product configuration (single or double injector, presence of printer or modem) and environmental conditions (mainly operating temperature). The D2 option is not compatible with option D3.

### D3 option – 18 Ampere/hour (Ah) UPS (Uninterruptible Power Supply)

The D3 option differs from the D2 option because it guarantees greater functioning autonomy, approximately 18 hours. The autonomy of the UPS system depends on different factors such as product configuration (single or double injector, presence of printer and modem) and the environmental conditions (mainly the operating temperature). The D3 option is not compatible with option D2.

### D4 option – Accessory Kit for Emergence Absorption System with Injection Pressure $\leq$ 6 bar (tanks not included)

The kit provides the set of objects necessary for connection and control of the by-pass system (which is enabled by the electronic control unit in the event that Dosaodor-D malfunctions). The kit includes the shut-off valve for the by-pass system, the model should be chosen from section N (N0-N9) of this Order Form.

### D5 option – Accessory Kit for Emergence Absorption System with Injection Pressure 6 to 14 bar (tanks not included)

The kit provides the set of objects necessary for connection and control of the by-pass system (which is enabled by the electronic control unit in the event that Dosaodor-D malfunctions). The kit includes the shut-off valve for the by-pass system, the model should be chosen from section N (N0-N9) of this Order Form.

### D6 option – Accessory Kit for Emergence Absorption System with Injection Pressure $>$ 14 bar (tanks not included)

The kit provides the set of objects necessary for connection and control of the by-pass system (which is enabled by the electronic control unit in the event that Dosaodor-D malfunctions). The kit includes the shut-off valve for the by-pass system, the model should be chosen from section N (N0-N9) of this Order Form.

## E) Main power supply (check one or more options)

This section defines the type of power supply for the product.

### E1 option – 230 V – 50 Hz, 12 Vcc

The 230V mains power supply is used to power the system (European standard).

### E2 option – 115 V – 60 Hz, 12 Vcc

The 115 V mains power supply is used to power the system (US standard).

## F) Front panel language (check one)

This section determines the language used for screen printing of the front panel located on the electronic control unit. The front panel has programming buttons and LED signals; there is a brief description for each button/signal in the language determined by the selection of this section.

### F1 option – Italian / English

The languages used for descriptions are: Italian and English.

### F2 option – Byelorussian / English

The languages used for descriptions are: Byelorussian and English.

### F3 option – English

The language used for descriptions is English.

## G) Display and printer language (check one)

This section determines the language set in the test phase which will be used during start up.

Other languages are also available (including Italian and English) and may be used in addition to the pre-selected language if necessary, by programming the appropriate display parameter.

The pre-selected language is used both to view the display and for printouts. Both the G5 and G6 options determine English with different systems of measurement. G5 determines the international system. G6 determines the U.S Imperial system.

### G1 option – Italian

View display and printouts in Italian.

### G2 option – Byelorussian

View display and printouts in Byelorussian.

### G3 option – Spanish

View display and printouts in Spanish.

### G4 option – Polish

View display and printouts in Polish.

### G5 option – English I.S. Units - International System

View display and printouts in English. International measurement system.

### G6 option – English Imperial U.S. Units – Imperial System

View display and printouts in English. U.S. Imperial measurement system.

Option for North American market, compatible with previous hardware versions.

### G7 option – French

View display and printouts in French.

### G8 option – Ukrainian

View display and printouts in Ukrainian.

## H) Communication (check one or more options)

This section allows the methodologies and functions of data communication and transmission from the Dosaodor-D product and external systems to be determined.

### H2 option – Dial-up modem for Electronic control unit with phone cable connection

Using this option allows the Dosaodor-D system to be monitored remotely by using DosaLink software (DSL) or other software programs that use the Modbus protocol and a modem connection.

The Dial-up modem is used when a telephone line is available at the installation site.

### H3 option – GSM Modem for Electronic control unit

Using this option allows the Dosaodor-D system to be monitored remotely by using DosaLink software (DSL) and a modem connection.

The GSM modem is used when there is no telephone line available at the place of the installation.

The current solution uses a Dual-band modem. For a Tri-band modem, please request technical analysis.

### H6 option – Telealarm and warning messaging

This functionality allows the Dosaodor-D system to send a notification (text message) via DosaLink software to one or more contactable managers in the case of events such as malfunctioning or changes of status.

The functionality requires DosaLink (DSL) software to be installed and an external modem GSM (GSM).

An installation of DosaLink software may manage one or more systems with the telealarm functionality. This is currently available for the Italian market. Technical analysis is recommended for other markets.

## I) Maximum working pressure (check one)

This section is used to proportion the system according to the working pressure (downstream pressure, in the injection area). Specific gravity constraint is required to let the "floating system" present in the calibration cylinder work properly.

### I1 option – 14 bar (203 psig) (odorant SG $\geq$ 0.7)

Maximum injection pressure equal to 14 bar. An indispensable condition for functioning is that the Specific Gravity of the liquid odorant is  $\geq 0.70 \text{ kg/dm}^3$

### I2 option – 38 bar (551 psig) (odorant SG $\geq$ 0.55)

Maximum injection pressure equal to 38 bar. An indispensable condition for functioning is that the Specific Gravity of the liquid odorant is  $\geq 0.55 \text{ kg/dm}^3$

### I3 option – 60 bar (870 psig) (odorant SG $\geq$ 0.7)

Maximum injection pressure equal to 60 bar. An indispensable condition for functioning is that the Specific Gravity of the liquid odorant is  $\geq 0.70 \text{ kg/dm}^3$

## L) Special versions (check one, both or none options)

This section defines the optional configuration choices.

### L1 option – Skid mounted

Supports are provided for skid mounting.

### L2 option – Low temperature

The system uses technical arrangements (including a "heating element" on the pneumatic panel) to guarantee correct operation even at low temperatures.

## M) Installation options - Injector (DN 3/4" short injector as standard) (check one)

This section defines the length and the nominal inlet of the liquid odorant injector. There are two types of injectors: a short injector used for piping with a nominal diameter of less than 250 mm (M2 and M4 options), and a long injector used for piping with a nominal diameter greater than or equal to 250 mm (M1 and M3 options).

### M1 option – DN 3/4" long injector (for downstream size $\geq$ DN 250 mm (DN10"))

The DN 3/4" long injector is provided in substitution for the DN 3/4" short one (standard).

### M2 option – DN 3/4" short injector (for downstream size $<$ DN 250 mm (DN10"))

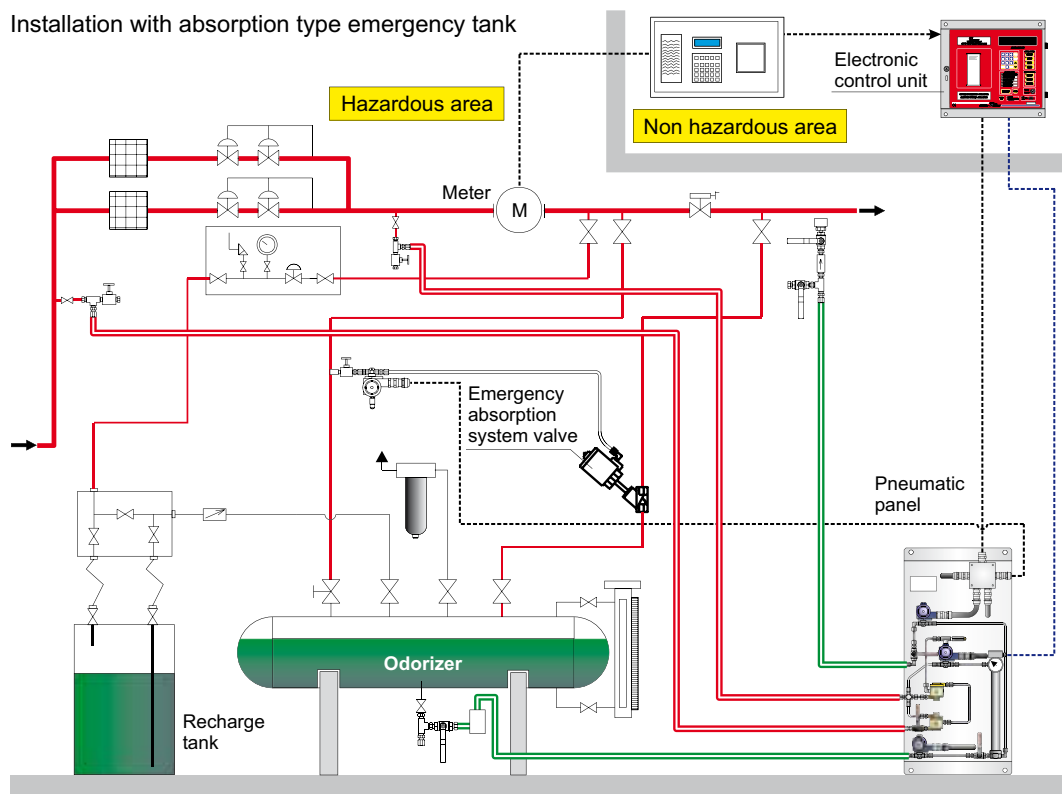
The DN 3/4" short injector is provided as standard.

### M3 option – DN 1/2" long injector (for downstream size $\geq$ DN 250 mm (DN10"))

The DN 1/2" long injector is recommended to be installed in a station already built in which is not possible to weld the 3/4" half coupling, but on the existing pipe is already available a 1/2" half coupling or thredolet.

### M4 option – DN 1/2" short injector (for downstream size $<$ DN 250 mm (DN10"))

The DN 1/2" short injector is recommended to be installed in a station already built in which is not possible to weld the 3/4" half coupling, but on the existing pipe is already available a 1/2" half coupling or thredolet.



## N) Installation options - Emergency absorption system valve (Standard: Stainless steel Pneumatic Valve FP940256AG DN 25 PN 16) (check one, or none options)

This section defines the type of valve to be used for shut-off of the by-pass system.

The option therefore depends on the presence of the by-pass system.

The N section to be taken into consideration requires the D4 option (accessory kit for by-pass shut-off).

### N0 – N9 options

There are different types of shut-off valves.

If no item is selected the standard valve will be provided, if the D4 option (accessory kit for by-pass shut-off) is present.

### Optional components – Containing tank

This section defines the installation of the stainless steel containing tank to contain possible odorant leakage. The containing tank installation is **strongly recommended**.

The VASC option must be indicated separately by the product commercial code (please see page 12 example).

### VASC option – Stainless steel containing tank

### Remote control center components

The options DSL (Dosalink software) and DUP/GSM (modem for personal computer) defines a remote control center. The remote control center can operate with more than one Dosaodor-D systems installed in field, if you are buying more than one unit of the Dosaodor-D system, only one must be configured choosing these options.

The DSL - DUP and GSM components must be indicated separately by the product commercial code (please see page 12 example).

### DSL option – DosaLink mini-SCADA Software

DosaLink software enables a local connection via modem, or a remote connection via modem, to one or more Dosaodor-D systems.

The software offers different functionalities including:

- acquisition of remote system control (for example modification of the odorization rate)
- acquisition of historical data: operation data, events and alarms
- possibility of periodically interrogating controlled systems in automatic mode

DosaLink Software for remote connection requires the use of a modem Dial-up or GSM (DUP or GSM).

If the telealarm functionality (H6) has been purchased, it is necessary to use the GSM modem (GSM).

The Dial-up (DUP) and GSM (GSM) modems can coexist in the same installation of DosaLink software and be used for different purposes: Dial-up modems for connection to the Dosaodor-D system and GSM modems for the forwarding of text notification messages to contact groups (the telealarm functionality is necessary: option H6).

#### DUP option – External dial-up modem for Personal Computer

This option must be combined with the presence of DosaLink (DSL) software.

The Dial-up desktop modem is used by DosaLink Software to connect to the Dosaodor-D systems in the field.

The Dial-up modem requires the presence of a traditional telephone line..

#### GSM option – External GSM modem for Personal Computer

This option must be in combination with DosaLink (DSL) software.

The GSM desktop modem is used by DosaLink Software to connect to Dosaodor-D systems in the field or to send text message notifications, if the telealarm (H6) functionality has been purchased.

The current solution uses a Dual-band modem. For Tri-band modems, please request technical analysis.

If the telealarm (H6) functionality is used, the selection of the GSM (GSM) modem is indispensable.

### Services - Training

This section defines the training courses available.

Training courses take place at Emerson Bologna Head Offices unless otherwise agreed with the Service department.

The D.D. course (DosaLink software) will look at other areas including installation and commissioning of the application (recommended option).

#### S.D. – Dosaodor-D start-up and trouble shooting training

The course lasts 2 days. The subjects covered concern commissioning of the system (subsequent to installation), its management and the procedures that must be carried out in the event of malfunctioning.

#### D.D. – Software DosaLink training

The course lasts 1 day. The subjects covered concern the functionalities offered by the application (automatic watchman, telecontrol, diagnostics, reports, telealarm, etc). If the course is held at the client's location the software and modem installation service will be provided.

#### Natural Gas Technologies

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