ODORANT INJECTION SYSTEM

Model Dosaodor-D
with Standard Electronic Control Unit

EMERSON™
Process Management

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.

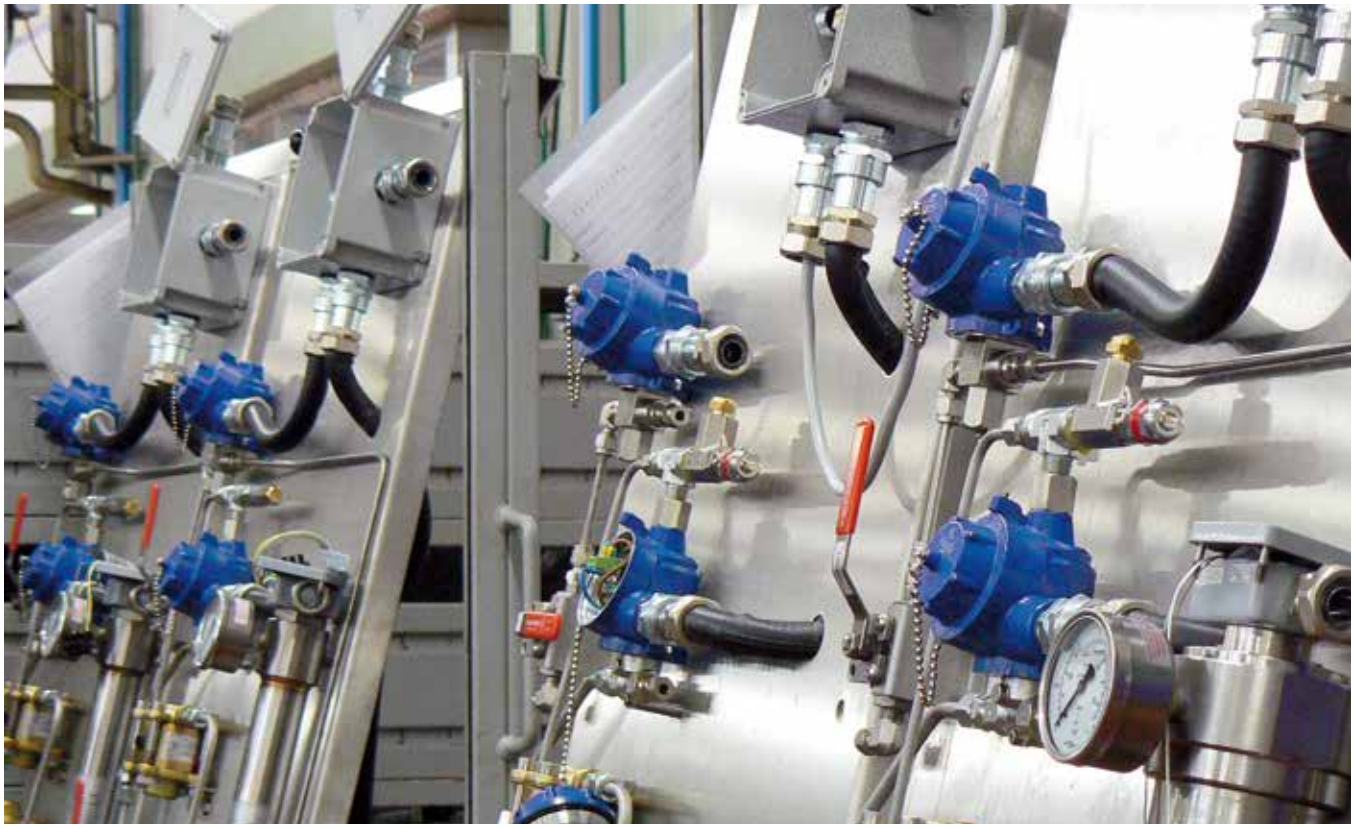
This data can be read locally by a laptop computer or remotely using third party SCADA products.

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^3/h	
	40 mg/Sm^3 (THT)	10 mg/Sm^3 (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

Dosaodor-D

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

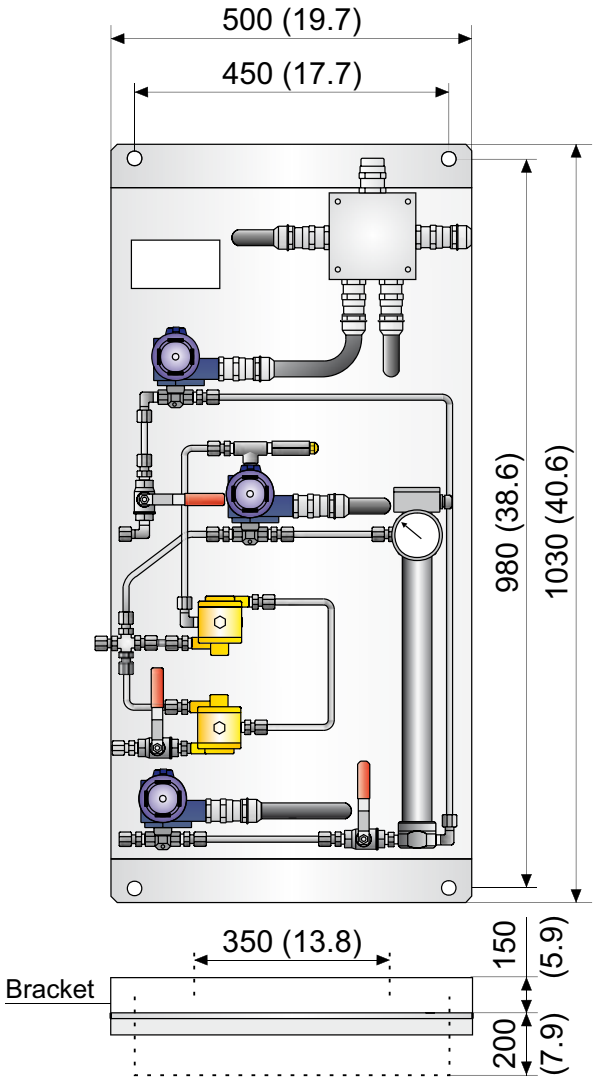
- Body material : Steel
- Maximum working pressure : 100 bar (1450 psi)
- Gasket material : Nitrile (NBR) rubber

Dosaodor-D

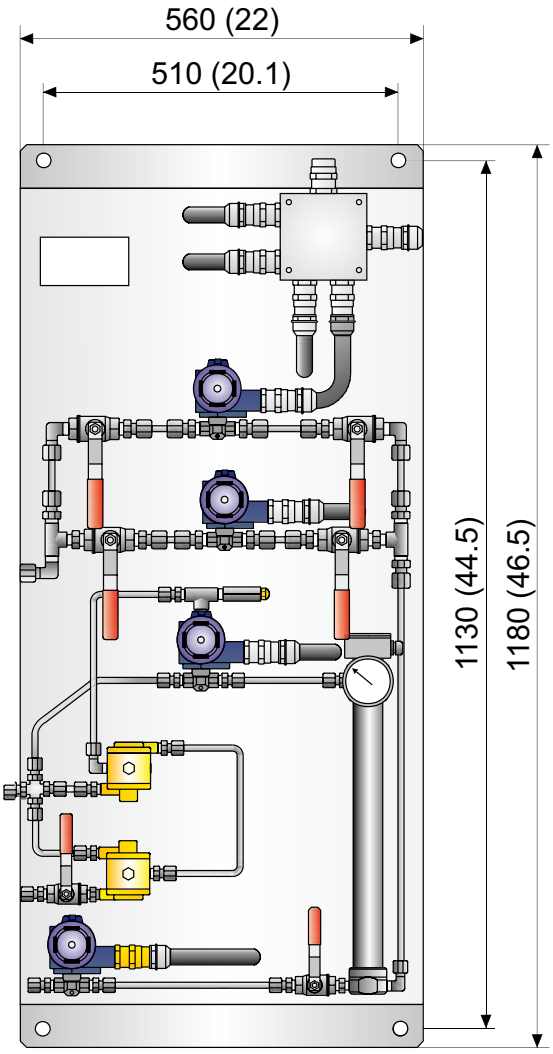
Overall dimensions mm (inch)

Pneumatic panel

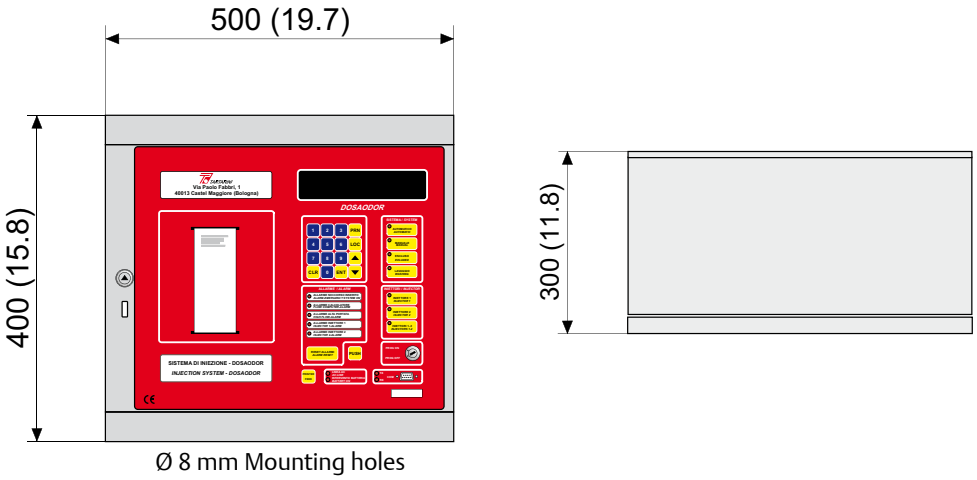
B1 Single injector version



B2 Dual injector version



Electronic control unit



Ø 8 mm Mounting holes

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:

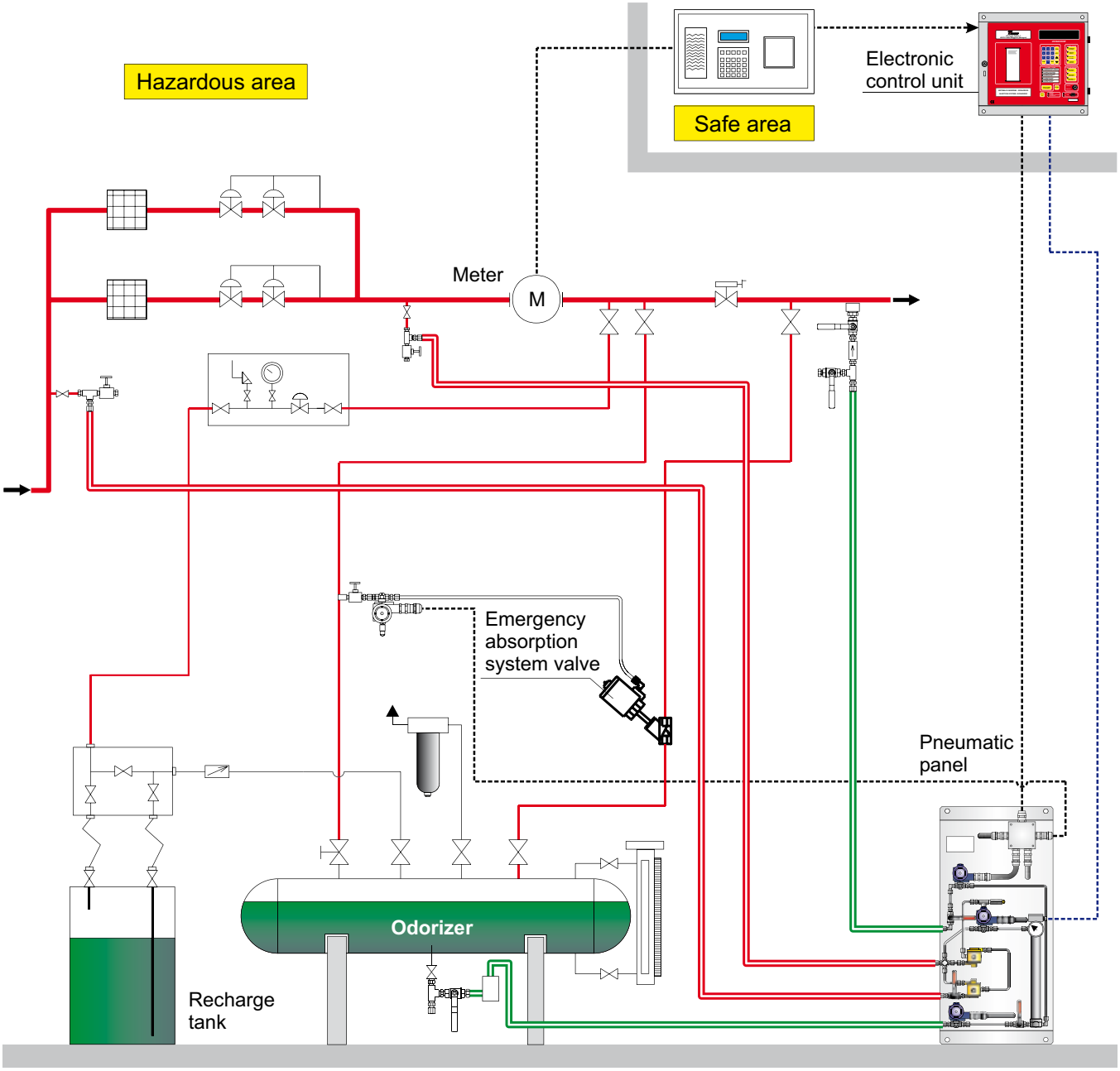
- MS Windows interface
- Single configuration point for each part of the equipment
- Complete configuration for each part of the equipment
- Periodic consultation of real time data, historical data and alarms
- Display of real time data, historical data and alarms
- Telealarm enabled with DosaLink software 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

System with Absorption Type Emergency Tank Installation Schematic



Industrial Regulators

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75070 USA
Tel: +1 800 558 5853
Outside US: +1 972 548 3574

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9000

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

Natural Gas Technologies

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75070 USA
Tel: +1 800 558 5853
Outside US: +1 972 548 3574

Europe
Bologna 40013, Italy
Tel: +39 051 419 0611
Chartres 28008, France
Tel: +33 2 37 33 47 00

Asia-Pacific
Singapore 128461, Singapore
Tel: +65 6770 8337

Middle East and Africa
Dubai, United Arab Emirates
Tel: +971 4811 8100

LP-Gas Equipment

Emerson Process Management
Regulator Technologies, Inc.

USA - Headquarters
McKinney, Texas 75070 USA
Tel: +1 800 558 5853
Outside US: +1 972 548 3574

TESCOM

Emerson Process Management
Tescom Corporation

USA - Headquarters
Elk River, Minnesota 55330-2445 USA
Tel: +1 763 241 3238
+1 800 447 1250

Europe
Selmsdorf 23923, Germany
Tel: +49 38823 31 287

Asia-Pacific
Shanghai 201206, China
Tel: +86 21 2892 9499

For further information visit www.emersonprocess.com/regulators

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FISHER FRANCEL™ TARTARINI™

***O.M.T. Officina Meccanica Tartarini S.R.L.**, Via P. Fabbri 1, I-40013 Castel Maggiore (Bologna), Italy*
R.E.A 184221 BO Cod. Fisc. 00623720372 Part. IVA 00519501209 N° IVA CEE IT 00519501209, Cap. Soc. 1.548 000 Euro i.v. R.I. 00623720372 - M BO 020330

***Francel SAS**, 3 Avenue Victor Hugo, CS 80125, Chartres 28008, France*
SIRET 552 068 637 00057 APE 2651B, N° TVA : FR84552068637, RCS Chartres B 552 068 637, SAS capital 534 400 Euro

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