

# TYPE 2031

## PISTON-OPERATED DIAPHRAGM VALVE



*Instruction Manual*

439692Y-Ind\*\*/Nov99

**bürkert**  
*Easy* Fluid Control Systems

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Congratulations on having purchasing the diaphragm valve type 2031.

## 1.1 GENERAL SAFETY INSTRUCTIONS

- Please verify that the product is complete and free from any damage.
- It is the customer's responsibility to select an appropriate valve for the application, ensure the unit is installed correctly and maintain the components.
- This product should only be installed and repaired by specialist staff using the correct tools.
- Please observe the relevant safety regulations throughout the operation, maintenance and repair of the product.
- If these instructions are ignored, no liability will be accepted and the guarantee on the device and accessories will be invalid.

## 1.2 DESCRIPTION OF THE DIAPHRAGM VALVE

The diaphragm valve type 2031 has been designed to control the flow of fluids, even charged or aggressive.

This 2/2-way valve is made up of :

- a valve body
- a diaphragm that isolates the fluid from the actuator (fluid and actuator never are in contact with each other)
- a pneumatically controlled actuator.

## 1.3 CONTROL FUNCTIONS OFFERED BY THE DIAPHRAGM VALVE

The valve type 2031 can operate either :

- as a spring-to-close valve (A function)
- as a spring-to-open valve (B function)
- as a double-acting valve (I function).



# INSTALLATION

## 2.1 RECOMMENDATIONS FOR INSTALLING THE VALVE



Insert the valve into the process according to the standard industrial practices (preferably according to ASME or DIN 11850 standards).

### 2.1.1 Before installation

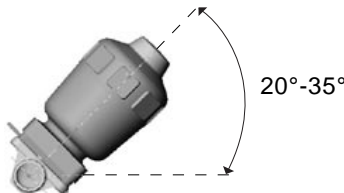
- Carefully clean the pipes.
- Remove all the pressures and tensible forces exerted on the valve by the pipes.

### 2.1.2 During installation

- Ensure the pipes are aligned.
- If the valve body must be welded onto the pipes, dismantle the valve (see § 4.2) to separate the actuator and the diaphragm from the body to prevent them from any damage.
- Preferably improve the surface quality by grinding the weldings.
- Carefully clean the body before mounting back the actuator and the diaphragm (see § 4.2).
- Connect the control medium depending on the operating mode chosen:
  - Function A: to the lower orifice
  - Function B: to the upper orifice
  - Function I: to both orifices.

### 2.1.3 Installation for self-draining

- Incline the valve of 20° to 35° (depending on the DN) with respect to the horizontal (see figure below)



- Install the pipes with a 2% minimum gradient in the direction of flow.



Self-draining in a process system is ultimately the responsibility of the system designer and/or end user.

## 3.1 GENERAL SPECIFICATIONS

The main advantages of the valve are the following:

- *Easy* to install and to use.
- Heat number indicated on each valve to ensure the traceability of the material.
- Any direction of flow.
- Self-draining (see § 2.1).
- No dead volume.
- Flow optimized design.
- Valve inside design optimized to reduce the turbulences to the minimum.
- Safe dismantle of the actuator: the cover can be unscrewed without any risk (the spring loses its tension progressively).
- Steam sterilizable.
- Autoclavable (models with PPS actuator).

## 3.2 ACTUATOR SPECIFICATIONS

- Material: Polyamid (PA) or phenylene polysulphide (PPS)

- Size:

Size	C	D	E	F	G	H
ø (mm)	40	50	63	80	100	125

- Ambient temperature:

Material	DN	Ambient temperature
PA	All	-10 °C to +60 °C*
PPS	≤ 80	+5 °C to +140 °C*
	≥ 100	+5 °C to +90 °C* (briefly up to +140 °C)

\* With pilot valve, max. +55 °C

- Control medium: neutral gases or air

- Admissible control pressure  
(Function A) :

Material	DN	Pressure (bar)
PA	≤ 100	10
	= 125	7
PPS	All	7



Do not use a control pressure higher than indicated to ensure the diaphragm longevity.

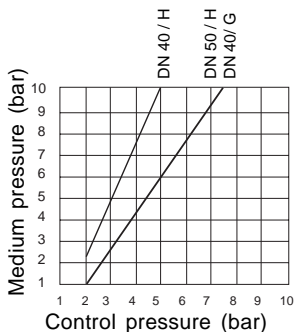
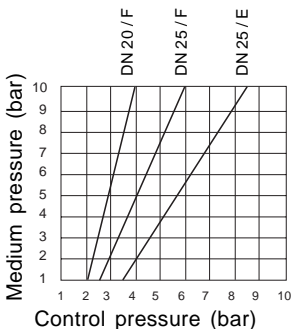
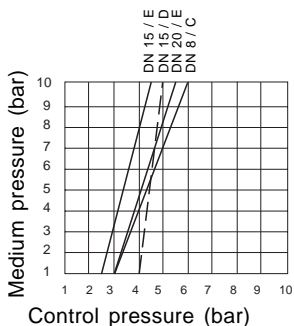


For more information on the reduced-strength actuators, please contact your nearest Bürkert agent.

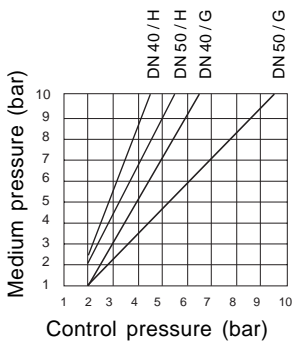
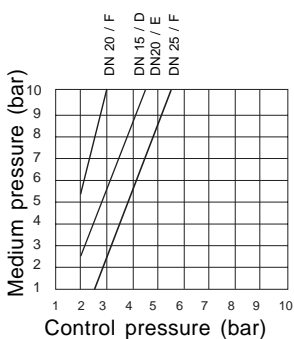
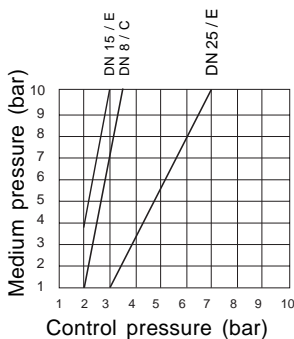
- Admissible control pressure (Functions B and I): see the diagram below corresponding to your type of diaphragm and DN of the valve/size of the actuator.



Do not use a control pressure higher than indicated (function B only) to ensure the diaphragm longevity.



**PTFE/EPDM diaphragm**



**Elastomer diaphragm**

## 3.3 DIAPHRAGM SPECIFICATIONS

- Material:
  - PTFE/EPDM
  - elastomer (EPDM, FPM or CSM)
- Temperature of the medium

Material	Temperature
PTFE/EPDM EPDM CSM	-10 °C to +130 °C
FPM	-5 °C to +150 °C

## 3.4 VALVE BODY SPECIFICATIONS

- Material:
  - Forged stainless steel (DIN 1.4435 BN2 / 316L according to ASME-BPE 1997).
  - Cast stainless steel (316L).
- Types of connections:
  - butt-weld ends which conform to ISO 4200, SMS 3008, DIN 11850, BS 4825-1 and JIS standards
  - Triclamp ends which conform to BS 4825-3, ISO 2852, DIN 32676, SMS 3017 standards
  - dairy pipe unions which conform to DIN 11851 or standards
  - other connections on request.
- Nominal diameter (DN): DN8 to DN50
- Temperature of the conveyed medium: depends on the diaphragm material.
- Operating pressure:
  - Static pressure: the valve being closed, the pressure is applied on one side of the diaphragm
  - Dynamic pressure: the valve being open, the pressure is applied in the whole valve body; the valve must close itself and be tight.

Pressure type		Static		Dynamic	
Diaphragm material		Elastomer	PTFE/ EPDM	Elastomer	PTFE/ EPDM
DN	Actuator size				
8	C	10	10	10	10
15	D	8	-	7	-
	E	10	10	10	10
20	E	10	-	10	-
	F	10	10	10	10
25	E	10	-	5	-
	F	10	10	10	7
40	G	10	10	6,5	5,5
	H	10	10	10	10
50	G	10	-	5	-
	H	10	10	7,5	7



# MAINTENANCE

## 4.1 MAINTENANCE AND STORING

### 4.1.1 Maintenance and order codes of the spare parts

- Regularly check if the diaphragm is not worn. Refer to the table below to have the order code (ident. no.) of the diaphragm corresponding to your valve (CSM diaphragms on request).



If your process uses muddy or abrasive fluids or fluids reaching high temperatures, the diaphragm must be checked often.

DN of body	Diaphragm ident. No.		
	EPDM diaphragm	FPM diaphragm	PTFE/EPDM diaphragm
8	642147G	640597E	643648X
15	642140M	640598P	636336X
20	642141A	640599Q	643234G
25	642142B	640600D	643235H
40	643645L	643653L	643659S
50	643646M	643656P	643660X

- The gaskets (see figure hereafter) can also be replaced: refer to the table below to have the order code (ident. no.) of the gasket set corresponding to your valve.

Actuator size	DN of body	Ident. No. of gasket set	
		PPS actuator	PA actuator
C	8	011465J	-
D	15	011477N	011426B
E	15, 20, 25	011488J	011440V
F	20, 25	011492E	011448Z
G	40, 50	012127G	012125E
H	40, 50	011494G	011464R

### 4.1.2 Storing

If the valve is stored for a long time, unscrew the body screws to avoid permanent change in shape of the diaphragm.





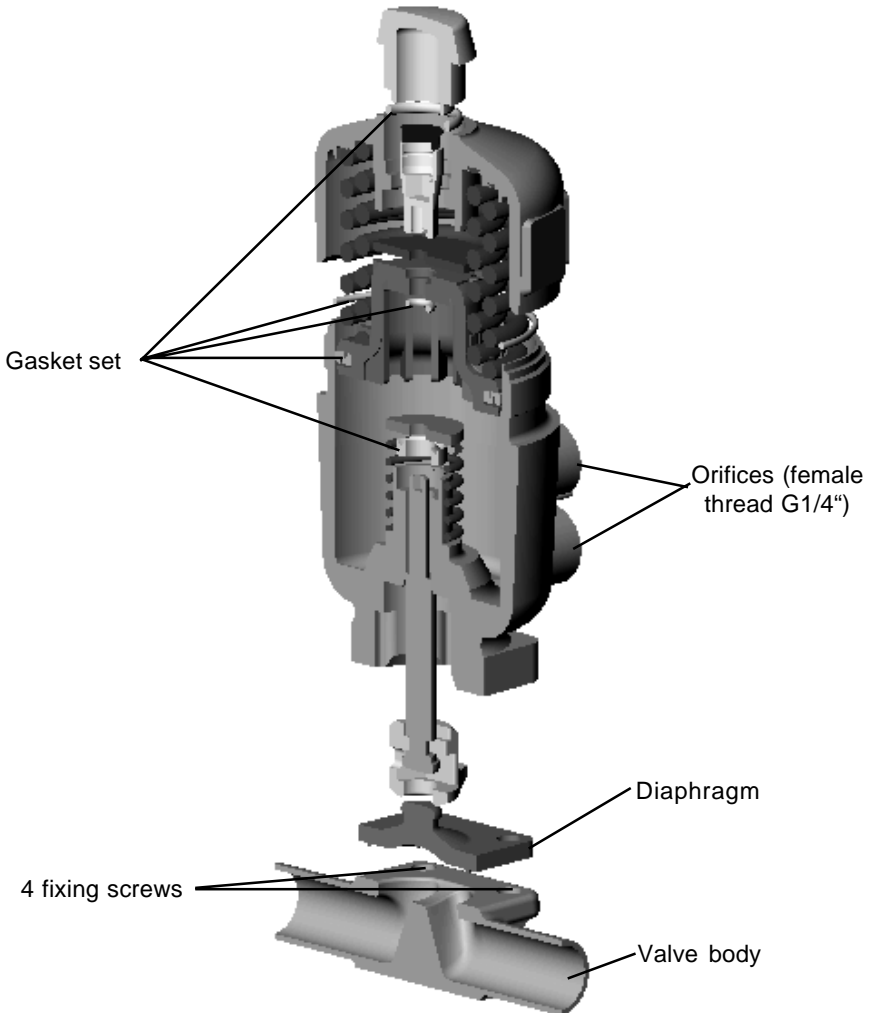
## 4.2 DISMANTLING THE DIAPHRAGM VALVE



Before dismantling or opening the valve, turn-off the medium and control medium and depressurize the pipes.



**Dismantling security** : the cover can be unscrewed without any risk (the spring loses its tension progressively).





## 4.2.1 Spring-to-close (A) or double-acting (I) valves

- Apply the control pressure indicated on the label to the lower orifice of the valve: the diaphragm separates from the body.
- Unscrew the 4 fixing screws in an alternating pattern and remove the valve body.
- Remove the diaphragm:
  - For DN15 and 20, remove the elastomer diaphragm.
  - For DN > 20, unscrew the elastomer diaphragm.
  - For a PTFE/EPDM diaphragm, turn a quarter turn to release the bayonet.
- Place back the new diaphragm so that the fixing holes are aligned with those of the diaphragm (screw home if necessary).
- Apply the control pressure indicated on the label to the lower orifice of the valve.
- Place back the valve body and the screws.
- Screw in an alternating pattern until the valve body is in its proper place, without tightening.
- Actuate the valve twice so that the diaphragm positions itself correctly.
- Remove the pressure then tighten the screws in an alternating pattern to the torque rating (in Nm) specified below:

DN	Diaphragm material	
	Elastomer	PTFE/EPDM
8	2	2,5
15	3,5	4
20	4	4,5
25	5	6
40	8	10
50	12	15



## 4.2.2 Spring-to-open (B) valve

- Unscrew the 4 fixing screws in an alternating pattern and remove the valve body.
- Apply the control pressure indicated on the label to the upper orifice of the valve: the diaphragm moves forward.
- Remove the diaphragm:
  - For DN15 and 20, remove the elastomer diaphragm.
  - For DN > 20, unscrew the elastomer diaphragm.
  - For a PTFE/EPDM diaphragm, turn a quarter turn to release the bayonet.
- Place back the new diaphragm so that the fixing holes are aligned with those of the diaphragm (screw home if necessary).
- Remove the pressure.
- Place back the valve body and the screws.
- Screw in an alternating pattern until the valve body is in its proper place, without tightening.
- Apply the pressure again and actuate the valve twice so that the diaphragm positions itself correctly.
- Remove the pressure then tighten the screws in an alternating pattern to the torque rating (in Nm) specified below:

DN	Diaphragm material	
	Elastomer	PTFE/EPDM
8	2	2,5
15	3,5	4
20	4	4,5
25	5	6
40	8	10
50	12	15



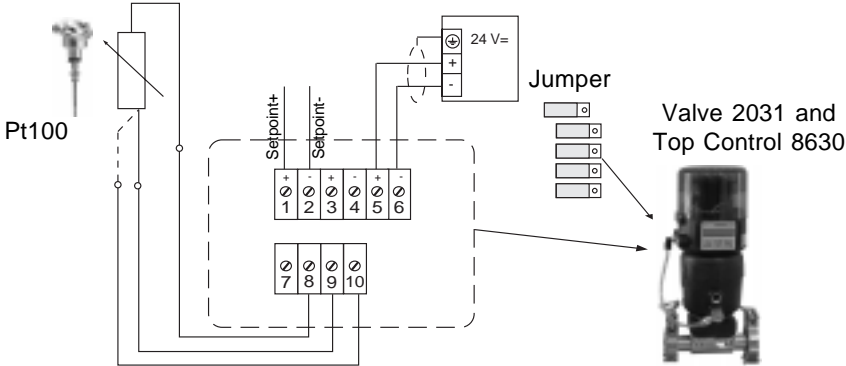
# EASY LINKS

Bürkert's EASY LINK is a simplified connection (point-to-point), without interface, between two Bürkert products.

Hereafter, some EASY LINK examples with a valve type 2031.

## 5.1 EASY CONTINUOUS TEMPERATURE CONTROL

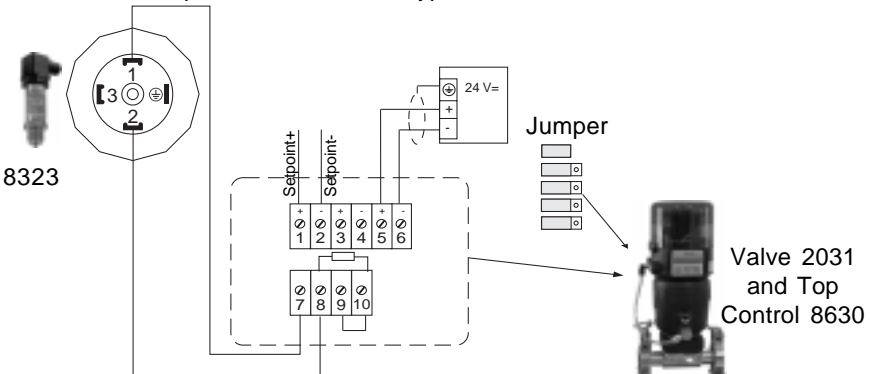
Link between the Top Control type 8630 mounted on a valve type 2031 and the temperature sensor type Pt100.



5.1 ENGLISH

## 5.2 EASY CONTINUOUS PRESSURE CONTROL

Link between the Top Control type 8630 mounted on a valve type 2031 and the pressure transmitter type 8323.



# SERVICE

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## Australia

Bürkert Fluid Control Systems  
Unit 1 No.2, Welder Road  
Seven Hills NSW 2147  
Tel +61 (0) 2 967 461 66  
Fax +61 (0) 2 967 461 67

## Austria

Bürkert Contromatic GmbH  
Central and Eastern Europe  
Diefenbachgasse 1-3  
A-1150 Wien  
Tel +43 (0) 1 894 13 33  
Fax +43 (0) 1 894 13 00

## Belgium

Bürkert Contromatic N.V./S.A  
Middelmolenaan 100  
B-2100 Deurne  
Tel +32 (0) 3 325 89 00,  
Fax +32 (0) 3 325 61 61

## Canada

Bürkert Contromatic Inc.  
760 Pacific Road, Unit 3  
Oakville, Ontario, L6L 6M5  
Tel +1 905 847 55 66,  
Fax +1 905 847 90 06

## China

Bürkert Contromatic  
(Suzhou) Co. Ltd.  
2/F, 71 Zhu Yuan Road  
215011 Suzhou  
Tel +86 512 808 19 16  
Fax +86 512 824 51 06

Bürkert Contromatic  
China/HK Ltd.

Rm. 1313  
No. 103, Cao Bao Road  
200233 Shanghai P.R.C  
Tel +86 21 6484 7007  
Fax +86 21 6427 1945

Bürkert Contromatic  
China/HK Ltd.  
Beijing Office  
Rm. 808, Jing Tai Building  
No. 24, Jianguomen  
Waidajie  
100022 Beijing P.R.C  
Tel +86 10 65 15 65 08  
Fax +86 10 65 15 65 07

Bürkert Contromatic  
China/HK Ltd.  
Cheng Du Representative Office  
Rm. 502, Fuji Building  
No. 26 Shududadao  
Dongfeng Street  
Chengdu P.R.C  
Tel +86 28 443 1895  
Fax +86 28 445 1341

Bürkert Contromatic  
China/HK Ltd.  
Guangzhou Representative Office  
Rm. 1305, Tower 2  
Dong-Jun Plaza  
Dongfeng, Road East  
Guangzhou P.R.C  
Tel +86 28 443 1895  
Fax +86 28 445 1341

## Denmark

Bürkert-Contromatic A/S  
Hørkær 24  
DK-2730 Herlev  
Tel +45 44 50 75 00  
Fax +45 44 50 75 75

## Finland

Bürkert Oy  
Atomitie 5  
SF-00370 Helsinki  
Tel +358 (0) 9 549 706 00  
Fax +358 (0) 9 503 12 75

## France

Bürkert Contromatic  
B.P. 21  
Triembach au Val  
F-67220 Villé  
Tel +33 (0) 388 58 91 11  
Fax +33 (0) 388 57 09 61

## Germany / Deutschland

Bürkert Steuer- und Regeltechnik  
Christian-Bürkert-Straße 13-17  
D-74653 Ingelfingen  
Tel +49 7940 10-0  
Fax +49 7940 10 361

Niederlassung NRW  
Holzener Straße 70  
D-58708 Menden  
Tel +49 2373 96 81-0  
Fax +49 2373 96 81-52

Niederlassung Frankfurt  
Am Flugplatz 27  
D-63329 Egelsbach  
Tel +49 6103 94 14-0  
Fax +49 6103 94 14-66

Niederlassung München  
Paul-Gerhardt-Allee 24  
D-81245 München  
Tel +49 89 82 92 28-0  
Fax +49 89 82 92 28-50

Niederlassung Berlin  
Bruno-Taut-Straße 4  
D-12524 Berlin  
Tel +49 30 67 97 17-0  
Fax +49 30 67 97 17-66

Niederlassung Dresden  
Christian Bürkert Straße 2  
D-01900 Großröhrsdorf  
Tel +49 35952 3 63 00  
Fax +49 35952 3 65 51

Niederlassung Hannover  
Rendsburger Straße 12  
D-30569 Hannover  
Tel +49 511 9 02 76-0  
Fax +49 511 9 02 76-66

Niederlassung Stuttgart  
Karl-Benz-Straße 19  
D-70794 Filderstadt (Bernh.)  
Tel +49 711 4 51 10-0  
Fax +49 711 4 51 10-66

## Great Britain

Bürkert Contromatic Ltd.  
Brimscombe Port Business Park  
Brimscombe, Stroud, Glos.  
GL5 2QF  
Tel. +44 (0) 1453 73 13 53  
Fax +44 (0) 1453 73 13 43

## Hong Kong

Bürkert Contromatic  
(China/HK) Ltd.  
Unit 708, Prosperity Centre  
77-81 Container Port Road  
Kwai Chung N.T.  
Hong Kong  
Tel +852 248 012 02  
Fax +852 241 819 45

## Italy

Bürkert Contromatic Italiana S.p.A.  
Centro Direzionale 'Colombiolo'  
Via Roma 74  
I-20060 Cassina De' Pecchi (MI)  
Tel +39 02 959 071  
Fax +39 02 959 07 251

## Japan

Bürkert Contromatic Ltd.  
3-39-8 Shonan  
Suginami-ku  
Tokyo 167-0054  
Tel +81 (0) 3 3247 3411  
Fax +81 (0) 3 3247 3472

## Korea

Bürkert Contromatic Korea Co. Ltd.  
4-10 Yangjae-Dong  
Seocho-Ku  
Seoul 137-130  
Tel. +82 (0) 2 346 255 92  
Fax +82 (0) 2 346 255 94

---

## SERVICE

---

### Malaysia

Bürkert Malaysia Sdn. Bhd.  
N° 22 Lorong Helang 2  
11700, Sungai Dua  
Penang  
Tel. +60 (0) 4 657 64 49  
Fax +60 (0) 4 657 21 06

### Netherlands

Bürkert Contromatic BV  
Computerweg 9  
NL-3606 AV Maarssen  
Tel. +31 (0) 346 58 10 10  
Fax +31 (0) 346 56 37 17

### New Zealand

Burkert Contromatic Ltd.  
Unit 5, 23 Hannigan drive  
Mt Wellington  
Auckland  
Tel +64 (0) 9 570 25 39  
Fax +64 (0) 9 570 25 73

### Norway

Bürkert Contromatic A/S  
Hvamstubben 17  
Box 243  
N-2026 Skjetten  
Tel +47 63 84 44 10  
Fax +47 63 84 44 55

### Poland

Bürkert Contromatic Sp.z.o.o.  
1 Szpitalna Street  
PL-00-684  
Warszawa  
Tel +48 (0) 22 827 29 00  
Fax +48 (0) 22 627 47 20

### Singapore

Burkert Contromatic Singapore Pte.Ltd.  
No.11 Playfair Road  
Singapore 367986  
Tel +65 383 26 12  
Fax +65 383 26 11

### Spain

Bürkert Contromatic Española S.A.  
San Gabriel 40-44  
E-08950 Esplugues de Llobregat  
Tel +34 93 371 08 58  
Fax +34 93 371 77 44

### South Africa

Burkert Contromatic Pty.Ltd.  
P.O.Box 26260, East Rand 1462  
Republic of South Africa  
Tel +27 (0) 11 397 2900  
Fax +27 (0) 11 397 4428

### Sweden

Bürkert Contromatic AB  
Skeppsbron 13 B  
S-21120 Malmö  
Tel +46 (0) 40 664 51 00  
Fax +46 (0) 40 664 51 01

### Switzerland

Bürkert Contromatic AB  
Havsörnstorget 21  
Box 1002  
S-12349 Farsta  
Tel +46 (0) 40 664 51 00  
Fax +46 (0) 8 724 60 22

### Switzerland

Bürkert-Contromatic AG Schweiz  
Bösch 65  
CH-6331 Hünenberg / ZG  
Tel +41 (0) 41 785 66 66  
Fax +41 (0) 41 785 66 33

### Taiwan

Bürkert Contromatic Taiwan Ltd.  
3F No. 475 Kuang-Fu South Road  
R.O.C - Taipei City  
Tel +886 (0) 2 275 831 99  
Fax +886 (0) 2 275 824 99

### Turkey

Bürkert Contromatic  
Akiskan Kontrol Sistemleri Ticaret  
A.S  
1203/8 Sok. No. 2-E  
Yenisehir  
Izmir  
Tel +90 (0) 232 459 53 95  
Fax +90 (0) 232 459 76 94

### Tzechia

Bürkert Contromatic Spol.s.r.o  
Prosenice c. 180  
CZ - 751 21 Prosenice  
Tel +42 0641 226 180  
Fax +42 0641 226 181

### USA/West/Main office

Burkert Contromatic Corp.  
2602 McGaw Avenue  
Irvine, CA 92614, USA  
Tel. +1 949 223 31 00  
Fax +1 949 223 31 98

### USA/South

Burkert Contromatic Corp.  
6724 Alexander Road  
Charlotte, North Carolina, 28270  
Tel. +1 704 367 11 73  
Fax +1 704 367 11 74

### USA/North-East

Burkert Contromatic Corp.  
7173 Thermal Road  
Charlotte, North Carolina, 28211  
Tel. +1 704 366 21 41  
Fax +1 704 366 24 28

### USA/West

Burkert Contromatic Corp.  
4449 East Bradford  
Orange, CA 92867  
Tel. +1 714 637 26 39  
Fax +1 714 637 21 62

### USA/Mid-West

Burkert Contromatic Corp.  
6245 Kincora Court  
Cincinnati, OH 45233  
Tel. +1 513 941 34 78  
Fax +1 513 941 29 05

