



Installation and Maintenance Manual

Air cylinder

Series 55-CQ2-Z

CE Ex II 2GD c 85°C (T6) Ta -10°C to 40°C
105°C (T4) Ta 40°C to 60°C

Marking description
Group II, Category 2
Suitable for Gas and Dust environment
Type of protection "constructional safety"
The maximum surface temperature is 85°C and the temperature class is T6 when the ambient temperature is: -10°C to 40°C
The maximum surface temperature is 105°C and the temperature class is T4 when the ambient temperature is 40°C to 60°C

1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

	Caution	Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury.
	Warning	Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury.
	Danger	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

Warning

- The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.
Since the products specified here can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.
- **Only trained personnel should operate pneumatically operated machinery and equipment.**
Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced personnel.
- **Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

- 1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
 - 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
 - 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).
- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**
 - 1) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.

1 Safety Instructions (Continued)

- 2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
- 3) An application, which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Caution

- Ensure that the air supply system is filtered to 5 microns.

2 Specifications

2.1 Specifications

Refer to the operation manual for this product.

Fluid		Air	
Max. operating pressure	Ø12 ~ Ø160	1.0 MPa	
	Ø180 ~ Ø200	0.7 MPa	
Min. operating pressure	Ø12 & Ø16	0.07 MPa	
	Ø20 ~ Ø200	0.05 MPa	
Ambient and fluid temperature		-10 ~ 60°C	
Lubrication		Not required	
Operating piston speed	Ø12 ~ Ø160	50 ~ 500 mm/s	
	Ø180 & Ø200	20 ~ 400 mm/s	
Cushion		No cushion	Rubber cushion
Allowable kinetic energy	Ø12	0.022 J	0.043 J
	Ø16	0.038 J	0.075 J
	Ø20	0.055 J	0.110 J
	Ø25	0.09 J	0.18 J
	Ø32	0.15 J	0.29 J
	Ø40	0.26 J	0.52 J
	Ø50	0.46 J	0.91 J
	Ø63	0.77 J	1.54 J
	Ø80	1.36 J	2.71 J
	Ø100	2.27 J	4.54 J
	Ø125	N/A	7.4 J
	Ø140	N/A	9.8 J
	Ø160	N/A	12.4 J
	Ø180	N/A	12.4 J
Ø200	N/A	12.4 J	
Explosive atmosphere		Gas and Dust	
Zone		1, 21, 2 and 22	

2.2 Production batch code

The production batch code printed on the label indicates the month and year of production as per the following table:

Production batch codes											
Year	2010	2011	2012	...	2021	2022	2023	...			
Month	O	P	Q	...	Z	A	B	...			
Jan	O	OO	PO	QO	...	ZO	AO	BO	...		
Feb	P	OP	PP	QQ	...	ZP	AP	BP	...		
Mar	Q	OQ	PQ	QQ	...	ZQ	AQ	BQ	...		
Apr	R	OR	PR	QR	...	ZR	AR	BR	...		
May	S	OS	PS	QS	...	ZS	AS	BS	...		
Jun	T	OT	PT	QT	...	ZT	AT	BT	...		
Jul	U	OU	PU	QU	...	ZU	AU	BU	...		
Aug	V	OV	PV	QV	...	ZV	AV	BV	...		
Sep	W	OW	PW	QW	...	ZW	AW	BW	...		
Oct	X	OX	PX	QX	...	ZX	AX	BX	...		
Nov	Y	OY	PY	QY	...	ZY	AY	BY	...		
Dec	Z	OZ	PZ	QZ	...	ZZ	AZ	BZ	...		

2.3 Production location

SMC JP SMC Tsukuba Factory#1, Onogomachi 6133, Joso Ibaraki 300-2593, Japan	SMC Italia S.p.A. Localita Recocce 67061 Carsoli (AQ)	SMC Industrial Automation CZ s.r.o. Cukrovárská 503/21 682 01 Vyškov, Czech Republic
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3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere except within the specified rating.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.

3 Installation (Continued)

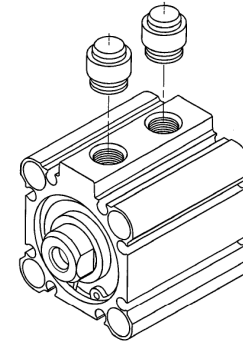
- Do not mount in a location exposed to radiant heat.
- Do not use in case of heavy dusty environment where dust can penetrate into the cylinder and dry the grease.
- Do not use in wet environments.

3.3 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1.5 to 2 threads exposed on the end of the pipe/fitting.

Model	Port size
55-CQ2*12*Z	M5 X 0.8
55-CQ2*16*Z	
55-CQ2*20*Z	
55-CQ2*25*Z	
55-CQ2*32*Z	M5 x 0.8 or Rc1/8
55-CQ2*40*Z	Rc1/8
55-CQ2*50*Z	Rc1/4
55-CQ2*63*Z	
55-CQ2*80*Z	
55-CQ2*100*Z	
55-CQ2*125*Z	Rc3/8
55-CQ2*140*Z	
55-CQ2*160*Z	
55-CQ2*180*Z	
55-CQ2*200*Z	Rc1/2
55-CQ2*32TF*Z	M5 x 0.8 or G1/8
55-CQ2*40TF*Z	Note 1)
55-CQ2*50TF*Z	G1/8
55-CQ2*63TF*Z	G1/4
55-CQ2*80TF*Z	
55-CQ2*100TF*Z	
55-CQ2*125TF*Z	
55-CQ2B140TF*Z	G3/8
55-CQ2B160TF*Z	
55-CQ2B180TF*Z	
55-CQ2B200TF*Z	
55-CQ2B200TF*Z	G1/2



Note 1) In the case without autoswitch, M5 x 0.8 is used for 5 stroke only.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

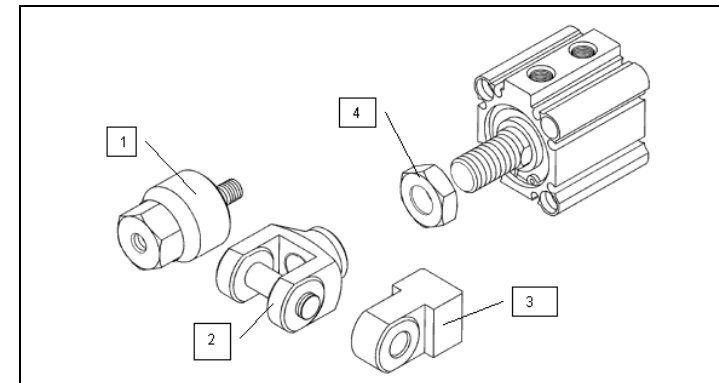
3.5 Electrical connection

Warning

- Provide a grounding connection to the actuator to avoid any spark arising from potential differences.

3.6 Mounting accessories

Rod end accessories



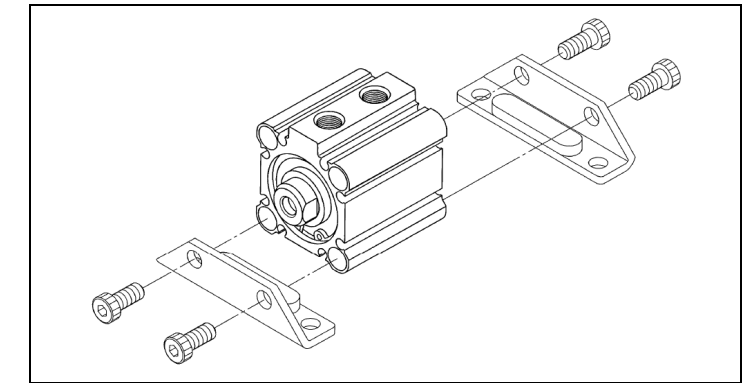
1	Floating joint	3	Single knuckle joint
2	Double knuckle joint	4	Rod end nut

3 Installation (Continued)

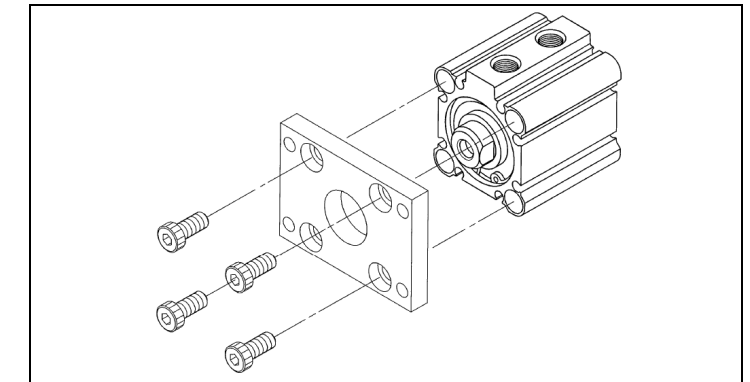
- Mounting procedure:
 - Screw the nut (4) loosely onto the rod end thread.
 - Screw the accessory (1, 2 or 3) onto the rod end thread.
 - Tighten the nut against the accessory to fix it in place.
- Use wrenches of the following dimensions:

Bore size (mm)	Width across flats (mm)		
	Floating joint	Double knuckle joint	Single knuckle joint
Ø12	10	10	10
Ø16	10	12	12
Ø20	13	16	16
Ø25	17	20	20
Ø32, Ø40	22	22	22
Ø50, Ø63	27	28	28
Ø80	32	38	38
Ø100	41	44	44
Ø125, Ø140	46	-	-
Ø160 ~ Ø200	55	-	-

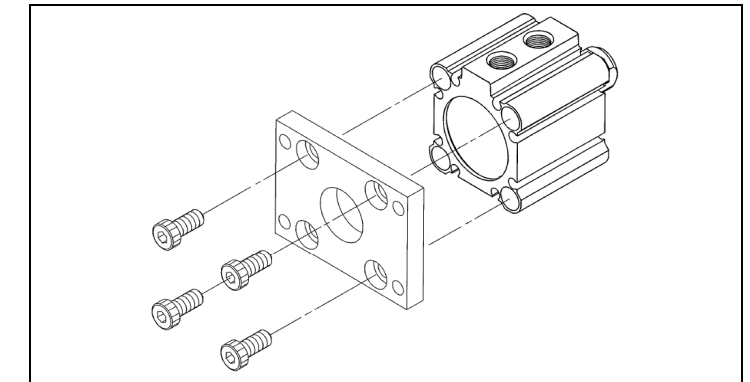
Foot brackets



Front flange

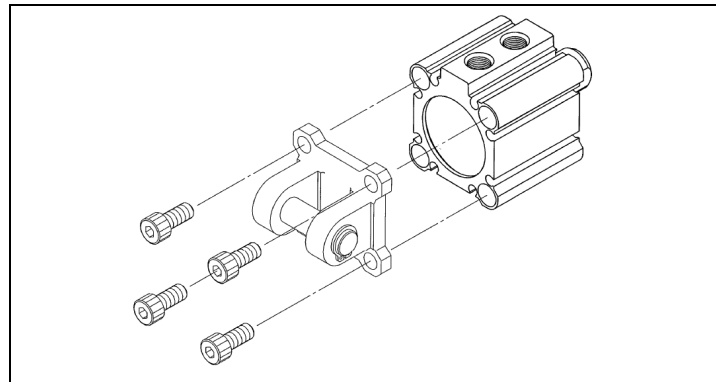


Rear flange



3 Installation (Continued)

Rear double clevis



- When replacing brackets, use the hexagon wrenches shown below.

Bore size (mm)	Width across flats (mm)	Tightening torque (Nm)
Ø12, Ø16	2.5	1.43 to 2.55
Ø20 ~ Ø40	4	8.98 to 12.0
Ø50	5	11.4 to 22.4
Ø63	6	25.0 to 44.9
Ø80, Ø100	8	43.9 to 78.5
Ø125 ~ Ø200	-	-

4 Settings

Refer to the operation manual for this product.

5 How to order

Refer to the operation manual for this product.

6 Outline dimensions

Refer to the operation manual for this product.

7 Maintenance

7.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Periodically check the rod surface, the rod seal and the cylinder tube external surface. Any damage or rust appearing on these components could increase friction and lead to dangerous conditions. Replace the whole actuator if any of these conditions should appear.
- Replace the seals, when air leakage is above allowable value given in the table below.

Internal leakage	10 cm ³ /min (ANR)
External leakage	5 cm ³ /min (ANR)

- Do not allow dust to form deposits on the outer surface of the actuator and mounting bracket.
- Periodically check for presence of lubrication.

7 Maintenance (Continued)

7.2 Seal replacement

Warning

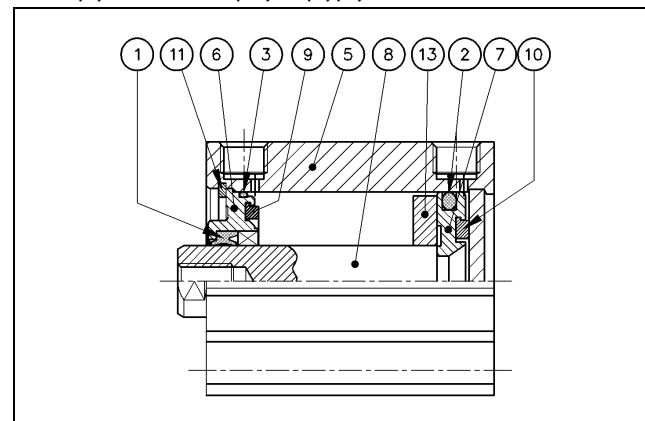
- Only use SMC seal kits as listed in the table below.

Bore size (mm)	Seal kit number			
	Standard	Anti-lateral load type	Long stroke type	Double rod type
Ø12	CQ2B12-PS			CQ2WB12-PS
Ø16	CQ2B16-PS			CQ2WB16-PS
Ø20	CQ2B20-PS			CQ2WB20-PS
Ø25	CQ2B25-PS			CQ2WB25-PS
Ø32	CQ2B32-PS		CQ2A32-L-PS	CQ2WB32-PS
Ø40	CQ2B40-PS		CQ2A40-L-PS	CQ2WB40-PS
Ø50	CQ2B50-PS		CQ2A50-L-PS	CQ2WB50-PS
Ø63	CQ2B63-PS		CQ2A63-L-PS	CQ2WB63-PS
Ø80	CQ2B80-PS		CQ2A80-L-PS	CQ2WB80-PS
Ø100	CQ2B100-PS		CQ2A100-L-PS	CQ2WB100-PS
Ø125	CQ2B125-PS			
Ø140	CQ2B140-PS			
Ø160	CQ2B160-PS			
Ø180	CQ2B180-PS			
Ø200	CQ2B200-PS			

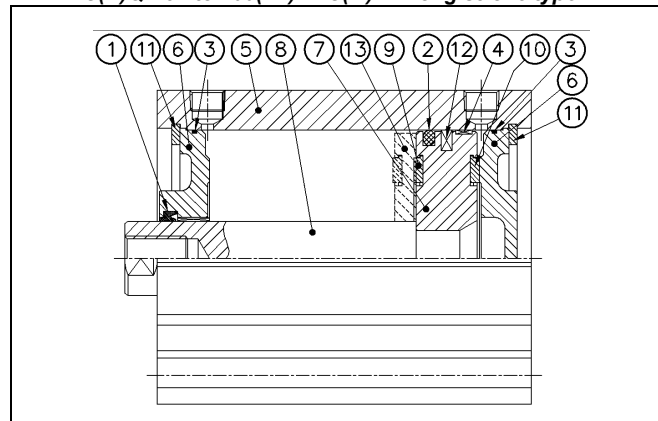
7.3 Disassembly procedure

- Disassemble the cylinder, remove the old grease and place all the parts on a clean cloth in a clean environment. Use a snap ring pliers to remove the snap ring. Remove the old tube gaskets, rod seal, piston seal, wear ring, using a fine screwdriver where necessary. If the magnet is present on the piston, do not remove it. This part is not to be replaced.

Model: C(D)Q2*12 to 100(TF)-*D(C)(M)Z

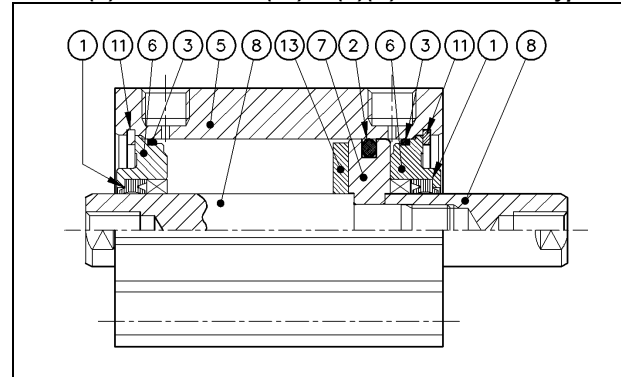


Models: C(D)Q2B125 to 200(TF)-*DC(M)Z
C(D)Q2*32 to 100(TF)-*DC(M)Z / Long stroke type

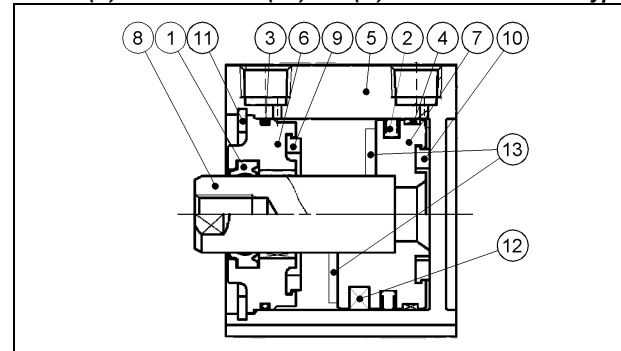


7 Maintenance (Continued)

Models: C(D)Q2W*12 to 200(TF)-*D(C)(M)Z / Double rod type



Models: C(D)Q2BS32 to 100(TF)-*DC(M)Z / Anti-lateral load type



1	Rod seal	6	Collar assembly	11	Snap ring
2	Piston seal	7	Piston	12	Magnet
3	Tube gasket	8	Piston rod	13	Spacer (when fitted)
4	Wear ring	9	Bumper A		
5	Cylinder tube	10	Bumper B		

7.4 Lubrication procedure

- Apply lubricant to:
 - rod seal
 - rod seal groove on the rod cover
 - piston outer surface
 - piston seal groove
 - piston seal
 - tube gaskets
 - piston rod surface
 - tube inner surface
- Lubricate the parts using the following SMC grease packs:

Product	Grease pack number	Weight (g)
All cylinders except -XC85	GR-S-010	10
	GR-S-020	20
-XC85 cylinders	GR-H-010	10

- The amount of lubricant to be applied is listed in the following table.

Bore size (mm)	Required amount of grease for the minimum stroke (g)	Additional amount of grease required for each 5mm of stroke (g)
Ø12	0.07	0.01
Ø16	0.10	0.01
Ø20	0.12	0.015
Ø25	0.18	0.02
Ø32	0.25	0.035
Ø40	0.36	0.045
Ø50	0.665	0.055
Ø63	0.77	0.07
Ø80	1.14	0.09
Ø100	1.51	0.11
Ø125	2.35	0.17
Ø140	2.95	0.22
Ø160	3.87	0.28
Ø180	4.89	0.36
Ø200	6.04	0.44

7 Maintenance (Continued)

7.5 Assembly procedure

- Inserting the collar assembly into the piston rod assembly.
- Apply grease to the end of the piston rod, especially on the 30° chamfer and on the flats. Insert with care the piston rod into the rod cover to prevent any damage to the rod seal.
- Inserting piston rod assembly and rod cover assembly into the cylinder tube.
- Insert slowly with care the piston assembly and the rod cover assembly into the cylinder tube to prevent any damage of the piston seal and tube gasket.
- Installing snap ring.
- Use appropriate pliers (tool for C shape snap ring) for installation.

Caution

When installing the snap ring, be aware that the snap ring may come off the pliers and could result in operator injury or equipment damage. Also make sure ring is firmly seated in ring groove.

- Checking assembly.
- Make sure that no air is leaking from packing seals and that the cylinder operates smoothly at minimum operating pressure. Check for cylinder smooth movement and for air leakage.

8 Limitations of use

Danger

- Do not exceed any of the specifications listed in section 2 of this document or the specific product catalogue.
- Air equipment has standard air leakage within certain limits. Do not use the equipment when the air itself can lead to explosion.
- Do not use this equipment where vibration could lead to equipment failure. Contact SMC for this specific situation.
- External impacts on the cylinder body could result in spark and/or cylinder damage. Avoid any application where foreign objects can hit the cylinder. In such situations install a suitable guard to prevent such impacts.
- Do not install or use this actuator in applications where the piston rod can impact foreign objects.
- Avoid applications where the piston rod end and the application joining parts create a possible ignition source.
- Use only ATEX certified auto switches. Order them separately.
- Do not use in the presence of strong magnetic fields that could generate a surface temperature higher than the value given for the temperature class.

9 Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
BULGARIA	(359) 2 974 4492	NETHERLANDS	(31) 20 531 8888
CZECH REP.	(420) 541 424 611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
HUNGARY	(36) 23 511 390	SWEDEN	(46) 8 603 1200
IRELAND	(353) 1 403 9000	SWITZERLAND	(41) 52 396 3131
ITALY	(39) 02 92711	UNITED KINGDOM	(44) 1908 563888

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