



Installation and Maintenance Manual

ISO cylinder series, 55-C85

CE Ex II 2GD c 90°C (T5) Ta -10°C to 40°C
110°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 90°C and the temperature class is T5 when the ambient temperature is: -10°C to 40°C
The maximum surface temperature is 110°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)

- 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.
- 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	1.0 MPa		
Min. operating pressure	Ø8	0.1 MPa	
	Ø10 & Ø12	0.08 MPa	
	Ø16 to Ø25	0.05 MPa	
Ambient and fluid temperature	-10 to 60°C		
Lubrication	Not required		
Operating piston speed	Rubber bumper	Air cushion	
	50 to 750 mm/s	50 to 1000 mm/s	
Cushion	Rubber bumper (both ends)	Air cushion (both ends)	
	Ø8	0.02 J	-
Allowable kinetic energy	Ø10	0.03 J	0.17 J
	Ø12	0.04 J	0.19 J
	Ø16	0.09 J	0.4 J
	Ø20	0.27 J	0.66 J
	Ø25	0.4 J	0.97 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	2003	2004	2005	...	2021	2022	2023	...	
Month	H	I	J	...	Z	A	B	...	
Jan	O	HO	IO	JO	...	ZO	AO	BO	...
Feb	P	HP	IP	JJ	...	ZP	AP	BP	...
Mar	Q	HQ	IQ	JQ	...	ZQ	AQ	BQ	...
Apr	R	HR	IR	JR	...	ZR	AR	BR	...
May	S	HS	IS	JS	...	ZS	AS	BS	...
Jun	T	HT	IT	JT	...	ZT	AT	BT	...
Jul	U	HU	IU	JU	...	ZU	AU	BU	...
Aug	V	HV	IV	JV	...	ZV	AV	BV	...
Sep	W	HW	IW	JW	...	ZW	AW	BW	...
Oct	X	HX	IX	JX	...	ZX	AX	BX	...
Nov	Y	HY	IY	JY	...	ZY	AY	BY	...
Dec	Z	HZ	IZ	JZ	...	ZZ	AZ	BZ	...

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.
- Do not mount in a location exposed to radiant heat.

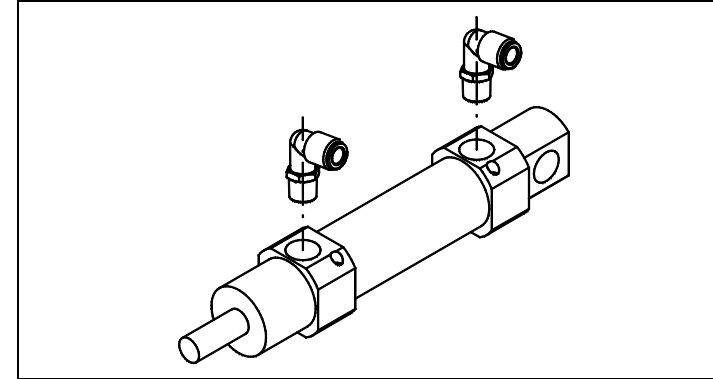
3 Installation (Continued)

- 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

Warning

- 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.



Bore size (mm)	Port size
Ø8, Ø10, Ø12, Ø16	M5 x 0.8
Ø20 & Ø25	G 1/8

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.

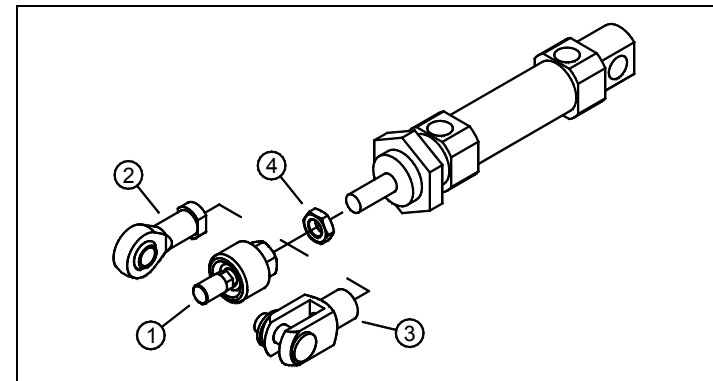
3.5 Electrical connection

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	Piston rod clevis
2	Piston rod ball joint	4	Rod end nut

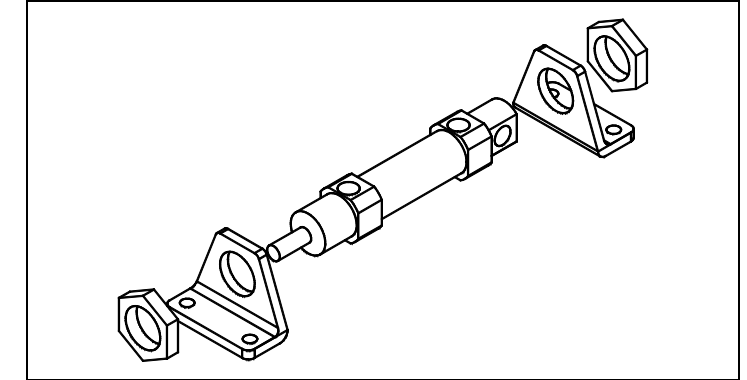
- Mounting procedure:
 - Screw the nut (4) loosely onto the rod end thread.
 - Screw the accessory (1, 2 or 3) onto the rod end thread.
 - Tighten the nut against the accessory to fix it in place.

3 Installation (Continued)

- Use wrenches of the following dimensions:

Bore size	Width across flats (mm)		
	Floating joint	Ball joint	Clevis
Ø8, Ø10	7	11	8
Ø12, Ø16	10	13	12
Ø20	13	16	16
Ø25	17	19	20

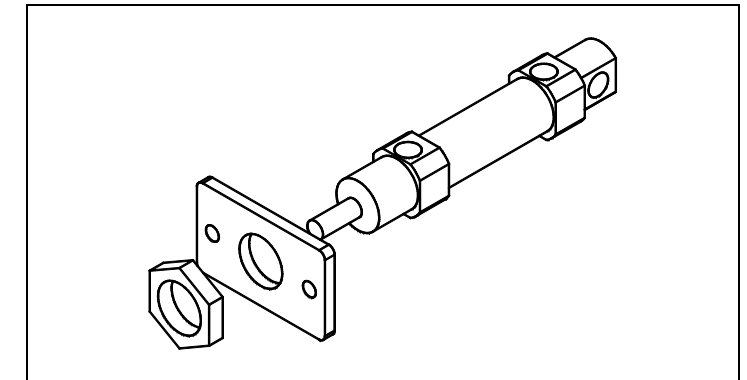
Foot brackets



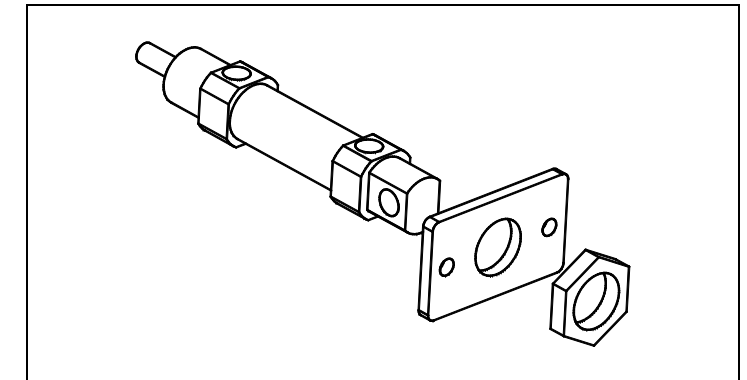
When replacing brackets, use the torque shown below to tighten nut.

Bore size (mm)	Width across flats (mm)	Tightening torque (Nm)
Ø8, Ø10	19	4
Ø12, Ø16	24	12
Ø20	32	30
Ø25	32	50

Front flange

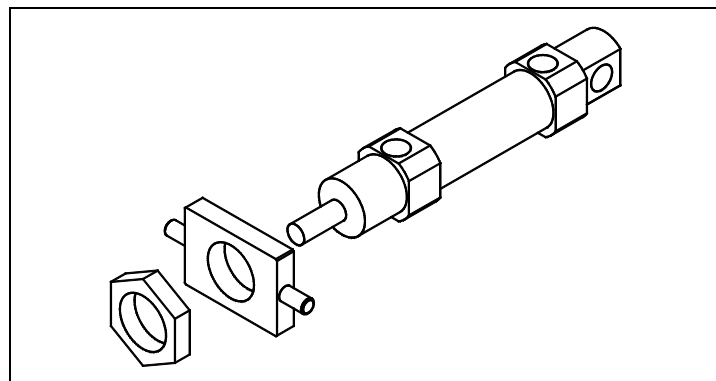


Head flange

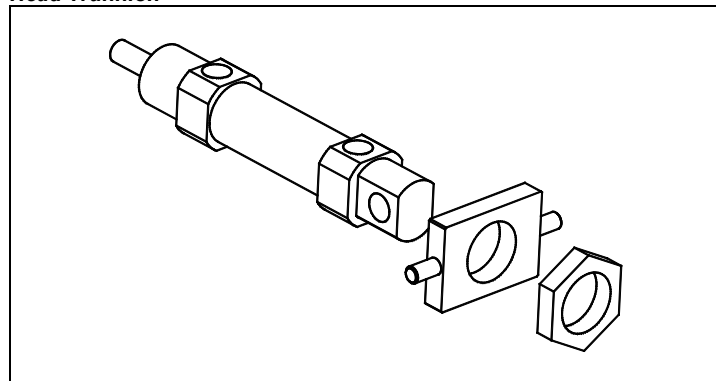


3 Installation (Continued)

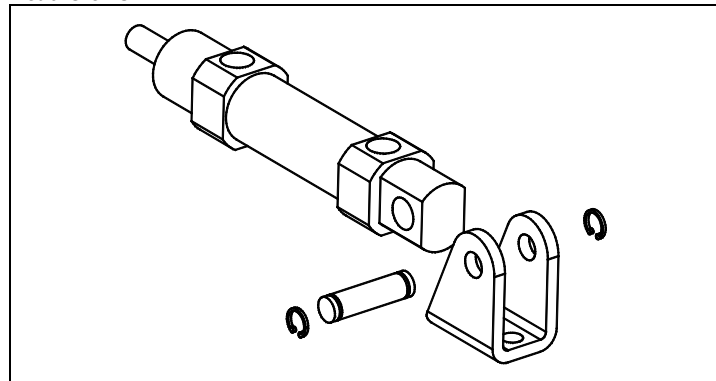
Rod Trunnion



Head Trunnion



Head Clevis

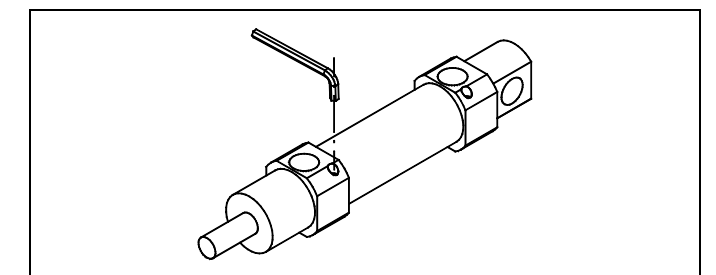


4 Settings

4.1 Air cushion adjustment

- For air cushion adjustment, tighten or loosen the cushion valve using a suitable hexagon socket screw key as listed in the table below.

Bore size (mm)	Width across flats (mm)
Ø8, Ø10, Ø12, Ø16, Ø20, Ø25	1.5 (hex head)



4 Settings (Continued)

Warning

- Do not open the cushion valve above the stopper. Cushion valves are provided with a crimp or a retaining ring as a stopping mechanism, and the cushion valve should not be opened above that point. If air is supplied and operation started without confirming the above condition, the cushion valve may be ejected from the cover.
- Do not operate the cushion valve in the fully closed or fully open state. Using it in the fully closed state will cause the cushion seal to be damaged. Using it in the fully opened state will cause the piston rod assembly or the cover to be damaged.
- Be certain to activate the air cushion at the stroke end. When the cylinder is used with the cushion valve in a fully open position, a suitable external device should be installed to absorb all of the kinetic energy of the mechanism, of which the actuator is part, before reaching each end of stroke. If this is not done, the piston rod assembly will be damaged.

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.

7.2 Seal replacement

Warning

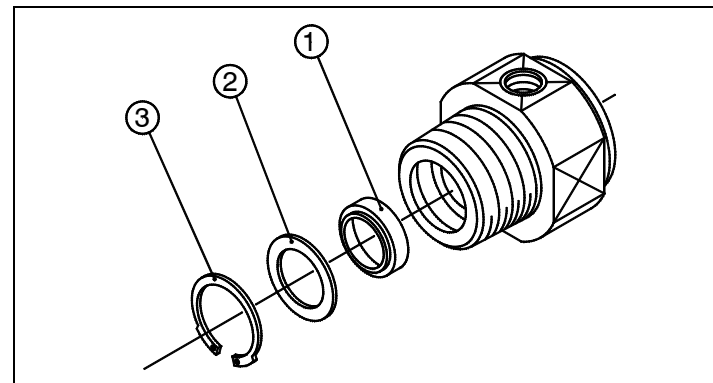
- Only use SMC seal kits as listed in the table below.

Bore size (mm)	Seal kit number		
	Standard	Non-rotating	XC22
Ø20	C85-20PS	C85K-20PS	DRP-8F
Ø25	C85-25PS	C85K-25PS	DRP-10F

7.3 Disassembly procedure

- Take out retaining ring and plain washer at rod cover, remove the old grease and place all the parts on a clean cloth in a clean environment. Remove the old rod seal, using a fine screwdriver where necessary.

7 Maintenance (Continued)



1	Rod seal
2	Plain Washer
3	Retaining Ring

7.4 Lubrication procedure

- Apply lubricant to:
 - Rod seal.
 - Rod seal groove on the rod cover.

- Lubricate the parts using the following SMC grease packs:

Product	Grease pack number	Weight (g)
Standard	GR-S-010	10
	GR-S-020	20

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

Bore size (mm)	Amount (g)
Ø8, Ø10, Ø12, Ø16	3
Ø20, Ø25	3 ~ 4

7.5 Assembly procedure

- The cylinder should be assembled in the following order: Put rod seal to rod cover after apply sufficient grease to seal and groove at rod cover, then put plain washer and retaining ring. 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
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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
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