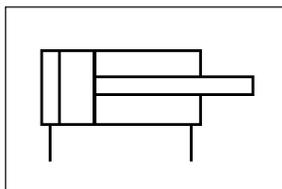




ORIGINAL INSTRUCTIONS

**Instruction Manual**  
**ISO Cylinder**  
**55-C85 Series**



Ex II 2GD	Ex h IIC T5/T4 Gb	-10°C ≤ Ta ≤ +60°C
	Ex h IIIC T89°C/T109°C Db	

Product marking shown above is for the standard product.

**Marking Description:**

Ex	Specific Marking for Explosion Protection
II	Equipment Group
2	Equipment Category
GD	Environment (Gas/Dust)
Ex h	Type of Protection – Constructional Safety 'c'
IIC	Gas Sub-Division
IIIC	Dust Sub-Division
T	Temp. Classification
Gb/Db	Equipment Protection Level
X	Special Conditions of Use
Ta	Ambient Temperature Range

The intended use of this actuator is to convert the potential energy provided by compressed air into a force which causes mechanical linear motion.

Certificate Number:	SMC19.0033 X
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Note 1: The X at the end of the certificate number represents that this product is subject to "Special Conditions of Use", please see Section 2.3.

**1 Safety Instructions**

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>1)</sup>, and other safety regulations.

<sup>1)</sup> ISO 4414: Pneumatic fluid power - General rules relating to systems.  
ISO 4413: Hydraulic fluid power - General rules relating to systems.  
IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)  
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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

**Warning**

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

**2 Specifications**

This product is suitable for use in Zones 1, 2, 21 and 22 only.

**2.1 Product Specifications:**

Refer to the operation manual for this product;

**2.1.1 Standard Product:**

Fluid	Air		
Max. Operating Pressure	1.0 MPa		
Min. Operating Pressure	Ø 8	0.10 MPa	
	Ø 10 & Ø 12	0.08 MPa	
	Ø 16 & Ø 25	0.05 MPa	
Ambient & Fluid Temperature	-10°C to +60°C		
Lubrication	Not Required		
Operating Piston Speed	Air Cushion	50 to 1000 mm/s	
	R.Bumper	50 to 750 mm/s	
Cushion	Air Cushion & Bumper		
Allowable Kinetic Energy	Air Cushion	Ø 10	0.17 J
		Ø 12	0.19 J
		Ø 16	0.40 J
		Ø 20	0.66 J
		Ø 25	0.97 J
	Rubber Bumper	Ø 8	0.02 J
		Ø 10	0.03 J
		Ø 12	0.04 J
		Ø 16	0.09 J
		Ø 20	0.27 J
Ø 25	0.40 J		

**2.2 Production Batch Code:**

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

		Production Batch Codes											
Year	Month	2021	2022	2023	...	2027	2028	2029	...				
		Z	A	B	...	F	G	H	...	Z	A	B	...
Jan	o	Zo	Ao	Bo	...	Fo	Go	Ho	...				
Feb	P	ZP	AP	BP	...	FP	GP	HP	...				
Mar	Q	ZQ	AQ	BQ	...	FQ	GQ	HQ	...				
Apr	R	ZR	AR	BR	...	FR	GR	HR	...				
May	S	ZS	AS	BS	...	FS	GS	HS	...				
Jun	T	ZT	AT	BT	...	FT	GT	HT	...				
Jul	U	ZU	AU	BU	...	FU	GU	HU	...				
Aug	V	ZV	AV	BV	...	FV	GV	HV	...				
Sep	W	ZW	AW	BW	...	FW	GW	HW	...				
Oct	X	ZX	AX	BX	...	FX	GX	HX	...				
Nov	y	Zy	Ay	By	...	Fy	Gy	Hy	...				
Dec	Z	ZZ	AZ	BZ	...	FZ	GZ	HZ	...				

**2.3 Special Conditions of Use:**

- Products are suitable for sub-divisions IIC & IIIC.
- Products are suitable for Zones 1, 2, 21 & 22 only.

**2.3.1 Temperature Marking:**

**2.3.1.1 Standard Product:**

- In the normal ambient temperature range (-10°C to +40°C) the product is rated to temperature class T5 and has a maximum surface temperature of 89°C.
- In the special ambient temperature range (+40°C to +60°C) the product is rated to temperature class T4 and has a maximum surface temperature of 109°C.

**3 Installation**

**3.1 Installation**

**Warning**

- Do not install the product unless the safety instructions have been read and understood.
- Do not twist or bend the cylinder, or mount the product when subject to tension.
- Do not use in an application where the product is stopped mid-stroke, via an external stop.
- Do not use where cylinders are being synchronised to move a single load.
- In order to install the product, use one of the brackets available found in the standard product catalogue;

Mounting Bracket [Part Number]	Sketch	Mounting Bracket [Part Number]	Sketch
Rod End Nut [C85NT*] (1-pc)		Mounting Nut [C85SN*] (1-pc)	
Foot [C85L*A] (1-pc)		Flange [C85F*] (1-pc)	
^Related to Mounting Bracket Option (L&M)		^Related to Mounting Bracket Option: G	
Foot [C85L*B] (2-pcs & M.Nut)		Trunnion [C85T*] (1-pc)	
^Related to Mounting Bracket Option (L&M)		^Related to Mounting Bracket Option: U	
Foot [C85L*C] (1-pc & M.Nut)		Clevis [C85C*] (1-bracket, 1-pin & 2-rings)	
^Related to Mounting Bracket Option (L&M)		^Related to Mounting Bracket Option: N	

Note 2: The "\*" represents the Bore Size (for Ø8 & Ø10 use 10, for Ø12 & Ø16 use 16 and for Ø20 & Ø25 use 25), see catalogue for more details.

- When replacing brackets use the hexagon wrench and torques shown below;

Bore [mm]	Outer Diameter of Nut [mm]	Tightening Torque [N.m]
Ø8 & Ø10	19	4
Ø12 & Ø16	24	12
Ø20	32	30
Ø25	32	50

Rod End Accessories	Sketch	Series
Floating Joint		JA
Rod Clevis		GKM
Rod End		KJ

Note 3: See the product catalogue for the exact code to order which relates to the bore size of your product.

- Tighten these accessories with a suitable wrench using the flat surfaces provided. Ensure that they are tightened against the rod end nut to prevent the accessory coming loose during operation.

Bore [mm]	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

**3.2 Environment**

**Warning**

- Do not use in an environment where corrosive gases, chemicals, water, salt water or steam are present.

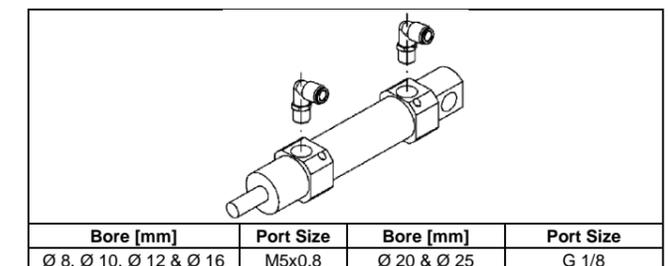
**3 Installation (continued)**

- 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 in excess of the product's specifications.
- Do not use in a place subject to heavy vibration and/or shock.
- Do not use in wet environments, where water can remove the presence of the lubrication.
- Do not use in case of heavy dusty environments where dust can penetrate into the cylinder and dry the grease.
- Do not allow dust layers to build up on the cylinder surface and insulate the product.

**3.3 Piping**

**Caution**

- Before connecting 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 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

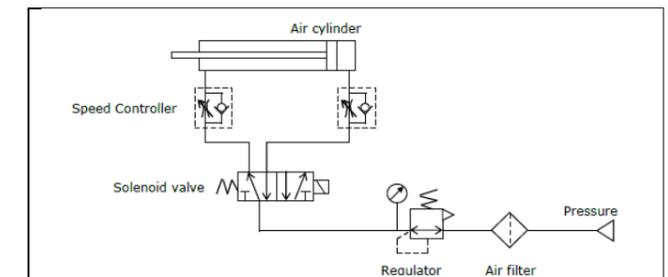


**3.4 Lubrication**

**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, refer to catalogue for details.

**3.5 Basic Circuit**



- Plugging one of the ports on the actuator is considered a non-intended use, and could relate to an increase in maximum surface temperature above what the product specification declares.

**3.6 Electrical Connection**

- The product should be grounded by the piston rod and the body in order to create an electrically conductive path to the system/application.
- Ground the product in accordance with applicable regulations.
- Do not pass an electrical current through the product.

**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 crimping 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 full 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 catalogue for 'How to Order'.

## 6 Outline Dimensions

Refer to standard product catalogue for outline dimensions.

## 7 Maintenance

### 7.1 General maintenance

#### Caution

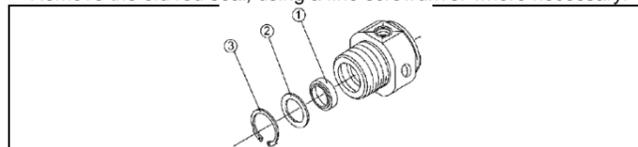
- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the 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.
  - If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
  - Do not make any modification to the product.
  - Do not disassemble the product, unless required by installation or maintenance instructions.
  - Do not use a product which looks or contains damage, this will invalidate the certification. If damage is seen, please replace the product immediately.
  - Periodically check the product for any damage or rust appearing. This could result in an increase in friction and lead to dangerous conditions. Replace the whole actuator if any of these conditions appear.
  - Periodically check the condition of the rod seal and for the presence of lubrication, where possible. If these areas appear to be dry, please follow the lubrication procedure.
  - Replace the seals, when air leakage is above the allowable value given in the table below;

	Allowable Leakage
Internal Leakage	10 cm <sup>3</sup> / min (ANR)
External Leakage	5 cm <sup>3</sup> / min (ANR)

### 7.2 Disassembly Procedure (only applicable to Ø20~Ø25)

- 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	3	Retaining Ring
2	Plain Washer		

### Caution

- If a magnet is present on the piston do not remove it. The magnet is not replaceable.

### 7.3 Seal Replacement Part Numbers

#### Warning

Only use SMC seal kits as listed in the table below;

Description	Applicable Bore [mm]	Part Number
Standard Single Rod	Ø 20 ~ Ø 25	C85-*PS
Single Non-Rotating Rod	Ø 20 ~ Ø 25	C85K-*PS
Single Rod XC22 Option	Ø 20	DRP-8F
	Ø 25	DRP-10F

**Note 4:** The \* represents the Bore Size (e.g. Ø25 is 25).

### 7.4 Lubrication Procedure

- Apply lubricant to:
  - The rod seal.
  - The rod seal groove.
- Lubricate the parts with the grease packs provided with the seal kit. For additional grease use the grease pack listed below.

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 [mm]	Stroke up to 100mm [g]
Ø 8 ~ Ø 16	3
Ø 20 ~ Ø 25	3 ~ 4

### 7.5 Reassembly Procedure (only applicable to Ø20~Ø25)

- The cylinder should be assembled in the following order;
  - Put the rod seal to the rod cover after apply sufficient grease to seal

- and groove of the rod cover.
- Place the plain washer and retaining ring.
  - Check for smooth movement and air leakage before placing back on the machine.

### Warning

- If leakage still exists the product should be replaced.

## 8 Limitations of Use

### 8.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

### Caution

#### 8.2 Obligations of the end-user

- Ensure the product is used within the specification outlined.
- Ensure that the maintenance periods are suitable for the application.
- Ensure any cleaning processes to remove dust layers are made with the atmosphere in mind (e.g. using a damp cloth to avoid static build up).
- Ensure that the application does not introduce additional hazards by mounting, loading, impacts or other methods.
- Ensure that there is sufficient ventilation and air circulation around the product.
- If the product is subject to direct heat sources in the application, they should be shielded so that the actuator temperature stays within the stated operating range.

### Danger

- Do not exceed any of the specifications listed in Section 2 of this document as this will be deemed improper use.
- Air equipment has an air leakage during operation within certain limits. Do not use this equipment when the air itself introduces additional hazards and could lead to an explosion.

## 8 Limitations of Use (continued)

- Use only Ex certified auto switches. These should be ordered separately.
- Do not use this product in the presence of strong magnetic fields that could generate a surface temperature higher than the product specification.
- Avoid applications where the piston rod end and the adjoining part in the application can create a possible ignition source.
- Do not install or use these actuators where there is the possibility for the piston rod to impact foreign objects.
- In the event of damage or failure of any parts located in the vicinity where this product has been installed, it is the responsibility of the user to determine whether or not this has compromised the safety and condition of this product and/or the application.
- External impact on the cylinder body could result in a spark and/or cylinder damage. Avoid any application where foreign objects can hit or impact the cylinder. In such situations the application should install a suitable guard to prevent this occurrence.
- Do not use this equipment where vibration could lead to failure.

## 9 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

## 10 Contacts

Refer to [www.smcworld.com](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor/importer.

## SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)  
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