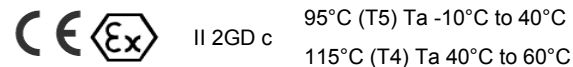




Installation and Maintenance Manual

Air Cylinder Series, 55-CG1



II 2GD c 95°C (T5) Ta -10°C to 40°C
115°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 95°C and the temperature class is T5 when the ambient temperature is: -10°C to 40°C
The maximum surface temperature is 115°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.**
 - Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
 - 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.
 - 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:**
 - Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
 - 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.

1 Safety Instructions (Continued)

- 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	0.05 MPa		
Ambient and fluid temperature	-10 to 60°C		
Lubrication	Not required		
Operating piston speed	Ø20~Ø63	50 to 1000 mm/ s	
	Ø80~Ø100	50 to 700 mm/ s	
Cushion	Air bumper	Rubber cushion	
Allowable kinetic energy	Ø20	R: 0.35 J	0.28 J
		H: 0.42 J	
	Ø25	R: 0.56 J	0.41 J
		H: 0.65 J	
	Ø32	0.91 J	0.66 J
	Ø40	1.8 J	1.2 J
	Ø50	3.4 J	2.0 J
	Ø63	4.9 J	3.4 J
Ø80	11.8 J	5.9 J	
Ø100	16.7 J	9.9 J	
Explosive atmosphere	Gas and Dust		
Zone	1, 21, 2 and 22		

R: Rod side H: Head side

Warning

- In case the kinetic energy exceeds the value given in the table, please contact SMC.

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	2011	2012	2013	...	2021	2022	2023	...	
Month	P	Q	R	...	Z	A	B	...	
Jan	O	PO	QO	RO	...	ZO	AO	BO	...
Feb	P	PP	QP	RJ	...	ZP	AP	BP	...
Mar	Q	PQ	QQ	RQ	...	ZQ	AQ	BQ	...
Apr	R	PR	QR	RR	...	ZR	AR	BR	...
May	S	PS	QS	RS	...	ZS	AS	BS	...
Jun	T	PT	QT	RT	...	ZT	AT	BT	...
Jul	U	PU	QU	RU	...	ZU	AU	BU	...
Aug	V	PV	QV	RV	...	ZV	AV	BV	...
Sep	W	PW	QW	RW	...	ZW	AW	BW	...
Oct	X	PX	QX	RX	...	ZX	AX	BX	...
Nov	Y	PY	QY	RY	...	ZY	AY	BY	...
Dec	Z	PZ	QZ	RZ	...	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.

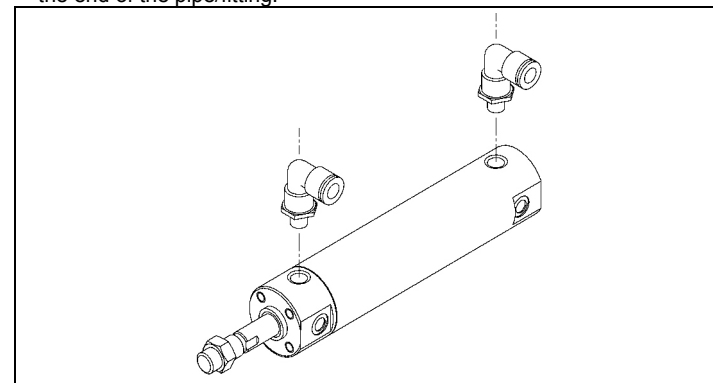
3 Installation (Continued)

- 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.
- 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.



Port size									
Bore	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	
Rubber	1/8				1/4		3/8	1/2	
Air	M5 x 0.8		1/8		1/4		3/8	1/2	

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.

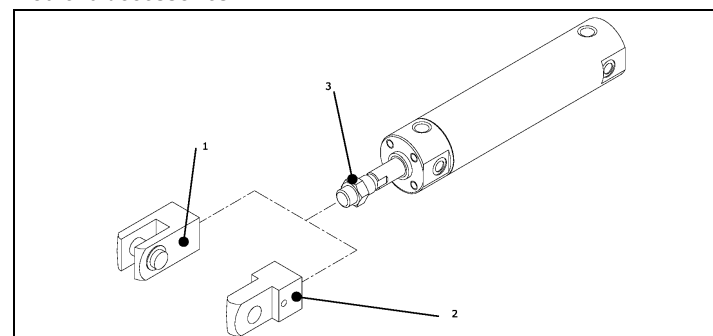
3.5 Electrical connection

Warning

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

3.6 Mounting accessories

Rod end accessories

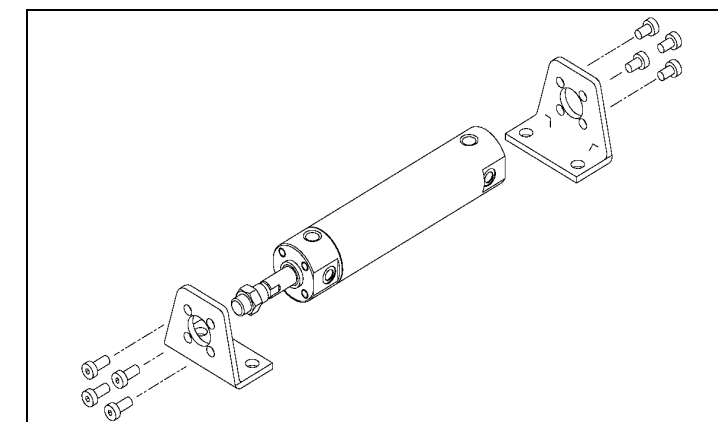


1	Double knuckle joint	2	Single knuckle joint
3	Rod end nut		

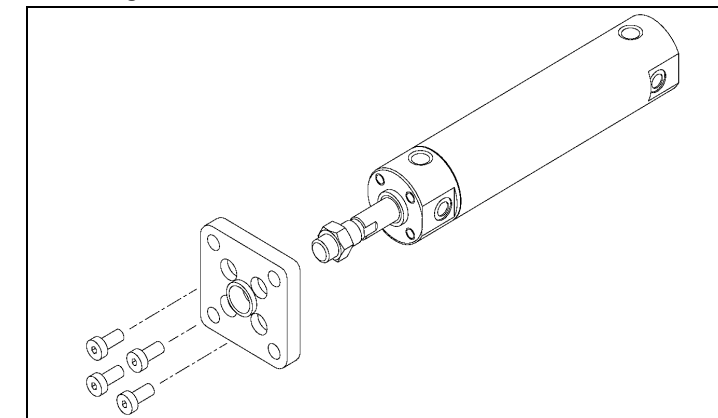
- Mounting procedure:
 - Screw the nut (3) loosely onto the rod end thread.
 - Screw the accessory (1 or 2) onto the rod end thread.
 - Tighten the nut against the accessory to fix it in place.

3 Installation (Continued)

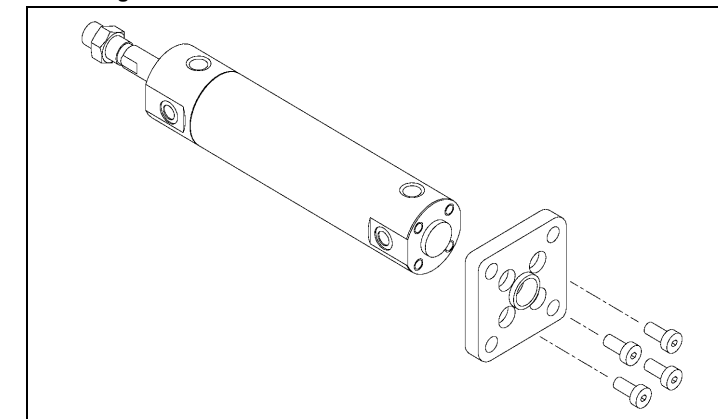
Axial Foot



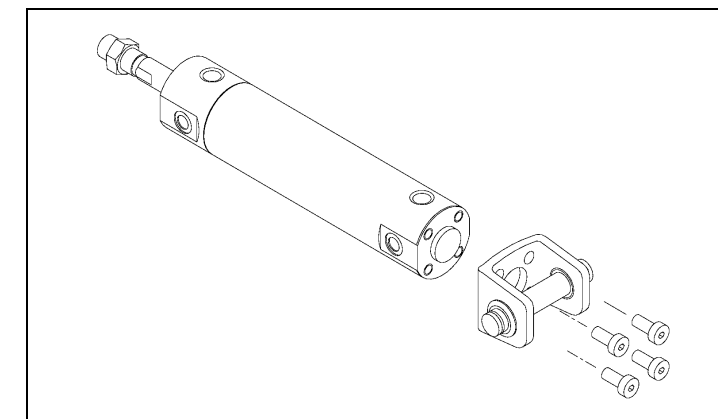
Front flange



Rear flange

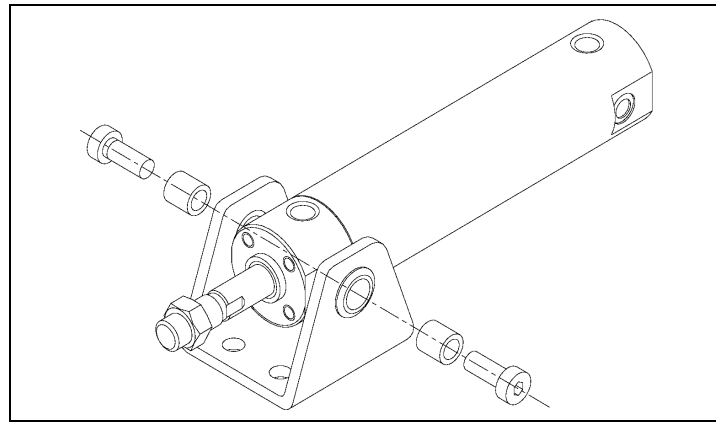


Clevis

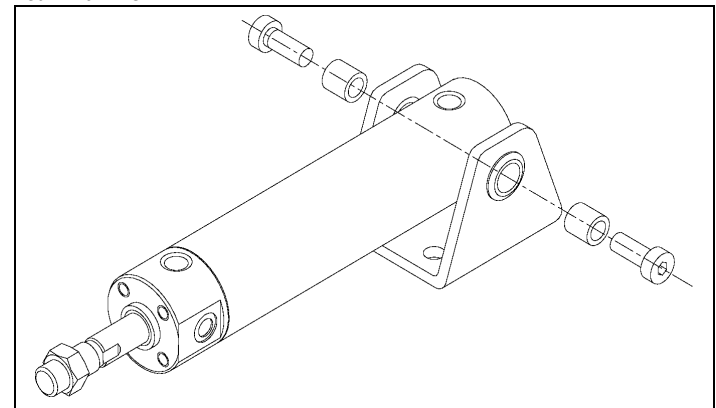


3 Installation (Continued)

Front Trunnion



Rear Trunnion



Tightening torque for mounting accessories on the cylinder (Nm) ±10%				
Bore size (mm)	Foot, Flange, Clevis	Trunnion	Cushion valve (press nut)	Cushion valve (Lock nut)
Ø20	1.5	2.2	2.0	0.5
Ø25	2.9	3.6	2.0	0.5
Ø32	2.9	9.0	2.0	0.5
Ø40	4.9	18.1	2.0	0.5
Ø50	11.8	31.9	4.9	1.0
Ø63	24.5	52.0	4.9	1.0
Ø80	24.5	-	19.6	2.0
Ø100	42.2	-	19.5	2.0

4 Settings

4.1 Air cushion adjustment

- For air-cushion adjustment, tighten or loosen the cushion valve using a screwdriver and a spanner. Ensure to tighten the lock nut firmly after adjustment.

Warning

- Do not operate the cushion valve in the fully closed or fully opened 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.

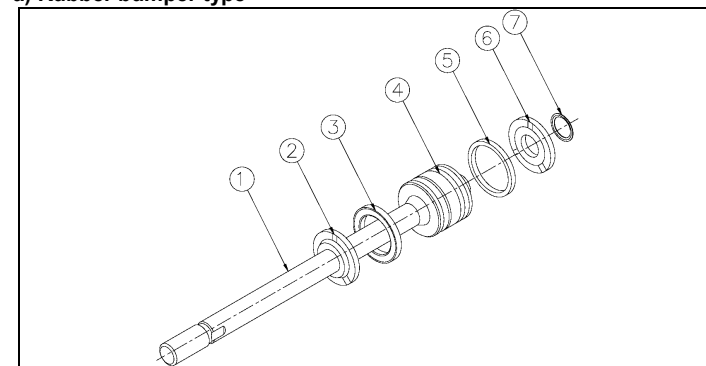
Bore size (mm)	Seal kit number	
	Rubber bumper	Air cushion
Ø20	CG1N20-PS	CG1A20-PS
Ø25	CG1N25-PS	CG1A25-PS
Ø32	CG1N32-PS	CG1A32-PS
Ø40	CG1N40-PS	CG1A40-PS

Note: For -XC10 version, 2 seals kits are required per cylinder.

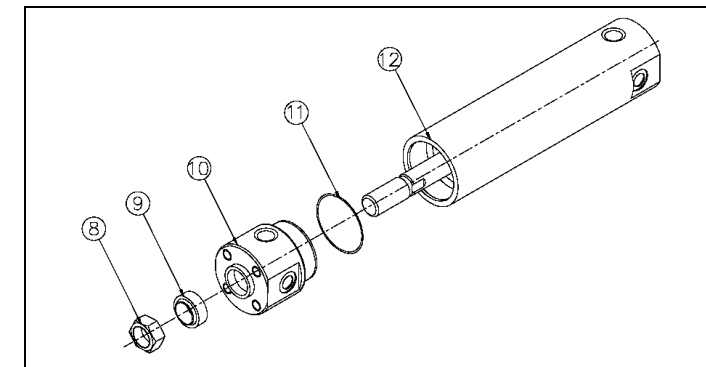
7.3 Disassembly procedure

- Use the following procedure for disassembling the cylinder and replacing the seals:
 - Gently hold tube cover at spanner flats with a vice, loosen the rod cover by applying a spanner or a monkey wrench on the spanner flats to take it off.
 - Disassemble the cylinder, remove the old grease and place all the parts on a clean cloth in a clean environment.
 - On reassembling, tighten the rod cover a little further (0° to 2°) than where it was before.

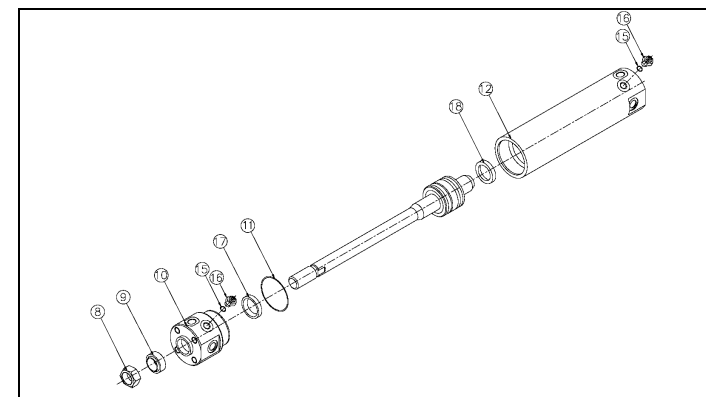
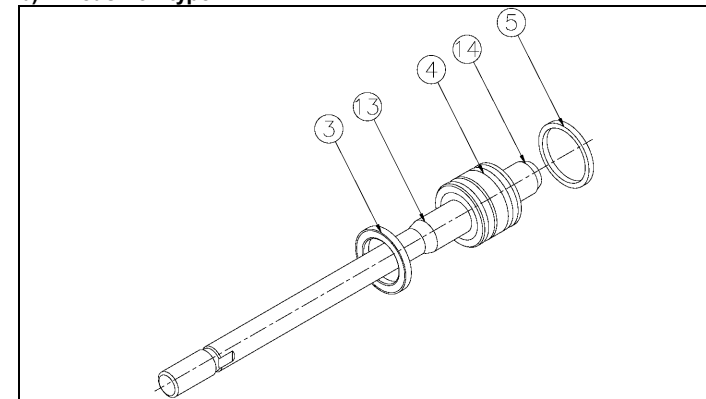
a) Rubber bumper type



7 Maintenance (Continued)



b) Air cushion type



1	Piston rod	10	Rod cover
2	Bumper A	11	Tube gasket
3	Piston seal	12	Tube cover
4	Magnet	13	Cushion ring A
5	Wear ring	14	Cushion ring B
6	Bumper B	15	Needle retainer gasket
7	Retaining ring	16	Cushion needle
8	Rod end nut	17	Cushion seal A
9	Rod seal	18	Cushion seal 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 inner and outer surface
 - Tube gaskets
 - Cushion seals
 - Cushion seal grooves on the covers
 - Piston rod surface
 - Tube inner surface

Maintenance (Continued)

- Lubricate the parts using the following SMC grease packs:

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

- The amount of lubricant, to be applied is given in the following table:

Bore size (mm)	Stroke up to 100 mm (g)	For each additional 50mm (g)
Ø20	2	0.5
Ø25, Ø32	3	0.5
Ø40	3 ~ 4	1

- 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
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SMC Corporation

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