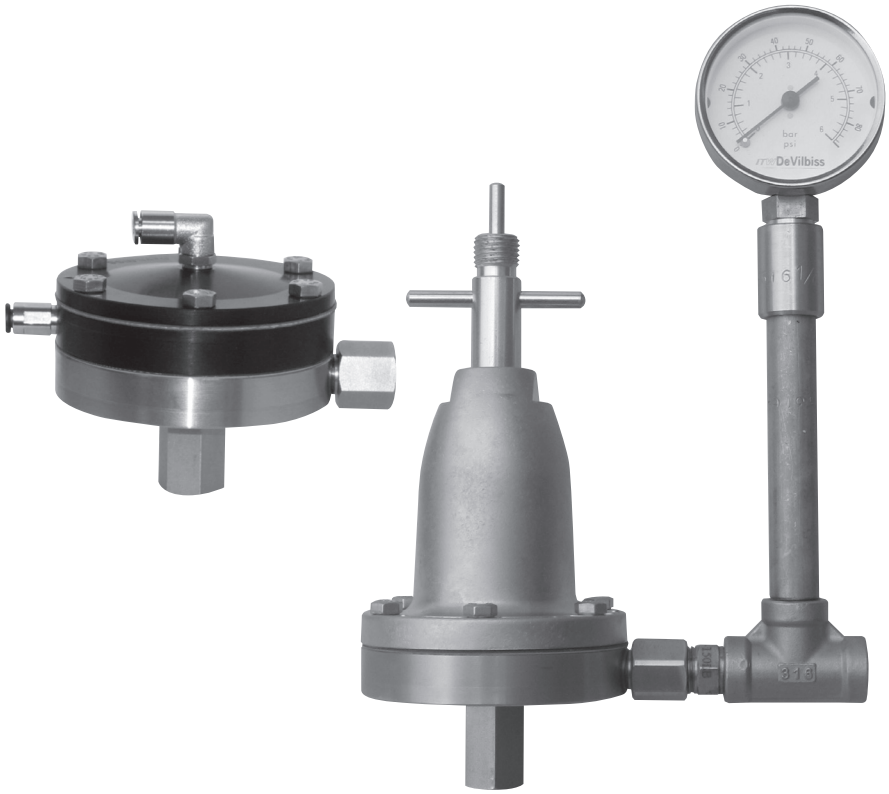
SERVICE MANUAL
EN

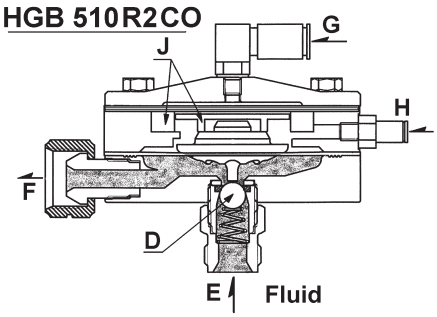
CE Ex II2G

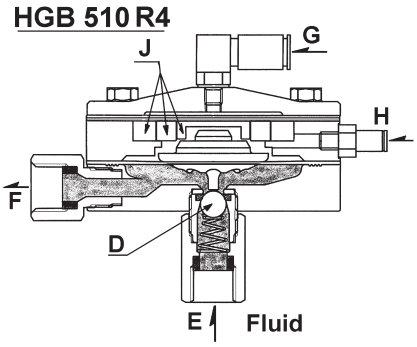
HGB-509 / HGB-510 / HGB-609 FLUID REGULATOR

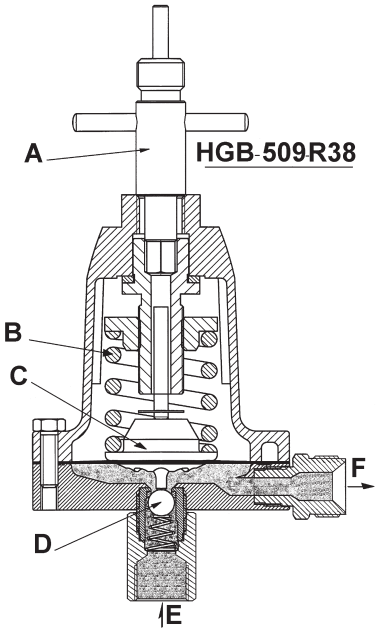


DESCRIPTION

Manually adjusted or remote air pressure controlled, these fluid regulators can provide material at constant pressure for one or two spray guns, using stainless steel ball valve and spring, "Perlast" valve seat. Especially design for application with low paint viscosity and needing accurate fluid flow regulation (Low hysteresis level).







A	Manual adjustment key
B	Spring
C	Diaphragm assembly
D	Ball valve
E	Fluid inlet
F	Fluid outlet
G	Pneumatic air command
H	Flushing air command
J	Piston & adjusting washer

Product Description / Object of Declaration:	**Fluid Regulator - HGB-509, HGB-510, HGBR-510, HGB-609, HGB-609-X-B38, HGBR-609, HGBR-609-B**
This Product is designed for use with:	**Solvent & Waterbased Materials**
Suitable for use in hazardous area:	**Zone 1/Zone 2**
Protection Level:	**Ex h IIB 80°C Gb X**
Notified body details and role:	**Element Materials Technology Rotterdam B.V. (2812)**
	Lodging of ATEX Technical file
This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:	**Carlisle Fluid Technologies Inc. 16430 N Scottsdale Scottsdale, AZ 85254**
Representative authorised to compile the technical file	**Sales and Marketing Director. CFT UK Ltd 1 Avenue de Lattre de Tassigny 94736 Nogent, Cedex. France**

EU Declaration of Conformity

CE Ex

This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:

Machinery Directive 2006/42/EC
ATEX Directive 2014/34/EU
by complying with the following statutory documents and harmonised standards:
EN ISO 12100:2010 Safety of Machinery - General Principles for Design
EN ISO 80079-36:2016 Explosive Atmospheres- Part 36:Non Electrical equipment for explosive atmospheres-Basic methods and requirements.
EN 1127-1:2019 Explosive atmospheres - Explosion prevention - Basic concepts

Providing all conditions of safe use / installation stated within the product manuals have been complied with and also installed in accordance with any applicable local codes of practice.

Signed for and on behalf of Carlisle Fluid Technologies:	F. A. Sutter	Executive President: Engineering and Operations, Scottsdale, AZ, 85254. USA
Document Part No. 4-3194R-4 EN	20/9/23	

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This Product is designed for use with:	**Solvent & Waterbased Materials**
Suitable for use in hazardous area:	**Zone 1/Zone 2**
Protection Level:	**Ex h IIB 80°C Gb X**
Approved body details and role:	**Element Materials Technology Warwick Ltd. UK. (0891)**
	Lodging of UKEX Technical file
This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:	**Carlisle Fluid Technologies Inc. 16430 N Scottsdale Scottsdale, AZ 85254**

UKCA Declaration of Conformity

This Declaration of Conformity / Incorporation is issued under the sole responsibility of the manufacturer:

Supply of Machinery (Safety) Regulations 2008
Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016
by complying with the following statutory documents and designated standards:
BS EN ISO 80079-36:2016 Explosive Atmospheres- Part 36:Non Electrical equipment for explosive atmospheres-Basic methods and requirements.
BS EN 1127-1:2019 Explosive atmospheres - Explosion prevention - Basic concepts

Providing all conditions of safe use / installation stated within the product manuals have been complied with and also installed in accordance with any applicable local codes of practice.

Signed for and on behalf of Carlisle Fluid Technologies:	F. A. Sutter	Executive President: Engineering and Operations, Scottsdale, AZ, 85254. USA
Document Part No. EN	20/9/23	

In this part sheet, the words **WARNING**, **CAUTION** and **NOTE** are used to emphasize important safety information as follows:

⚠ WARNING
Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage.

⚠ CAUTION
Hazards or unsafe practices which could result in minor personal injury, product or property damage.

NOTE
Important installation, operation or maintenance information.

⚠ WARNING

Read the following warnings before using this equipment.

READ THE MANUAL
Before operating finishing equipment, read and understand all safety, operation and maintenance information provided in the operation manual.

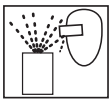
WEAR SAFETY GLASSES
Failure to wear safety glasses with side shields could result in serious eye injury or blindness.

DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE
Failure to De-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.

OPERATOR TRAINING
All personnel must be trained before operating finishing equipment.

EQUIPMENT MISUSE HAZARD
Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.

KEEP EQUIPMENT GUARDS IN PLACE
Do not operate the equipment if the safety devices have been removed.



PROJECTILE HAZARD
You may be injured by venting liquids or gases that are released under pressure, or flying debris.

PINCH POINT HAZARD
Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.

PACEMAKER WARNING
You are in the presence of magnetic fields which may interfere with the operation of certain pacemakers.

AUTOMATIC EQUIPMENT
Automatic equipment may start suddenly without warning.

INSPECT THE EQUIPMENT DAILY
Inspect the equipment for worn or broken parts on a daily basis. Do not operate the equipment if you are uncertain about its condition.

NEVER MODIFY THE EQUIPMENT
Do not modify the equipment unless the manufacturer provides written approval.

KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY

PRESSURE RELIEF PROCEDURE
Always follow the pressure relief procedure in the equipment instruction manual.

NOISE HAZARD
You may be injured by loud noise. Hearing protection may be required when using this equipment.

HIGH PRESSURE CONSIDERATION
High pressure can cause serious injury. Relieve all pressure before servicing. Spray from the spray gun, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.

STATIC CHARGE
Fluid may develop a static charge that must be dissipated through proper grounding of the equipment, objects to be sprayed and all other electrically conductive objects in the dispensing area. Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.

IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PROVIDE THIS INFORMATION TO THE OPERATOR OF THE EQUIPMENT.
FOR FURTHER SAFETY INFORMATION REGARDING THIS EQUIPMENT, SEE THE GENERAL EQUIPMENT SAFETY BOOKLET (77-5300).

SPECIFICATIONS

Type Reg	Order number	Thread		Inlet pressure min-max.bar	Outlet pressure max.bar	Fluid flow maximum L/min	Manometer bar
		Inlet	Outlet				
Manual Spring	HGB-509-5-R38	Female 3/8	Male 3/8	2 – 12,5	5	13	No
	HGB-609-1.2-B38			1 – 8	1,2	8,3	No
	HGB-609-5-B38			2 – 12,5	5	13	No
	HGB-609-9-B38			3 – 15	9	13	No
	HGB-609-1.2-R38			1 – 8	1,2	8,3	0 – 2,5
	HGB-609-5-R38			2 – 12,5	5	13	0 – 6
	HGB-609-9-R38			3 – 15	9	13	0 – 10
Pneumatic Adjustment	HGB-510-R1	Female 1/4	Female 1/4	2 – 15	15	1,6 (Tip 1,1mm)	No
	HGB-510-R2			1 – 15	7	1,3 (Tip 1,1mm)	No
	HGB-510-R4			1 – 15	4	0,8 (Tip 1,1mm)	No
	HGB-510-R1-CO	Male 3/8	Female 3/8	2 – 15	15	1,6 (Tip 1,1mm)	No
	HGB-510-R2-CO			1 – 15	7	1,3 (Tip 1,1mm)	No
	HGB-510-R4-CO			1 – 15	4	0,8 (Tip 1,1mm)	No

ALL MODELS		
Ambient Temperature Range: 0° – 50°C (32° – 122°F)	Fluid Temperature Range: 0° – 80°C (32° – 176°F)	Maximum Continuous Fluid Temperature: 60°C (140°F)

All the fluid passages are in stainless steel, membrane in PTFE, cover in aluminum nickel treatment for manual model or anodized for remote air control.

The regulators HGB-609 are equipped with stainless steel tee and riser tube and a manometer. The tightness of these connections ought to be perfect so to protect the manometer.

See drawings on « Accessories ».

IMPORTANT: These regulators may be used with most common coating and finishing materials. However, there are not designed for use with highly corrosive materials which have such characteristics, it must be expected that frequent and thorough cleaning will be required and/or the necessity for replacement of parts will be increased.

INSTALLATION

- The regulators must be fitted in horizontal position to remove heavy fluid particle deposit. The riser tube for manometer must be in vertical position. The manometer will be protected by air staying into the top of the riser tube. A good sealing ought to be done on the connectors so to remove any air leakage to protect the manometer.
- Connect the fluid supply line, coming from pump or pressure feed tank, under the regulator at the ¼" BSP or 3/8" NPS/BSP universal (See on page 11 depend of version used).
- Connect the regulated fluid line, to supply one or two spray gun, side port of the regulator at the ¼" BSP or 3/8" NPS/BSP universal (See on page 11 depend of version used).

Swivel connector female is used for "CO" version on remote control.

- The regulator must be earthed to dissipate any electrostatic charge which may be created by fluid or air flows. This can be achieved in using one of the screw ref 3A or 3B.

Electrical bond from the regulator to earth should be checked with an ohmmeter.

A resistance of less than 106 Ohms is recommended.

- Assume that during the installation, the regulator will filled completely the cavity under the diaphragm, this is to obtain the full accurate regulation specially in use at lower fluid flow delivery.

⚠ CAUTION

It is recommended that at the initial installation the material supply line should not be flushed through the regulator because pipe compound chips, scale, etc. may lodge on the valve seat USE AN IN LINE FILTER.

OPERATION

Manual regulator

Fluid pressure adjustment is done with the specific manual key. Insert the square side key into the central top hole of the regulator manual. See Fig A

Screw to increase fluid pressure, unscrew to decrease.

To flush the regulator for cleaning operation introduce the cylindrical side of the key into the regulator and screw at maximum to push the pin on the membrane support and open the regulator in order to have optimum flushing fluid flow.

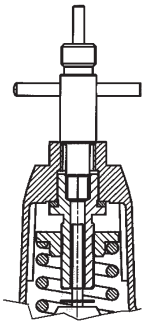


Fig A

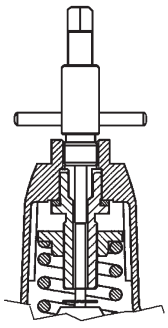
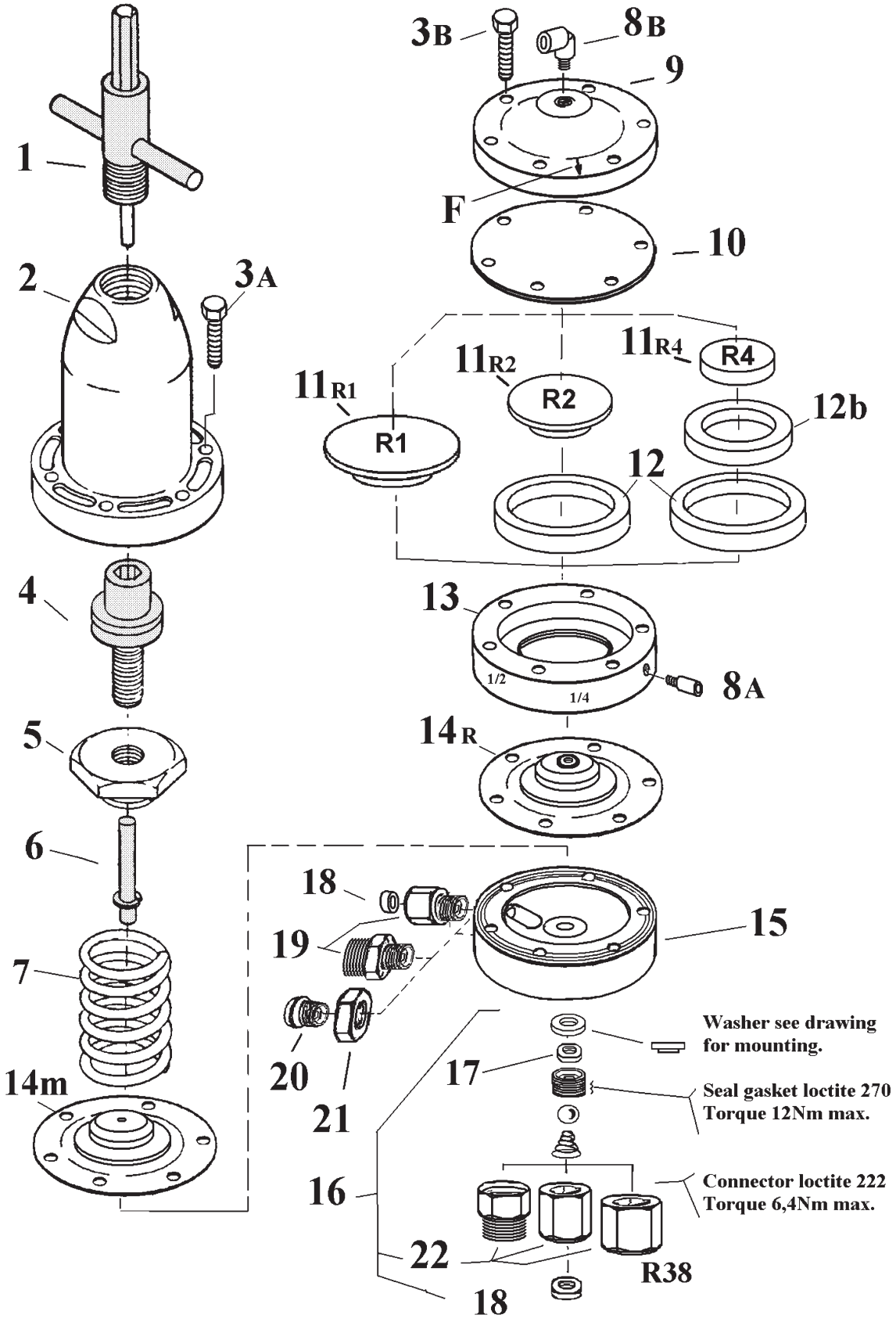


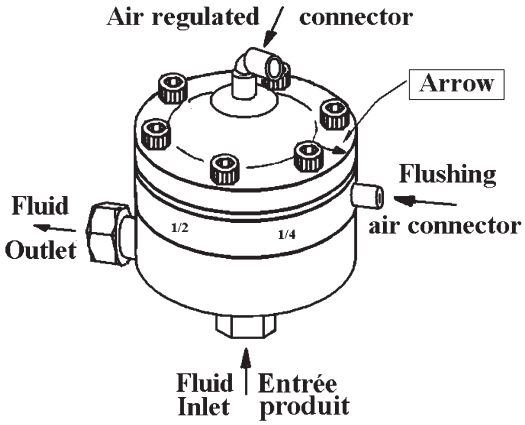
Fig B


Manual
HGB 509 / 609...
Pneumatic
HGB 510 R1 / R2 / R4
1
2
3A
4
5
6
7
14m
3B
8B
9
F
10
11R1
R1
11R2
R2
11R4
R4
12b
12
13
1/2
1/4
8A
14R
18
19
20
21
15
17
16
22
18
R38
Washer see drawing for mounting.
Seal gasket loctite 270 Torque 12Nm max.
Connector loctite 222 Torque 6,4Nm max.

PARTS LIST

Rep.	Order Number	Description	Qty.
1	HGB-404-1	Adjusting key	1
2	HGB-28	Cover	1
3A	S-1309-H	For HGB-509-5-R38 or 609-x-R38, Screw M5 * 16	6
3B	S-1330-H	For HGB-510-R1, R2 & R4, or (CO), Screw M5 * 25	
4	HGB-408-H	Adjusting screw assembly	1
5	HGB-7	Adjusting nut	1
6	HGB-403-H	Stem kit	1
7	HGB-13-H	Spring for diaphragm for HGB-509-5-R38 or HGB-609-5-R38.	1
	HGB-42	Spring for diaphragm for HGB-609-1.2-R38.	
	HGB-43	Spring for diaphragm for HGB-609-9-R38.	
8A	S-24383	Connector M5 for Rilsan tube. 2.7 *4 mm	1
8B	SSP-6462	Elbow connector M5 for rilsan tube 2.7*4 mm	1
9	HGB-54	Cover for HGB-510	1
10	HGB-55-K	Air diaphragm HGB-510	1
11R1	HGB-67	Disc for HGB-510-R1 or R1CO	1
11R2	HGB-56	Disc for HGB-510-R2 or R2CO	
11R4	HGB-63	Disc for HGB-510-R4 or R4CO	
12	HGB-68	Intermediary washer for R2 & R4	1
12b	HGB-64	Intermediary washer for R4	
13	HGB-57-1	Intermediary body	1
14m	HGB-422	Fluid diaphragm assy. for HGB-509, 609.	1
14R	HGB-424	Fluid diaphragm assy. for HGB-510-R1/R2/R4 or 1CO, 2CO, 4CO	
15		Regulator body	1
16	HGB-426-CO	Kit of Fluid inlet & ball valve with spring (3/8”BSP/NPS Male).	1
	HGB-426	Kit of Fluid inlet & ball valve with spring (1/4”BSP Female).	
	HGB-426-R38	Kit of Fluid inlet & ball valve with spring (3/8”BSP/NPS Female).	
17	S-28216	Gasket “D” shape	1
18	HGB-62	PTFE gasket	1 / 2
19	HGB-61	Fluid outlet connector for HGB-510-Rx, 1/4” Female	1
	HGB-81	Fluid outlet connector for HGB-509-5-R38 & HGB-609-X-B38, 3/8” Male	
	HGB-82	Fluid outlet connector for HGB-609-xx-R38, 1/4” BSP Male	
20	HGB-49	Fluid outlet insert connector for HGB-510-Rx-CO	1
21	HC-1000	Fluid outlet swivel connector for HGB-510-Rx-CO	1
22	HGB-60	Fluid inlet connector Female 1/4”BSP for HGB-510-Rx	1
	HGB-59	Fluid inlet connector Male 3/8”universal for HGB-510-Rx-CO	
	HGB-80	Fluid inlet connector Female 3/8”BSP for HGB-509/609-R38	

HGB-510- R1 / R2 / R4



OPERATION

Pneumatic adjustment regulator

For models HGB-510-R1, R2 or R4

The fluid pressure regulation is adjusted by remote air pressure regulator, for that connect Rilsan tube on the top connector on cover. To flush the regulator, connect air tube on the side connector (R1/R2/ R4) and set the air pressure to full open the valve regulator. It's useful to fit the air regulator close to the fluid regulator to obtain the accurate regulation at a low fluid flow. If it's not the case, you can obtain this accurate regulation in piercing the Rilsan tube with sewing needle near of the connector to create a small air leakage.

To flush the fluid line with solvent, connect the flushing air command to the right connector on the side of the regulator.

⚠ CAUTION

DO NOT EXCEED THE FLUSHING AIR COMMAND MORE THAN 1 BAR OVER THE SOLVENT PRESSURE.

NOTE

To come back at the initial set up after cleaning operation, purge the air line so to have no air pressure on intermediary chamber. This intermediary chamber can be used as a safe area if the membrane brakes and fluid leakage goes through the air line.

To know and differentiate what is your regulator model, an arrow is marked above the cover which is either in direction of the flushing air inlet connector for the R1 model or in direction of the 1/ 4 or 1/ 2 printed on the intermediary plate. Take care during the re assembling operation after maintenance to fit the cover in the right place corresponding to the model of regulator used.

PREVENTIVE MAINTENANCE

Periodic cleaning of regulator with a solvent compatible with the material being used is recommended. To clean material from the regulated material line and the regulator, these steps should be followed:

1. Relieve supply line pressure.
2. Put the regulator in flushing position (See "Operation"). This holds the valve off its seat.
3. Blow material back through the regulated line by introducing air pressure into the line down stream from the regulator. With spray gun attached this can be done by loosening air cap ring on gun, holding a rag over air cap and pulling gun trigger. This forces air in a reverse path through spray gun and air forces material back through regulated material line.
4. Unscrew the fluid inlet connector remove the spring and the ball valve. Clean all the parts and the gasket inside the valve body. If the gasket is damaged replace it. Please follow the instruction described on page 6. If the gasket is ok put thread locking compound (loctite 222) on the connector thread and tighten to a maximum torque of 6.4Nm.

Periodically clean exterior of regulator with solvent soaked rag.

REPLACEMENT OF PARTS

⚠ WARNING

Relieve the line pressure before servicing for pneumatic model (HGB-510). For manual model HGB-509 & 609, Relieve spring forces by unscrewing the adjusting screw rep 4 at the maximum (FIG A).

TO REPLACE DIAPHRAGM

1. Remove the 6 hex. head cap screws.
2. The diaphragm is sold complete with its washer and its fluid flow plastic deflector. These parts could be not separated, if diaphragm or the deflector is damaged replace it.
3. Install the new diaphragm kit into the regulator body.
4. Put the cover on the regulator and screw the 6 screws at 6.2 Nm.
5. For the pneumatic model HGB510, reassemble all the parts in the right order and position. It's recommended before to set the regulator that the two diaphragms work about 10 time so to be in full condition, this operation could be done in using the connector Rep 8 and pressurize the flushing cavity at 4 bar.

TO SERVICE VALVE ASSEMBLY

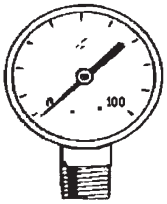
"Perlast D shape" seat and Ball valve.

1. Unscrew the fluid inlet valve and connector rep 16 from the regulator body.
2. Clean and check the valve, if the parts are damaged, replace the parts in using the valve kit.
3. Fit the washer in the right position small dimension in front of the "D" gasket, Screw the valve body on the regulator body with a sealing compound "loctite 270" on the third thread and tight at maximum torque 12Nm, Do not exceed this torque, over torque will damaged the regulator body.
4. Wait a few minutes for the loctite to dry and fit the ball valve and the spring
5. Clean the thread on the fluid inlet connector, use a thread locking compound like Loctite 222.
6. Apply a maximum torque 6.4Nm.

SERVICE CHECKS

CONDITION	CAUSES	REMEDES
Regulated pressure creep.	Improper seating of valve stem on seat.	Be sure that seat and ball valve are not damaged, worm or dirty.
	Diaphragm leaking.	Replace.
Regulated pressure drop.	Restriction in main material line or at valve seat inlet.	Clear l'obstruction
	Diaphragm damaged.	Replace.
Fluid leakage from under bonnet.	Loose cap screws.	Screw the 6 screws at a torque 8 mN.
	Diaphragm damaged.	Replace.

ACCESSORIES

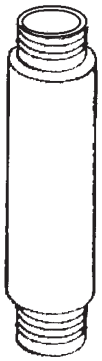


MA-25, GA-288

Manometer 2.5b,
6b or 10bar

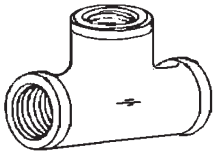
S-3008

Stainless steel adapter
1/4" BSP female / female



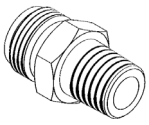
S-3007

Stainless steel riser tube
1/4"BSP – male/male



S-3006

Tee in stainless steel
1/4" BSP – Female



H-1580-H

Stainless steel
double male nipple,
1/4 bspt x 3/8 nps-bsp

WARRANTY POLICY

This product is covered by Carlisle Fluid Technologies' materials and workmanship limited warranty. The use of any parts or accessories, from a source other than Carlisle Fluid Technologies, will void all warranties. Failure to reasonably follow any maintenance guidance provided may invalidate any warranty.

For specific warranty information please contact Carlisle Fluid Technologies.

For technical assistance or to locate an authorized distributor, contact one of our international sales and customer support locations.

Region	Industrial / Automotive	Automotive Refinishing
Americas	Tel: 1-800-992-4657 Fax: 1-888-246-5732	Tel: 1-800-445-3988 Fax: 1-800-445-6643
Europe, Africa, Middle East, India	Tel: +44 (0)1202 571 111 Fax: +44 (0)1202 573 488	
China	Tel: +8621-3373 0108 Fax: +8621-3373 0308	
Japan	Tel: +81 45 785 6421 Fax: +81 45 785 6517	
Australia	Tel: +61 (0) 2 8525 7555 Fax: +61 (0) 2 8525 7575	

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Carlisle Fluid Technologies reserves the right to modify equipment specifications without prior notice.

CARLISLE FLUID TECHNOLOGIES

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