

# PURESTREAM - FRL

IS - F1 - 0 - 01/OM

## Trouble shooting

Trouble	Cause	Remedy
1. Restricted air flow	Filter element ( 5 ) clogged	Clean the filter element or replace.
2. Water level not visible	Dirt on the inner surface of the bowl (7.1.1 )	Clean the bowl.
3. Air leaks at Housing ( 1 ) and Bowl Guard ( 7.3 ) joint	'O'ring ( 7.1.2 ) damaged	Replace the 'O'ring.
4. Air leaks at bottom of the bowl ( 7.1.1 )	'O'ring ( 7.2.3 ) damaged	Replace 'O'ring.
5. Air leaks continuously through drain valve ( 7.2 )	Valve seat damaged	Replace the Drain valve assembly ( 7.2 )
6. The knob of the drain valve does not return	Valve components struck	Pull the knob and operate. If the valve gets struck again - Replace the Drain valve assembly ( 7.2 ).
7. Leakage in the bowl	Bowl broken	Change the bowl

## How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number

Example :- 'O' ring 6 5 0 1 0 2 for F14...

Subject to change

# PURESTREAM -FRL Installation / Operating / Maintenance Instructions

## Filter Series F1

IS - F1 - 0 - 01/OM

## Specifications

Model	F13...	F14...	F15...
Port size	1/8, 1/4, 3/8, 1/2		
Max. supply pressure	140 psi (10 bar)		
Installation	Vertical (as shown)		
Medium	Compressed air - Filtered		
Ambient / media temperature	41° - 120° F (5° - 50° C)		
Bowl material	Polycarbonate		

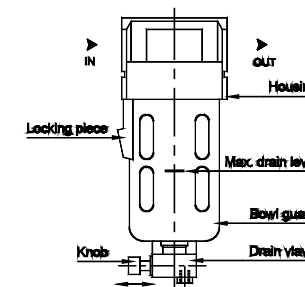


fig. 1

## Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

## Installation Instructions

1. Install in clean / acid free atmosphere.
2. Before installation of the unit , check whether the unit is as per the specification - especially the port size and the corresponding fittings to be used on the unit.
3. Flush the pipings for dirt , dust , rust and other foreign particles.
4. The arrow mark ➡ on the top of the housing indicates the flow direction , Inlet ➡ Outlet ( If the unit is connected in the reverse direction the unit will not function properly )
5. Use proper thread seals for ( R ) taper thread nipple , or face washer for ( G ) parallel thread nipple.
6. Tighten the pipings / nipples to the housing ports using proper tools. Do not give excess torque for tightening.
7. When using ( G ) parallel thread nipples , check the length of the thread as below.

Thread Size	Tightening torque, Lb - in (Nm)
1/4	106 - 125 (12 - 14)
3/8	195 - 215 (22 - 24)
1/2	250 - 270 (28 - 30)

8. To prevent the condensate splashing all over the place , the M5 thread provided in the drain valve can be used to take the condensate out through tubing. For this a nipple ( Ordering no: 722030 ) may be ordered if required.

## Operating Instructions

1. For draining the condensate water collected in the bowl ( 7.1.1 ) , press the knob of the Drain valve ( see fig.3).
2. It is advisable to drain the bowl every day . The frequency of draining can be decided based on the condensate collection . However , take care that the condensate level does not cross the " Max. level " marked on the bowlguard.

## Maintenance instructions

- a. Before dismantling the unit , exhaust the air in the Line completely.
- b. To clean the filter element ( 5 ) and the bowl ( 7.1.1 )  
 Removing the bowl guard ( 7.3 ) :- ( For models F14... & F15... ) Lift the bowl guard ( 7.3 ) upwards , pull down the locking piece ( 7.3.1 ) , Turn the bowl guard by 45 ° & pull down.  
 ( For model F13... ) unscrew the threaded bowl guard ( 7.3 ) in counter clockwise direction.  
 Dismantle the components and clean the filter element in kerosene and blow with compressed air . Clean the bowl with soap water or neutral detergent . Donot use thinner , kerosene , petrol , synthetic oil , trichloroethylene or other aromatic hydrocarbons .  
 ( Polycarbonate bowl may get damaged and possibly fail if exposed with these solvents ) .
- c. Check for damages in the 'O'rings ( 7.1.2 ) , ( 7.2.3 ) and other parts . Replace if needed ( or ) clean and reassemble.
- d. For assembly of the unit :- Apply general purpose grease on the 'O' rings ( 7.1.2 ) , ( 7.2.3 ) and on the surface of the housing where the 'O'ring enters the housing ( 1 ) . Reassemble all the components.  
 Assembling the bowl guard ( 7.3 ) :- ( For models F14... & F15... ) position the top flange lug portion of the bowl guard ( 7.3 ) to the corresponding slots in the housing ( 1 ) . Push the bowl guard fully into the housing. Turn the bowl guard by 45 ° till the locking piece ( 7.3.1 ) enters into the housing slot fully.  
 ( For model F13... ) Screw the threaded bowl guard ( 7.3 ) on to the housing ( 1 ) .

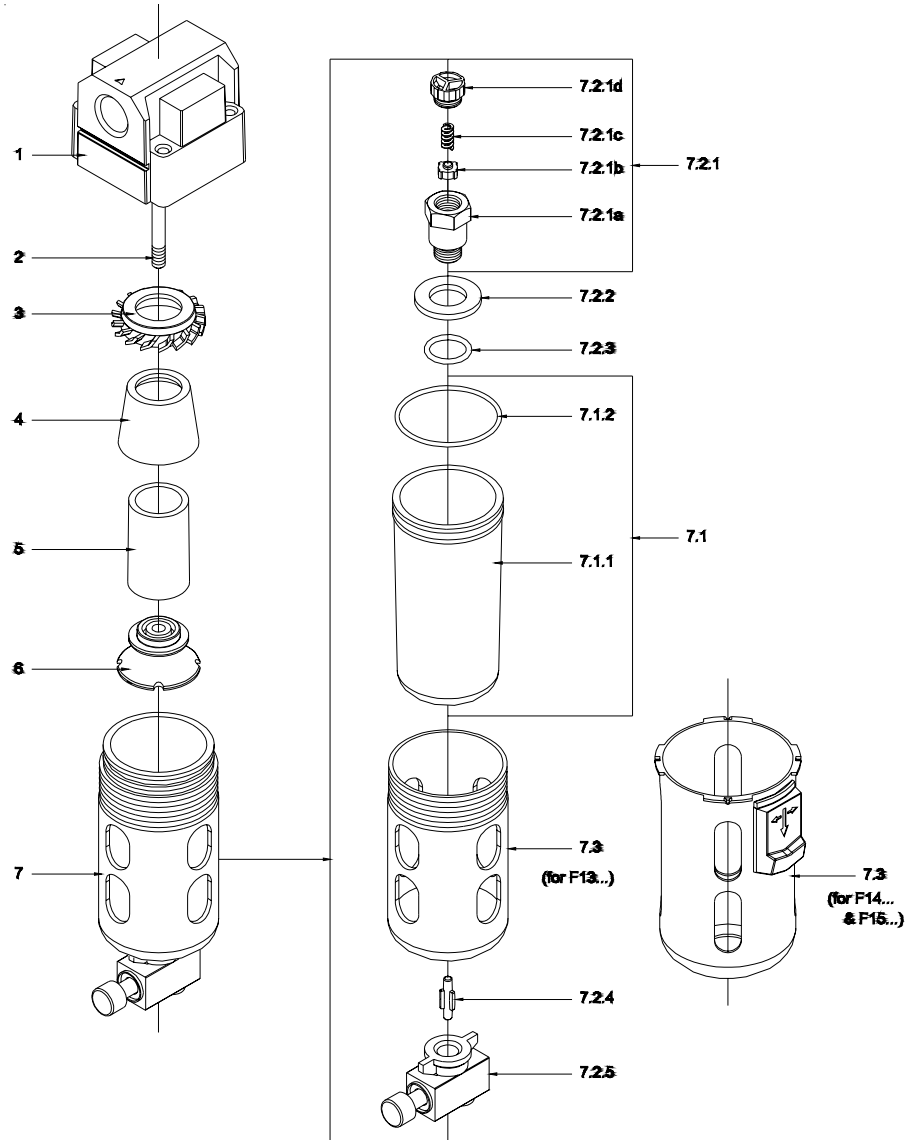


Fig. 2

SI No.	Part name / Ref. No	Ordering No. for		
		F13...	F14...	F15...
1	<b>Internal Plastic Spares</b>	<b>F13...-IPS</b>	<b>F14...-IPS</b>	<b>F15...-IPS</b>
	Separator (3)	782000	782001	782002
	Shield (4)	762000	762010	762020
	Filter holder (6)	712001	712002	712004
<b>Filter element - (5)</b>				
2	Filter element - 5 microns	582000	582020	582040
3	Filter element - 25 microns	582001	582021	582041
4	Filter element - 40 microns	582002	582022	582042
5	Filter element - 50 microns	582003	582023	582043
6	Filter element - 100 microns	582004	582024	582044
7	<b>Bowl with 'O' ring</b>	<b>LA2000</b>	<b>LA2001</b>	<b>LA2002</b>
	Bowl (7.1.1)	732001	732003	732004
	'O' ring (7.1.2)	650015	650108	650110
8	<b>Drain valve assembly (7.2)</b>	<b>SC2004</b>	<b>SC2004</b>	<b>SC2004</b>
	Gland assembly (7.2.1)	SA2009	SA2009	SA2009
	Gland (7.2.1a)	312071	312071	312071
	Valve seat (7.2.1b)	640000	640000	640000
	Spring (7.2.1c)	260001	260001	260001
	Spring guide nut (7.2.1d)	722061	722061	722061
	Sealing washer (7.2.2)	722060	722060	722060
	'O' ring (7.2.3)	650121	650121	650121
	Actuator (7.2.4)	722001	722001	722001
	Stem housing assy (7.2.5)	SA2002	SA2002	SA2002

Denotes for ordering items. For example, **Bowl with 'O' ring** will be supplied as kit consisting of Bowl (7.1.1), 'O' ring 7.1.2 accordingly.

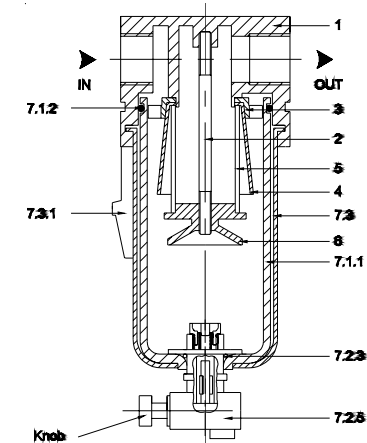


Fig. 3

# PURESTREAM - FRL

IS - R1 - 0 - 01/OM

## Trouble shooting

Trouble	Causes	Remedy
1. Continuous leak through the knob (1)	1. Diaphragm ( 9 ) damaged. 2. Relieving spherical seating of the valve cone damaged. 3. Dirt found in between the seating and the valvecone ( 13 ) 4. 'O'ring ( 16.1 ) damaged .	1. Replace diaphragm assembly ( 9 ) 2. Replace valve cone assembly ( 13 ) 3. Clean and reassemble. 4. Replace the 'O'ring ( 16.1 ) .
2. Setting pressure goes on increasing slowly	1. relieving spherical seat of the valve cone damaged. 2. Dirt found in between the seating and the valve cone. 3. 'O'ring ( 16.1 ) damaged	1. Replace the valvecone assembly ( 13 ) and clean the seating area 2. Clean and reassemble 3. Replace 'O'ring ( 16.1 ) .
3. After frequent use of adjustment , the pressure setting becomes not possible	Wearingout of the Adjusting screw ( 7 )	Replace the Adjusting screw assembly after applying general purpose Grease on threads and at bearing washer ( 6 ) .
4. Supply pressure directly connected to outlet port and pressure setting not possible.	Valvecone( 13 ) got struck	Dismantle the valvecone ( 13 ) . Clean using Kerosene and airjet . Reassemble after applying general purpose grease on 'O'ring ( 17 ) [ as applicable to the model ] and on the valve cone cylindrical portion
<b>Remarks</b> When the unit is erected in salty atmosphere , there are good chances of formation of Aluminium oxide inside the housing and the bottom plug ( 16 ) . This in due course may cause the valvecone getting struck . In this case dismantle the components and clean them using Kerosene and airjet . And during reassembly apply general purpose grease on all the inside surface of the housing and bottomplug as protection against corrosion . Also apply grease on the 'O'rings and cylindrical portion of the valvecone.		

## How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number  
 Example :- 'O' ring 650106 for R14...

Subject to change

# PURESTREAM - FRL

## Installation / Operating / Maintenance Instructions

### Regulator Series R1

IS - R1 - 0 - 01/OM

## Specifications

Model	R13...	R14...	R15...
Port size	1/4	3/8	1/2
Pressure gauge port size	1/8		
Max. supply pressure	225 psi (15 bar)		
Set pressure	Refer product nameplate		
Installation	Any position		
Medium	Compressed air - Filtered		
Ambient / media temperature	41° - 120° F (5° - 50° C)		

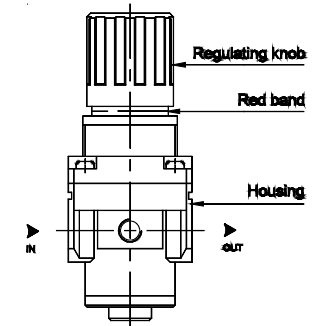


fig. 1

## Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

## Installation Instruction

1. Install in clean / acid free atmosphere.
2. Before installation of the unit , check whether the unit is as per the specification - especially the port size and the corresponding fittings to be used on the unit.
3. Flush the pipings for dirt , dust , rust and other foreign particles .
4. The arrow mark ► on the top of the housing indicates the flow direction , Inlet ► Outlet ( If the unit is connected in the reverse direction the air will continuously flow through the knob and the setting of the pressure is not possible. )
5. Use proper thread seals for ( R ) taper thread nipple , or face washer for ( G ) parallel thread nipple.
6. Tighten the pipings / nipples to the housing ports using proper tools. Do not give excess torque for tightening.
7. When using ( G ) parallel thread nipples , check the length of the thread.

Thread Size	Tightening torque, Lb - in (Nm)
1/4	106 - 125 (12 - 14)
3/8	195 - 215 (22 - 24)
1/2	250 - 270 (28 - 30)

8. Please ensure foreign particles / tape etc., does not enter the valve during assembly.

## Operating Instructions

1. To set the Regulator , pull the regulating knob till " Red band " ( Indicator ring ) is visible ( refer figure 1).
2. To increase the pressure turn the regulating knob in clockwise direction ( see the marking on the knob )
3. To reduce the pressure turn the regulating knob in counter clockwise direction
4. Set the pressure always in the ascending manner.
5. Set the pressure within the specified set pressure.

## Maintenance Instructions

- a. Before dismantling the unit , exhaust the air in the line completely.
- b. Dismantle the components and clean them in kerosene and blow with compressed air.
- c. Check for damages in the 'O'rings ( 15 ) , ( 16.1 ) , ( 17 ) and at sealing areas in the valvecone rubber, spherical relieving seating, seating area of the housing etc.,. Replace if needed. OR clean and reassemble.
- d. For assembly of the unit :- Apply general purpose grease on the 'O'rings ( 15 ) , ( 16.1 ) , ( 17 ) and on the cylindrical surface of the valvecone ( 13 ) , on threads of the adjusting screw ( 7 ) , and on bearing washer ( 6 ) . Reassemble all the components.

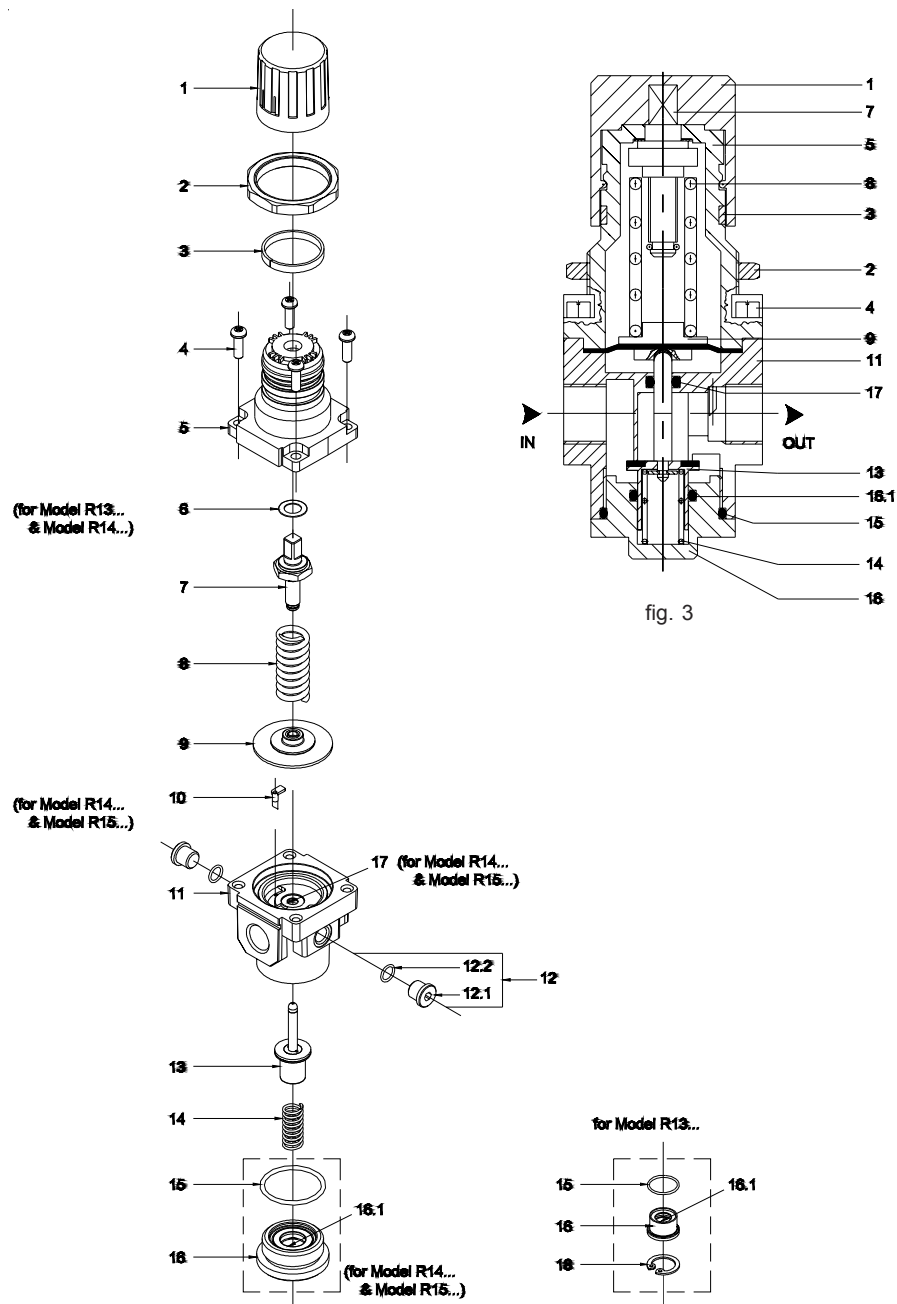


fig. 2

SI No.	Part name / Ref. No	Ordering No. for		
		R13...	R14...	R15...
1	Adjusting screw assembly (7)	LA2200	LA2201	LA2202
Main spring – (8)				
2	0.2 - 2 bar	062025	062031	062061
3	0.2 - 4 bar	062026	062032	062062
4	0.5 - 7 bar	062027	062033	062063
5	0.5 - 10 bar	062028	062030	062060
6	Diaphragm assembly (9)	SA2200	SA2201	SA2202
7	Port plug assembly (12)	LA2203	LA2203	LA2203
	Port plug (12.1)	312004	312004	312004
	'O' ring (12.2)	651004	651004	651004
8	Valve cone assembly	LA2207	SA2203	SA2204
	Valve cone (13)	312010	610001	610002
	'O' ring (15)	650009	650106	650107
	'O' ring (16.1)	650004	650104	650105
	'O' ring (17)	-	650100	650100

Denotes for ordering items. For example, **Valve cone assembly** the item will be supplied as kit, consisting of Valve cone, 'O' ring (15), 'O' ring (16.1) 'O' ring (17) accordingly.

# PURESTREAM - FRL

IS - L1 - 0 - 01/OM

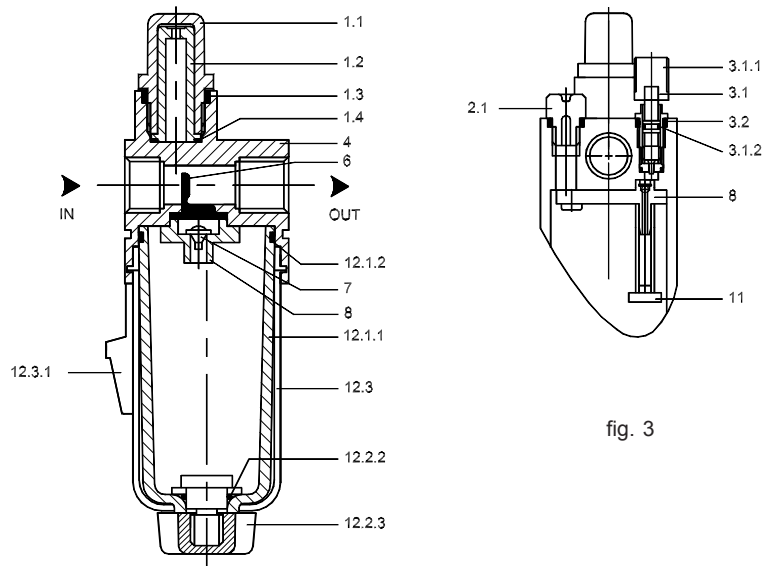


fig. 3

## Trouble shooting

Trouble	Cause	Remedy
1. Oil does not flow	1. Wrong port connection. 2. Air flow rate insufficient. 3. Oil below " minimum oil level ". 4. Oil adjustingscrew in closed condition 5. Oil filter ( 11 ) clogged. 6. "Oil path" clogged.	1. Change the port connection. 2. Refer specification and select the model. 3. Pour oil. 4. Adjust oil drops to your requirement. 5. Clean and reassemble. 6. Dismantle the unit. Clean the " Oil path ". with air jet and reassemble.
2. Oil leak through Needle assembly ( 3 )	'O'ring ( 3.1.2 ) damaged	Replace Needle assy ( 3 )
3. Oil leak through Housing & Needle assy	'O'ring ( 3.2 ) damaged	Replace 'O'ring ( 3.2 )
4. Flow of oil not adjustable.	'O'ring ( 3.3 ) damaged	Replace 'O'ring ( 3.3 )
5. Air bubbles along with oil drop.	'O'ring ( 5.3 ) damaged	Replace 'O'ring ( 5.3 )
6. Oil drops not seen through dome ( 1.1 )	'O'ring ( 1.4 ) damaged	Replace 'O'ring ( 1.4 )
7. Air leak through sight dome ( 1.1 )	'O'ring ( 1.3 ) damaged	Replace 'O'ring ( 1.3 )
8. Air leak at Housing ( 4 ) and bowl guard ( 12 )	'O'ring ( 12.1.2 ) damaged	Replace 'O'ring ( 12.1.2 )
9. Air leak at Gland plug ( 12.2.1 ) and bowl guard	'O'ring ( 12.2.3 ) damaged	Replace 'O'ring ( 12.2.3 )
10. Air leak at oil filling plug ( 2.1 )	'O'ring ( 2.2 ) damaged	Replace 'O'ring ( 2.2 )

## How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number

Example :- 'O' ring 650102 for L14...

Subject to change

# PURESTREAM - FRL

## Installation / Operating / Maintenance Instructions

### Lubricator Series L1

IS - L1 - 0 - 01/OM

## Specifications

Model	L13...	L14...	L15...
Port size	1/8, 1/4, 3/8, 1/2		
Max. supply pressure	140 psi (10 bar)		
Installation	Vertical (as shown)		
Recommended oil	ISO VG 32 / Mobil DTE Light		
Medium	Compressed air - Filtered		
Minimum operating flow - scfm (NI/min)	0.42 (12)	1.41 (40)	1.6 (45)
Ambient / media temperature	41° - 120° F (5° - 50° C)		
Bowl material	Polycarbonate		

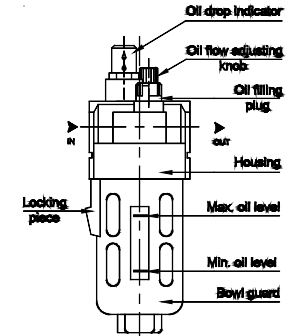


fig. 1

## Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

## Installation Instructions

- Install in clean / acid free atmosphere.
- Before installation of the unit , check whether the unit is as per the specification - especially the port size and the corresponding fittings to be used on the unit.
- Flush the pipings for dirt , dust , rust and other foreign particles.
- The arrow mark on the top of the housing indicates the flow direction , Inlet Outlet ( If the unit is connected in the reverse direction the unit will not function properly )
- Use proper thread seals for ( R ) taper thread nipple , or face washer for ( G ) parallel thread nipple.
- Tighten the pipings / nipples to the housing ports using proper tools . Do not give excess torque for tightening.
- When using ( G ) parallel thread nipples , check the length of the thread.

Thread Size	Tightening torque, Lb - in (Nm)
1/4	106 - 125 (12 - 14)
3/8	195 - 215 (22 - 24)
1/2	250 - 270 (28 - 30)

## Operating Instructions

**OIL FILLING:-** Remove the oil filling plug assembly ( 2 ). Pour the oil ( Recommended oil ISO VG 32 / Servo system 32 ) in to the lubricator.

**OIL FLOW ADJUSTMENT :-** Turn the needle knob ( 3.1.1 ) to adjust the oil drops to your requirement , clockwise to decrease and counter clockwise to increase the oil flow.

## Maintenance Instructions

a. Before dismantling the unit , exhaust the air in the line completely.

b. To clean the Lubricator :-

Removing the bowl guard ( 12.3 ) :- ( **For models L14... & L15...** ) Lift the bowl guard ( 12.3 ) upwards , pull down the locking piece ( 12.3.1 ) , turn the bowl guard ( 12.3 ) by 45 ° and pull down.  
( **For model L13...** ) unscrew the threaded bowl guard ( 12.3 )

Dismantle the components and clean all the components in kerosene and blow with compressed air . Clean the bowl only with soap water or neutral detergent . Donot use thinner , kerosene , petrol , synthetic oil , trichloroethylene or other aromatic hydrocarbons . ( Polycarbonate bowl may get damaged and possibly fail if exposed with these solvents )

c. Check for damages in the 'O'rings and other parts. Replace if needed ( or ) clean and reassemble.

d. For assembly of the unit :- Apply general purpose grease on the 'O'rings and on the surface of the housing where the 'O'ring enters the housing. Reassemble all the components.

Assembling the bowl guard :- ( **For models L14... & L15...** ) position the projected lug portion of the bowl guard to the corresponding slot in the housing. Push the bowl guard fully. Turn the bowl guard by 45 ° till the locking piece enters into the housing slot fully.  
( **For model L13...** ) screw in the threaded bowl guard.

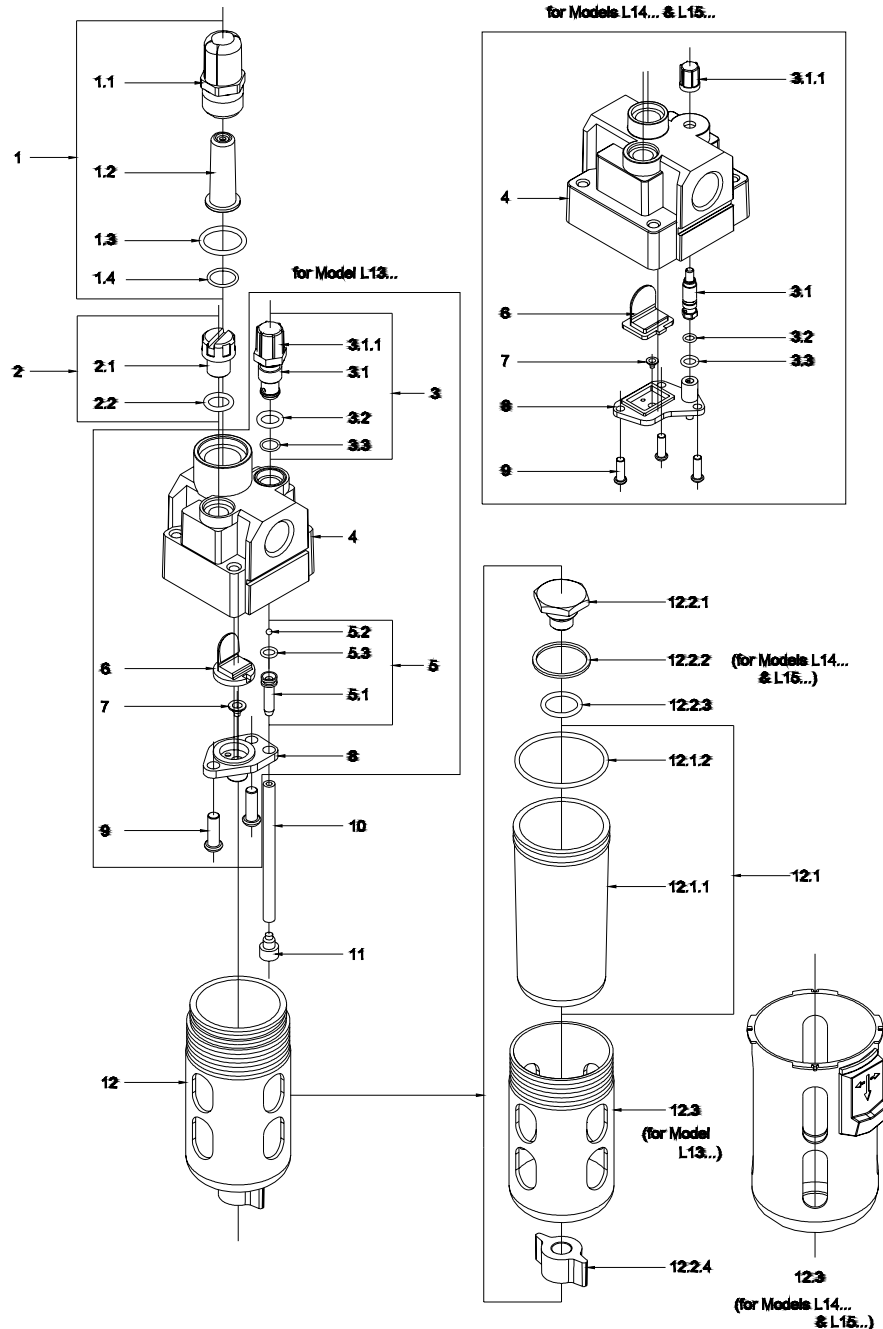


fig. 2

SI No.	Part name / Ref. No	Ordering No. for		
		L13...	L14...	L15...
1	<b>Sight dome assembly (1)</b>	LA2402	LA2402	LA2402
	Oil drop indicator (1.1)	732001	732001	732001
	Oil drop controller (1.2)	732002	732002	732002
	'O' ring (1.3)	650010	650010	650010
	'O' ring (1.4)	651004	651004	651004
2	<b>Oil filling plug assembly (2)</b>	LA2405	LA2406	LA2407
	Oil filling plug (2.1)	722010	722019	722025
	'O' ring (2.2)	650004	650006	650009
3	<b>Needle assembly (3)</b>	SC2400	SC2401	SC2401
	Needle housing	312007	312026	312026
	Knob (3.1.1)	712007	712007	712007
	'O' ring (3.1.2)	651001	651000	651000
	'O' ring (3.2)	650003	651003	651003
	'O' ring (3.3)	651003	650003	650003
4	<b>Connector assembly (5)</b>	LA2400	-	-
	Connector (5.1)	312008	-	-
	Ball (5.2)	849900	-	-
	'O' ring (5.3)	651002	-	-
5	<b>Jet deflector (6)</b>	772000	772002	772003
	Valve seat (7)	772001	772001	772001
	<b>Deflector retainer assembly (8)</b>	-	LA2403	LA2404
6	<b>Bowl assembly (12.1)</b>	LA2000	LA2001	LA2002
	Bowl (12.1.1)	732001	732003	732004
	'O' ring (12.1.2)	650015	650108	650110
7	<b>Gland plug assembly (12.2)</b>	LA2408	LA2409	LA2410
	Gland plug (12.2.1)	312009	312027	312050
	Sealing washer (12.2.2)	-	312020	312041
	'O' ring (12.2.3)	650008	650102	650102
	Gland nut (12.2.4)	722011	722011	722011

Denotes for ordering items. For example, **Bowl assembly (12.1)** will be supplied as kit, consisting of Bowl (12.1.1) and 'O' ring (12.1.2) accordingly.

- d. For assembly of the unit :- Apply general purpose grease on the 'O'rings and on the surface of the housing ( 11 ) where the 'O'ring enters the housing and on the cylindrical surface of the valvecone ( 13.1 ), on threads of the adjusting screw ( 7 ), and on bearing washer ( 6 ). Reassemble all the components.  
Assembling the bowl guard :- ( **For models FRC14... & FRC15...** ) position the projected lug portion of the bowl guard to the corresponding slot of the housing. Push the bowl guard fully. Turn the bowl guard by 45 ° till the locking piece enters into the housing slot fully.  
( **For model FRC13...** ) Screw in the threaded bowl guard.

## Trouble shooting

Trouble	Cause	Remedy
1. Continuous leak / flow through the knob ( 1 )	Wrong port connection	Change port connection
2. Continuous leak through the knob (1)	1. Diaphragm ( 9 ) damaged. 2. Damaged seating of the valve cone ( 13 ). 3. Dirt found in between the seating and the valve cone ( 13 ).	1. Replace diaphragm assembly (9) 2. Replace valvecone assembly ( 13 ) 3. Clean and reassemble
3. Setting pressure goes on increasing slowly	1. Damaged seating area of valvecone ( 13 ) 2. Seating area in the housing damaged 3. Dirt found in between the seating and the valve cone ( 13 )	1. Replace the valvecone assembly ( 13 ) 2. Clean the seating area 3. Clean and reassemble
4. After frequent use of adjustment , the pressure setting becomes not possible	Wearing out of the adjusting screw ( 7 )	Replace after applying general purpose Grease on threads and at bearing washer ( 6 ).
5. Supply pressure directly connected to Outlet port and pressure setting not possible	1. Valvecone ( 13 ) got struck	1. Dismantle the valvecone . Clean using Kerosene and airjet. Reassemble after applying general purpose Grease on 'O'rings ( 13.2 ) and ( 22 ) [ as applicable to the model ] and on the valvecone cylindrical portion.
6. Restricted air flow	Filter element ( 19 ) clogged	Clean the filter element or replace.
7. Water level not visible	Dirt on the inner surface of the bowl	Clean the bowl ( 21.1.1 ).
8. Air leaks at housing( 11 ) and bowlguard ( 21.3 ).	'O'ring ( 21.1.2 ) damaged	Replace.
9. Air leaks at the bottom of the bowl.	'O'ring ( 21.2.3 ) damaged	Replace.
10. Air leaks continuously through the drain valve ( 21.2 )	Valve seat damaged	Replace the drain valve assembly ( 21.2 ).
11. The knob of drain valve does not return	Valve components get struck	Pull the knob and operate. If the valve gets struck again - Replace.

## Remarks

When the unit is erected in salty atmosphere , there are good chances of formation of Aluminium oxide inside the housing . This in due course may cause the valve cone getting struck . In this case dismantle the components and clean them using Kerosene and airjet . And during reassembly apply general purpose grease on all the inside surface of the housing as protection against corrosion . Also apply grease on the 'O'rings and cylindrical portion of the valvecone.

## How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number

Example :- 'O' ring 6 5 0 1 0 0 for FRC14...

## Installation / Operating / Maintenance Instructions

### Filter Regulator Combination Series FRC1

## Specifications

Model	FRC13...	FRC14...	FRC15...
Port size	1/8, 1/4, 3/8, 1/2		
Pressure gauge port size	1/8		
Max. supply pressure	140 psi (10 bar)		
Set pressure	Refer product nameplate		
Installation	Vertical (as shown)		
Medium	Compressed air - Filtered		
Ambient / media temperature	41° - 120° F (5° - 50° C)		
Bowl material	Polycarbonate		

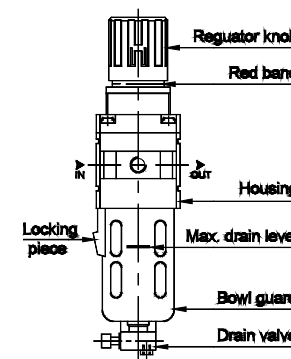


fig. 1

## Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

## Installation Instructions

- Install in clean / acid free atmosphere.
- Before installation of the unit , check whether the unit is as per the specification - especially the port size and the corresponding fittings to be used on the unit.
- Flush the pipings for dirt , dust , rust and other foreign particles.
- Connect the supply pressure to [IN] port and take the outlet from [OUT] port. ( If the unit is connected in the reverse direction the air will continuously flow through the bonnet and the setting of the pressure is not possible. )
- Use proper thread seals for ( R ) taper thread nipple , or face washer for ( G ) parallel thread nipple.
- Set the pressure in the Regulator within the specified Set Pressure. Otherwise the spring may brake .
- Tighten the pipings / nipples to the Housing ports using proper tools. Do not give excess torque for tightening.
- When using ( G ) parallel thread nipples , check the length of the thread.

Thread Size	Tightening torque, Lb - in (Nm)
1/4	106 - 125 (12 - 14)
3/8	195 - 215 (22 - 24)
1/2	250 - 270 (28 - 30)

- Please ensure foreign particles / tape etc., does not enter the valve during assembly.

## Operating Instructions

- To set the Regulator , pull the regulating knob till " Red band " ( Indicator ring ) is visible ( refer figure ).
- To increase the pressure , turn the regulating knob in clockwise direction ( see the marking on the knob ).
- To reduce the pressure , turn the regulating knob in counter clockwise direction ( see the marking on the knob ).
- Set the pressure always in the ascending manner.
- For draining the condensate water collected in the bowl ( 21.1.1 ) , press the knob of the drain valve ( 21.2 ).
- It is advisable to drain the bowl every day . The frequency of draining can be decided based on the condensate collection . However , take care that the condensate level does not cross the " Max. level " marked on the bowlguard.

## Maintenance Instructions

- Before dismantling the unit for maintenance :- 1. Check whether there is any leak observed. 2. Check whether you find any restricted flow. 3. Check whether the drain works properly. 4. Check whether the set pressure has changed.
5. Completely exhaust the air in the line.
- Dismantle the components and clean them in kerosene and blow with compressed air to clean the filter element ( 19 ) / bowl ( 21.1.1 )  
Removing the bowl guard ( 21.3 ) :- ( **For models FRC14... & FRC15...** ) Lift the bowl guard ( 21.3 ) upwards , pull down the locking piece , turn the bowl guard by 45 ° & pull down.  
( **For model FRC13...** ) Screw out the threaded bowl guard ( 21.3 ).  
Clean the bowl only with soap water or neutral detergent. Donot use thinner , kerosene , petrol , synthetic oil , trichloroethylene or other aromatic hydrocarbons.  
( Polycarbonate bowl may get damaged and possibly fail if exposed to these solvents )
- Check for damages in the 'O'rings and at sealing areas in the valvecone rubber , spherical seating , seating area of the housing etc., Replace if needed OR clean and reassemble .



## Assembly / Spare parts list

IS - FRC1 - 0 - 01/OM

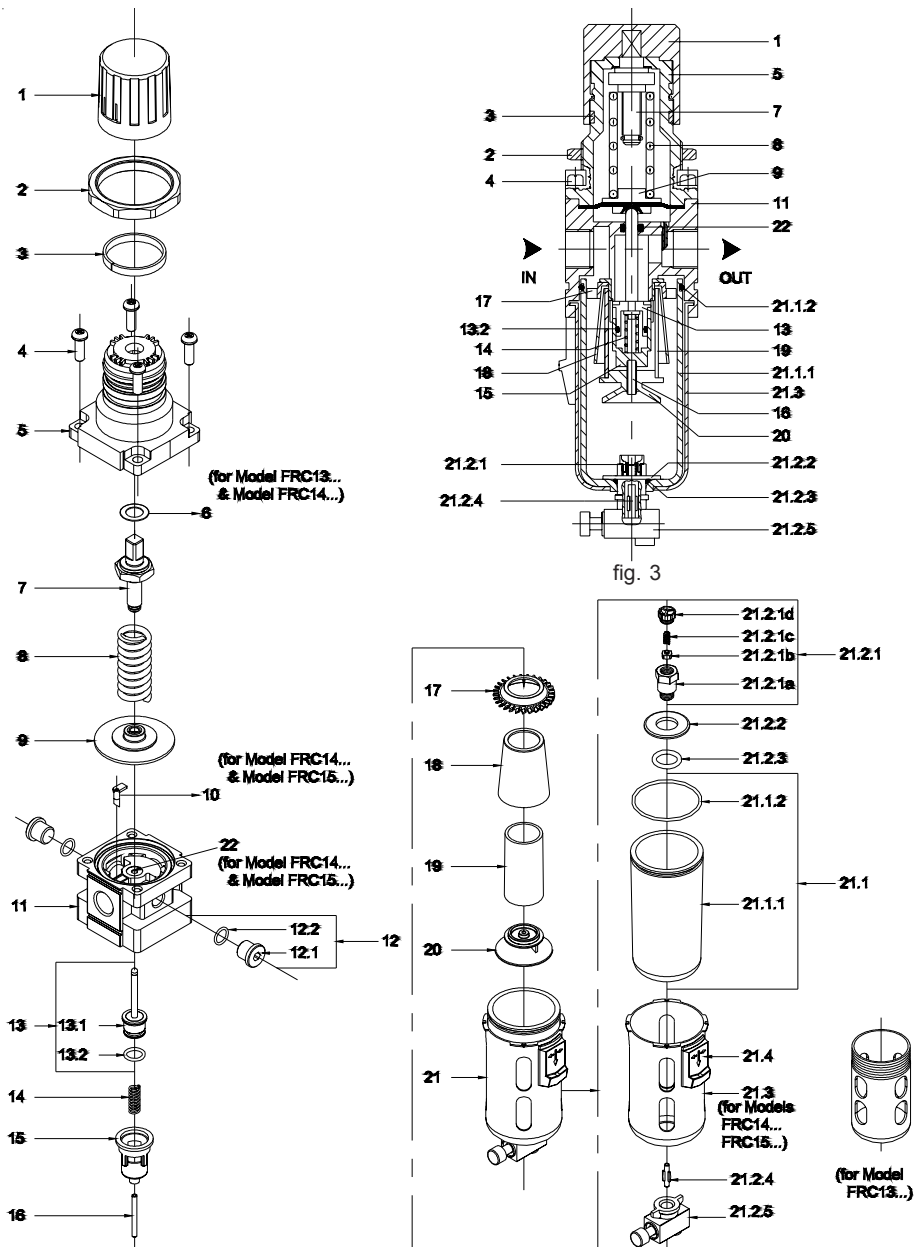


fig. 2

Spare parts list  
Filter Regulator combination Series FRC1

IS - FRC1 - 0 - 01/OM

SI No.	Part name / Ref. No	Ordering No. for		
		FRC13...	FRC14...	FRC15...
1	<b>Adjusting screw assembly (7)</b>	LA2200	LA2201	LA2202
2	0.2 - 2 bar	062025	062031	062061
3	0.2 - 4 bar	062026	062032	062062
4	0.5 - 7 bar	062027	062033	062063
5	0.5 - 10 bar	062028	062030	062060
6	<b>Diaphragm assembly (9)</b>	SA2200	SA2201	SA2202
7	<b>Port plug assembly (12)</b>	LA2203	LA2203	LA2203
	Port plug (12.1)	312004	312004	312004
	'O' ring (12.2)	651004	651004	651004
8	<b>Valve cone assembly (13)</b>	SA2602	SA2600	SA2601
	Valve cone (13.1)	312013	610003	610004
	'O' ring (13.2)	650002	650007	650103
9	<b>Internal Plastic Spares</b>	F13...-IPS	F14...-IPS	F15...-IPS
	Separator (17)	782000	782001	782002
	Shield (18)	762000	762010	762020
	Filter holder (20)	712001	712002	712004
10	Filter element - 5 microns (19)	582000	582026	582040
11	Filter element - 25 microns (19)	582001	582027	582041
12	Filter element - 40 microns (19)	582002	582025	582042
13	Filter element - 50 microns (19)	582003	582028	582043
14	Filter element - 100 microns (19)	582004	582029	582044
15	<b>Bowl assembly (21.1)</b>	LA2000	LA2001	LA2002
	Bowl (21.1.1)	732001	732003	732004
	'O' ring (21.1.2)	650015	650108	650110
16	<b>Drain valve assembly (21.2)</b>	SC2000	SC2001	SC2002
	Gland assembly (21.2.1)	SA2000	SA2000	SA2001
	Gland (21.2.1a)	312071	312071	312071
	Valve seat (21.2.1b)	640000	640000	640000
	Spring (21.2.1c)	260001	260001	260001
	Spring guide nut (21.2.1d)	722061	722061	722061
	Sealing washer (21.2.2)	722060	722060	722060
	'O' ring (21.2.3)	650121	650121	650121
	Actuator (21.2.4)	722001	722001	722001
	Stem housing assembly (21.2.5)	SA2002	SA2002	SA2002

Denotes for ordering items. For example, **Drain valve assembly (21.2)** will be supplied as kit, consisting of Gland assembly (21.2.1), Sealing washer (21.2.2), 'O' ring (21.2.3), Actuator (21.2.4) and Stem housing assembly (21.2.5) accordingly.



## Installation / Operating / Maintenance Instructions Filter - Regulator - Lubricator , Modular Series FRLM1

IS - FRLM1 - 0 - 01/OM

This modular FRLM unit consists of Filter , Regulator and Lubricator , assembled using Piping Adaptor ( 1 ) , Wallmounting Bracket ( 2 ) and Spacers etc.,

For details of ( a ) Specifications , ( b ) Installation ( c ) Operating and ( d ) Maintenance refer to the enclosed instructions sheets of the individual Filter ( IS - F1 - 02 ) Regulator ( IS - R1 - 02 ) and Lubricator ( IS - L1 - 02 ) .

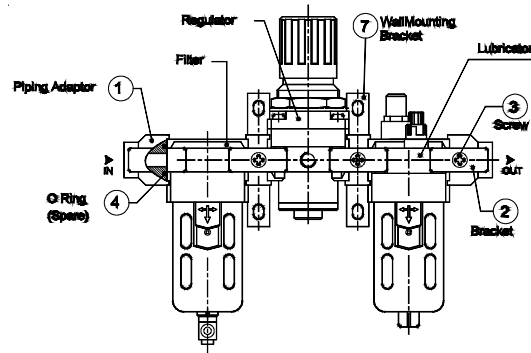


fig. 1

Model No	Filter Model No	Regulator Model No	Lubricator Model No	Piping Adaptor assembly ( 1 )	Wall Mounting Bracket assembly ( 7 )
FRLM13...	F13...	R13...	L13...	A2P01	A2W01
FRLM14...	F14...	R14...	L14...	A2P02	A2W02
FRLM15...	F15...	R15...	L15...	A2P03	A2W03

### Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

### Installation of Modular unit

1. Dismantle the Piping adaptor ( 1 ) from the assembly.
2. Assemble the Piping adaptor on to the rigid pipeline OR to the threaded fitting ( as the case may be ) using correct spanner.
3. Reassemble the Modular units just by stacking and tightening the screws.

#### Caution :

When the pipes or the fittings are assembled on to the Modular unit " Without removing the Piping Adaptor " from the assembly , ensure the following.

- (a). Hold the Piping Adaptor ( 1 ) using correct size spanner and tighten the pipes or fittings at both ends.
- (b). Ensure that the tightening load is NOT transmitted to the FRL assembly. Otherwise the guide ribs provided in the Spacers and Piping Adaptors may be damaged .

### Removal of the individual unit from the line

1. Remove the screws ( 3 ) and Brackets ( 2 ) adjacent to the unit to be removed.
2. Pullout the unit by sliding away from the line.

### Reassembly of the unit

1. Apply general purpose grease on the surface of the 'O'ring ( 4 ) and the sliding faces.
2. Reassemble the unit by sliding between the guide ribs.
3. Tighten the Brackets ( 2 ) using the screws ( 3 ) .

### How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number.

Example :- 'O' ring 6 5 0 0 1 1 for FRLM13...

This instruction sheet should be accompanied with  
(1) IS - F1 - 0 - 01/SB (2) IS - R1 - 0 - 01/SB (3) IS - L1 - 0 - 01/SB

Subject to change

## Installation / Operating / Maintenance instructions Filter Regulator Combination - Lubricator , Modular Series FRCLM1

IS - FRCLM1 - 0 - 01/OM

This modular FRCLM unit consists of Filter Regulator Combination unit and Lubricator , assembled using Piping Adaptor ( 1 ) , Wall mounting Bracket ( 7 ) etc.,

For details of ( a ) Specifications , ( b ) Installation ( c ) Operating and ( d ) Maintenance refer to the enclosed instruction sheets of the individual Filter Regulator Combination ( IS - FRC1 - 02 ) and the Lubricator ( IS - L1 - 02 ) .

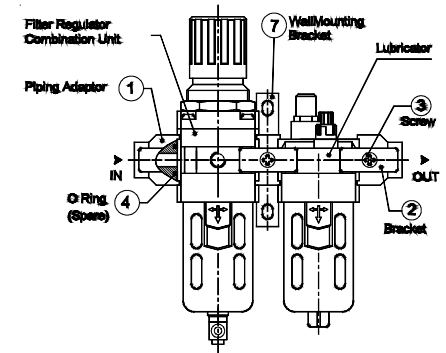


fig. 1

Model No	Filter Regulator Combination Model No	Lubricator Model No	Piping Adaptor assembly ( 1 )	Wall Mounting Bracket assembly ( 7 )
FRCLM13...	FRC13...	L13...	A2P01	A2W01
FRCLM14...	FRC14...	L14...	A2P02	A2W02
FRCLM15...	FRC15...	L15...	A2P03	A2W03

### Important

Since this equipment is used in compressed air line , proper precautions are to be taken for safety.

### Installation of Modular Unit

1. Dismantle the Piping Adaptor ( 1 ) from the assembly.
2. Assemble the Piping Adaptor on to the rigid pipeline OR to the threaded fitting ( as the case may be ) using correct spanner.
3. Reassemble the Modular units just by stacking and tightening the screws.

#### Caution :

When the pipes or the fittings are assembled on to the Modular unit " Without removing the Piping Adaptor " from the assembly , ensure the following.

- (a). Hold the Piping adaptor ( 1 ) using correct size spanner and tighten the pipes or fittings at both ends.
- (b). Ensure that the tightening load is NOT transmitted to the FRL assembly . Otherwise the guide ribs provided in the Spacer and Piping Adaptors may be damaged .

### Removal of the individual unit from the line

1. Remove the Screws ( 3 ) and Brackets ( 2 ) adjacent to the unit to be removed.
2. Pullout the unit by sliding away from the line.

### Reassembly of the unit

1. Apply general purpose grease on the surface of the 'O'ring ( 4 ) and the sliding faces.
2. Reassemble the unit by sliding between the guide ribs.
3. Tighten the Brackets ( 2 ) using the Screws ( 3 ) .

### How to order for spare parts

Mention the spare parts numbers as given in the tables and mention the model number.

Example :- 'O' ring 6 5 0 0 1 1 for FRCLM13...

This instruction sheet should be accompanied with  
(1) IS - FRC1 - 0 - 01/SB (2) IS - L1 - 0 - 01/SB

Subject to change

Assembly / Spare parts list  
Filter Regulator combination - Lubricator , Modular Series FRCLM1

IS - FRCLM1 - 0 - 01/OM

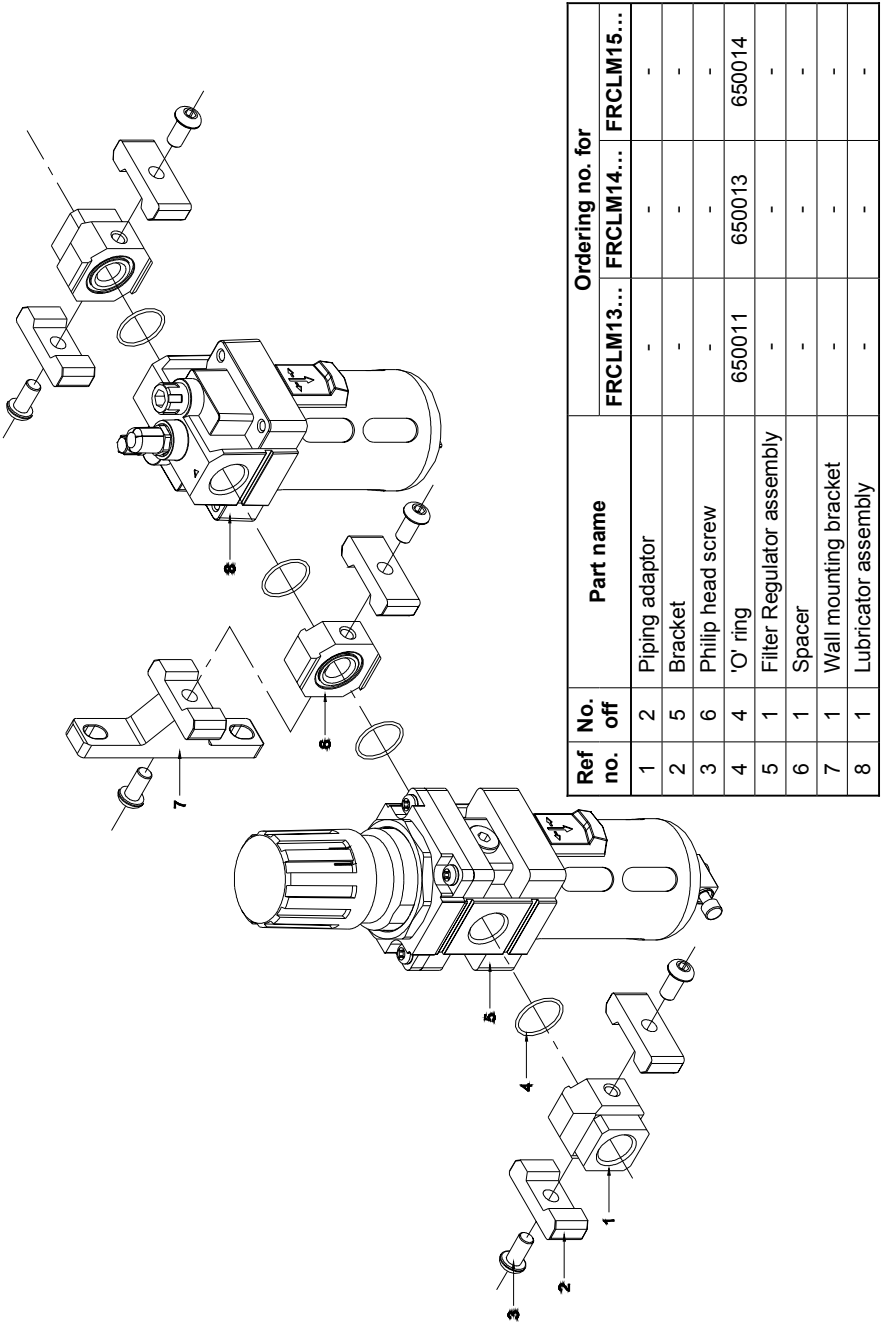


fig. 2

Assembly / Spare parts list  
Filter - Regulator - Lubricator , Modular Series FRLM1

IS - FRLM1 - 0 - 01/OM

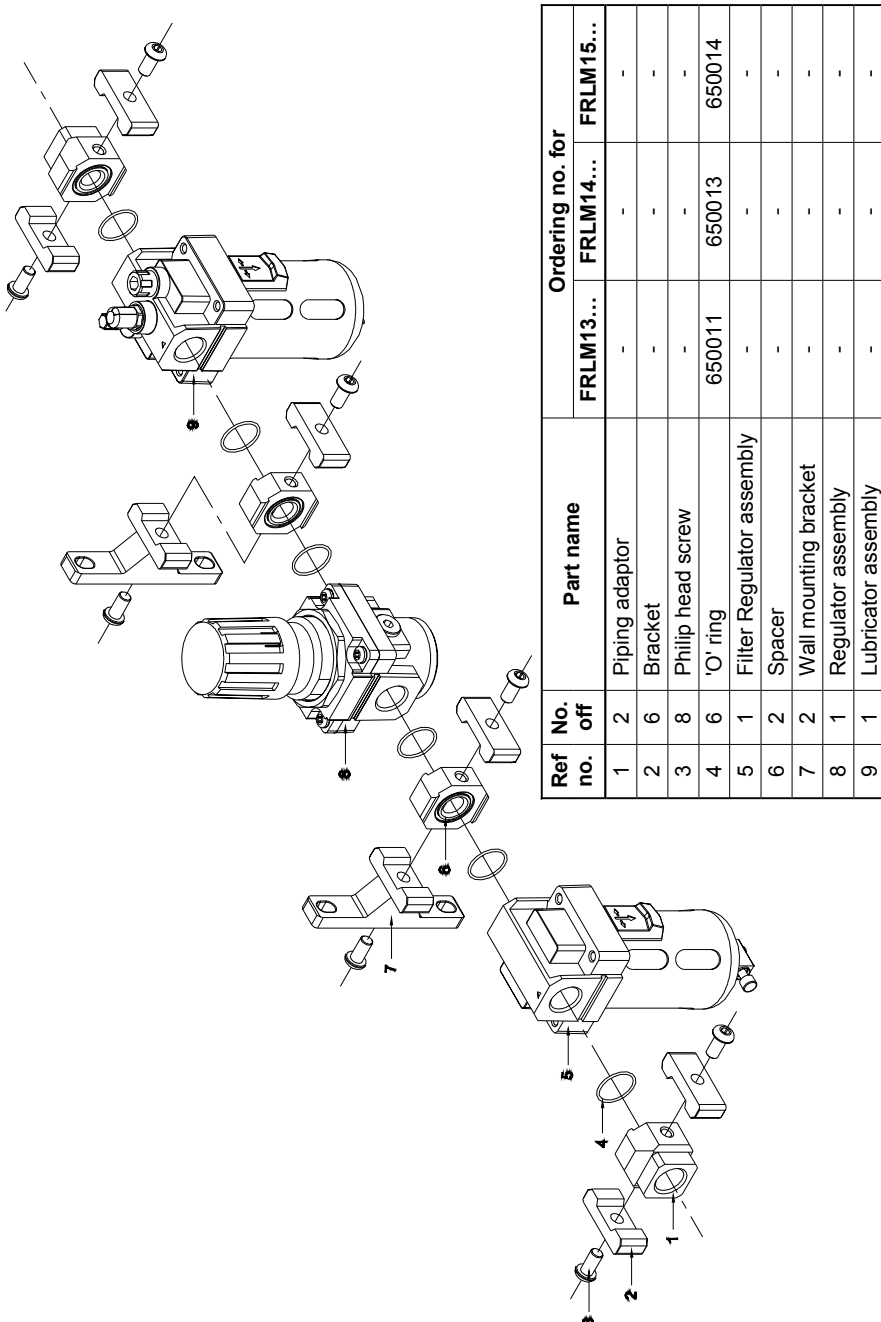


fig. 2

## Installation / Maintenance Instructions

### AUTOMATIC LINE DRAIN Series NL1

IS - NL1 - 0 - 01/OM

## Specification

Model	NL161
Port Size	G1/4
Condensate discharge capacity	60 ml / min.
Medium	Compressed air
Operating pressure (bar)	28 - 140 (2 - 10)
Ambient Temperature	41° - 140° F (5° - 60° C)
Installation	Vertical (as in the picture)
Materials of construction	Al, Brass, Nitrile, Acetal, Stainless Steel

## Function

The Automatic Line Drain is of normally open, float type, mountable in main airline piping.

The valve closes at and above 2 bar \*, and when the condensate level increases, the drain passage opens thus draining the condensate water.

When the condensate level decreases the drain passage closes.

\* at a minimum flow of 100 lts/min in the mainline piping

## Spare parts list

Description	Ordering No.
Drain assembly	SA2006
Bowl filter	752005
Piston assembly (15) (without Nutring (14))	SA2007
<b>Service kit</b>	<b>SK2020</b>

**Service kit** consists of the following:

- 'O' ring (3) - 1 no.
- Valve cone assembly (6) - 1 no.
- Spring (13) - 1 no.
- Nutring (14) - 1 no.
- 'O' ring (19) - 1 no.
- 'O' ring (20) - 1 no.
- 'O' ring (21) - 1 no.
- Gland clip (22) - 1 no.
- Hose connector (23) - 1 no.

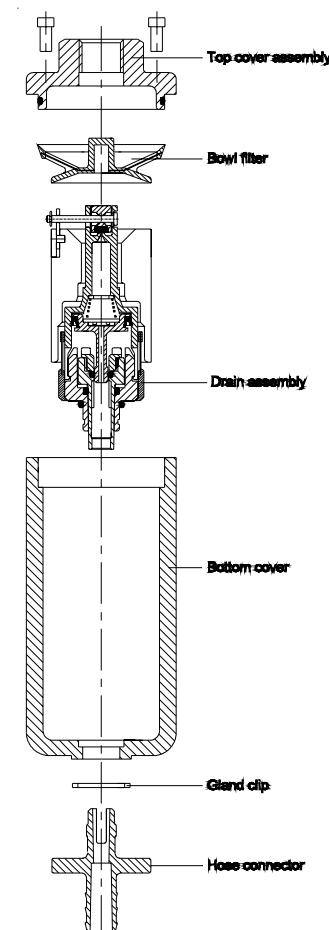


Fig. 1

**Maintenance Instructions**  
**AUTOMATIC LINE DRAIN Series NL1**

IS - NL1 - 0 - 01/OM

**Trouble shooting**

Trouble	Cause	Remedy
1. No draining of water	1. Bowl Filter (4) clogged 2. Drain Filter mesh (16) clogged 3. Orifice in the drain housing (11) gets clogged	Clean* & use Clean* & use Clean* & use / Clean* the Valve seat (9)
2. Continuous flow of air / water	1. Piston struck / Nutring (14) damaged 2. 'O'ring (19) damaged 3. 'O'ring (20) damaged 4. 'O'ring (21) damaged	Clean* / Replace Nutring (14) Clean* / Replace 'O'ring (19) Clean* / Replace 'O'ring (20) Clean* / Replace 'O'ring (21)

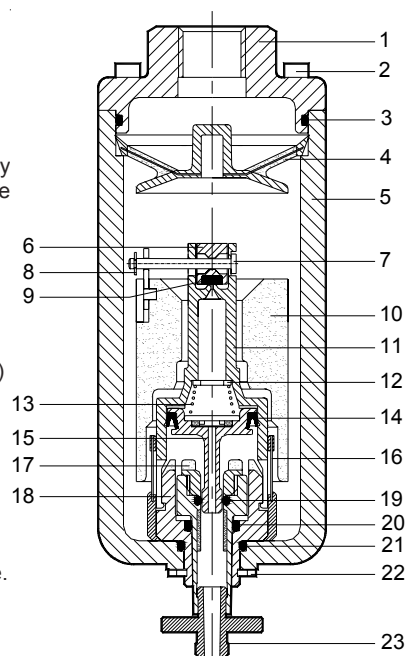
\* Clean using air and soap water.

**Dismantling / Assembly Instructions**

( Ref: Fig. 1 & 2)

**a. Dismantling Instructions**

1. Completely exhaust the air in the pipe line.
2. **To dismantle the float, valve cone and Drain assembly**
  - i) Unscrew the bolts (2) to dismantle the Top cover (1) & Bottom cover (5) assembly
  - ii) Remove the Gland clip (21) and remove the Drain assembly from the Bottom cover.
  - iii) Remove the Clip (8) and Cross pin (7) to dismantle Float (10).
  - iv) Remove Valve cone assembly (6).
  - vi) Remove the Drain filter (16)(slide out)
  - vii) Dismantle the Drain housing (11) & Gland (18), taking care that the Spring (13) & Prefilter (12) does not fall off.
  - viii) Remove the Spring (13) and Piston assembly (15)
  - ix) Unscrew Adaptor nut (17) to remove 'O'ring (19)



**Fig. 2**

**b. Assembly Instructions**

1. Ensure all components are clean and dirt free.
2. Apply general purpose grease on all 'O'rings and sealing areas.
3. **To Assemble the unit**, follow the above dismantling procedure in the reverse order

## **Air Preparation Units**

### **Filters, Regulators & Lubricators (FRLs) for compressed Air**

### **Safety Instructions**

#### **Compressed Air Safety**



**Following Safety instructions should be strictly followed. Failure to do so may result in accidents, equipment malfunctioning, serious personal injury and/or loss of life.**

*Compressed air is a source of considerable energy. When handling products dealing with compressed air, the following precautions must be taken to prevent accidents.*

1. Human hands or any parts of a human body should not block compressed air. Compressed air should not be allowed to impinge on any portion of the human body also.
2. Before connecting any pneumatic equipment to the compressed air supply, all mounted fittings, piping assemblies and electrical connections should be checked for security. All plastic plugs in the equipment used for protection during shipping should be removed.
3. No piping alterations, removal of fittings, repairing of equipment etc. should be attempted with air supplies connected. Air and electrical supplies must be disconnected before beginning any adjustment, maintenance or dismantling of equipment.
4. The maximum allowable operating pressures, temperature, flows etc. must be strictly observed. Failure to do so might result in catastrophic failure of equipment, and result in serious personal injury and/or death. Refer to individual catalogs for this information, and any other operating or application limitations.

#### **Compressed Air Safety for Pneumatic Equipment:**

##### **Warning**



##### **1. Compatibility of pneumatic equipment**

*Ensuring the compatibility of the procured FRL equipment is the responsibility of the person who designs the Pneumatic system and/or System specifications. This should be based on specifications or after analysis and /or tests to meet specific requirements.*

##### **2. Repair & Maintenance**

Assembly, handling, or repair of pneumatic systems should be performed by only trained and experienced operators.

##### **3. Safety First**

Do not service machinery/equipment or attempt to remove any component until safety is confirmed.

- 7 Inspection and maintenance of machinery/equipment should only be performed after confirmation that both compressed air and electrical supply have been positively disconnected and all residual compressed air in the system has been completely exhausted to the atmosphere.

##### **4. Contact OMEGA products if equipment is to be used in any of the following conditions:**

1. Equipment is to be used in conditions beyond the given specifications, or if equipment is to be used outdoors.
2. Equipment is to be used in conjunction with atomic energy, railroad, air navigation, automobiles or related vehicles, medical equipment or safety equipment.
3. In applications that adversely effect humans, animals, or property requiring special safety analysis.


## Safety Instructions for FRLs

### Product Selection

#### Warning



*Standard Filters, Regulators, Lubricators and Filter- Regulator Combination units should be used in accordance with the specifications mentioned in the catalogs/specification sheets of OMEGA. While installing and using this equipment, please also follow the respective specification & instruction manual available for each product.*

Wherever this symbol  is shown, it indicates **Caution!** and/or **Warning!**

*It indicates that operator error can lead to damage and malfunctioning of the pneumatic equipment and can lead to serious personal injury or loss of life.*

#### 1. Air Filter and Lubricator

Standard Filters and Lubricators incorporate polycarbonate bowls and/or observation windows. Do not use filters & lubricators in an environment that will expose the above components to synthetic fluids, organic solvents, corrosive chemicals, cutting lubricants, thread sealant or similar materials.

Make sure that the condensate is periodically drained when using manual drain valves on Filters.

#### 2. Regulator

- a. Safety devices shall be placed to prevent secondary (output) pressure from rising past the set pressure. This will ensure that damage to the components on the secondary side will be minimized in the event of a malfunction.
- b. In a standard regulator, when the supply pressure is removed or disconnected, either of the following may happen:
  1. The residual pressure will remain on the secondary side of the regulator.
  2. The pressure on the secondary side of the regulator will exhaust.

The designer should add components to the circuit to compensate for any of the above conditions.

- c. Regulator operation may be affected when used in Balanced or Secondary sealed circuits. Please consult OMEGA regarding these applications.

#### 3. Lubricators

Ensure proper function of the Lubricator. Minimum airflow rate should be ensured for effective lubrication.

#### 4. Automatic Drains – Normally Open

Ensure minimum working pressure for proper functioning of the Auto drain. The Filter unit must be periodically checked for condensate that would not be drained in case of any drain malfunction.