OPERATIONS MANUAL

UNDERPINNER
IM-3P SE

!!! For your safety !!!

Read the instructions manual carefully

INMES

SAP: 183/186

0504121

INTRODUCTION

Congratulations upon your purchase of the INMES IM-3P SE Underpinner, designed to fill your needs for finishing and productivity!

The IM-3P SE Underpinner allows you to assemble frames of the size you want, using a full range of profiles. It applies a wedge in the back of the moulding, making a strong frame. The INMES "SW" wedge is designed to use in woods of normal density, and the "HW" wedge is for use with hard woods.

The IM-3P SE Underpinner comes to you ready to use, requiring only installation. Please read on so as to make the best use of your new equipment.

SPECIFICATIONS

- Weight ——————————————————-- 50 lbs.
- Height ——————————————————— 45"
- Width ——————————————————— 15"
- Depth ——————————————————— 15"
- Widths of moulding ————————————- 3/8" - 4 3/4"
- Heights of moulding ———————————— 5/16" - 3 7/16"
- Wedge sizes ——————————————— 7-10-12-15mm (1/4"-3/8"-1/2"-5/8")

Optional Accessories

- Large extender table
- V02, V03 or round models pressure pads

Spare Parts included

- Small extender table
- 6mm Allen wrench
- 5mm Allen wrench
- 3mm Allen wrench
- Spare bolt with spacer for attaching machine to floor
- Bracket for the pressure pad
- V01 model pressure pad
- Magazine for 5mm and 7mm V-nails
- Magazine for 10mm V-nails
- Magazine for 12mm V-nails
- Magazine for 15mm V-nails
- Lubricant
- Manual
- Hand Shield (for CE machines only)

INSTALLATION

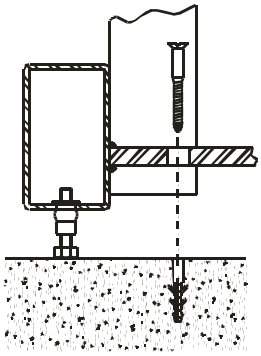


Fig.01

1) Setting up

To level the machine in the workplace, there are four bolts to insert on the bottom of the base, which you should screw up from the bottom all the way in, and then adjust the height to your satisfaction. If you wish to bolt your IM-3P to the floor, drill four holes for the insertion of the four bushings and screws (which are included in your package), as shown in Figure 1.

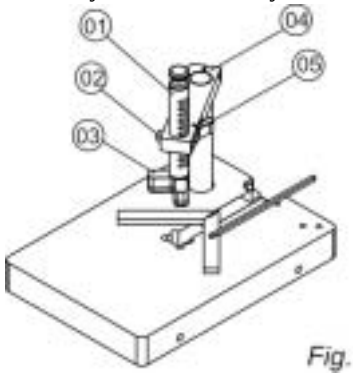


Fig. 1.1

Also its necessary to set the vertical pressure pad. Remove the screw fig. 1.1 (02), and press the button (05). Insert the bracket (01) into the upper support (04). Release the button (05) and insert the screw (02). So, insert the pressure pad (03) in the bracket (01).

Inmes products are constructed to have a long duration and are tested one by one. However, we ship the machines without oil inside the lubricator glass and it is necessary to fill the lubricator glass to obtain good performance of the equipment. In order to refill the lubricator glass, proceed as follow:

1) Shut air supply item 01 figure 1.2;
2) Use screw driver to loosen the screw item 02, figure 1.2, in order to draw the compressed air;
3) Unscrew the lubricator glass by turning it clockwise direction, item 03 figure 1.3;
4) Fill the lubricator glass with pneumatic oil, a little more than half glass;
5) Screw the lubricator glass back on makes sure the O-ring is sitting correctly in the housing.
6) Using a screw driver to tighten the screw item 02, figure 1.2;
7) Connect the air supply, item 01 figure 1.2

Fig. 1.2

Fig 1.3

PS. The number of drops of pneumatic oil is adjusted at the factory. It is usually not necessary to adjust it afterwards. We recommend the customer verify that after every 25 to 30 actions of the foot pedal, ONE drop should fall. If it is necessary to adjust it, please proceed as follow:

* Using a screw driver to rotate clockwise the screw 04 figure 12 until the screw is complete closed, and then rotate it anticlockwise about ¼ of its course, this will be the correct position for every 25 to 30 actions of the foot pedal, one drop must fall.

2) Compressed air supply

Hook up the compressed air to the filter/regulator. You will need a compressor which supplies an output of at least 1 cubic foot per minute of compressed air. More than this causes no problem.The operating pressure is normally 6 bar, or 85 psi. The pressure used by the machine depends upon the hardness of the moulding material, and is regulated by the pressure regulator knob. The pressure used cannot be more than 6 bar (85 psi).The compressed air which operates your machine should be free of dirt and humidity. For this reason there is a lubricator/filter mounted on the Underpinner.

Note: Read instructions at the back of this manual for operating and maintaining the Parker Mini Filter Regulator and Mini Lubricator.

OPERATION

1) Setting the stops for positioning wedges

The table of your machine has a scale (Fig. 2-02) with measurements from zero to 3¼", that allows you to set the stops (Fig. 2-05 and 2-06), in this manner determining where the wedges will be inserted in the corners. The rear stop (Fig. 2-05) determines the distance the wedge will be inserted from the outside of the frame. The distance setting between the rear stop and the front stop (Fig. 2-06) equals the distance between the outside and inside wedges.

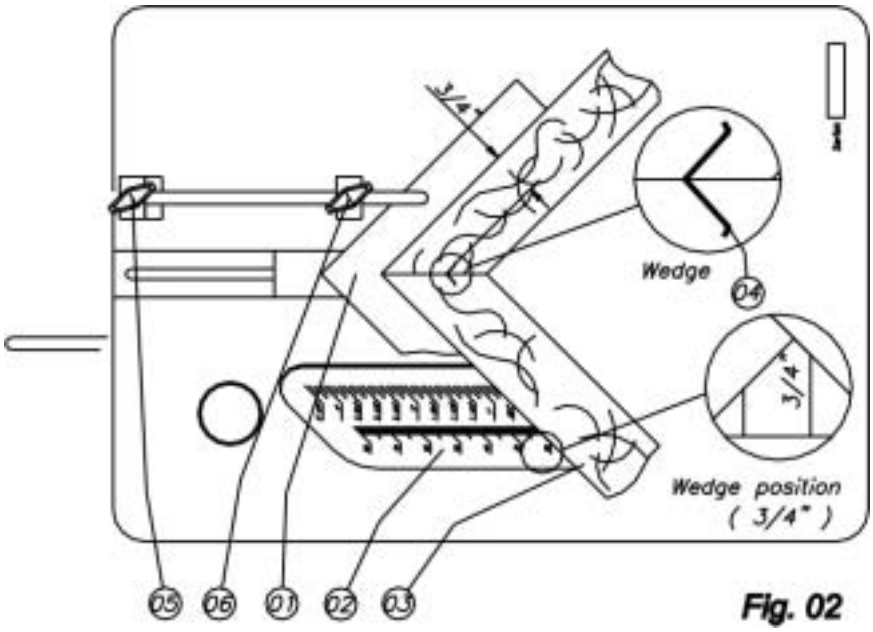


Fig. 02

If you want more wedges between the inside and outside ones, you will use your judgement in moving and stopping the slide guide as you move from the outside to the inside of the frame. Make sure the wedges are not placed too close to the edges of the moulding, so as not to split the material (Fig. 3).

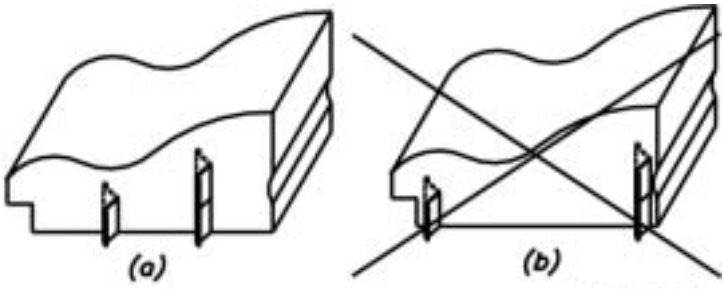


Fig. 03

2) Stacking wedges

If you want to stack the wedges in a particularly tall moulding, simply depress the foot-pedal twice, and two wedges will be inserted, one on top of the other (Fig. 4 and 5), or three times for a third wedge, etc.

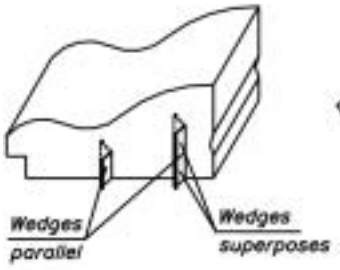


Fig. 04

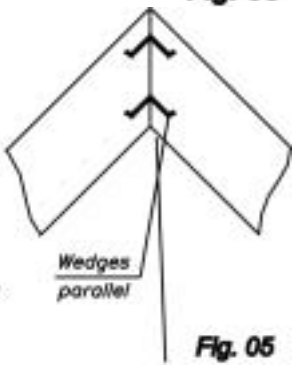


Fig. 05

3) Select proper wedge size

After you have selected the moulding and frame size, you can determine what size wedge and how many you want to use on each corner. You want to get the most rigidity possible to allow your glue to set. Make sure the wedge is not so tall

as to damage the moulding by coming through the top (Fig. 6).

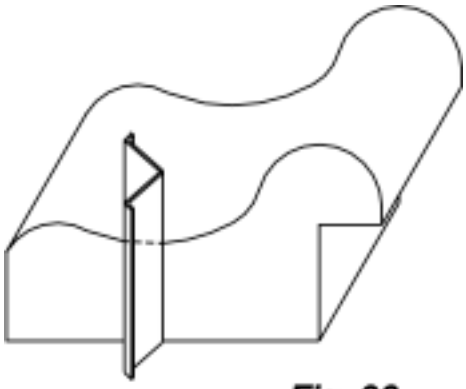


Fig. 06

4) Select the proper magazine size

Select the magazine size according to the size of wedge you will be using. The side of the magazine has a number on it which indicates which size wedge it takes (Fig. 7).
Important: The 7mm magazine has “7mm” marked on one side, for the 7mm wedges, and “5mm” marked on the other side, which takes the 5mm wedges.

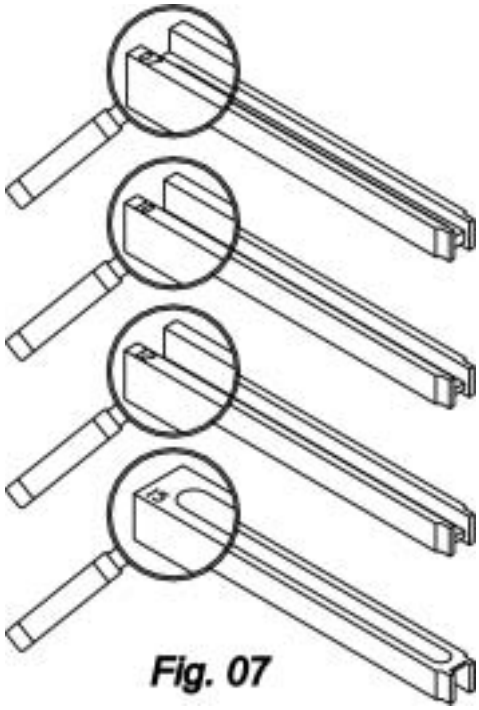


Fig. 07

5) Load the empty magazine into the machine

Pull back on the spring-loaded cable (Fig. 8-03), which allows you to slip the empty magazine into its slot (Fig. 8-02) in the table. Remember that the side facing up should have the number indicating the size wedge (in millimeters) stamped on it.

6) Load the V-nails into the magazine

Pull back on the cable again, and from the point of view of the side of the table where the spring-loaded cable (Fig. 8-03) is located (the back), put the wedges (Fig. 8-04) in the magazine (Fig. 8-01) with the cutting side (the side with the glue) facing up, and with the open end of the “V” facing away from you, towards the front of the table. Release the cable so that the spring pushes the shoe against the wedges, feeding them into the head as they are used.

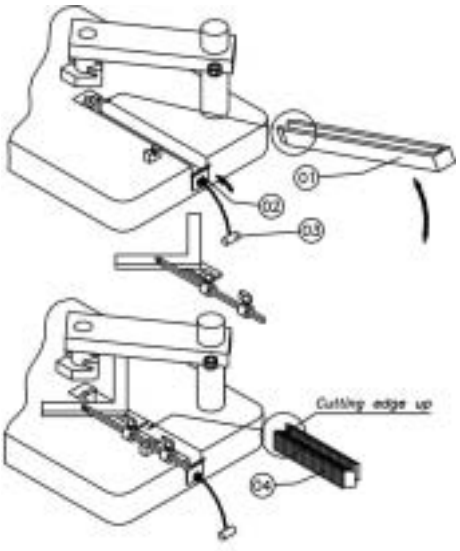


Fig. 08

7) Reversing position for large mouldings

When making large frames, you may find it convenient to work from the back side of the machine, using extender tables (available accessories) to support the moulding pieces. You only need to move the position of the foot pedal from the front to the back of the machine.

8) Set the position of the pressure pad

To optimize the consumption of your compressed air, as well as speeding up the operation, the height of the pressure pad should be adjusted according to the moulding's height, using the adjusting handle (Fig. 8-05). Pull the handle outwards and turn it counterclockwise to loosen the pad"s arm. The pad should be set ½" above the top of the moulding. Then tighten the pad's arm by turning the handle clockwise. The handle is springloaded and allows you to leave it in the position convenient o you when you release it.

MAINTENENCE

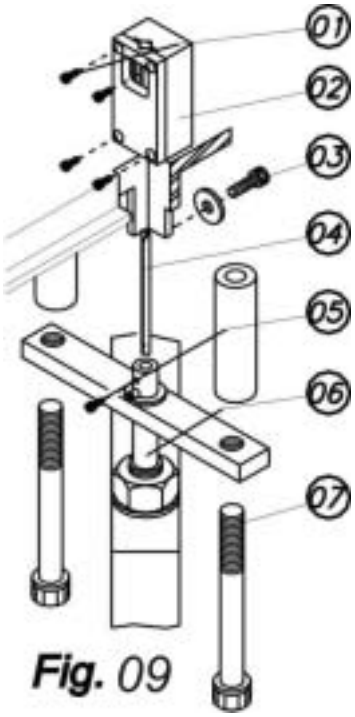


Fig. 09

1) <u>Lubrication</u> - All moving parts should be lubricated after every 40 hours of machine use. A lubricant comes with the machine.

2) <u>Location</u> - The Underpinner should be protected from weather, humidity, dust, etc.

3) <u>Replacing the nail driver rod</u> - If the drive rod (Fig. 09-04) breaks, replace it by following the following procedure:

Remove bolt (Fig. 09-03), and pull the assembly head up through the top of the table. Then remove the head screws (Fig. 09-01) and pull out the drive rod (Fig. 09-04). Place the new one in the head, <u>with the hole at the bottom</u> to receive bolt (Fig. 09-03). Put a drop of sewing machine oil on the drive rod before reassembling. After reassembling, make sure the drive rod moves freely up and down. When putting the head back on the machine, be sure it is level with the top of the table, and that the drive rod continues to move freely. You may do this by operating without wedges, and with the pressure pad rotated off to one side. **Keep hands away from pad!**

4) <u>Cleaning</u> -

a) <u>The pressure pad</u> should be cleaned periodically with warm water, <u>no soap</u>, in order to remove the glue applied to the joints of the frames.

b) <u>The slot</u> where the wedge comes up through the table should always be kept clean, as should the <u>entire table top</u>. Dried glue should be removed with warm water, <u>never</u> scraped off.

c) <u>The drive assembly</u> - Periodically you should clean the drive assembly head. Proceed as described above to replace the assembly. Wash with warm water, wipe thoroughly, then put a drop of sewing machine oil on the drive rod before reassembling. **Remember to keep hands away from pad when testing!** If the drive rod does not come out easily, <u>do not</u> beat it with a hammer**.**

SAFETY SHIELD IM-3P

1-1- Installing the Safety Shield IM-3P

Proceed as follow to install the IM-3P safety shield;

a) Make sure the machine is unplug from the air source;

b) Remove the IM-3P Safety Shield from the package 01 Fig. 11;

c) Set the safety shield using the two Allen bolt included with the safety shield kit. Use an 5mm Allen key Fig. 12;

d) From the factory the pneumatic air hoses are connected to the valve included with the safety shield Fig. 13. If one of these air hoses is not connected use the pneumatic scheme in the instructions manual to make the correct connection;

e) Once these procedures are done connect the IM-3P to the air source.

Fig. 11

Fig. 12

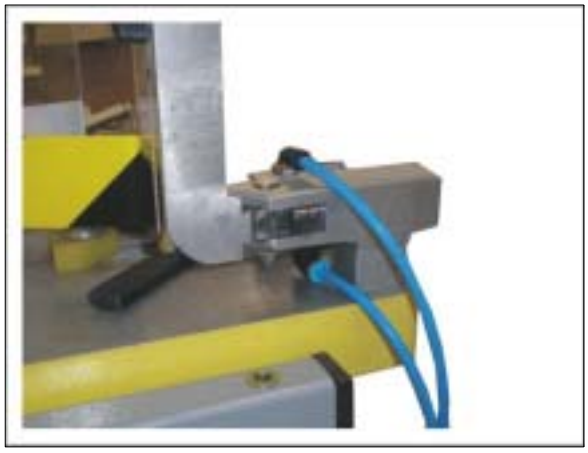


Fig. 13

1-2 – USING YOUR HAND SHIELD IM-3P (for CE machines only)

The safety shield must be proper in place for obtaining best performance of your equipment and for operator safety. It means the safety shield must be as shown in Fig. 14. In order to adjust the height of the safety shield loosen the handle 01 Fig. 14 and make the necessary adjustments, once you reach the desired height adjustment make sure to tighten the handle. For your safety when you open the safety shield Fig. 15 your machine will not operate. Only open the safety shield for servicing the machine. Make sure to keep the safety shield in place as Fig. 14 for high performance of your equipment.

Fig. 14

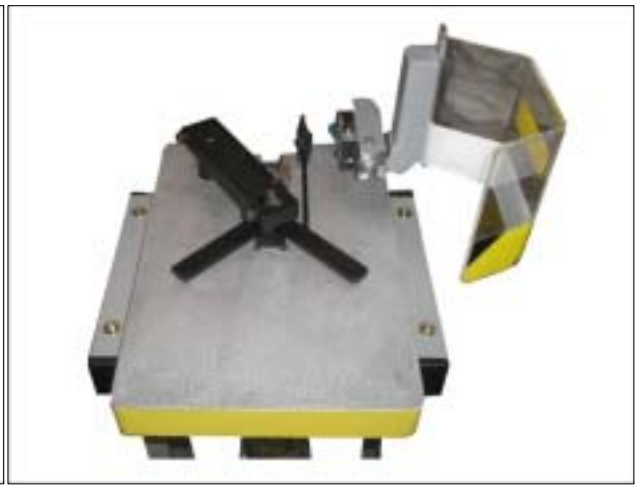


Fig. 15

TROUBLESHOOTING

Drive rod stuck - This can happen if:

a) Residues /dirt have gotten into the driver head assembly causing the drive rod to stick after it pushed up the wedge, not returning to its original position.

b) The wedges were placed in the cartridge upside down, i.e. with the glue side down. The glue side of the wedges is the cutting edge, and must face up. If the wedges are placed glue side down, instead of the drive rod pushing against the base of the wedge, the bevel on the cutting edge will act as a guide that directs the drive rod along the side of the wedge, causing the rod to get stuck, since it and the wedge are occupying the space designed for the drive rod alone.

To release the drive rod, simply pull down on the air cylinder. This will pull back the drive rod to its original position. Then make sure that the wedges have the glue side facing up in the cartridge. If they are in the proper position, you should clean the drive head assembly. If you cannot pull the air cylinder down, you should then perform the procedure described in paragraph 3 in the Maintenance section of this manual.

PARTS LIST FOR IM-3P SE

CODE	DESCRIPTION	CODE	DESCRIPTION
0301003	Base for positioning stops	0408009	Bolt M4x20mm
0301006	Bushing	0408012	Bolt M5x8mm
0301011	Guide bar for wedge spring loader	0408018	Bolt M6x20mm
0301013	Nut M16	0408029	Bolt M8x35mm
0301029	Spring-loaded cable shoe plate	0408037	Bolt M10X25mm
0301031	Magazine for 7mm wedges	0408052	Allen screw Internal M6X10mm
0301032	Magazine for 10mm wedges	0408007	Bolt M4X10mm
0301033	Magazine for 15mm wedges	0408113	Bolt M4x12mm
0301038	Bolt M5	0408114	Bolt M5x35mm
0301042	Pressure pad assembly shaft	0408140	Bolt Hex. M8x25mm
0301056	Pressure pad ajustment handle	0408144	Steel Revit 3,2x10,2mm
0301070	Foot pedal guard	0408160	Nut M4
0301071	Lower support arm	0416012	Spring
0301079	Magazine for 12mm wedges	0417008	Flex pin
0301080	Base leg	0417012	Bushing
0301081	Moulding guide and Teflon pad	0417092	Driver Pin DIN 7 5x16mm
0301087	Guide for drive piston	0504015	Label
0301201	Aluminum table top	P0301051	Spring loaded cable IM-2
0301208	Bushing IM-2/IM-3/3P	P0301164	Bushing IM-2/ IM-3/3P
0301209	Bolt IM-2 /IM-3/3P	P0301028	Position Stop IM-2
0301210	Drive piston	P0301030	Wedge shoe
0301382	Foot Pedal Guard IM-5P	P0416002	Spring IM-2
0301395	Pneumatic cylinder	P0301200	Drive head assemblyIM-2/IM-3/3P
0301401	Hose connector 1/4" AUS	P0408016	Bolt M6X16mm
0301420	Mounting bracket MiniFilter Regulato/Lubric.	P0301199	Drive rod IM-2
0301422	Nut M30x1,5mm	P0301005	Bushing IM-2
0301600	Bracket	P0301208	Bushing IM-2/IM-3/3P
0301601	Pin Button	P0301597	Kit Repair Pneumatic Cylinder INMES IM-3P
0301602	Tornillo M8	P0407281	Kit Repair Lubricator LOE 1/4 D FESTO
0301604	Upper Support IM-2/IM-3/IM-3P (Z)	P0407282	Kit Repair Foot Pedal F 5-1/4" FESTO
0301606	Button (Z)	P0407302	Kit Repair Filter Regulator LFR 1/4 D FESTO
0403003	Plastic foot		ACESSORIES
0405120	Label	0504121	Manual
0405302	Label	0408155	Allen wrench 3mm
0407005	Tube 6mm	0408139	Allen wrench 4.0mm
0407007	Elbow 1/4"	0408075	Allen wrench 5.0mm
0407053	Elbow 1/4"	0408076	Allen wrench 6.0mm
0407291	Hose connector 1/4"	0301059	Lube kit
0407300	Lubricator FESTO FRC 1/4"	P0301632	V01 Pressure Pad
0407301	Valve	P0301633	V02 Pressure Pad
0407303	Foot Pedal Valve F-5-1/4-B	P0301634	V03 Pressure Pad
0407310	Valve 1/8"	P0301635	Round Pressure Pad D50mm
0407366	Elbow 1/8"	P0301636	Round Pressure Pad D25mm

PARTS LIST SAFETY SHIELD IM-3P

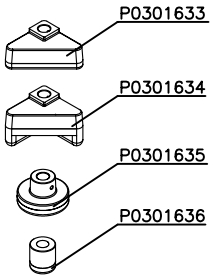
CODE	DESCRIPTION	CODE	DESCRIPTION
0301584	Pivot IM-4P/IM-5P	0407365	Valve 3/2 vias 1/8
0301588	Lock Pin IM-4P/IM-5P	0407366	Connection L 1/8" - 6mm
0301592	Acrylic Safety Shield IM-3P	0408010	Allen screw M8x25mm
0301593	Articulation Safety Shield IM-3P	0408020	Allen screw M8x30mm
0301594	Support Safety Shield IM-3P	0408200	Washer 1/4" (Z)
0302249	Washer (Z)	0408212	Self-locking nut MA 6mm (Z)
0405304	Label	0415003	Butterfly handle M6x20
0417010	Pin 6x24mm	0416078	Spring
0407299	Shorter Mufler 1/8"		

IM-3P SAP 183
IM-3P CE SAP 186

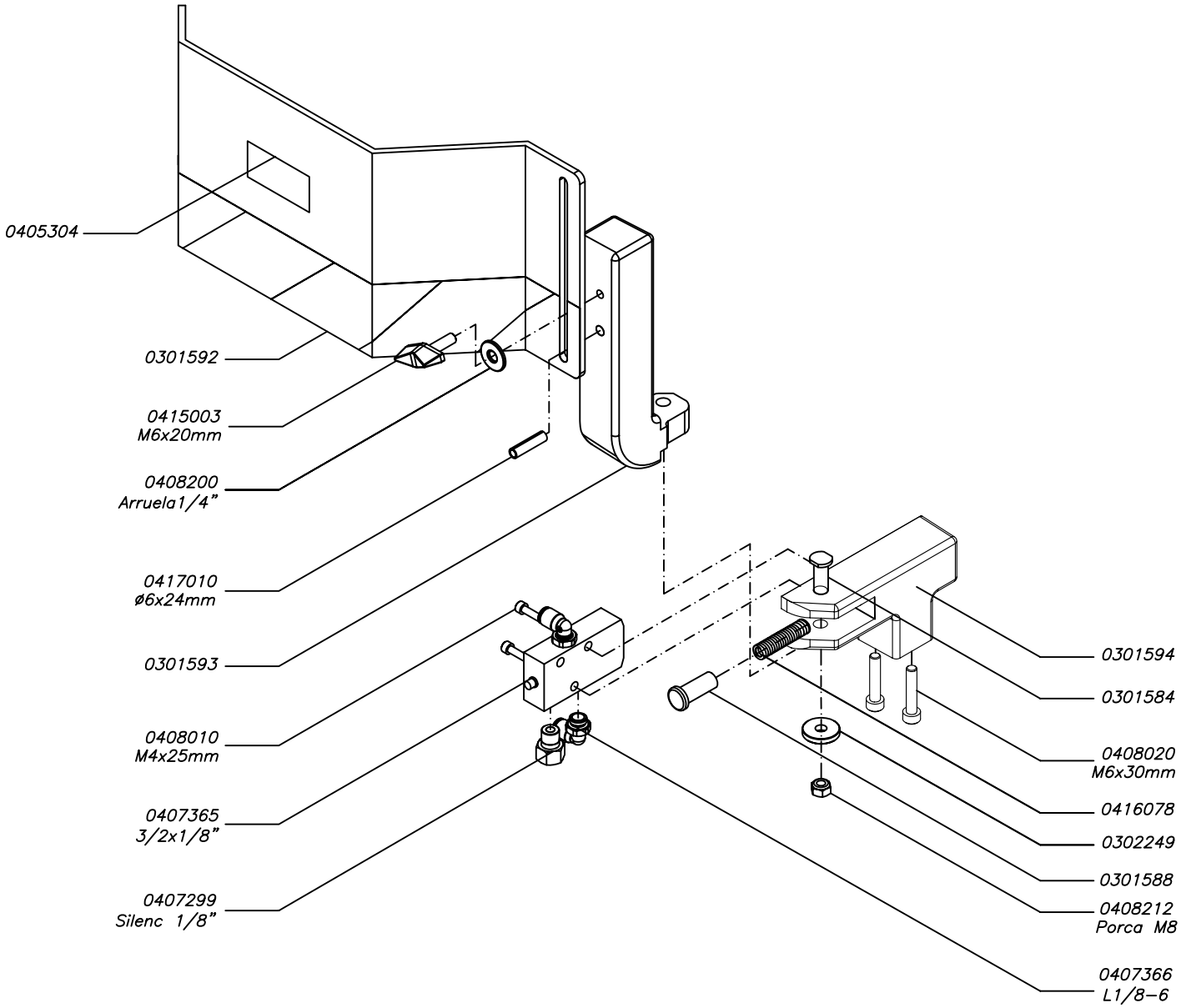
Kit reparo para Válvulas e Cilindros Kit de reparo para Válvulas y Cilindros Valves and cylinder kit repair	
Cód.	Kit
0301395	P0301597
0407303	P0407282
0407300	P0407302
	P0407281

Ps.: Parts 0301382 and 0408140 are for CE and AMN Machines Only

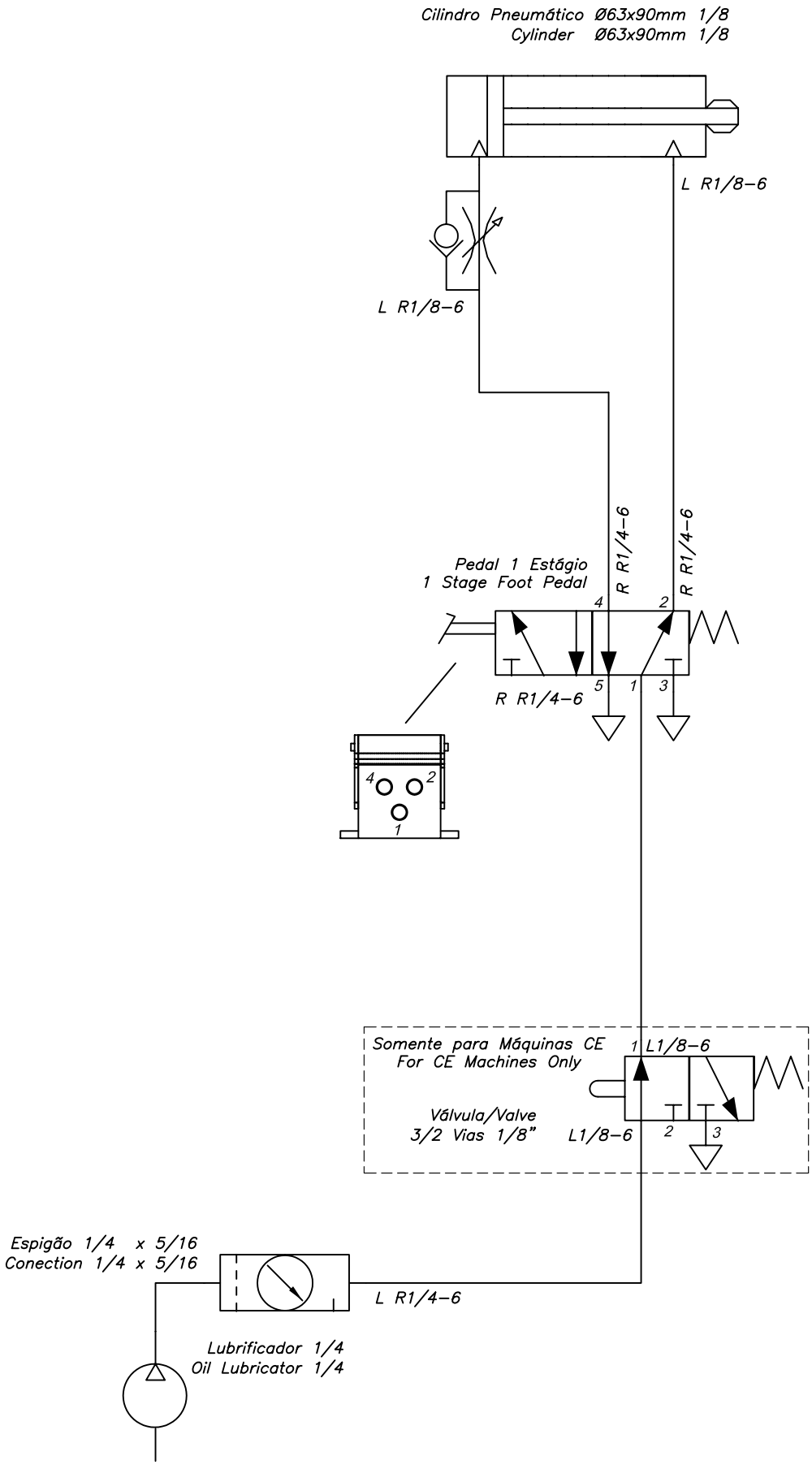
Pressionador Vertical Opcional
Optional Vertical Clamping
Prensor Vertical Opcional



PROTEÇÃO MÃOS IM–3P
SAFETY SHIELD IM–3P
PROTECCIÓN DE MANOS IM–3P



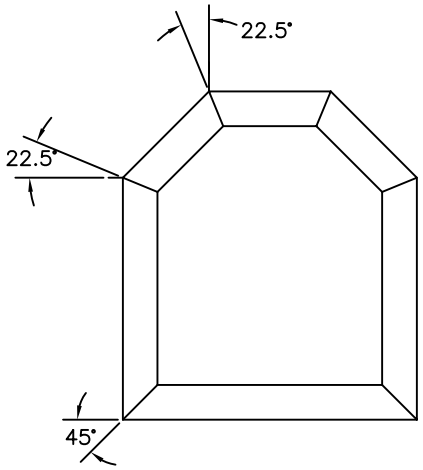
ESQUEMA PNEUMÁTICO IM–3P
PNEUMATICA IM–3P UNDERPINNER



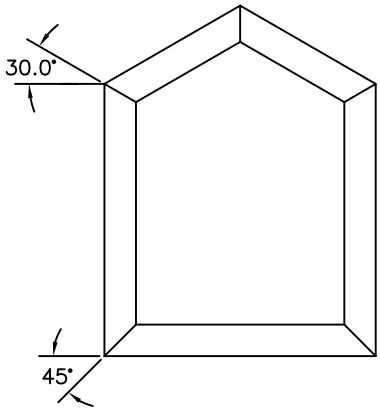
Samples of frames you can assembly with the IM–3P underpinner, when you have the accessories contact the distributor near you!

Accessories code

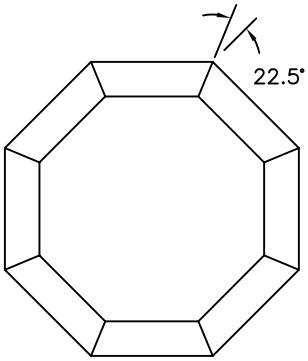
0301001 to hexagonal frames
0301002 to octogonal frames
0301085 to 18 sides frames
0301086 to 12 sides frames



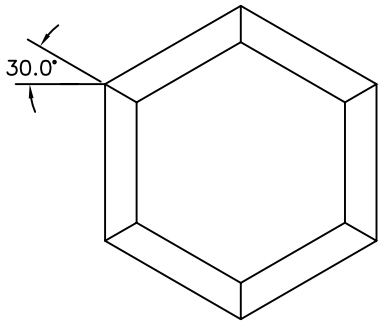
Octagonal – square



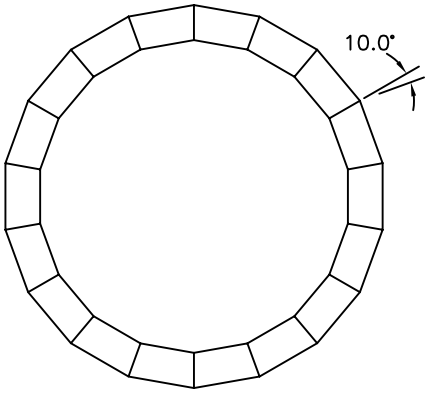
Hexagonal – square



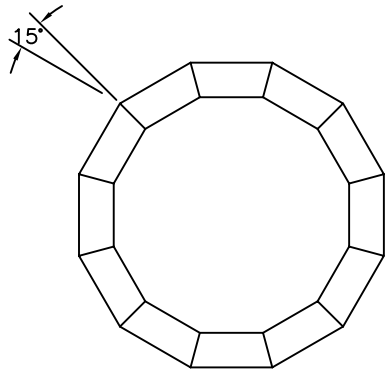
Octagonal



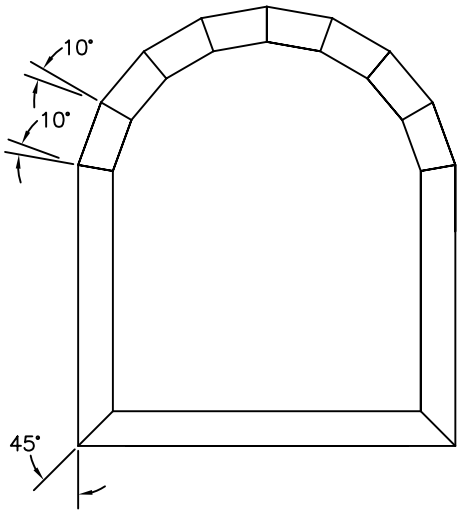
Hexagonal



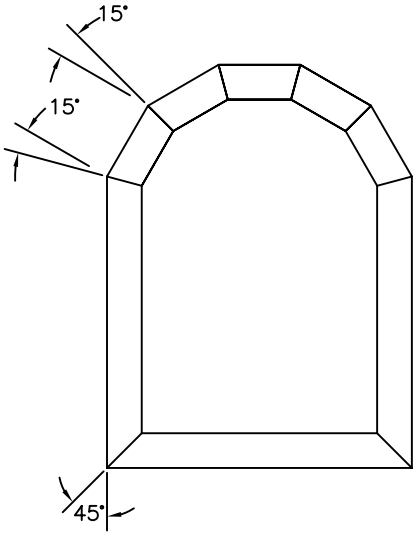
18 Sides



12 Sides

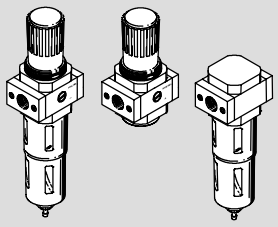


18 Sides – square



12 Sides – square

LFR/LR/LF/LFM/LFX-...-D-...



FESTO

Bedienungsanleitung
Operating instructions
Bruksanvisning

Original: de

0302g

Festo AG & Co. KG
Postfach
D-73726
Esslingen
Phone:
+49/711/347-0

395 823

Hinweis, Please Note, Notera

de Einbau und Inbetriebnahme nur von autorisiertem Fachpersonal, gemäß Bedienungsanleitung. Diese Produkte sind ausschließlich zur Verwendung mit Druckluft vorgesehen. Zur Verwendung mit anderen Medien (Flüssigkeiten oder Gasen) sind sie nicht geeignet.

en Fitting and commissioning to be carried out by qualified personnel only in accordance with the operating instructions. These products are specifically designed for compressed air use only. They are not suitable for use with any other fluid (liquid or gas).

sv Montering och idrifttagning får endast utföras av auktoriserad fackkunnig personal i enlighet med denna bruksanvisning. Dessa produkter är endast avsedda för användning med tryckluft. De lämpar sig ej för användning med andra medier (vätskor eller gaser).

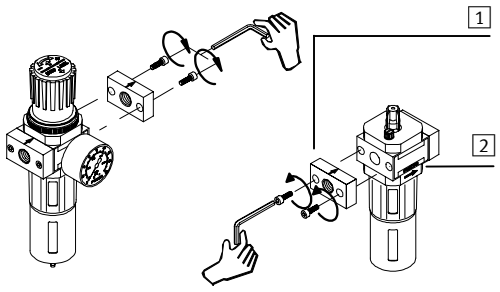


Bild 1 / Fig. 1

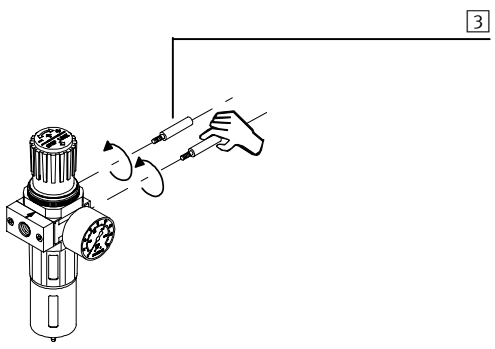


Bild 2 / Fig. 2

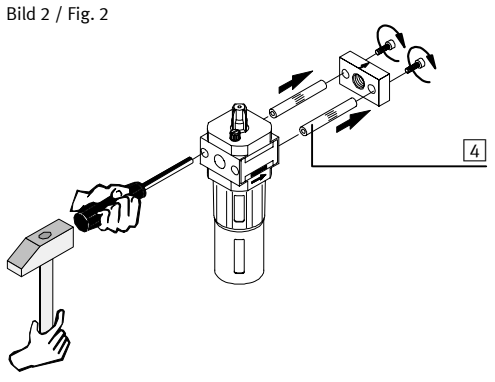


Bild 3 / Fig. 3

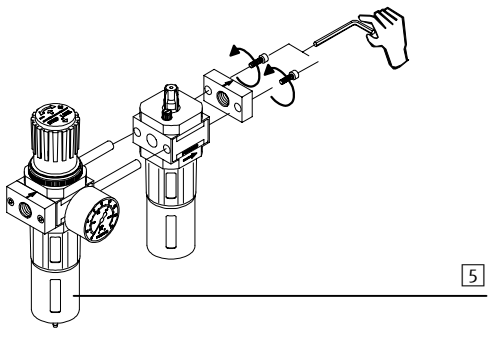


Bild 4 / Fig. 4

Filter-Regelventil, Druck-Regelventil, ...de
Filter, Fein-/Feinstfilter, Aktivkohlefilter
Typ LFR/LR/LF/LFM/LFX-...-D-...

1 Anwendung
Das L**R**/LF**R**-... regelt die zugeleitete Druckluft auf den eingestellten Arbeitsdruck und gleicht Druckschwankungen aus.
Das L**F**..-... mit Wasserabscheider befreit die Druckluft von Schmutzpartikeln und Kondenswasser.

2 Voraussetzungen für den Produkteinsatz
- Halten Sie die angegebenen Grenzwerte ein (z.B. für Drücke, Kräfte, Momente, Massen, Temperaturen).
- Berücksichtigen Sie die Umgebungsbedingungen am Einsatzort.
- Beachten Sie die Vorschriften der Berufsgenossenschaft, des Technischen Überwachungsvereins oder entsprechende nationale Bestimmungen.
- Belüften Sie Ihre Anlage insgesamt langsam. Dann treten keine unkontrollierten Bewegungen auf.
- Verwenden Sie das Produkt im Originalzustand ohne jegliche eigenmächtige Veränderung.

3 Einbau
- Verwenden Sie Absperrventile, um die Anlage für Montage und Wartung (z. B. Filterwechsel) drucklos zu schalten.
- Beachten Sie die Durchflussrichtung. Diese ist an den Hinweispfeilen [2] abzulesen.
- Berücksichtigen Sie genügend Platz unterhalb der Filterschale (min. 130 mm) für den Filterwechsel.
- Justieren Sie das L**F**..-... senkrecht (±5°).

Bei Einbau in die Rohrleitung:
- Drehen Sie die Rohrleitungen in die Anschlussflansche. Die Gewinde sind abzudichten.

Beim Zusammenbau von Fein- und Feinstfilter zu einer Filterkombination LFMBA-... :
- Beachten Sie die Reihenfolge der Feinstfilter in Durchflussrichtung. Der LFMB-Filter (1µm) muss dem LFMA-Filter (0,01µm) vorgeschaltet sein.

Beim Zusammenbau mit einem bereits vorhandenen Wartungsgerät der gleichen Baureihe (siehe Bild 1-4):
1. Anschlussflansche [1] (falls vorhanden) der beiden Geräte auf der Zusammenbauseite entfernen.
2. Gewindebolzen Typ FRB-D-... [3] (ggf. separat bestellen) in das Grundgerät drehen.
3. Anschlussflansch (falls vorhanden) am jeweiligen Anbaugerät entfernen und die zugehörigen Stehbolzen [4] austreiben (Austreibweg in Durchflussrichtung).
4. Anbaugerät mit Anschlussflansch montieren. Zwischen den Einzelgeräten, sowie dem Anschlussflansch muss jeweils eine Dichtung vorhanden sein.

Zum Einbau eines Manometers:
- Drehen Sie das Manometer in das vorhandene Anschlussgewinde. Die Manometerdichtung ist auf dem Manometer-Gewindeanschlusszapfen vormontiert. Der Alternativanschluss ist mit einer Verschluss-Schraube verschlossen. Setzen Sie gegebenenfalls die Verschluss-Schraube um (incl. Dichtung).
- Verschlauchen Sie die pneumatischen Anschlüsse.

4 Inbetriebnahme
Zur Einstellung des Reglers L**R**-..., LF**R**-...:
1. Ziehen Sie den Druck-Einstellknopf zur Entriegelung nach oben (vom Gehäuse weg).
2. Drehen Sie den Druck-Einstellknopf in Richtung "-" ganz zu.
3. Belüften Sie die Anlage langsam.
4. Drehen Sie den Druck-Einstellknopf in Richtung "+" bis der gewünschte Druck am Manometer angezeigt wird. Der Eingangsdruck muss mind. 1 bar größer sein als der Ausgangsdruck.
5. Drücken Sie den Druck-Einstellknopf nach unten (zum Gehäuse). Dadurch sichern Sie ihn gegen ungewolltes Verdrehen.

5 Wartung und Pflege
Bei Erreichen eines Kondensat-Pegels von ca. 10 mm unterhalb des Filterelements am manuellen Ablass:
- Drehen Sie die Ablass-Schraube gegen den Uhrzeigersinn (von unten gesehen) auf. Dadurch wird das Kondensat abgelassen.

Bei geringem Durchfluss trotz unveränderter Druckeinstellung (bei LF**X**-...-AC, Wechsel alle 1000 Betriebsstunden empfohlen):
- Wechseln Sie die Filterpatrone wie folgt:
  1. Anlage und Gerät entlüften.
  2. Drehen Sie den Filterteller [5] (bei LF**M**/LF**X**-...: die Filterpatrone) gegen den Uhrzeigersinn heraus.
  3. Einzelteile in umgekehrter Reihenfolge montieren (neue Filterpatrone nur am unteren Ende greifen).
  4. Wiederinbetriebnahme gemäß Kapitel ‚Inbetriebnahme'.

Zur Reinigung:
- Verwenden Sie ausschließlich:
  - Wasser oder Seifenlauge (max. +60 °C);
  - Waschbenzin (aromatenfrei).

6 Störungsbeseitigung

Störung	mögliche Ursache	Abhilfe
Keine Druckanzeige	Absperrventil geschlossen	Absperrventil öffnen
	Druck nicht eingestellt	Mit Druckeinstellknopf Druck einstellen
	Manometer defekt	Manometer austauschen
Geringer Durchfluss (bei Luftverbrauch bricht der Betriebsdruck zusammen)	Filterpatrone ist verschmutzt	Filterpatrone auswechseln
	Verengung zwischen Absperrventil und Wartungseinheit	Leitung kontrollieren
Druck steigt an über den eingestellten Betriebsdruck	Ventilteller am Dichtsitz defekt	Mit Beschreibung von Störung und Einsatzbedingungen zu Festo senden
Hörbares Abblasen am Einstellknopf	Ventilsitz beschädigt	
Hörbares Abblasen an der Ablassschraube	Ablassschraube undicht	Festdrehen oder erneuern

7 Technische Daten

Zul. Vordruck p1 max.	16 bar (ohne automatisches Ablassventil) 12 bar (mit automatischem Ablassventil)
p1 min	1,5 bar; 1 bar (nur bei L**R**-...-)
Zul. Arbeitsdruckbereich p2	0,5 ... max. 7 bar (bei LR-/LFR-...-**D7**-...) 0,5 bis 12 bar (bei LR-.../LFR-...-**D**-...)
Zul. Temperaturbereich	-10 °C ... +60 °C
Medium bei LF**M**..-...	+1,5 °C ... +60 °C
Medium bei LF**X**..-...	+1,5 °C ... +30 °C
Einbaulage	aufrecht stehend (± 5°); beliebig (nur L**R**-...)
Manometeranschluss	G1/8 (bei LR-/LFR-...**MINI**-...) G1/4 (bei LR-/LFR-...**MIDI**-/**MAXI**-...)
Filterfeinheit	40 µm (bei LF-/LFR-...-**D**-...); 5 µm (LF-/LFR-...-D-**5M**-...); 1 µm (bei LF**MB**-...-D-...); 0,01 µm (LF**MA**-/LF**MBA**-...-D-...)
Medium	Druckluft (- gefiltert mit Filterfeinheit:≤ 40 µm bei L**R**-... - ungeölt, gefiltert mit Filterfeinheit: ≤ 5 µm bei LFM**B**-... / ≤ 1 µm bei LFM**A**-... ≤ 0,01 µm bei LF**X**-...
Werkstoffe: Gehäuse: GD-Zn; Anschlussflansch: Al, GD-Zn; Schutzkorb: Al; Schale: PC (Macrolon); Innenteile: POM, PA; Drehknopf: PA; Filtermedium: PE (40 µm, 5 µm); Mikrofasergewebe (1 µm und 0,01 µm); Aktivkohle (LF**X**-...-AC); Dichtungen: NBR	

Filter regulator valve, pressure regulator, ... en
filter, fine/ultra-fine filter, active carbon filter
Type LF/LR/LFR/LFM/LFX-...-D-...

1 Application
The L**R**/LF**R**-... regulates the compressed air supplied to the set working pressure and compensates for fluctuations in pressure. The L**F**..-... with water separator cleans the compressed air of dirt particles and condensed water.

2 Conditions of use
- Observe the specified maximum values (e.g. for pressures, forces, torques, masses, temperatures).
- Take into account the prevailing ambient conditions.
- Observe national and local technical regulations.
- Slowly pressurize your complete system. This will prevent sudden uncontrolled movements.
- Always use the product in its original state. Unauthorized modifications are not permitted.

3 Fitting
- Use shut-off valves for making the system pressureless for fitting and maintenance(e.g. when changing the filter).
- Note the direction of flow. This can be seen on the arrows [2].
- Leave sufficient space below the filter bowl (min. 130 mm) for changing the filter.
- Adjust the L**F**..-... vertically (±5°).

Fitted in the fixed tubing:
- Screw the tubing into the connecting flanges. The threads must be sealed.

In combining fine and ultra-fine filters to form an LFMBA-... filter combination.
- Please observe the sequence of the ultra-fine filters in the direction of flow. The LFMB filter (1µm) must be in front of the LFMA filter (0,01µm).

Fitted together with another maintenance unit of the same type (see Fig. 1-4):
1. Remove the connecting flanges [1] (if available) from the sides of the devices which are to be fitted together.
2. Screw a threaded bolt of type FRB-D-... [3] (if necessary order separately) into the central unit.
3. Remove connecting flange (if available) from the additional unit and extract the spacer bolt [4] (extract path in the direction of flow).
4. Fit the additional unit with a connecting flange. Remember to insert seals between the individual units and the connecting flange.

Fitting the manometer:
- Screw the manometer into the existing threaded connector. The manometer seal is already fitted onto the threaded connector pin of the manometer. The alternative connection is closed with a blind plug. If necessary, replace the blind plug (incl. seal).
- Connect the tubing to the pneumatic connections.

4 Commissioning
Adjusting the regulator L**R**-..., LF**R**-...:
1. Pull the pressure setting button upwards to unlock it (away from the housing).
2. Turn the pressure setting button in the direction "-" as far as possible.
3. Slowly pressurize the complete system.
4. Turn the pressure setting button in the direction "+" until the desired pressure is shown on the manometer. The input pressure must be at least 1 bar greater than the output pressure.
5. Press the pressure setting button downwards (towards the housing) to secure it against unintentional turning.

5 Care and maintenance
If a condensate level of approx. 10 mm below the filter element is reached:
- Open the bleeder screw by turning it in an anti-clockwise direction (see from below). The condensate can then flow out.

With a small flow in spite of the same pressure setting (with LF**X**-...-AC we recommend replacement after every 1000 operating hours):
- Replace the filter element as follows:
  1. Exhaust the system and the regulator.
  2. Turn the filter bowl [5] (with LF**M**/LF**X**-...: the filter element) in an anti-clockwise direction.
  3. Refit the individual parts (hold the new filter element only at the lower end).
  4. Commission again in accordance with the chapter "Commissioning."
- Use only the cleaning agents specified for cleaning:
  - water or soap suds (max. +60 °C);
  - petroleum ether (free of aromatic compounds).

6 Eliminating faults

Fault	Possible cause	Remedy
No pressure display	Shut-off valve closed	Open shut-off valve
	Pressure not set	Set pressure with pressure adjusting knob
	Manometer defective	Replace manometer
Small flow (with air consumption operating pressure breaks down)	Filter element is dirty	Replace filter element
	Restriction between shut-off valve and service unit	Check tubing
Pressure rises above the set operating pressure	Valve disc on sealing seat defective	Return to Festo with description of fault and conditions of application
Blowing can be heard at the adjusting knob	Valve seating damaged	
Blowing can be heard at the outlet screw	Outlet screw leaks	Tighten or replace

7 Technical specifications

Perm. primary pressure	16 bar (without autom. condensate bleeder)
p1 max.	12 bar (with automatic condensate bleeder)
p1 min	1.5 bar; 1 bar (only L**R**-...)
Max. working pressure Range p2	0.5 ... 7 bar (at LR-/LFR-...-**D7**-...) 0.5 ... 12 bar (at LR-.../LFR-...-**D**-...)
Perm. temperature range	-10° C ... +60° C Medium with LF**M**..-... +1.5° C ... +60° C Medium with LF**X**..-... +1.5° C ... +30° C
Fitting position	standing upright (±5°); any (only L**R**-...)
Manometer connection	G1/8 (at LR-/LFR-...**MINI**-...) G1/4 (at LR-/LFR-...**MIDI**-/**MAXI**-...)
Filter fineness	40 µm (at LR-/LFR-...-**D**-...); 5 µm (at LR-/LFR-...-D-**5M**-...); 1 µm (at LF**MB**-...-D-...); 0,01 µm (at LF**MA**-/LF**MBA**-...-D-...)
Medium	compressed air - filtered with filter fineness ≤ 40 µm at L**R**-... - non-lubricated filtered with filter fineness: ≤ 5 µm at LFM**B**-... / ≤ 1 µm at LFM**A**-... ≤ 0,01 µm at LF**X**-...
Materials Housing: GD-Zn; Connection flange: Al, GD-Zn; Protect. cover: Al; Bowl: PC (macrolone); Internal parts: POM, PA; Pressure adjusting knob: PA; Filter medium: PE (40 µm, 5µm); Micro fibre fabric (1 µm und 0,01 µm); Active carbon (LF**X**-...-AC); Seals: NBR	

Filterreglerventil, tryckregulatorventil, ... sv
filter, mikrofilter, aktiv kolfilter
Typ LF/LR/LFR/LFM/LFX-...-D-...

1 Applikation
L**R**/LF**R**-... reglerar den tillförda tryckluften till inställt rbetstryck och utjämnar tryckvariationer.
L**F**..-... med vattenavskiljare befriar tryckluften från smutspartiklar och kondens.

2 Förutsättningar för korrekt användning av produkten
Dessa allmänna anvisningar skall alltid beaktas för korrekt och säker användning av produkten:
- Upprätthåll angivna gränsvärden för tryck, krafter, moment, massor, temperaturer.
- Ta hänsyn till rådande arbetsförhållanden.
- Beakta de lokala och nationella skyddsföreskrifterna.
- Pålufta hela anläggningen långsamt. Då uppträder inga okontrollerade rörelser.
- Använd produkten i originalskick utan egna modifieringar.

3 Montering
- Använd avstängningsventiler för att koppla anläggningen trycklös inför montering och underhåll (t ex filterbyte).
- Beakta flödesriktningen. Den framgår av pilarna [2].
- Ta hänsyn till utrymmesbehovet under filterskålen (min 130 mm) vid filterbyte.
- Justera L**F**..-... i lodrätt läge (±5°).

Montering i fast rörledning:
- Skruva fast rören i anslutningsflänsarna. Denna anslutning skall tätas.

Vid kombination av två fin- och mikrofilter till en filterkombination LFMBA-...:
- Beakta filtrens ordningsföljd i flödesriktningen. LFMB-filtret (1µm) skall monteras före LFMA-filtret (0,01µm).

Montering tillsammans med annan underhållsenhet av samma typ (se Bild 1-4):
1. Avlägsna båda anslutningsflänsarna [1] (om förefintlig) på de sidor som skall monteras mot varandra.
2. Skruva fast bulten FRB-D-... [3] i centralenheten (eventuellt beställs separat).
3. Avlägsna anslutningsflänsen (om förefintlig) från underhållsenheten och dra ut de distansbulten [4] (kort utdrag i flödesriktningen).
4. Montera underhållsenheten med en anslutningsfläns. Mellan de enskilda enheterna och anslutningflänsen skall alltid finnas en packning.

Montering av manometern:
- Skruva in manometern i den befintliga anslutningsgängan. Manometertätningen är förmonterad på manometerns gänganslutning. Altternativanslutningen är försluten med en blindpropp. Sätt vid behov i blindproppen (inkl. packning).
- Ansluta pneumatikslangarna.

4. Idrifttagning
Inställning av regulator L**R**-..., LF**R**-...:
1. Dra upp tryckinställningsratten för att låsa upp den (bort från höljet).
2. Vrid tryckinställningsratten till "-"
3. Pålufta hela anläggningen långsamt.
4. Vrid tryckinställningsratten mot "+", tills önskat tryck visas på manometern. Ingångstrycket måste vara minst 1 bar högre än utgångstrycket.
5. Tryck ned inställningsratten (mot höljet). Därigenom säkras den mot oavsiktlig justering.

5 Underhåll och skötsel
När en nivå på ca 10 mm under filtertallriken har uppnåtts:
- Öppna avtappningsskruven genom att vrida den moturs (sett underifrån). Nu tappas kondensatet av.

Vid låg genomströmning trots oförändrad tryckinställning (för LFX-...-AC, vi rekommenderar byte efter var 1000:e driftstimme):
- Byt ut filterpatronen enligt följande:
  1. Avlufta systemet och enheten.
  2. Vrid filterskålen [5] (för LF**M**/LF**X**-...: filterpatronen) moturs.
  3. Montera de enskilda komponenterna i omvänd ordningsföljd (greppa den nya filterpatronen endast nedtill).
  4. Upprepad idrifttagning enligt kapitel "Idrifttagning."

För rengöring:
- Använd endast nedan angivna rengöringsmedel:
  - vatten eller tvållösning (max +60 °C);
  - tvättbensin (aromatfri).

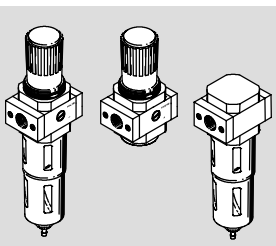
6 Åtgärdande av störningar

Fel	Möjlig orsak	Åtgärd
Inget tryck anges	Avstängningsventil stängd	Öppna avstängningsventil
	Tryck ej inställt	Ställ in trycket med tryckinställnings-ratten
	Manometer defekt	Byt manometer
Låg genomströmning (vid luftförbrukning rasar arbetstrycket)	Filterpatron är smutsig	Byt filterpatron
	Strypning mellan avstängningsventil och serviceenhet	Kontrollera ledning
Trycket stiger över det inställda arbetstrycket	Ventilplatta på tätningssäte defekt	Skicka till Festo med beskrivning av fel och användnings-villkor
Avblåsning hörs på inställningsratt	Ventilsäte skadat	
Avblåsning hörs på avtappningsskruv	Avtappningsskruv ej tät	Dra åt eller ersätt avtappningsskruv

7 Tekniska data

Tillåtet primärtryck	16 bar (utan aut. kondensatavtappning)
p1 max	12 bar (med aut. kondensatavtappning)
p1 min	1,5 bar; 1 bar (endast L**R**-...)
Max arbetstryck-intervall p2	0,5 till 7 bar (för LR-/LFR-...-**D7**-...) 0,5 till 12 bar (för LR-.../LFR-...-**D**-...)
Till. temperaturintervall	-10° C ... +60° C (lagring, medium, omgivning) +1,5° C ... +60° C (lufttemperatur med LF**M**..-...) +1,5° C ... +30° C (lufttemperatur med LF**X**..-...)
Monteringsläge	Upprätt (±5°); Valfritt (endast L**R**-...)
Manometer-anslutning	G1/8 (för LR-/LFR-...**MINI**-...) G1/4 (för LR-/LFR-...**MIDI**-/**MAXI**-...)
Filterfinlek	40 µm (för LR-/LFR-...-**D**-...); 5 µm (för LR-/LFR-...-D-**5M**-...); 1 µm (för LF**MB**-...-D-...); 0,01 µm (för LF**MA**-/LF**MBA**-...-D-...)
Medium	Tryckluft - filtrerad, filterfinlek ≤ 40 µm på L**R**-... - dimsmord eller filtrerad med filterfinlek: ≤ 5 µm på LFM**B**-... / ≤ 1 µm på LFM**A**-... ≤ 0,01 µm på LF**X**-...
Material: hus: GD-Zn; anslutningsfläns: Al, GD-Zn; skyddskorg: Al; Skal: PC (makrolon); inre detaljer: POM, PA; vridknapp: PA; filterpatron: PE (40 µm, 5 µm), mikrofiberväv (1 µm och 0,01 µm); Aktiv kol (LF**X**-...-AC); tätningar: NBR	

LFR/LR/LF/LFM/LFX-...-D-...



FESTO

Instrucciones de funcionamiento
Notice d'utilisation
Istruzioni per l'uso

Original: de

Festo AG & Co. KG
Postfach
D-73726
Esslingen
Phone:
+49/711/347-0

0302g

395 823

Por favor, observar, Note, Nota

es El montaje y puesta a punto sólo debe ser realizado por personal cualificado y según las instrucciones de funcionamiento. Estos productos están específicamente diseñados sólo para aire comprimido. Es inadecuado utilizar cualquier otro fluido (líquido o gas).

fr Montage et mise en service uniquement par du personnel agréé, conformément aux instructions d'utilisation. Ces produits sont conçus pour être exclusivement utilisés avec de l'air comprimé. Ils ne se prêtent pas aux applications avec d'autres fluides tels que les liquides ou les gaz.

it Montaggio e messa in funzione devono essere effettuati da personale qualificato e autorizzato, in conformità alle istruzioni per l'uso. Questi prodotti devono essere alimentati esclusivamente con aria compressa. Se ne sconsiglia l'impiego con altri fluidi (liquidi o gas).

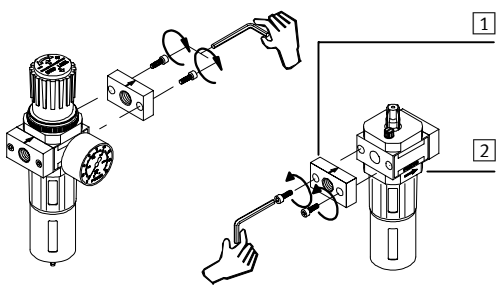


Fig. 1

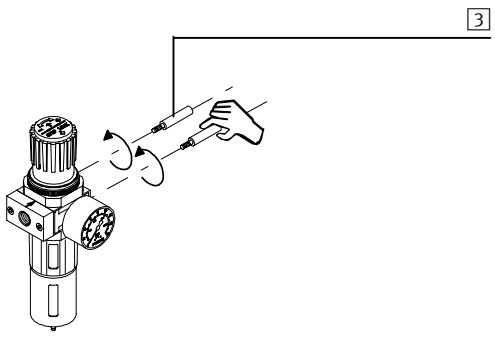


Fig. 2

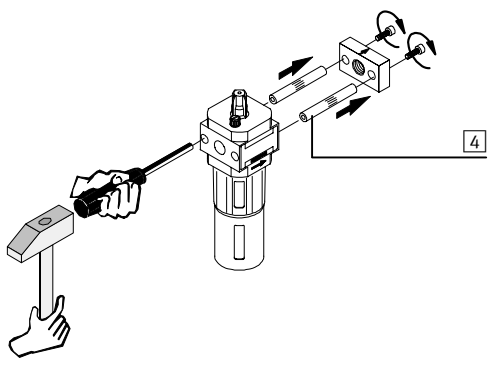


Fig. 3

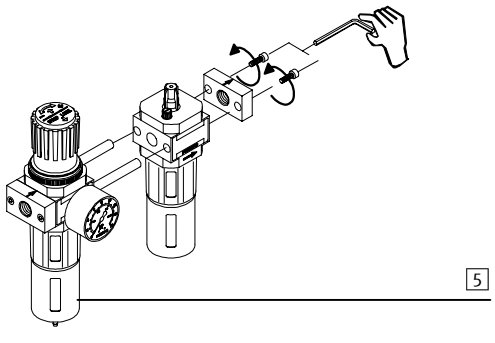


Fig. 4

Válvula reguladora con filtro, regulador de presión, , ...es filtro, filtro de carbón activo
Tipo LFR/LR/LF/LFM/LFX-...-D-...

1 Aplicación
El filtro regulador L**R**/LF**R**-... regula el aire hasta que se alcanza la presión de funcionamiento y compensa las fluctuaciones de la presión de entrada.
El L**F**..-... con separador de agua, extrae del aire a presión las partículas de suciedad y el condensado.

2 Condiciones de uso
Para un correcto y seguro uso del producto, deben respetarse en todo momento estas instrucciones:
- Observar los valores límite de presiones, fuerzas, pares, masas y temperaturas.
- Observar las condiciones ambientales imperantes.
- Respetar las normas y regulaciones oficiales nacionales y locales.
- Aplicar la presión al sistema lentamente. Esto evita movimientos bruscos e incontrolados.
- No se permiten modificaciones no autorizadas del producto.

3 Montaje
- Utilizar válvulas de cierre para descargar el aire del sistema durante el mantenimiento (p. ej. al cambiar el filtro).
- Observar el sentido del caudal indicado por las flechas [2].
- Dejar espacio suficiente debajo del filtro (mínimo 130 mm) para poder reemplazar el elemento filtrante.
- Montar siempre el L**F**..-... en posición vertical (±5°).

Montaje en tuberías fijas:
- Enroscar el tubo en las bridas de conexión. Las roscas deben estanqueizarse.

Al combinar dos filtros en la combinación LFMBA-...:
- Observar el orden de filtrado en el sentido del flujo. El filtro LFMB (1 µm) debe hallarse antes que el filtro LFMA (0,01 µm)

Montaje con unidades de mantenimiento existentes de la misma serie (véase fig. 1-4):
1. Sacar ambas bridas de conexión [1] (si existe) en los lados a unir.
2. Enroscar los pernos roscados [3] (tipo FRB-D-...) en la unidad central (eventualmente pedirlos por separado).
3. Sacar la brida de conexión (si existe) en la correspondiente unidad central y eliminar los pernos distanciadores [4] respectivos (lado extractor en sentido del flujo).
4. Montar la unidad adicional con una brida de conexión. No olvidarse de insertar juntas entre las unidades individuales y la brida de conexión.

Montaje del manómetro:
- Situar el manómetro en la conexión roscada existente. La junta del manómetro ja está montada en la parte roscada del manómetro. La conexión alternativa está cerrada con un tapón ciego. Si es necesario, sustituir el tapón ciego (incluida la junta).
- Apretar el manómetro y, si es necesario, el tapón ciego.

4 Puesta a punto
Ajuste del regulador L**R**-..., LF**R**-...
1. Tirar hacia arriba del pomo de ajuste del regulador para desbloquearlo (alejándolo del cuerpo).
2. Girar el pomo en el sentido "-" al máximo posible.
3. Aplicar presión lentamente al sistema.
4. Girar el pomo en el sentido "+" hasta que el manómetro indique la presión deseada. La presión de entrada debe ser por lo menos 1 bar superior a la presión de salida.
5. Empujar el pomo de ajuste de presión hacia abajo (hacia el cuerpo). Esto evitará que el pomo gire involuntariamente.

5 Cuidados y mantenimiento
Cuando se alcance un nivel de condensado de unos 10 mm por debajo del elemento filtrante:
- Abrir el tornillo de purga girándolo en sentido antihorario (visto desde abajo). Se descarga el condensado.

Si disminuye el caudal a pesar de haber el mismo ajuste de la presión (con LF**X**-...-AC recomendamos la sustitución cada 1000 horas de funcionamiento):
- Reemplace el elemento filtrante como sigue:
  1. Descargue de aire el sistema y el regulador.
  2. Gire el vaso del filtro [5] (con LF**M**/LF**X**-...: el elemento filtrante) en sentido antihorario.
  3. Vuelva a montar las piezas (sujete el nuevo filtro sólo por su extremo inferior).
  4. Poner a punto nuevamente según el capítulo "Puesta a punto".

Limpieza
- Usar sólo los agentes de limpieza especificados:
  - agua jabonosa (máx. +60 °C):
  - éter de petróleo (libre de compuestos aromáticos).

6 Eliminación de fallos

Fallo	Causa posible	Solución
No se indica presión	Válvula de cierre cerrada	Abrir la válvula de cierre
	Presión no ajustada	Ajustar la presión con el pomo
	Manómetro defectuoso	Reemplazar el manómetro
Bajo caudal (con el consumo de aire, la presión disminuye)	Elemento filtrante sucio	Susituir el elemento filtrante
	Restricción entre la válvula de cierre y la unidad de mantenimiento	Comprobar los tubos
La presión se eleva por encima de la ajustada	Disco de asiento de la válvula defectuoso	Devolver a Festo con descripción del fallo y las condiciones de la aplicación.
Pueden oírse fugas de aire en el pomo de ajuste	Asiento de la válvula dañado	
Pueden oírse fugas de aire en el tornillo de salida	El tornillo de salida tiene fugas	Apretarlo o reemplazarlo

7 Especificaciones técnicas

Presión de entrada p1 max.	16 bar (sin purga automática de condensados) 12 bar (con purga automática de condensados)
p1 min	min. p1 1,5 bar; 1 bar (sólo L**R**-...)
Margen de presión de trabajo máx. p2	de 0,5 a 7 bar (con LR-/LFR-...-**D7**-...) de 0,5 a 12 bar (con LR-.../LFR-...-**D**-...)
Margen de temperaturas:	-10° C ... +60° C (Almacenaje, fluído, ambiente) +1,5° C ... +60° C (Temp. del fluído con LF**M**..-...) +1,5° C ... +30° C (Temp. del fluído con LF**X**..-...)
Posición de montaje	Vertical (± 5°); indiferente (sólo LR-...)
Conexiones del manómetro	G1/8 (en LR-/LFR-...**MINI**-...) G1/4 (en LR-/LFR-...**MIDI**-/**MAXI**-...)
Finura del filtro	40 µm (con LF-/LFR-...-**D**-...); 5 µm (LF-/LFR-...-D-**5M**-...); 1 µm (con LF**MB**-...-D-...); 0,01 µm (LF**MA**-/LF**MBA**-...-D-...)
Fluido	Aire comprimido: - filtrado a finura de ≤ 40 µm con L**R**-... - no lubricado, filtrado a finura de ≤ 5 µm con LFM**B**-.../≤ 1 µm con LFM**A**-.../ ≤ 0,01 µm con LF**X**-...
Materiales: Cuerpo: GD-Zn; brida de conexión: Al, GD-Zn; protección: Al; vaso: PC (macrolone); piezas internas: POM, PA; pomo de ajuste de la presión: PA ; medio del filtro: PE (40 µm, 5 µm), microfibres (1 µm y 0,01 µm); carbón activo (LF**X**-...-AC); juntas: NBR	

Régulateur à filtre, régulateur à air comprimé, ...fr filtre, filtre à charbon actif
Type LFR/LR/LF/LFM/LFX-...-D-...

1 Application
Le L**R**/LF**R**-... régule la circulation d'air comprimé pour une pression de travail présélectionnée et compense les fluctuations de pression.
Le L**F**..-... avec séparateur d'eau élimine les particules de poussière et l'eau de condensation.

2 Conditions de mise en œuvre du produit
Remarques dont il convient de tenir compte en permanence, pour garantir un fonctionnement correct et en toute sécurité de ce produit:
- Respectez les valeurs limites (p. ex. pressions, forces, couples, masses, températures).
- Tenez compte de l'environnement de mise en oeuvre.
- Observez les prescriptions des organismes professionnels, des services de contrôle technique ou les réglementations nationales en vigueur.
- Mettez votre installation en pression progressivement. Vous éviterez ainsi tout mouvement incontrôlé.
- N'apportez aucune modification sans autorisation préalable.

3 Montage
- Utilisez une vanne d'isolement pour mettre l'installation hors pression lors du montage ou de l'entretien (changement de filtre par exemple).
- Respectez le sens d'écoulement indiqué par la flèche [2].
- Prévoyez la place nécessaire en dessous de la cuve du filtre (au moins 130 mm) pour le remplacement du filtre.
- Positionnez le L**F**..-... à la verticale (±5°).

Montage sur une conduite :
- Vissez les conduites sur les plaques de raccordement. Assurez l'étanchéité à leur niveau.

En cas d'assemblage de deux filtres fins de finesses différentes en une combinaison de filtrage LFMBA-...:
- Pensez au positionnement des filtres dans le sens de l'écoulement. Le filtre LFMB (1 µm) doit être placé en amont du filtre LFMA (0,01 µm).

En cas d'assemblage sur une unité de conditionnement d'air de même type, déjà en service (voir fig. 1-4):
1. Enlevez les deux plaques de raccordement [1] (si présent) sur les faces à assembler.
2. Vissez les goujons filetés [3] (type FRB-D-...) sur l'unité centrale (le cas échéant à commander séparément).
3. Enlevez la plaque de raccordement (si présent) de l'unité d'extension et chasser les goujons [4] (les extraire dans le sens de l'écoulement).
4. Installez l'unité d'extension avec les plaques de raccordement. Insérez un joint d'étanchéité entre chaque appareil ainsi qu'au niveau des plaques.

Montage du manomètre:
- Mettez en place le manomètre sur la sortie filetée de raccordement. Le joint du manomètre est prémonté sur le tourillon de raccordement fileté. L'autre branchement reste obturé par un bouchon. Permutez si nécessaire la position du bouchon (y compris le joint d'étan.).
- Resserrez le manomètre et éventuellement le manomètre.

4 Mise en service
Réglage du régulateur L**R**-..., LF**R**-... :
1. Tirer le bouton de réglage de la pression vers le haut pour déverrouiller le système (dans le sens opposé du boîtier).
2. Tourner le bouton de réglage de la pression à fond vers «-».
3. Mettre l'installation lentement sous pression.
4. Tourner le bouton de réglage de la pression vers «+» jusqu'à atteindre la pression souhaitée. La pression d'entrée doit être supérieure à celle de sortie d'au moins 1 bar.
5. Pousser le bouton de réglage vers le bas (vers le corps) pour le bloquer en rotation.

5 Maintenance et entretien
Lorsque le niveau se trouve env. 10 mm en dessous du filtre:
- Ouvrez la vis de purge en la tournant dans le sens antihoraire (vu de dessous). Laissez s'écouler le condensat.

Si l'écoulement se réduit alors que le réglage de la pression reste inchangé (pour LF**X**-...-AC, remplacement recommandé après 1000 heures de service):
- Remplacez la cartouche filtrante.

1. Purgez l'installation et l'appareil.
2. Tourner la coque du filtre [5] (pour LF**M**/LF**X**-... :la cartouche filtrante) dans le sens inverse des aiguilles d'une montre.
3. Monter les différentes pièces dans l'ordre inverse (ne saisir la cartouche filtrante que par le dessous).
4. Procéder à la remise en service conformément au chapitre Mise en service.

Pour le nettoyage:
- Utiliser uniquement les produits de nettoyage indiqués:
  - eau ou eau savonneuse (+60 °C max.);
  - ligroïne (non aromatique).

6 Dépannage

Panne	Cause possible	Solution
Pas d'affichage de pression	Soupape d'arrêt fermée	Ouvrir la soupape d'arrêt
	Pression non définie	Régler la pression à l'aide du bouton de réglage de la pression
	Manomètre défectueux	Remplacer le manomètre
Flux faible (lors de la consommation d'air, la pression de service baisse considérablement)	Cartouche filtrante encrassée	Remplacer la cartouche filtrante
	Etranglement entre la soupape d'arrêt et l'unité d'entretien	Contrôler la conduite
La pression augmente et dépasse la pression de service définie	Tête de distributeur défectueuse au niveau du siège du joint	Envoyer une description de la panne et des conditions d'utilisation à Festo
De l'air s'échappe bruyamment au niveau du bouton de réglage	Siège du distributeur endommagé	
De l'air s'échappe bruyamment au niveau de la vis de décharge	Vis de décharge pas étanche	Visser à fond ou remplacer

7 Caractéristiques techniques

Pression d'alim. adm. max. p1	16 bar (sans vanne de purge automatique) 12 bar (avec vanne de purge automatique)
p1 min	1,5 bar; 1 bar (uniquement pour le L**R**-...)
Plage de pression de travail adm. P2	0,5 à 7 bar (pour LR-.../LFR-...-**D7**-...) 0,5 à 12 bar (pour LR-.../LFR-...-**D**-...)
Plage de température adm.	-10° C ... +60° C (stockage, fluides, environnement) +1,5° C ... +60° C (temp. du fluide du LF**M**..-...) +1,5° C ... +30° C (temp. du fluide du LF**X**..-...)
Pos. de montage	verticale (± 5°); indifférente (uniquement LR-...)
Raccord du manomètre	G1/8 (pour LR-/LFR-...**MINI**-...) G1/4 (pour LR-/LFR-...**MIDI**-/**MAXI**-...)
Finesse de filtre	40 µm (pour LR-/LFR-...-**D**-...); 5 µm (LR-/LFR-...-D-**5M**-...); 1 µm (pour LF**MB**-...); 0,01 µm (LF**MA**-/LF**MBA**-...)
Fluide	Air comprimé - filtré avec une filtre ≤ 40 µm pour L**R**-... - exempt d'huile , filtré avec une filtre ≤ 5 µm pour LFM**B**-.../≤ 1 µm pour LFM**A**-.../ ≤ 0,01 µm sur LF**X**-...
Matériaux : Boîtier : GD-Zn ; flasque de raccordement: Al, GD-Zn; panier de protection : Al ; coque: PC (Makrolon); pièces intérieures: POM, PA; bouton de réglage de la pression: PA ; filtre: PE(40 µm, 5 µm), microfibres (1 µm et 0,01 µm); charbon actif (LF**X**-...-AC); joints: NBR	

Filtro-riduttore, riduttore di pressione, ...it filtro, filtro al carbone attivo
Tipo LFR/LR/LF/LFM/LFX-...-D-...

1 Applicazione
L' L**R**/LF**R**-... regola l'aria compressa in entrata in base alla pressione di lavoro impostata e compensa le variazioni di pressione.
L' L**F**..-... con separatore d'acqua libera l'aria compressa da particelle di sporcizia e condensa.

2 Condizioni di utilizzo
Indicazioni generali da osservare sempre per l'impiego regolamentare e sicuro del prodotto:
- Rispettare i valori limite ammessi (ad esempio per pressioni, forze, momenti, masse, temperature).
- Tenere in considerazione le condizioni ambientali prevalenti.
- Rispettare le norme dell'associa-zione di categoria, del TV o even-tuali regolamenti nazionali corrispondenti.
- Pressurizzare tutto l'impianto lentamente. In questo modo si evita che si verifichino movimenti incontrollati;
- Utilizzare il prodotto senza apportare alcuna variazione arbitraria.

3 Montaggio
- Per il montaggio e la manutenzione (ad es. sostituzione del filtro) utilizzare valvole di intercettazione per scaricare pressione dall'impianto.
- Prestare attenzione alla direzione del flusso indicata dalla freccia [2].
- Lasciare uno spazio sufficiente al di sotto della coppa del filtro (min. 130 mm) per la sostituzione del filtro.
- Regolare l' L**F**-... in posizione verticale (±5°).

Montaggio sul tubo:
- Avvitare le tubazioni alla flangia di collegamento e chiuderle a tenuta.

Dovendo riunire filtri a maglie strette e microfiltri per formare una batteria di filtri LFMBA-...:
- Rispettare l'ordine dei microfiltri in direzione del flusso. Il filtro LFMB (1 µm) deve essere inserito a monte del filtro LFMA (0,01 µm).

Montaggio insieme ad un altro dispositivo per la manutenzione della stessa serie già presente (vedere fig. 1-4):
1. Estrarre entrambe le flange [1] (se presenti) di collegamento sul lato adiacente.
2. Girare le viti [3] (tipo FRB-D-...) nel dispositivo centrale (eventualmente da ordinare separatamente).
3. Estrarre la flangia (se presente) dal rispettivo dispositivo da inserire e smontare i tiranti a vite [4] relativi (espulsione in direzione del flusso).
4. Montare l'accessorio con flangia di raccordo. Fra i singoli accessori e la flangia di raccordo deve sempre essere presente una guarnizione.

Montaggio del manometro:
- Collocare il manometro nella filettatura di raccordo presente. La guarnizione per il montaggio del manometro è già inserita nel perno filettato di collegamento del medesimo. Il raccordo alternativo è chiuso con una vite di chiusura. Trasferire eventualmente la vite di chiusura (compresa la guarnizione).
- Ruotare fino a serrare il manometro ed eventualmente la vite di chiusura.

4 Messa in servizio
Taratura dei riduttori tipo L**R**-..., LF**R**-...
1. Sbloccare la manopola di taratura della pressione tirandola verso l'alto, ossia in direzione opposta al corpo del riduttore.
2. Registrare la manopola ruotandola verso "-".
3. Alimentare gradualmente l'impianto.
4. Registrare la manopola verso "+", finché il manometro indica la pressione desiderata. La pressione di ingresso deve essere superiore di almeno 1 bar rispetto alla pressione di uscita.
5. Premere verso il basso la manopola di taratura della pressione in direzione del riduttore. In tal modo si impedisce qualsiasi tentativo di manomissione.

5 Cura e manutenzione
Quando si raggiunge un livello di circa 10 mm sotto il filtro:
- Aprire la vite di scarico ruotandol in senso antiorario (vista dal basso). Si scarica la condensa.

In caso di scarsa portata nonostante che l'impostazione della pressione non sia stata variata (con LF**X**-...-AC, sostituzione raccomandata ogni 1000 ore di funzionamiento):
- Sostituire la cartuccia del filtro.
  1. Scaricare la pressione dall'impianto e dal gruppo.
  2. Ruotare la tazza del filtro [5] (con LF**M**/LF**X**-...: la cartuccia) in senso antiorario.
  3. Per il riassemblaggio dei componenti procedere in ordine inverso (afferrare la cartuccia nuova solamente nella parte inferiore).
  4. Ripristinare il funzionamento del gruppo seguendo le istruzioni riportate al Cap. 'Messa in servizio'.

Pulizia: Utilizzare esclusivamente i detergenti indicati:
- acqua o acqua saponata (max. +60 °C);
- benzina solvente (non contenente composti aromatici).

6 Eliminazione dei guasti

Guasto	Possibili cause	Rimedio
Il manometro non indica nessuna pressione	Valvola di inter-cettazione chiusa	Aprire la valvola di intercettazione.
	Riduttore non tarato	Registrare la press con l'apposita manopola.
	Manometro difettoso	Sostituire il manometro.
Portata ridotta (all'attivazione delle utenze pneumatiche, si verifica il crollo della pressione di esercizio)	Cartuccia filtrante imbrattata	Sostituire la cartuccia filtrante.
	Strozzatura tra la valvola di intercet-tazione e il gruppo di trattamento aria	Controllare il tubo pneumatico di collegamento.
La pressione sale oltre il valore impostato per la pressione di esercizio	Cono della sede di tenuta della valvola difettoso	Spedire il particolare a Festo, accludendovi una descrizione scritta del guasto e delle condizioni di impiego.
Fuoriuscita di aria udibile nella manopola di taratura della pressione	Sede della valvola danneggiata	
Fuoriuscita di aria udibile nella vite di scarico	Problemi di tenuta della vite di scarico	Stringere la vite o sostituirla.

7 Dati tecnici

Pressione all'entrata max. p1	16 bar (senza valvola di scarico automatico) 12 bar (con valvola di scarico automatico)
p1 min	1,5 bar; 1 bar (solo L**R**-...)
Max. range di pressione di lavoro amm. p2	da 0,5 a 7 bar (con LR-/LFR-...-**D7**-...) da 0,5 a 12 bar (con LR-.../LFR-...-**D**-...)
Intervallo di temperatura ammissibile	da -10° C ... a +60° C (immagazzinaggio, mezzo ambiente) // Da +1,5° C ... a +60° C (temp. del mezzo con LF**M**..-...) // Da +1,5° C ... a +30° C (temp. del mezzo con LF**X**..-...)
Posizione di montaggio	fissa verticale (± 5°); qualsiasi (solo LR-...)
Attacco manometro	G1/8 (con LR-/LFR-...**MINI**-...) G1/4 (con LR-/LFR-...**MIDI**-/**MAXI**-...)
Finezza filtro	40 µm (con LF-/LFR-...-**D**-...); 5 µm (LF-/LFR-...-D-**5M**-...); 1 µm(con LF**MB**-...-D-...); 0,01 µm (LF**MA**-/LF**MBA**-...-D-...)
Fluido	aria compressa, - filtrata per finezza filtro ≤ 40 µm per L**R**-... - non lubrificata, filtrata per finezza filtro: ≤ 5 µm per LFM**B**-.../≤ 1 µm per LFM**A**-.../ ≤ 0,01 µm per LF**X**-...
Materiali: corpo: GD-Zn; flangia di collegamento: Al, GD-Zn; protezzione metallic: Al: tazza: PC (Makrolon); particolari interni: POM, PA; manopola tar. press.: PA ; materiale filtrante: PE (40 µm, 5 µm), tessuto di silicato di boro (1 µm e 0,01 µm); carbone attivo (LF**X**-...-AC); guarnizioni: NBR	

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