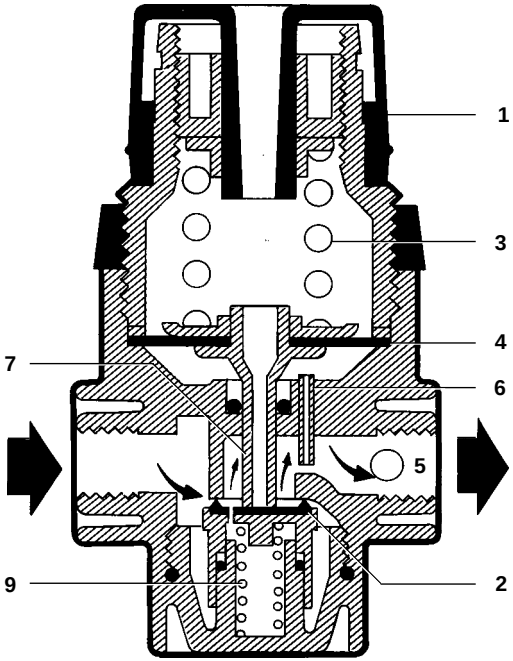
IM-P058-05
CH Issue 2

IR1 Spirax-Monnier International Compressed Air Regulator

Installation and Maintenance Instructions



How does the IR1 work

With adjustment knob (**1**) rotated fully anticlockwise, the valve return spring (**9**) will keep the main valve (**2**) shut. Clockwise rotation of the adjustment knob will compress the main pressure control spring (**3**), deflect the diaphragm (**4**) downwards, opening the main valve (**2**). As air flows to the downstream (**5**) side of the regulator, the secondary pressure increases. The secondary pressure is sensed by the aspirator (**6**) and transmitted to the underside of the diaphragm. As the controlled pressure varies, so does the force on the underside of the diaphragm. When this force (proportional to the secondary pressure) equals the compression in the main control spring, the main valve will shut. Any fall in the secondary pressure will cause the main valve to open sufficiently to meet the air flow requirements and accurately maintain the set secondary pressure.

On self-relieving models any appreciable rise in the secondary pressure from its set value will cause the diaphragm and the push rod (**7**) to lift. This will allow air to escape through the centre of the push rod to atmosphere. When excess pressure has been vented the orifice in the push rod will reseat on the main valve.

General safety, installation and maintenance guidelines

WARNING

As with all pressurised systems, do not attempt any installation or maintenance function if there is any pressure in the product or connected system.

Spirax-Monnier

Spirax-Monnier compressed air products are of well proven and simple design, with high natural levels of designed safety built-in. However, used or installed incorrectly, their performance and that of the system they are protecting or controlling, may suffer. The information given in this document indicates the product limiting conditions, maintenance and installation requirements and any specific component disposal needs (see Table opposite).

Note

Customers are reminded that under UK and EC Health, Safety and Environmental Law, when returning products to Spirax Sarco they must provide information on any hazards and the precautions to be taken due to contamination residues or mechanical damage which may present a health, safety or environmental risk. This information must be provided in writing including Health and Safety data sheets relating to any substances identified as hazardous.

Installation and operation

1. Filters, filter/regulators, lubricators, flowmeters, separators and drain traps should be fitted in horizontal pipelines, with the bowls vertically downwards.
2. Regulators and ball valves can be installed in any position.
3. On pressure regulators and combined filter/regulators, a pressure gauge can be connected to one of the $\frac{1}{8}$" ports. The gauge should be selected to cover the maximum pressure range of the main control spring. The gauge will indicate the downstream or controlled pressure.
4. Ensure that the control spring range for regulators and filter/regulators fully meets the pressure requirements of the system.
5. There are maximum operating pressures, and maximum operating and environmental temperatures for each product. These are shown in the Table opposite.
6. Adequate space should be provided around any product to allow easy access for routine servicing requirements.
7. Products fitted with a bowl (polycarbonate or metal) should be adequately drained - manually or automatically - to reduce the potentially harmful effects of water carryover.
8. **WARNING** Polycarbonate bowls and sight domes, and sight levels fitted to metal bowls, may be attacked by phosphate ester based fluids, solvents, chemical cleaners, carbon tetrachloride, etc. These and other similar substances should never be allowed to come into contact with these product components. Certain compressor lubricating oils also contain additives harmful to these components. Where there is any doubt, we recommend, in the interests of safety, that bowl guards or metal bowls are fitted.
9. Local regulations may restrict the use of this product below the conditions quoted.
10. For more detailed information on any individual product, please ask for the appropriate Technical Information Sheet listed in the Table opposite.

Maximum pressures / temperatures

Filters	Polycarbonate bowl		Metal bowl		Metal bowl with sight level		* Disposal	Technical Information Sheet
	bar	°C	bar	°C	bar	°C	Class	TI-
MF2	10	50	-	-	-	-	1 and 3	P050-05
IF2/D/A	10	50	17	80	17	70	1 and 2	P500-01
IC3/4/DA	10	50	17	80	17	70	1 and 2	P501-01
IXI	10	50	17	70	17	70	1 and 2	P057-01
SF3/A	-	-	17	80	17	70	1 and 3	P050-03
Regulators								
MR1/2/3	21 bar @ 70°C : Control ranges : 0.2 - 2, 0.3 - 4, 0.7 - 9 bar						1 and 3	P051-01
IR1	20 bar @ 70°C : Control ranges : 0.2 - 3.5, 0.5 - 10 bar						1 and 2	P058-01
SR2	21 bar @ 70°C : Control ranges : 1.3 - 17.0 bar						1 and 3	P570-01
SR3	21 bar @ 70°C : Control ranges : 0.2 - 4, 0.3 - 9 bar						1 and 3	P570-03
Filter regulators								
IP2/A/D	10	50	17	80	17	70	1 and 2	P510-01
	Ranges : 0.2 - 3.5, 0.5 - 10 bar							
MP2	10	50	-	-	-	-	1 and 3	P054-01
	Ranges : 0.2 - 2.0, 0.3 - 4.0, 0.7 - 9.0 bar							
MPC2	10	50	-	-	-	-	1 and 3	P054-04
	Ranges : 0.2 - 2.0, 0.3 - 4.0, 0.7 - 9.0 bar							
Lubricators								
ML3	10	50	-	-	-	-	1 and 3	P052-07
IL1	10	50	17	80	17	70	1 and 2	P059-01
SL3	-	-	17	80	17	70	1 and 3	P052-04
Other products								
IFM2	10	50	-	-	-	-	1 and 2	P580-01
S.M.S.	-	-	17	70	-	-	1 and 3	P050-17
All ball valves	All to 15 bar and 45°C (see performance graph on TI for full details)						1 and 4	P560-01
Dri-line	-	-	16	80	-	-	1 and 3	P050-07

*** Disposal classes**

1. Some plastic and/or rubber components
2. Main body zinc - epoxy coated
3. Main body aluminium - epoxy coated
4. Brass and steel
5. Electronic components

Commissioning

How to adjust the IR1:

- Lift the adjustment knob (**1**) to unlock.
- Turn the adjustment knob clockwise to increase secondary pressure, or anticlockwise to decrease.
- Push down to relock.
- It is recommended that adjustments are made under flow conditions - there may be a slight increase in set pressure when flow stops.

Spare parts

The spare parts available are detailed below. No other parts are available as spares.

Available spares	
Pressure control spring set (state pressure range)	**O**, **E**, **F**
Valve and diaphragm assembly	**G**, **H**, **J**, **K**, **L**, **M**, **N**

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of unit.

Example: 1 off Pressure control spring set (0.5 - 10 bar) for ¼" Spirax-Monnier IR1 International compressed air regulator.

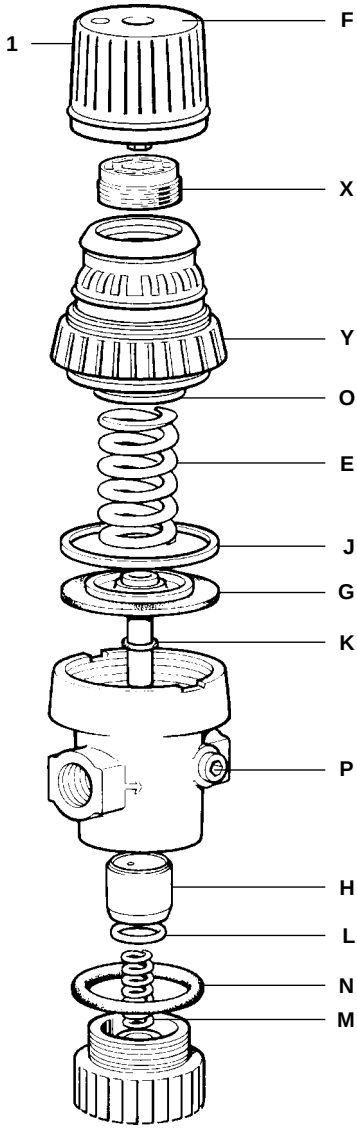
How to service the IR1

How to remove or replace the pressure control spring assembly:

Shut off the main air supply. Lift the adjustment knob to unlock. Rotate the adjustment knob fully anticlockwise until the stop is felt, continue rotating until the knob is free. Remove the adjuster nut (**X**) from inside the adjustment knob. Remove the control spring (**E**) and spring plate (**O**). Replace with a new control spring (**E**), spring plate (**O**) and screw in the adjuster nut (**X**), making sure the recess is facing upwards, until flush with the regulator body. Snap on the adjustment knob, being careful to line up the four driving lugs on the locking ring with the corresponding slots on the adjustment knob. Change the pressure indicator (**F**) to reflect the new pressure range, if required.

How to replace the valve and diaphragm assembly:

Isolate the regulator from the main supply. Rotate the adjustment knob fully anticlockwise until the stop is felt. Release mounting ring (**Y**), unscrew the bonnet assembly complete from the main body. Remove the diaphragm assembly and replace using new 'O' rings. Diaphragm sealing ring (**J**) fits on the top of the diaphragm.



Replace complete bonnet assembly and retorque to 25 Nm, using a 42 mm spanner.

How to replace the valve and return spring:

Isolate the regulator from the main air supply. Vent by rotating the adjustment knob fully anticlockwise. Unscrew the end cap and replace the components using new 'O' rings (**L**) and (**N**). Retighten to good hand tightness.