



Starter Relay Valve

RR100

Installation and Maintenance Information



Save These Instructions

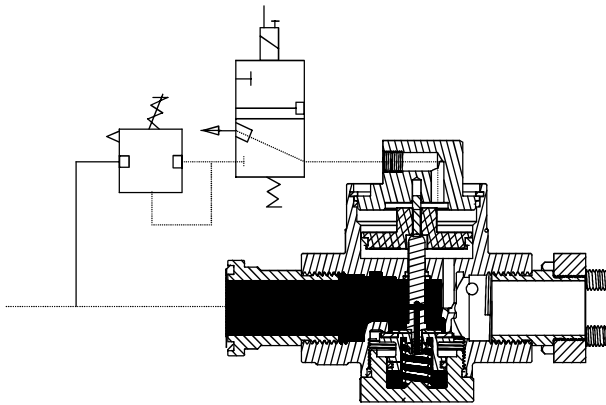
Description

The RR100-F30-D includes air valve and regulator functions.

The RR100-F30-D is made of three main components:

1. The master regulator which sets the pilot pressure.
2. The solenoid valve which will open or close the system when the operator actuates the switch key.
3. The slave regulator which is the main body.

The slave regulator will receive the signal from the master regulator through the solenoid valve. For pre-engage starters the signal pressure will come from the master regulator through the solenoid valve to the pilot "In" port of the air starter drive housing, giving the signal to engage the drive pinion into the ring gear. After engaging the drive pinion, air will come out through the "Out" port of the drive housing and will go to the cap of the slave regulator.

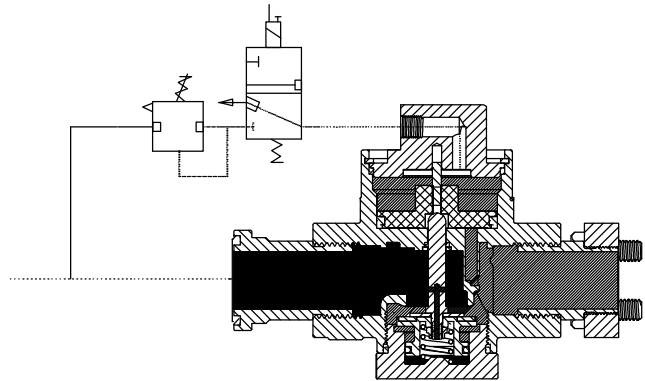


(Dwg. 45532504)

The slave regulator using the pressure signal on top of the upper piston will force the valve piston off its seat. That allows air to flow into the control chamber below the upper piston, through the outlet port of the RR100 valve to the starter motor. Outlet pressure increases in the downstream system and sensing chamber (under the upper piston) and applies an upward force on the bottom of the upper piston. The upper piston and valve piston move upward. Upward movement stops when the forces below the upper piston balance the force above the upper piston.

WARNING

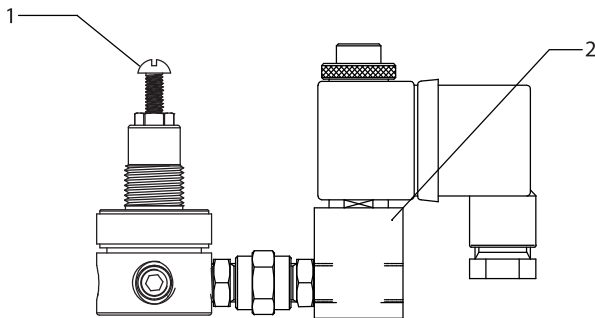
Do not use this starter relay valve with natural gas or other flammable gases.



(Dwg. 45533866)

Operation

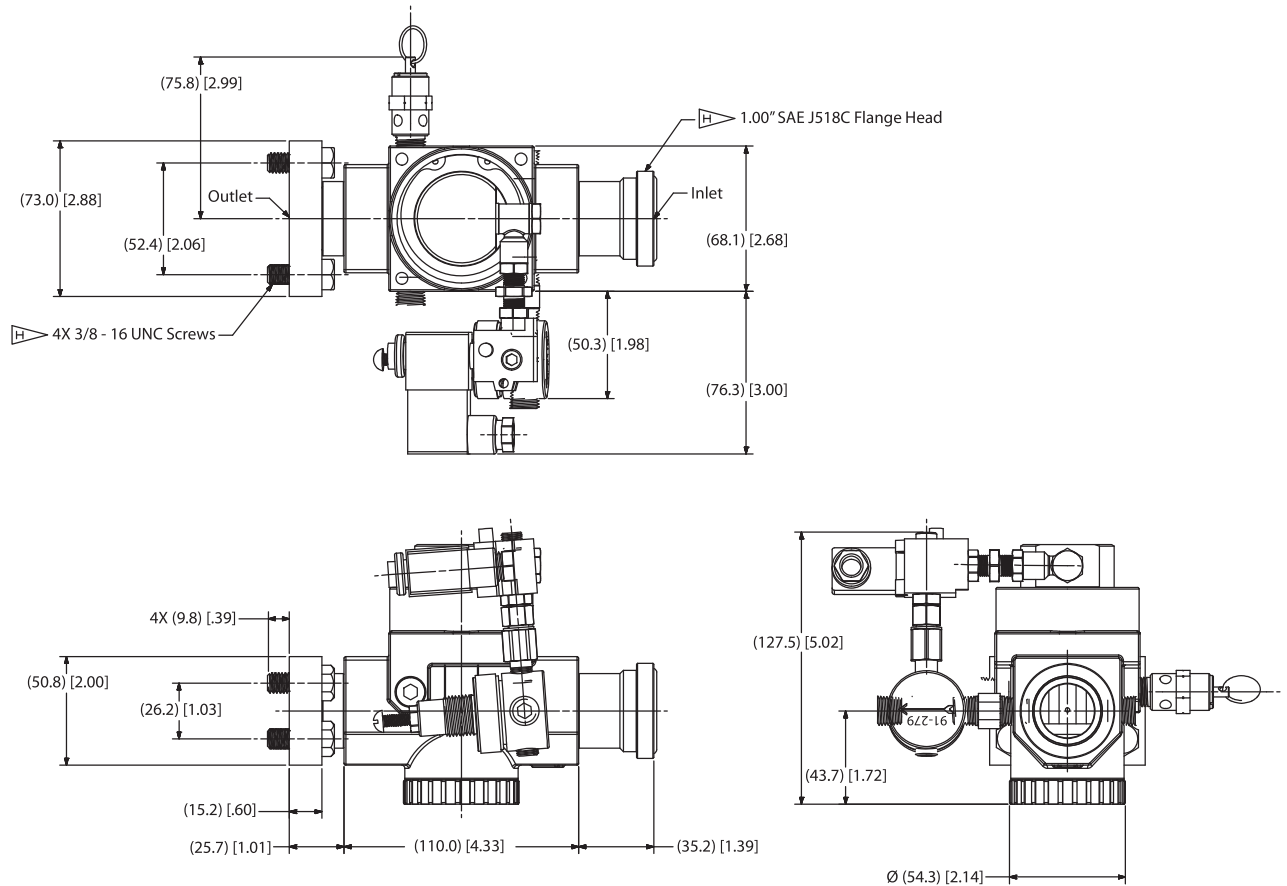
Clockwise rotation of screw (1) will open the seat in the master regulator and will increase the pressure between the master regulator and solenoid valve (2). Do not try to exceed 11 bar or 160 psig (or slightly higher than the working pressure of the starter). The pressure you adjust at the slave regulator will be slightly higher than the working pressure at the starter. In order to easily adjust the working pressure install a gauge on the gauge port.



(Dwg. 45534005)

The master pressure regulator is designed as a relieving regulator. When the pressure below the diaphragm reaches 1.5 bars over the adjusted pressure, the regulator exhausts the excess pressure.

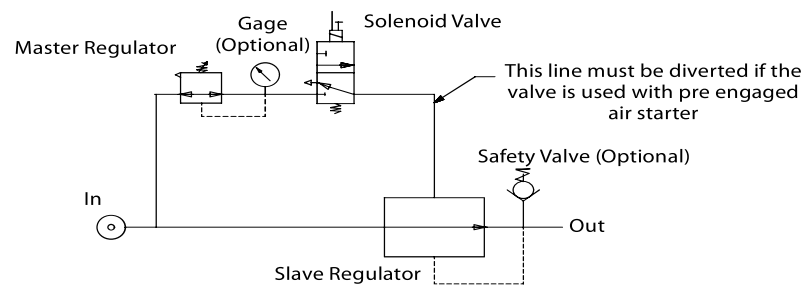
Dimensions



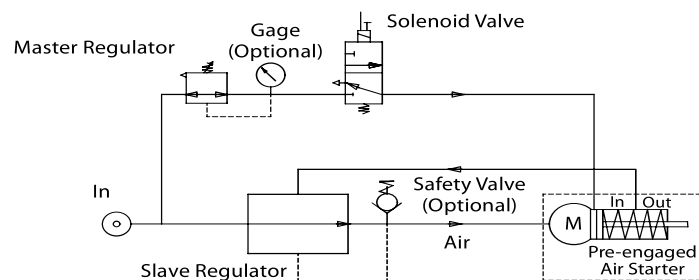
(Dwg. 45534021)

Schematics Piping Diagram

For Inertia Drive Applications



For Pre-Engaged Drive Applications



(Dwg. 80177223)

Installation

The RR100-F30 is specially designed and manufactured by **Ingersoll Rand** for use on air starter installations. Install it in accordance with the following instructions.

For installation of the valve on the starter

- 1. Install a 50 micron or 300 mesh compressed air Strainer upstream of the RR100-F30. If possible install the RR100-F30 directly on the Starter. The valve is delivered with the flange and 4 captive screws. Using a 14 mm wrench, tighten the 4 captive screws to 40 Nm torque.
- 2. Install the O-Ring in the Inlet Flange groove. Attach a 1 inch hose to the inlet of the valve with a ST400-16 4-bolt split-flange. Using a 14mm wrench, tighten the four flange bolts to 40 Nm torque.
- 3. If desired, connect an outlet pressure gauge to the gauge port. The gauge ports can also be used as additional outlets. Make sure unused gauge ports are plugged.

For installation of the valve in a different location than on the starter

- 1. Install a 50 micron or 300 mesh compressed air Strainer upstream of the RR100-F30.

- 2. For industrial or Marine applications the valve can be installed on a steel pipe in a remote location. Apply SMB-441 **Ingersoll Rand** Sealant to the tapped inlet of Flange ST400-18. Tighten the ST400-18 flange on the steel pipe to 80 Nm torque .
- 3. If desired, connect an outlet pressure gauge to the gauge port. Gauge ports can also be used as additional outlets. Make sure unused gauge ports are plugged.
- 4. Mount the RR100-F30 valve to flange ST400-18 with supplied flange fittings. Tighten the four flange bolts to 40 Nm Torque.
- 5. Attach a 1 inch hose to the outlet side of the valve with the ST400-16 4-bolt split-flange. Tighten bolts to 40 Nm torque.
- 6. Attach the 1 inch hose to the Starter Inlet flange. Tighten the 4 bolts to 40 Nm torque.
- 7. Pressurize the complete starting system. Using a soap solution, check for leaks.

Specifications

Master Regulator

Specifications		
Flow Capacity	17 l/s (36 scfm) Air	
Maximum Operating Temperature	82°C (180°F)	
Maximum Supply Pressure	30 bars (435 psig)	
Adjusting Range Pressure	0 - 11, bars (160 psig)	
Port Size	NPT	1/4
Gauge Port (s)	NPT	(2) 1/8
Weight	kg (lb)	0.2 (0.48)

Slave Regulator

Specifications		
Flow Capacity	380 l/s (800 scfm) Air	
Maximum Operating Temperature	82°C (180°F)	
Maximum Supply Pressure	30 bars (435 psig)	
Adjusting Range Pressure	0 - 11, bars (160 psig)	
Port Size	SAE	1inch
Gauge Port (s)	BSPT	(2) 1/4
Weight	kg (lb)	0.2 (0.48)

Materials of construction

Master Regulator

Materials of Construction	
Body	Brass
Bonnet	Brass
Diaphragm	Nitrile /Brass/Zinc-plated steel
Valve Assembly	Nitrile
Springs	Stainless Steel
Seals	Nitrile

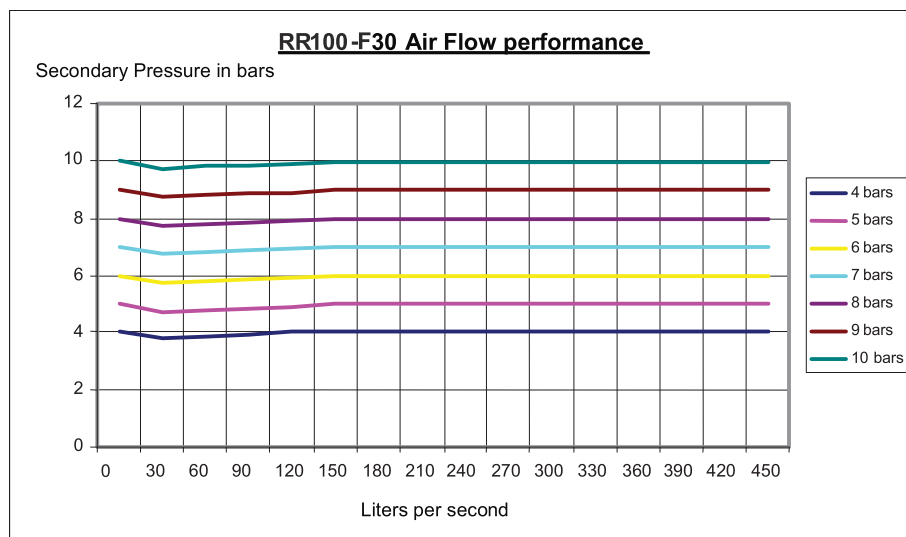
Slave Regulator

Materials of Construction	
Housing	Zinc/Steel
Cap	Aluminum
Upper Piston	Zinc
Valve Piston Assembly	Brass/Polyurethane
Springs	Stainless Steel
Seals	Nitrile

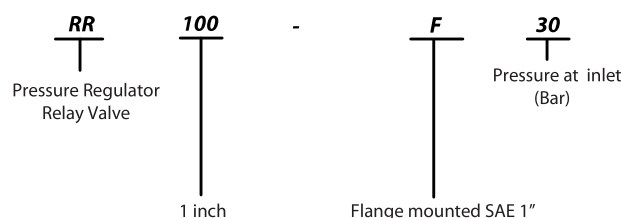
Solenoid Valve

Valve Normally Closed	3/2 Way
Seat Port Diameter	1.3 mm
Max. Ambient Temperature	82°C
Min Temperature Dry Air	-20°C
Kv	1.5
Max. working Pressure	10.5 Bars
Pressure to open plunger	16 Bars
Air Flow rate at 6 Bars	53 l/s
Plunger	Stainless Steel
Body Material	Zinc
Position	Any
Seals	Nitrile
Springs	Stainless Steel
Connector	Din 436540 (PG9)
Port	1/8 bsp
Protection	IP 65

Performance



Nomenclature



Maintenance and Recommendations

CAUTION

- Always wear eye protection when performing any maintenance on this valve.
- Always turn off the air and electrical supply and disconnect the air and electrical supply before installing or removing any component on this valve, before making any adjustments on this valve or before performing any maintenance on this valve.

Disassembly

General Information

1. Do not disassemble the valve any further than necessary to replace worn or damaged parts.
2. When grasping a part in a vise jaw, always use copper-covered vise jaws to protect the surface of the part and help prevent distortion. This is particularly true of threaded members.
3. Do not remove any part which is a press fit in or on a subassembly unless the removal of that part is necessary for replacement or repairs.
4. Always have a complete set of seals and O-rings on hand before starting any overhaul of a valve. Never reuse old seals or gaskets.

Disassembly of the Main Valve Body

Refer to Dwg. 45534054 and Parts List

1. Disconnect the pilot regulator assembly from the cap (1) of the valve.
2. Using a strap wrench, unscrew and remove the housing cover (2).
3. Pull the return spring and the piston assembly (4) from the valve housing. Turn the valve housing upside down. Using a retaining ring pliers remove the retaining ring (5).
4. Pull cap (1) from the valve housing.
5. Pull master piston (3) from the valve housing. Remove all the O-rings to be replaced.

Assembly

General Instructions

1. Whenever grasping a valve or part in a vise, always use copper-covered vise jaws. Take extra care with threaded parts or housings.
2. Clean every part before installation.
3. Apply a film of O-ring lubricant to all O-rings before final assembly.

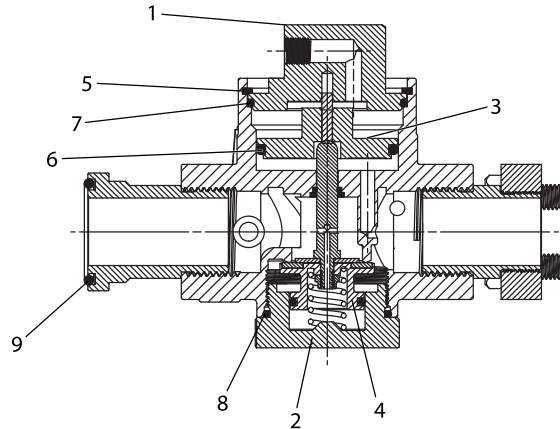
Assembly of the Valve

Refer to Dwg. 45534054 and Parts List

1. Lubricate the valve piston shaft with O-ring lubricant. Slide piston assembly (4) into the valve housing. Slide the piston spring into the bottom of the piston.

2. Place O-ring (8) in the groove of the valve housing.
3. Install housing cover (2) in the valve housing. Using a strap wrench tighten it enough not to loosen by hand.
4. Hold the valve housing in a vise.
5. Install O-ring (6) in the master piston groove, lubricate it with an O-ring lubricant, and slide the master piston (3) into the valve housing.
6. Install O-ring (7) in the valve housing groove.
7. Install cap (1) in the valve housing. Install retaining ring (5) using retaining ring pliers.
8. Reconnect the pilot regulator assembly to the cap of the valve.

Valve / Regulator RR100-F30 Parts Diagram



(Dwg. 45534054)

Valve / Regulator RR100-F30 Parts List

Item	Part Description	Part Number
1	Cap	RR100-616A
2	Housing Cover	RR100-338
3	Upper Piston	RR100-1
4	Valve Piston Assembly (includes spring, 6, 8)	RR100-K618-3
5	Retaining Ring	RR100-352
6	Upper Piston O-Ring	RR100-341
7	O-Ring	RR100-340
8	O-Ring	RR100-337
9	Inlet O-Ring	RR100-342
	Solenoid Valve 24V-DC 5 watt & Override	RR100-2450-5P
	Solenoid Valve 24V-DC 5 watt & Screw	RR100-2450-5S
	Solenoid Valve 24V-DC 8 watt & Override	RR100-K2450-8P
	Pilot Regulator with Solenoid Valve Assembly	RR100-K2450-5P
	Valve Tune-Up Kit (Includes Items 4,5,6,7,8,9)	RR100-TK1-3

Parts and Maintenance



The use of other than genuine Ingersoll Rand replacement parts may result in safety hazards, decreased motor performance, and increased maintenance, and may invalidate all warranties.

Ingersoll Rand is not responsible for customer modification of motors for applications on which Ingersoll Rand was not consulted. Repairs should be made only by authorized trained personnel. Consult your nearest Ingersoll Rand Authorized Service center.

When the life of the Tool has expired, it is recommended that the Tool be disassembled, degreased and parts be separated by material so that they can be recycled.

