Automatic Air Maintenance Panel
Series 391

Model 391-01

General Description

The **Inbal** Automatic Air Maintenance Panel series 391 automatically maintains the air or nitrogen pressure within preset limits in a dry pipe sprinkler system or a dry pilot line which actuate Deluge or Preaction system. The **Inbal** series 391 is mainly used in applications sourced by higher pressure than required for a dry system.

The Automatic Air Maintenance Panel consists of a Restriction Orifice, two Pressure Gauges for monitoring the supply and system air pressures, and a Air Pressure Supervisory Switch which may be connected through a control panel to any electric alarm. All these components are mounted in a Stainless Steel cabinet. The **Inbal** Panel 391 also includes a Pressure Regulator, Y-Strainer, Check Valve, and a Bypass Valve for fast fill of a dry pipe sprinkler system. Two Unions are provided for ease of installation. All components are factory assembled as a device, tested and set to 30 psi (2.1 bar).

Exclusion of the Pressure Regulator for air systems where pressure reduction is not needed as well as exclusion of the Pressure Supervisory Switch for Dry Pipe and Preaction Valves where the Pressure Switch is part of the control trim, is available by specifying the corresponding model number.

Technical Data

Model Numbers

391-01: Includes Pressure Regulator and Pressure Switch.
391-02: Excludes Pressure Regulator.
391-03: Excludes Pressure Switch.
391-04: Excludes Pressure Regulator and Pressure Switch.

Ends

½" NPT, female.

Pressure Rating

Maximum working pressure: 250 psi (21 Bar).

Temperature Range

Air: -40^{0}F to +140^{0}F (-40^{0}C to +60^{0}C).

Pressure Regulating Valve

FM Approved.
Equipped with relieving device.

Adjustment Range:
5 to 60 psi (0.35 - 4.1 bar).
Factory setting: 30 psi (2.1 bar).

Air Pressure Gauges

Approvals: FM Approved.
Connection: ¼" NPT.
Dial Size :3½" (89 mm) Diameter.
Dual Scale: 0 to 80 psi (0 - 5.5 bar).
Pressure Rating: Retarded to 250 psi (17 bar).
See bulletin F40-04-XX.

Pressure Switch

Approvals: FM Approved.
Pressure connection: ½" NPT, male.
Factory Adjustment: Operates on decrease at 25 psi (1.7 bar).
Pressure Range: 10-175 psi (0.7-12 bar).
Maximum Differential:
2 psi @ 20 psi.
5 psi @ 175 psi.
Pressure Rating: To 250 psi (17 bar).
Switch Contacts:
One set S.P.D.T.
10 amps @ 125/250 VAC.
2.5 amps @ 0-30 VDC.
Enclosure Classification: NEMA 4.
See bulletin F31-02-XX.

Strainer

See bulletin F40-03-XX.

Restriction Orifice

See bulletin F40-01-XX.

Shutoff Valve

See bulletin F40-08-XX.

Check Valve

See bulletin F40-12-XX.

Materials

Cabinet:

Stainless Steel AISI 304, 0.032" (0.8 mm) thickness, red Polyester coated.

Pressure Regulator:

Aluminum Body (Brass body - optional).

Strainer:

Body - Bronze , Nickel Chrome plated.
Screen - Sintered Bronze.

Shutoff, Bypass, and Check Valves:

Brass, Nickel Chrome plated.

Air Pressure Gauges:

Case - ABS, or Stainless Steel.
Window - Polycabonate, or Glass.
Burdon Tube - Bronze.

Pressure Switch Enclosures:

Cover - Die cast Aluminum, textured red powder coat finish.
Base - Plated Steel.

Weight

18 lbs (8.0 kg).

Operation

The **Inbal** Automatic Air Maintenance Panel series 391 feeds air into the system piping at the required pressure and volume supplied from any air source (air compressor, plant air supply, air or nitrogen storage tank). The air is supplied through a Y-Strainer (4) which prevents foreign particles from traveling to the Pressure Regulator (6) and to the Restriction Orifice (23). The Pressure Regulator reduces the inlet air pressure to a preadjusted outlet pressure. It will automatically maintain a constant pressure in the dry system regardless of fluctuations in the higher pressure source being used.

An Orifice (23) in the Automatic Air Maintenance Panel restricts the air supply to the system to ensure that the automatic air supply cannot replace air as fast as it escapes when a sprinkler operates.

Small air leaks from the air piping system will be compensated automatically by air feed from the Pressure Regulator.

The Bypass Valve (22) enables a fast restoration of the required pressure of the system after service or operation. In a set position, the Bypass Valve must be closed and the Shutoff Valve (3) open for proper automatic operation.

The Check Valve (19) in the Automatic Air Maintenance Panel prevents the loss of air pressure in the piping system when air pressure supply drops below the set pressure in the system. It also prevents reverse flow so that water cannot reach the Pressure Regulator after the dry pipe, deluge, or preaction system operates.

Should the air pressure drop at any time below the set point, the Air Pressure Supervisory Switch (15) activates an electric (low air pressure) alarm. The Pressure Gauges (12) & (17) monitor the pressure of the air supply entering the panel and the air pressure on the release system.

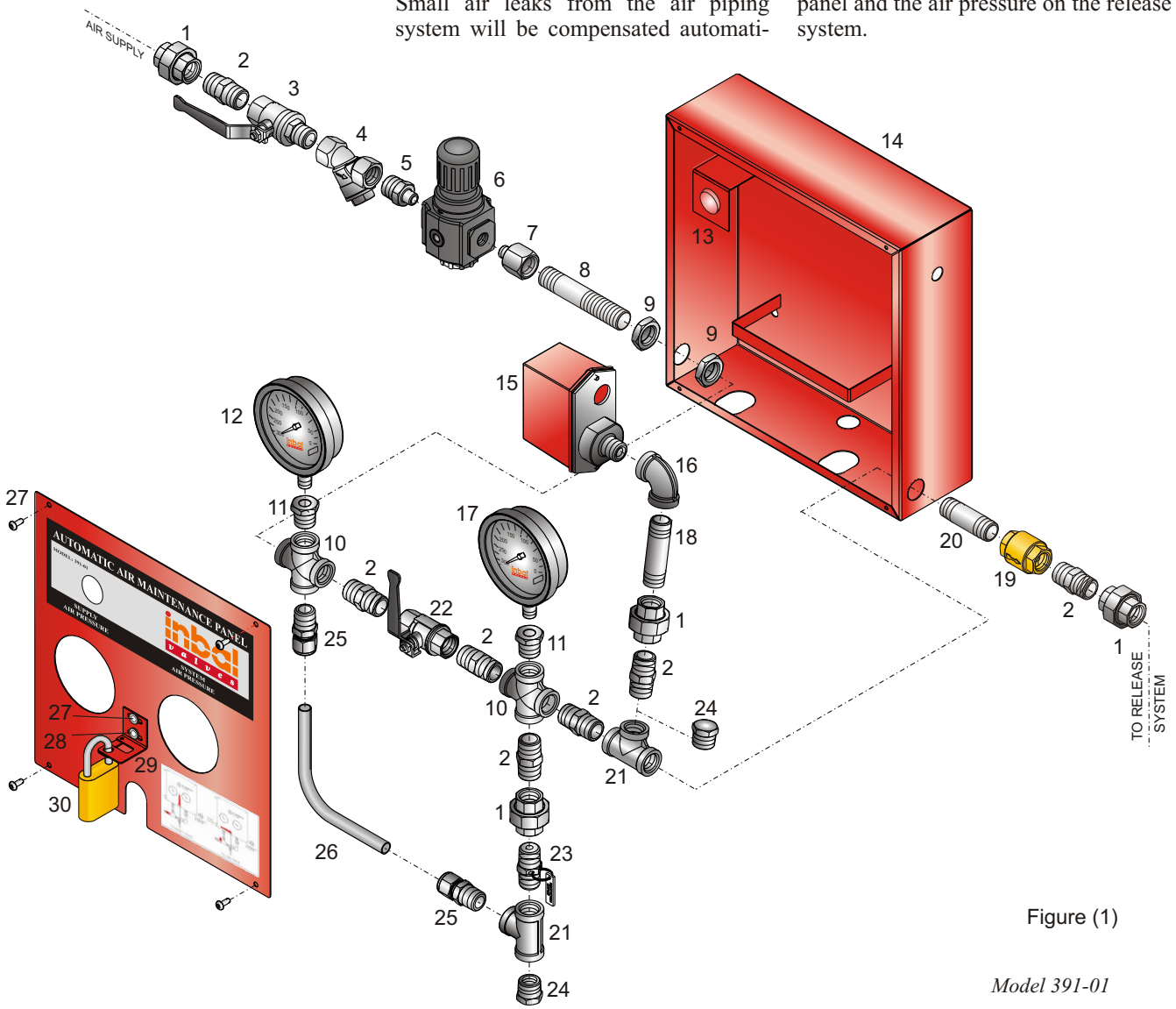

Figure (1)

Model 391-01

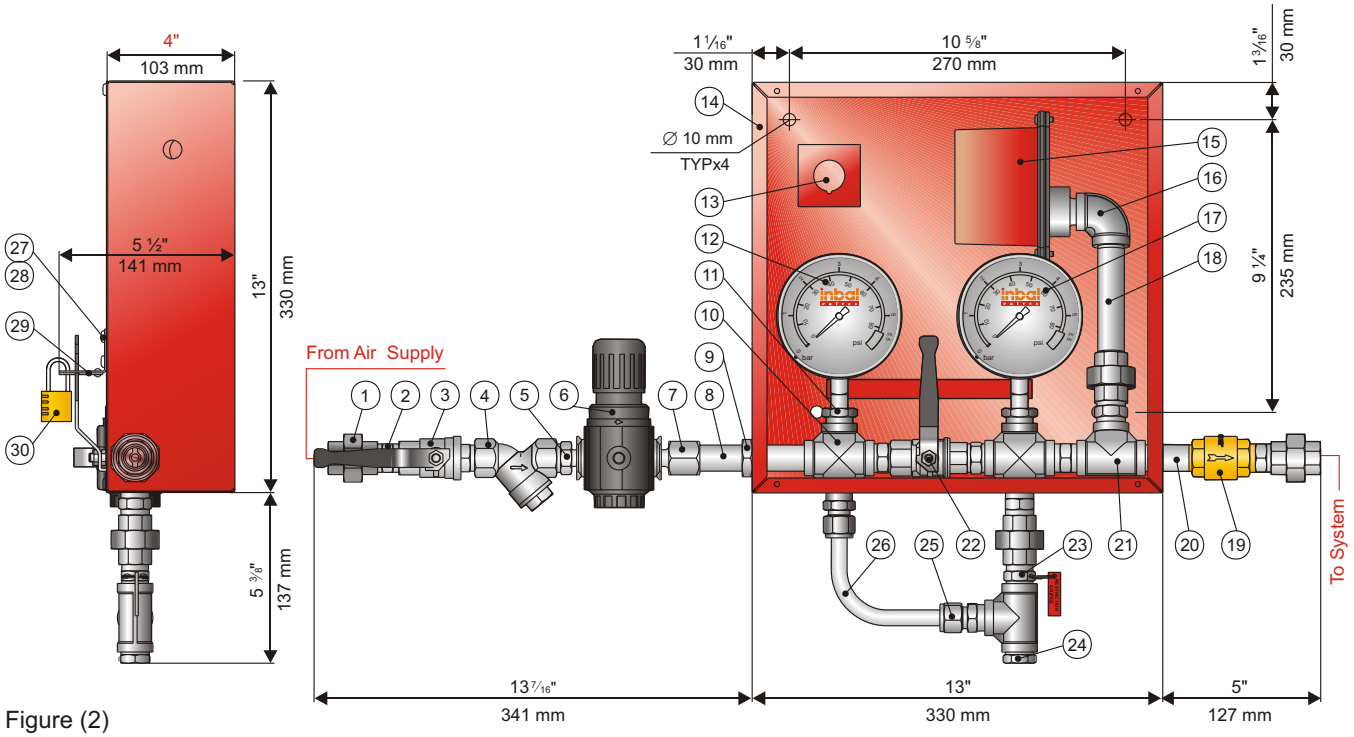

Figure (2)

Item	*Cat. No.*	*Description*	*Standard Material*	*Quantity*
1	210406008001	Union ½"	Stainless Steel AISI 304	4 (3[c])
2	212206008001	Hexagon Nipple ½"	Stainless Steel AISI 304	7 (6[c])
3	235102008000	Shutoff Valve ½"	Brass, Nickel Chrome plated	1
4	131006008000	Y-Strainer (screen 25 micron) ½"	Bronze, Nickel Chrome plated	1
5	212206020001	Hexagon Nipple ½" x ¼"[b]	Stainless Steel AISI 304	1
6	287006002003	Pressure Regulator[b]	Aluminium Body	1
7	312006003001	Adapter ¼"(M) x ½"(F)[b]	Stainless Steel AISI 304	1
8	312206019000	Nipple ½" x 4 ⅜"	Stainless Steel AISI 304	1
9	224206008004	Nut ½"	Stainless Steel AISI 304	2
10	211106008001	Cross ½"	Stainless Steel AISI 304	2
11	311002004000	Bushing ½" x ¼"	Brass, Nickel Chrome plated	2
12	213102018000	Air Supply Pressure Gauge	See bulletin F40-04-XX	1
13		Bulbe (24 VDS)	Optional	1
14	223306007002	Enclosure Assembly	Stainless Steel AISI 304	1
15	216100003000	Air Supervisory Pressure Switch[a]	See bulletin F31-02-XX	1
16	210002008000	Elbow ½"[a]	Stainless Steel AISI 304	1
17	213102018000	Air System Pressure Gauge	See bulletin F40-04-XX	1
18	212206006001	Nipple ½" x 4½"[a]	Stainless Steel AISI 304	1
19	237102008000	Check Valve ½"	Brass	1
20	312206016001	Nipple ½" x 2½"	Stainless Steel AISI 304	1
21	210106008001	Tee ½"	Stainless Steel AISI 304	2
22	235102008000	Bypass Valve ½"	Brass, Nickel Chrome plated	1
23	112802008000	Restriction Orifice (0.032" / 0.8mm)	Brass, Nickel Chrome plated	1
24	212106008000	Plug ½"	Brass, Nickel Chrome plated	2 (1[c])
25	318902016000	Flexible Fitting ½"(M) x OD½"	Brass, Nickel Chrome plated	2
26	994006008000	Air Supply Tube ½"	Stainless Steel AISI 316	1
27	227006004001	Alen Bolt M5x12	Stainless Steel AISI 304	6
28	224206015001	Nut M5	Stainless Steel AISI 304	2
29	222706006001	Locking Device	Stainless Steel AISI 304	1
30		Locker	Optional	1

a - Participates only in models 391-01 & 391-02
b - Participates only in models 391-01 & 391-03
c - Participates only in models 391-03 & 391-04

Installation

The installation of the Automatic Air Maintenance Panel must be in a visible, free access, dry spot on the air supply line to the deluge, dry pipe, or preaction valve trim.

Connect the **Inbal** Automatic Air Maintenance Panel to the air supply source and the valve trim through a ½" pipe. The Automatic Air Maintenance Panel is supplied assembled and set to 30 psi (2.1 bar).

For air fill open the Bypass Valve in the **Inbal** Automatic Air Maintenance Panel. Open the air supply control valve to pressurize the system. When the system pressure is equal to the designed / required pressure, close the Bypass Valve.

Note: Failure of closing the Bypass Valve after the line has been pressurized, neutralizes the Automatic performance of the Panel. The dry pipe system or the dry pilot line may not function to open the **Inbal** Automatic Water Control Valve.

If the system pressure, at any time, exceeds the Pressure Regulator setting, air may be momentarily exhausted from the Regulator bleed hole to retrieve the air pressure to the preset level.

To adjust the system pressure, pull the plastic knob on the Pressure Regulator and turn it clockwise to increase the system pressure, counter-clockwise to decrease the set pressure. The system pressure should be set at the minimum required value to minimize the trip time of the system in the event of a sprinkler operation.

Push the plastic knob on the Pressure Regulator to lock the setting when the system stabilizes at the desired pressure.

Connect the electrical conduit and the alarm circuitry. Note that for outdoor installations, a NEMA type 4 conduit hub should be used. Wire devices should be according to the NEC, IEC, or CENELEC standards and the requirements of the authorities having jurisdiction. Upon completion of installation, test the Air Maintenance Panel for proper operation.

If adjustment is required, turn the adjustment knob at the Pressure Switch clockwise to raise the alarm pressure and counter-clockwise to lower the alarm pressure.

Inspection, Maintenance, & Testing

It is recommended that the **Inbal** Automatic Air Maintenance Panel be periodically verified for proper operation and condition as part of the deluge, dry-pipe, or preaction system testing procedure.

Verify that the regulated air pressure is at the proper setting. Verify that the Bypass Valve is sealed in a closed position.

The Y-Strainer should be cleaned quarterly. The Check Valve should be inspected biannually for debris or clogging.

Check Pressure Gauge readings (recommended weekly). Both gauges should read the same pressure. If the reading is not the same, the Restriction Orifice should be cleaned.

If the system pressure is held higher than the preset level, the Bypass Valve and the Pressure Regulator should be inspected.

The Pressure Switch operation and alarm should be tested along the periodical testing of the **Inbal** Deluge, Dry-Pipe, or Preaction Valve.

Piping & Instrumentation Diagram

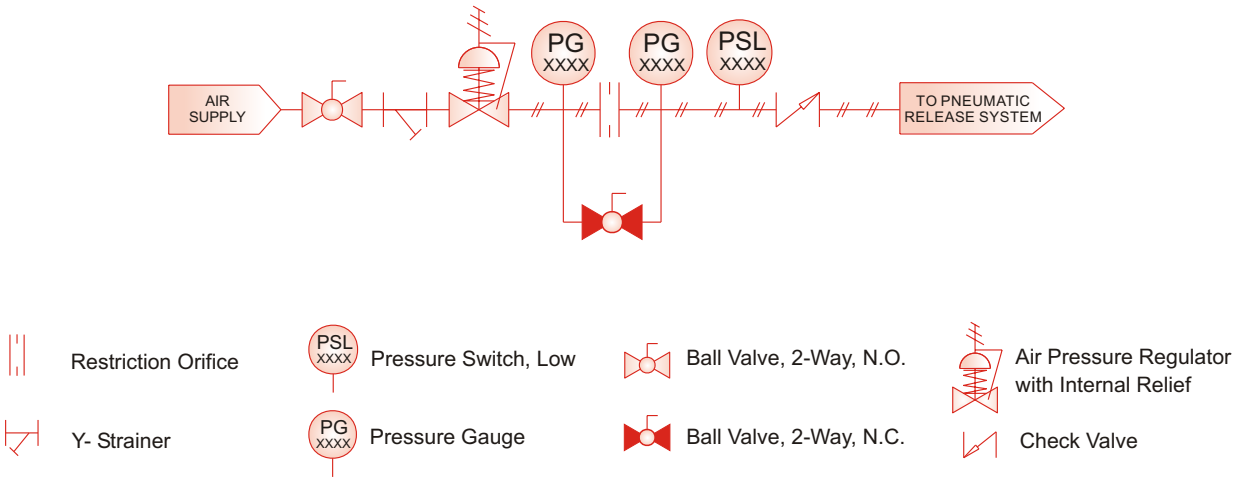

Figure (3) *Model 391-01*