

# LINEAR FRAGMENTATION FILL STATION INSTRUCTION & OPERATION HANDBOOK



# **WARNING!**

## **HIGH PRESSURE UNITS**

**Under no circumstances should the fill stations be operated with the safety relief valves removed and plugged, or adjusted above the factory set range.**

**Tampering with relief valves can result in an “Explosion Failure”**

**High pressure air has Tremendous Kinetic Energy and should be treated with the utmost caution.**

## GENERAL INFORMATION

### JORDAIR SCBA RECHARGING STATIONS

#### FILL-KAT-D FULLY ENCLOSED SLIDING DOOR FRONT LOADING MODEL

This manual covers the operation of the standard design of the Jordair SCBA linear refilling stations. Some of the custom options, which may be added to the SCBA refill stations, are included in this operation manual. Due to the program of product improvement at Jordair, older models may not include all of the listed features.

## GENERAL TECHNICAL INFORMATION

When the recharging station is delivered with the optional dual filling for 2216 and 4500 PSIG SCBA cylinders the 2216 PSIG SCBA fill assemblies are protected by a safety relief valve set at 2650 PSIG to ensure safe refilling. When a SCUBA fill point is included in a SCBA fill station this is also protected with a safety relief valve. Stations operating with a 6000 PSIG compressor and storage system have a safety valve set at 4750 PSIG to protect 4500 PSIG SCBA cylinders.

## CAUTION!

**Never attempt to repair or tighten leaking fittings while the system is pressurized. Always perform service and repair work on a fully depressurized system.**

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## FILL-KAT SERIES FILL STATIONS



### Jordair QC Program

- ISO 9001:2008 Cert. 97-544
- CSA Cert. No. LR77799
- CRN Pressure Components
- B&PV Licence MA-2007

### System Features:

- Larger gauge panel for all features
- Inlet and outlet 4" gauges
- Safety air shut off valve when door is open
- Electronically controlled filling
- Third Party Tested
- Front Door Steel Plate
- Operator Protection

### NFPA 1901 CERTIFIED REGULATOR CONTROLLED FILL STATION - SLIDING DOOR FILL-KAT LINEAR FILL STATION, PLC CONTROLLED

MODEL	NO. OF FILL POINTS	FILL TYPE	FILL PRESSURE	WEIGHT	SIZE (CM) H x D x W
FILL-KAT-D2	2	SCBA	2216, 3000 or 4500 PSIG	650 KG	173 x 97 x 86
FILL-KAT-D3	3	SCBA	2216, 3000 or 4500 PSIG	660 KG	173 x 97 x 86
FILL-KAT-D4	4	SCBA	2216, 3000 or 4500 PSIG	670 KG	173 x 97 x 86
FILL-KAT-D6	6	SCBA	2216, 3000 or 4500 PSIG	700 KG	173 x 137 x 86
FILL-KAT-D8	8	SCBA	2216, 3000 or 4500 PSIG	720 KG	173 x 137 x 86
FILL-KAT-D10	10	SCBA	2216, 3000 or 4500 PSIG	830 KG	173 x 178 x 86
FILL-KAT-D12	12	SCBA	2216, 3000 or 4500 PSIG	850 KG	173 x 178 x 86

## FILL-KAT FILL STATION STANDARD FEATURES

- The FILL-KAT series SCBA recharging system is a free standing and complete filling/de-fragmentation station for 2216, 3000 and/or 4500 psig cylinders. The SCBA refilling station is of a fully enclosed design to contain a SCBA cylinder failure or ruptured SCBA fill hose.
- The Jordair FILL-KAT series fill stations are the safest and most technically advanced filling stations offered in Canada for the containment and recharging of SCBA cylinders.
- Linear filling of SCBA cylinders with optional compressor interface for integrated compressor and fill station operation.
- Operator control is optional as open use or overseen by a password system which ensures only fully trained operators are filling the SCBA cylinders.
- The fill station is set to fill at the CSA standard rate of exactly 300 PSIG per minute; other fill rates up to 1500 PSIG per minute can be selected by entering the pass code and selecting the new fill rate displayed on the screen. The system defaults to the 300 PSIG/min rate.
- A fully enclosed SCBA containment system that encloses both the SCBA cylinders and the filling hoses with a sliding front access door. The door must be closed and locked before SCBA cylinders can be recharged.
- A toggle activated valve stops air flow to the filling points when the door is opened.
- Sliding front access door is ½" plate steel for optimum operator safety.
- The front access door is held in the closed position by a spring loaded pin type door lock.
- Heavy wall schedule 40 steel 8" pipe used to contain the SCBA cylinders within the recharge station.
- Anti-abrasion collars and liners in the SCBA containment sleeves to protect the exterior of the SCBA cylinders from abrasion damage during the filling process
- 6000 psig inlet ball type shut off valve to isolate the recharging station from the compressor and air storage cylinders.
- One anodised aluminum, self-venting and adjustable regulator with operating pressures from 0 to 6,000-PSIG inlets and 0 to 6,000-PSIG outlet pressures.
- The fill station has one fill hose per fill position and a quick disconnect to allow fill adapter changes for different pressures.
- When different filling pressures are required, a manual selection valve provides for the desired pressure and safety relief valve over-fill protection.
- The final fill pressure is selected on the touch screen when the FILL-KAT is ordered with more than one fill pressure option.
- Panel mounted SCBA cylinder ball type shut off valves for 2216, 3000 or 4500 PSIG fill positions.
- SCBA recharge assemblies are supplied for 2216/3000 or 4500 psig filling.
- A CRN certified safety relief valve is set for 2400/3200 or 4700 psig to protect the filling of the 2216/3000 or 4500 psig SCBA or SCUBA cylinders.
- The fill station has removable service access panels for ease of service of the pressure components.
- All pressure piping conforms to ASME code B31.1 and B31.3

## FILL-KAT FILL STATION UPGRADE OPTIONS

### ADDITIONAL FILL HOSES, REMOTE OUTLETS AND PRESSURES

<b>J-FSEFP</b>	Remote Fill Point / Bank Isolation with valve and gauge
<b>J-FSFP-IV-K</b>	Isolation Valve Kit for adding an additional fill pressure to fill station

### CASCADE OPTIONS, PARTS & ACCESSORIES

<b>J-FFS-3C</b>	Manual Cascade System - 3 Banks, for fill station
<b>J-FFS-4C</b>	Manual Cascade System - 4 Banks, for fill station
<b>J-SV1018-3</b>	Auto Cascade - For 3 banks c/w gauges
<b>J-SV1018-4</b>	Auto Cascade - For 4 banks c/w gauges
<b>J-PSV-6-6000-05</b>	Sequencing Valve for Auto Cascade - 6000 PSIG
<b>J-BPR-6-150-6000</b>	Priority Valve for Auto Cascade - 6000 PSIG

### FILL-KAT LINEAR FILL STATION PARTS & ACCESSORIES

<b>J-LFV-6000*</b>	Complete linear fill system for fill station
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\*The J-LFV-6000 includes all of the items shown below

<b>J-PT-6000</b>	Pressure transmitter for linear fill station
<b>J-PCV-6000</b>	Linear fill valve - 300 PSIG per minute flow rate
<b>6ES7-214-2AD23-0XB0</b>	PLC - For linear valve control only
<b>6AV 642-0AA11-0AX1</b>	Touch screen display for linear fill station

## PRODUCT SHEET: PROPORTIONAL FILL CONTROL

The subject of controlled fill rates for SCBA cylinders is both a manufacturers and CSA stated requirement. The rate selected by CSA in the breathing air standard is 300 PSIG per minute. The current method is to use an orifice to control the fill rate. The issue with an orifice is that it fills at a much higher rate than 300 PSIG/min at the beginning of the fill and slows to a very low rate of pressure rise at the end. This method results in a heat build up in the cylinder which then cools over the fill time of 15 minutes for a 4500 PSIG cylinder.

The ideal fill is at 300 PSIG/min regardless of the pressure in the SCBA cylinder. The continuous fill rate of 300 PSIG/min provides for low stress on the cylinder with even temperature though out and a cool fill. This type of fill is achieved by a PLC controlled fill valve which can open slowly to produce an even filling rate of 300 PSIG/min over the complete fill. A pressure transmitter provides the input to the PLC to control the filling rate of the proportional control valve.

Jordair and Bauer have developed the valve and software to achieve this exact 300 PSIG/min fill rate. The system works perfectly to provide an even pressure rise in the SCBA cylinder of 300 PSIG/min from the start to the end of the fill process.

The same valve system can be used for automatic decanting of the SCBA cylinders at 300 PSIG/min to a base pressure of 100 PSIG and then refilled at the same rate.

### SYSTEM CONTROL DESIGN:

The PLC has a master code which allows the Fire Chief if so desired to assign operator codes only to trained operators of the system. The SCBA cylinders can be identified with a bar or RFI code to allow tracking of the cylinders. The tracking requires specialty software which is written for the customers tracking and information requirements. The software is custom made and application specific based on a platform which can be downloaded to the Fire Departments central computer system.

Due to the different customer requirements and the type of information required all tracking software must be custom designed.

**FILL STATION OPERATION SEQUENCE:**

Once an operator code is established the system operates as follows:

- The operator loads the cylinders in the fill station of a specific fill pressure.
- The fill adapter is connected to the hose assembly by a quick disconnect.
- The operator closes the vent valves and opens the SCBA cylinder valves, cylinder pressure will register on the pressure gage for each fill assembly.
- The operator closes the door to the fill station.
- The operator enters the code on the PLC if required.
- The PLC displays the position pressure selection switch filling pressure of 2216, 3000 or 4500 PSIG.
- The PLC displays the fill pressure targeted by the selection switch.
- Push the start fill button. The system now commences to decant if required and fill the SCBA cylinders at 300 PSIG/min.
- The fill station is equipped with the specific number of fill heads on the quick disconnect system for the fill pressures requested by the customer.

The Jordair Fill stations provide a manual fill system as well which is locked out during normal operation. The manual system can be used in the event of a power failure or a problem with the automatic valve or PLC control. The manual system uses a standard orifice for average filling of the SCBA cylinders.