YORK®
ES Service Information

File In/With: N/A
SI0095
New 604

Equipment Affected: Chillers Using Reciprocating, Screw & Scroll Compressors

System Clean Up Procedure After Compressor Burnout - (Reciprocating/Screw/Scroll Compressors)

General

After a motor burnout, concerns often arise regarding recommended clean up procedures required to assure long term reliability of the newly installed compressor. Proper clean-up will assure that all contaminants are removed from the system, preventing a repeat burnout or damage to compressor mechanical parts. Basically, a burnout needs to be categorized into one of two types:

(A) – minor burnout where no oil discoloration is noted, or
(B) – severe burnout where noticeable or significant oil contamination (discoloration and/or acidic smell) is present due to overheating of the motor.

MINOR BURNOUT CLEAN UP PROCEDURE

Safety Precautions

Safety precautions such as wearing safety glasses are required. Protective gloves should also be utilized. Proper refrigerant handling/reclaim practices must be followed when removing the refrigerant from the compressor or system. Place the oil recovered from oil separators or other compressors in the system in a suitable container for disposal. Always be sure power is removed from the unit prior to beginning work. Lock out the disconnect switch as a precautionary measure.

The following steps should be followed to replace the compressor and clean up the system.

1. Remove the refrigerant from the defective compressor or system using environmentally correct procedures. Place any refrigerant removed from the compressor or system in suitable containers until it is re-installed.
2. Remove the defective compressor. Take precautions not to spill oil when piping is removed. Install the replacement compressor. Use a nitrogen purge when brazing piping.
3. When a minor burnout is encountered, changing the compressor oil and replacing the liquid line filter drier pleated felt cores with Sporlan HH charcoal clean up cores should be sufficient to clean up the system. Use the information provided in the attached tables (pages 6 - 11) to determine the type of filter dryer clean-up cores to use. If an external oil filter is present, it should be changed.
4. **DANFOSS SCROLL COMPRESSORS ONLY:** Pump the oil out of any remaining operating scroll compressor(s) in the circuit, using the oil fitting, into a suitable container. Dispose of the oil drained from the compressor(s) using environmentally friendly methods.
5. **COPELAND SCROLL COMPRESSORS ONLY:** Oil may be difficult to remove from Copeland Scroll Compressors. It is recommended that a dip tube (Baltimore RPC part number YK528182600) be used to remove oil from the sump of each compressor. Remove the Schrader core from the valve located a few inches from the bottom of the compressor and install the dip tube. Be careful not to hit the motor windings when inserting or removing the dip tube. Pump the oil from each of the compressors in the circuit into a suitable container. Dispose of the oil drained from the compressor(s) using environmentally friendly methods. Remove the dip tube and replace the core in each compressor. Do not leave the dip tube in a compressor.

6. **COMPRESSORS WITH OIL SEPARATORS ONLY:** When an oil separator is installed in the compressor circuit, the oil in the separator(s) must be drained into a suitable container. Dispose of the oil drained from the oil separator using environmentally friendly methods. A screw compressor doesn't have an oil sump, so the majority of the oil in the system will be in the separator.
7. Evacuate the system or compressor(s) to 500 microns using a thermistor vacuum gauge for reliable verification of vacuum.
8. Replace any refrigerant removed from the system or the compressor.
9. Replace the oil with the same type originally used in the compressor(s). Follow the YORK recommendations for the specific type of compressor/chiller oil charge and quantity. Pump the oil into the compressor or oil separator as required. If POE oil is installed, assure the container has not been open to atmosphere. Do not use POE oil from a previously opened container. If an aftermarket oil separator is installed, the oil charge may need to be verified with the manufacturer's specs.
10. Run the system and after several hours of operation, an oil sample should be taken and analyzed using a Sporlan AK-3 Acid Test Kit or equivalent to assure that acids are not present. If the oil sample tests acid-free, replace the filter drier clean-up cores with standard pleated filter drier cores. If additional clean up is required, change the oil, replace the charcoal cores, and run the system for several more hours, with subsequent oil testing and final drier core replacement using standard pleated felt elements. Repeat the procedure until the oil is acid free.
11. **POE OIL ONLY:** Dispose of any additional unused POE oil using environmentally correct methods. POE oil absorbs moisture once a container has been opened and cannot be used at a later time.

SEVERE BURNOUT CLEAN-UP PROCEDURE

When a severe burnout is encountered, oil discoloration and an acidic smell will be obvious. If the motor can be visually inspected, windings may show a partially burned or totally burned appearance. A combination of sludge, carbon, varnish, copper, and other debris may be present in the motor, compressor, and possibly the piping. Sight glasses may be damaged. This type of burn will require significant system clean up.

Safety Precautions

Safety precautions such as wearing safety glasses are required. Protective gloves should also be utilized. Proper refrigerant handling/reclaim practices must be followed when removing the refrigerant from the compressor or system. Place the oil recovered from oil separators or other compressors in the system in a suitable container for disposal. Always be sure power is removed from the unit prior to beginning work. Lock out the disconnect switch as a precautionary measure.

The following steps should be taken to replace the compressor and clean up the system.

1. Recover the refrigerant from the system and the compressor using environmentally correct procedures. Place the refrigerant in suitable containers for reclaim.
2. Remove the defective compressor. Take precautions not to spill oil when piping is removed.
3. **DANFOSS SCROLL COMPRESSORS ONLY:** Pump the oil out of the remaining operating scroll compressor(s) in the circuit, using the oil fitting, into a suitable container. Dispose of the oil drained from the compressor(s) using environmentally friendly methods.

4. **COPELAND SCROLL COMPRESSORS ONLY:** Oil maybe difficult to remove from Copeland Scroll Compressors. It is recommended that a dip tube (Baltimore RPC part number YK528182600) be used to remove oil from the sump of each compressor. Remove the Schrader core from the valve located a few inches from the bottom of the compressor and install the dip tube. Be careful not to hit the motor windings when inserting or removing the dip tube. Remove the oil from each of the compressors in the circuit. Remove the dip tube and replace the core in each compressor. Do not leave the dip tube in a compressor.
5. **XHS COMPRESSORS ONLY:** Remove the fill piece piping or muffler between the compressor and discharge service valve. Generally, a significant amount of oil will be found in these pieces. Assure that a pan is used to catch any oil that may spill. Clean the carbon deposits from the piping and have the muffler sent out to be cleaned, if needed. The muffler also has a return oil line to the compressor, which should be cleaned or replaced.
6. **COMPRESSORS WITH OIL SEPARATORS ONLY:** If the screw compressor (also some recips and scrolls) has an oil separator(s) installed, drain the oil, remove the separator(s) and send it (them) out for cleaning. Clean any associated oil lines, if needed. Dispose of the oil using enironmentally friendly procedures.
7. If an external oil filter is present, change the filter.
8. Clean carbon deposits from the discharge valve, suction valve, and piping as needed.
9. Clean the economizer valve and piping, if present, as required.
10. Disconnect any sensors or transducers mounted directly on the compressor.
11. Install the new compressor in the chiller adding sensors and transducers removed from the original compressor. NOTE: On a severe burn out, it is recommended the slide valve capacity control solenoid on an XHS screw compressor be replaced due to contaminated oil that may have entered the solenoid valve. Dirt may interfere with the solenoid valve operation and cause slide valve control problems. Use a nitrogen purge when brazing piping.
12. **SCREW COMPRESSORS WITH ECONOMIZERS ONLY:** On screw compressors with economizers, install an economizer line filter drier (Sporlan C-4813-G) in the economizer line as close to the compressor as possible. Continuously purge the line with nitrogen during brazing to avoid introducing oxides that will further contaminate the system. Install a single charcoal clean-up element Sporlan RC-4864-HH. See the attached table for selection.
13. Install suction line filter drier canisters as close to the compressor as possible. From the table attached, determine the type of suction line filter required, cores, and the quantity. In some cases, two filter driers will be required and should be installed in parallel to reduce pressure drop. The pressure drop is a result of the connections to the drier shell. Continuously purge the line with nitrogen during brazing to avoid introducing oxides, which will further contaminate the system. For clean-up purposes, Sporlan charcoal element cores RC-10098-HH should be installed. See the attached table for selection.
14. Replace the liquid line filter drier cores with Sporlan HH charcoal elements. 2 or 3 Sporlan RC-4864-HH elements will generally be required. In some cases, the sealed filter drier will need to be replaced with the recommended replaceable core type.
15. Replace the sight glass/moisture indicator, if damaged by the burn out.
16. Eco2 rooftop units use screens on the TXV inlets and will require the screen to be replaced.
17. In rare case where a DXS screw compressor motor is replaced in the field, the compressor capacity control solenoid valve should be replaced.
18. Evacuate the entire system to 500 microns using a thermistor vacuum gauge for reliable verification of vacuum. Recharge the system with a new or reclaimed refrigerant charge.

19. Replace the oil with the same type originally used in the compressor(s). Follow the YORK recommendations for the specific type of compressor/chiller oil charge and quantity. Pump the oil into the compressor or oil separator as required. If POE oil is installed, assure the container has not been open to atmosphere. Do not use POE oil from a previously opened container. If an aftermarket oil separator is installed, the oil charge may need to be verified with the manufacturer's specs.
20. Run the system for a period of 24 hours and monitor pressure drop across the system driers. Check the oil for acidity using a Sporlan AK-3 Test Kit or equivalent. If high acid levels are noted, replace the oil, replace all clean-up cores and run an additional 24 hours. The process is complete when the oil is acid free and the color is normal.
21. Once the system is running and clean, the economizer charcoal element should be replaced with a Sporlan pleated felt type RPE-48-BD, the suction line charcoal elements should be replaced with Sporlan RPE-100 pleated felt cores or removed completely, the liquid line driers should be replaced with standard pleated felt cores, and the external/internal compressor oil filter should be replaced. When the pleated felt core elements are installed, remove the screen in the canisters to reduce the pressure drop. See the attached table.
22. The system is now ready to return to normal operation.
23. **POE OIL ONLY:** Dispose of any additional unused POE oil using environmentally correct methods. POE oil absorbs moisture once a container has been opened and cannot be used at a later time.

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SEMI HERMETIC COMPRESSOR TYPE AND MODEL	COMPRESSOR OR TANDEM/TRIO, APPROXIMATE "TOTAL" NOMINAL TONS	SUCTION LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-175-2 Bracket, if needed	SUCTION LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	SUCTION LINE FILTER-DRIER STANDARD PLEATED LOW PRESSURE DROP FELT CORES (See Note 1) (Quantity per canister)
SCREW DXS112	55	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW DXS124	75	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW DXS136	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW DXS145	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120BA	70	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120BM	80	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120BF	90	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120CH	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120BH	107	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120CP	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
SCREW XHS120CS	120	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA43	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA44	60	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA63	70	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA64	75	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA83	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP PA84	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK43	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK44	60	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK63	70	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK64	75	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK83	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JK84	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG43	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG44	60	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG63	70	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG64	75	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG83	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JG84	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100

NOTE 1 - After clean-up, cores can be removed from canister rather than installing standard felt cores.

LIQUID LINE DRIER CLEAN-UP CORES (See Note 2) (Typically 2 or 3 per circuit are used)	LIQUID LINE DRIER STANDARD CORES (Typically 2 or 3 per circuit are used)	ECONOMIZER LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-685 Bracket, if required.	ECONOMIZER LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	ECONOMIZER LINE FILTER STANDARD PLEATED FELT CORES (See Note 1) (Quantity per circuit)
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	SPORLAN RSF-4813-T	SPORLAN RC-4864-HH	(1) RPE-48-BD
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

NOTE 2 - An asterisk (*) indicates a replaceable Core Drier Shell of the type indicated "may" need to be installed to replace the sealed type drier. Check the equipment to verify the drier type installed.

SEMI HERMETIC COMPRESSOR TYPE AND MODEL	COMPRESSOR OR TANDEM/TRIO, APPROXIMATE "TOTAL" NOMINAL TONS	SUCTION LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-175-2 Bracket, if needed	SUCTION LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	SUCTION LINE FILTER-DRIER STANDARD PLEATED LOW PRESSURE DROP FELT CORES (See Note 1) (Quantity per canister)
RECIP JS43 STYLE A-F	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JS44 STYLE A-F	60	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JS63 STYLE A-F	70	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JS64 STYLE A-F	75	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JS83 STYLE A-F	100	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP JS84 STYLE A-F	115	(2) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB4H	20	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
RECIP ZB4J	22	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
RECIP ZB4K	25	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB4M	30	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB6N	31	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB6R	33	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB6S	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB6W	40	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP ZB6AE	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z4H_A	20	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
RECIP Z4J_A	22	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
RECIP Z4K_A	25	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z4M_A	30	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z6N_A	31	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z6R_A	33	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z6S_A	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z6W_A	40	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP Z6AE_A	50	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP SS42	20	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
RECIP SS62	31	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP SS63	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
RECIP SS82	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100

NOTE 1 - After clean-up, cores can be removed from canister rather than installing standard felt cores.

LIQUID LINE DRIER CLEAN-UP CORES (See Note 2) (Typically 2 or 3 per circuit are used)	LIQUID LINE DRIER STANDARD CORES (Typically 2 or 3 per circuit are used)	ECONOMIZER LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-685 Bracket, if required.	ECONOMIZER LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	ECONOMIZER LINE FILTER STANDARD PLEATED FELT CORES (See Note 1) (Quantity per circuit)
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
SPORLAN RC-4864-HH	SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

NOTE 2 - An asterisk (*) indicates a replaceable Core Drier Shell of the type indicated "may" need to be installed to replace the sealed type drier. Check the equipment to verify the drier type installed.

SEMI HERMETIC COMPRESSOR TYPE AND MODEL	COMPRESSOR OR TANDEM/TRIO, APPROXIMATE "TOTAL" NOMINAL TONS	SUCTION LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-175-2 Bracket, if needed	SUCTION LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	SUCTION LINE FILTER-DRIER STANDARD PLEATED LOW PRESSURE DROP FELT CORES (See Note 1) (Quantity per canister)
COPELAND SCROLL ZR90 TANDEM	14	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
COPELAND SCROLL ZR12 TANDEM	20	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
COPELAND SCROLL ZR16 TANDEM	24	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR19 TANDEM	30	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR250 TANDEM	43	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR300 TANDEM	47	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR12 TRIO	30	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR16 TRIO	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR19 TRIO	40	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR250 TRIO	57	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
COPELAND SCROLL ZR300 TRIO	67	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
DANFOSS SCROLL SM090 TANDEM	14	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
DANFOSS SCROLL SM120 TANDEM	20	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
DANFOSS SCROLL SM125 TANDEM	22	(1) SPORLAN C-30013-G	(3) SPORLAN RC-10098-HH	(3) SPORLAN RPE-100
DANFOSS SCROLL SM160 TANDEM	24	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
DANFOSS SCROLL SM185 TANDEM	30	(1) SPORLAN C-40017-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
DANFOSS SCROLL SM125 TRIO	32	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
DANFOSS SCROLL SM160 TRIO	35	(1) SPORLAN C-40021-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100
DANFOSS SCROLL SM185 TRIO	40	(1) SPORLAN C-40025-G	(4) SPORLAN RC-10098-HH	(4) SPORLAN RPE-100

NOTE 1 - After clean-up, cores can be removed from canister rather than installing standard felt cores.

LIQUID LINE DRIER CLEAN-UP CORES (See Note 2) (Typically 2 or 3 per circuit are used)	LIQUID LINE DRIER STANDARD CORES (Typically 2 or 3 per circuit are used)	ECONOMIZER LINE FILTER-DRIER CANISTER (Quantity per circuit) Use A-685 Bracket, if required.	ECONOMIZER LINE FILTER-DRIER CHARCOAL CLEAN-UP CORES (Quantity per canister)	ECONOMIZER LINE FILTER STANDARD PLEATED FELT CORES (See Note 1) (Quantity per circuit)
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-9611-G DRIER SHELL AND (2) RC-4864-HH CORES	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-9611-G DRIER SHELL AND (2) RC-4864-HH CORES	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
(2) RC-4864-HH CORES	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-9611-G DRIER SHELL AND (2) RC-4864-HH CORES	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-9611-G DRIER SHELL AND (2) RC-4864-HH CORES	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-967 DRIER SHELL AND (2) RC-4864-HH CORES.	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED
* SPORLAN C-969 DRIER SHELL AND (2) RC-4864-HH	(2) SPORLAN RC-4864 (MINERAL OIL) OR RCW-48 (POE OIL)	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED

NOTE 2 - An asterisk (*) indicates a replaceable Core Drier Shell of the type indicated "may" need to be installed to replace the sealed type drier. Check the equipment to verify the drier type installed.