

LAS SOLUCIONES DE

# FIRI<sup>3</sup> oil system

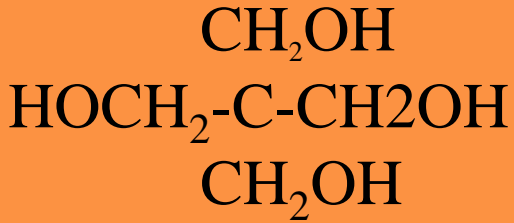


Castellana de Suministros Frigoríficos, S.A.



GALERÍA DE INNOVACIÓN 2005  
PRODUCTO DESTACADO

# POE LUBRICANTS STRUCTURE

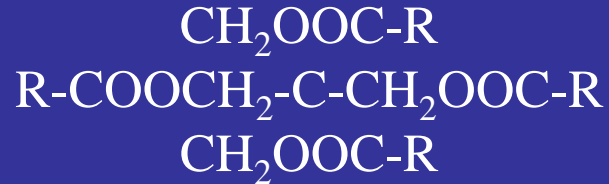


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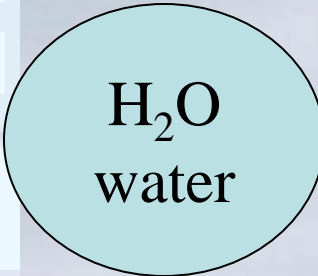
Pentaeritrithyl

POLIESTER



↑ This is a REVERESIBLE reaction, so it is totally necessary to avoid the contact between the lubricant and the water.

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# CLEANING CRONOLOGY

DATES & METHODS	NEEDS		
	A	A+B	A+B+C
UNTIL 1995	R-11 RECIRCULATION	NO NEED	NO NEED
1995 ÷ 2000	R-141b RECIRCULATION	* RINSES POE WITH CFC * KIMICLEANER/AKA FORCE II	THE NEED APPEARS SLOWLY
2000 ÷ 2005	* R-11 y R-141b no legal * RINSES * KIMICLEANER/AKA FORCE II	* R-11 y R-141b no legal * RINSES * KIMICLEANER/AKA FORCE II	* R-11 y R-141b no legal * RINSES * KIMICLEANER/AKA FORCE II
2005	FRI <sub>3</sub> OIL SYSTEM SOLVES IT PERFECTLY		



A.- Acids, water, oil cleaning  
 B.- retrofitting MO > POE  
 C.- Pipe break, air damages oil in the circuit



## DEFINITION

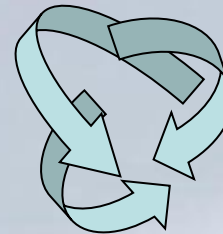
It is a system based on a reFRIGerating machine, designed by reFRIGerating Engineers, to clean oils from applications of reFRIGeration and A/C which have halocarbon refrigerants. It is totally automatic and it is also valid for Reclaiming and Recycling all those refrigerant gases with a quality of 150/200 ppm of oil.

# FRI<sub>3</sub> OIL SYSTEM “SOLUTIONS”

- 1
- **TECHNICAL :**
    - COMPRESSORS BURN OUTS
    - RETROFITTING MO > POE
    - NEW INSTAL WITH AIR CONTAMINATED POE
    - PREVENTIVE MAINTENANCE



- 2
- **ENVIROMENTAL:**
    - PEOPLE
      - ENVIRONMENTALLY FRIENDLY
      - GLOBAL SOLUTION FOR TOXIC WASTE
    - LAWS
      - REFRIGERANTS RECOVERY & RECYCLING
      - EQUIPMENTS RECYCLING
      - EASE OF REMOVAL OF RESIDUES

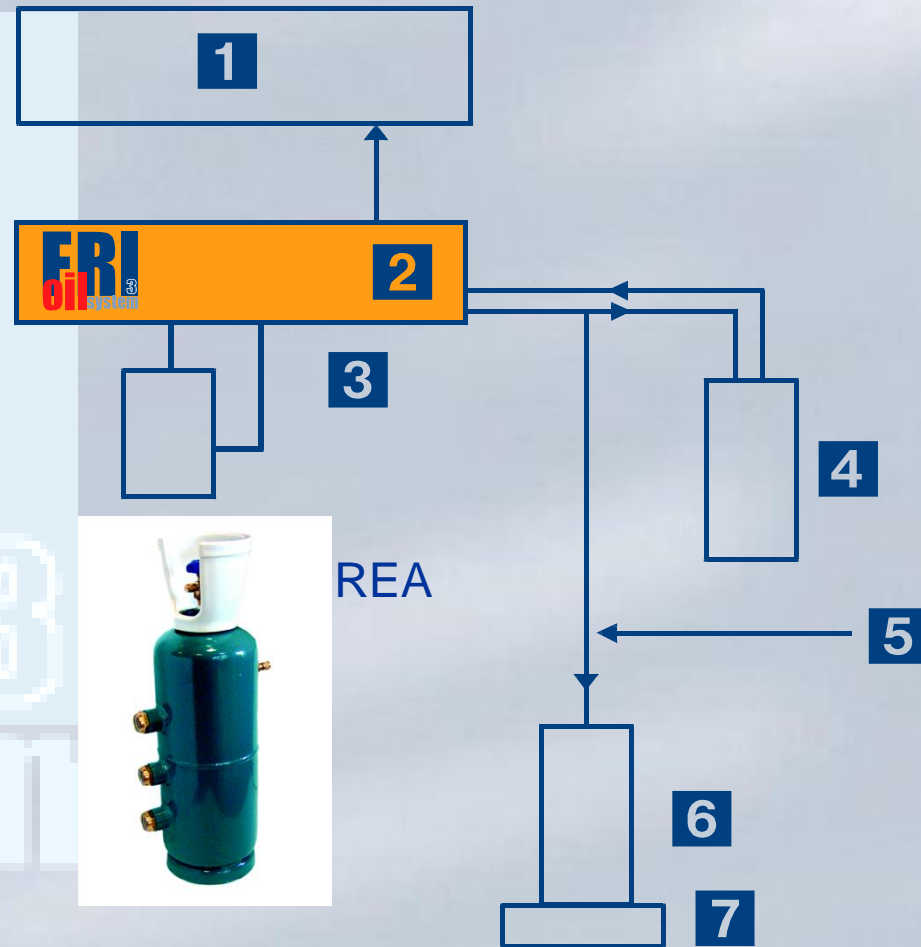


- 3
- **ECONOMIC:**
    - REUSE OF REFRIGERANTS
    - AVOID DISPOSAL OF REFRIGERANTS
    - NO NEED TO BUY NEW REFRIGERANT



System.

1. Contaminated system.
2. Main machine.
3. Outside portable oil receiver.(REA)
4. Refrigerant cylinder.
5. Case of reclaiming.
6. Recovery cylinder.
7. Scales.



# BASE PRINCIPLES OF THE CLEANING SYSTEM

- 1.- MISCIBILITY/SOLUBILITY
- 2.- DENSITIES DECANTATION
- 3.- LIQUIDS SEPARATION BY EVAPORATION OF THE REFRIGERANT

# 1.- MISCIBILITY/SOLUBILITY

TAKE ADVANTAGE OF THE MISCIBILITY/SOLUBILITY

LIQ (REF) / LIQ OIL+ ACIDS+ DISOLVED SOLIDS

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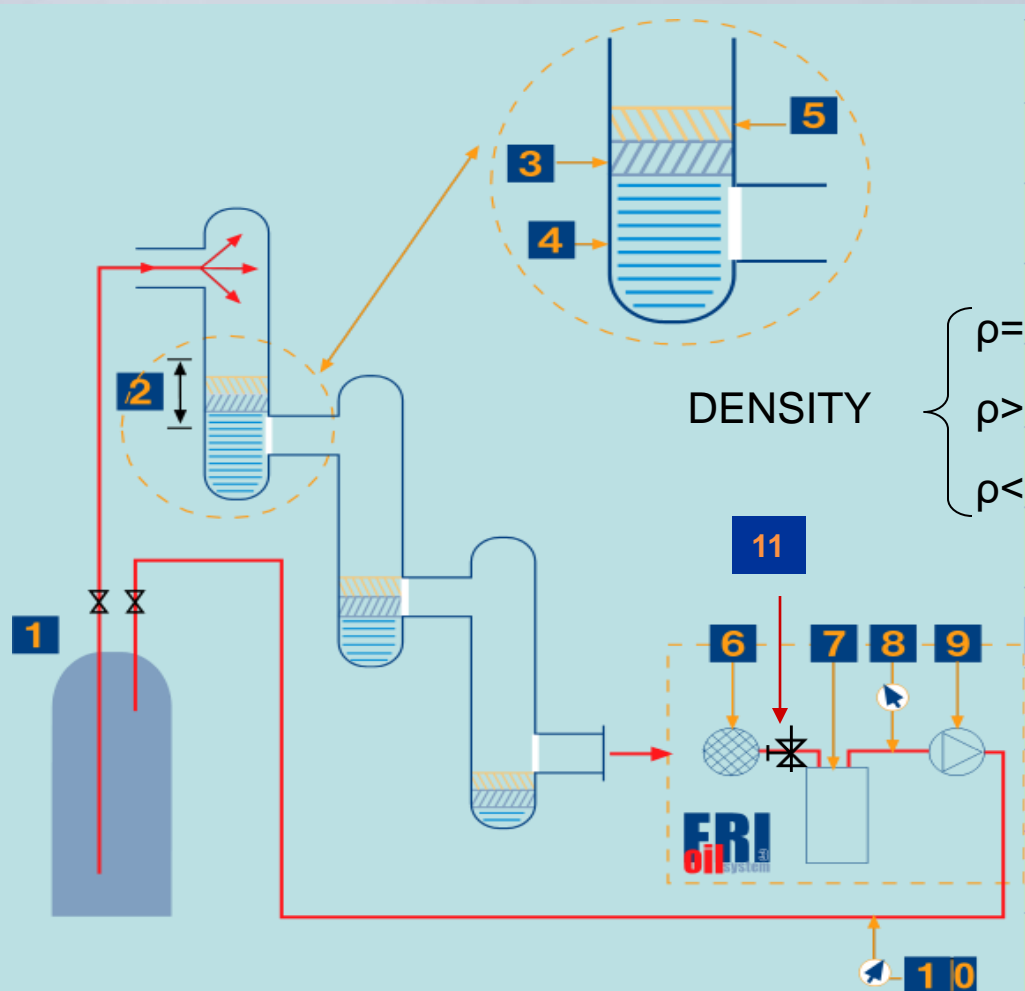
VAPOUR REF / LIQ OIL + ACIDS+ DISOLVED SOLIDS

TO REMOVE THE OIL FROM THE CONTAMINATED CIRCUIT, WE USE THE REFRIGERANT OF THE INSTALLATION OR A HCFC REFRIGERANT WHICH IS MISCIBLE AND SOLUBLE WITH ALL OILS

THE OIL (LIQ) IS MISCIBLE WITH THE ACID, THAT GOES OUT MIXED WITH IT.

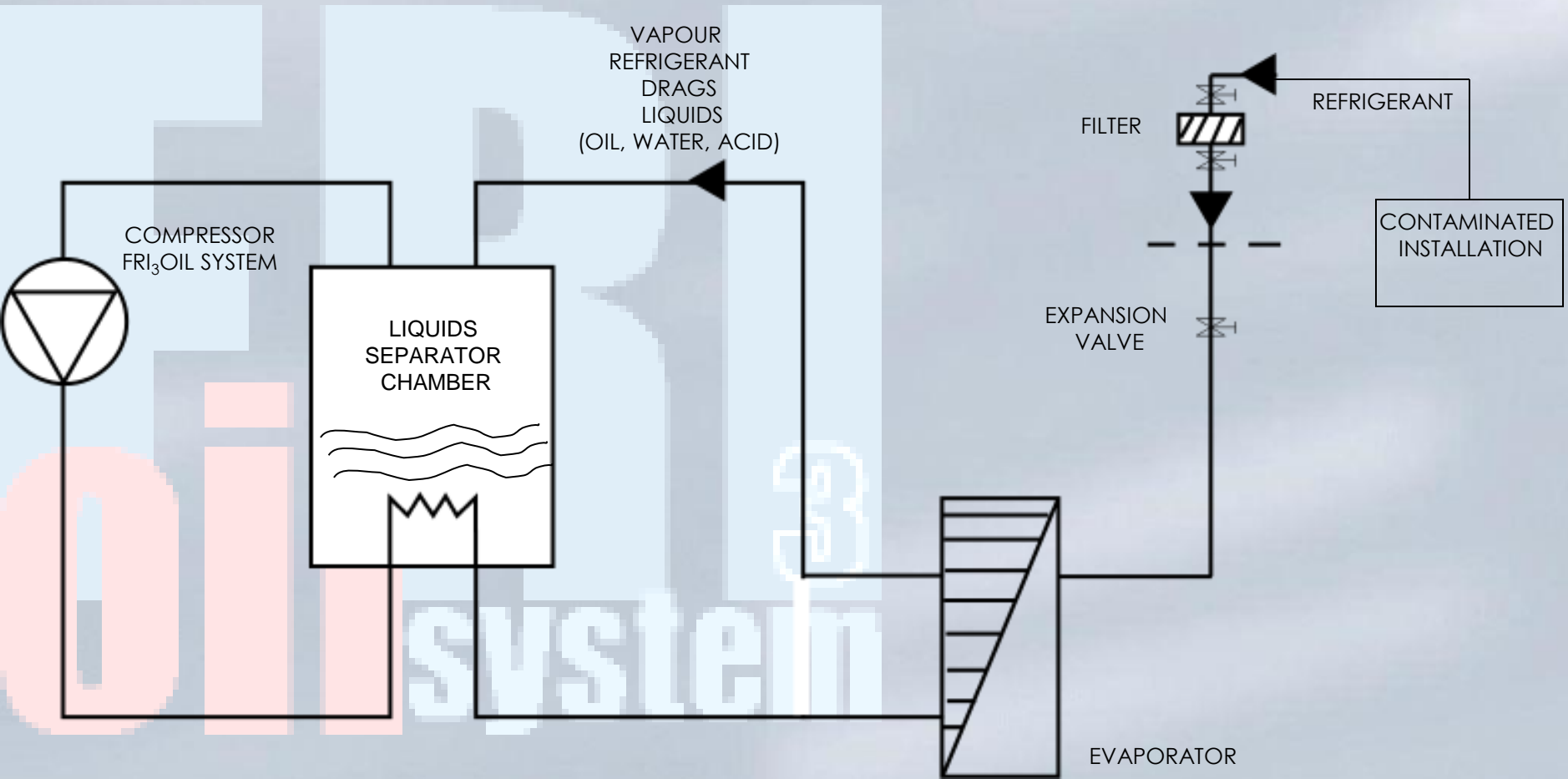


## 2.- DECANTATION OF DENSITIES

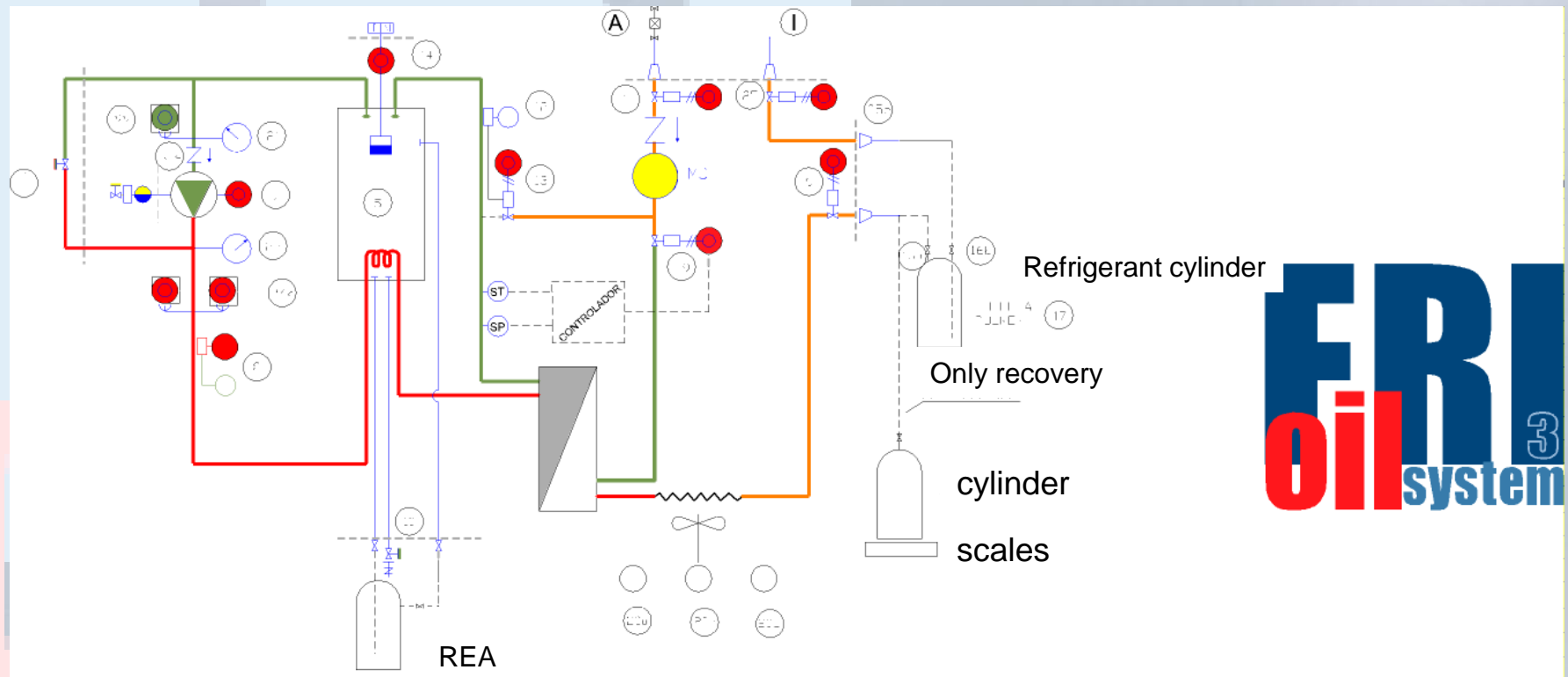


1. Refrigerant cylinder.
2. Up/Down.
3. Water.
4. Liquid Refrigerant.
5. Oil+Acids+Suspended Solids.
6. Sight Glass.
7. Liquids Separator trap.
8. Suction pressure.
9. Compressor.
10. Discharge pressure.
11. Expansion Device.

# 3.- LIQUIDS SEPARATION BY EVAPORATION OF REFRIGERANTS



# PRINCIPLE DIAGRAM FRI<sub>3</sub> OIL SYSTEM V.E.A.3.



**FRI<sub>3</sub>**  
**Oil** system

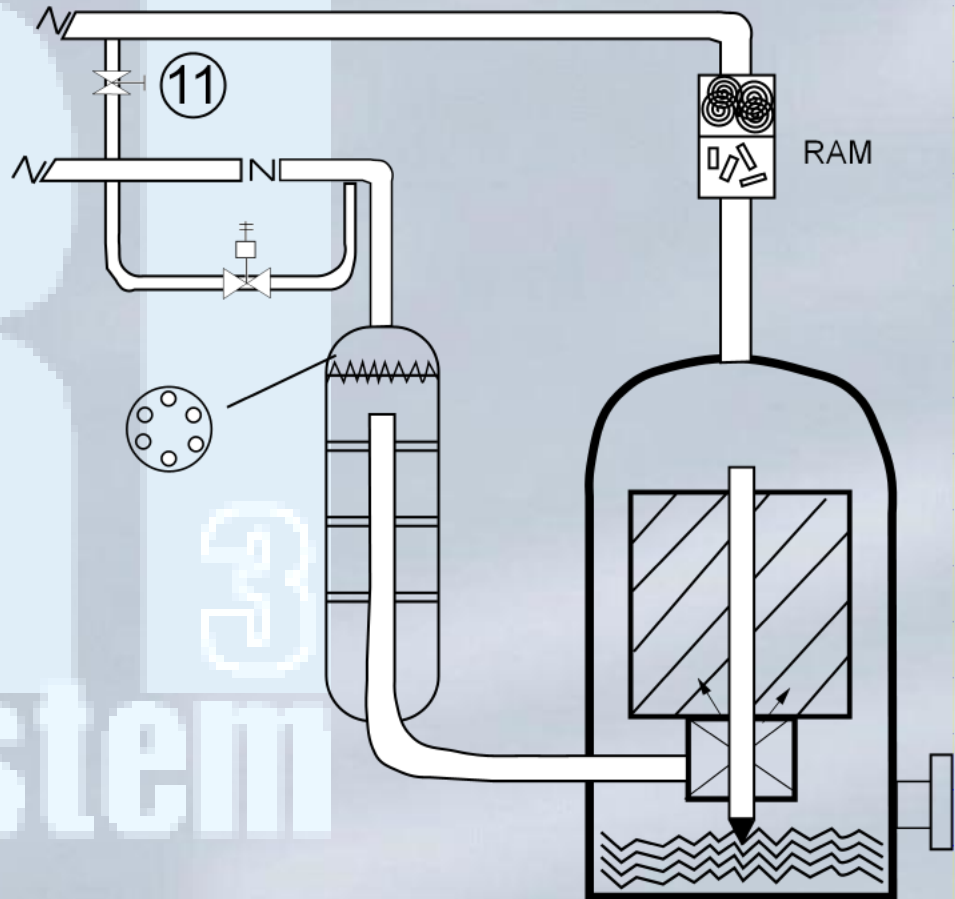
**FRI<sub>3</sub>**  
**Oil** system

**SF**  
castellana

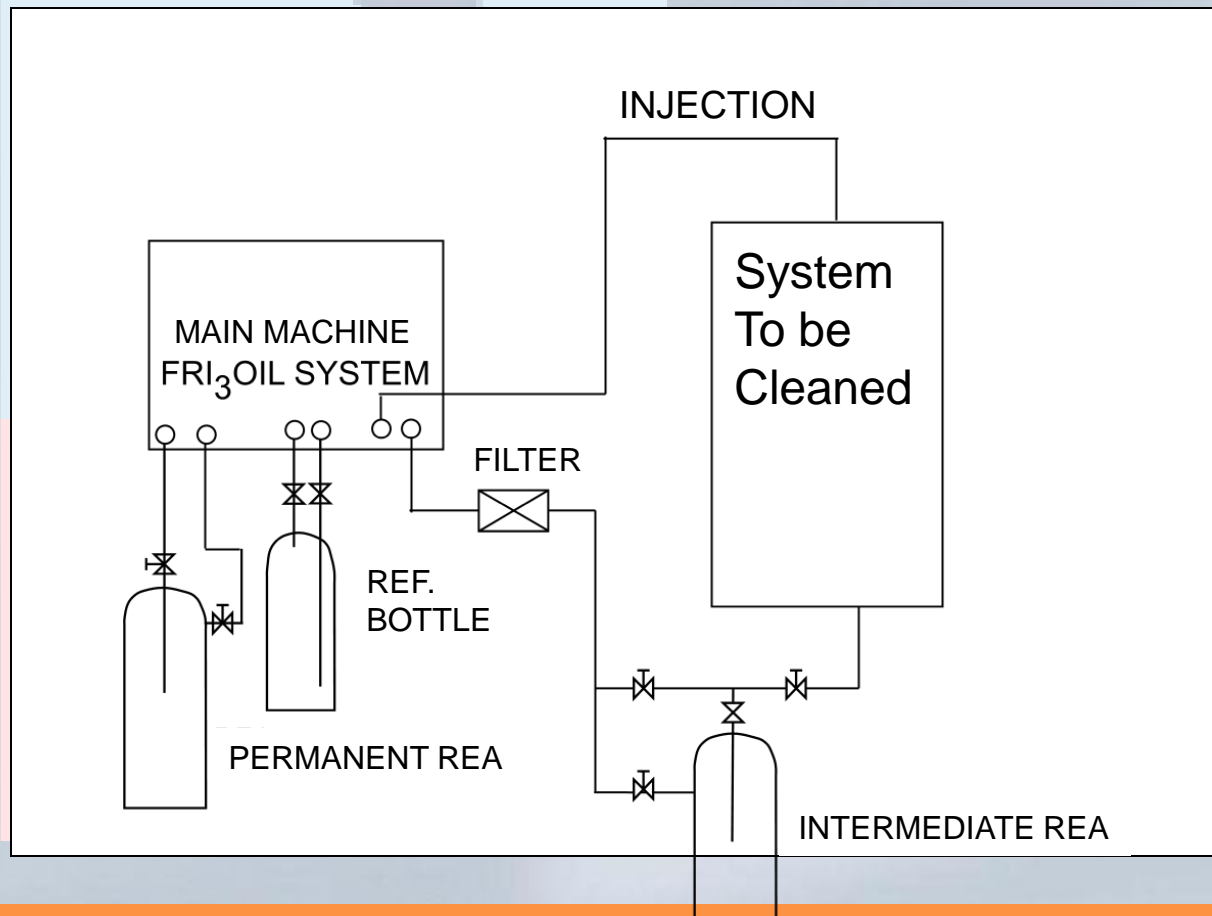
# AUTOMATIC PROTECTION FOR THE EXIT OF OIL AND DISCHARGE START

RE-START 30"  
STOP COMPRESSOR

PRE-START 120"  
START COMPRESSOR



# INTERMEDIATE “REA” USE, SPECIAL RECOMENDATION FOR BREAKDOWNS WITH WATER



WHY



IS AN INNOVATION?

- FIRST TIME A COMPLETELY AUTOMATIC MACHINE IS USED TO CLEAN OIL IN A REFRIGERATED SYSTEM, WITH AN AUTOMATON AND A TOUCH SCREEN
  - FIRST TIME THAT ONE ONLY EXPANSION VALVE IS USED IN THE SAME MACHINE FOR ALL HALOCARBON REFRIEGERANTS
  - FIRST TIME A ROTARY COMPRESSOR IS SUBCOOLED FROM OUTSIDE, WITH THE EXPANDED LIQUID, IN ORDER TO STOP ITS DISCHARGE TEMPERATURE, OBTAINING AN ALMOST UNLIMITED PERFORMANCE
- RESUME:
- CLEANING SYSTEM FOR ALL HALOCARBON REFRIGERANTS.
  - COMPLETELY AUTOMATIC



BESIDES...

- VALID MACHINE FOR:
  - REFRIGERANTS TRANSFER
  - RECOVERY & RECYCLING

## PERFORMANCE

### LIQUID PHASE TRANSFER

	refrigerants	$\pm 5\%$ (kg/h)
MP	R-401a R-134a	70
HP	R-22 R-404A R-407C	115
VHP	R-410a	135

# FRI<sub>3</sub>OIL SYSTEM V.E.A.2.



**CHARACTERISTICS:**

- CE MARKED
- 220 V      I                      50Hz                      1800W
- WEITH: 60Kg      - PORTABLE.

- GENERAL SIZES (mm):
- 660 WIDE
- 400 DEEP
- 630 HIGH

MAT. BOX: INOX STEEL  
 TRANSFER.....  
 LIQUID PHASE TRANSFER

MP	R-401-A R-134-a	70kg
HP	R-22 R-404-A R-407-C	115kg
VHP	R-410-A	135kg

