PASKALS
Advanced Fluid Systems

REFREGERANT /HALONS DECANTING, RECHARGING SYSTEM

"A MUST HAVE FOR WASTE GAS RECOVERY & RECHARGING PROCESS"

Refrigerants such as R-134a and other HFC are used as a cooling medium in appliances such as Domestic and Automotive Air Conditioners, Refrigerators, Chillers, Deep Freezers.

This Refrigerant is transferred in to liquid form in the Gas compressors but because of its Variant Physical Characteristics with Temperature and Pressure these refrigerants are not completely filled in the compressors and they remained as vapors in the supply tank and would cost a substantial amount to the OEMS as Wastage.

The Refrigerant Decanting/Recovery and recharging system is a HIGH PRESSURE facility for recovery and refilling of refrigerant in the main filling line.

"Due to their legendary quality & reliability under the toughest worldwide conditions combined with excellent price quality ratio the compact line high pressure products from Paskals are able to achieve more than 99% of the Refrigerant's, Halons and other Costly Gases ."

IN TECHNICAL COLLABORATION WITH

Haskel
MILTON ROY

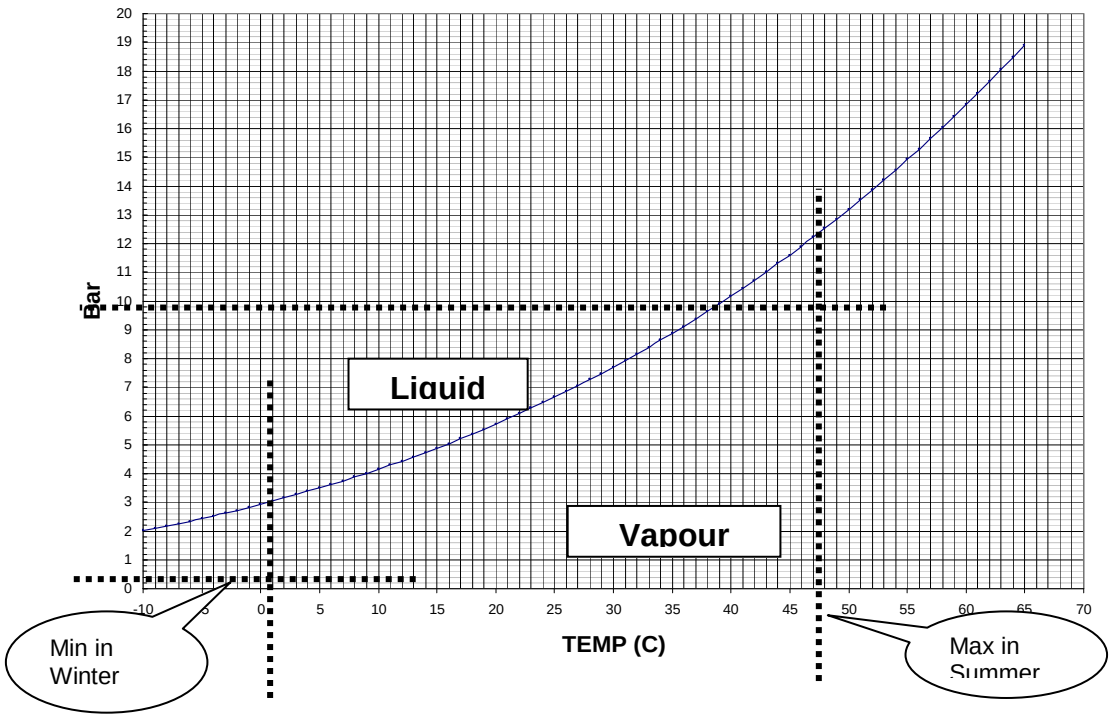
SYSTEM DETAILS

TECHNOLOGY USED

The basic problem at Production/Gas Filling site was to do with the physical properties of the gas (susceptibility to high variation in annual temp which made large amount of the gas to go into vapor state) and the inability of the current recovery system to deal with vapor state of the gas. The Pressure / Temp Vapor Curve of R 134a Refrigerant is given below. A new system had to not only decant the supply tank to near vacuum but also pressurize it in a sufficiently large recovery tank approx. to the range of 4.5 to 12.5 bar to meet the annual variation in temp. A tank unduly pressurized in winter may exceed permissible pressure and burst the tank in summer and hence the working pressure in the recovery tank had to be controlled on a day to day basis.

Low Pressure Refrigerant Vapors is recovered using Air Driven Gas Booster from Haskel USA (www.haskel.com) up to 12-13 bar and the Liquid is again pressurized at a Pressure of 16 bar using HASKEL USA Make AIR DRIVEN PUMP

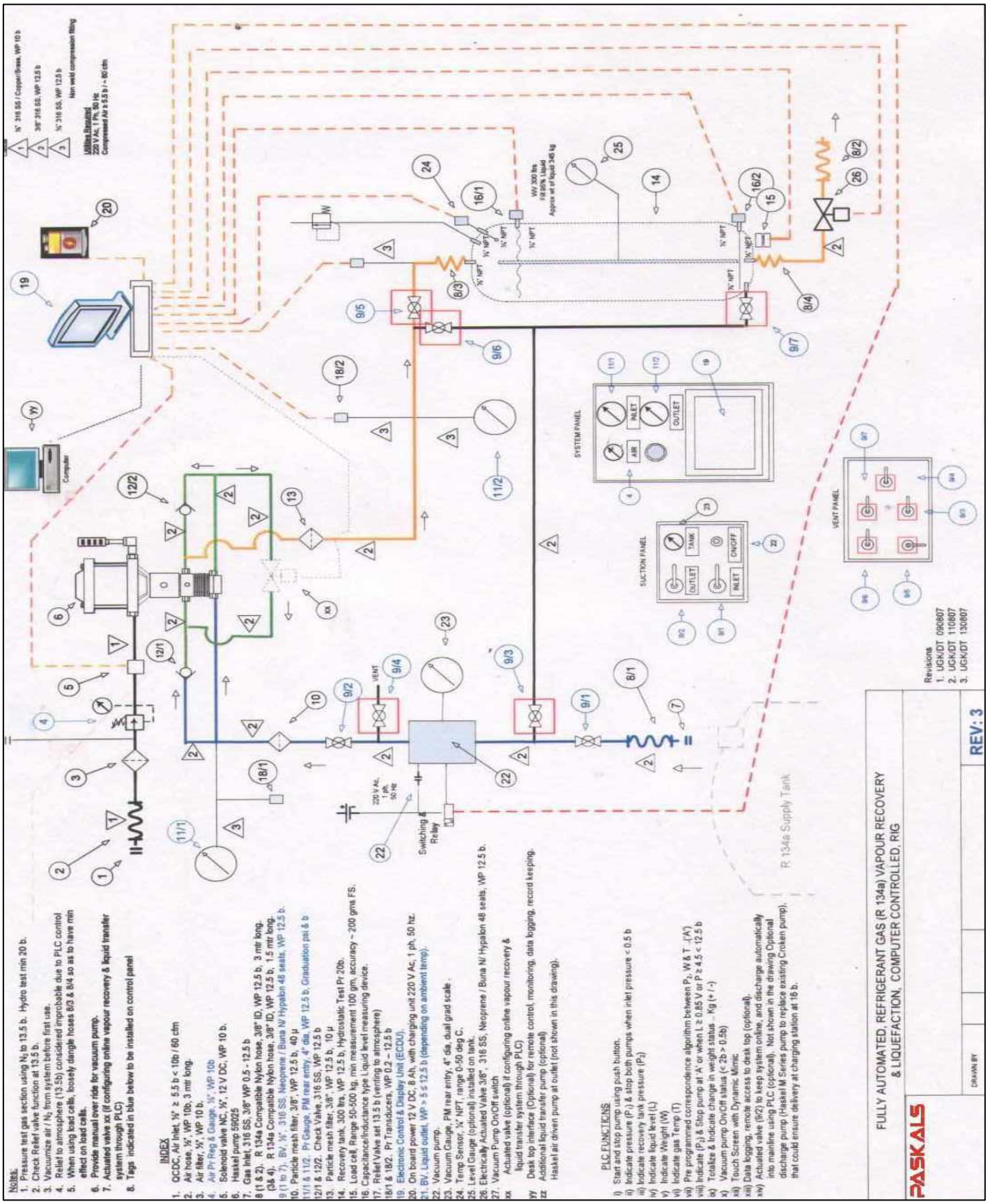
R 134a VAPOUR PT CURVE



SYSTEM SPECIFICATIONS

S.No.	Characteristic	Value of Characteristic
1	Air Drive Pressure	5-6 bar
2	Air Consumption	40-50 scfm
3	R-134a Tank specs	Gross wt :1315 Kg, Gas wt:798 Kg
4	Maximum Recovery	>99%
5	Maximum Recovery Pressure and Storage	>12 bar ,WC 300 Liters
6	Maximum Supply Pressure	>16 bar

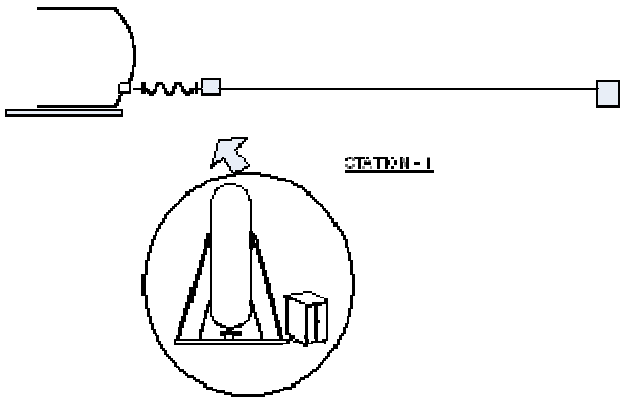
SYSTEM DETAILS



SYSTEM DETAILS

The complete system is divided in three parts

Plug & Play: A skid mounted new system with approx. foot print 12 sq. mtrs that can currently plug into the existing system by the simple insertion of a 'Tee Joint" in the existing piping.



Complete Evacuation of Gas: Using an electrical vacuum pump and a compressed air driven pressure pump, in series, > 99% evacuation of gas is feasible, to almost vacuum, irrespective of the annual variation of temp and pressure. This is done automatically by computer controlled sensors and an Embedded Processor using Pr/Temp vapors pressure characteristic algorithm of R134a. The user interface will be through a large color TFT touch screen that would have a dynamic mimic of the system. The system will not only recover the waste gas (there by accruing savings of about INR 60-70 lks / recovery station/annually), but could also provide an on line method for automation and control which is not there in the current facility.

Automation & Control: The automation and control, basically involves monitoring the weight of the gas, its pressure, temp etc. to facilitate the following.

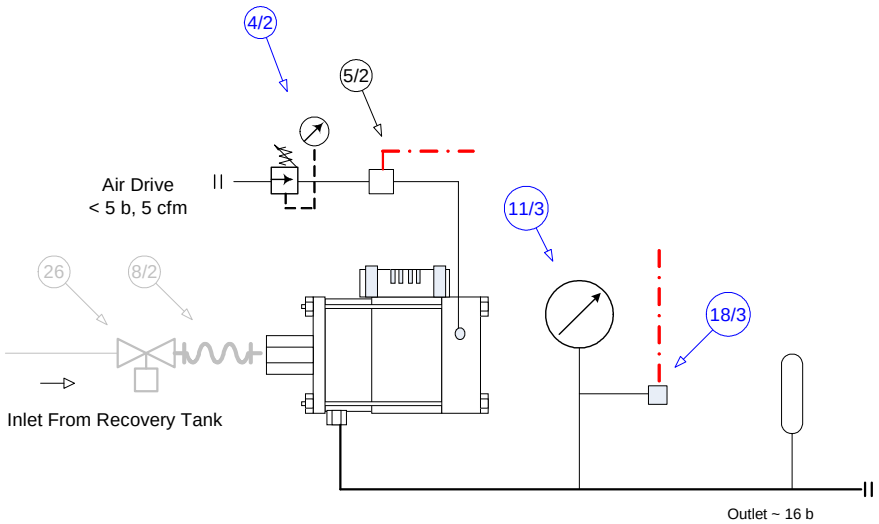
- Automatic indication and control of the pumping sequence involving a vacuum and pressure pump in series. The vacuum pump is brought on line only when the inlet is low and outlet pressure of the pressure pump is high (complete evacuation of the supply tank).
- Indication and control of the pressure and temp in the recovery tank between 4.5 to 12.5 bar to cater to annual variation of temperature to keep the R134a in the recovery tank in liquid form.
- Indication and accounting of the weight of the gas that is recovered either by means of the weight or flow control (by weight if the equipment is stand alone and by flow

SYSTEM DETAILS

- If the equipment is to be kept on line). It may also be possible to utilize the existing signal from the weighbridge.
- Audio visual warning to indicate when the tank is empty and needs replacement.
- Touch screen with mimics to indicate the process and make the controls user friendly to a semi-skilled technician.

OTHER FEATURES*

Delivery Pump System (Optional): For placing the recovery module described above, "Online" with current process, we also offer as optional equipment, a second Haskel air driven M pump at the outlet of the recovery module above, controlled by the same controls described above. This feature is to facilitate replacement of the existing downstream corken transfer pump that in our opinion is redundant. The proposed Haskel delivery pump would take the R 143a in liquid form and deliver to vehicle charging station (~ 150 mtrs distance) at constant pressure @ approx. 16 b or pressure specified by Maruti.



Remote Control & Monitoring station (Optional). By means of Ethernet, we could offer as optional equipment, Remote Desk Top Control for purpose of remote monitoring, data logging, record keeping etc. This would help the supervisor to instantly and actively monitor the refrigerant station from his work station without having to go all the way there.

*Please consult Factory for further Information.