

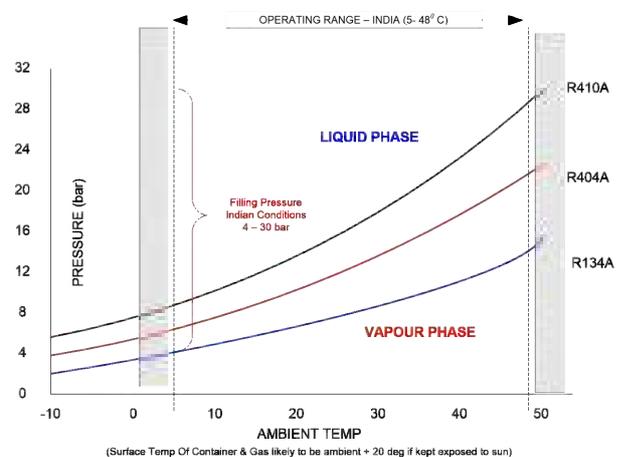
REFRIGERANT GAS R 134 a, R 23 & R 410

AUTOMATED GAS TRANSFER SYSTEMS

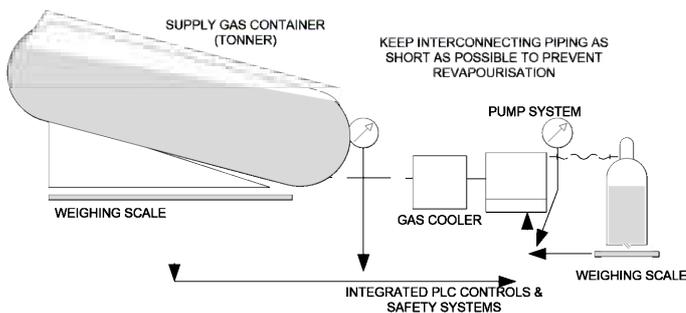
New range of environmentally friendly refrigerant gases, that conform to the "Montreal Protocol" are becoming increasingly common and have replaced the old CFC variety of gases in the "Refrigeration" & "Air-conditioning" as well as Automobile Industries in India. R 134A, R 23 and R 410A are some examples of the new range of gases. Such gases are also sometimes used for foaming (blowing agents to produce foam or insulation materials), as cleaning agents, in aerosol cans etc. The physical properties (behaviour under differing temp and pressure conditions) of these new range of gases are considerably different from the earlier CFC type gases. From the point of view of operational safety, process efficacy and cost effective operations, it is very necessary for the operating personnel who handle these gases to be familiar with the physical characteristics of these gases, viz Indian atmospheric conditions.

Like LPG, these type of gases are usually filled in containers (or cylinders) in liquid form, since the liquid density (weight / volume) is almost 280 times that of the gas density. Therefore, if or when allowed to expand from liquid to gas, the transformation is almost 280 times (reverse when converting gas to liquid). The main feature of the physical property, which determines whether the gas is in liquid or gas (vapour) form is its temperature and pressure. See graph along side. In summer, to get the vapour (gas) to turn liquid one may have to exert considerable amount of pressure. While filling cylinders, it is therefore necessary to monitor the gas temp at the pump inlet, the outlet pressure, and also the cylinder weight. Cooler the inlet gas, easier it is to fill the cylinder. If there is an increment in outlet pressure without corresponding increment in cylinder weight, it is an indication that the pump is transferring vapour (gas). If there is large increment in weight, without corresponding increment in pressure, it is an indication that the physical state of transfer, and the state within the cylinder, is in liquid form. It is also necessary to prevent excess charge inside the cylinder to prevent a burst situation. All the above aspects, which have a direct bearing to the safety and operational efficacy, necessitates high levels of skill,

VAPOUR CURVE (DuPont Gases)



REFRIGERANT TRANSFER SYSTEM



knowledge and attentiveness of the operator. Therefore a PLC automated system is the recommended solution. From turn key projects involving fully computerised systems to simple mechanical transfer devices, we have several customised and indigenous solutions for handling Refrigerant Gas (see reverse side). These solutions address several type of refrigerant gases (R134a, 407c and 410a etc) in liquid as well as vapour state under the excessive diurnal variations of Indian climatic conditions. Please discuss your requirements and project with our application engineers to find customised cost effective solutions for you.

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Gem Pressure Systems (India) Pvt.Ltd

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MULTIPLE OPTIONS

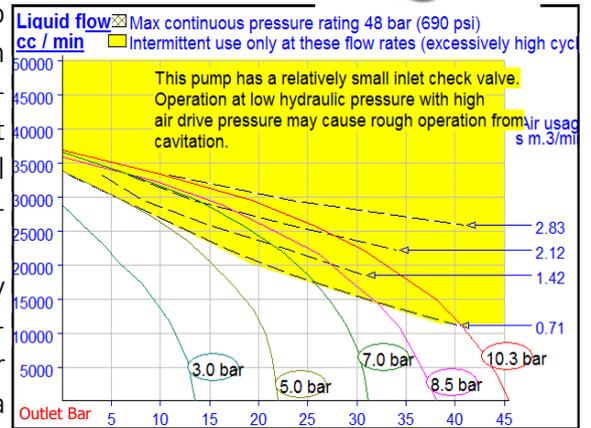


Simple Mechanical Pump System :

Model : 20002

This simple, light weight, robust, all mechanical, refrigerant gas transfer pump system comprises of a compressed air driven, specially modified and custom adapted pump, with FRL and manual speed control, manually adjustable relief valve to prevent over pressure, 7 micron filter, outlet control and vent valve, inlet and outlet pressure gauges, all of it packaged into a ruggedized roll bar frame that can easily be transported, moved about or grouted down permanently.

This simple mechanical model is not suitable for repetitive production activity and requires high operator skill to manually control the filling pressure, specially under high ambient temp conditions. Most suitable for on site gas transfer applications with low transfer rate requirement. The system is piped with a switching valve to facilitate slow vapour recovery.



Pressure Compensated Pump System :

Model : 20002-1

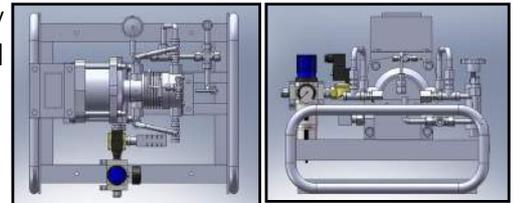
In addition to all the system components indicated above, this variant of the base model has a "Pressure Compensating Device" (Transducers with PLC control and warning) to provide automatic shutoff of the pump system at pre-set pressure. The pressure to be set on day to day basis according to a PT Vapour Curve algorithm to be supplied by us. This is a highly user friendly device that can be operated by semiskilled labour and used for rapid filling of cylinders (production line).



Pressure & Temp Compensated Pump System, With Dual Weighing Scale :

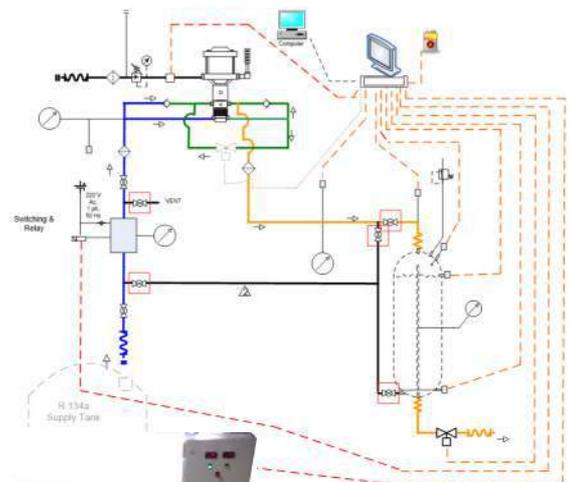
Model : 20002-3

In addition to all the system components indicated above, this completely automated system has both Pressure & Temp Compensating Devices (Transducers and RTD at inlet outlet with PLC control and warning as also a HMI Touch Screen that has process mimics and data logging outlet). to provide automatic shutoff of the pump system at preset inlet & outlet pressure. The system will be pre programmed with PT Vapour Curve algorithm to automatically compensate for diurnal variation of temp and adjust filling pressure. This totally user friendly device does not require any operator skill for rapid filling of cylinders (production line).

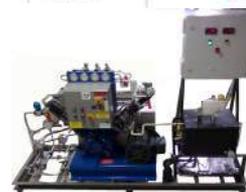


Customised & Fully Automatic Systems For Production Line Activity. Air Conditioning Equipment On Automobiles / Refrigeration & Air Conditioning Equipment.

These are complex, fully automated and comprehensive systems with warning and controls to decant 'Tonners' and meter exact quantity of the refrigerant gas, by weight, into air conditioning equipment of automobiles or refrigeration / air conditioning equipment on a rapidly moving production line. The are custom built to customer requirements and catering to ambient conditions at site. Please discuss your requirements with our application engineers.



Electrical Non Lubricated Oil Free Rix Compressors Besides the above, we can do all that and more using electrically driven, non lubricated Rix compressors.



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