

## HANSEN TECHNOLOGIES CORPORATION



40" LEVEL TRANSDUCER PROBE: VLT.04

### INTRODUCTION

Hansen **Techni-Level®** level transducer probes have fast become the industry standard for liquid refrigerant level control and monitoring. These reliable, well engineered electronic level transducer probes when properly used operate trouble-free and are not affected by reasonable changes in refrigerant temperature or pressure. They provide a computer compatible 4-20 mA (milliamperes) output signal proportional to liquid level. Probes consist of a compact, electronic transmitter in a watertight housing assembled on top of a rugged, capacitance type level sensor. Probe active lengths up to 125" are available. Normally, the probe must be inside a level column.

### APPLICATIONS

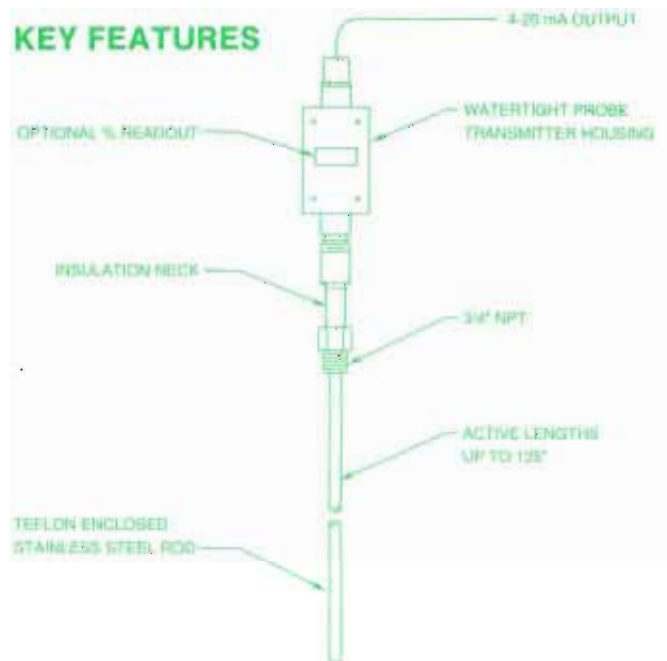
Vertical vessels  
Horizontal vessels  
Pump accumulators  
Pilot receivers  
Refrigerant loss monitoring

## Specifications, Applications, Service Instructions & Parts

### VLT 4-20 mA Techni-Level® LEVEL TRANSDUCER PROBES

for use in 4-20 mA control loops  
for refrigerant level control  
and monitoring

### KEY FEATURES



### FEATURES

Specifically designed for refrigeration systems  
Compact, complete solid-state transmitter and housing are located on top of probe sensor  
Computer compatible, two wire 4-20 mA signal  
Connectable to plant computer, PLC or other controlling device  
Electrically isolated output  
Rugged probe sensor design, 3/4" MPT fitting  
Suitable for ammonia, R22, R502, R12  
Active probe lengths up to 125"  
Remote display of level possible  
Level columns are available

## SPECIFICATIONS

Signal Output: 2 wire 4-20 mA, isolated  
 Input Power: 12 to 36 volt D.C., regulated,  
 to be available at the probe  
 Maximum Load Resistance: 1200 ohms  
 Classification: transmitter type/class 2U ANSI/ISA-S50.1  
 Enclosure: NEMA 4, watertight  
 Probe Sensor Fitting: 3/4" MPT  
 Standard Lengths: 20", 30", 40", 60", 80", 100", 120"  
 Custom Lengths: Up to 125"  
 Operating Temperature:  
 Transmitter: -20F° to 120F° ambient  
 Sensor: -60F° to 150F°  
 Max. Working Pressure: 360 PSIG  
 \*Low temperature application may require thermal  
 extension for probe transmitter; contact factory.

### Optional Level Column

Body: 3" Schedule 40 pipe  
 Sight Glass: Located at 50% level standard  
 (other levels to order)  
 Max. Working Pressure: 360 PSIG  
 Operating Temperature: -60F to 150F

## ADVANTAGES

These probes come factory pre-calibrated and tested on a refrigeration system. They have internal dampening to avert false alarms triggered by normal turbulence and splashing of refrigerant. The optional digital readout enables the plant operator to easily know the refrigerant level at a glance. The 4-20 mA signal is commonly used with computers, programmable controllers, and other accessories; it can also be easily converted to a 1 to 5 volt or 2 to 10 volt signal.

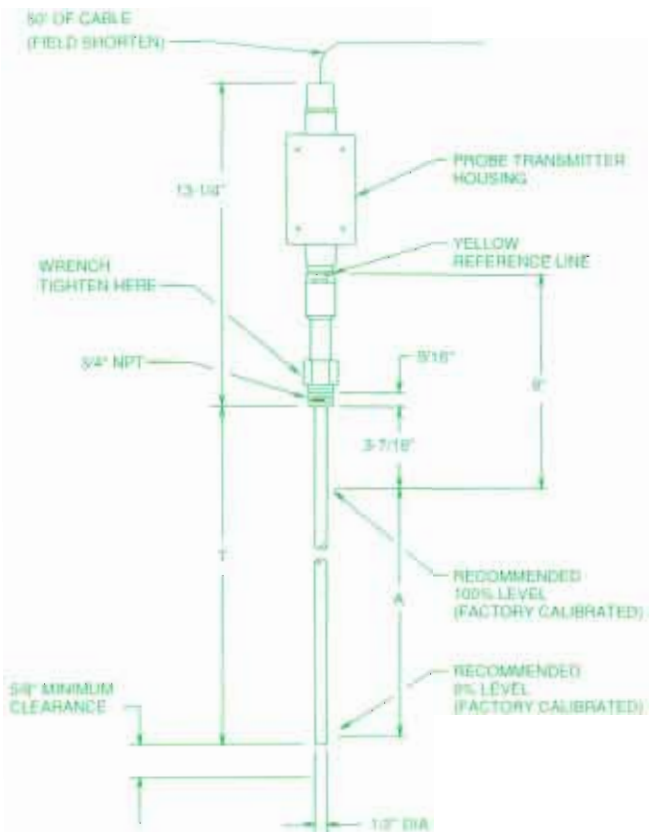
## INSTALLATION

Level columns are required in applications where refrigerant evaporation occurs within the vessel being monitored; such as flooded evaporators, low side vessels or accumulators. Using a level column separates the probe sensor from the boiling which occurs in the vessel. Therefore, refrigerant liquid level is being measured, not surges of bubbling liquid. When refrigerant temperature is lower than ambient, insulating the level column is strongly recommended.

When installing **Techni-Level**® probes adequate room should be provided above the 3/4" FPT opening on the column. If overhead space is not available, a level column with flanged connections and shut-off valves may be used. Equalizer lines and valves should be positioned as shown in the Level Column Piping Installation diagram on page 3. It is recommended that a high level float switch cut-out be installed whenever practical. This provides a non-adjustable safety in case of an accidental incorrect high level setting or failure of the high level control relay or interface device.

Remove probe from packing crate, being careful not to bend the probe sensor and insert into the opening of the level column. Tighten probe on hex, do not grip probe transmitter housing. Pressure test for leaks. Connect probe transmitter to control loop wiring per Wiring diagram on page 3. Fifty feet of 2-wire twisted pair cable is supplied with probe; greater lengths possible.

## PROBE DIMENSIONS



A (Active Length)	20"	30"	40"	60"	80"	100"	120"
T (Insertion Length)	24 1/2"	34 1/2"	44 1/2"	64 1/2"	84 1/2"	105"	125"

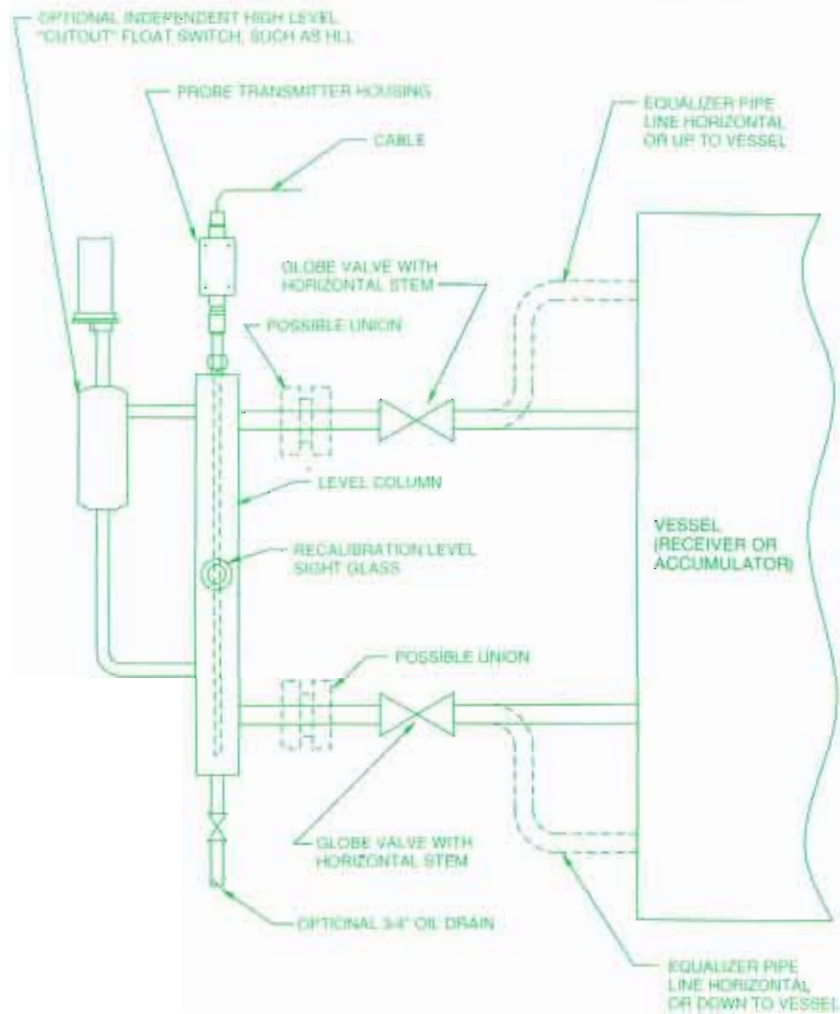
## OPTIONAL DIGITAL READOUT

Transducer probes can be factory fitted with an internal LCD digital readout. This readout is visible through a clear window in the cover of the watertight probe transmitter housing. It is internally powered and displays percentage of immersed probe active length. Ambient temperature range for the LCD readout is 32F to 120F. Specify the DR suffix when ordering probe; Example: catalog number VLTDR.02.

## REMOTE DISPLAY

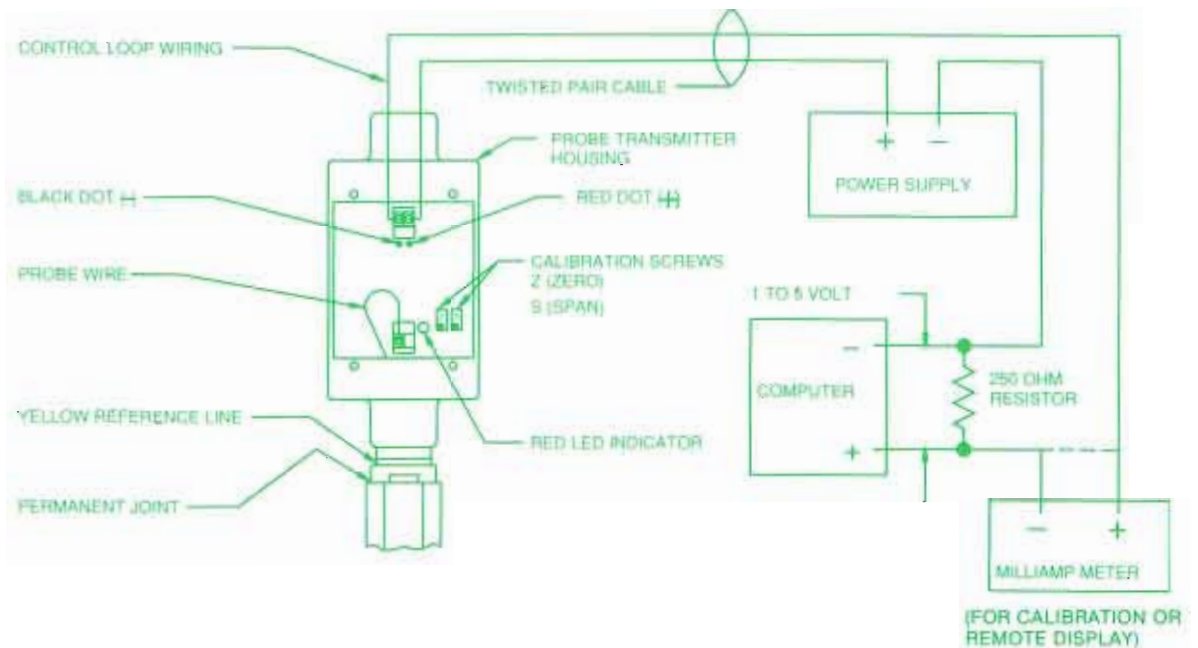
A milliamper meter may be inserted in series with the 4-20 mA control loop to facilitate localized indication of the liquid level. (See Wiring diagram on page 3). This may be an analog milliamper meter or comparable component, such as a digital process meter. Process meters can typically be calibrated to display the percentage of immersed probe active length. A pre-packaged, pre-calibrated, loop powered digital process meter in a NEMA 4 watertight enclosure is available; contact factory.

## LEVEL COLUMN PIPING INSTALLATION



ALLOW SPACE FOR INSULATION WHERE AND AS NECESSARY. USUALLY THE LEVEL COLUMN IS INSULATED TO REDUCE BUBBLING.

## WIRING (TYPICAL)



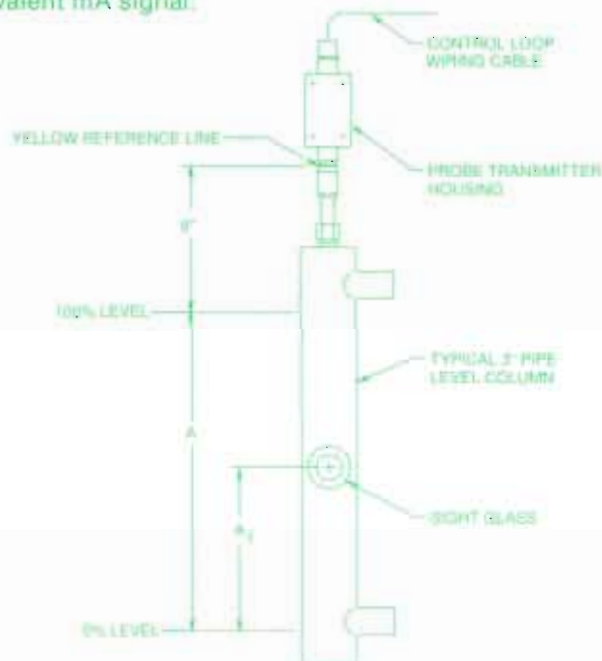
## RE-CALIBRATION

**Techni-Level®** level transducer probes are factory pre-calibrated to a 3" level column with the specified refrigerant. Probes installed in various other applications may require slight adjustment in calibration settings.

To re-calibrate probes not having the optional digital readout, a milliamper meter installed in series with the 4-20 mA control loop may be needed for the re-calibration procedure. See Wiring diagram on page 3. **Be aware that disconnecting the control loop wire to install a meter disables the probe.** Note that the computer or other controlling device will not be able to detect the refrigerant level while the control loop is disconnected. Take the necessary precautions to protect the compressor and all other equipment which relies on the probe signal.

Remove all liquid refrigerant from the level column or lower it to a level equal to 0%. Adjust the Z (zero) calibration screw slowly until the digital readout displays 0% or a milliamper meter reads 4 mA.

Raise the liquid level in the column to the 50% level or some other known level. Hansen standard level columns have a sight glass level at 50%. See diagram below to determine sight glass % level. Adjust the S (span) calibration screw slowly until the digital readout displays 50% or the milliamper meter reads 12 mA. For other levels adjust the S (span) calibration screw until the digital readout displays the equivalent sight glass % level point or a milliamper meter displays the equivalent mA signal.



Typical Normal 0% Level = 9" + Active Length (A) below yellow reference line  
Sight Glass % Level =  $A_1$  divided by Active Length (A)

## WARRANTY

Hansen **Techni-Level®** electronics are guaranteed against defective materials or workmanship for 90 days F.O.B. factory. All other **Techni-Level®** components are guaranteed for one year F.O.B. factory. No consequential damages or field labor is included.

## SAFE OPERATION

Hansen **Techni-Level®** level transducer probes have been designed specifically for refrigeration systems. These instructions and related safety precautions must be completely read and understood before selecting, using or servicing these probes. Only knowledgeable, trained refrigeration mechanics should install, operate or service these probes. Stated temperature and pressure limits should not be exceeded. Probes should not be removed from level columns or vessels unless system has been evacuated to zero pressure. **WARNING:** As with all electronic and mechanical components, there is a limited life expectancy. An expected life of seven to ten years is typical. This should be understood as only a suggested replacement time period. Actual condition and performance of electronics due to ambient conditions, quality of electrical current, voltage, etc. may necessitate a different replacement schedule. Regardless, all mechanical, electrical and electronic components should be inspected at least yearly to ensure their safe and continuous service. It is the responsibility of the installer to add devices (alarms, safety and limit controls, etc.) that protect or warn of any operating control failure. See also Safety Precautions in current List Price Bulletin and Safety Precaution Sheet supplied with product.

## ORDERING INFORMATION, Techni-Level® PROBES AND COLUMNS

Standard Active Probe Length*	Transducer Probe Cat. No.	Standard Level Column Cat. No.
20"	VLT.02	LC.02
30"	VLT.03	LC.03
40"	VLT.04	LC.04
60"	VLT.06	LC.06
80"	VLT.08	LC.08
100"	VLT.10	LC.10
120"	VLT.12	LC.12

\*Custom probe lengths and columns are available.

**TO ORDER:** Specify catalog number, refrigerant, probe active length and whether optional digital readout (DR) or level column is desired. (where possible describe and sketch the application)

## TYPICAL SPECIFICATIONS

"Refrigerant liquid level transducer probes shall have the ability to regulate a computer compatible output signal proportional to the percentage of probe active length immersed in liquid refrigerant, and shall not be affected by reasonable refrigerant temperature or pressure changes. Level transducers shall be **Techni-Level®** level transducer probes as manufactured by Hansen Technologies or approved equal".

## HANSEN TECHNOLOGIES CORPORATION

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