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NIRC2 Vacuum Operations

Introduction

D82 has its own vacuum system complete with automatic controller. The system consists of an electrically operated solenoid valve on which a turbo pump is mounted. The solenoid valve is mounted to the bottom of the D82 vacuum shell along with two full range vacuum gages. The turbo pump is connected to a oil-less roughing pump under D82 by a short length of vacuum line. The turbo pump controller is in a chassis also under D82 along with the auto controller. The turbo pump controller, a Pfeiffer DCU 100, also reads out one of two full range vacuum gages, Pfeiffer PKR 251, which can swapped with the other gage in case of malfunction.

The auto controller is on generator power so it will operate in case of main power failure. It controls and powers all of the D82 vacuum equipment. Pumping from ambient temperature is normally done in automatic mode after closing the plug valve to atmosphere from the back fill tank. Since the temperature is at ambient, the temperature controller will give a high temperature alarm which will activate the controller in automatic mode. In fact, any time the temperature exceeds the high temperature set point of the temperature controller the pumps will automatically come on and only go off after the alarm is reset. If and only if D82 is at ambient pressure, the switch under the red protective cover on the automatic controller chassis should be pushed and held while the controller is switched to auto or on. This opens the solenoid valve and delays the start of the turbo pump. The solenoid valve is opened so that there is not a burst of air into the pump from D82 that could stir up any particulates. The start of the turbo pump is held off for three hours so that the turbo does not over heat while the pressure is well above the pressure at which the turbo can get to full speed. In all cases, if the turbo is not up to speed in five hours, if it falls below speed, or if there is a failure, then the solenoid valve will close and the turbo will shut down. This is a safety feature to prevent air back flowing into the vacuum space, especially when the instrument is at cryogenic temperatures. When D82 is under vacuum, the switch should not be pushed. The allows the turbo to get up to full speed and for a few minutes of pumping before the solenoid valve is open. This keeps air off the cold optical surfaces.

Pfeiffer DCU 100

Operation

Normally no settings have to be made. The pressure is read by pushing the arrow keys to get to parameter 340. See the Pfeiffer Vacuum Operating Instructions for DCU 100

Parameter Settings

These are read and set from the controller front panel. See the Pfeiffer Vacuum Operating Instructions for DCU 100

001	Heating	off	
002	Standby	off	
004	RUTime ctr	on (Controller ON or Auto on)	off (Controller OFF)
010	Pump stat.	on (Controller ON or Auto on)	off (Controller OFF)
023	Motor TMP	on (Controller ON or Auto on)	off (Controller OFF)

024	Conf. Out.		(Not there)
025	OpMode BkP	0	
026	OpMode TMP	0	
027	gas mode	0	
030	Vent mode	1	
301	Oil defec	no	
303	Error code	no Err	
308	Set rotspd	1500	
309	Act rotspd		
310	TMP I-Mot		
311	TMP Op hrs		
312	Drv Softw.		
313	TMP Dclink		
314	Drv Op hrs		
315	TMP finspd		
316	TMP power		
317	power red		
319	Cycl count		
331 to 335			(Not there)
340	Pressure		
349	Drv Name		
350	Ctr Name	DCU	(Not listed in manual)
351	Ctr Softw	V0.8	(Not listed in manual)
360 to 369	Past Err (1 to 10)	Err 006	(These were run-up time errors)
700	TMP RUTime	120 min	
701	Swith Point	80%	
704	TMS heat Set		(Not there)
707	TMP Prot Set	50%	

720	Vent frequ	80%
721	Vent time	3600 s
738	Gage type	PKR250
794	Param Set	1
795	Servicelin	795
797	Address	1