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Subject: Remote Control of Pfeiffer TSH 071 D Vacuum Pump

The following describes procedures for remotely controlling the Pfeiffer TSH 071 D vacuum pump and for toggling the states of the parameters under remote control. This vacuum pump is presently installed in the JT-1 mixer measurement system. While one could just look up in the manual how to do these things, the manual for this particular set of options is a frustratingly ambiguous translation of German instructions into English.

Remote control of the TSH 071 D is accomplished by first putting the Display Control Unit (DCU) into remote mode and then controlling the vacuum pump with signals available from the REMOTE screw-down connector.

To put the TSH 071 D into remote mode, use the arrow buttons to select parameter number 028 on the front panel of the DCU and change it to a zero:

1. Use the arrow buttons to select Parameter 28
2. depress the (<-) and the (->) buttons at the same time to allow the parameter's state to be toggled
3. Set this parameter to a zero using the arrow buttons to put the unit into remote mode. Set it to one to return to normal operating mode.
4. Simultaneously depress both of the arrowed buttons so the mode change is stored.

Once the unit has been put into remote mode, the pins of the "REMOTE" connector on the TC 600 Electronic Drive Unit become active. The topmost pin (pin 1) on the connector is +24 Volts DC which is used to power the higher-numbered pins. Pins 2 through 9 correspond to parameters that are now under remote control. The pins can either be open, corresponding to an off state, or can be tied to pin 1, corresponding to an on state. The table on the following page is from page 30 of the TMH 071 P / TMU 071 P manual and displays the function that each pin controls. Pin 10 is ground.

To control these functions from the CPU, pin 1 on the REMOTE connector is connected to other pins on that connector. Connections on the REMOTE connector could be made using the relay on the back of the Lakeshore temperature monitor and controlled using GPIB commands to that instrument.

**Pin Occupancy and REMOTE plug functions for
Pfeiffer TSH 071 D Vacuum Pump**

Pin nr.	Input open (low)	Input closed (high) on +24V (pin 1)
1	+24 V	
2	venting blocked (see Section 3.5)	venting released (see Section 3.5)
3	motor, turbopump off	motor, turbopump on: the turbopump is driven, current flows through the motor coils
4	pumping station off	pumping station on: the turbopump is driven, backing pump is started via the relay box
5	heating off	heating on: the heating is switched on once the rotation speed switchpoint is attained and off when the rotation speed switchpoint is unattained
5		reset: by supplying a pulse ($T < 2s$) with an amplitude of 24V a malfunction acknowledgement can be processed
6	standby off	standby on: pump is accelerated to 66% of its nominal rotation speed
7	rotation speed setting mode off	the rotation speed can be changed by feeding a PWM signal to this pin or via Serial Interface RS 485 (see section 4.6. "Rotation Speed Setting Mode")
8	Output (low) rotation speed switchpoint not attained	Output (high) rotation speed switchpoint attained; output can be loaded with 24 V/50 mA
9	Output (low) Collective malfunction message; output can be loaded with 24 V/50 mA	Output (high) malfunction-free operations
10	Mass (ground)	_____