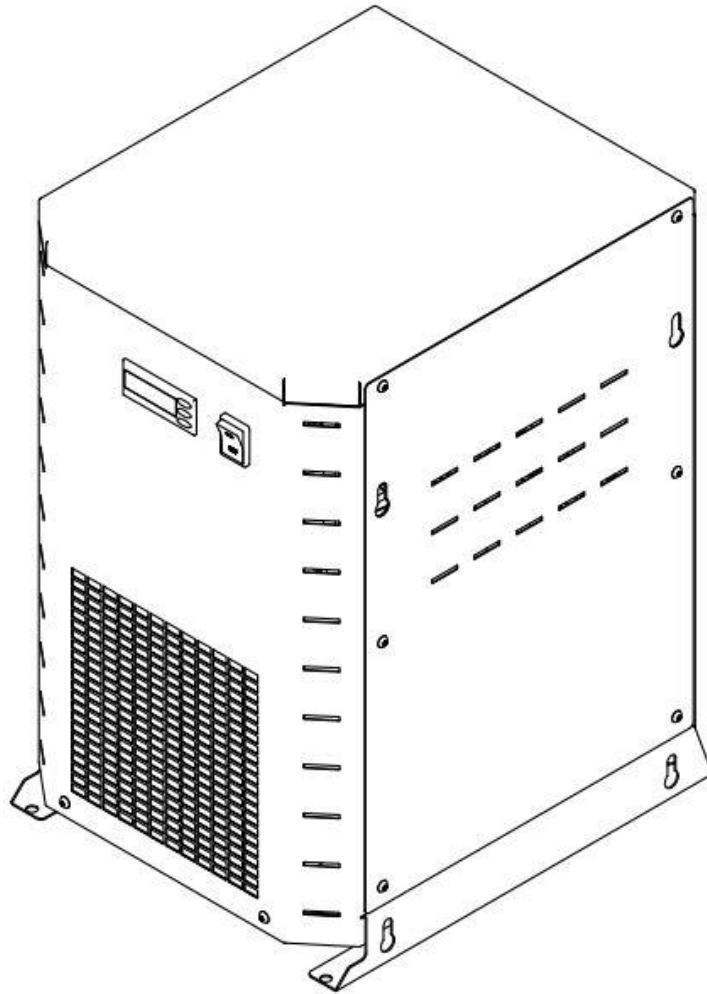


Troubleshooting

Refrigeration Dryer Series RDP 20 - 1900



1 Troubleshooting

Troubleshooting and maintenance procedures can only be performed by qualified personnel with the necessary knowledge.

Before any maintenance or service parts make sure that:

- **no part or device is powered and must not be connected to a power source**
- **that no part or device is under pressure and must not be connected to a compressed air system under pressure,**
- **that the maintenance staff fully and accurately read the operating instructions, and in particular the chapters relating to safety at work.**

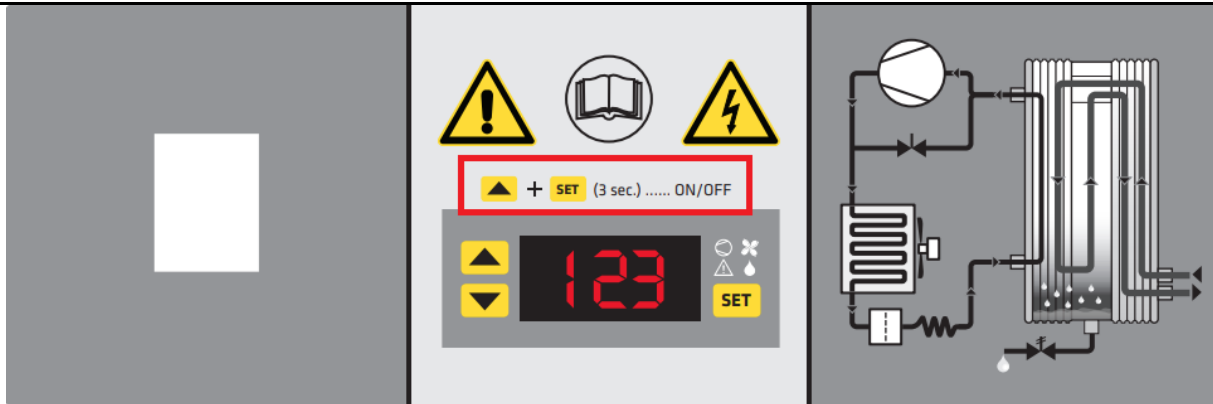
SYMPTOM	POSSIBLE CAUSE - PROPOSED COURSE OF ACTION
None of the LED lights on the controller are on *controller	<ul style="list-style-type: none"> ● Make sure that the system is connected to a power source. ● Check the electrical installation (internal and external). ● Check that the circuit board is not damaged.
The TEST button is pressed, but the condensate is not drained *condensate drain	<ul style="list-style-type: none"> ● The service valve in front of the drain is closed - open it. ● The dryer is not pressurized - set normal operating conditions. ● The solenoid valve is defective - replace the condensate separator. ● The circuit board is damaged - replace the condensate drain.
Condensate is only drained when the TEST button is pressed. *condensate drain	<ul style="list-style-type: none"> ● The capacitive sensor is dirty - open the condensate separator and clean the plastic tube of the sensor.
The spout blows out air. *condensate drain	<ul style="list-style-type: none"> ● The electromagnetic valve diaphragm is dirty - open the drain and clean it. ● The capacitive sensor is dirty - open the condensate separator and clean the plastic tube of the sensor.
The drain is in a state of alarm/ <i>doesn't work at all.</i> *condensate drain	<ul style="list-style-type: none"> ● The capacitive sensor is dirty - open the condensate separator and clean the plastic tube of the sensor. ● The service valve in front of the drain is closed - open it. ● The dryer is not pressurized - set normal operating conditions. ● The solenoid valve is defective - replace the condensate separator. ● <i>if the controller was replaced, it may be necessary to change the controller parameters (parameter "2" to be set on value "0") – see section 2.3</i>
Errors "Pf1", "Pf2", "Pf3" are shown on controller *controller *sensor	<ul style="list-style-type: none"> ● Pf1 - dew point sensor ● Pf2 - compressor sensor ● Pf3 - condenser sensor ● A sensor is missing or is badly/incorrectly installed – check the sensor wiring on the controller ● The controller is faulty/not working properly – the controller has to be replaced

<p>Error "Lt" is shown on controller</p> <p>*controller *sensor</p>	<ul style="list-style-type: none"> ● Lt error occurs when dew point temperature value drops below -1°C ● Bypass valve is not set properly – unscrew the protection cap and tighten the nub in a counter clockwise fashion for 1 full turn (360°), wait if dew point values are raising, if not repeat process ● May occur if the ambient temperature is too low ● May occur if the pressure switch has a malfunction (i.e does not supply and cut power to the condenser fan).
<p>Error "Cln" is shown on controller</p> <p>*controller *sensor</p>	<ul style="list-style-type: none"> ● Cln error occurs when the temperature on the condenser surpasses 70°C ● May occur if the ambient temperature is too high ● May occur if condenser coil is dirty – please clean the condenser coil. ● May occur if the fan is not working (there is no ambient airflow through the dryer) - please check the electrical wiring of the fan. ● May occur if there is a bad connection of temperature sensor Ntc. Cond. to the controller – check if the connection of condenser temperature sensor is good. ● May occur if the pressure switch has a malfunction (i.e does not supply and cut power to the condenser fan).
<p>Error "Ht" is shown on controller</p> <p>*controller *sensor</p>	<ul style="list-style-type: none"> ● Ht error occurs when the temperature of compressor surpasses 110°C ● Check the copper tubing for any leakage – there may very well be a leakage and the temperature goes above 110°C due to insufficient coolant in the system
<p>High dew point temperature shown on controller (E.g. >5°C)</p> <p>*controller *sensor *bypass *copper tubing</p>	<ul style="list-style-type: none"> ● Check if sensor is installed correctly (placed in the insulated tubing on evaporator inlet) – adjust the placement of sensor if needed ● Bypass valve is not set properly – unscrew the protection cap and tighten the nub in a clockwise fashion for 1 full turn (360°), wait if dew point values are lowering, if not repeat process ● There could be a leakage of coolant in the system – of possible check the pressure of the dryer on service valves ● May occur if the ambient temperature is too high
<p>Fan on condenser does not work</p> <p>*fan *controller</p>	<ul style="list-style-type: none"> ● Check the electrical wiring of the fan ● Check the output voltage for fan on the controller ● Check the working of the fan itself (connect it to an external power supply)
<p>Dryer does not start</p> <p>*controller *sensor *bypass *copper tubing</p>	<ul style="list-style-type: none"> ● Check the electrical installation (internal and external). ● Check if the controller is malfunctioning (E.g. is there output voltage on the controller pins after start up time has elapsed) ● Check if there are not safety switches (high and low pressure) active (this applies for first dryer start after it has been installed) ● If the dryer is 3 phase powered, check if the phase sequence is correct ● There could be leakage of coolant in the system – of possible check the pressure of the dryer on service valves

*** part/category with issue**

NOTE: When the condensate drain is in alarm condition, the solenoid valve will open every 7 minutes for 7.5 seconds

2 Controller RDC 2



The controller can be started by holding SET + UP button for 3 seconds. For three phase dryers, it is recommended that the controller remains in OFF state for 2 hours before start up. At start up, the controller shows the time remaining until compressor starts by displaying t0 and remaining seconds. The time remaining value can be changed by changing the parameter no. 5.

After the countdown is finished, the controller RDC 2 shows the temperature of the dew point reached by the refrigeration air dryer in the normal operation. By pressing the UP (▲) button, the outlet temperature of the compressor is displayed. By pressing the DOWN (▼) button, the condensation temperature is displayed (the temperature sensor is connected) or the condensation pressure is displayed (the pressure sensor is connected). In case of fault, an alarm will appear on the display. The alarm automatically turns off when the dryer is restarted and is operating properly.

a) Sensors used for regulation:

- 1) T_{dew} = Dew point temperature
- 2) T_{comp} = Compressor temperature
- 3) T_{cond} ali p_{cond} = Condensation temperature or pressure (4-20 mA)

b) Regulated components:

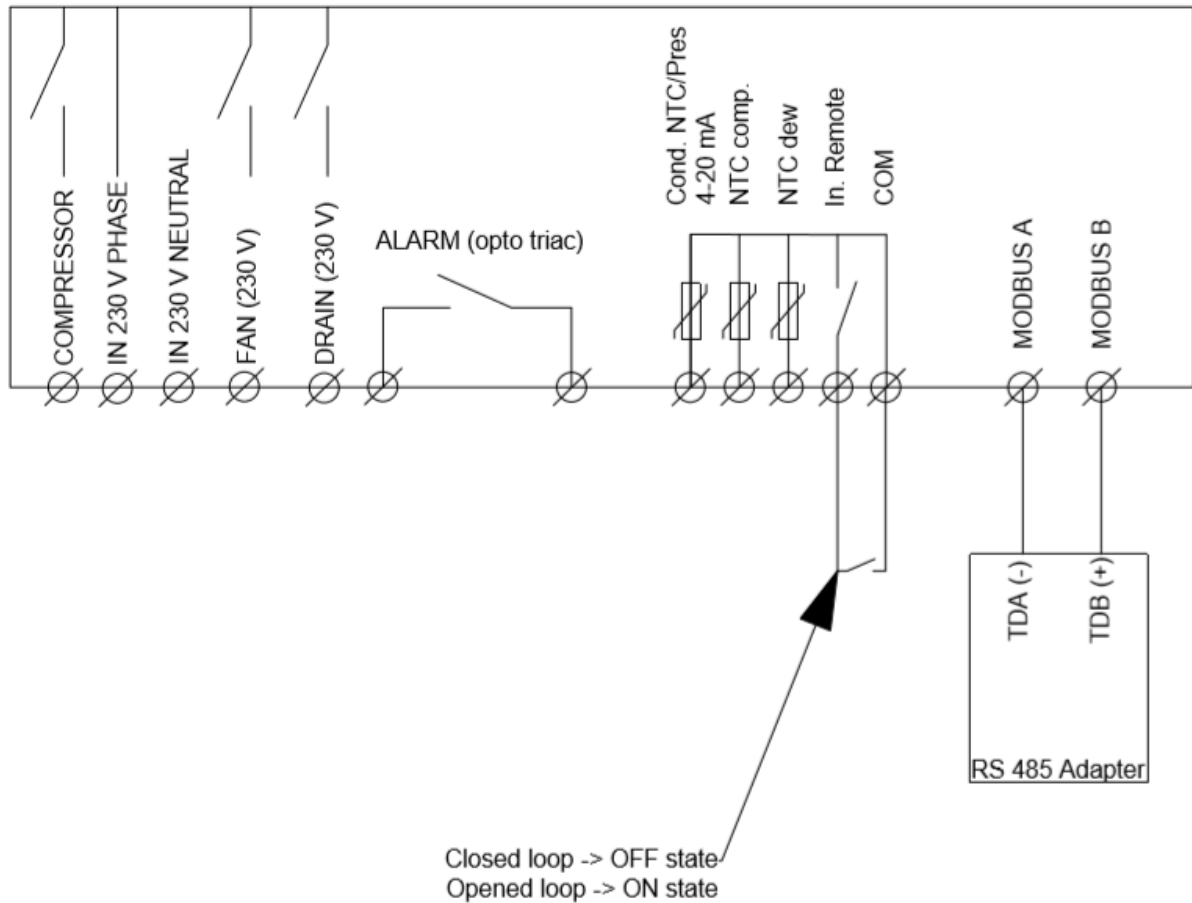
- 1) Fan (ON/OFF)
 - Fan symbol is displayed when in ON state
- 2) Compressor (ON/OFF)
 - Compressor symbol is displayed when in ON state
- 3) Drain (ON/OFF)
 - Drain symbol is displayed when in ON state

c) Operation of fan and compressor

- 1) Normal operation:
 - The compressor is always running
 - The fan is regulated based on measured condensation temperature or pressure
 - Dew point temperature is displayed.
- 2) Alarm operation
 - In alarm state the normal operation is overridden.

- If more alarms are activated the last one activated has priority with display and fan/compressor operation. All other active alarms have to be resolved before continuing in normal operation.
- Alarm is displayed.

2.1 Electric scheme RDC 2



The controller has 3 outputs (230 V), for compressor, fan and drain. The other outputs are for alarm. The alarm is triggered via opto triac, which can handle 600VAC/50mA.

Controller can also be turned OFF/ON via In. Remote. When the current flows, the controller goes to OFF state, when the circuit is disconnected, the controller is in ON state. (See the attached scheme above).

For the MODBUS communication, the twisted pair cable needs to be screwed to the A and B terminals. To communicate with the PC, an adapter is needed. The address for the MODBUS communication is 1.

2.2 RDC 2 parameters

Parameter number	Parameter name	Allowed to change	Press UP	Press DOWN	Default
1	Drain Cycle Value	yes	Increase value	Decrease value	1
2	Drain Period Value	yes	Increase value	Decrease value	200 sec
3	CondSensorType	no (unless sensor type not NTC)	Increase value	Decrease value	0
4		no	Increase value	Decrease value	5
5	Min Compressor OFF time	yes	Increase value	Decrease value	1 min
6		no	Increase value	Decrease value	2
7		no	Increase value	Decrease value	5
8		no	Increase value	Decrease value	0
9		no	Increase value	Decrease value	0
10		no	Increase value	Decrease value	0
11		no	Increase value	Decrease value	40.0
12		no	Increase value	Decrease value	39.5
13	Remote Control	yes	Increase value	Decrease value	0
14	MOD BUS Address	yes	Increase value	Decrease value	1
15		no	Increase value	Decrease value	365

2.3 RDC 2 parameter settings

In the following paragraph, a procedure to change the minimal compressor OFF time is shown.

To change the minimal compressor OFF time, you must choose programming parameter no. 5 and change the value from default to the desired value. To do that you must:

- Hold SET button for 3 seconds
- Enter password (000) (press SET 3 times)
- Continue pressing SET button until you reach parameter number 5
- You will see the default parameter value (1 min). Change it to a desired value if necessary, if not skip the next step
- Wait a couple of seconds, the controller exits automatically

Turn off the dryer and then turn it back on.

Every other parameter can be changed by similar procedure. Differences are in parameter number and in parameter value.

Factory reset

To reset the parameters in the WORKING status, you must first hold SET+UP for 3 seconds and you move to STANDBY status. When in STANDBY status, you can reset the parameters to default values by holding UP+DOWN for 3 seconds.

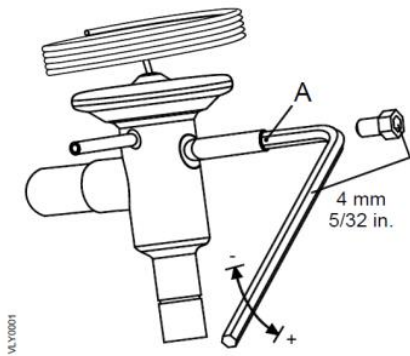
2.4 RDC 2 MODBUS communication

ADDRESS	NAME	TYPE	VARIABLE X	UNIT
40013	ADDRESS	RDWR	Address = X	
40014	Service Time	R_ONLY	Service Time = X	day
40015	No. of alarms in last 24h	R_ONLY	Alarm 24 H Number= X	
40016	No. of alarms since service	R_ONLY	Total Alarms = X	
40017	Days Between Maintenance	R_ONLY	Days after Service = X	
40018	Output Compressor Status	R_ONLY	0= Comp. OFF 1= Comp. ON	
40019	Output Fan Status	R_ONLY	0= Fan OFF 1= Fan ON	
40020	Output Drain Status	R_ONLY	0= Drain OFF 1= Drain ON	
40021	Output Alarm Status	R_ONLY	0= Alarm OFF 1= Alarm ON	
40022	T_Dew	R_ONLY	$T_Dew = (X-200)/10$	°C
40023	T_Comp	R_ONLY	$T_Comp = (X-200)/10$	°C
40024	T_Cond	R_ONLY	$T_Cond = (X-200)/10$	°C
40025	P_Cond	R_ONLY	$P_Cond = X/10$	Bar
40026	Digital Input status	R_ONLY	0= contact open 1 = contact close	
40027	Buttons	R_ONLY	0= no switches 1= SET 2=UP 3= SET & UP 4= DOWN 5= SET & DOWN 6= UP & DOWN 7= SET & UP & DOWN	
40028	Alarm CLn Status	R_ONLY	0=no alarm 1 = alarm active	
40029	Alarm Lt Status	R_ONLY	0=no alarm 1 = alarm active	
40030	Alarm Ht status	R_ONLY	0=no alarm 1 = alarm active	
40031	Alarm PF1 Status	R_ONLY	0=no alarm 1 = alarm active	
40032	Alarm PF2	R_ONLY	0=no alarm 1 = alarm active	
40033	Alarm PF3	R_ONLY	0=no alarm 1 = alarm active	
40034	Controller Status	R_ONLY	0= STANDBY 1=NORMAL OPERATION 2=PROGRAMMING MODE 3=ALARM MODE 4= TESTING MODE	

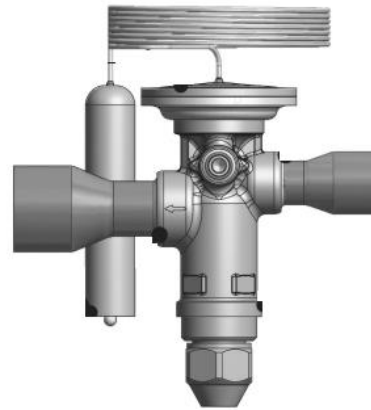
3 Hot gas bypass valve

The hot gas bypass valve injects a portion of the hot gases (taken from the compressor outlet) into the tube between the evaporator and the suction side of the compressor, thereby maintaining a constant temperature of the evaporator at about 1-2 °C. This injection prevents the formation of ice in the evaporator of the dryer under any load conditions. You can set it under no-load conditions (you have to close or open it to set the temperature on the controller to approximately 1-2 °C). To do this, the cap has to be unscrewed and then the valve turned in direction of “-” or “+” according to the image below. If you turn in “-” direction the temperature will drop, if you turn in “+” direction the temperature will rise. Please give it some time (10 - 20 min) before finishing the setting. A good initial rotation would be 360 °.

Below you see a schematic of a bypass valve.



2: RDP 20 - 600



1: RDP 750 - 1900

