

NOVATEC™

DUAL BED DRYER

Models: NDB-15, NDB-25

INSTRUCTION MANUAL



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PRODUCT SPECIFICATIONS
NDB-15, NDB-25

Model NDB-	15	15	25	25	25	25	25	25	25	25
Supply Voltage*	115	115	115	208	230	460	115	208	230	460
KVA	1.6	1.6	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Total Amperage	13.9	13.9	19.1	10.6	9.6	4.8	19.1	10.6	9.6	4.8
Aft. Htr. Amperage	8.7	8.7	13.9	7.7	7.0	3.5	13.9	7.7	7.0	3.5
Reg. Htr. Amp(L.B)	4.3	4.3	4.3	2.4	2.2	1.1	4.3	2.4	2.2	1.1
Reg. Htr. Amp(RB)	4.3	4.3	4.3	2.4	2.2	1.1	4.3	2.4	2.2	1.1
Aft. Htr. Wattage	1000	1000	1600	1600	1600	1600	1600	1600	1600	1600
Adsorption CFM	15	15	25	25	25	25	25	25	25	25
Desiccant per bed-lbs	7	7	10	10	10	10	10	10	10	10

***NOTE: ELECTRICAL SUPPLY POWER MUST BE SINGLE PHASE, 60 HZ**

Additional Specifications: All models:

Outlet Air Temp (Max)...	300 F
Outlet Duct Size...	2"
Cooling coil GPM Req...	1
Inlet Water Temp (max)...	80 F
Outlet Dewpoint...	-40 F
Cycle time per bed...	4 hrs
Desiccant Type...	13X
Blower Hp...	1/20
Regen Heater Watts...	500
Motor (115 Volts) Amps...	0.8

INSTALLATION

NDB-15, NDB-25

Mount NDB Dryer to the processing machine. Secure with bracing as required to stabilize the unit. Convenient lugs are located at the end and on the valve box for this purpose. Others may be used if necessary.

Connect power according to the Novatec nameplate, which is located on the frame or control box of the dryer.

Connect the required electrical power according to plant, local and state electrical codes and regulations. Electrical installation should only be performed by a qualified electrician.

NDB with Remote Hopper

Mount the NDB dryer on a suitable mounting platform (stand, table etc.) as close as possible to the drying hopper.

Connect power according to the Novatec nameplate, which is located on the frame or control box of the dryer.

Connect the required electrical power according to plant, local and state electrical codes and regulations. Electrical installation should only be performed by a qualified electrician.

Secure the hopper to the processing machine and brace as necessary to stabilize the hopper.

Install thermocouple in the fitting supplied in the hopper outlet. Make certain the leads are connected to their appropriate points inside the control box.

Connect heater power lines from the dryer to the heater box at the hopper.

Attach hoses from the dryer outlet to the hopper inlet and from the hopper outlet to the dryer inlet. If a length of high temperature hose is supplied with a unit having the heater at the hopper, it should be used for the return line. Do Not insulate the return airline.

DESCRIPTION OF OPERATION

The NDB Series dryer was designed to be a simple, compact and easy to use dryer that could be used for drying of plastics in cases where the throughput is 25lbs/hr. or less.

Moist air is drawn from the drying hopper by the blower assembly and it is directed through the valve assembly and into one of the desiccant beds. Moisture is adsorbed by the desiccant and the dry, low dewpoint air is blown across the process heater, heated to the desired temperature, and discharged from the dryer. A small portion of this air is diverted back through the second desiccant bed instead of traveling through the process heater. This air is heated by the regeneration heater, which is buried in the desiccant bed. The hot air regenerates the desiccant and carries away the moisture through the regeneration air exhaust port.

At the end of the regeneration heating cycle, the regeneration heater is shut down but the dry purge air continues to flow. This helps to carry some of the excess heat of regeneration away from the desiccant bed, allowing it to cool in preparation for the adsorption cycle.

At the end of the time 4-hour adsorption period a simple shift of the solenoid valve causes the diverter valve to change position. The freshly regenerated bed now begins adsorbing moisture and the other bed is regenerated. Just one blower (the process blower) is required for both the process and regeneration functions and it runs continuously when the dryer is on.

INITIAL START-UP PROCEDURES

Fill the hopper completely with material and turn the temperature controller to 60° F. Push the on/off switch to the “on” position and check the blower for proper rotation by observing the rotation of the motor at the end facing the control box. The proper rotation is indicated by an arrow on the blower housing.

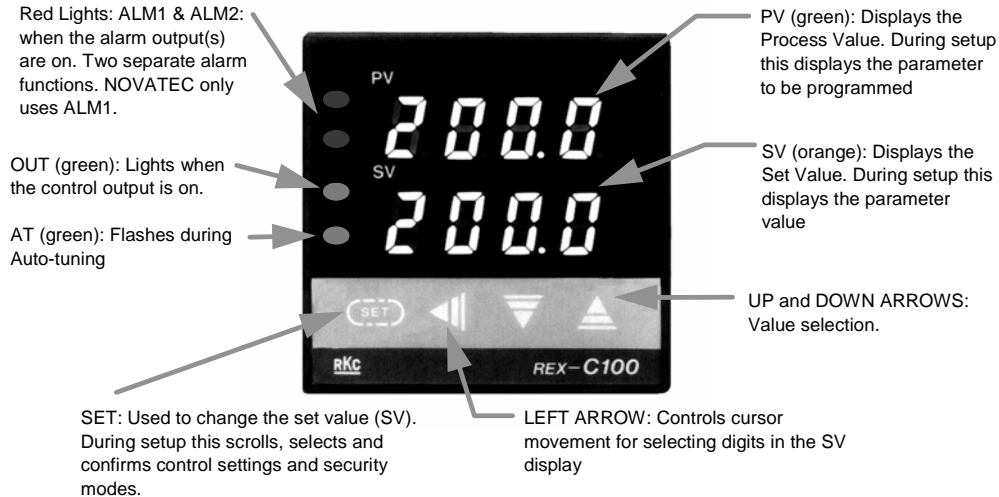
Allow the unit to dry-cycle for 24 hours with the hopper filled with material before operating. This will allow the moisture adsorbed by the desiccant during transit or inactivity to be discharged. Failure to dry cycle the unit may cause drying problems with the material. It is necessary to have material in the hopper in order for the regeneration cycle to function properly.

OPERATING PROCEDURE

After the initial start-up period, adjust the temperature controller to the drying temperature necessary for the material to be dried. Dry the plastic pellets for the required residence period, which is generally two to six hours depending on the material.

After the residence period is complete, the material is dry and ready for processing. As dry material is withdrawn from the bottom, wet material should be added to the hopper at the same rate. (NOTE: It is extremely important to keep the hopper as full as possible for proper drying.)

NDB-15, NDB-25 TEMPERATURE CONTROLLER
RKC Brand, Model: REX-C100, Novatec Part Number: 02275



INITIAL SETTINGS

Note: Initial set mode cannot be reached unless the LCK parameter (see below) is set to “0000”. To enter the initial set mode... Press and hold the SET and LEFT ARROW keys simultaneously for five seconds; (SL1) will display. Scroll through the settings with the SET key. Exit initial set mode the same way it was entered.

Setting	Description	Pre-set	Setting	Description	Pre-set
SL1	Input type (Type J T/C)	0001	SL8	Not Used	0000
SL2	Units - 0001 = °F 0000 = °C	0001	Pb	Preset value (PV) bias	0000
SL3	Heater break alarm. Not used	0000	oH	ON/OFF Action gap setting	0000
SL4	ALM1 type (Hi Dev) without alarm hold	0001	AH 1	Alarm1 gap setting	0001
SL5	ALM2 - Not used	0000	AH 2	Alarm2 gap setting	0000
SL6	Control Output - PID reverse action	0001	SLH	Hi limit set value (SV) °F Hi limit set value (SV) °C	0400 0204
SL7	Alarm Section	0000	SLL	Lo limit set value (SV)	0000

PARAMETER SETTINGS

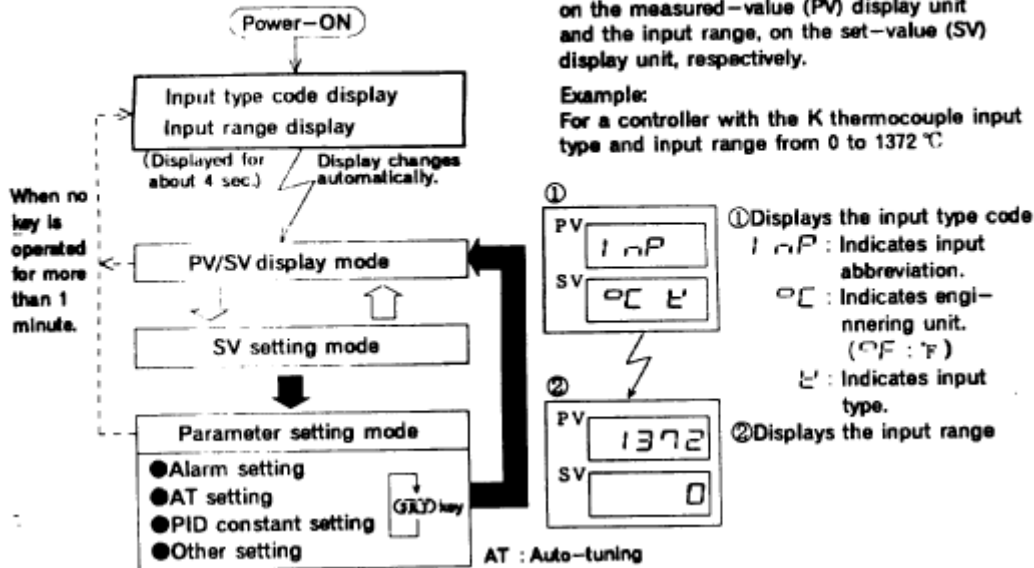
To access the parameter setting mode...Press the SET key for more than five seconds; (AL1) will display. Scroll through the parameters with the SET key. Exit parameter set mode the same way it was entered.

Parameter	Description	Pre-set	Parameter	Description	Pre-set
AL1	Alarm 1 deviation value	0020	Ar	Anti-reset windup (1 to 100%)	0100
ATU	1= auto-tuning start 0= auto-tuning stop	0000	T	Proportional cycle (1 to 100 sec)	0020
P	Proportional band	Determined By Auto-Tuning	LCK	DATA Lock	0100
I	Integral time				
D	Derivative time				

EXCERPTS from RKC REX C-100 OPERATION MANUAL

■ Calling-up procedure of each mode

- ⬆⬆ : Press the (SET) key.
- ⬆⬆ : Press the (SET) key for more than 5 sec.



⚠ Key operation cautions

- For this controller, the value whose setting was changed is not registered. It is registered for the first time it is shifted to the next parameter by pressing the (SET) key.
- When the controller is not set to the SV setting mode (the SV does not light brightly or dimly even with the (SET) key pressed) or each value does not light brightly or dimly even with the controller moved to the parameter setting mode, set data lock is activated. In this case, change the "LCK" parameter set-value to "0100".
- This controller returns to the PV/SV display mode status if key operation is not performed for more than 1 minute.

■ Set data locking procedures

This controller is provided with a set data locking function which disables each set-value change by the front key and also the auto-tuning function. Use this function for malfunction prevention at the end of each setting.

- Press the (SET) key by the required number of times to show "LCK" on the measured-value (PV) display unit.
- Press the ◀, ▲ and ▼ keys to set the number in the table at right. Thus the set data lock state can be selected.

0100	No set data locked. (All parameters changeable)
0101	Set data locked. (All parameters not changeable)
0110	Only the set-value (SV) is changeable with the set data locked

NOTES

1. Do not change the upper 2 digits "01" of the set-value, as it may cause malfunction.
2. Checking each set-value is possible during data lock.

<Error display>

Err	● RAM failure (Incorrect set-data write, etc.)
0000 (Flashing)	Overscale (Measured-value exceeds the high input display range limit.)

TROUBLE SHOOTING GUIDE

Most drying problems are the result of dirty filter(s), air leaks, desiccant contamination and malfunctioning regeneration heaters. It is seldom that other components fail.

<u>PROBLEM</u>	<u>INVESTIGATE</u>
Machine won't start	A, B, C
Inadequate or no Regeneration heat	E, F, G, H, I
Inadequate or no Process heat	D, F, H, I, J
Inadequate or no Adsorption air flow	A, E, H, I
Inadequate Dew point	E, F, G, H, I, K, L, M
Changeover Temp. too high	E, H, I

<u>CHECK</u>	<u>CONDITIONS</u>	<u>SOLUTIONS</u>
A. Power supply	A. No voltage or voltage incorrect	A. Check field installed disconnect and incoming power supply.
B. Transformer	B. No voltage on primary 1. No voltage on secondary.	B. See A 1. Check fuse; if ok Replace transformer.
C. Stop/Start Switch	C. No voltage through Switch.	C. Replace switch
D. Adsorption Motor	D. Voltage at motor, amperage incorrect.	D. Replace motor.
E. Cam Timer	E. Voltage to timer motor but timer doesn't rotate. 1. Cam Switch Malfunction 2. Cam Setting Incorrect	E. Replace timer 1. Replace timer 2. Adjust
F. Heater Amperage Reading (see Engineering Data Sheet)	F. Voltage correct 1. Voltage incorrect	F. Replace heater 1. Correct voltage Supply
G. Valve solenoid	G. No voltage at solenoid 1. Voltage at solenoid Valves move freely by hand	G. See E. 1. Replace valve solenoid
H. Filter	H. Filter dirty	H. replace element
I. Air Duct	I. Obstructed	I. Remove obstruction
J. Process Heater Temperature Controller	J. Adjustment incorrect 1. No voltage across Switch.	J. adjust 1. Replace controller
K. Leaks in system	K. Air leaks in or out of system.	K. Replace gaskets repair leaks as necessary

L. Desiccant	L. Contaminated 1. Saturated	L. Replace desiccant 1. Dry cycle for 24 hours.
M. Dewpoint Monitor	M. Not operating 1. Reverse flow through meter	M. Repair or replace 1. Make sure of positive pressure at the dewpoint sample port.

MAINTENANCE AND INSPECTION SCHEDULE

It is recommended that maintenance and inspection be done on a scheduled basis, Maintenance requirements will naturally vary widely for each installation and specific operating conditions. It is suggested that a complete inspection be preformed with necessary maintenance at the end of the first month, the first three months, and the first six months. These inspections will be indicative of how often future maintenance will be necessary.

Every Month

- A. Inspect air filters. Clean or replace as required. Replace if cartridge is broken. The time interval for inspection should be shortened if experience indicates unusual dust loading.
- B. Check system for air leaks or flow obstructions and correct as required.

Every 3 Months

- A. Check heater amperage (see Specification Sheet.)
- B. Check Motor amperage (see Specification Sheet.)
- C. Check all electrical connections to make sure that they have not become loose, especially those connections at contactors, motor starters, and heater elements.

Once Every Year

Check Solenoid valve operation and operation of valve.

Every 2 Years or as needed

Remove top cover of dryer and replace desiccant. Use high temperature silicon caulking to reseal the cover. (See specification page for the amount of desiccant.)

RECOMMENDED SPARE PARTS

The following parts are common to all NDB Series dryers and it is recommended that spares be kept on hand.

<u>ITEM</u>	<u>PART NUMBER</u>	<u>RECOMMENDED QUANTITY</u>
Temperature Controller	02275	1
Solenoid	00767	1
Cam Timer	00560	1
Solid State Relay, 50A	09007	1
Filter Element	00813	1

Additional Recommended Spares:

<u>ITEM</u>	<u>DRYER</u>	<u>PART NUMBER</u>	<u>QTY</u>
Desiccant	NDB 15	00246	14lbs
	NDB 25	00246	20lbs
Fuse, 2A, Slo-Blow	All (except 115v)	00812	3
Thermocouple	NDB 15, NDB 25	00984	1
	If hopper is remote	00764	1
Process Htr. Element	NDB 15	00780	1
	NDB 25 (115v)	00781	1
	NDB 25 (208v)	00830	1
	NDB 25 (230v)	00791	1
	NDB 25 (460v)	00833	1
Regen. Htr. Element	All 115 v	00779	2
	All 208v	00831	2
	All 230v	00790	2
	All 460v	00832	2

MATERIAL SAFETY SUMMARY

Some components used by NOVATEC may contain mercury, a chemical listed in the EPA (Environmental Protection Agency) Title III chemical list, EPA identification number 7439-97-6. The components are typically (i) mercury switch and/or (ii) mercury relay switches. These devices are listed as “ARTICLES” and as such are exempt from the “COMMUNITY RIGHT TO KNOW” per Title III.

Shipping requirements according to IATA (International Air Transport Authority) regulation 805 indicate that mercury switches and relays are exempt from the requirements of IATA regulation 805 providing they are of the totally enclosed leak-proof type in sealed metal or plastic units. All devices used by NOVATEC meet these requirements, and as such require no special packing.

Check the parts list included with this instruction manual for the presence of devices containing mercury that may have supplied with your equipment from NOVATEC. Material Safety Data Sheets for these devices and other special precautions have been provided in this manual. This information should be reviewed if applicable.

WARRANTY:

as of 10/28/2008

NOVATEC, INC. offers COMPREHENSIVE PRODUCT WARRANTIES on all of our plastics auxiliary equipment. We warrant each NOVATEC-manufactured product to be free from defects in materials and workmanship, under normal use and service for the periods listed under “Warranty Periods”. The obligation of Novatec, under this warranty, is limited to repairing or furnishing, without charge, a similar part to replace any part which fails under normal use due to a material or workmanship defect, within its respective warranty period. It is the purchaser’s responsibility to provide Novatec with immediate written notice of any such suspected defect. Warranted replacement parts will be billed and shipped F.O.B. point of manufacture. A credit will be issued when the purchaser returns the suspect defective part. Novatec shall not be held liable for damages or delay caused by defects. No allowance will be made for repairs or alterations without the written consent or approval of Novatec.

The provisions in equipment specifications are descriptive, unless expressly stated as warranties. The liability of Novatec to the purchaser, except as to title, arising out of the supplying of the said equipment, or its use, whether based upon warranty, contract or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided. All such liability shall terminate upon the expiration of said warranty periods. Novatec shall not in any event be held liable for any special, indirect or consequential damages. Commodities not manufactured by Novatec are warranted and guaranteed to Novatec by the original manufacturer and then only to the extent that Novatec is able to enforce such warranty or guaranty. Novatec, Inc. has not authorized anyone to make any warranty or representation other than the warranty contained here. Non-payment of invoice beyond 90 days will invalidate the warranty. A renewed warranty can be purchased directly from Novatec.

Models: NDB-15, NDB-25 Dryers...2 years

Exclusions: Routine maintenance/replacement parts are excluded from the warranty. These include, but are not limited to: hoses, desiccant, filters, filter elements, wiper seals, gaskets, dew point sensors, infrared lamps, motors and motor brushes. In addition, the use of abrasive materials will void the warranty of any product not specifically sold/designed for use with the specified abrasive material. Novatec reserves the right to limit the warranty if the customer installs replacement parts that do not meet the specifications of the original parts supplied by Novatec.

Specific Exclusions:

Desiccant and Filters

This warranty shall not apply to equipment:

1. Repaired or altered without written approval of NOVATEC unless such repair or alteration was, in our judgment, not responsible for the failure
2. Which has been subject to misuse, negligence, accident or incorrect wiring by others
3. Warranty is void if processing rates exceed manufacturer-recommended levels or if damage is caused by ineffective power isolation and/or power spikes/sags or incorrect installation.

Form# 200810 Warranty