INSTRUCTION MANUAL

NDB-15 through NDB-50

NDB-25

 DOCUMENT: NDB-15-50 IM 28 FEB 2018

NOVATEC™
Part of the MAGUIRE Family

Novatec, Inc. 222 E. Thomas Ave. Baltimore, MD 21225 | www.novatec.com

Phone: 410-789-4811
Toll Free: 800-938-6682
Main Fax: 410-789-4638

Parts Email: parts@novatec.com
Service Email:service@novatec.com
Sales Email: sales@novatec.com

NOTES:

Please record the following information, which is specific to this piece of equipment, in the space provided. Our Parts/Service Department will need these numbers to properly respond to any of your requests.

Instruction Manual: NDB-15-50 IM 28 FEB 2018

Model #:_____

Serial #_____

Table of Contents

1.0 PRODUCT SPECIFICATIONS

Model	**NDB-15**	**NDB-25**	**NDB-50**
Supply Voltage	115/1/60	460/1/60	460/3/60
KVA	1.6	2.2	11.2
Total Amperage	13.9	4.8	14.0
Process Heater Amperage	8.7	3.5	10.0
Regen Heater Amperage (Left Bed)	4.3	1.1	2.2
Regen Heater Amperage (Right Bed)	4.3	1.1	2.2
Process Heater Wattage	1000	1600	4600
Adsorption CFM	15	25	50
Desiccant per bed (Pounds)	7	10	20
Blower Hp	1/25	1/25	3/4

Additional Specifications: All models:

Outlet Air Temp (Max)… 350° F
Outlet Duct Size… 2”
Cooling coil GPM Req… 1
Inlet Water Temp (max)… 80° F
Outlet Dew Point… -40° F
Cycle time per bed… 4 hrs
Desiccant Type… 13X

2.0 INSTALLATION

NDB Dryers can be mounted directly 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.

The NDB can also be mounted on a floor stand next to the dryer. The floor stand (P/N SCR-FS-004) is supplied with a Vacuum Takeoff Box, a 1.5" probe and 5" casters. Dried material can be transferred to the process machine with a Machine Mount Loader.

Connect power to the dryer according to the 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.

3.0 DESCRIPTION OF OPERATION

NDB dryers are designed to be a simple, compact and easy to use for drying of plastics in cases where the throughput is 50 lb./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 dew point 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 timed 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.

4.0 INITIAL START- UP PROCEDURE

Fill the hopper completely with material and adjust the temperature controller to 60º 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.

5.0 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, additional 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.)

6.0 MONITORING PLC CYCLE

- Press ESC button on the Mini PLC
- Press the ⇓ arrow to the Set Param line.
- Press OK button. Main counter B1 should display with Cnt value at bottom of the screen
- Cnt value represents current count in minutes for the total cycle. If counter B1 fails to display, press ⇓ or ⇑ arrows until B1 displays with Cnt value.
- To fast cycle advance counter B1 connect the 115V hot wire to PLC input I2.
- Check schematic diagram for wires numbers to jump for fast cycle advance. Each 1 minute count becomes 1 second in the fast advance mode.
- On initial start fast advance B1 counter to 0 or 1 counter value. Reference the chart below for sequence of operation.

6.1 8- Hour Sequence of Operation

Time	Counter, B1	8 Hour Cycle
0 Hour, 0 Minute	0	Bed shift, left bed drying, overtemp alarm inactive.
0 Hour, 1 Minute	1	Right bed regen heater on.
0 Hour, 20 Minute	20	Overtemp alarm active.
1 Hour, 37 Minute	97	Right bed regen cooling, regen heater off.
4 Hour, 0 Minute	240	Bed shift, right bed drying, overtemp alarm inactive
4 Hour, 1 Minute	241	Left bed regen heater on.
4 Hour, 20 Minute	260	Overtemp alarm active.
5 Hour, 37 Minute	337	Left bed regen cooling, regen heater off.
8 Hour, 0 Minute	480	Bed shift, left bed drying.

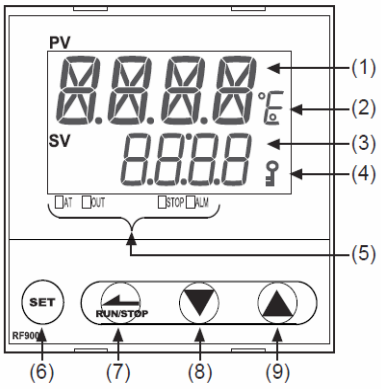
6.2 PLC Counter Settings

Counter	ON Value	OFF Value	Description
B1	480	0	Cycle reset
B3	0	240	Bed shift
B4	241	337	Left bed regen heater
B5	1	97	Right bed regen heater
B7	240	260	Right bed drying alarm delay
B8	0	20	Left bed drying alarm delay

7.0 TEMPERATURE CONTROLLER

RKC Brand, Model: RF-100, NOVATEC Part Number: 02275 (Replaces RKC Rex C-100)

7.1 Overview



(1)	Measured value (PV) display	[Green]	Displays Measured value (PV) or various parameter symbols.
(2)	Unit display	[Green]	Displays the units (Temperature units: °C or °F) of displayed data.
(3)	Set value (SV) display	[Orange]	Displays Set value (SV) or various parameter set values.
(4)	Set lock display	[Orange]	Lights when the settings are locked.
(5)	AT lamp	[Green]	Flashes when Autotuning is activated. (After Autotuning is completed: AT lamp will go out) Light during Startup tuning (ST) execution.
	Output lamp	[Green]	OUT: Lights when control output is turned on.
	STOP lamp	[Green]	Lights when control is stopped (STOP).
	Alarm lamp	[Orange]	ALM: Lights when alarm output is turned on.

7.2 Initial Settings

- To enter Engineering mode: Press RUN/STOP key for more than 2 seconds to change from RUN to STOP, STOP lamp turns on.
- Press & hold SET & RUN/STOP simultaneously until F00 displays.
- Continue to press SET until MODE displays. Change MODE setting to 0128, this allows access to engineering parameters above F09.
- Press SET until F00 displays, press UP/DOWN arrow keys until Function Block to be accessed appears.
- Press SET to scroll through parameters of each function block.
- Press UP/DOWN arrow keys to change values than return to Function Block.
- Press UP/DOWN Arrow keys to move to next Function Block.
- After parameters have been changed, return to F00 change MODE setting back to 0.
- Exit Engineering mode the same way it was entered.
- Press RUN/STOP key for more than 2 seconds to change from STOP to RUN, STOP lamp turns off.

Setting	Description	Pre-set	Setting	Description	Pre-set
F00 LocK	Data Lock: 0000 all parameters accessed	0000*	F21 SLH	Setting Limiter High	0400°F* 0204°C
F00 MoNI	Display all: 0000	0000*	F21 SLL	Setting Limiter Low	0000°F* 0000°C
F00 ModE	Access all: 0128	0000*	F41 AS1	ALM1 type = high deviation	0001*
R/S	Run/Stop Mode	0000* Run 0001 Stop	F41 AHo1	Alarm Hold: 000	0000* Off 0001 On
F04 AL 1	High Deviation Alarm setting	0020°F* 0010°C	F41 AH1	ALM1 gap setting	0001*
F21 INP	TC Type J & Units	0020* DegF 0003 DegC	F41 ALTI	Alarm Delay Timer 0-600 Seconds	0000*
F21 PGdP	Decimal Point	0000* None	F51 oS	Control reverse action Control direct action	0001*Heating 0000 Cooling
F21 boS	Burnout Direction	0000* Upscale	F91 0440	ROM version	
F21 PGSH	Input Scale High	0800°F* 0300°C	F91 WT	Integrated operating time	Hours
F21 PGSL	Input Scale Low	0000°F* 0000°C	F91 rCJ	Holding Peak Ambient Temp	Deg C or F

* Factory Default Setting

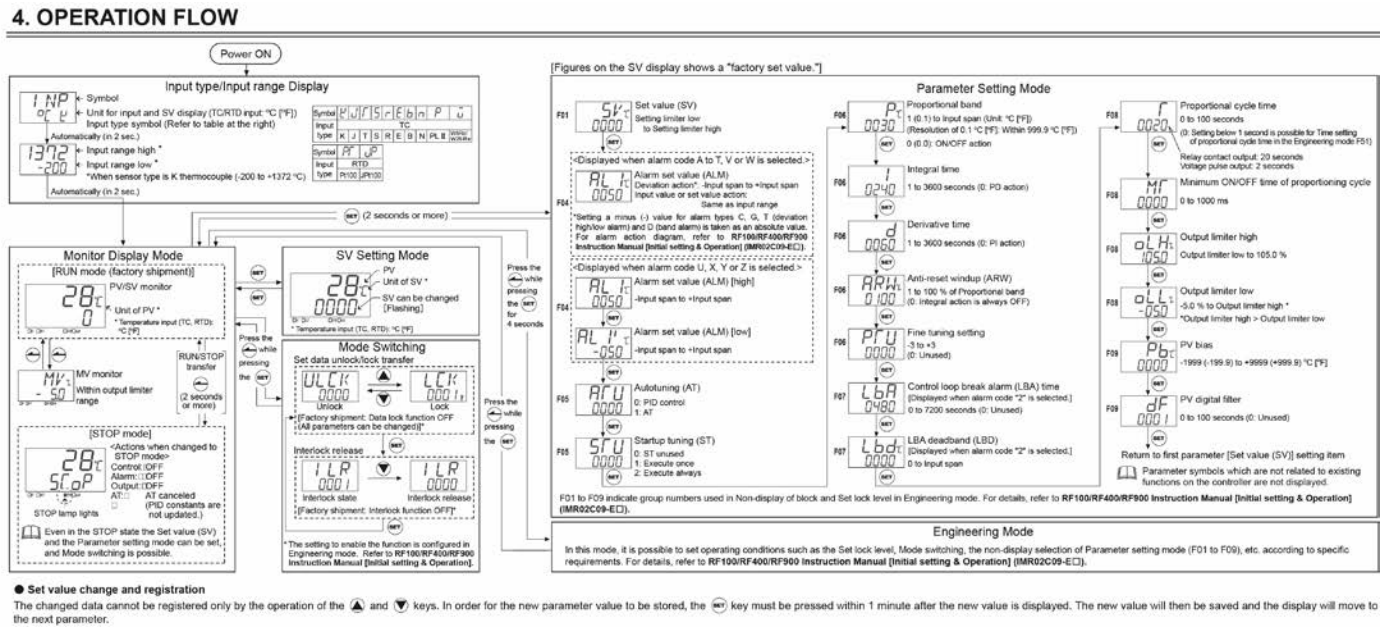
7.3 Parameter Settings

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	High Deviation alarm value	20°F* 10°C	PTU	Fine Tuning Mode	0000
ATU	On = auto-tuning start Off = auto-tuning stop	0001 0000*	T	Proportional cycle (1 to 100 sec)	0020
STU	Self Tuning	0000	MT	Minimum On/Off Time	0000
P	Proportional band	0030	oLH	Output Limiter High	105.0%
I	Integral time	0240	oLL	Output Limiter Low	-05.0%
d	Derivative time	0060	Pb	PV bias	0000
ARW	Anti-reset windup (1 to 100%)	0100	dF	Digital filter	0001

Refer to the RKC operation manual for complete details.

7.4 Excerpt from RKC REX C-100 Operation Manual



8.0 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.

PROBLEM	INVESTIGATE
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

CHECK	CONDITIONS	SOLUTIONS
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	B. See A
	1. No voltage on secondary.	1. Check fuse; of 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. Mini PLC	E. Voltage at PLC but no outputs.	E. Check that PLC is in Start mode & Input I1 is on.
F. Heater Amperage Reading	F. Voltage correct	F. Replace heater
	1. Voltage incorrect	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	J. Adjustment incorrect	J. adjust
Temperature Controller Switch.	1. No voltage across	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.

9.0 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 performed 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.)

10.0 RECOMMENDED SPARE PARTS

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

ITEM	PART NUMBER	RECOMMENDED QUANITY
Temperature Controller	02275	1
Solenoid	00767	1
Logo PLC	09029	1
Solid State Relay, 50A	09007	1
Filter Element	00813	1

Additional Recommended Spares:

ITEM	DRYER	PART NUMBER	QTY
Desiccant	NDB-15-T	00246	7 lb.
Desiccant	NDB-25-T	00246	20 lb.
Desiccant	NDB-50-T	00246	40 lb.
Fuse, 2A, Slo-Blow	460/3/60 VAC	00812	3
Thermocouple		00984 (2.5 ft.)	1
Process Htr. Element			
	NDB-15-T (115V)	00781	
	NDB-25-T (460V)	00833	1
	NDB-50-T (460V)	00933	
Regen. Htr. Element			
	NDB-15-T (115V)	00779	
	NDB-25-T (460V)	00832	2
	NDB-50-T (460V)	00832	4

11.0 WARRANTY

WARRANTY – NOVATEC, INC. - Effective Date 19 FEB 2018

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 are billed and shipped freight pre-paid. The purchaser must return the suspect defective part, freight prepaid and with identifying documentation to receive full credit for the part returned. 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.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any issues in connection with our equipment.

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 fromNovatec.

Warranty Periods:

Note: All warranty periods commence with the shipment of the equipment to the customer.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any issues in connection with our equipment.

Warranty Periods:

Note: All warranty periods commence with the shipment of the equipment to the customer.

5-Year (Except 1-Year on Non-Novatec Buy-Out Items)

Resin Drying to Include

NovaWheel™ Dryers *
Dual Bed Dryers
NovaDrier *
NDM-5 Membrane Dryer
Gas-Fired Process Heaters
Gas-Fired Regeneration Heaters
Drying Hoppers
Central Drying Hopper Assemblies
Heater/Blower Units and Hot-Air Dryer
Silo Dehumidifiers
NovaVac Dryers *
Nitrogen NovaDriers (Nitro)
DryTemp Plus

Central System Controls to Include

FlexTouch™ Series Controls
FlexXpand™ Series Controls
OptiFlex™ Series Controls
PLC Communications Modules
Greenboard Communications Modules
LOGO! Mini PLC
MCS-600 Series Controls – (Distributed I/O)
MCS-400 Series Controls
CL Silo Manager

Moisture Measurement Equipment to Include

MoistureMaster®

PET Resin Crystallizers

Resin Blending and Feeding to Include

WSB Blenders, MaxiBatch & Feeders *
Gaylord Sweeper Systems

Downstream Extrusion Equipment to Include

C and NC Bessemer Series Cutters
NPS Bessemer Series Pullers
NPC Mini Puller/Cutter
All NS Series Servo Saws
All Cooling and Vacuum Tanks Manufactured by Novatec

Resin Conveying and Systems Components to Include

GSL Series Vacuum Loaders
GlassVu Loaders, Receivers and Hoppers
VL/VLP Series Loaders
VRH, VR, VR-FL & VRP Series Receivers
Compressed Air Loaders
AL-B Barrel Loader
Cyclone Dust Collectors
Conveying System Accessories
Surge Bins
Valves and Accessories
Electronic Metal Separators
Quick Select Manifolds
Tilt Tables
Filter Dust Collectors
Drawer Magnets
Velocity Control Valves

3-Year

Resin Conveying System Components to Include

** VPDB Vacuum Positive Displacement Pumps
** SVP Vacuum Pumps
** MVP Vacuum Pumps
** Railcar Unloading Systems

****5-Year Extended Warranty** - When a MachineSense® data plan is activated for products with **, Novatec automatically extends the warranty to 5 years. The data plan must be activated within 60 days after product shipment, and remain active through the warranty period to maintain extended warranty eligibility. The first 6-months of data plan usage is free from Novatec.

1-Year

Infrared Dryers
UltraVac Vacuum Pumps
Vacuum Regenerative Blower Pumps

Custom Equipment of any kind unless otherwise specified

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, internal solenoids, fuses and motor brushes. Use with abrasive materials will void the warranty of any standard product. Wear resistant options may be available to extend usable service life with abrasive materials. 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:**

1. NovaDrier™ and *NITROdry*™ warranty is void if coalescing filters are not replaced on a 6-month or yearly basis (per instruction manual) and/or membrane has been exposed to ozone.
2. NovaVac Dryer -The ability of the canisters to hold vacuum will be compromised if the vacuum seal edge is damaged from mishandling. We do not warranty canisters damaged from improper handling. We do, however, warranty the seals.
3. LOAD CELLS on our WSB's are covered by Novatec standard warranty as long as they have not been damaged from improper handling.
4. Desiccant Wheel Warranty will be void if the wheel has been exposed to plasticizer, dust or other contaminants as a result of negligence on the part of the processor.
5. DryTemp+ - We assume no responsibility from equipment failures resulting from untreated or improperly treated water.

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.

NOTE: All conditions and content of this warranty are subject to changes without notice.