PENN TC3B21 Defrost Controller User Guide

Contents

PENN TC3B21 Defrost Controller

Product Information

The TC3B21 is a basic controller for refrigerated cabinets that features energy-saving strategies. This reference guide provides configuration parameters for the controller.

Configuration Parameters
The following parameters can be configured:

Parameter	Description
PAR. SP	Display refresh time CONTROL Setpoint differential Minimum setpoint Maximum setpoint Setpoint offset in energy saving Cooling or heating operation
PAR. CA1 CA2 P0 P1 P2 P4 P5 P8	Various configuration parameters
r0 r1 r2 r4 r5 r12	Various configuration parameters
PAR. DEF. COMPRESSOR	Compressor off minimum time Compressor on minimum time Compressor off time during cabinet probe alarm Compressor on time during cabinet probe alarm Threshold for high condenser temperature warning Threshold for high condenser temperature alarm High condenser temperature alarm delay DEFROST (if r5 = 0) Automatic defrost interval Threshold for defrost end Defrost duration Enable defrost at power-on Defrost delay after power-on Value displayed during defrost Dripping time Defrost interval counting mode Evaporation threshold for automatic defrost interval counting Enable defrost timeout alarm Adaptive defrost interval Threshold for adaptive defrost, relative to optimal evaporation temperature Compressor on consecutive time for defrost Evaporation threshold for adaptive defrost interval counting, relative to optimal evaporation temperature
PAR. A1 A4 A6 A7 A11	Various configuration parameters
PAR. HE2 HE3	Digital inputs – Door switch or multi-purpose input function, Open door alarm delay, Regulation inhibition maximum time with door open

Product Usage Instructions

Refer to the product manual and follow the configuration parameters to configure the TC3B21 defrost controller for your refrigerated cabinet. The controller features energy-saving strategies and can be configured for cooling or heating operation. The controller also features automatic defrost, defrost delay after power-on, and defrost duration.

The digital inputs can be used for door switches or multi-purpose input functions and feature an open door alarm delay and regulation inhibition maximum time with door open.

CONFIGURATION PARAMETERS

	PAR.	DEF.	SETPOINT	MIN. – MAX.
	SP	**0.0**	Setpoint	r1 to r2
	PAR.	DEF.	ANALOG INPUTS	MIN. – MAX.

	CA1	**0.0**	Cabinet probe offset	-25°C/°F to 25°C/°F
	CA2	**0.0**	Auxiliary probe offset	-25°C/°F to 25°C/°F
	P0	**1**	Probe type	0 = n/a 1 = NTC
	P1	**1**	Enable °C decimal point	0 = No 1 = Yes
	P2	**0**	Temperature unit of measurement	0 = °C 1 = °F
	P4	**0**	Configurable input function	0 = Door switch/multi-pur- pose inpu t 1 = Evaporator probe 2 = Condenser probe
	P5	**0**	Value displayed	0 = Cabinet temperature 1 = Setpoint 2 = Auxiliary temperature
	P8	**5**	Display refresh time	0 s to 250 s : 10
	PAR.	DEF.	CONTROL	MIN. – MAX.
	r0	**2.0**	Setpoint differential	1°C/°F to 15°C/°F
	r1	**–40**	Minimum setpoint	-99°C/°F to r2
	r2	**50.0**	Maximum setpoint	r1 to 199°C/°F
	r4	**0.0**	Setpoint offset in energy saving	0°C/°F to 99°C/°F
	r5	**0**	Cooling or heating operation	0 = Cooling 1 = Heating
	r12	**1**	Position of the r0 differential	0 = Asymmetric 1 = Symmetric
	PAR.	DEF.	COMPRESSOR	MIN. – MAX.
	C0	**0**	Compressor on delay after power-on	0 min to 240 min
	C2	**3**	Compressor off minimum time	0 min to 240 min
	C3	**0**	Compressor on minimum time	0 s to 240 s
	C4	**0**	Compressor off time during cabinet probe ala rm	0 min to 240 min
	C5	**10**	Compressor on time during cabinet probe ala rm	0 min to 240 min
	C6	**80.0**	Threshold for high condenser temperature wa rning	0°C/°F to 199°C/°F Differential = 2°C/4°F

C7	**90.0**	Threshold for high condenser temperature alarm	0°C/°F to 199°C/°F
C8	**1**	High condenser temperature alarm delay	0 min to 15 min

PAR.	DEF.	DEFROST (if r5 = 0)	MIN. – MAX.
d0	**8**	Automatic defrost interval	0 h to 99 h 0 = Only manual If d8 = 3, maximum interval
d2	**2.0**	Threshold for defrost end	-99°C/°F to 99°C/°F
d3	**30**	Defrost duration	0 min to 99 min If P4 = 1, maximum duration
d4	**0**	Enable defrost at power-on	0 = No 1 = Yes
d5	**0**	Defrost delay after power-on	0 min to 99 min
d6	**1**	Value displayed during defrost	0 = Cabinet temperature 1 = Display locked 2 = dEF label
d7	**2**	Dripping time	0 min to 15 min
d8	**0**	Defrost interval counting mode	0 = Device on hours 1 = Compressor on hours 2 = Hours evaporator temperature < d9 3 = Adaptive
d9	**0.0**	Evaporation threshold for automatic defrost in terval counting	-99°C/°F to 99°C/°F
d11	**0**	Enable defrost timeout alarm	0 = No 1 = Yes
d18	**40**	Adaptive defrost interval	0 min to 999 min If compressor on and evaporator te mperature < d22 0 = Only manual
d19	**3.0**	Threshold for adaptive defrost, relative to optimal evaporation temperature	0°C/°F to 40°C/°F Optimal evaporation temperature – d19

	d20	**180**	Compressor on consecutive time for defrost	0 min to 999 min 0 = Disabled
	d22	**2.0**	Evaporation threshold for adaptive defrost interval counting, relative to optimal e vaporation temperature	0°C/°F to 19°C/°F Optimal evaporation temperature + d22
	PAR.	DEF.	ALARMS	MIN. – MAX.
	A1	**10.0**	Threshold for low temperature alarm (relative to setpoint)	0°C/°F to 99°C/°F SP – A1 0 = Disabled
	A4	**10.0**	Threshold for high temperature alarm (relativ e to setpoint)	0°C/°F to 99°C/°F SP + A4 0 = Disabled
	A6	**12**	High temperature alarm delay after power-on	0 min to 99 min x 10
	A7	**15**	High and low temperature alarms delay	0 min to 240 min
	A11	**2.0**	High and low temperature alarms reset differ ential	1°C/°F to 15°C/°F

	PAR.	DEF.	DIGITAL INPUTS	MIN. – MAX.
	i0	**1**	Door switch or multi-purpose input function	0 = None 1 = Compressor off 2 = Energy saving 3 = iA alarm 4 = iA alarm + compressor off
	i1	**0**	Door switch or multi-purpose input activation	0 = With contact closed 1 = With contact open
	i2	**30**	Open door alarm delay	-1 min to 120 min If i0 = 3, multi-purpose input alarm d elay If i0 = 4, compressor on delay after alarm reset -1 = Disabled
	i3	**15**	Regulation inhibition maximum time with door open	-1 min to 120 min -1 = Until the closing

	i10	**0**	Door closed consecutive time for energy saving	0 min to 999 min After regulation temperature < SP 0 = Disabled
	i13	**180**	Number of door openings for defrost	0 to 240 0 = Disabled
	i14	**32**	Door open consecutive time for defrost	0 min to 240 min 0 = Disabled
	PAR.	DEF.	ENERGY SAVING (if r5 = 0)	MIN. – MAX.
	HE2	**0**	Energy saving maximum duration	0 min to 999 min 0 = Until the door opening
	HE3	**2**	No operation on the keyboard consecutive time for low consumption	0 min to 240 min 0 = Disabled
	PAR.	DEF.	SAFETIES	MIN. – MAX.
	POF	**1**	Enable ON/STAND-BY key	0 = No 1 = Yes
	PAS	**–19**	Password	-99 to 999 0 = Disabled

PRODUCT WARRANTY

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

SOFTWARE TERMS

Use of the software that is in (or constitutes) this product, or access to the cloud, or hosted services applicable to this product, if any, is subject to applicable end-user license, opensource software information, and other terms set forth at www.johnsoncontrols.com/techterms. Your use of this product constitutes an agreement to such terms.

SINGLE POINT OF CONTACT

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROL S PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRI CT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WEST ENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

CONTACT INFORMATION

Contact your local branch office:
www.johnsoncontrols.com/locations.

Contact Johnson Controls:
www.johnsoncontrols.com/contact-us.

Johnson Controls
507 E. Michigan St. Milwaukee, WI 53202-5211 USA
www.penncontrols.com.

Documents / Resources

	PENN TC3B21 Defrost Controller [pdf] User Guide TC3B21 Defrost Controller, TC3B21, Defrost Controller, Controller

References

- johnsoncontrols.com/buildingswarranty
- johnsoncontrols.com/contact-us
- johnsoncontrols.com/locations
- johnsoncontrols.com/techterms
- PENN