Penn TC3B22 Basic Defrost Controller European Installation Guide

Contents

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Instruction

Figure 1: UI

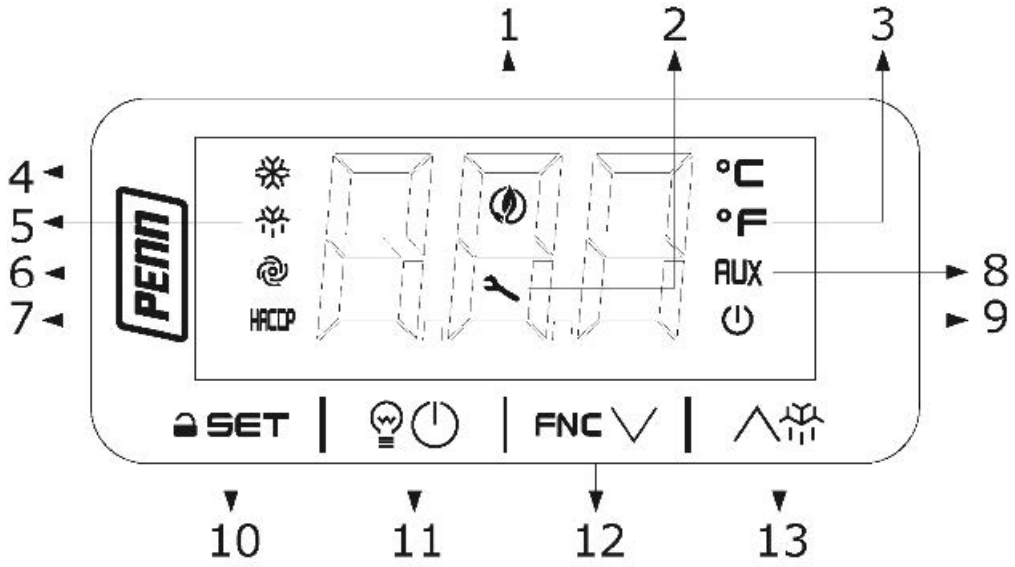


Figure 2: Dimensions, mm (in.)

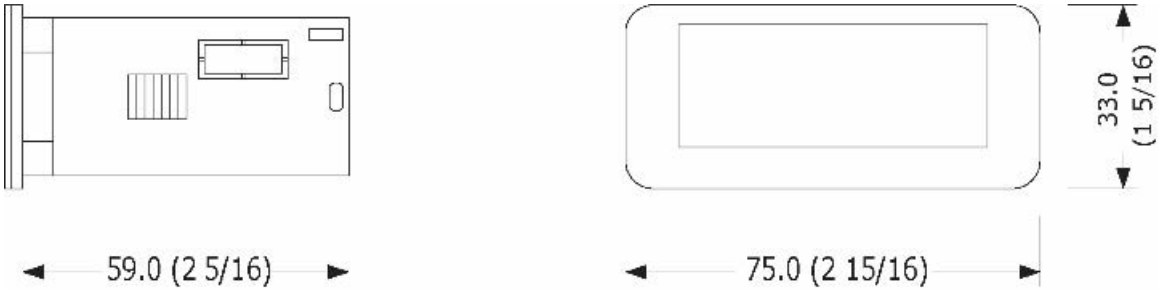


Figure 3: Drilling template, mm (in.)

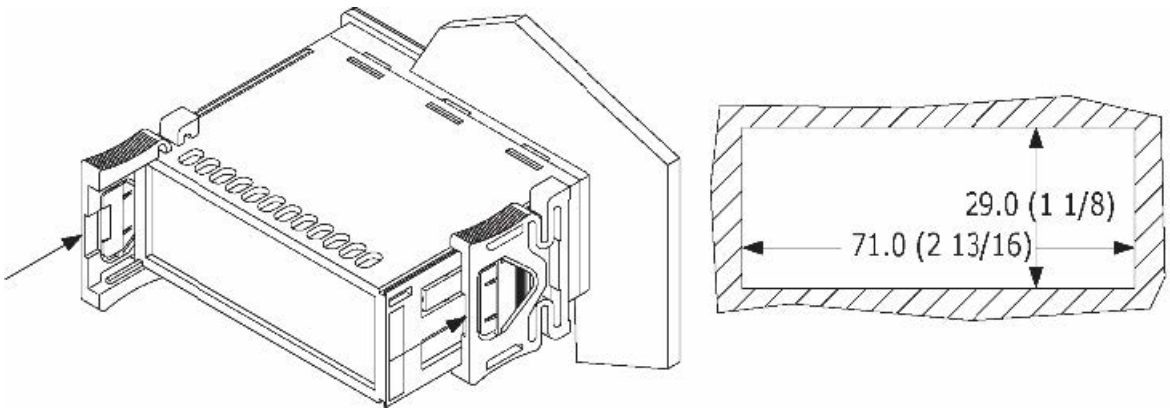
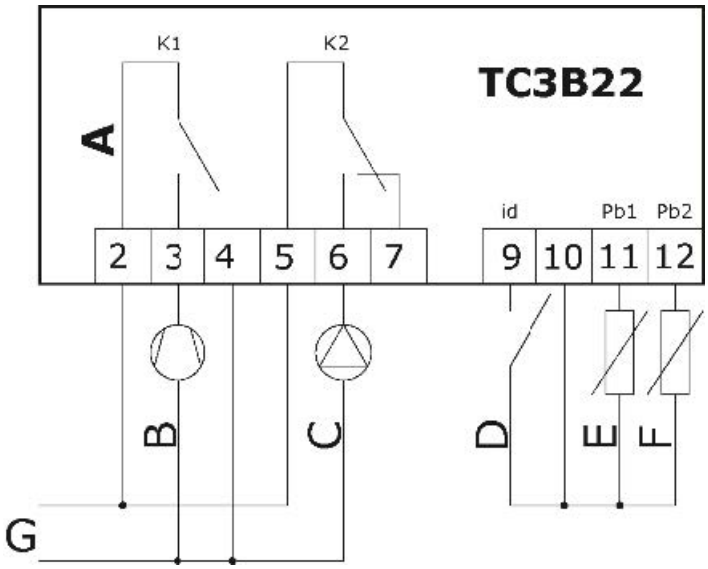


Figure 4: Electrical connection



- Controller for normal and low temperature units
- Power supply for TC3B22N7x: 230 VAC
- Cabinet probe and auxiliary probe with a negative temperature coefficient (NTC)
- Door switch or multi-purpose input
- Cooling or heating operation

MEASUREMENTS AND INSTALLATION

For the dimensions and drilling template, see Figure 2 and Figure 3. Fit the controller to a panel with the snap-in brackets supplied.

INSTALLATION PRECAUTIONS

- Ensure that the thickness of the panel is between 0.8 mm and 2.0 mm (1/32 and 1/16 in)
- Ensure that the working conditions are within the limits stated in TECHNICAL SPECIFICATIONS.
- Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- In compliance with safety regulations, install the device correctly to ensure adequate protection from contact with electrical parts. Fix all protective parts in such a way so as to need the aid of a tool to remove them.

ELECTRICAL CONNECTION

Important

- Use cables of an adequate wire gauge for the current running through them.
- To reduce any electromagnetic interference, connect the power cables as far away as possible from the signal cables.

For the electrical connection diagram, see Figure 4.

Electrical connection diagram callouts

Callout	Description
A	**Note:** Maximum 10 A
B	Compressor
C	Evaporator fans, configurable
D	Door switch or multi-purpose
E	Cabinet
F	Auxiliary, configurable
G	Power supply for TC3B22N7x: 230 VAC

PRECAUTIONS FOR ELECTRICAL CONNECTION

- If you use an electrical or pneumatic screwdriver, adjust the torque to a maximum of 0.5 N•m (4 in. lb).
- If you move the device from a cold to a warm place, the humidity may cause condensation to form inside. Wait an hour before you switch on the power.
- Make sure that the supply voltage, electrical frequency, and power are within the set limits. See TECHNICAL SPECIFICATIONS.
- Disconnect the power supply before you do any type of maintenance.
- Do not use the device as safety device.
- For repairs and further information, contact the Penn sales network.

FIRST-TIME

1. Follow the instructions in MEASUREMENTS AND INSTALLATION to install the controller.
2. Power up the device as shown in ELECTRICAL CONNECTION and an internal test runs. The test normally takes a few seconds. When it finishes the display switches off.
3. Configure the device as shown in Table 6.1 in SETTINGS.
   For recommended configuration parameters for first-time use, see the following table. DEF. PARAMETER MIN. – MAX.

PAR.	DEF.	PARAMETER	MIN. – MAX.
SP	**0.0**	Setpoint	r1 to r2
P2	**0**	Temperature unit of measurement	0 = °C 1 = °F
d1	**0**	Defrost type	0 = Electric 1 = Hot gas 2 = Compressor stopped

Check that the remaining settings are appropriate; see CONFIGURATION PARAMETERS.

4. Disconnect the device from the mains.
5. Make the electrical connection as shown in ELECTRICAL CONNECTION without powering up the device.
6. Power up the device.

UI AND MAIN FUNCTIONS

For a figure of the UI, see Figure 1.
UI callouts

Callout	Description
1	Energy saving
2	n/a
3	Temperature unit of measurement
4	Compressor
5	Defrost
6	Evaporator fan
7	n/a
8	Auxiliary
9	On or standby
10	SET key and keypad lock
11	ON/STANDBY key, escape, and cabinet light
12	DOWN key and additional functions menu
13	UP key and defrost

Switching the device on or off


If POF = 1, tap the ON/STAND-BY key for 4 s.
If the device is switched on, the display shows the P5 value, cabinet temperature by default.
If the display shows an alarm code, see ALARMS.

LED	ON	OFF	FLASHING
	Compressor on	Compressor off	• Compressor protection active • Setpoint setting active
	Defrost or pre-dripping acti ve	–	• Defrost delay active • Dripping active
	Evaporator fan on	Evaporator fan off	Evaporator fan stop active
AUX	• Alarm active • Cabinet light on by key	–	Cabinet light on by digital input
	• If device on, energy savi ng active • If device off, low consum ption active	–	–
°C/°F	View temperature	–	–
	Device off	Device on	Device on or off active

If 30 s have elapse and you do not press the keys, the display shows the “Loc” label and the keypad locks automatically.

Unlocking the keypad
Tap any key for 1 s. The display shows the label “UnL”.

Setting the setpoint
Check that the keypad is not locked.

1.		Tap the SET key.
2.		Tap the UP or DOWN key within 15 s to set the value within the limits r1 and r2.
3.		Tap the SET key or do not operate for 15 s.

Activating manual defrost (if r5 = 0, default)
Check that the keypad is not locked.

1. Tap the UP key for 2 s.

 If P4 = 1 (default), the defrost activates if the evaporator temperature is lower than the d2 threshold.

Turning the cabinet light on or off (if u0 = 3)

 Tap the ON/STAND-BY key.

ADDITIONAL FUNCTIONS

Navigating the additional functions menu
Before you begin, check that the keypad is not locked.

1.		To access the additional functions menu, tap the DOWN key for 4 s.
2.		To navigate to a label, tap the UP or DOWN key within 15 s.
3.		To select a label, tap the SET key.
4.		If you cannot edit the parameter, the value displays. If you can edit the parameter, tap the UP or DOWN key to navigate to the value that you want.
5.		To set the parameter value, tap the SET key.
6.		To exit the procedure, tap the ON/STAND-BY key, or do not operate the controller for 60 s.

Additional functions menu
Use the additional functions menu to cycle through the labels in the following table.

LABEL	VALUE	DESCRIPTION
CH		View compressor functioning hours in hundreds
rCH		Delete compressor functioning hours
	149	Command to delete compressor functioning hours
Pb1		Cabinet temperature
Pb2		Auxiliary temperature

SETTINGS

Setting configuration parameters

1.		Tap the SET key for 4 s. The display shows the label " **PA**".
2.		Tap the SET key.
3.		Tap the UP or DOWN key within 15 s to set the password. The default pass word is **"-19"**.
4.		Tap the SET key or do not operate for 15 s. The display shows the label "**SP**".
5.		Tap the UP or DOWN key to select a parameter.
6.		Tap the SET key.
7.		Tap the UP or DOWN key within 15 s to set the value.
8.		Tap the SET key or do not operate for 15 s.
9.		Tap the SET key for 4 s, or do not operate for 60 s, to exit the procedure.

Restoring the default factory settings and storing customized settings as default

Important

- Check that the factory settings are appropriate; see CONFIGURATION PARAMETERS.
- When you store customized settings, you overwrite the default.

1.		Tap the SET key for 4 s. The display shows the label “**PA**”.
2.		Tap the SET key.
3.		Tap the UP or DOWN key within 15 s to set the value.

VAL.	DESCRIPTION
149	Restores the default factory settings
161	Stores customized settings as default

4.		Tap the SET key or do not operate for 15 s. The display shows the label “**dEF**” when you set the value “**149**” or the label “**MAP**” when you set the value “**161**”.
5.		Tap the SET key.
6.		Tap the UP or DOWN key within 15 s to set “**4**”.

7.		Tap the SET key or do not operate for 15 s. The display shows “– -” flashing for 4 s, then the device exits the procedure.
8.	Interrupt the power supply to the device.	
9.		Tap the SET key 2 s before step 6. to exit the procedure beforehand.

ALARMS

COD.	DESCRIPTION	RESET	REMEDIES
Pr1	Cabinet probe alarm	Automatic	Check P0
Pr2	Auxiliary probe alarm	Automatic	Check probe integrity
			Check electrical connection
AL	Low temperature alarm	Automatic	Check A1
AH	High temperature alarm	Automatic	Check A4
id	Open door alarm	Automatic	Check i0 and i1
COH	High condenser temperature warning	Automatic	Check C6
CSd	High condenser temperature alarm	Manual	• Switch the device off and on • Check C7
iA	Multi-purpose input alarm	Automatic	Check i0 and i1
dFd	Defrost timeout alarm	Manual	• Tap any key • Check d2, d3, and d11

ELECTRICAL RATINGS

Output	Units	cULus (UL 60730)		CE (EN 60730)
	Applied voltage at 60 Hz	120 VAC	240 VAC	240 VAC
K1 compressor relay	Resistive amperes	12	12	10
	Inductive amperes	—	—	2
	Full load amperes	10	10	—
	Locked rotor amperes	60	60	—
K2 defrost or evaporator fan or configurable relay	Resistive amperes	8	8	5
	Inductive amperes	—	—	2
	Full load amperes	4.4	2.9	—
	Locked rotor amperes	26.4	17.4	—

TECHNICAL SPECIFICATIONS

Purpose of the control device	Function controller
Construction of the control device	Built-in electronic device
Container	Black, self-extinguishing
Category of heat and fire resistance	D
Measurements	75 mm x 33 mm x 59 mm (2 15/16 in. x 1 5/16 in. x 2 5/16 in.)
Mounting methods for the control device	Fit the controller to a panel with the snap-in brackets supplied
Degree of protection provided by the covering	IP65 in front
Connection method	Fixed screw terminal blocks for wires up to 2.5 mm²
Maximum permitted length for connection cables	
Power supply: 10 m (32.8 ft)	Analog inputs: 10 m (32.8 ft)
Digital inputs: 10 m (32.8 ft)	Digital outputs: 10 m (32.8 ft)
Operating temperature	From 0°C to 55°C (from 32°F to 131°F)
Storage temperature	From -25°C to 70°C (from -13°F to 158°F)
Operating humidity	Relative humidity without condensate from 10% to 90%
Pollution status of the control device	2
Compliance	
Europe	Johnson Controls declares product compliance meets requirements of EMC, LVD, and RoHS Directives.
USA	UL Recognized Component, SDFY2.SA516; FCC Part 15 Subpart B Class A
Canada	UL Recognized Component, SDFY8.SA516; ICES-003 Class A

Power supply	TC3B22N7x	230 VAC (+10% - 15%), 50/60 Hz (+/- 3Hz), max. 2 VA

Grounding methods for the control device		None
Rated impulse-withstand voltage		4 KV
Over-voltage category		III
Software class and structure		A
Analog inputs		2 for NTC probes (cabinet probe and auxiliary probe)
NTC probes	Sensor type	ß3435 (10 kohm at 25°C, 77°F)
	Measurement field	-40°C to 105°C (-40°F to 221°F)
	Resolution	0.1°C (1°F)
Digital inputs		1 dry contact (door switch/multi-purpose)

Dry contact	Contact type	5 VDC, 1.5 mA
	Power supply	None
	Protection	None
Digital outputs	2 electro-mechanical relays	

Type 1 or Type 2 actions	Type 1
Additional features of Type 1 or Type 2 actions	C
Display	3-digit custom display with function icons

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, open-source 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**

Important
The device must be disposed of according to local regulations governing the collection of electrical and electronic waste.

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

Documents / Resources

	**Penn TC3B22 Basic Defrost Controller European** [pdf] Installation Guide TC3B22N7x, TC3B22, TC3B22 Basic Defrost Controller European, Basic Defrost Controller European, Defrost Controller European, Controller European, European

References

- **johnsoncontrols.com/buildingswarranty**
- **johnsoncontrols.com/contact-us**
- **johnsoncontrols.com/locations**

- johnsoncontrols.com/techterms
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