

SmartSens Hybrid N-C6S Kit Instructions

Operation & Installation Manual



This kit **MUST** be installed in accordance with Manufacturer’s Installation Instructions.
All installation work **MUST** be carried out by an **AUTHORISED PERSON**.

DESCRIPTION

For many years, Brivis Add-On ICE Inverter systems have provided cooling to homes using electric powered refrigeration and supplied heating through gas.

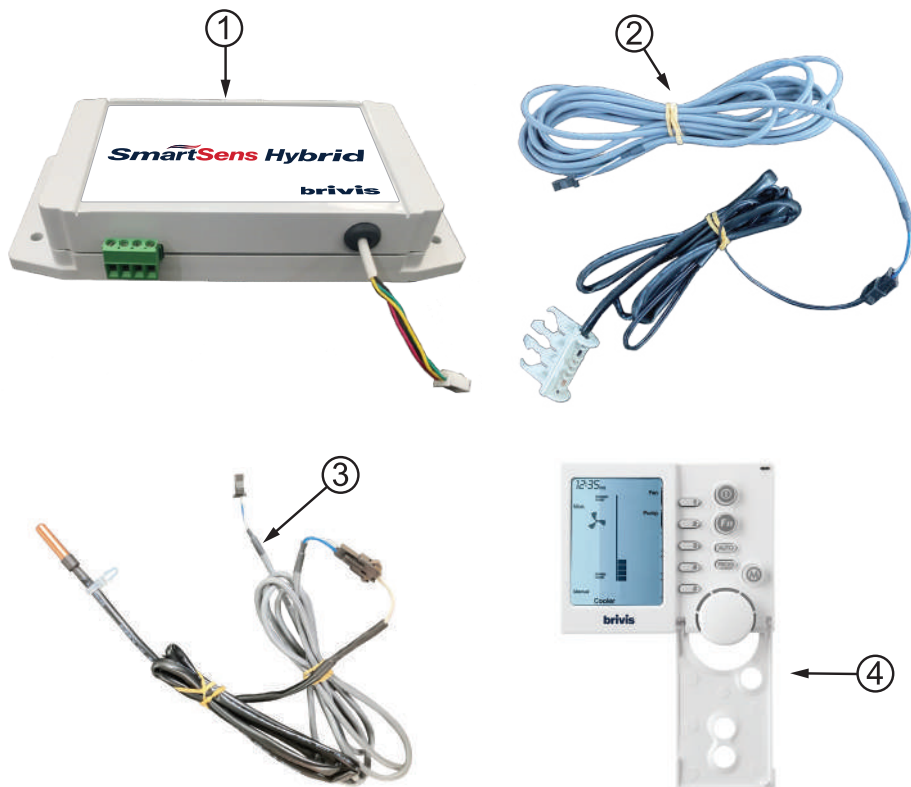
The SmartSens Hybrid controller extends the capability of Add-On ICE Inverter system to electric heating or heat pump operation. The user may direct the system to heat the home with gas or electricity at any ambient temperature or select auto mode, allowing the system to decide the best energy source to heat the home.

SmartSens Hybrid is a communication device which connects a Brivis Add-On ICE Inverter* and StarPro+ Ducted Gas Heater to the Brivis Networker (N-C6S).

MODELS

Compatible Models	DINLU10Z7, DINLU13Z7, DINLU15Z7, DINXU10Z7, DINXU13Z7, DINXU15Z7, DINXU17Z7, DINIB10Z7L, DINIB10Z7R, DINIB13Z7, DINIB15Z7
Appliance Type	Brivis Inverter R410A models only
SmartSens Hybrid Kit Part Number	SMARTSENSHKIT6

KIT PARTS



* Fixed speed ICE models are not compatible with SmartSens Hybrid.

+ StarPro heaters containing a N-G2 or N-G3 control board may only be SmartSens configured for reliable airflow management.

KIT CONTENTS

Item No.	Part Description	Qty	Image
1	SmartSens Hybrid Controller	1	
2	Ambient Temperature Sensor	1	
3	Return Air Temperature Sensor	1	
4	N-C6S Networker	1	
Not shown	Installation / Operation Instructions	1	

INSTALLATION



Both indoor and outdoor air conditioning systems must be isolated from mains power supply.

Disconnect power to Bravis ICE Inverter System. Make sure both indoor and outdoor ICE units are isolated from main power.

Disconnect power to the Bravis Ducted Gas Heater.



To avoid getting an electric shock, **NEVER** touch the electrical components soon after the power supply has been turned off. Always wait 10 minutes or more before you touch the electrical components.

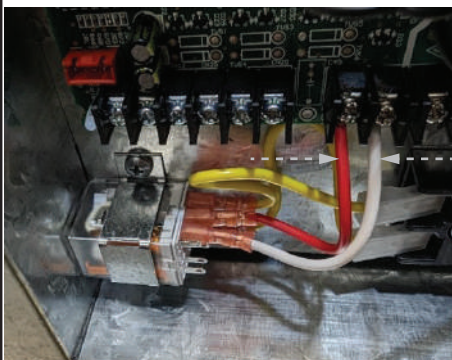
- Unplug the power cord plug from the Indoor ICE Unit.
- Remove Bravis ICE Indoor Unit Electric access panel.
- The 24 VAC Relay is located on the bottom where it receives power from the Ducted Gas Heater board.
- Ensure the relay red light is OFF, and that the power is discharged.

Bravis Ice Unit

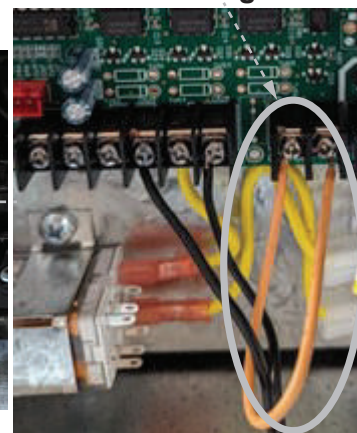


- Disconnect and remove the Red & White wire connections from the PCB ON/ OFF terminals.
- Remove the relay.
- Bridge the ON/OFF terminal (CN23) on the PCB with wire (minimum 0.5 mm²).

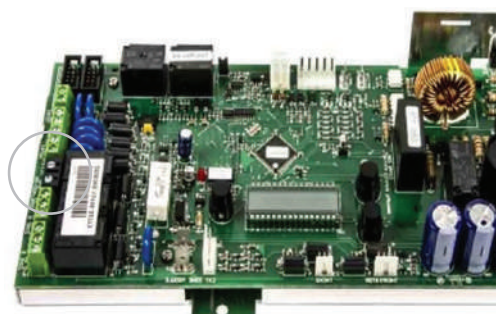
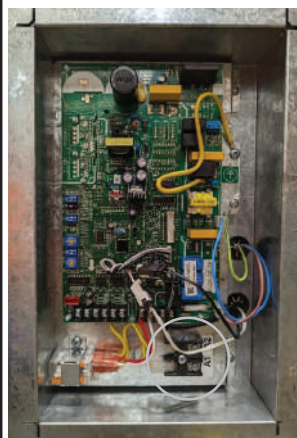
Note: Bridge wire is field supplied



Bridge

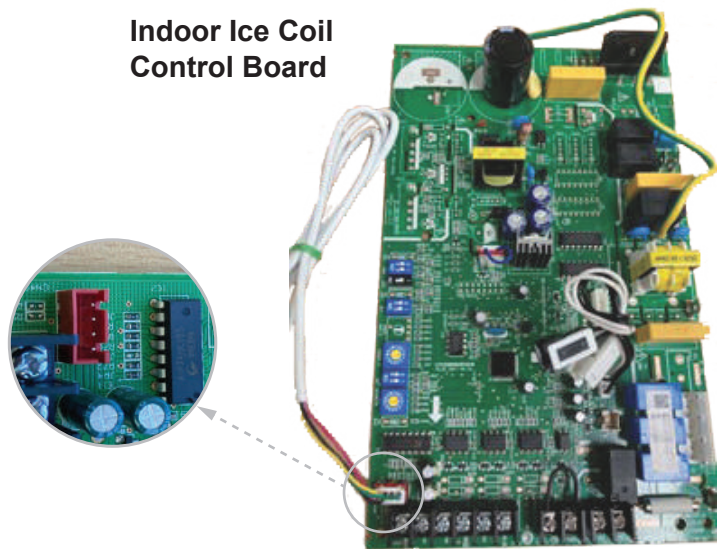


- Disconnect and remove the cable connected to A1, A2 Terminals.
- Disconnect the interconnecting cable from Heater PCB "Add-On Port."



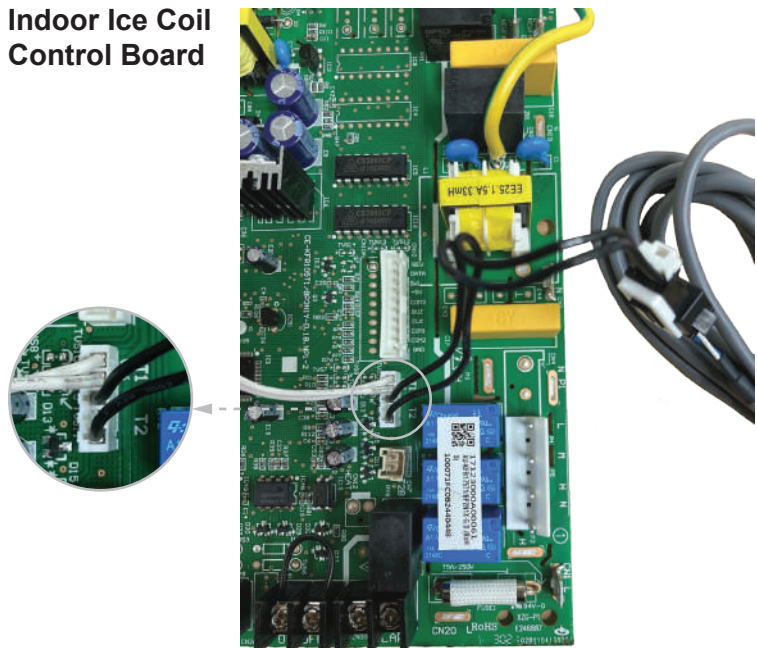
- Plug **SmartSens Hybrid RS485 communication cable** (Item 1, white color 4 core cable factory fitted and comes with unit) to CN40 Port (red receptor) located on the bottom corner of Bravis ICE indoor unit PCB Controller.

Indoor Ice Coil Control Board



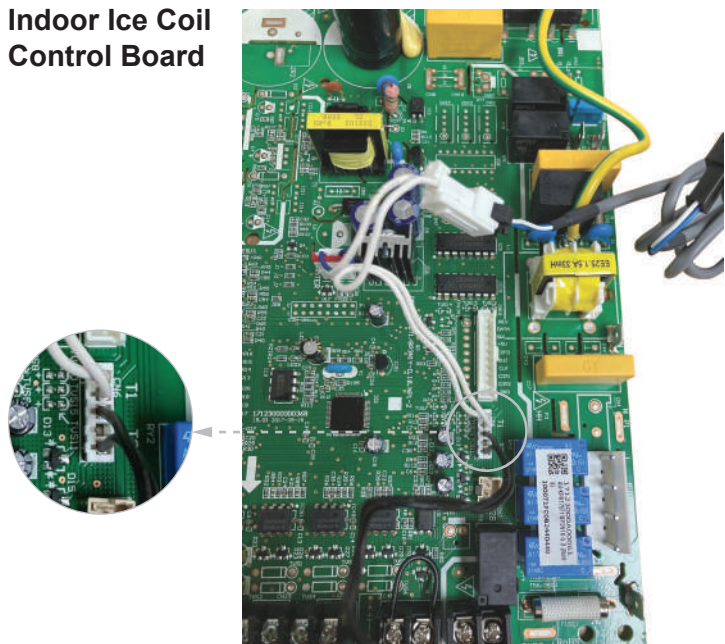
- Disconnect and remove original T2 Sensor from the Bravis ICE Indoor PCB, T2 Port (Black Colour loom)
- Plug '**Ambient Temperature Sensor**' extension Loom (Item 2, 30 m) to T2 Port (3 Way plug).
- Run this sensor to the outdoor unit and locate it next to condensing unit ambient sensor behind the coil (plastic clip is provided).

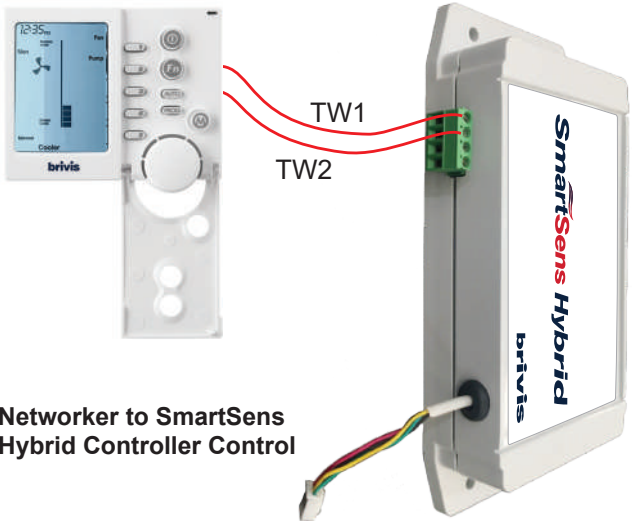
Indoor Ice Coil Control Board



- Disconnect and remove original T1 Sensor from the Bravis ICE Indoor PCB, T1 Port (White colour loom).
- Plug '**Return Air Temperature Sensor**' (Item 3) to T1 Port (2 Way plug, 3 m).
- Run this sensor to the Air Inlet side of Ducted Gas Heater and make sure sensor is placed inside the air return duct (metal bracket is provided).

Indoor Ice Coil Control Board



- For existing systems receiving this upgrade all Networker controllers must be replaced with CNTRLNC6S, all Remote Temperature Sensors may remain. - One CNTRLNC6S (Item 4) has been included with the Kit. - Additional Networker (N-C6S) controllers* may be configured to this system, order Part No. CNTRLNC6S.							
- Run two wire communication cable (Figure 8, 0.5mm²) and connect Networker to the 4-way green terminal block located on the side of the module box. - Remove TWB connection between Networker and NG2.	 Networker to SmartSens Hybrid Controller Control						
- For No Zone Application, Set Installer Parameter on N-G2A Heater controller NET506 = 0 - For Zone Application, Set Installer Parameter on N-G2A Heater controller NET506 = 1 - Please note that this configuration can also be done through wall controller Parameter ID 7 - Please note that NET506 Setting 2-7 is not used with this system	 <table border="1" data-bbox="813 1395 1323 1697"> <thead> <tr> <th>Installer Setting Number 7 Value</th><th>Primary Display</th></tr> </thead> <tbody> <tr> <td>0</td><td>  </td></tr> <tr> <td>1</td><td>  </td></tr> </tbody> </table>	Installer Setting Number 7 Value	Primary Display	0		1	
Installer Setting Number 7 Value	Primary Display						
0							
1							
- With all SmartSens Hybrid components installed, power the system ON. - The system is now ready for commissioning. Please follow the SmartSens Hybrid Networker operation instructions.							

**SmartSens Hybrid systems may contain a mix of N-C6S and N-C7S controllers if required.*

ADDING REFRIGERANT

Some air conditioning systems require additional charge to achieve the right air temperature during heating cycle.

Additional charge is dependant on air conditioner size as outlined in the below table below.

R410A refrigerant must be charged as a liquid. Refer to the instructions outline on your refrigerant cylinder to verify that the cylinder is oriented properly for charging. Charging as a gas may result in refrigerant separation and unsuitable unit operation.

Refer to the below table for additional refrigerant requirements.

Refrigerant cannot be added until the field wiring has been completed. Refrigerant may only be added after performing a leak test and system evacuation. When charging the system, care must be taken to ensure that the maximum permissible charge is not exceeded. Excessive charge may lead to liquid slugging and equipment damage. Ensure that appropriate refrigerant is used to charge the system. Inappropriate or contaminated substances may cause equipment damage. Refrigerant containers should be opened slowly to avoid injury. Always use protective gloves and protect your eyes when charging refrigerant.

Model	R410A Extra Charge
DONSC10Z7	No Extra Charge needed
DONSC13Z7	No Extra Charge needed
DONSC15Z7	Add 500 g
DONSC17Z7	Add 1000 g

SMARTSENS CONNECTION CHECKLIST

Item	Description	Yes/No
1.	Return air sensor T1 replaced?	
2.	Return air sensor T1 positioned within heater return air duct?	
3.	Outdoor ambient air sensor T2 replaced?	
4.	Outdoor ambient air sensor T2 located at outdoor coil fins?	
5.	S1/S2 communication cable between indoor and outdoor air conditioner PCB connected?	
6.	TWB connections between networker, heater and SmartSens controller	
7.	RS485 communication cable between SmartSens and Indoor coil PCB connected	
8.	On/Off terminal of indoor PCB bridged?	



Additional Networker (N-C6S) controllers may be configured to this system, order Part No. CNTRLNC6S.

Remote temperature sensors may also be configured to this system, order Part No. CNTRLNT1.

For existing systems receiving this upgrade all Networker controllers must be replaced with CNTRLNC6S, all Remote Temperature Sensors may remain.



If required, N-C6S and N-C7S controllers may be configured to the same SmartSens Hybrid system.

Power to the SmartSens Hybrid controller is provided through the CN40 connection.

If more than two N-C6S controllers are installed, a power module must be installed – Part Number MODN-PM1.

OPERATION

SmartSens Hybrid heating / cooling system consists of four major components: a Ducted Gas Heater (StarPro), an Electric air conditioner, ductwork system, interface controller and wall control unit(s). Air is drawn from the house through a large, centrally located, return air grille into the gas heater and electric air conditioner which are connected in series through a common duct. When cooling is demanded, the air is cooled by air conditioner and when heating is demanded, then air is warmed by either air conditioner or gas heater or combination of both.

When air conditioned (heated / cooled), the air is distributed throughout the house via a network of smaller ducts and released into each room through floor or ceiling outlets. The entire process is controlled via the SmartSens wall control unit (N-C6S), which is usually positioned in the living area on an internal wall away from windows and doors (where possible).

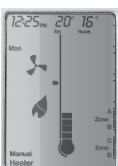
NETWORKER N-C6S

The following table details the functions and symbols of the Networker Controller.

Batteries

The Networker does not require batteries. If the networker display is blank, check that the 240V power supply and the thermostat cable are correctly connected.

Networker Wall Control Unit Features

Symbol	Description	Symbol	Description
	On/Off: Turns the networker on and off.		Variable Keys: Provide various functions depending on the selected program or mode. Functions are available only when text, a black box, or an arrow appears on the screen beside the key.
	Function (Fn): Used in conjunction with Keys 1 or Key 2 to activate special functions, such as message repeating and networker locking. The Fn button also activates the LED backlight.		Flame: Indicates that the heater is switched on. Flashes during pre-heat.
	Mode: Enables switching between a heater and cooler when both are connected to the networker. When selected, the active mode appears at the bottom of the screen, e.g. <i>Heating</i> .		Fan: Displays when the heater is switched on; indicates that the fan is active. Flashes during pre-heat.
	Heartbeat: When flashing, this icon indicates that room temperature is being sensed from this networker.		Thermometer: Registers the current room temperature. The small marker beside the thermometer indicates the temperature that the heater is currently set to maintain.
	Program (PROG): Provides access to the programmable settings of the networker.		Padlock: Indicates that the networker is locked. (Refer to Section 13.2, Lock the Networker.)
	Auto (AUTO): Switches between the preset program and manual operation.		Snowman: (Add-on air-conditioning only) Indicates the refrigeration compressor is running. Flashes when the compressor is in a safeguard time off period.
	Rotary Dial: Rotated to change settings.	 (Display)	Provides information about the system, such as the current time (top left), day of the week (left side), and selected appliance (bottom). The display also scrolls messages across the top of the screen, for added information such as operational states.

SMARTSENS HYBRID SWITCHING MODE OPERATIONS

N-C6S SmartSens wall controller provides additional options for heating areas in the home by using power through existing installed electric air conditioner.

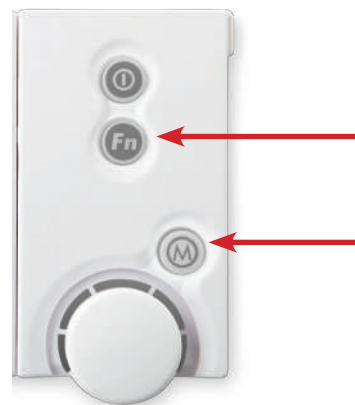
Modes available

Gas Heating	Electric Heating	Hybrid Gas and Electric Heating	Cooling
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When auto-switch is turned off (Manual mode), user can switch between electric or gas heat (forced) mode by following the steps below.

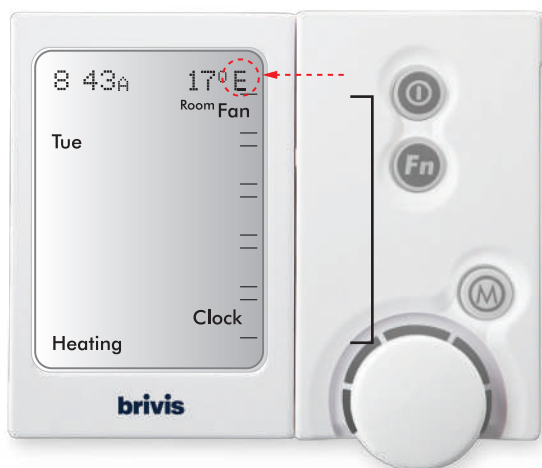
Manual (Forced) Electric Heating / Gas Heating Selection

- Press “Fn” button followed by “M” button.
- Repeat procedure to switch between electric (E) or gas (G) heating mode.



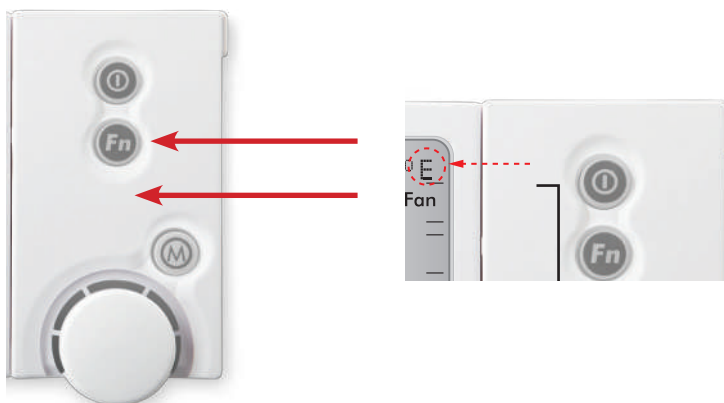
When the interface module (SmartSens Hybrid) is configured successfully, you will see the display as shown below.

Next to the N-C6S ambient temperature display, a stationary letter “E” or “G” will appear.



Auto (Hybrid) Electric Heating / Gas heating selection

- Press “Fn” button followed by “AUTO” button
- The “E” or “G” icon will flash intermittently.



When the interface module (SmartSens Hybrid) is configured successfully, you will see the display as shown in the table below. Next to the N-C6S ambient temperature display, a stationary letter “E” or “G” will appear.

Status Indication		Display
Stationary ‘E’	Electric Heating Forced Mode	Top right-hand corner
Stationary ‘G’	Gas Heating Forced Mode	
Flashing ‘G’ or ‘E’	Auto Hybrid mode	

How Auto Mode Heating Operates?

In Auto heating mode, the Smartsens controller will automatically switch between Gas heater and Electric air conditioner according to indoor / outdoor conditions.

When ambient temperature falls below default factory preset value ($<8^{\circ}\text{C}$), SmartSens will run the Ducted Gas Heater to avoid frequent defrost of the air conditioner. This will save electricity running costs associated with colder ambient conditions.



Default factory value can be ONLY configured and changed by the installer (Parameter 120).

When ambient temperature goes above default factory preset value ($>18^{\circ}\text{C}$), SmartSens will run the air conditioner to minimise electricity running costs associated with higher ambient conditions ultimately saving on customer’s gas bill.



Default factory value can ONLY be configured and changed only by the installer (Parameter 121).

When ambient temperature is within range of Hybrid operation ($8^{\circ}\text{C} \leq T \leq 18^{\circ}\text{C}$), SmartSens will monitor the indoor air temperatures. If indoor air is colder than required set point (room temperature is less than set point $<3^{\circ}\text{C}$) or room has been cold for more than a reasonable time (15 min), the Ducted Gas Heater will operate to provide comfort and bring room temperature close to required set point. Once the temperature of the room reaches within 3°C of setpoint, the conditioner will run to utilise low electricity running costs associated with low heat capacity.



Default factory value can ONLY be configured and changed by the installer (Parameter 122).

Installer Parameter Summary

Parameter	Default	Unit	Min	Max
Networker Installer Parameter 120	8	$^{\circ}\text{C}$	0	40
Networker Installer Parameter 121	10	$^{\circ}\text{C}$	0	40
Networker Installer Parameter 122	15	Min	1	60

NOTES

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**Cost of a local call may be higher from a mobile phone.
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