



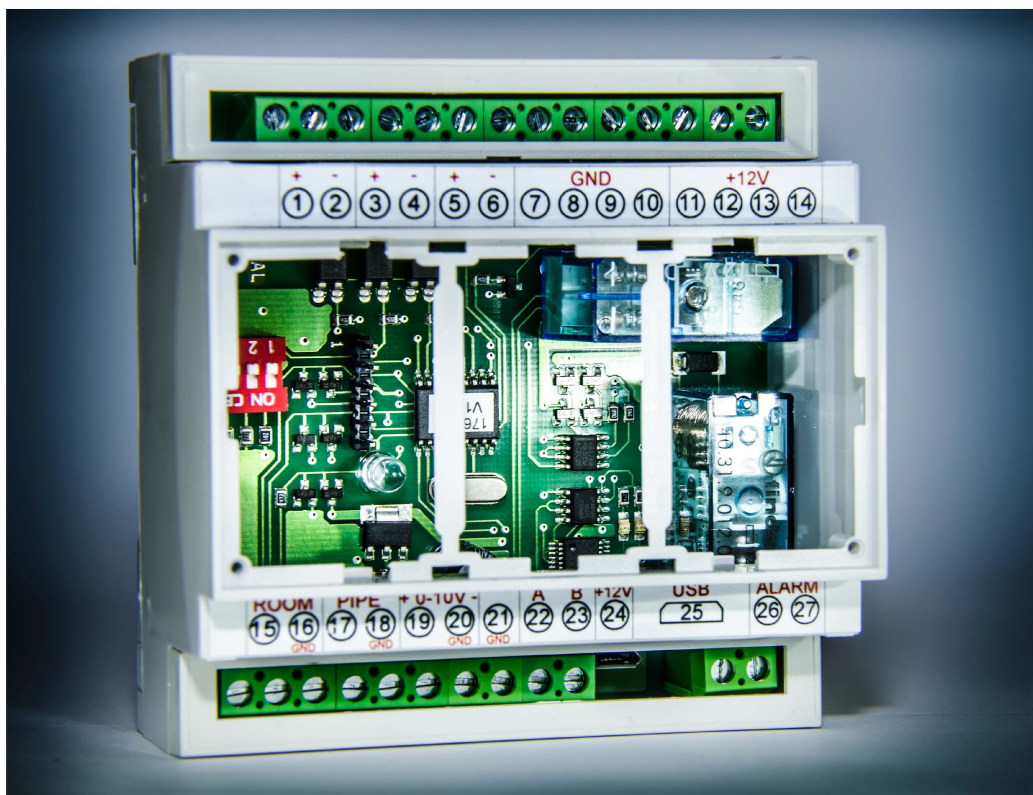
User's manual

Gree AHUcom

Type: U-Match Series 5

Version: 1.03

- Thank you for choosing GREE AHUcom, please read this user's manual carefully before operation and keep it for further reference.
- In case of lost manual, please, contact your local dealer, visit www.gree.at/site/page/view/navody or send email to info@tdmetal.cz
- TD Metal s.r.o. reserves the right to interpret this manual which will be subject to any change due to product improvement without further notice.



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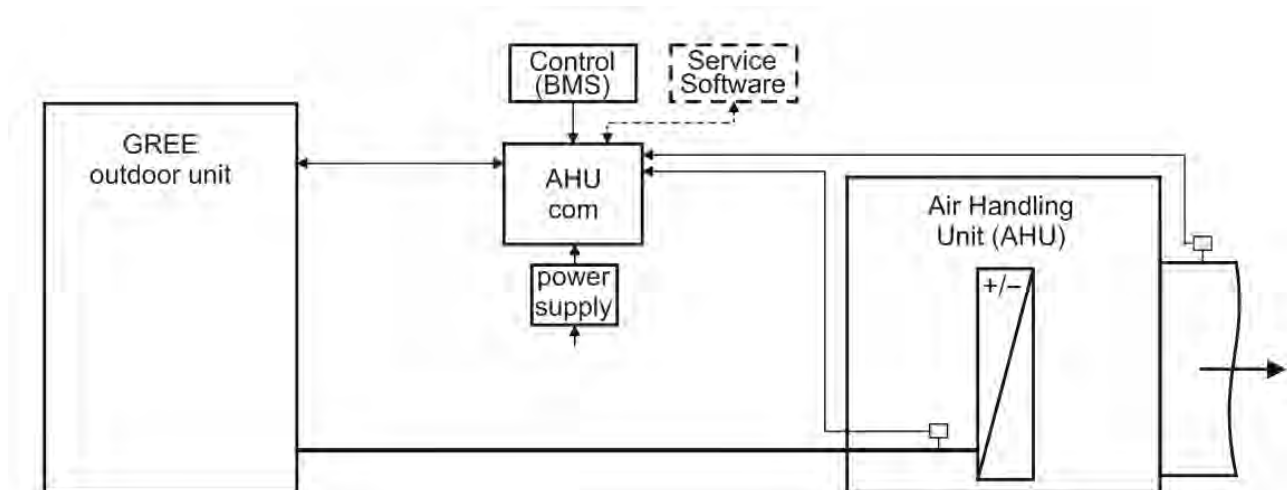
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1 General description of AHUcom

AHUcom electronic communication module allows you to connect GREE brand outdoor unit from U-Match Series 5 to any air handling units equipped with direct expansion air exchanger and drive it via any control system.

Commands from Control system:

- On / Off command - floating contact
- Cool / Heat command - floating contact
- power request - 0 to 10 V
- manual defrost command - floating contact



Communication module can control outdoor (condensing) units from GREE brand U-Match Series 5(GUHDxxNx3FO), which are available with power output range from 2,7 kW (9200 BTU/h) to 16 kW (55000 BTU/h).

More power output can be achieved with multiple outdoor units in parallel connection. Each of outdoor units has to be connected to an individual refrigerant circuit in air handling unit. Two or more units may not use the same refrigerant circuit.

2 Properties

2.1 Control commands

Upon complete connection, AHUcom module starts receiving commands from the master control system (eg. Air handling Unit control system, BMS, etc.) and turns on outdoor unit in required mode and performance. Control signals via floating contact are On/Off, Heating/ Cooling, Forced defrost. Analog signal Request Power is a DC voltage of 0 to 10V.

Unit's power (actual compressor frequency) can be different from the required parameter because e.g. its own microcontroller of outdoor unit doesn't allow high power in case of detected overheating or in case of very low evaporation temperature during cooling etc. Gradual increase and decrease of the compressor frequency is also controlled. Complete control system may reduce the frequency and capacity of the compressor, according to all the restrictions that determine rules of operation of the outdoor unit of GREE manufacturer at all times. There is also a potential free output to indicate faults to control system.

2.2 Operation notes

Gree compressors in U-match units are able to operate stably at 80-85Hz in a long term. Long term operation at 100Hz can lead to overheating and IPM protection error (H5). Therefore it's recommended to set 8 V - 8,5 V as maximum capacity to the Control system. AHUcom has an automatic internal protection, activated at compressor's running frequency of 90Hz, restricting control system/user to increase the frequency/capacity further.

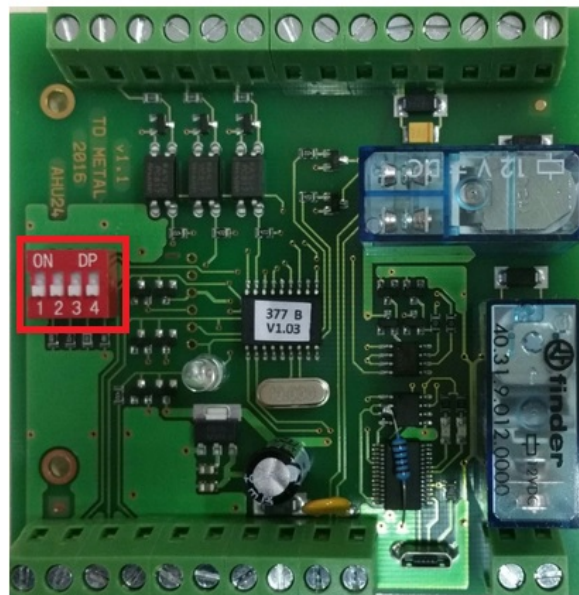
Please, use ON/OFF signal to shut down the operation of unit. There is minimum running frequency of Gree compressors, therefore setting frequency to 0Hz will result into unit running at this frequency instead of turning it off.

Duct sensor included in the kit serves for Text parser purposes. Temperature of the air is set by controller and duct sensor of AHU unit, MaR has its own PID regulator and temperature sensor. It is changing frequency of compressor based on temperature detected by sensor and Control system automatically calculates power output needed for the temperature set by the customer.

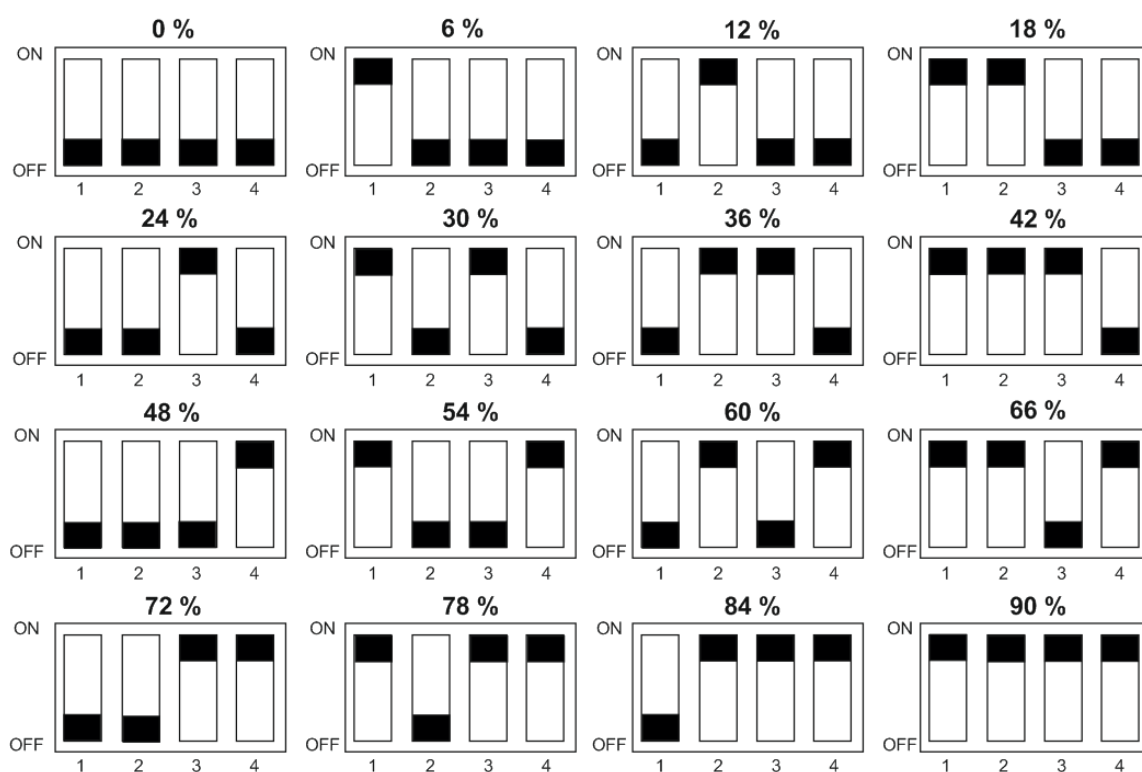
2.3 Using outdoor unit as an Fix-speed ON/OFF appliance

It is possible to use Inverter outdoor units from GREE U-Match series as an ON/OFF appliance.

AHUcom module has a manual electric DIP switch for this purpose, allowing users to set fix speed (capacity/frequency of compressor) in range between 0-90% of the maximum capacity.



There are 16 positions of DIP slides, corresponding to 0-90% capacity of compressor via 6% steps. Please, set demanded fix capacity using manual slides per schematic diagram below.



3 AHUcom technical specifications

3.1 Unit technical parameters

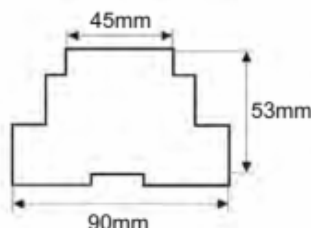
Application:	GREE U-Match Series 5 (GUHDxxNx3FO) + any air handling units equipped with direct expansion air exchanger
AHU unit capacity:	2,7 kW (9200 BTU/h) – 16 kW (55000 BTU/h) (more with parallel connection)
Power voltage:	220-240V/1Ph/50Hz (GUHDxxNK3FO) 380-415V/3Ph/50Hz (GUHDxxNK3FO)
Size of fitting pipe:	$\phi 1/4''$ or $\phi 3/8''$ (liquid), $\phi 1/2''$, $\phi 3/4''$, $\phi 3/8''$ or $\phi 5/8''$ (gas)

Please, refer to corresponding service manual for detailed technical specification of GREE outdoor unit
http://gree.at/uploads/servisni/servisni_manual_gree_en_u-match_dc_inverter_2015.pdf

3.2 AHUcom technical parameters

Power voltage:	12 VDC (Power supply 220 VAC to 12 VDC included in package)
Control device:	Master control system (AHU control system, BMS)
Analog signal inputs:	0-90% (0-10V, stepless)
Digital signal inputs:	3 floating contact signals, ON/OFF, HEAT/COOL and FORCED DEFROST
Digital signal output:	DEFROST - defrosting flag
Temperature operation range:	Minimum duct temperature $> 4^{\circ}\text{C}$ (cooling) Maximum duct temperature $< 30^{\circ}\text{C}$ (heating) Minimum pipe temperature $> 3^{\circ}\text{C}$ (cooling)
AHU kit module:	<i>Installation:</i> DIN rail (EN 60715) mounting <i>Material:</i> self-extinguishing Noryl, <i>Dimensions:</i> 87mm(w)x90mm(d)x58mm(h)

Profile view:



Package dimensions:	170mm(w)x115mm(d)x70mm(h)
Weight:	0,38kg

3.3 AHUcom package contents

1. AHUcom module
2. Duct type temperature sensor NTC 10k Ω
3. Pipe type temperature sensor NTC 10k Ω
4. Communication grounding cable
5. Power source - DIN mountable (230V AC to 12V DC)
6. USB flash disc (contains drivers, monitoring program TextParser, this User's manual in .pdf)



4 Safety & Installation precautions

WARNING

- Please read this manual carefully before you proceed with installation of AHUcom and operation of the unit. Not following instructions may result into property damage or injury.
- Only a qualified electrician should attempt to install this system. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures.
- Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also occur. Therefore, ensure that all wiring is tightly connected. When connecting each power wire to the terminal, follow the instructions and electrical wiring scheme.
- Don't touch with hands while the power is on, there is a risk of fire or electric shock.
- Use standard parts and parts included in kit.
- Use product only for its purpose and range of application.
- Do not install the system in locations where flammable gas can be generated, enters, build up, or leak. Do not install in locations where volatile inflammable materials are handled. Flammable gas or inflammable materials may ignite, cause fires.
- Be cautious that water can't enter the appliance.

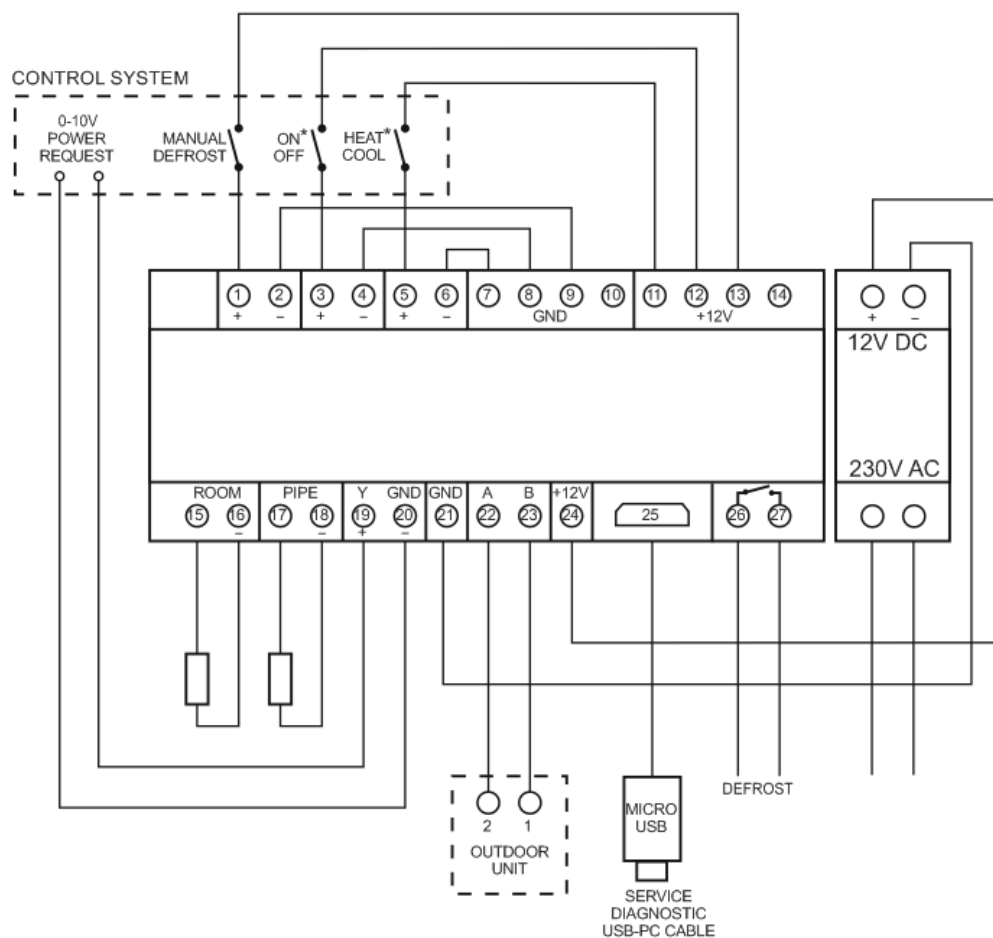
5 AHUcom installation

5.1 Electrical wiring instructions

- It's necessary to correctly connect wiring and signals for the proper functioning of the device. Supply voltage of 12V DC is available from the power adapter in the package.
- AHUcom requires two temperature sensors for correct operation - air outlet temperature of the Air Handling Unit (or room temperature) and the refrigerant temperature of the heat exchanger in Air handling Unit. The sensors are not polarized. For communication with the outdoor unit, it's connected via a data line, where it is necessary to comply A and B polarity.
- Connect the signals from the Control system to AHUcom. It is absolutely necessary to use the Service Program when you want to start the outdoor unit for the first time. It will help to find all the necessary data and information to be convinced about the correct operation.
- Each component connected to the AHUcom has its own polarity or labeling and wrong connection will cause malfunction or damage, except of temperature sensors, which allow connection without polarization. Complete wiring should be done according to the following diagram on next page.

5.2 Electrical wiring scheme

* Open = COOL; OFF (preset)
Closed = HEAT; ON



- 1 - | MANUAL DEFROST
- 2 - |
- 3 - |
- 4 - | ON - OFF
- 5 - |
- 6 - | COOL - HEAT
- 7 - |
- 8 - |
- 9 - | GND
- 10 - |
- 11 - |
- 12 - | +12V DC
- 13 - |
- 14 - |

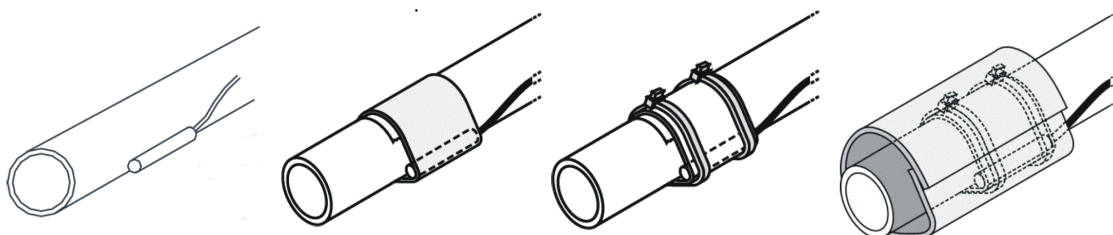
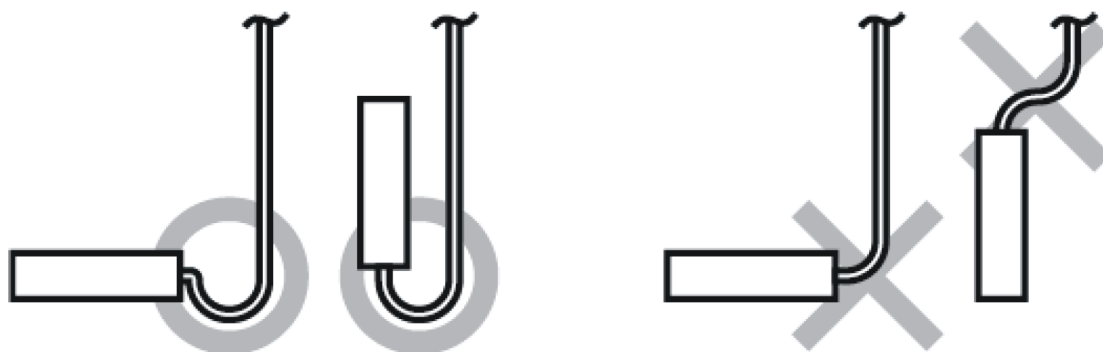
- 15 - | OUTLET / ROOM TEMPERATURE
- 16 - |
- 17 - | REFRIGERANT TEMPERATURE
- 18 - |
- 19 - |
- 20 - | POWER REQUEST 0 - 10V
- 21 - | SUPPLY GND
- 22 - | OUTDOOR UNIT COMMUNICATION
- 23 - |
- 24 - | SUPPLY +12V
- 25 - | SERVICE PROGRAM COMMUNICATION
- 26 - | DEFROSTING FLAG
- 27 - |

5.3 Pipe temperature sensor installation

Temperature sensors must be installed in the right places and de-frayed according to standard methods. The **Pipe Sensor** must be placed close to the refrigerant air exchanger on refrigerant pipe in Air Handling Unit. Use tying strap to attach the sensor tightly to the pipe to ensure good contact as shown below. Fix the pipe with foam insulation and do not expose wirings to flexed positions.

Note:

Temperature sensors included in kit serve just for maintenance / protection and diagnostic purposes. Temperatures crucial for operation of unit are monitored by sensors of master controller and AHU unit. This pipe sensor included in kit also serves as an antifreeze protection - it stops outdoor unit's operation if the detected temperature is 3°C or less.

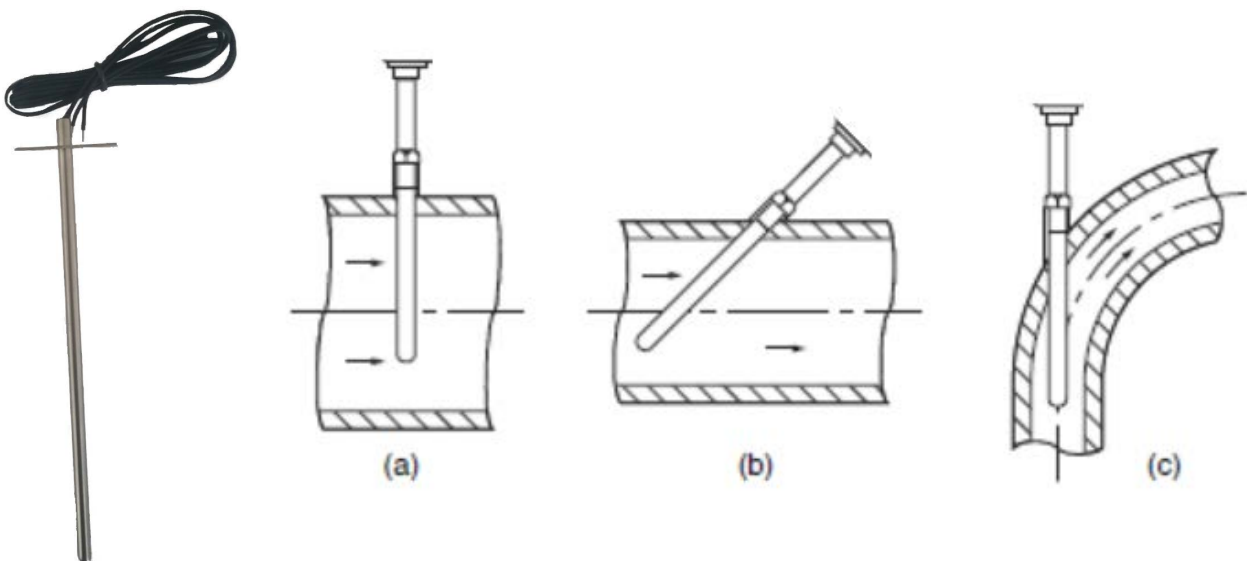


5.4 Room temperature sensor installation

Duct air temperature sensor must be placed in the outlet duct air handling unit in the recommended distance of 2 meters from the unit.

During installation choose one of the followings:

- (a) Install the Temperature Sensor vertically to the flow in tubes with relatively large diameters that enable deep insertion.
- (b) Install the Temperature Sensor on a diagonal against the flow in tubes with slim diameters that do not enable deep insertion.
- (c) Install the Temperature Sensor into the convex section of a bend if the tubing diameter is even thinner than in (b).



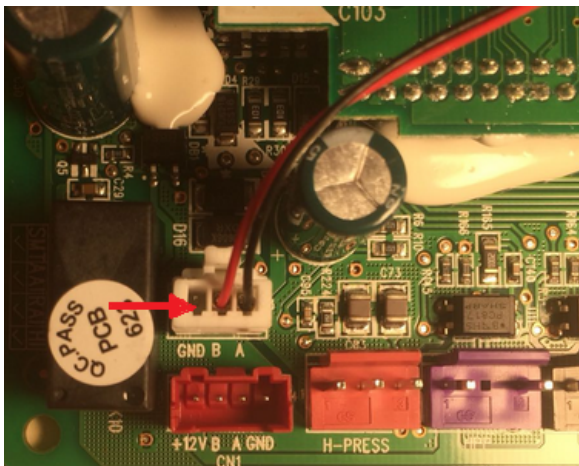
5.5 Connecting communication cable with grounding

Please disconnect original communication cable included in unit from factory from the mainboard and replace it by cable included in AHUcom with proper grounding (GND). As displayed at first picture below, original cable miss grounding connector (factory setup expects unified power supply for both indoor and outdoor unit).

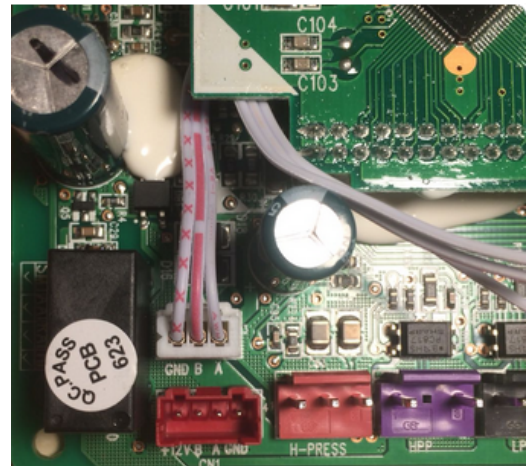
Note:

This step is not mandatory, however recommended to prevent problems that may occur in cases of unstable power supply.

Disconnect cable from outdoor mainboard:



Replace it by cable with proper grounding (GND) included in kit:



6 Text Parser comissioning

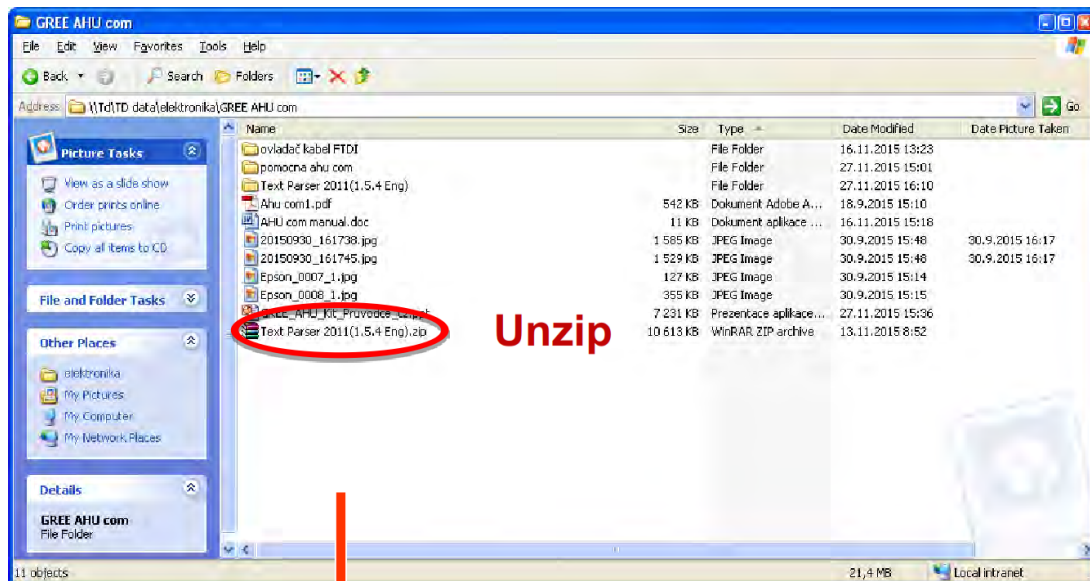
6.1 Connecting Service program Text Parser

For successful commissioning of the system it's absolutely necessary to check the operation status and values of the outdoor unit with Service Program after the start.

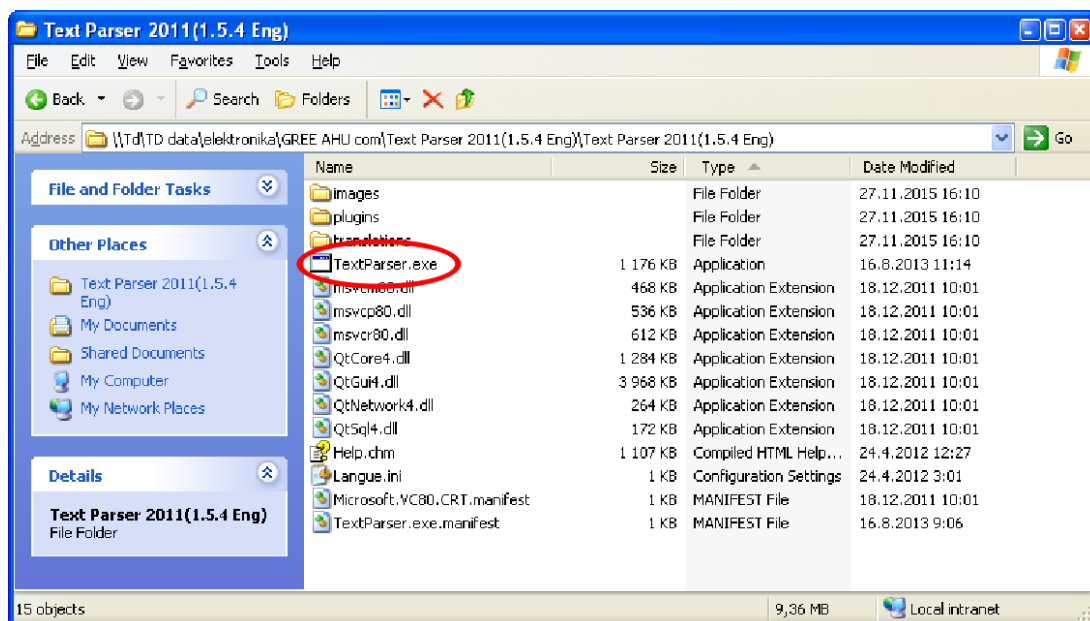
- Please, install necessary drivers before connecting AHUcom to your computer.
- Open the folder containing drivers on the attached USB flash disk and run Setup (CDM21216_Setup.exe). FTDI drivers will install automatically.
- In case of a problem, or for a detailed drivers installation guide, please refer to file [ftdi_guide.pdf](#) contained at your medium.
- Please, remove terminal block cover and connect AHUcom to your computer via USB cable according to picture below (position 25 at electrical wiring scheme). Data are transmitted to the computer and Text Parser program. The same procedure takes place for service purposes.



Find the program in a zip file (on a USB flash disk) and prepare a folder in your computer where the program Text Parser can be exported from the zip file into - create a new folder: **Text Parser 2011 (1.5.4 Eng)**



Run Service program **Text Parser.exe**



6.3 Monitoring environment

You should check values displayed in Text Parser prior to initial start up and for further service purposes.

Key parameters:

1. Ambient temperature at air inlet (room temperature)
2. Evaporator temperature (pipe temperature)
3. Compressor frequency set via MaR in Hz / % via 0-10V signal
4. Forced defrosting via MaR (control system uses time gaps, when there is no request needed for the operation the defrosting (beyond automatic defrosting U-Match outdoor units have)
5. Unit status
6. Unit operating mode
7. Next set frequency of compressor (system increases frequency gradually to achieve target frequency set in point 3)
8. Real actual running frequency of compressor
9. Drive memory chip error - it displays permanently and has no relevance, please, ignore it

TextParser 1.5.4(After Service Edition) -- monitoring

Settings Operations Help

IDU		Slave Wired Controller		Wired Controller		Fresh Air Damper Status		Body_sensing Mode	
1. Ambient Temp AirInlet	19.2	Commu ErrorRelatesMWC	No	Unit On_off	On	Sleep Mode	Close	Timer On Sign	
Ambient Temp Receiver	-87.6	Commu ErrorRelatesSWC	No	Ambient Temp Wired Controller	19.2	Out Mode	Close	Timer Off Sign	
2. Evaporator Temp	18	Commu ErrorRelatesODU	No	Current Temp	19.2	Health	Close	Refrigerant Reclaim	
IDU Fan Speed Level	1Fspeed			IDU Address	1	I_Demand	Close	Select Ambient Temp	
IDU Relative Humidity	0			EXV Open Set Value	16	Turbo	Close	Ambient Temp Under	
Aux Electrical Heater	No			3. Comp Operat Freq Set Value	84	No Auxiliary Heat Sign	Close	No E2 Shown Wired	
Water Pump	Close			ODU Fan Speed Set Value	0	Dry	Close	IDU Fan Blows Extra	
Fresh Air Damper Switch	Close			IDU Fan Speed Set Value	0	Quiet	Close	Comp Band Heater In	
Cold Plasma Generator	Open			Accumulated Time Filter Clean	0	Low Temp Dry Mode	Close	Standby Control Low	
Error Output Status	No			Temp Comp Value Air Inlet	0	Clean Function	0	4. Forced Defrosting	
IDU Evaporator Temp Sor Err	No			PC Control Info	No	Cooling SAVE Activated	No	Adjustment Mode ED	
IDU Ambient Temp Sor Err Air Inlet	No			Distant Lock	No	Heating SAVE Activated	No	Adjustment Mode Co	
Ambient Temp Sor Err Receiver	No			Distant_shield Temp Set	No	Child Lock	No	Adjustment Mode OI	
Humidity Sensor Error	No			Distant_shield Mode Set	No	Memory On_off Status	Memory	Adjustment Mode ID	
Water Full Protection	No								
IDU Memory Chip Error Sign	No								

ODU		ODU Fan Status		ODU Fan Quiet Status		Drive Charging Und	
5. Unit On_off	On	ODU Fan Status	Open	ODU Fan Quiet Status	No	Drive Charging Und	
6. ODU Operation Mode	Heat	Chassis Band Heater	Close	System Defrosting	No	AC Input Power Typ	
Outdoor Ambient Temp	20	Comp Band Heater	Open	System Oil Return	No	Drive Memory Chip E	
Condenser Temp	20	Away Valve Status	Open	EXV Status	Usual	Drive Charging Circa	
Surface Temp Condenser Tube	0	Compressor Status	Close	Voltage Decline Error	No	Abnormal Protection	
Discharge Temp	57	Comp Discharge Temp Prot	No	Over_high V Prot DC Bus	No	Electrical Box Temp	
ODU Fan Speed	780	Refrigerant Deficiency Prot	No	ACC Current Prot	No	AC Input Zero_cross	
ODU Fan Stage	10	DC Fan Prot	No	Drive IP MM Module Prot	No	Temp Drift Prot	
ODU Capacity	36K	Abnormal Prot 4Way Valve	No	Drive PF CP Prot	No		
ODU Fan Type	DC	Over_current Prot	No	Comp Start_up Failure	No		
EXV Step	150	Overload Prot	No	Comp Phase Loss Prot	No		
7. Inverter Comp Set Freq	0	Low Pressure Prot	No	Comp Drive Module Reset	No		
8. Inverter Comp Run Freq	0	High Pressure Prot	No	Comp Over Current Prot	No		

Commu Info	
Commu Role	Local
COM Numb	COM10
Port Number	1881
Server IP	172.16.52.108
Listen	Connect

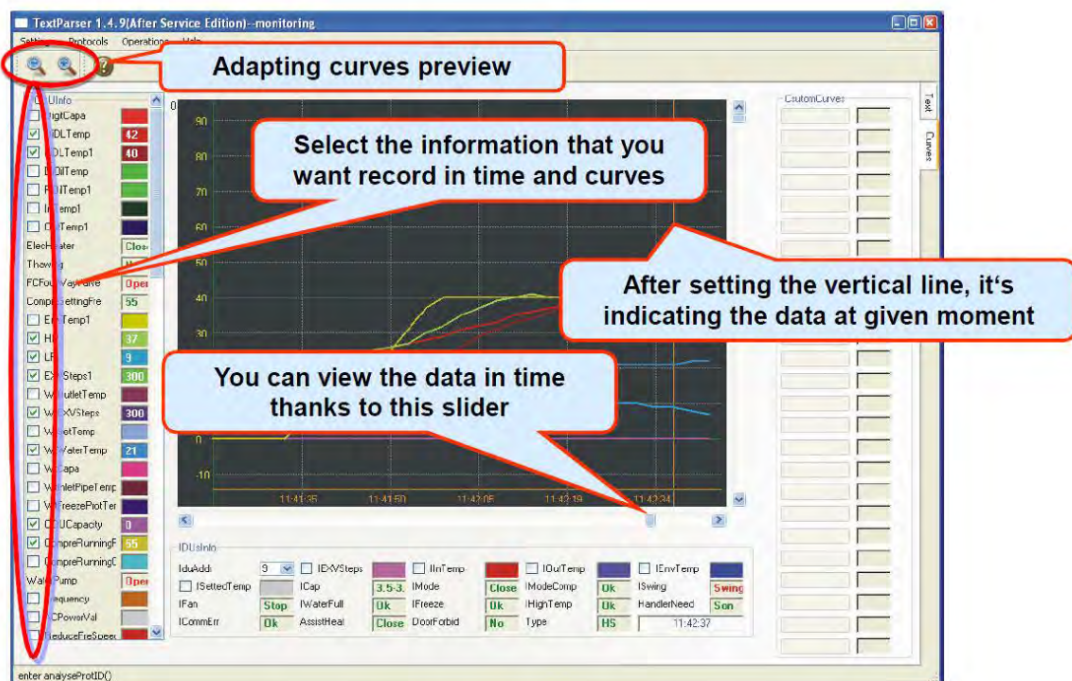
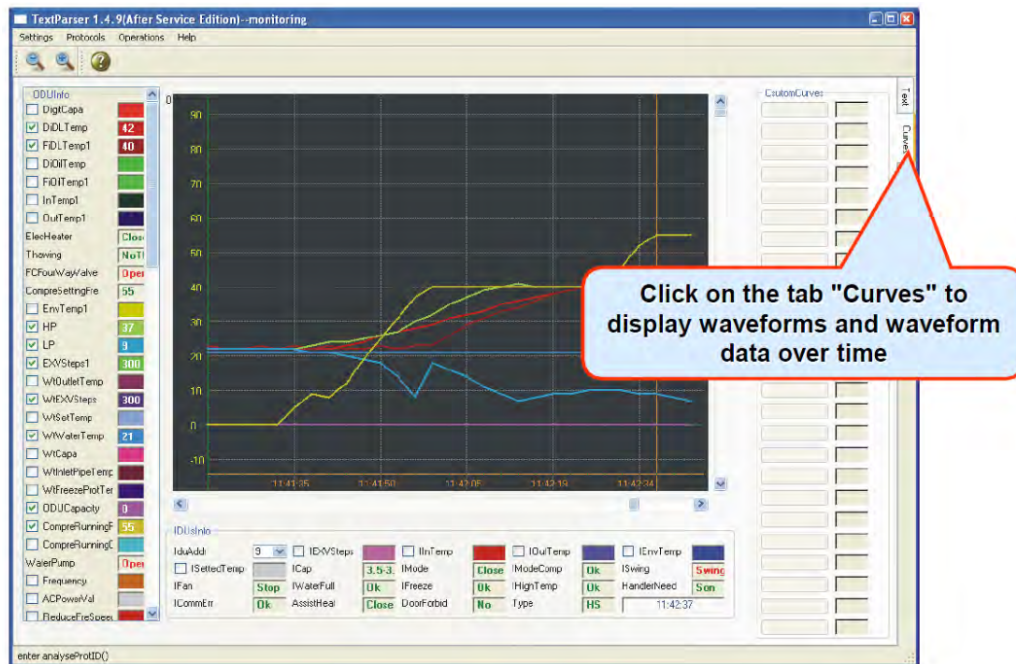
Data Info	
0x8F	0xF8
0x7E	0x6E
0xBB	0xAF
0xDA	0xAC
Com Used	Converter
Halters	

6.4 Final check prior to operation startup

- Program has been launched by file TextParser.exe
 - You have performed the basic setup of the COM Port and the pressure values.
 - You have started monitoring mode.
 - Now it will be followed by checking of received command signals from the master control system (AHU unit or BMS).
-
1. Send ON and OFF command from the Control system
Check status „Unit Mode“ in Text Parser - must correspond to (ON and OFF)
 2. Send Cool and Heat commands from the Control system (simultaneously with „ON“ command)
Check status „Unit Mode“ in Text Parser - must correspond to (COOL a HEAT)
 3. Send request for 20% of power (2V) from the Control system (simultaneously with „ON“ command)
Check value „FreqDcSpeed“ in Text Parser - must correspond to (20Hz)
 4. Send request for 90% of power (10V) (simultaneously with „ON“ command)
Check value „FreqDcSpeed“ in Text Parser - must correspond to (90Hz)
-
- Keep checking „SettingFreq“ value (frequency of Inverter set by microcomputer) (microcomputer can change or restrict frequency of Inverter due to treshold value limits)
 - Keep checking „RunningFreq“ (real operating frequency of Inverter)
 - Keep checking „EvaporatorTemp“ (value of indoor evaporator)
 - Keep checking „EnvTemp“, IEnvTemp“ and other values

If the values and operation of unit is appropriate, appliance is ready and fully operational.

6.5 Data waveforms



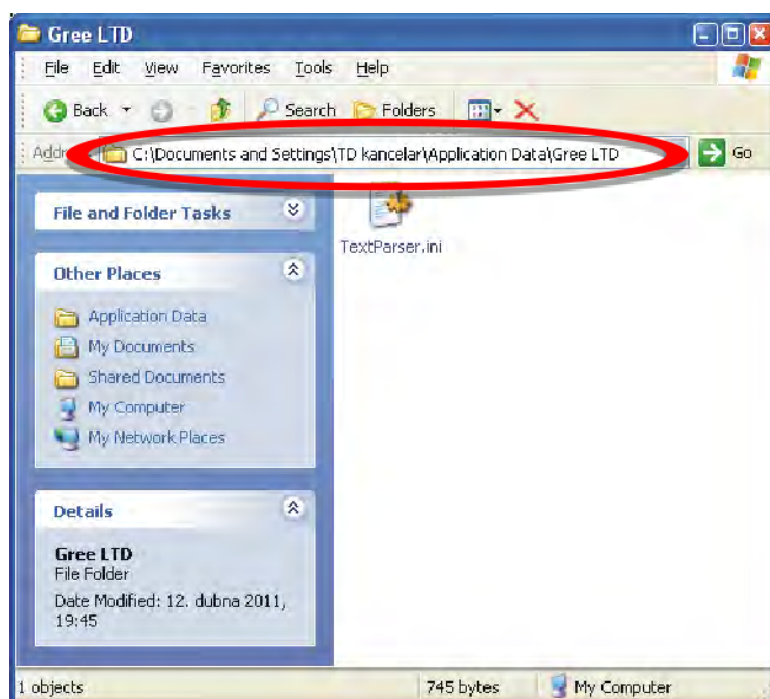
6.6 Data storage

When you exit the program, recorded data are stored into the following files. First one contains waveforms and parameter values during real-time monitoring. Second one saves the configuration of Text Parser program.

1) File with data and values from monitoring are saved to the folder "Datafiles" on the main computer disk in Access table format Def_XXXXXXX.XXXXXX.mdb



2) The program settings and preferences are stored in the initialization file:
C:\Documents and settings\Administrator\Application Data\Gree LTD\TextParser.ini



7 FAQ

Q: Outdoor unit doesn't start working after appropriate signals were issued.

A: Unit may not work in cooling mode if the minimum working temperatures of pipe (3 °C) and duct (10 °C) aren't met.

Q: LED diode at PCB is permanently lighting.

A: Communication between module and outdoor unit isn't established properly. Please, check connection via shielded twisted pair cable between A and B terminals. LED diode should be slowly blinking (2sec interval) when everything is connected correctly.

Q: LED diode at PCB is blinking very fast (0,5sec interval).

A: Communication between module and outdoor unit is established properly, but outdoor unit indicates error code at its mainboard display. Please, check service manual of outdoor unit to identify root cause of malfunction and fix it.

Q: Power request was set to 0V, but unit is still working instead of shutting down completely.

A: There is minimum running frequency of compressors, therefore the compressor in outdoor unit will continue working at minimum frequency. Please use ON/OFF signal to shut down unit completely.

Q: Sounds similar to clicking are coming out of AHUcom module.

A: There are relays at PCB of the module causing the sounds, everything is in order.

Q: Is it possible to make technical adjustments of AHUcom module ?

A: It is possible to make technical adjustments of digital outputs, control method etc. Please contact your local sales representative.

Q: I have read the manual thoroughly and installed everything per given instructions, but I was unable to make AHUcom module with the outdoor unit work.

A: Please contact your local respective dealer for a technical assistance.

Notes

[illegible]



TD metal s.r.o

Werichova 1, Olomouc

Czech republic, 779 00

Tel.: +420 585 237 171

Email: info@tdmetal.cz

www.gree.at, www.tdmetal.cz