**TRANE** ®

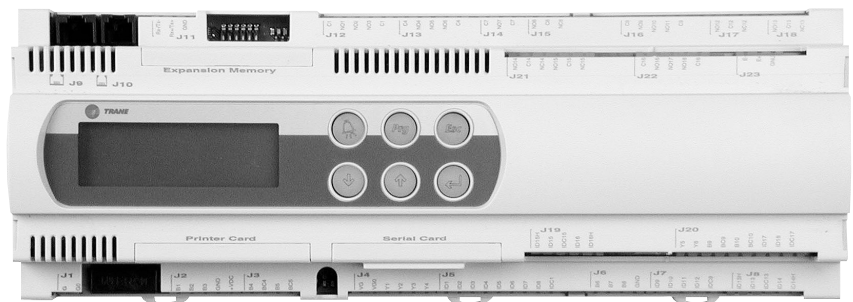# TRACER CH532
# Chiller controller
# User guide

## AquaStream²®

# General information

## Foreword

These Installation Operation and Maintenance instructions are given as a guide to good practice in the installation, start-up, operation and periodic maintenance by the user of TRACER CH532 chiller controller. They do not contain the full service procedures necessary for the continued successful operation of this equipment. The services of a qualified service technician should be employed, through the medium of a maintenance contract with a reputable service company.

## Warranty

Warranty is based on the general terms and conditions of the constructor. The warranty is void if the equipment is modified or repaired without the written approval of the constructor, if the operating limits are exceeded, or if the control system or the electrical wiring is modified.
Damage due to misuse, lack of maintenance, or failure to comply with the manufacturer's instructions, is not covered by the warranty obligation.
If the user does not conform to the rules of "Maintenance", it may entail cancellation of warranty and liabilities by the constructor.

## Reception

When the unit arrives on site, check it has not been damaged in any way during transport. If damage is observed, or even merely suspected, notify the carrier within 24 hours by registered letter. Notify the local Trane Sales office at the same time. The unit should be totally inspected within 3 days of delivery. If damage is observed, notify the last carrier by registered letter and notify the local sales office.

## General information

**About this manual**
Cautions appear at appropriate places in this instruction manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The constructor assumes no liability for installations or servicing performed by unqualified personnel.
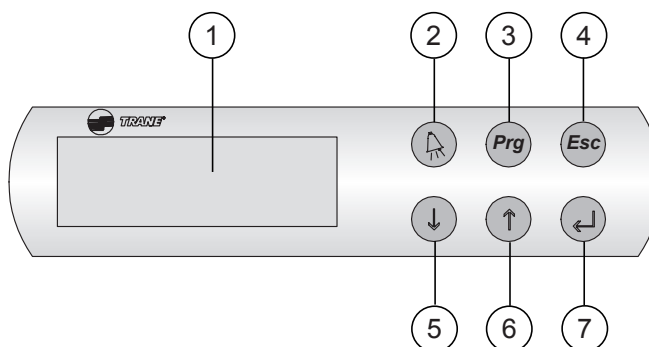
# Contents

# TRACER CH532 Presentation

**Important note:** This document describes all the functions available on TRACER CH532 with software version 2.0 and explains how to program it.
Certain parameters must only be modified by qualified personnel. Before changing any parameter, always check that the change does not affect the good and safe operation of the equipment. Operation must always stay in the catalogued limits.

Built-in control terminal features:
An LCD display (1), 4 lines x 20 characters with back lighting
6 buttons (2) to (7)

*Figure 1 - TRACER CH532 user interface*



2. Alarm button:
Used for displaying or manually resetting the alarms. The red LED lights up , when at least one alarm has been detected.

3. Program button:
Allows the various operating parameters to be set (safety parameters, thresholds).

4. Escape button:
Allows the return to default display

5.6. Downward and Upward arrows
Allows management of currently displayed screen and setting of values of control parameters

7 Validation button
Allows to move from line to line in the currently displayed screen and to confirm the set data.

# Hardware architecture

*Figure 2 - TRACER CH532 inputs and outputs*

# Hardware architecture

**Table 1 - TRACER CH532 General description**

| Item | Description |
|------|-------------|
| 1 | 24 V Power supply (G+,GO-) |
| 2 | Yellow LED (Power on) |
|   | Red LED (Alarm) |
| 3 | Fuse (2A , 5x20) |
| 4 | Universal Analog inputs: NTC,0/1V,0/10V,0/20mA, 4/20mA) |
| 5 | Passive Analog Inputs (NTC,PT1000 , ON/OFF) |
| 6 | Analog Outputs (0/10V) |
| 7 | Digital Inputs (24Vac / Vdc) |
| 8 | Digital Inputs (230Vac or 24Vac / Vdc) |
| 9 | Relays digital output |
| 10 | User interface |
| 11 | Communication interface |

# Hardware architecture

*Table 2 - Inputs and output summary list*

| | TRACER CH532 Medium Single circuit units | TRACER CH532 Large Dual circuit units |
|---|---|---|
| AI: Leaving water temperature sensor | **B3**: NTC | **B3**: NTC |
| AI: Entering water temperature sensor | **B4**: NTC | **B4**: NTC |
| AI: Ambient temperature sensor | **B5**: NTC | **B5**: NTC I |
| AI: Suction pressure circuit 1 - LP1 transducer | **B1**: 4..20mA | **B1**: 4..20mA |
| AI: Suction pressure circuit 2 - LP2 transducer | | **B6**: 4..20mA |
| AI: Discharge pressure circuit 1 - HP1 transducer | **B2**: 4..20mA | **B2**: 4..20mA |
| AI: Discharge pressure circuit 2 - HP2 transducer | | **B7**: 4..20mA |
| AI: External water setpoint reset (option) | **B8**: 0..10V-0..20mA | **B8**: 0..10V-0..20mA |
| AI: Unused | **B6**, B7 | **B9, B10** |
| DI: Compressor C circuit 1 fault | **ID1**: 24Vac | **ID1**: 24Vac |
| DI: Compressor C circuit 2 fault | | **ID17**: 24Vac |
| DI: Compressor A circuit 1 fault | **ID3**: 24Vac | **ID3**: 24Vac |
| DI: Compressor B circuit 1 fault | **ID4**: 24Vac | **ID4**: 24Vac |
| DI: Compressor A circuit 2 fault | | **ID11**: 24Vac |
| DI: Compressor B circuit 2 fault | | **ID12**: 24Vac |
| DI: High pressure Cut-out circuit 1 - HP1 switch | **ID14H**: 230Vac | **ID14H**: 230Vac |
| DI: High pressure Cut-out circuit 2 - HP2 switch | | **ID15H**: 230Vac |
| DI: Auxiliary set point On/Off | **ID8**: 24Vac | **ID8**: 24Vac |
| DI: Fans circuit 1 fault | **ID5**: 24Vac | **ID5**: 24Vac |
| DI: Fans circuit 2 fault | | **ID18**: 24Vac |
| DI: Circuit 1 On/Off (or Unit On/Off CH 532 medium) | **ID13H**: 230Vac | **ID13H**: 230Vac |
| DI: Circuit 2 On/Off | | **ID16H**: 230Vac |
| DI: Water flow control input | **ID2**: 24Vac | **ID2**: 24Vac |
| DI: Water pump 1 fault | **ID9**: 24Vac | **ID9**: 24Vac |
| DI: Water pump 2 fault | **ID10**: 24Vac | **ID10**: 24Vac |
| DI: Faults external reset | **ID6**: 24Vac | **ID6**: 24Vac |
| DI: Cooling/Heating mode switch | **ID7**: 24Vac | **ID7**: 24Vac |
| DI: Unused | **ID11, ID12** | - |
| DO: Compressor A circuit 1 output | **NO7**: NO-230Vac | **NO7**: NO-230Vac |
| DO: Compressors B and C circuit 1 output | **NO8**: NO-230Vac | **NO8**: NO-230Vac |
| DO: Compressor A circuit 2 output | | **NO13**: NO-230Vac |
| DO: Compressors B and C circuit 2 output | | **NO14**: NO-230Vac |
| DO: Fan 1 output Wye (Y) contactor - circuit 1 | **NO3**: NO-230Vac | **NO3**: NO-230Vac |
| DO: Fan 1 output Delta (D) contactor - circuit 1 | **NO4**: NO-230Vac | **NO4**: NO-230Vac |
| DO: Fan 2 output circuit 1 | **NO5**: NO-230Vac | **NO5**: NO-230Vac |
| DO: Fan 3 output circuit 1 | **NO6**: NO-230Vac | **NO6**: NO-230Vac |
| DO: Fan 1 output Wye (Y) contactor - circuit 2 | | **NO15**: NO-230Vac |
| DO: Fan 1 output Delta (D) contactor - circuit 2 | | **NO16**: NO-230Vac |
| DO: Fan 2 output circuit 2 | | **NO17**: NO-230Vac |
| DO: Fan 3 output circuit 2 | | **NO18**: NO-230Vac |
| DO: Water pump 1 | **NO1**: NO-230Vac | **NO1**: NO-230Vac |
| DO: Water pump 2 | **NO2**: NO-230Vac | **NO2**: NO-230Vac |
| DO: Antifreeze heater | **NC12**: NO-230Vac | **NC12**: NO-230Vac |
| DO: Circuit 1 fault | **NO9**: NO-230Vac | **NO9**: NO-230Vac |
| DO: Circuit 2 fault | | **NO11**: NO-230Vac |
| DO: Unit status or additional heating demand | **NO10**: NO-230Vac | **NO10**: NO-230Vac |
| DO: Unused | **NO11, NO13** | - |
| AO: Speed inverter - fan circuit 1 - HP1 output | **Y1**: 0..10V | **Y1**: 0..10V |
| AO: Speed inverter - fan circuit 2 - HP2 output | | **Y2**: 0..10V |
| AO: 4-way valve circuit 1 | **Y3**: 0..10V + **CONVONOFF** | **Y3**: 0..10V + **CONVONOFF** |
| AO: Unused | **Y4** | **Y4** |
| AO: 4-way valve circuit 2 | | **Y5**: 0..10V + **CONVONOFF** |
| AO: Unused | | **Y6** |
| AO: Unused | **Y2** | **Y2** |

Legend:
**AI:** Analog Input
**DI:** Digital Input
**AO:** Analog Output
**DO:** Digital Output
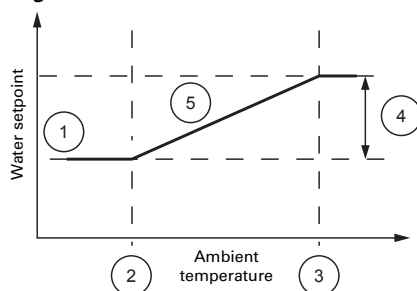**CONVONOFF:** ON/OFF converter

# Hardware architecture

**TRACER CH532** offers customer the possibility to use inputs or outputs in order to:
- use an external water setpoint reset using an analog input (refer to figure 3)
- use an auxiliary setpoint
- connect a remote on/off of the unit or a circuit
- reset faults
- connect a remote Cooling/Heating switch
- return a circuit fault

**Note: External water setpoint**
Based on a external signal input, it will be possible to offset the active setpoint from 0°C to 20°C. This function can be used in conjunction with the automatic setpoint reset function.

*Figure 3*



1. Leaving water temperature setpoint
2. Minimum value
3. Maximum value
4. Reset = 20°C
5. Active setpoint

*Table 3: Customer Inputs and output summary list*

| | | TRACER CH532 Medium Single circuit units | TRACER CH532 Large Dual circuit units |
|---|---|---|---|
| AI | External water setpoint reset (option) | **B8:** 0..10V-0..20mA | |
| DI | Auxiliary setpoint On/Off | **ID8:** 24Vac | |
| DI | Circuit 1 On/Off (or Unit On/Off for single circuit units) | **ID13H:** 230Vac | |
| DI | Circuit 2 On/Off | - | **ID16H:** 230Vac |
| DI | Faults external reset | **ID6:** 24Vac | |
| DI | Cooling/Heating mode switch | **ID7:** 24Vac | |
| DO | Circuit 1 fault | **NO9:** NO-230Vac | |
| DO | Circuit 2 fault | - | **NO11:** NO-230Vac |
| DO | Unit status or additional heating demand | **NO10:** NO-230Vac | |

Legend:
**AI:** Analog Input
**DI:** Digital Input
**DO:** Digital Output

# Starting/stopping the unit

Once the unit is powered on (main disconnect switch closed) **TRACER CH532** returns to the following display:

```
TRACER CH532          V2.0
   01/05/04           00:00
Water Temp           20.0°C
OFF BY KEYB.
```

Line 2 gives current date and time
Line 3 gives current leaving water temperature
Line 4 gives the unit status:
    **OFF BY KEYB** = Local stop
    **UNIT ON =** Unit running

Pressing (Esc) from any screen will return to this screen.

**1. Starting the unit:**

1. Press (↵)
2. Following screen will be displayed:

```
Status Unit
OFF BY KEYB.

Switch on unit ?             N
```

3. Press (↵)

4. Press (↓) or (↑) to change from "N" to "Y"

5. Press (↵) . Following screen will be displayed:

```
TRACER CH532          V2.0
   01/05/04           00:00
Water Temp           20.0°C
UNIT ON
```

**2. Stopping the unit**

1. Press (Esc) to exit from any menu and return to default display.

2. Press (↵) for 3 seconds unit will stop, and following screen will be displayed:

```
        Unit Switched Off
```

3. Press (Esc) to return to default display

**Note:** In case of power failure unit will restart in the state (operating mode, setpoints…) it was in before the power failure and default screen will be displayed.

# Menus

TRACER CH532 allows the user to access 4 menus to display or adjust operation parameters:

- "**Data display**" menu - This menu allows the user to visualize all operation parameters:
  - Water and air temperatures
  - Refrigerant pressures
  - Saturated refrigerant temperatures
  - Compressors status
  - Compressor running hours
  - Number of compressors starts
  - Unit operating mode
  - Compressors failures counters

- "**Settings**" menu - This menu is password protected. It allows access to the settings of:
  - Setpoints
  - Offset of cooling and heating setpoints
  - Unit operation validation
  - Customer inputs and outputs

- "**Clock**" menu - This menu is password protected. It allows access to the settings of:
  - Day of the week, hour, date
  - Daily or weekly program
  - Hourly zone program

- "**Configuration**" menu - This menu is password protected. It allows to adjust or change:
  - Unit definition
  - Compressors timers
  - High pressure control
  - Dead band, antifreeze and heater setpoints
  - Type of sensors and transducers
  - Operation protections
  - Cooling mode limitations
  - Defrost parameters
  - Compressor alarms

**Accessing the menus**
From any screen displayed, press

$\boxed{\text{Esc}}$ , **TRACER CH532** will then display the following screen:

**Data Display
Settings
Clock
Configuration**

1. $\boxed{\downarrow}$ or $\boxed{\uparrow}$ allow the cursor to move from line to line thus selecting one of the 4 menus.

**Note:** The selection is displayed in capital characters
2. Once one line is selected,

press $\boxed{\leftarrow}$ to validate the choice.

3. Pressing $\boxed{\text{Esc}}$ will exit the menu selection mode and return to default display.

# Display menu: "Data display"

From the menu screen, select "**Data Display**" then press ⏎

Pressing ↓ or ↑ will allow navigation from screen 1 to 8 as shown hereafter:

The menu is looped making it possible to scroll from the first item in the menu to the last item.

| Lvg Wat Temp | 08.0°C |
| Ret Wat Temp | 12.0°C |
| Amb Temp | 28.0°C |
| Active StP | 07.0°C |

**1. Water and air temperatures**
**Lvg Wat Temp =** Leaving water temperature
**Ret Wat Temp =** Entering water temperature
**Amb Temp =** Ambient air temperature
**Active StP =** Active water setpoint

| HP ckt1 | 00.0 bar |
| HP ckt2 | 00.0 bar |
| LP ckt1 | 00.0 bar |
| LP ckt2 | 00.0 bar |

**2. Refrigerant pressures**
**HP ckt1 =** Condensing Pressure circuit 1
**HP ckt2 =** Condensing Pressure circuit 2 (dual circuit units only)
**LP ckt1 =** Evaporating Pressure circuit 1
**LP ckt2 =** Evaporating Pressure circuit 2 (dual circuit units only)

**3. Refrigerant saturated temperatures**

| Sat Temp CDS1 | 00.0°C |
| Sat Temp CDS2 | 00.0°C |
| Sat Temp EVP1 | 00.0°C |
| Sat Temp EVP2 | 00.0°C |

**Sat Temp CDS1 =** Condensing temperature circuit 1
**Sat Temp CDS2 =** Condensing temperature circuit 2 (dual circuit units only)
**Sat Temp EVP1 =** Evaporating temperature circuit 1
**Sat Temp EVP2 =** Evaporating temperature circuit 2 (dual circuit units only)

**Legend for screens 4,5 and 6:**
**Cmp A1 =** Compressor A/circuit 1
**Cmp B1/C1 =** Compressor B and C/circuit 1
**Cmp A2 =** Compressor A/circuit 2 (dual circuit units only)
**Cmp B2/C2 =** Compressor B and C/circuit 2 (dual circuit units only)

| Cmp A1 | Off |
| Cmp B1 C1 | Off |
| Cmp A2 | Off |
| Cmp B2 C2 | Off |

**4. Compressors status**
Possible Status:
**Off =** Compressor stopped
**On =** Compressor running
**Rec.On =** Compressor will start after anti-short cycle
**Rec.Off =** Compressor will stop after anti-short cycle

| Cmp A1 | 000000 Hrs |
| Cmp B1 C1 | 000000 Hrs |
| Cmp A2 | 000000 Hrs |
| Cmp B2 C2 | 000000 Hrs |

**5. Compressors running time**
**Hrs** indicates the number of full hours compressor has been working since its first start.

**6. Number of compressors starts**

| Cmp A1 | 000000 Starts |
| Cmp B1 C1 | 000000 Starts |
| Cmp A2 | 000000 Starts |
| Cmp B2 C2 | 000000 Starts |

**Starts** indicates the number of compressor starts since first start-up.

**7. Operating mode**

| Mode | | Cooling |
| Stp | Local | 07.0°C |
| Ckt1 | | Enable |
| Ckt2 | | Enable |

**Mode =** Running mode
 - **Cooling =** Cold water production
 - **Heating =** Hot water production (Reversible chillers only)
**Stp      Local      07.0°C**
 - **Stp =** Current setpoint
 - **Local =** Source of Setpoint
      **Local =** Cooling or heating setpoint defined locally
      **Extern =** Auxiliary setpoint or operating mode by external contact
      **Auto =** setpoint by the automatic reset or the daily/weekly program
      **Remote =** Setpoint by supervisor

**Ckt1/Ckt 2 =** Operational circuits
 - **Enable =** Circuit is operational
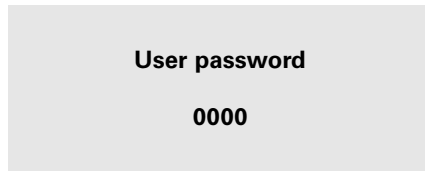 - **Disable =** Circuit is not operational

**8. Compressors failures counters**

| Nb of CMP faults | | |
| Cpt   A1:0 | | Cpt A 2:0 |
| Cpt   B1:0 | | Cpt B 2:0 |
| Cpt   C1:0 | | Cpt C 2:0 |

This menu indicates the number of compressors failure regardless of the history.

# Customer settings menu: "Settings"

From the menu screen, select "**Settings**" then press ⏎ . Following screen will appear:

> **User password**
>
> **0000**

Enter password:"0000" (factory-set)

Press ⏎ and cursor will move to first field of password. Pressing ↓ or ↑ will change the value from 0 to 9999. Keeping pressure on ↓ or ↑ will move the numbers fast.

Press ⏎ to confirm password.

Pressing ↓ ↑ will allow navigation from screen 1 to 5 as shown hereafter:

## 1. Setpoints

| | |
|---|---|
| **Cooling Stp** | **07.0°C** |
| **Heating Stp** | **45.0°C** |
| **Aux Wat Stp** | **10.0°C** |
| **Aux Wat** | **Disable** |

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑ . Confirm the value by pressing ⏎

| | |
|---|---|
| **Cooling StP** | **07.0°C** |
| **Heating StP** | **45.0°C** |
| **Aux Wat StP** | **10.0°C** |
| **Aux Wat** | **Disable** |

**Cooling Stp =** Cold water setpoint (-12 to 20°C - factory setting: 7°C)
**Heating Stp =** Hot water setpoint (20 to 60°C - factory setting: 45°C)
**Aux Wat Stp =** Auxiliary setpoint (-12 to 60°C - factory setting: 10°C)
**Aux Wat =** Auxiliary setpoint from external source:
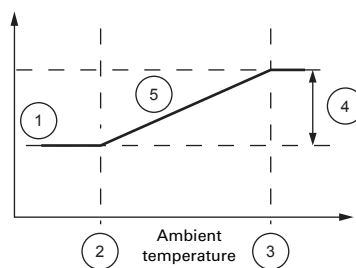**Enable =** Auxiliary setpoint validated
**Disable =** Auxiliary setpoint non-validated

## . Automatic cooling and heating mode setpoints reset

TRACER CH532 offers the possibility to offset cold and/or hot water setpoints according to ambient air temperature.
The automatic setpoint reset program will allow you to change the water temperature setpoint (cooling and heating mode) with the ambient temperature. This function can be used in conjunction with the external setpoint reset function.

*Figure 4*



1. Leaving water temperature setpoint
2. Starting point
3. Ending point
4. Reset delta
5. Active set point

Below the reset starting point, the water temperature setpoint will be the normal setting. Between the starting and ending point the setpoint will vary proportionally with the ambient temperature. After the ending point, the setpoint will stay at its maximum or minimum value.

## 2.1 Cooling mode setpoint reset

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑ . Confirm the value by pressing ⏎

| | |
|---|---|
| **Cold water reset** | **N** |
| **Start Point** | **20.0°C** |
| **End Point** | **30.0°C** |
| **Reset Delta** | **10.0°C** |

**Cold Water Reset:** Ambient temperature based cold water setpoint offset
    **Y** = Enabled
    **N** = Disabled (factory setting)
**Start Point:** Starting point (-15 to 50°C - factory setting: 20°C)
**End Point:** Ending point (-15 to 60°C - factory setting: 30°C)
**Reset Delta:** Reset amplitude (-15 to 15°C - factory setting: 10°C)

## 3. Heating mode setpoint reset (Reversible chillers only)

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑ . Confirm the value by pressing ⏎

| | |
|---|---|
| **Hot water reset** | **N** |
| **Start Point** | **20.0°C** |
| **End Point** | **30.0°C** |
| **Reset Delta** | **10.0°C** |

**Hot Water Reset:** Ambient temperature based hot water setpoint offset
    **Y** = Enabled
    **N** = Disabled (Factory setting)
**Start Point:** Starting point (-15 to 50°C - factory setting: 20°C)
**End Point:** Ending point (-15 to 60°C - factory setting: 30°C)
**Reset Delta:** Reset amplitude (-15 to 15°C - factory setting: 10°C)

# Customer settings menu: "Settings"

## 4. Operating mode

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| Mode | Cooling |
|---|---|
| Comp seq | Auto |
| Ckt1 | Enable |
| Ckt2 | Enable |

**Mode:** Operating mode
    **Cooling:** Cold water production (default factory setting)
    **Heating:** Hot water production (Reversible chillers only)
    **Extern:** (external control)
**Note:** When switching from cooling to heating mode or from heating to cooling mode, unit will stop for 15 s before restarting.
To allow chiller waterflow rate adjustment disable circuit 1 and 2, then start the unit.

**Comp seq**: Compressor sequencing

**1-2: fix order**

| | Single circuit | Dual circuit |
|---|---|---|
| Start order | A1,B1 | A1, A2, B1, B2 |
| Stop order | B1, A1 | B2, B1, A2, A1 |

**2-1: fix order**

| | Single circuit | Dual circuit |
|---|---|---|
| Start order | B1,A1 | A2, A1, B2, B1 |
| Stop order | A1, B1 | B1, B2, A1, A2 |

**Rotation**

| | Single circuit | Dual circuit |
|---|---|---|
| Start order | A1,B1 | A1, A2, B1, B2 |
| Stop order | A1,B1 | A1, A2, B1, B2 |

**Auto** (default factory setting)

The Auto sequence intend to have equivalent numbers of starts and stops and an equivalent number of compressor working hours. The compressor start order will prioritize the compressors which have the least number of working hours.
**Ckt1/2:** Circuit 1/2 operation
    **Enable:** circuit operational
    **Disable:** circuit non-operational
**Note:** It is possible to disable both circuit 1 and 2. Water pump will be kept in operation

## 5. Customer Inputs and Outputs

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| Analog Input | 0..10V |
|---|---|
| Ana. Input | Disable |

**Analog Input:** Signal type
    **0..10V** (factory setting)
    **0..1V**
    **0..20mA**
    **4..20mA**
**Note:** the total amplitude corresponds to reset delta of +20°C between 0%(0V,OA or 4 mA) and 100% (10V,1V, or 20 mA)

**Ana. Input** External setpoint reset
    **Y** = Enabled
    **N** = Disabled
**Pump Timer:** Time between unit stop (by keyboard or external contact) and stop of the pump
(1 to 10 min - factory setting = 1 min)

## 6. Customer outputs configuration

| Alarm Out: | MR only |
|---|---|
| State Out: | Unit state |
| Pump Timer: | 01 min |

**Default I/O:** (NO9 / NO11)
This output will be used to give an information about the circuit status: A configuration parameter will allow to choose between the following three indications concerning this circuit:
    **ALL:** All alarms (manual and automatic reset)
    **ALL But LA:** All alarms but without Low Ambient alarm
    **MR only:** Manual reset alarms only (factory setting)
**Status output:** (NO10)
    **Add Heat:** indicate an additionnal heat demand
    **Unit State** Send data telling that at least one compressor is ON (factory setting)

# Customer settings menu: "Settings"

**7. Remote Mode**

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

**Chiller control Mode:**
                    **Local**
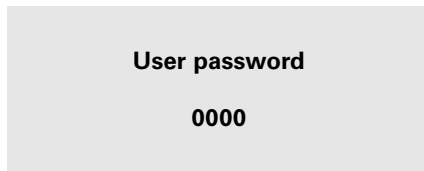                    **Remote**

**Local:** Setpoints are entered on the module. Orders sent from the BMS are not taken into account.

**Remote:** Orders sent from the BMS are taken into account.

# Clock Setting menu: "Clock"

From the menu screen, select "**Clock**" then press ↵ .
Following screen will appear:
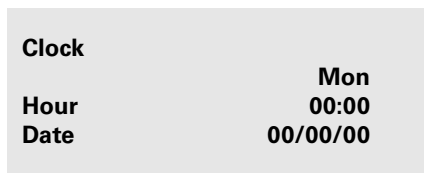
> **User password**
>
> **0000**

Enter default password:"0000" (factory set)

Press ↵ and cursor will move to first field of password. Pressing ↓ or ↑ will increment the value from 0 to 9999. Keeping pressure on ↓ or ↑ will move the numbers fast.

Press ↵ to confirm password.

Pressing ↓ or ↑ will allow navigation from screen 1 to 3 as shown hereafter:

## 1. Clock setting

To access one of the 4 parameters displayed, press and change value using ↓ or ↑ . Confirm the value by pressing ↵
**Mon:** Weekday

> **Clock**
>
> **Mon**
> **Hour** **00:00**
> **Date** **00/00/00**

    **Mon:** Monday (factory setting)
    **Tue:** Tuesday
    **Wed:** Wednesday
    **Thu:** Thursday
    **Fri:** Friday
    **Sat:** Saturday
    **Sun:** Sunday
**Hour:** Time (hours/minutes)
**Date:** Date setting (day/month/year)

## 2. ON/OFF program type

When enabled, this program will control the unit operation (On/Off).
This program will allow the user to:
- Make a choice between the daily and/or the weekly operation
- Define the operational days and hours
- Define the operating setpoints for each mode (cooling and heating)

The operating mode selected by the operator or by the external control will be taken into account.
Example:

| Time | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|------|--------|---------|-----------|----------|--------|----------|
| 00:00 | | | | | | |
| 02:00 | | | | | | |
| 04:00 | | | | | | |
| 06:00 | | | | | | |
| 08:00 | | | Example | | | |
| 10:00 | Operation enable | | | | | |
| 12:00 | ▪ from Monday to Friday | | | | | |
| 14:00 | ▪ from 8:00 to 18:00 | | | | | |
| 16:00 | | | | | | |
| 18:00 | | | | | | |
| 20:00 | | | | | | |
| 22:00 | | | | | | |

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑ . Confirm the value by pressing ↵

> **Program**
> **On/Off Unit**
> **Weekly** **N**
> **Daily** **N**

**Weekly:** Weekly program
    **Y**: Enabled
    **N**: Disabled (factory setting)
**Daily:** Daily program
    **Y**: Enabled
    **N**: Disabled (factory setting)

# Clock Setting menu: "Clock"

## 2.1 Weekly program

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value pressing ⏎

|  | Program Weekly |  |
| --- | --- | --- |
| Start |  | Mon |
| Stop |  | Fri |

**Start:** Starting day
**Stop:** Ending day

## 2.2 Daily program

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

|  | Program Daily |  |
| --- | --- | --- |
| Start |  | 00:00 |
| Stop |  | 00:00 |

**Start:** Start time
**Stop:** Stop time

## 3. Hourly Zone

The Daily/weekly program will allow you to define the cooling mode and heating mode setpoints. It will be possible to define within a day, four operating zones with different setpoint as follows:
Example:

To validate hourly zone program, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

|  | Program Hourly zone |
| --- | --- |
|  | Disable |

**Disable:** No program
**Enable:** Program used

## 3.1 Defining Zones

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

|  | Zone #1 |  |
| --- | --- | --- |
| Start |  | 00:00 |
| Cooling Stp |  | 07.0°C |
| Heating Stp |  | 45.0°C |

**Start:** Beginning Time
**Cooling StP:** Cooling mode setpoint (-20 to 20°C - factory setting: 7°C)
**Heating StP:** Heating mode setpoint - Reversible chillers only (20 to 60°C factory setting: 45°C)

Press ↓ or ↑ to reach zones 2,3 and 4. Proceed the same way as above for programming parameters.

| Time | Std setpoint | Zone 1 | Zone 2 | Zone 3 | Zone 4 | Setpoint |
| --- | --- | --- | --- | --- | --- | --- |
| 07:00 |  |  |  |  |  |  |
| 08:00 | Operating hours 8:00-18:00 | Starting at 10:00 | Starting at 11:00 | Starting at 13:00 | Starting at 16:00 | Std Stp |
| 09:00 |  |  |  |  |  |  |
| 10:00 |  |  |  |  |  | Stp 1 |
| 11:00 |  |  |  |  |  | Stp 2 |
| 12:00 |  |  |  |  |  |  |
| 13:00 |  |  |  |  |  | Stp 3 |
| 14:00 |  |  |  |  |  |  |
| 15:00 |  |  |  |  |  |  |
| 16:00 |  |  |  |  |  | Stp 4 |
| 17:00 |  |  |  |  |  |  |
| 18:00 |  |  |  |  |  |  |

**Note:** The automatic or external setpoint compensation or the external setpoint will change the standard setpoint only but will not affect the setpoints defined for the hourly zones 1, 2, 3 or 4.

# Unit configuration menu: "Configuration"

From the menu screen, select "**Configuration**" then press ⏎ . Following screen will appear:

> **User password**
>
> **0000**

Enter default password:"0000" (factory-set)

Press ⏎ and cursor will move to

first field of password. Pressing ↓

or ↑ will increment the value from

0 to 9999. Keeping pressure on ↓

or ↑ will move the numbers fast.

Press ⏎ to confirm password.

Pressing ↑ or ↓ will allow navigation from screen 1 to 11 as shown hereafter:

## 1. Unit definition
To access one of the 4 parameters

displayed, press ⏎ and change

value using ↓ or ↑ . Confirm the

value by pressing ⏎

> | Unit type: | Chiller |
> |---|---|
> | Refrg | R407C |
> | Fans/ckt | 3 |
> | Water pump | Single |

**Unit Type:** Unit type
    **Chiller:** Cooling only
    **Heat pump:** Reversible chiller
**Refrg:** Refrigerant R407C, R134a, R410A or R22
**Fans/ckt:** Number of fans per circuit: 1, 2, or 3
**Note:** Setting number of fans at 0, will stop all the fans, but will allow the compressors to run before being stopped by HP switch.
**Water Pump:** Water pump type
    **Single:** Single pump control
    **Dual:** Dual pump control
**Note:** Pump operation
The water pumps can be single or dual. A timer is used to delay the pump shut down in normal operating conditions. The timer is reset at each unit start.

*Figure 5 - Single pump operation*
**Note:** figures 5 to 8, Unit Off means that the unit is stopped by keyboard or by an external contact



*Figure 6 - Dual pump operation*



When twin pumps are used, a pump switch will occur at each start and also in case of fault on the pump in operation.

*Figure 7 - Single pump protection*

*Figure 8 - Dual pump protection*

Pump 1

Pump protection input

Pump 2

Fault reset

Pump 1

Message 46*          Message 46*

Operation Enable/Disable

Pump 2          Message 47*

Pump 1

Unit stopped
(manual reset)

Pump control outputs

Pump 2

* refer to "alarms" section for
meaning of message

CG-SV01B-E4

# Unit configuration menu: "Configuration"

## 2. Compressors timers

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| | |
|---|---|
| **ACC 1st Start** | **2 min** |
| **ACC On-On** | **5 min** |
| **Min On-On** | **060 s** |
| **Min Off-Off** | **015 s** |

**ACC 1st Start:** Short cycle compressor at first start (0 to 60 min - factory setting: 2min)
**ACC On-On:** Short cycle between 2 starts of the same compressor (2 to 10 min - factory: 5 min)
**Min On-On:** Minimum time to add compressor (5 to 240 s - factory setting: 60s)
**Min Off-Off:** Minimum time to remove compressor (1 to 120 s factory setting 15s)

## 3. HP Control

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value pressing ↵

| | |
|---|---|
| **Fan control** | **1Speed** |
| **Fan Ctrl Stp** | **15.0 b** |
| **Dead band Fan** | **06.0 b** |

**Fan Control:** Fan type:
    **1 speed:** 1 Speed fan
    **2 speed:** 2 Speed fan
    **Invert:** Inverter
**Fan Ctrl StP:** Fan control setpoint (10 to 30 bar - factory setting: 15 bar)
**Dead band Fan:** Fans regulation dead band (2 to 8 bar - factory setting: 5 bar)

## 4. Control dead bands

To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| | |
|---|---|
| **Dead band Cmp** | **03.0°C** |
| **Antifreeze** | **02.0°C** |
| **Heater** | **03.0°C** |

**Dead band Cmp:** Compressors regulation dead band around water temperature (0.4 to 8.0°C - factory setting: 3.0°C)
**AntiFreeze:** Cold water temperature limit (-15 to 10°C - factory setting: 2°C)
**Heater:** Evaporator heater setpoint according to ambient air temperature (0 to 10°C - factory setting: 3°C)

## 5. Winter Freeze Protection

| | |
|---|---|
| **CW High Limit** | **15°C** |
| **Pmp Cycle OFF** | **10 min** |
| **WinFreezeProtPmp** | **Yes** |
| **Ctrl Pump Required** | |

Chilled water high limit: (15 to 25°C: factory setting 15°C)
Water pump cycle OFF: (5 to 15 min: factory setting 10min)
Winter Freeeze protection with pump:

    **No ➡ Heater or Ethylene Glycol Required**
    **Yes ➡ Ctrl Pump Required**

## 6. Sensors and transducers

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

| Temp probe | NTC |
|---|---|
| Press probe | 4..20mA |
| Min Press | 0.0bar |
| Max Press | 30.0bar |

**Temp probe:** Sensor type:
**NTC** (factory setting)
**PT100**
**Press probe:** Pressure transducer:
**0..10V**
**0..1V**
**0..20mA**
**4..20mA** (factory setting)
**Min Press:** Pressure at 0V, 0mA or 4 mA (-1.0 to 0.0 bar - factory setting: 0.0 bar)
**Max Press:** Pressure at 10V, 1V or 20 mA (16 to 50 bar - factory setting: 30bar)

## 7. Operation limits

To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

| LP (Sat Temp) | -4°C |
|---|---|
| Timer LP | 60 s |
| HP Cool Stp | 28.0 bar |
| HP Heat Stp | 28.0 bar |

**LP (Sat Temp):** Low evaporating pressure limit  (-25 to 0°C - factory setting: -4°C)
**Timer LP:** Low pressure fault timer after compressor start (0 to 300 s - factory setting: 60s)
**HP Cool StP:** High pressure limit in cooling mode (15 to 40 bar - factory setting: 28 bar)
**HP Heat StP:** High pressure limit in heating mode (15 to 40 bar - factory setting: 28 bar)

## 8. Analog Output (for speed inverter)

**Note:** This screen is displayed only if "Invert" has been selected in the HP control menu (refer to §3)
To access one of the parameters displayed, press ⏎ and change value using ↓ or ↑. Confirm the value by pressing ⏎

| Analog output | | |
|---|---|---|
| Low | OV | 08.0 bar |
| High | 10V | 16.0 bar |

**Low      0V:** Minimum fan speed (0 to 10 bar - factory setting: 8 bar)
**High     10V:** Maximum fan speed (11 to 40 bar - factory setting: 16 bar)

## 9. Operating limits (cooling)

| | |
|---|---|
| Low Amb Cooling | On |
| Low Amb Limit | -10.0°C |
| CW High Limit | On |
| CW High Limit | 15.0°C |

**Low ambient temperature limitation:**
**On:** (factory setting) Low ambiant limited
**Off:** Low ambient temperature not limited
**Low ambient limit:** -20 to 20°C: factory setting -10°C
**Chilled water high limitation:**
**On:** High water temperature limited (factory setting)
**Off:** High water temperature not limited
**Chilled water high limit:** 10 to 20 °C: Factory setting 15°C

## 10. Defrost demand setpoint

| | |
|---|---|
| Low Amb Heat | -10.0°C |
| StP Min Temp | 10.0°C |
| Defrost Max | 12.0°C |
| StP Max Temp | 22.0°C |

**Low ambient heating:** -20 to 20°C, factory setting -10°C
**Setpoint at minimum ambient:** 1 to 30°C, (factory setting 10°C)
**Maximum ambient:** -20 to 20°C: (factory setting 12°C)
**Setpoint at maximum ambient:** 1 to 30°C, (factory setting 22°C)

## 11. Defrost cycle termination
To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| | |
|---|---|
| Term Stp | 20.0 bar |
| Drying time | 12 s |
| Max Defrost | 7 min |
| Min cycle | 25 min |

**Term StP:** Defrost termination setpoint (10 to 30bar - factory setting: 20 bar)
**Drying time:** Drying time (5 to 30 seconds - factory setting: 12s)
**Max Defrost:** Maximum defrost time (5 to 30 minutes - factory setting: 7 min)
**Min cycle:** Minimum time between defrost cycle (15 to 60min - factory setting: 25 min)

**Note:** Dual circuits have two independent refrigerant circuits. Defrost cycle will only occur on the circuit that needs it. The other circuit will continue its normal operation if required.

## 12. Compressor alarm
To access one of the parameters displayed, press ↵ and change value using ↓ or ↑. Confirm the value by pressing ↵

| | |
|---|---|
| Compressor alarm | 00000 h |
| Default parameters? | N |

**Compressor alarm:** Operating hours for a warning (0 to 999000 hours by 1000 hours)
Setting compressor alarm at 000000 h will disable the function.
**Note:** Total operating hours = compressor running hours + 3 x compressor starts
**Default parameters?:** Set the default parameters
**Y:** Reset all parameters
**N:** Keep all parameters

**Note:** When resetting, all parameters programmed on site will be definitively lost. Only factory default set parameters will be kept. Full configuration of the unit will have to be checked.

# Alarms

**1. Alarms display and Resetting**

A fault on a unit will be shown through the user interface or through 2 digital outputs, one for each refrigerant circuit.

The alarms are divided into 3 categories:
- **Warning.** Shows that something is wrong on the unit but unit can be kept in operation. A message is displayed on the user interface screen. These messages are not recorded in the history list.
- **Fault with automatic reset:** when the cause of the fault disappears, the fault is cancelled and unit operation will return to normal. The messages displayed on the user interface screen disappear but are recorded in the history list of faults. The fault is relayed through the digital output if I/O parameter is set to show a circuit fault.
- **Fault with manual reset:** when the cause of the fault disappears, a manual reset is required to restart the unit. The messages displayed on the user interface screen disappear and are recorded in the history list of faults. The fault is relayed through the digital output if I/O parameter is set to show a circuit fault.

Should an alarm occur, (A) will be lit in red.

Pressing (A) once will display the alarm message (refer to table 4 for possible messages)
When alarm message is displayed

press (A) to reset the default if necessary.

**2. Alarms history**
200 events can be recorded by TRACER CH532. Each record will give the fault description, the reset type, the order and the day and time of occurrence.

Maintaining (A) for 5 seconds give will access to the last event recorded.

Then using (↓) (↑) allows the user to view the complete history. (refer to table 5 for possible messages)

# Alarms

### Table 4 - Status, warnings and alarm messages

| No | Message | Reset Type | Unit status | Description |
|----|---------|-----------|-------------|-------------|
| 1 | No Alarm | - | Unit On | See unit status on Main display |
| 2 | Ext. Ckt1 Stop | - | Circuit 1 Off | Circuit 1 Off by Digital Input (Dual circuit units) |
| 3 | Ext. Ckt2 Stop | - | Circuit 2 Off | Circuit 2 Off by Digital Input (Dual circuit units) |
| 4 | User Ckt1 Stop | - | Circuit 1 Off | Circuit 1 Disable by Settings (via keyboard) |
| 5 | User Ckt2 Stop | - | Circuit 2 Off | Circuit 2 Disable by Settings (via keyboard) |
| 6 | Remote Ckt1 Stop | - | Circuit 1 Off | Circuit 1 Disable by Supervision |
| 7 | Remote Ckt2 Stop | - | Circuit 2 Off | Circuit 2 Disable by Supervision |
| 8 | Clock Unit Stop | - | Unit Off | Unit Off by Program (Hourly, Weekly) |
| 9 | Operator Stop | - | Unit Off | Unit Off by Operator (via keyboard) |
| 10 | Ckt1 Defrost | - | Unit On | Circuit 1 under defrosting |
| 11 | Ckt2 Defrost | - | Unit On | Circuit 2 under defrosting |
| 12 | Warning Comp.1 Maintenance | Manual | Unit On | Compressor running hours above the threshold defined in unit configuration.Each compressor start is equal to 3 running hours. |
| 13 | Warning Comp.2 Maintenance | Manual | Unit On | |
| 14 | Warning Comp.3 Maintenance | Manual | Unit On | |
| 15 | Warning Comp.4 Maintenance | Manual | Unit On | |
| 16 | Alarm Air Sensor | Auto | Unit Off | Defective Air sensor - |
| 17 | Alarm Ckt 1 Fault | Manual | Circuit 1 Off | Simultaneous manual reset faults CMP A1 and (B1 or C1) |
| 18 | Alarm Ckt 2 Fault | Manual | Circuit 2 Off | Simultaneous manual reset faults CMP A2 and (B2 or C2) |
| 19 | Alarm Ckt1 HP Limit | Auto | Unit On | Compressor B1C1 Off for high HP ckt1 |
| 20 | Alarm Ckt1 Limiting | Auto | Unit On | Compressor B1C1 Off for Hot water or low LP ckt1 |
| 21 | Alarm Ckt2 HP Limit | Auto | Unit On | Compressor B2C2 Off for high HP ckt2 |
| 22 | Alarm Ckt2 Limiting | Auto | Unit On | Compressor B2C2 Off for Hot water or low LP ckt2 |
| 23 | Alarm Comp. A1 Fault | Auto/Manual | CMP A1 Off | Manu if CMP A1 failure > 35 min or 6 failures within 3 hours 30 min |
| 24 | Alarm Comp. B1 Fault | Auto/Manual | CMP B1 Off | Manu if CMP B1 failure > 35 min or 6 failures within 3 hours 30 min |
| 25 | Alarm Comp. C1 Fault | Auto/Manual | CMP C1 Off | Manu if CMP C1 failure > 35 min or 6 failures within 3 hours 30 min |
| 26 | Alarm Comp. A2 Fault | Auto/Manual | CMP A2 Off | Manu if CMP A2 failure > 35 min or 6 failures within 3 hours 30 min |
| 27 | Alarm Comp. B2 Fault | Auto/Manual | CMP B2 Off | Manu if CMP B2 failure > 35 min or 6 failures within 3 hours 30 min |
| 28 | Alarm Comp. C2 Fault | Auto/Manual | CMP C2 Off | Manu if CMP C2 failure > 35 min or 6 failures within 3 hours 30 min |
| 29 | Alarm Ext. Setpoint Signal | Auto | Unit Off | Defective device or bad device configuration |
| 30 | Alarm Fan Protection 1 | Auto | Unit On | Defective fan on the circuit 1 |
| 31 | Alarm Fan Protection 2 | Auto | Unit On | Defective fan on the circuit 2 |
| 32 | Alarm HP Ckt1 Fault | Manual | Circuit 1 Off | High Pressure Cut-Out circuit 1 |
| 33 | Alarm HP Ckt2 Fault | Manual | Circuit 2 Off | High Pressure Cut-Out circuit 2 |
| 34 | Alarm HP Sensor Ckt1 | Auto | Circuit 1 Off | Defective pressure sensor HP1 |
| 35 | Alarm HP Sensor Ckt2 | Auto | Circuit 2 Off | Defective pressure sensor HP2 |
| 36 | Alarm Low Ambient | Auto | Unit Off | Ambient temperature too low for unit operation |
| 37 | Alarm Low Water Temp | Manual | Unit Off | LWT < antifreeze or INT (antifreeze-EWT)<=10°Cxsecond |
| 38 | Alarm LP Ckt1 Fault | Auto/Manual | Circuit 1 Off | Suction pressure too low on circuit 1 |
| 39 | Alarm LP Ckt2 Fault | Auto/Manual | Circuit 2 Off | Suction pressure too low on circuit 2 |
| 40 | Alarm LP Sensor Ckt1 | Auto | Circuit 1 Off | Defective pressure sensor LP1 |
| 41 | Alarm LP Sensor Ckt2 | Auto | Circuit 2 Off | Defective pressure sensor LP2 |
| 42 | Alarm Unit Fault | Manual | Unit Off | All the compressors are defectives |
| 43 | Alarm Water Flow (**) | Auto | Unit Off | No water flow. Reset by unit Off/On when pump Off |
| 44 | Alarm Water In Sensor | Auto | Unit On | Defective Return water sensor |
| 45 | Alarm Water Out Sensor | Auto | Unit Off | Defective Leaving water sensor |
| 46 | Alarm Water Pump1 | Manual | Unit On | Defective water pump 1 |
| 47 | Alarm Water Pump2 | Manual | Unit On | Defective water pump 2 |

(**) When the unit is shut down after a waterflow alarm for more than 1 minute, it is necessary to switch the unit Off and On again to reset the fault. The fault will automatically reset if the water pump is still running.

# Alarms

---

*Table 5 - History events record*

| No Message | Reset Type | Unit status | Description |
|---|---|---|---|
| No History | Auto | Unit On | No alarm was recorded |
| Air Sensor | Auto | Unit Off | Faulty sensor, out of range -30..+80°C (short circuit or open circuit) |
| Water In Sensor | Auto | Unit On | Faulty sensor, out of range -30..+80°C (short circuit or open circuit) |
| Water Out Sensor | Auto | Unit Off | Faulty sensor, out of range -30..+80°C (short circuit or open circuit) |
| Lp Sensor Ckt1 | Auto | Circuit 1 Off | Faulty sensor, out of range 0..10V, 0..1V,0..20mA or 4..20mA following configuration |
| Hp Sensor Ckt1 | Auto | Circuit 2 Off | Faulty sensor, out of range 0..10V, 0..1V,0..20mA or 4..20mA following configuration |
| Lp Sensor Ckt2 | Auto | Circuit 1 Off | Faulty sensor, out of range 0..10V, 0..1V,0..20mA or 4..20mA following configuration |
| Hp Sensor Ckt2 | Auto | Circuit 2 Off | Faulty sensor, out of range 0..10V, 0..1V,0..20mA or 4..20mA following configuration |
| Fan Protection 1 | Auto | Unit On | A fan on the circuit 1 is faulty |
| Fan Protection 2 | Auto | Unit On | A fan on the circuit 2 is faulty |
| Lp Ckt1 fault | Auto or Manual | Circuit 1 Off | Lp circuit 2 is below the setpoint. Manual reset after 3 faults within 1 hour |
| Lp Ckt2 fault | Auto or Manual | Circuit 2 Off | Lp circuit 1 is below the setpoint. Manual reset after 3 faults within 1 hour |
| Low Water Temp | Manual | Unit Off | LWT < antifreeze or INT (antifreeze-EWT)<=10°Cxsecond |
| Comp. A1 Fault | Auto or Manual | CMP A1 Off | Manual reset if CMP A1 failure > 35 min or 6 failures within 3 hours 30 min |
| Comp. B1 Fault | Auto or Manual | CMP B1 Off | Manual reset if CMP B1 failure > 35 min or 6 failures within 3 hours 30 min |
| Comp. C1 Fault | Auto or Manual | CMP C1 Off | Manual reset if CMP C1 failure > 35 min or 6 failures within 3 hours 30 min |
| Comp. A2 Fault | Auto or Manual | CMP A2 Off | Manual reset if CMP A2 failure > 35 min or 6 failures within 3 hours 30 min |
| Comp. B2 Fault | Auto or Manual | CMP B2 Off | Manual reset if CMP B2 failure > 35 min or 6 failures within 3 hours 30 min |
| Comp. C2 Fault | Auto or Manual | CMP C2 Off | Manual reset if CMP C2 failure > 35 min or 6 failures within 3 hours 30 min |
| Hp Ckt1 Fault | Manual | Circuit 1 Off | High pressure switch Cut-Out circuit 1 |
| Hp Ckt2 Fault | Manual | Circuit 2 Off | High pressure switch Cut-Out circuit 2 |
| Ckt1 Fault | Manual | Circuit 1 Off | Simultaneous faults compressor A1 and (B1 or C1) |
| Ckt2 Fault | Manual | Circuit 2 Off | Simultaneous faults compressor A2 and (B2 or C2) |
| Unit Fault | Manual | Unit Off | Simultaneous faults on all the compressors |
| Ext Setpoint Signal | Auto | Unit Off | Faulty sensor, out of range 0..10V, 0..1V,0..20mA or 4..20mA following configuration |
| Low Ambient | Auto | Unit Off | Air temperature below the setpoint while unit On |
| Water Pump 1 | Manual | Unit On | Fault on water pump #1 |
| Water Pump 2 | Manual | Unit On | Fault on water pump #2 |
| Water Flow | Auto | Unit Off | Loss of water flow for more than 4 sec when the system is On. Pump restarts by a manual unit Off and On |
| Defrost Ckt1 | Auto | Unit On | Defrost on circuit 1 |
| Defrost Ckt2 | Auto | Unit On | Defrost on circuit 2 |

# LonTalk® option

## Description

The Lon interface uses an Echelon FTT-10 transceiver, which is approved to be used on the TP/FT-10 channel.

This channel is characterized by the following main features:

• It consists of up to 60 nodes on a single network segment
• Data rate : 78 125 kbps
• Maximum distance : 1400 meters
• Recommended topology : daisy chain with double end terminator (105 ohms)

For futher details, refer to the official documentation LonWorks® FTT-10A free topology transeiver user's guide and to the official LonWorks® guidelines LonMark® layer 1-6 interoperability guidelines version 3.0.

These documents and additional information are available on the internet site www.lonmark.org

**Figure 9**



1. Connection to the Tracer CH532
2. Terminal block to the LonWorks® network (GND,A,B)
3. Service pin
4. Green status LED
5. Red service LED

To activate the service pin, simply short circuit the two pins for a moment using the tip of a screwdriver or similar tool. The service pin is available only in the node installation phase. When the pin is activated, the node sends a broadcast message in the LonWorks® containing the necessary information in order to be identified.

# LonTalk® option

## LED meaning and function

**Green Status LED**

| LED status | Meaning/Function |
|---|---|
| LED is OFF continuously. | • Normal condition<br>• Broken hardware<br>• No power |
| LED is ON.<br>. | • Broken hardware<br>• During the activation of the service pin<br>•The node is Applicationless |
| LED blinks 1second then always OFF | •When receiving a WINK command from the network (1) |
| LED blinks ½ second ON then always OFF | • Normal operation (usually after a reset) |
| LED flashes once every second | •The node card is not configured<br>•The node card is in continuous reset |

(1) By sending a request, you can request the controller's green status LED to blink ("wink"), a notification that the controller received the signal and is communicating.

**Red Service LED**

| LED status | Meaning/Function |
|---|---|
| LED is ON for 20 seconds when power is applied to the controller | •The controller is in a reset phase |
| LED is OFF continuously | •The controller is operating normally<br>• Broken hardware |
| LED is ON during 2 seconds then always OFF | •When power is applied to the controller<br>• After a reset |
| LED is ON continuously | •The controller is not working properly<br>• Broken hardware<br>• Problems of connection with the CH532 module |

## Object details

*Figure 10*



**Note:** BAS intergrators requiring .xif file need to contact their local sales representative.
Other optional network variables are not supported.

# LonTalk® option

---

Nv1    0=off
       1=on
nv2  range -12.2°C  48.8°C
nv3    0=chiller off
       1=chiller on
nv4  range  -40°C  93°C
nv7    1=heat mode
       3=cooling mode
nv8  range  10°C  93°C
nv11  range  -40°C  118°C
nv12  range  -40°C  118°C
nv13  range  -40°C  118°C
nv15    manual reset alarm
       auto reset alarm
       informational warning
       circuit 1 fans fault
       circuit 2 fans fault
       compressor A1 fault
       compressor B1 fault
       compressor C1 fault
       compressor A2 fault
       compressor B2 fault
       compressor C2 fault
       pump 1 fault
       pump 2 fault
nv16  chlr_off=0,  chlr_run=2
       HVAC_HEAT=1,  HVAC_COOL=3
       Chiller state  0=No alarm,  1=In alarm
       Run _enable  0=Chiller not allowed to start,  1=Chiller can start
       Local  0=Values can be changed remotely,  1=Values cannot be changed remotely
       Limited  (Not used)
       CHW_flow 0=No water flow,  1=Water flow detected
       CONDW_flow  (Not used)
       All other bits unused

Configuration properties
nc73    ChillerEnable (m)
nc52    inSendTime (m)
nc4    MaxSendTime (m)
nc7    CoolSetpt (m)
nc74    Mode (o)
nc78    HeatSetpt (o)
nc48    Heartbeat (o)

(m) = mandatory
(o) = optional

# LonTalk® option

## Cable characteristics

Level 4 cable may be used with TP/FT-10 channels. The level 4 cable specification used by Echelon and as originally defined by the National Electrical Manufacturers Association (NEMA) differs from the Category 4 specification proposed by the Electronic Industries Association / Telecommunication Industries Association (EIA / TIA). The following specifications can be used by cable suppliers to identify a compliant Level 4 cable.

| Specifications apply to shield or unshielded 22AWG (0.65mm²) cable | |
|---|---|
| D-C resistance (ohms/1000 feet at 20°C) maximum for a single copper conductor regardless of whether it is solid or stranded and is or is not metal coated | 18.0 |
| D-C resistance unbalance (percent) maximum | 5 |
| Mutual capacitance of a pair (pF/foot) maximum | 17 |
| Pair to ground capacitance unbalance (pF/1000 feet) maximum | 1000 |
| **Characteristic impedance (ohms)** | |
| 772 kHz | 102+/- 15% |
| 1.0 MHz | 100 +/- 15% |
| 4.0 MHz | 100 +/- 15% |
| 8.0 MHz | 100 +/- 15% |
| 10.0 MHz | 100 +/- 15% |
| 16.0 MHz | 100 +/- 15% |
| 20.0 MHz | 100 +/- 15% |
| **Attenuation (dB/1000 feet at 20°C) maximum** | |
| 772 kHz | 4.5 |
| 1.0 MHz | 5.5 |
| 4.0 MHz | 11 |
| 8.0 MHz | 15 |
| 10.0 MHz | 17 |
| 16.0 MHz | 22 |
| 20.0 MHz | 24 |

Worst pair to pair near end crosstalk (dB) minimum. Values are shown for information only. The minimum NEXT coupling loss for any pair combination at room temperature is to be greater than the value determined using the formula NEXT (F MHz)>NEXT (0.772)-15log10(F MHz / 0.772) for all frequencies in the range of 0.772 MHz for a length of 1000 feet.

| | |
|---|---|
| 772 kHz | 58 |
| 1.0 MHz | 56 |
| 4.0 MHz | 47 |
| 8.0 MHz | 42 |
| 10.0 MHz | 41 |
| 16.0 MHz | 38 |
| 20.0 MHz | 36 |

For the TP/FT-10 channel operating in a bus topology , the maximum bus length of level 4 22AWG (0.65 mm²) cabling is 1400 meters with a maximum stub length of 3 meters.
It is recommended to use shielded cable if high amplitude modulation noise exist or transient protection is required.

# Notes

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# Notes

# Notes

## Safety recommendations

To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits:

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter "Installation". Always provide a pressure regulator.
2. Disconnect the main supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

## Maintenance contract

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

## Training

The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it and maintaining it in perfect operating condition over a long period of time, the manufacturer has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

*The manufacturer has a policy of continuous product improvement, and reserves the right to alter any details of the products at any time without notice.*

*This publication is a general guide to install, use and properly maintain our products. The information given may be different from the specification for a particular country or for a specific order. In this event, please refer to your nearest office.*

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| Literature Order Number | CG-SVU01B-E4 |
|---|---|
| Date | 0304 |
| Supersedes | CG-SVU01A-E4-0902 |
| Stocking Location | Europe |

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