SYSCROLL 20-75 Air CO/HP CONTROL

SYSCROLL 20-75 Air – COOLING ONLY / HEAT PUMP

1-2 SCROLL COMPRESSOR / SINGLE CIRCUIT

INSTRUCTIONS FOR SERVICE

GENERAL INFORMATIONS

Introduction

Energy SBW is a compact electronic control for the complete management of cooling only / heat pump air to water units, with integrated functions for domestic hot water management, plant side pumps, dynamic set-point, auto-adaptive set-point modification.

Control architecture

Control SBW 655
Expansion SE 632
Driver EVD0000E31 "OPTION"
Driver Display EVDIS00EN0 "OPTION"
Remote terminal control SKW 22 L "OPTION"

Controlled devices

- Compressor
- Fan motors
- Reverse cycle valve
- Plant side pump
- Domestic hot water 3-ways valve
- Domestic hot water integration electrical heater
- Heating integration device (boiler)
- Alarm signalling device

KEYPAD / SBW

General informations

The terminal is provided with a 4 red digits with 7 segments with decimal point led, 18 LED and 4 buttons, so as to allow the programming of the control parameters (set-point, differential bands, alarm thresholds) and the main operations to be carried out by the user.

Keys description / function

KEY	DESCRIPTION	SINGLE PRESSURE (PRESS AND RELEASE)	LINKED FUNCTION	EXTENDED PRESSURE (MORE THAN 3 s)	MENU / NOTES
∧	UP	• Increase value • Go to next folder • Change Set-point (if UI25 =1)		• Enable Domestic Hot Water function	• Domestic hot water / Functions
∨	DOWN	• Decrease value • Go to previous folder • Change Set-point (if UI25 =1)		• Enable Stand-by	• Stand-by • Local ON / OFF
esc	ESC	• Exit without saving • Go to previous level	**mode**	• Change mode	• Menu Mode
set	SET	• Confirm value / exit with setting saving • Go to next level • Go to Status menu	**disp**	• Main display	• Menu Display

Keys combination

SIMBLE	KEYS COMBINATION	KEYS COMBINED ACTION SINGLE PRESSURE FUNCTION (PRESS AND RELEASE)	LINKED FUNCTION	MENU / NOTES
⏲/⚠	∧ + ∨	UP + DOWN	• Enable / Disable	• Time bands Menu
Prg	esc + set	ESC + SET	• Enter in "Program Menu"	• Program Menu

LED: operating mode / status

ICON	DESCRIPTION	COLOR	STEADY ICON	BLINKING ICON
	ALARM	RED	• Alarm ON	• Alarm quit
	HEATING	GREEN	• Mode: HEATING	• Antifreeze + Heat pump ON • Heating mode / remote
	COOLING	GREEN	• Mode: COOLING	• Cooling mode / remote
	STAND-BY	GREEN	• Mode: STAND-BY	• Stand-by mode / remote
	DEFROST	GREEN	• Mode: DEFROST	• Manual defrost
	ECONOMY	GREEN	• Configurable	• Configurable

LED: values / unit of measurement

ICON	DESCRIPTION	COLOR	STEADY ICON	BLINKING ICON
	CLOCK TIME BANDS	RED	• Current HR • Time bands authorization	• HR setting • Time bands programming
°C	DEGREE CELSIUS	RED	/	/
Bar	PRESSURE (Bar)	RED	/	/
%R.H	RELATIVE HUMIDITY (%)	RED	• Not used	• Not used
ABC	MENU (ABC)	RED	• Menu surf	/

LED: utility

LED N° (LEFT TO RIGHT)	DESCRIPTION	ICON
1	FIRST CAPACITY STEP	
2	SECOND CAPACITY STEP	
3	PRIMARY CIRCUIT PUMP	
4	SOURCE SIDE CIRCUIT PUMP	
5	ELECTRICAL RESISTANCE	
6	VALVE / PUMP SHW	
7	BOILER	

FOLDER MENU STRUCTURE (SBW600)

Folder structure is composed of totally four menus:

- **Main display menù**
- **Operating mode menù**
- **Status menù**
- **Program menu**

Main display menù

Main display menu is used to set what to display as a standard, without acting on any key.
Following information can be displayed:

- Ai → analogue input (temperature, pressure, voltage, current)
  - AIL1, AIL2, AIL3, AIL4, AIL5
  - AIE1, AIE2, AIE5
  - Air1, Air1
- rtC → room time clock
  - HH:MM
- SetP → standard set-point
  - SetP
- SetR → corrected set-point (according to climatic correction, etc.)
  - SetR

In order to set which variable to display, act this way:

- press SET key (at least for 3 seconds)
- scroll the menu with UP / DOWN keys
- choose the variable you want to display
- press SET key to confirm

Operating mode menù

Operating mode menu is used to set / change operating mode.
Following operating modes can be selected:

- StbY → stand-by
- HEAT → heat pump
- COOL → cooling
- AS → domestic hot water

In order to set / change operating mode, act this way:

- press ESC key (at least for 3 seconds)
- scroll the menu with UP / DOWN keys
- choose mode you want to operate
- press SET key to confirm

Status menù

Status menu is used to show resources values.

Following resources can be shown:

- Ai (AIL / AIE / Air) → analogue inputs (main board / expansion board / remote terminal) → **not changeable**
- di (diL / diE) → digital inputs (main board / expansion board) → not changeable
- AO (AOL / AOE) → analogue outputs (main board / expansion board) → **not changeable**
- dO (dOL / dOE) → digital outputs (main board / expansion board) → not changeable
- CL (HOUr / dAtE / YEAr) → clock → **changeable**
- AL (Er00 → Er98) → alarms → **not changeable**
- SP → standard set-point → **changeable**
- Sr → corrected set-point (according to climatic correction, etc.) → **not changeable**
- Hr → operating tens of hours → **changeable**

In order to display a specific analogue / digital input / output, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to display the different folders (Ai, di, AO, dO, CL, AL, SP, Sr, Hr)
- press SET key in order to enter a specific folder
- scroll the folder with UP / DOWN keys in order to display the different resources
- press SET key in order to show the value of a specific resource
- press ESC in order to reach main display

(CL) Clock adjustment

In order to adjust main board clock, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to reach CL folder
- press SET key in order to enter CL folder
- scroll the folder with UP / DOWN keys in order to display hour / date / year
- press SET key (at least for 3 seconds) in order to change hour / date / year
- press UP / DOWN keys in order to change hour / date / year
- press SET key to fix hour / date / year
- press ESC in order to reach main display

(AL) Alarm display

In order to display active alarm, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to reach AL folder
- press SET key in order to show active alarm (ErXX…)
- scroll the folder with UP / DOWN keys in order to display other active alarms
- press ESC in order to reach main display

NB: Alarm reset & delete to see pag. 40

(SP) Set-point setting

In order to set / modify actual set-point, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to reach SP folder
- press SET key in order to enter SP folder
- scroll the folder with UP / DOWN keys in order to display the different actual set-point
  - COOL → cooling set-point
  - HEAT → heating set-point
  - ACS → domestic hot water set-point
- press SET key in order to change a specific set-point (COOL in example)
- press UP / DOWN keys in order to change actual set-point
- press SET key to fix actual set-point
- press ESC in order to reach main display

(HR) Compressors / pump hours display / reset

In order to display compressors / pump operating hours, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to reach Hr folder
- press SET key in order to enter Hr folder
- scroll the folder with UP / DOWN keys in order to display the different devices (CP → compressor, PU → pump)
- press SET key in order to display a specific device operating hour (displayed value is tens of hours)
- press ESC in order to reach main display

In order to reset compressors / pump operating hours, act this way:

- press SET key
- scroll the menu with UP / DOWN keys in order to reach Hr folder
- press SET key in order to enter Hr folder
- scroll the folder with UP / DOWN keys in order to display the different devices (CP → compressor, PU → pump)
- press SET key (at least for 3 seconds) in order to reset a specific device operating hour
- press ESC in order to reach main display

Program menu

Program menu is used to define parameters, functions, passwords and to display alarm log.
Program menu is composed of totally four folders:

- **(PAr)** *Parameters* → change unit parameters
- **(FnC)***Functions* → manual operations (switch ON / switch OFF, alarm quit, historic alarm delete, multi function key use)
- **(PASS)** *Password* → define visibility levels for parameters / folders
- **(EU)** *Alarm log* → display alarm log

Parameters (PAr) folder

Parameter folder gives access to the following sub-folders, with following functions:

- CL / CE / Cr / CF → configure system *I/O* (L → local; E → expansion; r → remote; F → serial)
- *Ui* → user parameters
- tr → define *temperature regulation* parameters
- St → define *operating mode*
- CP → configure *compressor* parameters (type/number/timing)
- Pi → define plant side circuit *pump* parameters / functions
- FE → define *external exchanger fan* parameters / functions
- br → control the parameters for an additional step for heating and for domestic hot water integration (*boiler*)
- dF → define *defrost* parameters / functions
- dS → define set-point offset (*dynamic set-point*) depending on
- Ad → simulate an electronic inertial accumulator, acting on set-point and hysteresis (*adaptive* function), by confronting minimum / effective ON-OFF time
- AF → prevent breakages due to exchangers freezing (*antifreeze* function), by switching ON the unit in heating mode
- AS → define *domestic hot water* management parameters
- HP → define *heat pump block* management parameters
- PL → define *capacity limitation* to protect the unit (high/low T, high/low P)
- tE → define *time bands* management (different operating daily profiles)
- AL → define *alarms* management (automatic / manual reset, by-pass time, sampling)

In order to access Parameter folder and sub-folders, act this way:

- press ESC + SET keys together to open PAr menu
- press SET key to enter in Par sub-folders
- scroll the menu with UP / DOWN keys in order to find out desired sub-folder (CL in example)
- press SET key to enter in Par sub-folder (CL in example)
- scroll the menu with UP / DOWN keys in order to find out desired parameter (CL01 in example)
- press SET key to show desired parameter (CL01 in example)
- scroll the menu with UP / DOWN keys in order to adjust desired parameter (CL01 in example)
- press SET key to confirm
- press ESC in order to GO back to the previous level

System configuration PAr (CL / CE / Cr / CF)

CL / CE / Cr / CF sub-folders are used to configure system *I/O* (L → local; E → expansion; r → remote; F → serial)
- analogue input (type of probe, range, differential, logic function)
- digital input (logic function)
- digital output (logic function)
- analogue output (range)
- serial configuration (communication parameters)

Description	Unit	Value		Note
CL00 - AIL1 / analogue input type	num	2		NTC probe
CL01 - AIL2 / analogue input type	num	2		NTC probe
CL02 - AIL3 / analogue input type	num	0		If Dynamic set-point is required → **CL02 = 3** (4-20 mA) → **CL02 = 4** (0-10 V) → **CL02 = 5** (0-5 V) → **CL02 = 6** (0-1 V)
CL03 - AIL4 / analogue input type	num	3		High pressure transducer (4-20 mA)
CL04 - AIL5 / analogue input type	num	2		NTC probe
CL10 - AIL3 / analogue input end scale	°C/Bar	0		To be set according Dynamic set-point analogue input type
CL11 - AIL3 / analogue input start scale	°C/Bar	0		To be set according Dynamic set-point analogue input type
CL12 - AIL4 / analogue input end scale	°C/Bar	45		High pressure transducer end scale
CL13 - AIL4 / analogue input start scale	°C/Bar	0		High pressure transducer start scale
CL20 - AIL1 / analogue input differential	°C	0		
CL21 - AIL2 / analogue input differential	°C	0		
CL22 - AIL3 / analogue input differential	°C/Bar	0		
CL23 - AIL4 / analogue input differential	°C/Bar	0		
CL24 - AIL5 / analogue input differential	°C	0		
CL30 - AIL1 / analogue input configuration	num	1		RWT probe / plant side heat exchanger
CL31 - AIL2 / analogue input configuration	num	2		LWT probe / plant side heat exchanger
CL32 - AIL3 / analogue input configuration	num	0		If Dynamic set-point is required → **CL32 = 25**
CL33 - AIL4 / analogue input configuration	num	21		High pressure transducer

Description	Unit	Value	Note
CL34 - AIL5 / analogue input configuration	num	9	Outdoor air temperature
CL40 - DIL1 / digital input configuration	num	-39	Fan motor thermal protection
CL41 - DIL2 / digital input configuration	num	-43	Compressor 1 thermal protection →**CL 41= -43**
CL42 - DIL3 / digital input configuration	num	0	Compressor 2 thermal protection → **CL 44=44**
CL43 - DIL4 / digital input configuration	num	-55	Plant side flow switch
CL44 - DIL5 / digital input configuration	num	-32	Low pressure switch
CL45 - DIL6 / digital input configuration	num	-30	High pressure switch
CL50 - AIL1 / analogue input configuration (if configured as digital)	num	0	
CL51 - AIL2 / analogue input configuration (if configured as digital)	num	0	
CL52 - AIL3 / analogue input configuration (if configured as digital)	num	0	
CL53 - AIL4 / analogue input configuration (if configured as digital)	num	0	
CL54 - AIL5 / analogue input configuration (if configured as digital)	num	0	
CL60 - AOL5 / analogue output type	num	0	
CL61 - AOL3 / analogue output configuration	num	0	
CL62 - AOL4 / analogue output configuration	num	0	
CL63 - AOL5 / analogue output configuration	num	0	
CL71 - AOL1 / analogue output activation	num	1	Fan speed control
CL72 - AOL2 / analogue output activation	num	0	
CL74 - AOL1 / analogue output displacement	Deg	33	Phase shift analogue output AOL1
CL75 - AOL2 / analogue output displacement	Deg	27	
CL77 - AOL1 / analogue output pulse time	69 sec	25	Analogue output AOL1 pulse length
CL78 - AOL2 / analogue output pulse time	69 sec	10	
CL80 - AOL1 / analogue output configuration	num	56	External heat exchanger fan motors
CL81 - AOL2 / analogue output configuration	num	0	
CL90 - DOL1 / digital output configuration	num	1	Compressor 1
CL91 - DOL2 / digital output configuration	num	0	Compressor 2 set at 2
CL92 - DOL3 / digital output configuration	num	19	Fan motor
CL93 - DOL4 / digital output configuration	num	31	Alarm
CL94 - DOL5 / digital output configuration	num	0	With Heating integration kit → **CL94 = 30**
CL95 - DOL6 / digital output configuration	num	23	Antifreeze electrical heater
CL96 - AOL1 / analogue output configuration (if configured as digital)	num	0	
CL97 - AOL2 / analogue output configuration (if configured as digital)	num	0	

Description	Unit	Value		Note
CE00 - AIE1 / analogue input type	num	see note		External heat exchanger temperature probe SYSCROLL Air CO → **CE00 = 0** SYSCROLL Air HP → **CE00 = 2**
CE01 - AIE2 / analogue input type	num	0		With Domestic hot water temperature kit→ **CE01 = 2**
CE02 - AIE3 / analogue input type	num	0		resource not available
CE03 - AIE4 / analogue input type	num	0		
CE04 - AIE5 / analogue input type	num	0		
CE10 - AIE3 / analogue input end scale	°C/Bar	0		
CE11 - AIE3 / analogue input start scale	°C/Bar	0		
CE12 - AIE4 / analogue input end scale	°C/Bar	0		
CE13 - AIE4 / analogue input start scale	°C/Bar	0		
CE20 - AIE1 / analogue input differential	°C	0		
CE21 - AIE2 / analogue input differential	°C	0		
CE22 - AIE3 / analogue input differential	°C/Bar	0		
CE23 - AIE4 / analogue input differential	°C/Bar	0		
CE24 - AIE5 / analogue input differential	°C	0		
CE30 - AIE1 / analogue input configuration	num	see note		External heat exchanger temperature probe SYSCROLL Air CO → **CE30 = 0** SYSCROLL Air HP → **CE30 = 5**
CE31 - AIE2 / analogue input configuration	num	0		With Domestic hot water temperature kit → **CE31 = 11**
CE32 - AIE3 / analogue input configuration	num	0		resource not available
CE33 - AIE4 / analogue input configuration	num	0		
CE34 - AIE5 / analogue input configuration	num	0		
CE40 - DIE1 / digital input configuration	num	-24		Sequence phase control alarm
CE41 - DIE2 / digital input configuration	num	0		If Remote double set-point is required → **CE41 = -22**
CE42 - DIE3 / digital input configuration	num	0		If Remote ON-OFF is required → **CE42 = -2** If Remote Stand-by is required → **CE42 = -1**
CE43 - DIE4 / digital input configuration	num	0		SYSCROLL Air HP only If Remote COOL/HEAT is required → **CE43 =-3**
CE44 - DIE5 / digital input configuration	num	See note		Plant side pump thermal protection → **CE 44 = -47** No pump → **CE 44 = 0**

Description	Unit	Value		Note
CE45 - DIE6 / digital input configuration	num	0		With remote load Sheddind set → **CE 45 = 21**
CE50 - AIE1 / analogue input configuration (if configured as digital)	num	0		
CE51 - AIE2 / analogue input configuration (if configured as digital)	num	0		
CE52 - AIE3 / analogue input configuration (if configured as digital)	num	0		resource not available
CE53 - AIE4 / analogue input configuration (if configured as digital)	num	0		
CE54 - AIE5 / analogue input configuration (if configured as digital)	num	0		
CE60 - AOE5 / analogue output type	num	0		
CE61 - AOE3 / analogue output configuration	num	0		
CE62 - AOE4 / analogue output configuration	num	0		
CE63 - AOE5 / analogue output configuration	num	0		
CE70 - TCE1 / analogue output configuration	num	0		
CE71 - AOE1 / analogue output configuration	num	0		
CE72 - AOE2 / analogue output configuration	num	0		
CE73 - TCE1 / analogue output displacement	Deg	27		
CE74 - AOE1 / analogue output displacement	Deg	27		
CE75 - AOE2 / analogue output displacement	Deg	27		
CE76 - TCE1 / analogue output pulse time	69 sec	10		
CE77 - AOE1 / analogue output pulse time	69 sec	10		
CE78 - AOE2 / analogue output pulse time	69 sec	10		
CE79 - TCE1 / analogue output configuration	num	0		
CE80 - AOE1 / analogue output configuration	num	0		
CE81 - AOE2 / analogue output configuration	num	0		
CE90 - DOE1 / digital output configuration	num	See note		Plant side pump → **CE 90 = 14** No pump → **CE 90 = 0**
CE91 - DOE2 / digital output configuration	num	see note		Reverse valve SYSCROLL Air CO → **CE91 = 0** SYSCROLL Air HP → **CE91 = -5**
CE92 - DOE3 / digital output configuration	num	0		With Domestic hot water 3-ways valve → **CE92 = 9**
CE93 - DOE4 / digital output configuration	num	0		resource not available
CE94 - DOE5 / digital output configuration	num	0		With Domestic hot water integration kit → **CE94 = 28**

Description	Unit	Value		Note
CE95 - DOE6 / digital output configuration	num	0		resource not available
CE96 - AOE1 / analogue output configuration (if configured as digital)	num	0		
CE97 - AOE2 / analogue output configuration (if configured as digital)	num	0		

Description	Unit	Value	Note
Cr00 - AIR1 / analogue input type	num	0	
Cr01 - AIR2 / analogue input type	num	0	
Cr10 - AIR2 / analogue input end scale	C/Bar	0	
Cr11 - AIR2 / analogue input start scale	C/Bar	0	
Cr20 - AIR1 / analogue input differential	°C	0	
Cr21 - AIR2 / analogue input differential	C/Bar	0	
Cr30 - AIR1 / analogue input configuration	num	0	
Cr31 - AIR2 / analogue input configuration	num	0	
Cr50 - AIR2 / analogue input configuration (if configured as digital)	num	0	

Description	Unit	Value	Note
CF01 - COM1 protocol selection	num	1	
CF20 - Eliwell protocol control address	num	0	
CF21 - Eliwell protocol control family	num	0	
CF30 - Modbus protocol control address	num	1	
CF31 - Modbus protocol baudrate	num	3	
CF32 - Modbus protocol parity	num	1	
CF50 - RTC presence	num	1	
CF60 - Customer 1 code	num	0	
CF61 - Customer 2 code	num	0	

System configuration PAr – (Ui)

Ui sub-folder is used to configure *user interface*

Description	Unit	Value	Note
Ui00 - LED1 configuration	num	50	Compressor 1 → **Ui 00 = 50**
Ui01 - LED2 configuration	num	0	Compressor 2 → **Ui 01 = 51**
Ui02 - LED3 configuration	num	14	
Ui03 - LED4 configuration	num	0	
Ui04 - LED5 configuration	num	23	
Ui05 - LED6 configuration	num	9	
Ui06 - LED7 configuration	num	30	
Ui07 - Standby LED configuration	num	1	
Ui10 - Fundamental state display selection	num	0	
Ui11 - SKW basic state display 1	num	5	
Ui20 – Enable defrost/Sanitary water function from key	num	1	
Ui21 – Enable MODE function from key	num	1	
Ui22 – Enable DISP function from key	num	1	
Ui23 – Enable STAND BY function from key	num	1	
Ui24 – Enable SET function from key	num	1	
Ui25 – Setpoint edit function enable from main screen	num	0	
Ui27 - Installation engineer password	num	1	
Ui28 - Manufacturer password	num	2	
Ui30 - LED11 configuration	num	50	Compressor 1 →**Ui 30 = 50**
Ui31 - LED12 configuration	num	0	Compressor 2 →**Ui 31 = 51**
Ui32 - LED13 configuration	num	14	
Ui33 - LED14 configuration	num	0	
Ui34 - LED15 configuration	num	23	
Ui35 - LED16 configuration	num	9	
Ui36 - LED17 configuration	num	30	

Temperature regulation PAr – (tr)

tr sub-folder is used to define *temperature regulation* parameter
set-point (max/min/hysteresis)
type (proportional/differential)
probe selection

Description	Unit	Value	Note
tr00 - Thermoregulator type	num	0	tr00=0 → **proportional** tr00=1 → **differential**
tr01 - Heat pump activation	num	See note	tr01=0 → **heat pump disabled** → SYSCROLL Air CO tr01=1 → **heat pump enabled** → SYSCROLL Air HEAT PUMP
tr02 - COOL operation / proportional thermoregulation probe selection	num	0	tr02=0 → **RWT probe / plant side heat exchanger** tr02=1 → **LWT probe / plant side heat exchanger**
tr03 - HEAT operation / proportional thermoregulation probe selection	num	0	tr03=0 → **RWT probe / plant side heat exchanger** tr03=1 → **LWT probe / plant side heat exchanger**
tr04 - COOL operation / differential thermoregulation probe selection	num	0	tr04=0 → **RWT probe / plant side heat exchanger - OAT** tr04=1 → **LWT probe / plant side heat exchanger - OAT**
tr05 - HEAT operation / differential thermoregulation probe selection	num	0	tr05=0 → **RWT probe / plant side heat exchanger - OAT** tr05=1 → **LWT probe / plant side heat exchanger - OAT**
tr10 - COOL operation / thermoregulation set-point	°C	12	
tr11 - COOL operation / min set-point	°C	10	
tr12 - COOL operation / max set-point	°C	23	
tr13 - COOL operation / thermoregulation hysteresis	°C	1	
tr15 - COOL operation / set-point differential → double set-point	°C	5	If Remote double set-point is required add tr15 value to set-point
tr20 - HEAT operation / thermoregulation set-point	°C	40	
tr21 - HEAT operation / min set-point	°C	25	
tr22 - HEAT operation / max set-point	°C	50	
tr23 - HEAT operation / thermoregulation hysteresis	°C	1	
tr25 - HEAT operation / set-point differential → double set-point	°C	-5	If Remote double set-point is required add tr25 value to set-point

Operating mode PAr – (St)

St sub-folder is used to define *operating mode*
set-point (max/min/hysteresis)
type (proportional/differential)
probe selection

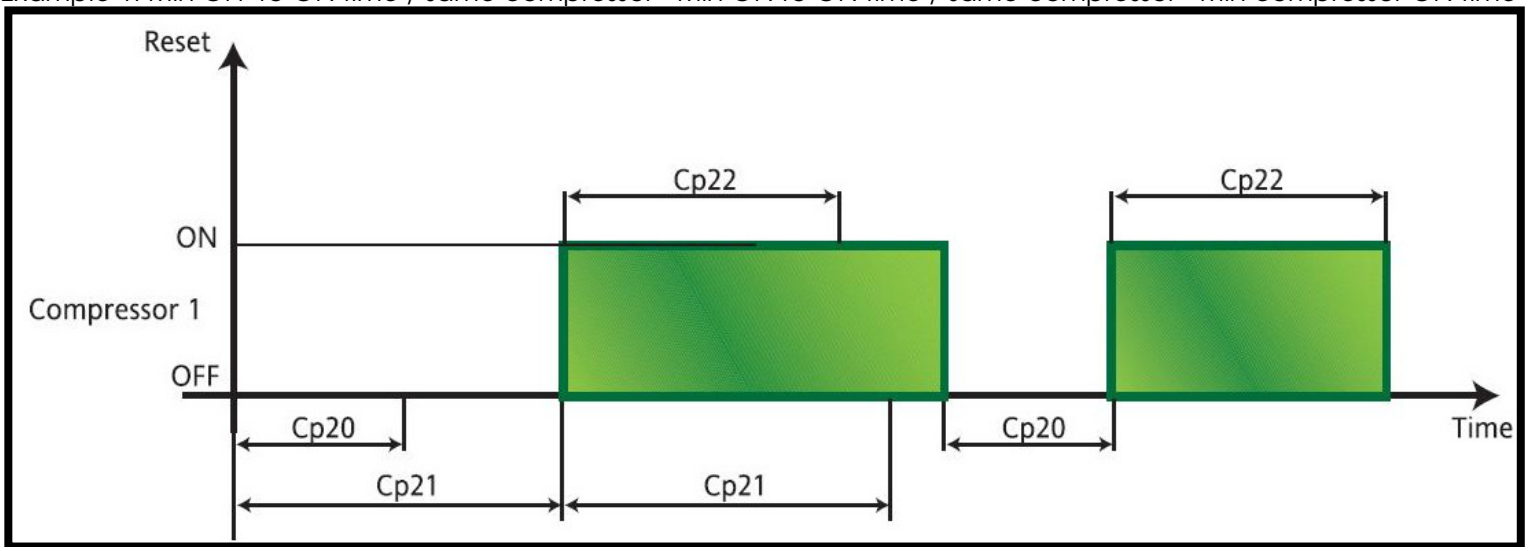
Description	Unit	Value	Note
St00 - Operating mode selection	num	see note	St00=0 → **COOL** → SYSCROLL Air CO St00=2 → **HEAT+COOL** → SYSCROLL Air HP
St01 - Automatic change over activation (by analogue input)	num	0	St01=0 → disable St01=1 → enable
St02 - Probe selection for automatic change over	num	0	St02=0 → OAT probe St02=1 → RWT probe / plant side heat exchanger St02=2 → LWT probe / plant side heat exchanger
St03 - HEAT operation / differential for automatic change over	°C	-10	
St04 - COOL operation / differential for automatic change over	°C	10	
St05 - Delay time for reverse valve switching	sec	0	
ST06 - Reversal valve switching from Heat to Defrost delay	sec	see note	St06=0 → SYSCROLL Air CO St00=10 → SYSCROLL Air HP
ST07 - Reversal valve switching from Defrost to Heat delay	sec	see note	St00=0 → SYSCROLL Air CO St00=10 → SYSCROLL Air HP
ST08 - Reversal valve activation time for pressure release	sec	0	

Compressor PAr – (CP)

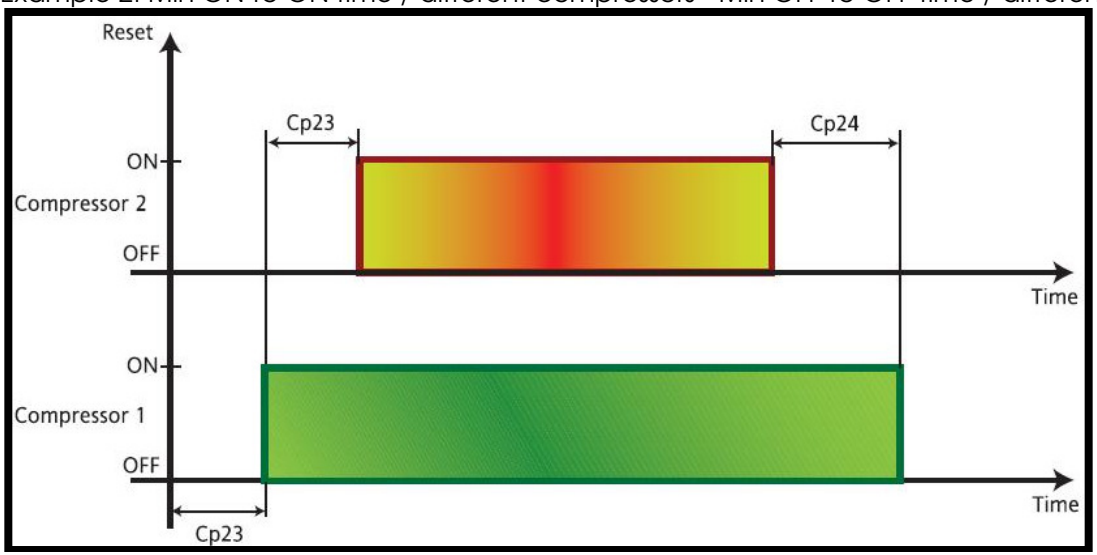
CP sub-folder is used to configure *compressor* parameters (type/number/timing)

Description	Unit	Value	Note
CP00 - Compressor type	num	0	
CP01 - Number of circuits	num	1	
CP02 - Number of compressors each circuit	num	1	For circuit with 2 compressors 2 → **CP 02 at 2**
CP03 - Number of part-load / each compressor	num	0	
CP10 - Circuits balance activation	num	0	
CP11 - Compressors balance activation	num	0	
CP12 - Circuit choice criteria	num	0	
CP13 - Compressor choice criteria	num	0	
CP14 - Compressor operating time for compressor ON cascade	sec*10	3	
CP20 - Min OFF to ON time / same compressor	sec*10	18	
CP21 - Min ON to ON time / same compressor	sec*10	30	
CP22 - Min compressor ON time	sec*10	18	
CP23 - Min ON to ON time / different compressors	sec	10	
CP24 - Min OFF to OFF time / different compressors	sec	10	
CP25 - Minimum compressor on time per splitting increment	sec	10	
CP26 - Minimum compressor on time per splitting decrease	sec	5	
CP27 - Defrost compressor/step delay minimum	sec	3	

Example 1: Min OFF to ON time / same compressor - Min ON to ON time / same compressor - Min compressor ON time



Example 2: Min ON to ON time / different compressors - Min OFF to OFF time / different compressors



Plant side circuit pump PAr – (Pi)

Pi sub-folder is used to define plant side circuit *pump* parameters / functions
- operating mode (disable / always ON / ON if compressor ON)
- digital control
- anti-sticking
- anti-freeze

Description	Unit	Value	Note
Pi00 - Operating selection plant side pump	num	1	pump disabled → **Pi00=0** continuous operation → **Pi00=1** pump ON if compressor ON → **Pi00=2**
Pi01 - Anti-sticking time (when pump is not active)	ore	12	
Pi03 - Minimum time for plant side pump switch-on	Sec x 10	10	
Pi10 - Enable primary circuit water pump on when anti-freeze heaters on	num	0	pump disabled → **Pi10=0** continuous operation → **Pi10=1**
Pi11 - Plant side pump activation if boiler is active	num	1	pump disabled → **Pi11=0** pump ON if boiler ON → **Pi11=1**
Pi20 - Delay between plant side pump ON and compressor ON	sec	60	
Pi21 - Delay between plant side compressor OFF and pump OFF	sec	60	
Pi22 - Period for plant side pump activation	min	30	
Pi50 - Probe selection for antifreeze protection through pump	num	2	antifreeze protection disabled → **Pi50=0** RWT probe / plant side heat exchanger → **Pi50=1** LWT probe / plant side heat exchanger → **Pi50=2** OAT probe → **Pi50=6**
Pi51 - Water set point for pump activation / antifreeze protection	°C	5	
Pi52 - Pump antifreeze protection / thermoregulation hysteresis	°C	2	

External exchanger fan PAr – (FE)

FE sub-folder is used to define *external heat exchanger fan* parameters / functions
operating mode (disable / always ON / ON if compressor ON)
analogue control

Description	Unit	Value	Note
FE00 - External exchanger fan mode selection	num	2	fan disabled → **FE00=0** continuous operation → **FE00=1** fan ON if compressor ON → **FE00=2**
FE01 - Surge current time open system intercooler fan	sec	2	
FE10 - Enable single condensation	num	0	
FE11 - Enable external exchanger fan special starts	num	1	
FE12 - Open system intercooler fan switch on setpoint during defrost	Bar	25	
FE13 - Open system intercooler fan switch-on hysteresis during defrost	Bar	4	
FE14 - Select probe to regulate open system intercooler fan during defrost	num	2	High pressure transducer
FE20 - Cut-off open system intercooler fan bypass time	sec	2	
FE21 - External exchanger fan pre-ventilation time	sec	0	
FE30 - Open system intercooler fan minimum speed in Cool	%	30	
FE31 - Open system intercooler fan average speed in Cool	%	100	
FE32 - Open system intercooler fan maximum speed in Cool	%	100	
FE33 - Select probe to regulate open system intercooler fan in Cool	num	2	High pressure transducer
FE34 - Open system intercooler fan minimum setpoint speed in Cool	Bar	15	
FE35 - Open system intercooler fan maximum speed differential in Cool	Bar	5	
FE36 - Open system intercooler fan proportional band speed in Cool	Bar	4	
FE37 - Open system intercooler fan maximum speed hysteresis in Cool	Bar	1	
FE38 - Open system intercooler fan hysteresis cut-off in Cool	Bar	1	
FE39 - Open system intercooler fan differential cut-off in Cool	Bar	2	

Description	Unit	Value	Note
FE50 - Open system intercooler fan minimum speed in Heat	%	30	
FE51 - Open system intercooler fan average speed in Heat	%	100	
FE52 - Open system intercooler fan maximum speed in Heat	%	100	
FE53 - Select probe to regulate open system intercooler fan in Heat	num	1	External heat exchanger temperature probe
FE54 - Open system intercooler fan minimum setpoint speed in Heat	°C	12	
FE55 - Open system intercooler fan maximum speed differential in Heat	°C	7	
FE56 - Open system intercooler fan proportional band speed in Heat	°C	5	
FE57 - Open system intercooler fan maximum speed hysteresis in Heat	°C	0,5	
FE58 - Open system intercooler fan hysteresis cut-off in Heat	°C	0,5	
FE59 - Open system intercooler fan differential cut-off in Heat	°C	1	

Internal exchanger electrical heaters PAr – (HI)

HI sub-folder is used to control the parameters of an *internal exchanger heater*, acting both for antifreeze function and integration during defrost

Description	Unit	Value	Note
HI00 - Enable internal exchanger antifreeze heaters in standby	num	1	
HI01 - Enable force heaters on during defrost	num	1	
HI10 - Select probe for antifreeze internal exchanger + heater	num	2	LWT probe / plant side heat exchanger
HI12 - Primary intercooler heaters regulator setpoint for anti-freeze	°C	5	
HI13 - Primary intercooler heaters regulator maximum setpoint for anti-freeze	°C	7	
HI14 - Primary intercooler heaters regulator minimum setpoint for anti-freeze	°C	-10	
HI15 - Primary intercooler heaters regulator hysteresis for anti-freeze	°C	0,5	

Boiler PAr – (br)

br sub-folder is used to control the parameters for an additional step for heating and for domestic hot water integration (*boiler*) operating mode (disable / differential → fixed or in function of outdoor air temperature) set-point / hysteresis

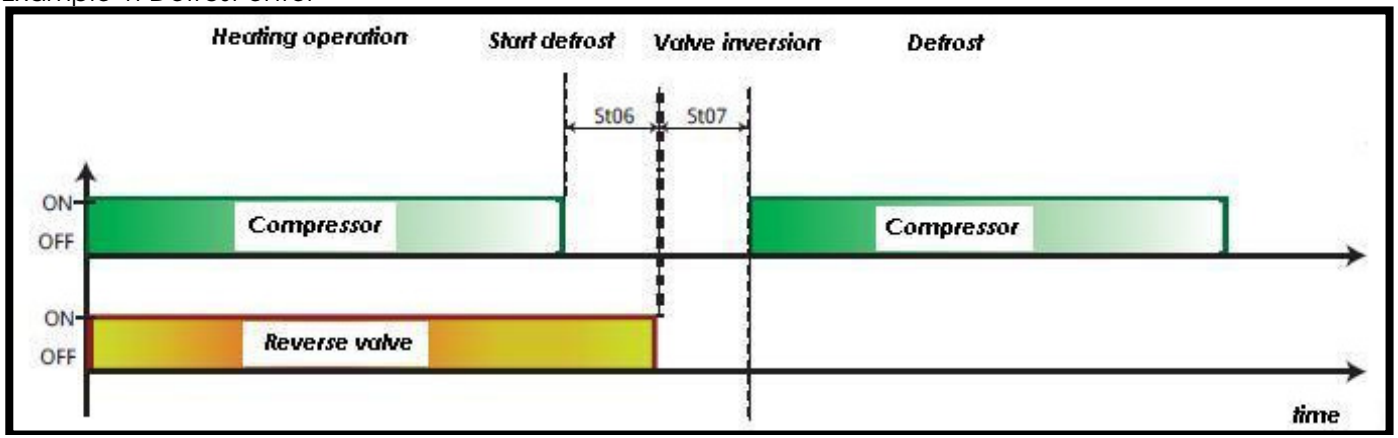
Description	Unit	Value	Note
br00 - Operating mode selection	num	0	boiler disabled → **br00=0** boiler with differential / set-point proportional to OAT → **br00=1** boiler with differential / set-point fixed step according OAT → **br00=2** boiler with differential / fixed set-point → **br00=3**
br01 - Dynamic differential set point	°C	10	
br02 - Maximum differential	°C	25,5	
br03 - Dynamic differential with heat pump block	°C	0	
br04 - Proportional band dynamic differential	°C	5	
br05 - Boiler thermoregulation hysteresis	°C	2	

Defrost PAr – (dF)

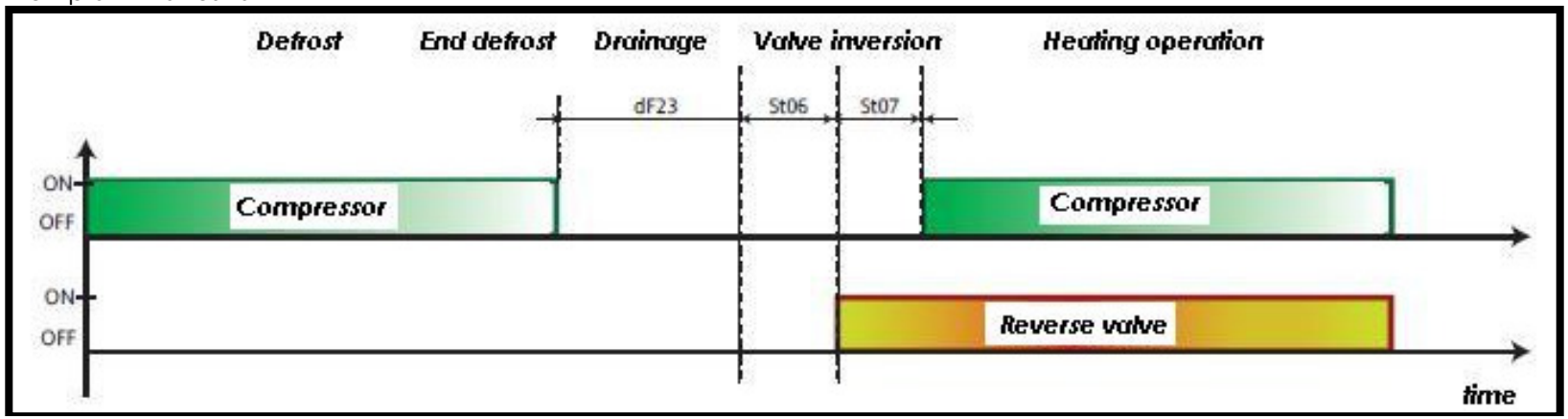
dF sub-folder is used to define *defrost* functions and parameters

Description	Unit	Value	Note
dF00 - Select defrost mode	num	See note	disabled → **dF00=0** → SYSCROLL Air CO enabled → **dF00=2** → SYSCROLL Air HP
dF01 - Enable maximum power for non-defrost circuit	num	1	
dF10 - Select probe to enable interval count between defrost cycles	Num	1	External heat exchanger temperature probe
dF11 - Setpoint for enable interval count between defrost cycles	°C/Bar	-4	
dF12 - Setpoint to clear cumulative time between defrost cycles	°C/Bar	15	
dF13 - Cumulative time between defrost cycles	Min	35	
dF14 - Minimum interval between defrost cycles	Min	40	
dF20 - Select probe to disable defrost	Num	1	External heat exchanger temperature probe
dF21 - Disable defrost setpoint	°C/Bar	15	
dF22 - Maximum defrost time	Minuti	5	
dF23 - Drip time	sec	20	
dF30 - Maximum dynamic defrost differential	°C/Bar	0	
dF31 - Dynamic defrost differential setpoint	°C	10	
dF32 - Defrost proportional band dynamic differential	°C	-5	

Example 1: Defrost enter



Example 2: Defrost exit



Dynamic set-point PAr – (dS)

dS sub-folder is used to define set-point offset (*dynamic set-point*) depending on
analogue input (0…1V, 0…5V, 0…10V, 4…20mA)
outdoor air temperature
room temperature

Description	Unit	Value	Note
dS00 - Thermoregulator dynamic differential selection / outdoor air temperature	num	0	disabled → **dS00=0** proportional → **dS00=1** fixed step → **dS00=2**
dS01 - COOL operation / Proportional band for dynamic differential	°C	5	
dS02 - HEAT operation / Proportional band for dynamic differential	°C	5	
dS03 - COOL operation / Maximum dynamic differential	°C	5	
dS04 - HEAT operation / Maximum dynamic differential	°C	5	
dS05 - COOL operation / Dynamic differential set-point	°C	15	
dS06 - HEAT operation / Dynamic differential set-point	°C	22	

Adaptive PAr – (Ad)

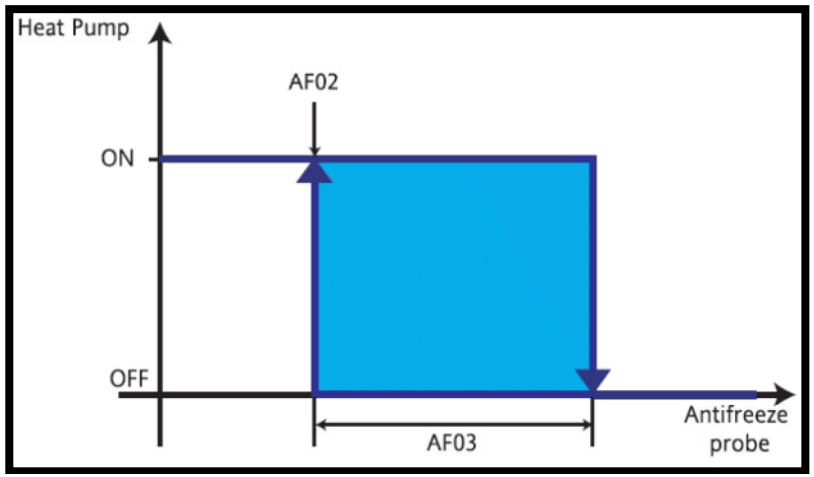
Ad sub-folder is used to simulate an electronic inertial accumulator, acting on set-point and hysteresis (*adaptive* function), by confronting minimum / effective ON-OFF time

Description	Unit	Value	Note
Ad00 - Selection for unit operation without inertial tank	Num	0	Disabled → **Ad00=0** Set-point → **Ad00=1** Hysteresis → **Ad00=2** Set-point + hysteresis → **Ad00=3**
Ad01 - Constant for inertial compensation	Num	2	
Ad02 - Differential for inertial compensation	°C	0,5	
Ad03 - COOL operation / Set point for inertial compensation block	°C	4	
Ad04 - HEAT operation / Set point for inertial compensation block	°C	50	
Ad05 - Time for compressor switching ON for regression of inertial compensation	sec x 10	24	
Ad06 - Reference time for compressor switching ON for inertial compensation	sec x 10	18	

Antifreeze function with heat pump PAr – (AF)

AF is used to prevent breakages due to exchangers freezing (*antifreeze* function), by switching ON the unit in heating mode

Description	Unit	Value	Note
AF00 - Antifreeze probe selection	num	0	antifreeze protection disabled → **AF00=0** RWT probe / plant side heat exchanger → **AF00=1** LWT probe / plant side heat exchanger → **AF00=2**
AF02 - Water set point for activation / antifreeze protection	°C	5	
AF03 - Antifreeze protection / thermoregulation hysteresis	°C	3	



Domestic Hot Water Parameters PAr – (AS)

AS is used to define *domestic hot water* management parameters
operating mode (disable / domestic hot water valve / resistance / pump)
set-point / hysteresis
anti-legionnaire's disease function

Description	Unit	Value	Note
AS00 - Selection for DHW operating mode	num	0	DHW production disabled → **AS00=0** Heat pump + DHW 3 ways valve → **AS00=1** DHW electrical heater → **AS00=2** Heat pump + DHW electrical heater + DHW 3 ways valve → **AS00=3** Heat pump + DHW pump → **AS00=4** DHW electrical heater → **AS00=5** Heat pump + DHW electrical heater + DHW pump → **AS00=6**
AS01 - DHW set point	°C	50	
AS02 - DHW / Minimum set point	°C	40	
AS03 - DHW / Maximum set point	°C	55	
AS04 - DHW hysteresis	°C	3	
AS05 - Set point differential for DHW deactivation	°C	3	
AS06 - DHW electrical heater hysteresis	°C	2	
AS07 - DHW electrical heater differential	°C	0	
AS08 - DHW antifreeze set point	°C	3	
AS09 - Maximum ON time for DHW	min	60	
AS10 - Minimum time OFF-ON for DHW	min	60	
AS11 - Dynamic constant for DHW set point	°C	0	
AS12 - DHW system maximum temperature	°C	65	
AS20 - DHW set point for anti-legionnaire's disease	°C	65	
AS21 - Minimum DHW set point for anti-legionnaire's disease	°C	60	
AS22 - Maximum DHW set point for anti-legionnaire's disease	°C	70	

Description	Unit	Value	Note
AS23 - DHW minimum deactivation/activation time for anti-legionnaire's disease	min	15	
AS25 - Anti-legionnaire's disease period, day 1	Hours	0	
AS26 - Event hour, day 1	Hours	0	
AS27 - Event minutes, day 1	Minutes	0	
AS28 - Anti-legionnaire's disease period, day 2	Hours	0	
AS29 - Event hour, day 2	Hours	0	
AS30 - Event minutes, day 2	Minutes	0	
AS31 - Anti-legionnaire's disease period, day 3	Hours	0	
AS32 - Event hour, day 3	Hours	0	
AS33 - Event minutes, day 3	Minutes	0	
AS34 - Anti-legionnaire's disease period, day 4	Hours	0	
AS35 - Event hour, day 4	Hours	0	
AS36 - Event minutes, day 4	Minutes	0	
AS37 - Anti-legionnaire's disease period, day 5	Hours	0	
AS38 - Event hour, day 5	Hours	0	
AS39 - Event minutes, day 5	Minutes	0	
AS40 - Anti-legionnaire's disease period, day 6	Hours	0	
AS41 - Event hour, day 6	Hours	0	
AS42 - Event minutes, day 6	Minutes	0	
AS43 - Anti-legionnaire's disease period, day 7	Hours	0	
AS44 - Event hour, day 7	Hours	0	
AS45 - Event minutes, day 7	Minutes	0	

Block Heat Pump PAr – (HP)

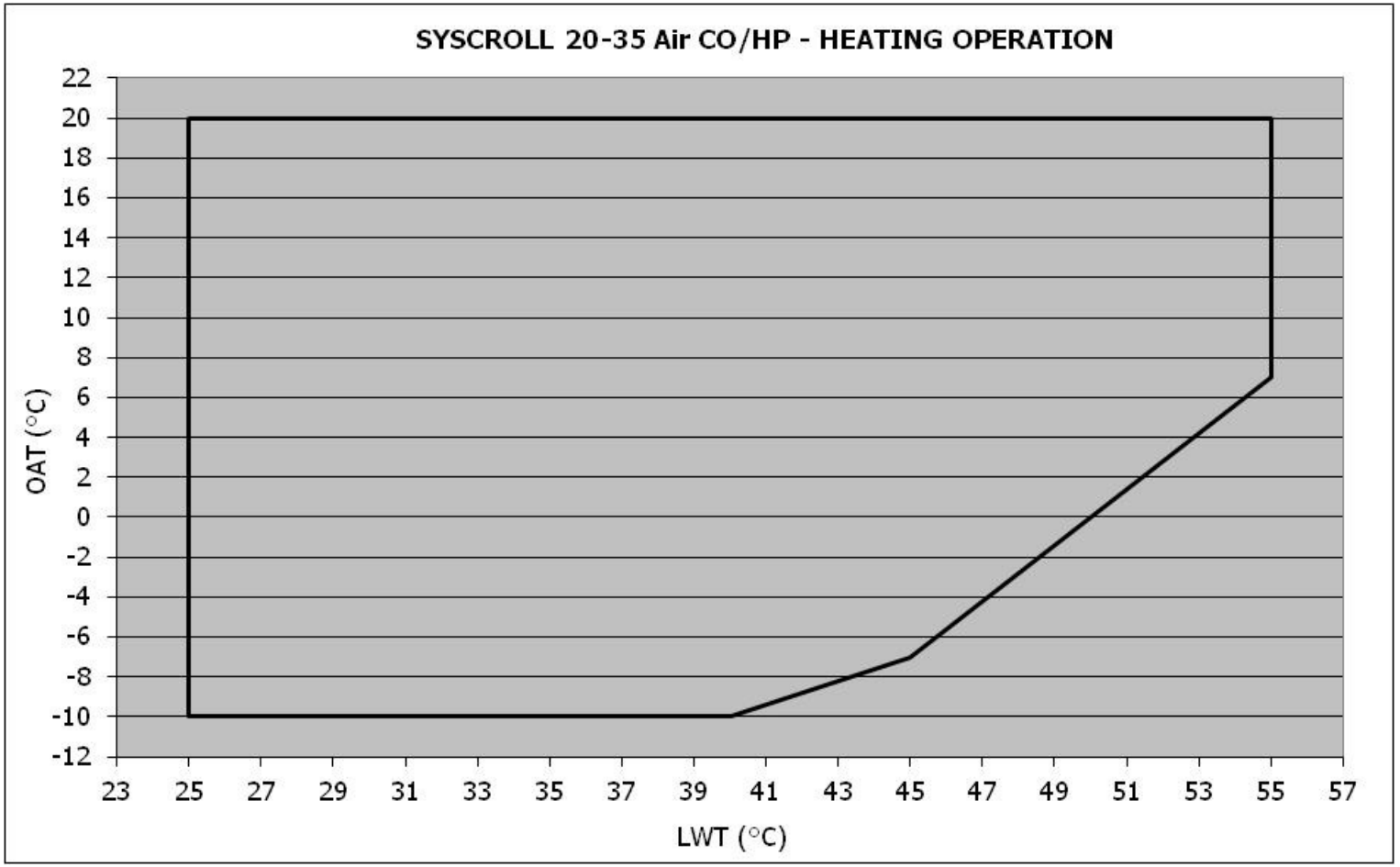
HP is used to define *heat pump block* management parameters
outdoor air temperature
thermoregulation temperature
digital input

Description	Unit	Value	Note
HP00 - Select heat pump lock probe 1	num	0	No probe (block pump disabled) → **HP00=0** RWT probe / plant side heat exchanger (COOLING mode) → **HP00=2** LWT probe / plant side heat exchanger (COOLING mode) → **HP00=3**
HP01 - Heat pump lock set point	°C	-8	
HP02 - Heat pump regulator hysteresis	°C	2	
HP03 - Heat pump lock maximum dynamic differential	°C	0	
HP04 - Block heat pump 1 dynamic differential set point	°C	0	
HP05 - Block heat pump 1 dynamic differential proportional band	°C	0	
HP10 - Select heat pump lock probe 2	°C	1	External temperature (HEATING mode) → **HP00=1**
HP11 - Heat pump lock set point	°C	-15	
HP12 - Heat pump lock hysteresis	°C	5	

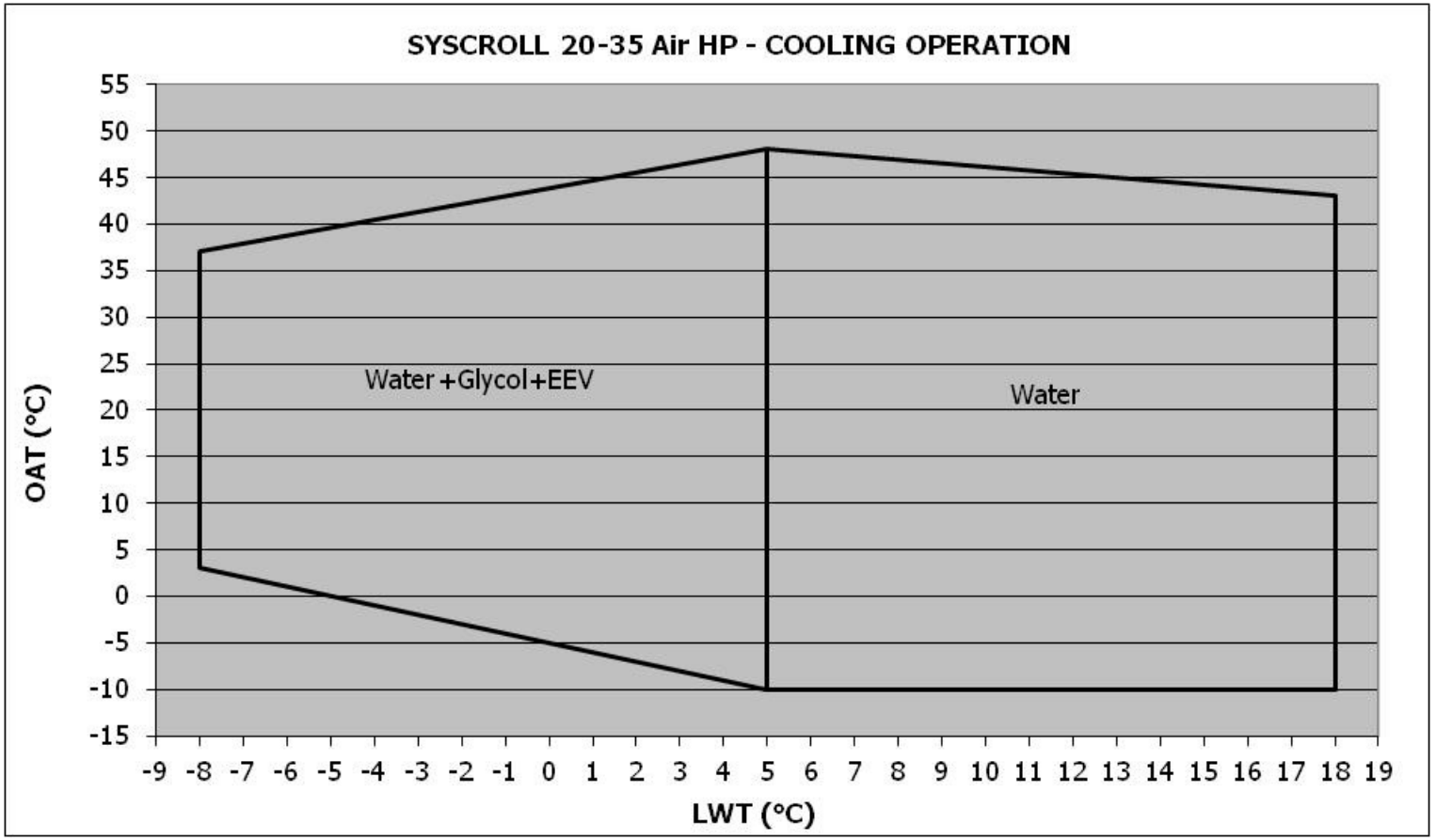
Power Limitations PAr – (PL)

PL is used to define *capacity limitation* to protect the unit (high/low T, high/low P)

Description	Unit	Value	Note
PL00 - Power limitation on external temperature proportional band	°C	0	
PL01 - External temperature set point for power limitation in Cool	°C	55	
PL02 - External temperature set point for power limitation in Heat	°C	-15	
PL10 - Power limitation on water/air temperature proportional band	°C	0	
PL11 - Select probe for power limitation on water/air temperature	Num	0	RWT probe → **PL11=1** LWT probe → **PL11=2**
PL12 - High temperature set point for power limitation	°C	55	**Heating mode** → This value is valid if OAT > 7 (°C). In case OAT is < 7 (°C) PL12 parameter has to be corrected according graphic **GR1**
PL13 - Low temperature set point for power limitation	°C	-8	**Cooling mode** → This value is valid if oat is < 37 (°C). In case OAT is > 37 (°C) PL13 parameter has to be corrected according graphic **GR2**
PL20 - Power limitation on pressure proportional band	Bar	5	
PL21 - High pressure set point for power limitation	Bar	40	
PL22 - Low pressure set point for power limitation	Bar	3	



GR1



GR2

Time Bands PAr – (tE)

tE is used to define *time bands* management (different operating daily profiles)

Description	Unit	Value		Note
tE00 - Enable time band operation	Num	0		tE00=0 → time bands disabled tE00=1 → time bands enabled
tE01 - Select profile, day 1 (Monday)	Num	1		tE01=0 → profile 1 tE01=1 → profile 2 tE01=2 → profile 3
tE02 - Select profile, day 2 (Tuesday)	Num	1		see tE01
tE03 - Select profile, day 3 (Wednesday)	Num	1		see tE01
tE04 - Select profile, day 4 (Thursday)	Num	1		see tE01
tE05 - Select profile, day 5 (Friday)	Num	1		see tE01
tE06 - Select profile, day 6 (Saturday)	Num	2		see tE01
tE07 - Select profile, day 7 (Sunday)	Num	3		see tE01
tE10 - Event start time hour 1, profile 1	Hours	7		
tE11 - Event start time minutes 1, profile 1	Minutes	0		
tE12 - Operating mode from event 1, profile 1	Num	0		tE12=0 → ON tE12=1 → stand-by
tE13 - Cool mode temperature regulator set point, from event 1, profile 1	°C	12		
tE14 - HP mode temperature regulator set point, from event 1, profile 1	°C	40		
tE15 - DHW set point, from event 1, profile 1	°C	45		
tE17 - Event start time hour 2, profile 1	Hours	12		
tE18 - Event start time minutes 2, profile 1	Minutes	0		
tE19 - Operating mode from event 2, profile 1	Num	0		tE19=0 → ON tE19=1 → stand-by
tE20 - Cool mode temperature regulator set point, from event 2, profile 1	°C	12		
tE21 - HP mode temperature regulator set point, from event 2, profile 1	°C	40		
tE22 - DHW set point, from event 2, profile 1	°C	45		
tE24 - Event start time hour 3, profile 1	Hours	15		
tE25 - Event start time minutes 3, profile 1	Minutes	0		

Description	Unit	Value		Note
tE26 - Operating mode from event 3, profile 1	Num	0		tE26=0 → ON tE26=1 → stand-by
tE27 - Cool mode temperature regulator set point, from event 3, profile 1	°C	12		
tE28 - HP mode temperature regulator set point, from event 3, profile 1	°C	40		
tE29 - DHW set point, from event 3 profile 1	°C	45		
tE31 - Event start time hour 4, profile 1	Hours	22		
tE32 - Event start time minutes 4, profile 1	Minutes	0		
tE33 - Operating mode from event 4, profile 1	Num	0		tE33=0 → ON tE33=1 → stand-by
tE34 - Cool mode temperature regulator set point, from event 4, profile 1	°C	12		
tE35 - HP mode temperature regulator set point, from event 4, profile 1	°C	40		
tE36 - DHW set point, from event 4, profile 1	°C	45		
tE38 - Event start time hour 1, profile 2	Hours	7		
tE39 - Event start time minutes 1, profile 2	Minutes	0		
tE40 - Operating mode from event 1, profile 2	Num	0		tE40=0 → ON tE40=1 → stand-by
tE41 - Cool mode temperature regulator set point, from event 1, profile 2	°C	12		
tE42 - HP mode temperature regulator set point, from event 1, profile 2	°C	40		
tE43 - DHW set point, from event 1, profile 2	°C	45		
tE45 - Event start time hour 2, profile 2	Hours	12		
tE46 - Event start time minutes 2, profile 2	Minutes	0		
tE47 - Operating mode from event 2, profile 2	Num	0		tE47=0 → ON tE47=1 → stand-by
tE48 - Cool mode temperature regulator set point, from event 2, profile 2	°C	12		
tE49 - HP mode temperature regulator set point, from event 2, profile 2	°C	40		
tE50 - DHW set point, from event 2, profile 2	°C	45		
tE52 - Event start time hour 3, profile 2	Hours	15		
tE53 - Event start time minutes 3, profile 2	Minutes	0		
tE54 - Operating mode from event 3, profile 2	Num	0		tE54=0 → ON tE54=1 → stand-by

Description	Unit	Value		Note
tE55 - Cool mode temperature regulator set point, from event 3, profile 2	°C	12		
tE56 - HP mode temperature regulator set point, from event 3, profile 2	°C	40		
tE57 - DHW set point, from event 3 profile 2	°C	45		
tE59 - Event start time hour 4, profile 2	Hours	22		
tE60 - Event start time minutes 4, profile 2	Minutes	0		
tE61 - Operating mode from event 4, profile 2	Num	0		tE61=0 → ON tE61=1 → stand-by
tE62 - Cool mode temperature regulator set point, from event 4, profile 2	°C	12		
tE63 - HP mode temperature regulator set point, from event 4, profile 2	°C	40		
tE64 - DHW set point, from event 4, profile 2	°C	45		
tE66 - Event start time hour 1, profile 3	Hours	7		
tE67 - Event start time minutes 1, profile 3	Minutes	0		
tE68 - Operating mode from event 1, profile 3	Num	0		tE68=0 → ON tE68=1 → stand-by
tE69 - Cool mode temperature regulator set point, from event 1, profile 3	°C	12		
tE70 - HP mode temperature regulator set point, from event 1, profile 3	°C	40		
tE71 - DHW set point, from event 1, profile 3	°C	45		
tE73 - Event start time hour 2, profile 3	Hours	12		
tE74 - Event start time minutes 2, profile 3	Minutes	0		
tE75 - Operating mode from event 2, profile 3	Num	0		tE75=0 → ON tE75=1 → stand-by
tE76 - Cool mode temperature regulator set point, from event 2, profile 3	°C	12		
tE77 - HP mode temperature regulator set point, from event 2, profile 3	°C	40		
tE78 - DHW set point, from event 2, profile 3	°C	45		
tE80 - Event start time hour 3, profile 3	Hours	15		
tE81 - Event start time minutes 3, profile 3	Minutes	0		
tE82 - Operating mode from event 3, profile 3	Num	0		tE82=0 → ON tE82=1 → stand-by
tE83 - Cool mode temperature regulator set point, from event 3, profile 3	°C	12		
tE84 - HP mode temperature regulator set point, from event 3, profile 3	°C	40		

Description	Unit	Value		Note
tE85 - DHW set point, from event 3 profile 3	°C	45		
tE87 - Event start time hour 4, profile 3	Hours	22		
tE88 - Event start time minutes 4, profile 3	Minutes	0		
tE89 - Operating mode from event 4, profile 3	Num	0		tE89=0 → ON tE89=1 → stand-by
tE90 - Cool mode temperature regulator set point, from event 4, profile 3	°C	12		
tE91 - HP mode temperature regulator set point, from event 4, profile 3	°C	40		
tE92 - DHW set point, from event 4, profile 3	°C	45		

Alarm PAr – (AL sub-folder)

AL is used to define *alarms* management (automatic / manual reset, by-pass time, sampling)

Description	Unit	Value		Note
AL00 - Time interval for alarm event count	Min	60		Alarms are counted every AL00/32 (minutes) = sample time
AL01 - Maximum number of events in alarm log	num	99		
DIGITAL ALARMS				
AL10 - Number of high pressure alarms	num	1		
AL11 - Low pressure alarm bypass time	sec	1		
AL12 - Number of low pressure alarms	num	1		
AL13 - Enable low pressure alarm during defrost	num	0		
AL14 - Bypass flow switch time from activation of the internal circuit water pump	sec	15		
AL15 - Flow switch activation time for plant side circuit automatic alarms	sec	5		
AL16 - Flow switch activation time for plant side circuit manual alarm	Sec x 10	2		
AL20 - Compressor thermal switch alarm bypass time	sec	1		
AL21 - Number of compressor thermal switch alarms	num	1		
AL25 - Number of external exchanger fan thermal switch alarms	num	1		
AL26 - Number of internal circuit pump thermal switch alarms	num	1		
ANALOGUE ALARMS				
AL40 - High pressure alarm regulator set point from analogue input	Bar	42		
AL41 - High pressure alarm regulator hysteresis from analogue input	Bar	2		
AL42 - Number of high pressure alarms from analogue input	num	1		
AL43 - Low pressure alarm bypass time from analogue input	sec	10		
AL47 - High temperature alarm regulator set point from analogue input	°C	60		
AL48 - High temperature alarm regulator hysteresis from analogue input	°C	2		
AL49 - High temperature time per alarm	sec x 10	30		
AL50 - Internal circuit antifreeze alarm bypass time	min	1		
AL51 - Internal circuit antifreeze alarm regulator set point	°C	4		In case LWT ≠ 7 & glicole → **AL 51 = LWT -3**
AL52 - Internal circuit antifreeze alarm regulator hysteresis	°C	2		
AL53 - Number of internal circuit antifreeze alarms	num	1		

Description	Unit	Value		Note
NO REFRIGERANT				
AL70 - Enable low refrigerant alarm	num	0		**AL70=0** → Low refrigerant alarm disabled **AL70=1** → Low refrigerant alarm enabled
AL71 - Low refrigerant alarm bypass time	min	5		
AL72 - Low refrigerant alarm differential	°C	2		
AL73 - Low refrigerant delay before alarm	min	30		
MAINTENANCE				
AL80 - Compressor start time for maintenance signal	orex100	0		
AL81 - Internal pump start time on maintenance signal	orex100	0		
AL82 - External pump start time on maintenance signal	orex100	0		

Functions (FnC) folder

Functions **FnC** folder is used to perform a number of manual functions such as switching the device on/off, acknowledging alarms, deleting the alarm history and using the Multi Function key **(MFK).**

Functions folder gives access to the following sub-folders, with following functions:

- **dEF** → activate manual defrost → not used
- **tA** → reset alarms
- **St** → switch device ON/OFF
- **CC** → copy card use (MFK)
- **EUr** → reset alarm log

In order to access Function folder and sub-folders, act this way:

- press ESC + SET keys together
- scroll the menu with UP / DOWN keys in order to access FnC folder
- press SET key to enter in FnC sub-folders
- scroll the menu with UP / DOWN keys in order to find out desired sub-folder (tA in example)

Alarm reset FnC – (tA)

tA is used to manually reset active alarms.

In order to reset active alarms, act this way:

- press ESC + SET keys together
- scroll the menu with UP / DOWN keys in order to access FnC folder
- press SET key to enter FnC sub-folders
- scroll the menu with UP / DOWN keys in order to access tA sub-folder
- press SET key to act manual alarm reset

Resetting an active alarm will save the alarm in the alarms log.

Change ON/OFF state FnC – (St)

St is used to change unit state from OFF to ON or viceversa.

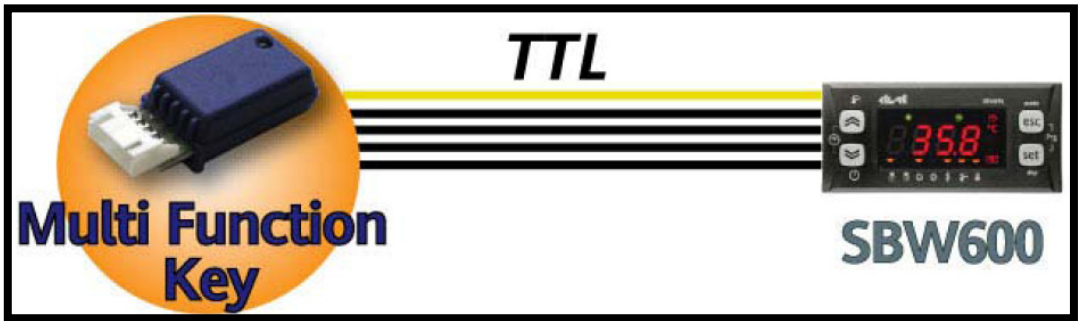
In order to change unit state, act this way:

- press ESC + SET keys together
- scroll the menu with UP / DOWN keys in order to access FnC folder
- press SET key to enter FnC sub-folders
- scroll the menu with UP / DOWN keys in order to access St sub-folder
- press SET key to change unit status OFF to ON or ON to OFF

Copy card use FnC – (CC)

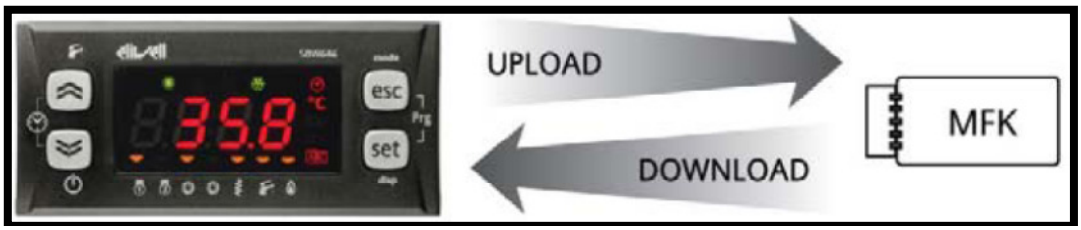
CC is used to upload / download parameters, to change device's firmware or to format copy card.

MFK has to be connected via TTL serial port to SBW device.



In order to upload / download / formatting, act this way:

- press ESC + SET keys together
- scroll the menu with UP / DOWN keys in order to access FnC folder
- press SET key to enter FnC sub-folders
- scroll the menu with UP / DOWN keys in order to access CC sub-folder
- press SET key to enter CC sub-folders
- scroll the menu with UP / DOWN keys in order to access desired function:
  - UL → upload
  - dL → download
  - Fr → format



- press SET key to perform desired function
- wait few seconds
  - if function is completed successfully, YES is displayed
  - if function is not completed successfully, Err is displayed

Once the function is performed, MFK can be removed

Alarm log reset FnC – (EUr)

EUr is used to reset alarm log.

In order to reset alarm log, act this way:

- press ESC + SET keys together
- scroll the menu with UP / DOWN keys in order to access FnC folder
- press SET key to enter FnC sub-folders
- scroll the menu with UP / DOWN keys in order to access Eur sub-folder
- press SET key at least for 3 seconds
- when YES label appears, alarm log has been deleted

List of Alarms

The alarm signal consists of a code, the format being "Ernn" (nn is a 2-figure number identifying the type of alarm, e.g. Er00, Er25, Er39….).
When more than one alarm occurs at the same time, the one with the lowest number will be shown first.
If the measurement on the main display is incorrect, in the event of an alarm, the alarm code will alternate with "----".
All possible alarms are listed in the list below with their respective codes and the relative utilities blocked

DIGITAL ALARMS

Alarm code	Alarm description	Alarm type	RESET A/M	CPS status	Plant side circuit pump status	Fan motor status	Sanitary Valve status	Sanitary Heater status
Er00	General alarm	Auto	A	OFF	OFF	OFF	OFF	OFF
Er01	High pressure circuit	Events	M	OFF				
Er05	Low pressure circuit	Events	A / M	OFF				
Er10	Thermal protection - compressor	Events	M	OFF				
Er20	Plant side flow switch	Time	M	OFF	OFF (1)	OFF	OFF (1)	OFF (1)
Er21	Thermal protection - plant side pump	Events	A / M	OFF	OFF	OFF	OFF (1)	OFF (1)
Er41	Thermal protection - fan motors	Events	A / M	OFF		OFF		

(1) If alarm is manual type

ANALOGUE ALARMS

Alarm code	Alarm description	Alarm type	RESET A/M	CPS status	Plant side circuit pump status	Source side circuit pump status	Sanitary Valve status	Sanitary Heater status
Er30	Plant side antifreeze	Auto	A	OFF				
Er35	Water high temperature	Auto	A	OFF				

OTHER ALARMS

Alarm code	Alarm description	Alarm type	RESET A/M	CPS status	Plant side circuit pump status	Source side circuit pump status	Sanitary Valve status	Sanitary Heater status
Er45	Clock failure	Auto	A					
Er46	Clock to be set	Auto	A					
Er47	LAN communication error	Auto	A					
Er48	Anti-Legionnaire	Auto	A					
Er60	RWT probe plant side failure	Auto	A	OFF	OFF			
Er61	LWT probe plant side failure	Auto	A	OFF	OFF			
Er62	Coil probe failure	Auto	A	OFF				
Er66	Sanitary hot water probe failure	Auto	A	OFF				
Er67	Display probe (T/P) failure	Auto	A					
Er68	Outdoor air temperature probe failure	Auto	A	OFF				
Er69	High pressure transducer failure	Auto	A	OFF				
Er73	Dinamic set-point failure	Auto	A					
Er80	Configuration error	Auto	A				OFF	OFF
Er81	Compressor maintenance	Auto	A					
Er85	Plant side pump maintenance	Auto	A					
Er90	Alarm history records exceeded message	Auto	A					

REMOTE TERMINAL / SKW22L (OPTIONAL)

General information

The remote terminal is provided with a back-lighted LCD display, 4 buttons, so as to reproduce all the information displayed in SBW 655 C and SE 632 devices.
The double display allows an easy way to configure.
Air temperature probe is integrated as a standard.

FOLDER MENU STRUCTURE (SKW22L)

Folder structure is composed of totally four menus (same as SB-SD-SCW600)

Keys description / function

KEY	DESCRIPTION	SINGLE PRESSURE (PRESS AND RELEASE)	LINKED FUNCTION	EXTENDED PRESSURE (MORE THAN 3 s)	MENU / NOTES
	UP	• Increase value • Go to next folder			
	DOWN	• Decrease value • Go to previous folder		• Local ON / OFF	• Local ON / OFF
	ESC	• Exit without saving • Go to previous level	**mode**	• Change mode	• Menu Mode
	SET	• Confirm value / exit with setting saving • Go to next level • Go to Status menu	**disp**	• Main display	• Menu Display

Keys combination

SIMBLE	KEYS COMBINATION	KEYS COMBINED ACTION SINGLE PRESSURE FUNCTION (PRESS AND RELEASE)	LINKED FUNCTION	MENU / NOTES
		UP + DOWN	• Manual Reset	• Alarm manual reset / pay-off
Prg		ESC + SET	• Enter in "Program Menu"	• Program Menu

LED: operating mode / status

ICON	DESCRIPTION	STEADY ICON	BLINKING ICON
	ALARM	• Alarm ON	• Alarm quit
	ECONOMY	• Configurable	• Configurable
	• Not used		
	CLOCK	• Current HR	• HR setting

ICON	DESCRIPTION	STEADY ICON	BLINKING ICON
	STAND-BY	• Mode: STAND-BY	• Stand-by mode / remote
	HEATING	• Mode: HEATING	• Antifreeze + Heat pump ON • Heating mode / remote
	COOLING	• Mode: COOLING	• Cooling mode / remote
		• Not used	
AUTO		• Not used	

ICON	LED N° (LEFT TO RIGHT)	DEFAULT	LINKED ICON
	1	Menu surf	
	2	Manual defrost	

LED: values / unit of measurement

ICON	DESCRIPTION
°C	DEGREE CELSIUS
	Not used

LED: utility

LED N° (LEFT TO RIGHT)	DESCRIPTION	ICON
1	FIRST CAPACITY STEP	
2	SECOND CAPACITY STEP	
3	THIRD CAPACITY STEP	
4	FOURTH CAPACITY STEP	
5	ELECTRICAL RESISTANCE	
6	SOURCE SIDE HEAT EXCHANGER FAN	
7	PRIMARY CIRCUIT PUMP	

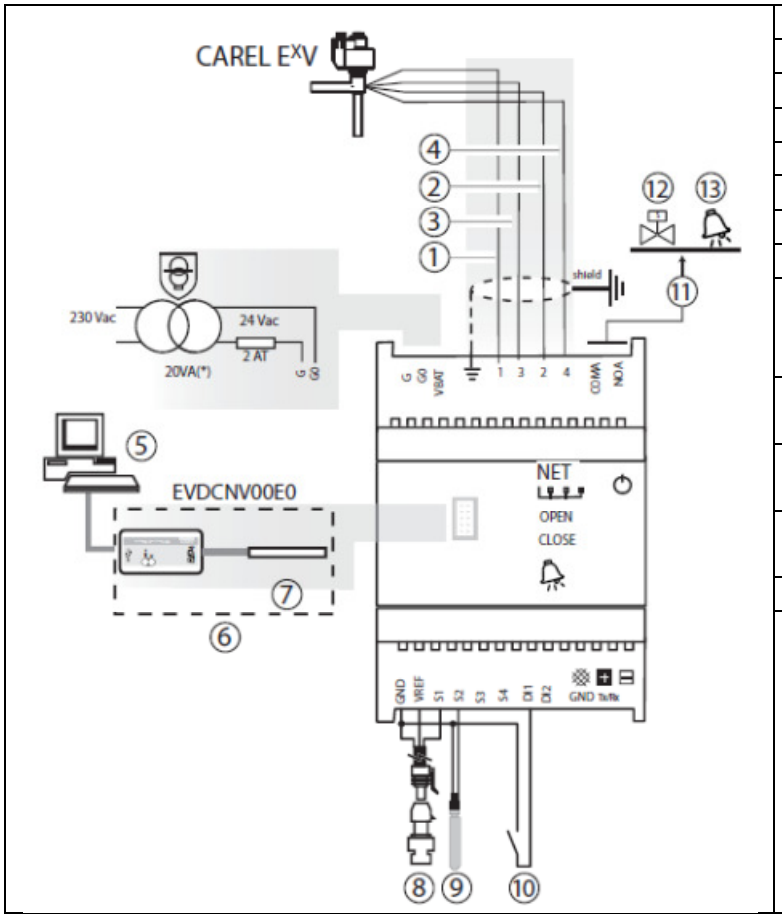
BIPOLAR STEPPER ELECTRONIC EXPANSION VALVE DRIVER / XVD

General informations

The system is composed by EVD (driver) and - as an accessory - EVDIS (display).
EVDIS display is used to configure the driver and to show resources. It is recommended to use this device to temporarily operate on the driver.

EVD	EVDIS
	

Connection diagram

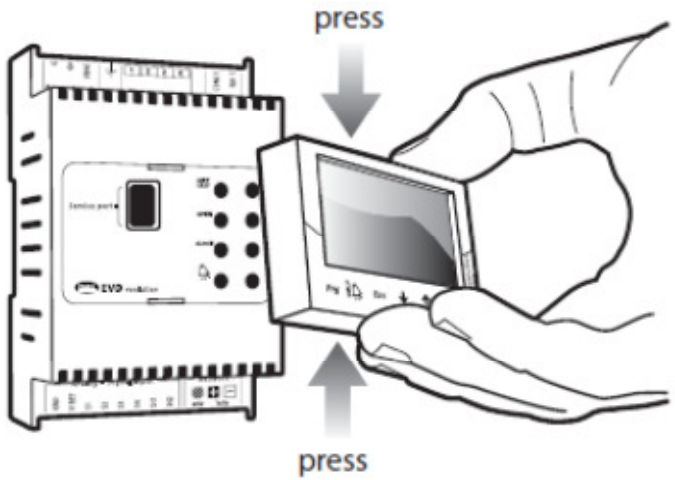


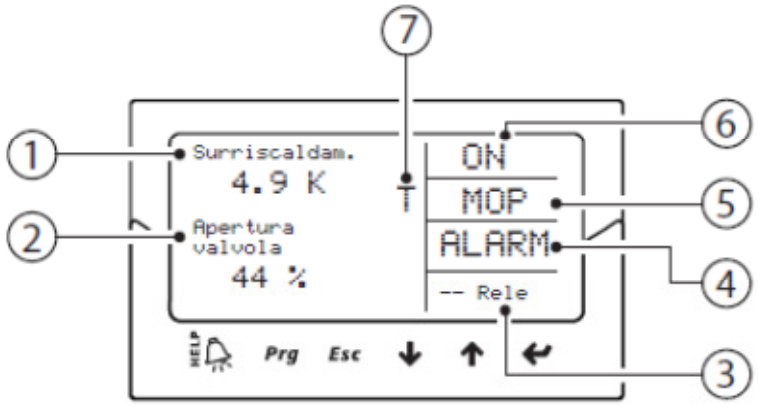
Key	Description
1	Green
2	Yellow
3	Brown
4	White
5	PC for configuration
6	USB/tLAN converter
7	Adapter
8	Ratiometric pressure transducer / evaporation pressure
9	NTC suction temperature probe
10	Digital input 1 (to enable driver)
11	Free contact (up to 230 Vac)
12	Solenoid valve
13	Alarm signal

EVD led

LED	ON	OFF	FLASHING
NET	Connection available	No connection	Communication error
OPEN	Valve opening	-	Driver disabled
CLOSE	Vale closing	-	Driver disabled
	Active alarm	-	-
	Driver powered	Driver not powered	Wrong power supply

Display and keypad





Keys description

KEY	DESCRIPTION
1	1st variable displayed
2	2nd variable displayed
3	Relay status
4	Alarm (press "HELP")
5	Protector activated
6	Control status
7	Adaptive control in progress

Display writings

	DESCRIPTION		DESCRIPTION
ON	Operation	TUN	Tuning in process
OFF	Stand-by	Low SH	Low superheat
POS	Positioning	LOP	Low evaporating pressure
WAIT	Wait	MOP	High evaporating pressure
CLOSE	Closing	High Tcond	High condensing temperature
INIT	Valve motor error recognition procedure		

Keypad functions

BUTTON	FUNCTION
Prg	Opens the screen to enter the password to access programming menu
HELP	• If in alarm status, display the alarm queue • In "Manufacturer" level, when scrolling the parameters, shows the explanation screens (Help)
Esc	• Exits the Programming (Service / Manufacturer) and Display modes • After setting a parameter, exits without saving the changes
↓ / ↑	• Navigates the display screens • Increases / decreases the value
↵	• Switches from the display to parameter programming mode • Confirms the value and returns to the list of parameters

Parameter list

CONFIGURATION		
USER*	**PARAMETR / DESCRIPTION**	**VALUE**
A	Network address	198
A	Refrigerant	R410A
A	Valve	CAREL EXV
A	Probe S1	User defined
A	Main control	User defined
A	Probe S2	CAREL NTC
A	Auxiliary control	Disabled
A	Probe S3	Not used
A	Relay configuration	Alarm relay
A	Probe S4	CAREL NTC
A	DI2 configuration	Not used
C	Display main variable 1	Superheat
C	Display main variable 2	Valve opening
C	S1 probe alarm management	No action
C	S2 probe alarm management	No action
C	S3 probe alarm management	No action
C	S4 probe alarm management	No action
C	Unit of measure	°C(K)/bar(g)
A	DI1 configuration	Regulation start / stop
C	Language	English

PROBES		
USER*	**PARAMETR / DESCRIPTION**	**VALUE**
C	S1 calibration offset	0
C	S1 calibration gain on 4-20 mA	1
C	S1 pressure MIN value	0
C	S1 pressure MAX value	15
C	S1 alarm MIN pressure	0
C	S1 alarm MAX pressure	18
C	S2 calibration offset	0
C	S2 calibration gain on 0-10 V	1
C	S2 alarm MIN temperature	-50
C	S2 alarm MAX temperature	105
C	S3 calibration offset	0
C	S3 calibration gain on 4-20 mA	1
C	S3 pressure MIN value	-1
C	S3 pressure MAX value	9.3
C	S3 alarm MIN pressure	-1
C	S3 alarm MAX pressure	9.3
C	S4 calibration offset	0
C	S4 alarm MIN temperature	-50
C	S4 alarm MAX temperature	105

CONTROL		
USER*	**PARAMETR / DESCRIPTION**	**VALUE**
A	Superheat set point	6
A	Valve opening at start-up	100%
C	Valve opened in stand-by	0
C	Start-up delay after defrost	10
A	Pre-position time	---
A	Hot gas bypass temperature set-point	---
A	Hot gas bypass pressure set-point	---
A	EPR pressure set-point	---
C	PID proportional gain	20
C	PID integral time	100
C	PID derivative time	15
A	Low SH protection threshold	2
C	Low SH protection integral time	15
A	LOP protection threshold	-50
C	LOP protection integral time	15
A	MOP protection threshold	50
A	Enable manual valve position	0
A	Manual valve position	0
C	Discharge superheat set point	---
C	Discharge temperature set point	---
C	MOP protection integral time	0

ADVANCED			
USER*	**PARAMETR / DESCRIPTION**	**VALUE**	**NOTES**
A	High Tcond threshold	---	
C	High Tcond integral time	---	
A	Modul thermost setpoint	---	
A	Modul thermost differential	---	
C	Modul thermost SHset offset	---	
C	CO_2 regul "A" coefficient	3,3	
C	CO_2 regul "B" coefficient	-22,7	
C	Start manual tuning	0	disabled
C	Tuning method	0	
C	Network settings	2	2=19200 bit/s
A	Power supply mode	0	24 Vac

ALARM CONFIGURATION			
USER*	**PARAMETR / DESCRIPTION**	**VALUE**	**NOTES**
C	Low superheat alarm timeout (Low SH)	300	0 = alarm disabled
C	Low evaporation pressure alarm timeout (LOP)	300	0 = alarm disabled
C	High evaporation pressure alarm timeout (MOP)	600	0 = alarm disabled
C	High condensing temperature alarm timeout (High Tcond)	600	0 = alarm disabled
C	Low suction temperature alarm threshold	-50	
C	Low suction temperature alarm timeout	300	0 = alarm disabled

VALVE		
USER*	**PARAMETR / DESCRIPTION**	**VALUE**
C	EEV minimum steps	50
C	EEV maximum steps	480
C	EEV closing steps	500
C	EEV nominal step rate	50
C	EEV nominal current	450
C	EEV holding current	100
C	EEV duty cycle	30
C	EEV opening synchronization	1
C	EEV closing synchronization	1

*A = Service (installer), C = Manufacturer

Alarm list

TYPE OF ALARM	LED	DISPLAY	RESET
Probe S1	Red	ALARM flashing	Automatic
Probe S2	Red	ALARM flashing	Automatic
Probe S3	Red	ALARM flashing	Automatic
Probe S4	Red	ALARM flashing	Automatic
Low SH	-	ALARM & Low SH flashing	Automatic
LOP		ALARM & LOP flashing	Automatic
MOP		ALARM & MOP flashing	Automatic
High Tcond		ALARM & MOP flashing	Automatic
Low suction temperature	-	ALARM flashing	Automatic
EEPROM damaged	Red	ALARM flashing	Replace driver
EEV motor error	Red	ALARM flashing	Automatic
LAN network communication error	Green NET flashing	ALARM flashing	Automatic
LAN network connection error	NET off	ALARM flashing	Automatic
Display connection error	-	Error message	Replace driver / display
Adaptive control ineffective	-	ALARM flashing	Automatic
Battery discharged	Red	ALARM flashing	Replace battery
Wrong power supply mode	Green POWER LED flashing Red	-	Change parameters