H422V8
User manual

Contents

1 Parameter list

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	S_ _	Functions about storage				
	St_	Functions about storage temperature				
	_t0	storage room temperature	-55.0	145.0	2.0	°C
	_tb	dead band	0.0	50.0	0.0	K
	_td	differential	0.0	50.0	0.2	K
	_tH	maximum set point of temperature from slave keyboard	-55.0	145.0	45.0	°C
	_tL	minimum set point of temperature from slave keyboard	-55.0	145.0	-55.0	°C
	_i0	storage room humidity	0.0	100.0	85.0	%
	_ib	dead band	0.0	50.0	0.0	%
	_id	differential	0.0	50.0	5.0	%
	_iH	maximum set point of humidity from slave keyboard	0.0	100.0	100.0	%
	_iL	minimum set point of humidity from slave keyboard	0.0	100.0	0.0	%
	SA_	Functions about air renew during storage				
	SAH	enable air renew during storage	oFF	_on	oFF	/
	SA0	immediate delay before first air renew	0	194 4:20:15	0	dd hh:mm:ss
	SAd	on-time duration in the air renew cycle	0	194 4:20:15	30:00	dd hh:mm:ss
	SAP	period of air renew cycle	0	194 4:20:15	12:00:00	dd hh:mm:ss
	SAh	enable forced air renew by keyboard short cut	oFF	_on	_on	/
	SAF	forced air renew duration	0	194 4:20:15	30:00	dd hh:mm:ss
	SAo	start / stop forced air renew	oFF	_on	oFF	/
	Fd_	Functions about defrost duration and timing				
1	Fd0	immediate delay before next defrost	0	194 4:20:15	0	dd hh:mm:ss
	Fdd	on-time duration of the defrost	0	194 4:20:15	30:00	dd hh:mm:ss
	Fdg	dripping time after defrost	0	194 4:20:15	2:00	dd hh:mm:ss
	FdE	evaporator fan activation delay after the defrost	0	194 4:20:15	15:00	dd hh:mm:ss
2	FdP	overall period of the defrost	0	194 4:20:15	4:00:00	dd hh:mm:ss
	Fd1	evaporator fan pulse duration (0.001 s units - select 0 for no pulse during defrost)	0	255	0	/
	Fd2	evaporator fan pulse period	0	194 4:20:15	1:00	dd hh:mm:ss
	FF_	Functions about forced defrost				
	FFh	enable forced defrost by keyboard short cut	oFF	_on	_on	/
	FFd	forced defrost duration	0	194 4:20:15	30:00	dd hh:mm:ss
3	FFo	start immediate forced defrost	oFF	_on	oFF	/
	FP_	Functions about defrost preference				
4	FPt	defrost type: 0=none / 1=pause / 2=air / 3=electric / 4=hot gas / 5=heat pump / 6=heat pump by hp	0	255	2	/
	Ft_	Functions about defrost temperature				
5	Ftt	defrost stop temperature	-55.0	146.0	6.0	°C
	M_ _	Functions about compressor				
	MU_	Functions about pressure switches				
6	MLH	low pressure safety restart (similar to Danfoss KP15 lp set point)	0.0	99.0	1.2	(gauge) bar
	MLL	low pressure safety stop (similar to Danfoss KP15 lp set point - differential)	0.0	99.0	0.2	(gauge) bar
	MHH	high pressure safety stop (similar to Danfoss KP15 hp set point)	0.0	99.0	28.0	(gauge) bar
	MHL	high pressure safety restart (similar to Danfoss KP15 hp set point - differential)	0.0	99.0	24.0	(gauge) bar
7	MUO	minimum oil differential pressure	0.0	30.0	2.0	(gauge) bar
8	MUU	enable pump down	oFF	_on	oFF	/
	H_ _	Heating				
	HP_	Heating preference				
	HPP	heating method: 0=none / 1=electric / 2=hot gas / 3=heat pump / 4=intern heat pump / 5=ihp2	0	255	0	/
	HPF	heating source: 0=dedicated heating / 1=defrost / 2=light	0	2	0	/
	U_ _	Dehumidification				
	UP_	Dehumidification preference				
	UPP	alternate refrigeration and heating	oFF	_on	oFF	/
9	UP1	during concurrent run force active heating	oFF	_on	oFF	/
	n_ _	Functions about fans				
	nc_	Functions about condenser fans				
	ncH	enable condenser fans when compressor is off and discharge pressure is over maximum	oFF	_on	_on	/
10	ncr	enable condenser fans speed regulation	oFF	_on	_on	/
11	ncU	fan minimum speed	0	255	40	/
	ncd	minimum HP-LP-difference to keep on fans	0.0	99.0	2.0	(gauge) bar
	n1H	fan 1 start pressure (similar to Danfoss KP5 set point) - active just when ncr is oFF	0.0	99.0	10.0	(gauge) bar
12	n1L	fan 1 stop pressure (similar to Danfoss KP5 set point - differential)	0.0	99.0	6.0	(gauge) bar
	nE_	Functions about evaporator fans				
	nEH	force evaporator fans when refrigeration is off	oFF	_on	oFF	/
	c_ _	Functions about door and light				
	cP_	Door switch and evaporator fan				
	cPH	stop evaporator fans when door is open	oFF	_on	_on	/
	cPF	pause defrost timer when air defrost is suspended by evaporator fan stop	oFF	_on	_on	/
	cPd	delay of fan automatic switch on	0	194 4:20:15	30:00	dd hh:mm:ss
	cl_	Functions about light				
	clH	switch on the light when the door is open and off when closed	oFF	_on	_on	/
13	clo	switch off the light automatically if it has been switched on from outside	oFF	_on	_on	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	cId	delay of light automatic switch off	0	194 4:20:15	30	dd hh:mm:ss
	v__	Functions about electronic expansion valve				
	vP_	Functions about electronic expansion valve preference				
14	vPH	enable electronic expansion valve	oFF	_on	_on	/
	vPP	refrigerant gas type: 0=R134A / 1=R404A / 2=R507A / 3=R22 / 4=R407C	0	255	0	/
	vt_	Functions about electronic expansion valve temperature				
15	vtt	wanted overheating (similar to Danfoss thermostatic overheating spring regulation)	0.0	99.0	8.0	K
16	vtH	maximum overheating	0.0	99.0	99.0	K
17	vtL	minimum overheating	0.0	99.0	6.0	K
	vtU	maximum pressure allowed in the suction line (similar to Danfoss MOP)	0.0	30.0	10.0	(gauge) bar
	vd_	Functions about electronic expansion valve timing				
18	vd1	on-off duty cycle duration	0	194 4:20:15	8	dd hh:mm:ss
19	vd2	on duty cycle duration at refrigeration start (set to 0 for previous stop value)	0	194 4:20:15	5	dd hh:mm:ss
20	vdd	on duty cycle adaptation speed (low value for slow adaptation and small swinging)	0	255	8	/
	b__	Functions about probe calibration				
	b1_	Probe nr. 1				
	b1C	room temperature	-99.0	99.0	0.0	K
	b1A	enable probe	oFF	_on	_on	/
	b2_	Probe nr. 2				
	b2C	defrost temperature	-99.0	99.0	0.0	K
	b2A	enable probe	oFF	_on	_on	/
	b3_	Probe nr. 3				
	b3C	suction temperature	-99.0	99.0	0.0	K
	b3A	enable probe	oFF	_on	_on	/
	b4_	Probe nr. 4				
	b4C	engine room temperature	-99.0	99.0	0.0	K
	b4A	enable probe	oFF	_on	_on	/
	b5_	Probe nr. 5				
	b5C	humidity	-99.0	99.0	0.0	%
	b5A	enable probe	oFF	_on	oFF	/
	b6_	Probe nr. 6				
	b6C	high pressure (HP)	-99.0	99.0	0.0	bar
	b6A	enable probe	oFF	_on	_on	/
	b7_	Probe nr. 7				
	b7C	low pressure (LP)	-99.0	99.0	0.0	bar
	b7A	enable probe	oFF	_on	_on	/
	b8_	Probe nr. 8				
	b8C	discharge temperature	-99.0	99.0	0.0	K
	b8A	enable probe	oFF	_on	_on	/
	b9_	Probe nr. 9				
	b9C	oil pressure - eventually connected to AN-5	-99.0	99.0	0.0	bar
	b9A	enable probe	oFF	_on	oFF	/
	L__	Functions about alarm and stand-by				
	Lt_	Temperature alarm				
21	LtL	low temperature alarm set point	-55.0	145.0	-2.0	°C
22	LtH	high temperature alarm set point	-55.0	145.0	14.0	°C
	Ltd	alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	LF_	Full stop temperature alarm				
	LFL	low temperature alarm set point	-55.0	145.0	-5.0	°C
	LFH	high temperature alarm set point	-55.0	145.0	20.0	°C
	LFd	alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	Li_	Humidity alarm				
	LiL	low humidity alarm set point	0.0	100.0	0.0	%
	LiH	high humidity alarm set point	0.0	100.0	100.0	%
	Lid	alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	Lj_	Full stop humidity alarm				
	LjL	low humidity alarm set point	0.0	100.0	0.0	%
	LjH	high humidity alarm set point	0.0	100.0	100.0	%
	Ljd	alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	LO_	Door alarm				
	LOH	enable door alarm	oFF	_on	_on	/
	LOd	door alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	LOt	temperature alarm minimum delay after door opening	0	194 4:20:15	15:00	dd hh:mm:ss
	LI_	Other alarm inputs				
	L1H	enable digital input 1 alarm (compressor safety devices)	oFF	_on	_on	/
	L1d	digital input 1 alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	L2H	enable digital input 2 alarm (evaporator safety)	oFF	_on	_on	/
	L2d	digital input 2 alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	L3H	enable digital input 3 alarm (heating safety thermostat)	oFF	_on	_on	/
	L3d	digital input 3 alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	L5H	enable digital input 5 alarm (compressor phase monitor / thermal overload relay)	oFF	_on	_on	/
	L5d	digital input 5 alarm delay	0	194 4:20:15	1	dd hh:mm:ss
	Lo_	On / stand-by status				
23	Loo	actual status: stand-by or on	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	d_ _	Functions about delays				
	dF_	Delay from previous stop				
	dF4	delay from stop to activation of relay nr. 4 - compressor	0	194 4:20:15	5:00	dd hh:mm:ss
	P_ _	Functions about master preferences				
	Pd_	Functions about network address				
	PdM	master address for global network communication	0	254	1	/
	PdS	number of slaves connected to this master	1	2	2	/
	PO_	Output assignment				
	PO2	assign out-2 relay to: 0=alarm / 1=heating / 2=humidifier / 3=air renew / 4=defrost duty / 5=humidity to FAN output / 6=outer dehumidifier / 7=OUT-1 / 8=OUT-3 / 9=OUT-4 / 10=OUT-5 / 11=OUT-6 / 12=FAN / 13=alarm NO / 14=fan off dehum	0	255	0	/
	I_ _	Functions about input-output and machine state (read only)				
	IA_	Analog inputs				
	IA1	room temperature	-55.0	145.0	-55.0	°C
	IA2	defrost temperature	-55.0	145.0	-55.0	°C
	IA3	suction temperature	-55.0	145.0	-55.0	°C
	IA4	engine room temperature	-55.0	145.0	-55.0	°C
	IA5	humidity	0.0	100.0	0.0	%
	IA6	high pressure (HP)	0.0	30.0	0.0	(gauge) bar
	IA7	low pressure (LP)	0.0	30.0	0.0	(gauge) bar
	IA8	discharge temperature	-55.0	145.0	-55.0	°C
	IA9	oil pressure - eventually connected to AN-5	0.0	30.0	0.0	(gauge) bar
	Id_	Digital input				
	Id1	compressor hardware safety	oFF	_on	oFF	/
	Id2	evaporator hardware safety	oFF	_on	oFF	/
	Id3	defrost hardware safety	oFF	_on	oFF	/
	Id4	door closed	oFF	_on	oFF	/
	Id5	phase software safety	oFF	_on	oFF	/
	OS_	Machine status				
	OSn	evaporator fan stopped by door opening or manual control	oFF	_on	oFF	/
	OA_	Analog output				
	LLA	actual alarm - read only (0 means no alarm)	0	255	0	/
	OA1	condenser	0	255	0	/
	OA2	humidity - 4...20 mA	0	255	0	/
	Od_	Digital output				
24	Od1	solenoid	oFF	_on	oFF	/
	Od2	heating	oFF	_on	oFF	/
	Od3	light	oFF	_on	oFF	/
	Od4	compressor	oFF	_on	oFF	/
	Od5	evaporator	oFF	_on	oFF	/
	Od6	defrost	oFF	_on	oFF	/
	Od7	alarm - eventually connected to OUT-2	oFF	_on	oFF	/
	Od8	steam producer - eventually connected OUT-2	oFF	_on	oFF	/
	Od9	air renew - eventually connected to OUT-2	oFF	_on	oFF	/
	E_ _	Functions about slave preferences				
	Ed_	Functions about network address				
	EdS	slave address for local network communication	1	254	1	/
	EY_	Functions about display				
	EYY	input to show on display: 1=IA1 / 2=IA2 ...	0	255	1	/
	EYr	enable display rotation: 0=off / 1=all / 2=selected	0	2	0	/
	E0_	Functions about display rotation, when EYr=1				
	E0d	duration of label display during rotation	0	255	1	/
	E0E	duration of value display during rotation	0	255	2	/
	E1_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E1d	duration of label display during rotation	0	255	0	/
	E1t	label text during rotation	000	yyy	rM=	/
	E1E	duration of value display during rotation	0	255	6	/
	E2_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E2d	duration of label display during rotation	0	255	1	/
	E2t	label text during rotation	000	yyy	dE=	/
	E2E	duration of value display during rotation	0	255	0	/
	E3_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E3d	duration of label display during rotation	0	255	1	/
	E3t	label text during rotation	000	yyy	SU=	/
	E3E	duration of value display during rotation	0	255	0	/
	E4_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E4d	duration of label display during rotation	0	255	1	/
	E4t	label text during rotation	000	yyy	Er=	/
	E4E	duration of value display during rotation	0	255	0	/
	E5_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E5d	duration of label display during rotation	0	255	1	/
	E5t	label text during rotation	000	yyy	rH=	/
	E5E	duration of value display during rotation	0	255	4	/
	E6_	Functions about display rotation, when EYr=2 (repeated for each parameter)				

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	E6d	duration of label display during rotation	0	255	1	/
	E6t	label text during rotation	000	yyy	HP=	/
	E6E	duration of value display during rotation	0	255	0	/
	E7_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E7d	duration of label display during rotation	0	255	1	/
	E7t	label text during rotation	000	yyy	LP=	/
	E7E	duration of value display during rotation	0	255	0	/
	E8_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E8d	duration of label display during rotation	0	255	1	/
	E8t	label text during rotation	000	yyy	dI=	/
	E8E	duration of value display during rotation	0	255	0	/
	E9_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	E9d	duration of label display during rotation	0	255	1	/
	E9t	label text during rotation	000	yyy	oI=	/
	E9E	duration of value display during rotation	0	255	0	/
	Eb_	Functions about buzzer				
	EbH	enable buzzer	0	1	1	/
	EF_	Functions about slave default				
25	EFF	reload slave default parameters from EEPROM, at next restart	0	1	0	/
	EP_	Functions about slave password				
26	EPA	set a new password	000	yyy	___	/

2 Parameter remarks

Nr.	Remark
1	Defrost is not performed twice in case safety switches of mc or evaporator are not ok.
2	The period of each cycle includes on-time + off-time, that is the overall duration of the cycle.
3	Following defrost cycles will be aligned to the end of forced one.
4	Add 100 to FPt parameter to enable the outer defrost drive on INP-4. The defrost is initiated by INP-4 closure; after defrost and until INP-4 is closed, the instrument does not leave the dripping mode, to coordinate with eventual other instruments.
5	In case of hot gas defrost, both IA2 and IA3 must reach Ftt.
6	When MLH<MLL,there is a delay of 10*(MLL-MLH) seconds on lp switch. Eventual pumpdown restart is over MLH+1 bar.
7	Fixed time 120 s and manual reset.
8	When activated, a clever pump down algorithm coordinates the solenoid, the evaporator and the mc. There is a 15 minutes delay between mc restarts. When MLL=MLH there is no restart at all. There is no concurrent run of mc and electric defrost or heating.
9	Forced refrigeration is disabled when room temperature is under LFL, forced heating is disabled over LFH.
10	When speed regulation is off the fan is operated on-off.
11	Caution! Speed regulation can cause fan fault or electronic board fault. Low and average minimum speed can increase the risk.
12	During the first 10 seconds of speed regulation, the n1L is replaced by (n1H+n1L)/2.
13	No action if the light is switched on from inside the room.
14	When off, the refrigeration solenoid is steadily on during cooling, as long as overheating is higher then vtL or b3A is off.
15	Caution! Low overheating causes liquid return and compressor damage.
16	Overheating over the maximum forces valve anticipated opening.
17	Overheating under the minimum delays valve opening.
18	Caution! Short duty cycle reduces valve life.
19	Caution! Low overheating causes liquid return and compressor damage.
20	Caution! High adaptation speed causes swing in the suction line and damage to the compressor.
21	The low temperature differential is fixed, and alarm status stops at 0.2 °C above the set point.
22	The high temperature differential is fixed, and alarm status stops at 0.2 °C under the set point.
23	Passing from stand-by to on and at power on, there is a 5 second delay spent in a virtual stand-by.
24	The minus sign on display ("-") signals that output is going to start after a delay.
25	This parameter is a late addition, not present on every instrument
26	The use of this parameter is restricted to ReFreeX authorized personnel; further detail is available on demand. This parameter is not implemented on every instrument. The value and the action of this parameter are local to each slave. If you are unsure, during action relative to this parameter, press B1 at any moment. Three underscores, three zero digits, and three empty-characters are considered trivial password values; any other combination of three alphanumeric characters is a non-trivial password. If a non-trivial password value is set, then entering the menu, the label PAS is shown. Press B6, then introduce the password, confirm by B6, and press B4. If the introduced value does not match the saved password, then the label PAS is shown again, and the operation may be retried for a maximum of other two times. In case of unlocking failure, the label bAd is shown. To exit, press B4 twice or B1 once. To remove the password, set EPA to value 000 . To set or to change the password, if you know the authorization code, set EPA to a new non-trivial value, and exit the menu. The label rEP is shown. Press B6, then reintroduce the same password, confirm by B6, and press B4. The label AUt is shown. Press B6, then introduce the authorization code, confirm by B6, and press B4.

3 Alarm list

Display	Alarm	
A01	low temperature	Low temperature limit has been reached.
A02	high temperature	High temperature limit has been reached.
A03	mc alarm	Pressure switch, thermistors, or any other compressor safety device has disconnected.
A04	evaporator alarm	Evaporator thermal relay, or other evaporator safety device has disconnected.
A05	defrost alarm	defrost safety thermostat, or any other defrost safety device has disconnected.
A06	door open	Time limit for door opening has been reached.
A07	mc phase	Compressor overload/thermal relay disconnected, or missing mains phase - manual reset.
A08	low temp stop	Low temperature limit for full stop has been reached - full system stop - manual reset.
A09	high temp stop	High temperature limit for full stop has been reached - full system stop - manual reset.
A10	oil pressure	Oil differential pressure remained under minimum value for 120 seconds - manual reset.
A11	low humidity	Low humidity limit has been reached
A12	high humidity	High humidity limit has been reached.
A13	low humid stop	Low humidity limit for full stop has been reached - full system stop - manual reset.
A14	high humid stop	High humidity limit for full stop has been reached - full system stop - manual reset.
A15	RTC memory loss	Memory loss of real time clock [RTC] - timer reset.

4 Slave alarm list

Display	Alarm	
A96	slave EEPROM	Failed write operation onto the slave EEPROM.
A97	out of range	The slave address EdS might be out of the master range, the latter going from 1 to PdS.
A98	no link	The slave does not receive any message from the master.
A99	lost link	The slave lost the communication with the master.

5 Button list

Push button		Function
B1	esc - silence - skip	Exit without saving from any menu - alarm buzzer silence - skip compressor delay.
B2	up	Up navigation in the menu.
B3	on/stand-by - pause	Toggle between on and stand-by - toggle evaporator fan stop.
B4	left - light	Left navigation in the menu - switch the light on and off.
B5	down - defrost	Down navigation in the menu - force immediate defrost.
B6	right - menu - set	Right navigation in the menu - display and modify the set point - enter menu.

6 Led list

Led		Function
L1	compressor	On during compressor run - blinking slowly during activation delay and pumpdown.
L2	evaporator	On during evaporator run - blinking slowly during activation delay and pumpdown.
L3	defrost-hum-deh	On during defrost and humidification - blinking slowly during dripping and dehumidification.
L4	air renew	On during air renew.
L5	heating	On during heating.
L6	unused	Unused in this application.
L7	light	On when lighting is on - blinking slowly during deactivation delay.

7 Soft command list

Soft command	Function

8 How to ...

How to ...	Function
Switch between on and stand-by.	Keep pressed B3 button, to activate and deactivate stand-by. In stand-by every output is disabled except light, leds from L1 to L6 blink, timers continue to count.
Stop or restart evaporator fans.	Press shortly the B3 button. When the evaporator fans are stopped, the display blinks.
Program the menu.	Keep pressed B6 to enter the menu. Navigate up and down with B2 and B5. Select the submenu by B6. Change the parameter by B2 and B5, press B6 to confirm, or B4 to go back without saving. The changes will have effect after the exit from programming pressing B4 repeatedly. Press B1 to exit immediately without saving any parameter.
Show or change temperature set.	Press shortly B6 - the display shows the current set point - change it by B2 and B5, and confirm it by B6. As alternative, enter the menu program as explained above, modify the parameter _t0, then confirm it.
Force an air renew.	Keep pressed B2.
Force a defrost.	Keep pressed B5.

9 Shortcut list

Buttons to press	Shortcut description - keep pressed 5 seconds
B5	Force an immediate defrost.
B2	Force an immediate air renew.

10 Led and push button location