ReFreeX

H411V5
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	12.0	°C
	_db	dead band	0.0	50.0	0.0	K
	dbd	differential	0.0	50.0	0.2	K
	_tH	safety maximum room temperature	-55.0	45.0	21.0	°C
	_tL	safety minimum room temperature	-55.0	45.0	10.0	°C
	_td	safety temperature differential	0.0	50.0	0.2	K
	SMM	storage room humidity	0.0	100.0	90.0	%
	SMd	differential	0.0	50.0	5.0	%
	SA_	Functions about air renew during storage				
1	SAH	enable air renew during storage - reset timers	oFF	_on	oFF	/
	dA6	immediate delay before first air renew	0	194 4:20:15	0	dd hh:mm:ss
	dA7	on-time duration in the air renew cycle	0	194 4:20:15	30:00	dd hh:mm:ss
2	dA8	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	/
	dAF	forced air renew duration	0	194 4:20:15	30:00	dd hh:mm:ss
	SAo	start / stop forced air renew	oFF	_on	oFF	/
	S2H	enable air renew control by CO2 concentration	oFF	_on	oFF	/
	S2r	enable it also during ripening	oFF	_on	oFF	/
	S2Y	enable it also when rYA is set	oFF	_on	oFF	/
3	S2S	CO2 concentration set point	0.0	100.0	100.0	%
	S2d	CO2 concentration differential	0.0	50.0	5.0	%
	Fd_	Functions about defrost duration and timing				
4	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
	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
5	FFo	start immediate forced defrost	oFF	_on	oFF	/
	FP_	Functions about defrost preference				
6	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				
7	Ftt	defrost stop temperature	-55.0	146.0	6.0	°C
	r_ _	Functions about ripening				
	rH_	Enable ripening functions and short cut				
8	rrH	enable ripening functions - reset timers	oFF	_on	oFF	/
	rrh	enable toggling between ripening and storage by keyboard short cut	oFF	_on	_on	/
	rt_	Functions about ripening temperature and humidity				
	_d0	immediate delay before starting ripening	0	194 4:20:15	0	dd hh:mm:ss
	_t1	ripening temperature nr. 1	-55.0	45.0	16.5	°C
	_d1	duration of temperature nr. 1	0	194 4:20:15	4 0:00:00	dd hh:mm:ss
	_t2	ripening temperature nr. 2	-55.0	45.0	15.5	°C
	_d2	duration of temperature nr. 2	0	194 4:20:15	1 0:00:00	dd hh:mm:ss
	_t3	ripening temperature nr. 3	-55.0	45.0	14.5	°C

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	_d3	duration of temperature nr. 3	0	194 4:20:15	0	dd hh:mm:ss
	_t4	ripening temperature nr. 4	-55.0	45.0	14.5	°C
	_d4	duration of temperature nr. 4	0	194 4:20:15	0	dd hh:mm:ss
9	_t5	ripening temperature nr. 5	-55.0	45.0	14.5	°C
	rMM	ripening humidity	0.0	100.0	90.0	%
	rMd	ripening humidity differential	0.0	50.0	5.0	%
	rY_	Functions about ethylene				
10	rYH	enable ethylene injection - reset timers	oFF	_on	oFF	/
11	YYb	use ethylene probe to control injections	oFF	_on	oFF	/
	rYY	ripening ethylene concentration	0.0	99.0	25.0	10*ppm
	rYd	ripening ethylene concentration differential	0.0	99.0	5.0	10*ppm
12	dY0	immediate delay before starting ripening	0	194 4:20:15	0	dd hh:mm:ss
13	_tY	minimum temperature before injecting ethylene	-55.0	45.0	16.0	°C
	dY2	first ethylene injection duration	0	194 4:20:15	30:00	dd hh:mm:ss
	_nY	number of following ethylene cycles of injection	0	255	0	/
14	dY3	delay between first ethylene injections end and following cycles	0	194 4:20:15	1 0:00:00	dd hh:mm:ss
	dY4	on-time duration of following ethylene injection cycles	0	194 4:20:15	30:00	dd hh:mm:ss
15	dY5	period of following ethylene injection cycles	0	194 4:20:15	12:00:00	dd hh:mm:ss
	rYh	enable forced ethylene injection by keyboard short cut	oFF	_on	_on	/
	dYF	forced ethylene injection duration	0	194 4:20:15	30:00	dd hh:mm:ss
	rYo	start / stop forced ethylene injection	oFF	_on	oFF	/
16	rYA	first ethylene injection performed but air renew not yet	oFF	_on	oFF	/
	rA_	Functions about air renew during ripening				
	rAH	enable air renew cycles during ripening - reset timers	oFF	_on	oFF	/
	_nA	number of air renew cycles	0	99	8	/
14	dA3	delay between first ethylene injection end and first air renew end	0	194 4:20:15	1 0:00:00	dd hh:mm:ss
	dA4	on-time duration in the air renew cycle	0	194 4:20:15	30:00	dd hh:mm:ss
15	dA5	period of air renew cycle	0	194 4:20:15	12:00:00	dd hh:mm:ss
	rAh	enable forced air renew by keyboard short cut	oFF	_on	_on	/
	rAF	forced air renew duration	0	194 4:20:15	30:00	dd hh:mm:ss
	rAo	start / stop forced air renew	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	2	/
	HFP	force heating during defrost	oFF	_on	oFF	/
	n__	Functions about fans				
	nU_	Functions about depression fans				
	nUS	number of depression fans during storage	0	3	2	/
	nUr	number of depression fans during ripening	0	3	3	/
	nU0	number of depression fans when refrigeration is required but does not work	0	3	1	/
	nUd	delay before establishing that refrigeration does not work	0	194 4:20:15	30:00	dd hh:mm:ss
17	nS0	speed regulation of depression fans when refrigeration does not work	0	255	32	/
	nS1	speed regulation of depression fan nr. 1 during storage	0	255	128	/
	nS2	speed regulation of depression fan nr. 2 during storage	0	255	128	/
	nS3	speed regulation of depression fan nr. 3 during storage	0	255	128	/
	nr1	speed regulation of depression fan nr. 1 during ripening	0	255	255	/
	nr2	speed regulation of depression fan nr. 2 during ripening	0	255	255	/
	nr3	speed regulation of depression fan nr. 3 during ripening	0	255	255	/
	nH1	activate on board speed regulation of depressure fan nr. 1	oFF	_on	oFF	/
	nH2	activate on board speed regulation of depressure fan nr. 2	oFF	_on	oFF	/
	nH3	activate on board speed regulation of depressure fan nr. 3	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	nE_	Functions about evaporator fans				
	nEH	force evaporator fans when refrigeration is off	oFF	_on	oFF	/
	nEM	force evaporator fans when humidification is on	oFF	_on	oFF	/
	nE0	enable evaporator fans when refrigeration is required but does not work	oFF	_on	oFF	/
	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	/
	Pd2	number of auxiliary masters connected to this master	0	2	2	/
	PO_	Output assignment				
	PO2	assign out-2 relay to: 0=alarm / 1=humidifier / 2=defrost / 3=OUT-1	0	255	1	/
	c__	Functions about door and light				
	cO_	Functions about door				
18	cOh	enable door operation from keyboard	oFF	_on	_on	/
19	cOF	enable door flashing light in case of alarm	oFF	_on	_on	/
20	cOd	delay between pushing button and door opening or closure	0	194 4:20:15	2	dd hh:mm:ss
	cOH	enable door automatic closure	oFF	_on	oFF	/
	cCd	delay of door automatic closure	0	194 4:20:15	30	dd hh:mm:ss
	cOU	enable depressure, refrigeration and other output when door is not closed	oFF	_on	oFF	/
	cOY	enable door opening after first ethylene injection and before first air renew	oFF	_on	_on	/
	cI_	Functions about light				
21	cIO	switch on the light during door operation	oFF	_on	_on	/
	cIH	switch on the light when the door is open and off when closed	oFF	_on	_on	/
22	cIo	switch off the light automatically if it has been switched on from outside	oFF	_on	_on	/
	cId	delay of light automatic switch off	0	194 4:20:15	30	dd hh:mm:ss
	cc_	Functions about curtain operation				
23	cch	enable curtain operation from keyboard	oFF	_on	oFF	/
24	ccc	keyboard in curtain mode	oFF	_on	oFF	/
21	ccO	enable curtain operation when door is not open	oFF	_on	oFF	/
21	ccI	enable curtain operation when light is off	oFF	_on	oFF	/
	v__	Functions about electronic expansion valve				
	vP_	Functions about electronic expansion valve preference				
25	vPH	enable electronic expansion valve	oFF	_on	_on	/
	vPP	refrigerant gas type: 0=R134A / 1=R404A / 2=R507A / 3=R22 / 4=R407C / 5=R407F / 6=R407A / 7=R410A / 8=R290 / 9=R1270 / 10=R744 / 11=R717 / 12=R1234y / 13=R1234z / 14=R449A / 15=R448A / 16=R452A / 17=R450A / 18=R513A / 19=R407H / 20=R23 / 21=R455A	0	255	0	/
26	vPd	network originating address of the pressure broadcast	0	255	0	/
	vt_	Functions about electronic expansion valve temperature				
27	vtt	wanted overheating (similar to Danfoss thermostatic overheating spring regulation)	0.0	99.0	8.0	K
28	vtH	maximum overheating	0.0	99.0	99.0	K
29	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				
30	vd1	on-off duty cycle duration	0	194 4:20:15	8	dd hh:mm:ss
31	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
32	vdd	on duty cycle adaptation speed (low value for slow adaptation and small swinging)	0	255	8	/
	vF_	Functions about turbo mode (forcing-on the expansion valve)				
33	vFP	turbo mode: 0=off / 1=on / 2=auto	0	255	2	/
	vFd	turbo mode delay	0	194 4:20:15	30:00	dd hh:mm:ss
	vFH	suction pipe overheating for turbo mode activation	0.0	99.0	12.0	K
	vFt	difference between product and set point required for turbo mode	0.0	99.0	1.0	K
	vb_	Functions about cooling capacity boost (raising a flag for the central unit)				

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	vbP	boost mode: 0=off / 1=on / 2=auto	0	255	2	/
	vbd	boost mode delay	0	194 4:20:15	1:00:00	dd hh:mm:ss
34	vbH	product descent ramp, per hour, under which boost mode is activated	0.0	99.0	0.5	K
	vbt	difference between product and set point required for boost mode	0.0	99.0	2.0	K
	b__	Functions about probe calibration				
	b1_	Probe nr. 1				
	b1C	calibration offset	-9.0	9.0	0.0	K
	b1A	use probe to calculate product average temperature	oFF	_on	oFF	/
	b1S	use probe for safety temperature	oFF	_on	_on	/
	b1L	use probe for alarm temperature	oFF	_on	_on	/
	b2_	Probe nr. 2				
	b2C	calibration offset	-9.0	9.0	0.0	K
	b2A	use probe to calculate product average temperature	oFF	_on	_on	/
	b2S	use probe for safety temperature	oFF	_on	_on	/
	b2L	use probe for alarm temperature	oFF	_on	_on	/
	b3_	Probe nr. 3				
	b3C	calibration offset	-9.0	9.0	0.0	K
	b3A	use probe to calculate product average temperature	oFF	_on	oFF	/
	b3S	use probe for safety temperature	oFF	_on	oFF	/
	b3L	use probe for alarm temperature	oFF	_on	oFF	/
	b4_	Probe nr. 4				
	b4C	calibration offset	-9.0	9.0	0.0	K
	b4A	use probe to calculate product average temperature	oFF	_on	_on	/
	b4S	use probe for safety temperature	oFF	_on	_on	/
	b4L	use probe for alarm temperature	oFF	_on	_on	/
	b5_	Probe nr. 5				
	b5C	calibration offset	-9.0	9.0	0.0	%
	b5A	use probe to calculate room humidity	oFF	_on	_on	/
	b6_	Probe nr. 6				
	b6C	calibration offset	-9.0	9.0	0.0	10*ppm
	b6A	use probe to calculate room ethylene	oFF	_on	oFF	/
	b7_	Probe nr. 7				
	b7C	calibration offset	-9.0	9.0	0.0	bar
	b7A	use probe to calculate suction pressure	oFF	_on	_on	/
	b8_	Probe nr. 8				
	b8C	calibration offset	-9.0	9.0	0.0	K
	b8A	use probe to calculate product average temperature	oFF	_on	_on	/
	b8S	use probe for safety temperature	oFF	_on	_on	/
	b8L	use probe for alarm temperature	oFF	_on	_on	/
	b9_	Probe nr. 9				
	b9C	calibration offset	-9.0	9.0	0.0	%
	b9A	use probe to calculate CO_2 concentration	oFF	_on	oFF	/
	b_1	Functions about probe calibration - auxiliary master 1				
	b11	Probe nr. 1				
	11C	calibration offset	-9.0	9.0	0.0	K
	11A	use probe to calculate product average temperature	oFF	_on	oFF	/
	11S	use probe for safety temperature	oFF	_on	oFF	/
	11L	use probe for alarm temperature	oFF	_on	oFF	/
	b12	Probe nr. 2				
	12C	calibration offset	-9.0	9.0	0.0	K
	12A	use probe to calculate product average temperature	oFF	_on	oFF	/
	12S	use probe for safety temperature	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	12L	use probe for alarm temperature	oFF	_on	oFF	/
	b13	Probe nr. 3				
	13C	calibration offset	-9.0	9.0	0.0	K
	13A	use probe to calculate product average temperature	oFF	_on	oFF	/
	13S	use probe for safety temperature	oFF	_on	oFF	/
	13L	use probe for alarm temperature	oFF	_on	oFF	/
	b14	Probe nr. 4				
	14C	calibration offset	-9.0	9.0	0.0	K
	14A	use probe to calculate product average temperature	oFF	_on	oFF	/
	14S	use probe for safety temperature	oFF	_on	oFF	/
	14L	use probe for alarm temperature	oFF	_on	oFF	/
	b15	Probe nr. 5				
	15C	calibration offset	-9.0	9.0	0.0	%
	15A	enable probe	oFF	_on	oFF	/
	b16	Probe nr. 6				
	16C	calibration offset	-9.0	9.0	0.0	%
	16A	enable probe	oFF	_on	oFF	/
	b17	Probe nr. 7				
	17C	calibration offset	-9.0	9.0	0.0	%
	17A	enable probe	oFF	_on	oFF	/
	b18	Probe nr. 8				
	18C	calibration offset	-9.0	9.0	0.0	K
	18A	use probe to calculate product average temperature	oFF	_on	oFF	/
	18S	use probe for safety temperature	oFF	_on	oFF	/
	18L	use probe for alarm temperature	oFF	_on	oFF	/
	b_2	Functions about probe calibration - auxiliary master 2				
	b21	Probe nr. 1				
	21C	calibration offset	-9.0	9.0	0.0	K
	21A	use probe to calculate product average temperature	oFF	_on	oFF	/
	21S	use probe for safety temperature	oFF	_on	oFF	/
	21L	use probe for alarm temperature	oFF	_on	oFF	/
	b22	Probe nr. 2				
	22C	calibration offset	-9.0	9.0	0.0	K
	22A	use probe to calculate product average temperature	oFF	_on	oFF	/
	22S	use probe for safety temperature	oFF	_on	oFF	/
	22L	use probe for alarm temperature	oFF	_on	oFF	/
	b23	Probe nr. 3				
	23C	calibration offset	-9.0	9.0	0.0	K
	23A	use probe to calculate product average temperature	oFF	_on	oFF	/
	23S	use probe for safety temperature	oFF	_on	oFF	/
	23L	use probe for alarm temperature	oFF	_on	oFF	/
	b24	Probe nr. 4				
35	24C	calibration offset	-9.0	9.0	0.0	K
	24A	use probe to calculate product average temperature	oFF	_on	oFF	/
	24S	use probe for safety temperature	oFF	_on	oFF	/
	24L	use probe for alarm temperature	oFF	_on	oFF	/
	b25	Probe nr. 5				
36	25C	calibration offset	-9.0	9.0	0.0	%
	25A	enable probe	oFF	_on	oFF	/
	b26	Probe nr. 6				
	26C	calibration offset	-9.0	9.0	0.0	%
	26A	enable probe	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	b27	Probe nr. 7				
	27C	calibration offset	-9.0	9.0	0.0	%
	27A	enable probe	oFF	_on	oFF	/
	b28	Probe nr. 8				
37	28C	calibration offset	-9.0	9.0	0.0	K
	28A	use probe to calculate product average temperature	oFF	_on	oFF	/
	28S	use probe for safety temperature	oFF	_on	oFF	/
	28L	use probe for alarm temperature	oFF	_on	oFF	/
	L__	Functions about alarm and stand-by				
	Lt_	Temperature alarm				
38	LtL	low temperature alarm set point	-55.0	145.0	-2.0	°C
39	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
	LC_	CO2 alarm				
	LCL	low CO2 level alarm set point	0.0	100.0	0.0	%
	LCH	high CO2 level alarm set point	0.0	100.0	100.0	%
	LCd	alarm delay	0	194 4:20:15	30:00	dd hh:mm:ss
	Lo_	On / stand-by status				
40	Loo	actual status: stand-by or on	oFF	_on	oFF	/
	d__	Functions about delays				
	dF_	Delay from previous stop				
	dF6	delay from request to activation of OUT-6: heating	0	194 4:20:15	3:00	dd hh:mm:ss
	I__	Functions about input-output and machine state (read only)				
	IA_	Analog inputs				
	IA1	analog input 1 (temperature)	-55.0	145.0	-55.0	°C
	IA2	analog input 2 (temperature)	-55.0	145.0	-55.0	°C
	IA3	analog input 3 (suction temperature)	-55.0	145.0	-55.0	°C
	IA4	analog input 4 (temperature)	-55.0	145.0	-55.0	°C
	IA5	analog input 5 (humidity)	0.0	100.0	0.0	%
	IA6	analog input 6 (ethylene)	0.0	999.0	0.0	10*ppm
	IA7	analog input 7 (low pressure)	0.0	999.0	0.0	(gauge) bar
	IA8	analog input 8 (temperature)	-55.0	145.0	-55.0	°C
3	IA9	analog input 9 (CO2)	0.0	100.0	0.0	%
	Id_	Digital input				
	Id1	digital input 1 (ethylene hardware safety)	oFF	_on	oFF	/
	Id2	digital input 2 (evaporator hardware safety)	oFF	_on	oFF	/
	Id3	digital input 3 (heating hardware safety)	oFF	_on	oFF	/
	Id4	digital input 4 (unused)	oFF	_on	oFF	/
	Id5	digital input 5 (phase-1 software safety)	oFF	_on	oFF	/
	OA_	Analog output				
	OA1	analog output "FAN"	0	255	0	/
	OA2	analog output "I out"	0	255	0	/
	Od_	Digital output				
	Od1	digital output 1 (refrigeration solenoid)	oFF	_on	oFF	/
	Od2	digital output 2 (steam producer)	oFF	_on	oFF	/
	Od3	digital output 3 (air renew)	oFF	_on	oFF	/
	Od4	digital output 4 (ethylene)	oFF	_on	oFF	/
	Od5	digital output 5 (evaporator)	oFF	_on	oFF	/
	Od6	digital output 6 (heating)	oFF	_on	oFF	/
	Od7	alarm - eventually connected to relay nr. 2	oFF	_on	oFF	/
	Od8	defrost - eventually connected to relay nr. 2	oFF	_on	oFF	/
	OS_	Machine status				

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	Ido	door fully open	oFF	_on	oFF	/
	Idc	door fully closed	oFF	_on	oFF	/
	Idh	door safety	oFF	_on	oFF	/
	IdP	door is presumed to be closed, combining history of door closure and safety	oFF	_on	oFF	/
	Ib7	button B8 is pressed	oFF	_on	oFF	/
	Ib8	button B7 is pressed	oFF	_on	oFF	/
	In1	safety of depressure fan 1	oFF	_on	oFF	/
	In2	safety of depressure fan 2	oFF	_on	oFF	/
	In3	safety of depressure fan 3	oFF	_on	oFF	/
	OS0	actual set point	-55.0	145.0	-55.0	°C
	OS1	low pressure (LP)	0.0	999.0	0.0	(gauge) bar
	OS2	refrigerant saturation temperature corresponding to the low pressure	-55.0	145.0	-55.0	°C
	OS3	refrigerant overheating at the evaporator outlet	-999.0	999.0	-999.0	K
	OS4	product average temperature	-55.0	145.0	-55.0	°C
	OS5	product temperature standard deviation	0.0	999.0	-999.0	K
	OS6	air average temperature	-55.0	145.0	-55.0	°C
	OS7	air temperature standard deviation	0.0	999.0	-999.0	K
34	OS8	product descent ramp, per hour	-999.0	999.0	-999.0	K
	OSr	ripening status: 0=off / 1=immediate delay / 2=t1 / 3=t2 / 4=t3 / 5=t4 / 6=t5	0	255	0	/
	OSt	ripening timer (in countdown-mode)	0	194 4:20:15	0	dd hh:mm:ss
	OSY	ethylene status: 0=off / 1=immediate delay / 2=waiting for temperature / 3=first on / 4=first over / 5=following on / 6=following pause / 7=ended / 8=forced	0	255	0	/
	OSU	ethylene timer (in countdown-mode)	0	194 4:20:15	0	dd hh:mm:ss
	OnY	remaining following-ethylene-cycles-of-injection, including the one eventually running	0	255	0	/
	OSb	ripening air renew status: 0=off / 1=waiting for ethylene / 2=first pause / 3=on / 4=pause / 5=ended / 6=forced	0	255	0	/
	OSv	ripening air renew timer (in countdown-mode)	0	194 4:20:15	0	dd hh:mm:ss
	OnA	remaining air-renew-cycles, including the one eventually running	0	255	0	/
	OSA	storage air renew status: 0=off / 1=immediate delay / 2=on / 3=pause / 4=forced	0	255	0	/
	OSX	storage air renew timer (in countdown-mode)	0	194 4:20:15	0	dd hh:mm:ss
	OSS	defrost status: 1=normal / 2=defr / 3=drip / 4=fan delay / 5=forced / 6=wait	0	255	0	/
	OSF	defrost timer (in countdown-mode)	0	194 4:20:15	0	dd hh:mm:ss
	OSd	auxiliary master 1 status: 0=off / 1=ok / 2=check / 3=reconnect / 4=none / 5=lost	0	255	0	/
	OSE	auxiliary master 2 status: 0=off / 1=ok / 2=check / 3=reconnect / 4=none / 5=lost	0	255	0	/
	LLA	actual alarm - read only (0 means no alarm)	0	255	0	/
	OSn	evaporator fan stopped by door opening or manual control	oFF	_on	oFF	/
	Odo	door is opening	oFF	_on	oFF	/
	Odc	door is closing	oFF	_on	oFF	/
	OdF	door light is flashing	oFF	_on	oFF	/
	OdL	room lighting	oFF	_on	oFF	/
	Ocu	curtain is unrolling	oFF	_on	oFF	/
	Ocr	curtain is rolling	oFF	_on	oFF	/
	On1	depressure fan 1	oFF	_on	oFF	/
	On2	depressure fan 2	oFF	_on	oFF	/
	On3	depressure fan 3	oFF	_on	oFF	/
	On0	refrigeration is required but not working	oFF	_on	oFF	/
	Ot1	speed regulation of depressure fan 1	0	255	0	/
	Ot2	speed regulation of depressure fan 2	0	255	0	/
	Ot3	speed regulation of depressure fan 3	0	255	0	/
	Onv	liquid refrigerant required from the central unit	oFF	_on	oFF	/
	OnH	hot gas required from the central unit	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	OnF	turbo mode	oFF	_on	oFF	/
	Onb	boost mode	oFF	_on	oFF	/
OU_		Functions about ripening quality during previous cycle				
	OUn	ripening serial number	0	65535	0	/
	OUd	ripening duration in hours, summing from _d1 to _d4	0	255	0	/
	OUI	initial product quality - ripening input	0	100	0	/
	OUO	final product quality - ripening output	0	100	0	/
	OUU	ripening process quality	0	100	0	/
Ov_		Functions about ripening quality during actual cycle				
	Ovd	ripening duration in hours, summing from _d1 to _d4	0	255	0	/
	OvI	initial product quality - ripening input	0	100	0	/
	OvO	final product quality - ripening output	0	100	0	/
	OvU	ripening process quality	0	100	0	/
I1A		Analog inputs - auxiliary master 1				
	IA1	analog input 1 (temperature)	-55.0	145.0	-55.0	°C
	IA2	analog input 2 (temperature)	-55.0	145.0	-55.0	°C
	IA3	analog input 3 (temperature)	-55.0	145.0	-55.0	°C
	IA4	analog input 4 (temperature)	-55.0	145.0	-55.0	°C
	IA5	analog input 5 (percentage of sensor range)	0.0	100.0	0.0	%
	IA6	analog input 6 (percentage of sensor range)	0.0	100.0	0.0	%
	IA7	analog input 7 (percentage of sensor range)	0.0	100.0	0.0	%
	IA8	analog input 8 (temperature)	-55.0	145.0	-55.0	°C
I1d		Digital input				
	Id1	digital input 1	oFF	_on	oFF	/
	Id2	digital input 2	oFF	_on	oFF	/
	Id3	digital input 3	oFF	_on	oFF	/
	Id4	digital input 4	oFF	_on	oFF	/
	Id5	digital input 5	oFF	_on	oFF	/
O1A		Analog output				
	OA1	analog output "FAN"	0	255	0	/
	OA2	analog output "I out"	0	255	0	/
O1d		Digital output				
	Od1	digital output 1	oFF	_on	oFF	/
	Od2	digital output 2	oFF	_on	oFF	/
	Od3	digital output 3	oFF	_on	oFF	/
	Od4	digital output 4	oFF	_on	oFF	/
	Od5	digital output 5	oFF	_on	oFF	/
	Od6	digital output 6	oFF	_on	oFF	/
I2A		Analog inputs - auxiliary master 2				
	IA1	analog input 1 (temperature)	-55.0	145.0	-55.0	°C
	IA2	analog input 2 (temperature)	-55.0	145.0	-55.0	°C
	IA3	analog input 3 (temperature)	-55.0	145.0	-55.0	°C
	IA4	analog input 4 (temperature)	-55.0	145.0	-55.0	°C
	IA5	analog input 5 (percentage of sensor range)	0.0	100.0	0.0	%
	IA6	analog input 6 (percentage of sensor range)	0.0	100.0	0.0	%
	IA7	analog input 7 (percentage of sensor range)	0.0	100.0	0.0	%
	IA8	analog input 8 (temperature)	-55.0	145.0	-55.0	°C
I2d		Digital input				
	Id1	digital input 1	oFF	_on	oFF	/
	Id2	digital input 2	oFF	_on	oFF	/
	Id3	digital input 3	oFF	_on	oFF	/
	Id4	digital input 4	oFF	_on	oFF	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	Id5	digital input 5	oFF	_on	oFF	/
O2A		Analog output				
	OA1	analog output "FAN"	0	255	0	/
	OA2	analog output "I out"	0	255	0	/
O2d		Digital output				
	Od1	digital output 1	oFF	_on	oFF	/
	Od2	digital output 2	oFF	_on	oFF	/
	Od3	digital output 3	oFF	_on	oFF	/
	Od4	digital output 4	oFF	_on	oFF	/
	Od5	digital output 5	oFF	_on	oFF	/
	Od6	digital output 6	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: 0=average temperature / 1=AN1 / 2=AN2 / ...	0	255	0	/
	EYS	value set by shortcut, during ripening: 0=_t0 / 1=_t1 / ... / 5=_t5 / 6=current	0	6	6	/
	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	1	/
	E1t	label text during rotation	000	yyy	rM=	/
	E1E	duration of value display during rotation	0	255	4	/
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	X1=	/
	E2E	duration of value display during rotation	0	255	4	/
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	X2=	/
	E4E	duration of value display during rotation	0	255	4	/
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)				
	E6d	duration of label display during rotation	0	255	1	/
	E6t	label text during rotation	000	yyy	Et=	/
	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	X3=	/

Rem.	Parameter	Description	Minimum	Maximum	Default	Unit
	E8E	duration of value display during rotation	0	255	0	/
	E8b	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	c2=	/
	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	_t=	/
	E9E	duration of value display during rotation	0	255	4	/
	F0_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F0d	duration of label display during rotation	0	255	1	/
	F0t	label text during rotation	000	yyy	LP=	/
	F0E	duration of value display during rotation	0	255	0	/
	F1_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F1d	duration of label display during rotation	0	255	1	/
	F1t	label text during rotation	000	yyy	Lt=	/
	F1E	duration of value display during rotation	0	255	0	/
	F2_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F2d	duration of label display during rotation	0	255	1	/
	F2t	label text during rotation	000	yyy	oh=	/
	F2E	duration of value display during rotation	0	255	0	/
	F3_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F3d	duration of label display during rotation	0	255	1	/
	F3t	label text during rotation	000	yyy	Av=	/
	F3E	duration of value display during rotation	0	255	4	/
	F4_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F4d	duration of label display during rotation	0	255	1	/
	F4t	label text during rotation	000	yyy	vr=	/
	F4E	duration of value display during rotation	0	255	0	/
	F5_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F5d	duration of label display during rotation	0	255	1	/
	F5t	label text during rotation	000	yyy	AA=	/
	F5E	duration of value display during rotation	0	255	0	/
	F6_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F6d	duration of label display during rotation	0	255	1	/
	F6t	label text during rotation	000	yyy	vA=	/
	F6E	duration of value display during rotation	0	255	0	/
	F7_	Functions about display rotation, when EYr=2 (repeated for each parameter)				
	F7d	duration of label display during rotation	0	255	1	/
	F7t	label text during rotation	000	yyy	MP=	/
	F7E	duration of value display during rotation	0	255	0	/
	Eb_	Functions about buzzer				
	EbH	enable buzzer	0	1	1	/
	Eh_	Functions about keyboard				
	Ehc	B6 action on the curtain: 0=unrolls / 1=rolls	0	1	0	/
	EF_	Functions about slave default				
	EFF	reload slave default parameters from EEPROM, at next restart	0	1	0	/

2 Parameter remarks

Nr.	Remark
1	During off-time counters continue to count and output is disabled. At reset command they stop and their value is reset. They are restarted by on command. The minus sign on display ("-") means that you already reset timers.
2	The period of each cycle includes on-time + off-time, that is the overall duration of the cycle.
3	In percentage over the sensor range
4	Defrost is not performed twice in case safety switches of mc or evaporator are not ok.
5	Following defrost cycles will be aligned to the end of forced one.
6	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.
7	In case of hot gas defrost, both IA2 and IA3 must reach Ftt.
8	The "oFF" command disables the ripening functions and enables the storage. The ripening timers continue however to run also if their output is disabled. To restart the ripening timers, please do the "rES" (reset) command. The "on_" command enables the ripening functions without restarting the timers. To begin a new ripening cycle, please do the "rES" command. The minus sign on display ("-") means that you have already reset the timers.
9	At the end of the ripening cycle the temperature is set to t5 until the manual reset of the ripening cycle.
10	The stop command resets forced operation counter.
11	In case of probe control, ethylene timers and settings are not used. You can still activate forced injections. In case of disabled probe, rYY is used to control curtain string motor when curtain is idle.
12	To synchronize ethylene injection and ripening start, set dY0 = _d0.
13	First ethylene injection is delayed until room temperature reaches _tY. _tY has no effect over following ethylene injections.
14	To synchronize the beginning of further ethylene injections and air renews, set dY3=dA3.
15	To synchronize the cycles of further ethylene injections and air renews, set dY3=dA3.
16	Set by the microcontroller - can be manually overwritten.
17	For variable-frequency drive (also named VFD or inverter), all of the speed regulation values are integer numbers expressing the output frequency in Hz; do not exceed 50 Hz unless you are instructed so. For thyristor on-board regulation, instead, the speed values range between 0 and 255, where 255 is the maximum speed.
18	Door operation disables every other keyboard operation.
19	The first pressure of push button inside the room - near the door - switches on the light, the second one opens the door, the third one activates the "man in room" alarm.
20	During the delay the flashing light is on.
21	For your safety, do not modify this parameter. This setting is supposed to be used just in case of emergency or testing.
22	No action if the light is switched on from inside the room.
23	Curtain operation disables every other operation keyboard operation.
24	For safety reason, door operation is disabled when curtain is enabled. Unrolling can be started also by a push button located near the depressure box, inside the room.
25	When off, the refrigeration solenoid is steadily on during cooling, as long as overheating is higher then vtL or b3A is off.
26	The address of the central unit who is broadcasting pressure (usually 1). Use 0 for previous application H425V1 with no origin specification.
27	Caution! Low overheating causes liquid return and compressor damage.
28	Overheating over the maximum forces valve anticipated opening.
29	Overheating under the minimum delays valve opening.
30	Caution! Short duty cycle reduces valve life.
31	Caution! Low overheating causes liquid return and compressor damage.
32	Caution! High adaptation speed causes swing in the suction line and damage to the compressor.
33	In turbo mode, the liquid refrigerant solenoid opens over vtt overheating, and closes at vtL. In H422V9, starting from revision 34, to enable turbo during heat pump, add 10 for on-mode and 20 for auto-mode.
34	Positive values mean temperature descent.
35	In H411V6, starting from revision 09, when the value of this parameter 23C is non-zero, while 23A, 23S, and 23L are all off, use this value as alarm threshold for the absolute difference between set point temperature and whichever product probe, use LCd as alarm delay, share the timer with the low CO2 alarm, and generate alarm A29, excessive set distance.
36	In H411V6, starting from revision 09, when the value of this parameter 24C is non-zero, while 24A, 24S, and 24L are all off, use this value, instead of _tL, as safety minimum temperature for product probes, and use this value, instead of LtL, as low-temperature alarm threshold for product probes; use Ltd as alarm delay, share the timer with the low temperature alarm, and generate alarm A28, low product temperature. Keep _tL as safety minimum temperature for air probes, and keep LtL as low-temperature alarm threshold for air probes.
37	In H411V6, starting from revision 09, when the value of this parameter 28C is non-zero, while 28A, 28S, and 28L are all off, use this value as alarm threshold for product probe spread, use Ltd as alarm delay, share the timer with the high temperature alarm, and generate alarm A27, excessive probe spread.

Nr.	Remark
38	The low temperature differential is fixed, and alarm status stops at 0.2 °C above the set point.
39	The high temperature differential is fixed, and alarm status stops at 0.2 °C under the set point.
40	Passing from stand-by to on and at power on, there is a 5 second delay spent in a virtual stand-by.

3 Alarm list

Display	Alarm	
A01	low temperature	Low temperature limit has been reached.
A02	high temperature	High temperature limit has been reached.
A03	ethylene alarm	The ethylene safety device has disconnected.
A04	evaporator alarm	Evaporator thermal relay, or other evaporator safety device has disconnected.
A05	heating alarm	The heating safety device has disconnected.
A06	door open	Time limit for door opening has been reached.
A07	phase alarm	Heating overload/thermal relay disconnected, or missing mains phase - manual reset.
A08	fan 1 alarm	Depress fan overload/thermal relay disconnected.
A09	fan 2 alarm	Depress fan overload/thermal relay disconnected.
A10	fan 3 alarm	Depress fan overload/thermal relay disconnected.
A11	man in room alarm	Somebody remained trapped inside the room.
A12	RTC memory loss	Memory loss of real time clock [RTC] - timer reset.
A13	EEPROM invalid	EEPROM invalid.
A14	EEPROM read start	EEPROM read start failure
A15	EEPROM read end	EEPROM read end failure
A16	EEPROM write start	EEPROM write start failure.
A17	EEPROM write end	EEPROM write end failure.
A18	EEPROM write max	EEPROM failure - reached the maximum number of writing attempts.
A19	low CO2	Low CO2 limit has been reached.
A20	high CO2	High CO2 limit has been reached.

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 - stop - silence	Exit without saving from any menu - door/curtain stop - alarm buzzer silence.
B2	up - open	Up navigation in the menu - door opening.
B3	on / stand-by	Toggle between on and stand-by.
B4	left - light - roll	Left navigation in the menu - switch the light on and off - roll the curtain.
B5	down - close	Down navigation in the menu - door closure.

	Push button	Function
B6	right-menu-set-unroll	Right navigation in the menu - display and modify set point - enter the menu - unroll the curtain.
B7	light - door - alarm	Remote button near to the door inside the room: switch on the light, open the door, and trigger man-in-room alarm.
B8	curtain	Remote button near to the depressure box inside the room: switch on and off the curtain unrolling.

6 Led list

	Led	Function
L1	cooling	On during cooling.
L2	depressure	On when all depressure fans are running.
L3	humidity	On when humidification is active.
L4	air renew	On during air renew - blinking slowly during pause and delay.
L5	heating	On during heating - blinking slowly during activation delay.
L6	ethylene	On during ethylene injection - blinking slowly when waiting for three events: temperature threshold ($\_tY$), following injections ($\_nY$), first air renew (rYA).
L7	light	On when lighting is on - blinking slowly during deactivation delay.

7 Soft command list

	Soft command	Function
1	new ripening	Start a new ripening. Save the one in progress, if any. Reset the ripening counter.
2	end ripening	End the ripening in progress, if any, and save it. Go to final temperature $\_t5$. Do not cancel planned air renew.
3	store green	Execute end ripening command, then go to green product storage.

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.
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.
Reset timers.	For the resettable controls in the menu program, confirming "rES", then confirming "on$\_$" or "oFF", has the joint effect of resetting timers and going into the enabled or disabled status.
Enter ripening mode.	Keep pressed B6+B3. As alternative, enter the menu program as explained above, set the parameter rrH, reset it in case it is a new ripening, then confirm it.
Enter storage mode.	Keep pressed B6+B1. As alternative, enter the menu program as explained above, set to oFF the parameter rrH, then confirm it.
Door operation.	Push B2 to open, B5 to close, and B1 to stop. If you are inside the room and the door is closed, press B7 once to switch on the light, press again to open the door, and again to trigger the man in room alarm. During door operation display shows "OPE" or "CLO". By default, when the door is open, the light is on and every other output is off. By default, door operation is disabled after the first ethylene injection and before subsequent air renew.

How to ...	Function
Curtain operation.	For safety reason, the curtain can be operated only when the door is fully open and the light is on. To activate the keyboard for the curtain, keep pressed B6+B4, then press shortly B6 or B8 to unroll, B4 to roll, B1 to stop, and again B1 to exit curtain mode. During curtain operation, every output is disabled. The display shows "Cur" with the curtain idle, "Unr" during unrolling, and "rOL" during rolling.

9 Shortcut list

Buttons to press	Shortcut description - keep pressed 5 seconds
B6+B3	Enter ripening mode.
B6+B1	Enter storage mode.
B6+B4	Activate the keyboard for curtain operation.
B6+B2	Force an immediate air renew.
B6+B5	Force an immediate ethylene injection.

10 Led and push button location