



H422V9  
User manual

## Contents

|                                 |    |
|---------------------------------|----|
| Contents                        | 2  |
| 1 Parameter list                | 3  |
| 2 Parameter remarks             | 8  |
| 3 Alarm list                    | 9  |
| 4 Slave alarm list              | 9  |
| 5 Button list                   | 9  |
| 6 Led list                      | 9  |
| 7 Soft command list             | 10 |
| 8 How to ...                    | 10 |
| 9 Shortcut list                 | 10 |
| 10 Led and push button location | 10 |

## 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     |      |
| 2    | FdE       | maximum evaporator fan activation delay after the defrost  | 0       | 194 4:20:15 | 15:00 dd hh:mm:ss    |      |
|      | FdF       | minimum evaporator fan activation delay after the defrost  | 0       | 194 4:20:15 | 5:00 dd hh:mm:ss     |      |
| 3    | 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     |      |
| 4    | Fd3       | defrost delay at power on  | 0       | 194 4:20:15 | 4:00:00 dd hh:mm:ss  |      |
|      | FdY       | temperature display timeout after end of defrost - resets IA1=OS4=OS5                                    | 0       | 194 4:20:15 | 20:00 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 /                  |      |
| 7    | FPF       | forced defrost type: 0=none / 1=pause / 2=air / 3=electric / 4=hot gas / 5=heat pump / 6=heat pump by hp | 0       | 255         | 2 /                  |      |
|      | FPr       | save defrost status into the real time clock   | oFF     | _on         | oFF /                |      |
|      | FPH       | activate defrost output during defrost   | oFF     | _on         | _on /                |      |
|      | FPI       | activate defrost output during forced defrost  | oFF     | _on         | _on /                |      |
|      | Ft__      | Functions about defrost temperature  |         |             |                      |      |
| 8    | Ftt       | defrost stop temperature   | -55.0   | 146.0       | 6.0                  | °C   |
|      | FtF       | forced defrost stop temperature  | -55.0   | 146.0       | 25.0                 | °C   |
|      | FtP       | evaporator fan activation temperature after the defrost  | -55.0   | 146.0       | -20.0                | °C   |
|      | M__       | Functions about compressor   |         |             |                      |      |
|      | MU__      | Functions about pressure switches  |         |             |                      |      |
|      | MLH       | low pressure safety restart ( similar to Danfoss KP15 lp set point )                                     | 0.0     | 99.0        | 0.4 (gauge) bar      |      |
|      | MLL       | low pressure safety stop ( similar to Danfoss KP15 lp set point - differential )                         | 0.0     | 99.0        | 0.2 (gauge) bar      |      |
|      | MLd       | delay of low pressure safety stop  | 0       | 194 4:20:15 | 10 dd hh:mm:ss       |      |
|      | MLU       | low pressure stop during pump down (intentional stop)  | 0.0     | 99.0        | 0.3 (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     |      |
| 9    | MUO       | minimum oil differential pressure  | 0.0     | 30.0        | 2.0 (gauge) bar      |      |
| 10   | MUU       | enable pump down   | oFF     | _on         | _on /                |      |
|      | MUM       | maximum pump down duration   | 0       | 194 4:20:15 | 1:00 dd hh:mm:ss     |      |
|      | MUL       | low pressure forcing mc restart (repump down)  | 0.0     | 99.0        | 1.0 (gauge) bar      |      |
|      | MUd       | minimum delay for mc restarts (repump down)  | 0       | 194 4:20:15 | 15:00 dd hh:mm:ss    |      |
|      | MUb       | do pump down before going to stand-by  | 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 /                  |      |
|      | HPd       | heating delay  | 0       | 194 4:20:15 | 3:00 dd hh:mm:ss     |      |
|      | U__       | Dehumidification   |         |             |                      |      |
|      | UP__      | Dehumidification preference  |         |             |                      |      |
| 11   | UPP       | dehumidification type: 0=none / 1=force refr / 2=force heat / 3=alternate / 4=outer                      | 0       | 255         | 0 /                  |      |
|      | UPH       | enable humidification  | oFF     | _on         | oFF /                |      |

| Rem. | Parameter | Description  | Minimum | Maximum     | Default             | Unit |
|------|-----------|--|---------|-------------|---------------------|------|
|      | 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 /               |      |
| 12   | ncr       | enable condenser fans speed regulation   | oFF     | _on         | _on /               |      |
| 13   | 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  |
| 14   | 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 /               |      |
|      | 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 /               |      |
|      | nEE       | delay before establishing that refrigeration does not work   | 0       | 194 4:20:15 | 30:00 dd hh:mm:ss   |      |
|      | nEt       | high defrost probe temperature forcing evaporator fan stop during cooling  | -55.0   | 146.0       | 25.0 °C             |      |
|      | nEd       | differential   | 0.0     | 99.0        | 5.0 K               |      |
|      | 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 /               |      |
| 15   | clo       | switch off the light automatically if it has been switched on from outside   | oFF     | _on         | _on /               |      |
|      | cld       | 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  |         |             |                     |      |
| 16   | 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 /                 |      |
| 17   | vPd       | network originating address of the pressure broadcast  | 0       | 255         | 0 /                 |      |
|      | vPC       | the room is served by a central refrigerating unit   | oFF     | _on         | oFF /               |      |
|      | vPS       | synchronize the liquid solenoid start with the central unit  | oFF     | _on         | oFF /               |      |
|      | vP0       | delay before establishing that not enough info is received from the central unit   | 0       | 194 4:20:15 | 5:00 dd hh:mm:ss    |      |
|      | vt_       | Functions about electronic expansion valve temperature   |         |             |                     |      |
| 18   | vtt       | wanted overheating (similar to Danfoss thermostatic overheating spring regulation)   | 0.0     | 99.0        | 8.0 K               |      |
| 19   | vtH       | maximum overheating  | 0.0     | 99.0        | 99.0 K              |      |
|      | vtl       | maximum low pressure (LP) to activate vtH parameter (maximum overheating)  | 0.0     | 99.0        | 0.1 (gauge)         | bar  |
| 20   | vtL       | minimum overheating  | 0.0     | 99.0        | 6.0 K               |      |
|      | vtF       | minimum overheating during hot gas defrost or heating  | 0.0     | 99.0        | 12.0 K              |      |
|      | vtP       | wanted overheating increase when evaporator fans are off during cooling  | 0.0     | 99.0        | 16.0 K              |      |
|      | vtU       | maximum pressure allowed in the suction line (similar to Danfoss MOP)  | 0.0     | 30.0        | 10.0 (gauge)        | bar  |
|      | vtv       | minimum high pressure (HP) to activate vtU parameter (MOP)   | 0.0     | 99.0        | 24.0 (gauge)        | bar  |
|      | vd_       | Functions about electronic expansion valve timing  |         |             |                     |      |
| 21   | vd1       | on-off duty cycle duration   | 0       | 194 4:20:15 | 8 dd hh:mm:ss       |      |
| 22   | 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       |      |
| 23   | 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)  |         |             |                     |      |
| 24   | 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 room 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)   |         |             |                     |      |
|      | 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 |      |
| 25   | vbH       | room descent ramp, per hour, under which boost mode is activated   | 0.0     | 99.0        | 0.5 K               |      |
|      | vbt       | difference between room and set point required for boost mode  | 0.0     | 99.0        | 2.0 K               |      |
|      | 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  |         |             |                     |      |
| 26   | 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 /               |      |

| Rem. | Parameter | Description  | Minimum | Maximum     | Default | Unit        |
|------|-----------|--|---------|-------------|---------|-------------|
|      | 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  |         |             |         |             |
|      | LtE       | alarm enable   | oFF     | _on         | _on /   |             |
| 27   | LtL       | low temperature alarm set point  | -55.0   | 145.0       | -2.0    | °C          |
| 28   | 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  |         |             |         |             |
|      | LFE       | alarm enable   | oFF     | _on         | _on /   |             |
|      | 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   |         |             |         |             |
|      | LiE       | alarm enable   | oFF     | _on         | oFF /   |             |
|      | 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   |         |             |         |             |
|      | LjE       | alarm enable   | oFF     | _on         | oFF /   |             |
|      | 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 |
|      | Ld_       | Low discharge overheating alarm  |         |             |         |             |
|      | LdE       | alarm enable   | oFF     | _on         | oFF /   |             |
|      | Ldo       | refrigerant overheating at the compressor outlet                                 | -99.0   | 99.0        | 16.0    | K           |
|      | Ldd       | alarm delay  | 0       | 194 4:20:15 | 5:00    | dd hh:mm:ss |
|      | LE_       | Stop for low discharge overheating alarm   |         |             |         |             |
|      | LEE       | alarm enable   | oFF     | _on         | _on /   |             |
|      | LES       | alarm show   | oFF     | _on         | oFF /   |             |
|      | LEo       | refrigerant overheating at the compressor outlet                                 | -99.0   | 99.0        | 12.0    | K           |
|      | Led       | alarm delay  | 0       | 194 4:20:15 | 10:00   | dd hh:mm:ss |
|      | LEF       | alarm reset delay  | 0       | 194 4:20:15 | 5:00    | dd hh:mm:ss |
|      | LM_       | High discharge temperature alarm   |         |             |         |             |
|      | LME       | alarm enable   | oFF     | _on         | oFF /   |             |
|      | LMt       | high temperature alarm set point   | -55.0   | 146.0       | 105.0   | °C          |
|      | LMd       | alarm delay  | 0       | 194 4:20:15 | 1:00    | dd hh:mm:ss |
|      | Ln_       | Stop for high discharge temperature alarm  |         |             |         |             |
|      | LnE       | alarm enable   | oFF     | _on         | _on /   |             |
|      | LnS       | alarm show   | oFF     | _on         | oFF /   |             |
|      | Lnt       | high temperature alarm set point   | -55.0   | 146.0       | 110.0   | °C          |
|      | Lnd       | alarm delay  | 0       | 194 4:20:15 | 1:00    | dd hh:mm:ss |
|      | LnF       | alarm reset delay  | 0       | 194 4:20:15 | 5:00    | 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   |         |             |         |             |
| 29   | Loo       | actual status: stand-by or on  | oFF     | _on         | oFF /   |             |
|      | d__       | Functions about delays   |         |             |         |             |
|      | dP_       | Delay at power on  |         |             |         |             |
| 30   | dP4       | delay at power on for relay nr. 4 - compressor                                   | 0       | 194 4:20:15 | 15:00   | dd hh:mm:ss |
|      | 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   |         |             |         |             |

| Rem. | Parameter | Description  | Minimum | Maximum       | Default | Unit        |
|------|-----------|--|---------|---------------|---------|-------------|
|      | 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=steam / 3=air renew / 4=defrost duty / 5=steam on FAN / 6=outer dehum / 7=OUT1 / 8=OUT3 / 9=OUT4 / 10=OUT5 / 11=OUT6 / 12=FAN / 13=alarm NO / 14=fan off dehum / 15=drain pump / 16=ss FAN / 17=16+2rm / 18=17+drp / 19=18+sdrp OUT6 / 20=5+14 / 21=alt heat ev / 22=19+ss OUT3 / 23=depr OUT2 / 24=Loo / 25=off / 26=ss OUT3 / 27=mc part / 28=eco OUT3 / 29=28+ip / 30=27+28 / 31=27+29 / 32=29+es AN2 / 33=27+32 / 34=ev FAN / 35=34+2 / 36=ss / 37=34+2mcs / 38=37+steam OUT3 | 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     | /           |
|      | OA_       | Analog output  |         |               |         |             |
|      | OA1       | condenser  | 0       | 255           | 0       | /           |
|      | OA2       | humidity - 4...20 mA   | 0       | 255           | 0       | /           |
|      | Od_       | Digital output   |         |               |         |             |
| 31   | 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     | /           |
|      | Od0       | digital output 2   | oFF     | _on           | oFF     | /           |
|      | OS_       | Machine status   |         |               |         |             |
|      | 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 compressor inlet  | -999.0  | 999.0         | -999.0  | K           |
|      | OS4       | temperature before defrost - reads IA1 at range reentering after defrost   | -55.0   | 145.0         | -55.0   | °C          |
|      | OS5       | set point temperature during defrost - reads IA1 at range reentering after defrost   | -55.0   | 145.0         | -55.0   | °C          |
| 25   | OS6       | room descent ramp, per hour  | -999.0  | 999.0         | -999.0  | K           |
|      | OS7       | refrigerant saturation temperature corresponding to the high pressure  | -55.0   | 145.0         | -55.0   | °C          |
|      | OS8       | refrigerant overheating at the compressor outlet   | -999.0  | 999.0         | -999.0  | K           |
|      | OSS       | defrost status: 1=normal / 2=defr / 3=drip / 4=fan delay / 5=forced / 6=wait   | 0       | 255           | 0       | /           |
|      | LLA       | actual alarm - read only (0 means no alarm)  | 0       | 255           | 0       | /           |
|      | OSF       | defrost timer (in countdown-mode)  | 0       | 194 4:20:15   | 0       | dd hh:mm:ss |
|      | OSY       | timer of the temperature display timeout, after the end of defrost (see FdY)   | 0       | 194 4:20:15   | 0       | dd hh:mm:ss |
|      | Ov0       | timer for not enough info (in countdown-mode)  | 0       | 194 4:20:15   | 0       | dd hh:mm:ss |
|      | OCH       | compressor hour counter  | 0       | 1193046:28:15 | 0       | h...h:mm:ss |
|      | OSb       | special defrost display in progress - affects OS4 and OS5 (see FdY)  | oFF     | _on           | oFF     | /           |
|      | ObY       | instrument not in stand-by (instrument on)   | oFF     | _on           | oFF     | /           |
|      | OSt       | the instrument reached the set temperature   | oFF     | _on           | oFF     | /           |
|      | OSn       | evaporator fan stopped by door opening or manual control   | oFF     | _on           | oFF     | /           |
|      | Ont       | evaporator fan stopped by defrost temperature  | oFF     | _on           | oFF     | /           |
|      | OSH       | compressor stopped by high pressure  | oFF     | _on           | oFF     | /           |
|      | OSL       | compressor stopped by low pressure   | oFF     | _on           | oFF     | /           |
|      | OSd       | compressor stopped by low discharge overheating  | oFF     | _on           | oFF     | /           |
|      | OSE       | compressor stopped by high discharge temperature   | oFF     | _on           | oFF     | /           |
|      | OSU       | compressor running for pump down   | oFF     | _on           | oFF     | /           |
|      | MOP       | MOP limitation intervened recently   | oFF     | _on           | oFF     | /           |
|      | OUP       | dehumidification in progress   | oFF     | _on           | oFF     | /           |
|      | OPC       | the room is served by a central refrigerating unit   | oFF     | _on           | oFF     | /           |
|      | Ov1       | not enough info is received from the central unit  | oFF     | _on           | oFF     | /           |
|      | On0       | refrigeration is required but not working  | oFF     | _on           | oFF     | /           |
|      | Onv       | liquid refrigerant required from the central unit  | oFF     | _on           | oFF     | /           |

| Rem. | Parameter | Description  | Minimum | Maximum | Default | Unit |
|------|-----------|--|---------|---------|---------|------|
|      | OnH       | hot gas required from the central unit                                     | oFF     | _on     | oFF     | /    |
|      | OnF       | turbo mode   | oFF     | _on     | oFF     | /    |
|      | Onb       | boost mode   | 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) |         |         |         |      |
|      | 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     | dl=     | /    |
|      | 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     | ol=     | /    |
|      | E9E       | duration of value display during rotation                                  | 0       | 255     | 0       | /    |
| 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     | _t=     | /    |
|      | F0E       | duration of value display during rotation                                  | 0       | 255     | 4       | /    |
| 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     | LP=     | /    |
|      | 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     | Lt=     | /    |
|      | 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     | oh=     | /    |
|      | F3E       | duration of value display during rotation                                  | 0       | 255     | 0       | /    |
| 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     | bF=     | /    |
|      | 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     | SF=     | /    |
|      | 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       | /    |

| Rem. | Parameter | Description  | Minimum | Maximum | Default | Unit |
|------|-----------|--|---------|---------|---------|------|
|      | F6t       | label text during rotation   | 000     | yyy     | MP=     | /    |
|      | 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     | Ht=     | /    |
|      | F7E       | duration of value display during rotation                                  | 0       | 255     | 0       | /    |
|      | F8        | Functions about display rotation, when EYr=2 (repeated for each parameter) |         |         |         |      |
|      | F8d       | duration of label display during rotation                                  | 0       | 255     | 1       | /    |
|      | F8t       | label text during rotation   | 000     | yyy     | od=     | /    |
|      | F8E       | duration of value display during rotation                                  | 0       | 255     | 0       | /    |
|      | Eb        | Functions about buzzer   |         |         |         |      |
|      | EbH       | enable buzzer  | 0       | 1       | 1       | /    |
|      | EF        | Functions about slave default  |         |         |         |      |
|      | EFF       | reload slave default parameters from EEPROM, at next restart               | 0       | 1       | 0       | /    |
|      | EP        | Functions about slave password   |         |         |         |      |
| 32   | 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 evaporator fans are restarted after FdF delay and before FdE delay, as soon as the defrost temperature reaches FtP.
  - 3 The period of each cycle includes on-time + off-time, that is the overall duration of the cycle.
  - 4 Eventually disabled by the parameter FPr.
  - 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 H422V9, starting from revision 09, when FPt or FPF is 6, Ftt and FtF set the HP dew temperature that stops heat pump defrost.
  - 8 In case of hot gas defrost, both IA2 and IA3 must reach Ftt.
  - 9 Fixed time 120 s and manual reset.
  - 10 When activated, a clever pump down algorithm coordinates the solenoid, the evaporator and the mc. There is no concurrent run of mc and electric defrost or heating.
  - 11 Forced refrigeration is disabled when room temperature is under LFL, forced heating is disabled over LFH.
  - 12 When speed regulation is off the fan is operated on-off.
  - 13 Caution! Speed regulation can cause fan fault or electronic board fault. Low and average minimum speed can increase the risk.
  - 14 During the first 10 seconds of speed regulation, the n1L is replaced by  $(n1H+n1L)/2$ .
  - 15 No action if the light is switched on from inside the room.
  - 16 When off, the refrigeration solenoid is steadily on during cooling, without any safety. Use turbo mode for better control.
  - 17 The address of the central unit who is broadcasting pressure (usually 1). Use 0 for previous application H425V1 with no origin specification.
  - 18 Caution! Low overheating causes liquid return and compressor damage.
  - 19 Overheating over the maximum forces valve anticipated opening.
  - 20 Overheating under the minimum delays valve opening.
  - 21 Caution! Short duty cycle reduces valve life.
  - 22 Caution! Low overheating causes liquid return and compressor damage.
  - 23 Caution! High adaptation speed causes swing in the suction line and damage to the compressor.
  - 24 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.
  - 25 Positive values mean temperature descent.
  - 26 In H422V9, starting from revision 14, when b1A is on, b4A is off, and b4C is non-zero, use AN-4 reading with set at  $0.0\text{ °C} + b4C$  to concur for low temperature alarm and to stop cooling.
  - 27 The low temperature differential is fixed, and alarm status stops at  $0.2\text{ °C}$  above the set point.
  - 28 The high temperature differential is fixed, and alarm status stops at  $0.2\text{ °C}$  under the set point.
  - 29 Passing from stand-by to on and at power on, there is a 5 second delay spent in a virtual stand-by.
  - 30 In case a crankcase heater is installed, a long delay is advised. Press Esc to skip compressor delay.
  - 31 The minus sign on display ("-") signals that output is going to start after a delay.
  - 32 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.  |
| A16     | EEPROM invalid     | EEPROM invalid.  |
| A17     | EEPROM read start  | EEPROM read start failure  |
| A18     | EEPROM read end    | EEPROM read end failure  |
| A19     | EEPROM write start | EEPROM write start failure.  |
| A20     | EEPROM write end   | EEPROM write end failure.  |
| A21     | EEPROM write max   | EEPROM failure - reached the maximum number of writing attempts.   |
| A22     | low discharge oh   | Refrigerant overheating at compressor outlet went under alarm threshold.                                   |
| A23     | low disch oh stop  | Refrigerant overheating at compressor outlet went under alarm threshold - compressor stop - delayed reset. |
| A24     | high discharge t   | Refrigerant temperature at compressor outlet went over alarm threshold.                                    |
| A25     | high disch stop    | Refrigerant temperature at compressor outlet went over alarm threshold - compressor stop - delayed reset.  |
| A26     | power cut          | Power has been restored after a cut.   |

### 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 or skip the one in progress. |
| 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  |
|--------------------------------|---|
| 4 skip mc delay                | Skip compressor delay.                                      |
| 5 skip defrost                 | Skip defrost in progress and enter fan pause.               |
| 6 reset mc counter             | Reset compressor hour counter.                              |
| 13 reset all instrument alarms | Reset all the instrument alarms and all the alarm counters. |

## 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.<br>Program the menu. | Press shortly the B3 button. When the evaporator fans are stopped, the display blinks.<br>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 <code>_t0</code> , then confirm it.   |
| Force an air renew.                                   | Keep pressed B2.   |
| Force or skip a defrost.                              | Keep pressed B5.   |

## 9 Shortcut list

| Buttons to press | Shortcut description - keep pressed 5 seconds            |
|------------------|--|
| B5               | Force an immediate defrost, or skip the one in progress. |
| B2               | Force an immediate air renew.                            |

## 10 Led and push button location

