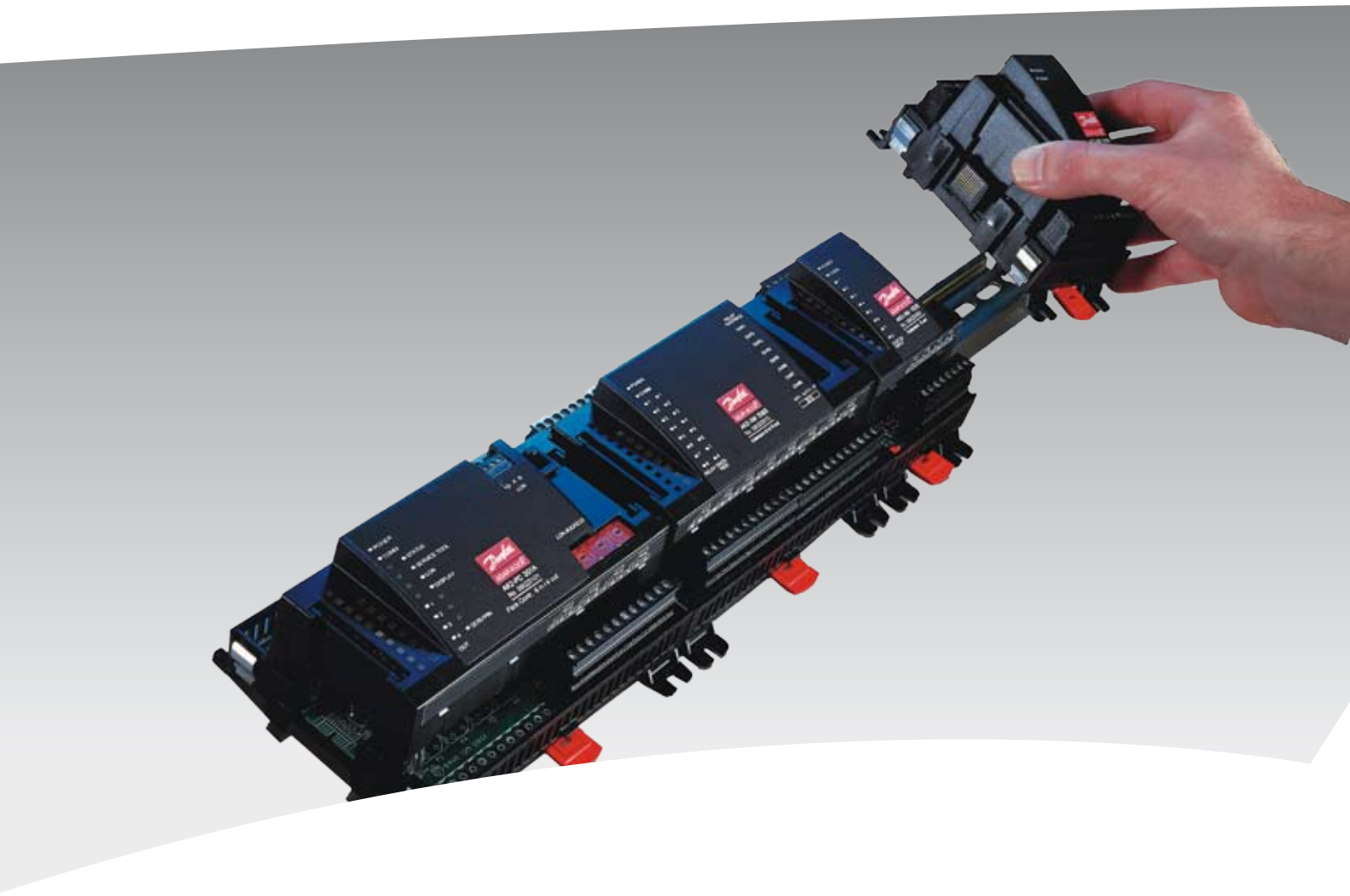


Capacity controller for water chiller
AK-CH 650

REFRIGERATION AND
AIR CONDITIONING

Menu operation via AKM

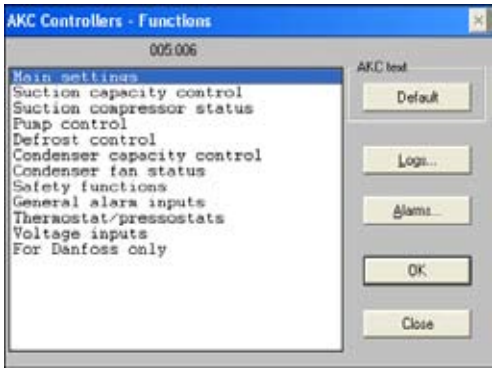
Menu list

This menu function can be used together with system software type AKM. The description is divided up into function groups that can be displayed on the PC screen. Within each group it is now possible to show the measured values, or settings. Regarding the use of AKM, reference is made to the AKM Manual.

Validity

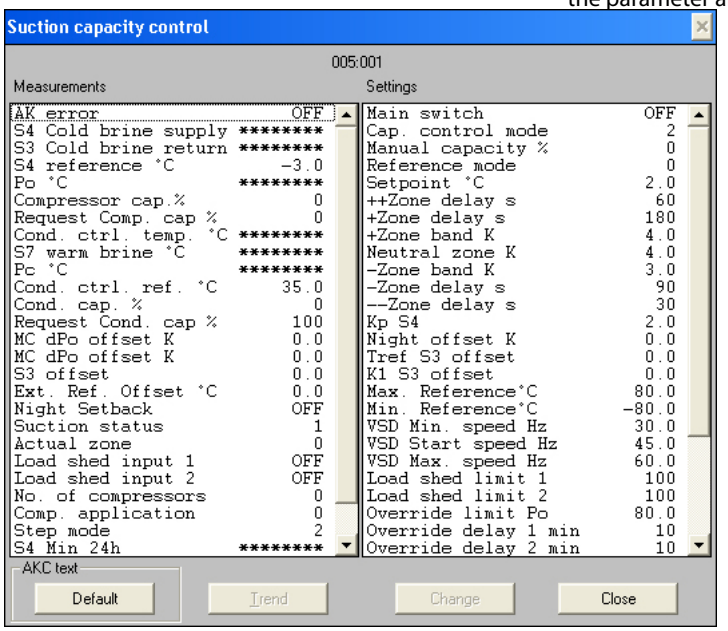
This menu opertion (from May 2007 applies to controller type AK-CH 650, code number 080Z0131 / 080Z0132 / 080Z0133 with programme version 1.0x.

Function groups



The operation is divided up into several function groups. When a selection has been made, push "OK", and you may continue to the next display. By way of example, "A Compressor capacity control" has been selected here.

From the measure line the different values can be read. The values are constantly updated.
In the list of settings the set values can be seen. If a setting has to be changed, select the parameter and proceed via "OK".



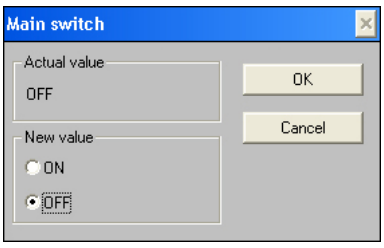
Measurements

The various measurements can be read directly. If a graphic display of the measurements is required, up to eight of them can be shown. Select the required measurements and push "Trend".

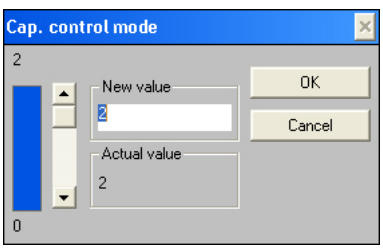
Settings

Settings can only be made for the daily operation. Configuration settings cannot be seen, changed or written out. They can only be made from the Service Tool programme.

There are four kinds of settings, ON/OFF settings, settings with a variable value, time settings and "reset alarms".



Set the required value and push "OK"



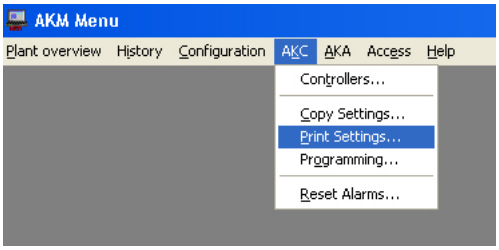
Enter the new value or move the sliding scale up or down. The new value will apply, when "OK" is pushed.

Go through the individual functions one by one and make the required settings. When settings have been made for one controller, the set values may be used as basis in the other controllers of the same type and with the same software version. Copy the settings by using the copy settings function in the AKM programme, and adjust subsequently any settings where there are deviations.

NB! If a list is required for noting down the individual settings, a printout can be made of it with a function in the AKM programme. Read the next section, "Documentation".

Documentation

Documentation of the settings of the individual controllers can be made with the print function in the AKM programme. Select the controller for which documentation of the settings is required and select the "Print Settings" function (cf. also the AKM Manual).



Functions

Shown below are function groups with corresponding measurements and settings. A printout of the given settings can be made using the AKM function "Print Settings" (see above).

Note

It has been necessary to make selections among the many measurements and settings coming from the controller.
The operation from the AKM programme cannot contain them all.
If there is a need for access to all measurements and settings, you should make use of Service Tool type AK-ST 500.

Main settings

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	External Main Switch	Status of input "Extern Main Switch". In pos. "OFF" the regulation is stopped by force
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Configuration lock	Lock of configuration. In order to select quick setup or select refrigerant type, the configuration lock must be "open". Note: "Main switch" must be OFF in order to set configuration lock in "open" position 0: Open 1: Locked
	Select quick setup	Select a pre defined application. All in- and outputs will be pre-defined. All setpoint will be adapted to the selected application. Please notice that the control ler will make a restart when a selection has been made. See AK-PC 840 manual for further details about the predefined applications.
	Refrigerant type Po	Select refrigerant type 0= not selected, 1=R12. 2=R22. 3=R134a. 4=R502. 5=R717. 6=R13. 7=R13b1. 8=R23. 9=R500. 10=R503. 11=R114. 12=R142b. 13=User defined 14=R32. 15=R227. 16=R401A. 17=R507. 18=R402A. 19=R404A. 20=R407C. 21=R407A. 22=R407B. 23=R410A. 24=R170. 25=R290. 26=R600. 27=R600a. 28=R744. 29=R1270. 30=R417A

Suction capacity control

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	MC dP0 offset K	Actual displacement value for the suction pressure in connection with a "P0 Optimiser" function (Master control function in AKA gateway)
	S3 offset	Contribution from reference displacement via S3 sensor
	Ext. Ref. Offset °C	Contribution from external reference displacement
	Night setback	Status of night setback function ON: Night (An increase of the evaporating pressure is permitted) OFF: Normal situation
	Suction status	0: Power up Controller has been powered up (power supply re-connected) 1: Stopped Capacity control has been stopped ("Main switch" = OFF or "Control mode" = OFF) 2: Manual Capacity is controlled manually ("Control mode" = MAN) 3: Alarm Capacity control is in alarm condition (fx. alarm on Po Min or Pc Max) 4: Restart Capacity control is waiting for elapse of "Restart time"

		5: Standby Capacity control is ready to start 10: Full loaded All capacity cutin 11: Running Capacity control is running
	Actual Zone	Actual zone for capacity regulation: 0: P0-error 1: - - Zone 2: - Zone 3: NZ 4: + Zone 5: + + Zone
	Load shed input 1	Actual status on Load shed input 1
	Load shed input 2	Actual status on Load shed input 2
	No. of compressors	Defined number of compressors
	Comp. application	Select the compressor application required (see AK-CH 650 manual for further details) 0: Single step only 1: 1xComp. w. unloaders + Single step 2: 2xComp. w. unloaders + Single step 3: Comp. w. unloaders only 4: 1xVariable speed + Single step 5: 1xVariable speed + Comp. w. unloaders 6: 2xVariable speed + Single step
	Step control mode	Selected coupling pattern for compressors Sequential: Compressors are cut in/out in strict accordance with compressor number Cyclic: Runtime equalisation between compressors Best fit: Compressors are cut in/out in order to make the best possible fit to actual load 0: Sequential 2: Cyclic 3: Best fit
	S4 Min 24h	Minimum value for S4 temp. For the last 24 hours
	S4 Max 24h	Maximum value for S4 temp. For the last 24 hours
	S4 Average 24h	Average value for S4 temp. For the last 24 hours
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Cap. control mode	0: MAN (The compressor capacity will be controlled manually) 1: OFF (The capacity control will be stopped) 2: AUTO (The capacity is controlled by the PI controller)
	Manual capacity %	Manual setting of compressor capacity The value is in % of total capacity controlled by the controller
	Reference mode	Choice of suction pressure reference 0: SP + Ext. Ref + Night + S3 offset: Used if you require override via 0-10V signal, S3 sensor or night setback. 1: SP + Po optimisation: Used if you want to optimise the reference from the refrigeration appliance (network function) which is most used
	Setpoint °C	Setting of required suction pressure in °C
	++Zone delay s	Time delay between step cut-ins in the regulation band over the "+Zone band" Set in seconds
	+Zone delay s	Time delay between step cut-ins in the regulation band over the neutral zone Set in seconds
	+Zone band K	Regulation band over the neutral zone
	Neutral zone K	Neutral zone for suction pressure
	-Zone band K	Regulation band under the neutral zone
	-Zone delay s	Time delay between step cut-outs in the regulation band under the neutral zone Set in seconds
	--Zone delay s	Time delay between step cut-outs in the regulation band under the "-Zone band" Set in seconds.
	Kp S4	Ampliflication factor for P0 regulation
	Night offset K	Displacement value for suction pressure in connection with an active night setback signal (set in Kelvin)
	Tref S3 offset	Reference temperature for the temperature signal S3, i.e. when = Tref, there is no displacement of the reference.
	K1 S3 offset	Displacement of the reference for the charge temperature S4 on an increase in S3 temperature in relation to "Tref S3 offset" of 1°C (K1 = 0 gives no displacement)
	Max.Reference °C	Max. permissible suction pressure reference

	Min.Reference °C	Min. permissible suction pressure reference
	VSD Min. speed Hz	Minimum allowed speed before stop of Variable Speed drive (Low load condition)
	VSD Start speed Hz	Minimum speed for start of Variable speed drive (Must be set higher than "VSD Min. Speed Hz")
	VSD Max. speed Hz	Highest permissible speed for the cormpressor motor
	Load shed limit 1	Set max capacity limit for load shed input 1
	Load shed limit 2	Set max capacity limit for load shed input 2
	Override limit Po	Set max load shedding override limit for suction pressure Po
	Override delay 1 min	Override delay for load shed limit 1. If the suction pressure exceeds "Override limit Po" during load shedding and the set delay has expired, the load shed limit 1 will be cancelled
	Override delay 2 min	Override delay for load shed limit 2. If the suction pressure exceeds "Override limit Po" during load shedding and the set delay has expired, the load shed limit 2 will be cancelled
	Po pump down limit °C	Set the actual pump down limit for the last compressor
	Initial start time	The time after start-up where the cut-in capacity is limited to the first compressor step.
	1 comp. start delay	On new start the start of the first compressor is delayed by the set delay time so that the brine pumps can bring the brine up to speed before start of the first compressor.
	Min. cap. change %	Minimum change in requested capacity that will result in cut in/out of compressors. Only valid for single step compressors controlled according to Best fit step control mode.
	Unloading mode	If capacity-regulated compressors with bypass valves are used, a venting method during falling capacity is chosen 0: Only one compressor may be discharged at a time 1: Two compressors may be discharged at a time
	Minimize cycling	Set amplification of dynamic zone extensions at compressor cut in/out 0: No reduction (no extension) 1: Low 2: Medium 3: High
	Emergency Cap. day%	The capacity in percent during cooling in the day period if there is a fault on the PO pressure transmitter.
	Emergency Cap. night	The capacity in percent during cooling in the night period if there is a fault on the PO pressure transmitter.

Suction compressor status

Measurements	AK error	When "ON", the controller is in alarm condition.	
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor	
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor	
	S4 reference °C	Actual reference temperatur for brine supply temperature	
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)	
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)	
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)	
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)	
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)	
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)	
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)	
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)	
	Request Cond. cap %	Reference for condenser capacity	
	VSD 1 safety	Status on safety input for variable speed controller on compressor 1 ON: Alarm OFF: No alarm	
	VSD 2 safety	Status on safety input for variable speed controller on compressor 2 ON: Alarm OFF: No alarm	
	VSD Speed %	The present speed of the compressor motor controlled by the frequency converter	
	Comp. 1 Status	0: Power up	Controller has been powered up/Compressor is not used
		1: Stopped	Compressor hat been stopped
		2: Manual	Compressor capacity is controlled manually
		3: Alarm	Compressor is in alarm condition (cut out on safety)
		4: Restart	Compressor is waiting for elapse of "Recycle time"
		5: Standby	Compressor is ready to start
		10: Full loaded	All capacity cutin
		11: Running	Capacity control is running

	Comp 2 … Status	As above for compressor no. 2 to 6
	Comp 1 capacity %	Actual cut-in capacity on this compressor
	Comp 2 …capacity %	As above for compressor no. 2 to 6
	Comp 1 Runtime % 24	Running time for compressor 1 in percent within the past 24 hours
	Comp 2 …Runtime % 24	As above for compressor no. 2 to 6
	Comp 1 Cycles / 24 h	Number of compressor starts during the past 24 hours
	Comp 2 …Cycles / 24 h	As above for compressor no. 2 to 6
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	1 Min. ON-time m	Minimum duration of ON period
	2 …Min. ON-time m	As above for compressor no. 2 to 6
	1 Min. OFF-time m	Minimum duration of OFF period
	2 …Min. OFF-time m	As above for compressor no. 2 to 6
	1 recycle time m	Minimum period of time between two successive starts.
	2 …recycle time m	As above for compressor no. 2 to 6
	1 runtime h	Compressor's total run time in hours
	2 …runtime h	As above for compressor no. 2 to 6
	1 Cycles Total	Total Number of compressor starts
	2 …Cycles Total	As above for compressor no. 2 to 6

Pump control

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Cold pump running	Reading of pump status 0: Pumps have stopped 1: Cold pump 1 is in use 2: Cold pump 2 is in use 3: Both pumps are in use
	Flow switch status	Current status for flow switch input
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Cold Pump ctrl.	Choice of pump operation 0: Both pumps are stopped 1: Cold pump 1 is in constant use 2: Cold pump 2 is in constant use 3: Both pumps are in constant use 4: Off set of operational time between the two pumps
	Pump cycle time	The operational times of the pumps before pump switch is carried out (pump's opera tional time before changeover to the other pump)
	Pump switch time	Overlap time during pump changeover where both pumps are in use (only relevant if the cold pump ctrl. is set to 4)
	Pump alarm delay	Delay on pump alarm before alarm is activated and automatic pump changeover car ried out (only if pump ctrl is set to 4)

Defrost control

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)

	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Defrost status	Current status for defrost function
	Defrost temp.	Current temperature of chosen defrost stop sensor
	Defrost time	Defrosting time for current or most recently completed defrost
	Average defrost time	Average defrosting time for the 10 most recent defrosts
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Start defrost	Manual start of defrost
	Stop defrost	Manual stop of defrost
	Defrost control	Select if defrost function is required
	Defrost stop sensor	Select defrost stop method 0: Stop exclusively on time 1: Stop at S3 temp. With time as backup 2: Stop at S4 temp. With time as backup
	Defrost stop temp.	Temperature value for defrost stop (the defrost is stopped when the temperature of the selected defrost sensor reached the set value)
	Max. defrost time	Max. permitted defrosting time in minutes (security time for stop using temperature)
	Drip delay	Delay time after defrost where compressors may not start so that the water has time to run off the refrigeration surfaces before start of refrigeration
	Comp. run at def.	Select if compressors are permitted to run during defrost

Condenser capacity control

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Condenser status	0: Power up Controller has been powered up (power supply re-connected) 1: Stopped Capacity control has been stopped ("Main switch" = OFF or "Control mode" = OFF) 2: Manual Capacity is controlled manually ("Control mode" = MAN) 3: Alarm Capacity control is in alarm condition (f.ex. Pc Max or Sd Max) 4: Restart Capacity control is waiting for elapse of "Restart time" 5: Standby Capacity control is ready to start 10: Full loaded All capacity cutin 11: Running Capacity control is running
	Air flow status	0: No RFG. select No refrigerant has been selected (monitoring of air flow can not start) 1: Tuning Monitoring function adapts to the condenser in question 2: OFF Monitoring function is switched OFF 3: OK Air flow is OK 4: Little dirt The amount of dirt decreases the performance of the condenser, clean when possible 5: Dirty The amount of dirt leads to considerable air flow problems, clean as soon as possible 6: Blocking The amount of dirt might lead to high pressure problems, clean now

	Sc3 Air on °C	Outdoor temperature in °C measured with Sc3 temperature sensor
	VSD Speed %	Status of analogue output signal "AO" for variable speed drive (in percent of full scale f.ex. 0 -10 V d.c.)
	VSD safety	Status of safety monitoring input for Variable Speed Drive ON: Alarm on VSD A safety monitoring input OFF: No alarm on VSD A safety monitoring input
	Heat rec. temp. °C	Temperature at the sensor for the heatrecovery function
	Heat recovery	Status on function "Heat recovery"
	No. of fans	Defined number of fans
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Cap. control mode	0: MAN (The condenser capacity will be controlled manually) 1: OFF (The capacity control will be stopped) 2: AUTO (The capacity is controlled by the PI controller)
	Manual capacity %	Manual setting of condenser capacity The value is in % of total capacity controlled by the controller
	Reference mode	0: Set point Reference = "PcA setpoint °C" 1: Floating Reference is changed as a function of the outdoor temperature measured by the "Sc3 air on" sensor, the set "Dimensioning tm K" and the actual compressor load.
	Setpoint °C	Setting of required discharge pressure in °C
	Dimensioning tm K	Dimensioning mean temperature differential between air- and condensing temperature at full load for the condenser in question (Typical 8 – 15K).
	Min. tm k	tm value at minimum load.
	Min. Reference °C	Min. permissible condensing pressure reference
	Max. Reference °C	Max. permissible condensing pressure reference
	Heat rec. SP °C	Condensing pressure reference when the thermostat for heat recovery is cut in.
	Heat rec. Cut In °C	Temperature value when the thermostat changes over to heat recovery.
	Heat rec. CutOut °C	Temperature value when the thermostat cuts out the heat recovery again
	Xp P-band K	Proportional band for PI controller
	Tn Integr. time s	Integration time for PI controller
	Control type	Selection of regulation type: 0: P regulation 1: PI regulation
	VSD Min. speed %	Minimum allowed speed before stop of Variable Speed drive (Low load condition)
	VSD Start speed %	Minimum speed for start of Variable speed drive (Must be set higher than "VSD Min. Speed %")

Condenser fan status

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Fan1 status	Status of the Fan 1 ON: Fan is running OFF: Fan is not running
	Fan2.... status	As above for fan 2 to 8
Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped

Safety Functions

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Ss suction gas °C	Suction gas temperature in °C
	Suction superheat K	Superheat in suction line
	Sd discharge gas °C	Discharge gas temperature in °C
	Anti freeze safety	Actual status of general shared frost protection input for all compressors

Settings	Main switch	Main switch: ON: Regulation OFF: Controller stopped
	Pc max. limit °C	Max. value of discharge pressure in °C (If the value is exceeded, the entire compressor capacity will be cut out) (At 3 K under PcA max. the entire condenser capacity will be cut in and the compressor capacity will be reduced)
	Sd max. limit °C	Max. value of discharge pressure in °C (If the value is exceeded, the entire compressor capacity will be cut out and the entire condenser capacity will be cut in)
	P0 min. limit °C	Min. value of suction pressure in °C (If the value becomes less, the entire compressor capacity will be cut out)
	P0 min delay at start	On start of the first compressor the security switch on the low-pressure security function "Po My limit" is delayed by the set time to prevent low-pressure dropout at start.
	SH min. Alarm K	Alarm limit for min. superheat
	SH max. Alarm K	Alarm limit for max. superheat
	SH Alarm delay m	Time delay before alarm for "SH min limit" and "SH min limit"
	Restart time m	Time delay before restart of compressors (Applies to the functions: "Sd max limit", "Pc max limit" and "P0 min limit")
	Liq.inj. SH CutIn K	Liquid injection in the suction line. Set superheat value where liquid injection is to start.
	Liq.inj. Sd CutIn °C	Liquid injection in suction line. Set Sd temperature where liquid injection is to start.
	Alarm monitoring S4	Select if alarm monitoring is required on charge temperature S4
	S4 High limit	High alarm limit for cold brine charge temperature
	S4 High delay	Delay on high charge temperature under normal regulation
	S4 High del pulldown	Delay on high charge temperature on start or during defrost
	S4 Low limit	Low alarm limit for cold bring charge temperature
	S4 low delay	Delay on low charge temperature

General alarm inputs

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)

	Request Cond. cap %	Reference for condenser capacity	
	DI 1 Alarm	Alarmstatus on the function defined as a DI1 alarm ON: Alarm is active OFF: No alarm, normal situation	
	DI 2.... Alarm	As above, but for the alarm functions 2 to 10	
Settings	Main switch	Main switch:	ON: Regulation OFF: Controller stopped
	DI 1 Alarm delay m	Time delay for the alarm "DI 1 Alarm"	
	DI 2.... Alarm delay m	As above, but for the alarm functions 2 to 10	

Thermostat/pressostats

Measurements	AK error	When "ON", the controller is in alarm condition.	
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor	
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor	
	S4 reference °C	Actual reference temperatur for brine supply temperature	
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)	
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)	
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)	
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)	
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)	
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)	
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)	
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)	
	Request Cond. cap %	Reference for condenser capacity	
	Thermostat 1 °C	Temperature measurement of function defined in Thermostat 1.	
	Thermostat 2 °C	Temperature measurement of function defined in Thermostat 2.	
	Thermostat 3 °C	Temperature measurement of function defined in Thermostat 3.	
	Pressostat 1 Bar	Pressure measurement of function defined in Pressure Control 1	
	Pressostat 2 Bar	As above, but for pressostat 2	
Settings	Main switch	Main switch:	ON: Regulation OFF: Controller stopped
	Ther. 1 Cutin °C	Cutin value for function defined in "Thermostat 1".	
	Ther. 1 Cutout °C	Cutout value for function defined in "Thermostat 1".	
	Ther. 1 High Alarm °C	High alarm limit "Thermostat 1"	
	Ther. 1 Low Alarm °C	Low alarm limit "Thermostat 1"	
	Ther. 1 High ALDly m	Time delay for high alarm "Thermostat 1"	
	Ther. 1 Low ALDly m	Time delay for low alarm "Thermostat 1"	
	Ther. 2.....	As above, but for thermostat 2	
	Ther. 3.....	As above, but for thermostat 3	
	Pres. 1 Cutin bar	Cutin value for function defined in "Pressure Control 1".	
	Pres. 1 Cutout bar	Cutout value for function defined in "Pressure Control 1".	
	Pres. 1 High alarm bar	High alarm limit "Pressostat 1"	
	Pres. 1 Low alarm bar	Low alarm limit "Pressostat 1"	
	Pres. 1 High ALDly m	Time delay for high alarm "Pressostat 1"	
	Pres. 1 Low ALDly m	Time delay for low alarm "Pressostat 1"	
	Pres. 2.....	As above, but for pressostat 2	

(Use Service Tool if data concerning thermostats 4 and 5 or from pressure controls 3, 4 and 5 have to be downloaded).

Voltage inputs

Measurements	AK error	When "ON", the controller is in alarm condition.
	S4 Cold brine supply	Actual cold brine supply temperature mesured with S4 temp. sensor
	S3 Cold brine return	Actual cold brine return temperature measured with S3 temp. sensor
	S4 reference °C	Actual reference temperatur for brine supply temperature
	P0 °C	Suction pressure in °C. (Measured with the pressure transmitter)
	Compressor cap. %	Cut-in compressor capacity in % (of total capacity)
	Request Comp. Cap %	Reference for compressor capacity (deviations may be due to time delays)
	Cond. ctrl. temp °C	Actual temperature for control sensor (Pc or S7)
	S7 warm brine °C	Actual warm brine temperature for S7 media sensor (Only used if S7 sensor is selected as regulation sensor)
	Pc °C	Condensing pressure in °C. (measured with the pressure transmitter)
	Cond. ctrl. ref. °C	Actual reference temp. for condenser capacity (incl. external reference signal, if any)
	Cond. cap. %	Cut-in condenser capacity in % (of total capacity)
	Request Cond. cap %	Reference for condenser capacity
	Volt 1 readout	Voltage measurement on the function defined in Volt 1.

Settings	Main switch	Main switch:	ON:	Regulation
			OFF:	Controller stopped

Volt 1 Cutin	The value where the relay is to cut in
Volt 1 Cutout	The value where the relay is to cut out
Volt 1 Cutin del. m	Time delay for cutin of relay
Volt 1 Cutout del. m	Time delay for cutout of relay
Volt 1 High Al.Limit	The value for the high alarm limit
Volt 1 Low Al.Limit	The value for the low alarm limit
Volt 1 High Al.Dly m	Time delay for high alarm
Volt 1 Low Al.Dly m	Time delay for low alarm

(Use Service Tool if data concerning Volt 2, 3, 4 and 5 are to be downloaded).

AKM menu: "For DANFOSS only"

This menu contains data and setting values for special internal controller functions.
Do not chage the stated values.

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alternations can be made without subsequential changes being necessary in specifications already agreed.
All trademarks in this material are property of the respecitve companies. Danfoss and Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.
DE-BD