

# Compressor Pack Controller AKC 25H1

Software version 1.3x

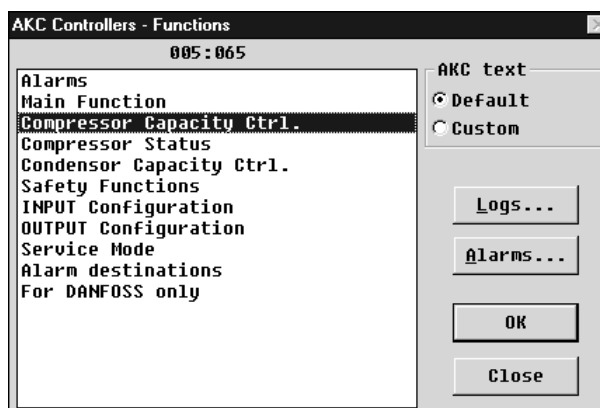
### Menu list

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.

### Application

This menu operation (dated September 1999), applies to controller type AKC 25H1, code number 084B2017 and 084B2018 with programme version 1.3x.

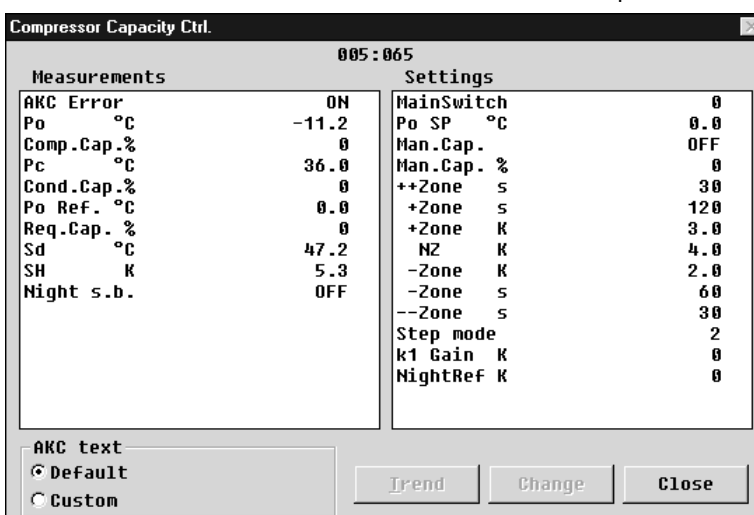
### Function groups



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, "Compressor capacity Ctrl." 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".

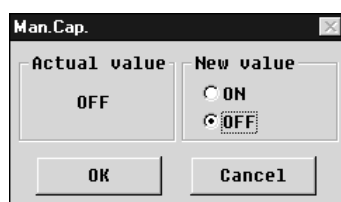


### Measurements

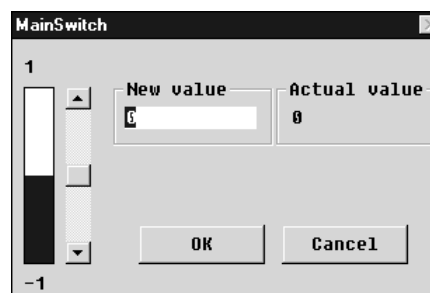
The various measurements can be read directly. If a graphic display of the measurements is required, up to eight of them can be shown. Select the required measurements and push "Trend".

### Settings

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"



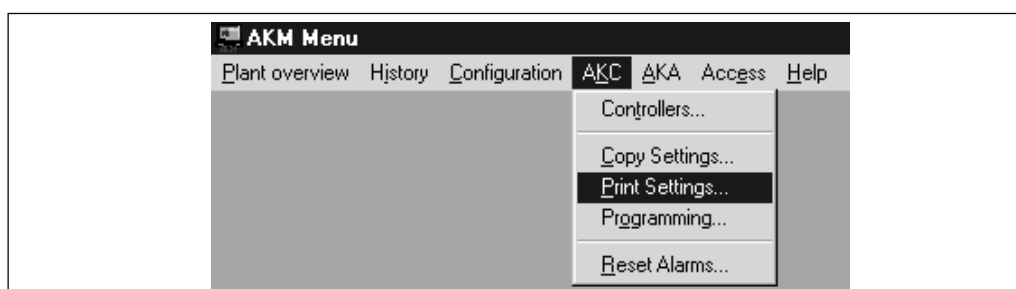
Enter the new value or move the sliding scale up or down. The new value will apply, when "OK" is pushed.

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).

## Alarms

See page 10.

## Main Function

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.		
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)		
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)		
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)		
Cond.Cap.%	Cut-in condenser capacity in %			
	Rfg.Type R	Reading of set refrigerant type		
Settings	Main Switch	Function switch:	1: Regulation	
			0: Controller stopped	
			-1: Service function	
Rfg. Type	Refrigerant selection:	0:	No refrigerant selection	12: R142b
		1:	R12	13: User defined
		2:	R22	14: R32
		3:	R134a	15: R227
		4:	R502	16: R401A
		5:	R717 (ammonia)	17: R507
		6:	R13	18: R402A
		7:	R13b1	19: R404A
		8:	R23	20: R407C
		9:	R500	21: R407A
		10:	R503	22: R407B
		11:	R114	23: R410A

Language	Selection of language. Three languages have been entered in the controller. Either: 0: English 1: German 2: Franch Or: 0: English 3: Danish 4: Spanish
	NB! If this setting is changed, another "Upload" must be made of the controller's data for the AKM programme. You do it this way: - Select one of the available languages. - Close the menu - Proceed to menu "Configuration" - "Advanced Configuration" - "Delete description file" - Push file type "Default" - Select controller's code number and software version - Push "OK" - Proceed to menu "Configuration" - "Upload" - Complete the fields "Network", "Net configuration" and "AKC description" - Push "OK"
Mains freq	Texts will now be obtained from the controller in the required language. Set the network frequency to 50 or 60 Hz

## Compressor Capacity Ctrl.

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
	P0 Ref. °C	Suction pressure reference (incl. external reference signal, if any)
	Req.Cap.%	Reference for compressor capacity (deviations may be due to time delays)
	Sd °C	Discharge gas temperature measured with the temperature sensor on the Sd input
	SH K	Measured superheat (Ss - P0). Ss = Temperature signal. P0 = Pressure signal.
	Night s.b.	Status of night setback function ON: An increase of the evaporating pressure is permitted OFF: Normal situation
Settings	Main Switch	Function switch: 1: Regulation 0: Controller stopped -1: Service function
	P0 SP °C	Setting of required suction pressure in °C
	Man.Cap.	Forced control function OFF: No forced control ON: There may be forced control of the compressor capacity
	Man.Cap.%	Forced control function Manual setting of compressor capacity The value is in % of total capacity controlled by the controller
	++Zone s	Time delay between step cut-ins in the regulation band over the "+Zone band" Set in seconds
	+Zone s	Time delay between step cut-ins in the regulation band over the neutral zone Set in seconds
	+Zone K	Regulation band over the neutral zone
	NZ K	Neutral zone for suction pressure
	-Zone K	Regulation band under the neutral zone
	-Zone s	Time delay between step cut-outs in the regulation band under the neutral zone Set in seconds
	--Zone s	Time delay between step cut-outs in the regulation band under the "-Zone band" Set in seconds
	Step mode	Cut-in and cut-out sequence for compressors 1: Sequential (first in, last out) 2: Cyclic (equalisation of run time)
	k1 Gain K	Displacement to be produced by max. reference signal (10 V) (value is only set, if "Ext.Ref" inputs is used)
	NightRef K	Displacement value for suction pressure in connection with an active night setback signal (set in Kelvin)
	ForcedNght	Forced control for night operation Evaporator reference changed by setting in "NightRef K"

## Compressor Status

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
	1 Cap. %	Actual cut-in capacity on this compressor
	1 Run Time	Compressor's aggregate run time in hours (Zero-setting of the value can be performed under "Output Configuration")
	1 Cut/24 h	Number of compressor starts during the past 24 hours
	2 ...	As above for compressor no. 2 to 9
	Settings	Main Switch

## Condenser Capacity Ctrl.

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
	Req. Cap.%	Reference for condenser capacity
Settings	Pc Ref. °C	Discharge pressure reference in °C
	Main Switch	Function switches:      1: Regulation 0: Controller stopped -1: Service function
	Pc SP °C	Setting of required discharge pressure in °C
	Man.Cap.	Forced control function OFF: No forced control ON: There may be forced control of the condenser capacity
	Man.Cap.%	Forced control function Manual setting of condenser capacity The value is in % of total capacity
	++Zone s	Time delay between step cut-ins in the regulation band over the "+Zone band"
	+Zone s	Time delay between step cut-ins in the regulation band over the neutral zone
	+Zone K	Regulation band over the neutral zone
	NZ K	Neutral zone for discharge pressure in K
	-Zone K	Regulation band under the neutral zone
	-Zone s	Time delay between step cut-outs in the regulation band under the neutral zone
	--Zone s	Time delay between step cut-outs in the regulation band under the "-Zone band"

## Safety Functions

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.% Pc °C	Cut-in compressor capacity in % (of total capacity) Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
Settings	Main Switch	Function switches:    1: Regulation 0: Controller stopped -1: Service function
	Sd Max °C	Max. value of discharge gas temperature (If the value is exceeded, the entire compressor capacity will be cut out)
	Pc Max °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 Pc Max. the entire condenser capacity is cut in)
	P0 Min °C	Min value of suction pressure in °C (If the value becomes less, the entire compressor capacity will be cut out)
	Restart m	Time delay before restart (Applies to the three earlier functions: "Sd Max", "Pc Max" and "P0 Min")
	SH Max K	Alarm limit for max. superheat
	SH Min K	Alarm limit for min. superheat
	SH Delay m	Time delay before alarm for "SH max" and "SH min"

## INPUT Configuration

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.% Pc °C	Cut-in compressor capacity in % (of total capacity) Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %

### Settings can only be made when the MAIN SWITCH input is cut out.

Settings	Main Switch	Function switches:    1: Regulation 0: Controller stopped -1: Service function
	DI1 Type	There are three settings for each input. Define first what the input is to register. Next, the information that is to belong to the input. And finally, a time delay. Alarm input DI 1 0: Input not used 1: Input registers the compressors' safety circuit Compressors no. is selected in the next menu 2: Input registers the condensers' safety circuit Condensers no. i selected in the next menu 3: Other alarm monitoring. (Alarm text is selected in next menu)
	DI1 Dev.No	Type = 1: (see above): Select the compressor no. Type = 2: (see above): Select the condenser no. Type = 3: (see above): Select the alarm text 0: Factory setting. Correct setting to one of the following values: 1: Low liquid level 2: Refrigerant leak 3: Current leak 4: Phase fault 5: Liquid flow switch 6: Air flow switch 7: Speed controller fault 8: Condensate pump fault 9: High condensate level
	DI1 Del m	Time delay from the alarm is registered until executed
	DI ...	As above for DI 2 to DI 9

## OUTPUT Configuration

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
	DO1 Cap. %	Output capacity in relation to the whole system's capacity
DO...	As above for DO 2 to DO 9	

### Settings

**Settings can only be made when the MAIN SWITCH input is cut out.**

Main Switch	Function switches:	1: Regulation 0: Controller stopped -1: Service function
DO1 Type	Relay outputs are used for:	0: Not used 1: Compressor / compressor steps 2: Condenser / condenser steps
DO1 Dev.No	Type = 1: (see above): Select the compressor no. Type = 2: (see above): Select the condenser no.	
DO1 Recy m	Minimum period of time between two successive starts (If the output controls an unloader or a condenser step, the setting will have no effect).	
DO1 ON m	Minimum duration of ON period (If the output controls an unloader or a condenser step, the setting will have no effect).	
DO1 Time h	Reading and adjustment, if applicable, of hourmeter	
DO...	As above for DO 2 to DO 9	

## Service Mode

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %
	P0 Bar	Suction pressure (measured with P0 pressure transmitter)
	Pc Bar	Discharge pressure (measured with Pc pressure transmitter)
	Ss °C	Suction gas temperature (measured with Ss temperature sensor)
	Sd °C	Discharge gas temperature (measured with Sd temperature sensor)
	S6 °C	Temperature measurement (performed with S6 temperature sensor) A display less than -150°C means that the input is short circuited
	Ext.Ref. V	Voltage signal on "Ext.Ref." input
	DI 1	Status of input DI 1. In pos. "ON" the signal is OK, and the controller can regulate
	DI ...	As above for DI 2 to DI 9
	Ext.Main	Status of "Main Switch" input. In pos. "OFF" the regulation is stopped by force
	DO1 Relay	Status of relay output DO 1. In pos. "ON" the relay is operated
DO ...	As above for DO 2 to DO 9	
AKC ON	Status of relay output "AKC ON" OFF: Forced closing of all AKV valves ON: Normal operation of AKC controllers	
Alarm Relay	Status of alarm output. In pos. "ON" the relay is operated, and there is no alarm	
Settings	Main Switch	Function switches:    1: Regulation 0: Controller stopped -1: Service function
	Man. Ctrl.	ON: Manual control permitted PLEASE NOTE! No monitoring When manual setting has been concluded, the setting must be changed to OFF
	DO 1 Relay	Manual operation of relay output DO 1 ON: Relay activated OFF: Relay not activated
	DO ...	As above for DO 2 to DO 9
	AKC ON	Manual operation of relay output "AKC ON" OFF: Forced closing of all AKV valves ON: (Activated) Normal operation
	Alarm Relay	Manual operation of alarm relay ON: Relay activated (no alarm) OFF: Relay not activated

## Alarm destinations

Measurements	AKC Error	When "ON", there is an alarm message. See page 10.
	P0 °C	Suction pressure in °C (measured with the pressure transmitter on the P0 input)
	Comp.Cap.%	Cut-in compressor capacity in % (of total capacity)
	Pc °C	Discharge pressure in °C (measured with the pressure transmitter on the Pc input)
	Cond.Cap.%	Cut-in condenser capacity in %

Settings	Main Switch	Function switches:	1: Regulation 0: Controller stopped -1: Service function
	Network	ON:	When alarms are registered via PC or Gateway printer
		OFF:	When alarm are registered via AKA 21, only

*Set the priority for the following alarm texts (choose between 1, 2 or 0. They have the following meaning:)*

- 1: Alarm at relay output + DANBUSS message
- 2: DANBUSS message only
- 0: No alarm and no DANBUSS message

The individual alarms are explained in more detail on page 10

StandbyMod	(Regulation has stopped)
Rfg.Type	(Changed refrigerant)
Man. Ctrl.	(Regulation is overridden)
No. DI Def.	(DI-input not defined)
P0 Min °C	(Min. value of suction pressure in °C)
Pc Max °C	(Max. value of discharge pressure in °C)
Sd Max °C	(Max. value of discharge gas temperature)
SH max/min	(Alarm limit for max/min. superheat)
DI1 AIdest	(Cut-out in safety circuit DI 1)
DI2 AIdest	(Cut-out in safety circuit DI 2)
DI3 AIdest	(Cut-out in safety circuit DI 3)
DI4 AIdest	(Cut-out in safety circuit DI 4)
DI5 AIdest	(Cut-out in safety circuit DI 5)
DI6 AIdest	(Cut-out in safety circuit DI 6)
DI7 AIdest	(Cut-out in safety circuit DI 7)
DI8 AIdest	(Cut-out in safety circuit DI 8)
DI9 AIdest	(Cut-out in safety circuit DI 9)

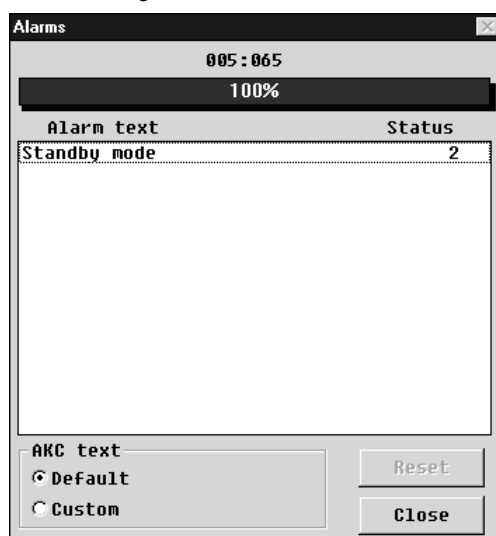
## AKM menu "For DANFOSS only"

This menu contains data and setting values for special internal controller functions.

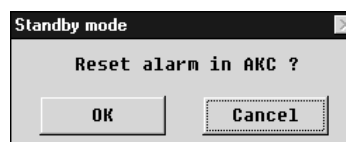
**Do not change the stated values.**

## Alarms

The menu display for alarms shows the active alarms. Dots will appear at the top of the menu for as long as data is being obtained.



Alarms may be acknowledged one by one by selecting one, and then pushing "OK". An Alarm message will now appear, e.g.:



The following alarm messages may occur:

Alarm message	Meaning	Action/cause
P0 Error	Faulty P0 pressure transmitter	Check connection
Pc Error	Faulty Pc pressure transmitter	Check connection
Ss Error	Faulty Ss sensor	Check sensor connection / sensor resistance
Sd Error	Faulty Sd sensor	Check sensor connection / sensor resistance
S6 Error	Faulty S6 sensor	Check sensor connection / sensor resistance
RFG.Type change after power up	Changed refrigerant	Check the selected refrigerant. Regulation with changed refrigerant may not be done until the controller has been de-energised
Discharge temp. too high	Too high discharge gas temperature	Sd higher than max. Sd setting. Wait for temperature to drop
Condensing temp. too high	Too high condensing temperature	Pc higher than max. Pc setting. Wait for temperature to drop
Suction temp. too low	Too low suction pressure temperature	P0 lower than min. P0 setting
Suction gas SH too high	Too high superheat (Ss-P0)	SH higher than max. SH setting
Suction gas SH too low	Too low superheat SH (Ss-P0)	SH lower than min. SH setting
Compr. no ( ) safety cut-out	Signal on terminal DI ( ) interrupted	Check compressor safety circuit
Compr. no ( ) not in auto	Wrong setting of switch on AKC 22H	Put switch in pos. "AUT."
Compr. no ( ) disch temp. cut-out	Alarm from AKC 22H	Check compressor safety circuit
Compr. no ( ) motor prot. cut-out	Alarm from AKC 22H	Check compressor safety circuit
Compr. no ( ) current cut-out	Alarm from AKC 22H	Check compressor safety circuit

Compr. no ( ) oil press. cut-out	Alarm from AKC 22H	Check compressor safety circuit
Compr. no ( ) disch press cut-out	Alarm from AKC 22H	Check compressor safety circuit
Cond no ( ) safety cut-out	Signal on terminal DI ( ) interrupted	Check condensator safety circuit
Low liquid level	Low level of refrigerant	Check refrigerant quantity
Refrigerant leak	Refrigerant leaking	Check the unit that monitors refrigerant leaks
Current fault	Wrong supply voltage	Check earth leakage circuit breaker
Phase fault	Wrong supply voltage	Check supply voltage
Liquid flow switch	Error message from liquid flow switch	Check the flow switch
Air flow switch	Error message from air flow switch	Check the flow switch
Speed controller fault	Speed controller has stopped	Check speed controller/frequency converter
Condensate pump fault	Faulty drip tray pump	Check the pump
High condensate level	High drip tray level	Check the drip tray
RFG.type not selected	No selection of refrigerant	Select refrigerant
Stand by mode	Regulation has stopped	The function switch (Main Switch) is either set in the position "Controller stopped" or "Service function".
Man. Compr. Cap. ctrl set ON	Regulation is overridden	The forced control function for the compressor capacity or the condenser capacity is active.
No DI defined for compressor	A "DI-input" for a compressor is not defined	Define the input under "Configuration of inputs" or set alarm destination at "0".

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