



# Danfoss EKC 347-AKS 4100U Electronic Controller Installation Guide

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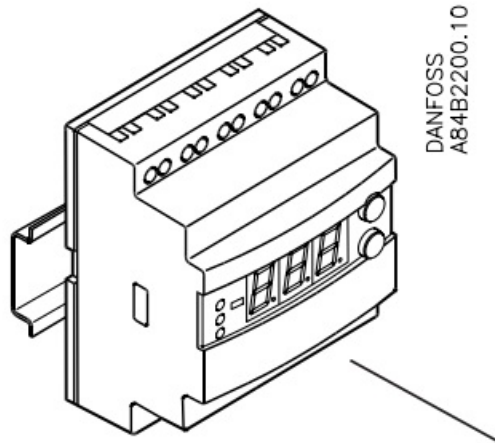


Installation guide  
Electronic controller  
Type EKC 347

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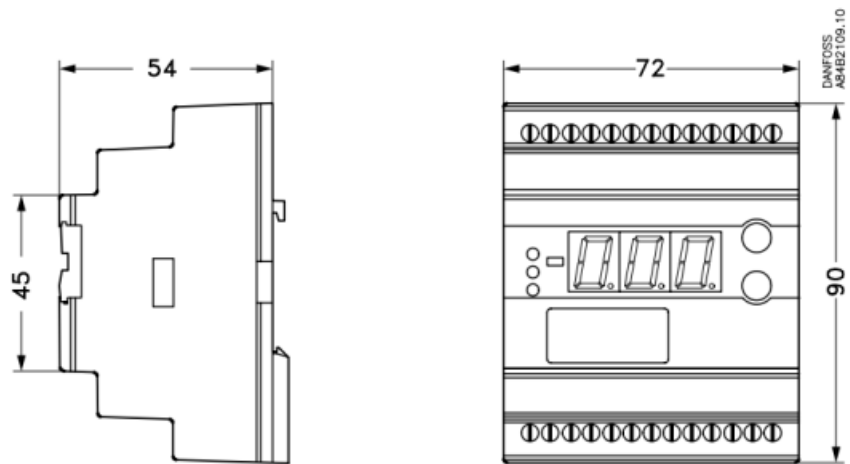
## Identification



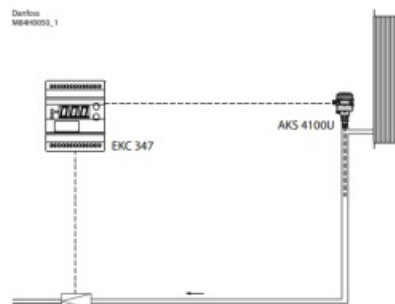
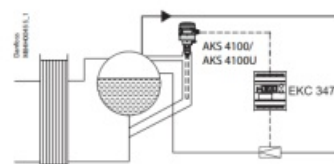
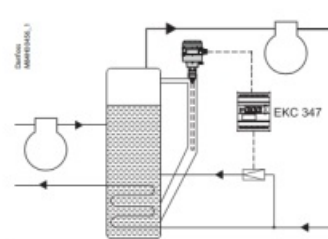
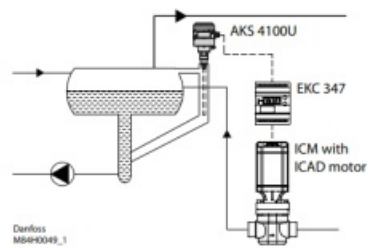
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## Dimensions

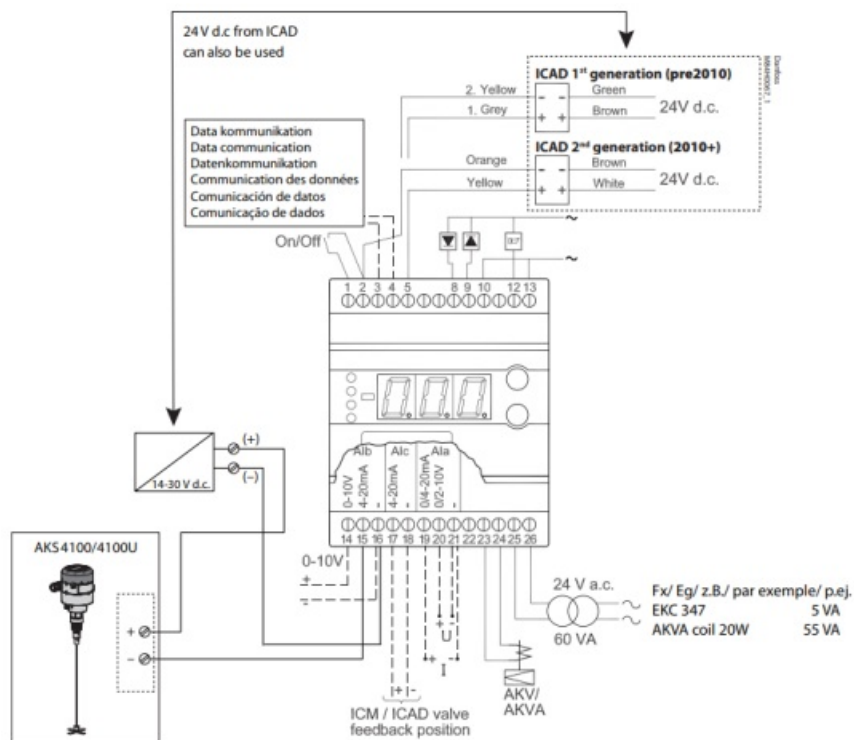


## Principle



Type = AKV / AKVA

## Connection



### Necessary connections

#### Terminals:

25-26 Supply voltage 24 V a.c.

15-16 Signal from level transmitter type AKS 4100/4100U or

14-16 Signal from transmitter 0-10V

23-24 Expansion valve type AKV or AKVA or

2-5 Expansion valve type: ICM with ICAD

1-2 Switch function for start/stop of regulation. If a switch is not connected, terminals 1 and 2 must be shortcircuited.

### Application dependent connections

#### Terminal:

12-13 Alarm relay

There is connection between 12 and 13 in alarm situations and when the controller is dead

8-10 Relay for lower level limit. There is connection between 8 and 10 when the set value is passed

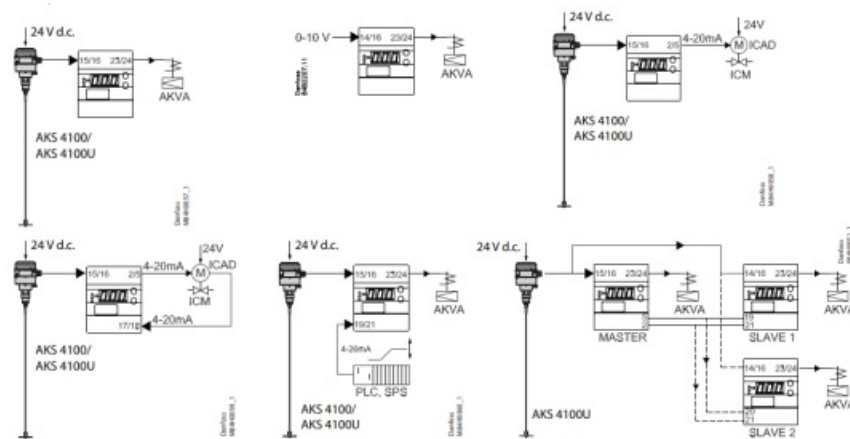
9-10 Relay for upper level limit. There is connection between 9 and 10 when the set value is passed

17-18 ICM valve feedback signal from ICAD 0/4-20 mA 19-21 Current signal or 20-21 Voltage signal from other regulation (for external reference displacement)

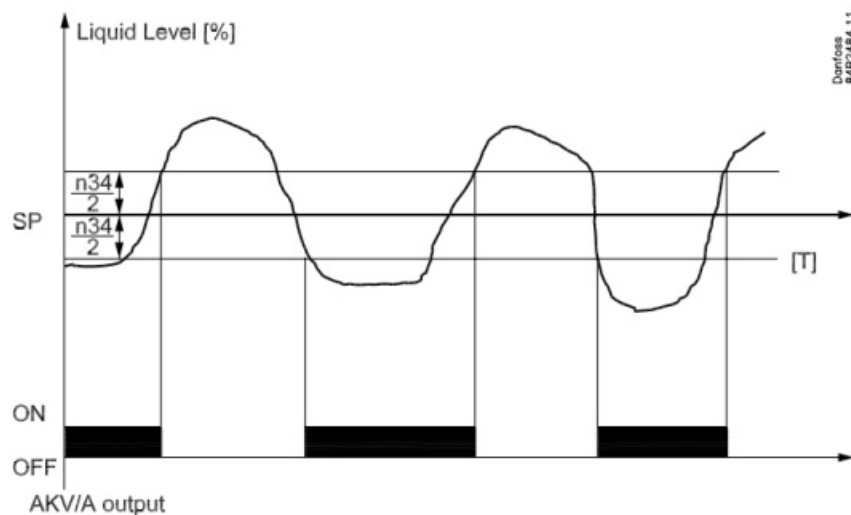
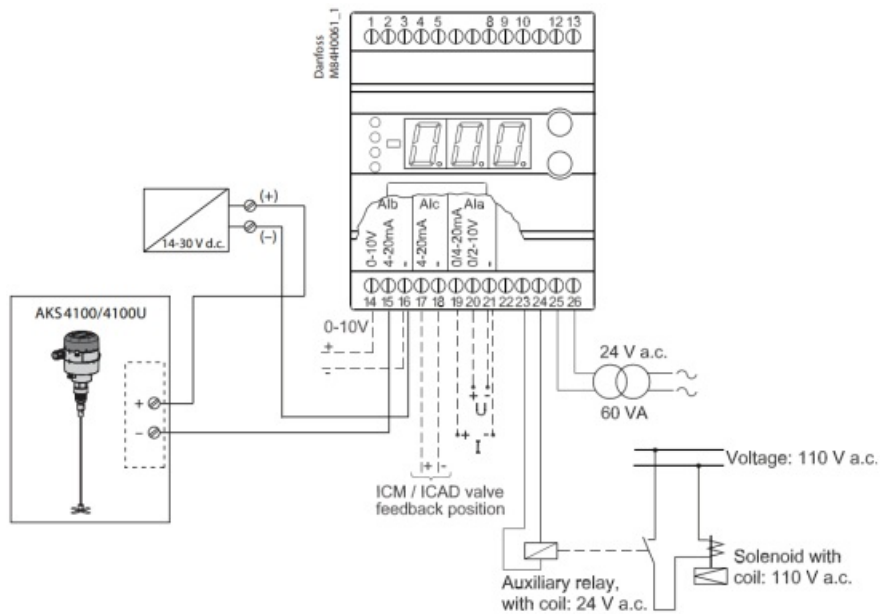
3-4 Data communication Mount only, if a data communication module has been mounted.

It is important that the installation of the data communication cable be done correctly. Cf. separate literature No. RC8AC...

### Connection examples



## EKC 347 – ON/OFF Application. Open/Close solenoid valve with coil 110 V



### ON/OFF application

Beside of modulating PI control EKC 347 does also support ON/ OFF operation with hysteresis.

To ensure this operation:

P.Band must be (n04)=0%//OFF

Hysteresis is given by (n34)

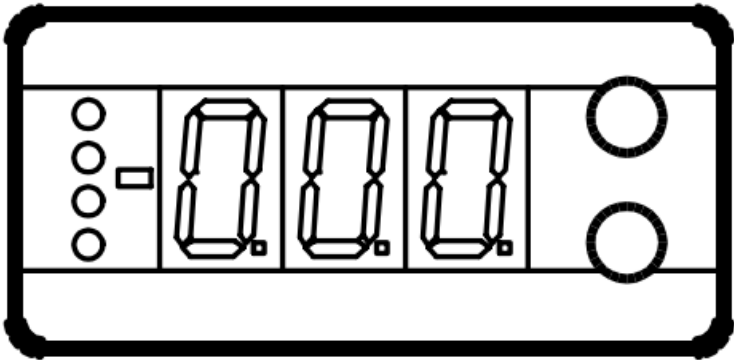
Setpoint as normal procedure. (pushing the upper/lower buttons simultaneously)

Low or High side system. (n35)

Operation

Display

The values will be shown with three digits, and after an operation the controller will return to its standard mode and show the measured liquid level.






Light-emitting diodes (LED) on front panel

There are LED's on the front panel which will light up when the corresponding relay is activated. The upper LED will indicate the valve's opening degree. A short pulse indicates a slow liquid flow and a long pulse a fast liquid flow. The three lowest LED's will flash, if there is an error in the regulation. In this situation you can upload the error code on the display and cancel the alarm by giving the uppermost button a brief push.

The buttons

When you want to change a setting, the two buttons will give you a higher or lower value depending on the button you are pushing. But before you change the value, you must have access to the menu. You obtain this by pushing the upper button for a couple of seconds – you will then enter the column with parameter codes. Find the parameter code you want to change and push the two buttons simultaneously. When you have changed the value, save the new value by once more pushing the two buttons simultaneously.

	Gives access to the menu (or cuts out an alarm)
	Gives access to changes
	Saves a change

Examples of operations

Set reference

1. Push the two buttons simultaneously
2. Push one of the buttons and select the new value
3. Push both buttons again to conclude the setting

Set one of the other menus

1. Push the upper button until a parameter is shown
2. Push one of the buttons and find the parameter you want to change
3. Push both buttons simultaneously until the parameter value is shown
4. Push one of the buttons and select the new value
5. Push both buttons again to conclude the setting

Literature survey:

Manual for EKC 347.....PS.G00.A—  
 Instruction for EKC 347.....PI.RP0.A—  
 Installation guide, “Data communication link  
 for ADAP-KOOL® ” .....RC8AC—

## Menu survey

SW = 1.1x

Function	Pa- ram- eter	Min.	Max.	Fac. s et- tin g
<b>Normal display</b>				
Read the measured liquid level	—	%		50.0
If you wish to see the actual opening degree, give the lower button a brief push	—	%		0
If you wish to set the required setpoint you obtain access by pushing both buttons simultaneously	—	0%	100%	100
<b>Level control</b>				
External contribution to the reference. Cf. also o10. Value is set in %-points.	r06	-100	100	0.0
Start / stop of level control	r12	OFF/0	ON/1	1
<b>Alarm</b>				
Upper level limit	A01	0 %	100%	85
Lower level limit	A02	0%	100%	15
Time delay for upper level limit	A03	0 s	999 s	50
Time delay for lower level limit	A15	0 s	999 s	10
Level alarm limit	A16	0%	100%	20
Delay for level alarm	A17	0 s	999 s	0

<p>The level alarm is linked to:</p> <p>0: Rising level (higher level than A16) 1: Falling level (lower level than A16)</p> <p>2: Same function as if A18=0. When A2 alarm is generated and Relay for lower level limit, gives OFF signal (cut out).</p> <p>3: Same function as if A18=1 When A2 alarm is generated and Relay for lower level limit, gives OFF signal (cut out).</p>	A18	0	3	0
<p>Function for Alarm relay when A1, A2 or A3 alarms are detected.</p> <p>0: Alarm relay to be activated when A1 or A2 or A3 are detected.</p> <p>1: Alarm relay only to be activated when A3 is detected.</p>	A19	0	1	0
<b>Regulating parameters</b>				
P – band	n04	0%/Off	200%	30
I: Integration time Tn	n05	60	600/Off	400
Period time (only if AKV/A valve is used)	n13	3 s	10 s	6
Max. opening degree	n32	0%	100%	100
Min. opening degree	n33	0%	100%	0
Neutral zone (only for ICM valve)	n34	2%	25%	2
<p>Definition of regulating principle</p> <p>Low: On the low-pressure side (valve closes when liquid level is rising)</p> <p>High: On the high-pressure side (valve opens when liquid level is rising )</p>	n35	Low/0	Hig/1	0
<b>Miscellaneous</b>				
Controller's address	o03*	0	60	0
ON/OFF switch (service-pin message)	o04*	OFF	ON	
<p>Define valve and output signal:</p> <p>1: ICM. AO: 4-20 mA</p> <p>2: ICM. AO: 0-20 mA</p> <p>3: AKV/A, AO: 4-20 mA</p> <p>4: AKV/A, AO: 0-20 mA</p> <p>Or if a master/slave function is used:</p> <p>5: AKV/A, MASTER</p> <p>6: AKV/A, SLAVE 1/1. AO:4-20 mA</p> <p>7: AKV/A, SLAVE 1/1. AO:0-20 mA</p> <p>8: AKV/A, SLAVE 1/2. AO:4-20 mA</p> <p>9: AKV/A, SLAVE 1/2. AO:0-20 mA</p> <p>10: AKV/A, SLAVE 2/2. AO:4-20 mA</p> <p>11: AKV/A, SLAVE 2/2. AO:0-20 mA</p> <p>12: AKV/A, SLAVE 1/1. AO:4-20 mA – AO always updated</p> <p>13: AKV/A, SLAVE 1/1. AO:0-20 mA- AO always updated</p> <p>14: AKV/A, SLAVE 1/2. AO:4-20 mA- AO always updated</p> <p>15: AKV/A, SLAVE 1/2. AO:0-20 mA- AO always updated</p> <p>16: AKV/A, SLAVE 2/2. AO:4-20 mA- AO always updated</p> <p>17: AKV/A, SLAVE 2/2. AO:0-20 mA- AO always updated</p>	o09	1	17	1

Define the input signal on terminals 10, 20, 21 (external reference displacement)  0: OFF 1: 4-20 mA 2: 0-20 mA 3: 2-10 V 4: 0-10 V	o10	0	4	0
Language 0=English, 1=German, 2=French, 3=Danish, 4=Spanish, 5=Italian, 6=Swedish. When you change the setting you must also activate o04.	o11*	0	6	0
Set supply voltage frequency	o12	0/50Hz	1/60 Hz	0
Selection of parameter for display and AO (except from when o09=1,2 or 5) If o34 = 0: 0: Liquid level is shown 1: Valve's opening degree OD will be shown If o34 = 1: 0: Liquid level is shown 1: The ICM valve position feedback signal [%] will be shown	o17	0	1	0
Manual control of outputs: OFF: No manual control 1: Upper level relay put in pos. ON 2: Lower level relay put in pos. ON 3: AKV/A output put in pos. ON 4: Alarm relay activated (cut out)	o18	OFF	4	0
Define input signal (level signal) on terminals 14, 15, 16 0: OFF 1: 4-20 mA 2: 0-10 V (also set the voltage values in the next two menus) Read functional description if the connection used is a master/slave function.	o31	0	2	1
Define input signal's lower value for terminal 14, if required	o32	0.0 V	4.9 V	4.0
Define input signal's upper value for terminal 14, if required	o33	5.0 V	10 V	6.0
Define input signal on terminals 17-18 0: Not used 1: ICM mA feedback signal from ICAD connected 2: Not used	o34	0	2	0
<b>Service</b>				
Read liquid level	u01	%		
Read liquid level reference	u02	%		
Read external contribution to the reference	u06	mA		
Read external contribution to the reference	u07	V		
Read current signal on the analog output	u08	mA		
Read status of input DI	u10			
Read valve's opening degree	u24	%		
Read level signal	u30	mA		



Read level signal	u31	V
Read signal from ICM/ICAD	u32	mA
Read signal from ICM/ICAD converted into %	u33	%

\*) This setting will only be possible if a data communication module has been installed in the controller.

#### Factory setting

If you need to return to the factory-set values, it can be done in this way:

- Cut out the supply voltage to the controller
- Keep both buttons depressed at the same time as you reconnect the supply voltage

## Error messages

The controller can give the following messages:		
E1	<b>Error message</b>	Errors in the controller
E12		The external reference contribution is outside the range
E21		Level signal outside the range 1)
E22		Signal from ICM/ICAD outside the range
A1	<b>Alarm message</b>	Upper level limit reached
A2		Lower level limit reached
A3		Alarm level limit reached

1)

If E21 is detected. EKC 347 will force the valve to close or open the valve depending on n35

If Low pressure has been selected. (n35=0)

The valve is forced to fully closed, however if Min. Opening Degree (n33) is higher than 0 the valve will open to the value of n33

If High pressure has been selected. (n35=1)

The valve is forced to fully open, however if Max. Opening Degree (n32) is lower than 100 the valve will open to the value of n32




The Product contains electrical components And may not be disposed together with domestic waste Equipment must be separate collected with Electrical and Electronic waste.

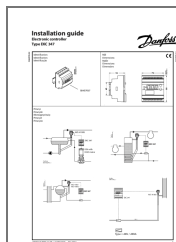
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## Documents / Resources



[Danfoss EKC 347-AKS 4100U Electronic Controller](#) [pdf] Installation Guide  
EKC 347, AKS 4100U, EKC 347-AKS 4100U Electronic Controller, EKC 347-AKS, 4100U  
Electronic Controller, Electronic Controller, Controller

## References

- [User Manual](#)

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