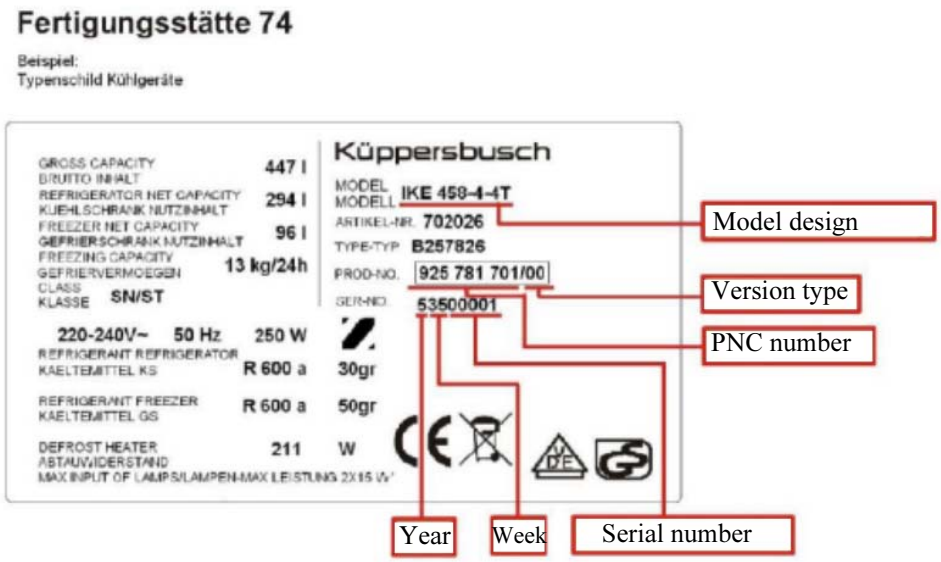
Replacing an NTC sensor

IKEF 238-5, IKEF 248-5, IKEF 308-5 Z3
IKE 309-5-2T, IKE 318-4-2T, IKE 339-0
IKE 458-4-4T, ITE 239-0

Service Manual: H8-74-05

Example of a name plate



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1. Safety

Danger!

Repairs may only be carried out by a qualified electrician!
Improper repairs can be extremely dangerous for the user.

It is essential that you observe the following instructions in order to prevent electric shocks:

- The casing and the frame may be live in the event of faults!
- Touching live components inside the appliance may cause dangerous currents to flow through your body!
- Disconnect the appliance from the mains prior to carrying out any repair work!
- When inspecting live parts, a residual current circuit breaker must always be used!
- The earthed conductor resistance must not exceed the resistance specified in the standard! It is vital for ensuring the safety of persons and the functioning of the appliance.
- On completion of repairs, an inspection must be carried out in accordance with VDE 0701 [Association of German Electrical Engineers] or in accordance with the corresponding regulations for your country!

Attention!

Make sure you observe the following instructions:

- The appliances must be disconnected from the mains prior to all repairs. If inspections must be carried out on live appliances, make sure you use a residual current operated device.

Sharp edges: Use protective gloves.

Components may be electrostatic!
Observe handling precautions!

2. Temperature sensor faults

If the NTC temperature sensor develops a fault, the corresponding symbols will be shown in the displays of the various electronic devices.

2.1 Fault checking

Attention!
Repairs may only be carried out by qualified electricians or specialists!

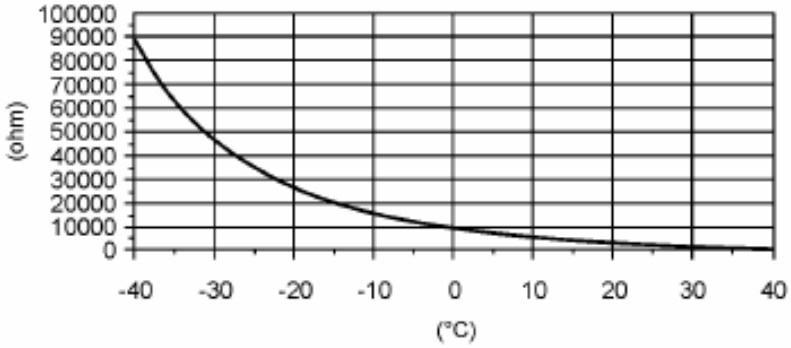
Attention!
Disconnect the appliance prior to commencing with work!

1. Pull the plug out of the socket and keep the doors closed for as long as possible.
2. Switch off the temperature sensor consumers in the electronics system.
3. Position a thermometer near the temperature sensor or so that it makes contact with the temperature sensor (place the thermometer in the centre zone of the evaporator plate for evaporator sensors).
4. At the same time measure the resistance at the ends of the connector.
5. Compare the reading of the temperature and the temperature of the resistance measured (see following chart).
6. The temperature sensor will not need to be replaced if the two temperatures vary by a max of + or - 10°C. In this case the contact may be faulty, so please check the wiring of the sensor and the contacts of its connector with the electronic unit. Otherwise the temperature sensor will be defect and will need to be replaced. Please refer to the table of appliances shown on page 8 for the correct order number.
7. Repeat items 3 to 6 for each individual temperature sensor.

2.2 Features of the temperature sensor

Temperature in °C	Resistance (ohms)	Temperature in °C	Resistance (ohms)
-40	90721	-30	47606
-39	84867	-29	44735
-38	79431	-28	42056
-37	74381	-27	39556
-36	69686	-26	37221
-35	65320	-25	35039
-34	61258	-24	32999
-33	57475	-23	31092
-32	53952	-22	29307
-31	50668	-21	27637

Temperature in °C	Resistance (ohms)	Temperature in °C	Resistance (ohms)
-20	26072	11	5087
-19	24600	12	4851
-18	23221	13	4626
-17	21928	14	4414
-16	20715	15	4213
-15	19577	16	4022
-14	18509	17	3840
-13	17506	18	3668
-12	16564	19	3505
-11	15678	20	3350
-10	14845	21	3202
-9	14059	22	3062
-8	13320	23	2929
-7	12624	24	2802
-6	11969	25	2682
-5	11352	26	2567
-4	10770	27	2458
-3	10222	28	2354
-2	9705	29	2255
-1	9218	30	2161
0	8758	31	2071
1	8322	32	1985
2	7911	33	1904
3	7523	34	1826
4	7156	35	1752
5	6809	36	1681
6	6481	37	1614
7	6171	38	1549
8	5877	39	1488
9	5600	40	1429
10	5337		


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
(ohm)
-40
-30
-20
-10
0
10
20
30
40
(°C)

3. Schedule of sensor installation

Defect NTC temperature sensor																		
Model	PNC	Date																
As at 09.2006			Refrigerator air			Refrigerator evaporator			Air 0°C			Freezer air					
			Kit no.	Proj. position	Spare part. no.	Kit no.	Proj. position	Spare part. no.	Kit no.	Proj. position	Spare part. no.	Kit no.	Proj. position	Spare part. no.	Kit no.	Spare part. no.	Note
IKEF238-5	92345700700	20040514	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF238-5	92345700700	20040702	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF238-5	92345700700	20050520	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF238-5	92345700700	20050715	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF238-5	92345701500	20060331	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF238-5	92345701600	20060623	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF248-5	92352401000	20040514	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF248-5	92352401000	20040702	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF248-5	92352401000	20050513	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF248-5	92352401001	20051028	C		433723	C		433723	D		433724	Kit not available			Not available		
IKEF308-5Z3	92570365900	20050311	C		433723	C		433723	B	1	433725	B	1	433725	Not available		2 compressors
IKEF308-5Z3	92570365900	20060414	C		433723	C		433723	B	1	433725	B	1	433725	Not available		2 compressors
IKEF308-5Z3	92570367000	20060424	C		433723	C		433723	B	1	433725	B	1	433725	Not available		2 compressors
IKE309-5-2T	92569665500	20050415	B	4	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE309-5-2T	92569666000	20060414	B	4	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE309-5-2T	92569666100	20060609	B	4	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570065900	20010216	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570065901	20010926	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570065902	20030124	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570065903	20030606	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570068000	20040402	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570068001	20040514	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570068002	20040924	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-4-2T	92570068003	20050225	B	2	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-5-2T	92570166800	20060324	B	5	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE318-5-2T	92570167000	20060602	B	5	433725	Kit not available			Kit not available			Kit not available			Kit not available		
IKE339																	
IKE458-4-4T	92578170100	20040910	B	8	433725	Not available			Not available			D		433724	C	433723	
ITE239-0	92275471300	20060519				Not available			Not available			B	3	433725	Not available		

4. Projection positions

Position 1

Position 2

Position 3

Position 4

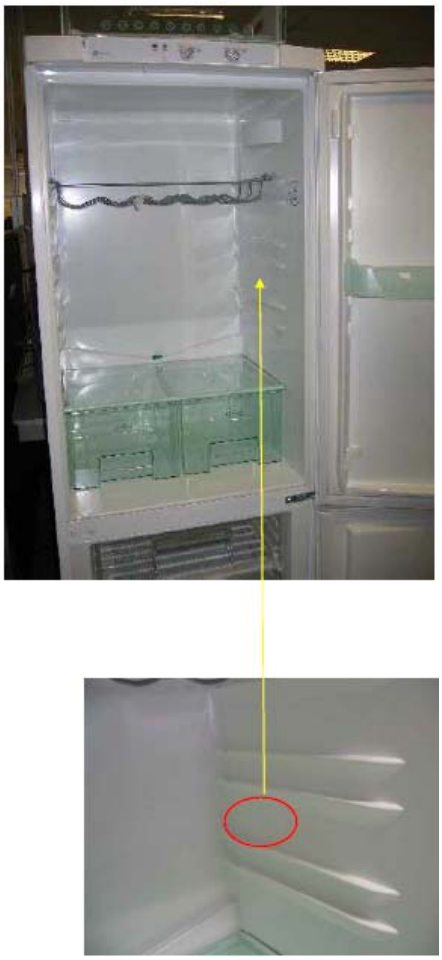
Position 5

Position 6

Position 7

Position 8

Position 9



5. Instructions for replacing a sensor

5.1 Kit B - spare-part no. 43 37 25

The service kit consists of:

- Temperature sensor for the service
- Housing cover for temperature sensor
- Screw cover
- Fixing screw
- 50 mm heat shrink tubing
- 2 x 15 mm heat shrink tubing
- Instruction sheet

***Warning*!**

Unplug the appliance, before carrying out the operations!

Please replace a defect sensor as follows:

1. Identify the indentation on the compartment wall (see figure and the section on projection positions).

2. Drill a 10 mm hole in the compartment just next to the indentation.

3. Cut the cable of the faulty temperature sensor.

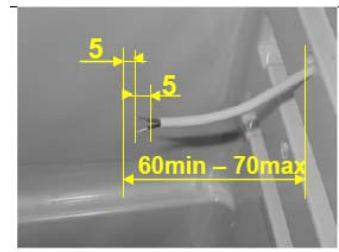
4. Take the cable with some pliers (note: the faulty sensor must not be removed from the inside of the compartment).

4

5. Pull out the cable of the temperature sensor.

5

6. Cut and remove the sleeve according to the measures shown in the figure.



6

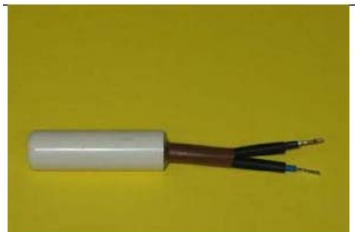
7. Solder the two cables.

7

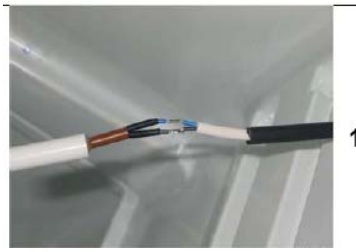
8. Insert the cable into the 50 mm heat shrink tubing.

8

9. Insert the cables of the new temperature sensor into the two 15 mm heat shrink tubings.


9

10. Solder the cables of the new temperature sensor with the cables of the cable pulled out before.


10

11. Warm up the two heat shrink tubings to insulate the 2 soldered junctions.


11

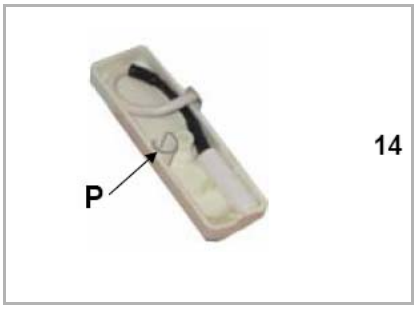
12. Warm up the 50 mm heat shrink tubing to insulate the cables with the junctions.


12

13. Fit the new sensor into the cover of the housing and fit the cable as shown in figure.


13

14. Insert the element P in the hole previously drilled in the compartment (where the cable comes out).



14

15. Fit the cover in the rectangular seat in the compartment (if no seat is there, place the cover so as not to interfere with the drawers and/or with the shelves) and fix it with the screw supplied with the kit.


15

16. Fit the screw cover.


16

5.2 Kit C - spare-part no. 43 37 23

The service kit consists of:

- Temperature sensor for the service
- 50 mm heat shrink tubing
- 2 x 15 mm heat shrink tubing
- Instruction sheet

***Warning*!**

Unplug the appliance, before carrying out the operations!

Please replace a defect sensor as follows:

1. Remove the shelves and/or the drawers. Remove the protection grid of the temperature sensor.

   Note! **The protection grid might be different according to the appliance.**

1

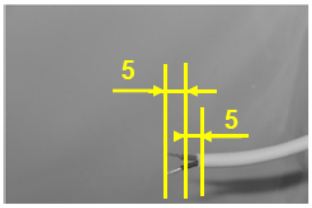
2. Remove the faulty temperature sensor.

2

3. Cut the cable of the faulty temperature sensor.

3

4. Cut and remove the sleeve according to the measures shown in the figure.



4

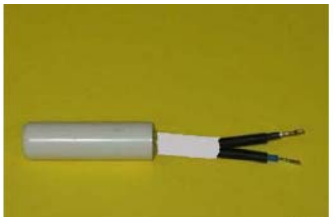
5. Solder the two cables.

5

6. Insert the cable into the 50 mm heat shrink tubing.


6

7. Insert the cables of the new temperature sensor into the two heat shrink tubings.


7

8. Solder the cables of the new temperature sensor with the cables of the cable pulled out before.


8

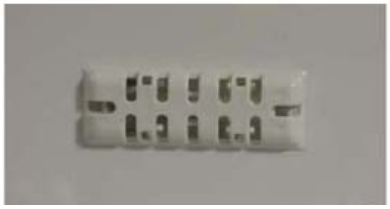
9. Warm up the two heat shrink tubings to insulate the 2 soldered junctions.


9

10. Warm up the 50 mm heat shrink tubing to insulate the cables with the junctions.


10

11. Fit the new sensor into its original housing.



5.3 Kit D - spare-part no. 43 37 24

The service kit consists of:

- Temperature sensor for the service
- 50 mm heat shrink tubing
- 2 x 15 mm heat shrink tubings
- Instruction sheet

***Warning*!**

Unplug the appliance, before carrying out the operations!

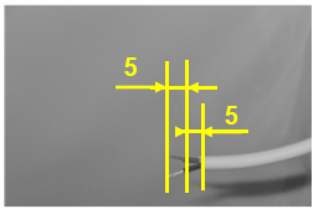
Please replace a defect sensor as follows:

1. Remove the shelves and/or the drawers. Access the faulty temperature sensor.

   Note! **The support of the temperature sensor might be different according to the appliance.**

2. Cut the cable of the faulty temperature sensor.

3. Cut and remove the sleeve according to the measures shown in the figure.



3

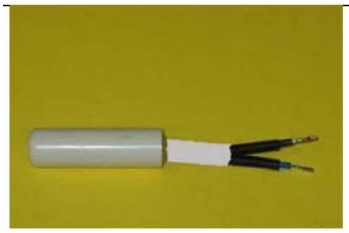
4. Solder the two cables.

4

5. Insert the cable into the 50 mm heat shrink tubing.

5

6. Insert the cables of the new temperature sensor into the two 15 mm heat shrink tubings.



6

7. Solder the cables of the new temperature sensor with the cables of the cable pulled out before.

7

8. Warm up the two heat shrink tubings to insulate the 2 soldered junctions.


8

9. Warm up the 50 mm heat shrink tubing to insulate the cables with the junctions.


9

10. Fit the new sensor into its original housing. Reposition the protection grid of the temperature sensor.

Note! **Place the cable so that it doesn't get in contact with the grid's hooks shown in the figure, in order to avoid damaging the cable when fitting the grid.**


11