SALLY

Transcript

[00:00] Speaker 1:
It.

[00:28] Speaker 2:
So I did a print out. Who wants to have it in paper?

[00:35] Speaker 3:
This is the.

[00:36] Speaker 2:
I'm sorry, this is the test report printed out.

[00:39] Speaker 3:
Sure, I'll have one. I can share that. I think you have.

[00:56] Speaker 1:
So we have it on the screen.

[00:57] Speaker 3:
Yes, I hopefully you receive the comments that I forwarded to Alexander.

[01:02] Speaker 1:
Yeah, we get it. Got it.

[01:04] Speaker 3:
You got it.

[01:05] Speaker 1:
And check intern.

[01:07] Speaker 3:
Okay.

[01:10] Speaker 1:
But I could only show no one.

[01:12] Speaker 2:
I will open.

[01:13] Speaker 3:
I will open the comments so that Muslim, your first. Your first comment is

that of course we need an abbreviations of everything that you have provided in this test. Because if you go through your testing, you have. You have written U V M E M. You don't know what is the definition of each of them. So we will go through them slowly and then you can understand the. For the resistance of the measurements of oiling page six. Okay, we have one comment coming from our engineering. It says the validation of winding resistance with data sheet required and justification for deviation result. Srikant, I think this was put from your side.

[02:32] Speaker 4:
Yeah. So this value what is coming from the result and the data set. There is a difference here. So just because we understand that data set what is defined that is the basis for design the motor. And okay, as per ic there is a variation range allowed. So I have compared to the data set value. So.

[03:02] Speaker 3:
So can you give us an example of where is the deviation that you're seeing?

[03:07] Speaker 2:
Yeah.

[03:07] Speaker 4:
If you open the data set.

[03:09] Speaker 2:
Yeah.

[03:28] Speaker 4:
And where is the commented file?

[03:51] Speaker 3:
It.

[04:18] Speaker 1:
Yeah.

[04:19] Speaker 4:
So I think the difference is page six of 78.

[04:23] Speaker 3:
Yeah. This is the longest report. Yeah.

[04:26] Speaker 1:
And on the data sheet you know where the resistance.

[04:29] Speaker 3:
What is it mentioned?

[04:30] Speaker 5:
You can. You can go to the live page.

[04:34] Speaker 1:
Oh, for the last page. Yes.

[04:40] Speaker 5:
There is a state of resistance in relative units 0.00457 and when you multiply it by 9.5 you get 0.043 ohms. And if you go back to the report, there is indicated 0.068 ohms. So I think this is a question.

[05:08] Speaker 2:
Yes.

[05:12] Speaker 3:
So yeah, that's the question we want to know. The deviation is showing here is different than the one that is provided in the data sheet.

[05:17] Speaker 4:
Because you know, based on this we have done our calculation for system studies. Now if we change these values first.

[05:33] Speaker 2:
So we. We are talking about different things. This is from the manual or from the electrical data sheet. It's this one phase diagram. And now we are measuring each single phase. So you cannot compare the values directly. So we are having. Forget it.

[06:09] Speaker 4:
But you can do equivalence. You can do A calculation and you can match.

[06:12] Speaker 3:
Okay.

[06:13] Speaker 4:
You are doing one winding, you can do three and you can calculate and tell what is the overall value for the impedance.

[06:21] Speaker 2:
Correct.

[06:22] Speaker 4:
Just to match with the data set.

[06:24] Speaker 2:
So this. This is not the.

[06:26] Speaker 4:
But your PT100 is one bonding wise.

[06:28] Speaker 2:
Right.

[06:29] Speaker 4:
One winding track reminding third winding.

[06:33] Speaker 1:
Is.

[06:33] Speaker 4:
Showing the value for single winding. So why this is different from this? Whatever he is telling is correct.

[06:42] Speaker 1:
This is overall impedance value 1 is the overall impedance. And here we have the single ones for the test report. But this is also. We only do one data for the calculation and verification. Because on the data sheet we have the equivalent values for the motor. And these are now the measurement individual values for each wind. The other one is the combined values which you can use for studies. And here. But there's no explanation or no verification between these two values. No.

[07:59] Speaker 2:
Yeah.

[07:59] Speaker 4:
No, but what we understand when you're doing a measurement it is giving for one phase.

[08:04] Speaker 2:
Correct.

[08:05] Speaker 4:
Because all phase. Phase is connected.

[08:07] Speaker 2:
Correct.

[08:07] Speaker 4:
Or you are doing only one certain one phase is connected. Correct one.

[08:11] Speaker 1:
Here we have all three phases measurement here.

[08:15] Speaker 2:
Yeah, we. So the. The terminal Terminal U1 minus V1. This is a measurement from connection point U to V1V. So you have a star point inside of the motor. It's connected and therefore you are measuring two windings in series.

[08:42] Speaker 3:
And the one that you provided for the data sheet, it is sync. That's what you're trying to say.

[08:47] Speaker 1:
No, it's a calculated one for the equivalent. Not comparable to the measured values.

[08:56] Speaker 2:
No, if you.

[08:58] Speaker 1:
There's no comparison for the.

[09:01] Speaker 2:
For the grid operator. So for the. If you make a grid design, this is a consumer, the motor is a consumer. And by this you can use these values to represent the motor in the grid side. So by these values with resistances you can calculate the behavior during startup and operation. You calculate the rated current and the starting current. Therefore you have the different values for.

[09:40] Speaker 1:
Be careful. For this one we have a starting converter. So it's not a direct online starting. So for starting it's only later on for after starting. You can take this for operation.

[09:54] Speaker 3:
But you're starting. Yes, you're starting through a converter. However, you should also be maintained at this point specific value. But my question is right now. So this values is the one that should be done the electrical studies on the 0.06 or the 0 or the 1 provided in data she data sheet.

[10:08] Speaker 2:
No, they. They are not in the data sheet.

[10:10] Speaker 4:
No, these are not.

[10:12] Speaker 1:

But we have the equivalent circuit diagram is a data sheet what can be taken for the studies?

[10:18] Speaker 6:
Studies?

[10:18] Speaker 4:
The data set values we are taking for studies. But our question is how to validate those data set values from the measurement or testing result. Why the variation?

[10:29] Speaker 3:
No, the variation is explained. But how can you convert it?

[10:31] Speaker 4:
Yeah, how we can convert because we need to. We have a name plate and this impotence value will go to the ice built data also. So we need to validate the measure and the data set values. How we can correlate this value?

[10:44] Speaker 3:
Is there an equation? Okay, we understand that this one, that this one is for your study. How you imagine an individual. And this is the one that's provided in your data sheet. However, how can we cross check it? How can we validate the values that you have provided here in the data sheet with the values that you have measured? You understand my point?

[11:03] Speaker 2:
I. I don't know if it's necessary to do that. So we are having internal.

[11:11] Speaker 3:
Why wouldn't it be necessary? No, we need it because this is how our electrical studies is done.

[11:16] Speaker 4:
Our design. Yeah, because you know the name plate, if you see your name plate for the motor needs to define the reactance value as in the reactance. So when you define the reactance value in the name plate, that has to be validated from your actual. What you made the motor, not from the data set.

[11:34] Speaker 2:
Yes.

[11:43] Speaker 4:
Data set can be revised. We need to know how to develop. Because if you

see the name we commented to remove the implant and that calculation for system. What about the G? I will validate my electrical network. It is working or not. I not telling them define the imp X but their impotence is not match documentation.

[12:55] Speaker 6:
Whether you want to fix a document.

[12:59] Speaker 4:
If there is a measure, then we have to do whatever the equivalent is. We're just trying to understand.

[13:29] Speaker 3:
Well, we're trying to understand now. This is why we have time to.

[13:31] Speaker 1:
Measure only this way. What we measure now is as explained. We need this to calculate later on the efficiency of the motor.

[13:41] Speaker 3:
Okay.

[13:42] Speaker 1:
And there we have then the comparison between the cold and the warm resistance.

[13:49] Speaker 2:
Yeah.

[13:50] Speaker 1:
For the heat goes inside the calculation for the efficiency.

[13:55] Speaker 4:
Efficiency.

[13:55] Speaker 1:
And the efficiency is then the acceptance criteria that we have to meet. That we have I think 70.7% for the efficiency of the motor. This is the important thing. Other thing is the heating up of the motor that we are in the range for class B for heating up of the motor. Therefore, we need also this code resistance to calculate it later on after the heat ones with the warm ones. And the cosiness is also then resulting from this from the test? From. From the test. So these are then the three important things what we have to guarantee for the motor. But there's no special especially value or a comparison to this equilibrium circuit diagrams and the measurement waves. And unfortunately I'm. I'm not such a motor expert to make this

correct.

[15:00] Speaker 4:
From motor acceptance point of view, that is a criteria. But also this is the impedance value which you need to put into our name plate and your circuit diagram which we need to use. So that data we need to validate what you are going to put into your nameplate or drawings for equivalent circuit for the motor. For motor acceptance, there is no doubt we are going to follow what we told efficiency and power factor values based on that and losses that are going to measure. And we. You have given the losses in your data set we will validate with that efficiency also will vary. So just we are understanding from the impedance point of view how we can find out the relation between the data set equivalent rest impedance and the individual winding resistance so that we can validate both values what is defined there. So you can think of. No need to answer now we'll see how we can. Or you can. You can ask someone.

[16:04] Speaker 3:
Yeah. If you have someone who is technical.

[16:08] Speaker 4:
How to convert into data sets of this.

[16:11] Speaker 3:
Yeah. If you have someone who is technical who can actually convert it from your measurements to actual data sheet values, it could be this will. This will solve the problem because it's only. I think it's an equation that needs to be done.

[16:23] Speaker 4:
Or you have to measure the resistance as per your equivalent circuit what you have shown in the data set.

[16:31] Speaker 1:
Yes, but we begin check later.

[16:34] Speaker 2:
We give you the answer later.

[16:36] Speaker 3:
Correct.

[16:37] Speaker 4:
Maybe you can go the next one.

[16:39] Speaker 3:

Yes. So next one is one that you have the heat resistance values we identified for motor M MTB. MTB as discussed, validate the 9.0 9.8 ohm. So I don't know what is happening.

[16:52] Speaker 4:
I think already we discussed this point while he was showing this.

[16:56] Speaker 1:
So I think we could.

[17:01] Speaker 4:
One is one is the space heater.

[17:04] Speaker 7:
In the motor and the other burst MTB and ntb. We have to change the description for this final test.

[17:11] Speaker 3:
You have changed the restriction description.

[17:16] Speaker 7:
It's now more clear.

[17:20] Speaker 3:
My concern is Thomas as well that I want to know for each of your testing because you have many values in the MTB and the MTB you have different resistances that you're imagining. Correct.

[17:30] Speaker 7:
One is 270 and one is 285.

[17:33] Speaker 3:
So how can we identify each of them? Identification because they're all showing SPT1.

[17:39] Speaker 4:
I think you have to push the pattern.

[17:40] Speaker 7:
The main terminal box is the last one, the NTB is the second one and the main space heater is 9.8 ohms. So it's quite clear to see.

[18:00] Speaker 2:
The.

[18:00] Speaker 4:
9.8 to heat is for the main space heater.

[18:06] Speaker 7:
It's for motor. The other boats are smaller, they have energy.

[18:14] Speaker 4:
I think you need a remote control. It went down power.

[18:24] Speaker 8:
Inside the motor and going around.

[18:37] Speaker 4:
Because so high temperature. So you are putting.

[18:42] Speaker 8:
It's simpler and because it's self regulating you don't need to have any weight control. As the motor heats up the it drops down powers.

[19:10] Speaker 7:
But this is the new main terminal box, this the NTB and this is the.

[19:16] Speaker 1:
For the 81 we can make a remark.

[19:19] Speaker 4:
Yeah.

[19:21] Speaker 1:
It'S called.

[19:22] Speaker 7:
The German word is Hauptglimkasten. Now in the, in the text you have seen downstairs we can, we can have a look. And that's the main terminal box and that's the entity I don't know.

[19:37] Speaker 3:
And.

[19:37] Speaker 7:
That'S clear and there will be a statement of that.

[19:40] Speaker 3:
So you will show it.

[19:41] Speaker 1:
We will make a remark.

[19:43] Speaker 3:
Your maker, Mark. So this is MTB and this is your mtb. Yeah.

[19:47] Speaker 1:
Okay, let's move to a.

[19:55] Speaker 4:
I have.

[19:55] Speaker 5:
One question regarding these resistances. So power rating of the MTB and mtb heater is 0.2kW. And when you divide the nominal voltage squared with the resistance you get the value of 0.2 kilowatts. But when you divide 9.8 ohms with the squared nominal voltage you're getting near 6 kilowatts.

[20:34] Speaker 2:
The difference will be the temperature. That's my estimation. And if the heater is heating up the resistance will increase. So this is the cold resistance.

[20:48] Speaker 3:
And.

[20:49] Speaker 2:
The resistance during normal operation will be much higher.

[20:56] Speaker 8:
Okay, but this won't work during normal operation. Basically the heater will in the main motor it won't work during normal operation.

[21:03] Speaker 2:
It's only supposed to work normal operation of the heater.

[21:06] Speaker 3:
Oh, okay.

[21:08] Speaker 2:
So it's a temperature depending resistance.

[21:12] Speaker 4:
But his question is coming 6 kilowatt. Actually it is 1.4 kilowatt aspect.

[21:17] Speaker 5:
So yes, in the data sheet this.

[21:19] Speaker 2:
Week I, I measured a lamp, a light and took the resistance and I noticed the same. So the temperature during operation of the, of the light is 2000 3000° and then the resistance will be much higher.

[21:39] Speaker 4:
So what you are saying this is 20°. Sorry, what is the temperature for this?

[21:44] Speaker 3:
20° ambient temperature.

[21:47] Speaker 4:
20°.

[21:48] Speaker 3:
Yeah, I don't know.

[21:49] Speaker 1:
Right. But it's not energized. So it's only. The measure is now the resistance of the.

[21:58] Speaker 2:
Without operation.

[21:59] Speaker 1:
Without operation. So we have no voltage on the terminals of the heater. So it's only the resistance of the system without voltage. When you have, when you have. We have to. I don't know if it's possible to check the power of the resistor when.

[22:21] Speaker 3:
We have power on it does not answer the question.

[22:25] Speaker 4:
Yeah, because if temperature goes high.

[22:31] Speaker 2:
If the heater is working, you would have a different value than this measured value here. You cannot measure during operation. And depending on the temperature, this device has a different resistance. So I don't know the operating temperature of the heater. I think you have 130, 150 degrees to heat up the whole ambient of the motor. You need a high power and therefore you have a high temperature. You cannot heat with 20 degree heating heat heater temperature. The, the ambient to 20 degree. It doesn't work. So you need much more temperature and therefore. So you have a high during the consumption of energy. It won't go over 1.4kW, 1.4kW total during the consumption. Okay, so and, and by, by this and together with the voltage you can calculate the resistance during operation. But this is. This is the resistance value taken from the device in cold condition and this will be compared with the manufacturer's

value. So we buy a heater from third party and we are getting. This is fine.
[24:03] Speaker 8:
We just want to make sure that if you. You said it's 1.4 kilowatts that it's not 6 kilowatts in the end.

[24:10] Speaker 2:
Yeah.

[24:11] Speaker 4:
Just one question. Which heater you are? I think what youing is a heat tracing cable, correct?

[24:17] Speaker 8:
It is not a heater, it's a heating cable.

[24:18] Speaker 2:
Right?

[24:19] Speaker 4:
Heating cable.

[24:19] Speaker 1:
And yes, you see we have for the thermal box we have the gdk. Yes, for the thermal boxes, yes.

[24:29] Speaker 8:
But for the main motor heating cable and vent.

[24:33] Speaker 6:
I checked.

[24:35] Speaker 2:
Yeah.

[24:35] Speaker 4:
Which invent cable 15 something.

[24:38] Speaker 8:
We have the data sheet.

[24:40] Speaker 4:
Yeah, Please can you see from the invent I can find out what is the 15 XTV2C. Oh, 15 XT. Yeah, yeah. We have used many this in Kazakhstan.

[24:55] Speaker 5:
But its power rating depends on the length many.

[24:58] Speaker 4:
It is very again very big design.

[25:03] Speaker 2:
Did you say it's a good design or a bad design?

[25:04] Speaker 4:
No, it's good design. We are using where we have. We have, you know, specialized specialized for different heat tracing requirement. Maybe we can check what is the length of this cable. So that will.

[25:49] Speaker 2:
Over there.

[26:16] Speaker 4:
Too many things.

[26:42] Speaker 1:
So maybe.

[26:45] Speaker 4:
We can check what is the total length of this 50 max TV. And based on that we have to see when at that temperature, when it is operating, what is the power.

[26:57] Speaker 3:
But that does not answer the question.

[27:00] Speaker 4:
Yeah, because they not able to answer. So we have to find out how to.

[27:07] Speaker 2:
Because this is.

[27:08] Speaker 3:
This is measured at no rule. There's nothing operating at all.

[27:10] Speaker 1:
Nothing.

[27:11] Speaker 3:
Nothing at all. And once it operates, it will go higher. So how come you are saying that it is maximum at 1.2kW? I don't understand what do you mean by.

[27:25] Speaker 5:
So the consumption of the heater is 1.4kW at indicated in the. Yes, but if

you consider only this resistance when you energize it on 20 degrees it can be up to 6kW and then the resistance will start to increase and the power will start to decrease.

[27:57] Speaker 3:
So you want to understand the correlations and understand.

[27:59] Speaker 2:
So I think it should be.

[28:00] Speaker 5:
I'm interested to see what is the exact power consumption. This is probably something TGN needs to. To confirm and to know.

[28:09] Speaker 4:
Yeah. So now if we know the heat tracing cable type and length, then we'll able to find out. So we'll validate based on that. Because I think that also they will do if they want to check.

[28:21] Speaker 3:
So.

[28:22] Speaker 4:
So what you know, you already told 15XTB and maybe we need to check what is the overall length. And based on that we'll calculate.

[28:29] Speaker 8:
Lucy, can we find out what the length of the heating cable is inside the motor?

[28:47] Speaker 3:
It is one cross sectional area as well for material common. So it is common. So there's nothing maybe to use a different.

[29:41] Speaker 4:
Is.

[30:07] Speaker 8:
1.4 constant power. But it's not constant power.

[30:14] Speaker 2:
Sorry, it's not constant power.

[30:16] Speaker 1:
Right.

[30:17] Speaker 2:

What is constant power?
[30:18] Speaker 3:
What do you mean heating power?

[30:19] Speaker 8:
It says 1.4kW constant power.

[30:23] Speaker 3:
Right.

[30:23] Speaker 2:
But yeah, it's constant. If. If you keep the voltage constant, it will always have this. This. This power.

[30:36] Speaker 4:
Depending on that voltage. So length is not here that we will see how much is the length and then we can.

[30:43] Speaker 1:
That's constant power.

[30:47] Speaker 4:
1.4. He's telling constant power only with respect to 15x TB. So depending on temperature this will. That's why it's not constant. 1560 B is a circular. If it is operating, it will give that much power all the time. That is the problem. Heating power. Heating, not electric heating power.

[31:14] Speaker 3:
So if you have known the length of the case, how is this correlate?

[31:18] Speaker 4:
Just all validate what they are writing 1400. And if you know the length, it is defined in the catalog various standard this much watt per meter. So I'll just multiply and see this is the same one.

[31:27] Speaker 3:
Oh, okay.

[31:28] Speaker 4:
How much output and how much.

[31:29] Speaker 8:
So we have like for 80 degrees, we have like 30 watts per meter.

[31:36] Speaker 4:
So if you know the length, we'll validate it.

[31:38] Speaker 3:
That's what. Okay, so also the next point right now it says identify PT100RTD number against each test result. Example 1 or 1 1.

[31:52] Speaker 1:
Or here you see the terminals, for example, from the documentation where which resistor is connected. There we have the rgds.

[32:38] Speaker 3:
And yeah.

[32:45] Speaker 7:
You have seen in the video and the camera, you could see that people follow the secrets.

[32:51] Speaker 3:
Yes, this is the one that we are trying to get.

[33:12] Speaker 2:
So this is a relation between the sensors and the phases. The phase sequencing. And on this page on. And here you have the sensors together with the position of the terminal boxes.

[33:36] Speaker 3:
So this is what you're saying that you're following these connections?

[33:39] Speaker 1:
Yes.

[33:40] Speaker 3:
Yeah, step by step. Can we have this extrapolated? You can extract it and put it in the flat procedure so that there is a reference to it. That's the point.

[33:49] Speaker 1:
We have our standard procedure. We have different documents. We cannot create now a complete different report.

[33:58] Speaker 3:
You have to understand my question. Understand my question before you come back and saying it's a standard procedure. Right now you have this in your outline drawing, correct?

[34:09] Speaker 2:
This is.

[34:09] Speaker 1:
Yeah, this is one official document. You have it also outline document.

[34:15] Speaker 3:
Okay, I'm requesting is take a snapshot of this and have it with the report. That's it. Instead of printing the report, you would report. You print this page as well. It is as simple as that. I'm not saying change the procedure.

[34:29] Speaker 1:
Okay, we will. Thank you very much.

[34:32] Speaker 3:
Because you get a special because Andres, see, you have to understand one thing. We right now are in attendance here of this hut.

[34:40] Speaker 1:
Yeah.

[34:41] Speaker 3:
Once it goes on site, there will be no one attending from this path. So the people you have the skilled people. But you have to whenever you have the skilled people, you need as well to understand the references of each one. You cannot waste time digging for each reference. Everything should be clear for them in the FAT procedure. That's the whole point. I understand your point. I understand your point fully. However, it should be 100% clear.

[35:17] Speaker 2:
You know.

[35:25] Speaker 3:
Okay, so right now we'll go for page seven for the no load unlocked rotor test.

[35:37] Speaker 1:
This is more technical.

[35:39] Speaker 3:
Yeah, now we go more technique. Define load type, description. Consider to test to analyze the power factor of 0.04 to 0.11 in test results.

[35:54] Speaker 2:
This is the locked rotor test. Let me explain for what it is used. We are doing a routine test for each motor. And this test is part of a routine test. We can do an advanced test acceptance test and we can have more special tests. For example, a starting torque test. You also ordered this in this case. And in case of you don't order a starting torque test, you don't have any

information about how the rotor of the motor is in which quality is it fine. Is it according to our internal requirements and so on. And this test costs some money and you cannot do it in, in every case. And this part, the locked rotor test is a method to have an information information about the quality of the rotor without coupling the motor in uncoupled condition. Morning.

[37:28] Speaker 4:
Use the chance to say hello to their old friends.

[37:32] Speaker 2:
Hello.

[37:32] Speaker 3:
Hi. How are you? Everything's fine.

[37:34] Speaker 4:
I'm always fine.

[37:35] Speaker 3:
That's great engineer. Oh, perfect.

[37:43] Speaker 1:
Yeah.

[37:51] Speaker 2:
So this is, this is a method that the manufacturer is getting a quality statement about the motor without do the high, the cost. The high cost test.

[38:06] Speaker 3:
Okay.

[38:07] Speaker 2:
And by this test we are locking the rotor and measuring by increasing the current. We are putting the nominal current and 160% plus and 50% less. We are having three points. And by this we are calculating or we are measuring the reactance of the motor. You can see it also in the equivalent diagram we just talked in the lecture.

[38:35] Speaker 3:
Yeah. This is your measuring magnetization and your losses.

[38:40] Speaker 2:
And the main information is only get the current and measure the voltage. That, that is the main information of. Of this test. And the power factor is. We, we are measuring it, but it's without any state meaning.

[38:58] Speaker 3:
But I am. Okay. I have a question between the locked rotor and the no load test. Okay. You are both measuring your.

[39:06] Speaker 2:
There are two different. Two different tests. Measurements. In one case the speed of the rotor is zero.

[39:13] Speaker 3:
Yeah.

[39:14] Speaker 2:
It's locked rotor condition. And the other is synchronous speed. Approximately.

[39:20] Speaker 3:
Yes.

[39:20] Speaker 2:
So in one case we are having slip one and in the other we are having slip zero.

[39:25] Speaker 3:
Okay, that's the point that I'm trying to get to right now. In the no load, basically you have zero slip. Okay. And you are measuring your losses based upon the magnetization which is happening for the road. Correct.

[39:41] Speaker 2:
Please repeat again.

[39:41] Speaker 3:
The losses that is being shown. Any losses. Your power factor, basically what I'm saying, your power factor here, which is 0.5 and 0.4 is only for the magnetization. The Losses of the reactor.

[39:53] Speaker 2:
Not here. In the.

[39:55] Speaker 3:
No load.

[39:55] Speaker 2:
No load left.

[39:56] Speaker 3:
Talking about now in the locked rotor, why is there a difference between.

In the power factor between 0.05 and 0.1.
[40:03] Speaker 2:
We are having a different current.

[40:09] Speaker 3:
Okay.

[40:10] Speaker 2:
We are having a different current and a different slip. The operation of the model is totally different. You cannot compare both. Okay. There are two different tests. One test, the. The no log test is used to have a. An statement meaning of the magnetization and the lock rotor test. And by the way, this is not requested by the iec.

[40:35] Speaker 3:
The power factor?

[40:36] Speaker 2:
No, the. The lock rotor test.

[40:38] Speaker 4:
So just one question.

[40:39] Speaker 2:
It's only from. From.

[40:41] Speaker 1:
Yeah.

[40:42] Speaker 6:
Good.

[40:42] Speaker 4:
Thanks for your clarity. What we commented here is just to define what kind of load you are considering for this. When you are doing a log rotor test. So in the long rotary you are doing a like reduce the voltage to I think 1.6 times or 1-832. And so if you divide by 11.

[41:01] Speaker 3:
KV because that your voltage you've only used 9 66, 1832 and 2055. This is what you're talking about?

[41:09] Speaker 4:
Yeah. 1832 is. Yeah. Around six times yours and your. So the 674 is coming as a full load current here.

[41:17] Speaker 3:
Okay.

[41:20] Speaker 2:
672 is.

[41:24] Speaker 4:
So it is about a full load current and you have reduced the voltage. And so you are trying to do a log rotor at reduced voltage.

[41:30] Speaker 8:
Okay.

[41:31] Speaker 4:
So how you are doing this test?

[41:34] Speaker 2:
That is something how we are doing it?

[41:37] Speaker 3:
Yeah.

[41:37] Speaker 4:
How you are achieving this log rotor.

[41:39] Speaker 3:
Condition, how you are injecting this.

[41:40] Speaker 2:
Yeah, we are having a big iron. Put it onto the roof, on the ground and then we switching it off. In this case, if we are here in coupled condition, we are doing it in a different way. But as I said, this is the test for routine test. In this case we are doing it with an iron. With an iron on clamped fixed on the ground. And in our case we will do it with our load machine. We control the load machine. We say speed is zero and the load machine keeps the rotor at zero speed. And then we switching on the voltage or we are increasing the voltage until the rated current.

[42:36] Speaker 4:
Load machine. Yeah, which you are holding the blocking.

[42:43] Speaker 3:
Okay, so this is clear. So polarization index zone. On the same page we have the measurements is showing as nano ampere. But in one of. In other. The other page, in page 38 is showing in gig ohms. I know it's the same thing, but why is the reference. Why one you have used nano ohms

and the other one you have used. Sorry Nano ampere and the other one you have used gig ohms.
[43:08] Speaker 2:
We are having a measurement device applying 5000 volts to the. To the winding and it is showing both. It's showing giga ohm and nano ampere. But I.

[43:24] Speaker 3:
So if you show on this page one is showing 164 nano ohms. Okay. If you see the polarization. Polarization index in the middle 164 you can see it nano nano. So yeah. Yeah. If you go to page 38 it will show. I think we talk about this Andreas.

[43:46] Speaker 1:
And this 38 is then the test certificate what they do before and.

[43:53] Speaker 2:
Yes.

[43:53] Speaker 1:
And there they have then take the.

[43:58] Speaker 3:
So the only problem I think we.

[44:00] Speaker 1:
Can also put on the go ohm value for the log rotor for the polarization index here.

[44:09] Speaker 2:
No, I. I don't. I. I cannot answer this because we are storing these values in the database and we are creating the protocol directly from database and we never use giga ohm. It's maybe something special of Drazo.

[44:30] Speaker 3:
We know it is the same thing. Yeah, but because we know if it is in nano ohms then it will be in giga ohms. Because it's showing the resistance. It's fine. But the consistency. Understand that.

[44:43] Speaker 1:
For the internal routine test what we added to this protocol.

[44:48] Speaker 3:
Okay.

[44:49] Speaker 1:

And there the first page, I think164, page seven. This is then what the colleagues are measured here in N. Okay. During last factory acceptances or with. Were we not here for the complete internal testing. Here again. Okay, so we repeat it. But in their programming for the test. For the test report they have to take the.

[45:21] Speaker 3:
But it's only if we can have a note that's saying that it's only for consistency so that we're aware of the situation. Okay. Next we go to page 11.

[45:41] Speaker 4:
This.

[45:41] Speaker 2:
Yes.

[45:46] Speaker 3:
In page 11 we have the locked rotor current to be specified in terms of rated voltage and current.

[48:08] Speaker 2:
K.

[48:33] Speaker 4:
It.

[49:00] Speaker 3:
Yes.

[50:19] Speaker 6:
To do this, I just want to know.

[50:46] Speaker 3:
Yes.

[50:47] Speaker 2:
On this.

[50:47] Speaker 6:
On this motor, when you're going to hook up the load, you're going to hook up the load on the LP side of the compressor or HP side of the compressor.

[50:57] Speaker 1:
I think we take AP sides drive LP side.

[51:02] Speaker 3:

Yeah.
[51:04] Speaker 6:
So your report there. Can you change to LP and HP.

[51:09] Speaker 2:
Whether they're NDE and DE both side.

[51:12] Speaker 8:
Is driving or at least use/use DE LP.

[51:17] Speaker 2:
Please help us.

[51:17] Speaker 6:
Suppose somebody will do something at site.

[51:25] Speaker 4:
So D HP and D LP something.

[51:28] Speaker 2:
That we have managed compressors.

[51:30] Speaker 1:
Different load on both sides.

[51:37] Speaker 3:
Different load.

[51:40] Speaker 4:
That's be different.

[51:40] Speaker 3:
Yeah.

[51:41] Speaker 6:
Because the bearing size also different. Both side sh also different.

[51:45] Speaker 3:
You know.

[52:02] Speaker 6:
But you go there hooked up. Let's. You must put a different compressor, different side.

[52:11] Speaker 3:
Did we come to a resolution? We did not discuss. Okay, so one of the comments in page 11 we have stated that the locked rotor current to be

specified in terms of rated voltage and current in your locked rotor.

[52:32] Speaker 4:
Sorry, JVA is here.

[52:39] Speaker 3:
Busy time now. Because everyone is working right now.

[52:44] Speaker 1:
Yeah.

[52:44] Speaker 4:
So log current in terms of voltage and current. Actually just to keep. Well, as we discussed already we did in you know like six times reduce the voltage and. And where is that one? So.

[53:12] Speaker 1:
This is the curve from the measurement from the protocol what explained before.

[53:17] Speaker 4:
Yeah, correct. So what. What your comment is that is it possible to do at the rated voltage and current or we can. We can only do at 1.66. 1.6 times of voltage.

[53:29] Speaker 2:
And so this test is to. To verify the reactance of the motor. And it will be done in three points. The defined points here. And by this measurement we come to the conclusion the reactance is fine. And that's all. That's all for this test. If we want to have the starting torque, then we have to increase the voltage much higher than than here. And this is a different test. And we do it later. And we did it.

[54:04] Speaker 3:
Okay. Okay.

[54:06] Speaker 1:
So there.

[54:06] Speaker 2:
But. But for this test the information and conclusions are closed. That's all.

[54:13] Speaker 4:
So that test we are doing separately under. You are doing that starting current test.

[54:20] Speaker 2:

The results are in that document. Yeah.
[54:24] Speaker 4:
So is it coming under the local district?

[54:27] Speaker 3:
I think your final.

[54:31] Speaker 4:
And the next question on this one is there is a mismatch on the log water power factor values. So if you see this is defined 0.1.

[54:41] Speaker 3:
Yeah. Starting 0.115 in your data sheet.

[54:47] Speaker 4:
Data set is 015. But here it is 0.10.

[54:50] Speaker 3:
Yeah. 1:1.

[54:57] Speaker 2:
So data sheet. It's the electrical documentation or which data sheet?

[55:00] Speaker 4:
Yeah, this is the electrical data sheet which was for this motor.

[55:05] Speaker 1:
You know which page.

[55:12] Speaker 4:
Yeah. Is this 115 0.115 log total power.

[55:24] Speaker 1:
This was in the calculated. And maybe we can revise this.

[55:30] Speaker 3:
So.

[55:30] Speaker 2:
But this is an pre calculated value and the measured value are maybe different.

[55:39] Speaker 3:
It's better for us.

[55:42] Speaker 2:
No, no, no, no. Forget it. Forget it.

[55:45] Speaker 3:
You.

[55:45] Speaker 2:
You will not use this motor in locked rotor conditions. Forget it.

[55:52] Speaker 3:
No, but saying. I'm saying it's better for us. It is shown lower. It's more. More efficient. I'm saying.

[55:57] Speaker 2:
No, no, it. It.

[55:59] Speaker 3:
I understand.

[56:00] Speaker 2:
Don't worry.

[56:00] Speaker 3:
I understand that you never use the Montreal.

[56:02] Speaker 1:
I understand.

[56:03] Speaker 2:
And. And the meaning is. Is nothing with efficiency.

[56:09] Speaker 3:
But so this one can be revised in data sheet. So this is only a data sheet.

[56:13] Speaker 2:
So it's a pre calculation. And sometimes I previously I was working in the engineering department and I often filled out these data sheets. And I'm wondering why for what is this value used? What are you doing with it? We are nominating that are pre calculations, but they are not always so precise and it's in our internal measurements. It's not an acceptance criteria. This value we are mentioned it. Yes, that's right. But without any information.

[56:51] Speaker 1:
Okay.

[56:53] Speaker 3:
And then we go to page 1212. When the temperature rise, you need to include a note for the calculation basis of the temperature rise, on what basis you have done these calculations.

[57:28] Speaker 2:
So please again your question.

[57:30] Speaker 3:
The question is basically we want to know how the calculation was done for the temperature, on what basis you have done your calculation.

[57:42] Speaker 2:
So this procedure is described in the IEC IEC 60 0. It's mentioned there this the -29. It's a complicated way to determine. I cannot explain it fully, but in my words, we are having. There are different possibilities. The first possibility is are we able to measure this full health. Then you have a way to determine the temperature. It's written in the iec. And the second is if I cannot reach it, if I enable all over 70%, then I do a different way. But in this case we. We have had here 681ampere. So the. The temperature mainly is influenced by the ampere. The amperes are producing the heat. And we got the. The rated current, but with reduced voltage. So there is. There may be an influence about increasing the voltage. And therefore we did the second test under no load conditions with nominal voltage.

[59:16] Speaker 3:
Okay.

[59:17] Speaker 2:
And by this temperature in the no load test, we are calculating to having here one one point. One measured point. So this was the entry engine. Here was the measured value. And here we are. We had another measured point. And then the curves the line. Because this is the ratio of the. Of the current it's shifted to the nominal value. And then we came up.

[59:59] Speaker 3:
You know, the points that you have extrapolated is basically they are extrapolated.

[01:00:03] Speaker 2:
Yeah.

[01:00:03] Speaker 3:
And one, one is showing your rated current, which is at the first line, which is 600.

[01:00:09] Speaker 2:
This is the. The rated one, the rated one.

[01:00:11] Speaker 3:

Because the ratio between I and in is one. So this is your rated current. And then you have another one showing close to a zero. But you cannot have zero. So you have added at around 20% or 138. And then you have as well rated current. And the last one, last table I cannot see because my. My points. Our points are. So your first one is partial load.

[01:00:39] Speaker 2:
Yeah.

[01:00:39] Speaker 3:
Rated reduced, reduced voltage, correct?

[01:00:43] Speaker 2:
Yeah.

[01:00:43] Speaker 3:
And then no load reduced. And then no load rated.

[01:00:48] Speaker 2:
Correct. This has not been done with reduced only. No load, no load with rated voltage. This test has been done. This is that one we will repeat today.

[01:01:01] Speaker 3:
Okay, so this is no load, no load rated rated current, voltage, weighted voltage, voltage. Okay, rated voltage. Sorry, yeah, no, not a rated voltage. And this one is partial load, reduced voltage, reduced voltage.

[01:01:14] Speaker 2:
And this one might raise this current. This one there is written in the IEC here that we are able. So it's on always to save some time, to save some money and to come to the equal results. And the IEC provides a rule measuring one of them with rated voltage. Calculate. So we are having an over temperature of 1.3 Kelvin means nothing, approximately nothing. And by this we are calculating the influence to reduce voltage. And by these three points we measured this point. We measured this. No, no, I think that is this one here, this one here, this is what we, what we measure.

[01:02:33] Speaker 4:
But you have not done this. No loader. This is already you have done.

[01:02:37] Speaker 2:
And this is also calculated. And then we are doing a parallel shift to.

[01:02:43] Speaker 3:
To that voltage.

[01:02:50] Speaker 2:
It's not a good example to explain this, this procedure because we are very close. We. We only have 31 KV kelvin over temperature. Normally we should come to end of class B.

[01:03:08] Speaker 3:
Maybe I. Maybe I. This is something I studied in university. Maybe it could be different from your side. But right now you have taken this point at one and you have taken it close to zero and you have extrapolated and you have joined the line. Shouldn't you have one value in the minute as well? No, why?

[01:03:23] Speaker 2:
Oh, it's explained in the I.

[01:03:25] Speaker 3:
Okay.

[01:03:26] Speaker 2:
And there is mentioned how we. We can and we have to do it.

[01:03:30] Speaker 3:
This is the point that we are trying to get to. Yeah, I understand that it mentioned I. But if you can go up.

[01:03:37] Speaker 2:
So it's. It's the. We are having the main temperature here and then we have to find out what is the voltage influence in temperature. This is done here with these two tests and it's allowed to calculate one by the other.

[01:03:55] Speaker 3:
Okay, Many points. First of all, here you are mentioning. But here you are mentioning Celsius. What is this?

[01:04:06] Speaker 1:
What is this?

[01:04:07] Speaker 2:
This is winding. This is. This is related to the temperature inside of the motor. And this is related to the cooling water temperature. So we are having two different references. Okay, One Reference is water and one is air.

[01:04:28] Speaker 3:
Okay.

[01:04:29] Speaker 2:
And we have had cooler increase by 7 degrees. It wasn't 7, it was less. But I put 7 degrees inside. And if you use 25 degree water you would have inside 32 degree. And these temperatures are referenced to that temperature, to the inside temperature of the water. And this is to water temperature. Same temperatures, but different references.

[01:05:06] Speaker 3:
Okay, but so this is in Celsius.

[01:05:11] Speaker 2:
No.

[01:05:13] Speaker 3:
And why is it Helen Celsius.

[01:05:17] Speaker 2:
This, this degree Kelvin is related to that temperature in Celsius. So the motor was approximately 60. This is a change 3.6 degrees Celsius.

[01:05:31] Speaker 3:
Okay. This is the change. This is the change.

[01:05:33] Speaker 2:
Okay.

[01:05:34] Speaker 3:
Okay.

[01:05:36] Speaker 1:
This is temperature wise.

[01:05:38] Speaker 3:
Yeah.

[01:05:38] Speaker 1:
This is line there. Therefore it's a kelvin and the others are absolute temperatures for the cooling.

[01:05:46] Speaker 3:
So system, can you go up? Andreas, I'm sorry, can I know why this one was not the values? Okay. Yeah. There's no test here. But you have values here. That's.

[01:06:04] Speaker 2:
Yeah, that's described in the IEC that you can calculate this line by this test.

There are rules how to recalculate this line.
[01:06:20] Speaker 3:
So this one is basically a calculated value.

[01:06:23] Speaker 2:
Yeah.

[01:06:23] Speaker 3:
And you only utilize these two.

[01:06:26] Speaker 2:
We did two measurements, otherwise there is a need to do one heat run in addition. So that means we are having here 0.6 degree.

[01:06:41] Speaker 3:
I understood your point. I understood the point that you're.

[01:06:44] Speaker 2:
When can I switch on the next heat? 1. I.

[01:06:47] Speaker 3:
You have done only 2 meters, one for node and one iterator. So that then after that you're able to calculate through this?

[01:06:52] Speaker 2:
Yeah.

[01:06:53] Speaker 3:
Okay. So. Okay, okay.

[01:06:55] Speaker 1:
But this is allowed.

[01:06:58] Speaker 3:
I'm not arguing, I'm not saying getting on the explanation.

[01:07:05] Speaker 2:
So.

[01:07:05] Speaker 3:
But you can ask your question if you do not receive. I just.

[01:07:10] Speaker 4:
We have just one question. What is the maximum temperature rise Here.

[01:07:16] Speaker 2:
Is you're telling 54 or 54. Oh, I, I Now we are talking about water. I'm not

sure if on your side you use the motor temperature inside. I don't know if you use it or do you only use the water temperature?

[01:07:43] Speaker 4:
No, you can tell me you refer.

[01:07:46] Speaker 2:
If we talk about water because some customers don't have these sensors. They are ordering the motor without temperature sensors inside of the cooler. Then they only have water. Therefore in our test field, if the customer orders sensors, we use these. If they don't use it, order it. We use our own. But we measure the inlet temperatures here.

[01:08:15] Speaker 1:
Temperature from the RTD for the hot.

[01:08:18] Speaker 2:
Air, hot air or cold air. And here for example, related to water, we are having a delta between water and air of 7 Kelvin. We are having the temperature rise detected by the warm resistance measurement. This is a mean value of the of the winding. We are having 38.6 Kelvin related to 25 degrees. And we are having a temperature increase of 54 related to the PT100. So the PT100 are normally higher than the mean value of the warm resistance because the resist the PD100 are placed to the lock spots in the warmer. So therefore this here a difference.

[01:09:28] Speaker 4:
So 54 degree is the temperature of the hot air outlet or intake outlet.

[01:09:35] Speaker 3:
Yes.

[01:09:35] Speaker 2:
Thanks to my often stove. The next light again. So 54 degrees.

[01:09:46] Speaker 4:
Very high.

[01:09:47] Speaker 3:
Very high.

[01:09:48] Speaker 2:
These are the PD100 of the windings.

[01:09:50] Speaker 1:
Okay.

[01:09:51] Speaker 2:
And what you ask for is related to these temperatures to the highest one.

[01:09:58] Speaker 4:
So this is the outlet air outlet temperature 54 degree centigrade.

[01:10:02] Speaker 2:
Now there are the windings. PT100 winding temperature, winding temperature.

[01:10:12] Speaker 4:
No, winding temperature is before the.

[01:10:17] Speaker 3:
No, no. Can. Can you go up again? Andreas? I'm sorry. Can you go back to the table? To the table that we were discussing? Yeah. So this table.

[01:10:30] Speaker 1:
What is.

[01:10:34] Speaker 3:
This?

[01:10:39] Speaker 1:
Thank you.

[01:10:44] Speaker 3:
No, this is.

[01:10:47] Speaker 2:
No, no, no, no. Everything is related to the motor.

[01:10:51] Speaker 3:
Okay.

[01:10:52] Speaker 2:
But one reference to the inlet temperature.

[01:10:55] Speaker 3:
And one reference to that one to.

[01:10:57] Speaker 2:
The water temperature in the batch. Always the same change temperature. So you are having a heat run. A heat run. So here you are.

[01:11:21] Speaker 3:
60.

[01:11:24] Speaker 2:
It's approximately 68. So because you were higher with the current than the rated current, we decreased this temperature. And by this. So here we are having 54 plus 25. This is. Yeah. This values should be from the heat one. So in this first line here.

[01:13:28] Speaker 6:
We.

[01:13:28] Speaker 2:
Measured with rated current a little bit higher. And we have had a water temperature of 20.8 degrees. And this will be. Yeah. And a temperature inlet of 25 degree. So this was the measured inlet temperature in the. In the motor. 75°. These values. So this is a partial load with reduced voltage we have had here related to the RTDS of 47 Kelvin. So now we go into the report.