



## One exact application of lathe with V&T (<http://www.EcoDriveCN.com> ) EcoDriveCN AC inverter drive speed controller

### Site conditions

Model of EcoDriveCN AC inverter drive speed controller (frequency inverter): V5-H-4T-2.2G/3.7L

Motor nameplate: 380V, 2.2kw, 4 poles, 5A, 1420r/min

Applicable field: For hydraulic automatic lathes, AC inverter drive speed controller drives the spindles of lathe. There are five steps for machining work pieces, including clamping, high speed drilling, low speed milling, cutting, and disengaging the spindle. Among these, the speed of drilling, milling and cutting is set by multi-step frequency of AC inverter drive speed controller.

### Parameter Setting and Adjustment of EcoDriveCN drives.

Parameters setting (not default): P0.03=4, P0.06=1, P0.08=P0.09=0.8, P0.11=P0.13=100, P4.22=40, P4.23=25, P4.24=80, P5.00=2, P5.01=03, P5.02=09, P5.03=10, P5.04=11, P9.02=1420, P9.03=2.2, P9.04=5, P9.05=2.9, P9.06=2.570, P9.07=13.6, P9.08=1.883, P9.09=213.7, P9.10=80.45, P9.11=68.96, P9.12=59.11, P9.13=57.47, P9.14=48.27.

### Solution to the problems of lathe adjustment

From the beginning, the machine has run for one week. There's no failure error for AC inverter drive speed controller. But the finished products are unqualified. At the beginning, just several of 100 finished products are unqualified. Later several of 10 products are unqualified.

The engineers say they checked all the mechanical factors, but no problem. So they double the problem is caused by our EcoDriveCN AC inverter drives (variable speed drives, frequency inverters, VSD, VFD, variable frequency drives). The customers guess that the torque of our drive is not stable. Then the milling is not in place, or too much, in the action of low speed milling. This results in bad quality of the products.

Now the main problem is, other steps of machining the work pieces are OK, except the action of milling.



## The processing procedure

Check the failure records: d0.00~d0.02=0.

There's no record of failure. Check the control model of EcoDriveCN drives: P0.03=0, vector control 1, and P0.16=0, it means automatic torque boost. Because the customers say the torque is not stable, we change it with P0.16=4 for manual torque boost.

Then test with some work pieces. The problem about milling is still there. For P0.16, we add to 8. The problem still exists. This means that it is not about torque boost.

Check the group of P9 parameters of EcoDriveCN drives.

When the customers adjusted the inverter, it was rotating self-studying. But control model is vector control 1. This may cause the problem that the torque is not desirable. Thus we change P0.03=4: vector control 2, and change the parameters of speed loop. The problem is as before.

And note that the status of current is stable, there's no unstable factor for torque. We have a suspicion that the self-studying of motor parameters is not correct.

So we remove the driving belt of motor, and re-operate for motor parameters self-learning. Then boot the lathe, machine some work pieces. There are still unqualified products. The engineers from the customers suggest to replace one new inverter speed controller. After replacing, operate self-studying for motor parameters. Then test the lathe, no better result: for 10 work pieces, there are still several unqualified ones. And the current, voltage, and frequency are all normal.

That means that there's no problem for AC inverter drive speed controller.

After these steps, we are sure that this is not caused by the torque of the drive.

The engineers on site communicate with the supplier (V&T Technologies Co., Ltd.), and discuss which factors may cause this result.

The EcoDriveCN inverter factory (V&T Technologies Co., Ltd.) thinks that this may be caused by this reason: the response is not in time when the milling action is switched to reverse direction. So try to slow the acceleration and deceleration. But the failure of over-load happens during the process of acceleration and deceleration.

So finally try to reduce the given speed of milling, from the original 25Hz to 15Hz. Finally there are no unqualified products now. Now the problem is solved!

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V&T Technologies Co., Ltd. <http://www.EcoDriveCN.com>

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V&T Technologies Co., Ltd. (<http://www.EcoDriveCN.com>) has rich experiences in the field of machine tool. AC inverter drive speed controllers from V&T are widely applied in the machine tool industry in the world, including lathe, drilling machine, CNC drilling machine, boring machine, cable making tool, chamfer machine, CNC boring machine, engraving machine, grinding machine, milling machine, shearing machine, die casting machine, drawing machine, high-speed drilling machine, multi-spindle drilling machine, electric discharge machine, laser engraving machine, etching machines, gear cutting machines, lapping machines, milling machines, planing machines and so on.

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