TROUBLESHOOTING MICROMAX AND VVX-MOTORS

IBC automatic
Industriautomation • Industriell elektronik

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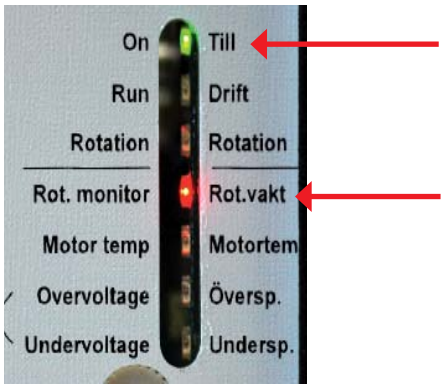
TROUBLESHOOTING MICROMAX, MICROMAX180, MICROMAX370, MICROMAX750

In case of fault on control unit or motor, green LED "Voltage on" flashes and one or several red LEDS will indicate the cause.

For a correct troubleshooting it is important to control which one or ones of the red LEDS are lit.

All alarm conditions remain on and must not be reset until the control above is made.

CONTROL UNIT TRIPS DUE TO THE ROTATION MONITOR



PROBABLE CAUSE OF FAULT AT INSTALLATION:

Magnet turned the wrong way (applies on the IBC rotation monitor)

Rotation monitor connected incorrectly (wrong polarity, applies on the IBC rotation monitor) white wire to terminal 9, brown wire to terminal 10.

PROBABLE CAUSE OF FAULT AT RUN:

Belt breakage.

Belt skids.

Rotor is stuck.

Motor/gear is broken.

CONTROL OF ROTATION MONITOR (APPLIES ON THE IBC ROTATION MONITOR)

Measure the voltage on terminals 9 and 10, at unaffected rotation monitor the voltage should be approx. 10VDC.
When the magnet affects the rotation monitor the voltage should be 2,7-3VDC.

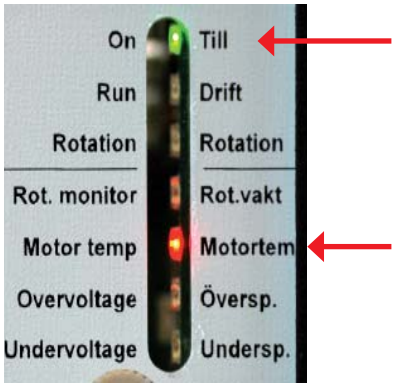
IBC has produced three different series of rotation monitors since 1988:

1988 to 2006-07-23
Production of rotation monitors with voltage 9,7V respectively 2,8-2,9V.

2006-07-24 till 2007-08-17
Production of 1700 pcs of ROHS-performance (unleaded) with voltage 10V respectively 2,7V.
At extreme cold, below -25 degrees Celsius, some of these rotation monitors may get locked and will in that case always show 2,7V, irrespective of if the rotation monitor is affected by the magnet or not.
Only rotation monitors with a voltage of 2,7V are the ones which in extreme cases may get locked. These rotation monitors should be exchanged.

As from 2007-08-18
The voltage is 10V or higher, respectively 3V.
These rotation monitors can not get locked.

THERMO-CONTACT IN THE MOTOR TRIPS DUE TO TOO HIGH MOTOR WINDING TEMPERATURE



PROBABLE CAUSE OF FAULT:

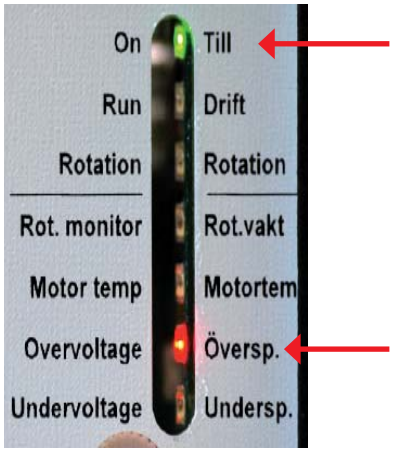
The rotor is heavy to run.

The gear is jammed, no oil.

Motor/gear is broken, e.g. bearing fault. Phase lost or winding burnt.

The thermo-contact in the motor will return to its normal position when the temperature is falling, but the alarm remains and must be reset on the control unit.

OVERVOLTAGE

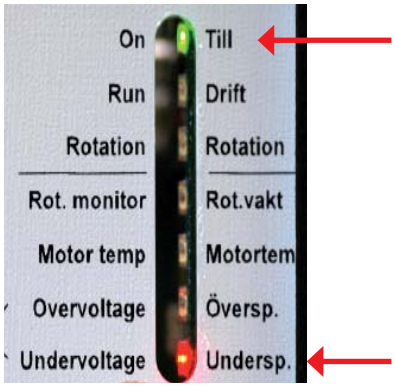


PROBABLE CAUSE OF FAULT:

Input voltage is over 250V for more than 4 - 5 sec, after which the control unit trips. Control the input voltage.

If the voltage is correct, the control unit is broken.

UNDERVOLTAGE

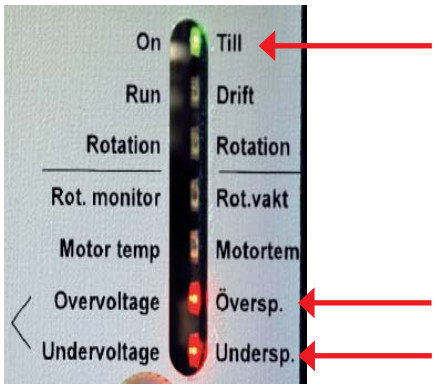


PROBABLE CAUSE OF FAULT:

The input voltage is below 205V for more than 4 - 5 sec, after which the control unit trips. Control the input voltage.

If the voltage is correct, the control unit is broken.

OVERLOAD CURRENT, SHORT CIRCUIT



When both "Overvoltage" and "Undervoltage" is lit, this indicates overload current or short circuit

OVERLOAD CURRENT: THE CONTROL UNIT LIMITS THE CURRENT AND THEN TRIPS AFTER 4-5 SEC. PROBABLE CAUSE OF FAULT:

The rotor is heavy to run.

The gear is jammed, no oil.

Motor/gear is broken, e.g. bearing fault.

The control unit is broken.

Measure the current:
MicroMax limits the current at 1,2A.
MicroMax180 limits the current at 2,4A.
MicroMax370 limits the current at 4A.
MicroMax750 limits the current at 7A.

When using a small motor of 25-40 W, the control unit will not trip due to overload current. This because, even with the motor shaft standing still, the current stays below the limit of the current. This implies that the control unit will trip due to the rotation monitor after 5-6 min. There is possibility that the control unit also may trip due to the thermo-contact if the motor gets too hot.

SHORT CIRCUIT PHASE-PHASE: THE CONTROL UNIT LIMITS THE CURRENT AND THEN TRIPS AFTER 45 SEC.

Motor winding problem.

Short circuit between the phases in the cable.

Measure the motor resistance, this should be equal on all phases.
(see page 8).

SHORT CIRCUIT PHASE-EARTH (EARTH FAULT). THE CONTROL UNIT TRIPS IMMEDIATELY.

Earth fault in the motor or the cable.

Cable jammed in between lid and edging on the connection box.

Measure the resistance between phase and earth. This should be infinate.

N.B. To reset the control unit at earth fault, it must be dead.

Put into practice it is hard to distinguish the typical example of faults above.

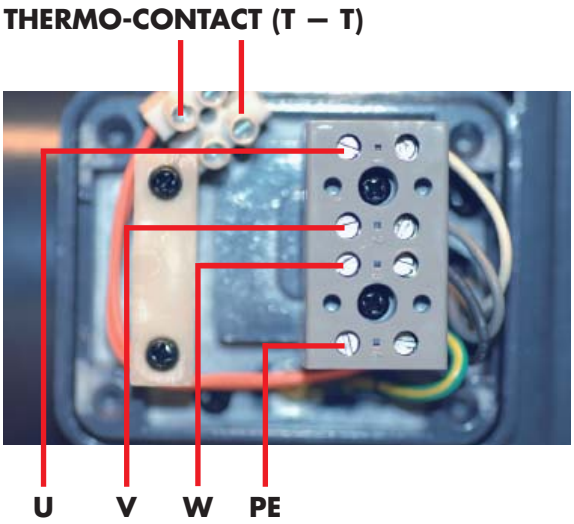
Reset the control unit.

If the control unit alarms after the reset, switch off the mains supply to the control unit, disconnect the motor cables (U, V, W) from the control unit and test it without the motor.
If the alarm returns the control unit is broken, if the alarm is gone continue trouble shooting as pointed out above.

CONNECTING AND TROUBLE SHOOTING VVX-MOTORS

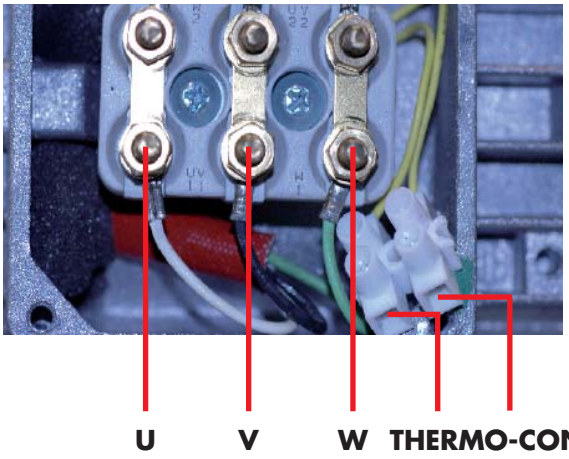
All IBC control units are fed with 1-phase 1x230V. The control unit builds up a 3-phase voltage of 3x230V. Therefore all VVX-motors controlled by MiniMax and MicroMax are 3-phase motors connected for 3x230V.

CONNECTING 3-PHASE IN LINE HELICAL GEAR MOTOR



VVX-motors with powers 25, 40 and 60W are in line helical gear motors made for 3x230V. These are not reversible for 3x400V.

CONNECTING 3-PHASE WORM GEAR MOTORS

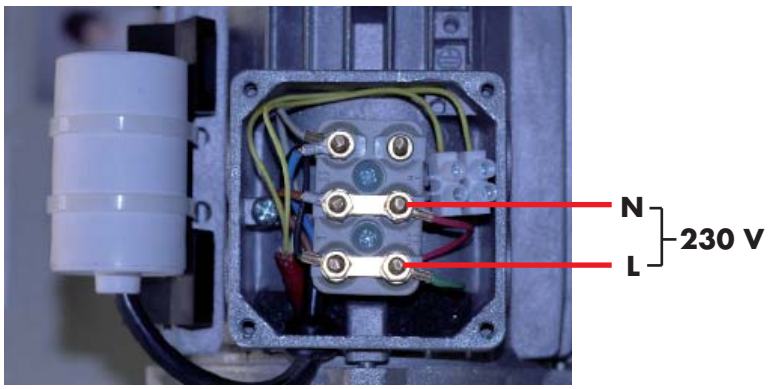


VVX-motors with powers 90, 180, 370 and 750W are worm gear motors made for 3x230/400V (D/Y).

At delivery from IBC these motors are D-connected, i.e. connected for 3x230V.
This connection is often called 111 since the tinplates are placed like three digits ”1” side by side.

All motors have their thermo-contacts drawn to terminal (connector) further connected to the control unit. Note that it is the control unit, via the thermo-contact, cutting the current if the motor gets too hot.

CONNECTING 1-PHASE WORM GEAR MOTORS



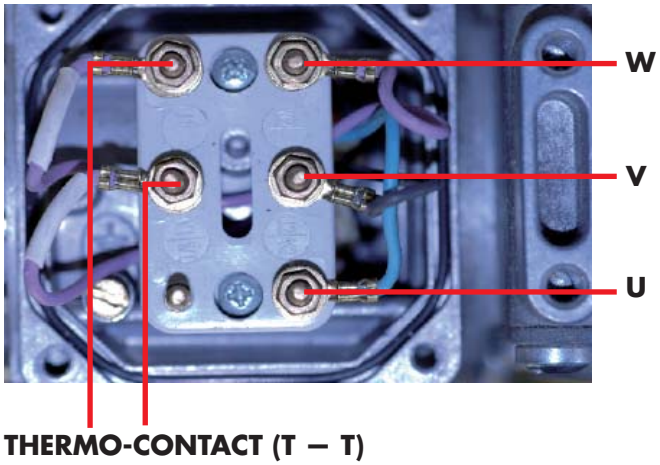
Motors controlled by the MicroStart are 1-phase motors connected for 1x230V. Here a run-capacitor is used to start the motor. This capacitor is mounted in the MicroStart control unit or on the motor, also see the MicroStart manual.

In most cases a thermo-contact drawn to terminal (connector) is used here too. *This is not shown on the image.*

As an alternative a thermal breaker, a so-called klixon, is mounted in the winding. This will cut the current in the winding and the motor will stop. When the motor is cooled down the breaker will close again.

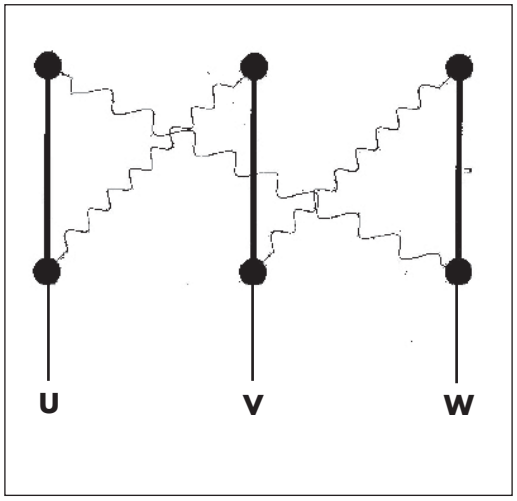
In this case the control unit will not alarm due to over temperature, in stead the rotation monitor will alarm.

CONNECTING 3-PHASE GEFEG-MOTORS

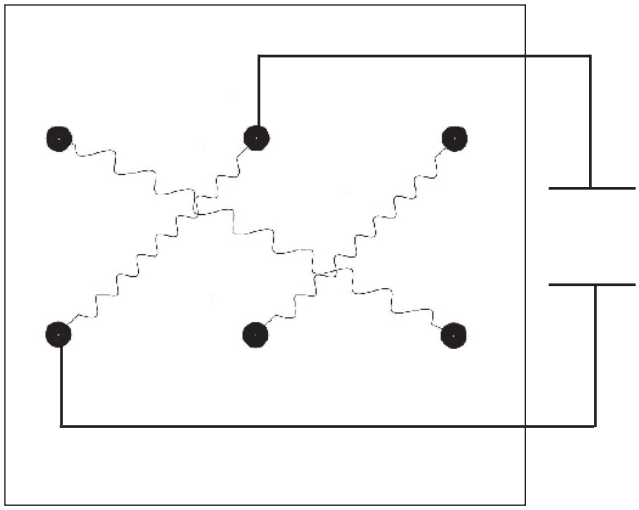


IBC earlier used a 3-phase motor of Gefeg-type. This motor has a connection according to the image on the left.
If this motor is to be replaced and there is uncertainty about how to connect the new motor, see connection alternatives above.

RESISTANCE MEASURING OF MOTOR WINDINGS



To guarantee that the motor windings are complete these should be tested using a “Megger” or a universal instrument.



RESISTANCE MEASURING

Before the test is made, the cable connection on the motor must be disconnected and the connection tinplates in the motor dismounted.

The resistance must be equal on all three phases.

PERSONAL NOTES

IBC automatic
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IBC automatic i Höganäs AB
Brännerigatan 5A
SE-263 37 Höganäs
Sweden
Telefon +46 42 33 00 10
Fax +46 42 33 03 75
www.ibc-automatic.se
info@ibc-automatic.se

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