# 11.0 Blade Selection Chart

| Tube Diameter | Wall Thickness | Blade Diameter- Metric (Normal Inch) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 225 (9") | 250 (10") | 275 (10-3/4") | 300 (12") | 315 (12-1/2") | 350 (14") | 401.0 (16") |
| 1/2" | .030"-.090" | 220BW | 240BW | 280BW | 300BW | 300BW | 320BW | 340BW |
| 1/2" | .090"-.150" | 200BW | 220BW | 240BW | 280BW | 280BW | 300BW | 320BW |
| 1" | .030"-.060" | 220BW | 240BW | 280BW | 300BW | 300BW | 320BW | 340BW |
| 1" | .060"-.090" | 220BW | 220BW | 240BW | 280BW | 280BW | 300BW | 320BW |
| 1" | .090"-.150" | 180BW | 220BW | 220BW | 240BW | 240BW | 280BW | 300BW |
| 1-1/2" | .030"-.060" | 220BW | 240BW | 260BW | 300BW | 300BW | 320BW | 340BW |
| 1-1/2" | .060"-.090" | 200BW | 220BW | 240BW | 280BW | 280BW | 300BW | 320BW |
| 1-1/2" | .090"-.150" | 180BW | 200BW | 220BW | 240BW | 240BW | 280BW | 300BW |
| 1-1/2" | .150"-.250" | 140C | 160C | 180C | 200C | 220C | 220C | 240BW |
| 2" | .030"-.060" | 240BW | 260BW | 280BW | 300BW | 300BW | 320BW | 340BW |
| 2" | .060"-.090" | 180BW | 200BW | 220BW | 240BW | 240BW | 280BW | 320BW |
| 2" | .090"-.180" | 140C | 160C | 180C | 220C | 220C | 220C | 300BW |
| 2" | .180"-.300" | 120C | 140C | 160C | 180C | 180C | 200C | 240BW |
| 2" | .300"-.500" | 100C | 110C | 120C | 140C | 140C | 160C | 180C |
| 2-1/2" | .030"-.060" | 240BW | 260BW | 280BW | 300BW | 300BW | 320BW | 340BW |
| 2-1/2" | .060"-.090" | 200BW | 220BW | 240BW | 260BW | 260BW | 280BW | 300BW |
| 2-1/2" | .090"-.150" | 180BW | 180C | 180C | 200C | 200C | 220C | 240BW |
| 2-1/2" | .150"-.250" | 120C | 140C | 160C | 180C | 180C | 200C | 220C |
| 2-1/2" | .250"-.400" | 100C | 110C | 120C | 140C | 140C | 160C | 180C |
| 2-1/2" | .400".500" | 90C | 100C | 110C | 120C | 120C | 140C | 160C |
| 3" | .030"-.060" | | | 280BW | 300BW | 300BW | 320BW | 340BW |
| 3" | .060"-.090" | | | 240BW | 260BW | 260BW | 280BW | 300BW |
| 3" | .090"-.150" | | | 180C | 200C | 200C | 220C | 240BW |
| 3" | .150".250" | | | 160C | 180C | 180C | 200C | 220C |
| 3" | .150"-.250" | | | 120C | 140C | 140C | 160C | 180C |
| 3" | .250"-.400" | | | 100C | 120C | 120C | 140C | 160C |
| 3-1/2" | .030"-.060" | | | | 300BW | 300BW | 320BW | 340BW |
| 3-1/2" | .060"-.090" | | | | 260BW | 260BW | 280BW | 300BW |
| 3-1/2" | .090"-.150" | | | | 200C | 200C | 220C | 240BW |
| 3-1/2" | .150".250" | | | | 180C | 180C | 200C | 220C |
| 3-1/2" | .150"-.250" | | | | 140C | 140C | 160C | 180C |
| 3-1/2" | .250"-.400" | | | | 120C | 120C | 140C | 160C |

**For Stainless Steel: Recommended Teeth X 1.2 approx.**

**For Non-Ferrous Materials: Recommended Teeth X .75 Approx**

| SOLID Diameter | Blade Diameter- Metric (Normal Inch) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 225 (9") | 250 (10") | 275 (10-3/4") | 300 (12") | 315 (12-1/2") | 350 (14") | 401.0 (16") |
| 1/4"-3/4" | 180BW | 180C | 200C | 220BW | 220BW | 280BW | 320BW |
| 3/4"-1-1/4" | 120C | 120C | 140C | 180C | 180C | 220BW | 240BW |
| 1-1/4"-1-3/4" | 100C | 100C | 120C | 140C | 140C | 180C | 200C |
| 1-3/4"-2-1/4" | 80C | 80C | 100C | 120C | 120C | 120C | 140C |
| 2-1/4"-2-3/4" | 60C | 60C | 70C | 80C | 80C | 80C | 90C |
| 2-3/4"-3-1/2" | | | | 60C | 60C | 60C | 80C |

*Figure 11-1*

# 12.0 Maintenance

**⚠WARNING**

**Make sure the electrical disconnect is OFF before working on the machine.**

**⚠WARNING**

**Maintenance should be performed on a regular basis by qualified personnel.**

**⚠WARNING**

**Always follow proper safety precautions when working on or around any machinery.**

## 12.1 Daily Maintenance

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- Do a general cleaning by removing dust and metal chips from the machine.
- Top off the coolant tank. (80% of full tank capacity).
- Inspect the disk/saw blade for wear.
- Check that the blade guard, shields, and emergency stops are in good working order.
- When through using machine, raise the head to reduce stress on the return spring.

## 12.2 Weekly Maintenance

- Clean the machine including the coolant tank and the area around it.
- Lubricate threaded components and sliding devices.
- Clean and grease the vise screw and sliding surfaces.
- Clean the guard housing for the disk/saw blade.
- Apply rust inhibitive lubricant to all non-painted surfaces.
- Sharpen the saw teeth.

## 12.3 Monthly Maintenance

- Thoroughly clean the machine including the coolant tank.
- Check that all screws on the motor, the pump, the vise jaws, and the guard are tight and secure.
- Check that the saw guard is operating properly.
- Use an EP90 or similar oil to lubricate the saw head pivot (A) and the saw miter pivot.

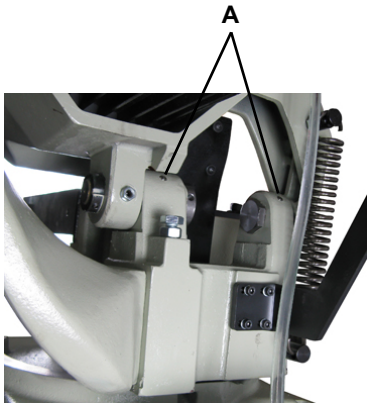



*Figure 12-1*

## 12.4 Yearly Maintenance

- Change the oil in the gear case as follows:
- Position the saw head in the horizontal position.
- Remove the connecting plug (A) from the electrical box socket and unscrew the feed handle (B).
- Place a container under the drain hole (C) and remove the drain plug.
- Drain off the old oil.
- Install the drain plug.
- Raise the head to the up position, add 1.58 qt. (1.5L) oil through the feed handle mounting hole.
- Install and connect the feed handle.

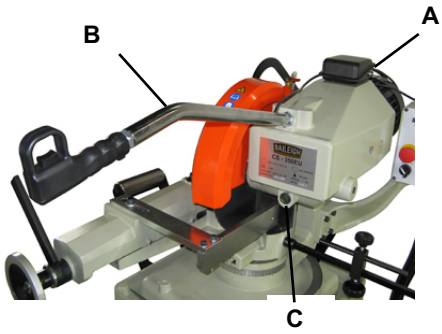



*Figure 12-2*

## 12.5 Oil Disposal

- Used oil products must be disposed of in a proper manner following local regulations.

## 12.6 Accessing and Cleaning the Coolant System

1. Remove the drain hose from the return screen.
2. Lift the tank and pump assembly off of the retaining tray and slide the assembly out of the stand.
3. Remove and clean the filter (A). Replace if needed.
4. Pour out the coolant from the tray.

5. Wash out the dirt and debris.
6. Replace the filter and install the pump and tank assembly so that the V-notch is over the retaining flange.
7. Fill the tank with coolant solution by pouring coolant through the chip strainer (A).


*Figure 12-3*

## 12.7 Oils for Lubricating Coolant

Any 10:1 (water to coolant) solution will work, however we recommend Baileigh B-Cool 20:1 (water to coolant) biodegradable metal cutting fluid. It has excellent cooling and heat transfer characteristics, is non-flammable, and extends blade and machine life. Each gallon of concentrate makes 21 gallons of coolant.

## 12.8 Storing Machine for Extended Period of Time

If the Cold Saw is to be inactive for a long period of time, prepare the machine as follows:

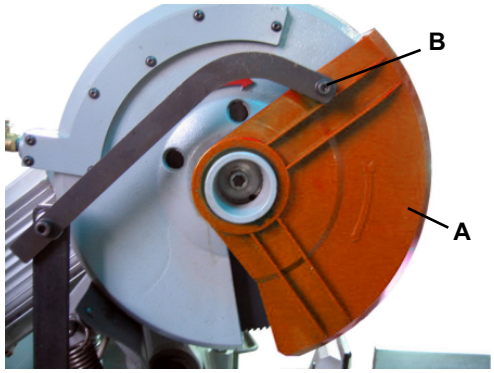
- Detach the plug from the electrical supply panel.
- Release the head return spring.
- Empty and clean the coolant tank.
- Clean and grease the machine.
- Cover the machine

**Note:** Proper maintenance can increase the life expectancy of your machine.

## 12.9 Cleaning Coolant Path

Once a year or if the coolant flow is reduced, remove the channel covers and clean the coolant flow paths.

1. Disconnect power to the saw.
2. To change the saw blade:
3. Release and pivot the mobile guard (A) by removing the hex socket screw (B).
4. Remove the screws, covers, and gaskets from each side of the saw guard.
5. Clean the coolant path (C) to remove all debris.
6. Install the gasket and cover and secure with the screws. If the gasket has been damage, an RTV type seal may be used, however do not allow sealant to get into the coolant flow path.
7. When complete, connect the mobile guard pivot arm.



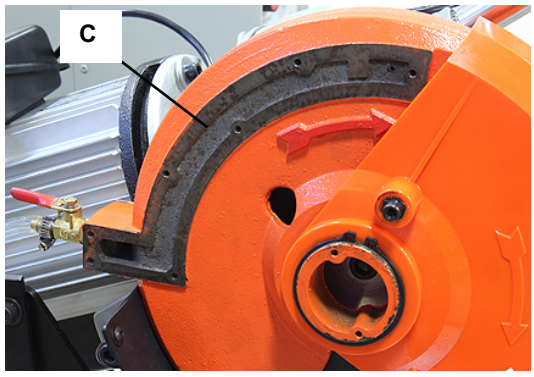




*Figure 12-4*

# 13.0 Lubrication Oil Table 1

**Above 82°F (Select from the products listed below)**

*Table 13-1*

| Brand | Hydraulic Tank Oil | Gear Oil | Slideway Oil |
|---|---|---|---|
| Mobil | DTE XL 68, DTE 16M | Mobilgear 634, SHC 460 | Mobil Vactra Oil No. 4 |
| Shell | Shell Tellus Oil 68 | Shell Omala Oil 460 | Shell Tonna Oil T220 |
| Exxon | Nuto H 68 | Spartan EP 460 | Febis K220 |

*Table 13-2*

| Brand | Hydraulic Cylinder Oil | Air Lube System | Grease Fittings |
|---|---|---|---|
| Mobil | DTE 21 | DTE 21 | Mobil UX2 EPO |
| Shell | Shell Carnea Oil 10 | Shell Carnea Oil 10 | Aluania Greaser 1 |
| Exxon | Spinesso 10 | Spinesso 10 | Ronex MP Beacon 2 |

# 14.0 Lubrication Oil Table 2

**Below 82°F (Select from the products listed below)**

*Table 14-1*

| Brand | Hydraulic Tank Oil | Gear Oil | Slideway Oil |
|---|---|---|---|
| Mobil | DTE XL 46, SHC 525 | Mobilgear 630, SHC 220 | Mobil Vactra Oil No. 4 |
| Shell | Shell Tellus Oil 46 | Shell Omala Oil 220 | Shell Tonna Oil T220 |
| Exxon | Nuto H 46 | Spartan EP 220 | Febis K220 |

*Table 14-2*

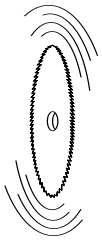
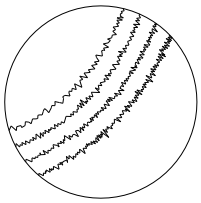
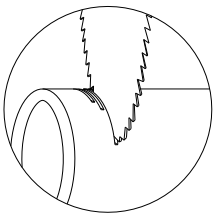
| Brand | Hydraulic Cylinder Oil | Air Lube System | Grease Fittings |
|---|---|---|---|
| Mobil | DTE 21 | DTE 21 | Mobil UX2 EPO |
| Shell | Shell Carnea Oil 10 | Shell Carnea Oil 10 | Aluania Greaser 1 |
| Exxon | Spinesso 10 | Spinesso 10 | Ronex MP Beacon 2 |

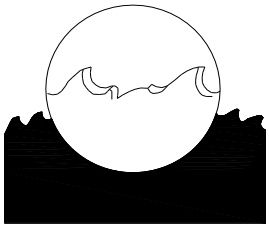
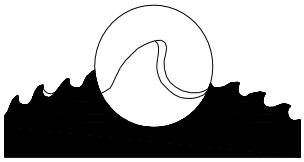
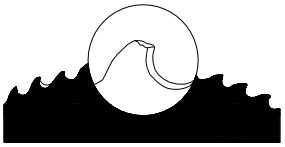
# 15.0 Troubleshooting

**⚠WARNING** **Make sure the electrical disconnect is OFF before working on the machine.**

## 15.1 Blade and Cut Diagnosis

*Table 15-1*

| Fault | Possible Cause | Remedy |
|---|---|---|
| DISK VIBRATION  | Wrong tooth pitch. | Choose a suitable disk. |
| | Unsuitable tooth profile. | Choose a suitable disk. |
| | Ineffective gripping of the part in the vise. | Check the gripping of the part. |
| | Dimensions of the solid section too large with respect to the maximum admissible cutting dimensions. | Abide by the instructions. |
| | Disk diameter incorrect and/or too large. | Decrease the disk diameter, adapting it to the dimensions of the part to be cut. |
| RIDGES ON THE CUTTING SURFACE  | Ineffective gripping of the part in the vise. | Check the gripping of the part. |
| | Too fast advance. | Decrease advance, exerting less cutting pressure. |
| | Disk teeth are worn. | Sharpen the tool. |
| | Insufficient lubricating coolant. | Check the level of the liquid in the tank.<br>Increase the flow of lubricating coolant, checking that the hole and the liquid outlet pipe are not blocked |
| | Teeth do not unload shavings well. | Choose a blade with a larger tooth pitch that allows better unloading of shavings and that holds more lubricating coolant. |
| CUT OFF THE STRAIGHT  | Too fast advance. | Decrease advance, exerting less cutting pressure. |
| | Ineffective gripping of the part in the vise. | Check the gripping of the part which may be moving sideways. |
| | Disk head off the straight. | Adjust the head. |
| | Disk sides differently sharpened. | Choose proper tool quality, type, and construction characteristics. |
| | Dirt on the gripping device. | Carefully clean the laying and contact surfaces. |
| BLADE STICKS IN THE CUT  | Too fast advance. | Decrease advance, exerting less cutting pressure. |
| | Low cutting speed. | Increase speed. |
| | Wrong tooth pitch. | Choose a suitable disk. |
| | Sticky accumulation of material on the disk. | Check the blend of lubricating coolant and choose a better-quality disk. |
| | Insufficient lubricating refrigerant. | Check the level of the liquid in the tank.<br>Increase the flow of lubricating coolant, checking that the hole and the liquid outlet pipe are not blocked. |
| TOOTH BREAKAGE | Too fast advance. | Decrease advance, exerting less cutting pressure. |
| | Wrong cutting speed. | Change disk speed and/or diameter. |
| | Wrong tooth pitch. | Choose a suitable disk. |

| Fault | Possible Cause | Remedy |
|---|---|---|
|  | Low quality disk. | Use a better-quality disk. |
| | Ineffective gripping of the part in the vise. | Check the gripping of the part. |
| | Previously broken tooth left in the cut. | Accurately remove all the parts left in. |
| | Cutting resumed on a groove made previously. | Make the cut elsewhere, turning the part. |
| | Insufficient lubricating coolant or wrong coolant. | Check the level of the liquid in the tank.<br>Increase the flow of lubricating coolant, checking that the hole and the liquid outlet pipe are not blocked. |
| | Sticky accumulation of material on the disk. | Check the blend of lubricating coolant and choose a better-quality disk. |
| PREMATURE DISK WEAR<br>  | Wrong running in of the disk. | When cutting for the first time run in the tool, making a series of cuts at a low advance speed, spraying the cutting area with lubricating coolant. |
| | Wrong cutting speed. | Change disk speed and / or diameter. |
| | Unsuitable tooth profile. | Choose a suitable disk. |
| | Wrong tooth pitch. | Choose a suitable disk. |
| | Low quality disk. | Use a better-quality disk. |
| | Insufficient lubricating refrigerant. | Check the level of the liquid in the tank.<br>Increase the flow of lubricating coolant, checking that the hole and the liquid outlet pipe are not blocked. |
| CHIPPED DISK<br>  | Hardness, shape or flaws in the material | Reduce the cutting pressure and/or the advance. |
| | Wrong cutting speed. | Change disk speed and/or diameter. |
| | Wrong tooth pitch. | Choose a suitable disk. |
| | Vibrations. | Check gripping of the part. |
| | Disk incorrectly sharpened. | Replace the disk with one that is more suitable and correctly sharpened. |
| | Low quality disk. | Use a better-quality disk. |
| | Incorrect emulsion of the lubricating coolant. | Check the percentage of water and oil in the emulsion. |

## 15.2 Inverter Troubleshooting


*Figure 15-1*

Make the following before operating all electronic components.

**Note:** Only qualified personnel can perform the electronic settings.

- Disconnect and lock out the machine from the power supply.
- Electronic parts are extremely sensitive, use care to avoid static electrical charges or tools that could cause a short circuit or crush the components.

- To avoid electrical shock from charged capacitors, wait until the lighted display is completely dark before starting any repair work.
- Pay special attention to the electronic circuit board, so it is still in good working order.
- Never connect the AC power directly to the output connector (U / V / W) of the drive controller. The electronic self-diagnostic program will keep you aware of situations such as motor overload, voltage too low or too high, etc.. The machine stops immediately when the program detects an error. The error will be displayed on the inverter's digital display in the control panel. Follow the instructions for correcting errors.
- Wait 5 seconds after a fault has been cleared before proceeding with reset using the keypad.

*Table 15-2*

| Fault | Probable Cause | Remedy |
|---|---|---|
| oc | Over Current<br>Abnormal increase in current. | Check the engine's power is the output of the frequency speed.<br>Check the connections to U/T1, and V1T2 W/T3 for a possible short circuit.<br>Check the connections between the drive and engine for a possible short circuit, and also the ground.<br>Check for loose contacts between the drive and motor.<br>Increase the acceleration time.<br>Check the motor overload conditions.<br>If, after you repair a short circuit and verified the items listed above, the anomalies continue the drive, the machine should be returned to the manufacturer. |
| OU | Over Voltage<br>The DC bus voltage has exceeded the maximum threshold. | Check if the input voltage is at the limit of the inverter.<br>Verify the presence of transients.<br>The regeneration of the engine could be cause excess DC bus voltage. In this case, the solution would be to increase the deceleration time, or add a braking resistor (and a brake unit) available.<br>Check whether the required braking power is located within the specified limits. |
| oH1<br>oH2 | Overheating<br>Heat Sink Temperature too high. | Make sure the room temperature located at the specified temperature limit.<br>Make sure the vent holes are not blocked.<br>Remove all foreign objects of heat sinks and check the status of clean the fins.<br>Check and clean the fan.<br>Observe the clearances to ensure adequate ventilation. |
| Lu | Low Voltage<br>The drive detects that the DC bus voltage is fallen below its minimum value. | Check if the input voltage is at the limited to that of the drive.<br>Check the motor load fault.<br>Check the wiring of the input terminals of Power R-S-T (for three-phase) is correct without loss of phase. |
| oL | Overload<br>The drive detects excessive output current. Note: The drive is likely to withstand Overload 150% of rated current for a maximum of 60 seconds. | Check if the motor is overloaded.<br>Reduce the configuration of the compensation torque in Pr.07.02.<br>Use a less powerful drive. |
| oL1 | Overload 1<br>Internal circuit electronic overload | Check the motor overload.<br>Check the configuration of overload electronic and thermal.<br>Use a higher power engine.<br>Reduce the current level so that the output current of the inverter does not exceed the value set by the rated engine, namely Pr.07.00. |
| oL2 | Overload 2<br>Motor overload. | Reduce the motor load.<br>Configure the sensor to a torque boost appropriate level (to PL06.03 PL06.05). |
| HPF1 | CC (clamp ammeter) | Consult factory. |

| Fault | Probable Cause | Remedy |
|---|---|---|
| HPF2 | OV Hardware Error Back to the factory. | Consult factory. |
| HPF3 | GFF Hardware Error | Consult factory. |
| HPF4 | OC Hardware Error | Consult factory. |
| bb | Block external database. (Refer to Pr.08.07) | The inverter output will be disabled when external input terminal (B.B) is active.<br>Disable the external input terminal (B.B) to activate the drive. |
| ocA | Excess current during acceleration | Short circuit at the output of the engine: Check isolation of the output line.<br>Torque boost too high: Reduce the torque compensation in Pr.07.02.<br>Acceleration time too short: Increase the acceleration time.<br>The power output of the inverter is too Low: Opt for a less powerful drive. |
| ocd | Excess current during deceleration | Short circuit at the output of the engine: Check isolation of the output line.<br>Deceleration time too short: Increase<br>The power output of the inverter is too Low: Opt for a less powerful drive. |
| ocn | Excess current during operation at constant speed | Short circuit at the output of the engine: Check isolation of the output line.<br>Sudden increase in engine load: Check the overload of the motor.<br>The power output of the inverter is too Low: Opt for a less powerful drive. |
| EF | External Fault | When multi-function input terminals (MI3-MI9) are set to default external the drive stops output U. V and W.<br>Restore the settings after Reset the fault. |
| cF1.0 | Internal EEPROM can not be programmed. | Consult factory. |
| cF1.1 | Internal EEPROM can not be programmed. | Consult factory. |
| cF2.0 | Reading the EEPROM Internal impossible. | Press the RESET button to restore all factory settings.<br>Consult factory. |
| cF2.1 | Reading the EEPROM Internal impossible. | Press the RESET button to restore all factory settings.<br>Consult factory. |
| cF3.0 | U-phase error | Consult factory. |
| cF3.1 | V-phase error | Consult factory. |
| cF3.2 | W-phase error | Consult factory. |
| cF3.3 | OV and LV | Consult factory. |
| cF3.4 cF3.5 | Error Sensor temperature | Consult factory. |
| GFF | Grounding problem | When one or more terminals output is / are set (s) to land, the current short-circuit current is greater than 50% of rated output current of the inverter, the power module of the inverter can be damaged. Note: Protection against short circuit is designed to protect the drive and not the user.<br>Check the power module IGBT is damaged.<br>Check the insulation of the output line. |
| cFA | Auto Acceleration / Deceleration fault | Check if the engine is designed for use with dimmers speed.<br>Check if the power of regeneration is too large.<br>It may be that the load has changed suddenly. |
| cE-- | Communication error | Check that the RS485 connection between the master controller and RS485 are not loose and the pins are correct.<br>Verify that the protocol communication, address, speed transmission, etc. are properly parameterized.<br>Use a good checksum calculation. |

| Fault | Probable Cause | Remedy |
|---|---|---|
| codE | Error protection software | Consult factory. |
| AErr | Analog signal error | Check wiring of the ACI |
| FbE | Error feedback signal of PID controller | Check the settings (Pr.1 0.01) and wiring AVI / ACI.<br>Make sure there is no error between the System response time and detection time of the return signal PID controller (Pr.1 0.08) |
| PHL | Phase loss | Check the wiring of the input phase to avoid loose contacts. |
| AUE | Automatic error | Check the wiring between the drive and the engine.<br>Retest. |
| CP10 | Communication time-out error on the control board or power board. | Press the RESET button to restore all factory settings.<br>Consult factory. |
| PtC1<br>PtC2 | Protection against overheating engine | Make sure the engine is overheating.<br>Check the settings in Pr.07. to 12 Pr.07.17. |
| PGEr | Error signal PG | Check the wiring of the card left.<br>Try a working PG card. |
| CGUd<br>CHbt | CANopen protection time-out (only for VFDxxxExxC)<br>CANopen pulse time-out (only for VFDxxxExxC) | Reconnect the CAN bus and reset.<br>Reconnect the CAN bus and reset. |
| CSYc | CANopen SYNC time-out (only for VFDxxxExxC) | Check synchronous message |
| Csdo | CANopen SDO time-out (only for VFDxxxExxC) | Check that the control channels are full. |
| CSbF | CANopen SDO Buffer overflow (only for VFDxxxExxC) | Too short time between commands. Please check the message SDO sent by the master.<br>Reset CAN bus. |
| CbSF | CAN bus will not power up (only for VFDxxxExxC) | Check if connected to the resistance terminus.<br>Check if the signal is abnormal.<br>Check if the master is connected. |
| CbtU | CAN Boot up fault (Only for VFDxxxExxC) | Check whether the master is connected.<br>Reset CAN bus. |
| CPto | CANopen communication protocol error (Only for VFDxxxExxC) | Verify that the protocol Communication is correct. |
| dEb | It will be displayed at the deceleration when Pr.08-24 is not set and when power off unexpected occurs, such as power loss momentary. | Pr.08-24 set to 0.<br>Check if the input power is stable. |
| AcL | Communication loop abnormally. | Check that the wiring Communication is correct.<br>Consult factory. |