**The purpose of this instruction** is to troubleshoot why the motor stall error is being displayed.

**Related documents:** Fault Trees (page 47-52) and Wiring Diagrams 60-192 (page 53-54)

**Department or Personnel responsible for this instruction:** Service Department

**CAUTION:** For this instruction high voltage may be exposed.

**Work Instruction:**
Confirm your system:

- CPXXXXXXXX IMS Driver :

  -PT403,405,407,410,415: go to section 1

  -AL325,600: go to section 2

- CPXXXXXXXX Kollmorgen Driver :

  -PT403,405,407,410,415: go to section 3

  -AL325,600: go to section 4

- CPAXXXXXXXX :

  -PT403,405,407,410,415: go to section 5

  -AL325,600: go to section 6

## Section 1:

**1..1.** With power to the system, try and turn on the compressor to run the cold head.

**1..2.** Is the green power indicator LED lot or flickering on the 24VDC power supply?

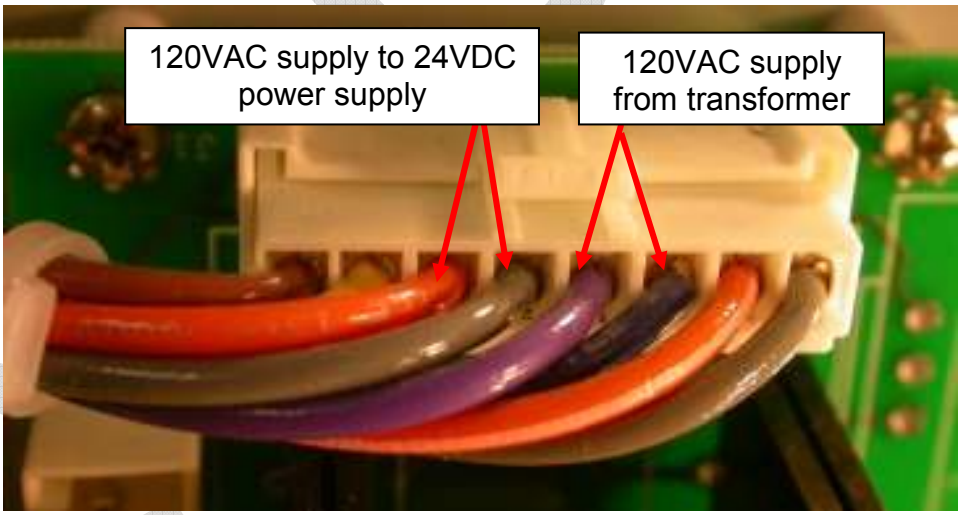
1..2.1. If the LED is lit, continue to 1..3.

1..2.2. If the LED is not lit, check if there is 120VAC on the input of the power supply.

1..2.3. If there is any voltage besides 120VAC or none at all, there may be a short or possible issue with the manual switch board (502-258).

1..2.3.1. Check continuity between the two inputs pins ACN and ACL to confirm there is no short.

1..2.3.2. Check for 120VAC from the transformer and to the 24VDC power supply.




1..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

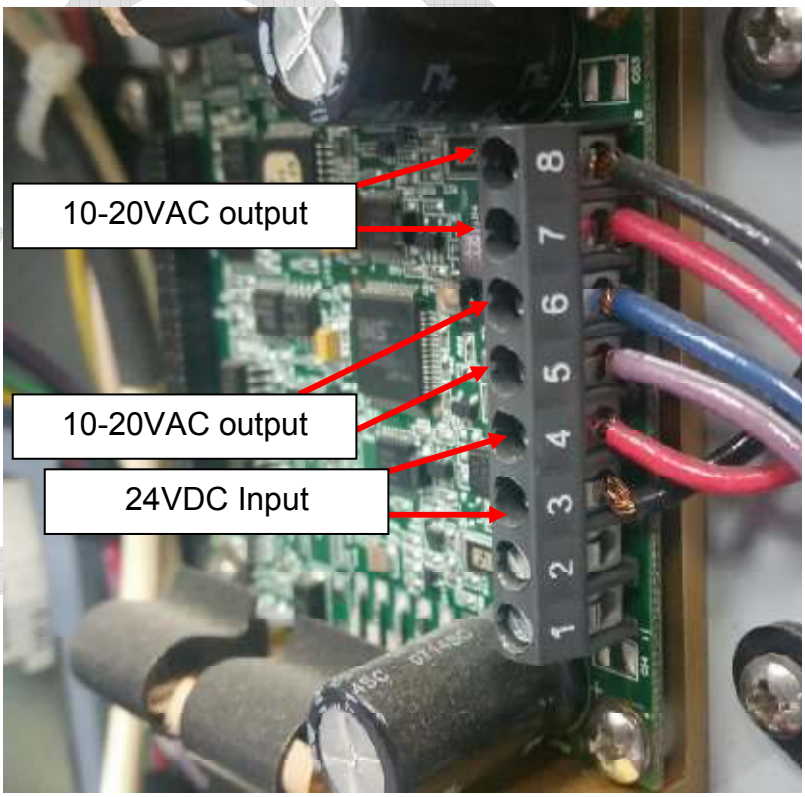
**1..3.** Is there 24VDC at the output of the power supply?

1..3.1. If there is 24VDC continue to step 1..4.

1..3.2. If there is not 24VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

1..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**1..4.** Is there 10-20VAC at the output pins of the driver, 5-6 and 7-8?

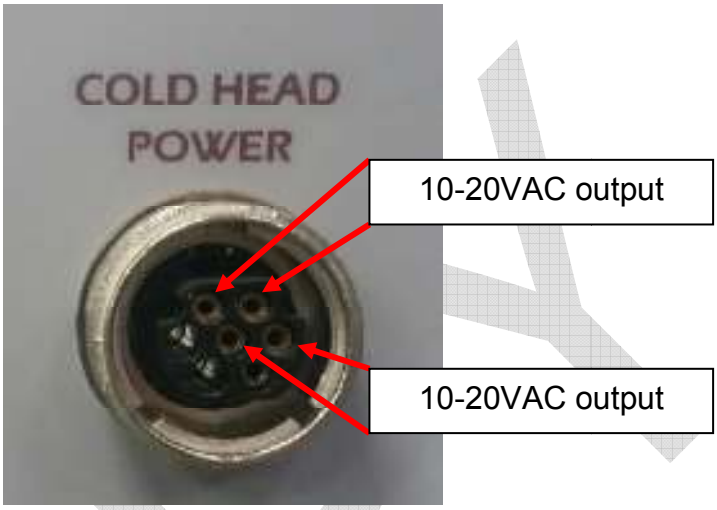



1..4.1. If there is 10-20VAC on pins 5-6 and 7-8 continue to step 1..5.

1..4.2. If there is not 10-20VAC at the output, confirm that there is there not a short with a continuity check between the output pins (V+ and V-).

1..4.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**1..5.** Is there 10-20VAC at the 7-pin connector at the front of the compressor?



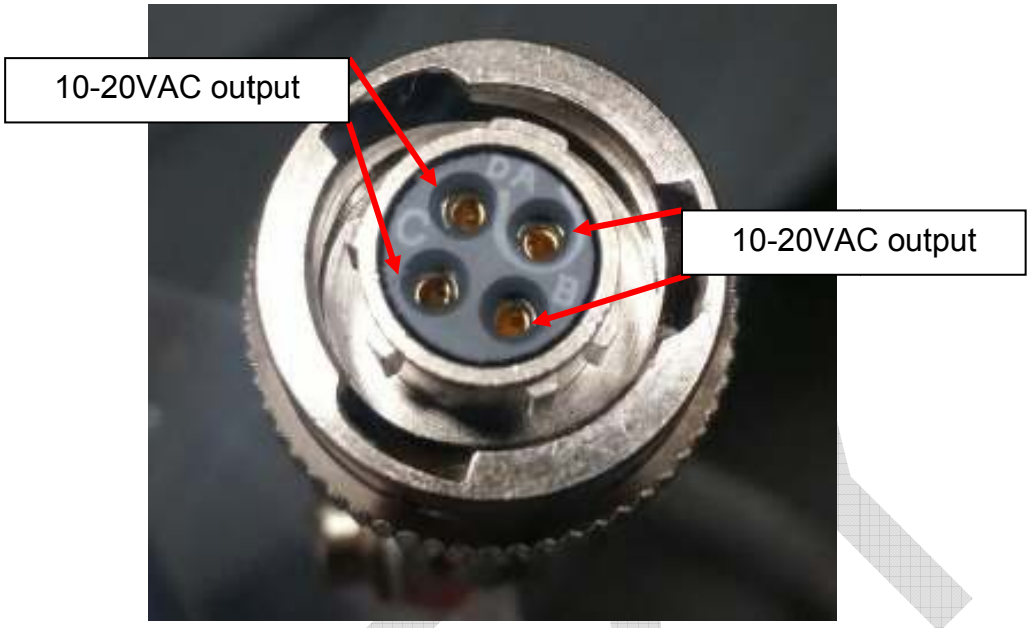

1..5.1. If there is 10-20VAC at the 7-pin connector continue to step 1..6.

1..5.2. If there is not 10-20VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 5 | → | 1 |
| 6 | → | 2 |
| 7 | → | 3 |
| 8 | → | 4 |

1..5.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**1..6.** Is there 10-20VAC at the end of the cold head motor cord?



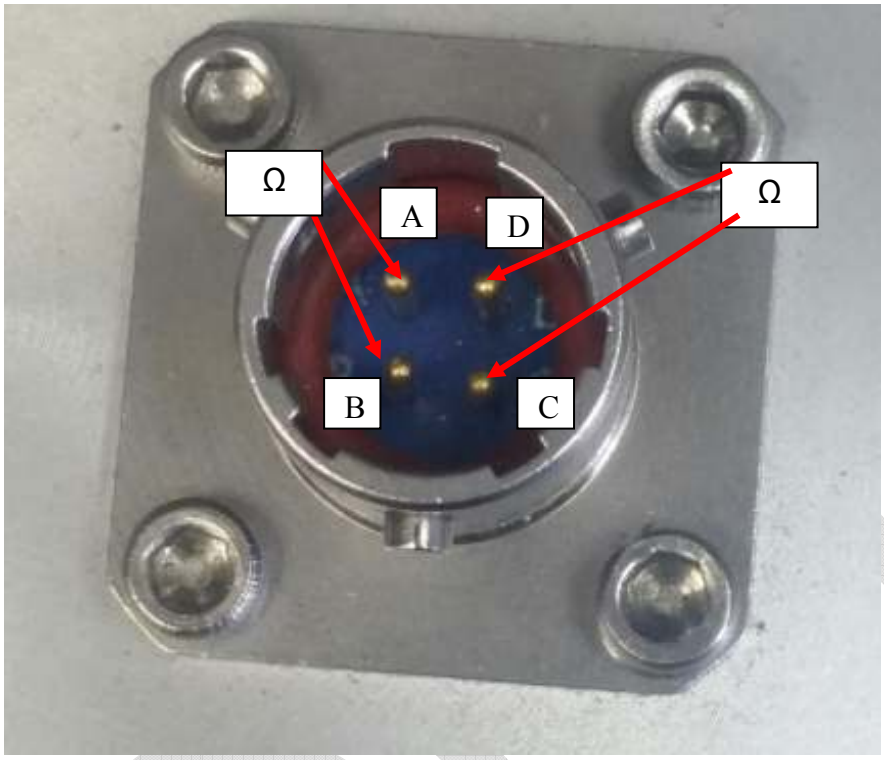

1..6.1. If there is 10-20VAC at the motor cord connector continue to step 1..7.

1..6.2. If there is not 10-20VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 5 | → | A |
| 6 | → | B |
| 7 | → | C |
| 8 | → | D |

1..6.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**1..7.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




**PT415 + 415RM Motor**
CPN: ELE407

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 RM and PT410 (non-remote)**
CPN: ELE304

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 Motor (not-remote)**
CPN: ELE305

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.4 |
| C-D | 1.4 |

1..7.1. If the resistance is in spec and there are no shorts to ground continue to step 1..8.

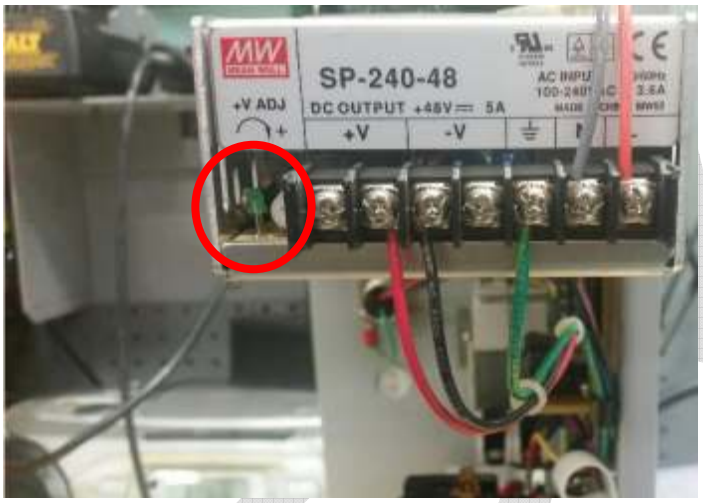
1..7.2. If the resistance is out of spec contact Cryomech.

**1..8.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning

## Section 2:

**2..1.** With power to the system, try and turn on the compressor to run the cold head.

**2..2.** Is the green power indicator LED lot or flickering on the 48VDC power supply?



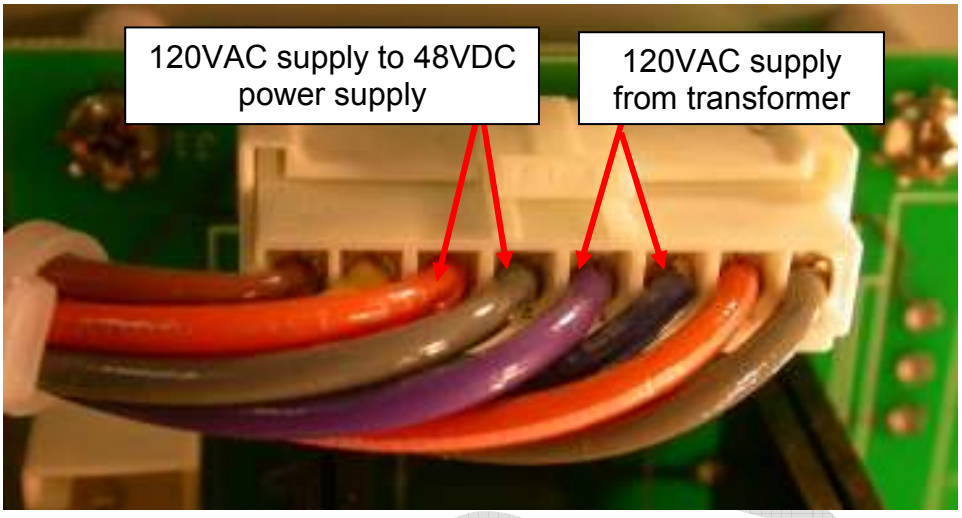

2..2.1. If the LED is lit, continue to 2..3.

2..2.2. If the LED is not lit, check if there is 120VAC on the input of the power supply.


2..2.3. If there is any voltage besides 120VAC or none at all, there may be a short or possible issue with the manual switch board (502-258).

2..2.3.1. Check continuity between the two inputs pins N and L to confirm there is no short.

2..2.3.2. Check for 120VAC from the transformer and to the 48VDC power supply.




2..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

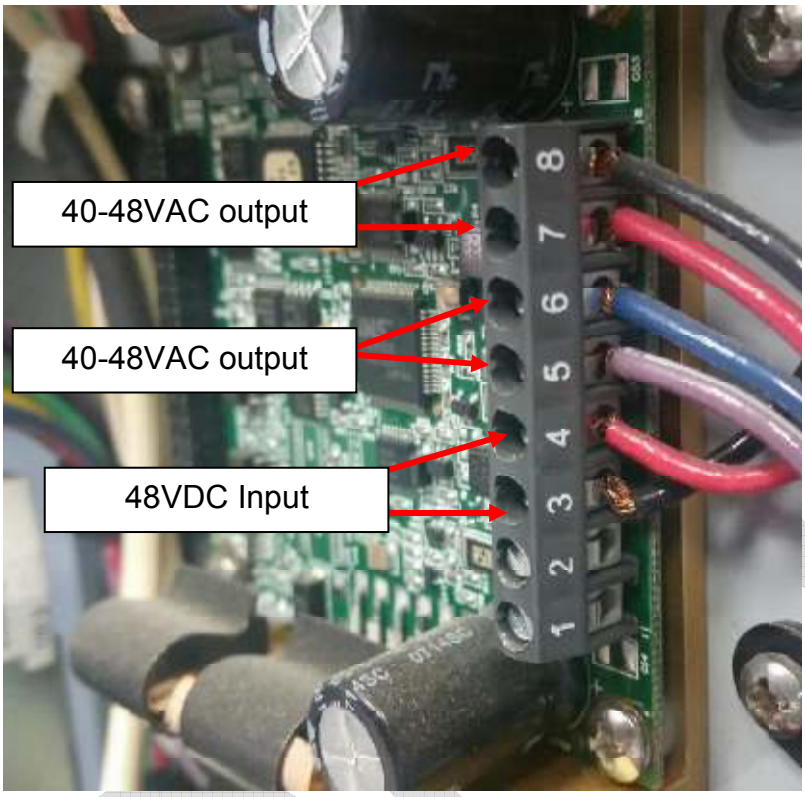
**2..3.** Is there 48VDC at the output of the power supply?


2..3.1. If there is 48VDC continue to step 2..4.

2..3.2. If there is not 48VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

2..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**2..4.** Is there 40-48VAC at the output pins of the driver, 5-6 and 7-8?

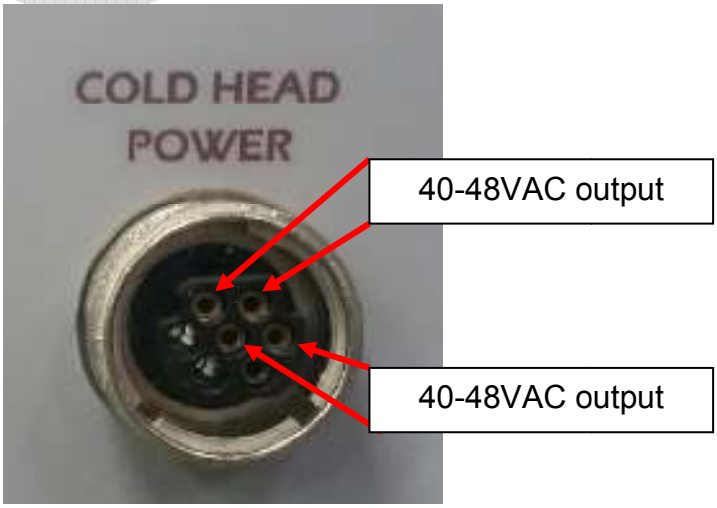



2..4.1. If there is 40-48VAC on pins 5-6 and 7-8 continue to step 2..5.

2..4.2. If there is not 40-48VAC at the output, confirm that there is there not a short with a continuity check between the output pins (V+ and V-).

2..4.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**2..5.** Is there 40-48VAC at the 7-pin connector at the front of the compressor?



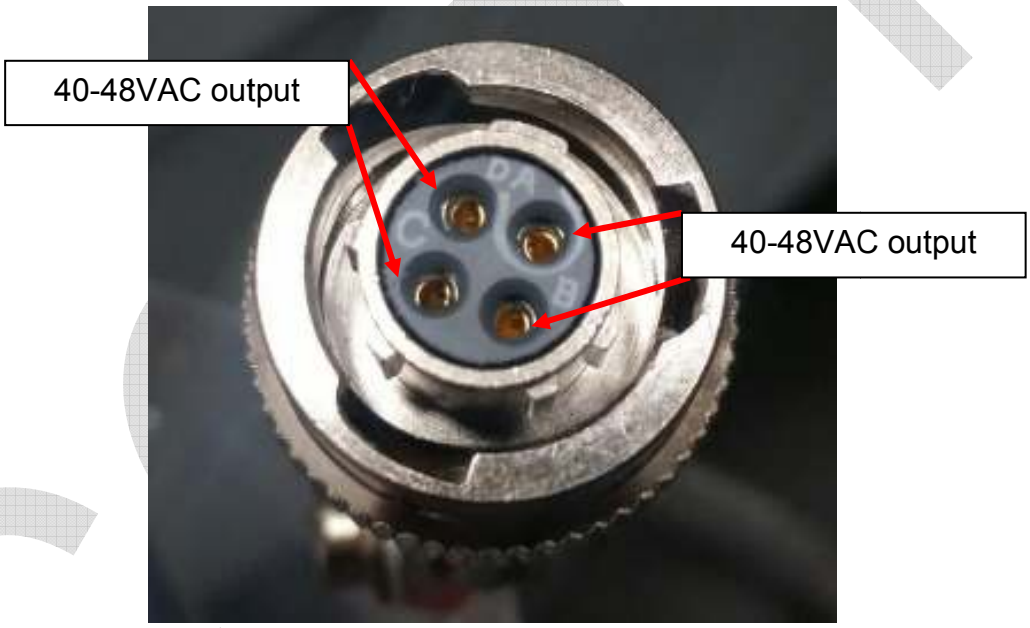
2..5.1. If there is 40-48VAC at the 7-pin connector continue to step 2..6.

2..5.2. If there is not 40-48VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 5 | → | 1 |
| 6 | → | 2 |
| 7 | → | 3 |
| 8 | → | 4 |

2..5.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**2..6.** Is there 40-48VAC at the end of the cold head motor cord?



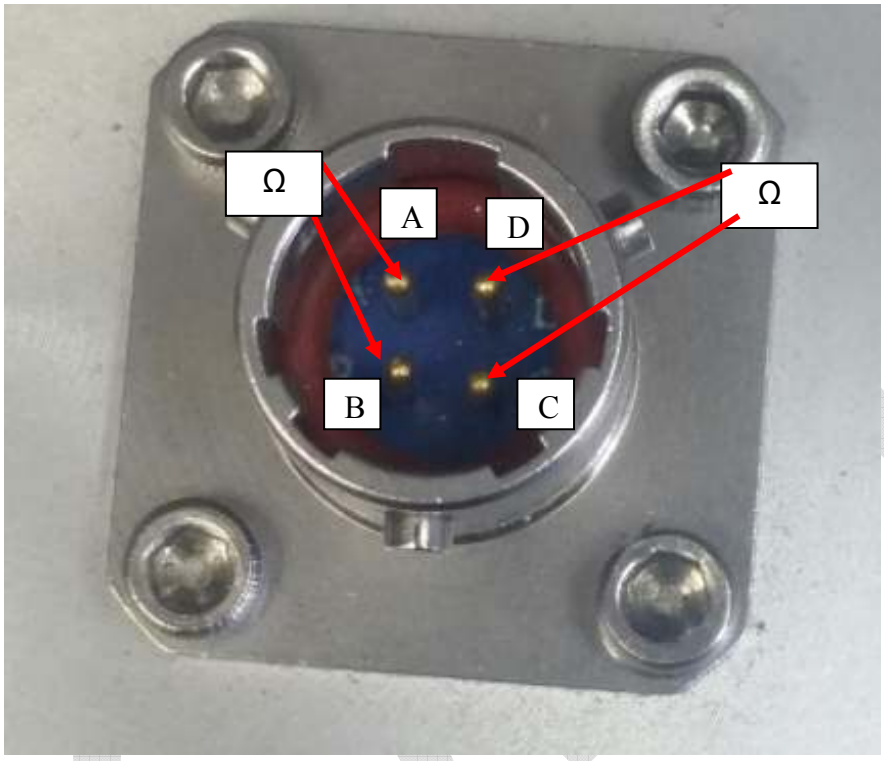

2..6.1. If there is 40-48VAC at the motor cord connector continue to step 2..7.

2..6.2. If there is not 40-48VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 5 | → | A |
| 6 | → | B |
| 7 | → | C |
| 8 | → | D |

2..6.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**2..7.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




**AL325/600 Motor**
CPN: MTR115

| Location | Resistance (ohms) |
|---|---|
| A-B | 2.2 |
| C-D | 2.2 |

2..7.1. If the resistance is in spec and there are no shorts to ground continue to step 2..8.

2..7.2. If the resistance is out of spec contact Cryomech.

**2..8.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning

## Section 3:

**3..1.** With power to the system, try and turn on the compressor to run the cold head.

**3..2.** Is the green power indicator LED lot or flickering on the 24VDC power supply?

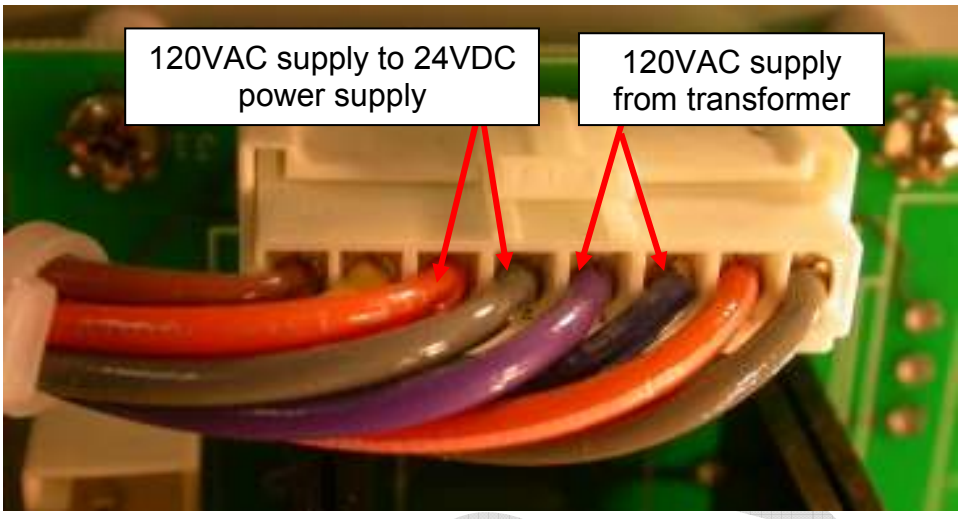
3..2.1. If the LED is lit, continue to 3..3.

3..2.2. If the LED is not lit, check if there is 120VAC on the input of the power supply.

3..2.3. If there is any voltage besides 120VAC or none at all, there may be a short or possible issue with the manual switch board (502-258).

3..2.3.1. Check continuity between the two inputs pins ACN and ACL to confirm there is no short.

3..2.3.2. Check for 120VAC from the transformer and to the 24VDC power supply.




3..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

3..2.3.4.

**3..3.** Is there 24VDC at the output of the power supply?

3..3.1. If there is 24VDC continue to step 3..4.

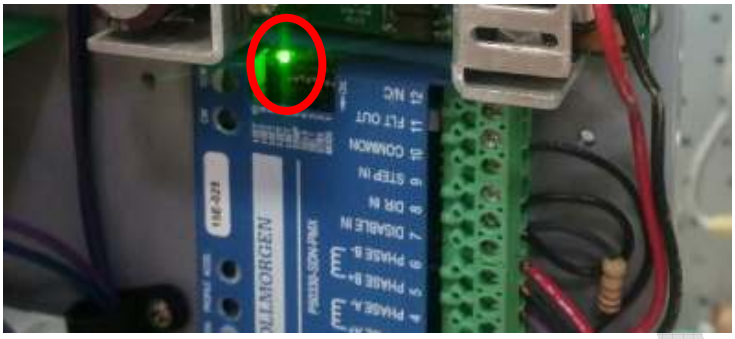
3..3.2. If there is not 24VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

3..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**3..4.** Confirm the dip switches are in the right position, shown below.


| Switch | Position |
|---|---|
| 1 | OFF |
| 2 | ON |
| 3 | ON |
| 4 | ON |
| 5 | OFF |
| 6 | OFF |
| 7 | ON |
| 8 | OFF |
| 9 | ON |
| 10 | ON |

**3..5.** Is the status LED blinking green?



3..5.1. If the status LED is blinking green continue to step 3..6.

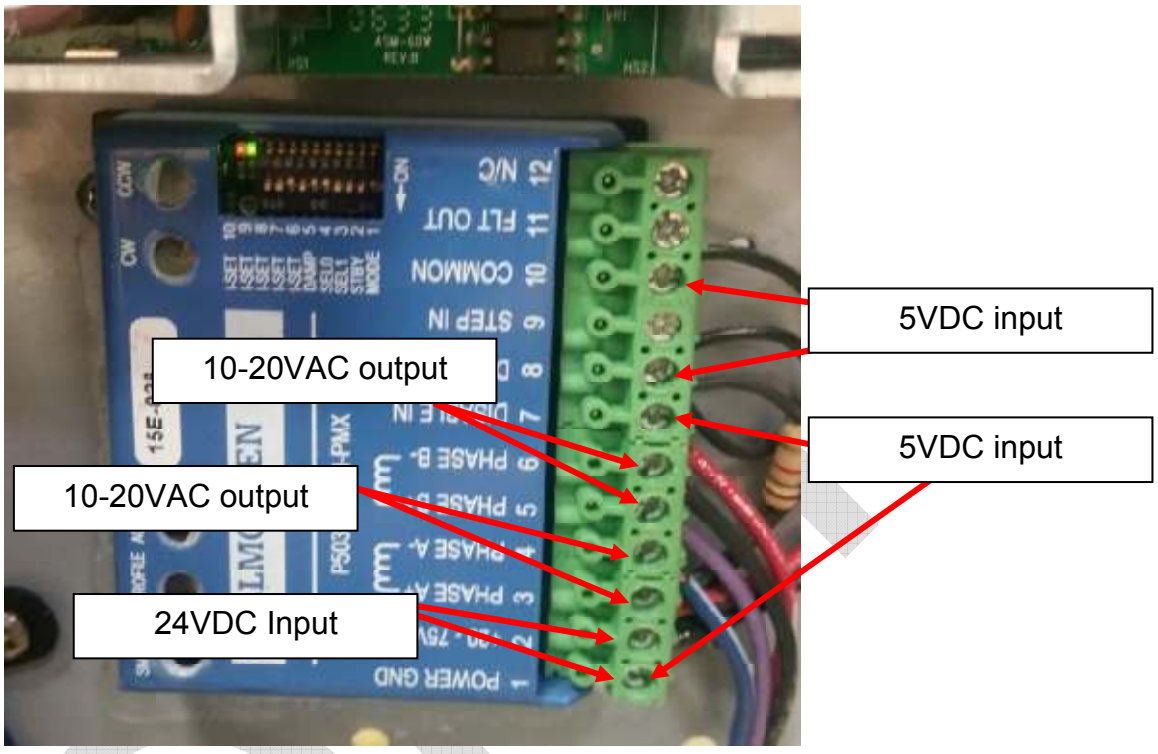
3..5.2. Turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

3..5.3. If the status LED is now blinking green continue to step 3..6.

3..5.4. If the status LED is still not blinking green, consult the chart below and report to Cryomech.

| | |
|---|---|
| Solid Green | Step & Dir MODE: 20–75VDC Power applied. VCO MODE: 20–75VDC Power applied & zero speed. |
| Flashing Green, Green, Green, Pause | VCO MODE only: Motor rotating CW direction. |
| Flashing Red, Red, Red, Pause | VCO MODE only: Motor rotating CCW direction. |
| Solid Red | Step MODE only: Drive is Disabled. No power to the motor. |

**3..6.** Is there 10-20VAC at the output pins of the driver, 3-4 and 5-6?




3..6.1. If there is 10-20VAC on pins 3-4 and 5-6 continue to step 3..7.

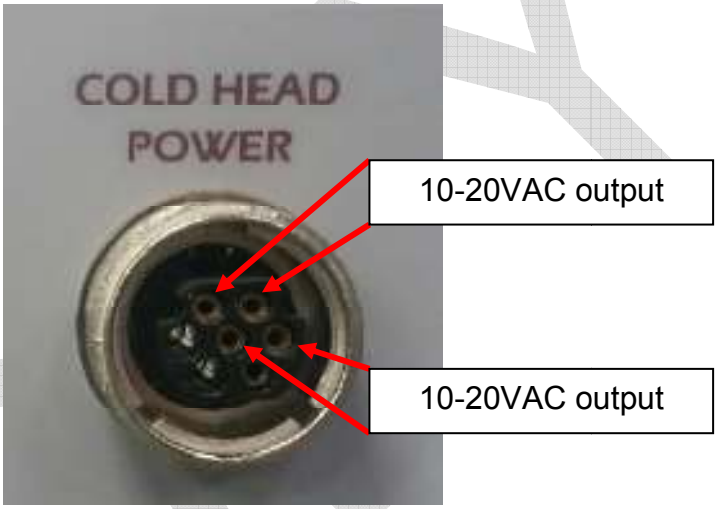
3..6.2. If there is not 10-20VAC at the output, turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

3..6.3. If the driver is now putting out 10-20VAC on pins 3-4 and 5-6, continue to step 3..7.

3..6.4. If the driver is still not putting out 10-20VAC on pins 3-4 and 5-6,confirm the driver is receiving 5VDC between pins 1-7 and 8-10. Check the resistor and make sure there is no discolor from heat dissipation.

3..6.4.1.1. If any of these voltages are incorrect or absent or the resistor is burnt out, contact Cryomech.

**3..7.** Is there 10-20VAC at the 7-pin connector at the front of the compressor?



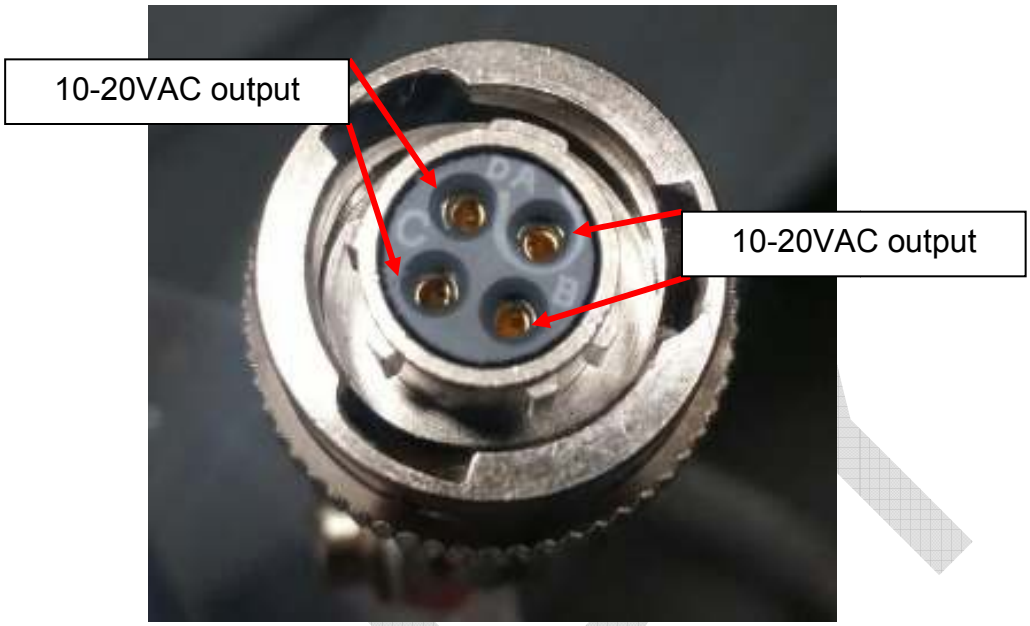

3..7.1. If there is 10-20VAC at the 7-pin connector continue to step 3..9.

3..7.2. If there is not 10-20VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 3 | → | 1 |
| 4 | → | 2 |
| 5 | → | 3 |
| 6 | → | 4 |

3..7.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**3..8.** Is there 10-20VAC at the end of the cold head motor cord?



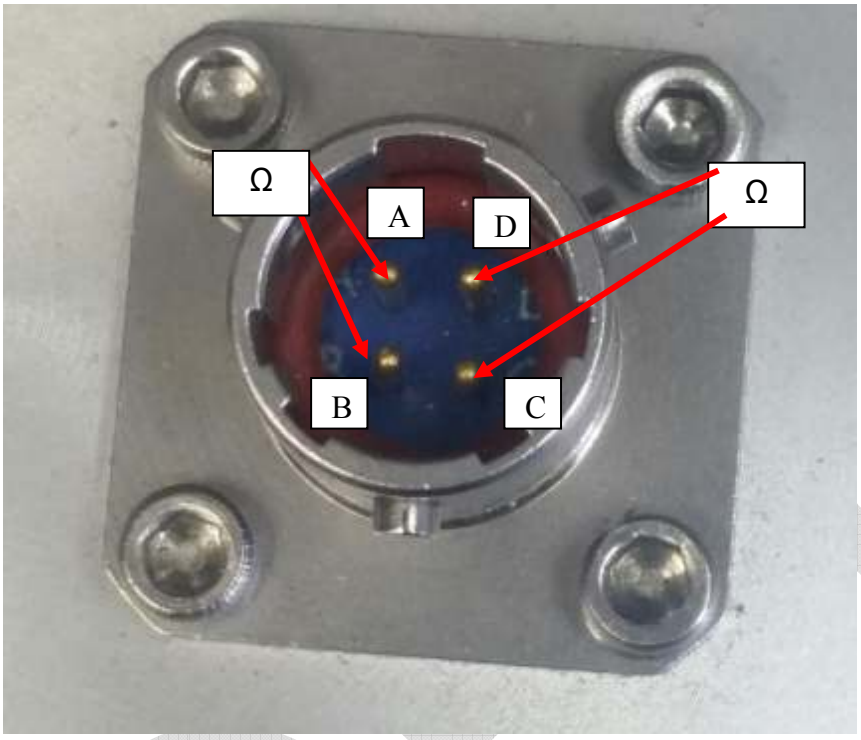

3..8.1. If there is 10-20VAC at the motor cord connector continue to step 3..10.

3..8.2. If there is not 10-20VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 3 | → | A |
| 4 | → | B |
| 5 | → | C |
| 6 | → | D |

3..8.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**3..9.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




**PT415 + 415RM Motor**
CPN: ELE407

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 RM and PT410 (non-remote)**
CPN: ELE304

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 Motor (not-remote)**
CPN: ELE305

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.4 |
| C-D | 1.4 |

3..9.1. If the resistance is in spec and there are no shorts to ground continue to step 3..11.

3..9.2. If the resistance is out of spec contact Cryomech.

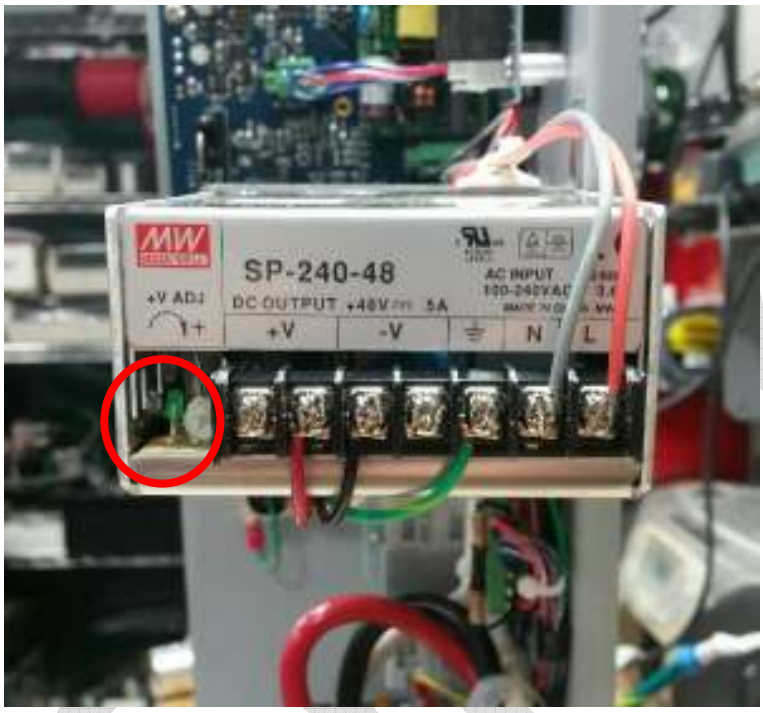
**3..10.** Try switching dip switch #8 to the ON position.


**3..11.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning.

## Section 4:

**4..1.** With power to the system, try and turn on the compressor to run the cold head.

**4..2.** Is the green power indicator LED lot or flickering on the 48VDC power supply?



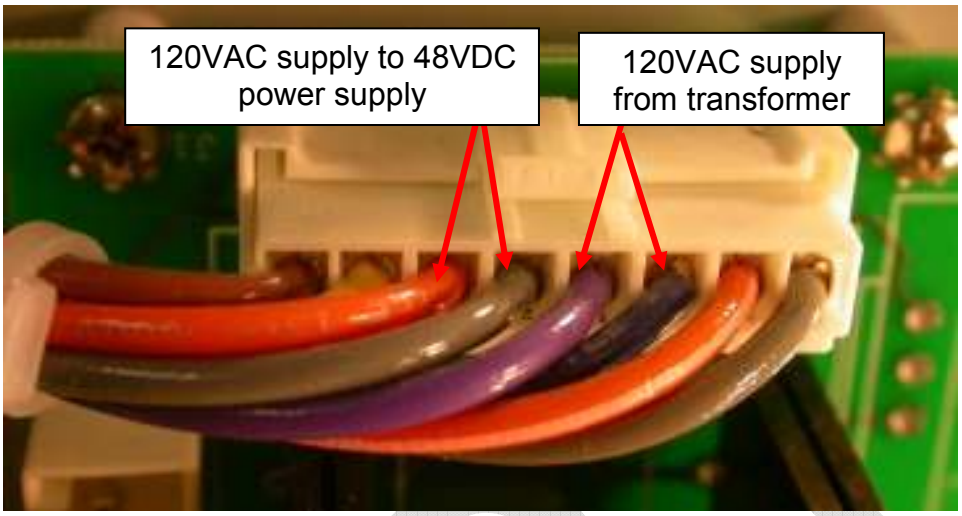

4..2.1. If the LED is lit, continue to 4..3.

4..2.2. If the LED is not lit, check if there is 120VAC on the input of the power supply.


4..2.3. If there is any voltage besides 120VAC or none at all, there may be a short or possible issue with the manual switch board (502-258).

4..2.3.1. Check continuity between the two inputs pins N and L to confirm there is no short.

4..2.3.2. Check for 120VAC from the transformer and to the 48VDC power supply.




4..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

**4..3.** Is there 48VDC at the output of the power supply?


4..3.1. If there is 48VDC continue to step 4..4.

4..3.2. If there is not 48VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

4..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**4..4.** Confirm the dip switches are in the right position, shown below.


| Switch | Position |
|---|---|
| 1 | OFF |
| 2 | ON |
| 3 | ON |
| 4 | ON |
| 5 | OFF |
| 6 | OFF |
| 7 | ON |
| 8 | ON |
| 9 | ON |
| 10 | ON |

**4..5.** Is the status LED blinking green?

4..5.1. If the status LED is blinking green continue to step 4..5.

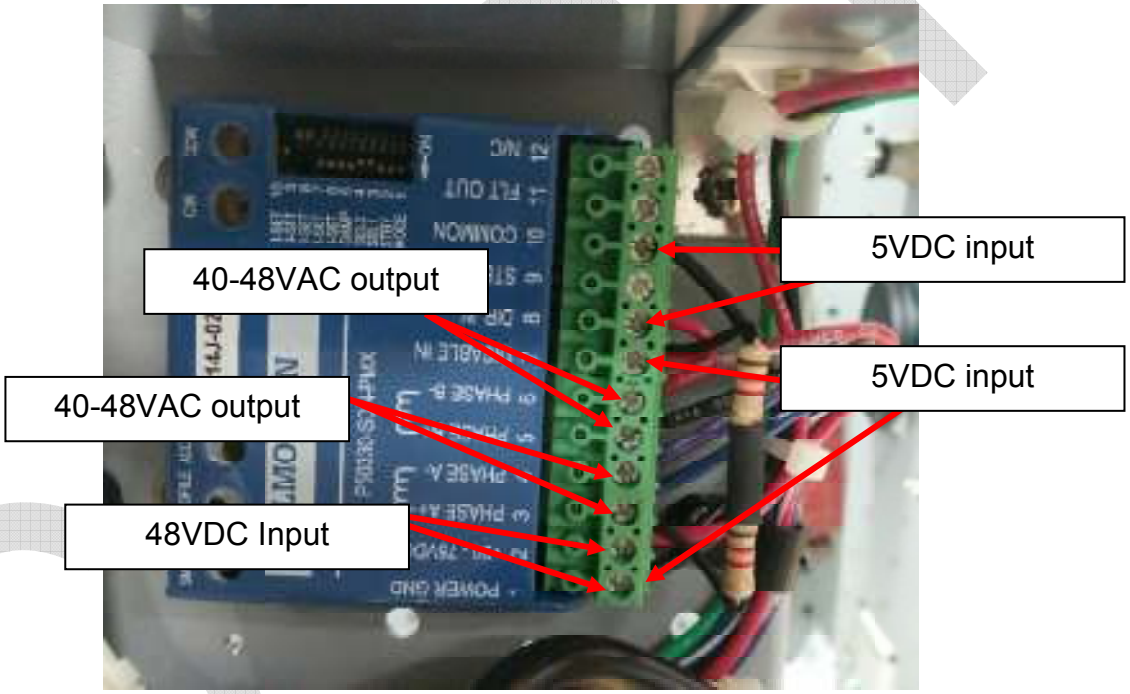
4..5.2. Turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

4..5.3. If the status LED is now blinking green continue to step 3..6.

4..5.4. If the status LED is still not blinking green, consult the chart below and report to Cryomech.

| | |
|---|---|
| Solid Green | Step & Dir MODE: 20–75VDC Power applied. VCO MODE: 20–75VDC Power applied & zero speed. |
| Flashing Green, Green, Green, Pause | VCO MODE only: Motor rotating CW direction. |
| Flashing Red, Red, Red, Pause | VCO MODE only: Motor rotating CCW direction. |
| Solid Red | Step MODE only: Drive is Disabled. No power to the motor. |

**4..6.** Is there 40-48VAC at the output pins of the driver, 3-4 and 5-6?




4..6.1. If there is 10-20VAC on pins 3-4 and 5-6 continue to step 4..7.

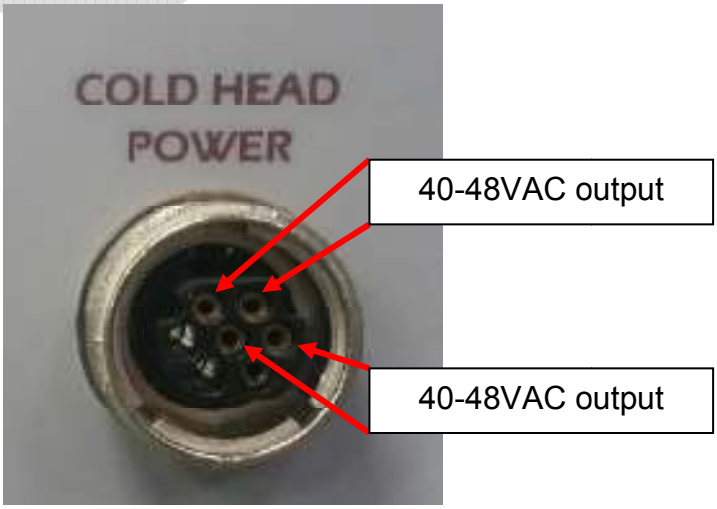
4..6.2. If there is not 40-48VAC at the output, turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

4..6.3. If the driver is now putting out 10-20VAC on pins 3-4 and 5-6, continue to step 4..7.

4..6.4. If the driver is still not putting out 10-20VAC on pins 3-4 and 5-6,confirm the driver is receiving 5VDC between pins 1-7 and 8-10. Check the resistor and make sure there is no discolor from heat dissipation.

4..6.4.1.1. If any of these voltages are incorrect or absent or the resistor is burnt out, contact Cryomech.

**4..7.** Is there 40-48VAC at the 7-pin connector at the front of the compressor?



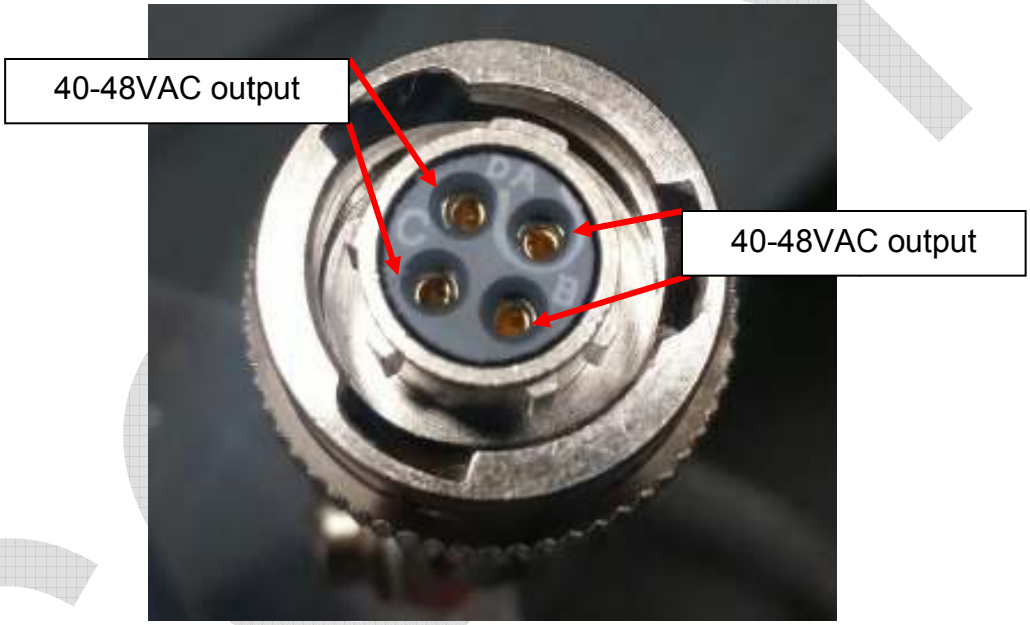

4..7.1. If there is 40-48VAC at the 7-pin connector continue to step 4..8.

4..7.2. If there is not 40-48VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 3 | → | 1 |
| 4 | → | 2 |
| 5 | → | 3 |
| 6 | → | 4 |

4..7.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**4..8.** Is there 40-48VAC at the end of the cold head motor cord?



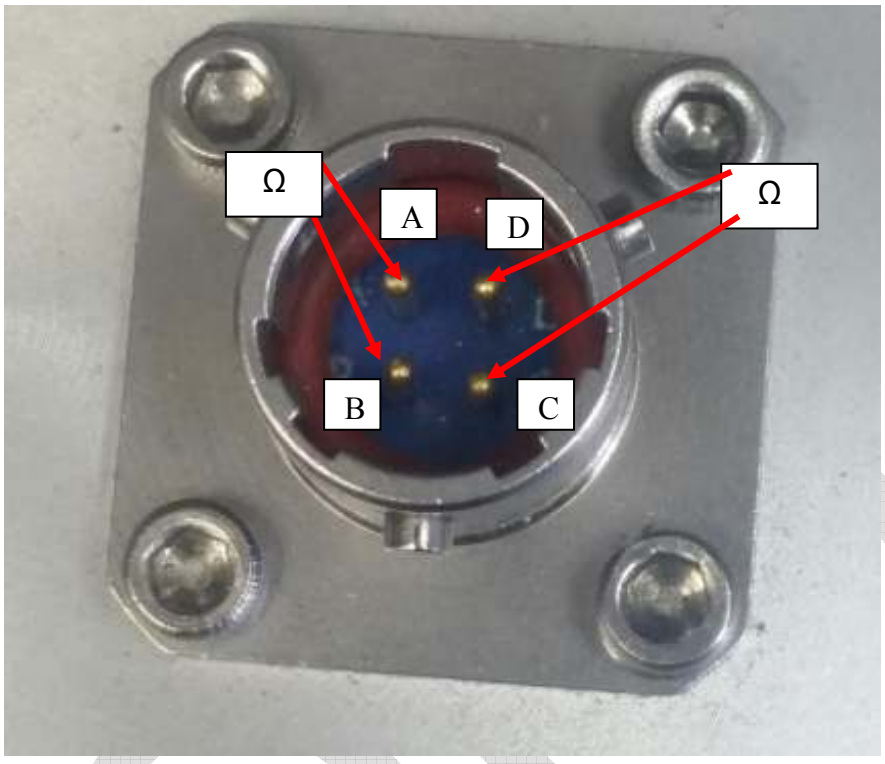

4..8.1. If there is 40-48VAC at the motor cord connector continue to step 4..9.

4..8.2. If there is not 40-48VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 3 | → | A |
| 4 | → | B |
| 5 | → | C |
| 6 | → | D |

4..8.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**4..9.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




AL325/600 Motor
CPN: MTR115

| Location | Resistance (ohms) |
|---|---|
| A-B | 2.2 |
| C-D | 2.2 |

4..9.1. If the resistance is in spec and there are no shorts to ground continue to step 4..10.

4..9.2. If the resistance is out of spec contact Cryomech.

**4..10.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning.

## Section 5:

**5..1.** With power to the system, try and turn on the compressor to run the cold head.

**5..2.** Is the green power indicator LED lot or flickering on the 24VDC power supply?

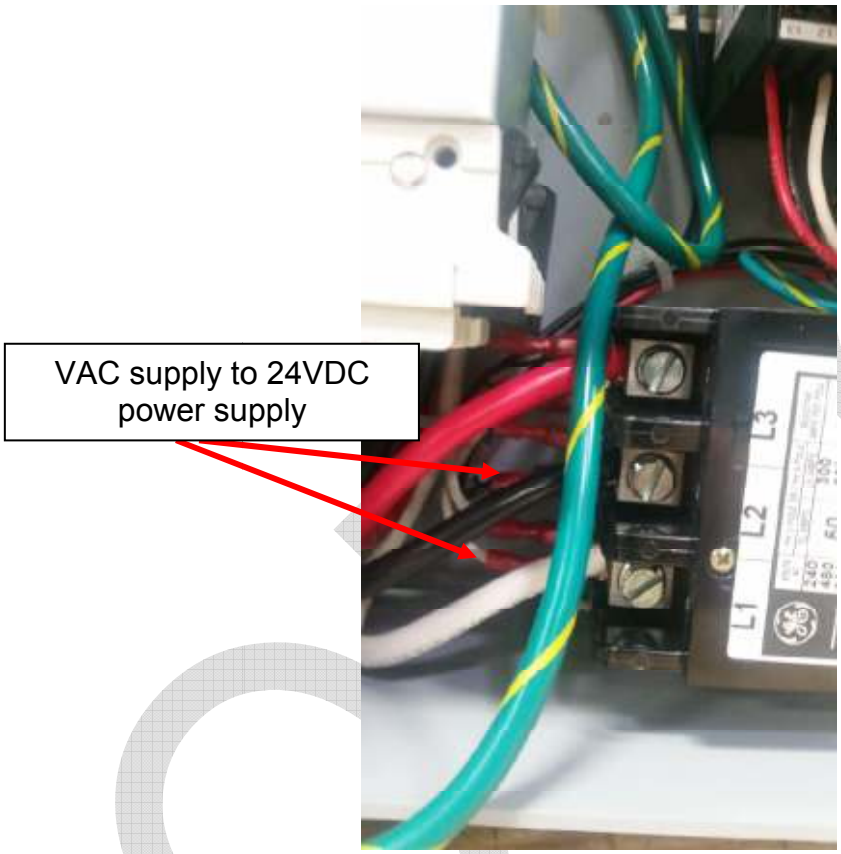

5..2.1. If the LED is lit, continue to 5..3.

5..2.2. If the LED is not lit, check if there is Line VAC on the input of the power supply.

5..2.3. If there is any voltage besides Line VAC or none at all, there may be a short or possible issue at the contactor.

5..2.3.1. Check continuity between the two inputs pins L1 and L2 to confirm there is no short.

5..2.3.2. Check for Line VAC from the contactor to the 24VDC power supply.




5..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

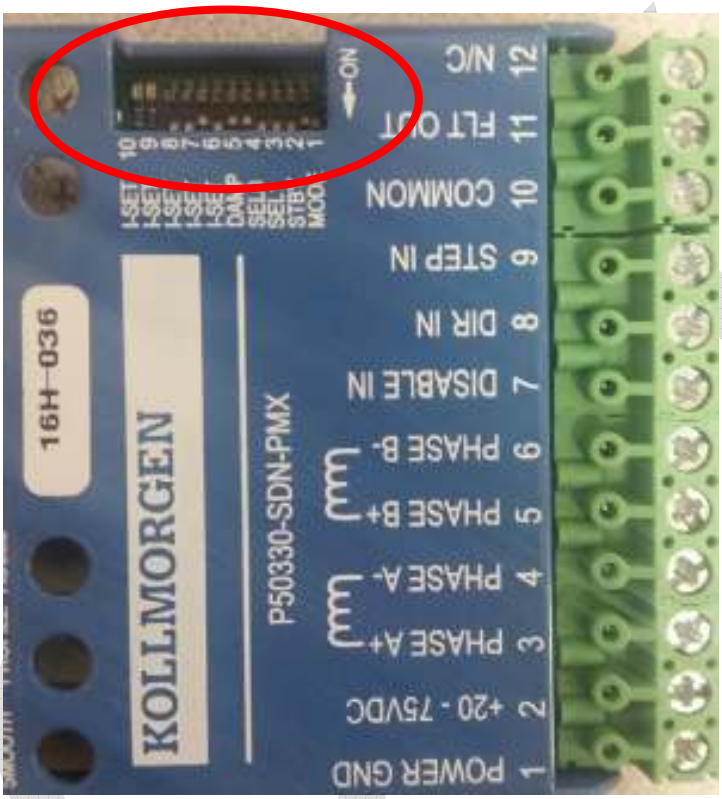
**5..3.** Is there 24VDC at the output of the power supply?

5..3.1. If there is 24VDC continue to step 5..4.

5..3.2. If there is not 24VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

5..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**5..4.** Confirm the dip switches are in the right position, shown below.




| Switch | Position |
|---|---|
| 1 | OFF |
| 2 | ON |
| 3 | ON |
| 4 | ON |
| 5 | OFF |
| 6 | OFF |
| 7 | ON |
| 8 | OFF |
| 9 | ON |
| 10 | ON |

Approved By:

**5..5.** Is the status LED blinking green?

5..5.1. If the status LED is blinking green continue to step 5..6.

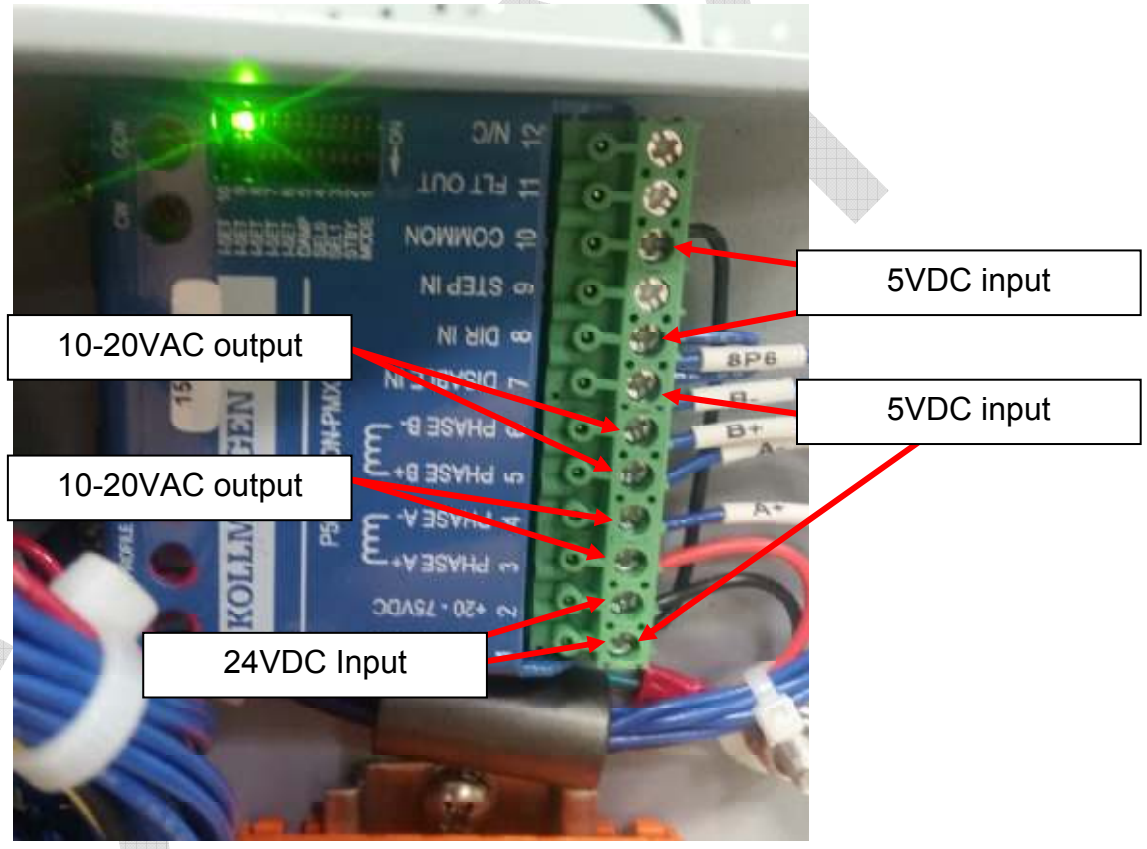
5..5.2. Turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

5..5.3. If the status LED is now blinking green continue to step 5..6.

5..5.4. If the status LED is still not blinking green, consult the chart below and report to Cryomech.

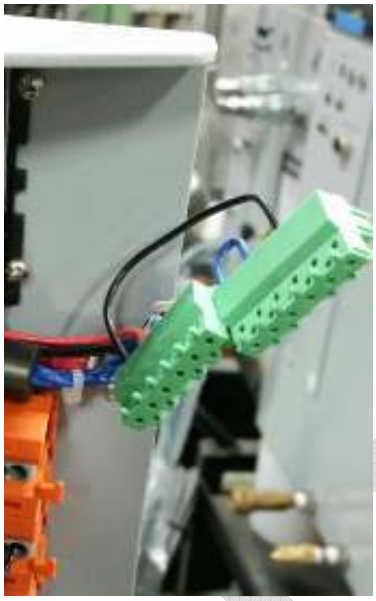
| | |
|---|---|
| Solid Green | Step & Dir MODE: 20–75VDC Power applied. VCO MODE: 20–75VDC Power applied & zero speed. |
| Flashing Green, Green, Green, Pause | VCO MODE only: Motor rotating CW direction. |
| Flashing Red, Red, Red, Pause | VCO MODE only: Motor rotating CCW direction. |
| Solid Red | Step MODE only: Drive is Disabled. No power to the motor. |

**5..6.** Is there 10-20VAC at the output pins of the driver, 3-4 and 5-6?




5..6.1. If there is 10-20VAC on pins 3-4 and 5-6 continue to step 5..7.

5..6.2. Turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

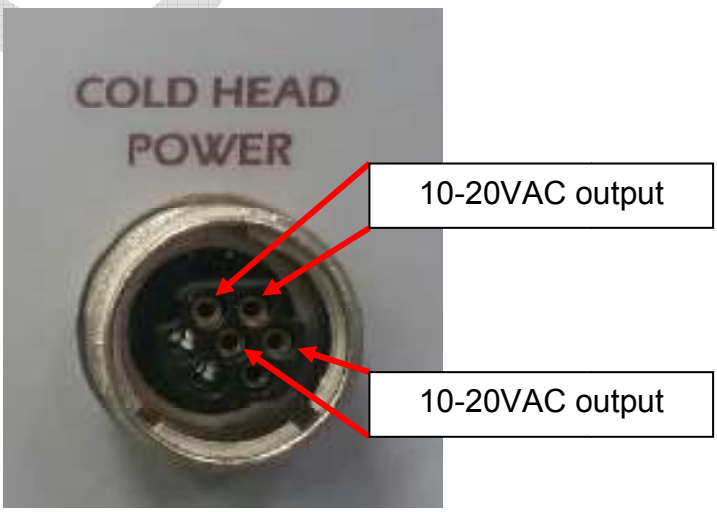


5..6.3. If the driver is now putting out 10-20VAC on pins 3-4 and 5-6, continue to step 5..7.

5..6.4. If the driver is still not putting out 10-20VAC on pins 3-4 and 5-6,confirm the driver is receiving 5VDC between pins 1-7 and 8-10. Check the resistor and make sure there is no discolor from heat dissipation.

5..6.4.1.1. If any of these voltages are incorrect or absent or the resistor is burnt out, contact Cryomech.

**5..7.** Is there 10-20VAC at the 7-pin connector at the front of the compressor?



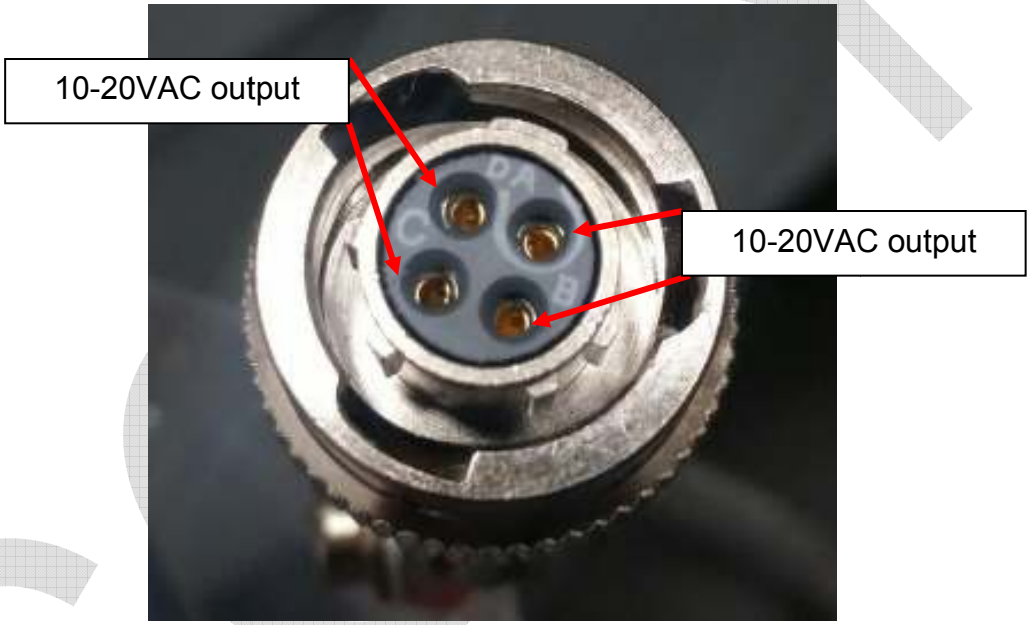

5..7.1. If there is 10-20VAC at the 7-pin connector continue to step 5..9.

5..7.2. If there is not 10-20VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 3 | → | 1 |
| 4 | → | 2 |
| 5 | → | 3 |
| 6 | → | 4 |

5..7.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**5..8.** Is there 10-20VAC at the end of the cold head motor cord?



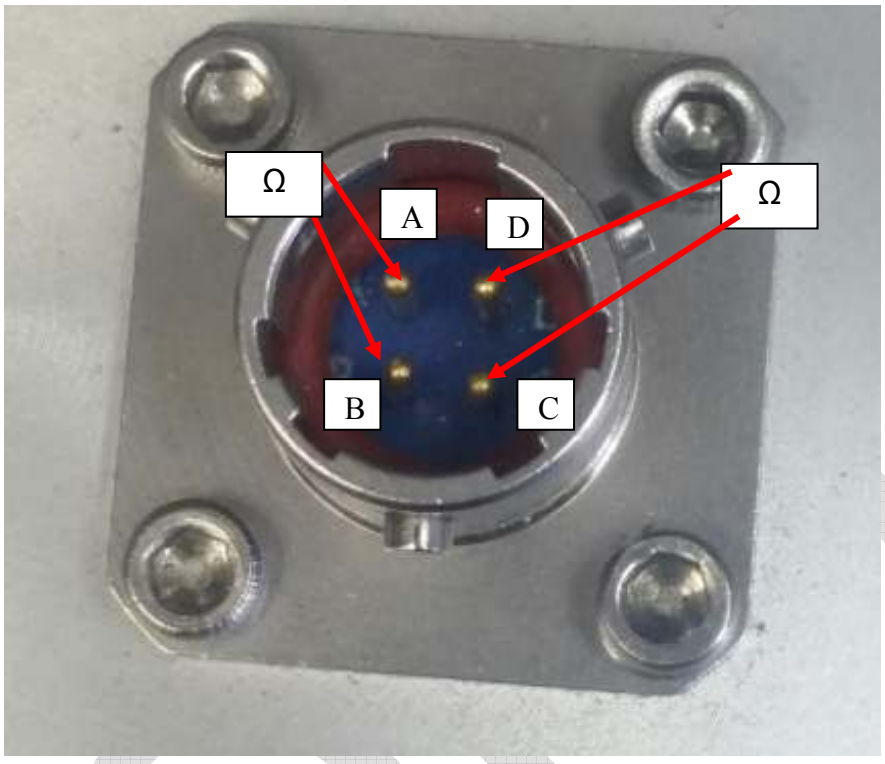

5..8.1. If there is 10-20VAC at the motor cord connector continue to step 5..10.

5..8.2. If there is not 10-20VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 3 | → | A |
| 4 | → | B |
| 5 | → | C |
| 6 | → | D |

5..8.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**5..9.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




**PT415 + 415RM Motor**
CPN: ELE407

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 RM and PT410 (non-remote)**
CPN: ELE304

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.8 |
| C-D | 1.8 |

**PT403/405/407 Motor (not-remote)**
CPN: ELE305

| Location | Resistance (ohms) |
|---|---|
| A-B | 1.4 |
| C-D | 1.4 |

5..9.1. If the resistance is in spec and there are no shorts to ground continue to step 5..11.

5..9.2. If the resistance is out of spec contact Cryomech.

**5..10.** Try switching dip switch #8 to the ON position.


**5..11.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning.

## Section 6:

**6..1.** With power to the system, try and turn on the compressor to run the cold head.

**6..2.** Is the green power indicator LED lot or flickering on the 48VDC power supply?

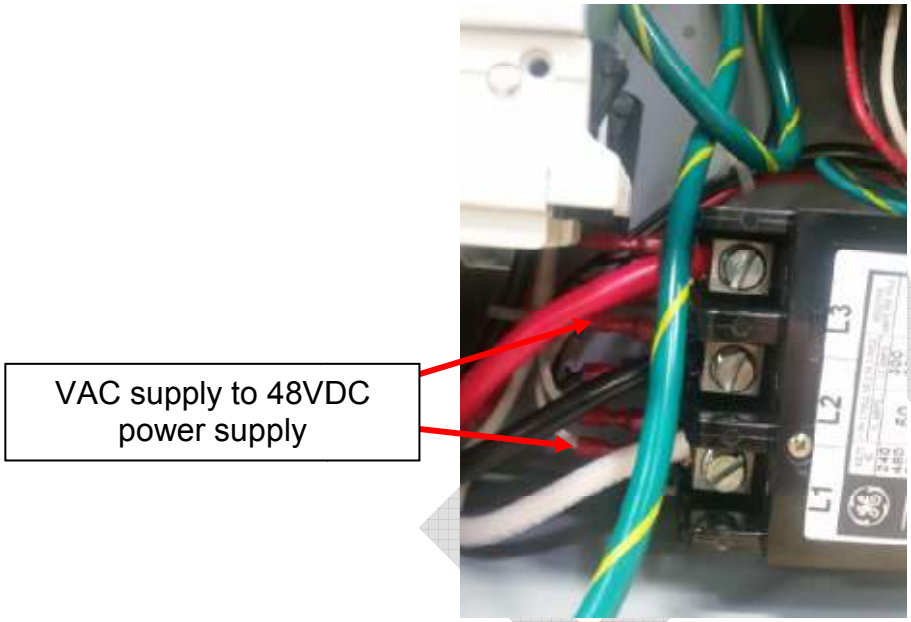

6..2.1. If the LED is lit, continue to 6..3.

6..2.2. If the LED is not lit, check if there is Line VAC on the input of the power supply.

6..2.3. If there is any voltage besides Line VAC or none at all, there may be a short or possible issue at the contactor.

6..2.3.1. Check continuity between the two inputs pins L1 and L2 to confirm there is no short.

6..2.3.2. Check for Line VAC from the contactor to the 48VDC power supply.




6..2.3.3. If any of these voltages are incorrect or absent, contact Cryomech.

**6..3.** Is there 48VDC at the output of the power supply?

6..3.1. If there is 48VDC continue to step 6..4.

6..3.2. If there is not 48VDC at the output, confirm that there is not a short with a continuity check between the output pins (V+ and V-)

6..3.2.1. If any of these voltages are incorrect or absent and there is no short found, contact Cryomech.

**6..4.** Confirm the dip switches are in the right position, shown below.


| Switch | Position |
|---|---|
| 1 | OFF |
| 2 | ON |
| 3 | ON |
| 4 | ON |
| 5 | OFF |
| 6 | OFF |
| 7 | ON |
| 8 | ON |
| 9 | ON |
| 10 | ON |

**6..5.** Is the status LED blinking green?

6..5.1. If the status LED is blinking green continue to step 6..6.

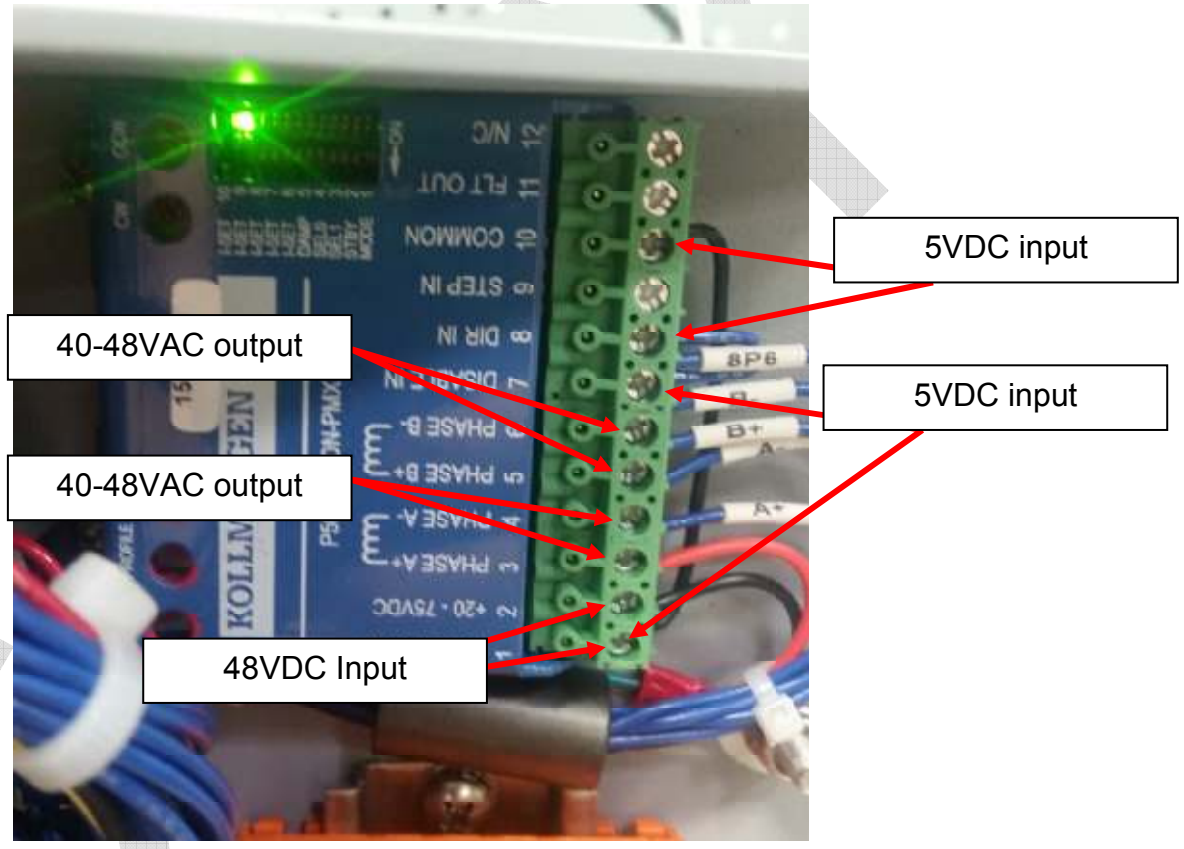
6..5.2. Turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

6..5.3. If the status LED is now blinking green continue to step 6..6.

6..5.4. If the status LED is still not blinking green, consult the chart below and report to Cryomech.

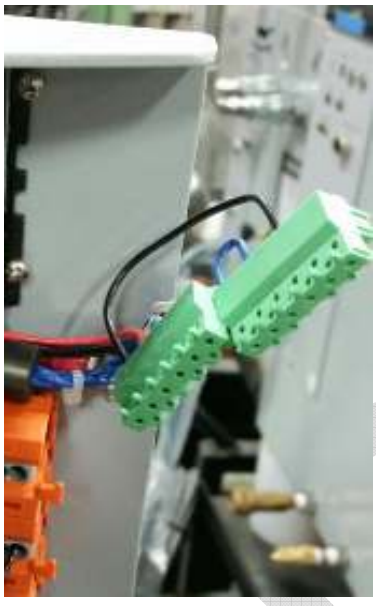
| | |
|---|---|
| Solid Green | Step & Dir MODE: 20–75VDC Power applied. VCO MODE: 20–75VDC Power applied & zero speed. |
| Flashing Green, Green, Green, Pause | VCO MODE only: Motor rotating CW direction. |
| Flashing Red, Red, Red, Pause | VCO MODE only: Motor rotating CCW direction. |
| Solid Red | Step MODE only: Drive is Disabled. No power to the motor. |

**6..6.** Is there 25-40VAC at the output pins of the driver, 3-4 and 5-6?




6..6.1. If there is 10-20VAC on pins 3-4 and 5-6 continue to step 4..7.

6..6.2. If there is not 40-48VAC at the output, turn the system off and remove power. Remove and rewire the green terminal block on the driver. The torque values are min: .35Nm and max: .40Nm. Once the terminal block is replaced, apply power and turn the system back on.

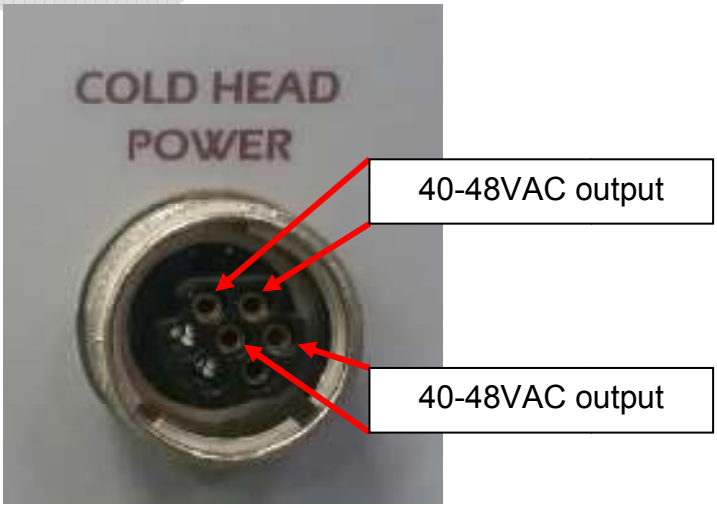


6..6.3. If the driver is now putting out 40-48VAC on pins 3-4 and 5-6 continue to step 6..7.

6..6.4. If the driver is still not putting out 40-48VAC on pins 3-4 and 5-6,confirm the driver is receiving 5VDC between pins 1-7 and 8-10. Check the resistor and make sure there is no discolor from heat dissipation.

6..6.4.1.1. If any of these voltages are incorrect or absent or the resistor is burnt out, contact Cryomech.

**6..7.** Is there 40-48VAC at the 7-pin connector at the front of the compressor?



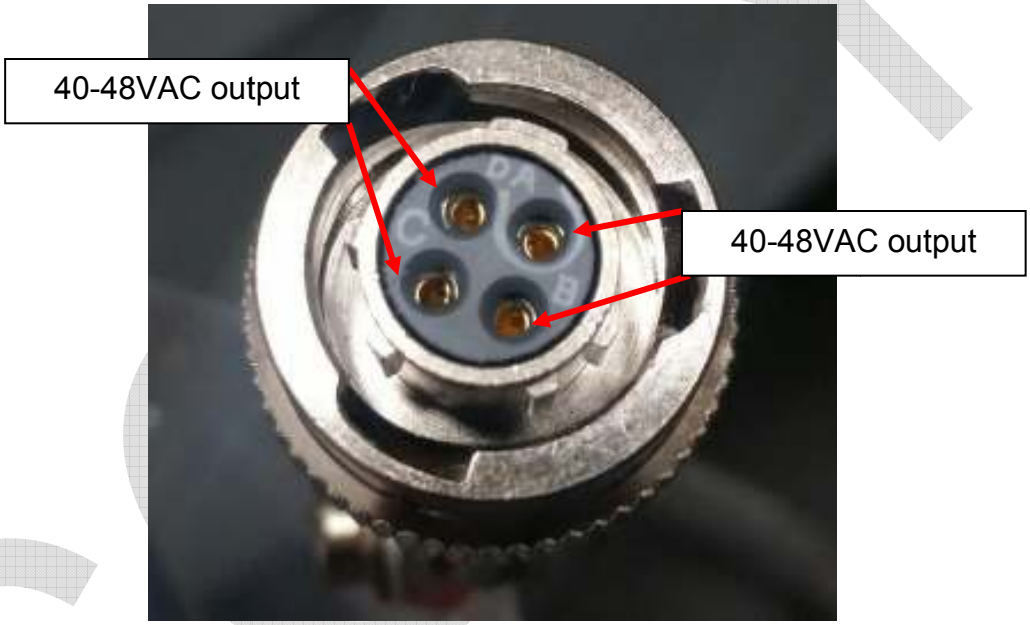

6..7.1. If there is 40-48VAC at the 7-pin connector continue to step 6..9.

6..7.2. If there is not 40-48VAC at the output, confirm that there is continuity between the driver output pin and its respective pin at the 7-Pin connector:

| Driver Pin | | 7-Pin |
|---|---|---|
| 3 | → | 1 |
| 4 | → | 2 |
| 5 | → | 3 |
| 6 | → | 4 |

6..7.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**6..8.** Is there 40-48VAC at the end of the cold head motor cord?



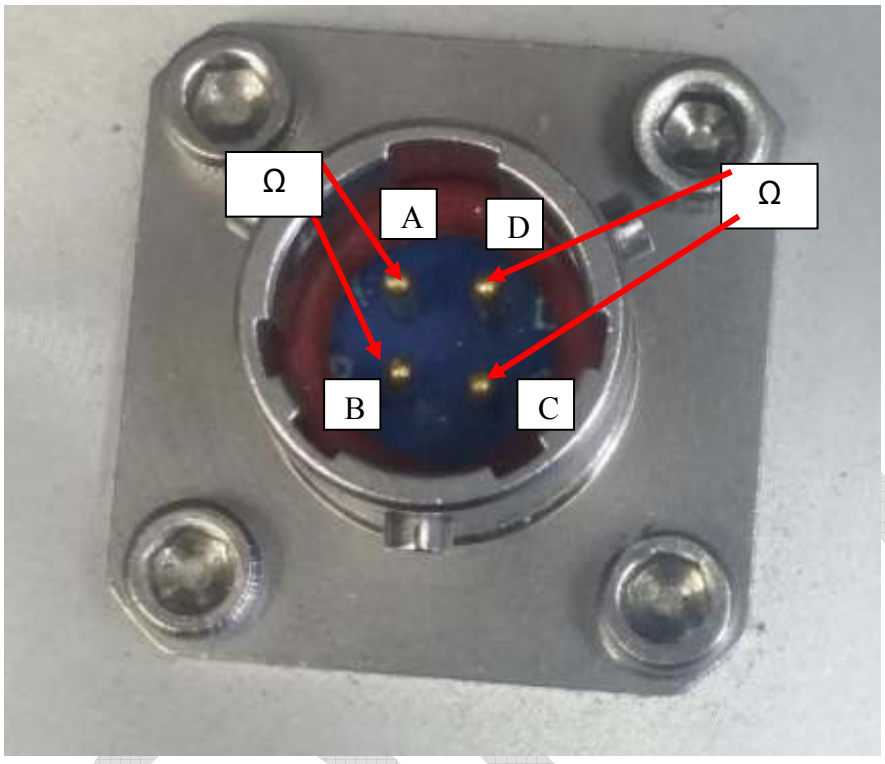

6..8.1. If there is 40-48VAC at the motor cord connector continue to step 6..10.

6..8.2. If there is not 40-48VAC at the motor cord, confirm that there is continuity between the driver output pin and its respective pin at the end of the cord:

| Driver Pin | | CHMC |
|---|---|---|
| 3 | → | A |
| 4 | → | B |
| 5 | → | C |
| 6 | → | D |

6..8.2.1. If any of these voltages are incorrect or absent and there is continuity between all the pins, contact Cryomech.

**6..9.** Check the resistances of the cold head motor between pins A-B and C-D as well as checking each pin to ground to see if there is a short.




**AL325/600 Motor**
CPN: MTR115

| Location | Resistance (ohms) |
|---|---|
| A-B | 2.2 |
| C-D | 2.2 |

6..9.1. If the resistance is in spec and there are no shorts to ground continue to step 6..11.

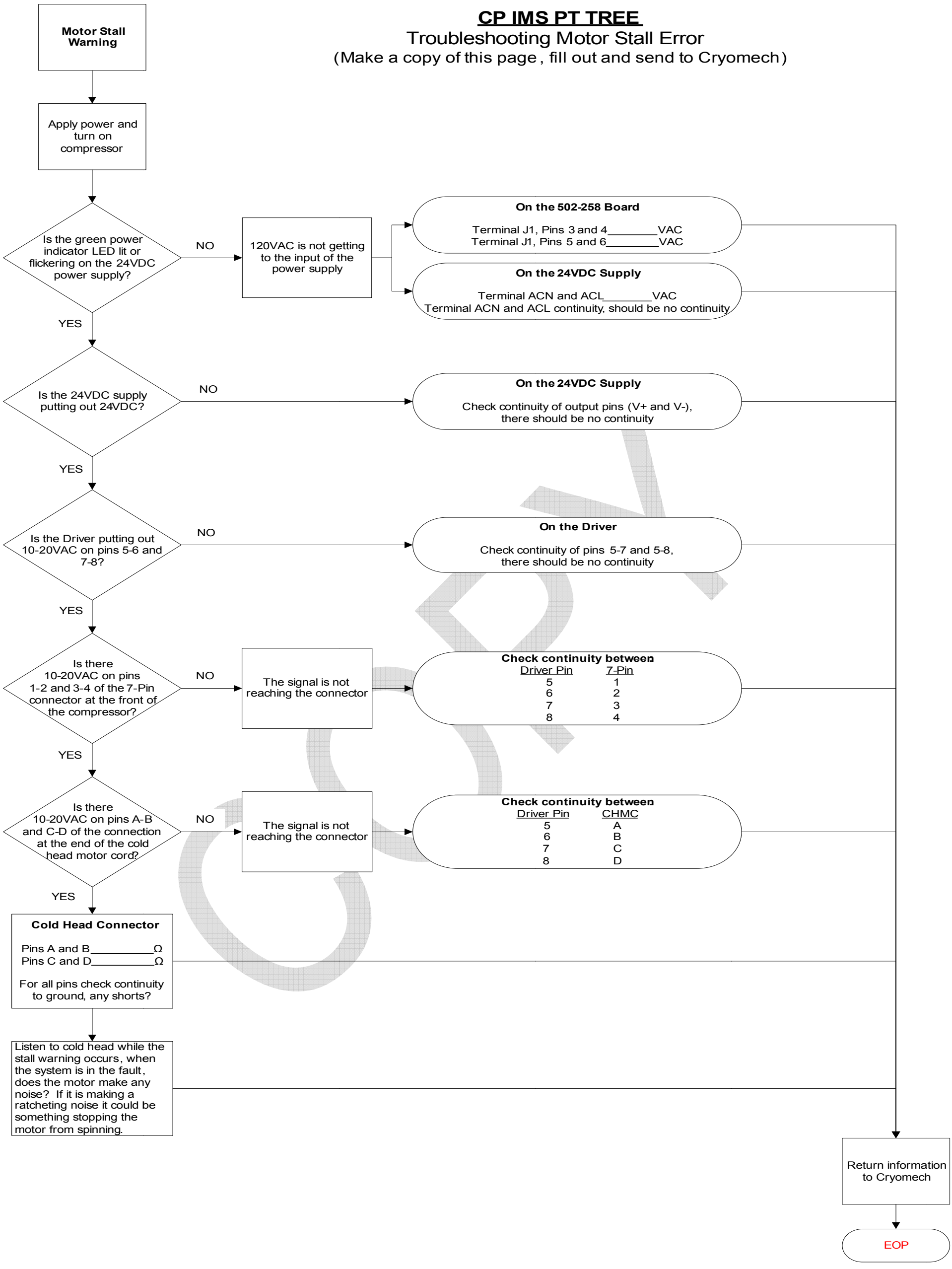
6..9.2. If the resistance is out of spec contact Cryomech.

**6..10.** Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning.

# CP IMS PT TREE

## Troubleshooting Motor Stall Error

(Make a copy of this page , fill out and send to Cryomech)



# CP IMS GM TREE

## Troubleshooting Motor Stall Error

(Make a copy of this page , fill out and send to Cryomech)

**Motor Stall Warning**

Apply power and turn on compressor

Is the green power indicator LED lit or flickering on the 24VDC power supply?

NO → 120VAC is not getting to the input of the power supply

- **On the 502-258 Board**
  Terminal J1, Pins 3 and 4_____VAC
  Terminal J1, Pins 5 and 6_____VAC
- **On the 48VDC Supply**
  Terminal ACN and ACL_____VAC
  Terminal ACN and ACL continuity, should be no continuity

YES

Is the 48VDC supply putting out 48VDC?

NO → **On the 48VDC Supply**
Check continuity of output pins (V+ and V-), there should be no continuity

YES

Is the Driver putting out 40-48VAC on pins 5-6 and 7-8?

NO → **On the Driver**
Check continuity of pins 5-7 and 5-8, there should be no continuity

YES

Is there 40-48VAC on pins 1-2 and 3-4 of the 7-Pin connector at the front of the compressor?

NO → The signal is not reaching the connector → **Check continuity between**

| Driver Pin | 7-Pin |
|---|---|
| 5 | 1 |
| 6 | 2 |
| 7 | 3 |
| 8 | 4 |

YES

Is there 40-48VAC on pins A-B and C-D of the connection at the end of the cold head motor cord?

NO → The signal is not reaching the connector → **Check continuity between**

| Driver Pin | CHMC |
|---|---|
| 5 | A |
| 6 | B |
| 7 | C |
| 8 | D |

YES

**Cold Head Connector**

Pins A and B_____Ω
Pins C and D_____Ω

For all pins check continuity to ground, any shorts?

Listen to cold head while the stall warning occurs, when the system is in the fault, does the motor make any noise? If it is making a ratcheting noise it could be something stopping the motor from spinning.

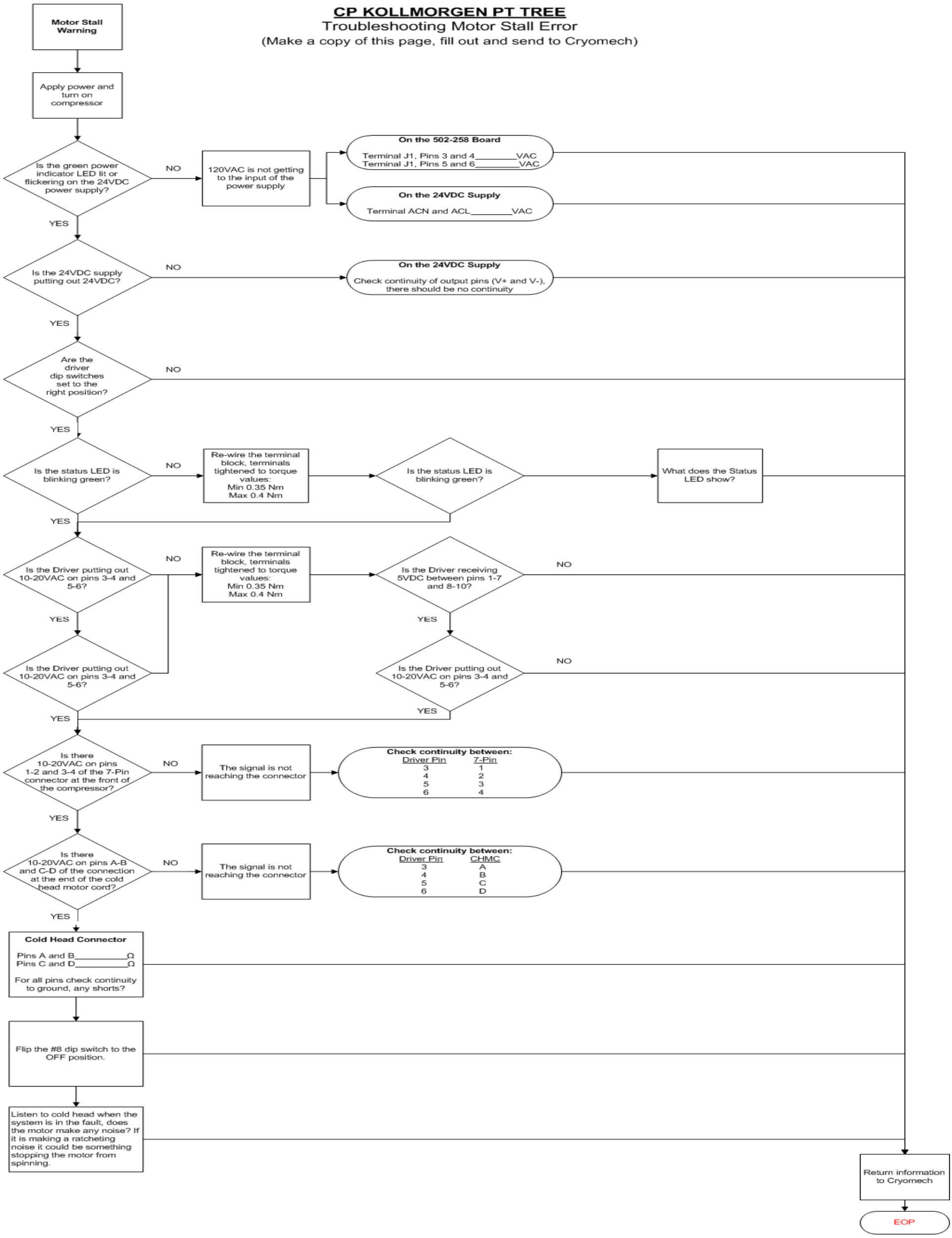
Return information to Cryomech

EOP

## CP KOLLMORGEN PT TREE

Troubleshooting Motor Stall Error

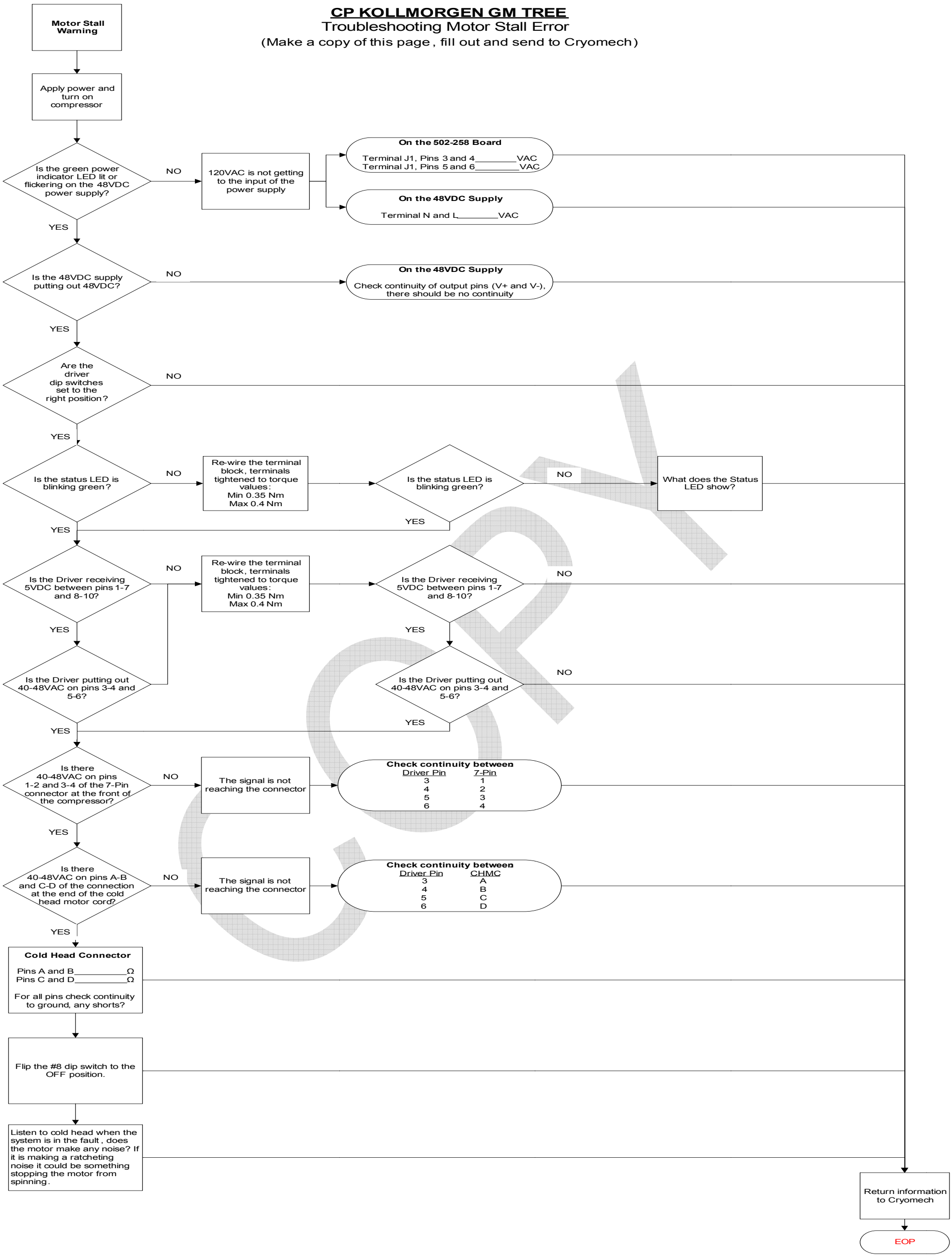
(Make a copy of this page, fill out and send to Cryomech)



## CP KOLLMORGEN GM TREE

Troubleshooting Motor Stall Error

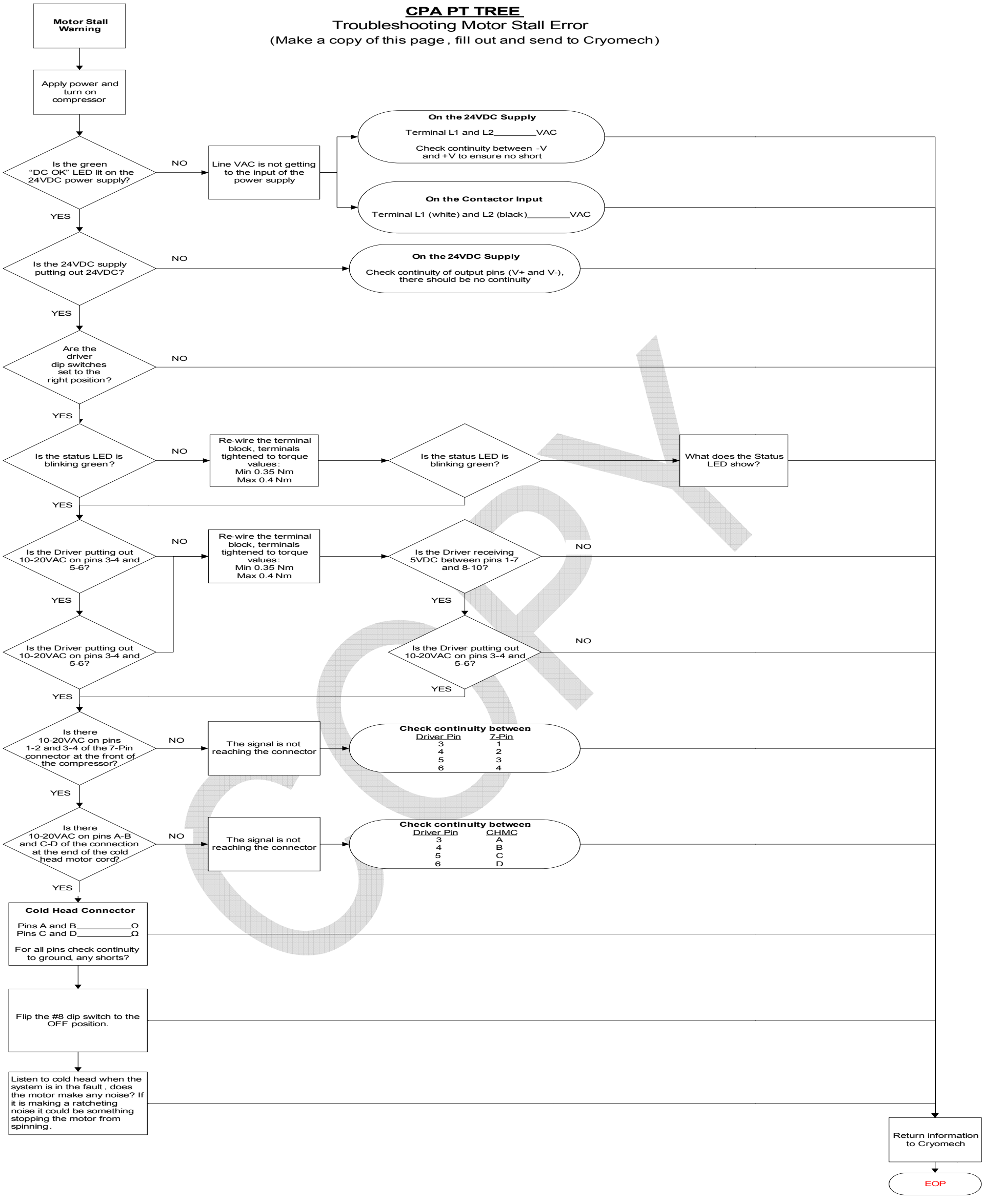
(Make a copy of this page , fill out and send to Cryomech)



## CPA PT TREE

Troubleshooting Motor Stall Error

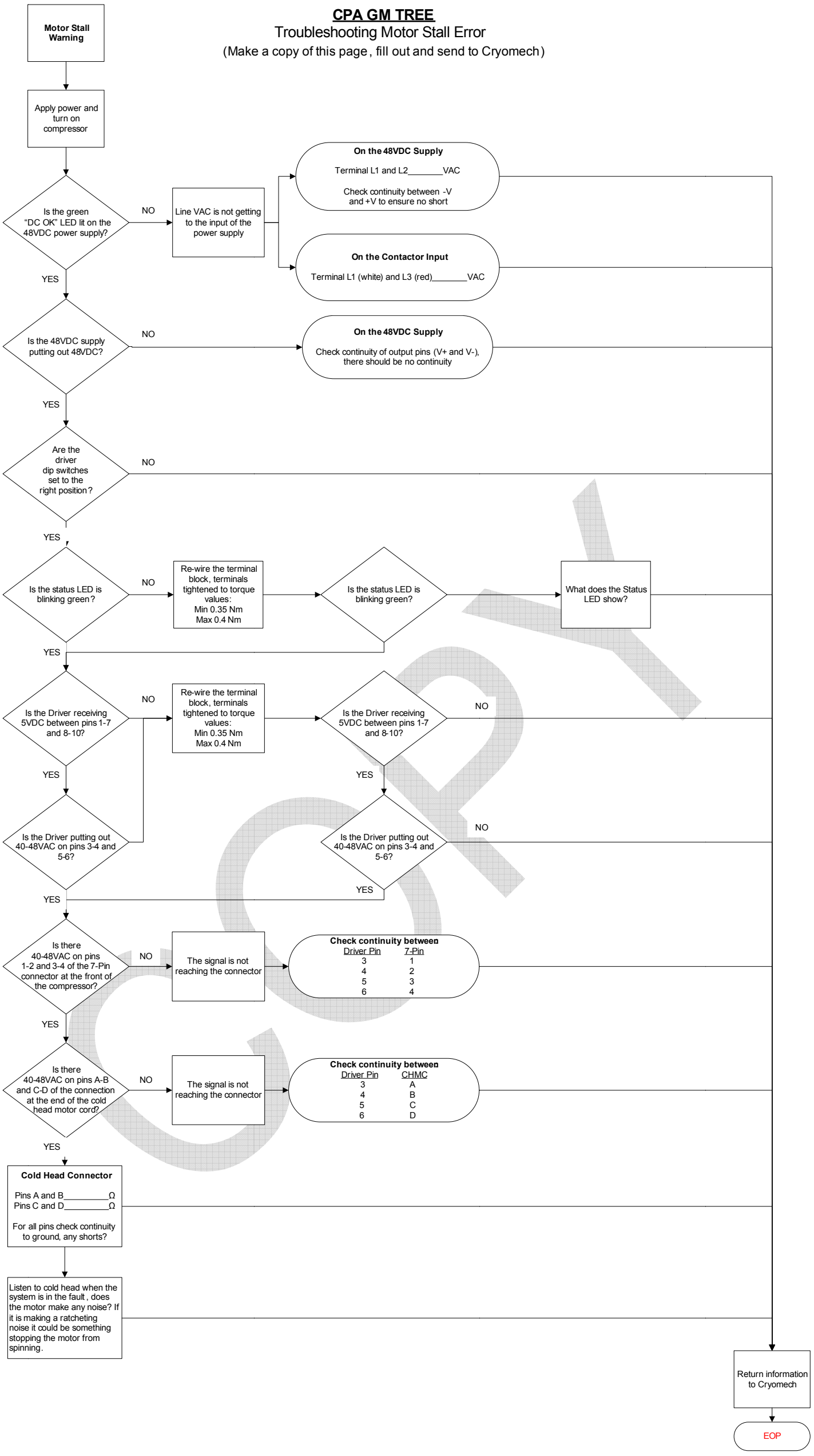
(Make a copy of this page , fill out and send to Cryomech)

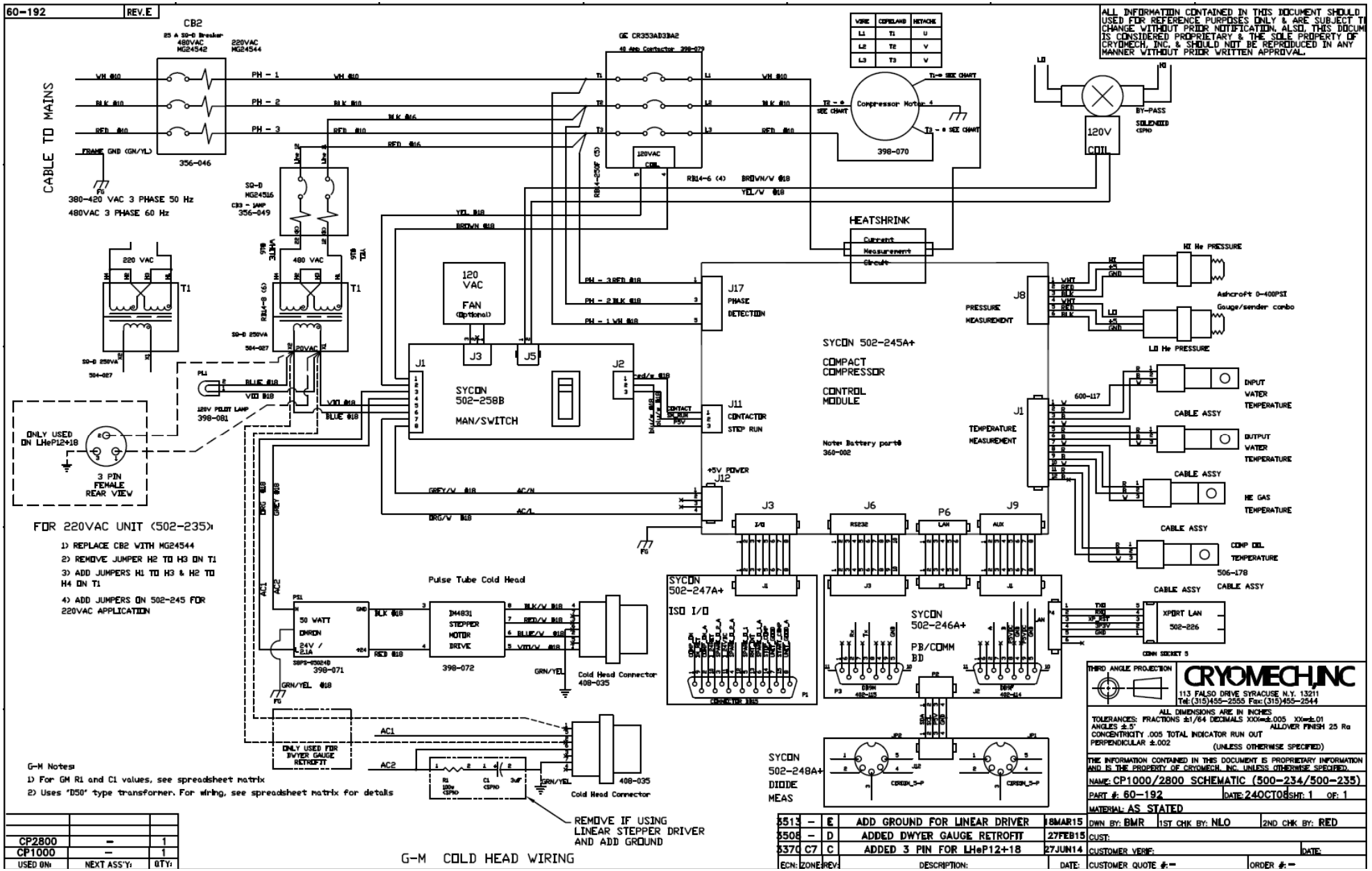


## CPA GM TREE

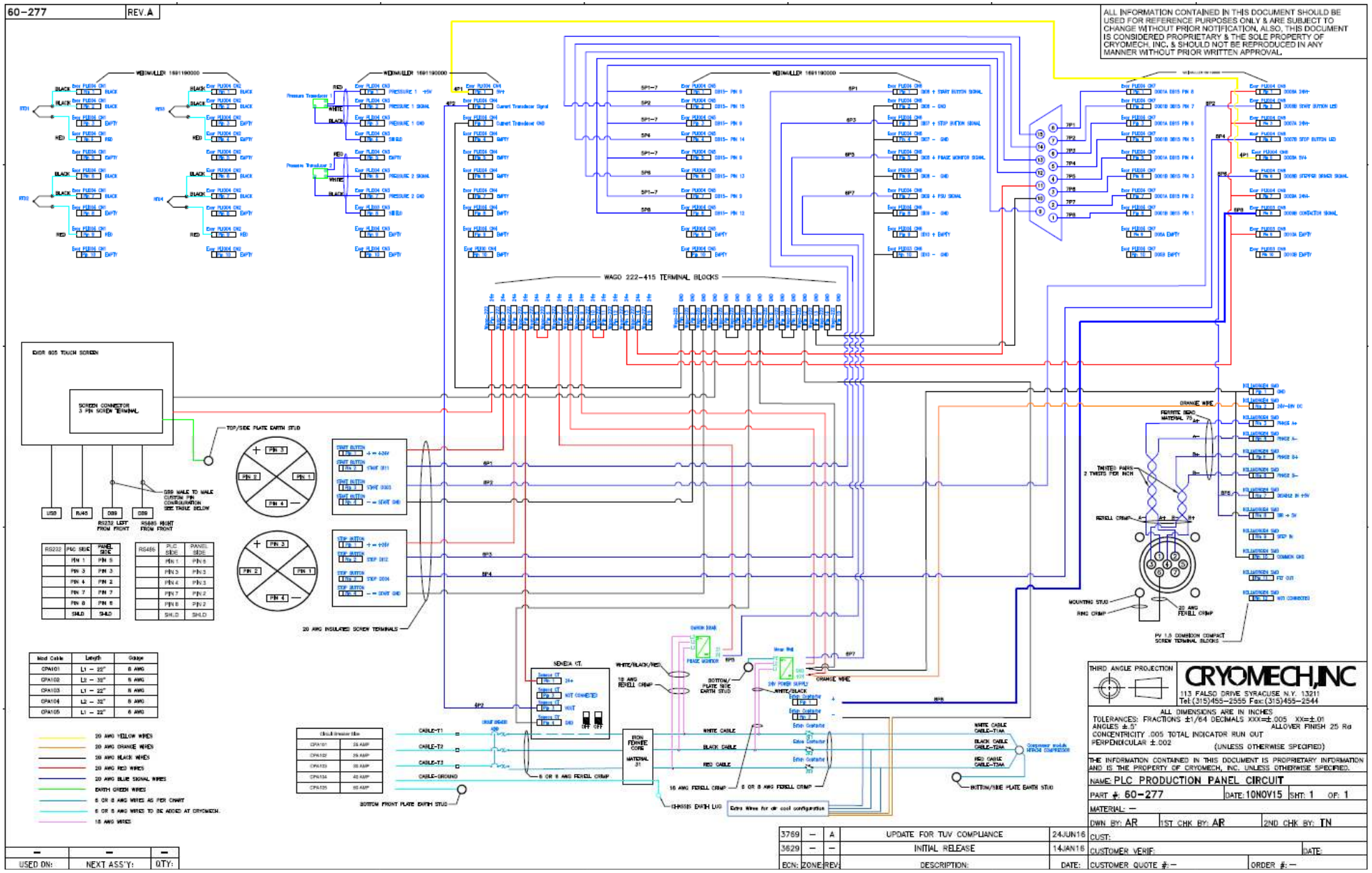
Troubleshooting Motor Stall Error

(Make a copy of this page, fill out and send to Cryomech)






Approved By:




Approved By:

Revision Section

| Date | Description of revisions made |
|---|---|
| 11/08/2013 | Origination of instruction |
| | |
| | |