# QUICK START GUIDE

## PARAMETERS

***FP* E FMV/15 / iSE RCF.M/15**
***FrigoSoft* E1**

REFR
FS E1.2_1d

Refrigeration HVAC

PARAMETERS

AC MOTOR DRIVE READY

RdY

APP APP MENU
SEt SETUP
SEtP MISC SETUP
PAR
diAG

Automatic approx. 2 s after switching on

| Type / Value | Description | Further information |
|---|---|---|

**Measured Values**

- *Refrigeration:*

| | | | | | |
|---|---|---|---|---|---|
| AP01 Y.Y | 01:pe SUCT PRES | Measured value | pe, Suction pressure: - 0.5 ... 7.0 (bar) | 9.1.2 |
| AP02 YY.YY % | 02:pe SUCT PRDV | Calculated value | pe, Suction pressure: -100.0 ... 100.0 % (*0.2 => bar) | |
| AP03 YY.Y | 03:pc COND PRES | Measured value | pc, Condensing pressure: 0.0 ... 30.0 (bar) | 9.1.3 |

- *Variable-speed Compressor (VsC):*

| | | | | |
|---|---|---|---|---|
| YY.Y Hz | | Measured value | Variable-speed Compressor: Motor Frequency | 9.1.4 |
| YY.Y A | | Measured value | Variable-speed Compressor: Motor current | |

- *Status:*

| | | | | |
|---|---|---|---|---|
| AP04 YYYY | 04:Ar_Si_Lm_FsC | Status | Status: Auto Restart_Start time inhibited_Limited_FsC | 9.1.1 |

- *Variable-speed Fans (VsF), Condenser:*

| | | | | |
|---|---|---|---|---|
| AP05 YY.Y % | 05:CD VfG ACT V | Actuating value | Variable speed Fan cond.: 0.0 ... 100.0 % | 9.1.4 |

**Settings**

***Compressor rack***

- *Suction pressure pe*

| | | | | | |
|---|---|---|---|---|---|
| AP06 2.5 | 06:pe MINIMUM | -16 °C* | Limit value _.__ bar | pe, Stop value "Pump Down limit": - 0.5 ... 7.0 (bar) | 8.3.2 |
| AP07 3.3 | 07:pe SETPOINT | -10 °C* | Setting _.__ bar | pe, Setpoint: - 0.5 ... 7.0 (bar) | |

- *Condensing pressure pc*

| | | | | | |
|---|---|---|---|---|---|
| AP08 15.0 | 08:pc SETPOINT | 35 °C* | Setting _.__ bar | pc, Setpoint: 0.0 ... 30.0 (bar) | 8.3.3 |
| AP09 23.0 | 09:pc MAXIMUM | 52 °C* | Limit value _.__ bar | pc, Limiting value: 0.0 ... 30.0 (bar) | |

***Variable-speed Compressor (VsC)***

- *Maximum motor current:*

| | | | | |
|---|---|---|---|---|
| AP10 FF.F | 10:VsC CURR MAX | Limit value __._ A | VsF, Maximum current: (min) ... (max) A | 8.3.4 |

- *Frequency range:*

| | | | | |
|---|---|---|---|---|
| AP11 60.0 | 11:VsC FREQ MAX | Limit value __._ Hz | VsC, Maximum frequency: ... 120.0 Hz | |
| AP12 25.0 | 12:VsC FREQ MIN | Limit value __._ Hz | VsC, Minimum frequency: ... 50.0 Hz | |

- *Time settings:*

| | | | | |
|---|---|---|---|---|
| AP13 100.0 | 13:VsC tinh TIM | Limit value __._ s | VsC, Inhibit delay: 0.0 ... 3000.0 s | 8.3.9 |

***Fixed-speed Compressor (FsC)***

- *Time settings:*

| | | | | |
|---|---|---|---|---|
| AP14 60.0 | 14:FsC ton DLY | Setting __._ s | FsC, Switch-on delay: 0.0 ... 3000.0 s | 8.3.5 |

***Controllers***

- *VsC: pe Controller:*

| | | | | |
|---|---|---|---|---|
| AP15 5.00 | 15:VsC CNTR PGN | Setting __.__ | pe controller, Proportional gain: 1.00 ... 25.00 | 8.3.8 |

***Other***

| | | | | |
|---|---|---|---|---|
| AP16 1210 | 16:FS___E1.2_1x | Measured values | Configuration name 121D | 8.3.9 |

Section in Product Manual

* Factory setting for R404A

Password required (Please enquire)

| Abbreviations | |
|---|---|
| VsC: | Variable-speed Compressor |
| FsC: | Fixed-speed Compressor |
| VfG: | Variable-speed fan group (Condenser / Dry cooler) |
| YYY.Y %: | Measured value depending on operating point |
| FF.F %: | Factory default value depending on frame size and rated power |

**(min):** Minimum value is 50 % of the maximum rated current of frequency inverter

**(max):** Maximum value is the maximum rated current of the frequency inverter

**Suggested refrigeration settings:**

Based on EN 12900

PARAMETERS

| | |
|---|---|
| AP06 | 2.5 |
| AP07 | 3.3 |
| AP08 | 15.0 |
| AP09 | 23.0 |

Factory setting

| R404A / R507 | | | R407C | | R22 | | | R134a | |
|---|---|---|---|---|---|---|---|---|---|
| LT | MT | HT | MT | HT | LT | MT | HT | MT | HT |
| -40 °C/ 0.3 | -16 °C/ 2.5 | 0 °C/ 5.0 | -16 °C/ 1.5 | 0 °C/ 3.6 | -37 °C/ 0.2 | -16 °C/ 1.8 | 0 °C/ 4.0 | -16 °C/ 0.6 | 0 °C/ 1.9 |
| -35 °C/ 0.6 | -10 °C/ 3.3 | 5 °C/ 6.0 | -10 °C/ 2.2 | 5 °C/ 4.5 | -32 °C/ 0.5 | -10 °C/ 2.6 | 5 °C/ 4.8 | -10 °C/ 1.0 | 5 °C/ 2.5 |
| 35.. °C/ 15.0 | 35.. °C/ 15.0 | 40.. °C/ 17.3 | 35.. °C/ 14.5 | 40.. °C/ 16.5 | 35.. °C/ 12.5 | 35.. °C/ 12.5 | 40.. °C/ 14.3 | 35.. °C/ 8.0 | 40.. °C/ 9.2 |
| 52 °C/ 23.0 | 52 °C/ 23.0 | 52 °C/ 23.0 | 52 °C/ 22.2 | 52 °C/ 22.2 | 52 °C/ 19.3 | 52 °C/ 19.3 | 52 °C/ 19.3 | 55 °C/ 13.9 | 55 °C/ 13.9 |

Diagnostics

diAG DIAGNOSTICS

| | | |
|---|---|---|
| YY.Y Hz | Measured values | Variable-speed Compressor: Motor frequency |
| YY.Y % | Measured values | VsC: Actuating value of Frequency: % of maximum frequency |
| YYY V | Measured values | DC link voltage |
| YY.Y A | Measured values | Variable-speed Compressor: Motor current |
| IN (INPUTS) | Measured values | Inputs |
| dIN (DIGIN WORD) YYYY | Measured values | Digital inputs: 0000 ... 0073 (hex) |

| dIN | DIN7 [13] | DIN6 [12] | DIN5 [11] | DIN2 [8] | DIN1 [7] |
|---|---|---|---|---|---|
| 00X0 | X | X | X | 0 | 0 |
| 00X1 | X | X | X | 0 | 1 |
| 00X2 | X | X | X | 1 | 0 |
| 00X3 | X | X | X | 1 | 1 |
| 000X | 1 | 0 | 0 | X | X |
| 001X | 1 | 0 | 1 | X | X |
| 002X | 1 | 1 | 0 | X | X |
| 003X | 1 | 1 | 1 | X | X |
| 004X | 0 | 0 | 0 | X | X |
| 005X | 0 | 0 | 1 | X | X |
| 006X | 0 | 1 | 0 | X | X |
| 007X | 0 | 1 | 1 | X | X |

Safety Circuit | Emerg. Operation | Activate Setp. pe2 | Lubric. f>=50 Hz | Start

Refer to page 7 for more details

| | | |
|---|---|---|
| IPA1 YY.Y % (ANIN 1 VALUE) | Measured values | Analog input 1: 0.0 ... 100.0 (%) |
| IPA2 YY.Y % (ANIN 2 VALUE) | Measured values | Analog input 2: 0.0 ... 100.0 (%) |
| OUt (OUTPUTS) | Measured values | Outputs |
| dOUt YYYY (DIGOUT WORD) | Measured values | Digital outputs: 0000 ... 0006 (hex) |

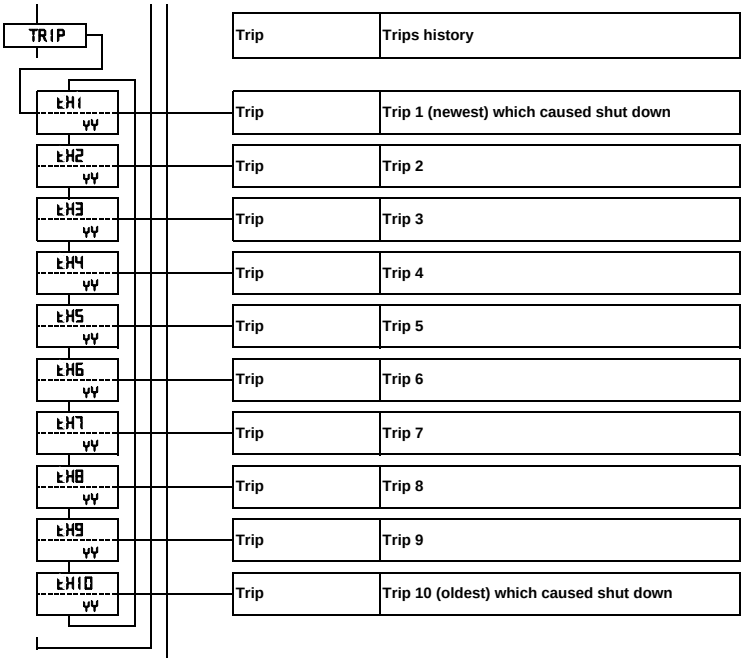
| dOUt | DOUT3 [RL1A-B] | DOUT2 [10A-10B] | DOUT1 [9A-9B] | |
|---|---|---|---|---|
| 0000 | 1 | 0 | 0 | Ready |
| 0001 | 1 | 0 | 1 | Operation VsC |
| 0003 | 1 | 1 | 1 | Operation VsC + FsC |
| 0004 | 0 | 0 | 0 | Trip |
| 0006 | 0 | 1 | 0 | Emergency operation FsC |

VsC Ready | Activate FsC | VsC in Operation

Refer to page 7 for more details

| | | |
|---|---|---|
| OPA1 YY.Y % (ANOUT 1 VALUE) | Measured values | Analog output 1: 0.0 ... 100.0 (%) |
| OPA2 YY.Y % (ANOUT 2 VALUE) | Measured values | Analog output 2: 0.0 ... 100.0 (%) |

Diagnostics




| | |
|---|---|
| Trip | Trips history |
| Trip | Trip 1 (newest) which caused shut down |
| Trip | Trip 2 |
| Trip | Trip 3 |
| Trip | Trip 4 |
| Trip | Trip 5 |
| Trip | Trip 6 |
| Trip | Trip 7 |
| Trip | Trip 8 |
| Trip | Trip 9 |
| Trip | Trip 10 (oldest) which caused shut down |

**Trip coding. Refer to page 10 for more details.**

| | |
|---|---|
| 1: | OVERVOLTAGE |
| 2: | UNDERVOLTAGE |
| 3: | OVERCURRENT |
| 5: | EXTERNAL TRIP |
| 6: | INVERSE TIME |
| 7: | CURRENT LOOP |
| 17: | MOTOR OVERTEMP |
| 24: | DESAT (OVER I) |
| 00: | OTHER |

Special settings

***Compressor rack***

*Suction pressure pe 2:*

***Variable-speed Compressor (VsC)***

*Time settings:*

*Frequency range:*

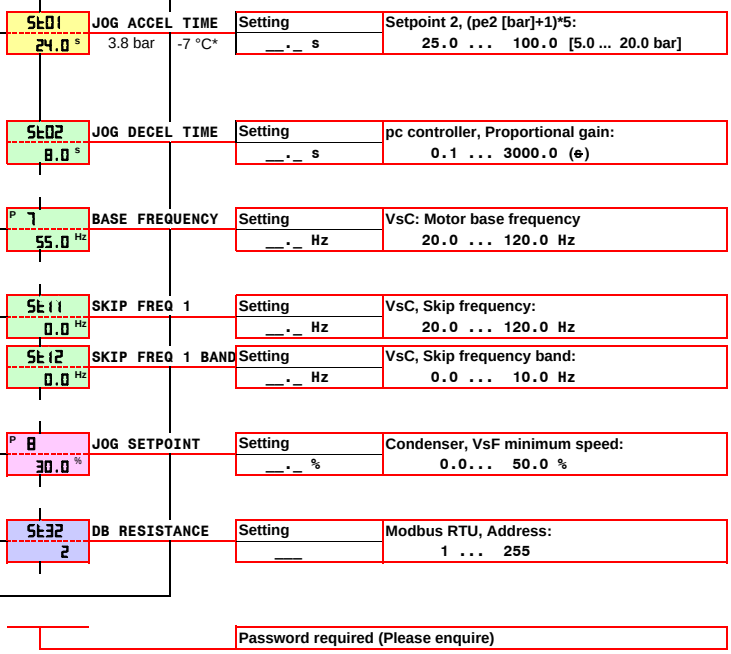
*- Resonance avoidance:*

***Controllers***

*- VfG: Condenser fan:*

***Communication***

*- Modbus RTU: Address*

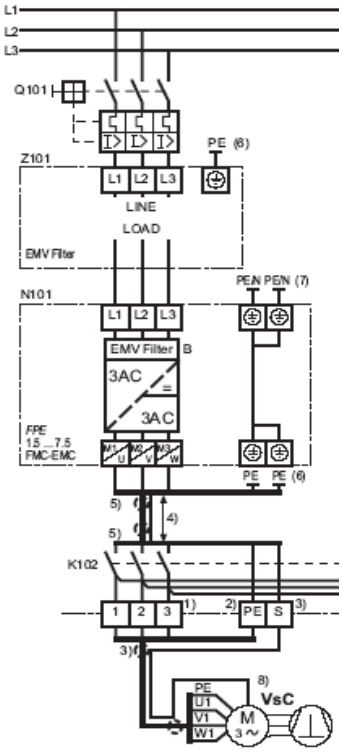



| | | |
|---|---|---|
| Setting | __._ s | Setpoint 2, (pe2 [bar]+1)*5: 25.0 ... 100.0 [5.0 ... 20.0 bar] |
| Setting | __._ s | pc controller, Proportional gain: 0.1 ... 3000.0 (e) |
| Setting | __._ Hz | VsC: Motor base frequency 20.0 ... 120.0 Hz |
| Setting | __._ Hz | VsC, Skip frequency: 20.0 ... 120.0 Hz |
| Setting | __._ Hz | VsC, Skip frequency band: 0.0 ... 10.0 Hz |
| Setting | __._ % | Condenser, VsF minimum speed: 0.0... 50.0 % |
| Setting | ___ | Modbus RTU, Address: 1 ... 255 |

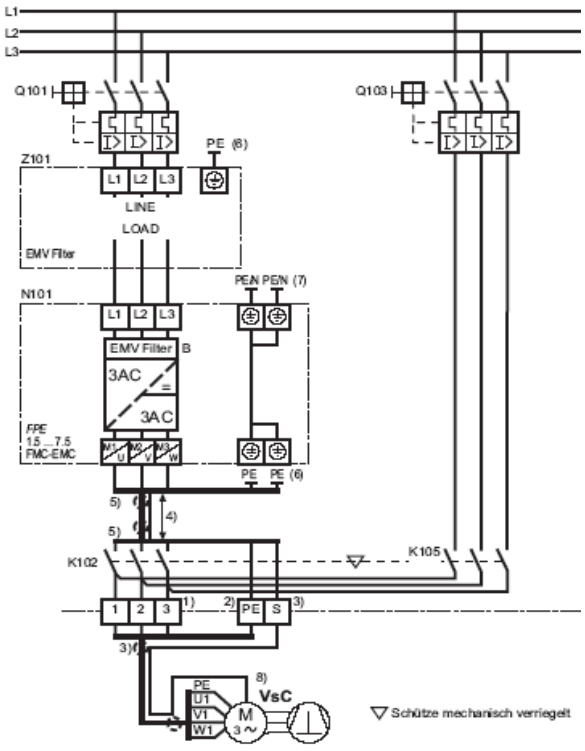
Password required (Please enquire)

# POWER SECTION

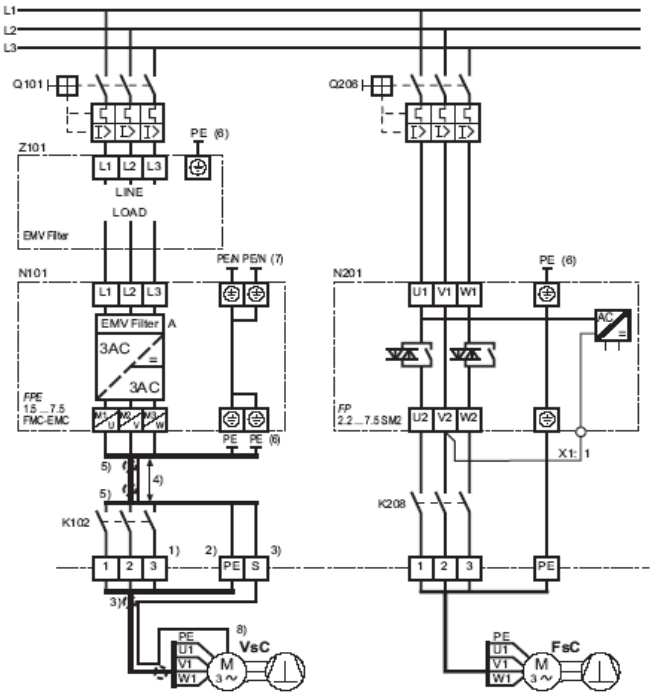
## Power connections




**FPE FMV / iSE RCF.M:**
**Power wiring**




**FPE FMV / iSE RCF.M:**
**Power wiring**
**(with bypass for Emergency Operation)**




**FPE FMV / iSE RCF.M:**
**Power wiring with two compressors**

## Power terminals

| Terminal / Designation | Signal / Function | Explanation | Further information |
|---|---|---|---|
| **PE, PE** | **Protective earth connections (both to be earthed)** | - Observe all safety and EMC requirements | **7.7.1** |
| **L1** | **Three phases of voltage supply** | - Ensure that supply voltage agrees with data on FrigoPack / iSpeed name plate | |
| **L2/N** | | | |
| **L3** | | | |
| DC+ | | - Do not use otherwise risk of damage to FrigoPack / iSpeed | |
| DBR | | | |
| (DC-) | | | |
| **M1/U** | **Compressor motor** | - Variable-speed Compressor via safety contactor | **7.7.1/ 7.7.2** |
| **M2/V** | | | |
| **M3/W** | | | |
| **PE** | **Protective earth connection to compressor motor** | | **7.7.2** |
| (DBR+) | | - Do not use otherwise risk of damage to FrigoPack / iSpeed | |
| (DBR-) | | | |

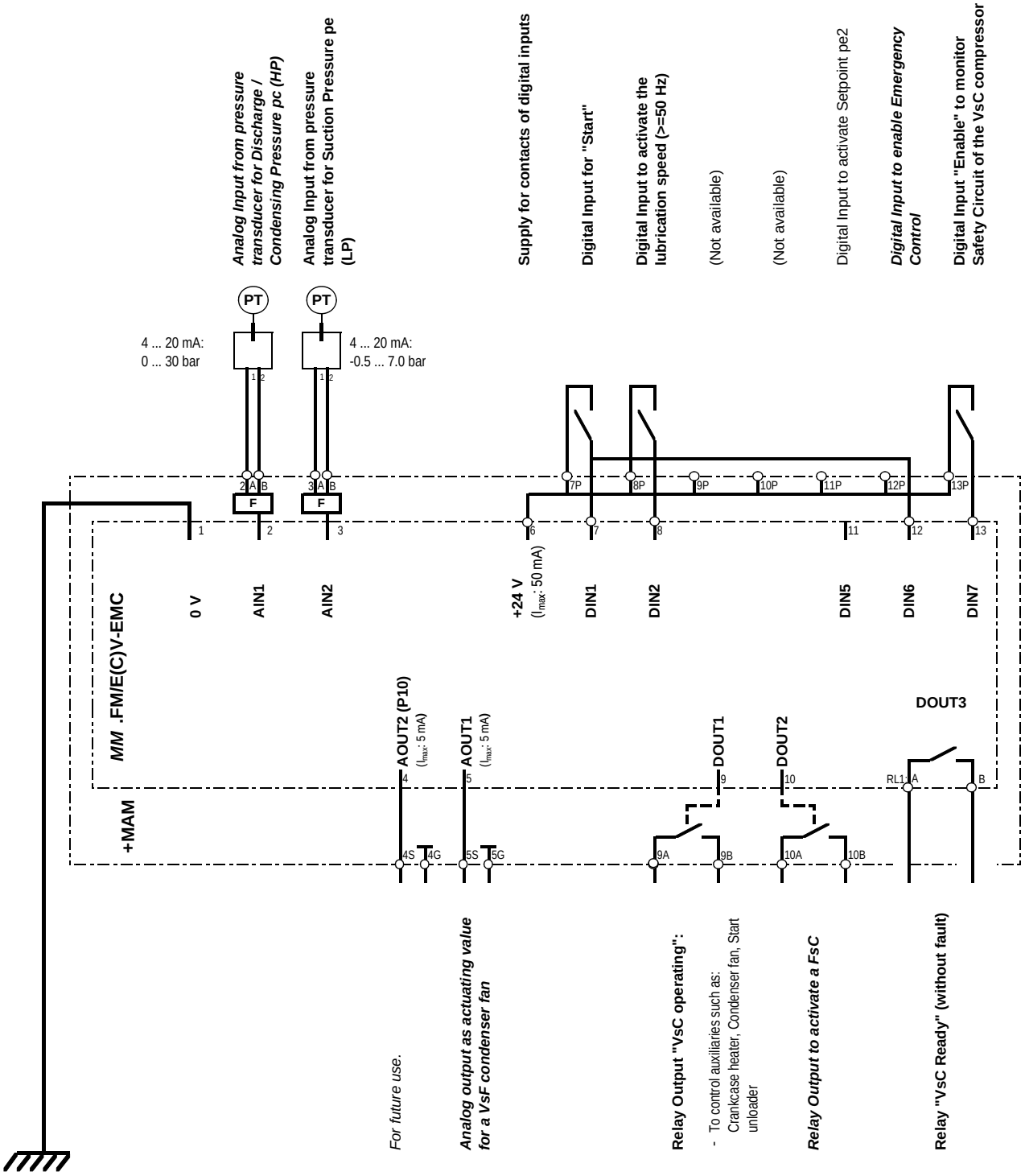
## Terminals for motor protection

| Terminal / Designation | Signal / Function | Explanation | Further information |
|---|---|---|---|
| **X2:** | | | |
| **FPE 1.5...7.5FMV-EMC:** **T H 1A - T H 1 B** | **Alternative a), Without processing:** | - Thermistor protection is processed in safety circuit, these two terminals must be linked | **6.2** |
| | **Alternative b), Direct processing of motor thermistors:** | - Connect motor thermistors between these two terminals | |
| | **Alternative c), Processing an external thermistor relay:** | - Connect the "normally open" contacts of external thermistor relay (e.g. KRIWAN) between these two terminals | |
| | **Alternative d), Processing an external thermistor relay:** | - Connect the "Normally open" contacts of an auxiliary relay wired to an external thermistor relay (e.g. KRIWAN) between these two terminals. | |

## CONTROL SECTION

### Control connections






**VfG: Variable-speed fan group (Condenser / Dry cooler).**

**VsC: Variable-speed Compressor (Inverter operation)**
**FsC: Fixed-speed Compressor**

## Terminals for control functions

| Terminal / Designation | | Signal / Function | Explanation | Further information |
|---|---|---|---|---|
| 1 | 0 V | Ground for analog signals | - Not available | |
| ***2A - 2B*** | ***AIN1*** | ***Analog Input from pressure transducer for Discharge / Condensing Pressure pc (HP):***<br>***0 mA: Fault***<br>***4 mA: 0.0 bar***<br>***20 mA: +30.0 bar*** | - *Discharge / condens. pressure pc (HP), optional use*<br>- *Suitable pressure transducer:*<br>*- A REFR-P-TRANSD-HP30+PL*<br>- *Connections:*<br>*- 1 --> 2A; 2 --> 2B* | ***7.7.4*** |
| **3A - 3B** | **AIN2** | **Analog Input from pressure transducer for Suction Pressure pe (LP):**<br>**0 mA: Fault**<br>**4 mA: -0.5 bar**<br>**20 mA: +7.0 bar** | - Suction pressure pe (LP), must be used<br>- Suitable pressure transducer:<br>- A REFR-P-TRANSD-LP7+PL<br>- *Connections:*<br>*- 1 --> 3A; 2 --> 3B* | **7.7.4** |
| 4S - 4G | P10 | Internal +10 V reference | - Do not use | |
| ***5S - 5G*** | ***AOUT1*** | ***Analog output as actuating value for a VsF condenser fan:***<br>***0 V: 0.00 % Actuating value***<br>***+10 V: 100.00 % Actuating value*** | - *VsF Condenser fan, actuating value*<br>- *5 mA max. load* | ***7.7.3*** |
| 6 | +24 V | Supply for contacts of digital inputs | - Not available | |
| **7P - 7** | **DIN1** | **Digital Input for "Start":**<br>**0 V: Controlled stop**<br>**+24 V: Start** | - Start | **5.2.1-3, 7.7.3** |
| ***8P - 8*** | ***DIN2*** | ***Digital Input to activate the lubrication speed (>=50 Hz):***<br>***0 V: No action***<br>***+24 V: Activated*** | - *Force to Lubrication Speed*<br>- *Optional use* | ***5.2.2/3, 7.7.3*** |
| 9P - 9 | DIN3 | Digital Input | - Not available | |
| **9A - 9B** | **DOUT1** | **Relay Output "VsC operating":**<br>Open: **VsC: Inhibited / Not operating**<br>Closed: **VsC: Starting / Operating** | - To control auxiliaries such as:<br>Crankcase heater, Condenser fan, Start unloader<br>- Max contact load: AC 230 V; 250 VA | **7.7.3** |
| 10P - 10 | DIN4 | Digital Input | - Not available | |
| **10A - 10B** | **DOUT2** | **Relay Output to activate a FsC:**<br>Open: **Not activated**<br>Closed: **Activated** | - Activate FsC Fixed-speed Compressor<br>- Max contact load: AC 230 V; 250 VA | **7.7.3** |
| 11P - 11 | DIN5 | Digital Input to activate Setpoint pe2:<br>0 V: No action<br>+24 V: Activate Setpoint pe2 | Digital Input to activate Setpoint pe2 | |
| ***12P - 12*** | ***DIN6*** | ***Digital Input to enable Emergency Control:***<br>*0 V: **No Emergency Control***<br>*+24 V: **Enable Emergency Control*** | - *Emergency operation (Operation with a defect inverter or compressor)*<br>- *Optional use* | ***5.3, 7.7.3*** |
| **13P - 13** | **DIN7** | **Digital Input "Enable" to monitor Safety Circuit of the VsC compressor:**<br>0 V: **Fault (immediate stop)**<br>+24 V: **Without fault** | - Safety circuit without fault<br>- Must be used<br>- Interrupt if there is a fault<br>(Required to stop inverter operation) | **5.4, 7.7.3** |
| **RL 1A - RL 1B** | **DOUT3** | **Relay output "Ready" (without fault):**<br>Open: **No supply, fault or alarm**<br>Closed: **Ready (no fault)** | - Ready to operate<br>- Max contact load: AC 230 V; 250 VA | **5.4, 7.7.3** |

**VsC: Variable-speed Compressor (Inverter operation)**
**FsC: Fixed-speed Compressor**
**VsF: Variable-speed fan group (Condenser / Dry cooler).**

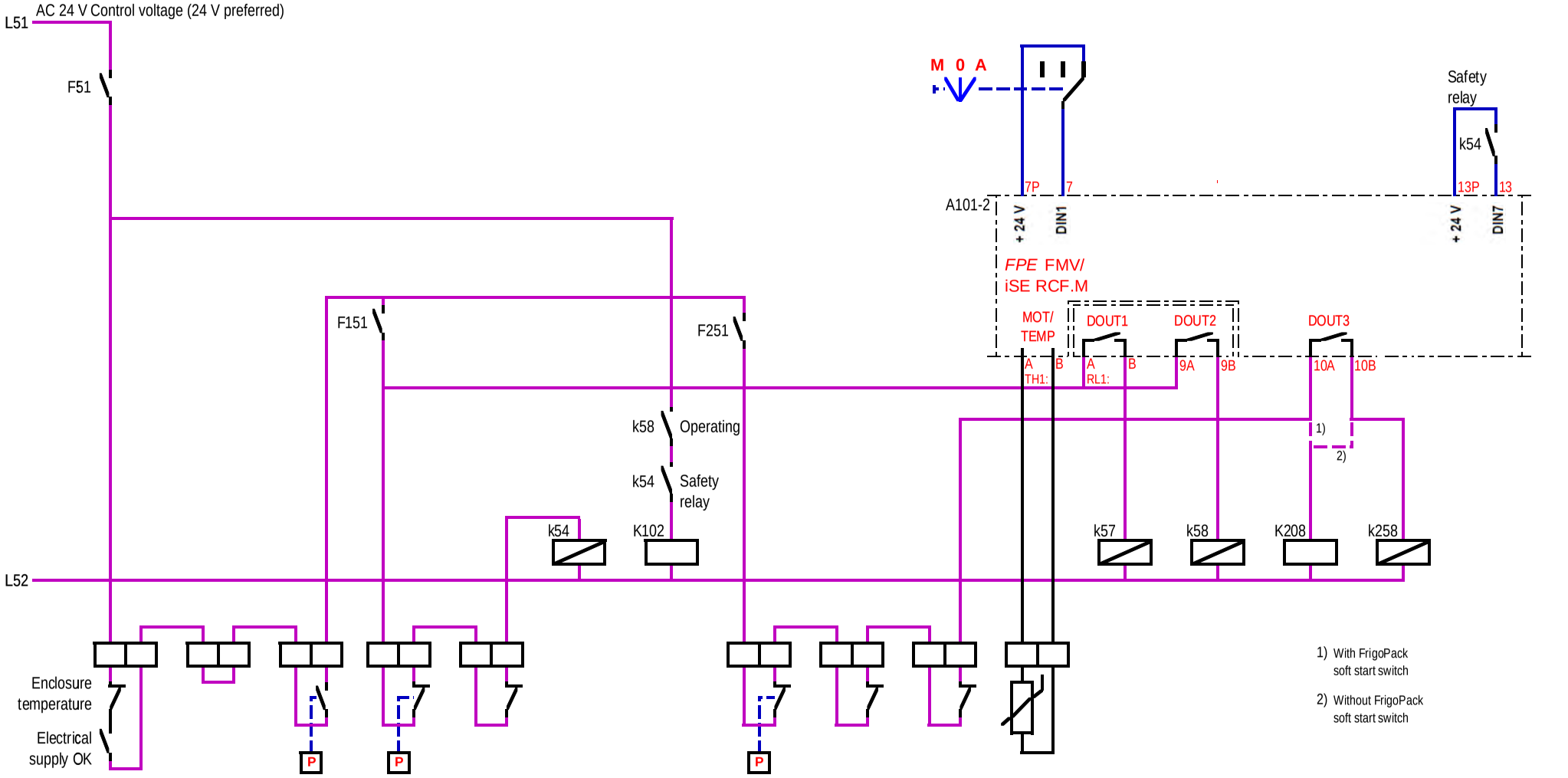
## Safety and control circuits

The following simplified overview of the safety and control wiring of a typical system only includes the wiring for AUTOMATIC operation.

It is recommended that the following additional functions are included in the control system:
- MANUAL mode of operation using a "Pump Down" circuit
- A security circuit to provide:
  - Automatic selection of MANUAL operation in an emergency
  - Means of stopping the evaporators if compressors are not available.

- Standard suggestions for the safety and control wiring with these features are available on request.

- KIMO RHVAC / Parker SPORLAN can assist with the planning of complex systems or systems with special requirements.



# FIRST TIME POWER UP

**Mounting and electrical safety:**

Ensure that all recommendations in the Product Manual have been adhered to.

**UL compliance where appropriate:**

Ensure that all recommendations in the Product Manual for UL compliance have been adhered to.

**EMC compliance:**

Ensure that all recommendations in the Product Manual for EMC compliance have been adhered to.

**Language selection:**

The language is only relevant when the two-line keypad from the FP(E) FEP / iSE/P RCF ranges are used for commissioning. The language is programmed in the refrigeration software and cannot be changed. The language required must be stated at the time of purchase.

**Selection of this refrigeration application, Restoring factory settings:**

- This refrigeration application is programmed in the refrigeration application software.
- On no account attempt to load the default factory settings as this will result in the refrigeration application being deleted.

**Storing configurations and parameter changes:**

Storing parameter changes is automatic with CP FMV/ iSE RCF.

**Pressure transducers:**

This refrigeration application is designed for use with the following pressure transducers:

| | | |
|---|---|---|
| - pe: -0.5 ... 7.0 bar | -7.25 ... 101.53 psi | Relative (gauge) pressure |
| - pc: 0 ... 30 bar | 0.00 ... 435.11 psi | |

WARNING: Only use approved pressure transducers.

**Recommended basic commissioning steps:**

- Verify that the power circuit corresponds to the suggestions on pages 4 and 5.
- In particular ensure that a safety contactor is fitted between the FrigoPackE FMV / iSpeedE RCF and the compressor.
- Verify that the control circuit corresponds to the suggestions on page 8.
- In particular ensure that two isolated contacts of a safety relay are connected to the safety contactor and also to input DIN7 (terminals 13P-13).
- Apply power with terminal 7 disconnected.
- Verify that the blue LED near terminals 3A and 3B from the suction pressure transducer lights. If not, then check the wiring to the transducer.
- Verify that the red LED near terminals 2A and 2B from the discharge pressure transducer lights if fitted. If not, then check the wiring to the transducer.
- Measure the pressures with a refrigeration pressure gauge. Verify that the pressure indicated at parameters AP01: and AP03: agree with these external measurements.

**Filling with refrigerant:**

- Ensure that FrigoPack/iSpeed RCF is not running by putting the control switch in the OFF position or by removing the connection to DIN1 at terminal 7.
- Switch to LOCAL mode as follows depending on which keypad is used:
  - Small keypad fitted:
    - Press key 'E' until Rdy is displayed.
    - Press key 'O' until a hand is displayed.
  - Large external keypad used:
    - Press key 'L/R'. LEDs "SEQ" and "REF" should light.
- Start the compressor by pressing the green key 'I'. After the start sequence the compressor will operate at the minimum set frequency.
- Stop the compressor by pressing the red key 'O'.
- The compressor will not restart until the time set by parameter AP13 has elapsed.
- Switch back to automatic operation on completion process by removing the electrical power, waiting until the keypad is dark, and then re-applying the electrical power.

<u>On no account forget to reconnect DIN1 and to select automatic operation.</u>

# TROUBLE SHOOTING LIST

| TRIP MESSAGE | POSSIBLE CAUSE | Hints for fault finding | REMEDIES |
|---|---|---|---|
| *** TRIPPED *** OVERVOLTAGE<br>Code: 1 → dCH 1 | * Voltage of supply too high | - Measure and document the voltage in all three input phases | - Rectify cause of any high voltage |
| | * Safety contactor not controlled correctly | - Check wiring of control circuit and compare function with KIMO RHVAC recommendations | - Modify wiring |
| | * Compressor motor defect | - Test if compressor motor will run with DOL supply | - Replace compressor motor |
| | | - Measure resistance of motor winding and compare with manufacturer's data<br>- Check insulation beween phases and to earth | |
| *** TRIPPED *** UNDERVOLTAGE | * Voltage of supply too low | - Measure and document the voltage in all three input phases | - Rectify cause of any low voltage |
| *** TRIPPED *** VDC RIPPLE | * Phase of supply voltage missing | | |
| *** TRIPPED *** DESAT (OVER I)<br>Code: 2 → dCLO | * Safety contactor not controlled correctly | - Check wiring of control circuit and compare function with KIMO RHVAC recommendations | - Modify wiring |
| *** TRIPPED *** OVERCURRENT<br>Code: 25 → dCrP | * Compressor motor defect | - Test if compressor motor will run with DOL supply | - Replace compressor motor |
| | | - Measure resistance of motor winding and compare with manufacturer's data<br>- Check insulation beween phases and to earth | |
| Code: 24 → ShrE<br>Code: 3 → OC | * Power section of FrigoPack / iSpeed faulty | - Remove motor cable connections to FrigoPack / iSpeed<br>Check if operation of CondensPack / iSpeed without a motor connected is possible<br>(No trip message: Probably OK;<br>Trip message: Probably defect) | - Replace FrigoPack / iSpeed |
| | | - Test for operation with a small test motor | |
| | * Incorrect motor connection | - Check wiring to motor terminals<br>(choice of star/delta, part winding etc.) | - Modify wiring |
| *** TRIPPED *** EXTERNAL TRIP<br>Code: 5 → Et | * Safety contactor not controlled correctly | - Check wiring of control circuit and compare function with KIMO RHVAC recommendations | - Modify wiring |
| | * Safety device in safety circuit tripped | - Check safety circuits. Possibly supply undervoltage at a monitoring device. | - Reset if necessary |
| | * DC 24 V control voltage missing | - Check DC 24 V control voltage at FrigoPack / iSpeed | - Modify wiring |
| | | - Short circuit with DC 24 V control voltage | |
| *** TRIPPED *** CURRENT LOOP<br>Code: 7 → LOOP | * Suction-pressure transducer not connected or connections swapped | - Check if blue LED at the input of FrigoPack / iSpeed lights | - Verify correct connection to transducer for suction pressure. Exchange leads if necessary |
| | * Transducer for suction pressure faulty | - Measure current from transducer for suction pressure at input to FrigoPack / iSpeed (must be at least +4 mA) | - Replace transducer for suction pressure |
| *** TRIPPED *** INVERSE TIME<br>Code: 6 → It | * Compressor start aborted | - Liquid refrigerant in compressor? | - Contact KIMO RHVAC / Parker-CIC for advice |
| | | - Defect compressor<br>- Incorrect size of FrigoPack / iSpeed or motor connected in delta instead of star. | |
| *** TRIPPED *** MOTOR OVERTEMP<br>Code: 17 → Ot | * Link TH1A-TH1B or MOT/TEMP missing | - Check wiring of motor protection circuit | - Modify wiring |
| | * No connection to motor protection PTC | | |
| | * Faulty connection to external PTC relay | | |
| | * Motor winding too hot | - Compressor overloaded | - Contact KIMO RHVAC / Parker-CIC for advice |
| *** TRIPPED *** ?ANYTHING ELSE? | * Anything else | | - Contact KIMO RHVAC / Parker-CIC for advice |

**Important note:**

These messages are of common trips likely to occur during commissioning.
Other trip messages can occur in fault conditions.

When requesting advice from your supplier, always make an exact note of the following:
- Exact trip message (if appropriate message indicated in both lines of display)
- Message displayed when key 'E' is pressed for at least 10 s.

# CHECKLIST

| KIMO Problem Code | | Part of installation | Checklist of questions for PROBLEM REPORT | Explanation | Terminals | Answer/ Confirmation |
|---|---|---|---|---|---|---|
| ES | | Electrical:<br>- Supply | • Are there any known power supply interruptions ? | | | Yes ☐ No ☐ |
| | | | • Do these power supply interruptions occur at the same time each day ? | - Indicate approx. times | | Yes ☐ No ☐<br>When: _____ |
| | | | • By what amount does the supply voltage vary ? | - Indicate min. and max. voltages | | Min.: _____ [V]<br>Max.: _____ [V] |
| EI | | - Installation | • Motor cable: Approx. Length ? | | | _____ |
| | | | • Motor cable: Type of screen ? | - Copper braid ?, Steel braid ?,<br>- Steel conduit ?, none ? | | Cu brd. ☐ Fe brd. ☐<br>Fe cond. ☐ None ☐ |
| | | | • Motor cable: Screen connected to mounting plate? | - Recommendations:<br>- Contact with large surface area | | Yes ☐ No ☐ |
| | | | • Motor cable: Screen connected to metal motor housing ? | - Make sure no "pig tails" | | Yes ☐ No ☐ |
| | | | • Is a galvanised mounting plate used in the electrical enclosure ? | | | Yes ☐ No ☐ |
| | | | • Is a motor filter used between the CondensPack / iSpeed CFF and the compressor motor ? | - If yes, indicate KIMO product code | | Yes ☐ No ☐<br>Pr. Cde: _____ |
| MT | | Compressor motor | • Have motor currents been entered into the PROBLEM REPORT ? | - Operating point<br>- Start up | | Yes ☐ No ☐<br>Yes ☐ No ☐ |
| MM | | *FrigoPack* / iSpeed: | | | | |
| MM | CI | - Control and sensor inputs | • Protective Earth of FrigoPack / iSpeed connected to mounting plate (two separate short connections) ? | - Terminal: | 2x PE | Yes ☐ No ☐ |
| | | | • Is the DC P24 control voltage present ? | - Terminal: | 6P - PE | Yes ☐ No ☐ |
| | | | • Connection of PTC motor protection ? | - Without processing<br>- Direct processing of motor thermistors | | ☐<br>☐ |
| | | | | - Processing an external thermistor relay | | Relay ☐ |
| | | | | - Terminal FPE FMV: | TH1 A-B | |
| | | | • Safety circuit OK ? | - Terminals for measuring: | 13 - PE | Yes ☐ No ☐ |
| | | | • Enable signal present ? | - Terminals for measuring: | 7 - PE | Yes ☐ No ☐ |
| | | | • Signal from suction-pressure transducer present ? | - Terminals for measuring: | 3B - PE | _____ [V] |
| | | | • *Signal from high-pressure transducer present ?* * | - *Terminals for measuring:* | *2B - PE* | _____ *[V]* |
| | | | * If used | - Terminal for measuring:<br>- Measured against: | ..<br>.. | |
| MM | PS | - Power section | • Reserved for future use | | | |
| MM | CA | - Control assembly | • Reserved for future use | | | |
| MM | CS | - Control settings, parameter | • Operating Mode LOCAL (Programming Pad: LEDs SEQ + REF light) ? | - Not suitable for normal operation, only use for commissioning: | | Yes ☐ No ☐ |
| | | | • Refrigeration / cooling parameters set ? | - The following parameters must be set:<br>**AP06 ... AP09** | | Yes ☐ No ☐ |
| RI | | Refrigeration: | | | | |
| | AP | - Application | • Required Refrigeration Power entered into PROBLEM REPORT ? | | | Yes ☐ No ☐ |
| | | | • Number of cooling outputs entered into the PROBLEM REPORT ? | | | Yes ☐ No ☐ |
| | | | • Operating pressure and temperatures entered into PROBLEM REPORT ? | - Operating point<br>- At start up | | Yes ☐ No ☐<br>Yes ☐ No ☐ |
| | | | • On/Off times of compressor pack entered into PROBLEM REPORT ? | - Enter variable and fixed speed compressor times separately | | Yes ☐ No ☐ |
| RI | IN | - Installation | • Reserved for future use | - tbd | | |
| RI | PS | - Pressure transducers | • Approx. cable length | | | _____ [m] |
| | | | • Type of screen | - Copper braid ?, Steel braid ?,<br>- Steel conduit ?, none ? | | Cu brd. ☐ Fe brd. ☐<br>Fe cond. ☐ None ☐ |
| | | | • Screen NOT connected at sensor end ? | | | Yes ☐ No ☐ |
| | | | • Screen connected to mounting plate of electricial enclosure ? | - Large area contact, no pig tails | | Yes ☐ No ☐ |
| | | | • Are measured pressures stable ? | - Indicate range of variation within 30 s | | Yes ☐ No ☐<br>pe/LP ____ pc/HP ____ [bar] |
| RI | RC | - Refrigeration compressor | • Oil present ? | | | Yes ☐ No ☐ |
| | | | • Basic data entered into PROBLEM REPORT ? | | | Yes ☐ No ☐ |

**FPE FMV/15 / iSE RCF.M/15**
**FrigoSoft E1**

**REFR**
**FS E1.2_1d**

Parker SPORLAN KIMO
Refrigeration HVAC

# CONFIGURATION OVERVIEW / PROBLEM REPORT

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Application** | Refrigeration ☐ | No. of cooling outlets ____ | Air Conditioning ☐ | Condenser ☐ | Other ____ | | | | |
| **Refrigerant** | R404A..... ☐ R507A..... ☐ | R407C..... ☐ R22..... ☐ | R134a..... ☐ R..... | Total refrig. Power ____ [kW] | Other ____ ____ | | | | |
| **Compressor 1** | Piston ☐ Start unloader ☐ Capacity control ____ [%] Manufacturer ____ | No. of cylinders ____ Part Winding ☐ ____ [%] | Scroll ☐ Variable speed ☐ ____ [%] Model ____ | **OR** | Screw ☐ Fixed speed ☐ ____ [%] | Other ____ No. of compressors ____ Anything special ____ | | | |
| **Compressor 2** | Piston ☐ Start unloader ☐ Capacity control ____ [%] Manufacturer ____ | No. of cylinders ____ Part Winding ☐ ____ [%] | Scroll ☐ Variable speed ☐ ____ [%] Model ____ | **OR** | Screw ☐ Fixed speed ☐ ____ [%] | Other ____ No. of compressors ____ Anything special ____ | | | |
| **Operating point** | Suction pressure ____ | High (discharge) pressure ____ | Pascal/ ☐ bar/ ☐ lb/in² ☐ gauge/ ☐ absolute ☐ | Suction gas temperature ____ [°C] | Discharge gas temperature ____ [°C] | Motor current ____ [A] | | | |
| **Start up** | Suction pressure ____ | High (discharge) pressure ____ | | Anything special ____ ____ | | Motor current ____ [A] | | | |

| | | | |
|---|---|---|---|
| **FrigoPack** Frequency inverter | **FrigoPack/iSpeed/**MotorMaster<br>Type FPE/MM/iSE<br>Serial number ____ | **Pressure sensors**<br>Suction pressure ____<br>Discharge pressure ____ | **FrigoSoft refrigeration/ A/C software** FS E1.2_1d<br>Version ____<br>Mode ____ |
| **FrigoPack** Soft Starter | **FrigoPack/iSpeed/**SoftCompact, LEKTROMIK<br>Type FP/MM/iS<br>Serial number ____ | **Compressor switching times**<br>Variable-speed compressor (VsC) $t_{ON}$ ____ [s] $t_{PERIOD}$ ____ [s]<br>Fixed speed compressor(s) (FsCs) $t_{ON}$ ____ [s] $t_{PERIOD}$ ____ [s] | |

**Report**

List of Measured Values in the APP MENU menu

| | |
|---|---|
| APO1 O1:pe SUCT PRES | ___._ [bar] |
| APO2 O2:pe SUCT PRDV | ___._ [%] |
| APO3 O3:pc COND PRES | ___._ [bar] |
| APO4 O4:Ar_Si_Lm_FsC | ____ |
| APO5 O5:CD VfG ACT V | ___._ [%] |

List of Adjustable Parameters in the APP MENU menu

| | | |
|---|---|---|
| APO6 O6:pe MINIMUM: 2.5 bar | ____ | [bar] |
| APO7 O7:pe SETPOINT: 3.3 bar | ____ | [bar] |
| APO8 O8:pc SETPOINT: 15.0 bar | ____ | [bar] |
| APO9 O9:pc MAXIMUM: 23.0 bar | ____ | [bar] |
| AP10 10:VsC CURR MAX: FF.F | ____ | [A] |
| AP11 11:VsC FREQ MAX: 60.0 | ____ | [Hz] |
| AP12 12:VsC FREQ MIN: 25.0 | ____ | [Hz] |
| AP13 13:VsC tinh TIM: 100.0 | ____ | [s] |
| AP14 14:FsC ton DLY: 60.0 | ____ | [s] |
| AP15 15:VsC CNTR PGN: 5.00 | ____ | |
| AP16 16:FS___E1.2_1x: 121D | ____ | |

Special settings:

| | | |
|---|---|---|
| St01 JOG ACCEL TIME: 24.0 s | ____ | [s] |
| St02 JOG DECEL TIME: 8.0 s | ____ | [s] |
| P7 BASE FREQUENCY: 55.0 Hz | ____ | [Hz] |
| St11 SKIP FREQ 1: 0.0 Hz | ____ | [Hz] |
| St12 SKIP FREQ 1 BAND: 0.0 Hz | ____ | [Hz] |
| P8 JOG SETPOINT: 30.0 % | ____ | [%] |

TRIP HISTORY

| TRIP | 1 (NEWEST) | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | 6 | 7 | 8 | 9 | 10 (OLDEST) |

| Manufacturer | Agent / Partner | Customer | Installation |
|---|---|---|---|
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