

# Preventive maintenance IDEV

February, 12 2021, Annual visit



## Customer

## Customer Ref. :

|                    |   |                                 |                  |   |  |
|--------------------|---|---------------------------------|------------------|---|--|
| Customer Company   | : |                                 | Site contact Tel | : |  |
| Site contact name  | : | Geir Vistung                    |                  |   |  |
| Site contact email | : |                                 |                  |   |  |
| Site company       | : | Digiplex Norway AS - Holtskogen |                  |   |  |
| Site address       | : | Holtskogen 31, 1825 Tomter      |                  |   |  |
| Site country       | : | Norway                          | Customer account | : |  |
| Room name          | : | Digiplex - Holtskogen POD E     |                  |   |  |

## Field Service Engineer

## Service Request # / Activity : WO-08409921

|             |   |                  |                  |   |                       |
|-------------|---|------------------|------------------|---|-----------------------|
| FSE name    | : | Mario dos Santos | Service District | : | Secure power - Norway |
| FSE address | : | Sandstuveien 68  |                  |   |                       |

## Visit results

Kompressor la ut på lavttrykks pressostet under oppstart pga lav utetemperatur, og startet kun ved tuning via Cooling Tuner. Mistenker noe lav totalfylling av kuldemedium. Kompressoren rakk ikke å stabilisere seg tilstrekkelig under drift grunnet lav last og utetemperatur. Maskinen fungerer ellers som normalt.

## (FSE) Recommendations / required actions

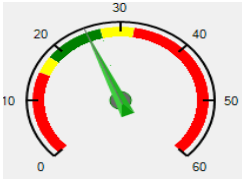
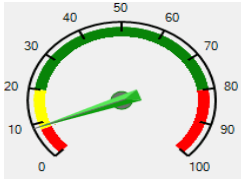
Det er funnet to lekkasjer på kondensator. Den ene i overgang manifold og væskerør ut av kondensatoren mot receiver. Den andre lekkasjen er funnet i gjengepartiet på sikkerhetsventilen. Lekkasjer og sjekk av totalfylling blir fulgt opp snarest, og avtales nærmere med kunden for utbedring.  
Se øvrige kommentarer i rapporten.

## Signature




|                    |                              |
|--------------------|------------------------------|
| Customer signature | Schneider Electric signature |
| Geir Vistung       | Mario dos Santos             |



| Equipment data                         |                       | Customer Ref. :      |                   |
|--|-----------------------|----------------------|-------------------|
| Equipment concerned                    | : IDEV                | Install/Startup date | : August, 27 2020 |
| Serial number                          | : SCE153579           | Capacity             | : 52.5 kW         |
| Configuration                          | : Group configuration |                      |                   |
| Unit number within group system: 1 / 2 |                       |                      |                   |

| Main Information  |   |
|---|---|
| Room & environmental conditions   | Cooling   |
|  <p><b>25 °C</b></p> |  <p><b>9.00%</b></p> |
| Ambient temperature   | Room environment humidity   |
|   | Equipment age : 0 years, 6 months, 0 days   |

| Visit data                                   |                           | Customer Ref. :  |                           |
|--|---------------------------|------------------|---------------------------|
| Service Request # / Activity : / WO-08409921 |                           |                  |                           |
| Work time start                              | : February, 12 2021 14:24 | Work time end    | : February, 22 2021 14:24 |
| Entitlement#                                 | :                         | Entitlement name | :                         |
| Account ID                                   | :                         | ISX Solution     | :                         |

| Lifecycle Indicator   |  | Parts replacement schedule |      |      |      |      |      |      |      |      |
|---|--|----------------------------|------|------|------|------|------|------|------|------|
| Part  |  | 2022                       | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| <br>Air filter |  | ✓                          |      |      |      |      |      |      |      |      |
| <br>Compressor |  |                            |      |      |      |      |      |      |      | ✓    |
| <br>Fan        |  |                            |      |      |      |      |      |      |      | ✓    |
| Cards   |  |                            |      |      |      |      |      |      |      | ✓    |
| Contactor   |  |                            |      |      |      |      |      |      |      | ✓    |

## Synthesis page

| Checks carried out            | Status when leaving | Comments   |
|-------------------------------|---------------------|--|
| System Room Check             | ●                   |  |
| <b>System check</b>           |                     |  |
| Visual Check                  | ●                   |  |
| Electric environment checking | ●                   |  |
| Electrical measurement        | ●                   |  |
| <b>Unit inspection</b>        |                     |  |
| Unit Functional check         | ●                   | Unit Functional check : Fuktindikator i seglasset indikerer at anlegget er tørt. Flashgass i seglasset under drift av kompressor kan indikere mangel på kuldemedium.<br>Pga lav last i rommet og lav utetemperatur rekker kompressoren ikke stabilisere seg tilstrekkelig.   |
| Heating check                 | ●                   |  |
| Serial Numbers                | ●                   |  |
| Settings                      | ●                   | Settings : Etter avtale med kunden er timeteller for Air filter service alarm og Unit service alarm deaktivert. Dette da filter sjekkes ved hver service.<br><br>Følgende setninger er endret for å sammenstille alle maskiner:<br>Humidity low threshold: Fra 20 til 0.0%rh.<br>Supply temp high threshold: Fra 30 til 28.8 grader. |
| <b>Service and Parts</b>      |                     |  |
| Parts with Life Duration      | ●                   |  |
| <b>IT Room Assessment</b>     |                     |  |
| Air flow check                | ●                   |  |
| Final Check                   | ●                   |  |
| <b>Notes</b>                  |                     |  |
| Comments                      | ●                   |  |

### Did you know ?



Circulation of cool air in a computer room is rarely optimized; typically only 30 to 50% of this air is actually employed to cool the IT equipments.

The ever increasing requirement for more density in today's IT equipment only heightens the need for data center air management specialists, who are properly trained to diagnose the computer room air flow and temperature requirements and recognize issues that can be corrected by implementing simple best practices.

Improved management of airflow in your IT room can result in:

**Lower Costs** - Reduced energy consumption and cold air demands.

**Increased Availability** - Improved server cooling results in higher reliability.

**Increased Capacity** - Better cooling efficiency increases equipment performance and eliminates the need to add more cooling units.

#### Schneider Electric's commitment:

Schneider Electric is committed to helping customers reduce energy costs and carbon emissions by 30%.

Deploying new technologies such as blade servers and virtualization create new challenges in terms of power, cooling and energy management. In addition, the capacity requirements of many Data Centers has been multiplied by 30 in 2 years, all experts agree that this rise will continue to accelerate.

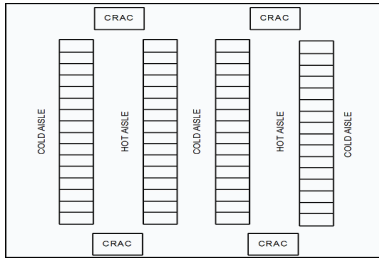
Optimizing the power consumption of computer rooms and data centers is critical and may require leveraging new technologies to achieve economies in power consumption. These economies are substantial.

To turn our words into action, our Schneider Electric's Field Service Engineers have received specific training to enable them to diagnose the effectiveness of the airflow in your IT rooms.

#### On the next page you will find the results of this evaluation.

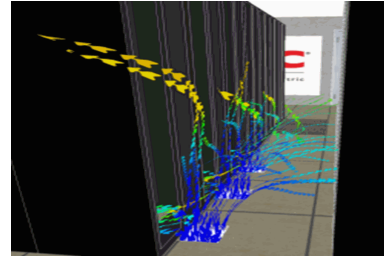
For more information on optimizing energy usage and availability in your data center, call one of our Energy Specialists on <http://www.schneider-electric.com>. To learn more please view our short [video](#) "Energy Management Services for Your Data Center". You can also download free white papers on this subject at [www.apc.com/en](http://www.apc.com/en) (under "Support" - "learn" - "White Papers")

### Cooling unit alignments



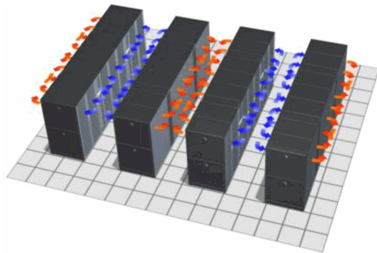
To optimize a raised-floor cooling system, cooling units must be aligned with hot aisles.

### Raised floor leakage



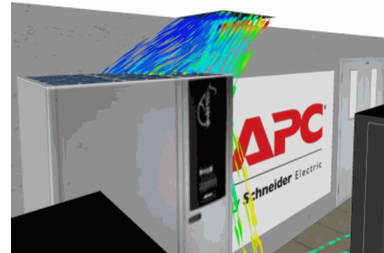
Cable cutouts in a raised floor environment should be sealed to avoid bypass airflow.

### Hot/Cold aisle configuration



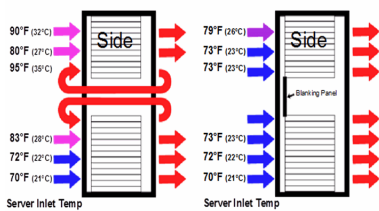
Configure rows in alternating 'hot' and 'cold' aisles to avoid mixing between 'hot' and 'cold' air.

### Diffuser location



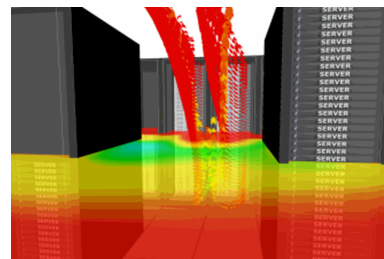
Roof or wall mounted distribution vents need to be properly positioned to better facilitate hot air removal.

### Gaps in the racks



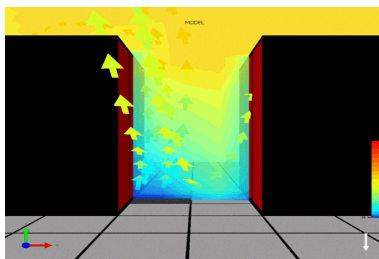
Prevent hot exhaust from re-entering the equipment's intake by installing blanking panels in all of the empty front panel U-spaces in the rack.

### Gaps in the rows



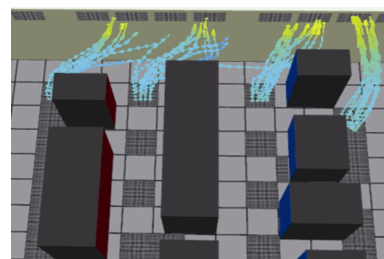
Prevent hot exhaust from recirculating back to the equipment's intake side by removing any openings (gaps) in the rows.

### Perforated tiles in hot aisle



To optimize a raised-floor cooling system, cooling air tiles must be located in the cold aisle and hot air return vents should be located above the hot aisle.

### Perforated tiles placement

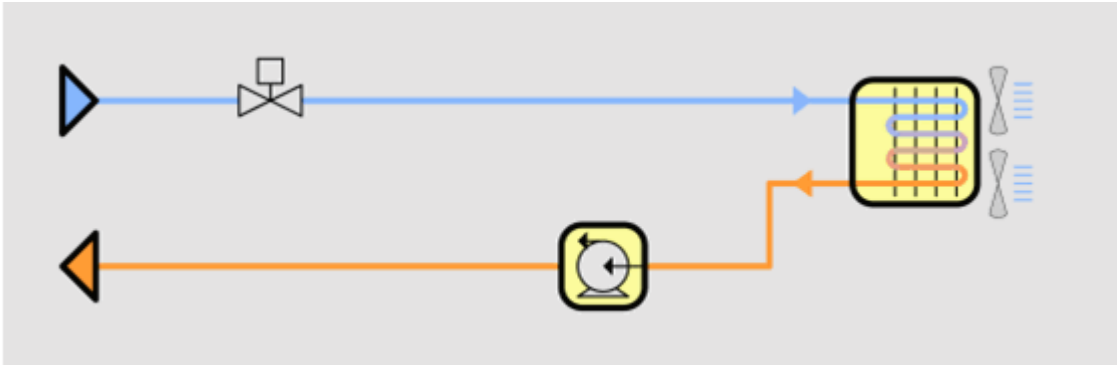


In order to optimize cooling units performance and decrease dehumidification needs, the location of distribution vents sources should ensure to not end up returning air to the CRAC unit at lower temperatures.

Maintenance summary

Det er funnet to lekkasjer på kondensator. Den ene i overgang manifold og væskerør ut av kondensatoren mot receiver. Den andre lekkasjen er funnet i gjengepartiet på sikkerhetsventilen. Lekkasje og sjekk av totalfylling blir fulgt opp snarest, og avtales nærmere med kunden for utbedring.  
Se øvrige kommentarer i rapporten.

Installation configuration



Comments

Customer  
[No comment](#)

Customer issues

Customer  
[No comment](#)

Schneider Electric  
[No comment](#)

List of measurement devices

| Device type               | Device model | Serial number | Last calibration date |
|---------------------------|--------------|---------------|-----------------------|
| Multimeter                | 179          | 25940502      | 12 December 2017      |
| Refrigerant Leak Detector | D-TEK        | To be filled  | 09 October 2017       |
| Oscilloscope              | Fluke 43B    | 28440409      | 10 September 2015     |
| Thermometer               | ETI          | D19401199     | 05 November 2020      |

## 1 System Room Check

### Room environment

|   |                 |              |
|---|-----------------|--------------|
| The environment where the equipment is located is suitable for service operation. | Yes             |              |
| Specify the type of room where the unit is located.                               | Electrical Room |              |
| Specify the type of cooling used in the room.                                     |                 | Satisfactory |
| Measure and record the room temperature:  | 25 °C           | Satisfactory |
| Room Environment Humidity   | 9 %             | Satisfactory |
| There is sufficient access to operate on the unit                                 | Yes             |              |

### Customer Room Designation

|                                       |                             |      |
|---------------------------------------|-----------------------------|------|
| Record the customer room designation: | Digiplex - Holtskogen POD E | Done |
|---------------------------------------|-----------------------------|------|

## 2 System check

### 2.1 Visual Check

|                          |           |
|--------------------------|-----------|
| Model number of the unit | IDAV1511A |
|--------------------------|-----------|

### Inspection

|   |              |
|---|--------------|
| Visual check for foreign conducting materials inside and on top equipment | Satisfactory |
|---|--------------|

### 2.2 Electric environment checking

#### Cable wiring

|   |     |
|---|-----|
| Power input/output wiring and ground cables checked for tightness | Yes |
| Field installed communication wiring check for tightness          | Yes |

### 2.3 Electrical measurement

#### Main input power supply measurements - Single phase

|           |       |
|-----------|-------|
| L1-N      | 236 V |
| L1-Ground | 236 V |

#### Main input power supply measurements - Three phases

|           |       |
|-----------|-------|
| L1-L2     | 408 V |
| L2-L3     | 408 V |
| L3-L1     | 409 V |
| L1-Ground | 236 V |
| L2-Ground | 236 V |
| L3-Ground | 233 V |

#### Transformer Voltage Check

|                           |        |
|---------------------------|--------|
| Transformer 1 Primary     | 236 V  |
| Transformer 1 Secondary 1 | 25.6 V |
| Transformer 1 Secondary 2 | 25.6 V |
| Transformer 2 Primary     | 0 V    |
| Transformer 2 Secondary 1 | 0 V    |
| Transformer 2 Secondary 2 | 0 V    |
| Transformer 3 Primary     | 0 V    |
| Transformer 3 Secondary 1 | 0 V    |



## 3 Unit inspection

### 3.1 Unit Functional check

|   |  |
|---|--|
| The unit firmware has been upgraded.        | No   |
| Installed firmware version                  | Display: aos_656.bin/bootmon_108.bin/Ledx2g_e11_600.bin / Unit 1.2.4.002_DFC.bin |
| Field Service Bulletins have been performed | No   |

### Fan Motors Current Measurements - Three phases

|   |       |
|---|-------|
| Total current of fan motors 1, 2 and 3 : L1 | 7.6 A |
| Total current of fan motors 1, 2 and 3 : L2 | 7.6 A |
| Total current of fan motors 1, 2 and 3 : L3 | 7.8 A |

### Controller

|   |     |
|---|-----|
| The controller and user interface addresses are configured properly           | Yes |
| The user interface display is working properly                                | Yes |
| The controller is properly configured for the unit type and options installed | Yes |

### Air flow

|  |      |
|--|------|
| All blowers move freely with no noise                                    | Yes  |
| The fans achieve the desired speed setting and have the correct rotation | Yes  |
| Fan speed (% of maximum)   | 75 % |
| External air dampers are open and working properly                       | Yes  |
| The air flow differential pressure switch has been calibrated and tested | Yes  |

### Air filter

|   |     |
|---|-----|
| The air filters were replaced                               | No  |
| The air filter run hours were reset to zero                 | No  |
| The air filter differential pressure switch has been tested | Yes |

### Cooling

|   |     |
|---|-----|
| All air bleed valve caps are installed and secure | Yes |
|---|-----|

### Sensor

|   |         |
|---|---------|
| All of the sensors are reading properly | Yes     |
| Return air temperature                  | 25.3 °C |
| Return air % relative humidity          | 9 %     |
| Delivery air temperature                | 25.1 °C |
| Chilled water inlet temperature         | 0 °C    |
| Hot water inlet temperature             | 0 °C    |
| Chilled water outlet temperature        | 0 °C    |
| Hot water outlet temperature            | 0 °C    |

### Circuit 1 check

|   |     |
|---|-----|
| Sight glass indicates the system is dry | No  |
| Circuit responds to the cooling demand  | Yes |

### Circuit 1 measurements

|   |         |
|---|---------|
| Suction pressure                        | 8.2 bar |
| Superheat temperature                   | 7.8 °C  |
| Suction line temperature                | 12.5 °C |
| Discharge pressure                      | 19 bar  |
| Subcooling temperature                  | 6.2 °C  |
| Liquid line filter temperature gradient | 0 °C    |
| Condenser inlet liquid temperature      | 0 °C    |
| Condenser outlet liquid temperature     | 0 °C    |
| Compressor current 1, L1                | 19.4 A  |
| Compressor current 1, L2                | 18.3 A  |
| Compressor current 1, L3                | 19.1 A  |
| Compressor current 2, L1                | 0 A     |
| Compressor current 2, L2                | 0 A     |
| Compressor current 2, L3                | 0 A     |

### Circuit 2 check

|   |     |
|---|-----|
| Sight glass indicates the system is dry | Yes |
| Circuit responds to the cooling demand  | Yes |

### Circuit 2 measurements

|   |       |
|---|-------|
| Suction pressure                        | 0 bar |
| Suction line temperature                | 0 °C  |
| Superheat temperature                   | 0 °C  |
| Discharge pressure                      | 0 bar |
| Subcooling temperature                  | 0 °C  |
| Liquid line filter temperature gradient | 0 °C  |
| Condenser inlet liquid temperature      | 0 °C  |
| Condenser outlet liquid temperature     | 0 °C  |
| Compressor current 1, L1                | 0 A   |
| Compressor current 1, L2                | 0 A   |
| Compressor current 1, L3                | 0 A   |
| Compressor current 2, L1                | 0 A   |
| Compressor current 2, L2                | 0 A   |
| Compressor current 2, L3                | 0 A   |

#### Section comments

Fuktindikator i seglasset indikerer at anlegget er tørt.

Flashgass i seglasset under drift av kompressor kan indikere mangel på kuldemedium.

Pga lav last i rommet og lav utetemperatur rekker kompressoren ikke stabilisere seg tilstrekkelig.

### 3.2 Heating check

|  |     |
|--|-----|
| The electric heaters respond to the demand | Yes |
|--|-----|

### Electric Heat Current Measurements Level 1

|                                 |       |
|---------------------------------|-------|
| Total electric heat current, L1 | 4.5 A |
| Total electric heat current, L2 | 4.4 A |
| Total electric heat current, L3 | 4.5 A |

### Electric Heat Current Measurements Level 2

|                                 |       |
|---------------------------------|-------|
| Total electric heat current, L1 | 8.9 A |
| Total electric heat current, L2 | 8.9 A |
| Total electric heat current, L3 | 8.9 A |

### Electric Heat Current Measurements Level 3

|                                 |        |
|---------------------------------|--------|
| Total electric heat current, L1 | 13.6 A |
| Total electric heat current, L2 | 13.5 A |
| Total electric heat current, L3 | 13.3 A |

### 3.3 Serial Numbers

#### Out Door Heat Exchanger - Three phases

|               |             |
|---------------|-------------|
| Model number  | OCC1701LTB  |
| Serial number | EB202000054 |

#### Measurements

|          |     |       |
|----------|-----|-------|
| L-N      | 5 A | 236 V |
| L1-L2    | 0 A | 0 V   |
| L1-L3    | 0 A | 0 V   |
| L2-L3    | 0 A | 0 V   |
| L-Ground | 0 A | 0 V   |

### 3.4 Settings

#### Group configuration

|                          |     |    |
|--------------------------|-----|----|
| Cycle time               | 0 h | No |
| Number of stand-by units | 0   |    |

#### Setpoints

|                                    |       |
|------------------------------------|-------|
| Cooling set point                  | 26 °C |
| Cooling proportional band          | 0 °C  |
| Dehumidification set point         | 55 %  |
| Dehumidification proportional band | 15 %  |
| Humidification set point           | 0 %   |
| Humidification proportional band   | 0 %   |
| Delivery air temperature set point | 0 °C  |

#### Alarm Thresholds

|                               |         |
|-------------------------------|---------|
| High room temperature         | 40 °C   |
| Low room temperature          | 17.8 °C |
| High room humidity            | 80 %    |
| Low room humidity             | 0 %     |
| High delivery air temperature | 28.8 °C |

#### Section comments

Etter avtale med kunden er timeteller for Air filter service alarm og Unit service alarm deaktivert. Dette da filter sjekkes ved hver service.

Følgende settinger er endret for å sammenstille alle maskiner:

Humidity low threshold: Fra 20 til 0.0%rh.

Supply temp high threshold: Fra 30 til 28.8 grader.

Supply temp low threshold. Fra 15 til 10grader.

Reheat setpoint. Fra 24 til 15grader.

## 4 Service and Parts

### 4.1 Parts with Life Duration

#### 4.1.1 Compressor

|                       |                |
|-----------------------|----------------|
| Reference             |                |
| Quantity              | 0              |
| Justification         | Other          |
| Installation date     | 27 August 2020 |
| Next replacement date | 2030           |

#### 4.1.2 Air filter

|                       |                |
|-----------------------|----------------|
| Reference             |                |
| Quantity              | 2              |
| Justification         | Other          |
| Installation date     | 27 August 2020 |
| Next replacement date | 2022           |

#### 4.1.3 Fan

|                       |                |
|-----------------------|----------------|
| Reference             |                |
| Quantity              | 0              |
| Justification         | Other          |
| Installation date     | 27 August 2020 |
| Next replacement date | 2030           |

#### 4.1.4 Cards

|                       |                |
|-----------------------|----------------|
| Reference             |                |
| Quantity              | 0              |
| Justification         | Other          |
| Installation date     | 27 August 2020 |
| Next replacement date | 2030           |

#### 4.1.5 Contactor

|                       |                |
|-----------------------|----------------|
| Reference             |                |
| Quantity              | 0              |
| Justification         | Other          |
| Installation date     | 27 August 2020 |
| Next replacement date | 2030           |

## 5 Final Check

### Final Inspection

|   |     |
|---|-----|
| The area around the Unit is clean and orderly                 | Yes |
| The unit is completely operational                            | No  |
| Active alarms are present                                     | No  |
| The interior/exterior of the unit is clean and free of debris | Yes |
| Interior and exterior panels are securely fastened            | Yes |

## 6 Notes

### 6.1 Comments

#### General comments

No comment

#### Unit Functional check

Fuktindikator i seglasset indikerer at anlegget er tørt.

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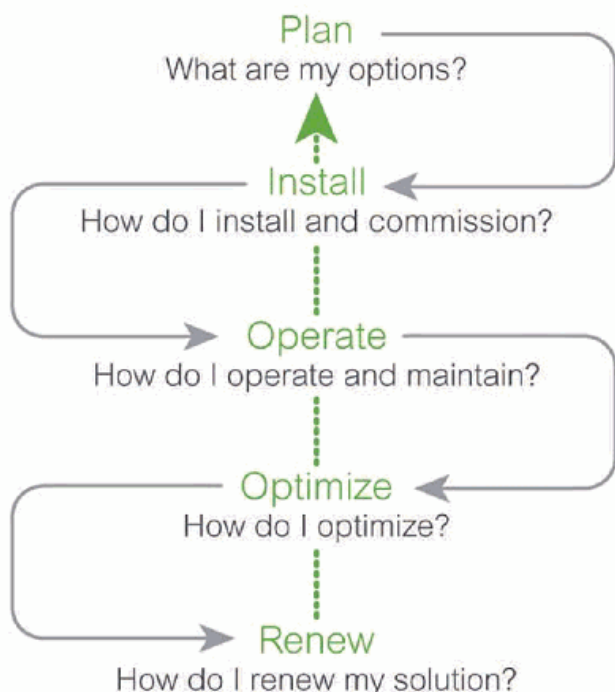
Supply temp low threshold. Fra 15 til 10grader.

Reheat setpoint. Fra 24 til 15grader.

# SERVICES SOLUTIONS FROM A TRUSTED ADVISOR

Rely on Schneider Electric Critical Power & Cooling Services to protect your UPS from unexpected issues and downtime. Trained and trusted professionals are at your disposal to support and provide high quality service for your equipments.

## Life Cycle Services



Schneider Electric Critical Power & Cooling Services (CPCS) provides the expertise, services, and support you need for your building, industry, power, or data center infrastructure.

- **Experience:** Our proud 170-year history has led us to worldwide recognition as the thought leader in energy management, power and cooling infrastructure, and energy efficiency.
- **Reputation:** Our highly trained teams — technical support, project managers, Field Service Engineers (FSEs) — and our strong commitment to quality service have earned us a reputation as a trusted advisor in the industries we serve.
- **Availability:** Our extensive worldwide service network is one of the largest in the world. This enables us to deliver service where and when you need it.
- **Expertise:** Our highly skilled, certified FSEs are trained directly by the product developers themselves. This provides them with the highest level of system knowledge, resulting in accurate and quick diagnosis and repair.
- **Speed:** If equipment issues should arise, our technical support team is only a phone call away, ready to help you quickly diagnose the problem. When on-site help is required, our service plans dispatch a FSE rapidly, ensuring your system is up and running as fast as possible.

### Plan

**Assessment:** Site survey, engineering analysis, environmental inspection.

**Design Planning:** Free online tools to plan and design tailor-made solutions.

### Install

**Project Management:** Assistance in completing rollouts on time and within budget.

**Installation:** Equipment implementation and optimization, physical assembly and logistics coordination.

**Start-up:** Initial setup, installation, verification.

**Training:** Onsite equipment orientation, operational and maintenance education.

### Operate

**Service Plans:** comprehensive onsite service packages with either Next-Business-Day availability or response upgrades to 4-hour and 8-hour.

**Monitoring Service:** 24\*7 digital monitoring service with instant access to data and experts through Smartphone apps well as operational insights and analytics.

**Preventive Maintenance:** Corrective maintenance, system cleaning, environmental inspection, functional verification, and free firmware upgrades.

### Optimize

**Asset Capacity Trending:** proactive asset planning guidance, along with analysis of critical power, cooling, and room layout domains.

**Data Center Health Check:** Site-level assessment as well as inventory list for Schneider Electric and 3rd party vendor equipment.

### Renew

**Modular Power Revitalization:** comprehensive on-site UPS refresh service for modular UPS solutions, updated by certified service professionals.

**Modernization Services:** solutions to protect your aging UPS from unexpected issues and downtime. Assets' availability will increase and investments maximized.

For more information, please visit Critical Power & Cooling Services website at:  
<http://www.schneider-electric.com/b2b/en/services/field-services/critical-power-and-cooling/>