Use Case 1:
Chiller specifications & Energy consumptions

- Chiller Full load Ampere = 277.2A
- Average loading throughout a normal day = 78.5% = 217.6A
- At 90% power factor @ 78.5% load = 243.82kW
- Estimated chiller operating hours = 8 hours x 5 days x 52 weeks = 2080hrs
- Estimated kWh per year = 243.82kW x 2080 = 507,145.6kWh

TARIFF C1 - MEDIUM VOLTAGE GENERAL COMMERCIAL TARIFF	
For each kilowatt of maximum demand per month	30.3 RM/kW
For all kWh	36.5 sen/kWh
The minimum monthly charge is RM600.00	
TARIFF C2 - MEDIUM VOLTAGE PEAK/OFF-PEAK COMMERCIAL TARIFF	
For each kilowatt of maximum demand per month during the peak period	45.1 RM/kW
For all kWh during the peak period	36.5 sen/kWh
For all kWh during the off-peak period	22.4 sen/kWh
The minimum monthly charge is RM600.00	

Estimated Load Saving %	10% RT/load saving	15% RT/load saving	20% RT/load saving
Estimated kWh saved/year	50,715	76,072	101,429
Estimated RM saved/year	18,511.00	27,766.00	37,022.00
Potential Max Demand Saving % x 243.82 x 12 months x RM30.3 with gradual remote set point strategy	8,865.00	13,298.00	17,731.00
Estimated Potential Saving RM/ year	27,376.00	40,674.00	54,753.00

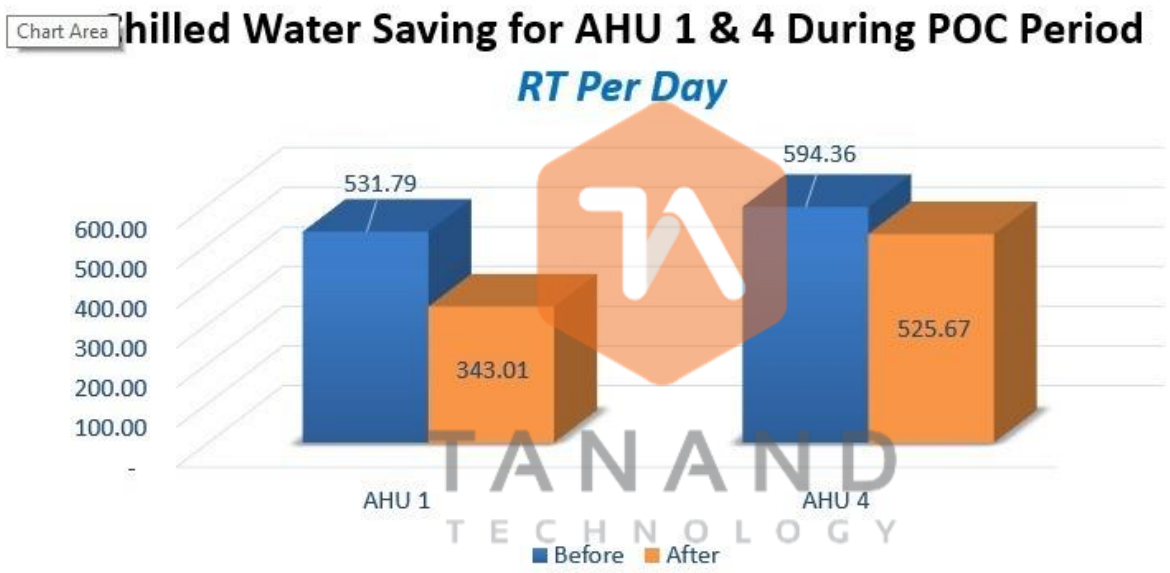
Use Case 2:
Chiller specifications & Energy consumptions

- Chiller Full load Ampere = 277.2A
- Average loading throughout a normal day = 78.5% = 217.6A
- At 90% power factor @ 78.5% load = 243.82kW
- Estimated chiller operating hours = 12 hours x 7 days x 52 weeks = 4368hrs
- Estimated kWh per year = 243.82kW x 4368hrs = 1,065,006kWh

TARIFF C1 - MEDIUM VOLTAGE GENERAL COMMERCIAL TARIFF	
For each kilowatt of maximum demand per month	30.3 RM/kW
For all kWh	36.5 sen/kWh
The minimum monthly charge is RM600.00	
TARIFF C2 - MEDIUM VOLTAGE PEAK/OFF-PEAK COMMERCIAL TARIFF	
For each kilowatt of maximum demand per month during the peak period	45.1 RM/kW
For all kWh during the peak period	36.5 sen/kWh
For all kWh during the off-peak period	22.4 sen/kWh
The minimum monthly charge is RM600.00	

Estimated Load Saving %	10% RT/load saving	15% RT/load saving	20% RT/load saving
Estimated kWh saved/year	106,500	159,750	213,000
Estimated RM saved/year	38,872.50	58,308.75	77,745.00
Potential Max Demand Saving % x 243.82 x 12 months x RM30.3 with gradual remote set point strategy	8,865.00	13,298.00	17,731.00
Estimated Potential Saving RM/ year	47,737.50	71,606.75	95,476.00

Result Achieved for AHU 1 & 4 During POC period at a well known MNC Semi Conductor Factory



AHU RT SAVING Achieved

AHU 1: (531.79 – 343.01) / 531.79 = 35.49%

AHU 4: (594.36 – 525.674) / 594.36 = 11.55%

Total Average Saving for AHU 1 + 4 = (1,126.15 – 868.68) / 1,126.15

= 22.86%

Before: 18 Feb – 28 Feb 2021

After: 07 Mar – 14 Mar 2021

Chiller Life Span Cost

Chiller is one of your most important workhorse & expensive asset in your buildings.

- It is also the biggest power consuming equipment in your building

Because of the unique features of EasiChiller:

You can save money on:

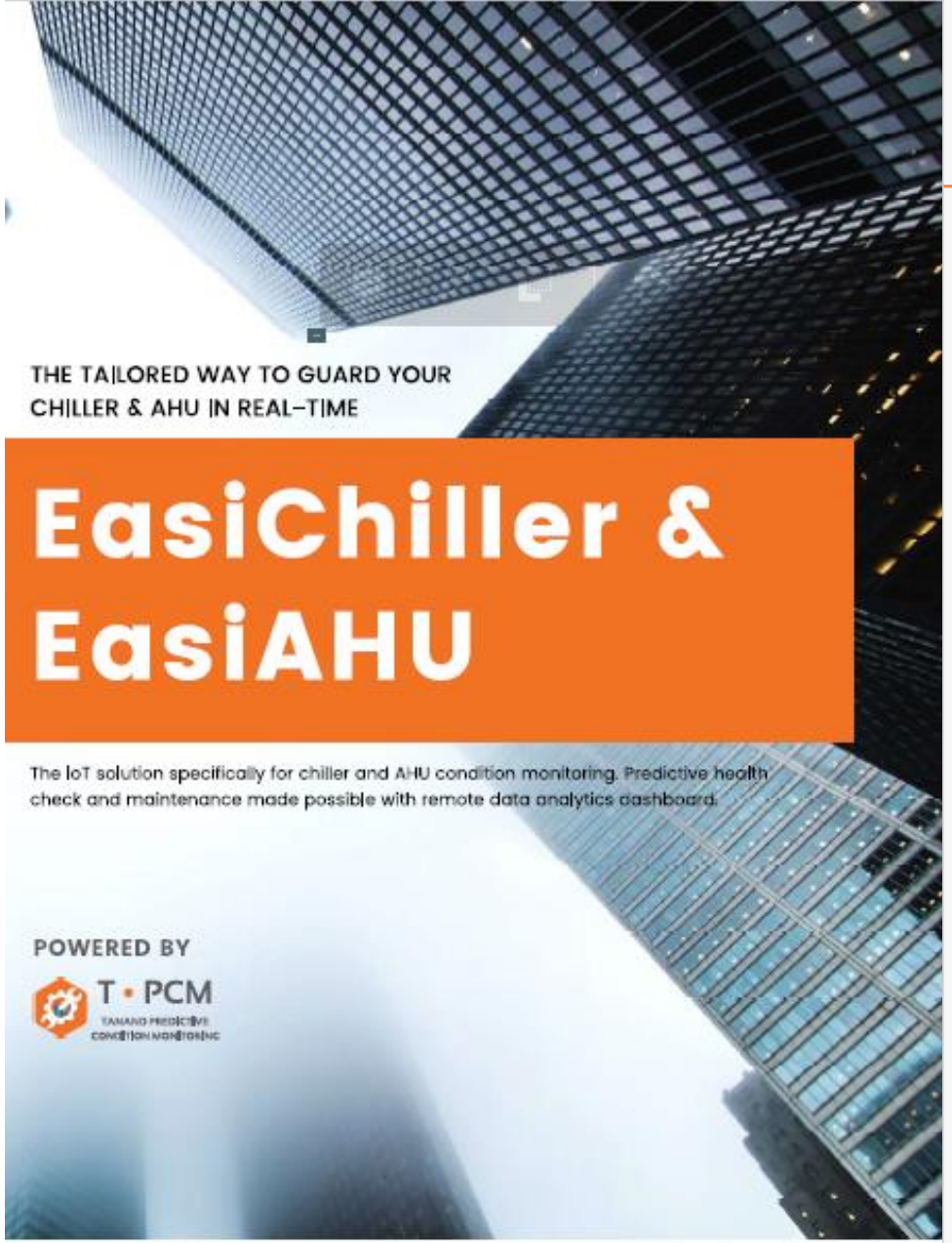
- ✓ Save Energy - Chiller efficiency will be closely monitored and ensure energy efficient
- ✓ Reduce Major breakdown and spare parts caused due to improper maintenance or overdue maintenance
- ✓ Increase Machine Operating Lifespan:
  - Typically, a well-maintained chiller operating lifespan is 20-25 years
  - Moderately maintained chiller operating lifespan is 15-20 years

- Extension of chiller operating lifespan of additional 5 years with CAPEX of RM500,000

will save you **RM125,000.00 - RM166,667.00**

EasyChiller Summary Features

- ✓ **Prolong your important & expensive Chiller lifespan with T-PCM (predictive conditioning monitoring) specifically designed for chiller**
- ✓ **Powered with IoT sensors (Energy, noise, vibration, flow/delta T) & Real-time scanning and machine learning fault analysis through your chiller logs(EasiChiller+)**
- ✓ **EasiChiller is a machine learning which serve as a Data-Driven + Chiller Expert monitoring your critical assets 24x7 with trend analysis**
- ✓ **Never missed Insightful monthly summary report for your chiller health score & historical scoring trend via email every month**
- ✓ **Abnormalities detection will be instantly sent to your operation team via Telegram or WhatsApp to prevent major faults or major damages to your critical asset**
- ✓ **EasiChiller also can be used for you to analyze & audit the performance or health score after each major service job are performed to your chiller.**



THE TAILORED WAY TO GUARD YOUR CHILLER & AHU IN REAL-TIME

EasiChiller & EasiAHU

The IoT solution specifically for chiller and AHU condition monitoring. Predictive health check and maintenance made possible with remote data analytics dashboard.

POWERED BY

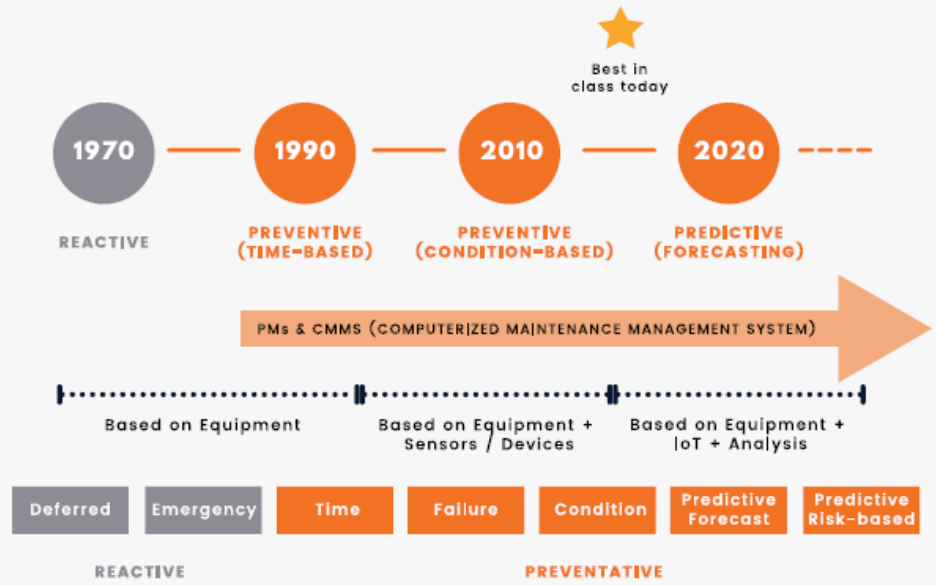
T • PCM

TANAKO PREDICTIVE CONDITION MONITORING

Maintenance Strategies

Environmental changes, actual run time, and deteriorating conditions are ever-changing and cannot be accurately measured despite having sufficient schedule-based preventive maintenance (PPM).

Where are you on your journey to ensure that such conditions do not happen in your building?



What You Need To Know

Every machine has its own unique pattern of habits and behaviors that can be expressed in a collection of operating data.

Once collected and calculated for scheduled-maintenance, these equations do not change unless through configuration or troubleshooting by engineers. More often than not, such maintenance either over-maintain or under-maintain chillers, leading to high maintenance cost and machine downtime in the long run.

While it is the conventional way to perform maintenance manually by hiring professionals on a frequent basis, **EasiChiller** and **EasiAHU** save you from the major overhaul maintenance cost and risk of sudden chiller/AHU outages by being permanently available and automated for optimization needs with less manpower.

The Covid-19 pandemic has not been kind to the industrial and commercial buildings' facilities management team, especially when they are an essential operational force to ensure ACMV equipment are operating at the optimum condition.

With reduction in manpower to carry out check ups and maintenance, dirty filters & dirty coils can easily occur to prevent you from achieving the desired temperature and dehumidifying (<70%), resulting in energy wastage that surges your utility cost up to 40%, further leading to:

- discomfort and bad indoor air quality
- increase in airborne virus
- bacteria transmission
- mold growing.

With self-learning data analytics and built-in intelligent algorithm, **EasiChiller** and **EasiAHU** automatically detect such abnormalities without requiring physical inspection.

This way, you can reduce your total workforce while still being able to run your HVAC requirements efficiently and extend lifespan of your equipment.

The Unique Features

As part of the T-PCM solution suite, EasiChiller and EasiAHU are the perfect combination for real-time condition monitoring, predictive failure detection, remote monitoring alerts, and health-scoring to maximize machine availability and reduce maintenance scheduling.

They aim to vet out 90% of your chiller and AHU issues before any serious abnormalities occurs.

EasiChiller

1. Measures differential temperature (Delta T) to ensure optimal chilled water temperature for best chiller performance.
2. Provides real-time and analytical trending data of chiller load and efficiency in kW/RT to notify you whenever KPI is not achieved.
3. Provides historical analysis & real-time performance benchmark for chillers with remotely configurable threshold setting.
4. Provides real-time chiller energy consumption in kW, kWh, Ampere and Voltage to alert you during every abnormal energy spikes.
5. Provides abnormalities predictive detection using machine learning algorithm on the IoT sensors data:
    - Unique normalization peak count to further identify abnormal power usage pattern in chillers to prevent maximum demand.
    - Unique combination of Vibration + Noise (dB & frequency) sensors to pick up noise abnormalities from chillers that can be left undetected by human ears.
6. Provides monthly auto-generated review report with summarized data of chiller utilization, efficiency, changes & abnormalities in one glance.
7. Comes with a dashboard featuring real-time Telegram notification / API integration to ServeDeck work order & PPM module.

How They Work

EasiChiller and **EasiAHU** perform predictive maintenance by using 24/7 self-diagnostics to continuously make micro-adjustments to your existing chillers and AHUs.

It monitors a multitude of co-related data points extracted from sensors equipped with our smart weightage system and then generates a unique health-point to make decisions about how to optimize your chillers in real-time.

This process of continual monitoring, evaluation, and adjustments can only be achieved with advanced deep learning methodologies and understanding of chiller and AHU mechanics.

Through the help of our simple yet powerful real-time data analytics driven dashboard with remote accessibility, EasiChiller and EasiAHU can easily transform maintenance from reactive to predictive.

The dashboard provides up to 12 months of behavioral trending data, in addition with a color-oriented heatmap for you to gain visibility and insights on your critical and high CAPEX chillers.

The dashboard features real-time alert notifications via Telegram Bot / API integration to ServeDeck work order and PPM module, further ensuring you a longer useful lifespan for your chillers and AHUs whilst providing real-time efficiency check on their performance.

REDUCE DOWNTIME WITH MINIMAL MANPOWER & MAINTENANCE COST

The Benefits

MAINTENANCE 4.0

EasiChiller and **EasiAHU** use real-time sensors and data analytics to predict the health point for all your chillers in your manufacturing processes.

With health-point system serving as a KPI for your machine condition, it re-evaluates itself after the maintenance has been done to show a comparison of your machine condition before and after.

As a result, you will prolong the lifespan of your chillers and AHUs.

The Benefits

MAINTENANCE 4.0

Additionally, **EasiChiller** and **EasiAHU** realize a demand-based maintenance work scheduling instead of scheduled-based maintenance work, which is made possible by our real-time sensors benchmark.

In the beginning of the week, your maintenance team can print out this demand-based schedule for their PPM work.

By the end of the week, the manager can use the dashboard to check on the quality of the maintenance work using the sensors feedback. This enables you to gauge the performance of your maintenance contractors.

The Benefits

REDUCE OPEX/CAPEX

Do you know that **EasiChiller** and **EasiAHU** are equivalent to hiring **MANY** and **EXPERIENCED** engineers running in 3 shifts?

They do what your experienced troubleshooting engineers can do, only they do it better!

It runs **24x7 MACHINE HEALTH CHECK WITHOUT SUPERVISION** needed and ensures your chillers are taken care of.

Not to mention, it also provides an **ON-DEMAND WEEKLY MAINTENANCE SCHEDULE** ,so you can reduce your manpower and maintenance cost (OPEX), as well as machine replacement (CAPEX).

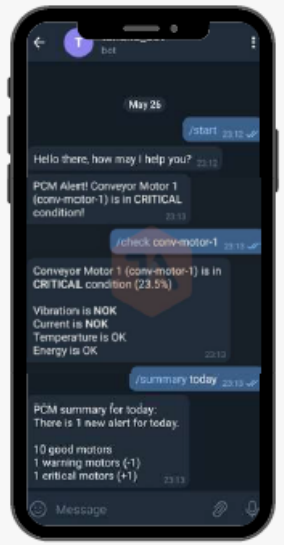
By the end of the week, an **AUTOMATED REPORT** will be emailed to your maintenance manager and team, by leveraging IoT sensors & predictive data analytics built-in.

This way, you can ensure all maintenance works are properly done and your KPI is achieved before moving into the next week.

ADIOS DOWNTIME!

Struggling with sudden downtime due to unexpected breakdowns?

Let EasiChiller and EasiAHU give you a peace of mind by predicting abnormalities using real-time machine data to diagnose and predict various types of failures before they mess with your operations, and most importantly, your KPI.



TANAND TELEGRAM BOT

Available Versions

EasiChiller Basic

The basic version that supports remote access, works with any chiller, inclusive of our real-time IoT sensors:

- smart energy meters (up to 1200A),
- ultrasonic flow meters,
- high accuracy PT100 sensors,
- vibration sensors,
- noise sensors.

EasiChiller + (Advanced)

The advanced version that works with major chiller brands (subject to chiller interfacing card availability) by integrating to your chiller interfacing card via Modbus / BACnet protocol.

Especially suitable for high capacity / high efficiency (MUST RUN) chillers without a sufficient backup unit.

Additional analytics data compared to EasiChiller Basic (subject to the availability of data from chiller HMI / PLC / Microcontroller unit):

- Captures finer details to ensure 99% chiller protection.
- Additional health score for 12 months: data analytics regarding compressor oil, pressure and oil temperature for 12 months.
- Additional health score: evaporator & condenser data, refrigerant condition and pressure.
- To achieve better energy efficiency and chiller part load efficiency when chiller load / demand changes, features remote setting via dashboard for:
  - chilled water outlet set point.
  - remote target capacity setting % (maximum ampere).
  - remote delay time.
  - N-Zone band setting.