




NORITZ[®]
COMMERCIAL
ONE
POWERED BY  Facilities Resource Group

SALES TRAINING

1


ONE COMPANY

 **NORITZ[®]**   **Facilities Resource Group**


COMMERCIAL
ONE

Combining Noritz “Best-in-Class” TRUE Commercial Tankless Water Heating Technology with Facilities Resource Group “Most Trusted” Commercial Water Heating Solutions Organization

2




NORITZ



COMMERCIAL
ONE

Over 75 Years of Innovation

- Established in 1951, Noritz is Globally Headquartered in Kobe, Japan.
- Noritz America out of Fountain Valley, CA has been present since 2002 covering US & CANADA.



Over 1 Million

- Units of gas water heaters manufactured in Japan per year. Our factory in Japan quickly delivers water heating products to match the specific needs of local customers around the world.

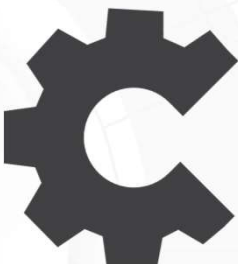
Operation in 17 Countries

- Over 3,600 Employees in Japan, over 2,700 Outside Japan for a total of OVER 6,300 employees Worldwide.

3

FRG



COMMERCIAL
ONE

Over 25 Years of Customer Excellence

- Established in 2001, Facilities Resource Group, out of Comstock Park, MI, has been building our business through our attention to detail, dedication to our customers, and exceptional service.

ZERO Stores Closures

- Our 24 / 7 / 365 Technical Support keeps our customer's doors open while producing dependable, reliable water heating systems.

Unmatched Solutions

- FRG provides the highest quality commercial water heating solutions in the industry with professionally-trained installation network and premium planned maintenance programs.

4

TRAINING AGENDA



Commercial Water Heating
Essentials



Technology, Performance,
and System Design



Customer Engagement and
Value Identification



Competitive Positioning and
Sales Strategy

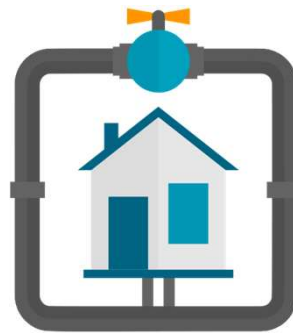
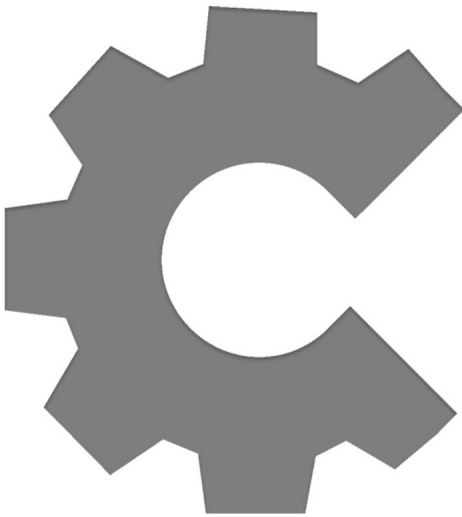


Application Demand &
Sizing Requirements

 **COMMERCIAL ONE**

5

COMMERCIAL WATER HEATING ESSENTIALS



- Introduction to Commercial Water Heating
- What Is a Commercial Gas Tankless System?
- Commercial Tankless Use Cases

6

COMMERCIAL WATER HEATING ESSENTIALS

Introduction to Commercial Water Heating

Critical Role in Industries

Commercial water heating supports essential operations across hospitality, healthcare, education, and food service industries.



Other Industries

- Food Manufacturing
- Laundromats



COMMERCIAL ONE

7

COMMERCIAL WATER HEATING ESSENTIALS

Introduction to Commercial Water Heating

Shift from Tank & Boiler to Tankless

The market is transitioning from traditional commercial tank heaters & commercial boilers to efficient, scalable tankless water heating solutions.



COMMERCIAL ONE

8

COMMERCIAL WATER HEATING ESSENTIALS

Introduction to Commercial Water Heating

Energy Efficiency and Sustainability

- New regulations drive demand for high-efficiency, low-emission water heaters with better energy control.
- State and Federal rebates reduce upfront installation costs, making high-efficiency systems more affordable while accelerating long-term energy and operational savings.



9

COMMERCIAL WATER HEATING ESSENTIALS

Introduction to Commercial Water Heating

Sales Strategy and Customer Value

Sales professionals focus on lifecycle value, reliability, and scalability to meet customers' operational goals.



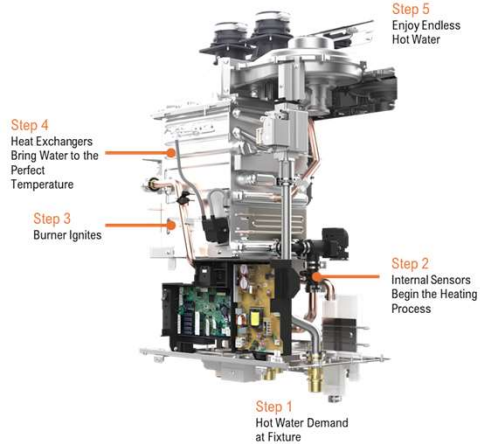
10

COMMERCIAL WATER HEATING ESSENTIALS

What Is a Commercial Gas Tankless System?

On-Demand Hot Water Heating

Tankless systems heat water instantly as it flows, eliminating the need for preheated storage tanks and reducing energy waste.



11

COMMERCIAL WATER HEATING ESSENTIALS

What Is a Commercial Gas Tankless System?

Advanced Combustion Control

Sophisticated combustion management modulates burner output to optimize energy use and ensure precise temperature delivery.

High-Efficiency Performance	Maximum output while lowering operational costs
Stability and Control	Precise temperature control for consistent hot water delivery, featuring high-elevation adjustments and safety lock-outs
Environmental Impact	Advanced combustion minimizes carbon footprint through lower emissions
Safety Features	Built-in mechanisms include flame sensors, lightning protection, and freeze protection



12

COMMERCIAL WATER HEATING ESSENTIALS

What Is a Commercial Gas Tankless System?

Modular Scalability and Redundancy

Multi-unit cascades allow scaling output and ensure continuous operation even during maintenance, minimizing downtime.



 COMMERCIAL ONE

13

COMMERCIAL WATER HEATING ESSENTIALS

What Is a Commercial Gas Tankless System?

Compact Design and Reliability

Compact footprint, venting flexibility, and longer service life distinguish tankless systems from traditional water heaters.



 COMMERCIAL ONE

14

COMMERCIAL WATER HEATING ESSENTIALS

Commercial Tankless Use Cases

Hotels, Hospitality, & Multi-Family

Provides endless hot water for guest rooms, laundries, and kitchens, supporting high occupancy and comfort.



COMMERCIAL ONE

15

COMMERCIAL WATER HEATING ESSENTIALS

Commercial Tankless Use Cases

Healthcare Facilities

Delivers precise, reliable hot water for sanitation, handwashing, and patient care with essential temperature control.



COMMERCIAL ONE

16

COMMERCIAL WATER HEATING ESSENTIALS

Commercial Tankless Use Cases

Educational Institutions & Dormitories

Reduce energy costs, support sustainability goals, ensure reliable hot water for high-demand environments, and lower long-term maintenance expenses.



17

COMMERCIAL WATER HEATING ESSENTIALS

Commercial Tankless Use Cases

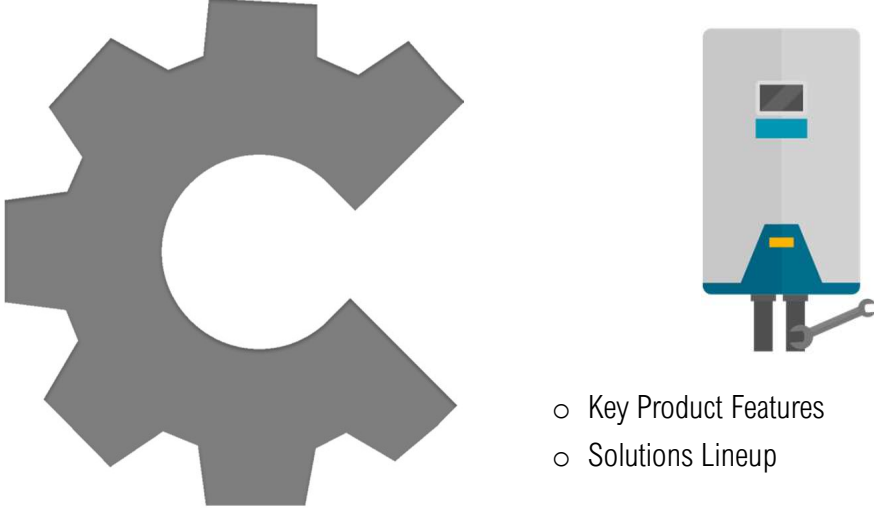
Restaurants and Food Service

Tankless systems ensure reliable hot water recovery for dishwashing and sanitation, reducing downtime during busy hours.



18

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN



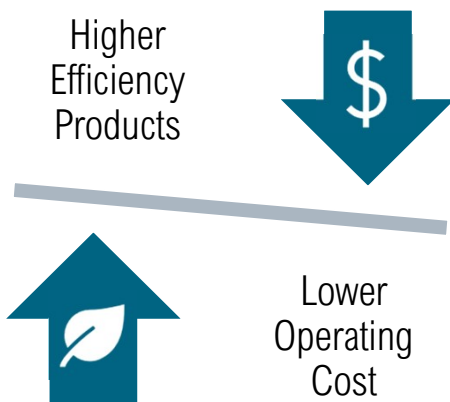
- Key Product Features
- Solutions Lineup

19

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Key Product Features

High Thermal Efficiency
Many models exceed 90% thermal efficiency, reducing energy waste and lowering operational costs significantly.



C O M M E R C I A L O N E

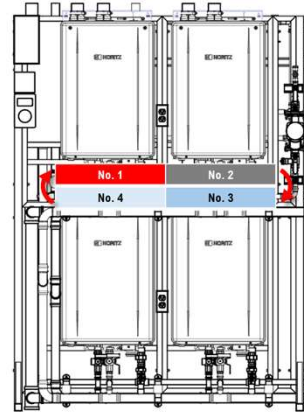
20

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Wide Modulation Range

- Burners adjust dynamically to hot water demand, ensuring consistent temperature and enhanced efficiency during all load periods.
- Industry-leading, non-primary cascading system control strategy to ensure 100% balanced run time across connected heaters.

Key Product Features



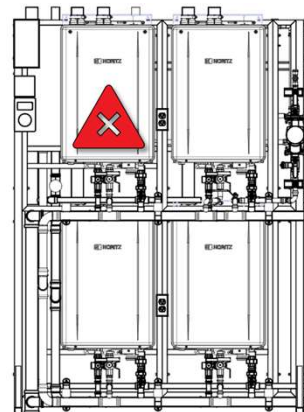
21

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Built-in Redundancy

Cascaded units provide uninterrupted hot water supply, allowing servicing without system downtime.

Key Product Features



22

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Key Product Features

Venting and Durability Features

Supports flexible venting options and includes corrosion-resistant heat exchangers, advanced controls, and freeze protection.



23

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

Our Commercial Gas Tankless Solutions Lineup

MODULAR



CONFIGURED



ENGINEERED



24

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

THE ENGINES – NCC199CDV

- BEST Commercial Heat Exchanger Warranty in the Industry (10 years)
- BEST Commercial Efficiency Rating (0.98)
- Common Vent up to 12 Units
- System Control Capable up to 24 Units
- System btuh Range: 199K to 4.8Mil



 C O M M E R C I A L O N E

25

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

THE ENGINES – Hybrid Hot

- Combining the BEST Commercial Tankless with a 119 Gallon Storage Tank with Hydrastone Lining
- Faster hot water recovery and larger first hour rating because of larger pump and bypass
- Multi unit capability up to 6 units
- Direct replacement of Commercial Tank Water Heaters in most small commercial applications



 C O M M E R C I A L O N E

26

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

MODULAR SERIES: CMK – CRK Systems (Features & Benefits)



- Easy to Transport
- Sturdy Aluminum Frame
- Install in Less Than 2 Hours
- True Commercial Manifold
- Best Value in the Industry
- Retrofit Easy Button

(CMK = Commercial Manifold Kit / CRK = Commercial Rack Kit)



CRK-BASE + CMK-BB4 Shown, NCC199CDV Pro Units Sold Separately.

27

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

MODULAR SERIES: CMK – CRK Systems (Options)

3 Wall Hanging Bundle Kit – Options (Can be Parallel Connected)



CMK-SS2 (2 Units)

CMK-SS3 (3 Units)

CMK-SS4 (4 Units)

2 Floor Standing Bundle Kit – Options (Can Also be Parallel Connected)



CMK-BB2 (1 to 2 Units)

CMK-BB4 (2 to 4 Units)

CRK-BASE
(Rack for 1 – 4 Units)



CRK-ADDON
(For Expansion)



NCC199CDV Pro Units Sold Separately

28

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

CONFIGURED SERIES: CR Systems (Features & Benefits)



CR61-FS6 Shown, NCC199CDV Pro Units Included.

- Pre-fabricated and assembled racking system (with heaters) for use in flat rooftop or mechanical room applications
- Floor standing models have a lower center of gravity (shorter than TTS) for increased stability and easier transportation
- Pre-piped manifolds and condensate lines with pre-wired multi-system to reduce installation time
- Professionally crated for direct site shipment

(CR = Commercial Rack)



COMMERCIAL ONE



TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

Solutions Lineup

CONFIGURED SERIES: CR Systems (Options)



CR61-WH3 Shown, NCC199CDV Pro Units Included.

Wall Hanging

- CR61-WH2 (2 Units)
- CR61-WH3 (3 Units)

Floor Standing

- CR61-FS3 (3 Units)
- CR61-FS4 (4 Units)
- CR61-FS5 (5 Units)
- CR61-FS6 (6 Units)

CR61 Wheel Kit is designed to simplify logistics of moving Noritz Commercial Racks from the crate to the installation site.



COMMERCIAL ONE

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

TTS SYNERGY
SERIES

Solutions Lineup

ENGINEERED SERIES: TTS Systems (Features & Benefits)



TTS-S3 Shown, NCC199CDV Pro Units Included.

(TTS = Total Tankless Solution)

- Most UNMATCHED Complete Water Heater Solution in the Industry
- OPC (One Point of Connection)
 - Water, Power, Gas, Condensate, Recirculation, Storage
- Resulting in a significant reduction in labor hours, contributing to improved operational efficiency, resource optimization, and reduction in business closure hours
- Professionally engineered solutions with customized options through FIOPs (Factory Installed Options). All FIOPs are engineered and highly-modular.



C O M M E R C I A L O N E

31

TECHNOLOGY, PERFORMANCE, AND SYSTEM DESIGN

TTS SYNERGY
SERIES

Solutions Lineup

ENGINEERED SERIES: TTS Systems (Options)



SWH Series

All the features from other TTS Systems while utilizing a wall hung configuration

Range from 399,800 to 799,600 BTU



S Series

Floor standing configuration and boasts all features found on our TTS Systems

S & TWST Series: Range from 399,800 to 1,199,400 BTU



TWST Series

All the features found on our TTS Systems while also utilizing a storage tank



FIOP

Custom offerings that are tailored to the needs and demands of a business

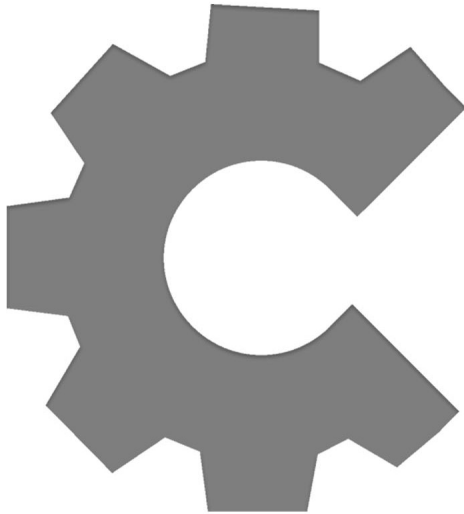
Range from 399,800 to 4.8 Mil BTU



C O M M E R C I A L O N E

32

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION



- Customer Pain Points
- Future View

33

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION

Customer Pain Points

High Energy Costs

Inefficient tank water heaters lead to high utility bills by consuming energy even during idle periods.



High Energy Costs



COMMERCIAL ONE

34

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION

Customer Pain Points

Frequent Downtime and Reliability Issues

- Tank failures and insufficient hot water cause operational disruptions and impact customer satisfaction.
- Frequent parts failures and high-cost repairs.



Frequent Downtime and Reliability Issues

 **COMMERCIAL ONE**

35

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION

Customer Pain Points

Space Constraints

Bulky tank systems occupy valuable floor space, limiting room in restaurants, hotels, and multifamily properties.



Space Constraints

 **COMMERCIAL ONE**

36

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION

Customer Pain Points

Temperature Inconsistency

Fluctuating hot water temperatures cause frustration, especially in healthcare and food service settings.



Temperature Inconsistency



37

CUSTOMER ENGAGEMENT AND VALUE IDENTIFICATION

Future View

Future Proofing and Scalability

Commercial customers evolve

- Tankless platforms allow staged expansion and easier retrofits compared to traditional systems
- Designing with growth in mind builds TRUST and often wins long term accounts

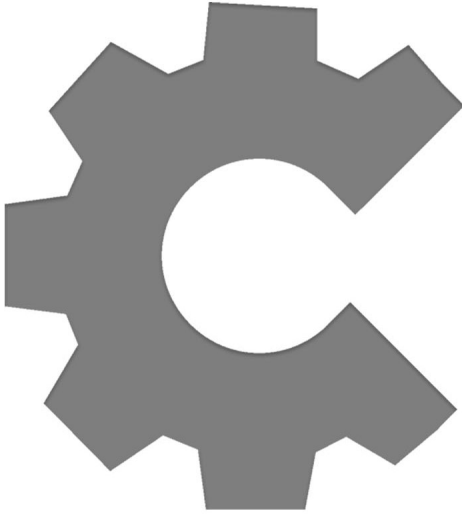


Future Proofing and Scalability



38

COMPETITIVE POSITIONING AND SALES STRATEGY



- Tank & Boiler vs. Tankless Comparison
- Application-Based Selling Strategy

39

COMPETITIVE POSITIONING AND SALES STRATEGY

Tank & Boiler vs. Tankless Comparison

Energy Efficiency

- Tankless systems heat water on demand, eliminating standby heat loss and lowering energy bills compared to traditional tanks.
- Tankless systems have a higher turndown ratio due to modulating gas valves and on-demand burners designed to adjust output precisely to real-time flow.
- Tanks & Boilers, by contrast, are built to heat and maintain large volumes of stored water, so their burners generally have less modulation range, leading to lower turndown capability and less efficiency at low-demand conditions.



Commercial Boiler



Noritz Solution

40

COMPETITIVE POSITIONING AND SALES STRATEGY

Tank & Boiler vs. Tankless Comparison

Thermal Cycling & Heat Stress

The high burner temperatures of commercial tank water heaters, combined with repeated thermal stress on the steel tank and insulating scale buildup that forces longer firing cycles, significantly shorten tank life, an effect that increases as hotter outlet water temperatures are required.



 COMMERCIAL ONE

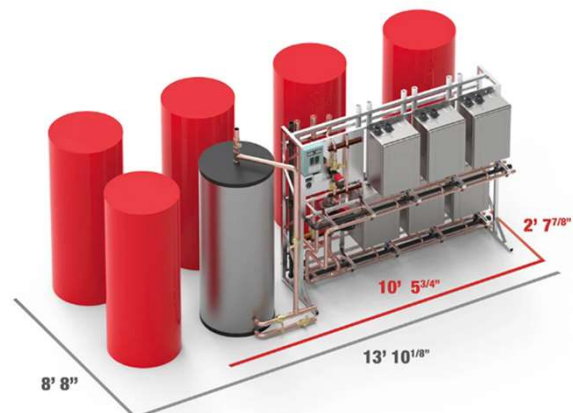
41

COMPETITIVE POSITIONING AND SALES STRATEGY

Tank & Boiler vs. Tankless Comparison

Space and Installation

Tank systems require large mechanical spaces, while tankless units offer compact designs that save floor space.



 COMMERCIAL ONE

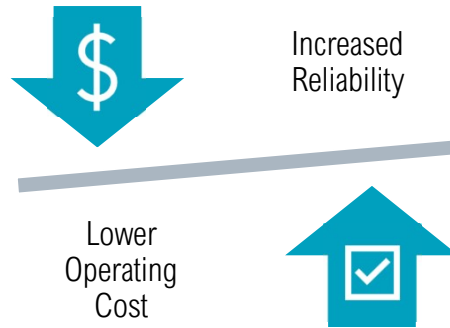
42

COMPETITIVE POSITIONING AND SALES STRATEGY

Tank & Boiler vs. Tankless Comparison

Operating Costs and Reliability

Tankless systems have lower lifetime costs due to higher efficiency, modular serviceability, and reduced risk of tank failure.



Help customers think beyond install price.

Reframe the conversation around **TOTAL COST OF OWNERSHIP**, not upfront equipment cost.



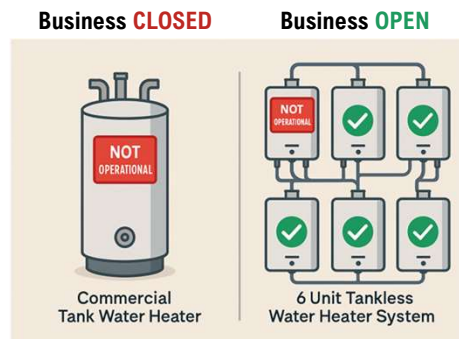
43

COMPETITIVE POSITIONING AND SALES STRATEGY

Tank & Boiler vs. Tankless Comparison

System Redundancy and Safety

Multiple tankless units provide built-in redundancy, reducing shutdown risks and enhancing safety over traditional tanks.



This is a massive **ADVANTAGE** in ALL commercial environments where downtime equals lost revenue, unhappy tenants, or stoppage of production.



44

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Start With DISCOVERY — Understand the Customer's Goals

Ask better questions before offering solutions:

- Are they expanding?
- Renovating?
- Adding equipment?
- Planning multi-year growth?



Designing with future demand in mind positions us as **EXPERT ADVISORS** and prevents undersized systems that limit future scalability.



45

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Avoid Like for Like Thinking — ENGINEER the Best Solution

- Existing systems are often incorrectly sized
- Replacement should **NOT** equal replication



Slow down, **EVALUATE** the entire hot water ecosystem, begin collecting key information to begin the sizing process to deliver a true solution instead of solving a short-term symptom.



46

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Design Around REAL Usage, Not Just Theoretical Load

- Understand how the building normally uses hot water.
- Many commercial sites have **short, intense peaks** rather than constant demand.
- In some cases, a smaller rack paired with storage may outperform a larger tankless only solution.



Build for **REAL WORLD** usage patterns.



47

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Water Quality Awareness

Never assume water conditions.

- Test and verify, hardness, chloramines, as municipal treatment changes can dramatically impact system longevity.
- If water pressure is an issue, booster pumps may be considered.



Educating the customer here positions us as professionals and **PROTECTS** both equipment life and brand reputation.



48

COMPETITIVE POSITIONING AND SALES STRATEGY

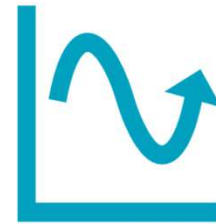
Application-Based Selling Strategy

Recirculation Strategy Matters

Understand if recirculation is controlled.

- Uncontrolled recirc loops can burn through lifecycle hours and erode warranty expectations.

Position **SMART** controls, proper pump strategies, and design considerations that protect long term system health.



49

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Maintenance Expectations (Critical in Commercial)

Set expectations early: commercial tankless systems require maintenance, often twice per year.

- Position this as a **STRENGTH**, not a weakness.
- Proactive maintenance ensures efficiency, longevity, warranty protection, and predictable operation.

Customers appreciate transparency when it's framed around **RELIABILITY** and lifecycle cost.



50

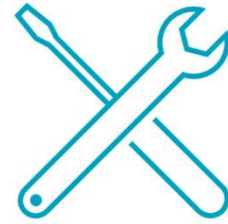
COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Serviceability and Accessibility

Rack systems designed for serviceability reduce labor costs and future downtime.

- Highlight ease of maintenance, component access, and standardized layouts.



Engineers and facility managers **APPRECIATE** deeply about this once they understand it.



51

COMPETITIVE POSITIONING AND SALES STRATEGY

Application-Based Selling Strategy

Commercial Professional Positioning

- Always aim to educate, not just sell
- Test assumptions, validate water quality, verify demand, and explain tradeoffs

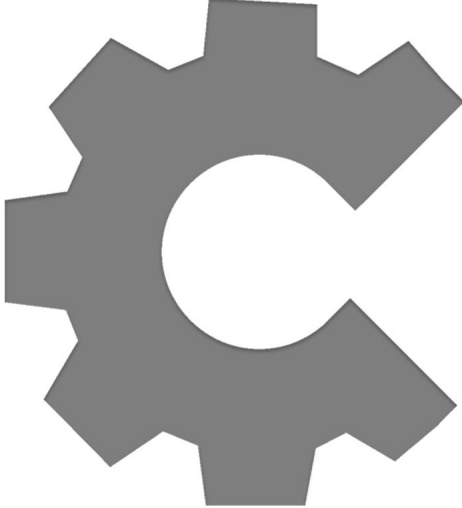



The goal is to be seen as the expert **GUIDING THE DECISION**, not the vendor pushing equipment.



52

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

- Sizing Inputs & Their Value
- Recommended Solution Offering

53

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Floors

What It Is

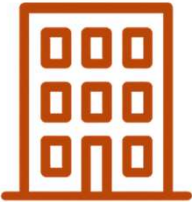
How many levels the hot water system must supply


Why It Matters

- Vertical height creates **static head pressure loss**.
- More floors often require **longer pipe runs**, increasing heat loss and impacting recirculation design.
- High rise buildings may require **multiple zones** or **split systems**.

Value

Ensures the system maintains consistent **pressure, temperature, and response time** across all levels, avoiding hot water delays or insufficient flow.




COMMERCIAL ONE

54

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Shower Heads



What It Is

Total showers used by guests, employees, residents, or gym patrons.



Why It Matters

- Showers represent one of the **highest GPM demands** in commercial applications.
- Peak-use periods (morning rush, gym turnover, shift changes) heavily influence **peak flow sizing**.



Value

Correctly modeling shower demand prevents **peak hour shortages**, ensuring systems deliver continuous hot water even during heavy usage.



C O M M E R C I A L O N E

55

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Sinks



What It Is

Includes handwashing stations in restrooms, kitchens, break rooms, classrooms, etc..



Why It Matters

- Individually low flow, but collectively significant in **high traffic environments**.
- Predictable, frequent use contributes to **baseline (continuous) demand**.



Value

Accurate sink counts **prevent undersizing** by accounting for the “always-on” background demand that supports hygiene and operation.



C O M M E R C I A L O N E

56

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Dishwashers

What It Is


Commercial warewashing equipment in restaurants, cafeterias, hospitality, etc.


Why It Matters

- Dishwashers require **high-temperature, high-volume bursts.**
- Booster heaters depend on consistent inlet temperature — tankless must sustain this.
- Cycle-based operation creates **intermittent but intense GPM and BTU loads.**

Value

Properly sized tankless systems ensure **sanitation compliance**, reduce recovery delays, and prevent equipment downtime in food service settings.




COMMERCIAL ONE

57

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Washing Machines

What It Is


Laundry equipment in hotels, multifamily, spas, gyms, and hospitals.


Why It Matters

- Washers draw large volumes of hot water during **fill cycles.**
- Multiple machines running simultaneously can create **peak stacking.**
- Hot cycles significantly increase total daily consumption.

Value

Ensures **stable operation** during heavy laundry turnover, prevents slow recovery, and reduces energy waste by matching tankless output to real usage.




COMMERCIAL ONE

58

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Public Lavatories

What It Is


Restrooms open to the public in lobbies, event spaces, retail, dining, etc.


Why It Matters

- High variability and **peak traffic spikes** (events, lunch hours).
- Multi sink stations create cumulative demand that influences recirculation design.

Value

Ensures fast delivery of hot water for guests and compliance with sanitation expectations, **improving the customer experience.**




COMMERCIAL ONE

59

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Number of Water Fixtures (Overall Fixture Count)

What It Is


A total count of all hot-water-consuming outlets in the building.


Why It Matters

- Fixture count is a fundamental basis for **total building load**, per industry sizing standards.
- Helps calculate **simultaneous usage probability**, which informs the true GPM capacity required.
- Critical for cascading and system redundancy planning.

Value

Allows **precise system right sizing** - not too small (risk of shortages), not too large (wasted capital and operational cost).











COMMERCIAL ONE

60

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

How These Inputs Work Together

Each individual sizing need contributes to a bigger picture:

Fixtures determine total peak GPM


Building layout impacts temperature maintenance & recirculation needs

Equipment loads (dishwashers, washers) dictate BTU demand

Simultaneous usage drives cascading system design

Environmental and operational needs dictate redundancy

Collectively, these inputs allow you to design a **high-performance, energy-efficient, precise commercial tankless solution** tailored to the building's actual behavior — not guesswork.



61

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:
12-Story Business Hotel with Gym + Banquet

Building Type:

- Full-service hotel

Floors:

- 12 (guest floors 2–12; lobby + kitchen + banquet on 1)

Occupancy:

- 220 rooms

Amenities:

- Lobby restrooms, fitness center, banquet kitchen, laundry

Target delivery temperature (mixed at point of use): 120 °F

Incoming water temperature (winter design):

- 50 °F - ΔT for sizing: 90 °F (140 – 50)

Recirculation:

- Yes, multi-zone risers





62

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet

1) Number of Building Floors

Input: 12 floors

Why it matters (applied):

- The vertical rise (~120–140 ft from plant to top fixtures) imposes static head and requires boosted recirculation for top-floor response times.

Design impact:

- Split the system into two primary riser zones with dedicated balancing valves and recirc pumps sized for each loop. This also enables staged heating plant operation.

Value realized:

- Consistent temperature and response across floors, reduced “cold first-minute” complaints, and better pump energy control.



63

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet

2) Number of Shower Heads

Input: 260 shower heads (approx. 1.2 per key across singles/doubles + 4 for gym + 6 for staff locker rooms)

Peak modeling assumptions:

- Fixture flow rate: 1.8 GPM per shower head (modern commercial low-flow)
- 250 Private Showers & 10 Public Showers (Probability of simultaneous use higher with Public Showers)

Design impact:

- Shower demand dominates peak flow; system must support this load concurrently with baseline fixtures and intermittent spikes from high occupancy.

Value realized:

- Prevents peak-hour shortages, protects guest experience.



64

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet

3) Number of Sinks

Input:

Guestroom lavatories: 220 / Public lavatories (lobby, banquet foyer, fitness): 34

Kitchen hand sinks + prep: 10 : **Total sinks: 264**

Peak modeling assumptions:

- Public Lav & Private Lav - Flow Rate: 0.5 GPM (Probability of simultaneous use higher with Public Lav's)
- Kitchen Hand Sinks, Prep Sinks (Flow Rate: 2.0 GPM - 5.0 GPM)
- Important to list out every type of fixture in commercial kitchen as GPM varies per fixtures type.

Design impact:

- Sinks contribute to baseline, predictable demand; must be layered into peak modeling to avoid undersizing.

Value realized:

- Right-sizing avoids "mystery" shortages caused by background draws.



65

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet

4) Number of Dishwashers

Input:

1 high-temp flight-type dishwasher (banquet/BOH) / 2 undercounter units (bar & pantry)

Why it Matters:

- Flight-type: 2.5–7.5GPM during operation 140–160 °F inlet target; cycles continuously during events.
- Undercounter: 0.6–3.0 GPM intermittent cycles of 60–120 sec with recovery.
- **Dishwasher model numbers crucial to accurately determine peak flowrate and necessary temperature requirements.**

Design impact:

- Dish machines are temperature-sensitive and need a certain flowrate to operate properly.

Value realized:

- Sanitation compliance and consistent service throughput.



66

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet **5) Number of Washing Machines**

Input:

8 (hotel OPL: 4 × 60 lbs., 4 × 40 lbs.)

Why It Matters:

- Draw per active machine: 2.0–3.0 GPM during fill spikes
- **Crucial to record model numbers or washer capacity in lbs. to ensure proper demand is satisfied.**

Design impact:

- Laundry creates short, intense bursts that overlap with showers (morning strip) and dish (breakfast/banquet).

Value realized:

- Avoids slow recovery, keeps housekeeping schedules intact.



67

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Sizing Inputs & Their Value

Scenario Snapshot:

12-Story Business Hotel with Gym + Banquet **7) Number of Water Fixtures (Overall Fixture Count)**

Input:

Showers: 260

Lavatories (guest + public + staff): 264

Kitchen/Prep/Dish: 13 total fixtures

Laundry: 8 machines

Fitness/Locker: already included above (showers/sinks)

Total fixtures for probability modeling: 662

Why it matters:

- Overall count supports simultaneity probability and cascaded system planning.
- Used to confirm Peak GPM modeling, ensure redundancy, and handle maintenance without service disruption.

ASHRAE Modified Hunter Curve - Fixture Units

Hotel - Motel		Restaurant**	
Type of Fixture	Fix. Units	Type of Fixture	Fix. Units
Private Lavatory	.75	Private Lavatory	.70
Public Lavatory	1.0	Public Lavatory	2.0
†Private Shower	1.5	†Private Shower	1.5
†Tub and Shower	1.5	†Public Shower	1.7
Basin - Barber	2.0	Sink - Kitchen	3.0
Sink - Slop	2.5	Sink - Pantry	2.5
Basin - Beauty Parlor	2.5	Sink - Slop	2.0
		Sink - Pot (Single)	2.5
		Sink - Pot (Double)	3.5
		Sink - Pot (Triple)	5.5
		Sink - Vegetable	2.0
		Sink - Bar	2.5
		Washer - Silver	2.0*
		Washer - Glass	2.0*
		Washer - Can	3.0
		Coffee Urn	1.2
		Bain Marie	1.0
		Pot and Pan Washer	2.0*
		Dish Pre-Rinse	2.5
		Pre-Scraper	2.0
		Pre-Scraper Conveyor	2.5
		36" Half Bradley	1.0
		36" Full Bradley	1.5

68

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Scenario Snapshot: 12-Story Business Hotel with Gym + Banquet

Sizing Inputs & Their Value

Pulling It Together — Peak GPM, GPH & BTU/h Load

FIXTURE TYPE	QUANTITY	FIXTURE UNITS	SUB-TOTAL FIXTURE UNITS	GPH	TOTAL GPH
Shower/Tub	250	1.50	375.00	45	11250
Public Shower	10	3.00	30.00	150	1500
Private Lav	220	0.75	165.00	2	440
Public Lav	34	1.00	34.00	5	170
Clothes Washer (40 lb)	4	2.94	11.76	80	320
Com. Clothes Washer (60lb)	4	4.41	17.65	120	480
Hand Sink	5	1.50	7.50	20	100
1-Comp Sink	5	2.50	12.50	30	150
Glass Washer	2	2.00	4.00	45	90
Dishwasher	1	4.20	4.20	120	120
TOTAL FIXTURE UNITS			661.61	TOTAL LOAD (GPH)	14620
PEAK LOAD (GPM)			83.6	PEAK LOAD (GPH)	3655

TANKLESS AND STORAGE

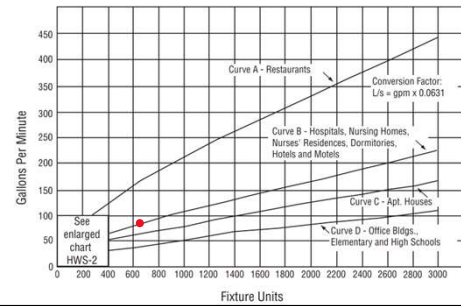
Demand Factor x Total GPH = $0.25 \times 14,620 = 3,655 \text{ GPH}$

Btu/h (HEAT LOAD) T & S = GPH x p x Cp x Delta T / eff
 $3655 \times 8.31 \times 1 \times (140-50) / .98 = 2,789,362 \text{ Btu/h}$

Btu/h (HEAT LOAD) TANKLESS = GPM x 60 (min/ hr.) x p x Cp x Delta T / eff
 $83.6 \times 60 \times 8.31 \times 1 \times (140 - 50) / .98 = 3,828,026 \text{ Btu/h}$

- p = density of water (8.31 LBm / gal)**
- Cp = Specific Heat [1 Btu/ (LBm x deg F)]**
- Delta T = Temp Rise (Tout - Tin)**

TANKLESS ONLY



69

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Scenario Snapshot: 12-Story Business Hotel with Gym + Banquet

Sizing Inputs & Their Value

Pulling It Together — Total Units

- ❖ Choice of equipment design does take retrofit into account; however, application alone is the main deciding factor. **Add +1 or +2 to system design for redundancy, and serviceability.**
- ❖ Recommendations are typically made on a **case-by-case basis**, with the specific application being one of the most critical factors.
- ❖ By understanding the types of fixtures commonly used in different applications, one can more accurately anticipate the appropriate system design direction.

Options	Model	Qty of Racks	Qty of Heaters	Qty of Storage Tanks (175 gal.)	Max Input (btu/hr.)	Max Total Flowrate (GPM)	Total Recovery (GPH)	1 st Hour Delivery (gal.)
1 – Tankless Only	TTS-S20	4	20	-	3,998,000	87.1	5,226	-
2 – Tankless with Storage	TTS-TWST16	4	16	2	3,198,400	69.7	4,179	4,424



70

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Scenario Snapshot: 12-Story Business Hotel with Gym + Banquet

Sizing Inputs & Their Value

What Each Input Enabled (Value Recap)

Floors:	Informed zoning and recirculation strategy → consistent top-floor performance.
Shower heads:	Defined the dominant peak GPM load.
Sinks:	Captured baseline/background demand → avoided hidden undersizing.
Dishwashers:	Ensured temperature stability for sanitation during cycles.
Washing machines:	Accounted for stacked bursts during hotel turnover.
Public lavatories:	Drove fast-delivery recirc near event spaces.
Total fixture count:	Supported probability modeling, cascade sizing, and N+1 redundancy.



71

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

Commercial Application Recommendation Scope Based on Sizing Inputs & System Type

- Each series - **Modular, Configured, and Engineered** - fits different levels of complexity, installation constraints, and operational demands.
- The sizing inputs (floors, fixtures, equipment loads, etc.) determine when each solution provides the best outcome.

MODULAR



CONFIGURED



ENGINEERED



72

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

1. MODULAR SERIES (CMK / CRK Systems)

❖ Best for SIMPLE to MID-RANGE Projects

Ideal When the Sizing Inputs Show:

- Ideal for emergency installs
- Low to moderate fixture count
- Light-to-normal peak demand
- Retrofit where existing tanks or small quantity of tankless banks are being replaced
- Limited mechanical room or rooftop access



Why This Series Works:

The Modular Series is designed for fast deployment, easy transport, and simple scalability.



73

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

1. MODULAR SERIES (CMK / CRK Systems)

❖ Best for SIMPLE to MID-RANGE Projects

Sizing Input Insight	Why Modular Works
Retrofit situations	“Retrofit Easy Button” + fast install under 2 hours
Limited site access (hallways, elevators)	Lightweight aluminum frame & modular components
Budget-sensitive customers	“Best Value in the Industry”



Recommended For:

- Small hotels / motels
- Quick-service restaurants
- Light commercial retail
- Small gyms
- Single-story schools or offices



74

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

2. CONFIGURED SERIES (CR Systems)

❖ Best for MID-RANGE to HIGHER DEMAND Projects

Ideal When the Sizing Inputs Show:

- Moderate to high fixture counts
- Multiple showers, laundry stations, or restaurant dishwashers 2-6 floors
- Need for rooftop installation or tight mechanical rooms
- Predictable or heavy peak usage (hospitality, multifamily, gyms)

Why This Series Works:

Configured Systems provide factory-assembled, pre-piped, pre-wired racking that significantly reduces install time while supporting stronger water heating demand.



75

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

2. CONFIGURED SERIES (CR Systems)

❖ Best for MID-RANGE to HIGHER DEMAND Projects

Sizing Input Insight	Why Configured Works
Rooftop or mechanical room constraints	Low center of gravity → easier and safer placement
Busy facilities needing fast changeover	Pre-wired multi-systems reduce install time
Requires direct site shipment	Systems arrive professionally crated



Recommended For:
 Mid-size hotels
 Multifamily properties
 Full-service restaurants
 Fitness centers
 Schools / dormitories



76

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

3. ENGINEERED SERIES (TTS Systems)

❖ Best for Complex, High-demand, or Customized projects

Ideal When the Sizing Inputs Show:

- High-rise buildings
- Large fixture counts (continuous use expectations)
- Multiple dishwashers + large laundry operations
- Complex recirculation loops & storage needs
- Long pipe runs with high-temperature maintenance requirements
- Need for full turnkey design
- Critical operations (downtime not acceptable)

Why This Series Works:

The Engineered Series is essentially a fully designed commercial plant room on a skid, delivering unmatched ease, capacity, and customization.



77

SIZING REQUIREMENTS & APPLICATION RECOMMENDATION

Recommended Solution Offering

3. ENGINEERED SERIES (TTS Systems)

❖ Best for Complex, High-demand, or Customized projects

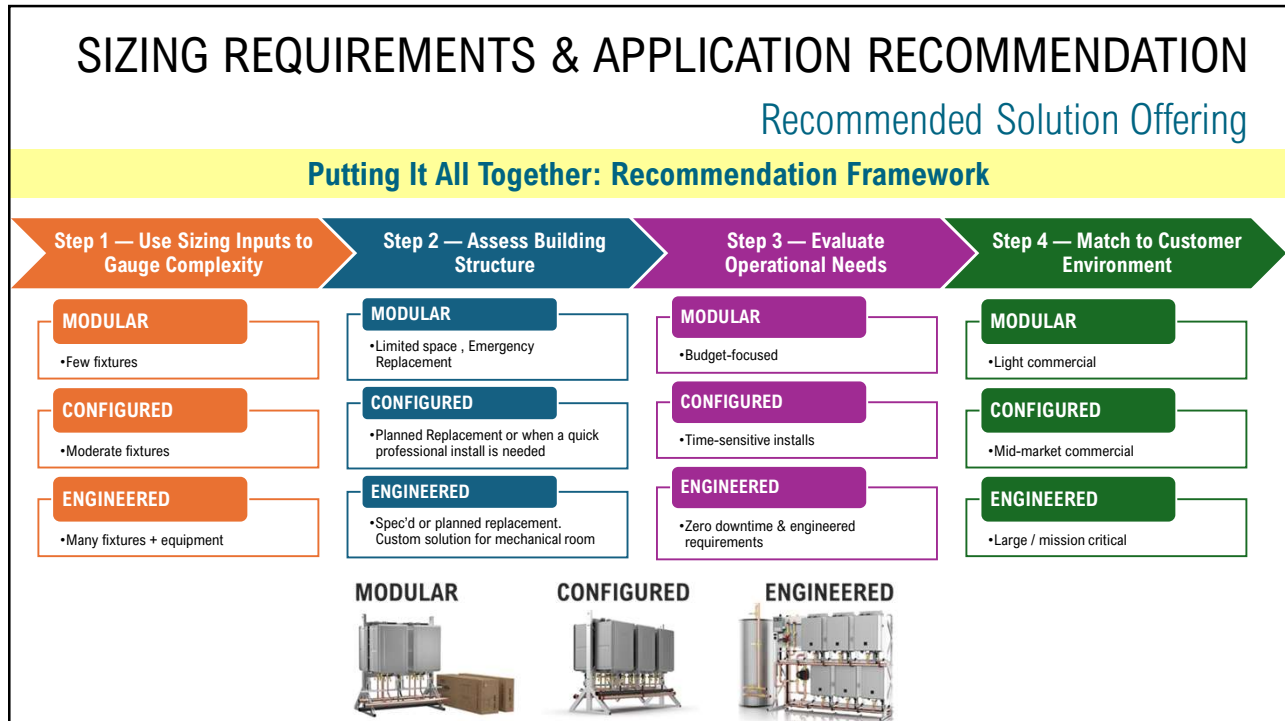
Sizing Input Insight	Why Configured Works
High critical load (big GPM + high BTU)	OPC (One Point of Connection) simplifies massive systems
Many floors / long runs	Included recirculation & storage options solve temperature maintenance
Complex equipment loads	Custom FIOPs allow electrical, gas, storage, and control tailoring
Need for lowest downtime	Turnkey design reduces install hours & operational disruption
Hospitals, hotels, stadiums	Full engineering ensures compliance and peak performance



Recommended For:

- Hospitals & medical centers
- Large hotels & resorts
- Large multifamily high-rises
- Universities
- Industrial facilities
- Stadiums, airports, convention centers

78




79



80

KEY TAKEAWAYS



Introduction to Commercial Water Heating


- Critical Role in Industries
- Shift from Tank & Boiler to Tankless
- Energy Efficiency and Sustainability
- Sales Strategy and Customer Value

What Is a Commercial Gas Tankless System?

- On-Demand Hot Water Heating
- Advanced Combustion Control
- Modular Scalability and Redundancy
- Compact Design and Reliability

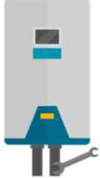
Commercial Tankless Use Cases

- Restaurants and Food Service
- Hotels, Hospitality, & Multi-Family
- Healthcare Facilities
- Educational Institutions & Dormitories



81

KEY TAKEAWAYS




Key Product Features

- High Thermal Efficiency
- Wide Modulation Range
- Built-in Redundancy
- Venting and Durability Features


Solutions Lineup

- Engines
 - NCC199CDV
 - Hybrid Hot
- Series
 - Modular – CMK / CRK
 - Configured - CR
 - Engineered - TTS



82

KEY TAKEAWAYS



Customer Pain Points


}

- High Energy Costs
- Frequent Downtime and Reliability Issues
- Temperature Inconsistency

Future View


}

- Future Proofing and Scalability



83

KEY TAKEAWAYS



Tank & Boiler vs. Tankless Comparison


}

- Energy Efficiency
- Thermal Cycling & Heat Stress
- Space and Installation
- Operating Costs and Reliability
- System Redundancy and Safety

Application-Based Selling Strategy

}

- Start With DISCOVERY — Understand the Customer's Goals
- Avoid Like for Like Thinking — ENGINEER the Best Solution
- Design Around REAL Usage, Not Just Theoretical Load
- Water Quality Awareness
- Recirculation Strategy Matters
- Maintenance Expectations (Critical in Commercial)
- Serviceability and Accessibility
- Commercial Professional Positioning



84

KEY TAKEAWAYS



Sizing Inputs &
Their Value

- What It Is
- Why It Matters
- Value
 - Number of Floors
 - Number of Shower Heads
 - Number of Sinks
 - Number of Dishwashers
 - Number of Washing Machines
 - Number of Public Lavatories
 - Number of Water Fixtures (Overall Fixture Count)
- Scenario Snapshot:
 - 12-Story Business Hotel with Gym + Banquet



C O M M E R C I A L O N E

85

KEY TAKEAWAYS



Recommended
Solution Offering

- Commercial Application Recommendation Scope Based on Sizing Inputs & System Type
 1. MODULAR SERIES (CMK / CRK Systems)
 2. CONFIGURED SERIES (CR Systems)
 3. ENGINEERED SERIES (TTS Systems)
- Putting It All Together: Recommendation Framework



C O M M E R C I A L O N E

86

QUESTIONS?



COMMERCIAL
ONE

SALES TRAINING

87