Humidifier Product Catalogue

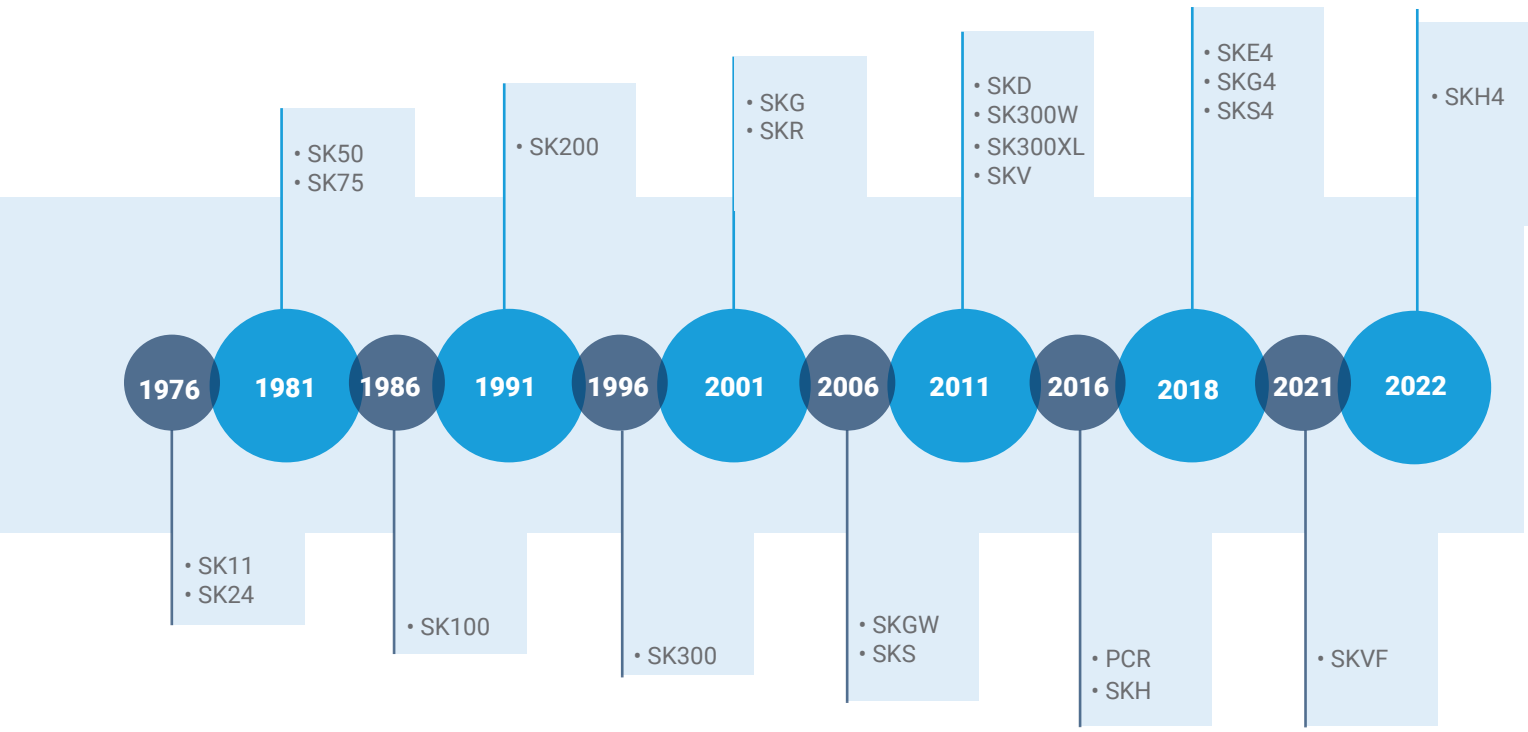
neptronic®

Overview

Since 1976, Neptronic has been committed to advancing our products by utilizing all that technology has to offer. Our commitment to quality is the foundation of every stage in our process. We build from the ground up, beginning with a thorough exploration of the most current ideas, and deliver a product that's engineered to perform. Neptronic's focus on integration across the board means that we can deliver a system suited to your exact needs.

The importance of humidification in our daily lives cannot be understated. Humidification is an essential component in maintaining ideal climate conditions for a variety of applications: the production of sensitive electronics that require environments completely free of dust and particulates; careful control of sterile conditions in a hospital's surgical suites; preservation of priceless manuscripts and artworks in museums, or your personal comfort at home and in the office. Neptronic's complete humidifier series with integrated controllers equipped with BACnet or Modbus will fulfill whatever your situation requires.

Demand the best. We do.



Humidifier Product Line

SKE4

Electric

- Capacities from 6 - 300 lb/hr
- Remove chamber easily, without tools
- Outdoor unit available

SKG4

Gas Fired

- Capacities from 110 - 810 lb/hr
- Modular design
- Outdoor unit available

SKS4

Steam to Steam

- Capacities from 17 - 1250 lb/hr
- Scale management system for easy maintenance
- Insulated external panels

SKVF

Evaporative Cooler

- Airflow up to 6000 CFM
- ECM fan with variable output
- Compact, quiet and standalone

SKR

Residential

- Capacities from 4.5 - 12 lb/hr
- Permanent cleanable chamber
- Reliable siphon drain

SKH4

High Pressure Atomizer

- Capacities up to 3000lb/hr
- Up to 4 zones
- Installation in-duct or in-space

SKV

Evaporative

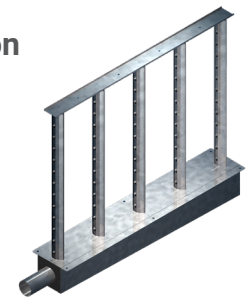
- Free cooling up to 22°F (12°C)
- Custom design to fit your application
- Hygienic operation with silver ion dosing system

SKD

Direct Steam

- Capacities from 5 - 1650 lb/hr
- Jacketed or Multi-Steam™ SD/HD
- Unique electronic steam controller
- Optional pressurized condensate return (PCR) system

Distribution



Steam Distribution

- Multi-Steam™ SD/HD distribution
- S.A.M. & S.A.M.E2 wands
- SDU (Space distribution unit)

SKE4 electric

RESISTIVE ELECTRIC STEAM HUMIDIFIER

The resistive heating elements of the SKE4 convert electrical energy to heat energy that is then transmitted to the surrounding water, raising the temperature to its boiling point, creating steam. The process allows mineral-free, odorless, sterile steam to be generated quickly with any water condition.

SKE4 Advantages

- Capacities from 6-300 lb/hr (2.7-136 kg/hr)
- Separate plumbing, controls, and high-voltage sections
- Remove the stainless steel evaporation chamber with ease
- Patent-pending water level detection system using 2 sensor technologies
- Drain water tempered to below 140ºF (60ºC)
- Patented Anti-Foaming Energy Conservation (AFEC) System
- Available with BACnet MS/TP or Modbus communication interface
- Optional ethernet module for BACnet IP or Modbus IP, and Web services
- Independent scheduling system for unit operation and drain cycle

System Overview

Patent-Pending Water Level Detection System

- Self-cleaning and self-calibrating sensors
- Utilizes 2 different sensor technologies
- Precise and reliable water level detection
- Anti-Foaming Energy Conservation (AFEC) System: drains water when foam is detected

***All Silicone Piping**

- No copper piping
- Resistant to higher water temperatures
- Suitable for all water types including DI and RO (Consult factory for Ultrapure water)

** Alternate piping available*

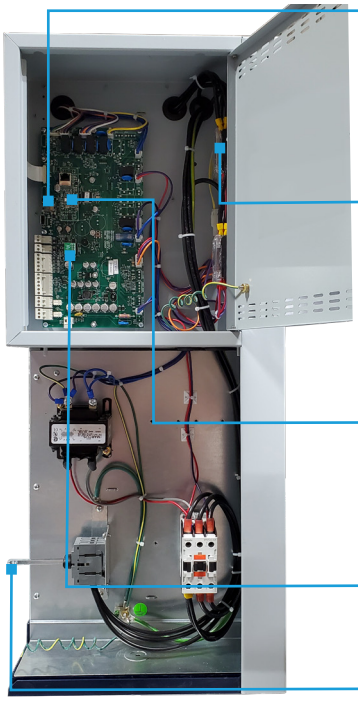
Manual Drain

- Functions even without power

Power drain pump

Quick Connect Water Inlet

- No tools required



SD Card

- Event history log
- Firmware upgrade

SSR with External Heat Sink

- No cooling fan required
- Reduces noise level

Ethernet Module (optional)

- BACnet IP or Modbus IP
- Local and remote web services

BACnet MS/TP and Modbus Module (optional)

Disconnect switch

Specifications

Fast and Easy Maintenance

No tools required

No heavy lifting required

Advanced controller with multiple connectivity options (see page 7)

Heating elements remain fixed within the enclosure

- No need to disconnect power cables
- No added weight from the elements when removing the evaporation chamber

Drop-down design limits lifting and simplifies handling

Evaporation chamber rests securely for easy maintenance

In-Duct Distribution

For Multi-Steam™ SD/HD and SAM in-duct distribution systems, refer to page 17.

SDU (Space Distribution Unit)

- Quiet operation
- No condensation
- Local or remote in-room steam distribution
- 3 models available (SDU4-1, SDU4-2, and SDU4-3)

For Models SKE4-N02 to SKE4-N30

Outdoor unit

- Fully insulated and constructed from heavy-duty steel
- Stainless steel bottom drip pan
- Zinc primer and polyurethane powder coating for resistance against scratches and corrosion on the exterior and interior surfaces
- Built-in anti-freeze and overheat protection
- Easy installation on a roof curb, stand or slab
- Connection can be made from side or bottom of unit for flexibility in any configuration

Output and Consumption

Model	Steam	Consumption									Steam Output		
	Capacity lb/hr [kg/hr]	Power (kW)	Amperage								Qty	Diameter inches [mm]	Space Distribution Unit (SDU)
			120/1	240/1	208/1	208/3	480/1	480/3	600/1	600/3			
SKE4-N02	6 [2.7]	2	17	8.5	10	-	4.5	-	3.5	-	1	1 3/8 [35]	SDU4-1
SKE4-N04	12 [5.5]	4	-	17	19	11.5	8.5	5	7	4	1	1 3/8 [35]	SDU4-1
SKE4-N06	18 [8]	6	-	26	30	16.5	13	7.2	10.5	6	1	1 3/8 [35]	SDU4-1
SKE4-N10	30 [14]	10	-	-	-	28	-	12	-	10	1	1 3/8 [35]	SDU4-2
SKE4-N14	40 [19]	13.5	-	-	-	38	-	16.5	-	13.5	1	1 3/8 [35]	SDU4-2
SKE4-N16	48 [21.8]	16	-	-	-	45	-	-	-	16	1	2 [51]	SDU4-3
SKE4-N20	60 [28]	20	-	-	-	-	-	25	-	20	1	2 [51]	SDU4-3
SKE4-N30	90 [41]	30	-	-	-	-	-	36	-	30	1	2 [51]	SDU4-3
SKE4-N20 L	60 [28]	20	-	-	-	56	-	-	-	-	1	3 [76]	-
SKE4-N40	120 [56]	40	-	-	-	-	-	50	-	40	1	3 [76]	-
SKE4-N50	150 [68]	50	-	-	-	-	-	60	-	50	1	3 [76]	-
SKE4-N60	180 [82]	60	-	-	-	-	-	72	-	60	1	3 [76]	-
SKE4-N30X	90 [41]	30	-	-	-	83.4	-	-	-	-	1	3 [76]	-
SKE4-N40X	120 [56]	40	-	-	-	111	-	-	-	-	1	3 [76]	-
SKE4-N70	210 [95]	70	-	-	-	-	-	84	-	70	1	3 [76]	-
SKE4-N80	240 [108]	80	-	-	-	-	-	96	-	81	2	3 [76]	-
SKE4-N90	270 [122]	90	-	-	-	-	-	109	-	91	2	3 [76]	-
SKE4-N100	300 [136]	100	-	-	-	-	-	120	-	96	2	3 [76]	-

SKE4-N02
SKE4-N04
SKE4-N06

SKE4-N10 SKE4-N20
SKE4-N14 SKE4-N30
SKE4-N16

SKE4-N20L SKE4-N50
SKE4-N40 SKE4-N60

SKE4-N30X SKE4-N80
SKE4-N40X SKE4-N90
SKE4-N70 SKE4-N100

Integrated, Multi-Platform Controller

The SK Controller is configured specifically for your SKE4, SKG4, SKS4, or SKVF unit.

- User-friendly interface consisting of a menu driven 128 x 64 LCD with 8 function buttons for faster configuration and operation
- User rights management allows for menu to display only functions available to the category of user logged in
- Quick Config menu allows for faster and easier installation, by displaying only the most commonly used functions and configurations
- Independent scheduling system for unit operation and drain cycle, configurable via the menu or the BACnet communication interface
- In-field firmware upgradeable via SD card, USB or BACnet
- Simple viewing and exporting of trending log and alarm log

One controller, one menu across humidifier types provides consistency and ease of use.

SKE4
ELECTRIC

SKG4
GAS FIRED

SKS4
STEAM TO STEAM

SKH4
ATOMIZING HIGH PRESSURE

Optional Features:

- The selectable BACnet MS/TP or Modbus communication interface allows access to over 75 objects/registers for integration with a BMS and IoT (Internet of Things)
- Ethernet Module
  - o BACnet IP or Modbus IP
  - o Web services make it possible to perform humidifier configurations, remote diagnostics and many more functions from any location

BACnet

Modbus

LonMark International

RESIDENTIAL HUMIDIFIER

Humidifying your home with a Neptronic SKR residential steam humidifier protects you from winter ailments. It reduces dry skin, sinus problems and scratchy throats by creating a healthier, more comfortable living environment. Proper humidity levels also protect valuables from permanent damage.

SKR Advantages

- Steam capacity from 4.5 to 12 lbs/hr (2 to 5.4 kg/hr)
- Permanent cleanable stainless steel evaporation chamber
- Patented siphon drain requires no drain valve or external tap
- Environment friendly – no plastic cylinders to replace
- On/Off operation, modulation optional
- Drain water tempered to below 140°F (60°C)
- Self-cleaning heating elements

System Overview

Intelligent Controller
- Manages control sequences and performs self diagnostics
- On/Off or modulating control functions
- LED status display

Evaporation Chamber
Permanent, easily serviceable, stainless steel chamber. No need to replace expensive plastic bottles.

Heating Element
Self-cleaning, electric heater elements.

Internal Plumbing Assembly

High Voltage Quick Connect
Safe, fast and easy connection and reconnection of line voltage.

Water Level Sensors
Conductive water level sensors for normal operation level and drain level.

Patented Siphon Drain
Eliminates the use of a physical device such as a drain valve or external P trap to drain water.

Water Fill Valve

Specifications

Output and Consumption

Model	Capacity	Power (kW)	Amperage			Width	Height	Depth	Height with SDU
			120V	208V	240V				
SKR14	4.5 lb/hr 2.0 kg/hr	1.4	12A	-	-	10.5” 267mm	14.5” 368mm	9” 229mm	19.75” 500mm
SKR25	7.5 lb/hr 3.4 kg/hr	2.5	-	12A	11A	10.5” 267mm	14.5” 368mm	9” 229mm	19.75” 500mm
SKR30	9 lb/hr 4.1 kg/hr	3	-	14.5A	13A	10.5” 267mm	14.5” 368mm	9” 229mm	19.75” 500mm
SKR40	12 lb/hr 5.4 kg/hr	4	-	19.2A	17A	10.5” 267mm	14.5” 368mm	9” 229mm	19.75” 500mm

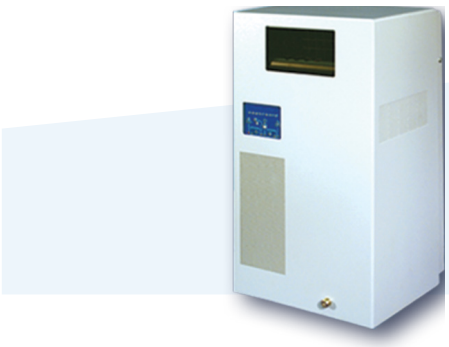
Note: Operation with maximum 0.5” (125Pa) duct static pressure at steam distribution manifold location.

In-duct distribution

For a duct distribution installation, the SKR requires a SAM Steam Distribution System (see page 17).

Integrated SDU (Space Distribution Unit)

This option is typically used in small stores, small warehouses and laboratories where the visibility of the unit is not an issue.



Remote SDU (Space Distribution Unit)

Ideal for condos/apartments without a duct network, the remote SDU is designed for through-the-wall installation to provide humidification directly into the room.

Features

- Distribution unit is installed through a wall partition
- SKR humidifier is installed in a closet or other closed location
- Modern design of SDU front grill blends into any decor
- Low noise (less than 40dBa at 1m)
- Standard, 120Vac power supply

SKG4 gas fired

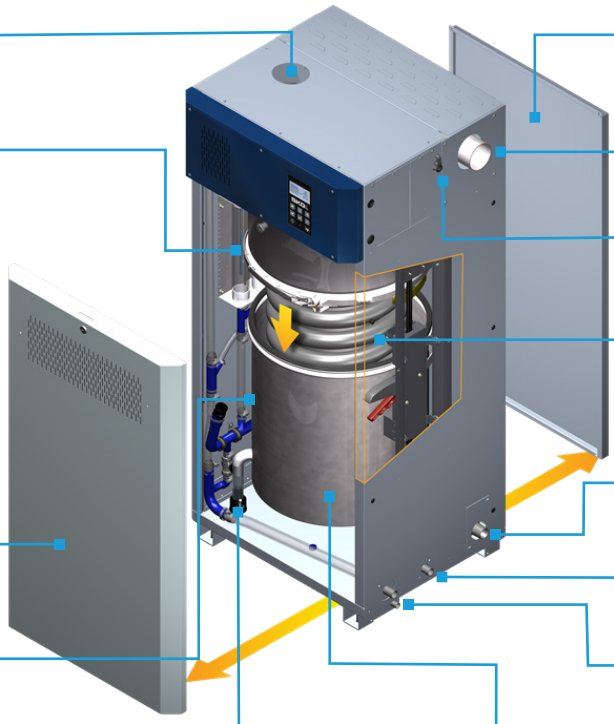
GAS FIRED HUMIDIFIER

The SKG4 gas fired humidifier generates mineral free, odorless, sterile steam by using the power of natural gas or propane. Cost of operation and its carbon footprint is much lower than electric humidifiers with equivalent control accuracy.

SKG4 Advantages

- Steam capacity from 110 to 810 lbs/hr (50 to 370 kg/hr)
- Maximum turndown of 16:1
- Functions with Tap, RO or DI water
- Combustion efficiency: 83% to 87%
- For Multi-Steam and SAM in-duct distribution systems, refer to page 17
- Easy servicing: clean and re-install within minutes
- Smallest footprint in the industry
- Patented Anti-Foaming Energy Conservation (AFEC) System
- Advanced controller with multiple connectivity options (see page 7)
- Waste water drained below 140°F (60°C)
- Self-adjusting burner for altitude compensation

System Overview



Steam Outlet

Patent-Pending Water Level Detection System
- Self-cleaning and self-calibrating sensors
- Utilizes 2 different sensor technologies
- Precise and reliable water level detection
- Anti-Foaming Energy Conservation (AFEC) System: drains water when foam is detected

Large, lockable, removable doors

Water supply valve and drain pump

Vent, gas, water and drain connections can be located on either side

Back door access

***Vent connection**

Electrical power connection

316SS Combustion chamber and heat exchanger

***Gas supply**

***Water supply**

***Drain**

Quick connect water outlet

316SS Evaporation chamber (shown in "DOWN" position)

Specifications

Output and Consumption

Model	No. of Modules	Steam Capacity (lb/hr) [kg/hr]	Input Capacity (btu/hr) [kW]	Current at 120Vac (A)	Current at 208Vac (A)	Current at 240Vac (A)	No. of Outlets	Multi-Steam header diam. in [mm]
SKG4-N1101 N/P	1	110 [50]	165,000 [49]	6.0	3.5	3.0	1	3" [76]
SKG4-N1551 N/P	1	155 [70]	215,000 [63]	6.0	3.5	3.0	1	3" [76]
SKG4-N1801 N/P	1	180 [80]	240,000 [70]	6.0	3.5	3.0	1	3" [76]
SKG4-N2101 N/P	1	210 [95]	249,000 [73]	6.0	3.5	3.0	1	3" [76]
SKG4-N2652 N/P	2	265 [120]	380,000 [112]	9.0	5.2	4.5	2	4" [100]
SKG4-N3102 N/P	2	310 [140]	430,000 [126]	9.0	5.2	4.5	2	4" [100]
SKG4-N3502 N/P	2	350 [160]	464,000 [136]	9.0	5.2	4.5	2	4" [100]
SKG4-N4052 N/P	2	405 [185]	498,000 [146]	9.0	5.2	4.5	2	4" [100]
SKG4-N5053 N/P	3	505 [230]	704,000 [206]	12.0	7.0	6.0	3	5" [125]
SKG4-N5603 N/P	3	560 [255]	713,000 [209]	12.0	7.0	6.0	3	5" [125]
SKG4-N6103 N/P	3	610 [275]	747,000 [219]	12.0	7.0	6.0	3	5" [125]
SKG4-N7104 N/P	4	710 [320]	953,000 [279]	15.0	8.7	7.5	4	(2x) 4" [100]
SKG4-N7654 N/P	4	765 [345]	962,000 [282]	15.0	8.7	7.5	4	(2x) 4" [100]
SKG4-N8104 N/P	4	810 [370]	996,000 [292]	15.0	8.7	7.5	4	(2x) 4" [100]

Outdoor Unit

- Hinged doors provide full access (serviceability) from the front, back and top of unit
- Fully insulated and constructed from heavy duty steel
- Stainless steel bottom drip pan
- Zinc primer and polyurethane powder coating for resistance against scratches and corrosion
- Built-in anti-freeze and overheat protection
- Easy installation on a roof curb, stand or slab
- Connection can be made from side or through the roof curb

Modular Design

Flexible Solution for Indoor/Outdoor Applications

Modular design offers flexibility and convenience; each module adds up to 210 lbs/hr (100 kg/hr) of steam capacity. With the smallest footprint in the industry, the SKG4 module can be easily installed and assembled on site when access is limited. Module assembly can be arranged in line, in an L shape, or back to back to accommodate any specific space conditions. Feed water, gas, water drain and flue connections can be located on either side of the enclosure.

SKS4 steam to steam

STEAM TO STEAM HUMIDIFIER

The SKS4 humidifier provides chemical free steam by using an on-site central boiler or steam generating station as a heat source. The raw steam under pressure from the boiler provides the energy to produce clean steam through a heat exchanger.

SKS4 Advantages

- Capacities from 17 to 1250 lbs/hr (8 to 570 kg/hr) of steam
- Stainless steel (for raw steam) heat exchangers
- Comprehensive scale management system
- Ease of servicing: clean and re-install within minutes
- Patent-pending water level detection system using 2 sensor technologies
- Uses either domestic, RO or DI water
- For Multi-Steam and SAM in-duct distribution systems, refer to page 17
- Available with BACnet MS/TP or Modbus communication
- Optional ethernet module for BACnet IP or Modbus IP, and web services
- Patented Anti-Foaming Energy Conservation (AFEC) System
- Drain water tempered to below 140°F (60°C)

System Overview

Heat Exchanger

Raw steam passes through the heat exchanger, thus providing the energy to produce clean steam. Made with 316 stainless steel for 5 - 15 psig steam.

Evaporation Chamber

The 304 stainless steel evaporation chamber is equipped with handles for easy removal without any tools.

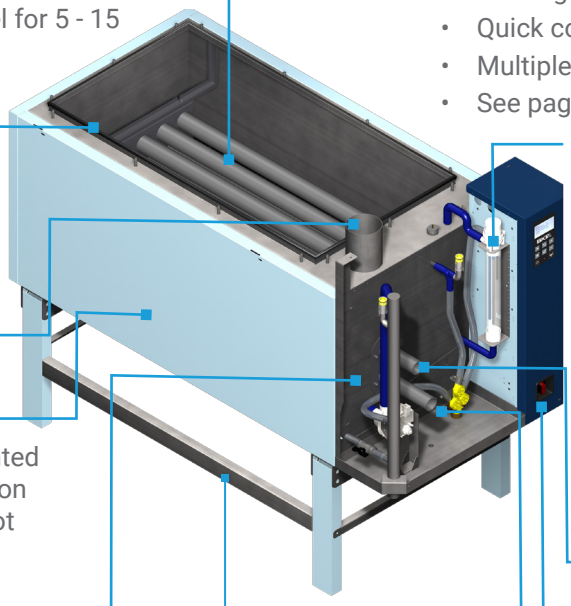
Steam Outlet

Insulated Cabinet

The fully enclosed steel, powder-painted cabinet with 1" (25mm) thick insulation eliminates accidental contact with hot surfaces and saves energy.

Scale Trap Trays

These trays can be accessed from the top of the unit, allowing for easy maintenance and scale removal.



Floor Stand

Adjustable legs ensure proper level when installed directly on the floor.

Built-in Controller

- Intuitive menu-driven user interface
- User rights management
- Quick config menu
- Multiple connectivity options
- See page 7 for more details

Patent-Pending Water Level Detection System

- Self-cleaning and self-calibrating sensors
- Utilizes 2 different sensor technologies
- Precise and reliable water level detection
- Anti-Foaming Energy Conservation (AFEC) System: drains water when foam is detected

Pressurized Steam Supply

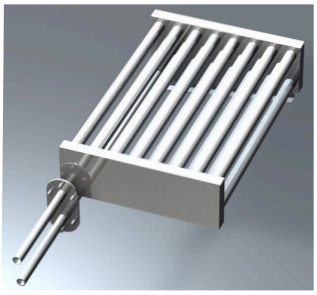
Disconnect Switch

Condensate Return

Outdoor unit available

Specifications

Heat Exchanger - SLP Stainless Steel 316 (For Raw Steam)



Model	Output Steam Capacity lbs/hr [kg/hr] for Supply Steam Pressure					Steam Outlet Qty & Ø in [mm]
	5 PSI [34.5 kPa] [34.5 kPa]	8 PSI [55.1 kPa]	10 PSI [68.9 kPa]	12 PSI [82.7 kPa]	15 PSI [103 kPa]	
SKS4-050-SLP	17 [8]	27 [12]	33 [15]	40 [18]	50 [23]	(1x) 2" [51]
SKS4-100-SLP	33 [15]	53 [24]	67 [30]	80 [36]	100 [45]	(1x) 3" [76]
SKS4-130-SLP	43 [19]	69 [31]	87 [39]	104 [47]	130 [59]	(1x) 3" [76]
SKS4-190-SLP	63 [28]	101 [46]	127 [57]	152 [69]	190 [86]	(1x) 3" [76]
SKS4-290-SLP	97 [44]	155 [70]	193 [87]	232 [105]	290 [132]	(1x) 4" [100]
SKS4-390-SLP	130 [59]	208 [94]	260 [118]	312 [142]	390 [177]	(1x) 4" [100]
SKS4-500-SLP	167 [76]	267 [121]	333 [151]	400 [182]	500 [230]	(1x) 5" [125]
SKS4-690-SLP	230 [104]	368 [167]	460 [209]	552 [251]	690 [314]	(1x) 5" [125]
SKS4-950-SLP	317 [144]	507 [230]	633 [287]	760 [345]	950 [432]	(2x) 4" [100]
SKS4-1250-SLP	417 [189]	667 [303]	833 [378]	1000 [454]	1250 [568]	(2x) 5" [125]

Self-Cleaning System

Scale Management System

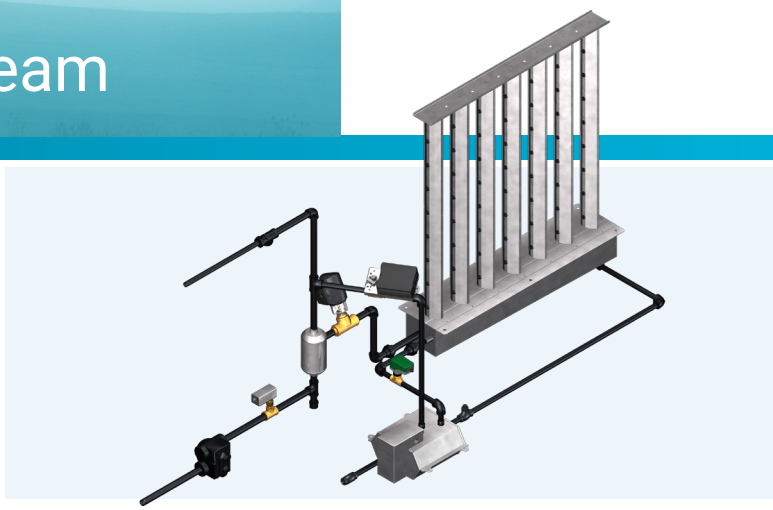
The SKS4 is designed with a comprehensive scale management system. The supply of cold water, located at the sloped bottom of the evaporation chamber, forces the precipitated mineral deposits into baskets that can easily be removed.

Modulating Control

The SKS4 is supplied with a Neptronic linear actuated globe valve, giving full modulation control of low pressure steam. The globe valve is available with either brass or stainless steel trim as an option.

DIRECT STEAM INJECTION HUMIDIFIER

The SKD direct steam injection system uses low pressure steam from an in-house boiler (maximum pressure 1 bar/15PSI) to humidify the air.



SKD Advantages

- Custom designed to meet your specific steam capacity and non-wetting distance requirements
- 5 steam distribution configurations: Multi-Steam™SD, Multi-Steam™ HD, or Jacketed (Single Tube, Multi-Tube, or Mini Rack)
- Unique Electronic Steam Controller (ESC) manages the sequence of operation to optimize energy efficiency and prevent condensate ejection
- Optional patent-pending pressurized condensate return (PCR) system. No gravity drain - no maintenance - returns condensate to steam source

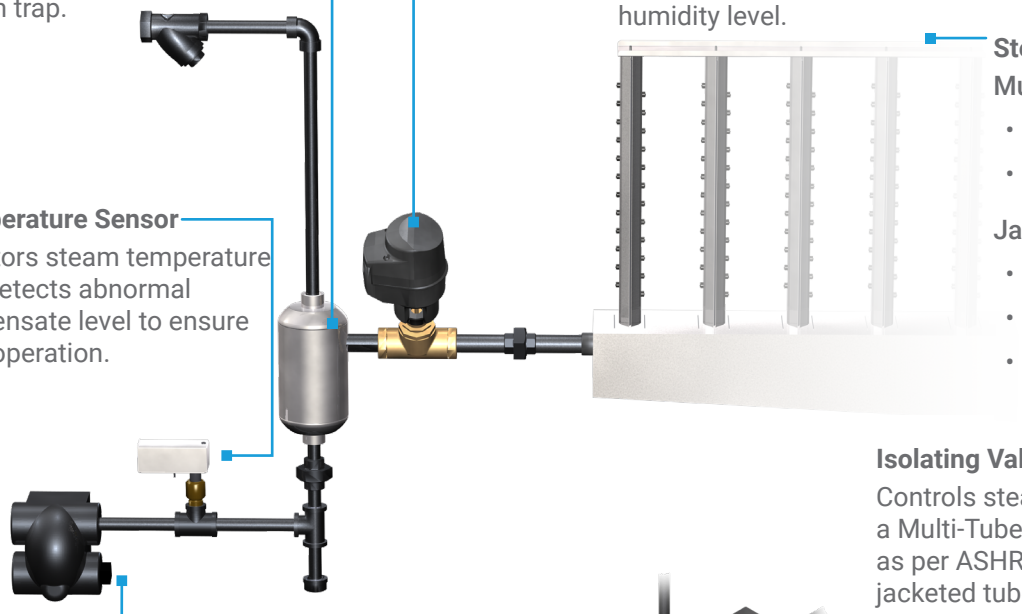
System Overview

Steam Separator

Supplies condensate-free steam to the steam control valve, while discharging condensate to the steam trap.

Steam Control Valve

Provides full modulation of the low pressure steam flow for a better control of the humidity level.



Steam Distribution System

Multi-Steam Configuration

- Multi-Steam™ SD
- Multi-Steam™ HD

Jacketed Tube Configuration

- Single Tube
- Multi Tube
- Mini Rack

Temperature Sensor

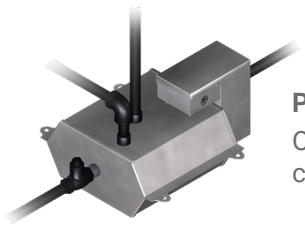
Monitors steam temperature and detects abnormal condensate level to ensure safe operation.

Isolating Valve

Controls steam supply to the jacket in a Multi-Tube configuration (mandatory as per ASHRAE standard 90.1 for all jacketed tube configurations).

F&T Steam Trap

Eliminates condensate from the steam line.



PCR

Optional patent-pending pressurized condensate return (PCR) system.

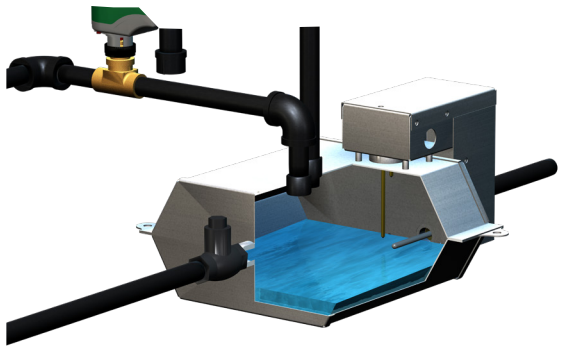
- No gravity drain
- No maintenance
- Returns condensate to steam source

Specifications

PCR

Pressurized Condensate Return system

The Neptronic Pressurized Condensate Return system (PCR) returns condensate generated within the steam dispersion tubes of a direct steam humidifier back to the steam source, thus eliminating the need for a gravity drain. Presently, the only other available technology is a pressurized steam humidifier with a heat exchanger (or re-evaporator).



Description	Neptronic PCR System (Pressurized Condensate Return)	Competitors Re-evaporators (Internal Heat Exchanger)
Real-time monitoring	Yes	No
BMS Integration	BACnet or Modbus	No
Maintenance	Not required	Systematic verification is a must*
Cleaning	Not required	De-scaling*
Downtime	None	During maintenance or when equipment is offline due to fouling*
Flooding of header	None	Possible due to reduced capacity due to fouling and standard piping configuration
Accessibility	Outside the duct for easy access	Standard cleaning procedure requires access to the top of header often located in duct (may require duct access by door)*
Compatibility	Insulated and non-insulated steam distributors and headers	Only insulated steam distributors and headers
Installation	Lowest clearance with simple and flexible installation due to smaller components	Higher clearance and integral design forces components below duct, resulting in potential ceiling clearance issues

*See manufacturer's manual for more information

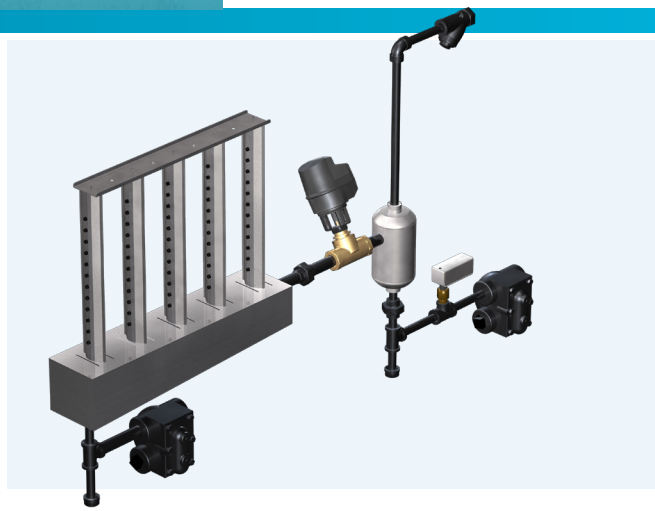
ESC Controller

Unique in the Industry

- Centralized wiring of sensors, valves and humidity controls
- Easy start-up and diagnostics
- Factory pre-configured operating temperature range
- 24 Vac operation
- BACnet or Modbus compatible

Multi-Steam™ SD (Non-insulated)

- Lowest capital cost injection system
- Easiest installation... contractor's favorite
- Header with built-in slope for improved condensate elimination



Multi-Steam™ HD (Insulated)

- Same as Multi-Steam™ SD plus: X-Stream™ Technology (see page 17)
- Lowest heat transferred to the airstream
- Lowest condensate produced

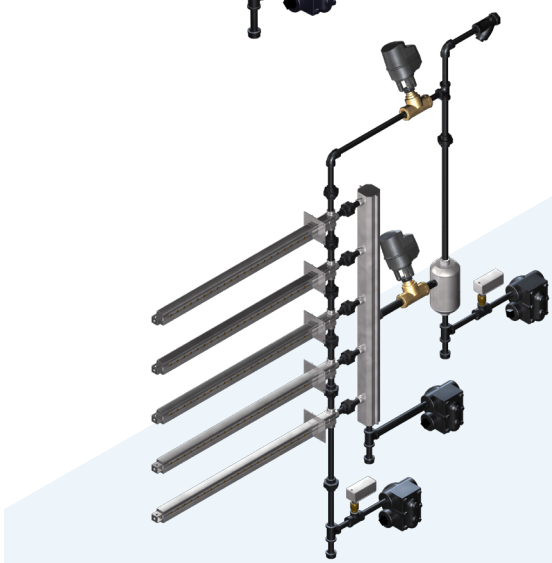
JACKETED

Single Tube

- For duct installations
- Low capacity applications: 5 - 170 lb/h (2 - 77 kg/h)
- Average non-wetting distance

Multi-Tube

- For duct or AHU installations
- Medium to high capacity applications: 5 - 1650 lb/h (2 - 750 kg/h)
- Short non-wetting distances
- Optional pressurized condensate return (PCR) system



Mini Rack

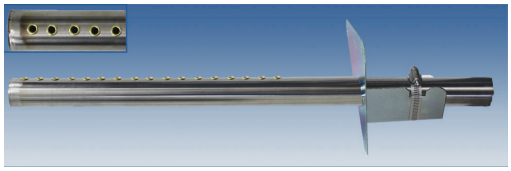
Same as Multi-Tube, plus:

- Designed for limited space installations such as reduced duct height
- Tubes pre-assembled on header

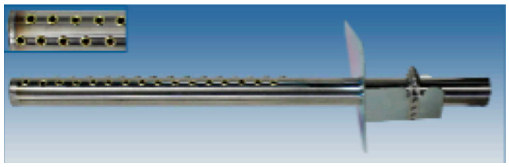
steam distribution types

S.A.M.

- Short absorption distance (less than 5ft/1500mm)
- Stainless steel tube with brass nozzles
- Nozzles prevent condensate from collecting in the duct
- Inclined steam dispersion tube to return condensate back to humidifier or steam trap



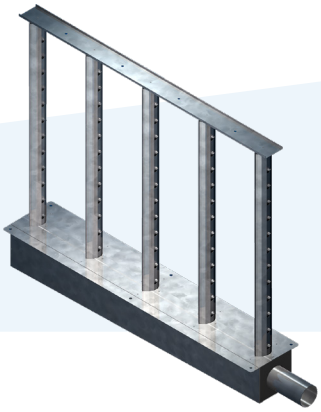
S.A.M.



S.A.M.E2

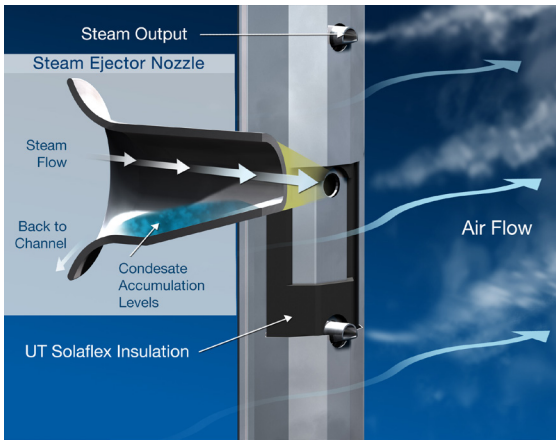
Multi-Steam™ SD (Non-Insulated)/HD (Insulated)

- For absorption distances of less than 3ft (900mm)
- Custom built for the duct or AHU
- Header with built-in slope for improved condensate elimination
- Brass insertion nozzles (SD), or 304 stainless steel eyelets (HD)
- Completely assembled (HD) or welded (SD) at the factory, or collapsible for in-field assembly



X-Stream™ Technology (HD Insulated)

- High efficiency insulated steam distributor (channel and header) with steam ejector eyelets
- Double wall 304 stainless steel with encapsulated Armacell
- UT/Solaflex™ foam insulation
- Specially engineered 304 stainless steel eyelets prevent condensate ejection on start up and any modulating humidity demand



Steam Distribution Applications

Steam Distribution System	SKR	SKE4	SKG4	SKS4	SKD
Multi-Steam™ SD		•	•	•	•
Mult-Steam™ HD		•	•	•	•
S.A.M.	•	•			
S.A.M.E2	•	•	•	•	

SKVF evaporative cooler

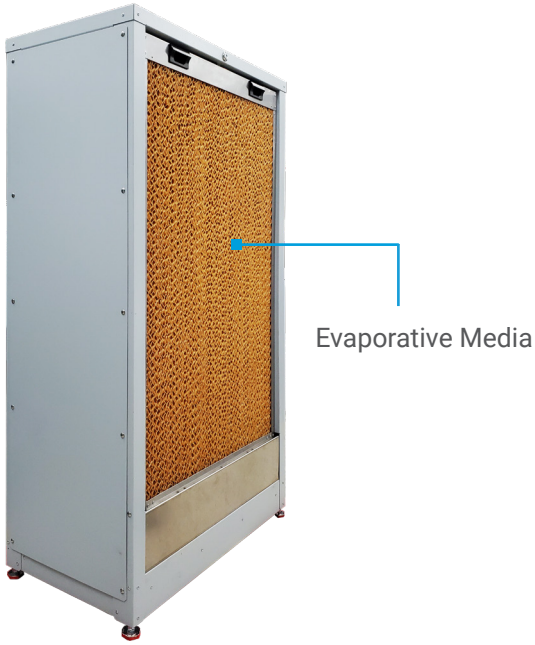
EVAPORATIVE COOLER

The SKVF evaporative cooler provides maximal comfort in industrial and commercial applications. It can be easily configured either to cool or humidify with its energy-efficient ECM fan and user-friendly interface to prevent unwanted heat build-ups.

SKVF Advantages

- ECM fan with variable output (10-100%)
- Compact, quiet and standalone evaporative cooler
- Free cooling up to 21.5°F (12°C)
- Very low energy consumption (< 1.5kW)
- Hygienic and environmentally friendly operation
- Very low and easy maintenance with removable panels
- Configurable for minimal water usage
- Configurable fan operation for continuous ventilation or media drying

System Overview



Nomenclature

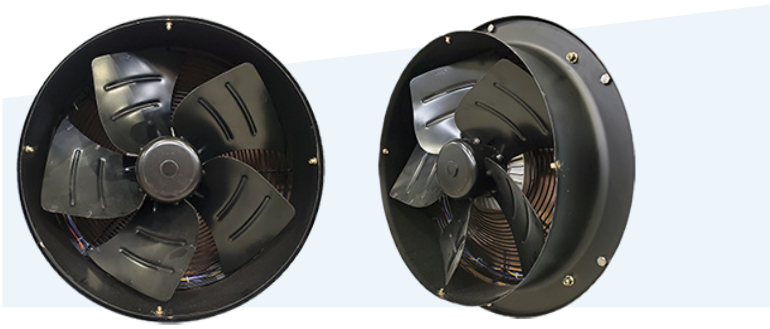
SKVF	-	R	60	-	85	B	C	S
		Type	CFM		Evaporation Factor	Fan Position	Voltage	Control Panel
		R = Recirculation D = Direct Feed	15 = 1500 CFM 30 = 3000 CFM 60 = 6000 CFM		85 = 85%	B = Back	A = 120Vac/1ph B = 208Vac/1ph C = 230-240Vac/1ph	S = Standard

Specifications

ECM Fan

Advantages of the SKVF's ECM fan:

- High energy efficiency – up to 30% more efficient than AC fans
- Integrated continuous control for the fan speed, torque and feedback signal
- Low operating temperatures increase the fan's reliability and longevity
- Relatively compact and versatile at high capacity

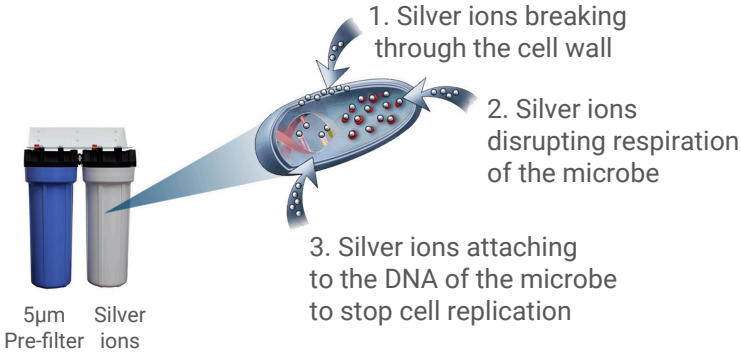


Water Quality

Hygienic operation with tap or RO water

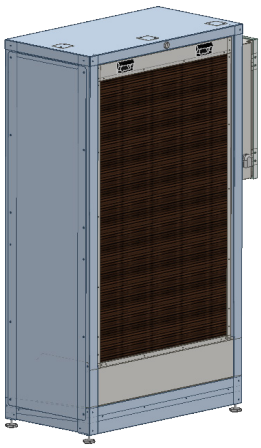
- Odor free media
- Water treated with 5µm pre-filter
- Anti-bacterial silver ion dosing cartridges prevent microbial growth
- UV sterilizer on water line (optional)
- Evaporative media fan drying sequence
- Normally open (NO) drain valve protection in case of power failure

How Silver Ions Work

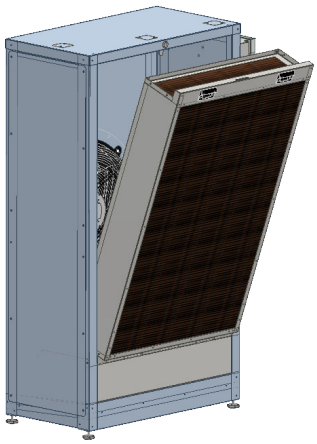


Easy Maintenance

The SKVF has been designed to facilitate access to the evaporative module components for easier maintenance. Remove the media cassette in two easy steps:



1. Use the access key to unlock the media cassette panel



2. Remove the media cassette from the SKVF

SKV evaporative

EVAPORATIVE HUMIDIFIER

With the SKV evaporative humidifier, water is supplied to the top of the evaporative module and flows down the wet media. Warm dry air passes through the wet media evaporating the water, thereby raising the humidity level.

SKV Advantages

- Very low machine energy consumption (<1kW)
- Hygienic operation
- Environmentally friendly
- Very low maintenance
- Free cooling up to 21.5°F (12°C)
- Custom modular design to fit any application
- Low pressure drop
- Fully ETL approved

System Overview

Inorganic Fibreglass Media

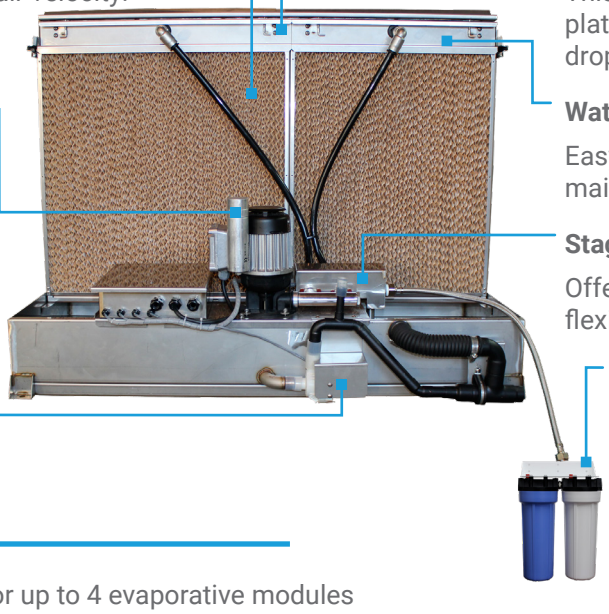
Hygienic, fire resistant and incombustible corrugated media, provides exceptional moisture absorption for continuous humidification and evaporative cooling, even at high air velocity.

Circulation Pump

Robust pump functions with tap or RO water

Drain Pump

Fast and reliable pump that lifts and re-circulates the drained water.



Parametric Design

Use the Neptronic Humidisoft web application to customize the evaporative module to your exact duct dimensions. This minimizes the need for blanking plates, thus ensuring a lower pressure drop.

Water Distribution Drawer

Easy to remove for cleaning and maintenance.

Staging Valves

Offers up to 5 stages providing very flexible and accurate control.

Silver Ion Cartridge

Water pre-treated with 5µm pre-filter and anti-bacterial silver ions prevent microbial growth.

SKV Controller

- Master/slave configuration for up to 4 evaporative modules
- On/Off or modulating control type
- Real-time clock with flexible scheduler
- Simple viewing and exporting of trending log and alarm log
- In-field firmware upgradeable via SD card
- Easy connection with only one 6-wire control cable
- Stainless steel IP56 rated (equivalent to NEMA type 4) enclosure for

Specifications

Nomenclature

SKV R 95 C 1 D C

Type
R: Recirculation
D: Direct Feed
O: OEM

Evaporation Factor
65: 65%
75: 75%
85: 85%
95: 95%

Controller
C: Controller (standard)
B: BACnet controller
-: None

No. of Stages
1: 1 Stage
2: 2 Stages
3: 3 Stages
4: 4 Stages
5: 5 Stages

Droplet
D: Droplet separator included (when required)

Voltage
A: 120Vac
C: 230Vac

Standards for media

North American:

- UL 900, Air Filter Units, [Class I (no flame or spark, less than 2.5 sq.in of smoke)]

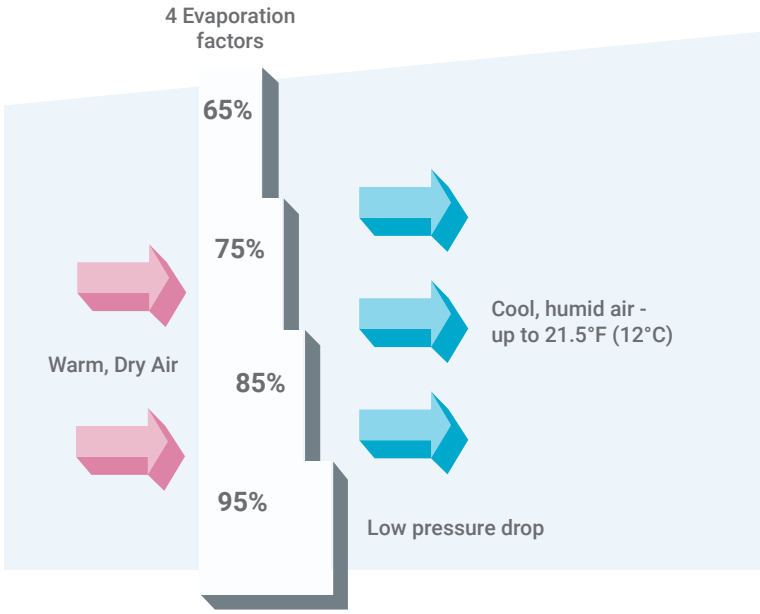
European:

- EN 13501-1, Fire classification of construction products and building elements - **Part 1: Classification using data from reaction to fire tests**
  - EN 1182, Non combustibility test method of building meaterials
  - EN 13823, Reaction to fire test for building products. Fire class: **A2**; Smoke production class: **s2**; flaming particles class: **d0**
- ISO 846, Evaluation of the action of microorganisms' microbiology testing lab
- ILH Berlin tested and found to fulfill the requirements from VDI6022 Part 1, suitable for use in HVAC systems

Hygienic and Safe

SKV Media Panels

- Inorganic and inflammable material
- Trouble free maintenance
- No water treatment required
- No risk of over saturation
- Media frame made of stainless steel
- Media easily removable from stainless steel frame



SKH4 Atomizing High Pressure

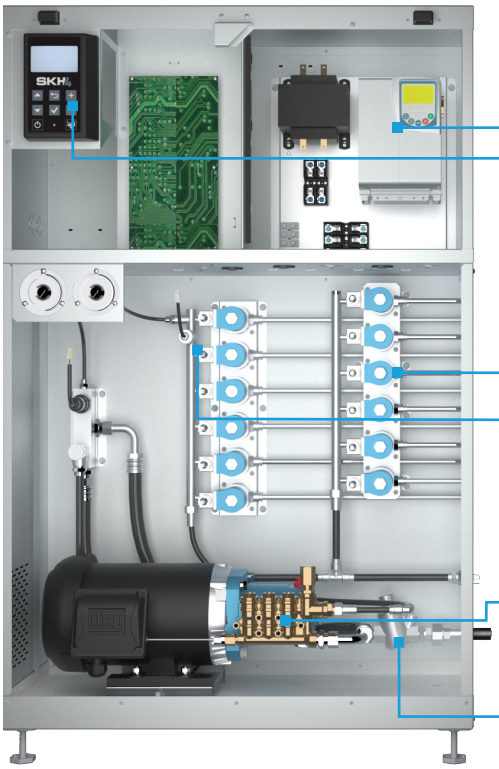
ATOMIZING HUMIDIFIER

The SKH4 pumps water at high pressure through a series of nozzles to produce a fine mist. By way of the adiabatic process, the SKH4 uses energy (heat) from the surrounding air to evaporate the fine mist (water droplets). This evaporative cooling/humidification process provides a very low energy impact with power consumption values of 1/2 HP to 5 HP (10.4 kW to 73.7 kW), which is less than other technologies of equivalent capacity, such as compressed air.

SKH Advantages

- High turndown and cost-effective brass oil lubricated pump.
- Low maintenance & hygienic stainless-steel water lubricated pump
- Pump station capacity 210-2800 lb/h (100-1250 L/h)
- Cost effective on/off motor control
- Energy efficient VFD motor control
- Up to 6 stage valves
- Valves inside pump station or remote
- Up to 4 zones per pump station
- Integrated, Multi-Platform controller
- 6-10 lb/h (3-5 L/h stainless steel anti-drip nozzle sprays water into fine 7-35- µm water droplets
- New in space fan assisted mist distributors
- Nozzle rack is custom made to fit your duct or AHU dimensions

System Overview



Variable Frequency Drive :
Allows higher turn down ratio of the output and saves energy. (Optional)

SK Family controller:
Display and PCB from the SK Family, familiar menus and connections for control. Networkable (BACnet & Modbus)

Valves :
Up to 6 stages for a pump unit, configurable inside or outside of the pump for ease of installation of the distribution network

Pressure and temperature sensors :
Multiple sensors to monitor the humidification and detect pressures losses in the system or blockages.

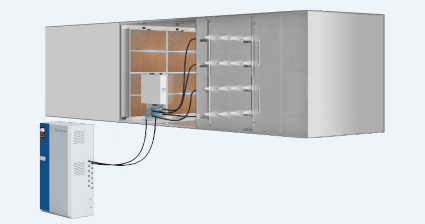
High Pressure pump:
Economic brass pump or
Oil-free Stainless Steel pump

Pressure regulator and gauge:
Water inlet pressure regulator and gauge to adjust the appropriate water inlet pressure.

Specifications

Models and Capacities

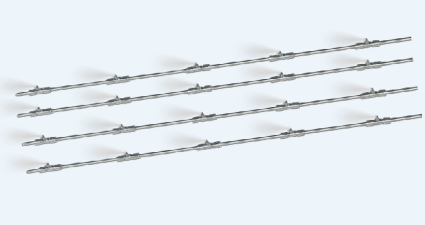
SKH4	-	N	100	B	2-2	-	E	M
		Frequency N = 60Hz	**Capacity** 021 = 210 lb/h 050 = 500 lb/h 100 = 1000 lb/h 185 = 1850 lb/h 280 = 2800 lb/h	**Stage valve** B = Brass S = SS oil free	**Stage valve** 0-6		**Voltage** A = 120V / 1ph B = 208V / 1ph C = 220-240V / 1ph D = 208V / 3ph E = 220-240V / 3ph F = 400V / 3ph G = 480V / 3ph H = 600V / 3ph	**Motor control** Blank: On/Off M=VFD
		E = 50 Hz	010 = 100 L/h 022 = 220 L/h 045 = 450 L/h 085 = 850 L/h 125 = 1250 L/h		**Drain valve:** 0 - 6			



In-Duct Nozzle Rack

Custom made nozzle rack and droplet separator installed in duct or AHU for precise output and the mist absorption.

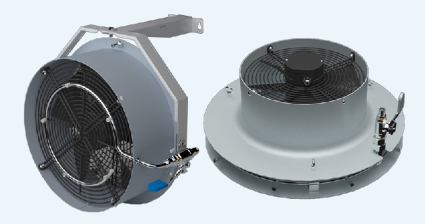
- Up to 6 stage valves to ensure precise humidity output
- Spray contained in duct, no ceiling height limitation



In-Space Nozzle Rack

Array of nozzle on a high-pressure piping network creating a series of mist cones.

- The SKH4 misting nozzles can be spread across large area, generally hanging from ceiling
- Multiple installations options to fit every space
- Cost effective solution ideal for large space with high ceiling (30ft / 9m)



MDU and ADU

Spray directly into the face with the help of a fan to reduce absorption in restricted spaces

- Lowers vertical absorption distances
- Improves distribution efficiency and coverage
- Multiple airflow patterns for different space configurations

Humidisoft

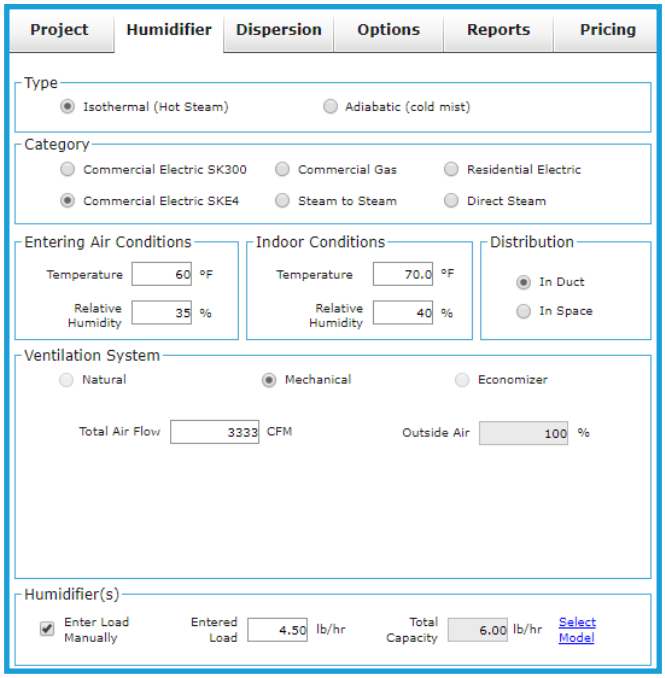
Specify your Humidifier online

Humidifer System Design and Specification Web Application

Ready to specify your Humidifier? Neptronic has developed a web application that saves you time when sizing and specifying Neptronic commercial, industrial or residential humidifiers.

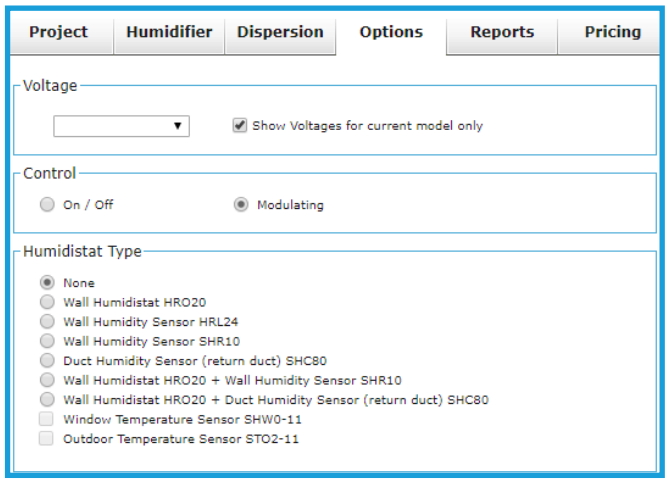
Features

- Automatic humidification load calculation
- Web based
- Selection specific report generator
- Only options related to your selections appear
- Manage users, clients, job sites and humidifier specs
- History log



Easy to Use

Go to neptronic.com, select Humidisoft and log in. Enter design requirements and Humidisoft automatically calculates the humidification load and adjusts available options based on your selections. When done, print a complete schedule, CSI and/or submittal report at the click of a button.



Humidifier Controls and Sensors

HRO20 / HROB20 (BACnet)
Humidity Controller

- BACnet MS/TP (model HROB20 only)
- 4 analog and 2 dry contact outputs
- 2 external sensor inputs
- Alarm and low signal selector input
- Independently configure PID on humidify & dehumidify ramps
- Adjustable setpoint with auto reset from external sensor

SHS20
Room High Limit Humidistat

HRC20

- **SHS20** - High-limit setpoint dial (20-90 %RH)
- **HRC20** - Humidity setpoint dial (10-60 %RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

HRL24
Room Humidistat

- Used to program the SK Humidifiers
- Icon-driven information and 1 line of text information
- 4 wires between humidistat and SK
- Programmable PID on humidity

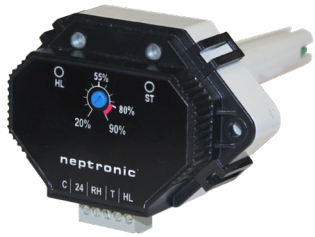
SHR10
Wall Mount Humidity Sensor

- Built-in temperature sensor
- Plastic cover for wall mount installation
- 2 analog outputs (0 - 10 Vdc)
- High accuracy and stability

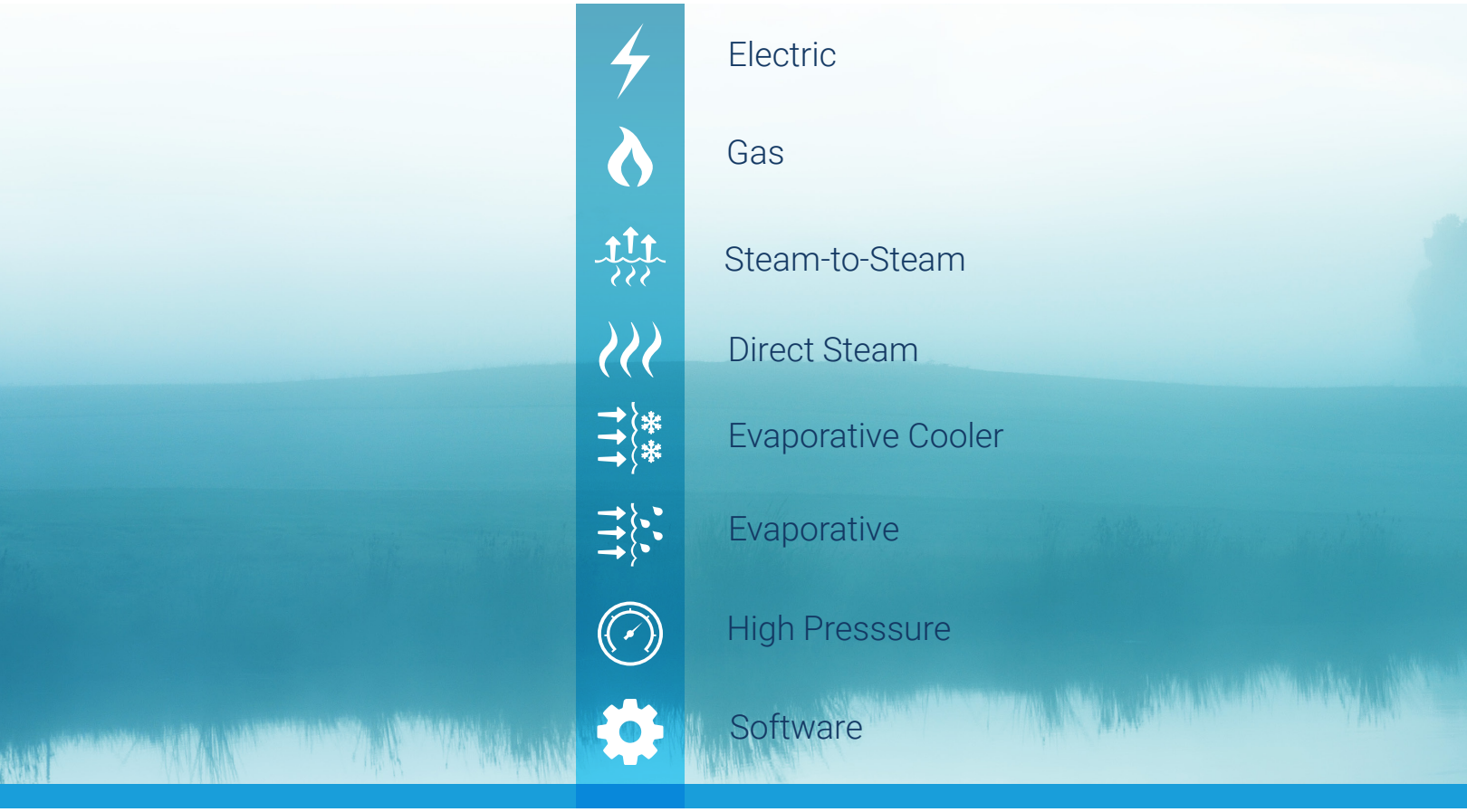
SHC80
Duct Mount Humidity Sensor

- Built-in temperature and humidity sensor
- 2 analog outputs (0 - 10 Vdc)
- Status LED

SHS80
Duct Mount High Limit Humidistat



- Built-in temperature and humidity sensor
- On/Off high limit humidistat with on-board setpoint adjustment (20-90 %RH)
- 2 analog outputs (0 - 10 Vdc)
- Status and high limit LEDs
- 1 dry contact output



neptronic.com

HVAC Controls For System Integrators

neptronic®

Overview

Neptronic features a wide range of BTL listed BACnet MS/TP or Modbus networked controllers that have proven integration with several BMS systems on multiple sites around the world. Neptronic networkable controllers offer flexibility and simplicity within any integration strategy to provide:

- Seamless integration and interoperability
- Real-time information management and control
- Lower costs and higher value
- Diverse control strategies
- Higher energy conservation

Save Time On Integration, Installation and Commissioning

Neptronic networkable controllers feature some or all of the following features and benefits.

Two MAC Address Configuration Methods

Set MAC address via user friendly menu on thermostat or locally on unit via DIP switches.

Auto Configuration and Detection

The controller automatically configures its device instance to a default value + MAC address. The controller automatically configures its baud rate by detecting the network speed upon connection.

Copy Configuration

Copy the controller's entire configuration and broadcast it to other controllers of the same type on the same network.

BACnet Objects

Multiple BACnet Objects per controller enable you to read/write information as you monitor and trend status of operation, alarms and schedules.

Firmware Upgrade via BACnet

Upgrade the device in the field via BACnet. Initiate the upgrade during normal operation and choose when to restart the system.

Programming Schedules

Determine occupancy in advance for 7 days with up to 6 events per day. Avoid constant monitoring and save energy.

Automatic Update of Changed Values

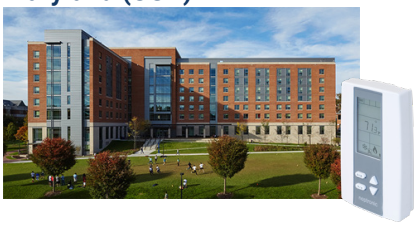
Enable subscription to update changed values automatically. Avoid regular polling of values, reduce traffic and transmit faster.

Service Display

If you are searching for a specific device, enabling the service mode will flash the device to easily locate the device.

Proven Integration
Around the World

UMCP Frederick Hall, Maryland (USA)



AUTOMATEDLOGIC
United Technologies

370 TFCB
Wall mount controllers

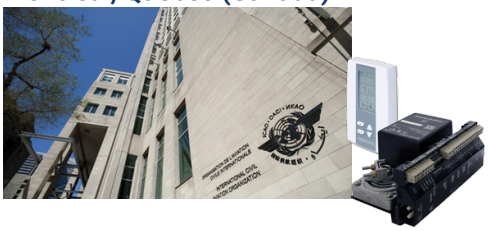
Wilson Project, Sidney, OHIO (USA)

Thompson Tractor Company, Alabster, Alabama (USA)

BUILDINGLOGIX

65 EVCB
Controllers

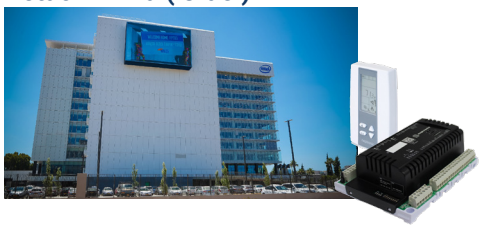
International Civil Aviation Organization (ICAO), Montreal, Quebec (Canada)



Delta CONTROLS
A Delta Group Company

1100 EVCB
Controllers

INTEL PTK-1 R&D Center, Petach Tikva (Israel)



700 EFCB
Controllers

Rashid Hospital, Dubai (UAE)

Honeywell

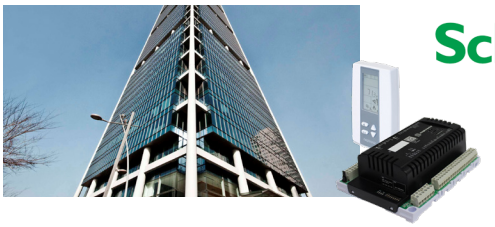
240 EVCB
Controllers

Funan Digitalife Mall, Singapore

Johnson Controls

950 TUCB
450 CMMB106
Controllers

Google Offices Tel-Aviv, Israel



Schneider Electric

700 EFCB
Controllers

Jurong Port, Singapore

Schneider Electric

700 EVCB
Controllers

Landmark 81, Vietnam

SIEMENS

700 EVCB
Controllers

Palm Tower, Qatar

TREND

1600 EVCB
Controllers

World Business Center Heathrow Airport London (UK)

TRIDIUM

200 EFCB
Controllers

Google Campus, India

TRIDIUM

350 EVCB
Controllers

EFCB

Fan Coil
Unit Controller

Fan coil unit controller (EFCB) with Digital Room Sensor (TDF)

Inputs

DI4
4 Digital*

AI6
6 Analog*

24Vac
120/240 Vac

Outputs

BO8
4 TRIACs
Up to **4** Digital*

AO4
4 Analog*

1, 2, or 3* Speed
or **ECM**

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

Room Sensor
3 Wires (Digital)

**Configurable*

Models

Model	Type	Extra 3A Relay
EFCB10TU2	24Vac	2
EFCB10TU4		4
EFCB11TU2	120Vac	2
EFCB11TU4		4
EFCB12TU2	240Vac	2
EFCB12TU4		4

Controller (EFCB)

- Real Time Clock (RTC) with 24 hour backup
- Configurable PI (Proportional-Integral) function
- Selectable proportional control band and dead band
- Independent cool/heat setpoint for NSB/OCC mode
- Selectable internal or external temperature sensor (10KΩ)
- Change over by contact or external temperature sensor
- Freeze protection
- BACnet MS/TP or Modbus communication (selectable)
- BACnet scheduler
- Firmware upgradeable via BACnet
- 4 AI can be configurated as Dry Contacts
- Digital room sensor with onboard or external CO_2 sensor with integrated logic
- ECM with Enable/Disable option

Applications

- 2 or 4 pipe systems
- Fan coil unit (up to 3 speeds and/or analog 0-10Vdc)
- Cooling signal (on/off, floating or modulating 0-10Vdc)
- Heating signal (on/off, floating, pulse or modulating 0-10Vdc)
- Reheat signal (on/off, floating, pulse or modulating 0-10Vdc)

TDF

Fan Coil
Digital Room Sensors

NEW

● TDF10 ● TDF40 ○ TDF70 ● TDF00 ● TDF30 ○ TDF60

Models

Horizontal Models	Temp.	RH	CO_2
● TDF10-100 ● TDF40-100 ○ TDF70-100	•		
● TDF10-101 ● TDF40-101 ○ TDF70-101	•	•	
● TDF10-102 ● TDF40-102 ○ TDF70-102	•	•	•
● TDF10-103 ● TDF40-103 ○ TDF70-103	•		•

Vertical Models	Temp.	RH	CO_2	PIR	VOC
● TDF00-100 ● TDF30-100 ○ TDF60-100	•				
● TDF00-101 ● TDF30-101 ○ TDF60-101	•	•			
● TDF00-102 ● TDF30-102 ○ TDF60-102	•	•	•		
● TDF00-104 ● TDF30-104 ○ TDF60-104	•			•	
● TDF00-105 ● TDF30-105 ○ TDF60-105	•	•		•	
● TDF00-106 ● TDF30-106 ○ TDF60-106	•	•	•		•
● TDF00-107 ● TDF30-107 ○ TDF60-107	•	•	•	•	•
● TDF00-108 ● TDF30-108 ○ TDF60-108	•	•	•	•	

Universal Digital Room Sensor (TDF)

- Built-in temperature sensor and optional humidity, CO_2, VOC and occupancy sensors (select models)
- Elegant design
- Universal wall-mount design
- Used to configure and operate the EFCB Fan Coil controllers
- Three wire connection between digital room sensor and controller
- Selectable Fahrenheit or Celsius scale
- BACnet service port via on-board mini USB connector
- Horizontal or vertical configuration

TSUB

Fan Coil
Wall Mount Controller

NEW

Inputs

AI2
2 Analog*
(Universal)

24Vac

Outputs

BO5
5 Binary*

AO2
2 Analog*

1, 2, or 3* Speed
or **ECM**

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Configurable*

Models

Models	Temp.	RH	PIR
○ TSUB00-100 ● TSUB30-100 ○ TSUB60-100	•		
○ TSUB00-101 ● TSUB30-101 ○ TSUB60-101	•	•	
○ TSUB00-104 ● TSUB30-104 ○ TSUB60-104	•		•
○ TSUB00-105 ● TSUB30-105 ○ TSUB60-105	•	•	•

Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- External occupancy input
- Dehumidification sequence compensated by auto activation of reheat output
- Real time clock (RTC) with 24-hour backup
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Low limit set protection (10°C/50°F)
- Occupancy and night set back (NSB) mode
- Selectable direction on outputs
- Option of pulse/floating/on-off output on binary outputs
- Compressor anti-cycling delay (configurable)
- ΔT control (on request)
- Selectable BACnet MS/TP or Modbus communication
- Selectable Fahrenheit or Celsius scale
- Multi level lockable access menu and setpoint

TSU

Fan Coil
Standalone Wall Mount Controller

NEW

Inputs

AI2
2 Analog*
(Universal)

24Vac

Outputs

BO5
5 Binary*
**Configurable*

AO2
2 Analog*

1, 2, or 3* Speed
or **ECM**

Models

Models	Temp.	RH	PIR
TSU00-110	•		
TSU00-111	•	•	
TSU00-114	•		•
TSU00-115	•	•	•

Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- External occupancy input
- Dehumidification sequence compensated by auto activation of reheat output
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Real time clock (RTC) with 24-hour backup
- 7-day programmable schedule

CCC

Fan Coil
Relay Interface Board

Models

Model	Voltage	Contact Ratings		Number of Outputs
		Resistive	Motor	
CCC713-07	120 Vac	7 A	1/4 HP	3
CCC714-07				4
CCC715-07				5
CCC723-07	240 Vac			3
CCC724-07				4
CCC725-07				5

Main Features

- 240/120 Vac
- 3, 4 or 5 contacts
- Metal box with secure 4-point mounting (models without enclosure also available)
- Equipped with built-in transformer (12VA max)

Applications

- Ideal for fan coil applications where 240/120 Vac equipment must be controlled by a 24Vac digital room sensor
- Designed to operate with TFC, TUCB, TSU, TSUB and TUUB controllers

EVCB

VAV
Unit Controller

VAV unit controller (EVCB) with Digital Room Sensor (TDU)

Inputs

DI2	AI2		
2 Digital*	**2** Analog*	**Pressure Sensor** (select models)	**24**Vac

Outputs

BO4	AO2
Up to **4** TRIACs	**2** Analog*

Communication

BAC	Mod	
BACnet MS/TP	**Modbus** RTU Slave	**Room Sensor** 3 Wires (Digital)

**Configurable*

Models

Model	TRIACS	Pressure Type	Feedback	Fan Powered Box
EVCB14NIT0S	0	Indep.		
EVCB14NIT2S	2	Indep.		
EVCB14NIT4S	4	Indep.		•
EVCB14NDT4S	4	Dep.		•
EVCB14NIT0SF	0	Indep.	•	
EVCB14NIT4SF	4	Indep.	•	•

External Motor

Model	TRIACS	Pressure Type	Motor
EVCB14NIT4X	4	Indep.	External
EVCB14NDT4X	4	Dep.	External

Controller (EVCB)

- Built-in actuator, 70 in.lb. (8Nm) (select models)
- On board differential pressure sensor (select models)
- Simple air balancing and commissioning via digital room sensor
- Automatically sets operation mode to pressure dependent or independent based on the presence of air flow
- Configurable PI (Proportional-Integral) function
- Independent, configurable proportional control band and dead band per ramp
- Selectable internal or external temperature sensor (10KΩ)
- Digital room sensor with on-board or external CO_2 sensor with integrated logic
- Changeover by contact or external temperature sensor
- Real time clock (RTC) with 24-hour backup
- BACnet MS/TP or Modbus communication (selectable)
- BACnet scheduling

Applications

- Single duct, cooling only and/or heating
- Up to 4 stage reheat and/or cool
- Up to 4 On/Off heat and/or cool
- Up to 4 time proportioned (TPM) heat or reheat
- Up to 2 analog (0-10Vdc) reheat and/or cool
- Up to 2 floating heat and/or cool
- Pressure dependent or pressure independent
- With or without auto changeover
- Supply/exhaust (requires an additional EVC)

TDU

VAV
Digital Room Sensors

NEW

● TDU10 ● TDU40 ○ TDU70 ● TDU00 ● TDU30 ○ TDU60

Models

Horizontal Models	Temp.	RH	CO_2
● TDU10-100 ● TDU40-100 ○ TDU70-100	•		
● TDU10-101 ● TDU40-101 ○ TDU70-101	•	•	
● TDU10-102 ● TDU40-102 ○ TDU70-102	•	•	•
● TDU10-103 ● TDU40-103 ○ TDU70-103	•		•

Vertical Models	Temp.	RH	CO_2	PIR	VOC
● TDU00-100 ● TDU30-100 ○ TDU60-100	•				
● TDU00-101 ● TDU30-101 ○ TDU60-101	•	•			
● TDU00-102 ● TDU30-102 ○ TDU60-102	•	•	•		
● TDU00-104 ● TDU30-104 ○ TDU60-104	•			•	
● TDU00-105 ● TDU30-105 ○ TDU60-105	•	•		•	
● TDU00-106 ● TDU30-106 ○ TDU60-106	•	•	•		•
● TDU00-107 ● TDU30-107 ○ TDU60-107	•	•	•	•	•
● TDU00-108 ● TDU30-108 ○ TDU60-108	•	•	•	•	

Universal Digital Room Sensor (TDU)

- Built-in temperature sensor and optional humidity, CO_2, VOC and occupancy sensors (select models)
- Elegant design
- Universal wall-mount design
- Used to configure and operate the EVCB VAV controllers
- Three wire connection between digital room sensor and controller
- Selectable Fahrenheit or Celsius scale
- BACnet service port via on-board mini USB connector
- Horizontal or vertical configuration

TRO24/TRO54

VAV
Wall Mount Controller

TRO24

Combination VAV controller and room thermostat.
Run control wires directly to TRO unit.

BACnet Model

Model	Options
TROB24T4XYZ1	BACnet

Stand-Alone Models

Model	Options
TRO24T4XYZ1	
TRO24T4XYZ3	Scheduler
TRO24-EXT1	Extended setpoint range

Applications

Ideal for existing installations and retrofits that already have an actuator mounted on the VAV box.

TRO54 Stand-Alone Models

Model	Analog outputs	TPM/Digital outputs	Sensor inputs
TRO5404	4	1 TPM	2
TRO54P3X1	2	3 Digital	2

Inputs

AI3
3 Analog*

24Vac

Outputs

BO4
4 TRIACs*

AO2
2 Analog*

Communication

BAC
BACnet
MS/TP

**Configurable*

Main Features

- Programmable PI function
- Selectable proportional control band and dead band
- Pressure sensor input with air flow program
- Selectable internal or external temperature sensor
- Changeover by contact or external temperature sensor
- Freeze protection
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- Manual Night set back override
- Multi level lockable access menu and setpoint

Main Features

- 24Vac operation
- Backlit LCD with simple icon and text driven menus
- Selectable Fahrenheit or Celsius scale
- "Night Set Back" mode with manual override
- Multi level lockable access menu and setpoint
- Selectable internal or external temperature sensor
- Selectable proportional control band

TUUB

Universal
Wall Mount Controller

NEW

BACnet™ Modbus c UL us LISTED CE BTL

CO_2 VOC

Packaged AC Rooftop Units *Heat Pumps* *Fan Coils*

Inputs

AI4
4 Analog*
(Universal)

24Vac

Outputs

BO6
6 Binary*

AO4
4 Analog*

1, 2, or 3* Speed or **ECM**

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Configurable*

Models

Models	Temp.	RH	CO_2	PIR	VOC
TUUB00-200 TUUB30-200 TUUB60-200	•				
TUUB00-201 TUUB30-201 TUUB60-201	•	•			
TUUB00-202 TUUB30-202 TUUB60-202	•	•	•		
TUUB00-203 TUUB30-203 TUUB60-203	•		•		
TUUB00-204 TUUB30-204 TUUB60-204	•			•	
TUUB00-205 TUUB30-205 TUUB60-205	•	•		•	
TUUB00-206 TUUB30-206 TUUB60-206	•	•	•		•
TUUB00-207 TUUB30-207 TUUB60-207	•	•	•	•	•

Main Features

- Optional internal/external humidity sensor input for simple and accurate humidity control
- External occupancy input
- Optional built-in CO_2 and VOC sensors
- Output selector jumper to switch between BO7 and AO1
- Dehumidification sequence compensated by auto activation of reheat output
- Real time clock (RTC) with 24-hour backup
- Precise temperature control with configurable PI (Proportional-Integral) function
- Selectable internal or external temperature sensor
- Low limit set protection (10°C/50°F)
- Occupancy and night set back (NSB) mode
- Selectable direction on outputs
- Option of pulse/floating/on-off output on binary outputs
- Internal/external occupancy input
- Compressor anti-cycling delay (configurable)
- ΔT control (on request)
- BACnet MS/TP or Modbus communication (selectable)

Universal Applications

- Fan coil units (2 or 4 pipes)
- Rooftop units
- Heat pumps
- Humidity control
- Packaged or split unitary systems
- Other heating/ cooling equipment

ARO/AROB

IAQ
Wall Mount Controller

Inputs

BI1
1 Binary*

AI1
1 Analog

Outputs

BO2
2 Binary*

AO2
2 Analog*

ECM

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Configurable*

Stand-Alone Models

Model	Temp.	RH	CO_2	VOC
ARO24T	•			
ARO24TH	•	•		
ARO24TGH	•	•	•	
ARO24TGVH	•	•	•	•

Networkable Models

Model	Temp.	RH	CO_2	VOC
AROB24T	•			
AROB24TH	•	•		
AROB24TGH	•	•	•	
AROB24TGVH	•	•	•	•

Main Features

- Built-in application profiles to automatically configure the controller for the selected application.
- Up to 4 simultaneous control loops
- Integrated ECM fan control mode
- Displays temperature, %RH, CO_2, VOC, and setpoints
- Display or hide all the required access for user interaction
- Precise temperature control with programmable PI function
- Independent cool and heat setpoint for No Occupancy

HROB20

Humidity Control
Wall Mount Controller

Applications

- Neptronic SKR, SKE4, SKS4, and SKG4 humidifiers
- Other humidification and dehumidification applications

Main Features

- BACnet MS/TP (stand-alone model HRO20 also available)
- 4 analog outputs and 2 dry contact outputs
- 2 configurable analog inputs
- Window or external temperature sensor input
- Alarm status and low signal selector input
- Independently configure PID on humidify & dehumidify ramps
- Adjustable setpoint with auto reset from external sensor
- Multi level lockable access menu, setpoint and control mode

CMMB100

I/O

Dual Mini Input Module
Expansion Controller

NEW

Input expansion board (CMMB)

Inputs

AI8
8 Analog*
(Universal)

24Vac/
24Vdc

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Configurable*

Models

Model	Inputs
CMMB100	8

Main Features

- BACnet MS/TP or Modbus communication (selectable)
- LED status indication of each input
- DIN rail mounting
- Removable see-through panel for easy access to DIP switches

CMMB102

I/O

Dual Mini I/O Module
Expansion Controller

NEW

Input and output expansion board (CMMB)

Inputs

AI4
4 Analog*
(Universal)

24Vac/
24Vdc

Outputs

BO2
2 Binary*

AO2
2 Analog*
(Universal)

SW
4 Override
Switches

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Configurable*

Models

Model	Inputs	Outputs
CMMB102	4	4

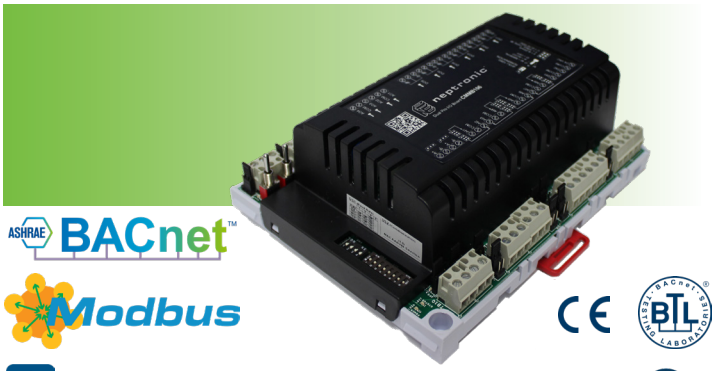
Main Features

- BACnet MS/TP or Modbus communication (selectable)
- 4 override switches to manually control each output
- LED status indication of each input and output
- DIN rail mounting
- Removable see-through panel for easy access to DIP switches

CMMB106

I/O

Dual Pro I/O Module
Expansion Controller



Input and output expansion board (CMMB)

Models

Type	Model	Buttons	Inputs	Outputs
Exp. Board	CMMB106		10	10
Thermostat	STLD24A	Fan & heat-cool	1	
Thermostat	STLD24B	Fan & °F/°C	1	

Inputs

DI2
2 Digital*

AI8
8 Analog* (Universal)

24Vac/ **30**Vdc

Outputs

DO6
6 Digital*

AO4
4 Analog*

SW
10 Override Switches

Communication

BAC
BACnet MS/TP

Mod
Modbus RTU Slave

**Configurable*

Expansion Board (CMMB)

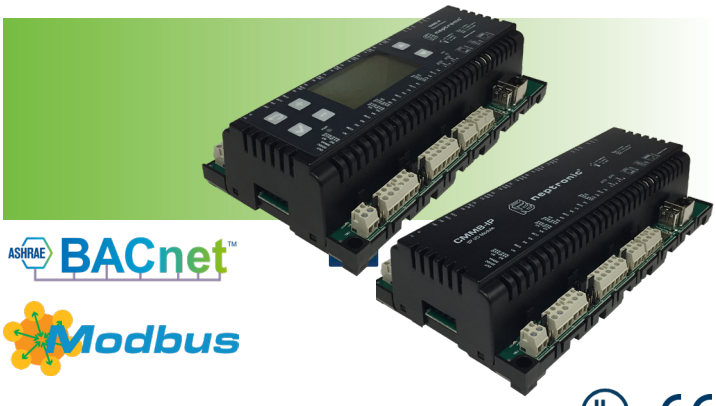
- BACnet MS/TP or Modbus communication (selectable)
- 10 inputs and 10 supervised outputs
- 10 override switches to manually control each output
- LED status indication of each input and output
- DIN rail mounting

Room Thermostat (STLD)

- User Interface fully customizable via Modbus RTU
- Backlit LCD with simple icon and text driven menus
- Built-in temperature sensor
- External temperature sensor input (10 KΩ)
- Selectable Fahrenheit or Celsius scale
- Set Modbus RTU baud rate via thermostat menu (9600, 19200, 38400 or 57600 bps)
- Set Modbus RTU address via thermostat menu or via DIPswitch

CMMB-IP

IP I/O Module
Expansion Controller



Models

Model	Router	Display	Communication Ports	
			BACnet Ports	Modbus Ports
CMMB-IP			1	1
CMMB-IP-L		•	1	1
CMMB-IP-R1B	•		1	
CMMB-IP-R2B	•		2	
CMMB-IP-RL1B	•	•	1	
CMMB-IP-RL2B	•	•	2	

Network Communication

BACnet MS/TP

- MS/TP @ 9600, 19200, 38400 or 76800 bps
- Automatic baud rate detection
- Automatic device instance configuration

BACnet IP/Ethernet

- All IP/Ethernet configuration via on board WEB page
- Display device status including each available data point, in addition to the BACnet object interface
- Supports DHCP or fixed/static addressing

Modbus RTU

- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

Modbus TCP/IP

- Connects to any Modbus TCP/IP master controller

Inputs

BI2
2 Binary*

AI8
8 Analog* (Universal)

24Vac/ **24**Vdc

Outputs

BO6
6 Binary*

AO4
4 Analog*

SW
10 Override Switches

Communication

BAC
BACnet MS/TP, IP
**Configurable*

Mod
Modbus RTU Slave, TCP/IP

IP
IP Network & Web Services

Features

Power & Communication

- 24Vac or 24Vdc supply
- Up to 2 RS-485 communication ports for BACnet MS/TP or Modbus RTU
- BACnet IP/Ethernet or Modbus TCP/IP
- Set network settings via embedded WEB server
- Provision for I/O expansion modules
- Router functionality (optional)

10 Inputs

- 2 binary inputs
- 8 universal inputs

10 Outputs

- 6 binary outputs
- 4 analog outputs
- Supervised manual override of outputs via local web page or local dip switches

Other

- SD card slot for updates
- USB port for 5 Vdc power supply
- RJ45 Ethernet connection for IP and WEB services
- Optional LCD display

CMMB1020

I/O

Remote I/O Module
Expansion Controller

BACnet

Modbus

Inputs

UI30

30 Universal

24Vac/
24Vdc

Outputs

BO12

12 Binary

AO4

4 Analog

UO4

4 Universal

Communication

BAC

BACnet
MS/TP

Mod

Modbus
RTU Slave

Models

Model	Inputs	Outputs
CMMB1020	30	20

Network Communication

- BACnet® MS/TP or Modbus communication ports (selectable via DIP switch)
- Select MAC address via DIP switch or via network

BACnet®

- MS/TP @ 9600, 19200, 38400, 76800 or 115000 bps
- Automatic baud rate detection
- Automatic device instance configuration
- Improved BACnet Stack
- Firmware upgradable via BACnet
- Expansion slot for connection to Neptronic RPB BACnet Router

Modbus

- Modbus @ 9600, 19200, 38400 or 57600 bps
- RTU Slave, 8 bits (configurable parity and stop bits)
- Connects to any Modbus master

Features

Power & Communication

- 24Vac or 24Vdc supply
- BACnet® MS/TP or Modbus communication port (selectable)

Inputs & Outputs

- 30 universal inputs
- 4 universal outputs
- 4 analog outputs
- 12 binary outputs

Installation

- LED status indication of each output
- DIN rail mounting
- Removable, non-strip, raising clamp terminals

Other

- 16-bit A/D Converter for greater resolution
- Supports Pt1000 and Ni1000

CMMB1322

I/O

Mini I/O Module
Expansion Controller

Input and output expansion board (CMMB)

Inputs

AI2
2 Analog*
(Universal)

120 or **240**Vac
(selectable)

Outputs

BO2
2 Binary*

SW
2 Override
Switches

24Vdc and **24**Vac
(aux. output)

Communication

BAC
BACnet
MS/TP

**Configurable*

Models

Type	Network	Inputs	Outputs
CMMB1322	BACnet MS/TP	2	2

Main Features

- BACnet MS/TP
- 2 inputs and 2 supervised outputs
- 2 override switches to manually control each output
- 120Vac or 240 Vac selectable power input
- 2 auxiliary outputs (24Vdc / 24Vac)

RPB

BACnet Router

Power

24VDC

Communication

BAC
BACnet
MS/TP, IP

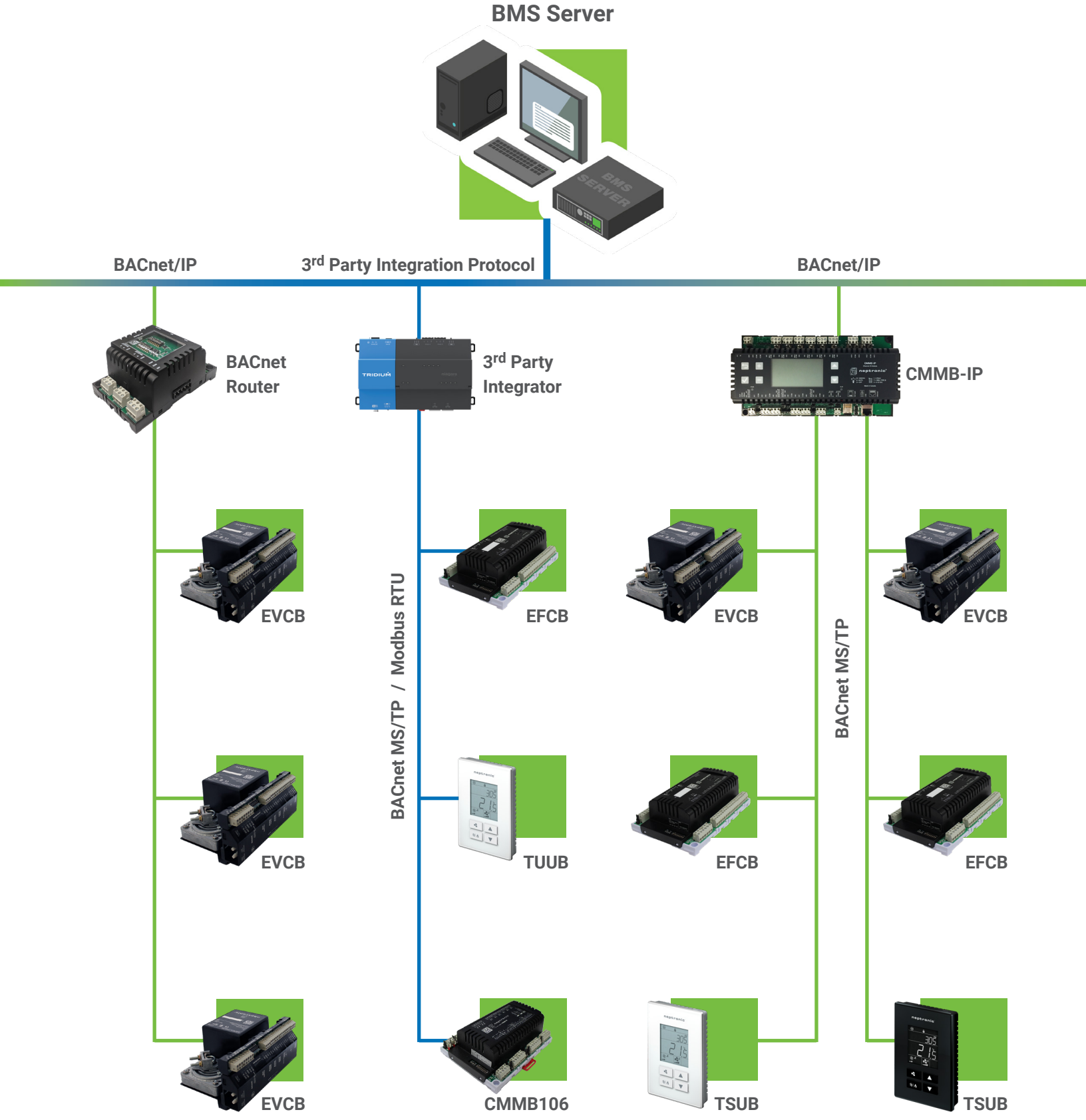
Models

Model	Description	Devices
RPB11	1-Port BACnet	Up to 32
RPB12	2-Port BACnet	Up to 64

Main Features

- 24Vac or 24Vdc supply
- Up to 32 or 64 BACnet devices without the use of additional line drivers
- Simple web based configuration for BACnet IP and MS/TP communication
- Connect using expansion slot to convert CMMB100E and CMMB102E as IP I/O cards
- Support up to 3 mini I/O cards in any combination and make them IP ready while maintaining the MS TP ports for BACnet routing

Typical System Architecture



SARB

Networkable IAQ Room Sensors

BACnet Modbus

VOC CO_2

Models

Model	Temp.	RH	CO_2	VOC
SARB24T	•			
SARB24TH	•	•		
SARB24TG	•		•	
SARB24TV	•			•
SARB24TGH	•	•	•	
SARB24TGVH	•	•	•	•

Inputs

BI1
1 Binary

AI1
1 Analog

24Vdc/
24Vac

Outputs

BO2
2 Binary*

AO2
2 Analog*

Communication

BAC
BACnet
MS/TP

Mod
Modbus
RTU Slave

**Outputs commandable via network*

Main Features

- 2 inputs and 4 outputs commandable via network
- Enthalpy and dew point calculations (available via network)
- Display or hide all the required access for user interaction
- Backlit LCD with simple icon and text-driven menus
- Selectable Fahrenheit or Celsius scale
- BACnet® MS/TP or Modbus (selectable via menu)
- Select MAC address via menu or via network
- Automatic baud rate detection
- Network service port via on-board mini USB connector

SAR

IAQ Room Sensors

Models

Model	Temp.	RH	CO_2	VOC
SAR24GH		•	•	
SAR24GV			•	•

Main Features

- CO_2 sensor feedback output (AO1)
- CO_2 warning and alarm level outputs (BO1 and BO2)
- Humidity or VOC sensor feedback output (AO2)
- Input voltage 24Vac or 24Vdc

Sensors

Humidity

SHC80: Duct Mount Humidity Sensor

- Duct mounted humidity sensor
- Built-in temperature sensor
- 2 analog outputs (0 - 10 Vdc)
- Status LED

SHS80: Duct Mount, High Limit Humidistat

- Built-in temperature and humidity sensor
- On/Off high limit humidistat with on-board setpoint adjustment
- 2 analog outputs (0-10 Vdc)
- Status and high limit LEDs
- 1 dry contact output

SHS20: Room High Limit Humidistat

- High-limit setpoint dial (20 - 90% RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

SHR10: Wall Mount Humidity Sensor

- Wall mounted humidity sensor
- Built-in temperature sensor
- Plastic cover for wall mount installation
- 2 analog outputs (0 - 10 Vdc)
- High accuracy and stability

HRL24: Room Humidistat

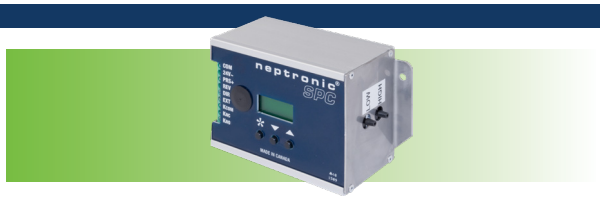
- Used to program the SK4 series humidifiers
- Icon-driven information and 1 line of text information
- 4 wires between humidistat and SK4
- Programmable PID on humidity

HRC20: Room Humidistat

- Humidity setpoint dial (10-60 %RH)
- Built-in humidity sensor
- 24Vac or 24Vdc
- 1 dry contact output

Sensors

Pressure



Model	Pressure Range
SPC 0.1	0 to 0.1" w.c.[25 Pa]
SPC 1.0	0 to 1.0" w.c.[250 Pa]
SPC 2.0	0 to 2.0" w.c.[500 Pa]
SPC 5.0	0 to 5.0" w.c.[1245 Pa]

SPC: Static Pressure Controller

- Simple installation and configuration
- Displays actual pressure reading
- Adjustable setpoint, dead band and response speed
- Selectable output signal
- Direct or reverse action outputs
- Fully calibrated
- Real-time pressure output for remote monitoring

Model	Pressure Range	Enclosure
SPD00-010	0-1" w.c.[250 Pa]	PCB only
SPD70-010	0-1" w.c.[250 Pa]	Metal enclosure
SPD00-020	0-2" w.c.[500 Pa]	PCB only
SPD70-020	0-2" w.c.[500 Pa]	Metal enclosure
SPD00-050	0-5" w.c.[1245 Pa]	PCB only
SPD70-050	0-5" w.c.[1245 Pa]	Metal enclosure

SPD: Static Pressure Differential Transducer

- Small footprint
- Simple and easy to install
- Selectable output signal (0-10 or 2-10 Vdc & 4-20 or 0-20mA)
- High flow impedance in the range of tens to hundreds of kPa

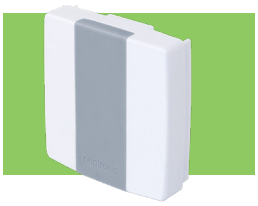
Sensors

Temperature

STC8: Duct Mount Temperature Sensor

- High accuracy and stability
- Fast thermal response
- Epoxy encapsulated sensor
- Extended durability
- Resistor/Temperature Curve
  - "G" matched (STC8-11, 10KΩ)
  - "A" matched (STC8-13, 3.3 KΩ)
- Compatible with Neptronic controllers

STC8-11	10KΩ
STC8-13	3.3KΩ
STC80X	Analog



STR1: Wall Mount Temperature Sensor

- Available with 10KΩ or 3.3KΩ thermistor
- High accuracy and stability
- Negative Temperature Coefficient (NTC)
- Compatible with Neptronic products

STR1-11	10KΩ
STR1-13	3.3KΩ

STP: Strap-On Water Temperature Sensor

- High accuracy and stability
- 10KΩ Type III Thermistor
- Designed for fan coil 2 pipe changeover applications
- Sensitive to non-polarity
- Temperature range: -40°C to 150°C (-40°F to 302°F)

STP7-11	Metal
STP1-11	Plastic

STI1-11: Immersion Water Temperature Sensor

- 10KΩ Type III Thermistor
- Immersion type temperature sensor
- Double encapsulation sensor eliminates moisture infiltration
- Machined 5 Brass thermowell
  - ABS plastic enclosure
  - Quick snap latch

OTW/SHW: Window Temperature Sensor

- 10KΩ (SHW0-11) or 3.3KΩ (OTW) temperature sensor
- Self adhesive: sticks directly on window

Accessories

CVC

- 24Vac or 24 Vdc supply
- 2 or 4 SPDT relays (staged or sequenced operation)
- Voltage or current input
- Adjustable relay setpoint, hysteresis and activation delay
- Input signal management (loss of signal)
- Displays input voltage or current
- LED status indication of each relay
- Snap Track mounting
- Non-strip, raising clam terminals

Model	Relays
CVC002	2
CVC004	4

SCC80: Changeover Control Sensor

- 24Vac or 24 Vdc supply
- Sensor operation temperature up to 80°C [176°F]
- Fast response, excellent accuracy
- SPDT output relay
- No adjustments required (pre-calibrated)
- Built-in mounting tabs and mounting screws supplied for easy installation
- Status LED

Actuators

Actuated Valves

ACTUATORS

Up to 70in.lb (8Nm)

D-B-S

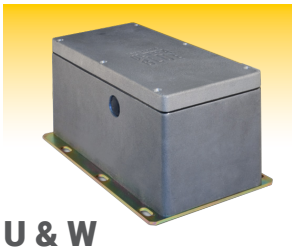
- 35in.lb (4Nm) to 70in.lb (8Nm)

Up to 360in.lb (40Nm)

L-T-R

- 140in.lb (16Nm) to 360in.lb (40Nm)

Up to 4000in.lb (450Nm)



U & W

- 1800in.lb (200Nm) to 4000in.lb (450Nm)

Fast

B-T-R

- Running time of 1.5sec to 30sec

Smoke Damper

BTX-LX

- Rated at 250°F (121°C)

Outdoor

IP65

- High humidity and outdoor applications

Linear

A-V-X

- Zone, globe and PIC valve applications

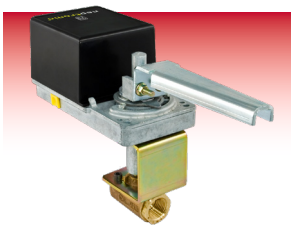
ACTUATED VALVES

Characterized Ball

Contoured Port Ball

Full Port Ball

Industrial Ball



Butterfly

Zone

Globe

MANUFACTURER OF

- HVAC CONTROLS
- ELECTRIC ACTUATORS
- ACTUATED VALVES
- HUMIDIFIERS
- ELECTRIC HEATERS

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