B:426 mm
T:420 mm

Life Is On | Schneider Electric

The smartest way to keep critical equipment cool

se.com/enclosures

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The smartest way to keep critical equipment cool

ClimaSys™ Smart Ventilation System

se.com/enclosures

Life Is On | Schneider Electric

The smartest way to keep critical equipment cool

B:303 mm
T:297 mm

F:210 mm
F:210 mm

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Why do ventilation systems fail?

When filters are blocked by dust or dirt and are not immediately replaced, less cool air is able to enter the enclosure, eventually causing:

- Inefficient fan operation, moving less air and consuming more energy
- Accumulated dust affecting internal moving parts, reducing effectiveness of heat dissipators, and could cause either conductivity or isolation across electronic radiators
- Increased internal temperature that reduces lifespan of electronic-based PLCs, motor controllers, speed drives, etc. by up to half, as well as safety risks due to overheated surfaces
- Failure of equipment, short-circuits, and faulty connections that, in turn, cause downtime for entire production lines and continuous critical processes, leading to significant losses

$22,000

Average cost of 1 minute of downtime for the US auto industry.

Source: ATS

€50,000

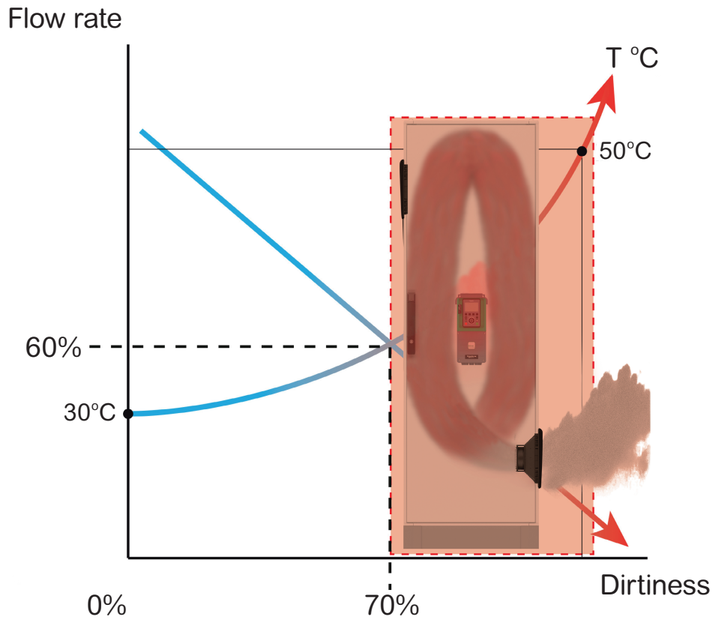
Average cost of 1 hour of downtime for metal foundries.

Estimated

70%

Percentage of installations facing performance issues due to dirty filters.

Estimated



Equipment health is directly dependent on filter dust levels. Clogged filters cause fans to run inefficiently, airflow to slow or stop, and equipment lifespan to be cut in half.

Keeping equipment cool in tough environments

The harsh reality for equipment

The temperature inside control panels and electrical distribution enclosures needs to be carefully controlled. Ventilation systems are essential to keeping conditions stable so that your critical automation and protection equipment runs smoothly. But, over time, ventilation filters collect dirt and can become blocked. If left unchecked, temperature rises, equipment fails, and production stops, causing big production loses.

Up to €5,000 per year

Wasted energy from 50 fans running at 20% efficiency due to having 100% clogged filters.

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The digitized solution that tackles every ventilation challenge

Continuous, system-wide monitoring

Introducing the ClimaSys Smart Ventilation System (CSVS) from Schneider Electric. It's digitized, scalable thermal network that gives you real-time monitoring of all critical ventilation and airing functions, across all of your automation or electrical distribution control panels. Stay connected with the health status of your entire thermal architecture at all times.

Ventilation predictive maintenance

Get advance notifications if filters or other parts need servicing or replacement, or if ventilation failure is imminent. You'll anticipate and avoid shutdowns.

You'll also cut operational costs by correcting high risk conditions before they cause equipment failures.

CSVS helps you optimize the four critical aspects of your equipment performance:

Higher reliability

Even the smallest equipment can be financially catastrophic for your business. Keeping ventilation working reliably keeps equipment and operations running continuously.

Longer lifespan

An efficient ventilation system can double the lifespan of speed drives, PLCs, UPSs, contactors, HMI, switches, batteries, electronic state relays, and more.

Greater energy efficiency

Fully clogged filters reduce fan efficiency by up to 80%. For 50 fans that's €5000* lost each year! Keeping filters clean maximizes energy efficiency and reduces cooling power requirements.

**Estimated calculation*

Enhanced safety

Efficient ventilation will keep surface temperatures under 70°C, helping avoid risk of fire, risk of burns to people, and risk of insulation failure which can cause exposed conductors and short circuits.

Smart Filters

Dust Sensor

Fan Sensor

FilterStat Controller

Thermal HUB

Smart Grids

Smart Fan

Connecting to ultimate ventilation performance

The ClimaSys Smart Ventilation System is a smart, tightly integrated network that makes your life easier. The nucleus of the system is the ClimaSys FilterStat controller that collects information from filter and fan sensors across all of your enclosures. Intelligent algorithms analyze all data inputs, helping FilterStat to keep you informed about the thermal status of every enclosure.

Unique, accurate dust filter analysis

Each Smart Fan and Smart Grid in the ClimaSys Smart Ventilation System includes a Smart Filter with integrated Dust Sensor. These sensors work with patented infrared technology and advanced algorithms. The system lets you know, by percentage and in real time, how much dirt has been accumulated and when the filters need to be replaced.

Additionally, each sensor measures the air temperature passing through the filter, for inlet and outlet Smart Grid locations. The system will also provide the delta-T value of the enclosure.

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Clear indicators help you take action

The ClimaSys Smart Ventilation System keeps you informed of ventilation system statuses in two very effective ways.

High-visibility LED indicators

Multi-colored LEDs on the front of each Smart Fan and Smart Grid give you clear indication of filter and fan status. The green light shows the system is working well, the orange light lets you know you may soon need to replace the filters, and the red light means the filters need to be replaced.

A purple light indicates that the Smart Fan has reached its end-of-life and needs to be replaced. For troubleshooting, the system also offers a ‘ping’ function to help you locate a selected enclosure by turning the LED blue.

- **Dust filter alarm** 0% - 60%
- **Dust filter alarm** 60% - 80%
- **Dust filter alarm** >80% Filter needs to be replaced or ventilation / airing alarm
- **Fan lifetime over** Lifetime of the fun is near to the over
- **PING function**

Detailed performance information

The FilterStat controller’s screen displays useful measurements and alarms to help keep your ventilation system running efficiently. The controller can also connect to a PLC, speed drive, HMI, or other equipment via a dry contact alarm relay, and an analog output indicating ‘dirtiest filter level’.

Filter Sensor Data	
Dust level	Level of filter dirtiness (from 0% to 100%)
Airflow temperature	Temperature of air that flows through each filter (bottom and top grilles)
Number of replacements	
Remaining time before next replacement	
Days since the last renewal of the filter	
Fan Sensor Data	
Airflow temperature (transported air)	Temperature of the air that throws the fan motor and blades
Blade speed measurement	Fan speed sensor (in RPM)
Current level	In Amps
Energy consumption	In kWh
Used and remaining lifetime	Approximation (in hours) according to the working temperature conditions

Complete fan and airflow performance monitoring

Beyond its dust and air temperature sensors in its Smart Filter, each Smart Fan in the ClimaSys Smart Ventilation System uses additional fan sensors to measure RPM (revolutions per minute) as well as the current consumed by the fan in mA. In addition, the temperature of the ‘transported’ air around the fan is measured.

Together, these sensors enable you to check how efficiently the fan is using energy and when the temperature inside the panel is higher than the capacity of the fan.

The system can integrate sensors from intake fans, roof fans, and internal recirculating (brassage) fans.

Alarms	
Dust filter alarm	Filter capacity is below user-defined level (LED colors: 0%-60% = green, 60%-80% = orange, >80% = blinking red)
Fan lack of energy	Fan is running, there is RPM reading, but current sensor has 0 mA reading
Fan rpm slow	Fan speed is below a user-defined level
Fan flaps blocked	Energy consumption of fan detected but the RPM is 0
Over-temperature alarm on airflow	Fan temperature exceeds a user defined threshold
Over-temperature or down-temperature alarm	Temperature alarm on inlet or outlet air from grids
Lifetime over	The fan life time is about to be over and requires replacement (LED color: violet)
ΔT deviation	Temperature deviation is greater that a user-defined threshold
Remote ref broken	A device in the network is disconnected

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F:210 mm

Adaptable to any new or existing enclosures

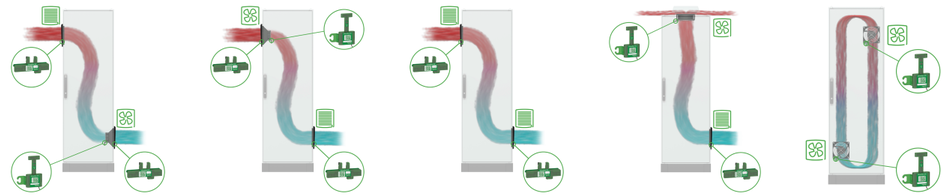
For Greenfield applications, the ClimaSys Smart Ventilation System offer is composed by a FilterStat and Thermal Hub Controllers and complete Smart Fans and Smart Grids with integrated Smart Filters and sensors.

For Brownfield, a retrofit kit option lets you digitize your existing panels and ClimaSys components in a simple, safe way.

CSVS is also compatible with ClimaSys CV fans and ClimaSys CC control devices standard products.

5 architectures are available

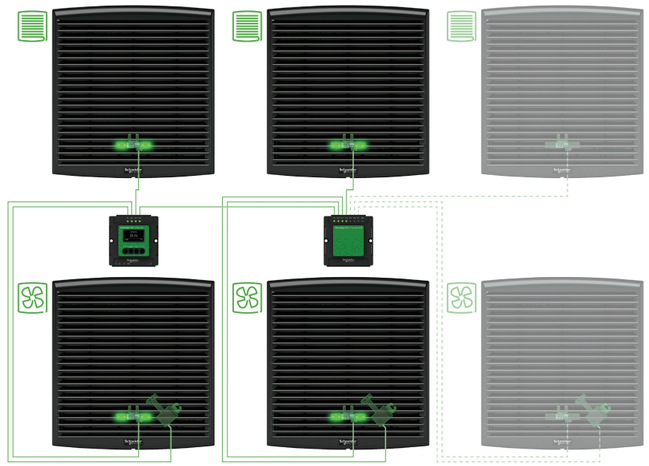
The system works with all possible architectures.
It will also work with extractor or ventilation type fans.



TOP	Airing (grid)	Ventilation (extraction)	Airing (grid)	Roof ventilation (extraction)	Brassage (internal fan)
BOTTOM	Ventilation (impulsion)	Airing (grid)	Airing (grid)	Airing (grid)	Brassage (internal fan)

Expand your network.

To support a large number of enclosures from a single FilterStat module, up to eight Thermal Hub devices can be used to extend network capacity to up to 256 sensors.



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F:210 mm

Build your **GREENFIELD** solution for a new installation

The nucleus of the system is the ClimaSys Filterstat™ controller that collects information from filter and fan sensors across all of your enclosures.

❶ Select your Smart Fan

❷ Select your Smart Grid

NSYCAG92DG

New ClimaSys Smart Grids Offer

Complete Smart Grid that includes:

- Dust Sensor
- Smart Filter G2*

Grid cut-out (mm²)	Grid references
92x92	NSYCAG92DG
125x125	NSYCAG125DG
223x223	NSYCAG223DG
291x291	NSYCAG291DG

[!] Control devices (thermostat, hygrostat, hygrotherm) **must be ordered separately.**

❸ Select your controller and potential thermal hubs to digitalize more than 1 enclosure

NSYCCOFST90250V

NSYCCOFSEM8U•

Filterstat Controllers (4 ports) and thermal hubs (8 ports)		
Voltage (V)	Controller ref.	Thermal hub ref.
30V AC/DC	NSYCCOFST30V	NSYCCOFSEM8U1
90-250V AC	NSYCCOFST90250V	NSYCCOFSEM8U2

Modular frame IP55

Trim frame IP55 for installing the Filterstat Controller and thermal Hub on enclosure doors, side panels etc.
Material and colour: same as controller.

Reference
NSYCCOFR55

❹ Select your communication cables

(the commonest architecture is made up of 3 cables to be selected for 1 enclosure with 1 fan at the bottom and 1 grid at the top)

NSYCCA50MFST

Filterstat communication cable

Black unshielded cable with 2 connectors on each side.
Material: PVC.

Length (mm)	Cable references
500	NSYCCA50MFST
1000	NSYCCA100MFST
1500	NSYCCA150MFST
2000	NSYCCA200MFST
3000	NSYCCA300MFST
4000	NSYCCA400MFST
5000	NSYCCA500MFST

Easy product selection with the Proclima selection tool

Select your **BROWNFIELD** kit for an existing installation

To digitalize an existing installation, order the appropriate brownfield kit:

Suitable for existing enclosures with fan at the bottom and grid at the top (lateral or door)

Characteristics		Brownfield kits
Grid cut-out size (mm)	Cable size (m)	References
92 x 92	0.5	NSYCCFSBRKIT92
125 x 125	1	NSYCCFSBRKIT125
223 x 223	1.5	NSYCCFSBRKIT223
291 x 291	2	NSYCCFSBRKIT291

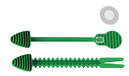
The kit includes:

- 2 units external covers grey smokey grids
- 2 units smart filters (2 Filter Mat G2 + 2 dust sensors)
- 1 unit Filterstat Controller (90-250 V, 50 Hz-60Hz)
- 3 cables
- 1 rpm + toroidal sensor
- Other equipment: 10 stickers and retainer flaps mini-tool kit

... or select brownfield components separately:

Characteristics	External Smart Grids	External smokey grids	Smart filters*	Dust Sensor
	External grids equipped with G2 filter and Dust Sensor to be installed in an existing grid support.	External grids to be installed in an existing grid support or used as spare part. Smart filter and Dust sensor to be ordered separately.	Set of 5 Smart filters for replacement on Smart Fans and Smart Grids.	Individual Dust Sensor ready to be implemented on any existing ClimaSys CV fan or ClimaSys CA grids in the brownfield installation or used as spare part.

Grid cut-out size(mm)	References		Filter type		References	
92 x 92	NSYCAG92DGC	NSYCAG92BPC	M1	G2	NSYCAF92DG	NSYCCAFSDUST
125 x 125	NSYCAG125DGC	NSYCAG125BPC	M1	G2	NSYCAF125DG	
			M1	G3	NSYCAF125G3DG	
223 x 223	NSYCAG223DGC	NSYCAG291BPC	M1	G2	NSYCAF223DG	
			M1	G3	NSYCAF223G3DG	
291 x 291	NSYCAG291DGC	NSYCAG223BPC	M1	G2	NSYCAF291DG	
			M1	G3	NSYCAF291G3DG	



10 stickers and retainer flaps mini-tool kit	Fan Sensor
Tool kit for digitalizing fans in brownfield installations without opening fan motor rear grids.	Individual Fan Sensor ready to be implemented on any existing fan in the brownfield installation or used as spare part.
Reference	
NSYCCABLK	NSYCCARPM

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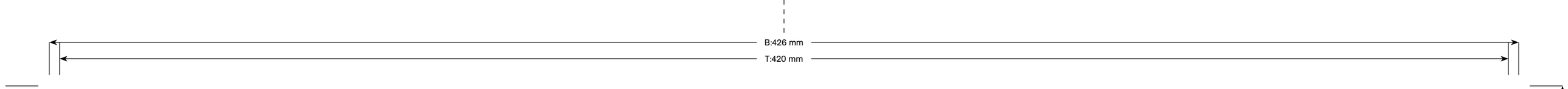


Smart ventilation systems

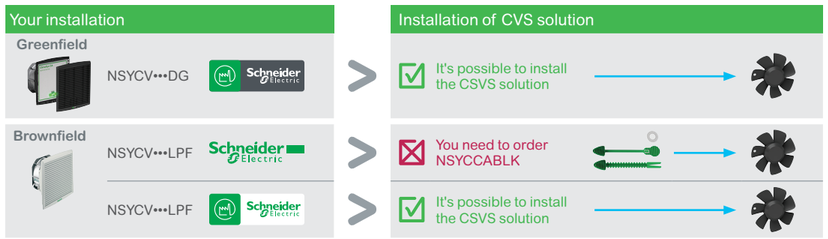
Forced Ventilation

Characteristics	Forced ventilation fan 38 m³/h	Forced ventilation fan 85 m³/h	Forced ventilation fan 165 m³/h	Forced ventilation fan 300 m³/h	Forced ventilation fan 560-850 m³/h
	The Smart fans are equipped with an axial motor, a protective housing on the front, rear surfaces, and a Smart filter with Dust sensor and a Fan sensor with infrared technology. The external smokey grid displays the status of the ventilation functions through the LED colours of the Dust sensor. This Smart filter can be replaced for maintenance during operation without risk of contact with the rotating element.				
Material of external grids	Injected thermoplastic (ASA PC). self-extinguishing according to UL 94 V-0.				
Colour of external grids	Smokey black RAL 9005				
Conditions of use	• The external temperature must not exceed 30°C and must be more than 5°C lower than the temperature required in the enclosure • The Smart filters that equip the Smart fans must be replaced when the alarm is triggered Filterstat controller • Storage Temperature: -40…+ 70°C				
Ingress protection rating (according to IEC 60529)	IP54				
Mechanical protection rating (according to IEC 62262)	IK08				
Installation	The cut-out template supplied with the device avoids the need for marking and protects the surface of the enclosure during handling.				
Options					

Free flow rate with standard filter (m³/h)	Flow rate with outlet grille(s) (m³/h) 1	2	Voltage range (nominal voltage)	Absorbed power (max. intensity)	Noise level	External dimensions (cut-out)	Weight	Operating temperature	Max. static pressure	Type of connection: by cable	by faston (1)	by faston (1)	by faston (1)	by terminal block
34 (50 Hz) 35 (60 Hz)	21 (50 Hz) 22 (60 Hz)	29 (50 Hz)	150 V...250 V (230 V)	4.5/4.8 W (0.16/0.17 A)	40/41 dB (A)	137 x 117 x 49 (92 x 92)	0.220 kg	-10…+ 70°C	29 Pa	NSYCVF38M230DG*	-	-	-	-
34 (50 Hz) 35 (60 Hz)	23 (50 Hz) 24 (60 Hz)	35 (50 Hz)	75 V...125 V (115 V)	3.3/3.5 W (0.16/0.16 A)	40/41 dB (A)	137 x 117 x 49 (92 x 92)	0.220 kg	-10…+ 70°C	29 Pa	NSYCVF38M115DG*	-	-	-	-
74 (50 Hz) 87 (60 Hz)	52 (50 Hz) 61 (60 Hz)	60 (50 Hz)	175 V...253 V (230 V)	17/15 W (0.121/0.097 A)	46/49 dB (A)	170 x 150 x 62 (125)	0.780 kg	-20…+60°C	50 Pa	-	NSYCVF85M230DG	-	-	-
68 (50 Hz) 81 (60 Hz)	54 (50 Hz) 63 (60 Hz)	62 (50 Hz)	75 V...126 V (115 V)	16/15 W (0.207/0.179 A)	46/49 dB (A)	170 x 150 x 62 (125)	0.780 kg	-20…+60°C	50 Pa	-	NSYCVF85M115DG	-	-	-
142 (50 Hz) 170 (60 Hz)	130 (50 Hz) 151 (60 Hz)	138 (50 Hz) 152 (60 Hz)	175 V...253 V (230 V)	16.3/14.3 W (0.12/0.94 A)	50/51 dB (A)	268 x 248 x 104 (223 x 223)	1.140 kg	-20…+60°C	50 Pa	-	-	NSYCVF165M230DG	-	-
151 (50 Hz) 173 (60 Hz)	130 (50 Hz) 151 (60 Hz)	138 (50 Hz) 156 (60 Hz)	75 V...126 V (115 V)	15.5/14.4 W (0.20/0.18 A)	50/51 dB (A)	268 x 248 x 104 (223 x 223)	1.140 kg	-20…+60°C	50 Pa	-	-	NSYCVF165M115DG	-	-
259 (50 Hz) 307 (60 Hz)	209 (50 Hz) 251 (60 Hz)	218 (50 Hz)	145 V...253 V (230 V)	36/37 W (0.17/0.16 A)	55/56 dB (A)	268 x 248 x 116 (223 x 223)	1.3 kg	-10…+ 70°C	158 Pa	-	-	-	NSYCVF300M230DG	-
259 (50 Hz) 307 (60 Hz)	209 (50 Hz) 251 (60 Hz)	221 (50 Hz)	75 V...126 V (115 V)	36/36 W (0.35/0.32 A)	55/56 dB (A)	268 x 248 x 116 (223 x 223)	1.3 kg	-10…+70°C	158 Pa	-	-	-	NSYCVF300M115DG	-
502 (50 Hz) 526 (60 Hz)	412 (50 Hz) 448 (60 Hz)	420 (50 Hz)	207 V...244 V (230 V)	68/85 W (0.52/0.370 A)	59/59 dB (A)	336 x 316 x 161 (291 x 291)	3.2 kg	-15…+60°C	140 Pa	-	-	-	-	NSYCVF560M230DG
522 (50 Hz) 526 (60 Hz)	425 (50 Hz) 417 (60 Hz)	434 (50 Hz)	103 V...122 V (115 V)	65/83 W (0.60/0.72 A)	59/59 dB (A)	336 x 316 x 161 (291 x 291)	3.2 kg	-15…+60°C	140 Pa	-	-	-	-	NSYCVF560M115DG
638 (50 Hz) 603 (60 Hz)	500 (50 Hz) 462 (60 Hz)	528 (50 Hz)	207 V...244 V (230 V)	150/195 W (0.65/0.85 A)	76/75 dB (A)	336 x 316 x 162 (291 x 291)	4.1 kg	-15…+60°C	170 Pa	-	-	-	-	NSYCVF850M230DG
783 (50 Hz) 744 (60 Hz)	643 (50 Hz) 442 (60 Hz)	654 (50 Hz)	103 V...122 V (115 V)	145/182 W (1.279/1.6 A)	78/77 dB (A)	336 x 316 x 162 (291 x 291)	4.1 kg	-15…+60°C	170 Pa	-	-	-	-	NSYCVF850M115DG
731 (50 Hz) 603 (60 Hz)	598 (50 Hz) 368 (60 Hz)	609 (50 Hz)	396 V...466 V (400 V)	126/126 W (0.226/0.232 A)	77/75 dB (A)	336 x 316 x 162 (291 x 291)	4.1 kg	-15…+60°C	170 Pa	-	-	-	-	NSYCVF850M400DG

(1) Fan models with connection are delivered with the connection cord included (2 metres).
* **Warning:** the fan NSYCVF38M230DG & NSYCVF38M115DG **MUST NOT** be connected to a power conversion module, an inverter or UPS type of power supply!

How to identify whether your ClimaSys CV fan has been upgraded to install the CSVS solution?



Thermal management system

Accessories

Smart Grid systems

Characteristics				Complete Smart Grids	External Smart Grids (without internal grid systems)
				Complete Smart Grid that includes: • Dust Sensor • SmartFilter G2	External grids equipped with G2 Smart filter and Dust Sensor to be installed in an existing grid support.
Material				Injected thermoplastic (PC), self-extinguishing according to UL 94 V-0	Injected thermoplastic (PC), self-extinguishing according to UL 94 V-0
Color				Smokey black RAL 9005	Smokey black RAL 9005
Ingress protection rating (according to IEC 60529)				IP54	IP54
Height (mm)	Width (mm)	Depth (mm)	Cut-out (mm)		References
137	117	13	92 x 92	NSYCAG92DG	NSYCAG92DGC
170	150	15	125 x 125	NSYCAG125DG	NSYCAG125DGC
268	248	18	223 x 223	NSYCAG223DG	NSYCAG223DGC
336	316	18	291 x 291	NSYCAG291DG	NSYCAG291DGC

Pockets

Characteristics	Plastic document pocket
	Fixed by adhesive tape.
Material	Polystyrene (PS)
Color	RAL 7035 grey (NSYDPA4: RAL 9001)
Supply	1 plastic document pocket

Dimensions (mm)				References	Smart filter references
Doc. format	A	B	C		
A5	174	188	22	NSYDPA5	NSYCAF92•DG & NSYCAF125•DG
A4	230	247	23	NSYDPA4	NSYCAF223•DG
A4	234	278	40	NSYDPA44(1)	NSYCAF223•DG
A3	285	476	35	NSYDPA3	NSYCAF291•DG

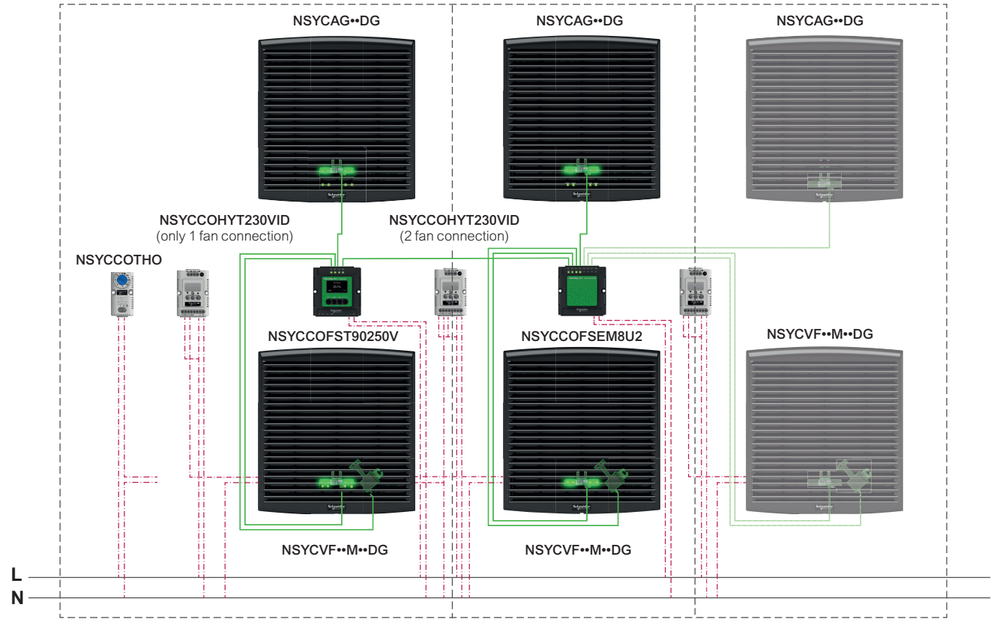
(1) Not compatible with 19" chassis or modular distribution installation.

Thermal management system

Accessories

External smokey grids (external cover only)		Smart filters		
		G2 M1 filters	G3 M1 filters	
External grids to be installed in an existing grid support or used as spare part. Smart filter and Dust sensor to be ordered separately.		Set of 5 Smart filters for replacement on Smart Fans and Smart Grids. For fans and grilles.		
Injected thermoplastic (PC), self-extinguishing according to UL 94 V-0		Polyester. Filters according to ISO 16890.		
Smokey black RAL 9005		White with green lettering		
IP54				
	Pack	References	Pack	References
NSYCAG92BPC	5	NSYCAF92DG		
NSYCAG125BPC	5	NSYCAF125DG	5	NSYCAF125G3DG
NSYCAG291BPC	5	NSYCAF223DG	5	NSYCAF223G3DG
NSYCAG223BPC	5	NSYCAF291DG	5	NSYCAF291G3DG

ClimaSys (CSVS) General wiring diagram



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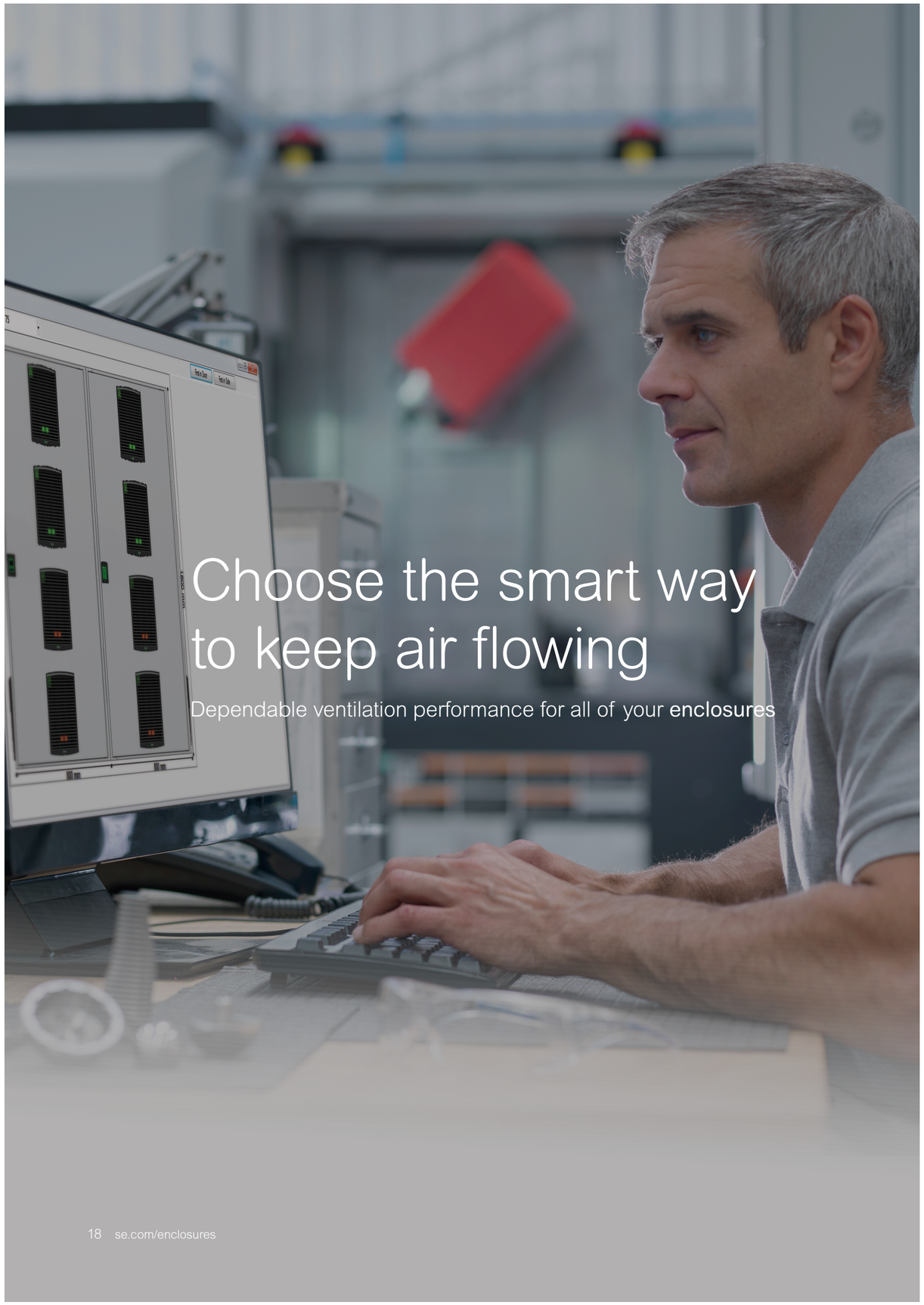

Choose the smart way to keep air flowing

Dependable ventilation performance for all of your **enclosures**

Next steps to building your solution

Determine your optimal thermal solution

ProClima™ thermal calculation software uses thermal data to propose the right thermal management choice to match the environment and electrical/electronic devices installed inside your control panel. The software takes into account variables such as: temperature, humidity, sun radiation, and indoor or outdoor settings. The program draws up a heat balance and defines the best ventilation, control, heating and cooling functions, while minimizing under- or over-sizing errors. Use ProClima to help design your ClimaSys Smart Ventilation System solution.

Select your ClimaSys Smart Ventilation System components

Refer to the CSVS online catalog pages for complete specifications on all CSVS components and to help define your solution for new or retrofit applications.

Reliable airflow for your equipment. Peace of mind for you.

The ClimaSys Smart Ventilation System is an enterprise-wide thermal solution that will help you track the health of ventilation across all of your enclosures.

You'll improve the maintenance and operation of your control panels and electrical cabinets, reducing CAPEX and OPEX by:

- Minimizing technical breakdowns
- Avoiding equipment failures and production downtime
- Increasing equipment lifespan
- Improving energy efficiency
- Replacing filters only when required

In fact, CSVS benefits every stage of an installation's life cycle.

Panel builders

- Deliver enclosures with pre-installed, intelligent ventilation monitoring and alarming.

OEMs and system integrators

- Ensure electronic equipment is protected against dust and thermal extremes.
- Support preventative maintenance with advance alerts.
- Help customers avoid technical breakdowns and disruptions.

Facility teams

- Apply time and cost-saving preventive and corrective maintenance.
- Easily identify and replace filters.
- Avoid fan failures using advance alerts.
- Avoid expensive production downtime.
- Enjoy energy efficiency savings.

90%

Potential annual savings on filters and filter maintenance for 20 enclosures.

Estimated

B:426 mm
T:420 mm
T:297 mm
B:303 mm
F:210 mm
F:210 mm