



❖ **SynJet® Spotlight Solutions**  
Philips Fortimo - October 2010

# SynJet® Spotlight Solutions for Philips Fortimo

- SynJet® Cooling Solutions Overview
- Applications – modules and conditions
- Fixture design recommendations – basics
- Part numbers and descriptions





## ❖ **Spotlight Cooling Solutions** Overview

# SynJet® Spotlight Cooler



**SynJet solutions for  
recessed downlights  
and tracklights 800  
to 2000 lumens**

# SynJet® Spotlight Solutions

- ▶ Highly reliable even in extreme conditions
  - Outlast the LEDs and Drivers with a rated lifetime of 100k hours
- ▶ Smaller heatsinks
  - Enables the smallest heatsinks for aesthetic fixture design with solutions as small as 75mm in diameter
- ▶ Low energy consumption
  - Consume very little energy using as little as 0.3W not impact the LED energy saving value proposition
- ▶ Quiet operation
  - Near silent solutions for all lumen and wattage packages



# SynJet® Spotlight Solutions – Designed for LEDs

Long life

Outlast the LEDs and Drivers with a rated lifetime of 100k hours

Any application in any ambient

Rated from -40°C up to 70°C ambient temperatures

Withstands dust and environmental buildup

Dust accumulation does not impact airflow or cooling effectiveness and the cooler can clear dust from nozzles and heatsink because of pulsating air flow, acts like scrubber, which maintains thermal performance over time

Designed for unexpected hot, cold, and damp conditions

Immune to thermal cycling, tested from -40°C to 105°C and in hot humid environments 85°C/85% r.h., Cooler will thrive during HVAC outages or the most extreme applications keeping your LEDs cool in unpredictable scenarios

Bump and vibration resistant for maintenance and wear and tear

Immune to vibrations, external bumps, and vibrations in all three directions, so no impact when redirecting tracklights, bumping during use, or maintenance of ceiling and lighting

# SynJet® Spotlight Cooler Solutions for Philips Fortimo



	SynJet ZFlow 65 Cooler and Spotlight Cooler 21W	SynJet ZFlow 75 Cooler and Spotlight Cooler 31W	SynJet ZFlow 75 Cooler and Spotlight Cooler 34W	SynJet ZFlow 75 Cooler and Spotlight Cooler 38W
LED Module Lumens (Approx.)	~1000	~2000	~2000	~2000
Thermal Wattage Cooled (Approx.)	21W	31W	34W	38W
Heatsink Diameter	75mm	75mm	87mm	100m

# SynJet® ZFlow 65 Cooler

- Available with 12V input, in Level Select.
  - Level Select – hardwired selection of operating sound level and thermal performance

SynJet ZFlow 65 Cooler		
Level Select		Spotlight Cooler 21W
High Performance	SPL <sup>1</sup> (dBA)	32
	TDP <sup>2</sup> (W)	21
Standard Performance	SPL <sup>1</sup> (dBA)	22
	TDP <sup>2</sup> (W)	17
Silent Performance	SPL <sup>1</sup> (dBA)	18
	TDP <sup>2</sup> (W)	13



1 SPL – Sound Pressure Level is measured at 1 meter distance per ISO 7779.

2 TDP – Thermal Design Power is based on a 30°C temperature rise of heat sink mounting surface above ambient temperature around cooler.



# SynJet® ZFlow 75 Cooler

- Available with 12V input, and Level Select or PWM.
  - Level Select – hardwired selection of operating sound level and thermal performance
  - PWM – pulse width modulation control of sound level and thermal performance, requires controller

SynJet ZFlow 75 Cooler				
Level Select		Spotlight Cooler 31W	Spotlight Cooler 34W	Spotlight Cooler 38W
High Performance	SPL <sup>1</sup> (dBA)	28	28	28
	TDP <sup>2</sup> (W)	31	34	38
Mid Performance	SPL <sup>1</sup> (dBA)	25	25	25
	TDP <sup>2</sup> (W)	27	30	33
Standard Performance	SPL <sup>1</sup> (dBA)	22	22	22
	TDP <sup>2</sup> (W)	22	26	31
PWM		Spotlight Cooler 31W	Spotlight Cooler 34W	Spotlight Cooler 38W
PWM (@100%)	SPL <sup>1</sup> (dBA)	28	28	28
	TDP <sup>2</sup> (W)	31	34	38



1 SPL – Sound Pressure Level is measured at 1 meter distance per ISO 7779.

2 TDP – Thermal Design Power is based on a 30°C temperature rise of heat sink mounting surface above ambient temperature around cooler.



## ❖ Applications

Philips Fortimo Modules and Conditions

# SynJet® Spotlight Cooling Solution – Selection Guide

## Open Plenum or Ventilated Tracklight up to 35°C Ambient

		SynJet® ZFlow 65 Cooler and Spotlight Cooler 21W		
Heatsink Diameter		75 mm		
LED Module	Lumen Output	Silent (18 dBA)	Standard (22 dBA)	High Performance (28 dBA)
Philips SLM	1100		✓	

# SynJet® Spotlight Cooling Solution – Selection Guide

## Open Plenum or Ventilated Tracklight up to 30°C Ambient

		SynJet® ZFlow 75 Cooler and Spotlight Cooler 31W			SynJet® ZFlow 75 Cooler and Spotlight Cooler 34W			SynJet® ZFlow 75 Cooler and Spotlight Cooler 38W		
Heatsink Diameter		75 mm			87 mm			100 mm		
LED Module	Lumen Output	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)
Philips SLM	1100	✓								
	2000		✓		✓					

# SynJet® Spotlight Cooling Solution – Selection Guide

## Open Plenum or Ventilated Tracklight up to 35°C Ambient

		SynJet® ZFlow 75 Cooler and Spotlight Cooler 31W			SynJet® ZFlow 75 Cooler and Spotlight Cooler 34W			SynJet® ZFlow 75 Cooler and Spotlight Cooler 38W		
Heatsink Diameter		75 mm			87 mm			100 mm		
LED Module	Lumen Output	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)	Standard (22 dBA)	Mid (25 dBA)	High (28 dBA)
Philips SLM	1100	✓								
	2000			✓		✓		✓		



# SynJet® Power Supply Options

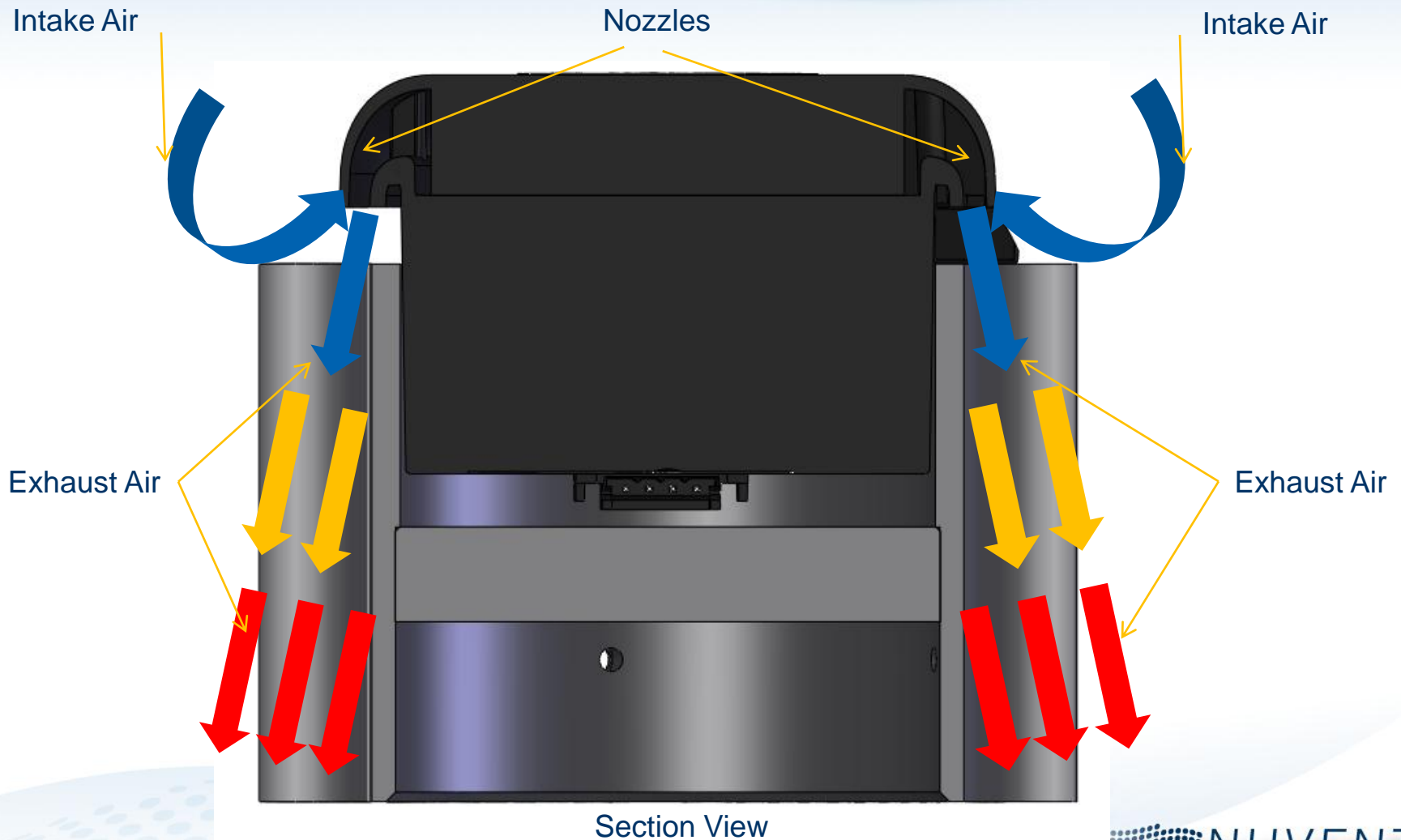
- LED Drivers with integrated 12V power supply for SynJet® Coolers are available from Philips



## ❖ Fixture Design

Thermal Recommendation - Basics

# SynJet® Airflow Basics



# Fixture Design Considerations - Basics

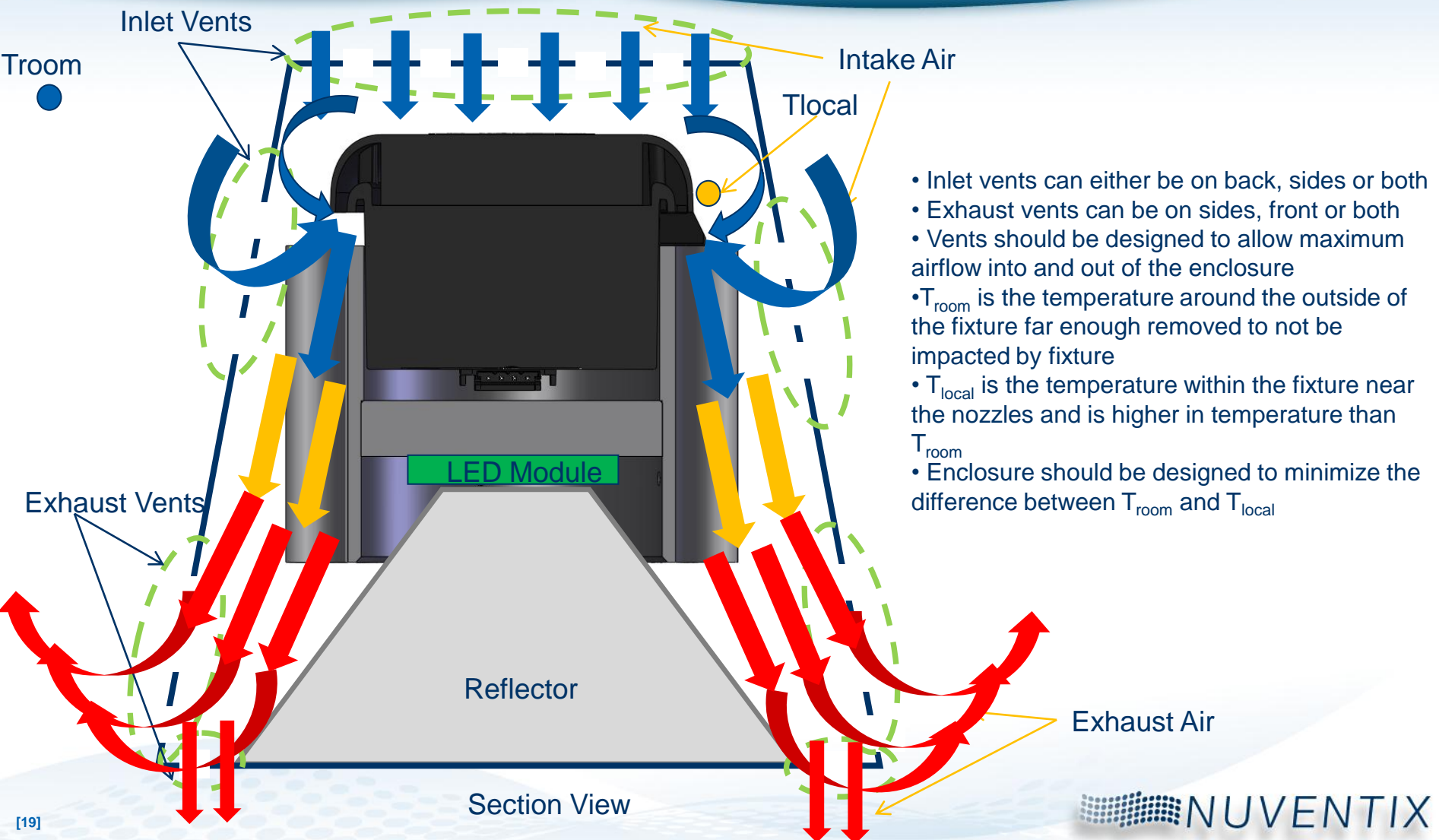
- The following threeslides provide basic considerations when designing a SynJet Spot Cooling Module into an enclosure. It is critical to design the enclosure for minimal impact on system airflow:
  - Inlet ventilation openings
    - ▶ The SynJet nozzles are both intake and exhaust openings, so the enclosure needs to be designed to have openings or air plenum around the nozzles to sufficiently pull in cool fresh air into the heat sink
  - Exhaust ventilation openings
    - ▶ The exhaust air from the heat sink needs to be able to exit out of the enclosure, otherwise the air will remain trapped within the enclosure and will heat up. The SynJet will move the heated air out and pull in fresh cool air if the exhaust ventilation openings are present and optimized

# Fixture Design Considerations - Basics

- The following threeslides provide basic considerations when designing a SynJet Spot Cooling Module into an enclosure. It is critical to design the enclosure for minimal impact on system airflow:
  - Ventilation design
    - ▶ Depends on many variables such as ambient temperature, acoustics, LED module being cooled, so to get an optimized design can take a few iterations to properly size the openings
  - Room temperature and local temperature within the enclosure
    - ▶ The ambient temperature around the enclosure ( $T_{\text{room}}$ ) is critical to deciding which thermal solution should be considered as the starting point for the design and the temperature within the enclosure ( $T_{\text{local}}$ ) will determine how well the system is ventilated and will impact the LED module temperature



# SynJet® Airflow Basics – Enclosure Guidelines





❖ Part Numbers and Descriptions

# SynJet® Spotlight Solutions

- SynJet ZFlow 65 Cooler and Spotlight Cooler 21W Solutions

SynJet ZFlow 65 Coolers	
Part Numbers	Part Description
SSSLS-CM012-013	SynJet SLC Cooler, Level Select, 12V, 600mm wires
Spotlight Cooler 21W Heatsinks	
Part Numbers	Part Description
HSSLS-CALCL-005	Heatsink, 21W, Philips SLM

- Wires Included

# SynJet® Spotlight Solutions

- SynJet ZFlow 75 Cooler and Spotlight Cooler 31W Solutions

SynJet ZFlow 75 Coolers		
ILD Part Numbers	ASIC Part Numbers	Part Description
SSLCS-CM012-001-D	SSLCS-CM012-001	SynJet, ZFlow 75, PWM, 12V, ILD
SSLCS-CM012-002-D	SSLCS-CM012-002	SynJet, ZFlow 75, Level Select, 12V, ILD
Spotlight Cooler 31W Heatsinks		
Part Numbers		Part Description
HSLCS-CALCL-001		Heatsink, 31W, Spotlight Cooler, Philips SLM

- Needs a wire harness

# SynJet® Spotlight Solutions

- SynJet ZFlow 75 Cooler and Spotlight Cooler 34W Solutions

SynJet ZFlow 75 Coolers		
ILD Part Numbers	ASIC Part Numbers	Part Description
SSLCS-CM012-001-D	SSLCS-CM012-001	SynJet, ZFlow 75, PWM, 12V, ILD
SSLCS-CM012-002-D	SSLCS-CM012-002	SynJet, ZFlow 75, Level Select, 12V, ILD
Spotlight Cooler 34W Heatsinks		
Part Numbers		Part Description
HSLCS-CALBL-001		Heatsink, 34W, Spotlight Cooler, Philips SLM, Black

- Needs a wire harness



# SynJet® Spotlight Solutions

- SynJet ZFlow 75 Cooler and Spotlight Cooler 38W Solutions

## SynJet ZFlow 75 Coolers

ILD Part Numbers	ASIC Part Numbers	Part Description
SSLCS-CM012-001-D	SSLCS-CM012-001	SynJet, ZFlow 75, PWM, 12V, ILD
SSLCS-CM012-002-D	SSLCS-CM012-002	SynJet, ZFlow 75, Level Select, 12V, ILD

## Spotlight Cooler 34W Heatsinks

Part Numbers	Part Description
HSLCS-CALBL-012	Heatsink, 38W, Spotlight Cooler, Philips SLM, Black

- Needs a wire harness

# SynJet® Spotlight Solutions

- SynJet Zflow 75 Coolers Require a Wire Harness

## SynJet ZFlow 75 Cooler Wire Harnesses

Part Numbers	Part Description
WALLS-C4150-001	SynJet Wire Harness, 4wire, 150mm
WALLS-C4240-001	SynJet Wire Harness, 4wire, 240mm
WALLS-C4370-001	SynJet Wire Harness, 4wire, 370mm
WALLS-C4600-001	SynJet Wire Harness, 4wire, 600mm



# SynJet® Spotlight Coolers

- Nuventix is working on a solution for the 3000 lumen Philips Fortimo SLM, which will be available in Q1 2011, please contact your Nuventix sales representative for more information
- For additional information, please see our website for spec sheets, design-in guides, and additional selection materials

Nuventix LED Thermal Management