

## System 27 NOVA

### Modular Electronic Temperature Control System

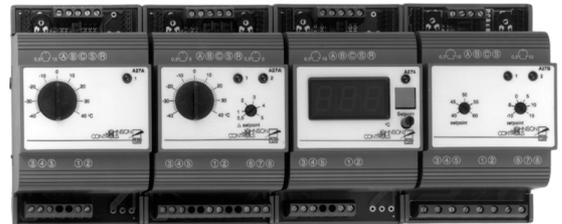
### Introduction

*System 27 NOVA is a family of modern modular electronic modules designed for a wide variety of control configurations in refrigeration, heating, ventilation, air-conditioning and other related fields.*

*The temperature control modules can be used as a stand alone device or together with other modules, such as, stage modules, display modules, time switch modules, etc., to achieve a diverse number of single or multistage applications.*

*Typical applications are:*

- refrigerated/freezer display cases
- beverage coolers
- liquid chillers
- cold-room storage.



**System 27 NOVA Modular  
Temperature Controls**

### Description

The modular concept was specially designed to make control configuration easier and still offer the flexibility necessary to answer the many individual control requirements encountered today.

#### Feature and Benefits

<input type="checkbox"/> <b>Modular design</b>	Provides the flexibility to realise the required control set up without redundancy and makes future expansion easy.
<input type="checkbox"/> <b>“Plug-in” quick connector wiring system</b>	Eliminates wiring between modules and reduces installation cost.
<input type="checkbox"/> <b>Adjustable differential and heating/cooling setting</b>	Provides flexibility to match any combination of heating or cooling applications.
<input type="checkbox"/> <b>Wide range of enclosures for sensing elements</b>	Matches various applications.
<input type="checkbox"/> <b>Attractive DIN-rail mount housing</b>	Easy and quick to install.
<input type="checkbox"/> <b>Setpoint shift output function</b>	Modules can be used for “multiple setpoint” applications.

The System 27 NOVA family includes the following modules:

### A27 Temperature Control Modules



These one- or two-stage temperature control modules can be used as a low cost control for stand alone applications, or as the primary control module for multiple stage applications. For this type of applications one or more stage modules can be connected to the

control module (thermostat) very easy by using the quick connector system. Four types of temperature control modules are available:

- \* One- or two-stage thermostats
- \* Differential thermostat:  
Responds to the difference of two temperature inputs.
- \* Frost protection thermostat:  
Senses low temperature and sensor failure.

### S27 Stage Modules



If multi-stage control is required one or more stage modules can be hooked up easily to an A27 temperature control module, simply by using the included quick connector. There are two types of stage modules available:

- \* modules with their stage setpoint linked to the thermostat setpoint. The stage setpoint can be set for the number of degrees of offset of the A27 temperature control module setpoint.
- \* modules with independent setpoint setting. These modules act as a thermostat but no additional sensor is required.

### D27A Temperature Display Modules



A display module connected to a temperature control module gives a digital indication of the measured temperature or setpoint. It is also possible to connect a sensor directly to the D27A for thermometer function. Three types of display modules are available:

- \* The DIN Rail mount display can be connected to a thermostat very easy by using the quick connector system.

- \* The Panelmount display can be used in any application where remote reading of the temperature is required.
- \* The Panelmount display/selector permits to read out up to 5 temperatures obtained from either a sensor or a thermostat or a combination



### Y27L Signal Converter



This module converts a temperature input signal to a standardised output signal of 0 to 10 or 4 to 20 mA. The input signal can either be obtained from a temperature sensor or a temperature control module. The signal converter can be used for those applications where an analogue output is required. Such as; to a motor, motor actuated valve, recorder etc.

### A99 Temperature Sensor



A wide variety of sensors is available to cover a large variety of applications. Please refer to the A99 temperature sensor bulletin.

## Note

The System 27 modules are intended to control equipment under normal operating conditions. Where failure or malfunction of the modules could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of or protect against failure or malfunction of the modules must be incorporated into and maintained as part of the control system.

## Application examples

At page 7 and 8 you will find some application examples. For more detailed information about wiring and adjustment, reference should be made to the installation sheets or application notes.

## Repair and Replacement

Repair is not possible. In case of an improperly functioning control, please check with your nearest supplier.

When contacting the supplier for a replacement you should state the type-model number of the control. This number can be found on the dataplate.

## Accessories dim. in mm

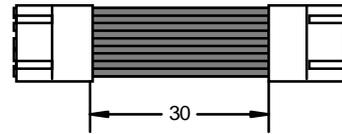


Fig. 1

**WRE027N600**

Quick Connector for connecting System 27 NOVA modules.

## Dimensions (mm)

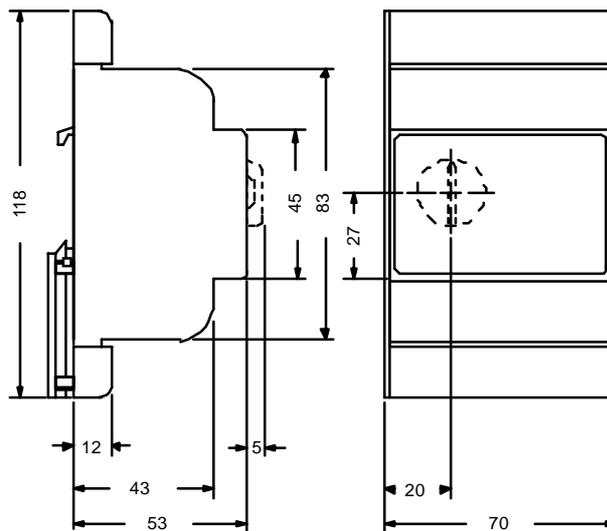


Fig. 3

System 27 NOVA Modules

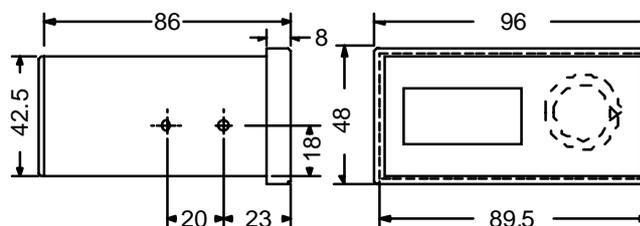


Fig. 4

Panelmount Display and Display/Selector Module

## Type Number Selection Table

### A27 Temperature Control Modules

#### One Stage Thermostat

Order number	Power supply	Setpoint range (°C)	Additional
A27A1N11	24 V ac/dc	-40 to +40	* Mode: field adjustable * Differential: 0.5 to 15K * SPDT contact 10(5)A 250 V ac * Setpoint shift: 0 to 10 K
A27A1N12	24 V ac/dc	10 to 100	
A27A2N11	230 V ac	-40 to +40	
A27A2N12	230 V ac	10 to 100	
A27A2N14	230 V ac	0 to 30	
A27A2N15	230 V ac	-20 to +60	

#### Two Stage Thermostat

Order number	Power supply	Setpoint range (°C)	Additional features
A27A1N21	24 V ac/dc	-40 to +40	* Mode: field adjustable * Differential: 0.5 to 5K * 2x SPDT contact 10(5)A 250V ac * Setpoint shift: 0 to 10 K * Δ Setpoint: 0.5 to 5 K (A27AxN251: 0.5 to 20 K )
A27A1N22	24 V ac/dc	10 to 100	
A27A1N251	24 V ac/dc	-20 to +60	
A27A2N21	230 V ac	-40 to +40	
A27A2N22	230 V ac	10 to 100	
A27A2N25	230 V ac	-20 to +60	
A27A2N251	230 V ac	-20 to +60	
A27A2N26	230 V ac	20 to 60	
A27A2N27	230 V ac	-20 to +20	

#### Differential Thermostat

Order number	Power supply	Setpoint range (K)	Additional features
A27D1N11	24 V ac/dc	0 to 10	* Hysteresis: 0.5 to 10 K * SPDT contact 10 (5) A 250 V ac
A27D2N11	230 V ac	0 to 10	
A27D2N12	230 V ac	0 to 20	

#### Frost Protection Thermostat

Order number	Power Supply	Setpoint range (°C)	Man./Auto.	Additional features
A27M2N11	230 V ac	-10 to +5	Man. reset	* Differential 1 K fixed * SPDT contact 10 (5) A 250 V ac
A27F1N11	24 V ac/dc	-10 to +5	Auto. reset	
A27F2N11	230 V ac	-10 to +5	Auto. reset	

### S27A Stage Modules

#### Stage module with stage setpoint related to thermostat setpoint

Order number	Power supply	Setpoint range (K)	Additional features
S27A1	24 V ac/dc	0.5 to 15	* Mode: field adjustable * Differential: 0.5 to 5K * 2x SPDT contact 10(5)A 250V ac * No additional sensor required * Quick connector included
S27A2	230 V ac	0.5 to 15	

#### Stage module with independent stage setpoint

Order number	Power supply	Number of outputs	Additional features
S27A3	230 V ac	1	* Mode: field adjustable * No additional sensor required * Quick connector included * Setpoint range -20 to +60 °C
S27A4	230 V ac	2	
S27A5	24 V ac/dc	1	

## D27A Temperature/Display Modules

### D27A Temperature Display Modules DIN rail mount

Order number	Power supply	Display range (°C)	Quick connector included	Additional features
D27A1N1	24 V ac	-40 to +99	no	* Can be used as a stand alone display or in conjunction with temperature control modules * Setpoint read out
D27A2N1	230 V ac	-40 to +99	no	
D27A2N1Q	230 V ac	-40 to +99	yes	

### D27A Temperature Display Modules Panel mount

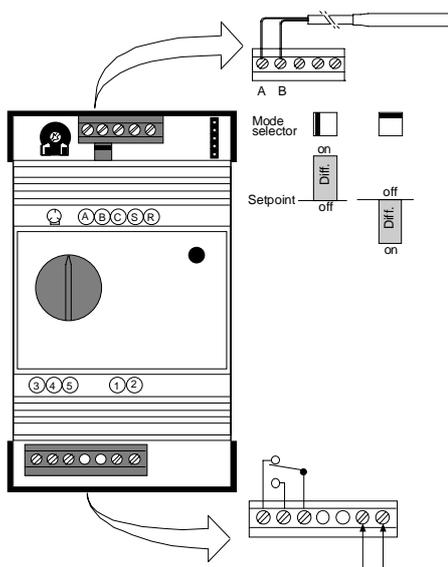
Order number	Power supply	With selector	Additional features
D27AF-9100	230 V ac	no	* Display range -40 to +99 °C
D27AG-9100	230 V ac	yes	* Display/selector reads out up to 5 temperatures

## Y27L Signal Converter

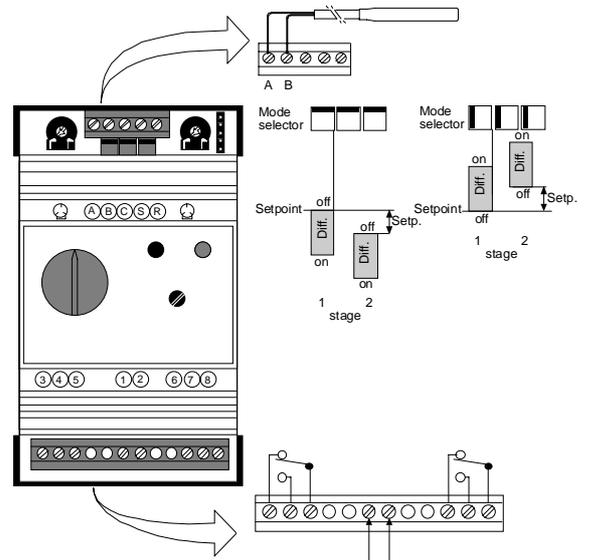
Order number	Power supply	Setpoint range °C	Span range °C
Y27L1	24 V ac	-50 to 100	2 to 200
Y27L2	230 V ac	-50 to 100	2 to 200

## Wiring & Adjustments

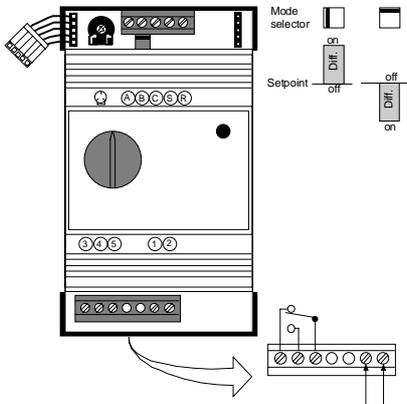
### One-stage Thermostat A27AxN1x



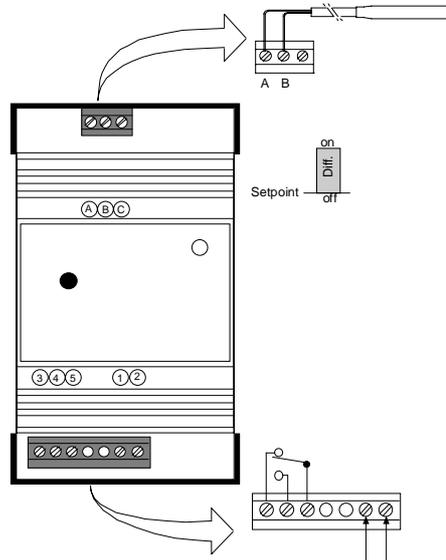
### Two-stage Thermostat A27AxN2x



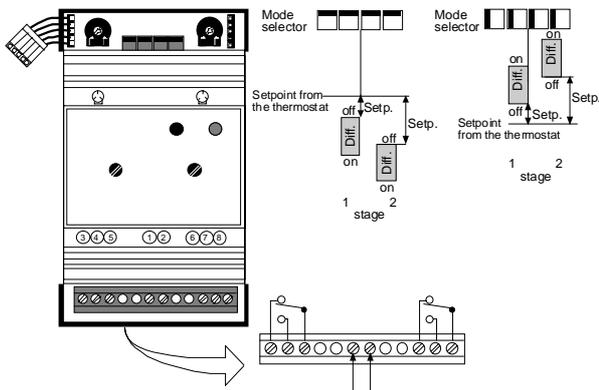
**Single Stage Module  
S27A3/S27A5**



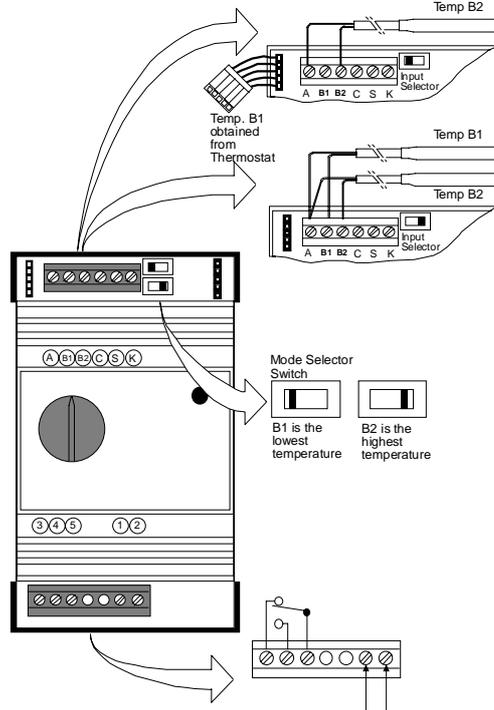
**Protection Thermostat  
A27FxN11  
A27MxN11**



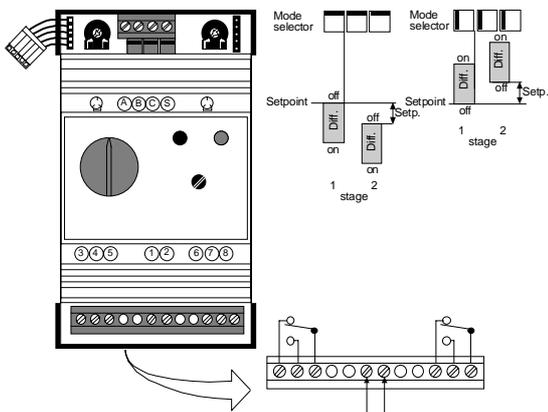
**Stage Module with stage setpoint  
related to thermostat setpoint  
S27A1/S27A2**



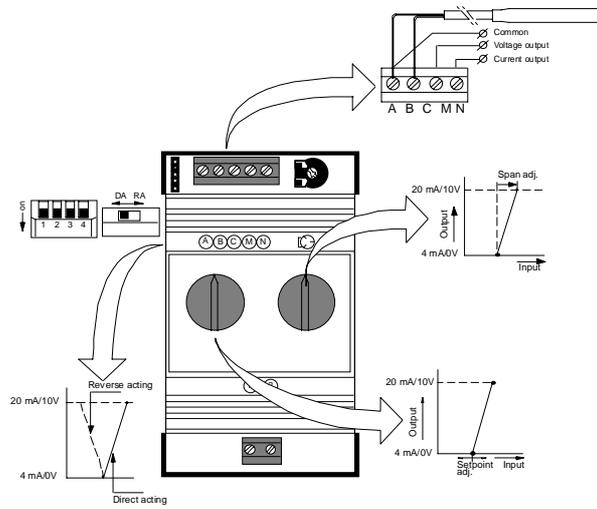
**Differential Thermostat  
A27DxN1x**



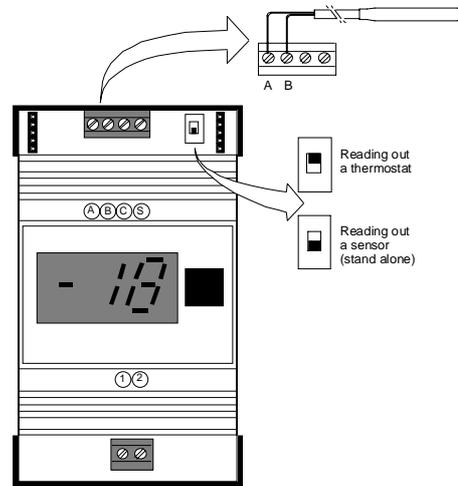
**Dual Stage Module  
S27A4**



### Signal Converter Module Y27L



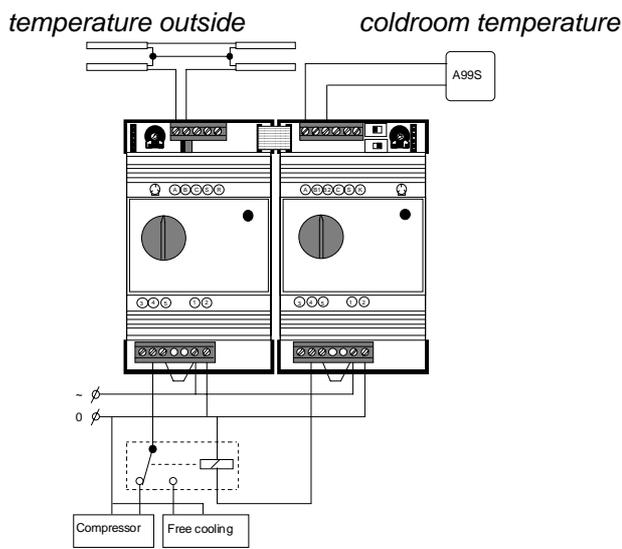
### Temperature Display Module D27A



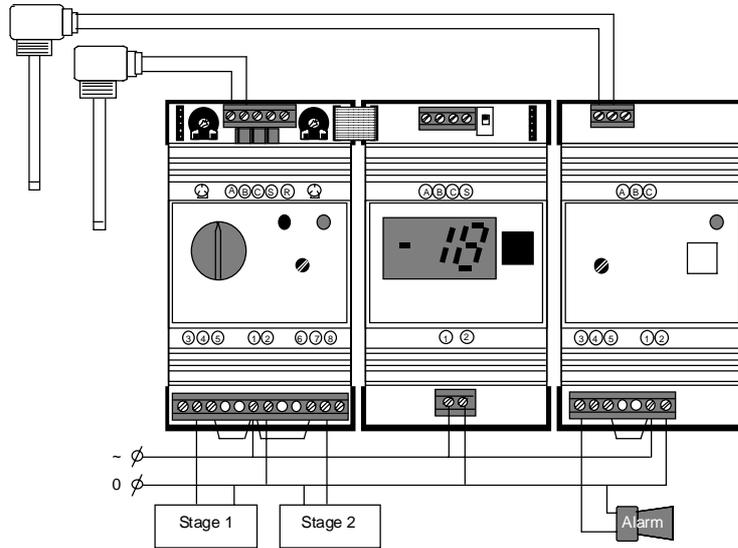
DIP switch selector		1	2	3	4
Input Signal	Thermostat	off			
	Sensor	on			
Setpoint range	-50 to 0°C		on	on	
	0 to 50°C		on	off	
	50 to 100°C		off	off	
Span range	2 to 20°C				on
	20 to 200°C				off

## Applications

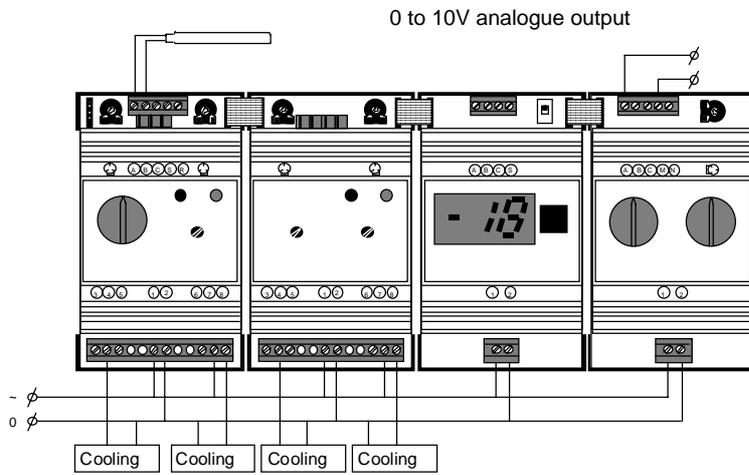
1- stage coldstore controller with temp. reading at four locations and free cooling.



### 2 - stage liquid chiller with display and frostprotection



### Four stage control with read-out and analogue output



---

# Note

## Specifications

### General System 27 NOVA

<b>Output relay rating</b>	SPDT 10(5)A 250 V ac 10 A 30 V dc
<b>Operating ambient temperature</b>	-10 to +50 °C
<b>Storage temperature</b>	-40 to +70 °C
<b>Operating (storage) R.H.</b>	10 to 90 % R.H. (non condensing)
<b>Terminals</b>	screw type max. wire thickness 2,5 mm <sup>2</sup>
<b>Power supply</b>	230 V ac +10% / -15% ; 50/60 Hz 24 V ac +10% / -15% ; 50/60 Hz

### Additional specification for display modules

<b>Power supply</b>	230 V ac +10% / -15% ; 50/60 Hz 24 V ac/dc +10% / -15% ; 50/60 Hz
<b>Resolution</b>	1°C
<b>Accuracy</b>	± 2 °C

### Signal converter

<b>Power supply</b>	230 V ac +10% / -15% ; 50/60 Hz 24 V ac +10% / -15% ; 50/60 Hz
<b>Output load</b>	voltage output Rmin = 1 k Ω current output Rmax = 500 Ω

*The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.*



#### Johnson Controls International, Inc.

Headquarters: Milwaukee, WI, USA  
 European Headquarters: Westendhof 8, 45143 Essen, Germany  
 European Factories: Lomagna (Italy), Leeuwarden (The Netherlands) and Essen (Germany)  
 Branch Offices: Principal European Cities.  
 This document is subject to change

Printed in Europe