

OPTIMISATION

OPTIMISATION OF REFRIGERATION COMPRESSOR CONTROLLERS

SPECIFICATION DATA

GENERAL

Optimisation provides the means of raising or lowering the target suction pressure in a Honeywell Genus® pack controller. Suction pressure optimisation means that suction pressures are raised to the highest level allowed within defined evaporator performance limits. This provides optimum compressor energy consumption while ensuring that the refrigerated merchandise quality is maintained at the optimum level within the case. The case is optimised using a combination of Honeywell Genus® components.

The optimisation system process consists of four main phases, these are:

- Phase 1 – Determine System Compatibility
- Phase 2 – Assess Energy Saving Requirement
- Phase 3 – Implement Energy Saving Process
- Phase 4 – Analyse Energy Saving

Determine System Compatibility

Optimisation can only be utilised in application where Honeywell Genus® components are installed.

In order to apply optimisation within an application, each component used in the process must communicate via the Honeywell Genus® network.

Calculate Energy Saving

For optimisation to be achieved specified Honeywell Genus® components must be in operation. The optimisation process begins with the monitoring of refrigerated cases via a Honeywell case & coldroom controller.

Tuscan Controller

With regards to optimisation, Honeywell's Tuscan controller controls and monitors the temperature of refrigerated cases. The controller has a temperature set-point, based on the average reading from the Air-on / Air-off probes

The controller is simple to configure with easily accessed bit switches. A hand-held Set-up unit is available to enable the operating parameters to be set or edited. Operating parameters can also be set via a front-end case display.

Honeywell Case & Coldroom Controllers

Honeywell's case and coldroom controllers have been developed to work either on the Honeywell Genus® network or stand-alone mode. However, only when a case controller is linked, via the Genus® network, to a Honeywell front-end system can a case be set to achieve optimisation.

Front-end systems are used as the central access and operating point within an optimised application. These networked control and monitoring systems permit two-way communication.

The front-end systems can be used to configure the operating parameters of any Honeywell case controller. Once the operating parameters of the case controller have been set the controller will be linked, via the Honeywell Genus® network, to a Honeywell front-end system.

Thereafter, during set periods, the average valve opening time of a case is monitored by the front-end system, via the case controller. Thus, providing an overall percentage opening for the case. The system then compares the percentage retrieved against the optimising control parameters set at the beginning of the process. Honeywell front-end systems that can be used in the optimisation process are:

- Supervisor Series
- PCVisor

Supervisor Series

Honeywell's Supervisor Series can monitor and control a maximum of 192 Genus® devices (6 networks x 32 devices) using the Honeywell Genus® network. Each Supervisor has a menu driven front panel and integral printer, with the option to connect an external printer. Optimisation parameters can be entered and edited via the Supervisor system. However, optimisation results cannot be viewed on the Supervisor front panel. When using Supervisor, access to optimisation analysis reports can only be achieved by connecting the system to a PC operating the Honeywell software InView2.

PCVisor

Honeywell PCVisor can monitor and control a maximum of 192 Genus® devices (6 networks x 32 devices) using the Honeywell Genus® network. The PCVisor is a touch screen PC that has the ability to operate web-based software and can be connected to an external printer.

Optimisation parameters can be entered and edited via the PCVisor system. Optimisation results can only be viewed on the PCVisor where Honeywell software InView2 has been installed.

Implement Energy Saving Process

Once the Honeywell front-end system has compared the percentage of valve opening time against the optimisation parameters it will communicate the appropriate command, again via the Genus® network, to the assigned Honeywell Genus® pack controller.

In order to select the correct command given to the pack controller, the front-end system cross-references the average opening time to a set of three threshold values; Optimise Up Level, Optimise Down Level and Optimise Zero Level.

Optimise Up Level (Default 70%)

If the average valve opening times of any cases are recorded as being below 70%, and no cases are recorded as being above the 'Optimise Down Level' (see below) then the pack controller is instructed to raise its target suction pressure.

Optimise Down Level (Default 90%)

If the average valve opening times of any cases are recorded as being above 90% then the pack controller is instructed to lower its target suction pressure.

Optimise Zero Level (Default 100%)

If the average valve opening times of any cases are recorded as being 100%, then the value can be used to instruct the pack controller in two ways:

- If a single case is above this level for a continuous number of average periods, and is greater than or equal to the Single Case Zero Count Parameter (default 3), then the pack controller is told to return to its standard, unoptimised target pressure.
- If multiple cases are above this level for a continuous number of average periods, and the total number of these cases are greater than or equal to the Multiple Case Zero Count Parameter (default 3), then the pack controller is told to return to its standard, unoptimised target pressure.

Honeywell pack controllers that can be used in the optimisation process are:

- Minipack 100
- Minipack 200

Minipack 100 & 200

With reference to optimisation, Honeywell's Minipack 100 and 200 Series have been developed to monitor and control compressor, within refrigerated applications capable of optimisation. Their primary function is to automatically control the suction pressure.

The Minipack has numerous software variants, all of which been developed to monitor and control compressor. However, not all variants are capable of being configured towards optimisation. The following Minipack software variants can be used in the optimisation process:

ABA	ACW	ADP
ABF	ACY	ADT
ACG	ADC	ADV

The Minipack series can be operated in 'stand alone' mode or as part of a network. Only when a pack controller is linked, via the Genus® network, to a Honeywell front-end system can a case be set to achieve optimisation.

Analyse Energy Saving

With the introduction and development of various food hygiene regulations there is a greater requirement for the monitoring and logging of case and coldroom operation data. Noncompliance with these regulations is detrimental to the management of any food storage application. Energy waste is also detrimental to such applications. With this in mind, Honeywell have developed a software program that caters for such a requirement.

InView2

InView2 is a software program designed to operate in conjunction with the Honeywell Genus® network. It is menu-driven and can be controlled using a touch-screen, mouse or keyboard.

The program works with the optimisation process to log and analyse case values and energy savings that have been achieved during optimisation. The results are shown in graph format. The method in which case values and energy savings are viewed depends on the front-end system operating in the optimised Honeywell Genus® network.

APPLICATIONS

- Honeywell Genus® networked refrigerated applications; capable of optimisation.

COMPONENT INFORMATION

Honeywell Genus® components described within this datasheet have been detailed with reference to the optimisation process only. For full component function and specification details please refer to the following product datasheets:

Product	Datasheet Reference Number
Tuscan Controller	EN0B-0009UK07
Supervisor Series	EN0B-0023UK07
PCVisor Series	EN0B-0024UK07
Minipack 100	EN0B-0015UK07
Minipack 200	EN0B-0015UK07
InView2	EN0B-0040UK07
Probes	EN0B-0025UK07

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