



**CAREL**

**Electronic Expansion Valve  
E<sup>2</sup>V Series Development**



# Carel E<sup>2</sup>V development



## Basic R&D activity

Operating concept study and prototyping  
Materials selection (chemical compatibility,...)

## Engineering

Laboratory test on models

Thermodynamic simulation and design

## Life test

Water and air flow tests

## Field test

**Since early 1996**

## Industrialization

# Carel E<sup>2</sup>V development

Basic R&D activity

Components and assembly prototyping

Prototypes assembly mechanical tests

Engineering

Prototypes assembly refrigerant flow tests

Pre-production samples (1000pcs)

Life test

Laser welding optimization

Proprietary regulation algorithm development

Field test

Industrialization

Since September **1999**

# Carel E<sup>2</sup>V development



Basic R&D activity

Samples pressure and leakage tests

Engineering

Wear and fatigue environment reproduction with 18 months of speeded up working (100% DC).  
More than 10 years in normal working (<15% DC)

Life test

Scheduled samples analysis:

No mechanical damage (strength,...)

No chemical damage (wear, parts weakness,...)

Field test

**Since December 2001**

Industrialization

# Carel E<sup>2</sup>V development



## Basic R&D activity

**Samples supply to selected customers**

**Refrigeration application in R&D Laboratory**

## Engineering

**Air conditioning units in R& D Laboratory**

## Life test

**Absolutely positive feedback form internal and external E<sup>2</sup>V tests**

**All applications give enthusiastic feedback on regulation algorithm assessment**

## Field test

**Since January 2002**

## Industrialization

# Carel E<sup>2</sup>V development

Basic R&D activity

Engineering

Life test

Field test

Industrialization

**Mechanical assembly optimization**

**Production technology review**

**Production costs and time optimization**

**One minute production cycle time (just-in-time)**

**Algorithm insertion**

**pCO Sistema**

**parametric controls**

**Mass production setting up...**

**Since June 2002**

# Carel E<sup>2</sup>V Availability

## E<sup>2</sup>V Samples

available now for selected application or field test.

Name	Code
E <sup>2</sup> V-09	E2V <b>09</b> P0S00
E <sup>2</sup> V-11	E2V <b>11</b> P0S00
E <sup>2</sup> V-14	E2V <b>14</b> P0S00
E <sup>2</sup> V-18	E2V <b>18</b> P0S00
E <sup>2</sup> V-24	E2V <b>24</b> P0S00
E <sup>2</sup> V-30	E2V <b>30</b> P0S00

# Carel E<sup>2</sup>V Availability

**E<sup>2</sup>V Mass production**  
July 2003

Name	Code
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E <sup>2</sup> V-09	E2V <b>09</b> A0S00
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E <sup>2</sup> V-11	E2V <b>11</b> A0S00
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E <sup>2</sup> V-14	E2V <b>14</b> A0S00
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E <sup>2</sup> V-18	E2V <b>18</b> A0S00
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E <sup>2</sup> V-24	E2V <b>24</b> A0S00
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E <sup>2</sup> V-30	E2V <b>30</b> A0S00
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<b>New!</b> <u>E<sup>2</sup>V-35</u>	<u>E2V<b>35</b>A0S00</u>
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[www.carel.com](http://www.carel.com)