

pRack pR300

CAREL



- ⒾTA Gestione gas custom nel pRack pR300
- ⒾNG Gas custom management on pRack pR300
- ⒾRE Gestion du gaz «custom» dans pRack pR300
- ⒾER Custom-Gas-Management im pRack pR300
- ⒾPA Gestión de gas custom en el pRack pR300

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QUESTE ISTRUZIONI** ←
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H i g h E f f i c i e n c y S o l u t i o n s

Gestione gas custom nel pRack pR300

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Per qualsiasi chiarimento o nel caso in cui non si riesca a risolvere il problema, contattare l'assistenza CAREL.

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1. REFRIGERANTI "CUSTOM"

1.1 Introduzione

Nella struttura pRack é prevista la possibilità di selezionare un refrigerante per ogni linea di aspirazione e ogni linea di condensazione. Dalla la versione 3.2 abbiamo introdotto un nuovo refrigerante "CUSTOM".

Questo refrigerante viene configurato mediante 12 parametri interi per la curva DEW, 12 per la curva BUBBLE e 12 per la curva BUBBLE da temperatura a pressione (introdotti dalla versione 4.0.1).

I parametri vengono distribuiti e validati da CAREL così come avviene normalmente per MPX PRO. CAREL per riconoscere il refrigerante e per verificare il corretto inserimento dei dati distribuisce un ID e 4 CRC (DEW, BUBBLE (temperatura), BUBBLE (pressione), GLOBAL) devono essere inseriti nel controllo assieme ai parametri dei coefficienti. La funzione dei CRC è quella di prevenire un inserimento errato oppure una manomissione dei dati da parte del costruttore. Se il CRC inserito dall'utente non corrisponde con quello generato dai parametri viene segnalato un allarme grave che non permette l'avvio del rack.

E' possibile definire un solo gas custom, ovvero non è possibile configurare due diversi gas custom su due linee diverse.

I parametri dei coefficienti sono disponibili in KSA, alla sezione "Gas custom management" raggiungibile dal seguente percorso Software & support --> Configuration & Updating Software --> parametric controller software --> pRack --> pRack Standard --> Gas custom management.

La configurazione del gas custom, utilizzando i sopracitati coefficienti, è possibile sia da terminale PGD alle maschere Ffa01..Ffa04 (per versioni precedenti la 4.0.1 maschere Cag16..Cag18) che da supervisione con protocollo MODBUS (attraverso i registri 300 e 5301...5340) e a partire dalla versione 3.2 del pRack pr300.

1.2 Configurazione

È possibile assegnare il refrigerante CUSTOM alle linee di aspirazione e condensazione tramite wizard:

```
Wizard 1b40
Compressors config.
Regulation by:
Measure unit: PRESSURE
              bar9
Refrigerant:  CUSTOM
```

o successivamente nelle masch. Caf04, Cbf04, Daf04 e Dbf04.

```
Cond.Config. Daf04

Refrigerant type:
                  CUSTOM
```

Per parametrizzare il refrigerante le maschere di configurazione sono presentate nel menu dedicato Configurazione -> Gas Custom (per versioni precedenti la 4.0.1 nel menù Compressori -> Linea 1 -> Avanzate)

La maschera Ffa01 permette di inserire i coefficienti per la conversione DEW:

Nota: per questo esempio di configurazione è stato utilizzato il refrigerante R448A

```
Custom gas Ffa01
Custom gas DEW coeff.
A= H: 8762 L: 8898
C= H: 32089 L: -23743
D= H: -24628 L: 8000
E= H: 1884 L: -21058
F= H: -24819 L: -29634
G= H: -2063 L: 6333
```

La maschera Ffa02 permette di inserire i coefficienti per la conversione BUBBLE:

```
Custom gas Ffa02
Custom gas BUB coeff.
A= H: 9374 L: 14786
C= H: -5494 L: -23487
D= H: 7700 L: 1344
E= H: -29725 L: -29378
F= H: -13170 L: -12485
G= H: -12638 L: 13371
```

La maschera **Ffa03** permette di inserire i coefficienti per la conversione BUBBLE da temperatura a pressione (introdotti dalla versione 4.0.1):

```
Custom Gas Ffa03
Custom Gas BUB T coeff
A= H: 12827 L:-11348
B= H: 18191 L:-27728
C= H: -18722 L: 6197
D= H: 5120 L: 2233
E= H: 25891 L: 829
F= H: 13861 L: -5569
```

La maschera **Ffa04** contiene i parametri relativi all'ID e CRC:

```
Custom Gas Ffa04
Custom Gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC:-29220
Dew T conv.CRC: -18200
Global CRC: 31757
```

Al termine della configurazione la campanella di allarme deve smettere di lampeggiare.

1.3 Supervisione

La configurazione dei parametri può essere effettuata anche tramite PVPRO. È stata creata una nuova categoria tra i parametri chiamata "Custom Refrigerant".

Value	Name	Unit	Current	Description
***	Gas_Custom_ID			Custom refrigerant - ID
***	Gas_Custom_Dew_A_H			DEW conversion - A coefficient HIGH part
***	Gas_Custom_Dew_A_L			DEW conversion - A coefficient LOW part
***	Gas_Custom_Dew_B_H			DEW conversion - B coefficient HIGH part
***	Gas_Custom_Dew_B_L			DEW conversion - B coefficient LOW part
***	Gas_Custom_Dew_C_H			DEW conversion - C coefficient HIGH part
***	Gas_Custom_Dew_C_L			DEW conversion - C coefficient LOW part
***	Gas_Custom_Dew_D_H			DEW conversion - D coefficient HIGH part
***	Gas_Custom_Dew_D_L			DEW conversion - D coefficient LOW part
***	Gas_Custom_Dew_E_H			DEW conversion - E coefficient HIGH part
***	Gas_Custom_Dew_E_L			DEW conversion - E coefficient LOW part
***	Gas_Custom_Dew_F_H			DEW conversion - F coefficient HIGH part
***	Gas_Custom_Dew_F_L			DEW conversion - F coefficient LOW part
***	Gas_Custom_Dew_CRC			DEW conversion - CRC check
***	Gas_Custom_BUBBLE_A_H			BUBBLE conversion - A coefficient HIGH part
***	Gas_Custom_BUBBLE_A_L			BUBBLE conversion - A coefficient LOW part
***	Gas_Custom_BUBBLE_B_H			BUBBLE conversion - B coefficient HIGH part
***	Gas_Custom_BUBBLE_B_L			BUBBLE conversion - B coefficient LOW part
***	Gas_Custom_BUBBLE_C_H			BUBBLE conversion - C coefficient HIGH part
***	Gas_Custom_BUBBLE_C_L			BUBBLE conversion - C coefficient LOW part
***	Gas_Custom_BUBBLE_D_H			BUBBLE conversion - D coefficient HIGH part
***	Gas_Custom_BUBBLE_D_L			BUBBLE conversion - D coefficient LOW part
***	Gas_Custom_BUBBLE_E_H			BUBBLE conversion - E coefficient HIGH part
***	Gas_Custom_BUBBLE_E_L			BUBBLE conversion - E coefficient LOW part
***	Gas_Custom_BUBBLE_F_H			BUBBLE conversion - F coefficient HIGH part
***	Gas_Custom_BUBBLE_F_L			BUBBLE conversion - F coefficient LOW part
***	Gas_Custom_BUBBLE_CRC			BUBBLE conversion - CRC check
***	Gas_Custom_CRC			Global CRC check

Fig. 1.a

In questa categoria possono essere immessi tutti i parametri utilizzando una singola schermata.

**Attenzione**

I parametri possono essere configurati solo nei modelli L1+L2 o sola L1, nella scheda dedicata per L2 non è necessaria nessuna impostazione. Se la linea 2 è configurata per utilizzare il refrigerante custom i parametri vengono automaticamente configurati attraverso la connessione plan con il controllo L1.

Esempio pratico: Esempio di tabella coefficienti per refrigerante R448A. Su KSA o a seguito della richiesta in BU-RET viene rilasciato un documento contenente tutti i parametri validati da CAREL per poter utilizzare il refrigerante desiderato.

Dew temperature		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2	DEW		
Gas name/comment:		R448A Solstice® N40			
Variable name	value	Carel	ModBus (H.Reg)		
Custom Gas	201,2	N/A	300 *		
GAS coefficient 1	8762	N/A	5301		
GAS coefficient 2	8898	N/A	5302		
GAS coefficient 3	32089	N/A	5303		
GAS coefficient 4	-23743	N/A	5304		
GAS coefficient 5	-24628	N/A	5305		
GAS coefficient 6	8000	N/A	5306		
GAS coefficient 7	1884	N/A	5307		
GAS coefficient 8	-21058	N/A	5308		
GAS coefficient 9	-24819	N/A	5309		
GAS coefficient 10	-29634	N/A	5310		
GAS coefficient 11	-2063	N/A	5311		
GAS coefficient 12	6333	N/A	5312		
CRC gas coefficients	27348	N/A	5313		
CRC gas coefficients (Global)	31757	N/A	5327		
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning :					
Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A DEW	

Fig. 1.b

In questo documento per pR300 si distingue in tre pagine differenti i coefficienti per la conversione DEW, BUBBLE e BUBBLE da temperatura a pressione (dalla versione 4.0.1), nell'esempio un ritaglio della pagina per la conversione DEW.

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1.4 Configurazione del pRack

Iniziare la configurazione partendo dal Wizard, in maschera Ib40 viene chiesto il refrigerante da utilizzare per la linea di aspirazione linea 1, configurare come segue:

```

Wizard Ib40
Compressors conf19.
Regulation by:
Measure unit: PRESSURE
                barg
Refrigerant:  CUSTOM
  
```

Eeguire la stessa configurazione per la linea di condensazione 1:

```

Wizard Ib93
Condensers conf19.
Regulation by:
Measure unit: PRESSURE
                barg
Refrigerant:  CUSTOM
  
```

Proseguire con il resto dell'impostazione in base al tipo di unità, al termine confermare per terminare il wizard:

```

Wizard
I/O Auto-configuration
under execution
■■■
Please wait...
  
```

Al termine del wizard si può notare l'allarme bloccante (non permette ai compressori di partire) che ricorda di parametrizzare i coefficienti per il refrigerante custom:

```

Alarms AL003
Custom gas error

(Check input param.)
  
```

Basterà popolare i parametri come segue per eliminare l'allarme e proseguire con l'avviamento. A partire dalla maschera Ffa01 inserire i valori direttamente dal documento refrigerante, prima per la conversione DEW:

```

Custom Gas Ffa01
Custom gas DEW coeff.
D= H: 8763 L: 8898
    H: 32889 L: -23743
C= H: -24628 L: 8000
    H: 1884 L: -21058
T= H: -24819 L: -29634
    H: -2063 L: 6333
  
```

Nota: per questo esempio di configurazione è stato utilizzato il refrigerante R448A

Dew temperature	variables set for	pRack pR300 v 4.0																																																																
Gas number ID:	201,2	DEW																																																																
Gas name/comment:	R448A Solstice® N40																																																																	
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Generation Time:	28/03/2017 10:12																																																																	
	R448A DEW																																																																	

Fig. 1.c

che si traduce nel seguente modo per la maschera Ffa01

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.a

Da cui:

coeff	H	L
A	8762	8898
B	32089	-23743
C	-24628	8000
D	1884	-21058
E	-24819	-29634
F	-206.3	6333

Tab. 1.b

Poi allo stesso modo per la conversione BUBBLE:

Bubble temperature variables set for pRack pR300 v 4.0

Gas number ID: **201,2** **BUBBLE**

Gas name/comment: **R448A**
Solstice® N40

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	201,2	N/A	300 *
GAS coefficient 1	9374	N/A	5314
GAS coefficient 2	14786	N/A	5315
GAS coefficient 3	-5484	N/A	5316
GAS coefficient 4	-23487	N/A	5317
GAS coefficient 5	7700	N/A	5318
GAS coefficient 6	1344	N/A	5319
GAS coefficient 7	-29725	N/A	5320
GAS coefficient 8	-29378	N/A	5321
GAS coefficient 9	-13170	N/A	5322
GAS coefficient 10	-12485	N/A	5323
GAS coefficient 11	-12638	N/A	5324
GAS coefficient 12	13371	N/A	5325
CRC gas coefficients	-29220	N/A	5326
CRC gas coefficients (Global)	31757	N/A	5327

*) the sent value includes 1 decimal. All the others are signed integers

Info section

Warning :
 Check Gas compatibility with valves, piping and materials before the use.

Generation Time: 28/03/2017 10:12

R448A BUBBLE

Fig. 1.d

che si traduce nel seguente modo per la maschera Ffa02

Da cui:

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.c

coeff	H	L
A	9374	14786
B	-5484	-23487
C	7700	1344
D	-29725	-29378
E	-13170	-12485
F	-12638	13371

Tab. 1.d

E allo stesso modo per la conversione BUBBLE da pressione a temperatura:

Bubble pressure	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A Solstice® N40																																																																		
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GAS coefficient 11	13861	N/A	5338																																																															
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Generation Time: 28/03/2017 10:12																																																																		
R448A BUBBLE																																																																		

Fig. 1.e

che si traduce nel seguente modo per la maschera Ffa02

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.e

Da cui:

coeff	H	L
A	12827	-11348
B	18191	-27728
C	-18722	6197
D	5120	2233
E	25891	829
F	13861	-5569

Tab. 1.f

```
Custom Gas Ffa04  
Custom Gas addit. info  
Refrigerant ID: 201.2  
Dew conv.CRC: 27348  
Bubble conv.CRC: -29220  
Dew T conv.CRC: -18200  
Global CRC: 31757
```

Per confermare i dati l'ultima maschera permette di inserire l'ID e i 4 CRC senza i quali non si potrà essere certi del corretto inserimento.

A questo punto se i parametri sono stati inseriti correttamente l'allarme ALO03 scompare e si può finalmente proseguire con l'avviamento.

Gas custom management on pRack pR300

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For any questions or if you are unable to solve the problem, contact the CAREL service

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cst@carel.com

1. "CUSTOM" REFRIGERANTS

1.1 Introduction

The pRack structure features the possibility to configure one refrigerant for each suction line and each condenser line. In version 3.2, a new "CUSTOM" refrigerant has been introduced.

This refrigerant is configured using 12 integer parameters for the DEW point curve and 12 for the BUBBLE point curve. In version 3.2, a new "CUSTOM" refrigerant has been introduced starting in version 4.0.1).

The parameters are distributed and validated by CAREL in the same way as for the MPXPRO. To identify the refrigerant and verify that the data is entered correctly, CAREL distributes an ID and 4 CRCs (DEW, BUBBLE (temperature), BUBBLE (pressure) and GLOBAL), which need to be entered in the controller, together with the coefficient parameters. The function of the CRCs is to prevent incorrect data entry or unwanted modifications to the data by the manufacturer. If the CRC entered by the user does not correspond to the one generated by the parameters, a serious alarm is signalled and the rack is prevented from starting.

Only one custom gas can be defined, i.e. two different custom gases cannot be set on two different lines.

The coefficient parameters are available on KSA section "[Gas custom management](#)" at the following path: Software & support --> Configuration & Updating Software --> parametric controller software --> pRack --> pRack Standard --> Gas custom management.

The custom gas can be configured using the coefficients described above on the pGD terminal, screens Ffa01...Ffa04 (for versions prior to 4.0.1, screens Cag16...Cag18) and on the supervisor, only via Modbus protocol (using registers 300 and 5301...5340) and starting from version 3.2 of pRack pR300.

1.2 Configuration

The CUSTOM refrigerant can be assigned to the suction and condenser lines using the wizard:

```
Wizard          Ib40
Compressors conf19.
Regulation by:  PRESSURE
Measure unit:   bar9
Refrigerant:   CUSTOM
```

or subsequently, on screens Caf04, Cbf04, Daf04 and Dbf04.

```
Cond.Conf19.   Daf04
Refrigerant type:
                CUSTOM
```

The configuration screens for setting the refrigerant parameter are available under Configuration -> Custom Gas (for versions prior to 4.0.1 under Compressors -> Line 1 -> Advanced).

Screen Ffa01 is used to enter the coefficients for DEW point conversion:

Note: R448A refrigerant was used in this configuration example

```
Custom gas     Ffa01
Custom gas DEW coeff.
D= H: 8762 L: 8898
C= H: 320899 L: -23743
O= H: -246288 L: 8000
D= H: 1884 L: -21058
T= H: -24019 L: -29634
T= H: -2063 L: 6338
```

Screen Ffa02 is used to enter the coefficients for BUBBLE point conversion:

```
Custom gas     Ffa02
Custom gas BUB coeff.
D= H: 9374 L: 14786
C= H: -5484 L: -23487
O= H: 7700 L: 1344
D= H: -29725 L: -29378
T= H: -13170 L: -12485
T= H: -12638 L: 13371
```

Screen **Ffa03** is used to enter the coefficients for BUBBLE point conversion from temperature to pressure (introduced starting in version 4.0.1):

```
Custom Gas Ffa03
Custom gas BUB T coeff
A= H: 12827 L: -11348
B= H: 18191 L: -27728
C= H: -18722 L: 6197
D= H: 5126 L: 2233
E= H: 25891 L: 829
F= H: 13861 L: -5569
```

Screen **Ffa04** contains the parameters corresponding to the ID and CRCs:

```
Custom Gas Ffa04
Custom gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC: -29220
Dew T conv.CRC: -18200
Global CRC: 31759
```

After completing the configuration, the alarm bell should stop flashing.

1.3 Supervisor

The parameters can also be configured using PVPRO.
 A new parameter category has been created, called "Custom Refrigerant".

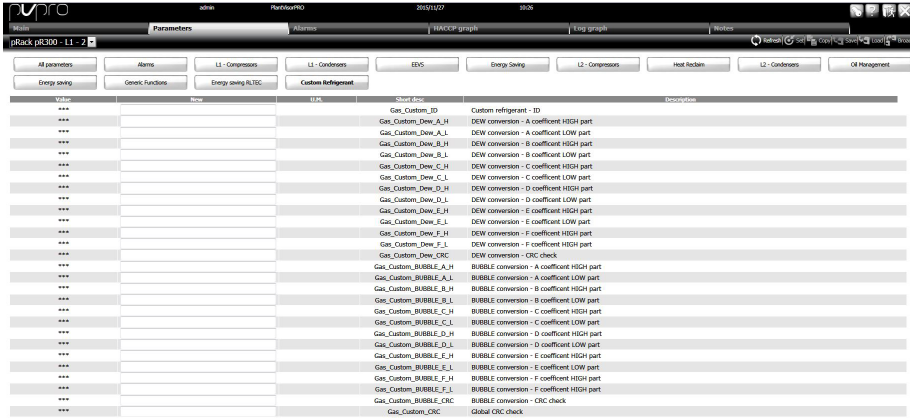


Fig. 1.a

In this category, all the parameters can be entered on one single screen.



Important

The parameters can only be set on models L1+L2 or L1 only; no settings are required on the dedicated board for L2.

If line 2 is configured to use a custom refrigerant, the parameters are automatically configured via the pLAN connection to the L1 controller.

Practical example

Example coefficient table for R448A refrigerant.

On KSA or following a request to BU-RET, a document is issued containing all the parameters validated by CAREL to configure and use the required refrigerant.

Dew temperature		variables set for	pRack pR300 v 4.0																																																																	
Gas number ID:		201,2	DEW																																																																	
Gas name/comment:		R448A Solstice® N40																																																																		
<table border="1"> <thead> <tr> <th>Variable name</th> <th>value</th> <th>Carel</th> <th>ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td>201,2</td> <td>N/A</td> <td>300 *</td> </tr> <tr> <td>GAS coefficient 1</td> <td>8762</td> <td>N/A</td> <td>5301</td> </tr> <tr> <td>GAS coefficient 2</td> <td>8898</td> <td>N/A</td> <td>5302</td> </tr> <tr> <td>GAS coefficient 3</td> <td>32089</td> <td>N/A</td> <td>5303</td> </tr> <tr> <td>GAS coefficient 4</td> <td>-23743</td> <td>N/A</td> <td>5304</td> </tr> <tr> <td>GAS coefficient 5</td> <td>-24628</td> <td>N/A</td> <td>5305</td> </tr> <tr> <td>GAS coefficient 6</td> <td>8000</td> <td>N/A</td> <td>5306</td> </tr> <tr> <td>GAS coefficient 7</td> <td>1884</td> <td>N/A</td> <td>5307</td> </tr> <tr> <td>GAS coefficient 8</td> <td>-21058</td> <td>N/A</td> <td>5308</td> </tr> <tr> <td>GAS coefficient 9</td> <td>-24819</td> <td>N/A</td> <td>5309</td> </tr> <tr> <td>GAS coefficient 10</td> <td>-29634</td> <td>N/A</td> <td>5310</td> </tr> <tr> <td>GAS coefficient 11</td> <td>-2063</td> <td>N/A</td> <td>5311</td> </tr> <tr> <td>GAS coefficient 12</td> <td>6333</td> <td>N/A</td> <td>5312</td> </tr> <tr> <td>CRC gas coefficients</td> <td>27348</td> <td>N/A</td> <td>5313</td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td>31757</td> <td>N/A</td> <td>5327</td> </tr> </tbody> </table> <p style="text-align: center;">*) the sent value includes 1 decimal. All the others are signed integers</p>					Variable name	value	Carel	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	8762	N/A	5301	GAS coefficient 2	8898	N/A	5302	GAS coefficient 3	32089	N/A	5303	GAS coefficient 4	-23743	N/A	5304	GAS coefficient 5	-24628	N/A	5305	GAS coefficient 6	8000	N/A	5306	GAS coefficient 7	1884	N/A	5307	GAS coefficient 8	-21058	N/A	5308	GAS coefficient 9	-24819	N/A	5309	GAS coefficient 10	-29634	N/A	5310	GAS coefficient 11	-2063	N/A	5311	GAS coefficient 12	6333	N/A	5312	CRC gas coefficients	27348	N/A	5313	CRC gas coefficients (Global)	31757	N/A	5327
Variable name	value	Carel	ModBus (H.Reg)																																																																	
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Info section																																																																				
Warning : Check Gas compatibility with valves, piping and materials before the use.																																																																				
Generation Time:		28/03/2017 10:12		R448A DEW																																																																

Fig. 1.b

In this document for the pR300, the coefficients for DEW, BUBBLE and BUBBLE conversion from temperature to pressure (the latter starting from version 4.0.1) are on three different pages; the example shows a section of the page for DEW point conversion.

CAREL

1.4 Configuring the pRack

Start the configuration using the Wizard; on screen lb40, the refrigerant to be used on suction line 1 is requested. Configure this as follows:

```

Wizard                               lb40
Compressors conf19.
Regulation by:
Measure unit:  PRESSURE
                barg
Refrigerant:   CUSTOM
  
```

Repeat the same configuration for condenser line 1:

```

Wizard                               lb93
Condensers conf19.
Regulation by:
Measure unit:  PRESSURE
                barg
Refrigerant:   CUSTOM
  
```

Continue with the rest of the settings based on the type of unit, and on completion confirm to close the wizard:

```

Wizard
I/O Auto-configuration
under execution
■■■
Please wait...
  
```

At the end of the wizard, a serious alarm is shown (the compressors are not able to start) highlighting that the coefficients for the custom refrigerant need to be set:

```

Alarms                               HLU03
Custom gas error

( Check input param. )
  
```

Simply enter the parameters as follows to cancel the alarm and continue the start-up procedure. Starting from screen Ffa01, enter the values taken directly from the refrigerant document, first for the DEW point conversion:

```

Custom gas                             Ffa01
Custom gas DEW coeff.
D=   H: 8762  L: 8898
B=   H: 32089 L: -23743
C=   H: -24628 L: 8000
D=   H: 1884  L: -21058
E=   H: -24819 L: -29634
F=   H: -2063  L: 6333
  
```

Note: R448A refrigerant was used in this configuration example

In this example, only the first 3 coefficients out of 12 have been entered; for correct operation, all 12 parameters shown on the specific document need to be entered:

Dew temperature		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2		DEW	
Gas name/comment:		R448A Solstice® N40			
				ModBus (H.Reg)	
Variable name	value	Carel			
Custom Gas	201,2	N/A		300 *	
GAS coefficient 1	8762	N/A		5301	
GAS coefficient 2	8898	N/A		5302	
GAS coefficient 3	32089	N/A		5303	
GAS coefficient 4	-23743	N/A		5304	
GAS coefficient 5	-24628	N/A		5305	
GAS coefficient 6	8000	N/A		5306	
GAS coefficient 7	1884	N/A		5307	
GAS coefficient 8	-21058	N/A		5308	
GAS coefficient 9	-24819	N/A		5309	
GAS coefficient 10	-29634	N/A		5310	
GAS coefficient 11	-2063	N/A		5311	
GAS coefficient 12	6333	N/A		5312	
CRC gas coefficients	27348	N/A		5313	
CRC gas coefficients (Global)	31757	N/A		5327	
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning : Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A DEW	

Fig. 1.c

which will be as follows for screen Ffa01

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.a

Hence:

coeff	H	L
A	8762	8898
B	32089	-23743
C	-24628	8000
D	1884	-21058
E	-24819	-29634
F	-206.3	6333

Tab. 1.b

Then proceed in the same way for the BUBBLE point conversion coefficients:

Bubble temperature	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A Solstice® N40																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Variable name</th> <th style="width: 20%;">value</th> <th style="width: 10%;">Carel</th> <th style="width: 10%;">ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td>201,2</td> <td>N/A</td> <td>300 *</td> </tr> <tr> <td>GAS coefficient 1</td> <td>9374</td> <td>N/A</td> <td>5314</td> </tr> <tr> <td>GAS coefficient 2</td> <td>14786</td> <td>N/A</td> <td>5315</td> </tr> <tr> <td>GAS coefficient 3</td> <td>-5484</td> <td>N/A</td> <td>5316</td> </tr> <tr> <td>GAS coefficient 4</td> <td>-23487</td> <td>N/A</td> <td>5317</td> </tr> <tr> <td>GAS coefficient 5</td> <td>7700</td> <td>N/A</td> <td>5318</td> </tr> <tr> <td>GAS coefficient 6</td> <td>1344</td> <td>N/A</td> <td>5319</td> </tr> <tr> <td>GAS coefficient 7</td> <td>-29725</td> <td>N/A</td> <td>5320</td> </tr> <tr> <td>GAS coefficient 8</td> <td>-29378</td> <td>N/A</td> <td>5321</td> </tr> <tr> <td>GAS coefficient 9</td> <td>-13170</td> <td>N/A</td> <td>5322</td> </tr> <tr> <td>GAS coefficient 10</td> <td>-12485</td> <td>N/A</td> <td>5323</td> </tr> <tr> <td>GAS coefficient 11</td> <td>-12638</td> <td>N/A</td> <td>5324</td> </tr> <tr> <td>GAS coefficient 12</td> <td>13371</td> <td>N/A</td> <td>5325</td> </tr> <tr> <td>CRC gas coefficients</td> <td>-29220</td> <td>N/A</td> <td>5326</td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td>31757</td> <td>N/A</td> <td>5327</td> </tr> </tbody> </table> <p style="text-align: right; font-size: small;">*) the sent value includes 1 decimal. All the others are signed integers</p>			Variable name	value	Carel	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	9374	N/A	5314	GAS coefficient 2	14786	N/A	5315	GAS coefficient 3	-5484	N/A	5316	GAS coefficient 4	-23487	N/A	5317	GAS coefficient 5	7700	N/A	5318	GAS coefficient 6	1344	N/A	5319	GAS coefficient 7	-29725	N/A	5320	GAS coefficient 8	-29378	N/A	5321	GAS coefficient 9	-13170	N/A	5322	GAS coefficient 10	-12485	N/A	5323	GAS coefficient 11	-12638	N/A	5324	GAS coefficient 12	13371	N/A	5325	CRC gas coefficients	-29220	N/A	5326	CRC gas coefficients (Global)	31757	N/A	5327
Variable name	value	Carel	ModBus (H.Reg)																																																															
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Info section																																																																		
<p>Warning : Check Gas compatibility with valves, piping and materials before the use.</p> <p>Generation Time: 28/03/2017 10:12</p> <p style="text-align: right;">R448A BUBBLE</p>																																																																		

Fig. 1.d

which will be as follows for screen Ffa02

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.c

Hence:

coeff	H	L
A	9374	14786
B	-5484	-23487
C	7700	1344
D	-29725	-29378
E	-13170	-12485
F	-12638	13371

Tab. 1.d

Then proceed in the same way for the BUBBLE point conversion from pressure to temperature:

Bubble pressure variables set for pRack pR300 v 4.0

Gas number ID: **201,2 BUBBLE**

Gas name/comment: **R448A**
Solstice® N40

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	201,2	N/A	300 *
GAS coefficient 1	12827	N/A	5328
GAS coefficient 2	-11348	N/A	5329
GAS coefficient 3	18191	N/A	5330
GAS coefficient 4	-27728	N/A	5331
GAS coefficient 5	-18722	N/A	5332
GAS coefficient 6	6197	N/A	5333
GAS coefficient 7	5120	N/A	5334
GAS coefficient 8	2233	N/A	5335
GAS coefficient 9	25891	N/A	5336
GAS coefficient 10	829	N/A	5337
GAS coefficient 11	13861	N/A	5338
GAS coefficient 12	-5569	N/A	5339
CRC gas coefficients	-18200	N/A	5340
CRC gas coefficients (Global)	31757	N/A	5327

*) the sent value includes 1 decimal. All the others are signed integers

Info section

Warning :
Check Gas compatibility with valves, piping and materials before the use.

Generation Time: 28/03/2017 10:12

R448A BUBBLE

Fig. 1.e

Which will be as follows for screen Ffa02

Hence:

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.a

coeff	H	L
A	12827	-11348
B	18191	-27728
C	-18722	6197
D	5120	2233
E	25891	829
F	13861	-5569

Tab. 1.b


```
Custom Gas Ffa04  
Custom Gas addit. info  
Refrigerant ID: 201.2  
Dew conv.CRC: 27348  
Bubble conv.CRC: -29220  
Dew T conv.CRC: -18200  
Global CRC: 31757
```

To confirm the data, on the last screen enter the ID and the 4 CRCs; without these, correct data entry cannot be verified.

At this stage if the parameters have been entered correctly, alarm ALO03 is cancelled and it is possible to proceed with start-up.

Gestion du gaz « custom » dans pRack pR300

Table des matières

1. RÉFRIGÉRANTS « CUSTOM »	5
1.1 Introduction.....	5
1.2 Configuration.....	5
1.3 Supervision	7
1.4 Configuration du pRack.....	9

Pour tout éclaircissement ou si l'on ne réussit pas à résoudre le problème, contacter l'assistance CAREL.

CST Carel +39 049 9716602
cst@carel.com

1. RÉFRIGÉRANTS « CUSTOM »

1.1 Introduction

La structure pRack prévoit la possibilité de configurer un réfrigérant pour chaque ligne d'aspiration et chaque ligne de condensation. La version 3.2 a introduit un nouveau réfrigérant « CUSTOM ».

Ce réfrigérant est configuré à l'aide de 12 paramètres entiers pour la courbe DEW et de 12 pour la courbe BUBBLE et 12 pour la courbe BUBBLE de température à pression (introduits dans la version 4.0.1).

Les paramètres sont distribués et validés par CAREL, ainsi que cela se produit normalement pour MPX PRO. Pour reconnaître le réfrigérant et vérifier la saisie correcte des données, CAREL distribue un ID et 4 CRC (DEW, BUBBLE [température], BUBBLE [pression], GLOBAL) qui doivent être entrés dans le contrôle en même temps que les paramètres des coefficients. La fonction des CRC sert à éviter une saisie erronée ou une altération des données par le constructeur. Si le CRC saisi par l'utilisateur ne correspond pas à celui qui a été généré par les paramètres, une alarme grave qui empêche le démarrage du rack se déclenche.

Un seul et unique gaz « custom » peut être défini ; en d'autres termes, on ne peut définir deux gaz « custom » différents sur deux lignes différentes.

Les paramètres des coefficients sont disponibles dans KSA, à la section « Gas custom management », qu'on peut atteindre avec le parcours suivant : software & support --> Configuration & Updating Software --> parametric controller software --> pRack --> pRack Standard --> Gas custom management.

À l'aide des coefficients susmentionnés, il est possible de configurer le gaz « custom » soit à partir du terminal PGD, sur les écrans Ffa01...Ffa04 (pour les versions précédentes à 4.0.0, les écrans Cag16...Cag18), soit à partir de la supervision, uniquement sur le protocole MODBUS (par le biais des registres 300 et 5301...5340), et à partir de la version 3.2 du pRack pR300.

1.2 Configuration

Un assistant permet d'attribuer le réfrigérant CUSTOM aux lignes d'aspiration et condensation :

```

Wizard                               1b40
Compressors conf19.
Regulation by:
Measure unit:      PRESSURE
                  bar9
Refrigerant:      CUSTOM
  
```

ou, par la suite, à l'aide des écrans Caf04, Cbf04, Daf04 et Dbf04.

```

Cond.Conf19.   Daf04
Refrigerant type:
                  CUSTOM
  
```

Les écrans de configuration permettant de paramétrer le réfrigérant se trouvent dans le menu Configuration -> Gaz Custom (pour les versions précédant la 4.0.1 dans le menu Compresseurs -> Ligne 1 -> Avancées)

L'écran Ffa01 permet de saisir les coefficients pour la conversion DEW :

Remarque: pour cet exemple de configuration, nous avons utilisé le réfrigérant R448A

```

Custom gas                               Ffa01
Custom gas DEW coeff.
A= H: 8762 L: 8898
B= H: 32089 L: -23743
C= H: -24628 L: 8000
D= H: 1884 L: -21058
E= H: -24819 L: -29634
F= H: -2063 L: 6333
  
```

L'écran Ffa02 permet de saisir les coefficients pour la conversion BUBBLE :

```

Custom gas                               Ffa02
Custom gas BUB coeff.
A= H: 9374 L: 14786
B= H: -5484 L: -23487
C= H: 7700 L: 1344
D= H: -29725 L: -29378
E= H: -13170 L: -12485
F= H: -12638 L: 13371
  
```

La fenêtre **Ffa03** permet de saisir les coefficients pour la conversion BUBBLE de température à pression (introduits dans la version 4.0.0):

```
Custom Gas Ffa03
Custom Gas BUB T coeff
A= H: 12827 L:-11348
B= H: 18191 L:-27728
C= H: -18722 L: 6197
D= H: 5120 L: 2233
E= H: 25891 L: 829
F= H: 13861 L: -5569
```

L'écran **Ffa04** contient les paramètres concernant l'ID et CRC:

```
Custom Gas Ffa04
Custom Gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC:-29220
Dew T conv.CRC: -18200
Global CRC: 31757
```

À la fin de la configuration, la clochette d'alarme ne doit plus clignoter.

1.3 Supervision

Les paramètres peuvent être également paramétrés à l'aide de PVPRO.
 Une nouvelle catégorie de paramètres a été créée ; elle s'appelle « Custom Refrigerant ».

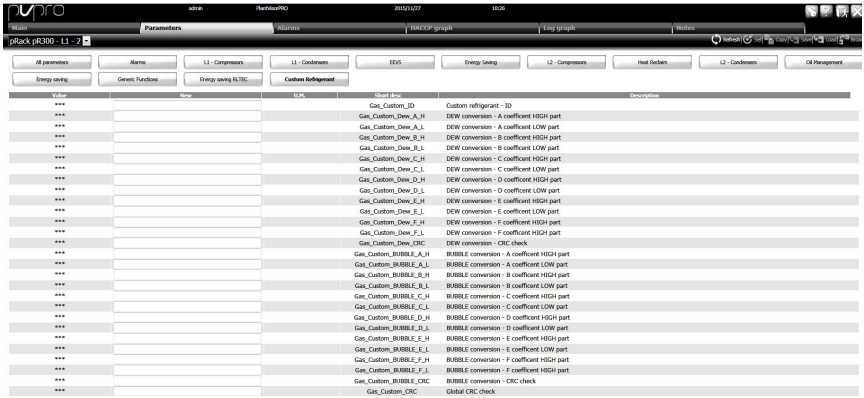


Fig. 1.a

Tous les paramètres de cette catégorie peuvent être saisis sur un seul écran.

**Attention !**

Les paramètres peuvent être configurés uniquement sur les modèles L1+L2 ou seulement L1 ; aucun réglage n'est nécessaire dans l'onglet dédié à L2.

Si la ligne 2 est configurée pour utiliser le réfrigérant « custom », les paramètres seront configurés automatiquement par le biais de la connexion pLAN avec le contrôle L1.

Exemple pratique

Exemple de tableau des coefficients pour réfrigérant R448A.

Un document se trouve sur KSA ou est délivré à la suite d'une demande dans BU-RET : il contient tous les paramètres validés par CAREL pour pouvoir utiliser le réfrigérant souhaité.

Dew temperature		variables set for	pRack pR300 v 4.0																																																																	
Gas number ID:		201,2	DEW																																																																	
Gas name/comment:		R448A Solstice® N40																																																																		
<table border="1"> <thead> <tr> <th>Variable name</th> <th>value</th> <th>Carel</th> <th>ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td>201,2</td> <td>N/A</td> <td>300 *</td> </tr> <tr> <td>GAS coefficient 1</td> <td>8762</td> <td>N/A</td> <td>5301</td> </tr> <tr> <td>GAS coefficient 2</td> <td>8898</td> <td>N/A</td> <td>5302</td> </tr> <tr> <td>GAS coefficient 3</td> <td>32089</td> <td>N/A</td> <td>5303</td> </tr> <tr> <td>GAS coefficient 4</td> <td>-23743</td> <td>N/A</td> <td>5304</td> </tr> <tr> <td>GAS coefficient 5</td> <td>-24628</td> <td>N/A</td> <td>5305</td> </tr> <tr> <td>GAS coefficient 6</td> <td>8000</td> <td>N/A</td> <td>5306</td> </tr> <tr> <td>GAS coefficient 7</td> <td>1884</td> <td>N/A</td> <td>5307</td> </tr> <tr> <td>GAS coefficient 8</td> <td>-21058</td> <td>N/A</td> <td>5308</td> </tr> <tr> <td>GAS coefficient 9</td> <td>-24819</td> <td>N/A</td> <td>5309</td> </tr> <tr> <td>GAS coefficient 10</td> <td>-29634</td> <td>N/A</td> <td>5310</td> </tr> <tr> <td>GAS coefficient 11</td> <td>-2063</td> <td>N/A</td> <td>5311</td> </tr> <tr> <td>GAS coefficient 12</td> <td>6333</td> <td>N/A</td> <td>5312</td> </tr> <tr> <td>CRC gas coefficients</td> <td>27348</td> <td>N/A</td> <td>5313</td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td>31757</td> <td>N/A</td> <td>5327</td> </tr> </tbody> </table> <p style="text-align: center;">*) the sent value includes 1 decimal. All the others are signed integers</p>					Variable name	value	Carel	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	8762	N/A	5301	GAS coefficient 2	8898	N/A	5302	GAS coefficient 3	32089	N/A	5303	GAS coefficient 4	-23743	N/A	5304	GAS coefficient 5	-24628	N/A	5305	GAS coefficient 6	8000	N/A	5306	GAS coefficient 7	1884	N/A	5307	GAS coefficient 8	-21058	N/A	5308	GAS coefficient 9	-24819	N/A	5309	GAS coefficient 10	-29634	N/A	5310	GAS coefficient 11	-2063	N/A	5311	GAS coefficient 12	6333	N/A	5312	CRC gas coefficients	27348	N/A	5313	CRC gas coefficients (Global)	31757	N/A	5327
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Info section																																																																				
Warning : Check Gas compatibility with valves, piping and materials before the use.																																																																				
Generation Time:		28/03/2017 10:12		R448A DEW																																																																

Fig. 1.b

Dans ce document pour pR300, on distingue, sur trois pages différentes, les coefficients pour la conversion DEW, BUBBLE et BUBBLE de température à pression (à partir de la version 4.0.1) ; l'exemple montre un détail de la page pour la conversion DEW.

1.4 Configuration du pRack

Commencer la configuration en utilisant l'assistant ; l'écran Ib40 demande le réfrigérant à utiliser pour la ligne d'aspiration ligne 1 ; configurer comme suit :

```

Wizard                               Ib40
Compressors conf19.
Regulation by:
Measure unit:    PRESSURE
                bar/g
Refrigerant:    CUSTOM
  
```

Exécuter la même configuration pour la ligne de condensation 1 :

```

Wizard                               Ib93
Condensers conf19.
Regulation by:
Measure unit:    PRESSURE
                bar/g
Refrigerant:    CUSTOM
  
```

Poursuivre avec le reste du réglage en fonction du type d'unité ; à la fin, confirmer pour terminer l'assistant :

```

Wizard
I/O Auto-configuration
under execution
■■■
Please wait...
  
```

Une fois terminé l'assistant, on peut noter une alarme bloquante (elle empêche aux compresseurs de démarrer) qui rappelle de paramétrer les coefficients pour le réfrigérant « custom » :

```

Alarms                               HL003
Custom gas error

( Check input param. )
  
```

Il suffira de renseigner les paramètres comme suit pour éliminer l'alarme et poursuivre avec le démarrage. Sur l'écran Ffa01, saisir les valeurs directement à partir du document « Réfrigérant », d'abord pour la conversion DEW :

```

Custom Gas                             Ffa01
Custom Gas DEW coeff.
DEW=   H: 8762   L: 8898
      H: 32089  L: -23743
      H: -24628 L: 6000
      H: 1884   L: -21058
      H: -24819 L: -29634
      H: -2063  L: 6338
  
```

Exemple de tableau des coefficients pour réfrigérant R448A

Pour notre exemple, nous avons saisi uniquement les 3 premiers coefficients des 12 ; pour obtenir un fonctionnement correct, il faudra saisir tous les 12 paramètres du document spécifique :

Dew temperature		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2		DEW	
Gas name/comment:		R448A Solstice® N40			
				ModBus (H.Reg)	
Variable name	value	Carel			
Custom Gas	201,2	N/A	300 *		
GAS coefficient 1	8762	N/A	5301		
GAS coefficient 2	8898	N/A	5302		
GAS coefficient 3	32089	N/A	5303		
GAS coefficient 4	-23743	N/A	5304		
GAS coefficient 5	-24628	N/A	5305		
GAS coefficient 6	8000	N/A	5306		
GAS coefficient 7	1884	N/A	5307		
GAS coefficient 8	-21058	N/A	5308		
GAS coefficient 9	-24819	N/A	5309		
GAS coefficient 10	-29634	N/A	5310		
GAS coefficient 11	-2063	N/A	5311		
GAS coefficient 12	6333	N/A	5312		
CRC gas coefficients	27348	N/A	5313		
CRC gas coefficients (Global)	31757	N/A	5327		
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning : Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A DEW	

Fig. 1.c

qui se traduit de la manière suivante pour l'écran Ffa01

coeff	H	L
A	GAZ coeff 1	GAZ coeff 2
B	GAZ coeff 3	GAZ coeff 4
C	GAZ coeff 5	GAZ coeff 6
D	GAZ coeff 7	GAZ coeff 8
E	GAZ coeff 9	GAZ coeff 10
F	GAZ coeff 11	GAZ coeff 12

Tab. 1.a

Où :

coeff	H	L
A	8762	8898
B	32089	-23743
C	-24628	8000
D	1884	-21058
E	-24819	-29634
F	-206.3	6333

Tab. 1.b

Procéder de la même manière pour la conversion BUBBLE :

Bubble temperature	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A Solstice® N40																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Variable name</th> <th style="width: 20%;">value</th> <th style="width: 15%;">Carel</th> <th style="width: 35%;">ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td>201,2</td> <td>N/A</td> <td>300 *</td> </tr> <tr> <td>GAS coefficient 1</td> <td>9374</td> <td>N/A</td> <td>5314</td> </tr> <tr> <td>GAS coefficient 2</td> <td>14786</td> <td>N/A</td> <td>5315</td> </tr> <tr> <td>GAS coefficient 3</td> <td>-5484</td> <td>N/A</td> <td>5316</td> </tr> <tr> <td>GAS coefficient 4</td> <td>-23487</td> <td>N/A</td> <td>5317</td> </tr> <tr> <td>GAS coefficient 5</td> <td>7700</td> <td>N/A</td> <td>5318</td> </tr> <tr> <td>GAS coefficient 6</td> <td>1344</td> <td>N/A</td> <td>5319</td> </tr> <tr> <td>GAS coefficient 7</td> <td>-29725</td> <td>N/A</td> <td>5320</td> </tr> <tr> <td>GAS coefficient 8</td> <td>-29378</td> <td>N/A</td> <td>5321</td> </tr> <tr> <td>GAS coefficient 9</td> <td>-13170</td> <td>N/A</td> <td>5322</td> </tr> <tr> <td>GAS coefficient 10</td> <td>-12485</td> <td>N/A</td> <td>5323</td> </tr> <tr> <td>GAS coefficient 11</td> <td>-12638</td> <td>N/A</td> <td>5324</td> </tr> <tr> <td>GAS coefficient 12</td> <td>13371</td> <td>N/A</td> <td>5325</td> </tr> <tr> <td>CRC gas coefficients</td> <td>-29220</td> <td>N/A</td> <td>5326</td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td>31757</td> <td>N/A</td> <td>5327</td> </tr> </tbody> </table> <p style="text-align: right; font-size: small;">*) the sent value includes 1 decimal. All the others are signed integers</p>			Variable name	value	Carel	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	9374	N/A	5314	GAS coefficient 2	14786	N/A	5315	GAS coefficient 3	-5484	N/A	5316	GAS coefficient 4	-23487	N/A	5317	GAS coefficient 5	7700	N/A	5318	GAS coefficient 6	1344	N/A	5319	GAS coefficient 7	-29725	N/A	5320	GAS coefficient 8	-29378	N/A	5321	GAS coefficient 9	-13170	N/A	5322	GAS coefficient 10	-12485	N/A	5323	GAS coefficient 11	-12638	N/A	5324	GAS coefficient 12	13371	N/A	5325	CRC gas coefficients	-29220	N/A	5326	CRC gas coefficients (Global)	31757	N/A	5327
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GAS coefficient 8	-29378	N/A	5321																																																															
GAS coefficient 9	-13170	N/A	5322																																																															
GAS coefficient 10	-12485	N/A	5323																																																															
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Warning : Check Gas compatibility with valves, piping and materials before the use.																																																																		
Generation Time:		28/03/2017 10:12																																																																
R448A BUBBLE																																																																		

Fig. 1.d

qui se traduit de la manière suivante pour l'écran Ffa02

Où :

coeff	H	L
A	GAZ coeff 1	GAZ coeff 2
B	GAZ coeff 3	GAZ coeff 4
C	GAZ coeff 5	GAZ coeff 6
D	GAZ coeff 7	GAZ coeff 8
E	GAZ coeff 9	GAZ coeff 10
F	GAZ coeff 11	GAZ coeff 12

Tab. 1.c

coeff	H	L
A	9374	14786
B	-5484	-23487
C	7700	1344
D	-29725	-29378
E	-13170	-12485
F	-12638	13371

Tab. 1.d

Procéder de la même manière pour la conversion BUBBLE de pression à température:

Bubble pressure		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2		BUBBLE	
Gas name/comment:		R448A Solstice® N40			
Variable name		value	Carel	ModBus (H.Reg)	
Custom Gas		201,2	N/A	300 *	
GAS coefficient 1		12827	N/A	5328	
GAS coefficient 2		-11348	N/A	5329	
GAS coefficient 3		18191	N/A	5330	
GAS coefficient 4		-27728	N/A	5331	
GAS coefficient 5		-18722	N/A	5332	
GAS coefficient 6		6197	N/A	5333	
GAS coefficient 7		5120	N/A	5334	
GAS coefficient 8		2233	N/A	5335	
GAS coefficient 9		25891	N/A	5336	
GAS coefficient 10		829	N/A	5337	
GAS coefficient 11		13861	N/A	5338	
GAS coefficient 12		-5569	N/A	5339	
CRC gas coefficients		-18200	N/A	5340	
CRC gas coefficients (Global)		31757	N/A	5327	
*)					
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning :					
Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A BUBBLE	

Fig. 1.e

Qui se traduit de la manière suivante pour l'écran Ffa02

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.e

Hence:

coeff	H	L
A	12827	-11348
B	18191	-27728
C	-18722	6197
D	5120	2233
E	25891	829
F	13861	-5569

Tab. 1.f

```
Custom Gas Ffa04  
Custom Gas addit. info  
Refrigerant ID: 201.2  
Dew conv.CRC: 27348  
Bubble conv.CRC:-29220  
Dew T conv.CRC: -18200  
Global CRC: 31757
```

Pour confirmer les données, le dernier masque de saisie permet d'entrer l'ID et les 4 CRC, sans lesquels il est impossible d'être certains que la saisie est correcte.

À ce point, si les paramètres ont été saisis correctement, l'alarme ALO03 disparaît et la procédure de démarrage peut continuer.

Custom-Gas-Management im pRack pR300

Index

1. CUSTOM-KÄLTEMITTEL	5
1.1 Einführung.....	5
1.2 Konfiguration.....	5
1.3 Überwachung.....	7
1.4 pRack-Konfiguration	9

Für Klarstellungen oder für Hilfe bei Problemlösungen bitte den CAREL-Service kontaktieren.

CST Carel +39 049 9716602
cst@carel.com

1. CUSTOM-KÄLTEMITTEL

1.1 Einführung

pRack sieht die Möglichkeit vor, ein Kältemittel für jede Saugleitung und für jede Verflüssigungsleitung zu konfigurieren. Ab der Version 3.2 steht ein neues CUSTOM-Kältemittel zur Verfügung.

Dieses Kältemittel wird mit 12 internen Parametern für die Taupunkt-Kurve (DEW) und 12 Parametern für die Siedepunkt-Kurve (BUBBLE) konfiguriert sowie 12 Parametern für die Siedepunkt-Kurve (BUBBLE) von Temperatur auf Druck (Einführung ab Version 4.0.1) konfiguriert.

Die Parameter werden von CAREL verteilt und validiert, genau wie es für MPX PRO erfolgt. Zur Erkennung des Kältemittels und zur Überprüfung der korrekten Dateneingabe verteilt CAREL eine ID und 4 CRC (DEW, BUBBLE (Temperatur), BUBBLE (Druck), GLOBAL) die zusammen mit den Parametern der Koeffizienten in das Steuergerät eingegeben werden müssen. Die CRC haben die Funktion, eine falsche Eingabe oder eine Änderung der Daten seitens des Herstellers zu vermeiden. Entspricht der vom Benutzer eingefügte CRC nicht dem von den Parametern generierten, wird ein schwerer Alarm gemeldet, der den Start des Racks nicht zulässt.

Es kann jeweils nur ein Custom Gas definiert werden, was bedeutet, dass es nicht möglich ist, für zwei unterschiedliche Linien zwei verschiedene Custom Gase zu konfigurieren.

Die Parameter der Koeffizienten sind in KSA verfügbar. Die Sektion "Gas custom management" ist über den folgenden Pfad erreichbar: Software & Support -> Configuration & Updating Software -> parametric controller software -> pRack -> pRack Standard -> Gas custom management.

Die Custom Gas Konfiguration mit den o.g. Koeffizienten ist sowohl über PGD-Terminal in den Menüfenstern Ffa01...Ffa04 (für Versionen vor der 4.0.0 Menüfenster Cag16...Cag18) als auch aus der Überwachung nur am Protokoll MODBUS (über die Register 300 und 5301...5340) und ab der Version 3.2 des pRack pR300 möglich.

1.2 Konfiguration

Das CUSTOM-Kältemittel kann den Saugleitungen und Verflüssigungsleitungen mithilfe des assistierten Verfahrens:

```
Wizard 1640
Compressors conf19.
Regulation by: PRESSURE
Measure unit: bar-g
Refrigerant: CUSTOM
```

oder im Nachhinein in den Menüfenstern Caf04, Cbf04, Daf04 und Dbf04 zugewiesen werden.

```
Cond.Conf19. Daf04
Refrigerant type: CUSTOM
```

Zur Parametrisierung des Kältemittels stehen die Menüfenster für die Konfiguration im entsprechenden Menü unter Konfiguration -> Gas Custom (für Versionen vor 4.0.1 im Menü Verdichter -> Leitung 1 -> Erweiterte Einstellungen)

Das Menüfenster Ffa01 lässt die Koeffizienten für die Taupunkt-Konvertierung (DEW) eingeben:

Anmerkung: Für dieses Konfigurationsbeispiel wurde das Kältemittel R448A benutzt

```
Custom Gas Ffa01
Custom Gas DEW coeff.
Dp H: 8762 L: 8898
Dp H: 32089 L: -23743
Dp H: -24628 L: 8000
Dp H: 1884 L: -21058
Dp H: -24819 L: -29634
Dp H: -2063 L: 6333
```

Das Menüfenster Ffa02 lässt die Koeffizienten für die Siedepunkt-Konvertierung (BUBBLE) eingeben:

```
Custom Gas Ffa02
Custom Gas BUB coeff.
Dp H: 9374 L: 14786
Dp H: -2484 L: -23487
Dp H: -27700 L: 1344
Dp H: -29725 L: -29378
Dp H: -13170 L: -12485
Dp H: -12638 L: 13371
```

Das Menüfenster **Ffa03** ermöglicht die Eingabe der Koeffizienten für die BUBBLE-Konvertierung von Temperatur auf Druck (Einführung ab Version 4.0.1):

```
Custom gas Ffa03
Custom gas BUB T coeff
A= H: 12827 L:-11348
B= H: 18191 L:-27728
C= H: -18722 L: 6197
D= H: 5120 L: 2233
E= H: 25891 L: 829
F= H: 13861 L: -5569
```

Das Menüfenster **Ffa04** umfasst die Parameter bzgl. ID und CRC:

```
Custom gas Ffa04
Custom gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC:-29220
Dew T conv.CRC: -18200
Global CRC: 31757
```

Nach Abschluss der Konfiguration sollte das Alarmsymbol nicht mehr blinken.

1.3 Überwachung

Die Parameter können auch über das PVPRO-Programm konfiguriert werden. Es wurde die neue Kategorie "Custom Refrigérant" eingerichtet.

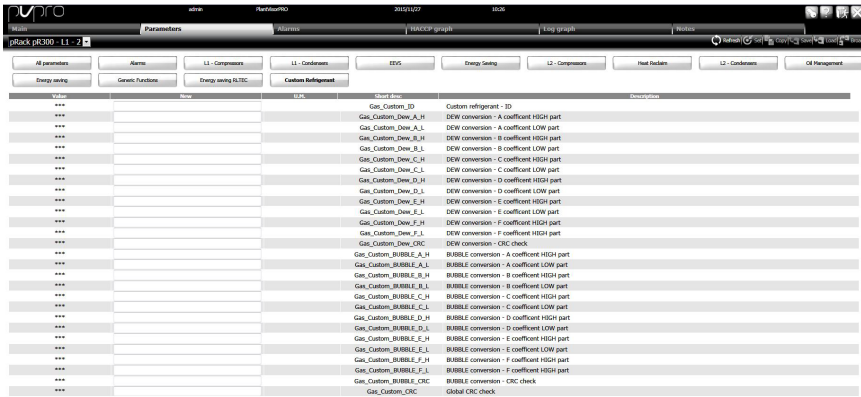


Fig. 1.a

In dieser Kategorie können alle Parameter über ein einziges Fenster eingefügt werden.



Achtung

Die Parameter können nur in den Modellen L1+L2 oder L1 konfiguriert werden. Im Fenster L2 ist keine Einstellung erforderlich.

Wurde die Leitung 2 für den Einsatz eines Custom-Kältemittels konfiguriert, werden die Parameter automatisch über die pLAN-Verbindung mit dem Steuergerät L1 konfiguriert.

Praktisches Beispiel

Beispiel einer Koeffiziententabelle für Kältemittel R448A.

Auf KSA oder infolge des Antrags in BU-RET wird ein Dokument mit allen von CAREL validierten Parametern herausgegeben, die den Einsatz des gewünschten Kältemittels ermöglichen.

Dew temperature		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2	DEW		
Gas name/comment:		R448A Solstice® N40			
Variable name		value	Carel	ModBus (H.Reg)	
Custom Gas		201,2	N/A	300 *	
GAS coefficient 1		8762	N/A	5301	
GAS coefficient 2		8898	N/A	5302	
GAS coefficient 3		32089	N/A	5303	
GAS coefficient 4		-23743	N/A	5304	
GAS coefficient 5		-24628	N/A	5305	
GAS coefficient 6		8000	N/A	5306	
GAS coefficient 7		1884	N/A	5307	
GAS coefficient 8		-21058	N/A	5308	
GAS coefficient 9		-24819	N/A	5309	
GAS coefficient 10		-29634	N/A	5310	
GAS coefficient 11		-2063	N/A	5311	
GAS coefficient 12		6333	N/A	5312	
CRC gas coefficients		27348	N/A	5313	
CRC gas coefficients (Global)		31757	N/A	5327	
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning : Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A DEW	

Fig. 1.b

In diesem Dokument wird für pR300 werden auf drei verschiedenen Seiten die Konvertierungskoeffizienten DEW, BUBBLE und BUBBLE von Temperatur auf Druck (ab Version 4.0.1) unterschieden. Das Beispiel zeigt einen Ausschnitt der Seite über die DEW-Konvertierung.

1.4 pRack-Konfiguration

Die Konfiguration mit dem assistierten Verfahren starten. Im Menüfenster **lb40** muss das für die Saugleitung 1 zu verwendende Kältemittel konfiguriert werden:

```

Wizard                               lb40
Compressors conf19.
Regulation by:
Measure unit:    PRESSURE
                 bar9
Refrigerant:    CUSTOM
  
```

Dieselbe Konfiguration für die Verflüssigungsleitung 1 ausführen:

```

Wizard                               lb93
Condensers conf19.
Regulation by:
Measure unit:    PRESSURE
                 bar9
Refrigerant:    CUSTOM
  
```

Die restlichen geräteabhängigen Einstellungen vornehmen. Abschließend bestätigen, um das assistierte Verfahren zu beenden:

```

Wizard
I/O Auto-configuration
under execution
■■■
Please wait...
  
```

Nach dem Abschluss des assistierten Verfahrens ist der Sperralarm aktiviert (er verhindert den Verdichteranlauf). Er erinnert daran, dass die Koeffizienten für das Custom-Kältemittel parametrieren werden müssen:

```

Alarms                               HL003
Custom gas error

(Check input param.)
  
```

Es genügt, die folgenden Parameter einzugeben, um den Alarm zu deaktivieren und das Gerät zu starten. Im Menüfenster **Ffa01** die Werte direkt aus dem Kältemittel-Dokument (zuerst für die Taupunkt-Konvertierung DEW) eingeben:

```

Custom gas                               Ffa01
Custom gas DEW coeff.
D=   H:  87632  L:  8898
d=   H:  320899 L: -23743
C=   H: -24628  L:  8000
D=   H:  1884   L: -21058
T=   H: -24819  L: -29634
F=   H: -2063   L:  6333
  
```

Anmerkung: Für dieses Konfigurationsbeispiel wurde das Kältemittel R448A benutzt.

In diesem Beispiel wurden nur die ersten 3 Koeffizienten von 12 eingegeben. Für den korrekten Betrieb müssen alle 12 Parameter des genannten Dokuments eingestellt werden:

Dew temperature		variables set for		pRack pR300 v 4.0																																																																	
Gas number ID:		201,2		DEW																																																																	
Gas name/comment:		R448A Solstice® N40																																																																			
<table border="1"> <thead> <tr> <th>Variable name</th> <th>value</th> <th>Carel</th> <th>ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td>201,2</td> <td>N/A</td> <td>300 *</td> </tr> <tr> <td>GAS coefficient 1</td> <td>8762</td> <td>N/A</td> <td>5301</td> </tr> <tr> <td>GAS coefficient 2</td> <td>8898</td> <td>N/A</td> <td>5302</td> </tr> <tr> <td>GAS coefficient 3</td> <td>32089</td> <td>N/A</td> <td>5303</td> </tr> <tr> <td>GAS coefficient 4</td> <td>-23743</td> <td>N/A</td> <td>5304</td> </tr> <tr> <td>GAS coefficient 5</td> <td>-24628</td> <td>N/A</td> <td>5305</td> </tr> <tr> <td>GAS coefficient 6</td> <td>8000</td> <td>N/A</td> <td>5306</td> </tr> <tr> <td>GAS coefficient 7</td> <td>1884</td> <td>N/A</td> <td>5307</td> </tr> <tr> <td>GAS coefficient 8</td> <td>-21058</td> <td>N/A</td> <td>5308</td> </tr> <tr> <td>GAS coefficient 9</td> <td>-24819</td> <td>N/A</td> <td>5309</td> </tr> <tr> <td>GAS coefficient 10</td> <td>-29634</td> <td>N/A</td> <td>5310</td> </tr> <tr> <td>GAS coefficient 11</td> <td>-2063</td> <td>N/A</td> <td>5311</td> </tr> <tr> <td>GAS coefficient 12</td> <td>6333</td> <td>N/A</td> <td>5312</td> </tr> <tr> <td>CRC gas coefficients</td> <td>27348</td> <td>N/A</td> <td>5313</td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td>31757</td> <td>N/A</td> <td>5327</td> </tr> </tbody> </table> <p style="text-align: center;">*) the sent value includes 1 decimal. All the others are signed integers</p>						Variable name	value	Carel	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	8762	N/A	5301	GAS coefficient 2	8898	N/A	5302	GAS coefficient 3	32089	N/A	5303	GAS coefficient 4	-23743	N/A	5304	GAS coefficient 5	-24628	N/A	5305	GAS coefficient 6	8000	N/A	5306	GAS coefficient 7	1884	N/A	5307	GAS coefficient 8	-21058	N/A	5308	GAS coefficient 9	-24819	N/A	5309	GAS coefficient 10	-29634	N/A	5310	GAS coefficient 11	-2063	N/A	5311	GAS coefficient 12	6333	N/A	5312	CRC gas coefficients	27348	N/A	5313	CRC gas coefficients (Global)	31757	N/A	5327
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Warning : Check Gas compatibility with valves, piping and materials before the use.																																																																					
Generation Time:		28/03/2017 10:12		R448A DEW																																																																	

Fig. 1.c

Für das Menüfenster Ffa01 heißt das:

Koeff.	H	L
A	GAS-Koeff. 1	GAS-Koeff. 2
B	GAS-Koeff. 3	GAS-Koeff. 4
C	GAS-Koeff. 5	GAS-Koeff. 6
D	GAS-Koeff. 7	GAS-Koeff. 8
E	GAS-Koeff. 9	GAS-Koeff. 10
F	GAS-Koeff. 11	GAS-Koeff. 12

Tab. 1.a

Daraus folgt:

Koeff.	H	L
A	8762	8898
B	32089	-23743
C	-24628	8000
D	1884	-21058
E	-24819	-29634
F	-206.3	6333

Tab. 1.b

Dasselbe gilt für die Siedepunkt-Konvertierung (BUBBLE):

Bubble temperature		variables set for	pRack pR300 v 4.0																																																																																	
Gas number ID:		201,2	BUBBLE																																																																																	
Gas name/comment:		R448A Solstice® N40																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Variable name</th> <th style="width: 20%;">value</th> <th style="width: 10%;">Carel</th> <th colspan="2" style="width: 30%;">ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr> <td>Custom Gas</td> <td style="text-align: center;">201.2</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">300 *</td> <td></td> </tr> <tr> <td>GAS coefficient 1</td> <td style="text-align: center;">9374</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5314</td> <td></td> </tr> <tr> <td>GAS coefficient 2</td> <td style="text-align: center;">14786</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5315</td> <td></td> </tr> <tr> <td>GAS coefficient 3</td> <td style="text-align: center;">-5484</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5316</td> <td></td> </tr> <tr> <td>GAS coefficient 4</td> <td style="text-align: center;">-23487</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5317</td> <td></td> </tr> <tr> <td>GAS coefficient 5</td> <td style="text-align: center;">7700</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5318</td> <td></td> </tr> <tr> <td>GAS coefficient 6</td> <td style="text-align: center;">1344</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5319</td> <td></td> </tr> <tr> <td>GAS coefficient 7</td> <td style="text-align: center;">-29725</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5320</td> <td></td> </tr> <tr> <td>GAS coefficient 8</td> <td style="text-align: center;">-29378</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5321</td> <td></td> </tr> <tr> <td>GAS coefficient 9</td> <td style="text-align: center;">-13170</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5322</td> <td></td> </tr> <tr> <td>GAS coefficient 10</td> <td style="text-align: center;">-12485</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5323</td> <td></td> </tr> <tr> <td>GAS coefficient 11</td> <td style="text-align: center;">-12638</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5324</td> <td></td> </tr> <tr> <td>GAS coefficient 12</td> <td style="text-align: center;">13371</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5325</td> <td></td> </tr> <tr> <td>CRC gas coefficients</td> <td style="text-align: center;">-29220</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5326</td> <td></td> </tr> <tr> <td>CRC gas coefficients (Global)</td> <td style="text-align: center;">31757</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">5327</td> <td></td> </tr> </tbody> </table> <p style="text-align: right; margin-right: 20px;">*) the sent value includes 1 decimal. All the others are signed integers</p>					Variable name	value	Carel	ModBus (H.Reg)		Custom Gas	201.2	N/A	300 *		GAS coefficient 1	9374	N/A	5314		GAS coefficient 2	14786	N/A	5315		GAS coefficient 3	-5484	N/A	5316		GAS coefficient 4	-23487	N/A	5317		GAS coefficient 5	7700	N/A	5318		GAS coefficient 6	1344	N/A	5319		GAS coefficient 7	-29725	N/A	5320		GAS coefficient 8	-29378	N/A	5321		GAS coefficient 9	-13170	N/A	5322		GAS coefficient 10	-12485	N/A	5323		GAS coefficient 11	-12638	N/A	5324		GAS coefficient 12	13371	N/A	5325		CRC gas coefficients	-29220	N/A	5326		CRC gas coefficients (Global)	31757	N/A	5327	
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GAS coefficient 8	-29378	N/A	5321																																																																																	
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Generation Time:		28/03/2017 10:12																																																																																		
R448A BUBBLE																																																																																				

Fig. 1.d

Für das Menüfenster **Ffa02** heißt das:

Koeff.	H	L
A	GAS-Koeff. 1	GAS-Koeff. 2
B	GAS-Koeff. 3	GAS-Koeff. 4
C	GAS-Koeff. 5	GAS-Koeff. 6
D	GAS-Koeff. 7	GAS-Koeff. 8
E	GAS-Koeff. 9	GAS-Koeff. 10
F	GAS-Koeff. 11	GAS-Koeff. 12

Tab. 1.c

Daraus folgt:

Koeff.	H	L
A	9374	14786
B	-5484	-23487
C	7700	1344
D	-29725	-29378
E	-13170	-12485
F	-12638	13371

Tab. 1.d

Analog gilt für die BUBBLE-Konvertierung von Druck auf Temperatur:

Bubble pressure	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A																																																																		
Solstice® N40																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Variable name</th> <th style="width: 20%;">value</th> <th style="width: 20%;">Caret</th> <th style="width: 20%;">ModBus (H.Reg)</th> </tr> </thead> <tbody> <tr><td>Custom Gas</td><td>201,2</td><td>N/A</td><td>300 *</td></tr> <tr><td>GAS coefficient 1</td><td>12827</td><td>N/A</td><td>5328</td></tr> <tr><td>GAS coefficient 2</td><td>-11348</td><td>N/A</td><td>5329</td></tr> <tr><td>GAS coefficient 3</td><td>18191</td><td>N/A</td><td>5330</td></tr> <tr><td>GAS coefficient 4</td><td>-27728</td><td>N/A</td><td>5331</td></tr> <tr><td>GAS coefficient 5</td><td>-18722</td><td>N/A</td><td>5332</td></tr> <tr><td>GAS coefficient 6</td><td>6197</td><td>N/A</td><td>5333</td></tr> <tr><td>GAS coefficient 7</td><td>5120</td><td>N/A</td><td>5334</td></tr> <tr><td>GAS coefficient 8</td><td>2233</td><td>N/A</td><td>5335</td></tr> <tr><td>GAS coefficient 9</td><td>25891</td><td>N/A</td><td>5336</td></tr> <tr><td>GAS coefficient 10</td><td>829</td><td>N/A</td><td>5337</td></tr> <tr><td>GAS coefficient 11</td><td>13861</td><td>N/A</td><td>5338</td></tr> <tr><td>GAS coefficient 12</td><td>-5569</td><td>N/A</td><td>5339</td></tr> <tr><td>CRC gas coefficients</td><td>-18200</td><td>N/A</td><td>5340</td></tr> <tr><td>CRC gas coefficients (Global)</td><td>31757</td><td>N/A</td><td>5327</td></tr> </tbody> </table> <p style="text-align: right; font-size: small;">*) the sent value includes 1 decimal. All the others are signed integers</p>			Variable name	value	Caret	ModBus (H.Reg)	Custom Gas	201,2	N/A	300 *	GAS coefficient 1	12827	N/A	5328	GAS coefficient 2	-11348	N/A	5329	GAS coefficient 3	18191	N/A	5330	GAS coefficient 4	-27728	N/A	5331	GAS coefficient 5	-18722	N/A	5332	GAS coefficient 6	6197	N/A	5333	GAS coefficient 7	5120	N/A	5334	GAS coefficient 8	2233	N/A	5335	GAS coefficient 9	25891	N/A	5336	GAS coefficient 10	829	N/A	5337	GAS coefficient 11	13861	N/A	5338	GAS coefficient 12	-5569	N/A	5339	CRC gas coefficients	-18200	N/A	5340	CRC gas coefficients (Global)	31757	N/A	5327
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GAS coefficient 2	-11348	N/A	5329																																																															
GAS coefficient 3	18191	N/A	5330																																																															
GAS coefficient 4	-27728	N/A	5331																																																															
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GAS coefficient 9	25891	N/A	5336																																																															
GAS coefficient 10	829	N/A	5337																																																															
GAS coefficient 11	13861	N/A	5338																																																															
GAS coefficient 12	-5569	N/A	5339																																																															
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Info section																																																																		
Warning : Check Gas compatibility with valves, piping and materials before the use.																																																																		
Generation Time: 28/03/2017 10:12		R448A BUBBLE																																																																

Fig. 1.e

was für das Menüfenster Ffa02 Folgendes ergibt:

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.e

Von denen:

coeff	H	L
A	12827	-11348
B	18191	-27728
C	-18722	6197
D	5120	2233
E	25891	829
F	13861	-5569

Tab. 1.f


```
Custom Gas Ffa04
Custom Gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC: -29220
Dew T conv.CRC: -18200
Global CRC: 31757
```

Um die Daten zu bestätigen können im letzten Menüfenster die ID und die 4 CRC eingegeben werden. Ohne diese Werte ist die korrekte Eingabe nicht gewährleistet.

Wurden die Parameter korrekt eingegeben, wird der Alarm ALO03 stillgelegt und man kann mit dem Startvorgang weiterfahren.

Gestión de gas custom en el pRack pR300

Índice

1. REFRIGERANTES "CUSTOM"	5
1.1 Introducción.....	5
1.2 Configuración.....	5
1.3 Supervisión	7
1.4 Configuración del pRack	9

Para cualquier aclaración o en el caso de que no se consiga resolver el problema, contactar con la asistencia de CAREL.

CST Carel +39 049 9716602
cst@carel.com

1. REFRIGERANTES "CUSTOM"

1.1 Introducción

En la estructura pRack está prevista la posibilidad de configurar un refrigerante por cada línea de aspiración y cada línea de condensación. Con la versión 3.2 hemos introducido un nuevo refrigerante "CUSTOM".

Este refrigerante se configura mediante 12 parámetros enteros para la curva DEW y 12 para la curva BUBBLE y 12 para la curva BUBBLE de temperatura a presión (introducidos desde la versión 4.0.1).

Los parámetros son distribuidos y validados por CAREL tal y como se hace normalmente para el MPX PRO. CAREL, para reconocer el refrigerante y para verificar la introducción correcta de los datos, distribuye un ID y 4 CRC (DEW, BUBBLE (temperatura), BUBBLE (presión), GLOBAL) que deben ser introducidos en el control junto con los parámetros de los coeficientes. La función de los CRC es la de prevenir una introducción errónea o bien una manumisión de los datos por parte del fabricante. Si el CRC introducido por el usuario no se corresponde con el generado desde los parámetros, se señala una alarma grave que no permite el arranque del rack.

Es posible definir un solo gas custom, pero no es posible configurar dos gas custom distintos en dos líneas diferentes.

Los parámetros de los coeficientes están disponibles en KSA, en la sección "Gas custom management" alcanzable siguiendo la ruta software & support --> Configuración & Updating Software --> parametric controller software --> pRack --> pRack Standard --> Gas custom management.

La configuración del gas custom, utilizando los coeficientes citados, es posible tanto desde terminal PGD a las pantallas Ffa01...Ffa04 (para versiones anteriores a la 4.0.0 pantallas Cag16...Cag18) como desde supervisión sólo con protocolo MODBUS (a través de los registros 300 y 5301...5340) y a partir de la versión 3.2 del pRack pR300.

1.2 Configuración

Es posible asignar el refrigerante CUSTOM a las líneas de aspiración y condensación por medio del wizard:

```
Wizard                               1b40
Compressors conf19.
Regulation by:
Measure unit:      PRESSURE
                  bar9
Refrigerant:      CUSTOM
```

o, a continuación, en las pantallas Caf04, Cbf04, Daf04 y Dbf04.

```
Cond. Conf19.                         Daf04
Refrigerant type:
                          CUSTOM
```

Para parametrizar el refrigerante, las pantallas de configuración están presentes en el menú Configuración -> Gas Custom (para versiones anteriores a la 4.0.1 en el menú Compresores -> Línea 1 -> Avanzadas).

La pantalla Ffa01 permite insertar los coeficientes para la conversión DEW:

Nota: para este ejemplo de configuración se ha utilizado el refrigerante R448A

```
Custom gas                             Ffa01
Custom gas DEW coeff.
D= H: 8762 L: 8898
C= H: 32089 L: -23743
O= H: -24628 L: 8000
D= H: 1884 L: -21058
T= H: -24819 L: -29634
T= H: -2063 L: 6333
```

La pantalla Ffa02 permite insertar los coeficientes para la conversión BUBBLE:

```
Custom gas                             Ffa02
Custom gas BUB coeff.
D= H: 9374 L: 14786
C= H: -5484 L: -23487
O= H: 2700 L: 1344
D= H: -29725 L: -29378
T= H: -13170 L: -12485
T= H: -12638 L: 13371
```

La pantalla **Ffa03** permite introducir los coeficientes para la conversión BUBBLE de temperatura a presión (introducidos desde la versión 4.0.1):

```
Custom Gas Ffa03
Custom Gas BUB T coeff
A= H: 12827 L:-11348
B= H: 18191 L:-27728
C= H: -18722 L: 6197
D= H: 5120 L: 2233
E= H: 25891 L: 829
F= H: 13861 L: -5569
```

La pantalla **Ffa04** contiene los parámetros correspondientes al ID y CRC:

```
Custom Gas Ffa04
Custom Gas addit. info
Refrigerant ID: 201.2
Dew conv.CRC: 27348
Bubble conv.CRC:-29220
Dew T conv.CRC: -18200
Global CRC: 31757
```

Al finalizar la configuración la campanita de alarma debe comenzar a parpadear.

1.3 Supervisión

La configuración de los parámetros puede ser efectuada también por medio del PVPRO. Se ha creado una nueva categoría entre los parámetros denominada "Custom Refrigerant".

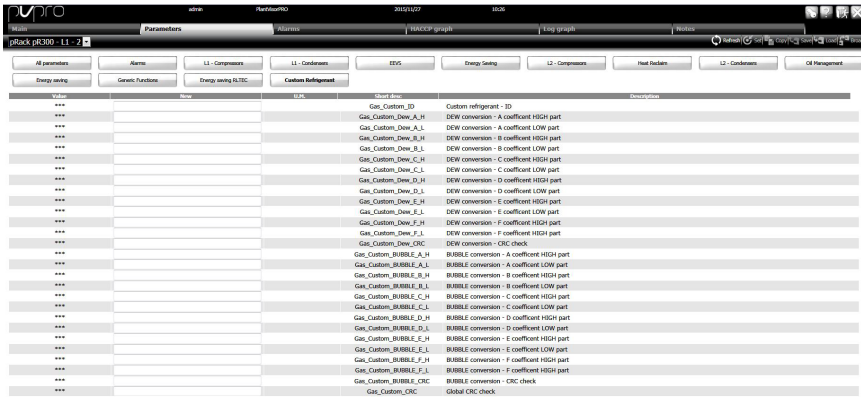
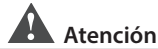


Fig. 1.a

En esta categoría se pueden introducir todos los parámetros utilizando una única pantalla.

**Atención**

Los parámetros pueden ser configurados sólo en los modelos L1+L2 o sólo en la L1, en la pestaña dedicada para L2 no es necesaria ninguna configuración.

Si la línea 2 está configurada para utilizar el refrigerante custom, los parámetros son configurados automáticamente por medio de la conexión pPlan con el control L1.

Ejemplo práctico

Nota: para este ejemplo de configuración se ha utilizado el refrigerante R448A.

En KSA o después del pedido en BU-RET se libera un documento conteniendo todos los parámetros validados por CAREL para poder utilizar el refrigerante deseado.

Dew temperature		variables set for		pRack pR300 v 4.0	
Gas number ID:		201,2	DEW		
Gas name/comment:		R448A Solstice® N40			
Variable name		value	Carel	ModBus (H.Reg)	
Custom Gas		201,2	N/A	300 *	
GAS coefficient 1		8762	N/A	5301	
GAS coefficient 2		8898	N/A	5302	
GAS coefficient 3		32089	N/A	5303	
GAS coefficient 4		-23743	N/A	5304	
GAS coefficient 5		-24628	N/A	5305	
GAS coefficient 6		8000	N/A	5306	
GAS coefficient 7		1884	N/A	5307	
GAS coefficient 8		-21058	N/A	5308	
GAS coefficient 9		-24819	N/A	5309	
GAS coefficient 10		-29634	N/A	5310	
GAS coefficient 11		-2063	N/A	5311	
GAS coefficient 12		6333	N/A	5312	
CRC gas coefficients		27348	N/A	5313	
CRC gas coefficients (Global)		31757	N/A	5327	
*) the sent value includes 1 decimal. All the others are signed integers					
Info section					
Warning : Check Gas compatibility with valves, piping and materials before the use.					
Generation Time:		28/03/2017 10:12		R448A DEW	

Fig. 1.b

En este documento para pR300 se distinguen en tres páginas diferentes los coeficientes para la conversión DEW, BUBBLE y BUBBLE de temperatura a presión (desde la versión 4.0.1), en el ejemplo, un recorte de la página para la conversión DEW.

CAREL

1.4 Configuración del pRack

Iniciar la configuración comenzando por el Wizard, en la pantalla lb40 se pregunta por el refrigerante a utilizar para la línea de aspiración línea 1, configurar como sigue:

```

Wizard                               lb40
Compressors conf19.
Regulation by: PRESSURE
Measure unit: bar9
Refrigerant: CUSTOM
  
```

Realizar la misma configuración para la línea de condensación 1:

```

Wizard                               lb93
Condensers conf19.
Regulation by: PRESSURE
Measure unit: bar9
Refrigerant: CUSTOM
  
```

Proseguir con el resto de las configuraciones en base al tipo de unidad, al finalizar, confirmar para terminar el wizard:

```

Wizard
I/O Auto-configuration
under execution
■■■
Please wait...
  
```

Al finalizar el wizard se puede notar la alarma bloqueante (no permite a los compresores arrancar) que recuerda parametrizar los coeficientes para el refrigerante custom:

```

Alarms                               AL003
Custom gas error

(Check input param.)
  
```

Bastará rellenar los parámetros como sigue para eliminar la alarma y proseguir con el arranque. En la pantalla Cag16 introducir los valores directamente en el documento refrigerante, primero para la conversión

DEW:

```

Custom Gas DEW coeff.
Wp1 H: 8763 L: 8898
Wp2 H: 32099 L: -23743
C=1 H: -24628 L: 8000
C=0 H: 1884 L: -21058
T=1 H: -24819 L: -29634
T= H: -2063 L: 6333
  
```

Ejemplo de tabla de coeficientes para refrigerante R448A

Dew temperature	variables set for	pRack pR300	v 4.0																																																																
Gas number ID: 201,2 DEW																																																																			
Gas name/comment: R448A Solstice® N40																																																																			
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R448A DEW																																																																			

Fig. 1.c

que si traduce en el siguiente modo per la pantalla Ffa01

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.a

Da cui:

coeff	H	L
A	8762	8898
B	32089	-23743
C	-24628	8000
D	1884	-21058
E	-24819	-29634
F	-206.3	6333

Tab. 1.b

Poi al mismo modo per la conversión BUBBLE:

Bubble temperature	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A Solstice® N40																																																																		
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Fig. 1.d

que si traduce en el siguiente modo per la pantalla Ffa02

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.c

Da cui:

coeff	H	L
A	9374	14786
B	-5484	-23487
C	7700	1344
D	-29725	-29378
E	-13170	-12485
F	-12638	13371

Tab. 1.d

Y del mismo modo para la conversión BUBBLE de presión a temperatura:

Bubble pressure	variables set for	pRack pR300 v 4.0																																																																
Gas number ID: 201,2 BUBBLE																																																																		
Gas name/comment: R448A Solstice® N40																																																																		
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R448A BUBBLE																																																																		

Fig. 1.e

que si traduce en el siguiente modo per la pantalla Ffa02

coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.e

Da cui:

coeff	H	L
A	12827	-11348
B	18191	-27728
C	-18722	6197
D	5120	2233
E	25891	829
F	13861	-5569

Tab. 1.f

```
Custom Gas Ffa04  
Custom Gas addit. info  
Refrigerant ID: 201.2  
Dew conv.CRC: 27348  
Bubble conv.CRC: -29220  
Dew T conv.CRC: -18200  
Global CRC: 31757
```

Para confirmar los datos, la última pantalla permite introducir el ID y los 4 CRC sin los cuales no se podrá estar seguro de la introducción correcta.

En este punto, si los parámetros se han introducido correctamente, la alarma ALO03 desaparece y se puede finalmente proseguir con la puesta en marcha

CAREL

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Agenzia / Agency: