pRack pR300

CAREL

ITA **Gestione gas custom nel pRack pR300**

ENG **Gas custom management on pRack pR300**

FRE **Gestion du gaz «custom» dans pRack pR300**

GER **Custom-Gas-Management im pRack pR300**

SPA **Gestión de gas custom en el pRack pR300**

LEGGI E CONSERVA QUESTE ISTRUZIONI
READ AND SAVE THESE INSTRUCTIONS

NO POWER & SIGNAL CABLES TOGETHER
READ CAREFULLY IN THE TEXT!

High Efficiency Solutions

Gestione gas custom nel pRack pR300

Indice

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

CST Carel +39 049 9716602
cst@carel.com

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.

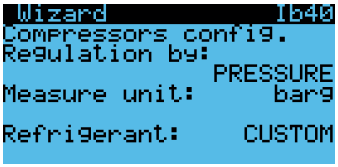
Il refrigerante è unico per tutte le linee, ovvero non è possibile selezionare gas custom su linee diverse ed impostarlo con coefficenti diversi tra di loro.

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.

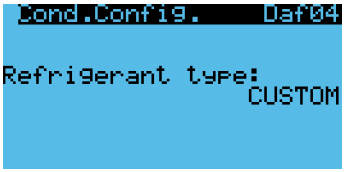
La configurazione del gas custom, utilizzando i sopracitati coefficienti, è possibile sia da terminale PGD alle maschere Ffa01...Ffa04 (per versioni precedenti la 4.0.1 maschere Cag16...Cag18) che da supervisione con protocollo MODBUS (attraverso i registri 300 e 5301...5340) e a partire dalla versione 3.2 del pRack pR300.

1.2 Configurazione

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

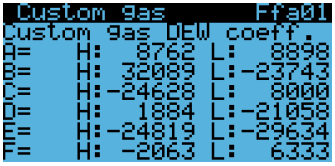


o successivamente nelle masch. Caf04, Cbf04, Daf04 e Dbf04.

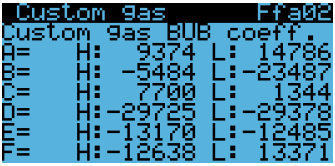


Per parametrizzare il refrigerante le maschere di configurazione sono presenti nel menu dedicato Impostazioni -> Gas Custom (per versioni precedenti la 4.0.1 nel menù Compressori -> Linea 1 -> Avanzate)

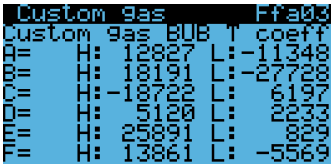
La maschera Ffa01 permette di inserire i coefficienti per la conversione DEW:



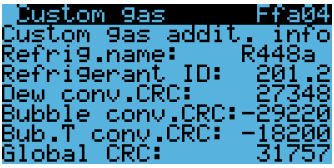
La maschera Ffa02 permette di inserire i coefficienti per la conversione BUBBLE:



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



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



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

1.3 Supervisione

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

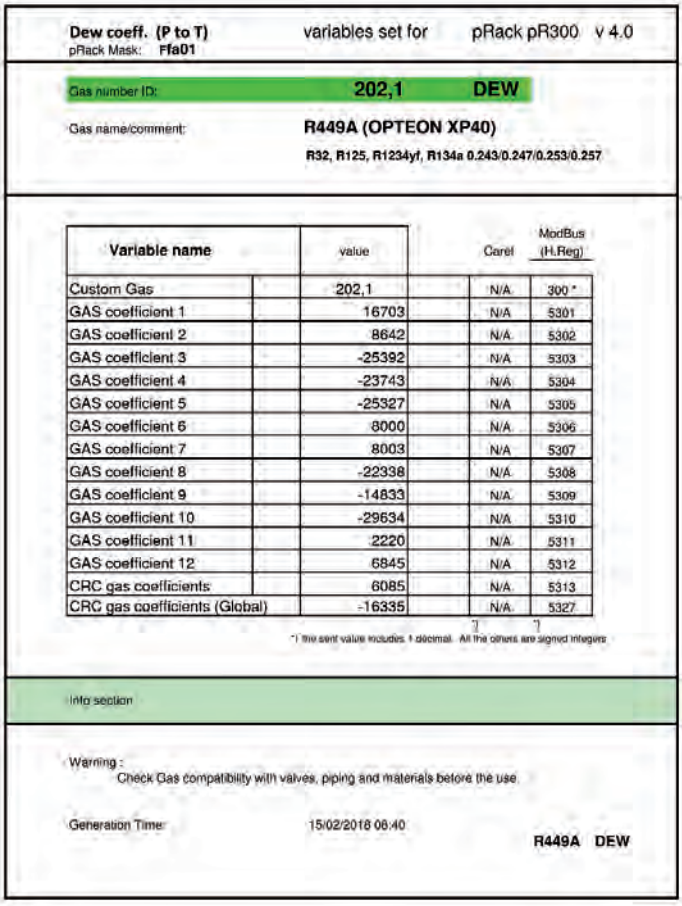
Fig. 1.a

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:
Inserimento del refrigerante custom (R449a) per applicazione singola linea.
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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

Gas number ID: **202,1** **DEW**

Gas name/comment: **R449A (OPTEON XP40)**

R32, R125, R1234yf, R134a 0.243/0.247/0.253/0.257

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	202,1	N/A	300 *
GAS coefficient 1	16703	N/A	5301
GAS coefficient 2	8642	N/A	5302
GAS coefficient 3	-25392	N/A	5303
GAS coefficient 4	-23743	N/A	5304
GAS coefficient 5	-25327	N/A	5305
GAS coefficient 6	8000	N/A	5306
GAS coefficient 7	8003	N/A	5307
GAS coefficient 8	-22338	N/A	5308
GAS coefficient 9	-14833	N/A	5309
GAS coefficient 10	-29634	N/A	5310
GAS coefficient 11	2220	N/A	5311
GAS coefficient 12	6845	N/A	5312
CRC gas coefficients	6085	N/A	5313
CRC gas coefficients (Global)	-16335	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: 15/02/2018 08:40

R449A DEW

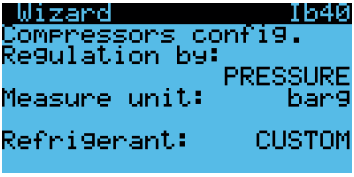
Fig. 1.b

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.

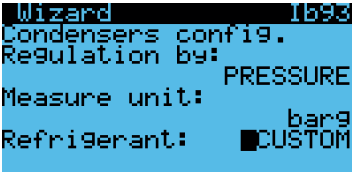
Una volta configurati i parametri relativi al gas custom selezionato, si consiglia di aggiornare la descrizione relativa all'ID refrigerante aggiungendo la sigla corrispondente (es. R448A).

1.4 Configurazione del pRack

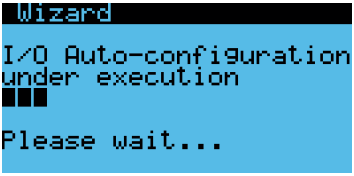
Iniziare la configurazione partendo dal Wizard, in maschera Ib40 viene chiesto il refrigerante da utilizzare per la linea di aspirazione linea 1, configurare come segue:



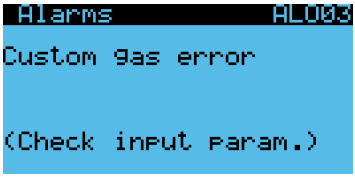
Eseguire la stessa configurazione per la linea di condensazione 1:



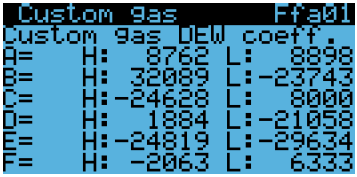
Proseguire con il resto dell'impostazione in base al tipo di unità, al termine confermare per terminare il wizard:



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:



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:



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

Dew coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

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: 15/02/2018 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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa02**

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: 15/02/2018 10:12

R448A BUBBLE

Fig. 1.d

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.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

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

Bubble T coeff. (T to P) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa03**

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

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: 15/02/2018 10:12

R448A BUBBLE T

Fig. 1.e

che si traduce nel seguente modo per la maschera **Ffa03**

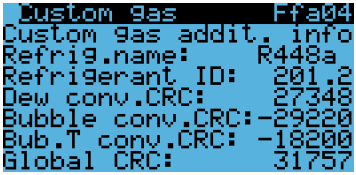
coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

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



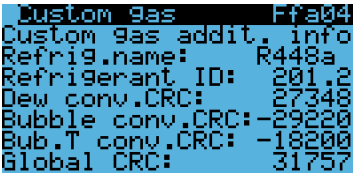
Per confermare i dati l'ultima maschera permette di inserire l'ID e i 4 CRC senza i quali non si potrà essere certi del corretto inserimento.

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

È possibile inoltre associare un nome al refrigerante custom configurato, definendo i caratteri che vanno a comporre la stringa da visualizzare.

Il nome, definito in maschera Ffa04, sarà visualizzato (sola lettura) in corrispondenza della selezione del tipo "custom" associato al refrigerante per ciascuna linea di aspirazione, di condensazione e in corrispondenza della stessa selezione per la regolazione ausiliaria.

Qui sotto l'esempio di visualizzazione per la linea di aspirazione 1.



Gas custom management on pRack pR300

Content

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

CST Carel +39 049 9716602
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 curvend 12 for the BUBBLE temperature-pressure curve (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.

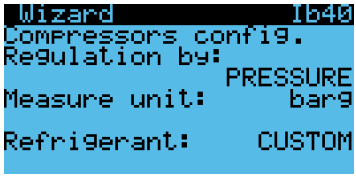
The refrigerant is unique for all lines; it is not possible to select gas-custom on different lines and set with different coecents.

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.

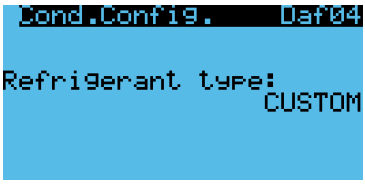
The custom gas can be configured using the coefficients described above on the pGD terminal, screens Ffa01...Ffa04 (for versions prior to 4.0.1, screens Cag16...Cag18) and on the supervisor, only via Modbus protocol (using registers 300 and 5301...5340) and starting from version 3.2 of pRack pR300.

1.2 Configuration

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

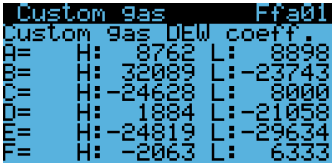


or subsequently, on screens Caf04, Cbf04, Daf04 and Dbf04.

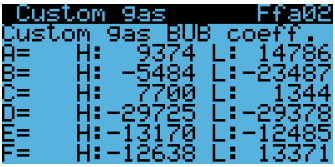


The configuration screens for setting the refrigerant parameter are available under Settings -> Custom Gas (for versions prior to 4.0.1 under Compressors -> Line 1 -> Advanced).

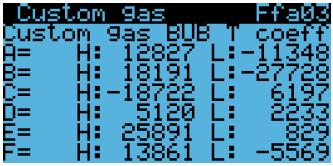
Screen **Ffa01** is used to enter the coefficients for DEW point conversion:
Note: R448A refrigerant was used in this configuration example



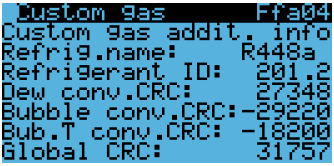
Screen **Ffa02** is used to enter the coefficients for BUBBLE point conversion:



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



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



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

1.3 Supervisor

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

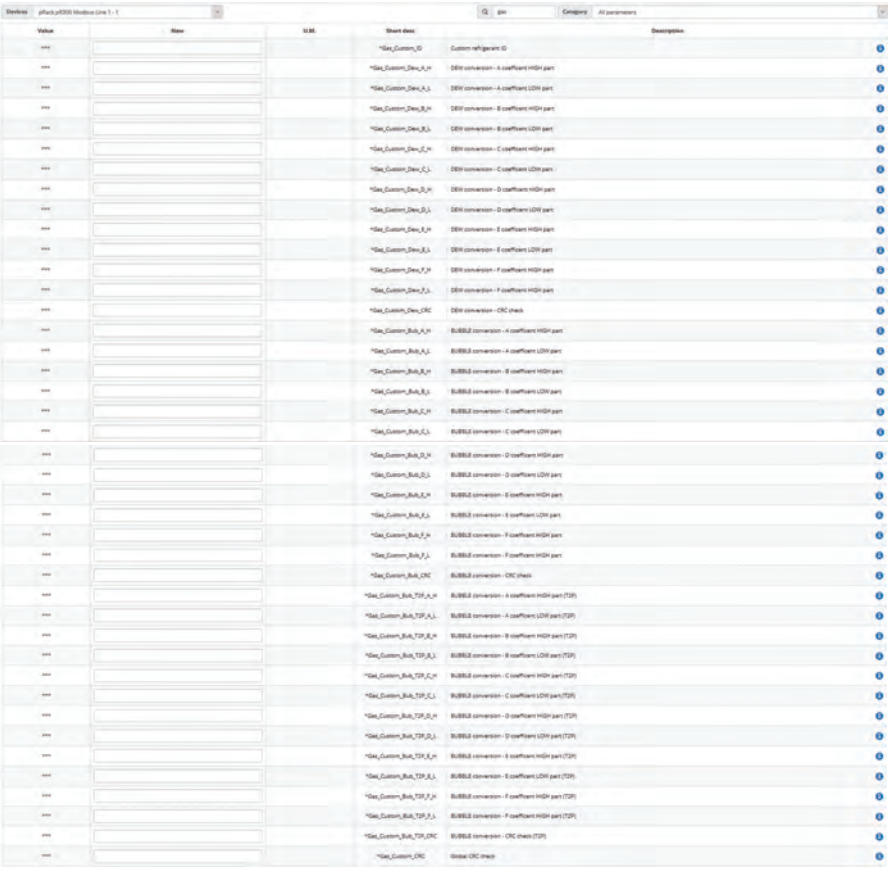


Fig. 1.a

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
Insertion of custom refrigerant (R449a) for single line application.
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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

Gas number ID: **202,1** **DEW**

Gas name/comment: **R449A (OPTEON XP40)**
R32, R125, R1234yf, R134a 0.243/0.247/0.253/0.257

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	202,1	N/A	300 *
GAS coefficient 1	16703	N/A	5301
GAS coefficient 2	8642	N/A	5302
GAS coefficient 3	-25392	N/A	5303
GAS coefficient 4	-23743	N/A	5304
GAS coefficient 5	-25327	N/A	5305
GAS coefficient 6	8000	N/A	5306
GAS coefficient 7	8003	N/A	5307
GAS coefficient 8	-22338	N/A	5308
GAS coefficient 9	-14833	N/A	5309
GAS coefficient 10	-29634	N/A	5310
GAS coefficient 11	2220	N/A	5311
GAS coefficient 12	6845	N/A	5312
CRC gas coefficients	6085	N/A	5313
CRC gas coefficients (Global)	-16335	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: 15/02/2018 08:40

R449A 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.

When parameters have been configured for the selected custom gas, it is advisable to update the description of ID-refrigerant by adding the corresponding code (eg R448A).

1.4 Configuring the pRack

Start the configuration using the Wizard; on screen Ib40, the refrigerant to be used on suction line 1 is requested. Configure this as follows:

```
Wizard              Ib40
Compressors config.
Regulation by:
                 PRESSURE
Measure unit:       barg

Refrigerant:      CUSTOM
```

Repeat the same configuration for condenser line 1:

```
Wizard              Ib93
Condensers config.
Regulation by:
                 PRESSURE
Measure unit:
                      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              AL003
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.
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
```

Note: R448A refrigerant was used in this configuration exampl

Dew coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

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: 15/02/2018 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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa02**

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: 15/02/2018 10:12

R448A BUBBLE

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 T coeff. (T to P) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa03**

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

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: 15/02/2018 10:12

R448A BUBBLE T

Fig. 1.e

Which will be as follows for screen **Ffa03**

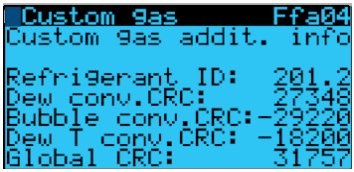
coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

Tab. 1.a

Hence:

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

Tab. 1.b



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

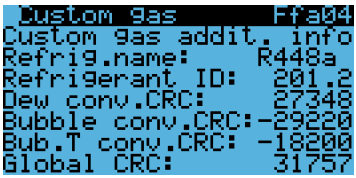
At this stage if the parameters have been entered correctly, alarm ALO03 is cancelled and it is possible to proceed with start-up.

It is possible to associate a name to the configured custom refrigerant, defining characters available for make up the string to be displayed.

Il nome, definito in maschera Ffa04, sarà visualizzato (sola lettura) in corrispondenza della selezione del tipo "custom" associato al refrigerante per ciascuna linea di aspirazione, di condensazione e in corrispondenza della stessa selezione per la regolazione ausiliaria.

The name, set in mask Ffa04, will be displayed (read only) in correspondence with the selection of "custom" type associated with the refrigerant for each suction, condensation line (corresponding of the same selection for the auxiliary regulation).

Below an example of visualization for the suction line 1.



Gestion du gaz « custom » dans pRack pR300

Table des matières

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.

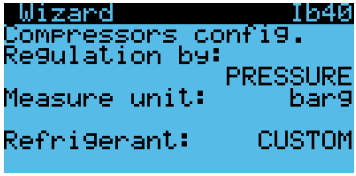
Le réfrigérant est unique pour toutes les lignes; il n'est pas possible de sélectionner un gaz personnalisé sur différentes lignes et de le régler avec des coefficients différents.

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.

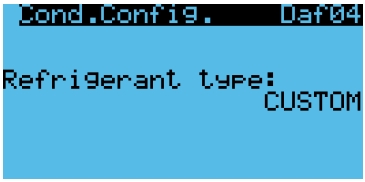
À l'aide des coefficients susmentionnés, il est possible de configurer le gaz «custom» soit à partir du terminal PGD, sur les écrans Ffa01...Ffa04 (pour les versions précédentes à 4.0.0, les écrans Cag16...Cag18), soit à partir de la supervision, uniquement sur le protocole MODBUS (par le biais des registres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

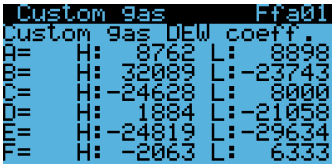


ou, par la suite, à l'aide des écrans Caf04, Cbf04, Daf04 et Dbf04.

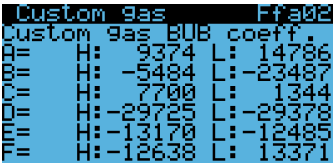


Les écrans de configuration permettant de paramétrer le réfrigérant se trouvent dans le menu Réglages-> Gaz Custom (pour les versions précédant la 4.0.1 dans le menu Compresseurs -> Ligne 1 -> Avancées)

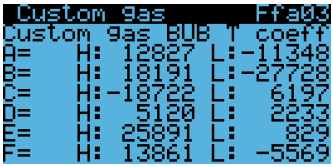
L'écran **Ffa01** permet de saisir les coefficients pour la conversion DEW :
Remarque: pour cet exemple de configuration, nous avons utilisé le réfrigérant R448A



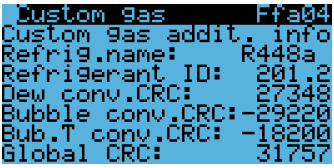
L'écran **Ffa02** permet de saisir les coefficients pour la conversion BUBBLE :



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



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



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 BOSS.
Une nouvelle catégorie de paramètres a été créée ; elle s'appelle « Custom Refrigerant ».

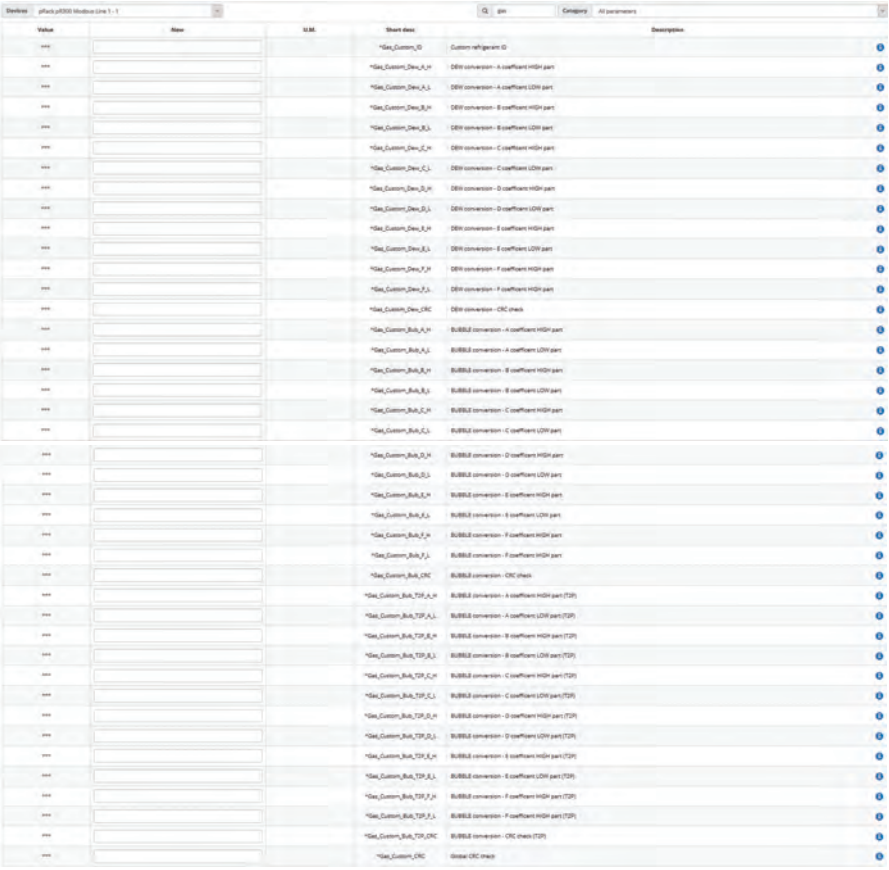


Fig. 1.a

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
Insertion de réfrigérant personnalisé (R449a) pour une application sur une seule ligne.
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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

Gas number ID: **202,1** **DEW**

Gas name/comment: **R449A (OPTEON XP40)**
R32, R125, R1234yf, R134a 0.243/0.247/0.253/0.257

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	202,1	N/A	300 *
GAS coefficient 1	16703	N/A	5301
GAS coefficient 2	8642	N/A	5302
GAS coefficient 3	-25392	N/A	5303
GAS coefficient 4	-23743	N/A	5304
GAS coefficient 5	-25327	N/A	5305
GAS coefficient 6	8000	N/A	5306
GAS coefficient 7	8003	N/A	5307
GAS coefficient 8	-22338	N/A	5308
GAS coefficient 9	-14833	N/A	5309
GAS coefficient 10	-29634	N/A	5310
GAS coefficient 11	2220	N/A	5311
GAS coefficient 12	6845	N/A	5312
CRC gas coefficients	6085	N/A	5313
CRC gas coefficients (Global)	-16335	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: 15/02/2018 08:40

R449A 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.

Lorsque les paramètres relatifs au gaz personnalisé sélectionné ont été configurés, il est conseillé de mettre à jour la description de l'identifiant du réfrigérant en ajoutant le code correspondant (par exemple, R448A).

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 config.
Regulation by:
                    PRESSURE
Measure unit:           barg

Refrigerant:          CUSTOM
```

Exécuter la même configuration pour la ligne de condensation 1 :

```
Wizard                  Ib93
Condensers config.
Regulation by:
                    PRESSURE
Measure unit:
                        barg
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                  ALU03
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.
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
```

Exemple de tableau des coefficients pour réfrigérant R448A

Dew coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

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: 15/02/2018 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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa02**

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: 15/02/2018 10:12

R448A BUBBLE

Fig. 1.d

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

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

Où :

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 T coeff. (T to P) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa03**

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

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: 15/02/2018 10:12

R448A BUBBLE T

Fig. 1.e

Qui se traduit de la manière suivante pour l'écran **Ffa03**

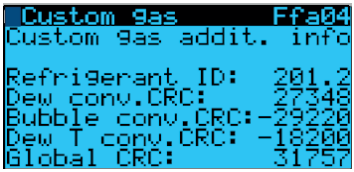
coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

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



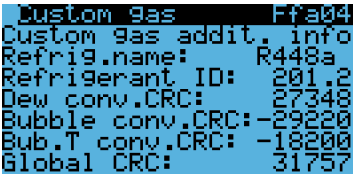
Pour confirmer les données, le dernier masque de saisie permet d'entrer l'ID et les 4 CRC, sans lesquels il est impossible d'être certains que la saisie est correcte.

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

Il est possible d'associer un nom au réfrigérant personnalisé configuré, en définissant les caractères composant la chaîne à afficher.

Le nom, défini pour le formulaire Ffa04, sera affiché (en lecture seule) en correspondance avec la sélection du type "personnalisé" associé au réfrigérant pour chaque conduite d'aspiration, conduite de condensation et en correspondance du même choix pour la régulation auxiliaire.

Ci-dessous l'exemple de visualisation pour la conduite d'aspiration 1.



Index

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.

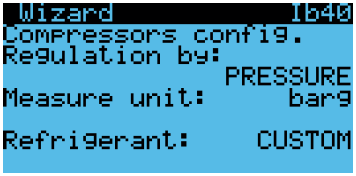
Das Kältemittel ist für alle Leitungen eindeutig; es ist nicht möglich, ein benutzerdefiniertes Gas in verschiedenen Leitungen auszuwählen und mit unterschiedlichen Koeffizienten einzustellen.

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.

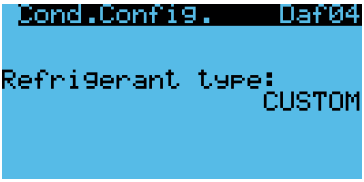
Die Custom Gas Konfiguration mit den o.g. Koeffizienten ist sowohl über PGD-Terminal in den Menüfenstern Ffa01...Ffa04 (für Versionen vor der 4.0.0 Menüfenster Cag16...Cag18) als auch aus der Überwachung nur am Protokoll MODBUS (über die Register 300 und 5301...5340) und ab der Version 3.2 des pRack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

1.2 Konfiguration

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



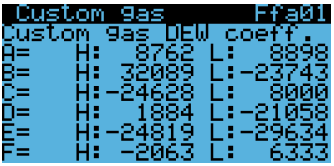
oder im Nachhinein in den Menüfenstern Caf04, Cbf04, Daf04 und Dbf04 zugewiesen werden.



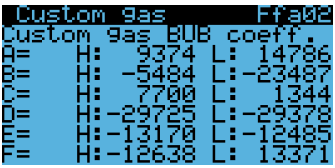
Zur Parametrisierung des Kältemittels stehen die Menüfenster für die Konfigurierung im entsprechenden Menü unter Einstellungen -> Gas Custom (für Versionen vor 4.0.1 im Menü Verdichter -> Leitung 1 -> Erweiterte Einstellungen)

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

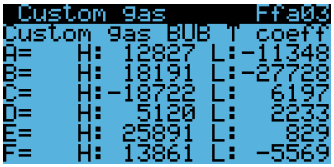
Anmerkung: Für dieses Konfigurationsbeispiel wurde das Kältemittel R448A benutzt



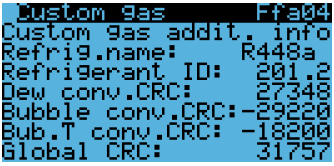
Das Menüfenster **Ffa02** lässt die Koeffizienten für die Siedepunkt-Konvertierung (BUBBLE) eingeben:



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



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



Nach Abschluss der Konfiguration sollte das Alarmsymbol nicht mehr blinken.

1.3 Überwachung

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

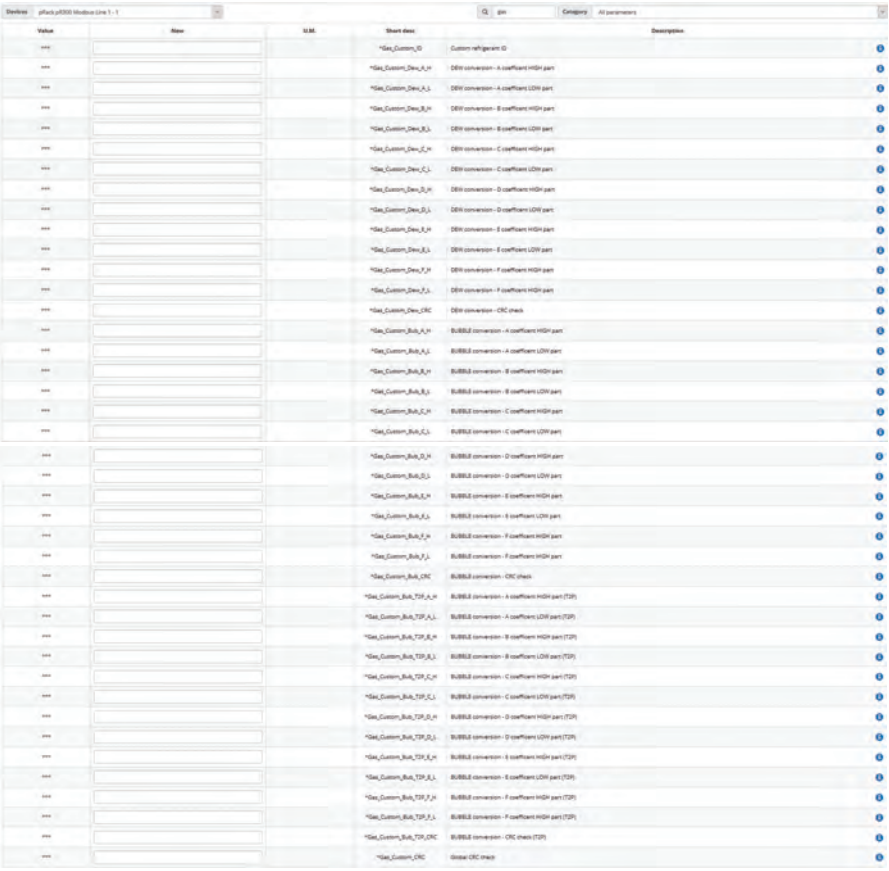


Fig. 1.a

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
Einbringen von Spezialkältemittel (R449a) für Einleitungsanwendungen.
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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

Gas number ID: **202,1** **DEW**

Gas name/comment: **R449A (OPTEON XP40)**
R32, R125, R1234yf, R134a 0.243/0.247/0.253/0.257

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	202,1	N/A	300 *
GAS coefficient 1	16703	N/A	5301
GAS coefficient 2	8642	N/A	5302
GAS coefficient 3	-25392	N/A	5303
GAS coefficient 4	-23743	N/A	5304
GAS coefficient 5	-25327	N/A	5305
GAS coefficient 6	8000	N/A	5306
GAS coefficient 7	8003	N/A	5307
GAS coefficient 8	-22338	N/A	5308
GAS coefficient 9	-14833	N/A	5309
GAS coefficient 10	-29634	N/A	5310
GAS coefficient 11	2220	N/A	5311
GAS coefficient 12	6845	N/A	5312
CRC gas coefficients	6085	N/A	5313
CRC gas coefficients (Global)	-16335	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: 15/02/2018 06:40

R449A DEW

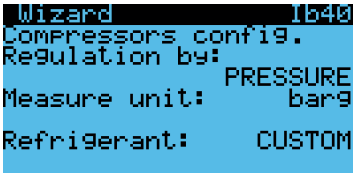
Fig. 1.b

IIn 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.

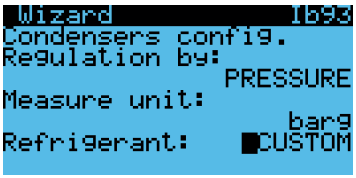
Wann die Parameter für das ausgewählte benutzerdefinierte Gas konfiguriert wurden, empfiehlt es sich, die Beschreibung der Kältemittel-ID durch Hinzufügen des entsprechenden Codes (z. B. R448A) zu aktualisieren.

1.4 pRack-Konfiguration

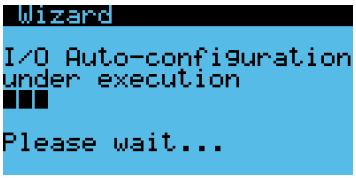
Die Konfiguration mit dem assistierten Verfahren starten. Im Menüfenster Ib40 muss das für die Saugleitung 1 zu verwendende Kältemittel konfiguriert werden:



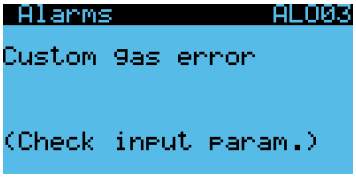
Dieselbe Konfiguration für die Verflüssigungsleitung 1 ausführen:



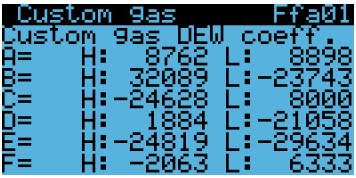
Die restlichen geräteabhängigen Einstellungen vornehmen. Abschließend bestätigen, um das assistierte Verfahren zu beenden:



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



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:



Anmerkung: Für dieses Konfigurationsbeispiel wurde das Kältemittel R448A benutzt.

Dew coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

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: 15/02/2018 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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa02**

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: 15/02/2018 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 T coeff. (T to P) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa03**

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

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: 15/02/2018 10:12

R448A BUBBLE T

Fig. 1.e

was für das Menüfenster **Ffa03** Folgendes ergibt:

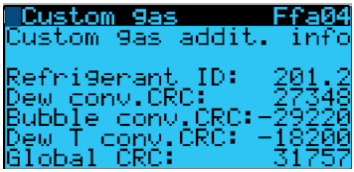
coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

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



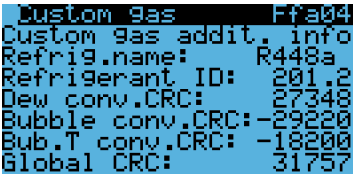
Um die Daten zu bestätigen können im letzten Menüfenster die ID und die 4 CRC eingeben werden. Ohne diese Werte ist die korrekte Eingabe nicht gewährleistet.

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

Es ist möglich, dem konfigurierten benutzerdefinierten Kältemittel einen Namen zuzuweisen, der die Zeichen definiert, aus denen die anzuzeigende Zeichenfolge besteht.

Der in der Form Ffa04 festgelegte Name wird entsprechend der Auswahl des dem Kältemittel zugeordneten "benutzerdefinierten" Typs für jede Saugleitung, Kondensationsleitung und entsprechend derselben Auswahl für die Hilfsregelung angezeigt (schreibgeschützt).

Unten das Visualisierungsbeispiel für die Saugleitung 1.



Gestión de gas custom en el pRack pR300

Índice

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 señaliza una alarma grave que no permite el arranque del rack.

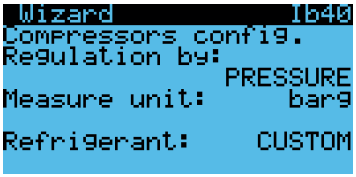
El refrigerante es lo mismo para todas las líneas, es decir, no es posible seleccionar gas personalizado en diferentes líneas y configurarlo con diferentes niveles de temperatura.

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.

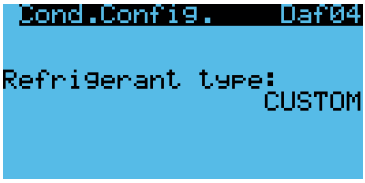
La configuración del gas custom, utilizando los coeficientes citados, es posible tanto desde terminal PGD a las pantallas Ffa01...Ffa04 (para versiones anteriores a la 4.0.0 pantallas Cag16...Cag18) como desde supervisión sólo con protocolo MODBUS (a través de los registros 300 y 5301...5340) y a partir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



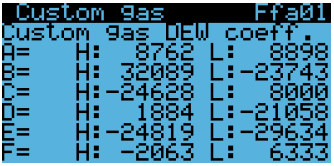
o, a continuación, en las pantallas Caf04, Cbf04, Daf04 y Dbf04.



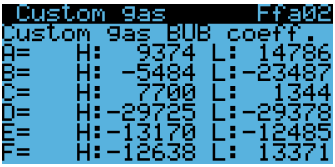
Para parametrizar el refrigerante, las pantallas de configuración están presentes en el menú Ajustes-> Gas Custom (para versiones anteriores a la 4.0.1 en el menú Compresores -> Línea 1 -> Avanzadas).

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

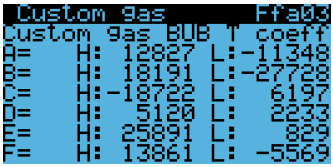
Nota: para este ejemplo de configuración se ha utilizado el refrigerante R448A



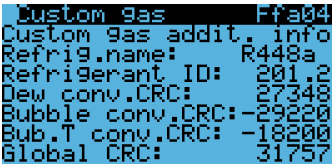
La pantalla **Ffa02** permite insertar los coeficientes para la conversión BUBBLE:



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



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



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 BOSS.
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 pLan con el control L1.

Ejemplo práctico
Inserción de refrigerante personalizado (R449a) para aplicación de una sola línea.
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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

Gas number ID: **202,1** **DEW**

Gas name/comment: **R449A (OPTEON XP40)**
R32, R125, R1234yf, R134a 0.243/0.247/0.253/0.257

Variable name	value	Carel	ModBus (H.Reg)
Custom Gas	202,1	N/A	300 *
GAS coefficient 1	16703	N/A	5301
GAS coefficient 2	8642	N/A	5302
GAS coefficient 3	-25392	N/A	5303
GAS coefficient 4	-23743	N/A	5304
GAS coefficient 5	-25327	N/A	5305
GAS coefficient 6	8000	N/A	5306
GAS coefficient 7	8003	N/A	5307
GAS coefficient 8	-22338	N/A	5308
GAS coefficient 9	-14833	N/A	5309
GAS coefficient 10	-29634	N/A	5310
GAS coefficient 11	2220	N/A	5311
GAS coefficient 12	6845	N/A	5312
CRC gas coefficients	6085	N/A	5313
CRC gas coefficients (Global)	-16335	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: 15/02/2018 08:40

R449A 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.

Cuando se hayan configurado los parámetros para el gas personalizado seleccionado, se recomienda actualizar la descripción de la identificación del refrigerante agregando el código correspondiente (por ejemplo, R448A).

1.4 Configuración del pRack

Iniciar la configuración comenzando por el Wizard, en la pantalla Ib40 se pregunta por el refrigerante a utilizar para la línea de aspiración línea 1, configurar como sigue:

```
Wizard                  Ib40
Compressors config.
Regulation by:
                    PRESSURE
Measure unit:           barg

Refrigerant:         CUSTOM
```

Realizar la misma configuración para la línea de condensación 1:

```
Wizard                  Ib93
Condensers config.
Regulation by:
                    PRESSURE
Measure unit:
                        barg
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 Ffa01 introducir los valores directamente en el documento refrigerante, primero para la conversión DEW:

```
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
```

Nota: por este ejemplo de configuración se utilizó el refrigerante R448A.

Dew coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa01**

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: 15/02/2018 10:12

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 coeff. (P to T) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa02**

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: 15/02/2018 10:12

R448A BUBBLE

Fig. 1.d

que si traduce en el siguiente modo para 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 T coeff. (T to P) variables set for pRack pR300 v 4.0
pRack Mask: **Ffa03**

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

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: 15/02/2018 10:12

R448A BUBBLE T

Fig. 1.e

que si traduce en el siguiente modo per la pantalla **Ffa03**

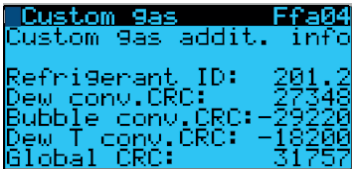
coeff	H	L
A	GAS coeff 1	GAS coeff 2
B	GAS coeff 3	GAS coeff 4
C	GAS coeff 5	GAS coeff 6
D	GAS coeff 7	GAS coeff 8
E	GAS coeff 9	GAS coeff 10
F	GAS coeff 11	GAS coeff 12

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



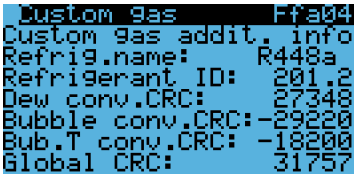
Para confirmar los datos, la última pantalla permite introducir el ID y los 4 CRC sin los cuales no se podrá estar seguro de la introducción correcta.

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

También es posible asociar un nombre al refrigerante personalizado, definiendo los caracteres que conforman la cadena que se mostrará.

El nombre, definido en la forma Ffa04, se mostrará (solo lectura) en correspondencia con la selección del tipo "personalizado" asociado con el refrigerante para cada línea de succión, línea de condensación y en correspondencia con la misma selección para la regulación auxiliar.

Debajo del ejemplo de visualización para la línea de succión 1.



CAREL

CAREL INDUSTRIES - Headquarters
Via dell'Industria, 11 - 35020 Brugine - Padova (Italy)
Tel. (+39) 049.9716611 - Fax (+39) 049.9716600
e-mail: carel@carel.com - **www.carel.com**

Agenzia / Agency:

"Gas custom management" +040010030 - 1.2 - 26.06.2019