



Options Guide

Sintesis air-cooled scroll chillers Models CGAF 300 – 700 kW



AUGUST 2017

CG-PRC049A-GB

Digit 1,2,3,4 – Unit model

CGAF = Air-Cooled Scroll Packaged Chiller

Digit 5, 6, 7 - Unit Nominal Tonnage

080 = 80 Tons

090 = 90 Tons

100 = 100 Tons

110 = 110 Tons

130 = 130 Tons

140 = 140 Tons

150 = 150 Tons

165 = 165 Tons

180 = 180 Tons

190 = 190 Tons

Digit 8 - Unit Voltage

D = 400 Volt / 50 Hz / 3 Phase

Digit 9 - Manufacturing Plant

E = Epinal, French

Digit 10, 11 - Design Sequence

AA = Factory assigned

Digit 12 - Efficiency Level

N = Standard Efficiency

H = High Efficiency

A = Extra High Efficiency

Digit 13 = Agency Listing

C = CE Certification

Digit 14 = Pressure Vessel Code

2 = Europe Standard (PED)

Digit 15 - Sound Level

X = Standard

L = Low Noise

E = Extra Low Noise

Digit 16 = Unit Application

X = Standard Ambient (14 To 115F/-10 To 46C)

L = Low Ambient (-4 To 115F/-20 To 46C)

H = High Ambient (14 To 131F/-10 To 52C)

D = Wide Ambient (-4 To 131F/-20 To 52C)

Digit 17 - Relief Valves Option

W = Without

Digit 18 - Water connection

X = Standard Grooved pipe

W = Grooved pipe + Weld couplings

2 = Grooved Pipe w/ Coupling & Flange Adapter

Digit 19 - Evaporator Application

N = Standard Cooling (39,2 To 68F/4 To 20C)

P = Low Temperature Process (39,2 To 10,4F/4 To -12C)

C = Ice-Making (19,4 To 68F/-7 To 20C)

Digit 20 - Evaporator Configurations

B = Brazed Plates Heat Exchanger

Digit 21 - Insulation

N = Standard thermal insulation

Digit 22 - Condenser coating

N = Micro channel

C = E-coated MCHE

Digit 23 - Condenser Heat Recovery

X = No Heat Recovery

P = Partial Heat Recovery

Digit 24 - Hydraulic pump

X = Signal On/Off Pump

1 = Dual pump standard pressure

3 = Dual pump high pressure

Digit 25 - Free Cooling

X = No option

Digit 26 - Power Line Type Connection

B = Disconnect Switch

Digit 27 - Control Panel Accessories

X = No option

1 = Under/Over Voltage Protection

2 = Under/Over Voltage Protection And
Ground Fault Protection

Digit 28 - Unit Operator Interface

C = Spanish

D = German

E = English

F = French

H = Dutch

I = Italian

M = Swedish

P = Polish

R = Russian

T = Czech

U = Greek

V = Portuguese-Portugal

2 = Romanian

6 = Hungarian

8 = Turkish

Digit 29 - Remote Interface

X = None Remote Interface

B = BACnet interface

M = Modbus interface

L = LonTalk interface

**Digit 30 - External Set points & Capacity
outputs**

X = None

A = External Set points & Capacity outputs

Digit 31 - Flow Switch

X = No Flow Switch

F = Field installed Flow Switch

Digit 32 - Electrical Panel Protection

X = Enclosure with deadfront protection

1 = Enclosure with IP 20 internal protection

Digit 33 - Master Slave

X = Without

A = With

Digit 34 - Unit User interface

L = Standard, Local UI supplied

Digit 35 - Energy meter

X = No energy meter

M = Energy meter installed

Digit 36 - Mini Chiller Plan Control

X = No MiniCPC

Digit 37 - Variable Primary Flow

X = Constant speed pump_No VFD

A = Pump Flow Controlled by Triple Duty
Valve

F = Constant speed pump_VFD Adjustment

T = Variable speed pump_Constant delta T

Digit 38 - Refrigerant Leak Detection

X = Not installed

Digit 39 - Web server

X = No installed

Digit 40 - Electrical Accessories

X = Not supplied

P = 230V-100W convenience outlet

Digit 41 - Performance Test Options

X = Run test w/o customer

B = Visual inspection

E = Performance test w/o customer

Digit 42 - Unit isolation

X = None

1 = Neoprene Isolators

4 = Neoprene Pads

Digit 43 - Label and Literature Language

B = Bulgarian
C = Spanish
D = German
E = English
F = French
H = Dutch SI
I = Italian
K = Finish
L = Danish
M = Swedish
N = Norwegianian
P = Polish
R = Russian
T = Czech
U = Greek
V = Portuguese
Z = Slovene
2 = Romanian
3 = Serbian
4 = Slovak
5 = Croatian
6 = Hungarian
8 = Turkish

Digit 44 - Shipping Package

X = Standard
A = Unit Containerization Package

Digit 45 - Refrigerant

X = None
A = Full Factory Refrigerant charge (HFC-410A)

Digit 49 - Freeze Protection (Factory Installed Only)

X = Without Freeze Protection
2 = With Freeze Protection

Digit 50 - Buffer Tank

X = No Tank
1 = With Tank

Digit 51 - Water Strainer

X = No Strainer
A = With Strainer Factory Installed

Digit 52 - Appearance Options

X = No appearance options

Digit 54 - Starter Type

A = Across the Line Starter/Direct on Line
B = Soft starter

Digit 55 - Programmable relays

X = None
A = With

Digit 56 - Fans Type

1 = AC fans
2 = EC fans
3 = EC Axitop fans

Digit 57 - NNSB

X = None
1 = NNSB

Digit 58 - Special

X = Standard Catalog
S = Special Requirement

Contents

1. Range Overview and General Information	12
2. Unit Nominal Tonnage, Digit 5-6-7	13
3. Unit voltage, Digit 8	14
400 V / 3 Ph / 50 Hz, Digit 8 = D	14
4. Manufacturing plant, Digit 9	14
Epinal, France, Digit 9= E	14
5. Efficiency level, Digit 12	14
5.1 Standard Efficiency (SE), Digit 12 = N	14
5.2 High Efficiency (HE), Digit 12 = H	15
5.3 Extra High Efficiency (XE), Digit 12= A	16
6. Agency listing, Digit 13	16
CE Certification, Digit 13= C	16
7. Pressure Vessel Code, Digit 14	16
Europe Standard (PED), Digit 14= 2	16
8. Sound level, Digit 15	16
8.1 Standard Noise (SN), Digit 15= X	16
8.1.1 Application	16
8.1.2 Description	16
8.2 Low Noise (LN), Digit 15= L	16
8.2.1 Application	16
8.2.2 Description	16
8.2.3 Benefits	17
8.3 Extra Low Noise (XLN), Digit 15= E	17
8.3.1 Application	17
8.3.2 Description	17
8.3.3 Benefits	18
9. Unit Application, Digit 16	18
9.1 Standard Ambient (Digit 16= X), Low Ambient (Digit 16= L)	18
9.2 High Ambient (Digit 16 = H), Wide Ambient (Digit 16= D)	19
10. Relief Valves Option, Digit 17	20
Without, Digit 17= W	20
11. Water connection, Digit 18	20

11.1	Standard Grooved pipe, Digit 18= X	20
11.1.1	Application.....	20
11.1.2	Description	20
11.2	Grooved pipe with Weld couplings, Digit 18= W	20
11.2.1	Application.....	20
11.2.2	Description	20
11.2.3	Benefits.....	21
11.3	Grooved Pipe with Coupling and Flange Adapter, Digit 18= 2	21
11.3.1	Application.....	21
11.3.2	Description	21
12.	Evaporator Application, Digit 19	22
12.1	Standard Cooling, Digit 19= N	22
12.2	Low Temperature Process, Digit 19= P	22
12.3	Ice-Making, Digit 19= C	22
12.3.1	Application.....	22
12.3.2	Description	22
12.3.3	Benefits	23
12.3.4	More details	23
13.	Evaporator Configurations, Digit 20	23
13.1	Brazed Plates Heat Exchanger, Digit 20= B	23
13.1.1	Application:	23
13.1.2	Description:	23
14.	Insulation, Digit 21	24
14.1	Standard thermal insulation, Digit 21= N	24
14.1.1	Application.....	24
14.1.2	Description	24
14.1.3	Benefits.....	24
14.1.4	Incompatibilities.....	24
15.	Condenser coating, Digit 22	24
15.1	Micro channel, Digit 22= N	24
15.1.1	Application.....	24
15.1.2	Description	24
15.1.3	Operation/Benefits	25
15.1.4	Incompatibilities.....	25
15.2	E-coated MCHE, Digit 22= C	25

16.	Condenser Heat Recovery, Digit 23	25
16.1	No Heat Recovery, Digit 23= X	25
16.2	Partial Heat Recovery, Digit 23= P	25
16.3	Total Heat Recovery - Full equipment, Digit 23= T	25
16.4	Total Heat Recovery - Without insulation, Digit 23= V	26
17.	Hydraulic pump, Digit 24.....	26
17.1	Hydraulic module	26
17.2	Signal On/Off Pump, Digit 24= X	27
17.3	Dual pump standard pressure, Digit 24= 1	27
17.3.1	Application.....	27
17.3.2	Description	27
17.3.3	Performance curves.....	29
17.3.4	Benefits.....	30
17.3.5	Incompatibilities.....	30
17.3.6	More details	30
17.4	Dual Pump High pressure, Digit 24= 3	31
17.4.1	Application.....	31
17.4.2	Description	31
17.4.3	Performance curves:	31
17.4.4	Benefits.....	33
17.4.5	Incompatibilities.....	33
17.4.6	More details	33
18.	Free cooling, Digit 25.....	33
19.	Power Line Type Connection, Digit 26.....	33
19.1	Disconnect Switch, Digit 26= B	33
19.1.1	Application.....	33
19.1.2	Description	33
19.1.4	Incompatibilities.....	33
20.	Control Panel Accessories, Digit 27.....	34
20.1	No option, Digit 27= X	34
20.2	Under/Over Voltage Protection, Digit 27= 1	34
20.2.1	Application.....	34
20.2.2	Description	34
20.2.3	Operation.....	34
20.2.4	Benefits.....	34

20.2.5	Incompatibilities.....	34
20.3	Under/Over Voltage Protection and Ground Fault Protection, Digit 27= 2	34
21.	Unit Operator Interface, Digit 28	34
	Select Language, Digit 28= C-D-E-F-H-I-M-P-R-T-U-V-2-6-8	34
22.	Remote Interface, Digit 29	35
22.1	None Remote Interface, Digit 29= X	35
22.2	BACnet Interface, Digit 29= B	35
22.2.1	Application.....	35
22.2.2	Description	35
22.3	ModBus Interface, Digit 29= M	36
22.3.1	Application.....	36
22.3.2	Description	36
22.3.3	Operation.....	37
22.4	LonTalk Interface, Digit 29= L	37
22.4.1	Application.....	37
22.4.2	Description	37
23.	External Set points & Capacity outputs, Digit 30.....	37
23.1	None, Digit 30= X	37
23.2	External Set points & Capacity outputs, Digit 30= A	37
23.2.1	Application.....	37
23.2.2	Description	37
23.2.3	Benefits.....	38
23.2.4	Incompatibilities.....	38
24.	Flow Switch, Digit 31	38
24.1	No Flow Switch, Digit 31= X	38
24.2	Field installed Flow Switch, Digit 31= F	38
24.2.1	Application.....	38
24.2.2	Description	38
25.	Electrical Panel Protection, Digit 32.....	39
25.1	Enclosure with Dead front Protection, Digit 32= X	39
25.1.1	Application.....	39
25.1.2	Description	39
25.1.3	Benefits.....	39
25.1.4	Incompatibilities.....	39
25.2	Enclosure with IP 20 Internal Protection, Digit 32= 1	39

25.2.1	Application.....	39
25.2.2	Description	40
26.	Master Slave, Digit 33.....	40
26.1	Without, Digit 33= X	40
26.2	With, Digit 33= A	40
26.2.1	Description	40
26.2.2	Operation.....	40
26.2.3	More details	40
27.	Energy meter, Digit 35	40
27.1	No energy meter, Digit 35= X	40
27.2	Energy meter installed, Digit 35= M	40
27.2.1	Description	40
28.	Variable Primary Flow, Digit 37.....	41
28.1	Constant speed pump - No VFD, Digit 37= X	41
28.1.1	Application/Description	41
28.1.2	Incompatibilities.....	41
28.2	Pump flow controlled by balancing valve, Digit 37= A	41
28.2.1	Application	41
28.2.2	Description.....	41
28.2.3	Benefits	41
28.2.4	Incompatibilities.....	41
28.3	Constant speed pump - VFD Adjustment, Digit 37= F	42
28.3.1	Application.....	42
28.3.2	Description	42
28.3.3	Benefits	42
28.3.4	Incompatibilities.....	42
28.4	Variable speed pump - Constant delta T, Digit 37= T	42
28.4.1	Application.....	42
28.4.2	Description	42
28.4.3	Incompatibilities.....	42
29.	Electrical accessories, Digit 40	42
29.1	Not supplied, Digit 40= X	42
29.2	230V-100W convenience outlet, Digit 40= P	42
30.	Performance Test Options, Digit 41	43
30.1	Run test without customer, Digit 41= X	43

30.2 Visual inspection, Digit 41= B	43
30.3 Performance test without customer, Digit 41= E	43
31. Unit isolators, Digit 42	43
31.2.1 Application	43
31.2.2 Description	43
31.2.3 Benefits	44
31.2.4 Incompatibilities	44
31.3 Neoprene pads, Digit 42= 4	44
31.3.1 Application	44
31.3.2 Description	44
31.3.3 Benefits	44
31.3.4 Incompatibilities	45
32. Label and Literature language, Digit 43	45
Language, Digit 43= B-C-D-E-F-H-I-K-L-M-N-P-R-T-U-V-Z-2-3-4-5-6-8	45
33. Shipping Package, Digit 44	45
33.1 Standard, Digit 44= X	45
33.2 Unit containerization Package, Digit 44= A	46
34. Refrigerant, Digit 45	46
Full Factory Refrigerant Charge (HFC-410A), Digit 45= A	46
35. Freeze Protection, Digit 49	46
35.1 With freeze protection, Digit 49= 2	46
35.1.1 Application	46
35.1.2 Description	46
35.1.3 Operation	46
35.1.4 Benefits	47
35.1.5 Incompatibilities	47
35.1.6 More details	47
35.2 Without freeze protection, Digit 49= X	48
36. Buffer tank, Digit 50	48
36.1 No Buffer tank, Digit 50= X	48
36.2 With Buffer tank, Digit 50= 1	48
36.2.1 Application	48
36.2.2 Description	49
36.2.3 Operation	49
36.2.4 Benefits	49

36.2.5	Incompatibilities.....	49
37.	Water strainer, Digit 51	50
37.1	No strainer, Digit 51= X	50
37.2	With strainer, Digit 51= A	50
37.2.1	Application.....	50
37.2.2	Description	50
37.2.3	Operation	51
37.2.4	Benefits.....	51
37.2.5	Incompatibilities.....	51
38.	Starter type, Digit 54.....	51
38.1	Across the line Starter/Direct on line, Digit 54= A	51
38.2	Soft starter, Digit 54= B	52
38.2.1	Application.....	52
38.2.2	Description	52
38.2.3	Operation.....	52
38.2.4	Benefits.....	52
38.2.5	Incompatibilities.....	52
38.2.6	More detail	52
39.	Programmable Relays, Digit 55	53
39.1	None, Digit 55= X	53
39.2	With, Digit 55= A	53
39.2.1	Application	53
39.2.2	Description	53
39.2.3	Operation.....	54
39.2.4	Benefits	54
40.	Type of fan, Digit 56.....	54
40.1	AC fans, Digit 56= 1	54
40.1.1	Application.....	54
40.1.2	Description	54
40.1.3	Incompatibilities.....	54
40.2	EC fans, Digit 56= 2	54
40.2.1	Application.....	54
40.2.2	Description	55
40.2.3	Benefits.....	55
40.2.4	Incompatibilities.....	55

40.3	EC Axitop fans, Digit 56= 3	55
40.3.1	Application.....	55
40.3.2	Description	55
40.3.3	Benefits.....	56
40.3.4	Incompatibilities.....	56
41.	Night Noise SetBack (NNSB), Digit 57	56
41.1	None, Digit 57= X	56
41.2	NNSB, Digit 57= 1	56
41.2.1	Application.....	56
41.2.2	Description	56
41.2.3	Benefits.....	56
41.2.4	Incompatibilities.....	56
42.	Special, Digit 58.....	56
42.1	Standard Catalog, Digit 58= X	56
42.2	Special requirement, Digit 58= S	56

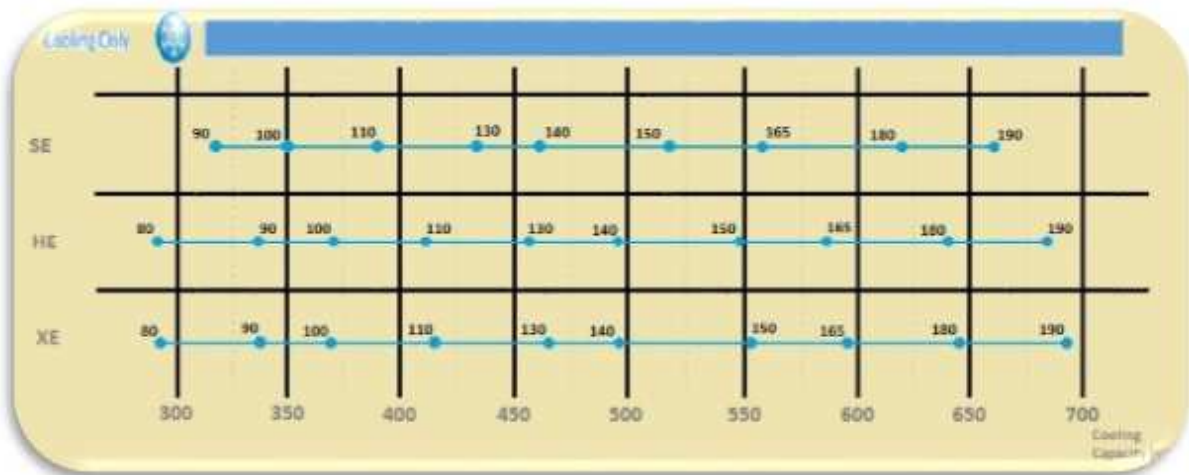
1. Range Overview and General Information

Before explaining the different options and accessories available, let's first take a look at the current range and review the main features of the CGAF chiller.





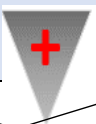


Illustration of a CGAF chiller

CGAF range overview



Sintesis family for CGAF chillers covers cooling capacity range from 300 to 700 kW.

Product definition

Base unit definition		Fans								
Efficiency	Application	AC Fans - 56 = 1			EC Fans - 56 = 2			EC Axitop Fans - 56 = 3		
SE 12 = N	Standard 16 = X	AC			EC Fans 					
	Low 16 = L	X			X			X		
HE 12 = H	High 16 = H	AC 			EC Fans 			X		
	Wide 16 = D	X			X			X		
XE 12 = A	Wide 16 = D	X			X			EC Axitop Fans 		
		X			X			X		
		15 = X	15 = L	15 = E	15 = X	15 = L	15 = E	15 = X	15 = L	15 = E
		/	Jacket	Compressor Box	/	Jacket	Compressor Box	/	Jacket	Compressor Box



: Plus one coil V module



: EC fan plus diffuser

2. Unit Nominal Tonnage, Digit 5-6-7

- 080 = 80 Nominal Tons
- 090 = 90 Nominal Tons
- 100 = 100 Nominal Tons
- 110 = 110 Nominal Tons
- 130 = 130 Nominal Tons
- 140 = 140 Nominal Tons
- 150 = 150 Nominal Tons
- 165 = 165 Nominal Tons
- 180 = 180 Nominal Tons
- 190 = 190 Nominal Tons

- **Compressor size:**

The table below shows the compressor tonnage for each size of a unit:

	1A	1B	1C	2A	2B	2C
Size	Comp. CKT1			Comp. CKT2		
080	25	25	-	25	25	-
090	25	30	-	25	30	-
100	30	30	-	30	30	-
110	30	40	-	30	40	-
130	40	40	-	40	40	-
140	30	30	30	25	25	25
150	30	30	30	30	30	30
165	30	30	40	30	30	40
180	40	40	30	40	40	30
190	40	40	40	40	40	40

Table 1: Compressor size in Ton

3. Unit voltage, Digit 8

400 V / 3 Ph / 50 Hz, Digit 8 = D

CGAF units are only available under 400V / 3 phases / 50Hz. The tolerance on the voltage is $\pm 10\%$.

4. Manufacturing plant, Digit 9

Epinal, France, Digit 9= E

All units are manufactured in France, Charmes factory.

5. Efficiency level, Digit 12

CGAF units are available in 3 efficiency level:

5.1 Standard Efficiency (SE), Digit 12 = N

The table below shows the Brazed Plates Heat Exchanger size (Evaporator) for CGAF with Standard Efficiency (SE):

	Size	090	100	110	130	140	150	165	180	190
SWEP	Number of plates	106	122	138	166	166	194	222	250	278

Condenser size:

Size	090	100	110	130	140	150	165	180	190	
Number of V module	3V				4V			5V		
Standard Ambient fans	4 AC (2 speeds) \ 2V + 2 AC (1 speed) \ 1V				4 AC (2 speeds) \ 2V + 4 AC (1 speed) \ 2V			10 AC (1 speed)		
Low Ambient fans										

5.2 High Efficiency (HE), Digit 12 = H

Compared to the base unit SE, HE units have a larger number of plates on the evaporator.

	Size	080	090	100	110	130	140	150	165	180	190
SWEP	Number of plates	138	138	166	194	222	250	278	278	278	294

For HE version, condenser has one V module more than SE version:

Size	080	090	100	110	130	140	150	165	180	190
Number of V module	3V	4V			5V			6V		
High Ambient fans	4 AC (2 speeds) \ 2V + 2 AC (1 speed) \ 1V	4 AC (2 speeds) \ 2V + 4 AC (1 speed) \ 2V			10 AC (1 speed)			12 AC (1 speed)		
Wide Ambient fans										

5.3 Extra High Efficiency (XE), Digit 12= A

- CGAF of XE version have the same exchangers as HE version.
- Only EC with Axitop fans are mounted on the unit (improving fan motors electrical consumption).

Size	080	090	100	110	130	140	150	165	180	190																																								
Number of V module	3V	4V				5V			6V																																									
Wide Ambient fans	EC with Axitop (ECA) <table border="1" style="width: 100%; text-align: center;"> <tr><td>ECA</td><td>ECA</td><td>ECA</td></tr> <tr><td>ECA</td><td>ECA</td><td>ECA</td></tr> </table>	ECA	ECA	ECA	ECA	ECA	ECA	EC with Axitop (ECA) <table border="1" style="width: 100%; text-align: center;"> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> </table>				ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	EC with Axitop (ECA) <table border="1" style="width: 100%; text-align: center;"> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> </table>			ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	EC with Axitop (ECA) <table border="1" style="width: 100%; text-align: center;"> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> <tr><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td><td>ECA</td></tr> </table>						ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA	ECA
ECA	ECA	ECA																																																
ECA	ECA	ECA																																																
ECA	ECA	ECA	ECA																																															
ECA	ECA	ECA	ECA																																															
ECA	ECA	ECA	ECA	ECA																																														
ECA	ECA	ECA	ECA	ECA																																														
ECA	ECA	ECA	ECA	ECA	ECA																																													
ECA	ECA	ECA	ECA	ECA	ECA																																													

6. Agency listing, Digit 13

CE Certification, Digit 13= C

All CGAF are CE certified.

For every units a CE certificate is sent to the TSO (Trane Sales Office) when the unit is finished.

7. Pressure Vessel Code, Digit 14

Europe Standard (PED), Digit 14= 2

It's a European certification.

8. Sound level, Digit 15

CGAF units are available in 3 classes of sound level:

8.1 Standard Noise (SN), Digit 15= X

8.1.1 Application

Environments without acoustical constraint.

For this option sound power levels are higher than Low noise and Extra Low Noise options.

8.1.2 Description

- No acoustic treatment
- Units available with AC fans (Digit 56= 1), EC fans (Digit 56= 2) and EC Axitop fans (Digit 56= 3) according to the Ambient.

8.2 Low Noise (LN), Digit 15= L

8.2.1 Application

When the unit is installed in a noise sensitive area.

Sound power levels are attenuate for this option.

8.2.2 Description

- Compressors are insulated with jacket
- Units available with AC fans, EC fans and EC Axitop fans.

Illustration compressors with jacket



8.2.3 Benefits

Sound reduction

8.3 Extra Low Noise (XLN), Digiq 15= E

8.3.1 Application

When the unit is installed in a noise sensitive environment.
Sound power levels are the lowest available.

8.3.2 Description

- Units with piping insulation
- Compressor sound box
- Units available with AC fans, EC fans and EC Axitop fans.

Picture of compressors



Compressors sound box



8.3.3 Benefits

More sound reduction

9. Unit Application, Digit 16

To choose the unit configuration for a best comfort, refer to operating map:

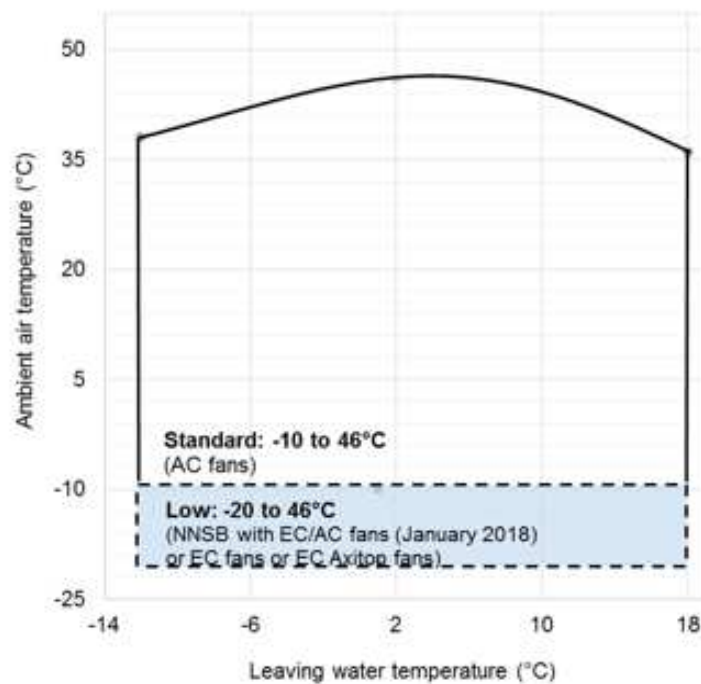
9.1 Standard Ambient (Digit 16= X), Low Ambient (Digit 16= L)

For CGAF with Standard Efficiency (SE), the operating map is indicate as follows:

Standard Ambient option from -10°C to +46°C

Low Ambient option from -20°C to +46°C

CGAF SE (Standard or Low ambient)



Incompatibilities

High and Wide Ambient.

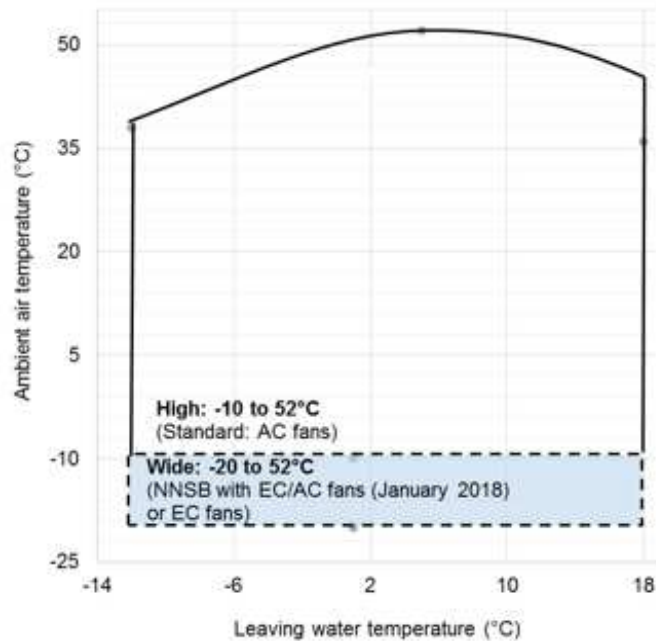
9.2 High Ambient (Digit 16 = H), Wide Ambient (Digit 16= D)

For CGAF with High Efficiency (HE), units operate with:

High Ambient option from -10°C to +52°C

Wide Ambient option from -20°C to +52°C

CGAF HE (High or wide ambient)



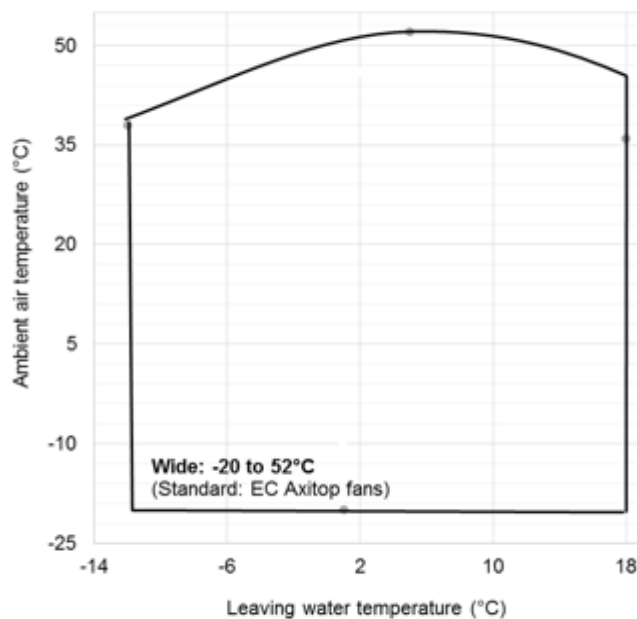
Incompatibilities

CGAF with Standard and Low Ambient.

For CGAF with Extra High Efficiency (XE), units only operate with:

Wide Ambient option from -20°C to +52°C

CGAF XE (Wide ambient)



10. Relief Valves Option, Digit 17

Without, Digit 17= W

Units without Relief Valves Option.

For systems equipped with scroll compressors, protection is taken from the European standard EN 378-2 relative to the protection of refrigerating systems and heat pumps. This harmonized standard gives presumption of conformity to the pressure Equipment Directive 97/23/EC.

Only a High Pressure switch classified in risk category IV is necessary to protect the unit when:

- The swept volume of the compressor is below 25 l/s;
- The refrigerant charge is below 100 kg per circuit; -
- The HP and LP side are not isolated by valve other than capped valve.

When the refrigerant charge is above 100 kg per circuit, a second pressure switch is installed in parallel to the first one.

11. Water connection, Digit 18

11.1 Standard Grooved pipe, Digit 18= X

11.1.1 Application

For standard units, Trane supplies grooved pipe connection without Victaulic coupling. This option is used to connect the CGAF to the water circuit.

Water connection has to be done on site.

11.1.2 Description

- Connection pipes are grooved
- Easy to connect the piping
- No Victaulic coupling on the water connection

11.2 Grooved pipe with Weld couplings, Digit 18= W

11.2.1 Application

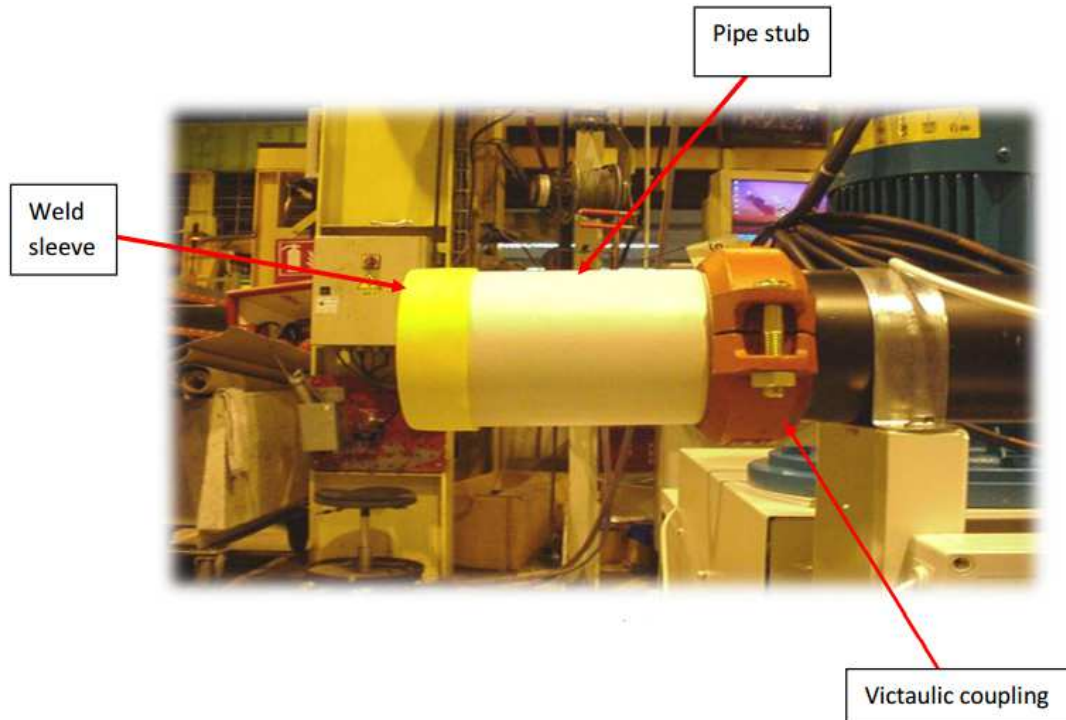
This option is used to connect the CGAF to the water circuit by pipe stub and couplings.

11.2.2 Description

Includes pipe stub and Victaulic couplings on water connection.

Used when tubes are welded.

Illustration Grooved pipe connection + Victaulic



11.2.3 Benefits

Victaulic piping systems are safe, efficient and cost-effective, eliminating hazardous welding and lowering risk during installation.

11.3 Grooved Pipe with Coupling and Flange Adapter, Digit 18= 2

11.3.1 Application

To connect the grooved pipe with the grooved flange adapter. A Victaulic coupling is used between them.

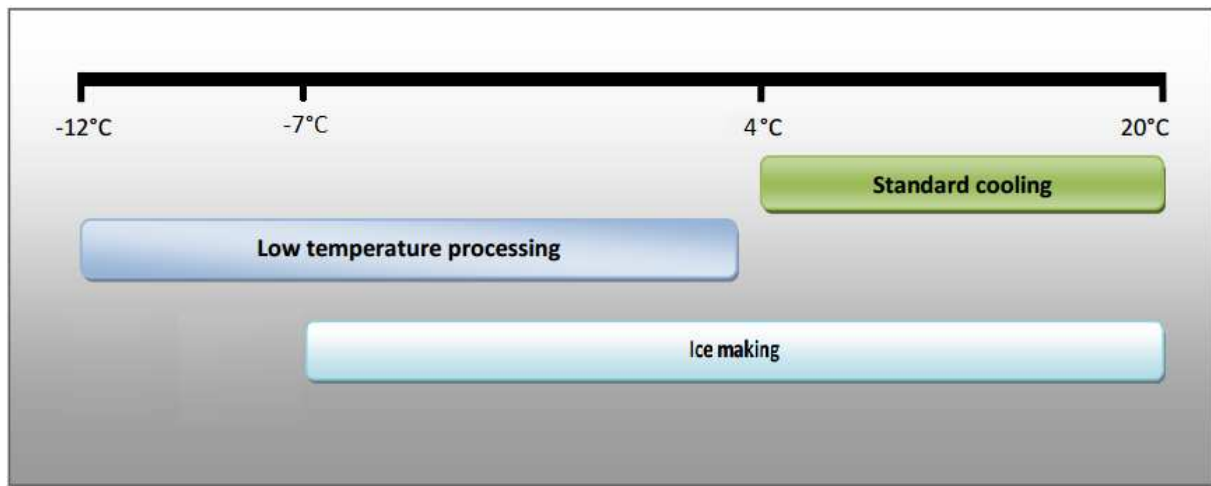
11.3.2 Description

This kind of pipe connection comes with a flange adapter which is used to convert both water connections from grooved pipe to flanged PN 10 connections.

Illustration Grooved pipe with coupling and flange adapter



12. Evaporator Application, Digit 19



Range of evaporator application option

The illustration above shows the application that can be adapted for evaporator. As we can see, 3 applications are available:

12.1 Standard Cooling, Digit 19= N

In standard, the evaporator is provided with standard cooling application which the evaporator leaving temperature is in a range of 4°C to 20°C.

12.2 Low Temperature Process, Digit 19= P

Low temperature processing with the range of leaving water temperature between -12°C and 4°C is an option.

12.3 Ice-Making, Digit 19= C

12.3.1 Application

The other option for evaporator is ice-making with a wide range of leaving water temperature between -7°C and 20°C. This option can be applied when the chiller is used to make ice at night.

12.3.2 Description

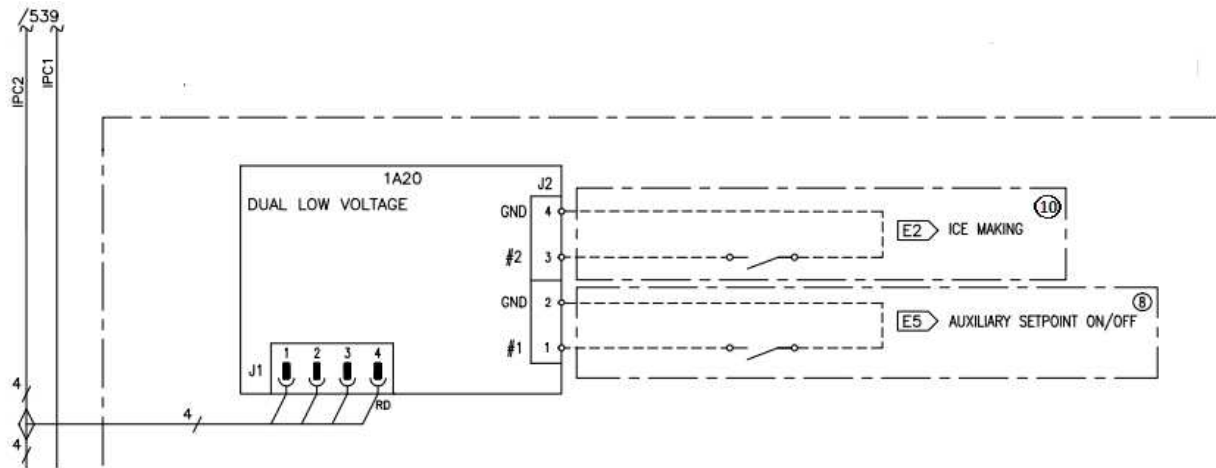
The frozen water (ice) serves as thermal storage that can be melted to produce cooling. 2 set points enable the customer to control the chiller for this option: one set point used for the day time and the other one used during the night time. At night, unit generates ice when utility rates are low (off-peak period) and uses ice for cooling during the day when utility rates are high (on-peak period).

Control on ice-making:

UC800 will accept several inputs to initiate Ice Building (one additional card is dedicated to ice making inputs):

1. External contact closure input (binary input for External Ice Building Command)
2. Front panel Ice Building command
3. Communicated Ice Building Command (LCI-C, BACnet, Modbus)

Illustration ice-making card



In ice building mode, the unit will be fully loaded and will operate until the ice command finishes or the entering water temperature reaches the Ice Termination set point.

- Requires a glycol solution in the chilled water system for freeze protection
- Requires an additional ice storage tank
- Also known as thermal ice storage

12.3.3 Benefits

- Reduces or even replaces mechanical cooling during the day.
- Reduces the electricity consumption cost.
- Avoid over sizing the chiller

12.3.4 More details

If Digit 19= C, then Digit 55= A (With Programmable relays)

13. Evaporator Configurations, Digit 20

13.1 Brazed Plates Heat Exchanger, Digit 20= B

13.1.1 Application:

Brazed plates heat exchangers are one of the most efficient ways to transfer heat. They are designed to provide performance with the lowest life-cycle cost.

13.1.2 Description:

Illustration Brazed Plates Heat Exchanger



14. Insulation, Digit 21

14.1 Standard thermal insulation, Digit 21= N

14.1.1 Application

It is a standard option.

Used to avoid condensation on the cold parts.

14.1.2 Description

All cold parts are covered with a factory-installed 19mm foam insulation:

- Evaporator
- Suction lines

Technical characteristics

Type of material	K-Flex elastomer roll
Color	Black
Thickness	19 mm
Operating Temperature	from -45°C to +85°C
Processing and storage temperature	from +10°C to +30°C
Thermal conductivity coefficient	(at +20°C) : $\lambda = 0,038 \text{ W/(m.K)}$ (at 0°C) : $\lambda = 0,036 \text{ W/(m.K)}$ (at -20°C) : $\lambda = 0,034 \text{ W/(m.K)}$

14.1.3 Benefits

Prevents condensation on the cold parts.

14.1.4 Incompatibilities

No incompatibility.

15. Condenser coating, Digit 22

15.1 Micro channel, Digit 22= N

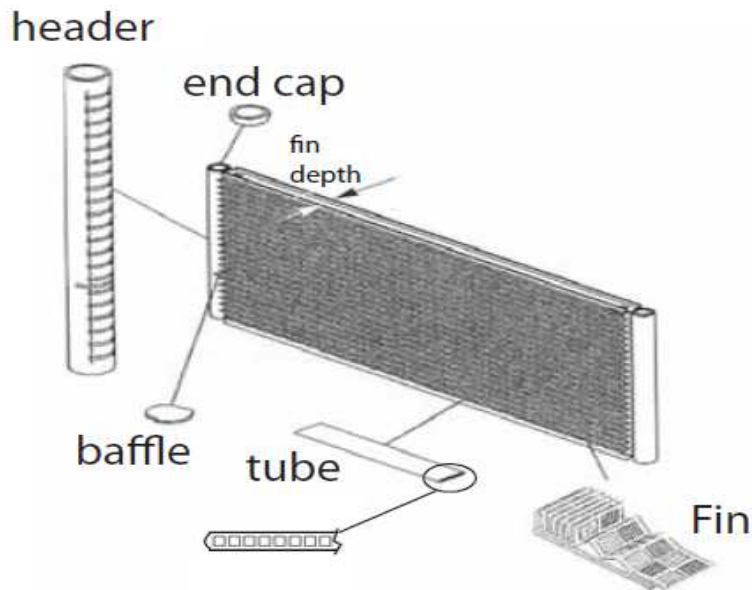
15.1.1 Application

Unit application: when the chiller is installed in a non-polluted area.

15.1.2 Description

The fully-brazed construction micro channel coil increases the coil rigidity making them more rugged to resist the rigors of job site handling and damage due to shipping. The micro channel coil's headers, tubes and fins are assembled and then sprayed with a powder flux bonding agent. The coil is then sent through a large controlled air automated brazing furnace that completely joins these separate pieces as one solid micro channel coil.

Illustration Micro channel coil construction



15.1.3 Operation/Benefits

This process substantially decreases the chances of leaks due to improper brazing techniques. Within each tube are ports that serve as paths for the refrigerant to flow through the micro channel coil. The bottom and top tubes of each coil section are always inactive refrigerant paths. This is done to prevent refrigerant leaks due to corrosion that may be present from moisture resting between the top or bottom tube and the gasket material and also serve as a buffer during the installation and removal of the coil section.

Each fin surface is angled and louvered to create air turbulence through the coil which provides more efficient and enhanced heat transfer without additional air pressure drop through the coil.

15.1.4 Incompatibilities

No incompatibility.

15.2 E-coated MCHE, Digit 22= C

An option to supply MCHE condenser coils with e-coating is available.

This e-coating withstand the exposure to typical corrosive atmospheres, in shore or industrial locations, without sensible impact on coil performances in what heat transfer and air pressure drop is a concern.

16. Condenser Heat Recovery, Digit 23

16.1 No Heat Recovery, Digit 23= X

Units without Heat Recovery option.

16.2 Partial Heat Recovery, Digit 23= P

Not available yet

16.3 Total Heat Recovery - Full equipment, Digit 23= T

Not available yet

16.4 Total Heat Recovery - Without insulation, Digit 23= V

Not available yet

17. Hydraulic pump, Digit 24

17.1 Hydraulic module

The hydraulic module option includes:

- Dual water pump
- Water strainer to protect the water circuit against accumulation of the foreign particles
- Expansion tank and pressure relief valve to protect the water circuit against over pressure
- Balancing valve to adjust the water flow
- Antifreeze protection
- Buffer tank

Illustration Hydraulic module

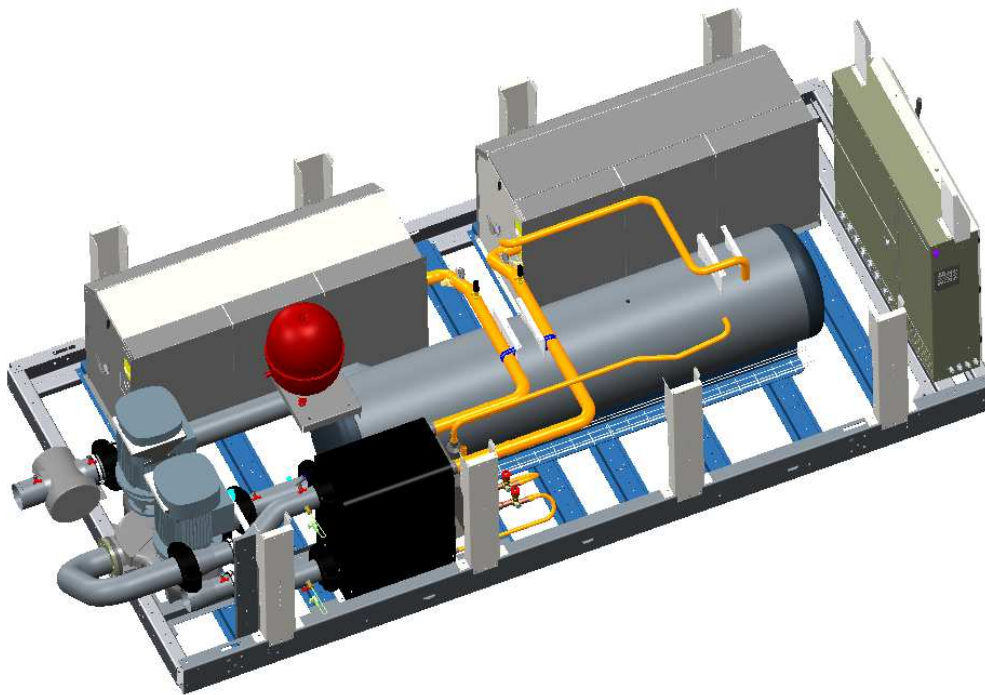
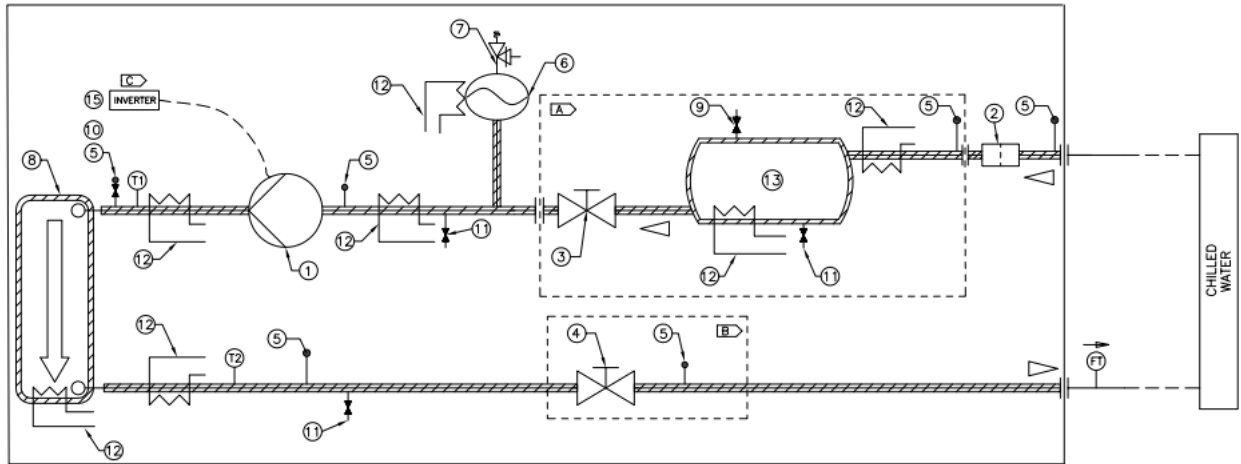


Illustration Hydraulic module water chart



ITEM	DESIGNATION
①	CENTRIFUGAL PUMP SINGLE OR DUAL
②	WATER STRAINER
③	BUTTERFLY VALVE
④	BALANCE VALVE
⑤	VALVE FOR PRESSURE POINT
⑥	EXPANSION TANK
⑦	WATER PRESSURE RELIEF VALVE
⑧	EXCHANGER

ITEM	DESIGNATION
⑨	AUTOMATIC AIR BLEED
⑩	MANUAL AIR BLEED
⑪	DRAIN VALVE
⑫	ANTIFREEZE PROTECTION
⑬	BUFFER TANK
⑮	INVERTER

ITEM	DESIGNATION
FT	WATER FLOW SWITCH
T1	EVAP WATER INLET TEMP SENSOR
T2	EVAP WATER OUTLET TEMP SENSOR

- A OPTIONAL BUFFER TANK
- B OPTIONAL BALANCING VALVE
- C OPTIONAL AFD

—	WATER LINE
—	INSULATED WATER LINE

17.2 Signal On/Off Pump, Digit 24= X

The customer is providing the pump.

17.3 Dual pump standard pressure, Digit 24= 1

17.3.1 Application

The supplier is **Grundfos**. Integrated into the unit, the pump is a part of the chiller and is used for chill water circulation.

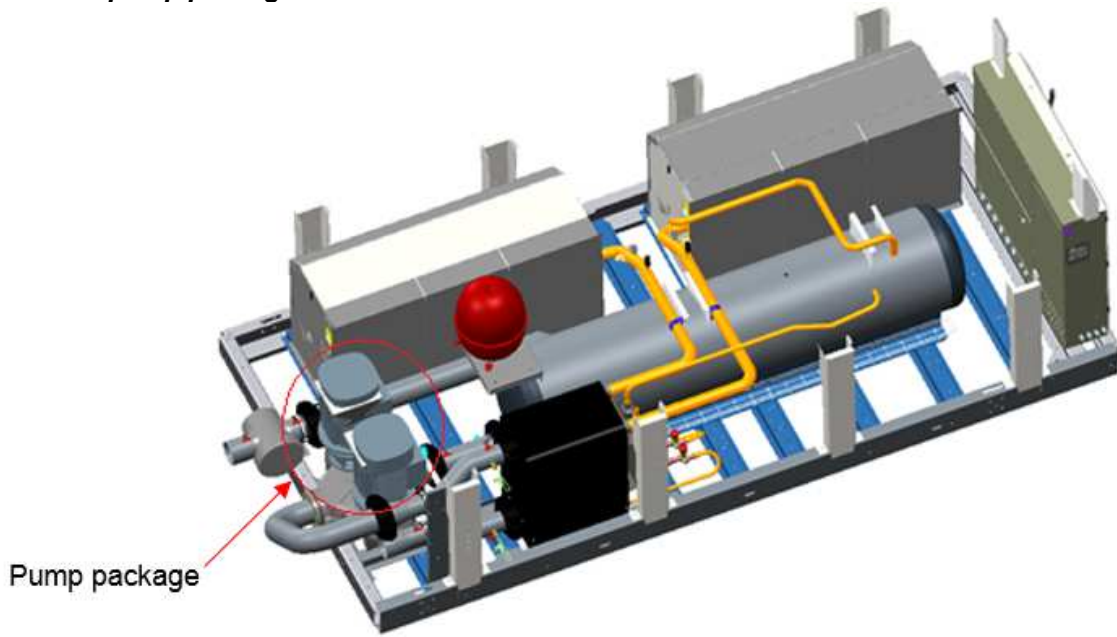
17.3.2 Description

The pump package is designed with twin pumps with the same capacity.

Illustration GRUNDFOS Dual Pump Standard Pressure



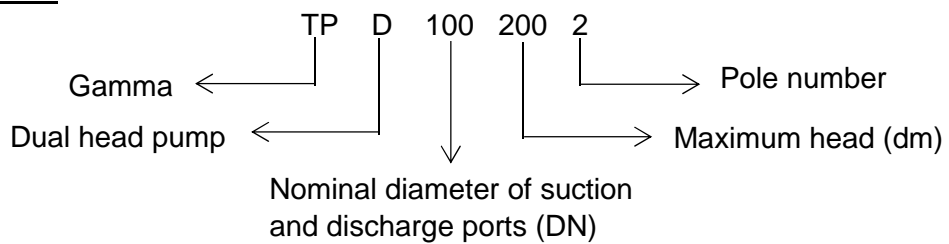
Illustration pump package on the unit



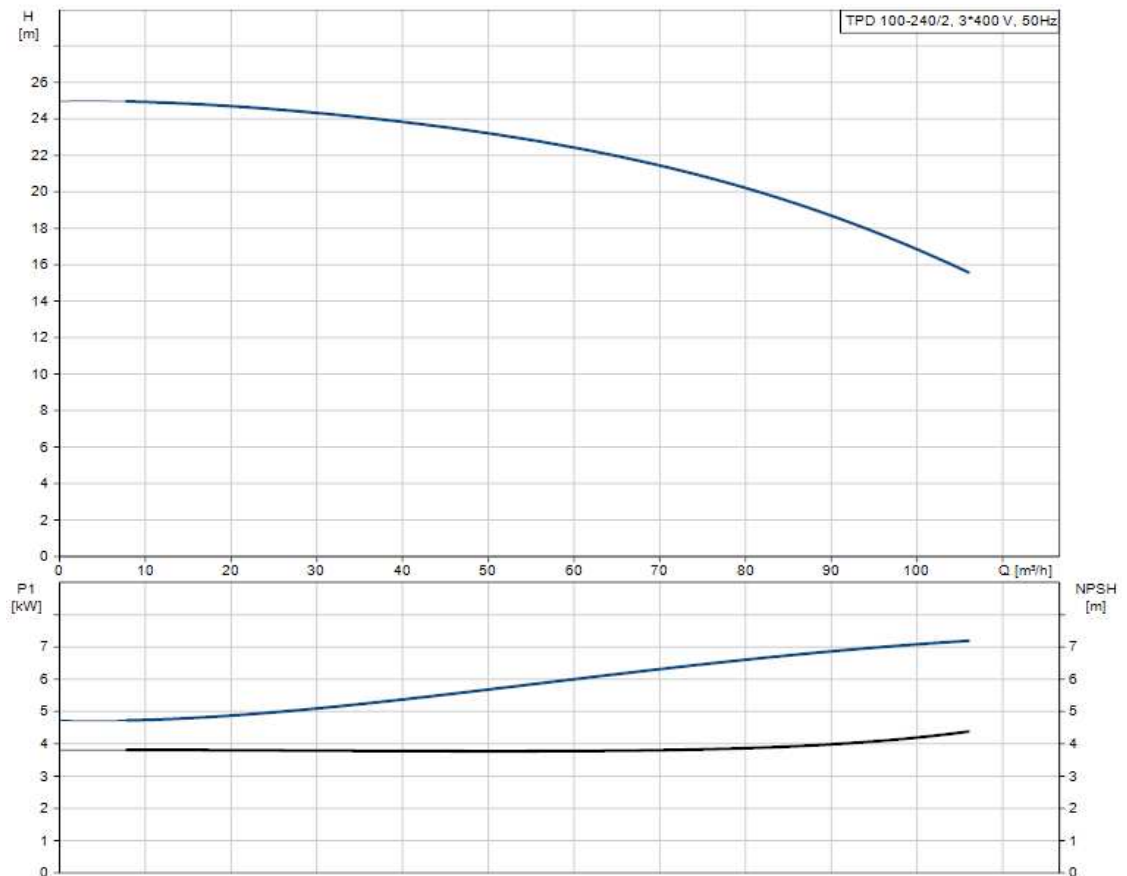
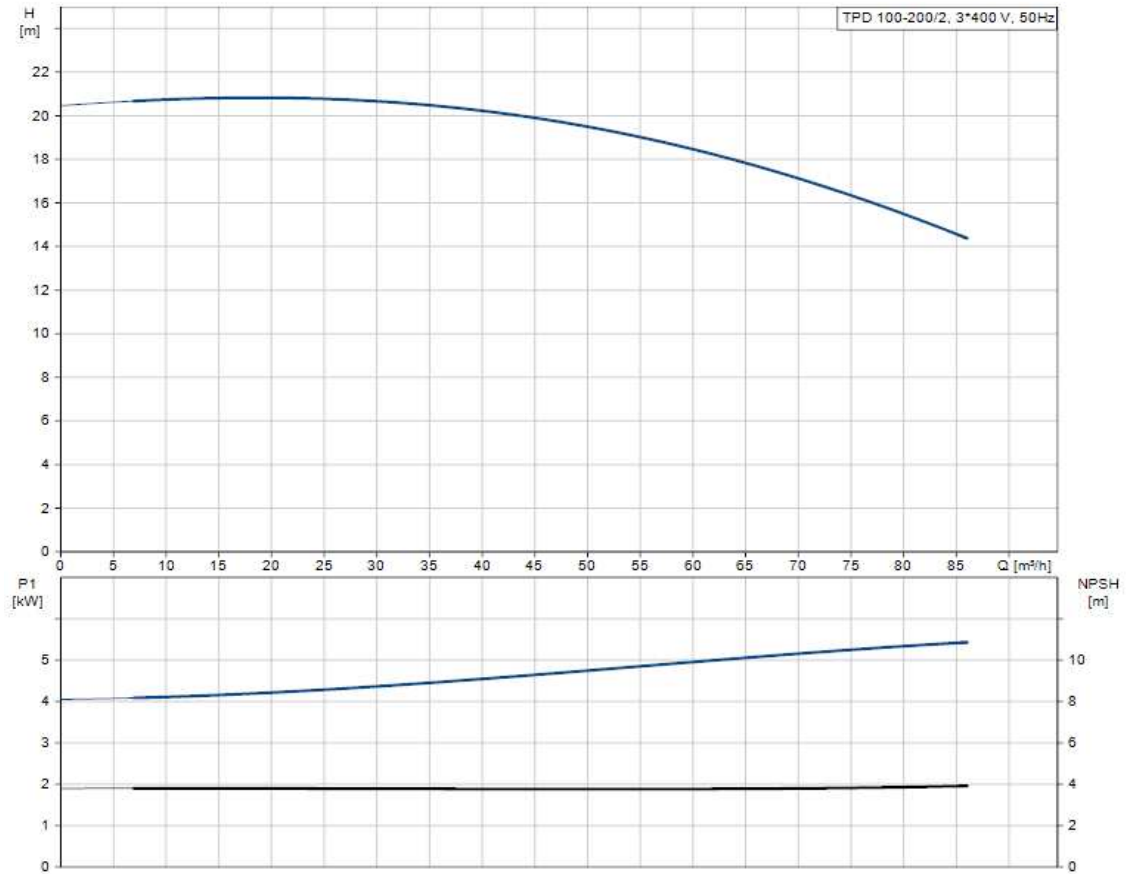
Pumps available:

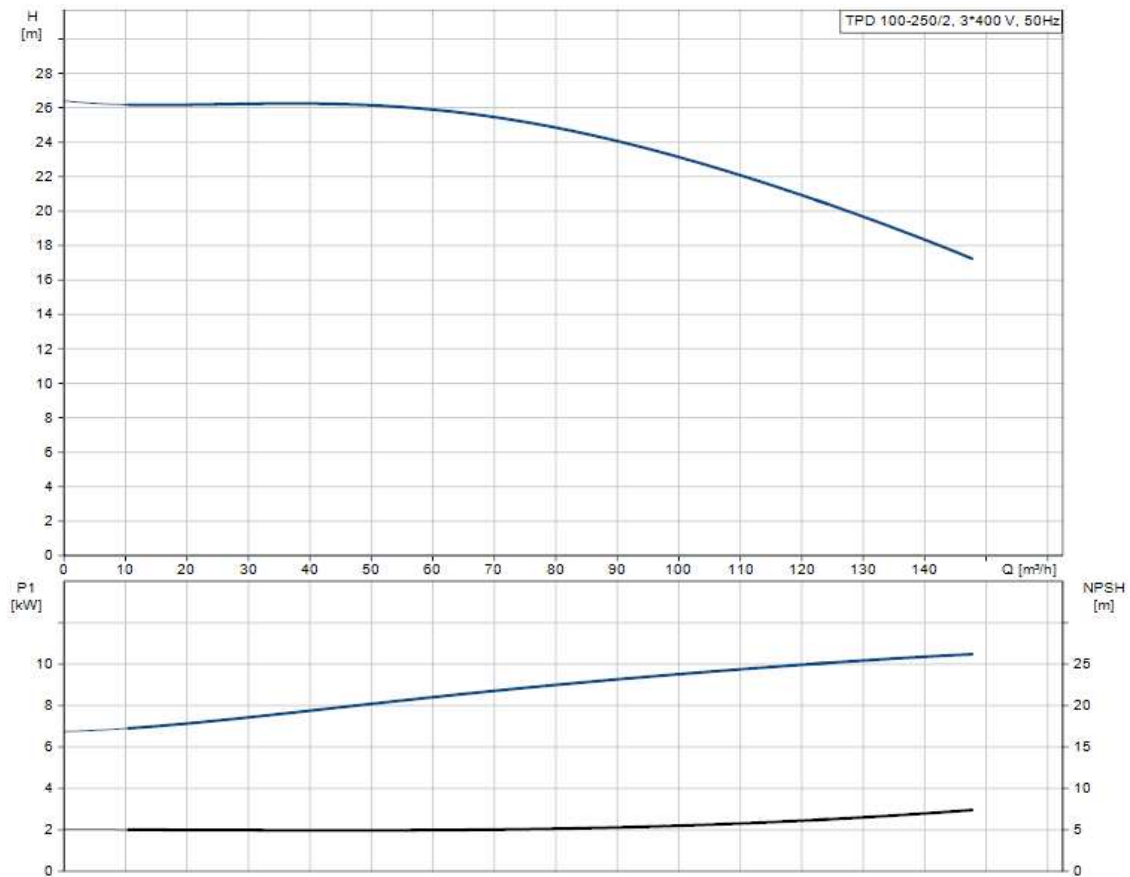
Unit sizes	Standard head Pump	P2 (kW)	Efficiency Class	Max flow m3/h
			IE (Motor)	
080	TPD 100-200-2	2 x 5,5	IE3	86
090				
100				
110	TPD 100-240-2	2 x 7,5	IE3	106
130				
140				
150				
165	TPD 100-250-2	2 x 11	IE3	148
180				
190				

Pump reference:



17.3.3 Performance curves





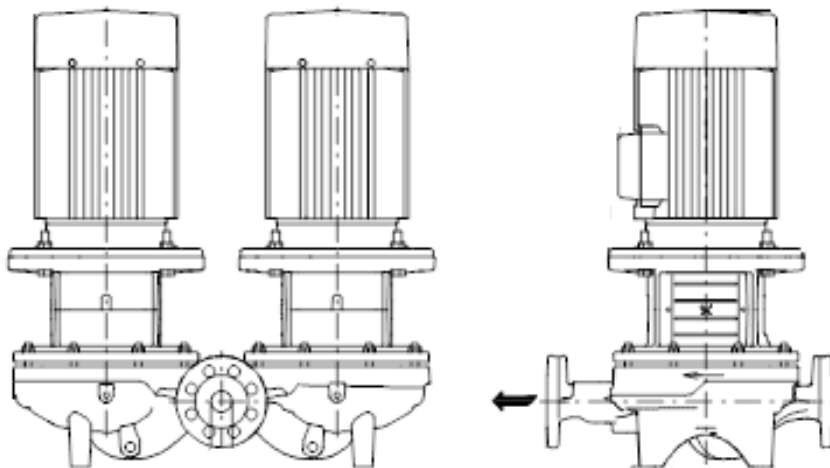
17.3.4 Benefits

- Motor and pump shafts are connected via a rigid two-part coupling
- Easy dismantling in case of service
- High corrosion resistance

17.3.5 Incompatibilities

Variable Primary flow (Digit 37= X-A-F-T)

17.3.6 More details



Pump drawing

Material specification

Pump housing

EN

Cast iron

EN-JL1040

Dimensions, electrical data and others details are available on **Grundfos website:**
<https://product-selection.grundfos.com/>

17.4 Dual Pump High pressure, Digit 24= 3

17.4.1 Application

Same as dual pump standard pressure.

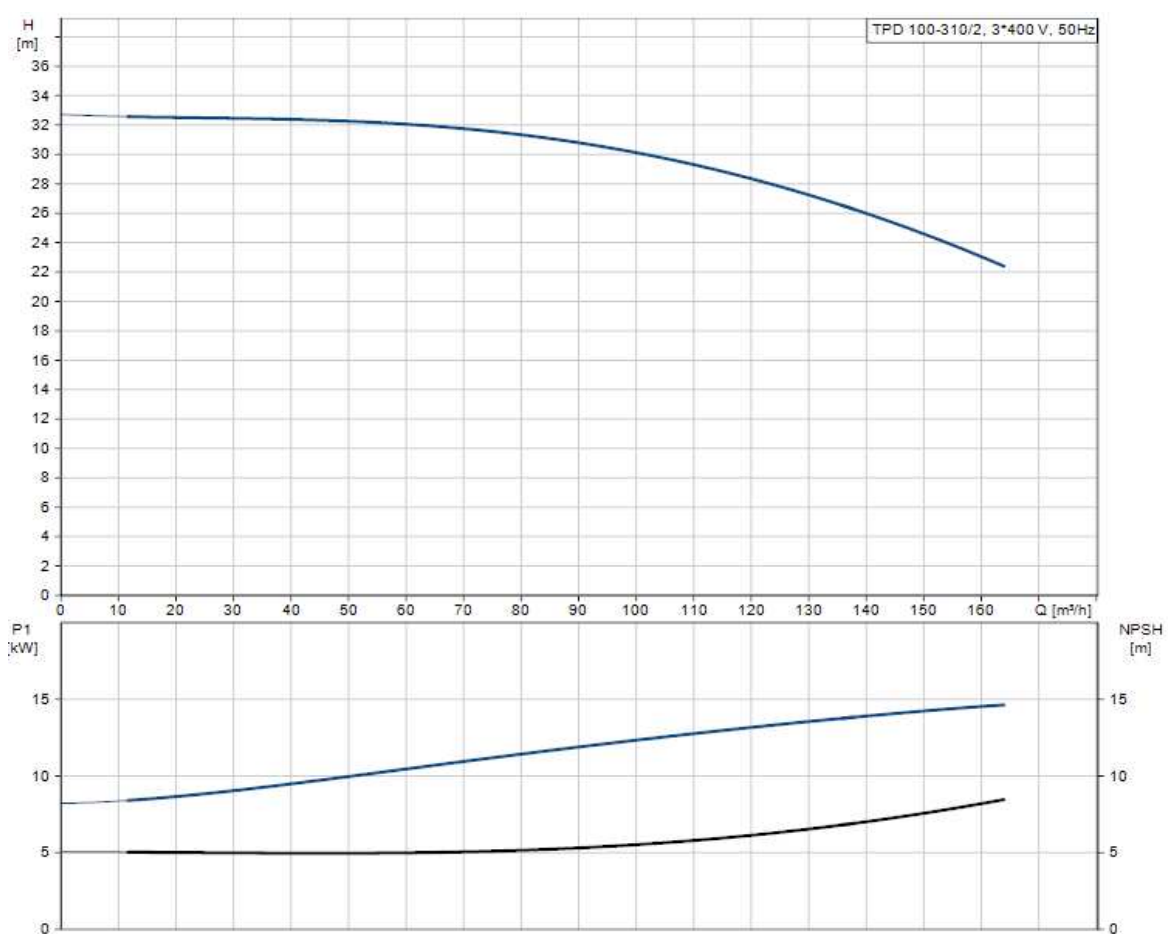
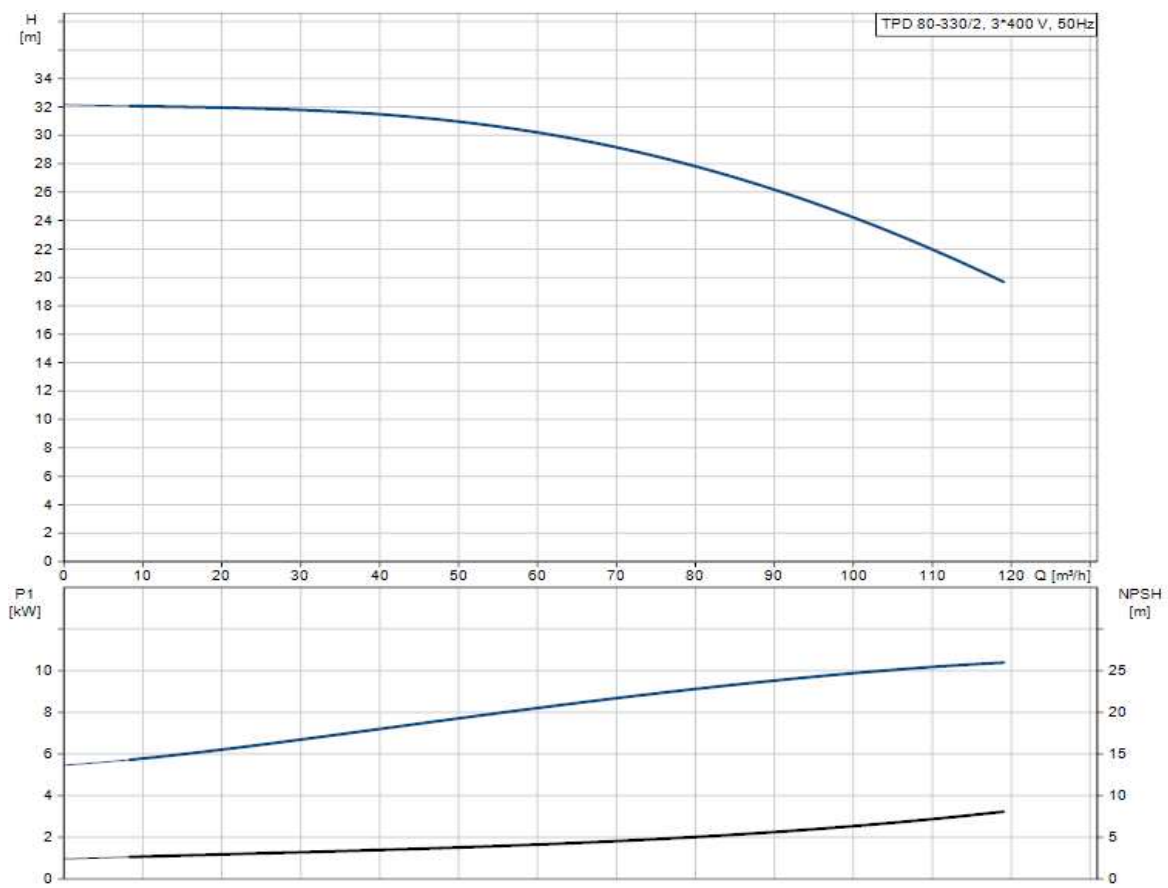
17.4.2 Description

Same as dual pump standard pressure but with a higher pressure.

Pumps available:

Unit sizes	High head Pump	P2 (kW)	Efficiency Class	Max flow m ³ /h
			IE (Motor)	
080	TPD 80-330-2	2 x 11	IE3	118
090				
100				
110				
130				
140	TPD 100-310-2	2 x 15	IE3	165
150				
165				
180				
190				

17.4.3 Performance curves:



17.4.4 Benefits

Same as dual pump standard pressure.

17.4.5 Incompatibilities

Variable Primary flow (Digit 37= X-A-F-T)

17.4.6 More details

Detailed information is available on **Grundfos website:**
<https://product-selection.grundfos.com/>

18. Free cooling, Digit 25

No option, Digit 25= X

Digit 25= F, G, H or J is not available.

19. Power Line Type Connection, Digit 26

19.1 Disconnect Switch, Digit 26= B

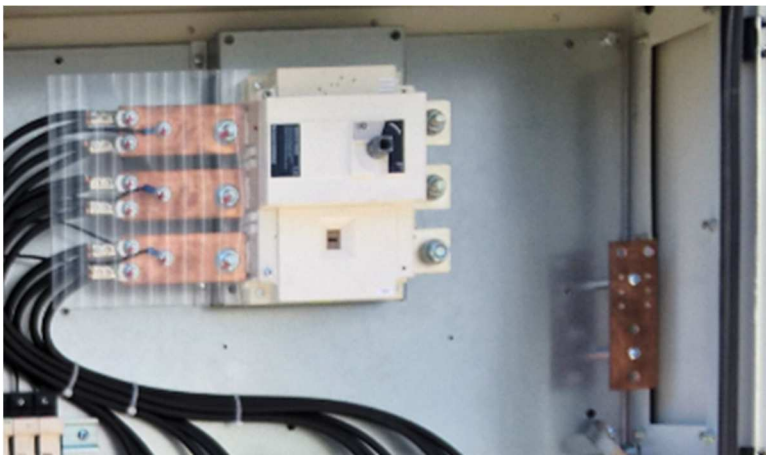
19.1.1 Application

A disconnect switch is a switch which has the capability to insulate the unit from the main power supply.

19.1.2 Description

Disconnect switch is factory-installed and located in electrical panel.

Illustration Disconnect Switch



19.1.3 Benefits

- It is possible to switch off the unit even it is running (not recommended).
- Ensures the safety during the maintenance works.

19.1.4 Incompatibilities

No incompatibility.

20. Control Panel Accessories, Digit 27

20.1 No option, Digit 27= X

CGAF units without under/over voltage protection.

20.2 Under/Over Voltage Protection, Digit 27= 1

20.2.1 Application

The CGAF chiller is designed to be powered with 400V +/- 10%. In case of voltages out of tolerance, the motor lifetime will reduce dramatically with the increase or decrease of voltage. This option is used to protect the unit against under/over voltage.

20.2.2 Description

Factory-installed / wired in the electrical panel.

20.2.3 Operation

UC800 continuously monitor chiller voltage to provide under and over voltage protection while any compressor is either starting or running.

If the value of voltage exceeds the minimum or maximum value in the unit, the unit will be shut down.

20.2.4 Benefits

The chiller is protected against network voltage variation that could reduce the lifetime of the motors when exceeding the given values.

20.2.5 Incompatibilities

No incompatibility.

20.3 Under/Over Voltage Protection and Ground Fault Protection, Digit 27= 2

Not develop yet

21. Unit Operator Interface, Digit 28

Select Language, Digit 28= C-D-E-F-H-I-M-P-R-T-U-V-2-6-8

Digit number	Language
C	Spanish
D	German
E	English
F	French
H	Dutch
I	Italian
M	Swedish
P	Polish
R	Russian
T	Czech
U	Greek
V	Portuguese
2	Romanian
6	Hungarian
8	Turkish

22. Remote Interface, Digit 29

22.1 None Remote Interface, Digit 29= X

CGAF units without remote communication option.

22.2 BACnet Interface, Digit 29= B

22.2.1 Application

The Building Automation and Control Network protocol is a standard that allows building automation systems or components from different manufacturers to share information and control functions.

BACnet provides building owners the capability to connect various types of building control systems or subsystems together for a variety of reasons.

22.2.2 Description

- Tracer™ UC800 is factory-mounted and located in the control panel box. We use BACnet over MSTP (See the integration guide to get information in this option).
- There are three rotary switches on the front of UC800.
- To get BACnet over IP a tracer SC is required (to be installed inside the building for operating in an acceptable air ambient temperature).

Illustration BACnet interface on Tracer™ UC800



22.3 ModBus Interface, Digit 29= M

22.3.1 Application

Modicon Communication Bus (Modbus) is an application layer-messaging protocol that, like BACnet, provides client/server communication between devices over a variety of networks.

22.3.2 Description

Tracer™ UC800 is factory-mounted and located in the control panel box to get ModBus Interface

Illustration ModBus Interface on Tracer™ UC800



22.3.3 Operation

During communications on a Modbus RTU network, the protocol determines how each controller will know its device address, recognize a message addressed to its device, determine what action to take, and extract any data or other information contained in the message.

22.4 LonTalk Interface, Digit 29= L

22.4.1 Application

- When a communication interface between a Tracer™ UC800 controller and a LonTalk network is needed.
- When the chiller needs to communicate with building automation system (BAS).

22.4.2 Description

- LonTalk communication is made with an LCI-C card.
- Factory installed with the chiller controller, located in the control panel box

Illustration LCI-C card



23. External Set points & Capacity outputs, Digit 30

23.1 None, Digit 30= X

CGAF unit without external set points and capacity outputs option.

23.2 External Set points & Capacity outputs, Digit 30= A

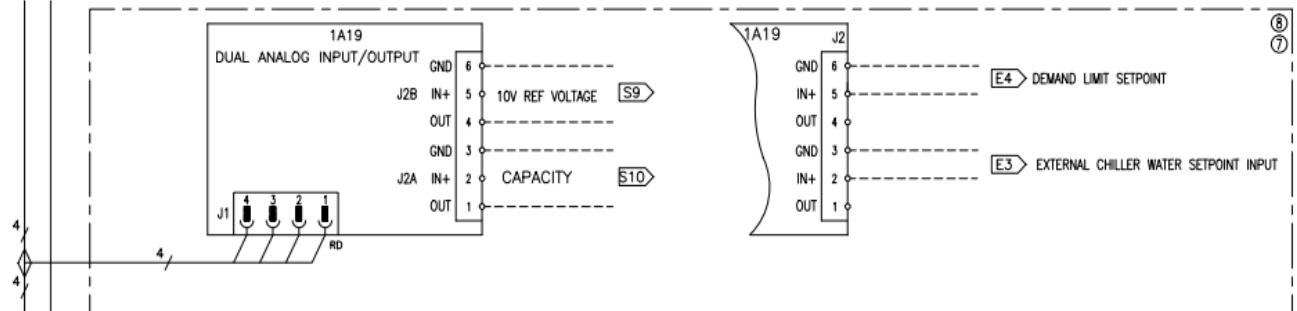
23.2.1 Application

- When the chilled water set point needs to be set by sending an external signal (E3)
- When the number of compressors allowed to start needs to be limited in order to control chiller power consumption by sending an external signal (E4)

23.2.2 Description

- There is one input to set the Chilled Water set point and one input according to the limit set point
- UC800 accepts dual analog input suitable for customer connection to set the unit external chilled water set point (ECWS) and the external demand limit set point (EDLS).

Illustration ECWS and EDLS card



23.2.3 Benefits

- Energy savings.
- Provides the possibility to set the chilled water and the demand limit set point from an external signal from remote location.
- Adaptation to customer power supply

23.2.4 Incompatibilities

No incompatibility.

24. Flow Switch, Digit 31

24.1 No Flow Switch, Digit 31= X

CGAF unit without flow switch option.

24.2 Field installed Flow Switch, Digit 31= F

24.2.1 Application

It is mandatory to use a flow switch with liquid chillers to stop the unit in case of water flow loss to avoid any water freezing in the evaporator. The flow switch is not unit mounted, it must be placed on the evaporator water piping (see installation detail in the IOM).

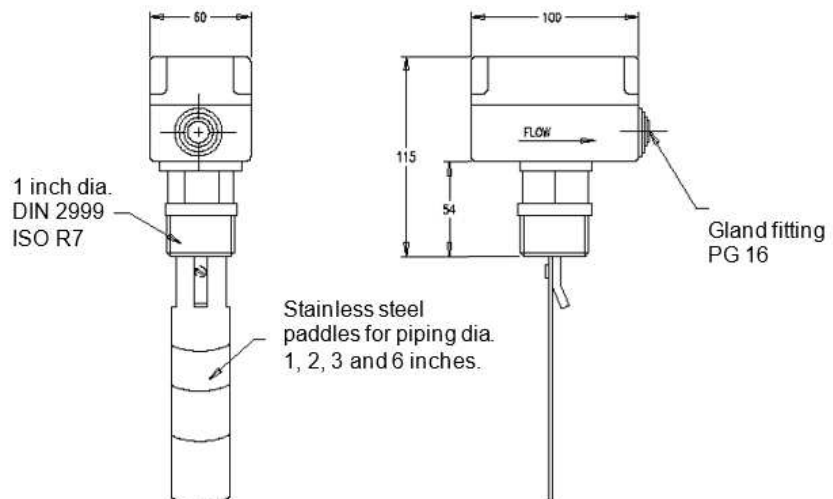
24.2.2 Description

When flow switch detects water flow, the unit is allowed to start if any cooling demand is detected. This safety accessory is shipped in the electrical panel.

Illustration Flow switch



Illustration Dimension



25. Electrical Panel Protection, Digit 32

The electrical protection is used to provide a protection against direct contacts to the power line connection inside the electrical panel.

25.1 Enclosure with Dead front Protection, Digit 32= X

25.1.1 Application

It is a standard application. Dead front security allows to protect users against electrical hazards when working inside the electrical panel.

25.1.2 Description

Dead front protection is a safety enclosure including electrical components. It is fitted in the electrical panel.

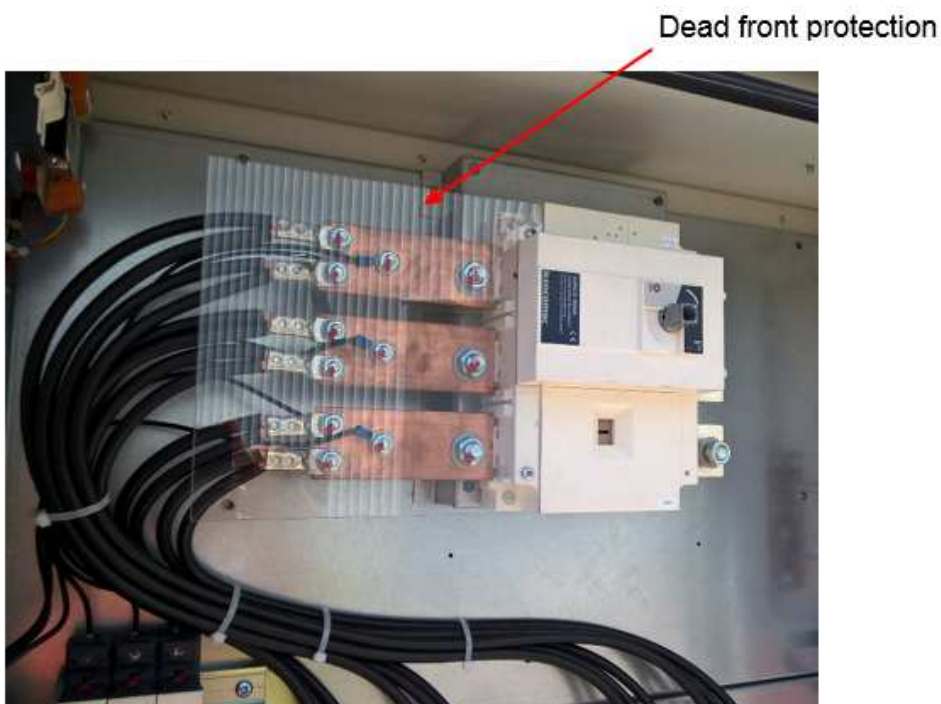


Illustration Dead front

25.1.3 Benefits

Users are protected against electrical hazards when working inside the electrical panel.

25.1.4 Incompatibilities

No incompatibility.

25.2 Enclosure with IP 20 Internal Protection, Digit 32= 1

25.2.1 Application

If the customer needs to protect the energized components inside the electrical panel with an IP20 protection (when the door is open = when the unit is de-energized downward the switch). IP20 protection is a higher level of protection than the standard Dead Front.

25.2.2 Description

Low Voltage components are placed behind a Plexiglas safety cover.

- **IP** = Internal Protection
- **2** = dangerous parts are protected against solid with a diameter superior to 12 mm.
- **0** = no protection against liquid.

26. Master Slave, Digit 33

26.1 Without, Digit 33= X

CGAF units without master/slave control.

26.2 With, Digit 33= A

26.2.1 Description

Controllers communicate using a master/slave technique, whereby, only one device (master) can initiate transactions (queries). Other device (slave) responds by supplying the requested data to the master or by taking the action requested in the query.

26.2.2 Operation

When the master is at his full capacity, there is activation of the slave like that the master can download and they regulate together.

Both units must have the master slave option.

26.2.3 More details

If Digit 33= A, then Digit 55= A (with Programmable relays)

27. Energy meter, Digit 35

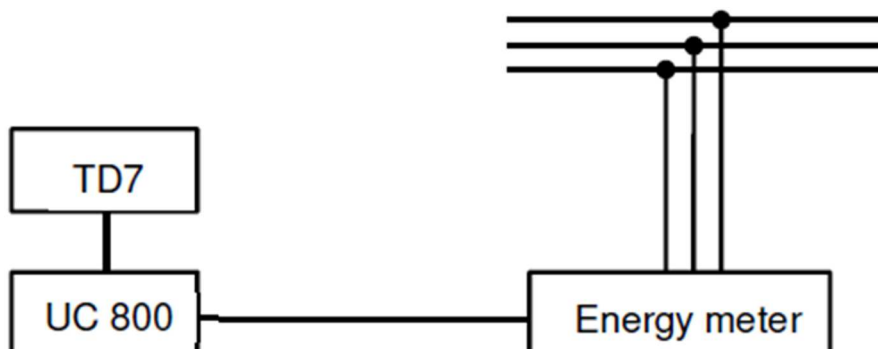
27.1 No energy meter, Digit 35= X

27.2 Energy meter installed, Digit 35= M

27.2.1 Description

The supplier is SOCOMEC.

The energy meter is installed in the electrical panel.



28. Variable Primary Flow, Digit 37

28.1 Constant speed pump - No VFD, Digit 37= X

28.1.1 Application/Description

Used as standard on CGAF units.
No Variable Frequency Drive (VFD) on the unit.

28.1.2 Incompatibilities

No pump package

28.2 Pump flow controlled by balancing valve, Digit 37= A

28.2.1 Application

- When the water flow has to be adjusted by valve.
- Used to adjust and stop water flow for servicing.

28.2.2 Description

- Memory valve factory installed.
- The water flow through the valve must be in the direction of the embossed arrow on the body.
- On site the service engineer set the position of the valve to adjust the water flow.

Illustration balancing valve with memory valve



28.2.3 Benefits

- Limitation of the water flow
- Adjusted water flow for servicing

28.2.4 Incompatibilities

No pump package

Warning: Be careful not to get flow lower than min value.

28.3 Constant speed pump - VFD Adjustment, Digit 37= F

28.3.1 Application

- When the water flow has to be adjusted by a constant speed pump, no VPF application is possible with a chiller control, but with external control you can change pump's VFD speed.
- Used to save energy on the pump consumption

28.3.2 Description

- Variable Frequency Drive (VFD) fitted on the unit
- Constant speed drive

28.3.3 Benefits

- Control of the water flow
- Energy saving on the pump consumption

28.3.4 Incompatibilities

No pump package

28.4 Variable speed pump - Constant delta T, Digit 37= T

28.4.1 Application

When the water flow has to be adjusted by varying the speed of pump – controlled by a chiller's controller.

28.4.2 Description

Constant temperature difference between entering and leaving temperature at the chiller plant.

28.4.3 Incompatibilities

No pump package

29. Electrical accessories, Digit 40

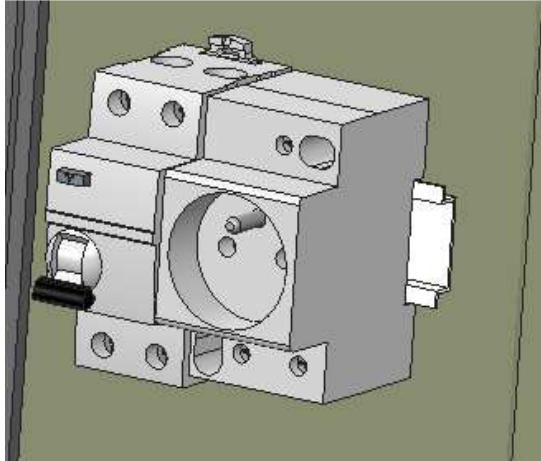
29.1 Not supplied, Digit 40= X

29.2 230V-100W convenience outlet, Digit 40= P

A socket French standard is available to supply a 230V-100W device. It is fitted in the electrical panel.



Illustration 230V-100W convenience outlet



A 30mA differential switch is installed upstream of the socket in accordance with standard 60204 (June 2017).

30. Performance Test Options, Digit 41

30.1 Run test without customer, Digit 41= X

30.2 Visual inspection, Digit 41= B

The customer will be able to see the unit to check the quality of the construction, the documentation provided with the unit and to check that the unit is in accordance with the order write up.

30.3 Performance test without customer, Digit 41= E

The test can be full load to be defined with Sales Support before order entry. It is a test without customer presence, however it is possible above 250 kW only, refer to method statement (on Litweb) for test limitations and capabilities.

This test is a good economical compromise that does not impact the delivery time in most cases (unless special requests), and tests reports are sent to the Trane Sales Office (TSO) once the test is fulfilled.

31. Unit isolators, Digit 42

31.1 None, Digit 42= X

The standard unit is without isolators.

31.2 Neoprene Isolators, Digit 42= 1

31.2.1 Application

Isolators are used to minimize vibrations transmitted to the building.

31.2.2 Description

They are installed under the chiller and shipped with it.

Illustration Neoprene Isolators



31.2.3 Benefits

Eliminate/minimize vibration and noise transmission throughout the building.

31.2.4 Incompatibilities

No incompatibility.

31.3 Neoprene pads, Digit 42= 4

31.3.1 Application

Neoprene pads are used to avoid direct contact of the chiller with the ground.

31.3.2 Description

They are installed under the chiller and shipped in the control panel.

Illustration Neoprene pads



31.3.3 Benefits

- Avoid direct contact of the base frame with the ground.

31.3.4 Incompatibilities

No incompatibility.

32. Label and Literature language, Digit 43

Language, Digit 43= B-C-D-E-F-H-I-K-L-M-N-P-R-T-U-V-Z-2-3-4-5-6-8

Digit number	Language
B	Bulgarian
C	Spanish
D	German
E	English
F	French
H	Dutch
I	Italian
K	Finnish
L	Danish
M	Swedish
N	Norwegian
P	Polish

Digit number	Language
R	Russian
T	Czech
U	Greek
V	Portuguese
Z	Slovene
2	Romanian
3	Serbian
4	Slovak
5	Croatian
6	Hungarian
8	Turkish

33. Shipping Package, Digit 44

33.1 Standard, Digit 44= X

In standard, units are provided with wood skid, a treated wood located under the base frame. In addition, a pull key is installed at each corner of the base frame.

Illustration units with wood skid and pull key





Wood skid on each corner

33.2 Unit containerization Package, Digit 44= A

When the chiller is shipped in a container, Trane adds 4 metallic clogs on the side of the unit to prevent contact between chiller and container while loading and unloading and during transport. An I-cube container is generally used.

Incompatibilities

Not compatible with units with EC Axitop fans (Digit 56= 3). The diffusers must be dismantled to be able to load the unit in a container.

34. Refrigerant, Digit 45

Full Factory Refrigerant Charge (HFC-410A), Digit 45= A

All units are running with R410A.

35. Freeze Protection, Digit 49

35.1 With freeze protection, Digit 49= 2

35.1.1 Application

- When the unit is exposed to ambient temperature between 0°C and -18°C.
- When the unit needs to be protected from freezing (no glycol in the water loop).
- By electric heaters activation.

35.1.2 Description

- Heaters on all cold parts (see *Illustration Hydraulic module water chart on Digit 24*).
- Heaters used are heat mat and heating cables.
- Freeze protection is integrated into the main power of the unit.

Note: The water piping between the chiller and the building has to be protected against freezing by installing heating cable

35.1.3 Operation

Freeze protection via the UC800 control turns on the heaters based on ambient temperature.

Anti-freeze heater power

Unit size	Evap BPHE		Buffer Tank		Pump package	
	SE	HE/XE	SE	HE/XE	SE	HE/XE
080	-	300 W	-	400 W x 2	120 W	
090	240 W		400 W x 2			
100	300 W					
110						
130						
140	400 W	400 W x 3				
150						
165						
180						
190						

Unit size	Water piping w/o pump		Water piping with pump w/o buffer tank			Water piping with pump with buffer tank			
	Inlet	Outlet	Inlet → Pump	Pump → BPHE	BPHE → Outlet	Inlet → buffer	buffer → Pump	Pump → BPHE	BPHE → Outlet
080	60 W		420 W	2 x 60 W	60 W	250 W	250 W	2 x 60 W	60 W
090									
100									
110									
130									
140	120 W		420 W	2 x 120 W	120 W	420 W	420 W	2 x 120 W	120 W
150									
165									
180									
190									

35.1.4 Benefits

- All the components are protected.
- No additional or dedicated electrical connection when installing

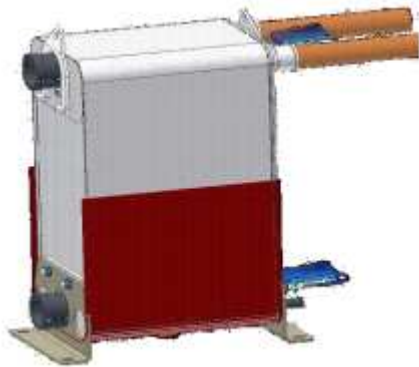
35.1.5 Incompatibilities

No incompatibility.

35.1.6 More details

On the evaporator a blanket heater is installed at the bottom of the brazed plate heat exchanger (BPHE).

Illustration Blanket heater



35.2 Without freeze protection, Digit 49= X

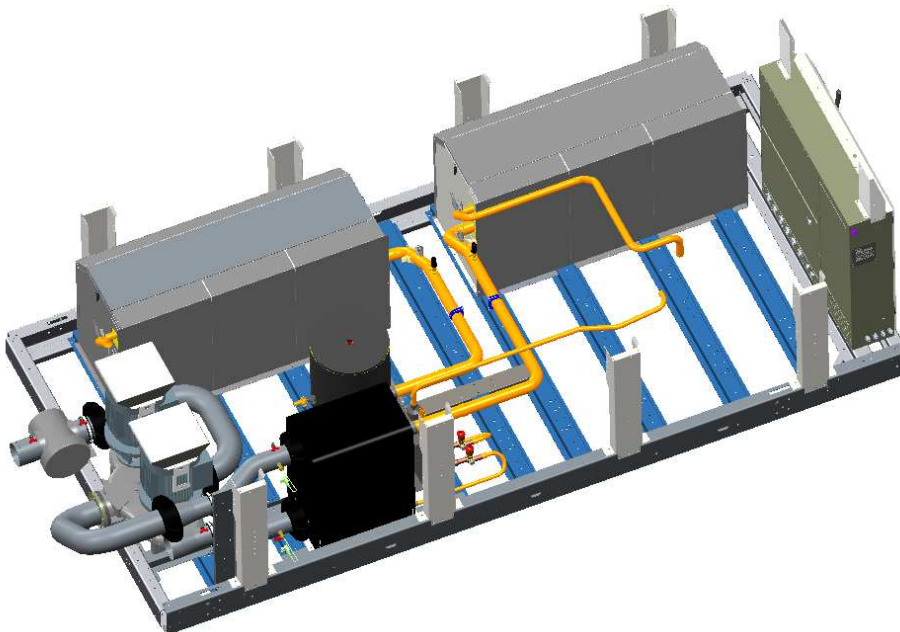
No heaters are provided but the anti-freeze protection is possible with the pump activation by UC800 control using external temperature sensor.

36. Buffer tank, Digit 50

36.1 No Buffer tank, Digit 50= X

Units without buffer tank.

Illustration CGAF without buffer tank



36.2 With Buffer tank, Digit 50= 1

36.2.1 Application

- Used to increase the chilled water circuit inertia.
- Allows to meet the two minutes water loop circulation.

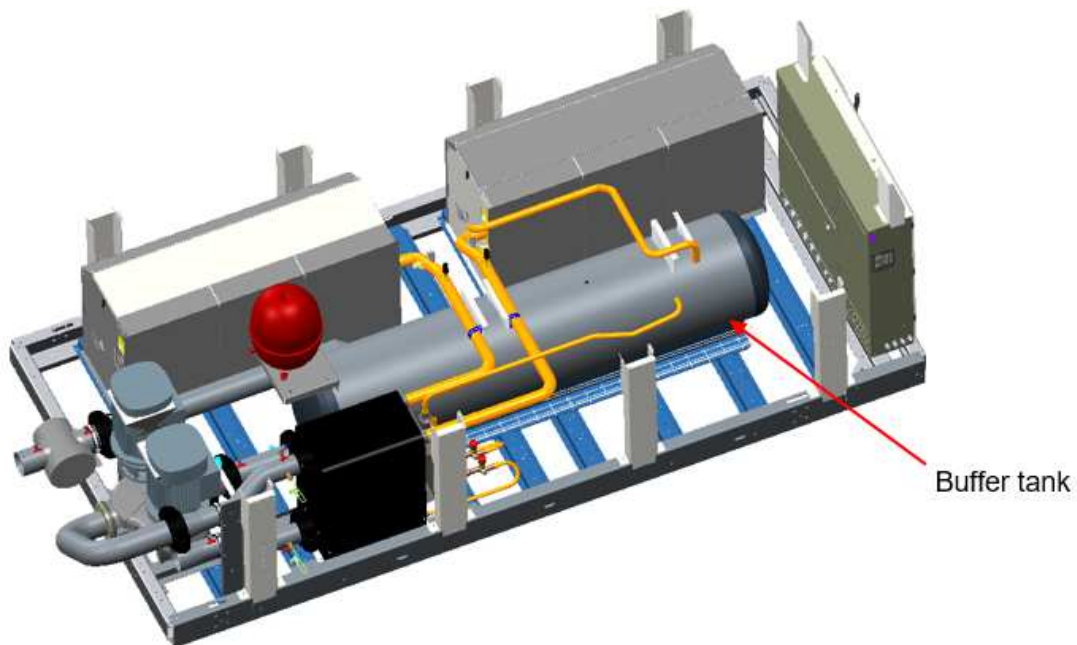
36.2.2 Description

- Buffer tank is factory-installed, located on the supply of water loop.
- It is installed before the water pump so that water pump can circulate the supplied water in buffer tank to the evaporator

Illustration Buffer tank



Illustration CGAF with Buffer tank



36.2.3 Operation

Works only with pump package units

36.2.4 Benefits

- Ease of installation at the building site
- Increases the compressor life span
- Allows more accurate water temperature

36.2.5 Incompatibilities

Not available with chiller without hydraulic module.

37. Water strainer, Digit 51

37.1 No strainer, Digit 51= X

CGAF units without water strainer.

Not compatible with Digit 24= 1, 3

37.2 With strainer, Digit 51= A

37.2.1 Application

For a prevention of accumulation of the foreign particles in the restricted area as the isolation valves and the brazed plate heat exchange.

37.2.2 Description

- Factory-installed
- Install on water inlet piping before the dual pump

Illustration water strainer

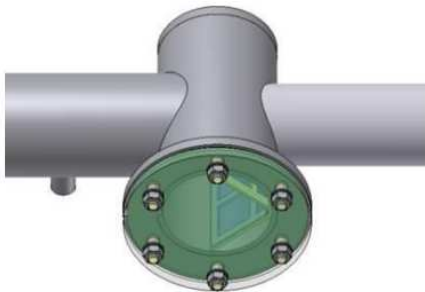
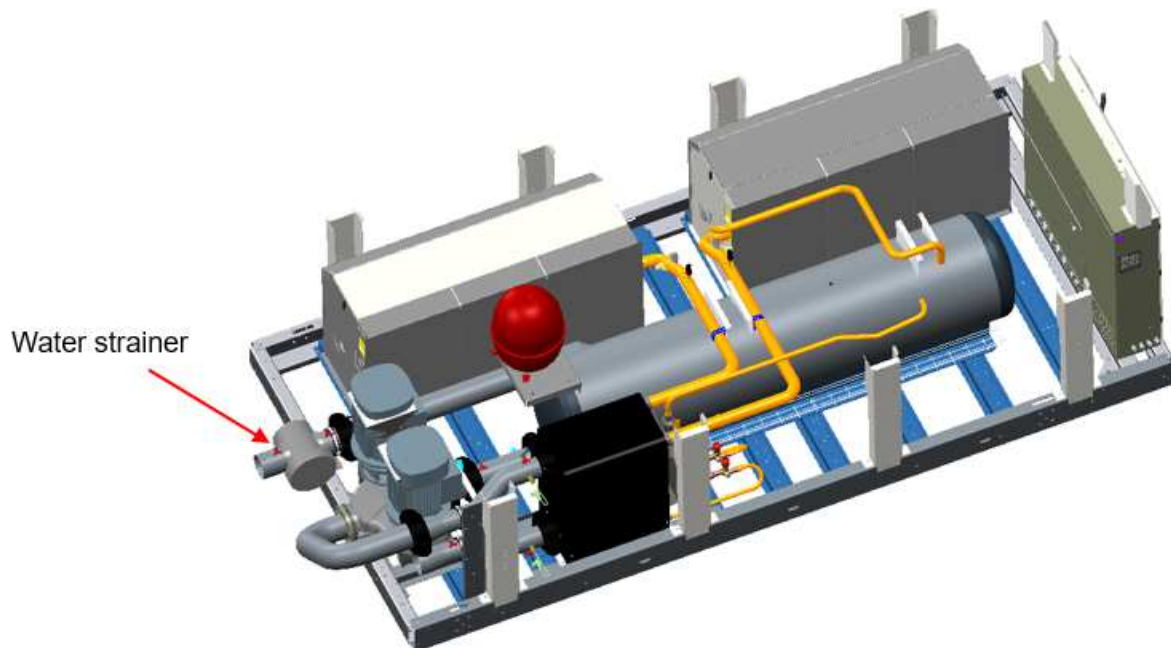
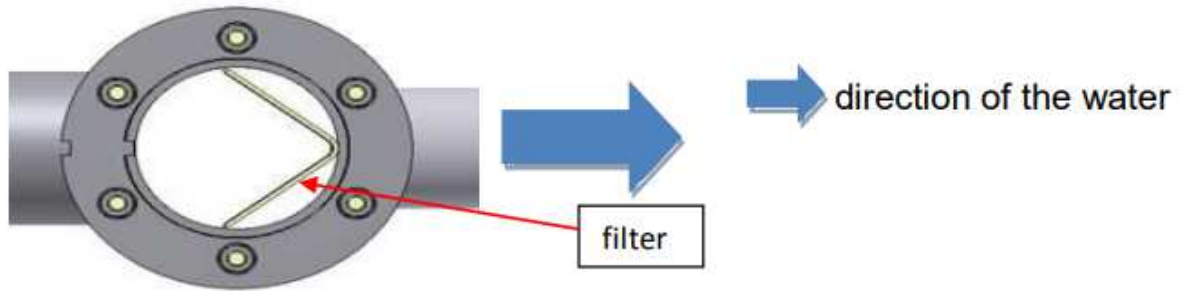


Illustration water strainer on the unit



37.2.3 Operation

Particles are retained in the filter.



Water strainer characteristics

Size	Filter	Mesh diameter
080-090-100- 110-130	DN 100	1,6 mm
140-150-165- 180-190	DN 100	0,4 mm

37.2.4 Benefits

- Increases the life of heat exchanger and isolation valves.
- Heat exchanger and isolation valves are protected.
- Avoid the abrasive effect of flowing particles.
- The customer do not have to dismount completely the strainer for cleaning or changing the filter.

37.2.5 Incompatibilities

No incompatibility.

38. Starter type, Digit 54

38.1 Across the line Starter/Direct on line, Digit 54= A

This is the standard starter located in the electrical panel of the unit.

Illustration circuit of direct on line



38.2 Soft starter, Digit 54= B

38.2.1 Application

To reduce inrush current when the compressors start.

38.2.2 Description

Factory-installed, located in the electrical panel of the unit.

38.2.3 Operation

- In this circuit, the soft starter replaces the direct on line starter.
- It controls the current flow which will generate the compressors to start gradually.

38.2.4 Benefits

- The compressor can start smoothly as the starting current is reduced.
- Smooth starting reduces motor and compressor wear.
- Less stress on the power supply.
- Reduce cable size.

38.2.5 Incompatibilities

Direct on line

38.2.6 More detail

Comparison between across line starter and soft starter

By installing soft starter in the circuit, it will reduce the starting current. There are 3 different sizes of compressor.

Compressor size	25	30	40
Across Line Starter (A)	260	320	413
Soft Starter (A)	156	192	248
% current reduction	40	40	40

Table 1: Inrush current

Compressor size	25	30	40
Across Line Starter (ms)	26	35	35
Soft Starter (ms)	50	50	50

Table 2: Startup time (ms)

As shown in **table 1**, inrush current is reduced by installing soft starter to the electrical circuit. Thus, the compressor will be started up with small quantity of current and it improves the stability of the power supply.

In **table 2**, it shows that the compressor with soft starter will take more time to run than with across the line starter. It means that the compressor starts progressively.

39. Programmable (annunciation) Relays, Digit 55

39.1 None, Digit 55= X

39.2 With, Digit 55= A

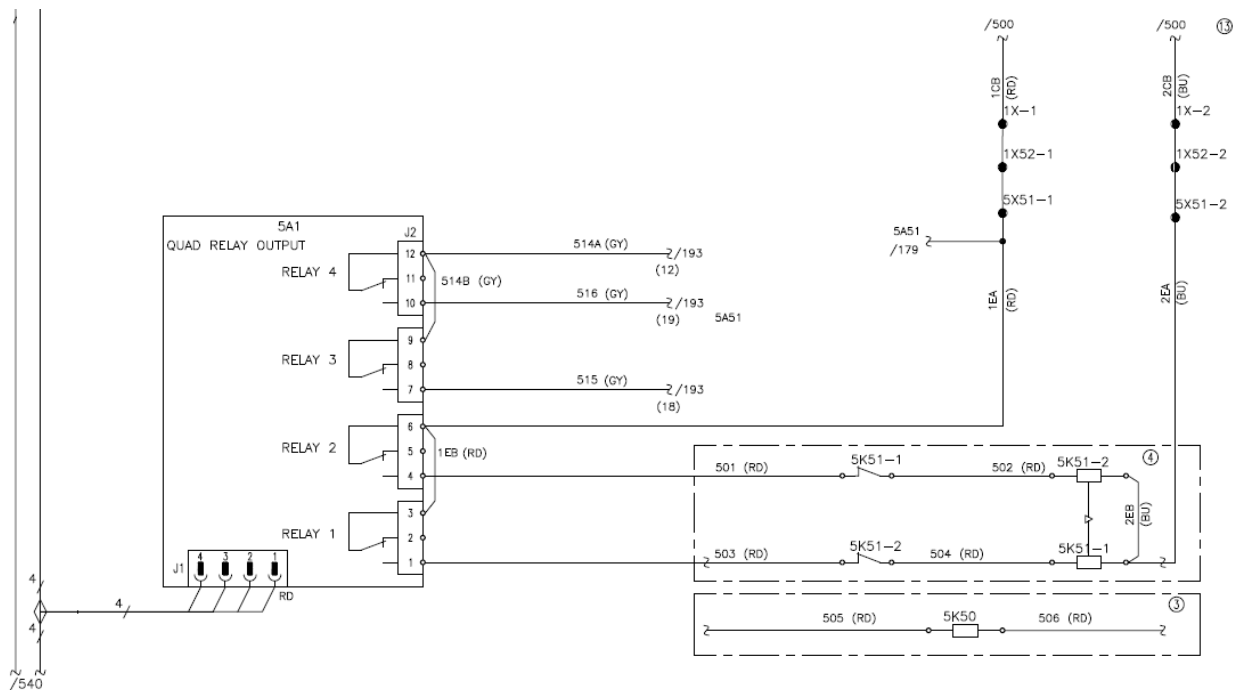
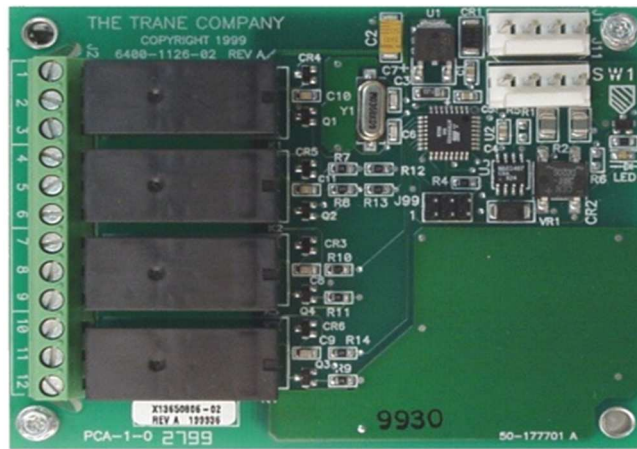
39.2.1 Application

When certain events or states of the chiller need to be remotely controlled.

39.2.2 Description

- Use 4 output relays as shown in the field wiring diagram.
- Factory installed, located in the control panel.

Illustration Relay output card



Relay output wiring diagram

39.2.3 Operation

- The relay will be energized when the event or state occurs.
- Works with UC800.
- Available outputs are Alarm-Latching, Alarm-Auto Reset, General Alarm, Warning, Chiller Limit Mode, Compressor Running and Tracer Control.

39.2.4 Benefits

- Customers will be alerted if the events or states of the chiller occur.
- Reduces maintenance works of the chiller

40. Type of fan, Digit 56

40.1 AC fans, Digit 56= 1

40.1.1 Application

- CGAF SE with Standard ambient application are equipped with AC fans
- CGAF HE with High ambient application are equipped with AC fans

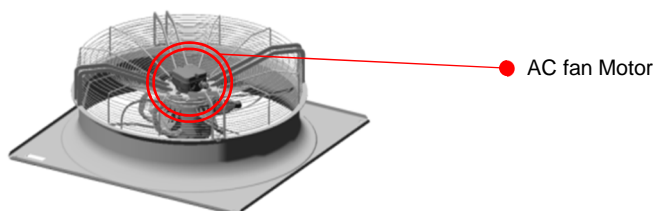
40.1.2 Description

Fans are class F, IP54 and built in accordance with EN60034-1 (2010) and EN61800-5-1 standard.

Two types of AC fans are used on the condenser:

- AC fans with 1 speed (3 poles)
- AC fans with 2 speeds (5 poles)

Illustration AC Fan



40.1.3 Incompatibilities

- CGAF XE
- Low ambient (Digit 16= L) & Wide ambient (Digit 16=D)
- Night Noise Setback option (Digit 57= 1)

40.2 EC fans, Digit 56= 2

40.2.1 Application

- CGAF SE with Low ambient application are equipped with EC fans
- CGAF HE with Wide ambient application are equipped with EC fans

40.2.2 Description

EC fan motors are very high efficiency, and maintain a high efficiency level at low speed. This means that in most cases they use from less than one third to one half of the electricity used by the traditional "shaded pole" induction motors used in the ventilation and refrigeration industries.

EC fans are class F, IP55 and built in accordance with EN 61800-5-1.

Illustration EC fan

Same grid design as AC fan
With EC motor (5 blades)

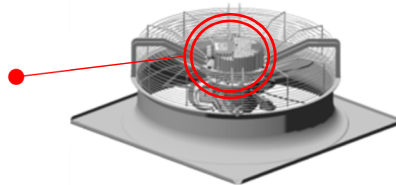
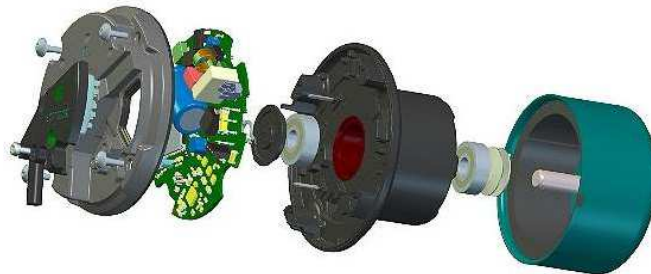


Illustration EC fan motor



40.2.3 Benefits

- Improved capacity modulation
- Reduced power consumption
- Reduced energy costs

40.2.4 Incompatibilities

- CGAF XE
- Standard ambient (Digit 16= X) & High ambient (Digit 16= H)

40.3 EC Axitop fans, Digit 56= 3

40.3.1 Application

- CGAF XE are equipped with EC Axitop fans with Wide Ambient option
- CGAF SE can be equipped with EC Axitop fans with Low Ambient option

40.3.2 Description

EC fans can be equipped with a special diffuser to deliver higher performance with optimized airflow. Efficiency is boosted by converting dynamic airflow into static pressure and reducing exit losses, allowing in most cases reduced fan speeds without affecting airflow.

Illustration EC Axitop fan



40.3.3 Benefits

- Higher performance delivered
- Reduced power consumption, especially at part load conditions

40.3.4 Incompatibilities

- CGAF HE
- Standard and High Ambient option

41. Night Noise SetBack (NNSB), Digit 57

41.1 None, Digit 57= X

41.2 NNSB, Digit 57= 1

41.2.1 Application

Useful when fans speed need to be reduced at night. When Night Noise Setback feature is activated, fans run at low speed.

41.2.2 Description

Night Noise Setback provides an additional low-noise operation profile. The sound level of the chiller is reduced by decreasing the fans speed which are controlled with an external on/off contact provided by the customer.

41.2.3 Benefits

This option is designed for night operation and ensures exceptional acoustic comfort without compromising efficiency when loads are increased.

41.2.4 Incompatibilities

AC fans (digit 56 = 1).

42. Special, Digit 58

42.1 Standard Catalog, Digit 58= X

42.2 Special requirement, Digit 58= S

When this digit is applied, make sure to supply a TFN N°.



Trane optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments, Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.trane.com.

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

© 2017 Trane All rights reserved
CG-PRC049A-GB August 2017

