CASCADA FRESH WATER STATION

Cascada Fresh Water Station is an innovative **compact** product for **FRESH WATER** production with overheating control that offers easy and quick installation by saving at the same time space in engine rooms and roofs. It is suitable for:

- **FRESH WATER** production at the desired temperature
- control and operation of solar fields
- control and operation of auxiliary energy sources
- control and operation of recirculation
- avoiding overheating of the buffer tanks and the solar collectors

Its low height as well as its construction quality (INOX 304 stainless steel box, fully openable and internally thermally insulated), make it suitable for installation on roofs.

System operation is fully automated via PLC with real-time display provided via touch screen or PC.

PRODUCT MODELS

MODEL	CASCADA STATION FW-CF 1/2	CASCADA STATION FW-CF 1/3
Heat Exchanger	CASCADA HE FW-CF 1/2	CASCADA HE FW-CF 1/3
Nominal Flow Rate (lt/min)	33,3	50
Nominal Flow Rate (m^3/h)	2	3
Nominal Useful Power (kW)*	70	105
Primary Circuit Connections	1 1/4''	1 1/2''
Secondary Circuit Connections	1''	1 1/4''
Heat Rejection Capacity (kW)**	15	20
Length (mm)	1570	1570
Width (mm)	1120	1120
Height (mm)	800	800
Weight (kg)	137	145
*(Primary circuit temperatures: 60-55°C, Secondary circuit temperatures: 20-50°C)		
**(Environment temperature : 42 °C, Solar field temperatures: 75-70 °C)		

TECHNICAL SPECIFICATIONS	
Casing material	INOX 304
Heat exchanger	CASCADA FRESH WATER
Heat transfer pump	Wilo / Grundfos PWM
Solar field pump	Wilo / Grundfos PWM
Recirculation pump	Optional
Cooling element material	Copper with aluminum fins
Cooling element welding type	Automatic circular welding
Primary circuit nominal operating pressure	3 bar
Primary circuit maximum operating pressure	6 bar
Secondary circuit nominal operating pressure	6 bar
Secondary circuit maximum operating pressure	12 bar
Nominal/maximum operating temperature	95°C/100°C
Three-way valve for overheating control	24V
Fan	230V
Automation control system	Control panel THALES AK400 with 4.3” touch screen

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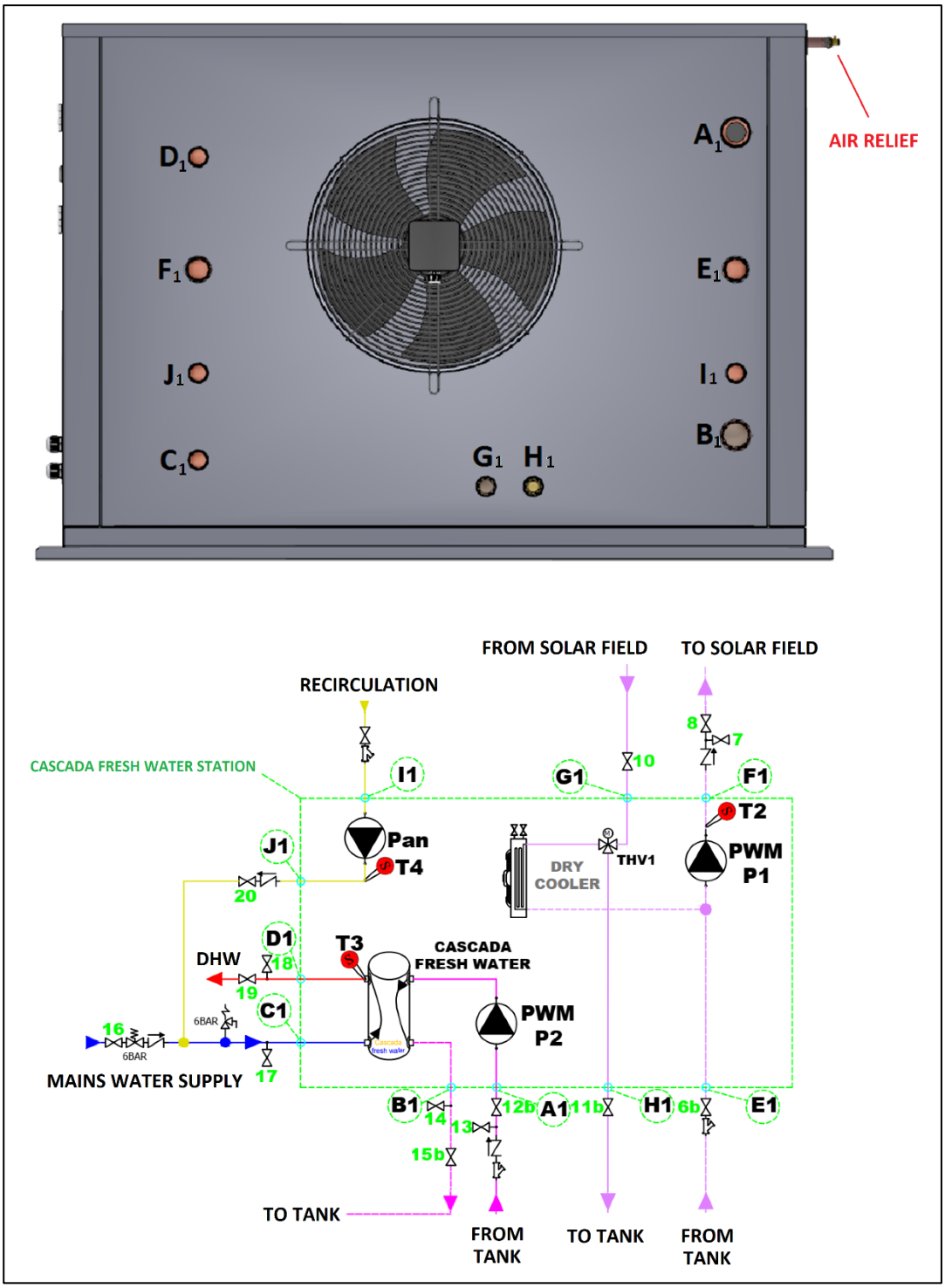
NOMENCLATURE AND HOLE DIAMETERS



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HOLES	CASCADA STATION FW-CF		USE
	1/2	1/3	
A1	1 1/4" FEMALE	1 1/2" FEMALE	ENERGY FROM TANK
B1	1 1/4" FEMALE	1 1/2" FEMALE	ENERGY TO TANK
C1	1'' FEMALE	1 1/4" FEMALE	COLD WATER ENTRANCE
D1	1'' FEMALE	1 1/4" FEMALE	HOT WATER EXIT
E1	1'' FEMALE	1 1/4" FEMALE	SOLAR PUMP SUCTION FROM TANK
F1	1'' FEMALE	1 1/4" FEMALE	TO SOLAR COLLECTORS
G1	1'' FEMALE	1 1/4" FEMALE	FROM SOLAR COLLECTORS
H1	1'' FEMALE	1 1/4" FEMALE	SOLAR FIELD ENERGY TO TANK
I1	1'' FEMALE		RECIRCULATION ENTRANCE
J1	1'' FEMALE		RECIRCULATION EXIT

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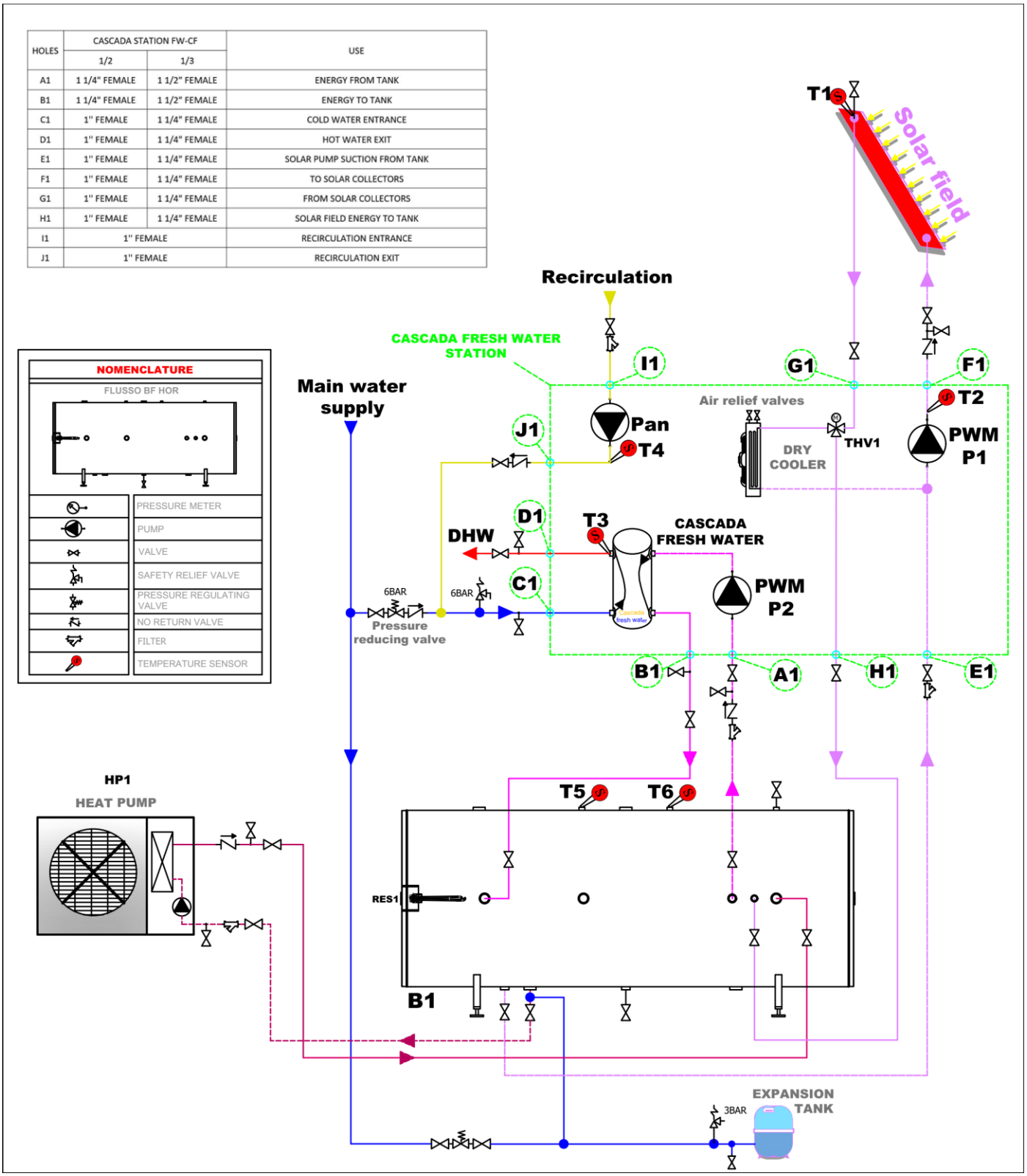
PIPING AND INSTRUMENTATION DIAGRAM (PID)

HOLES	CASCADA STATION FW-CF		USE
	1/2	1/3	
A1	1 1/4" FEMALE	1 1/2" FEMALE	ENERGY FROM TANK
B1	1 1/4" FEMALE	1 1/2" FEMALE	ENERGY TO TANK
C1	1" FEMALE	1 1/4" FEMALE	COLD WATER ENTRANCE
D1	1" FEMALE	1 1/4" FEMALE	HOT WATER EXIT
E1	1" FEMALE	1 1/4" FEMALE	SOLAR PUMP SUCTION FROM TANK
F1	1" FEMALE	1 1/4" FEMALE	TO SOLAR COLLECTORS
G1	1" FEMALE	1 1/4" FEMALE	FROM SOLAR COLLECTORS
H1	1" FEMALE	1 1/4" FEMALE	SOLAR FIELD ENERGY TO TANK
I1	1" FEMALE		RECIRCULATION ENTRANCE
J1	1" FEMALE		RECIRCULATION EXIT



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QUALITY CHARACTERISTICS

QUALITY CHARACTERISTIC	BENEFIT
In Line heating of domestic hot water through stored energy in buffer tanks	***It prevents the incubation of Legionella bacteria*** ***Maximizes the lifetime of the installation***
Innovative automation control system	***Optimum solar energy utilization*** ***Minimizing the use of auxiliary energy sources***
Integrated heat rejection system (overheating control)	***Overheating protection***
Relatively low temperature difference between primary and secondary circuit **(max 5°C)**	***Low charging temperatures*** ***Low operating cost***
Outer casing made of 304 stainless steel.	***Suitable for outdoor installation***
Design based in **patent**	***High energy efficiency*** ***Constant supply of water at the desired temperature*** ***Minimum pressure drop in the water supply***
Conversion of existing solar hot water storage systems to **FRESH WATER** systems	***Creation of small and large central solar systems on roofs for FRESH WATER with the addition of only a FRESH WATER STATION***
Avoiding scale build-up due to the **innovative design**	***Long lifecycle of the heat exchanger*** ***Stable and reliable operation***
Reverse flow cleaning	***Easy and quick cleaning***
Pre-built system **Small size** and **ergonomic design**	***Suitable for rooftop installation*** ***Easy installation and space saving*** ***Zero visual nuisance***

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AUTOMATION CONTROL SYSTEM THALES AK400 FUNCTIONS

FUNCTIONS	Default	Potential
Control and operation via integrated 4.3'' touch screen	√	
Visualize system operations in real time	√	
Domestic hot water temperature control (set point 1, time-schedule)	√	
Heat pump control (Remote on/off with time-schedule, tank temperature adjustment set point 2)	√	
Heating element control up to 3kW (built-in relay with schedule, tank temperature regulation set point 3)	√	
Variable speed water pump control (PWM/0-10V) for energy transfer	√	
Recirculation pump control (on/off)	√	
Solar Field Control with Variable Speed Water Pump (PWM/0-10V)	√	
Solar field overheating control (set point 4) with dry cooler and three-way solenoid valve (with digital motor)	√	
Future firmware upgrades		√

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TEMPERATURE AND PRESSURE DROP CHARTS

Example of calculating required primary circuit temperature

Suppose the supply we need is 25 lt/min. For the production of 45°C Domestic Hot Water (DHW) and a supply of 25 lt/min (see Figure 1), going vertically downwards we see that the required temperature in the primary circuit must be at least 46.7°C (see Figure 1).

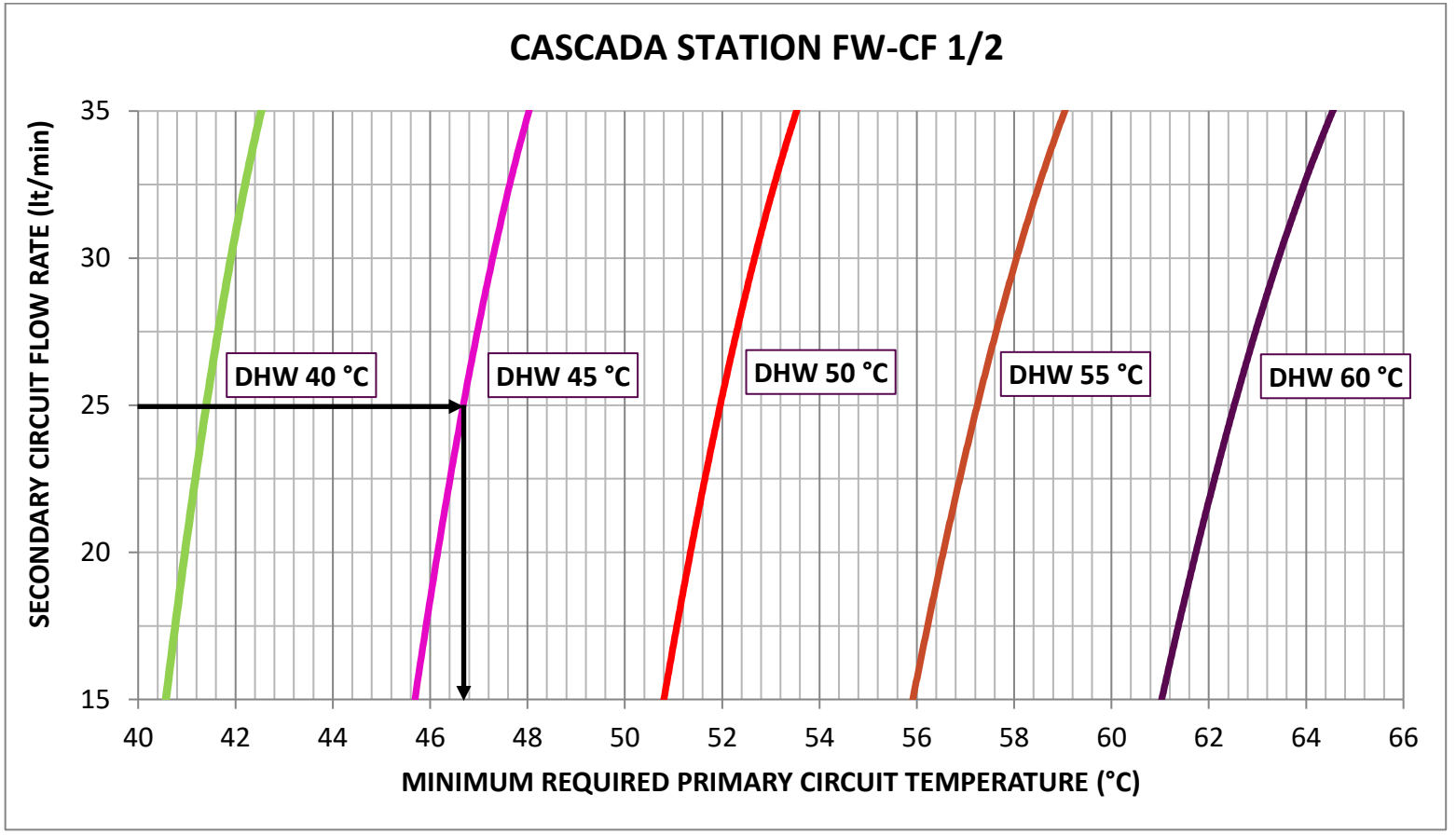

Figure 1

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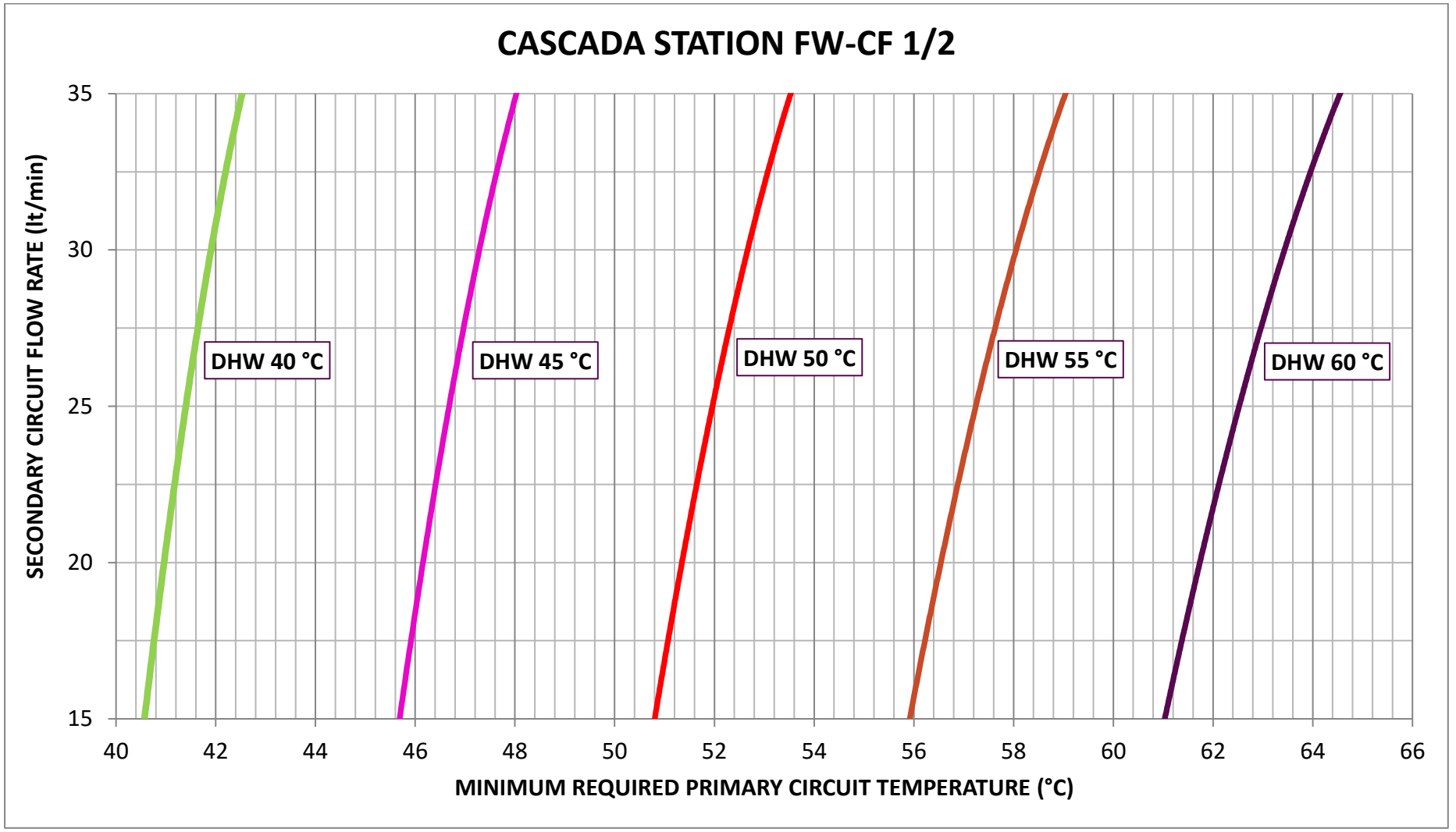
1) CASCADA STATION FW-CF 1/2



i) Minimum required primary circuit temperature as a function of the secondary circuit flow rate and the desired DHW temperature

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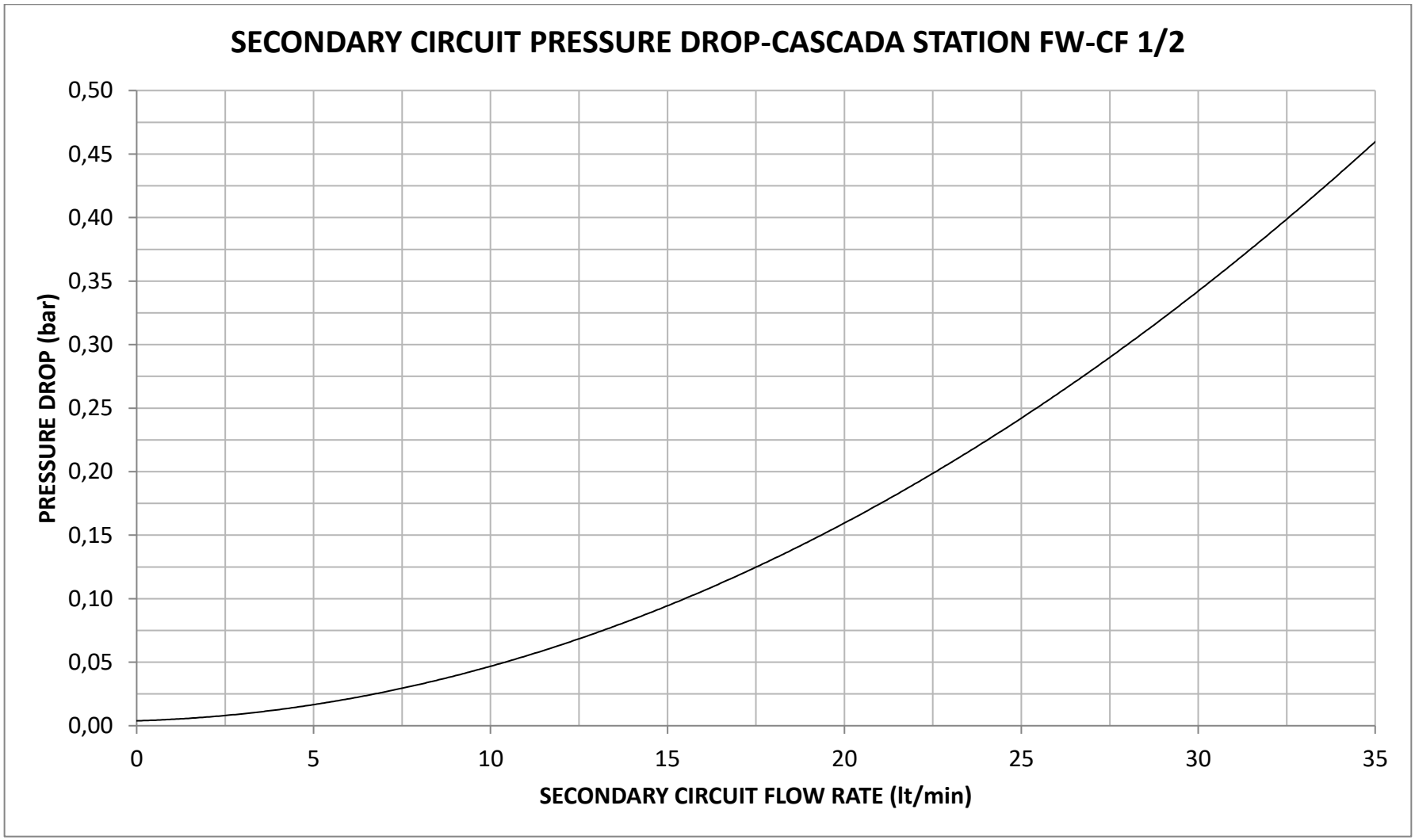

ii) Secondary circuit (DHW) pressure drop diagram

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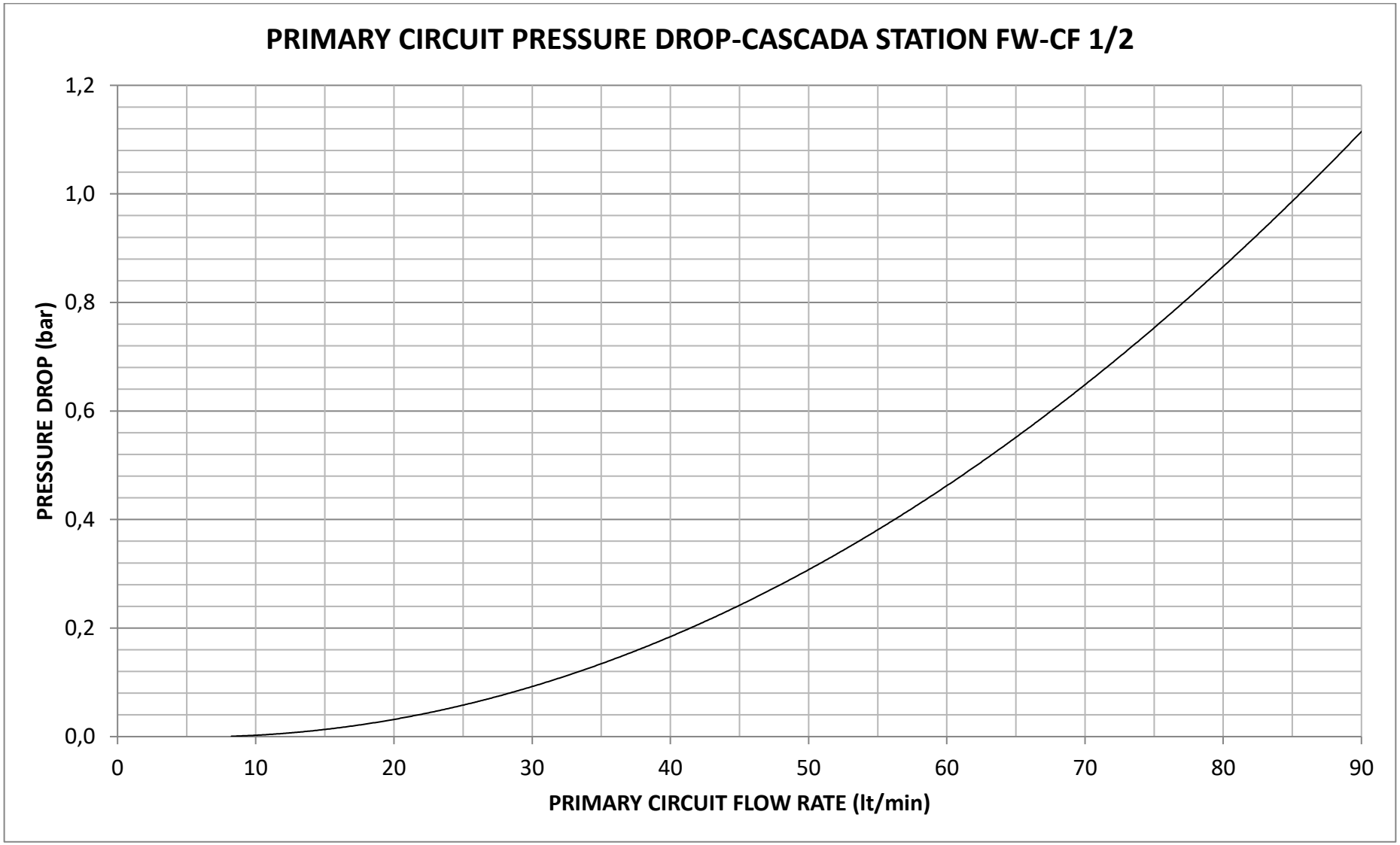

iii) Primary circuit pressure drop diagram

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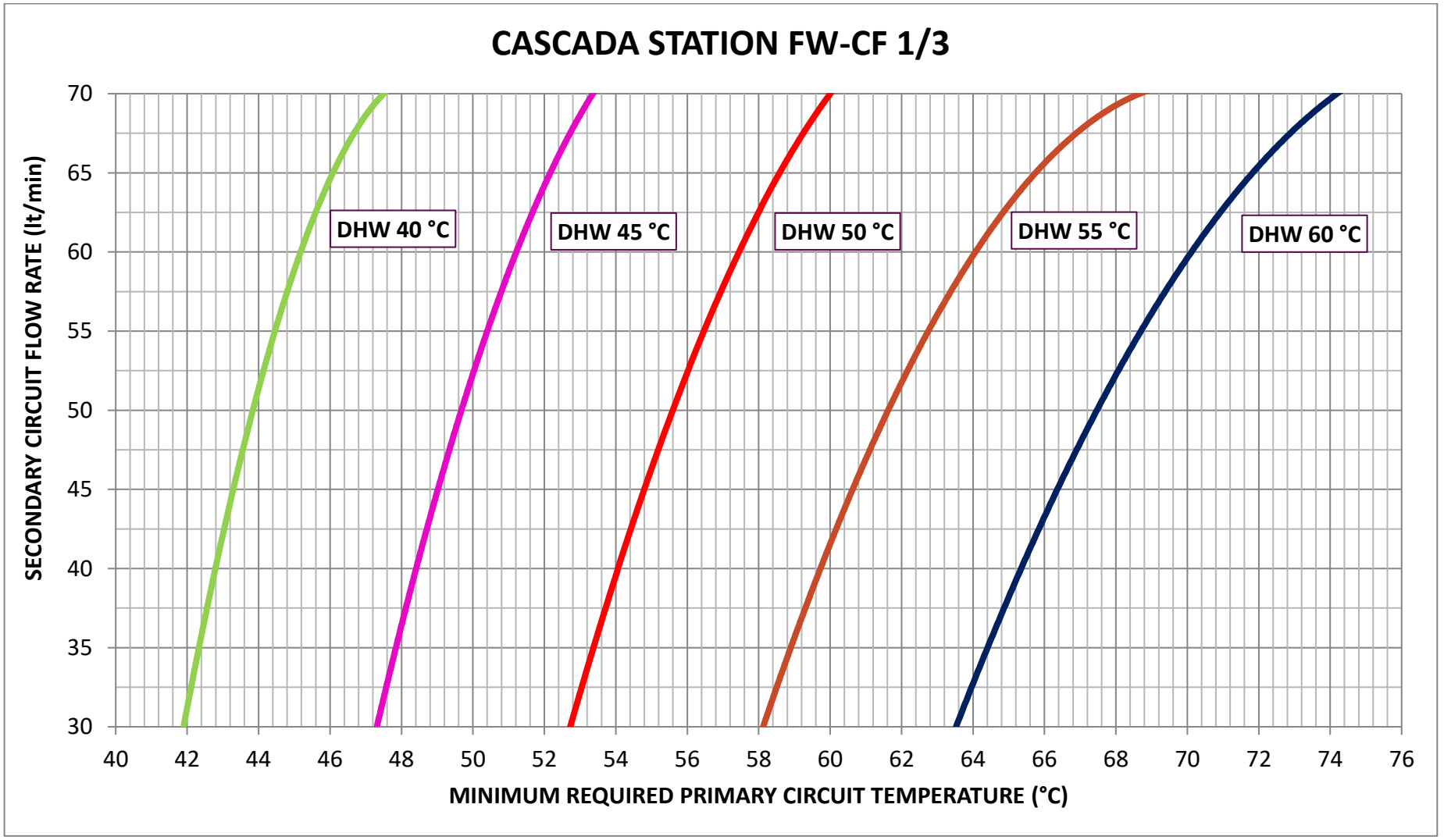
2) CASCADA STATION FW-CF 1/3



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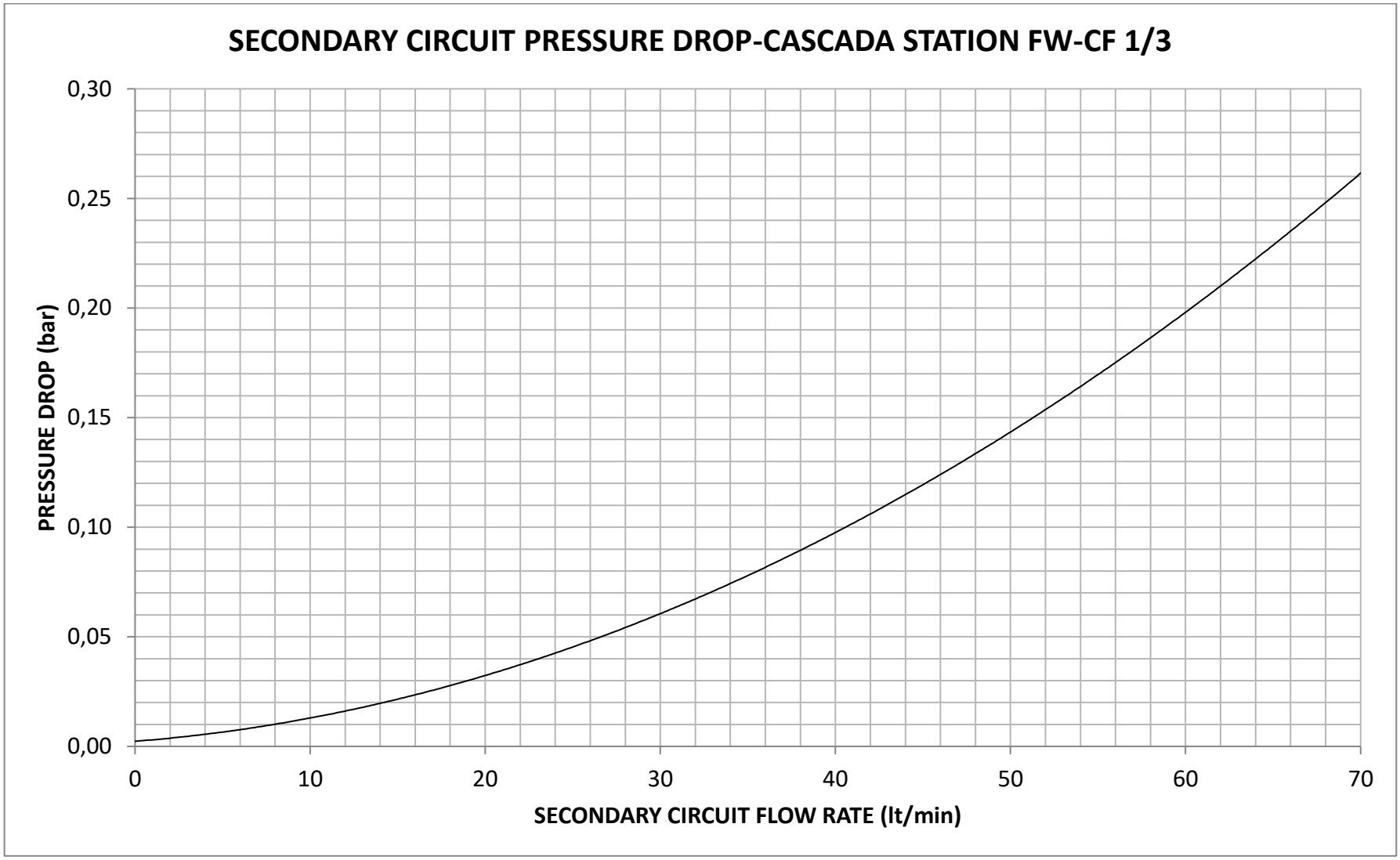

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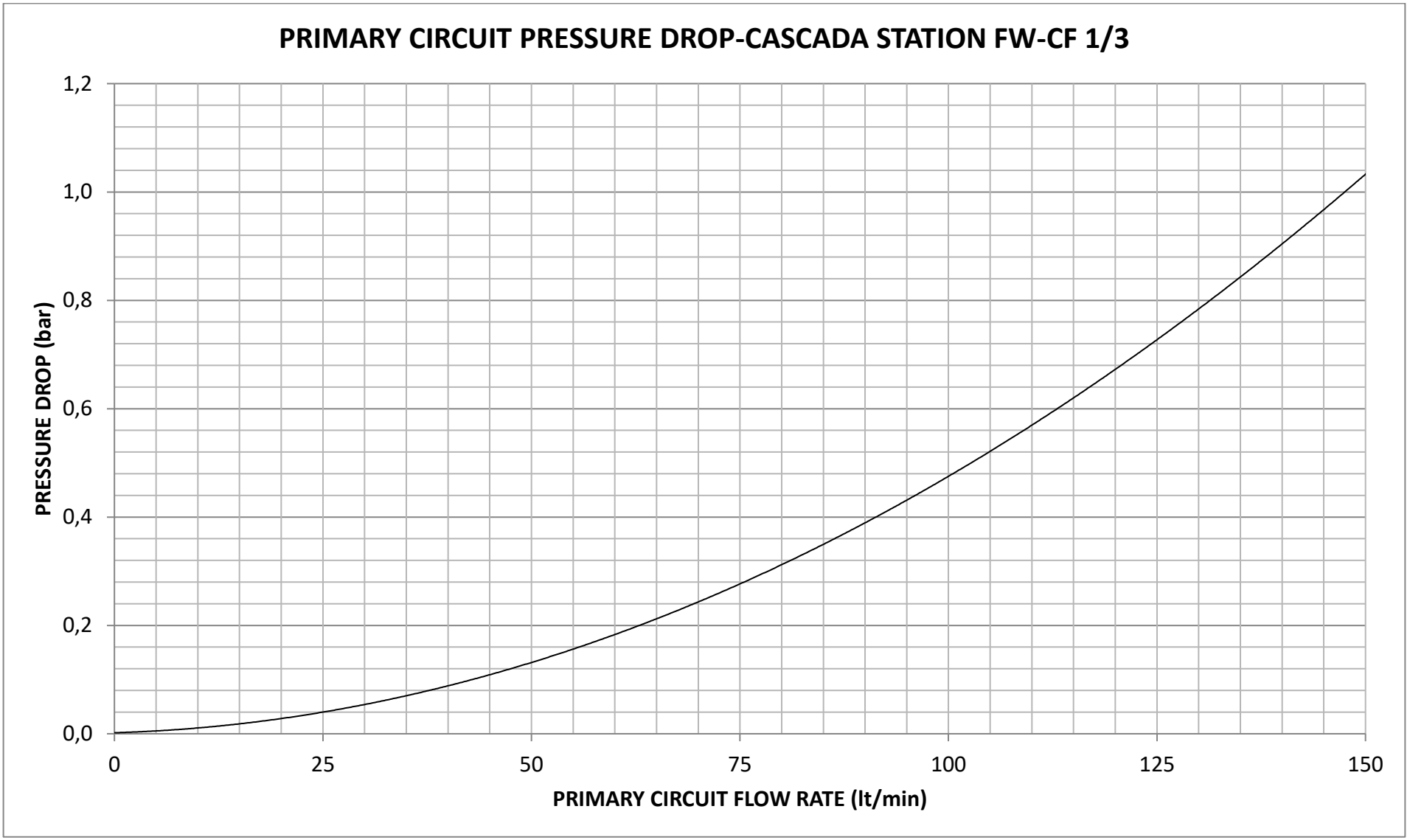

iii) Primary circuit pressure drop diagram

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