TCS TRAINING

IC-17-003 MARKET - EWCM 400D PRO STD

Presented by: Angelo Longo

- Variable capacity (Inverter and Copeland Scroll Digital ™ Compressor)

- Compact size
- Open for evolution

- Limited set of parameters

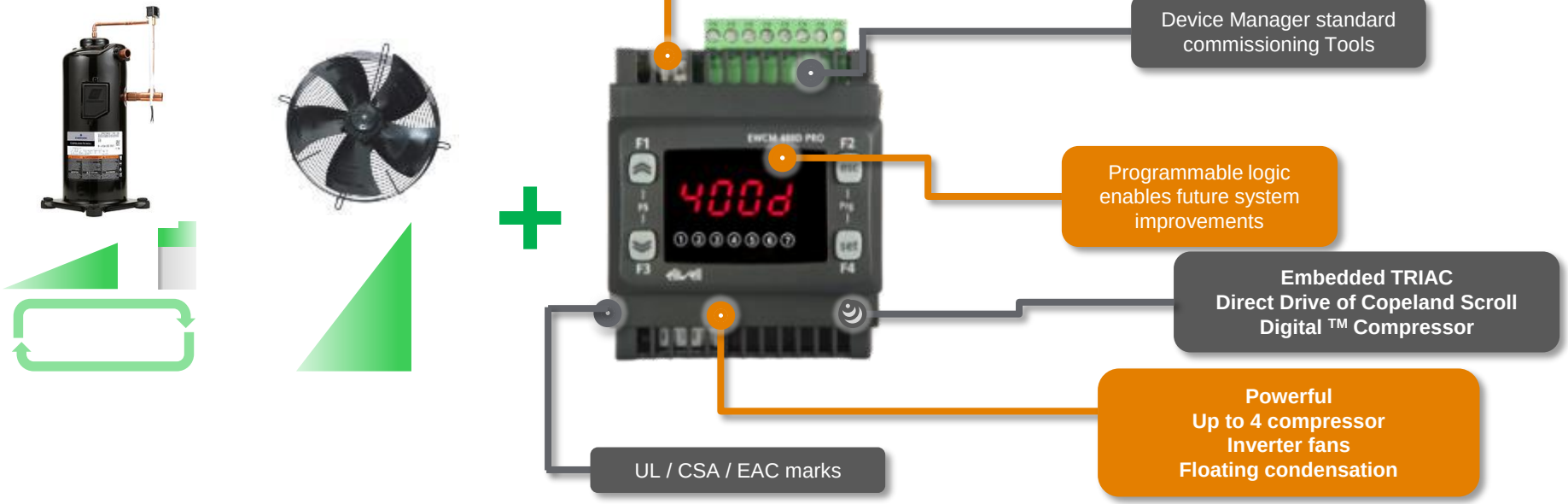
Life Is On eliwell by Schneider Electric

EWCM 400D PRO /A-STD

Variable capacity compressor rack application based on **FREEWay platform** packaged with all **standard configuration tools** and documentation of a **parametric controller** ready for Eliwell **Televis System** and open **MODBUS** connectivity.

EWCM 400D PRO / A-STD

- Compact
  - 4 DIN / 32x74 controller
  - 4 compressors
  - Direct drive of Copeland Scroll Digital TM Compressor / Inverter
- Easy to commission
  - Pre-defined application
  - «easy» commissioning
- Efficient
  - Variable capacity modulation
  - Variable speed fans
  - Floating condensation



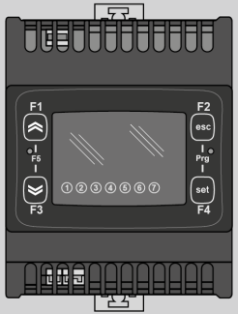
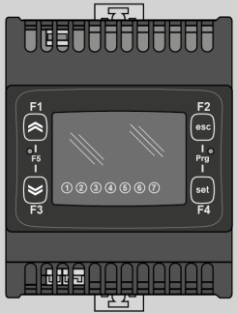
Strenght of application experience & Programmable Platform capabilities

OVERVIEW

Product derivative from the Free Smart platform

P/N	DESCRIPTION	PAD PRINTING	FW
EPDT1PSTD400	EWCM 436D PRO /A-STD	EWCM 400D PRO	704
EPDT1PSTD400A	EWCM 436D PRO /A-STD KIT W/CABLES	EWCM 400D PRO	704
EPD01PSTD400	EWCM 455D PRO /A-STD	EWCM 400D PRO	704
EPD01PSTD400A	EWCM 455D PRO /A-STD KIT W/CABLES	EWCM 400D PRO	704
EPE01PSTD400	EWCM 455P PRO /A-STD	EWCM 400P PRO	704
EPE01PSTD400A	EWCM 455P PRO /A-STD KIT W/CABLES	EWCM 400P PRO	704
EP5500000400	EXP 455D PRO	EXP 4D PRO	348
EP5500000400A	EXP 455D PRO KIT W/CABLES	EXP 4D PRO	348

OVERVIEW

	EWCM 436D PRO	EWCM 455D PRO	EWCM 455P PRO	EXP 455D PRO
DI	**6**	**6**		
AI	5	5		
RELAY	3	5		
OC	2	1		
TC	2	-		
AO	4 [1]	5 [2]		
				
	Embedded TRIAC direct Drive of Copeland Scroll Digital ™ Compressor	• ALTERNATIVE / SCREW Compressors • Drive of Copeland Scroll Digital ™ Compressor by external SSR (suggested SSM1A16BD Schneider Electric)		IO Expansion

1)

AO3,AO4	0…10V
AO5	4…20 mA
A01	PPM/PWM

2)

AO3,AO4,AO5	0…10V
A01, AO2	PPM/PWM

Features

- Suction pressure control by Inverter or Copeland Scroll Digital TM , alternative / screw compressors. Up to 4 compressors
- Discharge pressure control by inverter or up to 4 digital fans, Floating condensation, Antinoise
- General purpose regulator , Heat / Cool mode
- Refrigerant selection (Ert)
- Bar/°C
- IO Expansion (EnEp)
- Complete controller diagnostic
- RS-485 and Modbus RTU for thirdy party integration;
- TelevisGo / TelevisBlue compatible
- Optional remote display SKP (up to 10 m - 32,8 ft)

Compressors

- Suction pressure regulation
- 4 compressors :
  - ALTERNATIVE, SCREW (compr. 1-2-3-4)
  - Copeland Scroll Digital TM or inverter (compr.1)
- Selectable compressor type Ct1...Ct4
- Individual compressor step number nS1...nS4
- Proportional or ZN

Ct1 → Compressor type [0,5]
nS1 → Step number [1,4]

} Ct1 & CT2 & Ct3 & Ct4 == 0 → Capacity regulation disabled

Compressors

Compressor	Ct1	nS1	Ct 2-3-4	nS 2-3-4
Disabled	0	0	0	0
Alternative / screw 1 step (0%-100%)	1,2,3	1	1,2,3	1
Alternative / screw 2 steps (0%-50%-100%)	1,2,3	2	1,2,3	2
Alternative / screw 3 steps (0%-33%-66%-100%)	1,2,3	3	1,2,3	3
Alternative / screw 4 step (0%-25%-50%-75%-100%)	1,2,3	4	1,2,3	4
Inverter	4	1	-	-
Copeland Scroll Digital ™	5	1	-	-

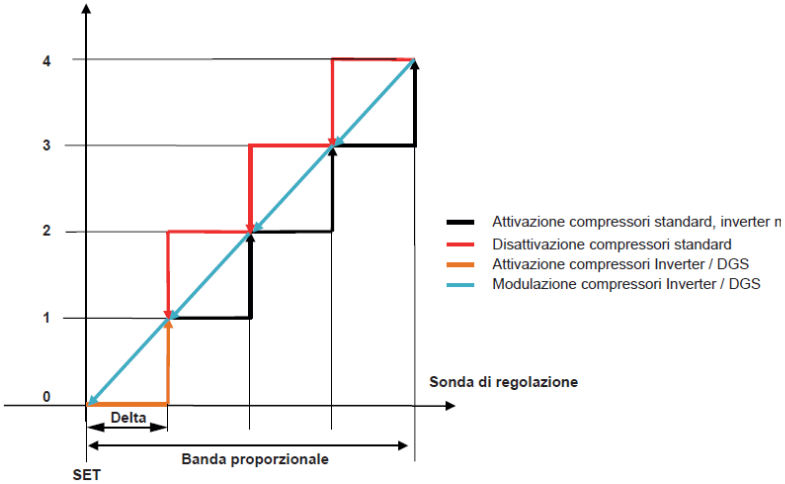
Compressors

Steps management :

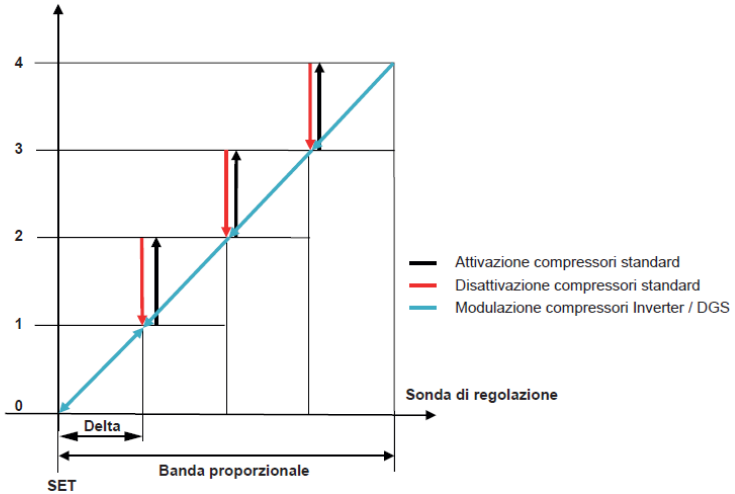
Potenza (%)	Ct1...Ct4 = 1				Ct1...Ct4 = 2				Ct1...Ct4 = 3			
	Accensione Compressore	Parzializzazione			Accensione Compressore	Parzializzazione			Accensione Compressore	Parzializzazione		
		1	2	3		1	2	3		1	2	3
100	ON	/	/	/	ON	ON	ON	ON	ON	/	/	/
75	ON	/	/	ON	ON	ON	ON	/	ON	/	/	ON
50	ON	/	ON	ON	ON	ON	/	/	ON	/	ON	/
25	ON	ON	ON	ON	ON	/	/	/	ON	ON	/	/
0	OFF	/	/	/	OFF	/	/	/	OFF	/	/	/

Compressors - Proportional control (CCFn = On)

MODULATING COMPRESSORS



CAP=OFF



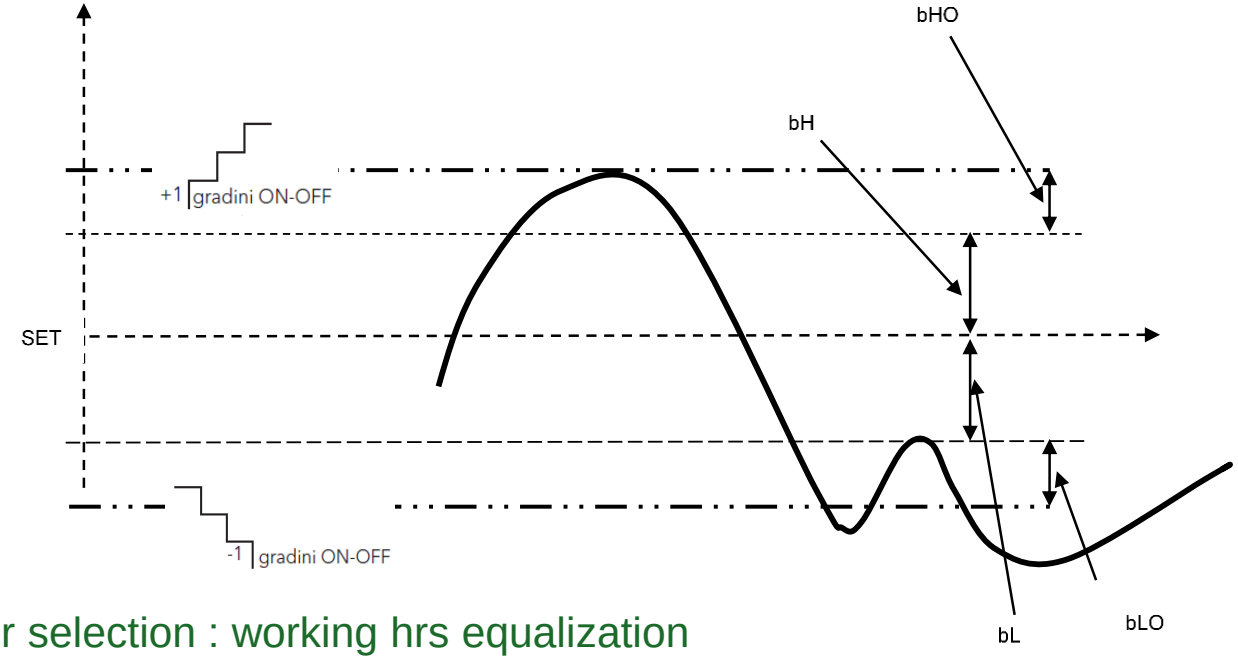
CAP=ON

Compressors - ZN control (CCFn = Off)

ON/OFF COMPRESSORS

- Timed insertion

Pressure	ΔT
SET+bH < P < SET+bH	dH
P >= SET+bHo	dHo
SET-bLo < P < SET-bL	dL
≤ SET-bLo	dLo



Compressor selection : working hrs equalization

Compressors - ZN control (CCFn = Off)

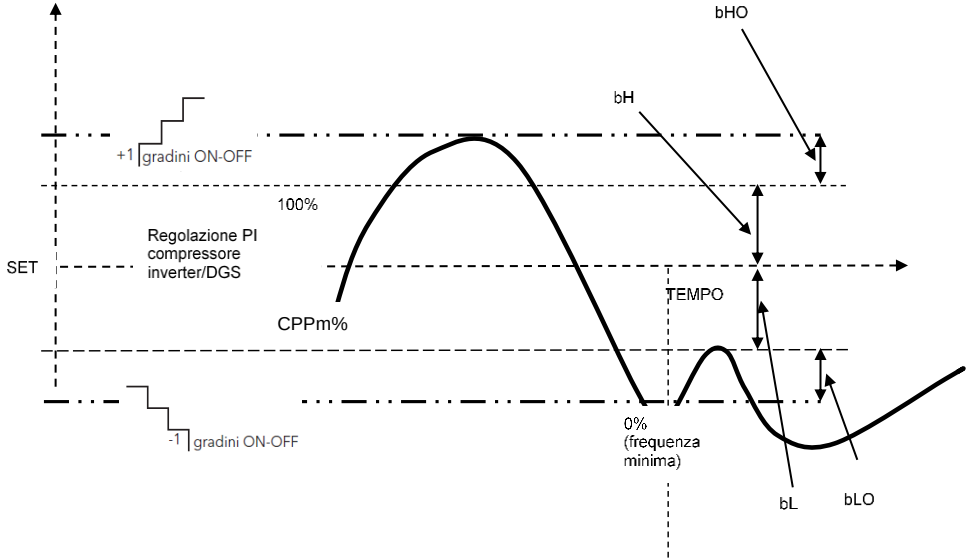
MODULATING COMPRESSORS

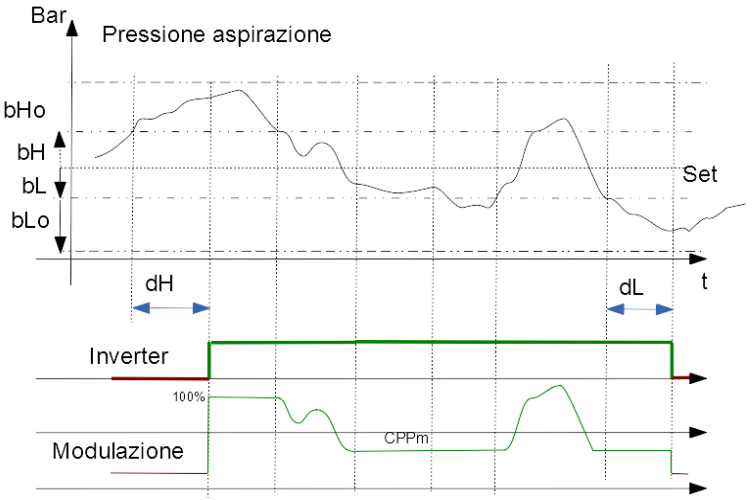
- Modulating compressor
  - First ON / last OFF
  - PI regulation in the range SEt-bL : SEt+bH
    - ❑ P > SEt+bH → 100%
    - ❑ P < SEt-bL → CPPm%
  - In case of ON-OFF compressor activation:
    - ❑ InSH = 0 → % unchanged
    - ❑ InSH <> 0 → forced at CPPm for InSH *
  - In case of ON-OFF compressor deactivation:
    - ❑ InSL = 0 → % unchanged
    - ❑ InSL <> 0 → forced at 100% for InSL *
  - ❑ OFF when P < SEt-bL for dL o dLo & last compressor ON

- ON-OFF compressor
  - Timed insertion

* ON-OFF compressor timed insertion disabled

Compressors - ZN control (CCFn = Off)





Compressors

Copeland Scroll Digital ™ Solenoid valve KIT compatible :

	COPELAND Bobina ID	COPELAND Corpo valvola ID
Kit 1	023-0060-00 / 20160927 Coil AC 220V 50/60Hz	010-0082-00 / 170313 Valve R410A
Kit 2	023-0104-02 / V1531 Coil AC 200-240V 50/60Hz Coil Type DRM8X	010-0182-00 / V1531 Solenoid Valve & Gasket Valve type 729RC

Setting EWCM 436D PRO for Copeland Scroll Digital ™ direct control:

- Connect the solenoid valve to TC1
- Configure DO6 = ±21 (DGS coil activation)
- Configure Dox = ±5 (compressore 1 activation)

Fans

- Discharge pressure regulation
- 4 digital fans (Proportional)
- 1 analogue output (PID) + Antinoise (night/day)
- Floating condensation

nFn → number of digital fans [0,4]
nFA → enable analogue fan [0,1]

} nFn & nFA == 0 → Fans disabled

PID

- Proportional only, ZN=0,2 Bar
- LLP : Min. % PID out
- HLP : Max % PID out (day)
- MLP : 100 % PID out for discharge pressure > MLP

Antinoise

- nhE : Anti-noise selection
  - 0 = DI
  - 1= RTC (Non/ NoF : Start/Stop time)
- HLn : Max % PID out (night)

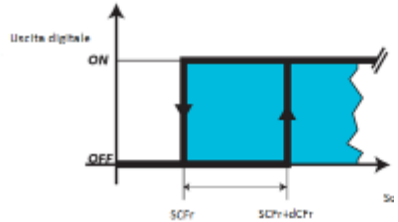
General purpose regulator

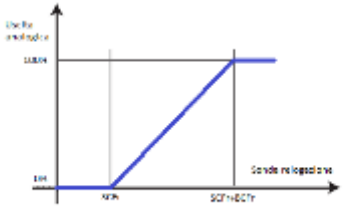
- Temperature regulation:
  - Dedicated sensor
  - Suction / Discharge pressure value converted
  - Other temperature sensors
- Activation : DO or AO
- HEAT/COOL mode

DIGITAL

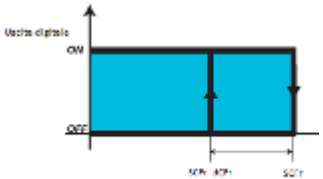
ANALOG

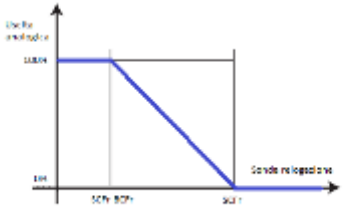
COOL





HEAT





Life Is On | Schneider Electric