

# Replacement Guidelines

Copeland™ Stream-N Compressors  
with Next Generation CoreSense™  
in Replacement of Stream-D Compressors



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**1 Introduction**

Built upon the success of CoreSense™ Diagnostics, Emerson is now introducing Next Generation CoreSense™ for Copeland™ Stream compressors featuring a modular design using state-of-the-art electronics. This modular design gives the customers the flexibility to choose the advanced features as per their system requirements.

The Next Generation CoreSense (or Next Gen CoreSense) is implemented on all Copeland Stream compressors from November 1<sup>st</sup>, 2019, in replacement of the previous CoreSense Diagnostics.

Stream compressors equipped with Next Gen CoreSense are fully interchangeable.

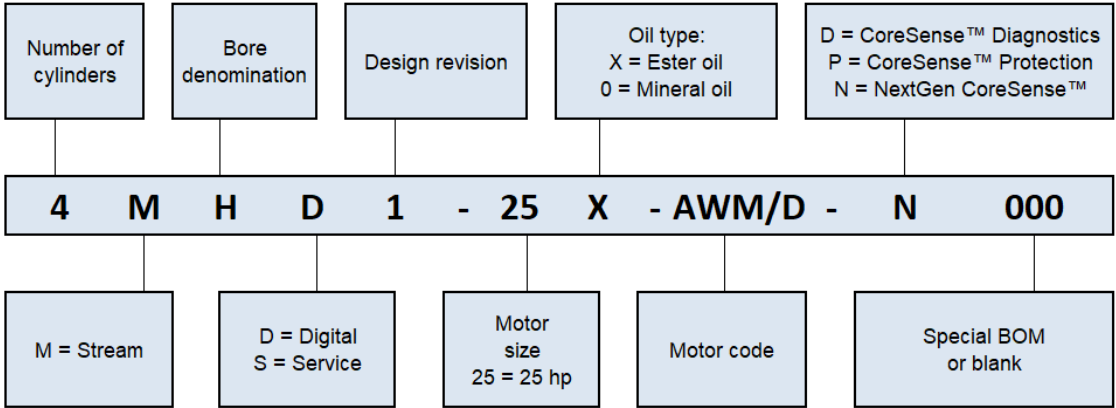


Figure 1: Next Generation CoreSense module on Stream compressor

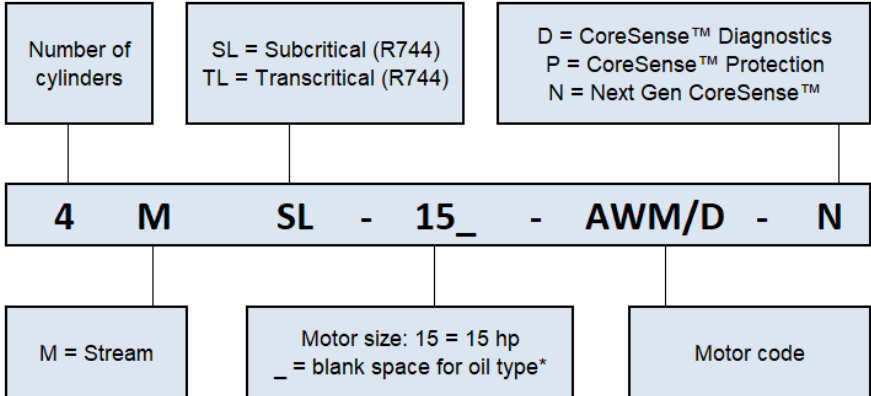
**2 Nomenclature**

The last digit in the nomenclature identifies the type of CoreSense fitted on the compressor. "D" stands for former CoreSense Diagnostics (Stream-D), "N" stands for Next Generation CoreSense (Stream-N).

**2.1 Standard and Digital Stream**



**2.2 Stream CO<sub>2</sub>**



## 3 Dimensions

The compressor dimensions are the same, only the position of the CoreSense module is different:

- in Stream-D compressors, the CoreSense Diagnostics module is located next to the oil pump;
- in Stream-N compressors, the Next Gen CoreSense module is located inside the terminal box.



Figure 2: Standard Stream compressors with CoreSense Diagnostics



Figure 3: Standard Stream compressors with Next Gen CoreSense

**4 Technical comparisons**

All Stream compressors are now delivered as standard with the Next Gen CoreSense module already installed in the terminal box, and the sensors preconnected.

**4.1 Features**

The Next Gen CoreSense combines oil and motor protection into one module, and provides advanced diagnostics and protection against faults such as high discharge temperature, locked rotor, single/missing phase, voltage imbalance, low voltage etc...

Former CoreSense Diagnostics	Next Generation CoreSense
Motor protection	Motor protection
Oil protection	Oil protection
Discharge temperature protection	Discharge temperature protection
Locked rotor protection	Locked rotor protection
Voltage imbalance protection	Voltage imbalance and phase assymetry protection
Low voltage protection	Low and high voltage protection
	Current monitoring / high current protection
Missing phase protection	Missing phase protection
	Welded contactor protection
Alarm history	Alarm history
Communication via Modbus (standard)	Communication via Modbus (optional)
Power consumption	Power consumption
Crankcase heater control	Crankcase heater control

Table 1: CoreSense features comparison

**4.2 Compressor technology**

The compressor technology remains the same; only the protection, the sensors and their location have changed.

**4.3 Terminal box**

The terminal boxes are basically the same, but the contents and the box covers are different.

**4.3.1 Terminal box external view**



Figure 4: Former CoreSense terminal box



Figure 5: Next Gen CoreSense terminal box

## 4.3.2 Terminal box internal view

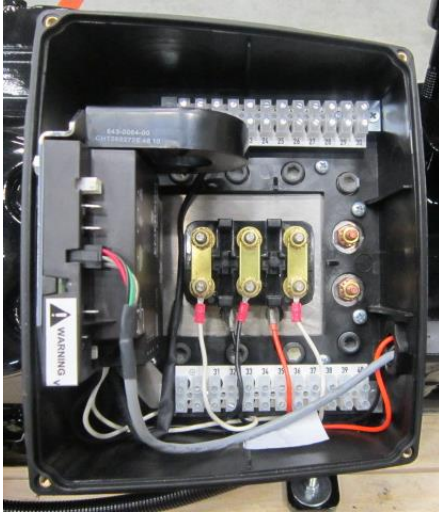


Figure 6: T-box internal view Stream-D



Figure 7: T-box internal view Stream-N

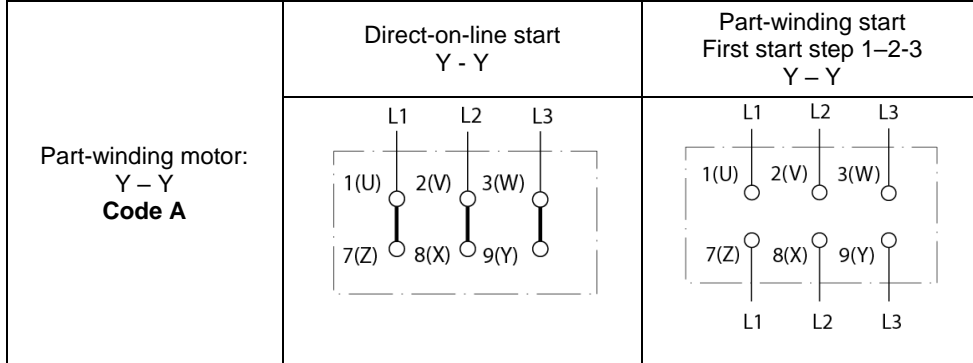
The Next Gen CoreSense module is located in the compressor terminal box. It is prewired to the oil pressure sensor (for compressors with oil pump), the motor thermistor chain (PTC), the discharge temperature sensor and the current sensor.

**Caution!** The power leads from the same phase should go through the current sensor in the same direction – see wiring diagrams in **Chapter 5**.

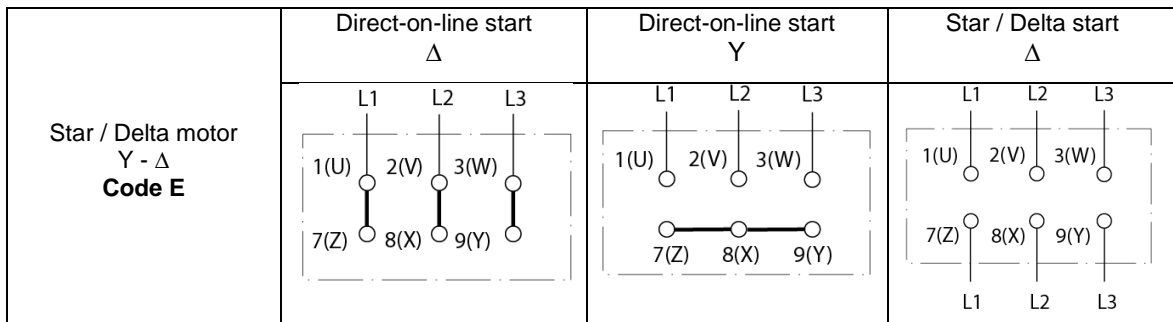
### 4.3.3 Terminal box isolators and jumper position

The terminal plates are identical, so the jumper position and the ground connection will remain the same.

Part-winding motors can be connected direct-on-line or part-winding start:

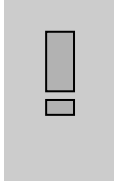


Star / Delta motors can be connected direct-on-line or Star / Delta start:





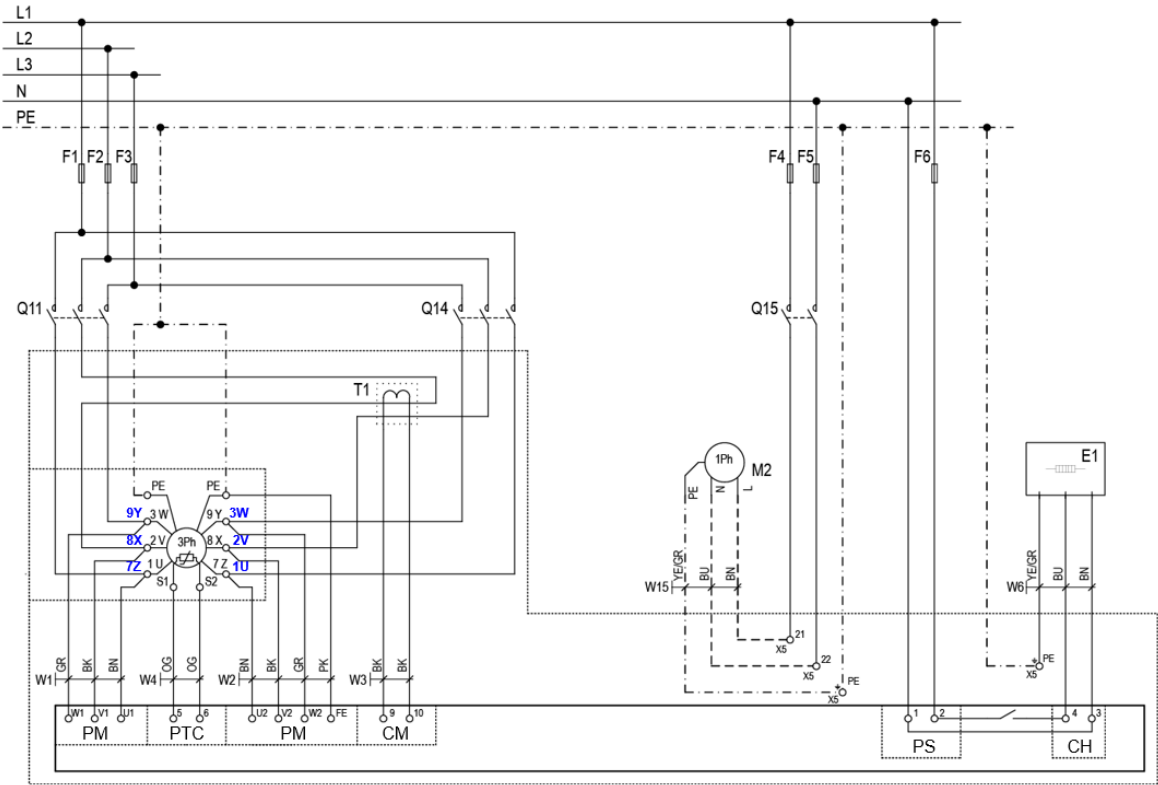
5 Wiring diagrams



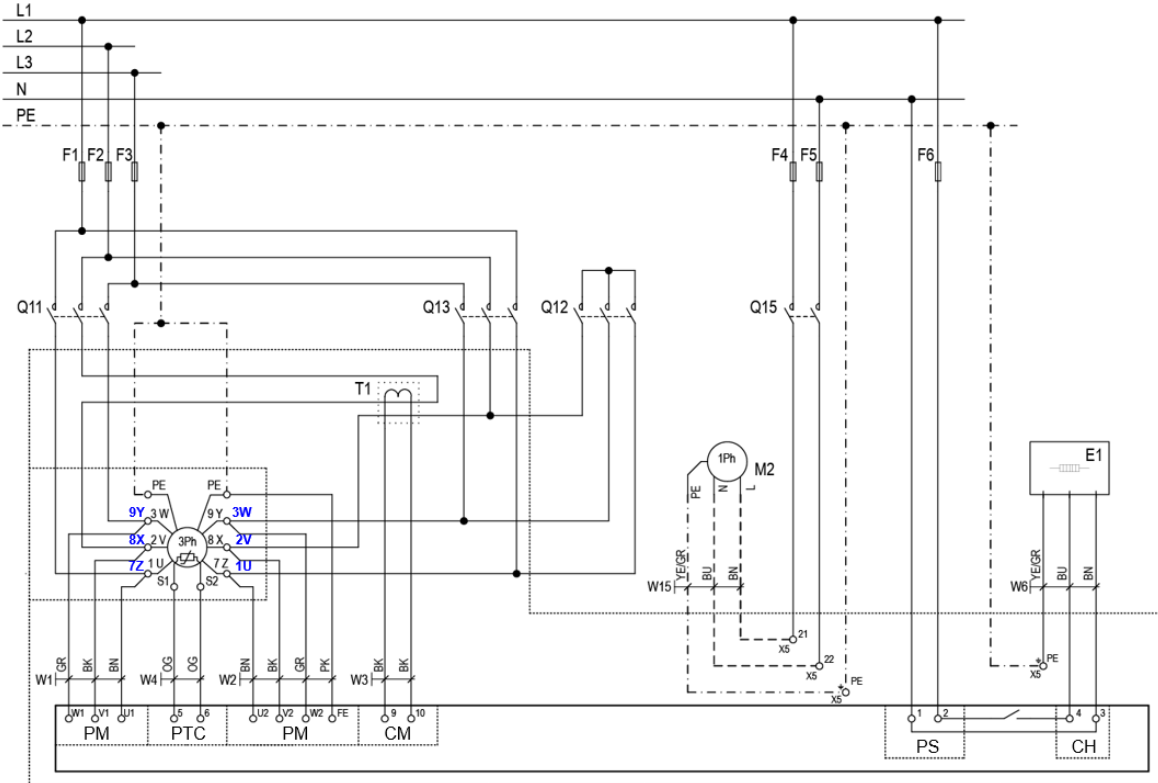
IMPORTANT

For Stream CO<sub>2</sub> small and medium compressor models (4MTL-05 to 4MTL-30 & 4MSL-03 to 4MSL-15), the blue positions 1U, 2V, 3W, 7Z, 8X, 9Y in diagrams below must be considered. The position of the terminals in all the other Stream compressor models corresponds to the black positions. The factory delivery is correct, DO NOT reverse the connections.

5.1 Part-winding motors (AW...)

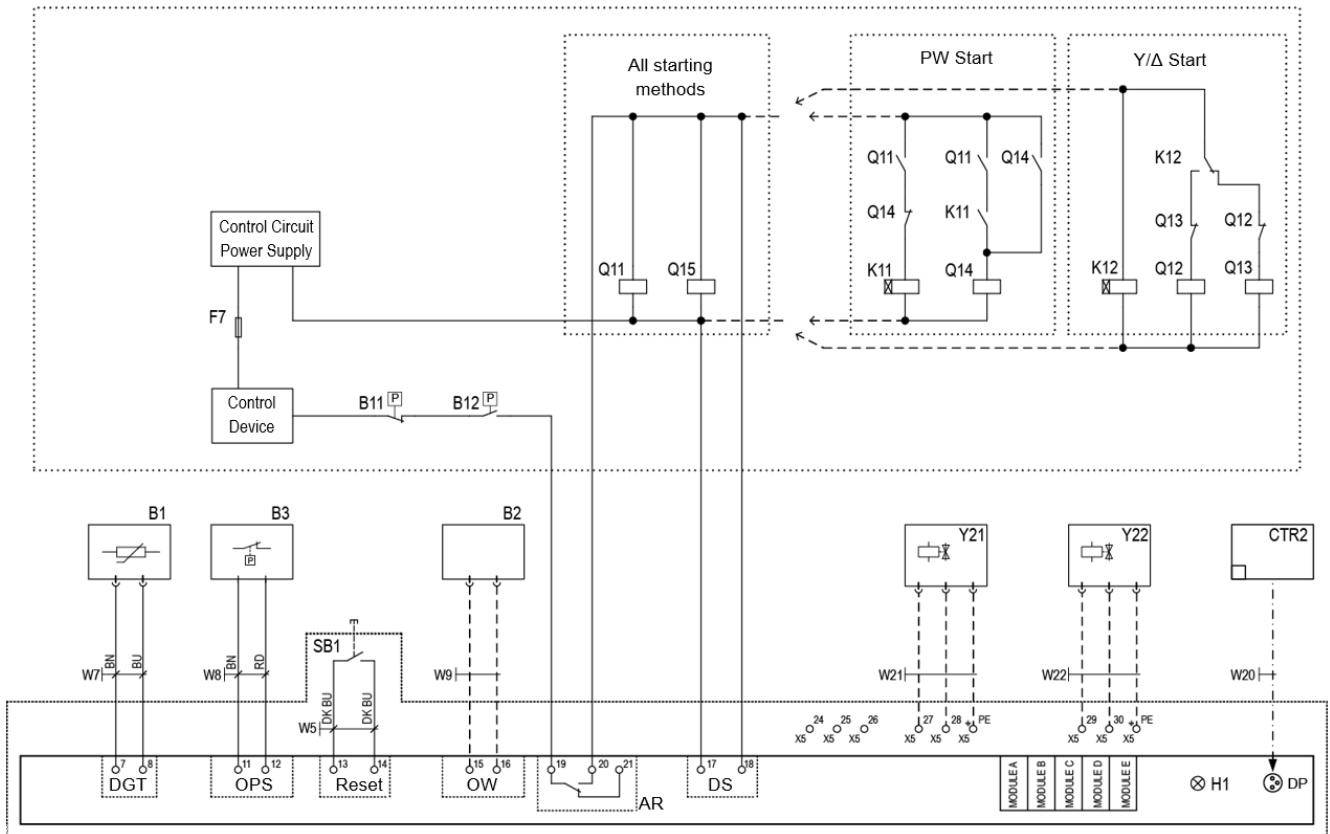


5.2 Star / Delta motors (EW...)





## 5.3 Part-winding and Star / Delta motors (AW... and EW...) – 2<sup>nd</sup> part



### Legend

B1 .....	Discharge gas sensor	DGT .....	Discharge gas temp. monitoring
B2 .....	Oil level watch (TraxOil)	OW .....	Digital oil level watch
B3 .....	Oil differential pressure switch (OPS)	OPS .....	Oil differential pressure protection
B11 .....	High-pressure switch	AR .....	Alarm relay
B12 .....	Low-pressure switch	DS .....	Demand signal
CTR2 .....	DP Gateway		
E1 .....	Heater	CH .....	Control oil heater
F1, F2, F3 .....	Compressor fuses	PTC .....	Motor thermal protection
F4, F5 .....	Fan fuses	PM .....	Phase monitoring
F6 .....	CoreSense and heater fuse	PS .....	Power supply
F7 .....	Control circuit fuse		
H1 .....	Diagnosis LED		
K11 .....	Time relay for part-winding (if used)	Q15 .....	Fan contactor
M2 .....	Fan motor	Q12 .....	Compressor contactor Y (if Y/Δ start)
Q11 .....	Compressor contactor	Q13 .....	Compressor contactor Δ (if Y/Δ start)
Q12 .....	Compressor contactor Y (if Y/Δ start)		
Q14 .....	Compressor contactor 2 <sup>nd</sup> part-winding (if used)		
SB1 .....	Reset button		
Y21 .....	Solenoid valve capacity control 1		
Y22 .....	Solenoid valve capacity control 2		
T1 .....	Current sensor	CM .....	Current monitoring

**6 Accessories**

Stream compressors with Next Gen CoreSense use the same accessories as the previous models.

**6.1 Standard delivery Stream-N compressors**

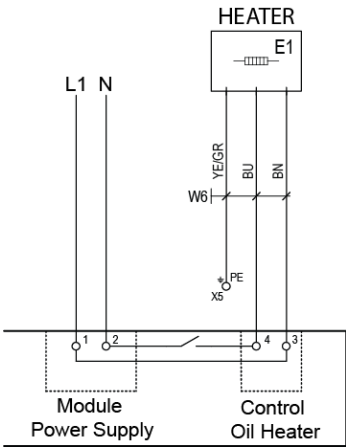
Please check whether the delivery is correct and complete. Any deficiency should be reported immediately in writing.

Standard delivery:

- Suction and discharge shut-off valves
- Oil charge, oil sight glass
- Spring mounting parts
- Next Gen CoreSense module prewired in terminal box
- Holding charge up to 2.5 bar(g) (dry air)

**6.2 Crankcase heater**

The Next Gen CoreSense module controls the crankcase heater directly. Therefore, only a crankcase heater with the same power supply as the CoreSense (115 VAC or 230 VAC) can be applied.



**Figure 8: Wiring diagram – Crankcase heater connections**

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