

Everything you need to know about Definite Purpose Contactors

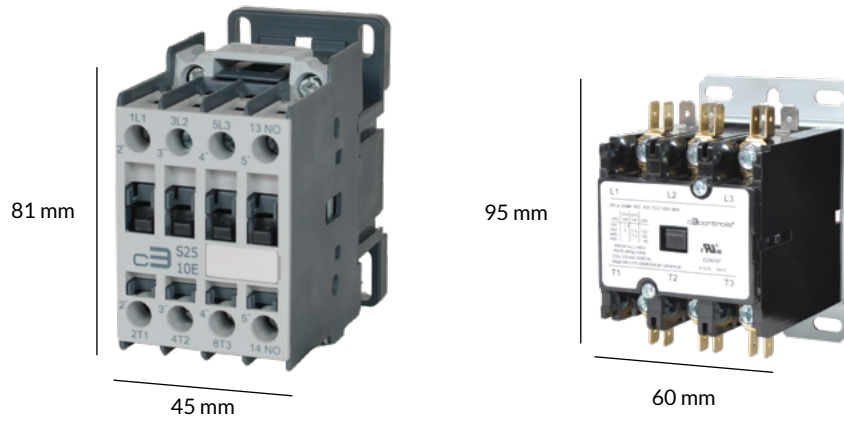
Introduction

Let's start with the basics of a Contactor. A Contactor is an electromechanical device that controls the switching of a load connected across it. When the coil is energized, the contactor will change its contact state from open to closed, making the equipment turn ON. Between the two main ratings of contactors, IEC and NEMA, there are many applications and contactor types a person can use. A common contactor in the HVAC industry is the Definite Purpose Contactor. As the name suggests, it was designed for a specific or "definite" purpose – HVAC applications (Heating, Ventilation, Air Conditioning and Refrigeration). Let's find out why designing a Definite Purpose Contactor was needed, and why a general contactor wasn't used.

During the mid 20th Century, leaders from the HVAC industry identified that this industry does not require expensive general purpose contactors. HVAC equipment, such as hermetic compressors have light duty applications, and using high-duty general purpose contactors for their switching was actually a mismatch. Out of this mismatch, a new line of contactors were designed and known as "Definite Purpose", or DP contactors.

Major differences between this new Definite Purpose contactor and a general purpose contactor are:

- Definite Purpose contactors are UL recognized, not listed.
- General purpose contactors have a smaller footprint when compared to a Definite Purpose contactor of a similar current rating.
- Apart from these differences, many of the IEC general purpose contactors available in the market have less coil noise and are easily removable and replaceable. The service life of a Definite Purpose contactor is shorter than that of a general purpose contactor because they are primarily designed to have much more mechanical, electrical, and recycle life.



25A IEC Contactor (3 Pole + Auxiliary) vs 25A DP Contactor, 3 Pole

Still, the DP contactor is a perfect choice for specific applications due to its greater compatibility and lower price.

So, what applications prefer DP contactors?

A thumb rule says that if a customer has an application that “heats, cools, refrigerates, controls, or moves air” then it is a suitable candidate for DP contactors. In the HVAC industry, these DP contactors are further divided into two segments:

1. Compact 1 and 2 Pole DP Contactors, up to 40A: Majorly used for residential and unitary air conditioning installation.
2. Standard Frame 2 to 3 Pole DP Contactors, up to a few hundred amps: Majorly used for commercial or industrial establishments which require centralized air conditioning.

As seen below, DP contactors have attracted several other industries as well.

Table 1. Four Digit SIC Numbers

SIC Codes	Description
2449	Hot tubs, manufacturing
3088	Hot tubs, plastic/fiberglass manufacturing
3548	Welding and cutting apparatus, gas or electric manufacturing
3556	Ovens, bakery manufacturing
3556	Meat grinders
3563	Air gas compressors manufacturing
3564	Fans/blowers/air purification manufacturing
3567	Industrial processing furnace/oven manufacturing
3581	Automatic vending machine manufacturing
3582	Washing machines, commercial manufacturing
3582	Dry cleaning and pressing machine manufacturing
3585	Air conditioning and heating equipment manufacturing
3589	Garbage disposers, commercial manufacturing
3629	Battery chargers rectifying/non-rotating manufacturing
3634	Humidifiers, electric, portable manufacturing
3639	Water heaters, electric, manufacturing
3821	Ovens, laboratory manufacturing
3842	Whirlpool baths/equipment manufacturing

Table 2. Six Digit SIC Numbers

SIC Codes	Description
308802	Hot Tubs and Spas Manufacturers
354801	Welding Equipment Supplies - Manufacturers
355605	Ovens - Bakers - Manufacturers
356301	Compressors - Air - Manufacturers
356303	Spraying Equipment - Manufacturers
356398	Air and Gas Compressors - Manufacturers
356401	Fans - Industrial and Commercial Manufacturers
356402	Air Cleaning and Purifying Equipment
356413	Ventilating Equipment Manufacturers
356498	Industrial and Commercial Fans and Blowers
356701	Ovens - Industrial Manufacturers
356789	Industrial Process - Furnaces/Ovens
358101	Vending Machine Manufacturers
358203	Pressing Machine - Manufacturers
358298	Commercial - Laundry Dry Clean Machine Manufacturers
358501	Air Conditioning Equipment - Manufacturers
358512	Marine Refrigeration and Air Conditioning Manufacturers
358513	Air Conditioners Room Units - Manufacturers
358598	Air Conditioning/Heating/Refrigeration Equipment - Manufacturers
358903	Compactors - Waste - Industrial/Commercial Manufacturers
363410	Water Jet Cutting
363908	Water Heaters - Manufacturers
369402	Battery Charging Equipment Manufacturers
399934	Tanning Salons Equipment - Manufacturers

How Definite Purpose Contactors are selected?

- Unlike General purpose contactors, which are rated typically based on HorsePower (HP) of the motor, Definite purpose contactors are rated on Motor Full Load Amps (FLA).
- DP contactors often have limitations on the maximum Locked Rotor Amps (LRA) it can handle. Generally, locked rotor amp ratings are 600% for 240 volts, 500% for 480 volts and 400% for 600 volts. Because of this limitation, IEC General purpose contactors rated for similar FLA can control a motor of higher HP compared to a DP contactor. Commonly available DP contactors are rated for 20, 25, 30, 40, 50, 60, 75, 90A (FLA).
- Coil voltage: Available voltages include 24V AC, 120V AC, 208/240V AC, 480V AC, 575V AC and some DC voltages as well.
- No. of poles: Manufacturers give a choice of 1, 2 and 3 poles. Often the manufacturer will give a 1 pole unit with shunt. What that means is that 1 line switching is controlled by a coil voltage and the other line (neutral) is always shorted.
- Further, two frames of 3 Pole DP contactors can be configured for reversing applications as well.

c3controls offers a wide range of [IEC General purpose contactors \(Series 300, 310\)](#) as well as [Definite Purpose contactors \(Series 280, 290\)](#). Both product lines include reversing and non-reversing configurations. Contact c3controls for help in selecting the appropriate contactor for your application.

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