

BULLETIN #: 12T-02A

SUPERSEDES: 12T-02, Dated Aug-9-2012
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**SUBJECT:** Optical Oil Level Regulator TECHNICAL MARKETING

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Products Affected: 06D 06E 06CC 06M 06U 06V
 5F 5H 05G 05K
 06TA/TR 06TS-TT-TU-TV

Carlyle is pleased to offer a new Optical Oil Level Regulator for all 06D/E/CC, 05G/K, and 06M compressor applications. The new optical oil level regulator is not Dual Voltage and is sold only as an accessory item; factory installation is not available at this time.

Carlyle Part No.	Description	Voltage	Compressor Model Usage						
			06D	06E	06CC 17-37cfm	06CC 50-99cfm	06M	05G	05K
06DA609572	Oil level regulator only	120Vac	X*		X*		X	X*	X*
06DA609573		240Vac	X*		X*		X	X*	X*
06EA607200	Oil level regulator with adapter for 06E compressors	120Vac		X		X			
06EA607201		240Vac		X		X			

* - Requires adapter kit 3-033-204 which must be ordered separately.

Description:

The new Carlyle Optical Oil Level Regulator controls and monitors the oil level in each individual compressor to ensure adequate oil lubrication is available to the compressors. If oil level is not maintained at 1/2 the compressor sight glass, the oil level regulator can be wired into the compressor stop/start circuit to trip the compressor. An optical sensor, not a mechanical float, is used to determine when oil filling is required by energizing a normally closed internal solenoid. Thus providing the following benefits:

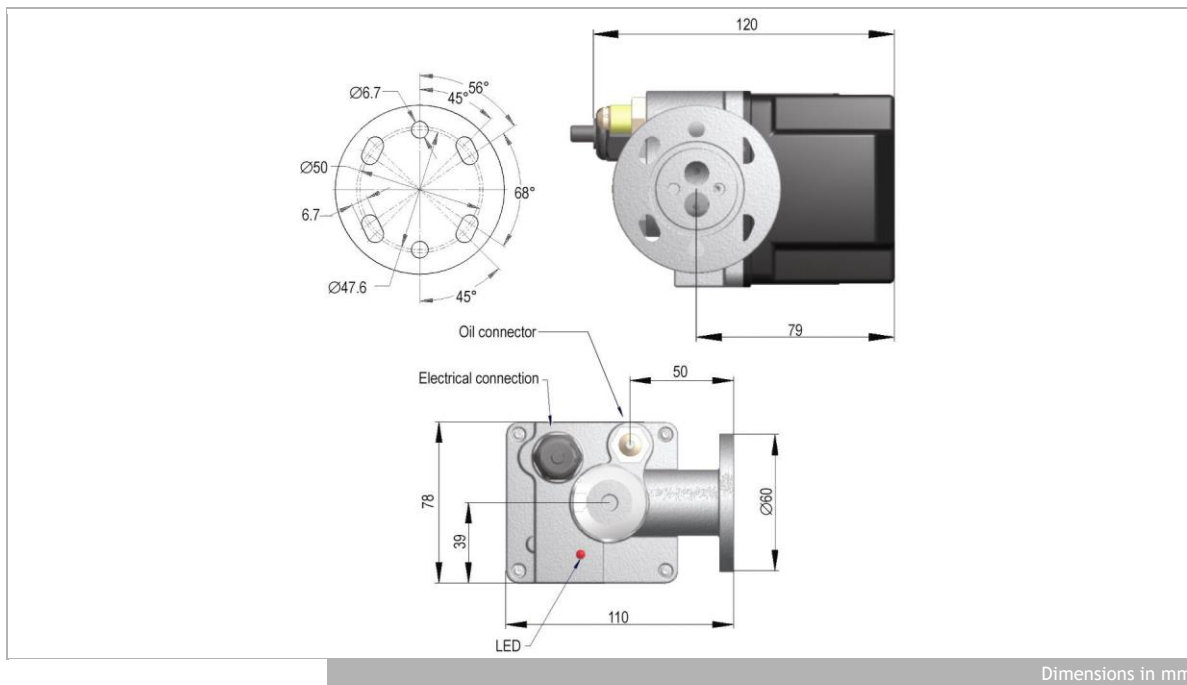
- No mechanical float required.
- No oil level adjustments required, the optical oil level regulator will always control level to 1/2 compressor sight-glass.
- Dual mounting position provides option for installation and improved field serviceability

(See Figure A).

The oil level regulator is designed to attach directly to the compressor's sight-glass connection for all 06D, 06E, and 06CC compressor models.

Function:

The oil level regulator uses an optical sensor to measure the oil level in the sightglass. If a low oil level is detected, the integrated (normally closed) oil supply solenoid valve is energized to opened. The oil is slowly injected into the compressor crankcase via the systems's oil reservoir. The regulator generates an alarm signal and activates the relay output if the oil level is still too low after a defined period of time. During the "oil deficiency" alarm status, the regulator continues to operate and inject oil into the crankcase. The alarm status is automatically reset and closes the soleniod valve once the oil level is at the 1/2 the sight glass setpoint.



Operation:

After the oil level regulator is switched on, the alarm relay picks up after 3s, provided no malfunction is present. Regardless of the oil level, a 20s delay is activated to allow the oil to settle. If the oil level is below the 1/2 sightglass setpoint, the internal solenoid valve will open and inject oil into the compressors crankcase per the following control cycles:

- 1st cycle : fill 5s / wait 5s
- 2nd cycle: fill 10s / wait 10s
- 3rd cycle: fill 20s / wait 20s

If after 135s the oil level setpoint has not been reached, the alarm relay drops out and the final fill cycle 30s fill / 30 waits begins. If an adequate oil level has been reached, the alarm relay picks up again after a 30s delay and the filling control cycle is reset.

Installation Instructions

- 1.) The oil level regulator is designed to attach directly to the compressor's crankcase for all 06D, 06E, 06CC, and 06M compressors. Unique adapters are required in order to install the oil level regulator correctly to 06D/E/CC compressor. Adapter kit 3-033-204 is sold separately and is required for all 06D compressors. For 06E compressor applications the adapter is supplied with the oil level regulator.
- 2.) No adapter is required for the 06M compressor models. Oil level regulator will attach in-place of the oil level sight-glass.
- 3.) Prior to installation, ensure that the pressure in the compressor is at atmospheric pressure.
- 4.) Prior to installation, ensure all orings are seated properly and lightly oiled.
- 5.) Ensure the part is clean and no debris near the oil fill port and oil inlet sight-glass cavity.
- 6.) The regulator must be mounted to the compressor horizontally and can be rotated 180 degrees as shown in **Figure A**.

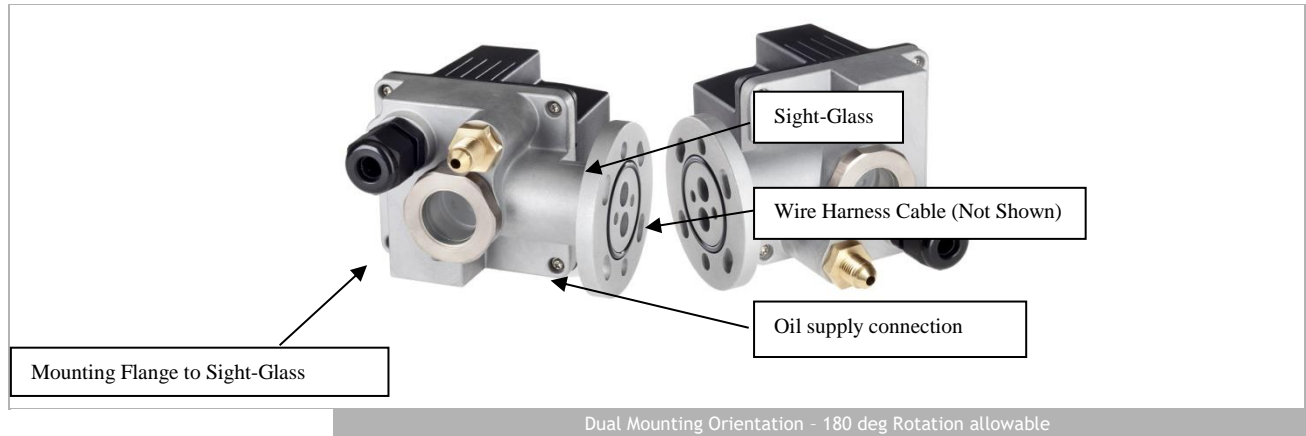


Figure A

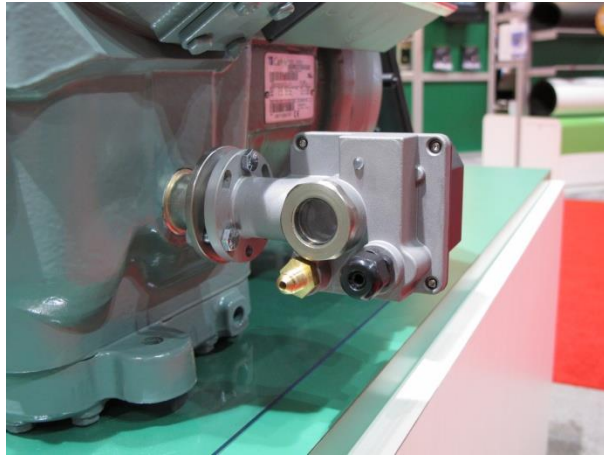
- 7.) An oil filter has to be installed in the oil supply line of the regulator to prevent internal debris entering the oil regulator and compressor.
- 8.) The regulator is not a dual voltage device, maintain the operating voltage specified on the regulator nameplate.
- 9.) The electrical connections should be performed by trained electrical personnel in accordance with the proposed electrical diagram supplied in this technical bulletin.

Notes:

- Before the regulator is powered up for the first time, the oil level should be at 1/4 sight-glass to prevent the alarm relay from being deactivated.
- Do not exceed the maximum operating temperatures and pressures as define by the technical specification outline in this bulletin.
- A typical oil system for recip compressors should include an oil reservoir, oil separator, pressure valve, discharge check valve, and an oil filter/strainer.
- A positive pressure is required to insure an adequate oil supply from the oil reservoir to the oil regulator. Installing a pressure valve (5 or 20 psig) will keep the oil reservoir pressure a set pressure above the compressor crankcase oil sump pressure.
- Leak check all connections prior to filling the system with refrigerant.

06D/06CC 17-37cfm) compressor Installation:

An oil level adapter kit is required (Carlyle part number 3-033-204) to be installed prior to installing the oil level regulator. Follow the installation instructions provided with the adapter kit 3-033-204.



06D/06CC Compressor

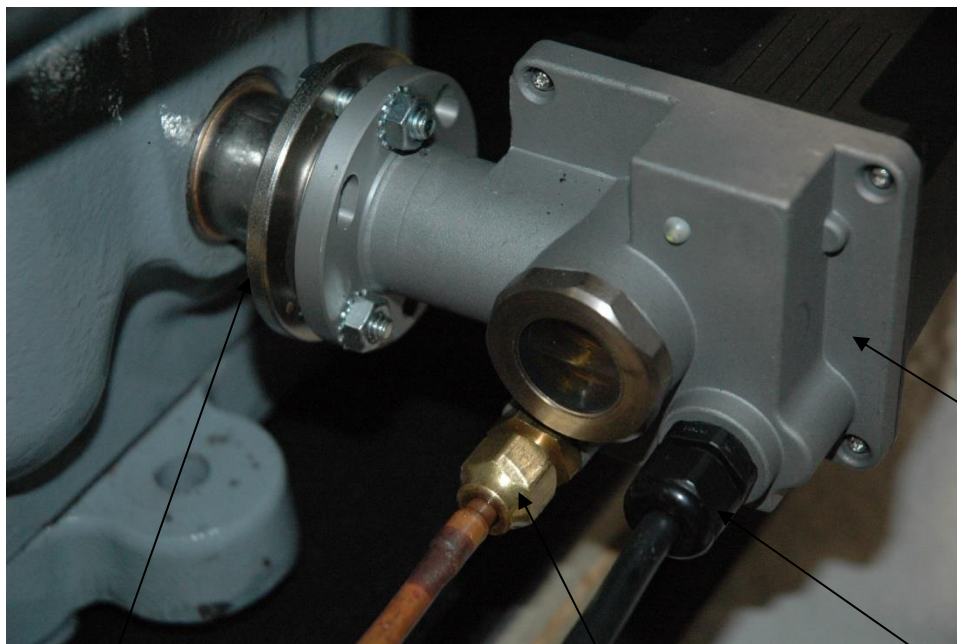
The oil level regulator has a three bolt oring flange that mounts to the 3-033-204 adapter. Ensure the oring is in-place and lightly oiled.

Once the adapter is installed, mount the regulator to the adapters flange face using the supplied bolts and torque to 8-10 ft/lbs equally.

Connect the oil reservoir supply line to the oil regulator's 7/16"-20 flare fitting.

Wire the unit according to the proposed wiring diagram provided in this bulletin.

Optical Oil Level Regulator Installed on 06D/06CC (17-37cfm) Compressor



Oil Level Adapter Fitting P/N 3-033-204

Oil Reservoir Supply Connection 7/16 -20 flare fitting.

Control Wiring

Oil Level Regulator Unit.

06E/06CC (50-99cfm) Compressor Installation: An oil level adapter fitting comes packaged with the oil level regulator. This adapter will off-set the oil level regulator sight-glass vertically downward 1/4" with respect to the compressor's crankcase sight-glass. This 1/4" off-set ensures the 06E compressor operates at the correct oil level per Carlyle Application Guide 574-069.

- Un-install the 06E/06CC compressor sight-glass cover and verify the surface is clean and free from debris.
- Ensure the adapter o-rings are in-place on both sides of the adapter and lightly oiled.
- Install the adapter on the 06E/06CC compressor using the 3 supplied allen head bolts (Torque 8-10 ft/lbs). Orient the adapter so the 1/4" offset is lower than the compressor's sight-glass (**Figure B**). This is necessary to achieve the correct operating oil level in the 06E compressor.
- Once the adapter is installed, mount the regulator to the adapters flange face using the supplied bolts and torque to 8-10 ft/lbs equally (**Figure C**).
- Wire the unit according to the proposed wiring diagram provided in this bulletin.
- Connect the oil reservoir supply line to the oil regulator's 7/16"-20 flare fitting.

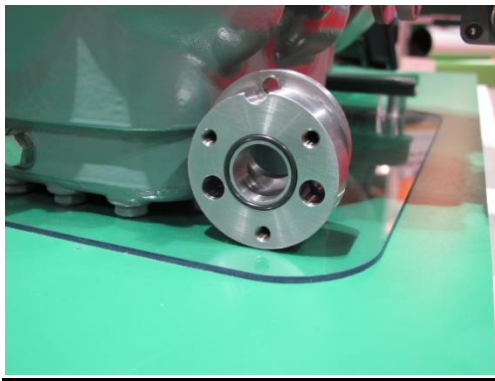


Figure B – Adapter Orientation

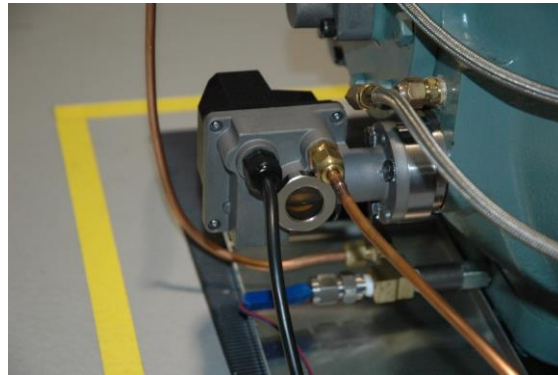


Figure C – 06E/06CC (50-99cfm) Installation

06M Compressor Installation: The oil level regulator requires no adapter for installation to the 06M compressor. Remove either sight-glass and install the oil level regulator in its place. Re-use the 3 sight-glass bolts and torque to 8-10ft-lbs. Use the new oring supplied with the oil level regulator.

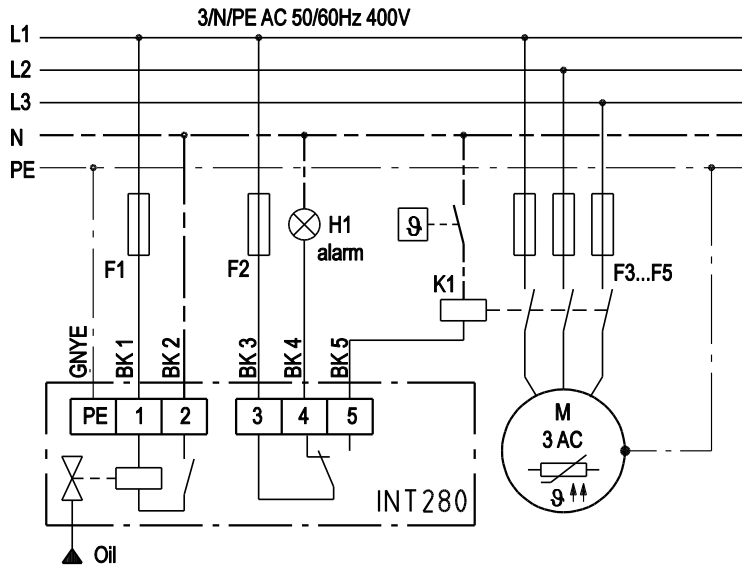
- Ensure the oring is in-place and lightly oiled.
- Wire the unit according to the proposed wiring diagram provided in this bulletin.
- Connect the oil reservoir supply line to the oil regulator's 7/16"-20 flare fitting.



LED Status Indications:

Condition	LED Status
Compressor Oil Level 1/2 sight glass	Solid Green
Oil Filling	Flashing Green
Oil Level too low after filling cycles	Solid Red
Regulator malfunction/Internal error	Flashing Red

Wiring Diagram



Technical Specifications

Supply Voltage	AC 115V 50/60Hz ±10%,15VA AC 230V 50/60Hz ±10%,15VA
Permitted ambient temperature	-22 to +140°F
Oil temperature	-22 to +212°F
Operating pressure	-14.5 to 435 psi
Differential pressure	14.5 to 362 psi (across valve)
Output relay	AC 240V, 2.5A, C300
Mechanical service life	Approx. 10 ⁶ switching cycles
Connecting cable	6xAWG18 (0.75mm ²), length 1m
Protection Class	IP65
Housing material	Aluminium
Oil Fill Connection	7/16"-20 UNF
Permitted oils	Standard mineral and ester oil
Weight	Approx. 0.5 lbs