Technical Bulletin (TB-008A)

HS 53, 64, 74 Screw Compressors

Version 9, July 2019

HS Screw Compressor Modules, Oil Injection Kits and Economizer Fittings

- The scope of this technical bulletin is to provide documentation to the components required for the HS semi-hermetic screw compressors.
- This document pertains to the HS53, 64, 74 series compressors.
- Each section shown below will provide detailed information for each component.
- This document does not include the HS85 series compressors which do not require these components as they are incorporated, internal into the compressor itself.
- As shown below, there are two separate application oil injection kits available depending on frame size of the compressor.
- The application oil injection kits are not voltage specific. Coils and optional modules are ordered separate depending on voltage required.

1. **Modules for HS Screw Compressors**
2. **Solenoids**
3. **Reverse Rotation Switch**
4. **Application Oil Injection Kits**
5. **Economizer/Liquid Injection Adapters**
6. **Historical Information**

1. Modules:

All HS Application – Oil Injection Kits are delivered with the SE-B* control module. This module is used to monitor oil flow.
This module acts as a relay in conjunction with the Oil Flow Switch and the Discharge Gas Temperature Sensor.
All HS53, 64 and 74 series screw compressors are included with the SE-E1 module pre-wired inside of the terminal box. This module provides motor winding and discharge gas temperature protection as well as rotation direction and phase failure.
The SE-E1module can also be used to monitor the phase of the external motor on the OS53 and 74 open drive compressors.
An optional SE-E2 module must be used when a VFD or Soft Starter is used on the HS series. This module can also be used on the OS53, 74 series compressors to monitor the phase of the external motor.
See document SH-100 and/or SH-500 for additional recommendations for the SE-B* and SE-E* wiring.
The ESC201 has been dis-continued for “new” applications.
An optional SE-i1 module can be used in place of the SE-B* or SE-E* modules. For complete detailed information regarding the SE-i1, please see document number CG-110 or CT-110.

Module Part Numbers		
SE-E1	**347017-10**	**110/220 volt**
SE-E2	**347038-01**	**24-230 volt**
SE-B3*	**347035-01**	**110/220 volt**
*** Included in Application Kit**		

SE-E1 (Standard) 115/230V

Monitors:
Motor Winding Temperature
Discharge Temperature
Rotation Direction
Phase Failure

SE-E2 (Option) 24/230V

Monitors:
Motor Winding Temperature
Discharge Temperature
Rotation Direction
Phase Failure
Phase Asymmetry

SE-B3 (Standard) 115/230V

Included in Application Kit

Monitors:
Oil Flow Monitoring

SE-i1 module: part number 347044-03.

Note: When using the SE-i1, the standard SE-E1 and SE-B3 modules must be removed.

2. Solenoid Coils:

The coils are not included as Standard Extent of Delivery and must be ordered separately.
Please note that a coil is needed for each unloader and also the oil solenoid valve. All compressors have two unloaders except the OS 53 which has one unloader.

Oil Solenoid Coils		
Compressor Model	**Part Number**	**Voltage**
HS 53, 64, 74 OS 53, 74	**884-0202-01**	**115V / 14 watt**
	884-0203-03	**230V / 17 watt**
	884-0201-01	**24 VDC / 20 watt**
	884-0202-00	**24 VAC / 14 watt**

3. Application Oil Injection Kits:

The current extent of delivery is as follows:

Application / Oil Injection Kits		
Compressor Model	Part Number	Extent of Delivery
HS 53	**999-0053-01**	Oil filter housing (with inlet/outlet fittings), oil filter element, 6 liter oil flow switch, oil solenoid, oil sight glass, economizer / liquid injection fitting, SE-B3 oil control module, oil switch capacitor, full flow ball valve, schrader fittings.
HS 64, 74	**999-6474-01**	Oil filter housing (with inlet/outlet fittings), oil filter element, 10 liter oil flow switch, oil solenoid, oil sight glass, economizer / liquid injection fitting, SE-B3 oil control module, oil switch capacitor, full flow ball valve, schrader fittings, jumper bar kit.

4. Mechanical Reverse Rotation Kit:

Reverse Rotation Switch Kit		
Compressor Model	**Part Number**	**Extent of Delivery**
HS 64	**999-1266-06**	**Rotation switch, dampener, all miscellaneous fittings**

5. Economizer / Liquid Injection Adapter Fittings:

Each application kit has an adapter fitting for economizer or liquid injection oil cooling included. The part number is 365210-02A. These kits include the fitting, o-rings and braze roto-lock bushing.

An optional roto-lock valve is available, part number 361321-06 (7/8” x 1-1/4”).

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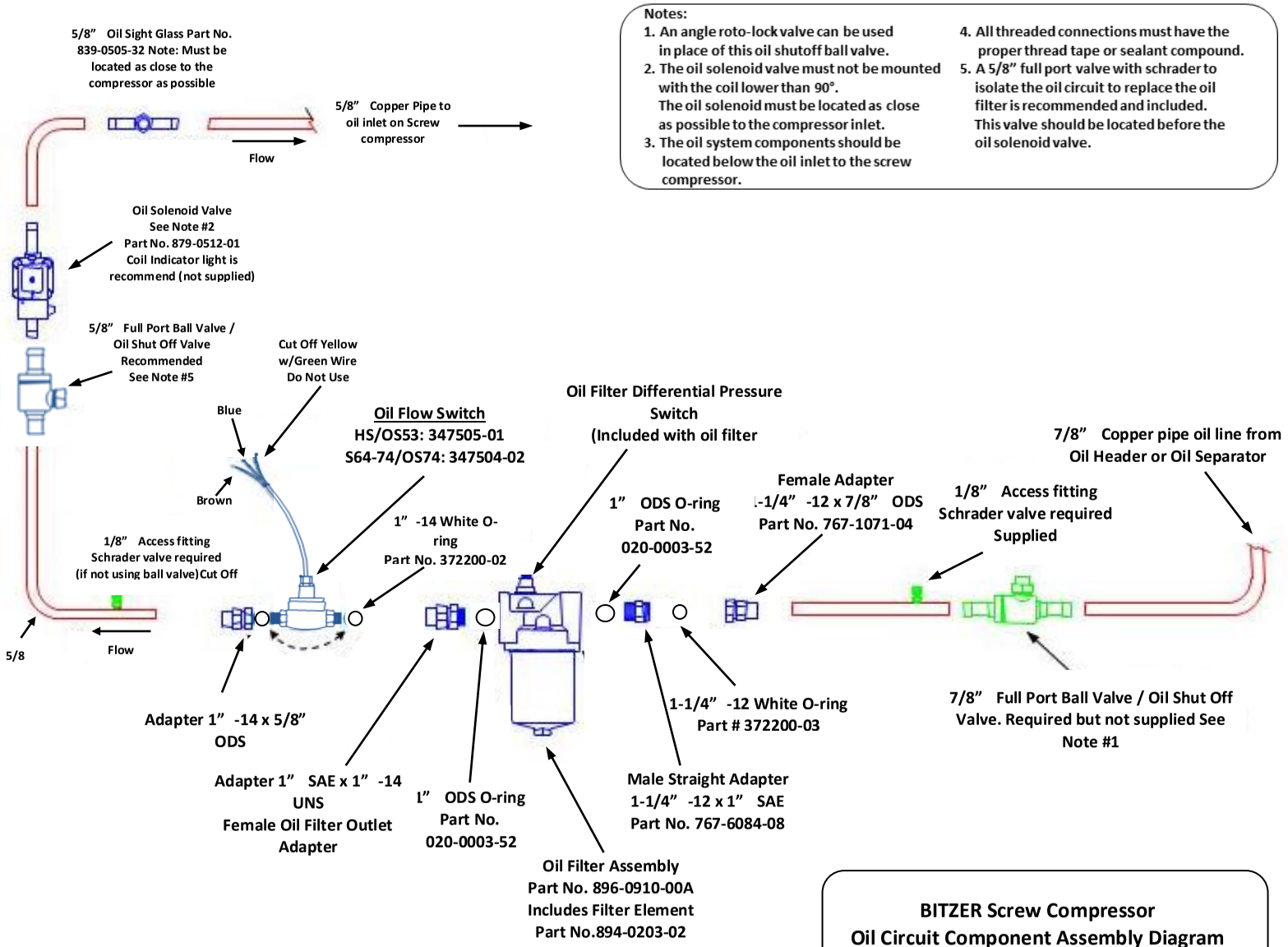
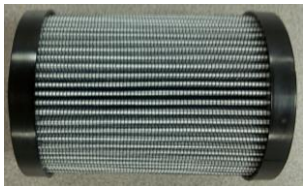
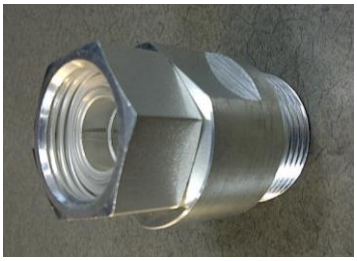
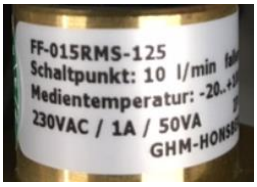
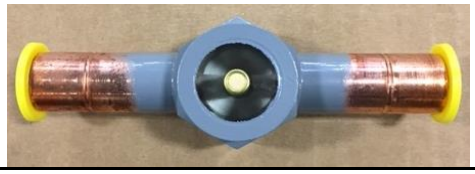


Notes:
1. An angle roto-lock valve can be used in place of this oil shutoff ball valve.
2. The oil solenoid valve must not be mounted with the coil lower than 90°. The oil solenoid must be located as close as possible to the compressor inlet.
3. The oil system components should be located below the oil inlet to the screw compressor.
4. All threaded connections must have the proper thread tape or sealant compound.
5. A 5/8" full port valve with schrader to isolate the oil circuit to replace the oil filter is recommended and included. This valve should be located before the oil solenoid valve.

BITZER Screw Compressor
Oil Circuit Component Assembly Diagram
996-0010-01A (01/2014)

Standard Application / Oil Injection Kit Parts:

Description	Part #	Product Image Application Oil Injection Kits 999-0053-01 and 999-6474-01	999-0053-01	999-6474-01
Oil Filter Housing Inlet Fitting	020-0003-52 366000-03 372200-03 767-6084-08		Yes	Yes
Oil Filter Housing (includes oil filter element)	896-0010-00A Wiring: Black-White N/O Black-Red N/C	 Oil Filter Element  894-0203-02	Yes	Yes
Oil Filter Outlet / Oil Flow Switch Inlet	767-3084-04		Yes	Yes
Oil Filter Housing Outlet O-ring	020-0003-52		Yes	Yes
Oil Flow Switch Outlet Adapter Roto Lock Fitting 1”-14 x5/8” Roto Lock	366000-14		Yes	Yes
Oil Switch Capacitor	343100-09		Yes	Yes
1/8” Schrader (2) included)	361501-21		Yes	Yes

Description	Part #	Product Image Application Oil Injection Kits 999-0053-01 and 999-6474-01	999-0053-01	999-6474-01
Oil Flow Switch as of 01/2014 Used in Kit Numbers 999-0053-01 and 999-6474-01	HS53 and OS53 347505-01 (6 liter) HS64/74 and OS74 347504-02 (10 liter)	  	Yes 6 Liter	Yes 10 Liter
Oil Flow Switch Inlet and Outlet O-rings	372200-02 (2) required		Yes	Yes
5/8” EBVT Bi-directional Ball Valve w/Schrader Fitting	C0000878		Yes	Yes
5/8” Oil Solenoid Valve (shown with coil-not included)	879-0512-01		Yes	Yes
5/8” Oil Sightglass	893-0508-32		Yes	Yes
Liquid Injection / Economizer M26 Adapter Kit	365210-02A Includes: 382403-04 365210-02D 372200-03 366000-03		Yes	Yes
HS64/74 Jumper Bar Kit	837-0300-00A		No	Yes

Items Included with Compressor:			
Description	**Part #**	**Product Image**	**Included with compressor**
HS53 9 Lead Electrical Connection Kit Included with HS53 Compressors	**343417-12**		**Yes**
PTC100 Discharge temperature sensor	**347032-01**		**Yes**

Optional Items for Reference:		
Description	**Part #**	**Product Image**
Capacity Unloader and Oil Solenoid Coil	**See Section 2**	
Optional PT1000 Discharge temperature sensor for use with ESC201	**347024-21**	
NTC Discharge Gas Temperature Sensor for use with SE-i1	**347041-01**	
Cable for NTC Discharge Temperature Sensor	**344900-02**	

6. Historical Information:

Electronic Modules:
1999 – 2003: the INT69VSY-II module was used. The SE-E1 and SE-E2 electronic modules shown on page 1 replaced the original INT69VSY-II.
1999-2003: The ESC200 was used and became obsolete.
2003 to Present: The optional ESC201 is offered.
2010 to Present: The SE-E1 module is included in standard delivery and is pre-wired inside of the terminal box.
2009 to Present: The SE-B3 module used with the oil flow switch is included with the application kits.
2019: The ESC201 has been obsoleted for new applications.

Discharge Gas Temperature Sensors:
1999 – 2009: the PT1000 sensor was included as standard delivery.
2009 to Present: The PTC100 sensor replaced the PT1000 as standard delivery.
Note: If using the optional ESC201 and to display the discharge temperature on the screen, the PT1000 sensor must be used. The standard PTC100 can be used with the ESC201 as a safety function, however, the temperature is not displayed on the screen.
2019: If using the SE-i1 module, the NTC discharge gas temperature sensor must be used.
Screwed sensor: 347041-01.
Cable: 344900-02.

Mechanical Reverse Rotation Switch:
2009: The rotation switches were removed from the application kits and offered as an option for all compressors.
2010: The connection location on all HS and OS74 compressors was removed.
2019: The connection location of the HS and OS53 compressors has been removed.

The mechanical reverse rotation switch used with the optional ESC201 is no longer included in the application kit as the SE-E1 provides rotation protection. The reverse rotation switch is available as an option.

The HS 53 and 74 series compressors no longer have a connection port on the discharge flange.

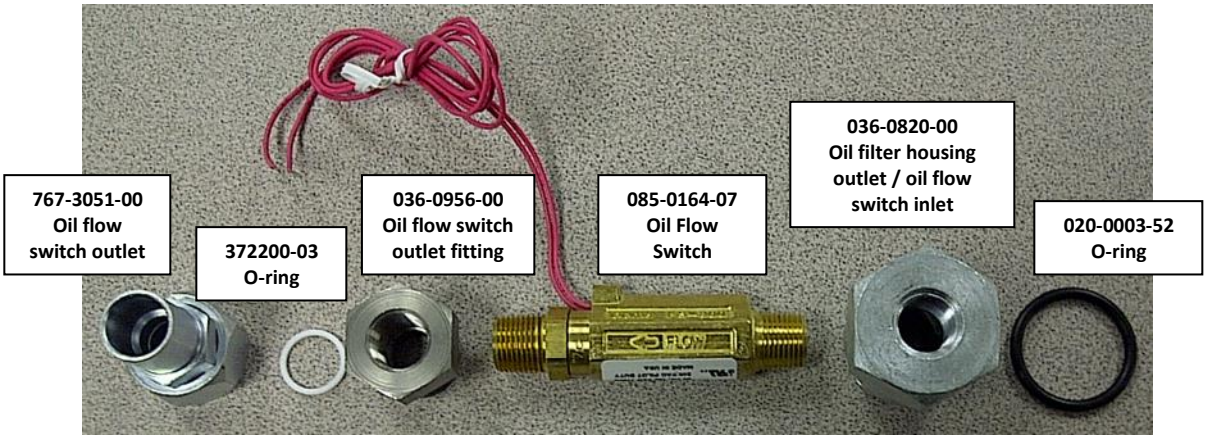
** If replacing a HS 53 or 74 compressor that was using the reverse rotation switch, this feature must be jumped out.
For the ESC boards, this was a redundant feature as the control board is already monitoring rotation.
Jumper connection terminals A3 and A7 on the ESC201 board.
Jumper connection terminals A4 and B6 if using the ESC200 board.

Historical Information Continued:

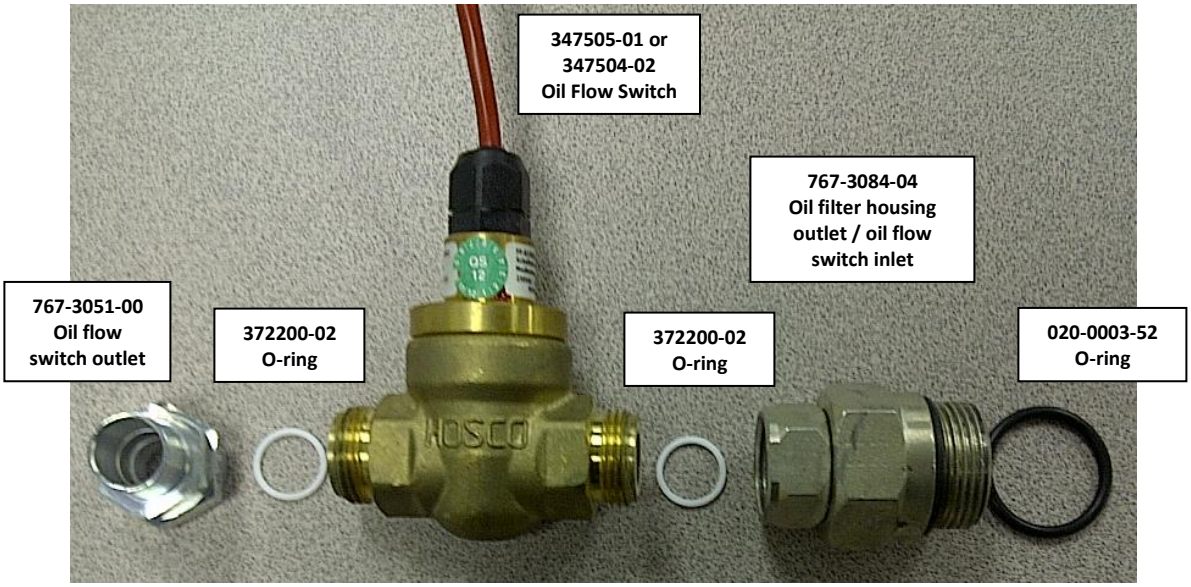
Oil Flow Switches:
2001 - 2009: **BITZER Joint Venture**: (1) oil flow switch was used for all screw compressors: 085-0164-07.
2009 - 2013: **BITZER US:** (1) oil flow switch was used for all screw compressors: 085-0164-07.
2014 to Present: **BITZER US**: (2) different oil flow switches are used depending on compressor frame size:
HS and OS53: 347505-01.
HS64/74 and OS74: 347504-02.

No cutting of the existing 5/8" copper piping will be required to replace an older switch to the newer switch.
See Service Bulletin SG-0007 for more info.

Obsolete Oil Flow Switch and Various Fittings <2014



Current Oil Flow Switch and Various Fittings >2014



Oil Filter Housing Dirty Oil Filter Switches:

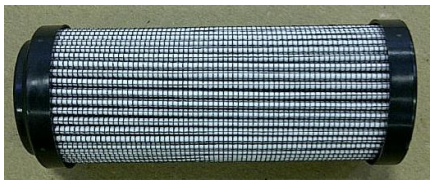
Prior to 1998:
896-8001-00 SAE-12 Thread

After 1998 to Present:
896-8001-00A SAE-10 Thread

Old PT1000:
White Shielded Cable

Oil Filter Elements:

Prior to 1998:
894-0204-02



After 1998 to Present:
894-0203-02