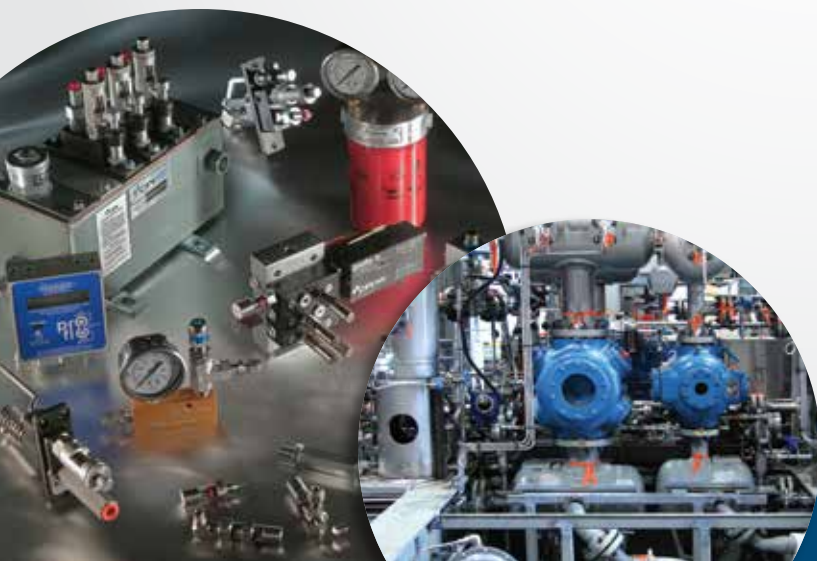




Lubrication Product Guide

The oil and lubrication system plays a very significant role in the performance of a reciprocating compressor. Too much, too little or inconsistent delivery can reduce performance, lead to premature wear and potentially result in catastrophic failure.

CPI provides industry leading lubrication system products and services, partnering with our customers to develop individual solutions to their unique lubrication needs. From individual components to complete, turnkey systems, we can provide the resources and expertise to ensure your compressor operates at peak performance and longevity.



 **CPI**® COMPRESSOR PRODUCTS INTL

Proven Solutions for the Global Compression Industry™

Divider Blocks & Accessories

HP+ DIVIDER BLOCKS

- Standard base plate assembly mounts to multiple traditional industry bolt patterns (CCT, Lincoln, Trabon)
- Simplified ordering process to save time and reduce errors
- Improved performance for applications up to 6500 PSI (448 BAR)
- Improved piston to bore geometry for consistent oil output and longer product life
- Improved overall sealing with precision CPI Custom 1/8 ORB (O-Ring Boss) port geometry
- Complete assembly standard with O-ring seals eliminating leakage and need for sealant
- Each assembly comes standard with Custom ORB inlet tube fitting
- Improved corrosion resistance with all components nickel plated
- All base plate assemblies feature internal check valves for added performance protection
- Standard O-ring seals are VITON® O-Rings (FKM) for improved chemical and heat resistance
- Each divider block assembly is easily configured to the customer's specific lubrication needs

View our full HP+ product brochure for product dimensions.

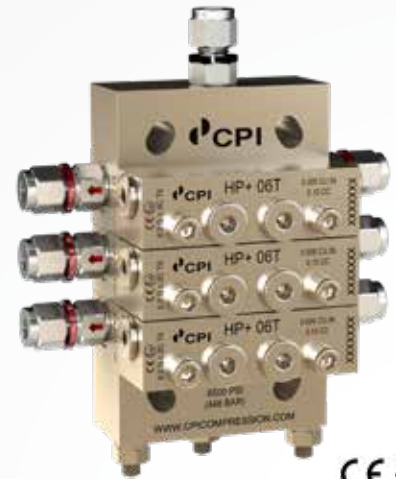
*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

BASE PLATE ASSEMBLIES (HP+)

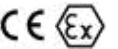
The HP+ base plate assemblies are pre-assembled and available to accommodate three to seven elements. The HP+ design mounts to multiple traditional industry bolt patterns. Base plate assemblies are fully assembled to simplify ordering and customer inventory. Each assembly comes with the CPI Custom 1/8 ORB to 1/4" OD tube inlet fitting.

METERING ELEMENTS (HP+)

CPI's HP+ divider block metering elements range in size 06 to 30 with oil output from 0.006 in³ (0.10 cc) to 0.060 in³ (1.00 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure the oil output of the assembly. A crossport bar transfers the oil of the element it is mounted underneath to the next element in series.



Complete HP+ Divider Block



II 2 G c IIC T6



HP+ Cross Port Bars



HP+ Base Plate Assembly



HP+ Metering Element

XD+ DIVIDER BLOCKS

CPI's XD+ Divider Blocks are an Extreme Duty Performance product line featuring:

- Symmetric element design adds mass around the piston for improved performance at higher pressures by reducing piston bore warping and expansion
- Improved piston to bore geometry for consistent oil output and longer product life
- Extreme performance for applications up to 8000 PSI (551 BAR)
- Simplified ordering process to save time and reduce errors
- Improved overall sealing with precision CPI Custom 1/8 ORB (O-Ring Boss) port geometry
- Dual inlet ports on top and bottom of divider block assembly for added flexibility
- Complete assembly standard with O-ring seals eliminating leakage and need for sealant
- Each assembly comes standard with Custom ORB inlet tube fitting and 1/4" NPT adapter fitting
- Improved corrosion resistance with all components nickel plated
- All base plate assemblies feature internal check valves for added performance protection
- Standard O-ring seals are VITON® O-Rings (FKM) for improved chemical and heat resistance
- Each divider block assembly is easily configured to the customer's specific lubrication needs

View our full XD+ product brochure for product dimensions.

*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

BASE PLATE ASSEMBLIES (XD+)

The XD+ base plate assemblies are pre-assembled and available to accommodate three to six elements. The XD+ design mounting pattern is unique. CPI offers all mounting brackets and information to provide easy customer installation. The base plate assemblies are fully assembled to simplify ordering and customer inventory. Each assembly comes with the CPI Custom 1/8 ORB to 1/4" OD tube inlet fitting and CPI Custom 1/8 ORB to 1/4" NPT female adapter fitting.

METERING ELEMENTS (XD+)

CPI's XD+ divider block metering elements range in size 06 to 30 with oil output from 0.006 in³ (0.10 cc) to 0.060 in³ (1.00 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure the oil output of the assembly. A Crossport bar transfers the oil of the element it is mounted underneath to the next element in series.



XD+ Cross Port Bars



XD+ Base Plate Assembly



XD+ Metering Element

SMX DIVIDER BLOCKS

CPI offers the DropsA SMX product line as an affordable performance product featuring:

- Multiple base plate assembly mounting patterns for traditional industry bolt patterns.
- Simplified ordering process to save time and reduce errors.
- Proven performance for applications up to 4000 PSI (276 BAR).
- Base assemblies are bolted together with a threaded insert and attachment screw. This provides no maximum limitation on the number of elements which can be used on the assembly.
- bypass element is available to accommodate an increase or decrease in lubrication points without disturbing the base assembly or pipe work. This element acts as a blank placeholder and is only used on four section or larger divider block assemblies.
- Each divider block assembly is easily configured to the customer's specific lubrication needs.

View our full SMX product brochure for product dimensions.

*Base Plate Assemblies, Metering Elements and Crossport Bars can all be purchased separately.

BASE PLATE ASSEMBLIES (SMX)

- Pre-assembled base plates to simplify ordering and customer inventory
- Accommodate three to eight elements
- Design allows for more elements to be added if required. Contact CPI if more than eight elements are required for the application.
- Available in three traditional industry bolt patterns (DropsA, Lincoln, Trabon).
- 1/4" NPT to 1/4" OD tube inlet fitting

METERING ELEMENTS (SMX)

SMX divider block metering elements range in size 04 to 65 with oil output from 0.0025 in³ (0.04 cc) to 0.080 in³ (1.30 cc). Twin elements are ported to deliver oil to both left and right base outlet ports. Single elements are ported to deliver oil to one base outlet port, either left or right side as desired. Crossport bars are available to configure oil output of the assembly. A crossport bar transfers the oil of the element it is mounted underneath to the next element in series.

BASE PLATE CHECK VALVES (SMX)

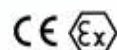
CPI recommends the use of the integral check valve and tube fitting with a 1/8" NPT geometry for SMX applications (Part 6500200421PRNPT) (only available through CPI and CPI distributors). This check valve is stainless steel and features an VITON® O-Rings (FKM) poppet sealing element. Other check valves are available if the recommended check valve does not meet the customer's application.

BASE PLATE FITTINGS (SMX)

CPI offers other Custom 1/8 ORB fittings to support customer's specific needs. Industry standard 1/8" NPT fittings can be used with sealant if a Custom 1/8 ORB fitting solution is not available.



Complete SMX Divider Block



II 2 G c IIC T6



SMX Cross Port Bars



SMX Base Plate Assembly



SMX Metering Element



Base Plate Check Valves - SMX



Base Plate Fittings - SMX

DIVIDER BLOCK ACCESSORIES (FOR SPECIFIC BLOCKS)

BASE PLATE CHECK VALVES (HP+ & XD+)

CPI recommends the use of the integral check valve and tube fitting featuring the CPI custom 1/8 ORB geometry for HP+ and XD+ applications. This check valve is stainless steel and features an VITON® O-Rings (FKM) poppet sealing element. This check valve is only available from CPI and CPI distributors. Other check valves are available if the recommended check valve does not meet the customer's application.



Base Plate Check Valves -HP+, XD+

BASE PLATE FITTINGS (HP+ & XD+)

CPI offers other custom 1/8 ORB fittings to support customer's specific needs. Industry standard 1/8" NPT fittings can be used with sealant if a Custom 1/8 ORB fitting solution is not available.



Base Plate Fittings - HP+, XD+

DIVIDER BLOCK ACCESSORIES (ALL BLOCKS)

MOUNTING BRACKETS (HP+, XD+, SMX)

CPI offers numerous mounting bracket options to suit the customer's mounting requirements.



Mounting Brackets

NEOMAG® CYCLE INDICATORS

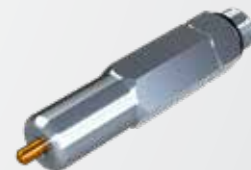
The Neomag® cycle indicator follows the divider block piston movement so the operator can monitor and control oil consumption, set lube rates, and easily spot problems in the divider block system.



Neomag® Cycle Indicator

RESET PIN INDICATOR

Reset pin indicators identify tubing or lubrication point blockage to enable the operator to quickly verify exactly which point is causing high pressure in the system. Available in pressure ratings from 1500 PSI to 5000 PSI.



Reset Pin Indicator

PROXIMITY SWITCH

Compressor Products International's captured proximity switch is an electronic cycle indicator designed for use with all compressor and grease divider blocks. The captured proximity switch, a single pole single throw magnetically operated reed switch, sends a dry contact signal to any PLC style control panel or directly to the lubrication monitor, such as Proflo® PF1, if it detects a reduction in the cycle time.



Proximity Switch

DIVIDER BLOCK ACCESSORIES (ALL BLOCKS CONT.)

POPR® POP OPEN PRESSURE RELIEF

The CPI POPR® valve (Pop Open Pressure Relief) is a more reliable, cleaner, and safer device than the Atmospheric Rupture Assembly.

Automatically activated when the divider block system over pressures, the POPR® snaps open and diverts the oil to the lubricator reservoir, a closed container, the lubricator pump oil supply line or back to the compressor frame. The unit remains in open position until reset with a simple snap to close action by a technician - no need to replace a ruptured disc again.



POPR® Pop Open Pressure Relief

ATMOSPHERIC RUPTURE ASSEMBLY

Atmospheric Rupture Assemblies are used to signal excessive pressure in a system. The assemblies contain an aluminum disc which ruptures at a predetermined pressure, venting the lubricant to atmosphere. The thickness of the metal disc determines the pressure at which the assembly ruptures. Discs are color coded to indicate relieving pressures. CPI offers full rupture indicator assemblies, components, as well as replacement rupture discs to help keep your system operating safely.

Note: Atmospheric rupture assemblies that lack return, when ruptured, leak oil out of the system.



Atmospheric Rupture Assembly



Atmospheric Rupture Discs

Check Valves

CVP® CHECK VALVE PROTECTOR AND XDC® EXTREME DUTY CHECK VALVE

The CPI CVP® check valve protector installed with the CPI XDC® extreme duty check valve (a double poppet stainless steel valve with Viton O-Rings) is designed to eliminate check valve failure caused by heat & gas stream contamination.

Unlike traditional check valve protectors, this assembly allows minimum oil capacity, reducing the amount of time at startup before oil actually gets to the injection point. The minimal design also eliminates fatigue failures from vibration typical of the older and larger check valve protector designs.



CVP® Assembly shown with gauge and XDC®

DOUBLE AND SINGLE BALL CHECK VALVES

CPI check valves are designed for high pressure applications where reverse flow and leakage must be kept to a minimum. Typical applications include engine, pump and compressor cylinder / packing lubrication and hydraulic systems. A relatively stiff spring in these check valves serves to increase the reliability of the circuit.

Check valves available from CPI include:

- Inline Single Ball, inline Double Ball
- 90° Single Ball, 90° Double Ball
- Inline Single Poppet



Sample Inline Double Ball Check Valves



Sample Inline Single Ball Check Valves

Monitoring and Shut Down Devices

PROFLO® PF1 MONITORING DEVICE

The Proflo® PF1 monitoring device provides shutdown protection for your compressor and collects operation data by monitoring the cycle times of the divider block system. If the pump fails or the cycle time of the divider block system slows down or speeds up, the Proflo® PF1 alerts the operator by displaying the changed cycle time on the LCD display. If the pump deteriorates, the cycle time will slow down and the Proflo® PF1 will change to alarm state and shut down the compressor, preventing damage to the compressor cylinders, pistons, rods and packing. The system data can be retrieved and analyzed using our Proflo™ USB-IR adaptor and Proflo™ Assist software.

PROFLO® PF1 24 VOLT

- Uses 2 "AA" Lithium batteries* for back-up power to the microprocessor when the control panel is turned off or the power fails
- Battery life is approximately 24 months

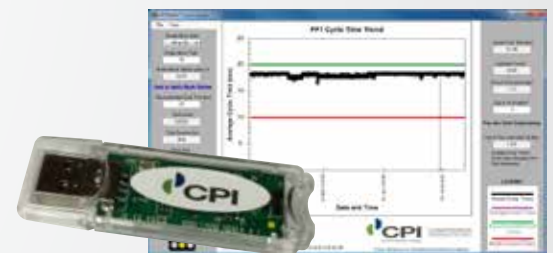
* Use L91 Energizer Lithium "AA" only



Proflo® PF1 Monitoring Device

PROFLO™ USB-IR ADAPTOR AND PROFLO™ ASSIST SOFTWARE

The Proflo™ USB-IR adaptor is designed to allow the direct transfer of information from the PF1 device to the user's computer. The PF1 monitoring device records the average cycle time for each 30 minute block of operation and can transmit this information via infrared signals. The Proflo™ USB-IR adaptor then captures the IR signals that are broadcasted by the PF1 device, and through the use of the software, translates those signals into information that the user can use to regulate their lubricator pumps.



Proflo™ USB-IR and Software

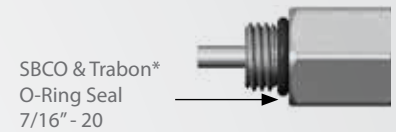
PROFLO® JR MONITORING DEVICE

- 3.3 volt hermetically sealed high temperature battery
- AC or DC operation, switch rated for 300 VDC and 120 VAC @.5 amps
- Patented sealed magnet assembly, No lost magnets, springs or spacers EVER
- Proximity switch output is standard with every unit
- Hall effect activated
- For CPI HP/XD/DropsA/Trabon/SB/Lincoln divider block/valve applications
- Blinking LED cycle indication
- Monitors movement of divider block piston for "timed" shutdown protection
- Closed loop or open loop operation
- Up to 10 year battery life, 5 year battery warranty



Proflo® Jr Monitoring Device

MAGNET ASSEMBLIES



*For use on CPI HP+ and XD+ Divider Blocks

Lubrication Accessories

SPTD SINGLE POINT TEST DEVICE

CPI's SPTD single point test device is capable of monitoring a single lubrication point to determine the exact quantity of oil injected into the cylinder or packing with the compressor running at normal operating temperatures and pressures. This helps show the reliability of the divider block and lube pump to determine possible cause of premature failure of cylinders, rings and rod packing.



Single Point Test Device

PURGE GUN

A purge gun is a cost effective method to remove air from the divider block system to ensure all lubrication points will receive lubrication immediately on start-up of the compressor.

- Troubleshoot the divider block system to locate blockage in divider blocks, tubing lines and cylinder/packing injection points
- Delivers full pressure at a minimum stroke for ease of use in tight quarters
- 36" (914 mm) stainless steel braided hose for long reach applications
- 5,000 psi stainless steel liquid filled pressure gauge
- Chrome-plated steel tube with bullseye sight glass



Purge Gun

LUBE GUARD PUMP ASSEMBLY

The Lube Guard pump assembly provides protection for the lubrication system by verifying that the camshaft is rotating while also indicating a low oil level condition in the lubrication box.

- Can be installed in any pump location in a CPI lubricator box
- Maintains pressure in the manifold to indicate sufficient oil level in a lubricator box
- The function of the orifice is to provide a controlled leak rate. An orifice kit is included to configure the Lube Guard to the application oil viscosity and volumetric flow rate



II 2 G c IICT6

Lube Guard Pump Assembly

BALANCING VALVE ASSEMBLIES

Balancing Valves (BV) are recommended for divider block systems experiencing pressure differentials ≥ 1000 PSI (70 BAR). They are designed to increase the efficiency and reliability of divider block systems by balancing the effect of injection point differentials on the divider block.

Balancing Valve Assemblies (BVA) include the balancing valve attached to a positional pressure gauge allowing operators to easily adjust and balance outlet pressures in the field.



Balancing Valve

Balancing Valve Assembly

FILTERS

Filtering the lubricant prior to the pumps will keep debris from damaging the high pressure system components.

The Delta-P Filter adapter filters lubricant through a 25 micron filter on the low pressure feed prior to the suction manifold on the high pressure pump assemblies. For harsh environments such as offshore salt environment or high concentrations of H2S gas, high pressure stainless steel filters are preferred.

Contact your CPI representative for more filter options.



Delta-P Filter



Stainless Steel Filter

Lubricator Pumps

CPI designs and manufactures a wide range high quality lubricator pumps that come in various models with several options. The model that's right for you will be the model designed to fit in your lubricator box.

- One piece steel pump body
- Precision roller rocker assembly
- Pyrex sight glass with protective housing
- Precision internal and outlet check valves
- Weatherproof construction
- Furnished as original equipment by engine, pump and compressor manufacturers
- Three pump types: vacuum, gravity, pressure
- Three pump sizes: 3/16", 1/4", 3/8"
- Modular cylinder design

Consult CPI for the right pump for your application.

MODEL P55 LUBRICATOR PUMPS

The CPI Model P55 pump is an updated version of the Premier Model P55 designed to retrofit Premier, Mega, McCord and Lincoln* lubricator boxes.

DISCONTINUED PUMPS

Model P92 Pumps - designed to replace Madison Kipp style pumps: models DSL, SVH and SVK

Model 2000 - designed to replace Manzel Model 76 and 88 lubricators

Model 2001 - designed to replace Manzel Model 94V and 100V lubricators

Model 2012E - designed primarily but not exclusively for the European pump market



CPI Model P55U



Discontinued CPI Model P92



Discontinued CPI Model 2001



Discontinued CPI Model 2012E

Lubrication Boxes

CPI lubrication boxes, commonly referred to as lubricators, will accurately deliver a predetermined quantity of oil normally under pressure, at regular intervals to moving parts on all types of industrial machinery. The lubricator consists of a reservoir, drive mechanism, and oil pumps. They are furnished in electric motor drive or shaft driven from the machinery to be lubricated. Shaft driven units can be direct drive, pulley/sheave, or oscillating drive motion.

- Force feed lubricators
- Heavy duty steel reservoirs
- All gear rotary drives
- Electric motor drives
- Ratchet drives
- Bottom rotary drives
- Suitable for use with petroleum and synthetic based lubricants.
- Automatic oil level controllers
- Level switches
- Electric heater and thermostat assemblies
- Shaft rotation alarms
- Partitions in reservoir for two or more lubricants
- Check valves available in carbon steel and stainless steel



Inside view of HVLV Lubricator Box



Example Lubricator Boxes

SAFEGUARD® Lubrication System Consoles

CPI provides custom lubrication system consoles for all reciprocating compressor applications.

CPI SAFEGUARD® lubrication system consoles are self-contained lubrication systems that have been designed for hazardous locations and all types of industrial machinery, including reciprocating compressors and reciprocating pumps.

The SAFEGUARD® 5000 lubrication system console is CPI's most versatile SAFEGUARD® lubrication solution meeting ATEX requirements. Adding the optional dual motor package allows for complete redundancy so that you never need to shut down your compressor for scheduled lubrication system maintenance. Each SAFEGUARD® 5000 is designed to work with CPI's extensive line of divider blocks and lubrication system accessories. Using one of CPI's patented shutdown devices or proximity switches, precisely timed and monitored lubrication is provided to your equipment, eliminating the significant costs of over- or under-lubrication.

CPI's SAFEGUARD® 1000 lubrication system console is a more condensed version of the SAFEGUARD® consoles. A standard system includes lubrication box with pumps, motor package, and oil reserve tank with a visual sight glass. As with all CPI-designed lubrication systems, the SAFEGUARD® 1000 can be tailored to fit your compression needs.



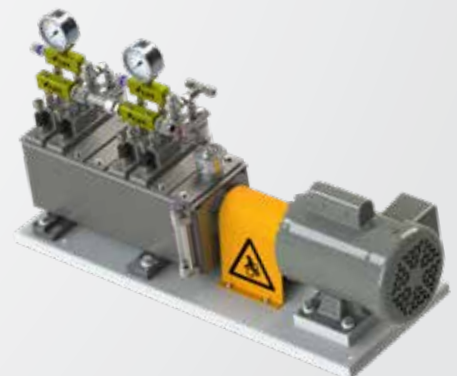
CPI Dual Motor SAFEGUARD® 5000 System



CPI SAFEGUARD® 1000



SAFEGUARD® 5000 motor package



SAFEGUARD® 1000 sample motor package



Due to the nature of our business, which almost invariably includes technical upgrades, CPI's involvement goes far beyond just supplying components. Our expertise encompasses not only our products but also an understanding of the compressors and processes on which they are operating.

The evolution of our business has enabled CPI to develop its own capabilities and to offer field services, which may vary, from a simple piston redesign and installation or a lubrication box installation, to fully project managing a major modernization of a compressor.

CPI field services include full feasibility studies, redesigns, manufacture or modernization of components, on-site service and overhauls. Our field service teams can solve any hard to isolate or recurring problems with your compressor. Down time is lost money and to minimize it, engineers will do a complete on site system analysis, troubleshoot the root causes and provide solutions.

CPI field services are able to maximize compressor efficiency either as an independent maintenance team or in conjunction with an operator's own personnel. Based in strategic locations around the world, CPI's field service teams are able to respond quickly to operators' needs... when it matters, where it matters. The technical team provides support by phone or e-mail 24 hours a day.



CPI prides itself on its unique approach to developing new compressor valve concepts and non-metallic materials used in the production of valves, piston rings, rider rings, packing and oil wipers. Our application expertise has transformed the performance and reliability of reciprocating compressors in a wide range of applications around the world.