Pall Corporation

HNP

HNP073 Series

FLUID CONDITIONING PURIFIERS

Flows up to 70 L/min • Fluid viscosities to 700 cst

*Filtration. Separation. Solution.*SM

HNP073 Series

Introduction

Extending service life

Reliability of systems and the life of system components and fluids are extended by minimising fluid oxidation, maintaining lubricity properties and reducing aeration. Corrosion within the fluid system can also be controlled by reducing the formation of acids. Acids are formed by the interaction of water with oil oxidation and other degradation products.

The many ways that Pall fluid conditioning systems save money

The application of the 'Pall' fluid conditioning purifier provides a wide range of opportunities for reducing operating costs:

- Extension of fluid life.
- Purification of collected fluids.
- Less frequent fluid disposal.
- Increased equipment reliability.
- Improved productivity.
- Reduced time for fluid changes.
- Unsupervised operation.
- Minimised corrosion within fluid systems.

Description

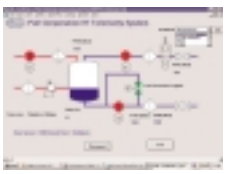
The Pall HNP fluid conditioning purifier uses the principle of vacuum dehydration to remove 100% of free water and as much as 90% of dissolved water. It also removes 100% of free and entrained gases and up to 80% of dissolved gases. Particulate removal is achieved using a high Beta rated ($ß_{x(c)} \geq 1000$) 'Ultipor III' filter element to polish the fluid before discharge back to the system reservoir.

The HNP Purifier can be used as a fixed installation or as a portable unit that is easily connected to any fluid system. Simple push button control starts the purifying process. Automatic controls, integral to the unit constantly monitor the operation of the purifier and will safely shutdown the unit if acceptable operating limits are exceeded.

Data logging provides the user with historical data on the operation and functionality of the purifier

The HNP073 can also be used in conjunction with other **Pall** Diagnostic equipment such as the **Pall** Water Sensor by monitoring system fluid water content levels and signalling the HNP to come on-line in the event that the fluid exceeds acceptable limits. When the water content returns to within specification, a further signal from the water sensor shuts down the purifier. This and other special applications are available – Contact the Pall sales office for details.

Telemetry



Pall telemetry system software is available providing a number of customer benefits:

- Real-time monitoring from any pc running a web browser, connecting via Ethernet network, modem (GSM, radio or PTSN landline) or direct cable connection.
- Automatic notification of fault conditions or service requirements to pre-selected e-mail addresses (including e-mail enabled mobile phones).
- Automatic mailing of logged data at scheduled intervals to pre-selected e-mail addresses for trending and further analysis - system usage, occurrences, operating pressures, system fluid temperature.
- Manual download of logged data for trending and further analysis – system usage, operating pressures, system fluid temperature.

Support services

To achieve optimum performance of specialist equipment, planned maintenance programmes and formalised service procedures should be employed and undertaken by only suitably qualified personnel.

To meet this requirement Pall provide Service Agreements in a range of flexible packages, designed to increase the overall effectiveness of operating any of the **Pall** range of HNP purifiers.

For more information on the support services available from the Pall Aftermarket Service Division, please refer to literature no. PIHPAMS, or contact Pall sales on (023) 9230 2409.

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Technical Information

How water enters a system

Water can enter a system in many ways including:

- Condensation from air.
- Seepage through reservoir covers, access panels, and damaged seals.
- Leakage from water-cooled heat exchangers.
- Retraction of water wetted cylinder rods.
- Contaminated make-up fluid.
- Worn and/or incorrectly installed gland seals.

Water in fluid takes two forms

Dissolved water (up to the saturation point) exists in most fluid systems and free water (above the saturation point) exists in many.

Fluid is said to be saturated when it contains all the dissolved water it can hold. Any increase in water content above this point results in the formation of free water droplets suspended in the fluid.

Free water can form stable emulsions with some fluids or can be entrained as droplets under other conditions leading to corrosion and other problems if not removed.

Damage caused by water

Water is the most common chemical contaminant in fluid systems. It attacks the system by causing:

- Metal etching through corrosion.
- Fluid breakdown, including additive precipitation, fluid oxidation and reduction of lubricating film thickness.
- Accelerated surface fatigue of metals.
- Accelerated abrasive wear of hydraulic components.
- Loss of dielectric strength in insulating fluids.

Corrosion

Corrosion is caused by the presence of acids and free water in a fluid resulting in:

- Rapid surface finish deterioration.
- Rust and corrosion pits (metal etching).
- Accelerated surface fatigue.
- 50% reduction in bearing life.

The production of these acids can be greatly reduced by the removal of water.

Fluid breakdown

In any mechanical system, the lubricant must be considered a key component. Fluid breakdown involves the loss of essential components of the fluid and accelerates the various forms of failure.

- Reduced viscosity and dynamic film thickness.
- Accelerates fatigue, eventually causing seizure.
- Causes additives to precipitate and form acid sludge which block clearances, plug filters and further accelerate wear.

HNP073 Performance

The HNP073 Purifier is designed to reduce and maintain the water content in a fluid system to below saturation level of the system fluid (<300ppm for a typical mineral oil). However, when large water ingress occurs, the HNP073 can remove up to 45 litres per day. The actual water removal rate depends on many variables including system design, oil type, temperature, viscosity, water content, emulsion stability and additives package.

HNP073 Series

Technical Information

Removes free and dissolved air

All fluids contain some dissolved air and other gases and may contain some free air. Air causes a variety of problems, many of which can be costly. These include:

- Foaming.
- Slow system response with erratic action.
- A reduction in system stiffness.
- Higher fluid temperature.
- Pump damage due to cavitation.
- Inability to develop full system pressure.
- Acceleration of fluid oxidation.

Ordering information

Purifier 'Pall' Part No: HNP073 [Table 1] [Table 2] [Table 3] [Table 4] [Table 5]

Replacement Element 'Pall' Part No:

Inlet:		HC8300EOT16 [Table 4]
Outlet:	Code C or N: (see table 5)	HC8304F [Table 3] 16 [Table 4]
Outlet:	Code A or B: (see table 5)	HC8304F [Table 3] 39 [Table 4]
Air Breather:		HC0293SEE5

Table 1. Voltage

Code	Voltage
S	400V AC
V	460V AC

Other voltages available on application.

Table 2. Electrical Frequency

Code	Electrical frequency
3	50 Hz – 3 PH
4	60 Hz – 3 PH

Other frequency and phase options available on application.

Pall Machinery and Equipment also design and manufacture explosion protected purifiers for Zones 1 and 2. Customer applications requiring purifiers for hazardous environments should refer to Pall publication PIH HXP or, consult the Pall sales office on +44 (0)23 9230 3303 or e-mail m&e_sales@pall.com.

Table 3. Filter Element

Code	Rating (µm) ($ß_{x(c)} \geq 1000$)*
KP	5
KN	7
KS	12
KT	22

Other filter element ratings available on application.

*Beta ratios are designated using the symbol (c) to signify they were measured using the ISO 16889 procedure.

Table 4. Seal Type

Code	Seal material	Fluid services
H	Nitrile	Petroleum based fluids
Z	Fluorocarbon	Specified synthetics

Table 5. Mounting Options

Code	Option	Nominal outlet filter length
C	Castor and wheels fitted	16"
N	Skid mounted	16"
A	Castor and wheels fitted	39"
B	Skid mounted	39"

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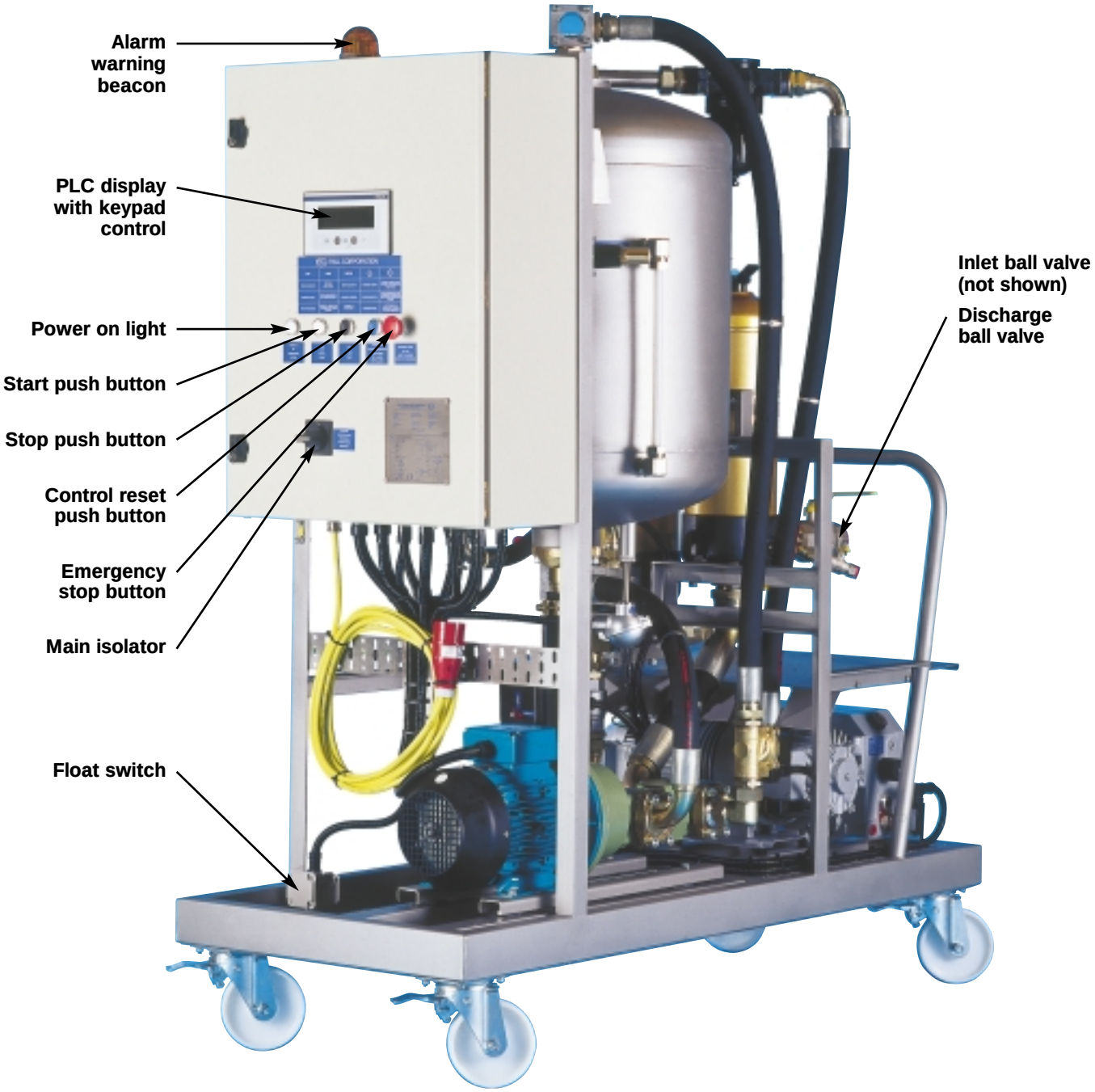
Instrumentation and Control



HNP073 Series
Specifications

General specification

Dry weight:	450 kg
Overall dimensions:	Length (mm): 1570 Width (mm): 680 Height (mm): 1920
Inlet connection:	G2" female to BS2779
Outlet connection:	G1½" female to BS2779 (other options available - consult Pall)
Circulation flow rate:	70 L/min 50 Hz option 84 L/min 60 Hz option
Total motor power:	5.5 kW (50Hz) 7.0 kW (60Hz)
Fluid compatibility:	Compatible with petroleum based fluids, synthetic hydraulic fluids rated for use with fluorocarbon seals (see table 4 for seal options).
Maximum viscosity (at purifier):	700 cSt
Temperature range:	+10°C to +75°C
Max pressure for inlet:	3.0 bar
Min pressure for inlet:	-0.4 bar g
Max pressure for outlet:	7 bar
Normal operating vacuum:	-0.60 to -0.9 bar g
Water removal:	**Pall** fluid conditioning purifiers removes all free water, free gases, dissolved water (up to 90%) and dissolved air (up to 80%).

The HNP073 meets all current harmonised European directives including the machinery, low voltage and EMC directives (CE marked).

WARNING:

If there is any possibility that the fluid being purified has been contaminated with a toxic fluid, the vapours of which could cause a hazard, the Pall Purifier should not be used unless adequate precautions have been taken to vent the vapours in accordance with safety standards and local codes. This caution is necessary to prevent the possibility of toxic injury to personnel.

The oil purifier must not be used for fluids with flash point below 93°C, or for fluids contaminated with flammable or combustible fluids. This caution is necessary to prevent the possibility of fire or explosion.

Pall Corporation

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Pall Corporation has offices and plants throughout the world in locations including: Argentina, Australia, Austria, Belgium, Brazil, Canada, China, France, Germany, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Korea, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Poland, Puerto Rico, Russia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, United States, and Venezuela. Distributors are located in all major industrial areas of the world.

Your distributor is:

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