Hire Rig (6)

Water Glycol Filtration System

User Manual

Mar 2019

V1.02

Filtertechnik 1 Central Park, Lenton Lane, Nottingham, NG7 2NR

Tel: +44 (0)115 9003 600 **Fax:** +44 (0)115 986 8875

Email: sales@filtertechnik.co.uk **Web:** www.filtertechnik.co.uk

Registered in England No: 03969985 VAT No: 760 821 731 Certification No. UK002838

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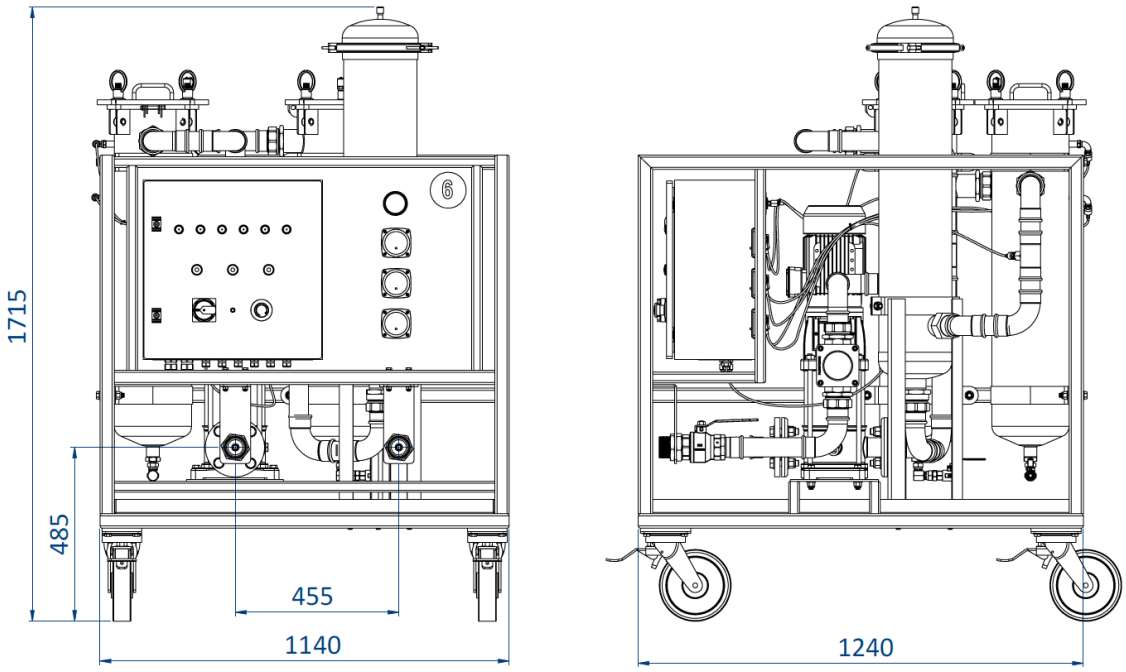
Specifications

Specification	Detail
Dimensions	(w)1240mm x (d)1140 mm x (h)1715 mm
Weight	180kg Approx
Finish	Powder coated: RAL 5004 Black Blue
Frame material	Plain Carbon Steel
Voltage	415 VAC 3P + N + E
Frequency	50 Hz ±2%
Current	16 Amp supply
Power	3 kW Pump & Motor
Duty cycle	Continuous
Noise level	<70dB @ 1 meter
Fluid compatibility	Water Glycol
Motor protection	Automatic thermal switch
Filtration	Particulate removal
System bypass	N/A
Filter indicators	Mechanical Gauge & Panel display
Operational Pressure	Up To 5 Bar
Fluid temperature	80°C Max
Flow	Approx 250 L/min
Fluid type	Water Glycol
Environment	IP55
Connections	2” BSPM c/w Ball Valve

Dimensions



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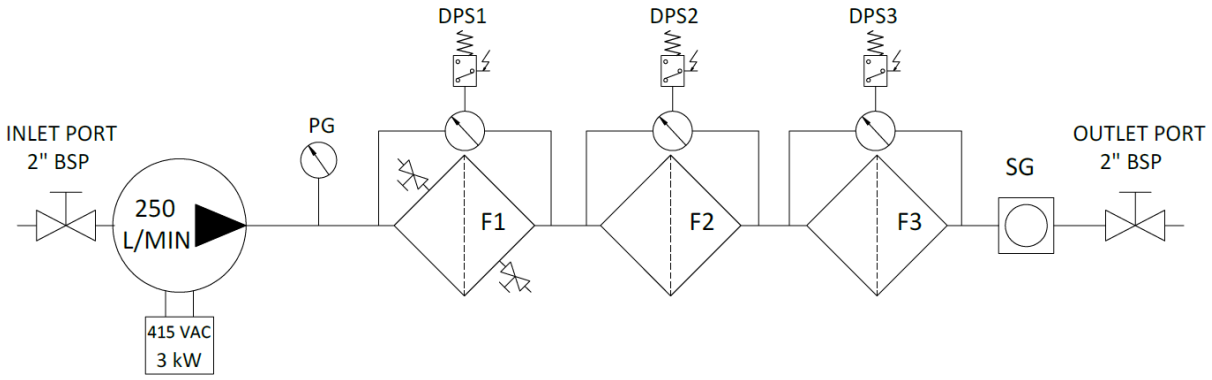
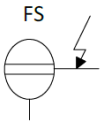
Fluid Circuit Diagram





KEY:

PGS	SYSTEM PRESSURE GUAGE
DPS1	DIFFERENTIAL PRESSURE SWITCH 1
DPS2	DIFFERENTIAL PRESSURE SWITCH 2
DPS3	DIFFERENTIAL PRESSURE SWITCH 3
F1	FILTER VESSEL 1
F2	FILTER VESSEL 2
F3	FILTER VESSEL 3
SG	SIGHT GLASS WITH SPINNER
FS	FLOAT SWITCH - ACTIVATES BUND ALARM

Product Overview

Hire Rig No: 6 is a water Glycol filtration system with mild steel frame construction Powder coated: RAL 5004 Black Blue, the pipework and other components are stainless steel.

The System operates on 415 VAC 3P + N + E via mains connection (16 AMP plug) and the multistage pump can deliver the contaminated fluid up to an impressive 250 L/min. The fluid is then passed through a 3-stage filtration process.

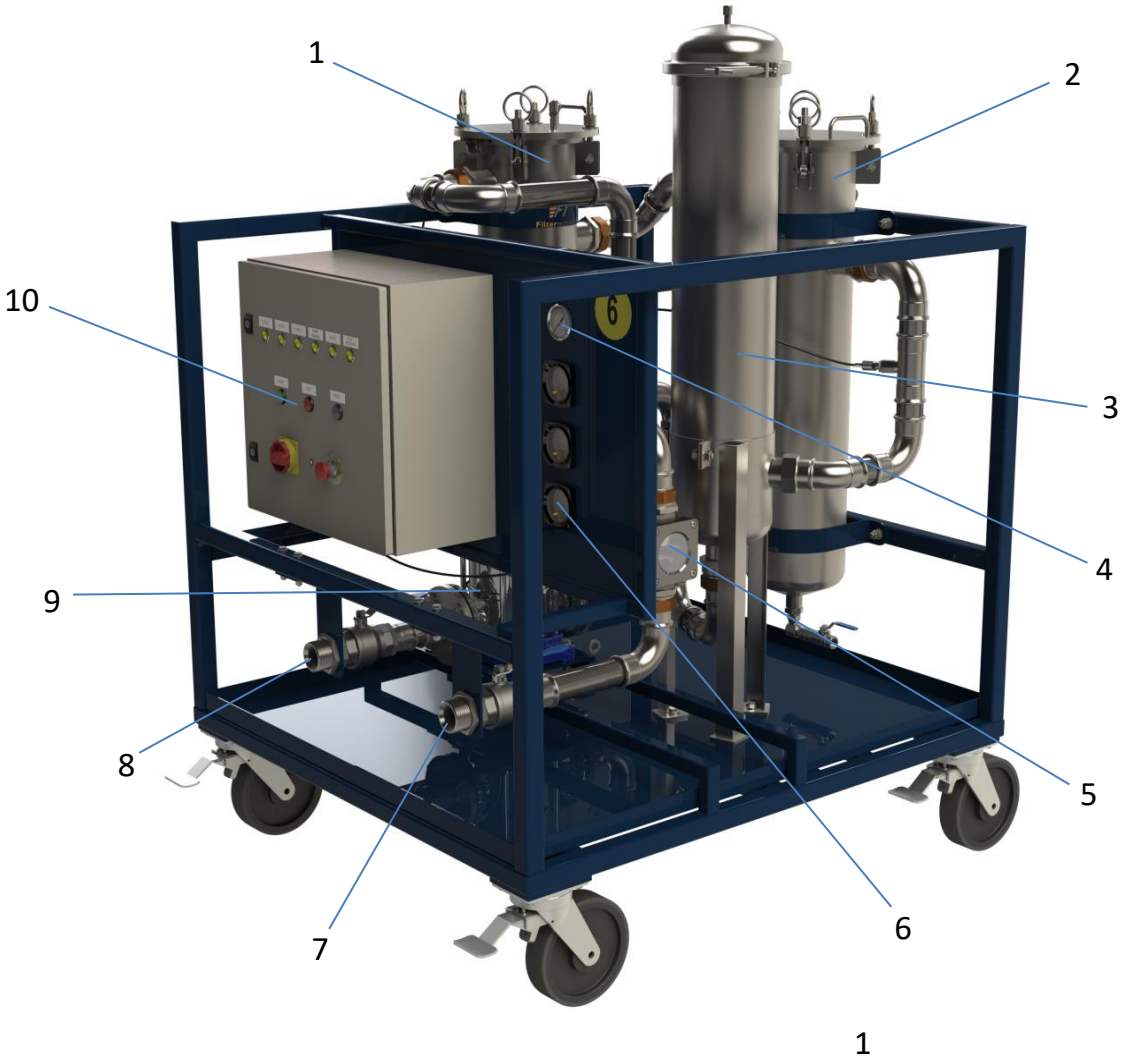
Stage 1 & 2 are size 2 filter bag vessels the final stage is a 3-stack filter housing (3 x 40” filter elements).

A flow site glass is fitted towards the outlet post filtration, which acts as a visual aid to the cleanliness of the fluid.

Health, Safety & Environmental Considerations

- This equipment should only be used for its intended purpose by competent and authorised persons, inappropriate use of electrical and mechanical equipment could cause serious injury or death.
- Children and minors should NEVER be permitted to operate or move this equipment.
- Do not attempt to open the electrical panel unless you are qualified to do so, risk of electric shock or death.
- Prolonged contact with oil or diesel fuel can cause damage to the skin. Appropriate PPE (personal protective equipment) should be worn when operating the unit e.g. protective gloves, safety glasses, safety shoes etc. Always observe local health and safety requirements.
- The unit should only be used on a flat, even surface and be attended at all times.
- Do not operate switches with wet hands.
- The unit must always be disconnected from the mains supply before carrying out any routine maintenance or repairs.
- Never start or stop the unit by inserting/removing the power supply or other plugs.
- Electrical cables and tubes should be checked for any signs of damage before starting the unit.
- Ensure a spill kit is available in case of any accidental spills.
- Used samples must be disposed of in accordance with local environmental requirements.
- Ensure any water drained from this equipment is disposed of in a responsible manner and in accordance with local environmental requirements.

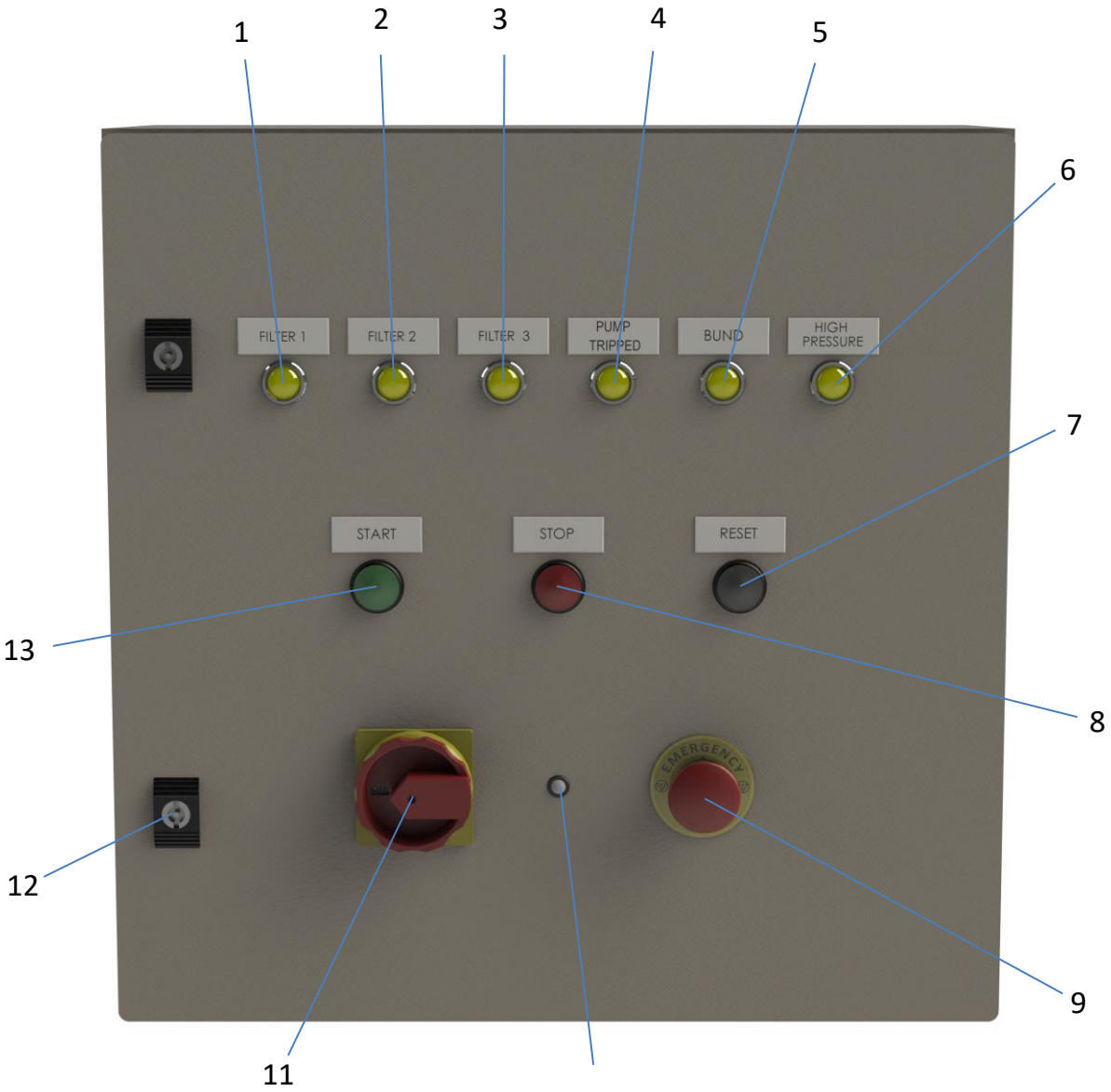
Component Identification:



Key:

1.) Size 2 Bag Filter Vessel – Stage 1 Filtration	7.) Inlet 2” BSPM Connection c/w Ball Valve
2.) Size 2 Bag Filter Vessel – Stage 2 Filtration	8.) Outlet 2” BSPM Connection c/w Ball Valve
3.) 3 x 40” Filter Vessel 2 – Stage 3 Filtration	9.) 250 L/min Vertical Multi Stage Pump
4.) System Pressure Gauge	10.) Control Panel
5.) Flow Sight Glass With Spinner	11.) Powder Coated Frame c/w Braked Wheels
6.) Differential Pressure Displays	

Control Panel layout



Key:

1.) Filter 1 Blocked Indicator (Amber)	8.) Stop Button (Red)
2.) Filter 2 Blocked Indicator (Amber)	9.) Emergency Stop Button (Twist to reset)
3.) Filter 3 Blocked Indicator (Amber)	10.) Isolator On Indicator (White)
4.) Pump Tripped Indicator (Amber)	11.) Mians Isolator (415 VAC 3P + N + E)
5.) Bund Alarm Indicator (Amber)	12.) Door Lock x 2
6.) High Pressure Indicator (Amber)	13.) Start Button (Green)
7.) Reset Button (Black)	

Operational Instructions

- Ensure the system is connected to a suitable 415 VAC 3P+N+E 16 Amp Supply & turn on the Isolator. The white LED will illuminate.
- Ensure All hoses and wet connections are attached.
- Ensure the correct filter elements are installed.
- To start the system press the 'START' button. The PUMP RUNNING LED will illuminate.
- To stop the system press the 'STOP' button. The pump will stop. The PUMP RUNNING LED will go out.

Fault Conditions

The following conditions will cause the pump to stop running and the FAULT Indicators to illuminate.

To start the pump after a fault condition, a manual reset is required. Correct the fault then press & hold 'RESET' button (BLACK) for 2 seconds.

1.)	FILTER 1	(Filter is blocked)	Indicator will illuminate.
2.)	FILTER 2	(Filter is blocked)	Indicator will illuminate.
3.)	FILTER 3	(Filter is blocked)	Indicator will illuminate.
4.)	PUMP TRIPPED	(The Thermal Overload of the pump is tripped)	Indicator will illuminate.
5.)	BUND	(The Float switch is activated in the bund)	Indicator will illuminate.
6.)	HIGH PRESSURE	(The system pressure exceeds safe limit)	Indicator will illumina

Any activation of the EMERGENCY STOP requires a manual reset of the system, this done by resetting the E-stop switch (Twist until it pops out) and pushing the illuminated EMERGENCY STOP OPERATED/RESET button.

Installation & Operating Instructions

Filter cell housing

This housing is suitable at the operating parameters stated, for all liquids classified as Group 2. This fluid group is as defined in the European Pressure Equipment Directive 97/23/EC.

Design Data:

Working temperature	110°C max
Maximum working pressure	10 Barg (liquid)
Connections	Inlet: The higher of the two larger connections Outlet: The lower of the two larger connections Vent: Located in the lid of the housing Drain: Located in the bottom

Installation:

Vent: Fit the blanking cap/plug (supplied) or the vent and gauge kit as appropriate to the lid. Seal with the aid of PTFE tape or an appropriate sealant as required.

Inlet/Outlet: Connect the inlet and outlet pipework to the housing connections.

For threaded connections use PTFE tape or an appropriate sealant as a seal. For flanged connections use a suitable gasket and for dairy connections use the correct sealing ring.

It is important that the pipe work to and from the filter is adequately supported

BEFORE OPERATING WE RECOMMEND THAT THE FILTER IS FLUSHED THOROUGHLY.
IMPORTANT SAFETY NOTES-PLEASE READ BEFORE USING THIS HOUSING

1.) Never attempt to open the housing whilst under pressure.
2.) Never operate the housing outside of its permitted operating parameters as stated (i.e. over pressure, under vacuum, over or under temperature).
3.) Housings using Vee clamps should not be used in cyclic pressure or shock load environments, or where highly viscous fluids could solidify the closure seal.
4.) For safety, it is recommended that a pressure relief device is installed in the system to prevent over-pressurisation.
5.) Never use the housing for fluids other than those it is rated for and ensure that the housing & seal materials are compatible with the process fluid.
6.) Care must be taken to protect operators from hot surfaces if the housing is being run at high temperatures.
7.) Failure of the filter housing could result from misuse - please ensure that these installation, operating & maintenance procedures are strictly adhered

The following factors have not been considered in the design of this housing, as they are either negligible or not considered appropriate for this product, unless specifically stated:

1.) Static pressure/head
2.) Traffic, wind and earthquake loading
3.) Decomposition effects of unstable fluids
4.) Creep, fatigue and corrosion allowances
5.) External fire

Operation:

IMPORTANT: ALWAYS ENSURE THAT THE SYSTEM IS NOT UNDER PRESSURE BEFORE OPENING THE HOUSING

Service:

Unscrew the clamp bolts with a suitable spanner. Swing the clamps clear of the cover. Remove the lid and 'O'- ring. Store them in a safe place where they cannot get dirty or damaged. Remove the basket compression plate.

Fitting the Perforated Basket

The housing is supplied with a perforated Cell support basket. There is an inner gasket fitted under the basket. Check the 'O'-ring groove and inner gasket for any damage, and place inner gasket in the groove. Place the basket into position ensuring that the inner gasket does not become dislodged.

Fitting the Filter Cells

Push the filter cell into the basket that is situated in the housing and check that the filter cell ring is fitted flush to the basket flare. Position the Cell compression plate onto the top of the Cell ring, with the large plate fitting against the Cell in the basket lip. This will compress the Cell and basket against the inner gasket.

Closing the Filter Housing - For housings with a Bolted closure

Check the housing top ring and groove, the 'O'-ring and lid for any dirt or damage. Clean away any foreign objects and replace defective parts as necessary.

Place the 'O'-ring into the groove at the top of the housing. Position the lid evenly over the housing ensuring the seal is not disturbed.

Swing the screw clamps up into position ensuring that the clamp locates correctly in the grooves on both the lid and housing top ring. Screw the clamps down evenly. Before tightening ensure the lid is set squarely on the housing top ring.

Finally nip down the screw clamps with a spanner in a diagonal basis across the filter housing. DO NOT over tighten.

Putting the Filter into Service

Ensure the inlet and outlet valves are shut. Ensure that the drain valves (if fitted) are closed or the drain plugs are fitted.

Open the vent valve or plug.

Gradually open the inlet valve on the upstream side of the filter housing whilst ensuring that the down stream valve remains closed.

As the housing fills, air will be expelled from the vent. When all the air has been expelled, fluid will begin to flow from the vent. For safety reasons, it is important to ensure that vent and drain connections are secure and that released fluid is disposed of to an appropriate drain or container. Appropriate measures should be taken if the liquid is hazardous.

Close the vent valve or plug, then slowly open the outlet valve-the filter is now in service and no attempt should be made to open the cover.

Regular venting of the housing, by opening the vent to permit any trapped air to vent to atmosphere, will maintain the operating efficiency of the filter. For safety reasons, it is important to ensure that venting is ONLY performed via a valve, that the valve is opened with extreme care and that released fluid is disposed of to an appropriate drain or container.

Appropriate measures should be taken if the liquid is hazardous.

The filter can be operated until the increase in the pressure differential across the filter Cell reaches approximately 1.5 bar

g (25psi), at this point the filter cell should be replaced.

Removing the Filter from Service

Close the outlet valve

Close the inlet valve

Caution- the filter cell housing will still be under pressure at this point.

Before opening the filter cell housing, the pressure must be relieved. This can be done either by carefully opening the vent valve or plug or the drain valve or plug, whichever is most appropriate.

Before opening the closure, open both the dirty drain and clean drain valves or plugs to allow all of the fluid to drain out of the housing. The vent must be open to allow the housing to drain properly.

If the fluid is hazardous, appropriate measures should be taken before opening the closure.

For safety reasons it is important to ensure that vent and drain connections (such as any valves or hoses) are secure and that released fluid is disposed of to an appropriate drain or container.

Replacing the Filter Cell Housings

Open the filter housing according to the instructions given in the section “Opening the filter housing” The new filter cells should be installed according to the instructions described under “Fitting the Filter Cells”.

Spent Filter Cell Disposal

The spent filter cells should be disposed of in a responsible manner. The filter itself can be disposed of by incineration or as landfill by an authorized contractor; however, it is important for the user to check how the contaminant contained in the filter should be disposed of.

Maintenance

The filter housing will require very little maintenance.

The outer surface should be kept clean and free from dirt. This will prevent contamination of the filter during Cell change

The Vee clamp should be maintained as follows:

A small amount of a suitable lubricant should be used on the sliding surfaces of the clamp. The ‘T’ bar thread must periodically greased. We recommend the use of a molybdenum based grease which will adhere to the thread. Binding of the thread could occur if they are not lubricated regularly.

Inspect the ‘O’-rings each time the filter housing is opened and replace as required.

The housing must be checked for any visible signs of corrosion or wear damage internally and externally on a routine basis.

Internal examination should be carried out via the housing clo

60 Series Filter Vessel

INSTALLATION & OPERATING INSTRUCTIONS

Design Data

HOUSING TYPE & SIZE	WORKING TEMP (°C)		MAX. WORKINIG PRESSURE (bar g)				FULL VACUUM	PED CAT.	EXCLUSIONS
	Min.	Max.	Liquid 2	Liquid 1	Gas 2	Gas 1			
61031; 61032; 61033 & 61034 (10" ; 20" ; 30" & 40")	-10	150	10	N/A	7.5	N/A	NO	1	EXPLOSIVE
61051; 61052; 61053 & 61054 (10" ; 20" ; 30" & 40")	-10	150	10	N/A	4.5	N/A	NO	1	EXPLOSIVE
61071; 61072; 61073 & 61074 (10" ; 20" ; 30" & 40")	-10	150	10	N/A	4.5	N/A	NO	1	EXPLOSIVE
61102;61103 & 61104 (20" ; 30" & 40")	-10	150	10	N/A	2	N/A	NO	1	EXPLOSIVE
61122; 61123; 61124 (20" ; 30" & 40")	-10	150	10	N/A	2	N/A	NO	1	EXPLOSIVE
61152; 61153; 61154 (20" ; 30" & 40")	-10	150	7	N/A	1.5	N/A	NO	1	EXPLOSIVE
61182 ; 61183 & 61184 (20"; 30" & 40")	-10	150	7	N/A	1.5	N/A	NO	1	EXPLOSIVE
62014GA (40")	-10	150	10	10	4.5	N/A	NO	1	EXPLOSIVE
62031; 62032; 62032 & 62034 (10" ; 20" ; 30" & 40")	-10	150	10	10	7.5	N/A	NO	1	EXPLOSIVE
62051; 62052; 62053 & 62054 (10" ; 20" ; 30" & 40")	-10	150	10	10	4.5	N/A	NO	1	EXPLOSIVE
62071; 62072 & 62073 (10" ; 20" & 30")	-10	150	10	10	4.5	N/A	No	1	EXPLOSIVE
62074 (40")	-10	150	10	10	4	N/A	NO	1	EXPLOSIVE
62102; 62103 & 62104 (20" ; 30" & 40")	-10	150	10	10	2	N/A	NO	1	EXPLOSIVE
62122; 62123 & 62124 (20" ; 30" & 40")	-10	150	10	10	2	N/A	No	1	EXPLOSIVE
62152; 62153 & 62154 (20" ; 30" & 40")	-10	150	7	7	1.5	N/A	No	1	EXPLOSIVE
62182; 62183 & 62184 (20" ; 30" & 40")	-10	150	7	7	1.5	N/A	NO	1	EXPLOSIVE
63032; 63033 & 63034 (20" ; 30" & 40")	-10	150	10	N/A	7.5	N/A	NO	1	EXPLOSIVE
63052; 63053 & 63054 (20" ; 30" & 40")	-10	150	10	N/A	4.5	N/A	NO	1	EXPLOSIVE
63072; 63073 & 63074 (20" ; 30" & 40")	-10	150	10	N/A	4.5	N/A	NO	1	EXPLOSIVE
63103 & 63104 (30" & 40")	-10	150	10	N/A	2	N/A	NO	1	EXPLOSIVE
63123 7 63124 (30" & 40")	-10	150	10	N/A	2	N/A	NO	1	EXPLOSIVE
63153 & 63154 (30" & 40")	-10	150	7	N/A	1.5	N/A	NO	1	EXPLOSIVE
63183 & 63184 (302 & 40")	-10	150	7	N/A	1.5	N/A	NO	1	EXPLOSIVE

64032; 64033 & 64034 (20" ; 30" & 40")	-10	150	10	10	7.5	N/A	NO	1	EXPLOSIVE
64052; 64053 & 64054 (20" ; 30" & 40")	-10	150	10	10	4.5	N/A	NO	1	EXPLOSIVE
64072 & 64073 (20" & 30")	-10	150	10	10	4.5	N/A	NO	1	EXPLOSIVE
64074 (40")	-10	150	10	10	4	N/A	NO	1	EXPLOSIVE
64103 & 64104 (30" & 40")	-10	150	10	10	2	N/A	NO	1	EXPLOSIVE
64123 & 64124 (30" &40")	-10	150	10	10	2	N/A	NO	1	EXPLOSIVE
65153 & 64154 (30" & 40")	-10	150	7	7	1.5	N/A	NO	1	EXPLOSIVE
64183 & 64184 (30" & 40")	-10	150	7	7	1.5	N/A	NO	1	EXPLOSIVE

These housings are suitable, at the operating parameters stated, for liquids and gasses as detailed in the Design Data table, These fluid groups are as defined in the European Pressure Directive 2014/68/EU.The housings meet the ATEX Directive 2014/34/EU Protection level CE Ex II 2 GD c X

ATEX Directive 2014/34/EU Protection Level

II 2 GD c X

Surface Temperature determined by process (Note 11)

Constructional Safety

For use in Gas/vapour/mist & dust atmospheres

Category 2 (Zone 1 and 21)

Equipment in this category is intended for use in areas in which explosive atmospheres caused by gases, vapours or air/dust mixtures are likely to occur

Non-mining products Group II

Declaration of Conformity

We declare that the products referred to in this document meet the requirements of the:

European Pressure Equipment Directive 2014/68/EU: Category I, assessment module A, refer to the design table.

ATEX Directive 2014/34/EU: equipment group II gases, vapours, mist and dust, equipment category 2 for use in explosive atmospheres Zone 1, Zone 2 and Zone 21, Zone 22.

Dossier lodged with TRaC.

Harmonised standards and other documents applied: EN1127-1, EN ISO 80079-37 & PD CLC/TR 6007932-1

This declaration is valid providing all conditions of safe use stated within the product manuals have been complied with and that the final equipment into which this product is installed has been re-assessed as required, in accordance with the essential health and safety requirements of the above standards, directives and statutory instruments and also installed in accordance with any applicable codes of practice.

Certificate of Conformity

We hereby certify that the products referred to in this document have been manufactured and tested in accordance with the requirements of the contract or purchase order and, unless otherwise stated, conform in all respects to the specifications relevant to these products.

Signed  Print: Neil Pizzey Position: Quality System Manager

Warranty:

FHD warrants the products described herein which are manufactured by FHO to be free from defects in material and workmanship for a period of (1) year from the date of shipment from FHO, under normal use and service. Its sole obligation under this warranty being limited to repairing or replacing, as herein after provided, at its option, any product found to FHO's satisfaction to be defective upon examination by it, provided that such product shall be returned for inspection to FHO's factory within (3) months after discovery of the defect. The repair or replacement of defective products will be made without change for parts or labour. This warranty shall not apply to (a) parts or products not manufactured by FHO, The warranty of such items being limited to the actual warranty extended to FHO by its supplier (b) any product that has been subject to abuse, negligence, accident or misapplication (c) any products altered or repaired by others than FHO; and (d) normal maintenance services and replacement service items (such as washers, gaskets and lubrication)made in with such service. To the extent permitted by English law, this limited warranty shall extend only to the buyer and any other person reasonably expected to use or consume the goods who is effected in person by any breach of the warranty. No action may be brought against FHO for an alleged breach of warranty unless such action instituted within (1) year from the date the cause of action accrues. This limited warranty shall be constructed and enforced to the fullest extend allowable by English law. Other than the obligation of FHO expressly set forth herein, FHO disclaims all warranties express or implied, including but not limited to any warranties of merchantability or fitness for a particular purpose, and any other obligation

Important Safety Notes

1. Never attempt to open the housing whilst under pressure. It is recommended that the user provides a suitable system to prevent opening under pressure
2. Never operate the housing outside of its permitted operating parameters as stated (i.e over pressure, under vacuum, over or under temperature).
3. Housings using Vee clamps should not be used in cyclic pressure or shock load environments, or where highly viscous fluids could solidify the closure seal.
4. For safety, it is the user's responsibility to ensure a suitable pressure relief device is installed into the system to prevent over-pressurisation.
5. Never use the housing for fluids other than those it is rated for and ensure that the housing & seal materials are compatible with the process fluid.
6. Care must be taken to protect operators from hot surfaces if the housing is being run at high temperatures.
7. Failure of the filter housing could result from misuse- please ensure that these installation, operating & maintenance procedures are strictly adhered to.
8. After shutdown leave the vessel to stand for 45 minutes before opening to allow for any static dissipation.
9. Minimum flow time after the filter to any open vessel to permit relaxation time (static dissipation) of non-conductive fluids must be greater than 100 seconds.
10. For safety, it is the users responsibility to ensure the housing is suitably bonded and earthed.
11. The surface temperature of the housing must not exceed the value shown above and 80% of the minimum ignition temperature of the gas atmosphere. For dust deposits the surface temperature must be 75% less than the minimum ignition temperature of the dust layer.

The following factors have not been considered in the design of this housing, as they are either negligible or not considered appropriate for this product, unless specifically stated.

1. Static pressure/head
2. Traffic, wind and earthquake loading
3. Decomposition effects of unstable fluids
4. Creep, fatigue and corrosion allowances
5. External fire

****

Connections

Inlet: The higher of the two larger connections

Outlet: The Lower of the two larger connections

Vent: Located in the lid of the housing

Dirty drain: Located in the inlet chamber of the housing (If applicable)

Clean drain: Located in the outlet chamber of the housing (If applicable)

Installation

Vent: Fit the blanking cap (Supplied) or the vent and gauge kit as appropriate, to the lid. Seal with the aid of PTFE tape or use an appropriate sealant as required.

Drains: Fit the blanking caps (Supplied) or drain valves as appropriate, to the drain connections. Seal With the aid of PTFE tape or use an appropriate sealant as required.

Inlet/Outlet: Connect the inlet and outlet pipework to the housing connections. For threaded connections use PTFE tape or an appropriate sealant as a seal. For flanged connections use a suitable gasket, and for dairy connections use the correct sealing ring.

It is important that the pipework to and from the filter is adequately supported

THE FILTER HOUSING MUST NOT BE USED AS A SUPPORT POINT.

BEFORE OPERATING WE RECOMMEND THAT THE FILTER IS FLUSHED THOROUGHLY

Operation

Opening the Filter Housing

If the filter housing has been in service, refer to the instruction given in the section “Removing the Filter from service”. Release the Vee clamp by undoing both the adjusters evenly. Remove the Vee clamp, lid and closure seal. Store them in a safe place where they cannot get dirty or damaged. Remove the compression plate and spring and seal assemblies as appropriate.

Fitting the Filter Cartridges

Inspect the seals at both ends of each cartridge (if fitted). Ensure there is no damage. Do not fit damaged cartridges. The cartridges are loaded into the housing through the top opening.

Note: 7, 12, 18 & 22 round housings are designed for maximum Ø66.5mm cartridges.

Fitting Double Open End Style (DOE) Cartridges

Locate each cartridge over the support guides fitted and push them firmly down onto the fixed pedestals located at the base of the guides. Position a spring and seal assembly in the top of each cartridge stack. When all are fitted, place the compression plate over the tie rod(s) and allow it to rest on the spring and seal assemblies. Screw the compression nuts evenly down on the tie rod(s) to compress the plate down onto the cartridge stacks. The compression nut(s) should be screwed down **Hand Tight** only. Approximately 15-20mm of spring compressio

Fitting Single Open End Style (SOE) Cartridges

Lubricate the 'o'-rings in the bottom end of the cartridge with clean water or product solution. Place one cartridge into each hole of the diaphragm plate. Push the cartridge down in position with a slight rotation ensuring that the fit feels firm and the cartridge remains in an upright position. Place the compression plate over the tie rod(s) and locate the spear at the top of each cartridge into one of the holes. Screw the compression nut(s) (with spring attached) down on the tie rod(s) by **Hand Only** to allow approximately 10mm free movement of the compression plate- note, many polymeric cartridges will expand at elevated temperatures- restricting the movement of the cartridges can cause damage! **Note:** This housing has two options for the filter cartridge O -ring bore – a pressed cup & a fully machined hole in the diaphragm plate. If the cartridge in use is an integrity testable grade, then the pressed cup version **must not** be used. It is imperative that the fully machined hole option is used.

Fitting Single Open End Style (Code 7) Cartridges

Lubricate the 'O'-rings in the bottom end of the cartridge with clean water or product solution. Place one cartridge into each hole of the diaphragm plate noting the position of the locking lugs. Push the cartridge down in position and rotate in a clockwise direction until the cartridge is locked in position under the lugs. Ensure that the fit feels firm and that the cartridge remains in an upright position. Place the compression plate over the tie rods and locate the spear at the top of each cartridge into one of the holes. Screw the compression nuts (with spring attached) down on the tie rods by **Hand Only** to allow approximately 10mm free movement of the compression plate – note, many polymeric cartridges will expand at elevated temperatures – restricting the movement of the cartridges can cause damage!

Closing the Filter Housing

Check the body of the flare, closure seal, lid and the Vee clamp for any dirt or damage. Clean away any foreign objects and replace defective parts as necessary.

Place the closure seal onto the flare at the top of the housing. Replace the lid.

The clamp has two adjusters, the normal open coupler that is to be placed at the front of the housing, and a second retained adjuster at the rear. These should be loosened before fitting the clamp around the cover lip and housing flare. A small amount of suitable lubricant can be used on the sliding faces of the clamp. Tighten both clamp adjusters evenly by **Hand Only** to ensure that there is even pressure by the clamp around the periphery of the housing and lid.

Putting the Filter into service

Ensure the inlet and outlet valves are shut. Ensure that the drain valve (if fitted) is closed or the drain plug is fitted. Open the vent valve or plug.

Gradually open the inlet valve on the upstream side of the filter housing whilst ensuring that the downstream valve remains closed.

As the housing fills, air will be expelled from the vent. When all the air has been expelled, fluid will begin to flow from the vent. For safety reasons, it is important to ensure that the vent and drain connections are secure and that released fluid is disposed of to an appropriate drain or container. Appropriate measures should be taken if the liquid is hazardous. Close the vent valve or plug, then slowly open the outlet valve – **The filter is now in service and no attempt should be made to open the closure.**

Regular venting of the housing, by opening the vent to permit any trapped air to be expelled, will maintain the operating efficiency of the filter. For safety reasons, it is important to ensure that venting is **ONLY** performed via a valve, that the valve is opened with extreme care and that released fluid is disposed of to an appropriate drain or container. Appropriate measures should be taken if the liquid is hazardous.

The filter can be operated until the increase in the pressure differential across the filter cartridge reaches approximately 1.5 bar g (25 psi); at this point the filter cartridges should be replaced.

Removing the Filter from service

Close the outlet valve

Close the inlet valve

Caution – the filter housing will still be under pressure at this point.

Before opening the filter housing, the pressure must be relieved. This can be done either by carefully opening the vent valve or plug or the drain valve or plug. Whichever is most appropriate.

Before opening the closure, open the drain valve or plug to allow all of the fluid to drain out of the housing. The vent must be open to allow the housing to drain properly.

If the fluid is hazardous, appropriate measures should be taken before opening the closure.

For safety reasons it is important to ensure that the vent and drain connections (such as any valves or hoses) are secure and that released fluid is disposed of to an appropriate drain or container.

Replacing the Filter Cartridges

Open the filter housing according to the instructions given in the section **"Opening the Filter Housing".**

Removal of Double Open End Style (DOE) Cartridges

Remove the spring and seal assemblies from the top of each cartridge. Remove the spent cartridges by sliding them off the guides.

Removal of Single Open End Style (SOE) Cartridges

Remove each cartridge from the diaphragm plate / pressed cup. Twisting and lifting each cartridge will assist in releasing the seal.

Removal of Single Open End Style (Code 7) Cartridges

Remove each cartridge from the diaphragm plate by rotating 45° in an anti-clockwise direction and then lifting to remove each cartridge.

The new cartridge should be installed according to the instructions described under **"Fitting the Filter Cartridges"**

Spent Cartridge Disposal

The spent filter cartridges should be disposed of in a responsible manner. The filter itself can be disposed of by incineration or as landfill by an authorised contractor, however, it is important for the user to check how the contaminant contained in the filter should be disposed of.

Maintenance

The filter housing will require very little maintenance.

The outer surface should be kept clean and free from dirt. This will prevent contamination of the filter during cartridge change.

The Vee clamp should be maintained as follows;

A small amount of suitable lubricant should be used on the sliding surfaces of the clamp. The 'T' bar thread **must** be periodically greased. We recommend the use of molybdenum based grease which will adhere to the thread. Binding of the threads could occur if they are not lubricated regularly.

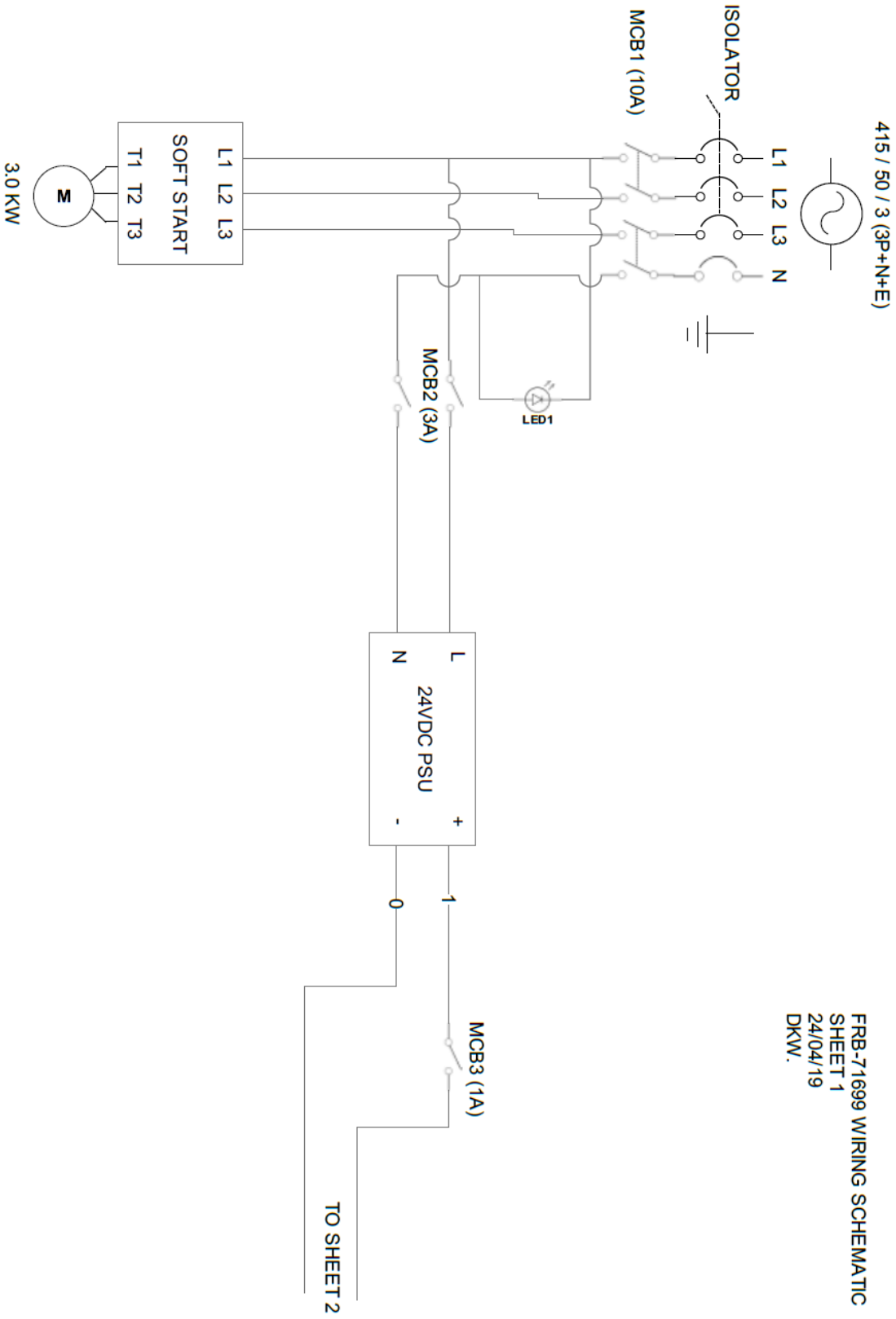
In the unlikely event of one or more of the compression nuts seizing up on a tie rod assembly. These can be removed by releasing the top section from the fixed bottom section of the tie rod. **Do Not** attempt to use the tie rod top section with the nut in place, as this will eventually lead to failure of the threads in the fixed section of the tie rod itself.

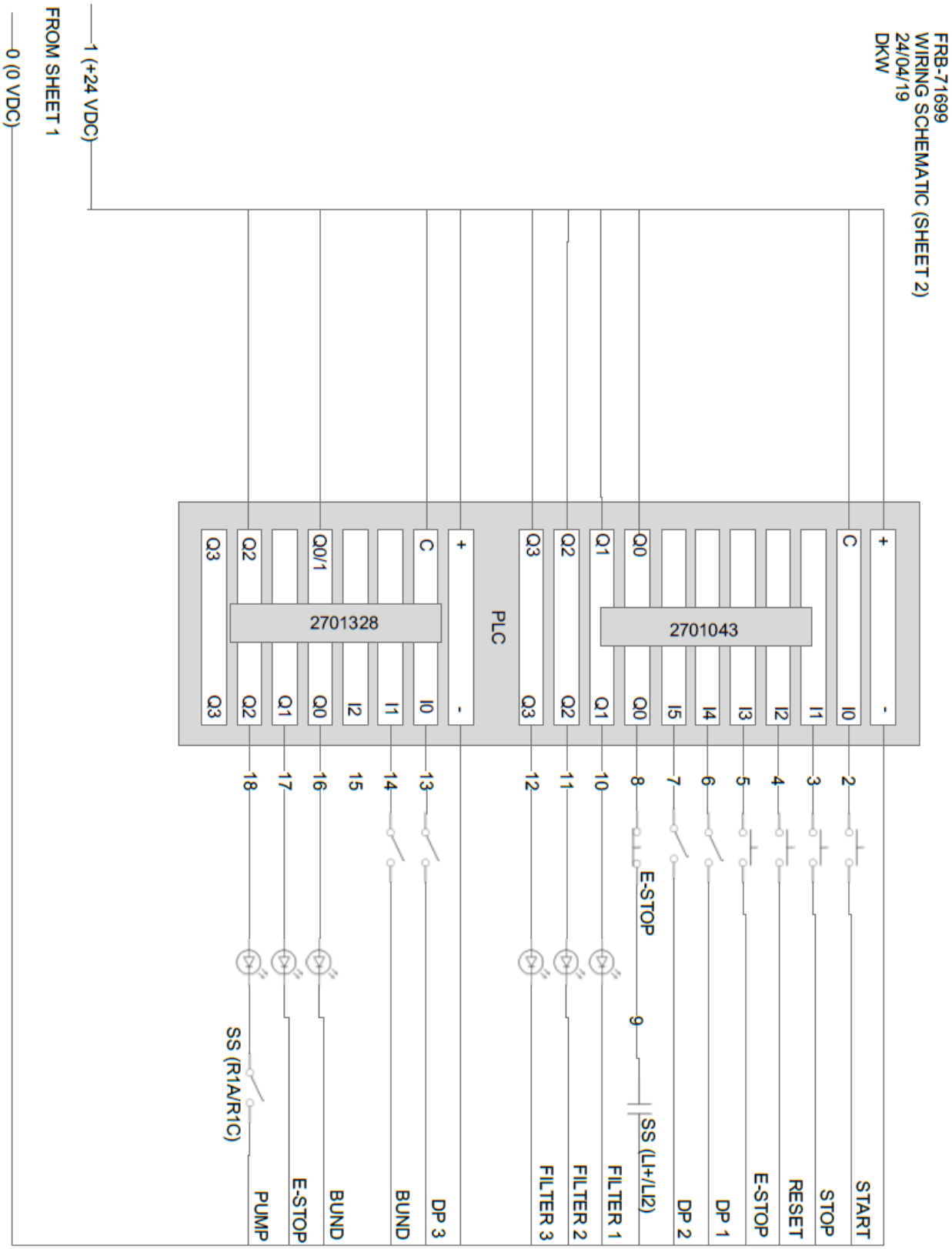
Inspect the closure seal each time the filter housing is opened and replace as required.

The housing must be checked for any visible signs of corrosion or wear damage internally and externally on a routine basis.

Internal examination should be carried out via the housing closure.

Electrical Schematic




FRB-71699
WIRING SCHEMATIC (SHEET 2)
24/04/19
DKW
FROM SHEET 1
1 (+24 VDC)
0 (0 VDC)
PLC
2701043
2701328
+
C
I0
I1
I2
I3
I4
I5
Q0
Q1
Q2
Q3
-
START
STOP
RESET
E-STOP
DP 1
DP 2
FILTER 1
FILTER 2
FILTER 3
SS (LI+/LI2)
E-STOP
BUND
BUND
DP 3
E-STOP
PUMP
SS (R1A/R1C)

Pump Information

e-SV™ SERIES - VERTICAL MULTISTAGE ELECTRIC PUMP
GENERAL INTRODUCTION

The e-SV pump is a non-self priming vertical multistage pump coupled to a standard motor.
The liquid end, located between the upper cover and the pump casing, is held in place by tie rods. The pump casing is available with different configurations and connection types.

MARKET SECTORS

- Civil
- Agricultural
- Light industry
- Water treatment
- Heating and air conditioning.

APPLICATIONS

- Handling of water, free of suspended solids, in the civil, industrial and agricultural sectors.
- Pressure boosting and water supply systems.
- Irrigation systems.
- Wash systems.
- Water treatment plants.
- Handling of moderately aggressive liquids, demineralised water, water and glycol, etc.
- Circulation of hot and cold water for heating, cooling and conditioning systems.
- Boiler feed.
- Pharmaceutical food & beverage industries.

❑ **LIQUID END MADE ENTIRELY OF STAINLESS STEEL IN THE 1, 3, 5, 10, 15, 22 m³/h STANDARD VERSION**

❑ **STANDARD MECHANICAL SEAL CAN BE REPLACED WITHOUT REMOVING THE MOTOR FROM THE PUMP (FOR 10, 15, 22, 33, 46, 66, 92, 125SV)**

❑ **STANDARD MOTOR**

❑ **CAN BE USED WITH THE HYDROVAR™ OR THE e-SM DRIVE CONTROL SYSTEM IN ORDER TO MANAGE THE OPERATION OF THE PUMP BASED ON THE SYSTEM CONDITIONS AND SAVE ENERGY**

SPECIFICATIONS

PUMP

- Delivery: up to **160 m³/h**.
- Head: up to **330 m**.
- Temperature of pumped liquid:
  - from -30°C to +120°C for standard version.
- Maximum operating **pressure**:
  - 1, 3, 5, 10, 15, 22SV with oval flanges: 16 bar (PN16) at 50°C.
  - 1, 3, 5, 10, 15, 22SV with round flanges or Victaulic®, Clamp or DIN 11851 connections: 25 bar (PN 25) at 50°C.
  - 33, 46SV: 16, 25, 40 bar (PN 16, PN 25 or PN 40) at 50°C.
  - 66, 92, 125SV: 16 or 25 bar (PN 16 or PN 25) at 50°C.
- Hydraulic performance compliant with ISO 9906:2012 - Grade 3B (ex ISO 9906:1999 - Annex A).
- Direction of rotation: clockwise looking at the pump from the top down (marked with an arrow on the adapter and on the coupling).

MOTOR

- Squirrel cage in short circuit, enclosed construction with external ventilation.
- IP55 protection.
- Class 155 (F) insulation.
- Performances according to EN 60034-1.
- Standard voltage:
  - Single-phase version: 220-240 V, 50 Hz.
  - Three-phase version: 220-240/380-415 V, 50 Hz for power up to 3 kW, 380-415/660-690 V, 50 Hz for power above 3 kW.

CHARACTERISTICS OF 1, 3, 5, 10, 15, 22SV SERIES

- Vertical multistage centrifugal pump. All metal parts in contact with the pumped liquid are made of stainless steel.
- The following versions are available:
  - **F**: round flanges, in-line delivery and suction ports, AISI 304.
  - **T**: oval flanges, in-line delivery and suction ports, AISI 304.
  - **R**: round flanges, delivery port above the suction port, with four adjustable positions, AISI 304.
  - **N**: round flanges, in-line delivery and suction ports, AISI 316.
  - **V**, **P**: Victaulic® couplings, in-line delivery and suction ports, AISI 316.
  - **C**: Clamp couplings (DIN 32676), in-line delivery and suction ports, AISI 316.
  - **K**: threaded couplings, (DIN 11851), in-line delivery and suction ports, AISI 316.
- Reduced axial thrusts enable the use of **standard motors** that are easily found in the market.
- Mechanical seal according to EN 12756 (ex DIN 24960) and ISO 3069 for 1, 3, 5SV and 10, 15, 22SV (≤ of 4 kW) series.
- **Balanced mechanical seal** according to EN 12756 (ex DIN 24960) and ISO 3069, which **can be replaced without removing the motor from the pump** for 10, 15 and 22SV (≥ of 5,5 kW) series.
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal.
- A second plug is available for 10, 15, 22SV series.
- Versions with round flanges that can be coupled to counter-flanges, according to EN 1092.
- Threaded, oval counter-flanges made of stainless steel are standard supply for the T versions.
- Round counter-flanges made of stainless steel are available on request for the F, R and N versions.
- Easy maintenance. No special tools required for assembly or disassembly.
- **The pumps for F, T, R, N versions are certified for drinking water use (WRAS and ACS certified)**.
- Standard version for temperatures ranging from -30°C to +120°C.

CHARACTERISTICS OF 33, 46, 66, 92, 125SV SERIES

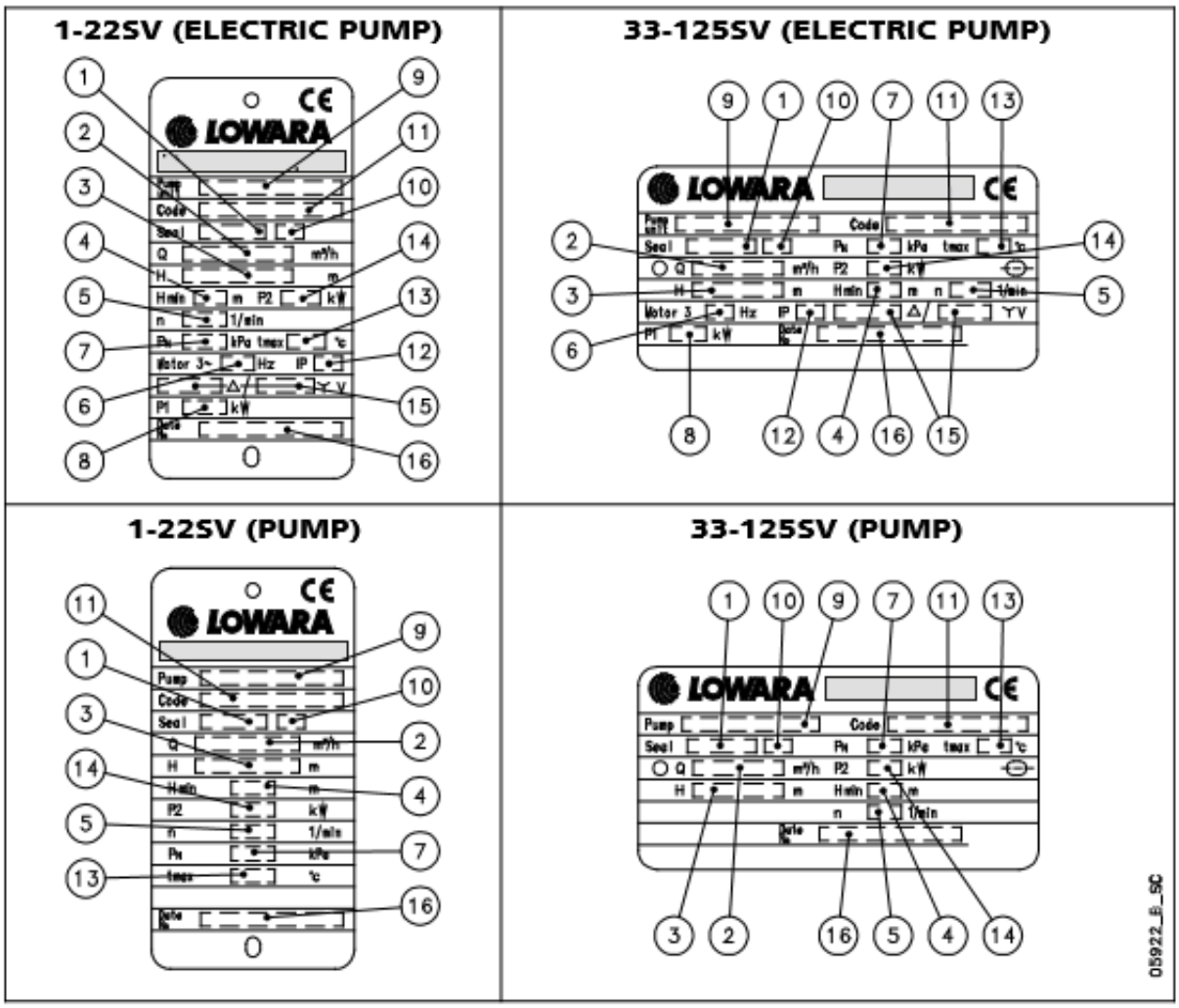
- The following versions are available:
  - **G**: vertical multistage centrifugal pump with impellers, diffusers and outer sleeve made entirely of stainless steel, and with pump casing and motor adaptor made of cast iron.
  - **N**, **P**: version made entirely of AISI 316 stainless steel.
- Innovative axial load compensation system on pumps with higher head. This ensures reduced axial thrusts and enables the use of **standard motors** that are easily found in the market.
- **Balanced mechanical seal** according to EN 12756 (ex DIN 24960) and ISO 3069, which **can be replaced without removing the motor from the pump**.
- Seal housing chamber designed to prevent the accumulation of air in the critical area next to the mechanical seal.
- **The pumps for G, N versions are certified for drinking water use (WRAS and ACS certified)**.
- Standard version for temperatures ranging from -30°C to +120°C.
- Pump body fitted with couplings for installing pressure gauges on both suction and delivery flanges.
- In-line ports with round flanges that can be coupled to counter-flanges, in compliance with EN 1092.
- Mechanical sturdiness and easy maintenance. No special tools required for assembly or disassembly.

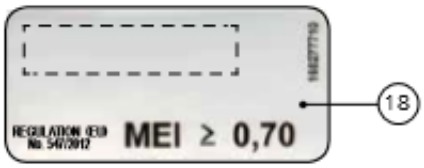
Inlet pressure of the pump plus static pressure of the water within the pump cannot exceed the nominal pressure (PN). Using different motors from those provided could limit inlet pressure.
In this event please contact customer services.

AVAILABLE ON REQUEST

Special versions are available to suit many applications. For details see page 136.

RATING PLATE

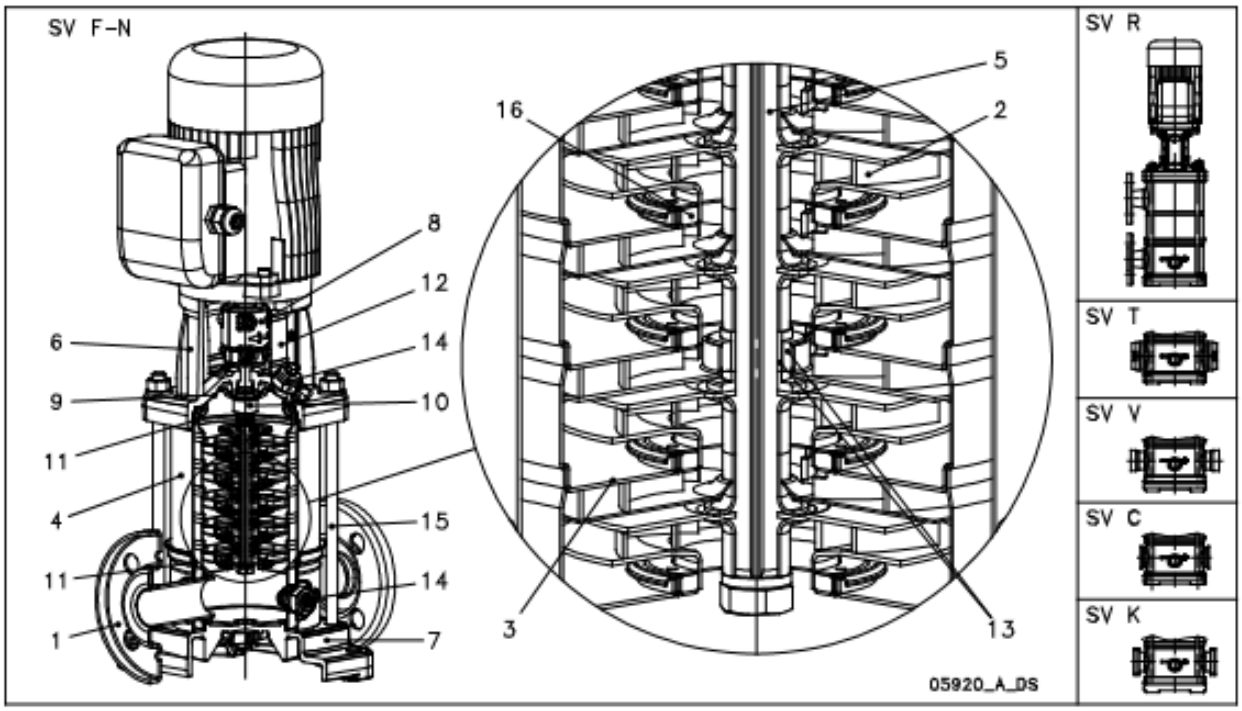




LEGEND

1 - Mechanical seal material identification code
2 - Capacity range
3 - Head range
4 - Minimum head (EN 60335-2-41)
5 - Speed
6 - Frequency
7 - Maximum operating pressure
8 - Electric pump unit absorbed power
9 - Pump / electric pump unit type
10 - O-ring material identification code
11 - Electric pump unit / pump part number
12 - Protection class
13 - Maximum operating liquid temperature (uses as EN 60335-2-41)
14 - Motor nominal power
15 - Rated voltage range
16 - Serial number (date + progressive number)
17 - Maximum operating liquid temperature (uses other than EN 60335-2-41)
18 - MEI label (Regulation (EU) n. 547/2012)

1, 3, 5SV SERIES and 10, 15, 22SV SERIES ≤ 4 kW
ELECTRIC PUMP CROSS SECTION AND MAIN COMPONENTS



F, T, R VERSIONS

REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
2	Impeller	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
3	Diffuser	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
4	Outer sleeve	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
5	Shaft	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
6	Adapter	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
7	Base	Aluminium	EN 1706-AC-AlSi11Cu2 (Fe) (AC46100)	-
8	Coupling	Aluminium	EN 1706-AC-AlSi11Cu2 (Fe) (AC46100)	-
9	Seal housing	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
10	Mechanical seal	Silicon carbide / Carbon / EPDM		
11	Elastomers	EPDM		
12	Coupling protection	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
13	Shaft sleeve and bushing	Tungsten carbide		
14	Fill / drain plugs	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
15	Tie rods	Galvanized steel	EN 10277-3-36SMnPb14 (1.0765)	
16	Wear ring	Technopolymer PPS		

1-22sv-ftr-en_a_tm

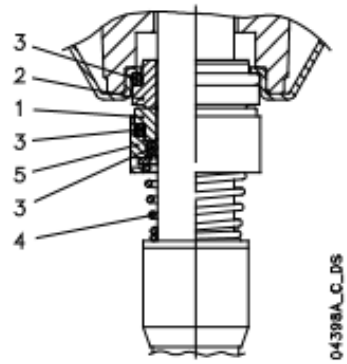
N, V, C, K VERSIONS

REF. N.	NAME	MATERIAL	REFERENCE STANDARDS	
			EUROPE	USA
1	Pump body	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
2	Impeller	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
3	Diffuser and upper spacer	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
4	Outer sleeve	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
5	Shaft	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
6	Adapter	Cast iron	EN 1561-GJL-250 (JL1040)	ASTM Class 35
7	Base	Aluminium	EN 1706-AC-AlSi11Cu2 (Fe) (AC46100)	-
8	Coupling	Aluminium	EN 1706-AC-AlSi11Cu2 (Fe) (AC46100)	-
9	Seal housing	Stainless steel	EN 10088-1-X2CrNiMo17-12-2 (1.4404)	AISI 316L
10	Mechanical seal	Silicon carbide / Carbon / EPDM		
11	Elastomers	EPDM		
12	Coupling protection	Stainless steel	EN 10088-1-X5CrNi18-10 (1.4301)	AISI 304
13	Shaft sleeve and bushing	Tungsten carbide		
14	Fill / drain plugs	Stainless steel	EN 10088-1-X5CrNiMo17-12-2 (1.4401)	AISI 316
15	Tie rods	Stainless steel	EN 10088-1-X17CrNi16-2 (1.4057)	AISI 431
16	Wear ring	Technopolymer PPS		

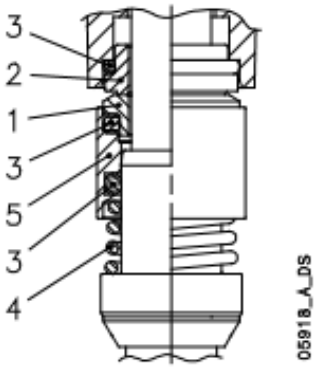
1-22sv-nvck-en_a_tm

e-SV™ SERIES
MECHANICAL SEALS, ACCORDING TO EN 12756

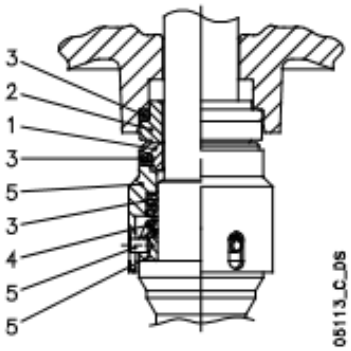
1, 3, 5SV (all models)
10, 15, 22SV ≤ 4 kW



10, 15, 22SV ≥ 5,5 kW



33, 46, 66, 92, 125SV



LIST OF MATERIALS

POSITION 1 - 2	POSITION 3	POSITION 4 - 5
Q_1 : Silicon Carbide	E : EPDM	G : AISI 316
B : Resin impregnated carbon	V : FKM (FPM)	
C : Special resin impregnated carbon	T : PTFE	

sv_ten-mec-en_b_tm

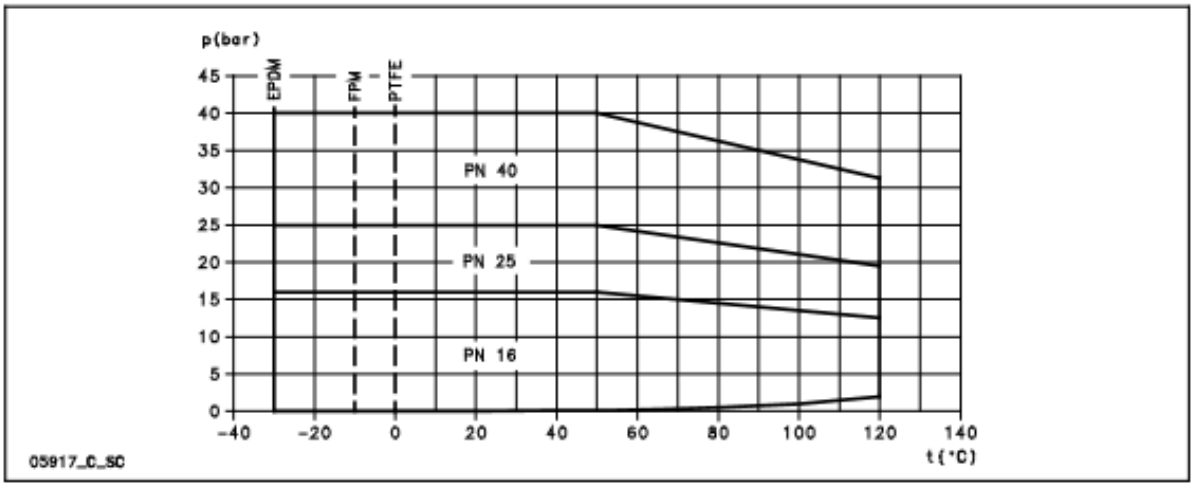
TYPE OF SEAL

TYPE	POSITION 1 ROTATING PART	POSITION 2 STATIONARY PART	POSITION 3 ELASTOMERS	POSITION 4 SPRINGS	POSITION 5 OTHER COMPONENTS	TEMPERATURE (°C)
STANDARD MECHANICAL SEAL						
Q_1 B E G G	Q_1	B	E	G	G	-30 +120
OTHER TYPES OF AVAILABLE MECHANICAL SEAL						
Q_1 Q_1 E G G	Q_1	Q_1	E	G	G	-30 +120
Q_1 B V G G	Q_1	B	V	G	G	-10 +120
Q_1 Q_1 V G G	Q_1	Q_1	V	G	G	-10 +120
*Q_1 C T G G	Q_1	C	T	G	G	0 +120
*Q_1 Q_1 T G G	Q_1	Q_1	T	G	G	0 +120

* Versions with anti-rotation lock pin of the fixed part.

sv_tipi-ten-mec-en_b_tc

PRESSURE/TEMPERATURE APPLICATION LIMITS FOR COMPLETE PUMP (APPLICABLE WITH ANY OF THE SEALS LISTED ABOVE)



Filtertechnik

LOWARA
a xylem brand

ErP 2009/125/EC

e-SV™ SERIES MOTORS

With the "Energy using Products" (EuP 2005/32/EC) and "Energy related Products" (ErP 2009/125/EC) directives, the European Commission has established requirements for promoting the use of products with low power consumption.

The various products considered include **three-phase 50 Hz surface motors with power outputs ranging from 0,75 to 375 kW**, also when integrated with other products, with characteristics as defined by the specific **Regulations (EC) No 640/2009** and **(EU) No 4/2014** implementing the requirements of the EuP and ErP Directives.

In accordance with regulations, the **three-phase 50 Hz surface motors with power outputs ranging from 0,75 to 375 kW** have a IE3 as minimum level of efficiency or IE2 fitted with variable speed drive. IE2 motor can be supplied without frequency converter as the obligation to have that device is related to when motor works and not when is placed on the market.

e-SV electric pumps are equipped with standard motors.

- Short-circuit squirrel-cage motor, enclosed construction with external ventilation (TEFC).
- **IP55** protection degree.
- Insulation class **155 (F)**.
- Electrical performances according to EN 60034-1.
- **Supplied IE3 three-phase surface motors ≥ 0,75 kW as standard**.
- IE efficiency level according to EN 60034-30:2009 and IEC 60034-30-1:2014 (≥ 0,75 kW).
- Metric cable gland according to EN 50262.
- PTC included in motors from 30 to 55 kW (one per phase, 155°C).

- **Single-phase** version:
  0,37 to 2,2 kW (2-pole)
  220-240 V 50 Hz
  Built-in automatic reset overload protection up to 1,5 kW.
  For higher powers the protection must be provided by the user.
- **Three-phase** version:
  0,37 to 55 kW (2-pole)
  220-240/380-415 V 50 Hz for power up to 3 kW.
  380-415/660-690 V 50 Hz for power above 3 kW.
  Overload protection to be provided by the user.

SINGLE-PHASE MOTORS AT 50 Hz, 2-POLE

P_N kW	MOTOR TYPE	IEC SIZE*	Construction Design	INPUT CURRENT In (A) 220-240 V	CAPACITOR µF	CAPACITOR V	DATA FOR 230 V 50 Hz VOLTAGE min^{-1}	Is / In	η %	cosφ	Tn Nm	Ts/Tn	Tm/Tn
0,37	SM71RB14/104	71R	V18/B14	2,79-2,85	14	450	2745	2,64	65,1	0,96	1,39	0,68	1,63
0,55	SM71B14/105	71		3,76-3,99	16	450	2820	3,72	68,9	0,91	1,86	0,61	2,00
0,75	SM80RB14/107	80R		4,90-4,85	20	450	2765	3,42	70,1	0,96	2,59	0,58	1,75
1,1	SM80B14/111	80		6,88-6,65	30	450	2800	3,89	74,7	0,96	3,75	0,46	1,72
1,5	SM90RB14/115	90R		9,21-8,58	40	450	2810	4,00	76,1	0,98	5,09	0,39	1,74
2,2	PLM90B14/122	90		12,5-11,6	70	450	2825	4,47	82,4	0,97	7,43	0,53	1,87

* R = Reduced size of motor casing as compared to shaft extension and flange.

1-22sv-motm-2p50-en_b_te

Filtertechnik

LOWARA
a xylem brand

ErP 2009/125/EC

e-SV™ SERIES MOTORS

With the "Energy using Products" (EuP 2005/32/EC) and "Energy related Products" (ErP 2009/125/EC) directives, the European Commission has established requirements for promoting the use of products with low power consumption.

The various products considered include **three-phase 50 Hz surface motors with power outputs ranging from 0,75 to 375 kW**, also when integrated with other products, with characteristics as defined by the specific **Regulations (EC) No 640/2009** and **(EU) No 4/2014** implementing the requirements of the EuP and ErP Directives.

In accordance with regulations, the **three-phase 50 Hz surface motors with power outputs ranging from 0,75 to 375 kW** have a IE3 as minimum level of efficiency or IE2 fitted with variable speed drive. IE2 motor can be supplied without frequency converter as the obligation to have that device is related to when motor works and not when is placed on the market.

e-SV electric pumps are equipped with standard motors.

- Short-circuit squirrel-cage motor, enclosed construction with external ventilation (TEFC).
- **IP55** protection degree.
- Insulation class **155 (F)**.
- Electrical performances according to EN 60034-1.
- **Supplied IE3 three-phase surface motors ≥ 0,75 kW as standard**.
- IE efficiency level according to EN 60034-30:2009 and IEC 60034-30-1:2014 (≥ 0,75 kW).
- Metric cable gland according to EN 50262.
- PTC included in motors from 30 to 55 kW (one per phase, 155°C).

- **Single-phase** version:
  0,37 to 2,2 kW (2-pole)
  220-240 V 50 Hz
  Built-in automatic reset overload protection up to 1,5 kW.
  For higher powers the protection must be provided by the user.
- **Three-phase** version:
  0,37 to 55 kW (2-pole)
  220-240/380-415 V 50 Hz for power up to 3 kW.
  380-415/660-690 V 50 Hz for power above 3 kW.
  Overload protection to be provided by the user.

SINGLE-PHASE MOTORS AT 50 Hz, 2-POLE

P_N kW	MOTOR TYPE	IEC SIZE*	Construction Design	INPUT CURRENT In (A) 220-240 V	CAPACITOR µF	CAPACITOR V	DATA FOR 230 V 50 Hz VOLTAGE min⁻¹	Is / In	η %	cosφ	Tn Nm	Ts/Tn	Tm/Tn
0,37	SM71RB14/104	71R	V18/B14	2,79-2,85	14	450	2745	2,64	65,1	0,96	1,39	0,68	1,63
0,55	SM71B14/105	71		3,76-3,99	16	450	2820	3,72	68,9	0,91	1,86	0,61	2,00
0,75	SM80RB14/107	80R		4,90-4,85	20	450	2765	3,42	70,1	0,96	2,59	0,58	1,75
1,1	SM80B14/111	80		6,88-6,65	30	450	2800	3,89	74,7	0,96	3,75	0,46	1,72
1,5	SM90RB14/115	90R		9,21-8,58	40	450	2810	4,00	76,1	0,98	5,09	0,39	1,74
2,2	PLM90B14/122	90		12,5-11,6	70	450	2825	4,47	82,4	0,97	7,43	0,53	1,87

* R = Reduced size of motor casing as compared to shaft extension and flange.

1-22sv-motm-2p50-en_b_te

e-SV™ SERIES
THREE-PHASE MOTORS AT 50 Hz, 2-POLE (from 30 to 55 kW)

P_N kW	Efficiency η_N % Δ 380 V Y 660 V 4/4	3/4	2/4	Δ 400 V Y 690 V 4/4	3/4	2/4	Δ 415 V 4/4	3/4	2/4	IE	Year of manufacture
30	94,0	94,0	93,1	94,1	94,0	92,8	94,2	93,9	92,6	3	From 11/2014
37	94,4	94,0	93,5	94,6	94,0	93,3	94,7	93,9	93,1		
45	94,8	94,9	94,6	95,1	95,1	94,6	95,3	95,2	94,5		
55	95,1	95,0	94,9	95,4	95,3	94,9	95,5	95,3	94,8		

P_N kW	Manufacturer WEG Equipamentos Eletricos S.A. Reg. No. 07.175.725/0010-50 Jaragua do Sul - SC (Brazil) Model	IEC SIZE	Construction Design	N. of Poles	f_N Hz	Data for 400 V / 50 Hz Voltage cosφ	Is / I_N	T_N Nm	Ts/T_N	Tm/Tn
30	W22 200L V1 30KW E3	200	V1	2	50	0,86	7,30	96,60	2,60	2,90
37	W22 200L V1 37KW E3	200				0,86	7,30	119,2	2,60	2,90
45	W22 225S/M V1 45KW E3	225				0,88	8,00	144,7	2,70	3,20
55	W22 250S/M V1 55KW E3	250				0,89	7,90	177,1	2,80	2,90

P_N kW	Voltage U_N V Δ 380 V	400 V	415 V	Y 660 V	690 V	I_N (A)	n_N min^{-1}	See note.	Operating conditions ** Altitude Above Sea Level (m)	T. amb min/max °C	ATEX
30	55,1	53,5	52,7	31,7	31,0		2960 ÷ 2970		≤ 1000	-15 / 40	No
37	67,7	65,6	64,7	39,0	38,0		2960 ÷ 2970				
45	80,1	77,6	74,6	46,1	45,0		2965 ÷ 2970				
55	97,6	93,5	91,0	56,2	54,2		2960 ÷ 2965				

** Operating conditions to be referred to motor only. About electric pump, refer to limits in user's manual.

sv-IE3-mott55-2p50-en_a_te

Note: Observe the regulations and codes locally in force regarding sorted waste disposal.

MOTOR NOISE 2-POLE MOTORS

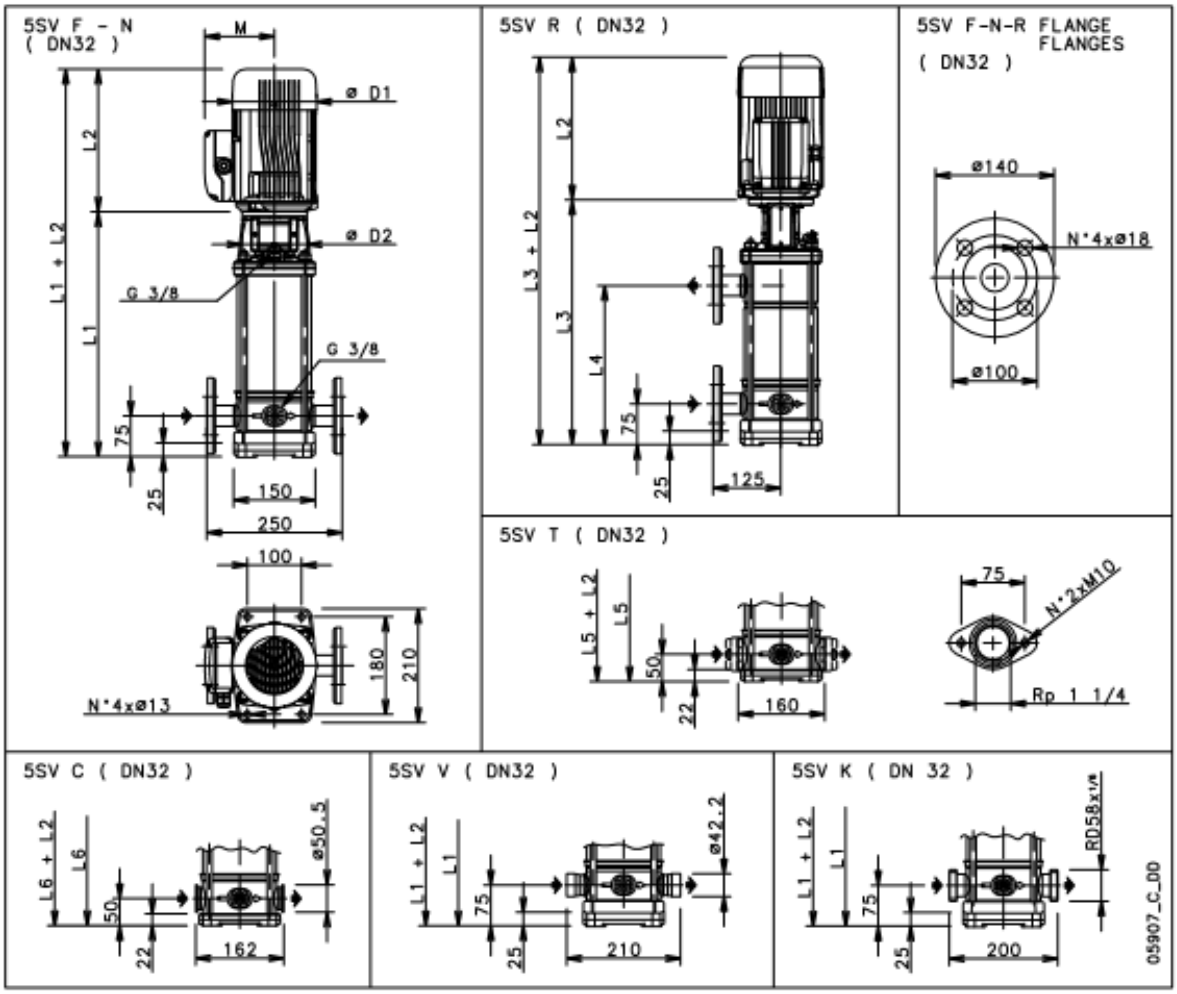
POWER kW	MOTOR TYPE IEC SIZE*	NOISE LpA dB
0,37	71R	<70
0,55	71	<70
0,75	80-80R	<70
1,1	80	<70
1,5	90-90R	<70
2,2	90	<70
3	100R	<70
4	112R	<70
5,5	132R	<70
7,5	132	71
11	160R	73
15	160	71
18,5	160	73
22	180R	70
30	200	72
37	200	72
45	225	75
55	250	75

*R = Reduced motor casing size with respect to shaft extension and related flange.

1-125sv_mott_2p50-en_b_tr

The table show the mean sound pressure (Lp) measured as per Curve A (Standard ISO 1680). Noise values were measured with the 50 Hz motor running idle with a tolerance of 3 dB (A).

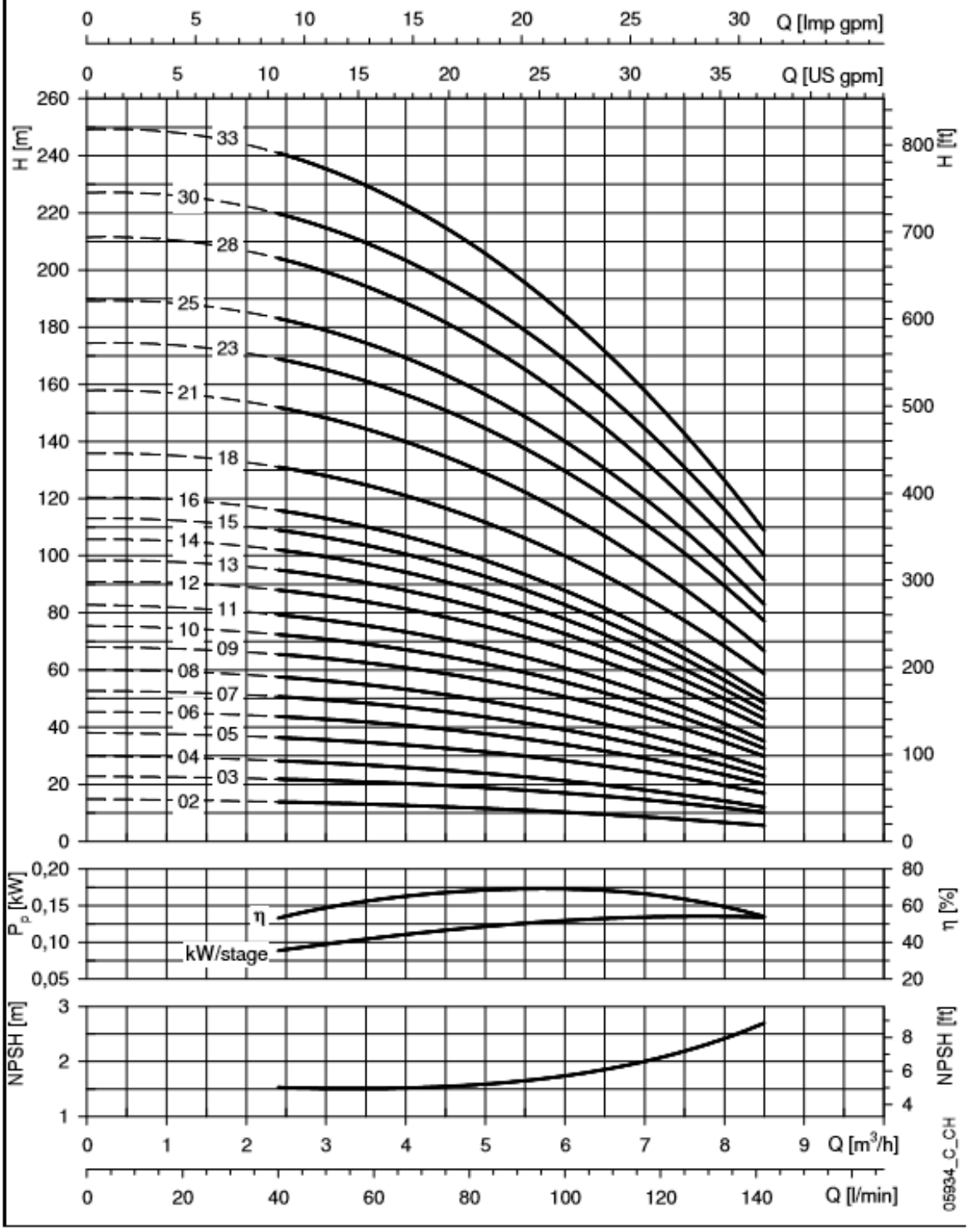
5SV SERIES
DIMENSIONS AND WEIGHTS AT 50 Hz, 2 POLES



PUMP TYPE	MOTOR		DIMENSIONS (mm)													WEIGHT kg	
				L2						M		D1				ELECTRIC
	kW	SIZE	L1	1 ~	3 ~	L3	L4	L5	L6	1 ~	3 ~	1 ~	3 ~	D2	PUMP	PUMP
5SV02..	0,37	71	268	209	209	-	-	243	243	111	111	120	120	105	8,4	13,2
5SV03..	0,55	71	293	231	231	-	-	268	268	121	121	140	140	105	8,9	15,7
5SV04..	0,55	71	318	231	231	-	-	293	293	121	121	140	140	105	9,4	16,1
5SV05../D	0,75	80	353	226	263	-	-	328	328	121	129	140	155	120	10,5	20,1
5SV06../D	1,1	80	378	263	263	-	-	353	353	137	129	155	155	120	11	22,4
5SV07../D	1,1	80	403	263	263	403	242	378	378	137	129	155	155	120	11,5	22,9
5SV08../D	1,1	80	428	263	263	428	267	403	403	137	129	155	155	120	12,1	23,5
5SV09../D	1,5	90	463	263	263	463	292	438	438	137	129	155	155	140	12,7	26
5SV10../D	1,5	90	488	263	263	488	317	463	463	137	129	155	155	140	13,1	26,5
5SV11../D	1,5	90	513	263	263	513	342	488	488	137	129	155	155	140	13,6	27
5SV12../D	2,2	90	538	298	298	538	367	513	513	151	134	174	174	140	14,1	32,3
5SV13../D	2,2	90	563	298	298	563	392	538	538	151	134	174	174	140	14,6	32,8
5SV14../D	2,2	90	588	298	298	588	417	563	563	151	134	174	174	140	15	33,2
5SV15../D	2,2	90	613	298	298	613	442	588	588	151	134	174	174	140	15,5	33,7
5SV16../D	2,2	90	638	298	298	638	467	613	613	151	134	174	174	140	16	34,2
5SV18../D	3	100	698	-	298	698	517	673	673	-	134	-	174	160	18	39
5SV21../D	3	100	773	-	298	773	592	748	748	-	134	-	174	160	19,4	40,4
5SV23../D	4	112	823	-	319	823	642	-	798	-	154	-	197	160	20,4	47
5SV25../D	4	112	873	-	319	873	692	-	848	-	154	-	197	160	21,3	48
5SV28../D	4	112	948	-	319	948	767	-	923	-	154	-	197	160	23	49,4
5SV30../D	5,5	132	1018	-	375	1018	817	-	993	-	168	-	214	300	28,1	65,7
5SV33../D	5,5	132	1093	-	375	1093	892	-	1068	-	168	-	214	300	29,5	67,1

5SV SERIES
OPERATING CHARACTERISTICS AT 50 Hz, 2 POLES

5SV	~ 2900 [rpm]	ISO 9906:2012 - Grade 3B



These performances are valid for liquids with density ρ = 1.0 Kg/dm³ and kinematic viscosity ν = 1 mm²/sec.

Warranty Statement

All products manufactured or distributed by Filtertechnik Ltd are subject to the following, and only the following, Limited Express Warranties, and no others:

For a period of one (1) year from and after the date of delivery of a new Filtertechnik product, Filtertechnik warrants and guarantees only to the original purchaser/user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to ninety (90) days from the date of delivery. A product claimed to be defective must be returned to the place of purchase. Filtertechnik, at its sole option, shall replace the defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product damaged or impaired by external forces or used for any purpose other than that for which it was originally sold.

THIS IS THE EXTENT OF WARRANTIES AVAILABLE ON THIS PRODUCT. FILTERTECHNIK SHALL HAVE NO LIABILITY WHATSOEVER FOR CONSEQUENTIAL DAMAGES FOLLOWING THE USE OF ANY DEFECTIVE PRODUCT OR BY REASON OF THE FAILURE OF ANY PRODUCT. FILTERTECHNIK SPECIFICALLY DISAVOWS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE (EXCEPT FOR THOSE WHICH APPLY TO PRODUCT OR PART THEREOF THAT IS USED OR BOUGHT FOR USE PRIMARILY FOR PERSONAL, FAMILY OR HOUSEHOLD PURPOSES), WARRANTIES OF DESCRIPTION, WARRANTIES OF MERCHANTABILITY, TRADE USE OR WARRANTIES OF TRADE USAGE.

EC DECLARATION OF CONFORMITY

Machinery Description

Machine Type:	HIRE RIG No:6
Serial Number:	FT023471-01

Applicable directives

Low voltage Directive 73/23/EEC (as amended by 93/68/EEC)
Electromagnetic Compatibility Directive 2004/108/EC
Machinery Directive 98/37/EC

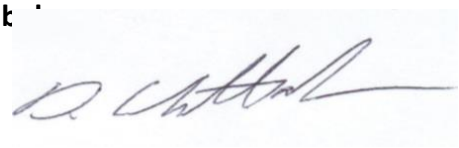
Declaration

We, Filtertechnik Limited, declare that the above referenced product(s), to which the declaration relates, is in conformity with the provisions of the Directives listed above

IMPORTANT

This declaration is only valid when the machinery has been installed, operated and maintained in accordance with the applicable installation, Operation and Maintenance Instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.

The technical construction file for this product is maintained at the address given b



Mr D Whittaker, Engineering Director
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